

Hisense

Operation Installation & Maintenance Manual

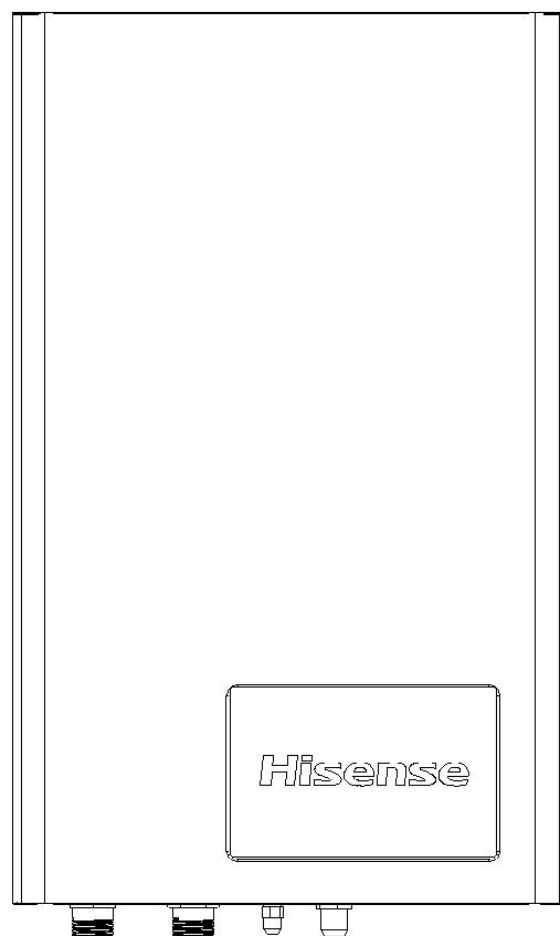
MULTIFUNCTIONAL MULTI-SPLIT
AIR CONDITIONER

- WATER MODULE -

Water Module
AFM-54EX4SA

IMPORTANT:

*READ AND UNDERSTAND
THIS MANUAL BEFORE
USING THIS HEAT-PUMP
AIR CONDITIONERS.
KEEP THIS MANUAL FOR
FUTURE REFERENCE.*



P00651Q

ORIGINAL INSTRUCTIONS

IMPORTANT NOTICE

- Hisense pursues a policy of continuing improvement in design and performance of products. The right is therefore reserved to vary specifications without notice.
- Hisense cannot anticipate every possible circumstance that might involve a potential hazard.
- This air conditioner is designed for several uses only, such as room cooling and heating, and domestic hot water in water tank.
- Do not use this water module for other purposes, such as drying clothes, refrigerating foods, or for other cooling or heating process.
- No part of this manual may be reproduced without written permission.
- Install water module in the indoor places, such as basement, balcony, equipment room and water closet etc.
- Do not install water module in following places that easily cause fire, mechanical deformation or failure.
 - *Where there is splashing oil (including engine oil).
 - *Where there are sulfurous gases (such as hot spring).
 - *Where there are flammable gases.
 - *Coastal places with salts, strong acids and alkali which are corrosive to the module.
 - *Where there is splashing water.
- Pay attention to the following points when the unit is installed in hospital or other facilities where there are strong electromagnetic waves from medical equipment.
 - *Do not install the unit where the electromagnetic wave is directly radiated to the electrical box, wiring, remote controller and adapter.
 - *At least 3 meters from strong electromagnetic wave radiators, such as radio equipment.
- Installation and service must conform to local standards, laws and regulations.
- Signal words (DANGER, WARNING and CAUTION) are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

DANGER

: Immediate hazards which WILL result in severe personal injury or death.

WARNING

: Hazards or unsafe practices which COULD result in severe personal injury or death.

CAUTION

: Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.

NOTE

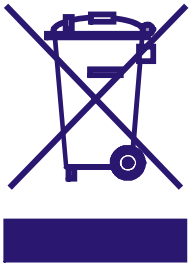
: Useful information for operation and/or maintenance.

- If you have any questions, contact your dealer or service center of Hisense
- Water module must be installed indoors and designed for the temperatures in the table below. Use it in this temperature range.

Temperature		(°C)	
		Minimum	Maximum
Water Module	Indoor	0	35
	Temperature of Supplied Hot Water	20	35

This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

IMPORTANT NOTICE



Correct Disposal of this product

This marking indicates that this product should not be disposed with other household wastes. 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.

CHECKING PRODUCT RECEIVED

- Upon receiving this product, inspect it for any shipping damage. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct.

The standard utilization of the unit shall be explained in these instructions.

Therefore, the utilization of the unit other than those indicated in these instructions is not recommended.

Please contact your local agent, as the occasion arises.

Hisense's liability shall not cover defects arising from the alteration performed by a customer without Hisense's consent in a written form.

TABLE OF CONTENTS

Part I. Water Module Operation Manual

1. Safety Summary	1
2. Introduction	2
3. Wire Remote Controller	4
4. Before Running	6
5. Run Modes	6
5.1 Starting Operation Steps	6
5.1.1 Standard Time Setting	6
5.1.2 Heating	7
5.1.3 Miscellaneous Running	11
5.1.4 Timer Operations	13
5.1.5 7-Day Timing Operations	13
5.1.6 In-situ Settings	16
5.2 Stop Operation	19
5.3 Other Indications	19
5.4 Check	19
5.4.1 Check Mode 1	19
5.4.2 Check Mode 2	21
6. Automatic Control	22
7. Trouble Shooting	22
7.1 If Problems Not Solved	22
7.2 Water Module Not Running	22
7.3 Heating Capacity Insufficient	22
7.4 Solution of Non-failures	22
7.5 Solution of Failures	22

Part II. Water Module Installation and Maintenance Manual

1. Introduction	24
2. Special Precautions	24
3. Introduction to the Machine	24
3.1 General	24
3.2 Examples of Application	24
4. Necessary Tools and Instrument List for Installation	26
5. Transportation and Handling	26
5.1 Transportation	26
5.2 Handling	26
6. Introduction to Water Module	27
6.1 Accessories and Optional Parts	27
6.2 Main Parts of Water Module	28
6.3 System Cycle Diagram	29
7. Installation of Water Module	30
7.1 Initial Check	30
7.2 Install Water Module	31

TABLE OF CONTENTS

7.2.1 Inspect and Open Water Module	31
7.2.2 Install Water Module.....	32
8. Refrigerant and Water Pipe	33
8.1 Refrigerant Pipeline and Tubing	33
8.2 Connect Refrigerant Pipeline	33
8.3 Connect Water Pipeline	33
9. Water Circulation	35
9.1 Check Water Circulation	35
9.2 Check Water Capacity and Initial Pressure of Expansion Tank	35
9.3 Adjust Initial Pressure of Expansion Tank	37
9.4 Inject Water.....	37
10. Wiring	37
10.1 General Check.....	38
10.2 Wiring	39
11. Install Electric Three-way Valve	43
12. Installation of External Water Pump	44
13. Setting of DIP Switch.....	45
14. Test Run	46
14.1 Check Before Test Run	46
14.2 Energize Water Module	47
14.3 On-site Setting.....	47
14.4 Test Run and Final Check	47
14.5 Floor Dry Running	51
15. Maintenance and Repair	51
Part III Manual of Domestic Water Tank	
1. Introduction.....	52
1.1 Comprehensive Information.....	52
1.2 Scope.....	52
2. Accessories	52
3. Water Tank Installation.....	52
3.1 Main Parts.....	53
3.2 Safety Device.....	54
3.3 Installation Guide	54
3.4 Install Water Tank.....	54
3.5 Connect Water Module	54
3.6 On- Site Wiring.....	55
3.7 Power Line Requirements	55
3.8 Temperature Sensor Wiring Diagram	55
3.9 Water Tank Power Line and Temperature Switch Wiring Diagram	55
3.10 Water Tank Pipeline Connection	56
3.11 Pipeline Requirements.....	56
3.12 Discharge Water	56
3.13 Maintenance and Repair.....	57
3.14 Troubleshooting	57
3.15 Technical Specification.....	57

Part I. Water Module Operation Manual

1. Safety Summary

DANGER

- Do not perform installation work, refrigerant piping work, water piping work and electrical wiring connection without referring to the installation manual,. If the instructions are not followed, it may result in water leakage, electric shock or fire.
- Do not charge oxygen, acetylene or other flammable and poisonous gases into the refrigerant cycle when performing leakage test or air-tight test. These types of gases are extremely dangerous and can cause an explosion. It is recommended that compressed air, nitrogen or refrigerant be used for these types of tests.
- Do not pour water into water module. These products are equipped with electrical parts. If poured, it will cause a serious electrical shock.
- Do not open the service cover or electrical box for water module without turning OFF the main power supply.
- Do not touch or adjust safety devices inside the units. If these devices are touched or readjusted, it may cause serious accident.
- Refrigerant leakage can cause difficulty with breathing due to insufficient air. Turn OFF the main switch, extinguish any naked flames and contact your local dealer, if refrigerant leakage occurs.
- Air-tight test
The refrigerant (fluorocarbon) for the units is nonflammable, nonpoisonous and inodorous. Leaked refrigerant meeting naked flame can generate poisonous gases. The refrigerant gas is heavier than air. If there is full of refrigerant gas near ground, it may cause asphyxia.
- The tion and operational system shall secure safety against refrigerant leakage according to local regulations and standards.
- Use an ELB (Electrical Leakage Breaker) with medium sensing speed or above, with the acting time 0.1s or less. If not used, it will cause an electric shock or a fire
- Connect refrigerant piping securely before the compressor starts running. The refrigerant piping for repair should only be moved, handled and removed after compressor stops.
- Do not short circuit the protective devices when the unit is running. If so, it may result in serious accident such as fire.

WARNING

- Do not use sprays, such as insecticide, lacquer, hair spray or other flammable gases. within approximately one (1) meter from the units.
- If circuit breaker or fuse is often activated, stop system and contact your local dealer.
- Check that the ground wire is securely connected. If the unit isn't correctly grounded, it leads to electric shock. Do not connect the ground wiring to gas piping, tap water piping, lightning conductor or ground wiring for telephone.
- Connect a fuse of specified capacity.
- Before performing any brazing work, check to ensure that there is no flammable material around. When using refrigerant, be sure to wear leather gloves to prevent cold injuries.
- Protect the wires, electrical parts, etc. from rats or other small animals. If not protected rats may gnaw at unprotected parts and which could lead to a fire.
- Use specified cable between units. If not it may lead to electrical failure or a fire.
- Fix the cables securely and ensure that the terminals are tightened by the specified torque. External forces on the terminals could lead to loosening and a fire or electrical failure.
- Install the wall-hung part of water module on a place firm enough indoor. If not, water module may drop and cause personal injury or machine damage.
- Water pump sound of water module and refrigerant flow sound should be taken into account while selecting installation position.
- Do not install water module below freezing point.
- Install water module where the wire controller can easily operate.
- Do not install the unit where there are oil, steam gas, organic solvent and corrosive gases (ammonia, sulfide and acid etc), because corrosion may cause refrigerant leakage, electrical failure, performance degradation and machine damage.
- Install specified accessories and parts. If not, it may cause water leakage, electric shock, fire or malfunctioning of water module.
- The installation manual and all relevant rules and criteria should be followed for the electrical installations. If not, it may lead to electrical failure or a fire due to insufficient capacity or nonconformance.

- 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.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The appliance shall be installed in accordance with national wiring regulations.

CAUTION

- Do not put any foreign material on the unit.
- Do not put additional materials in the unit.
- Provide a strong and correct foundation so that:
A. Water module is not on an incline.
B. Abnormal sound does not occur.
- Use the tap water and make sure that it is not hard water. If hard water is used, the plate type heat exchanger, electrical heating and various valves will have a decrease in their service life. Do not heat too hard underground water, spring water and well water. If so the service life of the product can't be guaranteed.
- Do not use galvanized parts in the water circuit because they may cause corrosion.
- Do not cut off power supply of water module when it is not used in winter. When shut down and certain conditions are met, the unit may automatically antifreeze.
- Circulating water must be drained if power cuts off when it is not used for a long period of time. If the circulating water is not drained, system will be damaged by freezing.
- If the time interval from commissioning to use by user is longer than one month, drain the circulating water in system.

- Do not install the water module, remote controller and cable within approximately 3 meters from strong electromagnetic wave radiators, such as medical equipment.
- Water module can't function normally under the following circumstances:
*The electric power of the power transformer for electricity supply is the same as that of water module.
*Power source of large power electrical equipment is too close to the power cord of water module.
Equipment: such as elevator, container crane, electrical railway rectifier, power inverter, electric arc furnace, electric furnace, large induction motor and large relay, which consume much electricity.

Under the above circumstances, due to rapid change in electric power consumption and switch action, power cord of water module will generate very large inductive surge voltage. Therefore, for protecting power supply to water module, before electrical installation, carefully examine the criteria and specification for field installation.

- The A-weighted emission sound pressure level at workstations is not exceeds 70dB(A).

2. Introduction

The air conditioner provides the functions of air conditioning cooling, heating, floor heating, and domestic hot water by air-refrigerant and refrigerant-water heat pump circulation. These functions are controlled by wire controller. (For the use of air conditioner, refer to the user's manual of outdoor unit and indoor unit of air conditioner).

The air conditioner can be used together with the floor heating circuit and domestic water tank.

2.1 Inspection Prior to Startup

- Ensure that the pressure on the water pressure gauge is above 0.1 MPa, the domestic water tank is full of water and the tap water inlet valve is opened.
- The outdoor unit, indoor unit and water module must be energized. If not, the air conditioner cannot start.

2.2 Precautions for Heat Recovery Running

- If a water tank is installed when cooling, the wire controller is used to set 5.1.6 In-situ Settings E8") heat recovery function as active, system will automatically enter heat recovery running state. Indoor unit refrigerates and uses the heat

produced during condensation to heat the hot water in the domestic water tank. But when there are only a few air conditioners for refrigerating, the recovered heat is few and the heating capacity of the water tank might be insufficient. The hot water heating capacity can be increased by adding running indoor units or closing all indoor units and starting the water tank heating.

- For heat recovery during cooling, when the water temperature rises in the water tank, the refrigerating capacity of indoor units may be decreased. If indoor units are kept from being affected, the upper limit of temperature in heat recovery can be set by 5.1.6 In-situ Settings "J8") or set heat recovery function as inactive (5.1.6 In-situ Settings "E8").
- If the seven-day timing sets the domestic water tank heating, heat recovery function should be set as inactive.
- For running in the refrigerating season, if heat recovery function is set as active, the lowest water temperature guarantee function of the water tank 5.1.6 In-situ Settings "F2") is recommended as inactive, because this may save electricity fee.

2.3 Precautions for Floor Heating

- In order to prevent damage by too rapid temperature rise, when the floor heating is first-time used, make the floor drying, see details in 5.1.2.2. At this moment, do not use indoor air conditioner for heating.
- Because the thermal inertia of water is large, when floor heating is started, room temperature may not rise quickly due to different in-situ installation conditions.

- When the outdoor environmental temperature is very low, or the load in the room is large and the electric heating of water module is set as active (5.1.6 In-situ Settings "d1"), system will automatically run and the electric heater of water module will produce additional heat. At the moment the unit energy consumption will increase. If the energy consumption is wished to be reduced, the electric heating of water module may be set as inactive, but the room temperature will not reach the set value.

2.4 Precautions for Domestic Hot Water Run

- Domestic hot water may be heated by heat pump and electric heating. When water temperature in the domestic water tank rises to a certain temperature, electric heating is used for heating. In view of electricity saving, the set temperature of domestic hot water should not be too high, at most 55°C. This can reduce the possibility of starting electric heating and save electricity fee.
- Use of wire controller can shut down electric heating for water tank (5.1.6 In-situ Settings "d8"), and hence hot water is heated by the heat pump. The electricity may be saved, but hot water heating will take a longer time and the highest temperature the water tank can be heated may be lower and possibly not reach the set temperature.
- Quick heating can satisfy emergent use of domestic hot water and reduce the heating time. However, if indoor air conditioner is heating and user selects quick heating, the unit heating takes precedence over heating by indoor air conditioner. Therefore, for quick heating, manually shut down indoor air conditioner heating.
- Wire controller is used to set the lowest water temperature guarantee function of water tank (5.1.6 In-situ Settings "E3" and "F2") and maintain the water temperature in water tank above the set lowest temperature (5.1.6 In-situ Settings "F5").
- Domestic water tank should be set pursuant to its capacity. If the capacity of water storage tank is large, it is necessary to prolong the seven-day set time period or advance the starting time of electric heating for water tank (5.1.6 In-situ Settings "J7").
- If the seven-day timing is set for domestic hot water, do not use it when the air conditioner is being used.

2.5 Precautions for simultaneous running

- If air conditioner heating simultaneously runs with floor heating or domestic hot water, because the outdoor unit has a fixed heating capacity, the heating effect of air conditioner and water module heating is not as good as heating solely by air conditioner or by water module. Simultaneous running is not recommended.

- For simultaneous running of air conditioner heating and floor heating, or air conditioner heating and domestic hot water tank heating, the air conditioner heating takes precedence in system.
- During simultaneous running, if the heating capacity by domestic hot water tank or floor heating is insufficient, the electric heating of water tank or water module will be automatically started to generate additional heat (when the electric heating setting is active in the in-situ settings), but this may cause increase of energy consumption, and all indoor units of air conditioner may be shut down to reduce energy consumption.

2.6 Precautions for Test Run

- During cooling test run, the unit will not proceed to heat recovery running.
- If the hot water heating by water module is started when indoor unit of air conditioner is heating test run, it will turn to simultaneous heating by indoor unit and water module, so do not start water module for heating hot water during heating test run.

2.7 Other Precautions

- If machine is stopped for a long period of time in winter, drain out water in water module and water pipes to prevent freezing.
- When hot water heating by water module is running, the wire controller of indoor unit is used to start the cooling. If the air conditioner priority setting (5.1.6 In-situ Settings "J3") is active, the hot water heating will be stopped and turned to the air conditioner cooling; if the air conditioner priority setting is inactive, the heating continues. If indoor unit is cooling and the hot water heating by water module is started by the wire controller, cooling continues; if the hot water heating is wished to be immediately active, manually stop cooling by indoor unit.
- If outdoor unit fails, wire controller is used to set emergent mode (5.1.6 In-situ Settings "G4"). At the floor heating mode, the electric heating only by water module can provide heat; at the domestic hot water mode, the electric heating by water tank may heat the water.
- When the air conditioner priority setting (5.1.6 In-situ Settings "J3") is inactive and water module is heating hot water, if wire remote controller of indoor unit is set to cooling or air blowing, cooling is not running, but air blowing is normally and hot air will be blown out. Then wire remote controller being set to cooling or air blowing is not recommended.

3. Wire Remote Controller (See Fig.3.1.)

The wire remote controller comprises two major parts. The upper part is LCD screen and the lower part includes functional keys.

Fig.3.1 indicates the LCD displays and operation keys of water module.

CAUTION

Press keys only by finger and use of other objects may damage the keys. Do not touch "CHECK" key because it is only intended for technical service personnel. If press this key by accident, press again to recover.

• Temperature setting

Press "Temperature Adjustment" key once, the set outlet water temperature will increase or decrease 1°C. During floor heating, the lowest set temperature is 20°C and the highest set temperature is 55°C; during domestic hot water running, the lowest set temperature is 35°C and the highest set temperature is 75°C.

• Set temperature and actual temperature

"Set Temperature" is the target outlet water temperature of water module. Due to error of outlet water temperature sensor, the measured temperature may have a deviation from the actual temperature.

• Contact keys

The keys on the remote controller are contact type which only needs being pressed by finger. The running status may be confirmed on the LCD screen.

• LCD indications disappear

If all indications disappear during system running, this is because of communication signal distortion by electromagnetic interference. In this case, cut of the power and energize again, the communication failure may be eliminated.

• External mounting of wire remote controller

If water module is installed at a position inconvenient for operation, remove the wire remote controller, power off and then use the shielded twisted pair to lead out and mount. The wiring path should not cause short circuit or circuit break of communication lines. The longest leading-out line is 500 meters long.

NOTE

For convenience of understanding, Fig.3.1 shows anything that can be displayed. In normal running, only part of icons will display on the LCD screen.

CAUTION

Although the LCD display includes the icons of swimming pool water, fan coil, boiler and solar energy etc., this water module does not have these functions.

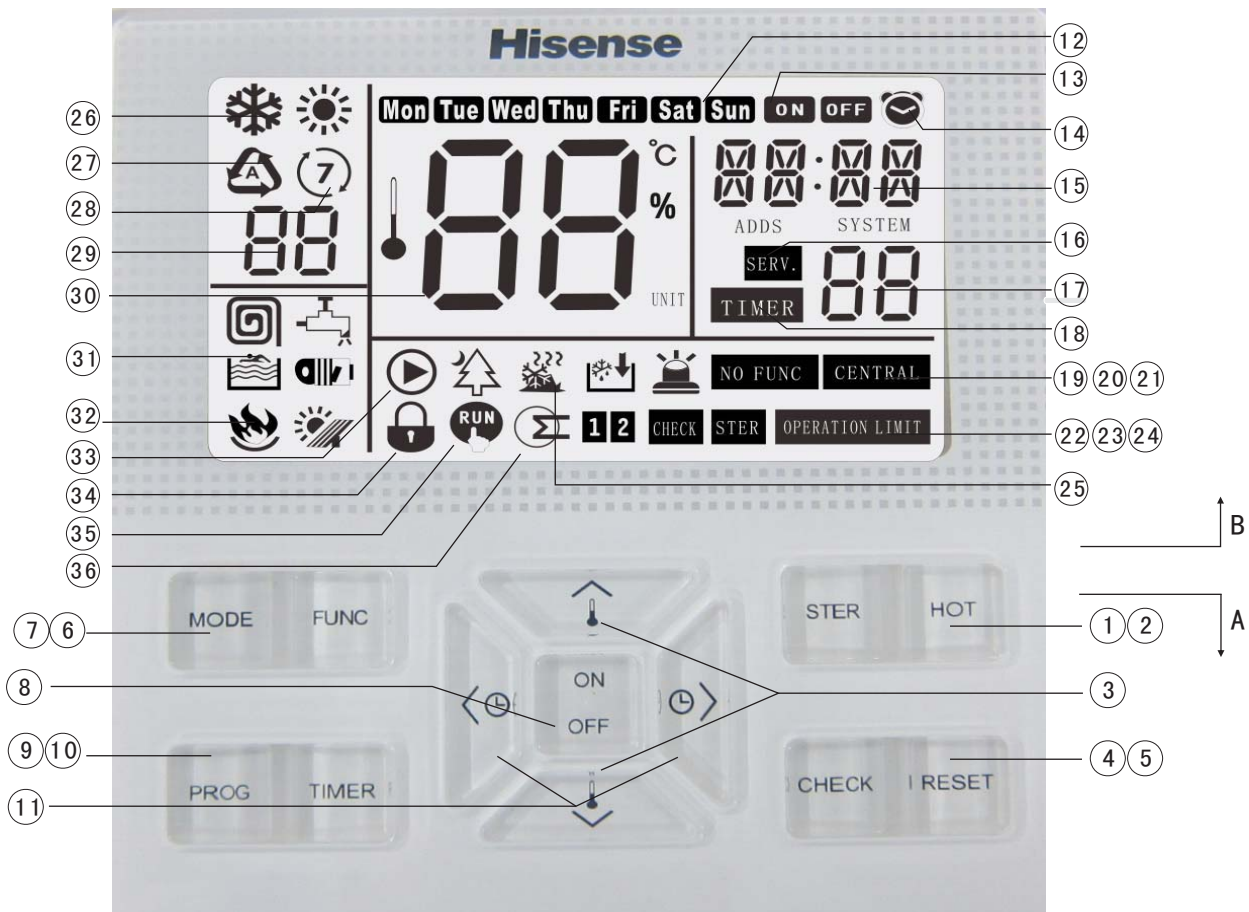


Fig.3.1 Wire Remote Controller

A. Operation Keys

- ① STER (Sterilization)
- ② HOT (Domestic Hot Water)
- ③ Temperature Setting
- ④ CHECK
- ⑤ RESET
- ⑥ FUNC (Function Selection)
- ⑦ MODE (Run Mode Selection)
- ⑧ "ON/OFF" (LED lamp)
- ⑨ PROG (Time Schedule)
- ⑩ TIMER
- ⑪ Time Setting

B. LCD Displays

- ⑫ Date
- ⑬ System ON/OFF **ON** / **OFF**
- ⑭ Clock
- ⑮ Time
- ⑯ " **SERV.** " Service
- ⑰ Service Code
- ⑱ " **TIMER** " Timer Timing
- ⑲ Alarm Icon
- ⑳ " **NO FUNC** Function Not Available"
- ㉑ " **CENTRAL** Centralized Control"
- ㉒ " **CHECK** CHECK "
- ㉓ " **STER** Sterilization"
- ㉔ " **OPERATION LIMIT** Run Restricted"
- ㉕ Defrosting /Automatic Antifreezing
- ㉖ Cooling /Heating Run Mode
- ㉗ Automatic
- ㉘ 7-Day Timing Mode
- ㉙ Temperature Code
- ㉚ Set Temperature
- ㉛ Floor Heating /Domestic Hot Water /Swimming Pool Water / Fan Coil
- ㉜ Boiler / Solar Energy
- ㉝ Water Pump Run / Energy Saving
- ㉞ Locked
- ㉟ Test Run
- ㊱ Electric Heater

4. Before Running

⚠ CAUTION

- The machine not used for a long time should energize over 12 hours before starting. Do not start it immediately after power on, so as to prevent damage of compressor because the lubricating oil is not sufficiently preheated.
- Check whether the outdoor unit is covered by snow. If so, remove the snow by lukewarm water lower than 50°C to prevent damage to plastic parts.
- Do not cut off power supply of water module even if not in use. If it will not be used for long, drain out circulating water in system. If the power is cut off without draining out circulating water, system will be damaged because of water freezing.
- Domestic hot water function is an optional function that needs setting (5.1.6 In-situ Settings “d3”) in the in-situ settings.
- These functions can be used only after being set in the in-situ settings, such as heat recovery function 5.1.6 In-situ Settings “E8”, sterilization function 5.1.6 In-situ Settings “C7”, automatic adjustment function of floor heating outlet water temperature 5.1.6 In-situ Settings “b9”.
- “Floor Drying” must be run before floor heating in each heating season, or else the temperature rises too quickly and it may damage the floor without preheating, see details in 5.1.2.2.

