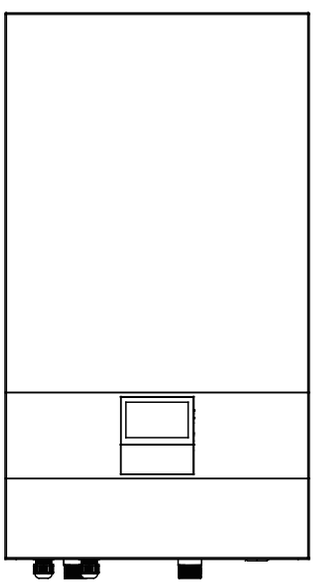
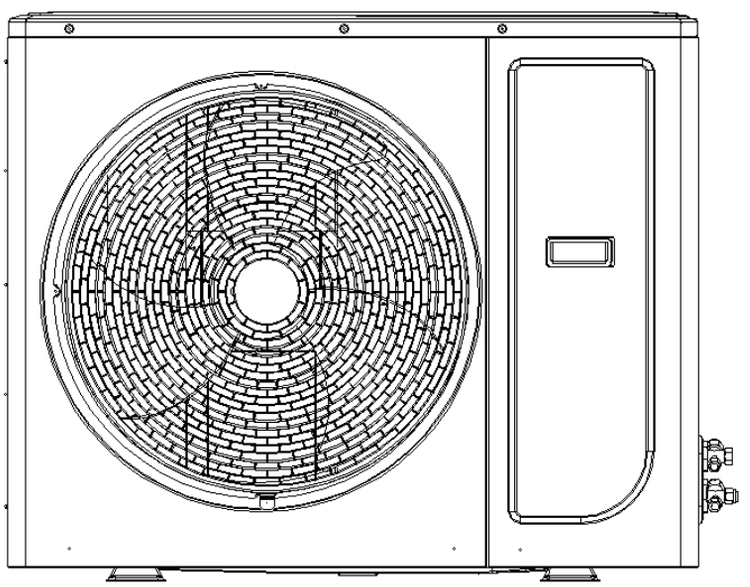
DC INVERTER AIR SOURCE HEAT PUMP SPLIT SYSTEM

- Instructions Manual -

Original instructions
Intended for commercial use



Indoor Unit



Outdoor Unit

Indoor Unit Models:
KFS-40B/EN8BP, KFS-60B/EN8BP, KFS-80B/EN8BP, KFS-100B/EN8BP
KFS-120B/EN8BP, KFS-140B/EN8BP, KFS-160B/EN8BP, KFS-100B/EN8SBP
KFS-120B/EN8SBP, KFS-140B/EN8SBP, KFS-160B/EN8SBP

Outdoor Unit Models:
KFS-40W/N8BP, KFS-60W/N8BP, KFS-80W/N8BP, KFS-100W/N8BP
KFS-120W/N8BP, KFS-140W/N8BP, KFS-160W/N8BP, KFS-100W/N8SBP
KFS-120W/N8SBP, KFS-140W/N8SBP, KFS-160W/N8SBP

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NOTE:

⚠ Please read the instructions carefully before installation and do not discard them and keep the instructions for future reference.

⚠ Before operating the machine, make sure it is installed by professionals. If in doubt, please contact your dealer for advice and information.

1 Manual

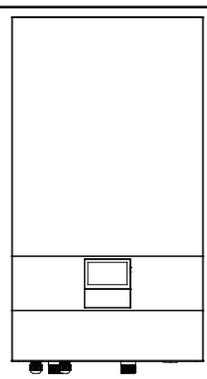
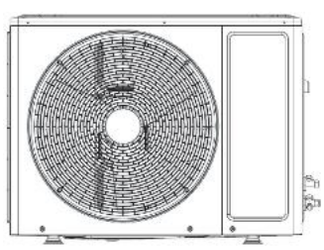
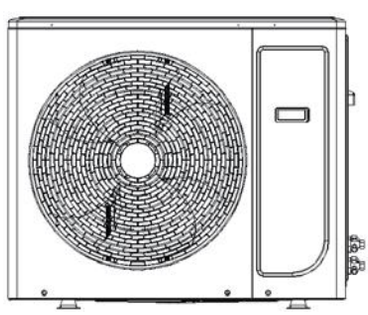
This manual contains important information of the machine. Please read the manual carefully before installation

Outline

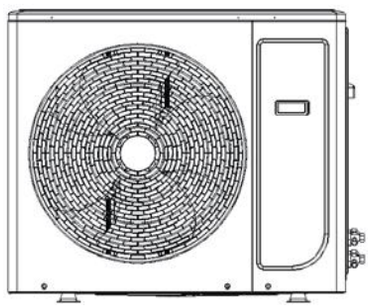
The split system consists of two parts: indoor unit and outdoor unit, which are connected by copper pipes. The indoor unit is the indoor part of the air source heat pump, which is used for heating (heating water) or refrigeration. The inner unit can be connected with fan coil, underground heating equipment, low-temperature radiator and domestic hot water tank.
The system is equipped with auxiliary heater to assist heating at low temperature. The auxiliary heater can also be used as standby in case of outdoor unit failure.

Items in product packaging box

- Please make sure that all items are in the carton before installation.
- At delivery, the unit must be checked and any damage must be reported immediately to the carrier claims agent.
- Bring the unit as close as possible to the final installation position in its original package in order to prevent damage during transport.

Indoor Uni t Carton			
Item		Image	Quantity
Indoor unit	4-16kW		One
Outdoor Unit Carton			
Item		Image	Quantity
Outdoor unit	4/6/8kW		One
	10/12kW		One

And on the next page.....

Outdoor Unit Carton			
Item		Image	Quantity
Outdoor unit	14/16kW		One

Tools to install the unit

NO.	Name	NO.	Name
1	Percussion drill	10	Sleeve set
2	Gradienter	11	bolt driver
3	Copper pipe bending equipment	12	Wire stripper
4	Water pipe bending equipment	13	Vacuum pump
5	Gas welding gun	14	Pressure gauge
6	Flaring tool	15	Electronic scale
7	Tape measure	16	Adjustable wrench
8	Hexagon wrench	17	Protective equipment, such as gloves, glasses
9	Pipe cutter		

2 Safety instructions

The precautions listed here are divided into the following types. They are quite important, so be sure to follow them carefully. Meanings of **DANGER**, **WARNING**, **CAUTION** and **NOTE** symbols.

ⓘ INFORMATION

- Read these instructions carefully before installation. Keep this manual in a handy for future reference.
- Improper installation of equipment or accessories may result in electric shock, short-circuit, leakage, fire or other damage to the equipment. Be sure to only use accessories made by the supplier, which are specifically designed for the equipment and make sure to get installation done by a professional.
- All the activities described in this manual must be carried out by a licensed technician. Be sure to wear adequate personal protection equipment such as gloves and safety glasses while installing the unit or carrying out maintenance activities.
- Contact your dealer for any further assistance.



Caution:Risk of fire/
flammable materials

⚠ WARNING

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

⚠ DANGER

Indicates an imminently hazardous situation which if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a potentially hazardous situation which if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation which if not avoided, may result in minor or moderate injury.
It is also used to alert against unsafe practices.

⚠ CAUTION

Indicates situations that could only result in accidental equipment or property damage.

Explanation of symbols display on the unit.

	WARNING	This symbol shows that this appliance used a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.
	CAUTION	This symbol shows that the operation manual should be read carefully.
	CAUTION	This symbol shows that a service personnel should be handling this equipment with reference to the installation manual.
	CAUTION	This symbol shows that a service personnel should be handling this equipment with reference to the installation manual.
	CAUTION	This symbol shows that information is available such as the operating manual or installation manual.

⚠ DANGER

- Before touching electric terminal parts, turn off power switch.
- When service panels are removed, live parts can be easily touched by accident.
- Never leave the unit unattended during installation or servicing when the service panel is removed.
- Do not touch water pipes during and immediately after operation as the pipes may be hot and could burn your hands. To avoid injury, give the piping time to return to normal temperature or be sure to wear protective gloves.
- Do not touch any switch with wet fingers. Touching a switch with wet fingers can cause electrical shock.
- Before touching electrical parts, turn off all applicable power to the unit.

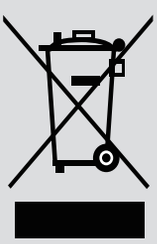
⚠ WARNING

- All the activities described in this manual must be carried out by a licensed technician. Be sure to wear adequate personal protection equipment such as gloves and safety glasses while installation the unit or carrying out maintenance activities.
- Ensure that the installation of Indoor and outdoor unit is safe and reliable. If the machine is not installed firmly or not properly, it will cause damage. The minimum support weight required for installation is 20g/mm^2, and full consideration should be given to strong winds, hurricanes or earthquakes. When installing the machine in a closed area or limited space, please consider the size and ventilation of the room to prevent suffocation due to refrigerant leakage.
- 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.
- Tear apart and throw away plastic packaging bags so that children will not play with them. Children playing with plastic bags face danger of death by suffocation.
- Safely dispose of packing materials such as nails and other metal or wood parts that could cause injuries.

- Ask your dealer or qualified personnel to perform installation work in accordance with this manual. Do not install the unit yourself. Improper installation could result in water leakage, electric shocks or fire.
- Be sure to use only specified accessories and parts for installation work. Failure to use specified parts may result in water leakage, electric shocks, fire, or the unit falling from its mount.
- Install the unit on a foundation that can withstand its weight. Insufficient physical strength may cause the equipment to fall and possible injury.
- Perform specified installation work with full consideration of strong wind, hurricanes, or earthquakes. Improper installation work may result in accidents due to equipment falling.
- Make certain that all electrical work is carried out by qualified personnel according to the local laws and regulations and this manual using a separate circuit. Insufficient capacity of the power supply circuit or improper electrical constructio may lead to electric shocks or fire.
- Be sure to install a ground fault circuit interrupter according to local laws and regulations. Failure to install a ground fault circuit interrupter may cause electric shocks and fire.
- Make sure all wiring is secure. Use the specified wires and ensure that terminal connections or wires are protected from water and other adverse external forces. Incomplete connection or affixing may cause a fire.
- When wiring the power supply, form the wires so that the front panel can be securely fastened. If the front panel is not in place there could be overheating of the terminals, electric shocks or fire.
- After completing the installation work, check to make sure that there is no refrigerant leakage.
  Never directly touch any leaking refrigerant as it could cause severe frostbite. Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor and other refrigerant cycle parts. Burns or frostbite are possible if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touch them, be sure to wear protective gloves.
- Do not touch the internal parts (pump, backup heater, etc.) during and immediately after operation. Touching the internal parts can cause burns. To avoid injury, give the internal parts time to return to normal temperature or, if you must touch them, be sure to wear protective gloves.
- If the unit is not used for a long time, it is recommended not to turn off the power supply. If the power is turned off, the protection devices of some products (such as water pump anti-lock and anti-freezing device) will not be available.
- Improper installation of equipment or accessories may result in electric shock, short-circuit, leakage, fire or other damage to the equipment. Be sure to only use accessories made by the supplier, which are specifically designed for the equipment and make sure to get installation done by a professional.
- During installation or repair of the unit, please do not unplug or plug in the power supply, and do not leave the unit unattended (It may cause fire or electric shock).
- After completing the installation work, check to make sure that there is no refrigerant leakage.
- Never directly touch any leaking refrigerant and the refrigerant pipes. It could cause severe frostbite. During and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor and other refrigerant cycle parts. Burns or frostbite are possible if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touc them, be sure to wear protective gloves.
- Do not touch the internal parts (pump, backup heater, etc.) during and immediately after operation. Touching the internal parts can cause burns. To avoid injury, give the internal parts time to return to normal temperature or, if you must touch them, be sure to wear protective gloves.
- Do not place heaters or other electrical appliances near the power cord (It may cause fire or electric shock)
- Please note that water cannot be poured directly from the unit. Do not let water enter electrical components. (It may cause fire or electric shock)
- That the appliance shall be disconnected from its power source during service and when replacing parts and, if that the removal of the plug is foreseen, it shall be clearly indicated that the removal of the plug has to be such that an operator can check from any of the points to which he has access that the plug remains removed. If this is not possible, due to the construction of the appliance or its installation, a disconnection with a locking system in the isolated position shall be provided.
- If the unit is not used for a long time, it is recommended not to turn off the power supply. If the power is turned off, the protection devices of some products (such as water pump anti-lock and anti-freezing device) will not be available.

⚠ CAUTION

- Ground the unit.
- Grounding resistance should be according to local laws and regulations.
- Do not connect the ground wire to gas or water pipes, lightning conductors or telephone ground wires.
- Incomplete grounding may cause electric shocks.
  -Gas pipes: Fire or an explosion might occur if the gas leaks.
  -Water pipes: Hard vinyl tubes are not effective grounds.
  -Lightning conductors or telephone ground wires: Electrical threshold may rise abnormally if struck by a lightning bolt.
- Install the power wire at least 3 feet (1 meter) away from televisions or radios to prevent interference or noise. (Depending on the radio waves, a distance of 3 feet (1 meter) may not be sufficient to eliminate the noise.)
- Do not wash the unit. This may cause electric shocks or fire. The appliance must be installed in accordance with national wiring regulations. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- Do not install the unit in the following places:
  -Where there is mist of mineral oil, oil spray or vapors. Plastic parts may deteriorate, and cause them to come loose or water to leak.
  -Where corrosive gases (such as sulphurous acid gas) are produced. Where corrosion of copper pipes or soldered parts may cause refrigerant to leak.
  -Where there is machinery which emits electromagnetic waves. Electromagnetic waves can disturb the control system and cause equipment malfunction.
  -Where flammable gases may leak, where carbon fibre or ignitable dust is suspended in the air or where volatile flammables such as paint thinner or gasoline are handled. These types of gases might cause a fire.
  -Where the air contains high levels of salt such as near the ocean.
  -Where voltage fluctuates a lot, such as in factories.
  -In vehicles or vessels.
  -Where acidic or alkaline vapors are present.
  This appliance can be used by children 8 years old and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they are supervised or given instruction on using the unit in a safe manner and understand the hazards involved. Children should not play with the unit. Cleaning and
  user maintenance
  should not be done by children without supervision.
- Children should be supervised to ensure that they do not play with the appliance.
- If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person.
- This marking indicates that this product should not be disposed with other household wastes through out 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.



- **DISPOSAL:** Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary. Do not dispose of electrical appliances as municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substance can leak into the groundwater and get into the food chain, damaging your health and well-being.
- 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.
- The wiring must be performed by professional technicians in accordance with national wiring regulation and this circuit diagram. An all-pole disconnection device which has at least 3mm separation distance in all pole and a residual current device (RCD) with the rating not exceeding 30mA shall be incorporated in the fixed wiring

according to the national rule.

- Confirm the safety of the installation area (walls, floors, etc.) without hidden dangers such as water, electricity, and gas. Before wiring/pipes.
- Before installation, check whether the user's power supply meets the electrical installation requirements of unit (including reliable grounding, leakage, and wire diameter electrical load, etc.). If the electrical installation requirements of the product are not met, the installation of the product is prohibited until the product is rectified.
- When installing multiple air conditioners in a centralized manner, please confirm the load balance of the three-phase power supply, and multiple units are prevented from being assembled into the same phase of the three-phase power supply.
- Product installation should be fixed firmly. Take reinforcement measures, when necessary.
- Please carry out drainage system and the pipeline work according to the instructions. If the drainage system or pipeline is defective, water leakage may occur, and it should be dealt with immediately to avoid getting other household products wet and damaged.
- Please do not clean the unit when the power is on. When cleaning the unit, please turn off the power after shutting down. Otherwise, you may be injured by a high-speed fan or electric shock.
  Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- When the unit has problems or peculiar smell, please do not continue to operate the unit. Turn off the power immediately and stop the machine. Otherwise, electric shock or fire may be caused.
- Do not put your fingers into the fan and evaporator. High speed fans can cause serious injury.
- In order to avoid the danger of inadvertently resetting the thermal breaker, the equipment cannot use external switching devices, such as timers, or be connected to a circuit that is often open or closed.
- This device is not designed for people with weak physical or mental behavior ability (including children), as well as people who have no use experience and do not understand the heating system. Unless it is used under the safety guidance and supervision of the person in charge, or has received training on the use of this equipment. Children should use the equipment under the supervision of adults to ensure their safe use of the equipment.

NOTE

- **About Fluorinated Gas**
  -This heat pump unit contains fluorinated gasses. For specific information on the type of gas and the amount, please refer to the relevant label on the unit itself. Compliance with national gas regulations shall be observed.
  -Installation, service, maintenance and repair of this unit must be performed by a certified technician.
  -Product uninstallation and recycling must be performed by a certified technician.
  -If the system has a leak-detection system installed, it must be checked for leaks at least every 12 months. When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.
- **Frequency of Refrigerant Leakage Check**
  -For unit that contains fluoridated greenhouse gases in quantities of 5 tons of CO_2 equivalents or more, but of less than 50 tons of CO_2 equivalent, at least every 12 months, or where a leakage detection system is installed, at least every 24 months.
  -For unit that contains fluoridated greenhouse gases in quantities of 50 tons of CO_2 equivalents or more, but of less than 500 tons of CO_2 equivalent at least every six months, or where a leakage detection system is installed, at least every 12 months.
  -For unit that contains fluoridated greenhouse gases in quantities of 500 tons of CO_2 equivalents or more, at least every three months, or where a leakage detection system is installed, at least every six months.
  -This heat pump unit is a hermetically sealed equipment that contains fluoridated greenhouse gases.
  -Only certificated person is allowed to do installation, operation and maintenance.
- **Special requirements for R32**
  -Do not have refrigerant leakage and open flame.

-Be aware that the R32 refrigerant does not contain an odor.
-The appliance shall be stored so as to prevent mechanical damage and in a well-ventilated room without continuously operating ignition sources (example: open flames, an operating gas appliance) and the room size corresponds to the room area as specified for operation.
-Do not re-use joints which have been used already.
-Joints made in installation between parts of refrigerant system shall be accessible for maintenance purposes.-Make sure installation, servicing, maintenance and repair comply with instructions and with applicable legislation (for example national gas regulation) and are executed only by authorized persons.
-Pipework should be protected from physical damage.
-Installation of pipework shall be kept to a minimum.

The machine shall be installed in a well-ventilated room without continuous fire source,and the room area during installation shall not be less than the data in the following table:

Model	Min. room area
40/60	8m^2
80	10m^2
100	11m^2
120	12m^2
140/160	14m^2

Materials required for installation of split heat pump

Note:

1. Be sure to confirm the model name and the serial number of the unit.

2.  Must be hard wired, plug is not allowed. Must comply with standard 60245 IEC57.

Wires specifications

Model	Outdoor Unit Separate power supply wires	Indoor Unit Separate power supply wires	Signal connecting wires
4/6kW	⩾ 3 x 4mm²	⩾ 3 x 4mm²	⩾ 2 x 0.5mm² (Twisted pair shielded wire)
8/10kW	⩾ 3 x 4mm²	⩾ 3 x 4mm²	
12/14/16kW	⩾ 3 x 6mm²	⩾ 3 x 4mm²	
10/12/14/16kW (3-phase)	⩾ 5 x 4mm²	⩾ 5 x 4mm²	
Notes: The distance between power supply wires and signal wires should be kept at least 300mm.			

Water pipe specifications

Model	Entering/leaving water pipe (External thread)	Water pipe	Drain outlet
4/6kW	1''	≥1''	Ø25mm
8/10kW	1''	≥1''	Ø25mm
12/14/16kW	1''	≥1''	Ø25mm

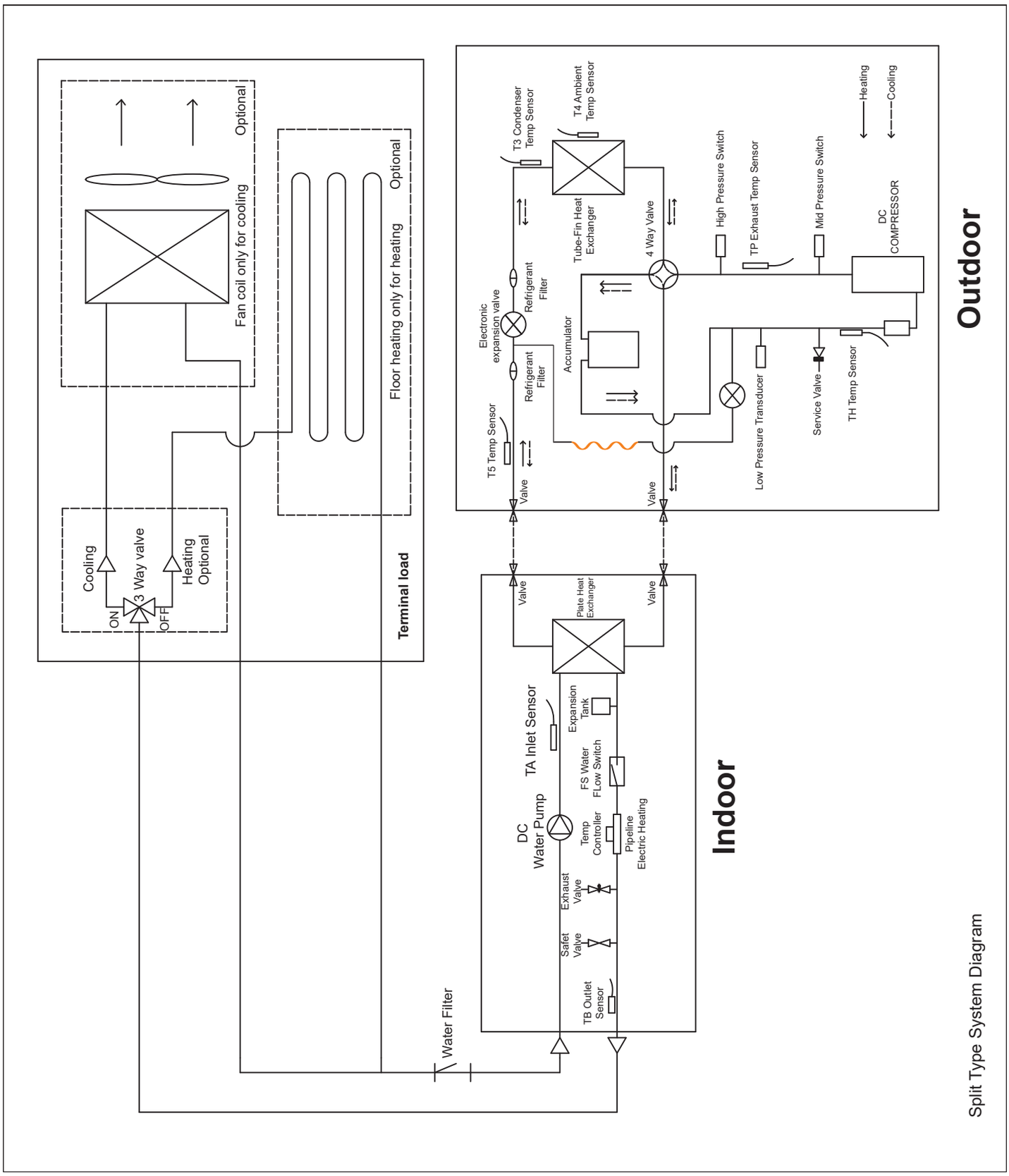
Two way valve (district heating)

Note: each district heating needs a two-way valve

Connection of fluorine pipeline

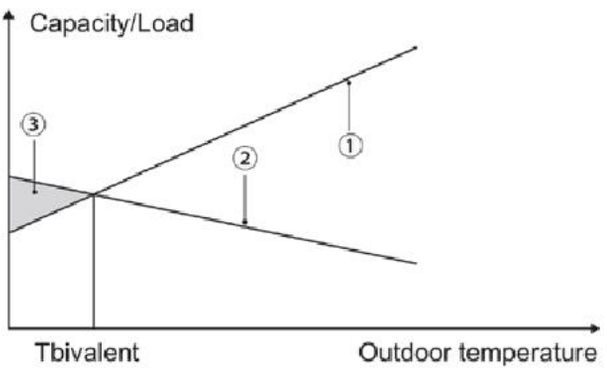
Model	Liquid pipe	Gas pipe
4/6kW	1/4''	5/8''
8/10kW	3/8''	5/8''
12/14/16kW	3/8''	5/8''

System principle and installation diagram



3 General introductions

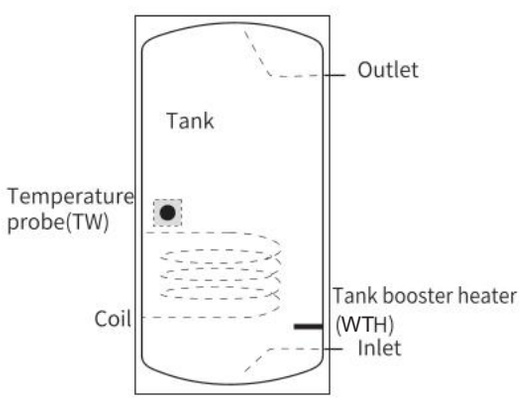
- These units are used for both heating and cooling applications and domestic hot water tanks. They can be combined with fan coil units, floor heating applications, low temperature high efficiency radiators, domestic hot water tanks (field supply) and solar kits (field supply).
- A wired controller is supplied with the unit.
- If you choose the built-in backup heater unit, the backup heater can increase the heating capacity during cold outdoor temperatures. The backup heater also serves as a backup in case of malfunctioning and for frozen protection of the outside water piping during winter time.



① Heat pump capacity.
② Required heating capacity (site dependent).
③ Additional heating capacity provided by backup heater.

Domestic hot water tank (field supply)

A domestic hot water tank(with or without booster heater) can be connected to the unit.
The requirement of the tank is different for different unit and material of heat exchanger.



The booster heater should be installed below the temperature probe (TW).
The heat exchanger (coil) should be installed below the temperature probe.

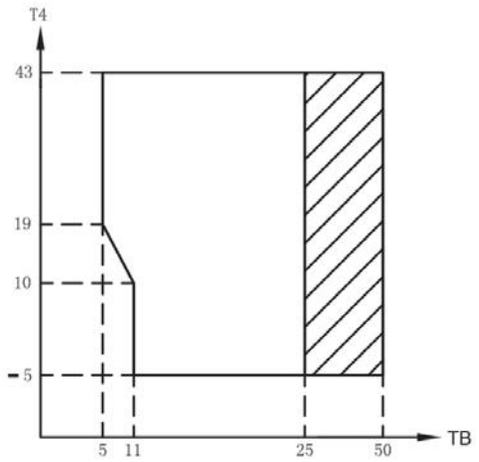
Indoor Unit		4-6kW	8-10kW	12-16kW
Volume of tank (L)	Recommended	100~250	150~300	200~500
Heat exchange area/m^2 (Stainless steel coil)	Minimum	1.4	1.4	1.6
Heat exchange area/m^2 (Enamel coil)	Minimum	2.0	2.0	2.5

Room thermostat(field supply)
Room thermostat can be connected to the unit (room thermostat should be kept away from heating source when selecting the installation place).
Solar kit for domestic hot water tank(field supply)
An optional solar kit can be connected to the unit.

Operation range		
Indoor Unit	Outlet water (Heating mode)	25℃ to 65℃
	Outlet water (Cooling mode)	7℃ to 25℃
	Domestic hot water	25℃ to 60℃
	Ambient temperature	5℃ to 35℃
Outdoor Unit	Ambient temperature(Heating mode)	-25℃ to 35℃
	Ambient temperature(Cooling mode)	-5℃ to 43℃
Water Pressure		0.1-0.3MPa
Water flow	40/60	0.60-1.50m^3/h
	80/100	0.60-2.10m^3/h
	120/140/160	0.60-3.00m^3/h

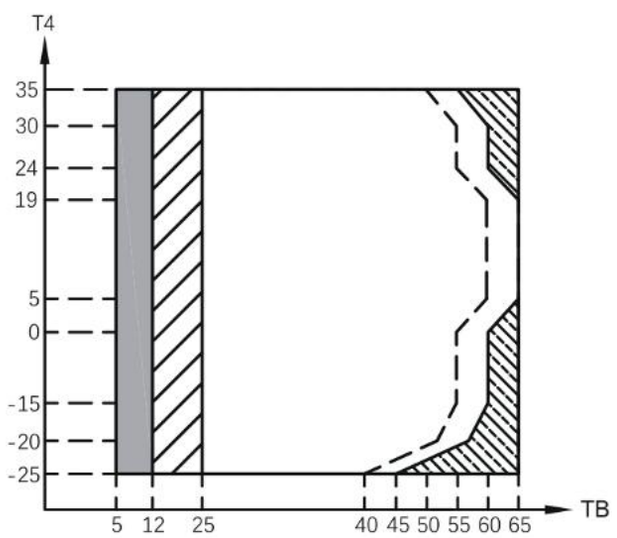
The unit have anti-freezing protection function that uses the heat pump or backup heater to keep the water system safe from freezing in all conditions.

In cooling mode, the lowest outlet water temperature (TB) that the unit can reach in different outdoor temperature (T4) is listed below:



Operation range by heat pump with possible limitation and protection.

In heating mode, the water flowing temperature (TB) range in different outdoor temperature (T4) is listed below:



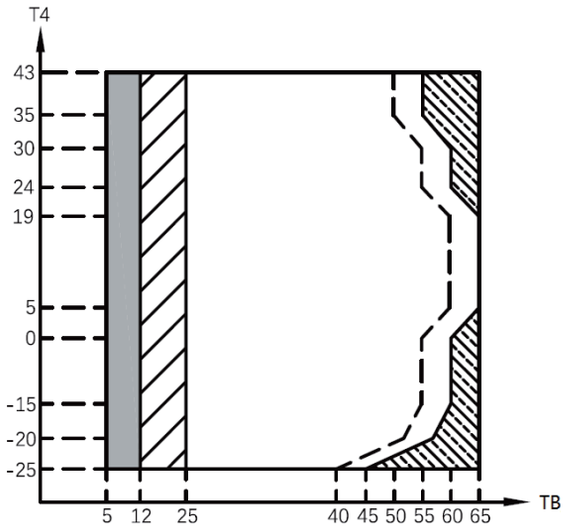
If IPH/AHS setting is valid, only IPH/AHS turns on;
If IPH/AHS setting is invalid, only heat pump turns on; limitation and protection may occur during heat pump operation.

operation range by heat pump with possible limitation and protection.

Heat pump turns off, only IPH/AHS turns on.

Maximum inlet water temperature line for heat pump operation.

In DHW mode, the water flowing temperature (TB) range in different outdoor temperature (T4) is listed below:



If IPH/AHS setting is valid, only IPH/AHS turns on;
If IPH/AHS setting is invalid, only heat pump turns on; limitation and protection may occur during heat pump operation.

operation range by heat pump with possible limitation and protection.

Heat pump turns off, only IPH/AHS turns on.

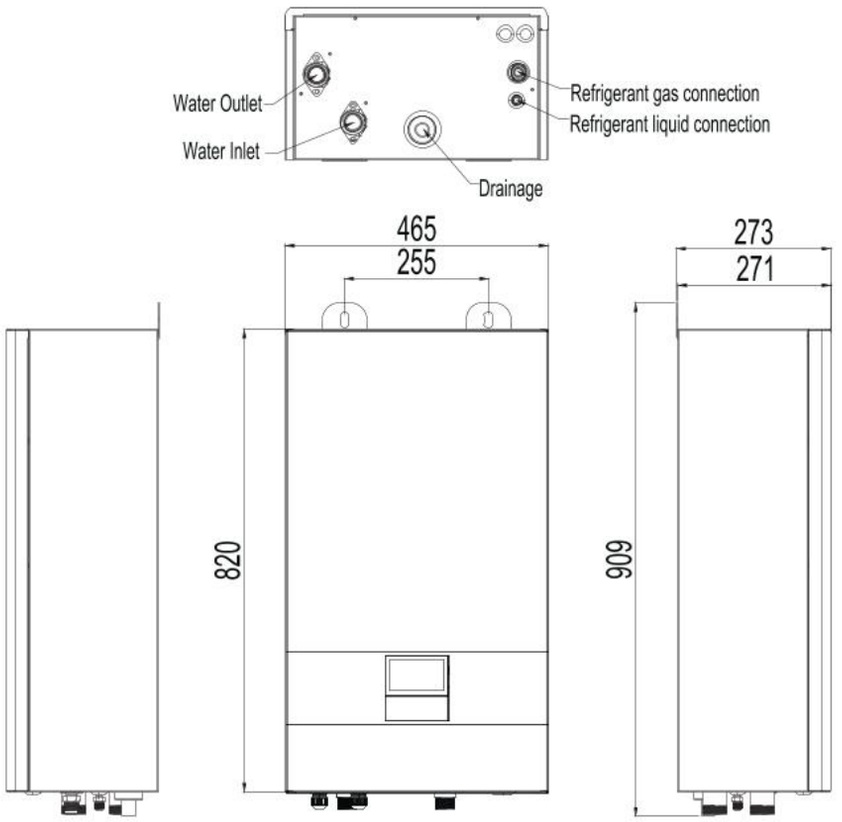
Maximum inlet water temperature line for heat pump operation.

4 Equipment Overview

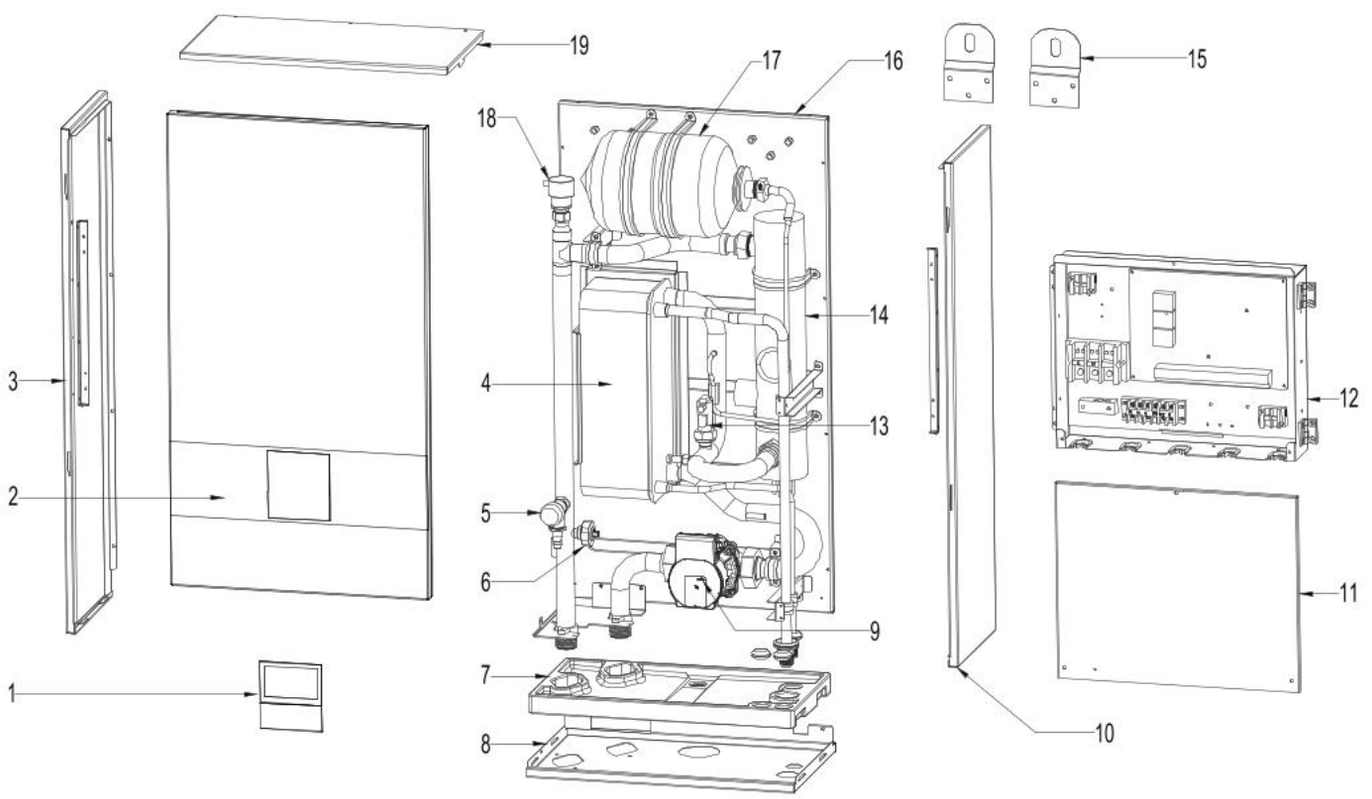
Split variable frequency heat pump consists of two parts: indoor and outdoor unit

4.1 Indoor unit

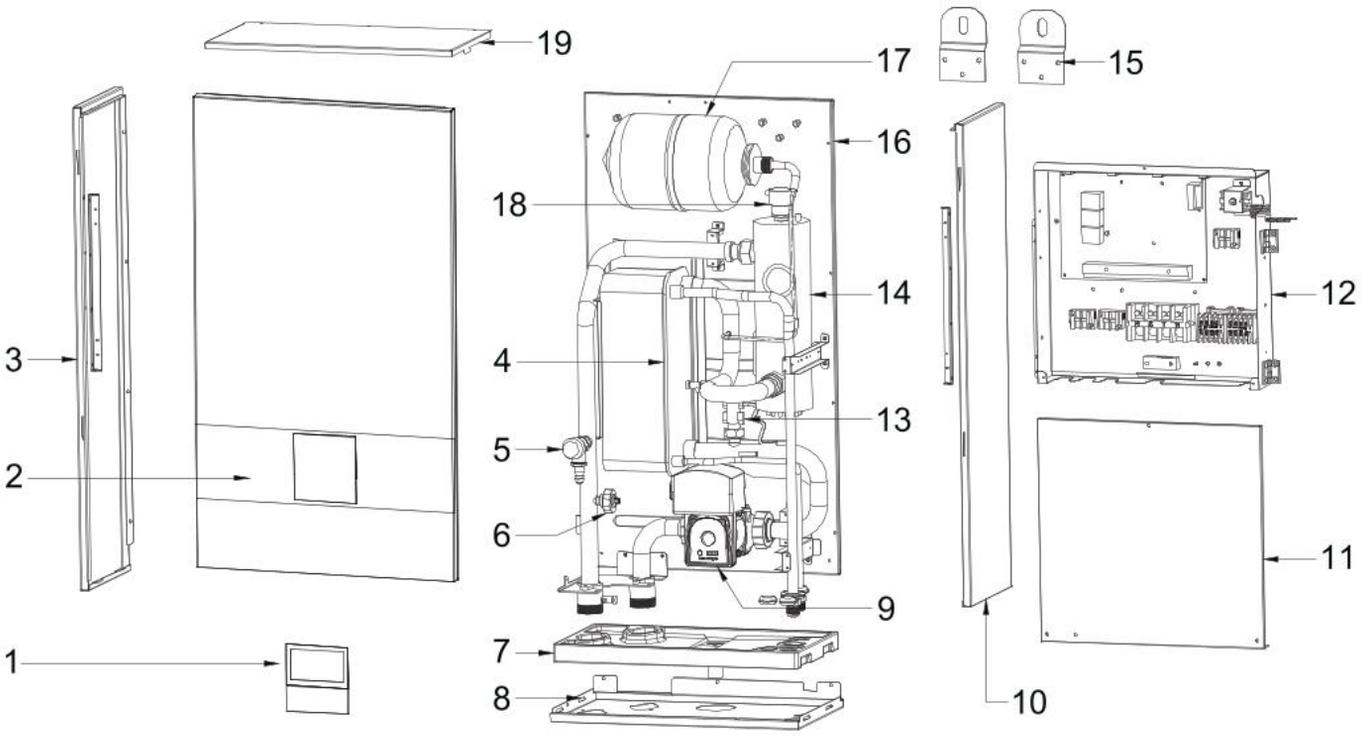
Outline drawing of indoor unit: 4-16kW



Internal structure diagram of indoor unit: 4-16kW



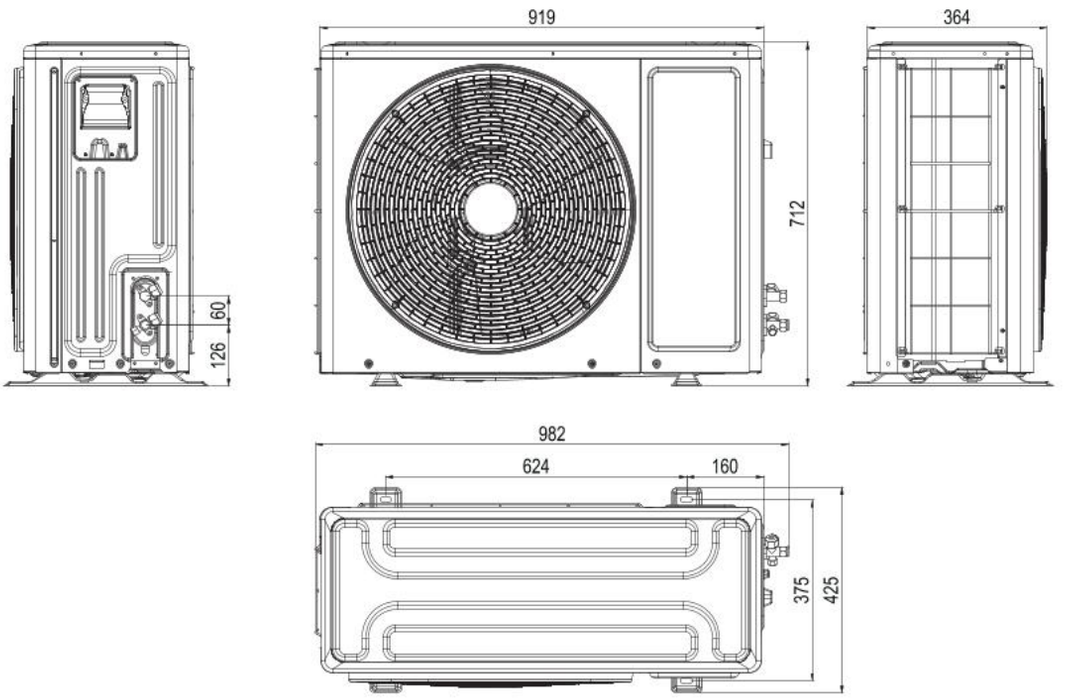
Internal structure diagram of indoor unit: 10-16kW (3-phase)



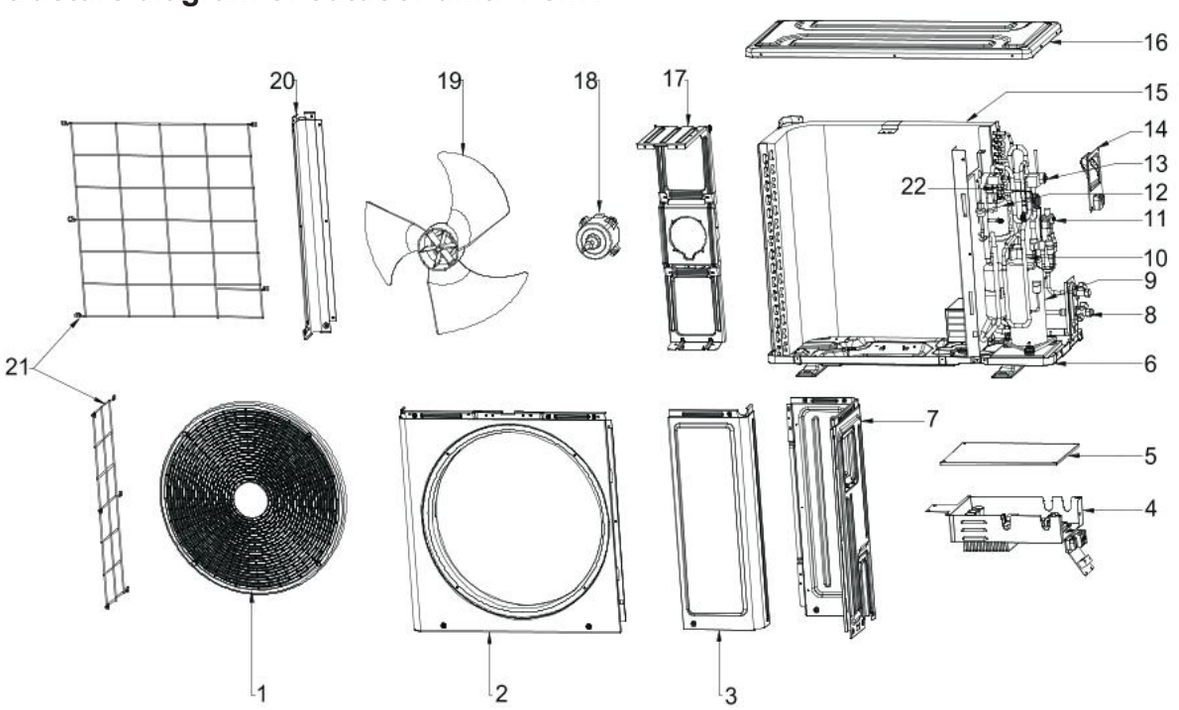
NO.	Name	NO.	Name	NO.	Name
1	Touch screen wire controller	8	Bottom panel	15	Wall panel
2	Front panel	9	Water pump	16	Rear panel assembly
3	Left side panel	10	Right side panel	17	Expansion tank
4	Plate heat exchanger	11	Electric control box cover	18	Automatic exhaust valve
5	Safety valve	12	Electronic control assembly	19	Cover
6	Water pressure sensor	13	Water flow switch		
7	Water tray	14	Electric heating assembly		

4.2 Outdoor unit

Outdoor unit outline drawing: 4-8kW

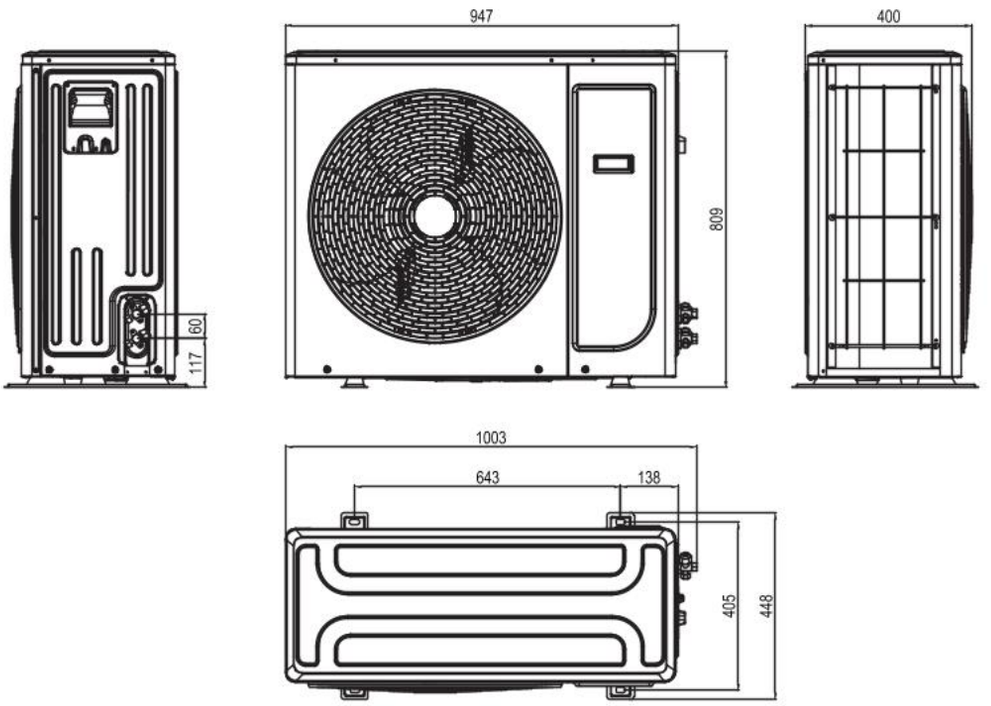


Internal structure diagram of outdoor unit: 4-8kW

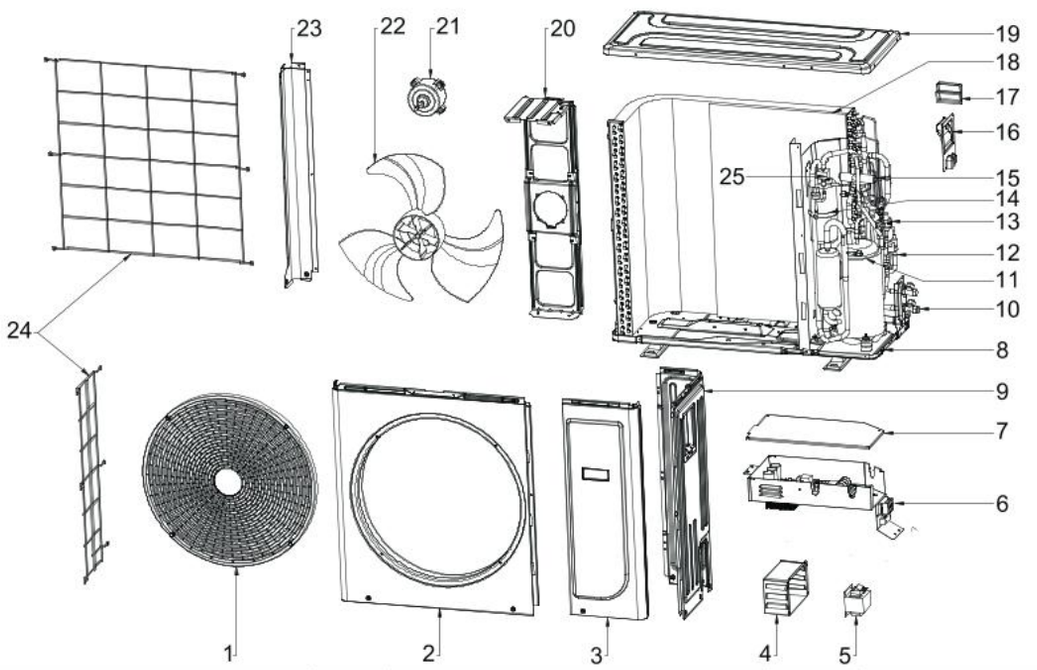


NO.	Name	NO.	Name	NO.	Name
1	Air outlet grille	9	Compressor	17	Motor bracket
2	Front panel	10	Pipe assembly	18	Motor
3	Right front panel	11	Electronic expansion valve	19	Axial flow blade
4	Electric control box assembly	12	Vapor-liquid separator	20	Left rear pillar
5	Cover of Electric box	13	Four way valve	21	Barbed wire cover
6	Chassis	14	Right Handle	22	Solenoid valve
7	Right rear quarter panel	15	Condenser/Evaporator		
8	Globe valve	16	Top Cover		

Outline drawing of outdoor unit: 10-12kW

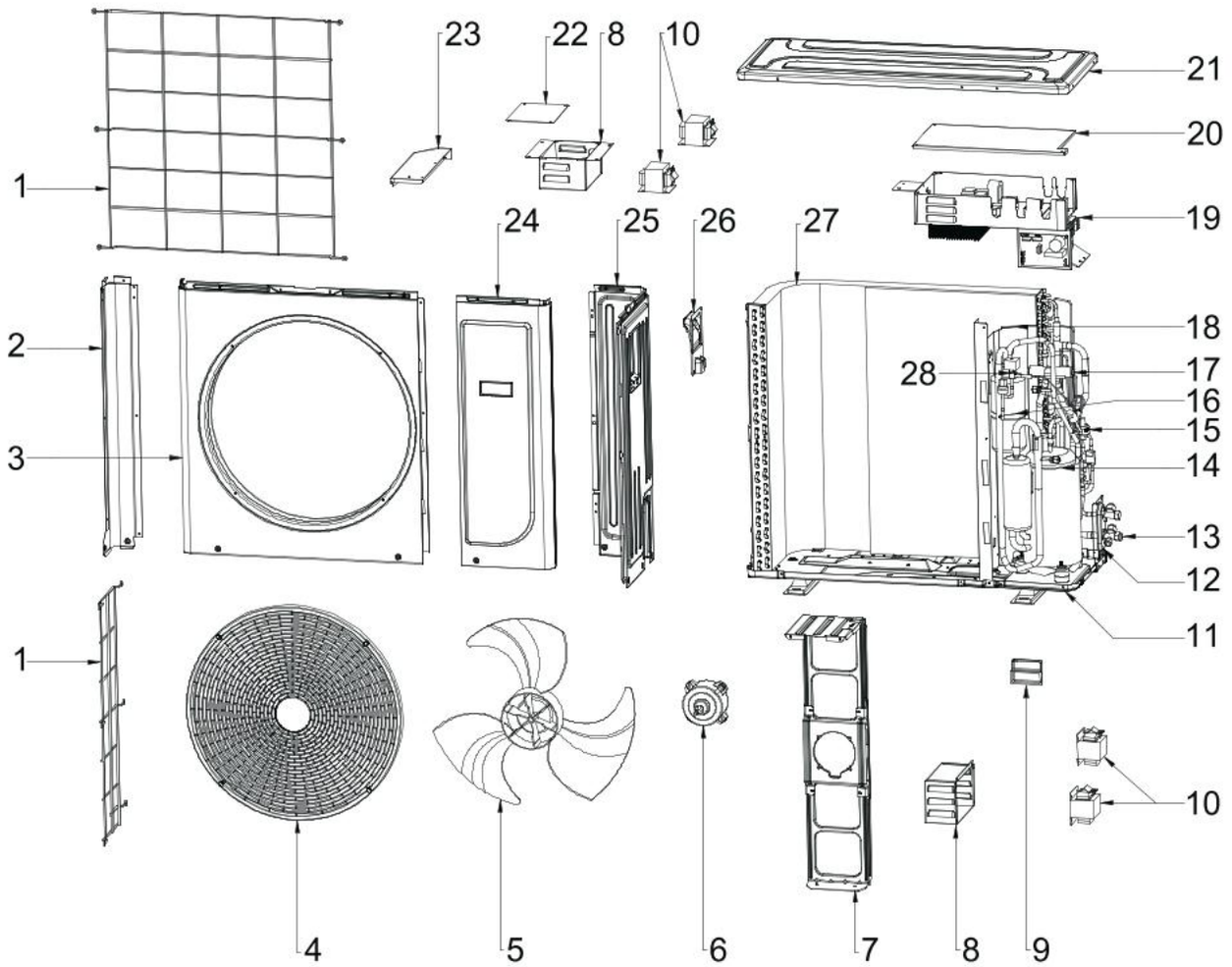


Internal structure diagram of outdoor unit: 10-12kW (1-phase)



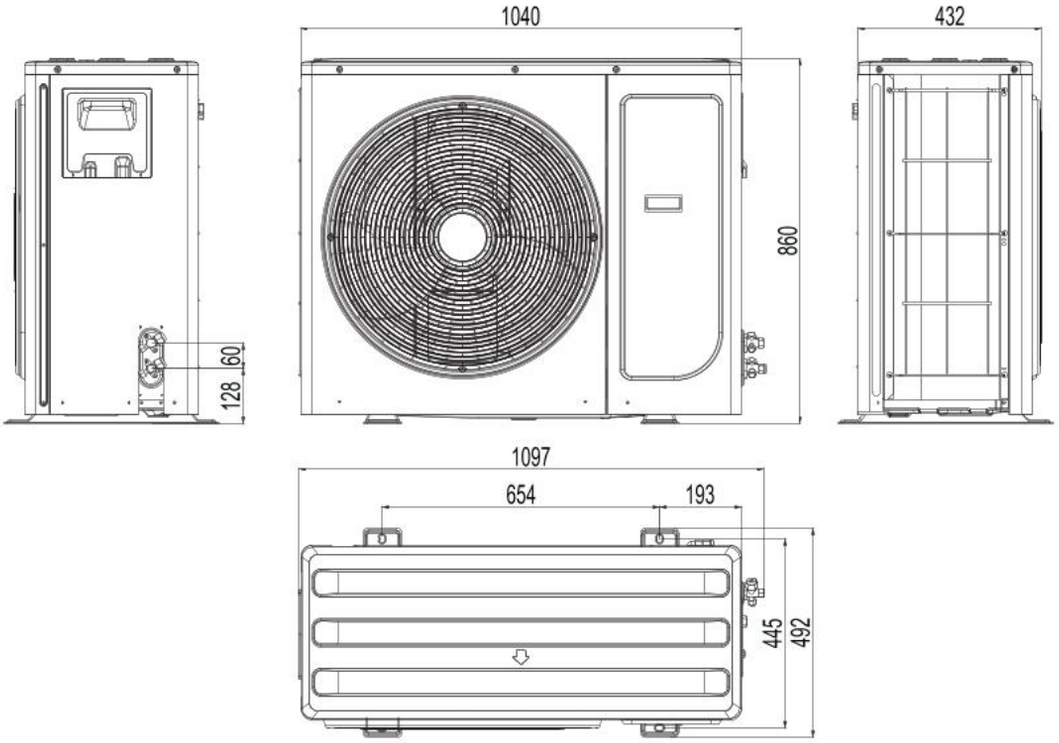
NO.	Name	NO.	Name	NO.	Name
1	Air outlet grille	10	Globe valve	19	Top Cover
2	Front panel	11	Compressor	20	Motor bracket
3	Right front panel	12	Pipe assembly	21	Motor
4	Reactance waterproof box	13	Electronic expansion valve	22	Axial flow blade
5	Reactor	14	Vapor-liquid separator	23	Left rear pillar
6	Electric control box assembly	15	Four way valve	24	Barbed wire cover
7	Cover of Electric box	16	Right Handle	25	Solenoid valve
8	Chassis	17	Handle		
9	Right rear quarter panel	18	Condenser/Evaporator		

Internal structure diagram of outdoor unit: 10-12kW (3-phase)

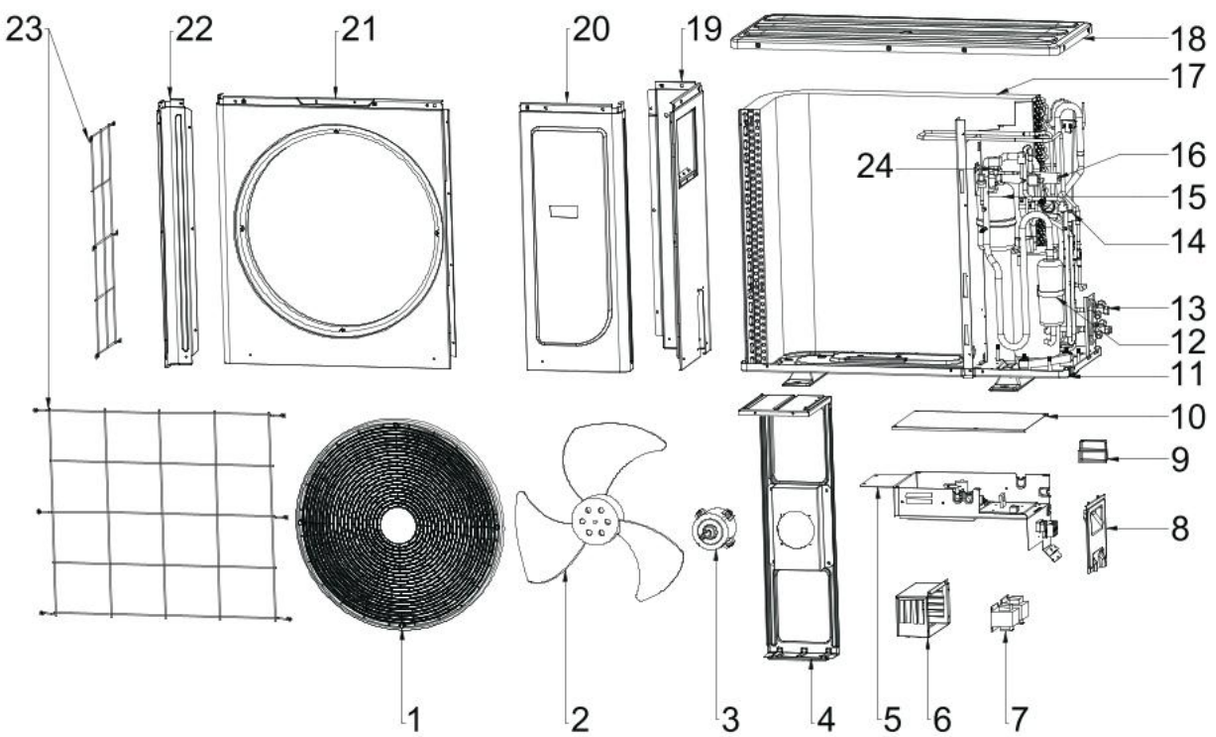


NO.	Name	NO.	Name	NO.	Name
1	Barbed wire cover	11	Chassis	21	Top Cover
2	Left rear pillar	12	Valve plate	22	Reactance waterproof box Cover
3	Front panel	13	Globe valve	23	Reactance fixing plate
4	Air outlet grille	14	Compressor	24	Right front panel
5	Axial flow blade	15	Electronic expansion valve	25	Right rear quarter panel
6	Motor	16	Vapor-liquid separator	26	Right Handle
7	Motor bracket	17	4-way valve	27	Finned heat exchanger
8	Reactance waterproof box assembly	18	Middle diaphragm	28	Solenoid valve
9	Handle	19	Electric control components		
10	Reactor	20	Electric control box cover		

Outline drawing of outdoor unit: 14-16kW

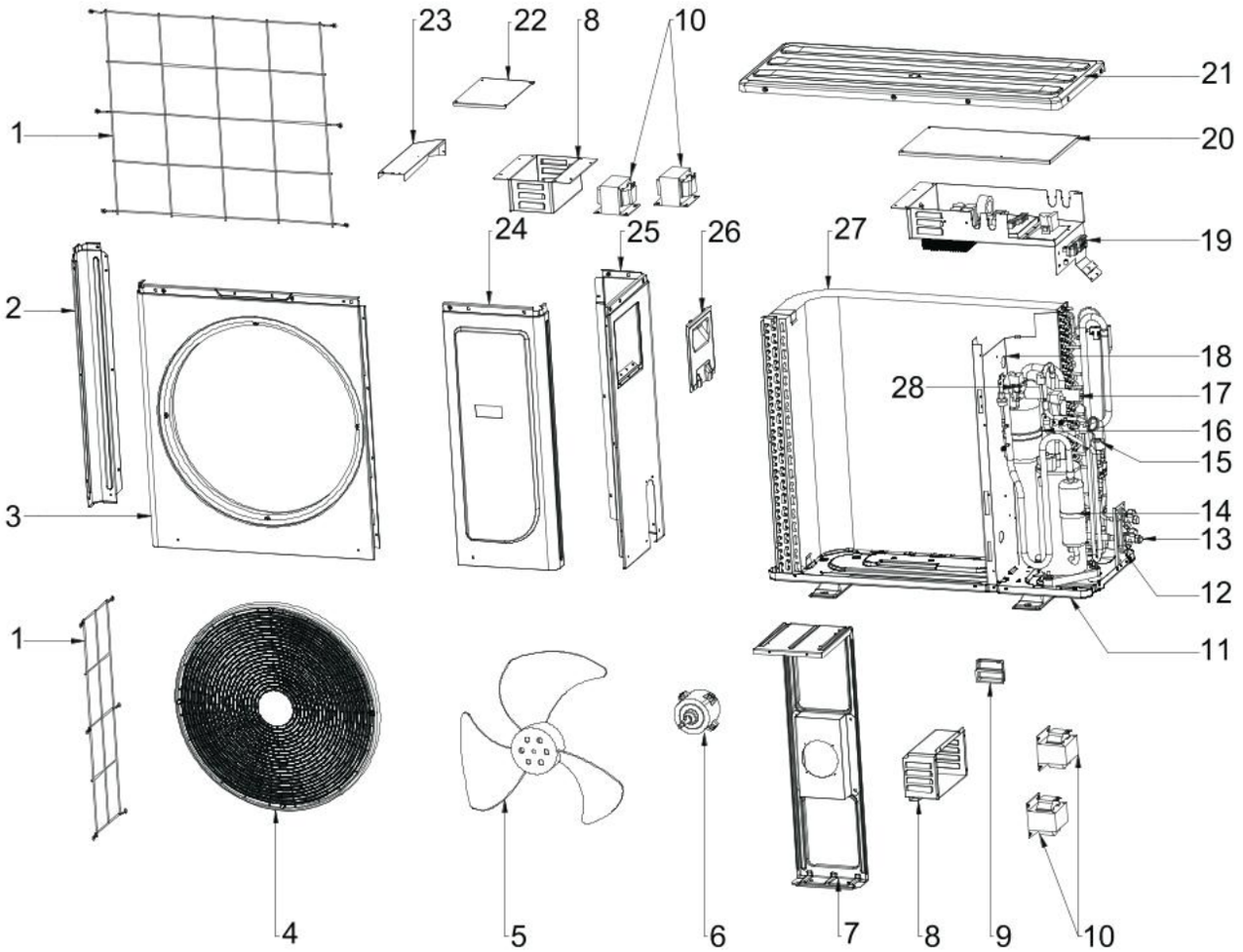


Internal structure diagram of outdoor unit: 14-16kW (1-phase)



NO.	Name	NO.	Name	NO.	Name
1	Air outlet grille	9	Handle	17	Condenser/Evaporator
2	Axial flow blade	10	Cover of Electric box	18	Top Cover
3	Motor	11	Chassis	19	Right rear quarter panel
4	Motor bracket	12	Compressor	20	Right front panel
5	Electric control box assembly	13	Globe valve	21	Front panel
6	Reactance waterproof box	14	Electronic expansion valve	22	Left rear pillar
7	Reactor	15	Vapor-liquid separator	23	Barbed wire cover
8	Right Handle	16	Four way valve	24	Solenoid valve

