

#### 4.4.9 Setting of Rapid Water Heating

Rapid water heating: Under the condition allowed by outdoor unit, start compressor and electric heating to heat up water rapidly.

Setting of rapid water heating: Under water heating mode, press "FUNCTION" button to switch to rapid function. Icon of rapid function blinks. Press "ENTER/CANCEL" to enable the rapid function.

Cancellation of rapid water heating: Under water heating mode, press "FUNCTION" button to switch to rapid function. Press "ENTER/CANCEL" to cancel the rapid function.

Note:

① Rapid function is valid only once. When the hydro box reaches the condition of keeping temperature, rapid function is cancelled to save energy.

② After water heating is off, rapid water heating function is canceled.

#### 4.4.10 Setting of Water Heating Timer On/Off

Whether water heating is on or off, water heating timer on or off can be set.

Setting of water heating timer:

Press "TIMER" to enter the setting of timer. Icon "ON" will blink.

Press "▲" or "▼" to adjust the timing for water heating to be turned on. Press "ENTER/CANCEL" to complete the setting.

Pressing "TIMER" button before pressing "ENTER/CANCEL" button can save the setting of timer on and switch to the setting of timer off. Icon "OFF" will blink.

Press "▲" or "▼" to adjust the timing for water heating to be turned off. Press "ENTER/CANCEL" button or "TIMER" button to complete the setting.

Pressing "▲" or "▼" each time will increase or decrease the time by 1 minute. However, holding "▲" or "▼" for 5 seconds will increase or decrease the time by 10 minutes.

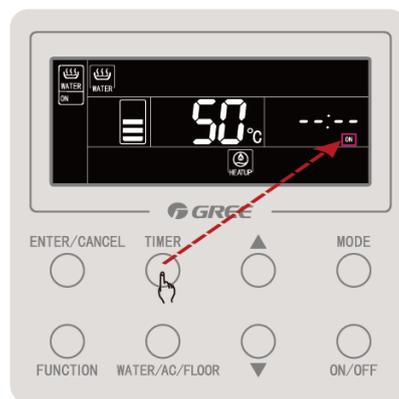
Cancellation of water heating timer:

Press "TIMER" to enter the setting of timer. Pressing "TIMER" button can switch between timer on and timer off. Press "ENTER/CANCEL" to cancel water heating timer.

Setting of water heating timer is as below:



Power on with timer unset



Press the "TIMER" button to set power-on timer for water heating



Press the "▲" or "▼" button to set the water heating



Press the "TIMER" button to switch to power-off timer for water heating



Press the "▲" or "▼" button to set the water heating power-off time



Press the "ENTER/CANCEL" button to enable the timer on/off for water heating

Cancellation of water heating timer on is as below:



Effective status of water heating timer



Press the "TIMER" button to switch to power-on timer



Press the "ENTER/CANCEL" button to cancel power-on timer for water heating

Cancellation of water heating timer off is as below:



Effective status of water heating timer



Press the "TIMER" button for twice to switch to power-off timer



Press the "ENTER/CANCEL" button to cancel water heating power-off timer

#### 4.4.11. Setting of Preset Water Heating

Setting of preset water heating:

Under water heating mode, press "MODE" button to switch to preset mode (Then wired controller will remind user to set the preset time. If unit is already in preset mode, skip this step). Press "TIMER" button and the character "Preset" blinks.

Press "▲" or "▼" to adjust the preset time for water heating. Press "ENTER/CANCEL" button to complete the setting.

Cancellation of preset water heating:

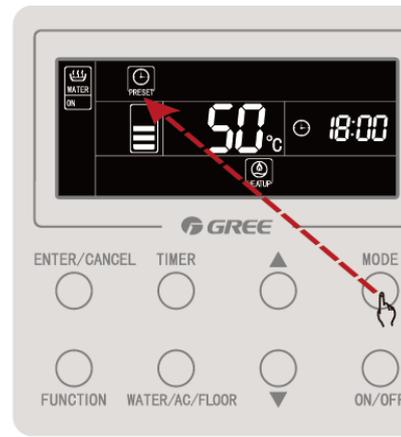
Under water heating mode, press "MODE" button to switch to preset mode (If unit is already in preset mode, skip this step). Press "TIMER" button and the character "Preset" blinks. Press "ENTER/CANCEL" button to cancel the setting.

Setting of preset water heating is as below:

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Power on status



Press the "MODE" button to switch preset mode



Press the "▲" or "▼" button to set the preset time for water heating



Press the "TIMER" button to enter the setting of water heating preset tin



Press the "ENTER/CANCEL" button to set the preset setting of water heating



Power on status



Press the "MODE" button to switch preset mode



Press the "▲" or "▼" button to set the preset time for water heating

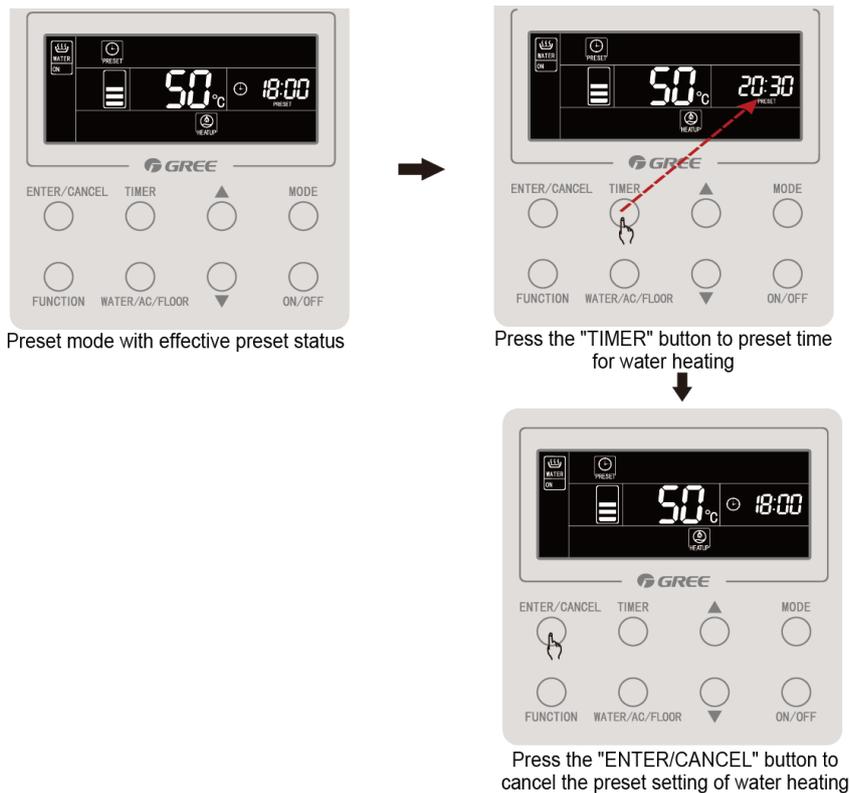


Press the "TIMER" button to enter the setting of water heating preset tin



Press the "ENTER/CANCEL" button to set the preset setting of water heating

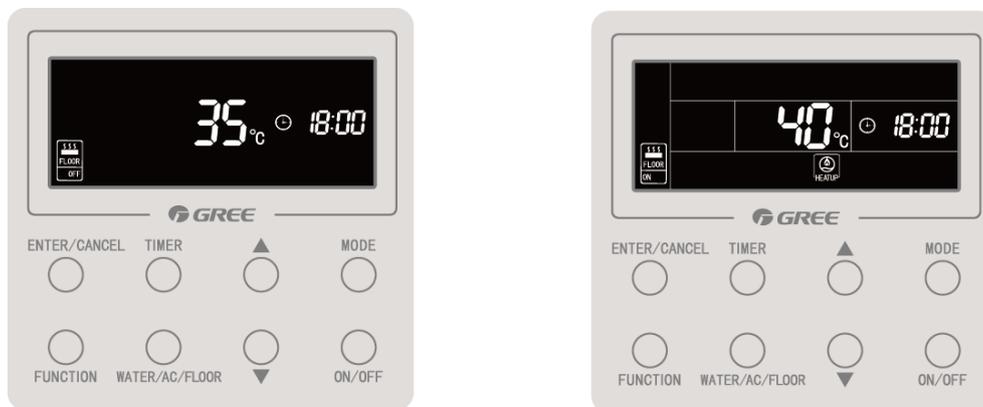
Cancellation of preset water heating is as below:



#### 4.4.12. On/Off of Floor Heating

On/Off of floor heating: On the interface of floor heating, press "ON/OFF" button, and floor heating will be on or off.

On the interface of water heating: press "WATER/AC/FLOOR" button once to activate the interface of floor heating. After that, pressing "ON/OFF" each time will switch floor heating on or off.



#### 4.4.13. Water Temperature Setting of Floor Heating

When floor heating is on, pressing "▲" or "▼" button will increase or decrease set temperature by 1°C. Holding "▲" or "▼" button will increase or decrease set temperature by 1°C every 0.3 seconds.

Temperature setting range for floor heating is 25°C~maximum water temperature for floor heating. Default water temperature is 40°C.

Note:

1. Default maximum water temperature for floor heating is 45°C. Professional operators can adjust the maximum water temperature from 40°C to 52°C.

2. When floor heating water temperature auto setting function is effective, pressing "▲" or "▼" button will not change the water temperature.

#### 4.4.14. Switch of Floor Heating Functions

The following functions can be set when floor heating is on or off:

Floor heating is on/off	Functions	Remarks
Floor heating is on	Floor Heating Water Temperature Auto Setting, Rapid Floor Heating, Absence	
Floor heating is off	Absence	

On the interface of floor heating, when floor heating is turned on, pressing “FUNCTION” button once will change floor heating functions circularly as below:



When floor heating is turned off, only the absence function will be available.

#### 4.4.15. Setting of Floor Heating Water Temperature Auto Setting

Floor heating water temperature auto setting: Floor heating water temperature will be set automatically by hydro box main board according to outdoor ambient temperature.

Setting of floor heating water temperature auto setting: Under floor heating, press "FUNCTION" button to switch to auto function. Icon of auto blinks. In the temperature zone, current auto setting level will be blinking. Press “▲” or “▼” to select a setting level. Press “ENTER/CANCEL” to enable the auto setting function.

Cancellation of floor heating water temperature auto setting: Under floor heating, press “FUNCTION” button to switch to auto function. Then press “ENTER/CANCEL” to cancel the auto setting function.

#### 4.4.16. Setting of Rapid Floor Heating

Rapid floor heating: Under the condition allowed by outdoor unit, start compressor and electric heating to heat the floor rapidly.

Setting of rapid floor heating: Under floor heating mode, press “FUNCTION” button to switch to rapid function. Icon of rapid function blinks. Press “ENTER/CANCEL” to enable the rapid function.

Cancellation of rapid floor heating: Under floor heating mode, press “FUNCTION” button to switch to rapid function. Press “ENTER/CANCEL” to cancel the rapid function.

Note:

① Rapid function is valid only once. When the hydro box reaches the condition of keeping temperature, rapid function is cancelled to save energy.

② After floor heating is off, rapid floor heating function is cancelled.

#### 4.4.17. Setting of Floor Heating Absence Function

Floor heating absence function: When user is absent, unit will maintain the water temperature to avoid pipeline from frost and prevent indoor equipment from damage.

Setting of floor heating absence function: Under On/Off status of floor heating, press “FUNCTION” button to switch to absence function. Icon of absence blinks. Press “ENTER/CANCEL” to enable the absence function.

Cancellation of floor heating absence function: Under On/Off status of floor heating, press “FUNCTION” button to switch to absence function. Then press “ENTER/CANCEL” to cancel the absence function.

#### 4.4.18. Setting of Floor Heating Timer On/Off

Whether floor heating is on or off, floor heating timer on or off can be set.

Setting of floor heating timer:

Press “TIMER” to enter the setting of timer. Icon “ON” will blink.

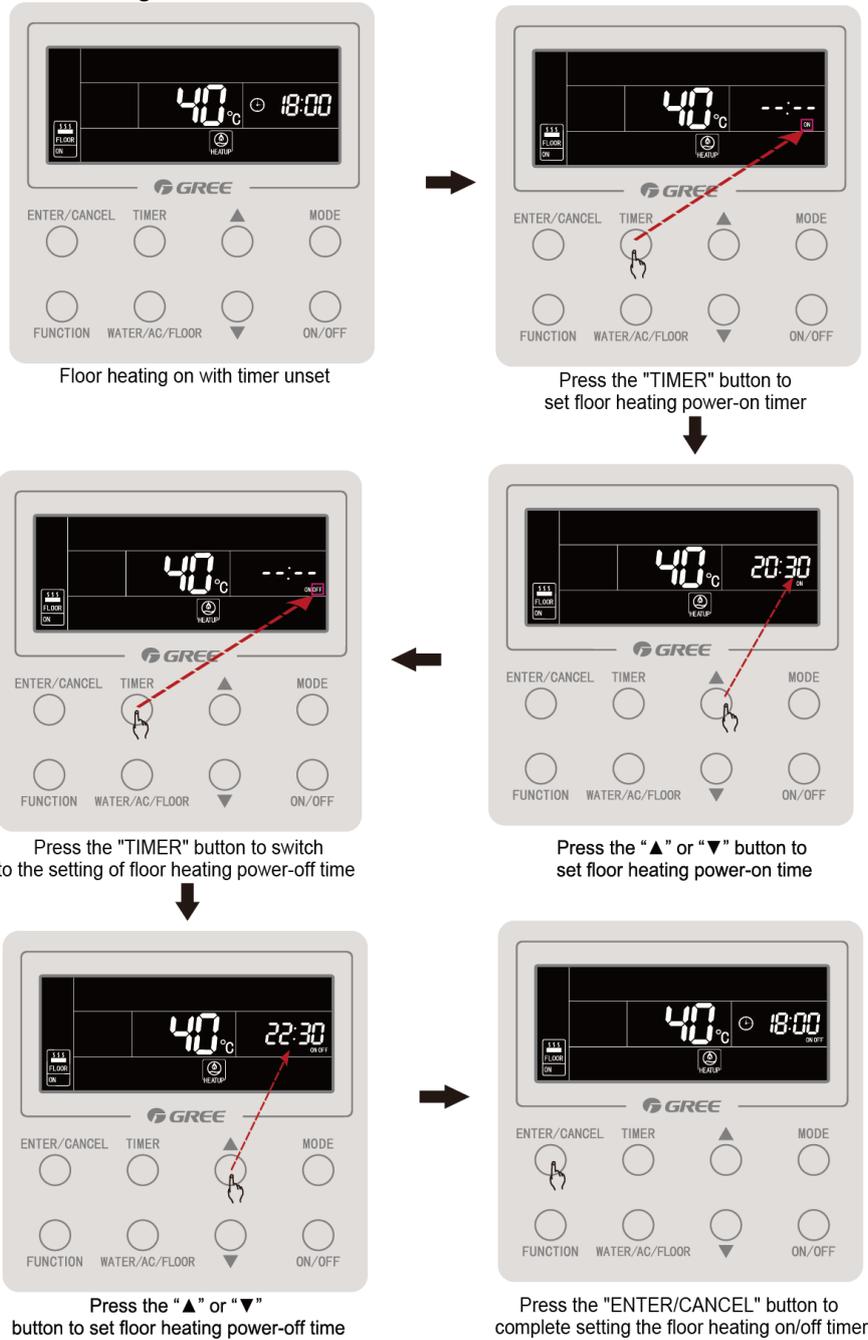
Press “▲” or “▼” to adjust the timing for floor heating to be turned on. Press “ENTER/CANCEL” to complete the setting.

Pressing “TIMER” button before pressing “ENTER/CANCEL” button can save the setting of timer on and switch to the setting of timer off. Icon “OFF” will blink.

Press “▲” or “▼” to adjust the timing for floor heating to be turned off. Press “ENTER/CANCEL” button or “TIMER” button to complete the setting.

Pressing “▲” or “▼” each time will increase or decrease the time by 1 minute. However, holding “▲” or “▼” for 5 seconds will increase or decrease the time by 10 minutes.

Cancellation of floor heating timer:  
 Press "TIMER" to enter the setting of timer. Pressing "TIMER" button can switch between timer on and timer off. Press "ENTER/CANCEL" to cancel floor heating timer.  
 Setting of floor heating timer is as below:



Cancellation of floor heating timer on is as below:



Effective status of floor heating power on/off timer



Press the "TIMER" button to switch to power-on timer



Press the "ENTER/CANCEL" button to cancel power-on timer of floor heating

Cancellation of floor heating timer off is as below:



Effective status of water heating timer



Press the "TIMER" button for twice to switch to power-off timer



Press the "ENTER/CANCEL" button to cancel water heating power-off timer

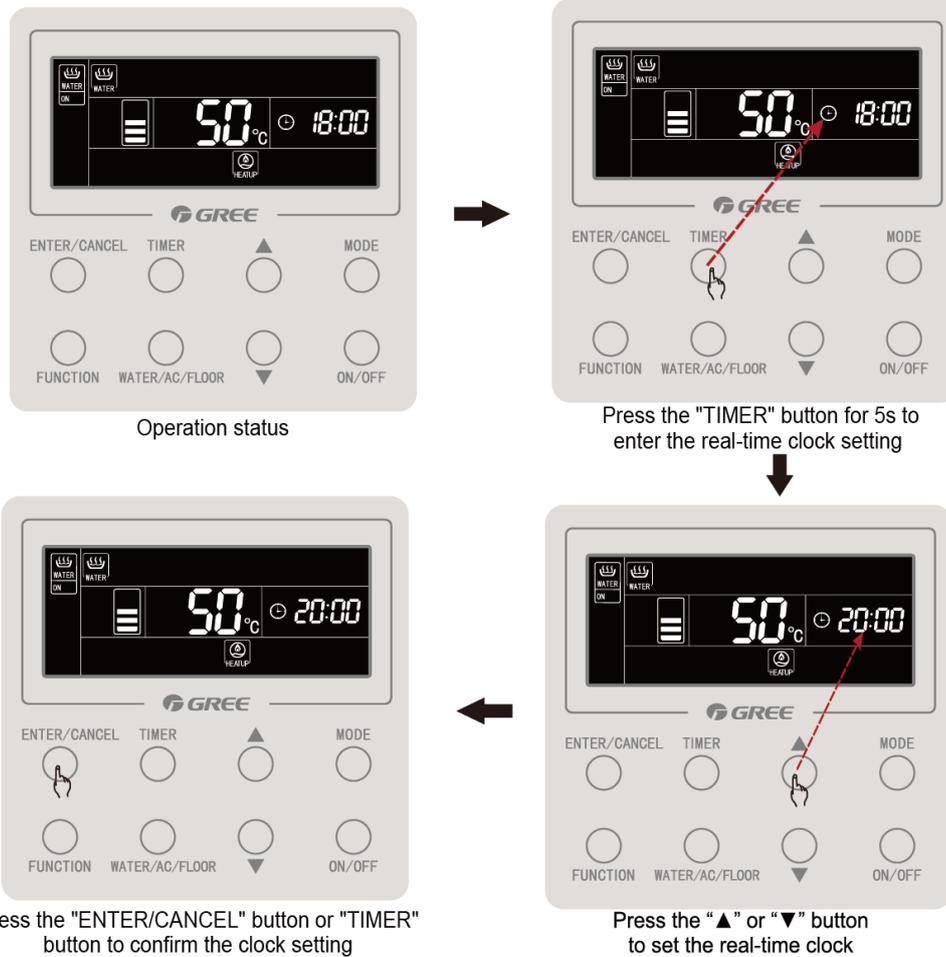
#### 4.4.19 Setting of Clock

Clock display: Timer zone will display system clock whether unit is turned on or not. When icon  blinks, user can set the clock.

System clock: Hold "TIMER" button for 5 seconds to enter the setting of clock. Icon  blinks. Pressing "▲" or "▼" can increase or decrease the time by 1 minute. However, holding "▲"

or “▼” for 5 seconds can increase or decrease the time by 10 minutes. Then press “ENTER/CANCEL” button or “TIMER” button to save and exit the setting.

Setting of clock is as below:



#### 4.4.20 Setting of Cleaning

Start the water pump to drain and clean the waterway for the engineering installation.

When water heating and floor heating are off and sterilizing function is not taking place, press and hold “WATER/AC/FLOOR” button for 5 seconds. The character “CLEAN” is lit up. During cleaning, the character “CLEAN” will be blinking. Press and hold “WATER/AC/FLOOR” button for another 5 seconds, and cleaning will stop. The character “CLEAN” will be off.

#### 4.4.21 Remote Shield

Remote shield: Remote monitor and central controller can disable relevant functions of wired controller so as to realize the function of remote control.

The function of remote shield includes all shield and partial shield. When All Shield function is on, all controls of the wired controller are disabled. When Partial Shield function is on, those controls that are shielded will be disabled.

When the remote monitor or central controller activates Remote Shield on the wired controller, icon of  will show. If user wants to control through the wired controller, icon  will blink to remind that these controls are disabled.

#### 4.4.22 Child Lock

When unit is turned on or off normally, pressing “▲” and “▼” buttons together for 5 seconds will turn on child lock function.  will show on the display. Press and hold “▲” and “▼” buttons again for 5 seconds to turn off child lock function.

All the other buttons will be disabled when Child Lock function is on.

### 4.5 Malfunction Display

When malfunction occurs during operation, temperature zone of wired controller will display malfunction codes. If several malfunctions happen at the same time, malfunction codes will be displayed one by one circularly.

Note: If malfunction occurs, please turn off the unit and send for professionals to repair.  
Below is a display when the quantity of group controlled hydro boxes is inconsistent.



4.5.1 Table of Malfunction Codes for Outdoor Unit

Content symbol Distinctive symbol		0	1	2	3	4	5
Indoor	L	Indoor unit malfunction	Indoor fan protection	Auxiliary heating protection	Water overflow protection	Power supply over-current protection	Anti-freezing protection
	d		Indoor unit PCB malfunction	Malfunction of water tank lower water temperature sensor	Malfunction of ambient temperature sensor	Malfunction of inlet tube temperature sensor	Malfunction of middle temperature sensor
	y						
Outdoor	E	Outdoor unit malfunction	High pressure protection	Low discharge temperature protection	Low pressure protection	Compressor high discharge temperature protection	
	F	Outdoor unit main board malfunction	Malfunction of high pressure sensor		Malfunction of low pressure sensor		Malfunction of discharge temperature sensor for compressor 1
	J	Other module protection	Over-current protection for compressor 1	Over-current protection for compressor 2	Over-current protection for compressor 3	Over-current protection for compressor 4	Over-current protection for compressor 5
	b		Malfunction of outdoor	Malfunction of defrosting	Malfunction of defrosting	Malfunction of	Malfunction of

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			ambient temperature sensor	temperature sensor 1	temperature sensor 2	sub-cooler outflow temperature sensor	sub-cooler exhaust temperature sensor
	P	Compressor drive board malfunction	Compressor drive board operation error	Compressor drive board power voltage protection	Compressor drive module reset protection	Compressor drive PFC protection	Inverter compressor over-current protection
	H	Fan drive board malfunction	Fan drive board operation error	Fan drive board power voltage protection	Fan drive module reset protection	Fan drive PFC protection	Variable frequency fan over-current protection
Commissioning	U	Deficient preheating of compressor		Wrong outdoor unit capacity code/jumper cap setting	Power phase sequence protection	Refrigerant shortage protection	Wrong compressor drive board address
	C	Communication failure between indoor and outdoor units, and indoor unit wired controllers		Communication failure between main control board and inverter compressor drive	Communication failure between main control board and variable frequency fan drive	Malfunction of lack of indoor unit	Indoor unit project number conflict warning
Status	A	Unit is ready for commissioning.		After-sales refrigerant recycling	Defrosting	Oil return	
	n	Economic mode setting			Forcible defrosting	Maximum output capacity	Forcible offset of indoor unit project number

Content symbol	Distinctive symbol	6	7	8	9	A	H
Indoor	L	Mode conflict	No master indoor unit	Power supply shortage	Inconsistent number of group-controlled indoor units	Inconsistent series of group-controlled indoor units	Warning against poor air quality
	d	Malfunction of outlet tube temperature sensor	Malfunction of humidity sensor	Malfunction of water temperature sensor	Jumper cap malfunction	Indoor unit network address error	Wired controller PCB error
	y						
Outdoor	E						
	F	Malfunction of discharge temperature sensor for compressor 2	Malfunction of discharge temperature sensor for compressor 3	Malfunction of discharge temperature sensor for compressor 4	Malfunction of discharge temperature sensor for compressor 5	Malfunction of discharge temperature sensor for compressor 6	Compressor 1 current sensor error
	J	Over-current protection for compressor 6	4-way valve leakage protection	High system pressure ratio protection	Low system pressure ratio protection	Exceptional pressure protection	
	b	Malfunction of gas separator inlet tube	Malfunction of gas separator outlet tube	Malfunction of outdoor humidity sensor	Malfunction of heat exchanger exhaust temperature	Malfunction of oil return 1 temperature sensor	System clock error

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		temperature sensor 1	temperature sensor (outlet tube A)		sensor		
	P	Compressor drive IPM module protection	Compressor drive temperature sensor malfunction	Compressor drive IPM over-temperature protection	Inverter compressor out-of-step protection	Compressor drive storage chip malfunction	Compressor drive DC bus high voltage protection
	H	Fan drive IPM module protection	Fan drive temperature sensor malfunction	Fan drive IPM over-temperature protection	Variable frequency fan out-of-step protection	Variable frequency fan drive storage chip malfunction	Fan drive DC bus high voltage protection

Content symbol Distinctive symbol		6	7	8	9	A	H
Commissioning	U	Warning against valve error		Indoor unit pipeline malfunction	Outdoor unit pipeline malfunction		
	C	Warning against inconsistency of outdoor unit number	Converter communication error	Compressor emergency status	Fan emergency status	Module emergency status	Rated capacity ratio of indoor and outdoor units is too high
Status	A	Setting of cooling and heating	Setting of quiet mode	Mode of vacuum pumping			Heating
	n	Unit malfunction query	Unit parameter query	Indoor unit project number query	Query of the number of online indoor units	Cooling and heating model	Heating model

Content symbol Distinctive symbol		C	L	E	F	J	P
Indoor	L	Models of indoor and outdoor units are not matched	Malfunction of water flow switch	Abnormal rotation speed of EC DC water pump	Malfunction of shunt valve setting	Wrong setting of function DIP switch	PG motor zero-crossing malfunction
	d	Abnormal setting of capacity DIP switch	Malfunction of air discharge temperature sensor	Malfunction of indoor CO <sub>2</sub> sensor	Malfunction of water tank upper water temperature sensor	Malfunction of backwater temperature sensor	Malfunction of floor heating water inlet pipe temperature sensor
	y						
Outdoor	E						
	F	Compressor 2 current sensor error	Compressor 3 current sensor error	Compressor 4 current sensor error	Compressor 5 current sensor error	Compressor 6 current sensor error	DC motor malfunction
	J	Water flow switch protection	Low high pressure protection	Oil return pipe is blocked	Oil return pipe is leaking		
	b	Compressor 1 top cover temperature sensor falling protection	Compressor 2 top cover temperature sensor falling protection	Malfunction of condenser inlet tube temperature sensor	Malfunction of condenser outlet tube temperature sensor	High pressure and low pressure sensors are connected	Malfunction of oil return 2 temperature sensor

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						reversely.	
	P	Malfunction of compressor drive current detection circuit	Compressor drive DC bus low voltage protection	Inverter compressor out-of-phase protection	Malfunction of compressor drive recharging circuit	Inverter compressor startup failure	Inverter compressor AC current protection
	H	Malfunction of fan drive current detection circuit	Fan drive DC bus low voltage protection	Variable frequency fan out-of-phase protection	Malfunction of fan drive recharging circuit	Variable frequency startup failure	Variable frequency fan AC current protection
Commissioning	U	Master indoor unit is set.	Compressor emergency operation DIP switch is wrong	Ineffective refrigerant charging			
	C	Malfunction of lack of master unit	Rated capacity ratio of indoor and outdoor units is too low		Malfunction due to multiple master control units	DIP switch conflict of system address	Malfunction due to multiple master wired controllers
Status	A	Cooling	Auto refrigerant charging	Manual refrigerant charging	Fan blow	Filter cleaning reminder	Unit starting commissioning confirmation
	n	Cooling model		Negative code	Fan model	High temperature prevention in heating	

Content symbol Distinctive symbol	U	b	d	n	y
Indoor	L				
	D	Malfunction of floor heating water outlet tube temperature sensor	Project commissioning	Malfunction of solar power temperature sensor	Malfunction of air guide louver
	Y				
Outdoor	E				
	F	Malfunction of compressor 1 top cover temperature sensor	Malfunction of compressor 2 top cover temperature sensor		
	J				
	B	Malfunction of oil return 3 temperature sensor	Malfunction of oil return 4 temperature sensor		
	P	Inverter compressor drive AC input voltage abnormal protection			
	H	Inverter compressor drive AC input current abnormal protection			

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Commissioning	U					
	C	Communication malfunction between indoor unit and the receiver board	Overflow distribution of IP address			
Status	A	Remote emergency shutdown	Emergency shutdown	Restricted operation	Child lock status	Shielding status
	N	Eliminate the long-distance shielding command of indoor unit	Barcode inquiry		Outdoor unit connection pipe length correction	

#### 4.5.2 Table of Malfunction Codes for Hydro Box

Display code	Description	Display code	Description	Display code	Description
L0	Hydro box malfunction	LL	Malfunction of water flow switch	dA	Hydro box network address error
L4	Power supply over-current protection	LE	Abnormal rotation speed of EC DC water pump	dH	Wired controller PCB error
L5	Anti-freezing protection	LF	Malfunction of floor heating shunt valve setting	dF	Malfunction of upper water temperature sensor
L6	Mode conflict	d1	Indoor unit PCB malfunction	dJ	Malfunction of backwater temperature sensor
L8	Power supply shortage	d2	Malfunction of lower water temperature sensor	dP	Malfunction of hydro box water inlet temperature sensor
L9	Inconsistent number of group-controlled hydro boxes	d4	Malfunction of refrigerant inlet tube temperature sensor	dU	Malfunction of hydro box water outlet temperature sensor
LA	Inconsistent series of group-controlled hydro boxes	d6	Malfunction of refrigerant outlet tube temperature sensor	db	Special code: project commissioning code
LC	Models of hydro box and outdoor unit are not matched	d9	Jumper cap malfunction	dd	Malfunction of solar power temperature sensor

#### 4.5.3 Table of Commissioning Codes

Display code	Description	Display code	Description	Display code	Description
U2	Wrong outdoor unit capacity code/ jumper cap setting	UE	Ineffective refrigerant charging	CH	Rated capacity ratio is too high.
U3	Power phase sequence protection	UL	Compressor emergency operation DIP switch is wrong.	CL	Rated capacity ratio is too low.
U4	Refrigerant shortage protection	C0	Communication failure between indoor and outdoor units, indoor units and wired controllers	CF	Malfunction due to multiple master control units
U5	Wrong compressor drive board address	C2	Communication failure between main control board and inverter compressor drive	CJ	DIP switch conflict of system address
U6	Warning against valve error	C3	Communication failure between main control board and variable	CP	Malfunction due to multiple master wired

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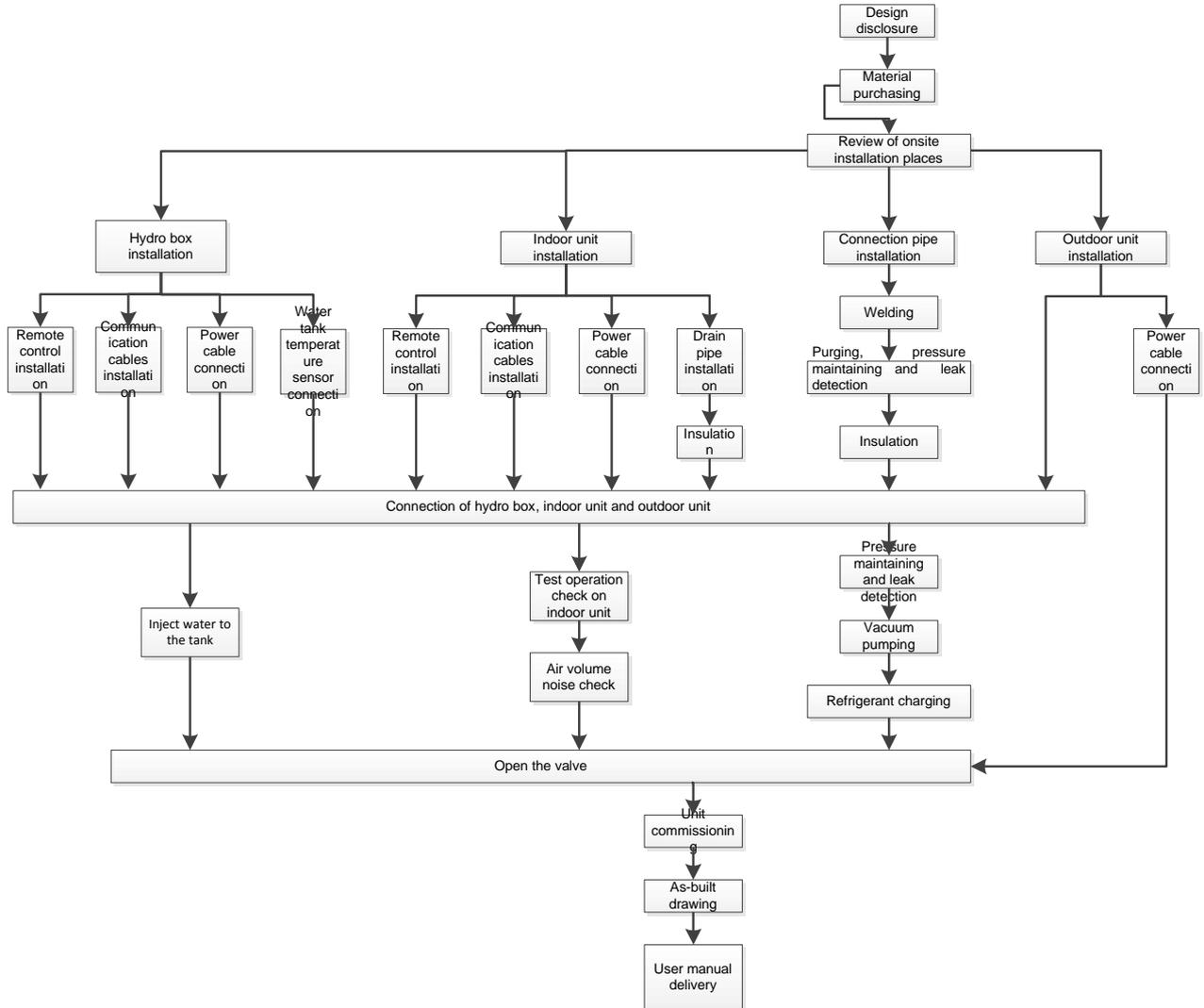
			frequency fan drive		controllers
U8	Indoor unit pipeline malfunction	C4	Malfunction of lack of indoor unit	CU	Communication malfunction between indoor unit and the receiver board
U9	Outdoor unit pipeline malfunction	C5	Indoor unit project number conflict warning	Cb	Overflow distribution of IP address
UC	Master indoor unit is set.	C6	Warning against inconsistency of outdoor unit number		

#### 4.5.4 Table of Status Codes

Display code	Description	Display code	Description
A0	Unit is ready for commissioning.	A8	Mode of vacuum pumping
A1	Compressor operating parameter query	AJ	Filter cleaning reminder
A2	After-sales refrigerant recycling	AU	Remote emergency shutdown
A3	Defrosting	Ab	Emergency shutdown
A5	Online test	Ad	Restricted operation

# Chapter 3 Installation

## 1. Engineering Installation Flowchart



## 2.Common Tools and Devices

- Three-stage distribution box----Fig. 1
- Multifunctional measurement gauge---Fig. 2

The measurement gauge shall be able to withstand higher pressure. The size of connection pipe is different from the previous pipe in order to avoid misuse.

- Control valve---Fig. 3

Avoid overflow of refrigerant during moving and enable instant open and close of liquid pipe side and refrigerant charging tank port.

- Charging safety device (gas-liquid separator)

Usually, refrigerant must be changed into liquid state. Since R410A is a kind of mixed refrigerant, hazards may be caused if the mixed ratio changes. In order to avoid refrigerant flowing back to compressor in liquid state, this device can be used to make refrigerant get into compressor securely.

- Electronic scale----Fig. 5

Electronic scale is the recommended device for charging R410A.

- Refrigerant container---Fig. 6

Confirm the refrigerant type before charging. Usually, R410A refrigerant in liquid state shall be charged.

- Thermal resistor vacuum measurement meter---Fig. 7

In order to remove the vapor in refrigeration circulation, proper vacuum drying must be applied. For this purpose, you can use this device to check if the system is vacuum.

- Vacuum pump---Fig. 8

Use it to vacuum the refrigeration circulation and detection system.

- Welding tool---Fig. 9
- Pipe bender---Fig. 10
- Pipe expander---Fig. 11

In order to adapt to the high pressure of R410A, the shape of expander is different from the conventional one.

- Nitrogen tank---Fig. 12

The nitrogen in the tank is for driving oxygen during welding in order to avoid forming oxidation film and oxidation inside the system.

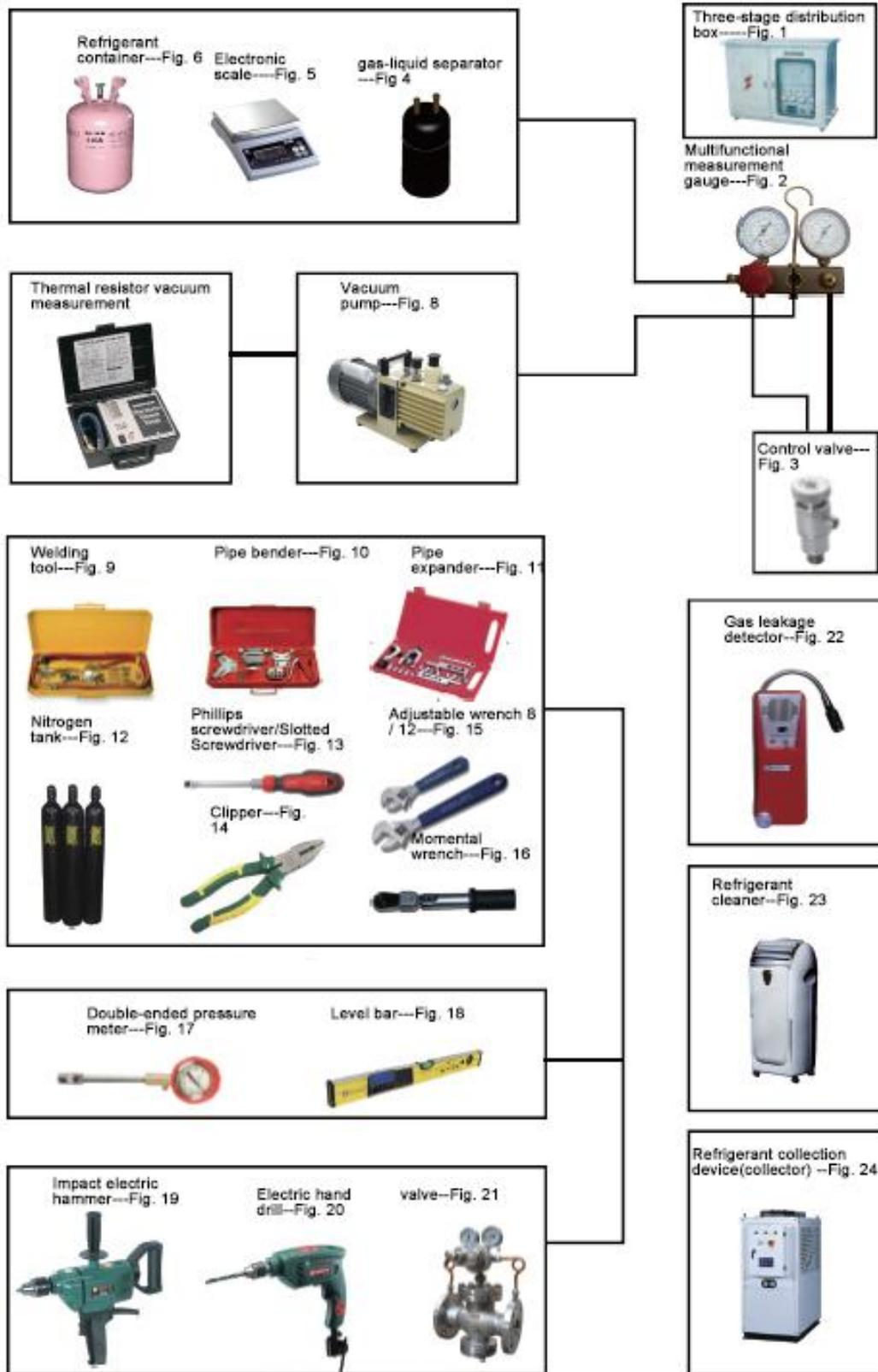
- Phillips screwdriver/Slotted Screwdriver---Fig. 13
- Clipper---Fig. 14
- Adjustable wrench 8 / 12---Fig. 15
- Momental wrench---Fig. 16

Tighten flaring nut

- Double-ended pressure meter---Fig. 17
- Level bar---Fig. 18
- Impact electric hammer---Fig. 19
- Electric hand drill--Fig. 20
- Oxygen relief valve/Nitrogen relief valve/Acetylene relief valve/ Backfire check valve--Fig. 21
- Gas leakage detector--Fig. 22

Specialized for leakage detection for HFC refrigerant.

- Refrigerant cleaner--Fig. 23
- Refrigerant collection device(collector) --Fig. 24



Note:  
All tools shall comply with related safety qualification.

## 3. Preparation before Installation

### 3.1 Notices for Installation Engineering

#### 3.1.1 Safety requirements for installation engineering



Warning! All personnel involved in the installation must attend safety education courses and pass corresponding safety examinations before installation. Only qualified personnel can attend the installation. Relevant personnel must be held responsible for any violation of the regulation.



Warning! Personnel and property safety are highly concerned during the entire installation process. Installation implementation must abide by relevant national safety regulations to ensure personnel and property safety.

#### 3.1.2 Importance of installation engineering

VRF air conditioning systems use refrigerant, instead of other agent, to directly evaporate to carry out the system heat. High level of pipe cleanness and dryness is required in the system. When preparing and laying out various pipes onsite, if impurities, water, or dust is still inside refrigerant pipes or there is impurities and air inside the water system pipeline due to improper installation, various problems may occur in the system or even lead to system breakdown.

Problems that usually occur during installation are as follows:

No.	Installation Problem	Possible Consequence
1	Dust or impurities enter into the refrigeration system.	Pipes are blocked; air conditioning performance is reduced; compressor wear is increased or even hinder the normal operation of the system and burn the compressor.
2	Nitrogen is not filled into the refrigerant pipe or insufficient nitrogen is filled before welding.	Pipes are blocked; air conditioning performance is reduced; compressor wear is increased or even hinder the normal operation of the system and burn the compressor.
3	The vacuum degree in the refrigerant pipe is insufficient.	The refrigeration performance is reduced. The system fails to keep normal operation due to frequent protection measures. When the problem getting serious, compressor and other major components can be damaged.
4	Water enters into the refrigeration pipe.	Copper plating may appear on the compressor and reduce the compressor efficiency with abnormal noise generated; failures may occur in the system due to ice plug.
5	The refrigerant pipe specifications do not meet the configuration requirements.	Smaller configuration specifications can increase the system pipe resistance and affect the cooling performance; larger configuration specifications are waste of materials and can also reduce the cooling performance.
6	Refrigerant pipe is blocked.	The cooling performance is reduced; in certain cases, it may cause long-term compressor operating under overheat conditions; the lubricating effect can be affected and the compressor may be burnt if impurities were mixed with the lubricating oil.
7	Refrigerant pipe exceeds the limit.	The loss in pipe is considerable and the unit energy efficiency decreases, which are harmful for long-term running of the system.
8	Incorrect amount of refrigerant is filled.	The system cannot correctly control the flow allocation; the compressor may be operating under over-heating environment or running when the refrigerant flows back to the compressor.
9	The refrigerant pipe leaks.	Insufficient refrigerant circulating in the system decreases the cooling performance of the air conditioner. Long-term operation under such circumstance may cause an overheating compressor or even damage the compressor.
10	Water drainage from the condensate water pipe is not smooth.	Residual water in IDUs can affect the normal operation of the system. The possible water leakage can damage the IDU's decoration.
11	The ratio of slop for condensate water pipe is insufficient or the condensate water pipe is incorrectly connected.	Reverse slop or inconsistent connection of condensate water pipe can hinder the smooth drainage and cause leakage of the IDU.
12	The air channel is improperly fixed.	The air channel will deform; vibration and noise occur during unit operating.

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13	The guide vane of air channel is not reasonably manufactured.	Uneven air quantity allocation reduces the overall performance of the air conditioner.
14	The refrigerant pipe or condensate water pipe does not meet the insulation requirement.	Water can easily condensate and drip to damage the indoor decoration, or even trigger the protection mode of system due to overheating operation.
15	The installation space for IDU is insufficient.	Since there is a lack of space for maintenance and checking, indoor decoration might need to be damaged during such operation.
16	The IDU or the location of the air outlet or return air inlet is not designed reasonably.	The air outlet or return air inlet may be short-circuited, thus affecting the air conditioning performance.
17	The ODU is installed in an improper place.	The ODU is difficult to be maintained; unit exhaust is not smooth, which reduces the heat exchanging performance or even prevent the system from normal operation; in addition, the cold and hot air for heat exchange and the noise may annoy people in surrounding areas.
18	Power cables are incorrectly provided.	Unit components may be damaged and potential safety hazard may occur.
19	Control communication cables are incorrectly provided or improperly connected.	The normal communication in the system fails or the control over IDUs and ODUs turn in a mess.
20	Control communication cables are not properly protected.	The communication cables are short-circuited or disconnected, and the unit cannot be started up due to communication failure.
21	Circulating inlet/outlet pipe of hydro box is blocked; floor heating pipe is blocked; water pipe at user side is blocked; or there are impurities in water system;	Water heating/floor heating effect gets worse; pump of hydro box is broken or hydro box occurs water flow switch protection or the complete unit occurs high pressure protection;
22	There is air in the circulating inlet/outlet pipe of hydro box; there is air in the floor heating pipe; there is air in the water pipe at user side; there is air in the water tank;	Water heating/floor heating effect gets worse; pump of hydro box is broken or hydro box occurs water flow switch protection or the complete unit occurs high pressure protection;
23	Auto vent valve is not installed at the top of water system	There is air in the waterway. Water heating/floor heating effect gets worse; pump of hydro box is broken or hydro box occurs water flow switch protection or the complete unit occurs high pressure protection;
24	The hydro box is not installed in indoor places	When the temperature is winter is too low, the hydro box may get frozen easily;
25	Insulation hasnt been done to the water system pipeline	When the temperature is winter is too low, the hydro box may get frozen easily;
26	The resistance of floor heating water system is too big, but engineering water pump is not installed	Floor heating effect gets worse and floor heating engineering water pump shall be installed;
27	Floor heating embedded pipe hasnt been designed according to the requirement; the distance between two floor heating pipes is too big or the diameter of floor heating pipe is too small	Floor heating effect gets worse and energy consumption increases;
28	Water makeup pipe of circulating water of hydro box hasnt installed pressure relief device	The water pressure inside circulating pipe of hydro box is too big; safety valve of hydro box leaks and causes water accumulation, which affects water heating effect;
29	When the hydro box is connected to the water tank or floor heating, waterway solenoid valve C and valve D haven't been installed; or the selected solenoid valve is not straight through, whose resistance is too big	Water heating/floor heating effect gets worse and energy consumption increases;

Understand the special requirement (if any) for unit installation before implementation to ensure installation quality. Relevant installers must have corresponding engineering construction qualifications. Special type operators involved in the engineering implementation, such as welders, electricians, and refrigeration mechanics must have relevant operating licenses and are accredited with vocational qualification certification.

### 3.1.3 Cooperation between different professions

A quality installation of air conditioning engineering depends on careful organization and close

cooperation between different professions such as architecture, structure, electric, water supply and drainage, fire-fighting, and decoration. Pipes must be laid in places away from any automatic spray head for fire-fighting, and must be reasonably arranged to ensure that the pipes fit the electric, luminaries, and decoration.