5.1 Starting Operation Steps

5.1.1 Standard Time Setting

Step 1

Power on, four straight lines and the default state of wire remote controller will appear on the LCD screen. The function run previously may also appear.



Step 2

Press the timing key ⑩ for 3 seconds and go to the standard time setting. The current day in this week and the current time are flashing. Press the temperature adjustment key ③ to adjust the day in the week. Press right or left key of time setting ⑪ to adjust the time; and press once, minute increases or decreases 1; press it long, the minute increases or decreases 10. Press the time schedule key ⑨ to quit from the standard time setting, or without operation for continuous 15 seconds, it quits from the standard time setting.

5. Run Modes



NOTE

Time setting must be conducted at the standby state. It is unable to set the time after starting.

5.1.2 Heating

NOTE

- After the main power supply on, restart the machine and the previously set functions will appear on the LCD screen.
 - Heating functions comprise: floor heating , water tank heating .
 - Heating functions must be selected according to actually mounted terminals. If the terminals aren't mounted, set in the in-situ settings (5.1.6 In-situ Settings "d3", "d4").
-

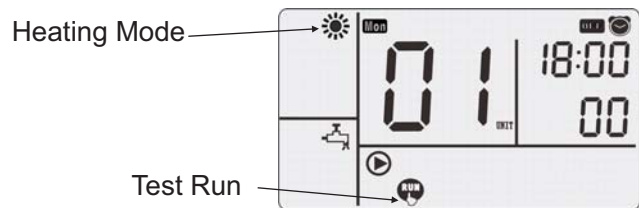
5.1.2.1 Hot Water Test Run

CAUTION

- Hot water test run should be carried out (default as 2 hours) after the equipment is installed (see details in the installation manual) and the in-situ setting operation steps.
 - Test run should be selected according to actually mounted terminals. During test run period, all corresponding terminals must be test run, including floor heating and domestic hot water tank etc.
-

Step 1

At the standby state, press simultaneously the mode key ⑦ and the CHECK key ④ for 3 seconds, and start the hot water test run function, seen below:

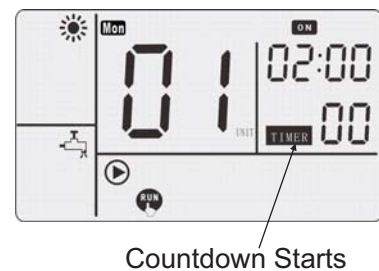


Step 2

Press the function key ⑥, switch to the floor heating or domestic water tank function.

Step 3

Press the ON/ OFF ⑧, the LED lamp on, and the machine begins running, meanwhile 2 hours' countdown starts.



Step 4

Countdown ends and quit from the hot water test run.

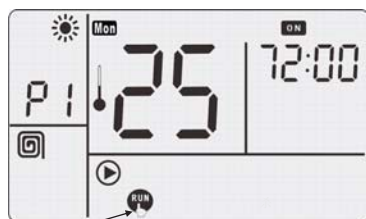
NOTE

- Press the time setting key ⑪ to adjust the time; press right key once to add 30 minutes, and press left key to minus 30 minutes, and the default time is 2 hours.
 - The default set temperature for test run is 55°C (target value of outlet water temperature), without the need of manual temperature setting.
 - Test run is counting down and the clock minuses once every 30 minutes. After countdown, it automatically quit from test run.
 - Test run is used for machine commissioning and ensures normal running of refrigerant system and water system. After normal running, press ON/OFF key ⑧ to quit from the hot water test run in advance.
-

5.1.2.2 Floor Drying

Step 1

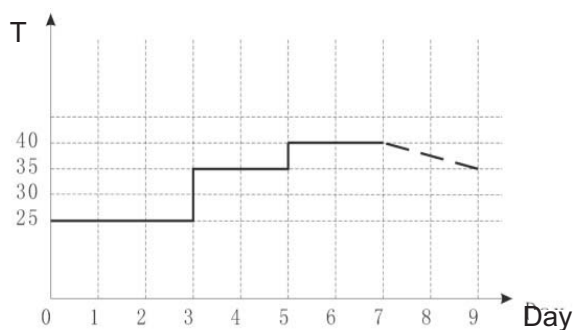
At the standby state, press simultaneously the reset key ⑤ and the hot water key ② for 3 seconds, go to floor drying.



Test Run
flashes at 1 Hz

Step 2

Heating for 7 days at this mode, and the outlet water temperature automatically follow the requirements.



- Outlet water temperature is set as 25°C running for 72 hours
- Outlet water temperature is set as 35°C running for 48 hours
- Outlet water temperature is set as 40°C running for 48 hours

Step 3

After the floor drying runs for 7 days, the outlet water temperature of water module returns to the set value. If there isn't a set value, it returns to the default value.

CAUTION

- Before each heating season, user must run the floor heating to prevent damage to the floor by the very quick temperature rise.
- Water must be replenished in the water system (reconfirm that the vent valve is open) before floor heating, and confirm that the water pressure is within a normal range.
- At the floor drying mode, the wire controller only responds to the startup/shutdown requests, but not to other modes, functions and temperature adjustment etc.
- 7 days are the accumulated time for floor drying. If the machine is shutdown halfway, after startup next time, it will continue the floor drying. The run icon flashes at 1 Hz.
- If instantaneous power failure occurs while running, it continues floor drying after power connection. In case of power on after long-time power off, it goes to the off state of floor drying. Press the ON/OFF key ⑧, go to the floor drying again (running time accumulates for 7 days).

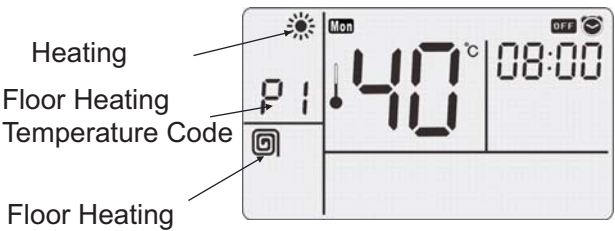
CAUTION

Floor drying can quit in advance, and press simultaneously the reset key ⑤ and the hot water key ② for 3 seconds, quit from the floor drying in advance. Be careful, quitting from the floor drying in advance may cause damage to the user's floor.

5.1.2.3 Floor heating

Step 1

Power on, the default state of wire remote controller will, and previously running function may appear on the LCD screen. According to the actually mounted terminals, refer to “5.1.6 In-situ Settings” for the settings; press the function key ⑥, floor heating appears on the LCD screen; continuously press the function key ⑥, the icon will change between floor heating  and water tank  until the floor heating is selected.

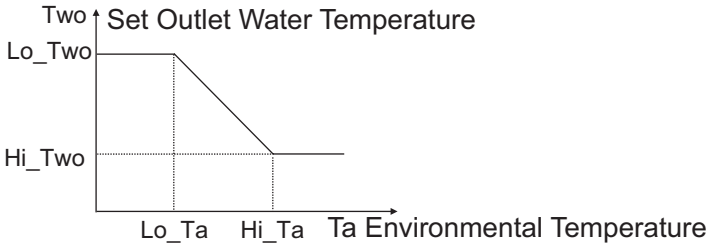


Step 2

If the outlet water set temperature is increased, press “^” of the temperature setting key ③; if it is reduced, press “v”. For heating, the highest outlet water set temperature is 55°C, and the lowest set temperature is 20°C.

NOTE

- In the in-situ settings of the wire controller, it may also set the automatic regulation mode of outlet water temperature. After setting, the outlet water temperature can be automatically regulated according to change in outdoor environmental temperature (OTC), see details in “5.1.6 In-situ Settings”. The settings include automatic regulation function active/inactive (“b9”), beginning and ending time each day (“C1” “C2”), lowest and highest environmental temperatures (“C3”, “C4”) and the set water temperatures corresponding to the highest and lowest environmental temperatures (“C5”, “C6”).
- OTC (outlet temperature control) function. Under this function, system outlet water temperature will be automatically controlled between Lo_Ta and Hi_Ta according to change in the environmental temperature. See the details about temperature control below.



Lo_Two Low Environmental Temperature Set Value (C5)

Hi_Two High Environmental Temperature Set Value (C6)

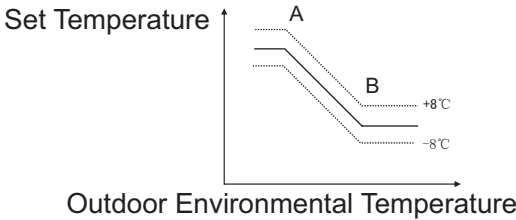
Lo_Ta Low Environmental Temperature (C3)

Hi_Ta High Environmental Temperature (C4)

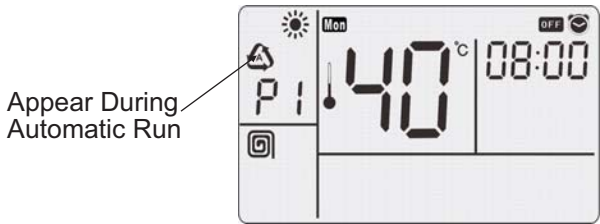
Two Set Outlet Water Temperature

Ta Outdoor Environmental Temperature

- When the machine is at the automatic outlet water temperature control state, the set outlet water temperature is automatically calculated by the wire controller. User may adjust $\pm 8^{\circ}\text{C}$ based on the calculation result, but if the adjusting range exceeds the upper and lower limits of temperature settings, the upper and lower limits should prevail.

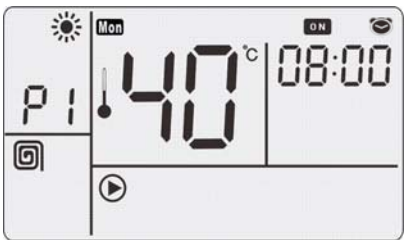


- When OTC starts, the automatic run icon will display to indicate the OTC function. After the timing ends, automatic run icon will disappear.



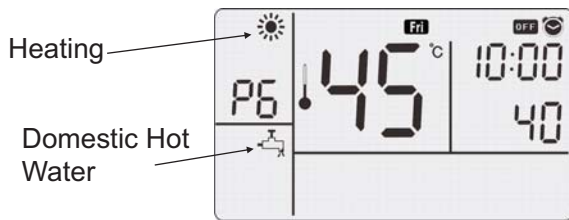
Step 3

Press the ON/OFF key ⑧, the LED lamp on, and the machine begins running.



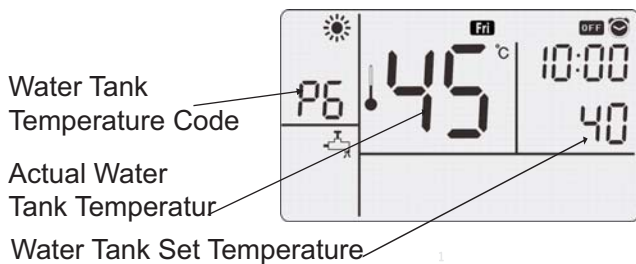
5.1.2.4 Domestic Hot Water Running Step 1

Power on, the default state of wire remote controller will, and previously running function may appear on the LCD screen. According to the actual mounting (refer to 5.1.6 In-situ Settings “d3”), press function key ⑥ to show domestic hot water ; continuously press function key ⑥ to shift the icon between floor heating and domestic hot water until the domestic hot water is selected.



Step 2

To increase water tank temperature, press “^” of the temperature setting key ③; if it is reduced, press “v”. For domestic hot water, the highest outlet water set temperature is 75°C, and the lowest set temperature is 35°C.



Step 3

Press ON/OFF key ⑧, the LED lamp on, and the machine begins running.

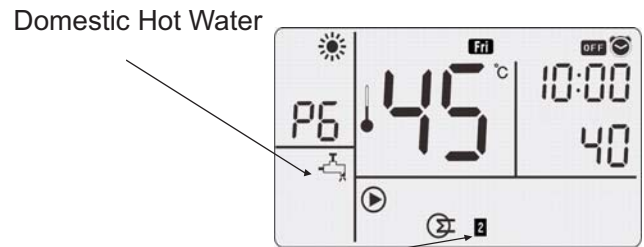


5.1.2.5 Powerful Water Storage Running Step 1

Before powerful water storage, go to “5.1.6 In-situ Settings”, set the set temperature for powerful water storage. of water tank (“F6”), and also set the “Electric Heating of Water Tank” (“d8”) as active.

Step 2

At the standby state, press the hot water key ② for 3 seconds, and go to powerful water storage.



Electric Heater of Water Tank

Step 3

After going to powerful water storage, the domestic hot water- and electric heater ③ at 1 Hz. This means powerful water storage is running.

Step 4

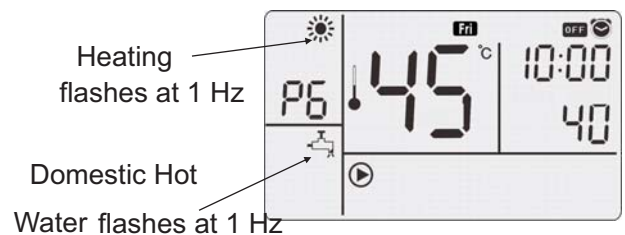
After powerful water storage starts, under the following 3 conditions, quit from the powerful water storage.

- (1) At powerful water storage mode, press the hot water key ② for 3 seconds.
- (2) When the water tank temperature reaches the set water temperature for powerful water storage (5.1.6 In-situ Settings “F6”).
- (3) Press ON/OFF key ⑧, the machine stops running.

5.1.2.6 Heat Recovery

Step 1

At the standby state, set “Heat Recovery” function as active (5.1.6 In-situ Settings “E8=1”) and the domestic water tank mode active (5.1.6 In-situ Settings “d3=1”). At the indoor air conditioner cooling mode, it automatically turns to heat recovery function.



Step 2

After going to heat recovery, the wire controller maintains the original state, the heating icon and the domestic hot water icon flash at 1 Hz. This means the machine is at the state of heat recovery.

Step 3

After heat recovery starts, under the following conditions, quit from heat recovery run

- (1) All indoor units stop cooling and stand by.
- (2) The water tank temperature reaches the upper limit set for heat recovery (default upper limit of temperature is 40°C, 5.1.6 In-situ Settings "J8").

5.1.2.7 Sterilization

Step 1

2 methods for going to the sterilization:

Method 1: Automatic run each week

Before sterilization, go to 5.1.6 In-situ Settings "C7" and activate "Sterilization" and set as follows

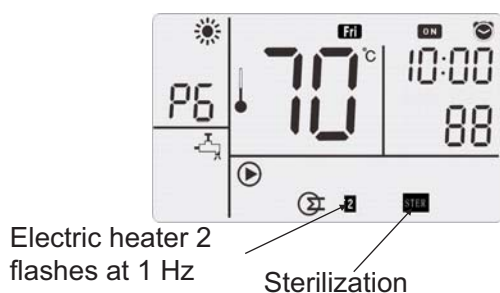
- (1) Beginning time ("C8").
- (2) On which day of each week ("C9").
- (3) Continuous running time ("CA").
- (4) Highest temperature default as 70°C ("Cb").

After setting, the machine sterilize once each week, without the need of manual operation.

Method 2: Manual operation

At the standby state, press the sterilization key

① for 3 seconds, and go to sterilization.



Step 2

After going to sterilization function, sterilization icon ②③ lights up, electric heating of water tank starts, electric heating icon ②④ flashes at 1 Hz. This means high temperature sterilization is running.

Step 3

After sterilization starts, by different ways of going to sterilization function, there are 2 ways of quitting.

Method 1: Automatic quit

Heat the water in the water tank to the set temperature for sterilization (5.1.6 In-situ Settings "Cb" set value) and maintain the set time (5.1.6 In-situ Settings "CA" set value), and then automatically quit from sterilization.

Method 2: Manual quit

- (1) Press the sterilization key ① for 3 seconds under "Sterilization" function.
- (2) Press the ON/OFF key ⑧, the machine stops running.

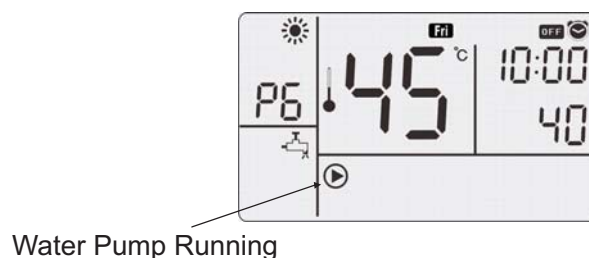
NOTE

Either automatically or manually entered into the sterilization, after reaching the automatic quit will automatically quit, it can manually quit.

5.1.3 Miscellaneous Running

5.1.3.1 Water Pump Anticorrosion Running

- When the machine is not used for long, to prevent rusting of circulating parts of water pump, the machine automatically starts water pump at a fixed time interval.
- Conditions for startup
At the standby state, the automatic startup is already set during ex factory. This function may be stopped, but it is not recommended to stop (5.1.6 In-situ Settings "G1").



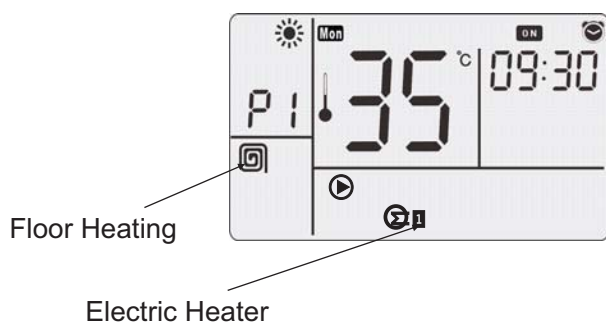
- The default time for automatic running of anticorrosion is 0:00 (5.1.6 In-situ Settings "G2") of each Saturday (5.1.6 In-situ Settings "G3"). Anticorrosion continues for 1 minute and then automatically quit to shutdown state.
- After anticorrosion is started, under the following 3 conditions, quit from the water pump anticorrosion
 - (1) Running time is 1 minute.
 - (2) Timed function starts.
 - (3) With manual operation for interference.

5.1.3.2 Emergency Mode

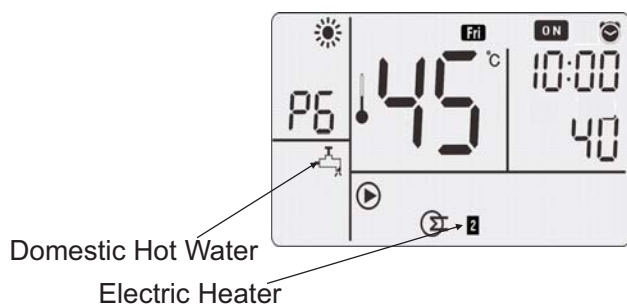
CAUTION

Emergency mode is an emergent work mode using the electrical heating to produce heat, for meeting the heating need of user and after setting as the emergency mode by 5.1.6 In-situ Settings “G4=1”, during the maintenance period of outdoor unit when it fails to work. According to work mode and state, when the electric heating work at this state, the electric heating icon ③ or ④ flashes at 1s.

- When the floor heating starts, the electric heating icon ③ flashes at the frequency 1 Hz to remind the user of the outdoor unit's failure and that only electric heating functions



- When the domestic hot water function starts, the electric heater icon ④ flashes at the frequency 1 Hz to remind the user of the outdoor unit's failure and that only electric heater functions.



- At the emergency mode, press the ON/OFF key ⑧, the machine stops running.

CAUTION

After the outdoor unit is recovered to normal state, quit from the emergency mode (5.1.6 In-situ Settings “G4=0”).

5.1.3.3 One-key Lock

NOTE

- After system goes to one-key lock, stop time-related functions that can automatically start the machine, including 7-day timing, timer, sterilization, automatic water storage, and lowest water temperature guarantee.
- If the user leaves room long, start the one-key lock to avoid start of timing function of in-situ settings.

Step 1

Press the reset key ⑤ for 3 seconds, go to one-key lock and water module is directly shut down. The lock icon flashes at 1 Hz.



Step 2

Press the reset key ⑤ for 3 seconds, quit from the one-key lock, and water module is at the shutdown state. All timed functions before lock are cancelled. The user needs pressing the time schedule key ⑨ or timing key ⑩ to start needed timed functions.

CAUTION

Be cautious, the one-key lock function may cancel the set time schedules and timing function!

5.1.3.4 Lock of Wire Controller's Keyboard

Step 1

When the wire controller is energized, press “<” and “>” of the time setting key ⑪ for 3 seconds and go to the lock of wire controller's keyboard.



Step 2

Press “<” and “>” of the time setting key ⑪ for 3 seconds, and quit from the locked state.

NOTE

- After the keyboard of wire controller is locked, it will give no response to key acting and prevent wrong operation by children.
- Keyboard lock does not affect the run state of the machine.

5.1.4 Timer Operations

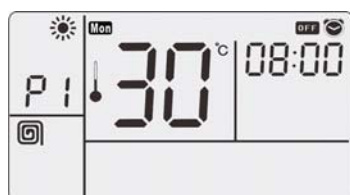
NOTE

- At the timed running state, system will run or stop at the set time.
- When the timing function is set, the timer setting after instantaneous power failure will maintain; after long-time power off, the timing function will be automatically cancelled.

5.1.4.1 Set Floor Heating Timer

Step 1

Power on, four straight lines will appear on the display screen. The function run previously may also appear.

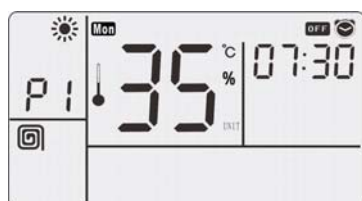


Step 2

Press the function selection key ⑥, and the floor heating icon appears on the LCD screen.

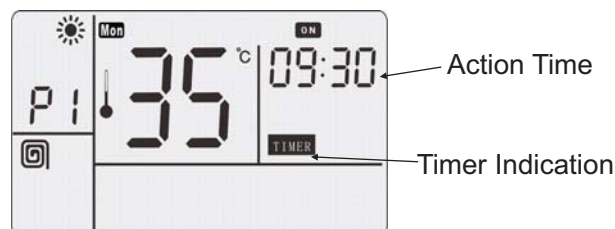
Step 3

Press “^” of the temperature control key ③ to increase the outlet water set temperature; press “v” to reduce it. For floor heating, the highest outlet water set temperature is 55°C and the lowest set temperature is 20°C.



Step 4

If press the timing key ⑩ at the stop state, the indications “ON” and “TIMER” will appear. If press the timing key ⑩ at the run state, the indications “OFF” and “TIMER” will appear.



Press “>” of the time setting key ⑪, the set time will increase; press “<” key, the set time will decrease. The set time may be between 30 minutes to 24 hours and adjusted at the interval of 30 minutes. At the timed run state, system will run or stop after the set time.

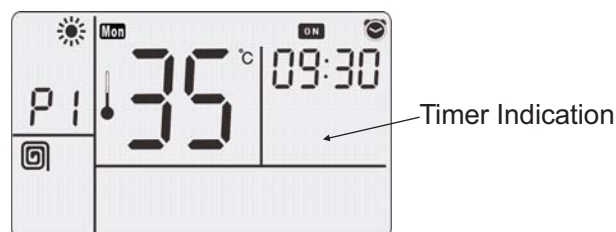
For example, if the set time is “09: 30 ”, the machine will run or stop 9.5 hours later.

5.1.4.2 Set Domestic Hot Water Timer

The domestic hot water timer has the same setting as the floor heating timer. Select the domestic hot water function, and operate as per Step 4 of 5.1.4.1.

5.1.4.3 Cancel Timing

Press the timing key ⑩ again, the timer indication disappears and the timing function is cancelled.



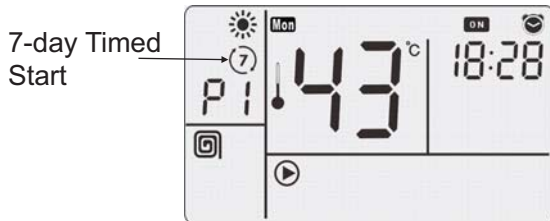
5.1.5 7-Day Timing Operations

5.1.5.1 Entry and Exit from 7-day Timing Mode

Press the time schedule key ⑨ to go to and quit from 7-day timed run mode. At the 7-day timed run mode, the machine starts and stops as scheduled procedures. At this mode, it is able to manually start/stop, adjust water temperature, change the running function and start the timer. If instantaneous power failure or long-time power cut occurs at 7-day timed run mode, after reenergizing, it still runs as per the requirement for 7-day timing. If two settings appear at the same time point, the later setting will prevail. During 7-day timing setting, the ON/OFF time points are not necessarily occur in pairs.

NOTE

After long-time power cut, reenergizing needs checking whether the data and time are correct. If the time needs being adjusted, refer to 5.1.1 standard time setting.

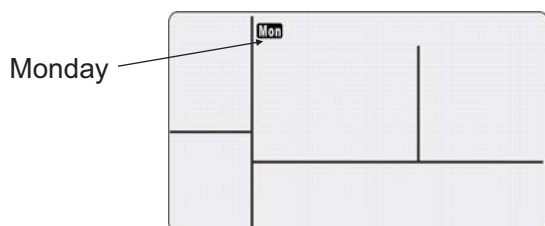


5.1.5.2 Schedule Setting

At the shutdown state (it can't turn to schedule setting when the machine is on), press the time schedule key ⑨ for 3 seconds, start or stop the schedule setting function. At this mode, through using 8 keys, time schedule key ⑨, ">", "<" of time setting key ⑪ ^, " ", "v" of temperature control key ③, cancel, sterilization key ①, run mode selection ⑦ and function selection ⑥, the timing function at 8 time periods each day can be realized and also set the functions and parameters such as outlet water temperature at each time period.