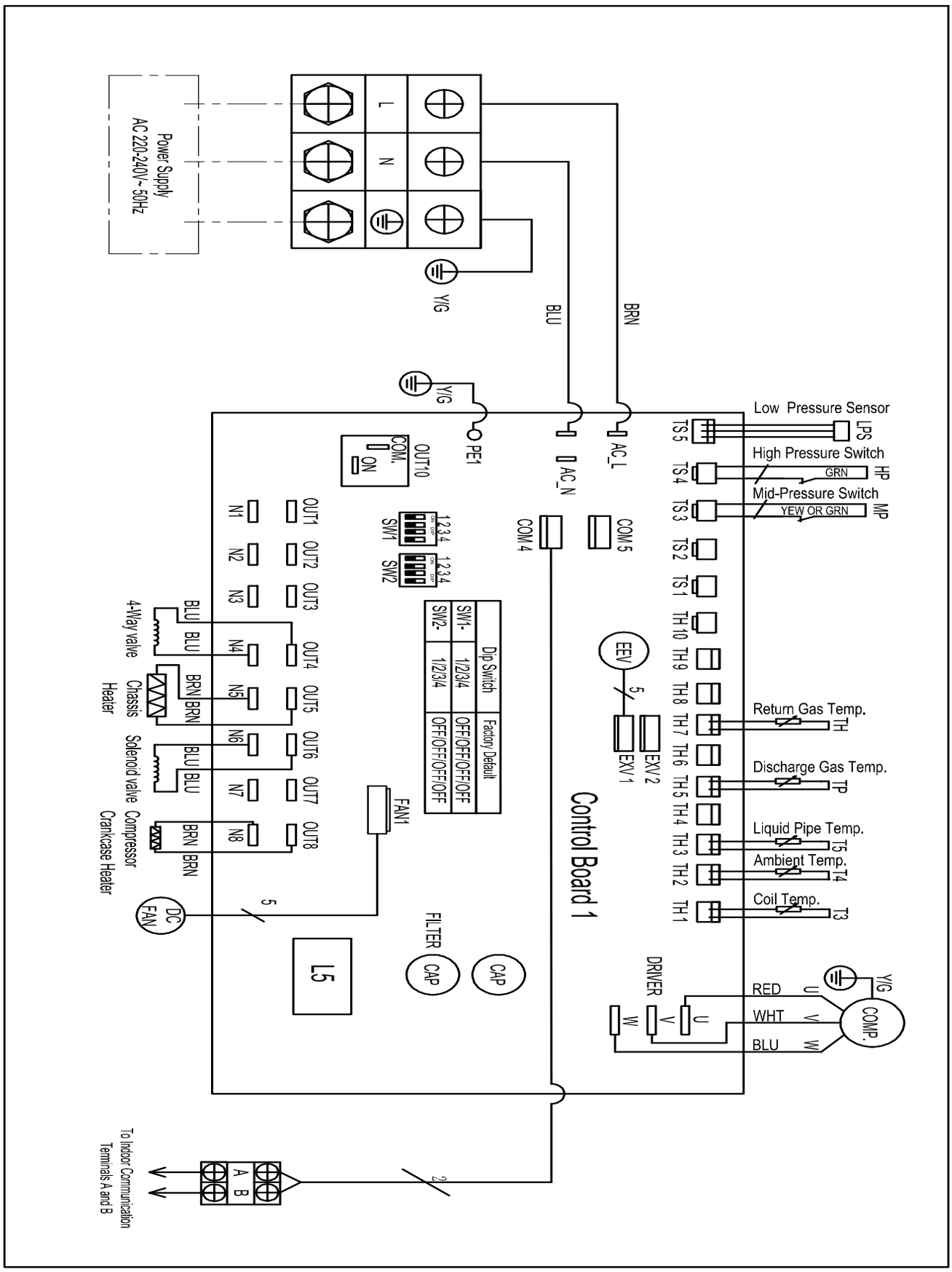
Internal structure diagram of outdoor unit: 14-16kW (3-phase)



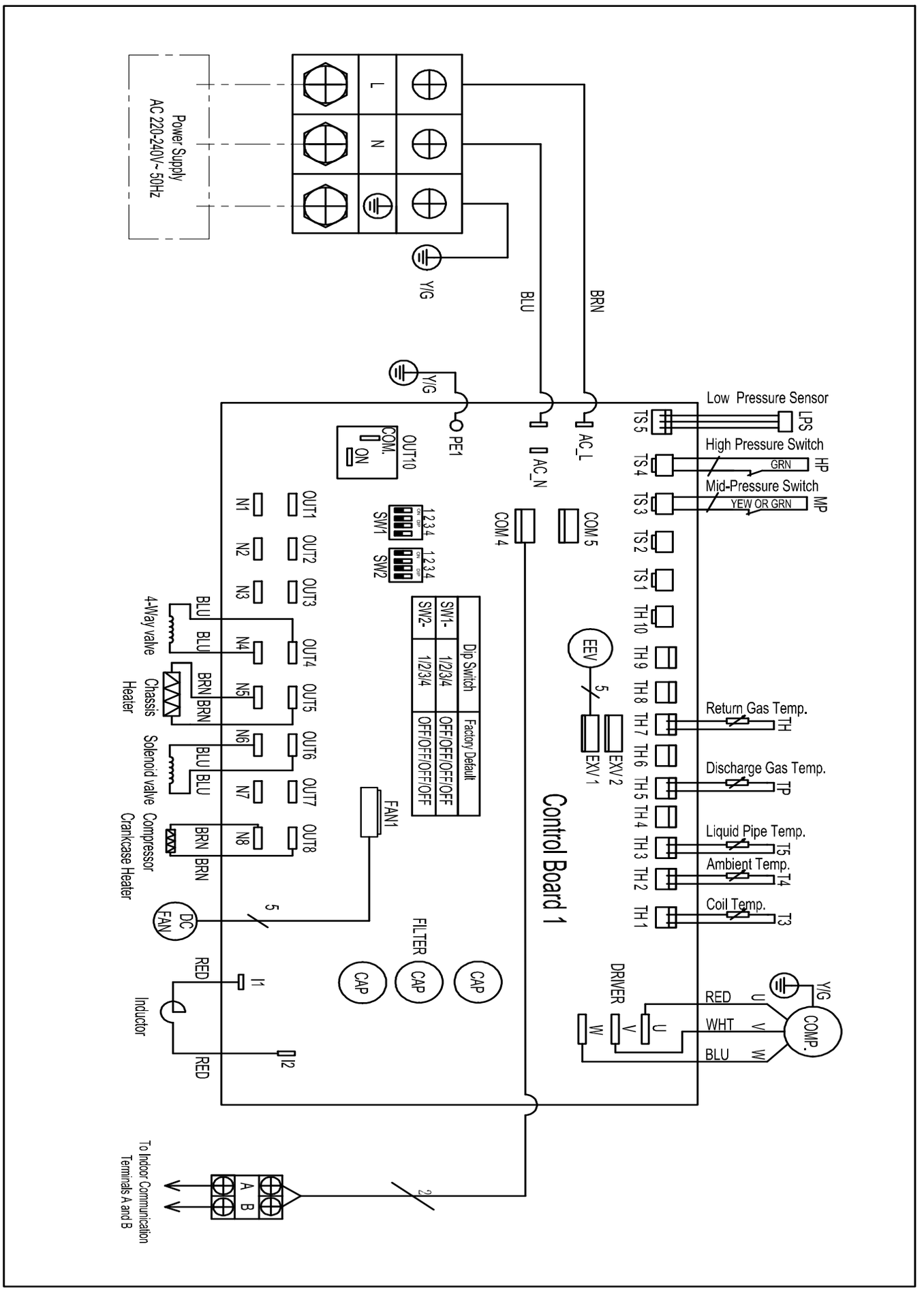
NO.	Name	NO.	Name	NO.	Name
1	Barbed wire cover	11	Chassis	21	Top Cover
2	Left rear pillar	12	Valve plate	22	Reactance waterproof box Cover
3	Front panel	13	Globe valve	23	Reactance fixing plate
4	Air outlet grille	14	Compressor	24	Right front panel
5	Axial flow blade	15	Electronic expansion valve	25	Right rear quarter panel
6	Motor	16	Vapor-liquid separator	26	Right Handle
7	Motor bracket	17	4-way valve	27	Finned heat exchanger
8	Reactance waterproof box assembly	18	Middle diaphragm	28	Solenoid valve
9	Handle	19	Electric control components		
10	Reactor	20	Electric control box cover		

5 Electrical wiring diagram

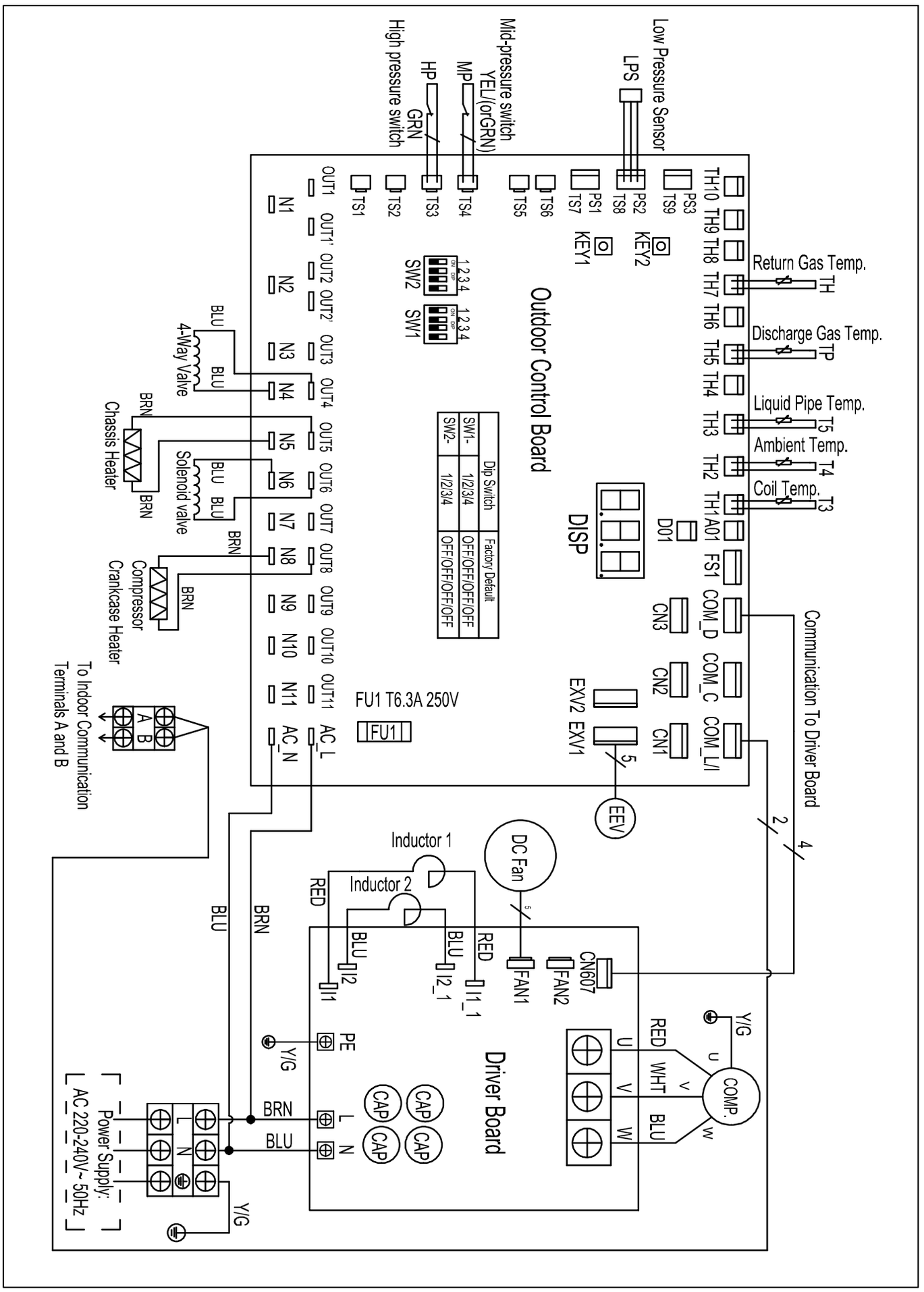
5.1 Electrical wiring diagram of the outdoor unit: 4-6kW



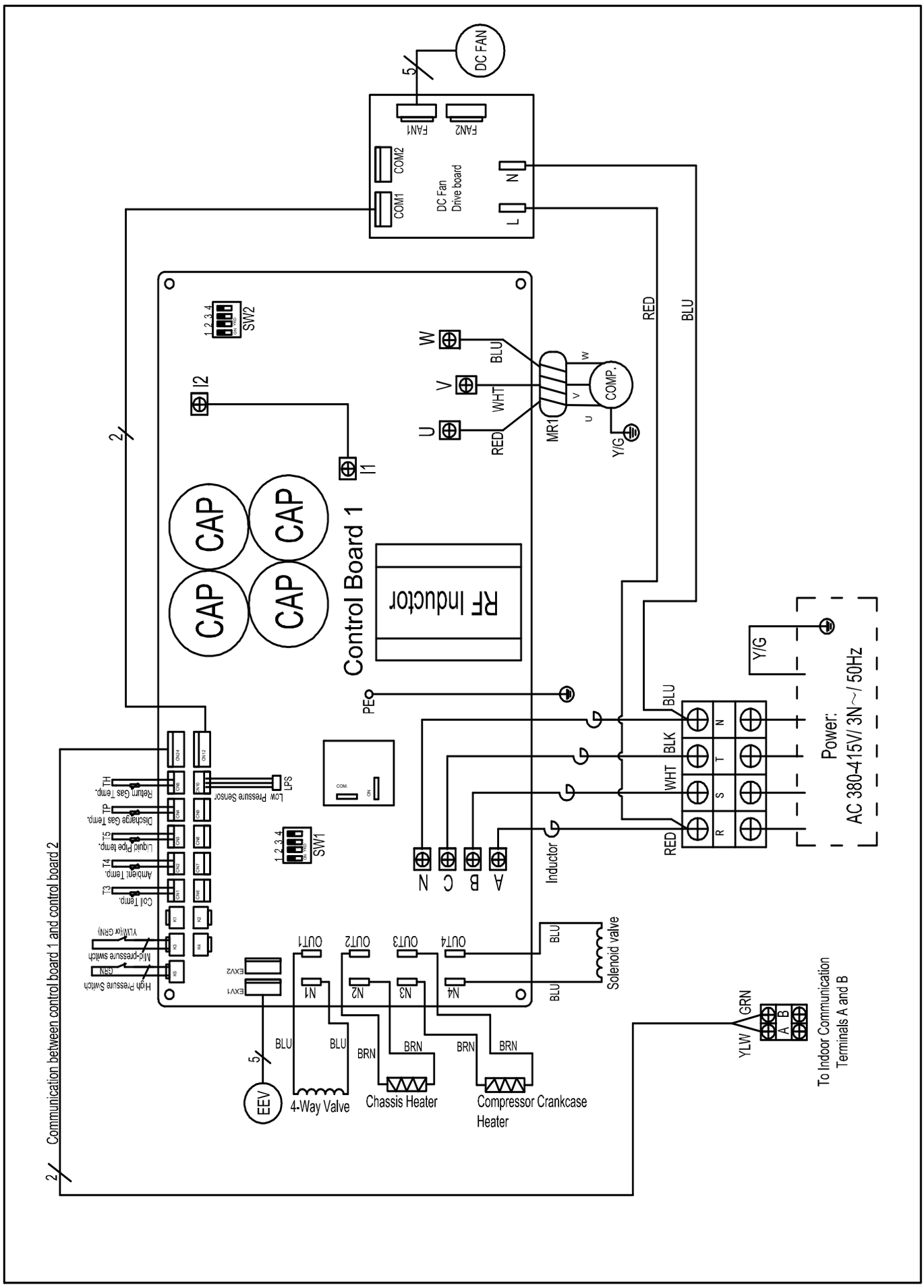
5.2 Electrical wiring diagram of the outdoor unit: 8-12kW



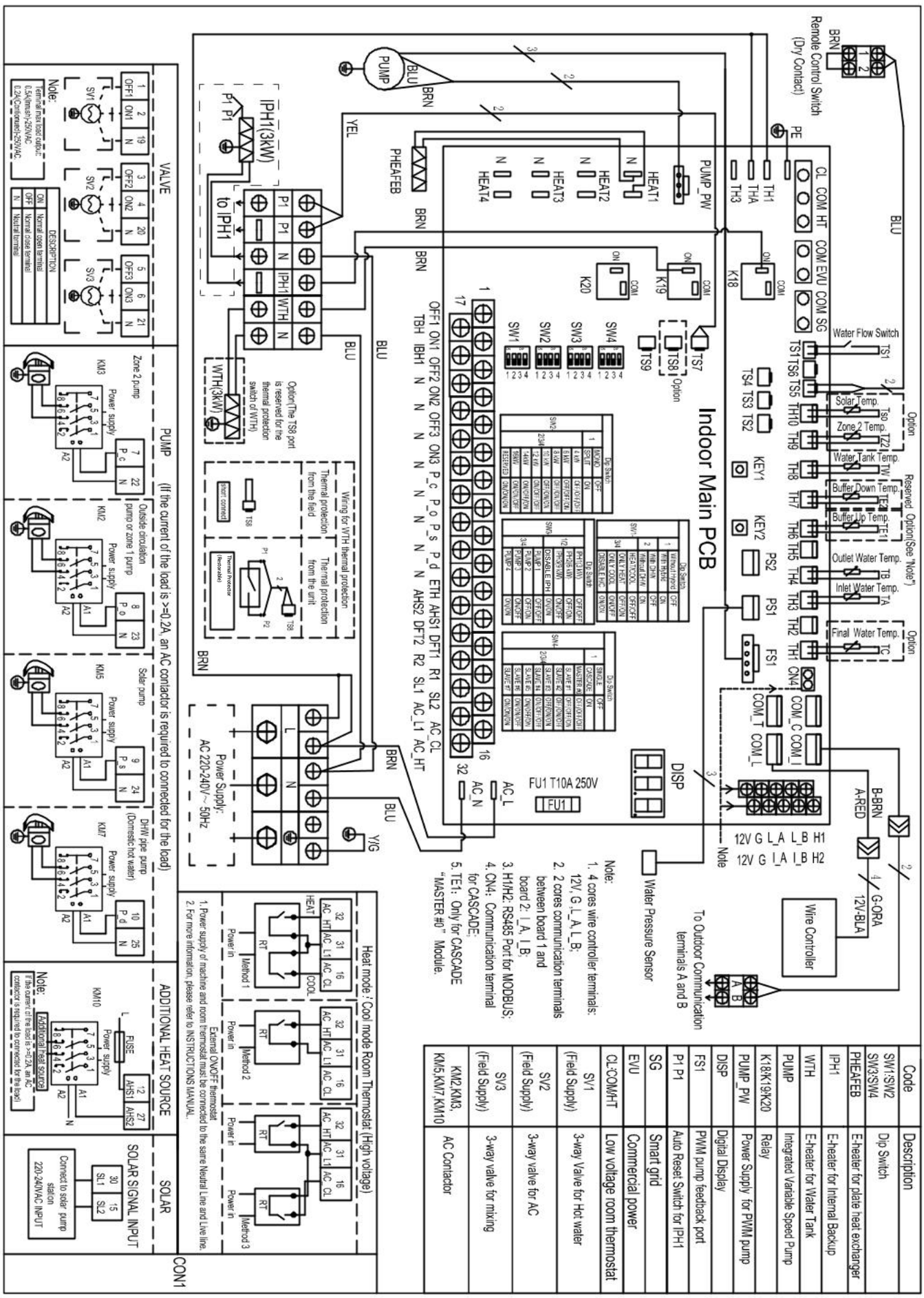
5.3 Electrical wiring diagram of the outdoor unit: 14-16kW



5.4 Electrical wiring diagram of Outdoor unit: 10-16kW (3-phase)

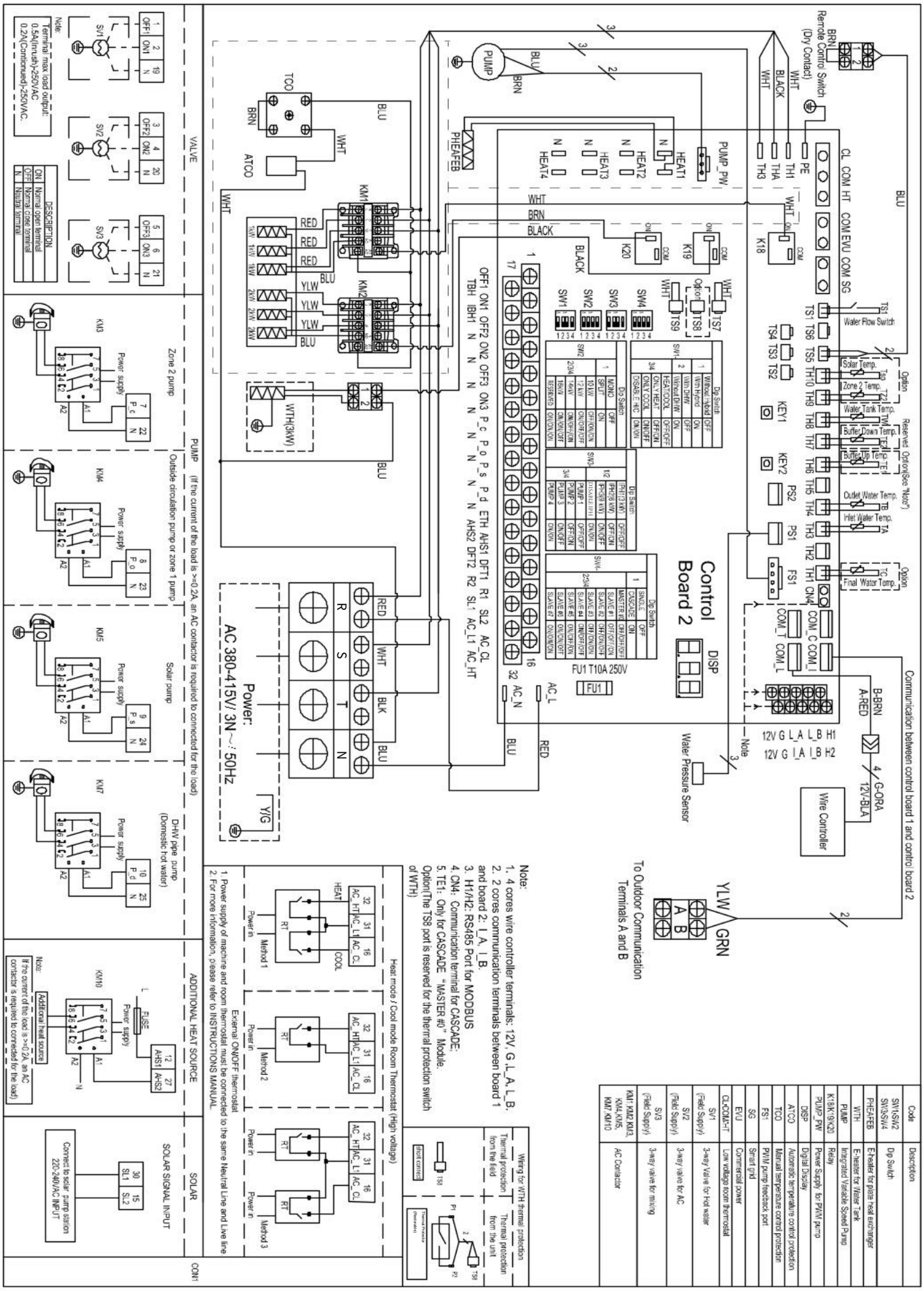


5.5 Electrical wiring diagram of the indoor unit: 4-16kW (1-phase)



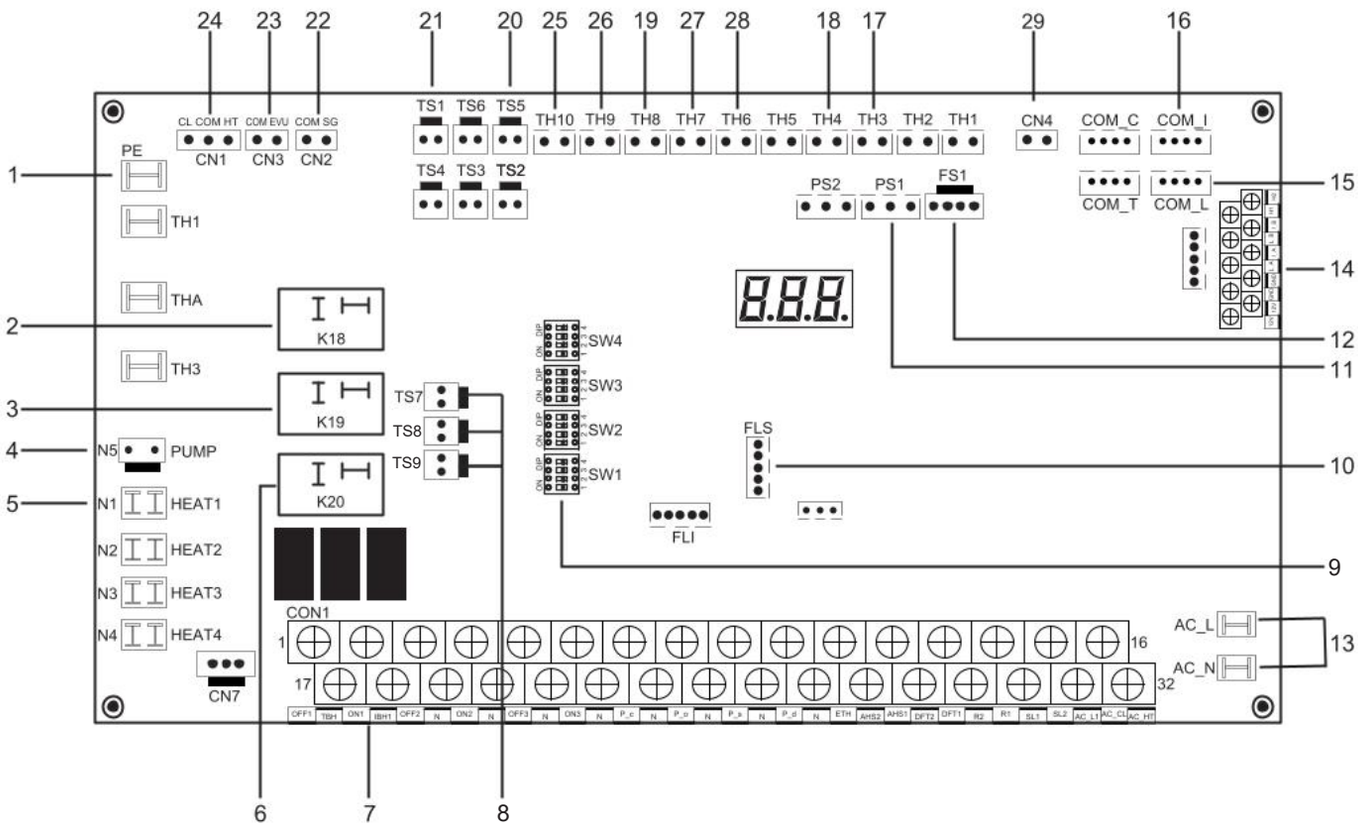
Code	Description
SW1:SW2 SW3:SW4	Dip Switch
PHEAFEB	E-heater for plate heat exchanger
IPH1	E-heater for Internal Backup
WTH	E-heater for Water Tank
PUMP	Integrated Variable Speed Pump
K18;K19;K20	Relay
PUMP_PW	Power Supply for PWM pump
DISP	Digital Display
FS1	PWM pump feedback port
P1 P1	Auto Reset Switch for IPH1
SG	Smart grid
EVU	Commercial power
CL;COM/HT	Low voltage room thermostat
SV1 (Field Supply)	3-way Valve for Hot water
SV2 (Field Supply)	3-way valve for AC
SV3 (Field Supply)	3-way valve for mixing
KM2,KM3, KM5,KM7,KM10	AC Contactor

5.6 Electrical wiring diagram of the indoor unit: 10-16kW (3-phase)



6 Electronic control box

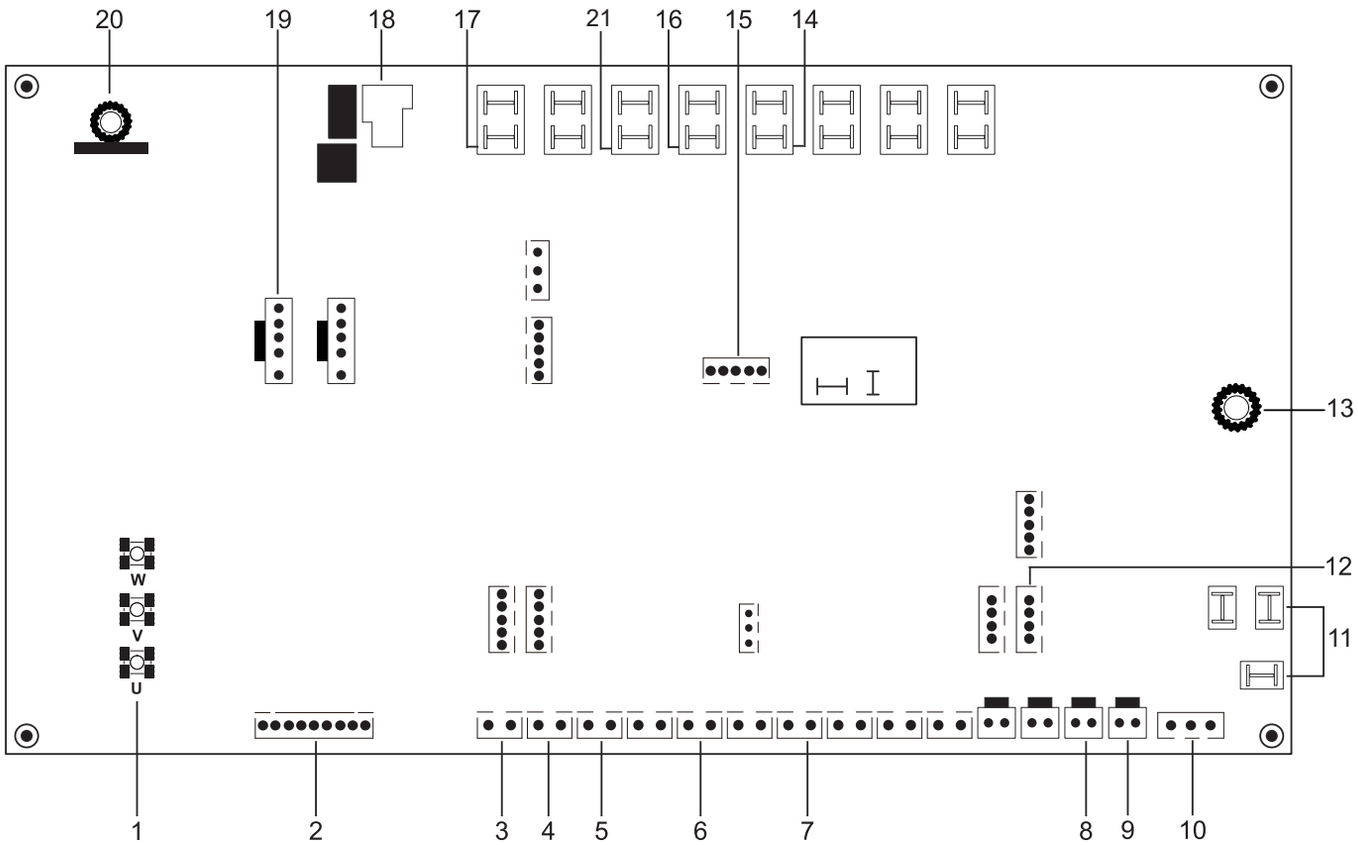
6.1 Main control board of hydraulic module



Items	Port label	function	Items	Port label	function
1	PE	Port for ground	16	COM_I	Comunication portm
2	K18	Relay for internal backup heater(IPH,3kW)	17	TH3	Inlet water temperature
3	K19	Relay for domestic water tank heater(3kW)	18	TH4	Outlet water temperature
4	Pump	Power supply of internal pump	19	TH8	Domestic water tank temperature
5	HEAT 1	Plate heat exchange anti-freezing heater	20	TS5	Remote switch
6	K20	Relay only for internal backup heater of 3-Phase model, 6 kW	21	TS1	Water flow switch
7	CON1	Terminals(Reserved)	22	SG	Smart Grid
8	TS7/TS9	High temperature protection switch for IPH	23	EVU	PV signal
	TS8	High temperature protection switch for WTH	24	CN1	Low Voltage thermostatv
9	SW1/2/3/4	Dip switch	25	Tso	Solar water heater sensor
10	FLS	Program update	26	TZ2	Zone 2 temperature
11	PS1	Water pressure sensor	27	TE2	Reserved
12	FS1	Internal pump speed feedback	28	TE1	Buffer temp. sensor for CASCADE
13	AC	Power supply	29	COM_L	Communication port
14	U19	Communication ports			
15	COM_L	Wired controller			

6.2 1-phase for 4-16kW units

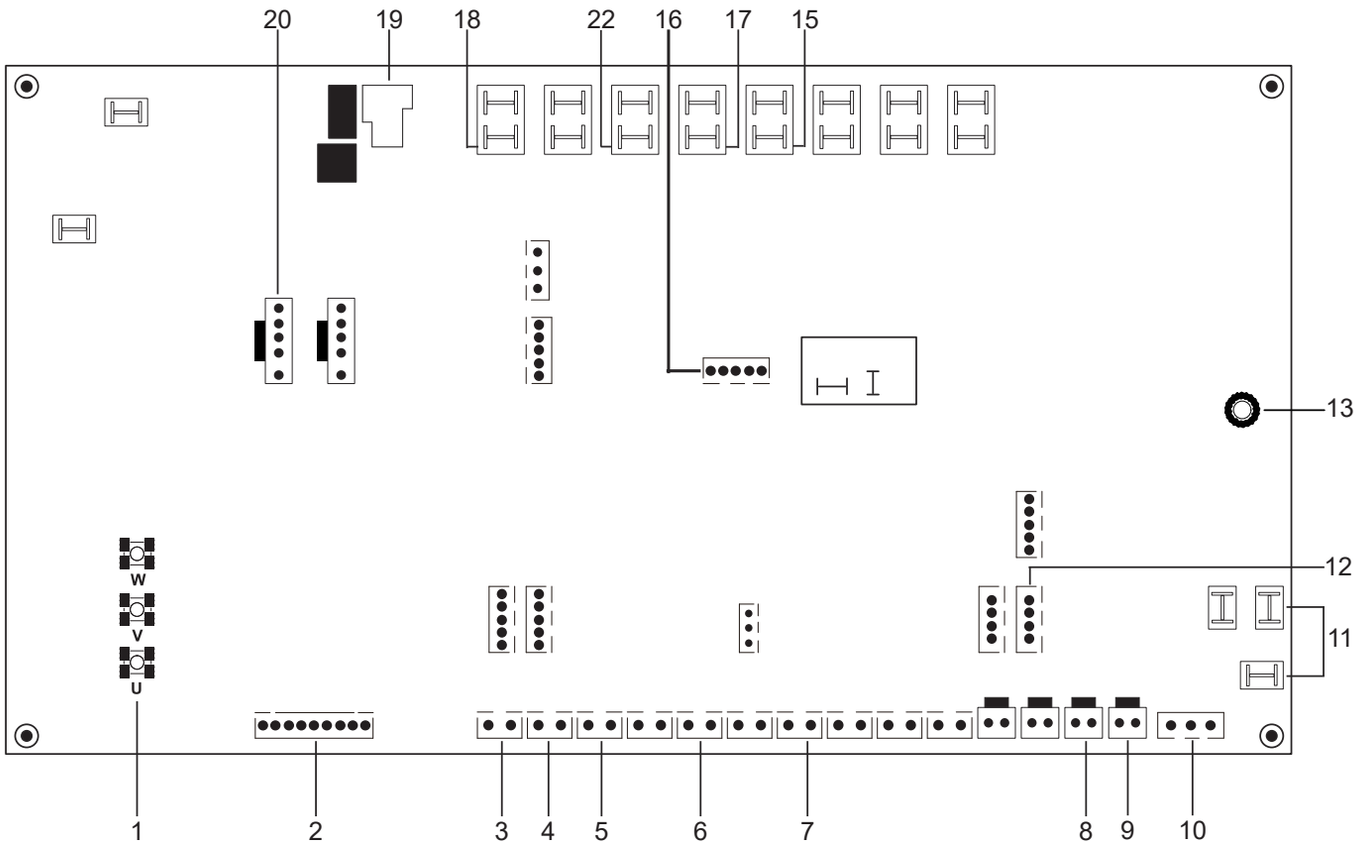
1) PCB A, 4-6kW, Drive and refrigerant system PCB



Items	Port label	function	Items	Port label	function
1	U/V/W	Compressor output	12	COM4	Communication with hydraulic module PCB
2	JTAG	Drive program update	13	PE1	Port for ground
3	TH1	Coil temperature sensor	14	OUT4	4-Way Valve
4	TH2	Outdoor ambient temperature sensor	15	FLS	PCB Program update
5	TH3	Refrigerant liquid temperature sensor	16	OUT5	Chassis Heater
6	TH5	Discharge Gas Temperature sensor	17	OUT8	Compressor Crankcase Heater
7	TH7	Suction temperature sensor	18	K9	Relay for PFC
8	TS3	HP2: Middle pressure switch	19	FAN1	DC Fan
9	TS4	HP1: High pressure switch	20	L1	Common mode inductance
10	TS5	LPS: Low pressure sensor	21	OUT6	Solenoid valve
11	AC	Power supply			

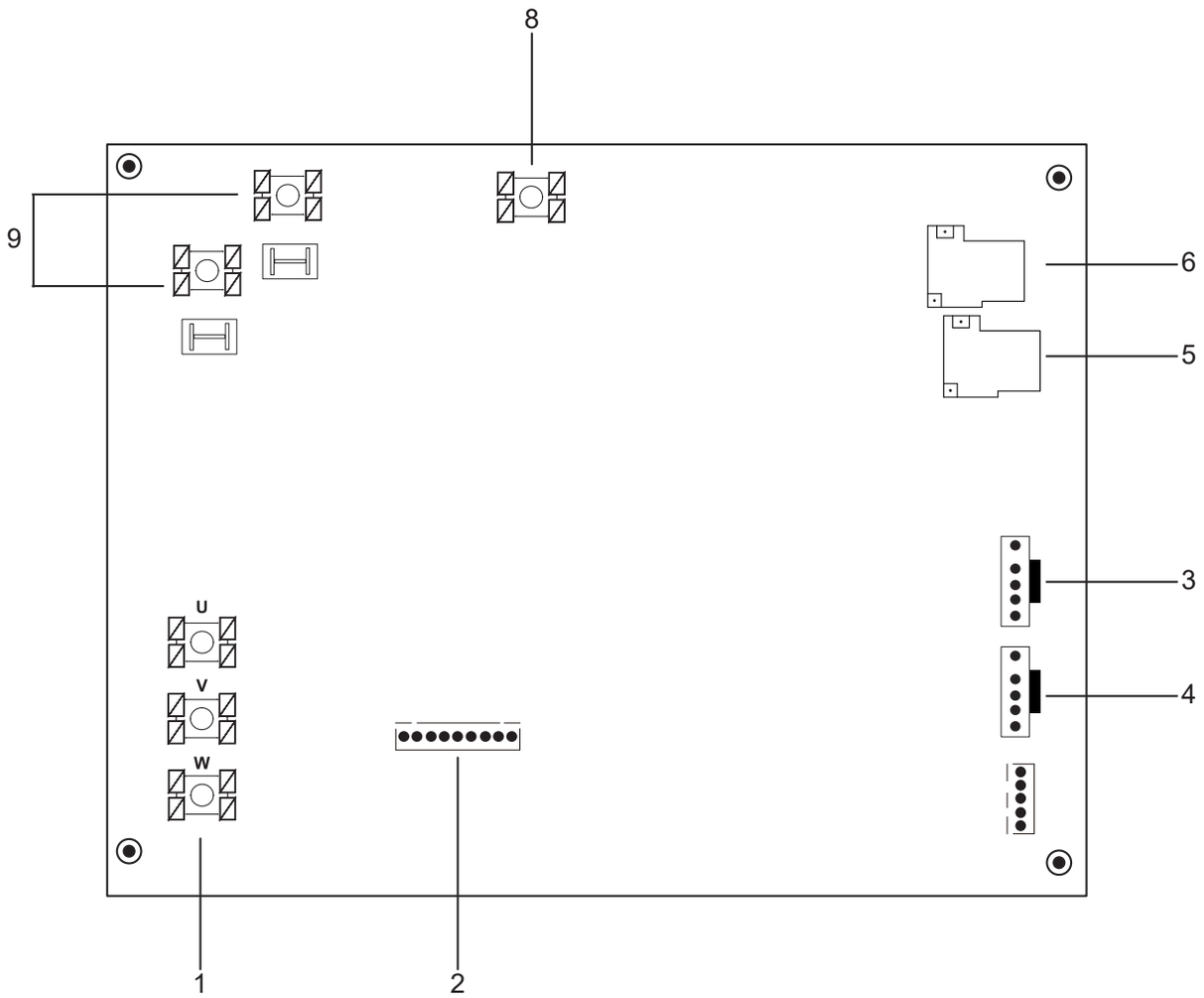
2) PCB A, 8-10-12kW, Drive and refrigerant system PCB

Notification: 8kW and 10-12kW models has different PCB A but same connect ports



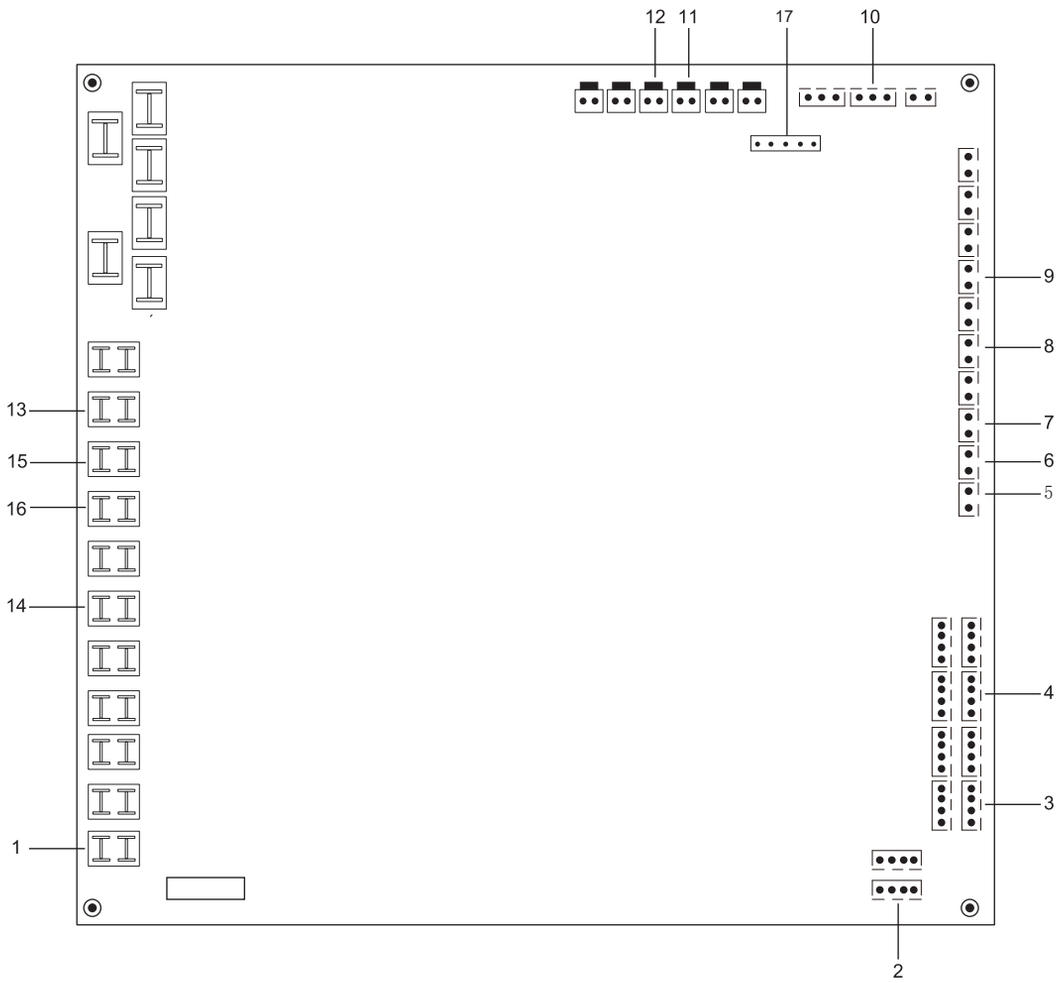
Items	Port label	function	Items	Port label	function
1	U/V/W	Compressor output	12	COM4	Communication with hydraulic module PCB
2	JTAG	Drive program update	13	PE1	Port for ground
3	TH1	Coil temperature sensor	14	/	Filter components
4	TH2	Outdoor ambient temperature sensor	15	OUT4	4-way valve
5	TH3	Refrigerant liquid temperature sensor	16	FLS	PCB Program update
6	TH5	Discharge Gas Temperature sensor	17	OUT5	Chassis Heater
7	TH7	Suction temperature sensor	18	OUT8	Compressor Crankcase Heater
8	TS3	HP2: Middle pressure switch	19	K9	Relay for PFC
9	TS4	HP1: High pressure switch	20	FAN1	DC Fan
10	TS5	LPS: Low pressure sensor	21	/	Common mode inductance
11	AC	Power supply	22	OUT6	Solenoid valve

3) PCB A, 14-16kW, Drive PCB



Items	Port label	Function
1	U/V/W	Compressor output
2	JTAG	Drive program update
3	FAN1	DC fan
4	FAN2	Reserved
5	K2	Relay for PFC
6	K1	Relay for PFC
7	/	Filter components
8	PE	Port for ground
9	AC	Power supply
10	/	Drive components

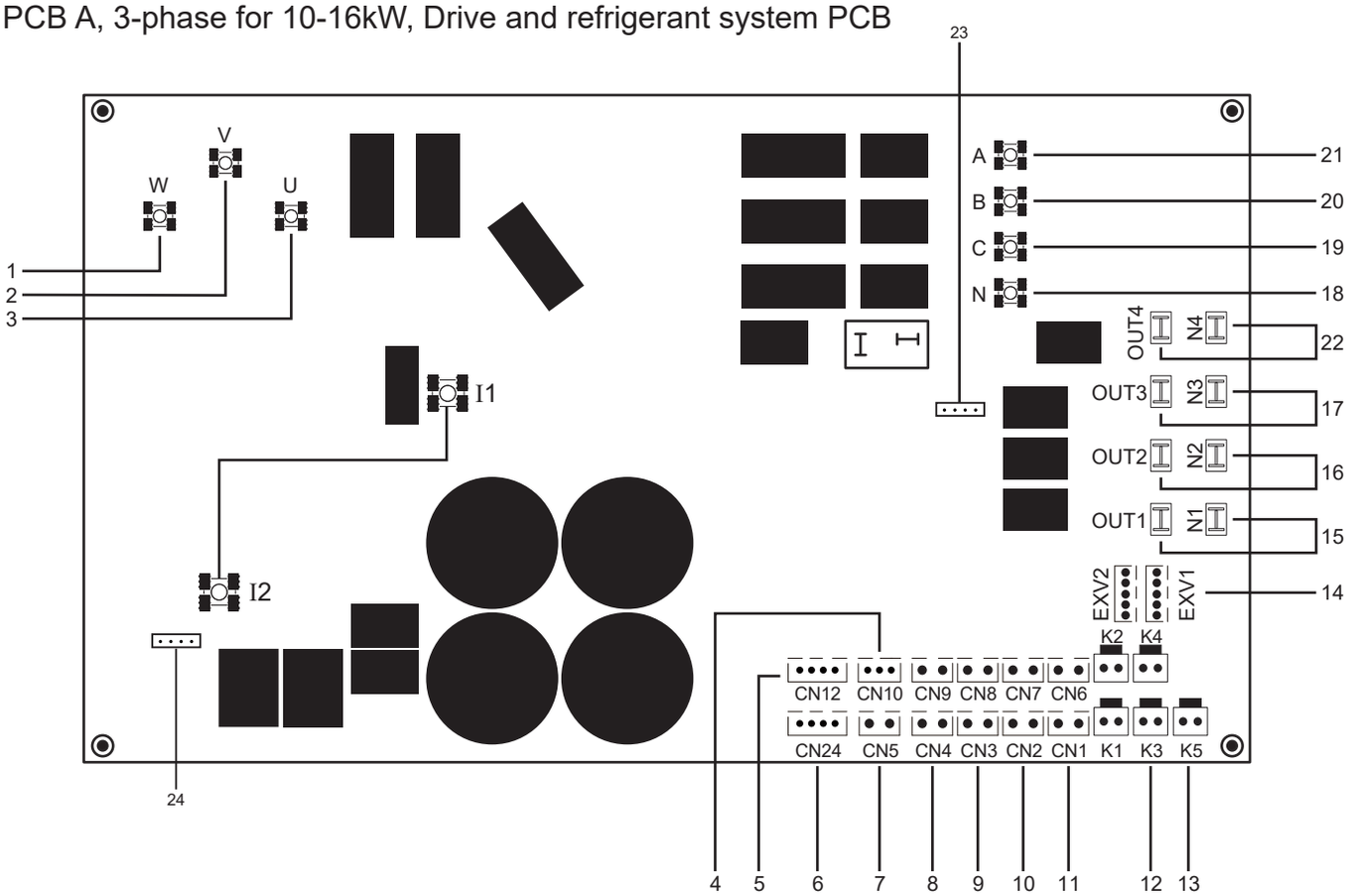
4) PCB B, 14-16kW, Refrigerant system PCB



Items	Port label	Function
1	AC (L/N)	Power supply
2	EXV1	Electric expansive valve
3	COM_L/I	Communication with hydraulic module PCB
4	COM_D	Communication with inverter module PCB
5	TH1	T3: Coil temperature sensor
6	TH2	T4: Outdoor ambient temperature sensor
7	TH3	T5: liquid temperature sensor
8	TH5	TP: Discharge Gas Temperature sensor
9	TH7	TH: Suction temperature sensor
10	TS8	LPS: Low pressure sensor
11	TS4	HP2: Middle pressure switch
12	TS3	HP1: High pressure switch
13	Output 4	4-way valve
14	Output 8	Compressor Crankcase Heater
15	Output 5	Chassis Heater
16	Output 6	Solenoid valve
17	FLS	System program update

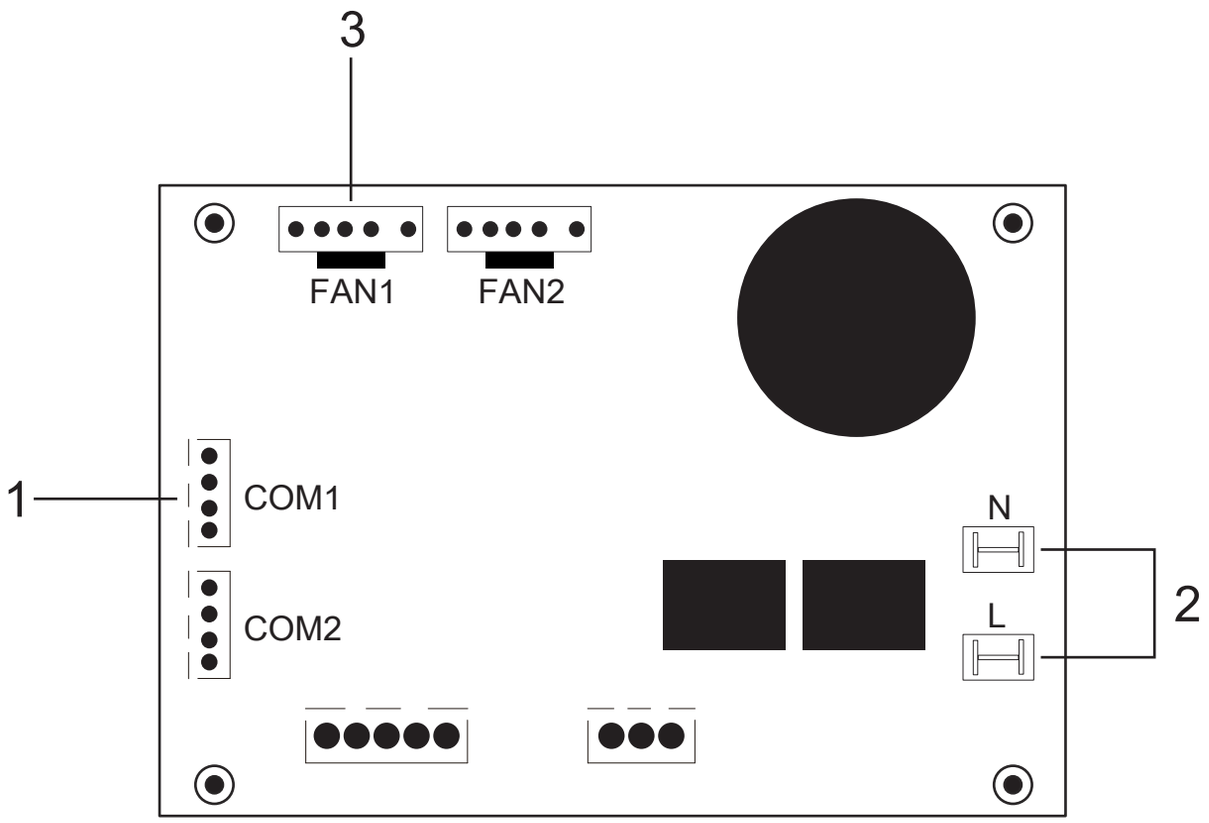
6.3 3-phase for 10-16kW units

1) PCB A, 3-phase for 10-16kW, Drive and refrigerant system PCB



Items	Port label	Function	Items	Port label	Function
1	w	Compressor connection port	12	K3	Medium pressure switch
2	v		13	K5	High pressure switch
3	u		14	EXV1	Electronic expansion valve
4	CN10	Low pressure sensor	15	OUT1,N1	4-way valve
5	CN12	Communication between control board 1 and DC fan drive board	16	OUT2,N2	Chassis Heater
6	CN24	Communication between control board 1 and control board 2	17	OUT3,N3	Compressor Crankcase Heater
7	CN5	Suction temperature	18	N	Power supply
8	CN4	Discharge Gas Temperature	19	C	
9	CN3	EEV Liquid temperature	20	B	
10	CN2	Ambient temperature	21	A	
11	CN1	Coil temperature	22	OUT4,N4	Solenoid valve
			23	JS2	System program update
			24	JS3	Drive Program update

2) PCB B, 3-phase for 10-16kW, DC Fan drive board



Items	Port label	Function
1	COM1	Communication between PCB A and PCB B
2	L, N	Power supply
3	FAN1	DC FAN

7 Field wiring

⚠ WARNING

- At least one leakage switch or other disconnecting device shall be installed, and contact spacing shall be set on all electrodes, which shall be included in the fixed wiring in accordance with relevant laws and regulations.
- Please turn off the power when wiring.
- All wiring and component installation work shall be completed by licensed electricians and comply with the laws and regulations of their country.
- Wiring shall be carried out in strict accordance with the circuit diagram and instructions of the unit.
- Be sure to use a dedicated power supply. Never use a power supply shared by another appliance.
- Ground wires must be installed. Do not connect the machine to the ground wire of public pipeline, lightning arrester or telephone. The incomplete ground wire will cause electric shock.
- Be sure to install a ground fault circuit interrupter (30 mA). Failure to do so may cause electrical shock.
- Be sure to install the required fuses or circuit breakers.

7.1 Precautions on electrical wiring work

- Fix cables so that cables do not make contact with the pipes (especially on the high pressure side).
- Secure the electrical wiring with cable ties as shown in figure so that it does not come in contact with the piping, particularly on the high-pressure side.
- Make sure no external pressure is applied to the terminal connectors.
- When installing the ground fault circuit interrupter make sure that it is compatible with the inverter (resistant to high frequency electrical noise) to avoid unnecessary opening of the ground fault circuit interrupter.

NOTE

The ground fault circuit interrupter must be a high- speed type breaker of 30 mA (<0.1 s).

- This unit is equipped with an inverter. Installing a phase advancing capacitor not only will reduce the power factor improvement effect, but also may cause abnormal heating of the capacitor due to high-frequency waves. Never install a phase advancing capacitor as it could lead to an accident.

7.2 Wiring overview

The illustration below gives an overview of the required field wiring between several parts of the installation.
(Refer to page 34 for illustration)

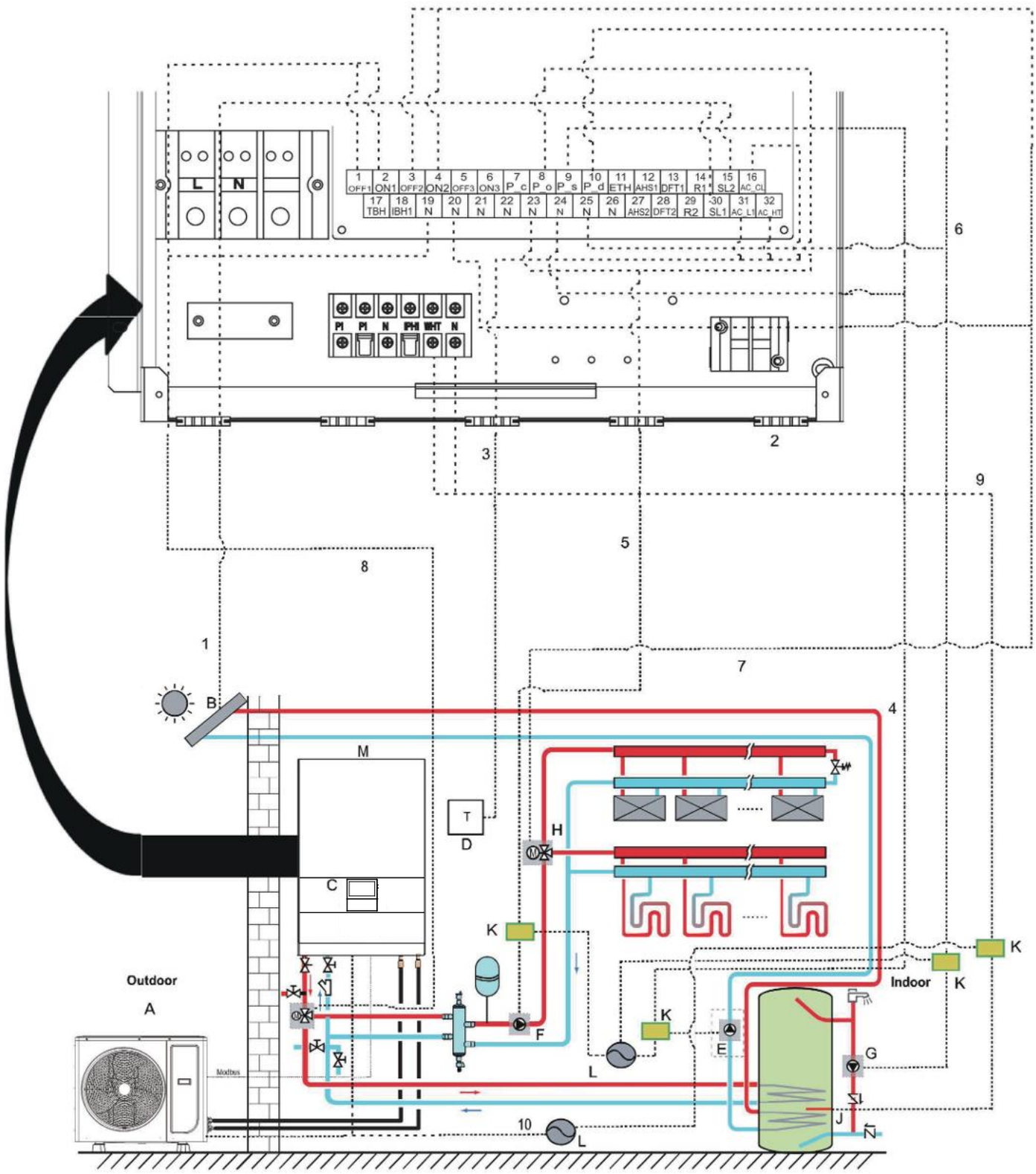
NOTE

Please use H07RN-F for the power wire, all the cable are connect to high voltage except for thermistor cable and cable for user interface.

- Equipment must be grounded.
- All high-voltage external load, if it is metal or a grounded port, must be grounded.
- All external load current is needed less than 0.2A, if the single load current is greater than 0.2A, the load must be controlled through AC contactor.
- AHS1" "AHS2", "A1" "A2", wiring terminal ports provide only the switch signal.
  Please refer to image of 8.6 to get the ports position in the unit.

7.3 Field wiring guidelines

Most field wiring on the unit is to be made on the terminal block inside the switch box. To gain access to the terminal block, remove the switch box service panel.



Legend			
A	Outdoor unit	H	SV2: 3-way valve (field supply)
B	Solar energy kit (field supplied)	I	SV1: 3-way valve for domestic hot water tank (field supply)
C	User interface	J	Booster heater
D	High voltage room thermostat (field supplied)	K	Contactor
E	P_s: Solar pump (field supply)	L	Power supply
F	P_o: Outside circulation pump (field supply)	M	Indoor unit
G	P_d: DHW pump (field supply)		

⚠ WARNING

Switch off all power including the unit power supply and backup heater and domestic hot water tank power supply (if applicable) before removing the switch box service panel.

- Fix all cables using cable ties.
- A dedicated power circuit is required for the backup heater.
- Installations equipped with a domestic hot water tank (field supply) require a dedicated power circuit for the booster heater. Please refer to the domestic hot water tank Installation & Owner's Manual. Secure the wiring in the order shown below.
- Lay out the electrical wiring so that the front cover does not rise up when doing wiring work and attach the front cover securely.
- Follow the electric wiring diagram for electrical wiring works (the electrical wiring diagram is located on the back of the electric control box cover).
- Install the wires and fix the cover firmly so that the cover may be fit in properly.

The table below gives a wiring overview of required field wiring.

Table 6-1 Specification of single-phase power line

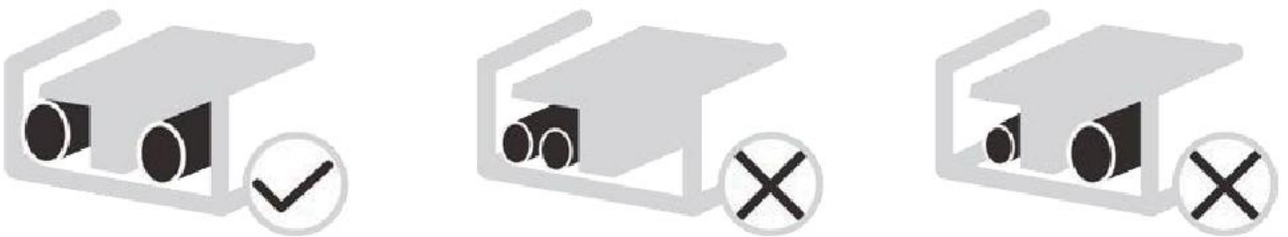
Model		4kW	6kW	8kW	10kW	12kW	14kW	16kW
United Power supply (outdoor power supply must fuse down the indoor power supply to 20 amps)		3x6mm^2	3x6mm^2	3x10mm^2	3x10mm^2	3x10mm^2	3x10mm^2	3x10mm^2
Separated Power Supply	Indoor	3x4mm^2	3x4mm^2	3x4mm^2	3x4mm^2	3x4mm^2	3x4mm^2	3x4mm^2
	Outdoor	3x4mm^2	3x4mm^2	3x4mm^2	3x4mm^2	3x6mm^2	3x6mm^2	3x6mm^2

Table 6-2 Specification of three-phase power line

Model		10kW	12kW	14kW	16kW
United Power supply (outdoor power supply must fuse down the indoor power supply to 20 amps)		5x6mm^2	5x6mm^2	5x6mm^2	5x6mm^2
Separated Power Supply	Indoor	5x4mm^2	5x4mm^2	5x4mm^2	5x4mm^2
	Outdoor	5x4mm^2	5x4mm^2	5x4mm^2	5x4mm^2

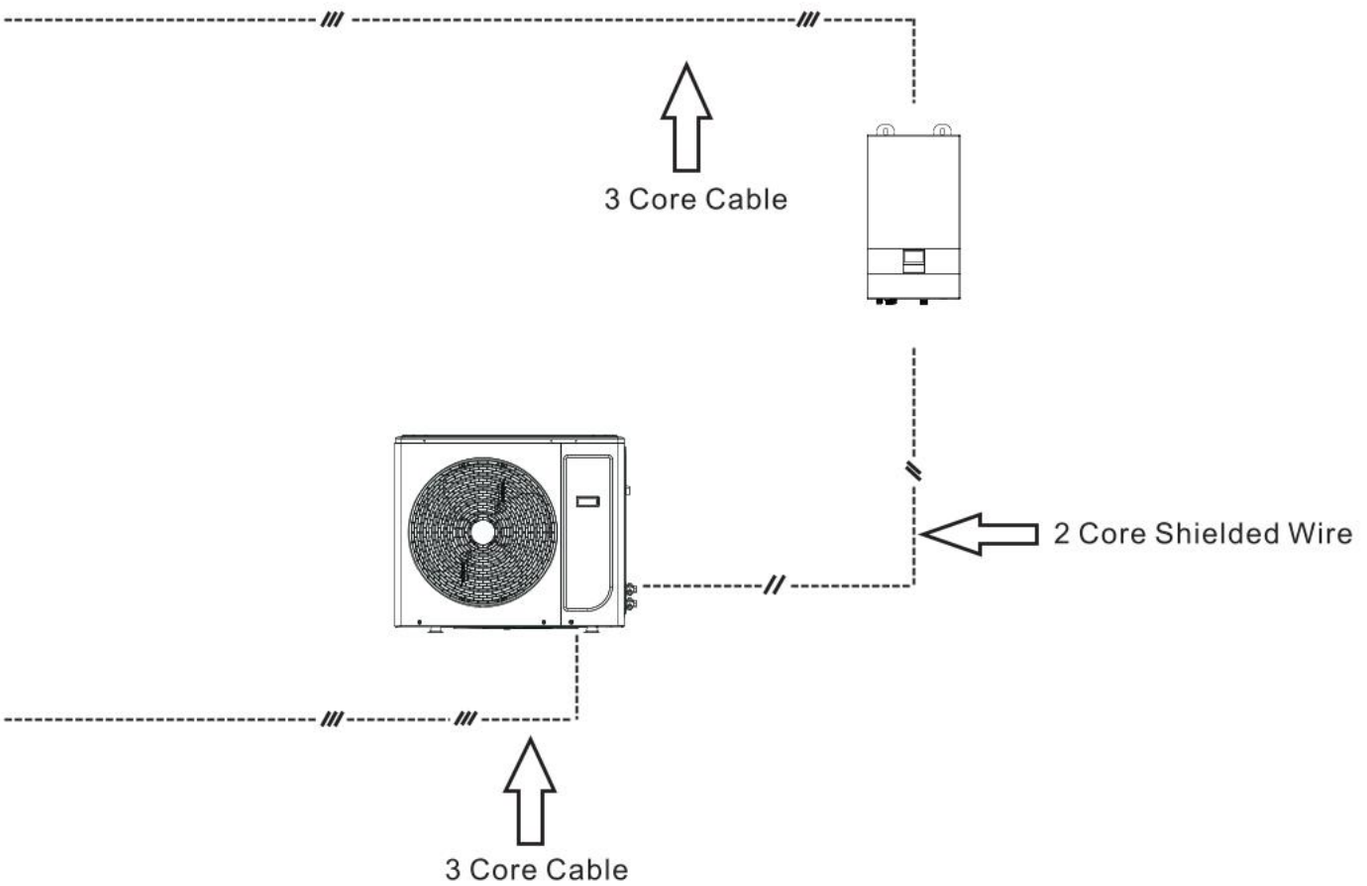
7.4 Precautions on wiring of power supply

- Use a round crimp-style terminal for connection to the power supply terminal board. In case it cannot be used due to unavoidable reasons, be sure to observe the following instructions.
  -Do not connect different gauge wires to the same power supply terminal. (Loose connections may cause overheating.)
  -When connecting wires of the same gauge, connect them according to the figure below.

