



VRF SYSTEM

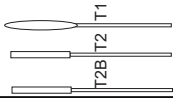
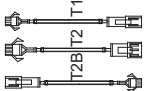
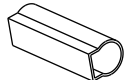
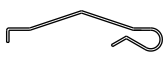
AHU Kit

Installation and Operating Manual

Please carefully read this manual before using, and keep this manual well for future reference. To protect your lawful rights and interests, your control box must be installed by a professional worker.

MY2025

Accessories

Accessories Name	Quantity	Shape	Purpose
Installation and Operating Manual	1		/
Wired controller	1		For control and parameter query
Wired controller connection cable	2		One 0.8m, and the other 10m
Temperature sensor	3		Detect AHU return air temperature or outlet air temperature, center temperature and outlet temperature of evaporator
Connection cable of temperature sensor	3		Extension connecting cables of sensors for return air temperature, center temperature and outlet air temperature of evaporator
Sensor sleeve	2		For sensors installation
Sensor shrapnel	2		Fasten the sensor

Installation precaution of wired controller

1. Do not drop or knock the controller.
2. Before installation, please test the wired controller to ensure it is within its receiving range.
3. The wired controller shall keep a distance of at least 1m from the nearest TV set or stereo equipment to prevent image interference or noise interference.
4. Do not install the wired controller under direct sunlight or near a heat source, such as a stove.

Explanation of nouns

T1: Return air temperature or outlet air temperature of AHU.

T2: Center temperature of AHU heat exchanger.

T2B: Outlet temperature of AHU heat exchanger.

CONTENTS

PAGE

1. Safety Precautions.....	1
2. AHU Kit Dimension and Selection.....	2
3. Pipeline Installation.....	4
4. Electrical Connection.....	10
5. Application Control.....	12
6. Parameter Query and Error Code	20
7. Appendix	21

1. Safety Precautions

Warning

- The installation work must be done by the dealer or a professional worker.
The installer must have relevant professional knowledge. Otherwise, it may cause wrong operation. Incorrect operation may cause fire, electric shock, injury, water leakage and other situations.
- If you plan to purchase related products locally, please purchase the products specified by our company
Once you purchase retail products (such as humidifiers) other than our designated products, it may cause fire, electric shock, water leakage, etc. In addition, special attention should be paid to retail products that should be installed by professionals.
- When the equipment is installed in a small room, effective protective measures should be taken to ensure that the refrigerant leakage concentration does not exceed the critical level in the room
- For detailed measures, please consult with the dealer.
- Connection of power supply shall meet the relevant regulations formulated by the local electrical authority.
According to relevant laws and regulations, grounding must be safe and reliable. If the grounding is not perfect, it may cause electric shock.
- If the air conditioner is to be moved or reinstalled, please let the dealer or a professional worker operate. Incorrect installation will cause fire, electric shock, injury or water leakage, etc.
- The user is not permitted to remodeling or repair the unit of own accord.
Incorrect repairing will cause fire risk, electric shock, injury, water leakage and other accidents, so repairing must be performed by the dealer or a professional worker.

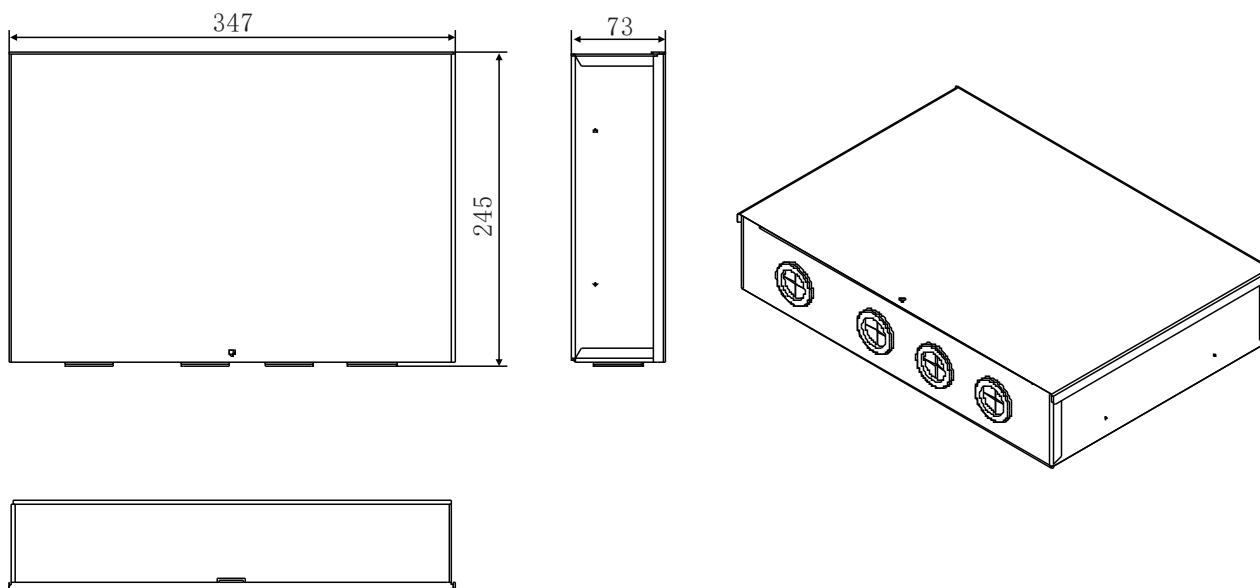
Attention

- Confirm whether the drain pipe can drain smoothly.
Improper installation of piping will cause water leakage, wetting of furniture and other problems.
- Confirm whether the current leakage protection switch is installed
The current leakage protection switch must be equipped or there may be an electric shock.
- The leakage protection switch must be installed, otherwise, it may cause electric shock.
If any inflammable gas leaks, there may be a fire risk around the AHU.
- Confirm whether the foundation and lifting installation are firm and reliable
If the foundation or suspension is not firm and reliable enough, there may be a fall accident.
- Confirm whether the cable is connected correctly
If any cable is incorrectly connected, any electrical part may be damaged.
- Before installation, if this unit is exposed to water or other moisture, its electrical components may be shorted. Do not store it in a damp basement or exposed to rain or water.
- In case of refrigerant leakage during installation, ventilate the room immediately. The leaked refrigerant may generate some toxic gas if it contacts any flame.
- If the air conditioner is installed in the metal part of the building, it must be electrically insulated according to the relevant standards
- After installation, confirm that there is no refrigerant leakage.
If the refrigerant gas enters and contacts some flame source such as a heater, a stove or an electric cooker, it may generate some toxic gas.
- Arising out of product improvement, this instruction is subject to any change without prior notice.

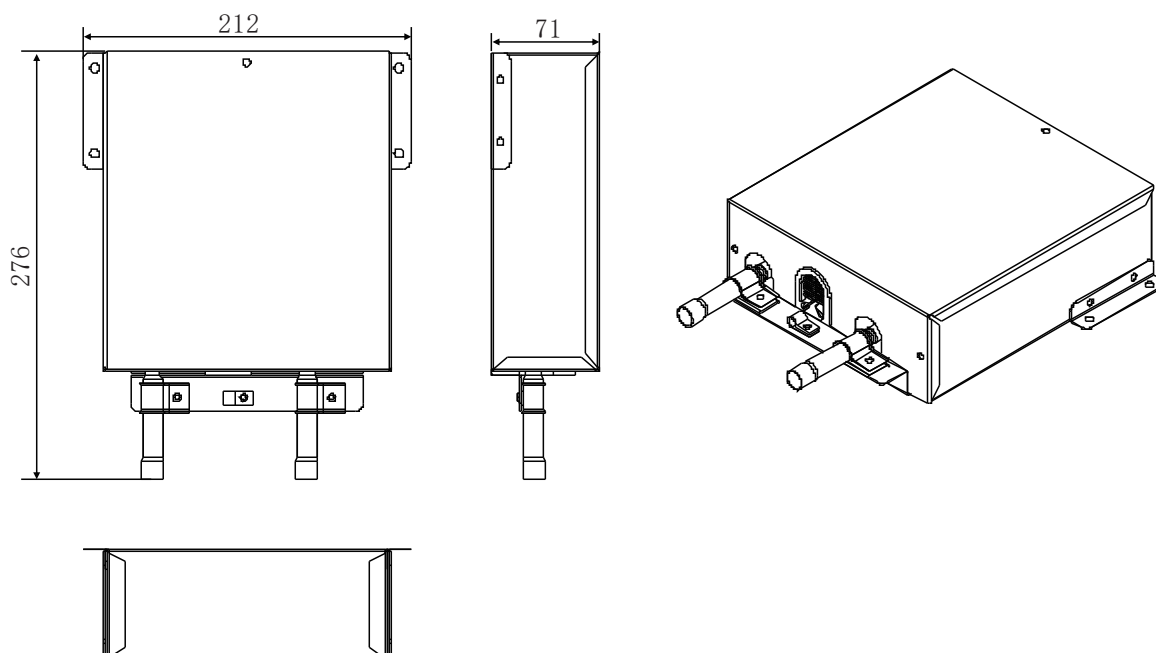
2. AHU Kit Dimension and Selection

2-1 AHU Dimensions

1. AHU Kit Dimensions



2. AHU EXV box dimensions



2. AHU kit dimension and selection

2-2 AHU Kit Selection

AHU Kit's electric control main board is the same one from 0.8HP to 120HP; one main board corresponds to one address; the HP of AHU capacity is set through SW1 of the main board and the DIP switch of SW5, and different AHU capacity is matched by matching with different EXV box, with the specific corresponding relationship as below:

SW5: 1-OFF; 2-OFF 				SW5: 1-OFF; 2-ON 				SW5: 1-ON (Reserved); 2-OFF  SW5: 1-ON (Reserved); 2-ON 			
SW1	Model	HP	Recommend model and quantity of EXV box	SW1	Model	HP	Recommend model and quantity of EXV box	SW1	Model	HP	Recommend model and quantity of EXV box
0	2.2kW	0.8HP	AHU Kit - EXV03 1 piece	0	28kW	10HP	AHU Kit - EXV14 1 piece	0	126kW	45HP	AHU Kit - EXV22 2 pcs
1	2.8kW	1HP		1	33.5kW	12HP		1	140kW	50HP	
2	3.6kW	1.2HP		2	40kW	14HP		2	154kW	55HP	
3	4.5kW	1.7HP	AHU Kit - EXV03 1 piece	3	45kW	16HP	AHU Kit - EXV22 1 piece	3	168kW	60HP	AHU Kit - EXV22 3 pcs
4	5.6kW	2HP		4	50kW	18HP		4	182kW	65HP	
5	7.1kW	2.5HP		5	56kW	20HP		5	196kW	70HP	
6	8.0kW	3HP		6	61.5kW	22HP		6	210kW	75HP	
7	9.0kW	3.2HP	AHU Kit - EXV07 1 piece	7	67kW	24HP	AHU Kit - EXV14 2 pcs	7	224kW	80HP	AHU Kit - EXV22 4 pcs
8	11.2kW	4HP		8	73kW	26HP		8	238kW	85HP	
9	14kW	5HP		9	78.5kW	28HP	AHU Kit - EXV22 2 pcs	9	252kW	90HP	
A	16kW	6HP		A	85kW	30HP		A	266kW	95HP	
B	20kW	7HP	AHU Kit - EXV14 1 piece	B	90kW	32HP		B	280kW	100HP	
C	22.4kW	8HP		C	95kW	34HP		C	294kW	105HP	
D	25.2kW	9HP		D	101kW	36HP		D	308kW	110HP	
E	25.2kW	9HP		E	106kW	38HP		E	322kW	115HP	
F	25.2kW	9HP		F	112kW	40HP		F	336kW	120HP	

3. Pipeline Installation

3-1 Precautions for Installation of AHU Kit

Attention

Installation may cause machine failure in the following places (if unavoidable, please consult):

- Places containing mineral oil such as cutting oil.
- Places with high salinity in the air such as sea air
- Place where corrosive gas is generated, such as hot spring area where sulfur gas is generated
- Places such as factories with severe power supply and voltage fluctuations.
- Places such as cars or cabins.
- Oil vapor-filled place such as kitchens
- Places with strong electromagnetic waves.
- Places where flammable gases or materials are present.
- Places where acidic or alkaline gases evaporate.
- Other places with special environmental conditions.
- This series of air conditioner is comfortable type. It should not be used in the machine room or places for storing precision instruments, food, animals and plants, artworks and other special purposes.

3-2 Requirements of connection length and drop height between AHU EXV box and indoor and outdoor units

1. For the allowable length of piping, please refer to the outdoor unit manual.
2. For the allowable drop height of piping, please refer to the outdoor unit manual.
3. The length of the pipeline should generally not exceed 8m between the AHU EXV box and the AHU evaporator.

Notice:

- The AHU EXV boxes are only used for R410a refrigerant system, and can only be matched with the VRF outdoor unit as specified by our company;
- During the installation of connecting pipes, air, dust and other sundries shall be prevented from being intruded into the pipeline system;
- Corresponding connecting pipes can be installed only after the outdoor unit, AHU, the AHU EXV boxes and other parts are fixed;
- When installing the connecting pipe, it is necessary to keep it dry to prevent moisture from entering the pipeline system.
- The connecting copper pipe must be wrapped with insulation material (the thickness is usually more than 10mm, and the enclosed wet area is appropriately thickened).

3-3 AHU EXV boxes

Model	AHU-EXV03	AHU-EXV07	AHU-EXV14	AHU-EXV22
Inlet pipe size of liquid pipe	φ 9.52	φ 9.52	φ 12.7	φ 15.88
Outlet pipe size of liquid pipe	φ 9.52	φ 9.52	φ 12.7	φ 15.88

3-4 Recommended AHU piping specifications

For the gas-liquid pipings of parallel multiple AHU EXV boxes, recommended piping sizes is as follow according to the AHU capacity:

AHU capacity (A×100W)	Liquid piping (mm)	Gas piping (mm)	AHU capacity (A×100W)	Liquid piping (mm)	Gas piping (mm)
A < 168	φ 9.52	φ 15.88	1040 ≤ A < 1540	φ 19.05	φ 38.1
168 ≤ A < 224	φ 9.52	φ 19.05	1540 ≤ A < 1800	φ 19.05	φ 41.2
224 ≤ A < 330	φ 9.52	φ 22.2	1800 ≤ A < 2450	φ 22.2	φ 44.5
330 ≤ A < 470	φ 12.7	φ 28.6	2450 ≤ A < 2690	φ 25.4	φ 54
470 ≤ A < 710	φ 15.88	φ 28.6	2690 ≤ A < 3584	φ 28.6	φ 54
710 ≤ A < 1040	φ 19.05	φ 31.8			

3. Pipeline Installation

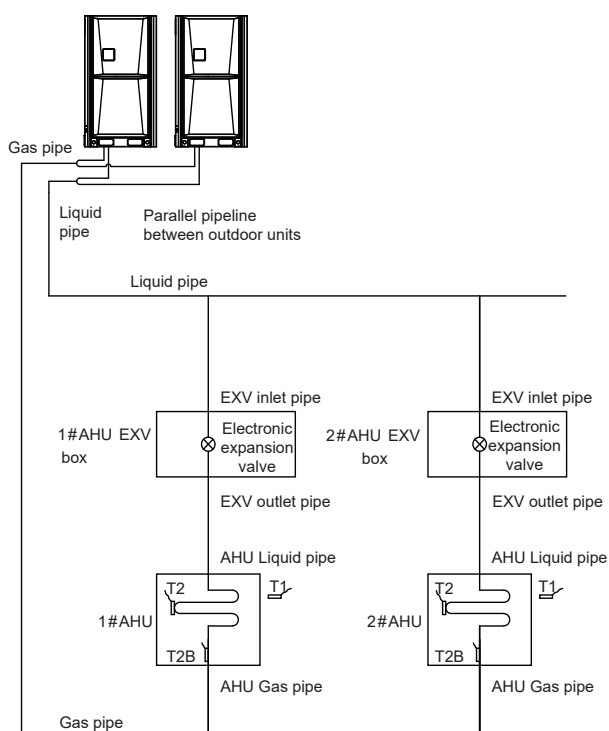
3-5 Typical recommended pipeline installation schemes

There are diversified installation schemes for AHU kit that is matched with the multi-split air conditioner and AHU. Aiming at different sizes of AHU heat exchangers, structure forms of heat exchangers, the number of inlet and outlet pipes of heat exchangers, the configuration and control of AHU fans, using requirements on actual users, etc., there are different combination and installation methods, where there are different using effects. The following is the common installation methods, and combination can be conducted on the basis of the following installation methods. For more detailed installation and design scheme, please consult manufacturers or technical managers of local manufacturers.

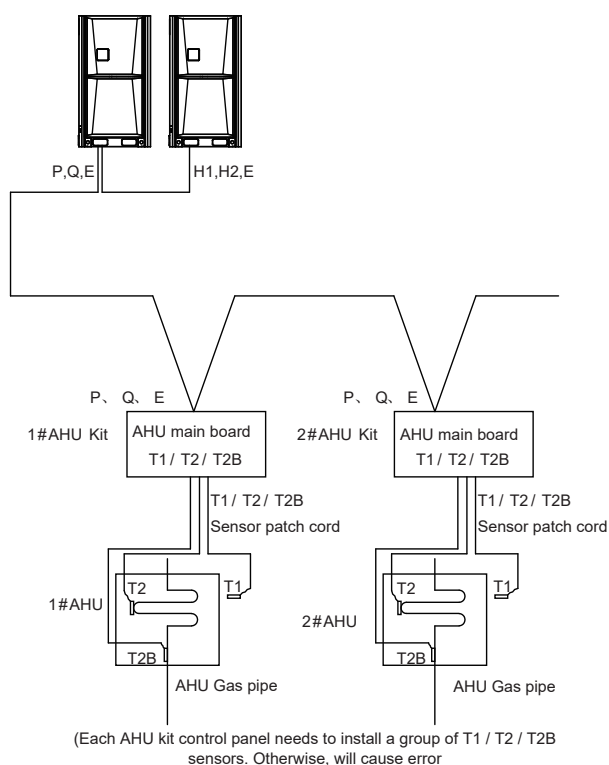
1. First installation diagram of pipelines, communication lines and sensors

This installation method is used for AHU, generally requires an AHU kit with an EXV box.