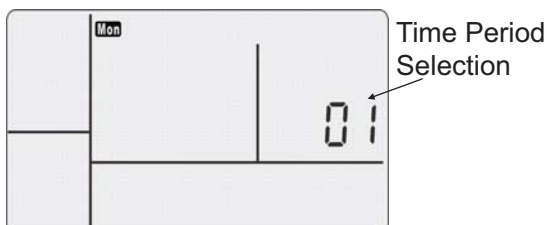
Step 1

Press the time schedule key ⑨ for 3 seconds, go to the setting of day in the week, and the icon "Mon" flashes. Through ^, "v" of the temperature control key ③, the day in the week is selected.



Step 2

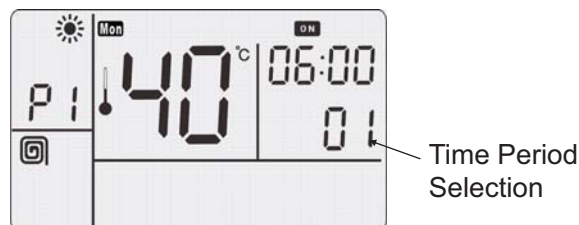
Press the time schedule key ⑨, go to the time period setting state each day. The time period [01] flashes at 1 Hz. Press ">", "<" of the time setting key ⑪, and selected the time periods to be set, from time period 1 to 8.



If the time period is not set and only the number of time periods is flashing, as shown above.

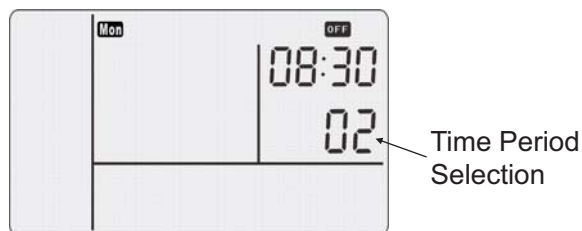
NOTE

- There are two indication states after time period is set.
- Type one: timed startup indication.



The time period above is 01. The machine starts at 6:00 in the morning of Monday for floor heating, the controlled outlet water temperature is 40°C, and floor heating code is P1.

- Type two: timed shut down indication.

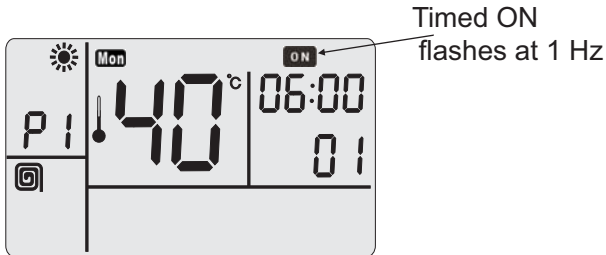


In the Fig. above, the time period for timing is 02, and the machine executes the order of shutdown at 8:30 in the morning of Monday.

Step 3

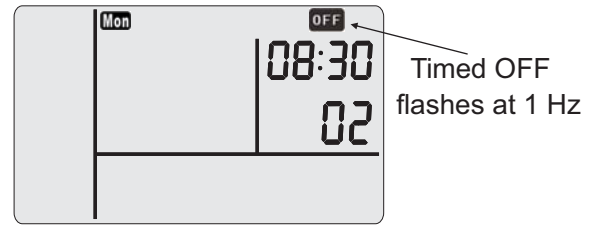
Press the time schedule key ⑨, and then through pressing ">", "<" of the time setting key ⑪, select the timed on ("ON" flashes at 1 Hz), timed off ("OFF" flashes at 1 Hz) and cancel timing ("ON / OFF" ON/OFF flash at

- (1) If the timed on (“ON” flashes at 1 Hz) is selected, press the time schedule key ⑨ to indicate the time, set mode, set function and target outlet water temperature of the timed startup. And the timed startup icon flashes at 1 Hz.



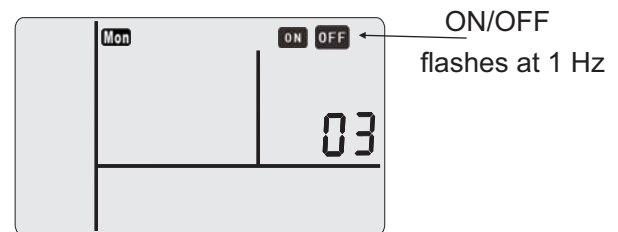
- (a) Press time schedule key ⑨, and go to time setting 06:00. Now press “>”, “<” of time setting key ⑪, clock increases or decreases by 15 minutes, and press “>”, “<” for long, clock increases or decreases by 1 hour.
- (b) Press time schedule key ⑨, and go to the mode setting. Now press “>”, “<” of time setting key ⑪ to select. Because this model only has the heating function, the cooling mode can not be selected.
- (c) Press time schedule key ⑨, and go to function selection setting. Now press “>”, “<” of time setting key ⑪, and according to actually mounted terminals, set by referring to “5.1.6 In-situ Settings”. The floor heating or domestic hot water function is selected, and P1 floor heating or P6 domestic hot water on the LCD screen will change according to the function selected.
- (d) Press time schedule key ⑨, and go to the temperature control. Through “^”, “v” of the temperature regulation key ③, the target temperature of water outlet is set. For floor heating, the lowest set temperature is 20°C and the highest set temperature is 55°C; for domestic hot water running, the lowest set temperature is 35°C and the highest set temperature is 75°C.

- (2) If the timed off (“OFF” flashes at 1 Hz) is selected, press the time schedule key ⑨ to indicate the time of the timed shutdown. And the timed shutdown icon flashes at 1 Hz.



Press the time schedule key ⑨, and go to time setting 08:30. Now press “>”, “<” of time setting key ⑪, clock increases or decreases by 15 minutes, and press “>”, “<” for long, clock increases or decreases by 1 hour.

- (3) If select the sterilization key ① to cancel timing (“ON OFF” ON/OFF flashes at 1 Hz), the LCD screen displays as follows



Press the time schedule key ⑨, cancel the timing for this time period and return to the time period selection state.

Step 4

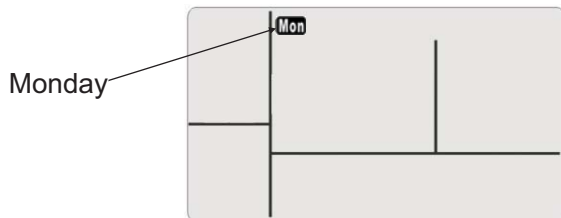
Return to the time period selection state, set other time periods. After the time periods for the date are set, press the sterilization key ① for canceling, and return to the week selection state. Implement the similar settings for other days in the week. At the selection state of day in the week, press the cancel key (sterilization key ①), and quit from the time schedule setting state.

NOTE

- At each kind of setting state, press the cancel key (sterilization key ①) to return the upper level setting state, and until quit from the time schedule setting.
- In a same day if the time settings for time periods are the same, the later settings should prevail and the previous settings will be automatically cancelled.

Step 5

When “**Tue**” flashes at 1 Hz, press the hot water key ② for 3s, copy the settings of the previous day (Monday) to the current day (Tuesday), and “**Tue**” is changed to be “**Wed**” and flashes at 1 Hz. If press the hot water key ② for 3s again, the settings may be copied from Tuesday to Wednesday. This function may copy the settings of the previous day. 7 days are finished in order, and the 7-day timing function can be quickly set.



Step 6

After setting, repeat Step 4 and quit from the time schedule setting. After all settings for the seven day timing, fill the details of settings in “13. Seven-Day Timed Running Schedule” for inquiry.

5.1.6 In-situ Settings

(functions of wire remote controller)

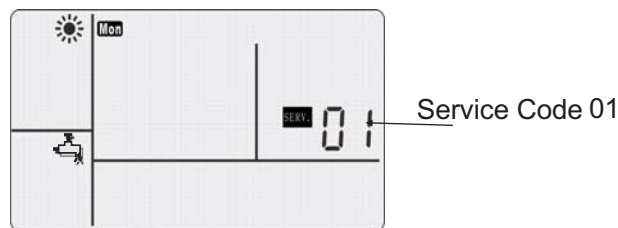
With the wire remote controller, the user can set different terminals in the in-situ settings according to the installation of terminals. Functional change of the wire remote controller can be selected only when this function is effective, see details in Step 4. User may select whether to start the floor heating outlet temperature control function (OTC), electric heater of water module, electric heater of water tank and the outdoor environmental temperature of electric heating.

NOTE

- When the machine is on, it is unable to go to the in-situ settings of wire remote controller.
- During selection of set mode, press “^”, “v” of the temperature regulation key ③, and select the cooling system number and address for in-situ settings. If system and address selection is unnecessary, follow the default settings of system.
- In the in-situ setting state, if no operations within 2 hours, wire remote controller automatically returns to the usual state.
- After going to the in-situ setting state, when it is reenergized after power cutoff, either instant or long-time, the wire remote controller will return to the usual state.

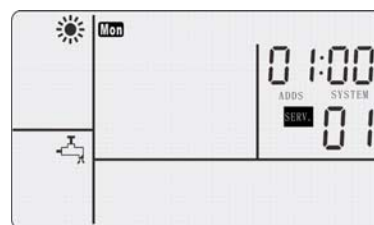
Step 1

At the OFF state, press simultaneously the CHECK key ④ and the reset key ⑤ for 3 seconds, and go to the in-situ settings. The service function number flashes at 1 Hz. The wire remote controller displays below.



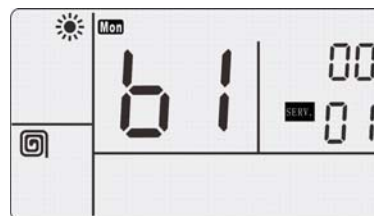
Step 2

Press CHECK key ④ on the interface above, and go to in-situ setting mode.



Step 3

Press the CHECK key ④ again and go to the in-situ function setting state.



Step 4

Press “>”, “<” of time setting key ⑪ to change the items to be set; press the sterilization key ① and the CHECK key ④ to change the set value. If these functions need being used, such as floor heating and domestic hot water of the wire remote controller, the floor heating is set as the default value as per the relevant options of in-situ settings and already set before ex-factory. Only this function is active, it may make selection, see details below.

Function	In-situ Setting
Floor Heating	d4
Domestic Hot Water	d3

Step 5

Continuously press “>”, “<” of the time setting key , and the user may check the set codes and content for ⑪ commonly used items of in-situ settings, see details below:

No.	Code	Settings	Default Value	Range	Minimum Adjusting Unit	Unit	Explanation to Functions	Remarks
1	b9	automatic temperature adjustment	inactive	inactive/active	/	/	OTC function inactive/active	00 inactive, 01 active
2	C1	beginning time of automatic temperature adjustment	23:00	0:00-23:00	1	h	beginning time of OTC	value indicates 24 hours per day
3	C2	ending time of automatic temperature adjustment	5:00	0:00-23:00	1	h	ending time of OTC	value indicates 24 hours per day
4	C3	low environmental temperature	-20	-20~5	1	°C	determine the OTC temperature curve	value indicates temperature range
5	C4	high environmental temperature	20	6~25	1	°C		value indicates temperature range
6	C5	set water temperature of low environmental temperature	44	20~55	1	°C		value indicates temperature range
7	C6	set water temperature of high environmental temperature	25	25~55	1	°C		value indicates temperature range
8	C7	sterilization selection	inactive	inactive/active	/	/	sterilization inactive/active	00 inactive, 01 active
9	C8	sterilization run time	0:00	0:00-23:00	1	h	beginning time of sterilization	value indicates 24 hours per day
10	C9	sterilization run date	06	01~07	1	day	default run time is each Saturday	value indicates 7 days per week
11	CA	sterilization lasting time	10	10~60	1	min	sterilization lasting time	value indicates range of minutes
12	Cb	sterilization temperature setting	70	50~70	1	°C	sterilization temperature	value indicates temperature range
13	d1	electric heating of water module	active	active/inactive	/	/	electric heating of water module active/inactive	00 inactive, 01 active
14	d3	domestic hot water (water tank mode)	inactive	inactive/active	/	/	water tank mode inactive/active	00 inactive, 01 active
15	d4	floor heating	active	active/inactive	/	/	floor heating active/inactive	00 inactive, 01 active
16	d8	electric heating of water tank	inactive	inactive/active	/	/		00 inactive, 01 active
17	d9	electric heating work mode of water tank	ordinary	ordinary/advanced	/	/	Advanced mode will increase frequency of using electric heating of water tank and accelerate water heating speed, but this will increase electricity consumption.	00 inactive, 01 active
18	E3	water tank lowest water temperature guarantee during floor heating	inactive	inactive/active	/	/	After the setting is active, during floor heating, start the electric heating of water tank and ensure that the water tank is not lower than the temperature set by F5.	00 inactive, 01 active
19	E8	heat recovery	inactive	inactive/active	/	/	When the domestic water tank is installed and the function is active, during air conditioner cooling, water module can conduct heat recovery running.	00 inactive, 01 active
20	E9	starting outdoor environmental temperature of electric heating of water module	4	-20~10	1	°C	the outdoor environmental temperature is higher than the set value, and electric heating of water module can't start.	value indicates temperature range
21	F2	lowest water temperature guarantee of water tank during standby	inactive	inactive/active	/	/	After the setting is active, the wire controller at off state can start the electric heating of water tank to keep the water tank is not lower than the temperature set by F5.	00 inactive, 01 active
22	F5	lowest water temperature guarantee of water tank	35	35~65	1	°C	When the lowest water temperature guarantee of water tank is active, the water tank temperature is lower than the set value, and start the electric heating to guarantee the water tank temperature.	value indicates temperature range
23	F6	water temperature set value of powerful water storage	45	35~75	1	°C	After power water storage is running and reaches the "water tank storage water temperature", system quits.	value indicates temperature range
24	F8	forced run of water pump	inactive	inactive/active	/	/	During commissioning, forced start the water pump for water pipe vents, or else the air in the circulating pipe can't be vented. After commissioning, set it as inactive again, or else the water pump will continuously run.	00 inactive, 01 active

No.	Code	Settings	Default Value	Range	Minimum Adjusting Unit	Unit	Explanation to Functions	Remarks
25	J1	use of water tank heat for defrosting	inactive	inactive/active	/	/	This function will shorten the defrosting time and improve defrosting effect, but it will reduce the water temperature in water tank.	00 inactive, 01 active
26	J2	standby time of water module electric heating	30	1~99	1	min	After the electric heating of water module satisfies the conditions, it needs being started with delayed time, for the purpose of preventing frequent startup by electric heating and reduce energy consumption.	value indicates range of minutes
27	J3	air conditioner priority	active	inactive/active	/	/	whether to activate the air conditioner priority function	00 inactive, 01 active
28	J6	water module electric heating during defrosting	inactive	inactive/active	/	/	This function can shorten the defrosting time but increase electricity consumption.	00 inactive, 01 active
29	J7	standby time of water tank electric heating	45	01~60	1	min	When the outdoor unit has insufficient capacity, the water tank electric heating needs delaying the set time for startup, for the purpose of preventing frequent starting and reducing energy consumption.	value indicates range of minutes
30	J8	upper limit of heat recovery water temperature	40	20~45	1	°C	When heat recovery is active and reaches the temperature, quit from water tank heat recovery	value indicates temperature range
31	G1	water pump anticorrosion	inactive	inactive/active	/	/	If not running long, start the water pump for short-time run to prevent rusting.	00 inactive, 01 active
32	G2	water pump anticorrosion running time	0:00	0: 00-23: 00	1	h	water pump anticorrosion startup time	value indicates 24 hours per day
33	G3	water pump anticorrosion running period	6	01~07	1	day	default run time is each Saturday	value indicates 7 days per week
34	G4	Emergency mode	inactive	inactive/active	/	/	When the outdoor unit fails to work, only the electric heating runs, but this may increase electricity consumption (for repair).	00 inactive, 01 active
35	G5	Use of floor heating for defrosting	inactive	inactive/active	/	/	This function can shorten the defrosting time and improve defrosting effect, but it will reduce the floor heating water temperature.	00 inactive, 01 active
36	G6	Longest continuous running time of water tank	60	02~20	10	m	The longest running time of heat pump under water tank mode.	set value × 10 = actual running minutes

Step 6

When the user makes the in-situ settings, some items that needn't being set may be wrongfully set. The following items must be the default value. Setting error may result in inability of normal run of water module.

No.	Code	Default Value	Remarks
1	b4	inactive	00 inactive, 01 active
2	b6	inactive	00 inactive, 01 active
3	b7	inactive	00 inactive, 01 active
4	d2	inactive	00 inactive, 01 active
5	E1	inactive	00 inactive, 01 active
6	E7	inactive	00 inactive, 01~03active
7	F3	inactive	00 inactive, 01~24active
8	F9	inactive	00 inactive, 01active
9	H2	inactive	00 inactive, 01active
10	H9	inactive	00 inactive , 01active
11	J4	inactive	00 inactive , 01active
12	J5	inactive	00 inactive , 01active

Step 7

Press the reset key ⑤, and quit from in-situ settings.

NOTE

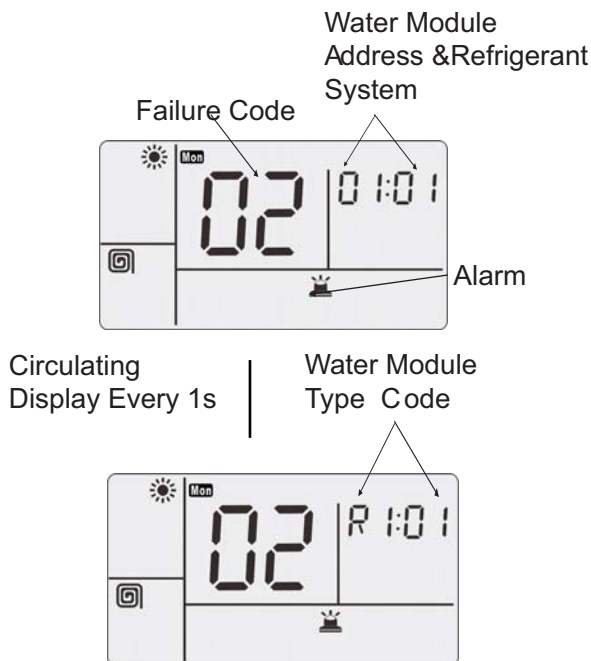
- When the lowest water temperature guarantee function is set as active, the electricity consumption will increase.
- This table does not contain all wire controller set functions. If functional setting not covered in the table is needed, consult local dealer.

5.2 Stop Operation

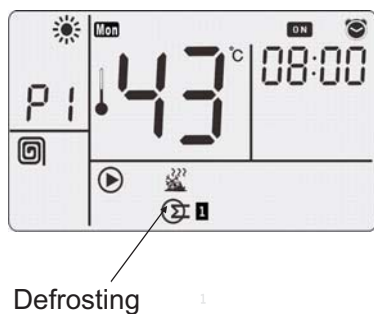
Press the ON/OFF key ⑧, system stops running, and the LED lamp will also be off.

5.3 Other Indications

- Abnormal “alarm” indication appears in case of abnormality
If the abnormal situations occur to protective device and “ON/OFF” indication lamp, the “alarm” icon will appear on the LCD screen. Then detect the cause of abnormality and make adjustment. Press the ON/OFF key ⑧ or reset key ⑤ once, the alarm on the wire remote controller is canceled. When the “alarm” appears on the LCD screen, the cause of abnormality and number of abnormal machine will appear on the temperature indication zone of the screen. In this case, consult your local dealer.



- “Defrosting” icon
When the heating turns to the defrosting, the “defrosting” icon appears on the screen.



- “Function Not Available” icon
The wire remote controller is a universal component. If any function not available for water module is operated, “Function Not Available” will display on the screen and flashes for 5 times.



5.4 CHECK

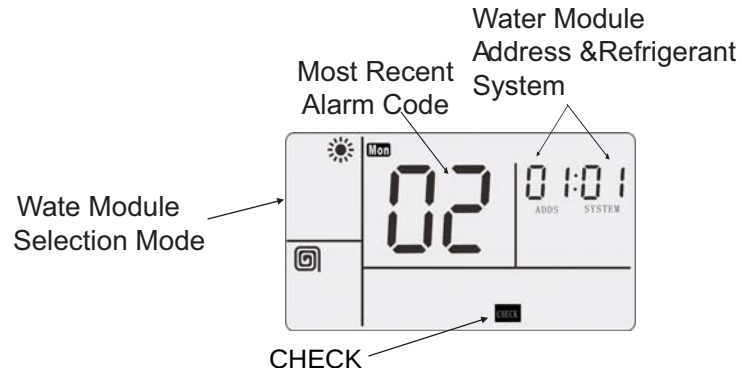
CHECK modes include [CHECK Mode 1] and [CHECK Mode 2]:

- CHECK Mode 1: It displays the sensor data updated every 30 seconds.
- CHECK Mode 2: It displays data prior to alarm and stored in EEPROM.

5.4.1 CHECK Mode 1

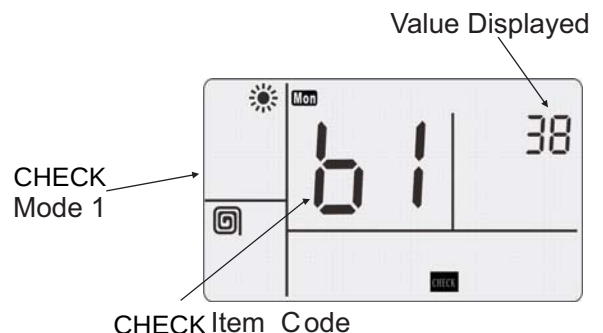
Step 1

Press the CHECK key ④ for 3 seconds and go to water module selection state of the CHECK mode.



Step 2

Press the CHECK key ④ or wait for 7 seconds, and go to the communication of [Required Data Format for CHECK 1], and to the data display state of the CHECK 1.

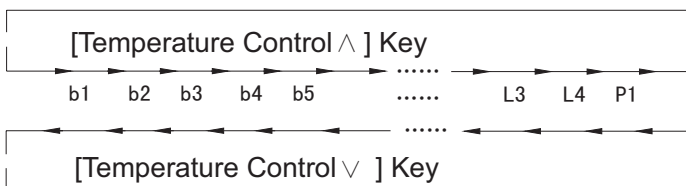


Step 3

Continuously press the temperature regulation key^③ “^”, “v”, and the circulating display of CHECK items are shown the right. The set temperature display area displays Check item code.

[Temperature Control] Key.

See the table below for “CHECK Mode 1” data.



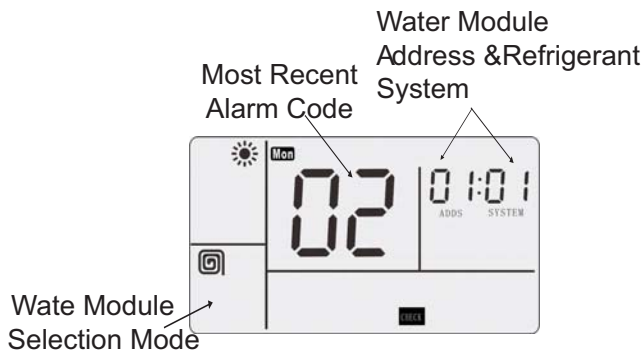
No.	Items for CHECK	Code	Unit	Example	Notes to Parameters
1	target water temperature	b1	°C	45	set temperature for wire controller
2	water module inlet water temperature	b2	°C	30	actually measured temperature
3	water module outlet water temperature	b3	°C	35	actually measured temperature
4	water module liquid tube	b4	°C	34	actually measured temperature
5	heat exchanger outlet water temperature	b5	°C	40	actually measured temperature
6	environmental temperature	b6	°C	25	actually measured temperature
7	water module air tube temperature	b7	°C	60	actually measured temperature
8	domestic water tank water temperature	b8	°C	53	water tank test temperature
9	outdoor unit evaporation temperature	b9	°C	6	actually measured temperature
10	top vent temperature of compressor	bA	°C	70	actually measured temperature
11	thermally sensitive resistance temperature of wire controller	bb	°C	30	standby (actually measured room temperature)
12	set water temperature of domestic water tank	bC	°C	55	-
13	standby	bD	°C	30	-
14	standby	bE	°C	30	-
15	environmental temperature (average)	bF	°C	25	Average calculated value of environmental temperature
16	water module input/output state	C1		8	b1: temperature control input state b2: forced temperature control stop input b3: water module water pump run state b4: water module electric heating state b5: electric heating state of domestic water tank
17	reason for stopping	d1		10	display the reason for previous stop, see details in technical information II
18	occurrences of abnormalities	E1	times	5	-
19	occurrences of instantaneous power failure of indoor unit	E2	times	6	-
20	occurrences of errors of communication between wire controller and water module	E3	times	7	-
21	occurrences of abnormalities of frequency inverter	E4	times	8	-
22	air vent pressure	H1	MPa	29	outdoor unit pressure 10 times value
23	air suction pressure	H2	MPa	6	outdoor unit pressure 10 times value
24	target vent pressure	H3	MPa	23	outdoor unit pressure 10 times value
25	running frequency of compressor	H4	Hz	80	-
26	water module capacity	J1		140	automatically identified by machine type
27	outdoor unit number	J2		WP01	-
28	refrigerant system number	J3		1	-
29	refrigerant system number	J4		0	-
30	running state	J5		0	shut down 0 floor heating temperature control ON 1 OFF 2 Fan coil temperature control ON 3 OFF 4 Water tank temperature control ON 5 OFF 6
31	wire controller number of water module	J6		V11	-
32	expansion valve opening of water module	L1		30	according to maximum opening percentage
33	expansion valve opening of outdoor unit	L2		20	according to maximum opening percentage
34	expansion valve opening of outdoor unit	L3		20	according to maximum opening percentage
35	expansion valve opening of outdoor unit	L4		20	according to maximum opening percentage
36	working current of compressor	P1		12	-

5.4.2 CHECK Mode 2

Step 1

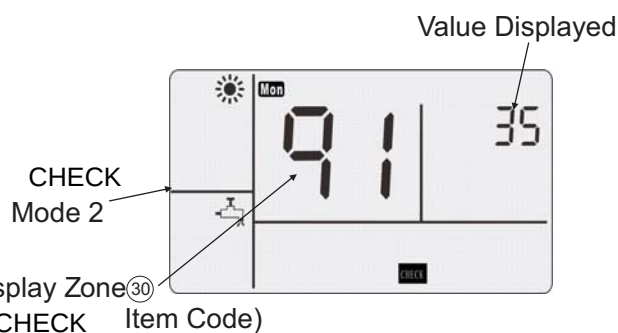
Go to CHECK mode 1 before proceeding to the CHECK mode.