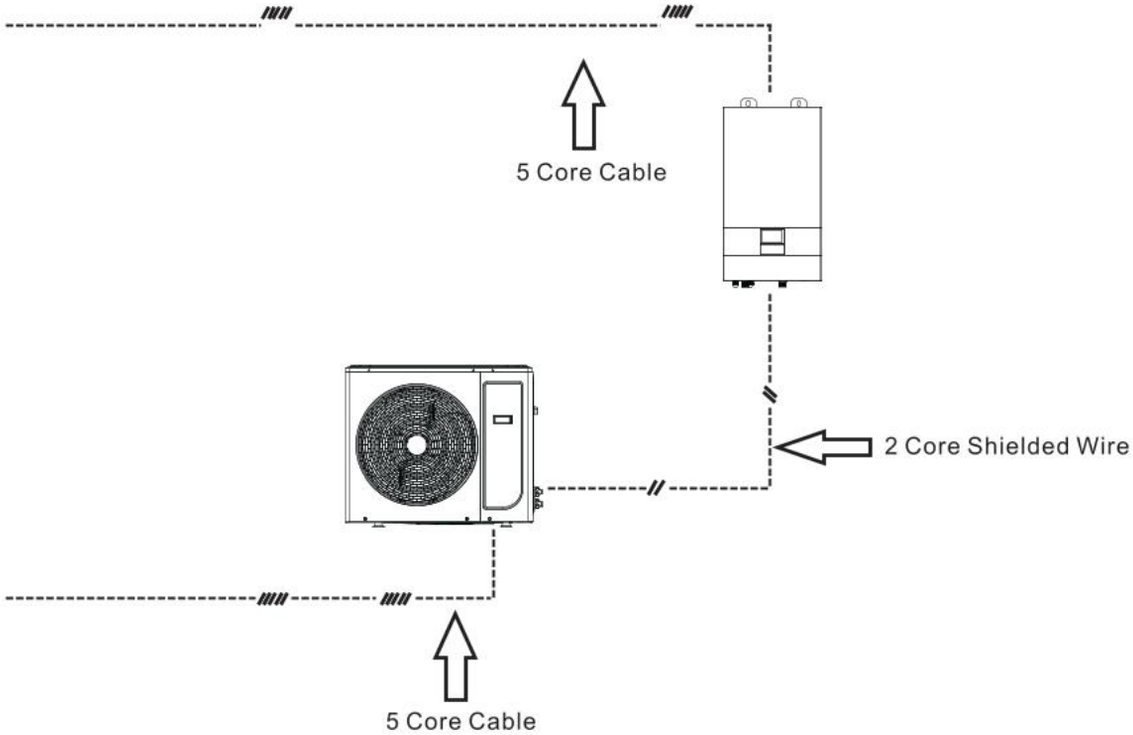


- Use the correct screwdriver to tighten the terminal screws. Small screwdrivers can damage the screw head and prevent appropriate tightening.
- Over-tightening the terminal screws can damage the screws.
- Attach a ground fault circuit interrupter and fuse to the power supply line.
- In wiring, make certain that prescribed wires are used, carry out complete connections, and fix the wires so that outside force cannot affect the terminals.

7.5 Schematic diagram of power input connection



1-phase for 4-16kW



3-phase for 10-16kW

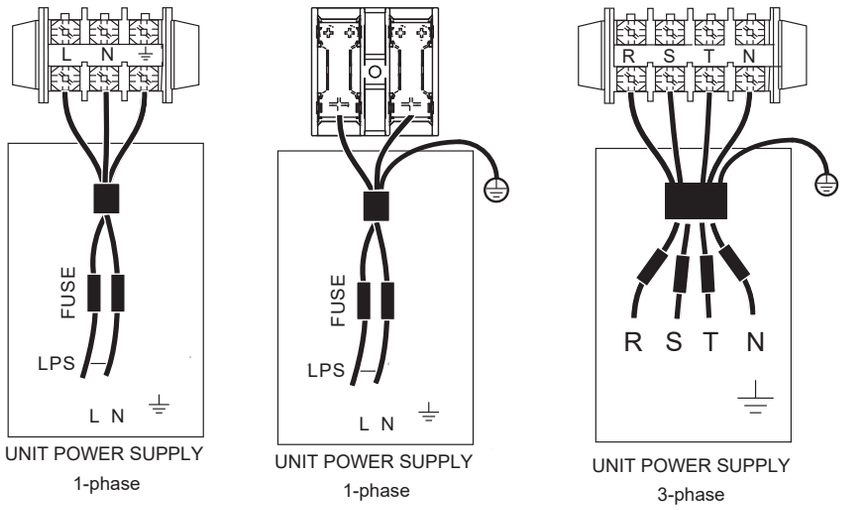
Details of type and rating of fuses

Model	Fuse type	Rating	Model	Fuse type	Rating
4kW	T30AH250V	30a 250V	10/12kW 3-Ph	T10AH250V	10a 250V
6kW	T30AH250V	30a 250V		T30AH250V	30a 250V
8kW	T30AH250V	30a 250V		T6.3AH250V	6.3a 250V
10kW	T30AH250V	30a 250V	14/16kW 3-Ph	T10AH250V	10a 250V
12kW	T30AH250V	30a 250V		T30AH250V	30a 250V
14kW	T30AH250V	30a 250V		T6.3AH250V	6.3a 250V
	T25AH250V	25a 250V			
	T6.3AL250V	6.3a 250V			
16kW	T30AH250V	30a 250V			
	T25AH250V	25a 250V			
	T6.3AL250V	6.3a 250V			

Table 6-3 NB cable entry either top or bottom of the indoor unit

Model	Rated Input Power/ Rated Current Outdoor Unit	Indoor Unit
4kW	1900W / 8.26A	95W(+ 3000W**) / 0.4A (+13.6 A **)
6kW	2900W / 12.6A	95W(+ 3000W**) / 0.4A (+13.6 A **)
8kW	3800W / 16.5A	95W(+ 3000W**) / 0.4A (+13.6 A **)
10kW	4500W / 19.6A	95W(+ 3000W**) / 0.4A (+13.6 A **)
12kW	5700W / 24.8A	95W(+ 3000W**) / 0.4A (+13.6 A **)
14kW	5900W / 25.6A	95W(+ 3000W**) / 0.4A (+13.6 A **)
16kW	6800W / 29.6A	95W(+ 3000W**) / 0.4A (+13.6 A **)
10kW 3-Ph	4500W / 6.7A	95W(+ 9000W**) / 0.4A (+13.6 A **)
12kW 3-Ph	5700W / 8.3A	95W(+ 9000W**) / 0.4A (+13.6 A **)
14kW 3-Ph	5900W / 8.6A	95W(+ 9000W**) / 0.4A (+13.6 A **)
16kW 3-Ph	7500W / 10.9A	95W(+ 9000W**) / 0.4A (+13.6 A **)
Remark ** related to the supplementary heater.		

7.6 Remove the switch box cover



NOTE

The ground fault circuit interrupter must be 1 high-speed type of 30mA(<0.1s). Please use 3-core shielded wire.
The default of backup heater is option 3 (for 9kW backup heater).
Stated values are maximum values (see electrical data for exact values).

When connecting to the power supply terminal, use the circular wiring terminal with the insulation casing (see Figure 6.1). Use power cord that conforms to the specifications and connect the power cord firmly. To prevent the cord from being pulled out by external force, make sure it is fixed securely.
If circular wiring terminal with the insulation casing cannot be used, please make sure that:
● Do not connect two power cords with different diameters to the same power supply terminal (may cause overheating of wires due to loose wiring) (See Figure 6.2).

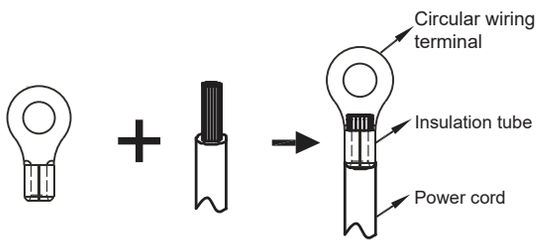


Figure 9.1

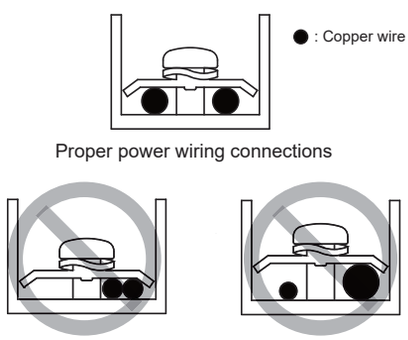
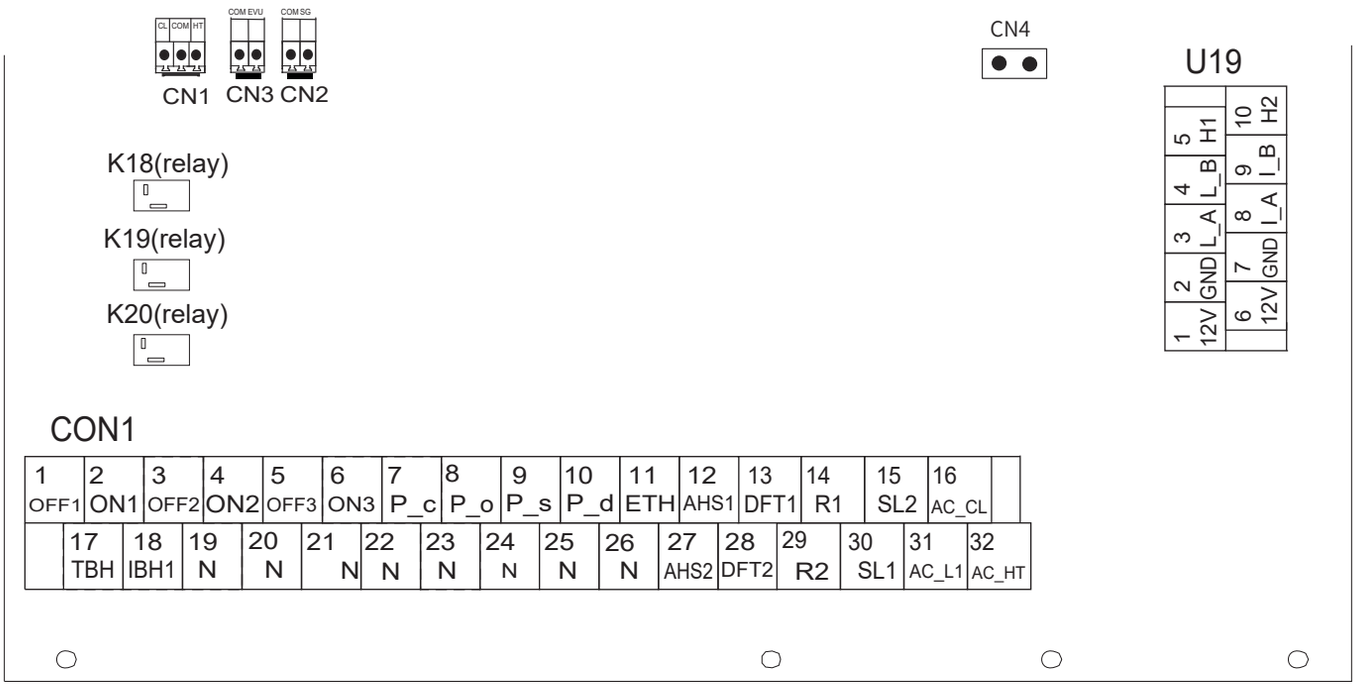


Figure 9.2

8 Connection for other components



	Code	Print		Connect to
CON1	①	1	OFF1	SV1(3-way valve)
		2	ON1	
		19	N	
	②	3	OFF2	SV2(3-way valve)
		4	ON2	
		20	N	
	③	5	OFF3	SV2(3-way valve)
		6	ON3	
		21	N	
	④	7	P_c	Pump(zone 2 pump)
		22	N	
	⑤	8	P_o	Outside circulation pump/zone 1 pump
		23	N	
	⑥	9	P_s	Solar energy pump
		24	N	
	⑦	10	P_d	DHW pipe pump
		25	N	
	⑧	11	ETH	Reserved
		26	N	
	⑨	12	AHS1	Additional heat source
		27	AHS2	
	⑩	13	DFT1	Reserved
		28	DFT2	
	⑪	14	R1	Reserved
		29	R2	
	⑫	15	SL2	Solar energy input signal
		30	SL1	
	⑬	16	AC_CL	Room thermostat input（high voltage）
		31	AC_L1	
		32	AC_HT	

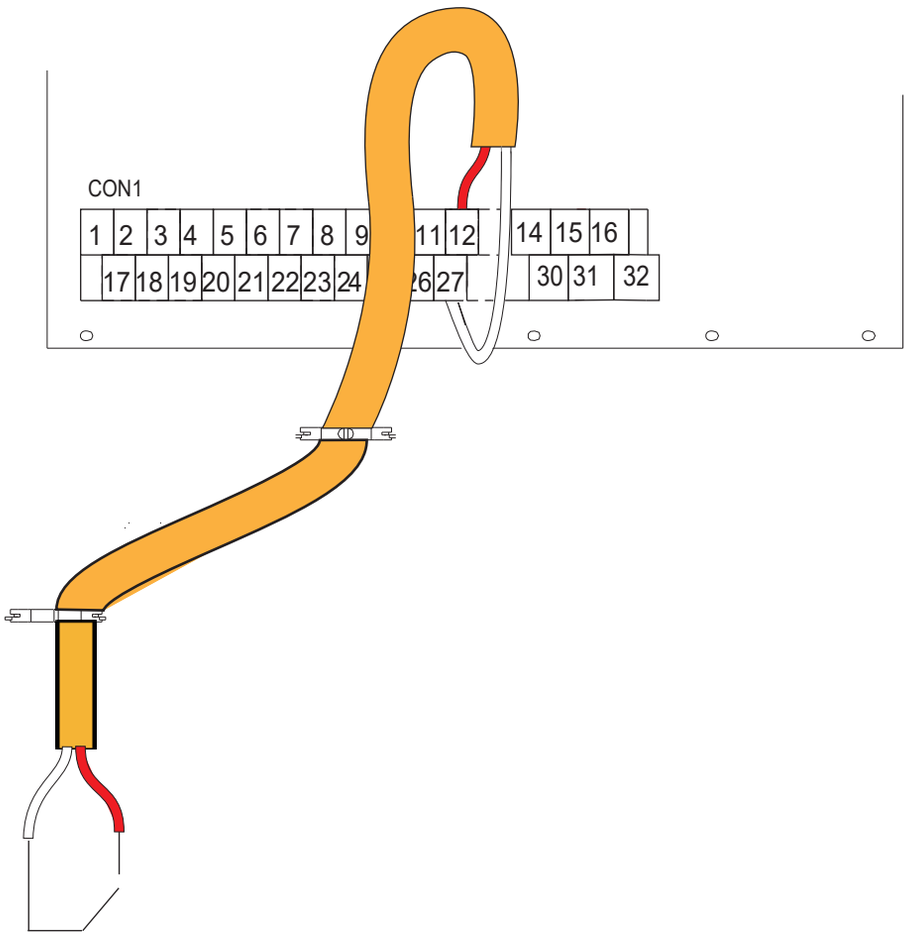
	Code	Print	Connect to
CN1	①	CL	Room thermostat inpu（Low voltage）
	②	COM	
	③	HT	
CN2	①	COM	SG
	②	SG	
CN3	①	COM	EVU
	②	EVU	
CN4	Communication terminal		Each module by sequence for CASCADE

	Code	Print		Connect to
U19	①	1	12V	Wired controller
		2	GND	
		3	L_A	
		4	L_B	
	②	6	12V	To outdoor unit
		7	GND	
		8	I_A	
		9	I_B	
	③	5	H1	RS485 PORT FOR MODBUS
		10	H2	

Port provide the control signal to the load. Two kind of control signal port:

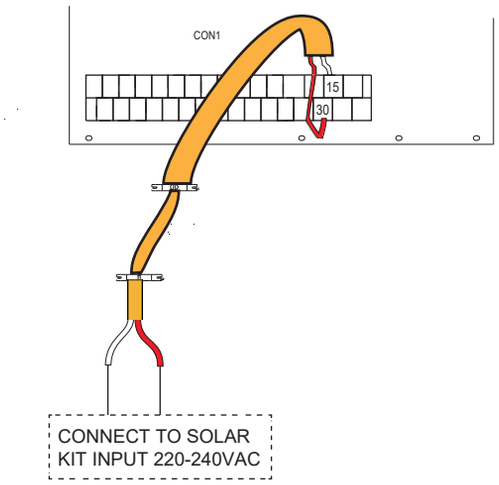
Type 1： Dry connector without voltage.

Type 2： Port provide the signal with 220V voltage. If the current of load is <0.2A, load can connect to the port directly. If the current of load is >=0.2A, the AC contactor is required to connected for the load.



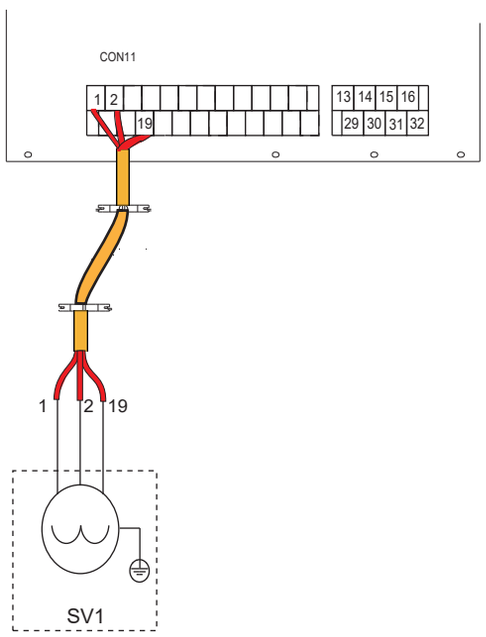
Type1 For additional heat source control

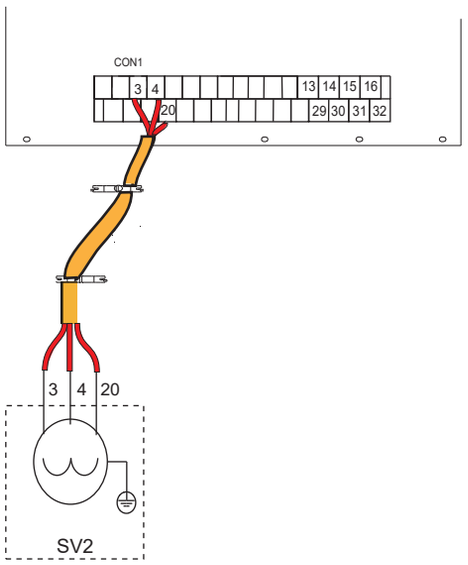
8.1 For solar energy input signal:

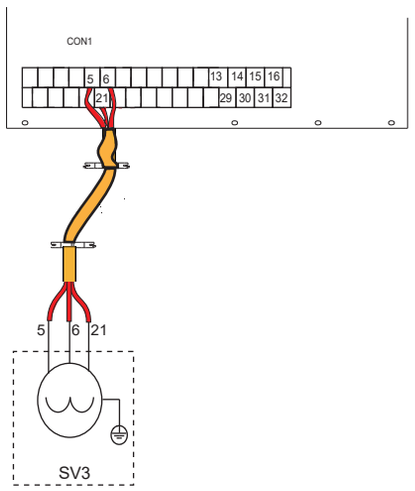


Voltage	220-240VAC
Maximum running current(A)	0.2
Wiring size(mm^2)	0.75

8.2 For 3-way valve SV1、SV2 and SV3:





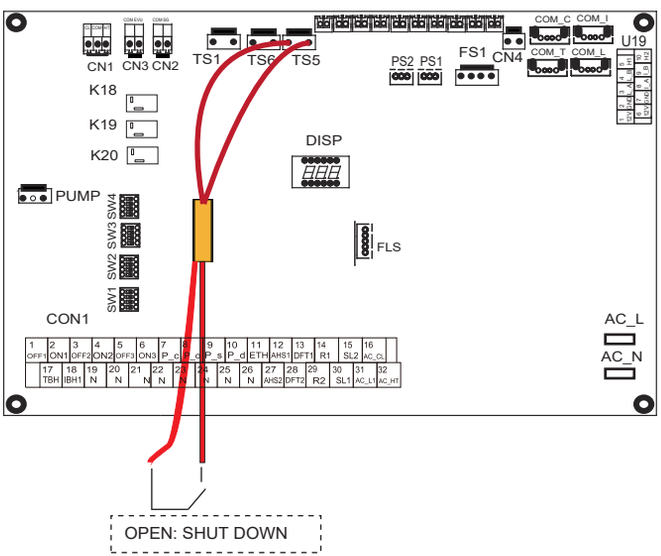


Voltage	220-240VAC
Maximum running current(A)	0.2
Wiring size(mm^2)	0.75
Control port signal type	Type 2

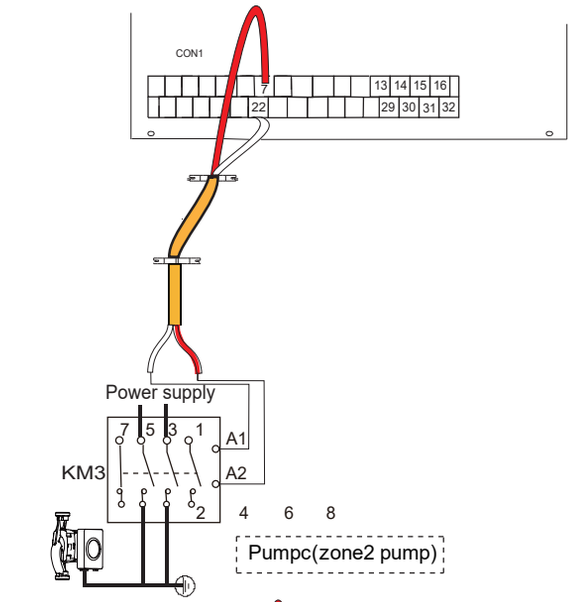
a)Procedure

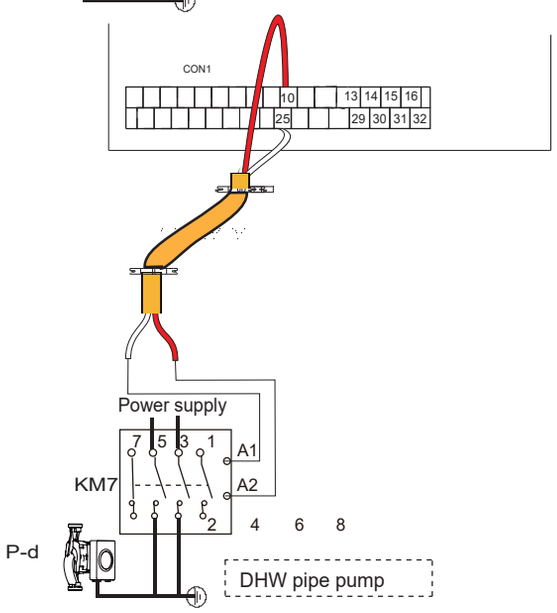
- Connect the cable to the appropriate terminals as shown in the picture.
- Fix the cable reliably.

8.3 For remote shut down:



8.4 For Pump and DHW pipe pump:





Voltage	220-240VAC
Maximum running current(A)	0.2
Wiring size(mm^2)	0.75
Control port signal type	Type 2

a)Procedure

- Connect the cable to the appropriate terminals as shown in the picture.
- Fix the cable reliably.

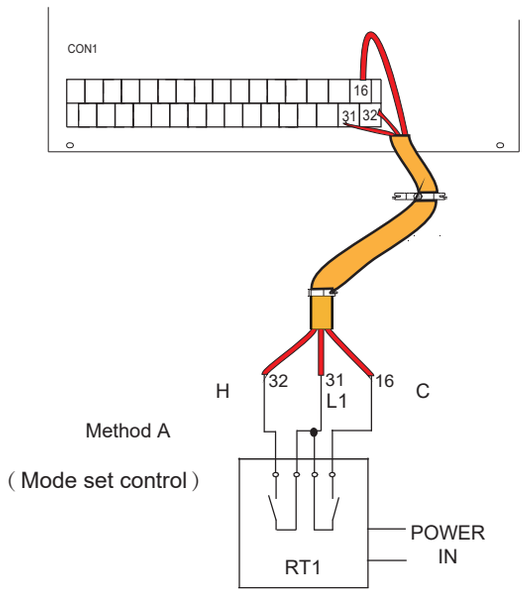
8.5 For room thermostat:

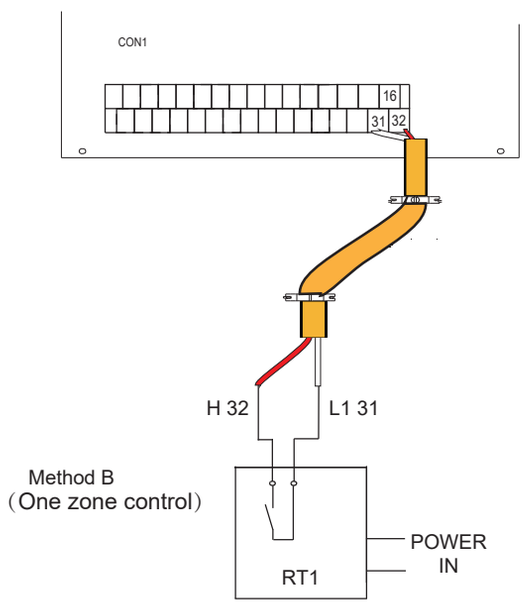
Room thermostat type 1(High voltage): "POWER IN" provide the working voltage to the RT, doesn't provide the voltage to the RT connector directly. Port "31 L1" provide the 220V voltage to the RT connector. Port "31 L1" connect from the unit main power supply port L of 1- phase power supply.
Room thermostat type 2(Low voltage) : "POWER IN" provide the working voltage to the RT.

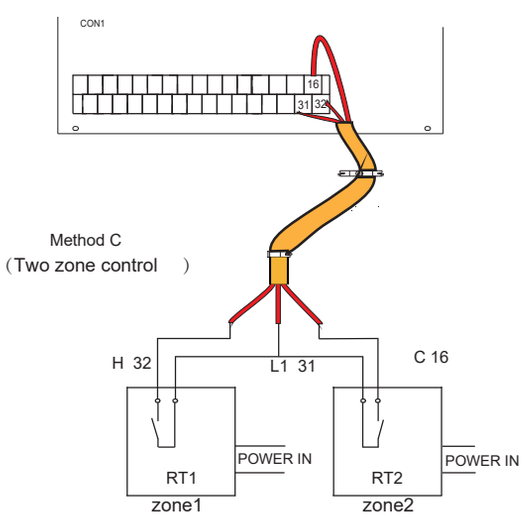
NOTE

There are two optional connect method depend on the room thermostat type.

Room thermostat type 1 (High voltage):







Voltage	220-240VAC
Maximum running current(A)	0.2
Wiring size(mm^2)	0.75

There are three methods for connecting the thermostat cable (as described in the picture above) and it depends on the application.

●Method 1 (Mode set control)

RT can control heating and cooling individually, like the controller for 4-pipe FCU. When the hydraulic module is connected with the external temperature controller, user interface set ROOM THERMOSTAT to MODE SET：

1.1 When unit detect voltage is 230VAC between CL and L1, the unit operates in the cooling mode.

1.2 When unit detect voltage is 230VAC between HT and L1, the unit operates in the heating mode.

1.3 When unit detect voltage is 0VAC for both side (CL-L1, HT-L1) the unit stop working for space heating or cooling.

1.4 When unit detect voltage is 230VAC for both side (CL-L1, HT-L1) the unit working in cooling mode.

●Method 2 (One zone control)

RT provide the switch signal to unit. User interface set ROOM THERMOSTAT to ONE ZONE：

2.1 When unit detect voltage is 230VAC between HT and L1, unit turns on.

2.2 When unit detect voltage is 0VAC between HT and L1, unit turns off.

●Method 3 (Double zone control)

Hydraulic Module is connected with two room thermostat, while user interface set ROOM THERMOSTAT to ZONES:

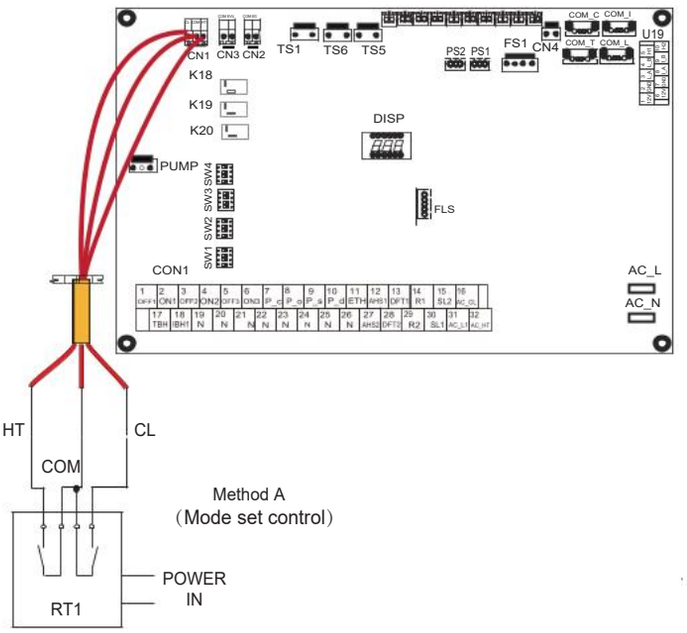
3.1 When unit detect voltage is 230VAC between HT and L1, zone1 turns on. When unit detect voltage is 0VAC between HT and L1, zone1 turns off.

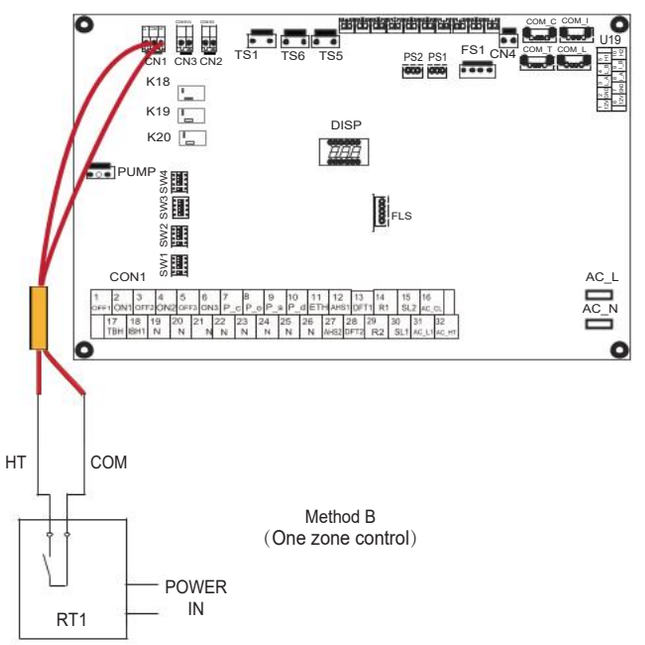
3.2 When unit detect voltage is 230VAC between CL and L1, zone2 turns on according to climate temp curve. When unit detect voltage is 0VAC between CL and L1, zone2 turns off.

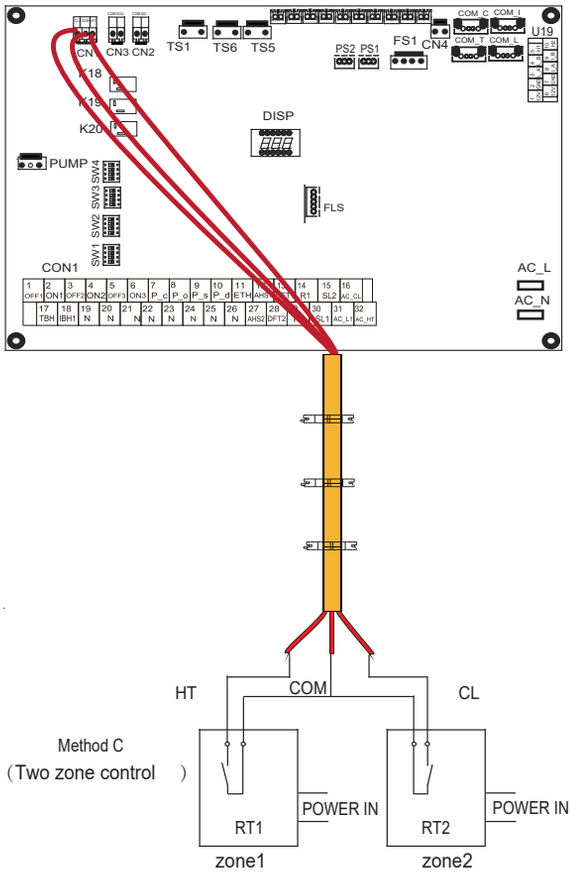
3.3 When HT-L1 and CL-L1 are detected as 0VAC, unit turns off.

3.4 When HT-L1 and CL-L1 are detected as 230VAC, both zone1 and zone2 turn on.

Room thermostat type2 (Low voltage):







There are three methods for connecting the thermostat cable (as described in the picture above) and it depends on the application.

● Method A (Mode set control)

RT can control heating and cooling individually, like the controller for 4-pipe FCU. When the hydraulic module is connected with the external temperature controller, user interface set ROOM THERMOSTAT to MODE SET：

A.1 When unit detect voltage is 12VDC between CL and COM the unit operates in the cooling mode.

A.2 When unit detect voltage is 12VDC between HT and COM, the unit operates in the heating mode.

A.3 When unit detect voltage is 0VDC for both side (CL-COM, HT-COM) the unit stop working for space heating or cooling.

A.4 When unit detect voltage is 12VDC for both side (CL-COM, HT-COM) the unit working in cooling mode.

● Method B (One zone control)

RT provides the switch signal to unit. User interface set ROOM THERMOSTAT to ONE ZONE：

B.1 When unit detect voltage is 12VDC between HT and COM, unit turns on.

B.2 When unit detect voltage is 0VDC between HT and COM, unit turns off.

● Method C (Two zone control)

Hydraulic Module is connected with two room thermostat, while user interface set ROOM THERMOSTAT to ZONES:

C.1 When unit detect voltage is 12VDC between HT and COM, zone1 turn on. When unit detect voltage is 0VDC between HT and COM, zone1 turn off.

C.2 When unit detect voltage is 12VDC between CL and COM, zone2 turn on according to climate temp curve. When unit detect voltage is 0V between CL and COM, zone2 turn off.

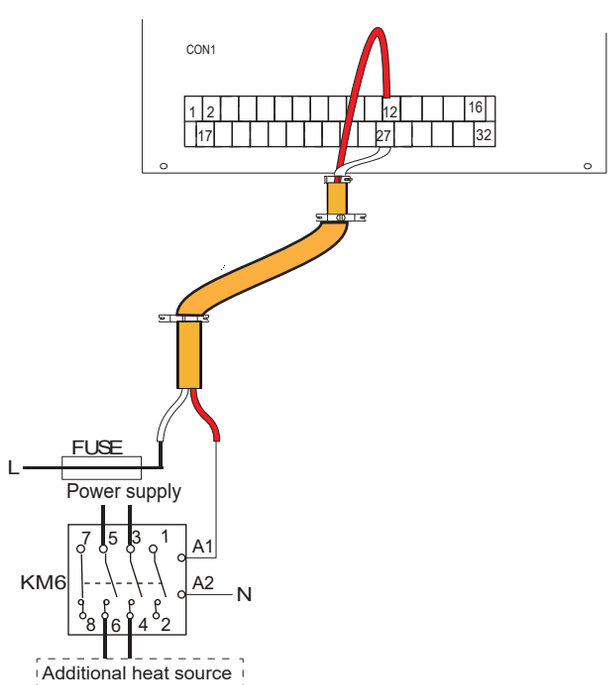
C.3 When HT-COM and CL-COM are detected as 0VDC, unit turn off.

C.4 When HT-COM and CL-COM are detected as 12VDC, both zone1 and zone2 turn on.

NOTE

- The wiring of the thermostat should correspond to the settings of the user interface.
- Power supply of machine and room thermostat must be connected to the same Neutral Line.
- Zone 2 can only operate in heating mode, when cooling mode is set on user interface and zone1 is OFF, “CL” in zone2 closes, system still keeps 'OFF'. While installation, the wiring of thermostats for zone1 and zone2 must be correct.

8.6 For additional heat source control:

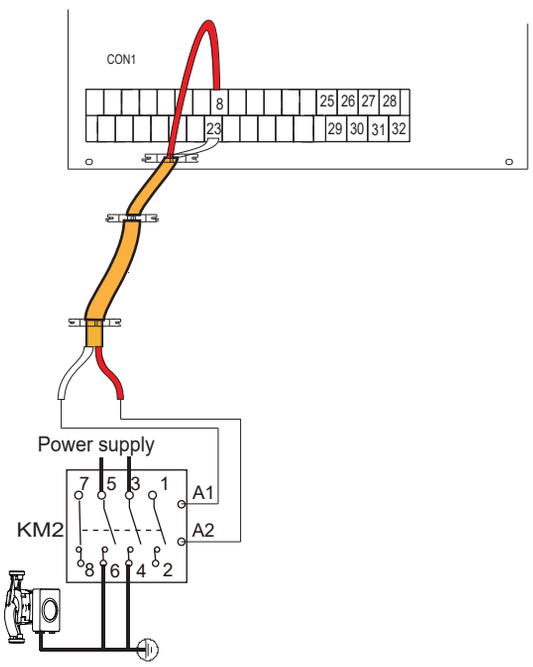


Voltage	220-240VAC
Maximum running current(A)	0.2
Wiring size(mm²)	0.75
Control port signal type	Type 2

⚠ WARNING

This part only applies to the unit without an interval backup heater. If there is an interval backup heater in the unit, the hydraulic module should not be connected to any additional heat source.

8.7 For outside circulation pump P_o:



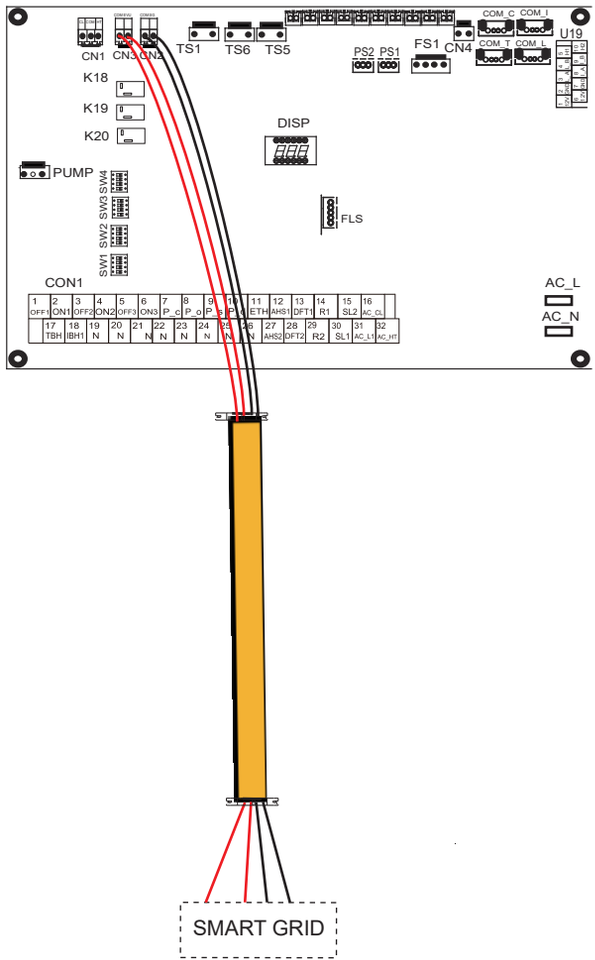
Voltage	220-240VAC
Maximum running current(A)	0.2
Wiring size(mm²)	0.75
Control port signal type	Type 2

a)Procedure

- Connect the cable to the appropriate terminals as shown in the picture.
- Fix the cable reliably.

8.8 For smart grid:

The unit has smart grid function, there are two ports on PCB to connect SG signal and EVU signal as following:



1.when EVU signal is on, the unit operate as below: DHW mode turn on, the setting temperature will be changed to 70℃ automatically, and the WTH operate as below: TW<69℃, the WTH is on, TW ≥ 70℃, the WTH is off. The unit operate in cooling/heating mode as the normal logic.

2.When EVU signal is off, and SG signal is on, the unit operate normally.

3.When EVU signal is off, SG signal is off, the DHW mode is off, and the WHT is invalid, disinfect function is invalid. The max running time for cooling/ heating is "SG RUNNIN TIME", then unit will be off.

9 Indoor unit installation

⚠ WARNING

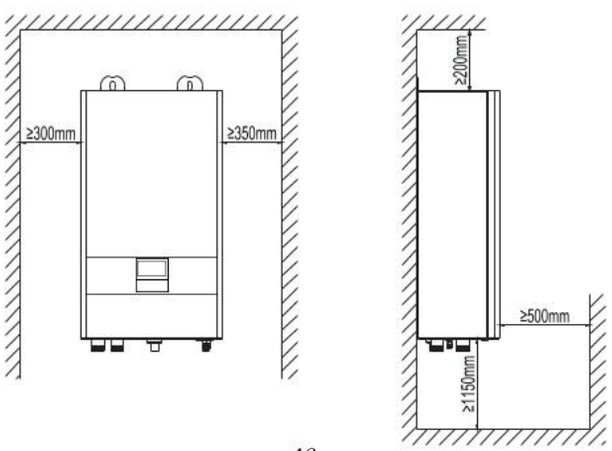
- There is flammable refrigerant in the unit and it should be installed in a well-ventilated site. If the unit is installed inside, an additional refrigerant detection device and ventilation equipment must be added in accordance with the standard EN378. Be sure to adopt adequate measures to prevent the unit from being used as a shelter by small animals.
- Small animals making contact with electrical parts can cause malfunction, smoke or fire. Please instruct the customer to keep the area around the unit clean.
- The equipment is not intended for use in a potentially explosive atmosphere.
- Do not grasp the control box or pipe to lift the unit.
- The indoor unit weight is approximately 50kg and should be lifted by two persons.

9.1 Selecting installation location

If the indoor unit is installed on the indoor wall, the installation location should meet the following conditions and be approved by the customer

- The installation location shall be the location with low air relative humidity and low heat transfer coefficient to reduce frosting.
- The space location can fully ensure that the maintenance space must meet the size requirements of the following figure.
- Provide condensate drainage and pressure relief valve exhaust.
- The wall of the selected installation location must be flat and strong, a safe location that can bear the total weight of the unit and vibration.
- The space around the unit allows sufficient air circulation, and there is no danger of suffocation or fire due to the leakage of flammable gas.
- Pay attention to the length and distance of all pipes, and meet the refrigerant pipe parameter table on page 56.
- When the unit running in the cooling mode, condensate may drop from the water inlet and water outlet pipes. Please make sure the dropping condensate will not result in damage of your furniture and other devices.
- Places where there is no possibility of flammable gas or product leak.
- The equipment is not intended for use in a potentially explosive atmosphere.
- Places where water leaking from the unit cannot cause damage to the location (e.g. in case of a blocked drain pipe).
- Do not install the unit in places often used as a work space. In case of construction work (e.g. grinding etc.) where a lot of dust is created, the unit must be covered.
- Do not place any object or equipment on top of the unit (top plate).
- Do not climb, sit or stand on top of the unit.
- Be sure that sufficient precautions are taken in case of refrigerant leakage according to relevant local laws and regulations.

9.2 Installation space



9.3 Plumbing engineering

Water volume and sizing expansion vessels

The units are equipped with an expansion vessel of 5L that has a default charging pressure of 1.5bar. To assure proper operation of the unit, the charging pressure of the expansion vessel might need to be adjusted.

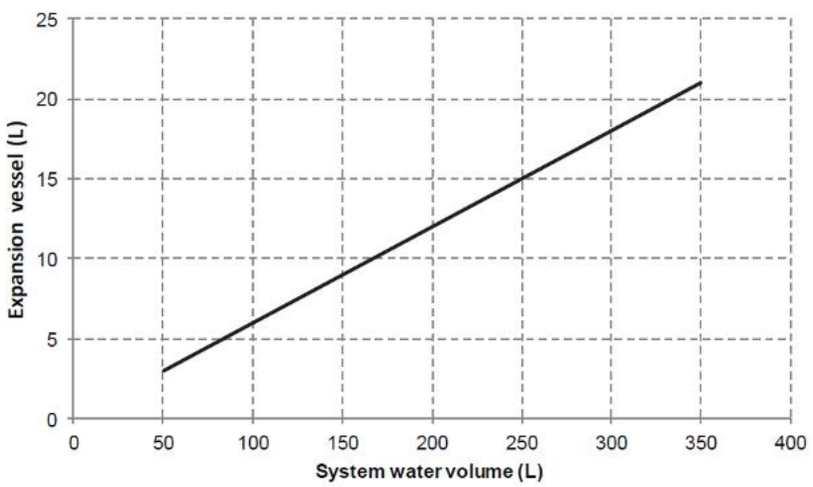
1)Check that the total water volume in the installation, excluding the internal water volume of the unit, is at least capacity*17(L). For example, if the unit capacity is 10KW, the minimum water volume is 170L (10*17=170).

- In most applications this minimum water volume will be satisfactory.
- In critical processes or in rooms with a high heat load though, extra water might be required.
- When circulation in each space heating loop is controlled by remotely controlled valves, it is important that this minimum water volume is kept even if all the valves are closed.

2)Expansion vessel volume must fit the total water system volume.

3)To size the expansion for the heating and cooling circuit.

The expansion vessel volume can follow the figure below:



Water circuit connection

Water connections must be made correctly in accordance with labels on the indoor unit, with respect to the water inlet and water outlet.

NOTE

Be careful not to deform the unit's piping by using excessive force when connecting the piping. Deforming the piping can cause the unit to malfunction.

If air, moisture or dust gets in the water circuit, problems may occur. Therefore, always take into account the following when connecting the water circuit:

- Use clean pipes only.
- Hold the pipe end downwards when removing burrs.
- Cover the pipe end when inserting it through a wall to prevent dust and dirt entering.
- Use a good thread sealant for sealing the connections. The sealing must be able to withstand the pressures and temperatures of the system.
- When using non-copper metallic pipes, be sure to insulate two materials from each other to prevent galvanic corrosion.
- As copper is a soft material, use appropriate tools for connecting the water circuit. Inappropriate tools will cause damage to the pipes.

NOTE

The unit is only to be used in a closed water system. Application in an open water circuit can lead to excessive corrosion of the water piping:

- Never use Zn-coated parts in the water circuit. Excessive corrosion of these parts may occur as copper piping is used in the unit's internal water circuit.
- When using a 3-way valve in the water circuit. Preferably choose a ball type 3-way valve to guarantee full separation between the domestic hot water and floor heating water circuit.
- When using a 3-way valve or a 2-way valve in the water circuit. The recommended maximum changeover time of the valve should be less than 60 seconds.

Water circuit anti-freeze protection

All internal hydroponic parts are insulated to reduce heat loss. Insulation must also be added to the field piping.
The software contains special functions using the heat pump and backup heater (if it is available) to protect the entire system against freezing. When the temperature of the water flow in the system drops to a certain value, the unit will heat the water, either using the heat pump, the electric heating tap, or the backup heater. The freeze protection function will turn off only when the temperature increases to a certain value.
In event of a power failure, the above features would not protect the unit from freezing.

NOTE

When the unit is not running for a long time, make sure the unit is powered on all the time, if you want to cut off the power, the water in the system pipe needs to be drained clean, avoid the pump and pipeline system be damaged by freezing. Also the power of the unit needs to be cut off after water in the system is drained clean.
Water may enter into the flow switch and cannot be drained out and may freeze when the temperature is low enough. The flow switch should be removed and dried, then can be reinstalled in the unit.

- Counterclockwise rotation, remove the flow switch.
- Drying the flow switch completely.

Check the water circulation

Before proceeding with the installation, please check the following points:

1. The maximum water pressure is ≤0.3 MPa (Rated Water Pressure).
2. To facilitate service and maintenance, please install a shut-off valve at the inlet and outlet. Pay attention to the installation position of the shut-off valve.
3. It is recommended to install at least one drain valve in the lowest section of the water circulation system to drain the water cleanly during maintenance.
4. The indoor unit has an automatic exhaust valve. Do not tighten the automatic exhaust valve, so as not to affect the automatic exhaust function in the water circuit.
5. Pay attention to the parts in the piping to be able to withstand the maximum water pressure requirements of the system.

NOTE

- The Max Water Pressure of the system pipe is ≤1.0MPa, otherwise it will cause rupture.
- A Y-type filter must be installed at the water inlet.

Water injection

1. Connect the water supply pipe to the inlet and outlet pipes of the system.
2. Make sure that the automatic exhaust valve has been opened (at least two turns).
3. Fill with water until the pressure shows close to 0.2 MPa.

Use the exhaust valve to exhaust the air in the waterway as much as possible in order to avoid the air going into the waterway which may cause the equipment to malfunction.

NOTE

- When filling water, the air in the system may not be completely exhausted. The remaining air will be automatically discharged by the automatic exhaust valve after the unit runs for one hour. Additional water may be added afterwards.
- The water pressure displayed on the remote controller's display largely depends on the water temperature (the higher the water temperature, the greater the water pressure).
- The water pressure must be kept >0.03MPa at all times to prevent air from entering the water circulation.

The unit may drain the excess water through the safety valve.

- Water quality should be complied with EN 98/83 EC Directives.
- The rated water flow must meet the requirements shown in the table below

Model	Water flow (m^3/h)
4kW	0.69
6kW	1.03
8kW	1.38
10kW	1.72
12kW	2.06
14kW	2.41
16kW	2.75

10 The installation of the outdoor unit

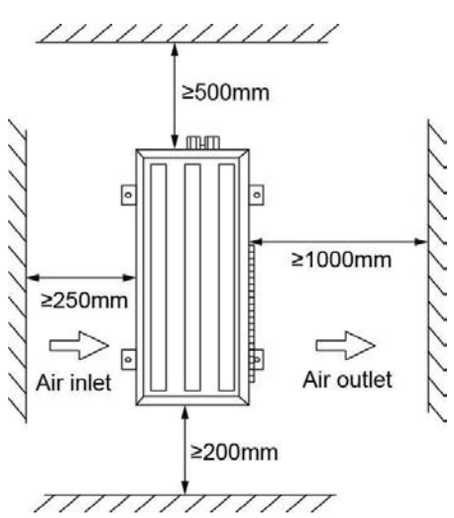
10.1 Precautions for choosing the installation location

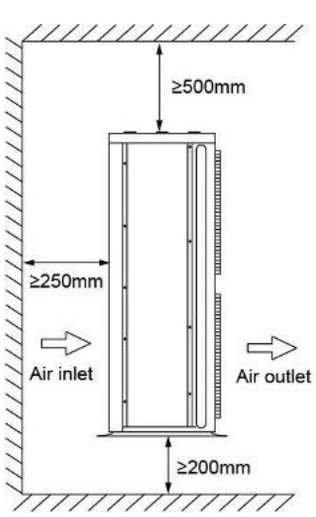
⚠ WARNING

Please take appropriate measures such as using a fine mesh fence to prevent the outdoor machine from being used as a habitat by some small animals.
Contact of small animals with electrical parts may cause the unit to malfunction, smoke or catch fire. Please keep the surrounding environment clean.

- Choose a place that is strong enough to support the weight and vibration of the unit.
- Choose a place with good ventilation and noise from the operation of the unit that will not cause trouble to neighbors or users.
- Avoid installing it close to the bedroom, as the noise of the unit will cause trouble.
- There must be enough space to facilitate installation and maintenance
- There must be enough space for ventilation, and there must be no obstacles within 1 meter in front of the air outlet of the unit
- No flammable gas leaks near the installation point.
- Install the unit, power cords and wires, and keep at least three meters away from the TV and other radio devices to avoid interference with picture quality and sound quality.
- There is an electromagnetic interference problem, the distance must be increased, and the electrical appliances must be shielded to ensure a good grounding.
- At the seaside or in places with high salinity, the corrosiveness is strong, which may shorten the service life of the unit.
- When the external machine is defrosted, more condensed water will be generated. Drainage facilities should be made to avoid affecting others.
- When installing the unit in a place exposed to strong wind, pay special attention to the following.
- Strong winds of 5m/sec or more blowing against the unit's air outlet causes a short circuit (suction of discharge air), and this may have the following consequences:
  -Deterioration of the operational capacity.
  -Frequent frost acceleration in heating operation.
  -Disruption of operation due to rise of high pressure.
  -When a strong wind blows continuously on the front of the unit, the fan can start rotating very fast until it breaks.
- Places where rain can be avoided as much as possible.

10.2 Installation space

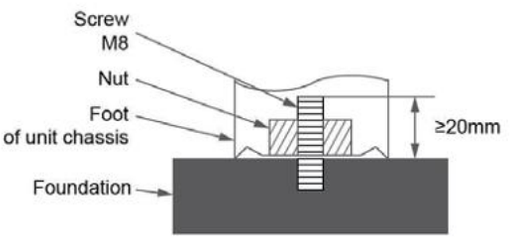


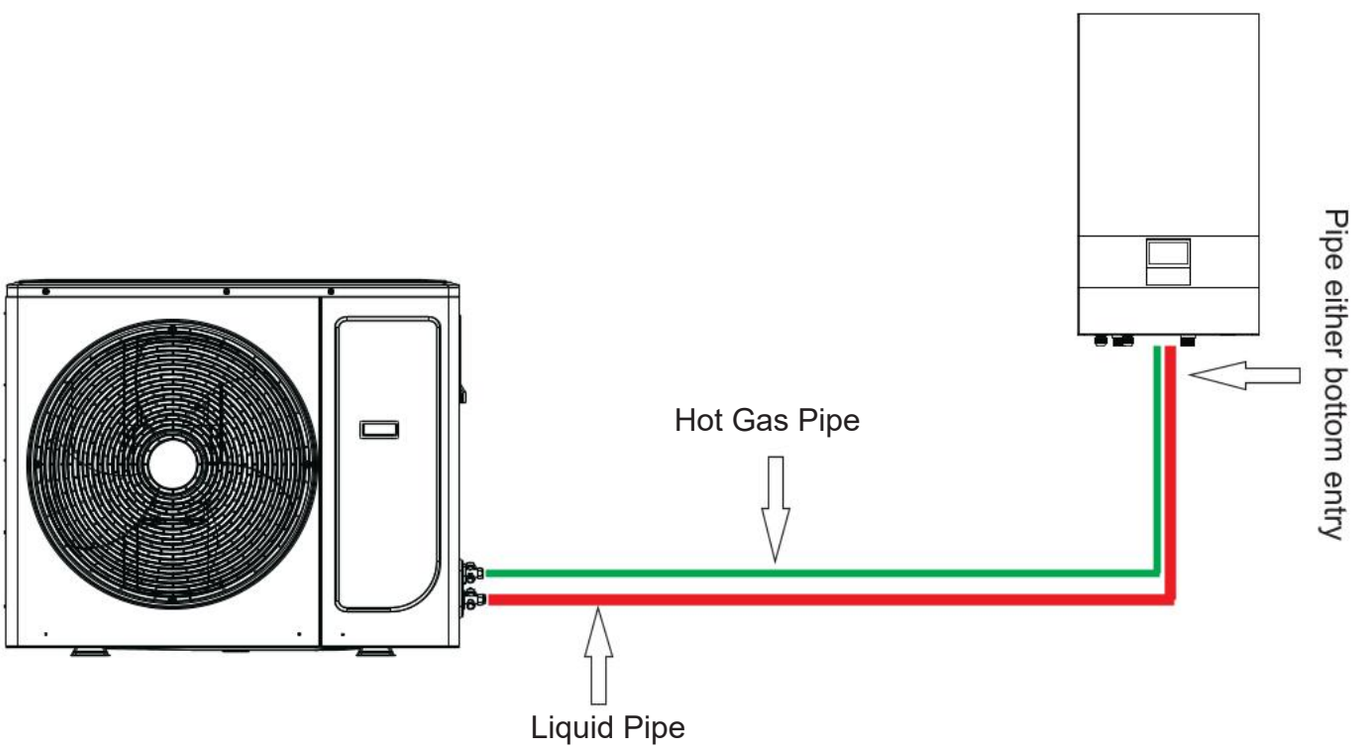


10.3 Outdoor unit installation

When installing the outdoor unit, please refer to the installation guide, and choose the installation location to meet the size requirements of the above figure

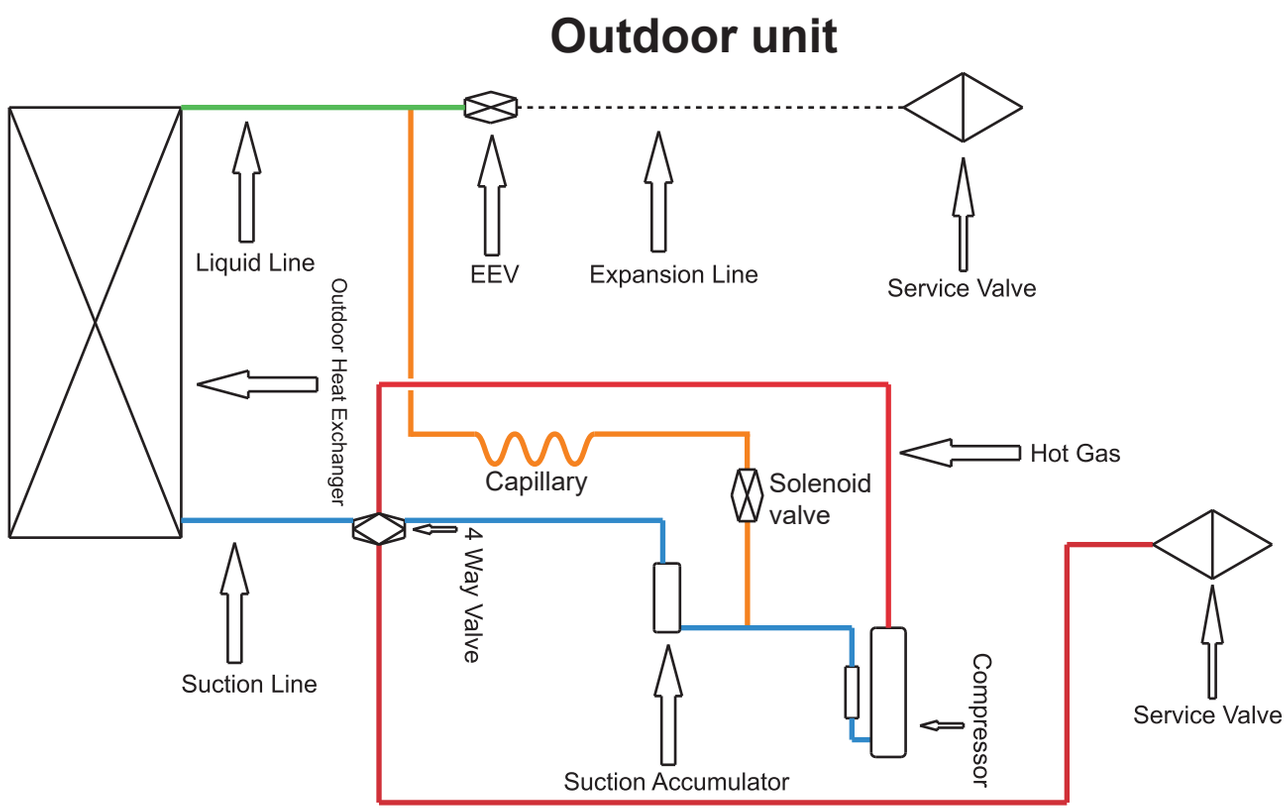
1. Confirm that the strength and levelness of the installation position meet the installation requirements, and the unit will not cause vibration or noise after installation.
2. Prepare four sets of basic M8 bolts, nuts, and shock-proof rubber pads. (Optional).
3. According to the foundation drawing, fix the machine with foundation bolts. It is better to screw it into the foundation bolt, leaving 20mm on the foundation surface.

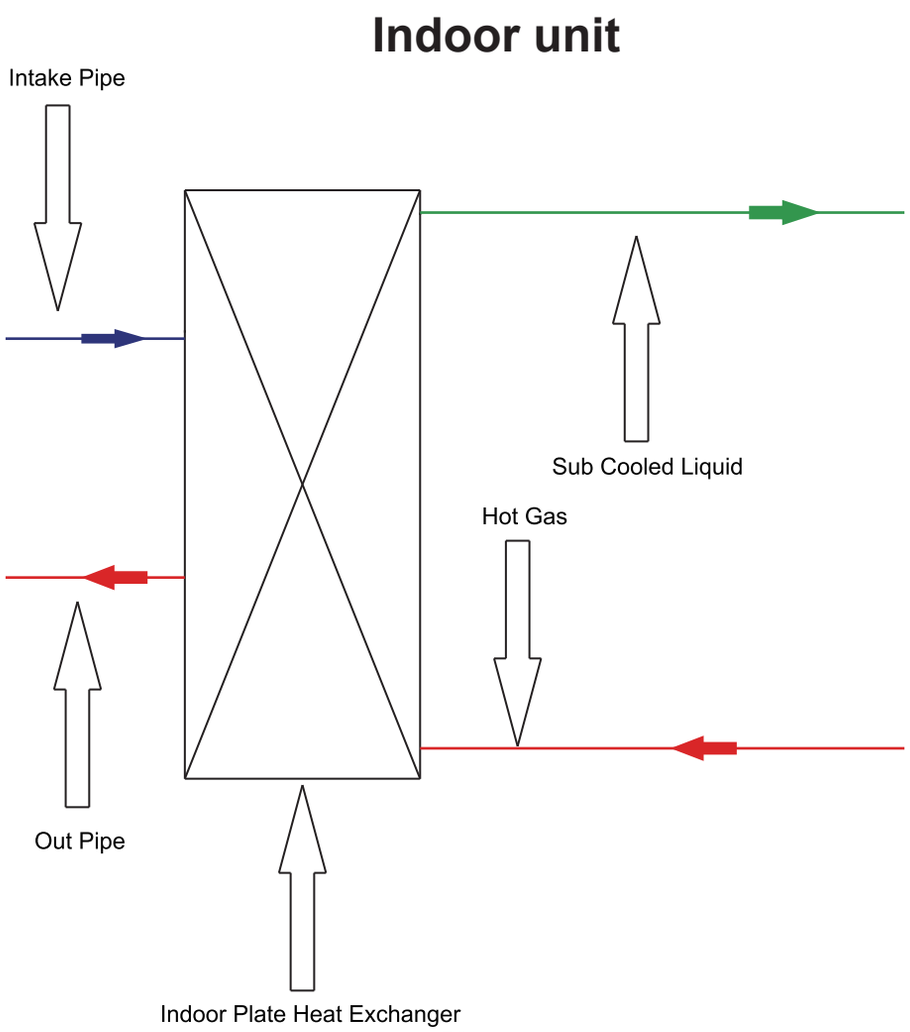




10.4 Refrigerant piping project

Installation guide, description and technical parameters of the refrigerant pipes of the indoor and outdoor units. The location of the air pipe and water pipe of the unit has been shown in the equipment overview.





Connecting pipeline installation work

When connecting the fluorine gas pipe, use two wrenches to tighten or loosen the nut. Otherwise, it will damage the pipeline and cause leakage.