Pipeline installation diagram of first installation method



Installation diagram of communication line and AHU sensor for the first installation method

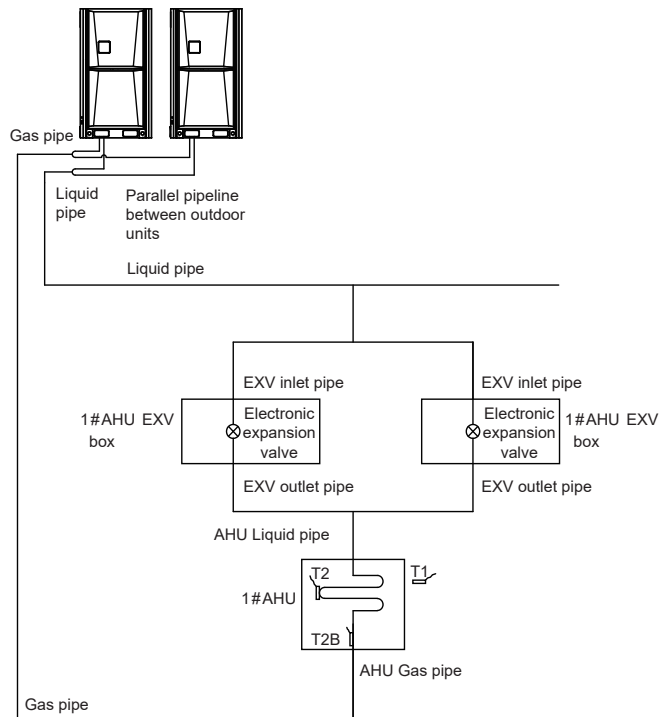


2. Second installation diagram of pipelines, communication lines and sensors

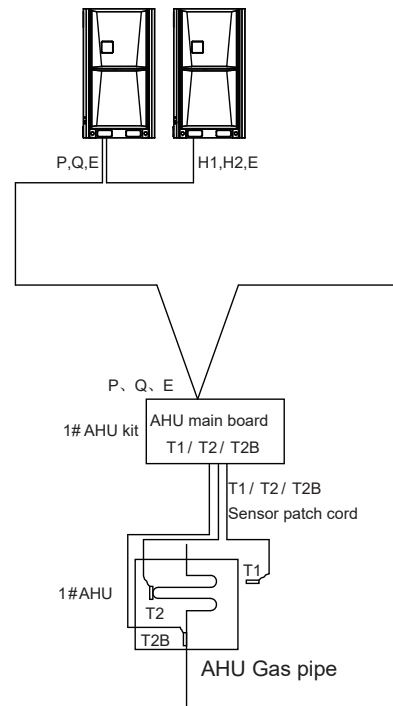
The installation methods are generally applied to the capacity of AHU below 120 HP, and one AHU Kit only needs to be selected. However, the boxes for the EXV matched with the capacity of AHU shall be connected in parallel, and the coils of all electronic expansion valves shall be controlled by this AHU Kit.

3. Pipeline Installation

Pipeline installation diagram of second installation method



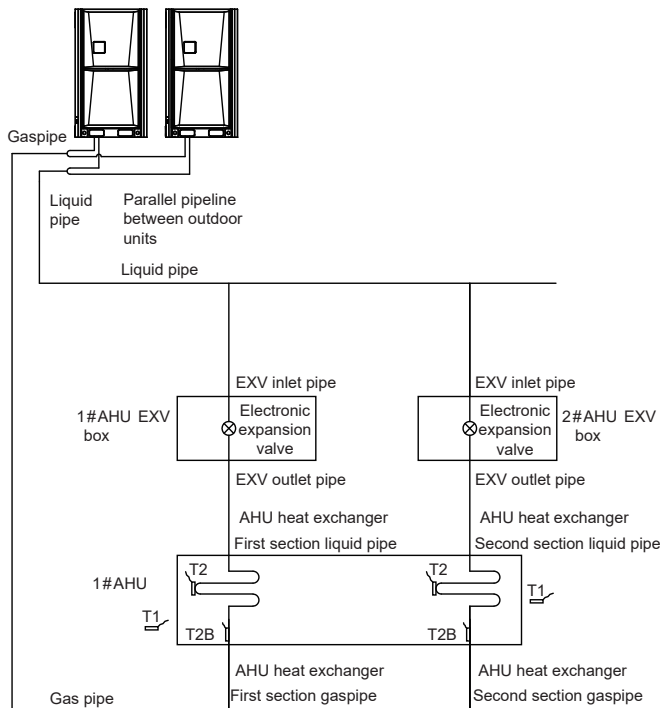
Pipeline installation diagram of communication line and AHU sensor of second installation method



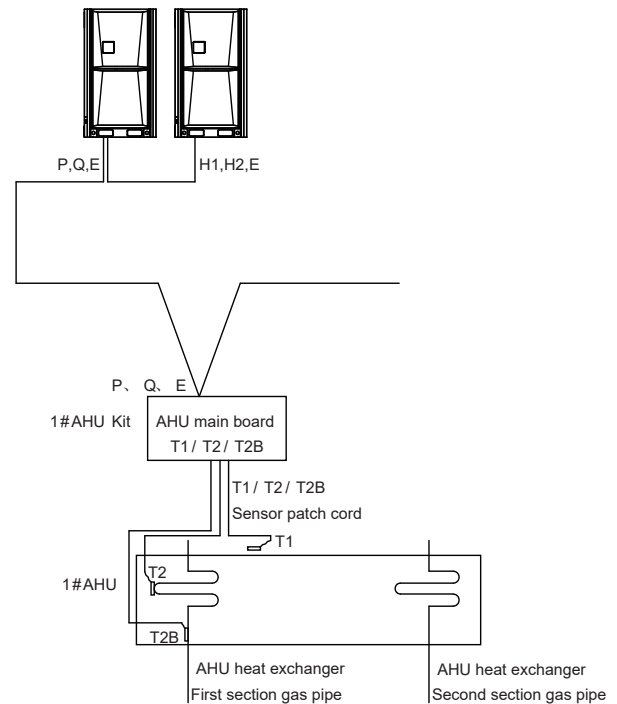
3. Third installation diagram of pipelines, communication lines and sensors

The installation method is generally applied to the capacity of AHU below 120 HP, and one AHU kit only needs to be selected. It is used to control the AHU whose heat exchanger is divided into several parts, and each part is equipped with one EXV box, EXV boxes are controlled by same AHU kit. And T2 & T2B only need to install in one part of the heat exchanger.

Pipeline installation diagram of third installation method



Installation diagram of communication line and AHU sensor of third installation method

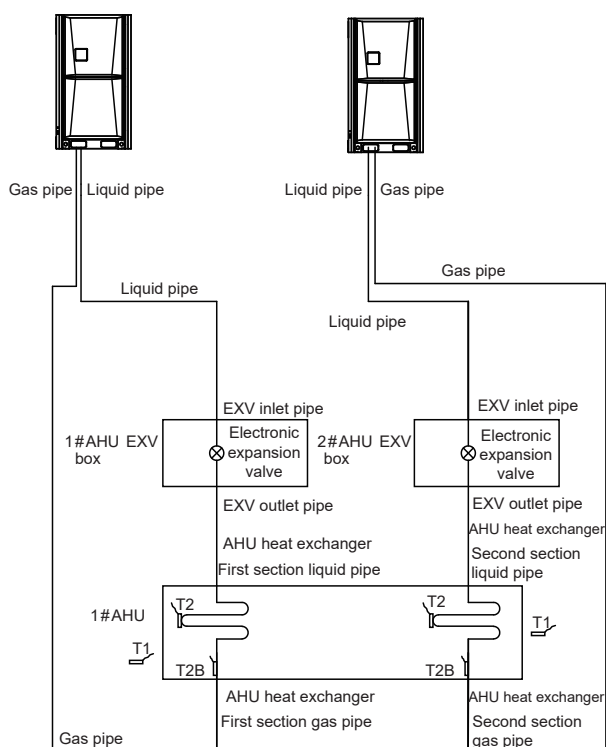


3. Pipeline Installation

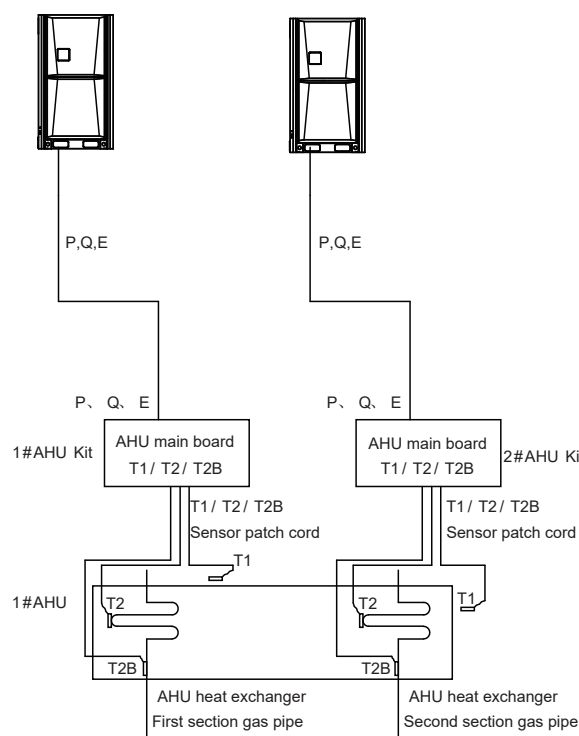
4. Fourth installation diagram of pipelines, communication lines and sensors

The heat exchangers of AHU for which the installation methods are generally applied are divided into multiple ones, each heat exchanger is connected into a set of individual system using a set of outdoor units and is connected in parallel with 1 box for the EXV or multiple EXV boxes to match with the capacity, and each set of system may be equipped with either 1 or multiple AHU Kit.

Pipeline installation diagram of fourth installation method

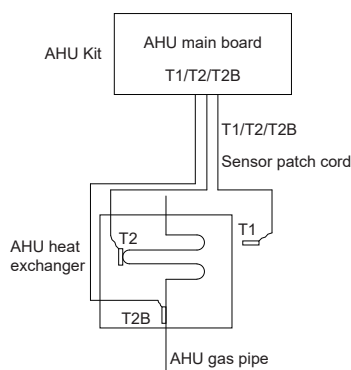


Pipeline installation diagram of communication line and AHU sensor of fourth installation method



3-6 AHU Kit sensor installation

1. The main board in each AHU Kit must be equipped with a set of temperature sensors of T1\T2\T2B; and if the capacity of the individual AHU kit is not large enough, resulting in multiple AHU Kits that need to be connected in parallel to be connected with the same AHU heat exchanger, the sensor of each AHU Kit also needs to be installed inside the AHU heat exchanger and connected to main board, or else, the AHU main board without the temperature sensors of T1\T2\T2B will give an alarm of sensor fault, and relevant controlling operation can't be conducted. The schematic diagram of T1, T2 and T2B installation is as follows:



3. Pipeline Installation

2. Installation position and function of T1, T2 and T2B temperature sensors

T1:

- 1) When select the target room ambient temperature computing control or 0-10V control, T1 sensor is working as the return air temperature sensor of the indoor unit, which is installed at the air return vent of the indoor unit for detecting the return air temperature of the indoor unit. The difference between the ambient temperature T1 and set temperature of the indoor unit affects the capacity demand of the indoor unit to the outdoor unit:

In cooling mode: When the return air temperature T1 of the indoor unit is below set temperature, the indoor unit will stop Indoor capacity demand will be 0;

In heating mode: When the return air temperature T1 of the indoor unit is above set temperature, the indoor unit will stop, and the Indoor capacity demand will be 0;

In addition, set the AHU kit as the fresh processor, and in cooling mode, at T1 temperature below 20°C, there is no capacity demand for the indoor unit, and the indoor unit is switched to the fan mode; and at T1 temperature above 50°C, there is no capacity demand for the indoor unit, the indoor unit is switched to OFF mode, and meanwhile, at T1 temperature above 43°C, the indoor unit runs forcibly at fan speed.