In the CHECK mode 1, press the CHECK key ④ for 3 seconds to water module selection state.



Step 2

Press CHECK key ④ or wait for 7 seconds, and go to communication of [Required Data Format for CHECK 2], and to data display state of CHECK 2.

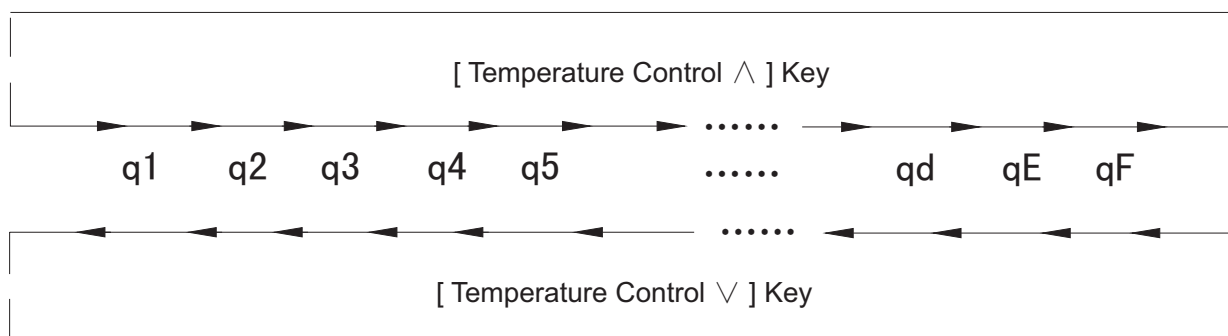


Step 3

At CHECK data display state, press temperature regulation key ③ “V” and “^”, and switch CHECK display items. Display zone ③ of set temperature will display CHECK item code.

Step 4

In CHECK mode 2, press CHECK key ④, quit from CHECK. Or in CHECK mode 1 or 2, without any operations in 2 hours, it automatically quits from the CHECK.



NOTE

- Refer to the table in the right for the “CHECK Mode 2” data.
- Explanations for table of “CHECK Modes 1, 2”:

More codes will appear during CHECK, but not for this model. The table gives no more explanation. Be careful while using.

No.	Items for CHECK	Code	Unit	Example	Notes to Parameters
1	water module inlet water temperature	91	°C	30	actually measured temperature
2	water module outlet water temperature	92	°C	35	actually measured temperature
3	liquid tube temperature	93	°C	45	actually measured temperature
4	outdoor environmental temperature	94	°C	25	actually measured temperature
5	air tube temperature	95	°C	40	actually measured temperature
6	outdoor unit evaporation temperature	96	°C	8	actually measured temperature
7	heat exchanger outlet water temperature	97	°C	8	actually measured temperature
8	top vent temperature of compressor	98	°C	60	actually measured temperature
9	air vent pressure	99	MPa	23	outdoor unit pressure 10 times value
10	air suction pressure	9A	MPa	6	outdoor unit pressure 10 times value
11	target frequency of water module	9b	Hz	135	-
12	running frequency of compressor	9C	Hz	55	-
13	expansion valve opening of water module	9d	%	5	according to maximum opening percentage
14	expansion valve opening of outdoor unit	9E	%	10	according to maximum opening percentage
15	working current of compressor	9F	A	5	-

6. Automatic Control

- Three-minute stop protection
In order to protect the compressor, when the compressor stops, it can not run in at least 3 minutes. 3 minutes later, the compressor automatically runs.
- Three-minute running protection
The compressor should run for at least 3 minutes. If less than 3 minutes, even though water module outlet water temperature reaches the set temperature, the compressor will stop still after 3 minutes. But if the compressor runs less than 3 minutes, the wire controller is used to stop it and the compressor will be stopped.
- Automatic defrosting function
Press the “ ON/OFF ” key to stop the heating. The outdoor unit will automatically detect the frost and conduct at most 10 minutes’ defrosting.
- Automatic anti-freezing function
In winter, for preventing water pipes and pump from being broken by freezing, in the shutdown state, when the water temperature in the water system is low, system will automatically start the water pump or electric heating for preventing water system freezing.

7. Trouble Shooting



- When water module leaks water, stop using it and contact local dealer.
- When odorous smell is smelt or white smoke emits from the machine, immediately contact local dealer.

7.1 If Problems Not Solved

If the problems aren't solved after inspecting the following items, contact your local dealer and provide the following information.

- (1) Model and name
- (2) Failure description
- (3) Failure code on the LCD screen

7.2 Water Module Not Running

- (1) Check whether the set water temperature is correct.
- (2) Check whether the water system fully vents air. The dial switch DSW3-2 is dialed to ON and it can control water pump running, commissioning and venting air. After commissioning, dial it to OFF, or else the water pump will continue running.

7.3 Heating Capacity Insufficient

- (1) Check whether doors and windows are open.
- (2) Check whether the environmental temperature is within the running range.

7.4 Solution of Non-failures

- (1) After long-time use, due to dampness bacteria will grow around water module and affected with mildew. Clean often and keep good ventilation.
- (2) When the machine is running or stopping, it is normal to hear the refrigerant flow sound.

7.5 Solution of Failures

Table 7.1 can help user and installation and commissioning personnel to solve some problems. If the problems cannot be solved, contact your local dealer.

Table 7.1

No.	Failures	Inspection	Trouble shooting
1	no indication, no response of key	1. check power supply for main board 2. check wire controller and main board wiring	1. re-supply of power 2. replacement of communication cable
2	no indication, response of key	inspect whether the wire controller's circuit board polluted by dust or moisturized	eliminate moisture and dusts by hot air blower or electric dryer
3	indication, no response of key	1. check whether the communication cable is the specific shielded cable of the company 2. check whether the wire controller and the main board wiring terminal are loose	change the shielded cable
4	unclear indication	1. open the bottom cover of wire controller to check whether there is dust pollution in the circuit board 2. open the bottom cover of wire controller to check whether the circuit board is moisturized	1. clean dusts 2. blow by hot air blower or electric dryer
5	backlight not shining	open the bottom cover of wire controller and remove the circuit board to check whether there is broken wires in the backlight power cable	reconnection
6	“03” alarm	check whether the wire controller and main board wires loose or broken	change a new communication cable

Table 5.1 Seven-Day Timed Run Schedule

Time Period	ON/OFF	[hh:mm]	Function	[°C]	Remarks
Monday					
1		:			
2		:			
3		:			
4		:			
5		:			
6		:			
7		:			
8		:			
Tuesday					
1		:			
2		:			
3		:			
4		:			
5		:			
6		:			
7		:			
8		:			
Wednesday					
1		:			
2		:			
3		:			
4		:			
5		:			
6		:			
7		:			
8		:			
Thursday					
1		:			
2		:			
3		:			
4		:			
5		:			
6		:			
7		:			
8		:			
Friday					
1		:			
2		:			
3		:			
4		:			
5		:			
6		:			
7		:			
8		:			
Saturday					
1		:			
2		:			
3		:			
4		:			
5		:			
6		:			
7		:			
8		:			
Sunday					
1		:			
2		:			
3		:			
4		:			
5		:			
6		:			
7		:			
8		:			

Part II. Water Module

Installation and Maintenance Manual

1. Introduction

Read this installation manual carefully before installing the module and follow the instructions for installation. After installation, conduct test run to confirm normal running of the machine. Water module must be installed indoor with the environmental temperature between 0-35°C.

WARNING

- Without reading the installation manual, do not carry out refrigerant piping connection, water pipe connection and wiring connection.
- Check whether the ground wire connection is correct and firm.
- Connect to the fuse of specified capacity.
- The user should not replace the power cord and this must be conducted by professional repair personnel.

CAUTION

- Water module, wire remote controller and wires should not be installed 3m from the strong electromagnetic wave radiation source, such as medical appliances.

2. Special Precautions

- Water module uses R410A refrigerant. Pipe system must be kept clean, dry and sealed.
- Because R410A is a mixed refrigerant, it must be added in liquid state. If the added refrigerant is gaseous, the composition will change and the air conditioning system may not work normally.
- Design pressure at the refrigerant side is 4.15MPa and that at water side is 0.3 MPa. Select corresponding copper pipes and water pipes according to the design pressure.

3. Introduction to the Machine

3.1 General

Water module is a single heating system mounted on the wall and can be connected to floor heating and domestic water tank. When the outdoor temperature is too low or the indoor load is large, water module will start the electric heater to generate additional heat. If the outdoor unit fails to work, the backup heater can independently provide heat.

3.2 Examples of Application

CAUTION

When water module is used for another heat source series (such as gas furnace), the temperature of water flowing back to water module should not exceed 55°C. If this requirement is not met, our company will not take any responsibility for damage caused.

The following are several typical examples of application

- Example 1
Multifunctional unit is used for air conditioner, floor heating and domestic water tank. Electric tee valves must be connected to water tank and floor heating, see Fig.3.1.
- Example 2
Multifunctional unit is used for air conditioner and floor heating, see Fig.3.2.
- Example 3
Multifunctional unit is used for air conditioner and domestic hot water, see Fig.3.3.

CAUTION

When each independent floor heating has an independent remote control valve, a pressure differential bypass valve must be installed to avoid too large or too small water flow in the heating loop.

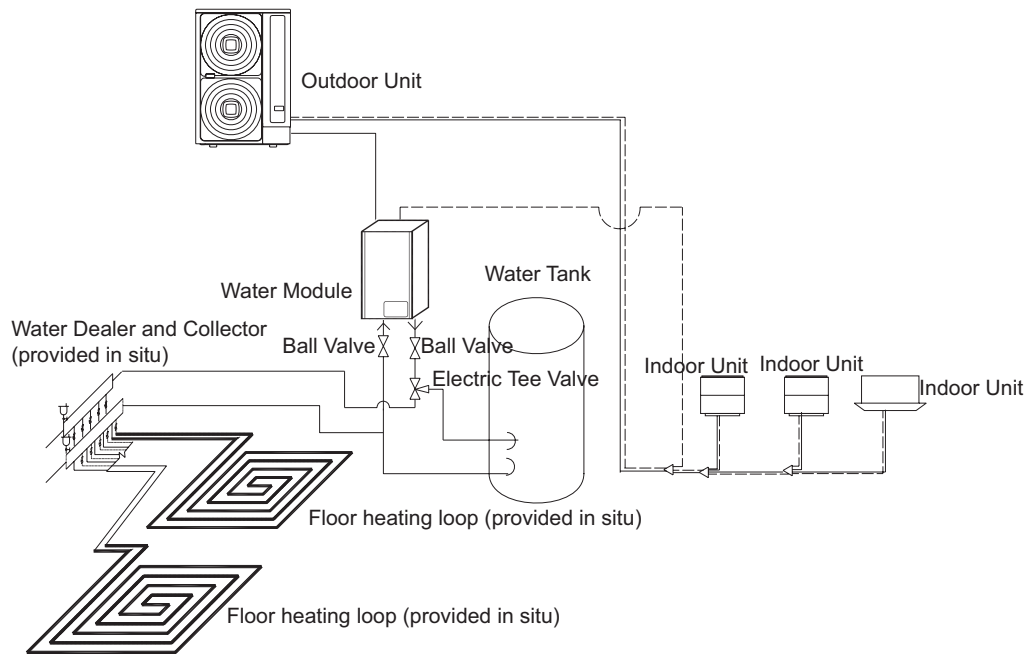


Fig.3.1 Multifunctional multi-split system connection diagram (water tank + floor heating)

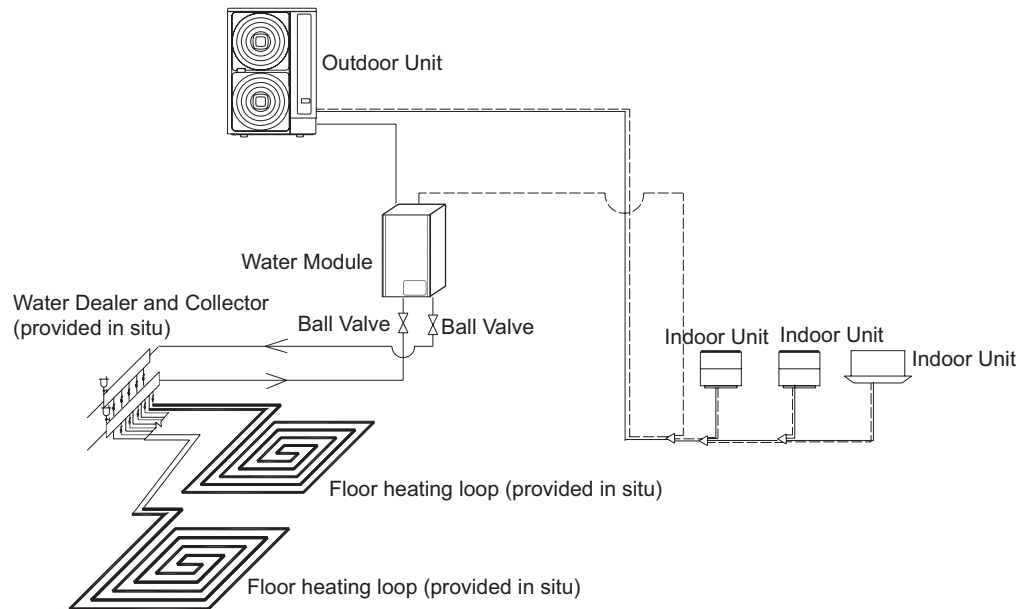


Fig.3.2 Multifunctional multi-split system connection diagram (floor heating only)

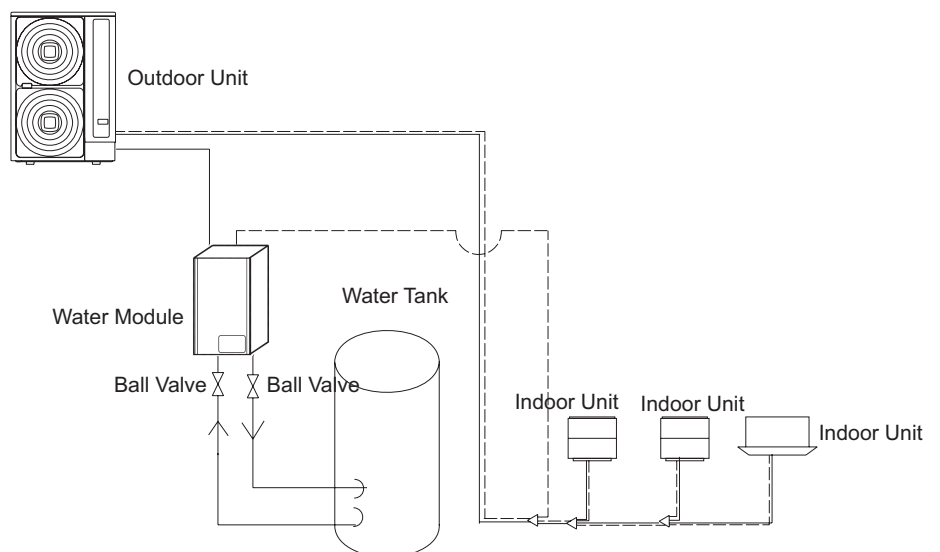


Fig.3.3 Multifunctional multi-split system connection diagram (water tank only)

4. Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool	No.	Tool	No.	Tool
1	Handsaw	6	Pipe Bender	11	Spanner	16	Leveller
2	Screwdriver	7	Pliers	12	Charging Cylinder	17	Clamper for Solderless Terminals
3	Vacuum Pump	8	Pipe Cutter	13	Gauge Manifold	18	Hoist (for Indoor Unit)
4	Refrigerant Gas Hose	9	Brazing Kit	14	Cutter for Wires	19	Ammeter
5	Megohmmeter	10	Hexagon Wrench	15	Gas Leak Detector	20	Voltage Meter

CAUTION

About vacuum pump, refrigerant gas hose, charging cylinder and multifunctional measuring instruments, use suitable equipments for R410A respectively. Do not mix other refrigerant.

DANGER

Foreign matters such as moisture, oxidation scale and grease easily affect the performance of refrigerant, so the moisture, dusts and oil in the refrigerating system must be removed. If not use the specified materials and tools, it may lead to an explosion, personal injury, refrigerant leakage, electrical failure or a fire.

5. Transportation and Handling

5.1 Transportation

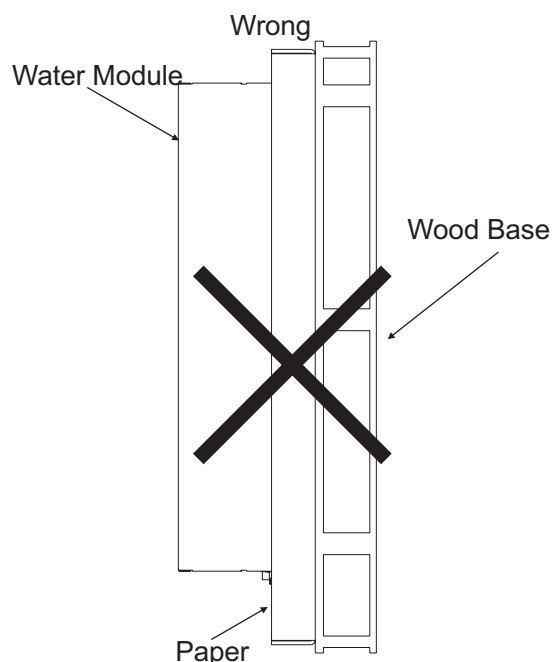
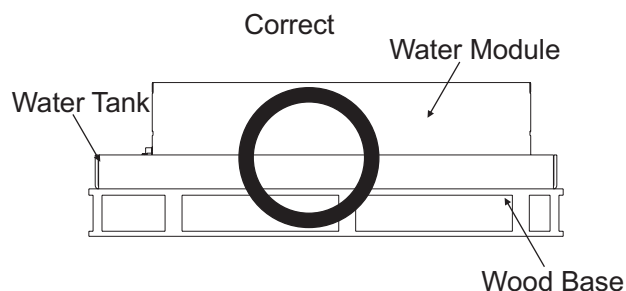
- Transport water module in the packing boxes.
- Unpack the product only before installation for avoiding damage during transportation, .
- Transport the product as close to the installation location as practical before unpacking.

5.2 Handling

- Water module is about 74kg and needs two or more persons for moving and handling.
- Take protection measures during handling (wear gloves etc.)
- Do not remove wood base during handling by hand.
- Take surface protection measures and be careful not to damage the face panel on the unit's surface during handling.
- Do not grasp the pipes and face panel during handling.
- Attention when water module is put, avoid falling.

CAUTION

Do not step on the cardboard of the external package or put any materials on the air conditioner. Four layers are allowed for stacking during transportation.



6. Introduction to Water Module

6.1 Accessories and Optional Parts

Table 6.1 are packed and transported with water module. Check to ensure that the accessories listed in.

! CAUTION

If any of these accessories are not packed and transported with the water module, contact your local dealer.

! WARNING

Before installation and commissioning, do not put any irrelevant materials in water module. Ensure that there are no foreign materials into the unit. Otherwise, a fire or an accident may occur.

Table 6.1 Accessories

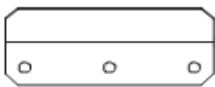
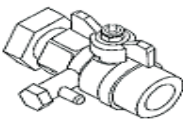
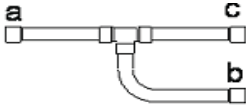
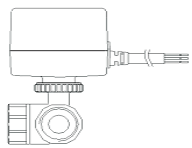
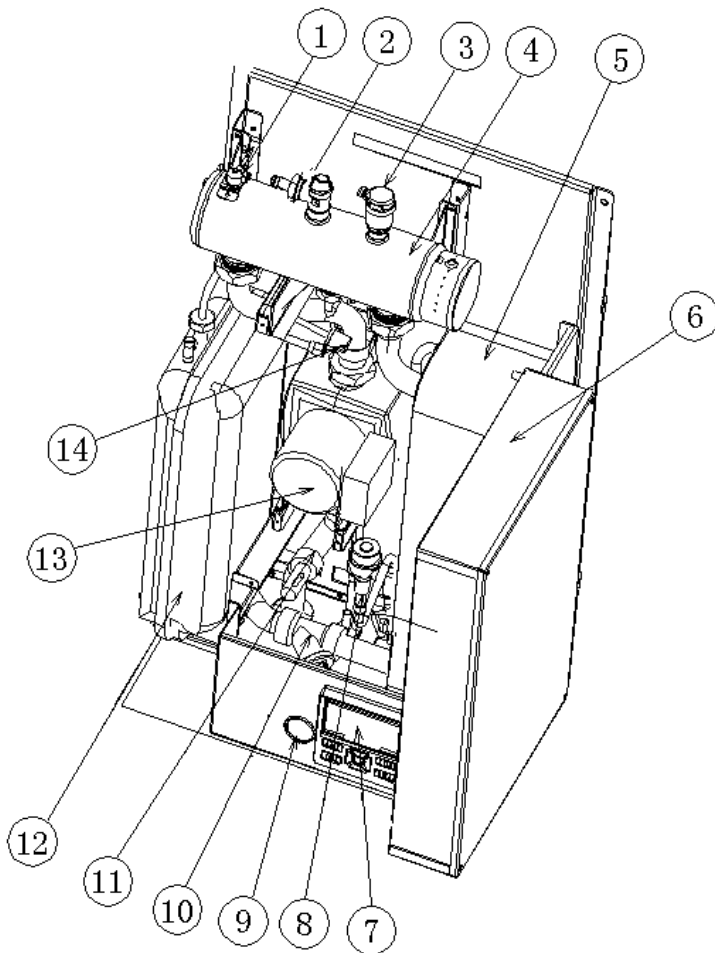
No.	Name	Quantity	Picture	Remarks
1	Wall Hanging Board	1		Temporarily fix water module on the wall; for actual fixing, the expansion bolts must be used to securely fix water module on the wall.
2	Instruction Manual	1		
3	Ball Valve	2		Connect at the water inlet/outlet of water module, for connecting/disconnecting water pipe, drain and filling.
7	Rubber Gasket	2		Used for sealing the connections between water module and ball valves.
4	Liquid Tube Manifold	1		It is used for the first manifold of liquid tube of the refrigerating system. Opening a connects liquid tube of outdoor unit; opening b connects liquid tube of water module, and opening c connects the liquid tube of indoor unit.
5	Strap	3		
6	Stainless Steel Screw	4		

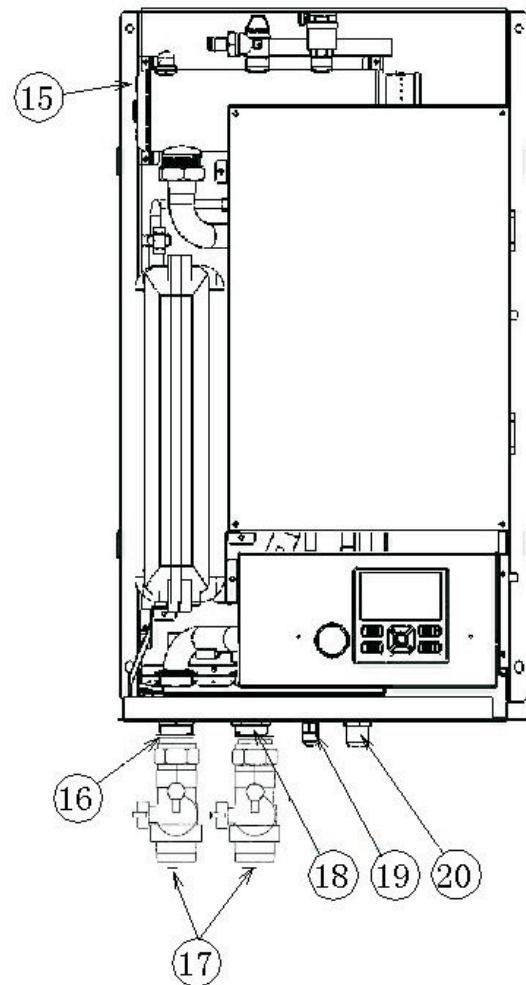
Table 6.2 Optional Parts

No.	Name	Quantity	Picture	Remarks
1	Water Tank Temperature Sensor	1		Used when system is connected to the domestic water tank. Detect water tank temperature.
2	Electric Tee Valve	1		Used when the domestic water tank and the floor heating are connected. Switch water pipes between domestic water tank and floor heating.