⚠ WARNING

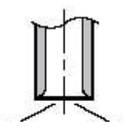
The pipeline installation work must be installed by experienced refrigeration technicians and must comply with relevant local laws and regulations.

Pipe flaring

To expand each nozzle, follow the steps below:

1.Cut the pipe with a pipe cutting tool.

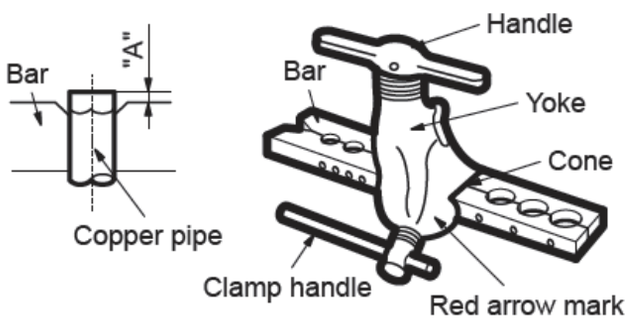
2.Remove burrs, and cut the surface downward to prevent debris from falling into the tube.



1. Right angle cutting
2. Deburring

3.Remove the brass nut from the shut-off valve and put the nut on the pipe.

4. Expand the nozzle and place it in the position shown below.



Check the flaring

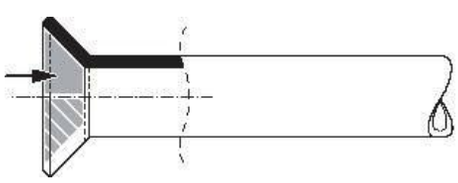
1.The internal surface of the flaring shall not have jagged burrs, cracks and other defects.
2.Flaring must be complete
3.Ensure that the nut is suitable, such as: the size of the flaring must be fitted to the inner cone of the nut; the fitting surface ratio is ≥90%.

NOTE

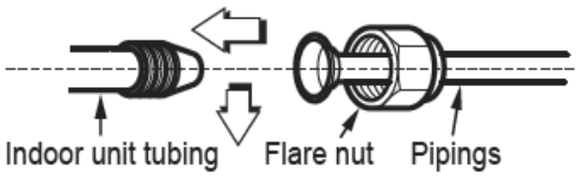
- Do not use mineral oil in the flaring. Mineral oil entering the system will shorten the service life of the machine.
- Do not use piping that has already been used.
- Do not install a dryer on the R32 machine to ensure its service life, the drying material may dissolve and damage the system.
- Flaring does not meet the above requirements, which may cause refrigerant gas leakage.

Refrigerant pipe connection

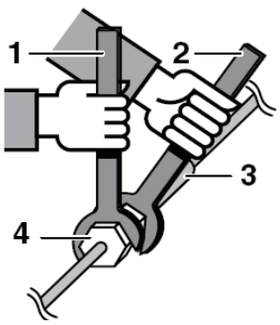
1. When connecting the nut, coat the inner surface of the nut with ether oil or ester oil, and tighten it by hand three or four turns before tightening.



2. Align the center of the pipes.



3. Sufficiently tighten the flare nut with fingers, and then tighten it with a spanner and torque wrench.
4. The protective nut is a one-time part, it can't be reused. In case it is removed, it should be replaced with a new one.
5. When loosening the nut, use two wrenches at the same time. When connecting the pipe, use a wrench and a torque wrench to tighten the nut at the same time to prevent the nut from cracking or leaking.



1 Torque wrench
2 Spanner
3 Piping union
4 Flare nut

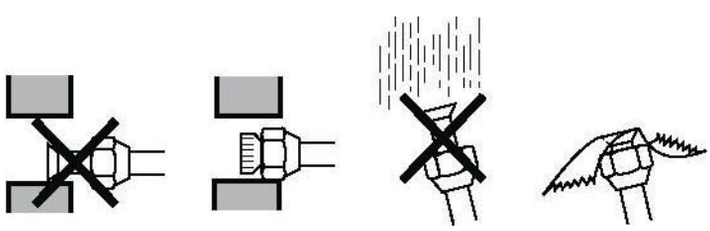
Outer diameter		Torque
mm	Inch	mm
6.35	1/4	6.35
9.52	3/8	9.52
12.7	1/2	12.7
15.88	5/8	15.88
19.05	3/4	19.05

NOTE

- Excessive torque can break nut on installation conditions.
- When flared joints are reused indoors, the flare part should be re-fabricated.

Piping operation guide

- Protect the nozzle to prevent moisture and dust.
- All piping elbows should be as gentle as possible and bend with a pipe bender.
- The bending radius must be ≥30mm.

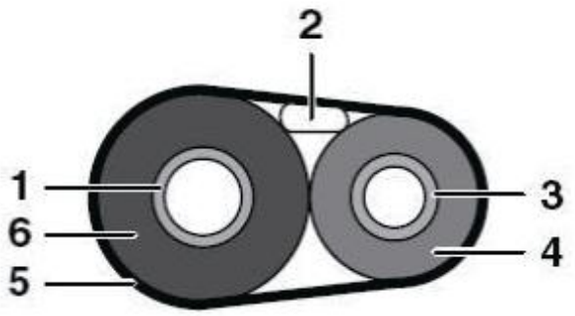


Selection of copper and insulation materials

When using commercial copper pipes and components, please refer to the following information

- Insulation material: polyethylene foam
  -Heat transfer rate: 0.041 to 0.052 W mK (0.035 to 0.045 kcal/mh°C)
  -The maximum surface temperature of fluorine gas pipe can reach 110 °C, select the insulation material that can withstand this temperature
- The fluorine gas pipe and the liquid pipe must be insulated, and the specifications of the insulation material are as follows:

Piping specification		Insulation pipe	
Outer diameter	thickness	Inner diameter	thickness
6.35 mm (1/4")	≥0.75 mm	7-9 mm	≥10 mm
9.52 mm (3/8")	≥0.75 mm	10-12 mm	≥10 mm
12.7 mm (1/2")	≥0.75 mm	10-12 mm	≥10 mm
15.88 mm (5/8")	≥1.0 mm	20-24 mm	≥13 mm
19.05 mm (7/8")	≥1.0 mm	20-24 mm	≥13 mm



1 Gas pipe
2 Inter-unit wiring
3 Liquid pipe
4 Liquid pipe insulation
5 Finishing tape
6 Gas pipe insulation

● separate insulation pipes shall be used for fluorine gas refrigerant pipes and liquid refrigerant pipes.

Check for gas leaks

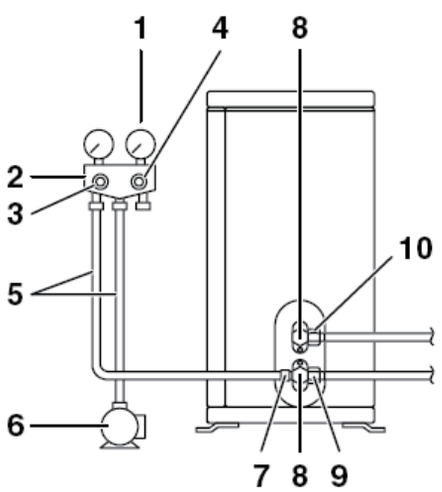
Connections are completed and the outdoor unit and indoor unit are connected, be sure to check whether the gas will leak.

⚠ WARNING

- Except for the specified refrigerant (R32), do not mix other substances into the refrigerant circulation pipe.
- When refrigerant leaks, ventilate the room as soon as possible.
- R32 refrigerant and other refrigerants cannot be directly discharged into the environment.

NOTE

- Use R32 special vacuum pump. Using the same vacuum pump for different refrigerants may damage the vacuum pump or unit.
- Operate the stop valve stem with a hexagonal wrench (5mm).
- All refrigerant pipe interfaces shall be tightened to the specified torque with a torque wrench. Refer to the guide "connecting refrigerant pipe to external unit" for details.



1 Pressure meter
2 Gauge manifold
3 Low-pressure valve (Lo)
4 High-pressure valve (Hi)
5 Charging hoses
6 Vacuum pump
7 Service port
8 Valve lids
9 Gas stop valve
10 Liquid stop valve

10.5 Refill the refrigerant

If you need to refill the refrigerant, please refer to the nameplate of the unit, which describes the type of refrigerant and the required quantity.

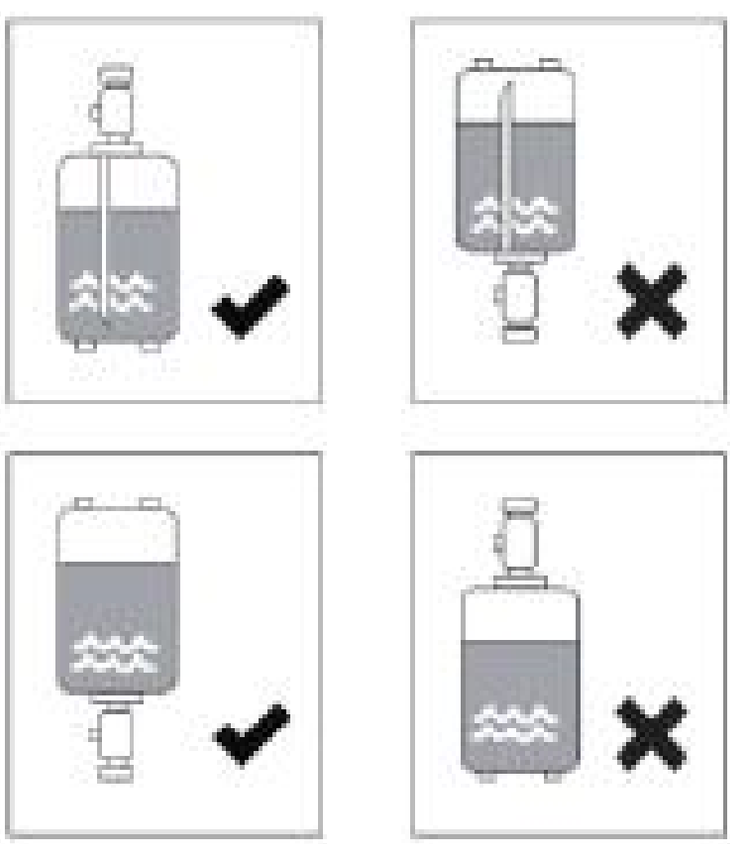
Add refrigerant

Refrigerant pipe parameters	4kW	6kW	8kW	10kW	12kW	14kW	16kW
Maximum allowable length of the pipe between the inner machine and the outer machine	30m	30m	30m	30m	30m	30m	30m
Maximum allowable height difference between internal machine and external machine	8m	8m	8m	8m	8m	8m	8m
When adding refrigerant, the length of refrigerant pipe shall exceed 15m	20g/m	20g/m	38g/m	38g/m	38g/m	38g/m	38g/m
Gas tube	15.88mm(5/8")						
Liquid tube	6.35mm(1/4")		9.52mm (3/8")				

Add R32

NOTE

- Add the specified amount of refrigerant and inject it into the liquid pipe in liquid form. Because the refrigerant is a mixed refrigerant, injected into the tube in a gaseous state may change the composition of the refrigerant and make it unable to operate normally.
- Before injecting, please check whether the cylinder is equipped with a siphon.



11 Pre operation inspection

11.1 Inspection before initial startup

⚠ WARNING

Switch off the power supply before making any connections.

1) Field wiring check

Check whether the specifications of the connecting wire and the connection conditions meet the requirements.
Check whether the capacity of the air switch and related specifications meet the requirements.

2) Fuses or protection devices

Check that the fuses or the locally installed protection devices are of the size and type specified. Make sure that neither a fuse nor a protection device has been bypassed.

3) Ground wire

Connect the ground wire correctly and tighten the ground terminal.

4) Fixed

Check whether the unit is well fixed to avoid abnormal noise and vibration during startup.

5) Equipment

Check whether there are any damaged components inside the unit or the pipes are squeezed or deformed or flattened.

6) Refrigerant leak

Check the unit for refrigerant leakage. If there is a leakage, please contact your local dealer.

7) Voltage

Check and confirm the power supply voltage, which must be consistent with the requirements on the nameplate of the unit.

8) Auto exhaust valve

Make sure that the exhaust port of the exhaust valve is open (releasing at least 2 turns).

9) Pressure relief valve

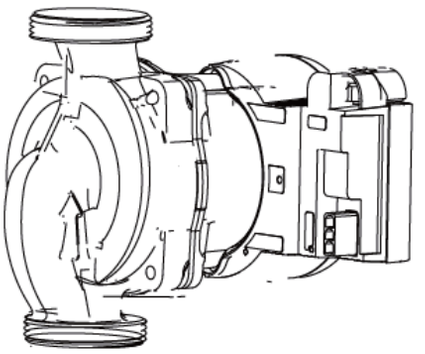
Check if the backup heater vessel is completely filled with water by operating the pressure relief valve. It should purge water instead of air.

Note: OPERATING THE SYSTEM WITH THE BACKUP HEATER VESSEL NOT COMPLETELY FILLED WITH WATER WILL DAMAGE THE BACKUP HEATER!

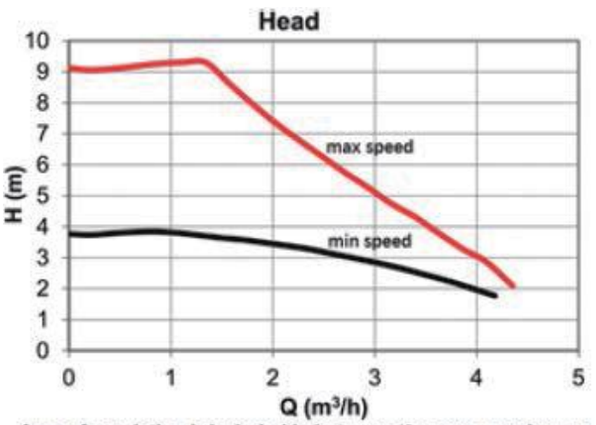
10) Waterway valve

Install each valve correctly and open it. Operating the system after closing the valve will damage the pump!

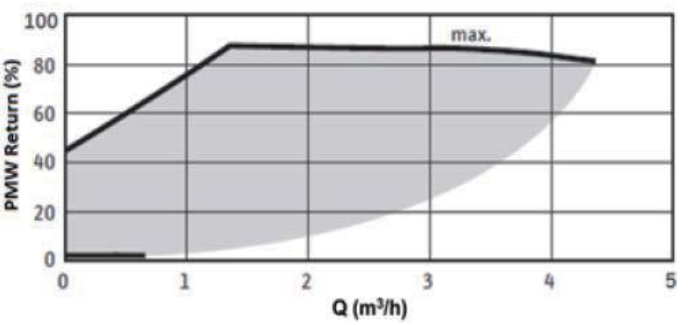
11.2 Introduction of the pump



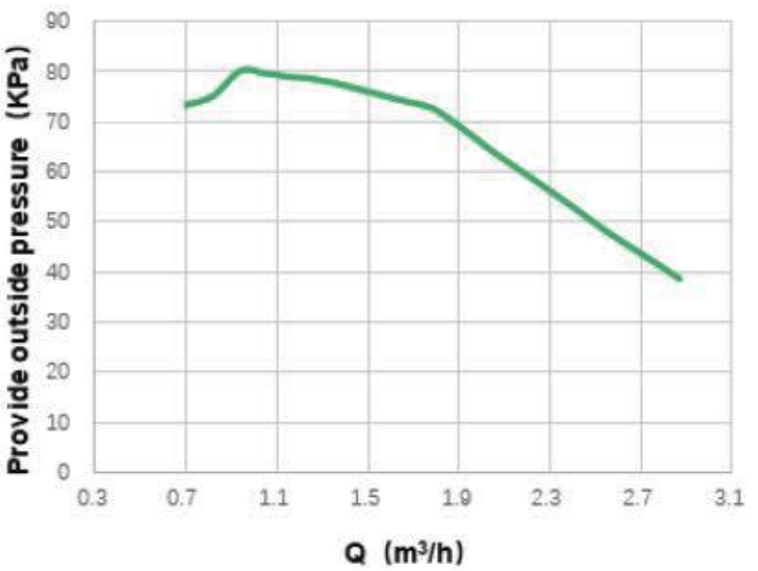
The pump is controlled via a digital low-voltage pulse-width modulation signal which means that the speed of rotation depends on the input signal. The speed changes as a function of the input profile.
The relationships between the head and the water flow rated, the PMW Return and the water flow rated are shown in the graph below.



Area of regulation is included in between the max speed curve and the min speed curve.



The internal pump maintains maximum output, the indoor unit can provide the head and flow:



Available external static pressure VS Flow rate

⚠ WARNING

- If the valves are at the incorrect position, the circulation pump will be damaged.
- If it's necessary to check the running status of the pump when unit power on, please do not touch the internal electronic control box components to avoid electric shock.
- Normal operating voltage range of the pump is 198 ~ 253 V, beyond this range can lead to failure or damage to the pump.

11.3 Failure diagnosis at first installation

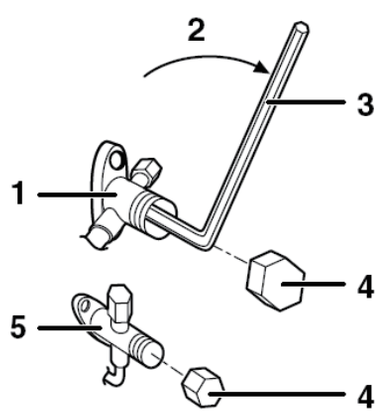
- If nothing is displayed on the user interface, it is necessary to check for any of the following abnormalities before diagnosing possible error codes.
  -Disconnection or wiring error (between power supply and unit and between unit and user interface).
  -The fuse on the PCB may be broken.
- If the user interface shows "P01" as an error code, there is a possibility that there is air in the system, or the water level in the system is less than the required minimum.
- If the error code E01 is displayed on the user interface, check the wiring between the user interface and unit.

More error codes and failure causes can be found in the appendix to the failure and protection table.

11.4 Pump down operation

In order to protect the environment, be sure to pump down when relocating or disposing of the unit. The pump down operation will extract all refrigerant from the piping into the outdoor unit.

1. Remove the valve lid from liquid stop valve and gas stop valve.
2. Carry out the forced cooling operation.
3. After 5 to 10 minutes (after only 1 or 2 minutes in case of very low ambient temperatures (<–10°C)), close the liquid stop valve with a hexagonal wrench.
4. After 2-3 minutes, close the gas stop valve and stop cooling operation.



1	Gas stop valve
2	Close
3	Hexagonal wrench
4	Valve lid
5	Liquid stop valve

After the initial installation the system needs to be commissioned this document will explain & show how to set up and commission an air to water heat pump.

Stage 1: check that the system wiring is complete and connected properly before switching on the power to the indoor and outdoor unit.

Ensuring that the isolators are switched off at this point and all cables are secure and all terminals are tight and there are no bare ends exposed.

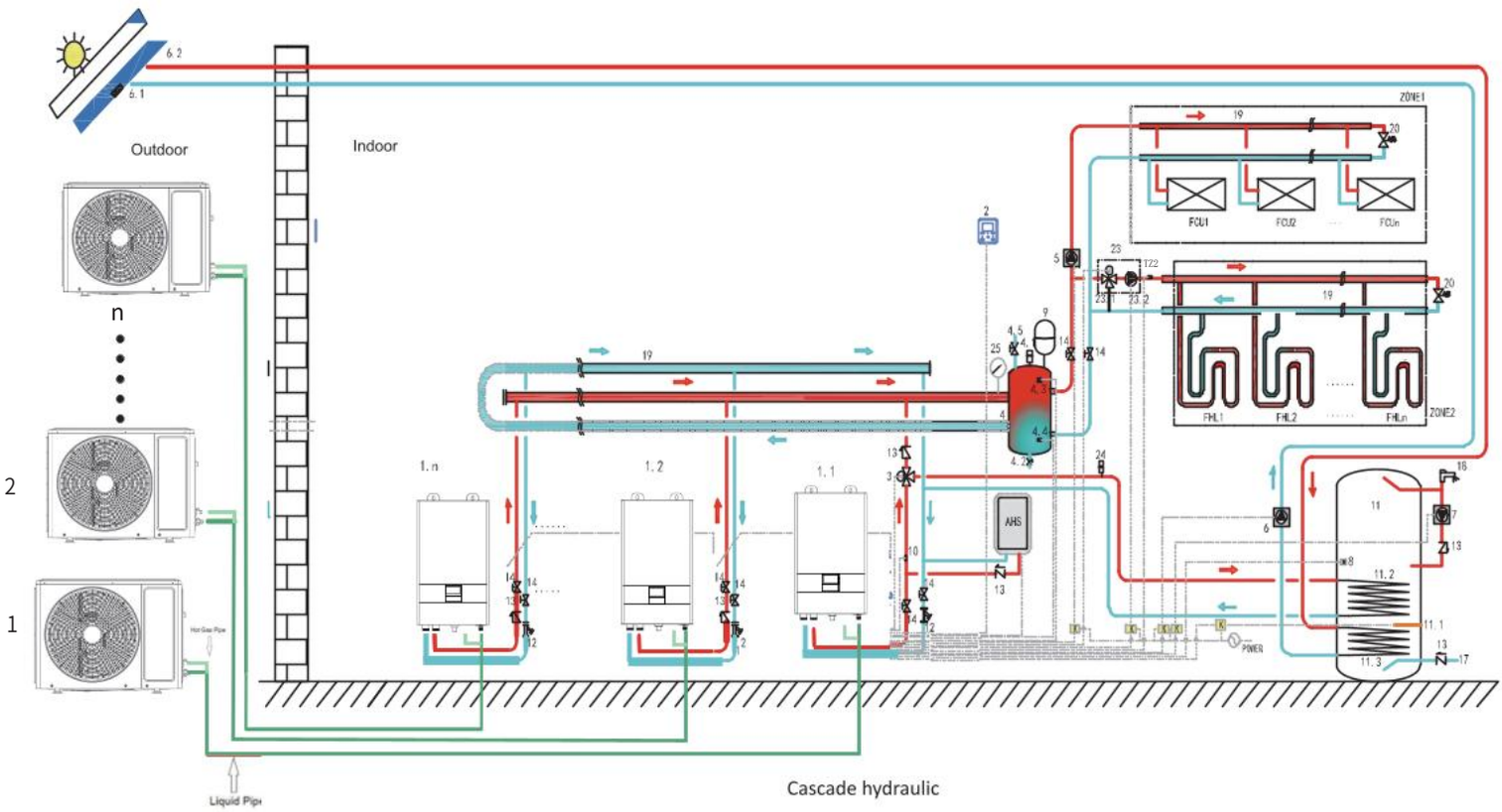
Stage 2: pipe work before commissioning the system and turning the power on you must ensure that the system has no leaks and that the correct charge is in the system if you are not the installation engineer please ensure that the pre–commissioning sheet is completed

Stage 3: switch 0n the power and set up the LCD controller on the indoor unit.

12 Typical application

12.1 Cascade application

12.1.1 Hydraulic system



Legend			
1.1	Master unit	11.3	Coil 2: heat exchanger for solar water heater kit
1.2…n	Slave unit	12	Filter(Accessory)
2	User interface	13	Check valve(Field supply)
3	SV1: 3-way valve(Field supply)	14	Shut- off valve (Field supply)
4	Balance tank (Field supply)	17	Tap water inlet pipe(Field supply)
4.1	Automatc bleed valve	18	Hot water tap(Field supply)
4.2	Drainage valve	19	Collector/Distributor(Field supply)
4.3	TE1: Balance tank upper temperature sensor for CASCADE application	20	Bypass valve(Field supply)
4.4	TE2: Balance tank lower temperature sensor(reserved)	23	Mixing station(Field supply)
4.5	Filling valve	23.1	SV3: Mixing valve(Fieldsupply)
5	P_O: Outside circulaton pump (Field supply)	23.2	P_C: Zone B circulation pump(Field supply)
6	P_S: Solar pump(Field supply)	24	Automatic beed valve(Field supply)
6.1	Tsolar: Solar temperature sensor(Optional)	25	Watermanometer(Field supply)
6.2	solar collector (Field supply)	TZ2	Zone B water flow temperature sensor(Optional)
7	P_D: DHW pipe pump(Field supply)	RAD1…n	Radiator(Field supply)
8	TW:Domestc water tank temperature sensor(Accessory)	FHL 1…n	Floor heating loop(Field supply)
9	Expansion vessel(Field supply)	K	Contactor(Field supply)
10	TC: Total water flow temperature sensor(optional)	ZONE 1	The space cooling or heating mode
11	Domestc water tank(Field supply)	ZONE 2	The space heating mode
11.1	WTH: Domestc water tank heater	AHS	Auxiliary heat source(Field supply)
11.2	Coil 1: heat exchanger for heat pump		

NOTE

- **The example is just for application illustration, please confirm the exact installation method according to the installation manual.**
- **At most 8 units can be controlled in group.**
- **The group control system can control and view the operation of the entire system only by connecting the master to the wire controller.**
- **If the DHW function is required, the water tank can only be connected to the master unit water circuit through a 3-way valve, and controlled by the master unit.**
- **If AHS is needed, it can only be connected to the master waterway and controlled by the master unit.**
- **The TE1 temperature sensor must be installed in the parallel system (otherwise unit cannot be started).**
- **If the balance tank is too large, TE2 needs to be added in order to improve the control accuracy.**
- **TE2 is set in the lower part of the balance tank.**
- **The water inlet and outlet pipe joints of each unit of the parallel system should be connected with soft connections and one-way valves must be installed at the water outlet pipe.**

- **Space heating /cooling**
  All salve units can operate in space heating mode. The operation mode and setting temperature are set on the user interface (2). Due to changes of the outdoor temperature and there required load indoors, multiple outdoor units may operate at different times.
  In cooling mode with FCU, SV3 (23.1) and P_C (23.2) keep OFF, P_O (5) keeps ON;
  In heating mode , when both ZONE 1 and ZONE 2 work, P_C (23.2) and P_O (5) keep ON, SV3(23.1) switches between ON and OFF according to the set TZ2.
  In heating mode, when only ZONE 1 work, P_O (5) keep ON, SV3 (23.1) and P_C (23.2) keep OFF. In heating mode, when only ZONE 2 work, P_O (5) keep OFF, P_C (23.2) keep ON and SV3 (23.1) switches between ON and OFF according to the set TZ2.

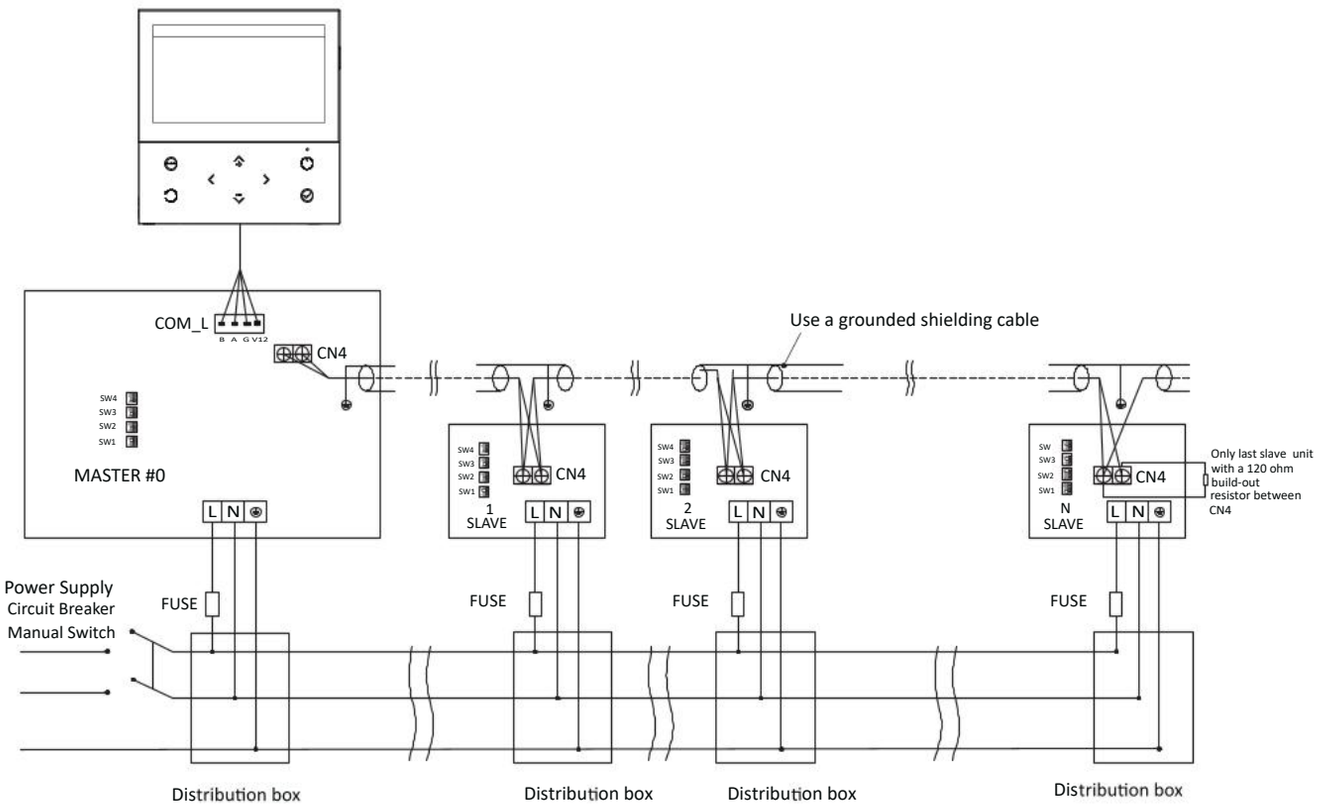
- **Domestic water heating**
  Only master unit (1.1) can operate in DHW mode. Desired hot water temperature is set on the user interface (2). In DHW mode, SV1 (3) keeps ON. When master unit operated in DHW mode, slave units can operate in space cooling/heating mode.

- **AHS control**
  AHS is only controlled by master unit. When master unit operates in DHW mode, AHS can only be used for producing domestic hot water; when master unit operates in heating mode, AHS can only be used for heating mode.

- **WTH control**
  WTH is only controlled by master unit.

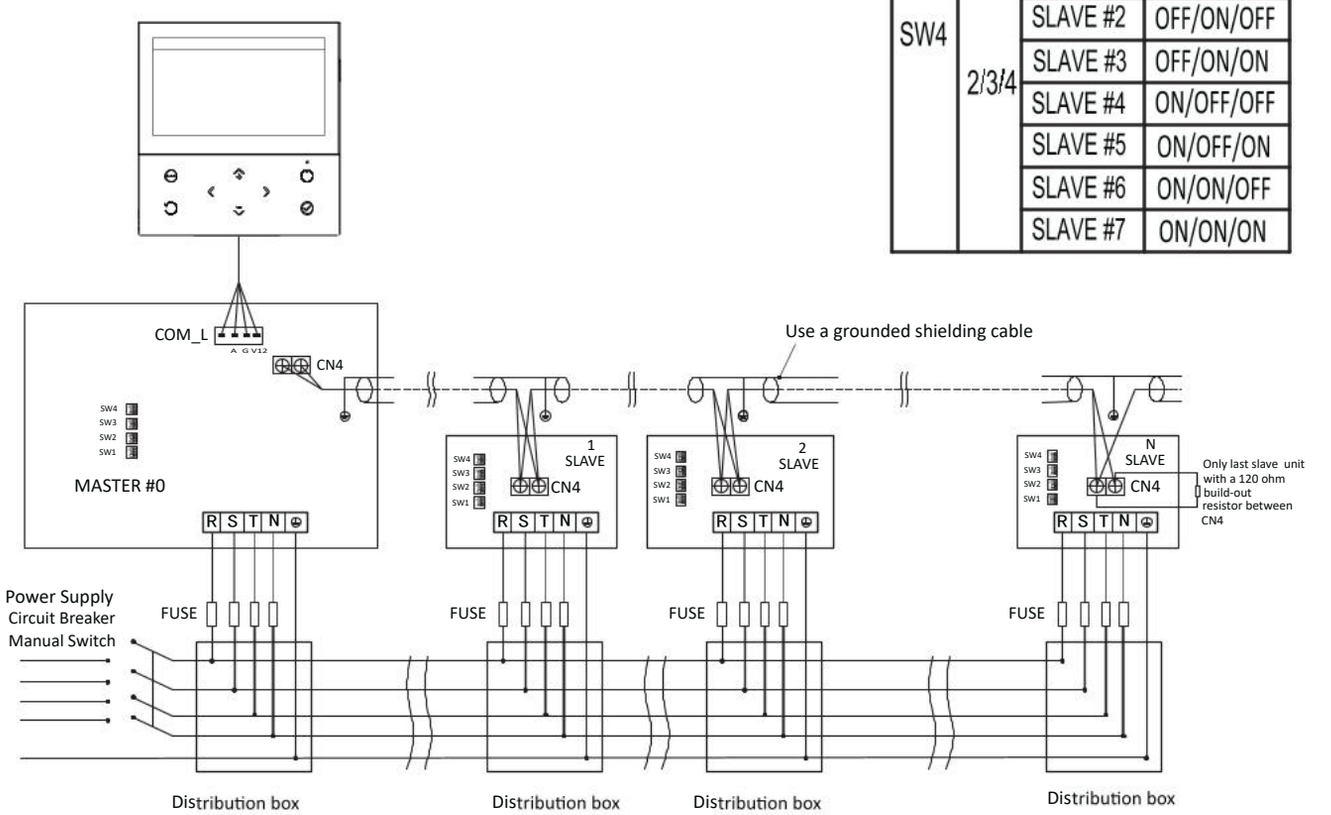
- **Solar energy control**
  Solar water heater kit is only controlled by Master unit.

12.1.2 Wiring



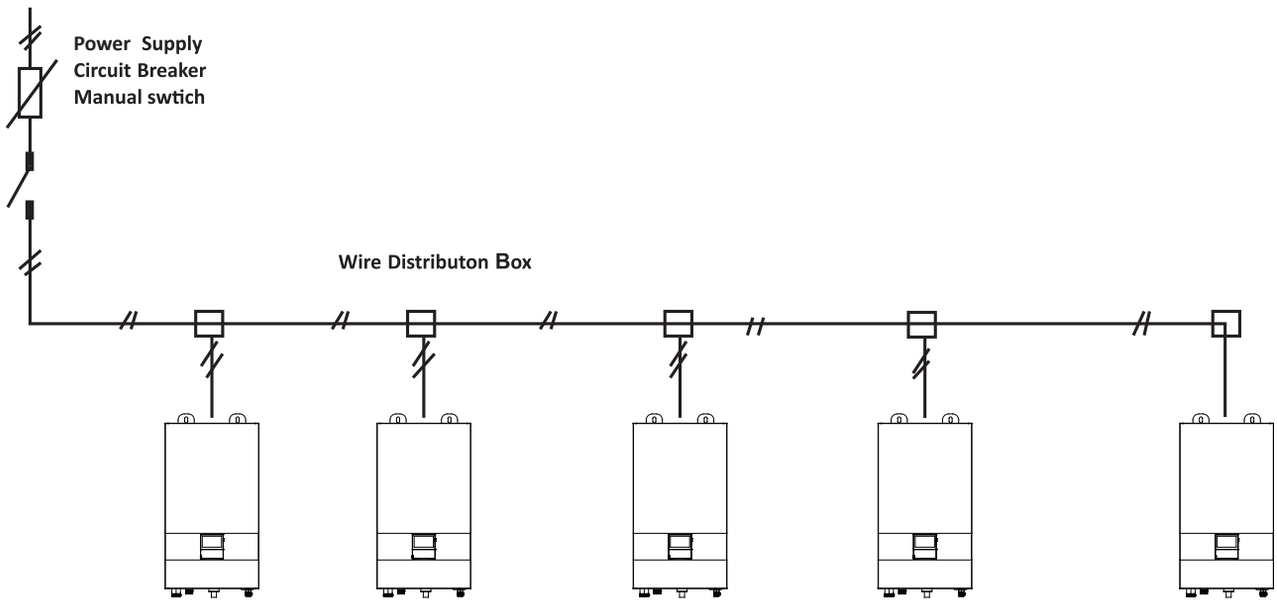
Cascade system wiring diagram for single phase 4~16kW models

Dip Switch			
SW4	1	SINGLE	OFF
		CASCADE	ON
	2/3/4	MASTER#0	OFF/OFF/OFF
		SLAVE #1	OFF/OFF/ON
		SLAVE #2	OFF/ON/OFF
		SLAVE #3	OFF/ON/ON
		SLAVE #4	ON/OFF/OFF
		SLAVE #5	ON/OFF/ON
		SLAVE #6	ON/ON/OFF
		SLAVE #7	ON/ON/ON



Cascade system wiring diagram for three phase 10~16kW models

12.1.3 Power supply



8.4 Balance tank volume requirement

NO.	model	Balance tank (L)
1	4~10 kW	⩾25
2	12~16 kW	⩾40

13 Field settings

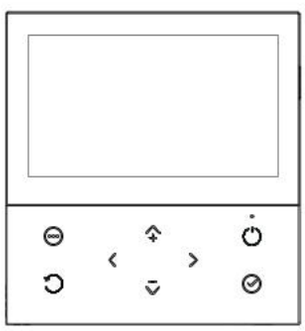
The unit should be configured to match the installation environment (outdoor climate, installed options, etc.) and user demand. A number of field settings are available. These settings are accessible and programmable through Going to "⊙" > Installer Level > System parameter " in user interface.

Procedure

To change one or more field settings, proceed as follows.

NOTE

Temperature values displayed on the wired controller (user interface) are in °C.



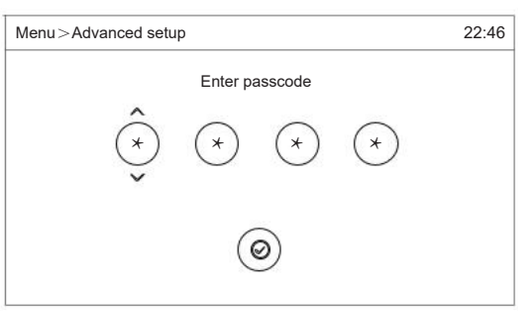
Keys	Function
⊙	• Go to the menu structure(on the home page)
< > ∧ ∨	• Navigate the cursor on the display • Navigate in the menu structure • Adjust settings
⏻	• Turn on/off the space heating/cooling operation or DHW mode • Turn on/or off functions in the menu structure
↩	• Come back to the up level
✓	• Go to the next step when programming a schedule in the menu structure; and confirm a selection to enter in the submenu of the menu structure.

About System parameter

"System parameter" is designed for the installer to set the parameters.

- Setting the composition of equipment.
- Setting the parameters.

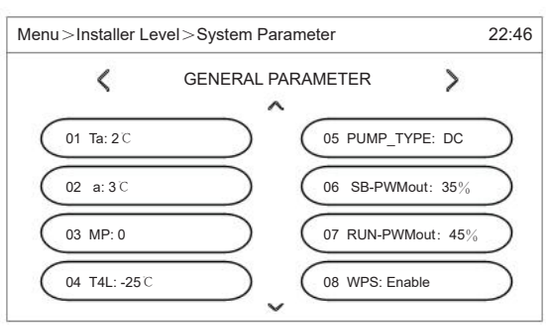
How to go to System parameter.
Go to ⊙ > Installer Level>System parameter.

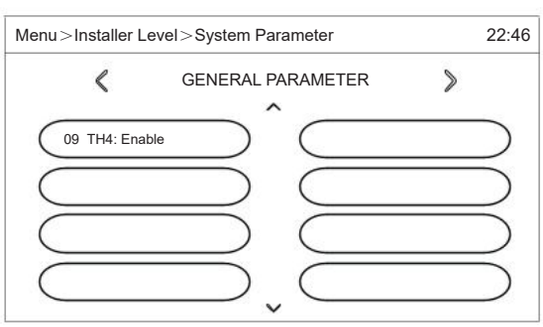


Press < or > to navigate and press ∧ ∨ to adjust the numerical valve , and then press confirm button.
The password is 1212.

1 GENERAL PARAMETER

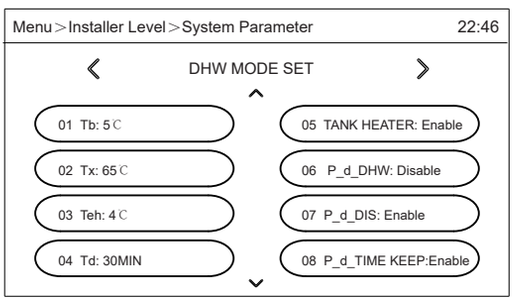
Go to ⊙ > Installer Level > System parameter > GENERAL PARAMETER. The following pages will be displayed:

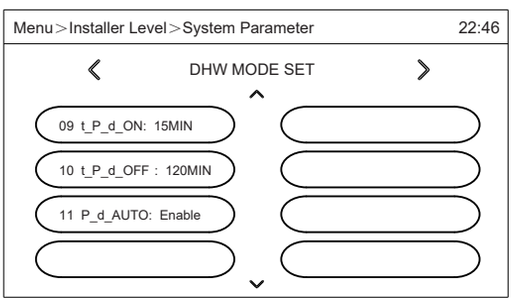




2 DHW MODE SET

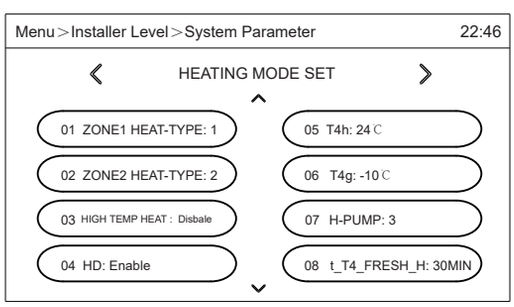
DHW = domestic hot water
Go to ⚙ > Installer Level > System Parameter >DHW MODE SET. The following pages will be displayed.

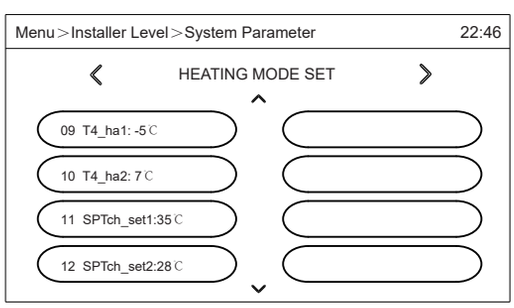




3 HEAT MODE SET

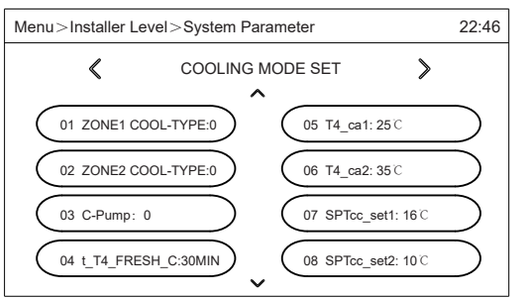
Go to ⚙ > Installer Level > System Parameter > HEAT MODE SET. The following pages will be displayed.





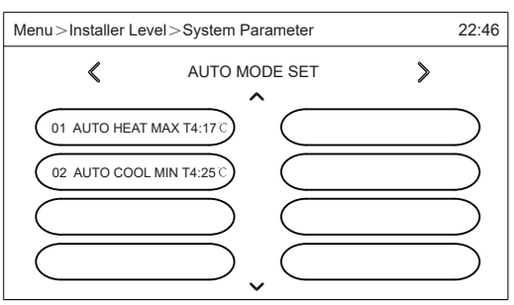
4 COOL MODE SET

Go to ⚙ >Installer Level > System Parameter >COOLING MODE SET The following pages will be displayed.



5 AUTO MODE SET

Go to ⚙ >Installer Level > System Parameter >AUTO MODE SET.The following pages will be displayed.



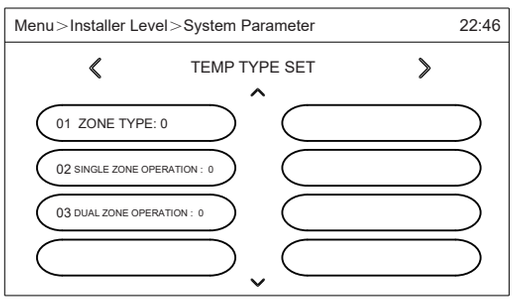
6 TEMP. TYPE SET

About TEMP. TYPE SET

The TEMP. TYPE SETTING is used for selecting whether the water flow temperature or room temperature is used to control the ON/OFF of the heat pump.

When ROOM TEMP. is enabled, the target water flow temperature will be calculated from climate-related curves.

Go to > Installer Level > System Parameter > TEMP TYPE SET.The following pages will be displayed.



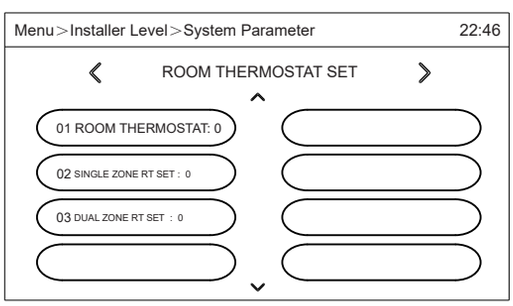
7 ROOM THERMOSTAT SET

About ROOM THERMOSTAT SET

The ROOM THERMOSTAT SET is used to set whether the room thermostat is available.

How to set the ROOM THERMOSTAT SET.

Go to > Installer Level > System Parameter >ROOM THERMOSTAT SET.The following pages will be displayed.



NOTE

ROOM THERMOSTAT =0 (NON), no room thermostat.

ROOM THERMOSTAT =1 (MODE SET), the wiring of room thermostat should follow method A.

ROOM THERMOSTAT=2(ONE ZONE), the wiring of room thermostat should follow method B.

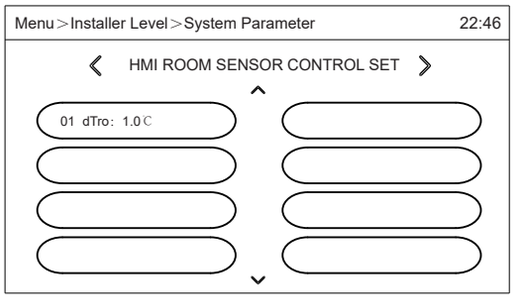
ROOM THERMOSTAT=3(TWO ZONES), the wiring of room thermostat should follow method C (refer to 9.7.6 "Connection for other components/- For room thermostat")

8 HMI ROOM SENSOR CONTROL SET

HMI ROOM SENSOR CONTROL SET is set the difference between real room temperature and desired room temperature. If the unit attained the difference,it will shut down.

How to set the HMI ROOM SENSOR CONTROL SET

Go to > Installer Level > System Parameter > HMI ROOM SENSOR CONTROL SET The following pages will be displayed.

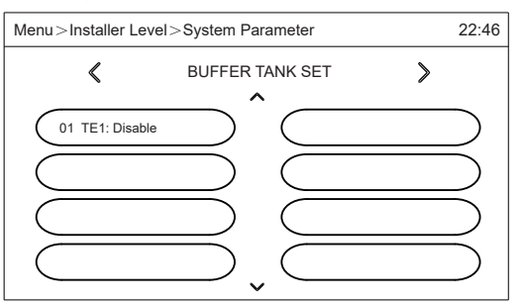


9 BUFFER TANK SET

BUFFER TANK SET is to enable the temperature sensor TE1 installed on buffer tank in cascade application.

How to set the BUFFER TANK SET .

Go to > Installer Level > System Parameter >BUFFER TANK SET. The following pages will be displayed

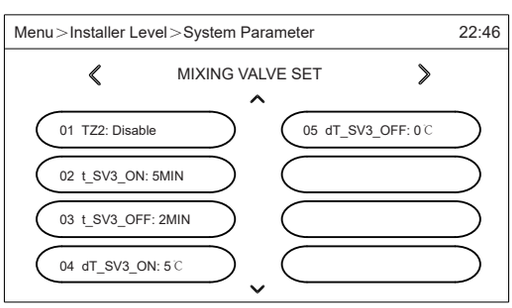


10 MIXING VALVE SET

MIXING VALVE SET is to set the parameters which adjust the opening of three-valve SV3 installed on Zone 2

How to set the MIXING VALVE SET.

Go to > Installer Level > System Parameter >MIXING VALVE SET. The following pages will be displayed

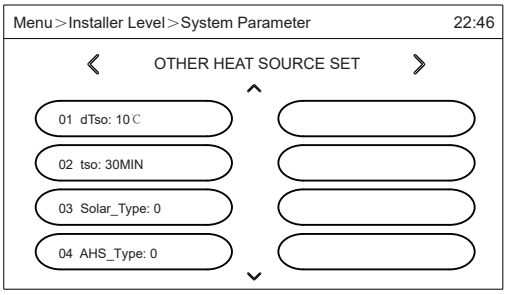


11 OTHER HEATING SOURCE SET

The OTHER HEATING SOURCE SET is used to set the parameters of the backup heater, additional heating sources and solar energy kit.

How to enter the TEMP. TYPE SETTING.

Go to > Installer Level > System Parmeter > OTHER HEAT SOURCE SET. The following pages will be displayed

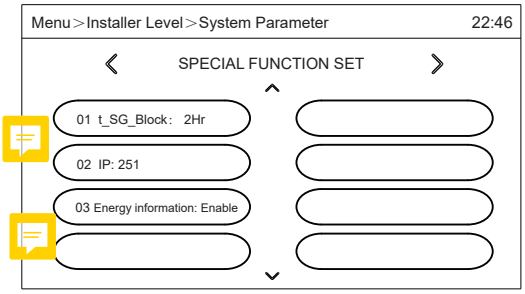


12 SPECIAL FUNCTION SET

SPECIAL FUNCTION SET is to set some functions that are seldom used in comparison with normal functions.

How to enter the SPECIAL FUNCTION SET.

Go to > Installer Level > System Parmeter > SPECIAL FUNCTION SET. The following pages will be displayed

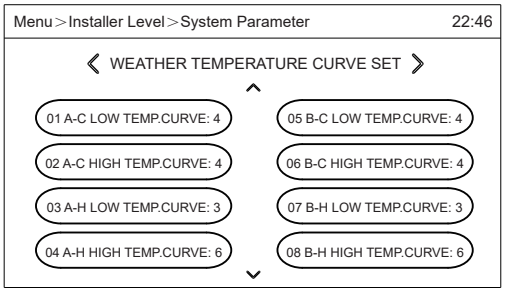


13 WEATHER TEMPERATURE CURVE SET

The function is to set the desired weather compensation temperature curve.

How to enter the WEATHER TEMPERATURE CURVE SET

Go to > Installer Level > System Parmeter > WEATHER TEMPERATURE CURVE SET The following pages will be displayed



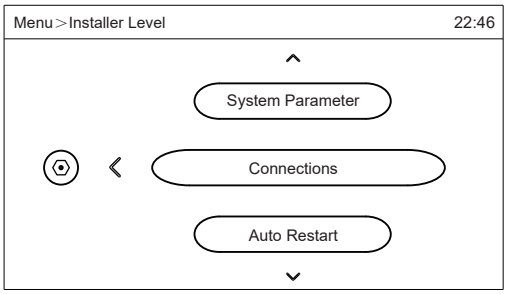
A-C: Zone1 Cooling B-C: Zone 2 Cooling
A-H: Zone1 Heating B-H: Zone2 Heating

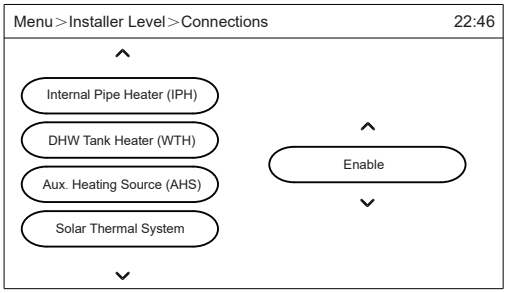
14 CONNECTIONS

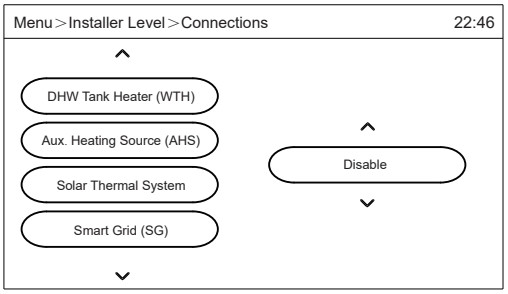
The function is used to enable or disable other heat source(IPH/WTH/AHS/Solar thermal) and Smart Grid.

Go to > Installer Level > Connections

The following pages will be displayed





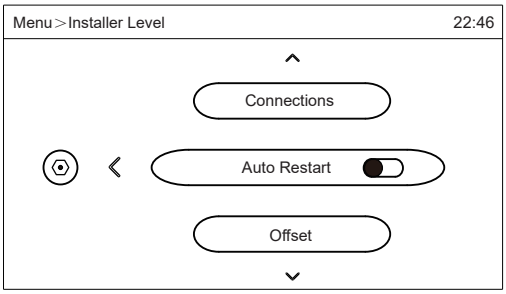


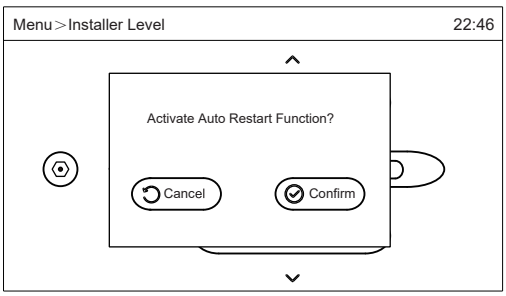
15 AUTO RESTART

This function is used to select whether or not to reapply the user interface settings from before the power failure when power is restored to the unit.

Go to > Installer Level > AUTO RESTART.

The following pages will be displayed





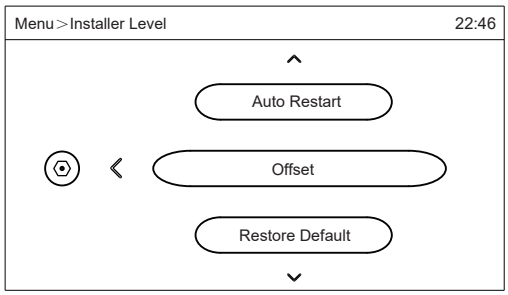
Press cancel button to abort, confirm button to enable "Auto Restart"

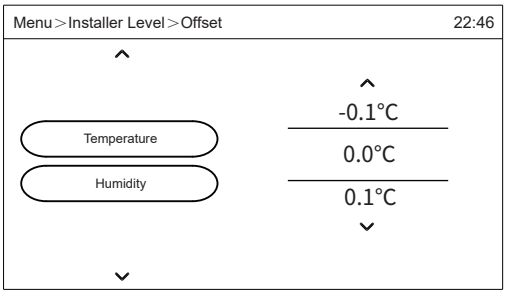
16 Offset

The function is used to correct room temperature and humidity.

Go to ⚙ > Installer Level > Offset

The following pages will be displayed





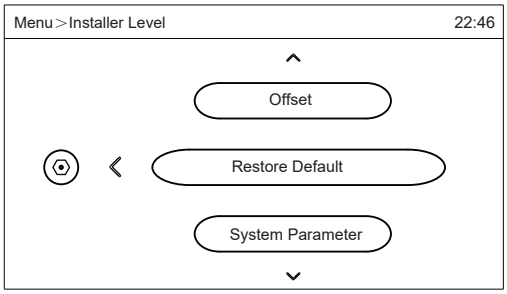
17 RESTORE DEFAULT

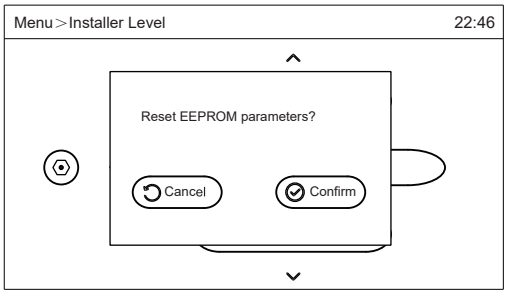
RESTORE DEFAULT is used to restore all the parameters set in the user interface to the factory setting.

How to enter the RESTORE DEFAULT.

Go to ⚙ > Installer Level > RESTORE FACTORY.

The following pages will be displayed

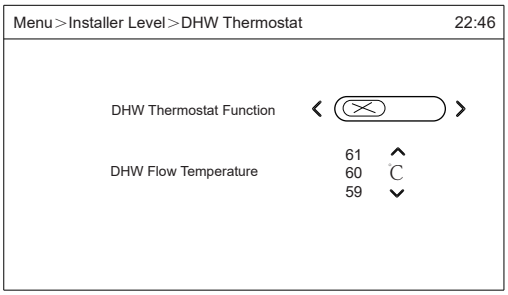




Press cancel button to abort, confirm button to reset all EEPROM parameters to the values to be set in the factory.

18 DHW Thermostat

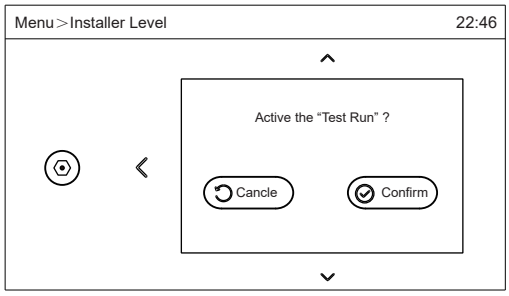
The function is only for HP using a customized hot water thermostat.
Go to ⚙ > Installer Level > DHW Thermostat, and then press "✓", the following page will be displayed.



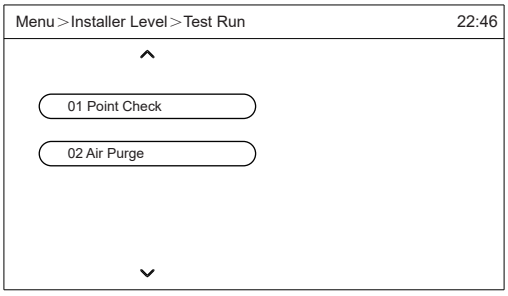
1st item "DHW Thermostat Function": ⊗ means disabling the function; ✓ means enabing the function.
Press left or right button to select ⊗ or ✓, the default is ⊗ .
2nd item "DHW Flow Temperature" is to set the desired HP leaving water temperature, the range is 25°C-75°C, the default is 60°C.

19 Test Run

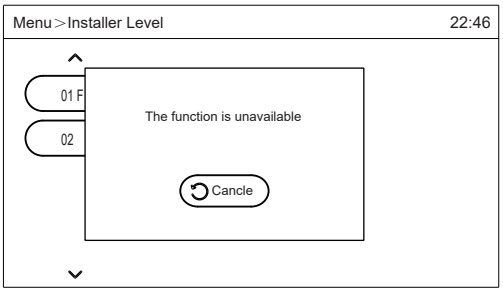
The function is used to check correct operation of the valves, circulation pump, and to take an air purging of the water system.
Go to ⚙ > Installer Level > Test Run, and then press "✓", The following page will be displayed.



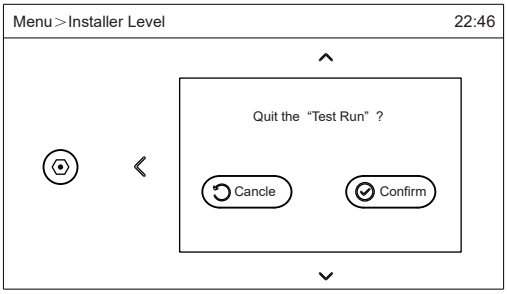
Press "✓" to go to the function "Test Run", the following page will be displayed.



Press up and down buttons to select 1st item "01 Point Check" and then press "✓" the following page will be displayed.



The function is for reserved.Press" ↺ "exit the page.
2nd item "Air Purge" is to drive air out of the water system.
If you want to exit "Test Run", you must press "↺" continuously until the screen displays the following page, and press "✓" to exit the function.



For cascade application, you must firtly select the module to be tested, and then repeat previous operations.

The parameters related to this chapter are shown in the table below.

Order number	Code	State	Default	Minimum	Maximum	Setting interval	Unit
1.1	Ta	Temperature difference between target LWT and real LWT for startup heat pump	2	1	5	1	℃
1.2	a	DeltaT between the target LWT and real LWT for restarting	3	1	10	1	℃
1.3	Mp	Select priority mode	0	0	2	1	/
1.4	T4L	Minimum ambient temp. of compressor operation for heating and hot water	-25	-40	-21	1	℃
1.5	PUMP_TYPE	Internal DC pump type	DC	DC	AC	1	/
1.6	SB-PWMout	Standby DC pump output	35	10	100	1	%
1.7	RUN-PWMout	Minimum DC pump operation output	40	30	100	1	%
1.8	WPS	Enable or disable water pressure detect,1=Enable,0=Disable	1	0	1	1	/
1.9	TH4	Enabel or disable chassi heater,1=Enable,0=Disable	1	0	1	1	/
2.1	Tb	Temperature difference between target hot water and real tank water for startup heat pump	5	2	15	1	℃
2.2	Tx	Target disinfect temperature	65	55	75	1	℃
2.3	Teh	Ambient temperature of tank heater startup	4	-10	40	1	℃
2.4	Td	Disinfect running time	30	20	120	1	MIN
2.5	TANK HEATER	Enable or disable tank heater,NON=Disable, YES=Enable	YES	NON	YES	/	/
2.6	P_d_DHW	Enable or disable tank pump control, NON=Disable, YES=Enable	NON	NON	YES	/	/
2.7	P_d_DIS	Enable or disable tank pump in disinfect mode, NON=Disable, YES=Enable	YES	NON	YES	/	/
2.8	P_d_TIME KEEP	Enable or disable tank pump operation timing, NON=Disable, YES=Enable	YES	NON	YES	/	/
2.9	t_P_d_on	Tank pump ON time	15	5	120	1	MIN
2.10	t_P_d_OFF	Tank pump OFF time	120	5	180	1	MIN
2.11	P_d_AUTO	Enable or disable tank pump normal ON, NON=Disable, YES=Enable	YES	NON	YES	/	/
3.1	ZONE A HEAT-TYPE	Zone A heating terminal device type, 0=FCU,1=RAD,2=FLH	RAD	FCU	FLH	1	/
3.2	ZONE B HEAT-TYPE	Zone B heating terminal device type, 0=FCU,1=RAD,2=FLH	FLH	FCU	FLH	1	/
3.3	HIGH TEMP HEAT OFF	Enable or disable high temperature shutdown, 0=Disable, 1=Enable	0	0	1	1	/
3.4	HD	0=Disbale IPH,1=Enable IPH	1	0	1	1	/
3.5	T4h	Maximum shutdown T4 temperature	24	10	30	1	℃
3.6	T4g	Ambient temperature of Enabling IPH or AHS	-10	-20	20	1	℃
3.7	H-PUMP	DC pump standby speed for heating	3	0	3	1	/
3.8	t_T4_FRESH_H	Refresh time of climate curve for heating	30	30	360	10	MIN
3.9	T4_ha1	Auto climate curve ambient temp. 1 for heating	-5	-25	35	1	℃
3.10	T4_ha2	Auto climate curve ambient temp. 2 for heating	7	-25	35	1	℃
3.11	SPTch_set1	Auto climate curve target temp. 1 for heating	35	25	60	1	℃
3.12	SPTch_set2	Auto climate curve target temp. 2 for heating	28	25	60	1	℃
4.1	ZONE A COOL TYPE	Zone A cooling terminal device type, 0=FCU,1=RAD,2=FLH	FCU	FCU	FLH	1	/
4.2	ZONE B COOL TYPE	Zone B cooling terminal device type, 0=FCU,1=RAD,2=FLH	FCU	FCU	FLH	1	/
4.3	C-Pump	DC pump standby speed for cooling	3	0	3	1	/
4.4	t_T4_FRESH_C	Refresh time of climate curve for cooling	30	30	360	10	MIN
4.5	T4_ca1	Auto climate curve ambient temp. 1 for cooling	25	-5	46	1	℃
4.6	T4_ca2	Auto climate curve ambient temp. 2 for cooling	35	-5	46	1	℃
4.7	SPTcc_set1	Auto climate curve target temp. 1 for cooling	16	5	25	1	℃
4.8	SPTcc_set2	Auto climate curve target temp. 2 for cooling	10	5	25	1	℃
5.1	AUTO HEAT MAX T4	Maxmum ambient temp. of auto-heating mode	17	10	17	1	℃
5.2	AUTO COOL MIN T4	Minimum ambient temp. of auto-cooling mode	25	20	29	1	℃
6.1	ZONE TYPE	Two zones, 0 = single zone, 2 =dual zone	1	1	2	1	/
6.2	SINGLE ZONE OPERATION	Single zone target temperature type	0	0	3	1	/
6.3	DUAL ZONE OPERATION	Dual zone target temperature type (2 and 6 for reserved)	0	0	7	1	/

Order number	Code	State	Default	Minimum	Maximum	Setting interval	Unit
7.1	ROOM THERMOSTAT	Room thermostat type, 0=NON=without room thermostat, 1=MODE SET,2=ONE ZONE,3=TWO ZONES	0	0	3	1	/
7.2	SINGLE ZONE RT SET	Target temperature type on ROOM THERMOSTAT = MODE SET or ONE ZONE	0	0	1	1	/
7.3	DUAL ZONE RT SET	Target temperature type on ROOM THERMOSTAT = TWO	0	0	3	1	/
8.1	dTro	dTro is the bias of room temperature to start and stop the heat pump, when dTro is set 1 and room target is 20degreeC, which means to reach 20degreeC to be standby and less than 19degreesC to restart.	1	0.5	3	0.5	℃
9.1	TE1	Enable or disable TE1, NON=Disable, YES=Enable	NON	NON	YES	/	/
10.1	TZ2	Enable or disable TZ2, NON=Disable, YES=Enable	NON	NON	YES	/	/
10.2	t_SV3_ON	SV3 on time	5	0	0	1	MIN
10.3	t_SV3_OFF	SV3 off time	2	0	120	1	MIN
10.4	dT_SV3_ON	Temperature difference for SV3 ON	5	0	10	1	℃
10.5	dT_SV3_OFF	Temperature difference for SV3 OFF	0	-10	0	1	℃
11.1	dTso	Temperature difference for startup solar pump	10	2	20	1	℃
11.2	tso	Solar pump running time	30	0	90	1	MIN
11.3	Solar_Type	Solar type, 0=NON,1=Solar temp. sensor, 2=SL1SL2	0	0	2	1	/
11.4	AHS_Type	0=AHSDisable ,1=AHS with only heating, 2=AHS both heating and DHW	0	0	2	1	/
12.1	t_SG_Block	Smart Grid block time	2	0	24	1	Hr
12.2	IP	Address code	251	1	255	1	/
12.3	Energy Information	Enable: to display ; Disable: not to display	Enable	Enable	Disable	/	/

The function description in the table below.