#### 3.1.3.1 Requirements for cooperation with civil engineering:

- 1) The riser should be installed in the air conditioning tube well, and the horizontal pipe should be placed in the ceiling, if possible.
- 2) A place should be reserved for the ODU base to prevent the waterproof layer or insulating layer on the roof from being damaged in later phase of installation.
- 3) At places on walls or floors where pipes need to go through, holes or casing should be preserved. If the pipe needs to go through a bearing beam, a steel casing must be prepared.

#### 3.1.3.2 Requirements for cooperation with decoration engineering:

- 1) The air conditioning installation should not damage the bearing structure or the decorative style. Air conditioning pipes should be laid out along the bottom of the beam as possible. If pipes meet one another at the same elevation, process based on the following principles:
  - 2) Air conditioning pipes should be laid out along the bottom of the beam as possible. If pipes meet one another at the same elevation, process based on the following principles:
    - (1) Drain pipes, air ducts and pressure pipes should leave places for gravity pipes;
    - (2) Air ducts and small pipes should leave places for major pipes.

#### 3.1.3.3 Requirements for cooperation with electric:

After the capacity of air conditioning unit is determined, check the following aspects with relevant electric design personnel:

- 1) Whether the electrical load is designed based on the requirement of the air conditioning unit;
- 2) Whether the power cable and circuit breaker meet the unit requirement and abide by relevant national safety regulations;
- 3) Whether the regional power supply quality (including voltage fluctuation and interference noise) meet the international requirement.

Any nonconformity must be resolved through coordination.

## 3.2 Onsite Review of Design Drawing

Installation personnel must carefully read and understand the design scheme and drawings provided by engineering designers, and prepare detailed and feasible construction organization design after reviewing the onsite status.

The following aspects of working drawing must be reviewed:

## GMV5 Home DC Inverter Multi VRF Units

No.	Content	Result
1	The loads of indoor and ODU must match. The gross rated capacity of the IDU should be set to a value that is 80% to 100% of the rated capacity of the ODU. In actual conditions, if the capacity of concurrently operating IDUs exceeds 100% of the rated capacity of the ODU, the air conditioning system fails to meet the requirement. Note: Configuration in excess of the capacity of the IDUs can affect the comfort for users. The more the excess is, the lower the adjustment capacity of an air conditioning unit will be and even the system reliability can be affected. Therefore, relevant regulations on capacity limit must be strictly followed.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
2	If the refrigerant pipe design complies with the operation requirement of unit: 1) The total length of refrigerant pipe shall comply with the design requirement of unit; 2) Height difference between IDU and ODU If ODU is installed higher than IDU, max height difference H40m; If ODU is installed lower than IDU, max height difference H50m; 3) The refrigeration system pipe diameter, branch pipe model shall comply with technical requirements.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
3	The drainage method of unit condensate water pipe must be reasonable; the pipeline slope must follow the design requirement of unit.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
4	If the installation of unit complies with the requirement of installation space	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
5	The air duct of IDU is reasonably organized.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
6	The configuration specifications, type, and control method of power cables should meet the design requirement of unit	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
7	The arrangement, total length, and control method of control line should meet the design requirement of unit.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
8	If the installation of hydro box complies with the requirement of installation space	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
9	If the installation of water tank complies with the requirement of installation space	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
10	If the installation of floor heating pipe complies with the installation requirement	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
11	If the installation of floor heating water separator and water collector complies with the installation requirement when connecting the floor heating pipe	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
12	If the installation of pressure difference bypass valve between floor heating separator and water collector complies with the installation requirement	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
13	If the electric connection of floor heating engineering pump and floor heating electric performer complies with the requirement of circuit diagram of hydro box	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
14	If the connection of temperature sensor of hydro box complies with the requirement of circuit diagram of hydro box	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
15	If the installation of user water return pump complies with the installation requirement and requirement of circuit diagram	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
16	If the installation of water system pipeline complies with the installation requirement Install the water system pipeline according to the connection schematic diagram, make good insulation measure and install vent valve, etc.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
17	If the installation of water makeup pipe of circulating water of hydro box complies with the installation requirement Pressure relief valve, filter, etc. shall be installed	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
18	If the matching of ODU, IDU, hydro box and water tank complies with the requirement	<input type="checkbox"/> Passed <input type="checkbox"/> Failed



Note: Engineering construction personnel must strictly abide by the design drawings. If any design cannot be implemented during construction and needs to be modified, contact the designer first for approval and prepare a written document, that is, the design modification record.

### 3.3 Selection of Installation Materials

#### 3.3.1 Notices for selecting installation materials

- 1) The materials, equipment and instruments used during air conditioning engineering construction must have certifications and test reports.
- 2) Products with fireproof requirements must be provided with fireproof inspection certificates

and must meet national and relevant compulsory standards.

3) If environmentally-friendly materials are to be used as required by customers, all such materials must meet national environmental protection requirement and be provided with relevant certificates.

### 3.3.2 Requirements for selecting installation materials

#### 3.3.2.1 Copper pipe

1) Dephosphorization drawing copper pipe with tensile strength not less than 240kgf/mm<sup>2</sup> must be used;

2) Specifications requirement:

R410A Refrigerant System		
Outer diameter(mm/inch)	Wall thickness(mm)	Model
Φ6.35(1/4)	≥0.8	0
Φ9.52(3/8)	≥0.8	0
Φ12.70(1/2)	≥0.8	0
Φ15.9(5/8)	≥1.0	0
Φ19.05(3/4)	≥1.0	0
Φ22.2(7/8)	≥1.2	1/2H
Φ25.40(1/1)	≥1.2	1/2H
Φ28.60(9/8)	≥1.2	1/2H

Note:

- ① Appearance requirement: The inner and outer surface of pipe should be smooth without pinhole, crack, peeling, blister, inclusion, copper powder, carbon deposition, rust, dirt or severe oxide film, and without obvious scratch, pit, spot and other defects.
- ② After the inner part of the copper pipe is cleaned and dried, the inlet and outlet must be sealed tightly by using pipe caps, plugs or adhesive tapes.

#### 3.3.2.2 Condensate water pipe

1) Pipes that can be used for air conditioner drainage include: water supplying UPVC pipe, PP-R pipe, PP-C pipe, and HDG steel pipe;

2) Requirements for specifications and wall thickness

(1) Water supplying UPVC pipe: Φ32mm×2mm, Φ40mm×2mm, Φ50mm×2.5mm;

(2) HDG steel pipe: Φ25mm×3.25mm, Φ32mm×3.25mm, Φ40mm×3.5mm, Φ50mm×3.5mm.

#### 3.3.2.3 Insulation material

1) Rubber foam insulation material;

2) Specifications and requirements

(1) Flame retardancy level: B1 or higher;

(2) Refractoriness: at least 120°C;

(3) The insulation thickness of condensate water pipe: at least 10 mm;

(4) When the diameter of copper pipe is equal to or greater than Φ15.9 mm, the thickness of insulation material should be at least 20 mm; when the diameter of copper pipe is less than 15.9 mm, the thickness of insulation material should be at least 15 mm.

### 3.3.2.4 Water system pipe (circulating pipe of hydro box and water inlet and outlet pipe of water tank)

- 1) Circulating pipe of hydro box: Hot water pipe must be used. The PPR pipe with outer diameter DN25 which is S2.5 series (thickness is 4.2mm) is recommended.
- 2) Water inlet and outlet pipe of water tank: Hot water pipe must be used. The PPR pipe with outer diameter DN20 which is S2.5 series (thickness is 3.4mm) is recommended.
- 3) All applied PPR pipes must comply with national standards GB/T18742. If other insulated pipeline are adopted, the above can be reference.
- 4) The water system pipes must be insulated. Usually, the thickness of heat insulating material is 15mm; the outdoor or exposed pipe shall be wrapped for beautiful appearance.

### 3.3.2.5 Floor heating pipe

- 1) The floor heating pipe shall comply with level 4 in national standards GB/T 18891.
- 2) The pipe quality and mechanical property must comply with related national standard.
- 3) The floor heating pipe shall be with oxygen barrier layer.
- 4) The operation pressure of floor heating pipe shall not be less than 0.4MPa.
- 5) Applicable pipe types: PE-RT pipe, PE-X pipe and so on.
- 6) Pipe size: DN16, DN20 and so on.
- 7) The distance between two floor heating pipes shall be within 100~150mm.
- 8) The main floor heating pipe must be insulated. Usually, the thickness of heat insulating material is 15mm; the outdoor or exposed pipe shall be wrapped for beautiful appearance.

### 3.3.2.6 Communication cable



Note: For air conditioning units installed in places with strong electromagnetic interference, shielded wire must be used as the communication cables of the IDU and wired controller, and shielded twisted pairs must be used as the communication cables between IDUs and between the IDU and ODU.

Communication cable selection for ODU and IDUs

Wire Type	Total Length of Communication Cables Between IDU and IDU (ODU) L(m)	Number of Wire Pieces x Wire Diameter (mm <sup>2</sup> )	Wire Standard	Remark
Common sheath twisted pair copper core	L≤1000	≥2×0.75	GB/T 5023.3-2008	If the wire diameter is enlarged to 2×1mm <sup>2</sup> , the overall communication length can reach 1500m.

Communication cable selection for IDU and wired controller

Wire Type	Total Length of Communication Cables Between IDU and Wired Controller L(m)	Number of Wire Pieces x Wire Diameter (mm <sup>2</sup> )	Wire Standard	Remark
Common sheath twisted pair copper core	L≤250	≥2×0.75	GB/T 5023.3-2008	The overall communication length cannot exceed 250m.

### 3.3.2.7 Power cable

Only copper conductors can be used as power cables. The copper conductors must meet relevant national standard and satisfy the carrying capacity of unit.

## 4 Three Operation Modes

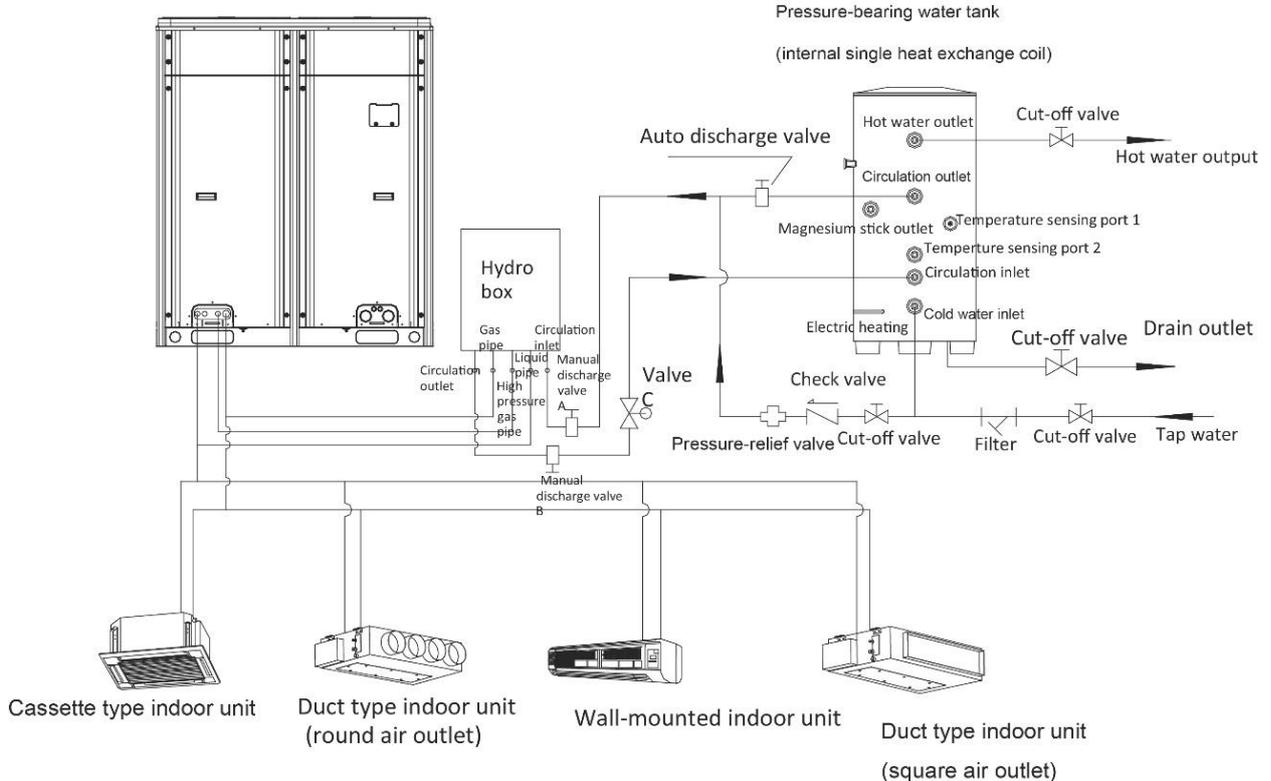
### 4.1 Operation mode 1: Air conditioning + water heating

This solution can satisfy large demand for hot water. It is applicable for 4 or more persons or bathing:

Outdoor model		Indoor unit	Hydro box	Water tank
Top discharge	GMV-S224W/A-X GMV-S280W/A-X	Indoor units of GMV5	NRQD16G/A-S	Water tank with internal coil: SXVD200LCJ/A-K SXVD300LCJ/A-K SXVD350LCJ/A-K SXVD400LCJ/A-K (2) Solar power connectable water tank with internal coil: SXVD200LCJ2/A-K SXVD300LCJ2/A-K SXVD350LCJ2/A-K SXVD400LCJ2/A-K

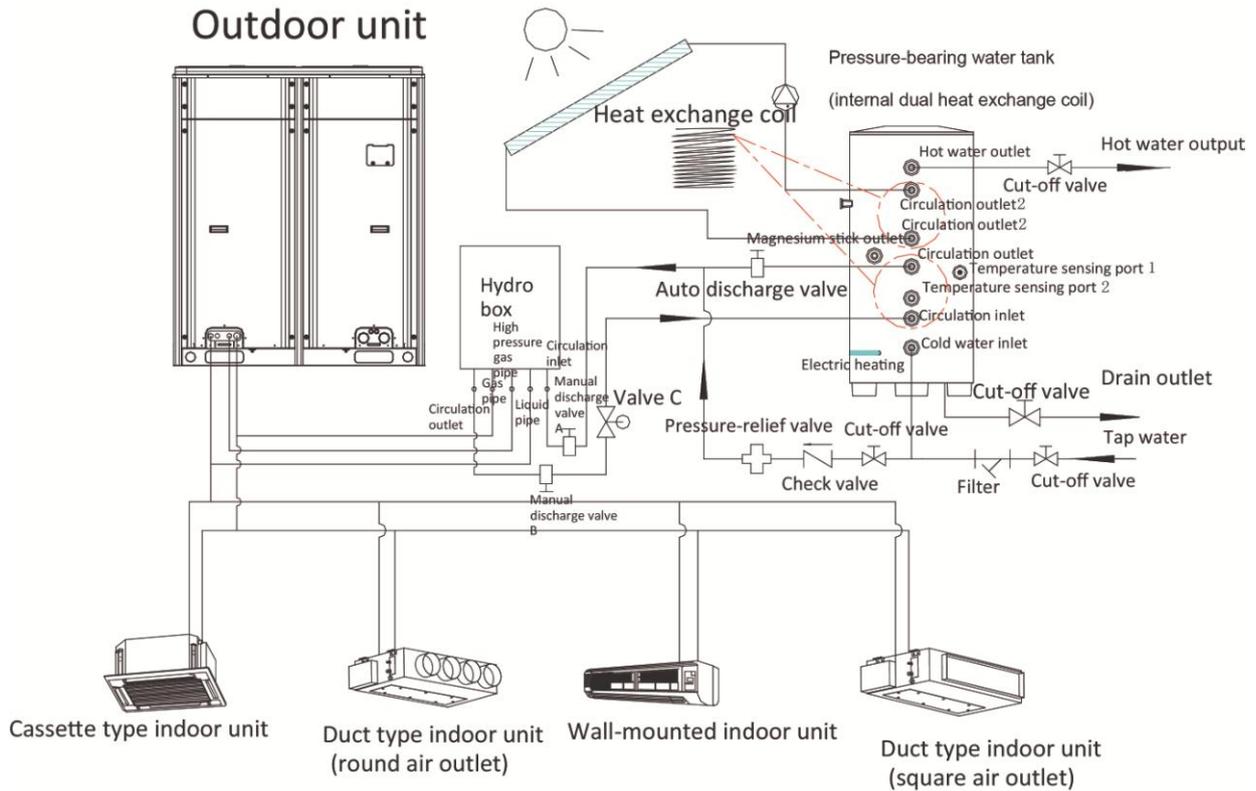
Installation method:

#### Outdoor unit



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If solar power is to be connected, installation method is as below:



### 4.2 Operation mode 2: Air conditioning + water heating + floor heating

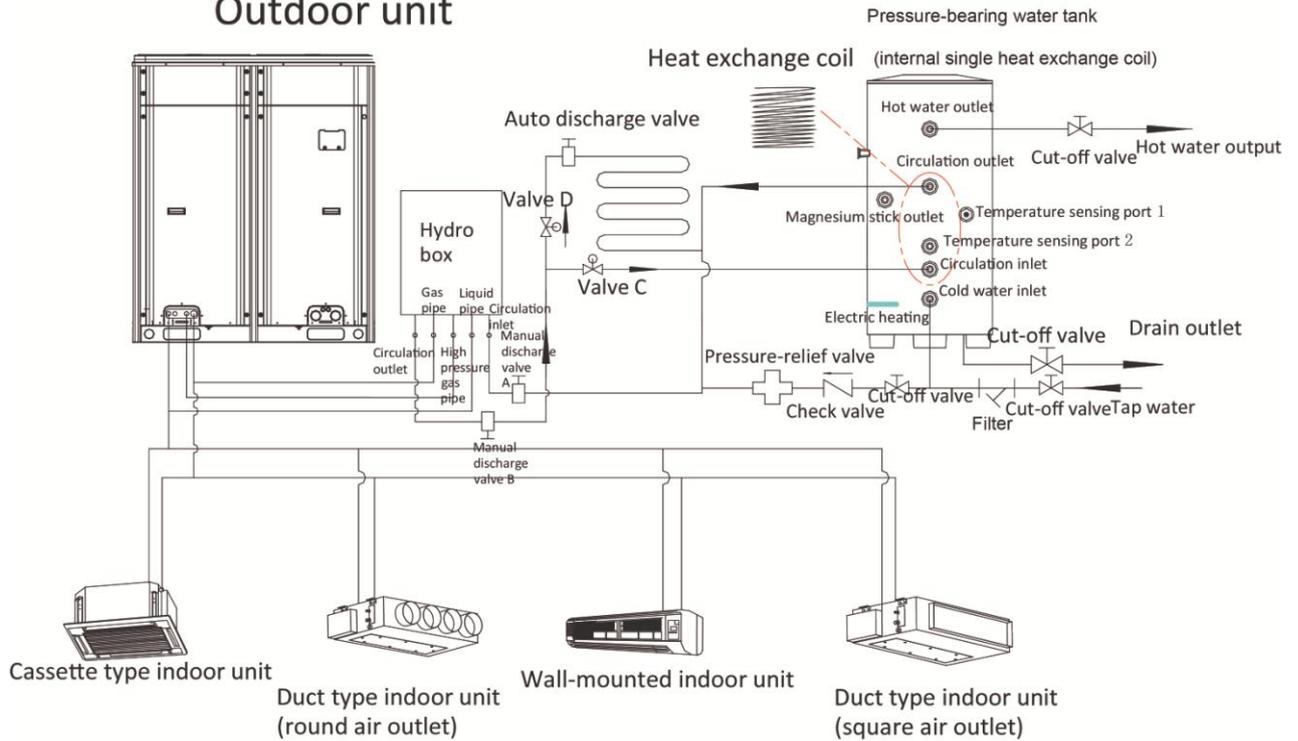
Outdoor model		Indoor unit	Hydro box	Water tank
Top discharge	GMV-S224W/A-X GMV-S280W/A-X	Indoor units of GMV5	NRQD16G/A-S	(1) Water tank with internal coil: SXVD200LCJ/A-K SXVD300LCJ/A-K SXVD350LCJ/A-K SXVD400LCJ/A-K (2) Solar power connectable water tank with internal coil: SXVD200LCJ2/A-KSXVD300LCJ2/A-K SXVD350LCJ2/A-K SXVD400LCJ2/A-K

Note:

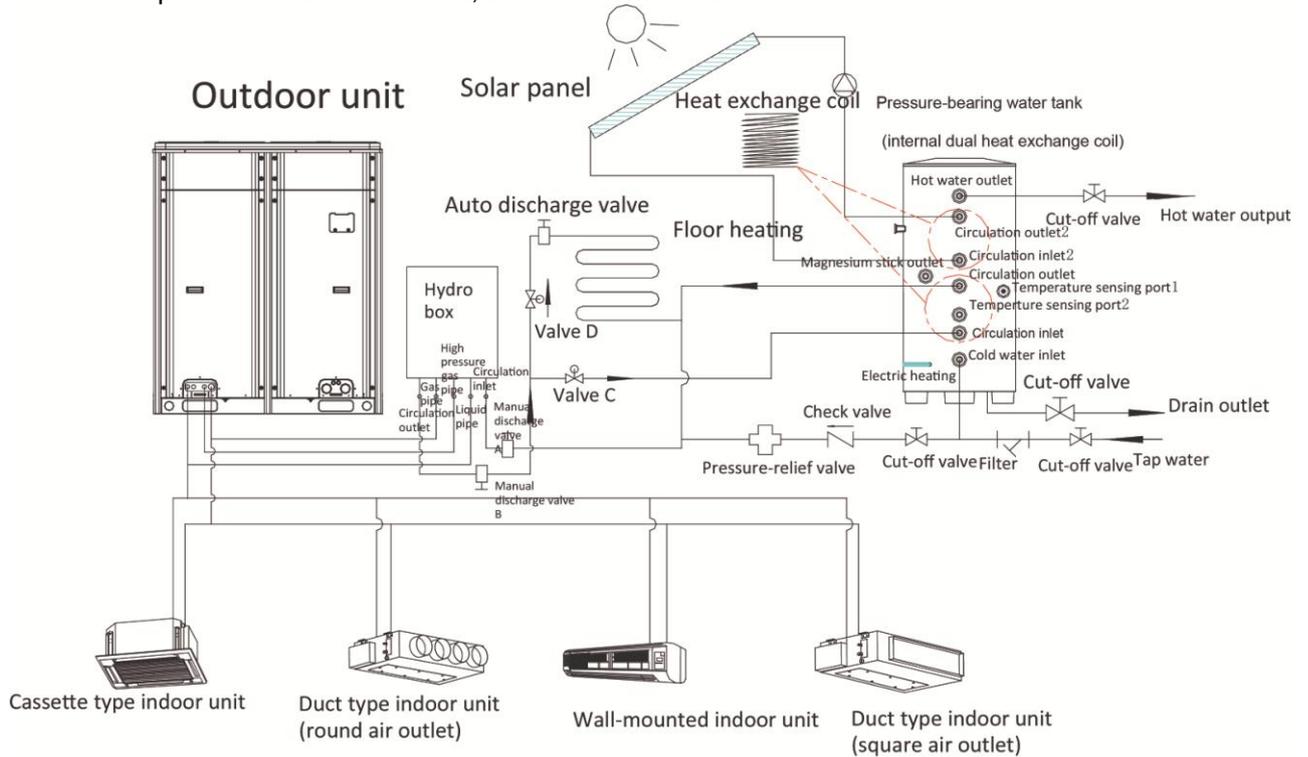
Valve C and valve D should be straight-through electromagnetic water valve of small resistance. Valve C, valve D and floor heating actuator should all be normally closed.

Installation method:

### Outdoor unit



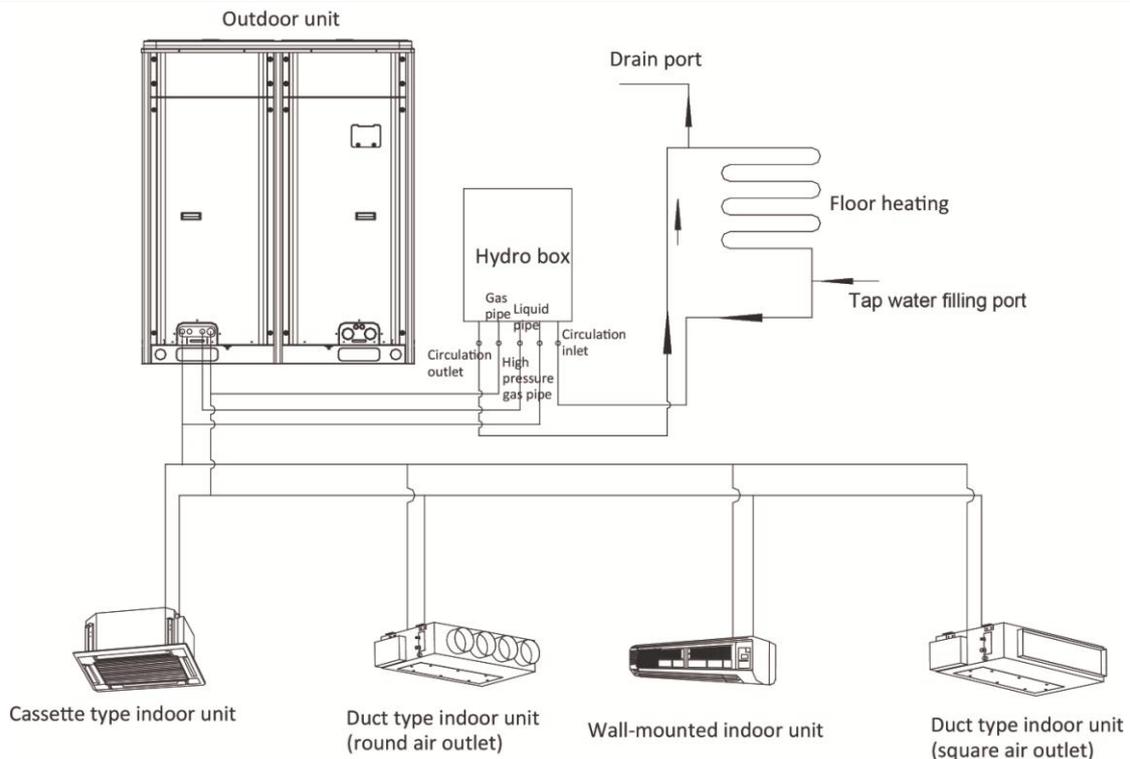
If solar power is to be connected, installation method is as below:



### 4.3 Operation mode 3: Air conditioning + floor heating

Operation mode 3: Air conditioning + floor heating			
	Outdoor model	Indoor unit	Hydro box
Top discharge	GMV-S224W/A-X GMV-S280W/A-X	Indoor units of GMV5	NRQD16G/A-S

Installation method:



**⚠ Notices:**

Before installation and debugging, please read the following notices carefully!

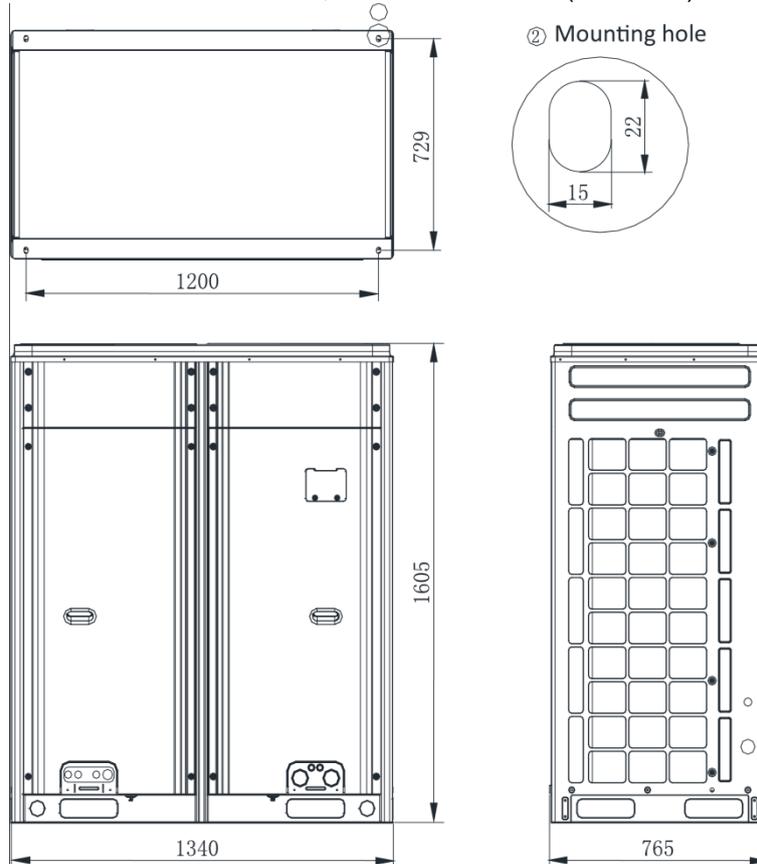
- (1) Hydro box is only used for closed-type water system. For open-type water system such as water tank with no coil, please do not use hydro box. It should be installed indoors at ambient temperature of 4~35. Never install the hydro box outdoors, otherwise vibration will occur.
- (2) If units will be stopped or powered off for a long time, please drain away the water in the hydro box, water tank and floor heating pipeline, otherwise, units will get frozen. During installation, please install drain valve at the inlet and outlet pipe of hydro box to ensure water can be completely drained.
- (3) Before power is on, please check the main board if the DIP switch S2 is consistent with the actual condition of connected equipment. If it is not consistent, units reliability will be affected and temperature sensor error will occur.
- (4) If water replenishing pressure is larger than 3bar, please add pressure-relief valve at the water replenishing port to make sure water pressure is less than or equal to 3bar. Otherwise, pressure relief valve will be open and cause water leak.
- (5) For the connection of floor heating equipment, if pressure loss of water system outside hydro box is more than 6m, please add an engineering water pump.
- (6) Air conditioner wired controller can control floor heating. For the details of setting method and operation, please refer to the manual of hydro box and the manual of wired controller.
- (7) When connecting hydro box with water tank, please connect the circulation outlet of hydro box with the circulation inlet of water tank, and connect the circulation inlet of hydro box with the circulation outlet of water tank. Please refer to the manual of hydro box for installation details.

- (8) If you need to connect the hydro box with floor heating system or water tank, please install waterline solenoid valve C and solenoid valve D according to units installation diagram. The solenoid valves are used to control the heating of water tank and floor waterline. Valve C and valve D should be straight-through electromagnetic water valve of small resistance (Valve C and valve D are supplied for hydro box NRQD16G/A-S). Valve C, valve D and floor heating actuator should all be normally closed.
- (9) When floor heating is connected, its water system is different from the water system of water tank. Therefore, tap water filling port and drain port should be connected during the engineering setting.
- (10) User can require project engineer to add back water pump based on actual needs. This can maintain users water pipe temperature and avoid waste.
- (11) Water pipeline can only be installed after hydro box is installed securely. When installing the connection pipes, please prevent dust or other foreign matters from getting in the pipeline.
- (12) After the entire pipeline is connected, check if there is any leak. After ensuring that there is no leak, apply insulation treatment to the pipeline. Please pay special care to the insulation treatment of valves, pipe joints, and other joints. We suggest you use insulating cotton that is thicker than 15mm.
- (13) The temperature keeping and pressure bearing water tank depends on tap water pressure to supply hot water. Only when there is tap water will hot water be available. When user wants to use hot water, please keep the cut-off valve of water tank cold water inlet in open status.
- (14) Cooling and floor heating cannot be started at the same time. If floor heating cannot start working and Mode conflict is displayed, please turn indoor unit into heat mode or turn it off in heat mode.
- (15) The horizontal distance between hydro box and water tank should not exceed 5 meters and the vertical distance between them should not exceed 3 meters. If the distance exceeds above limits, please contact our company. Recommended installation method is to keep the water tank at lower side and the hydro box at upper side.
- (16) Please prepare installation materials according to above dimensions and specifications. If cut-off valve is installed outdoors, its better to use PPR pipe fittings to avoid the valve from being frozen under low temperature.

## 5. Installation of ODU

### 5.1 ODU Dimensions and Installation Hole Size

Outline dimension of GMV-S224W/A-X, GMV-S280W/A-X (Unit: mm):



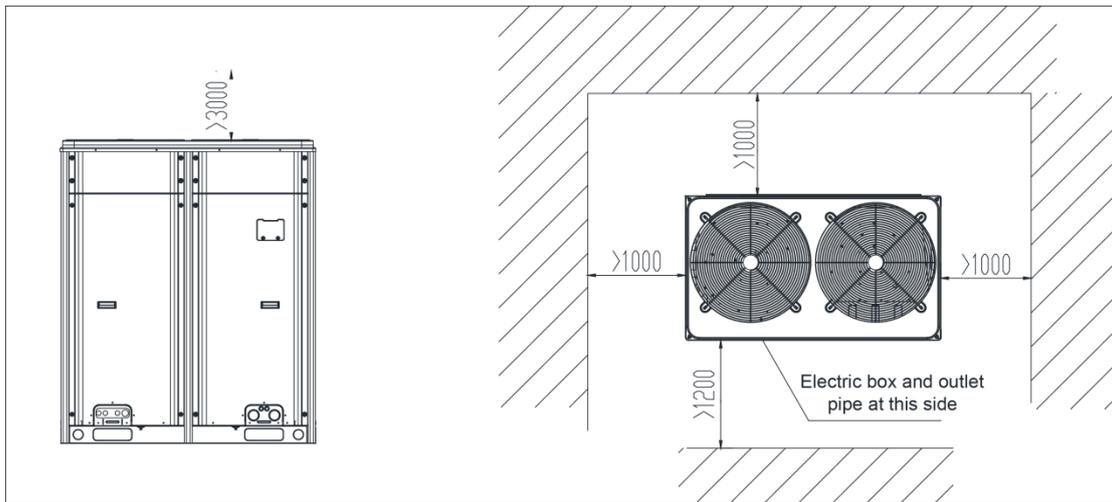
### 5.2 Selection of Outdoor Unit Installation Place

- ◆ The ODU should be installed near bedrooms, studies or meeting rooms;
- ◆ The installation place should be able to withstand the weight of outdoor unit;
- ◆ The installation place shall be ventilated to ensure there is no obstacle at air inlet and air outlet of unit and sufficient maintenance space is reserved;
- ◆ The installation place will not be embedded by snow and rain, and will not be affected by garbage and oil fog.

### 5.3 Installation Space Requirement for ODU

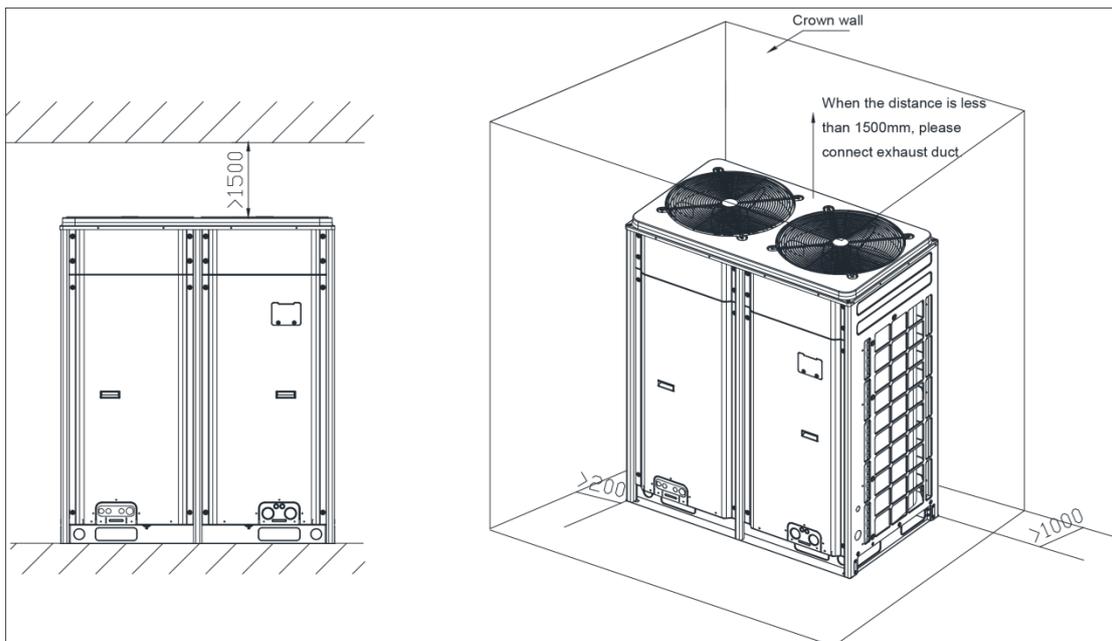
#### 5.3.1 Installation space requirement for single-module unit

Basic installation space requirement for GMV-S224W/A-X, GMV-S280W/A-X (Unit: mm):

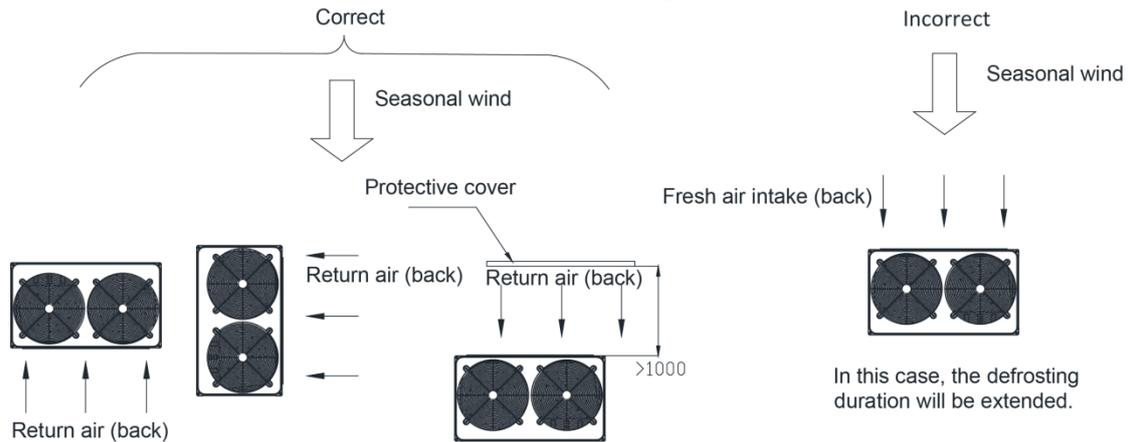


If there are walls at four sides of unit, please follow the above-mentioned basic space requirement;

In principle, if a crown wall (obstacles for keeping out the wind) exists over the machine, a distance of at least 3000mm should be left between the top of the machine and the crown wall. If the front, rear, left and right sides of the machine are open spaces, the distance between the top of the machine and the crown wall should be at least 1500mm. If the requirement for the minimum 1500 mm cannot be met, or the spaces around the machine are not open, an exhaust air duct needs to be connected to maintain smooth ventilation.

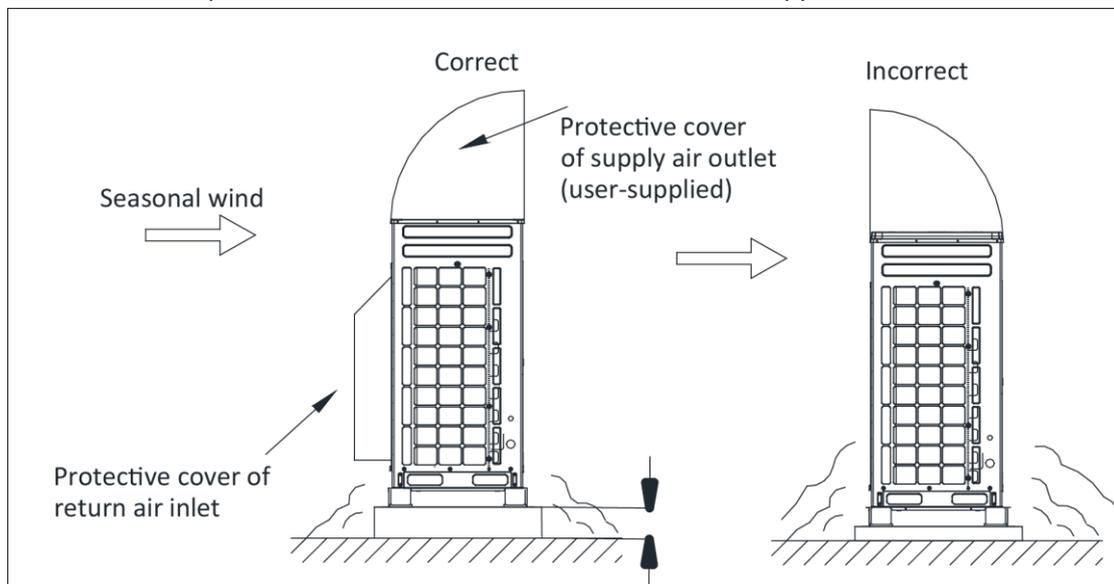


### 5.3.2 Monsoons must be considered during ODU installation



### 5.3.3 Snow must be considered during ODU installation.

In order to prevent covering the air supply and air return by snow, an air supply protective cover and air return protective cover and one foundation shall be applied.



### 5.3.4 Installation space requirement for equipment floor

If the ODU is to be installed in the equipment floor, induced and exhaust air duct must be connected;

In the equipment floor, the opening rate of shutters must be at least 80%, and the angle between the shutters and the horizontal plane should be less than  $20^\circ$ .

#### 5.3.4.1 Preparation before installing static pressure ventilating duct

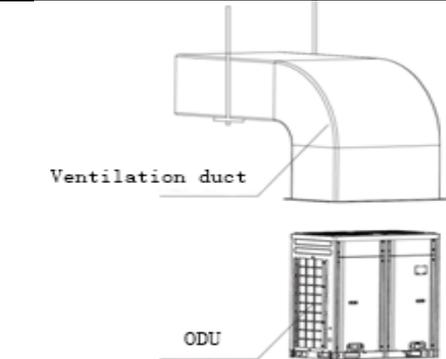
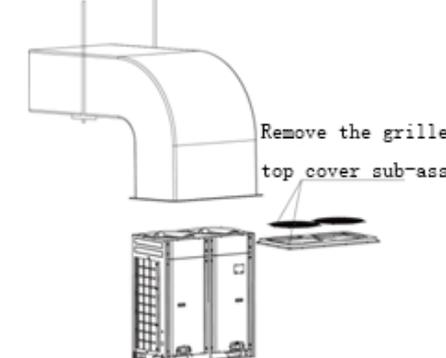
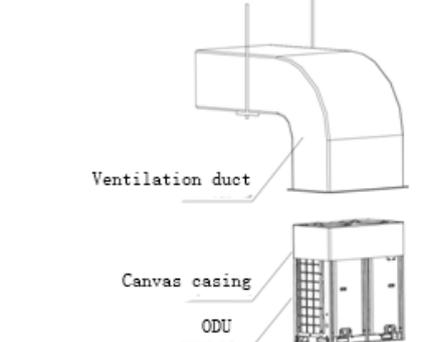
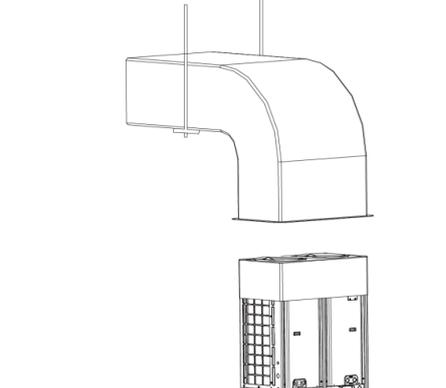
- 1) The ODU is installed properly;
- 2) The steel-plate ventilating duct is designed based on the unit and engineering requirement, and is installed properly according to the engineering standards;
- 3) Based on the unit dimensions and the size of steel-plate ventilating duct, prepare materials such as canvas casing, tin foil, steel bar and tapping screw, as well as tools such as hand-operated electric drill, air screw driver and screwdriver.

### 5.3.4.2 Installation of pressure ventilating duct

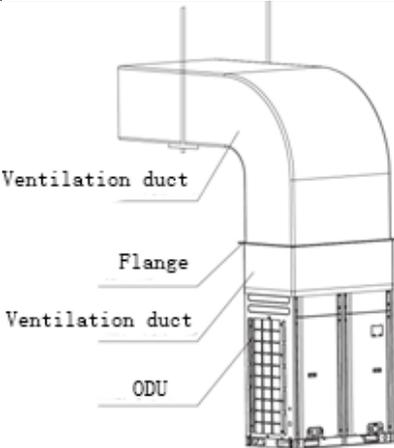
Two methods are available to connect an ODU to static pressure ventilating duct, they are reserving the unit top cover and removing the unit top cover.

When the effective area of air inlet is less than 70% of the total air inlet area of outdoor unit, please introduce exhauster. The total air volume of exhauster shall not be less than 80% of total air inlet volume.