6.2 Main Parts of Water Module



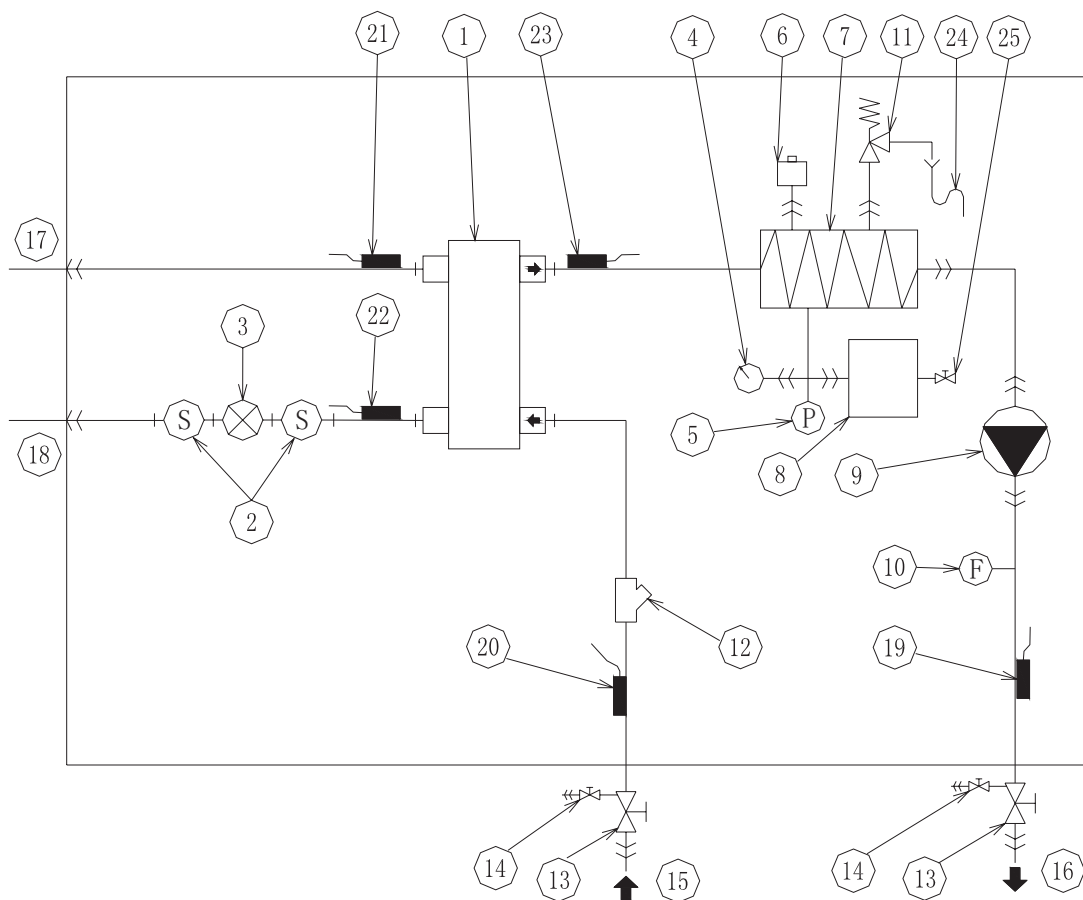
- ① Electric Heating Temperature Switch in Water Module
With built-in electric heating temperature switch, water module heater is turned off at too high temperature, avoiding burnout. If burnout occurs, the unit stops. After temperature reduces, temperature switch will automatically restore.
- ② Safety Valve
Ensure hydraulic pressure not too high in water cycle when water system pressure is below 3 bar. If the hydraulic pressure is too high, drain some water. Lead drainage tube of safety valve to building downcomer.
- ③ Automatic Vent Valve
Remove residual air in water system through automatic vent valve.
- ④ Electrical Heater in Water Module
Supply extra energy to the unit when the heat pump lacks capacity.
- ⑤ Plate Heat Exchanger
Refrigerant and water performs heat exchange in plate heat exchanger.
- ⑥ Electrical Box
- ⑦ Wired Controller
User can set up and operate water module through wired controller.



- ⑧ Electronic Expansion Valve
Restricting element in heat pump system.
- ⑨ Pressure Gage
Read pressure in water circulating system.
- ⑩ Filter
Prevent impurities in filter system from flowing into plate heat exchanger and blocking heat transport channel. Regularly remove and clean filter net.
- ⑪ Water Flow Switch
Water flow channel disconnects and the unit stops when water flow is too low.
- ⑫ Expansion Tank
Absorb volume change caused by temperature changes in water circulating system.
- ⑬ Water Pump
Feed power to water circulating system.
- ⑭ Low Water Temperature Switch
It trips and the unit stops when pressure in water circulating system is too low.
- ⑮ Temperature Fuse in Water Module Heater
Temperature fuse disconnects and electrical heater cuts off at too high temperature. It can not automatically restore.

- ⑩ Water Inlet
- ⑪ Ball Valve
- Isolate water circulation after ball valve in water inlet and outlet are closed. Water make-up inlet in ball valve supplements water to water circulating system.
- ⑫ Water Outlet
- ⑬ Refrigerant Lliquid Tube Joint
- ⑭ Refrigerant Air Tube Joint

6.3 System Cycle Diagram



- ① Plate Heat Exchanger
- ② Filter
- ③ Electrical Expansion Valve
- ④ Pressure Gage
- ⑤ Water Pressure Switch
- ⑥ Automatic Vent Valve
- ⑦ Electrical Heater
- ⑧ Expansion Tank
- ⑨ Water Pump
- ⑩ Water flow switch
- ⑪ Safety Valve
- ⑫ Water Filter
- ⑬ Ball Valve
- ⑭ Water Make-up Inlet
- ⑮ Water Inlet
- ⑯ Water Outlet
- ⑰ Refrigerant AirTube
- ⑱ Refrigerant Liquid Tube
- ⑲ Water Outlet Temperature
- ⑳ Water Inlet Temperature
- ㉑ Air Tube Temperature
- ㉒ Liquid Tube Temperature
- ㉓ Water Outlet Temperature of Plate Heat Exchanger
- ㉔ Drain Pipe
- ㉕ Charging Port of Expansion Tank

7. Installation of Water Module

7.1 Initial Check

- See dimension of water module in Fig.7.1 (unit: mm).

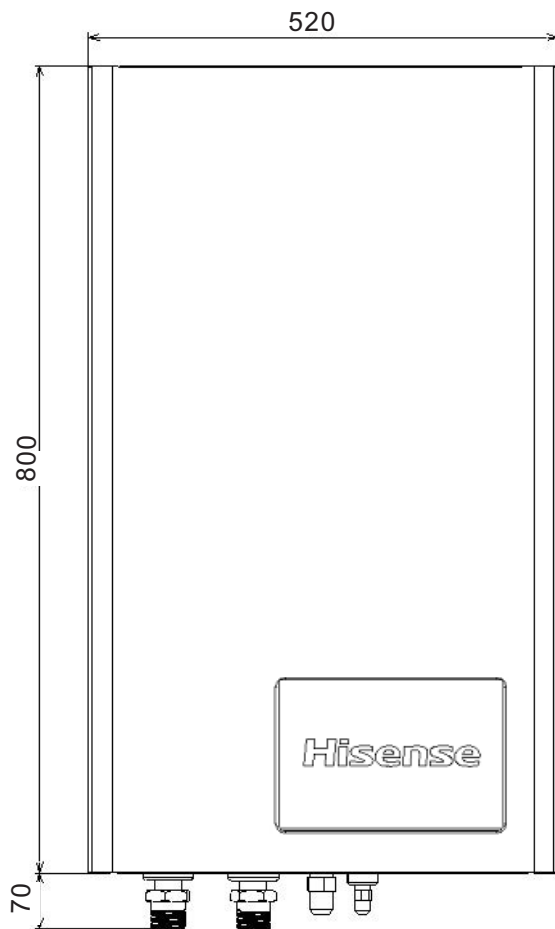


Fig.7.1a Dimension of Water Module

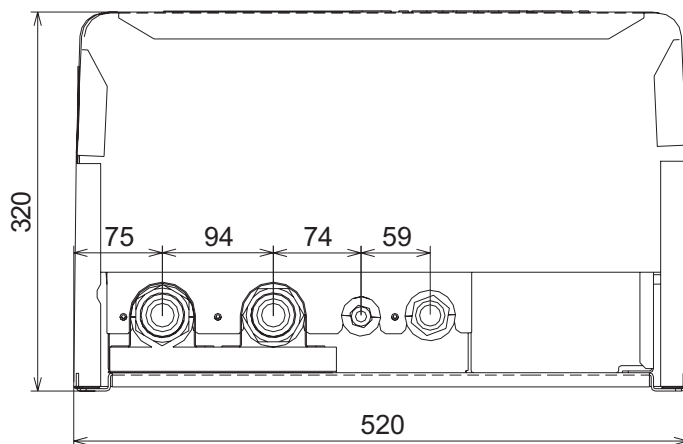


Fig.7.1b Dimension of Water Module

- Install water module to a place where it is easy to operation and maintenance, seen in Fig.7.2.

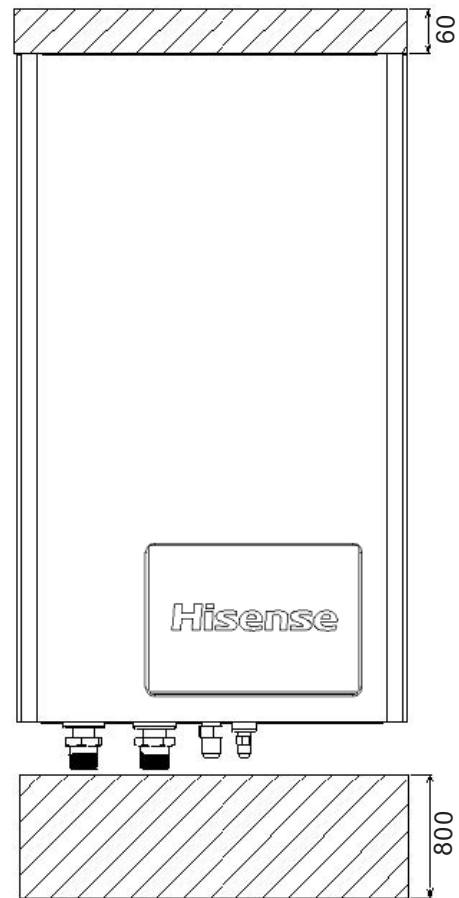


Fig.7.2a Installation and Maintenance Space

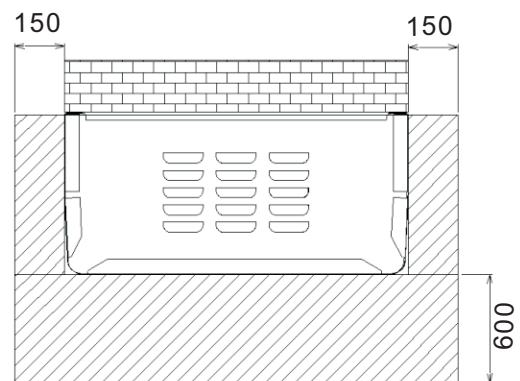


Fig.7.2b Installation and Maintenance Space

▨ Means maintenance space.

Selection of installation location:

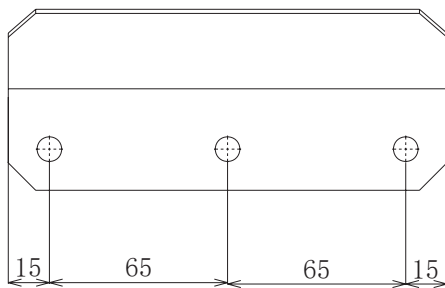
- Indoor installation is made in selected special machine room, closed balcony, basement, corridor, equipment room or other indoor area with sufficient space.
- Installation surface must be flat, vertical and nonflammable wall and bear running weight of unit (76kg).
- Installation location is free from freezing.

- Water module is installed in cool place, avoiding exposure to sunshine, high temperature or radiation by heat source.
- Temperature of place where water module is installed should be within 0-35°C, and relative humidity is no more than 80%.
- Water module should be put in a place free from corrosive acid and alkaline gas.
- Do not install water module in places with high greasy dirt, fibre, dust and volatile flammable gas such as gasoline and paint solvent.
- Do not install water module in a place where the electromagnetic wave can directly radiate electric box.
- Keep 3m away from electromagnetic wave radiation at lest.
- Noise of water module should not affect people's daily life and working.

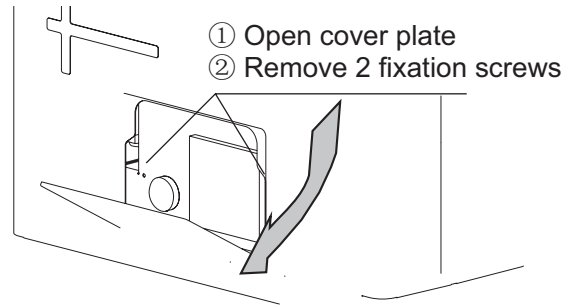
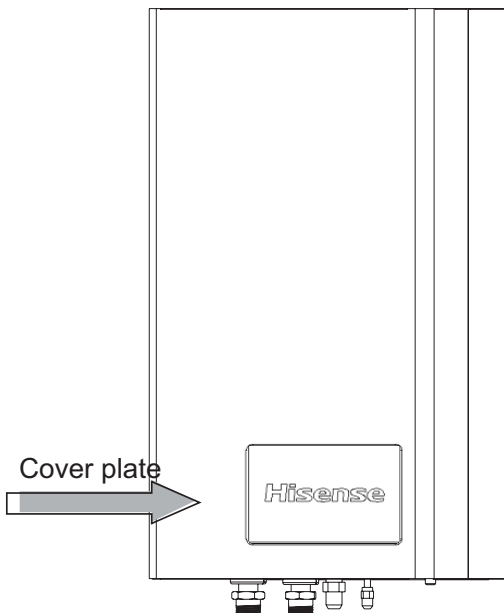
7.2 Install Water Module

7.2.1 Inspect and Open Water Module

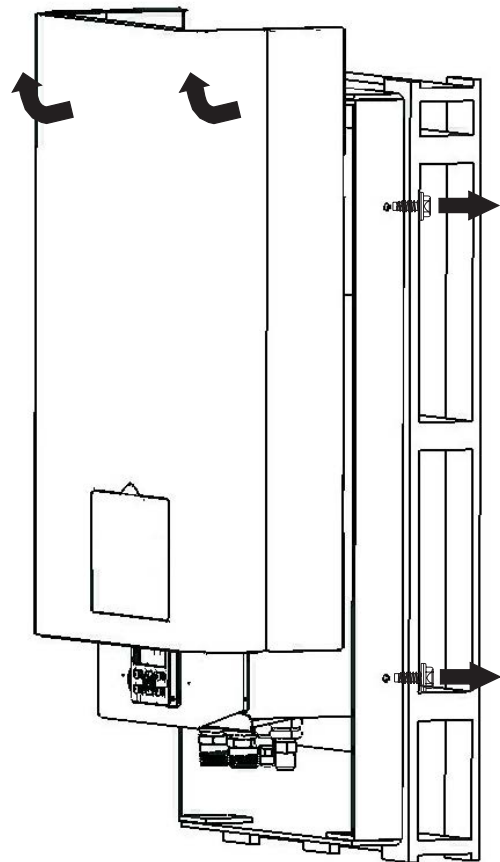
- Take out "wall hanging board" provided together with the unit from packing crate and the dimension of wall hanging board is seen below: (unit: mm)



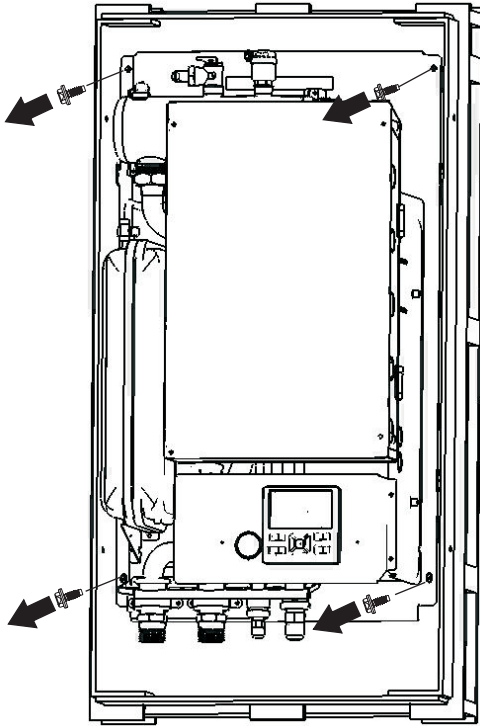
- Mount wall hanging board to the wall using three M8 expansion bolts.
- Open the lower cover plate in front plate of water module, you can see the pressure gage, wired controller and cover plate are fixed by magnets.



- Remove four screws in both sides and lift external housing upward and remove it.

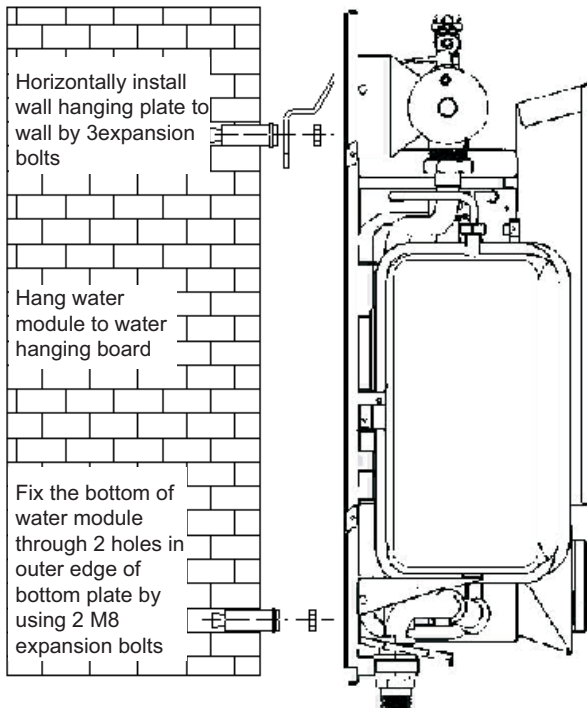


- As shown below, remove four screws on wood base and separate the unit from packing base and wood base.



7.2.2 Install Water Module

- Mounting wall must bear running weight of water module (76kg);
 - a. Water module does not tilt;
 - b. Water module does not have abnormal vibration and noise when running;
- Hang water module to wall board.



8. Refrigerant and Water Pipe

! DANGER

R410A refrigerant is adopted. When leakage and air tight test are made, do not mix with oxygen, acetylene, inflammable gas and poisonous gas. They are very dangerous and may cause explosion. Recommend using compressed air, nitrogen or refrigerant.

8.1 Refrigerant Pipeline and Tubing

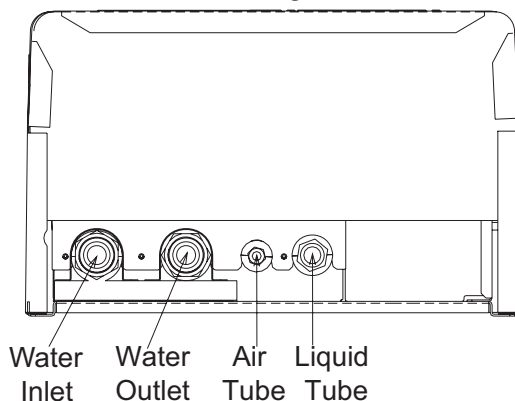
- (1) Copper tube are prepared on site.
- (2) Pipe dimension are selected as follows.
Unit (mm)

Type	Air tube	Liquid
54	Φ 12.7	Φ 9.53

- (3) Select copper tube without dust and moisture.
Blow dust and impurity in pipeline with nitrogen or dry air before pipeline is mounted.

8.2 Connect Refrigerant Pipeline

- (1) Confirm stop valve is closed. Gas and liquid tube are located as shown in Fig.8.1:



- (2) As shown in Fig.8.2, screw up nut cap. Refer to the torque required below:

Pipe Diameter	Torque(N•m)
φ 9.53	40
φ 12.7	60

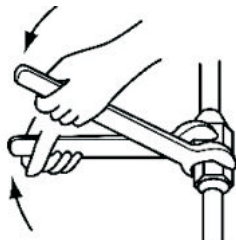


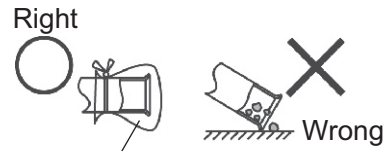
Fig.8.2 Screw up Nut Cap

- (3) Heat preservation of refrigerant tube
After tube is connected, heat preservation material on site should be used to keep air tube, liquid tube and connecting nut warm, and wrap the tube with adhesive tape, avoiding heat dissipation condensation on surface of pipeline.

! CAUTION

- When the tube passes through holes, tube head should be sealed by sealing cap.
- Seal the tube end with sealing cap or adhesive tape. Do not directly put tube down on the ground.

Do not put tube down on the ground



Seal with Adhesive Tape or Sealing Cap

- (4) Charging and discharging of refrigerant
Operate according to installation and maintenance manual of outdoor unit.

8.3 Connect Water Pipeline

- (1) The connecting location of water pipeline is seen in Fig.8.1.
- (2) Install ball valve
There are two ball valves provided with the unit. For convenience of repair and maintenance, install the ball valves on water inlet and outlet tube of water module. Installation location refers to the section 6.2 Main Parts.

! CAUTION

- When ball valve is mounted, rubber gasket must be mounted (accompanied with the unit), otherwise water leakage may be caused.
- Note the location of ball valve, and the direction of ball valve drain valve, which are essential to maintenance.
- Screw up ball valve by using two wrenches.

- (3) Notes for connecting water tube
 - A small amount of water may exist in water module. Note that when sealing cap is opened.
 - Pay attention to connection location of tube. Do not connect water inlet and water outlet tube inversely.
 - Use water tube conforming to specification. Dimension of water tube is equal to or above interface dimension in machine (G1/1/4"). For main connecting pipeline, recommend using DN40 water tube to reduce pressure loss in pipeline.
 - Properly keep water tube thermal insulated and avoid pipeline freezing.
 - Regularly clean water filter.
- (4) Basic requirements for operating water tube:
 - Let the end of tube face downward when deburring, avoiding foreign matter invading into tube.

- Thoroughly flush all water pipelines before installation, ensure no foreign matter before use. Note that do not flush any foreign material into plate heat exchanger.
- Apply good sealant to seal joint and the joint must bear pressure and temperature of system.
- If water tubes of different material are used, ensure they are isolated, preventing electrical conduction and corrosion.
- Galvanized parts that may cause corrosion in water system are prohibited.
- Water tube and tube joint must be supported independently on water module.
- Tube and tube joint in water module should be easy to remove and convenient to operate and clean.
- Flexible joint should be used between water module interface and on-site pipeline, avoiding vibration propagation and pipeline breakage.
- Arrange drainage interface at low positions in water system, make water in water module and pipeline smoothly drained out. Arrange air exhaust device at high positions. Do not treat air exhaust valve and drainage interface thermally for repair convenience.

⚠ CAUTION

- Seal the tube end with sealing cap or adhesive tape. Do not directly put tube down on the ground.
- Seal the tube end with sealing cap or adhesive tape. Do not directly put tube down on the ground.

Do not put tube down on the ground

Right



Wrong

Seal with Adhesive Tape or Sealing Cap

- (5) Water treatment and water quality control
- Confirm with water treatment company that antifreezing solution, scale inhibitor, corrosion remover that are used in water treatment do not corrode stainless steel and copper products before use. When system links with water tank, to avoid domestic hot water contaminated by coil leakage, antifreezing solution, scale inhibitor, corrosion remover are not allowed to use.
 - Water quality control methods and reference refer to water quality requirements issued by Japan Refrigeration and Air Conditioning Industry Association (JRA-GL-02-1994). Medium and low water temperature reference values of water module unit are seen in table 8.1.

Table 8.1 Benchmark of Medium and Low Water Temperature and Make-up Water Quality (Reference Value)

	Item	Medium and Low Water Temperature System		Tendency	
		Circulation water 20°C < T < 60 °C	Make-up water	Corrosin	Scale
	PH (25 °C)	7.0 to 8.0	7.0 to 8.0	√	√
Standard Items	Electroconductibility(mS/m) (25 °C)	<30	<30	√	√
	Chloridion(mgCl/L)	<50	<50	√	
	Sulfion (mgSO ₄ ²⁻ /L)	<50	<50	√	
	Acid consumption(PH4.8)(mgCaCO ₃ /L)	<50	<50		√
	Total hardness (mgCaCO ₃ /L)	<70	<70		√
	Calcium hardness (mgCaCO ₃ /L)	<50	<50		√
	Ionic state silicon(mgCaSiO ₂ /L)	<30	<30		√
Reference Items	Iron (mgFe/L)	<1.0	<0.3	√	√
	Copper (mgCu/L)	<1.0	<0.1	√	
	Sulfion (mgS ²⁻ /L)	Undetermined	Undetermined	√	
	Ammonia ion mgNH ₄ ⁺ /L)	<0.3	<1.0	√	
	Chlorine residue (mgCl/L)	<0.25	<0.3	√	
	Free carbon dioxide (mgCO ₂ /L)	<0.4	<4.0	√	
	Stability index	-	-	√	√

9. Water Circulation

Check water pipe is correctly connected, if not so, the unit can not work normally.

9.1 Check Water Circulation

- (1) Water module is connected to water circulation system through water inlet and outlet.
This water circulation system must be installed by qualified plumber in accordance with relevant national regulations.
- (2) Water module is only applicable to closed water system. When applied to opened water system, water pipe may be corroded.
- (3) Check before water module installation:
 - The maximal water pressure in system is no more than 0.3Mpa. If make-up water pressure on site is more than 0.3Mpa, recommend reducing valve or automatic make-up valve is mounted on site.
 - Outfall should be the lowest point of system, drain all circulated water from system when system is maintained.
 - Ensure safety valve can drain water normally, and actually lead drainage tube into building downcomer, avoiding water flowing into electrical parts.
 - Air exhaust device should be arranged at highest point of system. Check automatic vent valve in water module discharges air normally and whether the sound of quick venting occurs. If vent valve leaks water or is damaged, contact local dealer.

9.2 Check Water Capacity and Initial Pressure of Expansion Tank

- (1) The unit has a built-in 8L expansion tank, and default initial pressure is 0.1MPa.
- (2) To ensure the unit works normally, the initial pressure of expansion tank should be adjusted according to the circulated water capacity.
 - Check the total capacity of water in circulation system is 16L at least. In most cases, this minimal capacity will be appropriate.
 - Use water capacity checklist 9.1 to decide whether initial pressure of expansion tank is adjusted.
 - Use water capacity checklist to confirm the total capacity of water in installation system is below allowed maximal water capacity.
 - Installation height difference: It is the height difference between highest point of water circulation and water module. If water module is mounted at the highest point, above all water tubes, the installation height is deemed to be 0 m.
- (3) Calculate initial pressure of expansion tank
Decide initial pressure (Pg) according to the maximal installation height difference (H), seen below:

$$Pg=H/10+0.3$$

Unit: H(m), Pg(bar)

Note: 0.3 is the minimal initial pressure of expansion tank set outside the factory.

