



# ***Service Manual***

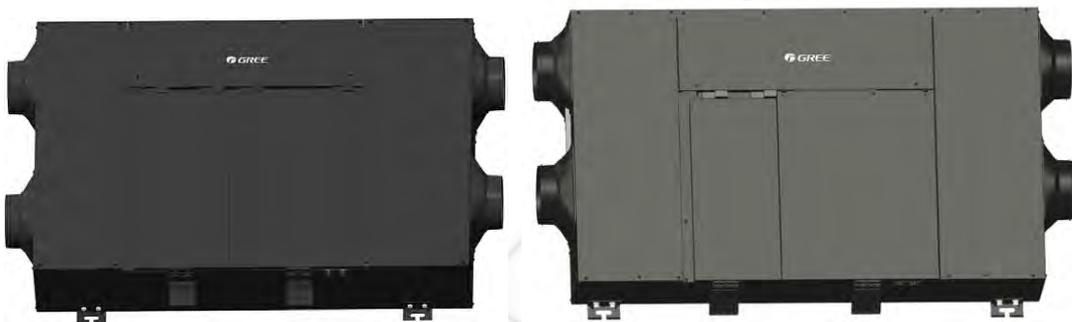
## **Energy Recovery Ventilation System**

(GC201908-I)

Rate Frequency:50/60Hz

Air Volume Range: 150/250/350/500m<sup>3</sup>/h

Operation Range: -25°C~48°C



# Safety Precautions

## **WARNINGS!**

Meaning of warnings and marks.

The warnings in this manual are classified according to its seriousness and possibility of occurrence.



It indicates emergent dangerous situation; if it is not avoided, personal death or serious injury may be caused.



It indicates potential dangerous situation; if it is not avoided, personal death or serious injury may be caused.



It indicates potential dangerous situation; if it is not avoided, slight or medium injury may be caused. It can also be used for warning unsafe behavior.



It indicates that this situation may only cause equipment or property loss.



It indicates useful tips or additional information.



It indicates that there is jumping connection function.

# Preface

Thank you for selecting Gree product.

For correct installation, operation and maintenance, please read this manual carefully.

This manual is applicable for energy recovery ventilation system, which clarifies the operation safety requirements, basic principles and implementation methods in three aspects of engineering installation, debugging and maintenance. Related operators must proceed works strictly according to national (local) safety regulations and technical requirements in this manual. Otherwise, maybe the ventilation system cannot work normally or even break down. What's more, accident of personal injury may occur.

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## Chapter I Product Introduction

### 1 Introduction of Indoor Unit

#### 1.1 Product Specification

Models of energy recovery ventilation system :

Models	Product code	Fresh air volume	Outline diagram
		m <sup>3</sup> /h	
FHBQGL-D1.5DA-T	EH01300060	150	
FHBQGL-D2.5DA-T	EH01300080	250	
FHBQGL-D3.5DA-T	EH01300070	350	
FHBQGL-D5DA-T	EH01300050	500	



**NOTE!** Fresh air volume is the air outlet volume tested under rated static pressure.

## 1.2 Product Operation Range

Operation condition range	>-25°C
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## 2 Basic Working Principle

### 2.1 Introduction of Working Principle

Energy recovery ventilation system is a kind of air processing device that purifies outdoor fresh air, exchanges heat and humidity with indoor discharge air, and then sends the fresh air to indoors after recycling the heat of discharge air. This unit consists of filtration section, energy recovery core section and fan section. Filtration section is made up of F7 level filters. Energy recovery core section achieves sufficient heat and humidity exchange of fresh air and discharge air. Meanwhile, fresh air operation mode can be adjusted according to different seasons, which ensures fresh air volume as well as energy savings.

### 2.2 Operation Principle Diagram of the System

#### 2.2.1 Operation Principle Diagram of this Unit:

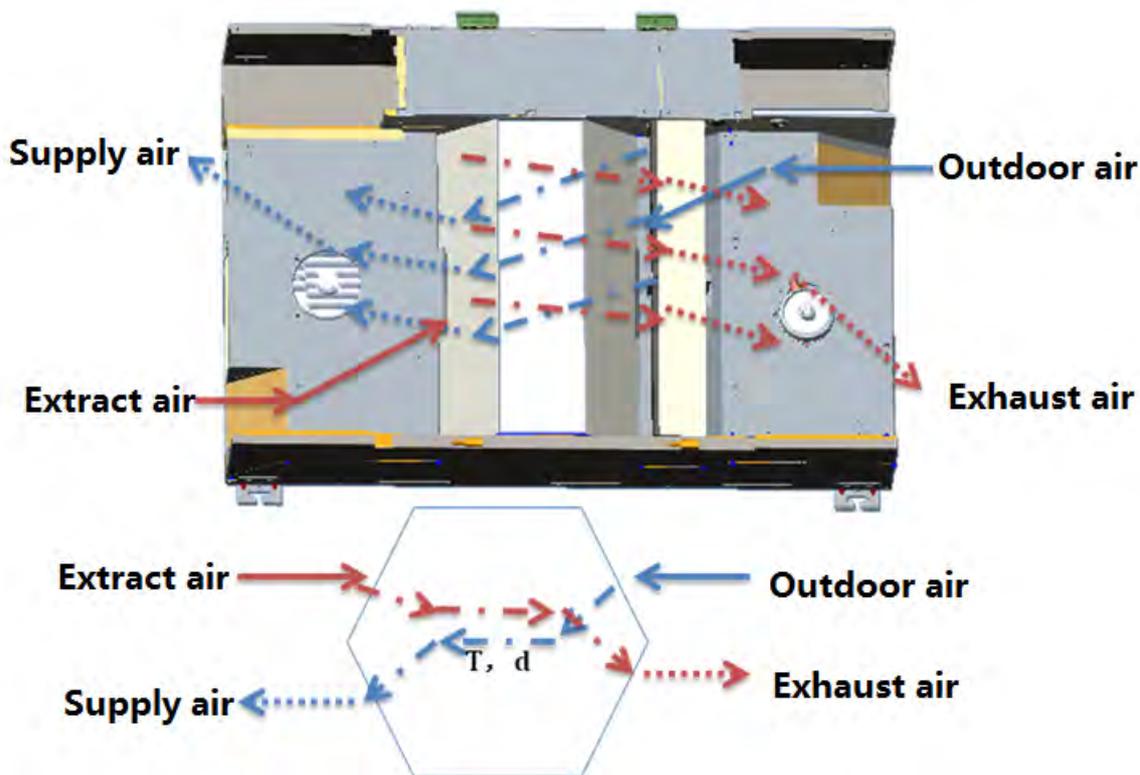


Fig. 1 Operation Principle Diagram of this unit

## 2.3 Part's Name and Main Functions

Table 1 Part List

No.	Name	Main function
1	Fresh air fan	Provide strong motivity to fresh air, resist air duct static pressure and send fresh air to the destination.
2	Air discharge fan	Discharge indoor stagnant air timely.
3	filter	Purify outdoor air and discharge air to protect the energy recovery core.
4	Energy recovery core	Achieve sufficient heat and humidity exchange of fresh air and return air.

Table 2 Main Functions

No.	Name	Main function
1	Auto control	According to the air quality class detected by air box, the operation of fresh air unit is adjusted automatically to control indoor air quality.
2	Linkage control	Achieve linkage operation with VRF indoor unit; fresh air unit will start or shut down automatically according to the on/off status of VRF indoor unit.
3	Operation control	Manual control of energy recovery operation.
4	Energy recovery mode	Fresh air will be supplied to indoors after heat and humidity exchange with return air.
5	Bypass mode	In transitional season, fresh air will be supplied to indoors direction after purification, without heat and humidity exchange.
6	Air discharge mode	In cold season, only indoor stagnant air will be discharged to outdoors.

### 3 Basic Specifications

Table 3 Unit Specifications

Model		FHBQGL-D1.5DA-T	FHBQGL-D2.5DA-T	FHBQGL-D3.5DA-T	FHBQGL-D5DA-T
Product code		EH01300060	EH01300080	EH01300070	EH01300050
Rated voltage	V	220-240 /208-230			
Rated frequency	Hz	50/60			
Rated power input	W	50	105	150	300
Rated current	A	0.35	0.7	1	1.9
Air flow volume	m <sup>3</sup> /h	150	250	350	500
Thermal efficiency(nominal flow rate)	—	80%	79%	75%	80%
Thermal efficiency(reference flow rate)	—	90%	79%	—	—
Outdoor static pressure	Pa	100	100	100	100
Sound power level (H)	dB	41	49	50	55
Net weight	kg	50	50	60	71.5
Outline dimension (WxDxH)	mm	1160×700×220	1160×700×220	1200×785×240	1385×785×240
Air inlet port dimension	mm	Φ149.9±0.3	Φ149.9±0.3	Φ149.9±0.3	Φ185±0.3
Air outlet port dimension	mm	Φ149.9±0.3	Φ149.9±0.3	Φ149.9±0.3	Φ185±0.3
Stacking layers		7	7	7	7



#### NOTES!

- ① Sound power level is tested in semi-anechoic room according to related test method specified in standard EN ISO 3744. Actual noise may be various due to actual environment influence.
- ② Thermal efficiency is tested according to related test method and temperature condition specified in standard EN 13141-7-2010. Actual thermal efficiency may be various due to actual temperature condition.
- ③ Specifications may be changed due to product improvement. Please refer to nameplates of the units.
- ④ The nominal static pressure is the static pressure tested acquiescently when leaving the factory, other high-level filter might affect unit performance parameter.