- 2) When select the target air supply temperature control, T1 sensor is working as air supply temperature control, T1 sensor is working as air supply temperature sensor of the indoor unit, which needs to be installed at the air supply vent of AHU to detect the air supply temperature of AHU.

T2:

T2 is the center temperature of the heat exchanger of the indoor unit, which is generally installed at the neutral position of certain flow passage of the heat exchanger of the indoor unit. It is working temperature in the cooling mode and evaporating temperature in the heating mode. The main uses are as follows:

In heating mode: It is used for detecting the center temperature of the heat exchanger to modify the outdoor actual output and adjust the indoor fan speed. In heating mode, the value T2 is lower, the actual output frequency the outdoor unit is increased, while the value T2 is higher, the actual output frequency the outdoor unit is decreased. In heating mode, if the value of T2 is below a certain set value, the indoor unit will be switched to low fan speed of OFF mode as anti-cold protection. The higher the T2, the smaller the Opening degree of EXV, the lower the T2, the larger the Opening degree of EXV.

In cooling mode: It is used for detecting the center temperature of the heat exchanger, achieving the over-low protection of the evaporating temperature of the indoor unit. When the T2 temperature is lower than the certain value, the indoor unit adopts low evaporation temperature protection, the Indoor capacity demand is set to 0, and the electronic expansion valve is closed.

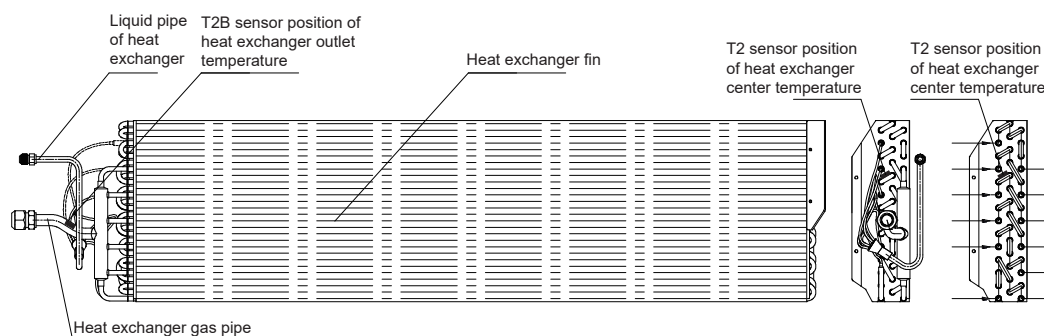
T2B:

T2B is the outlet temperature of the heat exchanger of the indoor unit, which is generally installed at the total gas pipe position of the heat exchanger of the indoor unit for detecting the outlet temperature of the heat exchanger of the indoor unit.

In cooling mode: The value T2B temperature is higher, the modification value of capacity demand for the actual output of the outdoor unit is increased, while the value T2B temperature is lower, the modification value of capacity demand for the actual output of the outdoor unit is decreased. The higher the T2B, the larger the Opening degree of EXV, the lower the T2B, the smaller the Opening degree of EXV.

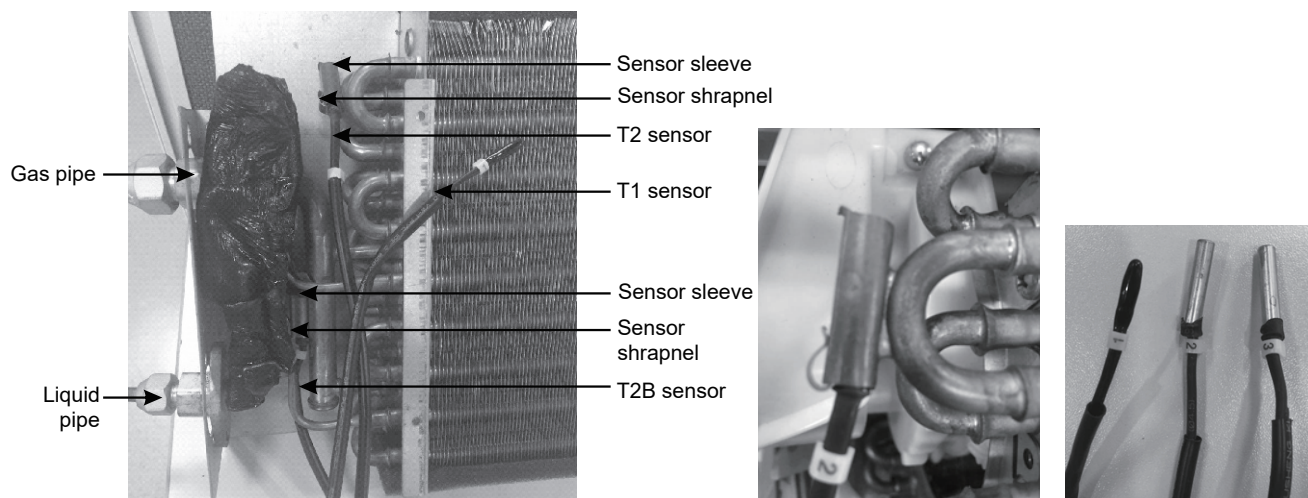
In heating mode: T2B does not participate in the system control operation.

The installation diagram of T1, T2 and T2B temperature sensors is as follows:

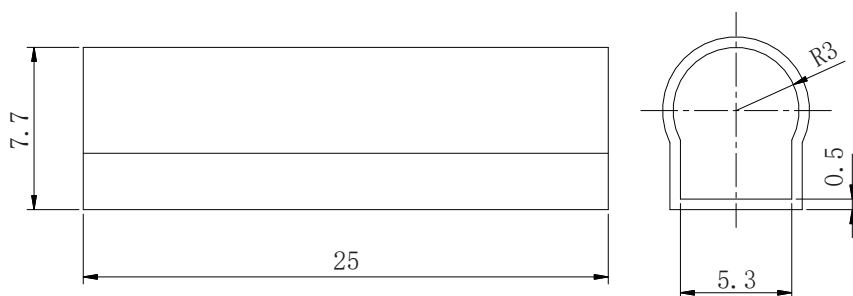


3. Pipeline Installation

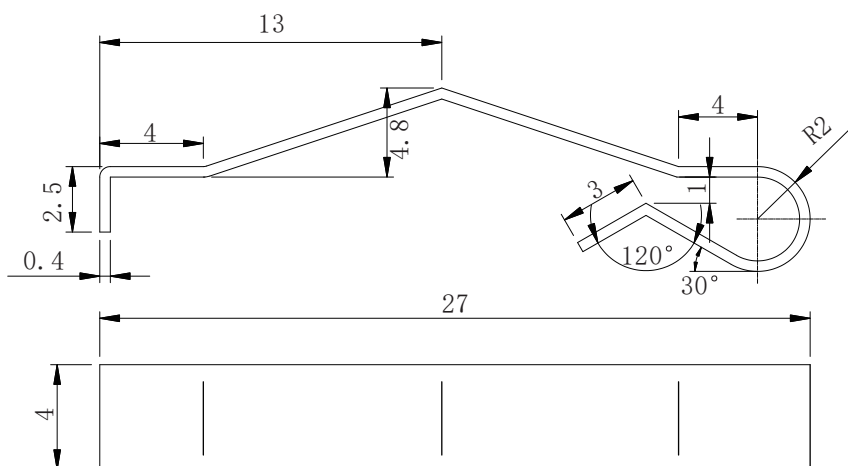
3) The physical photos of the T1\T2\T2B temperature sensor installation are as follows:



4) Sensor sleeve and shrapnel for fixing T2\T2B sensor can be provided by the business manager or technical manager of our company. In the event of commodity procurement, the reference sizes of sensor sleeve are as blow:



5) The reference size of the sensor shrapnel is as follows:



! Attention

- Users must use our company's standard T1/T2/T2B sensor. If other types of sensors are used, different temperature values may cause the machine to malfunction and affect the normal use of the machine
- It is necessary to install and fix sensors with sensor sleeve and shrapnel with standard configurations in accessories of our company, and ascertain whether or not fixing is firm, and in the event of poor fixing, it may result in error in the temperature detection value.

4. Electrical Connection

4-1 Electrical Wiring

! Attention

- The air conditioner shall use special power supply, and the power supply voltage shall meet the rated voltage.
- The external power supply circuit of the air conditioner must have grounding wire, and the AHU power supply ground wire should be reliably connected with the external grounding wire.
- Wiring construction must be carried out by professional technicians according to the circuit icon.
- The connected fixed line must be equipped with an all pole breaking device with a contact opening distance of at least 3mm.
- Set up leakage protection device according to the requirements of the relevant national electrical equipment technical standards
- The power cord and signal line shall be arranged orderly and reasonably without mutual interference, and shall not contact with the connecting pipe and valve body.
Generally, two electric wires can't be bonded and connected, unless joints are welded fixedly and wrapped with the insulating tape.
- After all wiring construction completed, the power can be switched on after careful inspection and confirmation.

