

# Climate 5000 VRF Technical Databook

Controllers & Accessories



**BOSCH**

## Control System

### Individual Remote Controllers

- |   |        |
|---|--------|
| 1. Wireless remote controller           | IRC    |
| 2. Wired remote controller              | WRC-HP |
| 3. Wired remote controller              | WRC-HR |
| 4. Wired remote controller (hotel room) | HWRC   |

### Centralised Remote Controllers

- |  |       |
|--|-------|
| 1. Centralised remote controller – touch key style | CC-TS |
| 2. Centralised remote controller – weekly schedule | CC-WT |

### Gateways

- |                         |         |
|-------------------------|---------|
| 1. LonWorks BMS gateway | BMS-LON |
| 2. BACnet® BMS gateway  | BMS-BAC |
| 3. Modbus BMS gateway   | BMS-MOD |
| 4. Network Gateway      | BVIM    |

### Network monitoring system

- |                        |      |
|------------------------|------|
| 1. Intelligent Manager | BVIM |
|------------------------|------|

### Accessories

- |                                    |                 |
|------------------------------------|-----------------|
| 1. Digital power ammeter           | DPA-3           |
| 2. Hotel card key interface module | HK-IM           |
| 3. Infrared sensor controller      | IFS             |
| 4. Fault alarm controller          | ODU-FA          |
| 5. AHU control kit                 | AHUKIT-01/02/03 |

## Infrared remote controller

### IRC

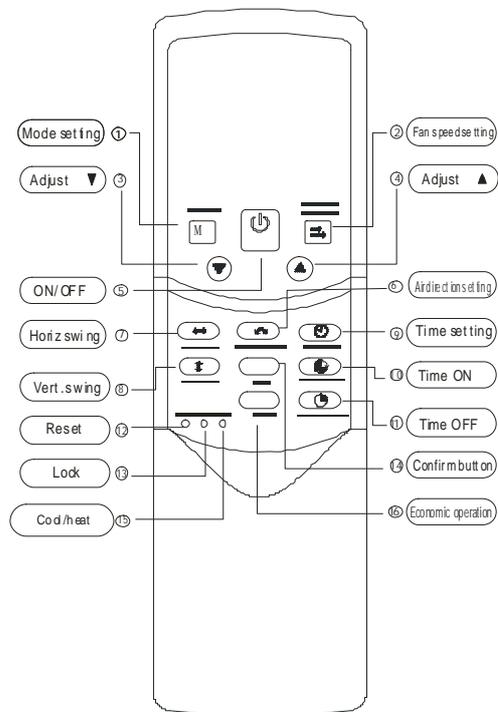
Remote controller specifications

Model	IRC
Rated Voltage	3.0 V
Lowest Voltage	2.4 V
Reaching Distance	8m~11m
Operation Condition	-5°C~+60°C

Performance features

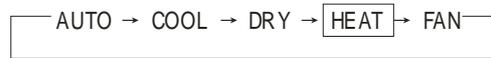
1. Operating mode: cool, heat, dry, fan only and auto
2. Timer setting function in 24 hours.
3. Indoor setting temperature range: 17°C ~30°C.
4. LCD (Liquid Crystal Display) of all functions.
5. Night light function

Parts name



**(1) Mode button**

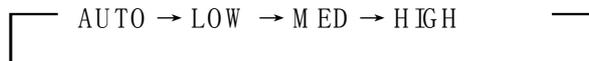
If pressing, running mode will be selected in the following sequence:



**Notes:** No heating mode for cooling only type unit.

**(2) Fans peed**

Fan speed will be selected in following sequence, if pressing this button:



**(3) Adjust button ▼**

Decrease the set temp. Keeping pressing will decrease the temp with 1°C per 0.5s.

**(4) Adjust button ▲**

Increase the set temp. Keeping pressing will increase the temp with 1°C per 0.5s.

**(5) ON/OFF button**

For turning on or turning off the air conditioner.

**(6) Air direction**

Activate swing function of air deflector. Once pressing, air deflector will turn 6 digress. For normal operation and better cooling and heating effect, deflector will not turn to the degree which is the state of deflector when the unit is turned off (Only available when remote controller is used with corresponding unit.)

**(7) Horiz swing**

Activate or turn off horizontal swing function. (Only available when remote controller is used with corresponding unit.)

**(8) Vert swing**

Activate or turn off vertical swing function. (Only available when remote controller is used with corresponding unit.)

**(9) Clock**

Display the current time. (12:00 is displayed when resetting or electrifying for the first time.) Press CLOCK for 5s, icon indicating hour will flash with 0.5s. Press it again will flash minute and ▼ and ▲ button are used to adjust the figure. Setting or modification is effective only by pressing OK button to make confirmation.

**(10) Time ON**

For time ON setting. Once pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour. Adjusting the figure to 0.00 will cancel time ON setting.

**(11) Time OFF**

For time OFF setting. Once pressing this button, the time will increase by 0.5 hour. When the set time exceeds 10 hours, pressing the button will increase the time by 1 hour. Adjust the figure to 0.00 will cancel time ON setting.

**(12) Reset button**(inner located)

Press this button with a needle of 1mm to cancel the current setting and reset remote controller.

**(13) Lock button**(inner located)

Press this button with a needle of 1mm to lock or unlock the current setting.

**(14) OK button**

Used to confirm the time setting and modification.

**(15) COOL/HEAT (inner located)**

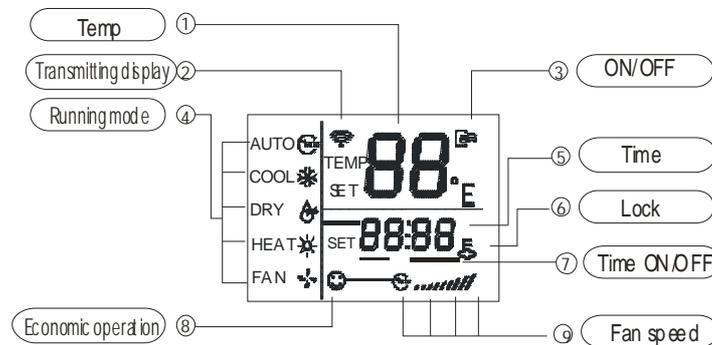
Press this button with a needle of 1mm to shift mode between COOL only and COOL&HEAT.

During setting, backlight will be lightened. Factory default mode is COOL & HEAT.

**(16) ECO button**

Activate or turn off economic operation mode. It is suggested to turn on this function when sleeping. (Only available when remote controller is used with corresponding unit.)

## LCD display



### Notes:

IRC is able to set the indoor units' addresses individually.

## How to set address through Wireless Remote Controller IRC

- Press the LOCK button for more than 5 seconds, then the controller gets into address setting mode.
- Press the ON/OFF button to start transmitting signal in the address setting mode. If the transmitting signal icon has been turned on, then step can be omitted. When working in address setting mode, press ON/OFF will not turn the controller off.
- In the address setting mode, there are 2 main functions:
  - Querying address: Please point the remote controller to the indoor unit, then press MODE button, the corresponding indoor unit will display its address.
  - Setting address: Use the UP and DOWN buttons to choose an address you want. Then point the remote controller to the indoor unit and then press the FAN button to set the indoor unit's address. The corresponding indoor unit will display the new address and record it. After about 4 seconds, this displaying will fade out and the indoor units turn to normal display mode.

**Notes:** Address cannot be repeated in the same system.

- After setting all the addresses, users can press the LOCK button for 5 seconds to exit the address setting mode.

## Touch key wired controller: WRC-HP



Wired controller specifications

Model	WRC-HP
Power Supply Voltage	DC 5.0 V
Ambient Temperature Range	-5°C ~ +43°C
Ambient Humidity Range	RH40%~RH90%

### Performance features

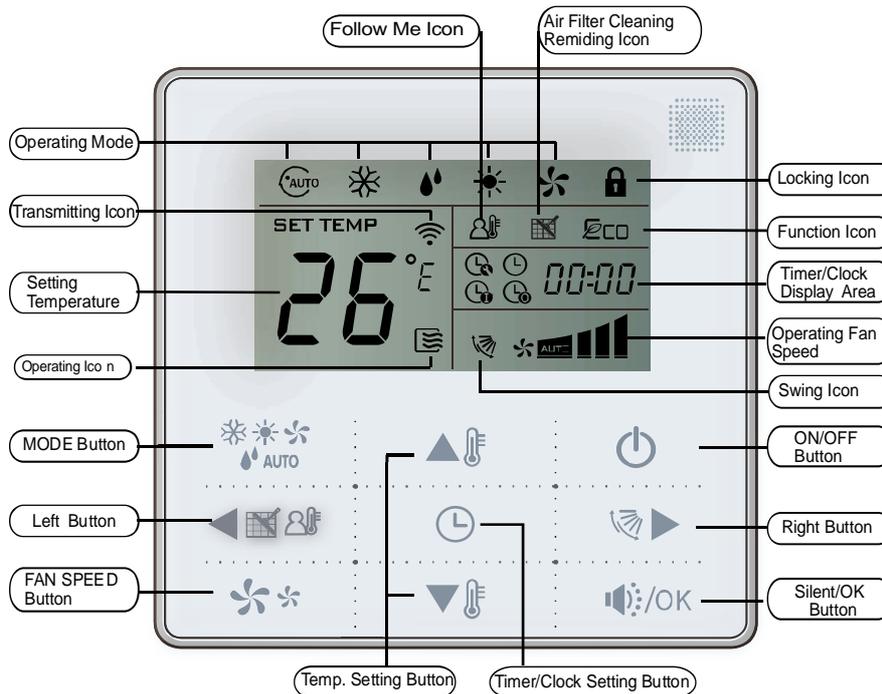
1. Operating mode: cool, heat, dry, fan and auto.
2. Set the mode through buttons.
3. Indoor setting temperature range: 17°C ~ 30°C.
4. LCD (Liquid Crystal Display).
5. Touch key
6. Can switch Fahrenheit degree and Centigrade degree.

### Function summarize

WRC-HP is the touch key wired controller.

New function	Basic function
Air filter cleaning reminding function	ON and OFF the air-conditioner
Indoor unit address setting function	Auto-restart function
Remote control receiver function	Time ON and Time OFF setting
Lock the wired controller	Clock setting
Silent mode	Setting the Operating mode, Temperature
Follow me	Fan speed and Swing functions

## Wired controller appearance



### (1) Remote signal receiving function

There is the signal receiver for wireless remote controller on the WRC-HP. You can use the wireless remote controller to control the air-conditioner through the wired controller when the system has been powered on.

**Notes:** The wired controller will not receive the swing controlling instruction. For the indoor unit with swinging function, you can directly use the remote controller to control swinging through the display panel of the indoor unit, or use the swing button on the wired remote controller to control the indoor unit for swinging.

### (2) ON/OFF button

Press the ON/OFF button to control the indoor unit on and off state. When the unit is turned off, press the ON/OFF button, the unit will be turned on and the operating icon lights up. When the unit is turned on, press the ON/OFF button, the unit will be turned off and the operating icon lights off.

### (3) Mode button

Press the mode button to set the operating mode, after each button press the operation mode will circle as follow:



When the controller has been set to cool-only, then there is no HEAT mode.

#### (4) Fan speed setting

Under COOL, HEAT and FAN modes, press the fan speed button can adjust the fan speed setting. After each fan speed button press will circle as follow:

AUTO→LOW→MID→HIGH→AUTO

Under AUTO and DRY modes, the fan speed is not adjustable and the default fan speed is auto.

#### (5) Temperature setting

Under AUTO, COOL, DRY, HEAT modes, press the Temp adjust Up/Down buttons to set the temperature, the adjusting range is 17°C~30°C (or 62°F~88°F). The setting temperature cannot be adjusted under FAN mode.

#### (6) Timer on and Timer off setting

Press the timer/clock setting button, then enter into the timer on setting state, and the screen will display timer icon



You can press Temperature setting buttons to adjust the time. When the time setting is less than 10 hours, each press the Temp setting buttons will increase or decrease 0.5 hour. When the timer setting is more than 10 hours, each press Temp setting buttons will increase or decrease 1 hour, the maximum timer setting is 24 hours. After finish adjusting the time on setting, press the Silent/OK button or wait for 5 seconds to confirm and exit the time on setting.

**Notes:** If the wired controller has been set timer on/ off, press the ON/OFF button to turn on/ turn off the unit then the timer will be canceled simultaneously.

#### (7) Clock setting

Long press the timer/clock setting button for 3 seconds, and then enter into the clock setting state. The hour position of the clock will flash, and can press Temp setting buttons to adjust the hour value.

After finish the hour setting, press left button or right button to switch to minute position setting, then the minute position will flash, press Temp setting buttons to adjust the minute value. After finish the clock setting, press the button or wait for 5seconds to confirm and exit the setting state.

#### (8) Silent/OK button

Under the cooling, heating and auto mode, when operate the silent mode, it can reduce the running noise through setting the fan speed to low. This will help you bring a quieter environment.

Under AUTO, DRY mode, the fan speed is auto and the Silent /OK button doesn't work.

### **(9) Wired controller locking**

Short press the temperature adjusting UP and DOWN buttons simultaneously, the wired controller enters into locking state, and the locking icon will be lighted up. Under the locking state, the wired controller will not respond to buttons by pressing and the control instruction from the wireless remote controller. Simultaneously press temperature adjusting buttons again will cancel the locking state.

### **(10) Air filter cleaning reminding function**

The wired controller records the total running time of the indoor unit, when the accumulated running time reaches the pre-set value, air filter cleaning reminding icon will be lighted up, to remind that the air filter of the indoor unit needs to be cleaned. Long press left button for 3 seconds, and clear the reminding icon and the wired controller will re-accumulate the total running time of the indoor unit.

**Notes:** The default setting value of reminding function is 2500 hours, and it can change to be 1250 hours, 5000 hours or 10000 hours.

### **(11) Swing function**

If the indoor unit supports swing function, press the right button to adjust the air outlet direction of the indoor unit. Long press this button for 3 seconds can turn on or turn off the auto-swing function. When the auto-swing function is turned on, the swing icon will be lighted up.

### **(12) Follow me function**

When the system is running and the operating mode is Cooling, Heating or Auto, press the left button will activate the Follow Me function. Press left button again will cancel follow me function. When the operating mode is changed, and then will cancel this function as well. When the Follow Me function is activated, the icon will be light up, and the wired controller will display room temperature read from the local sensor, and transmit the temperature value to the indoor unit every 3 minutes.

### **(13) Setting addresses**

- Press the Temp. UP and DOWN button simultaneously for more than 8 seconds, then the controller gets into address setting mode.
- In the address setting mode, there are 2 main functions:
- Querying address: press MODE button, the corresponding indoor unit will display its address.
- Setting address: use the UP and DOWN buttons to choose an address you want. Then press the FAN button to set the indoor unit's address. The corresponding indoor unit will display the new address and record it. After about 4 seconds, this displaying will fade out and indoor units turn to normal display mode.
- After setting addresses, users can press the Silent/OK button can exit the address setting mode.

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- After re-power, users can query the indoor address again: long press the UP and DOWN button simultaneously will enter the address setting page, press ON/OFF button and then press MODE button, the indoor address will be displayed on the indoor display board.
- In the address setting mode, wired controller does not respond to any command from remote controller.

## Installations

### 1) Safety precaution

- Stated below are important safety issues that must be obeyed. Confirm there is no abnormal phenomena during test operation after complete.
- Installation by other persons may lead to imperfect installation, electric shock or fire. Improper installation may lead to electric shock or fire. A random disassembly may cause abnormal operation or heating, which may result in fire.
- Do not install the controller in a place vulnerable to leakage of flammable gases. Once flammable gases are leaked and left around the wired controller, fire may occur.
- The wiring should adapt to the wired controller current. Otherwise, electric leakage or heating may occur and result in fire. The specified cables shall be applied in the wiring. No external force may be applied to the terminal. Otherwise, wire cut and heating may occur and result in fire.
- Don't place the wired controller near the lamps, to avoid the remote signal of the controller to be disturbed. Do not install the unit and controller in a place with much oil, steam, sulfide gas. Otherwise, the product may deform and fail.

#### Preparation before Installation:

Make sure the following parts has been prepared.

Name	Qty.	Remarks
Wired controller	1	\
Cross round head wood mounting screw	3	M4×20 (For mounting on the wall.)
Cross round head mounting screw	2	M4×25 (For mounting on the electrical switch box.)
Installation manual	1	\
Owner's manual	1	\
Plastic expansion pipe	3	For mounting on the wall
Plastic screw bar	2	For fixing on the 86 electrician box.
Switching wires for signal receiving board	1	For connecting the signal receiving board and 4-core shield wire.
Switching wires for wired controller signal	1	(If needed) For connecting the main control panel and 4-core shielding wire.

#### Prepare for the following at installation site.

Name	Qty. (embedded into wall)	Specification remarks (only for reference)	Remarks
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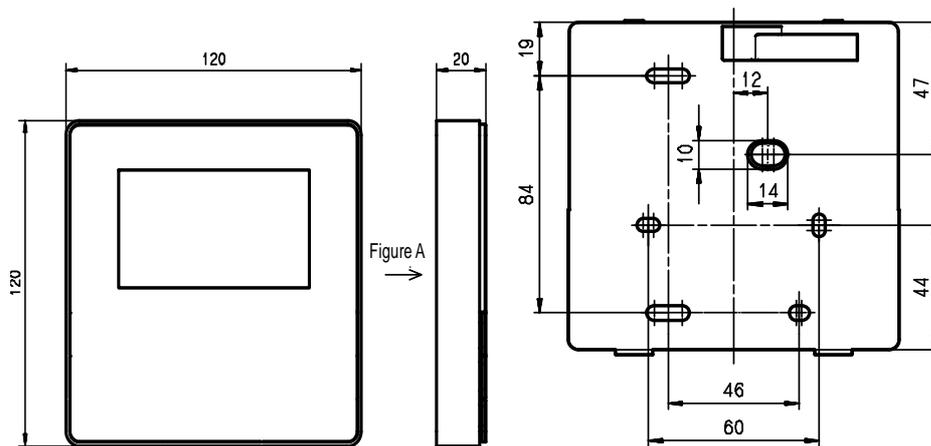
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4-core shield cable	1	RVVP-0.5 mm <sup>2</sup> ×4	The longest is 15M
86 electrician box	1	/	/
Wiring tube (insulating sleeve and tightening screw)	1	/	/

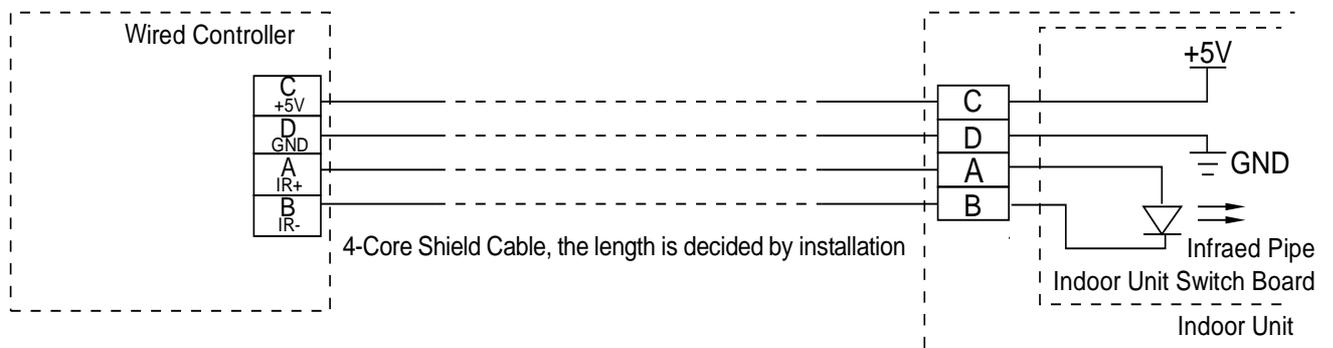
### Installation procedure

- Circuit of wired controller is low voltage circuit. Never connect it with a standard 220V or 380V circuit or put it into a same wiring tube with the circuit.
- The shield cable must be connected stable to the ground, or transmission may fail.
- Don not attempt to extend the shield cable by cutting, if it is necessary, use terminal connection block to connect.
- After finishing connection, do not use mucker to have the insulation check to the signal wire.

Dimensions: 120\*120\*20mm

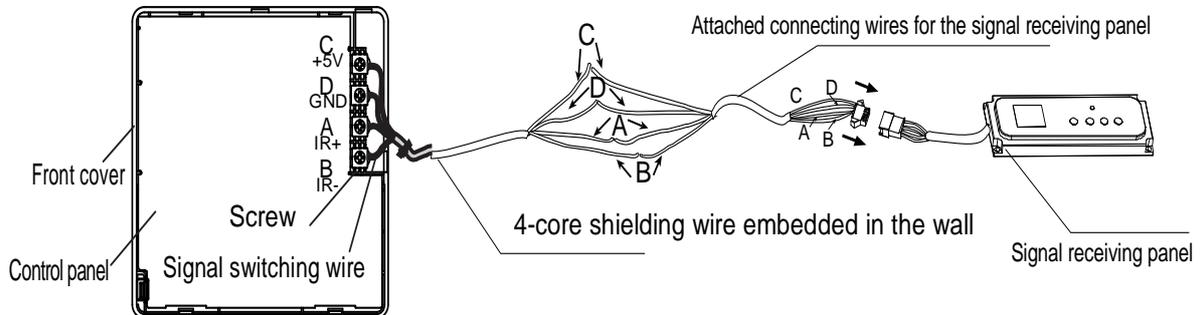


### Wiring principle sketch

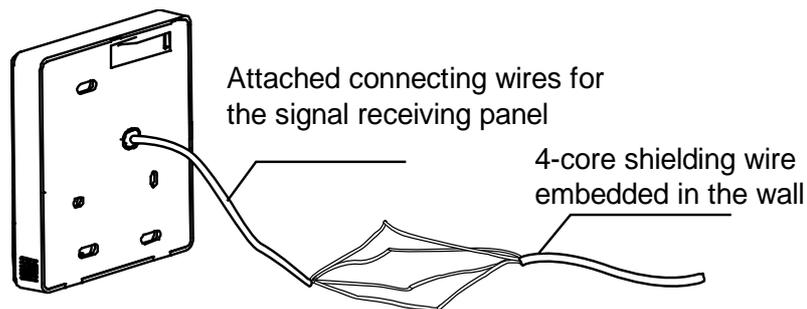


**Wiring figure:**

1) Connect two terminals of embedded 4-core shielding wire with the switching wires of wired remote controller and signal receiving board. Make sure the sequence of 4 terminals (A, B, C and D) should correspond to the wire sequence of signal switching wires (A, B, C and D).

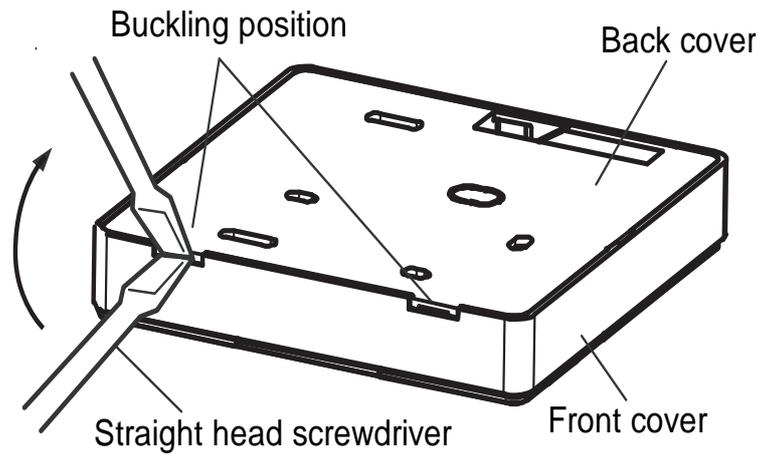


2) If embedded 4-core shielding wire cannot go through the wired controller, it can use signal switching for connection and make sure the wires are reliable and firm. The tightening torque range of the screw is 0.8~1.2N .m (8~12 kgf.cm).

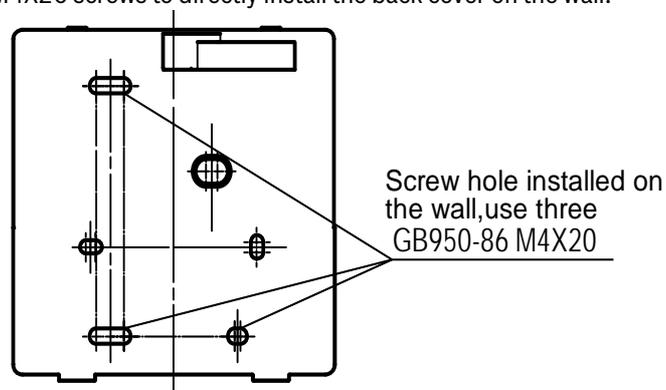


**Back cover installation**

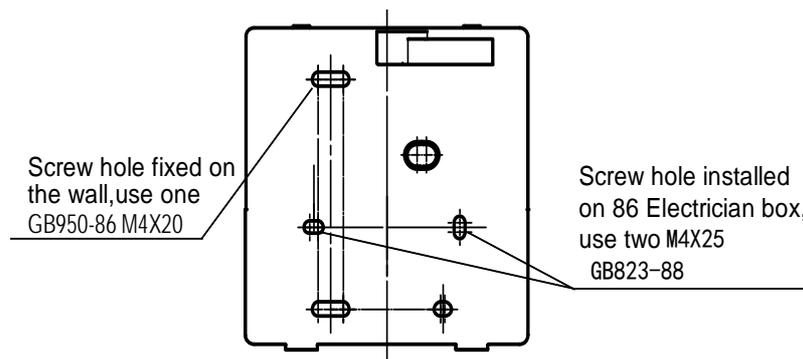
1) Use straight head screwdriver to insert into the buckling position in the bottom of a wired controller, and spin the screwdriver to take down the back cover. (Pay attention to spinning direction, if not you maybe damage the back cover.)



2) Use three GB950-86 M4X20 screws to directly install the back cover on the wall.

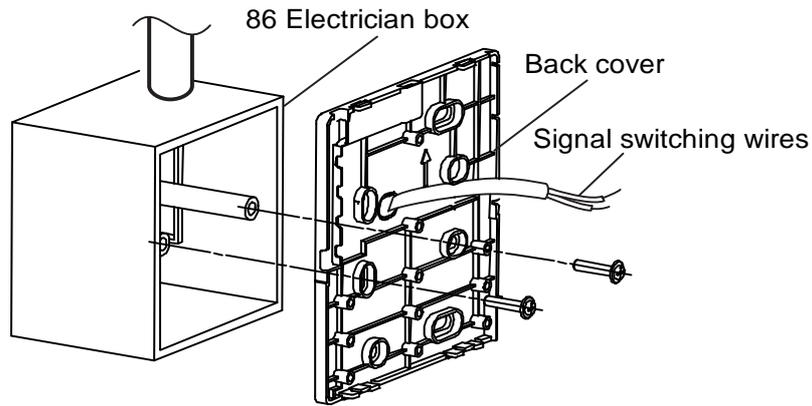


3) Use two M4X25 GB823-88 screws to install the back cover on the 86 electrician box, and use one GB950-86 M4X20 screw for fixing the wall.



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4) Adjust the length of two plastic screw bars in the accessory to be the standard length from the electrical box screw bar to the wall. Make sure when install the screw bar to the electrical box screw bar, make it as flat as the wall.

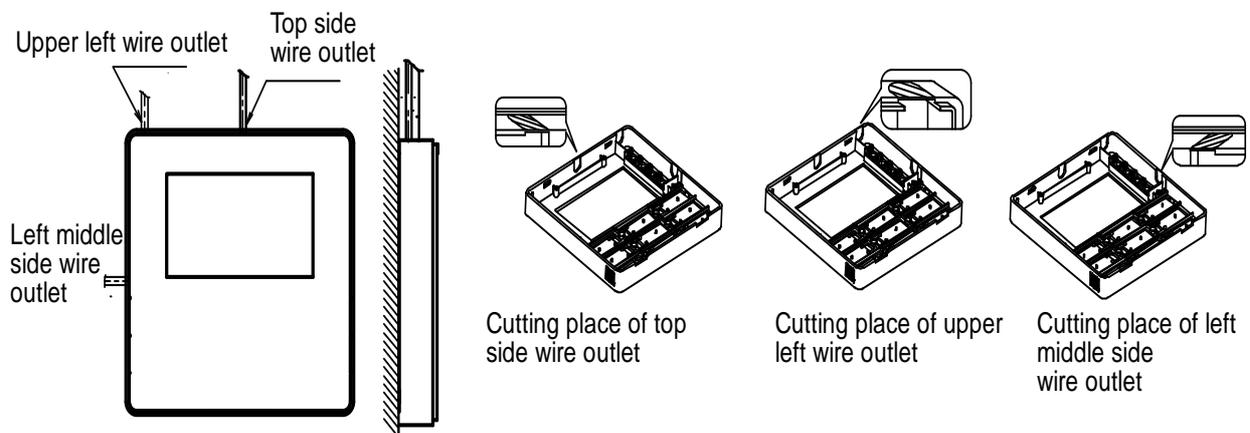


### Notes:

1. Use cross head screws to fix the wired controller bottom cover in the electric control box through the screw bar. Make sure the wired controller bottom cover is on the same level after installation, and then install the wired controller back to the bottom cover.
2. Over fasten the screw will lead to deformation of the back cover.

### Neaten the wires

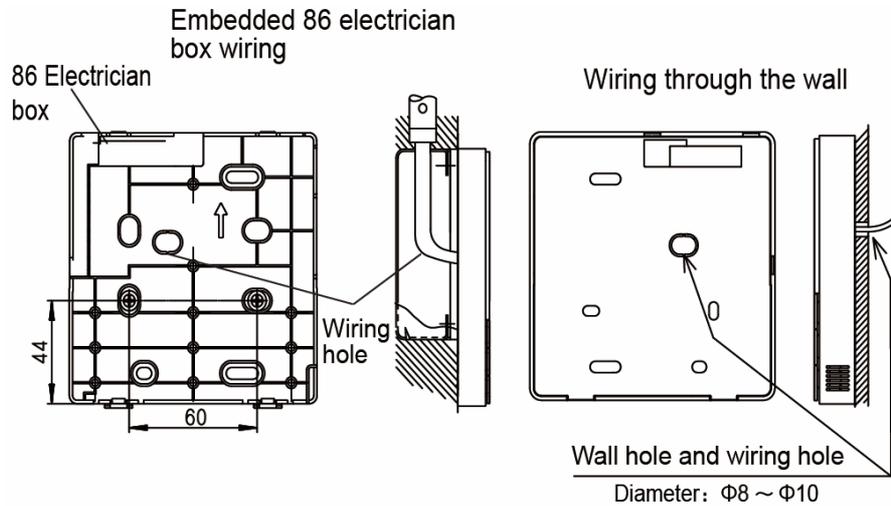
1) There are three positions of signal wire outlet around the wired controller, when the wired controller directly is installed on the flat wall.



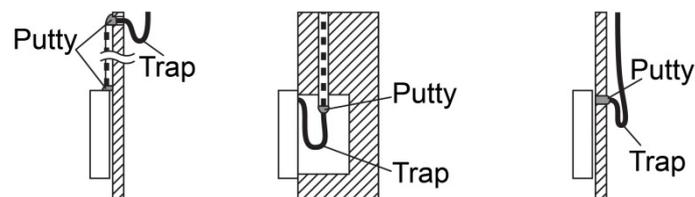
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### 2) Shielded wiring

When the wired controller is stalled with electrician box, the back cover of wired controller is already reserved one hole for wire outlet. It is also available for the shielded wire passing by the wall.

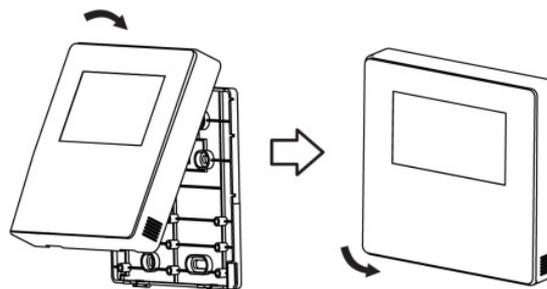


3) Avoid the water enter into the wired controller, use trap and putty to seal the connectors of wires during wiring installation. When under installation, reserve certain length of the connecting wire for convenient to take down the wired controller while during maintenance.



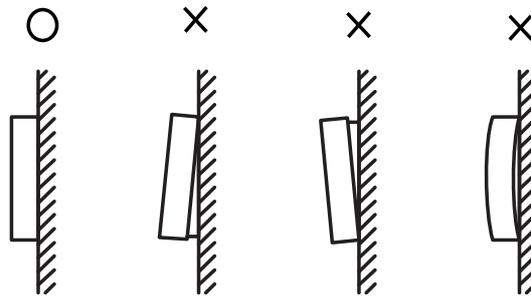
### Front cover installation

1) After adjusting the front cover and then buckle the front cover; avoid clamping the communication switching wire during installation.



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2) Correct install the back cover and firmly buckle the front cover and back cover, if not you maybe make the front cover drop off.



### Wired controller initial parameters setting:

1. Change the related functions of the controller through adjusting the initial parameters, details refer to table 1
2. The wired controller initial parameter includes two codes "XY", the first code "X" means functions class, and the second code "Y" means the detailed configuration of this function.
3. Setting method:
  - 1) Press "Mode" and "Fan" button simultaneously for 5 seconds to enter the parameter setting state;
  - 2) The value of this first code "X" is "0"; press the temperature setting button UP and DOWN to adjust the second code value;
  - 3) After setting the second code value, press Silent/OK button to switch the first code to the next value;
  - 4) When the first code value is "6", press Silent /OK button again to exit the parameters setting.
4. The parameters setting function only under the situation which needs to adjust the default functions' setting states; otherwise do not need to be set.

Table 1

First code	Functions	Second code				
		0	1	2	3	4
0	Cool-only/ Cool-Heat selection	Cool-Heat (Default)	Cool-only	/		/
1	Indoor unit communication address setting	Yes(Default)	None	/	/	/
2	Auto-restart	Yes(Default)	None	/	/	/
3	Air filter cleaning reminding function	Cancel the reminding function	1250 hours	2500 hours (Default)	5000hours	10000 hours
5	Remote receiving function	Yes(Default)	None	/	/	/
6	Centigrade/ Fahrenheit display	Centigrade	Fahrenheit	/	/	/

### Notes:

The second code of the filter cleaning reminding is 2500 hours, which as default.

## Wired Remote Controller : WRC-HR (For RDCI Series)



Wired controller specifications

Model	WRC-HR
Power Supply Voltage	DC 5.0 V
Ambient Temperature Range	-5°C ~ +43°C
Ambient Humidity Range	RH40%~RH90%

### Performance features

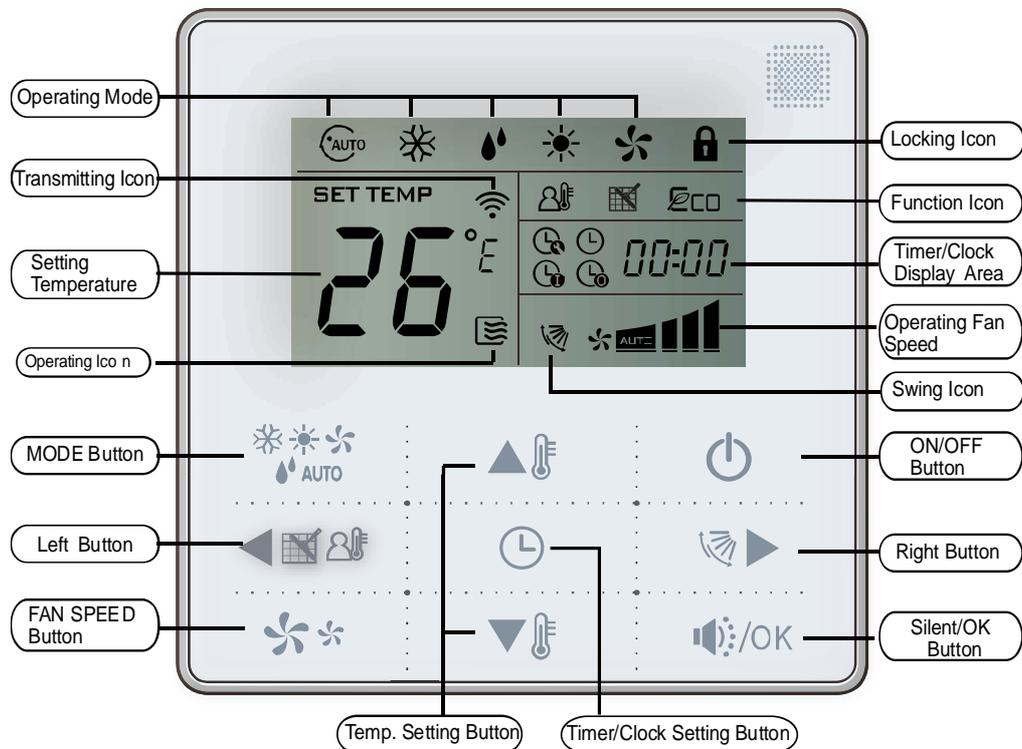
1. Operating mode: cool, heat, dry, fan and auto.
2. Set the mode through buttons.
3. Indoor setting temperature range: 17°C ~ 30°C.
4. LCD (Liquid Crystal Display).
5. Auto mode for RDCI series

### Functions summary

The controller has functions as follows:

- 1) Compatible with 3-pipe and 2-pipe system.
- 2) Clock and Timer function;
- 3) Auto-restart function;
- 4) Query function;
- 5) Indoor unit error display function
- 6) Auto mode and air filter cleaning reminding function
- 7) Can switch Fahrenheit degree and Centigrade degree.

## Appearance



### (1) ON/OFF button

Press the On/Off button to control the indoor unit on and off state.

When the unit is turned off, press this button, the unit will be turned on and the operation icon  lights on. When the unit is turned on, press this button, the unit will be turned off and the operation icon  lights off.

### (2) Mode button

✧ Press the button to select the operation mode, each press will change as following order:

AUTO→COOL→DRY→HEAT→FAN→AUTO

✧ Cool-only mode will change as following order:

COOL→DRY→FAN→COOL

**Notes:** Heat-only mode can only set to HEAT mode.

- When mode setting is in progress, the screen light the mode "set" string and display the setting mode of the wired controller. After the mode setting is completed, "set" strings extinguish and the screen display the actual operation mode of the indoor unit.
- The indoor unit has 3 different actual operation modes: COOL/HEAT/FAN. The actual operation mode of the indoor unit may be different from the setting mode of the controller. For example: If the setting mode is AUTO, the actual operation mode of the indoor unit may be COOL or HEAT. If the setting mode is DRY, the actual operation mode of the indoor unit is COOLING.

### (3) Clock setting

First power on or reset the wired controller, the clock will display 12:00. Long pressing the Timer/CLOCK button for 2 seconds can enter to the clock setting state. At this time, the minute position will be flashed; press  or  button can adjust the minute.

After finishing the hour setting, press left button  or right button  to switch to minute position setting, then the minute position will flash, press  and  to adjust the minute value.

After finish the clock setting, press the  button or wait for 5 seconds to confirm and exit the setting state.

### (4)Timer setting

Press the timer/clock setting button to enter the timer on setting state, and the screen will display  and 0-0h. Press  and  buttons can adjust the timer. When the timer setting is less than 10 hours, each press  or  button will increase or decrease 0.5 hour. When the timer setting is more than 10 hours, each press  or  will increase or decrease 1 hour, the maximum timer setting is 24 hours.

After adjusting the timer on setting, press the  button or wait for 5 seconds to confirm and exit the timer on setting.

Under the timer on setting state, press the timer/clock setting button, then enter into the timer off setting state, and the screen will display  and 0-0h.

The setting method of timer off is the same as the timer on.

Under timer setting state, set the timer on and timer off to be 0.0h can cancel timer on and timer off.

#### Notes:

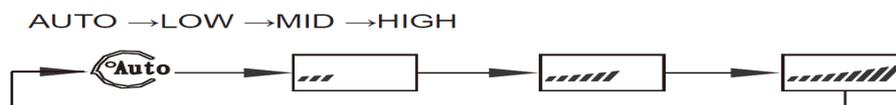
If the controller has been set timer on/ off, press the ON/OFF to turn on/ off the unit and the timer will be canceled simultaneously.

### (1) Fan speed

Under COOL, HEAT and FAN modes, press the fan speed button can adjust the fan speed setting.

Under AUTO and DRY modes the fan speed is not adjustable and the fan speed defaults auto speed.

1) Press the FAN SPEED button to set the fan speed of indoor unit. The fan speed switch order as follow:



2) Under AUTO and DRY modes the fan speed is not adjustable and the fan speed defaults auto speed.

### (6)Temperature setting

Press the temperature adjusting buttons  or  to increase or decrease the setting temperature. Under AUTO/COOL/DRY/HEAT operating mode can set the temperature, the setting range: 17°C-30°C(62°F-88°F).

The setting temperature cannot be adjusted under the FAN mode.

### (7) Swing function

Press the swing button  to activate the swing function when the fan of indoor unit is turned on, and the swing icon  will be lighted up. Press this button again can turn off the swing function, and the swing icon  lights off. This function is effective when it is used with the relative indoor unit.

### (1) Silent mode

Under the COOL, HEAT, FAN modes, press the silent button  can enter the silent operation. It is used to reduce the running noise through setting the fan speed to low.

Under the AUTO, DRY mode, the fan speed is auto and the silent button  doesn't work.

### (2) Locking wired controller

Press the temperature adjusting buttons  and  simultaneously, the wired controller enters locking state, and the locking icon  will be lighted up.

Under the locking state, the wired controller will not respond from the buttons pressing and the command of the remote controller.

Press the temperature adjusting buttons  and  simultaneously again can cancel the locking state.

### (3) Query function

Long press the FAN SPEED button and Silent /OK button will display the temperature from temperature sensor. Use  and  buttons can switch display of room temperature (Tf), middle evaporator temperature t2 and evaporator-outlet temperatureT2b. Press  button or wait 5s will exit the query function and back to normal display.

### (11) Air filter cleaning reminding function

The wired controller records the total running time of the indoor unit, when the accumulated running time reaches the pre-set value, the air filter cleaning reminding icon  will be lighted up to remind users need to clean the air filter of the indoor unit.

Long press  button for 2 seconds, and reset the reminding icon  and the wired controller will re-accumulate the total running time of the indoor unit.

The default setting value of the reminding function is 2500 hours, and it can change to be 1250 hours, 5000 hours or 10000 hours.

**(13) Auto operation mode (3-pipe system)**

- 1) 3-pipe system auto operation mode can automatically switch to COOL mode or HEAT mode depending on the temperature difference between setting temperature( $T_s$ ) and indoor temperature( $T_f$ ), and the fan speed is adjustable.
- 2) The wired controller will set the unit to operate on heating mode when  $T_s$  minus the  $T_f$  difference value is over than  $\Delta T$ , and changeover to cooling mode when  $T_s$  minus the  $T_f$  difference value is less than  $-\Delta T$ . The minimum operating mode switching interval is 15 minutes.
- 3) Under 3-pipe system auto operation mode, the auto mode icon "AUTO" flashes, and the COOL or HEAT icon will be lighted up depending on the actual operation mode.
- 4) The default  $\Delta T$  is 2°C, the value can be changed from 1~4°C. Please refer to WIRED REMOTE CONTROLLER INITIAL PARAMETER SETTING for detailed setting methods.
- 5) The auto operation mode of the controller cannot be changed by other control terminals, such as wireless remote controller, central remote controller, etc.

**Notes:**

- 1) The wired controller can be used in a 2-pipe system; in that case the controller should be set to 2-pipe system mode.
- 2) For a 2-pipe system, auto operation mode will set the unit to operate on COOL mode and the fan speed is set to auto and is not adjustable.

**Codes description**

The wired controller can display the fault codes when the units malfunction or protection, the code as follow:

Codes	Description
E0	Modes confliction of the indoor unit
E1	Communication malfunction between indoor/outdoor units
E2	T1 sensor malfunction
E3	T2 sensor malfunction
E4	T2B sensor malfunction
Ed	Outdoor unit malfunction
EE	Water level switch checking malfunction
F2	Wired controller EEPROM malfunction
F3	Communication malfunction between wired controller and indoor unit
F4	Wired controller temperature sensor malfunction

**Notes:**

1. The wired controller cannot display the EEPROM malfunction of the indoor unit

- Under a state of fault display, wired controller does not respond to any button operation.

### Wired controller initial parameters setting

- Change the related functions of the controller through adjusting the initial parameters, details refer to table 1.
- The wired remote controller initial parameter include two codes "XY", the first code "X" means function class, the second code "Y" means the detailed configuration of this function.
- Setting method:
  - ① Simultaneously long press "Mode" and "Fan" button of the wired remote controller for 5 seconds to enter the parameter setting state;
  - ② The value of this first code "X" is "0", press the temperature setting button  and  to adjust the second code value;
    - After setting the second code value, press Silent/Ok button  to switch the first code to the next value;
    - When the first code value is "6", press Silent/Ok button  again will exit the parameters setting.
- The parameters setting function only under the situation which needs to adjust the default functions' setting states; otherwise there is no need to do the setting.

Table 1

First code	Function	Second code				
		0	1	2	3	4
0	Cool-only/Cool-Heat selection	Cool-Heat (Default)	Cool-only	/	/	/
2	Power-off memory	Yes(Default)	None	/	/	/
3	Filter cleaning reminding	Cancel the reminding icon	1250 hours	2500 hours (Default)	5000 hours	10000 hours
6	Centigrade/ Fahrenheit display	Centigrade (Default)	Fahrenheit	/	/	/
7	3-pipe system/ 2-pipe system	3-pipe system (Default)	2-pipe system	/	/	/
8	Setting ΔT value	/	1°C	2°C (Default)	3°C	4°C

## Installation

### 1) Safety precaution

- Stated below are important safety issues that must be obeyed. Confirm there is no abnormal phenomena during test operation after complete.
- Installation by other persons may lead to imperfect installation, electric shock or fire. Improper installation may lead to electric shock or fire. A random disassembly may cause abnormal operation or heating, which may result in fire.
- Do not install the controller in a place vulnerable to leakage of flammable gases. Once flammable gases are leaked and left around the wired controller, fire may occur.
- The wiring should adapt to the wired controller current. Otherwise, electric leakage or heating may occur and result in fire. The specified cables shall be applied in the wiring. No external force may be applied to the terminal. Otherwise, wire cut and heating may occur and result in fire.
- Don't place the wired controller near the lamps, to avoid the remote signal of the controller to be disturbed. Do not install the unit and controller in a place with much oil, steam, sulfide gas. Otherwise, the product may deform and fail.

#### **Preparation before Installation:**

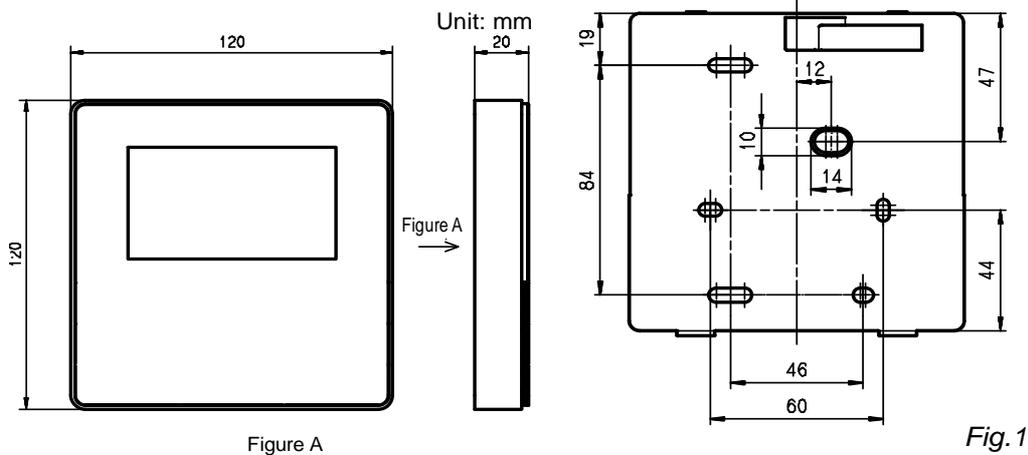
Make sure the following parts has been prepared.