- (4) Confirm allowed maximal water capacity

The process of calculating allowed maximal water capacity in whole circulation is:

- ① Calculate maximal water capacity corresponding to initial pressure Pg by using maximal water capacity curve graph 9.2.
- ② Confirm the total maximal water capacity in water circulation is smaller than above value. If not so, the expansion tank in water module is smaller for system.

CAUTION

- When initial pressure in expansion tank is set as 0.03MPa at minimum, the water quantity required by system is higher than limit value, it may consider replacing expansion tank with bigger capacity.
- The mismatch between big capacity expansion tank and water module structure may cause expansion tank unable to be mounted into water module.
- If big capacity expansion tank mismatches with water module structure, safety valve with higher action pressure can be selected, and do not vary capacity of expansion tank. Select safety valve with action value 0.5Mpa.

Table 9.1 Water Capacity Checklist

	Installation height difference (a)	Water Capacity	
		≤220L	>220L
Safety Valve (3bar)	≤7m	No need to adjust initial pressure of expansion tank	Things need to do : Must reduce initial pressure. Calculate it based on the section "initial pressure of expansion tank". Check water capacity is lower than allowed maximal water capacity (using the figures below).
	>7m	Things need to do : Must increase initial pressure. Calculate it based on the section "initial pressure of expansion tank". Check water capacity is lower than allowed maximal water capacity (using the figures below).	The expansion tank is too small to install. (It needs proper expansion tank or use safety valve with high activated pressure that is supplied from local place)
	Installation height difference (a)	Water capacity	
		≤330L	>330L
Safety Valve (5bar)	≤7m	No need to adjust initial pressure of expansion tank	Things need to do : Must reduce initial pressure. Calculate it based on the section "initial pressure of expansion tank". Check water capacity is lower than allowed maximal water capacity (using the figures below).
	>7m	Things need to do : Must increase initial pressure. Calculate it based on the section "initial pressure of expansion tank". Check water capacity is lower than allowed maximal water capacity (using the figures below).	The expansion tank is too small to install. (It needs proper expansion tank supplied from local place)

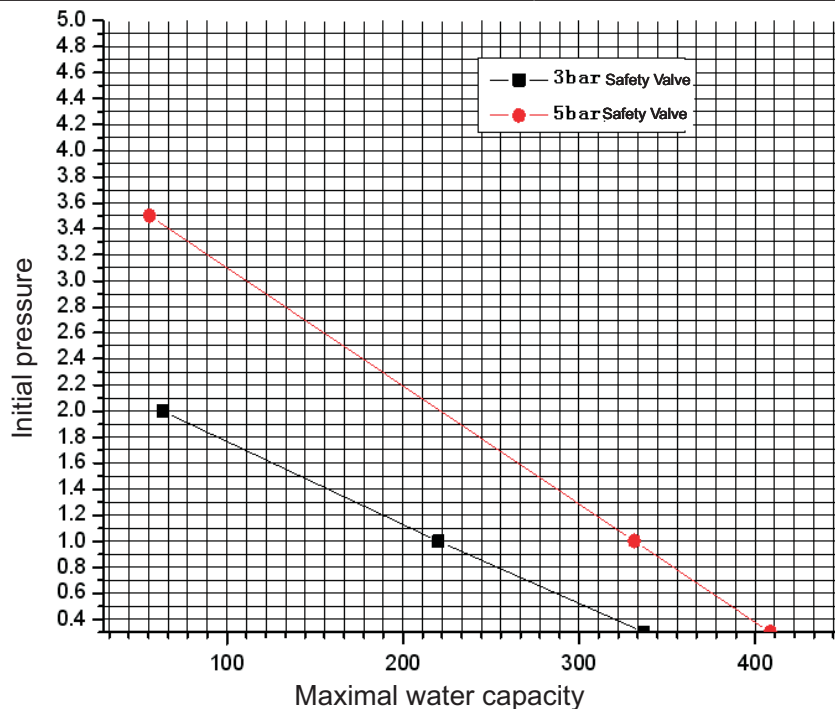
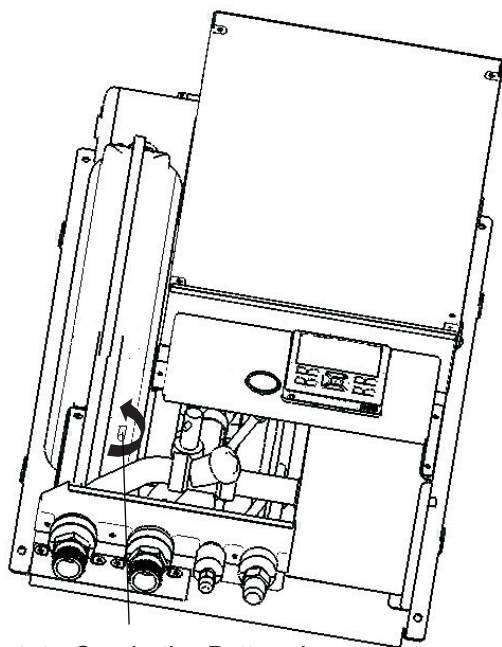


Fig.9.2 Maximal Water Capacity Curve Graph

9.3 Adjust Initial Pressure of Expansion Tank

- (1) Only use dry nitrogen to adjust default initial pressure of expansion tank when changed.
- (2) Improper adjustment of initial pressure will lead to system malfunction. Initial pressure must be only adjusted by professional service staff.

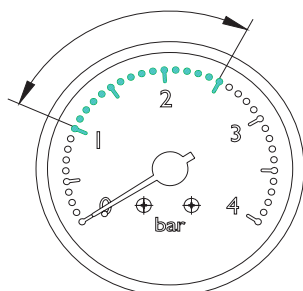


Rotate Cap in the Bottom in Anticlockwise Way, You Can See Thimble.

9.4 Inject Water

- (1) If system is mounted with water make-up inlet, you can directly supplement water through this inlet. If not mounted, you can supplement water through make-up port in ball valve (refer to the section 6.3 Main Parts).
- (2) Ensure automatic vent valve is opened (rotate two circles at least).
- (3) Supplement water until pressure in pressure gage is approx. 0.2MPa. The water pressure of unit working normally sees below. If pressure of tap water on site is lower than 0.2MPa, adopt booster pump to increase pressure up to 0.2MPa. Discharge air from system using vent valve as far as possible.
- (4) Open safety valve, check whether water is drained normally when water pressure is too high.

Normal Pressure Zone



CAUTION

- When water is injected, do not discharge air from system. Discharge residual air through automatic vent valve in first running several hours of system. Extra water may be injected regarding water pressure attenuation .
- Water pressure in pressure gage varies with water temperature. However, water pressure should maintain above 0.1 MPa, avoiding air invasion. When lower than 0.2 MPa, manually supplement water into system.
- When water pressure is too high, the unit will drain some water through safety valve.

10. Wiring

WARNING

- Cut off main power supply in water module and outdoor unit for more than 3 minutes before wiring or regular check.
- Ensure fan in outdoor unit stops before wiring or regular check.
- Protect wires, drainage tube and electrical apparatus, avoiding damage by mouse and other animals. If they are not protected, the mouse may bit unprotected apparatus and lead to fire.
- Wrap electrical wire wrapped with adhesive tape and seal electrical connection, preventing condensation and insect invasion.
- Fasten electrical wire tightly to water module by string.
- Avoid electrical wire, refrigerant pipeline, metal plate edge and electrical component inside machine contacts each other, otherwise, it may damage electrical wire and lead to fire.
- Apply ELB with medium induction speed. If not used, it may lead to electric shock or fire.
- Tighten screws following the torques below:

Screw specification	Torque range
M4	1.0 to 1.3 N·m
M5	2.0 to 2.4 N·m
M6	4.0 to 5.0 N·m
M7	9.0 to 11.0 N·m
M8	18.0 to 23.0 N·m

10.1 General Check

- (1) Ensure all electrical apparatus used on site (power switch, cut-out switch, lead, conduit and terminal block) are selected according to technical manual I and national electrician standard. Wiring must be made according to national specification.
- (2) Check voltage is within rated voltage $\pm 6\%$. If too low, system will not start. If too high, electrical parts will be burnt out.
- (3) Check cable capacity. See specification of power line connected on site in table 10.1.
- (4) Confirm ground wire is connected.

Table 10.1 Electrical Parameters of Water Module and Electric Wire Specification

Capacity	Power Source	Rated Current	Power Source Cable Size	Transmitting Cable Size
			EN60335-1 *1	EN60335-1 *1
54	220V-240V ~50Hz	16.9A	2.5mm ²	0.75mm ²

NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) The wire sizes marked with *1 in the above table are selected at the rated current of the unit according to the European Standard, EN60335-1. Use the wires which are not lighter than the ordinary polyvinyl chloride sheathed flexible cord (code designation H05VV-F).
- 3) Use a shielded cable for the transmitting circuit and connect it to ground.
- 4) In the case that power cables are connected in series, add each unit maximum current and select wires below.

Selection According to EN60 335-1

Current i (A)	Wire Size (mm ²)
$i \leq 6$	2.5
$6 < i \leq 10$	2.5
$10 < i \leq 16$	2.5
$16 < i \leq 25$	4
$25 < i \leq 32$	6
$32 < i \leq 40$	10
$40 < i \leq 63$	16
$63 < i$	※1

CAUTION: In the case that current exceeds 63A, do not connect cables in series.

10.2 Wiring

10.2.1 Structure Diagram

(1) See holes linking electric wire in water module in Fig.10.1.

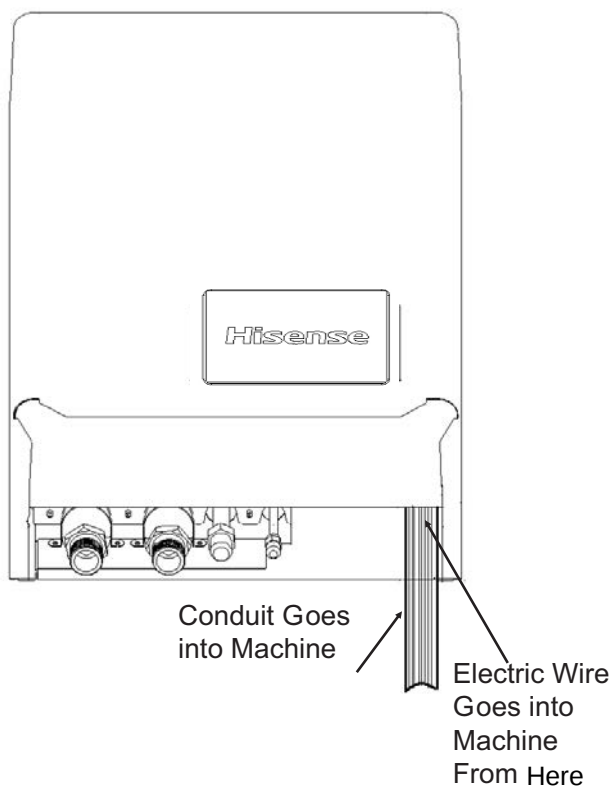


Fig.10.1 Electric Wiring Location Diagram

(2) Inner wiring diagram of water module 10.2

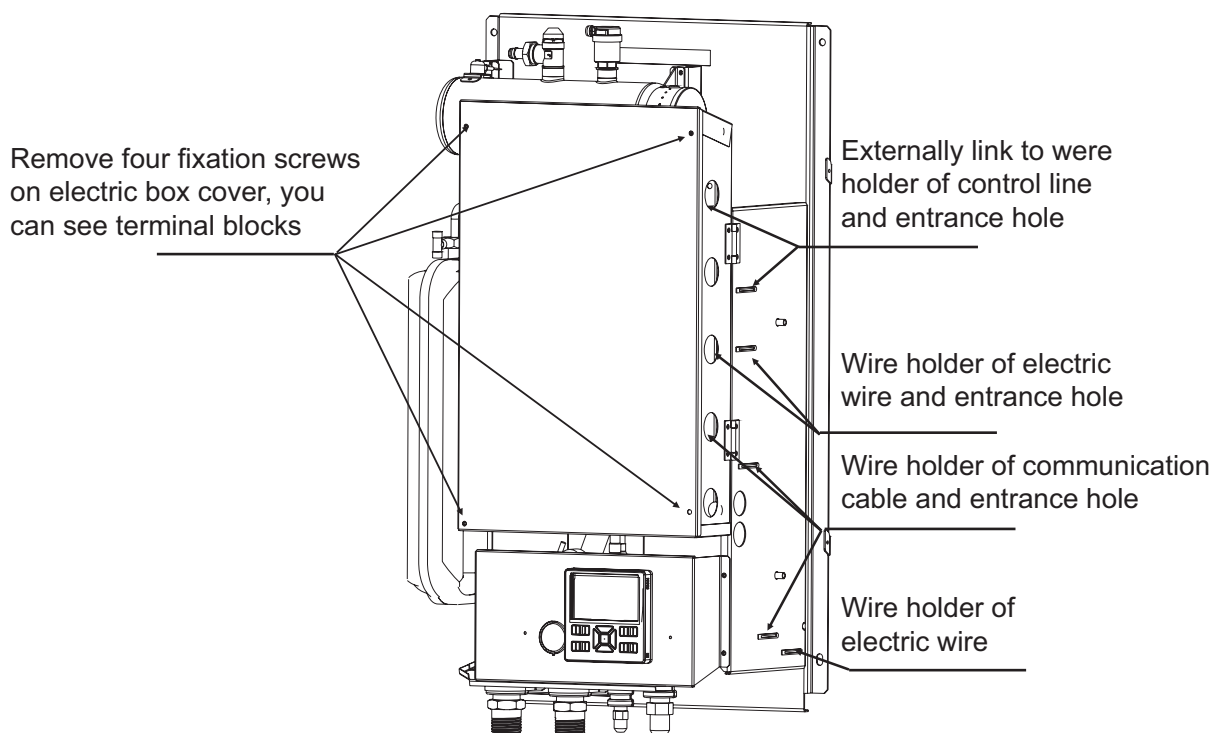
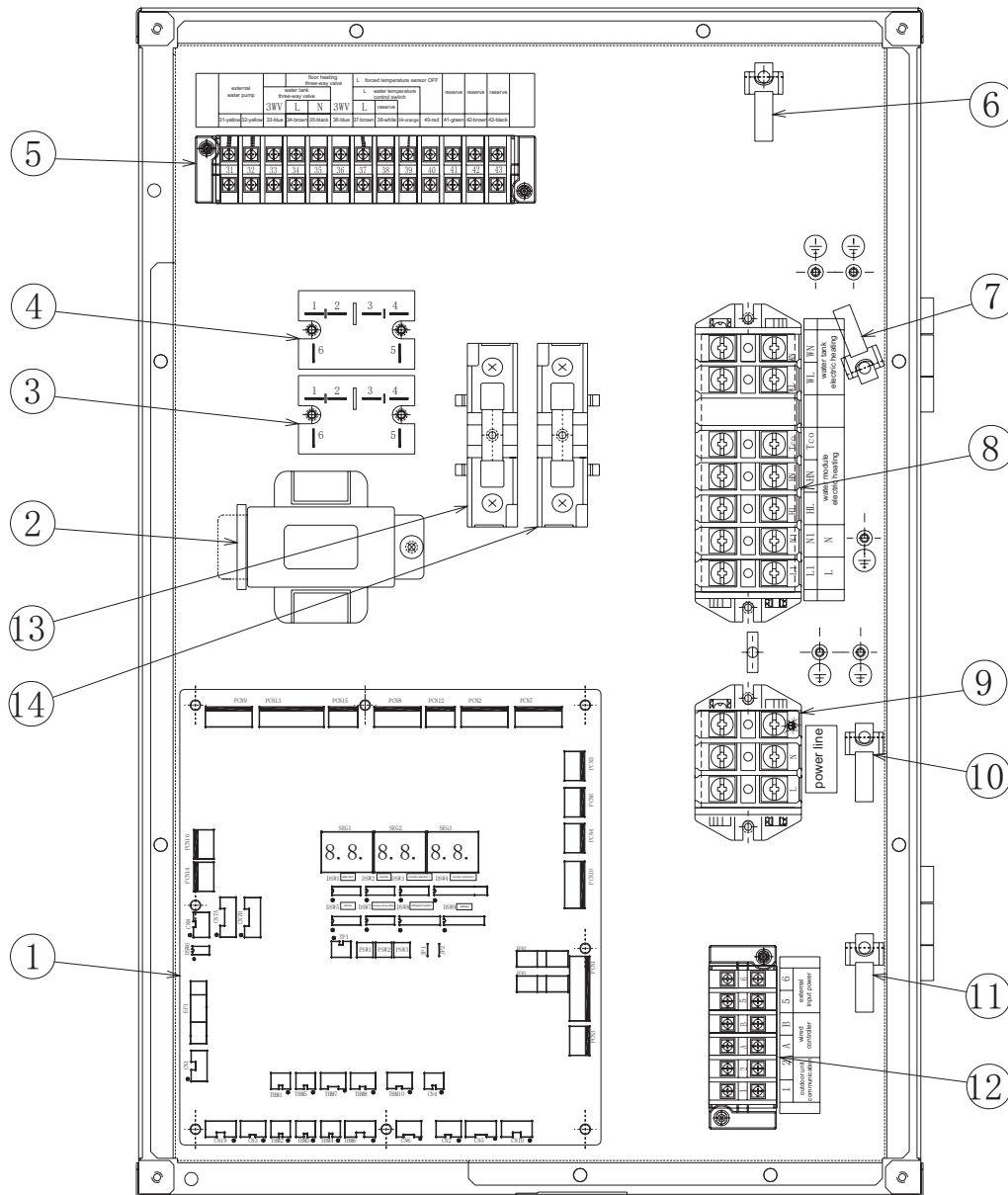


Fig.10.2 Inner Wiring Diagram

CAUTION

Indoor and outdoor unit must adopt fixed wiring.
Conduit must be hard and goes into machine.
Tighten electric wire and communication cable with
wire holder shown in Fig.10.2.

10.2.2 Main Parts of Electric Box



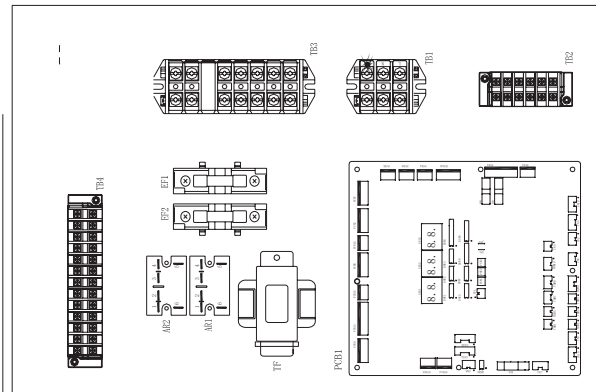
- ① PCB
- ② Transformer
- ③ Relay
 - Used for electric heating in water module
- ④ Relay
 - Used in electrical heater in refrigerator
- ⑤ Terminal Block TB4
 - Used for small power control and adopt signal
- ⑥ Wire Holder
 - Fix external input power of TB4 terminal block
- ⑦ Wire Holder
 - Fix external input power of TB4 terminal block
- ⑧ Terminal Block TB3
 - Used for electric heating of water module and electric heating of water tank externally connected
- ⑨ Terminal Block TB1
 - Used for introducing 220V power cable externally connected
- ⑩ Wire Holder
 - Used for fixing 220V power cable externally connected
- ⑪ Wire Holder
 - Used for fixing communication cable of indoor and outdoor unit
- ⑫ Terminal Block
 - Connect Communication cable and externally connected cable
- ⑬ Fuse
 - Used for electric heating in water module, 25A
- ⑭ Fuse
 - Used for electric heating in water tank, 25A

electric wiring diagram

heat pump type

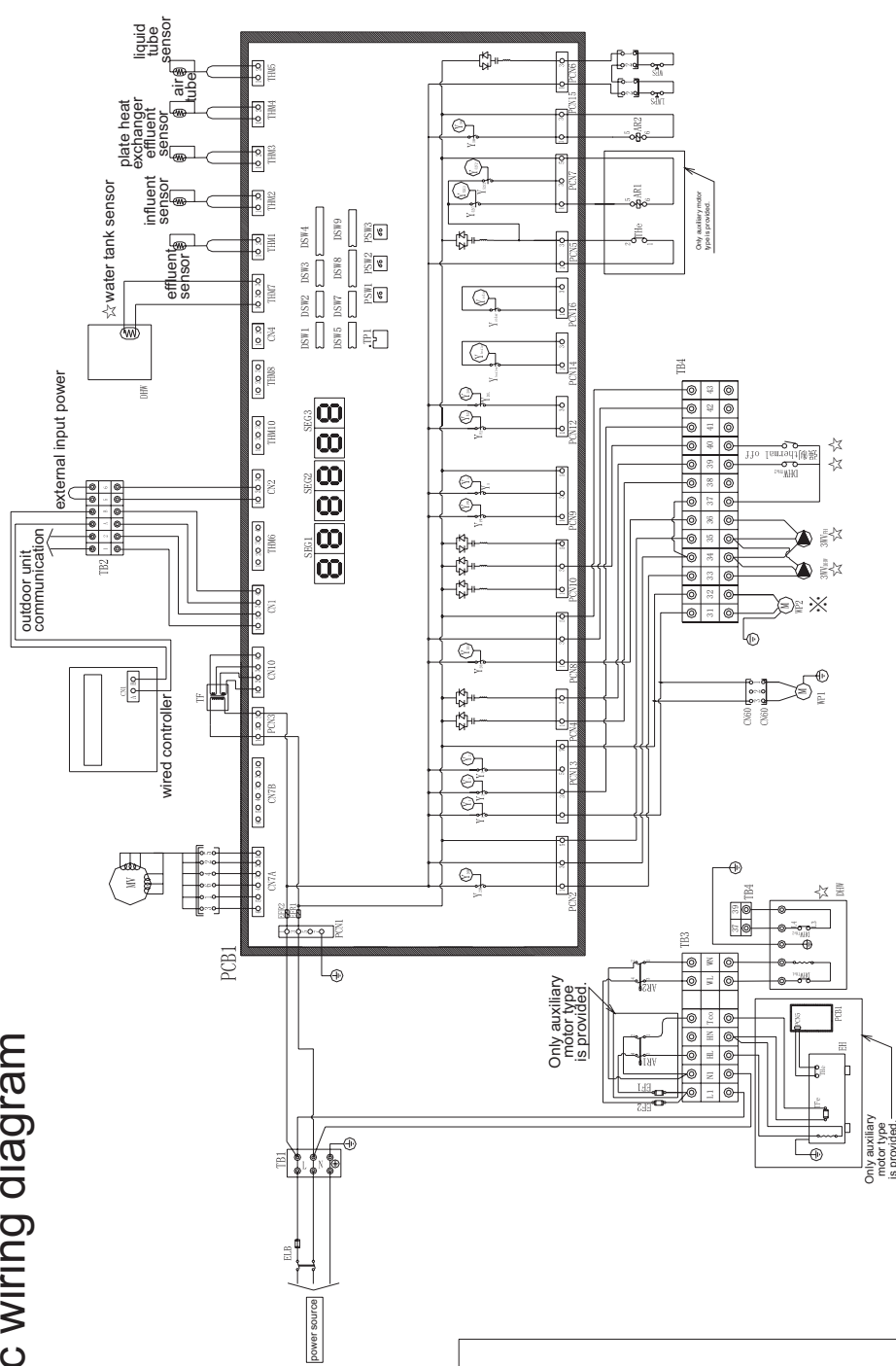
- : Factory wiring
- : Earth wire
- - : Leakage protector must be made.
- ☆ : Parts are selected by function.

Electrical control box of indoor unit



Warning When electrical parts are checked, the operation switch must be set as OFF, and power supply is cut off.

Technique requirements:
1. All on-site wiring and equipments must be conforming to local regulations.