4-2 Power Supply Specifications

The power cable specifications are recommended in the table below. If the capacity is too small, the wiring will overheat and the machine will be burned

Model	AHU-Kit
Voltage/frequency	220-240V~50Hz
Power cable specification and wire diameter	1.0mm ² ×2, grounding wire 1.0mm ²
Communication line specification and wire diameter	Two-core shielded wire 0.75mm ²

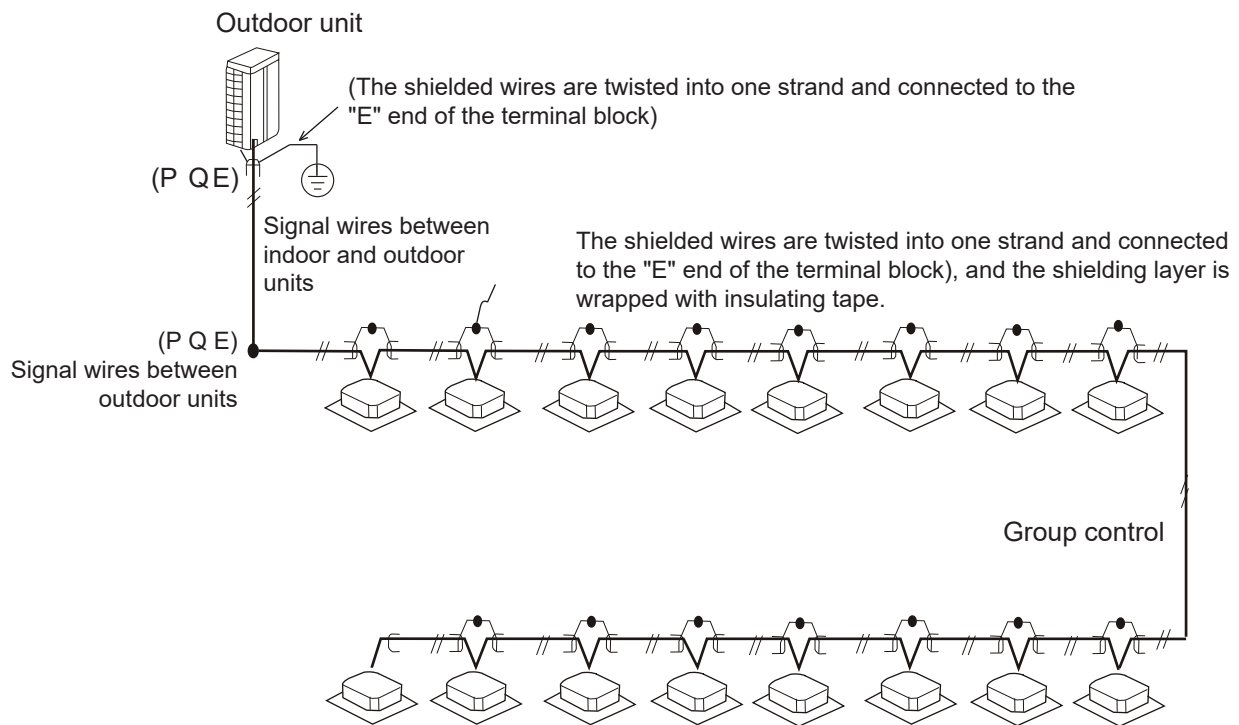
! Warning

When reading this instruction and instruction for wire splice as mentioned in this section, please be sure to keep in mind: All wire splices readily available must conform to the guidelines of the National Electrical Code (NEC) and any applicable national and local regulations. And make sure they meet the applicable equipment grounding requirements in the NEC.

4-3 Wiring suggestions for signal wires between outdoor unit and AHU Kit

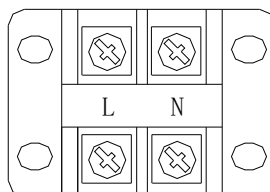
- 1) Signal wires must adopt shielded cables. Using other conducting wires may cause signal interference, resulting in malfunction.
- 2) The shielding layers of all shielded wires are twisted into one strand and connected to the "E" end of the terminal block (see the figure below).
- 3) Do not bundle the signal wire with refrigerant pipe, power cable, etc. When the power cable and the signal wire are laid in parallel, the distance between them should be kept at more than 300 mm to prevent the signal source from being interfered.
- 4) The signal wire cannot form a closed loop.
- 5) The signal wire has polarity, which must be paid attention to when wiring. The signal wire of AHU is connected to the terminals of "P, Q and E", and is in one-to-one correspondence with "P, Q and E" on connecting terminals of the outdoor unit, and connecting inversely is not permitted.
- 6) The signal wires of indoor and outdoor units shall be two-core shielded wires, with wire diameter being larger than or equal to 0.75mm², the connecting mode shall be the hand-in-hand connecting mode, and star connection is strictly prohibited. The signal wire of PQE shall be connected correctly due to polarity, the conducting wire of the shielded layer must be connected with the E wiring terminal, and the signal wires of indoor and outdoor units can only be led out of the master outdoor unit.

4. Electrical Connection

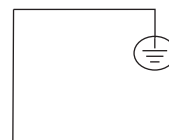


4-4 Recommended Wring of AHU Power Supply

- 1) (For AHU power supply in the same system, please use the same circuit; and the power must be turned on or off simultaneously. Otherwise, the service life of the system will be seriously affected and even such indoor units may not be booted.)
- 2) All AHU power supplies, leakage protectors and manual switches connected to the same outdoor unit should be universal.
- 3) The AHU power cable is connected to the terminal block marked "L, N", and the ground wire of the power cable is connected to the electric control box "⊕"