Previous No.	parameter	value	function
1.3	Mp	0	hot water priority
		1	space heating/cooling priority
		2	Preemtpy
1.4	T4L		if ambient temperature less than T4L,do not turn on heat pump, but can turn on backup heater or AHS
1.5	PUMP_TYPE		AC means internal water pump is alternating current DC means internal water pump is PWM
1.6	SB-PWMout		means PWM pump running speed when heat pump is standby mode in which the compressor shuts down because of getting a target temperature
1.7	RUN-PWMout		PWM pump must not operate below this speed when PWM pump is in speed adjustment
12.2	IP		heat pump address code in group controller
9.1	TE1		to activate temperature sensor mounted on top of buffer tank in cascade mode, but the function is for reserved
10.1	TZ2		to activate Zone 2 inlet temperature sensor function to get a low zone 2 target water temperature

Previous No.	parameter	value	function
2.3	Teh		if ambient temerature is higher than Teh, heat pump can't turn on hot water tank heater automatically unless manullly turn on tank heater
3.3	HIGH TEMP HEAT OFF		enable or disable the function: don't turn on heat pump if ambient temperature is higher than T4h in heating mode
3.5	T4h		
3.7	H-PUMP	0-State 1; 1-State 2; 2-State 3; 3-State 4	When the unit switches off in cooling or heating mode, the running state of DC pump can be set by the wire controller: State 1: the cycle is to be on 1 minute at the minimum output (30%) first, and then off 3 minutes State 2: the cycle is to be on 1 minute at the minimum output (30%) first, and then off 10 minutes State 3: the cycle is to be on 2 minutes at the minimum output(30%) first, and then off 15 minutes State 4(default state): to keep running at the minimum output (30%).
3.8	t_T4_FRESH_H		the controller refresh the ambient temperature by the time interval (set byt_T4_FRESH_H) when use weather temperatue curve function in heating mode
4.3	C-Pump		to refer to the 3.7 H-PUMP
4.4	t_T4_FRESH_C		the controller refresh the ambient temperature by the time interval (set byt_T4_FRESH_C) when use weather temperatue curve function in cooling mode
6.2	SINGLE ZONE OPERATION	0=set water temp.(manually adjustment) 1=set water temp.(weather curve temp.) 2=for reserved 3=set room temp.(real weather curve temp.)	use it to set target temperature type when 6.1 ZONE TYPE=ONE(only one zone)
6.3	DUAL ZONE OPERATION	1)=0: Zone 1 and Zone 2 are both water temp.(manually adjustment) 2)=1:Zone 1 is water temp.(manually adjustment); Zone 2 is water temp.(weather curve temp.) 3)=2: for reserved 4)=3: Zone 1 is water temp.(manually adjustment);Zone 2 is room temp.(real weather curve temp.) 5)=4: Zone 1 is water temp.(real weather curve temp.); Zone 2 is water temp.(manaully adjustment) 6)=5: Zone 1 and Zone 2 are both weather curve temp. 7)=6: for reserved 8)=7: Zone 1 is weather curve temp. Zone 2 is room temp.(real weather curve temp.).	use it to set target temperature type when 6.1 ZONE TYPE=TWO(two zones)

Interface Parameter Setup						Actual Result							
zone type	ROOM TERMOSTAT	SINGLE ZONE OPERATION	DUAL ZONE OPERATION	SINGLE ZONE RT SET	DUAL ZONE RT SET	ON/OFF	Mode	Zone A display Temperature	Zone B display Temperature	Zone A Setting Temperature	Zone B Setting Temperature	ZONE Parameter
Single Zone	0	0 1 2 3	/	/	/	Operational	Cool/Heat/ Auto	Leaving Water Temperature Room Temperature	/	Target LWT Weather Curve control, Interface will popup a notice Reserved Target Room Temperature	/	0
Dual Zone	0	/	0 1 2 3 4 5 6 7	/	/	Operational	Cool/Heat/ Auto	Leaving Water Temperature	Leaving Water Temperature Room Temperature Leaving Water Temperature Room Temperature	Target LWT Weather Curve control, Interface will popup a notice	Target LWT Weather Curve control, Interface will popup a notice Reserved Target Room Temperature Target LWT Weather Curve control, Interface will popup a notice Reserved Target Room Temperature	1
/	1	/	/	0 1	/	Non-operational, Interface will popup a notice	Non-operational, Interface will popup a notice	Leaving Water Temperature	/	Target LWT Weather Curve control, Interface will popup a notice	/	0
/	2	/	/	0 1	/	Non-operational, Interface will popup a notice	Cool/Heat	Leaving Water Temperature	/	Target LWT Weather Curve control, Interface will popup a notice	/	0
/	3	/	/	/	0 1 2 3	Non-operational, Interface will popup a notice	Cool/Heat	Leaving Water Temperature	Leaving Water Temperature	Target LWT Target LWT Weather Curve control, Interface will popup a notice	Target LWT Weather Curve control, Interface will popup a notice Target LWT Weather Curve control, Interface will popup a notice	1

14 Test run and final checks

The installer is obliged to verify correct operation of unit after installation.

Final checks

Before switching on the unit, read following recommendations:

- When the complete installation and all necessary settings have been carried out, close all front panels of the unit and refit the unit cover.
- The service panel of the switch box may only be opened by a licensed electrician for maintenance purposes.

⚠ That during the first running period of the unit, required power input may be higher than stated on the nameplate of the unit. This phenomenon originates from the compressor that needs elapse of a 50 hours run in period before reaching smooth operation and stable power consumption.

15 Maintenance and service

In order to ensure optimal availability of the unit, a number of checks and inspections on the unit and the field wiring have to be carried out at regular intervals.
This maintenance needs to be carried out by your local technician.
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This maintenance has to be carried out by your local technician.

⚠ WARNING

ELECTRIC SHOCK

- Before carrying out any maintenance or repairing activity, must switch off the power supply on the supply panel.
- Do not touch any live part for 10 minutes after the power supply is turned off.
- The crank heater of compressor may operate even in standby.
- Please note that some sections of the electric component box are hot.
- Forbid touch any conductive parts.
- Forbid rinse the unit. It may cause electric shock or fire.
- Forbid leave the unit unattended when service panel is removed.

The following checks must be performed at least once a year by qualified person.

- Water pressure: Check the water pressure, if it is below 1 bar, fill water to the system.
- Water filter: Clean the water filter.
- Water pressure relief valve: Check for correct operation of the pressure relief valve by turning the black knob on the valve counter-clock Wise:
  -If you do not hear a clacking sound, contact your local dealer.
  -In case the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your local dealer.
- Pressure relief valve hose: Check that the pressure relief valve hose is positioned appropriately to drain the water.
- Backup heater vessel insulation cover: Check that the backup heater insulation cover is fastened tightly around the backup heater vessel.

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⚠ WARNING

- Domestic hot water tank pressure relief valve (field supply) Applies only to installations with a domestic hot water tank. Check for correct operation of the pressure relief valve on the domestic hot water tank.
- Domestic hot water tank booster heater: Applies only to installations with a domestic hot water tank. It is advisable to remove lime buildup on the booster heater to extend its life span, especially in regions with hard water. To do so, drain the domestic hot water tank, remove the booster heater from the domestic hot water tank and immerse in a bucket (or similar) with lime-removing product for 24 hours.

Unit switch box

-Carry out a thorough visual inspection of the switch box and look for obvious defects such as loose connections or defective wiring.

-Check for correct operation of contactors with an ohm meter. All contacts of these contactors must be in open position.

-Use of glycol (Refer to "Water circuit anti-freeze protection") Document the glycol concentration and the pH-value in the system at least once a year.

-A PH-value below 8.0 indicates that a significant portion of the inhibitor has been depleted and that more inhibitor needs to be added.

-When the PH-value is below 7.0 then oxidation of the glycol occurred, the system should be drained and flushed thoroughly before severe damage occurs.

- Make sure that the disposal of the glycol solution is done in accordance with relevant local laws and regulations.

16 Trouble shooting

This section provides useful information for diagnosing and correcting certain troubles which may occur in the unit. This troubleshooting and related corrective actions may only be carried out by your local technician.

General guidelines

Before starting the troubleshooting procedure, carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

⚠ WARNING

- When carrying out an inspection on the switch box of the unit, always make sure that the main switch of the unit is switched off.
- When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. Under no circumstances can safety devices be bridged or changed to a value other than the factory setting. If the cause of the problem cannot be found, call your local dealer.
- If the pressure relief valve is not working correctly and is to be replaced, always reconnect the flexible hose attached to the pressure relief valve to avoid water dripping out of the unit!

For problems related to the optional solar kit for domestic water heating, refer to the troubleshooting in the Installation and owner's manual for that kit.

General symptoms

Symptom 1: The unit is turned on but the unit is not heating or cooling as expected

POSSIBLE CAUSES	CORRECTIVE ACTION
The temperature setting is not correct.	Check parameters and running mode
The water flow is too low.	● Check that all shut off valves of the water circuit are in the right position. ● Check if the water filter is plugged. ● Make sure there is no air in the water system. ● Check on the manometer that there is sufficient water pressure. The water pressure must be>0.1 MPa (water is cold). ● Make sure that the expansion vessel is not broken. ● Check that the resistance in the water circuit is not too high for the pump.
The water volume in the installation is too low.	Make sure that the water volume in the installation is above the minimum required value (refer to "**Water volume and sizing expansion vessels**").

Symptom 2: The unit is turned on but the compressor is not starting (space heating or domestic water heating)

POSSIBLE CAUSES	CORRECTIVE ACTION
The unit maybe operate out of its operation range (the water temperature is too low).	In case of low water temperature, the system utilizes the backup heater to reach the minimum water temperature first (12°C). ● Check that the backup heater power supply is correct. ● Check that the backup heater thermal fuse is closed. ● Check that the backup heater thermal protector is not activated. ● Check that the backup heater contactors are not broken.

Symptom 3: Pump is making noise (cavitation)

POSSIBLE CAUSES	CORRECTIVE ACTION
There is air in the system.	Purge air.
Water pressure at pump inlet is too low.	● Check on the manometer that there is sufficient water pressure. ● The water pressure must be > 0.1 MPa (water is cold). ● Check that the manometer is not broken. ● Check that the expansion vessel is not broken. ● Check that the setting of the pre- pressure of the expansion vessel is correct (refer to "**Water volume and sizing expansion vessels**").

Symptom 4: The water pressure relief valve opens

POSSIBLE CAUSES	CORRECTIVE ACTION
The expansion vessel is broken.	Replace the expansion vessel.
The filling water pressure in the installation is higher than 0.3MPa.	Make sure that the filling water pressure in the installation is about 0.10~0.20MPa (refer to "**Water volume and sizing expansion vessels**").

Symptom 5: The water pressure relief valve leaks

POSSIBLE CAUSES	CORRECTIVE ACTION
Dirt is blocking the water pressure relief valve outlet.	Check for correct operation of the pressure relief valve by turning the red knob on the valve counter clockwise: ● If you do not hear a clacking sound, contact your local dealer. In case the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your local dealer.

17 Information servicing

1) Checks to the area

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

2) Work procedure

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

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 work space 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. no 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 power or CO_2 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 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 circuits shall be checked for the presence of refrigerant; marking to the equipment continues to be visible and legible.
- Marking 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.

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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, and 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.

10) Repairs to sealed components

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

Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected.

b)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.

⚠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.

11) Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use. Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

12) Cabling

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

13) Detection of flammable refrigerants

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

14) Leak detection methods

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

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system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

15) Removal and evacuation

- When breaking into the refrigerant circuit to make repairs of 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 closed to any ignition sources and there is ventilation available.

16) Charging procedures

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

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize 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.

17) Decommissioning

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

a)Become familiar with the equipment and its operation.
b)Isolate system electrically
c) Before attempting the procedure ensure that:
  -Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
  -All personal protective equipment is available and being used correctly;
  -The recovery process is supervised at all times by a competent person;
  -Recovery equipment and cylinders conform to the appropriate standards.
d)Pump down refrigerant system, if possible.
e)If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
f) Make sure that cylinder is situated on the scales before recovery takes place.
g)Start the recovery machine and operate in accordance with manufacturer s instructions.
h)Do not overfill cylinders. (No more than 80% volume liquid charge).
i) Do not exceed the maximum working pressure of the cylinder, even temporarily.

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j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

18) Labeling

Equipment shall be labeled 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.

19) Recovery

When removing refrigerant from a system, either for service 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 numbers of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labeled 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.

20) Transportation, marking and storage for units

Transport of equipment containing flammable refrigerants Compliance with the transport regulations
Marking of equipment using signs Compliance with local regulations
Disposal of equipment using flammable refrigerants Compliance with national regulations
Storage of equipment/appliances
The storage of equipment should be in accordance with the manufacturer’s instructions.
Storage of packed (unsold) equipment
Storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge.
The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

18 Appendix

18.1 Breakdown and protection

Fault number	Fault name	Failure analysis	Diagnosis method	Solution
P01	Water flow protection	1. Lack of water in water system. 2. Water flow switch is fault. 3. Water system is blocked.	1. Check whether the valve of water replenishing is off. 2. Check whether the water flow switch is damage. 3. Check whether the Y shape filter is blocked.	1. Open the valve. 2. Change the water flow switch. 3. Clean or change the filter net.
P02	High pressure protection	1. Water flow is over low. 2. High pressure switch is fault. 3. Refrigerant system is blocked. 4. EXV is locked.	1. Check whether there is water shortage or insufficient pump flow 2. Check whether the high pressure switch is damage. 3. Check whether the refrigerant system is blocked. 4. Check whether there is EXV reset sound when the unit is standby, and power on or off.	1. Refill water or Add an additional water pump. 2. Change high pressure switch. 3. Change the filter of refrigerant system. 4. Change the EXV.
P03	Low pressure protection	1. Lack of refrigerant. 2. Refrigerant system is blocked. 3. The unit is not running in regulations operating condition.	1. Check whether the refrigerant system is leakage. 2. Check whether the filter in refrigerant system is blocked. 3. Check whether the outdoor ambient and the inlet water temperature is normal.	1. Repair the leakage point. 2. Change the filter of refrigerant system. 3. If the am bient temperature and water temperature is too high or low, the unit will stop
P04	Condenser temperature (T3) over-heat protection	1. Airflow of outdoor fan is insufficient. 2. Condenser is too dirty. 3. The temperature sensor (T3) is fault.	1. Check whether there is any obstacle which is preventing the airflow. 2. Check whether the condenser is too dirty. 3. Check whether the condenser pipe temperature sensor (T3) is normal.	1. Clean the vents 2. Clean the condenser. 3. Replace the Temperature sensor.
P05	Discharge temperature protection	1. Lack of refrigerant. 2. Discharge temperature sensor is fault.	1. Check whether the refrigerant system is leakage. 2. Check whether the discharge temperature sensor is normal.	1. Repair the leakage point. 2. Replace the temperature sensor
P06	Anti-freezing protection of leaving water	1. Water flow is too low. 2. Heat-exchanger is blocked. 3. Y shape filter in water system is blocked. 4. Load is too low.	1. Check whether there is some air in water circuit system. 2. Check whether the heat-exchanger is blocked. 3. Check whether the Y shape filter is blocked. 4. Check whether the water circuit system is reasonable.	1. If there is a problem with the drain valve, replace it with a new one. 2. Blow the plate heat exchanger with water or high-pressure gas in the opposite direction for cleaning 3. Clean the filter. 4. The water circulation system must have a shunt.
P07	Anti-freezing protection of condenser pipe	1. Lack of refrigerant. 2. Water circuit system is blocked. 3. Refrigerant system is blocked.	1. Check for leaks in the system. 2. Check whether Y shape filter is blocked. 3. Check whether filter in refrigerant system is blocked	1. Repair the leakage point. 2. Clean the filter. 3. Replace the filter.
P08	Medium pressure protection	Medium pressure switch off	Check whether the medium pressure switch is open circuit, when turn off the unit	Replace the medium pressure switch.

And on the next page.....

P10	Cooling low pressure protection	1. Lack of refrigerant. 2. The refrigeration system is blocked 3. Exceeding the scope of system work.	1. Check whether the system is leaking 2. Check if the filter net is blocked. 3. Check whether the ambient temperature or water temperature exceeds the limit.	1. Repair the leak and refill the refrigerant 2. Replace the filter. 3. Exceed the system working limit, can't run
P11	DC fan 1 failure	1. The fan is faulty or stuck 2. The main control board is faulty	1. Check whether the fan is stuck, or replace with a new fan 2. Replace the main control board	1. Check if the fan is stuck, or replace with a new fan 2. Replace the main control board
P12	Reserved	/	/	/
P13	4-way valve fault	1. Entering/leaving water temperature sensors are reversely inserted. 2. 4-way valve is fault. 3. PCB is fault.	1. Check whether the entering and leaving temperature sensors are reversely inserted. 2. Check whether action of 4-way valve is normal. 3. Check whether the sample temperature of motherboard is accurate	1. Correct the wrong place. 2. Try to switch repeatedly to see if it works; if not, replace it. 3. If it is wrong, replace it.
P21	DC pump is abnormal	1. The water pump is faulty or stuck. 2. The system lacks water and is blocked. 3. Power supply is abnormal. 4. Main control board failure.	1. Check whether the water pump is blocked, or replace with a new water pump. 2. Check whether the system is short of water; whether it is blocked, and whether the valve is closed 3. Check power supply. 4. Replace the main control board	1. Check if the water pump is blocked, or replace with a new water pump. 2. Refill water or clean or replace the filter net and open the valve. 3. Provide a correct power supply 4. Replace the main control board
P24	Reserved	/	/	/
P25	Outlet pressure sensor failure	1. The sensor connection line is open or short circuited 2. Sensor failure. 3. The main control board is faulty	1. Use a multimeter to check whether the sensor and connection are abnormal. 2. Replace the faulty sensor with a normal sensor to confirm whether it is normal. 3. Replace the main control board and confirm whether it is normal	1. Repair the connecting wire and plug or replace the sensor 2. Replace the main control board
E01	Communication error of controller	1. The communication cable is disconnected 2. The wire controller is faulty 3. The main control board is faulty	1. Check whether the communication cable is open or the plug is in poor contact 2. Confirm whether the wire controller is normal on a normal machine. 3. Use a normal wire controller to confirm whether it is normal on the faulty machine	1. Replace the communication cable or repair 2. Replace the line controller 3. Replace the main control board
E02	TP exhaust temperature sensor failure	1. The sensor connection line is open or short-circuited 2. Sensor failure. 3. The main control board is faulty	1. Use a multimeter to check whether the sensor and connection are abnormal 2. Replace the faulty sensor with a normal sensor to confirm whether it is normal. 3. Replace the main control board and confirm whether it is normal.	1. Repair the connecting wire and plug or replace the sensor 2. Replace the main control board

And on the next page.....

E03	T3 coil temperature sensor failure	1. The sensor connection line is open or short-circuited. 2. Sensor failure. 3. Main control board failure.	1. Use a multimeter to check whether the sensor and connection are abnormal 2. Replace the faulty sensor with a normal sensor to confirm whether it is normal 3. Replace the main control board and confirm whether it is normal.	1. Repair the connecting wire and plug or replace the sensor. 2. Replace the main control board.
E04	T4 Ambient temperature sensor failure	1. The sensor connection line is open or short-circuited. 2. Sensor failure. 3. Main control board failure.	1. Use a multimeter to check whether the sensor and connection are abnormal 2. Replace the faulty sensor with a normal sensor to confirm whether it is normal 3. Replace the main control board and confirm whether it is normal	1. Repair the connecting wire and plug or replace the sensor 2. Replace the main control board
E05	T5 liquid pipe temperature sensor failure	1. The sensor connection line is open or short-circuited. 2. Sensor failure. 3. Main control board failure.	1. Use a multimeter to check whether the sensor and connection are abnormal 2. Replace the faulty sensor with a normal sensor to confirm whether it is normal 3. Replace the main control board and confirm whether it is normal	1. Repair the connecting wire and plug or replace the sensor. 2. Replace the main control board.
E06	TH return air temperature sensor failure	1. The sensor connection line is open or short-circuited. 2. Sensor failure. 3. Main control board failure.	1. Use a multimeter to check whether the sensor and connection are abnormal 2. Replace the faulty sensor with a normal sensor to confirm whether it is normal 3. Replace the main control board and confirm whether it is normal	1. Repair the connecting wire and plug or replace the sensor. 2. Replace the main control board.
E07	TW water tank temperature sensor failure	1. The sensor connection line is open or short-circuited. 2. Sensor failure. 3. Main control board failure.	1. Use a multimeter to check whether the sensor and connection are abnormal 2. Replace the faulty sensor with a normal sensor to confirm whether it is normal 3. Replace the main control board and confirm whether it is normal	1. Repair the connecting wire and plug or replace the sensor. 2. Replace the main control board.
E08	TA Inlet water temperature sensor failure	1. The sensor connection line is open or short-circuited. 2. Sensor failure. 3. Main control board failure.	1. Use a multimeter to check whether the sensor and connection are abnormal 2. Replace the faulty sensor with a normal sensor to confirm whether it is normal 3. Replace the main control board and confirm whether it is normal	1. Repair the connecting wire and plug or replace the sensor. 2. Replace the main control board.
E09	TB outlet water temperature sensor failure	1. The sensor connection line is open or short-circuited. 2. Sensor failure. 3. Main control board failure.	1. Use a multimeter to check whether the sensor and connection are abnormal 2. Replace the faulty sensor with a normal sensor to confirm whether it is normal 3. Replace the main control board and confirm whether it is normal	1. Repair the connecting wire and plug or replace the sensor. 2. Replace the main control board.

And on the next page.....

E10	Communication failure between main control board and drive board	1. The communication cable is disconnected 2. The main control board is faulty. 3. The drive module is faulty.	1. Check whether the communication cable is open or the plug is in poor contact 2. Replace the main control board and confirm whether it is normal. 3. Replace the drive board and confirm whether it is normal.	1. Replace or repair the communication cable. 2. Replace the main control board 3. Replace the drive module.
E11	Reserved	/	/	/
E12	Reserved	/	/	/
E13	Reserved	/	/	/
E14	Low pressure sensor LPS failure	1. The sensor connection line is open or short-circuited. 2. Sensor failure. 3. The main control board is faulty.	1. Check whether the communication cable is open or the plug is in poor contact 2. Replace the main control board and confirm whether it is normal. 3. Replace the drive board and confirm whether it is normal.	1. Replace or repair the communication cable. 2. Replace the main control board 3. Replace the drive module.
E15	DC bus voltage is too low	Wiring error or IPM module failure. Check whether the wiring is wrong, reconnect the cable or replace the IPM module.		
E16	DC bus voltage is too high			
E17	AC current protection (input current)			
E18	IPM module is abnormal			
E19	PFC abnormal			
E20	Compressor failed to start			
E21	Compressor phase loss			
E22	IPM Module reset			
E23	Compressor over-current			
E24	PFC module temperature is too high			
E25	Current detection circuit failure			
E26	Out of step			
E27	PFC module temperature sensor is abnormal			
E28	communication fail			

And on the next page.....

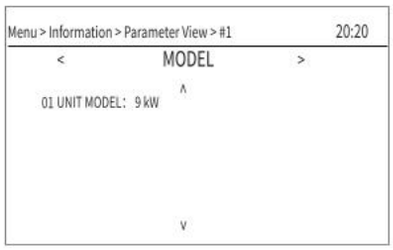
E29	IPM module temperature is too high	Wiring error or IPM module failure. Check whether the wiring is wrong, reconnect the cable or replace the IPM module.
E30	IPM module temperature sensor failure	
E31	Reserved	
E32	Reserved	
E33	Reserved	
E34	AC input voltage is abnormal	
E35	IPM adjustment data	
E36	Reserved	
E37	Reserved	
E38	Reserved	
E49	TC failure of the final water temperature sensor	Wiring error or the sensor fault: Check whether the wiring is wrong, reconnect the cable; Replace the sensor.
E50	Solar temperature sensor Tso failure	
E51	The built-in temperature sensor Tro of the wire controller is faulty	
E52	Zone 2 temperature sensor TZ2 failure	
E53	Top temp TE1 sensor of butter tank faulty	
E54	Bottom temp sensor TE2 of buffer tank faulty	
E55	Inlet water pressure sensor faulty TA	
E56	Outlet water pressure sensor faulty TB	
E57	Reserved	
E58	Reserved	
E59	MODULE OFFLINE	For CASCADE application, there are communication errors between master module and slave modules, please check whether the wiring is correct.

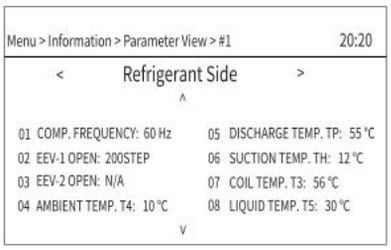
18.2 Run parameter query

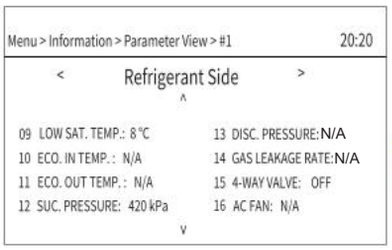
This menu is for installer or service engineer reviewing the operation parameters.

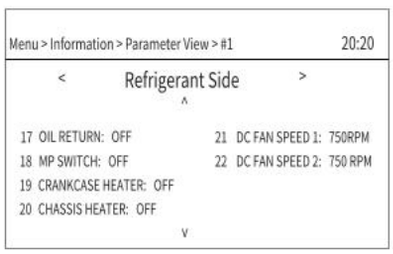
At home page, go to '' ⊖ '' >"Information" >''PARAMETER VIEW''.

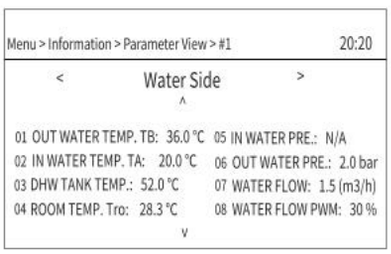
Press "✓". There are twelve pages for the operating parameter as following. Use " 》"" 《" "⌃" "⌄"to scroll.

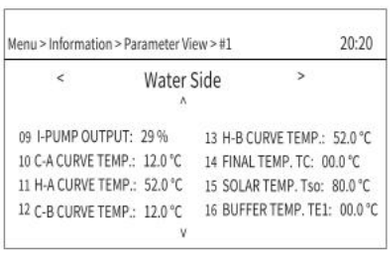


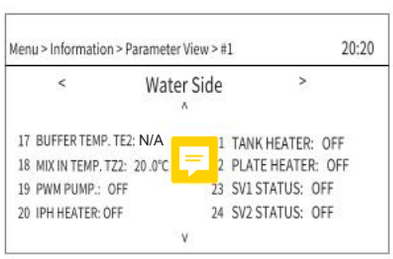


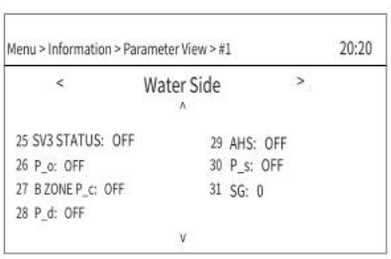


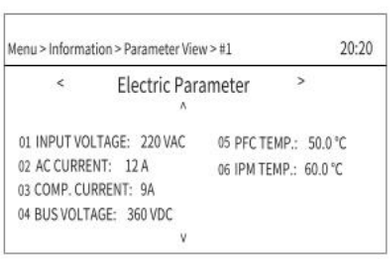




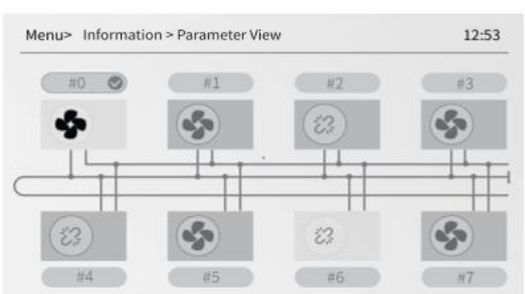








For cascade application, after you select "PARAMETER VIEW" at home page,the screen will appear the page of selecting the module to be viewed:



Press 》or 《to select the module to be viewed, and then press ⊘ to confirm your choice.

Press"》"and " 《" to check the operation parameter of the module. The address of the module is in the upper right corner. The address #0 means main module. The others(#1~#7) mean slave modules.

means the normal module. means the lost module.

NOTE

The flow rates parameters are calculated according to the pump running parameters,the deviation is different at different flow rates,the maximum of deviation is 15%.The flow parameters are calculated according to the electrical parameters of the pump operation.

Note:

It is strictly forbidden to power off the unit during the heating season in winter to ensure the normal operation of the antifreeze function of the unit.

When the unit is not used for a long time, please drain the water in the system cleanly.

If the unit is not in use for a long time before putting it back into use, please check whether the water pump rotor can operate normally. If it can't rotate normally, or if the rotation is blocked or the rotation is not smooth, let the rotor run freely before starting the unit; if you have any questions, please promptly Call the after-sales service number.

The design specifications, performance and technical parameters of the product will be changed due to product improvement, and will not be notified at that time. Please refer to the product.

版次	标记	处数	技术变更单编号	修改说明	签名
A				修改P71.72.74.以及电路图拨码内容	何健聪

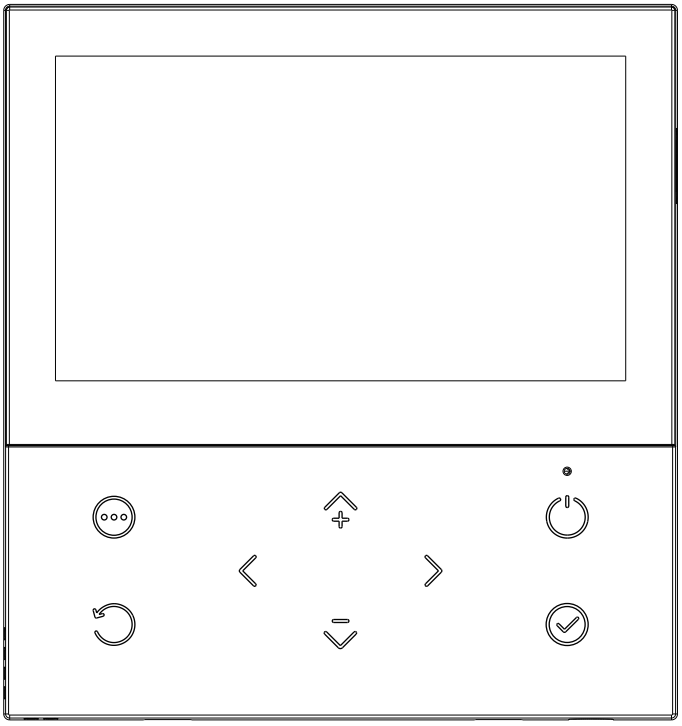
此页不印刷，仅标识说明书版本

编码：802000101955

图号：SMS-ZX-KFS-CP-R32-EN-1[A]

OPERATION MANUAL

Wired Controller



Thank you very much for purchasing our product, Before using the unit, please read this manual carefully and keep it for future reference

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1 SAFETY INSTRUCTION

1.1 About the manual

⚠ DANGER

Indicates a situation that results in death or serious injury.

⚠ DANGER: RISK OF ELECTROCUTION

Indicates a situation that could result in electrocution.

⚠ DANGER: RISK OF BURNING

Indicates a situation that could result in burning because of extreme hot temperatures.

⚠ WARNING

Indicates a situation that could result in death or serious injury.

⚠ CAUTION

Indicates a situation that could result in minor or moderate injury.

NOTE

Indicates a situation that could result in equipment or property damage.

INFORMATION

Indicates useful tips or additional information.

1.2 For the user

- If you are not sure how to operate the unit, contact your installer.
- The appliance is not intended for use by persons, including children, with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children must be supervised to ensure that they do not play with the product.

⚠ CAUTION

DO NOT rinse the unit. This may cause electric shocks or fire.

- The unit is marked with the following symbol:

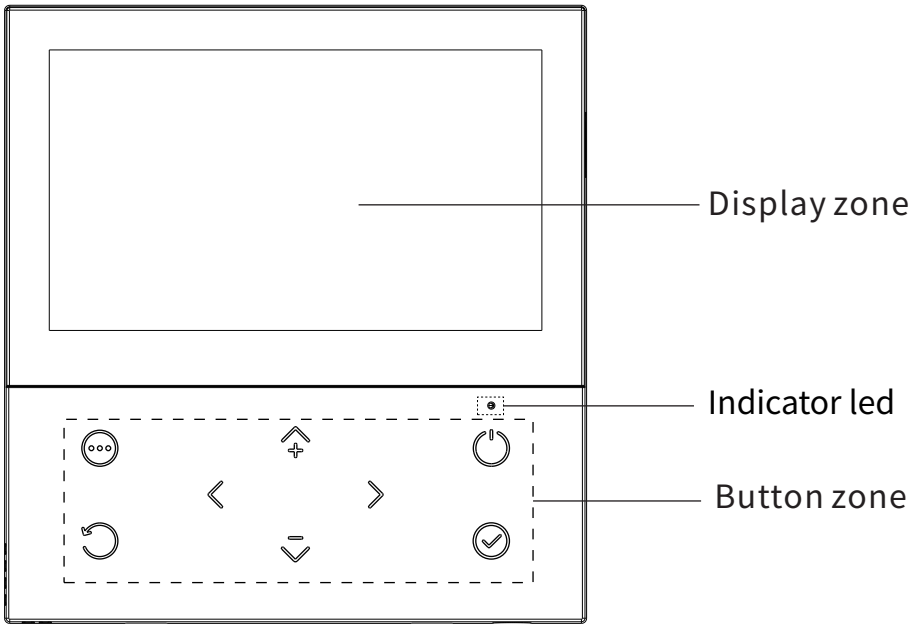


This means that electrical and electronic products cannot be mixed with unsorted household waste. DO NOT try to dismantle the system yourself: the dismantling of the system, treatment of the refrigerant, of oil and of other parts must be done by an authorized installer and must comply with applicable legislation. Units must be treated at a specialized treatment facility for reuse, recycling and recovery. By ensuring this product is disposed of correctly, you will help to prevent potential negative consequences for the environment and human health. For more information, contact your installer or local authority.

- Placed in location away from radiation.

2 OVERVIEW OF WIRED CONTROLLER

2.1 The appearance



MENU

Enter the menu structure from the home page.

ON/OFF

Turn on or off the space operation mode, DHW mode or the function in the menu structure.

ARROW

Navigate the cursor on the display; Navigate in the menu structure, Adjust the settings, Flip pages in the menu structure.

BACK

Back to the up level.

ENTER

Go to the next step when programming a schedule in the menu structure, Confirm a selection, Enter a submenu in the menu structure, move to and from between the items in menu when edit the parameters.

- **Indicator led**

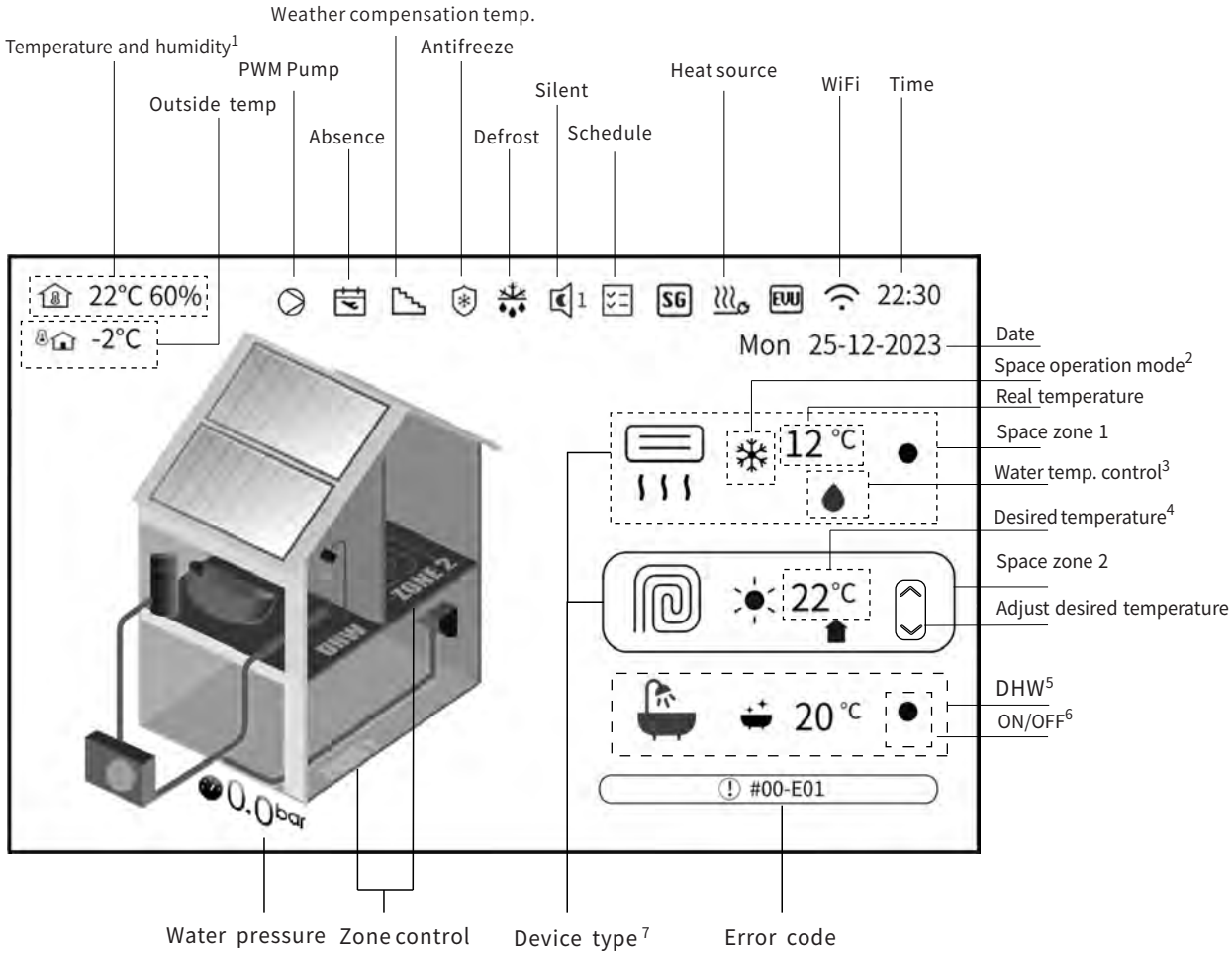
When power supply of the wired controller is on, the led is either always on or flash.

On turning the unit off, the led will be always on.

On turning the unit on, the led flash one time per two seconds.

On updating the software, the led flash fast.

2.2 Status icons



1. Real temperature & humidity of the room where the wired controller is located.
2. Space operation mode: Heating - , Cooling - and AUTO - .
3. Water drop means desired temperature is leaving water temperature.
   The icon means desired temperature is the temperature of the room where the wired controller is placed.
4. When the icon appears, the temperature is desired temperature, otherwise it is real temperature.
5. There is a domestic hot water(DHW) pruduction function: DHW - , disinfection - .
6. When turn on heat pump the icon is yellow. when compressor starts up the icon is green. When turn off heat pump the icon will disappear.
7. There are 3 types of devices: floor loop heater(FLH) - , fan coil unit(FCU) - and radiator(RAD) - .

Note: An icon is displayed on the screen only when the function associated with it is activated.

The actual order of the icons may be different from the order shown in the image above.

3 HOME PAGES

When power supply of the wired controller is initially on, the screen will appear "Loading..." to initializ the system and then enter home page in a few seconds.

You can use the home pages to read out and change settings that are meant for daily usage. What you can see and do on the home pages is described where applicable. Depending on the system layout, the following home pages may be possible:

- Water flow desired temperature (MAIN)
- Room desired temperature(ROOM)
- DHW tank actual temperature (TANK) (DHW=Domestic Hot Water)

Home page 1

If dip switch SW1-2=OFF(which means DHW mode is valid) and any one of the settings on Table 1 is set, home page 1 will appear:

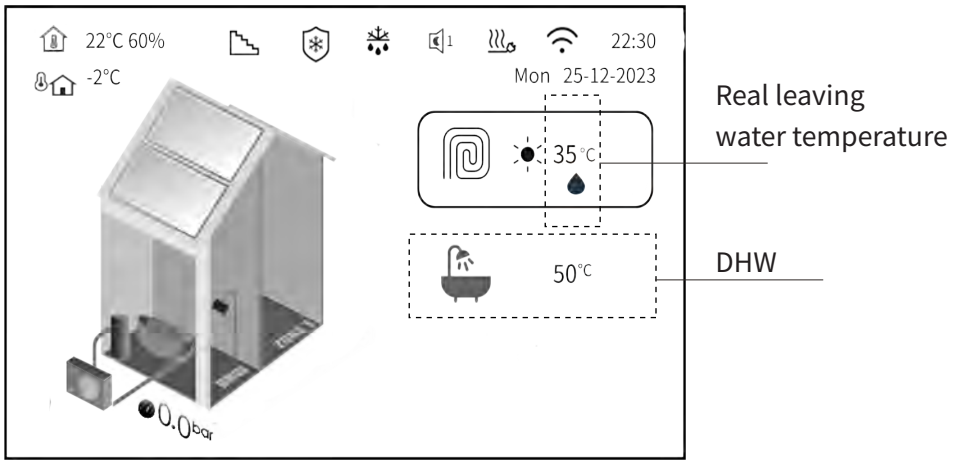
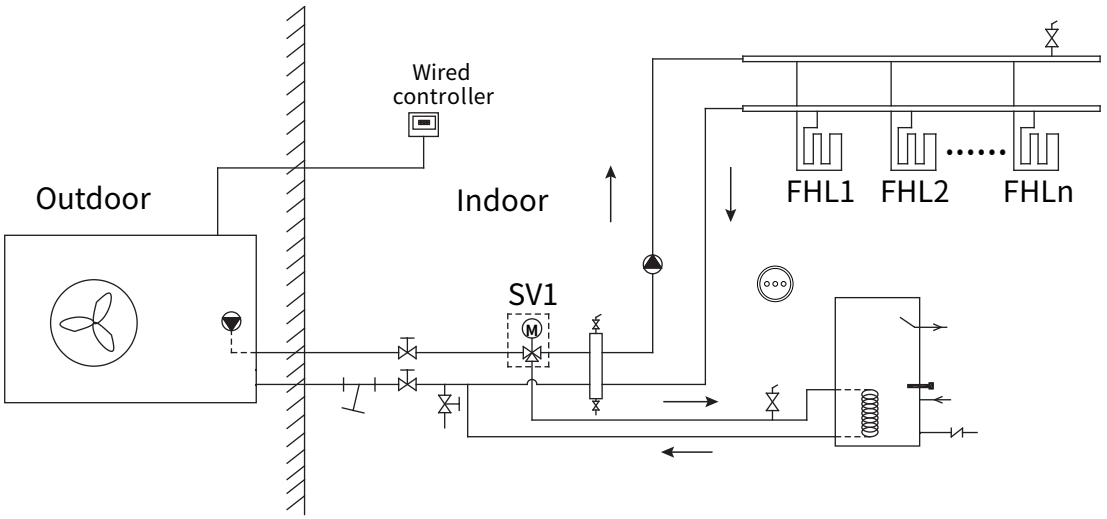


Table 1

No.	System Parameter Setting	Room thermostat	Weather curve temp.
1	ZONE TYPE = 0 and SINGLE ZONE OPERATION SET = 0 and ROOM THERMOSTAT = 0	NON	NON
2	ZONE TYPE = 0 and SINGLE ZONE OPERATION SET = 1 and ROOM THERMOSTAT = 0	NON	YES
3	ROOM THERMOSTAT = 1 and SINGLE ZONE RT OPERATION = 0	YES	NON
4	ROOM THERMOSTAT = 1 and SINGLE ZONE RT OPERATION = 1	YES	YES
5	ROOM THERMOSTAT = 2 and SINGLE ZONE RT OPERATION = 0	YES	NON
6	ROOM THERMOSTAT = 2 and SINGLE ZONE RT OPERATION = 0	YES	YES

The system has only one space operation zone whose desired temperature is leaving water temperature. You can adjust desired temperature by manual or selecting desired weather curve compensation temperature.

Refer to" ⚙ > Installer Level > System Parameter > TEMP. TYPE SET and ROOM THERMOSTAT" for the settings in "Installation and owner's manual".
The system has the function including floor heating and domestic hot water:



Home page 2

If dip switch SW1-2=OFF and the settings on Table 2 is set, home page 2 will appear:

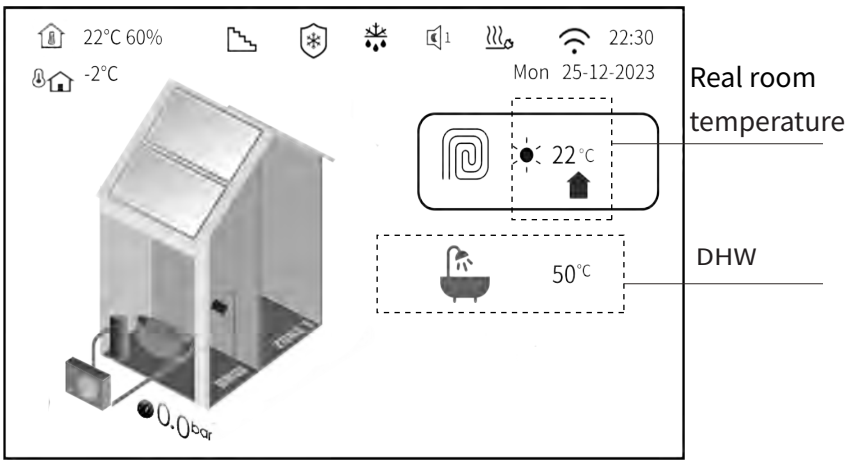
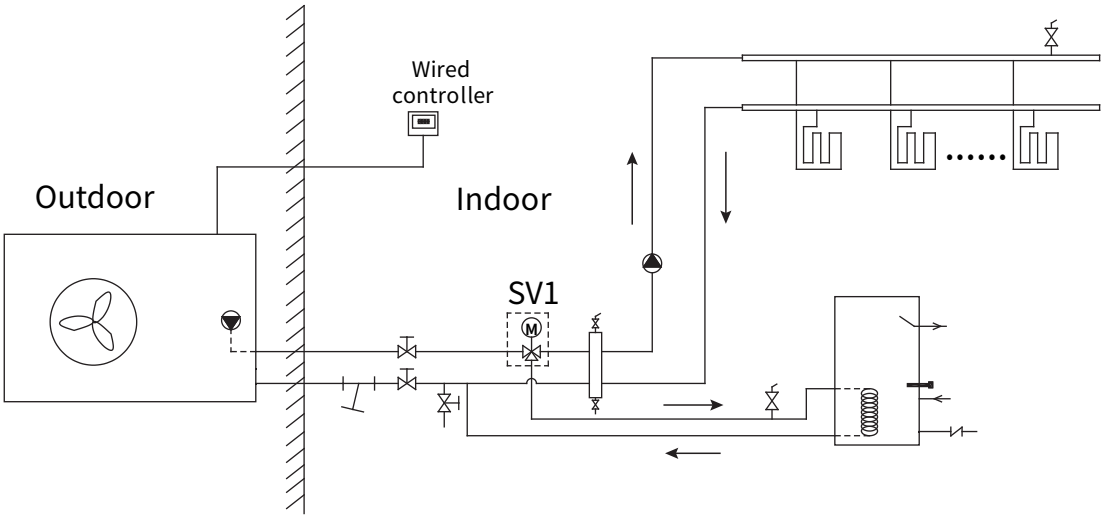


Table 2

No.	System Parameter Setting	Room thermostat	Weather curve temp.
1	ZONE TYPE = 0 and SINGLE ZONE OPERATION SET = 3 and ROOM THERMOSTAT = 0	NON	YES

The system has only one space operation zone whose desired temperature is room temperature detected by the temperature sensor installed on wired controller. You can adjust desired room temperature by manual and select desired weather curve temperature by Table 2. You cannot directly adjust desired leaving water temperature by manual.
Refer to "⚙ > Installer Level > System Parameter > TEMP. TYPE SET and ROOM THERMOSTAT" for the settings in "Installation and owner's manual".
The system has the function including floor heating and domestic hot water:



NOTE:

The wired controller should be installed in the floor heating room to check the room temperature.

Home page 3

If dip switch SW1-2=OFF and any one of the settings on Table 3 is set, home page 3 will: appear:

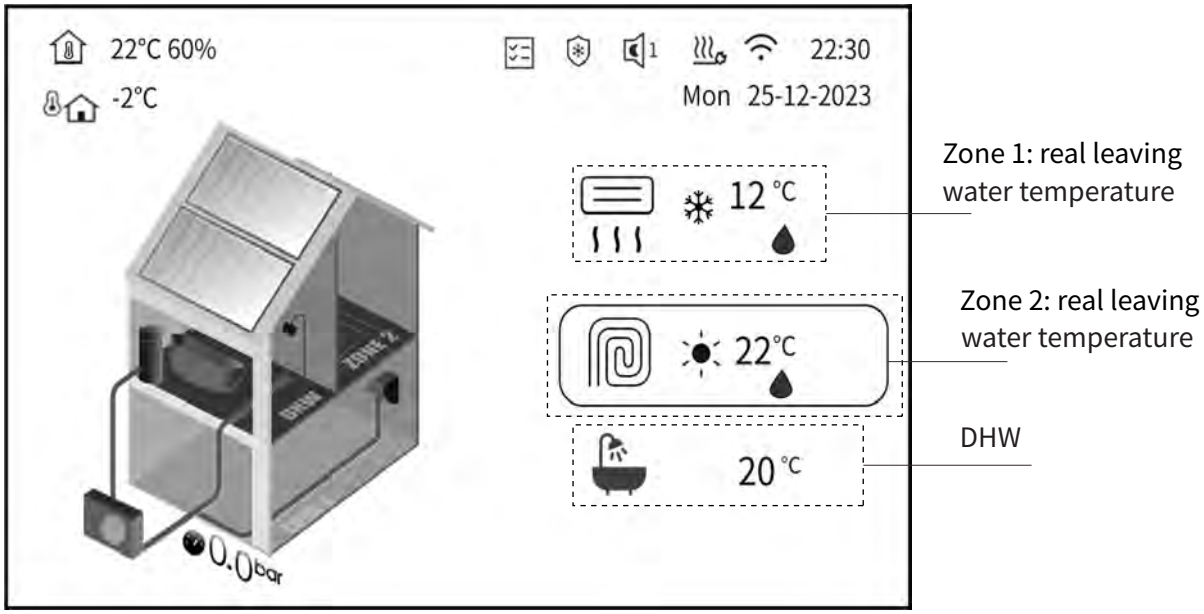


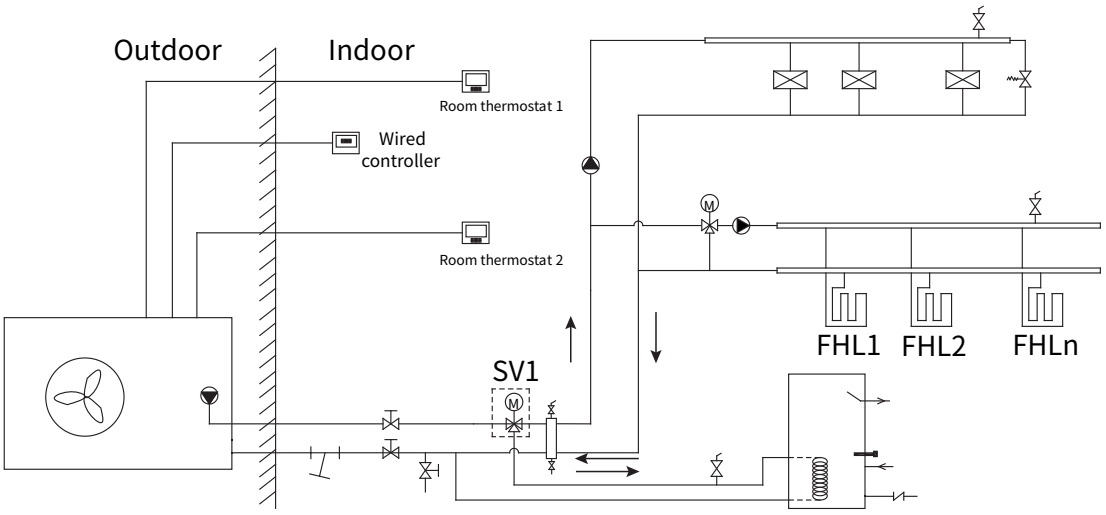
Table 3

No.	System Parameter Setting	Room thermostat	Weather curve temp.	
			Zone 1	Zone 2
1	ROOM THERMOSTAT = 0 and ZONE TYPE = 1 and DULE ZONE OPERATION SET = 0	NON	NON	NON
2	ROOM THERMOSTAT = 0 and ZONE TYPE = 1 and DULE ZONE OPERATION SET = 1	NON	NON	YES
3	ROOM THERMOSTAT = 0 and ZONE TYPE = 1 and DULE ZONE OPERATION SET = 4	NON	YES	NON
4	ROOM THERMOSTAT = 0 and ZONE TYPE = 1 and DULE ZONE OPERATION SET = 5	NON	YES	YES
5	ROOM THERMOSTAT = 3 and DULE ZONE RT OPERATION = 0	YES	NON	NON
6	ROOM THERMOSTAT = 3 and DULE ZONE RT OPERATION = 1	YES	NON	YES
7	ROOM THERMOSTAT = 3 and DULE ZONE RT OPERATION = 2	YES	YES	NON
8	ROOM THERMOSTAT = 3 and DULE ZONE RT OPERATION = 3	YES	YES	YES

The system has two space operation zones whose desired temperature is leaving water temperature not the room temperature. You can adjust desired temperature by manual or selecting desired weather curve compensation temperature by Table 3.

Refer to " > Installer Level > System Parameter > TEMP. TYPE SET and ROOM THERMOSTAT" for the settings in "Installation and owner's manual".

The system has the function including floor heating, space cooling for fan coil and domestic hot water:



Home page 4

If dip switch SW1-2 is set to "ON" and any one of the settings on Table 4 is set, home page 4 will appear:

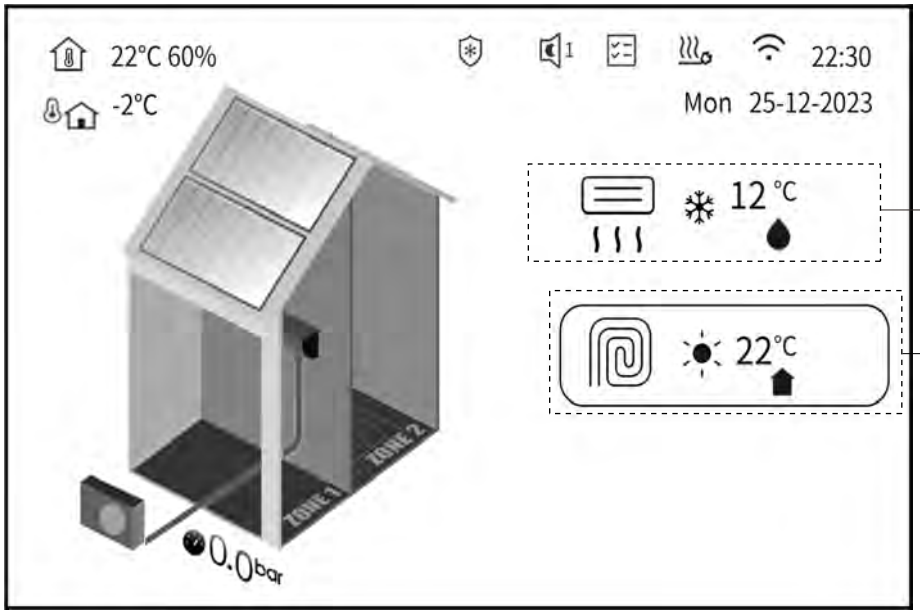


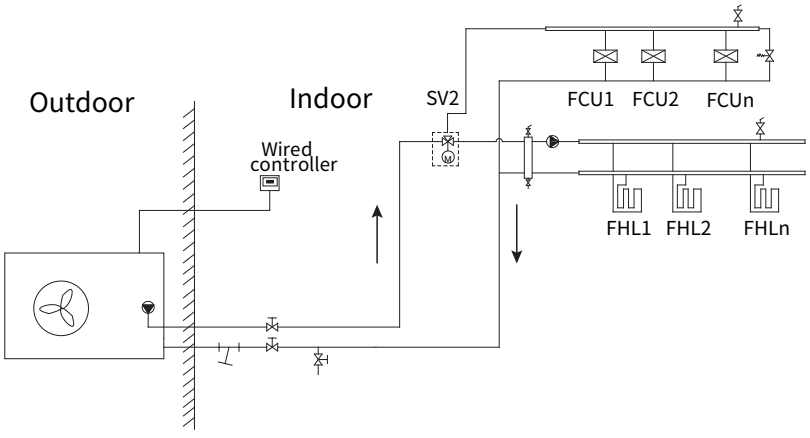
Table 4

No.	System Parameter Setting	Room thermostat	Weather curve temp.	
			Zone 1	Zone 2
1	ROOM THERMOSTAT = 0 and ZONE TYPE = 1 and DULE ZONE OPERATION SET = 3	NON	NON	YES
2	ROOM THERMOSTAT = 0 and ZONE TYPE = 1 and DULE ZONE OPERATION SET = 7	NON	YES	YES

The system has two space operation zones. Desired temperature of Zone 1 is leaving water temperature, and desired temperature of Zone 2 is the room temperature where wired controller is located. You can adjust desired temperature by manual or selecting desired weather curve compensation temperature by Table 4.

Refer to "⚙ > Installer Level > System Parameter > TEMP. TYPE SET and ROOM THERMOSTAT" for the settings in "Installation and owner's manual".

The system has the function including floor heating and space heating for fan coil:



NOTE:

1. All the pictures in the manual are only used to explain, the actual pages displayed may have some difference.
2. The software of the wired controller can be upgraded, new version functions may not be be described in the manual.

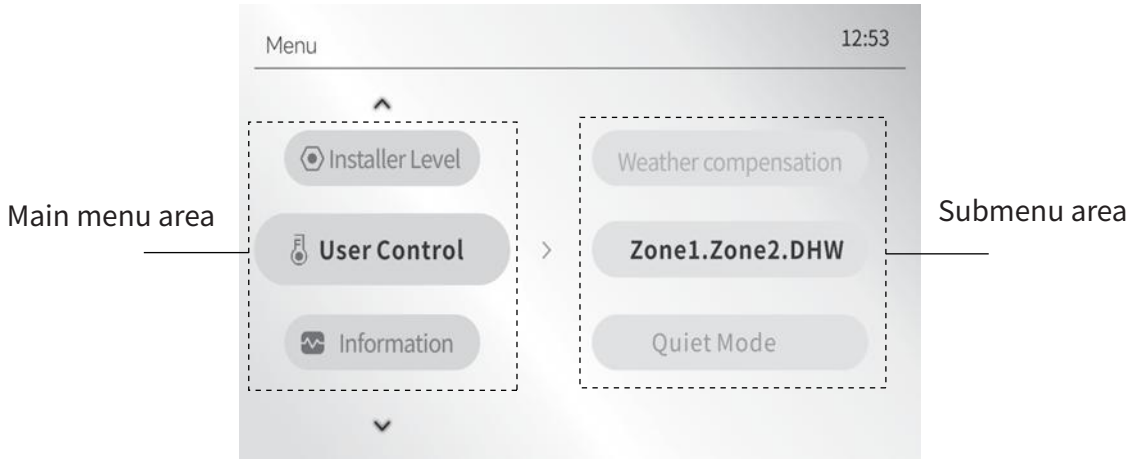
4 MENU STRUCTURE

4.1 About the menu structure

You can use the menu structure to read out and configure settings that are NOT meant for daily usage. What you can see and do in the menu structure is described where applicable.

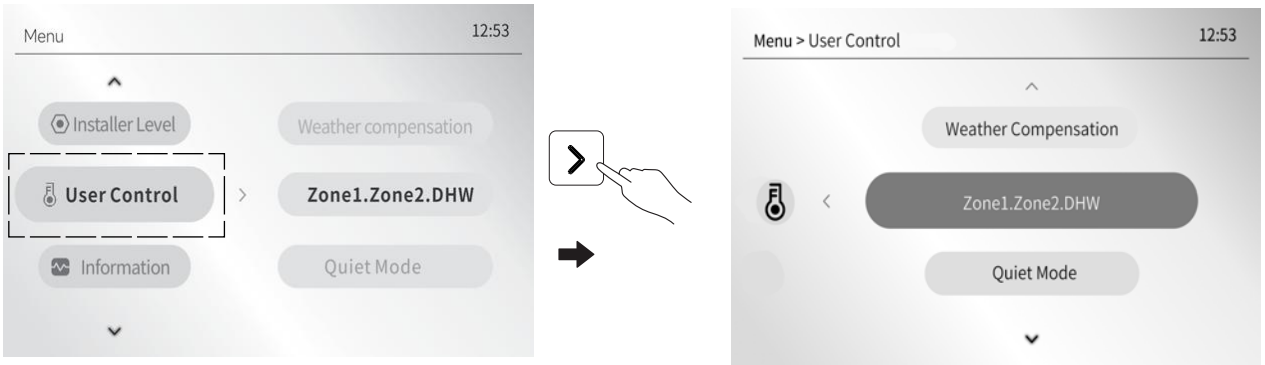
4.2 To go to the menu structure

Press "⊙" on any one page and then go into main menu structure page.

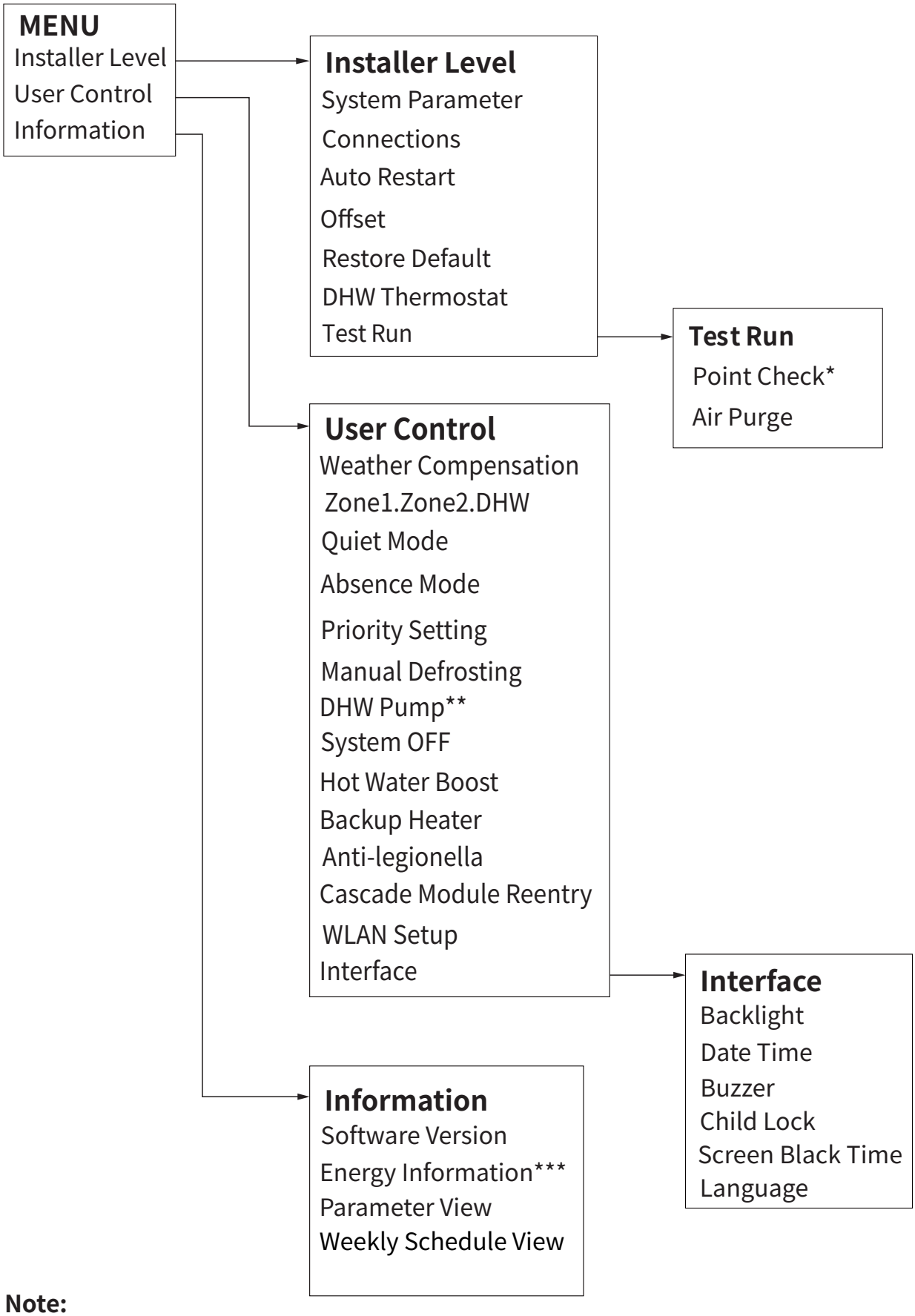


4.3 To navigate in the menu structure

Press " ⌃ " and " ⌄ " to select a main menu to be set , and then press" › " to enter its submenu.