## 4 Optional Accessories

Energy recovery ventilation system includes the following optional parts:

Table 4 Accessories

Name	Model	Remark
Fresh air inlet port	FK-XW150A	Installed on external wall
Discharged air outlet port	FK-XW150B	Installed on external wall
Fresh air outlet port	FK-X075A	Installed indoors
Discharged air inlet port	FK-X100A	Installed indoors

## Chapter II Control

### 1 Unit Control

#### 1.1 Overall Control Ideology

The load of energy recovery ventilation system has two blades. By controlling the operation of fan, it supplies fresh air to indoors and discharges indoor stagnant air continuously to improve indoor air quality. For control strategy, energy recovery ventilation system can achieve linkage control with VRF and auto control according to the air quality detected by air box. If the energy recovery ventilation system is connected to VRF system through communication wire, when VRF indoor unit starts, the energy recovery ventilation system will start too. When all VRF indoor units shut down, the energy recovery ventilation system will shut down too.

Energy recovery ventilation system has five fan speeds, which are high, medium-high, medium, medium-low and low. Energy recovery ventilation system can detect the fresh air temperature in real time during operation. The system also has the functions of timer, filter cleaning reminder, filter replacing reminder, air quality display, auto operation, etc.

##### 1.1.1 Unit Control Principle

Indoor unit and wired controller transfer temperature, load and control information through communication wire. Wired controller is the man-machine operation interface for setting and controlling unit operation status. Unit operation status and error can be displayed on the wired controller directly.

- (1) Operation control: Manual control. Control the startup, shutdown, fan speed and other functions of energy recovery ventilation system manually through wired controller.

- (2) Linkage control: Linkage between energy recovery ventilation system and VRF indoor unit.  
When VRF indoor unit starts, the energy recovery ventilation system will start too. When all VRF indoor units shut down, the energy recovery ventilation system will enter standby status.
- (3) Auto control: The startup and shutdown of energy recovery ventilation system is adjusted automatically according to the air quality class detected by air box, so as to control indoor air quality.
- (4) Fresh air temperature sensor: Detect fresh air temperature to confirm the operation mode of energy recovery ventilation system.
- (5) Filter cleaning reminder function: Judge if cleaning reminder condition is reached according to accumulated operation time and set outdoor environment. If the condition is reached, cleaning reminder will be displayed on the wired controller.
- (6) Filter replacing reminder function: Judge if replacing reminder condition is reached according to accumulated operation time and set outdoor environment. If the condition is reached, replacing reminder will be displayed on the wired controller.
- (7) Bypass mode: When indoor and outdoor temperature difference is not big, control incomplete heat exchange between fresh air and discharged air to make discharged air goes through bypass way.

## 1.2 Unit Operation Flowchart

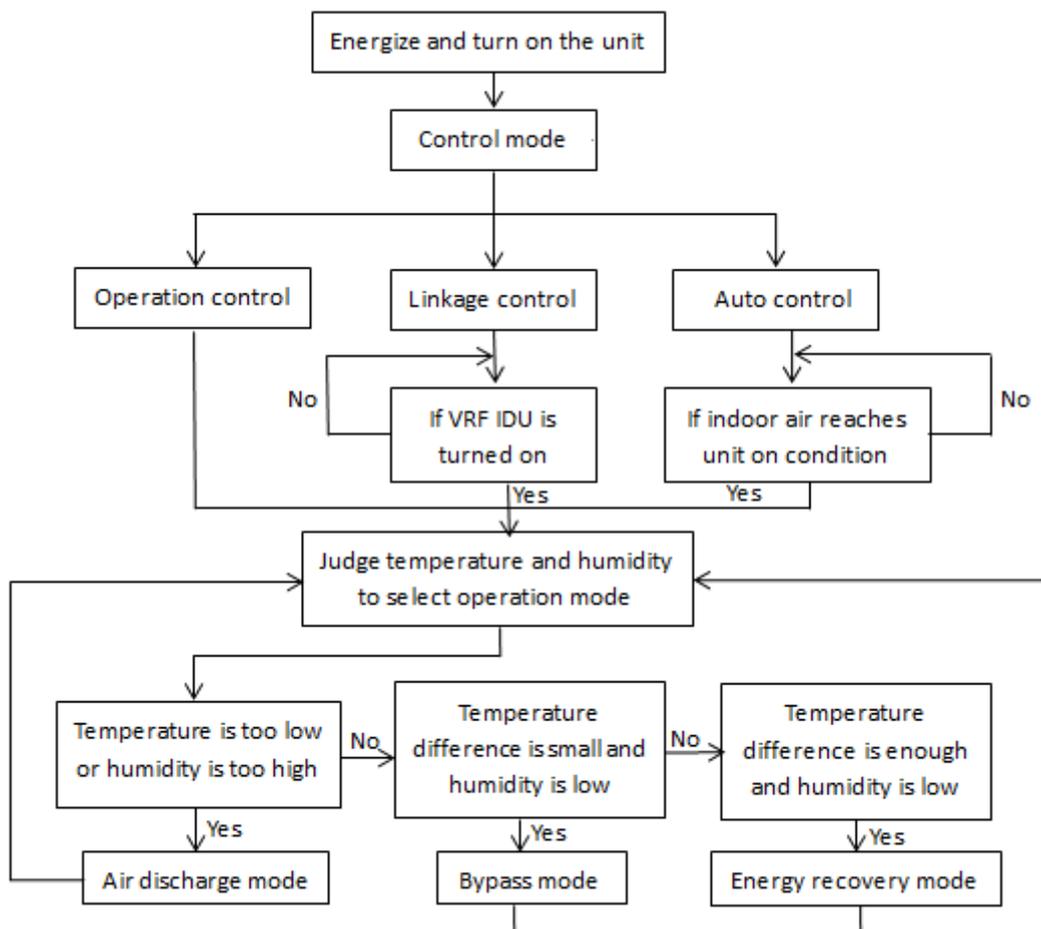


Fig. 2 Logic Flowchart

## 1.3 Unit Control Functions

Unit control functions: Linkage, operation, auto, fan speed control, timer, lock, air quality display, group control, etc.



Group control and linkage control are available only when the energy recovery ventilation system is connected to VRF system; auto control is available only when the air box is connected.