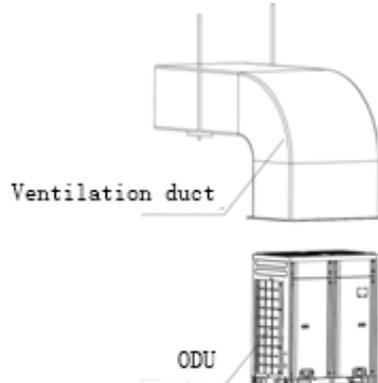
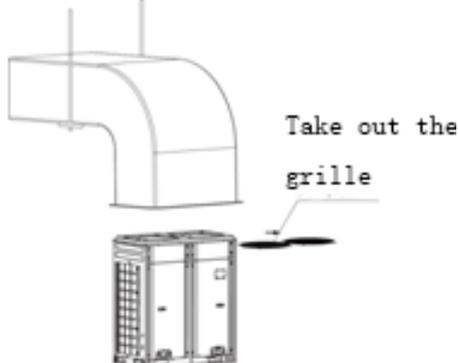
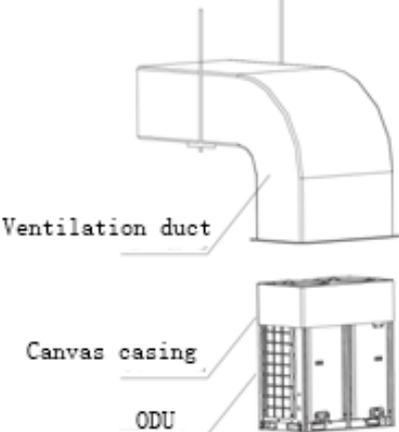
Method 1: Reserve the unit top cover and press the canvas casing with top cover. Detailed operations are as follows:

Procedures	Figure	Operation instruction	Remark
Step 1		<ol style="list-style-type: none"> <li>① Select the installation position of ODU and fix the ODU;</li> <li>② Confirm the installation position of ventilation duct according to the position of ODU;</li> <li>③ Make and install ventilation duct according to the figure at the left side.</li> </ol>	<ol style="list-style-type: none"> <li>① Material of ventilation duct: steel plate or sheet iron;</li> <li>② Ventilation duct is prepared by the user.</li> </ol>
Step 2		<ol style="list-style-type: none"> <li>① Use an air screwdriver or screwdriver to unfasten the tapping screws that fixing the top cover sub-assy;</li> <li>② Take out the grille from the top of top cover sub-assy.</li> </ol>	Remove the grille on the top cover. Otherwise, the air volume, especially the unit operating performance will be affected;
Step 3		<ol style="list-style-type: none"> <li>① Put the canvas casing inside out; cover one end of the canvas casing over the unit downward until the canvas end face is aligned with the unit or a bit higher than the top of the unit.</li> </ol>	
Step 4		<ol style="list-style-type: none"> <li>① Put the top cover back and tightly press the canvas casing;</li> <li>② Use tapping screws to fix the top cover onto the unit.</li> </ol>	

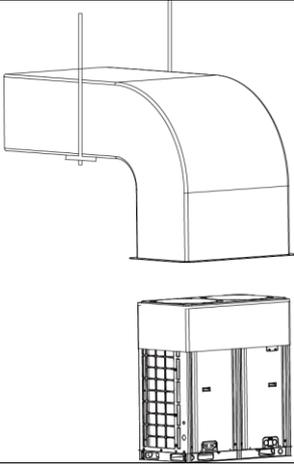
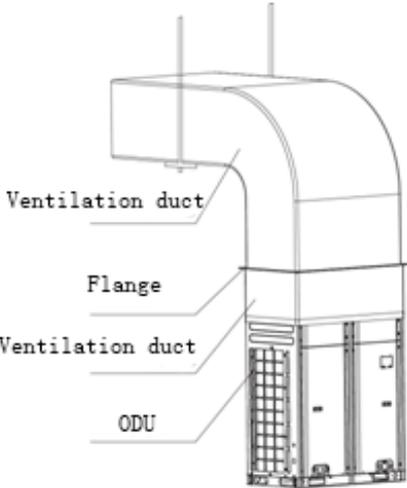
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<p>Step 5</p>		<ol style="list-style-type: none"> <li>① Pull up the canvas casing reversely and use the steel bar to press the canvas casing tightly onto the counter flange of the steel-plate ventilation duct;</li> <li>② Use a hand-operated electric drill to drill holes and fasten the parts by using tapping screws;</li> <li>③ Use the tin foil to seal the joints and check the joints' reliability.</li> </ol>	
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Method 2: Reserve the unit top cover and press the canvas casing with external steel bar. Detailed operations are as follows:

Procedures	Figure	Operation instruction	Remark
<p>Step 1</p>		<ol style="list-style-type: none"> <li>① Select the installation position of ODU and fix the ODU;</li> <li>② Confirm the installation position of ventilation duct according to the position of ODU;</li> <li>③ Make and install ventilation duct according to the figure at the left side.</li> </ol>	<ol style="list-style-type: none"> <li>① Material of ventilation duct: steel plate or sheet iron;</li> <li>② Ventilation duct is prepared by the user.</li> </ol>
<p>Step 2</p>		<ol style="list-style-type: none"> <li>① Take out the grille from the top of the top cover sub-assy.</li> </ol>	<p>Remove the grille on the top cover. Otherwise, the air volume, especially the unit operating performance will be affected.</p>
<p>Step 3</p>		<ol style="list-style-type: none"> <li>① Use the prepared canvas casing inside out to cover the surroundings over the top of the unit. Keep the top of canvas casing 30mm to 50mm higher over the top of the unit.</li> </ol>	

## GMV5 Home DC Inverter Multi VRF Units

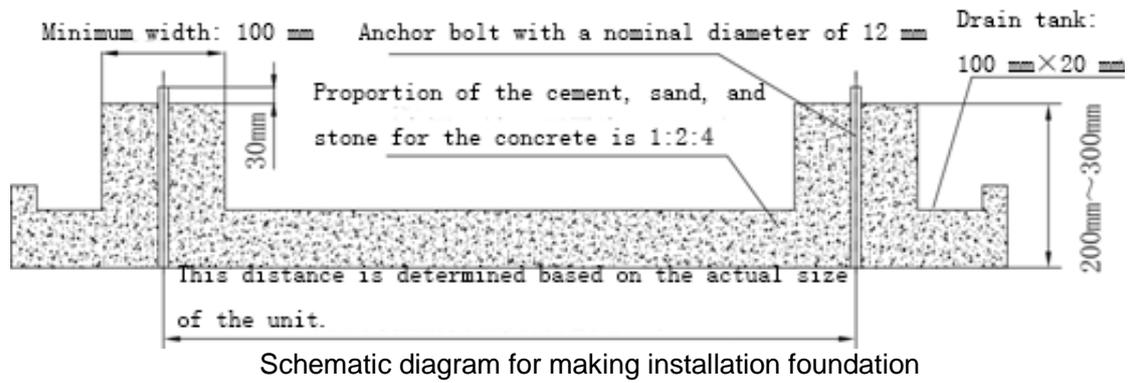
Step 4		<p>① Use a steel bar to press tightly the canvas casing around the top cover of the unit. Use a hand-operated electric drill to drill holes and fasten the canvas casing onto the unit through steel bar by using tapping screws.</p>	<p>For method 2, since drills are required on the top cover, the powder coated protective layer on the top cover will be damaged. As a result, the anti-corrosion performance of the unit top cover will be reduced.</p>
Step 5		<p>① Pull up the canvas casing reversely and use the steel bar to press the canvas casing tightly onto the counter flange of the steel-plate ventilating duct;</p> <p>② Use a hand-operated electric drill to drill holes and fasten the parts by using tapping screws;</p> <p>③ Use the tin foil to seal the joints and check the joints' reliability.</p>	

### 5.4 Installation Foundation of ODU

The concrete foundation of the ODU must be strong enough. Ensure that the drainage is smooth and that the ground drainage or floor drainage is not affected.

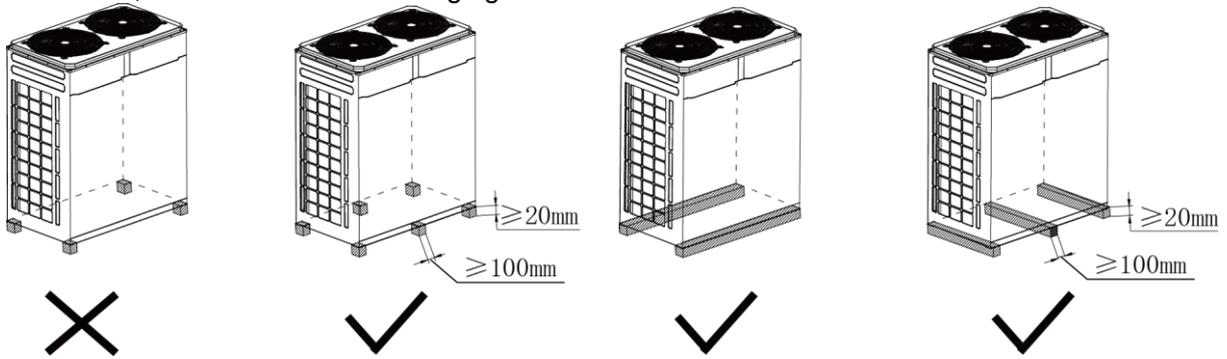
Requirements on the concrete foundation are as follows:

- 1) The concrete foundation must be flat and have enough rigidity and strength to undertake the unit's weight during running. The height of the foundation is 200 mm to 300 mm, which is determined based on the size of the unit;
- 2) The proportion of the cement, sand, and stone for the concrete is 1:2:4. Place 10 reinforced steel bars ( $\phi 10$  mm) with a space between of 30 mm;
- 3) Use the mortar to flatten the surface of the foundation. Sharp edges must be chamfered;
- 4) When the foundation is built on a concrete floor, crushed stones are not required. But the foundation surface must be roughened;
- 5) Clear the oil stains, crushed stones, dirt, and water in the reserved bolt hole of the foundation and install a temporary cover before installing bolts;
- 6) Build a drainage ditch around the foundation to discharge the condensate water;
- 7) If the air conditioner is installed on the roof, check the intensity of the building and take waterproof measures;
- 8) If a u-steel foundation is adopted, the structure must be designed with sufficient rigidity and strength.



### 5.5 Vibration Reduction for ODU

The ODU must be fixed securely. Apply a thick rubber sheet or corrugated damping rubber pad with thickness of 200 mm or more and width of 100 mm or more between the ODU and the foundation, as shown in the following figures.

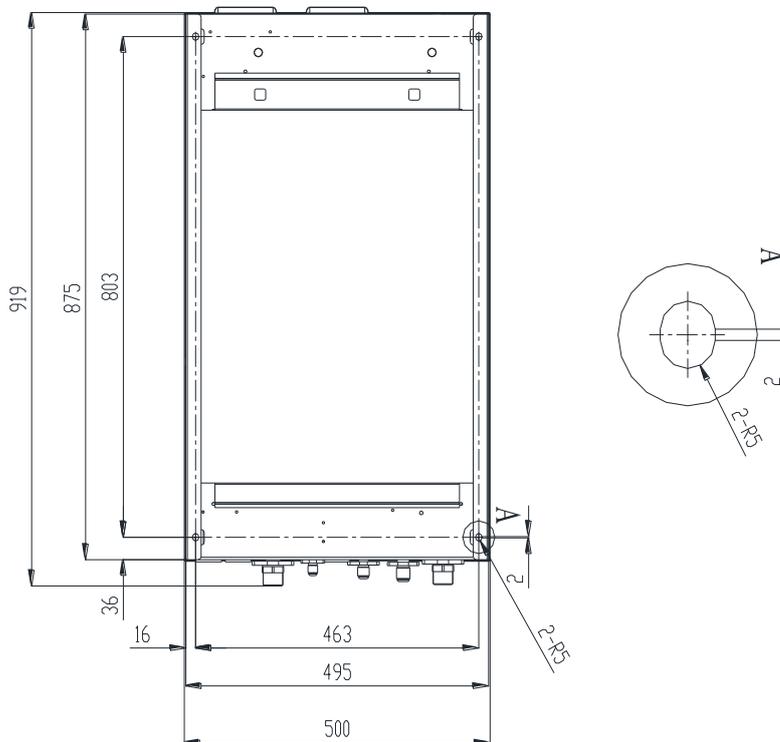


### 6. Installation of IDU

Please refer to the related manual of IDU.

## 7. Installation of Hydro Box

### 7.1 Outline dimension and installation hole dimension of hydro box



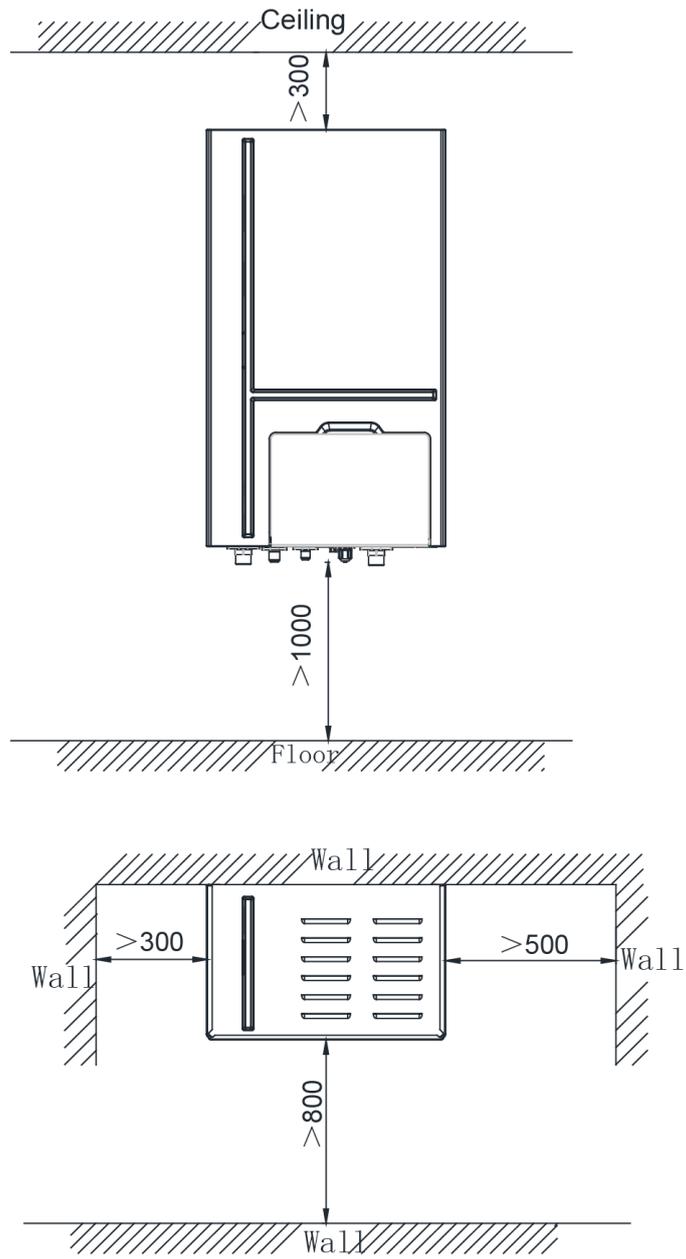
### 7.2 Installation Position of Hydro Box

- ◆ The hydro box shall be installed indoors with ambient temperature from 4°C~35°C. Prohibit install the hydro box outdoors. Otherwise, malfunction may be caused;
- ◆ The hydro box must be vertically installed facing upwards and wall-mounted installation method shall be adopted;
- ◆ The installation place should be able to withstand the weight of hydro box;
- ◆ The installation position shall be well ventilated to ensure there is no obstacle at the top grille of unit and sufficient maintenance space shall be reserved;
- ◆ The hydro box shall not be affected by garbage and oil fog.

### 7.3 Requirements for Installation Space of Hydro Box (Unit: mm)

The hydro box must be vertically installed facing upwards and wall-mounted installation method shall be adopted.

GMV5 Home DC Inverter Multi VRF Units

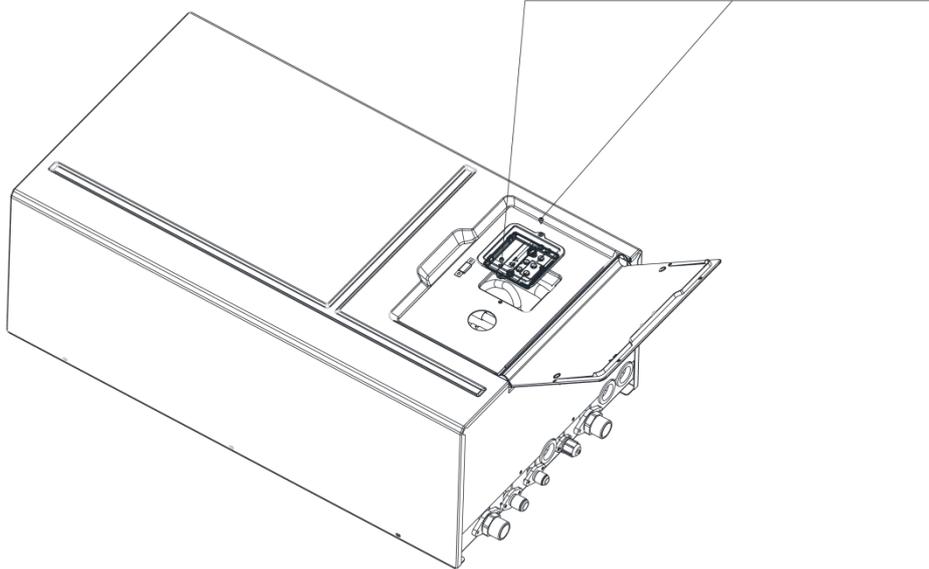


## 7.4 Installation Procedures of Hydro Box

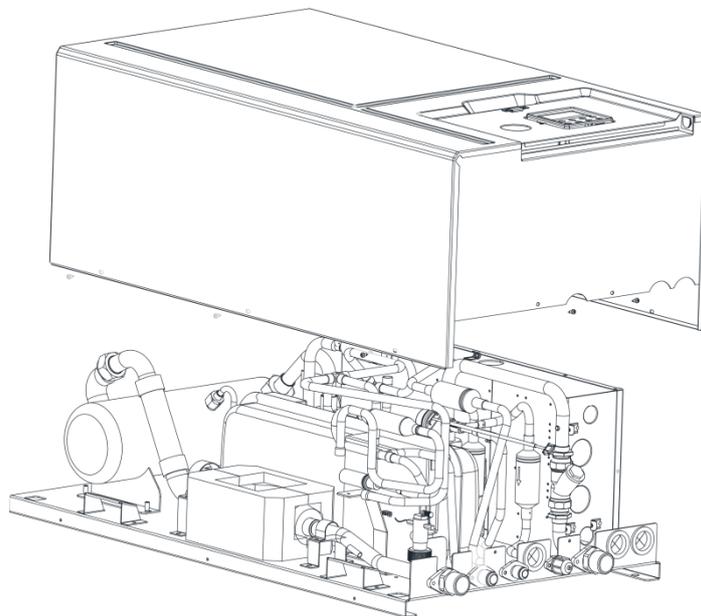
Installation steps:

Step 1: Open the panel cover; remove the installation support screw of wired controller; take out the wired controller and its support; disconnect the connection wire of wired controller.

Remove the screw and disconnect the connection wire of wired controller

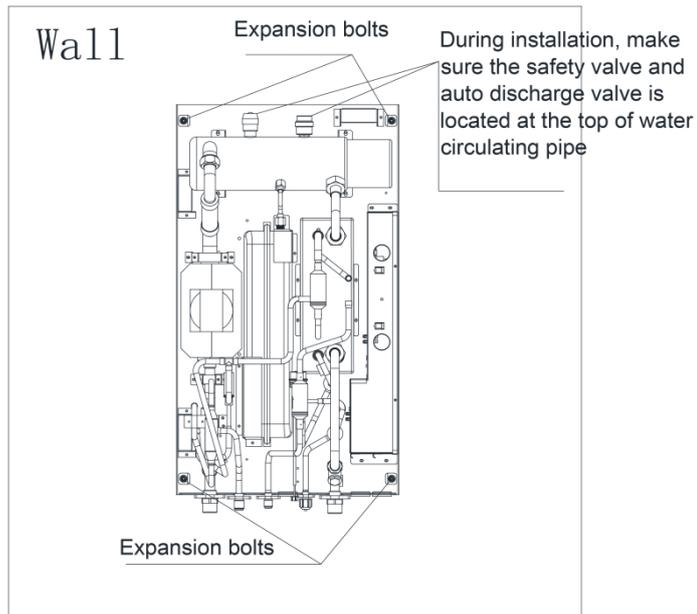


Step 2: Remove the 8 screws around the panel and then take out the panel.

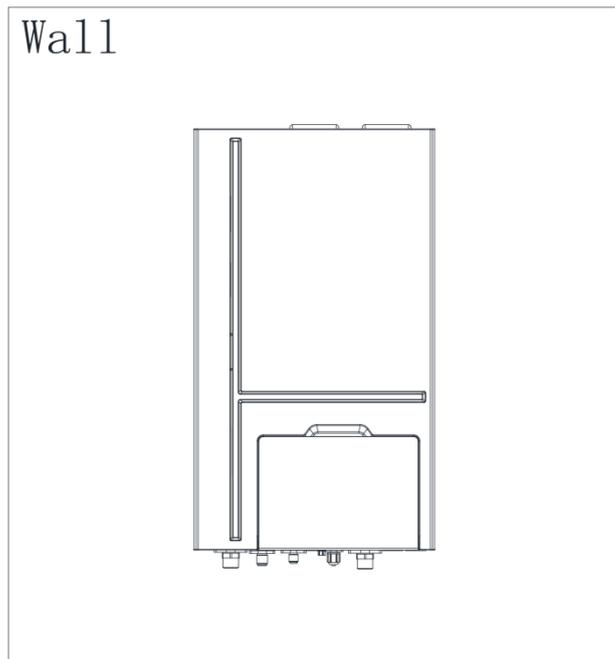


## GMV5 Home DC Inverter Multi VRF Units

Step 3: Select the wall for installation; drive 4 expansion screws on the wall according to the installation location of hydro box; hang the hydro box with panel removed on the 4 expansion bolts and then tighten the nut.



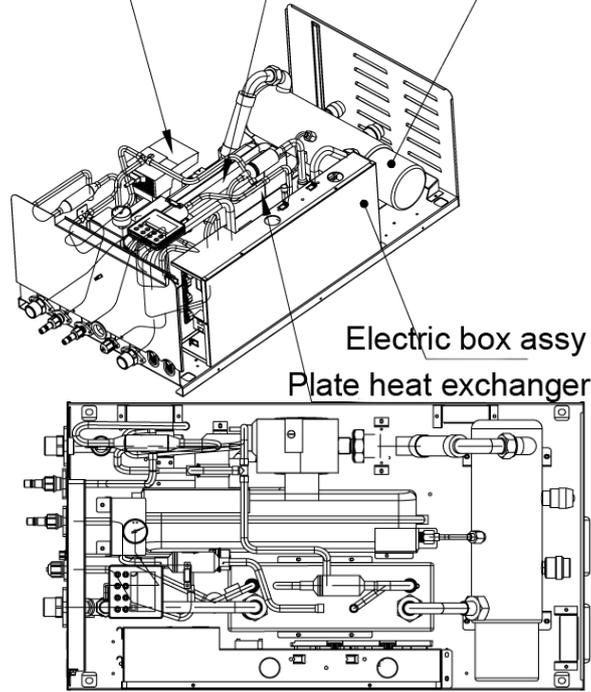
Step 4: Assemble the panel and tighten the screw; connect the connection wire of wired controller and then install the wired controller back to the panel.



### 7.5 Internal Structure and Pipeline Instruction of Hydro Box

Hydro box mainly consists of water pump, plate heat exchanger, electric heater and electric control, etc. Its internal structure is shown as below:

Water pump Expansion tank Electric heat

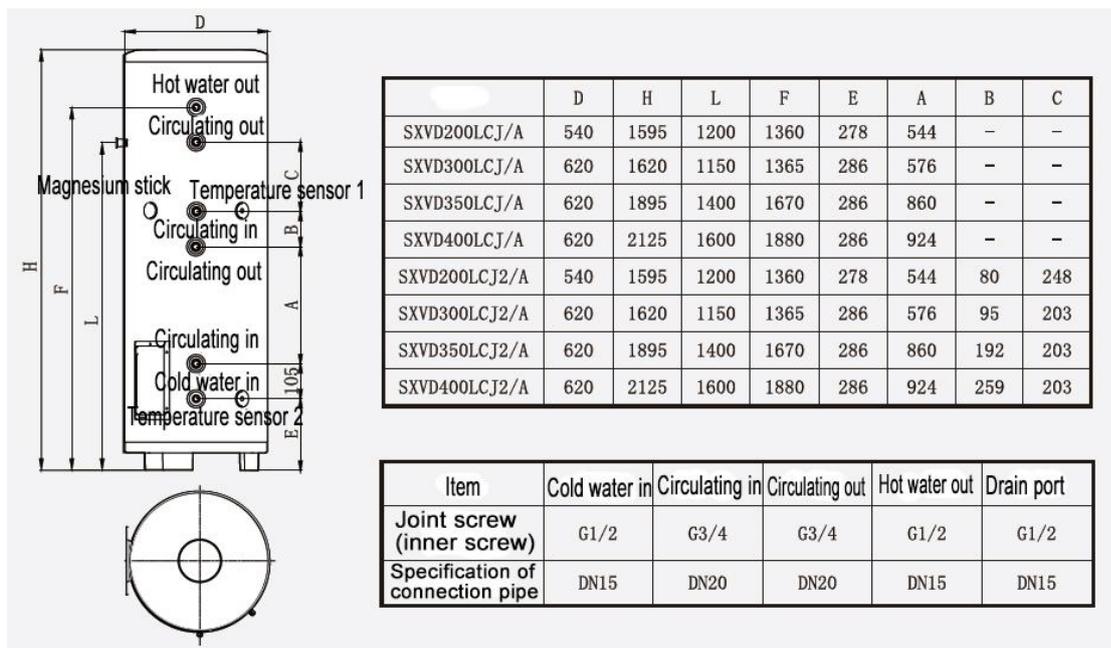


Water outlet pipe  
Gas pipe  
High-pressure gas pipe  
Liquid pipe  
Water inlet pipe



## 8. Installation of Water Tank

### 8.1 Outline Dimension and Installation Dimension of Water Tank

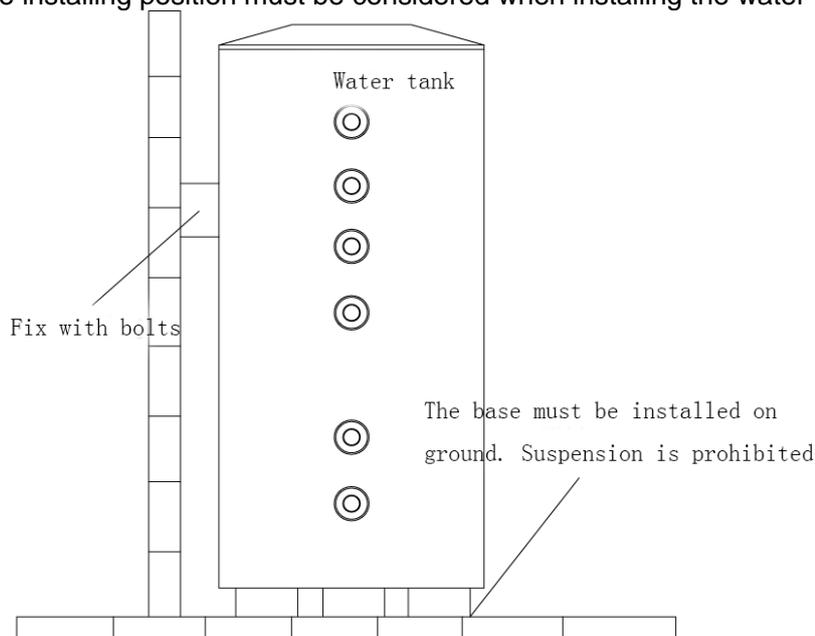


## 8.2 Installation Position of Water Tank

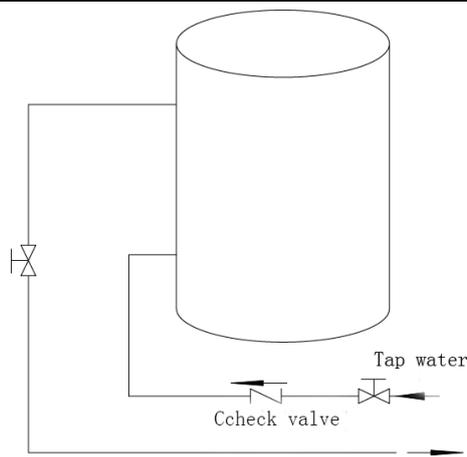
- (1) The water tank shall be installed in the place where the temp is over 0°C. It may be installed outdoors, e.g. balcony, roof or ground, according to the position of water heater. It may also be installed indoor.
- (2) The installation site shall withstand the weight of the water tank.
- (3) The drainage vent of water tank shall be close to drain ditch or sinker.
- (4) The horizontal distance and vertical distance between heat pump unit and water tank shall not exceed 5m and 3m respectively.

## 8.3 Installation Notice for Water Tank

- (1) The thermal insulation water tank shall be installed within a horizontal distance of 5m and a vertical fall of 3m to the hydro box. It can be installed indoors or outdoors, such as balcony, rooftop or floor.
- (2) The vertical thermal insulation water tank must be placed upright, with the bottom on ground. The installing position must be firm and solid. To avoid shaking, the water tank must be fixed onto the wall with bolts. See below for details. The weight bearing capacity of the installing position must be considered when installing the water tank.



- (3) For replenishing to water tank, supply of hot water and drainage of water tank, the tap water pipe, hot water connector and ground drain shall be available close to the thermal insulation water tank.
- (4) Connection of inlet / outlet pipe: The included safety check valve (Take care that the “→” direction shall point toward the thermal insulation tank) shall be connected to the inlet of water tank by using PPR pipe and be sealed with adhesive tape, as shown below. Another end of the check valve shall be connected to the tap water. The hot water pipe shall be connected to the outlet of water tank by using PPR pipe.



Note:

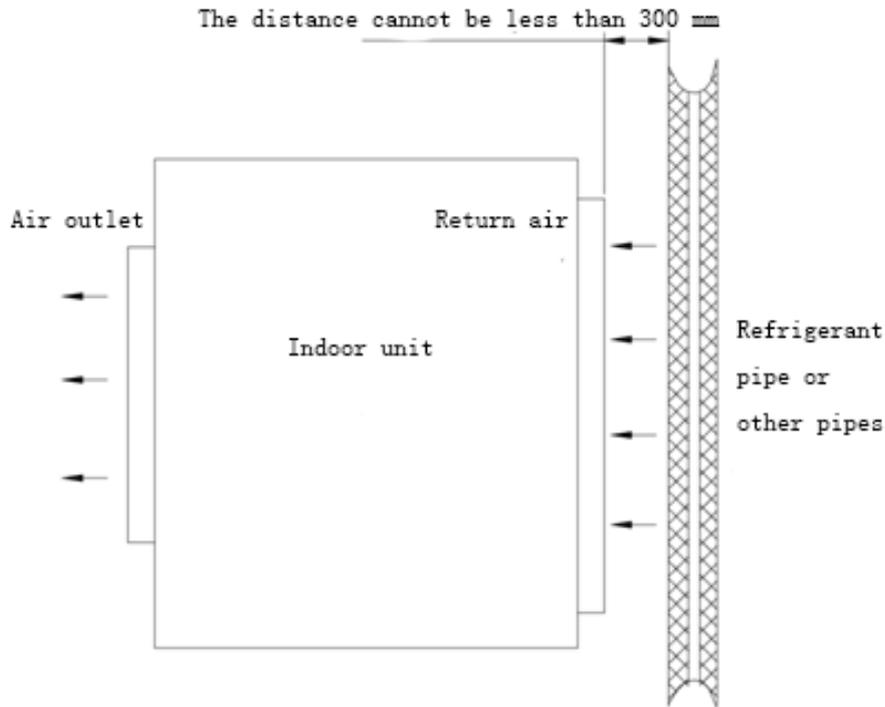
To ensure safety during use of water, the inlet and outlet of water tank must be connected with a specific length of PPR pipe. The length “L” is calculated as below:  $L \geq 70 \times R^2$ , in which “L” refers to pipe length (unit: cm) and R refers to the inner radius of the pipe (unit: cm). Thermal insulation shall be done and metal pipe shall not be used. For the first time of use, make sure that the water tank is filled with water before connecting to the power. The water tank shall not run without water.

## 9.Design, Installation and Insulation of Refrigerant Pipeline

### 9.1 Notices for Pipeline Design

- 1) The air conditioning installation should not damage the bearing structure or the decorative style;
- 2) Air conditioning pipes should be laid out along the bottom of the beam as possible. If pipes meet one another at the same elevation, process based on the following principles:
  - (1) Drain pipes, air ducts and pressure pipes should leave places for gravity pipes;
  - (2) Air ducts and small pipes should leave places for major pipes;
- 3) Make sure the pipes directions and branches are correct with minimum length. Use minimum number of braze welding junctions and elbows;
- 4) The refrigerant pipe cannot affect air discharge and return of indoor units.

The minimum distance between the refrigerant pipe with an insulation layer and the air return box is 300 mm. If the air return or manhole is at the right lower part of the unit, the minimum distance is 150 mm. When the refrigerant pipe needs to be laid at the air outlet side, avoid laying the pipe at the front of the air outlet. The refrigerant pipe cannot connect to any part of the unit except the joint points. If the preceding principles are not followed, performance of the unit will be affected and running noises will be increased.



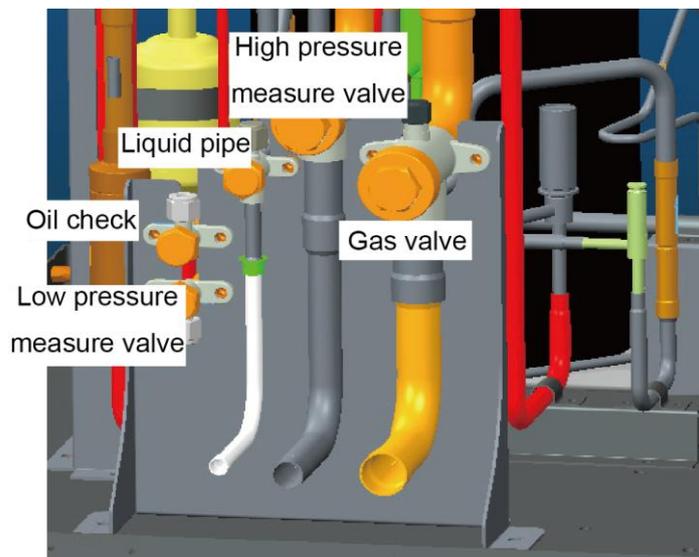
4) The refrigerant pipe must be laid away from the manhole of the unit so that sufficient space can be reserved for maintenance.

5) The riser should be installed in the air conditioning tube well, and the horizontal pipe should be placed in the ceiling, if possible.

## 9.2 Schematic Diagram of Refrigerant Piping

### 9.2.1 Piping instruction

#### 1) Piping instruction for top discharge ODU



Note:

① Functions of oil check valve: During after-sale maintenance, the oil check valve can be used to extract lubricating oil samples, which are further detected to analyze the oil quality in the system. The oil check valve can also serve as the inlet for lubricating oil charging. Stop the system for at least 12 hours and wait until the system internal pressure is lower than 0.2MPa before the extracting of lubricating oil from the system; otherwise, overheat oil and overhigh pressure may

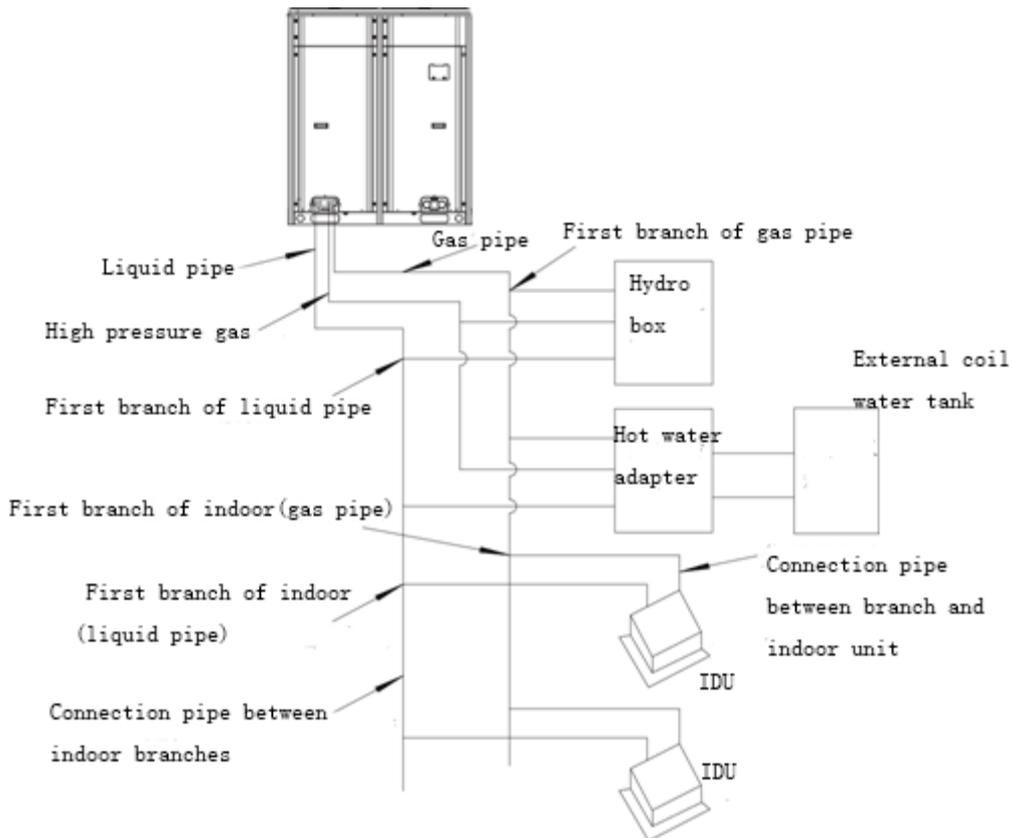
burn the operator.

② Functions of low-pressure check valve: It is mainly used for low pressure detection of the system and refrigerant charging during after-sales maintenance.

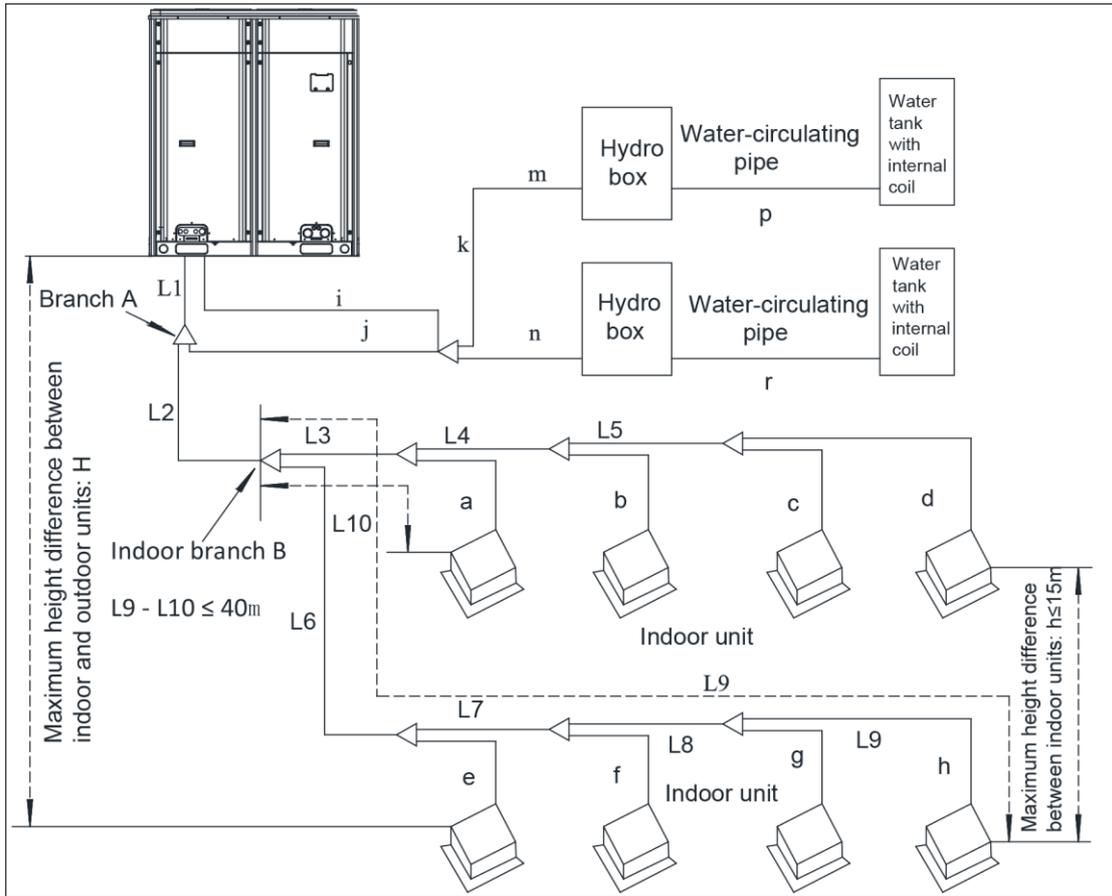
**2) Piping instruction for hydro box**



**9.2.2 Schematic diagram for refrigerant piping of top discharge outdoor unit**



### 9.3 Allowable Length and Height Different of Refrigerant Piping of IDU and ODU



L10: Distance from the first indoor branch pipe to the farthest IDU  
 L11: Distance from the first indoor branch pipe to the nearest IDU

The equivalent distance of IDU branch pipe is 0.5m

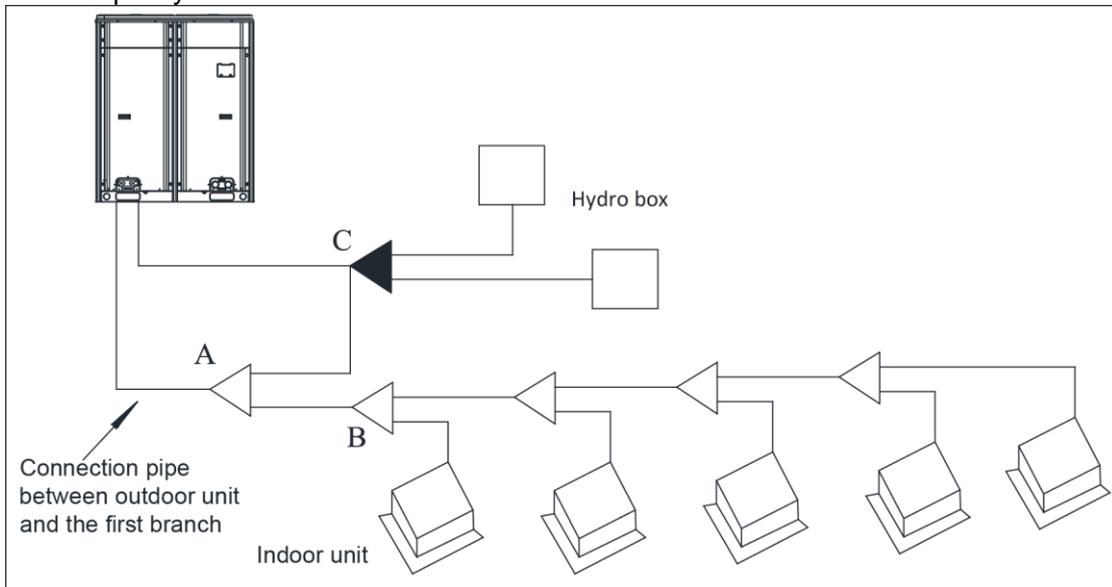
Content		Length (m)	Remark
Actual total connection pipe length		$\leq 300$	$L1+L2+L3+L4+...+L9+a+b+...+l+m$
Length from the ODU to the farthest IDU	Actual length	$\leq 120$	$L1+L6+L7+L8+L9+h$
	Equivalent length	$\leq 150$	
Length difference between the first indoor branch to the farthest IDU and nearest IDU		$\leq 40$	$L10-L11$
Distance from the first indoor branch pipe to the farthest IDU (1)		$\leq 40$	$L6+L7+L8+L9+h$
Height difference between IDU and ODU (H)	ODU is higher than IDU	$\leq 40$	—
	ODU is lower than IDU	$\leq 50$	—
Max height difference between ODU and hydro box		$\leq 25$	—
Max height difference between IDUs (including hydro box) (h)		$\leq 15$	—
Max length of main pipe (2)		$\leq 90$	L1
Length between IDU and its nearest branch pipe (3)		$\leq 10$	a, b, c, d, e, f, g, h
Max refrigerant pipe length between ODU and hydro box		$\leq 30$	$i+j+k+l$
Horizontal distance from hydro box to water tank with internal coil		$\leq 5$	P or r

**⚠ Notices:**

- ① Separate piping of hydro box and piping of IDU from the position of branch pipe A.
- ② Under normal condition, the pipe length from IDU branch pipe B to farthest IDU is 40m.  
When the following conditions are satisfied, the pipe length can reach 90m:
  - a. Actual length of total piping:  $L_1+L_2 \times 2+ L_3 \times 2+ L_4 \times 2+ \dots + L_8 \times 2+a+b+ \dots +i+j+k+m+n \leq 300m$ ;
  - b. Distance from each IDU to its nearest branch pipe: a, b, c, d, e, f, g, h  $\leq 40m$ ;
  - c. Length difference between the indoor branch B to the farthest IDU and nearest IDU:  $L_9-L_{10} \leq 40m$ ;
- ③ If the distance between IDU to its nearest branch pipe is above 10m, the diameter of IDU liquid pipe whose diameter is smaller than or equal to 6.35mm should be bigger.

### 9.4 Size of Refrigerant Piping

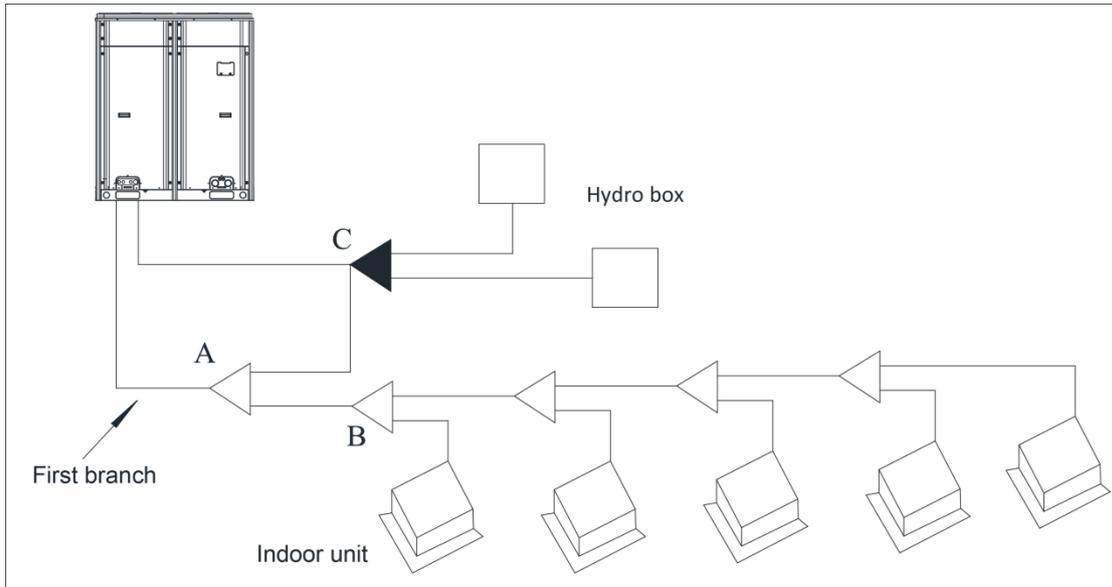
(1) The size of ping between ODU and branch pipe (main pipe) is confirmed by ODU capacity.



Capacity of ODU	Gas pipe	Liquid pipe	High pressure gas pipe
224	Φ19.05	Φ9.52	Φ12.7/15.9
280	Φ22. 2	Φ9.52	Φ12.7/15.9

Note: The requirements for high pressure gas pipe size please refer to the content in "Piping size between branch pipes"

(2) Slection of branch pipe



Selection of branch pipe A (the first branch pipe)

Selection of branch A (i.e. first branch)		
R410A system	Outdoor unit	Model
Y-type branch	GMV-S224W/A-X, GMV-S280W/A-X	FQ01B/A

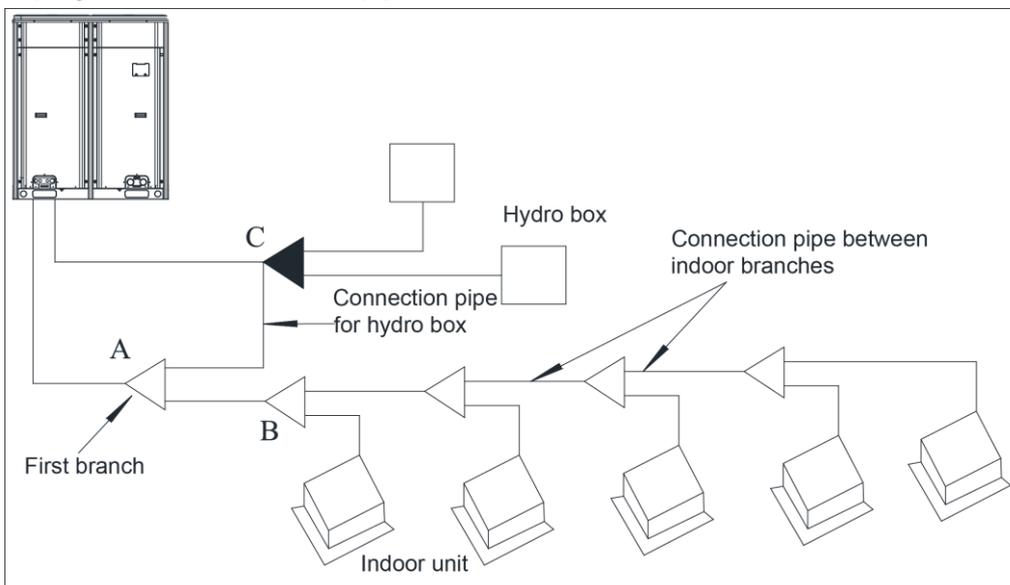
Selection of branch pipe B (branch pipe between IDUs)

Selection of branch B (i.e. branch between indoor units)		
R410A system	Total rated capacity of downstream indoor units: X(kW)	Model
Y-type branch	$X \leq 20$	FQ01A/A
	$20 < X \leq 30$	FQ01B/A
	$30 < X \leq 70$	FQ02/A
	$70 < X \leq 135$	FQ03/A
	$135 < X$	FQ04/A

Selection of branch pipe C (connected to hydro box)

R410A system	Total number of downstream hydro box	Model
Y-type branch	X=1	Unnecessary
Y-type branch	X=2	FQ02W/A

(3) Piping size between branch pipes



**GMV5 Home DC Inverter Multi VRF Units**

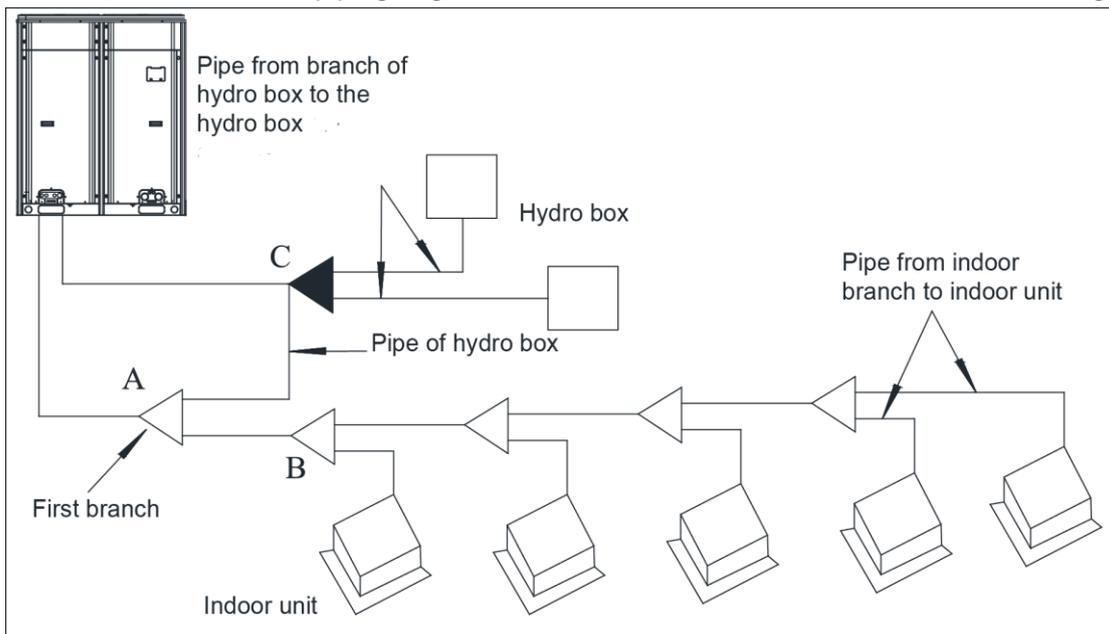
**Piping size between branch pipe A and C, branch pipe C and ODU:**

Total number of connected hydro box: X	Dimension of pipe between branch A and C, dimension of pipe between branch C and outdoor unit		
	Gas pipe	Liquid pipe	High pressure gas pipe
X=1	Φ15.9	Φ9.52	Φ12.7
X=2	Φ22.2	Φ9.52	Φ15.9

**Piping size between IDU branch pipes:**

Total rated capacity of downstream IDUs X (kW)	Piping size between IDU branch pipes	
	Gas pipe	Liquid pipe
X≤5.6	Φ12.7	Φ6.35
5.6<X≤14.2	Φ15.9	Φ9.52
14.2<X≤22.0	Φ19.05	Φ9.52
22.0<X≤30.0	Φ22.2	Φ9.52
30.0<X≤45.0	Φ28.6	Φ12.7
45.0<X≤67.0	Φ28.6	Φ15.9
67.0<X≤95.0	Φ34.9	Φ15.9
95.0<X≤135.0	Φ41.3	Φ19.05
135.0<X	Φ44.5	Φ22.2

(4) The piping dimension between the branch to its connected terminal is the same as the piping dimension of terminal (if the distance from the first branch to a certain IDU exceeds 30m, the diameter of piping at gas side from the first branch to this IDU should be bigger).