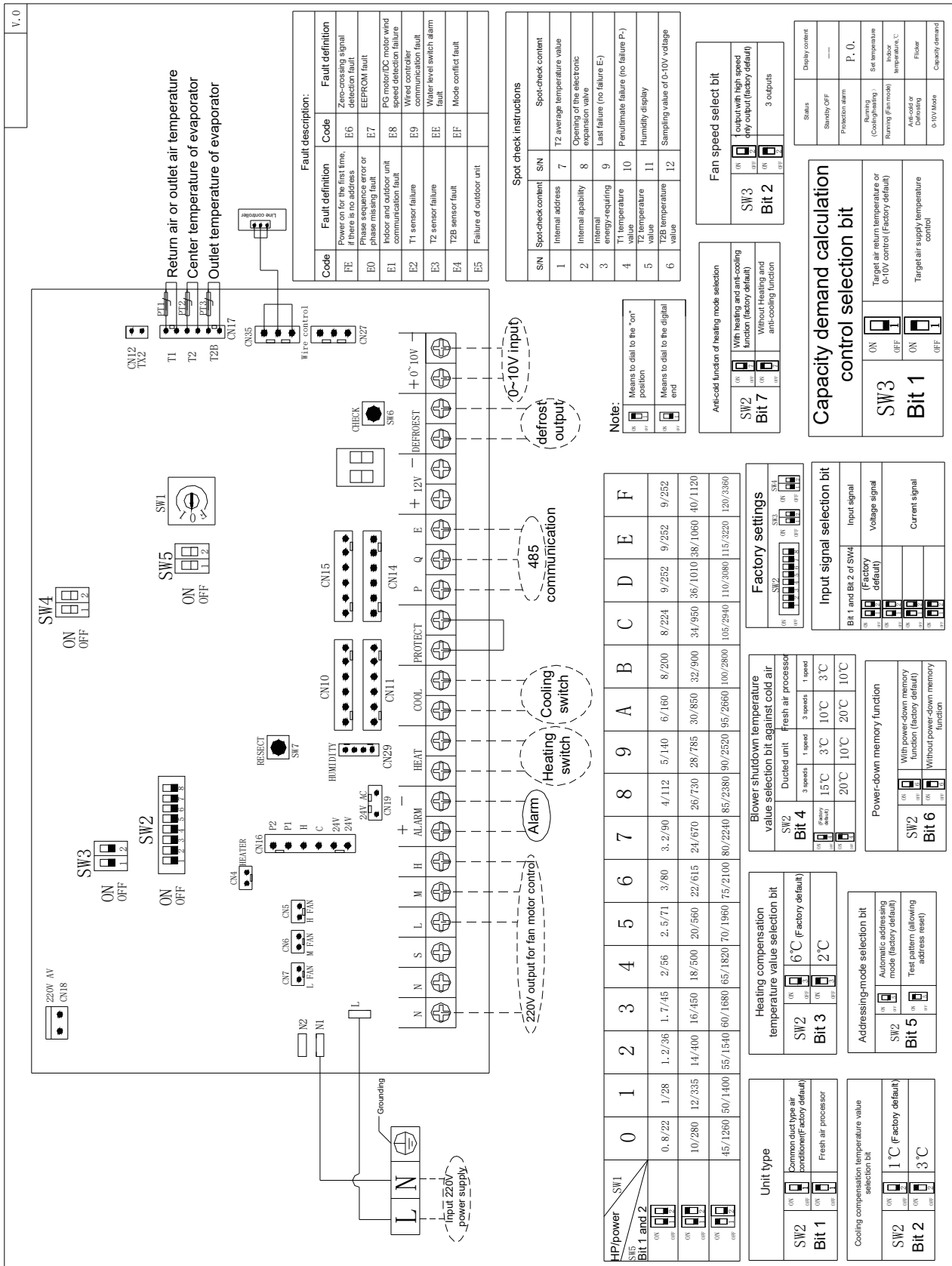
Single-phase power supply model



Grounding wire mark

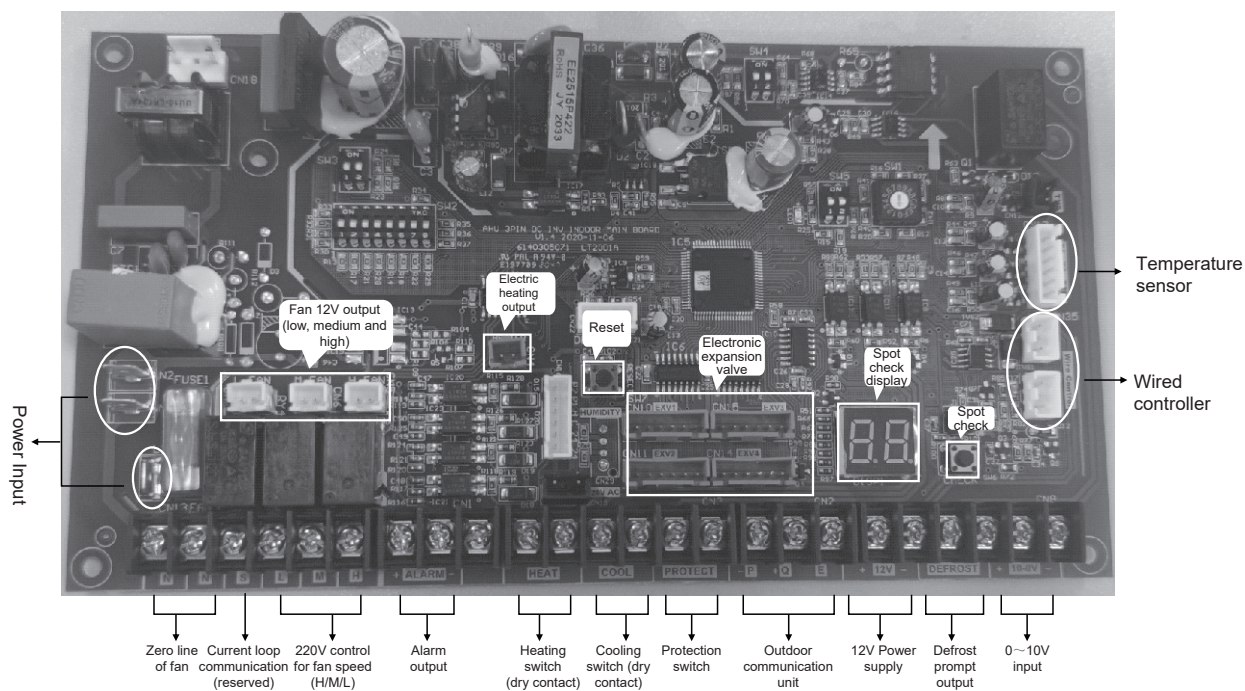
5. Application Control

5-1 AHU Kit Wiring Diagram

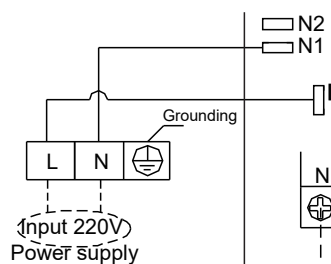
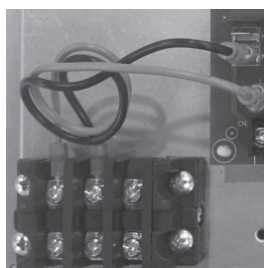


5. Application Control

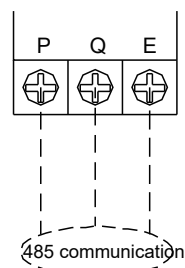
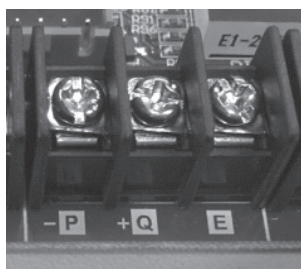
5-2 Installation of Input and Output Wiring in AHU Kit



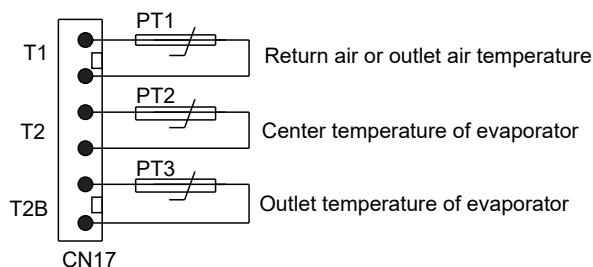
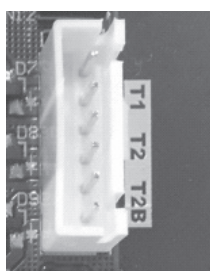
1. Power cord input: Please refer to the electrical connection instructions of the AHU kit.



2. Communication wires between outdoor unit and AHU kit: please refer to the instructions of pipe installation and electrical connection of AHU kit.



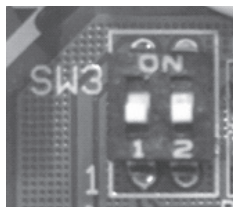
3. AHU T1/T2/T2B sensor connection: please refer to the installation instructions of AHU kit pipeline.



5. Application Control

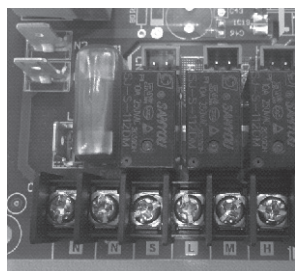
4. Fan speed selection

- 1) The SW3-2-bit DIP switch of the main board can determine the fan control output of the main board is based on one speed or three speed. In the event of outputting at one speed, the main board outputs at the high speed output regardless of high, medium and low speed for the wired controller; and choose 3 speed control, the main board outputs high, medium and low speed based on setting and its control requirements.
- 2) There are different anti-cold controlled functions in heating mode and limitation of fan speed at high temperature in cooling mode when it made different fan speed selection.



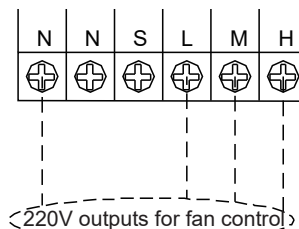
SW3-2	1	The AC is controlled by 3 speeds with outputs. (H/M/L)
	0	The AC motor is controlled by 1 speed with high speed output (Factory default)

- 3) Outputs at the high, medium and low speed of the AHU Kit's main board are 220V, which are used for controlling the actuation state of the AC contactor of the fan motor of AHU, and it can't be used for supplying power to the motor. (This output port can be used to directly power the motor with input power not exceeding 600W)
- 4) For outputs at the high, medium and low speed of the AHU Kit's main board, the 12V output port can also be directly used, which can be connected externally with the relay for direct control the motor.

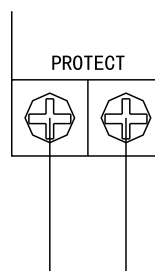


Low, medium and high speed with 12V output

Low, medium and high speed with 220V output



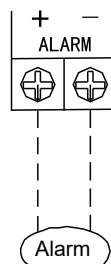
- 5) The AHU Kit's main board is equipped with the protective detection port for detecting the ON/OFF signal, which is generally used for the hotel room card. The main board can operate normally in the ON state, while can't operate in the OFF state. It can also be used for detecting the current protection or thermal protection of the contactor of AC fan, and when the contactor of the AC fan trips and outputs the OFF signal, the medium, main board can conduct shutdown protection. The input port is directly short circuited in the factory.



- 6) If the indoor unit fan of AHU isn't controlled by the AHU Kit of our company, but is controlled independently by other schemes, In cooling mode, it is necessary to consider fan control when cool air preventing control is required for the indoor unit fan in the event of the defrosting of the outdoor unit and the attenuation of heating capacity.
- 7) The control of the indoor unit fan of AHU is associated with the installation of the system. For the specific using method, please contact manufacturers and the technical managers of local manufacturers for technical guidance.

5. Fault alarm output port

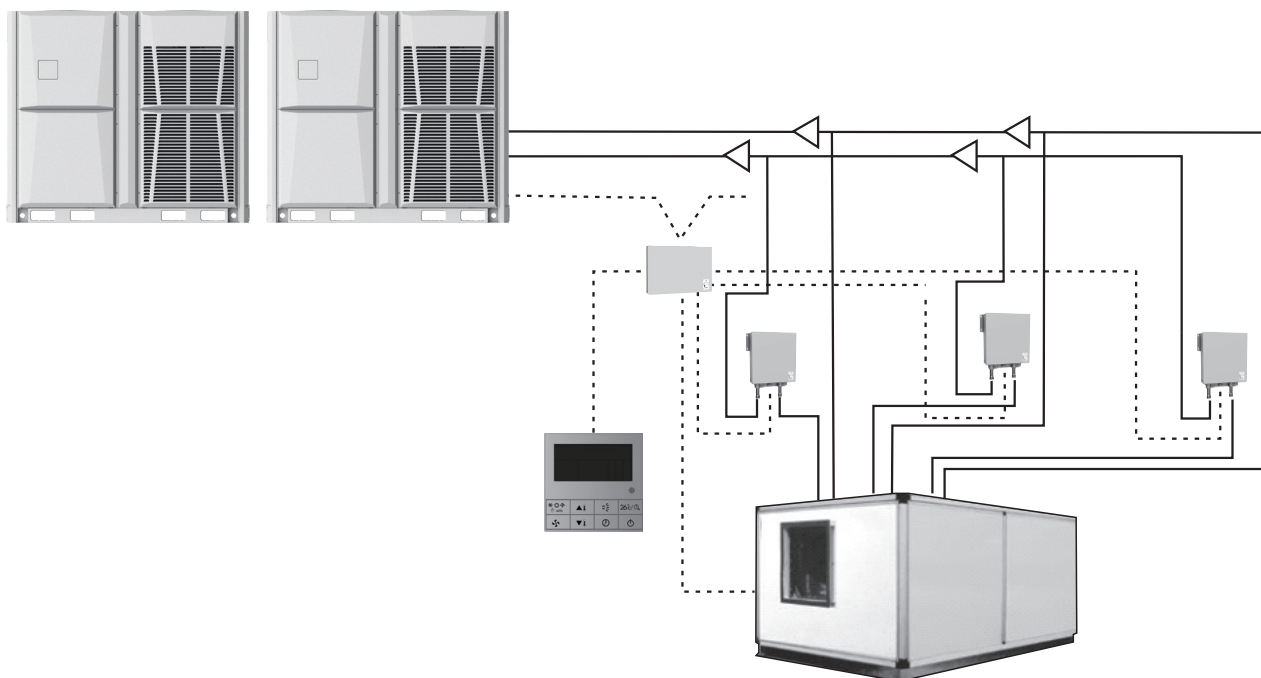
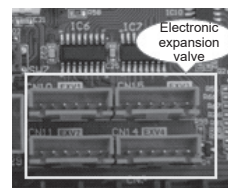
The AHU Kit's main board is equipped with the fault indicating output port, at which the 12V voltage signal is outputted for indicating AHU Kit is faulty in the event of fault.