## 2 Wired Controller

### 2.1 XK112

#### 2.1.1 Appearance Introduction



Fig. 3 Interface of Wired Controller

#### 2.1.2 LCD of Wired Controller

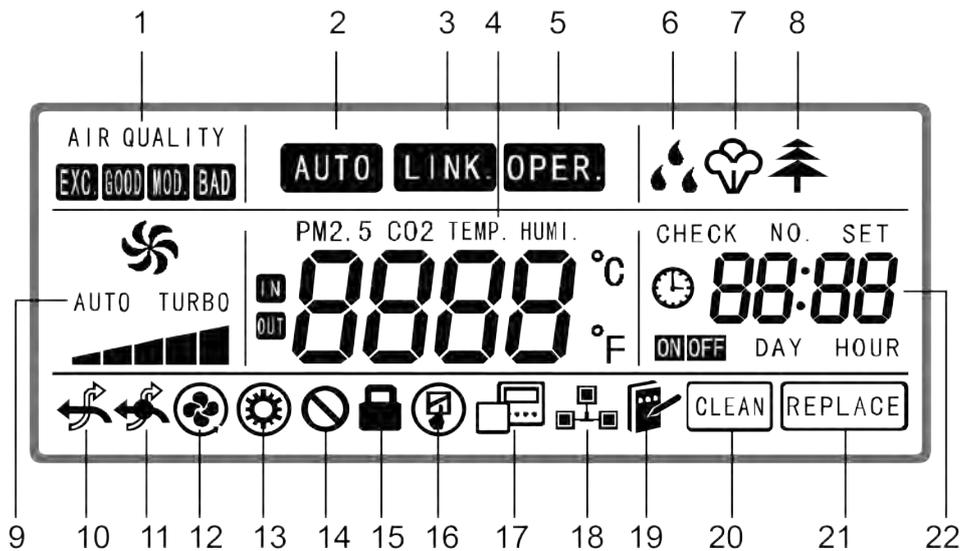


Fig. 4 LCD Graphics of Wired Controller

## 2.1.3 LCD Display Instruction

Table 5 LCD Display List

No.	Display name	Instructions
1	Indoor air quality level	There are a total 4 levels for indoor air quality: excellent, good, moderate, bad.
2	Auto	Auto mode: when there is air box, it can automatically operate according to the set target air quality level.
3	Linkage	Linkage mode: when there is multi-VRF unit, it will operate with the multi-VRF unit together.
4	Display area of air quality parameter	When there is no air box, it only displays temperature; when there is air box, it will circularly display air quality parameters: PM2.5 density, carbon dioxide density, temperature, relative humidity.
5	Operation	Operating mode.
6	Dehumidification	Dehumidifying function.
7	Humidification	Humidifying function.
8	Health	Health function.
9	Wind speed	Display of wind speed.
10	By-pass operation	It will display when the unit is under by-pass operating status or low-temperature operating status.
11	Full heat exchange operation	It will display when the unit is under full heat exchange operating status.
12	Air discharge operation	It will display when the unit is under air discharge operating status or indoor purification mode.
13	Ancillary heating	It will display when this function is turned on.
14	Prohibition	Prohibit operation.
15	Child lock	Prevent misoperation of children.
16	Shielding	Long-distance monitor shields operation of display board: shield the ON/OFF function, shield the startup, shield the shutdown, shield the mode, shield the timer function, etc.
17	Secondary wired controller	It will display when secondary wired controller is set.
18	Group control	It will display in group control.
19	Memory	In memory of ON/OFF status of unit, when power failure occurs, the unit will resume to the former status when being energized.
20	Washing	Remind of washing.
21	Replacement	Remind of replacement.
22	Display area for timer and parameter setting	Mainly for displaying time, project code, parameter setting, parameter inquiry, etc.
 <b>NOTE!</b> Some display of wired controller may vary as unit functions are different.		

## 2.2 View of Buttons

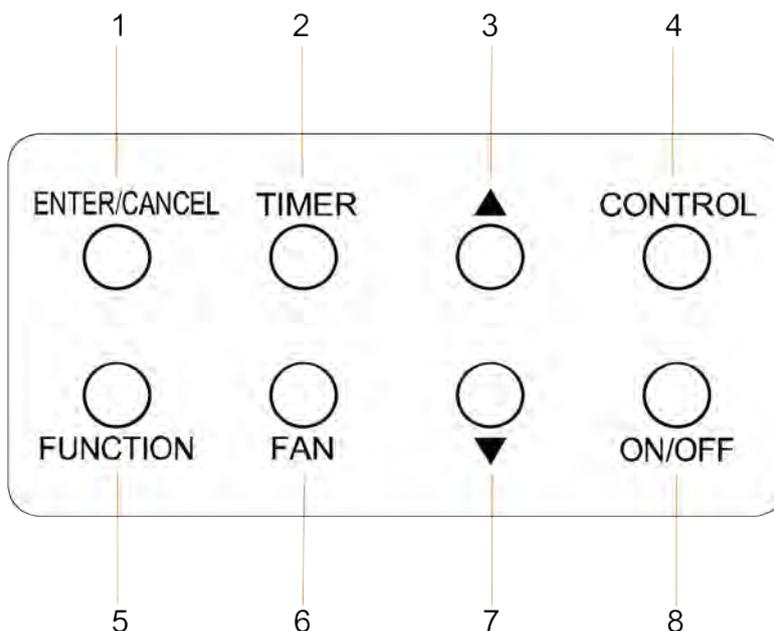


Fig. 5 View of Buttons

## 2.3 Function Instruction of Buttons

Table 6 Button Function Instruction

Button No.	Button name	Function Instruction of Buttons
1	Enter/Cancel	Select and cancel of function
2	Timer	Timer setting
3	Add	(1)Timer setting.
7	Subtract	(2)Parameter setting and inquiry.
4	Control	Switch the modes, including auto, linkage, operation. (Note: auto mode is valid when connecting to air quality sensor, linkage mode is valid when connecting to multi-VRF unit)
5	Function	Sellection of dehumidification, humidification, and health functions, activate or cancel the function via "ENTER/CANCEL" button.
6	Fan	It can switch among low, medium-low, medium, medium-high, high, turbo, and auto speed.
8	On/Off	ON/OFF of the unit.
3+7	Child Lock	Press and hold "▲" and "▼" button simultaneously for 5 seconds to start up or cancel the child lock function.

## 2.4 Engineering Parameter Enquiry

Unit parameters can be checked in unit on or off status.

- (1) Hold on pressing “Function” button for 5s to enter the interface of parameter enquiry. “C00” is displayed in the temperature zone and the icon “Check” lights up.
- (2) Under “C00” interface, press “Control” button for three times continuously to enter engineering parameter enquiry.
- (3) Press “▲” or “▼” button to select parameter code.
- (4) Press “Enter/Cancel” button to return to last step until exits viewing parameters.

Table 7 Parameters Viewing List

Parameter code	Parameter name	Parameter range	Viewing method
C00	Entrance of adjustable parameter	—	Timer area displays: project number of the current fresh air unit.
C01	View the project code of indoor unit and locate the faulted IDU	project code of IDU:1~255	<p>Operation method: Enter viewing: press “Control” button in “C01” status to enter the interface of viewing project code of IDU. Press “▲” or “▼” button to switch the project code of IDU.</p> <p>Display method: Air parameter zone: malfunction of the current IDU.( The air parameter zone will display the malfunctions in turn with an interval of 3 seconds if there are several malfunctions in one IDU) Timer zone: current project code of fresh air unit/C5 malfunction of project code conflict. If there is only one fresh air unit in this HBS network, timer zone will display the project code of fresh air unit directly under “C01” interface.</p>
C05	Entrance of viewing historical malfunction of IDU	Five historical malfunctions	<p>1. Enter viewing: in “C05” status, timer zone doesn’t display, press “Control” button to enter the interface of viewing historical malfunction. Press “▲” and “▼” button to switch the project code of IDU (if there is only one IDU, skip the selection operation); “Code” icon is on and project code blinks;air parameter zone displays the first error code as defaulted (recent error), error sequence and error code are on; error code won’t be displayed if there is no error.</p> <p>2. Press “Control” button again to view the error code of current IDU. project code will turn to on from blinking, error sequence is on, error code is blinking; press “▲” and “▼” button to switch error sequence; error sequence will increase if “▲” button is pressed and error sequence will decrease if “▼” button is pressed. Press “Enter/Cancel” button to return to the last step.</p> <p>Display method: Air parameter zone: error sequence and error code. (display from left to right) (1~5, errors will be displayed from old to new) Timer zone: project code, “Code” icon is on.</p>

Parameter code	Parameter name	Parameter range	Viewing method
C06	Inquiry of filter replace time percentage	Pollution level: 0~100	Timer area displays. (Only display the IDU parameter with the minimum project number)
C07	Inquiry for temperature of fresh air inlet temperature sensor	Temperature range: -25~99	Operating methods: enter into the inquiry, under "C07" status, press "CONTROL" button to enter into indoor unit air inlet temperature sensor inquiry interface, press "▲" and "▼" to switch indoor unit number. Displaying method: Display of air parameter area: project number of the current indoor unit; display of timer area: temperature of air inlet temperature sensor
C08	Inquiry for filter washing time percentage	Pollution level: 0~100	Timer area displays. (Only display the parameter of IDU with the minimum project number)
C09	View address of wired controller	1, 2	Timer zone: displays the address of wired controller.
C10	Inquiry for setting of positive and negative pressure	0~2	Display of timer area:00:normal wind speed notch setting; 01:positive pressure mode;02:negative pressure mode.
C11	Inquiry for quantity of group control	1~16	Display of timer area: quantity of IDU in HBS network.
C13	View the code of CAN2 network	1~255	Timer zone: displays current CAN2 network code.
C16	Inquiry for parameter of outdoor maximum relative humidity under air discharge mode	40~90	Display of timer area: relative humidity parameter.
C17	Inquiry for outdoor relative humidity	20~90	Display of timer area: relative humidity value.