4.4 menu structure overview



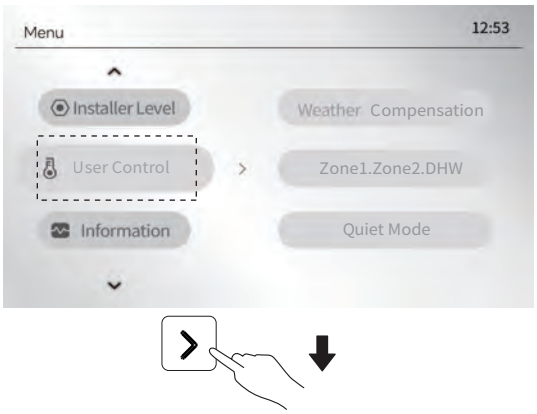
Note:
01 Point Check is available only for R290, not for R32.
**** DHW Pump** schedule function is available only for R290, not for R32.
*****Energy Information*** is optional.

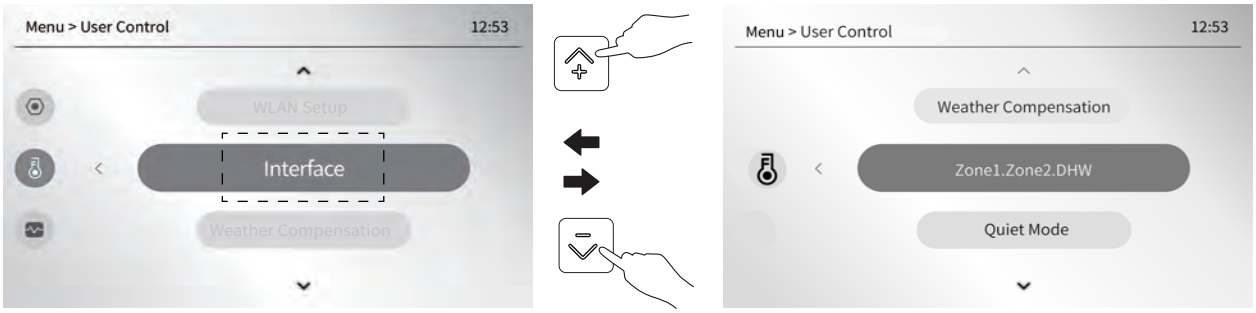
5 BASIC USAGE

5.1 Screen setting

On any one page go to " > User Control > Interface", you can set these function relative to the screen:

- Backlight
- Date Time
- Buzzer
- Child Lock
- Screen Black Time
- Language

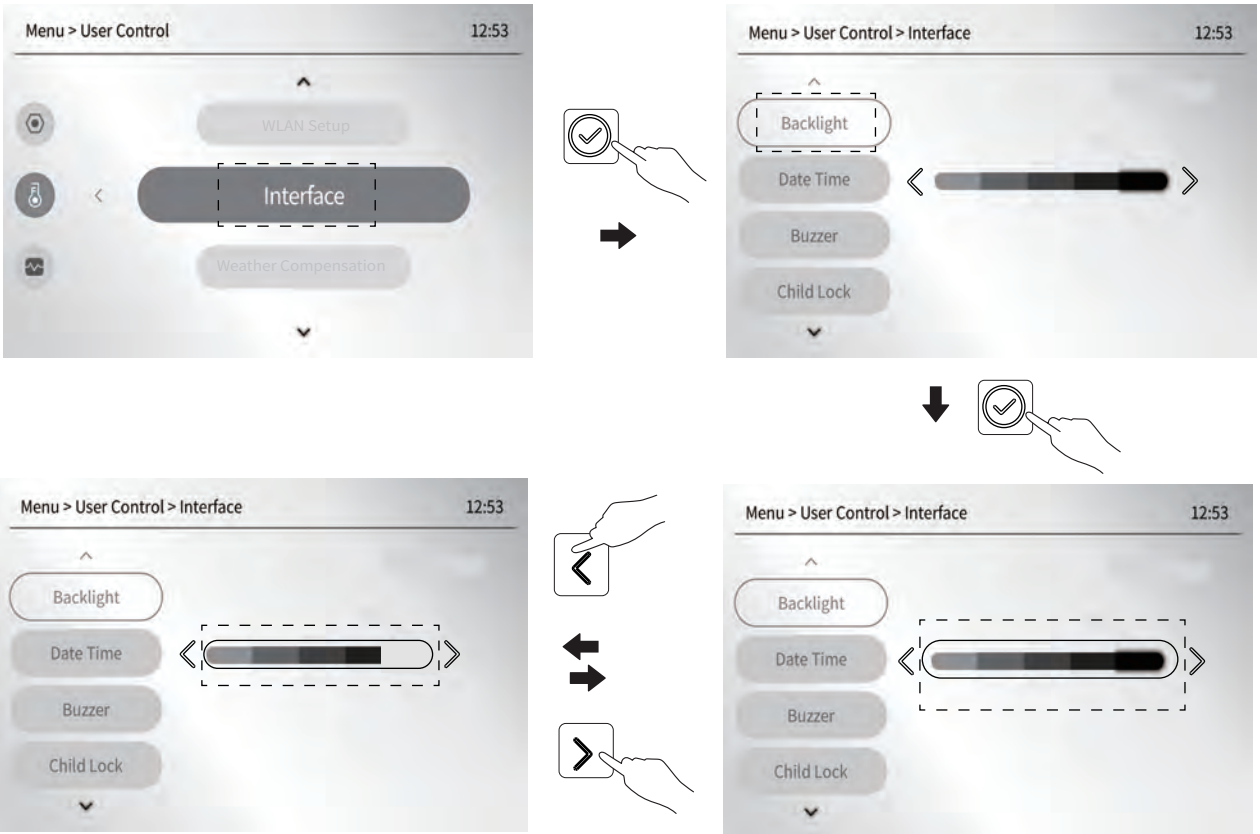




5.1.1 Backlight

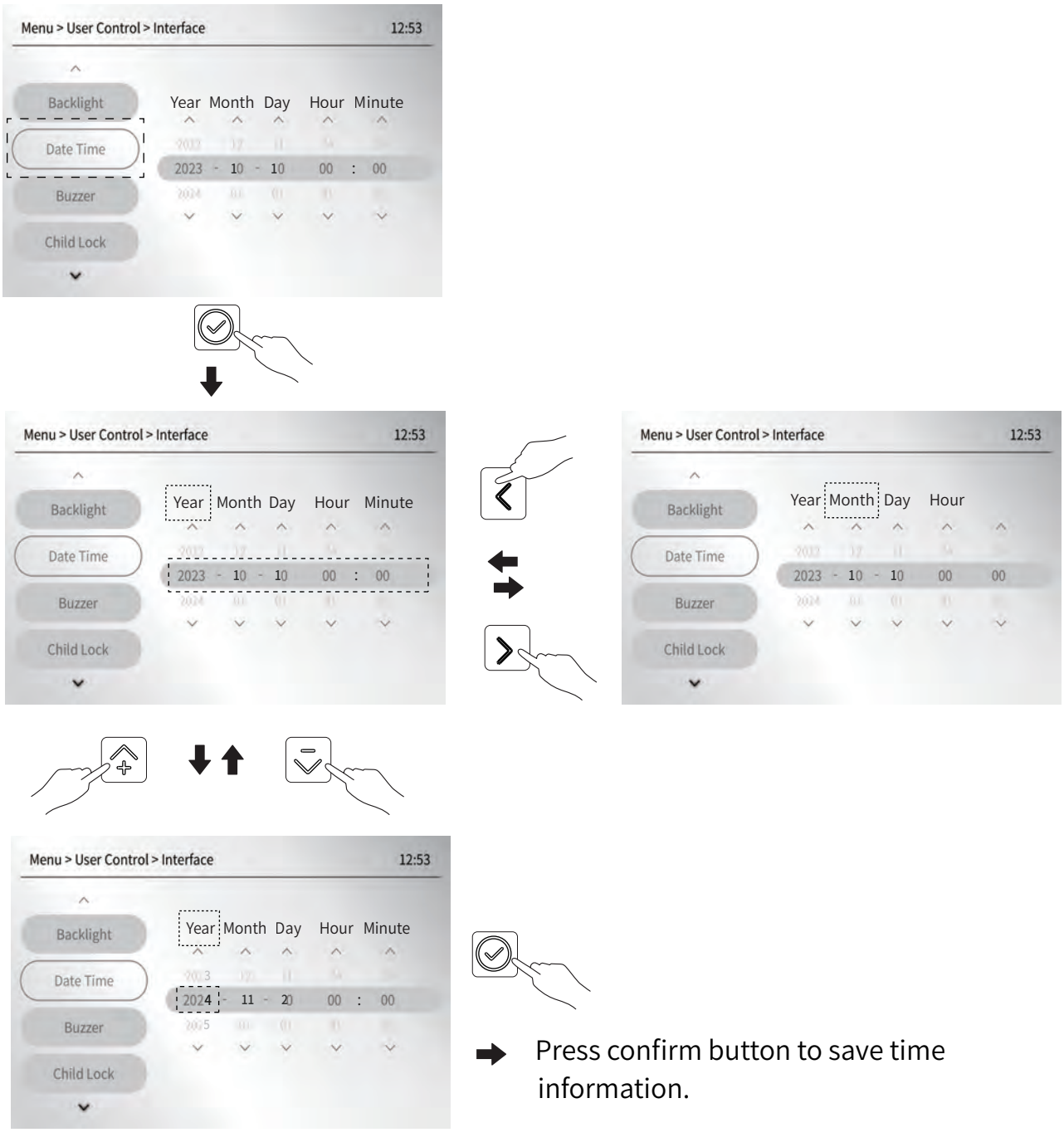
The function is to adjust screen brightness.

On any one page go to " > User Control > Interface > Backlight ".



5.1.2 Date Time

Go to " > User Control > Interface > Date Time " , and then press , next press or to select "Year" / "Month" / "Day" / "Hour" / " Minute " to be set, press to confirm it again, and then press or to adjust the date or time.

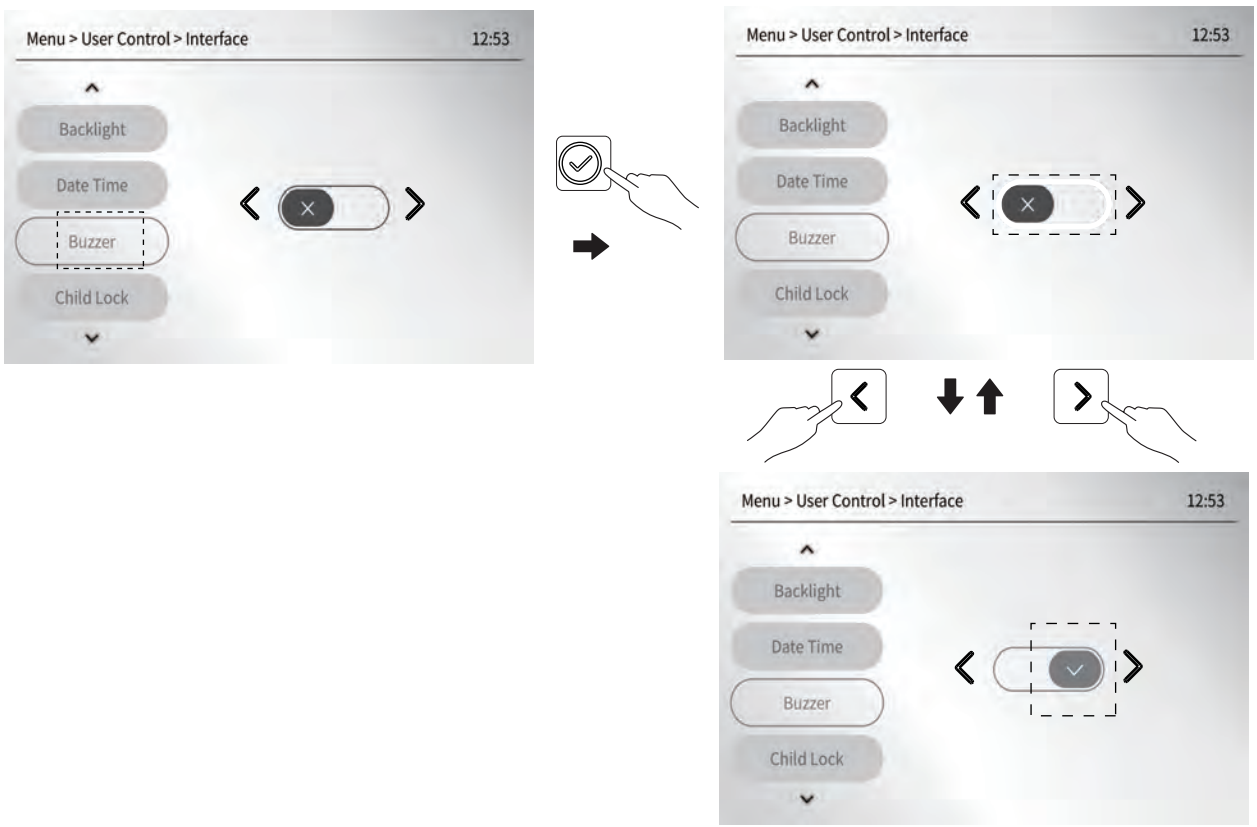


➡ Press confirm button to save time information.

5.1.3 Buzzer

Set whether or not the buzzer sounds when any one button is pressed.

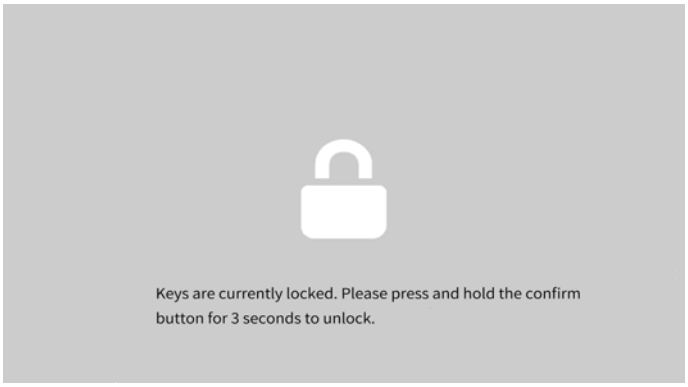
Go to " > User Control > Interface > Buzzer " , and then press , next press or to select - silent or - sound.



5.1.4 Child Lock

"Child Lock" is to set to lock or unlock the screen.

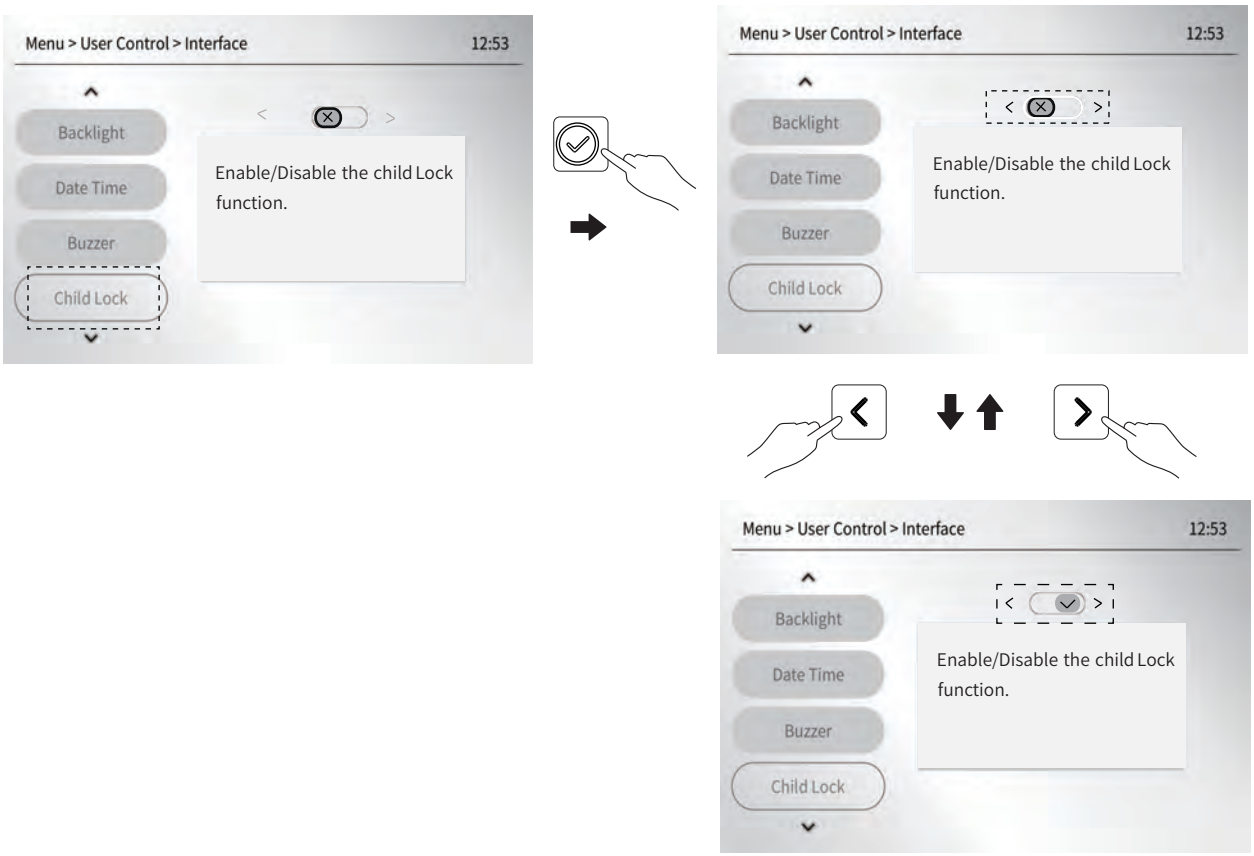
Long Press " ✓ " button for 3 seconds on any one page to lock the screen, and then if press any one button the following screen will appear :



and then the screen will get black in the time "5.1.5 Screen Black Time". After locking the screen, you can only unlock the screen to control the interface again by long-pressing " ✓ " button for 3 seconds.

You can cancel the screen lock function by setting "Child Lock" to ✕ .

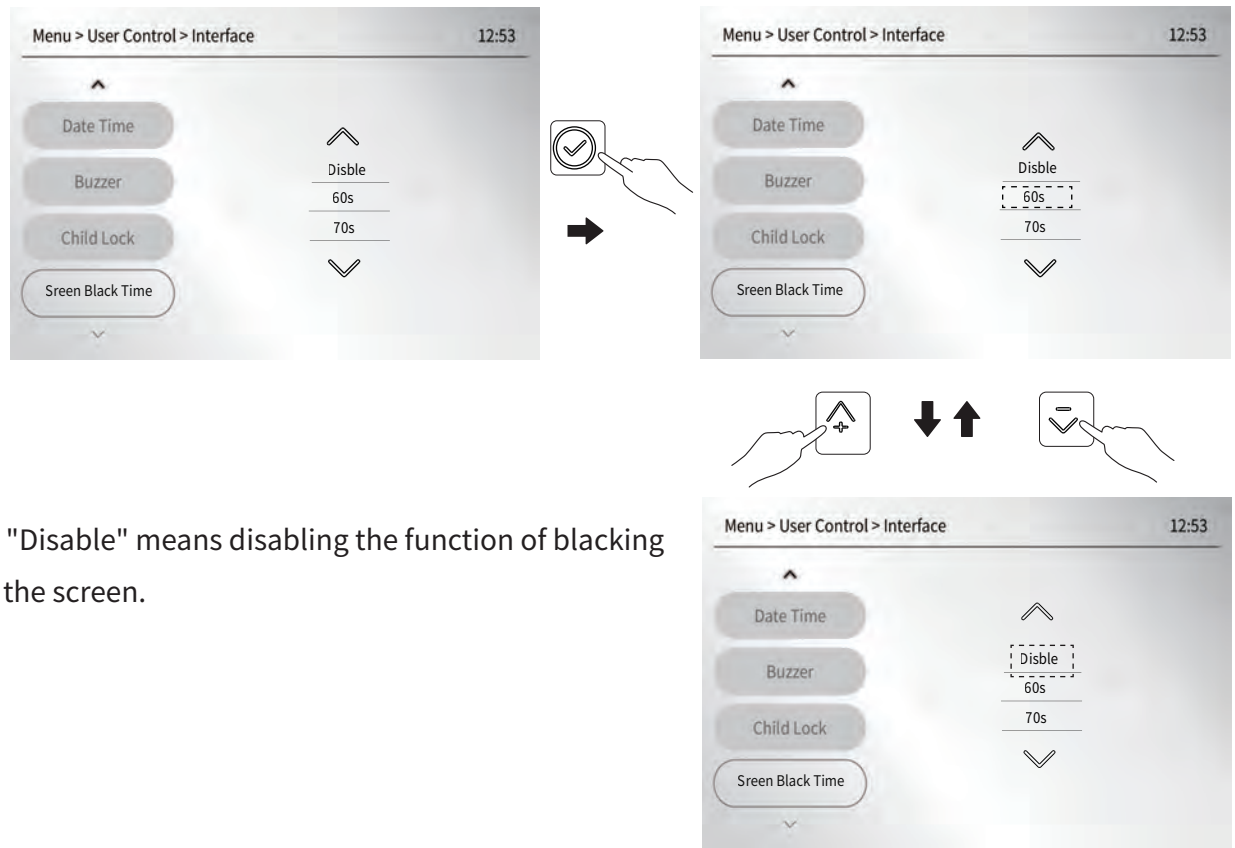
Go to " ••• > User Control > Interface > Child Lock " , and then press ✓ .



5.1.5 Screen Black Time

The function is to set the time of lighting up the screen. If there is no any handling during the time, the screen will get black with power saving. The default setting is 60 seconds.

Go to " > User Control > Interface > Screen Black Time, and then press .

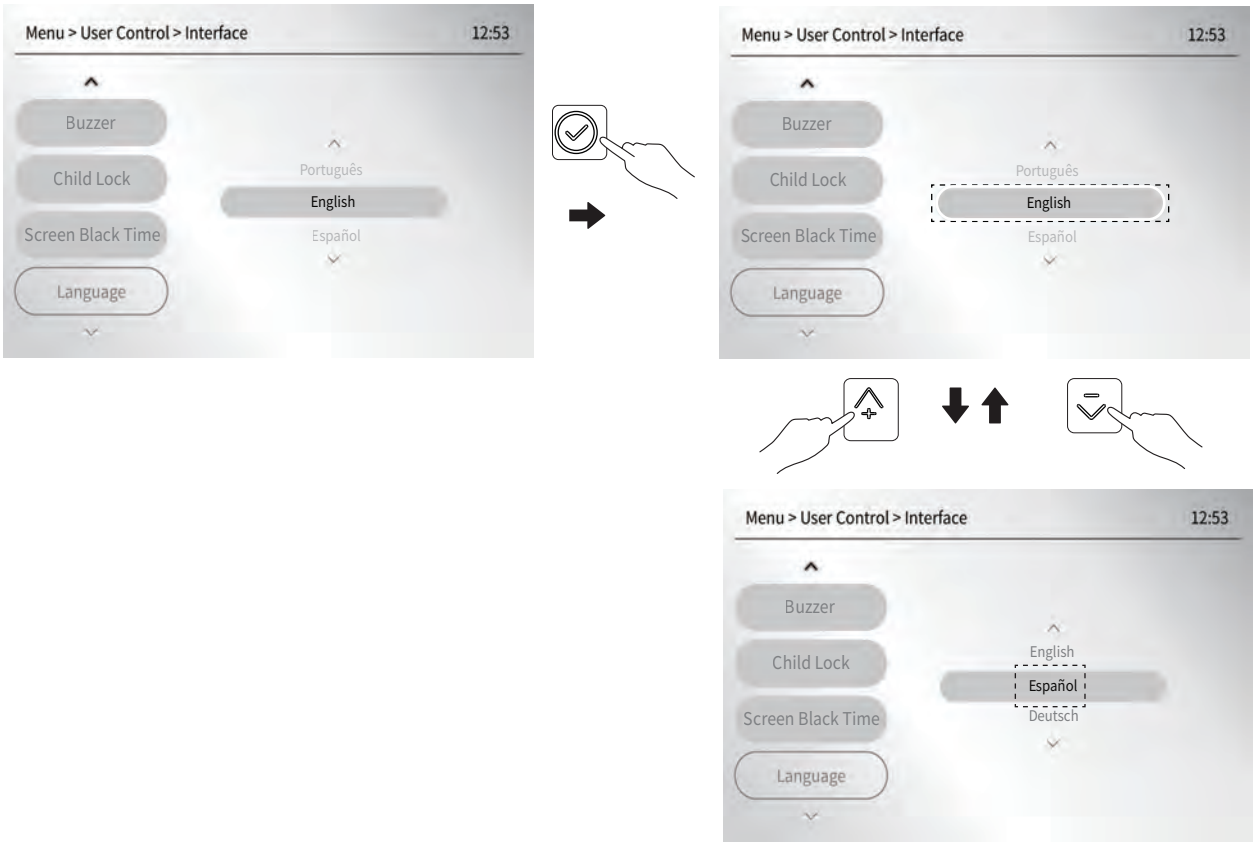


"Disable" means disabling the function of blacking the screen.

5.1.6 Language - Setting the language

The function is to set the desired language. The default is English.

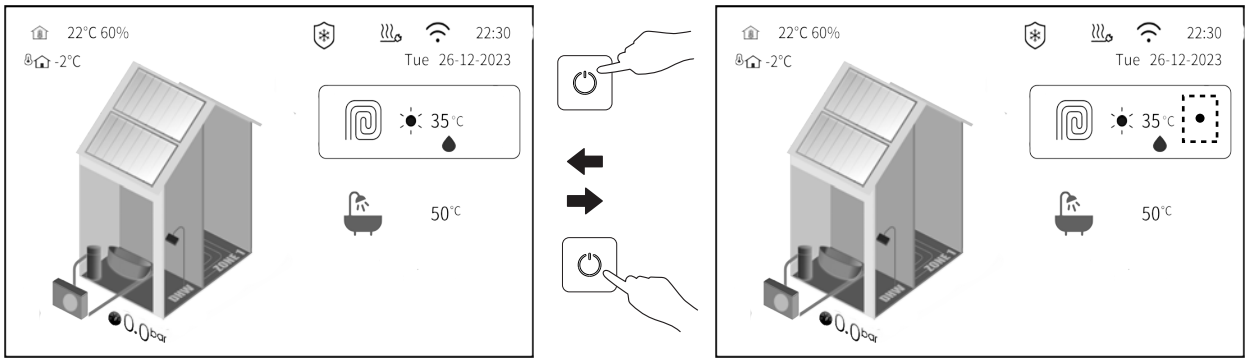
Go to" ⚙ > User Control > Interface > Chile Lock " , and then press ✓.



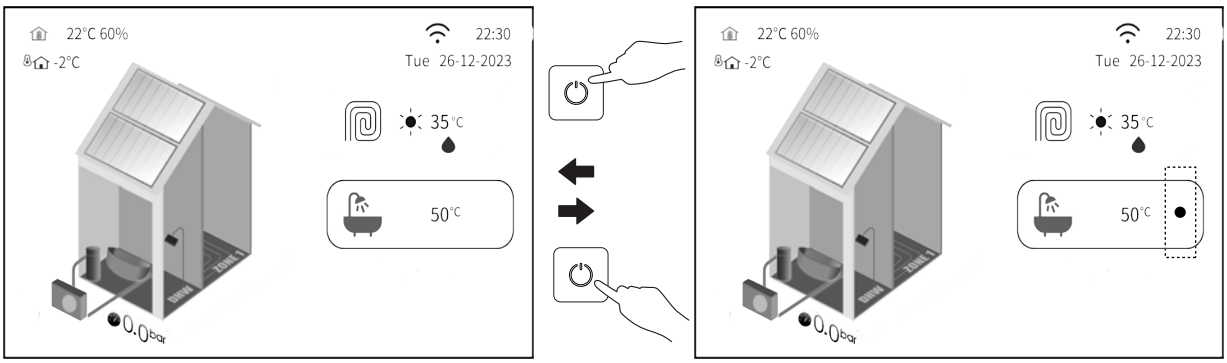
5.2 Turning on/off the unit on home page

- The ON/OFF of the unit can be controlled by the interface if the ROOM THERMOSTAT is NON. (Refer to" ⚙ > Installer Level > System Parameter > ROOM THERMOSTAT SET" for the settings in "Installation and owner's manual".)
- Press the button "⌃"or "⌄" on home page to move the cursor(blue rectangular box) to a space or DHW operation mode, and then press the button " ✓ " to turn on or off the mode.

5.2.1 Turn on/off the the space operation(heating or cooling) mode:

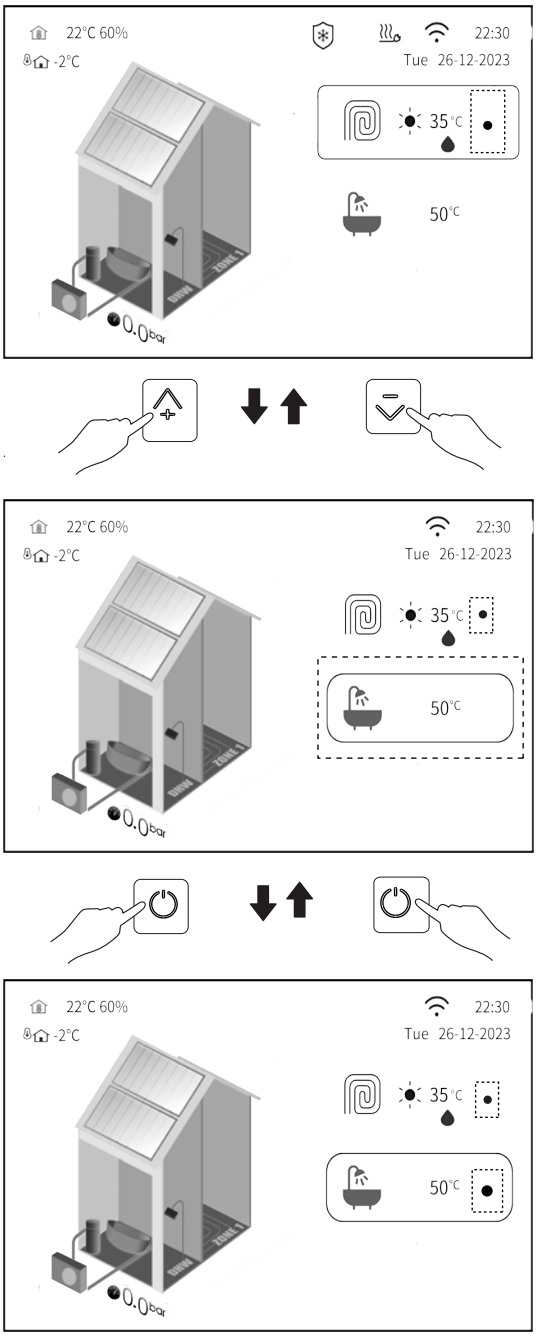


5.2.2 Turn on/off DHW mode:



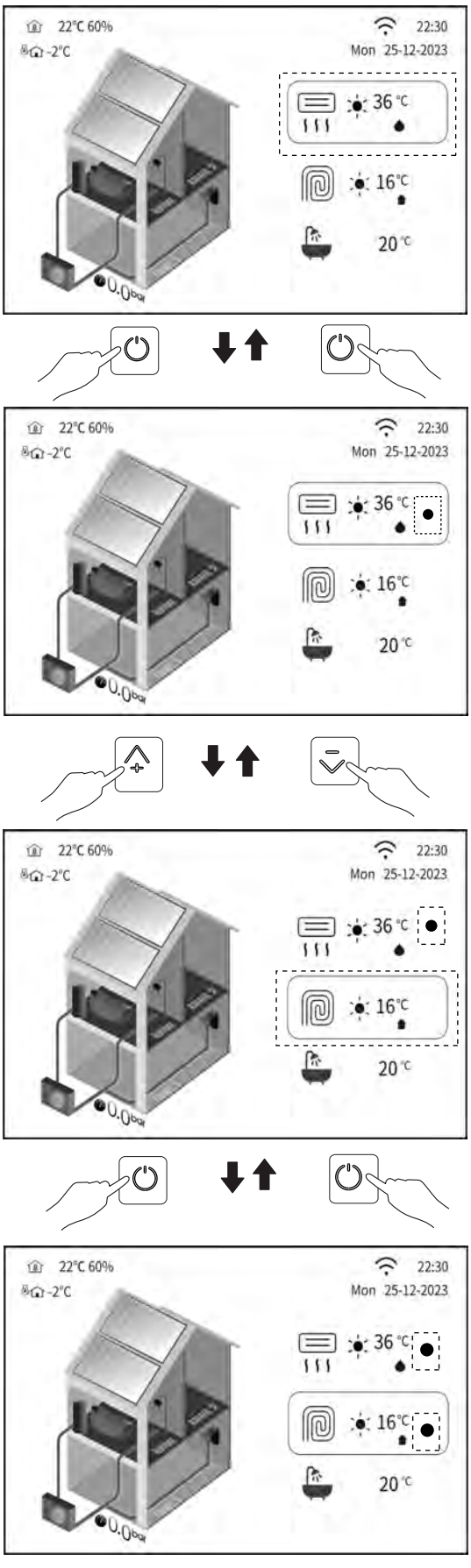
5.2.3 Turn on/off both space operation and DHW mode:

First turning on space operation mode by 5.2.1, and then turn on DHW mode by 5.2.2.



5.2.4 Turn on/off space operation mode both ZONE 1 and ZONE 2:

For example, the desired temperature of zone 1 is water temperature, and the desired temperature of zone 2 is room temperature.

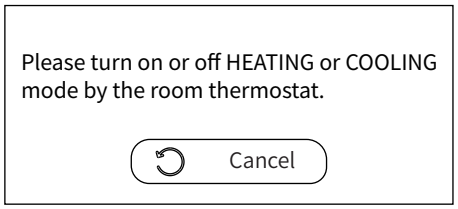


Note: you can also turn on or off the unit as described in section 5.5.

5.2.5 Use the room thermostat to turn on or off the unit for space heating or cooling.

If the room thermostat is not set "NON" (Refer to" > Installer Level > System Parameter > TEMP. TYPE SET and ROOM THERMOSTAT SET" for the settings in"Installation and owner's manual"), space heating or cooling mode of the unit is turned on or off by room thermostats.

If press the button" " to turn on the unit on home page, the following text will appear on home page:



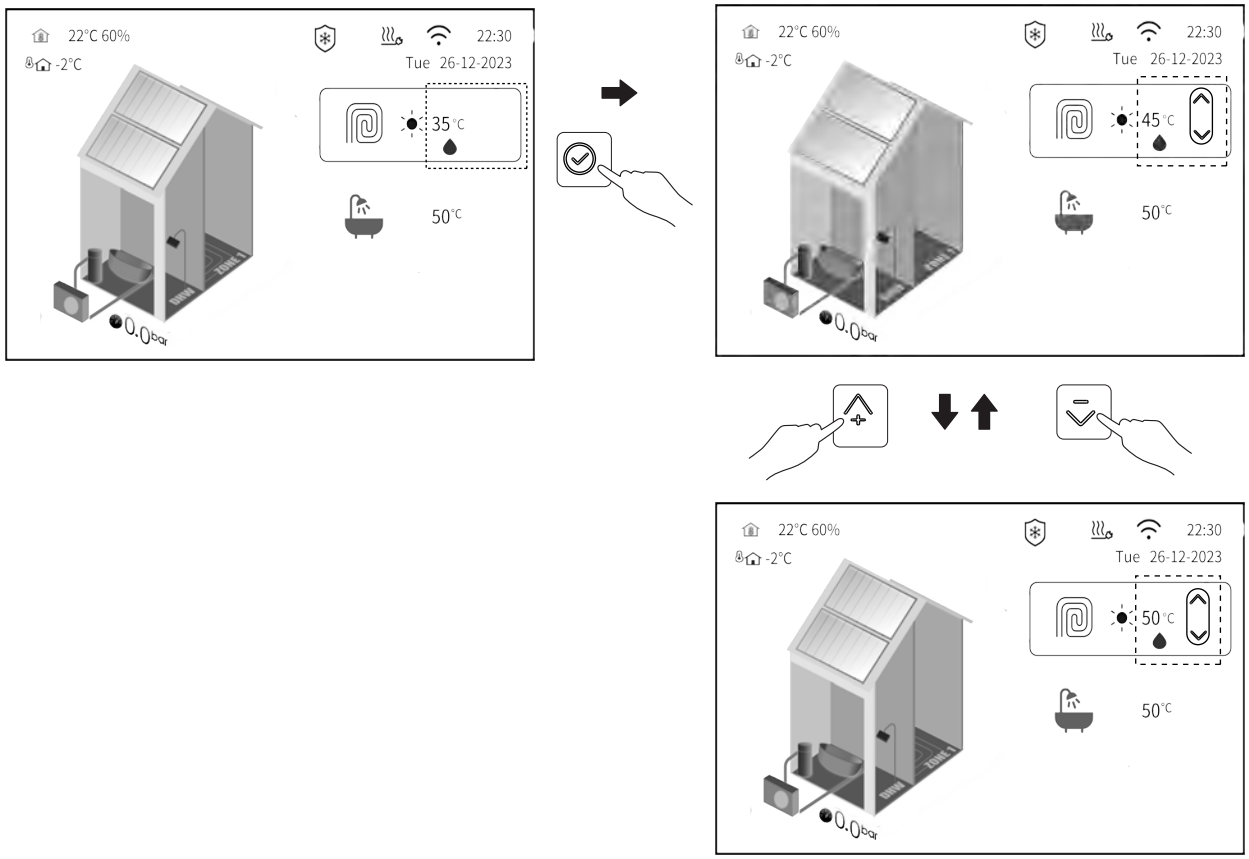
to press to canel the operation of turning the unit on or off and then back to home page.

5.3 Adjusting the desired temperature on home page

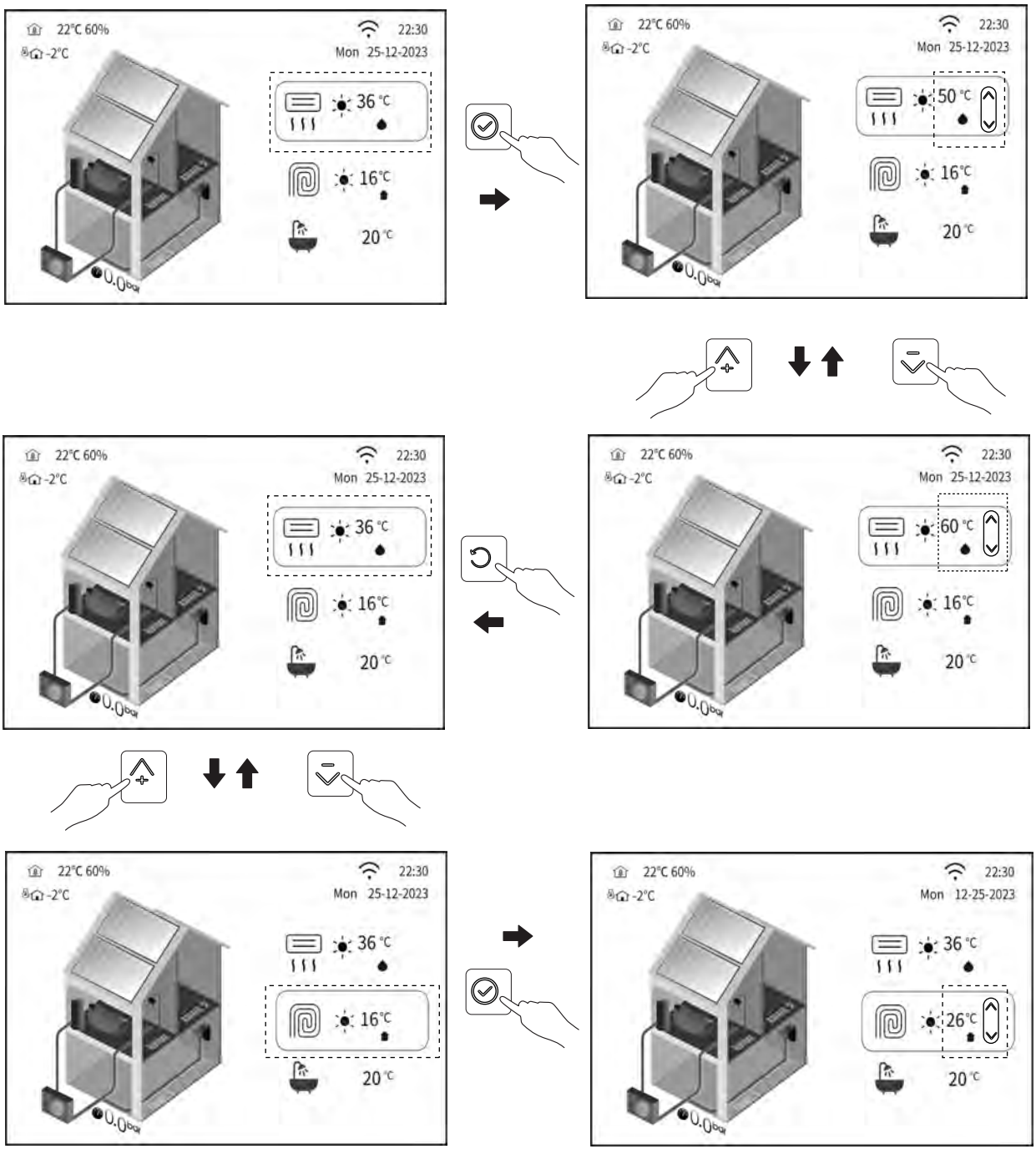
On home page move the cursor to the sapce or DHW operation mode, and then press the button " ", the flowing page will appear:

5.3.1 Adjust the desired temperature of space operation mode

For example, when there is only one zone set by the system, on home page move the cursor to zone 1 side, and then press the button " ".



When there are two zones set by the system, on home page move the cursor to the zone to be adjusted, and then press the button " ⊘ ".

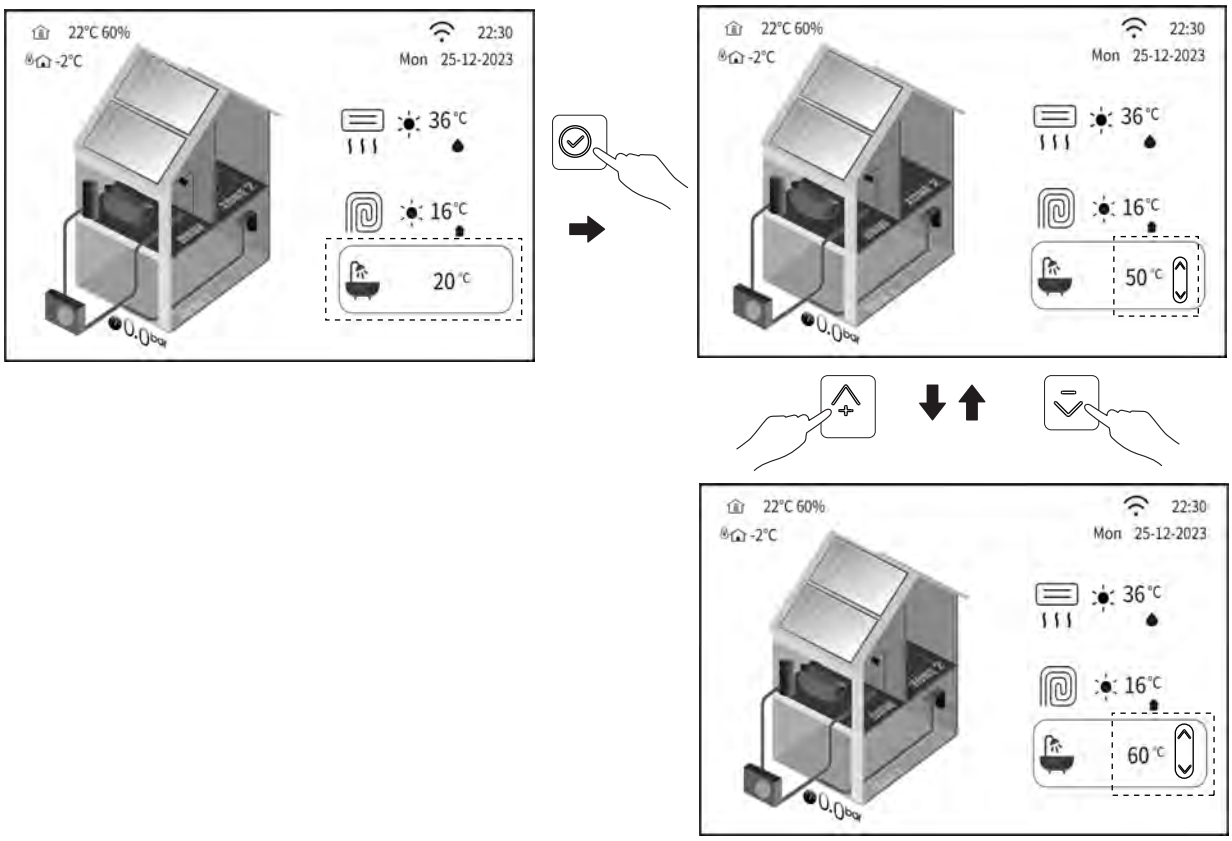


Note: you can also adjust the desired temperature of space operation mode as described in section 5.5.

5.3.2 Adjust the desired temperature of DHW mode

For example, there are two zones and DHW production mode set by the system.

On home page move the cursor to DHW side, and then press the button " ".

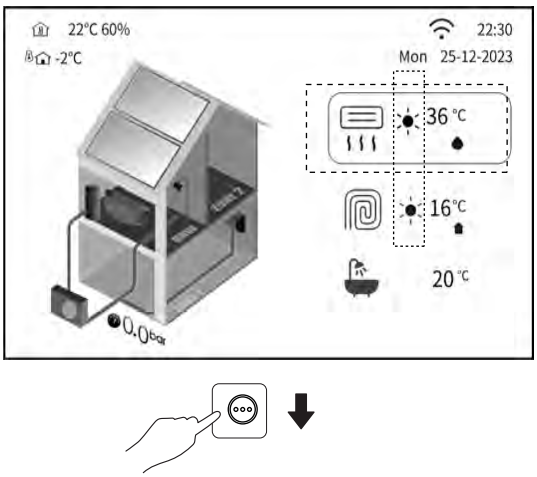


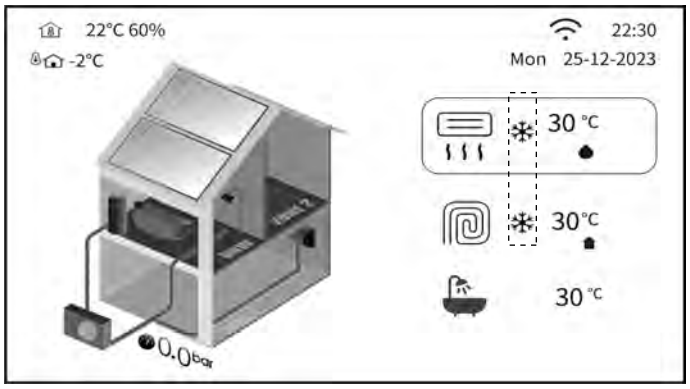
When weather compensation function is actived, you can't adjust the desired temperature directly on home pages, but you can reset weather compensation temperature for refering to "**6.2 Weather Compensation**".

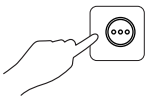
Note: you can also adjust the desired temperature of DHW mode as described in section 5.5.

5.4 Adjusting space operation mode on home page

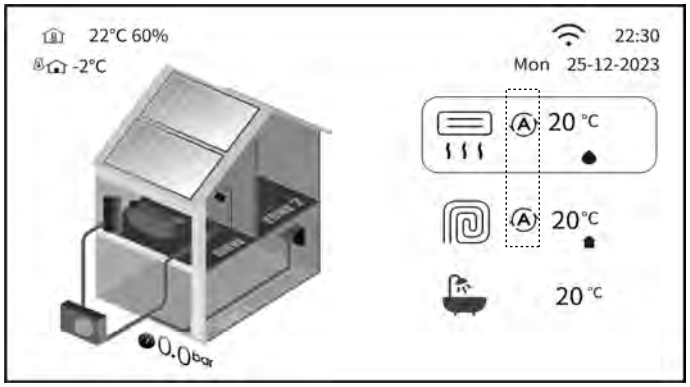
Long press the button " " to switch the space operation mode between cooling and heating and automatic on home page, don't let go till you see the new mode icon.

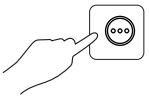




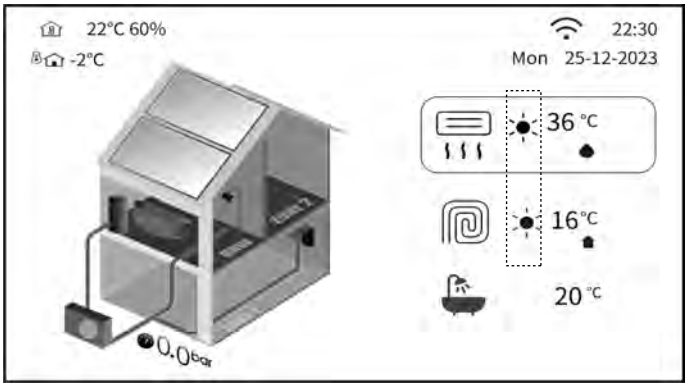


Press and hold the confirmation button until the mode changes





Press and hold the confirmation button until the mode changes



Automatic changeover is only possible under certain conditions.

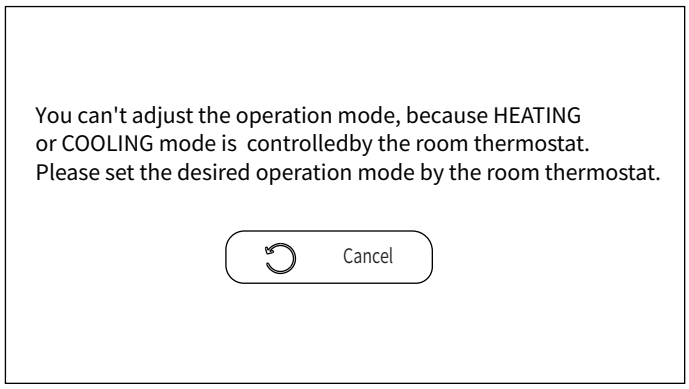
Zone 1 and Zone 2 have the same space operation mode.

Refer to " ⚙ > Installer Level > System Parameter > AUTO MODE SET" for the setting in "Installation and owner's manual".

Note: you can also adjust space operation mode as described in section 5.5.

- Adjust space operation mode by the room thermostat

Refer to " > Installer Level > System Parameter > "ROOM THERMOSTAT SET" for the setting in"Installation and owner's manual ". If you press the button " " to change space operation mode on home page, the following text will appear on home page:



5.5 About the menu "Zone1.Zone2.DHW"

By the menu " Zone1.Zone2.DHW ", you can:

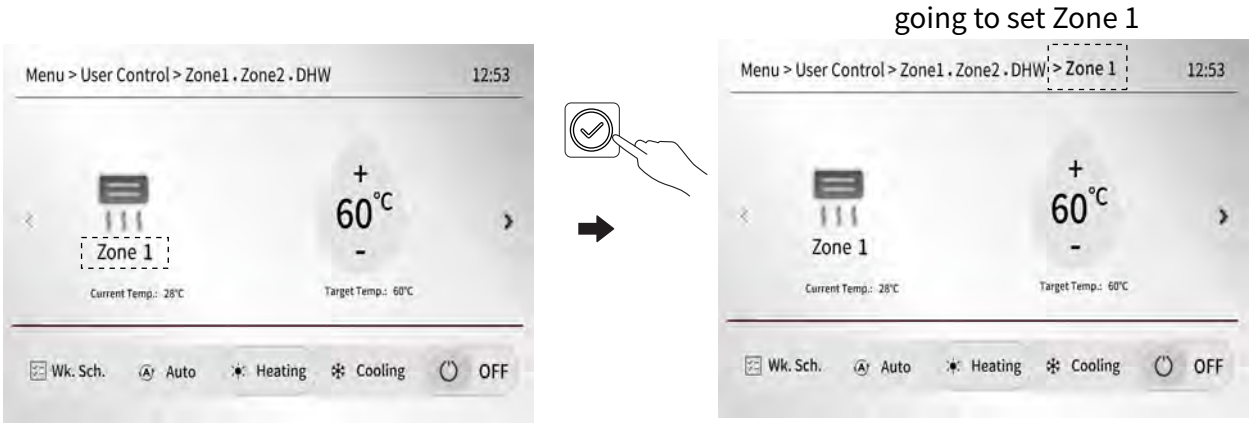
1) Turn the unit on or off.
2) Set desired operation mode - AUTO or Heating or Cooling or DHW or both space operation mode and DHW.
3) Adjust the desired temperature.
4) Set weekly schedule operation of the unit.

Refer to "3 HOME PAGES" for the detail information about Zone 1, Zone 2 or DHW.

5.5.1 How to go into the menu " Zone1.Zone2.DHW "

On any one page press " > User Control > Zone1.Zone2.DHW " and then press .

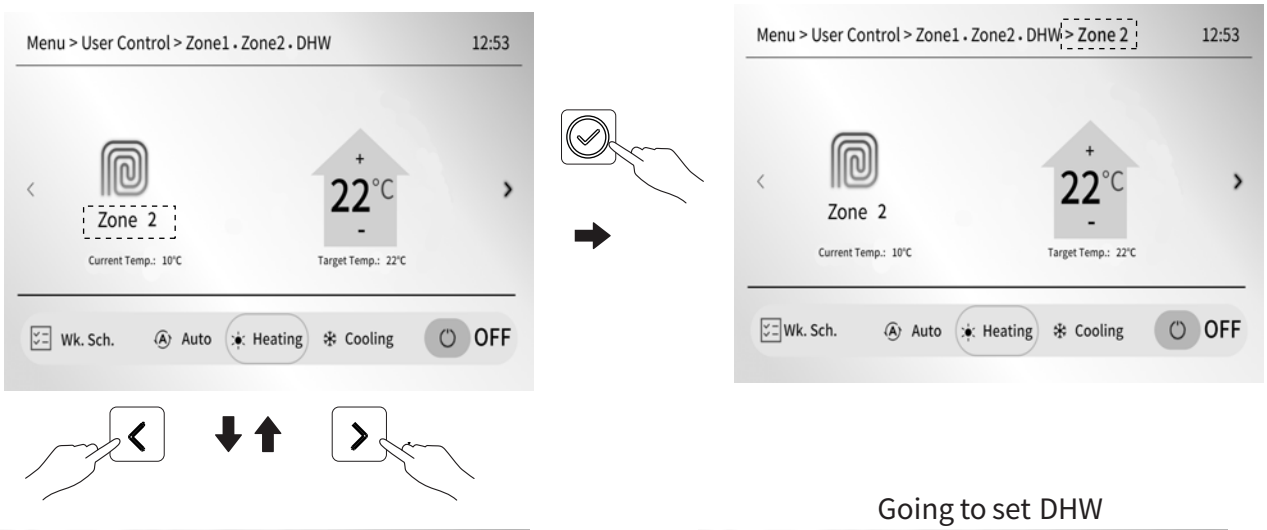
5.5.2 Select Zone 1 or Zone 2 or DHW to be set



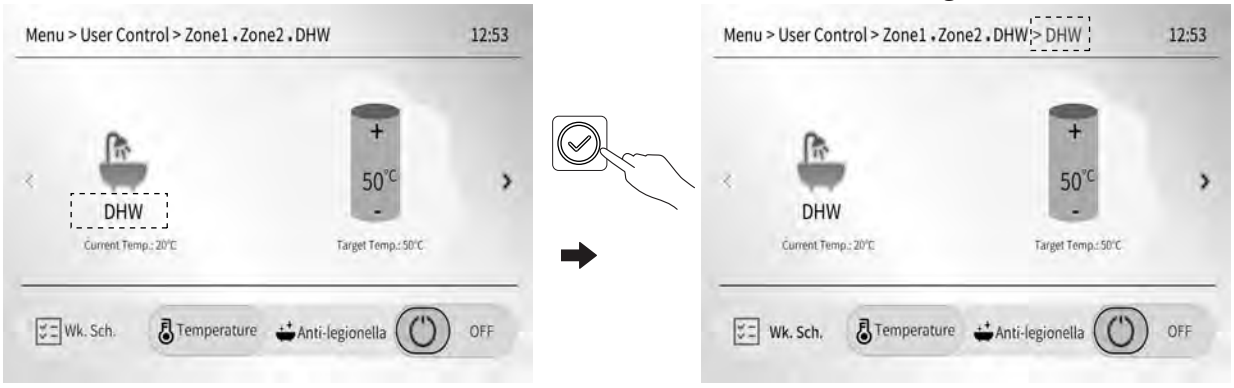


to next page

Going to set Zone2



Going to set DHW

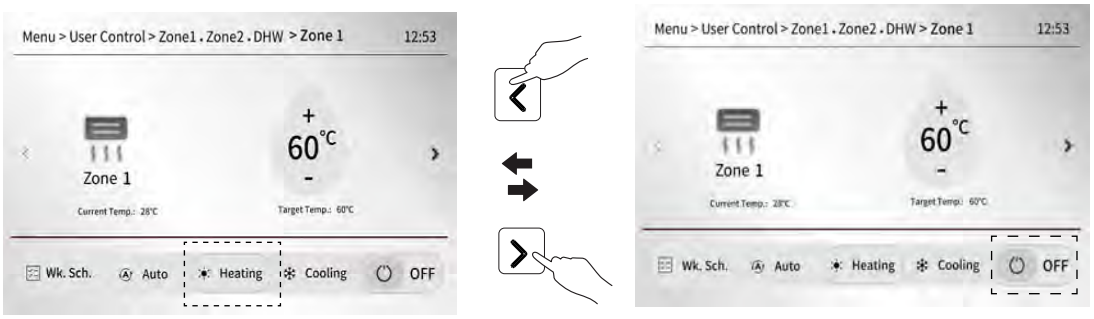


5.5.3 Set Zone 1 or Zone 2 or DHW to be selected

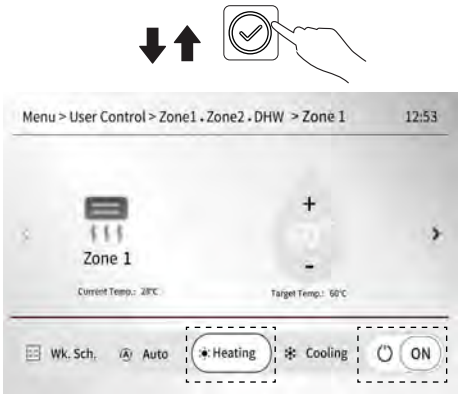
When you has selected Zone 1 or Zone 2 or DHW to be set by 5.5.2, you can:

1) Turn on or off the unit

- Turn on or off Zone 1



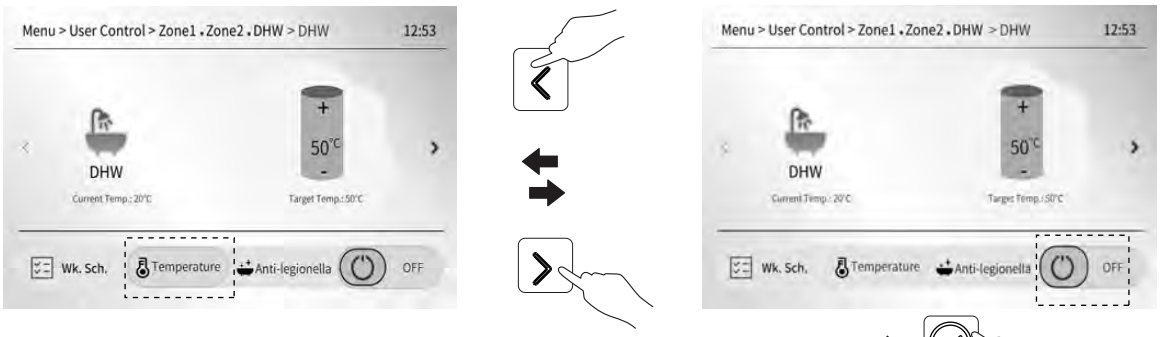
Here Heating is current operation mode.



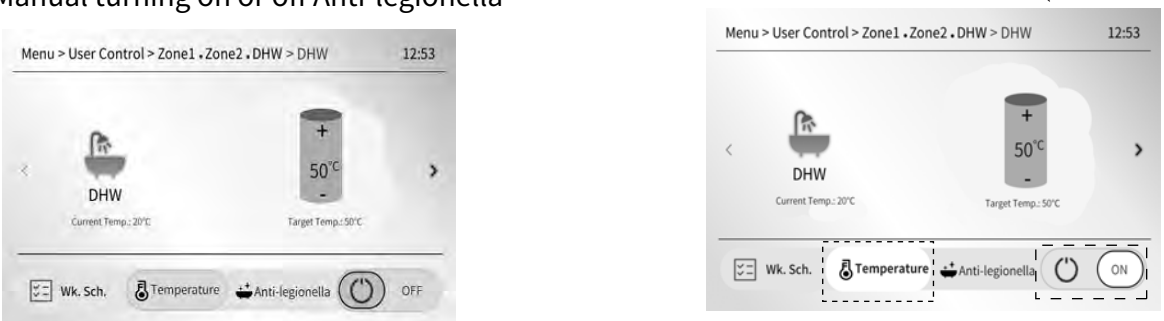
- Turn on or off Zone 2

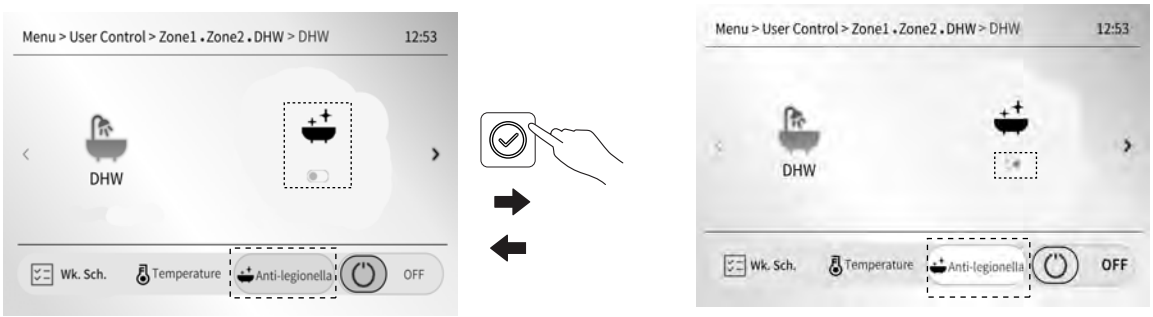
You can also turn on or off Zone 2 following the method of turning on or off Zone 1.

- Turn on or off DHW



- Manual turning on or off Anti-legionella





Note: You can turn on or off only space operation mode, or only DHW production mode, or combined space operation and DHW production mode.

2) Adjust the desired temperature

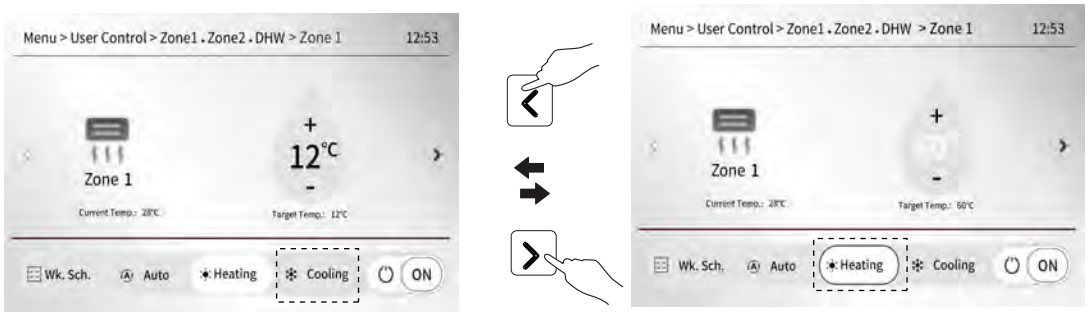
Step 1- Going to Zone 1, Zone 2 or DHW to be adjusted by following 5.5.2.

Step 2- Turning on the unit by following 5.5.3. 1).

Step 3- Moving the cursor to the current operating mode.

- Adjust the desired temperature of Zone 1

For example, you finished Step 1 and Step 2, and Zone 1 is currently operating on heating mode.