**Piping size of IDU**

IDU capacity X (kW)	Piping size between IDU branch to IDU	
	Gas pipe	Liquid pipe
X≤2.8	Φ9.52	Φ6.35
2.8<X≤5.0	Φ12.7	Φ6.35
5.0<X≤14.0	Φ15.9	Φ9.52
14.0<X≤16.0	Φ19.05	Φ9.52
16.0<X≤28.0	Φ22.2	Φ9.52

**Piping size of hydro box**

Terminal	Piping size between hydro box/adaptor and its branch pipe		
	Gas pipe	Liquid pipe	High pressure gas pipe
Hydro box	Φ15.9	Φ9.52	Φ12.7

## 9.5 Installation and Insulation of Refrigerant Pipe

### 9.5.1 Pipe installation for cooling system

#### 9.5.1.1 Processing to refrigerant pipes

##### 9.5.1.1.1 Cut-off and burring



Warning! Use a special-purpose pipe cutter to cut copper pipes instead of using a hacksaw.

- 1) Use a special-purpose pipe cutter to cut copper pipes;
- 2) Cut the pipes gently to ensure that the copper pipe does not deform;
- 3) After cutting the pipes, use a slicker to grater bur the pipes with the pipe opening inclining downward so that the copper scales do not fall into the pipe;
- 4) If the copper pipe is not used immediately after cut-off, cover it with a sealing cap or adhesive tape;
- 5) Allowable deviation: Skewness of the cross section cannot exceed 1% of the copper pipe caliber.

##### 9.5.1.1.2 Pipe cleaning

- 1) Cleaning with a piece of silk cloth-applicable to straight pipes
  - (1) Wrap a thin steel wire with a piece of clean silk cloth. Crumple the cloth into a lump with diameter larger than the pipe caliber;
  - (2) Apply several drops of chlorylene to the cloth. Push the cloth in from one end of the pipe and pull out from the other end;
  - (3) Every time the cloth is pulled out, remove the dust and sundries with chlorylene;
  - (4) Wash repeatedly until the pipe is clean.
- 2) Cleaning with nitrogen-applicable to coils  
Blow off all dust and sundries in the pipe with nitrogen.



Warning! After cleaning, cover the both ends of the pipe with a sealing cap or adhesive tape.

##### 9.4.1.1.3 Pipe bending



##### Notices

During bending, there must be no corrugation or deformation inside the pipe.

The welding point of the pipe should not be at the bending part. The distance between the nozzle welding joint and the bending part should not be less than 100 mm.

- 1) Processing requirements:  
The radius of the bending pipe must exceed 3.5D. The ratio of the short diameter after bending to the original diameter must exceed 2/3.
- 2) Processing methods:
  - (1) Manual bending: applies to thin copper pipes ( $\Phi 6.35$  mm to  $\Phi 12.7$  mm)
  - (2) Mechanical bending: applicable range ( $\Phi 6.35$ mm to  $\Phi 54.1$ mm)

##### 9.4.1.1.4 Pipe expanding

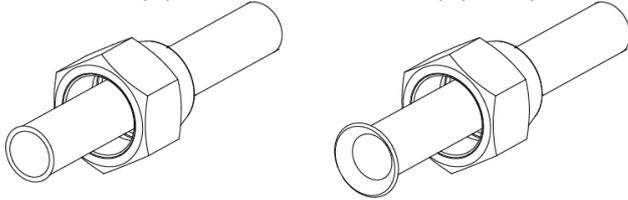
Pipe expanding is used to provide a welding point for pipe connection. Requirements on pipe expanding are as follows:

- 1) Before pipe expanding, apply appropriate amount of lubricant on the surface of the pipe. (The lubricant must meet the refrigerant system's requirements);
- 2) Pipe expanding length must be in accordance with the insertion depth of the caliber;
- 3) To avoid leakage due to straight lines at the expanding point, turn round the copper pipe and then make corrections;
- 4) Apply appropriate force during pipe expanding to avoid crack.

##### 9.4.1.1.5 Flaring

Another mode of pipe connection is flare opening connection, which requires pipe flaring before connection.

- 1) Put the flaring nuts into the copper pipe;
- 2) Put the pipe into the root of the pipe expander and the arrange flaring;



- (1) Before pipe flaring, apply appropriate amount of lubricant on the surface of the opening to ensure smooth pass of flaring nuts and avoid pipe distortion;
- (2) The concentricity must be ensured after pipe flaring. The sealing face must be intact without any burr, crack, or wrinkle;
- (3) Use a slicker to remove the little burs in the pipe port.

### 9.5.1.2 Installation of refrigerant pipes

#### 9.5.1.2.1 Operation sequence

The sequence for installing the refrigerant pipe is as follows:

Preparing and installing the support, hanger, and bracket – Piping according to the drawing – Cleaning the pipe – Processing the pipe – Adding an insulation sleeve – Connecting the pipe – Fixing the pipe – Blowing contaminants in the pipe system – Performing a air-tightness test – Performing insulation.

#### 9.5.1.2.2 Construction of support, hanger, and bracket

- 1) Construction of supports, hangers, and brackets for pipes: These parts must be fixed securely in reasonable type and style without any tilt. The surface is clean without any dirt. The parts embedded into the wall or floor cannot be painted or coated and must be free from grease stains;
- 2) Construction of fixing bolts for devices: Ensure sufficient rigidity for the devices. Take anticorrosive measures for exposed part of built-in fittings. If the foundation must be waterproof, takes waterproof measures;
- 3) Construction of steel casings: Equip a steel casing for all pipes which are led through the wall or floor. Pipe welding joints cannot be placed inside the sleeve. The steel casing must be parallel with the bottom of the wall or floor but be 20 mm or more above the bottom. The diameter of the steel casing must be determined based on the thickness of the insulation layer and the inclination degree of the condensate water pipe. Fill the gap between the pipe and the sleeve with flexible and non-flammable materials. The sleeve cannot be used as a support point of the pipe.
- 4) Operation sequence



If possible, make ink lines on the ground and project them to the top of the building.

#### 5) Installing built-in metal fittings

Select built-in metal fittings in accordance with local regulations.

#### 6) Installing expansion bolts

Use expansion bolts when built-in metal fittings are unavailable due to design change.

#### 7) Installing expansion bolts

●If the foot pedal is 2m or more from the ground, there must be three points of support.

The foot pedal must be tightened securely with the ladder.

●Do not perform operations on the top of the ladder.

#### 9.5.1.2.3 Shaping and fixing of pipes

When installing refrigerant pipes, ensure that the directions and branches are correct with minimum length. Use minimum number of braze welding junctions and elbows. Alignment and

insulation after installation cannot affect the pipe location and elevation. There shall not be flat bending or corrugation on the pipe after piping.

Use angle steel support, bracket, round steel hanger, U-type pipe clip, or flat steel to fix pipes outside the insulation layer. It is better that the insulation materials be not compressed to ensure good insulation.

The style and workmanship of supports, hangers, and brackets must follow the standard T616 HVAC Systems Design Handbook.

The minimum distance between supports, hangers, and brackets is listed in the table below:

External Diameter of the Pipe (mm)	$\phi \leq 16$	$16 < \phi < 19.05$	$\phi \geq 19.05$
Distance between Horizontal Pipes (mm)	1000	1500	2000
Distance between Vertical Pipes (mm)	1500	2000	2500

The pipe led through a wall or beam must be fixed by a support, hanger, or bracket on both ends at the position 300 mm away from the hole.

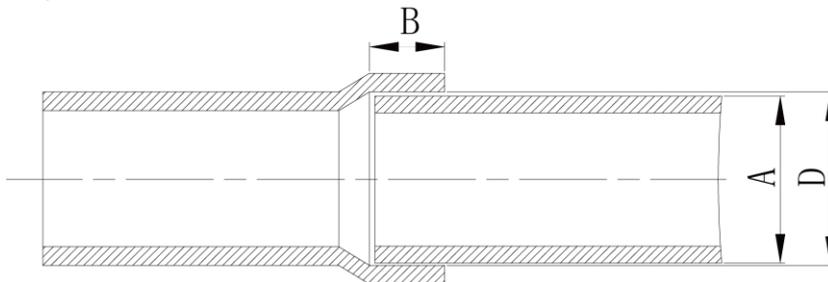
9.5.1.2.4 Pipe connection

1) Flaring connection:

The refrigerant pipes and IDUs are connected by using the flare opening. Therefore, the quality of flaring connection must be ensured. The flaring depth of the bell mouth cannot be smaller than the caliber. The flaring direction must face towards the direction of medium flow. Use two torque wrenches to fasten the connection.

2) Socket welding:

The gap between socket components should be proper to ensure that the connection will not loose from the friction surface. The flaring direction of the socket component must face towards the direction of medium flow. During pipe connect, protect the braze welding part according the length specified below:



A: External Diameter of the Pipe (mm)	B: Minimum Insertion Depth (mm)	D-A: Gap between Pipes (mm)
$\phi 6.35$	6	0.05~0.21
$\phi 9.52$ $\phi 12.7$	7	
$\phi 15.8$	8	0.05~0.27
$\phi 19.05$ $\phi 22.2$ $\phi 25.4$	10	
$\phi 28.6$ , $\phi 31.8$	12	
$\phi 38.1$ $\phi 44.5$	19	0.15~0.35
$\phi 54.1$	24	0.15~0.35

3) Bell socket welding

The bell socket welding is another form of socket welding. It uses the sleeve or pipe in a larger size for welding. The insertion depth cannot be smaller than that required by socket welding.

4) Flange connection

The pipes with large caliber and the devices are always connected by using a flange, which must be clean and intact. Before installation, apply lubricant on the surface of the flange. Two flanges must be symmetrical. Fasten with screws at the diagonal direction to avoid inclination.

9.5.1.2.5 Welding protection

Aerate with nitrogen before and during welding and keep aerating for 30 s after the welding is

finished.

Equip a pressure regulator valve to the nitrogen cylinder.

The nitrogen flow is above 4-6 L/min (pressure of 0.02 to 0.05Mpa) and must be regulated based on the pipe caliber.

9.5.1.2.6 Requirements on manifold installation

Manifolds are used to divert refrigerant. Requirements on manifold installation are as follows:

1) Ensure that the manifold is close to the IDU to reduce impact on refrigerant assignment by IDU branches;

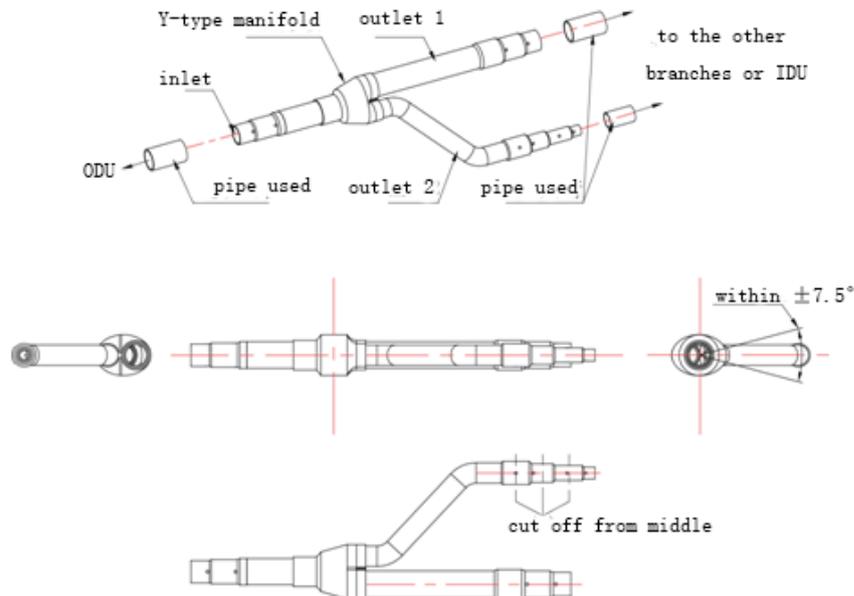
2) The manifold must be that specified by the manufacture and match with the devices;

3) Ensure that the manifold model is correct;

4) Manifolds can be laid in the following ways:

(1) Horizontal installation: The three ports must be on the same level. The shaping size and assembly angle cannot be changed;

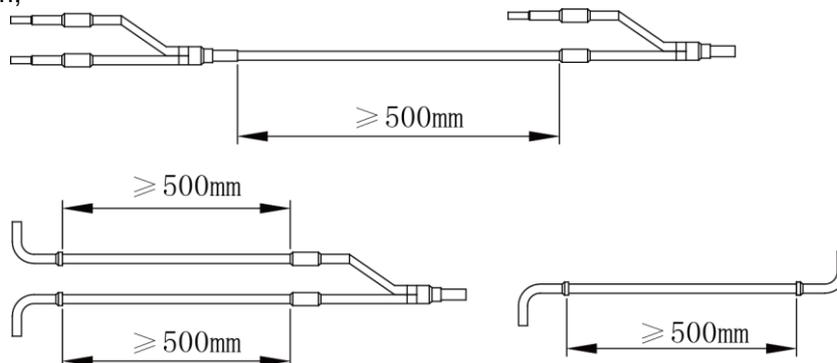
(2) Vertical installation: The direction can be upwards or downwards. Three ports must be on the same elevation without inclination;



(3) The length of a straight pipe between two manifolds cannot be less than 500 mm;

(4) The length of a straight pipe before the main pipe port of the manifold cannot be less than 500 mm;

(5) The length of a straight pipe between the branch of the manifold and the IDU cannot be less than 500 mm;



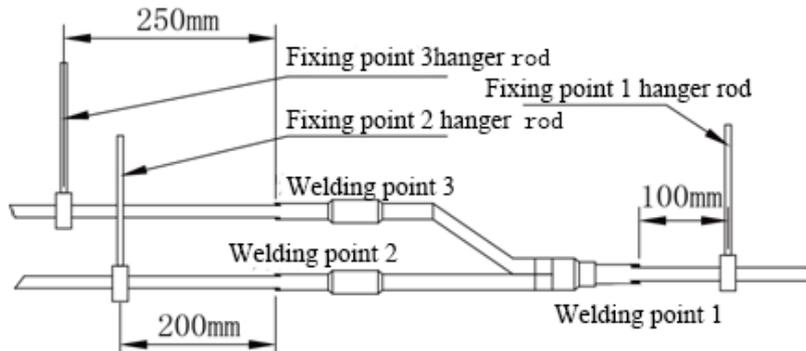
5) Fixing of manifolds

There must be three fixing point for both horizontal and vertical installation of the Y-type manifold:

Fixing point 1: 100 mm on the main inlet manifold from the welding point;

Fixing point 2: 200 mm on the main branched pipe from the welding point;

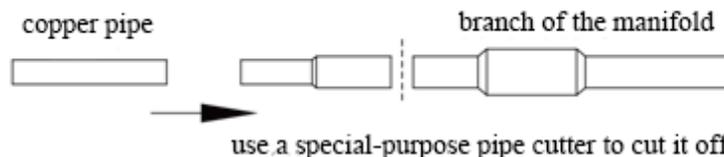
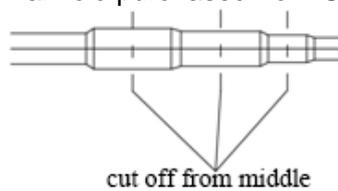
Fixing point 3: 250 mm on the branched pipe from the welding point.



Branches of a manifold must be laid parallel and cannot be wrapped in superimposed mode.

6) The liquid pipe and gas pipe must have the same length and be laid in the same route;

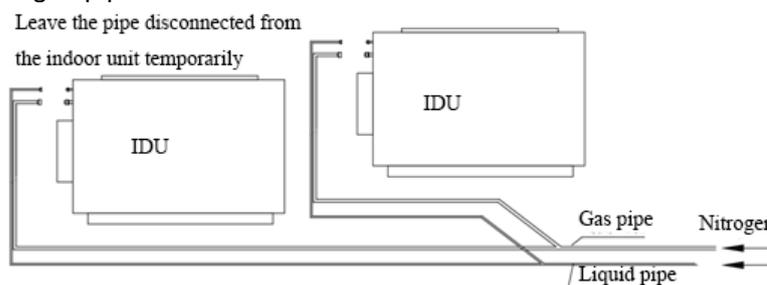
7) The Y-type manifold has an attached pipe used to adjust the diameter of different pipes. If the pipe size on site does not match the size of the manifold junction, use the pipe cutter to cut at the middle of the pipe and remove burrs. Then insert the copper pipe to proper depth. A concave bag for positioning is available to the manifold purchased from Gree.



8) Because the manifold structure is complex, perform with care to ensure tight insulation.

#### 9.4.1.2.7 Pipe cleaning by nitrogen

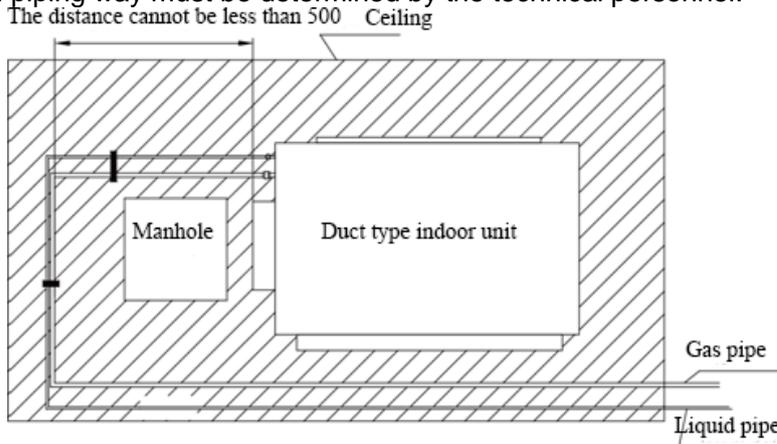
Before connecting the flare opening of the pipe to the IDU, connect the pressure regulator valve on the nitrogen cylinder to the liquid pipe in the outdoor pipe system. Regulate the nitrogen pressure to about 5kgf/cm<sup>2</sup> and blow nitrogen into the pipe for 1minute. Repeat this operation for three times till the dirt and water are discharged. After cleaning the liquid pipe, perform the same operation to clean the gas pipe.



Perform an air-tightness test and a vacuum test to the entire refrigerant pipe system after the construction is finished.

There must be a secure distance between pipes. Pipes in different types must be fixed separately.

9.5.1.2.8 During refrigerant pipe installation, ensure a distance above 500 mm between the pipe and the electric box of the unit for maintenance. In a case when the space is not enough, the final piping way must be determined by the technical personnel.



9.4.1.2.9

As the piping for the VRF system is complex, it is recommended that a filter is installed for the gas pipe and a drier is installed for the liquid pipe during construction. This ensures aridity and cleanliness of the piping system and further improves the operation stability of the system.

The procedure is as follows:

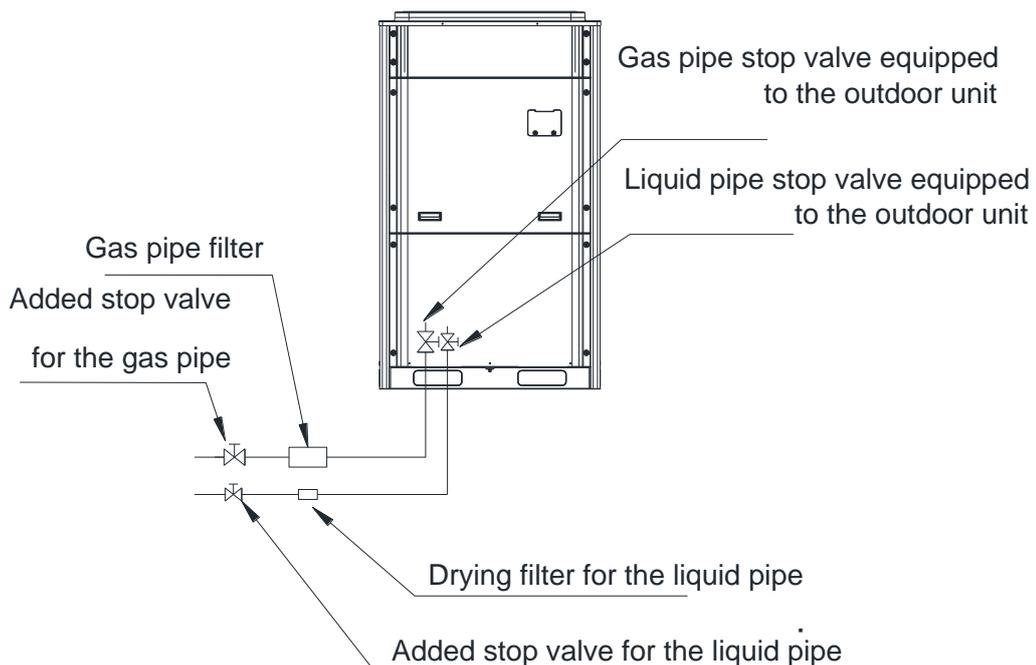
First, weld a stop valve with the corresponding caliber to the gas pipe and liquid pipe at the position relatively close to the ODU and easy for operation.

Second, install a filter (100 mesh/ft<sup>2</sup>) between the added stop valve outside the gas pipe and the stop valve of the ODU. Then install a drier filter between the added stop valve outside the liquid pipe and the stop valve of the ODU.

Lastly, after the test run is complete,

To remove the filter from the gas pipe after starting all IDUs and keeping them running cooling mode for 24 hours: power off all units; turn off the two stop valves of the gas pipe; remove the filter; short connect with a copper pipe with the same caliber and vacuumize the pipe; open the two stop valves and keep normal running.

To remove the drier filter from the liquid pipe after starting all IDUs and keeping them running in heating mode for 24 hours: power off all units; turn off the two stop valves of the liquid pipe; remove the filter; short connect with a copper pipe with the same caliber and vacuumize the pipe; open the two stop valves and keep normal running.



## 9.5.1.3 Air-tightness test

**Precautions:**

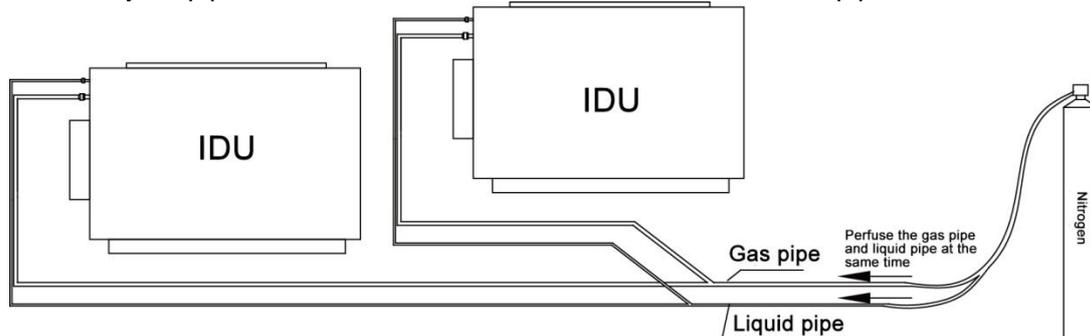
The measuring range of the test pressure gauge for R410A system must be above 4.5MPa. Record the value displayed on the pressure gauge, ambient temperature, and test time.

Pressure correction: The pressure changes by 0.01MPa when the temperature changes by 1°C.

The pressure meets the requirement if it does not change.

If the pressure must be kept for a long time, decrease the pressure to 0.5MPa or lower. High pressure for a long time may cause leakage at the welding point or safety hazard.

Before performing the air-tightness test to the refrigerant pipes, do not conduct insulation or wrapping at the welding or flaring opening joints of the IDU. The pressure must be increased simultaneously for pipes on outdoor sides and cannot be increased for pipes on one side.



Note: Before performing the air-tightness test, do not conduct insulation or wrapping at the welding joints.

## 9.5.1.3.1 Importance of the air-tightness test

Air-tightness of the multi-module air conditioning system mainly refers to the tightness of the refrigerant pipes, which ensures secure and reliable running of the air conditioner.

Refrigerant leakage may affect functions of the air conditions or even damage the compressor and make the system to break down. Therefore, a air-tightness test must be performed. If refrigerant leakage is detected after the system is installed, it is very difficult to locate the leaking point as the suspending ceiling has been decorated. Therefore, the air-tightness test must be performed before ceiling sealing for indoor decoration is finished.

## 9.5.1.3.2 Procedure for performing the air-tightness test

Stop valves of the gas and liquid pipes of the ODU are turned off at delivery.

Before test, apply a small amount of required lubricant on the block nut and pipe terminals and use two wrenches to fix the block nut.

The ODU pipes cannot be connected when the air-tightness test is being performed.

The test pressure for R410A system is 4.15MPa. Use dry nitrogen as media for the air-tightness test. Increase the pressure slowly by following the steps below:

Step 1: Increase the pressure to 0.5MPa. Stop for 5 minutes and then perform air-tightness check. Major leakage may be detected.

Step 2: Increase the pressure to 1.5MPa. Stop for 5 minutes and then perform air-tightness check. Minor leakage may be detected;

Step 3: Increase the pressure for R410A system to 4.15MPa. Stop for 5 minutes and then perform strength check. Slight leakage or blow holes may be detected. After increasing the pressure to the test pressure, keep the pressure for 24 hours and check whether it decreases. If the pressure does not decrease, it meets the requirement.

## 9.5.1.4 Vacuumization and desiccation for the system

## 9.5.1.4.1 Requirements on the vacuum pump

- 1) The vacuum pump for different refrigerant systems cannot be the same.
- 2) The ultimate vacuum degree of the vacuum pump should reach -0.1Mpa.
- 3) The air discharge capacity of the vacuum pump must be greater than 4L/S.
- 4) The precision of the vacuum pump must be greater than 0.02mmHg.
- 5) The system vacuum pump must be equipped with a check valve.

## 9.5.1.4.2 Procedure and precautions for vacuumization and desiccation

- 1) Before vacuumization, ensure that the stop valves of the gas pipe, liquid pipes and high-pressure gas pipe are turned off.

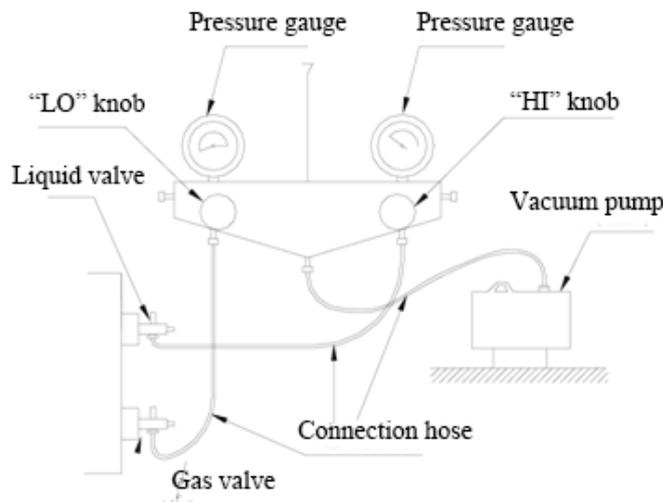
- 2) Use the perfusing duct to connect the regulator valve and vacuum pump to detection connectors of the gas pipe valve, liquid pipe valve and high-pressure gas pipe valve.
- 3) Vacuumize for 4 hours and check whether the vacuum degree reaches -0.1MPa or more. If not, leakage may exist. Perform leakage check again. If no leakage exists, continue to vacuumize for 2 hours.
- 4) If the vacuum degree cannot be kept after vacuumization is performed for twice, there may be water in the pipe when it is confirmed that no leakage exists. In this case, discharge water by means of vacuum breaking. Perfuse nitrogen at 0.05MPa to the pipe. Vacuumize for 2 hours and keep vacuuming for 1 hour. If the vacuum degree of -0.1MPa cannot be reached, repeat this operation till water is discharged.
- 5) After vacuumization, turn off the regulator valve and keep for 1 hour. Ensure that the pressure of the regulator valve does not increase.

9.5.1.4.2 Precautions:

- 1) Arrange vacuumization from the gas pipe and liquid pipe simultaneously and then arrange vacuumization from the high-pressure gas pipe.

Check if the gas pipe valve, liquid pipe valve and high pressure gas pipe valves of ODU connected with IDU and hydro box are fully closed.

As shown below, discharge air with vacuum pump from the gas pipe valve, liquid pipe valve and high pressure gas pipe valves of ODU. If all IDUs and ODU are energized, the unit can enter vacuum pumping mode of IDUs, ensuring that the valves of IDU and hydro box are open.



- 2) Turn off the valve before powering off the vacuum pump.
- 3) Keep vacuuming for 2 hours. The vacuum meets the requirement if the pressure displayed by the vacuum gauge does not increase.

## 9.5.2 Insulation for the refrigerant system pipe

### 9.5.2.1 Insulation materials

Use closed-cell foam insulation materials with flame retardant grade of B1.

The heat conductivity is not greater than 0.035 w/(m·k) when the average temperature is 0°C.

### 9.5.2.2 Thickness of the insulation layer

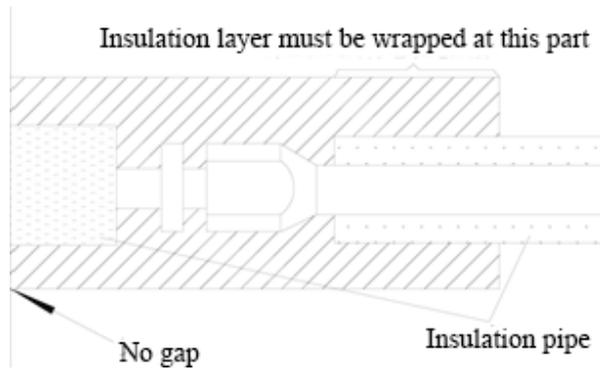
External Diameter of the Pipe (mm)	≤12.7	≥15.88
Thickness of the Insulation Layer (mm)	≥15	≥20

Use sunblock, anti-weathering, and non-cracking insulation materials for outdoor pipes.

### 9.5.2.3 Procedure of insulation

- 1) Select insulation materials based on design requirements.

- 2) Wear the insulation sleeve before connecting refrigerant pipes. Users cannot cut the insulation material apart and then wrap up with ties after connecting the pipes by welding.
- 3) Specifications of the insulation sleeve must match with that of the refrigerant pipes.
- 4) Reserve a distance of about 200mm near the welding point to protect the insulation sleeve during welding. After performing the air-tightness test, perform insulation to the welding point separately to ensure continuity of the insulation sleeve.
- 5) The insulation layer cannot crack during construction. Bond the insulation material joints with special glue and then wrap them with electrical adhesive tape. The width of the adhesive tape must be 50mm or more to ensure secure connection.
- 6) Use glue to bond the insulation material at the water outlet to the unit to prevent dewing.
- 7) Wrap joints of indoor/outdoor units with insulation materials. There must be no gap between the joint and the wall of the indoor/outdoor unit, as shown in the following figure.



## 10. Pipe Installation and Insulation for the Condensate Water System and Insulation for the Ducts

### 10.1 Pipe Installation and Insulation for the Condensate Water System

#### 10.1.1 Pipes

Generally, U-PVC water supply pipes bonded with special glue are adopted as condensate water pipes. PP-R, PP-C, and hot galvanized steel pipes can also be adopted. Aluminium plastic compound pipes cannot be used.

#### 10.1.2 Requirements on installation

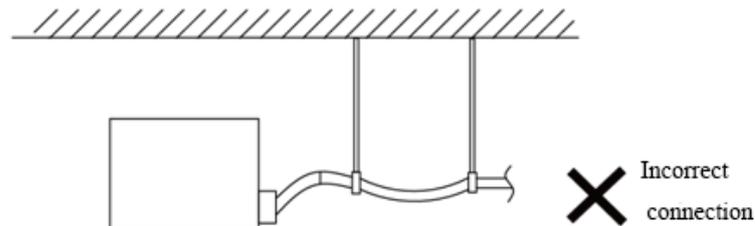
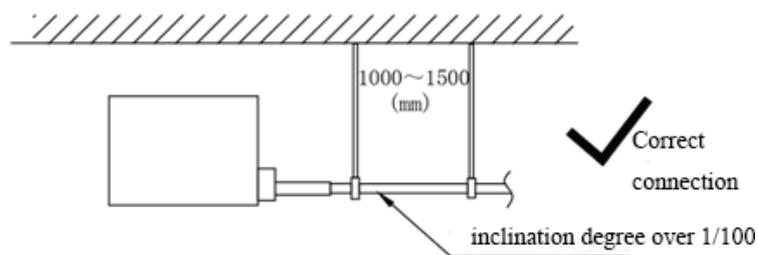
1) Determine the direction and elevation of a condensate water pipe before installing it. Avoid overlapping it with other pipes to ensure straight inclination. The clamp of the pipe hanger is fixed outside the insulation layer. The height of the clamp can be adjusted.

2) Distance between hangers:

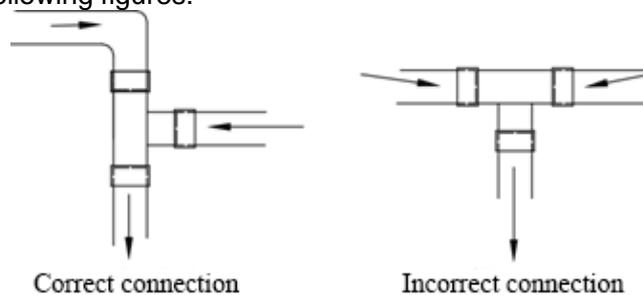
External Diameter of the Pipe (mm)	$\Phi \leq 25$	$32 > \Phi \geq 25$	$\Phi \geq 32$
Distance between Horizontal Pipes (mm)	800	1000	1500
Distance between Vertical Pipes (mm)	1500		2000

There are at least two hangers for each vertical pipe.

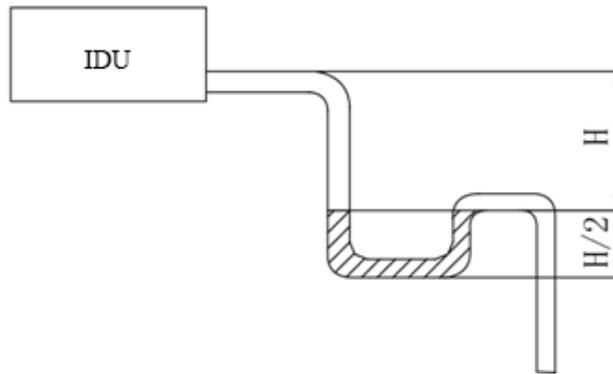
3) The inclination degree of the condensate water pipe must be above 1% and that of the main pipe cannot be lower than 0.3%. Adverse slopes are not allowed.



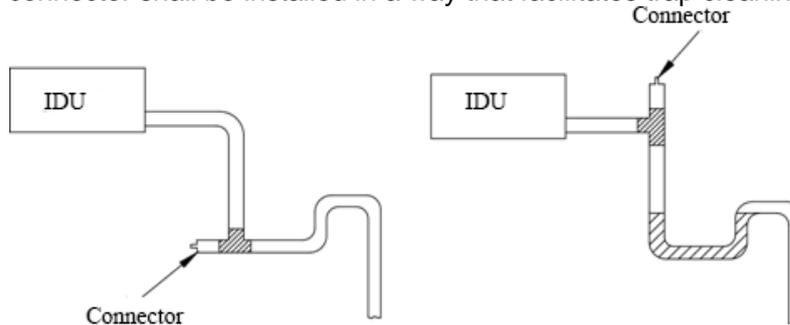
4) When connecting three-way pipes, the two-way straight pipes must be laid on the same slope, as shown in the following figures.



- 5) The condensate water pipe cannot be tied with the refrigerant pipe.
- 6) A ventilation hole must be provided on the top of the drain pipe to ensure smoother discharge of condensate water.
- 7) After pipes are connected, perform a test with some water and another test with full water in the pipe to check whether drainage is smooth and whether water leakage exists in the pipe system.
- 8) Equip a steel casing for all pipes which are led through the wall or floor. Pipe bonding joints cannot be placed inside the sleeve. The steel casing must be parallel with the bottom of the floor or wall. There must be a height drop of 20 mm from the ground when the pipe is led through the floor. The sleeve cannot affect the inclination degree of the pipe. Fill the gap between the pipe and the sleeve with flexible and non-flammable materials. The sleeve cannot be used as a support point of the pipe.
- 9) Bond the insulation material joints with special glue and then wrap them with plastic adhesive tape. The width of the adhesive tape must be 5cm or more to prevent dewing.
- 10) When connecting the drain pipe to that of the IDU, fix the pipes with the bands provided upon delivery instead of using the glue to facilitate further maintenance.
- 11) When connecting the drain pipe branches to the main pipe, lead through from the above part of the main pipe.
- 12) If the air volume of the IDUs is high and outdoor air resorption may be caused by negative suction pressure, provide a u-type drain trap at the water outlet side of each IDU, as shown in the following figure.



Install drain trap connectors as shown in the following figure;  
 Install a drain trap connector for each unit;  
 The drain trap connector shall be installed in a way that facilitates trap cleaning.

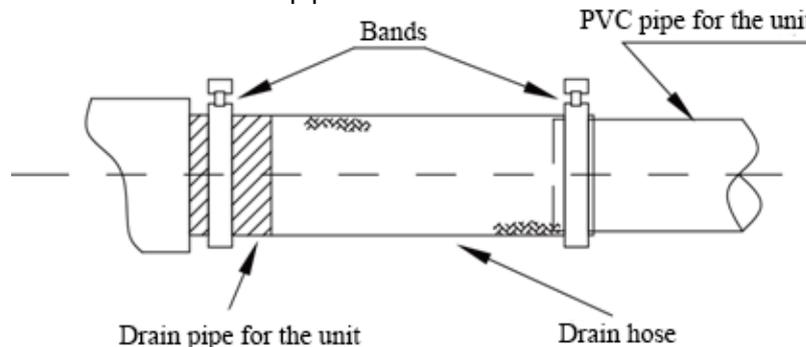


13) During condensate water pipe installation, ensure a distance above 500 mm between the pipe and the electric box of the unit for maintenance. In a case when the space is not enough, the final piping way must be determined by the technical personnel.

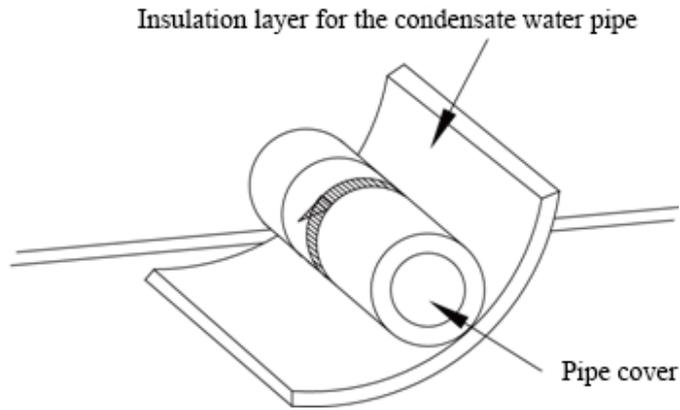
### 10.1.3 Requirements on installation of drain pipes for different types of IDUs

#### 10.1.3.1 Drain pipe installation for hidden duct type IDU

- 1) Ensure an inclination degree of greater than 1% when connecting the drain pipe to the IDU.
- 2) When connecting the drain pipe to that of the IDU, fix the pipes with the bands instead of using the glue to facilitate further maintenance.
- 3) There is a condensate water outlet on both sides of the IDU. After one condensate water outlet is determined, use the rubber stopper to block the other outlet. Tie it with threads and strap with insulation materials to prevent leakage.
- 4) The connection between the drain pipe and that of the IDU is shown in the following figure:



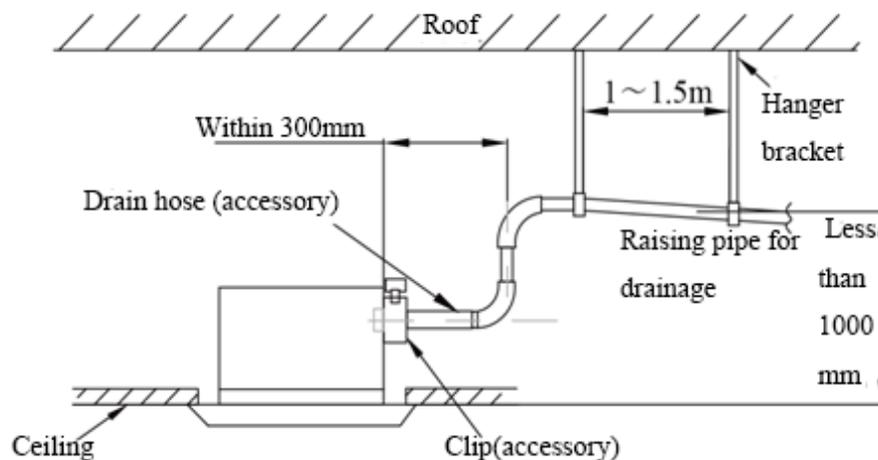
5) Apply insulation materials to the condensate water pipe joints to prevent dewing. Insulation for connection between the drain pipe and that of the IDU is shown in the following figure:



### 10.1.3.2 Drain pipe installation for cassette type IDU

1) Use pipe clips instead of applying glue to connect the hoses provided upon delivery and plastic pipes on the device. Connect the other end of the joint to the elbow. The height from the suction inlet of the discharge pump is about 200 to 500 mm. Ensure a proper inclination degree while connecting to the main drain pipe.

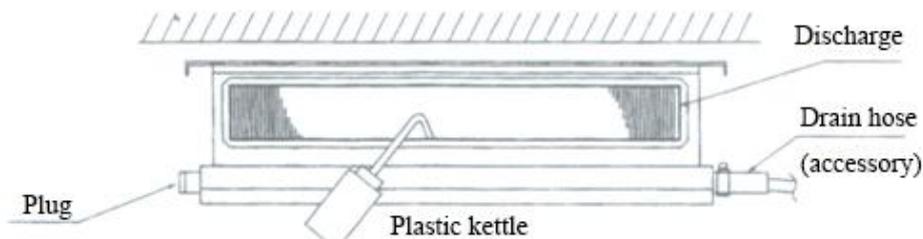
2) The lifting pipe for drainage must be provided as shown in the following figure:



3) The drain pump shall be fixed securely. Otherwise, abnormal noises will be generated.

### 10.1.4 Drain test

Fill water to each IDU and check the water level of water tray and transparent condensate drain hose, to check if water can drain smoothly. If water cannot drain smoothly, check if the pipe is blocked or if the gradient of condensate pipe is not sufficient, and then solve the problem.



(Drain hose can be installed from the left side and right side.)

The drain pipe hose which is not used must be plugged.)

### 10.1.5 Full water test

1) Block the drain hole at the end of condensate pipe to ensure water can be kept in the pipe

during full water test;

2) Fill water from the water tray of unit to make water level of water tray higher than the top end of drain pipe. make the pipe full of water;

3) Check each joint of drain pipe to make sure there is no leakage.

### 10.1.6 Insulation for the condensate water pipe

A、Insulation materials

Use closed-cell foam insulation materials with retardant grade of B1.

The heat conductivity is not greater than 0.035 w/(m·k) when the average temperature is 0°C.

B、Thickness of the Insulation Layer

Thickness of the insulation layer for the condensate water pipe must be greater than 10 mm.

C、Bond the insulation material joints with special glue and then wrap them with plastic adhesive. The width of the adhesive must be greater than 5 cm to prevent dewing.

D、Insulation is not required for the outdoor part of condensate water pipes.

## 10.2 Insulation for air ducts

1) Insulation for air duct components and devices must be performed after the air leakage test is performed or after quality check.

2) Use centrifugal glass wool or rubber and plastic materials for insulation or use novel insulation air ducts.

3) The insulation layer should be flat and tight without any crack or gap.

4) Thickness of the insulation layer:

(1) For the air supply and return air duct laid in a room without an air conditioner, thickness of the rubber and plastic insulation layer is 35 mm.

(2) For the air supply and return air pipe laid in an air conditioning room, thickness of the rubber and plastic insulation layer is 20 mm.

5) Supports, hangers, and brackets of the air duct must be installed outside the insulation layer. A chock must be provided between the support, hanger, or brackets and the air duct.

# 11. Installation and Insulation of Hot Water System Pipeline

## 11.1 Connection of Hot Water System Pipeline

Hot water system pipeline mainly consists of circulating water inlet/outlet pipe between hydro box and water tank, water inlet/outlet pipe of water tank, floor heating water pipe between hydro box and floor heating room.

Preparation of Pipe: Hot water pipes are applied as circulating water inlet/outlet pipe. The PPR pipe with outer diameter DN25 which is S2.5 series (thickness is 4.2mm) is recommended. Hot water pipes are applied as inlet pipe for cold water and outlet pipe for hot water. The PPR pipe with outer diameter DN20 which is S2.5 series (thickness is 3.4mm) is recommended. All applied PPR pipes must comply with national standards GB/T18742. If other insulated pipeline are adopted, the above can be reference.