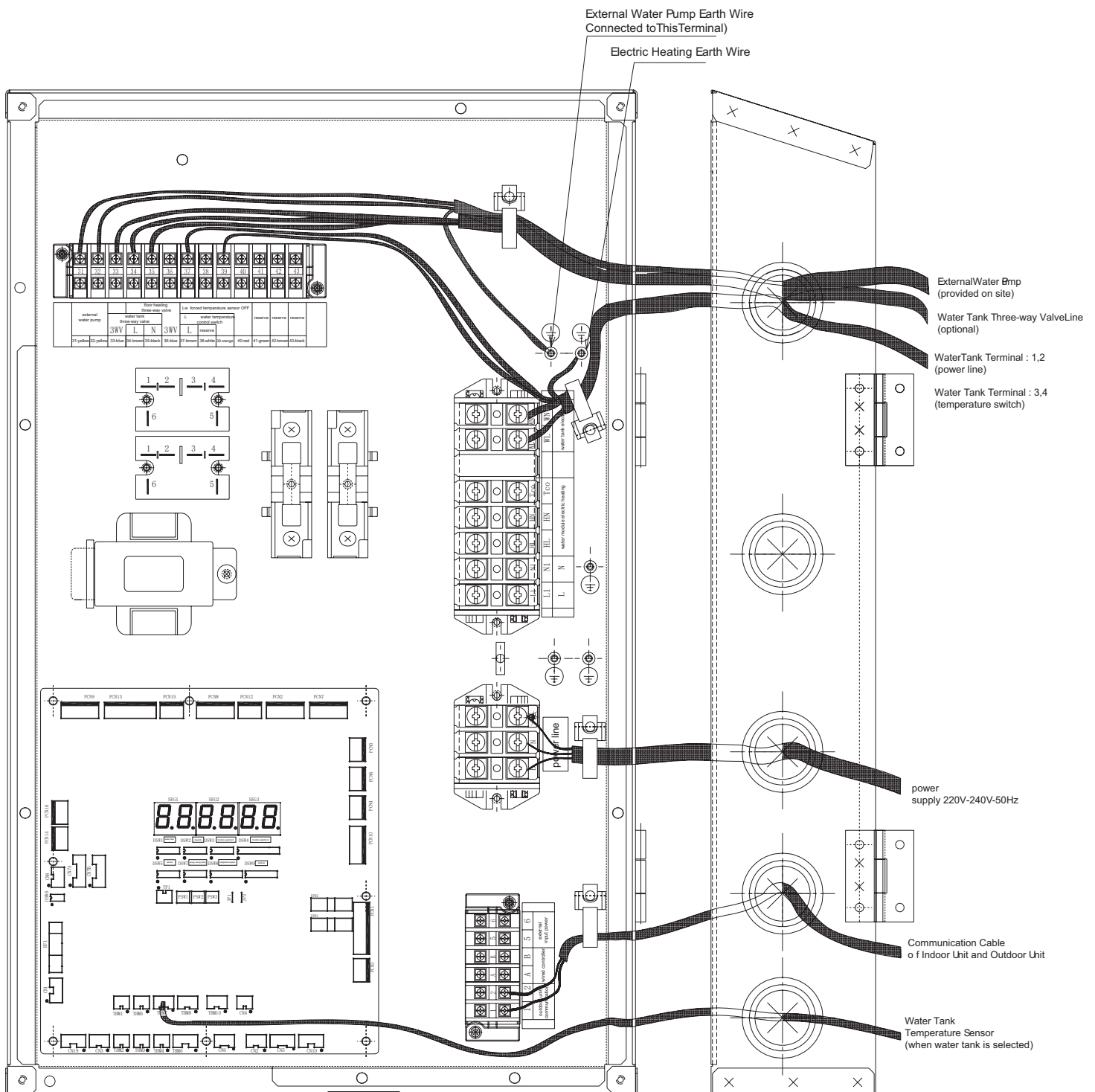


Mark	Name
PCN ₁₋₅	Terminal block
TF _{1,2,3,4}	Terminal strip
TF	Transformer
TF ₅	Electric heating fuse
TF ₆	Electric heating temperature controller
WFS	Water flow switch
WP1	Built-in water pump in water module
WP2	External water pump (assembled on site)
Y ₁ , Y ₂ , Y ₃ , Y ₄ , Y ₅	Relay (on the board)
Y ₆ , Y ₇ , Y ₈ , Y ₉ , Y ₁₀	Relay (on the board)
Y ₁₁ , Y ₁₂ , Y ₁₃ , Y ₁₄ , Y ₁₅	Relay (on the board)
Y ₁₆ , Y ₁₇ , Y ₁₈ , Y ₁₉ , Y ₂₀	Relay (on the board)
3W ₁ , 3W ₂ , 3W ₃	Water tank three-way valve
3W ₄ , 3W ₅	Floor heating three-way valve

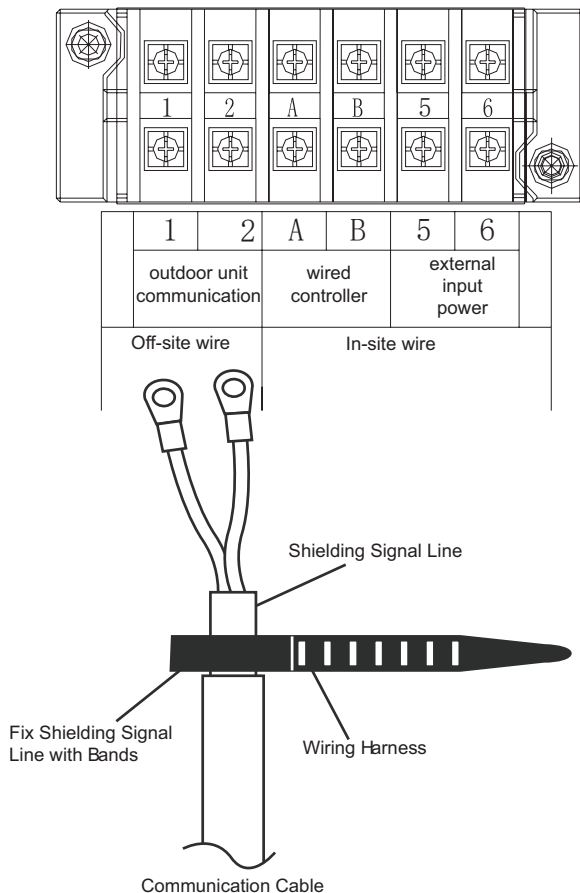
Mark	Name
ARI, AR2	Relay
CMC	AC contactor
CN ₁₋₁₀	Terminal block
CN ₁₁	Terminal block
DHW	Water tank
DHW ₁ , DHW ₂ , DHW ₃	Water tank temperature controller
DSW ₁ , DSW ₂ , DSW ₃	Dial switch
EF1, EF2	Fuse (on the board)
EF1, EF2	Fuse
EH	Water module electric heating
LWPS	Low water pressure switch
MV	Electrical expansion valve
PCB1	Circuit board

H7B02163A

10..2.4 Inner Wiring



10.2.5 Connect Communication Cable

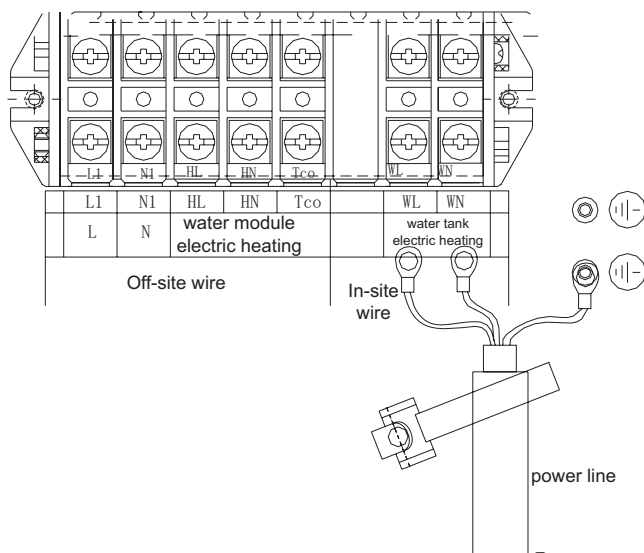


CAUTION

between outdoor unit and water module is fixed with wiring harness.

10.2.6 Connect Power Line

- (1) Connect power line and earth wire to the terminal of electric box and fix with wiring harness, seen below.
- (2) Check and ensure live line and null line of terminal blocks in power supply are correctly linked. If connected inversely, some parts may be damaged.



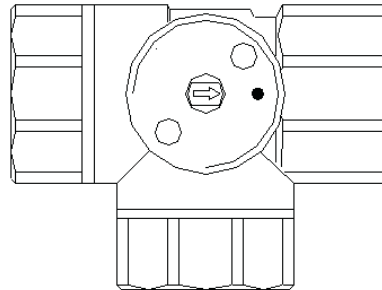
11. Install Electric Three-way Valve



CAUTION

Electrical three-way valve is used only when floor heating and domestic water tank are mounted.

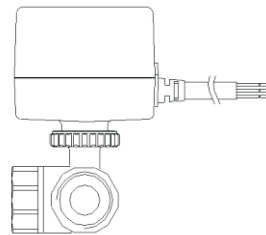
11.1 Valve Body Confirmation



CAUTION

The installation method of electrical three-way valve and connection direction of water tube are exclusive. Ensure the arrow on valve rod aligns with black circle before installation.

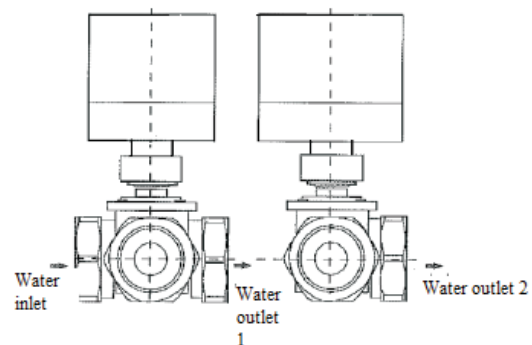
11.2 Install Actuator



CAUTION

Tighten coil and valve body. Three-core line of actuator must be opposite to lateral outlet of three-way ball valve.

11.3 Connection Direction of WaterTube



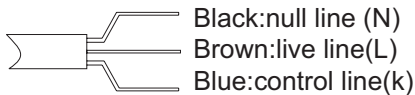
- Flow direction identifications are provided on valve body. Link water module outlet tube to "water inlet", floor heating to "water outlet 1" and domestic water tank to "water outlet 2".

CAUTION

- When electronic three-way valve is energized(K), "water outlet 2" opens, "water outlet 1" closes. When control line is deenergized, "water outlet 1" opens and "water outlet 2" closes.
- Actuator must be mounted horizontally upward.
- Do not apply brute force on actuator when installed.
- Threads connected to actuator must be national standard pipe thread (G1/1external thread).
- Do not connect actuator with valve body by using taper thread.
- Installation of valve body and pipeline must keep clean.
- Valve body and pipeline must be horizontally mounted.
- Ensure pipeline and valve body are thermally insulated. Do not wrap actuator into thermal insulation layer.

11.4 Electronic Three-way Valve Wiring

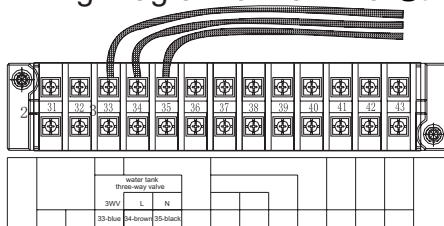
11.4.1 Wiring Color



CAUTION

Do not connect three color wires inversely, otherwise three-way valve coil may be burnt out.

11.4.2 Wiring Diagram of Terminal Strip in Water



11.5 Troubleshooting

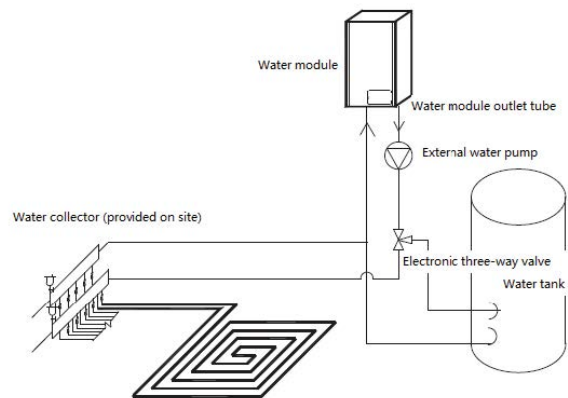
No.	Abnormality	Cause	Solution
1	On valve is inversely connected with Off valve.	Wiring error	Change the position of control line and live line.
2	Actuator does not work.	Wiring error. Wire burnout. Water flows into actuator or motor is damaged.	Check power supply and circuit of actuator.
3	Thread connection cracks.	Connecting thread is not matched. Installation is not conforming to specification or too strong force is applied.	Replace actuator. Replace valve body.
4	Valve is unable to be opened or closed fully.	Pipelines are blocked by impurities or water quality is too bad	Clean impurities or install pre-filter.

12. Installation of External Water Pump

When multi-functional VRV machine is installed, if water side flow is lower than 1.1m³/h due to too long connecting water tube and large resistance at water side, an external water pump should be added in external pipeline system. The start/off control of external water pump will be synchronous with that of built-in water pump.

12.1 Installation Location

Install external water pump at water outlet tube of water module, in front of floor heating or water tank. If linked to floor heating and water tank at same time, the external water pump should be installed in front of electronic three-way valve, seen below:



12.2 Type Selection Requirements of External Water Pump

Technical requirement for external water pump type

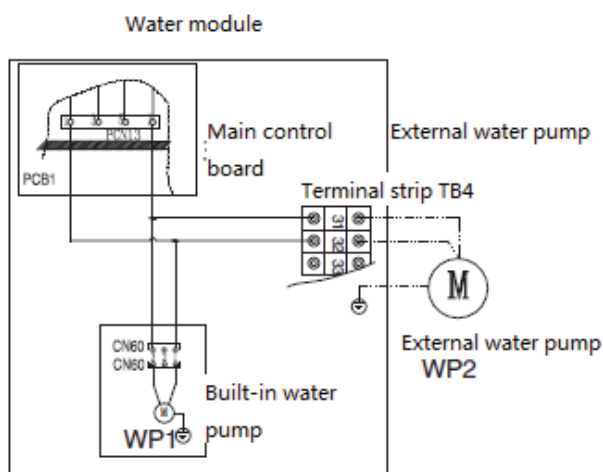
No.	Specification	Unit	Reference value
1	Rated voltage	V	220-240
2	Max. input power	W	≤280
3	Max. Current	A	≤2
4	Highest lift	m	≥6
5	Rated flow	M ³ /h	≥1.25
6	Inlet and outlet caliber	mm	25
7	Noise	dB	≤40

12.3 Recommended Type of External Water Pump

No.	Manufacturer	Type
1	Zhejiang Xinjie Pump Industry Co., Ltd	XPS25-12-180
2	Grundfos	UPS-25-125
3	Wilo	RS25/8 RS25/6

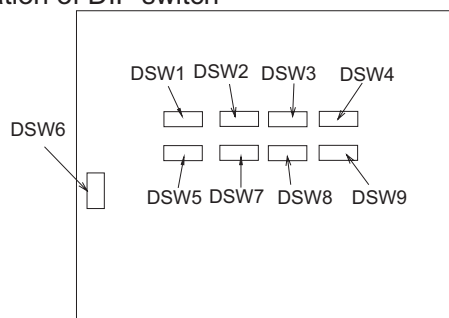
12.4 External Water Pump Wiring

Wiring is made to external water pump as shown below:



13. Setting of DIP Switch

Location of DIP switch



There are 9 DIP switches installed in water module. Set up these switches as required. Firstly Power cut before setting DIP switch and then set up. If power is not cut off, the setting contents will be invalid.

(1) DSW1 setting (reserve)

Set as Off at factory.

(2) DSW2 setting (capacity code)

No need to set up.

This switch is used to set up water module capacity and already set at factory.

Model	54
Setting position	ON OFF ☐ 1 ☐ 2 ☐ 3 ☐ 4

(3) DSW3 setting (for unit special function)

Setting function	Function Setting	Electrical heating Forced OFF	Water pump forced No
Setting position	ON OFF ☐ 1 ☐ 2 ☐ 3 ☐ 4	ON OFF ☐ 1 ☐ 2 ☐ 3 ☐ 4	ON OFF ☐ 1 ☐ 2 ☐ 3 ☐ 4

Set as Off at factory.

After set as “electric heating forced OFF”, water module electric heating will not start, saving electricity, but reducing heating effect. “Water pump forced ON” is used if water pump runs independently when water module is installed and commissioned.

(4) DSW4 setting (for unit special function)

Set as Off at factory.

This switch is used to set up special function.

setting function	factory setting	water temperature sensor makes invalid correction.	Goal Pd correction 1 (increase goal Pd)
setting position	ON OFF ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8	ON OFF ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8	ON OFF ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8
setting function	increase opening ratio of water module electric heating	Goal Pd correction 2 (increase goal Pd)	
setting position	ON OFF ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8	ON OFF ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8	

Considering measured value of water temperature sensor differs from actual water temperature, system will automatically correct tested water temperature. After set as “water temperature sensor makes invalid correction”, system will not correct tested water temperature.

When set as “goal Pd correction 1” and “goal Pd correction 2”, the high pressure in system will increase if heating effect is undesired, and the heating ability will improve. When set as “increase opening ratio of water module electric heating”, water module electric heating will shut off when outlet temperature reaches higher level, so that the heating ability will improve.

(5) DSW5 setting(reserve)

Set as Off at factory.



(6) DSW 6 setting(fuse reset)

Set as Off at factory.



Once strong electricity is connected to binding post in TB2 no. 1 and 2 line, PCB fuse will melt. At this moment, firstly correct connecting wire and then switch No. 1 switch to ON position.



(7) DSW7 setting (reserve)

Set as Off at factory.



(8) DSW8 setting (refrigeration system no. setting)

Required to set up

Already set as OFF at factory.



(9) DSW9 setting (address setting)

Set as Off at factory.



Water module type address is not required to set up. System automatically sets water module address as 63#.

14. Test Run

Commissioning and test run is made as required by table 11.2 and make record in table 11.1.

14.1 Check Before Test Run

Power cut before wiring. After the unit is mounted, Check before leakage protector starts:

1. On-site wiring
The wiring between outdoor unit and water module, water module and electronic three-way valve, water module and domestic water tank (optional) are made according to the wiring diagram and national regulations.
2. Fuse or protection device
Check the dimension and type of fuse or protection device installed on site are conforming to technical specification in table 10.1.. Confirm that the fuse and protection device are not bypassed.
3. Earth wire
ensure earth wire is connected and conforming to requirements.
4. Inner wiring
Check no loose connector or damaged electrical component inside electrical box.
5. Fixation
Check the unit is fixed, avoiding abnormal noise and vibration when the unit is started.
6. Damaged parts
Check no damaged component or pressed tube inside the unit.
7. Refrigerant leakage
Check no refrigerant leakage inside unit. If occurs, contact local dealer.
8. Power voltage
Check on-site power voltage that must be consistent with voltage value in unit name plate.
9. Vent valve
Ensure vent valve is opened and screwed by two circles at least.
10. Safety valve
Check system is fully injected with water. When safety valve is manually opened, water rather than air is drained.
11. Ball valve
Ensure ball valve is correctly installed and fully opened. Closing valve running system will damage water pump.
12. Electronic three-way valve
Ensure wiring method of electronic three-way valve and installation direction of valve body are conforming to requirements.

13. Check water circuit before test run

- (A) Confirm all water pipes are constructed in correct state before test run.
- (B) Inject water into water module. Confirm circulating water is fully injected into plate heat exchanger. Open water pump and vent valve to confirm air is discharged from the unit and pipeline.
- (C) Switch dial switch DSW3-2(details are seen below) into ON position to forcibly operate water pump. Check water pump is correctly mounted by reading pressure gage and confirming water switch action. After check, dial back dial switch, otherwise, water pump will keep running.



- (D) After first test run, clean water filter and confirm no dirt in filter net.

WARNING

- The unit starts only when all check points are cleared up.
- Pay attention when system is running:
 - (A) Do not touch any part in exhaust end, because the housing of exhaust end in compressor and pipeline has more than 90°C temperature.
 - (B) Do not press AC contactor button, otherwise serious accident may be caused.
- Do not touch any electrical component 3 minutes after main power supply is cut off.

14.2 Energize Water Module

After water module is energized, wired controller icon will be shown in initial state, which lasts 10 seconds. Displaying contents refer to the Fig.3.1 “3. wired remote controller”.

CAUTION

- It is normal that after water module is energized, it may directly enter anti-freezing running mode, and water pump automatically runs if outdoor temperature is very low.

14.3 On-site Setting

- Installation person can set up selected parameters based on installation environment and user's needs. Details refer to the section 5.1.6.

14.4 Test Run and Final Check

After installation finishes, the installation person must check water module and outdoor unit are correctly installed.

- Test run of floor heating

Test run of floor heating is made according to the section 5.1.2.1. After test lasts 2 hours or it reaches set temperature, system will automatically stop. Also it may be stopped by pressing ON/OFF key. If there is error or failure, the wired controller screen will show error code. Error code refers to the table 14.3.

- Test run of domestic hot water

Test run of floor heating is made according to the section 5.1.2.1. In general, when water temperature increase by 5 °C, the water tank heating will work normally.

CAUTION

When test run of floor heating is made, higher temperature in water module (55 °C) will damage floors due to expansion by heat and contraction by cold. control the test run time. Recommend it is within 30 minutes.

Table 14.1 Test Run and Maintenance Record

Type:	Series no.:	Compressor no.:
Use Name and Address:	Date:	

1. Does automatic vent valve discharge air normally? ☐
2. Does the reading of water pressure gage reaches required pressure (0.1-0.25MPa)? ☐
3. Is water inlet and outlet of water module correctly installed? Are all water pipes are conducted with non-leakage test? ☐
4. Are accessories provided with unit correctly installed? ☐
5. Does compressor sound abnormally? ☐
6. Does system start for 20 minutes at least ? ☐
7. Check temperature in water inlet and outlet:
Inlet: _____ °C, outlet : _____ °C
8. Check refrigerant temperature
Temperature in refrigerant liquid tube: _____ °C
Temperature in refrigerant air tube: _____ °C
9. Check pressure
Air exhaust pressure: _____ Mpa
Air suction pressure: _____ Mpa
10. Check voltage
Rated voltage : _____ V
Running voltage: _____ V
Starting voltage: _____ V
11. Check input current in compressor
Input power: _____ kW Running current: _____ A
12. Is there enough water flowing through plate heat exchanger?
13. Is refrigerant filled sufficiently?
14. Does control device run correctly?
15. Does safety device (e.g. flow switch) work normally? ☐
16. Is refrigerant system leakage test and water system leakage test performed? ☐
17. Are all machine covers fixed? ☐
18. Do all machine covers sound abnormally? ☐
19. Is water filter net cleaned? ☐
20. Is Water filter cleaned after first test run? ☐
21. Is stop valve fully opened? ☐
22. Is machine inside and outside cleaned? ☐
23. Does safety valve drainwater smoothly into downcomer? ☐

Table 14.2 Check Wiring in Test Run are Correct.

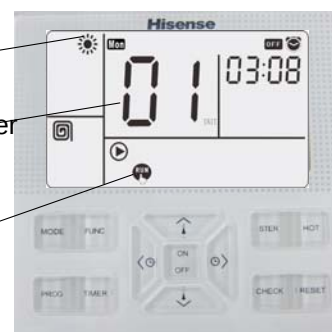
NOTE

Each independent refrigeration system must.

Heating Mode

Water Module Number

Display of
Test Run



Operation steps in “test run” mode of wired controller:

- ① Energize the unit.
- ② Operation procedures in “test run mode” of wired controller Press “mode” button and “spot check” button for 3 sec above.

If interface shown in wired controller is same to schematic diagram the line control is wired correctly.

If no display or water module number is wrongly displayed, it is abnormal.

③

Display of wired controller	Fault	Check after power cut
No display	Outdoor unit is not energized. Wired controller is wrongly wired.	1. Connection between connecting line of wired controller and indoor unit terminal strip 2. Terminal block of wired controller
	Power line is wrongly connected or loose.	3. Wiring sequence of each terminal strip 4. Screw in each terminal strip is firmly fixed.
Water module number is wrongly displayed.	Water module is not energized. Communication cable between water module and outdoor unit is not connected.	

Return (1) after checks are done.

- ④ Select floor heating or domestic hot water mode by pressing functional key (floor heating and domestic hot water need perform test run)
- ⑤ Press “ ON/OFF ” button.

Test run (the machine automatically shuts off after running for 2 hours)

It is abnormal if air-conditioner is not started or indicating lamp in wired controller flashes.

⑥

Display in wired controller	Phenomenon	Fault	Check after Power Cut:
Running indicating lamp flashes (1 time/sec) and alarm no.“03” flashes.	Water module does not start.	Outdoor unit is not energized. Communication cable is wrongly wired or loose.	1. Correct wiring sequence in terminal strip: Fuse in PCB will be burnt out due to wrong wiring. (Restore once through DSW in PCB) Restore procedures of fuse burnout in communication cable 1) Correctly connect terminal strip. 2) Set up dial position as below Water module PCB DSW6  2. Wiring in terminal strip is firm. 3. Wiring sequence of power line between outdoor unit and water module.
Running indicating lamp flashes (1 time/ 2 sec)	Water module does not start.	Wired controller breaks or wiring is wrong. Wired controller is in bad contact. Wired controller is wrongly wired.	Same to item 1,2,3 in ③.
Other display or flashing in addition to above phenomenon	Water module does not start or stops after starting once.	Joints in temperature sensor or other connector is wrong. Protection device action or other fault exist.	Check in comparison with fault code list 11.3.

Table 14.3 Fault Code

9	Abnormality	Cause
03	Communication is abnormal.	Communication cable between water module and outdoor unit or wired controller is abnormal.
11	Water temperature sensor at inlet is abnormal.	Temperature sensor is in short-circuit or open-circuit.
12	Water temperature sensor at outlet is abnormal.	Temperature sensor is in short-circuit or open-circuit.
13	Temperature sensor of liquid tube is abnormal.	Temperature sensor is in short-circuit or open-circuit.
14	Temperature sensor of air tube is abnormal.	Temperature sensor is in short-circuit or open-circuit.
15	Temperature sensor of water tank is abnormal.	Temperature sensor is in short-circuit or open-circuit.
17	Temperature sensor at outlet of plate heat exchanger is abnormal.	Temperature sensor is in short-circuit or open-circuit.
70	Water is abnormal.	Water system has insufficient pressure or water flow is very low.
71	Water tank electric heating is abnormal.	Electric heating temperature protective switch in water tank cuts off.
72	Water module electric heating is abnormal.	Electric heating temperature protective switch in water module cuts off.
76	Liquid tube is frozen.	Liquid tube has too low temperature.
79	Outdoor unit combination is abnormal.	Outdoor unit type is not matched.
80	Communication is abnormal.	Communication between wired controller and water module is abnormal.
7C	Communication is abnormal.	Communication between air-conditioner indoor unit and outdoor unit is abnormal.

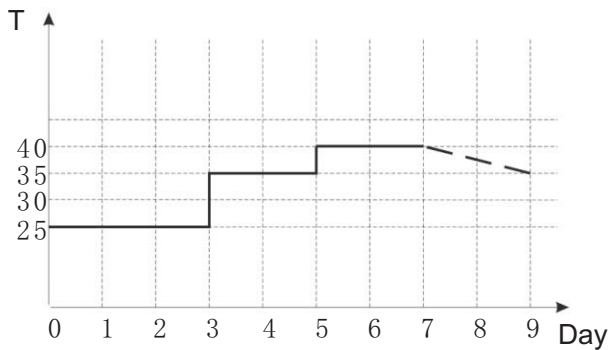
CAUTION

When indoor unit runs, if water module occurs alarm 70 or 76, alarm 7A may exist in indoor unit . If it is alarm 7C, alarm 7B may exist in indoor unit. Alarm 7A or 7B in indoor unit disappear after fault is removed. If need to restart the unit, manually reset indoor unit that occurs alarm (press OFF key or reset key in wired remote controller).