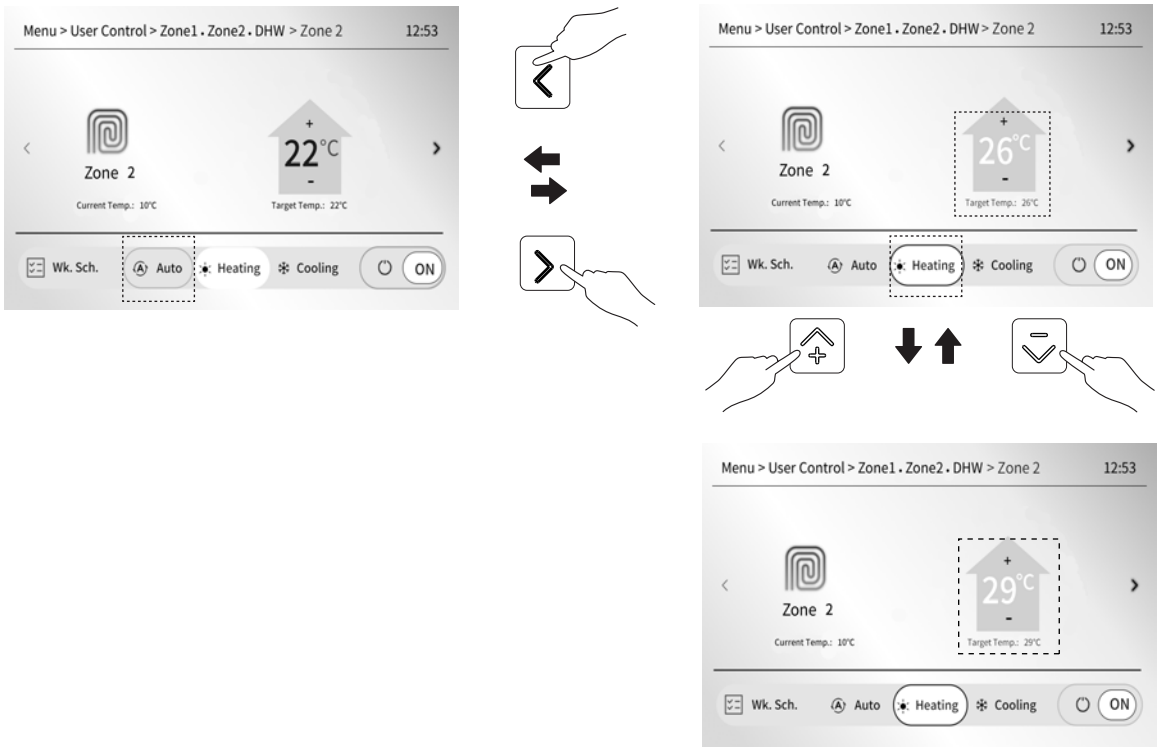


to next page



Big water drop icon means desired Zone 1 temperature is leaving water temperature.

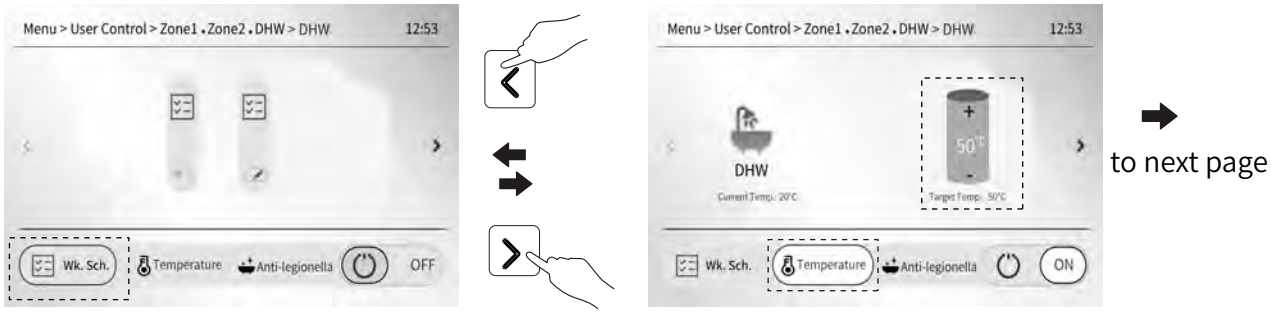
- Adjust the desired temperature of Zone 2
  You can adjust the desired temperature of Zone 2 in the same way you adjust desired temperature of Zone 1. For example, Zone 2 is currently operating on heating mode.



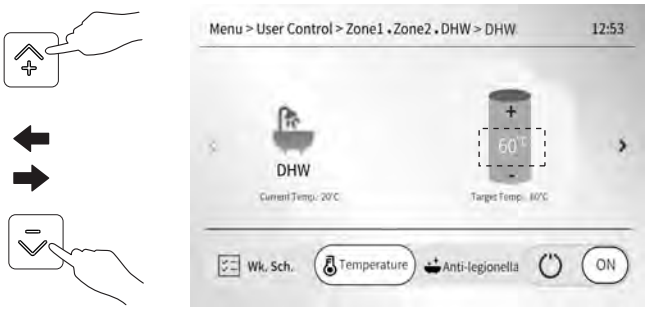
Big room icon means desired Zone 2 temperature is room temperature measured by the temperature sensor installed in the wired controller.

When weather compensation function is actived, you can't adjust the desired temperature directly on home pages, but you can reset weather compensation temperature for refering to "**6.2 Weather Compensation**".

- Adjust the desired DHW temperature
  For example, you finished Step 1 and Step 2, and move the cursor to "Temperature".

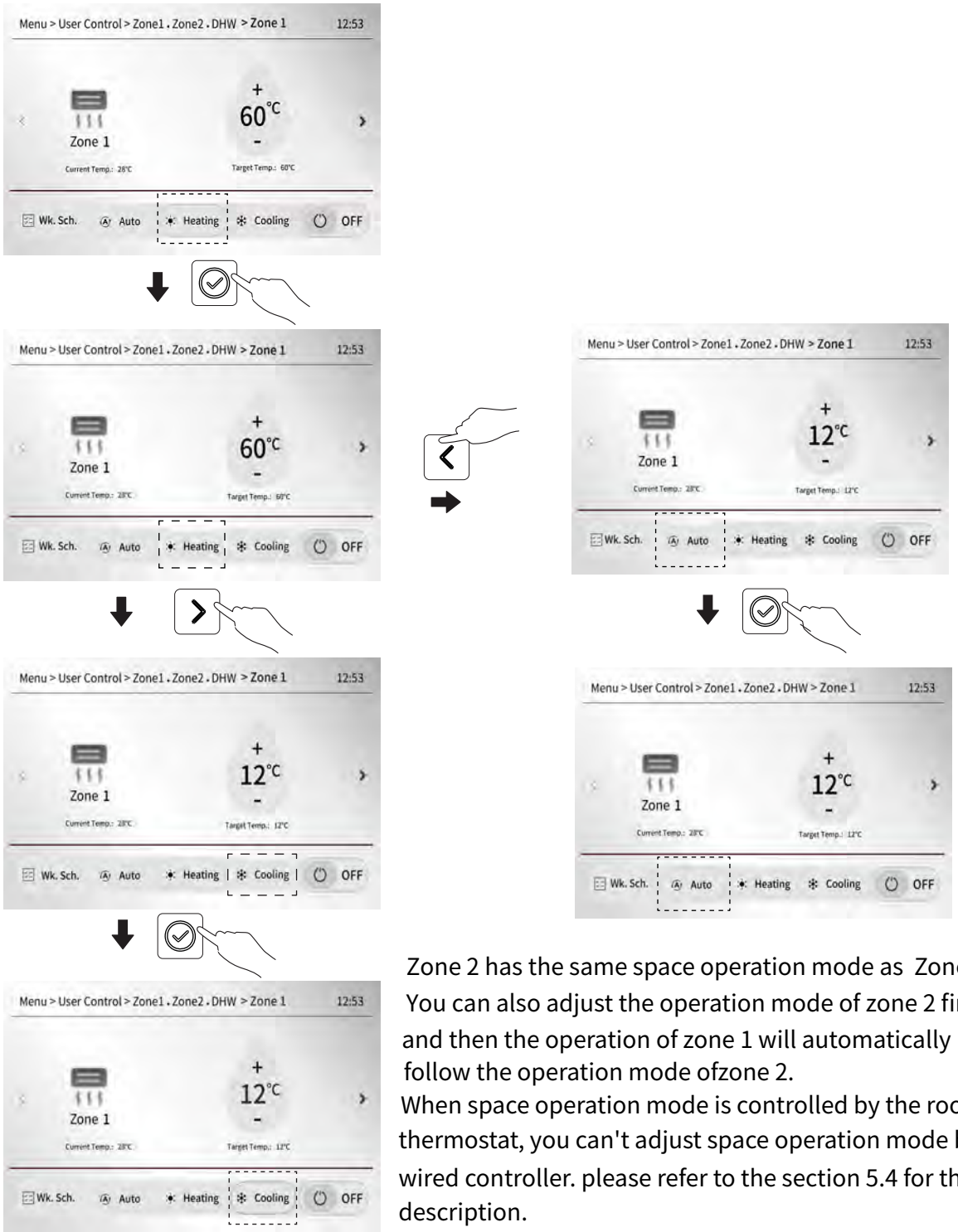


to next page



3) Adjust space operation mode

- adjust space operation mode of Zone 1 (Assuming the current mode is heating)



Zone 2 has the same space operation mode as Zone 1. You can also adjust the operation mode of zone 2 first, and then the operation of zone 1 will automatically follow the operation mode ofzone 2.

When space operation mode is controlled by the room thermostat, you can't adjust space operation mode by wired controller. please refer to the section 5.4 for the description.

6 OPERATION

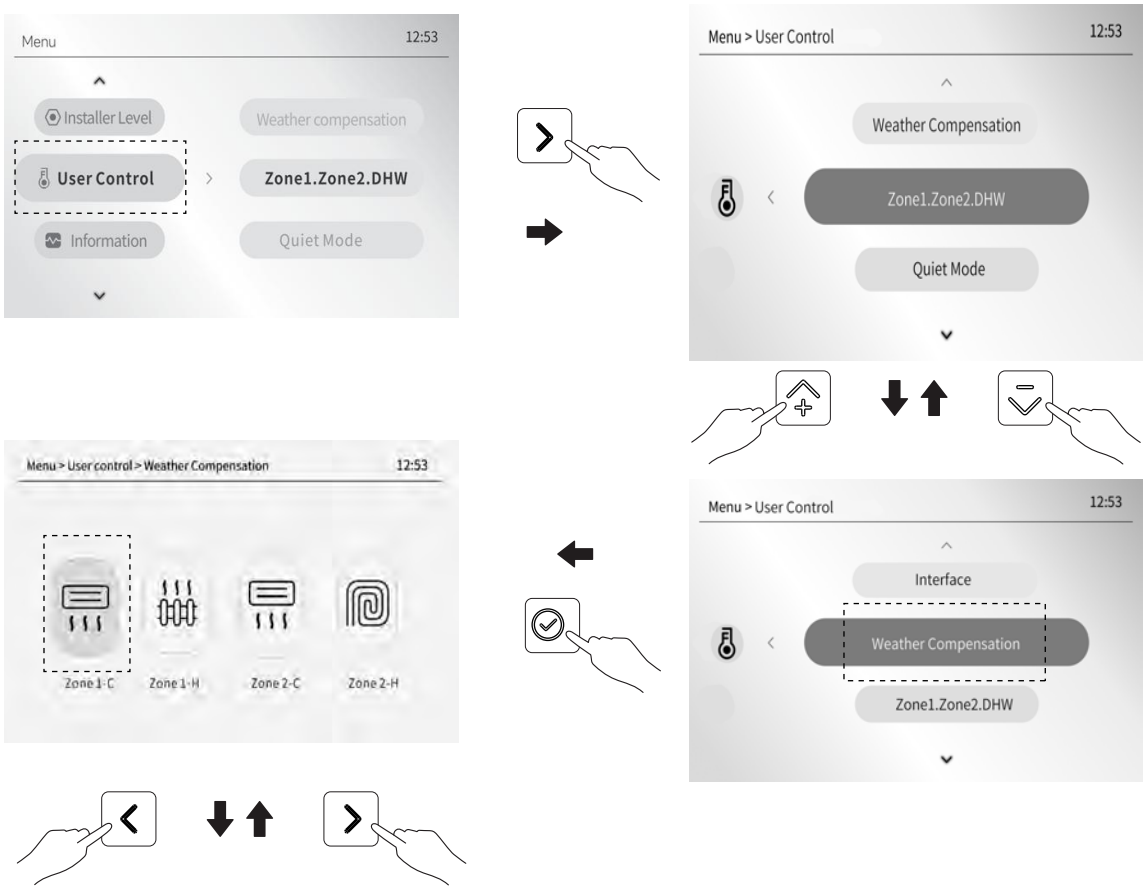
6.1 Operation mode set

About operation mode, please refer to "5.4 "and "5.5.3 Adjusting space operation mode".

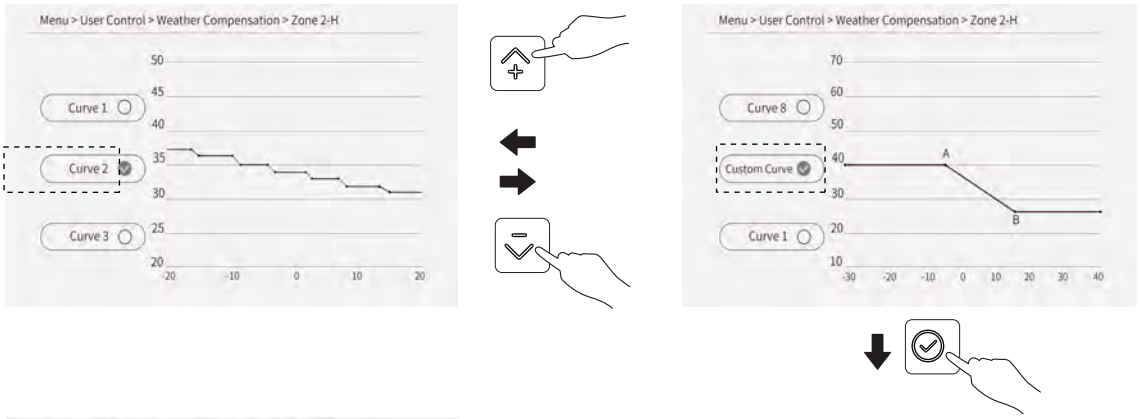
6.2 Weather Compensation

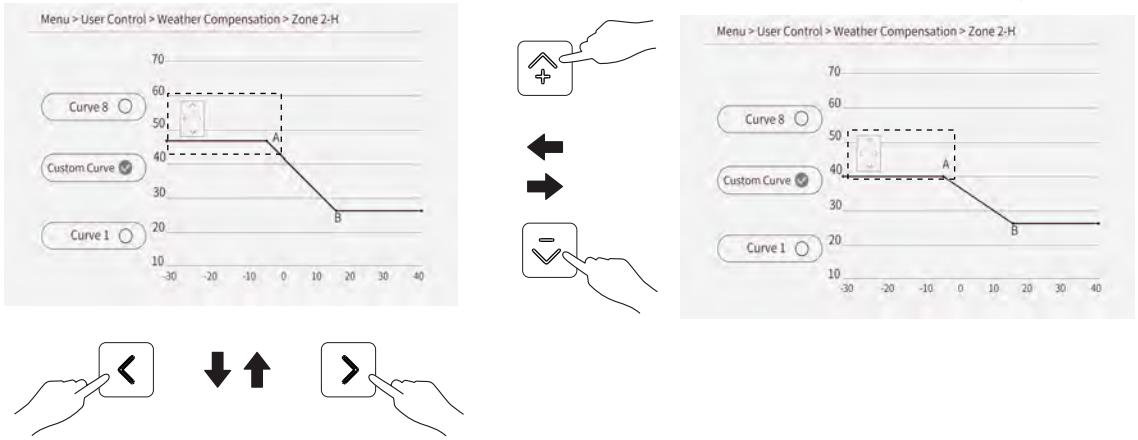
Weather compensation function is used to preset the desired water flow temperature depending on the outside air temperature. During the warmer weather the heating is reduced, to save energy weather compensation can decrease the desired water flow temperature when the outdoor air temperature increased in heating mode.

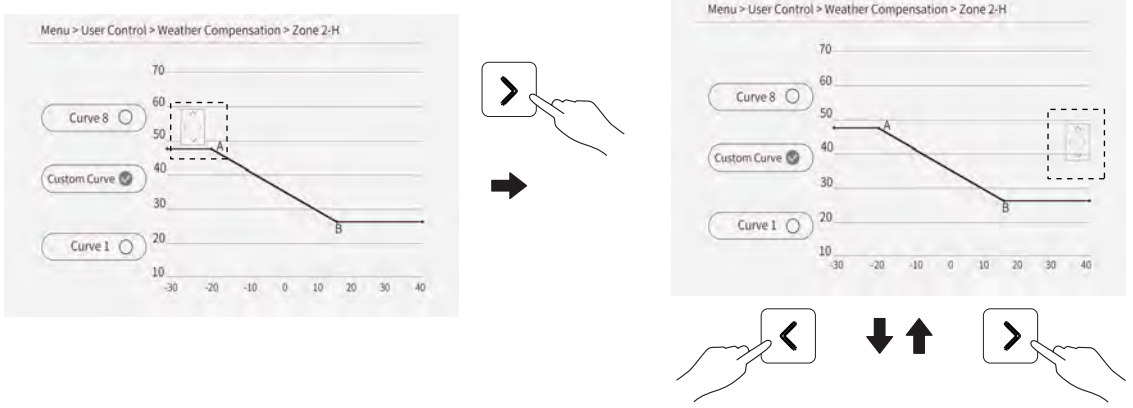
How to set desired weather compensation curve temperature

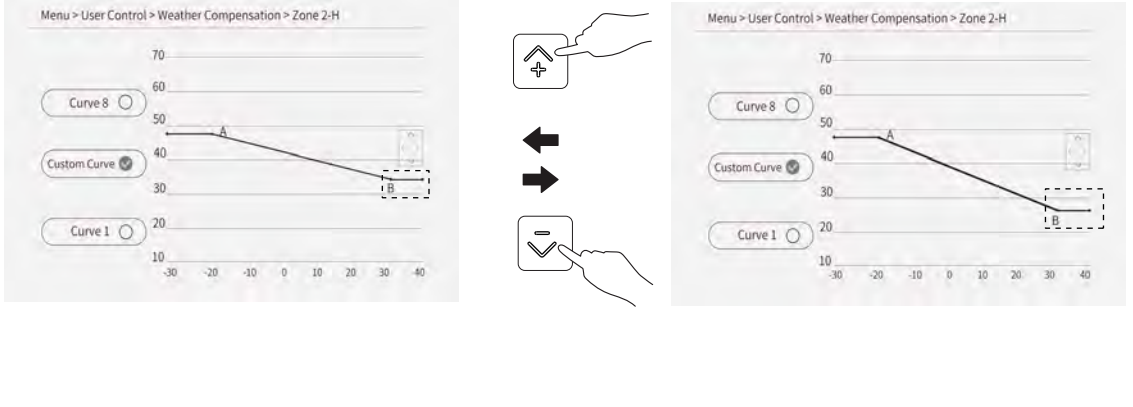


to next page


Menu > User Control > Weather Compensation > Zone 2-H
Curve 1
Curve 2
Curve 3
Custom Curve
Curve 8
A
B


Menu > User Control > Weather Compensation > Zone 2-H
Curve 8
Custom Curve
Curve 1
A
B


Menu > User Control > Weather Compensation > Zone 2-H
Curve 8
Custom Curve
Curve 1
A
B


Menu > User Control > Weather Compensation > Zone 2-H
Curve 8
Custom Curve
Curve 1
A
B


Menu > User Control > Weather Compensation > Zone 2-H
Curve 8
Custom Curve
Curve 1
A
B

Press " " or " " to select a desired weather compensation curse on the page , and then press the button " " to confirm the setting.

i INFORMATION

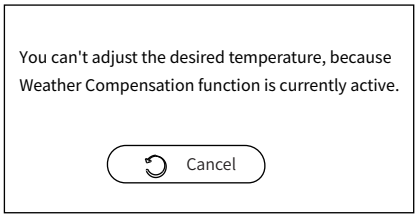
Weather compensation have four kinds of curves:

1. the curve of the high temperature setting for heating.
2. the curve of the low temperature setting for heating.
3. the curve of the high temperature setting for cooling.
4. the curve of the low temperature setting for cooling.

There are 8 high heating temperature cures to be set for high heating temperature device types: FCU or Radiator.
There are 8 low heating temperature cures to be set for low heating temperature device types: FLH.
There are 8 high cooling temperature cures to be set for high cooling temperature device types: FLH or Radiator.
There are 8 low cooling temperature cures to be set for low cooling temperature device types: FCU.

The desired temperature (TB) can't be adjusted directly when the temperature curve is valid.

- The device type of a zone is to be decided by your setting, refer to the setting " > Installer Level > System Parameter > HEATING MODE SET or COOLING MODE SET".
- You can customize your weather compensation curve, i.e. the 9th curve - "Custom curve".
- If weather compensation function is activated, the desired temperature cannot be adjusted on home page and on the menu "Zone1.Zone2.DHW", otherwise the following text will appear:

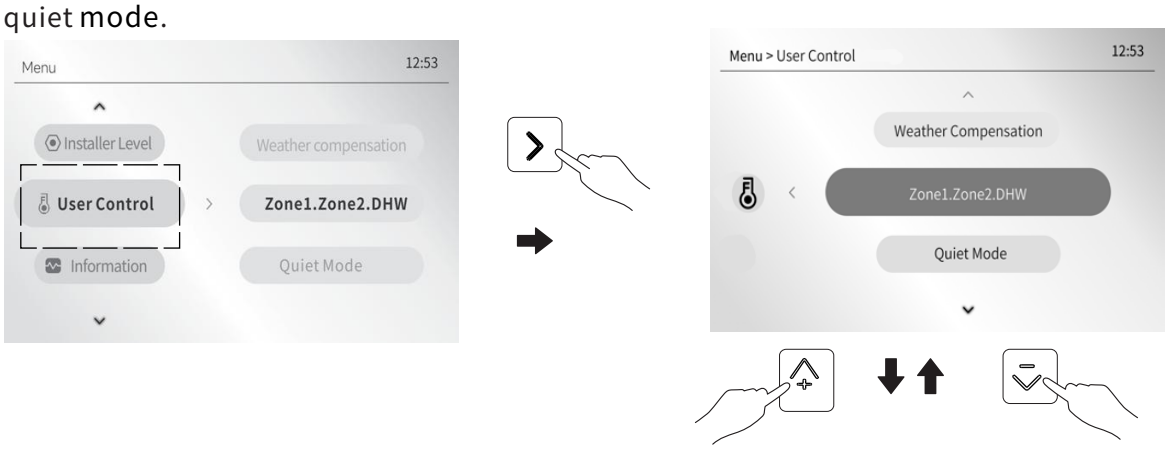


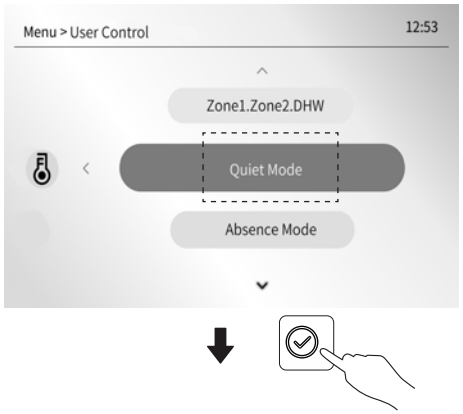
6.3 Quiet Mode

The quiet function is used to reduce the noise of heat pump when it is running, however, it also decreases the heating/cooling capacity of the system.

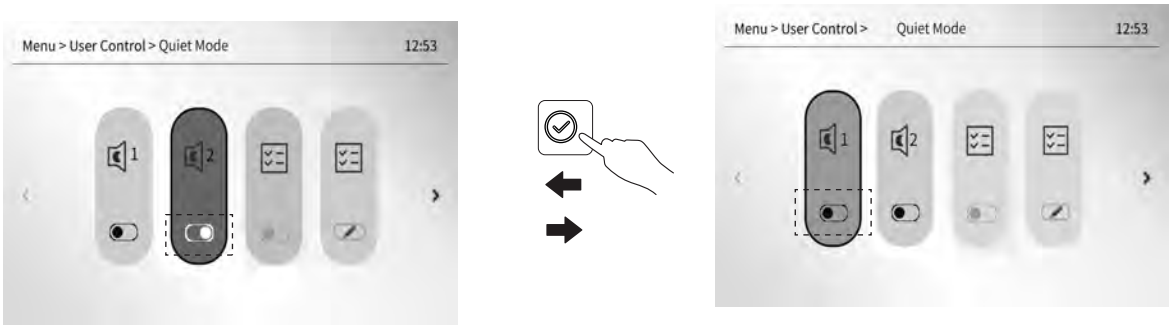
- How to go to "Quiet Mode"

  On any one page go to " > User Control > Quiet Mode" to enable or make a weekly schedule of quiet mode.



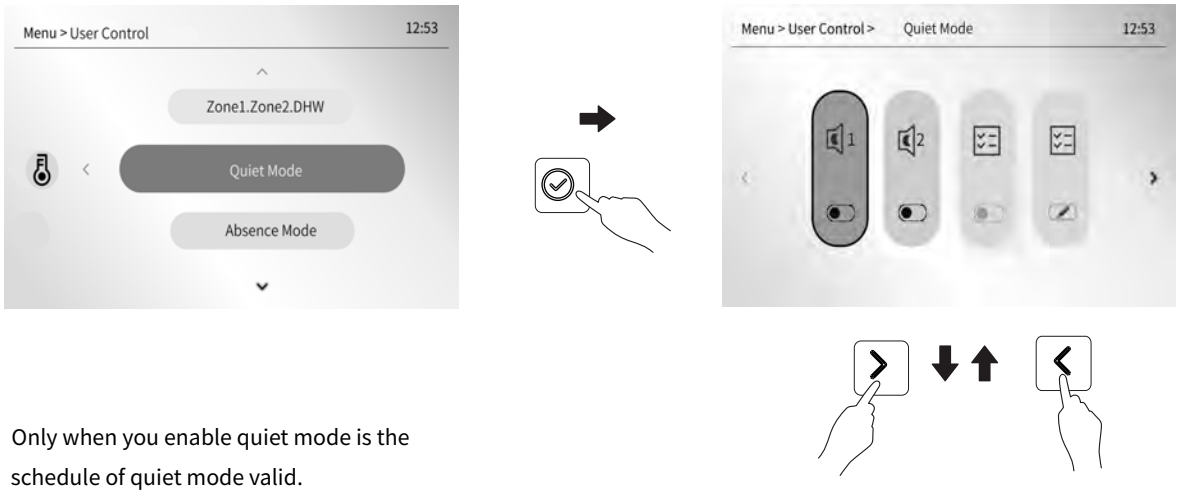


- To enable quiet mode

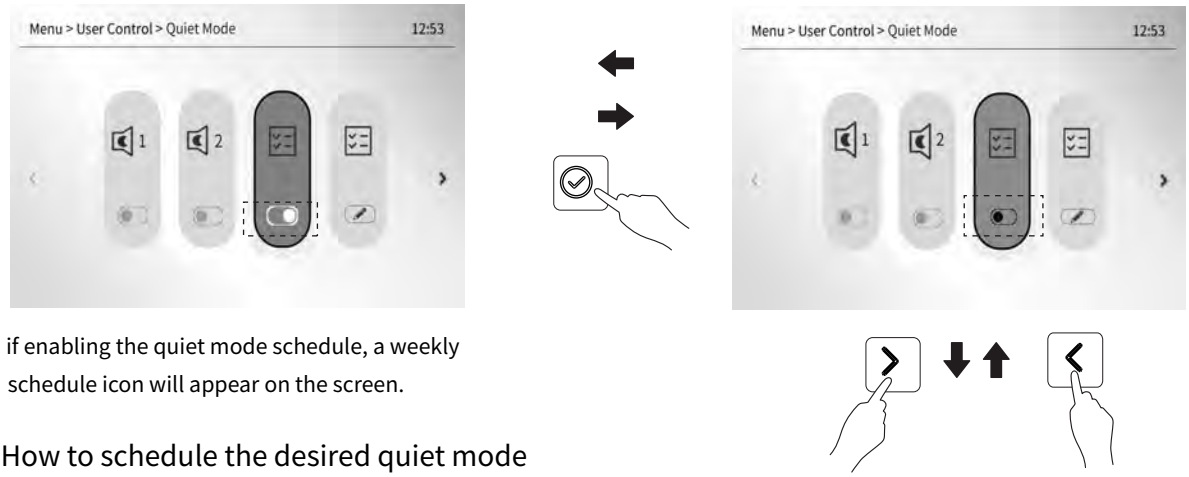


Press left or right button to select desired quiet level, and then press confirm button to enabel quiet function. The unit will always operate at the selected quiet level until you disble the quiet level.

- To enable or disable the schedule of quiet mode



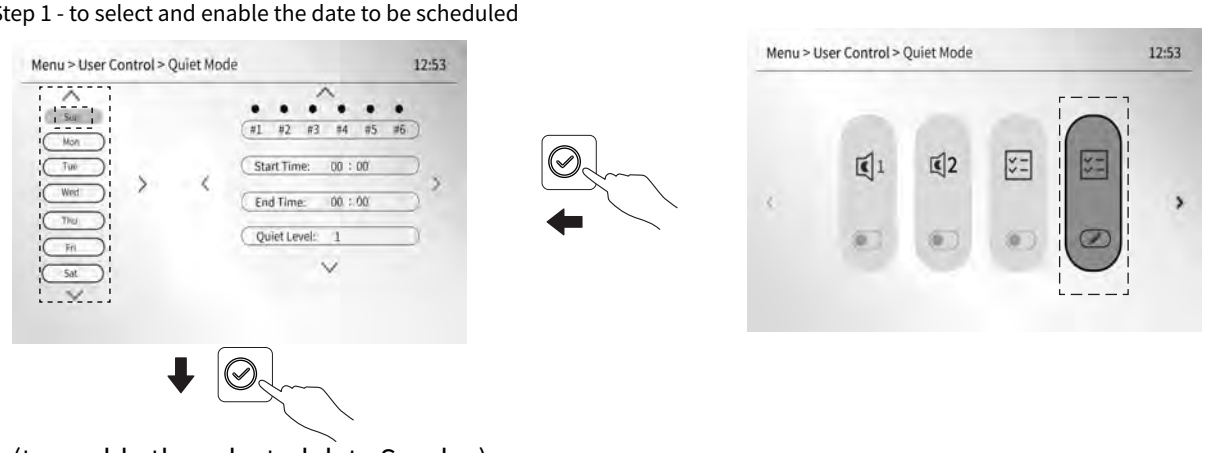
Only when you enable quiet mode is the schedule of quiet mode valid.



if enabling the quiet mode schedule, a weekly schedule icon will appear on the screen.

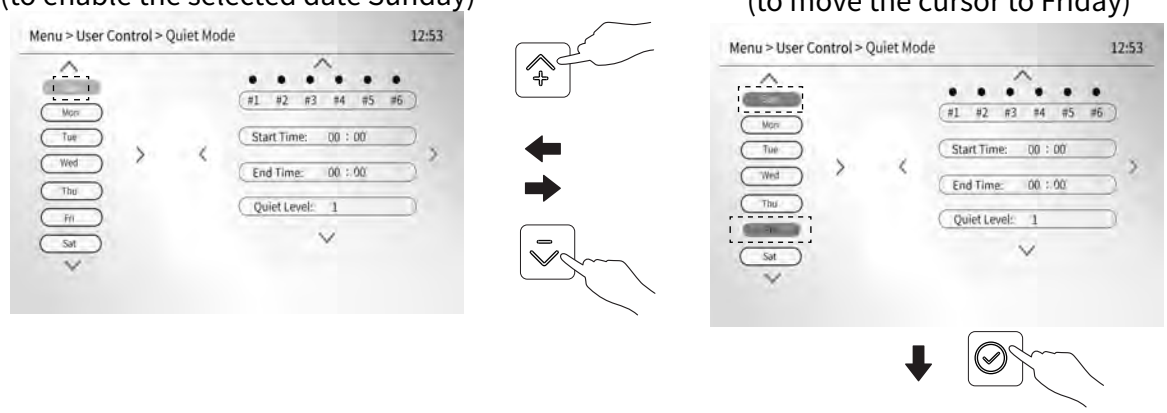
- How to schedule the desired quiet mode

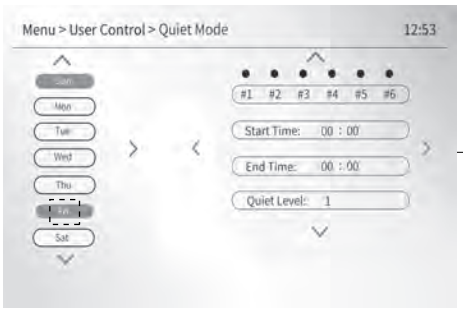
Step 1 - to select and enable the date to be scheduled



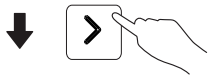
(to enable the selected date Sunday)

(to move the cursor to Friday)

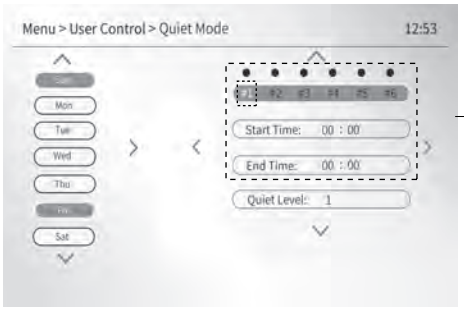




That is an example of selecting and enabling Sunday and Friday for scheduling the quiet operation, and these two dates will share the same timer setting. See note 1 (Method B) for details.

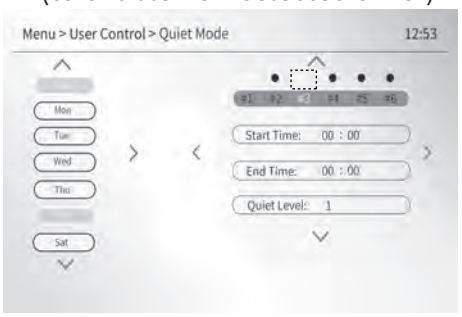


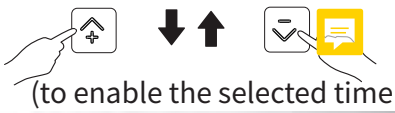
Step 2 - to set the desired timers, see note 2



6 timers

(to enable new selected timer)

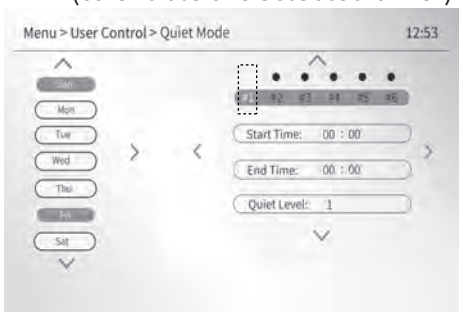


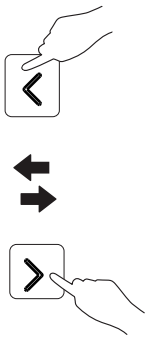


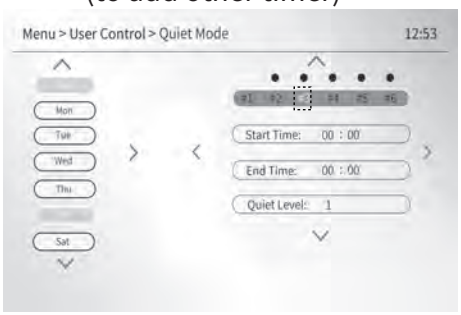
(to enable the selected timer)



(to add other timer)

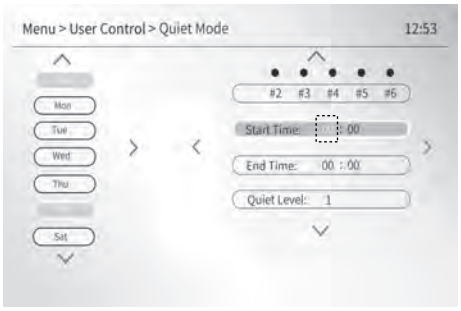


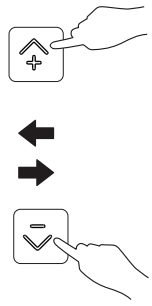


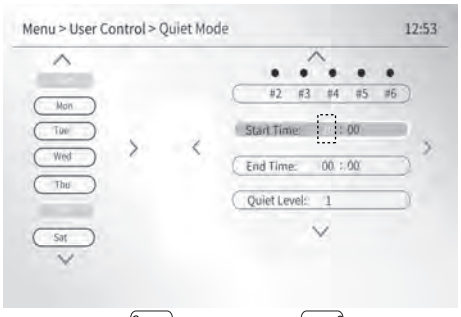




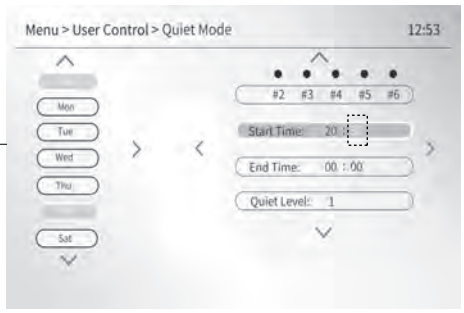
(to set start time)



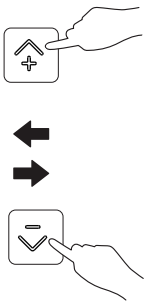


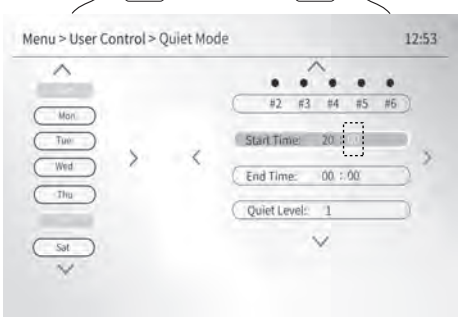


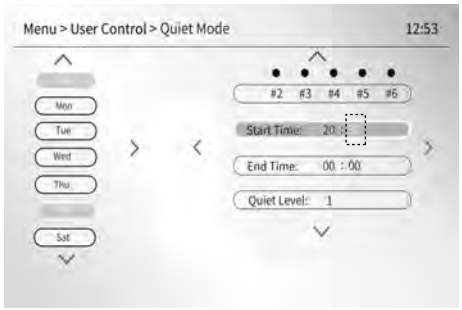




to next page

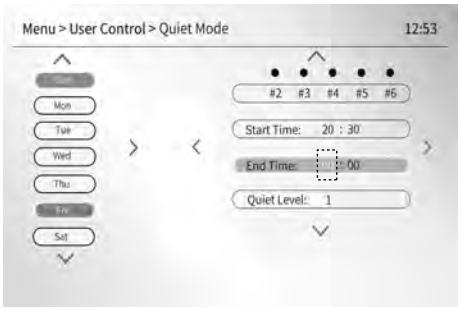




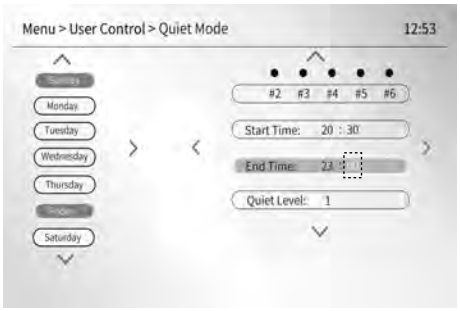


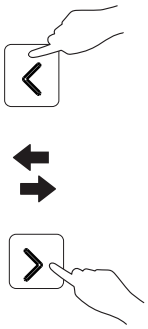


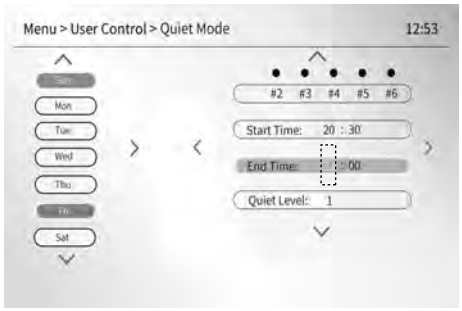
(to set end time)





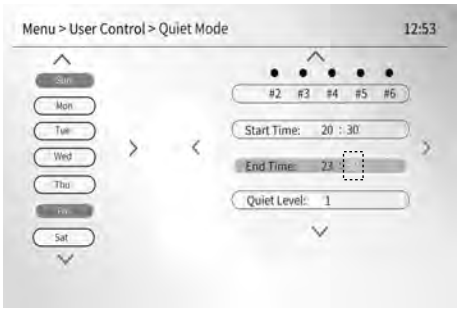






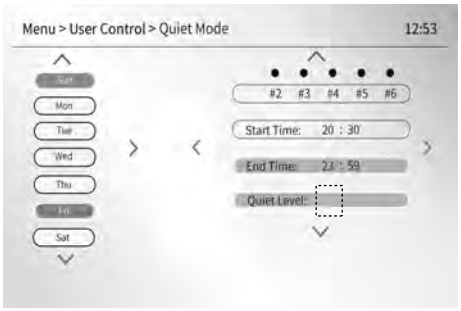


Step 3- to set desired quiet level

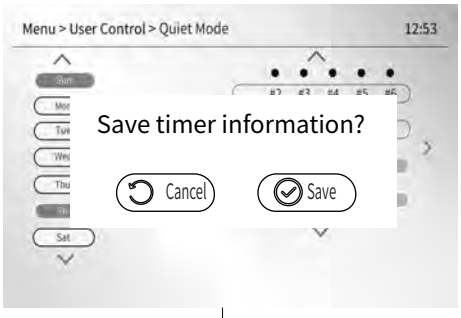


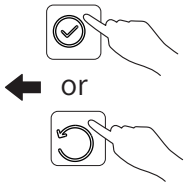


(to set quiet level)

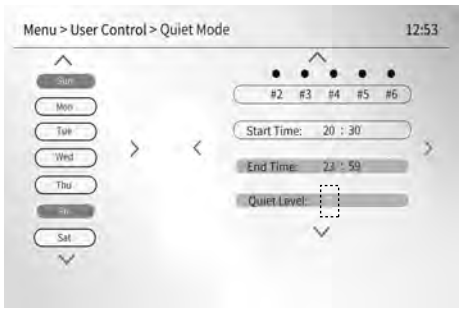








or



(If the unit has only one quiet level,
Please ignore this setting)



To abort the setting
of the timer



To save the setting
of the timers, See Note 3

Note:

1) When scheduling the dates in the foregoing Step 1, you can schedule a certain day or several day in a week or a whole week for your desired quiet operation.

- If you want to schedule only a certain day in Step 1, in Step 2 you can enable one

or several or all 6 timers you want, and then set the start and end time for each of these enabled timers.

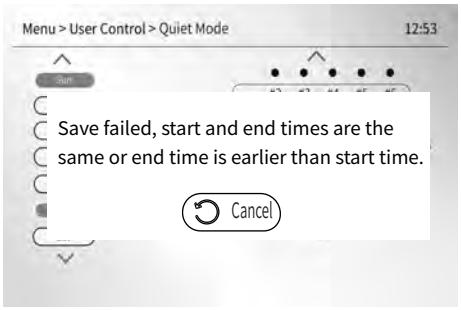
- When you desire to schedule more than one day, there are two methods of setting the dates.

Method A is that you set only any one desired date in Step 1, in Step 2 you enable the desired timers (you can enable one, several or all 6 timers) for it, and then set the start and end time for each of these enabled timers. After finishing setting these enabled timers, save the setting and back to the first step to set another desired date, and then repeat as you have just done until you have set the desired timers for each of these desired date. As a result, every scheduled dates can have its own timer setting, with varying the number of timers, start time and end time. Table 5 below is an example of scheduling Sunday, Wednesday and Friday for quiet operation in this method. Monday, Tuesday, Thursday and Saturday aren't scheduled for quiet operation. Two timers #1 and #3 are available for Sunday. Two timers #1 and #2 are available for Wednesday. Three timers #1 and #2 and #3 are available for Friday. Three timers #4 and #5 and #6 are disabled.

Method B is to set all desired dates in Step 1, and then in Step 2 to enable the desired timers (you can enable one or server or all 6 timers) for these desired dates, and then set the start and end time for each of these enabled timers. As a result these desired dates will share the same timer setting. Table 6 is another example of scheduling a whole week for quiet operation in the method. Every day shares 3 timers #1, #2 and #3. Three timers #4 and #5 and #6 are invalid.

2) There are 6 timers from #1 to #6 in total , and each of the 6 timers has its start and end time. You must select at least one date in order to set the timer.

3) If End Time is set to be the same as or earlier than Start Time, when press ✓, an error message will appear on the screen.



Press ↺ to back to the current setting to reset the start and end time.

Table 5

Date		#1			#2			#3			#4, #5 and #6		
No.	Schedule?												
Sunday	YES	Enable			Disable			Enable			Disable		
		Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level
		00:00	8:00	2	/			21:00	23:59	1	/		
Monday	NON	/											
Tuesday	NON	/											
Wednesday	YES	Enable			Enable			Disable			Disable		
		Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level
		2:00	6:00	2	12:00	14:00	1	/			/		
Thursday	NON	/											
Friday	YES	Enable			Enable			Enable			Disable		
		Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level
		00:00	8:00	2	14:00	16:00	1	21:00	23:59	1	/		
Saturday	NON	/											

Table 6

Date		#1			#2			#3			#4, #5 and #6		
No.	Schedule?												
Sunday	YES	Enable			Enable			Enable			Disable		
		Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level
		00:00	8:00		12:00	14:00		21:00	23:59		/		
Monday	YES	/											
Tuesday	YES	/											
Wednesday	YES	Enable			Enable			Enable			Disable		
		Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level
		00:00	8:00		12:00	14:00		21:00	23:59		/		
Thursday	YES	/											
Friday	YES	Enable			Enable			Enable			Disable		
		Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level	Start Time	End Time	Quiet Level
		00:00	8:00		12:00	14:00		21:00	23:59		/		
Saturday	YES	/											

- How to cancel the scheduled date

If you want to cancel a scheduled date, you must disable all the enabled timers for the date. For example, in order to cancel Wednesday in Table 5, youcan't disable Wednesday directly, and you must disable two enabled timers #1 and #2 in Step 2 relative to it.

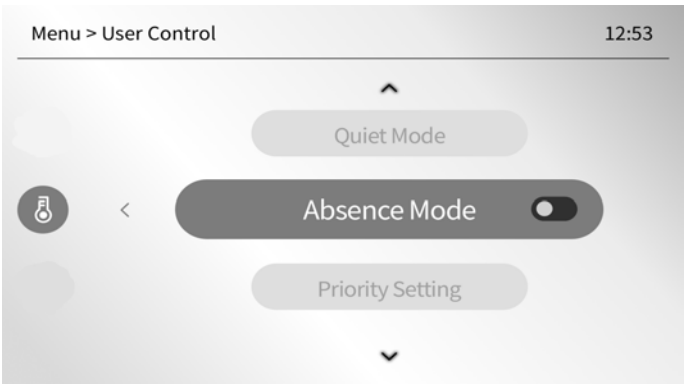
If the quiet mode is activated, the quiet icon will display on the home page.

Note: If APP activates a Weekly Schedule, the weekly schedule of the interface is automatically deactivated or invalid.

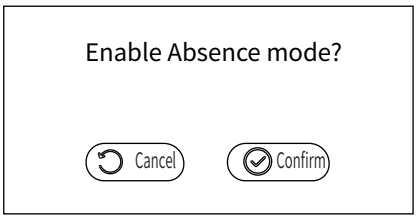
6.4 Absence Mode

The function is used to prevent the unit from frozing in cold winter during your holiday away home. When power supply of the unit is on but is off status, if water temperature is low, the unit will automatically operate on heating mode to raise the water temperature.

On any one page go to "> User Control > Absence Mode" to press to enable or disable the function.

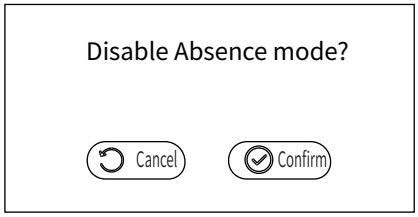


When you enable absence mode, the following text will appear on the screen:



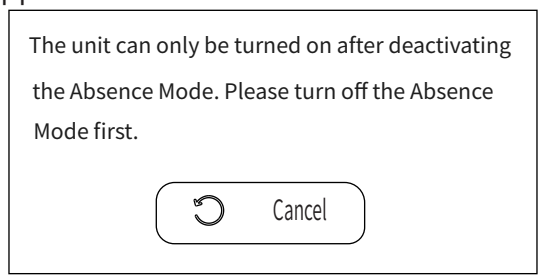
Press disable the function, to enable the function.

When you want to cancel absence mode, the following text will appear on the screen:



Press ↺ to remain to enable the function, ✓ to disable absence mode.

When you enable absence mode, and at the end of your holiday if you want to turn on the unit on the home page or on the menu "Zone1.Zone2. DHW" as described on section 5.2 and 5.5, the following text will appear on the screen:



When the unit is running, if you activate the Absence mode, the unit will shut down.

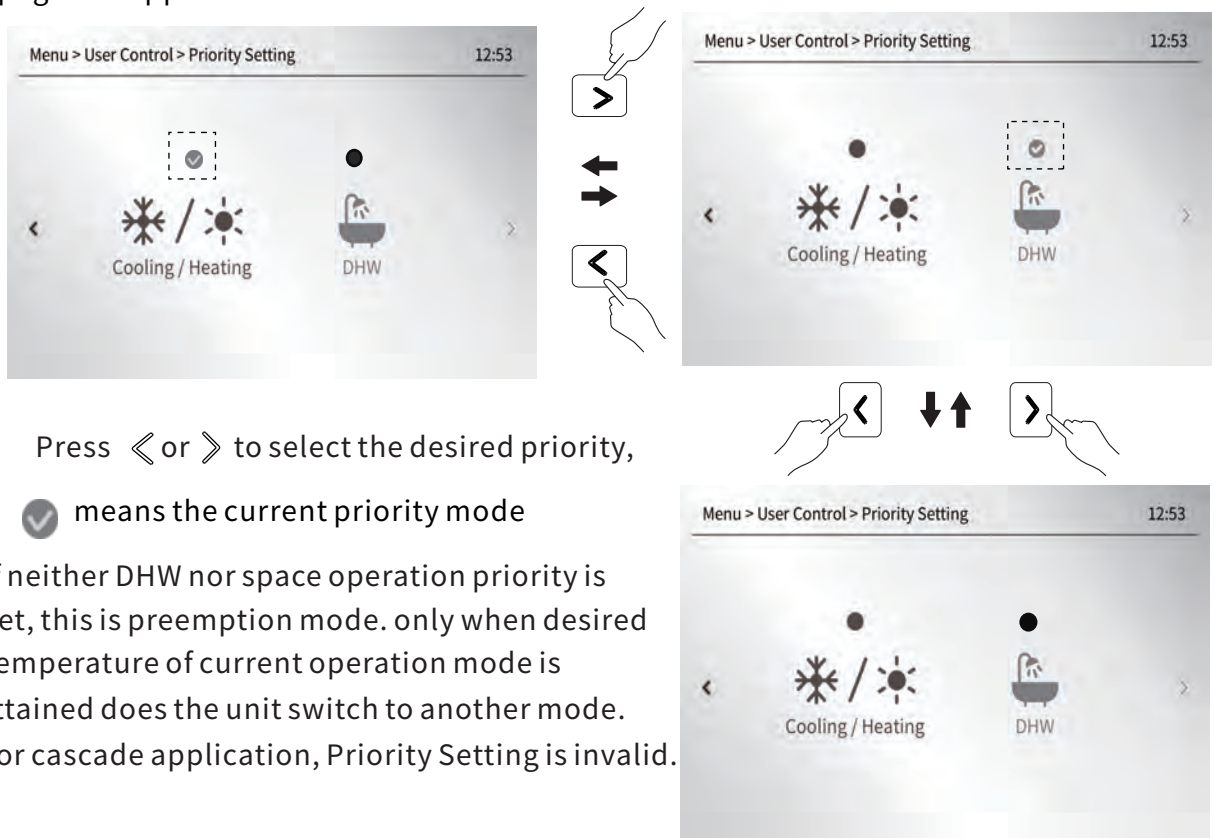
If Absence mode is activated, the absence icon will display on the screen.

6.5 Priority Setting

The unction is used to set whether domestic hot water production mode(DHW) or space operation mode takes priority. If DHW priority is set, only when desired DHW temperature is attained does the unit run at space operation mode.

If space operation mode priority is set, only when desired space operation temperature is attained does the unit run at DHW mode.

On any one page go to "⋯ > User Control > Priority Setting", and then press ✓ , the following page will appear:



Press ‹ or › to select the desired priority,

✓ means the current priority mode

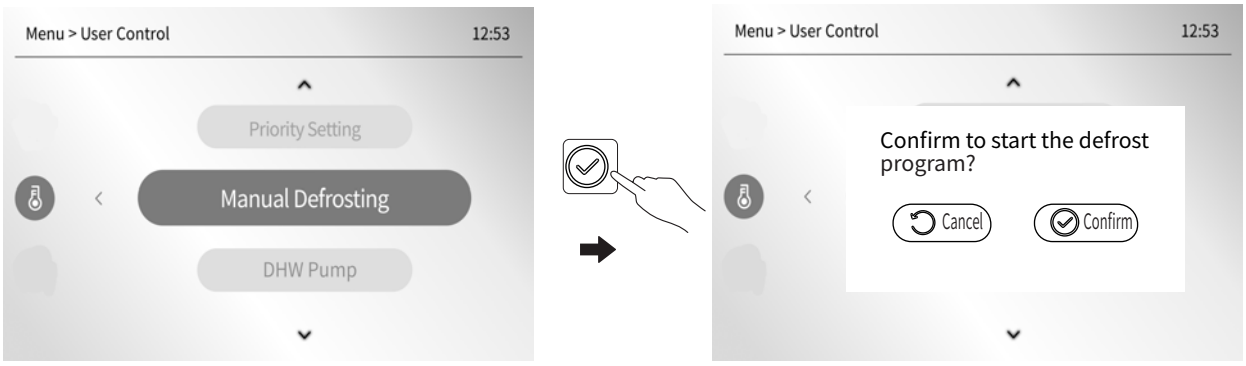
If neither DHW nor space operation priority is set, this is preemption mode. only when desired temperature of current operation mode is attained does the unit switch to another mode.

For cascade application, Priority Setting is invalid.

6.6 Manual Defrosting

The function is used to force the unit to defrost when the unit operates in heat or DHW mode in cold winter.

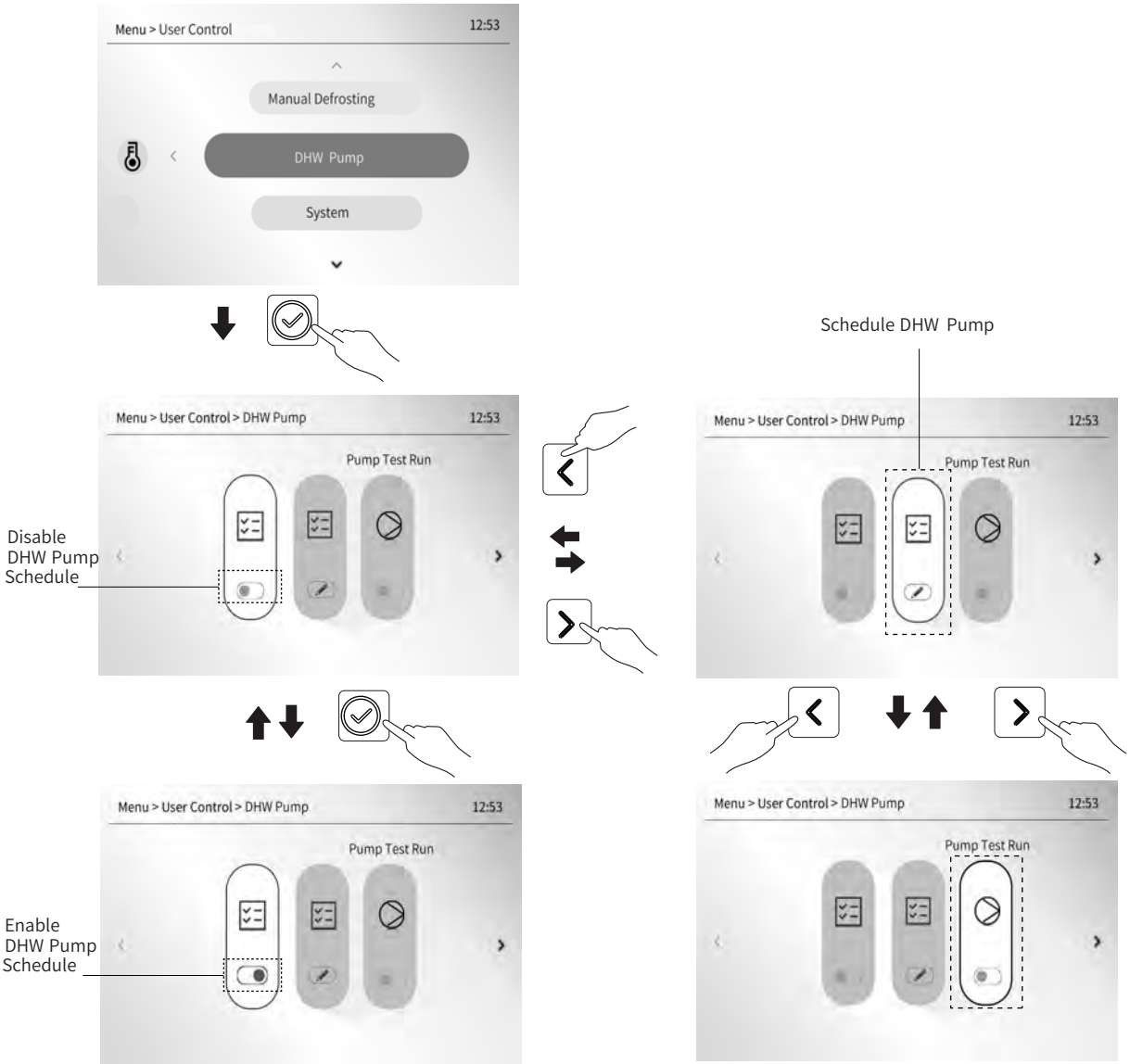
On any one page go to "⋯ > User Control > Manual Defrosting", and then press ✓ to enable the function. This is a one-time function and defrosting icon will appear on the screen.



6.7 DHW Pump

DHW pump is used to recirculate the water inside domestic water net.

To go to " ⋯ > User Control > DHW Pump", and then press ✓ to set the desired control.



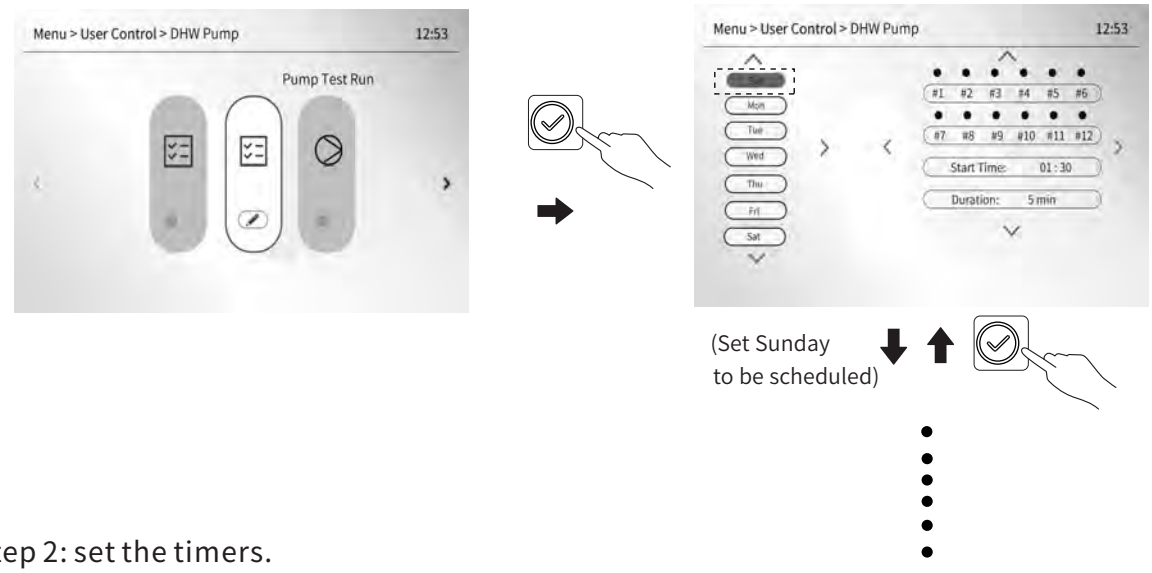
The function of pump test run is used to manually debug DHW pump and once-time effective.

- How to schedule DHW Pump

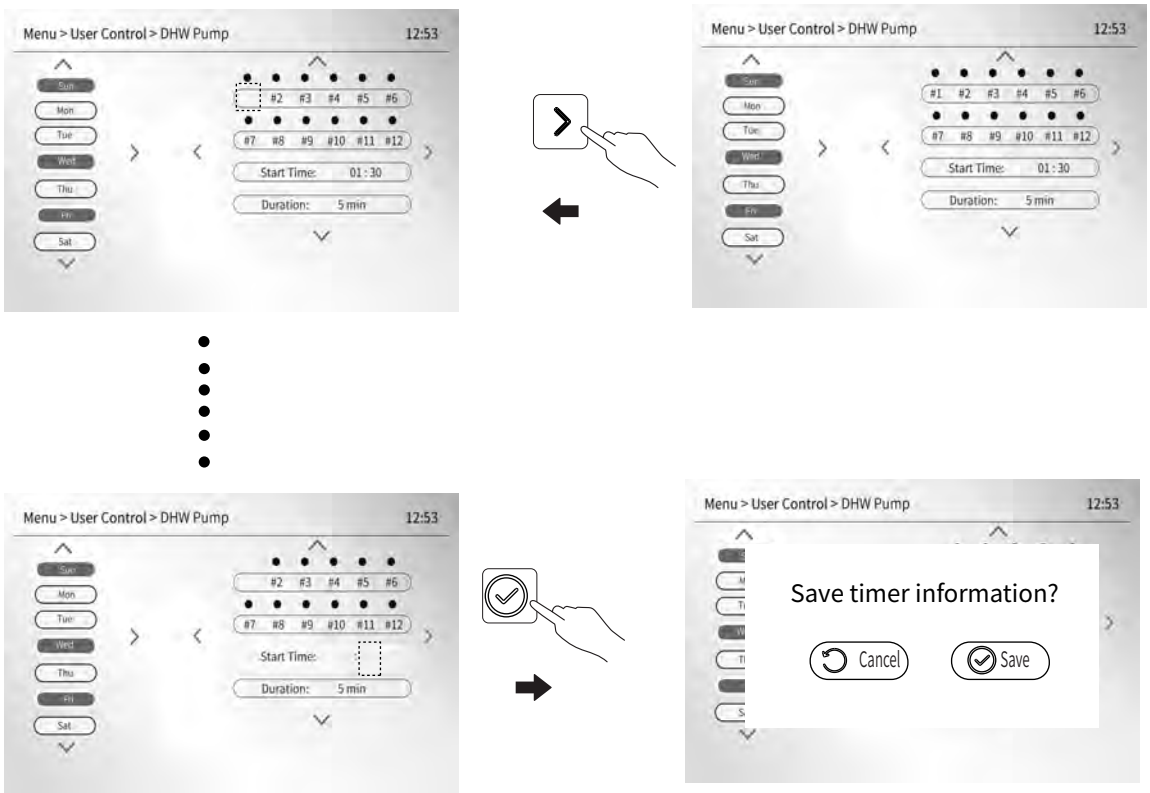
You can customize DHW pump's weekly operation schedule in exactly the same way as you would set up a weekly schedule for Quiet Mode.

For example, you want to set a schedule for Sunday, Wednesday and Friday:

Step 1: set a certain day or several certain days of a whole week to be scheduled.



Step 2: set the timers.



Press ↺ to abort the current setting, ✓ to save the current setting.

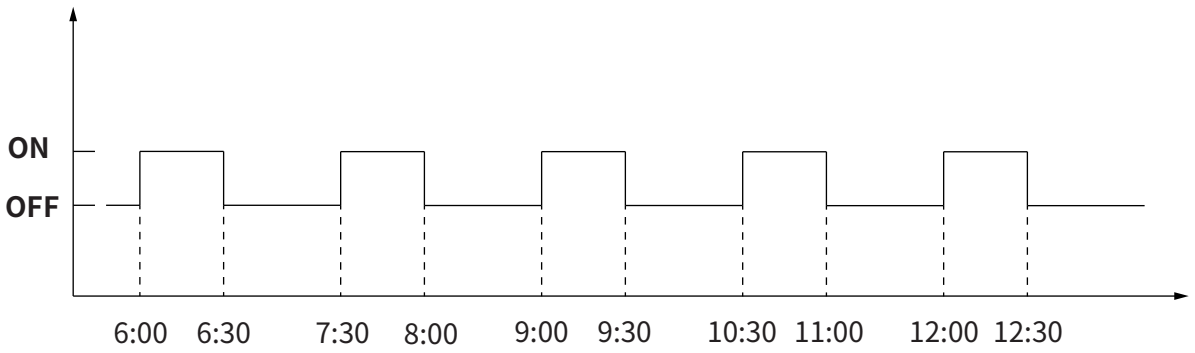
The time "Duration" is the time when DHW pump starts to run continuously after each timer arrive at. It can only be set in the menu "Installer Level", refer to "⋯ > InstallerLevel > System Parameter > DHW MODE SET".

For the example, you have set three dates (Sunday, Wednesday and Friday) and the timer #1 to schedule the operation of DHW pump. DHW pump will start at am 6:30 on each of these three days of these three days and then stop after running for 25min.