Installation of circulating pipes: the water inlet of hydro box shall connect with outlet of circulating pipe of water tank while the water outlet of hydro box shall connect with the inlet of circulating pipe of water tank. The manual vent valve A shall be vertically installed upward near the water inlet of hydro box. The manual vent valve B must be vertically installed downward beside the inlet of circulating pipe of water tank. If the conditions are permitted, install the manual vent valve B in the place which is convenient for users. The two vent valves above are equipped

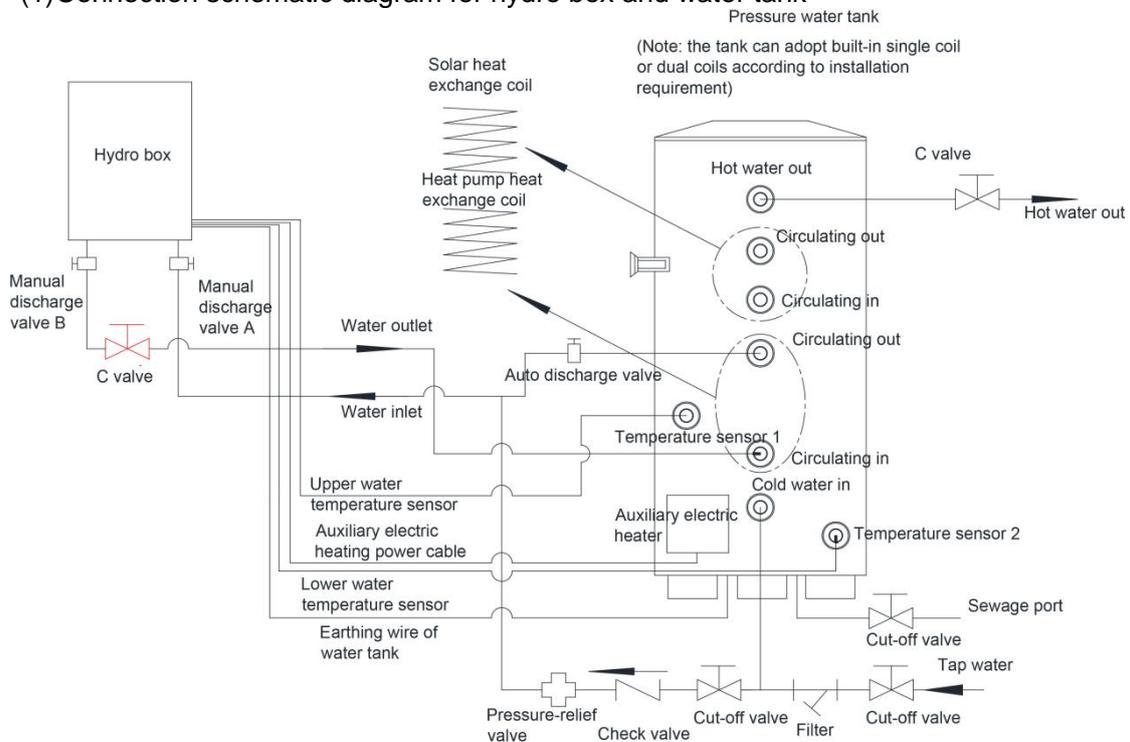
with the unit.

Installation of water pipe of water tank: safety check valve, filter and cutoff valve must be installed in inlet pipe according to the installation diagram of the unit( pay attention to the direction of safety check valve: “→”on the valve shall point at water tank). At least one cutoff valve shall be installed for water outlet pipe.

Installation of blowing tube on the bottom of the water tank: Connect the drain vent with the floor drain by PPR pipe. A cutoff valve must be installed in the blowing tube and the cutoff valve must be installed in the place which is convenient for users.

After all pipelines have been installed, execute leak detection. If there is no leakage, execute insulation work to all pipelines, especially to the valve and pipe joints. Insulating cotton whose thickness is not less than 15mm is recommended. After wrapping the pipe with insulating cotton, bundle the pipe, water temp sensor and wires.

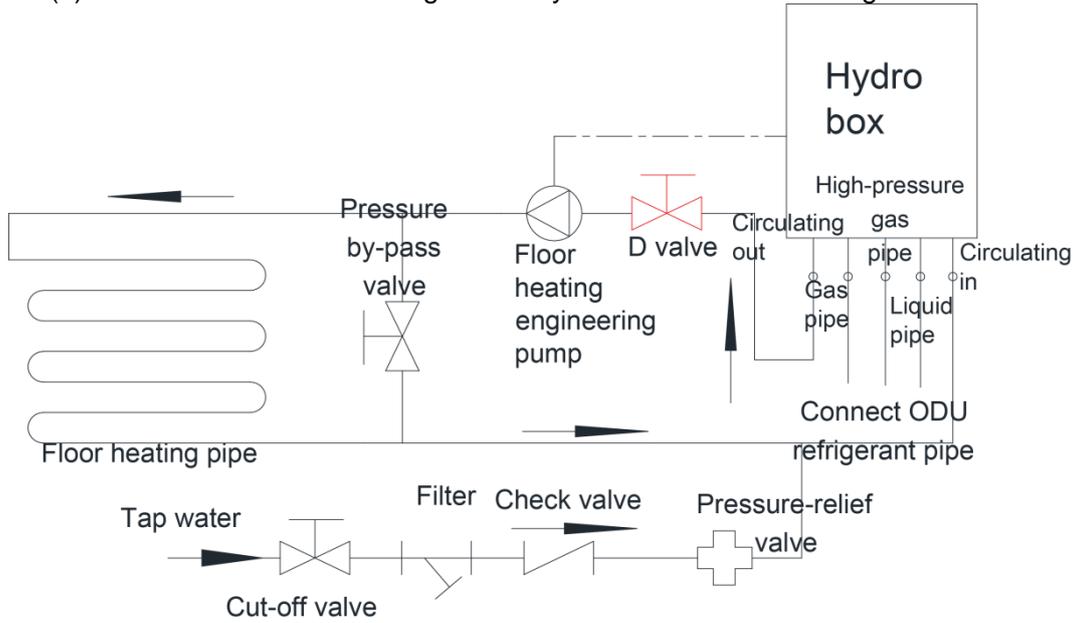
(1)Connection schematic diagram for hydro box and water tank



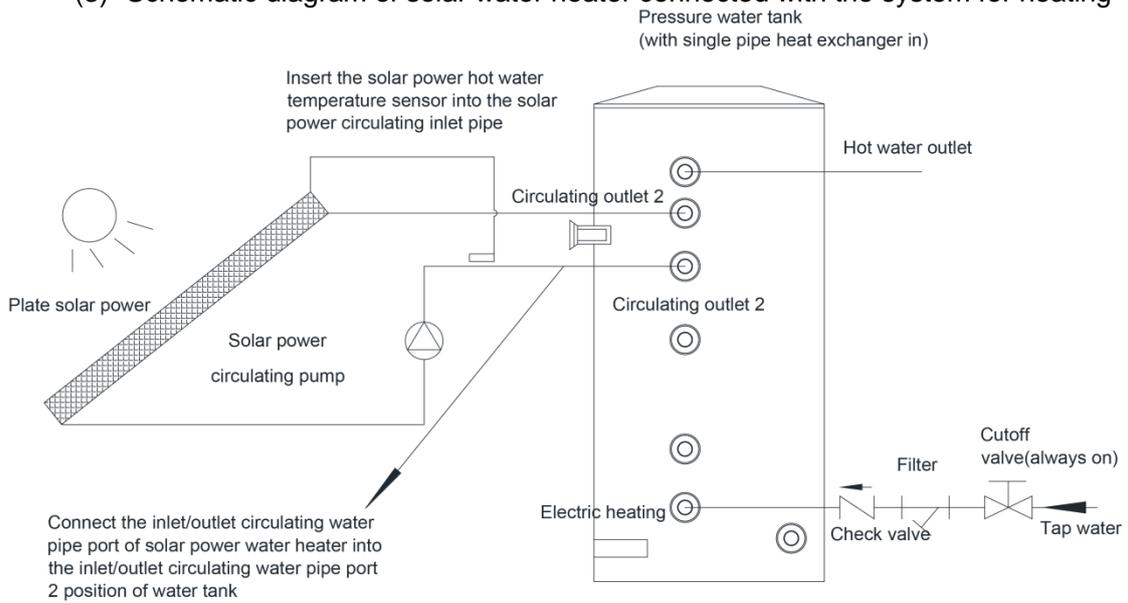
Note:

1. Only temp sensor in the bottom part is equipped in hydro box and the temp sensor in the upper part is self-provided by water tank.
2. Connect temp sensor port 1 of water tank with the water temp sensor on the upper part of hydro box.
3. Connect temp sensor port 2 of water tank with the water temp sensor on the lower part of hydro box.
4. The connection method of upper temp sensor is mutual connection in the air, connected with temp sensor port 2 of water tank.
5. If the water tank just has one temp sensor port, connect the temp sensor on the upper part of hydro box with temp sensor port of water tank.

(2) Connection schematic diagram for hydro box and floor heating

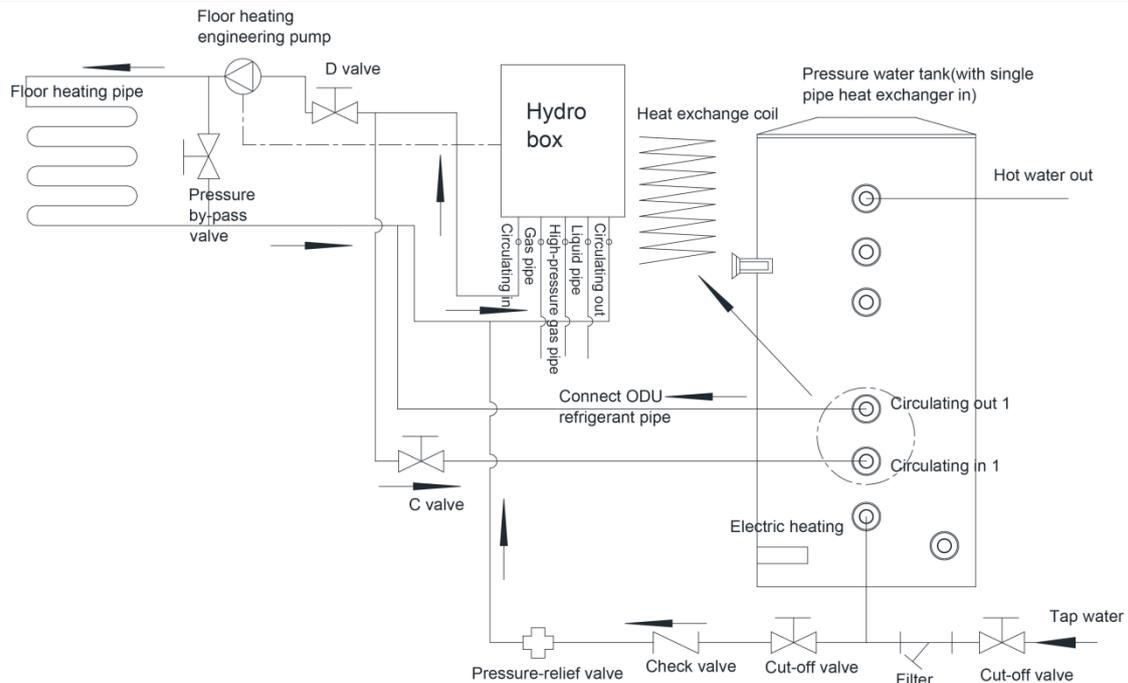


(3) Schematic diagram of solar water heater connected with the system for heating



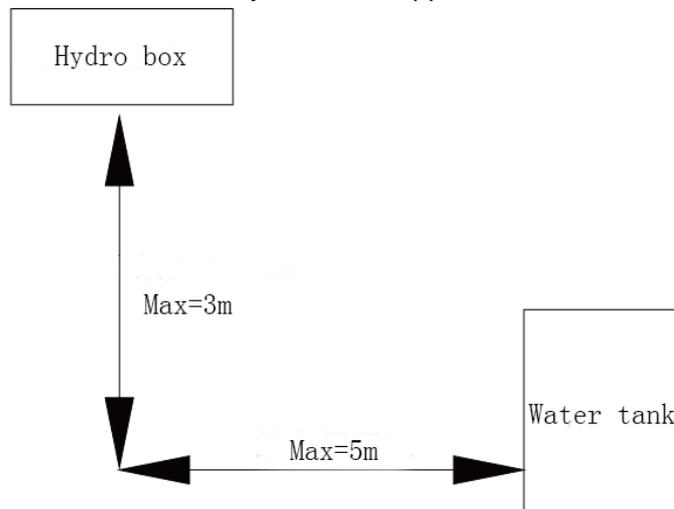
(4) Connection schematic diagram of hydro box with water tank and floor heating

## GMV5 Home DC Inverter Multi VRF Units



Note:

1. The horizontal distance between hydro box and thermal insulation water tank shall not exceed 5m, and the vertical fall shall not exceed 3m. It is recommended to install the water tank at lower and install the hydro box at upper.



2. If the total waterpower loss between floor heating pipeline and valves exceeds 6m, please add floor heating engineering pump behind the solenoid valve D. There is control interface reserved in the electric box of hydro box. Please connect wire according to the wiring diagram on the electric box.
3. Prepare materials according to connector size and specification above. If the cutoff valve is installed outdoors, it is recommended to use PPR fittings, thus to avoid freezing under low temperature.
4. The hydro box shall be properly fixed before proceeding to installation of water pipes. During installation of the connection pipe, prevent the dust or other foreign articles from entering the pipe system.
5. The thermal insulation pressure water tank is supplied of hot water based on tap water pressure. The user can have hot water only when there is tap water.
6. During use, the cutoff valve at the cold water inlet of water tank shall be kept normally open.
7. If you put the unit out of use for a long period and cut off the power, please make sure to drain the water thoroughly out of the hydro box and floor heating pipe, in order to prevent

the system from freezing.

## 11.2 Connection Requirements of Hydro box and water Tank

Connect hydrobox with water tank by water pipe which can be galvanized pipe or seamless steel pipe, like PVC pipe, PPR pipe, etc.

Size of interface	
Name	Screw of joint
Circulating water inlet/outlet of hydro box	G1A
Cold water inlet of water tank	G1/2
Circulating water inlet/outlet of water tank	G3/4
Hot water outlet of water tank	G1/2
Pipe joint	G3/4

Note:

The circulating water pipe shall be insulated with insulating material whose thickness is not less than 15mm.

The circulating water pipe shall be sealed to prevent water leakage.

## 11.3 Installation Requirements of Water System

- (1) The cold water inlet of pressure water tank shall be connected to tap water pipe, and the hot water outlet shall be connected to the water terminal.
- (2) The tap water inlet shall be connected with one-way valve, filter and relief valve.
- (3) For easy repair, manual cutoff valve shall be installed at water inlet or outlet.
- (4) Exhaust valve shall be installed at the highest position of water pipe.
- (5) To avoid waiting too long when using hot water, please add hot water return line if the water terminals are dispersed and the water tank is far from such terminals.
- (6) If possible, please equip an expansion tank. Generally, the size of expansion tank shall be 5~10% of the size of the whole water system.

## 11.4 Capacity Setting of Water Tank

The ex-factory defaulted capacity of water tank is 300L. If the actually installed water tank capacity is smaller than 300L, setting is not needed. If the actually installed water tank capacity is bigger than 300L, please arrange the following setting.

## GMV5 Home DC Inverter Multi VRF Units



Step 1: Under water heating and floor heating off status (unit on status is ok)  
Note: LCD is under awoken status;



Step 2: Hold on pressing "FUNCTION" button for 5s and then C00 will be displayed;



Step 3: Press "MODE" button for 3 times within one second;  
Note: During operation, "Invalid" icon blinks twice and the buzzer gives out two short sounds and one long sound;



Step 4: Hold on pressing "FUNCTION" button for 5s and then P00 will be displayed;



## GMV5 Home DC Inverter Multi VRF Units



Step 5: Press “▲” or “▼” button to enter P60;



Step 6: Press “MODE” button to enter hydro box selection setting;

Note: When only one hydro box is under control, it will enter Step 9 directly;



Step 8: Press “MODE” button to enter water tank capacity setting;



Step 7: Press “▲” or “▼” button to select the sequence(1~3) of hydro box for setting;

Note: If selection is not needed, next step can be entered;



Step 9: Press “▲” or “▼” button to set water tank capacity;



Step 10: Press “ENTER/CANCEL” button to confirm the water tank capacity setting of current hydro box;

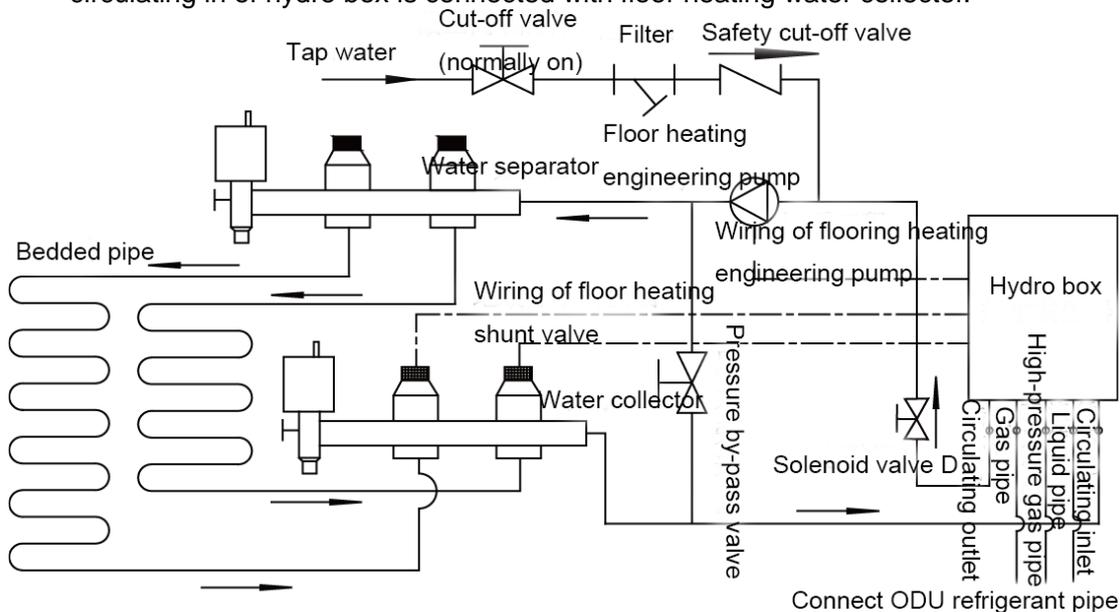
Note: 1. If you need to set the water tank capacity of other hydro box, please repeat step 6 to step 10 (for one wired controller controlling several units or several wired controllers controlling several units);

2. When all setting operation has been done, press “ON/OFF” button to exit parameter setting directly or press “ENTER/CANCEL” button to return P60;

## 11.5 Installation of Floor Heating Performer (floor heating water separation valve)

When connecting floor heating, floor heating performer is recommended to be installed, so that you can control each room separately in order to save energy. This hydro box is with floor heating performer interface (single phase 220V), which can be connected with the floor heating performer. Through setting the linkage between IDU wired controller and floor heating performer, indoor wired controller can control the startup of floor heating performer in that room. Indoor wired controller can set the ambient temperature of corresponding room and control the startup/shutdown of floor heating of that room.

- (1) Before installation, please make sure the performer is normally closed type.
- (2) The wiring of floor heating water separation valve in the performer is according to the wiring diagram.
- (3) Connect a pressure bypass valve between the performers.
- (4) The circulating out of hydro box is connected with floor heating water separator and the circulating in of hydro box is connected with floor heating water collector.



- (5) The corresponding setting relationship between floor heating water separation valve and IDU:



Notices:

- ① The corresponding relationship setting must be done in unit off status.
- ② Only the IDU connected with wired controller and floor heating can be set for corresponding relationship (linkage). The IDU connected with light board or controlled by wireless remote controller cannot be set!

Step 1: Confirm the IDU project no. which is in the same room with floor heating and the corresponding floor heating shunt valve no.:

- 1) Check the IDU project no. in its wired controller. For example: The IDU project no. in this room is "9".
- 2) Check the floor heating shunt valve no. connected with the floor heating in the electric box of hydro box. For example: The floor heating shunt valve no. is "floor heating shunt valve 3".
- 3) Make sure the IDU is in accordance with the floor heating shunt valve. As the examples above, floor heating shunt valve 3 is in accordance with IDU project no. 9.

Step 2: Setting of corresponding relationship(linkage) is shown as below:

## GMV5 Home DC Inverter Multi VRF Units



Step 1: Under water heating and floor heating off status (unit on status is ok)  
Note: LCD is under awoken status;



Step 2: Hold on pressing “FUNCTION” button for 5s and then C00 will be displayed;



Step 3: Press “MODE” button for 3 times within one second;  
Note: During operation, “INVALID” icon blinks twice and the buzzer gives out two short sounds and one long sound;



Step 4: Hold on pressing “FUNCTION” button for 5s and then P00 will be displayed;



Step 5: Press “▲” or “▼” button to enter P79;



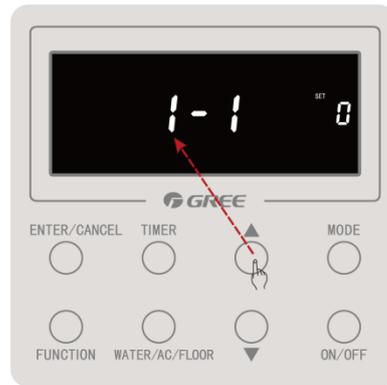
Step 6: Press “MODE” button to enter hydro box selection setting;  
Note: When only one hydro box is under control, it will enter Step 8 directly;



## GMV5 Home DC Inverter Multi VRF Units



Step 8: Press "MODE" button to enter shunt valve selection setting;



Step 7: Press "▲" or "▼" button to select the sequence(1`3) of hydro box for setting;  
Note: If selection is not needed, next step can be entered;



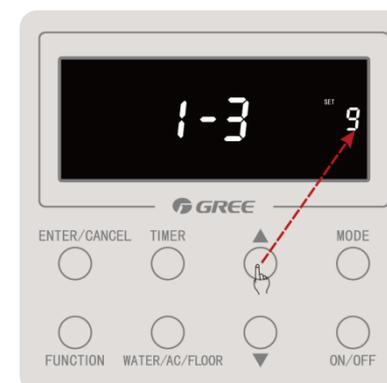
Step 9: Press "▲" or "▼" button to select the sequence(1`6) of shunt valve for setting;  
Note: If selection is not needed, next step can be entered;



Step 10: Press "MODE" button to enter indoor unit selection setting



Step 12: Press "ENTER/CANCEL" button to confirm the setting of current shunt valve and indoor unit;  
Note: 1. If you need to set the shunt valve and indoor unit of other hydro box, please repeat step 6 to step 12 (for one wired controller controlling several units or several wired controllers controlling several units) or repeat step 8 to step 12 (for one wired controller controlling one unit);  
2. When all setting operation has been done, press "ON/OFF" button to exit parameter setting directly or press "ENTER/CANCEL" button to return P79;  
3. Cancel of shunt valve setting is the same as the setting step of shunt valve. The difference is that when set the IDU project no. into 0, the matching is invalid, which means cancel the setting of that shunt valve; if you need to cancel all matching, please set all IDU project no. in matching into 0;



Step 11: Press "▲" or "▼" button to select the indoor unit(project no. 1`255) for setting;  
Note: If selection is not needed, next step can be entered;

# 12. Electric Installation

## 12.1 Precautions

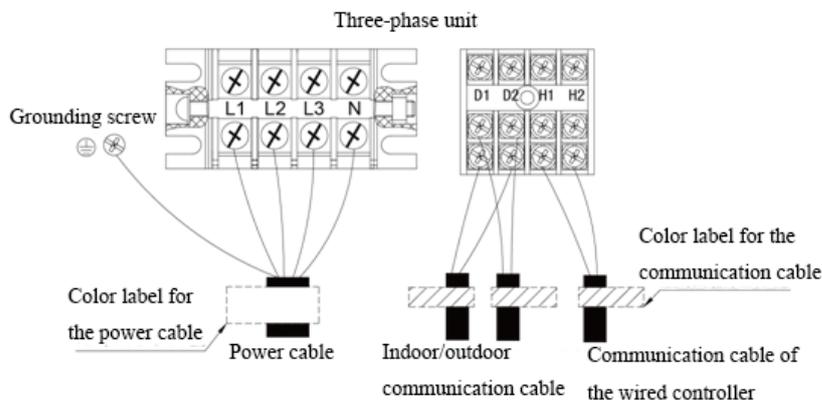
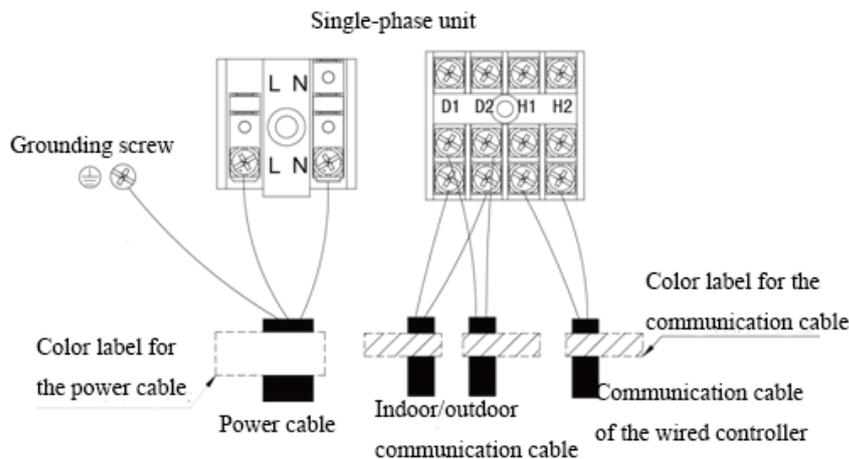


Dangerous!

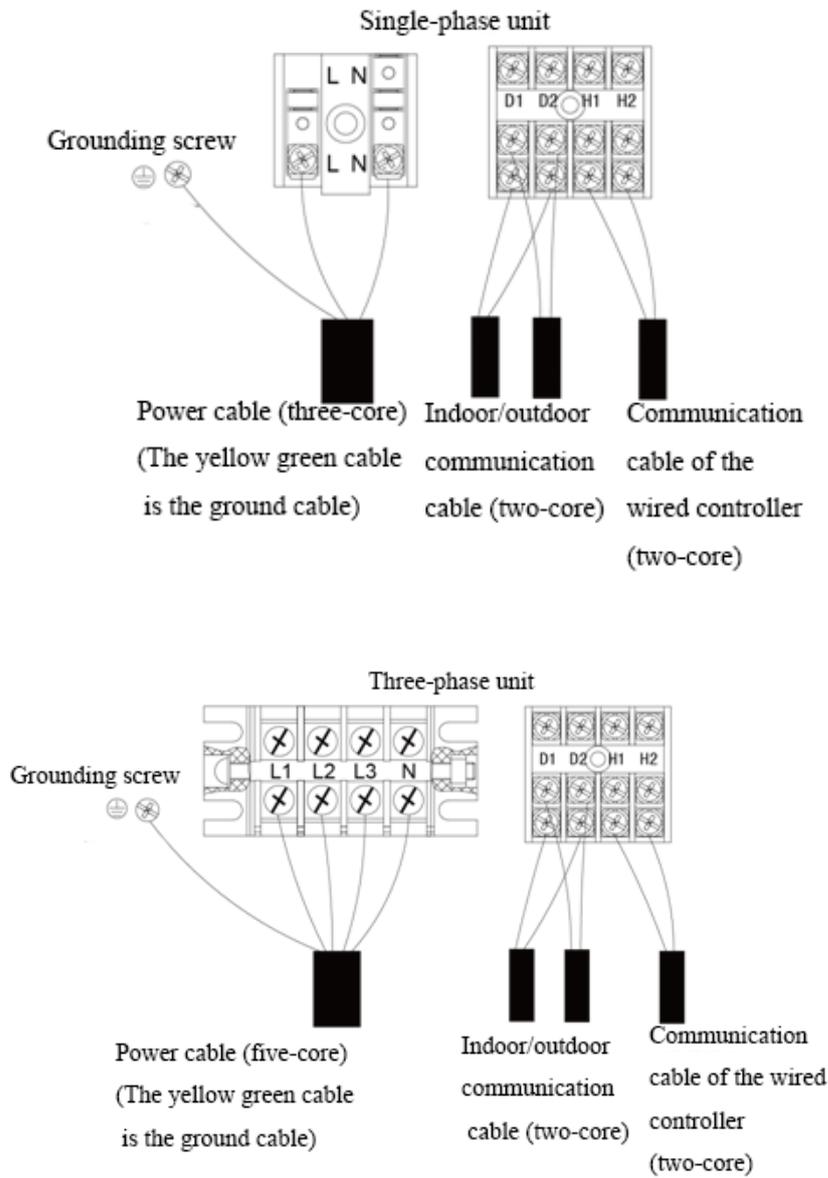
- ① The electric installation personnel must get related qualification.
- ② The air conditioning unit is category 1 electrical appliance which requires reliable grounding.
- ③ The grounding resistance must meet the requirement of local law.
- ④ The yellow green cable inside the air conditioning unit is a grounding cable. It cannot be used for other purposes or be cut off. Do not fix it with tapping screws. Otherwise, an electric shock may be caused.
- ⑤ A reliable grounding terminal must be provided for the power. Do not connect the grounding cable to any of the following:
  - a. Water pipes; b. Gas pipes; c. Drainage pipe; d. Other places deemed as unreliable.
- ⑥ The power cable and the communication cable must be laid separately with a distance of greater than 20cm. Otherwise, the communication of the unit will be affected.
- ⑦ Both the power cable and communication cable must be connected properly. If the power cable is connected to the communication port, the main board will be burnt.

During installation, the power cable and communication cable can be identified in the following ways:

Method 1: Use sheaths in different colors.



The diameter of the power cable is larger than that of the communication cable. Alternatively, adopt three cores or more for the power cable and two cores for the communication cable.

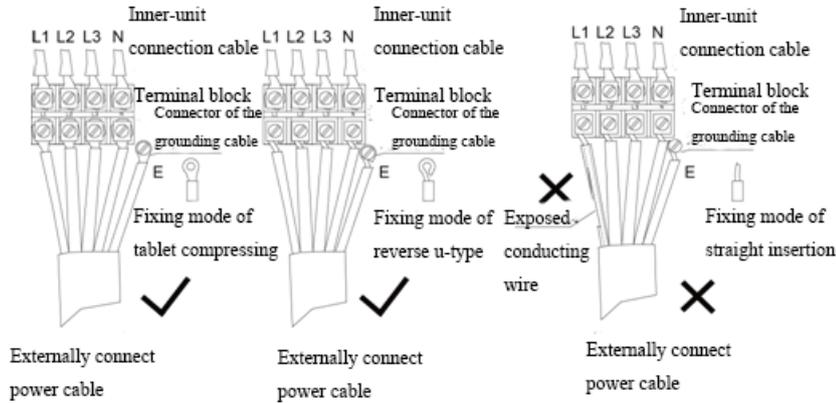


Elaborate the method with the installation personnel on site no matter which method is adopted.

## 12.2 Installation of Power

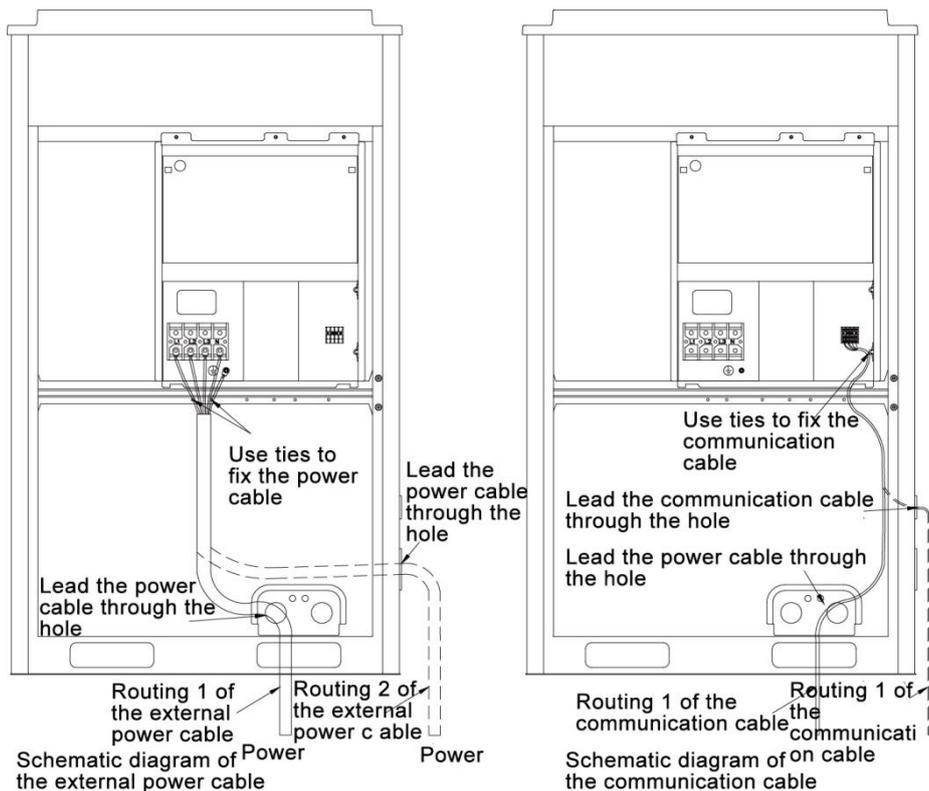
### 12.2.1 Procedure for installing the power cable

Step 1: Knock off the knockouts used for threading the external power cable, fit the threading rubber ring to the hole, and thread the power cable through the hole. Connect L1, L2, L3, and N of the power cable, and the grounding cable to L1, L2, L3, and N on the power terminal block and the grounding screw next to the terminal block respectively.



Step 2: Fasten and fix the power cable with ties (support heads).

Step 3: Lay the power cable and communication cable for the ODU according to the following figures:



**Warning!** Provide a threading rubber ring when threading a strong power cable or a communication cable.

### 12.2.2 Power cable diameter and circuit breaker selection

Each unit shall be equipped with a circuit breaker for shortcircuit and abnormal overload protection. IDUs and ODU shall be set with the main circuit breaker separately, for connecting or cutting off the main power.

#### 12.2.2.1 ODU

The circuit breaker and power cable diameter of ODU can refer to the following table:

## GMV5 Home DC Inverter Multi VRF Units

Model	Power supply	Capacity of circuit breaker (A)	Min. sectional area of grounding wire (mm <sup>2</sup> )	Min. sectional area of power cable (mm <sup>2</sup> )
GMV-S224W/A-X	380V 3N~50Hz	20	2.5	2.5
GMV-S280W/A-X	380V 3N~50Hz	25	2.5	2.5

### Note:

- ① The circuit breaker must support magnetic release and thermal release at the same time to protect the system from short circuit and overload.
- ② The power cable specification means the selected specification when BV single-core wire(2~4 pcs) goes through plastic pipe in ambient temperature of 40°C and the circuit breaker operates in 40°C. If the actual installation condition changes, please refer to the instruction manual for power cable and circuit breaker provided by the manufacturer.
- ③ The circuit breaker shall adopt D type circuit breaker.
- ④ The sectional area of a wire is applicable for a distance range of up to 15 m. If the distance is greater than 15 m, increase the sectional area of the wire correspondingly to prevent the wire from being burned due to overload current and to avoid fire.

### 12.2.2.2 Hydro box

The circuit breaker and power cable diameter of hydro box can refer to the following table:

Model	Power supply	Capacity of circuit breaker (A)	Min. sectional area of power cable (mm <sup>2</sup> )		
			Live wire	Neut ral wire	Grounding wire
NRQD16G/A-S	220V~50Hz	32	6	6	6

### Note:

- ① The power cable must be copper cable with operation temperature not higher than the specified value.
- ② If the length of power cable is longer than 15m, please increase the sectional area of power cable in order to avoid hazards caused by overload.
- ③ The power cable specification means the selected specification when BV single-core wire(2~4 pcs) goes through plastic pipe in ambient temperature of 40°C and the circuit breaker operates in 40°C. The circuit breaker shall adopt D type circuit breaker.
- ④ If the actual installation condition changes, please refer to the instruction manual for power cable and circuit breaker provided by the manufacturer.

### 12.2.2.3 IDU

For information about the leakage circuit breaker for an indoor unit, refer to the following table. The circuit breaker capacities listed in the following table indicate the circuit breaker capacities when all indoor units in the same system are connecting connected to the main power.

Total capacity of indoor units	Capacity of circuit breaker (A)	Min. sectional area of power cable (mm <sup>2</sup> )	Min. sectional area of grounding wire (mm <sup>2</sup> )
below 10A	10	1.0	1.0
16~10A	16	1.5	1.5

## GMV5 Home DC Inverter Multi VRF Units

20~16A	20	2.5	2.5
32~20A	32	4.0	4.0
40~32A	40	6.0	6.0
50~40A	50	10.0	10.0
63~50A	63	16.0	16.0
80~63A	80	25.0	16.0
100~80A	100	35.0	16.0
125~100A	125	50.0	25.0

The breaker capacity and power cable specifications when a circuit breaker is installed on each indoor unit independently.

IDU model	Capacity of circuit breaker (A)	Min. sectional area of grounding wire (mm <sup>2</sup> )	Min. sectional area of power cable (mm <sup>2</sup> )
Wall-mounted type	6	1.0	1.0
Duct type(pure heat pump)	6	1.0	1.0
Cassette type(pure heat pump)	6	1.0	1.0
One-way cassette	6	1.0	1.0

If the IDU is with auxiliary electric heating, please select the capacity of circuit breaker according to the capacity of auxiliary electric heater. Please refer to the following table.

IDU model (with auxiliary electric heater)	Capacity of circuit breaker (A)	Min. sectional area of grounding wire (mm <sup>2</sup> )	Min. sectional area of power cable (mm <sup>2</sup> )
22, 25, 28, 32, 36 duct type unit	6	1.0	1.0
40, 45, 50 duct type unit	10	1.0	1.0
56, 63, 71, 80 duct type unit	16	1.5	1.5
90, 100, 112, 125, 140 duct type unit	10	1.0	1.0
28, 36, 45, 50 cassette type unit	6	1.0	1.0
56, 63, 71, 80 cassette type unit	10	1.0	1.0
90, 112, 125, 140 cassette type unit	6	1.0	1.0



Note:

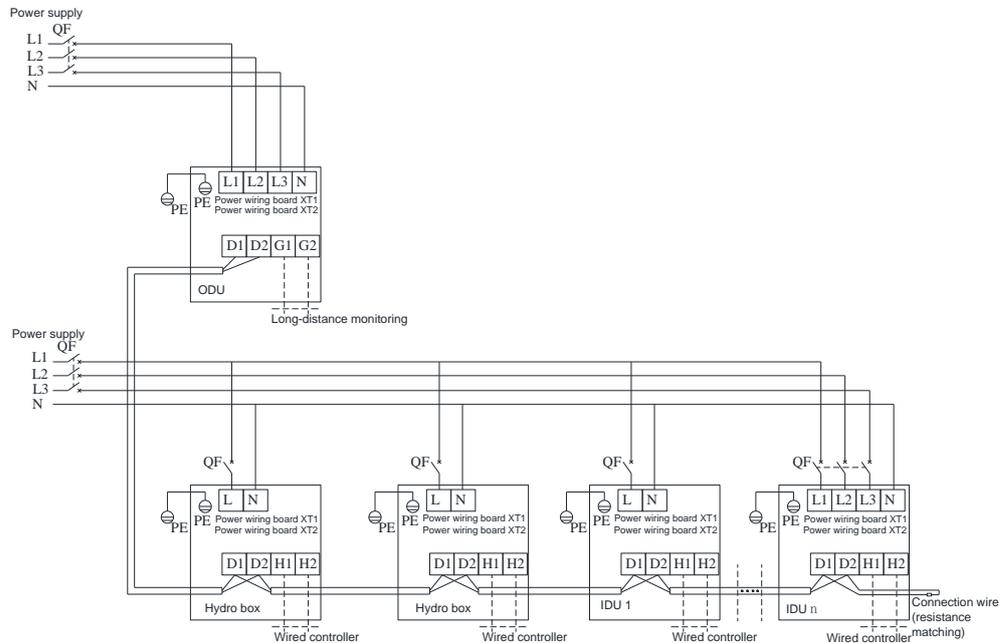
- ① The circuit breaker and power cable specifications are selected based on the maximum power (maximum current) of the units.
- ② The power cable specifications are obtained under the conditions that the ambient temperature is 40°C, the working temperature of multi-core copper cable (for example, YJV cable) is 90°C, and the cable is exposed in cable troughs. In different applications, adjust the specifications based on national standards.
- ③ Only copper cable can be used.
- ④ The sectional area of a wire is applicable for a distance range of up to 15 m. If the distance is greater than 15 m, increase the sectional area of the wire correspondingly to prevent the wire from being burned due to overload current and to avoid fire.
- ⑤ The circuit breaker specifications are obtained under the conditions that the ambient temperature is 40°C when the circuit breaker is working. In different applications, adjust the specifications based on the circuit breaker manual.
- ⑥ The circuit breaker must support magnetic release and thermal release at the same time to protect the system from short circuit and overload.

## 12.2.3 External wiring diagram of unit

### 12.2.3.1 ODU with hydro box and IDU

 Note:

Each unit shall be equipped with a circuit breaker for shortcircuit and abnormal overload protection. IDUs and ODU shall be set with the main circuit breaker separately, for connecting or cutting off the main power.

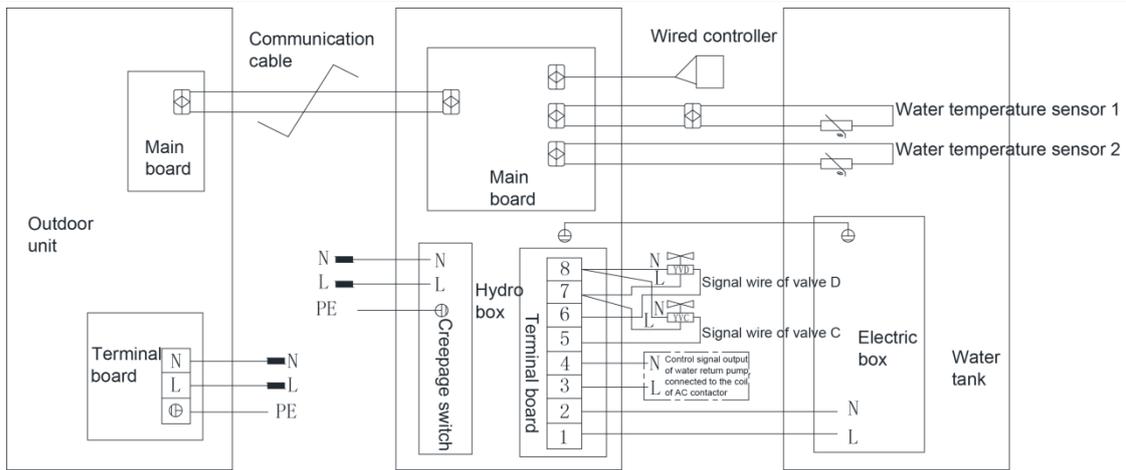


### 12.2.3.2 Hydro box and water tank

#### (1) Electric wiring and connection

- (1) Loosen the screws fixing the electric box cover on the hydro box. Open the electric box cover.
- (2) Connect one end of the electric heating power cable included on the water tank to the terminal board of the main unit. The specific wiring terminal please refer to the wiring diagram.
- (3) Apply heat conductive silicone gel onto the water temperature sensor which leads out from the hydro box, and then insert it into the lower water temperature sensor port at the lower part of water tank. Connect the upper water temperature sensor included on water tank (i.e. upper temperature sensor port in the middle of water tank) to the red connector leading out from the terminal box on hydro box. Then, put it into electric box.
- (4) Tighten the strong current cables with cable clamp and cover up the electric box.
- (5) The wired controller shall be fixed properly. The communication wires from wired controller and hydro box shall be correctly connected.
- (6) Take care to route the strong current cables separately from the light current cables.

## GMV5 Home DC Inverter Multi VRF Units



Note: The above wiring diagram is only for reference. Detailed content please refer to the wiring diagram stuck inside the electric box of unit.

### (2) Confirm DIP of mainboard

Confirm the S<sub>1</sub> and S<sub>2</sub> DIP switch on the main board of hydro box. S<sub>1</sub> DIP means capacity DIP switch. S<sub>2</sub> DIP means function DIP.

#### Capacity DIP(S<sub>1</sub>) of Hydro Box

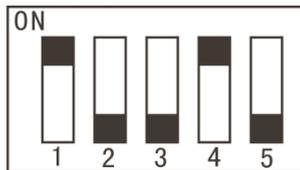
Capacity DIP switch S<sub>1</sub> is 5 bit. Please do not change it.

Capacity of hydro box	Capacity DIP switch				Model DIP switch
	1	2	3	4	5
16	ON	OFF	OFF	ON	OFF

Note:

- ① DIP switch shall be set correctly and cannot be set in the middle position. When the switch is set to "ON", it means "0"; when the switch is set to the opposite direction of "ON", it means "1".

Example: S<sub>1</sub> is as shown in the following figure:



- ② The black part is the bar for setting DIP.

#### (S<sub>2</sub>) Function DIP (S<sub>2</sub>) of hydro box

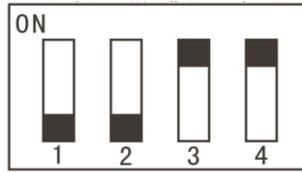
Note: Please set strictly according to actual situation of project.

Function DIP S<sub>2</sub> of hydro box has 4 digits. "1", "2", "3" and "4" mean "Gree water tank", "floor heater", "solar power", "self-made water tank" respectively. The DIP of each function is applicable: setting to "number" means this function is connected; setting to "ON" means not connected. "1" and "2" must be set according to the actual situation of project. "3" and "4" cannot be changed, otherwise the unit may occur temperature sensor error or cannot operate.

DIP sequence	Meaning	DIP		Ex-factory setting
		Not connected	Connected	
1	Gree water tank	ON	OFF	OFF
2	Floor heating	ON	OFF	OFF
3	Solar power	ON	OFF	ON
4	Self-made	ON	OFF	ON

	water tank	
--	------------	--

For example, S2 as shown in the figure:

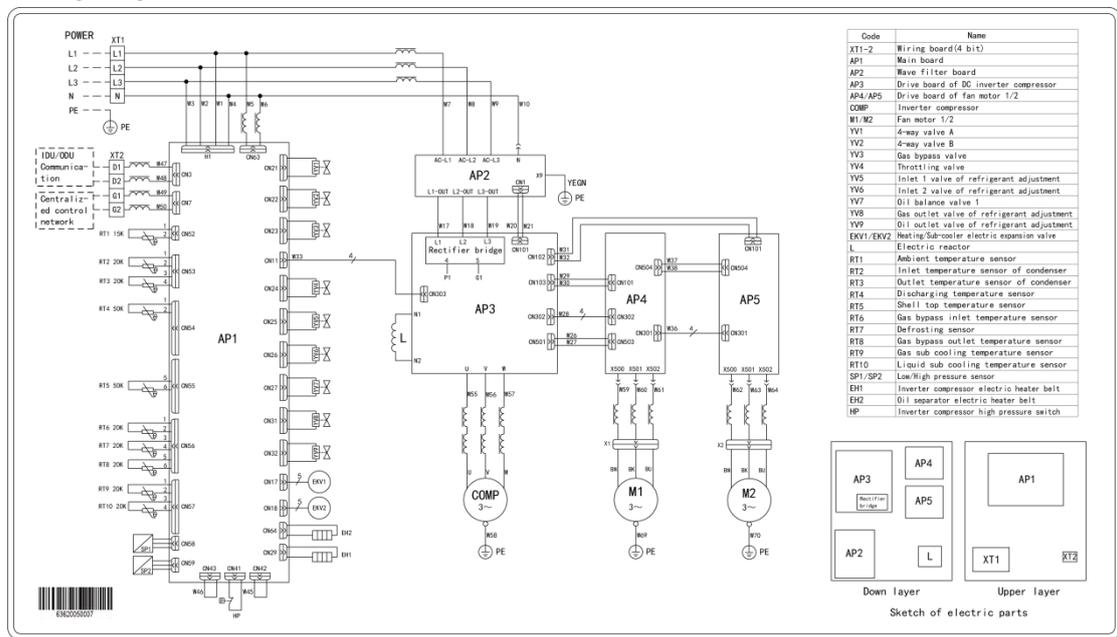


Note: The black part is the dial rod.