Parameter code	Parameter name	Parameter range	Viewing method
C18	One-button viewing of indoor unit project code (CAN1 network)	1~255	<p>Operation method (slave wired controller cannot activate or cancel one-button viewing function of project code):</p> <p>Setting method: enter viewing, press "Control" button in "C18" status to enter the interface of viewing project code of IDU. Press "▲" or "▼" button to switch the project code of IDU.</p> <p>Cancellation method:</p> <p>If user exits C18 viewing interface within 20s, display of project code will be cancelled.</p> <p>If it exits after 20s due to overtime, press "On/Off" button under unit on or unit off status to cancel project code display.</p> <p>The method of exiting project code display of any wired controller in CAN network is the same as the method in point ②.</p> <p>Display method:</p> <p>Air parameter zone: displays sequence of the current indoor unit.</p> <p>Timer zone: displays project code of indoor unit.</p> <p>All indoor units, wired controller in CAN network all display its project code (wire controller displays IDU project code in turn with an interval of 3s, project code is displayed from small to big).</p>
C19	Inquiry for major air box (only when it connects to air box)	00~01	<p>Under C19 status, press "CONTROL" button, timer area displays the major box setting parameter 00 or 01, 01 means the major air box. Air parameter area displays the address dial code of air box. Press "▲" and "▼" can switch the air box.</p>
Nb	View barcode	0~9,A~Z, a~z	<p>Operation method (slave wired controller doesn't support nb enquiry):</p> <p>Enter viewing: in "nb" status, timer zone doesn't display, press "Control" button to enter the interface of viewing barcode. Temperature zone displays "nb" and project code in timer zone blinks. Press "▲" and "▼" button to switch the project code of IDU. Project code will increase if "▲" button is pressed and project code will decrease if "▼" button is pressed;</p> <p>Short press "Control" button to select IDU. In this case, temperature zone displays "Un" and timer zone displays "-n". Press "▲" and "▼" button to display IDU barcode and IDU controller barcode. Press "Enter/Cancel" button to return to the last status. Air parameter zone displays "nb" and timer zone displays the IDU project code that is viewed currently; press</p>

Parameter code	Parameter name	Parameter range	Viewing method				
Nb	View barcode	0~9,A~Z, a~z	“Enter/Cancel” button to return to the last step. Display method: Air parameter zone: displays nb /Un/Pc/barcode. Timer zone: displays -n/project code/barcode.				
			Example	Air parameter zone	Timer zone	Remark 1	Remark 2
			IDU barcode N1r012815 0066	Un (displayed at the right side)	-n (displayed in the center)	It means the below is the IDU barcode	Press “▼” button to display downwards; press “▲” button to display upwards.
				N1r	0128	First 7 digits of barcode	
				150	066	Last 6 digits of barcode	
			IDU controller N1r012815 0067	Pc	-n	It means the below is the IDU controller barcode	
				N1r	0128	First 7 digits of barcode	
				150	067	Last 6 digits of barcode	
			Display example is as below:				
			 <b>NOTE!</b> Un means IDU barcode; Pc means IDU controller barcode. When there is only one IDU, under “nb” status, press “Mode” button directly to enter barcode enquiry; do not need to select IDU project code. When there is no operation within 60S, viewing status will be exited. Barcode viewing sequence starts from IDU barcode; when viewing of IDU controller barcode is ended, it doesn't circulate, which means it will not view IDU barcode when “▲” button is pressed.				

## 2.5 Engineering Parameter Settings

Unit parameters can be set in unit on or off status.

- (1) Hold on pressing “Function” button for 5s and the temperature zone displays “C00”. Under “C00” interface, press “Control” button for three times continuously and then hold on pressing “Function” button for 5s to enter the parameter setting interface of wired controller. “P00” is displayed in temperature zone.
- (2) Press “▲” or “▼” button to select parameter code and press “Control” button to switch to parameter setting. At that time, parameter value is blinking. Press “▲” or “▼” button to adjust the parameter value and press “Enter/Cancel” button to finish and save setting.
- (3) Press “Enter/Cancel” button to return to last step until exits setting parameters.

Table 8 Parameters Setting List

Parameter code	Parameter name	Parameter range	Instructions
P09	Set the positive and negative pressure 【Default-00】	00, 01, 02	00: normal fan speed setting, fan speed of fresh air motor and return air motor are in accordance with the set fan speed of wired controller. 01: positive pressure mode, setting of the fan speed of fresh air motor and return air motor is switched automatically according to positive pressure mode logic. 02: negative pressure mode, setting of the fan speed of fresh air motor and return air motor is switched automatically according to negative pressure mode logic.
P10	Parameter setting for outdoor maximum relative humidity under air discharge mode 【Default-90】	40~90	Take 10 as an increasing unit.
P13	Set the addresses of dual wired controllers 【Default-01】	01: Master wired controller 02: Slave wired controller	When two wired controllers control one indoor unit, the addresses of the two wired controllers should be different. 01 is the top unit in HBS bus and the other wired controller must be set as 02. Note: If the user hasn't set the address and 01 finds that it receives the information of other 01, it will report error.
P14	Quantity setting for one-for-more indoor unit 【Default-01】	00:this function is prohibited 01-16:quantity of indoor unit	Set corresponding value according to the quantity of indoor units connected.

Parameter code	Parameter name	Parameter range	Instructions
P15	Power-fail memory mode 【Default-01】	00:turn off the unit when being re-energized after power failure 01:resume the former status when being re-energized after power failure	
P16	Temperature unit conversion 【Default-00: degree Celsius】	00:degree Celsius 01:degree Fahrenheit	
P17	Clear IDU historical errors 【Default-00: Celsius】	00: not clear 01: clear	Clear all IDU historical errors in HBS network.
P30	Static pressure setting 【Default-100】	Static pressure: 100、75、50	Unit: pa.
P33	Timer function setting 【Default-00】	00:count down 01:timer	
P34	Valid for repeat time setting 【Default-01】	00:invalid for repeat 01:valid for repeat	Valid for only the timer function is set.
P35	Return to ex-factory setting 【Default-00】	00:invalid 01:valid	After selecting 01, press and hold "ENTER/CANCEL" button for 5 seconds, the user function will resume to ex-factory status.
P36	Engineering setting resumes ex-factory setting 【Default-00: Celsius】	00: invalid 01: valid	When 01 is selected, hold on pressing "Enter/Cancel" button, so that engineering setting of indoor units in HBS network will resume ex-factory setting.

Parameter code	Parameter name	Parameter range	Instructions																		
P42	Set IDU project code 【Default-in initial operation, the system generates this value automatically】	1~255	<p>Operation method.</p> <p>Enter viewing: in “P42” status, it will display the project code of the first IDU; when there is only one IDU, press “Control” button to enter setting menu; when one wired controller controls several indoor units, it will enter IDU selection menu; press “▲” and “▼” button to switch IDU project code; “Code” icon is on and timer zone displays project code; temperature zone is defaulted to display IDU sequence; press “Control” button and the air parameter zone and timer zone will display the barcode of the IDU of current project code.</p> <p>Display method is as below.</p> <table border="1" data-bbox="724 689 1469 1173"> <thead> <tr> <th data-bbox="724 689 858 824">Example</th> <th data-bbox="858 689 1018 824">Air parameter zone</th> <th data-bbox="1018 689 1161 824">Timer zone</th> <th data-bbox="1161 689 1321 824">Remark 1</th> <th data-bbox="1321 689 1469 824">Remark 2</th> </tr> </thead> <tbody> <tr> <td data-bbox="724 824 858 1173" rowspan="3">                     IDU barcode N1r01281 50066                 </td> <td data-bbox="858 824 1018 1003">Un (displayed at the right side)</td> <td data-bbox="1018 824 1161 1003">-n (displayed in the center)</td> <td data-bbox="1161 824 1321 1003">It means the below is the IDU barcode</td> <td data-bbox="1321 824 1469 1003">Press “▼” button to display downwards</td> </tr> <tr> <td data-bbox="858 1003 1018 1093">N1r</td> <td data-bbox="1018 1003 1161 1093">0128</td> <td data-bbox="1161 1003 1321 1093">First 7 digits of barcode</td> <td data-bbox="1321 1003 1469 1093">; press “▲” button to display upwards.</td> </tr> <tr> <td data-bbox="858 1093 1018 1173">150</td> <td data-bbox="1018 1093 1161 1173">066</td> <td data-bbox="1161 1093 1321 1173">Last 6 digits of barcode</td> <td data-bbox="1321 1093 1469 1173"></td> </tr> </tbody> </table> <p>Press “Control” button to enter setting menu. The project code displayed in timer zone is blinking. Press “▲” and “▼” button to adjust project code. Hold on pressing “▲” or “▼” button: within 5s, units digit of project code will increase or decrease; from 5s to 10s, tens digit of project code will increase or decrease. Press “Enter/Cancel” button to confirm setting and return to the last step.</p> <p>Display method: Air parameter zone: displays IDU sequence. Timer zone: project code is on/blinks and “Code” icon is on.</p>	Example	Air parameter zone	Timer zone	Remark 1	Remark 2	IDU barcode N1r01281 50066	Un (displayed at the right side)	-n (displayed in the center)	It means the below is the IDU barcode	Press “▼” button to display downwards	N1r	0128	First 7 digits of barcode	; press “▲” button to display upwards.	150	066	Last 6 digits of barcode	
Example	Air parameter zone	Timer zone	Remark 1	Remark 2																	
IDU barcode N1r01281 50066	Un (displayed at the right side)	-n (displayed in the center)	It means the below is the IDU barcode	Press “▼” button to display downwards																	
	N1r	0128	First 7 digits of barcode	; press “▲” button to display upwards.																	
	150	066	Last 6 digits of barcode																		
P45	Reset one-button IDU project code 【Default-00】	00: invalid 01: valid	When it is set to 01, wired controller will send IDU project code reset command.																		
P48	Humidity range setting (invalid for preserving this item)	00: requirement for humidity range 40%-60% 01: requirement for humidity range 20%-80%	When it is set as 00, the fresh air relative humidity of fresh air unit is controlled within 40%-60%; when it is set as 01, the fresh air relative humidity of fresh air unit is controlled within 20%-80%.																		