NO.	Name	QTY.	Remarks
1	Wired Controller	1	/
2	Wood mounting screw	3	M4×20(For mounting on the wall)
3	mounting screw	3	M4×25(For mounting on the electrical switch box)
4	Installation manual	1	/
5	Owner's manual	1	/
6	Plastic screw bar	2	For fixing on the 86 electrician box
7	Switching wires for signal receiving board	1	For connecting the signal receiving board and 4-core shielding wire
8	Switching wires for wire controller signal	1	For connecting the main control panel and 4-core shielding wire

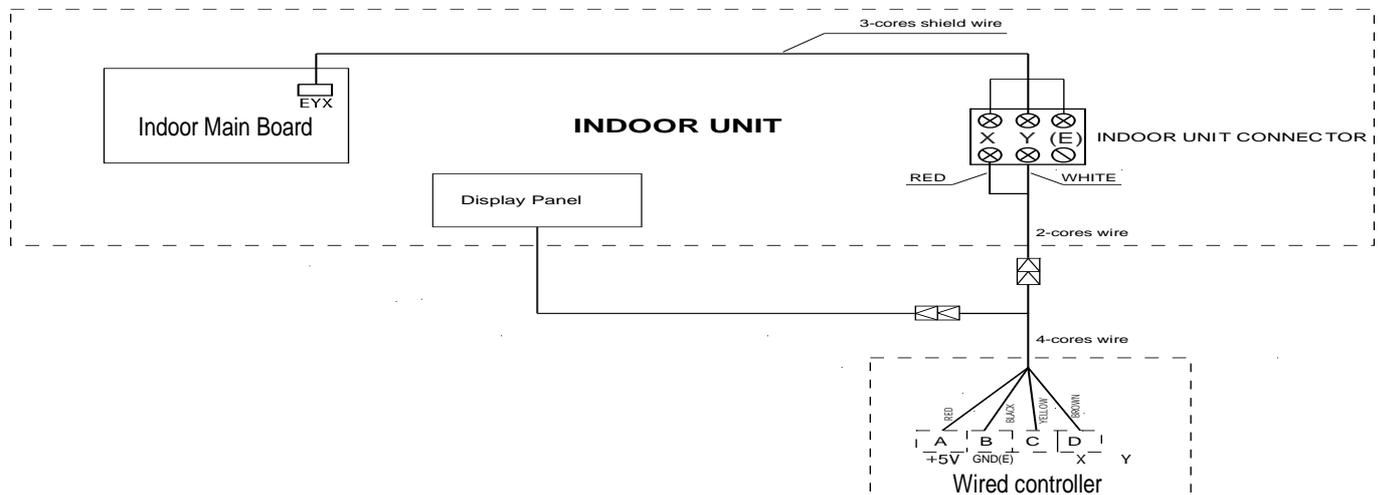
#### **Prepare for the following at installation site.**

NO.	Name	QTY.	Remarks
1	4-core shielded cable	1	The longest length should be less than 15m.
2	86 Electrician box	1	/
3	Wiring tube(insulating sleeve and tightening screw)	1	/

## 2) Dimension: 120\*120\*20mm



## 3) Wiring Principle Sketch:



### Notes:

- 1) This wired controller is compatible with the indoor unit of 3-pipe system and 2-pipe system.
- 2) Please do not connect the wired controller and a centralized controller to the same X, Y, E port, otherwise it will lead to conflict.

## 4) Back cover installation

- Use straight head screwdriver to insert into the buckling position in the bottom of the wired controller, and spin the screwdriver to take down the back cover. (Pay attention to spinning direction, otherwise will damage the back cover!) (Fig.2)
- Use three GB950-86 M4X20 screws to directly install the back cover on the wall. (Fig.3)
- Use two M4X25 GB823-88screws to install the back cover on the 86 electrician box, and use one GB950-86 M4X20 screw for fixing on the wall. (Fig.4.1)

## VRF Controllers

- Adjust the length of two plastic screw bars in the accessory to be standard length from the electrical box screw bar to the wall. Make sure when install the screw bar to the electrical box screw bar, make it as flat as the wall. (Fig.4.2)
- Use cross head screws to fix the wired controller bottom cover in the electric control box through the screw bar. Make sure the wired controller bottom cover is on the same level after installation, and then install the wired controller back to the bottom covers.
- Over fasten the screw will lead to deformation of the back cover.

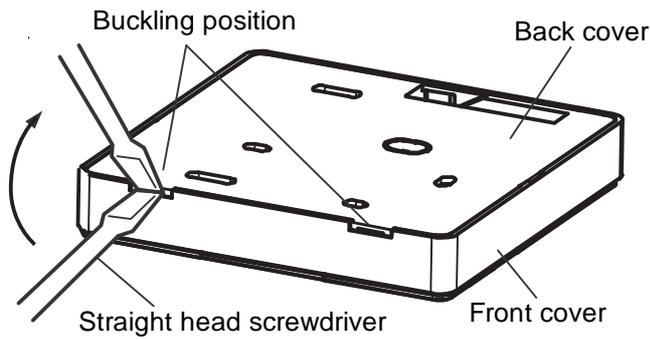


Fig.2

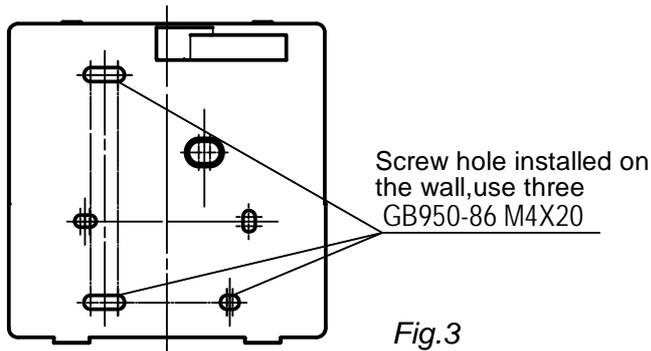


Fig.3

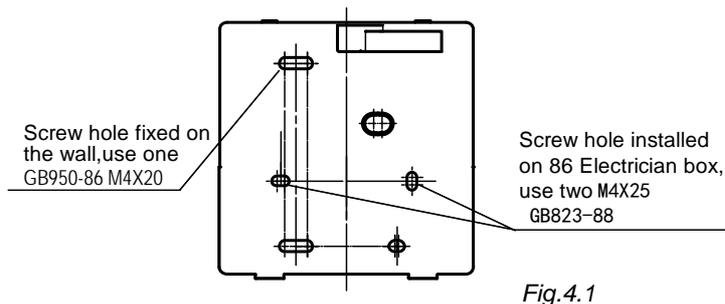


Fig.4.1

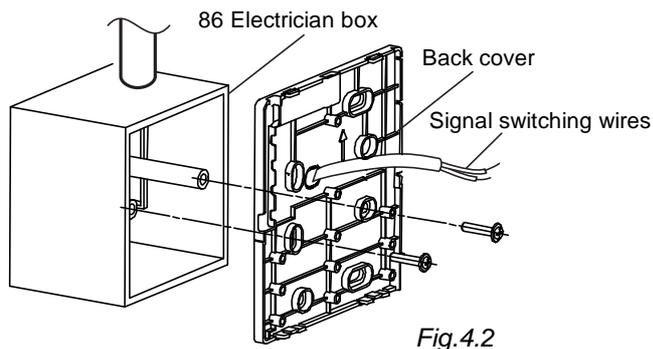
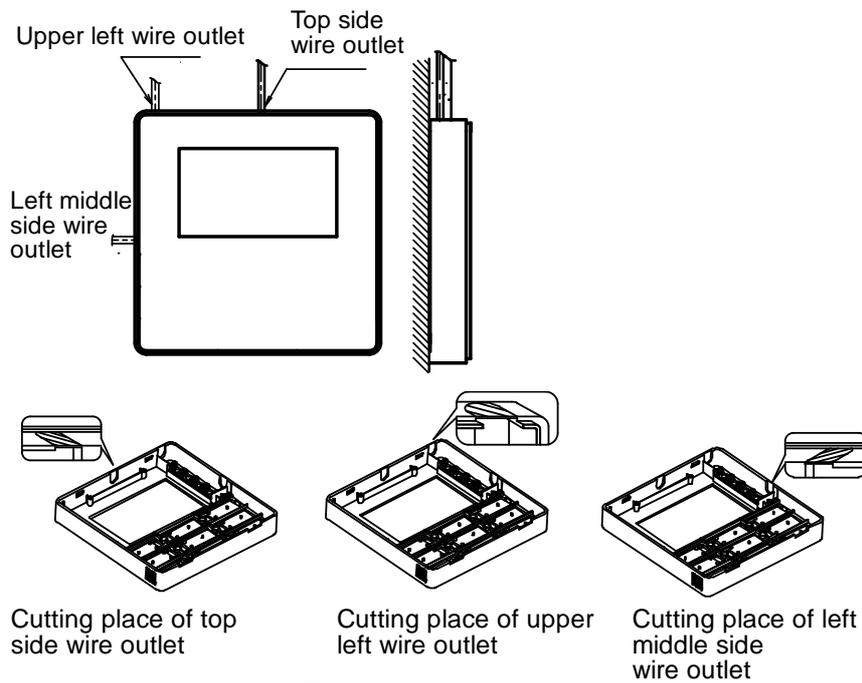


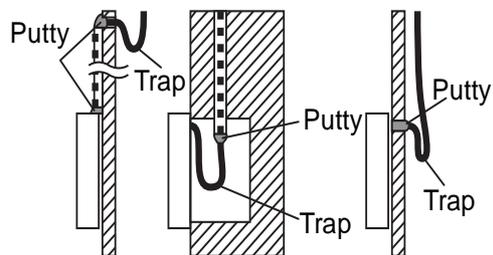
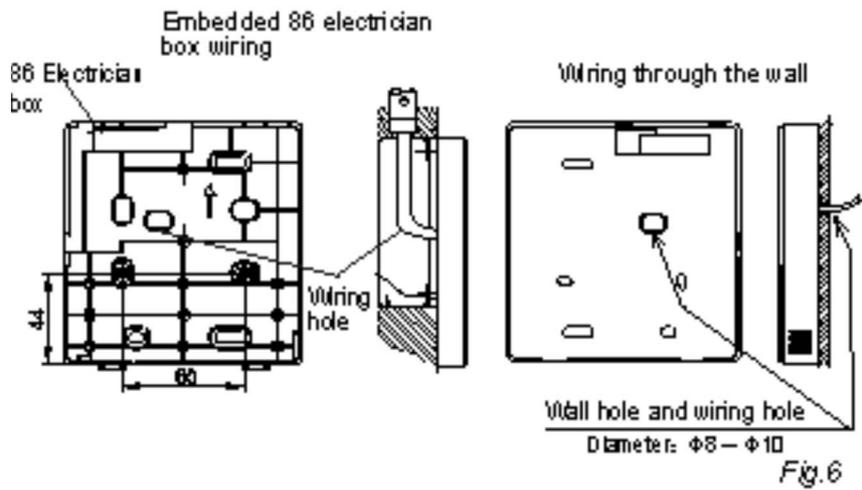
Fig.4.2

### 5) Wiring figure

#### A. Wiring, three outlet positions



#### B. Shielded wiring



*Fig.7*

6) Front cover installation

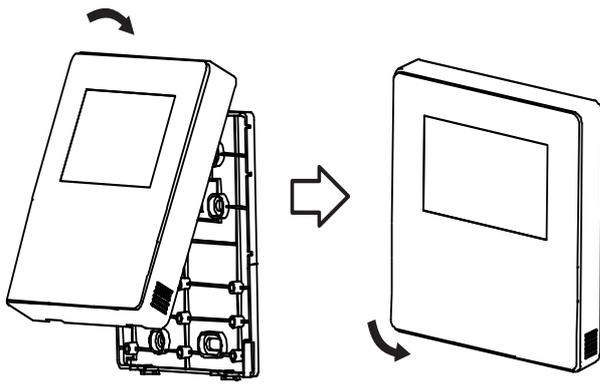


Fig.9

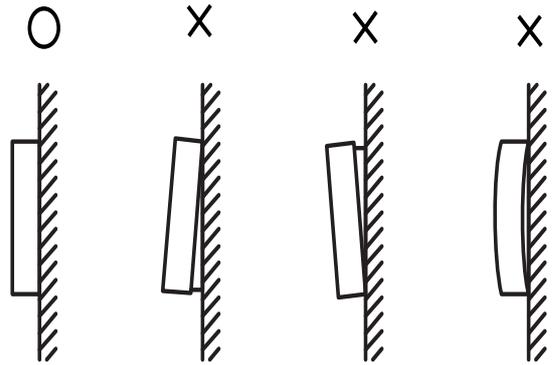


Fig.10

Notes:

1. After adjusting the front cover and then buckle the front cover; avoid clamping the communication switching wire during installation. (Fig.9)
2. Correct install the back cover and firmly buckle the front cover and back cover, otherwise will make the front cover drop off. (Fig. 10)

## Wired Remote Controller (Hotel room) : HWRC



Wired controller specifications

Model	HWRC
Power Supply Voltage	DC 5.0 V
Ambient Temperature Range	-5°C ~ +43°C
Ambient Humidity Range	RH40%~RH90%

### Performance Features

1. Operating mode: cool and heat.
2. Set the mode through combination buttons.
3. Indoor setting temperature range: 17°C ~30°C.
4. LCD (Liquid Crystal Display).

### Appearance

HWRC is a mode-button hidden wired controller. Designed with succinct appearance can be apply for hotel, hospital and school etc.



#### (1) ON/OFF button

Press the ON/OFF button can turn on or turn off air conditioner.

## (2) Selecting mode

When the unit is turned on, press the temperature adjusting buttons ▲ and ▼ simultaneously for 3 seconds can select the operation mode, each press will switch the operation mode as the following order:

COOL→ HEAT→COOL

## (3) Fan speed button

1) When the unit is turned on, press the FAN SPEED key to set the fan speed of the indoor unit.

The fan speed switching order is:

AUTO→LOW →MID →HIGH→ AUTO

2) Setting the fan speed to AUTO when the indoor unit will actually run at LOW speed.

## (4) Setting temperature

When the unit is turned on, press the temperature adjusting buttons ▲ or ▼ button can increase or decrease the setting temperature, the setting range is 17°C-30°C.

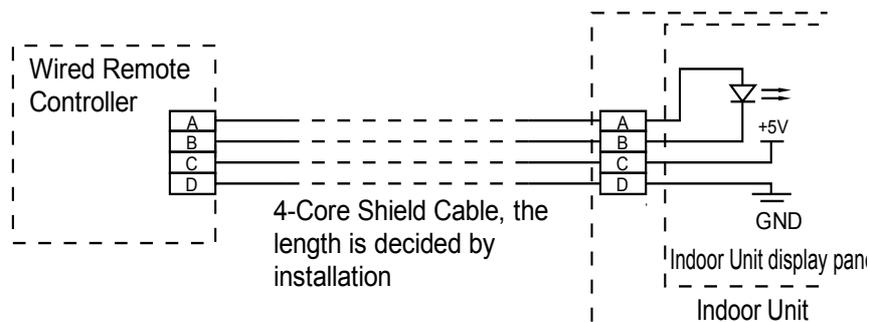
## (5) 26°C setting button

When the unit is turned on, you can press the 26°C shortcut key to quickly set the operation temperature to 26°C.

## Installation

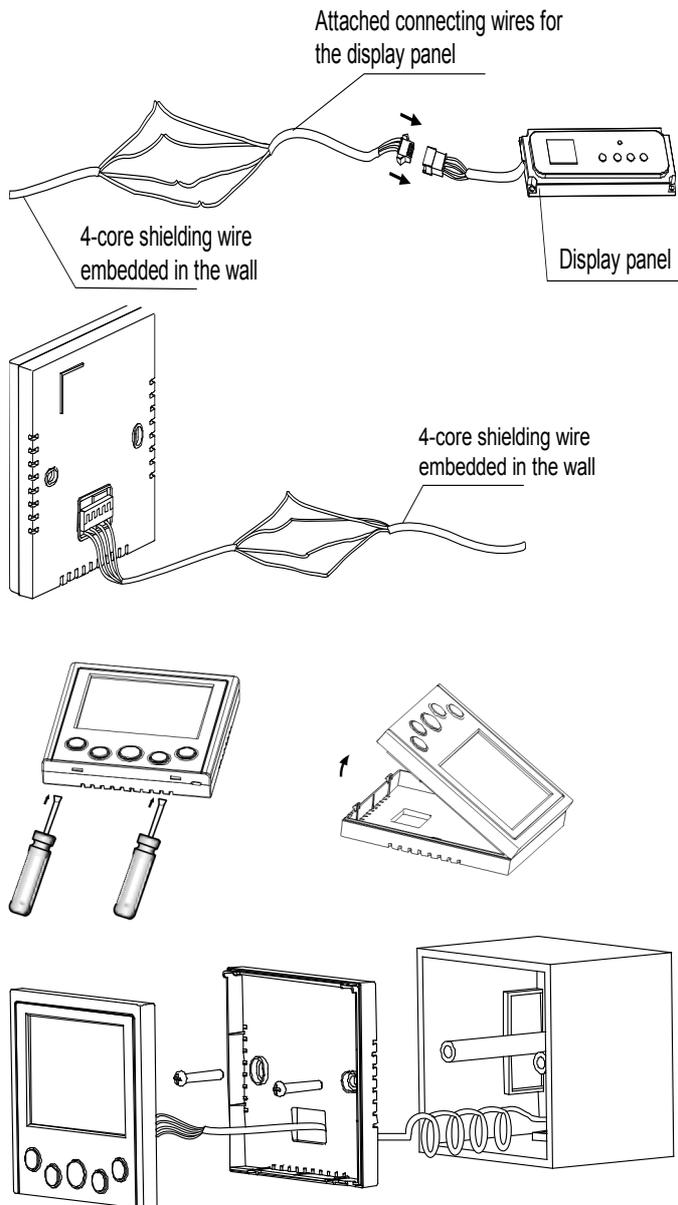
### Installation methods

Principle diagram of wired controller



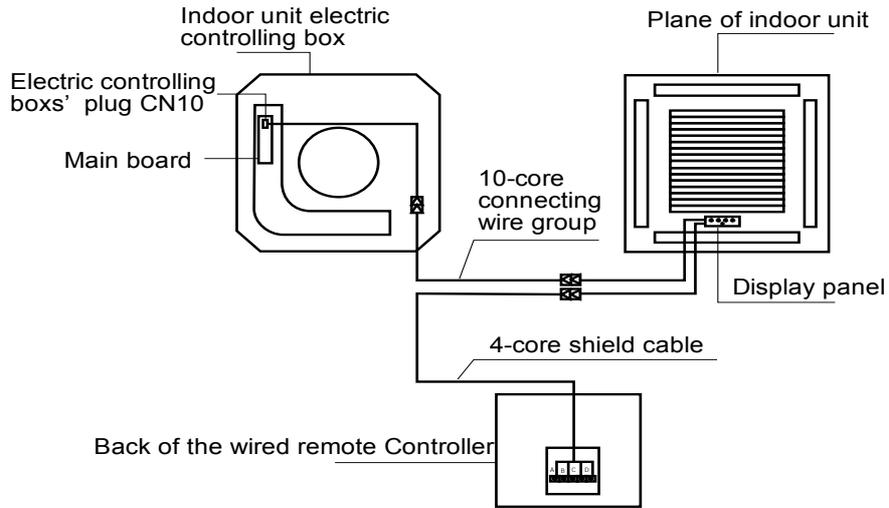
## VRF Controllers

### Installation instruction figure

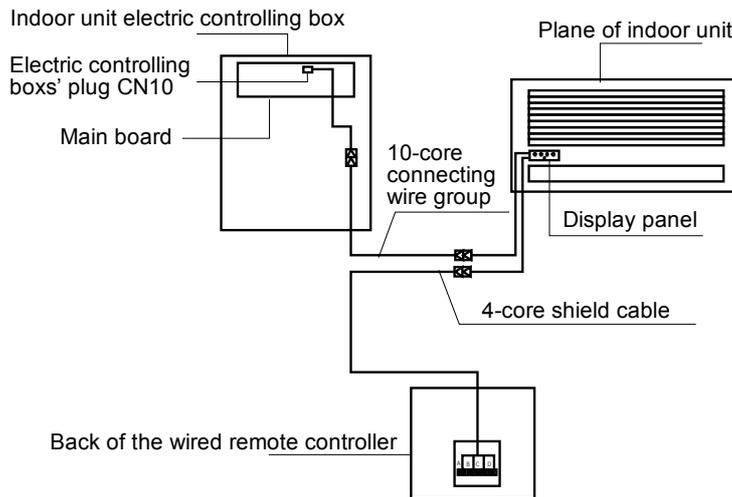


**Wiring figure**

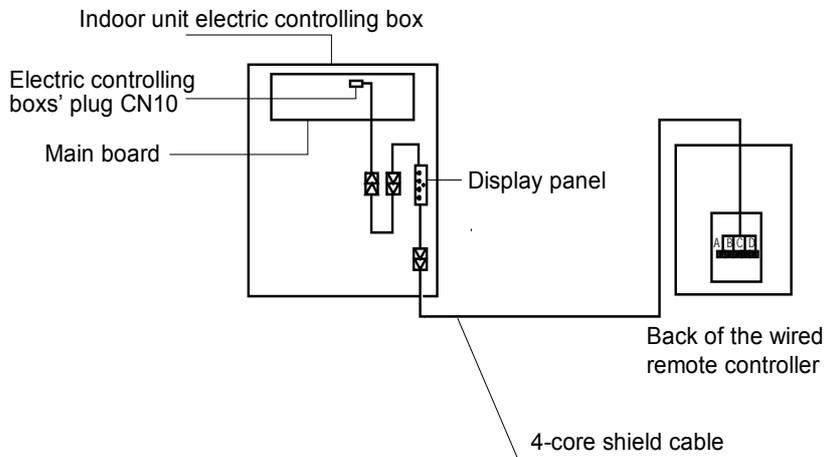
1) Wiring figure of the wired controller connect with the four-way cassette type indoor unit.



2) Wiring figure of the wired controller connect with the courtyard-style duct type indoor unit.

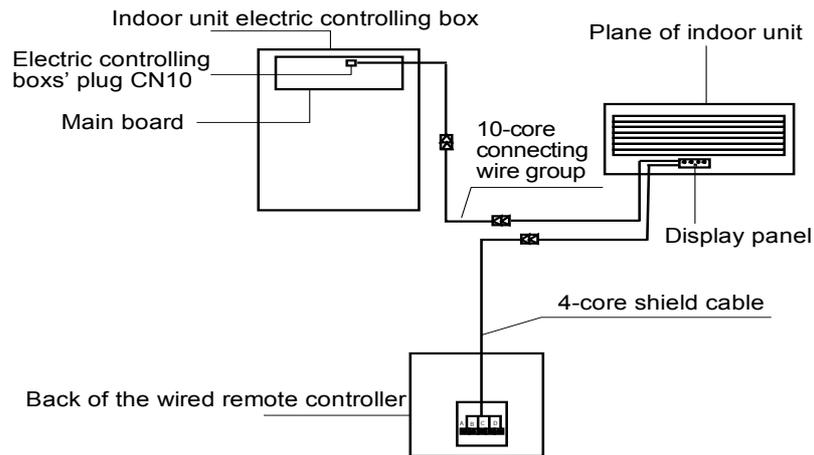


3) Wiring figure of the wired controller connect with the high-static pressure duct type indoor unit.

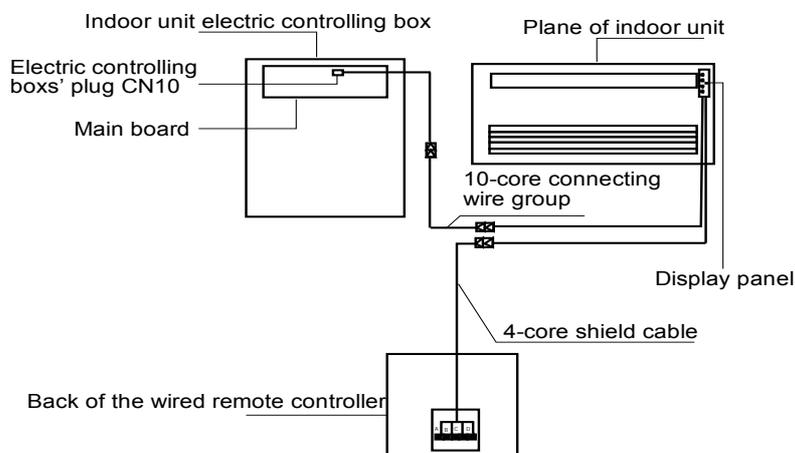


## VRF Controllers

### 4) Wiring figure of the wired controller connect with the wall hanging type indoor unit.



### 5) Wiring figure of the wired controller connect with the stand-hanging type indoor unit.



### Preparation before Installation:

Make sure the following parts has been prepared.

NO.	Name	Qty.	Remark
1	Wired controller	1	—
2	Installation & owner's manual	2	—
3	M4×25 Cross head screwdriver	2	For installing the wired controller on the electrical box.
4	Installation and owner's manual	1	For installing the wired controller on the electrical box.
5	Connective wires to the signal receive panel.	1	For connecting the signal receiving panel with the 4-core shielding wire.

## VRF Controllers

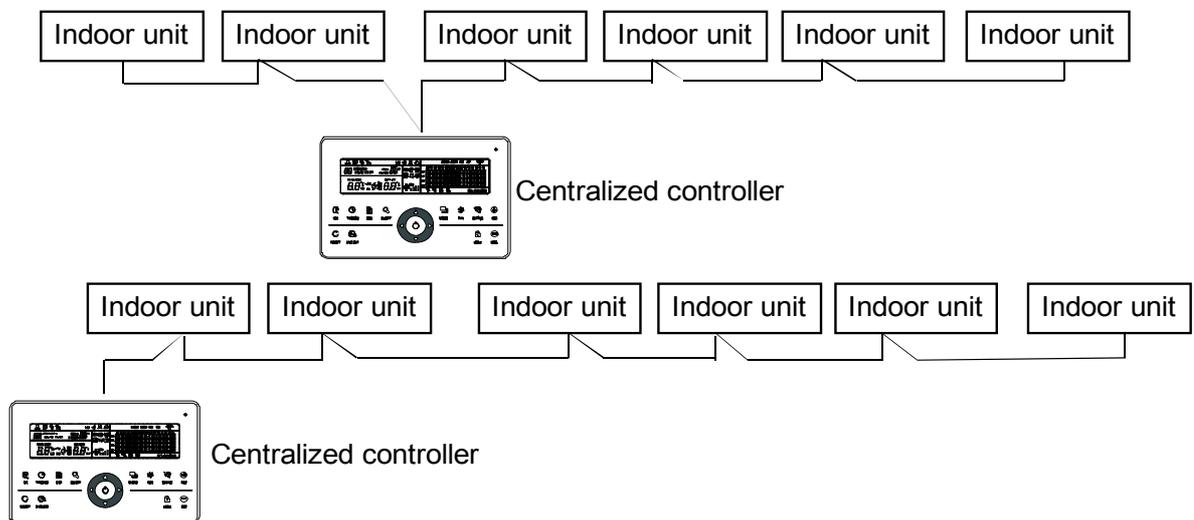
Prepare for the following at installation site.

NO.	Name	Qty.	Remark
1	Electric cabinet	1	General electrical box size, embedded in the wall in advance.
2	4-core shielding wire	1	PVVR-0.5 mm <sup>2</sup> x4, embedded in the wall in advance.
3	Wiring tube(insulation casing)	1	Pre-embedded in to the wall and the length should be less than 15m.
4	Cross head screwdriver	1	For installing the cross head screw.
5	Small cross head screwdriver	1	For taking down the bottom cover of wired controller.

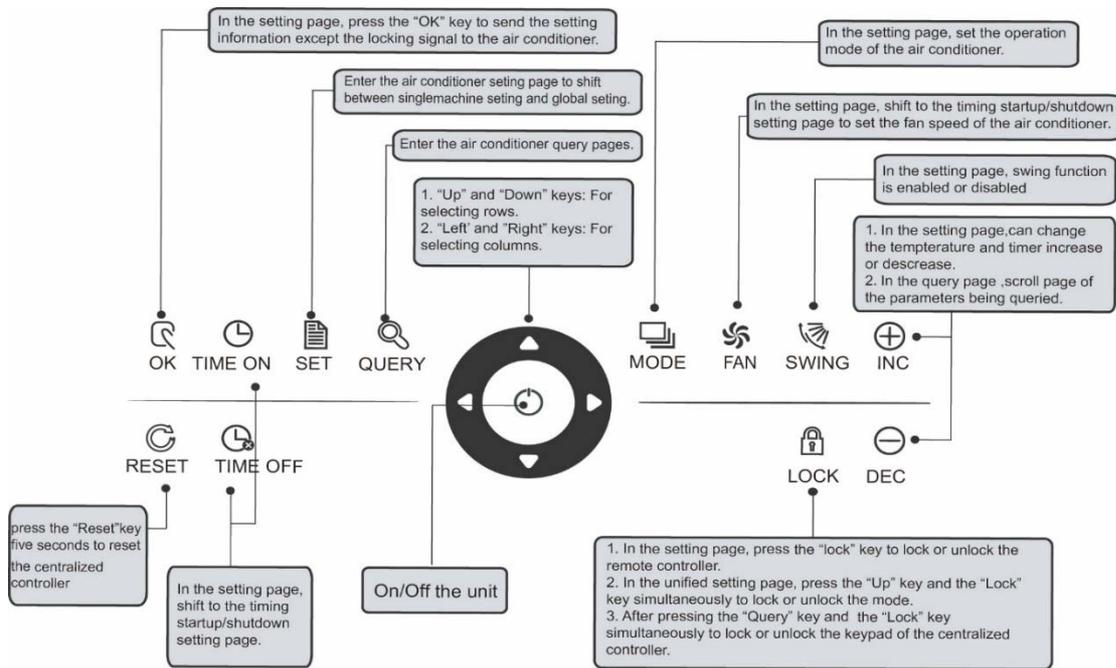
## Touch key centralized controller: CC-TS



CC-TS is new designed and it is a touch key centralized controller. It can be connected up to 64 indoor units, and the connection length can be up to 1200m. The centralized controller has the air filter cleaning reminding function and it is convenient to remind users to clean the air filter. Both of the following wiring modes centralized controller and indoor units are applicable.



## General functions and description



### (1) Query key

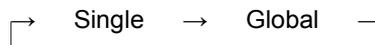
Any time when you press the key, the selected operation mode is to query the operational state of the air conditioner.

By default, the first in-service air conditioner will be queried.

### (1) Setting key

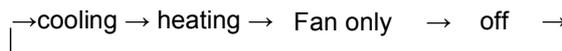
In other display modes, press this key can enter the setting mode.

By default, it is a single setting, and the first in-service air conditioner is displayed. In setting the operation mode, press this key again, and the operation will be performed for all air conditioners in the network. Press the key repeatedly to shift between a single setting and global setting.



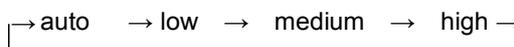
### (2) Mode key

Under the setting operation mode, press this key to set the operation.



### (3) Fan key

Under the setting operation mode, press this key to set the fan of the indoor unit to run in the automatic, high, medium or low level of air.



**(4) Time on key** 

Under the setting operation mode, press this key can set the timing to turn on the air conditioner; press this key again can exit the timing setting, and restore the normal temperature regulation operation mode

**(5) Time off key** 

Under the setting operation mode, press this key can set the timing shutdown of air conditioner, press this key again will exit the timing setting, and restore the normal temperature regulation operation mode.

**(6) Swing key** 

Under the setting operation mode, press this key can enable or disable the swing function. If all currently selected air conditioners have no swing function, no effect will result after pressing the key.

**(7) Leftward key** 

In the query mode, if this key is pressed, the operation state data of the previous air conditioner will be displayed. If it is currently on the first machine, the data of the last machine will be displayed, when the key is pressed. If you hold down this key, the address will decrease one by one. In the setting mode, if it is in single operation mode, the air conditioner of the previous in-service address number will be selected, when this key is pressed, if it is in the global operation mode, no effect will result when this key is pressed. In the main page, press the key to enter the query mode. By default, it is the first in-service air conditioner.

**(8) Rightward key** 

In the query mode, when the key is pressed, the next in-service air conditioner is selected, and its operational state data will be displayed. If it is currently on the last air conditioner, the first one is selected and its data displays, when the key is pressed. If this key is long pressed, the address will increase one by one.

In the setting mode, if it is in the single operation mode, when the key is pressed, the next in-service air conditioner will be selected. If it is in the global operation mode, no effect will result when the key is pressed.

In the main page, press the key to enter the query mode. By default, it is the first in-service air conditioner.

**(9) Downward key** 

In the main page, press this key can enter the query mode. By default, it is the first in-service air conditioner. In any other time, press this key  will select the next row corresponding position air conditioner.

In the setting mode, if the global operation mode is selected, this key is invalid. If it is on the last row, press this key again to shift to the first row air conditioner. If this key is long pressed, the row will increase one by one.

**(10) Upward key** 

In the main page, press this key can enter the query mode. By default, it is the first in-service air conditioner. In any other time, press this key will select the previous corresponding position air conditioner.

In the setting mode, if selected all the air conditioners to operate, this key is invalid.

If it is on the first row, press this key again, and shift to the last row corresponding air conditioner.

If you hold down this key, the row will decrease one by one.

**(11) Add key**  INC

1) Query mode:

Press this key, display the data of the last page. If it is now in the last page, press this key again and the first page will be displayed.

2) Setting operation mode

① Temperature adjusting method

Press this key; the setting temperature will increase 1°C. If you hold down the key "  INC ", the setting temperature will increase one by one.

When reached the highest allowed to set temperature, it cannot increase.

② Timing on or timing off setting method

Press this key "  INC ", it will select the next setting time. If you hold down this key, the next data will be selected one by one. When reached the max. allowed setting time, it cannot increase.

**(12) Reduce key**  DEC

1) Query mode

Press this key "  DEC ", display the data of the previous page. If it is now in the first page, press is key again and the last page will be displayed.

2) Setting operation mode

① Temperature adjusting method

Press this key "  DEC ", the setting temperature will decrease 1°C. If you hold down this key, the setting temperature will decrease one by one. When reached the lowest allowed set temperature, it cannot decrease.

② Timing on or timing off setting method

Press this key "  DEC ", it will select the next setting time. If you hold down the key "  DEC ", the next data will be selected one by one. When reached the min allowed setting time, it cannot decrease.

**(13) ON/OFF key** 

Any time when you press the key, the centralized startup/shutdown operation is performed for all current in-service air conditioners in the centralized controller network.

**(14) Confirmation key** 

In the setting mode, press this key can send the currently selected mode state and the auxiliary function state to the selected air conditioner.

**(15) Reset key** 

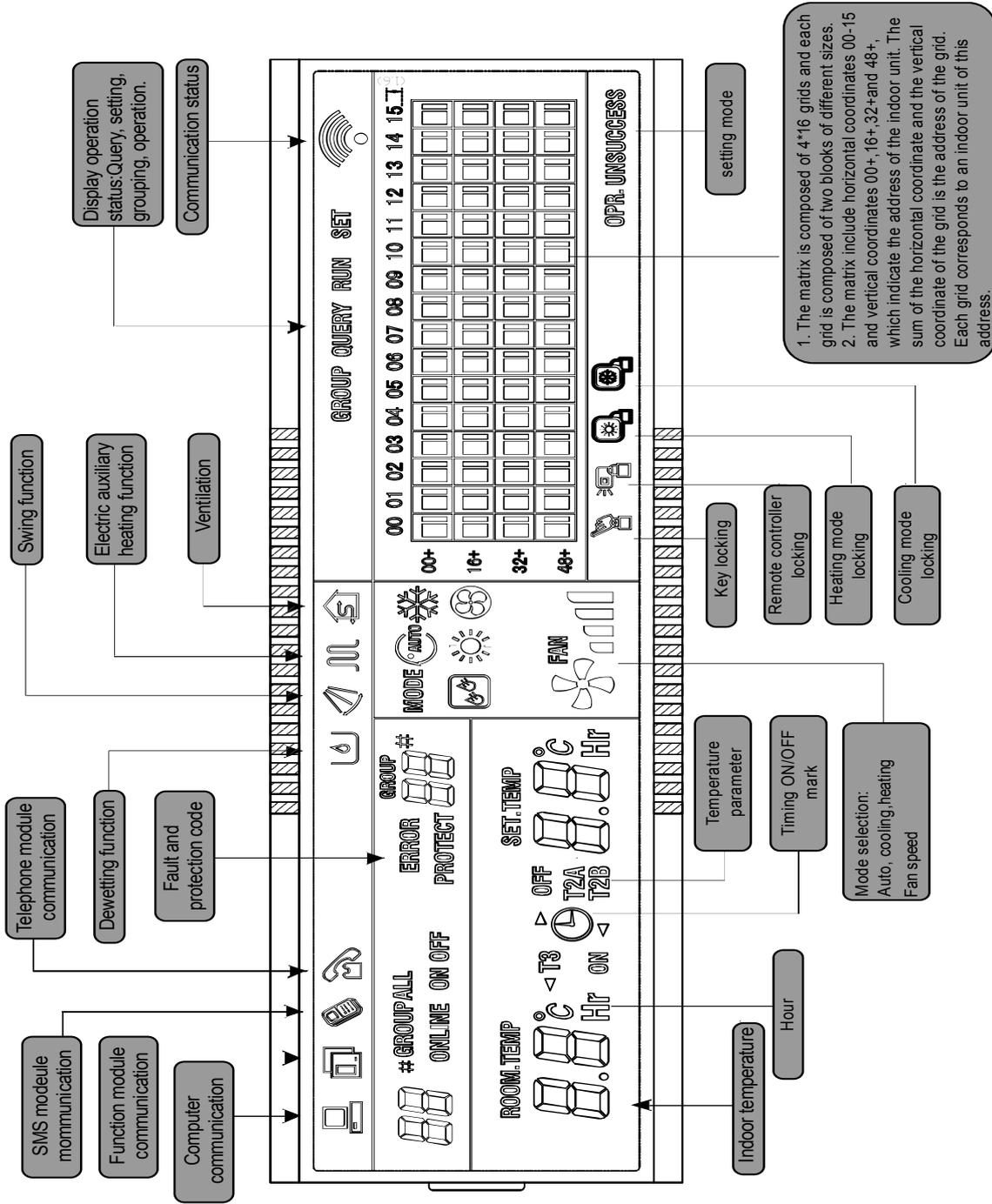
Any time when the reset key is pressed, the centralized controller will reset. The result is the same as the result of restoring power-on after power failure.

**(18) Lock key** 

Any time when this key is pressed, the selected air conditioner can be locked or unlocked.

# LCD display

## Full display of LCD



## Other operations

### Various locking functions

#### 1. Centralized controller locking

The centralized controller locking state will be recorded when powered off. It won't dismiss when re-power on until receiving the unlocking order.

##### 1) Effect

- ① When the centralized controller is under locking state, it cannot change the air conditioner's operating state through the centralized controller (such as ON/OFF the unit, setting mode, change the setting temperature, change the fan speed, unlock the existing locking state etc.), but it can do the query operation, until unlocking and then recover to normal.
- ② When the centralized controller is under the locking state, all the air conditioners in the centralized controller network will be remote controller locked.

##### 2) Operation

###### ① Locking

The centralized controller can be locked by the computer only.

###### ② Unlocking

a) When the centralized controller and computer communicate normally

The centralized controller can be unlocked by the computer only. When the centralized controller is unlocked, the controller will send the order to unlock the remote controller locking of all the air conditioners.

b) When the centralized controller and computer communication abnormally

When the centralized controller is locking, the centralized controller can be unlocked by the way that the press QUERY key and holds on, then press MODE key (it should operate within one minute after centralized controller is re-powered on or the RESET key is pressed).

The remote controller locking of the air conditioner is remained.

#### 2. Remote controller locking

##### 1) Effect

- ① When the air conditioner is under remote controller locking state, it will not receive the remote signals from remote controller or wired controller, until unlocking.
- ② The air conditioner can be operated by the centralized controller.

##### 2) Operation

- ① Can lock or unlock through the computer.
- ② Can operate by a centralized controller.

## VRF Controllers

In the centralized controller setting interface, press LOCK key to lock or unlock.

If the current state is remote controller locking, press the key to unlock.

If there's no remote controller locking, press the key to lock.

### 3. Mode locking

#### 1) Effect

Under the mode locking state, only can choose the mode which hasn't conflict with locking mode through centralized controller to operate the air conditioner,

#### 2) Operation

Can set the heat and cool mode lock or not

Under mode locking state, if set the new mode locking, it must be unlocking first, then can operate the new mode locking.

① Can lock or unlock through the computer.

② Can operate by a centralized controller.

In the centralized controller setting interface, choose all the air conditioners of the centralized controller network as the object, press Upward key and hold on, then press LOCK key to do the mode locking or unlocking.

If the current state is mode locking, press the key to unlock.

If there isn't a mode of locking, press the key to lock.

### Power on or reset

When the centralized controller is powered on or resets by the RESET key:

The buzzer long buzz for 2 seconds: all display segments of the LCD are luminous for 2 seconds and then goes off; 1 second later, the system enters normal display state. The centralized controller is in the main page display state and displays the first page, and searches the in-service air conditioners in the network.

Once the search is finished, the centralized controller enters the mode setting page, and sets the first in-service air conditioner by default.

### Emergency stop and forced on

When the emergent stop switch of the centralized controller is connected, all the air conditioners in the centralized controller network will be shut down compulsorily, and the LED flashes as 0.5Hz. The centralized controller and computer and all functional modules are disabled from startup and shutdown until the emergent stop switch is broken. When the forced on the switch of the centralized controller is connected, all air conditioners in the network of the centralized controller will start up compulsorily. By default, they will run before the power failure mode.

## VRF Controllers

The startup and shut down operations of the centralized controller and computer and all functional modules will be disabled (only the command of a startup is sent to the air conditioner, without affecting operation of the remote controller after startup) until the forced on the switch is broken.

If the foregoing two switches are connected concurrently, the emergent stop switch shall have preference.

### ON and OFF operation

Use the " " key or " " key can turn on and turn off the air conditioners in the centralized controller network.

The ON mode will accord to the system mode locking or other limit conditions for judging, if there is conflict, it will auto adjust to the next mode without conflict; if all the modes have a conflict, then it cannot operate the unit.

### Use " " key to TURN ON and TURN OFF the unit

Press this key can operate a single air conditioner or all the air conditioners in the centralized controller network.

1) Choose the object. Press SET key to choose a single air conditioner or all air conditioners in the centralized controller network. If choose a single air conditioner, then use the keys , ,  and

 can choose the air conditioner.

2) Use "MODE", "FAN", "ADD" and "Reduce" key to set the operating mode and operating parameters, such as fan speed, setting temperature etc.

3) Use " " key, centralized controller sends the relative order to the operating object.

After setting the operating parameter for the air conditioner, if not press the key " ", the setting parameter will not be sent to the air conditioner, and the current operation of the air conditioner is not affected (except locking operation).

### Use " " key to TURN ON and TURN OFF the unit

Only can operate all air conditioners, not for single in the centralized controller network:

Long press " " key: press this key for over 2 seconds then loose.

Short press " " key: press this key and then loose within 2 seconds.

According to different states and operation ways of air conditioners in the current centralized, there are following situations:

1) If there are one or more air conditioners is under ON state (include timing process of timing ON and OFF), " " key only short press effective.

Only sends the shutdown order to the air conditioner which under the ON state, and if the unit is under the OFF state, the controller will not send OFF order to it.

The memory function is activated; the current state of all air conditioners is memorized.

2) All the air conditioners in the centralized controller network are OFF states.

① Short press "⏻" key

The centralized controller reads the memory contents, and sends relative order to all air conditioners.

② Long press "⏻" key

a) If current page is setting parameters, and the setting mode is not OFF, the centralized controller will send orders to all air conditioners according to parameters, such as setting mode, fan speed, setting temperature, etc.

b) If the current is under setting interface but the setting mode is OFF state or under other interfaces, the centralized controller will send the default ON order to all air conditioners. The default ON order is: cooling mode, high fan speed, setting temperature is 24°C or 76°F, operates the swinging function.

### Air filter cleaning remind display description

1) The centralized controller records the total running time of the indoor unit.

When the accumulated running time reaches the pre-set value, the reminding dual "88" (as show in c part of the Fig. A) will display "FL" to remind users that the air filter of the indoor unit need to be cleaned.

When the centralized controller displays FL, it needs to manual operation to clear the icon. Press SWING key  and hold on then press QUERY key , can clear FL reminding.

At the same time, the accumulated time of centralized controller powered on will be cleared.

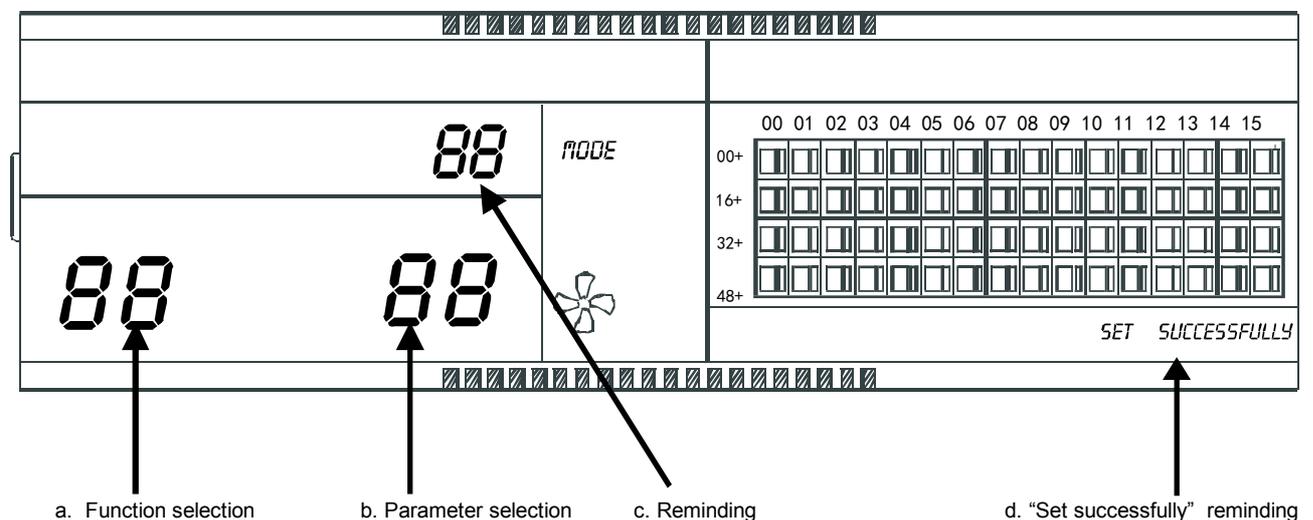


Fig. A

2) Function setting

① Dial the dial code 3 to "ON" ( refer to table 2.3 ), and when controller power on within 1 minute, press QUERY key and FAN key together will enter the optional function setting page. The icon  (as show in b part of the Fig. A) will be flashed with 1Hz frequency (default display 00), and users can choose the function from table 2.2.

## VRF Controllers

Press "**INC**" and "**DEC**" keys can select function, and then press "**OK**" key to enter parameter selection.

- After entering parameter selection, the function selection icon **BB** (as show in a part of the Fig. A) will be lighted on; the parameter selection icon **BB** (as show in b part of the Fig. A) will be flashed with 1Hz frequency and display optional parameter code. Through pressing "**INC**" and "**DEC**" keys can select the detailed parameter.

- Press "**OK**" to confirm parameter selection (details parameter codes' corresponding time refer to table 2.3).
- After setting successfully, the function selection icon **BB** and parameter selection icon will be lighted on, the screen will display "Setting successfully" (as show in b part of the Fig. A). After 3 seconds will exit optional function setting automatically, and the screen will be back to normal display. After entering optional function setting, no operations in 5 seconds will exit function selection automatically, the setting parameter will not change. Only press "**OK**" key to confirm the parameter then the setting parameter will save.