## 12.3 Wiring diagram

### 12.3.1 Wiring diagram of ODU

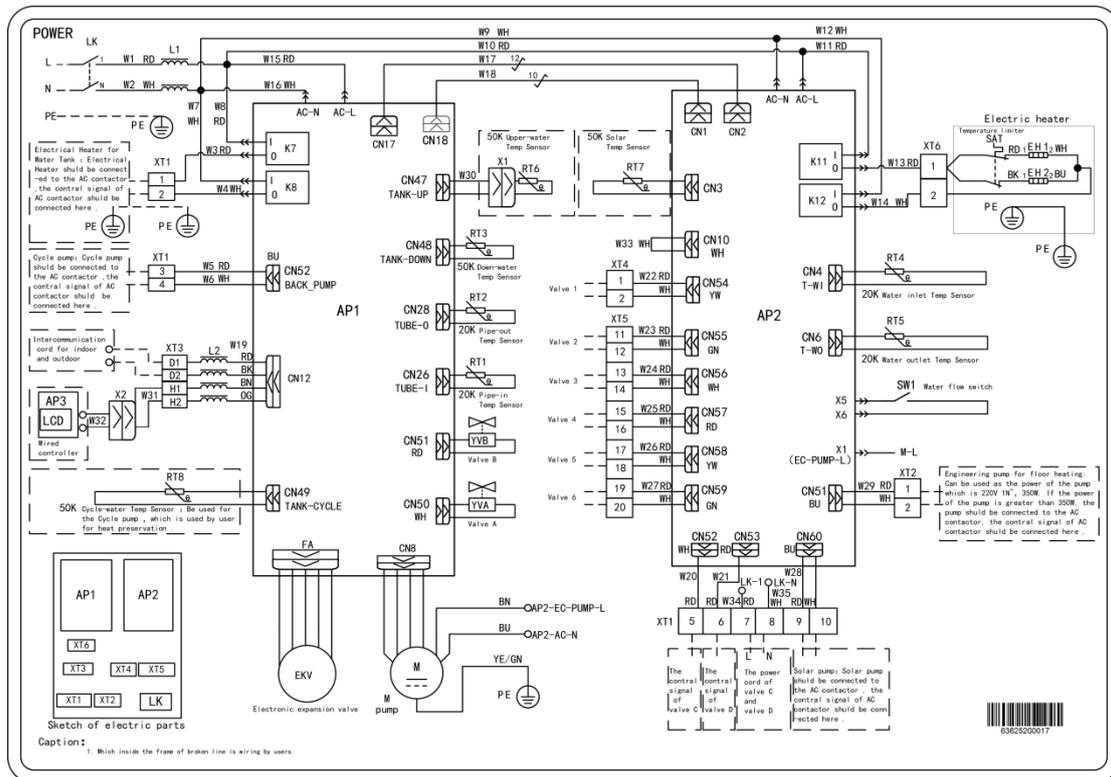
Wiring diagram of GMV-S224W/A-X, GMV-S280W/A-X



Note: The above wiring diagram is only for reference. Detailed content please refer to the wiring diagram stuck in the electric box of unit.

### 12.3.2 Wiring diagram of hydro box

Electric principle diagram of NRQD16G/A-S



Note: The above wiring diagram is only for reference. Detailed content please refer to the wiring diagram stuck in the electric box of unit.

### 12.3.3 Wiring diagram of IDU

Please refer to the related manual of IDU.

## 12. Installation of the Communication System

The CAN communication network is adopted for GMV5 Home. Manual DIP or identification on polarities of the communication cable is not required for the IDU. Only the function DIP needs to be set for the ODU. For details, see the description on function setting of the ODU.

### 12.1 Connection of Communication Cable

#### 12.1.1 Communication connection includes the following parts:

- (1) Communication between ODU and indoor units (hydro box, IDUs).
- (2) Communication between indoor units (hydro box, IDUs) and indoor units (hydro box, IDUs).
- (3) Communication between IDU and wired controller.
- (4) Communication between IDU and light board.
- (5) Communication between hydro box and wired controller.

#### 12.1.2 Communication way

GMV5 Home adopts CAN bus communication way.

#### 12.1.3 Selection of the material of communication cable

 Note:

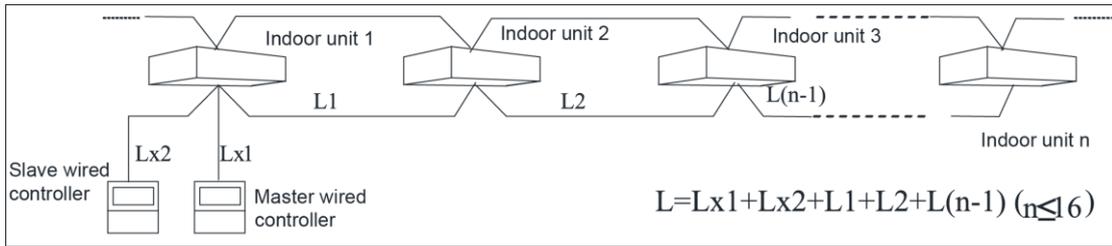
For air conditioning units installed in places with strong electromagnetic interference, shielded wire must be used as the communication cables of the indoor units and wired controller, and shielded twisted pairs must be used as the communication cables between indoor units and

between the IDU and ODU.

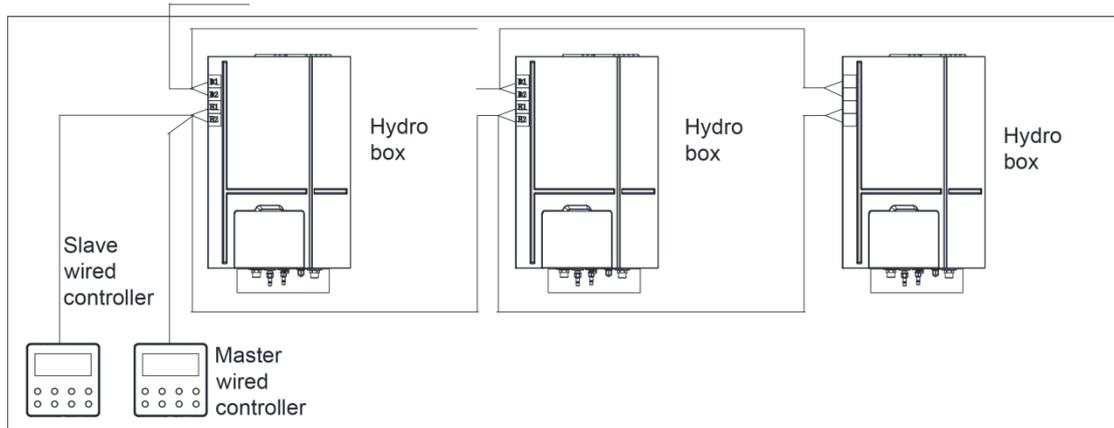
(1) Communication cable selection for IDUs/hydro box and wired controller

Wire type	Total length of communication cables of the IDU and wired controller L(m)	Number of wire pieces x wire diameter (mm <sup>2</sup> )	Wire standard	Remark
Common sheath twisted pair copper core (RVVS)	L≤250	≥2×0.75	GB/T 5023.5-2008	The overall communication length cannot exceed 250m.
Common shielded sheath twisted pair copper core (RVVSP)	L≤250	≥2×0.75	GB/T 5023.5-2008	If the unit is installed in places with strong electromagnetic interference, shielded wire must be used (RVVSP).

Connection between IDU and wired controller is shown as below:



Connection between hydro box and wired controller is shown as below:

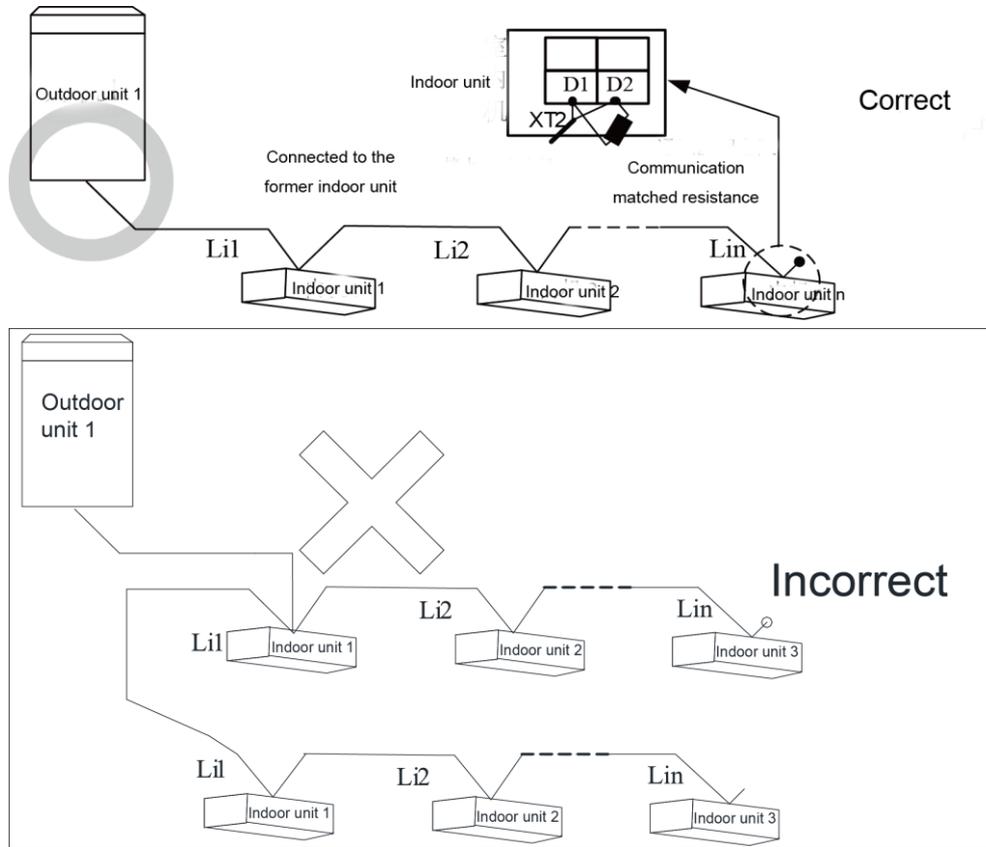


(2) Communication cable selection for ODU and IDUs/hydro box

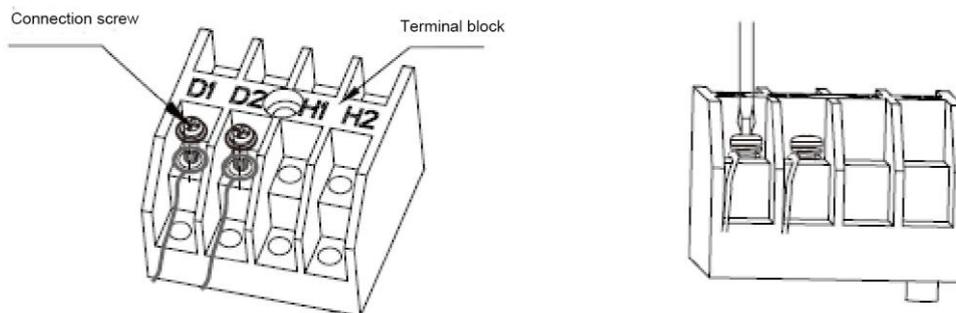
Type of wire	Total length of communication wire between indoor unit and another indoor unit (outdoor unit): L(m)	Wire size (mm <sup>2</sup> )	Material standard	Remarks
Light/Ordinary PVC sheathed twisted-pair copper core wire (RVVS)	L≤1000	≥2×0.75	IEC 60227-5:2007	If wire size is enlarged to 2×1mm <sup>2</sup> , communication wire could be longer, but the total length shall not exceed 1500m.
Shielded light/ordinary PVC sheathed twisted-pair copper core wire (RVVSP)	L≤1000	≥2×0.75	IEC 60227-5:2007	If unit is installed in a place with intense magnetic field or strong interference, it's necessary to use shielded wire (RVVSP).

### 12.1.4 Connection of communication cables

- (1) Communication lead wire of indoor and outdoor units must be connected in series instead of in star mode. The terminal unit of communication lead wire of indoor and outdoor units must be connected with communication matched resistance (Single unit system is provided as the assembly of outdoor unit).



- (2) Connection of communication terminal: All connection wires must be secured with screws.



- (3) If a communication wire is not long enough and needs to be connected with another wire by peeling away its outer layer, crimp connection or soldering connection must be adopted.

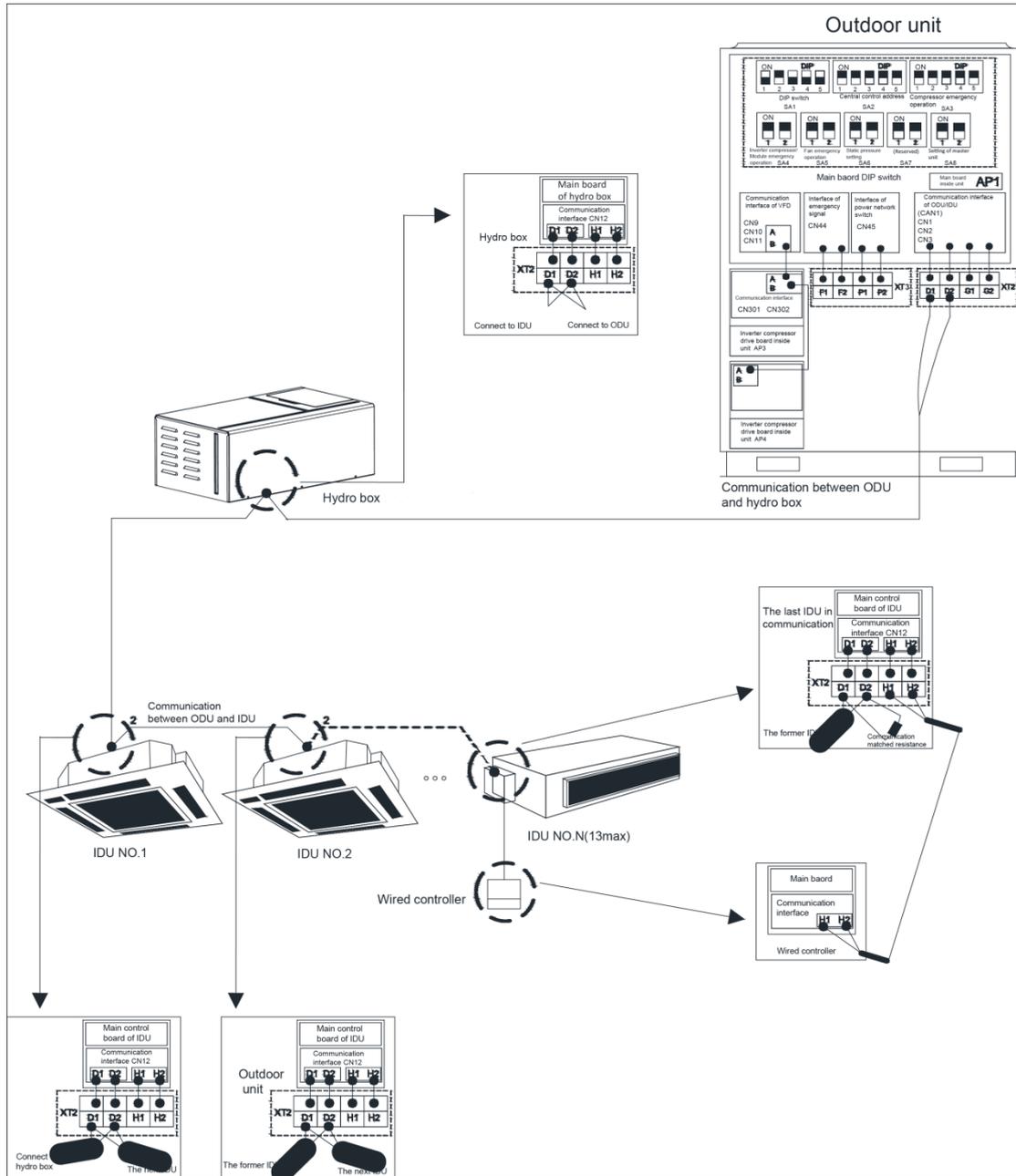
### 12.2 Setting of Communication Address

Auto addressing technology is adopted. Manual setting of address is not needed.

## 12.3 Connection Way and Procedures of Communication Cable

### 12.3.1 Connection of communication cable between ODU and IDUs/hydro box

Open the electric box cover of ODU, IDU and hydro box. The communication wire goes to the electric box from the hole. Connect the wires of ODU, IDUs and hydro box according to the wiring diagram stuck on the unit. The selection of specifications of power cable please refer to the unit's power capacity, installation environment. After confirmation, the connection of ODU, IDUs and hydro box are arranged through D1/D2 port of wiring board XT2. Then install the electric box cover. Please refer to the following figure:



Note:

- ① The communication cable and power cable must be laid separately to avoid interference.
- ② The communication cable must be long enough to avoid joints.
- ③ Indoor units and hydro box must be connected in series. The last IDU shall be connected to a matching resistor (placed in the package of the ODU).

### 12.3.2 Communication connection between the IDU and wired controller

Connection modes for the communication cable between the IDU and wired controller are shown in the following figures:

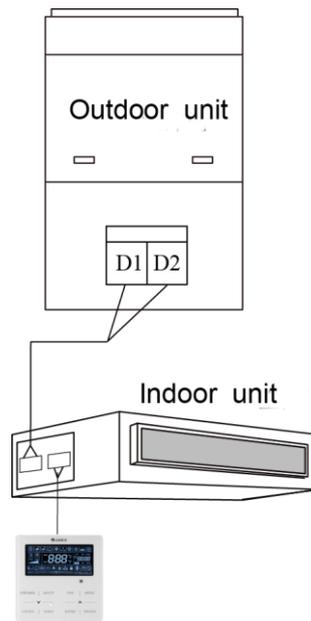


Figure 2 One wired controller controlling one IDU

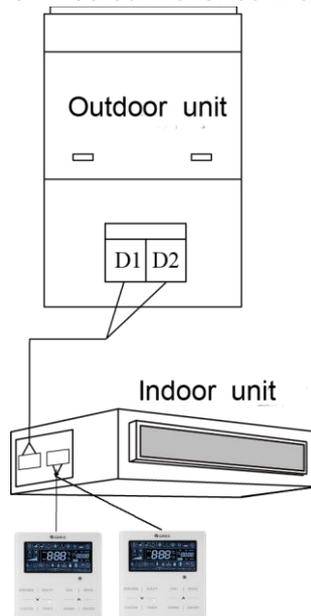


Figure 3 Two wired controllers controlling one IDU

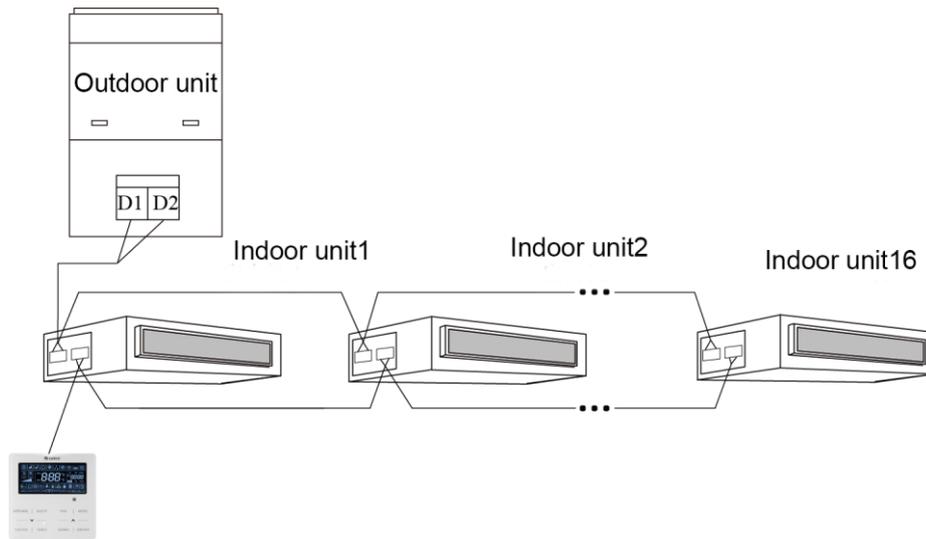


Figure 4 One wired controller controlling multiple IDUs

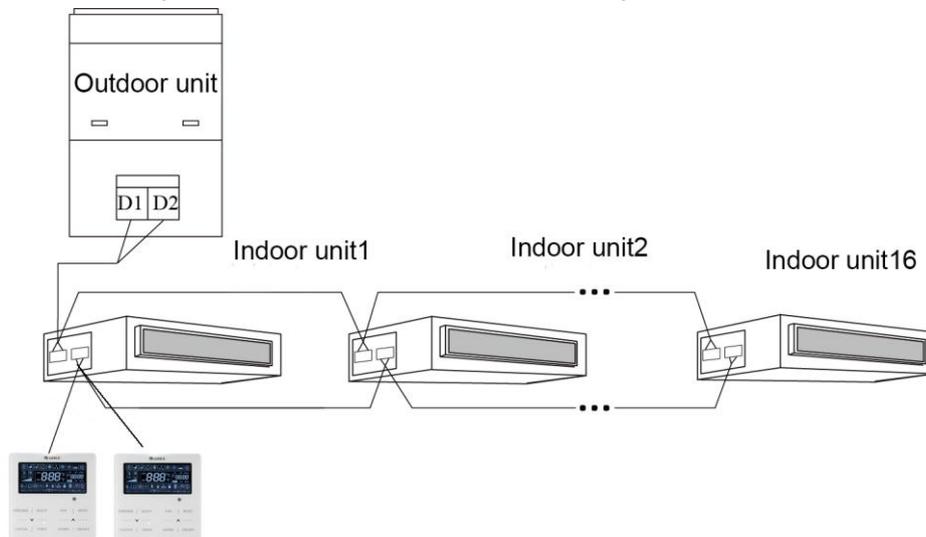


Figure 5 Two wired controllers controlling multiple IDUs

When two wired controllers control several indoor units, wired controllers can be connected with any one of the indoor units, which are required to be of the same series. One and only one of the two wired controllers shall be set as the secondary wired controller. The number of indoor units controlled by wired controller cannot exceed 16. All the connected indoor units must be in the same network.

- (1) The secondary wired controller can be set when unit is turned on or off.
- (2) Keep pressing “Function” button for 5 seconds on the wired controller that is to be set as the secondary wired controller. Temperature zone will display “C00”. Continue to press “Function” button for 5 seconds, and the parameter setting interface will be displayed. The temperature zone will then display “P00”.
- (3) Select code P13 by pressing “” or “”. Press “Mode” button to switch to parameter value setting. When the parameter value is flickering, select code “02” by pressing “” or “”. Then press “Enter/Cancel” button to finish setting.
- (4) Users can press “Enter/Cancel” button to return to a previous stage until parameter setting exits.

User parameter setting list is shown below:

Parameter code	Parameter name	Parameter range	Default value	Remarks
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## GMV5 Home DC Inverter Multi VRF Units

P13	Wired controller address setting	01: Primary wired controller 02: Secondary wired controller	01	When two wired controllers control one (or more) indoor units, the addresses of the controllers must be different. Secondary wired controller (address is 02) does not support unit's parameter setting except setting of its own address.
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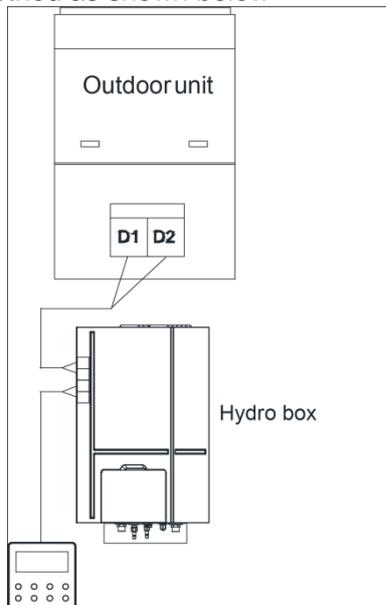


**⚠ Note:**

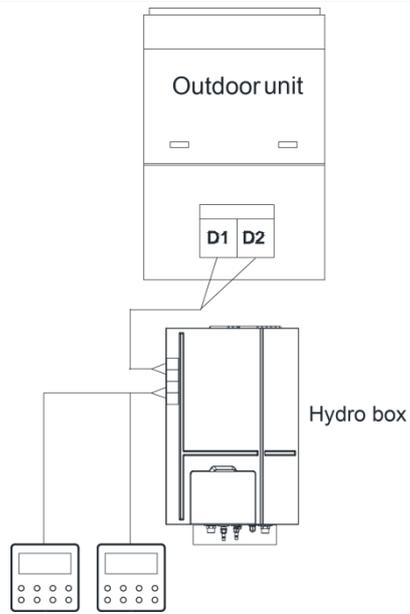
- a) All wired controllers are set as primary wired controller before leaving factory.
- b) Under the status of parameter setting, speed button, timer button, sleep button and swing button are all invalid. Pressing “On/Off” button will return to homepage but won’t turn on or off the unit.
- c) Under the status of parameter setting, remote control signal is invalid.

### 12.3.3 Communication connection between the hydro box and wired controller

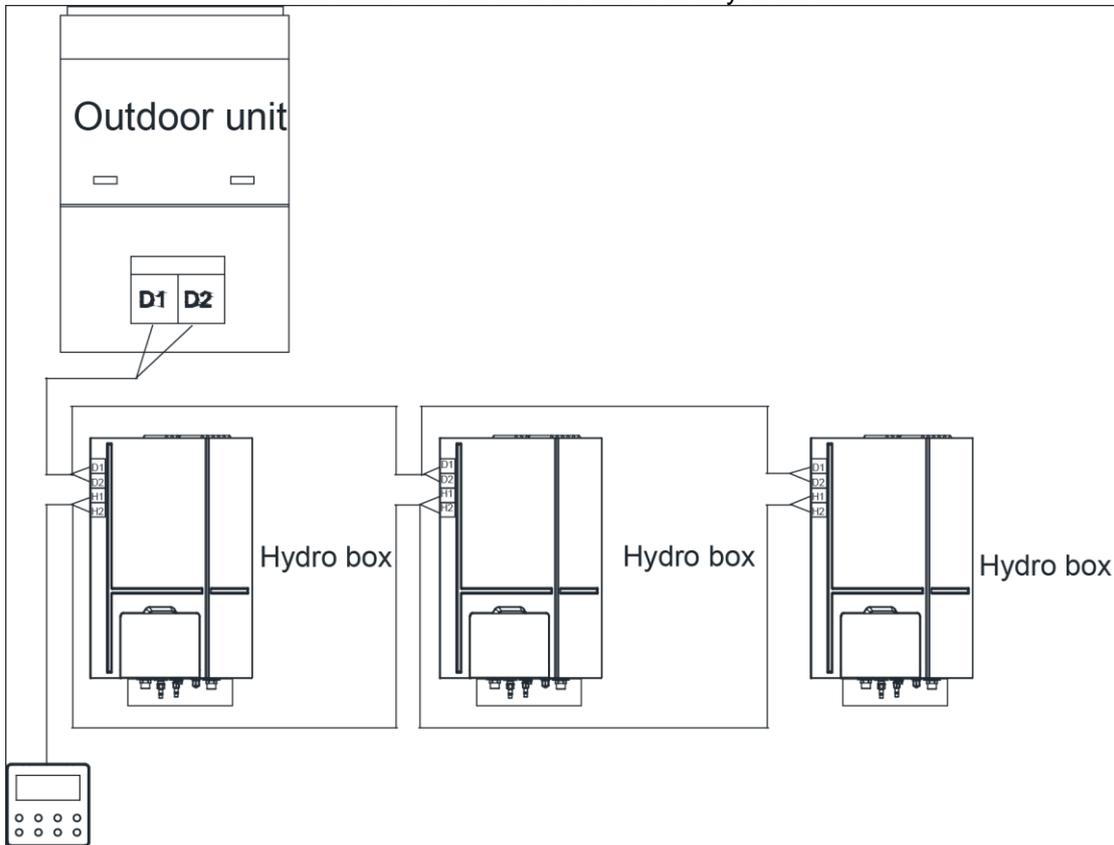
There are four connection method as shown below



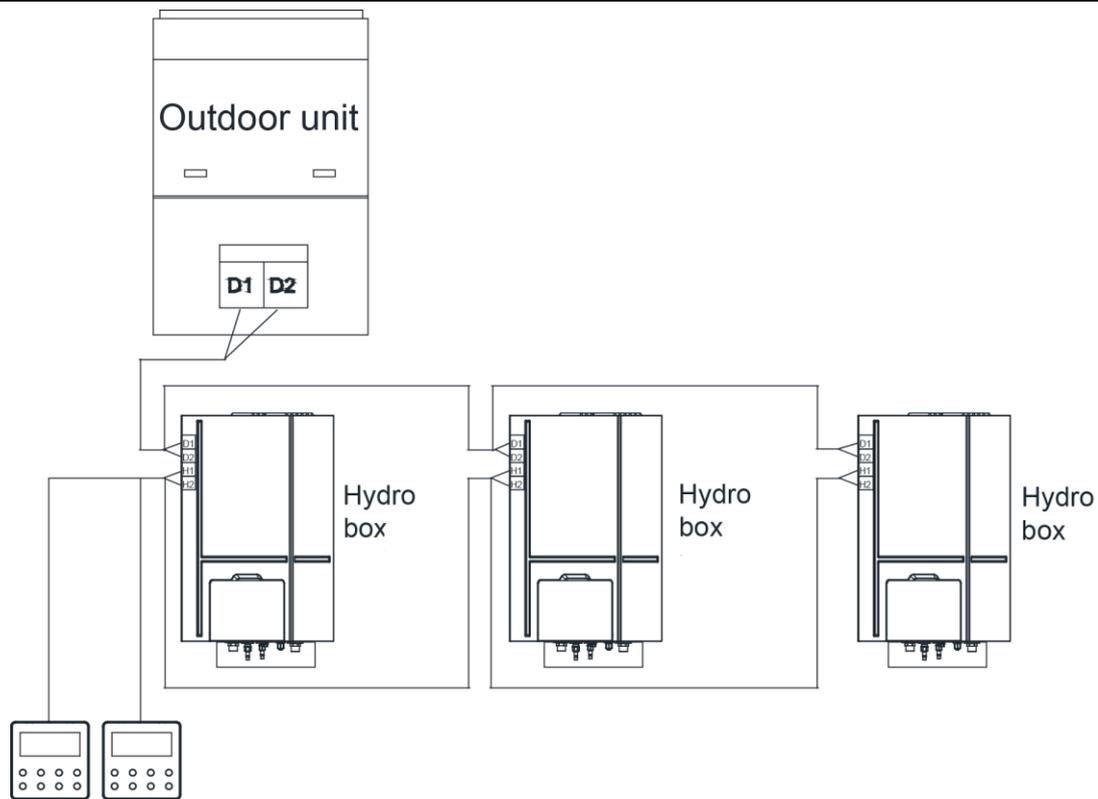
One wired controller controls one hydro box



Two wired controllers control one hydro box



One wired controller controls multiple hydro boxes



Two wired controllers control multiple hydro boxes

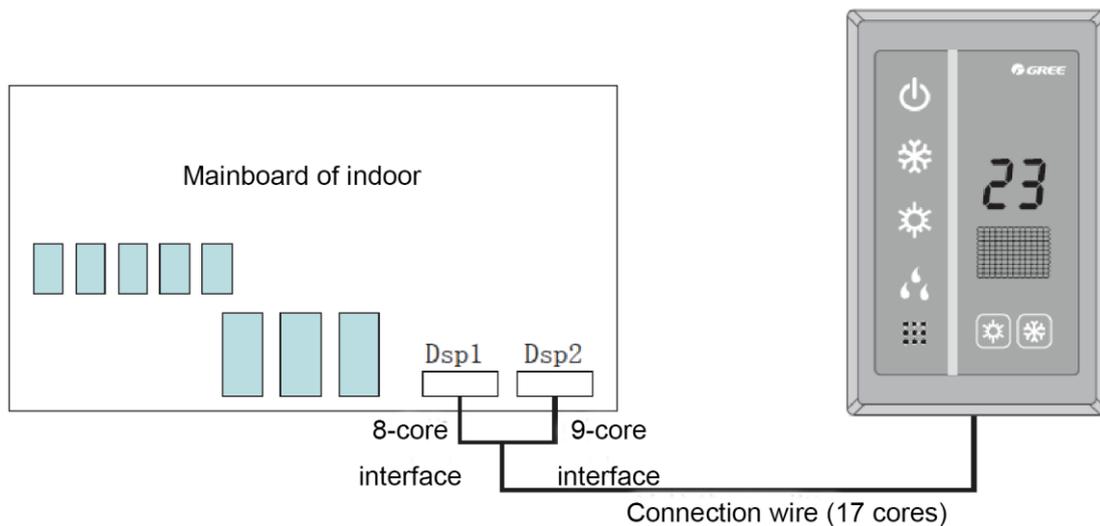
**Wiring instructions:**

- (1) When one wired controller controls several hydro boxes , the wired controller can connect to any one of the hydro boxes , but the devices connected to wired controller must be either hydro boxes . Up to 3 hydro boxes are connectable and the connected hydro boxes must be in a same network.
- (2) When two wired controllers control one hydro box at the same time, the wired controllers must have different addresses.
- (3) When two wired controllers control several hydro boxes , the wired controller can connect to any one of the hydro box, but the devices connected to wire controller must be either hydro boxes . Addresses of wired controllers must be different from each other. Up to 3 hydro boxes are connectable and the connected hydro boxes must be in a same network.
- (4) When one (or two) wired controller controls several or hydro boxes, the controlled hydro box must have the same setting.
- (5) Communication network between wired controller and hydro box must be connected according to one of the 4 connection methods stated above. If the connection includes two wired controllers, only one can be set as a master controller (addr 01) while the other as slave wired controller (addr 02). Only two wired controllers can be connected at most.

**12.3.4 Connection between the duct type IDU and receiver board**

When the duct type IDU needs to be connected to the remote-control receiver board, connect via Dsp1 and Dsp2 on the main board of the IDU:

Type of ndoor unit	Connection wire	Corresponding interface on mainboard
Duct type	Inter-board connection (17 cores)	Dsp1 (interconnecting with the 8-core interface) Dsp2 (interconnecting with the 9-core interface)



**⚠ Note:**

- a) Wired controller and remote-control receiver board can be used at the same time.
- b) If remote-control receiver board is selected, please select a remote controller.

## 13. Refrigerant Charging

### 13.1 Precautions on Refrigerant Leakage

Personnel related to air conditioning engineering design and installation operators must abide by the safety requirement for preventing refrigerant leakage specified in local laws and regulations. If such safety requirement is unavailable in local documents, the design and operation must be implemented based on the following principles: the system adopts the R410A refrigerant, which is nonflammable and nontoxic. However, the space for refrigerant leakage must be sufficient to ensure that the refrigerant concentration does not exceed that specified in the safety requirement; otherwise, people involved can be stifled by the refrigerant.

The maximum refrigerant charge and maximum refrigerant concentration in the system are calculated directly based on the size of the air conditioning space. The unit of refrigerant concentration is  $1 \text{ kg/m}^3$ .

- 1) Flow direction of refrigerant leakage.
- 2) Room for refrigerant leakage. Since the concentration of refrigerant is greater than that of air, pay attention to the spaces where the refrigerant may residue, for example, the basement.

Method for calculating the maximum concentration of refrigerant:

- ① Calculate the refrigerant charge quantity of each system.

Charge quantity of an ODU upon delivery (for the system consisting of multiple modules in parallel, the accumulative charge quantity of modules upon delivery is used) + Onsite charge quantity = Total refrigerant charge quantity in the system (kg)

- ② Calculate the volume of minimum air conditioning space ( $\text{m}^3$ )

Volume of air conditioning space ( $\text{m}^3$ ) = Length x Width x Height

Note: The length, width and height here refer to the effective length, width and height of the indoor space.

- ③ Calculate the maximum refrigerant concentration of the refrigeration system.

"Total refrigerant quantity of the system" / "the volume of minimum air conditioning space"  $\leq$  Maximum allowable concentration ( $\text{kg/m}^3$ )

Note: If the maximum allowable refrigerant concentration is not available in relevant local standard, use  $0.3 \text{ kg/m}^3$  as the maximum allowable refrigerant concentration.

- ④ If the maximum refrigerant concentration exceeds the allowed threshold, the refrigeration system must be redesigned. In this case, separate the refrigeration system into multiple small-capacity refrigeration systems, or adopt other ventilation measures, or contact local Gree sales company.

## 13.2 Calculation of Additional Refrigerant Charge Amount

### 13.2.1 Constitution of additional refrigerant charge

Additional refrigerant charge amount = additional refrigerant charge of liquid pipe × additional refrigerant charge of hydro box + additional refrigerant charge of high pressure gas pipe

(1) Additional refrigerant charge of liquid pipe

Additional refrigerant charge of liquid pipe(kg)=∑length of liquid pipe × refrigerant charge amount of every meter of liquid pipe.

Refrigerant charge amount of every meter of liquid pipe(kg/m)							
φ28.6	φ25.4	φ22.2	φ19.05	φ15.9	φ12.7	φ9.52	φ6.35
0.680	0.520	0.350	0.250	0.170	0.110	0.054	0.022

⚠ Note:

- ① Liquid pipe includes the liquid pipe which ODU connects IDU and the liquid pipe which ODU connects hydro box.
- ② For GMV-S120WL/A-S, GMV-S140WL/A-S, GMV-S160WL/A-S, if the total liquid pipe length is within 20m, no additional refrigerant charge is needed.

(2) Additional refrigerant charge of hydro box

Additional refrigerant charge of hydro box(kg)=0.3\*quantity of hydro box

(3) Additional refrigerant charge of high pressure gas pipe

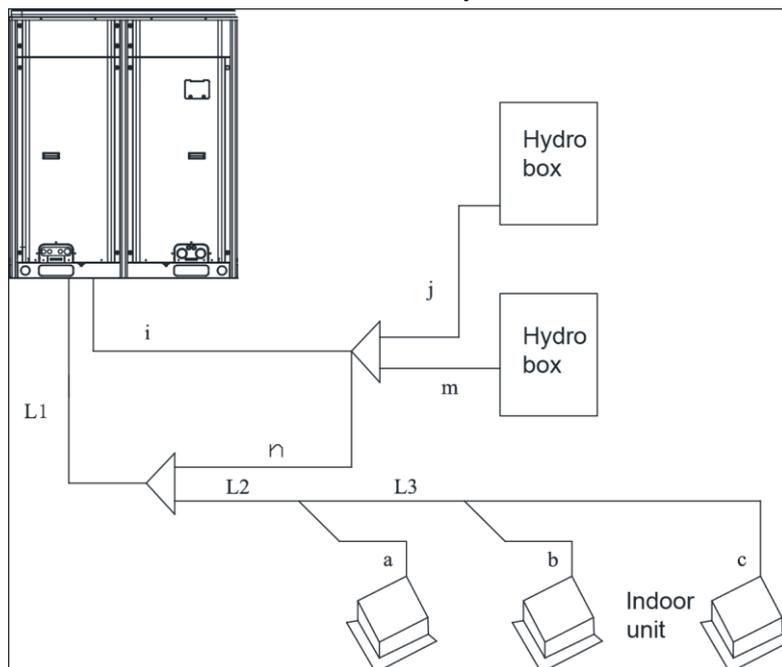
Additional refrigerant charge of high pressure gas pipe(kg)=∑length of high pressure pipe × refrigerant charge amount of every meter of high pressure pipe.

Refrigerant charge amount of every meter of high pressure pipe(kg/m)			
φ19.05	φ15.9	φ12.7	φ9.52
0.15	0.12	0.09	0.05

⚠ Note: High pressure pipe includes the high pressure pipe which ODU connects hydro box.

### 13.2.2 Example of calculation

Top discharge GMV-S280W/A-X is taken for example (three sets of indoor unit GMV-NHD90PLS/ES are connected and two sets of hydro box NRQD16G/A-S are connected):



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(1) Additional refrigerant charge of liquid pipe(kg) =  $\Sigma$ length of liquid pipe  $\times$  refrigerant charge amount of every meter of liquid pipe

No.	L1	L2	L3	a	b	c	n	m	j
Pipe diameter	$\phi 9.52$								
Length	10m	10m	5m	5m	5m	10m	5m	5m	8m
Additional charge amount	0.54	0.54	0.27	0.27	0.27	0.54	0.27	0.27	0.432

(2) Additional refrigerant charge of hydro box(kg)= $0.3 \times 2 = 0.6$ kg

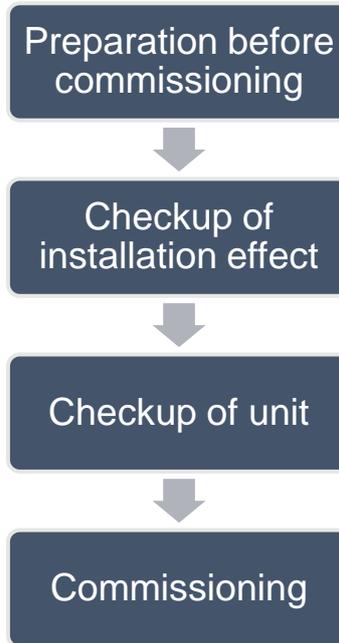
(3) Additional refrigerant charge of high pressure gas pipe(kg)= $\Sigma$ length of high pressure pipe  $\times$  refrigerant charge amount of every meter of high pressure pipe= $2.1$ kg

No.	i	j	m
Pipe diameter	$\phi 15.9$	$\phi 12.7$	$\phi 12.7$
Length	10m	5m	5m
Additional charge amount	1.2	0.45	0.45

(4) Total additional refrigerant charge amount(kg)= $3.402 + 0.6 + 2.1 = 6.102$ kg

# Chapter 4 Commissioning Operation

## 1. Commissioning Flowchart



## 2. Safety Notices



Warning!

All commissioning and maintenance personnel must lean and strictly comply with construction security specifications. Security measures must be taken especially for outdoor operations;

Workers of special types of labor, such as refrigerating engineers, electricians, and welders, must have professional certificates. No worker is allowed to do another type of labor.

The equipment must be powered off before relevant operations, and other security requirements should be strictly complied with.

All installation and maintenance operations must comply with design requirements of this product and national and local security operation requirements. Rule-breaking operations are prohibited.

It is not allowed to force start the compressor with direct power supply.

## 3. Preparation before Commissioning

### 3.1 Preparation of Commissioning Tools

Inner hexagon spanner	Digital display temperature meter
Adjustable wrench	Noise meter
Phillips screwdriver	Clamp meter
Slotted screwdriver	Digital multimeter
Vacuum pump	Electric meter
Electronic scale	Time-meter
High and low pressure gauge for	Standing ladder

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corresponding refrigerant system	
Wind velocity indicator	.....

At present, there are two commissioning methods for unit, one is to operate directly via the button on mainboard of outdoor unit, another is to install special software and conduct commissioning via PC, the PC software can at the same time display parameter of indoor and outdoor units. (For specific operation please refer to corresponding instruction manual).

### 3.2 Preparation of Commissioning Papers

In order to record the situation of installation and commissioning of unit, the following commissioning documents should be completely prepared: programme confirmation meeting record sheet before commissioning, record sheet of commissioning personnel, check table before commissioning, commissioning data record sheet, commissioning report, etc.

Programme confirmation meeting record sheet:

Programme confirmation meeting for commissioning of *** engineering air conditioner
Subject: ***
Date: ***
Place: ***
Attendee: ***
Contents: ***
1
2
3

Commissioning data record sheet:

Project name:		Model:	
Conner:		Date:	
Model and quantity of outdoor unit	Model and quantity of hydro box	Model and quantity of water tank	
Rated capacity of outdoor unit (kW):	Total rated capacity of indoor unit (kW):	Total length of refrigerant pipe (m):	
Maximum height difference between indoor and outdoor units (m):	Height difference between hydro box and outdoor unit (m):	Adding quantity of refrigerant (kg):	
Commissioning status: <input type="checkbox"/> cooling <input type="checkbox"/> heating <input type="checkbox"/> water heating <input type="checkbox"/> floor heating Operating quantity and capacity of indoor unit: Operating quantity and capacity of hydro box:			
Status and Parameter	Unit	Before startup	30min    60min    90min

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Status and parameter of outdoor unit	Outdoor ambient temperature	℃				
	Supply voltage	V				
	Frequency	Hz				
	Current of compressor	A				
	Exhaust temperature	℃				
	High pressure of system	℃				
	Low pressure of system	℃				
	.....					
Parameter of 1# indoor unit	Rated capacity	KW				
	Ambient temperature	℃				
	Wind notch of indoor unit	Notch				
	Temperature of air outlet	℃				
	Wind speed in air outlet	M/S				
	Noise	dB				
	Drainage of water collecting tray	—				
Parameter of 2# indoor unit	Rated capacity	KW				
	Ambient temperature	℃				
	Wind notch of indoor unit	Notch				
	Temperature of air outlet	℃				
	Wind speed of air outlet	M/S				
	Noise	dB				
	Drainage of water collecting tray	—				
.....						
Parameter of hydro box	Rated capacity	KW				
	Water temperature in water tank	℃				

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	Notch of water pump	Notch				
	Water-out temperature	°C				
	Water-in temperature	°C				
.....						

### 3.3 Inspection before Commissioning



Caution!

Check Table before Commissioning					
Type	No.	Item for checking	Reference	Pass or not	Checked by
Checkup of installation drawing	1	Check if the engineering design drawing is complete.			
	2	Check if the construction is conducted according to design drawing.			
Checkup of installation environment	3	Check if there is pollution source around installation place of outdoor unit, whether the selection of installation position of outdoor unit is correct.	Refer to installation of outdoor unit		
	4	Check if basement of outdoor unit is firm enough? Whether its damping and drainage comply with the requirement?	Refer to installation of outdoor unit		
	5	Check if the outdoor unit is operated with static pressure? Whether it has been set with corresponding static pressure?			
Checkup of cooling system	6	Check if the capacity of indoor unit accounts for 80%~100% of rated capacity of outdoor unit?	80%~100%		
	7	Check if pipeline of refrigerant and water pipe are in conformity with the requirements?	Refer to installation requirements		
	8	Check if the height difference between indoor unit and outdoor unit meet the design requirement of unit?	Height difference when outdoor unit is in upper position 40m Height difference when outdoor unit is in lower		

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			position50m		
9	Check if height difference among indoor units are in conformity with design requirement of unit?	15m			
10	Check if the length of pipeline between outdoor unit and the farthest indoor unit is less or equal to 120m?	120m			
11	Check if the total length of pipeline is less than 300m?	300m			
12	Check if the length from outdoor unit to the first branch pipe is larger than 90m? If it is, does the pipe diameter need to be enlarged?	when it is larger than 90m, the pipe diameter should be accordingly enlarged.			
13	Check if the distance between indoor unit to its nearest branch pipe is larger than 10m? If it is, does the pipe diameter need to be enlarged?	when it is larger than 10m, the pipe diameter should be accordingly enlarged.			
14	Inclination pitch of indoor and outdoor branch pipes should not be over the required ranged.	Install it horizontally, refer to installation of branch pipe.			
15	Check if all the cut-off valves of outdoor unit are opened as large as possible?				
16	Check if pressure of refrigerant is normal? Use high pressure gauge to connect to valve of liquid pipe of outdoor unit, and use low pressure gauge to connect to valve of air pipe of outdoor unit, and then read the numerical value respectively.	At this time, high pressure and low pressure of system is in an equal status, and the difference between saturation temperature and ambient temperature (take the higher one in indoor and outdoor temperature) should not be over 5C, otherwise please check if there is leakage in outdoor unit.			
17	Check if there is oil stain of refrigerant oil in valve? If there is,				

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		use soapy water or leak detector to conduct leak detection. After it is checked to be leak, stop the subsequent commissioning immediately. Resume the commissioning work after the leaking problem is solved.			
	18	Before starting the commissioning, whether the outdoor unit has conducted preheating for over 8 hours?			
Checkup of electrical system	19	Check if connecting method of power cord is correct, if the wiring terminals are firm enough?			
	20	Check if appearance of power cord is in good condition without being exposed?	The appearance of power cord is in good condition without being exposed.		
	21	Check if capacity of power supply is less than maximum power of unit?	It should be larger than maximum power of unit.		
	22	Check if there is looseness in electrical components inside electric box under power-off status?	It is not allowed to be loose.		
	23	Check if wire diameter of indoor unit, outdoor unit, hydro box and water tank is in conformity with design requirement of unit?	Refer to electrical installation		
	24	Check if circuit breaker and electrical leakage switch have met the design requirements of unit	Refer to electrical installation		
	25	Check if supply voltate, phase sequence and frequency have met the requirement of unit?	It should be in conformity with name plate of unit, voltage fluctuation range should be within 10%		
	26	Check if the distance from power cord to TV set is over 1m?			
	27	Check if there is strong electromagnetic interference, dust or acid and alkali gas in surrounding of unit			
	28	Check if wire stock of communication wire is in conformity			

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Checkup of communication system		with design requirement of unit?			
	29	Check if dial switch of outdoor unit is correct?			
	30	Check if communication between outdoor main control unit and indoor unit, outdoor control unit and hydro box are correct?	Tandem connection		
	31	Check if communication connection between indoor unit and hydro box is correct?			
	32	Check if communication connection between indoor unit and wired controller, hydro box and wired controller are correct?			
	33	Check if the last indoor unit with communication has been installed with matching resistance?			
	34	Communication wire should not be laid with power cord in the same slot, it should be independently laid with inflaming retarding hard PVC tube, and parallel distance between communication wire and strong electrical wire should be over 20cm.			
Checkup for installation of indoor unit	35	Check if degree of slope of drain pipe of indoor unit is 1/100?			
	36	Check if increased height of drain pipe of indoor unit is less than 85cm?			
	37	Check if drainage of indoor unit is smooth?			
	38	Check if there is U-shape water storage elbow in drain pipe of indoor unit?			
	39	Check if there is soft connection in air outlet and air returning inlet of indoor unit? If there is static pressure box in air returning inlet?			
	40	Check if there is drain outlet of water pipe in indoor unit?			
Checkup for	41	Check if wired controller or panel of main indoor unit have been stuck with the mark of main?			
	42	Check if hydro box is installed indoors?	Indoor location		

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installation of hydro box	43	Check if hydro box is installed in the location with ambient temperature of over 4C	It should be installed in the location with ambient temperature of over 4C.		
	44	Check if the hydro box is installed in rainproof position	It should be rainproof.		
	45	Check if installation of water tank is firm.	It should be firm.		
	46	Check if model of hydro box and water tank is correctly matched.	Refer to requirement of model selection		
	47	Check if quantity of hydro box is in conformity with the requirement?	Refer to requirement of model selection		
	48	Check if connecting quantity of water tank is in conformity with the requirement?	Refer to requirement of model selection		
	49	Check if S2 dial switch in mainboard of hydro box is in conformity with actual situation of connecting equipment?	Refer to dial switch instruction of hydro box.		
	50	After the hydro box is connected to floor heating , calculate if there is water power loss? If there has installed engineering water pump?	Refer to actual situation and instruction manual, generally if delivery lift is over 6m, it should install a floor heating engineering water pump.		
	51	When the hydro box is connected to water tank or floor heating, whether C valve and D valve have been installed in water system? Whether the C valve and D valve is straight-through type with small resistance?	There should install C valve and D valve with straight-through type with small resistance.		
	52	Check if C valve, D valve and floor heating performer are normally closed?	Normally closed		
	53	Check if water cycle has been conducted heat insulation protection?	Refer to installation manual.		
	54	Whether there is reducing valve	It should install		

		when water replenishing pressure is over 3 bar?	reducing valve in water system.		
	55	Check if floor heating performer of each room has been connected to hydro box? If it has conducted linkage setting with indoor unit?	Refer to installation setting of hydro box		
	56	Check if auto emptier is installed in floor heating water cycle and hot water cycle?	Refer to installation instruction of hydro box.		
	57	Check if hydro box is installed in the first branch pipe?	It should be installed in the forefront of branch pipe.		