5. Application Control

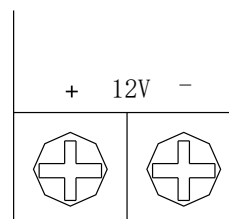
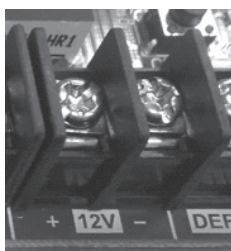
6. Electronic expansion valve control port

The AHU Kit's main board is equipped with 4 output ports of the electronic expansion valves, which can control 4 electronic expansion valves at a maximum. It is suggested for customers to purchase the AHU EXV boxes directly from manufacturer or electronic expansion valves and coils recommended by manufacturer. Electronic expansion valves in which specifications and models aren't specified by manufacturer may result in failure to control them.



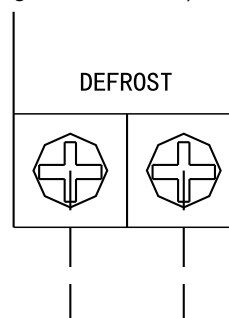
7. Output port of 12V power supply

The AHU Kit's main board is equipped with a 12V power supply output port, which can provide a 12V power supply when the main board is powered, and the operating current of other devices should not be greater than exceed 150mA current.



8. Defrosting prompt output port of outdoor unit

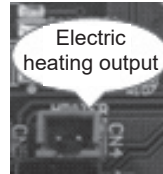
The AHU kit's main board is equipped with the defrosting prompt output port, which is normally closed when indoor units run cooling or heating mode normally; and in the defrosting state for the outdoor unit, this output port is open after four-way valve reverses direction, which is used for indicating the fan motor contactor that isn't controlled by AHU kit to stop the fan. It can prevent AHU from blowing out cold wind during the defrosting process of outdoor unit. (This dry contract can only send ON/OFF signal, and cannot be used for the current greater than 2A.)



5. Application Control

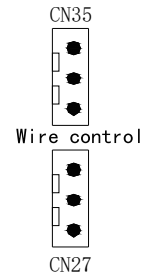
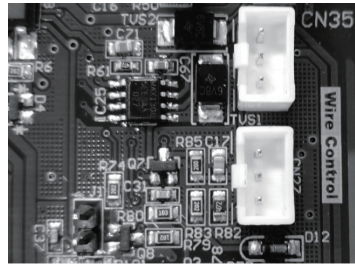
9. AHU kit auxiliary electric heating output port

The AHU Kit's main board is equipped with auxiliary electric heating output port of CN4, which is 12 power supply signal output. It shall be connected externally with a relay, which is used for controlling the actuation of the auxiliary electric heating relay.

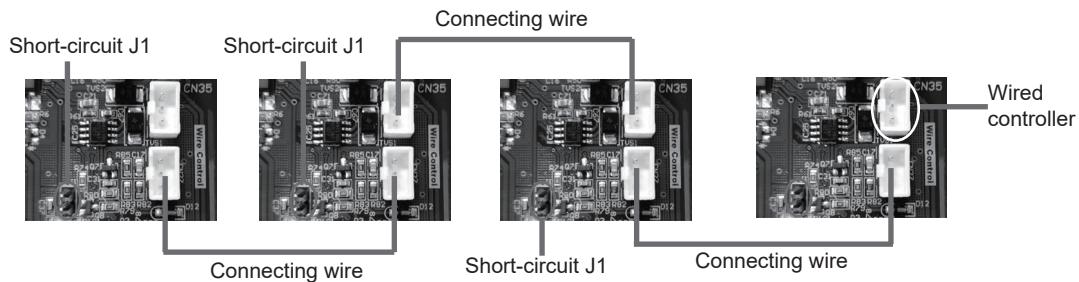


10. Installation of AHU Kit wired controller

- 1) The AHU Kit's main board is equipped with two three-core wired controller connecting ports, and the wired controller can be connected to any one port.



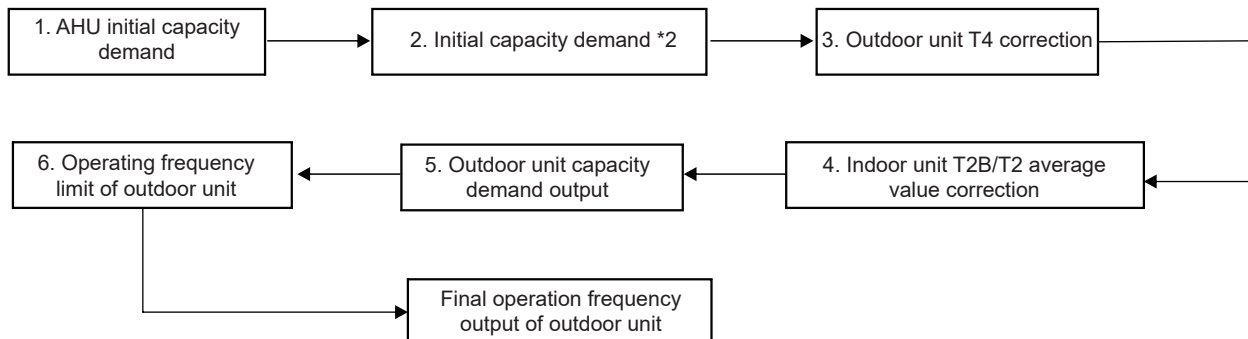
- 2) One wired controller controls several AHU kit main boards



One wired controller controls several AHU kit main boards, with the connecting diagram above. The functions are as follows:

- ① The wired controller sends same signal, i.e., turn on all or turn off all.
- ② The wired controller can only query the relevant parameters of the main board whose J1 port is not short-circuited, and cannot query the relevant parameters of other main boards.
- ③ It is necessary to reserve the J1 port of only one main board that isn't short-circuit, and J1 ports of other main boards must be short-circuit, or else, the communication fault of the wired controller will occur.
- ④ One controller can control 4 AHU kit at maximum.

11. The calculation process of the compressor capacity output of the outdoor unit is as follows:



There are three schemes for calculating the initial capacity demand of AHU:

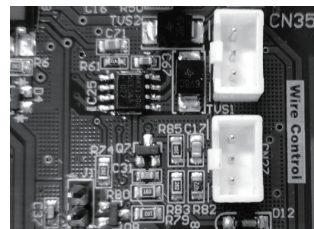
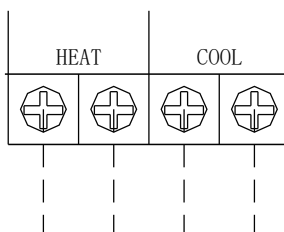
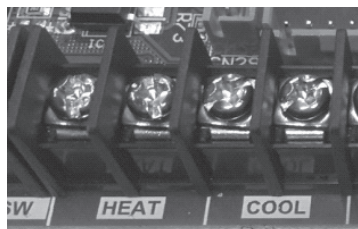
- ① Capacity demand calculation control for target indoor outlet air temperature.
- ② Capacity demand calculation control for target indoor return air temperature.
- ③ Capacity demand calculation control of 0-10V voltage input

5. Application Control

12. System start-up method

There are two methods to start the system

- 1) Wired controller (or centralized controller) start-up control
- 2) 'COOL' and 'HEAT' dry contact start-up control



Self-adaptive judgment of two start-up method:

- ① When selecting the capacity demand calculation control of target indoor outlet air temperature, It is forced to be wired controller start-up control rather than dry contact start-up control.
- ② After power on, the indoor unit allows the wired controller to set the running mode, temperature, fan speed and other settings.
- ③ When firstly receiving the cooling/heating mode signal of the dry contact controller, the indoor unit will switch to its mode controlled by dry contact only, without accepting the mode control signals of the wired controller, and such switch is irreversible (except for re-powering on).
- ④ In dry contact mode, the fan speeds of cooling and heating mode is fixed to high speed.
- ⑤ The control selection of dry contact and wired controller will not be recorded in the power down memory. After power on again, the logic will be executed from.

13. Capacity demand calculation control for target indoor outlet air temperature.

SW3-1	1	Capacity demand calculation control for target indoor outlet air temperature. Only the setting mode and fan speed of wired controller are available, and the setting of the wired controller under 0-10V voltage input capacity demand control and the settings of cooling and heating dry contact under 0-10V voltage input capacity demand control are unavailable.
	0	Capacity demand calculation control for target indoor return air temperature or Capacity demand calculation control of 0-10V voltage input (including T1/TS capacity demand control, the setting of wired controller under 0-10V voltage input capacity demand control and cooling and heating dry contact input under 0-10V voltage input control (Factory default).