Table 2.1: The code of selecting the clear filter function

Function code	Function setting
00	Only display, no function
01	Cleaning filter screen reminding

Table 2.2: The code of different times of reminding clear filter

Parameter code	Time (hour)
00	0
01	1250
02	2500
03	5000
04	10000

## Dial code operation specification

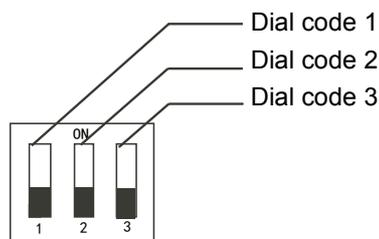


Table 2.3

	ON	OFF
Dial code 1	CCM30 for 3-pige	CCM30 for 2-pige

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Dial code 2	Fahrenheit	Centigrade
Dial code 3	With the optional function	No the optional function

### Notes:

1. For the new series product, we can connect the indoor Centralised controller via XYE port of master outdoor unit of every refrigerant system. Notice that in this case, the outdoor unit must be set to auto addressing mode. And it will be effective after about 6 minutes.
2. To connect indoor Central controller via XYE port of indoor unit, this wiring method is suitable for all type of indoor units, not just for new indoor units.
3. When new indoor units and old indoor units mix connect to one refrigerant system, we can just connect the indoor Central controller via XYE port of indoor units. If we connect the indoor Central controller via XYE port of master outdoor unit, the Central controller cannot control old indoor units.
4. If one system that connect to indoor Central controller include 10 HP or above duct indoor unit, we recommend you set the address of every indoor unit manually.

### Fault and protection codes

Fault code	Content
EF	Other faults
EE	Water level detection malfunction
ED	Reserved
EC	Cleaning malfunction
EB	Inverter module protection
EA	Current of compressor is too large (4 Times)
E9	Communication malfunction between main board and display board
E8	Wind blowing speed is out of control
E7	EEPROM error
E6	Detection of current direction alternating is abnormal
E5	T3 or T4 sensor of discharge of compressor fails down
E4	T2B sensor malfunction
E3	T2A sensor malfunction
E2	T1 sensor malfunction
E1	Communication malfunction
E0	Phase sequence disorder or loss of power phase
07#	/
06#	/
05#	/
04#	/
03#	Communication malfunction between centralized controller and PC(gateway)
02#	Communication malfunction between centralized controller and functional module
01#	Communication malfunction between centralized controller and network interface module
00#	Communication malfunction between network interface module and main control board

Protection code	Content
PF	Other protection
PE	Reserved
PD	Reserved
PC	Reserved
PB	Reserved
PA	Reserved

P9	Reserved
P8	Compressor's current is too large
P7	Voltage of power supply is too high or too low
P6	Pressure of discharge is too low
P5	Pressure of discharge is too high
P4	Temp. of discharge pipe is abnormal
P3	Temp. of compressor is abnormal
P2	Condenser high-temperature protection
P1	Anti-cool air or defrost protection
P0	Evaporator temperature protection

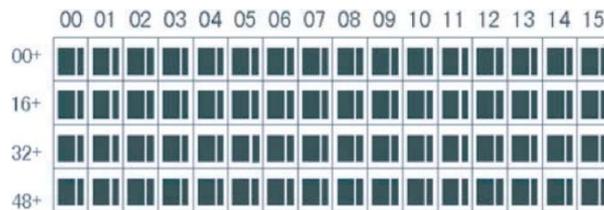
## General display data entries

### 1) General display data is displayed in all display pages.

- Under the interconnected control of the computer or gateway, the data is displayed in graphic (  ). Otherwise, no data is displayed.
- If the centralized controller is connected with the functional module for communication, the data is displayed in graphics (  ). Otherwise, no data is displayed.
- If the centralized controller is connected with the SMS remote control module for communication, the data is displayed in graphics (  ). Otherwise, no data is displayed.
- If the centralized controller is connected with the telephone remote control module for communication, the data is displayed in graphics (  ). Otherwise, no data is displayed.
- In normal operation of the centralized controller, the periodical cycle module communicates with the network interface module, and the data is displayed dynamically and cyclically: (blank),  ,  ,  ,  .
- In the centralized control locked state or the keypad locked state, the locking flag (  ) is displayed. After unlocking, it is not displayed. In the centralized controller locked state or the keypad locked state, the locking flag is displayed constantly. If both of them are locked concurrently, the locking flag is displayed constantly.
- In the setting page, if the selected air conditioner is in the remote controller locked state (in case of non-single unit operation, as long as one unit is in the remote controller locked state, it is deemed the locked state), the flag (  ) is displayed constantly.
- If all indoor units lock the cooling mode, this flag (  ) will display, and if all indoor units lock the heating mode, the flag (  ) will display.

## 2) Data display handling

- Indoor unit code (address) display: display range: 00~63, and with # being luminous concurrently.
- Indoor temperature display: display range: 00~99°C (or 99°F). The indoor temperature is displayed concurrently. If the temperature is higher than 99°C (or 99°F), 99°C (or 99°F) will be displayed. If the temperature value is invalid, ‘--’ will be displayed.
- If timing startup or shutdown is set, the flag (🕒) is displayed.
- T3, T2A and T2B display: in the single-machine query page, display can shift between T3, T2A and T2B; by the way, the temperature value is displayed concurrently, with the corresponding °C being luminous.
- In case of air conditioner fault or protection, the corresponding fault or protection code, the corresponding fault or protection code can be displayed.
- Liquid crystal matrix display description:



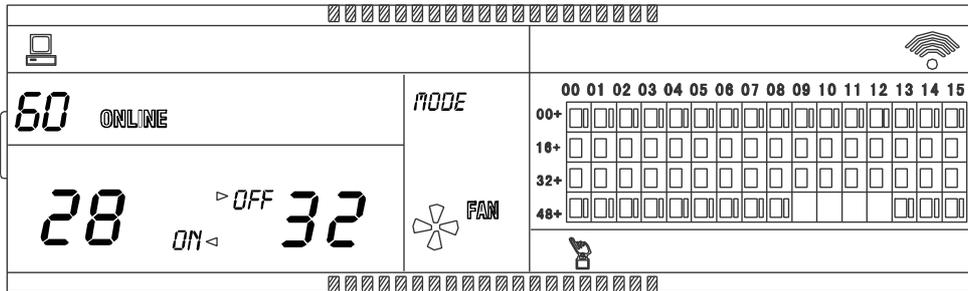
The liquid crystal matrix is composed of 4×16 grids, and each grid is composed of two blocks of different sizes. The matrix includes horizontal coordinates 00~15 on the upper side and vertical coordinates 00+, 16+, 32+ and 48+ on the left side, which indicate the address of the indoor unit. The sum of the horizontal coordinate and the vertical coordinate of the grid is the address of the grid. Each grid corresponds to an indoor unit of this address. One grid is composed of two blocks of different sizes. The state indication table is as follows;

	Constantly on	Slow blink		Fast blink
Big black block	In-service	Selected	Fault of indoor or outdoor unit	Out of service
Small black block	Power on			Power off

### 3) LCD display description

- Description of the main page

The LCD displays the main page, 60 air conditioners are in service, of which 28 are powered on and 32 off.



In the matrix, the big dots from (16+, 00) to (32+, 15) are luminous, and the small dots are not luminous. It indicates the 32 air conditioners with the addresses from 16 to 47 are powered off.

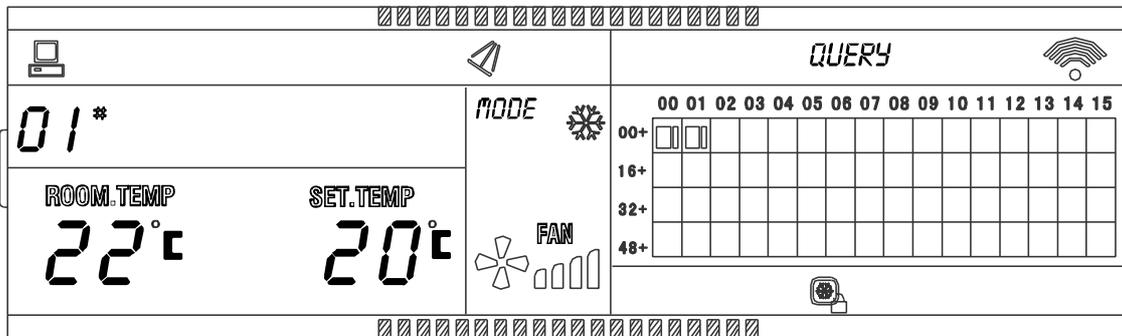
In the matrix, the big and small dots from (48+, 09) to (48+, 12) are not luminous. It indicates the four air conditioners with the address from 57 to 60 are outside the network.

All other big and small dots in the matrix are luminous. It indicates all other air conditioners are in the network and powered on.

The address of the air conditioner is sum of the coordinates. For example, the address of (48+, 09) is 09+48=57.

The centralized controller keypad is locked, and the centralized controller communicates with the computer normally.

- Description of the query page

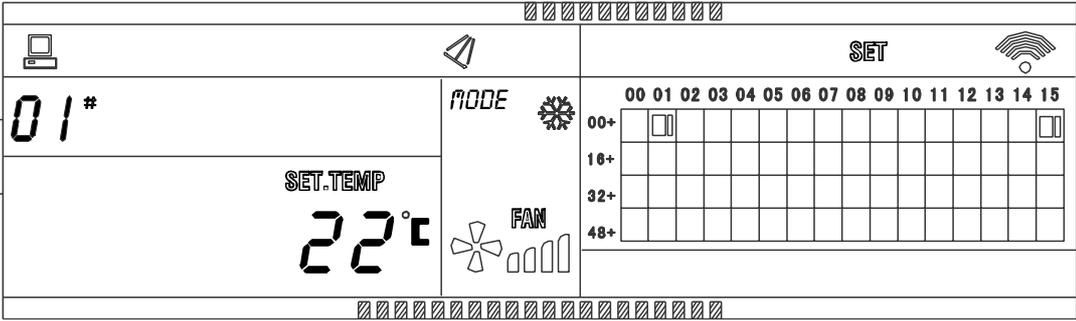


The LCD displays the query page, and the air conditioner with the address of 01 is being queried. Mode of the air conditioner with the address 01 is cooling, high speed air supply, swing on, indoor temperature 22°C, setting temperature 20°C and cooling mode locked.

In the matrix, only the big and small black dots at (00+, 00) and (00+, 01) are luminous. It indicates the in-service and power-on state of the air conditioners with the addresses of 00 and 01.

The centralized controller communicates with the computer normally.

- Description of the setting page



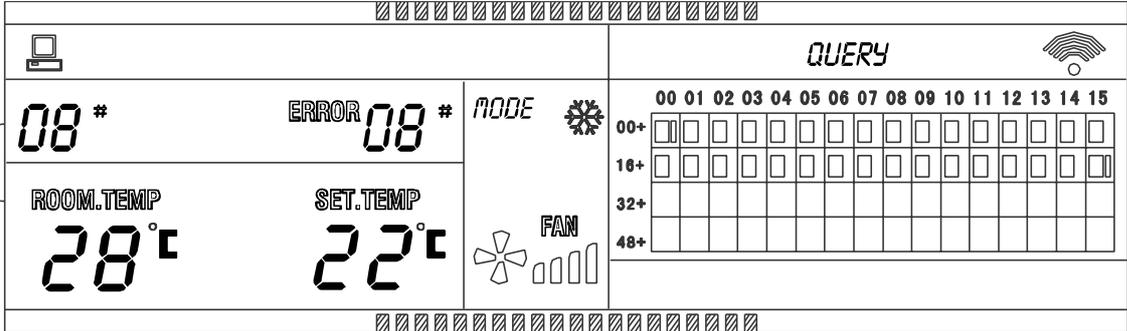
The LCD display displays the setting page, and queries the air conditioner with the address of 01.

The mode of the air conditioner with the address 01 is: Cooling, high fan speed, swing on, setting temperature 22°C and cooling.

In the matrix, only the big black dots at (00+, 01) to (00+, 15) are luminous. It indicates the air conditioners with the addresses 01 and 15 are in service.

The centralized controller communicates with the computer normally.

- Fault page display description



Query the air conditioner with the address of 08 in the query page.

The air conditioner with the address of 08 is faulty, and fault code is 08. The big black dot below (00+, 08) blinks.

In the matrix, only the big and small black dots at (00+, 00) and (16+, 15) illuminate. It indicates the in-service state of the air conditioner power on, with the addresses 00 and 31.

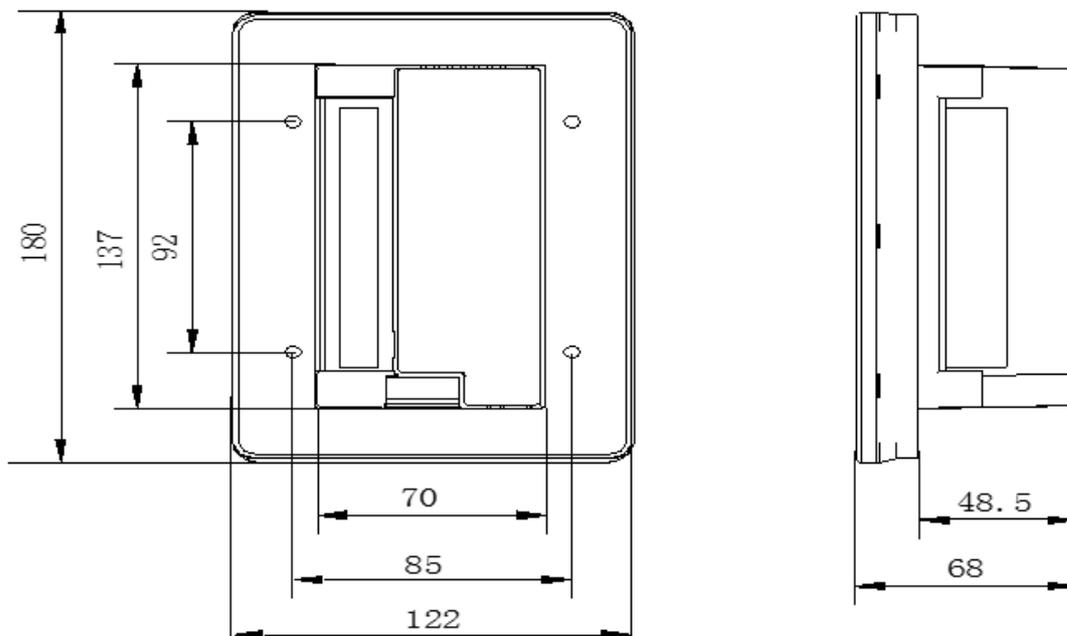
The centralized controller communicates with the computer normally.

### 3.2.6 Centralized controller installation

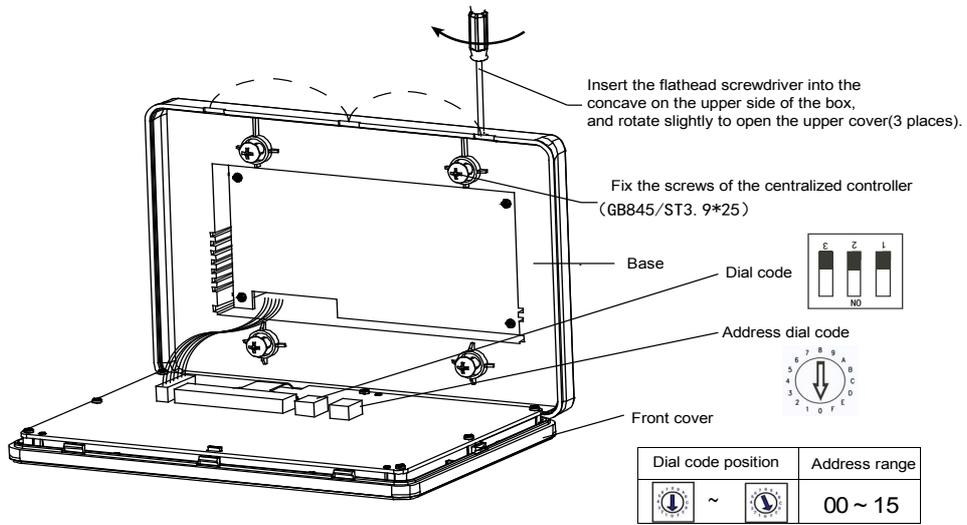
#### Dimensions (Unit: mm)

There are two kinds of appearance for your choice. The main difference is the controller cover and you can choose you like.

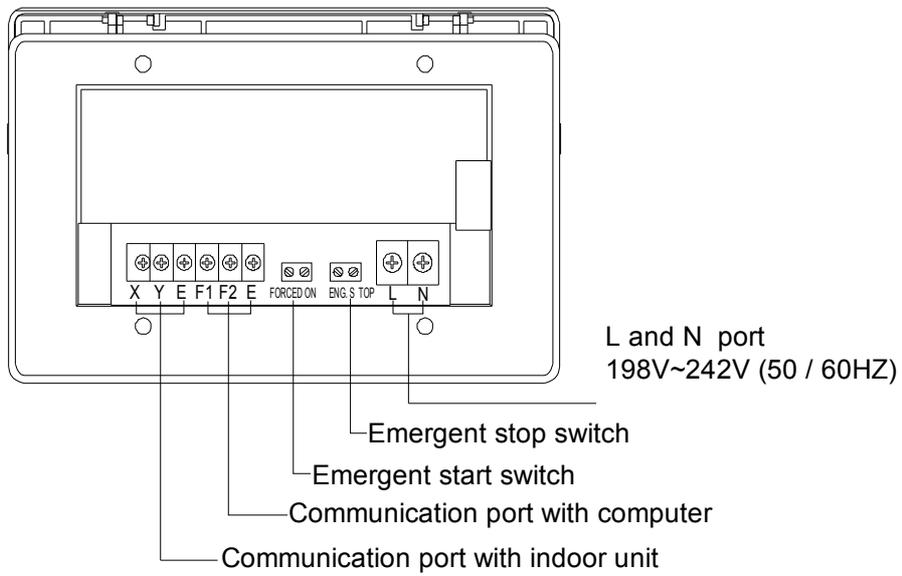
- (1) The structure A must be embedded into the wall of the installation mode, taken from the walls of the interior wiring way would be more appropriate; and you must reserve a chisel installation on the wall before installation.
- (2) The structure B does not need to be embedded into the wall, playing four mounting screw mounting and shape is a regular cuboid, can also like the old structure embedded in the wall mounted, connecting line from the set control above and below, and a rear leading-out.



### Installation diagram

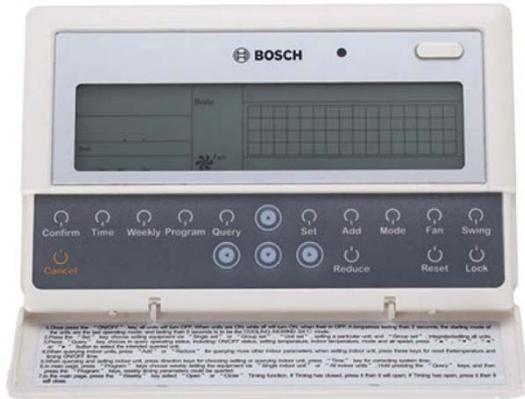


### Terminal instruction



## Centralized controller with weekly schedule timer: CC-WT

CC-WT can control 64 indoor units control with weekly schedule timer function. With the function above, CC-WT can't be connected to the network control system. And actually it does not have the port F1, F2, E, which are needed if connects to the computer.



- 7-days Weekly schedule setting (Maximum 128 weekly & daily schedules)
- Max. 64 indoor units group control or individual setting
- Clear and bright screen with LCD backlight
- Temperature setting
- Wireless remote control restriction
- Mode lock
- Permanent schedule setting storage

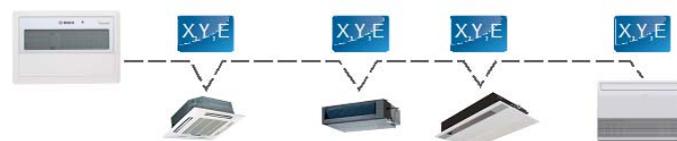
### System configure

CC-WT is only an indoor unit centralized controller and with this device could set the indoor unit's functions compactly and conveniently.

1. All the indoor units and outdoor units are DCI series, the topology of the network can be as follows. Moreover the 2<sup>nd</sup> way of connecting is also adaptable in this condition.



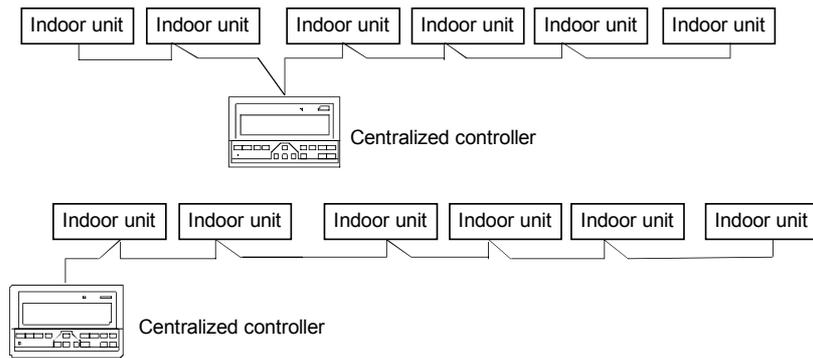
2. The indoor units contain any V4 series, wiring connection method is as follows.



CC-WT controller needs connecting it with other indoor units in a hand-in-hand way.

For the 2<sup>nd</sup> type of topology, either of the connecting ways below is available.

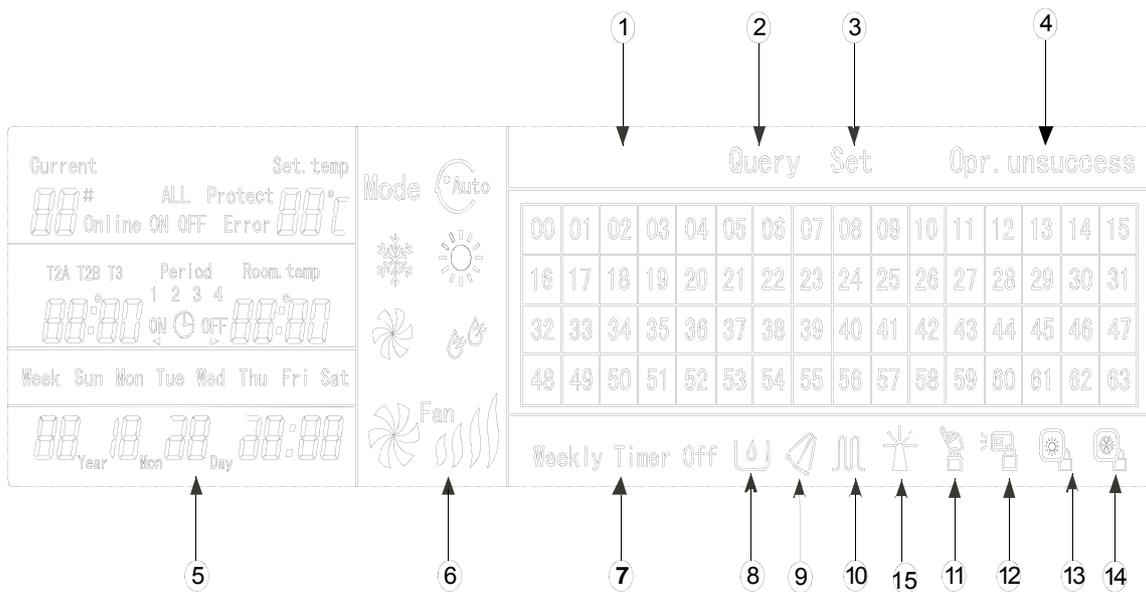
## VRF Controllers



### Notes:

1. For the new series product, we can connect the centralised controller via XYE port of master outdoor unit of every refrigerant system. Notice that in this case, the outdoor unit must be set to auto addressing mode. And it will be effective after about 6 minutes.
2. To connect centralized controller via XYE port of indoor unit, this wiring method is suitable for all type of indoor units, not just for new indoor units.
3. When new indoor units and old indoor units mix connect to one refrigerant system, we can just connect the indoor centralised controller via XYE port of indoor units. If we connect the indoor centralised controller via XYE port of master outdoor unit, the centralised controller cannot control old indoor units.
4. If one system that connect to centralised controller include 10 HP or above duct indoor unit, we recommend you set the address of every indoor unit manually.

### 3.3.2 LCD display



1	On-line conditioner matrix table of A/C 0-63	8	Economy run
2	Query	9	Swing
3	Set	10	Electric auxiliary heater
4	Operate result	11	Locking keyboard
5	Date time	12	Remote controller locking: does not respond signal from remote controller.
6	Run mode	13	Heating mode locking: only heating mode is effective.
7	Weekly-timer off	14	Cooling mode locking: only cooling mode is effective
15	Indoor unit malfunction		

### LCD icon description

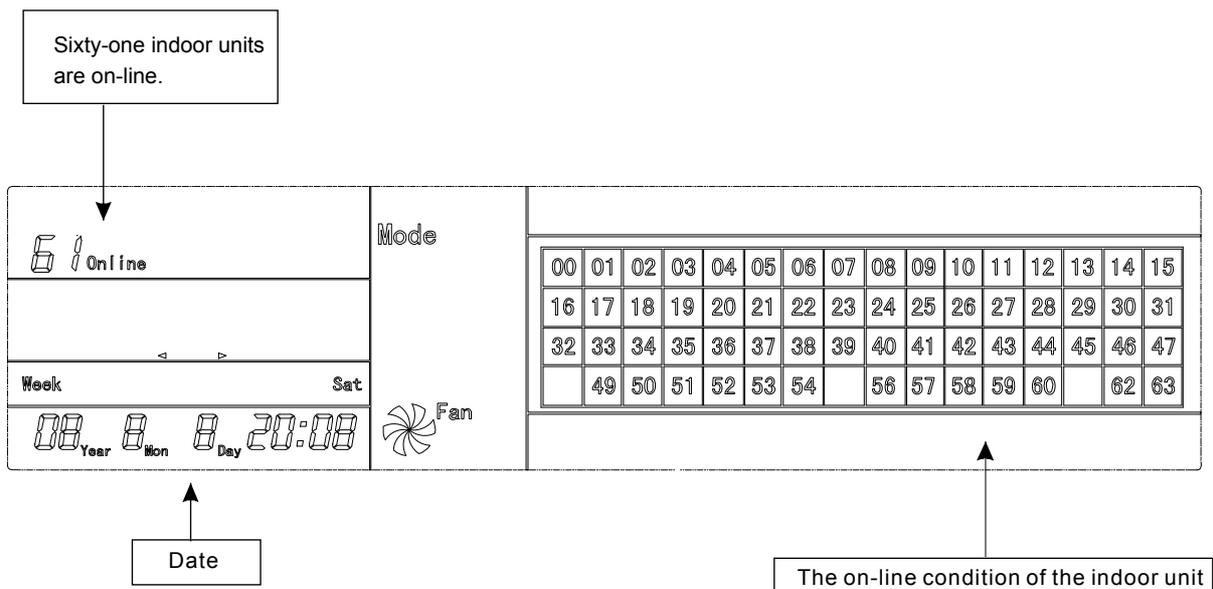
Icon	Meaning	Icon	Meaning
	Auto mode		Fan only mode
	Cooling mode		Dry mode
	Heating mode		Fan speed
	Electric auxiliary heating		Lock heat mode
	Lock cool mode		Wireless controller lock

## VRF Controllers

	Lock keyboard	Set	Set mode
Query	Query mode	Opr. unsuccess	Operating result
Weekly Timer Off	Weekly timer off	ALL	All units are selected
Online	Online state	Protect	Protection code follows
Error	Error code follows	Set. temp	Set temperature
Period 1 2 3 4	Corresponding period	Room. temp	Room temperature
T2A	Temp. of the middle of evaporator	T2B	Temp. of the outlet of the condenser
T3	Temp. Of outdoor pipe	Mon	Monday
Tue	Tuesday	Wed	Wednesday
Thu	Thursday	Fri	Friday
Sat	Saturday	Sun	Sunday

- The main interface of the weekly-timer central controller (user interface)

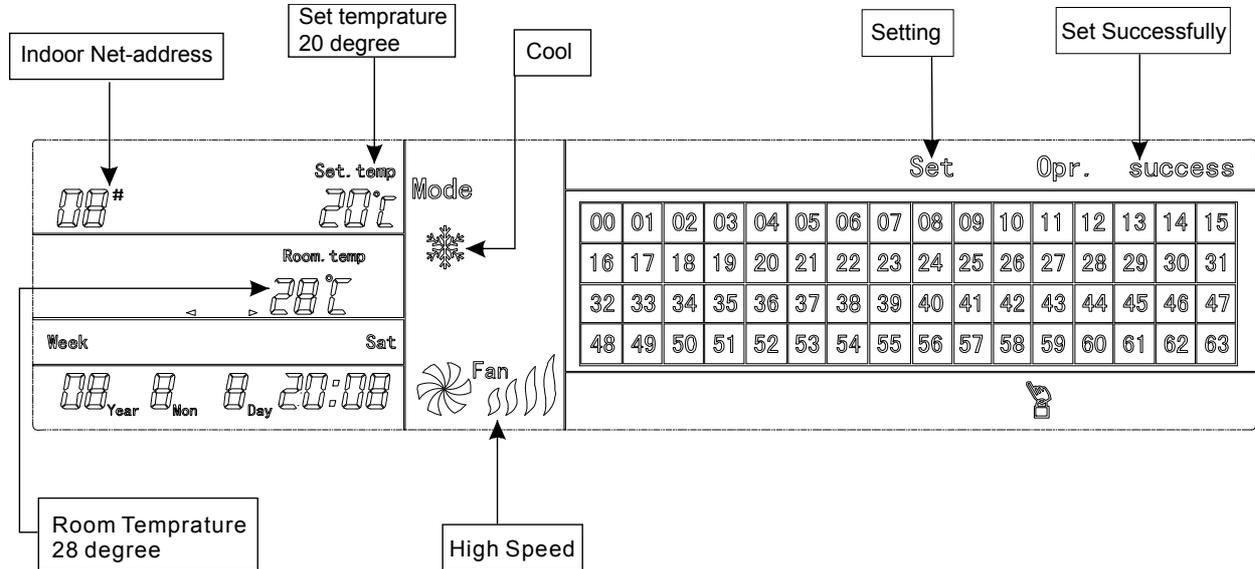
- 1) Under the other pages, press  to return to the main interface.
- 2) Under the other pages, automatically return to the main interface when no operation for a period of time.
- 3) The main interface displays the on-line condition of the indoor unit.



## VRF Controllers

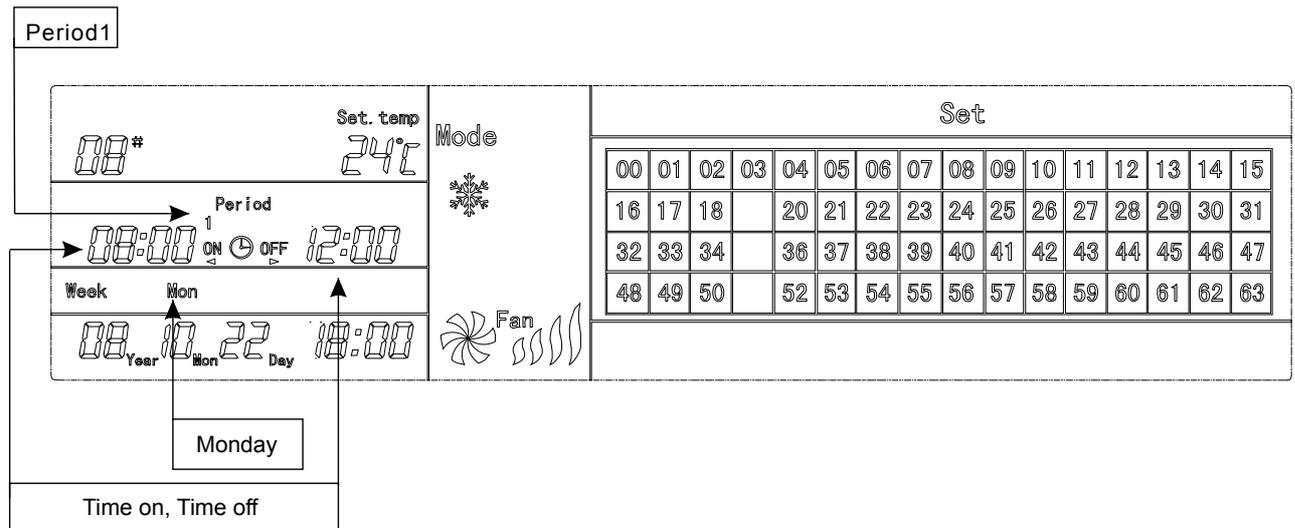
- Setting interface of single weekly-timer central controller

- 1) Under the main interface, press to select **Set** the single setting interface.
- 2) Automatically return to the main interface when no operation for a period of time.
- 3) Set the running state of single air conditioner under this page.



- Setting interface of weekly timer parameters of single weekly-timer central controller

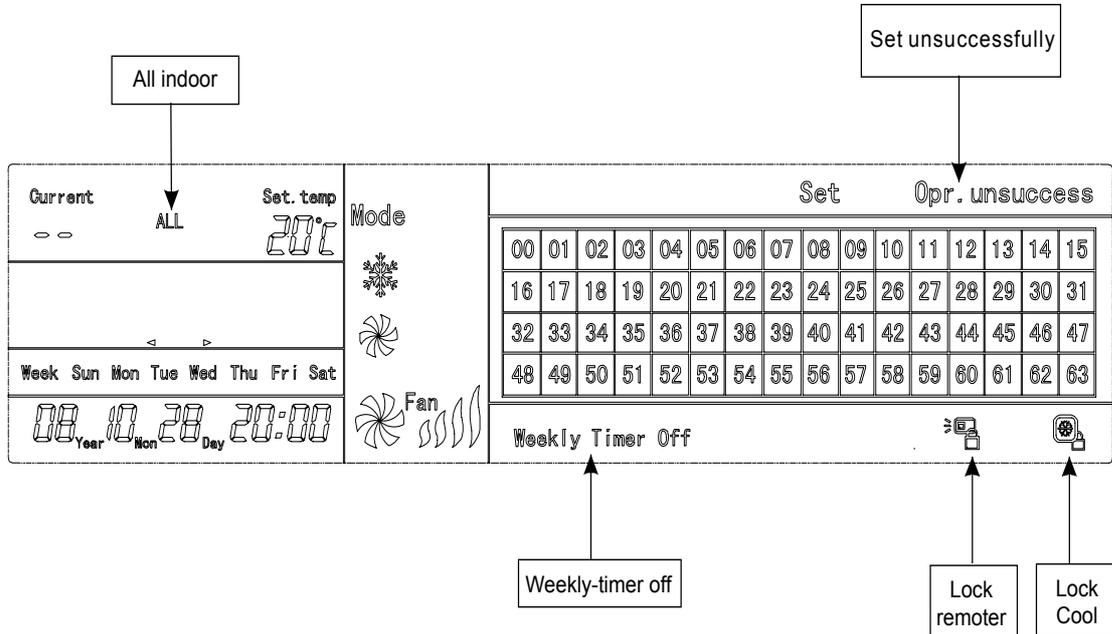
- 1) Under the main interface, press **Program** to display the parameter setting interface of single weekly timer.
- 2) Automatically return to the main interface if no operation is performed for a period of time.
- 3) Under this page, set the weekly timer parameters of single air conditioner, including startup time, shutdown time, the running mode of this period, temperature and wind speed.
- 4) One air conditioner can be at most set with four periods in one day from Monday to Sunday.



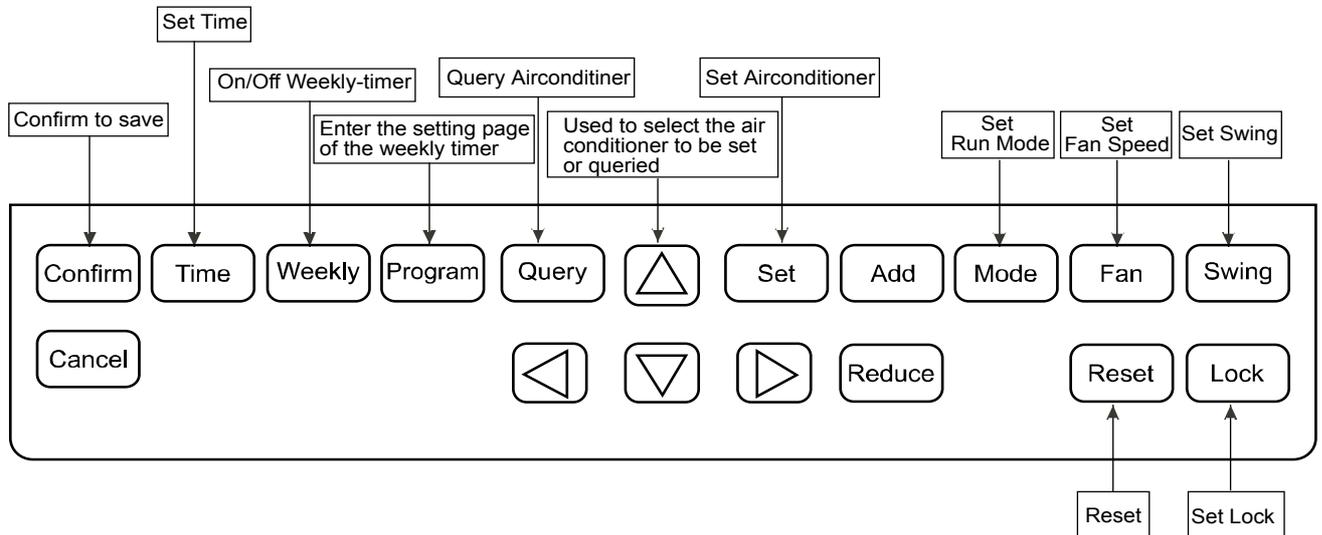
## VRF Controllers

- Unified setting interface of the weekly-timer central controller

- 1) Under the main interface, press **Set** to display the unified setting interface.
- 2) Automatically return to the main interface if no operation is performed for a period of time.
- 3) Set the running mode of all air conditioners under this page, including mode, temperature and Fan speed.



### 3.3.4 Button names



#### 1) On/Off button

Press the ON/OFF button. All air conditioners will be shut down if they are running; on the contrary, they will be started up. If you press the button for less than 5 seconds, the startup mode is the last running mode of the air conditioner. If you press the button for more than 5 seconds, the startup mode is cooling, fan runs at high speed, and the set temp. is 24 degrees.

## **2) SET button**

Press the SET button, and then select set single or set all. Set single indicates to set the parameter (such as mode/ temperature/fan speed/ weekly timer) of a single selected air conditioner. Set all indicates to set the parameter of all air conditioners controlled by the central controller.

## **3) Query button**

Press the Query button can query the running condition of the unit, such as on or off, temperature setting, indoor temperature, fan speed and running mode. Press direction buttons (Up, Down, Left and Right button) can select the unit which you want to query.

## **4) Up, Down, Left, Right buttons (Direction buttons)**

When querying or setting the indoor units, press these four buttons to select the indoor units that we need to set or queried. When setting the weekly timer, it is used for selecting the day of the week and the time of startup and shutdown.

## **5) Add button**

When querying the indoor unit, press the Add button can query more parameter of the indoor unit. When setting the indoor unit, it is for adjust the setting temperature. When setting the weekly timer, it is for adjust the time of startup and shutdown.

## **6) Reduce button**

When querying the indoor unit, press the "Reduce" button to query more parameter of the indoor unit. When setting the indoor unit, it is for modifying the setting temperature. When setting the weekly timer, it is for modifying the time of startup and shutdown.

## **7) Mode button**

When setting the indoor unit, it is used for setting the running mode of the indoor unit which includes auto, cooling, heating, fan mode, dry and shutting down.

## **8) Fan button**

When setting the indoor unit, it is for setting the wind speed of the indoor unit which includes high speed, middle speed, low speed and automatic speed.

### **9) Swing button**

In setting the indoor unit, it is for setting the swing function of the indoor unit.

### **10) Lock button**

When setting, press the Lock button to lock the remote controller of all or single indoor unit. Press the Query button and hold under the main page, then repress the Lock button again to lock the keyboard of the central controller; press the Mode button and then press the Lock button again will lock the running mode.

### **11) Reset button**

The central controller re-scans the indoor unit in the network as recharging after power off.

### **12) Program button**

Under the main page, press the Program button can set the weekly timer of single or all indoor units. Press the Query button and hold, and then press the Program button to query the weekly timer parameters.

### **13) Weekly button**

Under the main page, press the Weekly button can start up or shut down the weekly timer function.

### **14) Time button**

Under the main page, press the Time button for 5 seconds can enter the time-modifying state, and then press Add or Reduce button will change the setting time. Press Left or Right can select minute/ hour/ day/ month/ year.

Finally, press the Confirm button to save the modification.

### **15) Confirm button**

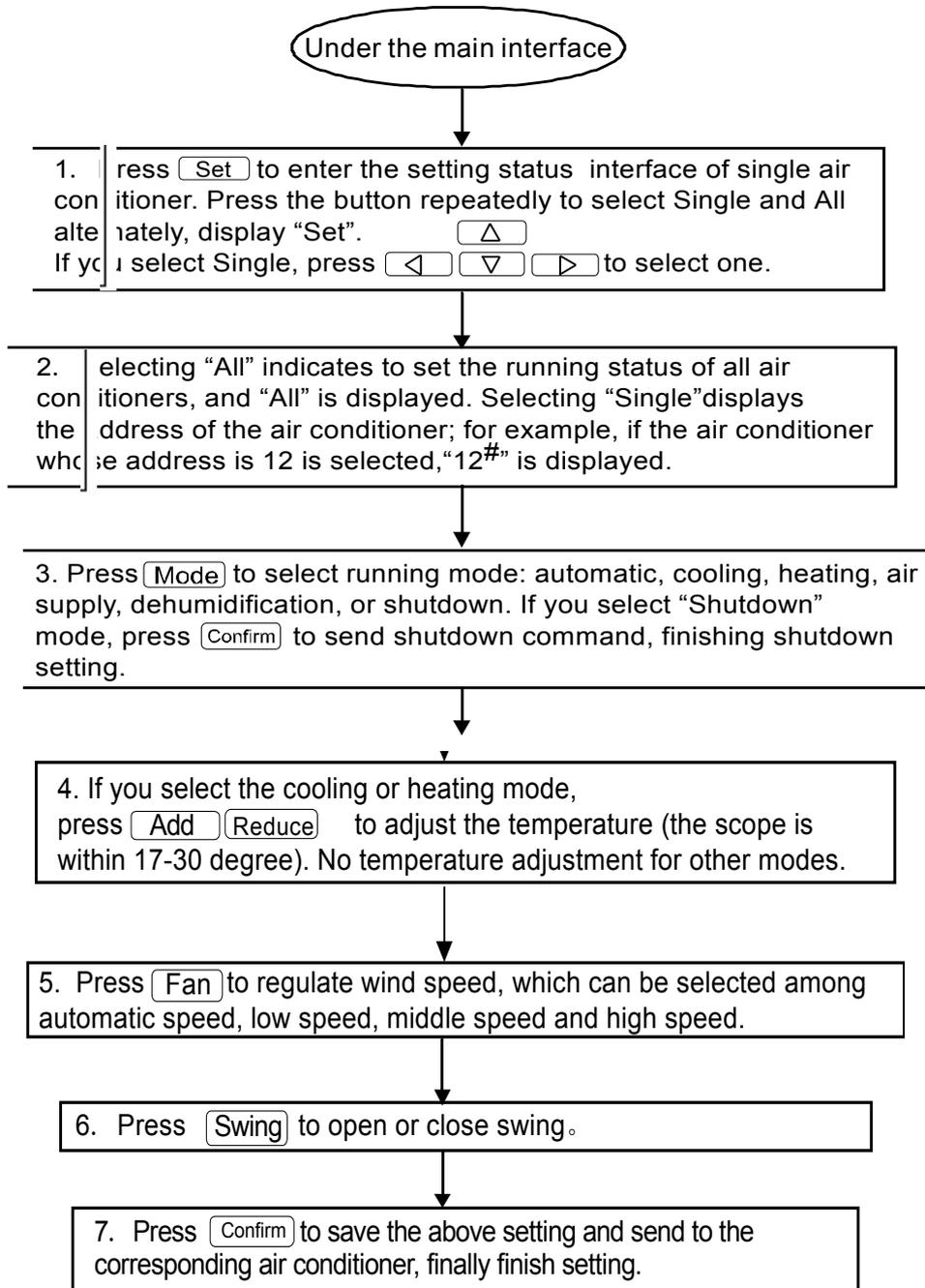
Save data and send the command required to the indoor unit, such as setting the mode of the air conditioner.

### **16) Cancel button**

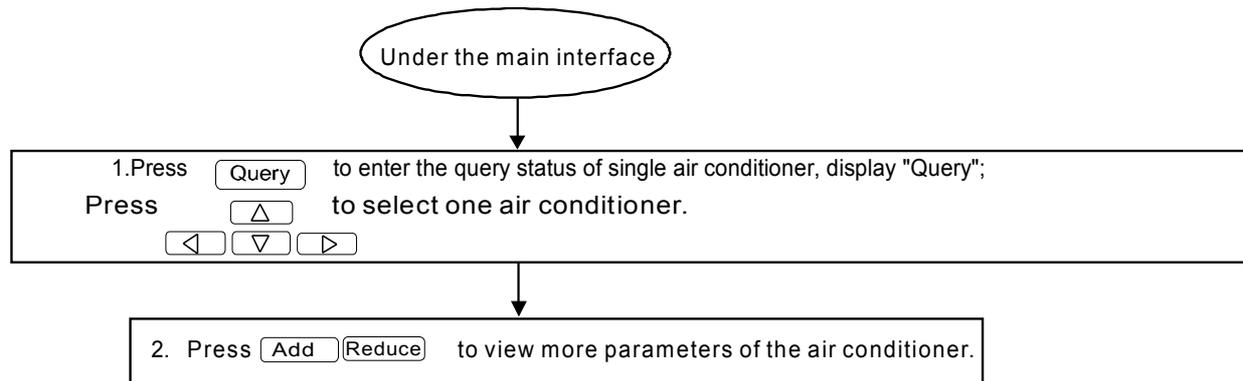
Cancel the last operation and return to the last interface.

## Operating the centralized controller

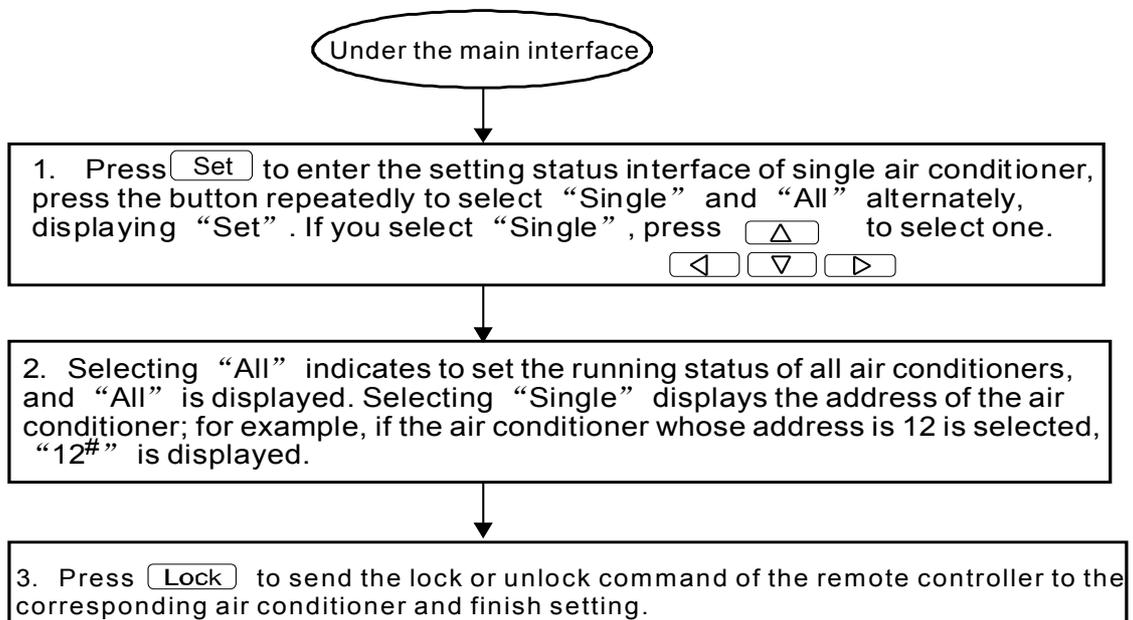
### (1) How to set the running state of the air conditioner?