## 4.Commissioning Operation

Note: An indoor unit must be set to be master indoor unit and only one can be set during commissioning.

If there is no special requirement, there's no need to set other functions and you can operate the unit in factory settings. If special functions are needed, please refer to relevant section in this manual.

### 4.1 Commissioning Operation of Hydro Box

#### 4.1.1 Confirm Main Board DIP Switch

Confirm the DIP switch  $S_1$  and  $S_2$  on the main board of hydro box.  $S_1$  is capacity DIP switch while  $S_2$  is function DIP switch.

##### 4.1.1.1 Capacity DIP Switch of Hydro Box (S1)

Capacity DIP switch  $S_1$  has 5 digits. No not alter it arbitrarily.

Capacity of hydro box	Capacity DIP switch				Model DIP switch
	1	2	3	4	5
16	ON	OFF	OFF	ON	OFF

Note:

DIP switch must be set in place. Never set the switch in a middle position. "ON" indicates "0" status while the opposite direction indicates "1" status.

Example:  $S_1$  is as below:



The black part indicates the lever.

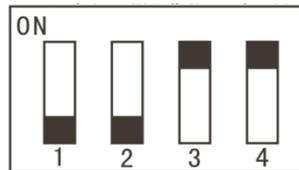
##### 4.1.1.2 Function DIP Switch of Hydro Box (S2)

Note: Please set in strict accordance with actual engineering condition.

Function DIP switch S2 has 4 digits, which are "1", "2", "3" and "4", indicating "Gree water tank", "floor heating", "solar power", "Self-made water tank" respectively. Each function can be set according to this rule: Moving lever to "number" means "Connect" and moving lever to "ON" means "Not connect". Digit "1" and "2" must be set based on actual engineering condition. Digit "3" and "4" cannot be changed arbitrarily, otherwise unit will have temperature sensor malfunction or fails to run.

Number of DIP switch	Meaning	DIP switch		Factory setting
		Not connect	Connect	
1	Gree water tank	ON	OFF	OFF
2	Floor heating	ON	OFF	OFF
3	Solar power	ON	OFF	ON
4	Self-made water tank	ON	OFF	ON

Example: S2 is as below:



Note: The black part indicates the lever.

## 4.1.2 Commissioning Operation

### 4.1.2.1 Preparation for Commissioning

- (1) Check if unit is correctly installed.
- (2) Check if the pipeline of water system and wires of electrical system are connected properly.
- (3) Check if the circulating water pipe adopts thermal insulation.
- (4) Check if ground wire is connected.
- (5) Check if the voltage is unit's rated voltage.
- (6) Check if the check valves and relief valves of water inlet and water outlet are correctly installed.
- (7) Check if the pipeline of water system is evacuated and check if the air outlet valve and blow down valve are closed.
- (8) Water inlet pressure must be above 0.15MPa.

### 4.1.2.2 Water System Commissioning (Leak Detection and Evacuation)

#### 4.1.2.2.1 Leak Detection

After the pipeline of water system is connected, perform leak detection. After confirming that there is no leak, adopt thermal insulation to the pipeline of water system. Pay attention that the valves and pipe joints also need thermal insulation. We recommend you to use thermal insulation cotton that is more than 15mm's thick.

#### 4.1.2.2.2 Water Filling and Air Discharge between Hydro Box and Water Tank and Floor Heating Pipe

(1) Make sure that each pipe of water system is well connected. Close the air outlet valve that connects with hydro box in exit pipe engineering construction and make sure that the blow down valve is closed completely.

(2) Open the water replenishing valve and fill water in. open the air outlet valve that is connected in engineering construction.

(3) When there is water coming out from the air outlet valve, open the manual air outlet valve A.

(4) When water flows out from air outlet valve A, energize the hydro box and turn on cleaning mode to start evacuation. The operation method is: Under OFF status of hydro box, press and hold "WATER/AC/FLOOR" for 5s and then "Clean" is lit up.



(5) After running for 15~20 minutes, observe the air outlet valve that connects with hydro box during exit pipe engineering construction. When water is flowing out steadily with no air flow, it means evacuation is completed. Then you can close the manual air outlet valve A and stop the hydro box. The operation method is: Press and hold "WATER/AC/FLOOR" for 5s and hydro box will stop cleaning. "Clean" goes off.



#### 4.1.2.2.3 Evacuation of Water Tank and User Side Pipeline

(1) Make sure each pipe joint of water tank is well connected and the blow down valve of water tank is closed completely.

(2) Open the water replenishing valve of water tank and the water valve at user side. Fill water into the tank until there is water coming out from the water valve at user side without any air flow. Then water tank has finished water filling and evacuation. Close the water valve at user side and go on with commissioning of the entire unit.

#### 4.1.2.2.4 Re-evacuation

After all the wires of indoor units, outdoor unit and hydro box are connected and the commissioning of fluorine system is finished, perform evacuation again. Following is the operation procedure:

(1) Open the hot water tap and water replenishing valve of water tank to fill water inside until water temperature reaches 20~30°C.

(2) Turn on water heating mode and open manual air outlet valve A in the meantime.

(3) After 15~20 minutes of operation, if the temperature difference between entering water temperature and leaving water temperature of hydro box is smaller than 10°C, it means evacuation is completed. Then you can close the manual air outlet valve A and stop the hydro box.

Evacuation of water system is done.

(4) Above operation procedure must be done on the condition that water tank water temperature is lower than 45°C. If temperature difference of hydro box cannot satisfy the required value when water tank temperature reaches 45°C, turn off the unit. Then open the hot water tap and fill hot water into the water tank through the water replenishing valve until water temperature reaches 20~30°C. After that, turn on heating mode and open manual air outlet valve A again to perform evacuation.



Warning: Water pump is set to  before ex factory. Never try to change the setting, otherwise, water pump will get damaged and unit will have malfunction.

#### 4.1.3 Settings of Floor Heating Performer and Indoor Unit

Please refer to the previous section.

#### 4.1.4 Capacity Setting of Water Tank

Please refer to the previous section.

#### 4.1.5 Test Operation

Test operation of hydro box should be conducted simultaneously with test operation of outdoor unit. Please refer to the following section about commissioning of the entire unit.

### 4.2 Commissioning Operation of the Entire Unit

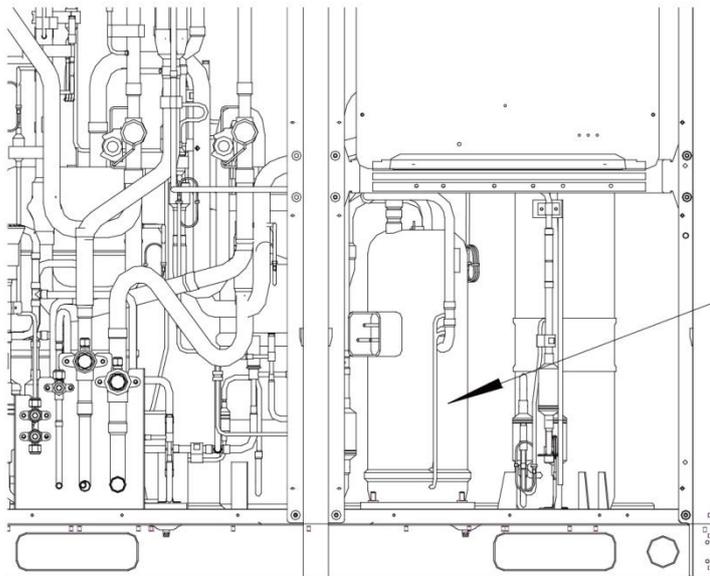
#### 4.2.1 Preparation for Test Operation

- 1) Power can be turned on only after all installation work is finished.
- 2) All control circuits, electric wires are connected correctly and securely. Gas pipe valve and liquid pipe valve are open completely.
- 3) All fragmental objects, such as metal scrap, wire stub and clamp, should be removed from the unit.
- 4) Check if the surface and pipes of unit are damaged during transportation or carrying.
- 5) Check if the wiring terminals of electric components are loosened or not. Check if the phase sequence is correct.
- 6) Check the opening and closing status of valves. After outdoor unit is connected with hydro box, three valves (gas valve, liquid valve, high pressure gas valve) of the outdoor unit must be open.

#### 4.2.2 Test Operation

##### 4.2.2.1 Precautions

(1) Before starting commissioning, make sure that the compressor has been preheated for more than 8 hours and check whether preheating is normal by touching. Commissioning can be started only when preheating is normal. Otherwise, compressor may be damaged. Commissioning must be performed or guided by professional personnel.



Make sure the compressor has been preheated for more than 8 hours.

Make sure the compressor has been preheated for more than 8 hours.

(2) When unit commissioning is started, the system automatically selected an operation mode according to the environment temperature.

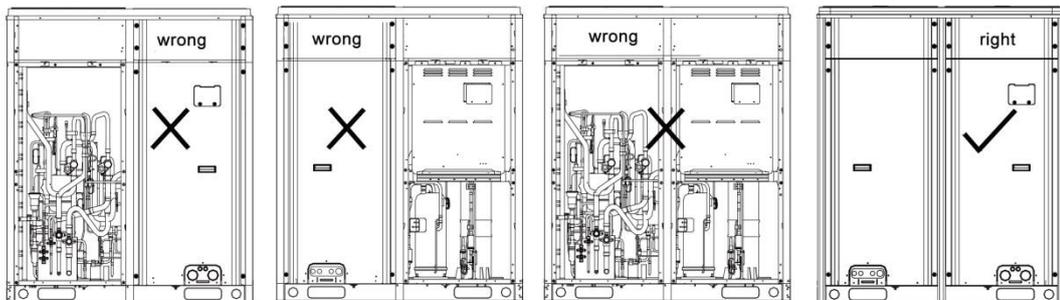
a. When outdoor temperature is higher than 20°C, commissioning should be in cooling mode and water heating mode.

b. When outdoor temperature is lower than 20°C, commissioning should be in heating mode and water heating mode.

Note: If system is not connected with water tank or the water heating function of hydro box is wrongly set, unit will not run in water heating mode.

(3)、 Before starting commissioning, make sure again that stop valves of all basic modules of the outdoor unit have been completely opened.

(4)、 During commissioning, the front panel of outdoor unit must be completely covered. Otherwise, commissioning accuracy may be affected (as shown in the following figure).



(5)、 Before commissioning, make sure that additional refrigerant to pipes has been finished completely or for more than 70%.

(6)、 The following table describes progress display of each phase during commissioning:

Progress Description for Commissioning Phases							
Progress	Commissioning code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
01_Master unit setting	db	ON	01	ON	A0	ON	System is in non-commissioning

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							status.
	db	ON	01	ON	OC	ON	System has set a master unit and automatically enters the next step.
02_Unit address distribution	db	ON	02	ON	Ad	Blinking	System is assigning addresses.
	db	ON	02	ON	L7	Blinking	There is no master indoor unit. Please set master indoor unit. If no master indoor unit is set within 1 minute, system will automatically set one.
	db	ON	02	ON	OC	ON	System has finished address distribution and automatically enters the next step.
03_Basic module quantity confirmation	db	ON	03	ON	0104	Blinking	LED3 displays the quantity of outdoor unit. Confirm manually if the quantity is 01.
	db	ON	03	ON	OC	ON	System has confirmed the quantity of outdoor unit and automatically enters the next step.
04_Indoor unit quantity confirmation	db	ON	04	ON	0180	Blinking	LED3 displays the quantity of indoor unit. Confirm manually if the quantity of indoor unit is correct.
	db	ON	04	ON	OC	ON	System has confirmed the quantity of indoor unit and automatically enters the next step.
05_Internal communication detection	db	ON	05	ON	C2	ON	System detects communication failure between master unit and inverter compressor drive.
	db	ON	05	ON	C3	ON	System detects communication failure between master unit and variable frequency fan drive.
	db	ON	05	ON	CH	ON	"Rated capacity ratio is over-high" between indoor units and outdoor unit
	db	ON	05	ON	CL	ON	"Rated capacity ratio is over-low" between indoor units and outdoor unit
	db	ON	05	ON	OC	ON	System has completed detection and automatically enters the next step.
Progress Description for Commissioning Phases							
	Commissioning code		Progress code		Status code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	

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06_ Component detection for outdoor unit	db	ON	06	ON	Corresponding error code	ON	System detects component failure of outdoor unit.
	db	ON	06	ON	OC	ON	System detects that no outdoor unit component fails and automatically enters the next step.
07_ Component detection for indoor units	db	ON	07	ON	Corresponding error code	ON	System detects component failure of indoor unit. XXXX means the project number of faulty indoor unit. 3s later, the corresponding error code will be displayed. For instance, if no.100 indoor unit has d5 error, then LED3 will display circularly as below: 01(2s later), 00(2s later), d5.
	db	ON	07	ON	OC	ON	System detects that no indoor unit component fails and automatically enters the next step.
08_ Compressor preheating confirmation	db	ON	08	ON	U0	ON	System gives a prompt if the preheat time for compressor is less than 8 hours.
	db	ON	08	ON	OC	ON	System detects that the compressor preheating time is more than 8 hours and automatically enters the next step.
09_Refrigerant detection before startup	db	ON	09	ON	U4	ON	System detects insufficient refrigerant and stops to balance the pressure lower than 0.3Mpa.
	db	ON	09	ON	OC	ON	System detects that refrigerant is normal and automatically enters the next step.
10_Outdoor unit valves detection before startup	db	ON	10	ON	ON	ON	Outdoor unit valves are being inspected.
	db	ON	10	ON	U6	ON	Outdoor unit valves are not fully opened.
	db	ON	10	ON	OC	ON	Outdoor unit valves are opened properly.
11_Calculate refrigerant charging amount manually	db	ON	11	ON	AE	ON	The refrigerant charging status is that charging amount of refrigerant shall be calculated manually (additional refrigerant must be accurately calculated).
12_ Unit commissioning startup confirmation	db	ON	12	ON	AP	Blinking	System waits for a unit commissioning startup command.
	db	ON	12	ON	AE	ON	The unit has been set to

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							commissioning operation status of manual calculation of refrigerant charging amount
13_							No meaning.
14_							No meaning.
15_ Commissioning in cooling and water heating	db	ON	15	ON	AC	ON	System is in cooling-mode commissioning operation (system automatically selects the commissioning operation mode with no need of manual setting).
	db	ON	15	ON	11	ON	System is in water-heating-mode commissioning operation (System automatically selects the commissioning operation mode with no need of manual setting).
	db	ON	15	ON	Corresponding error code	ON	Malfunction occurs during cooling-mode commissioning operation.
	db	ON	15	ON	U9	ON	Malfunction occurs to outdoor unit pipes or valves.
	db	ON	15	ON	U8	ON	System detects pipe failure of indoor unit. XXXX means the project number of faulty indoor unit. 3s later, U8 will be displayed. For instance, if no.100 indoor unit has U8 error, then LED3 will display circularly as below: 01(2s later), 00(2s later), U8.
16_ Commissioning in heating and water heating	db	ON	16	ON	AH	ON	System is in heating-mode commissioning operation (system automatically selects the commissioning operation mode with no need of manual setting).
	db	ON	16	ON	11	ON	System is in water-heating-mode commissioning operation (System automatically selects the commissioning operation mode with no need of manual setting).
	db	ON	16	ON	Corresponding error code	ON	Malfunction occurs during heating-mode commissioning operation.
	db	ON	16	ON	U9	ON	Malfunction occurs to outdoor unit pipes or valves.

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	db	ON	16	ON	U8	ON	System detects pipe failure of indoor unit. XXXX means the project number of faulty indoor unit. 3s later, U8 will be displayed. For instance, if no.100 indoor unit has U8 error, then LED3 will display circularly as below: 01(2s later), 00(2s later), U8.
17_ Commissioning completed	01~04	ON	OF	ON	OF	ON	The unit has completed commissioning and in standby status. LED1 displays module address. LED2 and LED3 display "OF".

### 4.2.2.2 Commissioning Operation Mode

There are two commissioning modes for the unit. One is to perform commissioning directly through the main board of outdoor unit. The other is to perform commissioning on a PC through special software. Parameters of indoor units and outdoor unit can be simultaneously displayed and historical data can be stored and queried with the second method. (For details about the two methods, please refer to relevant instructions.)

Commissioning through the main board of outdoor unit:

Basic operation	Operation method	Remarks
Start of commissioning	Press and hold SW7 button on master control unit for more than 5 seconds.	
Selection of commissioning operation mode without wired controller	After the unit has started commissioning, press SW4 button and SW5 button simultaneously under any commissioning phase.	After entering this mode, system will no longer detect the communication status between indoor unit and wired controller. Indoor units can proceed with commissioning without wired controller.
Exit of commissioning	After the unit has started commissioning, press and hold SW7 button on master control unit for more than 5 seconds to quit commissioning.	
Pause of commissioning	After the unit has started commissioning, short press SW6 back button on master control unit to interrupt commissioning. Then system will stay in the last completed progress of the current commissioning phase.	This function is available after the 9 <sup>th</sup> step. For example, when system receives commissioning pause signal during the 10 <sup>th</sup> step 10_Outdoor unit valves detection before startup, it will return to the completion status of the 9 <sup>th</sup> step 9_Refrigerant detection before startup.
Continue of commissioning	When commissioning is paused, short press SW6 back button on master control unit again to continue commissioning.	

When commissioning is performed through the main board of outdoor unit, the main board provides the following commissioning functions:

Step 1: Cover the front panel of outdoor unit completely and open the commissioning window of outdoor unit.

Step 2: Under power-off status of outdoor unit, set up corresponding static pressure mode for

the outdoor unit according to static pressure design requirements for outdoor engineering. For details about the setting method, please see the “Outdoor Fan Static Pressre Setting DIP Switch (SA6\_ESP\_S)” section.

Step 3: Under power-off status of outdoor unit, set one module to be a master control unit. For details about the setting method, please see the “Master Unit Setting DIP Switch SA\_MASTER-S” section. Note: This model is a single-module system and program will default it as the master unit. There is no need to set master unit.

Step 4: Power on outdoor unit and all the indoor units. Make sure all indoor units are powered on. Then outdoor unit will display “non-commissioning status”.

Step 5: Find the module with “01” address, which is the master control unit. On the master control unit, press and hold SW7 button for more than 5 seconds to enter commissioning.

Step 6: Wait for the unit to automatically start commissioning progresses 01 and 02.

Because this model is a single-module system and program defaults it as a master unit, there is no need to set master control unit. Digital tube of master control unit will display as below:

Progress	Commissioning code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
01_Master unit setting	db	ON	01	ON	OC	ON	System has set a master unit and automatically enters the next step.

After the above status is maintained for 2 seconds, system will enter address distribution automatically.

In progress 02, if master indoor unit is not detected, then the corresponding error will be displayed:

Progress	LED1		LED2		LED3	
	Function code	Display mode	Current progress	Display mode	Current status	Display mode
02_Unit address distribution	db	ON	02	ON	L7	Blinking

At this time, all buttons are invalid. You can set master indoor unit through the commissioning software within 1 minute. If master indoor unit is not set in 1 minute, system will set up a master indoor unit automatically. Then the system will automatically enters the next step.

Step 7: When the unit runs to progress 03, the quantity of outdoor modules needs to be confirmed manually. Outdoor unit will display as follows:

Progress	Commissioning code		Progress code		Status code	
	LED1		LED2		LED3	
	Code	Display status	Code	Display status	Code	Display status
03_Basic module quantity confirmation	db	ON	03	ON	Quantity of modules	Blinking

Note: LED3 code indicates the quantity of outdoor unit and it displays “01” in this case, which means there is only one outdoor unit.

If it displays “01”, press SW7 on master unit to confirm it. Then the unit will automatically enter progress 04:

Progress	Commissioning code		Progress code		Status code	
	LED1		LED2		LED3	
	Code	Display status	Code	Display status	Code	Display status

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03_ Basic module quantity confirmation	db	ON	03	ON	OC	ON
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If the quantity displayed is different from the number of actually connected modules, disconnect power and check whether communication wires are connected between outdoor modules. Single-module system cannot have communication connection with other outdoor units. After the check, start commissioning again.

Step 8: When the unit runs to progress 04, the quantity of indoor unit needs to be confirmed manually. Main board of each module will display as follows:

	Commissioning code		Progress code		Status code	
Progress	LED1		LED2		LED3	
	Code	Display status	Code	Display status	Code	Display status
04_ Indoor unit quantity confirmation	db	ON	04	ON	Quantity of connected indoor units	Blinking

If the quantity displayed is the same with the number of actually connected units, press SW7 on the master unit to confirm it. The unit will automatically starts the next commissioning progress:

	Commissioning code		Progress code		Status code	
Progress	LED1		LED2		LED3	
	Code	Display status	Code	Display status	Code	Display status
04_ Indoor unit quantity confirmation	db	ON	04	ON	OC	ON

Step 9: Progress 05 is "Internal communication detection".

If no error is detected, system will display as follows and then enter the next progress.

	Commissioning code		Progress code		Status code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
05_ Internal communication detection	db	ON	05	ON	OC	ON	System has completed detection and automatically enters the next step.

If error is detected, system will stay at current status and wait for manual troubleshooting.

Corresponding error codes include:

	Commissioning code		Progress code		Status code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	

05_ Internal communication detection	db	ON	05	ON	C2	ON	System detects communication failure between master unit and inverter compressor drive.
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	db	ON	05	ON	C3	ON	System detects communication failure between master unit and variable frequency fan drive.
	db	ON	05	ON	CH	ON	"Rated capacity ratio is over-high" between indoor units and outdoor unit
	db	ON	05	ON	CL	ON	"Rated capacity ratio is over-low" between indoor units and outdoor unit.

For details about the above troubleshooting method, please refer to "Troubleshooting Method" Part.

Step 10: Progress 06 is Component detection for outdoor unit.

If no error is detected, system will display as follows and then enter the next progress.

	Commissioning code		Progress code		Status code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
06_ Component detection for outdoor unit	db	ON	06	ON	OC	ON	System detects that no outdoor unit component fails and automatically enters the next step.

If error is detected, system will stay at current status and wait for manual troubleshooting. Corresponding error codes include:

	Commissioning code		Progress code		Status code		Error name
Progress	LED1		LED2		LED3		
	Function code	Display status	Current progress	Display status	Current status	Display mode	
06_ Component detection for outdoor unit	db	ON	06	ON	Corresponding error code	ON	System detects component failure of outdoor unit.

For details about the above troubleshooting method, please refer to Troubleshooting Method Part.

Step 11: Progress 07 is Component detection for indoor units.

If no error is detected, system will display as follows and then enter the next progress.

	Commissioning code		Progress code		Status code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
07_ Component detection for indoor units	db	ON	07	ON	OC	ON	System detects that no indoor unit component fails and automatically enters the next step.

If error is detected, system will stay at current status and wait for manual troubleshooting.

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Corresponding error codes include:

	Commissioning code		Progress code		Status code		Error name
Progress	LED1		LED2		LED3		
	Function code	Display status	Current progress	Display status	Current status	Display mode	
07_Component detection for indoor units	db	ON	07	ON	XXXX/Corresponding error code	ON	System detects component failure of indoor unit.

XXXX means the project number of faulty indoor unit. 3s later, the corresponding error code will be displayed. For instance, if no.100 indoor unit has d5 error, then LED3 will display circularly as below: 01(2s later), 00(2s later), d5.

For details about the above troubleshooting method, please refer to “Troubleshooting Method” Part.

Step 12: Progress 08 is “Compressor preheating confirmation”.

If it is detected that compressor has been preheated for more than 8 hours, system will display as follows and then enter the next progress.

	Commissioning code		Progress code		Status code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
08_ Compressor preheating confirmation	db	ON	08	ON	OC	ON	System detects that the compressor preheating time is more than 8 hours and automatically enters the next step.

If it is detected that the compressor has not been preheated for more than 8 hours, system will give error alarm and display as follows. If compressor has been preheated for more than 2 hours, you can press SW7 button to skip the waiting time and system will automatically enter the next progress. However, this will cause forcible start of the compressor, which may get it damaged.

	Commissioning code		Progress code		Status code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
08_ Compressor preheating confirmation	db	ON	08	ON	U0	ON	System gives a prompt if the preheat time for compressor is less than 8 hours.

Step 13: Progress 09 is Refrigerant detection before startup.

If the refrigerant quantity inside the system meets the operation startup requirements, system will display as follows and then automatically enter the next progress.

	Commissioning code		Progress code		Status code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
09_Refrigerant detection before	db	ON	09	ON	0C	ON	System detects that refrigerant is normal and automatically enters

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startup							the next step.
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If there is no or not enough refrigerant inside the system to meet the operation startup requirements, system will display U4 Refrigerant shortage protection and fail to continue with the next progress. In this case, check for leakage or add refrigerant until error disappears.

Progress	Commissioning code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
09_Refrigerant detection before startup	db	ON	09	ON	U4	ON	System detects insufficient refrigerant and stops to balance the pressure lower than 0.3Mpa.

Step 14: Progress 10 is Outdoor unit valves detection before startup.

If master unit displays as follows, it means valves detection is being started.

Progress	Commissioning code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
10_ Outdoor unit valves detection before startup	db	ON	10	ON	ON	ON	Outdoor unit valves are being inspected.

If the unit detects that valve status is not normal, it will display as follows:

Progress	Commissioning code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
10_ Outdoor unit valves detection before startup	db	ON	10	ON	U6	ON	Outdoor unit valves are not fully opened.

In this case, check the big and small valves whether they are fully opened or not. After the check, press SW6 to return to the previous step and restart valves detection.

If it is detected that valve status is normal, system will display as follows and automatically enter the next progress.

Progress	Commissioning code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
10_ Outdoor unit valves detection before startup	db	ON	10	ON	OC	ON	Outdoor unit valves are opened properly.

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Step 15: Progress 11 is Calculate refrigerant charging amount manually.

There is no need to operate. System gives a prompt and then automatically enters the next progress.

Step 16: Progress 12 is Unit commissioning startup confirmation.

In order to make sure that all preparations are done before starting up the unit, it is required to confirm again whether to start the unit or not. Operation is as below:

If master unit displays as follows, it means the unit is waiting for confirmation signal.

Progress	Commissioning code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
12_Unit commissioning startup confirmation	db	ON	12	ON	AP		System waits for a unit commissioning startup command.

If it is confirmed to start up the unit, press SW7. The unit will display as follows and start next progress automatically:

Progress	Commissioning code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
12_Unit commissioning startup confirmation	db	ON	12	ON	AE	ON	The unit has been set to commissioning operation status of manual calculation of refrigerant charging amount.

Step 17: After unit startup confirmation, system will select cooling/heating/water heating mode according to ambient temperature.

A. If system selects cooling mode and water heating mode, the former part cooling mode will be displayed as below:

Progress	Commissioning code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
15_Manual charge first cooling, then water heating operation	db	ON	15	ON	AC	ON	System is in cooling-mode commissioning operation (system automatically selects the commissioning operation mode with no need of manual setting).
	db	ON	15	ON	Corresponding error code	ON	Malfunction occurs during cooling-mode commissioning operation.
	db	ON	15	ON	U9	ON	Malfunction occurs to outdoor unit pipes or valves.
	db	ON	15	ON	XXXX/U8	ON	System detects pipe failure of indoor unit. XXXX means the

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							project number of faulty indoor unit. 3s later, U8 will be displayed. For instance, if no.100 indoor unit has U8 error, then LED3 will display circularly as below: 01(2s later), 00(2s later), U8.
--	--	--	--	--	--	--	---

The latter part water heating mode will be displayed as below:

	Commissioning code		Progress code		Status code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
15_Manual charge first cooling, then water heating operation	db	ON	15	ON	11	ON	System is in water-heating-mode commissioning operation (System automatically selects the commissioning operation mode with no need of manual setting).
	db	ON	15	ON	Corresponding error code	ON	Malfunction occurs during cooling-mode commissioning operation.
	db	ON	15	ON	U9	ON	Malfunction occurs to outdoor unit pipes or valves.
	db	ON	15	ON	XXXX/U8	ON	System detects pipe failure of indoor unit. XXXX means the project number of faulty indoor unit. 3s later, U8 will be displayed. For instance, if no.100 indoor unit has U8 error, then LED3 will display circularly as below: 01(2s later), 00(2s later), U8.

B. If system selects heating mode and water heating mode, the former part heating mode will be displayed as below:

	Commissioning code		Progress code		Status code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
16_Manual charge first heating, then water heating operation	db	ON	16	ON	AH	ON	System is in heating-mode commissioning operation (system automatically selects the commissioning operation

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							mode with no need of manual setting).
	db	ON	16	ON	Corresponding error code	ON	Malfunction occurs during heating-mode commissioning operation.
	db	ON	16	ON	U9	ON	Malfunction occurs to outdoor unit pipes or valves.
	db	ON	16	ON	XXXX/U8	ON	System detects pipe failure of indoor unit. XXXX means the project number of faulty indoor unit. 3s later, U8 will be displayed. For instance, if no.100 indoor unit has U8 error, then LED3 will display circularly as below: 01(2s later), 00(2s later), U8.

The latter part water heating mode will be displayed as below:

Progress	Commissioning code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
16_Manual charge first heating, then water heating operation	db	ON	16	ON	11	ON	System is in water-heating-mode commissioning operation (System automatically selects the commissioning operation mode with no need of manual setting).
	db	ON	16	ON	Corresponding error code	ON	Malfunction occurs during heating-mode commissioning operation.
	db	ON	16	ON	U9	ON	Malfunction occurs to outdoor unit pipes or valves.
	db	ON	16	ON	XXXX/U8	ON	System detects pipe failure of indoor unit. XXXX means the project number of faulty indoor unit. 3s later, U8 will be displayed. For instance, if no.100 indoor unit has U8 error, then LED3 will display circularly as below: 01(2s later), 00(2s later), U8.

Step 18: If no error occurs after the unit has continuously run for 40 minutes, system will automatically confirm that commissioning is completed. The entire unit stops and resumes

standby status with display as below:

Progress	Commissioning code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
17_Commissioning completed	0104	ON	OF	ON	OF	ON	The unit has completed commissioning and in standby status. LED1 displays module address. LED2 and LED3 display OF.

Step 19: After commissioning is completed, set functions according to the actual engineering requirements on functions. For specific details, please refer to System Function Setting Method. Skip this step if there is no special requirement.

Step 20: Deliver the product to user for use and inform users about usage precautions.

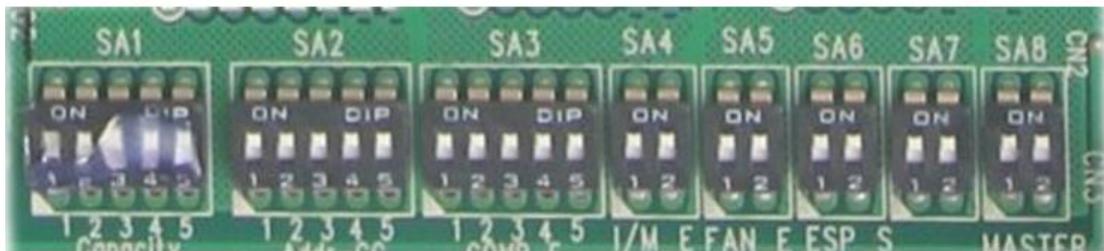
## 5. DIP Switch Instructions of GMV5 Unic

### 5.1 GMV5 Unic Outdoor Unit (GMV-S224W/A-X,GMV-S280W/A-X)

Application of outdoor unit functions includes function DIP switch setting and function button setting, as well as special requirements used for the engineering.

#### 5.1.1 Function DIP Switch Settings

The function DIP switch settings are located at SA1~SA8 from AP1 of outdoor unit main board. Below is the factory settings:



DIP Switch	Name	Meaning	Factory Settings	Remarks
SA1_capacity	Capacity DIP switch	Defines the rated capacity of the unit	Set in factory	The factory setting cannot be changed.
SA2_Addr-CC	Centralized control address DIP switch	Defines and differentiates addresses of different systems in the case of centralized control by multiple systems.	00000	The address DIP switch is used only when centralized control is required. Otherwise, the factory settings are used without being changed.
SA3_COMP-E	Compressor emergency operation	Provides aftersales emergency settings for 2#-6# compressors.	00000	It is better not to use the emergency function. Replace the compressor at the first time

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	DIP switch			when an exception occurs.
SA4_I/M-E	Compressor emergency operation DIP switch	Provides aftersales emergency settings for 1# compressor.	00	It is better not to use the emergency function. Replace the compressor at the first time when an exception occurs.
SA5_FAN-E	Fan emergency operation DIP switch	Provides aftersales emergency settings for fans.	00	It is better not to use the emergency function. Replace relevant parts of the fan at the first time when an exception occurs.
SA6_ESP_S	Outdoor fan static pressure setting DIP switch	Sets the static pressure of the fan according to the static pressure of the exhaust pipeline connected with the engineering unit, to guarantee normal operation of the unit.	00	This DIP switch should be set based on actual engineering conditions, neither over-large nor over-small. It is unnecessary to change the factory settings in outdoor locations.
SA7	Reserved DIP switch	—	00	It has been set before leaving the factory and it's not allowed to be changed.
SA8_MASTER-S	Master unit setting DIP switch	Defines the master unit	00	It has been set before leaving the factory and it's not allowed to be changed.

**Instruction:**

**1) Centralized control address DIP switch (SA2\_Addr-CC)**

The centralized control address DIP switch (SA2\_Addr-CC) indicates the centralized control address required when different refrigerating systems are controlled in a centralized manner. The default factory setting is "00000". If it is not required to use centralized control between multiple refrigerating systems, this DIP switch can retain the factory settings without being changed.

If it is required to use centralized control between multiple refrigerating systems, set the DIP switch according to the following methods:

- A. The DIP switch must be set on the master unit. Otherwise, the setting is invalid;
- B. The centralized control address DIP switch (SA2\_Addr-CC) on the master unit of a refrigerating system must be set to "00000", and this system is the master system.
- C. The centralized control address DIP switch (SA2\_Addr-CC) on the master unit of other refrigerating systems must be set as follows:

SA2					Add. No.
DIP1	DIP2	DIP3	DIP4	DIP5	
1	0	0	0	0	2
0	1	0	0	0	3
0	0	1	0	0	4
0	0	0	1	0	5
0	0	0	0	1	6
1	0	0	0	1	7
0	1	0	0	1	8
0	0	1	0	1	9

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0	0	0	1	1	10
1	0	0	1	1	11
0	1	0	1	1	12
0	0	1	1	1	13
1	0	1	1	1	14
0	1	1	1	1	15
1	1	1	1	1	16

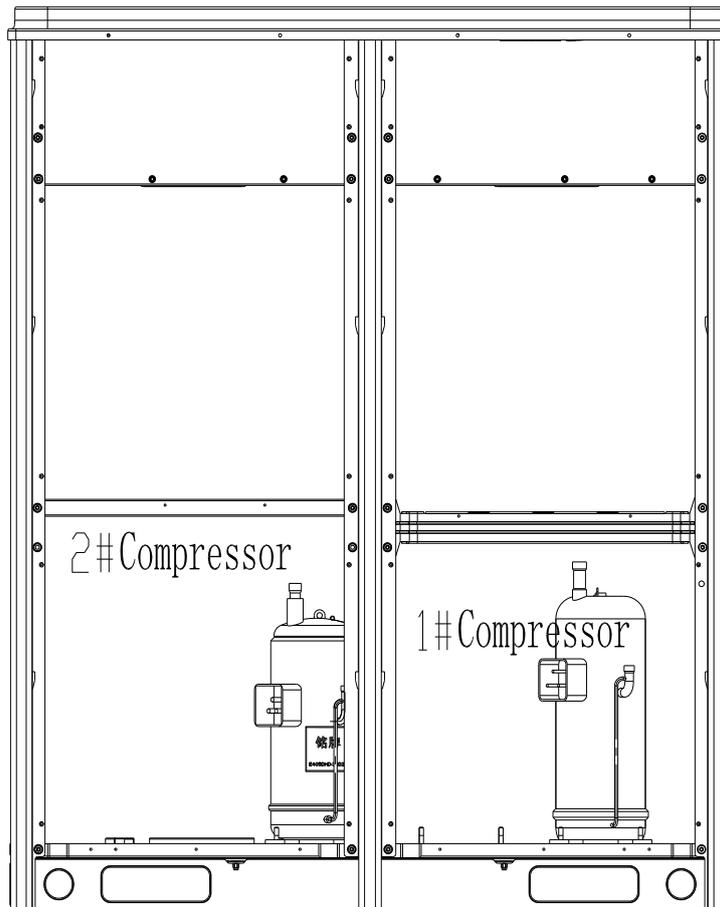
D. The centralized control address DIP switch (SA2\_Addr-CC) cannot be the same between different refrigerating systems. Otherwise, address conflicts may occur and the unit cannot run properly.

2) Compressor Emergency Operation DIP Switch (SA3\_COMP-E)

Corresponding to 2#~6# compressors, the compressor emergency operation DIP switch (SA3\_COMP-E) is used for aftersales emergency settings when an exception occurs on a compressor. It can shield the operation of the abnormal compressor in a short time and guarantee the emergency operation of other compressors.

When it is required to shield the operation of 2#-6# compressors upon failure, set the DIP switch according to the following methods:

Compressor Emergency Operation DIP Switch (SA3_COMP-E)					Remarks
DIP1	DIP2	DIP3	DIP4	DIP5	
0	0	0	0	0	Not shielding the operation of 2#-6# compressors
1	0	0	0	0	Shielding the operation of 2# compressor
0	1	0	0	0	Shielding the operation of 3# compressor
0	0	1	0	0	Shielding the operation of 4# compressor
0	0	0	1	0	Shielding the operation of 5# compressor
0	0	0	0	1	Shielding the operation of 6# compressor



Precautions:

- A. When the DIP switch setting is not covered in the above scope, a DIP switch setting exception fault may occur.
- B. Only one compressor can be set to emergency mode on a module;
- C. The compressor emergency operation mode is valid only in a single-module multi-compressor system.
- D. The default factory setting is "00000";
- E. The system cannot continually run for more than 24 hours in compressor emergency operation status. Once 24 hours are exceeded, the entire unit will be forcibly stopped and the limited operation code "Ad" is displayed on the IDU.
- F. 1#-6# compressors are defined from right to left facing the front of the unit.

3) 1# Compressor Emergency Operation DIP Switch (SA4\_I/M-E)

The 1# compressor emergency operation DIP switch (SA4\_I/M-E) is used for aftersales emergency settings when an exception occurs on the 1# compressor. It can shield the operation of the abnormal compressor in a short time and guarantee the emergency operation of other compressors.

When it is required to set the 1# compressor as emergency mode, set the DIP switch as follows:

1# Compressor Emergency Operation DIP Switch (SA4_I/M-E)		
DIP1	DIP2	Remarks
0	0	Not shielding the operation of 1# compressor

1	0	Shielding the operation of 1# compressor
---	---	---

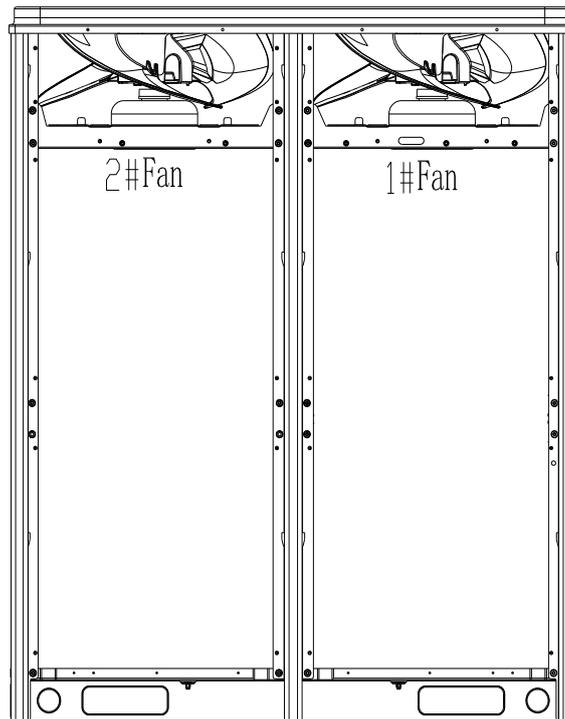
Precautions:

- A. When the DIP switch setting is not covered in the above scope, a DIP switch setting exception fault may occur.
- B. Only one compressor can be set as emergency mode on a module.
- C. The compressor emergency operation mode is valid only in a single-module multi-compressor system;
- D. The default factory setting is “00”;
- E. The system cannot continually run for more than 24 hours in compressor emergency operation status. Once 24 hours are exceeded, the entire unit will be forcibly stopped and the limited operation code “Ad” is displayed on the IDU.
- F. 1#-6# compressors are defined from right to left facing the front of the unit.

4) Fan Emergency Operation DIP Switch (SA5\_FAN-E)

The fan emergency operation DIP switch (SA5\_FAN) is used for aftersales emergency settings when an exception occurs on a dual-module fan. It can shield the operation of a fan in a short time and guarantee the emergency operation of the system.

Fan Positions



When it is required to set the fan to emergency mode, set the DIP switch as follows:

Fan Emergency Operation DIP Switch (SA5_FAN-E)		
DIP1	DIP2	Remark
0	0	No fan in emergency operation mode
1	0	Shielding the operation of 1#

		fan
0	1	Shielding the operation of 2# fan

**Precautions:**

- A. When the DIP switch setting is not covered in the above scope, a DIP switch setting exception fault may occur.
- B. Only one fan can be set to emergency mode on a module.
- C. The default factory setting is “00”.
- D. The system cannot continually run for more than 120 hours in fan emergency operation status. Once 120 hours are exceeded, the entire unit will be forcibly stopped and the limited operation code “Ad” is displayed on the IDU.

**5) Outdoor Fan Static Pressure Setting DIP Switch (SA6\_ESP\_S)**

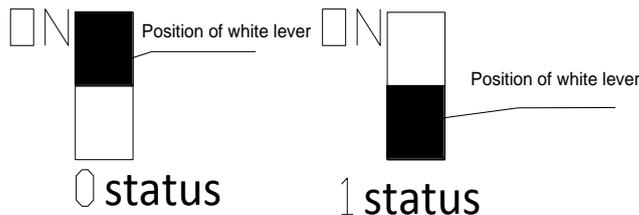
The outdoor fan static pressure setting DIP switch (SA6\_ESP\_S) is used in special locations such as the unit installation equipment room. In locations where air ducts are required to be connected, zero static pressure, low static pressure, medium static pressure, and high static pressure can be set according to the design of air ducts. The setting methods are as follows:

Outdoor Fan Static Pressure Setting DIP Switch (SA6_ESP_S)		
DIP1	DIP2	Static Pressure Range
0	0	0Pa
1	0	30Pa
0	1	50Pa
1	1	80Pa

The default factory setting is “00”.

**6) Explanation of DIP switch positions**

On the DIP switch, “ON” indicates “0” status and the opposite direction indicates “1” status. The position of white lever indicates the position to be set to.



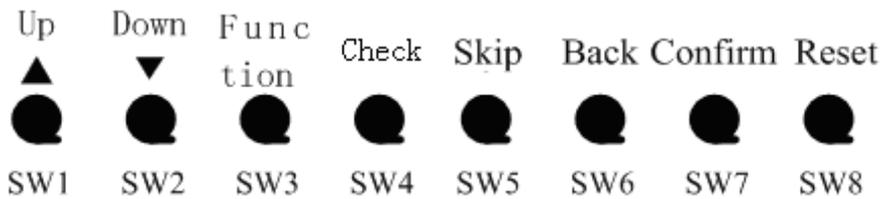
**5.1.2 System Function Button Operations**

**Notes:**

- ① System function settings and inquiry must be performed after commissioning of the entire unit.
- ② System function settings and inquiry can be used no matter whether the entire unit runs.

**5.1.2.1 Introduction to Function Buttons**

The main board AP1 of the outdoor unit consists of eight function buttons:



Function Button Name and Meaning		
Button	Code	Function Meaning
SW1	UP	Indicates the upward selection button.
SW2	DOWN	Indicates the downward selection button.
SW3	FUNCTION	Indicates the function button, used for function settings.
SW4	CHECK	Indicates the inquiry button, used for function inquiry.
SW5	SKIP	Indicates the skip button.
SW6	BACK	Indicates the return button, used to return to the upper-level menu.
SW7	CONFIRM	Indicates the confirmation button.
SW8	RESET	Indicates the reset button, used to restore factory settings.

### 5.1.2.2 Introduction to Functions

#### 1) List of functions

Function Code	Function Name	Function Meaning	Factory Settings		Remarks
			Code	Meaning	
A2	Refrigerant recovery operation	Fully or partially recovers refrigerants in a faulty module or	—	—	It can only be set.
A6	Unit cooling/heating function	Sets the unit to cooling/heating, cooling only, heating only or air supply mode for centralized management.	n	Cooling/heating function	It can be set and inquired
A7	Outdoor silent mode	Sets different silent modes to meet users' requirements.	1	10 kinds of silent modes	It can be set and inquired.
A8	Aftersales vacuuming mode	Automatically enables all electronic expansion valves and valves and electromagnetic valves during maintenance to guarantee vacuum processing in all pipelines.	—	—	It can only be set.
n0	Conservation control 1	Automatically decreases the power consumption of the unit according to system operation parameters.	0	No automatic conservation settings.	It can be set and inquired.
n3	Forcible defrosting operation	Forcibly enables ODU defrosting operation.	—	—	It can only be set.
n4	Conservation control 2	Forcibly decreases the maximum power consumption of the unit	0	No capacity output limitation	It can be set and inquired.