Parameter code	Parameter name	Parameter range	Instructions
P49	Outdoor pollution level parameter setting 【Default-02】	01:good 02:fine 03:light pollution 04:medium pollution 05:heavy pollution 06:severe pollution	Set the outdoor pollution level parameter according to pollution degree of different regions.
P50	Indoor air quality level setting 【Default-02】	01:good 02:fine	In auto control mode, automatically set the indoor air quality according to the setting of indoor air quality level.
P51	Major air box setting 【Default-00】 (it can be set only when connecting to air box)	00:not major air box 01:major air box	Under P51 status, press “CONTROL” button, the timer area displays the major air box setting parameter 00 or 01, air parameter area displays address dial code of air box, each time press the “CONTROL” button can jump to the next air box. Press “▲” and “▼” can adjust the setting of 00 or 01 of major air box. Press “ENTER/CANCEL” button to save the setting after all the parameters are set. There is only one major air box, if several boxes are set, it will be subject to the latest one.
P53	Air box PM2.5 sensor operating status setting 【default—00】 (it can be set only when connecting to air box)	00:off 01:on	Under P53 status, press “CONTROL” button, the timer area will display the setting parameter 00 or 01 of PM2.5 sensor operating status, air parameter area will display the address dial code of air box. Each time press “Control” button can jump to the next air box. Press “▲” and “▼” can adjust the PM2.5 sensor operating status setting 00 or 01. After all the parameters are set, press “ENTER/ CANCEL” button to quit the setting.
P56	Sleep mode setting 【Default-00】	00:off 01:on	—
P57	Start time of sleep mode 【Default-23:00】	20:00-00:00	When adjusting time, press “▲” or “▼” to increase or decrease 1min; hold “▲” or “▼” for 5s to increase or decrease 10min.
P58	End time of sleep mode 【Default-06:00】	05:00-10:00	

Parameter code	Parameter name	Parameter range	Instructions
P59	Automatic control sensor setting 【Default-01】	00: Integrated sensor 01: CO <sub>2</sub> sensor	When setting "00", the unit's automatic control mode operates according to the concentration of PM2.5 and CO <sub>2</sub> ; When setting "01", the unit's automatic control mode operates automatically according to the concentration of CO <sub>2</sub> .

## Chapter III Installation

### 1 Engineering Installation Flow Chart

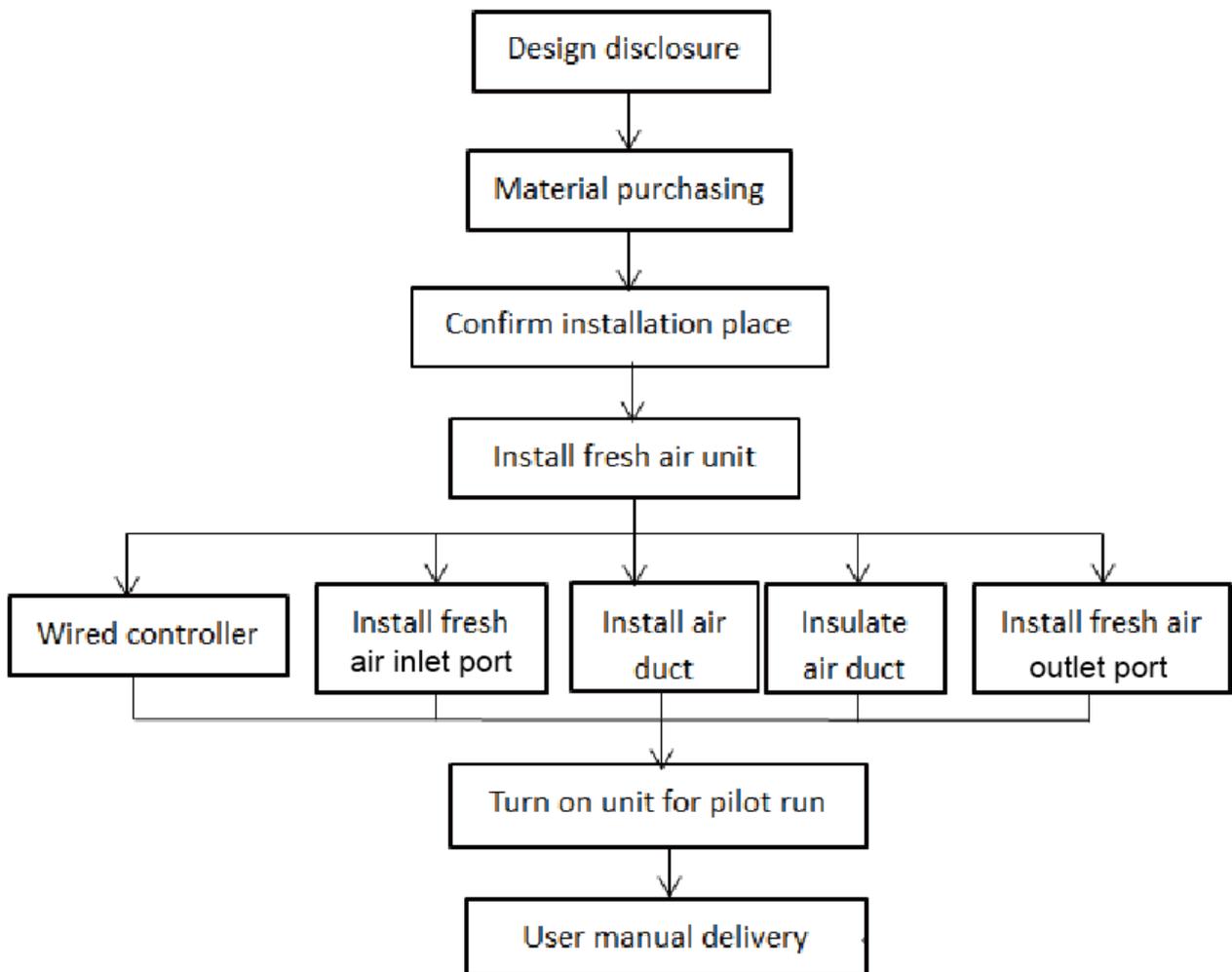


Fig.6

## 2 Preparation before Installation

### 2.1 Notices for Engineering Installation

#### 2.1.1 Safety Requirements for Engineering Installation



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



**WARNING!** Personnel and property safety are highly concerned during the entire installation process.

Installation implementation must abide by relevant national safety regulations to ensure personnel and property safety.

#### 2.1.2 Importance of Engineering Installation

Gree energy recovery ventilation system is a central fresh air system for residence. Installation problem of the system may affect indoor air quality. Problems that usually occur during installation are as follows:

Table 9 Engineering Installation Problem List

No.	Installation Problem	Possible Consequence
1	There are impurities in the duct (sands, dust and other impurities)	It will affect the service life of filter and increase the initial resistance of air duct and filter.
2	The air channel is improperly fixed	The air channel will deform; vibration and noise occur during unit operating.
3	Insulation of air channel is not stuck properly	In northern China, big indoor and outdoor temperature difference may cause condensation.
4	The unit installation space is insufficient.	Since there is a lack of space for maintenance and checking, indoor decoration might need to be damaged during such operation.
5	The air inlet or outlet is not designed reasonably	It will affect the distribution of fresh air discharge field.
6	Power cords are incorrectly provided	Unit components may be damaged and potential safety hazard may occur.
7	Control communication cables are incorrectly provided or improperly connected	The normal communication in the system fails or the control over IDUs and ODUs turn in a mess.
8	Control communication cables are not properly protected	The communication cables are short-circuited or disconnected, and the unit cannot be started up due to communication failure.

Understand the special requirement (if any) for unit installation before implementation to ensure installation quality. Relevant installers must have corresponding engineering construction qualifications.

Special type operators involved in the engineering implementation, such as welders and electricians, must have relevant operating licenses and are accredited with vocational qualification certification.

### **2.1.3 Cooperation Between Different Professions**

A quality installation of air conditioning engineering depends on careful organization and close cooperation between different professions such as architecture, structure, electric, water supply and drainage, fire-fighting, and decoration. Pipes must be laid in places away from any automatic spray head for fire-fighting, and must be reasonably arranged to ensure that the pipes fit the electric, luminaries, and decoration.

#### **2.1.3.1 Requirements for cooperation with civil engineering:**

- (1) Specialized pipeline well and wind well shall be reserved.
- (2) Hole and bushing shall be reserved and installation place from wires and pipes shall be reserved.
- (3) If hole hasn't been reserved, hole can be drilled, but not in load bearing beam and load bearing wall.