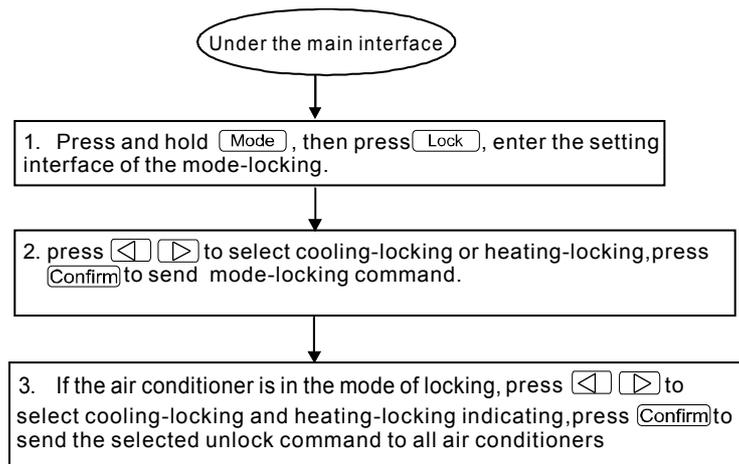
(2) How to query the running state of the air conditioner?



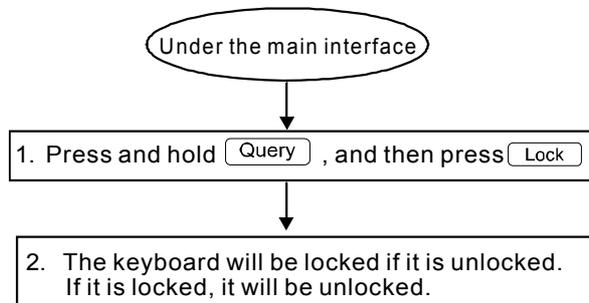
(3) How to lock and unlock the remote controller of the air conditioner?



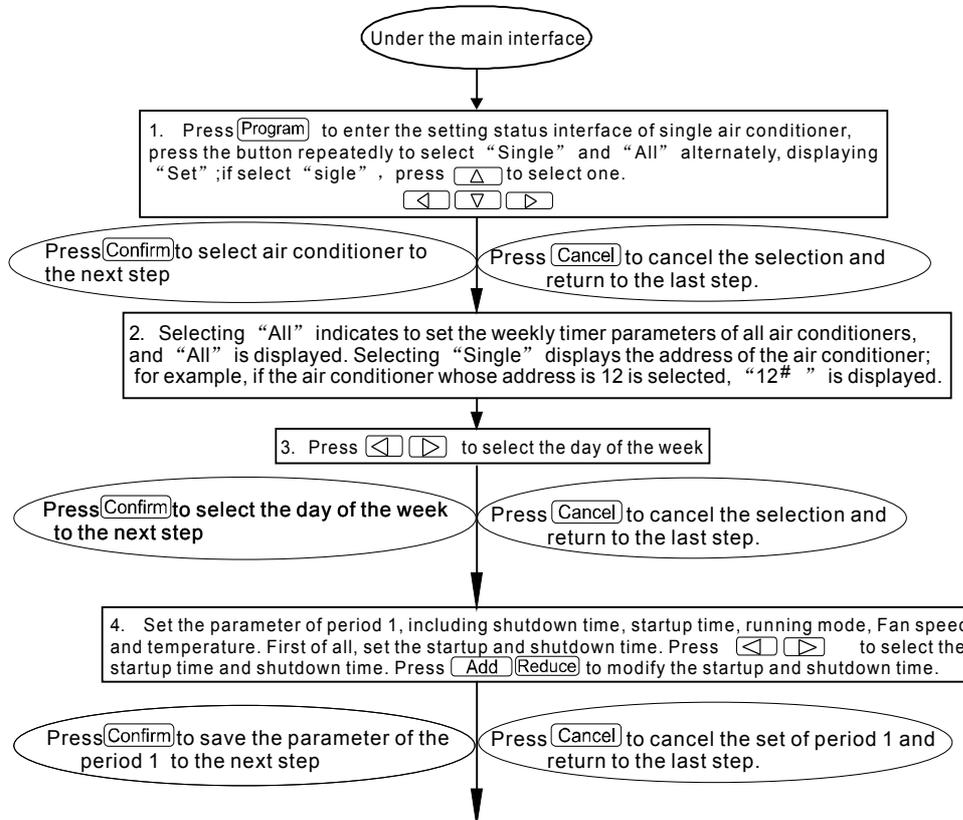
**(4) How to lock and unlock the mode of the air conditioner?**

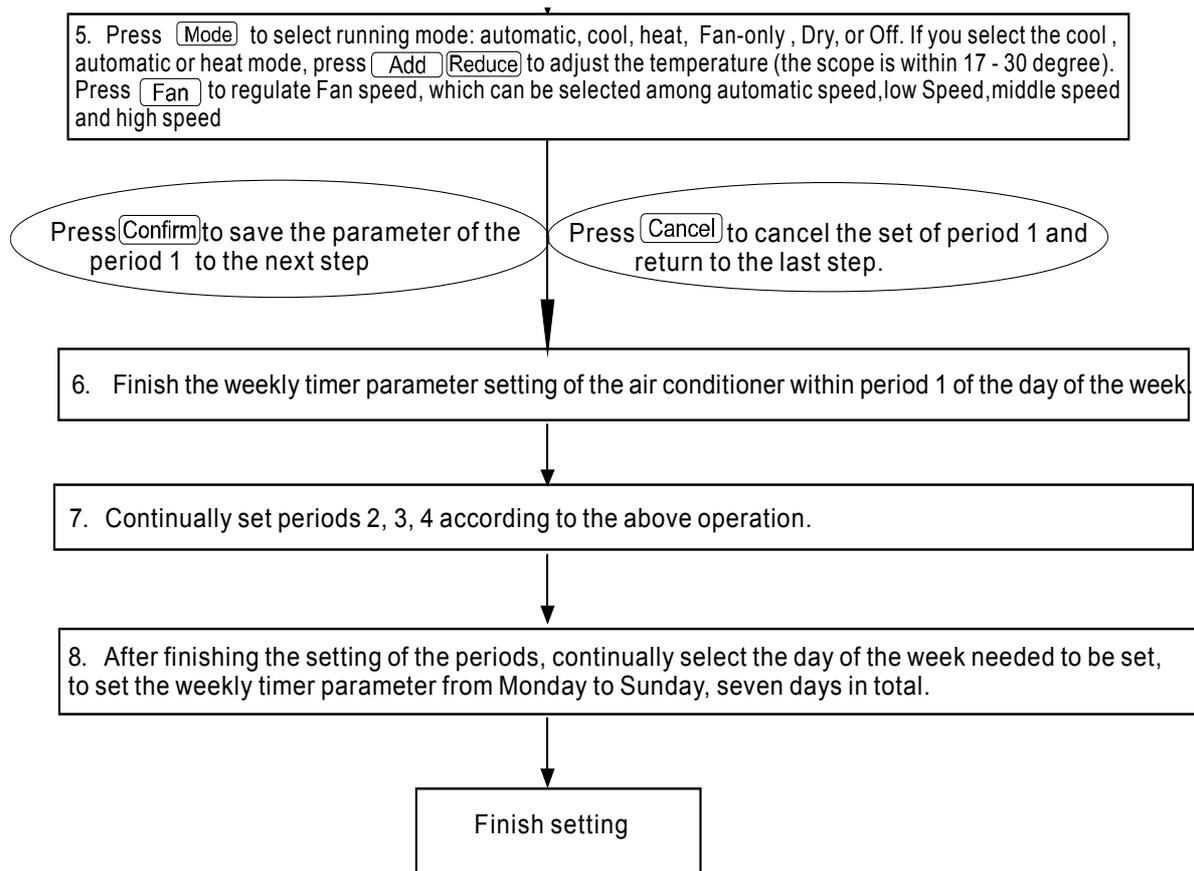


**(5) How to lock and unlock the key board of the weekly-timer central controller?**

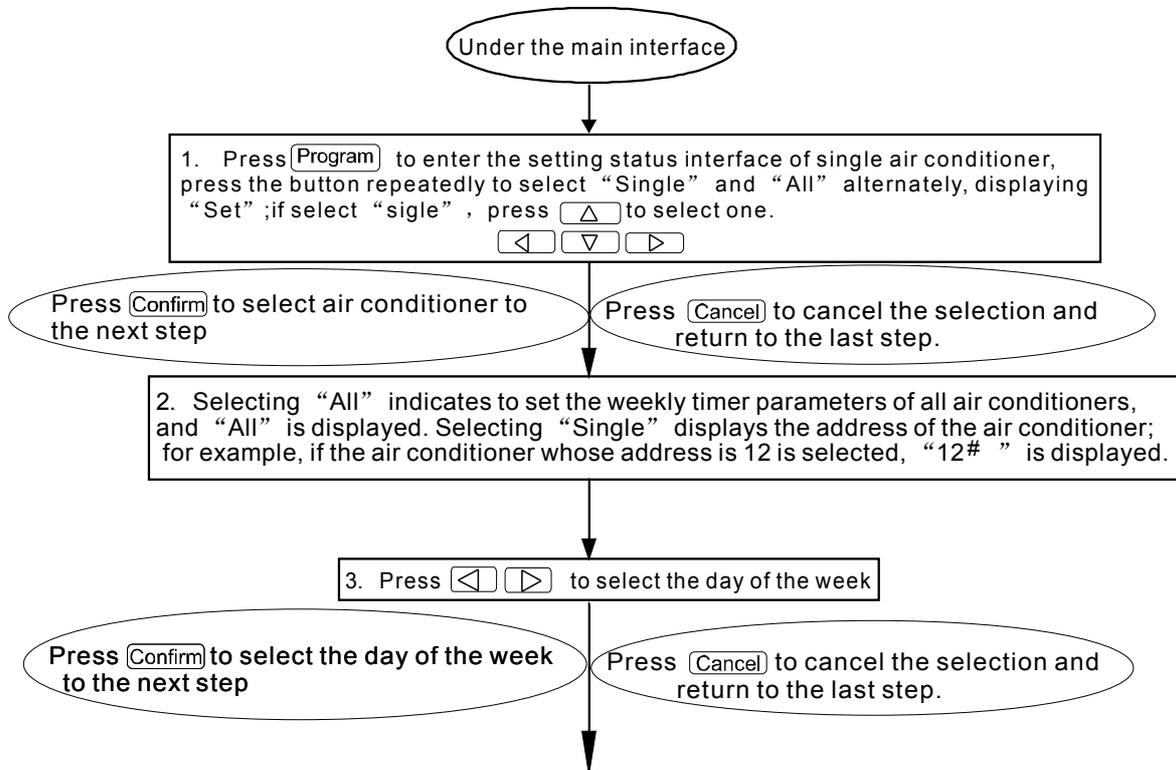


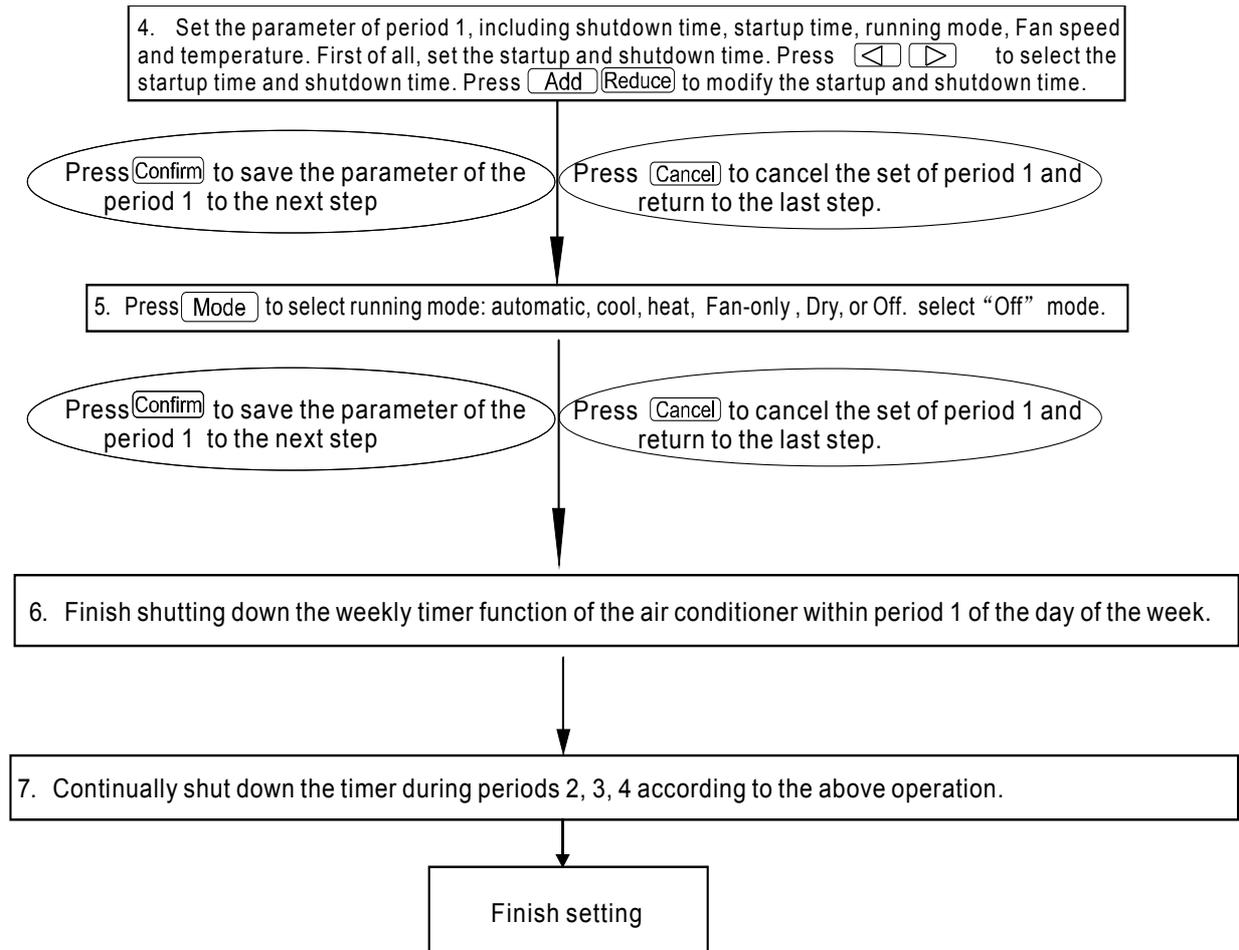
**(6) How to set the function and relevant parameters of the weekly timer of the air conditioner?**



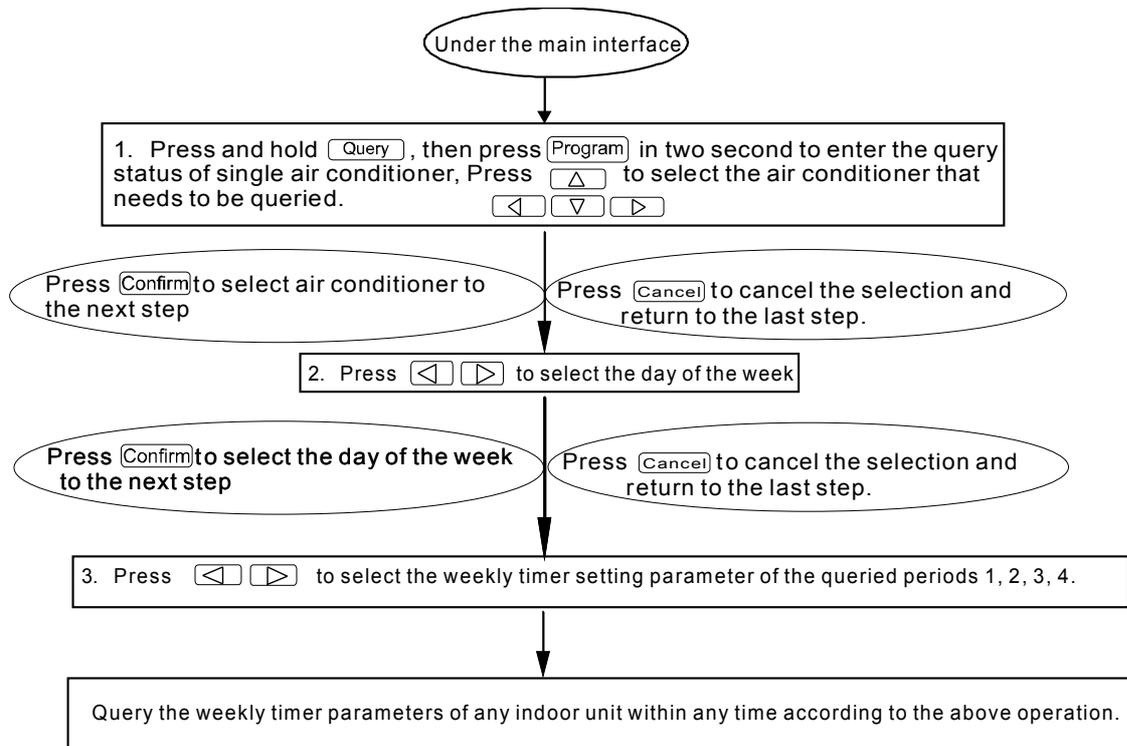


**(7) How to turn off the weekly timer setting of a period of an air conditioner?**

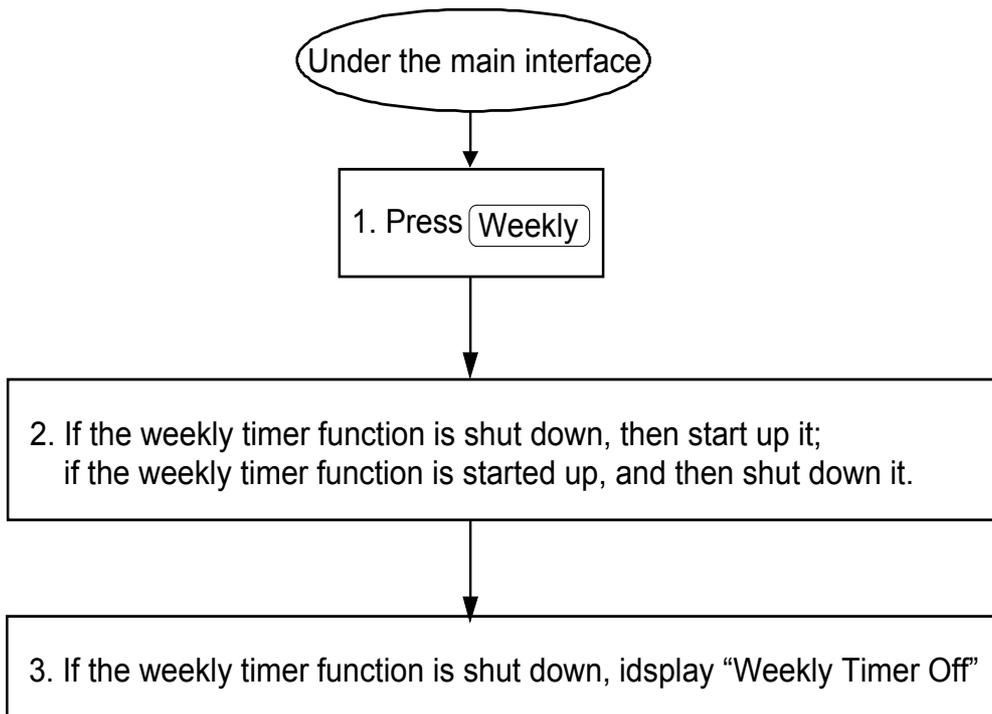




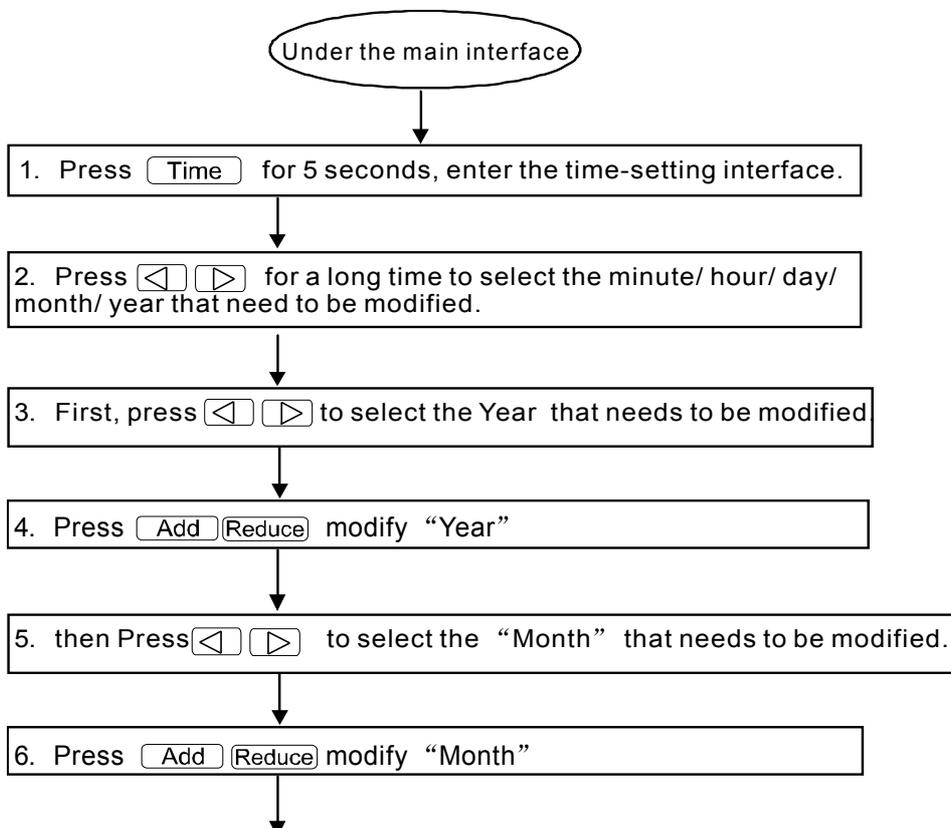
**(8) How to query the weekly timer setting parameter of the air conditioner?**



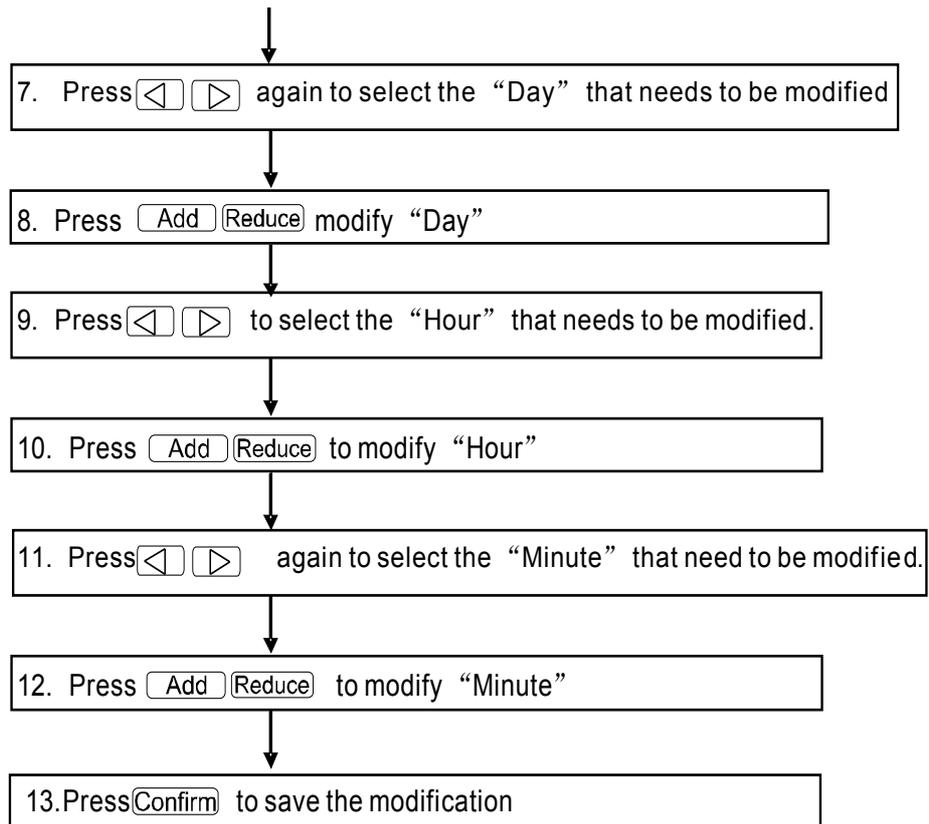
(9) How to start up or shut down the weekly timer function of all air conditioners?



(10) How to modify the system time?



## VRF Controllers



### Notes:

There is always a time interval between 2 periods. This means the period's off time should not be the same as the starting time of next work period. The least time interval should be 10 minutes, or else the units cannot work as our interval.

**(11) Fault and protection codes**

Fault code	Content
EF	Other faults
EE	Water level detection malfunction
ED	Reserved
EC	Cleaning malfunction
EB	Inverter module protection
EA	Current of compressor is too large (4 Times)
E9	Communication malfunction between main board and display board
E8	Wind blowing speed is out of control
E7	EEPROM error
E6	Detection of current direction alternating is abnormal
E5	T3 or T4 sensor of discharge of compressor fails down
E4	T2B sensor malfunction
E3	T2A sensor malfunction
E2	T1 sensor malfunction
E1	Communication malfunction
E0	Phase sequence disorder or loss of power phase
07#	/
06#	/
05#	/
04#	/
03#	Communication malfunction between centralized controller and PC(gateway)
02#	Communication malfunction between centralized controller and functional module
01#	Communication malfunction between centralized controller and network interface module
00#	Communication malfunction between network interface module and main control board

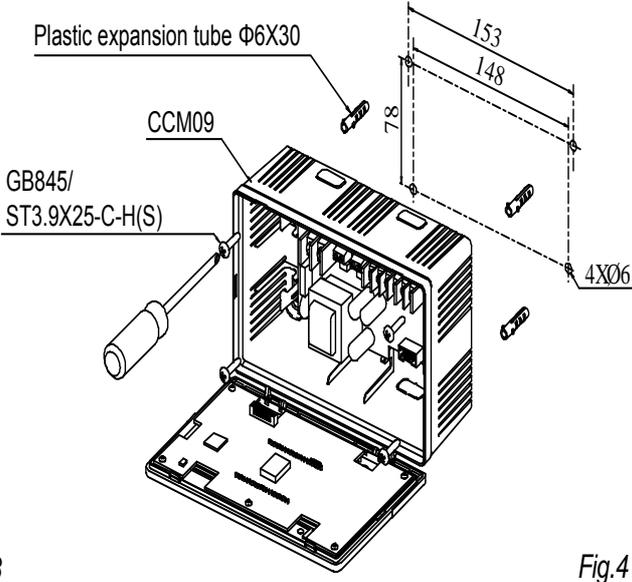
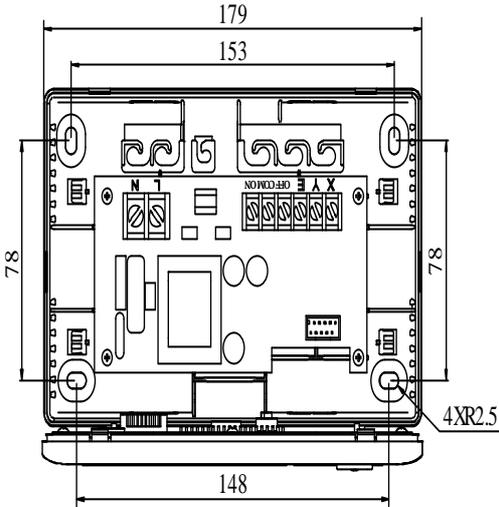
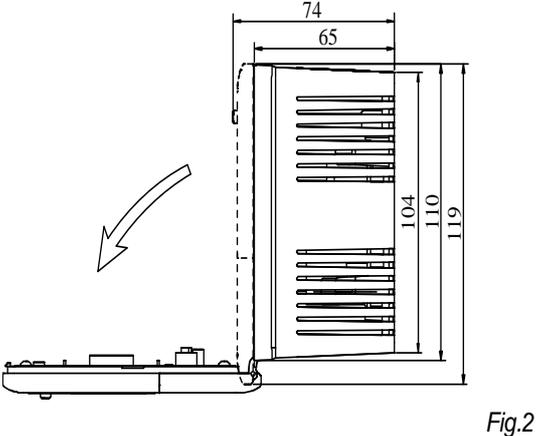
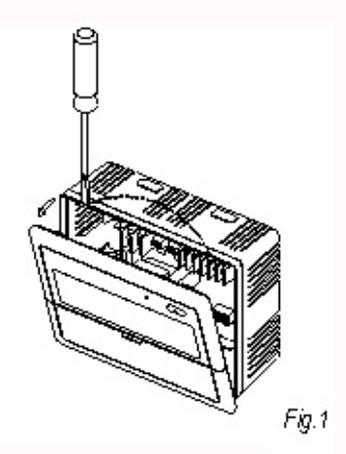
## VRF Controllers

Protection code	Content
PF	Other protection
PE	Reserved
PD	Reserved
PC	Reserved
PB	Reserved
PA	Reserved
P9	Reserved
P8	Compressor's current is too large
P7	Voltage of power supply is too high or too low
P6	Pressure of discharge is too low
P5	Pressure of discharge is too high
P4	Temp. of discharge pipe is abnormal
P3	Temp. of compressor is abnormal
P2	Condenser high-temperature protection
P1	Anti-cool air or defrost protection
P0	Evaporator temperature protection

### Installation

The thickness of the central controller cable shall be adjusted according to the length of the cable. A proper cable tube shall be used to install the cable of the central controller.

Insert the flat tip screwdriver into the recess on the top panel of the case and slightly turn to open the top cover of the central controller.



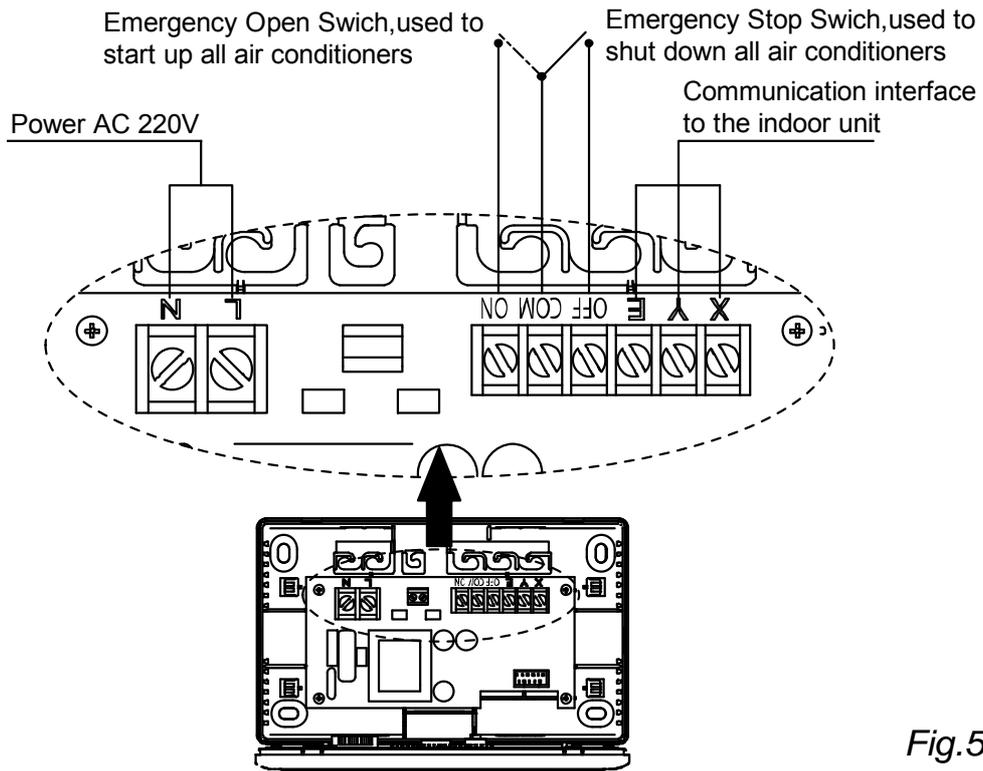


Fig.5

Installation dimensions:  
As shown in the figure  
on the right side.

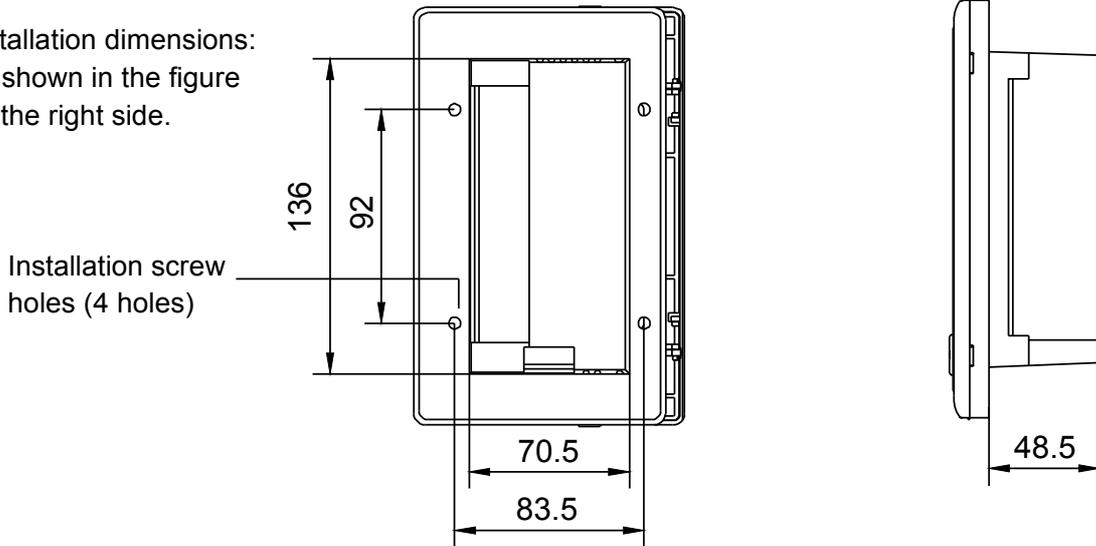


Fig.6

# VRF Controllers

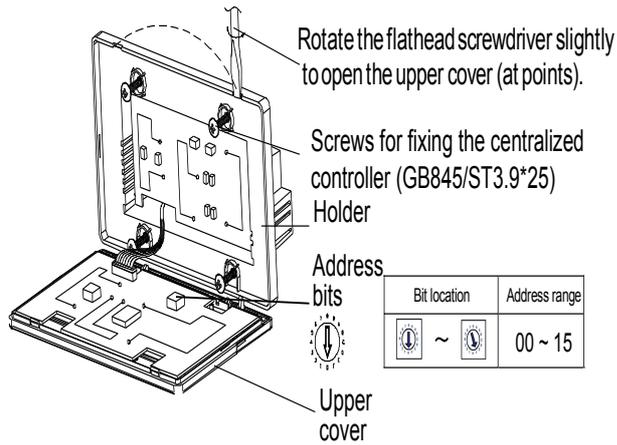
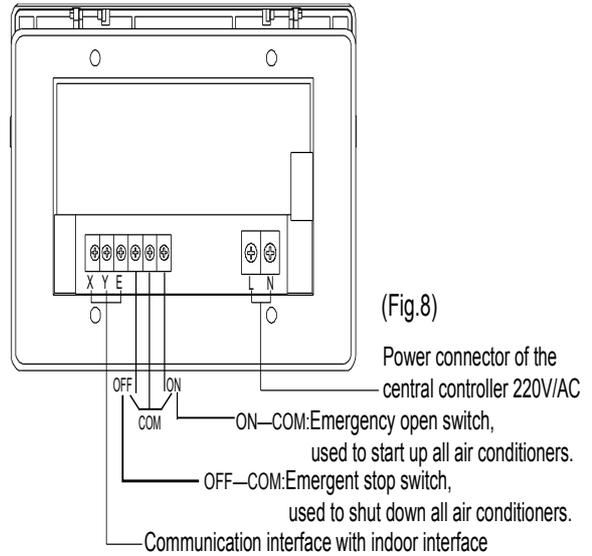


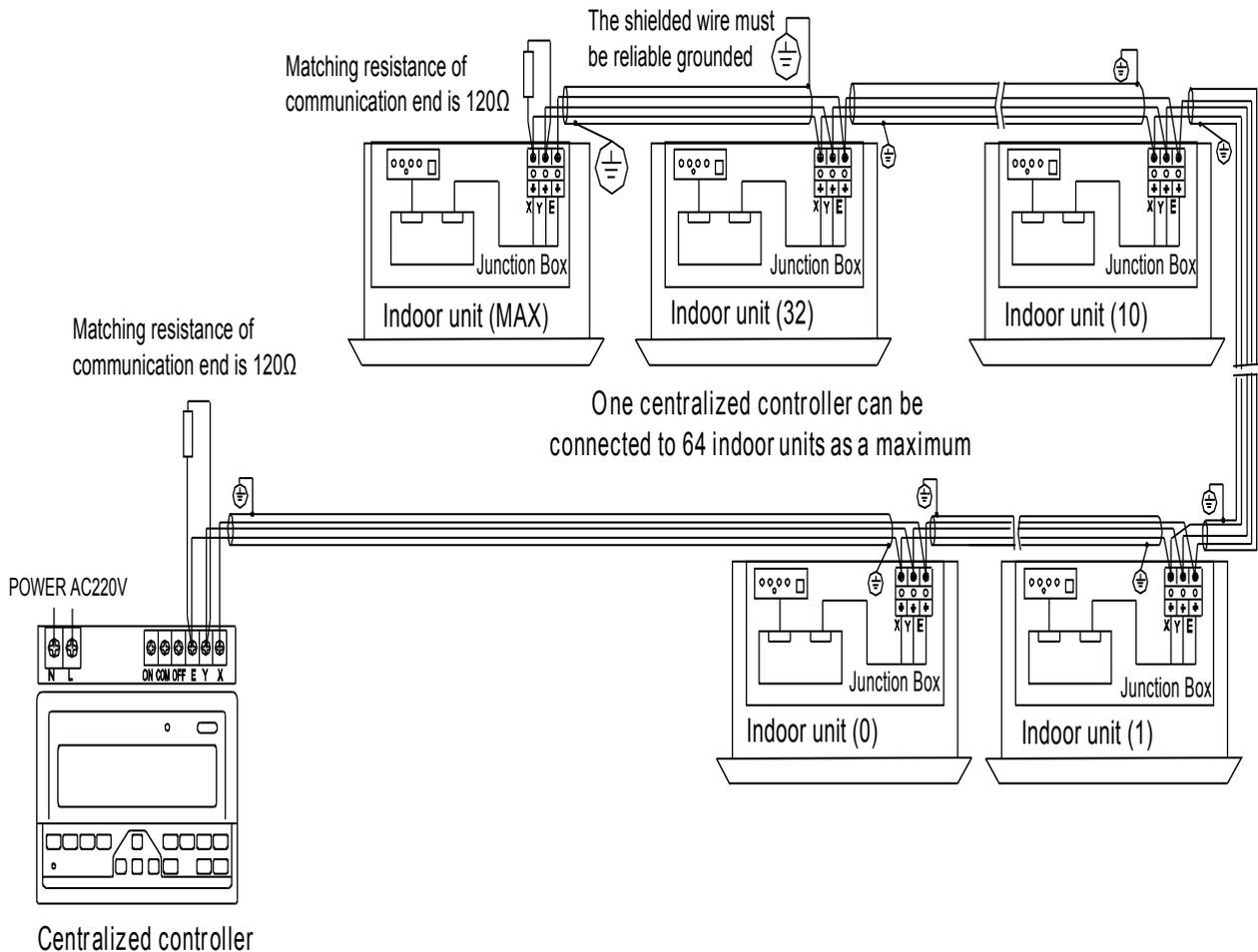
Fig.7



(Fig.8)

## Connecting diagram of network-based air conditioning system

(There are two types of indoor units, namely indoor unit with external network interface module on the main control board or built-in network interface module in the main control board.)



## LonWorks BMS gateway: BMS-LON

The new LonWorks gateway BMS-LON is inline with LonWorks standard and can be connected up to 64 VRF indoor units to the LonWorks network directly. It can connect multiple refrigeration systems and do not need to connect centralized controller within the system. It must be connected from outdoor unit's XYE ports.

BMS-LON helps other LonWorks devices gathering the information from the VRF air conditioning system and help setting the indoor units' working mode.

- Connect Central A/C system to LonWorks network.
- Easily download the program on line
- BMS-LON gateway applies non-polar twisted pair lines, which makes connecting to LonWorks network easily.
- Be able to bridge the indoor units to the BMS.



### General function

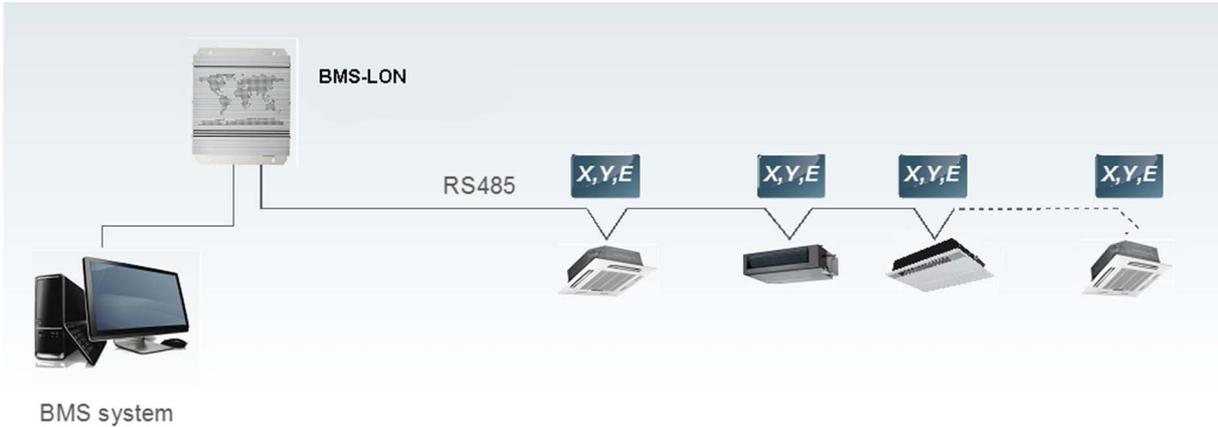
Monitoring	Controlling
ON/OFF state report	Mode setting for single unit
Running mode state report	Mode setting for all units
Fan speed state report	Stop setting for single
Set temp. value report	Emergency stop for single unit
Indoor temp. value report	Fan speed setting for single unit
Error state report	Fan speed setting for all units
Online/offline state report	Temp. setting for single unit
Quality of connection state report	Temp. setting for all units

### System configure

Indoor units can be connected to the BMS system through BMS-LON and can gather all the units' information and control the indoor units. As a result, the indoor units need firstly connecting to the computer to make a central monitoring system. The composition of the whole network is as follows:

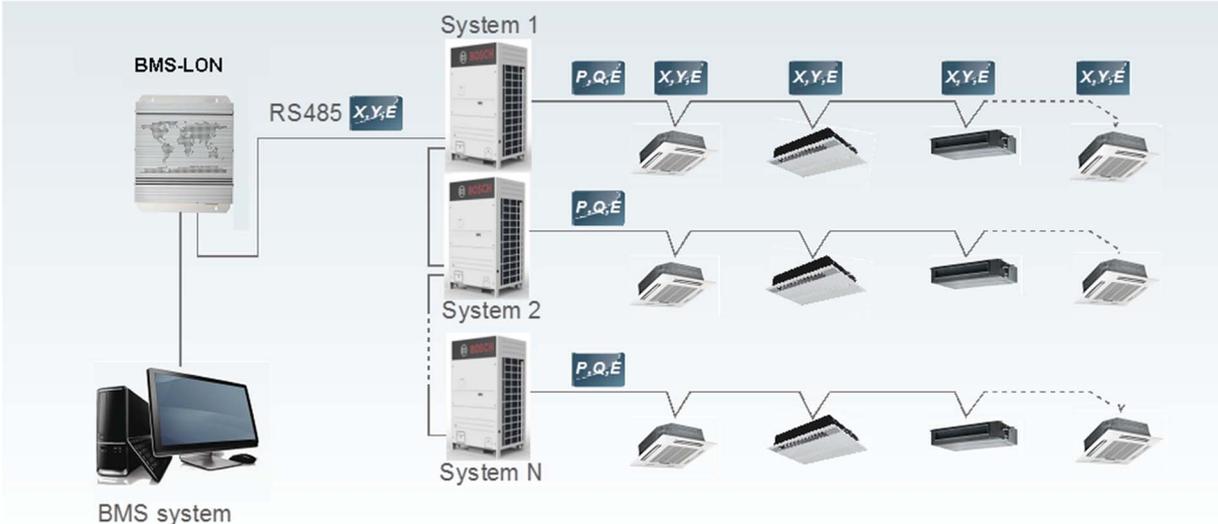
Connection method 1:

Suitable for all of VRF air conditioner systems and connect max 64 indoor units.



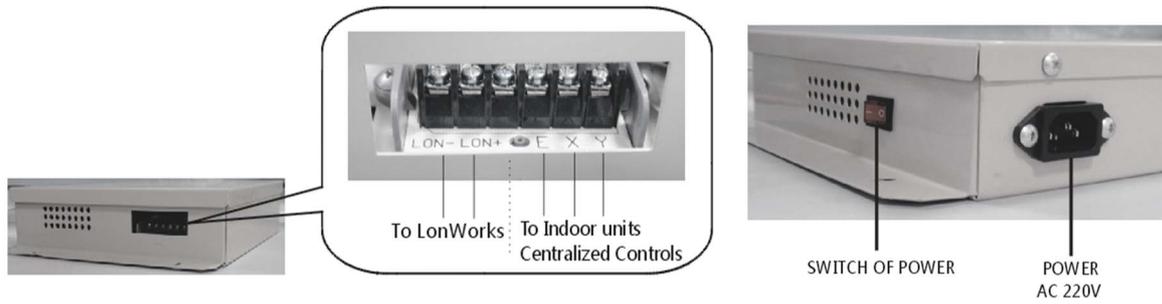
Connection method 2:

Only suitable for SDCI & DCI series and connect max 64 indoor units. The outdoor unit must be set to auto addressing mode, and it will be effective after about 6 minutes.



## VRF Controllers

### Connecting ports



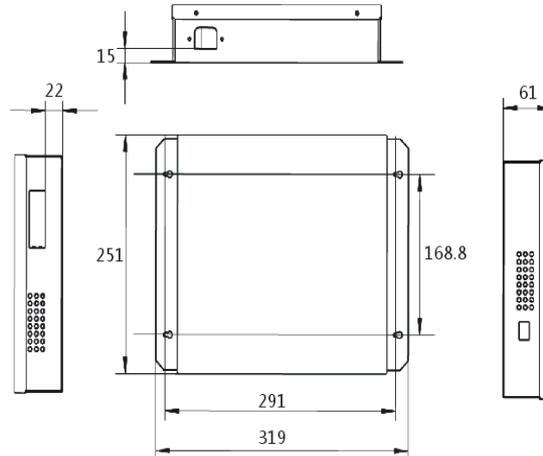
**LON- and LON+ port:** The ports should be connected to the computer's COM port, using the RS-232 communicative standard.

**XYE ports:** These ports use a removable connecting way to help user connect the LonWorks network conveniently.

**POWER:** This port should be connected to the AC 220V power adaptor.

### External View

Dimensions: 319\*251\*61mm



**Notes:** There are three installation methods as shown in below figure. Don't install the unit in any other orientation.



## BACnet® gateway: BMS-BAC

BMS-BAC is a gateway to connect the indoor units and outdoor units to the BACnet. BACnet stands for the Building Automation and Control Network. BMS-BAC gathers the information of the indoor units and outdoor units. Besides, BMS-BAC is able to send the command to the units.

- Be able to bridge the indoor and outdoor units to the BACnet protocol BMS.
- Also be able to connect the indoor and outdoor units only, without the BMS.
- Contains 4 groups of RS485 communication ports and able to connect up to 256 indoor units or 128 outdoor units instead.
- User can check the units' state and change their settings via local network.
- With the WEB service control.