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			settings	
n5	Indoor unit project number offset	Prevents IDU project number conflicts when different refrigerating systems are controlled in a centralized manner.		It can only be set.
n6	Fault inquiry	Inquire historical fault information of the ODU.		It can only be inquired.
n7	Parameter inquiry	Inquire real-time operation parameters of the ODU.		It can only be inquired.
n8	Indoor unit project number inquiry	Displays address of all IDUs via ODU		It can only be inquired.
n9	Online IDU quantity inquiry	Display the quantity of online IDUs.		It can only be inquired.
nb	Outdoor unit bar code function inquiry	Inquire the entire unit bar code and controller barcode of outdoor unit	—	It can only be inquired.

**2) Description of Functions**

**(1) A2 Refrigerant recovery operation**

This function partially recovers refrigerants in a faulty module or IDU pipeline during unit maintenance. The refrigerant recovery volume of each basic module is as follows:

Model of ODU	Maximum Refrigerant Recovery Volume (kg)
GMV-S224W/A-X	7.5
GMV-S280W/A-X	7.5

Refrigerant recovery operating mode is refrigerant recovery mode of pipelines of indoor unit.

Refrigerant Recovery Mode Code	Refrigerant Recovery Mode Name	Remarks
01	Indoor unit pipeline refrigerant recovery	This mode is selected when an IDU fails and it is required to recover refrigerants from the IDU pipeline.

When this function is enabled, the ODU automatically starts and recovers refrigerants to the ODU or IDU pipeline.

**(2) A6 Unit cooling/heating function**

This function sets operation modes of the entire unit, including:

Function Mode of ODU		Operation Mode of IDU
Code	Name	
nA	Cooling/heating	Cooling mode, dry mode, heating mode, floor heating mode, heating water mode, and air supply mode, etc. (Notes: the heating/floor heating mode and cooling/dry

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		mode cannot operate at the same time)
nC	Cooling only	Cooling mode, dry mode, heating water mode, air supply mode, etc.
nH	Heating only	Heating mode, floor heating mode, heating water mode, air supply mode, etc. (Notes: heating mode and air supply mode cannot operate at the same time)
nF	Air supply	Air supply mode.

The user or administrator can set operation modes of the ODU according to actual situations to prevent conflicts.

When it is required to set different refrigerating systems to the same functional mode, set the master system according to the above requirements. For the master system settings, please see the “Centralized Control Address DIP Switch (SA2\_Addr-CC)”.

**(3) A7 Outdoor silent mode**

This function is used when users require lower environment noises, including night-time automatic silent mode and forcible silent mode.

For the night-time automatic silent mode, the system can automatically judges the highest daytime environment temperature and then starts silent operations in a certain interval to guarantee night-time low-noise operation. There are nine types of night-time automatic silent modes for selection:

Silent Mode	Code	Starting the Silent Mode X Hours after the Daytime Temperature Reaches the Highest	Stopping the Night-time Silent Mode after Continual Operations for Y Hours	Noise Degree
Mode 1	01	6	10	Low-noise mode
Mode 2	02	6	12	
Mode 3	03	8	8	
Mode 4	04	8	10	
Mode 5	05	10	8	
Mode 6	06	10	10	
Mode 7	07	4	14	
Mode 8	08	6	8	Low and medium noise mode
Mode 9	09	12	10	Superlow-noise mode

Note: The highest daytime temperature is generally in 13:00-15:00.

For the forcible silent mode, the system runs in low-noise mode no matter in the daytime or night-time. The forcible silent mode fails in three categories:

Silent Mode	Code	Noise Degree
Mode 10	10	Low-noise mode
Mode 11	11	Low and medium noise mode
Mode 12	12	Superlow-noise mode

Notes: The system capacity may fall off after the silent mode is set. Therefore, try to balance the noise with the capacity in selecting a silent mode category. The factory setting is “00”.

**(4) A8 Aftersales vacuuming mode**

This function ensures the vacuum degree of the entire system during maintenance to prevent operation functions of dead zones. Expansion valves and electromagnetic valves of the unit will be enabled after this function is set.

(5) nO Conservation control 1

System conservation is set when conservation operations are required. The default factory setting is capacity priority control mode. The system capacity may fall off after the conservation mode is set.

Code	Function Name
01	Conservation control – invalid (factory settings)
02	Conservation control – valid

(6) n3 Forcible defrosting operation

This function is set when forcible defrosting is required for the unit during maintenance. After this function is enabled, the system automatically quits according to quitting conditions and then automatically runs based on system conditions.

(7) n4 Conservation control 2

The highest capacity output limitation is set when users require forcibly limiting the system power consumption. The setting scope is as follows:

Code	Highest Output Capacity
10	100% (factory settings)
09	90%
08	80%
07	70%

Note: The cooling or heating effect may fall off after the capacity limitation is set.

(8) n5 Indoor unit project number offset

This function sets the IDU project number when multiple refrigerating systems are controlled in a centralized manner (by using a remote monitor or centralized controller), avoiding the same project number between different systems. If the project number is not set, project number conflicts may occur among systems.

This function only needs to be set on the master system, which is the system with the centralized control address SA2 DIP switch being “00000”. For details, see the “Centralized Control Address DIP Switch (SA2\_Addr-CC)”.

(9) n6 Fault inquiry

This function inquires historical faults of the system. Up to five historical faults can be memorized in time order.

(10) n7 Parameter inquiry

This function inquires operation parameter of each module of the ODU in real time.

(11) n8 Indoor unit address inquiry

This function inquires addresses of all IDUs through one operation of the ODU.

(12) n9 Online IDU quantity inquiry

This function inquires the quantity of online IDUs through the ODU.

### 5.1.3 Function Setting Operations

Step 1: Open the commissioning window of the master unit panel;

Step 2: Power on the entire unit;

Step 3: Press “SW3” on the master unit to enter the to-be-selected status of function settings.

By default, the master unit is displayed as below:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode
A7	Flicker	00	Flicker	00	Flicker

Users can select corresponding functions by pressing “SW1 (UP)” or “SW2 (DOWN)” on the master unit, including:

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LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode
A7	Flicker	00	Flicker	00	Flicker
A6	Flicker	00	Flicker	00	Flicker
A2	Flicker	00	Flicker	00	Flicker
A8	Flicker	00	Flicker	00	Flicker
n0	Flicker	01	Flicker	00	Flicker
n3	Flicker	00	Flicker	00	Flicker
n4	Flicker	00	Flicker	00	Flicker
n5	Flicker	00	Flicker	00	Flicker

After selecting the functions to be set, press SW7 to confirm entering function settings. The master unit is displayed as below:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode
A7	On	00	Flicker	OC	Flicker
A6	On	nC	Flicker	nC	Flicker
A2	On	01	Flicker	00	Flicker
A8	On	00	Flicker	OC	Flicker
n0	On	01	Flicker	OC	Flicker
n3	On	00	Flicker	00	Flicker
n4	On	10	Flicker	OC	Flicker
n5	On	00	Flicker	OC	Flicker

Then go to step 4 to set corresponding functions. Step 4: Set function parameters. Setting methods of function parameters are as below: A7 A7 Outdoor silent mode setting1A7

Step 1: Confirm entering the A7 outdoor silent mode settings. The master unit is displayed as below:

LED1		LED2		LED3	
Function Code	Display Mode	Silent Mode Code	Display Mode	Current Status	Display Mode
A7	On	00	Flicker	OC	Flicker

Step 2: Select a corresponding silent mode by pressing SW1 (UP) or SW2 (DOWN).

LED1		LED2		LED3	
Function Code	Display Mode	Silent Mode Code	Display Mode	Current Status	Display Mode
A7	On	00	Flicker	OC	Flicker
A7	On	01	Flicker	OC	Flicker
A7	On	02	Flicker	OC	Flicker
A7	On	03	Flicker	OC	Flicker
A7	On	04	Flicker	OC	Flicker
A7	On	05	Flicker	OC	Flicker
A7	On	06	Flicker	OC	Flicker
A7	On	07	Flicker	OC	Flicker
A7	On	08	Flicker	OC	Flicker
A7	On	09	Flicker	OC	Flicker

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A7	On	10	Flicker	OC	Flicker
A7	On	11	Flicker	OC	Flicker
A7	On	12	Flicker	OC	Flicker

Step 3: Press SW7 to confirm selecting the mode. The master unit is displayed as below:

LED1		LED2		LED3	
Function Code	Display Mode	Silent Mode Code	Display Mode	Current Status	Display Mode
A7	On	00	On	OC	On
A7	On	01	On	OC	On
A7	On	02	On	OC	On
A7	On	03	On	OC	On
A7	On	04	On	OC	On
A7	On	05	On	OC	On
A7	On	06	On	OC	On
A7	On	07	On	OC	On
A7	On	08	On	OC	On
A7	On	09	On	OC	On
A7	On	10	On	OC	On
A7	On	11	On	OC	On
A7	On	12	On	OC	On

On the master unit, press SW6 to return to the upper level (press SW6 in setting status to return to the upper level; press SW6 after settings are completed to resume to the normal operating status of the unit).

If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit resumes the current status.

The default factory setting is 00, that is, silent mode 10.

① A6 Unit cooling/heating function settings

Step 1: Confirm entering into the A6 unit cooling/heating function settings. The outdoor unit will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	ODU Function Mode Code	Display Mode	ODU Function Mode Code	Display Mode
A6	On	nC	Flicker	nC	Flicker

Step 2: Select a corresponding cooling/heating function by pressing SW1 (UP) or SW2 (DOWN).

LED1		LED2		LED3	
Function Code	Display Mode	ODU Function Mode Code	Display Mode	ODU Function Mode Code	Display Mode
A6	On	nC	Flicker	nC	Flicker
A6	On	nH	Flicker	nH	Flicker
A6	On	nA	Flicker	nA	Flicker
A6	On	nF	Flicker	nF	Flicker

Step 3: Press SW7 to confirm selecting the mode. The master unit is displayed as below:

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LED1		LED2		LED3	
Function Code	Display Mode	ODU Function Code	Display Mode	ODU Function Code	Display Mode
A6	On	nC	On	nC	On
A6	On	nH	On	nH	On
A6	On	nA	On	nA	On
A6	On	nF	On	nF	On

On the outdoor unit, press SW6 to return to the upper level (press SW6 in setting status to return to the upper level; press SW6 after settings are completed to resume to the normal operating status of the unit).

If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit resumes to the current status.

The default factory setting is nA cooling/heating.

A2 Refrigerant recovery operation settings

Step 1: After entering into the A2 refrigerant recovery operation settings, the master unit will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	Refrigerant Recovery Code	Display Mode	Current Status	Display Mode
A2	On	01	Flicker	00	Flicker

Step 2: The default setting is 01. Select 01 or 02 by pressing SW1 (UP) or SW2 (DOWN). Press SW7 to confirm selecting the mode.

On the outdoor unit, press SW6 to return to the upper level.

If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit resumes to the current status.

Step 3: Select 01 as in step 2 to enter into IDU refrigerant recovery. Digital LEDs and status LEDs of all basic modules will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	Refrigerant Recovery Code	Display Mode	Current Status	Display Mode
A2	On	01	On	[Module oow-pressure Ps]	On

LED3 shows the low-pressure value of a module. If the value is negative, LED3 circularly displays the negative code nE and the numeric value in every one second. For example, for -30C, LED3 alternately displays nE for one second and then 30 for another second.

Step 4: Close liquid-tube stop valves of all basic modules of the ODU. When the low-pressure value displayed in LED3 continually flickers, quickly close air-tube stop valves of all basic modules and then press SW7 on the master unit to confirm completing refrigerant recovery or power off the entire unit.

If no operations are performed after the low-pressure value displayed on LED3 continually flickers for three minutes, the entire unit will be forcibly stopped.

On the master unit, press SW6 to return to the upper level for resuming to the standby status of the entire unit (press SW6 in setting status to return to the upper level; press SW6 after settings are completed to resume to the normal operating status of the unit).

Notes:

Another startup is not allowed within 10 minutes after refrigerant recovery.

A8 aftersales vacuuming mode setting

Step 1: After entering into A8 aftersales vacuuming mode setting, the master unit will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode

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A8	On	00	Flicker	OC	Flicker
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Enter the to-be-confirmed status of system vacuuming mode settings.

Step 2: Press SW7 to confirm entering into the to-be-confirmed status of system vacuuming mode settings. All modules are displayed as below:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress	Display Mode	Current Status	Display Mode
A8	On	00	On	OC	On

Expansion valves and electromagnetic valves of all outdoor and IDUs are opened, and the entire unit cannot be enabled.

Press SW6 on the master unit to quit the vacuuming status. Alternatively, the entire unit quits the vacuuming status after 24 hours.

System conservation operation settings

Step 1: After entering into n0 system conservation operation settings, the master unit will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	Code	Display Mode	Current Status	Display Mode
n0	On	01	Flicker	OC	Flicker

Step 2: Select a corresponding mode by pressing SW1 (UP) or SW2 (DOWN).

LED1		LED2		LED3	
Function Code	Display Mode	Code	Display Mode	Current Status	Display Mode
n0	On	01	Flicker	OC	Flicker
n0	On	02	Flicker	OC	Flicker

Step 3: Press SW7 to confirm selecting the mode. The master unit will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	Code	Display Mode	Current Status	Display Mode
n0	On	01	On	OC	On
n0	On	02	On	OC	On

If no button operations are performed for five minutes, the function setting automatically quits and the unit restores the current status. (Press SW6 in setting status to return to the upper level; press SW6 after settings are completed to resume to the normal operating status of the unit.)

Forcible defrosting operation settings

Step 1: After entering into n3 forcible defrosting operation settings, the master unit will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/Mode	Display Mode	Current Status	Display Mode
n3	On	00	Flicker	00	Flicker

Step 2: Press SW7 to confirm entering into forcible defrosting, the master module will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/Mode	Display Mode	Current Status	Display Mode

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n3	On	00	On	00	On
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When the unit reaches defrosting quit conditions, the system automatically quits and resumes to the normal operation control.

**Highest capacity output limitation settings**

Step 1: After entering into n4 highest capacity output limitation setting, the master unit will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	Highest Output Capacity	Display Mode	Current Status	Display Mode
n4	On	10	Flicker	OC	Flicker

Step 2: Select a corresponding capacity limitation value by pressing SW1 (UP) or SW2 (DOWN).

LED1		LED2		LED3	
Function Code	Display Mode	Highest Output Capacity	Display Mode	Current Status	Display Mode
n4	On	10	Flicker	OC	Flicker
n4	On	09	Flicker	OC	Flicker
n4	On	08	Flicker	OC	Flicker
n4	On	07	Flicker	OC	Flicker

Step 3: Press SW7 to confirm selecting the mode. The master module will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	Highest Output Capacity	Display Mode	Current Status	Display Mode
n4	On	10	On	OC	On
n4	On	09	On	OC	On
n4	On	08	On	OC	On
n4	On	07	On	OC	On

If no button operation are performed on the master unit for five minutes, the function setting automatically quits and the unit resumes to the current status. (Press SW6 in setting status to return to the upper level; press SW6 after settings are completed to resume to the normal operating status of the unit.)

**Indoor unit project number offset setting**

Step 1: After entering into n5 indoor unit project number offset setting, the master unit will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/Mode	Display Mode	Current Status	Display Mode
n5	On	00	Flicker	00	Flicker

Step 2: Press SW7 to send the project number offset command. The master module will display as below:

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LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/Mode	Display Mode	Current Status	Display Mode
n5	On	00	On	OC	On

After 10 seconds later, the system quits this mode and resumes to the normal operation mode.

Note: This function only needs to be operated on the master system, which is the system with the centralized control address SA2 DIP switch being 00000. For details, see the Centralized Control Address DIP Switch (SA2\_Addr-CC).

### 5.1.4 Function Inquiry Operation

Step 1: Open the commissioning window of the master unit panel.

Step 2: Power on the entire unit.

Step 3: Press SW4 on the master unit to enter into inquiry status;

Step 4: Select a function to be inquired by pressing SW1 (UP) or SW2 (DOWN) on the master unit. By default, the A7 outdoor silent mode will display for inquiry.

For example, select the A6 unit cooling/heating function. The display is as below:

LED1		LED2		LED3	
Function Code	Display Mode	ODU Function Code	Display Mode	ODU Function Code	Display Mode
A6	On	nA	On	nA	On

Step 5: If the n8 IDU address inquiry is selected, the display is as follows. Enter the to-be-confirmed status of IDU project number inquiry.

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/Mode	Display Mode	Current Status	Display Mode
n8	Flicker	00	Flicker	00	Flicker

Press “SW7” and select the IDU project number inquiry on the master unit. The master unit will display as below:

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/Mode	Display Mode	Current Status	Display Mode
n8	On	00	On	00	On

Regardless of the current display status of wired controllers or display panels of all IDUs, the current display status are all switched to the IDU project number. However, it will not influence the settings and operation status of outdoor and IDUs.

此 On the master unit, press “SW6” to return to the upper level. The IDU retains the project number display status.

On the master unit, press and hold “SW6” to quit the address display status for all IDUs and return to the upper level.

If no quit button operations are performed on the master unit for 30 minutes, the function setting automatically quits and the unit resumes to the current status.

Step 6: If the n9 IDU address inquiry is selected, the display will as below:

LED1		LED2		LED3	
Function Code	Display Mode	Quantity of IDUs (kilobit and hundred-bit)	Display Mode	Quantity of IDUs (Ten-bit and one-bit)	Display Mode

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n9	On	00	On	00	Flicker
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The nixie tube of LED2 displays kilobit and hundred-bit, nixie tube of LED3 displays ten-bit and one-bit. For example, if the quantity of IDUs is 75, "0075" is displayed.

If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit resumes to the current status.

Notes: The online IDU quantity inquiry function can only inquire quantity of IDU (including hydro box) of cooling only system.

Step 7: If the n6 fault inquiry is selected, it will display as below and enter into the to-be-confirmed status of fault inquiry.

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/Mode	Display Mode	Current Status	Display Mode
n6	Flicker	00	Flicker	00	Flicker

Press "SW7" on the master unit to confirm fault inquiry.

Press SW1 (UP) or SW2 (DOWN), LED3 will alternately display the historical fault code and module address in an interval of one second in the sequence of fault records. LED2 will display the fault sequence number. If there are no fault records, LED2 and LED3 will display "00" by default. Up to five historical faults can be inquired. The faults that can be inquired are as below:

Code		Code	
E1	High-pressure protection	P9	Inverter compressor out-of-step protection
E3	Low-pressure protection	C2	Communication failure between the master unit and inverter compressor driver
U4	Refrigerant shortage protection	P8	Over-high temperature protection of inverter compressor driver module
E2	Discharge low-temperature protection	P7	Temperature sensor failure of inverter compressor driver module
J9	Over-low pressure ratio protection	PF	Charge circuit failure of inverter compressor driver
J8	Over-high pressure ratio protection	HL	DC bus bar over-low voltage protection of inverter outdoor fan driver
J7	Four-way valve leakage protection	HH	DC bus bar over-high voltage protection of inverter outdoor fan driver
E5	High-temperature protection of compressor 1	H6	IPM Inverter outdoor fan driver IPM module protection
E6	High-temperature protection of compressor 2	HJ	Inverter outdoor fan startup failure
J2	Over-current protection of compressor 2	HE	Inverter outdoor fan phase lacking protection
EU	Top high-temperature protection of compressor 1	H3	Inverter outdoor fan driver module reset
Eb	Top high-temperature protection of compressor 2	H5	Inverter outdoor fan over-current protection
PL	DC bus bar over-low voltage protection of inverter compressor driver	HC	Current detection circuit failure of inverter outdoor fan driver
PH	DC bus bar over-high voltage protection for inverter	H9	Inverter outdoor fan out-of-step protection

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	compressor driver		
P6	IPM module protection of inverter compressor driver	C3	Communication failure between the master unit and inverter outdoor fan driver
PJ	Inverter compressor startup failure	H8	Over-high temperature protection of inverter outdoor fan driver module
PE	Inverter compressor phase lacking protection	H7	Temperature sensor failure of inverter outdoor fan driver module
P3	Inverter compressor driver module reset		
P5	Inverter compressor over-current protection		
PC	Current detection circuit failure of inverter compressor driver		

The display are as below:

LED1		LED2		LED3	
Function Code	Display Mode	Fault Sequence	Display Mode	Current Status	Display Mode
n6	On	01	On	Corresponding historical fault/module address	Alternately display
n6	On	02	On		Alternately display
n6	On	03	On		Alternately display
n6	On	04	On		Alternately display
n6	On	05	On		Alternately display

If there are less than five historical faults, LED2 and LED3 display “00” indicating there are no more historical faults after the last fault is displayed.

Under fault inquiry status, press and hold “SW7” for five seconds to clear all historical faults of the ODU.

Step 8: If the n7 parameter inquiry is selected, the display is as below. The unit enters into to-be-confirmed status of parameter inquiry.

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/Mode	Display Mode	Current Status	Display Mode
n7	Flicker	00	Flicker	00	Flicker

On the master unit, press “SW7” to confirm parameter inquiry and enter into module confirmation status for parameter inquiry. The display is as below:

LED1		LED2		LED3	
Function Code	Display Mode	Module Address	Display Mode	Current Status	Display Mode
n7	On	01	Flicker	00	Flicker

Select corresponding outdoor unit for inquiry by pressing SW1 (UP) or SW2 (DOWN) and then press SW7 to confirm. The display is as below:

LED1	LED2	LED3
------	------	------

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Function Code	Display Mode	Parameter Code	Display Mode	Current Status	Display Mode
n7	On	XX	On	Parameter value	Flicker

LED2 displays the parameter code of the module and LED3 displays the parameter value. Parameters are displayed in the following sequence. By default, the outdoor ambient temperature value is displayed. Select a corresponding parameter value by pressing SW1 (UP) or SW2 (DOWN).

Parameter Code	Parameter Name	Remarks
01	Outdoor ambient temperature	
02	Operating frequency of compressor 1	
03	Operating frequency of compressor 2	
04	Operating frequency of outdoor fan	
05	Module high-pressure	
06	Module low-pressure	
07	Discharge temperature of compressor 1	
08	Discharge temperature of compressor 2	
09	Discharge temperature of compressor 3	GMV Unic This parameter is invalid for the GMV Unic series
10	Discharge temperature of compressor 4	GMV Unic This parameter is invalid for the GMV Unic series
11	Discharge temperature of compressor 5	GMV Unic This parameter is invalid for the GMV Unic series
12	Discharge temperature of compressor 6	GMV Unic This parameter is invalid for the GMV Unic series
13	Operating frequency of compressor 3	This parameter is invalid for the GMV Unic series
14	Current value of compressor 1	
15	Current value of compressor 2	
16	Current value of compressor 3	This parameter is invalid for the GMV Unic series
17	Current value of compressor 4	This parameter is invalid for the GMV Unic series
18	Current value of compressor 5	This parameter is invalid for the GMV Unic series
19	Current value of compressor 6	This parameter is invalid for the GMV Unic series

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20	Reserved	
21	Module temperature of compressor 1	
22	Module temperature of compressor 2	
23	Module temperature of outdoor fan 1	
24	Module temperature of outdoor fan 2	
25	Outdoor unit heating EXV1	
26	Outdoor unit heating EXV 2	
27	Subcooler EXV	
28	Defrosting temperature	
29	Liquid-extracting temperature of subcooler	
30	Outlet temperature of steam separator	
31	Oil return temperature	This parameter is invalid for the GMV Unic series
32	Inlet-tube temperature of condenser	
33	Outlet temperature of condenser	

Notes:

① If a parameter value is negative, LED3 will circularly display the negative code “nE” and the numeric value at every one second. For example, for -30°C, LED3 will alternately display “nE” for one second and then “30” for another second.

② The discharge temperature and ambient temperature will be displayed as four-digit values, circularly displaying the higher two digits and then the lower two digits. For example, if 01 and 15 are alternately displayed, it indicates 115°C. If nE, 00, 28 are alternately displayed, it indicates -28°C.

③ If a parameter is invalid for the unit, “00” is displayed. If no button operations are performed on the master unit for five minutes, the function setting will automatically quit and the unit will resumes to the current status.

Step 9: If the “nb ODU barcode inquiry” is selected, it will display as below and enter into “to-be-confirmed status of ODU barcode inquiry”.

LED1		LED2		LED3	
Function Code	Display Mode	Current Progress/Mode	Display Mode	Current Status	Display Mode
nb	Flicker	00	Flicker	00	Flicker

Press SW7 on the master unit to enter into the next-level menu selection. The display is as below:

LED1		LED2		LED3	
Function Code	Display Mode	Module Address	Display Mode	Current Status	Display Mode
nb	On	01	Flicker	00	Flicker

Select corresponding outdoor unit for inquiry by pressing SW1 (▲) and SW2 (▼) and then press SW7 to confirm. The display is as below:

LED1		LED2		LED3	
------	--	------	--	------	--

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Function Code	Display Mode	Parameter Code	Display Mode	Current Status	Display Mode
nb	On	Un/Pc	Flicker	-n	Flicker

Notes: Un indicates the entire-unit barcode and Pc indicates the controller barcode.

After confirming the module, select a barcode sequence by pressing SW1 (▲) or SW2 (▼). The displayed sequence is as below:

Entire-unit barcode (1-13 bits) and controller barcode (1-13 bits), that is, entire-unit barcode header → entire-unit barcode (1-6 bits) → entire-unit barcode (7-12 bits) → entire-unit barcode (13 bit) → controller barcode header → controller barcode (1-6 bits) → controller barcode (7-12 bits) → controller barcode (13 bit). The display is as below:

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
Barcode	On	Barcode	On	Barcode	On

Example:

N1R0128150066

Barcode of entire-unit: N1R0128150066

N1M0128150067

Barcode of controller: N1M0128150067

Display sequence is as below:

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
nb	On	Un	Flicker	-n	Flicker

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
N1	On	R0	On	12	On

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
81	On	50	On	06	On

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
6X	On/Off	XX	Off	XX	Off

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
nb	On	Pc	Flicker	-n	Flicker

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
N1	On	M0	On	12	On

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
81	On	50	On	06	On

LED1		LED2		LED3	
Parameter Code	Display Mode	Parameter Code	Display Mode	Parameter Code	Display Mode
7X	On/Off	XX	Off	XX	Off

If a parameter is invalid for the unit, "00" is displayed.

On the master unit, press SW6 to return to the upper level if there are two levels of menu. Press SW4 to quit the inquiry status.

If no button operations are performed on the master unit for five minutes, the function setting automatically quits and the unit resumes to the current status.

Step 10: In inquiry status, press SW4 to quit the status.

### 5.1.5 Resuming Factory Settings

Resuming Factory Settings	Setting Method		
Resuming setting 1	Press and hold SW8 on the master unit for more than 10 seconds.	All the LEDs will flicker for three seconds.	All the factory settings of the ODU are resumed and the unit will wait for re-commissioning.
Resuming setting 2	Press and hold SW3 and SW8 on the master unit for more than 10 seconds.	All the LEDs will flicker for 5 seconds.	Re-commissioning is not required, The quantity of outdoor and indoor units is memorized. Addresses of outdoor and indoor units are all cleared. All the other functional settings are cleared.
Resuming setting 3	Press and hold SW5 and SW8 on the master unit for more than 10 seconds.	All the LEDs will flicker for 7 seconds.	Re-commissioning is not required. The quantity of outdoor and indoor units is memorized. Addresses of outdoor and indoor units retain the preceding settings. All the other functional settings are cleared.

## 5.2 Hydro Box (NRQD16G/A-S)

### 5.2.1 Functional Dial Switch of Hydro Box NRQD16G/A-S

Functional dial switches of unit are in S1 and S2 of mainboard AP1, the default factory settings are as below:



Code	Name	Meaning	Default Setting	Remarks
S1_capacity	Capacity Code	Nominal rated capacity of unit	Default	The default factory settings are completed, which cannot be changed.
S2_Function	Functional dial switch	Setting of equipments for connecting hydro box	1100	After finishing installing the unit, conduct dial switch setting according to actual connected equipment.

Instruction:

#### 1) Functional Dial Switch (S2\_Function)

The functional dial switch is four-digit: "1", "2", "3", "4", which respectively represent the following Gree water tank, floor heating, solar energy, self-made water tank. Each type of functional dial switch: dial "OFF" means the function is "connected", dial "ON" means the function is "disconnected".

"1" and "2" must be set according to actual engineering situation, "3" and "4" is not allowed to be changed arbitrarily, otherwise it may cause temperature sensor failure or the unit cannot operate normally.

Specific meanings are as below:

Serial No. of Dial Switch	Meaning	Dial Switch		Default Setting
		disconnected	connected	
1	Gree water tank	ON	OFF	OFF
2	Floor heating	ON	OFF	OFF
3	Solar energy	ON	OFF	ON
4	Self-made water tank	ON	OFF	ON

### 5.2.2 Functional Application of Hydro Box

Functions of hydro box covers user operation functions and engineering application functions. For user operation functions please refer to instruction manual of hydro box and wired controller.

Engineering application functions include:

SN	Function Name
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1	Engineering No. Inquiry and Setting
2	User Parameter Inquiry
3	User Parameter Setting
4	Engineering Parameter Inquiry
5	Engineering Parameter Setting

Engineering application functions can be operated via wired controller of hydro box (model: XK56).

### 5.2.2.1 Engineering Application Functions Operated via XK56 Wired Controller

#### **Engineering inquiry and setting of hydro box**

The setting is the same as inquiry and setting for engineering No. of indoor unit, as below:

##### 1. Engineering No. inquiry of a single indoor unit

Press and hold the “Function” button for five seconds in power-on or power-off status to enter into parameter inquiry interface “C00”. The timer area of wired controller will display the engineering No. of the current indoor unit. If the current wired controller works in one-to-many mode, the displayed indoor unit in the timer area is the unit with the minimum project No.;

##### 2. Inquiry for engineering No. of multiple indoor units

① Engineering No. inquiry of indoor units in one-to-many mode: press and hold the “Function” button for five seconds in power-on or power-off status to enter into parameter inquiry interface “C00”. Press “▽” to switch to “C01”, and then press the “Mode” button to enter to inquiry. The timer area displays engineering No. of indoor unit from small to large. Press “Δ” or “▽” to switch engineering number.

Notes: It is normal if the buzzer of the indoor unit operated by the wired controller rings. The purpose of ringing the buzzer is to facilitate engineering commissioning personnel to locate the indoor unit, especially for the indoor unit without any LED panel because it cannot display its engineering number.

② Engineering number inquiry of indoor units in the entire communication network: Press and hold “Function” button for five seconds in power-on or power-off status to enter into parameter inquiry interface “C00”. Press “▽” button to switch to “C18”, and then press “Mode” button to enter the inquiry. The timer area of wired controller of the whole network will display engineering No. of corresponding indoor unit.

Method for quitting inquiry:

Quit the “C18” inquiry interface;

Press the “ON/OFF” button on any wired controller in the network.

##### 3. Engineering No. Setting of Indoor Unit

Press and hold the “Function” button for five seconds in power-on or power-off status to enter into parameter inquiry interface “C00”. Continuously press the “Mode” button for three times, and then press and hold the “Function” button for five seconds to enter into engineering parameter setting interface. The temperature area displays “P00”. Press “▽” button to switch to “P42”.

A single indoor unit: press “Mode” button, the engineering No. in timer area flickers, press “Δ” or “▽” button to adjust engineering No., and then press “Enter” button to conform the setting and return to the upper-level menu.

One-to-many unit: Press the “Mode” button to enter into indoor unit selection menu. Press “Δ” or “▽” button to switch indoor unit, and press “Mode” button to set the engineering number of current indoor unit, as the above methods.

#### **User Parameter Inquiry**

User parameter can be inquired under power-on or power-off status.

1、 Press and hold the “Function” button for five seconds to enter into user parameter inquiry interface, the temperature area displays “C00”, and the “View” icon is on;

2、 Select a parameter code by pressing “▲” or “▼” button.

3、 Press “Enter/Cancel” button to return to the upper-level menu till quitting parameter inquiry.

User parameter inquiry list is as below:

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Table 2.1 User Parameter Inquiry List

Parameter Code	Parameter Name	Parameter Range	View Method
C00	Parameter setting ingress	-	Under "C00" status, the timer area displays the engineering number of the current hydro box; when one wired controller simultaneously controls multiple hydro boxes, it will only display the minimum engineering number.
C01	Inquiry of engineering number of indoor unit (hydro box) and locating of faulty indoor unit (hydro box)	1-255: online engineering number of indoor unit	<p>Operating method: Enter into inquiry: under "C01" status, press "Mode" button to enter into engineering number inquiry interface of hydro box, press "▲" or "▼" to switch engineering number of hydro box.</p> <p>Display mode: Temperature area: displays the current hydro box is faulty (it only displays the faulty hydro box, when there are more than on hydro boxes are faulty, temperature area will display alternately with an interval of 3 seconds); Timer area: (engineering numbers conflict C5 fault)/displays the engineering number of the current hydro box.</p> <p>Notes: "C01" inquiry will not automatically quit if it is overtime, it can only quit manually;</p>
C03	Quantity inquiry for indoor unit (including hydro box) of system network	1-80	Timer area: displays total quantity of indoor units (including indoor unit and hydro box) of the system
C06	Prior operation inquiry	00: general operation 01: prior operation	<p>Operating method: Enter into inquiry, under the "C06" status, press "Mode" button to enter into prior operation inquiry interface, press "" or "" button to switch number of hydro box.</p> <p>Display mode: Temperature area: displays engineering number of the current hydro box; Timer area: displays prior operating setting value of the current hydro box.</p>
C09	Inquiry of address of wired controller	01, 02	Timer area: displays address of the wired controller
C11	Quantity inquiry for one wired controller controls multiple indoor units (including hydro box) at the same time	1-16	Timer area: displays the quantity of indoor units (hydro box) controlled by wired controller.
C12	Outdoor ambient temperature inquiry	-	Timer area: displays ambient temperature of master outdoor unit

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C18	Engineering number inquiry for indoor unit (hydro box) of communication network	1~255	<p>Operating method: enter into the inquiry, under “C18” status, press “Mode” button to start engineering number inquiry of hydro box, the wired controller will enter into hydro box engineering number inquiry interface, press “▲” or “▼” to switch engineering number of hydro box.</p> <p>Display mode:</p> <p>Temperature area: displays serial number of the current hydro box;</p> <p>Timer area: displays engineering number of hydro box.</p> <p>Notes:</p> <p>① When turning on the engineering number inquiry for hydro box function, the timer area of wired controllers of the whole system network will display engineering number of hydro box controlled by each wired controller (if one wired controller controls multiple hydro boxes at the same time, it will display engineering number of different hydro boxes with an interval of 3 seconds);</p> <p>② Secondary wired controller cannot turn on or cancel the engineering number inquiry for hydro box</p> <p>Cancel method:</p> <p>① If user quit the “C18” inquiry interface manually, it will immediately cancel the inquiry;</p> <p>② If there is no operation for 20 minutes and it quits “C18” inquiry interface, press “ON/OFF” button under power-on or power-off status to cancel this function;</p> <p>③ After the function is started, use either one of wired controller in the same system network and press “ON/OFF” button under power-on or power-off status of unit can quit this function.</p>
C21	Inquiry of hot water temperature	0 ~ 100℃	<p>Operating method:</p> <p>Enter into the inquiry, under “C21” status, press “Mode” button to enter into water tank temperature inquiry interface, press “▲” or “▼” to switch engineering number of hot water generator.</p> <p>Display mode:</p> <p>Display of temperature area: engineering number of the current hydro box</p> <p>Display of timer area: hot water temperature of the current hydro box</p>

Notes:

Under parameter inquiry status, the buttons “function”, “timer”, “heating water/air conditioner/floor heating” are invalid.

**User parameter setting**

User parameter can be set under power-on or power-off status.

1. Press and hold “Function” button for five seconds, the temperature area displays “C00”, and then press and hold “Function” button for five seconds to enter into parameter setting interface of wired controller, then the temperature area displays “P00”.

2. Press “▲” or “▼” button can select parameter code, press “Mode” button to switch to

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parameter setting, then the parameter flickers, press “▲” or “▼” can adjust parameter value, and then press “Confirm/Cancel” button to complete the setting.

3. Press “Enter/Cancel” button can return to the upper level till quit the parameter setting.

User parameter setting list is as below:

User Parameter Setting List

Parameter Code	Parameter Name	Parameter Range	Default Value	Remarks
P13	Wired controller address settings	01: master wired controller 02: slave wired controller	01	When the two wired controllers simultaneously control one or more IDUs, the two wired controllers should use different addresses. The slave wired controller (address: 02) does not have the unit parameter setting function except its own address settings.
P14	Group-controlled IDU (hydro box) quantity settings	00: disabled 01-03: quantity of hydro box	01	This value is set according to the quantity of connected hydro box.
P43	Preferential operation settings	00: common operation 01: preferential operation	00	When power supply is insufficient, users are allowed to power on/off the hydro box with preferential operation and other hydro boxes are forcibly powered off.
P46	Whether the water tank standby thermal insulating function is allowed	00: allowed 01: not allowed	00	
P47	Water tank standby thermal insulating function temperature setting value	35 ~ 46°C	42°C	
P50	Sunflower thermal insulating water temperature setting	35 ~ 50°C	40°C	
P53	Hot water temperature auto setting revision value	-2 ~ 8°C	0°C	
P54	High temperature sterilization circulating days	0 ~ 60	0	When it sets as 0, the high temperature sterilization function setting is valid in the next time.
P55	High temperature sterilization advanced startup time	0~3 hours	1	
P56	Whether the hot water auxiliary	00: allowed 01: not allowed	00	

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	heating is turned on in normal operation			
P58	Whether the auto heat recovery is allowed	00: allowed 01: not allowed	00	
P59	Auto heat recovery water temperature setting	35 ~ 46°C	42°C	
P73	Whether the fast heating mode is allowed	00: allowed 01: not allowed	01	
P80	Whether floor heating auxiliary heating is allowed to start up	00: allowed 01: not allowed	00	
P81	Maximum setting value of floor heating water yielding temperature	40~52°C	45°C	

### Notes:

Under parameter setting status, “heating water/air conditioner/floor heating”, and “Timer” buttons are invalid. By pressing the “ON/OFF” button, users can return to the main interface but will not turn on/off the unit.

### Engineering parameter inquiry

Engineering parameters can be inquired in power-on or power-off status.

- 1) Press and hold “Function” button for five seconds to enter into engineering parameter inquiry interface. The temperature area displays “C00”, and “View” icon is on;
  - 2) Within five seconds after “C00” is displayed, continuously press the “Mode” button for three times in an interval within one second to enter into engineering parameter inquiry.
  - 3) Select a parameter code by pressing “▲” or “▼”.
  - 4) Press “Enter/Cancel” button to return to the upper level menu till quitting parameter inquiry.
- In the engineering parameter inquiry interface, users can also inquire user parameters.

The engineering parameter inquiry list is as below:

#### Engineering Parameter Inquiry List

Parameter Code	Parameter Name	Parameter Range	View Method
C00	Parameter setting ingress	-	Under “C00” status, timer area displays the engineering number of the current hydro box, when one wired controller controls multiple hydro boxes at the same time, it will only display the engineering number of hydro box with the minimum number;
C02	Water tank capacity inquiry	150 ~3500L	Operating method: Enter into the inquiry, under “C02” status, press “Mode” button to enter into water tank capacity inquiry interface, press “▲” and “▼” to switch hydro box. Display method:

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			<p>Display of temperature area: engineering number of the current hydro box</p> <p>Display of timer area: capacity of the current connected water tank.</p>
C05	Historical fault inquiry ingress of hydro box	Five historical faults	<p>Operating method:</p> <p>1. Enter into the inquiry, under “C05” status, press “Mode” button to enter into historical fault inquiry interface, press “▲” or “▼” button to switch engineering number of equipment. Press “Mode” button to switch serial No. of fault. Press “Enter/Cancel” button to return to the upper level.</p> <p>Display Mode:</p> <p>Temperature area: displays serial No. of fault and fault code</p> <p>Timer area: displays engineering number of equipment</p>
C10	Static pressure setting inquiry of outdoor unit	<p>00: 0Pa</p> <p>20: 20Pa</p> <p>50: 50Pa</p> <p>80: 80Pa</p>	<p>Operating method:</p> <p>Enter into the inquiry, under “C10” status, press “Mode” button to enter into static pressure setting inquiry interface of outdoor unit.</p> <p>Display mode:</p> <p>Temperature area: displays address of the current outdoor unit</p> <p>Timer area: display static pressure setting value</p>
C13	Outdoor unit network number inquiry	1~255	<p>Timer area: displays network number of the current outdoor unit</p>
C14	Temperature inquiry for inlet-tube temperature sensor of hydro box	-30~138℃	<p>Operating method:</p> <p>Enter into the inquiry, under “C14” status, press “Mode” button to enter into refrigerant inlet-tube temperature sensor inquiry interface, press “▲” or “▼” button to switch engineering number of equipment.</p> <p>Display mode:</p> <p>Temperature area: displays engineering number of the current equipment</p> <p>Timer area: displays temperature</p> <p>If there is only one equipment in HBS network, then under “C14” interface, timer area will directly display the temperature.</p>
C15	Temperature inquiry for refrigerant outlet temperature sensor of hydro box	-30~138℃	<p>Operating method:</p> <p>Enter into inquiry, under “C15” status, press “Mode” button to enter into refrigerant outlet temperature sensor inquiry interface, press “▲” or “▼” button to switch engineering number of equipment.</p> <p>Display mode:</p> <p>Temperature area: displays engineering number of the current equipment</p> <p>Timer area: displays temperature</p> <p>If there is only one equipment in the HBS network, then under the “C15” interface, timer area will directly display the temperature.</p>
C16	Opening degree inquiry	0~20	<p>Operating method:</p> <p>Enter into the inquiry, under “C16” status, press “Mode” button to</p>

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	of electronic expansion valve of hydro box		<p>enter into opening degree inquiry interface of electronic expansion valve, press “” or “” switch to switch engineering number of equipment.</p> <p>Display mode:</p> <p>Temperature area: displays engineering number of the current equipment.</p> <p>Timer area: display the opening degree</p> <p>If there is only one equipment in the HBS network, then under the “C16” interface, timer area will directly display opening degree of electronic expansion valve.</p>
C19	Temperature inquiry for water inlet temperature sensor of hydro box	-30~138℃	<p>Operating method:</p> <p>Enter into inquiry, under the “C19” status, press “Mode” button to enter into water inlet temperature sensor temperature inquiry interface, press “” or “” button to switch engineering number of equipment.</p> <p>Display mode:</p> <p>Temperature area: display engineering number of the current equipment</p> <p>Timer area: displays the temperature</p> <p>If there is only one equipment in the HBS network, then under the “C19” interface, timer area will directly display the temperature.</p>
C20	Temperature inquiry for water outlet temperature sensor of hydro box	-30~138℃	<p>Operating method:</p> <p>Enter into the inquiry, under the “C20” status, press “Mode” button to enter into water outlet temperature sensor temperature inquiry interface, press “” or “” button to switch engineering number of equipmet.</p> <p>Display mode:</p> <p>Temperature area: displays engineering number of the current equipment</p> <p>Timer area: displays temperature</p> <p>If there is only one equipment in the HBS network, then under the “C20” interface, timer area will directly display the temperature.</p>
n2	Capacity configuration ratio upper-limit of indoor/outdoor unit	<p>35:135%</p> <p>50:150%</p> <p>10: 110%</p>	<p>Temperature area: displays parameter code</p> <p>Timer area: displays setting value of capacity configuration ratio of the current indoor and outdoor units</p>
n6	Historical fault inquiry ingress of outdoor unit	Five historical faults	<p>Operating method:</p> <p>Enter into the inquiry, under the “n6” status, press “Mode” button to enter into outdoor unit fault code inquiry (when one wired controller controls multiple indoor units at the same time, it can only inquire the memorized fault with the minimum engineering number), press “” or “” button to switch serial number of fault. Press “Enter/Cancel” button to return to the upper level status.</p> <p>Display mode:</p>

GMV5 Home DC Inverter Multi VRF Units

			<p>Temperature area: displays serial number of fault and fault code (displays from left to right) (1~5, sorting order of faults are from old to new).</p> <p>Timer area: displays engineering number of outdoor unit.</p>																																							
n7	Parameter inquiry ingress of outdoor unit	01~13 25~29	<p>Operating method (n7 inquiry is not supported for the slave wired controller):</p> <p>Under the “n7” status, the timer area will not display. Press “Mode” button to enter into parameter inquiry of outdoor unit, the first bit in the temperature area (display bit of the outdoor unit module ID) flickers. Press “▲” and “▼” to switch the outdoor unit module ID. Press the “Mode” button to select an outdoor unit module. In this case, the first bit in the temperature area stops flickering, and the second and third bits in the temperature area display the parameter code. The timer area displays a corresponding parameter. Press “” or “” to switch the parameter code, and press “Enter/Cancel” button to return to the upper level menu.</p> <p>Display mode:</p> <p>Temperature area: displays module ID of outdoor unit and parameter code from left to right.</p> <p>Timer area: displays corresponding parameter to the right.</p> <table border="1"> <thead> <tr> <th>Parameter Code</th> <th>Parameter Name</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>Outdoor ambient temperature</td> <td>°C/°F</td> </tr> <tr> <td>02</td> <td>Operating frequency of compressor 1</td> <td>Hz</td> </tr> <tr> <td>03</td> <td>Operating frequency of compressor 2</td> <td>Hz</td> </tr> <tr> <td>04</td> <td>Operating frequency of outdoor fan</td> <td>Hz</td> </tr> <tr> <td>05</td> <td>High pressure of outdoor unit</td> <td>°C/°F</td> </tr> <tr> <td>06</td> <td>Low pressure of outdoor unit</td> <td>°C/°F</td> </tr> <tr> <td>07</td> <td>Discharge temperature of compressor 1</td> <td>°C/°F</td> </tr> <tr> <td>08</td> <td>Discharge temperature of compressor 2</td> <td>°C/°F</td> </tr> <tr> <td>09</td> <td>Discharge temperature of compressor 3</td> <td>°C/°F</td> </tr> <tr> <td>10</td> <td>Discharge temperature of compressor 4</td> <td>°C/°F</td> </tr> <tr> <td>11</td> <td>Discharge temperature of compressor 5</td> <td>°C/°F</td> </tr> <tr> <td>12</td> <td>Discharge temperature of compressor 6</td> <td>°C/°F</td> </tr> </tbody> </table>	Parameter Code	Parameter Name	Unit	01	Outdoor ambient temperature	°C/°F	02	Operating frequency of compressor 1	Hz	03	Operating frequency of compressor 2	Hz	04	Operating frequency of outdoor fan	Hz	05	High pressure of outdoor unit	°C/°F	06	Low pressure of outdoor unit	°C/°F	07	Discharge temperature of compressor 1	°C/°F	08	Discharge temperature of compressor 2	°C/°F	09	Discharge temperature of compressor 3	°C/°F	10	Discharge temperature of compressor 4	°C/°F	11	Discharge temperature of compressor 5	°C/°F	12	Discharge temperature of compressor 6	°C/°F
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				13	Operating frequency of compressor 3	Hz
				25	Outdoor unit heating EXV1 (Actual value = displayed value*10)	PLS
				26	Outdoor unit heating EXV2 (Actual value = displayed value*10)	PLS
				27	Subcooler EXV (Actual value = displayed value*10)	PLS
				28	Defrosting temperature	°C/°F
				29	Liquid-extracting temperature of subcooler	°C/°F
				30	Outlet temperature of steam separator	°C/°F
				31	Oil returning temperature	°C/°F
				32	Inlet-tube temperature of condenser	°C/°F
				33	Outlet-tube temperature of condenser	°C/°F
A6	Cooling/heating function of the entire unit	nA: cooling/heating nC: cooling only nH: heating only nF: air supply	Temperature area: displays parameter code Timer area: displays setting value of cooling/heating function of the current unit			
nb	Barcode inquiry of hydro box	0~9, A~Z, a~z,-	Operating method (nb inquiry is not supported for the slave wired controller) Under the “nb” status, timer area will display nothing. Press “Mode” button to enter into barcode inquiry, the temperature area displays “nb”, and engineering number in timer area flickers. Press “▲” and “▲” button to switch engineering number of indoor unit. Press “Mode” button to select an indoor unit, then the temperature area displays “Un”, timer area displays “-n”, press “” and “” buttons to display barcode of indoor unit and barcode of controller of indoor unit. Press “Enter/Cancel” button to return to the upper level status, the temperature area will display “nb”, and timer area will display the engineering number of indoor unit to be inquired. Press “Enter/Cancel” button again to return to the upper level. Display mode: Temperature area: nb/Un/Pc/Barcode. Timer area: -n/engineering number/barcode			