14.5 Floor Dry Running

Operation steps of floor dry running (see the section 5.1.2.2):

- (1) In standby state, press reset key ⑤ and hot water key ② for three seconds, to start dry test run of floor. The temperature of test run depends on running time. Setting temperature is shown during running and the residual running time will be shown too.



- (2) Effluent temperature is set as 25°C for running 72 hours, 35°C for 48 hours and 40°C for running 48 hours respectively.
- (3) After test run of supplying hot water for seven days, effluent temperature comes back to setting value. If the temperature is not set, it will be default value (35°C).
- (4) When floor is in dry run, the unit can be started and closed, but the functions and effluent temperature can not be changed.
- (5) The time of floor dry run is cumulative. After the unit is closed, it will enter floor dry run when it starts next time.

CAUTION

- Floor heating system must be commissioned before use.
- The commissioning of floor heating system must be made by the construction unit.
- The floor dry run of floor heating system must do after the top coat is dried thoroughly (21 days after filling layer is finished at least). At first time of supplying heat, increase hot water temperature steadily till designed value. Adjust heating pipeline connected to water knockout trap and water collector until it works normally.
- In heating effect of floor heating system, the temperature shown in black ball thermometer 1.5m from the center of room is taken as reference for evaluation and appraisal.

15. Maintenance and Repair

Regularly check water module as required in section 11.1 "test run".

CAUTION

Power cut outdoor unit and water module before maintenance and repair.

Check the followings once at least every year:

- (1) Water pressure
Check water pressure is above 0.1Mpa before startup. Supplement water if lower than 0.1MPa.
- (2) Filter
Clean water filter and filter net.
- (3) Safety valve
 - ① Stir manual switch of safety valve to check if water flows out;
 - ② If no water comes out, contact local dealer.
 - ③ If water continuously flows out, firstly close valve on water pipeline and contact local dealer.
- (4) Drainage hose in safety valve
Check safety valve hose drains water smoothly.
- (5) Electrical box
Check electrical box is loosened or not.
- (6) Water module heater
Check heater is wrapped tightly by thermal material in water module heater.
- (7) Water circuit deposit and blockage
 - After running for a while, foreign particles, dust and calcium carbonate contained in water and other mineral materials may deposit on surface of plate heat exchanger. Consume excessive electricity .
 - Regularly clean water filter regarding blockage degree in water filter. Otherwise filter net may be damaged due to excessive pressure, and filter failure is caused.

Part III Manual of Domestic Water Tank

Pay particular attention to the following items during installation. Check after installation.

No.	Check items	Check results
1	If unit safely grounded?	
2	Can installation ground bear weight of water tank?	
3	Are heat preservation measures taken for preventing water tube freezing?	
4	Are temperature pressure valve drainage tube and drain outlet tube introduced to downcomer?	
5	If repair and maintenance record is filled in?	

WARNING

- Installation must be performed by dealer or professional personnel. Improper installation will lead to water leakage, electricity shock or fire.
- Install according to this manual. Improper installation will lead to water leakage, electricity shock or fire.
- Use specified parts and accessories. Using undesignated parts will lead to water leakage, electricity shock, fire or abnormal running of water tank.

CAUTION

- Read carefully this manual before install water tank. User should keep this manual properly.
- Power cut before maintenance and repair. Non-professional personnel are not allowed to operate.
- Power supply in water tank must be grounded reliably.
- Power cut before clean water tank.
- Do not put any articles above water tank. Falling or turning over will lead to injury. Do not block water inlet or outlet of water tank.
- Recommend installing this equipment to balcony or indoor at temperature from 0 to 43 °C.
- If not use for a long time, drain out the unit and water pipeline on site.
- Hot water may cause serious burns. Test water temperature with hands. Use after the water is mixed till proper temperature.
- A temperature pressure valve which fit with local national requirments should be installed together with water tank to avoid the excessive higher temperature and pressure.
- Use tap water that is not hard. If use hard water, water tank liner, heat exchange coil, valves will

shorten their service lives. Do not use well water, underground water, spring water, otherwise, the service life of product can not be guaranteed.

- The water can not be drunk. If solids, discoloration, sludge and foreign taste occur, do not use and contact local dealer.
- Connecting of water tube with tap water tube should be operated by qualified staff using proper piping material according to local regulations and standards
- Do not use dechlorination device because it may cause bacteria proliferation in water tank.
- When water is treated by water purifying system, water quality problem may occur. Contact local dealer.
- Do not add bath agent into water tank, which may cause water tank and piping failure.

1. Introduction

1.1 Comprehensive Information

This section involves installation description of water tank in multi-function system. Read carefully before installation and strictly follow it.

Three capacities in water tank are: 150L, 200L and 300L. Water tank must be mounted vertically on ground.

1.2 Scope

This section illustrates installation process and accessories and spare parts required by water tank installation.

2. Temperature pressure valve

Name	Qty	Illustration	Technical data
Temperature pressure valve	1		Connection size: G3/4 (inch) Operating value: 94°C /0.85MPa

3. Water Tank Installation

- This water tank is designed for heat pump type heating system produced by our company. If other water tank, accessories or spare parts is used, we can not guarantee the good running and reliability of system. We will not be liable for any fault caused by above reasons.
- Temperature in water tank should be below 50 °C. If above 50°C, electric heating, magnesium rod and water tank liner will have service life reduced.
- Water tank supplies hot water from tap water. Domestic hot water is only used when tap water is connected.

- When tap water pressure is more than 0.65MPa, reducing valve must be mounted to reduce water tank pressure.
 - For safety, do not add ethylene glycol into water circulation. If added, water will be contaminated when heat exchanger coil leaks.
 - When water hardness is more than 250-300 ppm, recommend using softened water to reduce water tank scale.
 - Immediately flush water tank with fresh water after installation. Flush once every day in first five days of installation.
 - After used for a while (depend on local water quality and use frequency), clean water tank and remove scales.
- a. Power cut and close water inlet valve.
 - b. Open water outlet valve and drainage valve to empty water tank.

CAUTION

When scales are removed, temperature in water tank may be a little high, it should prevent burns or drainage equipment damaged.

- c. Close drainage valve after cleaning several minutes with water inlet valve opened. Ensure effluent water is closed after water tank is full of water. Power on and get back to work.
- Always check water tank and its surroundings has accumulated water or not. If leak, contact local dealer.
 - Clean the housing with wet cloth. Do not use corrosive cleaning agent.
 - If water tank is not used for more than 2 weeks, a certain amount of hydrogen will gather in water tank. Recommend open temperature pressure valve handle or water outlet faucet for several minutes to release hydrogen, however, do not open hot water faucet in dish-cleaning machine and washing machine, etc. When nitrogen is released, do not make open flame or operate other electrical apparatus. When gas is released, releasing sound will be heard.

3.1 Main Parts

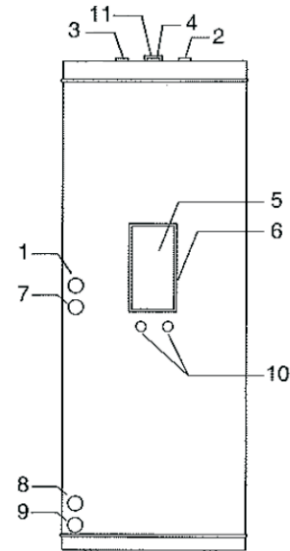
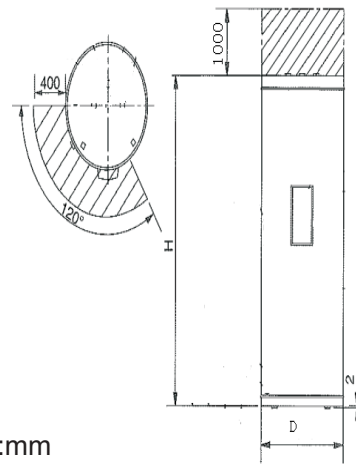


Fig.3.1-1 Main Parts of Water Tank



Unit:mm

Fig.3.1-2 Maintenance Space in Water Tank

- | | |
|-------------------------------------|-------------------------|
| 1. Temperature sensor | 6. Electrical box cover |
| 2. Cold water joint | 7. Coil inlet |
| 3. Hot water joint | 8. Coil outlet |
| 4. Temperature pressure valve joint | 9. Drain outlet |
| 5. Electrical box | 10. Cable fixed head |
| | 11. Magnesium rod |

Water tank type	H(mm)	D(mm)
HDHWT-150E/3H1Q	880	φ 648
HDHWT-150ES/3H1Q	1606	φ 470
HDHWT-200E/3H1Q	1080	φ 648
HDHWT-300E/3H1Q	1480	φ 648

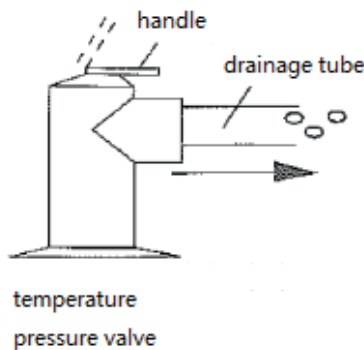
CAUTION

Ensure installation “” and maintenance space.

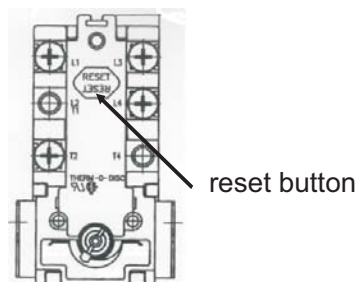
3.2 Safety Device

CAUTION

- Temperature pressure valve must be tightly connected with drainage tube. Drainage tube must be connected as shown in Fig.3.10 and introduced to building downcomer (The water temperature in drainage tube may be high, note burns).
- Temperature pressure valve in water tank can not be connected for other purposes.
- Check temperature pressure valve once half a year. When checking, open temperature pressure valve handle (seen below), temperature pressure valve will smoothly drain water out. The water temperature may be high, note burns. Reset after it is errorless. If drainage fails, contact local dealer for repair.
- Temperature pressure valve and its drainage tube must keep smooth and not blocked.



- Do not install electric heating without protective device.
- Temperature protection device: Water tank electric heating has temperature protection device. When temperature is high, temperature switch will cut off power. Power will restore automatically when temperature is lower than 75°C.
- Temperature protection device cuts off electric heating power at high temperature. After disconnected, open electrical box cover and press red button to reset temperature protection device. Location of red button is seen below:



- Electrical box cover must be opened by qualified electrician.
- Power cut before open electrical box cover .
- Temperature pressure valve is used to prevent too high temperature in water tank ($>94^{\circ}\text{C}$) and water pressure ($>0.85\text{MPa}$).

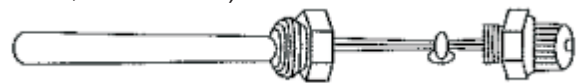
3.3 Installation Guide

Note when water tank is installed:

- Recommend installing this equipment to balcony or outdoor at temperature from 0°C to 43°C .
- Water tank is mounted near floor drain to connect temperature pressure valve drainage tube.
- Do not install water tank in place with corrosive gas.
- Installation location is free from frosting.
- Installation location must bear weight of water tank containing water.
- Ensure dimension of water tube is above 1 inch (recommend DN40 water tube), provide enough capacity to pipeline and reduced resistance in pipeline system.
- Water tank is located in a place that is convenient for repair and ensuring electrical box opened. Refer to Fig.3.1-2.
- No accumulated water around installation location.
- Arrange filter at water inlet tube, preventing domestic water contaminated by impurities.
- Ensure water tank is full of water before energizing.

3.4 Install Water Tank

1. Check water tank has complete accessories.
2. When mounted on ground, ensure the bottom of water tank flat and vertically install water tank. If mounted in bath room where water exists, recommend installing on a foundation higher than ground, preventing the bottom soaked by water.
3. Temperature sensor should be inserted into temperature probe as deeply as possible. Fix it with provided cable fastening. (Cable tie must be between temperature probe and cable fixed head, seen below).



4. Because water pressure exists in water tank, when magnesium rod is replaced, first close water inlet valve and drain outlet for 10-20 sec, and then replace magnesium rod. After replacement, open water inlet valve. If water sprays from water tank through above measures taken, confirm water temperature in water tank, preventing burns. Besides, do not place electrical parts or electrical products near water tank, preventing electrical shock or fire due to electrical short-circuit.

3.5 Connect Water Module

Refer to the section 3.2 "typical application examples

3.6 On-site Wiring

CAUTION

Electrical wiring must be performed by professional technician according to national regulations.

- (1) Correctly mount cable water proof head and electrical box cover, preventing short circuit caused by water intruding into electrical box.
- (2) Auxiliary electric heating is 3kW. Power line connection should give concern to live line and null line, and be grounded strictly. Detailed wiring diagram refers to wiring diagram and Fig.3.9.
- (3) Temperature sensor is weak electricity signal, preventing mixed with strong electricity signal.

3.7 Power Line Requirements

Water Module Type	Power Source	Rated Current	Power Source Cable Size
			EN60335-1*1
Full series water tank power supply	220V-240V ~50Hz	16.9A	2.5mm ²
Water tank temperature switch	220V-240V ~50Hz	-	≤2.5mm ²

*1 The power cord type designation is H05VV-F

According to EN60335-1	
Current(A)	Wire Size(mm ²)
i ≤ 3	1 ~ 2.5
3 < i ≤ 6	1 ~ 2.5
6 < i ≤ 10	1 ~ 2.5
10 < i ≤ 16	1.5 ~ 4
16 < i ≤ 25	2.5 ~ 6
25 < i ≤ 32	4 ~ 10
32 < i ≤ 50	6 ~ 16
50 < i ≤ 63	10 ~ 25

CAUTION: In the case that current exceeds 63A, do not connect cables in series.

NOTE

- (1) Installation of on-site wire must be conforming to local regulations.
- (2) The above line ※ 1 is selected according to relevant international standard.
- (3) When power line is connected in series, total current value selects power line specification.

3.8 Temperature Sensor Wiring Diagram

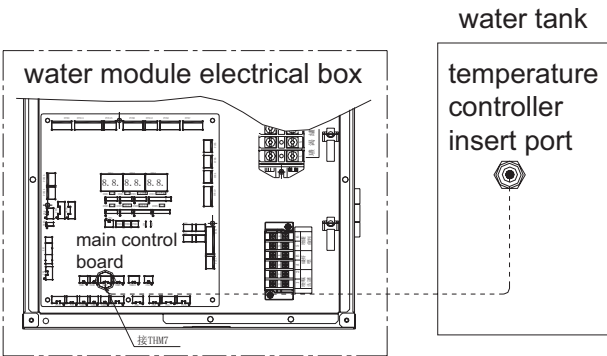


Fig.3.8 Water tank temperature sensor wiring diagram

3.9 Water Tank Power Line and Temperature Switch Wiring Diagram

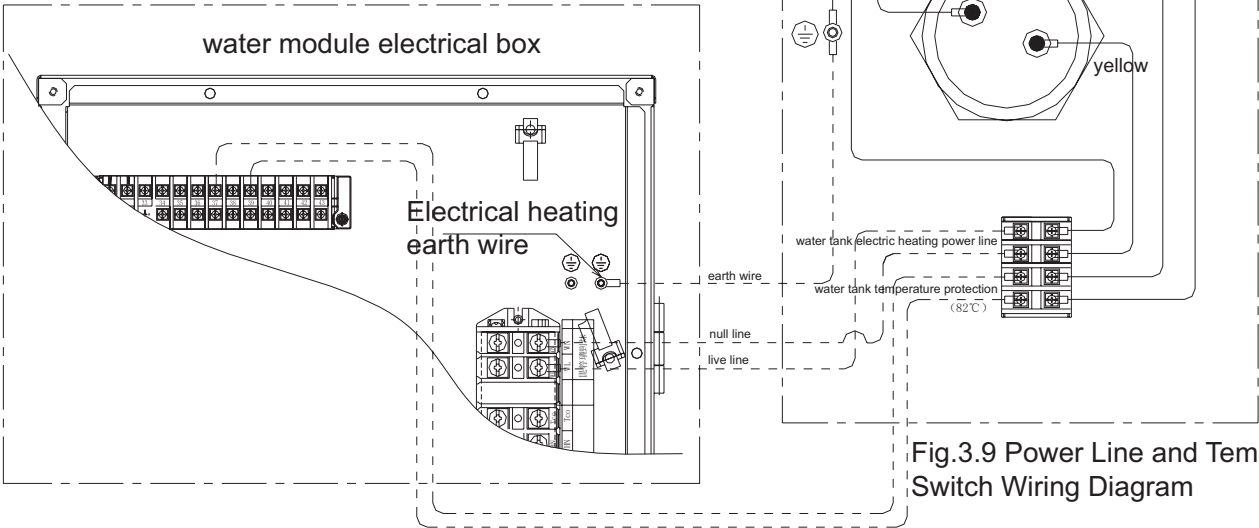


Fig.3.9 Power Line and Temperature Switch Wiring Diagram

3.10 Water Tank Pipeline Connection

Connect pipeline of water tank as shown in Fig.3.10. The size of connecting pipe thread of water tank is seen below.

No.	Name	Connecting pipe thread
1	Cold water joint	Rp3/4"(male thread)
2	Hot water joint	Rp3/4"(male thread)
3	Coil inlet	G3/4"(male thread)
4	Coil outlet	G3/4"(male thread)
5	Drain outlet	Rp3/4"(male thread)
6	Temperature pressure valve interface	G3/4"(male thread)

Rp is British sealed cylinder female thread.

G is British non-sealed cylinder thread.

CAUTION

- Clean pipelines and fixed elbow connected on site and ensure no impurities inside piping before connected to water tank, otherwise, the equipment fails normal operation.

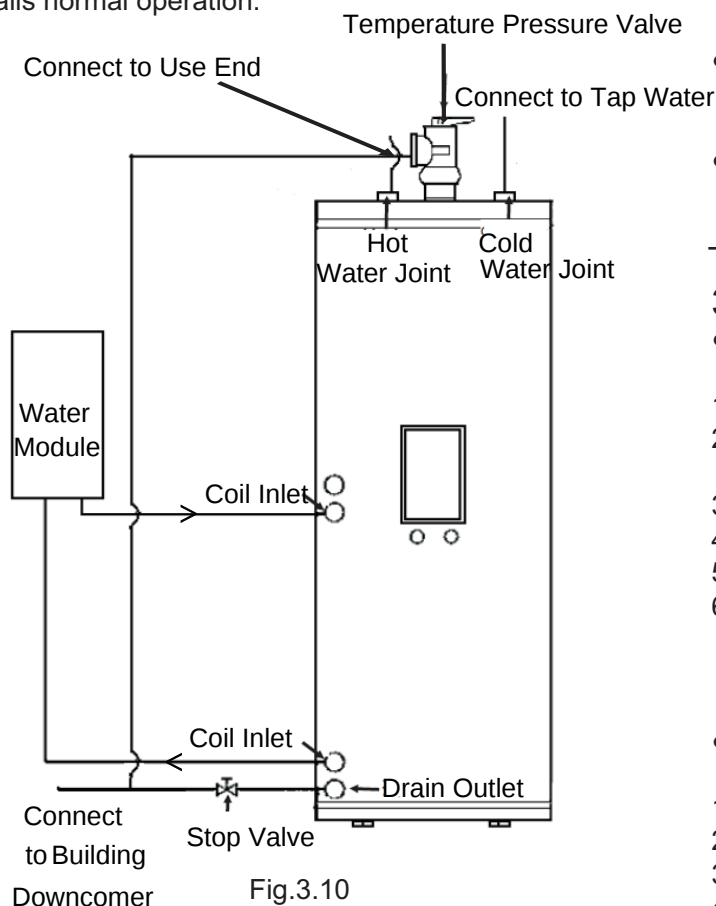


Fig.3.10

3.11 Pipeline Requirements

- All pipelines connected to faucet must be gradually lowered.
- Do not use electrical welding, cooper welding or other welding material to connect pipelines or weld pipelines.
- Outlet tube, safety valve and drain valve must be mounted far from electrical apparatus.
- To ensure safe use, inlet and outlet tube must be connected to PPR tube of a certain length >

70*R2(R is pipe inner diameter). Do not use metal pipe.

- Drain tube of temperature pressure safety valve must be connected to a safe location without hurting people.

CAUTION

- Water pipelines are installed after water tank is fixed.
- Do not make dust and other impurities invade into pipeline system when connection tube are installed.
- Temperature pressure valve may spray hot water. To avoid hurting people, proper pipe joint must be connected to temperature pressure valve, and connect temperature pressure valve to stop valve of drain outlet through PPR tube, seen in Fig.3.10.
- Drain tube introduces water into building downcomer. A stop valve suitable for pipeline size must be mounted in drainage pipeline. Stop valve must be installed in a place that is convenient to the user.
- Inject water into water tank after all water pipelines are mounted. Ensure stop valve connecting drain pipe is closed.
- Check leakage in all water pipelines. Thermally treat all pipelines after ensuring no water leakage.

3.12 Discharge Water

- Inject water
Inject water into water tank:
 1. Power cut.
 2. Open each hot water faucet and discharge air in system pipeline.
 3. Open cold water supply valve.
 4. Check no leakage.
 5. Close all faucets after air is discharged.
 6. Open temperature pressure valve to ensure water flows through effluent pipe (move ball type wrench to the left). The location of temperature pressure valve refers to Fig.3.10.
- Discharge water
Discharge water from water tank as follows:
 1. Power cut.
 2. Close cold water supply valve.
 3. Open hot water faucet.
 4. Open stop valve of drain port.
- Anti-freezing measures
 1. If not use for long time, drain circulating water from the unit and on-site piping.
 2. If the above operation fails, keep the unit connected to power supply, make water pump regularly automatically run to prevent water circuit freezing.

3.13 Maintenance and Repair

To ensure good operation in the unit, it should work with the local dealer to regularly check the unit and on-site wiring.

CAUTION

Power cut water module and outdoor unit before maintenance and repair.

- Check the following items once every one:
 1. Water tank electric heating
Recommend cleaning water scale in electrical heating rod to prolong service life, particularly when tap water is hard. Drain water from water tank and take electric heating rod and soak it into a bucket of solution mixed with descaling solution for 24 hours.
 2. Temperature pressure valve
Check temperature pressure valve works normally. Move ball wrench to the left, and open temperature pressure valve to ensure water flows through effluent tube.
 3. Electrical box in water module
Thoroughly check electrical box, and seek for obvious negligence, e.g. loose connection or wrong wiring.
Check AC contactor works normally by using multimeter and all terminal blocks in AC contactor do not contact with other parts.

3.14 Troubleshooting

- Comprehensive guide
Observe and thoroughly check electric box before solution and seek obvious negligence, e.g. loose wiring or wrong wiring.
Carefully read this section before contact local dealer, which can save your money and time.
Find out the opening of safety device when safety device is opened and unit stops. Safety device can not be beyond the setting value at factory. If reasons are not found, contact local dealer.
- Comprehensive symptom

No.	Symptom	Possible Cause	Solution
1	No water flows from hot faucet.	Main water source is closed.	Check stop valve of all water circulation are opened.
2	Water flowing from hot faucet is cold.	Water module does not work.	Refer to the manual. Check water module. If problem continues, contact local dealer.
3	Water flows intermittently.	Temperature protection device fails	Power cut water module. If no water flows from outlet tube, it still fails, contact local dealer.
4	Water continuously flows out.	Temperature pressure valve fails	Check temperature pressure valve.
5	No water flows out.	Water inlet valve fails.	Open water inlet valve.

3.15 Technical Specification

Running temperature scope at outdoor side:
-20-43°C

Water tank specification

Type		HDHWT 150ES /3H1Q	HDHWT 150E/ 3H1Q	HDHWT 200E/ 3H1Q	HDHW- 300E/ 3H1Q
Capacity (L)		150	150	200	300
Size (mm)		Φ470x 1606	Φ648 x880	Φ648 x1080	Φ648 x1480
Water Tank Electric Heating	Power Supply	220V-240V~ 50Hz			
	Curren t (A)	13			
	Power (Kw)	3			
Water Side Design Pressure (MPa)		0.65			
Max. working Pressure of Water Tank (MPa)		0.85			
Max. working Pressure of Coil (MPa)		0.65			
Opening Pressure of Safety Valve (MPa)		0.85			
Size of Safety Valve Joint (inch)		G3/4 ^(b)			
Size of Cold and Hot Water Inlet and Outlet (inch)		Rp3/4 ^(a)			
Size of Coil Inlet and Outlet (inch)		G3/4 ^(b)			
Weight (kg)		56	65	77	96
Weight Containing Water (kg)		206	215	277	396
Max. Water Supply Pressure		0.65			

(a) Rp is British sealed cylinder female thread.

(b) G is British non-sealed cylinder thread.

Maintenance and Repair Record of Water Tank

Water tank type:

Use name and address:

Spot check items: ①magnesium rod spot check②electric heating rod cleaning③ liner cleaning

Mark checked item in the following record as “√” with an oily pen and write down the date, status and staff, etc.

Staff					
Date					
Status	①				
	②				
	③				
Staff					
Date					
Status	①				
	②				
	③				
Staff					
Date					
Status	①				
	②				
	③				
Staff					
Date					
Status	①				
	②				
	③				
Staff					
Date					
Status	①				
	②				
	③				
Staff					
Date					
Status	①				
	②				
	③				
Staff					
Installation date: Year month day					



1041180

Qingdao Hisense Hitachi Air-conditioning Systems Co., Ltd.

Add: 218, Qianwangang Road, Economic & Technical Development Zone, Qingdao, P.R. China

<http://www.hisense-vrf.com> E-mail: export@hisensehitachi.com

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