### Functions description

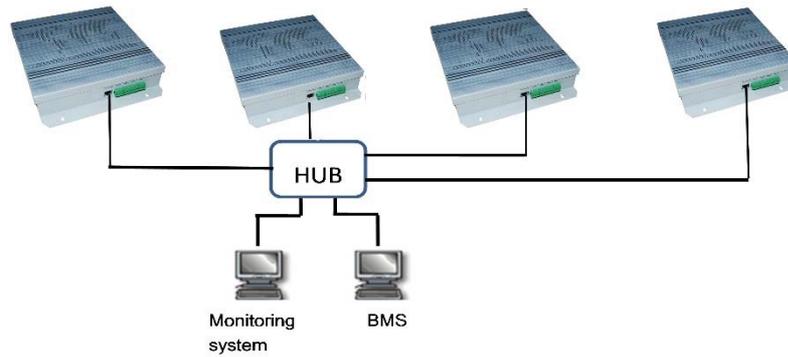
BMS-BAC gateway provides the BACnet ports for Building Management System (BMS) and air conditioner to realize the systems integration. It also can be connected with the Bosch Climate 5000 VRF independently.

BMS -LONbuilt- in the BACnet function module and WEB page services. It supports BACnet/IP access and local web browser access. It can control and monitor up to 256 indoor units or 128 outdoor units.

### System configure

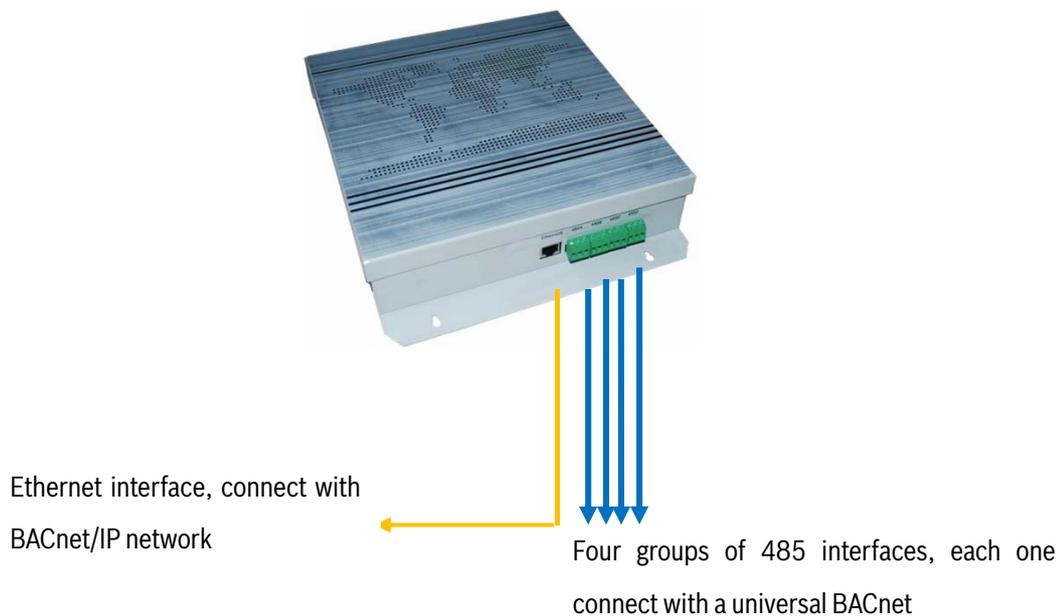
- ✘ BMS-BAC and the BMS control system must be in the same IP subnet segment, and you need to set configuration before you using.
- ✘ After IP setting, you can modify the BMS-BAC IP through WEB function.
- ✘ The default administrator account is "admin" and password is "12345".
- ✘ Default IP address: 192.168.1.8
- ✘ BMS-BAC is able to connect up to 4 groups of RS485 communicative network. Each port can connect up to 64 indoor units or up to 32 outdoor units and 8 refrigerant systems.
- ✘ If there are a few BMS-BAC applied in the system, BMS-BAC can be connected to the HUB and then connected to the monitoring system and BMS.

## VRF Controllers



**Notes:** BMS-BAC and the BMS computer must be at the same subnet address field. Or else, the device cannot work normally. The default address of BMS-BAC is set to be under the segment "192.168.1.\*".

## Connecting ports and functions



Power Switch



Power Supply(AC220V/50Hz)  
Power line (Prefabrication)

**Ethernet port** is an Ethernet interface base on the BACnet network protocol. Connect this port with the BACnet HUB, then the device connect to the HUB can communicate with the BMS-BAC.

## VRF Controllers

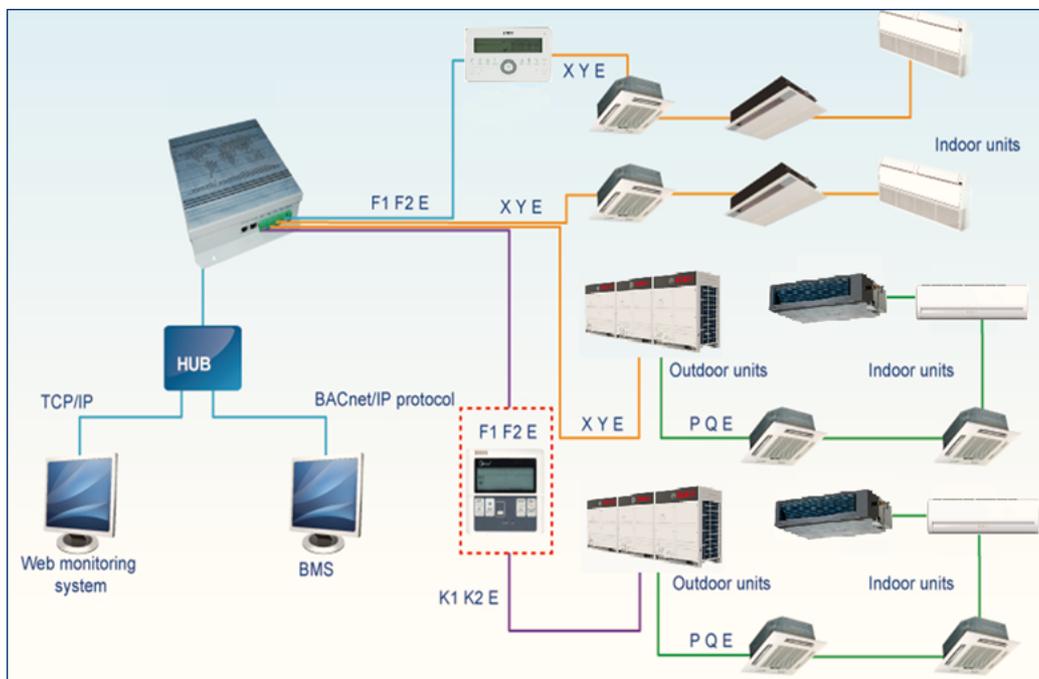
**Four groups of RS485 ports:** Each port can be connected directly to XYE ports of indoor units or the K1K2E ports of the outdoor units; each port can also be connected to one indoor controller Centralised controller through F1F2E ports, and the address of indoor centralized controller must be set to zero (0) which need to connect with BMS-BAC.

### Reset setting

After power on, short connect the port 1 and port 2 can reset the gateway to the factory setting if you need. The connection method as following:



### Network example



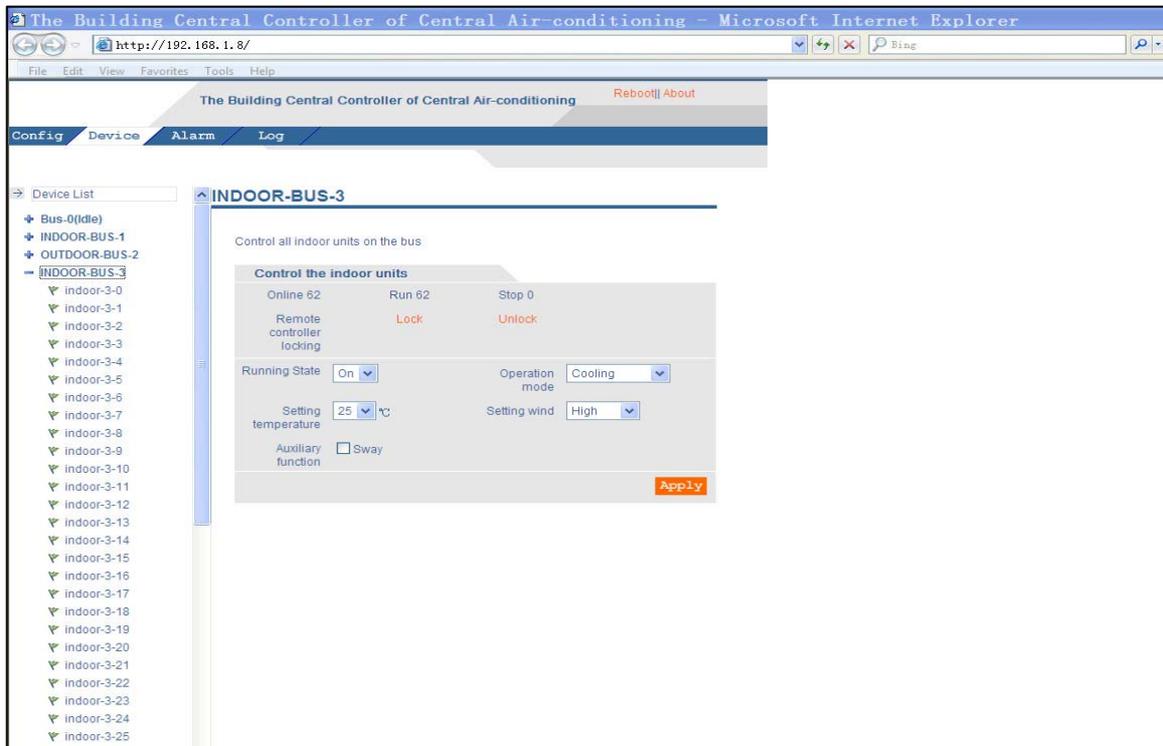
- Each port can connect up to 64 indoor units or up to 32 outdoor units and 8 refrigerant systems.
- Each port can be connected directly to XYE ports of indoor units or the K1K2E ports of the outdoor units.
- Each port can also be connected to one centralized controller or one outdoor monitor controller through F1F2E ports, and then the address of indoor centralized controller must be set to zero (0) and the address of outdoor monitor controller must be set to 16.
- When connecting to the indoor centralised controller via XYE ports of master outdoor unit of every refrigerant system. Notice that in this case, the outdoor unit must be set to auto addressing mode, and it will be effective after about 6 minutes.

### WEB access

## VRF Controllers

BMS-BAC can offer WEB service, which allows users access the gateway from the local computer network.

Type the address of BMS-BAC in the explorer's address field and users can view then BMS-BAC's connecting state or change the working state of the indoor units. The interfaces are as follows:



### Notes:

1. To save the air conditioner's running data; an SD card is needed but not included in this product. Users can purchase one from the market. SD cards of different volume can save different periods of running data. Normally an SD card of 1 GB is able to save the data of more than 1 year.
2. Do not operate the air-conditioner frequently, for avoiding the operating state would be different from the expected state. The operation time interval between different objects in the same air-conditioner should be over 10~20 seconds and ensure that the air conditioner state can be changed timeliness and effectiveness.

## Network setting

There is an Ethernet (Eth0) port in the controller. The Ethernet port is the network port of BACnet/IP.

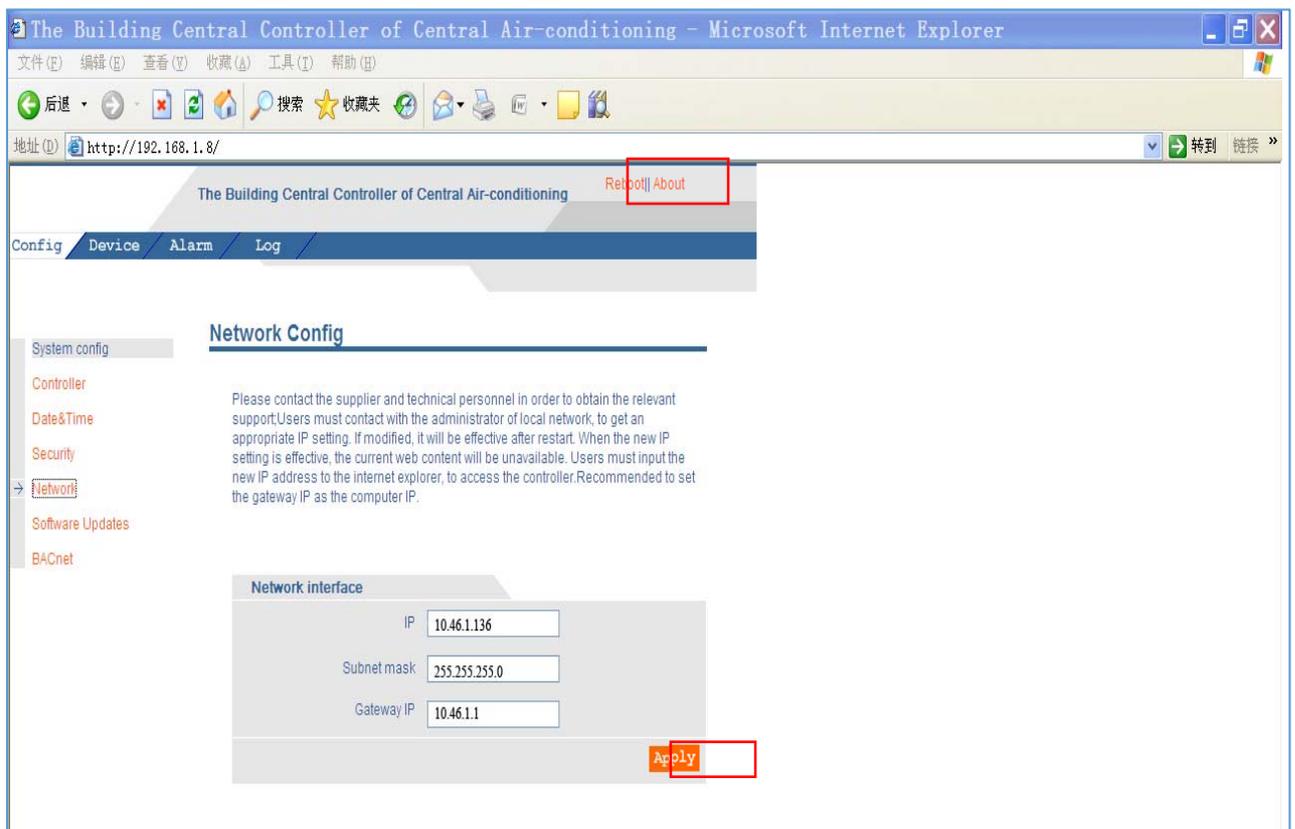
IP address of Eth0 has been set "192.168.1.8" before ex-factory, please modify the address of BMS-BAC and make sure that the address is in the same subnet with the BMS computer before used.

Moreover, the default administrator account to login the BMS-BAC is "Admin", default password "12345".

If the gateway and PC in different network segment, you need to replace IP address 192.168.1.8 to your IP address first.

For example: the new IP address is 10.46.1.136, subnet mask 255.255.255.0 and gateway 10.46.1.1.

After configuration, must click the "Apply" and "Reboot" key to restart the BMS-BAC.



## Available BMS

BMS-BAC has a wonderful adaptability to the BMS. It can be connected to many company's building management system software. We can get the mainly supporting BMS information from the table below:

	Company	BMS software	Brand
1	SIMENS	APOGEE	
2	TRANE	Tracer Summit	
3	Honeywell	Alerton	
4	Schneider	Andover	
5	Johnson	METASYS	

## BACnet setting

The BACnet network number only represents a BACnet Centralized Controller, and in the range from 0 to 65535. After setting must be restart the device.

BACnet network No. is the BACnet network No. that belong to the BACnet device of the VRF series air conditioner which under connect with the BACnet centralized controller. For different centralized controller must be set in different BACnet network NO., which is the unique number in the system could not be used for represent the other device or BACnet centralized controller.

The calculation formula of air-conditioner indoor and outdoor unit instance number is as follow:

Device ID=BTXX;

B is the bus Number 0-3;

T means type, 0 is the indoor unit, 1 is the outdoor unit;

XX is the indoor unit Number 0-63 or outdoor unit 0-31;

## Object table

This device provides with different objects tables for the different types of outdoor units which are in using for the VRF system. System will automatically identify the in using outdoor unit and generate the BACnet object.

### ➤ Indoor objects

This equipment provides with fourteen types of BACnet object, show as the following table, for connecting with indoor unit using in the Building Management System (BMS) or other system which suitable for BACnet Protocol.

Number	Content
1	Device information
2	Operation mode
3	Fan state
4	Preset temperature
5	Indoor temperature
6	Timer on setting
7	Timer off setting
8	Swing function
9	Electric heater function
10	Malfunction state
11	Protection state
12	Mode query
13	Fan speed query
14	Temperature setting query

**1. Device information**

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Device + AC number	R
Object Name	CharacterString	Indoor_**	R
Object Type	BACnetObject Type	Device	R
Device Status	BACnetDeviceStatus	Operational	R
Producer Name	CharacterString	AC Inc	R
Producer Identifier	Unisgned16	111 (Unsigned)	R
Model Name	CharacterString	Get one of these from Protocol analysis: Wall Mounted Type Floor Type Embedded Type Duct Type Floor & ceiling Type AC Auxiliary Machine Type Digital Mutil-connection Type Frequency Conversion Type Digital Rotation Type	R
Firmware Edition	CharacterString	1.0	R
Application Software Edition	CharacterString	1.0	R
Protocol Edition	Unsigned	1	R
Protocol Correspondency Type	Unsigned	3	R
Protocol Service Support	BACnetServiceSupport	ReadProperty	R
Protocol Object Types Support	BACnetObjectTypesSupport	AnalogInput	R
Object Array	BACnetArray[n]	Array all object	R
Max length of APDU support	Unsigned	1476	R
Segmentation support	BACnetSegmentation	Segmented both(0)	R
Local Time	Time		R/W
Local Date	Date		R/W
APDU Segmentation Time over	Unsigned	2000	O
APDU Time over	Unsigned	3000	R
APDU Resend Times	Unsigned	3	R
Device Address Binding	AddressBinding	ASN.1 "	R
Operation instruction	Select the "Object name" property of this selected object, it means "Model information" and cannot be set.		

## 2. Operation mode

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Multistate-output 1	R
Object Name	CharacterString	AC_OMode Setting	R
Object Type	BACnetObjectType	Multistate-output	R
Description	CharacterString	Operation mode setting	O
Current value	Unsigned		W
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
States number	Unsigned	6	R
States text	BACnet ARRAY[N] CharacterString	Auto Cool Heat Dehumidify Fan Only Stop	O
Priority Array	BACnetPriorityArra	NULL	R
Release default	Unsigned	6	R
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Feedback value	Unsigned	6	O
Event enable	BACnet Event TransitionBits	T T T	O
Affirm transform	BACnet Event TransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	Select the object "current value" property, and the property that is the "operation mode" state. The property is writable and can be set on the "current value" property. When "current value" property is "1" means running the Heating mode; When "current value" property is "2", means running the Cooling mode; When "current value" property is "3" means running the Dehumidify mode; When "current value" property is "4" means running the Fan only mode; When "current value" property is "5" means running the Auto mode; When "current value" property is "3" means Turn off.		

### 3. Fan states

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Multistate-output 2	R
Object Name	CharacterString	AC_OFan Speed	R
Object Type	BACnetObjectType	Multistate-output	R
Description	CharacterString	Fan Speed Setting	O
Current value	Unsigned		W
Status Flags	BACnetStatusFlags	F F F F	R
Status Flags	BACnet Event States	Normal	R
Event states	BOOLEAN	F	R
Out of service	Unsigned	5	R
States number	BACnet ARRAY[N] CharacterString	Stop Auto Low Middle High	O
Priority Array	BACnetPriorityArra	NULL	R
Release default	Unsigned	5	R
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Feedback value	Unsigned	5	O
Event enable	BACnetEvent TransitionBits	T T T	O
Affirm transform	BACnetEvent TransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	<p>Select the object "current value" property, and the property that is the "operation fan speed" state. The property is writable and can be set on the "current value" property. When "current value" property is "1" means running the high fan; When "current value" property is "2" means running the middle fan; When "current value" property is "3" means running the low fan; When "current value" property is "4" means running the auto fan; When "current value" property is "5" means fan stop.</p> <p>For ensure the normal work of the air conditioner and during air conditioner operating, if the "current value" is set to "5" (the order of stopping the fan), it will be automatically ignored air conditioner system.</p>		

**4. Preset temperature**

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Analog-output 1	R
Object Name	Character String	AC_OTemp Setting	R
Object Type	BACnetObjectType	Analog-output	R
Description	CharacterString	Temperature Setting	O
Current value	REAL		W
Status Flags	BACnetStatusFlags	F F F F	R
Status Flags	BACnet Event States	Normal	R
Event states	BOOLEAN	F	R
Unit	BACnet Engineering Units	Degree-Celsius	R
Minimum	REAL	16	O
Maximum	REAL	32	O
Priority array Value	BACnetPriority Arra	NULL	R
Default release	REAL	25	R
Distinguishability	REAL	1	O
COV increment	REAL	1	O
Low valve value	REAL	16	O
High valve value	REAL	32	O
Width valve value	REAL	1	O
Enable valve value	BACnet Limit Enable	T T	O
Event enable	BACnet Event Transition Bits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Publicly type	Unsigned	1701	O
Time delay	Unsigned	1	O
Affirm transform	BACnetEvent TransitionBits	T T T	O
Operation instruction	Select the object "current value" property, and the property that is the current "Setting temperature". The property is writable and can be set. The "Minimum" means the lower limit value of the setting temperature; The "Maximum" means the lower limit value of the setting temperature, and the setting temperature value cannot exceed the upper limit value and lower limit value.		

**5. Room temperature**

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Analog-input 1	R
Object Name	CharacterString	AC_ITemplIndoor	R
Object Type	BACnetObjectType	Analog-input	R
Current value	REAL		R
Description	CharacterString	Indoor temperature	O
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnetEventStates	Normal	R
Reliability	BACnetReliability	NO-FAULT-DETECTED	R
Out of service	BOOLEAN	F	R
Unit	BACnetEngineering Units	Degree-Celsius	R
Minimum	REAL	-20	O
Maximum	REAL	100	O
Distinguishability	REAL	1	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Low valve value	REAL	-20	O
High valve value	REAL	100	O
Width valve value	REAL	1	O
Enable valve value	BACnetLimitEnable	T T	O
Event enable	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	event	O
Operation instruction	<p>Select the object "current value" property, and the property that is the current "Room temperature". The property is read only and cannot be set. The "Minimum" means the lower limit value of the temperature; The "Maximum" means the lower limit value of the temperature.</p> <p>When "the current value is greater than the" upper limit value "or" less than "lower limit value", the controller will automatically generate alarm warning to BMS.</p>		

**6. Timer on setting**

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnet Object Identifier	Analog-input 2	R
Object Name	Character String	AC_IOnTime	R
Object Type	BACnet Object Type	Analog-input	R
Current value	REAL		R
Description	Character String	On Time	O
Status Flags	BACnet Status Flags	F F F F	R
Event states	BACnet Event States	Normal	R
Reliability	BACnet Reliability	NO-FAULT-DETECTED	R
Out of service	BOOLEAN	F	R
Unit	BACnetEngineering Units	Hours	R
Minimum	REAL	0	O
Maximum	REAL	24	O
Distinguishability	REAL	0.25	O
Reliability	BACnetReliability	NO-FAULT-DETECTED	R
Priority Array	BACnetPriorityArra	NULL	O
Default release	REAL	0	O
COV INCREMENT	REAL	0.25	O
Low valve value	REAL	24	O
High valve value	REAL	0.5	O
Enable valve value	BACnetLimitEnable	T T	O
Event enable	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Publicly type	Unsigned	1701	O
Time delay	Unsigned	1	O
Affirm transform	BACnetEventTransitionBits	T T T	O
Operation instruction	Select the object "current value" property and the property that is the current "Timer on time". The property is read only and cannot be set. "0" to "24" means no timer to 24 hours timer.		

**7. Timer off setting**

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Analog-input 3	R
Object Name	CharacterString	AC_IOffTime	R
Object Type	BACnetObjectType	Analog-input	R
Current value	REAL	0	R
Description	CharacterString	Off Time	O
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnetEventStates	Normal	R
Out of service	BOOLEAN	F	R
Unit	BACnetEngineering Units	Hours	R
Minimum	REAL	0	O
Maximum	REAL	24	O
Distinguishability	REAL	0.25	O
Priority Array	BACnetPriorityArra	NULL	R
Default release	REAL	0	R
COV INCREMENT	REAL	0.25	O
Low valve value	REAL	0	O
High valve value	REAL	24	O
Width valve value	REAL	0.5	O
Enable valve value	BACnetLimitEnable	T T	O
Event enable	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Publicly type	Unsigned	1701	O
Time delay	Unsigned	1	O
Affirm transform	BACnetEventTransitionBits	T T T	O
Operation instruction	Select the object "current value" property and the property that is the current "Timer off time". The property is read only and cannot be set. "0" to "24" means no timer to 24 hours timer.		

**8. Swing function**

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Binary-output 1	R
Object Name	CharacterString	AC_OSwing	R
Object Type	BACnetObjectType	Binary-output	R
Current value	BACnetBinaryPV	inactive	W
Description	CharacterString	Swing Setting	O
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnetEventStates	Normal	R
Out of service	BOOLEAN	F	R
Polarity	BACnetPolarity	Normal	R
Inactive text	CharacterString	Turn off	O
Active text	CharacterString	Turn on	O
Time delay	Unsigned	1	O
States change time	BACnetDateTime		O
States change times	Unsigned		O
Change time to 0	BACnetDateTime		O
Publicly type	Unsigned	1701	O
Feedback value	BACnetBinaryPV	inactive	O
Event enable	BACnetEventTransitionBits	T T T	R
Affirm transform	BACnetEventTransitionBits	T T T	O
Priority Array	BACnetPriorityArra	NULL	R
Default release	BACnetBinaryPV	inactive	R
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	Select the object "current value" property and the property that is the "Swing function" states. "Inactive" states means the swing function is turn off, "active" states means the swing function is turn on.		

## 9. Electronic heater function

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Binary-output 2	R
Object Name	CharacterString	AC_OElecHeat	R
Object Type	BACnetObjectType	Binary-output	R
Current value	BACnetBinaryPV	Inactive	W
Description	CharacterString	Elecheat Setting	O
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnetEventStates	Normal	R
Out of service	BOOLEAN	F	R
Polarity	BACnet Polarity	Normal	R
Inactive text	CharacterString	Turn off	O
Active text	CharacterString	Turn on	O
Time delay	Unsigned	1	O
States change time	BACnetDateTime		O
States change times	Unsigned		O
Change time to 0	BACnetDateTime		O
Publicly type	Unsigned	1701	O
Feedback value	BACnet Binary PV	inactive	O
Event enable	BACnetEvent TransitionBits	T T T	R
Affirm transform	BACnetEvent TransitionBits	T T T	O
Priority Array	BACnet Priority Arra	NULL	R
Default release	BACnetBinaryPV	inactive	R
Notify Type	BACnetNotify Type	alarm	O
Operation instruction	<p>Select the object "current value" property and the property that is the "electric auxiliary heater function" states. "Inactive" states means the electric auxiliary heater is turn off, "active" states means the electric auxiliary heater is turn on.</p> <p>For ensure the normal work of the air conditioner and during air conditioner operating, if the "current value" is set to "electric auxiliary heater function" turn on command, it will be automatically ignored air conditioner system.</p>		

## 10. Error states

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Multistate-input 1	R
Object Name	Character String	AC_IMalfunction	R
Object Type	BACnetObjectType	Multistate-input	R
Current value	CharacterString	Malfunction State	O
Description	Unsigned		R
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
States number	Unsigned	17	R
States text	BACnet ARRAY[N] CharacterString	No E EF EE ED EC EB EA E9 E8 E7 E6 E5 E4 E3 E2 E1 E0	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Event enable	BACnetEventTransitionBits	T T T	O
Affirm transform	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	<p>Select the object "current value" property, and the property that is the current "error states", the property is read only. If the "current value" is "No E" means that no error, the other error codes means the relevant error, the details please refer to related product manual.</p> <p>When multiple faults occur at the same time, it will only display the smallest object number. Among them, if the "current value" is "1" means "E0"; if the "current value" is "2" means "E1"; if the "current value" is "3" means "E2"; if the "current value" is "4" means "E3"; if the "current value" is "5" means "E4"; if the "current value" is "6" means "E5"; if the "current value" is "7" means "E6"; if the "current value" is "8" means "E7"; if the "current value" is "9" means "E8"; if the "current value" is "10" means "E9"; if the "current value" is "11" means "EA"; if the "current value" is "12" means "EB"; if the "current value" is "13" means "EC"; if the "current value" is "14" means "ED"; if the "current value" is "15" means "EE"; if the "current value" is "16" means "EF"; if the "current value" is "17" means no error.</p>		

## 11. Protection states

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Multistate-input 2	R
Object Name	CharacterString	AC_IProtect	R
Object Type	BACnetObjectType	Multistate-input	R
Current value	CharacterString	Protect State	O
Description	Unsigned		R
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
States number	Unsigned	11	R
States text	BACnetARRAY[N] CharacterString	No P PF P8 P7 P6 P5 P4 P3 P2 P1 P0	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Event enable	BACnet Event Transition Bits	T T T	O
Affirm transform	BACnet Event Transition Bits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	<p>Select the object "current value" property, and the property that is the current "protection states", the property is read only. If the "current value" is "No P" means that no protection, the other protection codes means the relevant error, the details please refer to related product manual.</p> <p>When multiple faults occur at the same time, it will only display the smallest object number. Among them, if the "current value" is "1" means "P0"; if the "current value" is "2" means P1; if the "current value" is "3" means P2; if the "current value" is "4" means P3; if the "current value" is "5" means P4; if the "current value" is "6" means P5; if the "current value" is "7" means P6; if the "current value" is "8" means P7; if the "current value" is "9" means P8; if the "current value" is "10" means PF; if the "current value" is "11" means no protection.</p>		

**12. Mode query**

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnet Object Identifier	Multistate-input 3	R
Object Name	Character String	AC_Query Mode	R
Object Type	BACnet Object Type	Multistate -input	R
Description	Character String	Query Mode	O
States text	BACnet ARRAY[N] CharacterString	{"Heat", "Cool", "Dehumidify", "Fan only", "Auto", "Stop"}	O

**13. Fan speed query**

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Multistate-input 4	R
Object Name	CharacterString	AC_QueryFa nSpeed	R
Object Type	BACnetObjectType	Multistate -input	R
Description	CharacterString	Query Fan Speed	O
States text	BACnet ARRAY[N] CharacterString	{"High", "Middle", "Low", "Auto", "Stop"}	O

**14. Temperature setting query**

Property identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Multistate-input 4	R
Object Name	CharacterString	AC_Quer Temp Setting	R
Object Type	BACnetObjectType	Multistate -input	R
Current value	REAL	0	r
Description	CharacterString	QueryTempSetting	O
Unit	BACnetEngineeringUnits	Degree-Celsius	R

## Outdoor objects

The device provides ten types of BACnet object for connecting with Inverter A/C or Digital A/C as the following table, and using in the Building Management System (BMS) or other system which suitable for BACnet Protocol.

Number	Content
1	Device Information
2	Operation mode
3	Fan state
4	Outdoor temperature
5	Indoor unit quantity
6	The current of compressor 1
7	The current of compressor 2
8	The current of compressor 3
9	Malfunction state
10	Protection state

### 1. Device information

Property Identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Device + ACnumber	R
Object Name	CharacterString	Outdoor_***	R
Object Type	BACnetObjectType	Device	R
System State	BACnetDeviceStatus	Operational	R
Producer Name	CharacterString	AC Inc	R
Producer Identifier	Unsigned16	111(Unsigned)	R
Model Name	CharacterString	Frequency Conversion AC or Digital rotation AC	R
Firmware Edition	CharacterString	1.0	R
Application Software Edition	CharacterString	1.0	R
Protocol Edition	Unsigned	1	R
Protocol Correspondency Type	Unsigned	3	R
Protocol Service Support	BACnetServiceSupport	Read Property etc.	R
Protocol Object Types Support	BACnetObjectTypesSupport	Analog Input etc.	R
Object Array	BACnetArray[n]	List all objects	R
Max length of APDU support	Unsigned	1476	R
Segmentation support	BACnetSegmentation	Segmented both(0)	R
Local Time	Time		R/W
Local Date	Date		R/W
APDU SEGMENTATION TIMEOVER	Unsigned	2000	O
APDU TIMEOVER	Unsigned	3000	R
APDU RESEND TIMES	Unsigned	3	R
Device Address Binding	AddressBinding	ASN.1 "	R
Operation instruction	Select the "Object name" property of this selected object, it means "Model information" and cannot be set. Specific "model name" by the protocol specified.		

## 2. Operation mode

Property Identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Multistate-input 1	R
Object Name	CharacterString	AC_IOperationMode	R
Object Type	BACnetObjectType	Multistate-input	R
Description	CharacterString	Operation mode	O
Current value	Unsigned		R
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
States number	Unsigned	3	R
States text	BACnetARRAY[N] CharacterString	Stop Cool Heat	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Event enable	BACnetEventTransitionBits	T T T	O
Affirm transform	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	Select the object "current value" property, and the property that is the "outdoor operation mode" state. The property cannot be set. When "current value" property is "1" means running the Heating mode; When "current value" property is "2" means running the Cooling mode; When "current value" property is "3" means Turn off.		

## 3. Fan states

Property Identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Multistate-iutput 2	R
Object Name	CharacterString	AC_IFanSpeed	R
Object Type	BACnetObjectType	Multistate- iutput	R
Current value	Unsigned		O
Description	CharacterString	Fan speed	R
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
States number	Unsigned	4	R
States text	BACnetARRAY[N] CharacterString	Stop Low Middle High	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Event enable	BACnetEventTransitionBits	T T T	O
Affirm transform	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	Select the object "current value" property, and the property that is the "operation fan speed" states. The property cannot be set. When "current value" property is "1" means running the high fan; When "current value" property is "2" means running the middle fan; When "current value" property is "3" means running the low fan; When "current value" property is "4" means fan stop.		

#### 4. Outdoor temperature

Property Identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Analog-iutput 1	R
Object Name	CharacterString	AC_ITempOutdoor	R
Object Type	BACnetObjectType	Analog-iutput	R
Current value	REAL		R
Description	CharacterString	Outdoor Temperature	O
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
Unit	BACnetEngineering Units	Degree-Celsius	R
Minimum	REAL	-20	O
Maximum	REAL	100	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Low valve value	REAL	-20	O
High valve value	REAL	100	O
Width valve value	REAL	1	O
Enable valve value	BACnetLimitEnable	T T	O
Event enable	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	event	O
Operation instruction	Select the object "current value" property, and the property that is the current "outdoor temperature". The property cannot be set. The "Minimum" means the lower limit value of the temperature; The "Maximum" means the lower limit value of the temperature. When the current value is greater than the" upper limit value" or less than "lower limit value", the controller will automatically generate alarm warning to BMS.		

#### 5. Indoor quantity

Property Identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Analog-iutput 2	R
Object Name	CharacterString	AC_ITotalACs	R
Object Type	BACnetObjectType	Analog-iutput	R
Current value	REAL		R
Description	CharacterString	Indoor unit qty	O
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
Unit	BACnetEngineering Units		R
Minimum	REAL	0	O
Maximum	REAL	250	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Low valve value	REAL	0	O
High valve value	REAL	250	O
Width valve value	REAL	1	O
Enable valve value	BACnetLimitEnable	T T	O
Event enable	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	Select the object "current value" property, and the property that is the current "indoor quantity". The property cannot be set.		

**6. Compressor 1 current**

Property Identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Analog-utput 3	R
Object Name	CharacterString	AC_ICom1Current	R
Object Type	BACnetObjectType	Analog-utput	R
Current value	REAL		R
Description	CharacterString	Compressor 1 current	O
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
Unit	BACnetEngineering Units	Amperes	R
Minimum	REAL	0	O
Maximum	REAL	200	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Low valve value	REAL	0	O
High valve value	REAL	200	O
Width valve value	REAL	1	O
Enable valve value	BACnetLimitEnable	T T	O
Event enable	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	Select the object "current value" property, the property that is the "compressor 1 current" and cannot be set. The "Minimum" means the lower limit value of the compressor 1 current; The "Maximum" means the lower limit value of the compressor 1 current. When "the current value is greater than the" upper limit value" or less than "lower limit value", the controller will automatically generate alarm warning to BMS.		

**7. Compressor 2 current**

Property Identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Analog-utput 4	R
Object Name	CharacterString	AC_ICom2Current	R
Object Type	BACnetObjectType	Analog-utput	R
Current value	REAL		R
Description	CharacterString	Compressor 2 current	O
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
Unit	BACnetEngineering Units	Amperes	R
Minimum	REAL	0	O
Maximum	REAL	200	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Low valve value	REAL	0	O
High valve value	REAL	200	O
Width valve value	REAL	1	O
Enable valve value	BACnetLimitEnable	T T	O
Event enable	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	Select the object "current value" property, the property that is the "compressor 2 current" and cannot be set. The "Minimum" means the lower limit value of the compressor 2 current; The "Maximum" means the lower limit value of the compressor 2 current. When "the current value is greater than the" upper limit value" or less than "lower limit value", the controller will automatically generate alarm warning to BMS.		

**8. Compressor 3 current**

Property Identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Analog-output 5	R
Object Name	CharacterString	AC_ICom3Current	R
Object Type	BACnetObjectType	Analog-output	R
Current value	REAL		R
Description	CharacterString	Compressor 3 current	O
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
Unit	BACnetEngineering Units	Amperes	R
Minimum	REAL	0	O
Maximum	REAL	200	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Low valve value	REAL	0	O
High valve value	REAL	200	O
Width valve value	REAL	1	O
Enable valve value	BACnetLimitEnable	T T	O
Event enable	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	Select the object "current value" property, the property that is the "compressor 3 current" and cannot be set. The "Minimum" means the lower limit value of the compressor 3 current; The "Maximum" means the lower limit value of the compressor 3 current. When "the current value is greater than the" upper limit value" or less than "lower limit value", the controller will automatically generate alarm warning to BMS.		

## 9. Error states

Property Identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Multistate-input 3	R
Object Name	CharacterString	AC_IOutfunction	R
Object Type	BACnetObjectType	Multistate-input	R
Description	CharacterString	Malfunction State	O
Current value	Unsigned		R
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
States number	Unsigned	17	R
States text	BACnetARRAY[N] CharacterString	No E EF EE ED EC EB EA E9 E8 E7 E6 E5 E4 E3 E2 E1 E0	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Event enable	BACnetEventTransitionBits	T T T	O
Affirm transform	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	<p>Select the object "current value" property, and the property that is the current "error states", the property is read only. If the "current value" is "No E" means that no error, the other error codes means the relevant error, the details please refer to related product manual.</p> <p>When multiple faults occur at the same time, it will only display the smallest object number. Among them, if the "current value" is "1" means "E0 "; if the "current value" is "2" means E1; if the "current value" is "3" means E2; if the "current value" is "4" means E3; if the "current value" is "5" means E4; if the "current value" is "6" means E5; if the "current value" is "7" means E6; if the "current value" is "8" means E7; if the "current value" is "9" means E8; if the "current value" is "10" means E9; if the "current value" is "11" means EA; if the "current value" is "12" means EB; if the "current value" is "13" means EC; if the "current value" is "14" means ED; if the "current value" is "15" means EE; if the "current value" is "16" means EF; if the "current value" is "17" means no error.</p>		

## 10. Protection states

Property Identifier	Data mode	Property value	Read/write
Object Identifier	BACnetObjectIdentifier	Multistate-input 4	R
Object Name	CharacterString	AC_IOutprotect	R
Object Type	BACnetObjectType	Multistate-input	R
Description	CharacterString	Protect State	O
Current value	Unsigned		R
Status Flags	BACnetStatusFlags	F F F F	R
Event states	BACnet EventStates	Normal	R
Out of service	BOOLEAN	F	R
States number	Unsigned	17	R
States text	BACnet ARRAY[N]CharacterString	No P PF PE PD PC PB PA P9 P8 P7 P6 P5 P4 P3 P2 P1 P0	O
Time delay	Unsigned	1	O
Publicly type	Unsigned	1701	O
Event enable	BACnetEventTransitionBits	T T T	O
Affirm transform	BACnetEventTransitionBits	T T T	O
Notify Type	BACnetNotifyType	alarm	O
Operation instruction	<p>Select the object "current value" property, and the property that is the current "protection states", the property is read only. If the "current value" is "No P" means that no protection, the other protection codes means the relevant error, the details please refer to related product manual.</p> <p>When multiple faults occur at the same time, it will only display the smallest object number. Among them, if the "current value" is "1" means "P0 "; if the "current value" is "2" means P1; if the "current value" is "3" means P2; if the "current value" is "4" means P3; if the "current value" is "5" means P4; if the "current value" is "6" means P5; if the "current value" is "7" means P6; if the "current value" is "8" means P7; if the "current value" is "9" means P8; if the "current value" is "10" means PF; if the "current value" is "11" means PA; if the "current value" is "12" means PB; if the "current value" is "13" means PC; if the "current value" is "14" means PD; if the "current value" is "15" means PE; if the "current value" is "16" means PF; if the "current value" is "17" means no protection.</p>		

#### 4.2.10 Announce BACnet protocol realize the consistency

✓ **Mode of supportive BACnet consistency**

- |        |                                     |        |                          |
|--------|-------------------------------------|--------|--------------------------|
| Mode 1 | <input type="checkbox"/>            | Mode 4 | <input type="checkbox"/> |
| Mode 2 | <input type="checkbox"/>            | Mode 5 | <input type="checkbox"/> |
| Mode 3 | <input checked="" type="checkbox"/> | Mode 6 | <input type="checkbox"/> |

✓ **Functional group of supportive BACnet**

- |  |                          |                          |                          |
|--|--------------------------|--------------------------|--------------------------|
| Clock function group                               |                          | <input type="checkbox"/> |                          |
| Hand-operation equipment functional group          |                          | <input type="checkbox"/> |                          |
| Personal computer working station functional group |                          | <input type="checkbox"/> |                          |
| Event start functional group                       |                          | <input type="checkbox"/> |                          |
| Event response functional group                    | <input type="checkbox"/> |                          |                          |
| COV event start functional group                   | <input type="checkbox"/> |                          |                          |
| COV event response functional group                |                          | <input type="checkbox"/> |                          |
| File functional group                              |                          | <input type="checkbox"/> |                          |
| Reinitialization functional group                  | <input type="checkbox"/> |                          |                          |
| Virtual operator interface functional group        |                          | <input type="checkbox"/> |                          |
| Virtual terminal functional group                  |                          |                          | <input type="checkbox"/> |
| Communication equipment functional group           | <input type="checkbox"/> |                          |                          |
| Time main station functional group                 |                          | <input type="checkbox"/> |                          |

VRF Controllers

✓ Application services of supplied BACnet

Application services	Request start	Request preformed
Confirm alarm	<input type="checkbox"/>	<input type="checkbox"/>
Confirmed COV notification	<input type="checkbox"/>	<input type="checkbox"/>
Confirmed event notification	<input type="checkbox"/>	<input type="checkbox"/>
Get Alarm Summary	<input type="checkbox"/>	<input type="checkbox"/>
Get Enrollment Summary	<input type="checkbox"/>	<input type="checkbox"/>
Unconfirmed COV Notification	<input type="checkbox"/>	<input type="checkbox"/>
Unconfirmed event notification	<input type="checkbox"/>	<input type="checkbox"/>
Atomic Read File	<input type="checkbox"/>	<input type="checkbox"/>
Atomic write File	<input type="checkbox"/>	<input type="checkbox"/>
Add List Element	<input type="checkbox"/>	<input type="checkbox"/>
Remove List Element	<input type="checkbox"/>	<input type="checkbox"/>
Create Object	<input type="checkbox"/>	<input type="checkbox"/>
Delete Object	<input type="checkbox"/>	<input type="checkbox"/>
Read Property	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Read Property Conditional	<input type="checkbox"/>	<input type="checkbox"/>
Read Property Multiple	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Write Property	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Write Property Multiple	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Device Communication Control	<input type="checkbox"/>	<input type="checkbox"/>
Confirmed Private Transfer	<input type="checkbox"/>	<input type="checkbox"/>
Unconfirmed Private Transfer	<input type="checkbox"/>	<input type="checkbox"/>
Reinitialize Device	<input type="checkbox"/>	<input type="checkbox"/>
Confirmed Text Message	<input type="checkbox"/>	<input type="checkbox"/>
Unconfirmed Text Message	<input type="checkbox"/>	<input type="checkbox"/>
Time Synchronization	<input type="checkbox"/>	<input type="checkbox"/>
Who-Has	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
I-Has	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Who-Is	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
I-Am	<input type="checkbox"/>	<input checked="" type="checkbox"/>
VT –Open	<input type="checkbox"/>	<input type="checkbox"/>
VT –Open	<input type="checkbox"/>	<input type="checkbox"/>
VT –Open	<input type="checkbox"/>	<input type="checkbox"/>
Authentication Service	<input type="checkbox"/>	<input type="checkbox"/>

Request secret key service	<input type="checkbox"/>	<input type="checkbox"/>
----------------------------	--------------------------	--------------------------

✓ **Supportive object Type**

Object Type	support or not	Dynamic creatie or not	Dynamic delete or not	Optional attribute support	writable attribute
Analog Input Object Type	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	—	—
Analog Output Object Type	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	—	—
Analog Value Object Type	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	—	—
Binary Input Object Type	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	—	—
Binary Output Object Type	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	—	—
Binary Value Object Type	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	—	—
Calendar Object Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—	—
Command Object Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—	—
Device Object Type	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	—	—
Event Enrollment Object Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—	—
File Object Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—	—
Group Object Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—	—
Loop Object Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—	—
Multi-state Input Object Type	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	—	—
Multi-state Output Object Type	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	—	—
Notification Class Object Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—	—
Program Object Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—	—
Schedule Object Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	—	—

VRF Controllers

✓ **Option of Data Link Layer**

- ISO 8802-3,10BASE5                       ARCNET, coax star
- ISO 8802-3,10BASE2                       ARCNET, coax bus
- ISO 8802-3,10BASET                       ARCNET, twisted pair star
- ISO 8802-3, Fiber                       ARCNET, twisted pair star
- MS/TP master, baud rate(s):\_\_\_\_\_                       ARCNET, fiber star
- MS/TP slave, baud rate(s):\_\_\_\_\_                       LonTalk, medium:\_\_\_\_\_
- Point-To-Point, EIA232, baud rate(s):\_\_\_\_\_                       other
- Point-To-Point, modem, baud rate(s):\_\_\_\_\_

✓ **Supportive character set**

- ANSI X3.4                       IBM TM/Microsoft TM DBCS                       JIS C 6226
- ISO 10646(ICS-4)                       ISO 10646(UCS2)                       ISO 8859-1

✓ **Especial function**

- Subsection request support                       yes                       no                      window size: 1476
- Subsection responds support                       yes                       no                      window size: 1476

Notes: BACnet® is a registered trademark of America ASHRAE association which registered in United State and other countries.

## Modbus gateway: BMS-MOD

BMS-MOD support the Modbus protocol network, bridge the Bosch Climate 5000 VRF system to the BMS (Building management system) and support RTU or TCP/IP mode.

- Support the Modbus protocol network
- Built-in WEB server function
- Each gateway can be connected up to 64/16 indoor units and 4 outdoor units
- Transfer the information via the RTU mode
- Can directly connect with indoor/outdoor units without centralized controller



### Main features

- Can check and control all indoor units through built-in Web server functions.
- Can directly connect with indoor/outdoor units without centralized controller and monitor controller
- Can control indoor units, configure gateway through Web function in the LAN.
- Can connect to the BMS system through TCP/IP or RTU.
- BMS system can control and get the running real-time data of the air conditioner through BMS-MOD

### Ports instruction



WAN port Connect to the router by 5 Ethernet cables to ensure that PC can access to the web page.