#### **2.1.3.2 Requirements for cooperation with decoration engineering:**

- (1) Installation places for IDU, air duct, air port, maintenance port, wired controller, etc. shall be reserved. Air supply or air return cannot be blocked. Air supply port and air return port cannot be closed. The position of maintenance port shall be convenient for maintaining the unit and the position of wired controller shall be convenient for operation.
- (2) The appearance of air port and maintenance port shall be in accordance with the decoration style.
- (3) All indoor pipeline shall be laid inside the ceiling. All pipeline installation shall save installation space and avoid conflict with the decoration.

#### **2.1.3.3 Requirements for cooperation with electric:**

- (1) Whether the reserved circuit, power type and power capacity meet the operation requirement.

- (2) Whether the power cable and circuit breaker meet the unit requirement and abide by relevant national safety regulations.
- (3) Whether the regional power supply quality (including voltage fluctuation and interference noise) meet the international requirement; any nonconformity must be resolved through coordination.

## 2.2 Onsite Review of Design Drawing

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

Table 10 Confirmation List of Construction Drawing

No.	Content to be confirmed	Confirmation result
1	Whether the total length of fresh air pipeline meet unit design requirement.	
2	Whether the installation place meet the installation space requirement of unit. Whether sufficient maintenance position and space are reserved.	
3	Whether the installation of air duct meet the requirement.	
4	Whether the power cord specification, type and control way meet unit design requirement.	
5	Whether the manufacture, total length and control way of control wire meet unit design requirement.	



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

## 2.3 Selection of Installation Materials

### 2.3.1 Notices for Installation Materials Selection

The materials, equipment and instruments used during air conditioning engineering construction must have certifications and test reports. Products with fireproof requirements must be provided with fireproof inspection certificates and must meet national and relevant compulsory standards. If environmentally-friendly materials are to be used as required by customers, all such materials must meet national environmental protection requirement and be provided with relevant certificates.

## 2.3.2 Preparation of Tools

Tools for installing ventilation pipeline and unit: general electric tools, electric equipment for ventilation air conditioner and frequently-used tools.

General electric tools include:

- Electric portable drill

Usage: electric portable drill is the most widely used tool. Matched with twist drill, it is mainly used for drilling holes in metal part, wood and plastic part, etc.

- Electric hammer

Usage: matched with alloy bit, it can drill holes, cut grooves and arrange roughing etc. on the concrete, rock and wall, etc.

- Impact drill

Usage: impact drill has two operation ways. When it is set to rotation status, it can be used as electric drill in match with twist bit; when it is set to rotation status with impact, it can be used for drilling holes in brick, concrete, ceramic and other brittle materials in match with alloy bit.

- Abrader (grinding machine)

Usage: in match with fibre strengthened linear grinding wheel for grinding, it is used for the polishing of metal part, cutting, beveling before welding and clear trimming and burrs; in match with diamond slicing blade, it can cut non-metal materials such as ceramic tile and stone, etc; in match with specialized grinding wheel, it can be used for grinding glass; in match with wire brush, it can be used for removing rust; in match with rubber gasket and round sand paper, it can be used for sanding.

## 2.3.3 Preparation of Materials

(1) Pipes:

Fresh air duct can adopt PVC pipe, whose normal diameter is listed below:  $\Phi 75\text{mm}$ ,  $\Phi 110\text{mm}$ ,  $\Phi 160\text{mm}$ ,  $\Phi 200\text{mm}$ .

## (2) Plates:

Plate is also the main material for making air duct assy. Galvanized steel plate, normal low-carbon steel plate, stainless steel plate and aluminum plate, etc. are commonly used.

- Galvanized steel plate

Performance: galvanized steel plate uses Q195, Q235A plate with galvanization as its protection layer. Its specification is the same as normal steel plate with thickness from 0.5~1.5mm. As the surface of galvanized steel plate is silver white, its surface is corrosion-resistant and doesn't need being painted. It is commonly used for the air duct system which is in humid environment without acid mist.

- Normal low-carbon steel plate

Performance: normal low-carbon steel plate is Q235-B(GB700-1988) steel, which is supplied in plates or coils after cold rolling or hot rolling. It has good plasticity and processability. Its processing is simple and convenient, which can be welded. But it may be rusted easily, it shall be painted to prevent corrosion.

- Stainless steel plate

Performance: stainless steel plate contains a large amount of chrome and nickel. Certain stainless steel plate also contains copper. It has the characteristic of high-temperature resistance and corrosion resistance. Its surface is usually white. Stainless steel with different alloy element may have different corrosion resistance to medium. You can select suitable stainless steel material according to the difference of corrosion medium. Stainless steel plate is usually used for the air duct system in chemical environment, which needs corrosion resistance.

- Aluminum plate

Performance: aluminum plate is divided into industrial pure aluminum and aluminum alloy plate. Its relative density is light and its surface is covered by a layer of compact alumina film whose color is silver white. Aluminum has good plasticity and strong acid resistance. It is easily corrupted by alkali and salt, so it is usually used for the ventilation air channel which needs acid resistance. Aluminum plate is soft and may not cause sparkle during collision, so it is usually adopted in the ventilation air channel with explosion prevention requirement.

## (3) Insulation materials

Insulation material is mainly for cold prevention and hot prevention. Incompact fibre and porous material are used for insulation material. Currently, PE insulation board and foamed rubber insulation material, etc. are commonly used as insulation material.

PEF:

Features: advanced foaming technology is adopted. It has good insulation performance, which is soft, light, fireproof and corrosion-resistant. It is commonly used as insulation material for building, air conditioner and low-temperature pipeline; its construction is simple and convenient.

Rubber insulation cotton:

Features: it takes NBR PVC as main material. In match with various auxiliary materials and foamed by special technique, it becomes soft insulation material. It has the features of soft texture, small density, low heat conductivity coefficient, good weather resistance, wide application temperature range, damping, noise absorption, fire resistance, water resistance, etc. It won't make pollution in production and application, which belongs to eco-friendly product.

Specification of rubber foaming pipe

Air duct	Insulation thickness	Material
Various pipes diameter	≥15mm	Rubber foaming pipe, fire-resistant class B1 or above.
Thickness of insulation material shall increase if it is installed in humid environment.		

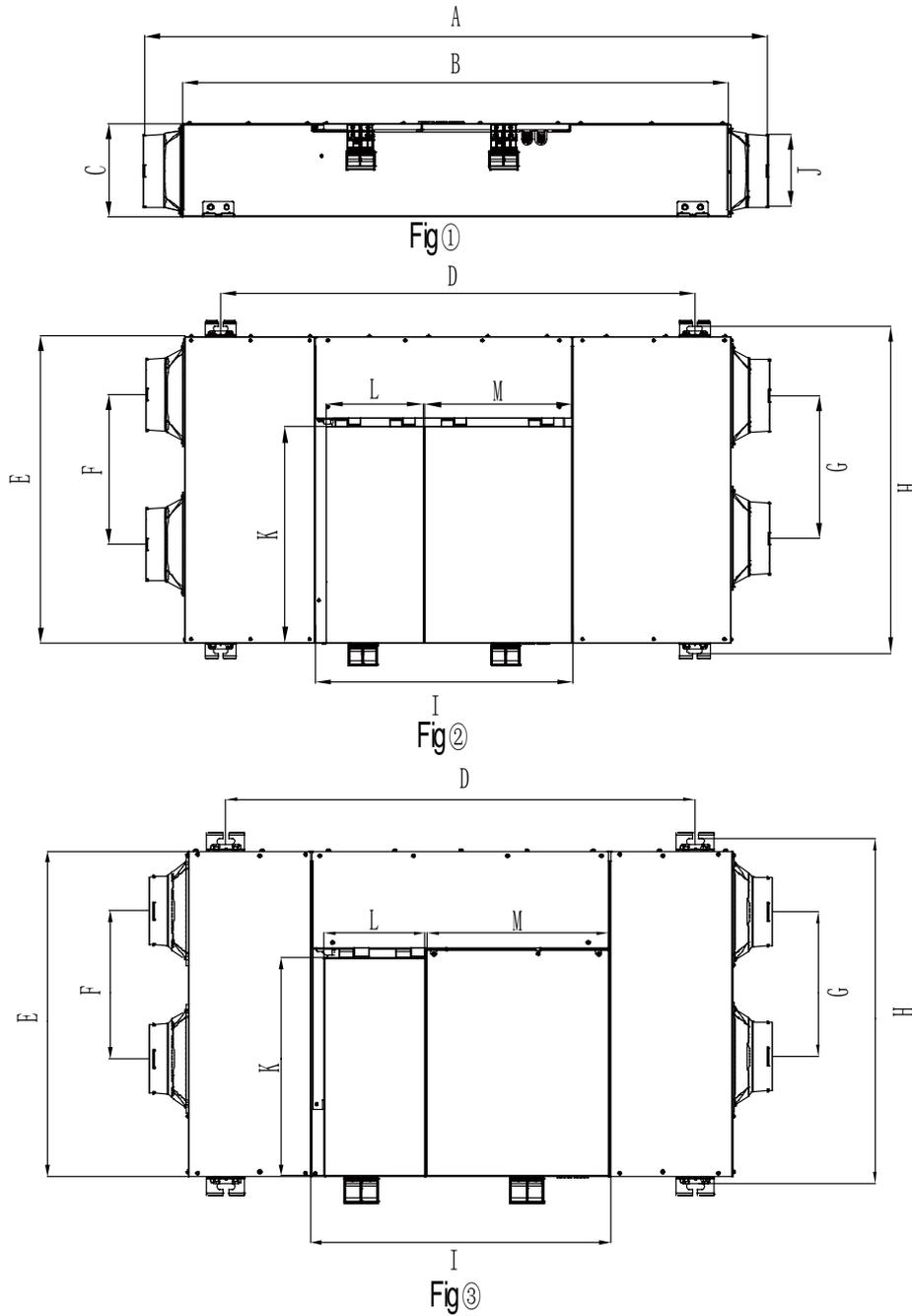
## (4) Hanging rod, support

Specification:

- 1) Hanging rod: M10 (same specification with the nut).
- 2) Steel channel: 5# or above.
- 3) Steel angle: equal sides 30mm×30mm×3mm or above.
- 4) Round steel: Φ10mm or above.

## 3 Unit Installation

### 3.1 Outline Dimension



Fig②is the front view of maintenance panel of FHBQGL-D3.5DA-T and FHBQGL-D5DA-T;

Fig③is the front view of maintenance panel of FHBQGL-D1.5DA-T and FHBQGL-D2.5DA-T.

Fig. 7 Outline Dimension Diagram

Table 11 Outline Dimension List

Unit: mm

Model	A	B	C	D	E	F	G	H	I	J	K	L	M
FHBQGL-D1.5A-T	1326	1160	220	1000	700	318	311	740	636	150	470	216	388
FHBQGL-D2.5A-T	1326	1160	220	1000	700	318	311	740	636	150	470	216	388
FHBQGL-D3.5A-T	1366	1200	240	897	785	424	377	825	650	150	555	277	343
FHBQGL-D5A-T	1584	1385	240	1203	785	383	366	825	653	185	555	248	375

### 3.2 Requirement for Installation Position and Space

(1) Energy recovery ventilation system is usually installed in corridor, kitchen or balcony, etc.

The installation way is hanging in the ceiling. Total length of fresh air duct cannot exceed 20m. The air duct should be made of nonflammable or non-combustible materials.

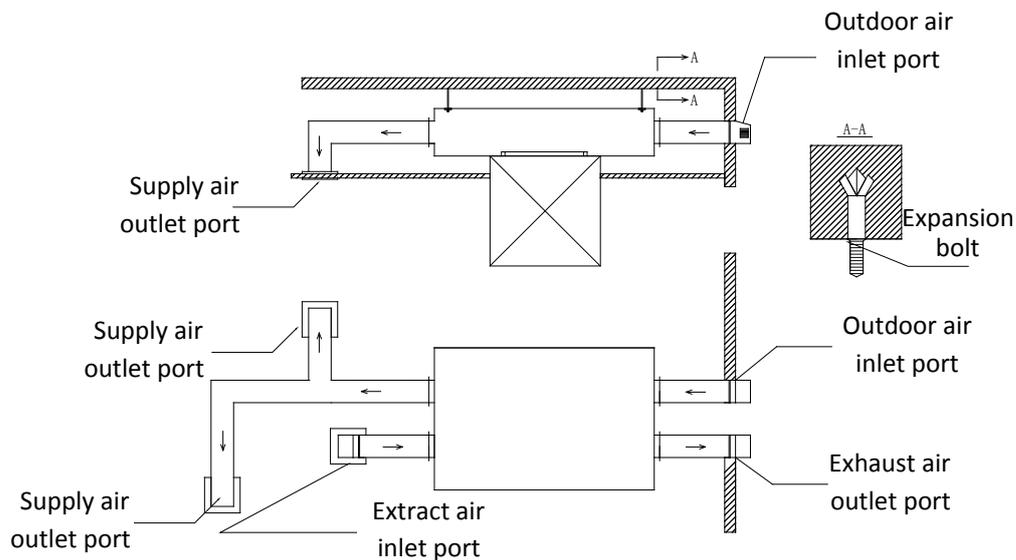


Fig. 8 Installation Diagram

(2) Elbow shall be set as little as possible. Elbow quantity in each duct line shall be within 3.

The bent part of elbow should be designed as a circular arc, avoiding a 90° right-angle bend.

(3) Try to avoid using it if the resistance difference of pipeline at both sides of air outlet of fresh air unit is big.

(4) The internal wall of duct shall be smooth, not afford to dust and not folded. The user shall by indoor and outdoor air inlet ports and air outlet ports in Gree sales offices. Outdoor air inlet port shall be installed in the area where is convenient for maintenance.

- (5) If the user wants the indoor noise as small as possible, the muffler shall be applied in the connection joints of air ducts. Please consult with a professional as there are many kinds of muffler. When suitable mufflers are installed, the noise at air outlet port can be reduced by 4~6 dB.
- (6) The air filter inside the unit shall be replaced regularly. Therefore, in design and installation, the maintenance space should be left under the unit. The recommended dimension of reserved maintenance port is 600×600(mm).

**NOTE!**

When installing FHBQGL-D1.5DA-T and FHBQGL-D2.5DA-T in ceiling, maintenance panel 1 and maintenance panel 2 should be completely exposed to the maintenance port, so that the user can remove the maintenance panel 2 with a screwdriver.

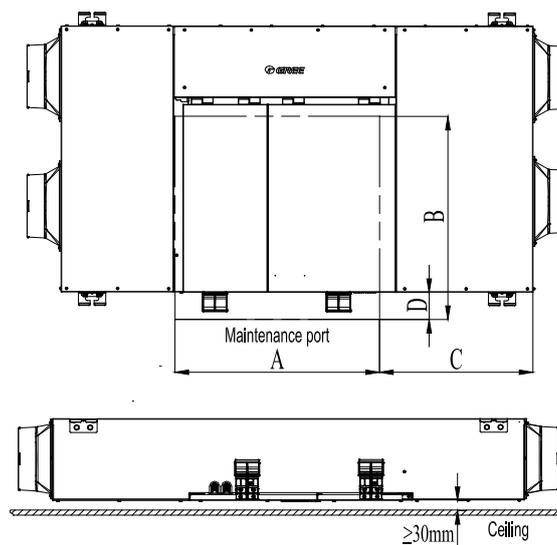


Fig. 9 Diagram of Maintenance Port

Table 12 Specification of Unit Maintenance Space

Unit: mm

Model	A	B	C	D
FHBQGL-D1.5DA-T	600	600	260	80
FHBQGL-D2.5DA-T	600	600	260	80
FHBQGL-D3.5DA-T	600	600	315	80
FHBQGL-D5DA-T	600	600	450	80

- (7) The unit shall adopt ceiling installation with installation height of 2.3m from the floor.
- (8) Use M10 expansion bolts for fixing the unit with the ceiling.

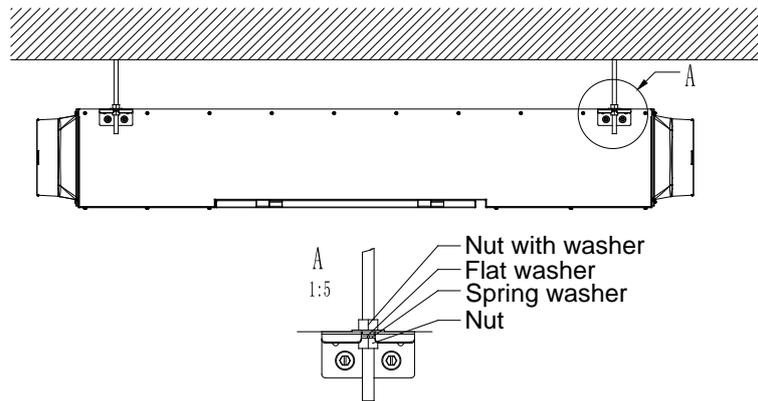


Fig. 10 Hanging Rod

- (9) If it is necessary, the user shall prepare hoses for connecting PVC duct of main unit air inlet/outlet port. During installing the hose, it shall be laid smoothly without folding and bending. The vertical fall between air inlet/outlet port and pipeline shall be less than 100mm.