Another example, a whole week is scheduled and each day has the same setting of timers and the time "Duration" has been set to 30min. Setting the timers as follows:

NO.	Start Time
#1	6 : 00
#2	7 : 30
#3	9 : 00
#4	10 : 30
#5	12 : 00
#6~#12	Disable

The pump will run as follows:



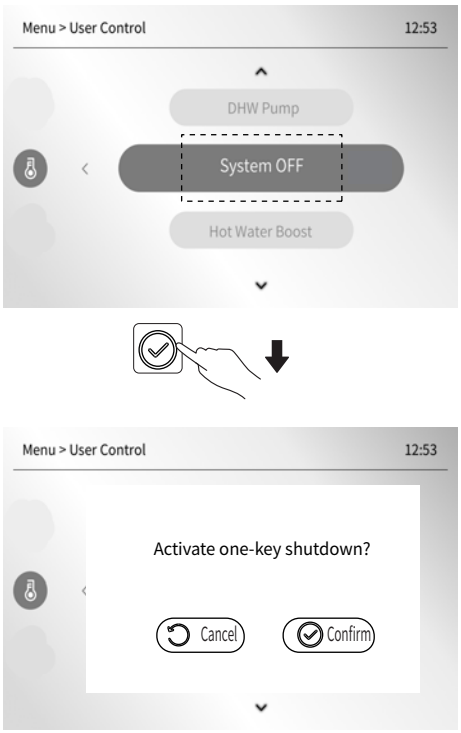
There are a total of 12 timers that can be set, but the example has only 5 available timers from #1 to #5.

Note: DHW pump scheduling function is only available for R290 models.

6.8 System OFF

The function is used to force the unit to shut down.

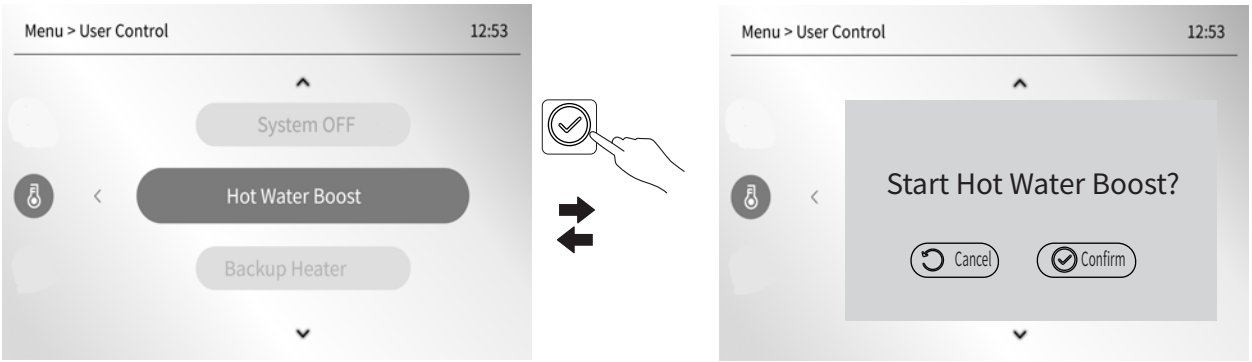
On any one page go to " > User Control > System OFF", and then press to enable the function, to cancel the function.



6.9 Hot Water Boost

The functon is used to force the system to operate in DHW mode. The unit and the booster or addition heater will operate for DHW mode together to attain the desired hot water temperature as fast as possible. This is a one-time function. If you want to use the funtion again, please reenable it.

On any one page go to "> User Control > Hot Water Boost", and then press to enable or disable the function.

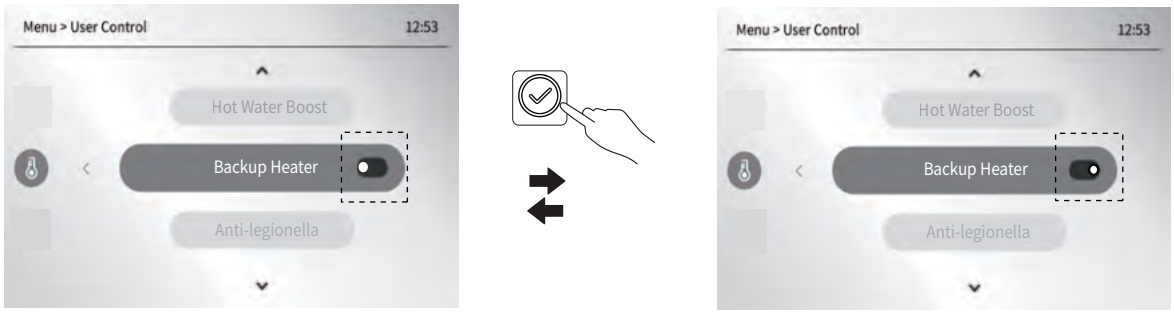


When the unit is operating on Hot Water Boost, you don't disable it, and the unit doesn't stop untill the desired hot water temperatre is getted.

6.10 Backup Heater

The function is used to force to turn on the internal heater, AHS or WTH.

On any one page go to " Menu > User Control > Backup Heater", and then press to enable or disable the function.



This funtion is a one-time effective. if you want to use the funtion again, please reenable it.

IPH=Internal pipe backup heater. AHS=Additonal heating source. WTH=Water tank heater.

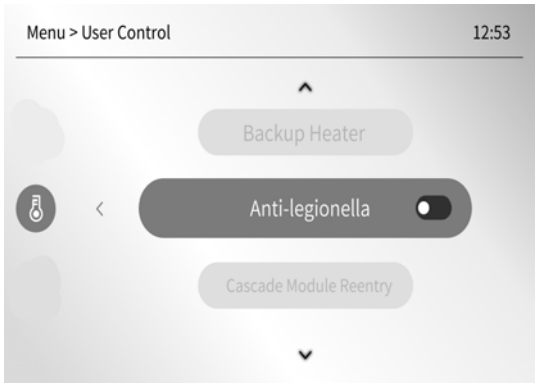
For the units without IPH or AHS or WTH, please ignore the function.

6.11 Anti-legionella

The functon is used to kill the legionella of domestic hot water tank. When you enable the function, DHW hot water temperature will reach 55°C～75°C forcedly.

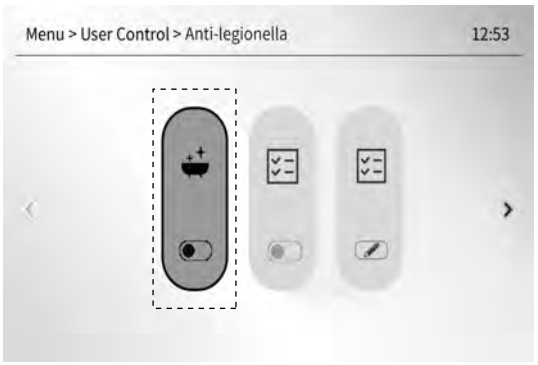
On any one page go to " > User Control > Anti-legionella", and then press , you can :

- Set a manual Anti-legionella or schedule Anti-legionella operation.
  Refer to Step 1 below to enable a manually Anti-legionella which is a one-time effective.
  If you want to use Anti-legionella again, you must enable the funtion again.
- Enable the schedule of Anti-legionella operation
  In order for Anti-legionella to operate as scheduled, you must first activate Anti-legionella operation schedule following the steps below, referring to Step 2 below for enabling it.



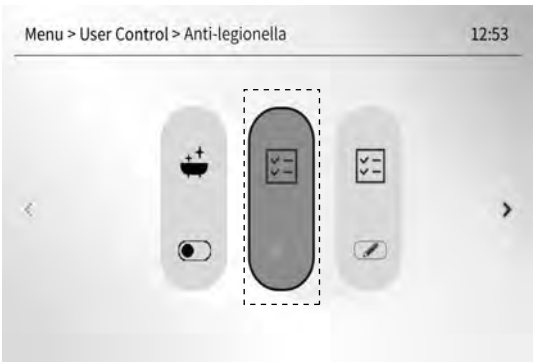


to next page

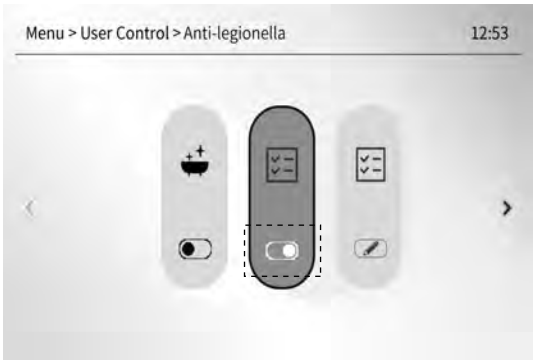


Step 1

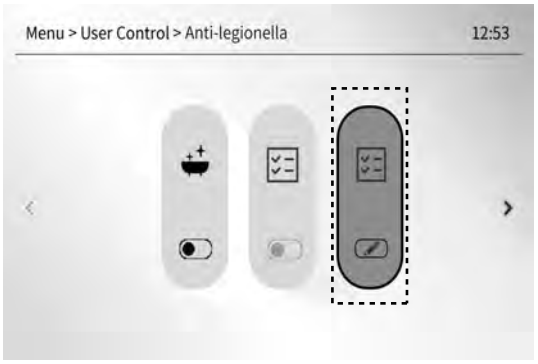




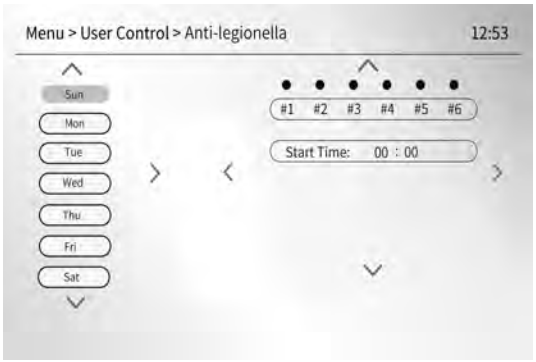
Step 2







Step 3



- Schedule Anti-legionella operation

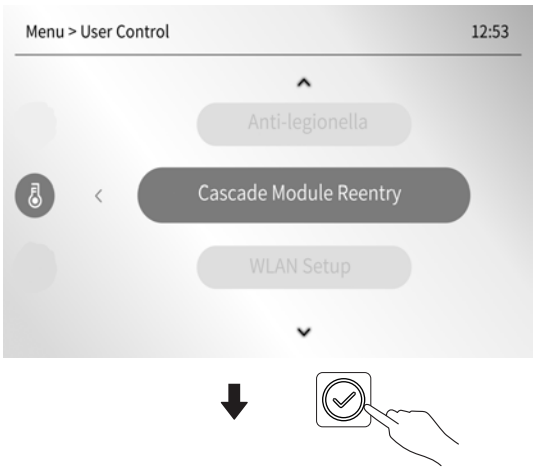
You can customize Anti-legionella's weekly operation schedule in exactly the same way as you would set up a weekly schedule for Quiet Mode, refer to Step 3 above for setting a desire schedule.

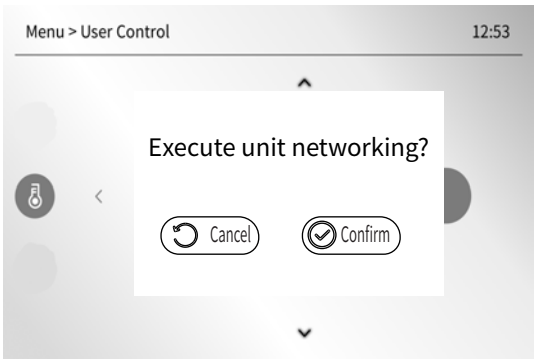
There are 6 timers from #1 to #6 in total , and each of the 6 timers has only a start time to be set. and each of the desired dates to be scheduled can share the same timer setting or has its own timer setting.

6.12 Cascade Module Reentry

In cascade application if one or more modules are offline, you can enable the function to make these offline modules to reentry cascade net.

On any one page go to " > User Control > Cascade Module Reentre", and then press to enable the function.





The interface will automatically recognize lost modules and rejoin them to the cascade network.

After executing unit networking the interface will automatically back to main menu.

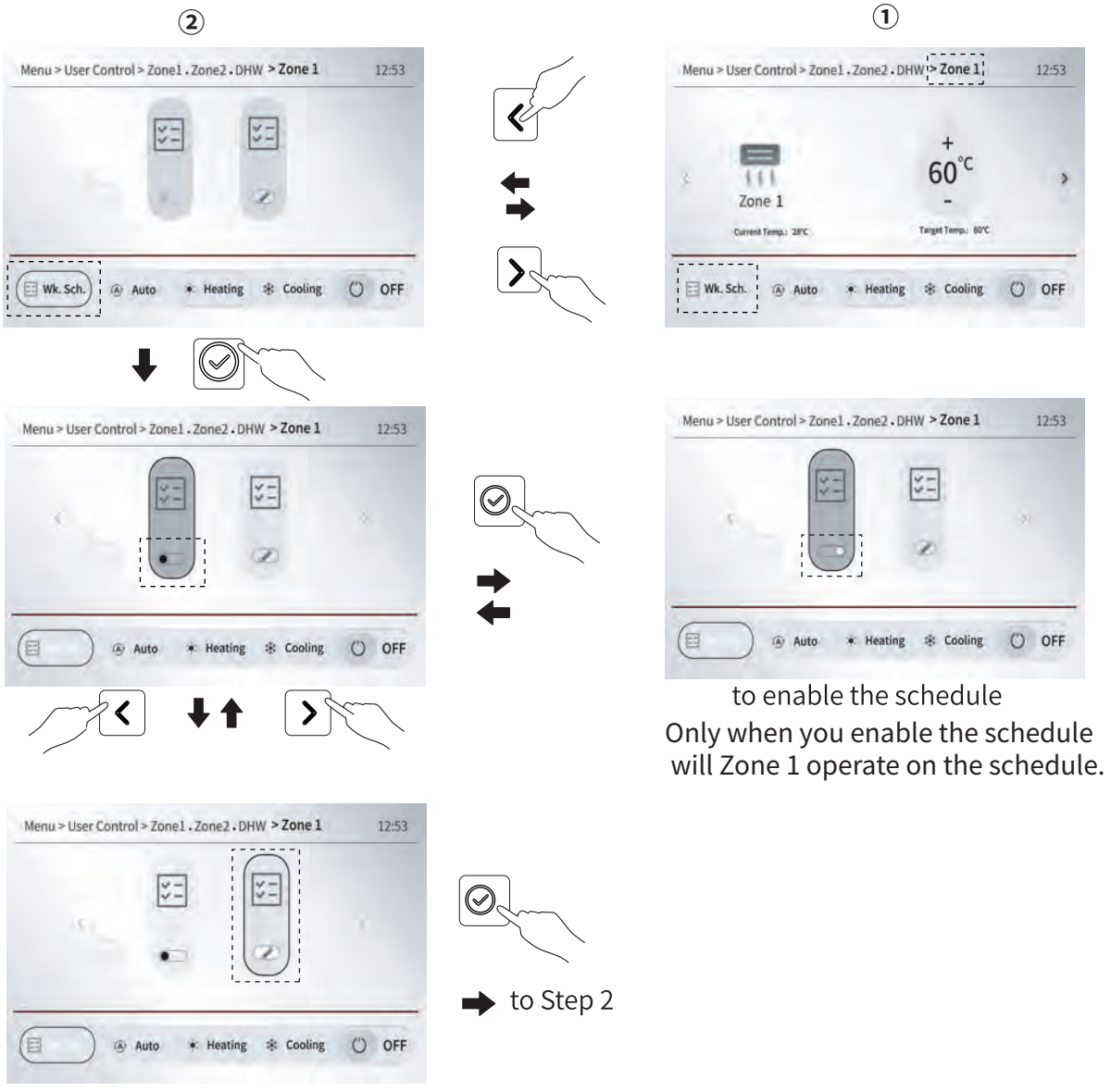
6.13 Zone1.Zone2.DHW Weekly Schedule

You can make or cancel a weekly schedule for the unit's space operation and DHW mode in exactly the sameway as you would set up a weekly schedule for Quiet Mode.
You can go to Zone 1 or Zone 2 or DHW by 5.5.2 to make a weekly schedule of the unit.

- The schedule to be made on Zone 1 can only be for Zone 1,not for Zone 2 and DHW, and vice versa.

6.13.1 How to go to Zone 1 to make a schedule of the unit

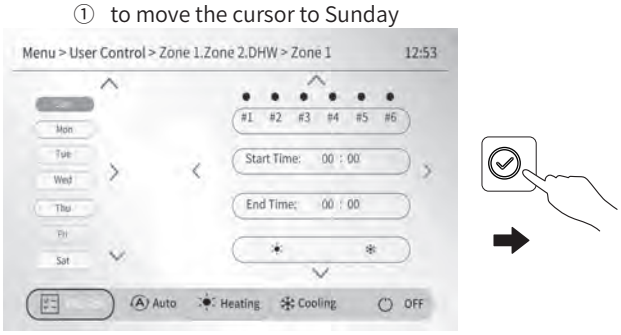
- Step 1- to go to set Zone 1 by 5.5.2.



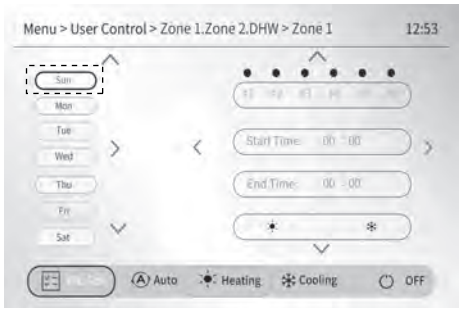
- Step 2- to set desired dates

  Here are the steps to set two dates(Sunday and Wednesday) using Method A mentioned in the note of Section 6.3.

① to move the cursor to Sunday



to set Sunday



to go to Step 3: Setting one or several timers

to go to Step 4: Setting Start Time

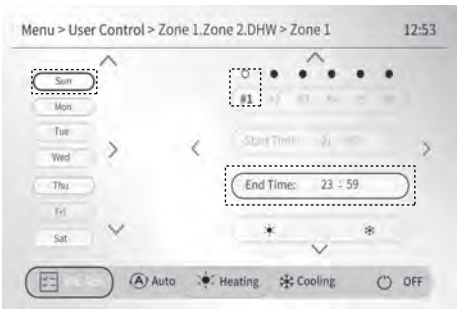
to go to Step 5: Setting End Time

to go to Step 6: Setting desired mode and temperature to Zone 1

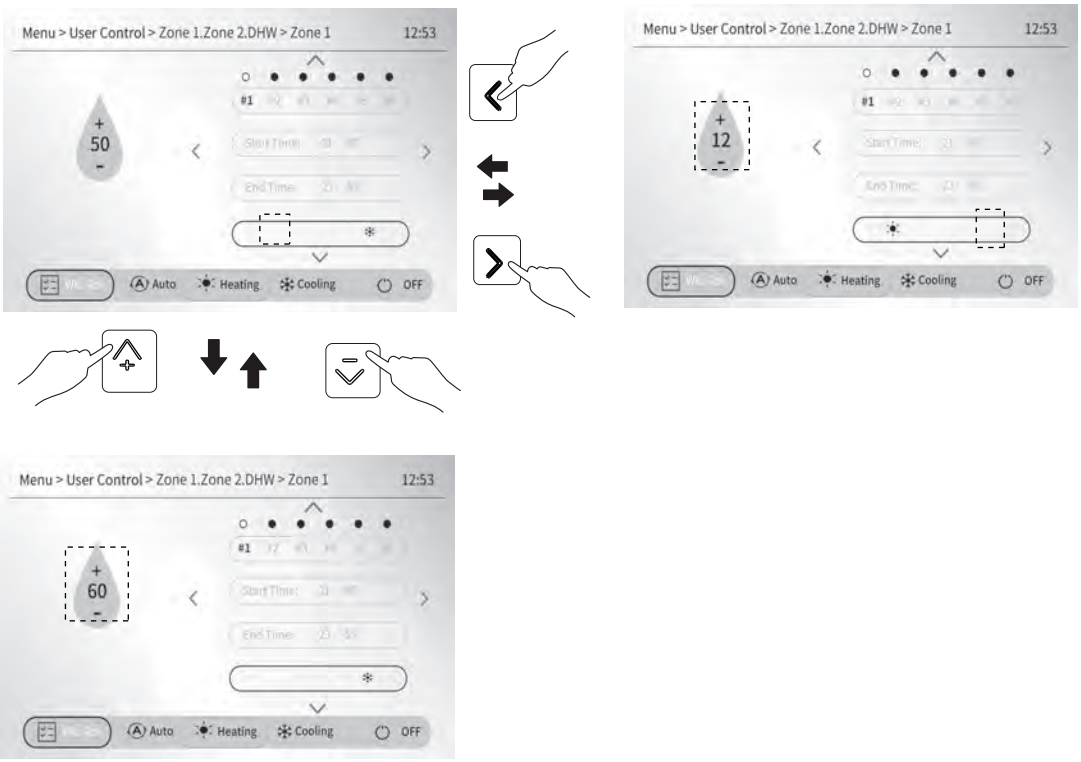
When you finished Step 7, press to save the setting, and then press back to Screen ① to select Wednesday by press up and down buttons, and then follow the steps of setting the schedule of the date Sunday. Friday's schedule can be different from Sunday's one, for example, there are 4 timers to be available on Sunday, but only 1 timers to be available on Sunday.

- Refer to Section 6.3 for the setting of Step 3 and Step 4 and Step5
- Step 6 - to set desired mode and temperature

Step5



to next page



6.13.2 How to go to Zone 2 to make a schedule of the unit

You can also go to Zone 2 to make a schedule of the unit by following Section 6.13.1.

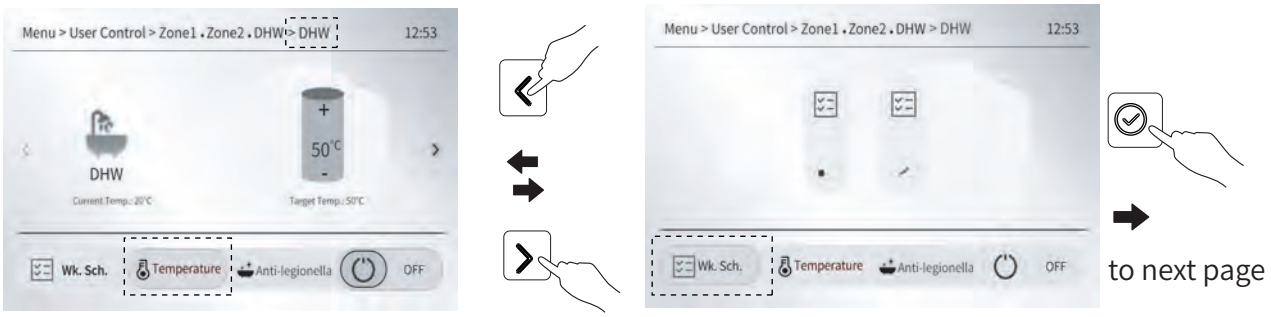
i INFORMATION

1. You have to reset WEEKLY SCHEDULE, if you change WATER FLOW TEMP. to the ROOM TEMP. or you change ROOM TEMP. to WATER FLOW TEMP.
2. If room thermostat is effective, WEEKLY SCHEDULE is invalid.
3. If the start time is the same as the end time in one timer, the timer is invalid.

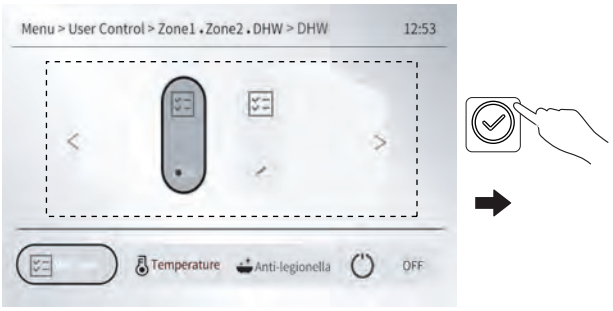
6.13.3 How to go to DHW to make a schedule of the unit

You can also go to DHW to make the schedule of the unit by following Section 6.13.1.

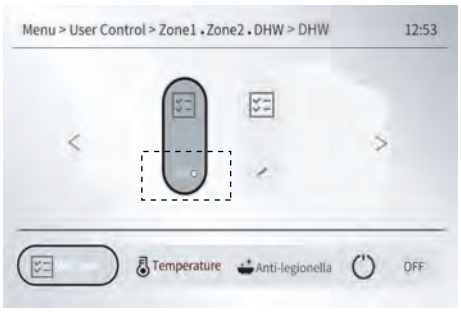
The following example is to show how to go to DHW to make a schedule of DHW mode.



to next page



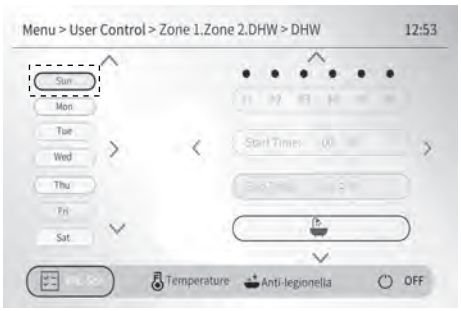
to enable the schedule









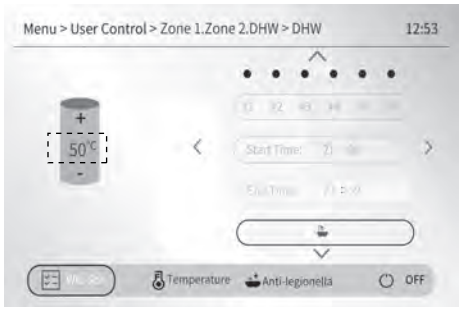




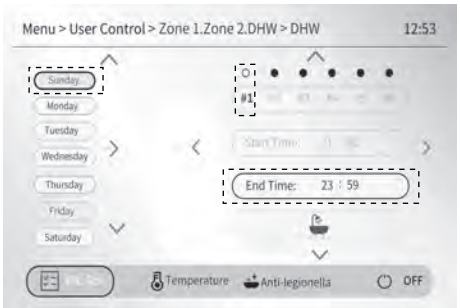
to go to set one or several timers

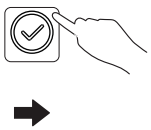
to go to set Start Time

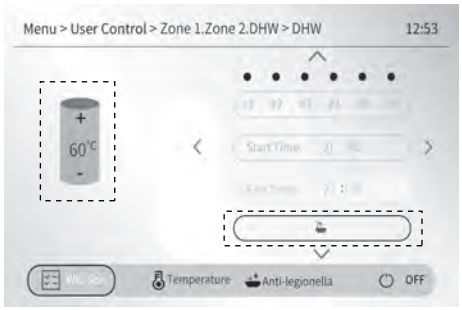
to go to set End Time











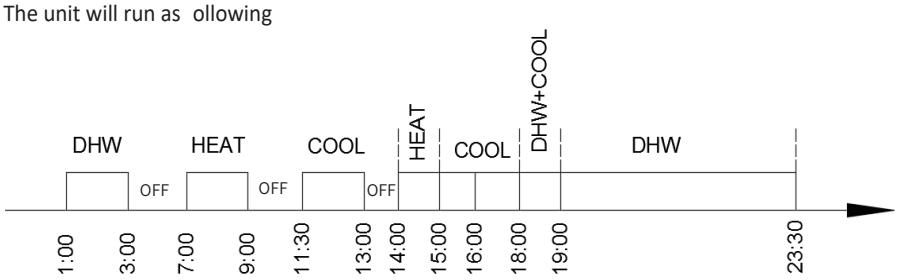
6.13.4 A example

For a example, the system has anly DHW + a space operation zone. Refer to "⚙ > Installer Level > System Parameter > TEMP. TYPE SET and ROOM THERMOSTAT".

Six timers are set as ollowing

NO.	START	END	MODE	TEMP
T1	1：00	3：00	DHW	0 C
T2	：00	：00	HEAT	2 C
T3	11：30	13：00	COOL	20 C
T4	14：00	1 ：00	HEAT	2 C
T	1 ：00	1 ：00	COOL	20 C
T	1 ：00	23：30	DHW	0 C

The unit will run as ollowing



The operation o the controller at the ollowing time

T ME	The operation o the controller
1：00	DHW mode is turned ON
3：00	DHW mode is turned OFF
：00	HEAT MODE is turned ON
：00	HEAT MODE is turned OFF
11：30	COOL MODE is turned ON
13：00	COOL MODE is turned OFF
14：00	HEAT MODE is turned ON
1 ：00	COOL MODE is turned ON and HEAT MODE is turned OFF
1 ：00	DHW MODE and COOL MODE are turned ON
1 ：00	DHW MODE is turned ON
23：30	DHW mode is turned OFF

Note: If APP activates a Weekly Schedule, the weekly schedule of the interface is automatically deactivated or invalid.

6.14 About the Menu "Information"

The menu "Information" is used to view the information of the unit:

- Software version of main PCB and wired controller.
- Energy information generated during unit operation.
- Real parameter value generated during unit operation.
- Overview of Weekly Schedule

6.14.1 Software Version

The functon is to view the version of the software of wired controller and main control PCB.

On any one page go to " > Information > Software Version", and then press to view:



6.14.2 Energy Information (Optional)

The functon is used to provide with current or history energy data of heat pump below:

Heating capacity(kW)/ Power consumption(kW)/COP;
DHW capacity(kW)/ Power consumption(kW)/COP;
Cooling capacity(kW)/ Power consumption(kW)/EER;

These energy data are displayed as real-time values relative to current operation mode.

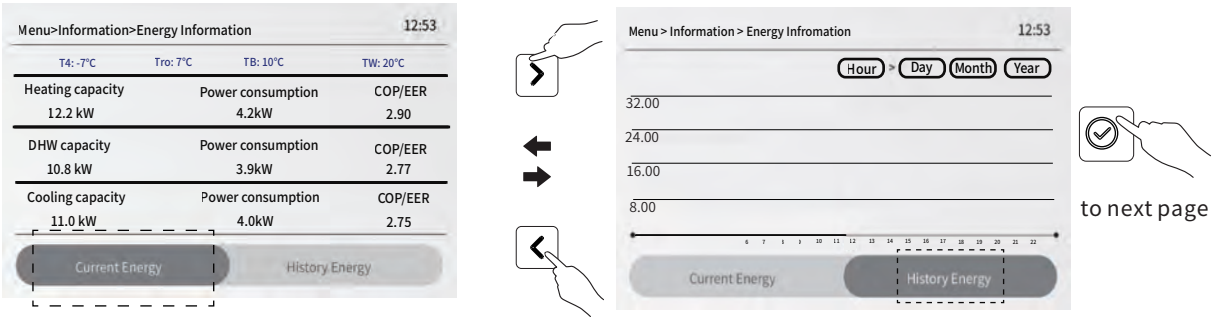
You can also view history energy data which are stored as cumulative average values by per hour, per day, per month, per year.

- How to go into "Energy Infromation"

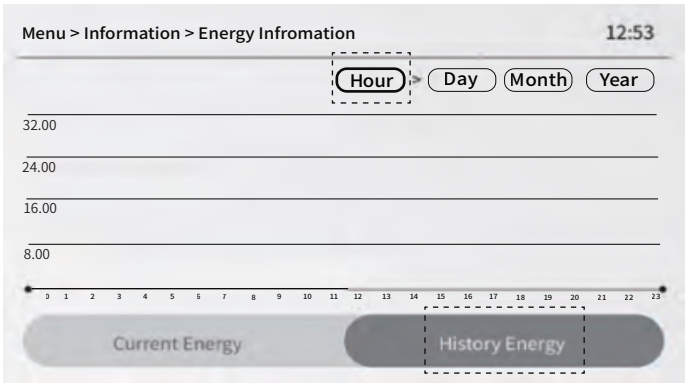
On any one page go to " > Information > Energy information", and then press . You can view both current and historical energy data.

- Select to view current or historical energy infromation

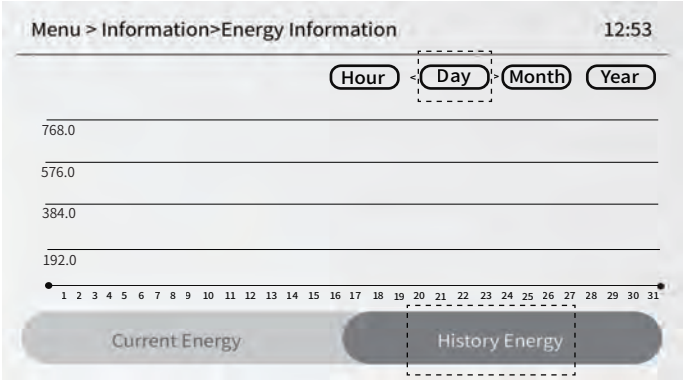
Current energy data page



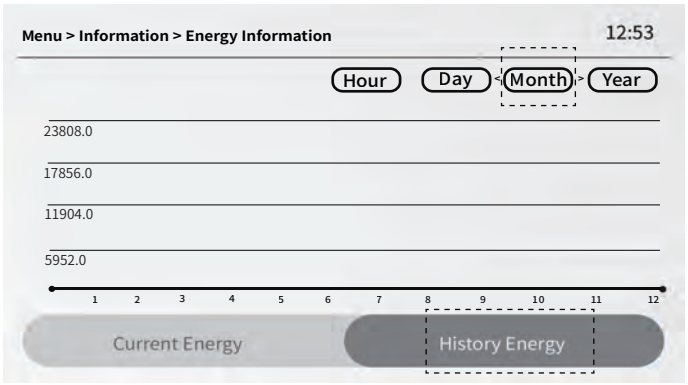
Current (real) Temp.:
T4: Outdoor Temp.
Tro: Room Temp. (detected by the temp. sensor inside wired controller)
TB: leaving Water Temp.
TW: DHW water Temp.


Menu > Information > Energy Infromation
12:53
Hour
Day
Month
Year
32.00
24.00
16.00
8.00
Current Energy
History Energy

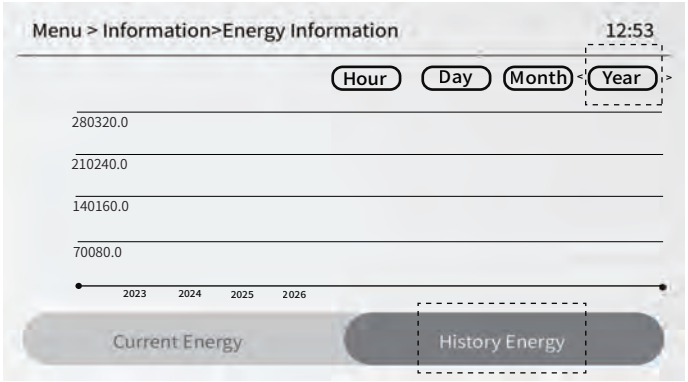



Menu > Information>Energy Information
12:53
Hour
Day
Month
Year
768.0
576.0
384.0
192.0
Current Energy
History Energy



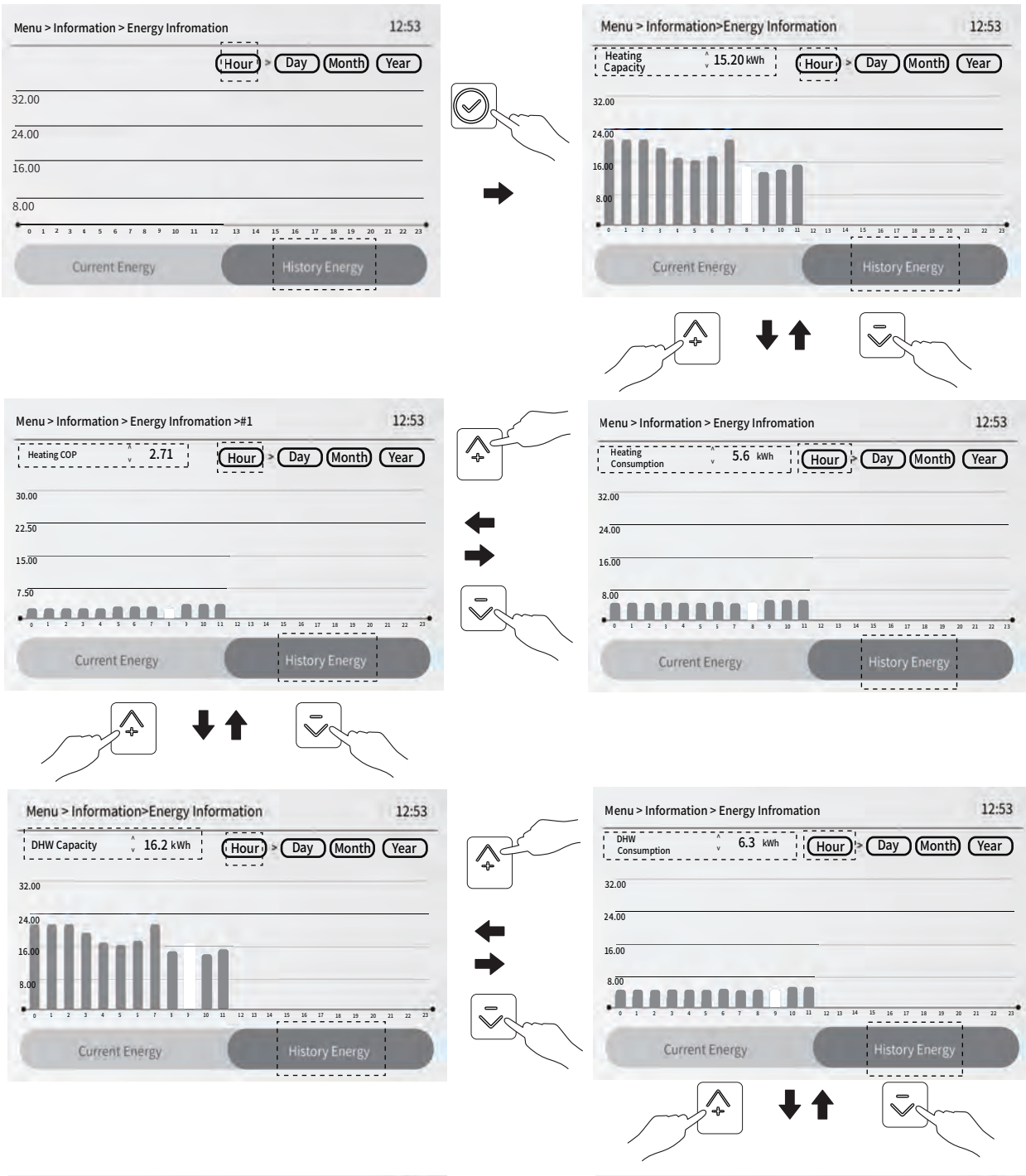

Menu > Information > Energy Information
12:53
Hour
Day
Month
Year
23808.0
17856.0
11904.0
5952.0
Current Energy
History Energy

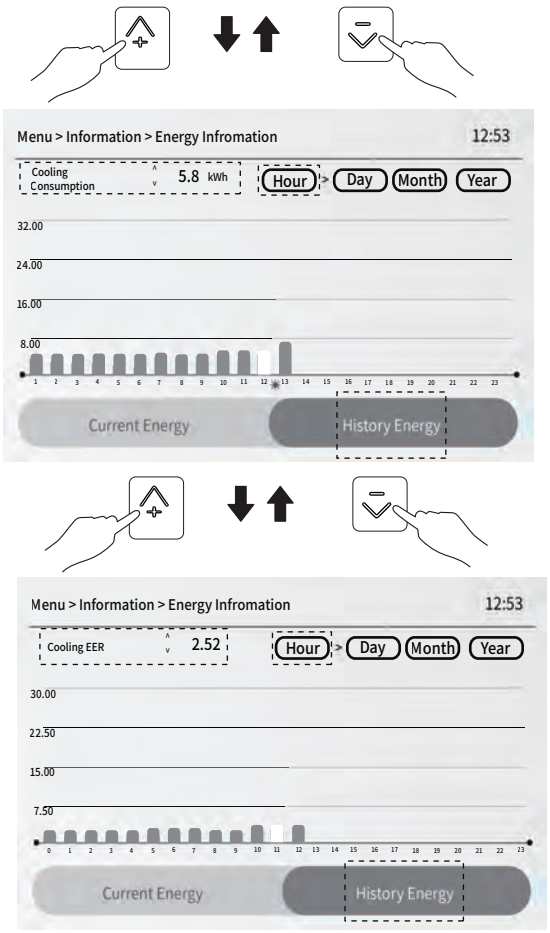



Menu > Information>Energy Information
12:53
Hour
Day
Month
Year
280320.0
210240.0
140160.0
70080.0
2023
2024
2025
2026
Current Energy
History Energy

- View historical energy data by hourly, daily, monthly or yearly.

  for examply, when you want to view historical energy data by hour, you shoud follow the process described below.

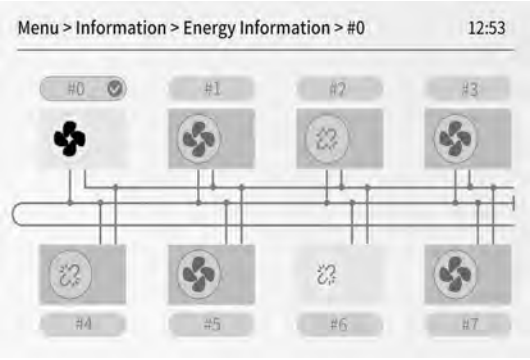




If you want to view historical energy data by per day, per month or per year, you shoud first go into historical energy pages of the day , month or year as described above, and then follow the same steps as viewing energy data by per hour.

The accuracy of temperature and the water flow rate detected by the sensors inside heat pump, sudden power failures and the transient nature of the operating conditions, etc, all these factors will all affected the accuracy of energy data.

For cascade application, on any one page go to "⊙ > Information > Energy Information > #1" the following page will appear:



and then press 〈 or 〉 to select the module to be viewed, press ⊙ to confirm your choice.

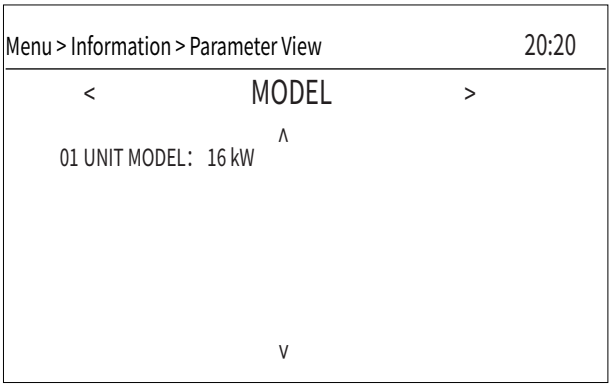
- the normal module

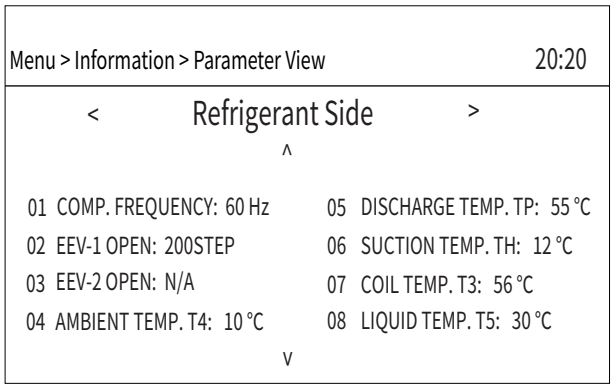
- the lost module

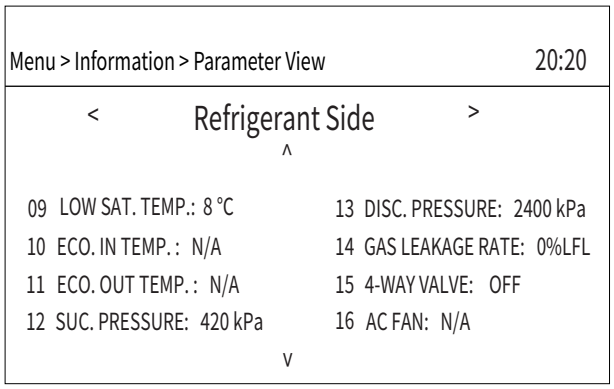
6.14.3 Parameter View

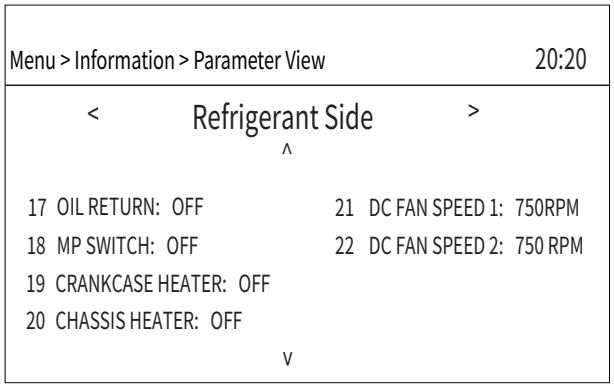
The operation is for installer or service engineer reviewing the operation parameter.

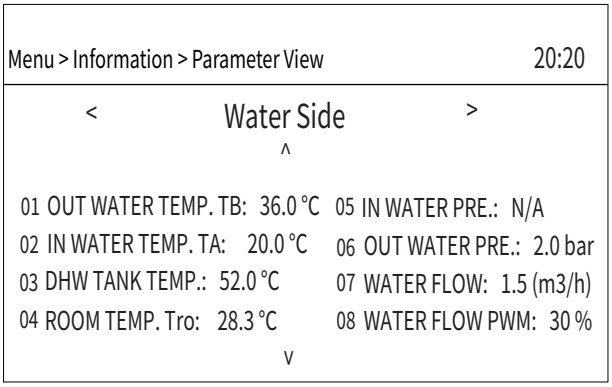
On any one page go to "⋯ > Information > Parameter View", and then press ✓ to enter menu, next to press 4 arrow buttons to view the operation parameter of the unit.

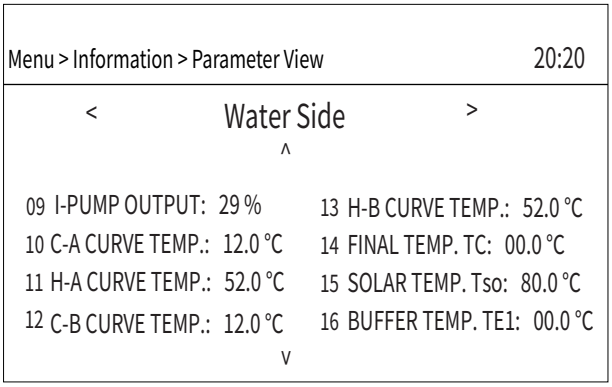


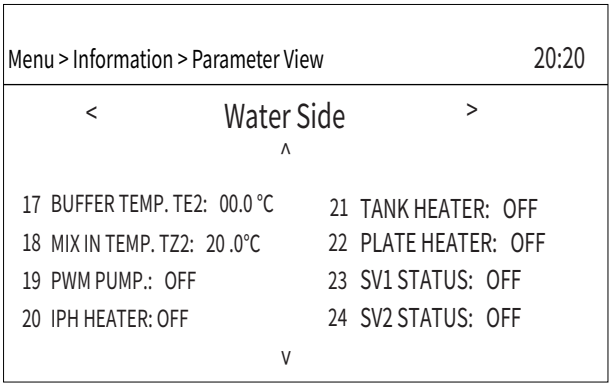


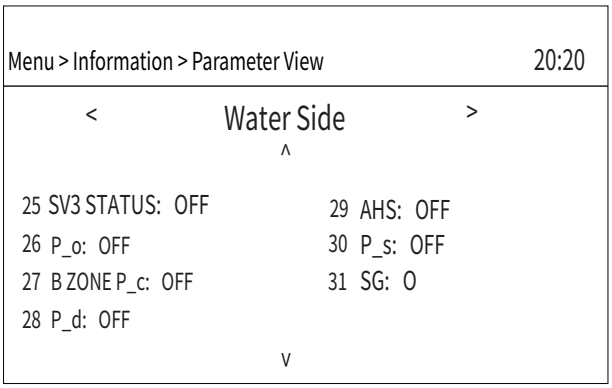


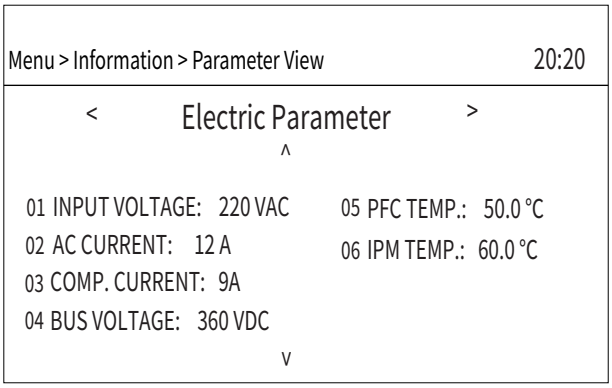



Menu > Information > Parameter View
20:20
< Water Side >
^
01 OUT WATER TEMP. TB: 36.0 °C
02 IN WATER TEMP. TA: 20.0 °C
03 DHW TANK TEMP.: 52.0 °C
04 ROOM TEMP. Tro: 28.3 °C
05 IN WATER PRE.: N/A
06 OUT WATER PRE.: 2.0 bar
07 WATER FLOW: 1.5 (m3/h)
08 WATER FLOW PWM: 30 %
v

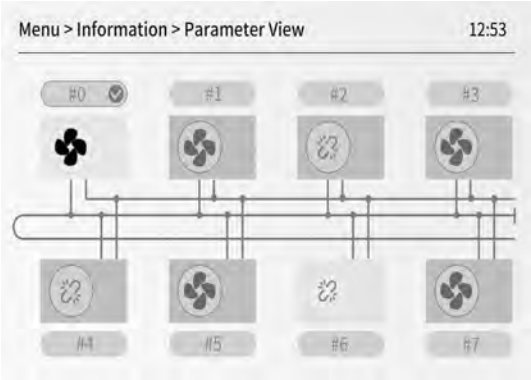

Menu > Information > Parameter View
20:20
< Water Side >
^
09 I-PUMP OUTPUT: 29 %
10 C-A CURVE TEMP.: 12.0 °C
11 H-A CURVE TEMP.: 52.0 °C
12 C-B CURVE TEMP.: 12.0 °C
13 H-B CURVE TEMP.: 52.0 °C
14 FINAL TEMP. TC: 00.0 °C
15 SOLAR TEMP. Tso: 80.0 °C
16 BUFFER TEMP. TE1: 00.0 °C
v


Menu > Information > Parameter View
20:20
< Water Side >
^
17 BUFFER TEMP. TE2: 00.0 °C
18 MIX IN TEMP. TZ2: 20 .0°C
19 PWM PUMP.: OFF
20 IPH HEATER: OFF
21 TANK HEATER: OFF
22 PLATE HEATER: OFF
23 SV1 STATUS: OFF
24 SV2 STATUS: OFF
v


Menu > Information > Parameter View
20:20
< Water Side >
^
25 SV3 STATUS: OFF
26 P_o: OFF
27 B ZONE P_c: OFF
28 P_d: OFF
29 AHS: OFF
30 P_s: OFF
31 SG: O
v



For cascade application, on any one page go to "> Information > Parameter View", the following page will appear:

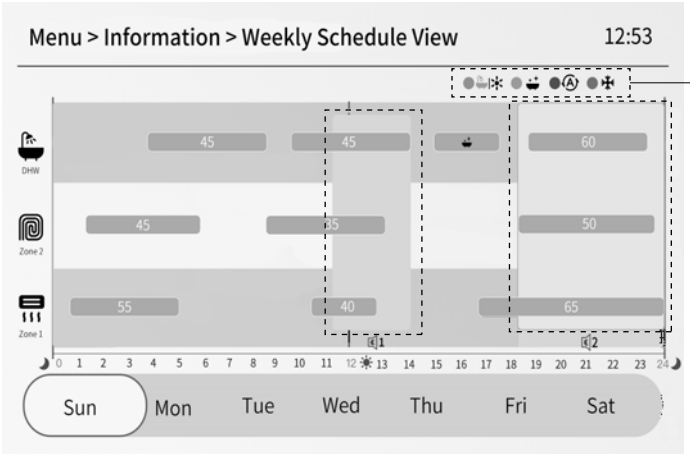


Press 〈 or 〉to select the module to be viewed, and then press to confirm your choice.

means the normal module. means the lost module.

6.14.4 Weekly Schedule View

The function is used to check weekly schedules of quiet mode and space operation and DHW mode. Go to " > Information> Weekly Schedule View" to view the schedule.



The picture above is the example of the schedule of Sunday. Press < or >to go to other dates, and then press to view the schedule of the date.

There are three schedules of the operation mode, zone 1, zone 2 and DHW.

Figures mean desired temperature.

rectangular frames with rounded corners mean the timers.

Two dotted frames mean scheduling quiet mode 1 and 2.

By reviewing the schedule you can adjust it to your needs.

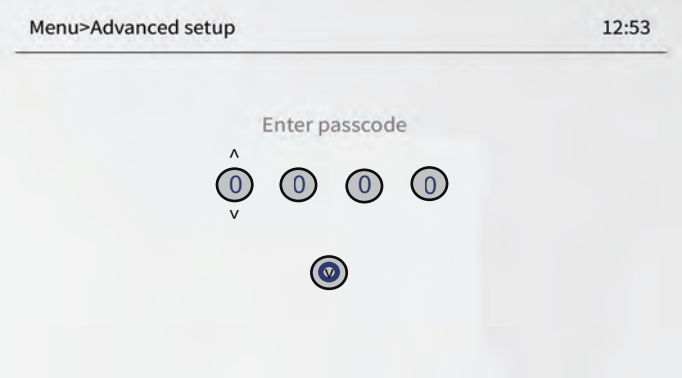
6.15 About the menu "Installer Level"

Installer Level is used for installer and service engineer.

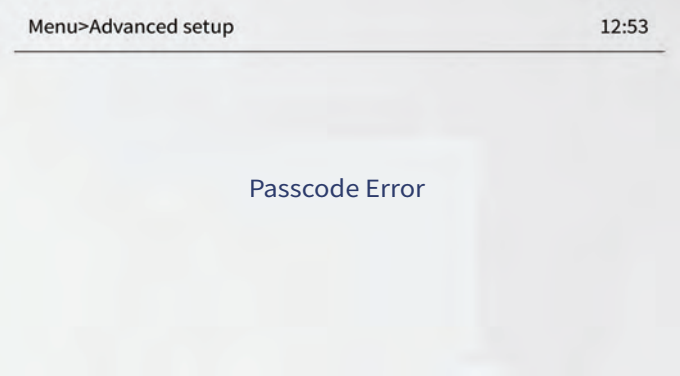
- Setting the function of the unit
- Setting the parameters.

6.15.1 How to go to the menu "Installer Level "

Go to " " > "Installer Level", and then press " ", the following page will:



please enter the correct passcode, if the passcode is incorrect, the following page will appear:



Please reenter the correct password.

Installer Level is used for installer or service engineer. It is NOT intended for the home owner changing the setting of the items of the menu.

- I t is for this reason password protection is required to prevent unauthorized access to the service settings.
- The password is 1212.

i INFORMATION

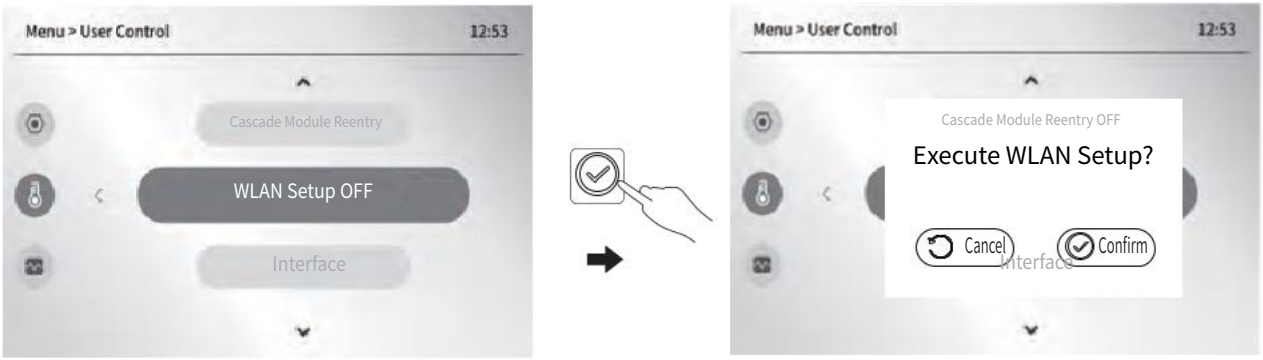
The unit must be turn off before you enter Instller Level menu. After exiting the menu setting, the unit must be power off, and then be power on again in ten seconds.

6.16 WLAN Setup

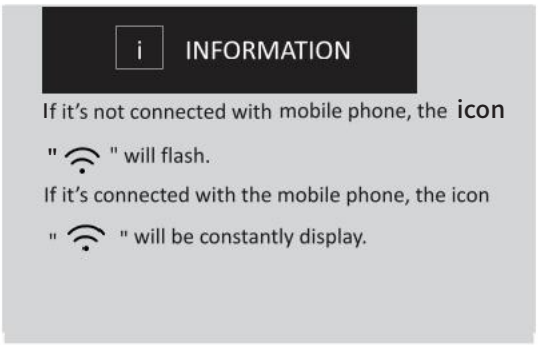
- The wired controller realizes intelligent control with a built in module, which receives control signal from the APP.
- Before connecting the WLAN, please check for it if the router in your environment is active and make sure that the wired controller is well connected to the wireless signal.
- During the Wireless distribution process, the LCD icon flashes to indicate that the network is being deployed. After the process is completed, the icon will be constantly on.

6.16.1 Wired Controller Setting

Activate **WLAN** by interface. Go to > "User Control" > "WLAN Setup", and then press .



Press exit WLAN Setup, excute a WLAN Setup net connection.



6.16.2 Mobile Device Setting

- **Connecting WLAN:**

(1) Install APP

Please research "thermomax" in APP STORE or GOOGLE PLAY to install the APP

(2) ADD DEVICE

Refer to the figures below to add the device in numerical orders:

1. Sign in



2. Permissions

Allow notification



Open the Bluetooth



Allow the location



3. Add device



4. Auto-add





5. Connect WiFi



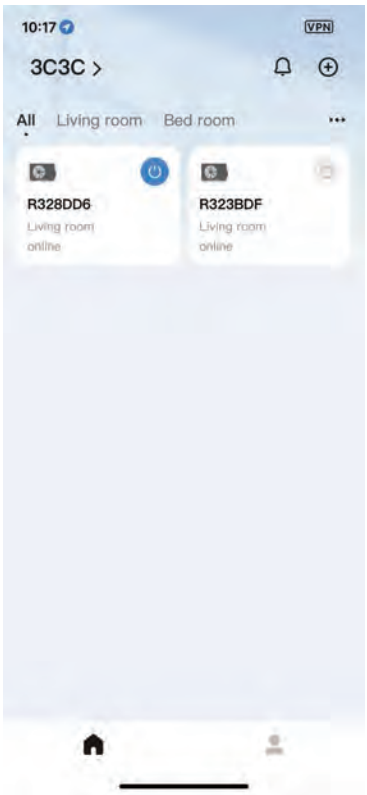
6.Connect device



7.Configure the room



8.Finish add device



After the appliance is successfully connected, the LCD icon of the wired controller is constantly on, and the heat pump can be controlled through teh APP.

The operations above is for reference only; the real operations may be different from it.

Warning and troubleshooting or networking ailure

When the product is connected to the network, please make sure that the phone is as close as possible to the product.

We only support 2.4GHz band routers at present.

Special characters(punctuation, spaces, etc.)are not recommended as part of the WLAN name.

It is recomended that the number of devices connected to a router shoud be appropriate lest home appliances are affected by weak or unstable network signal.

If the password of the router or WLAN is changed, clear all settings and reset the appliance.

The contents of APP might change in version updates and actual operation shall prevail.

7 Weather Compensation table

Table 4 the environment temperature curve of the low temperature setting for heating

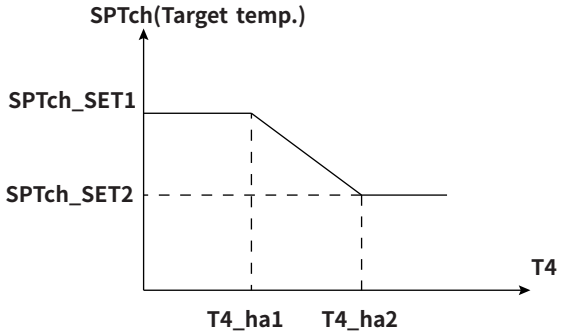
T4	≤ -20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0
1-SPTc	38	38	38	38	38	37	37	37	37	37	37	36	36	36	36	36	36	35	35	35	35
2-SPTc	37	37	37	37	37	36	36	36	36	36	36	35	35	35	35	35	35	34	34	34	34
3-SPTc	36	36	36	35	35	35	35	35	35	34	34	34	34	34	34	33	33	33	33	33	33
4-SPTc	35	35	35	34	34	34	34	34	34	33	33	33	33	33	33	32	32	32	32	32	32
5-SPTc	34	34	34	33	33	33	33	33	33	32	32	32	32	32	32	31	31	31	31	31	31
6-SPTc	32	32	32	32	31	31	31	31	31	31	31	31	30	30	30	30	30	30	30	30	29
7-SPTc	31	31	31	31	30	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	28
8-SPTc	29	29	29	29	28	28	28	28	28	28	28	28	27	27	27	27	27	27	27	27	26
T4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	≥20	
1-SPTc	35	35	34	34	34	34	34	34	33	33	33	33	33	33	32	32	32	32	32	32	32
2-SPTc	34	34	33	33	33	33	33	33	32	32	32	32	32	32	31	31	31	31	31	31	31
3-SPTc	32	32	32	32	32	32	31	31	31	31	31	31	30	30	30	30	30	30	29	29	29
4-SPTc	31	31	31	31	31	31	30	30	30	30	30	30	29	29	29	29	29	29	28	28	28
5-SPTc	30	30	30	30	30	30	29	29	29	29	29	29	28	28	28	28	28	28	27	27	27
6-SPTc	29	29	29	29	29	29	28	28	28	28	28	28	27	27	27	27	27	27	26	26	26
7-SPTc	28	28	28	28	28	28	27	27	27	27	27	27	26	26	26	26	26	26	25	25	25
8-SPTc	26	26	26	26	26	26	26	25	25	25	25	25	25	25	25	24	24	24	24	24	24

Table 5 the environment temperature curve of the high temperature setting for heating

T4	≤ -20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0
1-SPTc	55	55	55	55	54	54	54	54	54	54	54	54	53	53	53	53	53	53	53	53	52
2-SPTc	53	53	53	53	52	52	52	52	52	52	52	52	51	51	51	51	51	51	51	51	50
3-SPTc	52	52	52	52	51	51	51	51	51	51	51	51	50	50	50	50	50	50	50	50	49
4-SPTc	50	50	50	50	49	49	49	49	49	49	49	49	48	48	48	48	48	48	48	48	47
5-SPTc	48	48	48	48	47	47	47	47	47	47	47	47	46	46	46	46	46	46	46	46	45
6-SPTc	45	45	45	45	44	44	44	44	44	44	44	44	43	43	43	43	43	43	43	43	42
7-SPTc	43	43	43	43	42	42	42	42	42	42	42	42	41	41	41	41	41	41	41	41	40
8-SPTc	40	40	40	40	39	39	39	39	39	39	39	39	38	38	38	38	38	38	38	38	37
T4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	≥20	
1-SPTc	52	52	52	52	52	52	52	51	51	51	51	51	51	51	51	50	50	50	50	50	50
2-SPTc	50	50	50	50	50	50	50	49	49	49	49	49	49	49	49	48	48	48	48	48	48
3-SPTc	49	49	49	49	49	49	49	48	48	48	48	48	48	48	48	47	47	47	47	47	47
4-SPTc	47	47	47	47	47	47	47	46	46	46	46	46	46	46	46	45	45	45	45	45	45
5-SPTc	45	45	45	45	45	45	45	44	44	44	44	44	44	44	44	43	43	43	43	43	43
6-SPTc	42	42	42	42	42	42	42	41	41	41	41	41	41	41	41	40	40	40	40	40	40
7-SPTc	40	40	40	40	40	40	40	39	39	39	39	39	39	39	39	38	38	38	38	38	38
8-SPTc	37	37	37	37	37	37	37	36	36	36	36	36	36	36	36	35	35	35	35	35	35

The heating automatic setting curve:

The automatic setting curve is the ninth curve, this is the calculation:



State: In the setting the wired controller, if T4_ha2<T4_ha 1, then exchange their value; if SPTch_SET1 < SPTch_SET2, then exchange their value.

Table 6 the environment temperature curve of the low temperature setting for cooling

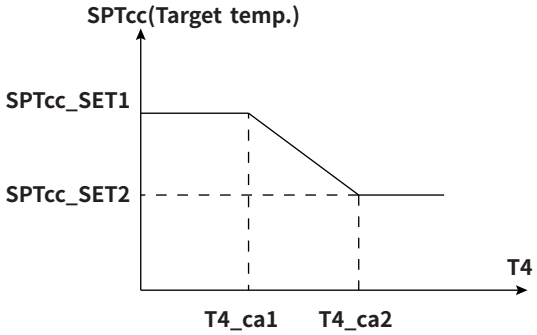
T4	-10≤T4<15	15≤T4<22	22≤T4<30	30≤T4
1-SPTc	16	11	8	7
2-SPTc	17	12	9	7
3-SPTc	18	13	10	7
4-SPTc	19	14	11	8
5-SPTc	20	15	12	9
6-SPTc	21	16	13	10
7-SPTc	22	17	14	11
8-SPTc	23	18	15	12

Table 7 the environment temperature curve of the high temperature setting for cooling

T4	-10≤T4<15	15≤T4<22	22≤T4<30	30≤T4
1-SPTc	20	18	17	16
2-SPTc	21	19	18	17
3-SPTc	22	20	19	17
4-SPTc	23	21	19	18
5-SPTc	24	21	20	18
6-SPTc	24	22	20	19
7-SPTc	25	22	21	19
8-SPTc	25	23	21	20

The cooling automatic setting curve:

The automatic setting curve is the ninth curve, this is the calculation:



State: In the setting the wired controller, if T4_ca2<T4_ca 1, then exchange their value; if SPTcc_SET1 < SPTcc_SET2, then exchange their value.