A1B1E port: Connect to the XYE ports of the indoor unit and the K1K2E ports of the outdoor unit

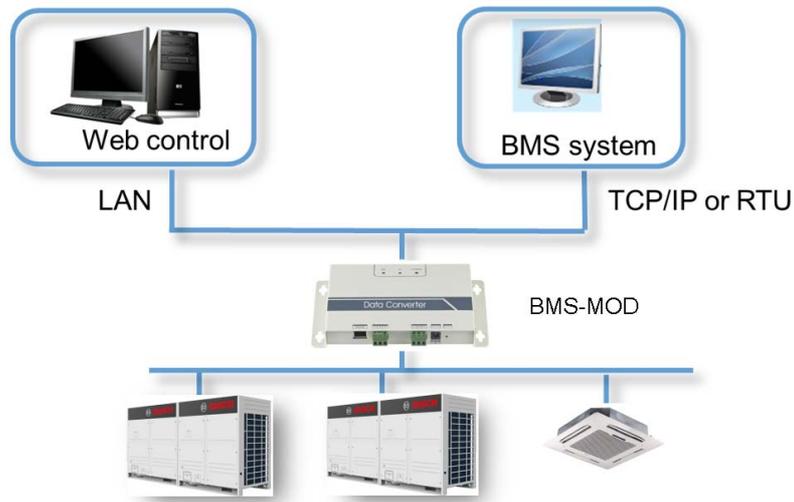
A2B2E port: Connect to the terminal serial port.

POWER port: Offer DC 5V

Reset button: Can reset to the original setting.

## Network structure

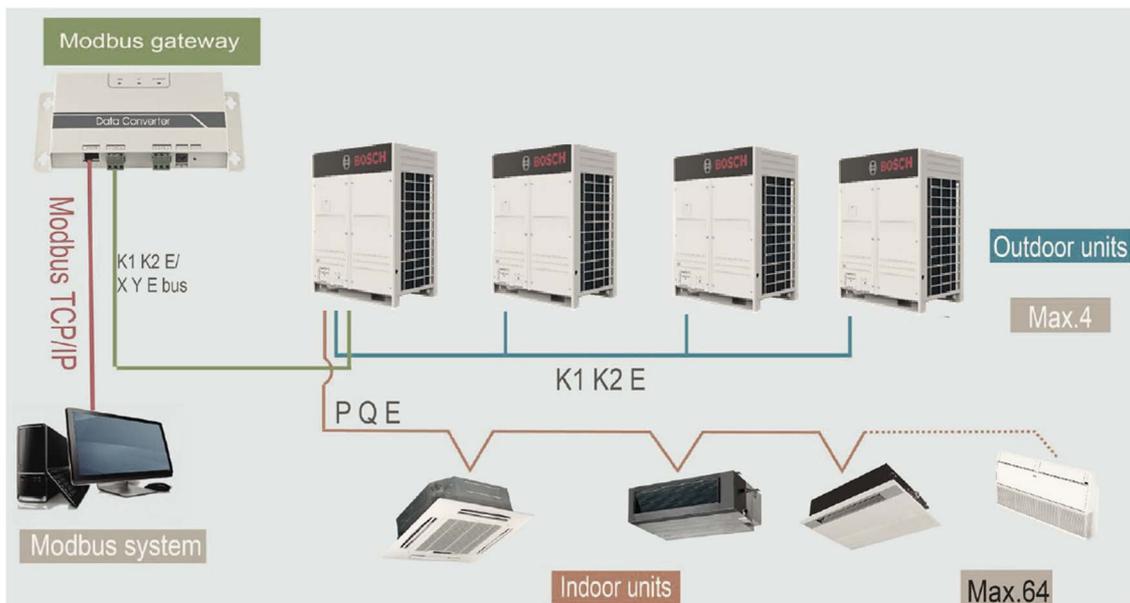
- ◆ Can control the unit and configuration the gateway through WEB function in the LAN
- ◆ Can be connected to the BMS system through TCP/IP or RTU mode



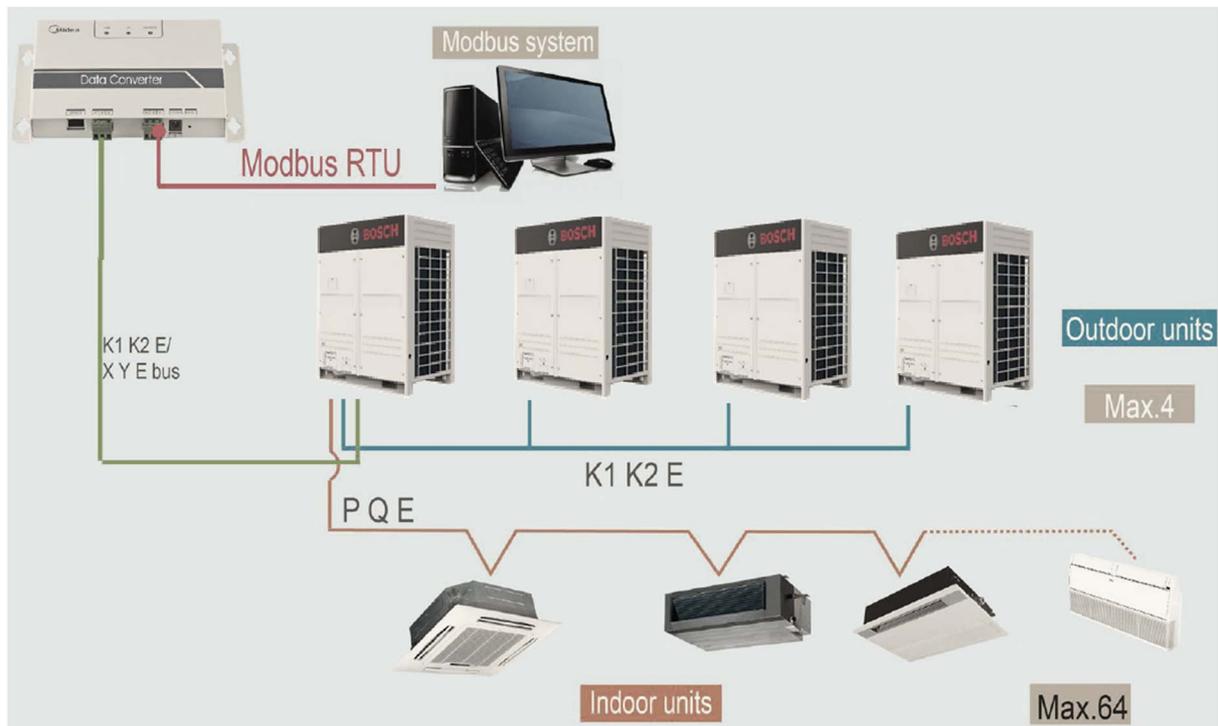
## Network example

1. One Modbus gateway can bridge one refrigerant system with a PC or the Modbus master
2. The PC system with the Modbus protocol port can communicate with BMS-MOD through RTU or TCP/IP method to control and monitor units. There are two methods for your reference.

### 1) TCP/IP connection method:



## 2) RTU connection method:



### Notes:

- ◆ If it doesn't monitor the ODU's states, it can directly connect to the XYE ports of the indoor/outdoor units in both ways above.
- ◆ If it connects to XYE ports of master ODU, ODU must be set to auto addressing mode.
- ◆ XYE and K1K2E must be connected hand by hand.
- ◆ It supports two kinds of baud rates (600 and 4800) of the outdoor unit can be connected. Baud rate is 600 for DCI series
- ◆ One Modbus gateway can bridge one refrigerant system with a PC or the BMS system (Modbus master).
- ◆ When the baud rate of the outdoor unit is 600, can be connected up to 64 indoor units and 4 outdoor units.
- ◆ When the baud rate of the outdoor unit is 4800, can be connected up to 60 indoor units (indoor address must be from 4 to 63) and 4 outdoor units.
- ◆ The addresses of accessed indoor/outdoor units can't repeat; 4 outdoor units must be in the same system.

## Operation introduction

### IP Configuration

The default IP address of the Modbus gateway is 192.168.1.200. Modbus gateway and the PC which can be used for visiting the websites must be in the same subnet segment, it should be 192.168.1.xxx (xxx must be from 2 to 254). There are 2 methods to configure IP: configure single IP and configure several IP.

#### Configure single IP

Open protocol dialog, configure the IP address and subnet mask, for example: the IP address is 192.168.1.211, and the subnet mask is 255.255.255.0.

After setting, please click "OK" button.

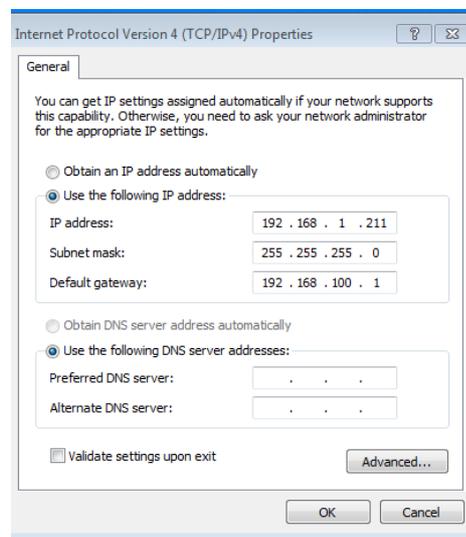


Fig.4.1

### Configure several IP

Before configuring several IP, it needs to configure a statistic IP address. Open the property dialog, select the "Advanced", and it will display the TCP/IP setting dialog.

Click "Add" button in the IP address bar can add an IP address which is in the same segment as "192.168.1.200", for example ,the IP address is 192.168.1.209, subnet mask is 255.255.255.0, and click "OK" button will be OK.

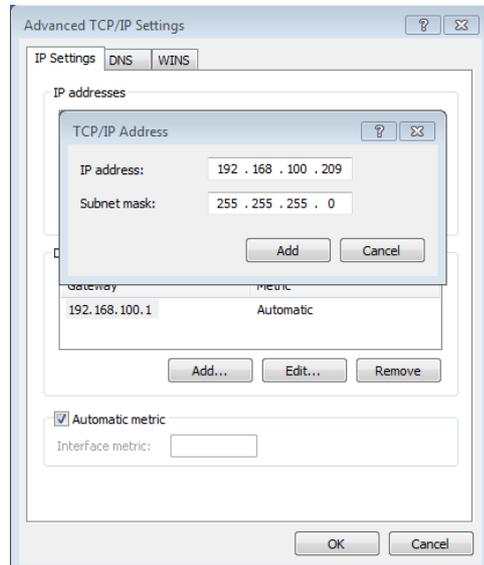


Fig.4.2

### *The gateway configuration*

Input "http://192.168.1.200" in the address bar in IE Browser (suggest using IE Browser) and press Enter button will enter the WEB page of Modbus gateway. You can click the "Configuration" button and will display the following dialog.

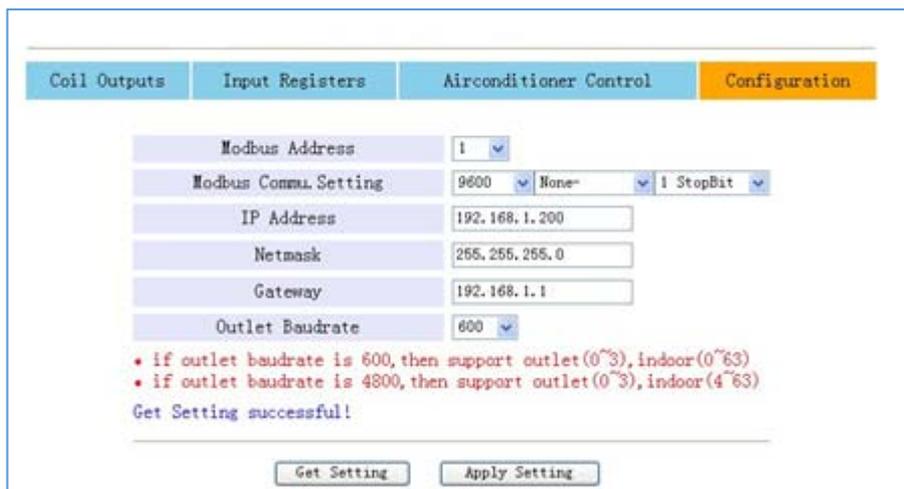


Fig.4.3

**Parameters Setting:**

Parameter	Description
Modbus address	Modbus ID is used to distinguish multiple gateways which with Modbus protocol in the same subnet segment. The ID must not repeat and can be modified.
Modbus communication setting	Baud rate: suggest 9600; Check bit: no checking by default Stop bit: 1 Stop Bit by default
IP address	IP address of Modbus gateway, multiple IP addresses can't repeat.
Subnet Mask	Default: 255.255.255.0
Gateway	Local gateway address
Baud rate of the outdoor unit	Outdoor communication baud rate which is connected to Modbus gateway

Click "Application Settings" after changing the corresponding parameters. If you want the use the updated setting, please click "Get Settings" button.

Modbus gateway will restart automatically after changing settings, and the network will break and reconnect automatically.

*A/C information query*

Select "Power winding" or "input register" in the web page to query the information of the air conditioner unit. When select "power winding", it will display the following dialog.

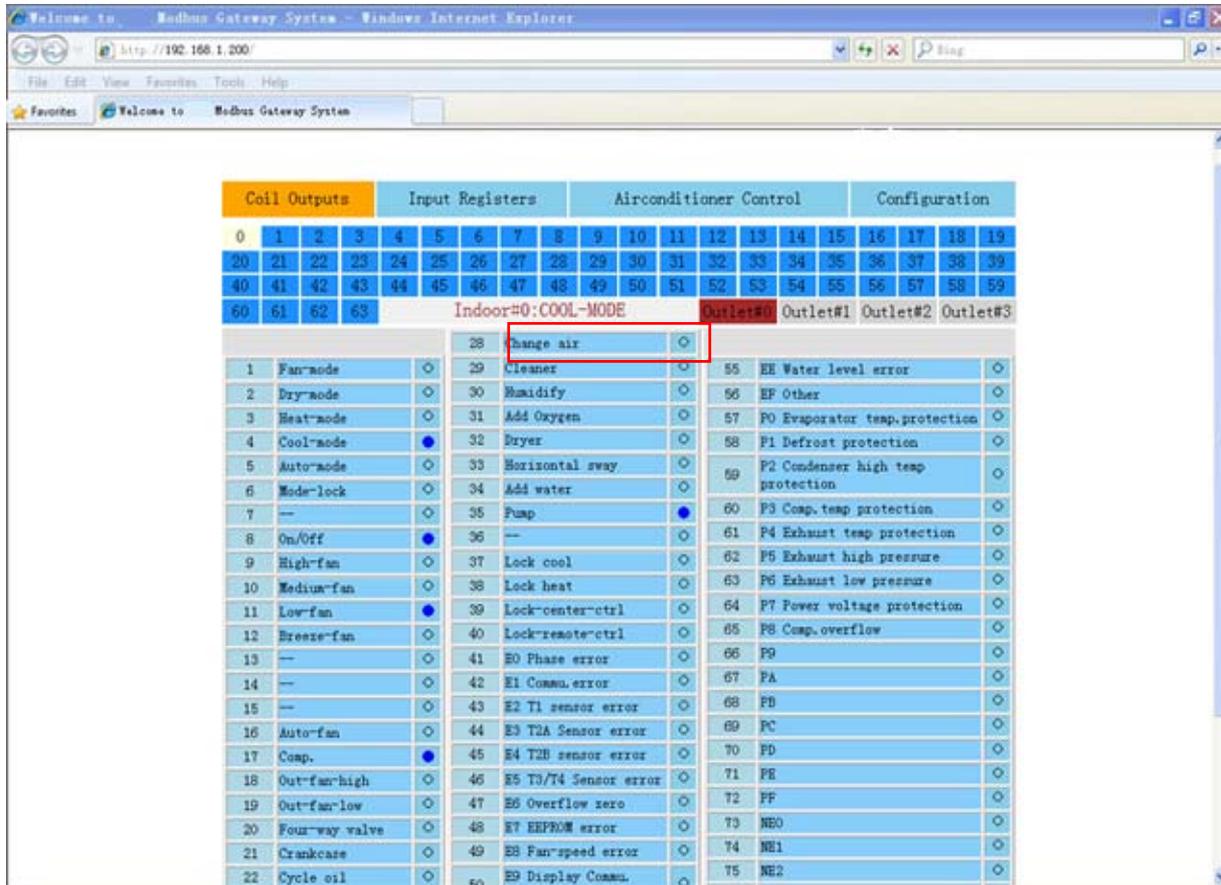


Fig.4.4

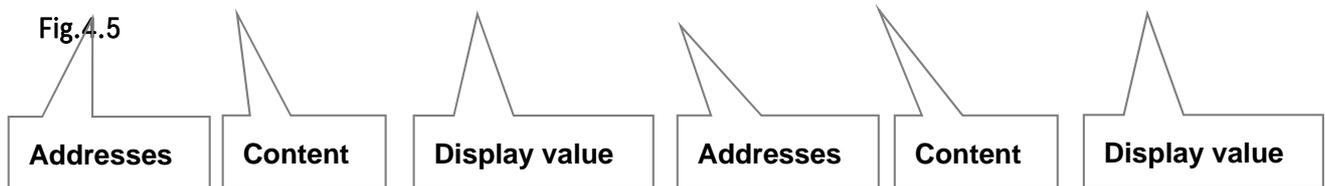
When click the address number of the indoor or outdoor unit, it will display corresponding operation information of the air conditioner. The chosen device will display in the red frame.

## VRF Controllers

When click "input register", it will display as following dialog:

Coil Outputs				Input Registers				Airconditioner Control								Configuration			
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
60	61	62	63	Indoor#0:Error/Protect								Outlet#0	Outlet#1	Outlet#2	Outlet#3				
30001	System status		2/0002		30017	Protection status		0/0000											
30002	UnitStyle-1		224/00E0		30018	Outlet 0~3 online status		0/0000											
30003	UnitStyle-2		20/0014		30019	AC 0~15 online status		1/0001											
30004	Set temp.Ts		17/0011		30020	AC 16~31 online status		65280/FF00											
30005	Room temp.T1		90/005A		30021	AC 32~47 online status		65535/FFFF											
30006	Evaporator-temp.T2A		92/005C		30022	AC 48~63 online status		4091/0FFB											
30007	Evaporator-temp.T2B		90/005A		30023	Outlet 0~3 error status		0/0000											
30008	Condenser temp.T3		255/00FF		30024	Outlet 0~3 run status		0/0000											
30009	--		0/0000		30025	AC 0~15 error status		1/0001											
30010	--		0/0000		30026	AC 16~31 error status		0/0000											
30011	Timer-on		0/0000		30027	AC 32~47 error status		0/0000											
30012	Timer-off		0/0000		30028	AC 48~63 error status		58/003A											
30013	Power		10/000A		30029	AC 0~15 run status		0/0000											
30014	--		0/0000		30030	AC 16~31 run status		0/0000											
30015	--		0/0000		30031	AC 32~47 run status		0/0000											
30016	Error status		128/0080		30032	AC 48~63 run status		0/0000											

Fig.4.5



The first column is the address, the second is the content and the third is displayed value, e.g. 17/0011, 17 is decimal display, 0011 is hexadecimal display.

Explanation of part of the content:

For example, 0~3 outdoor unit online state is 1/0001. When 0# indoor unit is online, its value is 1/0001(decimalism /hexadecimal); when No. 0 and No.1 indoor unit are online, its value is 3/0003 (decimalism /hexadecimal).

**Air Conditioner Control**

When click “Air Conditioner Control” on the web page, it will display as following dialog:

Single control area

Group control area

Fig. 4.6

Single control area:

You can control a single air conditioner, set mode, fan speed, temperature setting and click "Apply" button to carry out a single controlling function.

Group Control area:

Choose the corresponding group control button, all the indoor units under the control of the Modbus gateway will be turn on or turn off.

## Software installation and debug

### PC access mode

The PC system with Modbus protocol port can communicate with the Modbus gateway through TCP/IP protocol or Modbus RTU. For detailed information, please refer to 4.3.3 Network example.

### Install Modbus Poll software

Through Modbus Poll software to access debugging.

When finish installing Modbus Poll software, the home page will display as following dialog:

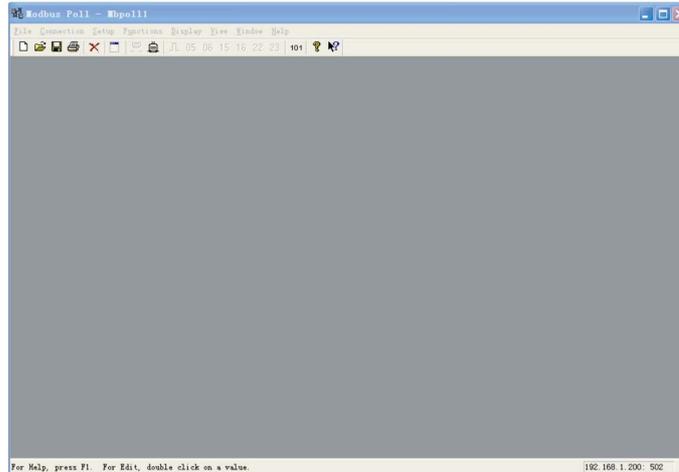


Fig.4.7

### Connect Modbus Gateway

There're 2 connection methods: TCP/IP and Modbus RTU

#### 1) Connection through TCP/IP

Choose "Connection"->"Connection" in Fig.4.3, it will enter the following dialog, and then you can choose TCP/IP in the Pop-up window:

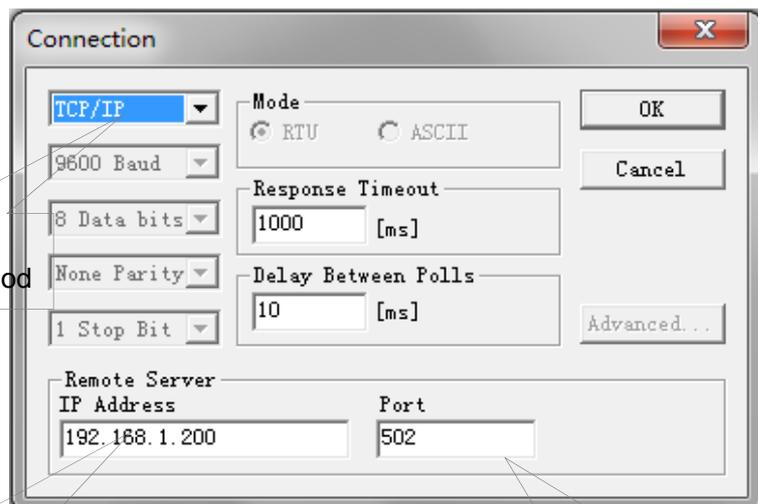


Fig.4.8

To choose the connection method

IP address of the gateway for connection

Connection port: default 502 port

## 2) Connection through Modbus/RTU

Choose RTU to connect, it will display as following dialog and you can set the corresponding parameters.

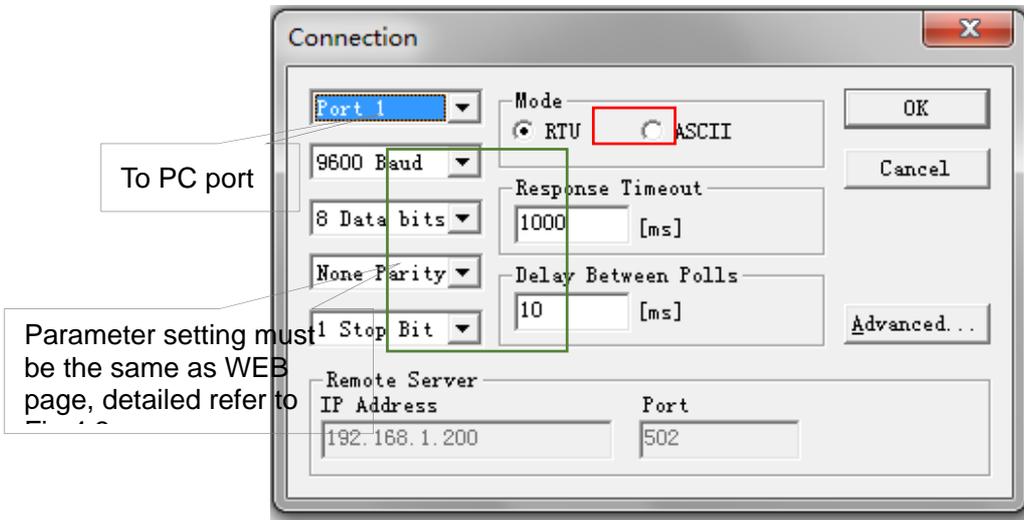


Fig.4.9

### Test

Modbus Poll software can read/write the content of the corresponding address in mapping table. Take reading coil content for an example:

Choose "Poll Definition" under "Setup", it will display the following dialog.

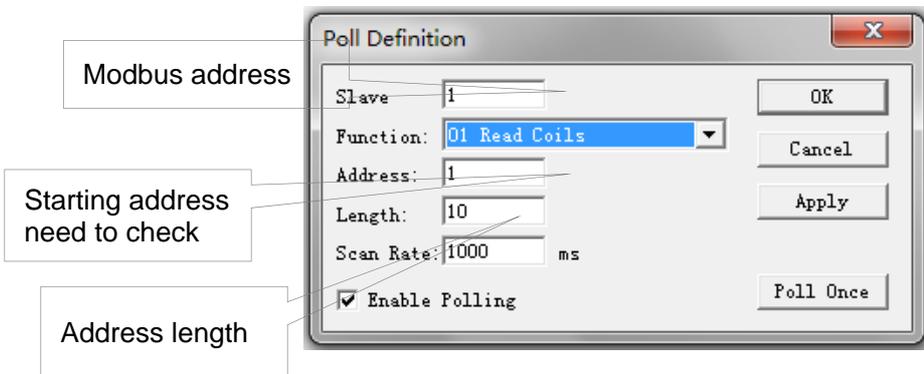
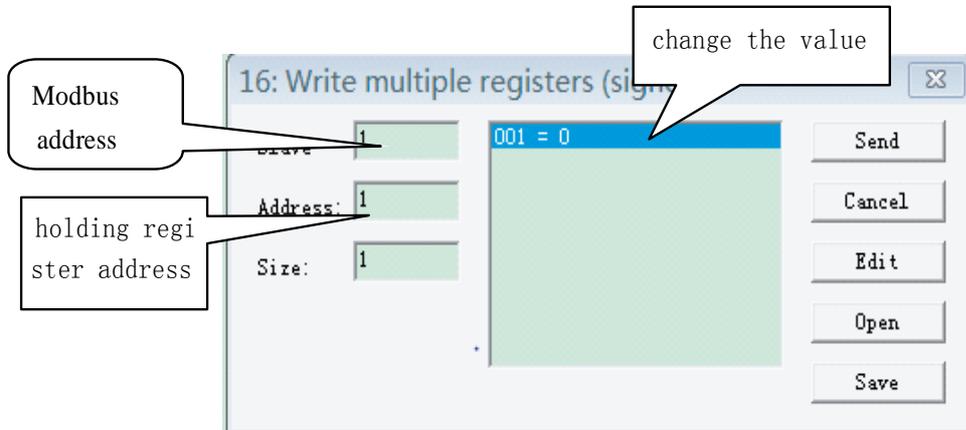


Fig.4.10

Click "OK" button, it will display the content of the reading. If the reading content is the same as the value of the web page which has the same address, it means that the software debugging success.

**Take writing holding register for example:**

Choose **16** button in Fig.3.7, as shown below:



After changed the value, click "send" button to finish the writing operation.

***Software Reset***

Press "RESET" button on the gateway for 3 seconds and power on again, the software configuration will be back to the original setting.

**Function Code**

Function code	Function name	Function
0x01	Read Coils	Read
0x04	Read Input Register	Read
0x10	Write Holding Register	Write

**Abnormal Reply**

The master unit sends requests and waits for a reply from the slave unit. When there's no error, the slave unit will reply normally, but if the data checking error, the slave unit does not respond. When the master unit sends a wrong data (except checking error), the slave will respond abnormally.

Code	Name	Description
0x01	Illegal function code	The slave units receive a function code that can't comply.
0x02	Illegal function code	The address of received data isn't permitted by the slave units.
0x03	Illegal data	The value of query area data isn't permitted by the slave units
0x06	Slave busy	The slave unit is busy processing a long program command, and don't receive information from the main unit.

## Mapping table

### Indoor unit variable mapping table

Modbus description	Indoor address number	Modbus register address	Data name	Length	Octet Order	Explanation
Coils(R)	0	1	Fan mode	1 Octet	1	1: Yes; 0:No
		2	Dry mode			1: Yes; 0:No
		3	Heat mode			1: Yes; 0:No
		4	Cool mode			1: Yes; 0:No
		5	Auto mode			1: Yes; 0:No
		6	Mode locking			1: Yes; 0:No
		7	Reserve			Reserve, stay 0
		8	On/Off			1= on; 0=off
		9-16	High fan speed	1 Octet	2	1= on; 0=off
			Mid fan speed			1= on; 0=off
			Low fan speed			1= on; 0=off
			Low fan speed			1= on; 0=off
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0
			Auto(fixed)fan			1= on; 0=off
		17-24	Compressor	1 Octet	3	1= on; 0=off
			ODU high fan speed			1= on; 0=off
			ODU low fan speed			1= on; 0=off
			4-way valve			1= on; 0=off
			Crankcase			1= on; 0=off
			Oil return			Reserve, stay 0
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0

**Indoor unit variable mapping table**

Modbus description	Indoor address number	Modbus register address	Data name	Length	Octet Order	Explanation
Coils(R)	0	25-32	ECO operation	1 Octet	4	1 = on; 0=off
			Electric auxiliary heating			1 = on; 0=off
			Swing			1 = on; 0=off
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0
		33-40	Horizontal swing	1 Octet	5	1 = on ;0=off
			Add water			1 = on ;0=off
			Water drain pump			1 = on ;0=off
			Reserve			Reserve, stay 0
			Locking cool mode			1: Yes; 0:No
			Locking heat mode			1: Yes; 0:No
			Centralized controller lock			1: Yes; 0:No
			Remote controller lock			1: Yes; 0:No
		41-48	E0 Phase sequence error or no phase	1 Octet	6	1:Error; 0:Normal
			E1 communication error			1:Error; 0:Normal
			E2 T1 sensor error			1:Error; 0:Normal
			E3 T2A sensor error			1:Error; 0:Normal
			E4 T2B sensor error			1:Error; 0:Normal
			E5 T3/T4/Digital compressor discharge temp. sensor error			1:Error; 0:Normal
			E6 Zero crossing detection error			1:Error; 0:Normal
			E7 EEPROM error			1:Error; 0:Normal
		49-56	E8 Fan speed detection error	1 Octet	7	1:Error; 0:Normal
			E9 Mainboard and display board communication error			1:Error; 0:Normal
			EA Compressor over current (4 times)			1:Error; 0:Normal
			EB Inverter module protection			1:Error; 0:Normal
			EC Flesh error			1:Error; 0:Normal
			ED Outdoor unit error protection			1:Error; 0:Normal
			EE Water level detection error			1:Error; 0:Normal
			EF Other errors			1:Error; 0:Normal
		57-64	P0 Evaporator temp. protection	1 Octet	8	1:Protection; 0:Normal
			P1 anti-cold or defrost protection			1:Protection; 0:Normal
			P2 Condenser high temp. protection			1:Protection; 0:Normal
P3 Compressor temp. protection	1:Protection; 0:Normal					
P4 Discharge pipe temp. protection	1:Protection; 0:Normal					
P5 Discharge high pressure protection	1:Protection; 0:Normal					
P6 Discharge low pressure protection	1:Protection; 0:Normal					

VRF Controllers

			P7 Over voltage or under voltage protection			1:Protection; 0:Normal
--	--	--	---	--	--	---------------------------

*Indoor unit variable mapping table*

Modbus description	Indoor address number	Modbus register address	Data name	Length	Octet Order	Explanation	
Coils(R)	0	65-72	P8 Compressor over current protection	1 Octet	9	1:Protection; 0:Normal	
			P9			Reserve, stay 0	
			PA			Reserve, stay 0	
			PB			Reserve, stay 0	
			PC			Reserve, stay 0	
			PD			Reserve, stay 0	
			PE			Reserve, stay 0	
			PF Other protections			1:Protection; 0:Normal	
		73-80	0# Network connection module and mainboard communication error	1 Octet	10	1:Error; 0:Normal	
			1# Centralized controller and network module error			1:Error; 0:Normal	
			2# Centralized controller and function module communication error			1:Error; 0:Normal	
			3# Centralized controller and computer (gateway) communication error			1:Error; 0:Normal	
			4# Order limit execution			1:Error; 0:Normal	
			5# Order timeout, not execution			1:Error; 0:Normal	
			6# Destination address not exist			1:Error; 0:Normal	
	7# Error (unsupported) order	1:Error; 0:Normal					
	81-128	Reserve	6 Octet	11~16	Reserve, stay 0		
	1	129-136	129	Fan mode	1 Octet	17	1: Yes; 0:No
			130	Dry mode			1: Yes; 0:No
			131	Heat mode			1: Yes; 0:No
			132	Cool mode			1: Yes; 0:No
			133	Auto mode			1: Yes; 0:No
			134	Mode locking state			1: Yes; 0:No
			135	Reserve			Reserve, stay 0
			136	On/Off state			1: on; 0:off
		137-144	High fan speed	1 Octet	18	1: Yes; 0:No	
			Mid fan speed			1: Yes; 0:No	
			Low fan speed			1: Yes; 0:No	
			Low fan speed			1: Yes; 0:No	
			Reserve			Reserve, stay 0	
			Reserve			Reserve, stay 0	
			Reserve			Reserve, stay 0	
	Auto(fixed)fan	1: Yes; 0:No					
	145-152	Compressor	1 Octet	19	1= on; 0=off		
		ODU high fan speed			1= on; 0=off		
		ODU low fan speed			1= on; 0=off		
		4-way valve			1= on; 0=off		

VRF Controllers

			Crankcase			1 = on; 0=off
			Oil return			Reserve, stay 0
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0

*Indoor unit variable mapping table*

Modbus description	Indoor address number	Modbus register address	Data name	Length	Octet Order	Explanation
Coils(R)	1	153-160	Eco operation	1 Octet	20	1 = on; 0=off
			Electric auxiliary heating			1 = on; 0=off
			Swing			1 = on; 0=off
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0
			Reserve			Reserve, stay 0
		161-168	Horizontal swing	1 Octet	21	1 = on; 0=off
			Add water			1 = on; 0=off
			Water drain pump			1 = on; 0=off
			Reserve			Reserve, stay 0
			Locking cool mode			1: Yes; 0:No
			Locking heat mode			1: Yes; 0:No
			Centralized controller lock			1: Yes; 0:No
			Remote controller lock			1: Yes; 0:No
		169-176	E0 Phase sequence error or no phase	1 Octet	22	1:Error; 0:Normal
			E1 communication error			1:Error; 0:Normal
			E2 T1 sensor error			1:Error; 0:Normal
			E3 T2A sensor error			1:Error; 0:Normal
			E4 T2B sensor error			1:Error;0: Normal
			E5 T3/T4/Digital compressor discharge temp. sensor error			1:Error; 0:Normal
			E6 Zero crossing detection error			1:Error;0: Normal
			E7 EEPROM error			1:Error; 0:Normal
		177-184	E8 Fan speed detection error	1 Octet	23	1:Error; 0:Normal
			E9 Mainboard and display board communication error			1:Error; 0:Normal
			EA Compressor over current (4 times)			1:Error; 0:Normal
			EB Inverter module protection			1:Error; 0:Normal
			EC Flesh error			1:Error; 0:Normal
			ED Outdoor unit error protection			1:Error; 0:Normal
			EE Water level detection error			1:Error; 0:Normal
			EF Other errors			1:Error; 0:Normal
		185-192	P0 Evaporator temp. protection	1 Octet	24	1:Protection; 0:Normal
			P1 anti-cold or defrost protection			1:Protection; 0:Normal
			P2 Condenser high temp. protection			1:Protection; 0:Normal
			P3 Compressor temp. protection			1:Protection;

VRF Controllers

						0:Normal
			P4 Discharge pipe temp. protection			1:Protection; 0:Normal
			P5 Discharge high pressure protection			1:Protection; 0:Normal
			P6 Discharge low pressure protection			1:Protection; 0:Normal
			P7 Power supply over or under voltage protection			1:Protection; 0:Normal

*Indoor unit variable mapping table*

Modbus description	Indoor address number	Modbus register address	Data name	Length	Octet Order	Explanation
Coils(R)	1	193-200	P8 Compressor over current protection	1 Octet	25	1:Protection; 0:Normal
			P9			Reserve, stay 0
			PA			Reserve, stay 0
			PB			Reserve, stay 0
			PC			Reserve, stay 0
			PD			Reserve, stay 0
			PE			Reserve, stay 0
			PF Other protections			1:Protection; 0:Normal
		201-208	0# Network connection module and mainboard communication error	1 Octet	26	1:Error; 0:Normal
			1# Centralized controller and network module error			1:Error;0: Normal
			2# Centralized controller and function module communication error			1:Error;0: Normal
			3# Centralized controller and computer or gateway communication error			1:Error;0: Normal
			4# Order limit execution			1:Error;0:Normal
			5# Order timeout, not execution			1:Error;0: Normal
			6# Destination address not exist			1:Error;0:Normal
7# Error (unsupported) order	1:Error;0:Normal					
209-256	Reserve	6 Octet	27~32	Reserve, stay 0		

*Indoor unit variable mapping table*

Modbus description	Indoor address number	Modbus register address	Data name	Length	Octet Order	Explanation
Coils(R)	n	(128*n+1)- (128*n+8)	The same as the 1# indoor unit	1 Octet	n*16+1	The same as the 1# indoor unit.
		(128*n+9)- (128*n+16)		1 Octet	n*16+2	
		(128*n+17)- (128*n+24)		1 Octet	n*16+3	
		(128*n+25)- (128*n+31)		1 Octet	n*16+4	
		(128*n+32)- (128*n+40)		1 Octet	n*16+5	
		(128*n+41)- (128*n+48)		1 Octet	n*16+6	
		(128*n+49)- (128*n+56)		1 Octet	n*16+7	
		(128*n+57)- (128*n+64)		1 Octet	n*16+8	
		(128*n+65)- (128*n+72)		1 Octet	n*16+9	
		(128*n+73)- (128*n+80)		1 Octet	n*16+10	
		(128*n+81)- (128*n+128 )		6 Octet	(n*16+11)~(n*16+16)	
	63	8065-8072	The same as the 1# indoor unit.	1 Octet	1009	The same as the 1# indoor unit.
		8073-8080		1 Octet	1010	
		8081-8088		1 Octet	1011	
		8089-8096		1 Octet	1012	
		8097-8104		1 Octet	1013	
		8105-8112		1 Octet	1014	
		8113-8120		1 Octet	1015	
		8121-8128		1 Octet	1016	
		8129-8136		1 Octet	1017	
8137-8144		1 Octet		1018		
8145-8192		6 Octet		1019~1024		

**Indoor unit variable mapping table**

Modbus description	Indoor address number	Modbus register address	Data name	Length	Explanation
Input Register (R)	0	30001	System state	2 Octet	bit0: the running state of the system 1:running, 0:stop; bit1: the error state of the system, 1:error,0:normal; bit2: local/remote, 1:remote, 0:local
		30002	Model message 1	2 Octet	
		30003	Model message 2	2 Octet	
		30004	Setting temp Ts	2 Octet	16~32 means the temperature range is 16 to 32°C
		30005	Indoor temp T1	2 Octet	0~240 means the temperature range is from - 20 to 100°C
		30006	Evaporator pipe temp T2A	2 Octet	0~240 means the temperature range is from - 20 to 100°C
		30007	Evaporator medium pipe temp. T2B	2 Octet	0~240 means the temperature range is from - 20 to 100°C
		30008	Condenser pipe temp T3	2 Octet	0~240 means the temperature range is from - 20 to 100°C
		30009	Reserve		
		30010	Reserve		
		30011	Timer on	2 Octet	0~96 means no timer ~ 24 hours timer
		30012	Timer off	2 Octet	0~96 means no timer ~ 24 hours timer
		30013	Electric consumption power	2 Octet	Unit :0.1HP
		30014~30015	Reserve	4 Octet	Reserve, stay 0
		30016	Error state	2 Octet	bit0: means E0 error, 1:Yes, 0:No bit1: means E1 error, 1:Yes, 0:No ..... bit15: means EF error,1:Yes, 0:No
		30017	Protection state	2 Octet	bit0: means P0 protection, 1: Yes, 0: No bit1: means P1 protection, 1: Yes, 0: No ..... bit15: means PF protection , 1: Yes, 0: No
30018	0~3 outdoor unit online state	2 Octet	bit0: means 0# outdoor unit online, 1: Yes, 0: No bit1: means 1# outdoor unit online, 1: Yes, 0: No bit2: means 2# outdoor unit online, 1: Yes, 0: No bit3: means 3# outdoor unit online, 1: Yes, 0: No		
30019	0~15 indoor unit online state	2 Octet	bit0: means 0# indoor unit online, 1: Yes, 0: No bit1: means 1# indoor unit online, 1: Yes, 0: No ..... bit15: means 15# indoor unit online, 1: Yes, 0: No		

*Indoor unit variable mapping table*

Modbus description	Indoor address number	Modbus register address	Data name	Length	Explanation
Input Register (R)	0	30020	16~31# indoor unit online state	2 Octet	bit0: means 16# indoor unit online, 1: Yes, 0: No bit1: means 17# indoor unit online, 1: Yes, 0: No ..... bit15: means 31# indoor unit online, 1: Yes, 0: No
		30021	32~47# indoor unit online state	2 Octet	bit0: means 32# indoor unit online, 1: Yes, 0: No bit1: means 33# indoor unit online, 1: Yes, 0: No ..... bit15: means 47# indoor unit online, 1: Yes, 0: No
		30022	48~63# indoor unit online state	2 Octet	bit0: means 48# indoor unit online, 1: Yes, 0: No bit1: means 49# indoor unit online, 1: Yes, 0: No ..... bit1: means 63# indoor unit online, 1: Yes, 0: No
		30023	0~3 #outdoor unit error state	2 Octet	bit0: means 0# outdoor unit error, 1: Yes, 0: No bit1: means 1# outdoor unit error, 1: Yes, 0: No bit2: means 2# outdoor unit error, 1: Yes, 0: No bit3: means 3# outdoor unit error, 1: Yes, 0: No
		30024	0~3# outdoor unit running state	2 Octet	bit0: means 0# outdoor unit running state, 1: Yes, 0: No bit1: means 1# outdoor unit running state, 1: Yes, 0: No bit2: means 2# outdoor unit running state, 1: Yes, 0: No bit3: means 3# outdoor unit running state, 1: Yes, 0: No
		30025	0~15# indoor unit error state	2 Octet	bit0: means 0# indoor unit error state, 1: Yes, 0: No bit1: means 1# indoor unit error state, 1: Yes, 0: No ..... bit15: means 15# indoor unit error state, 1: Yes, 0: No

*Indoor unit variable mapping table*

Modbus description	Indoor address number	Modbus register address	Data name	Length	Explanation
Input Register (R)	0	30026	16~31# indoor unit error state	2 Octet	bit0: means 16# indoor unit error state, 1: Yes, 0: No bit1: means 17# indoor unit error state, 1: Yes, 0: No ..... bit15: means 31# indoor unit error state, 1: Yes, 0: No
		30027	32~47# indoor unit error state	2 Octet	bit0: means 32# indoor unit error state, 1: Yes, 0: No bit1: means 33# indoor unit error state, 1: Yes, 0: No ..... bit15: means 47# indoor unit error state, 1: Yes, 0: No
		30028	48~63# indoor unit error state	2 Octet	bit0: means 48# indoor unit error state, 1: Yes, 0: No bit1: means 49# indoor unit error state, 1: Yes, 0: No ..... bit15: means 63# indoor unit error state, 1: Yes, 0: No
		30029	0~15# indoor unit running state	2 Octet	bit0: means 0# indoor unit running state, 1: Yes, 0: No bit1: means 1# indoor unit running state, 1: Yes, 0: No bit15: means 15# indoor unit running state, 1: Yes, 0: No
		30030	16~31# indoor unit running state	2 Octet	bit0: means 16# indoor unit running state, 1: Yes, 0: No bit1: means 17# indoor unit running state, 1: Yes, 0: No bit15: means 31# indoor unit running state, 1: Yes, 0: No
		30031	32~47# indoor unit running state	2 Octet	bit0: means 32# indoor unit running state, 1: Yes, 0: No bit1: means 33# indoor unit running state, 1: Yes, 0: No ..... bit15: means 47# indoor unit running state, 1: Yes, 0: No
		30032	48~63# indoor unit running state	2 Octet	bit0: means 48# indoor unit error state, 1: Yes, 0: No bit1: means 49# indoor unit error state, 1: Yes, 0: No ..... bit15: means 63# indoor unit error state, 1: Yes, 0: No

**Indoor unit variable mapping table**

Modbus description	Indoor address number	Modbus register address	Data name	Length	Explanation
Input Register (R)	1	30033	Reserve		Reserve, stay 0
		30034	Model message 1	2 Octet	
		30035	Model message 2	2 Octet	
		30036	Setting temp. Ts	2 Octet	16~32 means the temperature range is 16 to 32°C
		30037	Indoor temp T1	2 Octet	0~240 means the temperature range is from - 20 to 100°C
		30038	Evaporator pipe temp. T2A	2 Octet	0~240 means the temperature range is from - 20 to 100°C
		30039	Evaporator medium pipe temp. T2B	2 Octet	0~240 means the temperature range is from - 20 to 100°C
		30040	Condenser pipe temp. T3	2 Octet	0~240 means the temperature range is from - 20 to 100°C
		30041	Reserve		
		30042	Reserve		
		30043	Timer on	2 Octet	0~96 means no timer ~ 24 hours timer
		30044	Timer off	2 Octet	0~96 means no timer~ 24 hours timer
		30045	Electric consumption power	2 Octet	Unit :0.1HP
		30046~30047	Reserve	4 Octet	Reserve, stay 0
		30048	Error state	2 Octet	The same as the 0# indoor unit.
		30049	Protection state	2 Octet	
		30050	0~3 outdoor unit online state	2 Octet	
		30051	0~15 indoor unit online state	2 Octet	
		30052	16~31 indoor unit online state	2 Octet	
		30053	32~47 indoor unit online state	2 Octet	
		30054	48~63 indoor unit online state	2 Octet	
		30055	0~3 outdoor unit error state	2 Octet	
		30056	0~3 outdoor unit running state	2 Octet	
		30057	0~15 indoor unit error state	2 Octet	
		30058	16~31 indoor unit error state	2 Octet	
		30059	32~47 indoor unit error state	2 Octet	
		30060	48~63 indoor unit error state	2 Octet	
		30061	0~15 indoor unit running state	2 Octet	
		30062	16~31 indoor unit running state	2 Octet	
		30063	32~47 indoor unit running state	2 Octet	
30064	48~63 indoor unit running state	2 Octet			

*Indoor unit variable mapping table*

Modbus description	Indoor address number	Modbus register address	Data name	Length	Explanation
Input Register (R)	n	30000+n*32+1	Reserve		The same as the 1# indoor unit.
		30000+n*32+2	Model message 1	2 Octet	
		30000+n*32+3	Model message 2	2 Octet	
		30000+n*32+4	Setting temp. Ts	2 Octet	
		30000+n*32+5	Indoor temp T1	2 Octet	
		30000+n*32+6	Evaporator pipe temp. T2A	2 Octet	
		30000+n*32+7	Evaporator medium pipe temp. T2B	2 Octet	
		30000+n*32+8	Condenser pipe temp. T3	2 Octet	
		30000+n*32+9	Reserve		
		30000+n*32+10	Reserve		
		30000+n*32+11	Timer on	2 Octet	
		30000+n*32+12	Timer off	2 Octet	
		30000+n*32+13	Electric consumption power	2 Octet	
		(30000+n*32+14) ~ (30000+n*32+32)	Reserve	38 Octet	
	63	32017	Reserve		The same as the 1# indoor unit.
		32018	Model message 1	2 Octet	
		32019	Model message 2	2 Octet	
		32020	Setting temp. Ts	2 Octet	
		32021	Indoor temp. T1	2 Octet	
		32022	Evaporator pipe temp. T2A	2 Octet	
		32023	Evaporator medium pipe temp. T2B	2 Octet	
		32024	Condenser pipe temp. T3	2 Octet	
		32025	Reserve		
		32026	Reserve		
		32027	Timer on	2 Octet	
32028	Timer off	2 Octet			
32029	Electric consumption power	2 Octet			
32030~32048	Reserve	38 Octet			

**Indoor unit variable mapping table**

Modbus description	Indoor address number	Modbus register address	Data name	Length	Explanation
Holding register (W)	0	40001	Refrigerant system on/off	2 Octet	0:All-off the system 1:All-on the system – The summer mode 1: cooling, 17°C, Low speed, no timer and auxiliary; 2 : All-on the system – The summer mode 2: cooling, 24°C, medium speed, no timer and auxiliary; 3: All-on the system – The summer mode 3: cooling, 26°C, high speed, no timer and auxiliary; 4: All-on the system - the winter mode 1: heat mode, 30°C, high speed, no timer and auxiliary; 5: All-on the system - the winter mode 2: heat mode, 26°C, medium speed, no timer and auxiliary; 6: All-on the system - the winter mode 3: heat mode, 24°C, low speed, no timer and auxiliary.
		40002	Setting mode	2 Octet	bit15~bit8: reserve, stay 0 bit7: turn On/Off, 1: On, 0: Off bit6: reserve, stay 0 bit5: mode lock bit4: auto mode 1: Yes, 0: No bit3: cool mode 1: Yes, 0: No bit2: heat mode 1: Yes, 0: No bit1: dry mode 1: Yes, 0: No bit0: Fan mode 1: Yes, 0: No bit6~bit0: every bit mutually exclusive.
		40003	Setting fan speed	2 Octet	bit15~bit8: reserve, stay 0 bit7: Auto fan 1: Yes, 0: No bit6~bit3: reserve, stay 0 bit2: Low fan speed 1: Yes, 0: No bit1: Medium fan speed 1: Yes, 0: No bit0: High fan speed 1: Yes, 0: No bit7~bit0: every bit mutually exclusive.
		40004	Setting temperature	2 Octet	16~32 means the temperature range is 16 to 32°C
		40005	Time on	2 Octet	0~96 means no timer ~ 24 hours timer
		40006	Time off	2 Octet	0~96 means no timer ~ 24 hours timer

*Indoor unit variable mapping table*

Modbus description	Indoor address number	Modbus register address	Data name	Length	Explanation
Holding register (W)	0	40007	Auxiliary function state	2 Octet	bit15~bit4:Reserve, stay 0 bit3: Change of air 1:On, 0:Off bit2: Swing 1: On, 0: Off bit1: Electric auxiliary heating 1: On, 0: Off bit0: Economic operation 1: On, 0: Off
		40008-40032	Reserve	50 Octet	Reserve , cannot write.
	1	40033	Reserve	2 Octet	The same as the 0# indoor unit.
		40034	Setting mode	2 Octet	
		40035	Setting fan speed	2 Octet	
		40036	Setting temperature	2 Octet	
		40037	Time on	2 Octet	
		40038	Time off	2 Octet	
		40039	Auxiliary function state	2 Octet	
	40040~40064	Reserve	50 Octet	Reserve , cannot write.	
	n	$40000+n*32+1$	Reserve	2 Octet	The same as the 1# indoor unit.
		$40000+n*32+2$	Setting mode	2 Octet	
		$40000+n*32+3$	Setting fan speed	2 Octet	
		$40000+n*32+4$	Setting temperature	2 Octet	
		$40000+n*32+5$	Time on	2 Octet	
		$40000+n*32+6$	Time off	2 Octet	
		$40000+n*32+7$	Auxiliary function state	2 Octet	
		$(40000+n*32+8)~(40000+n*32+32)$	Reserve	50 Octet	Reserve , cannot write.
	63	42017	Reserve	2 Octet	The same as the 1# indoor unit.
		42018	Setting mode	2 Octet	
		42019	Setting fan speed	2 Octet	
		42020	Setting temperature	2 Octet	
		42021	Time on	2 Octet	

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		42022	Time off	2 Octet	
		42023	Auxiliary function state	2 Octet	
		42024~42048	Reserve	50 Octet	Reserve, cannot write.