1) Capacity demand calculation control for target indoor outlet air temperature

- ① The DIP switch selects the capacity demand calculation control for target indoor outlet air temperature, the T1 sensor of indoor unit main board is installed at the air outlet, at which T1 temperature is outlet air temperature.
- ② The setting temperature of wired controller is outlet air temperature (the wired controller needs to be customized).
- ③ You can only set mode, fan speed, target outlet air temperature and other parameter by wired controller, it is not available to control unit by cooling and heating dry contact control.
- ④ All the indoor units are normal ducted units.
- ⑤ Cooling and heating capacity demand is sent by the following rules: The initial capacity demand sent from the indoor unit to the outdoor unit in the starting state = $HP \times 3$. Record the current capacity demand, then detect target outlet air temperature and real outlet air temperature, send new calculating capacity demand to outdoor unit every 2 minutes. The maximum capacity demand sent from the indoor unit to the outdoor unit is: $HP \times 3 \times 2$, and the minimum value is 1.

14. Capacity demand calculation control for target indoor return air temperature and capacity demand calculation control of 0-10 voltage input:

SW3-1	1	Capacity demand calculation control for target indoor outlet air temperature. Only the setting mode and fan speed of wired controller are available, and the setting of the wired controller under 0-10V voltage input capacity demand control and the settings of cooling and heating dry contact under 0-10V voltage input capacity demand control are unavailable.
	0	Capacity demand calculation control for target indoor return air temperature or Capacity demand calculation control of 0-10V voltage input (including T1/TS capacity demand control, the setting of wired controller under 0-10V voltage input capacity demand control and cooling and heating dry contact input under 0-10V voltage input control (Factory default).

5. Application Control

1) Capacity demand calculation control for target indoor return air temperature:

- ① Under this control method, it needs to control the indoor return air temperature, the setting temperature of wired controller is target indoor return air temperature.
- ② T1 temperature sensor needs to be installed at the return air site of AHU to detect the return air temperature of AHU.
- ③ AHU can be turned on by wired controller or cooling and heating dry contact control.
- ④ AHU main board can adjust the capacity demand for sending to the outdoor unit automatically which is based on T1 temperature and setting temperature. The initial capacity demand sent from AHU to outdoor units is: $HP \times \text{coefficient}$, where the HP is determined by capacity DIP switch, while the coefficient is determined by return air temperature and setting temperature.

2) Capacity demand calculation control of 0-10V voltage input:

AHU initial capacity demand of indoor unit = $HP \times 3 \times \text{coefficient}$, where the coefficient is determined by input voltage of 0 to 10V, shown as below (Deviation: 5%):

Coefficient	Max. voltage	Min. voltage	Coefficient	Max. voltage	Min. voltage
150%	/	9.2	60%	5.5	5.0
140%	9.4	8.9	55%	5.2	4.7
130%	9.1	8.6	50%	4.9	4.4
120%	8.8	8.3	45%	4.6	4.1
110%	8.5	8.0	40%	4.3	3.8
105%	8.2	7.7	35%	4.0	3.5
100%	7.9	7.4	30%	3.7	3.2
95%	7.6	7.1	25%	3.4	2.9
90%	7.3	6.8	20%	3.1	2.6
85%	7	6.5	15%	2.8	2.3
80%	6.7	6.2	10%	2.5	2.0
75%	6.4	5.9	5%	2.2	1.7
70%	6.1	5.6	0%	1.9	/
65%	5.8	5.3			

- ① Under 0-10V voltage input control, AHU kit detects the cooling and heating dry contact signal, the fan speed is forced to high speed. (The wired controller can only query parameters, and it is not available to set mode, fan speed and temperature.)
If the 'COOL' port is ON, the AHU will run cooling mode, and the fan speed is forced to high speed.
If the 'HEAT' port is on, the AHU will run heating mode, and the fan speed is forced to high speed.
If the 'COOL' and 'HEAT' ports are ON or OFF, the AHU will be OFF.
- ② When the AHU is turned on by wired controller, 0-10V voltage input is only for calculating capacity demand, the wired controller can set mode and fan speed. (it is not available to set temperature by wired controller)
- ③ If there is start-up signal from dry contact ports or wired controller, the input voltage id coefficient of 0%, it means AHU reaches setting temperature; if there is no start-up signal, it means the AHU is OFF.
- ④ Under 0-10V voltage input control, When the outdoor unit is top discharge VRF, the dial-up SW13-2 of top discharge VRF need to dial ON.

5. Application Control

5-3 Definition of AHU Kit Main Board DIP Switches

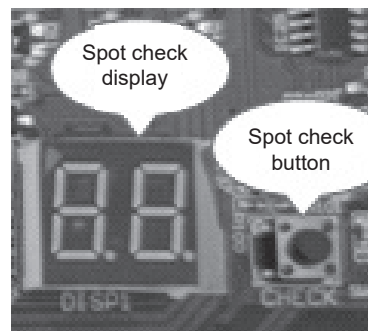
1. DIP switches

DIP position	Status	Function Description
SW2-1	1	Fresh air processor, the return air of AHU is full fresh air.
	0	Normal ducted unit, the return air of AHU is indoor air. (Factory default)
SW2-2	1	1℃ temperature compensation in cooling mode
	0	3℃ temperature compensation in cooling mode (Factory default)
SW2-3	1	2℃ temperature compensation in heating mode
	0	6℃ temperature compensation in heating mode (Factory default)
SW2-4	1	Normal ducted unit, 3 fan speeds, anti-cold wind temperature: 20 ℃; Normal ducted unit, 1 fan speed, anti-cold wind temperature: 10 ℃; Fresh air processor, 3 fan speeds, anti-cold wind temperature: 20 ℃; Fresh air processor, 1 fan speed, anti-cold wind temperature: 10 ℃;
	0	Normal ducted unit, 3 fan speeds, anti-cold wind temperature: 15℃; Normal ducted unit, 1 fan speed, anti-cold wind temperature: 3℃; Fresh air processor, 3 fan speeds, anti-cold wind temperature: 10℃; Fresh air processor, 1 fan speed, anti-cold wind temperature: 3℃; (Factory default)
SW2-5	1	Test mode (it allows to eliminate address).
	0	Automatic addressing mode. (Factory default)
SW2-6	1	Without power-down memory function.
	0	With power-down memory function. (Factory default)
SW2-7	1	Without anti-cold wind function in heating mode
	0	Anti-cold wind function in heating mode (Factory default)
SW3-1	1	Capacity demand calculation control for target indoor outlet air temperature. Only the setting mode and fan speed of wired controller are available, and the setting of the wired controller under 0-10V voltage input capacity demand control and the settings of cooling and heating dry contact under 0-10V voltage input capacity demand control.
	0	Capacity demand calculation control for target indoor return air temperature or Capacity demand calculation control of 0-10V voltage input (including T1/TS capacity demand control, the setting of wired controller under 0-10V voltage input capacity demand control and cooling and heating dry contact input under 0-10V voltage input control. (Factory default)
SW3-2	1	AC fan motor has high speed, medium speed and low speed output.
	0	AC fan motor has high speed output. (Factory default)
SW4-1/2	01\10\11	The input signal of 0-10V port is current signal, 0-20 mA.
	00	The input signal of 0-10V port is voltage signal

6. Parameter Query and Error Code

6-1 Spot check operation and parameters

Spot check sequence	Display content
1	Indoor unit address
2	Indoor unit capacity
3	Indoor capacity demand
4	T1 temperature value
5	T2 temperature value
6	T2B temperature value
7	T2 average of temperature value
8	Opening degree of EXV
9	Last error code (No error displays E-)
10	Last second error code (No error displays P-)
11	Humidity display
12	Sampling value of 0-10V voltage



Capacity and capacity demand display rule:

If the displayed value is less than 10, directly display the value with one decimal place;

If the displayed value is greater than or equal to 10 and less than 100, the value is displayed as an integer without a decimal point;

If the displayed value is greater than or equal to 100, the hundreds and tens digits of the value are displayed, and the tens digit has a decimal point.

For example:

If the display value is 5, the digital tube displays "5.0"

If the display value is 12.5, the digital tube displays "12"

If the display value is 287.5, the digital tube displays "28."

6-2 AHU kit error code

Fault definition	Display content
First time powered and there is no address of AHU	FE
Phase sequence error	E0
Communication fault between indoor and outdoor unit	E1
T1 sensor fault	E2
T2 sensor fault	E3
T2B sensor fault	E4
Outdoor unit fault	E5
Zero-crossing signal detection fault	E6
EEPROM fault	E7
PG motor/DC motor speed detection fault	E8
Wired controller communication fault	E9
Water level switch alarm fault	EE
Mode conflict fault	EF

7. Appendix

Name and content of hazardous substances in products						
Part Name	Hazardous substance					
	Lead (PB)	Mercury (Hg)	Cadmium (CD)	Hexavalent chromium (Cr (VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Compressor and accessories	×	○	×	○	○	○
Heat exchanger	○	○	○	○	○	○
Parts and valves of pipeline	×	○	○	○	○	○
Refrigerant	○	○	○	○	○	○
Motor	×	○	×	○	○	○
Control box and electrical components	×	○	×	○	○	○
Power cable and connection cable	×	○	○	○	○	○
Fasteners such as screws and pads	×	○	○	○	○	○
Rubber parts	○	○	○	○	○	○
Other metal parts	○	○	○	○	○	○
Other plastic parts	○	○	○	○	○	○
Printed matter	○	○	○	○	○	○
Foam parts	○	○	○	○	○	○
Heat insulation cotton	○	○	○	○	○	○
This form is compiled according to SJ / T 11364. ○: Indicate that the content of harmful substances in all homogeneous materials of the component is below the limit requirements as specified in GB/T 26572. ×: Indicate that the content of harmful substances in at least one homogenous material of the component exceeds the limit requirements as specified in GB/T 26572. However, the conventional technical conditions can't make components and parts of the product free of the above harmful substances, and subsequently, the content of harmful substances will be reduced gradually with the progress of the alternative technology. In order to protect the environment and human health: 1. The package of this product can be recycled. After being discarded, please separate this product from household wastes, and consumers will be responsible for conveying it to qualified recycling sites; 2. The recycling center will recycle the materials in the recycled products by appropriate methods; 3. For the detailed information of the recycling of this product, please consult local government, waste and disposal service center or dealers.						