**Indoor unit variable mapping table**

Modbus description	Indoor address number	Modbus register address	Data name	Length	Explanation
	64	/	/	/	Can group control the 0-7# indoor units and the format is the same as the above each indoor unit.
	65	/	/	/	Can group control the 8-15# indoor units and the format is the same as the above each indoor unit.
	66	/	/	/	Can group control the 16-23# indoor units and the format is the same as the above each indoor unit.
	67	/	/	/	Can group control the 24-31# indoor units and the format is the same as the above each indoor unit.
	68	/	/	/	Can group control the 32-39# indoor units and the format is the same as the above each indoor unit.
	69	/	/	/	Can group control the 40-47# indoor units and the format is the same as the above each indoor unit.
	70	/	/	/	Can group control the 48-55# indoor units and the format is the same as the above each indoor unit.
	71	/	/	/	Can group control the 56-63# indoor units and the format is the same as the above each indoor unit.
	72	/	/	/	Can group control the 0-63# indoor units and the format is the same as the above each indoor unit.

Explain:

- For Coil

Address = (Value of Modbus address for registers) - 1

- For Input register

Address = (Value of Modbus address for registers) - 30001

- For holding register

Address = (Value of Modbus address for registers) - 40001

**Outdoor unit variable mapping table**

Modbus description	Indoor address number	Modbus register address	Data name	Explanation
Coils(R)	0	8192+1	Cool mode	1: Yes, 0: No
		8194	Heat mode	1: Yes, 0: No
		8195	Reserve	Reserve, stay 0
		8196	Reserve	Reserve, stay 0
		8197	Reserve	Reserve, stay 0
		8198	Reserve	Reserve, stay 0
		8199	Lock indicator	1: Yes, 0: No
		8200	Force locking	1: Yes, 0: No
		8201	Low speed	1: Yes, 0: No
		8202	Medium speed	1: Yes, 0: No
		8203	High speed	1: Yes, 0: No
		8204	Reserve	Reserve, stay 0
		8205	Reserve	Reserve, stay 0
		8206	Reserve	Reserve, stay 0
		8207	Reserve	Reserve, stay 0
		8208	Reserve	Reserve, stay 0
		8209	4-way valveST1	1: on, 0: off
		8210	Auxiliary 4-way valve ST2	1: on, 0: off
		8211	Solenoid valve SV1	1: on, 0: off
		8212	Solenoid valve SV2	1: on, 0: off
		8213	Solenoid valve SV3	1: on, 0: off
		8214	Solenoid valve SV4	1: on, 0: off
		8215	Solenoid valve SV5	1: on, 0: off
		8216	Solenoid valve SV6	1: on, 0: off
		8217	Compressor 1	1: on, 0: off
		8218	Compressor 2	1: on, 0: off
		8219	Compressor 3	1: on, 0: off
		8220	Reserve	Reserve, stay 0
		8221	Reserve	Reserve, stay 0
		8222	Reserve	Reserve, stay 0
		8223	Reserve	Reserve, stay 0
		8224	Reserve	Reserve, stay 0
		8225	E0 Outdoor unit communication error	1:Error, 0: Normal
		8226	E1 Phase sequence error or no phase	1:Error, 0: Normal
		8227	E2 Communication error between outdoor and indoor unit	1:Error, 0: Normal
		8228	E4 Reserve	Reserve, stay 0
8229	E3 T3/T4/digital compressor discharge temperature sensor error	1:Error, 0: Normal		
8230	E5 Reserve	Reserve, stay 0		
8231	E6 T6 sensor error	1:Error, 0: Normal		
8232	E7 Reserve	Reserve, stay 0		
8233	E8 Reserve	Reserve, stay 0		
8234	E9 Voltage error	1:Error, 0: Normal		
8235	H1 Network communication error	1:Error, 0: Normal		
8236	H0 DSP communication error	1:Error, 0: Normal		

		8237	H2 Outdoor unit quantities decreasing error (Only master unit effective)	1:Error, 0: Normal
		8238	H3 Outdoor unit quantities increasing error (Only master unit effective)	Reserve, stay 0

***Outdoor unit variable mapping table***

Modbus description	Indoor address number	Modbus register address	Data name	Explanation
Coils(R)	0	8239	EE Reserve	Reserve, stay 0
		8240	EF Other error	
		8241	P0 Compressor top temp. protection	1:protection, 0: Normal
		8242	P1 Discharge high pressure protection	1:protection, 0: Normal
		8243	P2 Discharge low pressure protection	1:protection, 0: Normal
		8244	P3 Current protection of compressor 1	1:protection, 0: Normal
		8245	P4 Discharge pipe temp. protection	1:protection, 0: Normal
		8246	P5 Condenser high temp protection	1:protection, 0: Normal
		8247	P6 Inverter module protection	1:protection, 0: Normal
		8248	P7 Current protection of compressor 2	1:protection, 0: Normal
		8249	P8 Current protection of compressor 3	1:protection, 0: Normal
		8250	P9 Over voltage and under voltage protections	1:protection, 0: Normal
		8251	PA Defrost protection	1:protection, 0: Normal
		8252	PB Reserve	Reserve, stay 0
		8253	PC Reserve	Reserve, stay 0
		8254	PD Oil return	1:protection, 0: Normal
		8255	PE Oil Balance	1:protection, 0: Normal
		8256	PF Other error	1:protection, 0: Normal
		8257~8320	Reserve	Reserve, stay 0
		1	8320+1	Cool mode
	8322		Heat mode	1: Yes, 0: No
	8323		Reserve	Reserve, stay 0
	8324		Reserve	Reserve, stay 0
	8325		Reserve	Reserve, stay 0
	8326		Reserve	Reserve, stay 0

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		8327	Lock indicator	1: Yes, 0: No
		8328	Force locking	1: Yes, 0: No
		8329	Low speed	1: Yes, 0: No
		8330	Medium speed	1: Yes, 0: No
		8331	High speed	1: Yes, 0: No
		8332	Reserve	Reserve, stay 0
		8333	Reserve	Reserve, stay 0
		8334	Reserve	Reserve, stay 0
		8335	Reserve	Reserve, stay 0
		8336	Reserve	Reserve, stay 0
		8337	4-way valveST1	1: on, 0: off
		8338	Auxiliary 4-way valve ST2	1: on, 0: off
		8339	Solenoid valve SV1	1: on, 0: off
		8340	Solenoid valve SV2	1: on, 0: off
		8341	Solenoid valve SV3	1: on, 0: off
		8342	Solenoid valve SV4	1: on, 0: off
		8343	Solenoid valve SV5	1: on, 0: off
		8344	Solenoid valve SV6	1: on, 0: off
		8345	Compressor 1	1: on, 0: off
		8346	Compressor 2	1: on, 0: off
		8347	Compressor 3	1: on, 0: off
		8348	Reserve	Reserve, stay 0
		8349	Reserve	Reserve, stay 0
		8350	Reserve	Reserve, stay 0
		8351	Reserve	Reserve, stay 0
		8352	Reserve	Reserve, stay 0

*Outdoor unit variable mapping table*

Modbus description	Indoor address number	Modbus register address	Data name	Explanation
Coils(R)	1	8353	E0 Outdoor unit communication error	1:Error, 0: Normal
		8354	E1 Phase sequence error or no phase	1:Error, 0: Normal
		8355	E2 Communication error between outdoor and indoor unit	1:Error, 0: Normal
		8356	E4 Reserve	Reserve, stay 0
		8357	E3 T3/T4/digital compressor discharge temperature sensor error	1:Error, 0: Normal
		8358	E5 Reserve	Reserve, stay 0
		8359	E6 T6 sensor error	1:Error, 0: Normal
		8360	E7 Reserve	Reserve, stay 0
		8361	E8 Reserve	Reserve, stay 0
		8362	E9 Voltage error	1:Error, 0: Normal
		8363	H1 Network communication error	1:Error, 0: Normal
		8364	H0 DSP communication error	1:Error, 0: Normal
		8365	H2 Outdoor unit quantities decreasing error (Only master unit effective)	1:Error, 0: Normal

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		8366	H3 Outdoor unit quantities increasing error (Only master unit effective)	Reserve, stay 0
		8367	EE Reserve	Reserve, stay 0
		8368	EF Other error	
		8369	P0 Compressor top temp. protection	1:protection, 0: Normal
		8370	P1 Discharge high pressure protection	1:protection, 0: Normal
		8371	P2 Discharge low pressure protection	1:protection, 0: Normal
		8372	P3 Current protection of compressor 1	1:protection, 0: Normal
		8373	P4 Discharge pipe temp. protection	1:protection, 0: Normal
		8374	P5 Condenser high temp protection	1:protection, 0: Normal
		8375	P6 Inverter module protection	1:protection, 0: Normal
		8376	P7 Current protection of compressor 2	1:protection, 0: Normal
		8377	P8 Current protection of compressor 3	1:protection, 0: Normal
		8378	P9 Over voltage and under voltage protections	1:protection, 0: Normal
		8379	PA Defrost protection	1:protection, 0: Normal
		8380	PB Reserve	Reserve, stay 0
		8381	PC Reserve	Reserve, stay 0
		8382	PD Oil return	1:protection, 0: Normal
		8383	PE Oil Balance	1:protection, 0: Normal
		8384	PF Other error	1:protection, 0: Normal
		8385-8448	Reserve	Reserve, stay 0

**Outdoor unit variable mapping table**

Modbus description	Indoor address number	Modbus register address	Data name	Explanation
Coils(R)	n	8192+n*128+1	Cool mode	1: Yes, 0: No
		8192+n*128+2	Heat mode	1: Yes, 0: No
		8192+n*128+3	Reserve	Reserve, stay 0
		8192+n*128+4	Reserve	Reserve, stay 0
		8192+n*128+5	Reserve	Reserve, stay 0
		8192+n*128+6	Reserve	Reserve, stay 0
		8192+n*128+7	Lock indicator	1: Yes, 0: No
		8192+n*128+8	Force locking	1: Yes, 0: No
		8192+n*128+9	Low speed	1: Yes, 0: No
		8192+n*128+10	Medium speed	1: Yes, 0: No
		8192+n*128+11	High speed	1: Yes, 0: No
		8192+n*128+12	Reserve	Reserve, stay 0
		8192+n*128+13	Reserve	Reserve, stay 0
		8192+n*128+14	Reserve	Reserve, stay 0
		8192+n*128+15	Reserve	Reserve, stay 0
		8192+n*128+16	Reserve	Reserve, stay 0
		8192+n*128+17	4-way valve ST1	1: on, 0: off
		8192+n*128+18	Auxiliary 4-way valve ST2	1: on, 0: off
		8192+n*128+19	Solenoid valve SV1	1: on, 0: off
		8192+n*128+20	Solenoid valve SV2	1: on, 0: off
		8192+n*128+21	Solenoid valve SV3	1: on, 0: off
		8192+n*128+22	Solenoid valve SV4	1: on, 0: off
		8192+n*128+23	Solenoid valve SV5	1: on, 0: off
		8192+n*128+24	Solenoid valve SV6	1: on, 0: off
		8192+n*128+25	Compressor 1	1: on, 0: off
		8192+n*128+26	Compressor 2	1: on, 0: off
		8192+n*128+27	Compressor 3	1: on, 0: off
		8192+n*128+28	Reserve	Reserve, stay 0
		8192+n*128+29	Reserve	Reserve, stay 0
		8192+n*128+30	Reserve	Reserve, stay 0
		8192+n*128+31	Reserve	Reserve, stay 0
		8192+n*128+32	Reserve	Reserve, stay 0
		8192+n*128+33	E0 Outdoor unit communication error	1:Error, 0: Normal
		8192+n*128+34	E1 Phase sequence error or no phase	1:Error, 0: Normal
		8192+n*128+35	E2 Communication error between outdoor and indoor unit	1:Error, 0: Normal
		8192+n*128+36	E4 Reserve	Reserve, stay 0
		8192+n*128+37	E3 T3/T4/digital compressor discharge temperature sensor error	1:Error, 0: Normal
		8192+n*128+38	E5 Reserve	Reserve, stay 0
		8192+n*128+39	E6 T6 sensor error	1:Error, 0: Normal
		8192+n*128+40	E7 Reserve	Reserve, stay 0
		8192+n*128+41	E8 Reserve	Reserve, stay 0
		8192+n*128+42	E9 Voltage error	1:Error, 0: Normal
		8192+n*128+43	H1 Network communication error	1:Error, 0: Normal

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		8192+n*128+44	H0 DSP communication error	1:Error, 0: Normal
		8192+n*128+45	H2 Outdoor unit quantities decreasing error (Only master unit effective)	1:Error, 0: Normal
		8192+n*128+46	H3 Outdoor unit quantities increasing error (Only master unit effective)	Reserve, stay 0
		8192+n*128+47	EE Reserve	Reserve, stay 0
		8192+n*128+48	EF Other error	

**Outdoor unit variable mapping table**

Modbus description	Indoor address number	Modbus register address	Data name	Explanation
Coils(R)	n	8192+n*128+49	P0 Compressor top temp. protection	1:protection, 0:Normal
		8192+n*128+50	P1 Discharge high pressure protection	1:protection, 0: Normal
		8192+n*128+51	P2 Discharge low pressure protection	1:protection, 0: Normal
		8192+n*128+52	P3 Current protection of compressor 1	1:protection, 0: Normal
		8192+n*128+53	P4 Discharge pipe temp. protection	1:protection, 0: Normal
		8192+n*128+54	P5 Condenser high temp protection	1:protection, 0: Normal
		8192+n*128+55	P6 Inverter module protection	1:protection, 0: Normal
		8192+n*128+56	P7 Current protection of compressor 2	1:protection, 0: Normal
		8192+n*128+57	P8 Current protection of compressor 3	1:protection, 0: Normal
		8192+n*128+58	P9 Over voltage and under voltage protections	1:protection, 0: Normal
		8192+n*128+59	PA Defrost protection	1:protection, 0: Normal
		8192+n*128+60	PB Reserve	Reserve, stay 0
		8192+n*128+61	PC Reserve	Reserve, stay 0
		8192+n*128+62	PD Oil return	1:protection, 0: Normal
		8192+n*128+63	PE Oil Balance	1:protection, 0: Normal
		8192+n*128+64	PF Other error	1:protection, 0: Normal
		(8192+n*128+65)~(8192+n*128+128)	Reserve	Reserve, stay 0
		3	8577	Cool mode
	8578		Heat mode	1: Yes, 0: No
	8579		Reserve	Reserve, stay 0
	8580		Reserve	Reserve, stay 0
	8581		Reserve	Reserve, stay 0
	8582		Reserve	Reserve, stay 0
	8583		Lock indicator	1: Yes, 0: No
	8584		Force locking	1: Yes, 0: No
	8585		Low speed	1: Yes, 0: No
	8586		Medium speed	1: Yes, 0: No
	8587		High speed	1: Yes, 0: No
8588	Reserve		Reserve, stay 0	
8589	Reserve	Reserve, stay 0		
8590	Reserve	Reserve, stay 0		
8591	Reserve	Reserve, stay 0		

VRF Controllers

		8592	Reserve	Reserve, stay 0
		8593	4-way valveST1	1: on, 0: off
		8594	Auxiliary 4-way valve ST2	1: on, 0: off
		8595	Solenoid valve SV1	1: on, 0: off
		8596	Solenoid valve SV2	1: on, 0: off
		8597	Solenoid valve SV3	1: on, 0: off
		8598	Solenoid valve SV4	1: on, 0: off
		8599	Solenoid valve SV5	1: on, 0: off
		8600	Solenoid valve SV6	1: on, 0: off
		8601	Compressor 1	1: on, 0: off
		8602	Compressor 2	1: on, 0: off
		8603	Compressor 3	1: on, 0: off
		8604	Reserve	Reserve, stay 0
		8605	Reserve	Reserve, stay 0
		8606	Reserve	Reserve, stay 0
		8607	Reserve	Reserve, stay 0
		8608	Reserve	Reserve, stay 0

*Outdoor unit variable mapping table*

Modbus description	Indoor address number	Modbus register address	Data name	Explanation
Coils(R)	3	8609	E0 Outdoor unit communication error	1:Error, 0: Normal
		8610	E1 Phase sequence error or no phase	1:Error, 0: Normal
		8611	E2 Communication error between outdoor and indoor unit	1:Error, 0: Normal
		8612	E4 Reserve	Reserve, stay 0
		8613	E3 T3/T4/digital compressor discharge temperature sensor error	1:Error, 0: Normal
		8614	E5 Reserve	Reserve, stay 0
		8615	E6 T6 sensor error	1:Error, 0: Normal
		8616	E7 Reserve	Reserve, stay 0
		8617	E8 Reserve	Reserve, stay 0
		8618	E9 Voltage error	1:Error, 0: Normal
		8619	H1 Network communication error	1:Error, 0: Normal
		8620	H0 DSP communication error	1:Error, 0: Normal
		8621	H2 Outdoor unit quantities decreasing error (Only master unit effective)	1:Error, 0: Normal
		8622	H3 Outdoor unit quantities increasing error (Only master unit effective)	Reserve, stay 0
		8623	EE Reserve	Reserve, stay 0
		8624	EF Other error	
		8625	P0 Compressor top temp. protection	1:protection, 0:Normal
		8626	P1 Discharge high pressure protection	1:protection, 0: Normal
		8627	P2 Discharge low pressure protection	1:protection, 0: Normal
		8628	P3 Current protection of compressor 1	1:protection, 0: Normal
8629	P4 Discharge pipe temp. protection	1:protection, 0: Normal		

VRF Controllers

		8630	P5 Condenser high temp. protection	1:protection, 0: Normal
		8631	P6 Inverter module protection	1:protection, 0: Normal
		8632	P7 Current protection of compressor 2	1:protection, 0: Normal
		8633	P8 Current protection of compressor 3	1:protection, 0: Normal
		8634	P9 Over voltage and under voltage protections	1:protection, 0: Normal
		8635	PA Defrost protection	1:protection, 0: Normal
		8636	PB Reserve	Reserve, stay 0
		8637	PC Reserve	Reserve, stay 0
		8638	PD Oil return	1:protection, 0: Normal
		8639	PE Oil Balance	1:protection, 0: Normal
		8640	PF Other error	1:protection, 0: Normal
		8641~8704	Reserve	Reserve, stay 0

**Outdoor unit variable mapping table**

Modbus description	Indoor address number	Modbus register address	Data name	Explanation
Input register (R)	0	32048+1	Reserve	Reserve, stay 0
		32050	The first byte of models message	
		32051	The second byte of model message	
		32052	Ambient temperature T4	0~240 means the temperature range is from -20 to 100°C (temp*2+20)
		32053	Condenser outlet temperature T3	0~240 means the temperature range is from -20 to 100°C (temp*2+20)
		32054	Condenser inlet temperature T6	0~240 means the temperature range is from -20 to 100°C (temp*2+20)
		32056	The discharge temperature of compressor 2	0~240 means the temperature range is from -20 to 100°C (temp*2+20)
		32057	The discharge temperature of compressor 3	0~240 means the temperature range is from -20 to 100°C (temp*2+20)
		32058	Quantity of indoor units	0~250 means 0~250 indoor units
		32059	Current of compressor 1	0~200 means the current range from 0A to 200A
		32060	Current of compressor 2	0~200 means the current range from 0A to 200A
		32061	Current of compressor 3	0~200 means the current

				range from 0A to 200A
		32062	Inverter compressor frequency	0~250 means 0~250Hz
		32063	Opening degree of EXV 1	00h~07Dh means 0~1000 step open degree and resolution is 8 step; OFFh means no the data.
		32064	Opening degree of EXV 2	
		32065	Capacity of outdoor unit	Each 1 means 1HP, and 0~250 means 0~250
		32066~32080	Reserve	Reserve, stay 0
	1	32081	Reserve	Reserve, stay 0
		32082	The first byte of models message	
		32083	The second byte of model message	
		32084	Ambient temperature T4	0~240 means the temperature range is from -20 to 100°C (temp*2+20)
		32085	Condenser outlet temperature T3	0~240 means the temperature range is from -20 to 100°C (temp*2+20)
		32086	Condenser inlet temperature T6	0~240 means the temperature range is from -20 to 100°C (temp*2+20)
		32087	The discharge temperature of compressor 2	0~240 means the temperature range is from -20 to 100°C (temp*2+20)

**Outdoor unit variable mapping table**

Modbus description	Indoor address number	Modbus register address	Data name	Explanation
Input register (R)	1	32089	Current of compressor 3	0~200 means the current range from 0A to 200A
		32090	Inverter compressor frequency	0~250 means 0~250Hz
		32091	Opening degree of EXV 1	00h~07Dh means 0~1000 step open degree and resolution is 8 step; OFFh means no the data.
		32092	Opening degree of EXV 2	
		32093	Capacity of outdoor unit	Each 1 means 1HP, and 0~250 means 0~250
		32094	Reserve	Reserve, stay 0
	2	32113	Reserve	Reserve, stay 0
		32114	The first byte of models message	
		32115	The second byte of model message	

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		32116	Ambient temperature T4	0~240 means the temperature range is from - 20 to 100°C (temp*2+20)
		32117	Condenser outlet temperature T3	0~240 means the temperature range is from - 20 to 100°C (temp*2+20)
		32118	Condenser inlet temperature T6	0~240 means the temperature range is from - 20 to 100°C (temp*2+20)
		32119	The discharge temperature of compressor 2	0~240 means the temperature range is from - 20 to 100°C (temp*2+20)
		32120	The discharge temperature of compressor 3	0~240 means the temperature range is from - 20 to 100°C (temp*2+20)
		32121	Quantity of indoor units	0~250 means 0~250 indoor units
		32122	Current of compressor 1	0~200 means the current range from 0A to 200A
		32123	Current of compressor 2	0~200 means the current range from 0A to 200A
		32124	Current of compressor 3	0~200 means the current range from 0A to 200A
		32125	Inverter compressor frequency	0~250 means 0~250Hz
		32126	Opening degree of EXV 1	00h~07Dh means 0~1000 step open degree and resolution is 8 step; 0FFh means no the data.
		32127	Opening degree of EXV 2	
		32128	Capacity of outdoor unit	Each 1 means 1HP, and 0~250 means 0~250
		32129	Reserve	Reserve, stay 0

**Outdoor unit variable mapping table**

Modbus description	Indoor address number	Modbus register address	Data name	Explanation
Input register (R)	3	32145	Reserve	Reserve, stay 0
		32146	The first byte of models message	
		32147	The second byte of model message	
		32148	Ambient temperature T4	0~240 means the temperature range is from - 20 to 100°C (temp*2+20)
		32149	Condenser outlet temperature T3	0~240 means the temperature range is from - 20 to 100°C (temp*2+20)
		32150	Condenser inlet temperature T6	0~240 means the temperature range is from - 20 to 100°C (temp*2+20)

## VRF Controllers

		32151	The discharge temperature of compressor 2	0~240 means the temperature range is from - 20 to 100°C (temp*2+20)
		32152	The discharge temperature of compressor 3	0~240 means the temperature range is from - 20 to 100°C (temp*2+20)
		32153	Quantity of indoor units	0~250 means 0~250 indoor units
		32154	Current of compressor 1	0~200 means the current range from 0A to 200A
		32155	Current of compressor 2	0~200 means the current range from 0A to 200A
		32156	Current of compressor 3	0~200 means the current range from 0A to 200A
		32157	Inverter compressor frequency	0~250 means 0~250Hz
		32158	Opening degree of EXV 1	00h~07Dh means 0~1000 step open degree and resolution is 8 step; 0FFh means no the data.
		32159	Opening degree of EXV 2	
		32160	Capacity of outdoor unit	Each 1 means 1HP, and 0~250 means 0~250
		32161	Reserve	Reserve, stay 0

Explain:

Address = (Value of Modbus address for registers) - 1

- For Input register

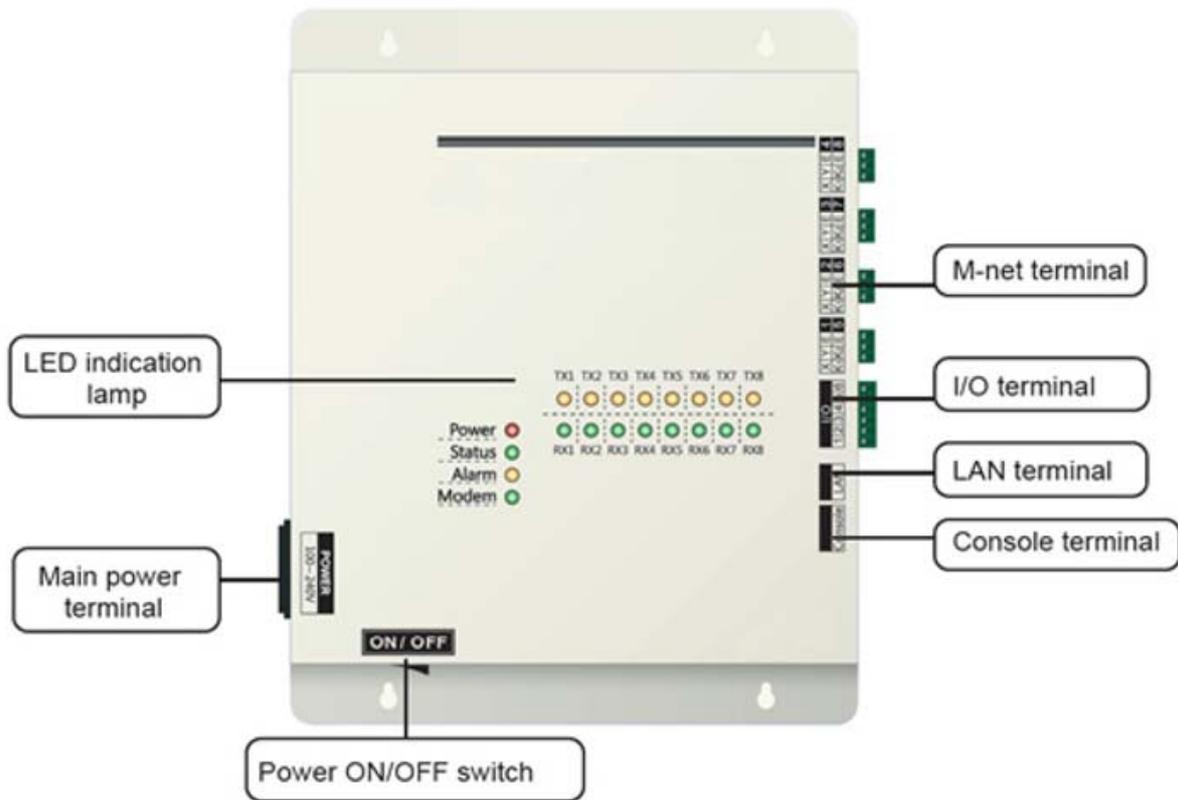
Address = (Value of Modbus address for registers) - 30001

- For Holding register

Address = (Value of Modbus address for registers) - 40001

## Bosch VRF Intelligent Manager (BVIM)

**BVIM** gateway is used for querying and controls the air conditioning indoor unit, and transmits the state information of the indoor unit to the computer and transmits the controlling and querying orders sent by the computer to the indoor unit.

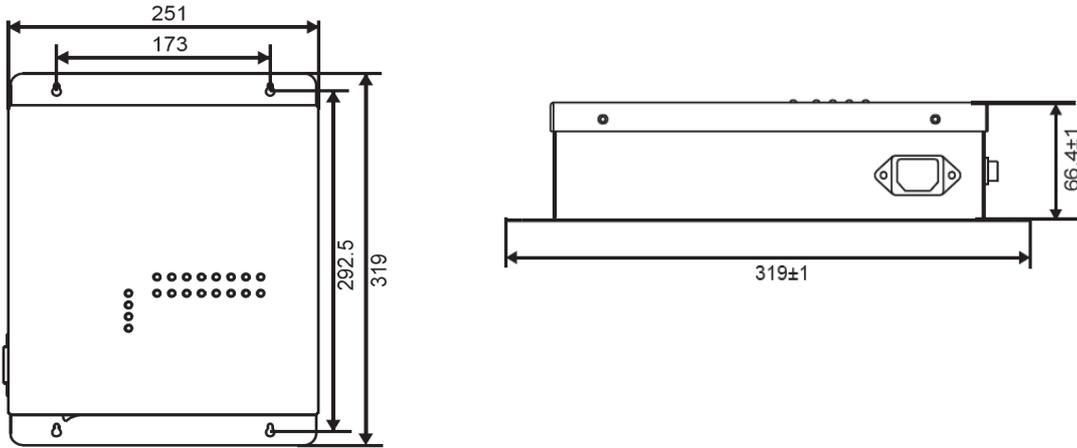


BVIM Gateway has 8 M-net terminals, 1 LAN terminal, 8 M-net terminal indication lamps, 4 state display lamps (Power, Status, Alarm, and Modem) and a power switch. Connection to the central air conditioner system through the M-net terminal, and connects the local area network or Internet network through a LAN terminal. Computer or other similar devices can visit BVIM WEB through Brower, and the local or remote control devices.

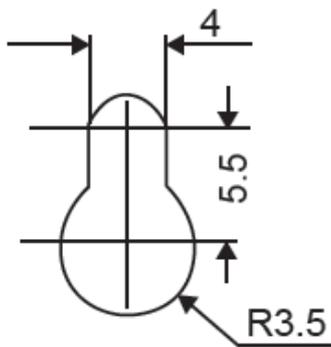
**Notes:** BVIM gateway needs to be installed at the end of the XYE or K1K2E communication wire, cannot be installed in the middle of the XYE or K1K2E communication wire. Connection needs to use 0.7mm<sup>2</sup> ~ 1.0mm<sup>2</sup> three cores shielded wire.

## Gateway structure

Dimensions: 319\*251\*66.4mm



Detailed drawing of installation holes (Unit: mm)



Installation precautions:

- Install at a place where should not affect by electromagnetic wave or dust;
- Avoid to install at a place where affect by sunshine or heat source device etc;
- Avoid to install at a place where has high humidity or can contact the water;
- Avoid to install at a place where will produce corrosive or flammable gas.

## Bosch VRF Intelligent Manager - network control system

Intelligent Manager designed specifically to control VRF systems, is based on a centralized format and dedicated to the complete control and monitoring of all the system's functions. It can be used as a flexible multi-purpose system and applied to a variety of needs, according to the scale, purpose and control method of each building.

- Connect computer and Ethernet by cables
- 16 Ethernet central controllers can be connected at most for one computer
- One gateway can connect Max.4 refrigerating system
- Long-distance monitoring
- Multi-operating system
- User friendly Operation interfaces
- Simple electric charge output report, personalization selection mode of electrical quantity (Force apportion or on apportion)
- Find the indoor unit quickly refer to building layout

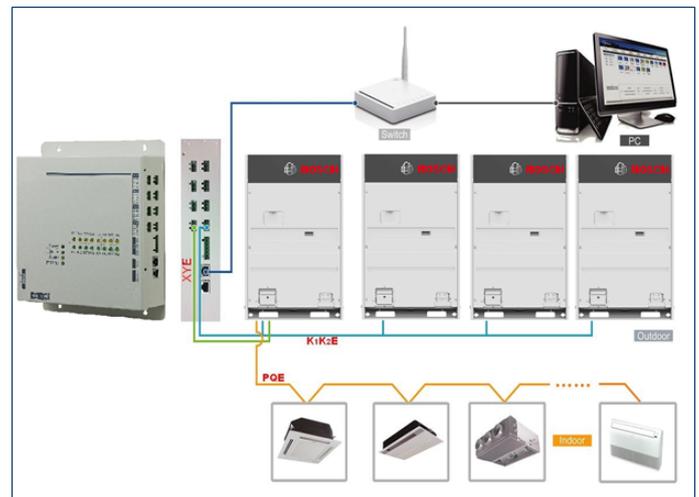


### System Configuration

- AT compatible machine that runs Microsoft® windows®
- OS: XP Professional (English version)
- Windows 7 Home /Premium/Professional (Corresponds to 8 different languages.\*)
- 32-bit version is supported.
- CPU: Inter® Pentium® 2.5GHz or above
- HDD:80 GB or more of free space
- Memory: 2 GB or more
- Display: 1024 x 768 dots or more
- Max.4 refrigerant systems for 1 interface.

And maximum of 4 M-interfaces, 64 refrigerant

systems, 1,024 indoor units, and 256 outdoor units can be controlled by one PC.



For the details please refer to installation manual.

## WEB home page of BVIM gateway

BVIM is based on WEB technology, unrelated to computer or similar devices operational systems. BVIM insert into the network then can browse the WEB page through the browser of the system platform, we suggest using IE (9.0 or above), Firefox (11.0 or above), Chrome (18.0 or above) or Safari ((5.1 or above).

The screenshot displays the BVIM gateway web interface. At the top, a status bar shows: Error(5), Offline(0), Schedule(8), Cool(69), Heat(0), Fan(0), Off(71), Locked(10), and Selected(0). Below this is a grid of 120 VRF controller status cards, arranged in 8 rows and 15 columns. Each card shows a temperature reading and a status icon. The temperatures range from 21°C to 33°C. The status icons include a house with a fan, a house with a fire, and a house with a lock. Below the grid is a control panel with two tabs: 'Device control' and 'Device detailed information'. The 'Device control' tab is active and contains several input fields with dropdown menus: 'On/Off', 'Mode', 'Fan', 'Temp.', and 'Swing'.

ID	Temp														
40411	25°C	40412	25°C	40413	25°C	40414	25°C	40415	25°C	40416	25°C	40417	25°C	40418	25°C
40419	25°C	40420	25°C	40421	25°C	40422	25°C	40423	25°C	40424	25°C	40425	25°C	40426	25°C
40427	25°C	40428	25°C	40429	24°C	40430	25°C	40431	25°C	40432	25°C	40433	25°C	40434	25°C
40435	25°C	40436	25°C	40437	25°C	40438	25°C	40439	25°C	40440	25°C	40441	25°C	40442	25°C
40443	25°C	40444	25°C	40445	25°C	40446	25°C	40447	25°C	40448	25°C	40449	25°C	40450	25°C
40451	25°C	40452	25°C	40453	25°C	40454	25°C	40455	25°C	40456	25°C	40457	25°C	40458	25°C
40459	25°C	40460	25°C	40461	25°C	40462	25°C	41100	28°C	41101	28°C	41102	27°C	41103	28°C
41104	28°C	41105	28°C	41106	26°C	41200	31°C	41202	25°C	41203	21°C	41204	25°C	41205	25°C
41206	26°C	41207	32°C	41208	26°C	41209	32°C	41210	33°C	41211	28°C	41220	25°C	41139	27°C
41201	26°C														

## BVIM Network

- 1) BVIM gateway can connect to the local area network or Internet network through a LAN terminal.
- 2) Terminals are listed to be two rows, 1 to 4 is XYE terminals, and 5 to 8 is K1, K2 and E terminals. Computer or other similar devices can visit BVIM WEB through browser, and the local or remote control devices.

## Digital Power Ammeter - DPA

The digital ammeter is a device to calculate the power consumption of the outdoor unit and transmit the information when it is required.

- ✧ Steadily functioning and needs no adjusting.
- ✧ Works in wide working temperature, from -35°C to +55°C
- ✧ Able to be built inside the outdoor units



### Digital ammeter wiring

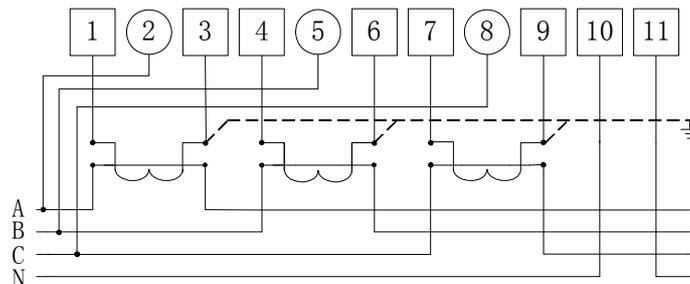
The ammeter has two kinds of ports.

One is the power port used to calculate the current flow through it.

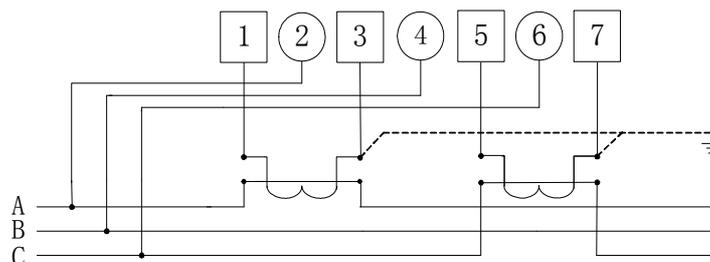
The other is the signal port O, A, E used to send the signals to the other device.

Both of these two kinds of port should be connected and fastened before use.

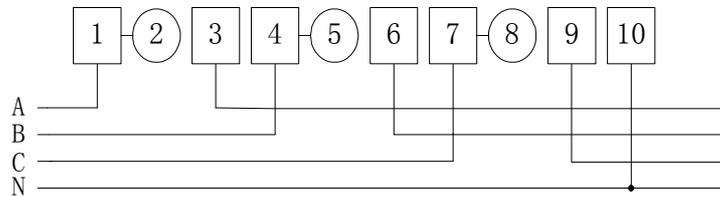
#### 1) Three-phase four-wire system with current transformer



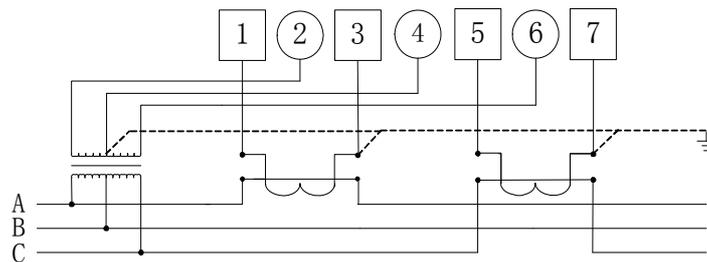
#### 2) Three-phase three-wire system with current transformer



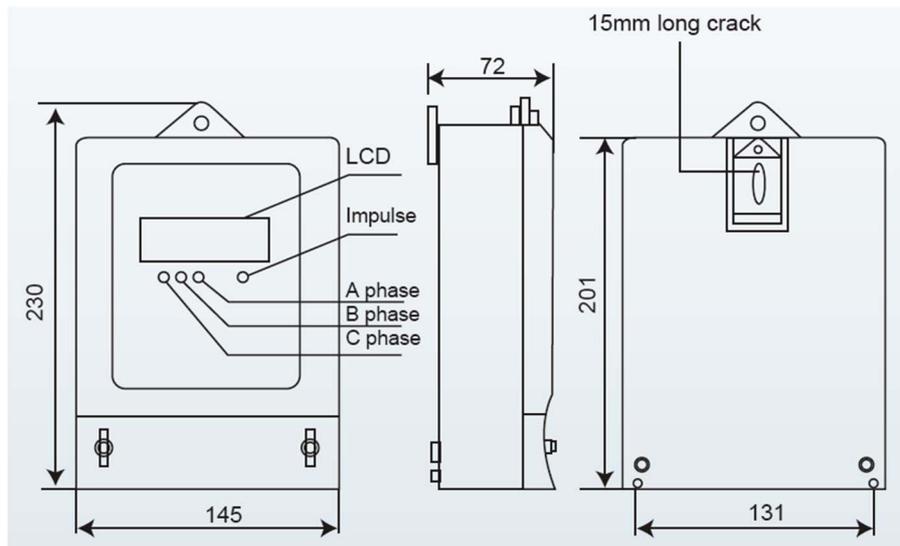
3) Three-phase four-wire system



4) Three-phase three-wire system with current transformer and voltage transformer



Installation



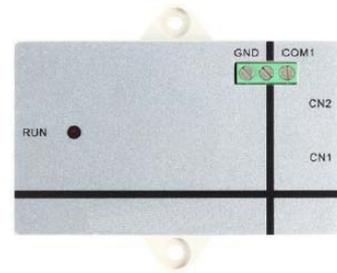
**Notes:** The ammeter device is an optional device. Without this device, the central AC system is also able to work normally.

If users want to realize the network fee calculating function, this device is necessary. And each outdoor unit should equip one ammeter. Do remember to fix the power line terminals and the signal line terminals before use.

## Hotel card key interface module: HK-IM

HK-IM is mainly designed for the hotel card-insert system. It offers a smart way to save energy and manage the air conditioners.

- A smart way to save energy and money.
- Cooperates with the hotel card-insert system.
- Extra power supply is unnecessary.
- Connected but insulate to the card-insert system
- Cooperate with the wired controller to automate control.
- Easy to install.



### Wiring

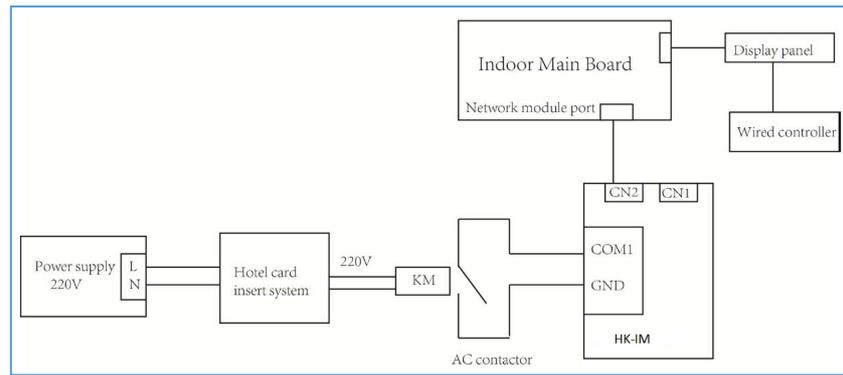
When the card is inserted, to turn on the air conditioner, the terminal COM and GND should be connected or short. So the card-insert system should send the signal to the terminal COM and GND. When connecting the COM port and GND, it will send a turn ON signal to the indoor unit; when the COM port and GND are broken, it will send a turn OFF signal to the indoor unit.

HK-IM can be connected to the network module port of the indoor unit the hotel card system can provide the DC 5V. The wiring diagram should be as follows.

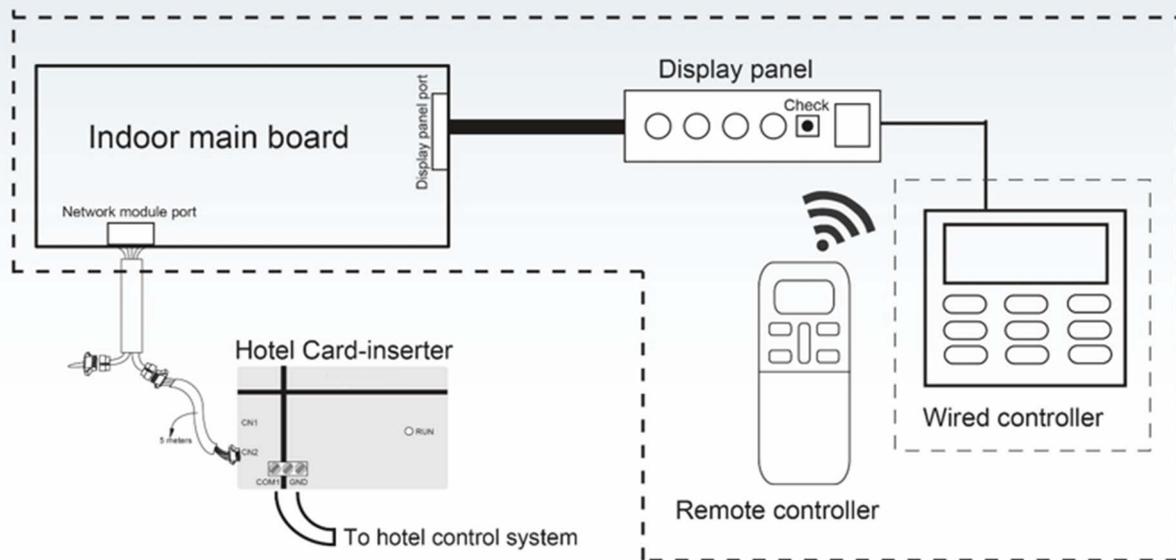
### Wiring diagram:

- HK-IM can be cooperated with the wired controller or remote controller to automate control.
- Can use remote controller and wired controller to control A/C.
- Includes a build-in auto-restart function and HK-IM control will not affect auto-restart function of the indoor unit.
- Only need to connect to the network module port of the indoor unit and wiring is simple.
- When connecting the COM port and GND, it will send a turn ON signal to the indoor unit; when the COM port and GND are broken, it will send a turn OFF signal to the indoor unit.

## VRF Controllers

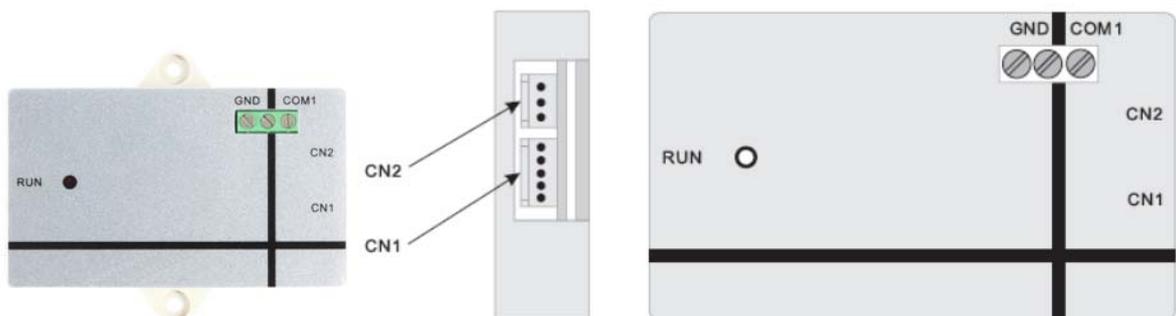


## Hotel card key interface module



### Notes:

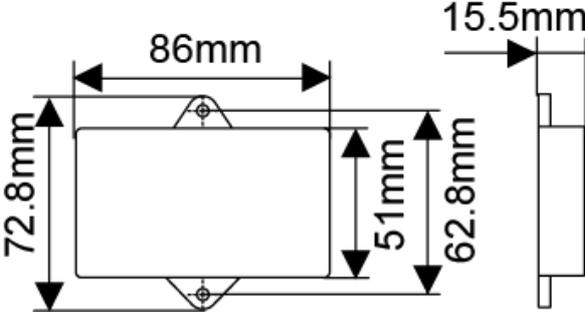
- 1) An AC contactor or a delay is necessary to transform the signal.
- 2) Wiring assy. 2 connects the CN2 of hotel card-insert assy. to network module port of indoor main control board.
- 3) CN1 port reserved.



**Notes:** COM1 and GND terminals should be short to work and not be connected to the power. The electricity voltage over 5V will probably damage the device or get the device burnt and cause fire.

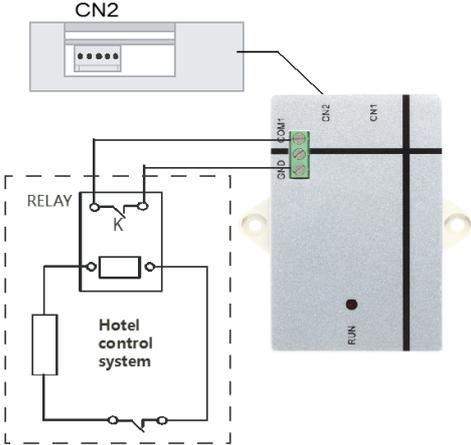
### Installation

#### Dimensions

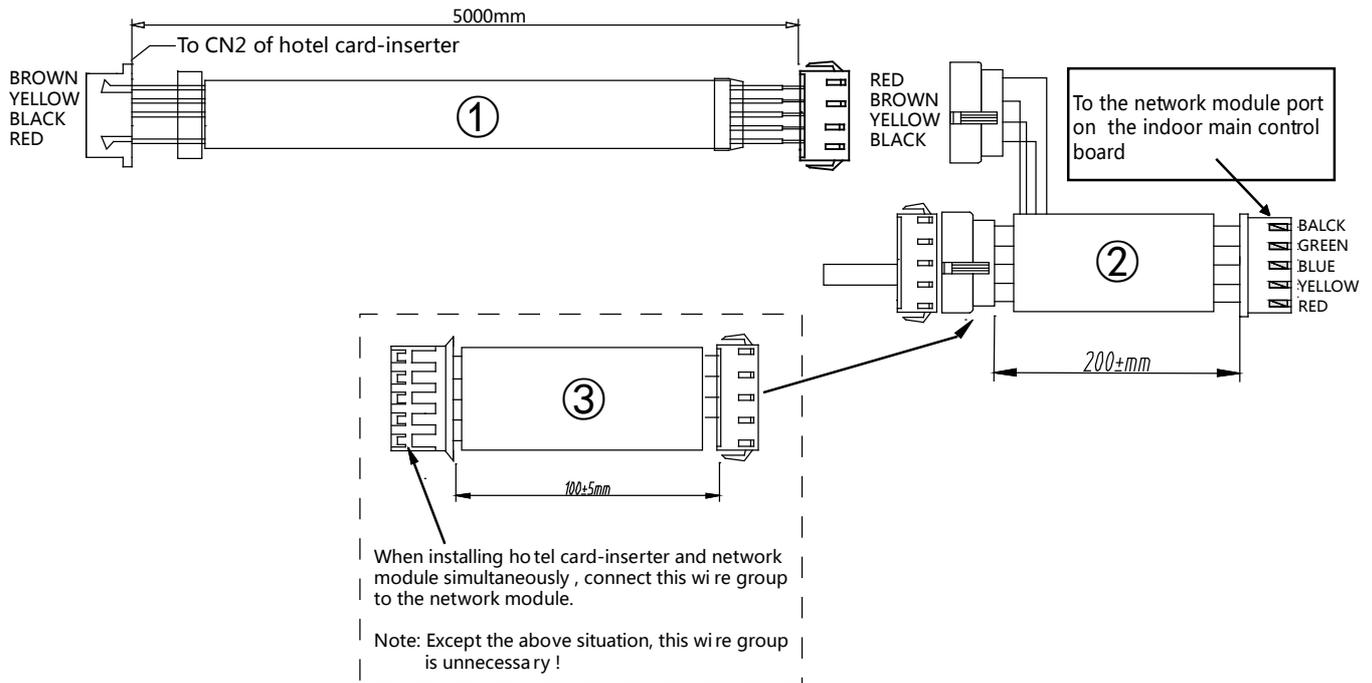


#### Wiring method and figure:

CN2 port needs to connect with network module port of the indoor unit.



## VRF Controllers



### Notes:

The COM1 and GND input port of hotel card-inserter is a switch signal, which must be connected to the hotel control system through a RELAY component for controlling the ON or OFF state between COM1 and GND.

When the COM1 and GND input port connect with the relay, it is unnecessary to consider the wire sequence, but the wiring length must be short as possible.

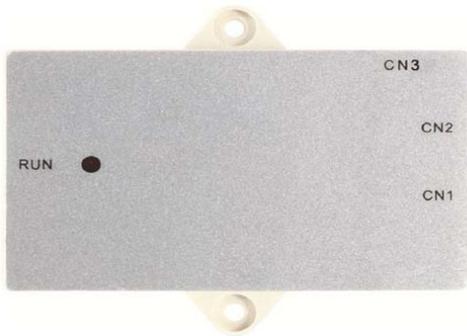
The ①②③ connecting wires are standard wires.

The ③ connecting wire is only used for the situation which you need use the hotel card-inserter and the network module at the same time

### 6.2.3 Operation description

- 1) Connect 5-place terminal at fixed rated wired controller via 5 terminals: A, B, C, D, and E.
- 2) Connect LCD at main control panel of indoor unit via terminals REV, C, D, and E.
- 3) Upon wiring according to the wiring diagram in, please power on the A/C and the indication lamp of the hotel card-inserter will be light up. When the card has been inserted between in COM1 and GND (means the relay is closed and the COM1 and GND are short connect), air conditioner is turned on and can be controlled normally.
- 4) When no card has been inserted between in COM1 and GND (i.e. it is broken), the ON/OFF button of remote controller or wired controller cannot start air conditioner, but two beeps of air conditioner closed down signals be giving out.
- 5) When power on every time, user need to use the remote controller or wired controller to turn on air conditioner and setting operation mode.  
User must use the remote controller or wired controller to turn on air conditioner and set operation modes when the first start-up main unit. After then, operation modes of this performance would be memorized, although took off card and insert it on again, as long as power does not be cut off from main unit.  
I.e. if the A/C does not power down, when the card is pulled out, it will turn off the A/C; when insert the card again, the system will perform as per the last setting.
- 6) System can receive signal delivering from remote controller or wired controller, and transits the signal to indoor unit; it can also memorizes the latest ON/OFF information sending by remote controller or wired controller (Timing, Eco and swing information can be transited but memorized.)
- 7) Upon powered to card-inserter, transited signal defaults as unit shutdown. Once take off the card, system will send signal of unit shut down twice; till to the next time card is inserted, system will not start unit until 3 seconds later, because of memory information delivery.

## Infrared sensor controller: IFS



Infrared control box



Infrared sensor module

IFS is an Infrared sensor, which is able to detect whether there is people nearby and auto change the air conditioner back to running mode. This humanistic device helps making a comfortable environment for the users and the turning down the conditioner automatically.

- Easy to install on the wall or ceiling.
- With a wide detective range up to 100 digress.
- Detective distance: horizontal is at least 4M and vertical is about 3M, great sensibility.
- Optional auto-restart function.
- Automatically adjust the room environment.
- Automatically extend the shutting down time, avoiding frequent ON/OFF.
- Graceful appearance accommodates itself to different buildings.
- Be powered from the indoor unit display panel. Extra power supply is unnecessary.

### Wiring

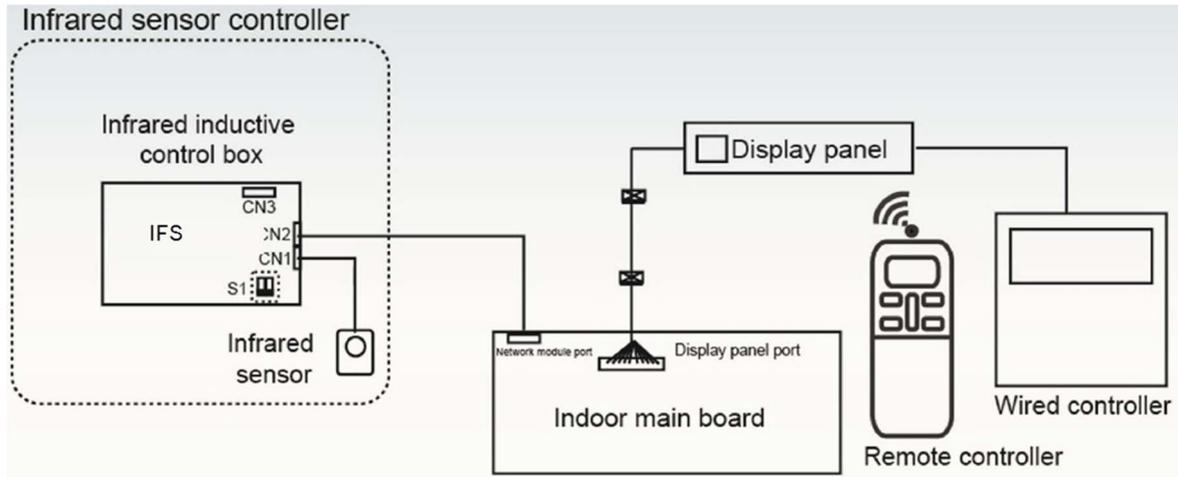
The Infrared sensor controller IFS contains a sensor and a control box.

The control box helps connecting the device to the wired controller and the indoor unit.

IFS can be connected to the network module port of the indoor unit and get the power supply DC 5V from it.

When connecting the COM port and GND, it will send a turn ON signal to the indoor unit; when the COM port and GND are broken, it will send a turn OFF signal to the indoor unit.

## VRF Controllers

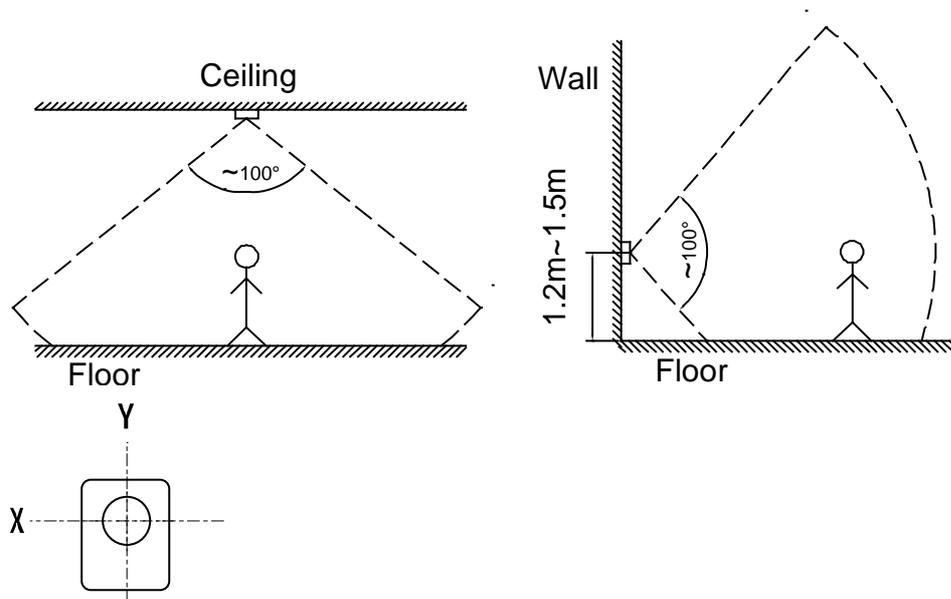


- ✧ IFS can work together with the remote controller or wired controller.
- ✧ CN1 is used for connecting the infrared sensor.
- ✧ CN2 is used for connecting the network module port of the indoor unit.
- ✧ CN3 port reserved.
- ✧ The switch S1 stands for:

ON		Turn off the indoor units in 0.5 hour after users leave (default).
ON		Turn off the indoor units in 1 hour after users leave.
ON		With optional auto-restart function.
ON		Without optional auto-restart function.

## VRF Controllers

### Infra-red sensor installation place



#### Notes:

The induction distance of X-direction is farther than the Y-direction, ensure that the X-direction of infra-red sensor parallel to the corridor direction to obtain the best induction effect.

#### How to use

The general function of IFS is turning down the indoor unit automatically. So users should run the indoor unit firstly and adjust the temperature, fan speed, etc. via the remote controller or wired controller. Once set, users do not need to turn down the indoor unit. The IFS will turn it down automatically after the users leave. Once the users come to the Infrared sensor's detective area, the IFS turns the indoor unit on and runs it at the state which is set previously.

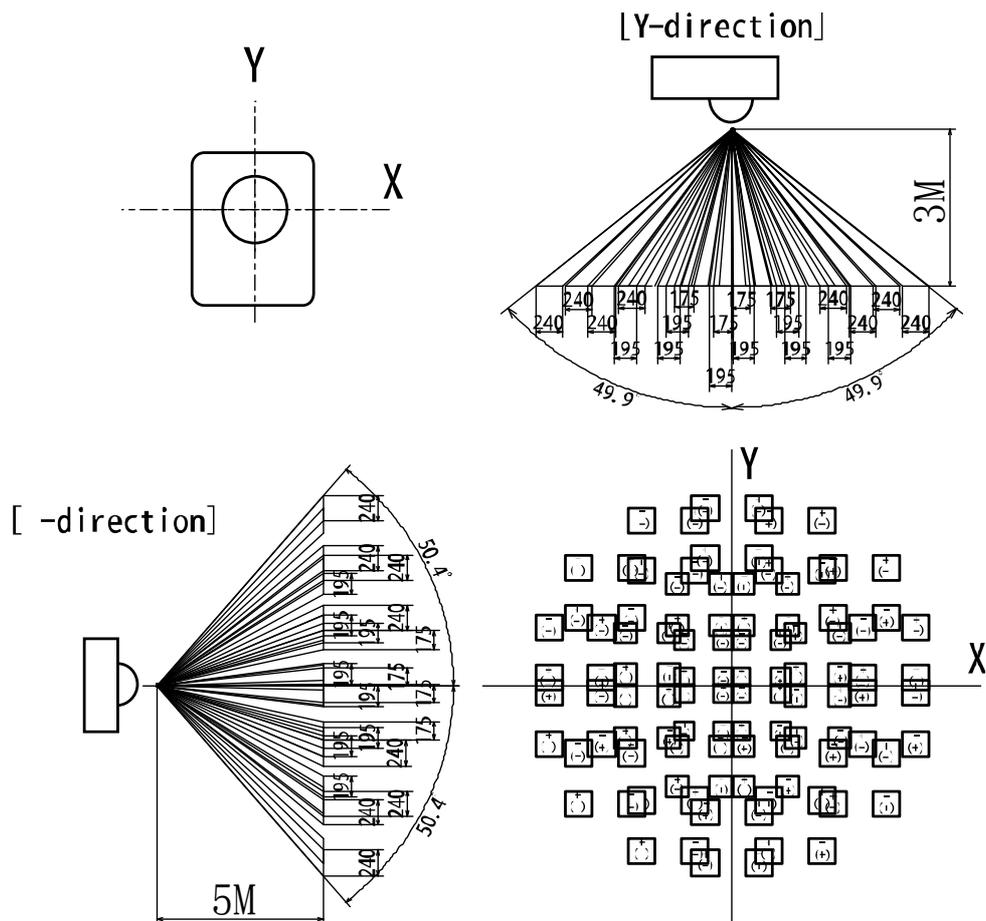
Main parameters:

Input voltage	DC +5V
Ambient temperature	-5°C~43°C
Ambient humidity	RH40%~RH90%

#### Operation Instruction

1) Infrared sensors can induct human activities in certain area and turn off the indoor unit automatically if there is nobody activity.

The induction range and angle is shown as below:

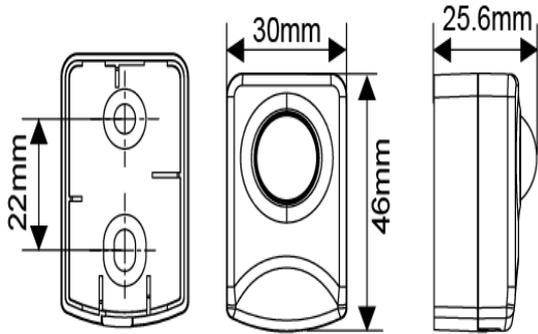


- 2) When the indoor unit is turned on and the infrared sensor does not induct human activities or did not receive commands from the wired or remote controller lasting for 30 minutes (or 60 minutes, according to the switch S1-1 setting on the Infrared inductive control box), then the inductive controller will turn off the indoor unit automatically. Until next time induct human activities, the infrared inductive controller turn on the indoor unit again.
- 3) The inductive controller will continue inducting human activities and determine whether turn off or turn on the indoor unit when the indoor unit is turned on by the wired or remote controller, despite of timer setting, or control instructions to the indoor unit from other control terminal such as central controller.
- 4) It is recommended that do not use Central Control Module or other control terminals when the indoor unit is connecting the infrared inductive controller. Otherwise the operation conflict or control failure may happen.
- 5) Do not place the infrared sensor close to the radio frequency interference source, or it may cause a mistaken triggering on the infrared sensor.

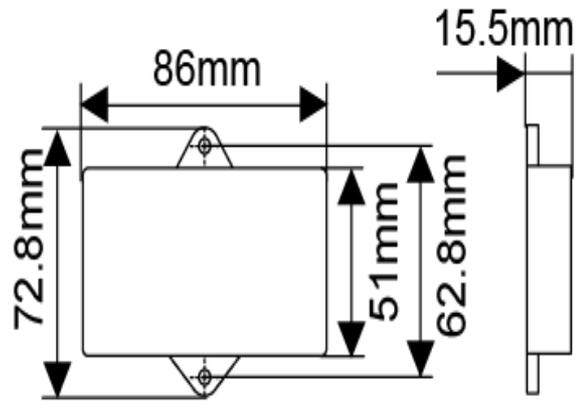
## Installation

### Dimensions

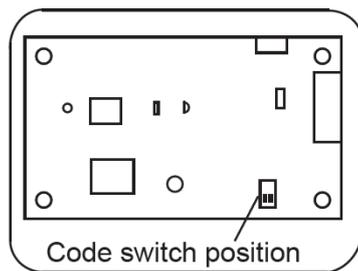
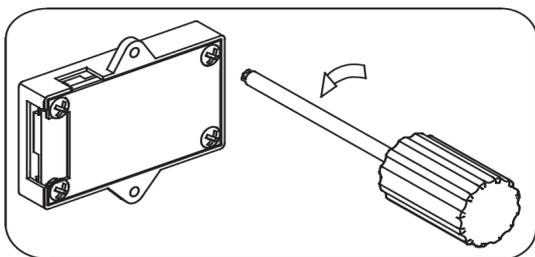
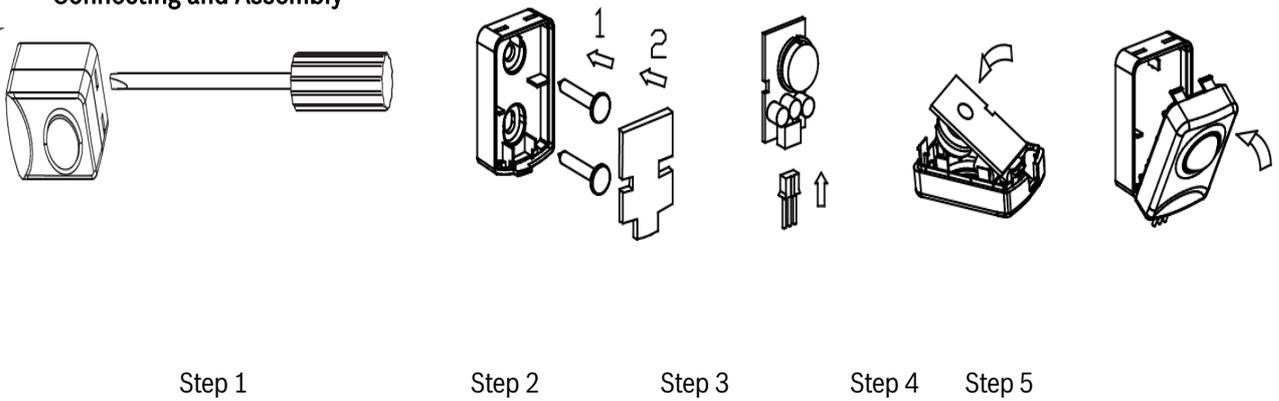
Infrared sensor

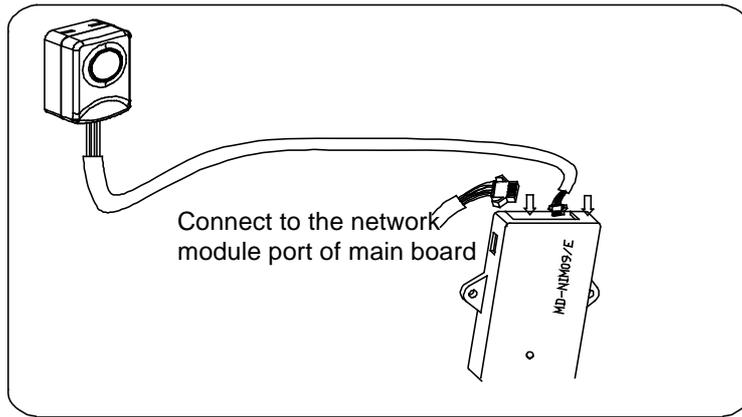


Control box

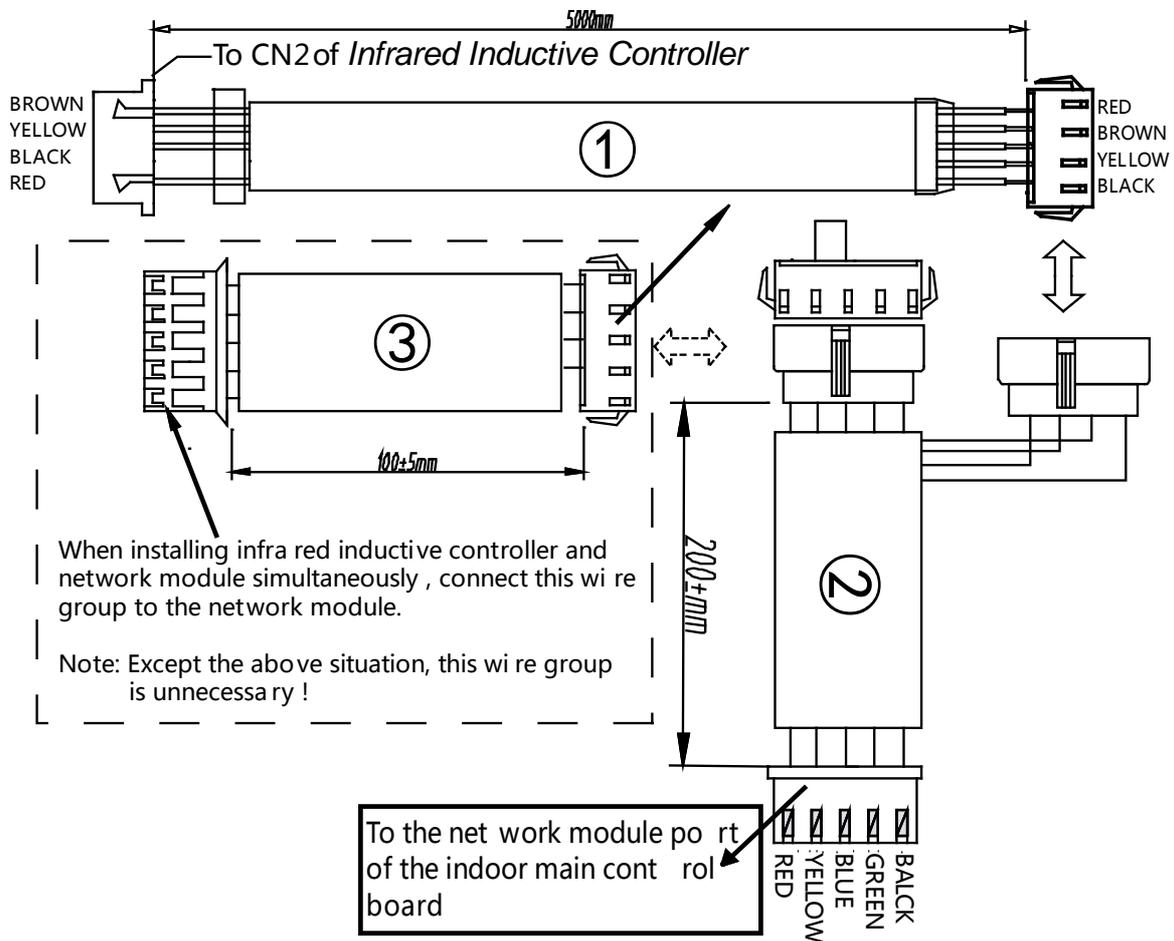


### Connecting and Assembly





※ Wires methods



**Notes:**

The Infrared inductive controller is a low voltage device, so it's forbidden to contact with above 220V or 380V high-voltage cable directly, and it can't be placed at the same wiring pipe with the above described loop and the interval space of the wiring pipes should be at least more than 300~500mm.

## Outdoor Unit Failure Alarm : ODU-FA

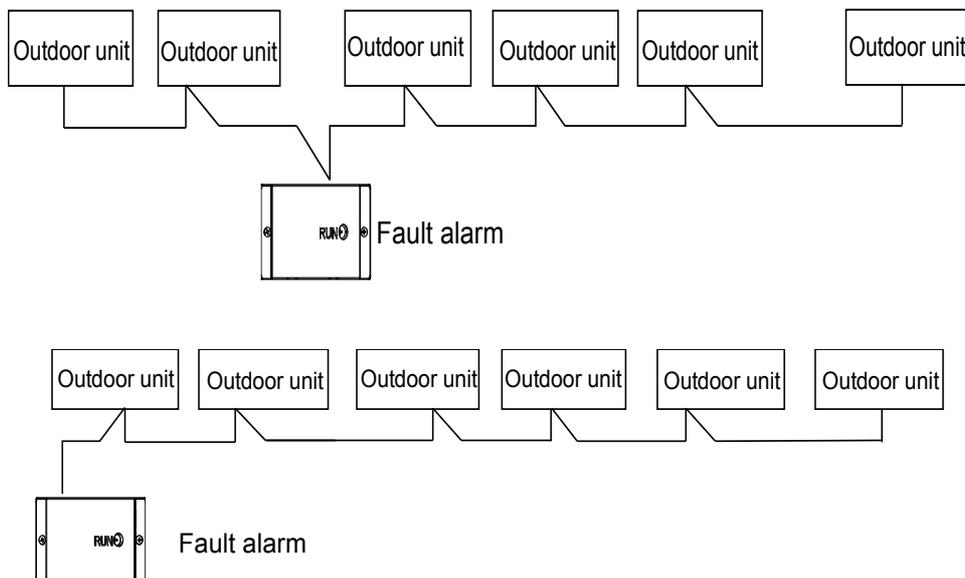
ODU-FA is specially designed for engineering applications. It does not display the outdoor unit's working parameters, but it can connect to the alarm device when outdoor unit is working abnormally, the RUN light will flash.

- Connect the outdoor unit through K1 K2 E terminals.
- Output and input the same power through the fault alarm output side.
- With LED indication function.



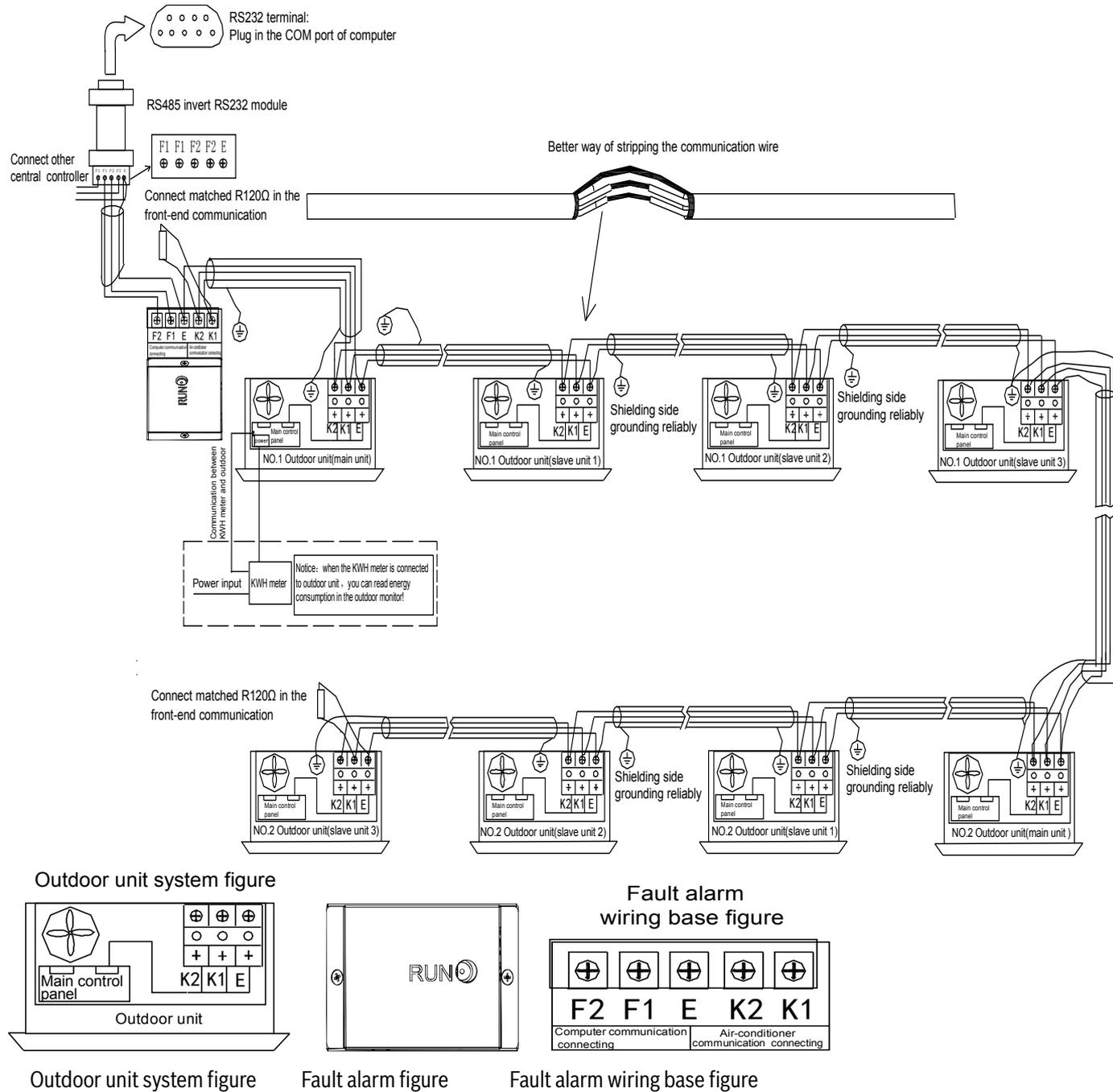
### Wiring methods

There are two wiring methods can be connected for fault alarm controller. Each fault alarm controller can be connected up to 32 outdoor units and 8 refrigerant systems.



### System wiring diagram

- 1) One computer can be connected only one fault alarm controller.
- 2) Must connect according to the follow system wiring method, if not it will not work normally.
- 3) You need to connect R120 to the front or rear of the monitoring system, and at the end of communication wire masking should be reliable ground.

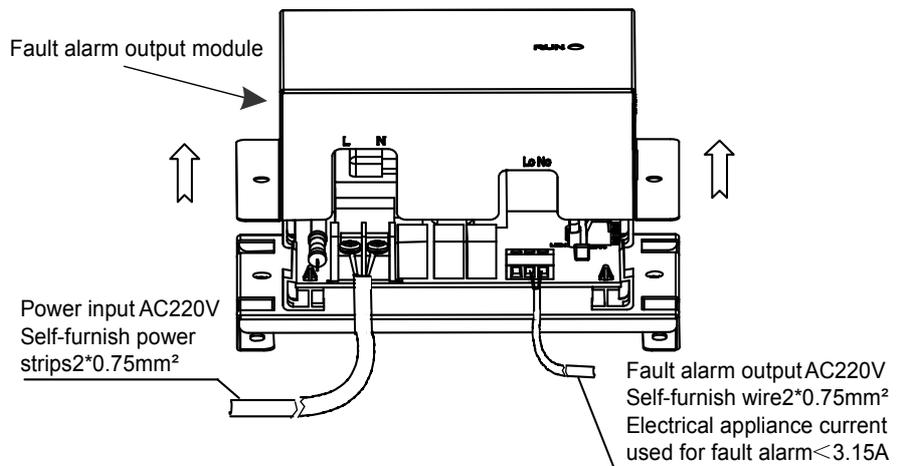


**Notes:**

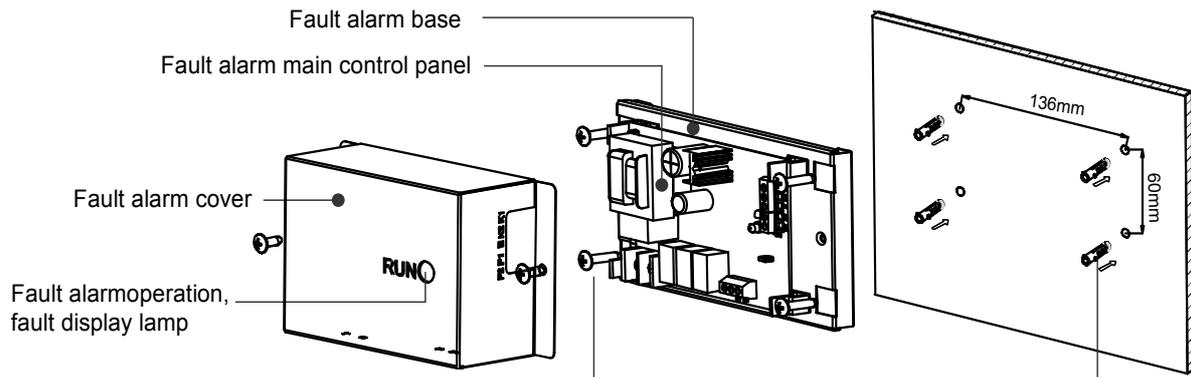
1. First install the fault alarm controller, after setting the fault protection through the outdoor main panel 2 minutes, observe the indication lamp whether be flashed or not, then judge whether the fault alarm communication with the outdoor unit.
2. When using the fault alarm controller, its output connected appliance requirements: all the AC220V appliances lower than 3.15 A current can be the fault alarm controller appliance, such as miniwatt lamp.

**Installation**

1. The RS485 shift RS232 module, connecting wire in the wiring figure can be used only when network monitoring need to connect the computer;
2. One computer cannot connect with one fault alarm and outdoor central controller at the same time, you must choose one for connection;
3. When connected to the computer with 3rd network control system, the default address of the alarm module is 16 and it cannot be changed. Outdoor unit addresses need to be set manually and the outdoor unit addresses cannot be repetitive, or the system cannot operate normally;
4. Power part and fault output part as follows display:



## VRF Controllers



Fix the base at the holes,  
and use the cross screwdriver  
to screw the cross recessed pan  
head tapping screws into the  
plastic expanded tube, and fix the base.

Use electric drill to drill four holes with  $\phi 6\text{mm}$   
and depth are 30mm, and then put the plastic  
expanded tube into the holes.

## DX-AHU (Air Handling Unit) control box

### 14,28,56kW - AHU KIT01-1, AHU KIT02-1, AHU KIT03-1

- Electrical mounting plate can be flipped, easy to install and maintain
- Can be used to connect VRF outdoor units with DX AHU or other brand indoor units, but cannot connect to the heat recovery system
- The Sheet Metal integration design
- Built-in electronic expansion valve
- One main control board
- Add the T2C indoor evaporator inlet sensor
- With failure feedback function
- Can only connect to R410A refrigerant system



The new AHU control boxes of 14 kW, 28 kW and 56 kW can be used to connect VRF outdoor units with DX AHU or other brand indoor units, but cannot connect to the heat recovery system.

The EXV is controlled by superheat degree; one gas pipe and one liquid pipe, easy to install and maintain. The diameters of these three models are different, you can choose you need models.

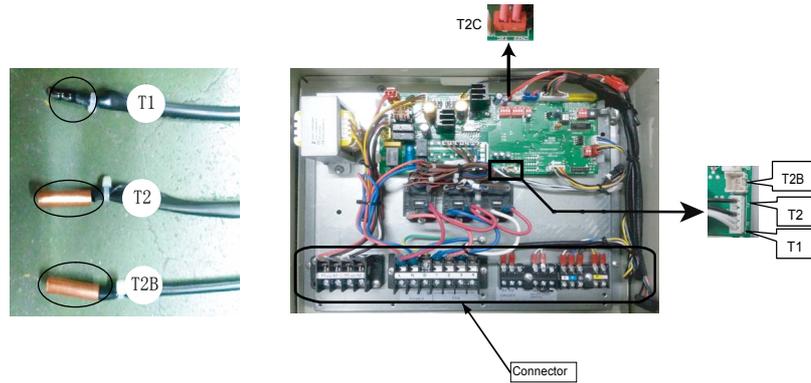
### Electric control box wiring figure

AHUKIT01-02-03 are applied one main control board, the temperature sensor T1, T2 and T2B must be connected to the main control board before first powered on.

- T1 is indoor temperature sensor, install at the air inlet of the indoor unit.
- T2 is indoor evaporator intermediate temperature sensor, install at the intermediate of temperature evaporators.
- T2B is indoor evaporator outlet sensor, install at the outlet of the evaporator.

## VRF Controllers

- T2C is indoor evaporator inlet sensor, and it has been installed before the product leaves the factory.



## Error and protection codes

When the AHU control box is working abnormally, it can display the malfunction and protection codes through the new or old display panel. At the same time, you can check the temperature parameters by the LED display panel.

### New display panel

Codes	Descriptions
FE	Without address when first time power on
H0	M-home not matched between MS module and control box
E0	Mode conflict
E1	Communication malfunction between indoor unit and outdoor unit
E2	T1 sensor malfunction
E3	T2 sensor malfunction
E4	T2B/T2C sensor malfunction
E7	EEPROM malfunction
Ed	Outdoor unit malfunction
EE	Water level switch malfunction

**Query instructions**

Sequence	Display contents	Remarks
0	Normal display	
1	Address of AHU control box	
2	Capacity of AHU control box	Actual address is 1~59, but check value displays 1~58.
3	Net address of AHU control box	0~63
4	Actual setting Temp.	
5	T1 actual Temp.	Minimum displays - 9 °C
6	T1 actual Temp.	Minimum displays - 9 °C
7	T2 actual pipe Temp.	Minimum displays - 9 °C
8	T2B actual pipe Temp.	Minimum displays - 9 °C
9	T2C actual pipe Temp.	Minimum displays - 9 °C
10	Error code	
11	—	End of check

**Basic specification**

Model		AHUKIT01	AHUKIT02	AHUKIT03
Power supply		220-240V~ 50Hz		
Indoor unit capacity	kW	9~20	20.1~33	40~56
IP-class		IPX0	IPX0	IPX0
Piping size (in/out)	mm	Φ8/Φ8	Φ12.7/Φ12.7	Φ16/Φ16
Dimension	mm	375×350×150		
Packing dimension	mm	490×240×420		

## Dial code definition

### 1) SW1 definition

<p>SW1</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 1 means the factory test mode</li> <li>• 0 automatic search address mode (factory default)</li> </ul>
<p>SW1</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 1 means select DC fan(reserved)</li> <li>• 0 means select AC fan</li> </ul>
<p>SW1</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 00 means DC fan static pressure selection 0 set (reserved)</li> </ul>
<p>SW1</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 00 means DC fan static pressure selection 0 set (reserved)</li> </ul>
<p>SW1</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 01 means DC fan static pressure selection 1 set (reserved)</li> </ul>
<p>SW1</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 10 means DC fan static pressure selection 2 set (reserved)</li> </ul>
<p>SW1</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 11 means DC fan static pressure selection 3 set (reserved)</li> </ul>

### 2) SW2 definition

<p>SW2</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 00 means temperature of shut down against cool air is 15°C</li> </ul>	<p>SW2</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 00 means the time of TERMAL stop the fan is 4 minutes</li> </ul>
<p>SW2</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 01 means temperature of shut down against cool air is 20°C</li> </ul>	<p>SW2</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 01 means the time of TERMAL stop the fan is 8 minutes</li> </ul>
<p>SW2</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 10 means temperature of shut down against cool air is 24°C</li> </ul>	<p>SW2</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 10 means the time of TERMAL stop the fan is 12 minutes</li> </ul>
<p>SW2</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 11 means temperature of shut down against cool air is 26°C</li> </ul>	<p>SW2</p> <p>ON <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>1234</p>	<ul style="list-style-type: none"> <li>• 11 means the time of TERMAL stop the fan is 16 minutes</li> </ul>

## VRF Controllers

### 3) SW5 definition

	<ul style="list-style-type: none"> <li>• 00 means the temperature compensation under heating mode is 6°C</li> </ul>
	<ul style="list-style-type: none"> <li>• 01 means the temperature compensation under heating mode is 2°C</li> </ul>
	<ul style="list-style-type: none"> <li>• 10 means the temperature compensation under heating mode is 4°C</li> </ul>
	<ul style="list-style-type: none"> <li>• 11 means the temperature compensation under heating mode is 8°C</li> </ul>

### 4) SW6 definition

	<ul style="list-style-type: none"> <li>• 1 means the old display panel</li> <li>• 0 means the new display panel</li> </ul>
	<ul style="list-style-type: none"> <li>• 1 means automatic mode automatic fan</li> <li>• 0 means non-automatic mode automatic fan</li> </ul>
	Reserved

### 5) SW7 definition

	Standard configuration
	The last set of the network

### 6) J1, J2 definition

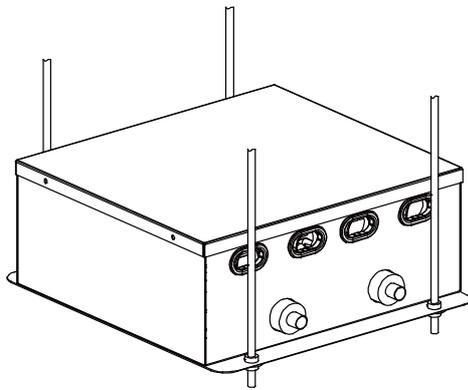
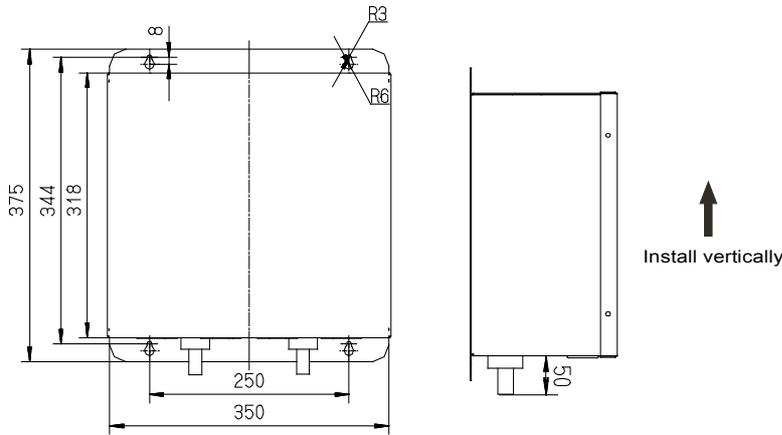
	J1 Jumperless for has power down memory function
	J1 Jumper for has no power down memory function
	Reserved

### 7) 0/1 definition

	Means 0
	Means 1

## Installation methods

1) Installation methods for vertically, and horizontal installation is invalid.

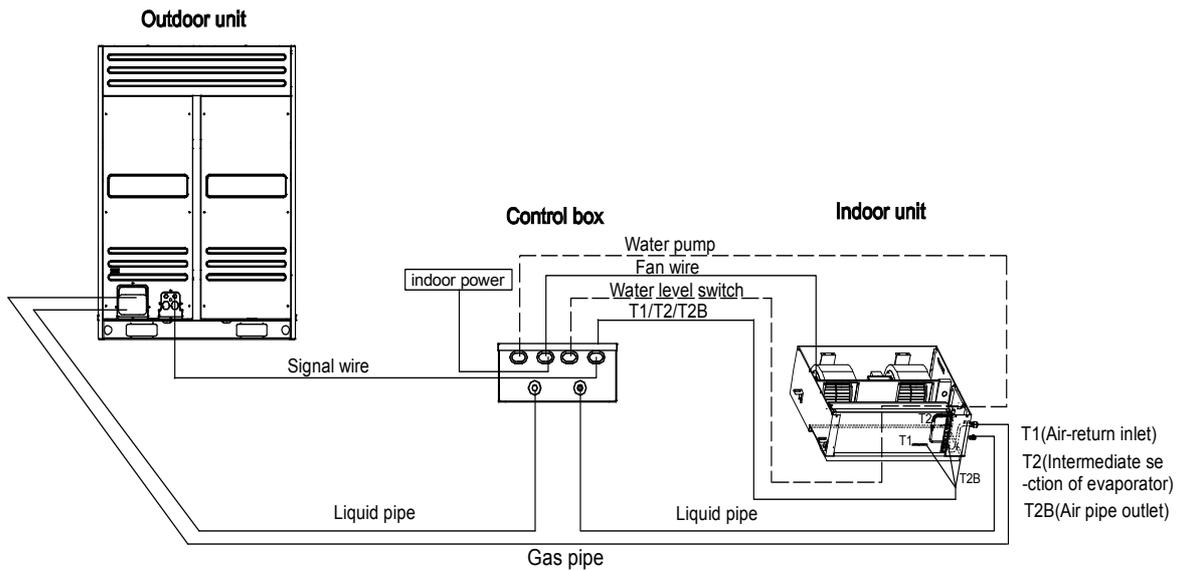


Wrong installation way

Vertically (✓)

Horizontally (✗)

2) Wiring diagram between indoor and outdoor units.



**Notes:** 1) If it is needed, user can select the backup function in the dotted line frame.

2) T2C has been installed before the product leaves the factory

## VRF Controllers



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