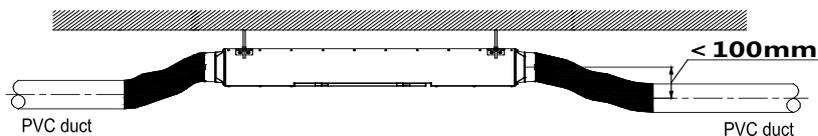


Fig. 11 Installation Diagram of Hoses

- (10) Energy recovery ventilation system shall not be installed in the following locations:
- 1) Fire disaster or overheat might occur if installing in high temperature location or places with open fire.
  - 2) In any places with oil mist/gas, e.g. kitchen, fire disaster might occur. If you want to install it in kitchen, please install ceiling to separate supply air fan and oil mist/gas.
  - 3) If the installation location is wet, e.g. bathroom, there might be electricity leakage or other problems. If you want to install it in bathroom, please install ceiling to separate supply air fan and humidity.
  - 4) If any machines with radioactive electromagnetic wave are near the installation location, the equipment might be out of work.

## 4 Design and Installation of Air Supply Duct

### 4.1 Notices for Air Duct Design

The models of this series all adopt low static pressure design with outdoor static pressure ranged from 0 to 50Pa. during engineering installation, air supply duct shall not be too long (recommended length of air duct is within 20m) to avoid insufficient static pressure, which may cause insufficient air volume and poor fresh air effect.

### 4.2 Selection of Air Port

#### 4.2.1 Selection of Air Port

Table 13 Types of Air Port

Fresh air inlet port	FK-XW150A	Connected pipe size 160mm
Discharge air outlet port	FK-XW150B	Connected pipe size 160mm
Fresh air outlet port	FK-X075A	Connected pipe size 75mm
Discharge air inlet port	FK-X100A	Connected pipe size 110mm

Fresh air inlet port is used for preventing rain from getting into the fresh air duct, as well as for ensuring construction beauty.

## 5 Electric Installation

### 5.1 Safety Notices



#### **DANGEROUS!**

- ① All personnels for electric installation must get the qualification for special electric operation.
- ② Energy recovery ventilation system is class I electric appliance, which must take reliable grounding measures. The grounding resistor shall comply with national standard.
- ③ The yellow-green wire inside the unit is grounding wire, which cannot be used for other purpose or cut off. It cannot be fixed with tappings screw. Otherwise, electric shock may be caused.
- ④ Power supply must provide reliable grounding terminal. Do not connect the ground wire to the following:
  - a) Water pipe.
  - b) Gas pipe.

- c) Drain pipe.
  - d) Other places that are deemed as not reliable by professional personnel.
- ⑤ Power cord and communication wire shall be laid separately with distance above 10cm. otherwise, communication malfunction may be caused.
- ⑥ Power cord and communication wire shall be connected properly. If the power cord is connected to the communication port, the mainboard will be burnt.

## 5.2 Installation of Power

### 5.2.1 Installation Instructions of Power Cord

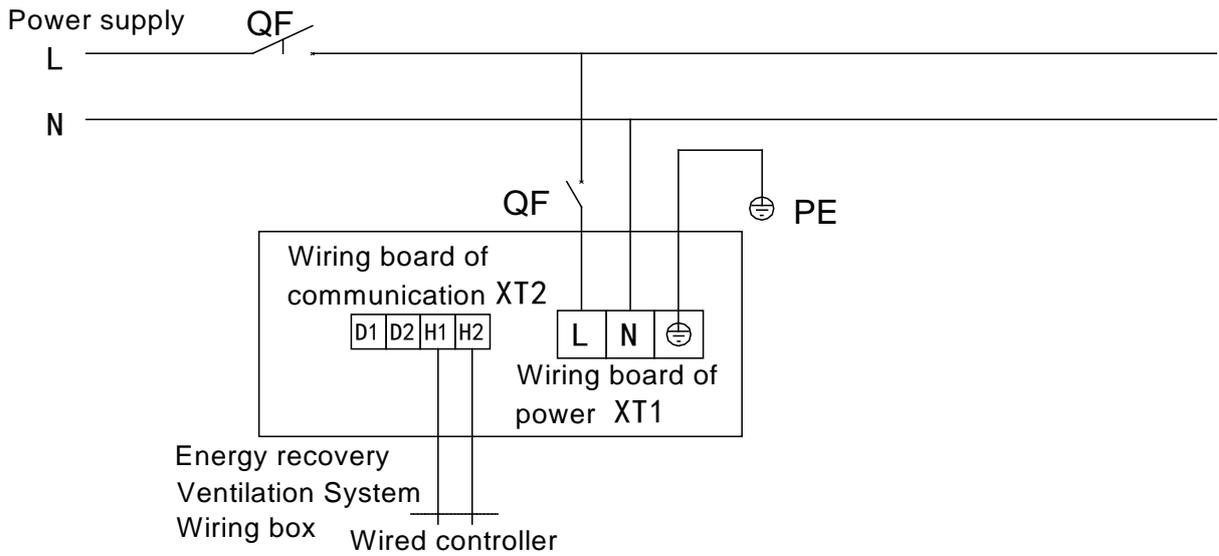
- (1) Lay the wire according to the wiring diagram provided with the unit. The power cord must be laid in the wire tube for protection. Reserve sufficient length of wire at the two ends of power cord, to ensure that the power cord will not be stretched during connection. Prohibit lengthening the power cord.
- (2) When the unit is installed and fixed, connect the power cord to the unit from specialized power for air conditioner. Before connecting wire, make sure the power switch is off and make warning label.
- (3) Open the electric box cover of unit; let the wire go through wire loop and connect corresponding phase wire (live wire), neutral wire, grounding wire to correct position.
- (4) After making sure the connection of power cord is correct, use specialized wire clip inside the electric box to fix the power cord to avoid losing of wiring terminal or stretching by external force.
- (5) After finishing connecting wire, close the electric box cover and take sufficient measures for preventing dust and water.

### 5.2.2 Selection of Power Cord Diameter and Air Switch

Table 14 Electric Selection List

Model	Power	Air switch capacity (A)	Minimum sectional area of ground wire(mm <sup>2</sup> )	Minimum sectional area of power cord(mm <sup>2</sup> )
FHBQGL-D1.5DA-T	208-230V~,60Hz; 220-240V~,50Hz	6	1.0	1.0
FHBQGL-D2.5DA-T		6	1.0	1.0
FHBQGL-D3.5DA-T		6	1.0	1.0
FHBQGL-D5DA-T		6	1.0	1.0

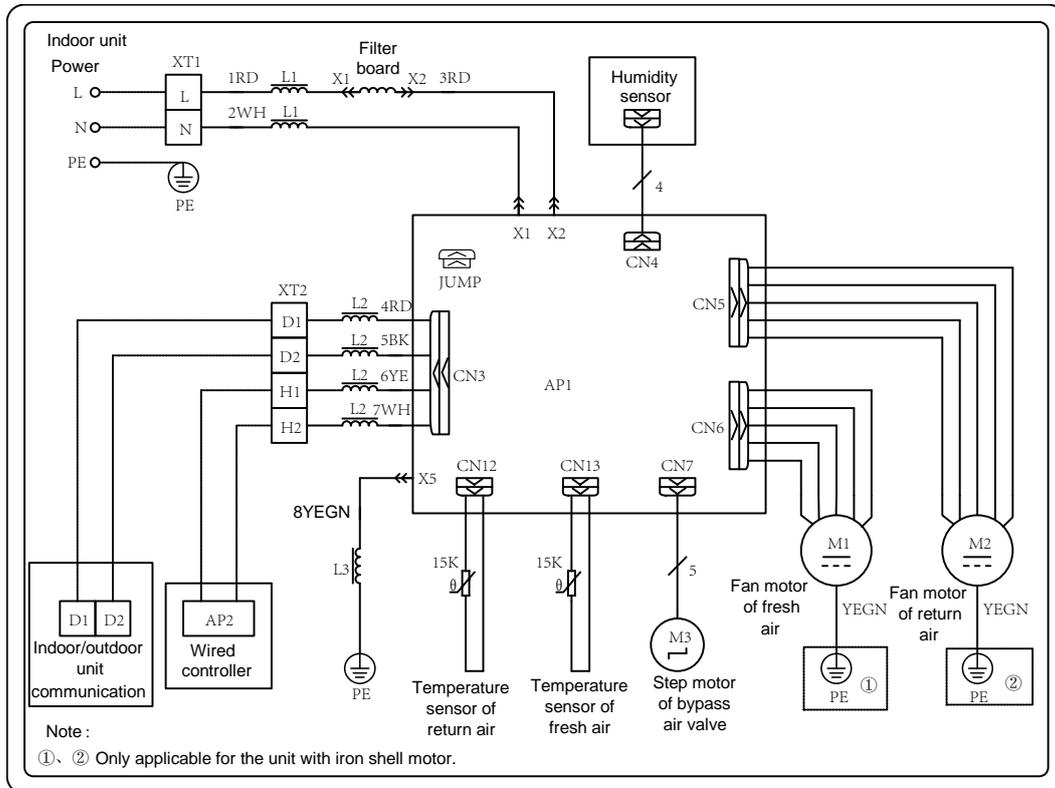
### 5.2.3 Unit External Wiring Diagram



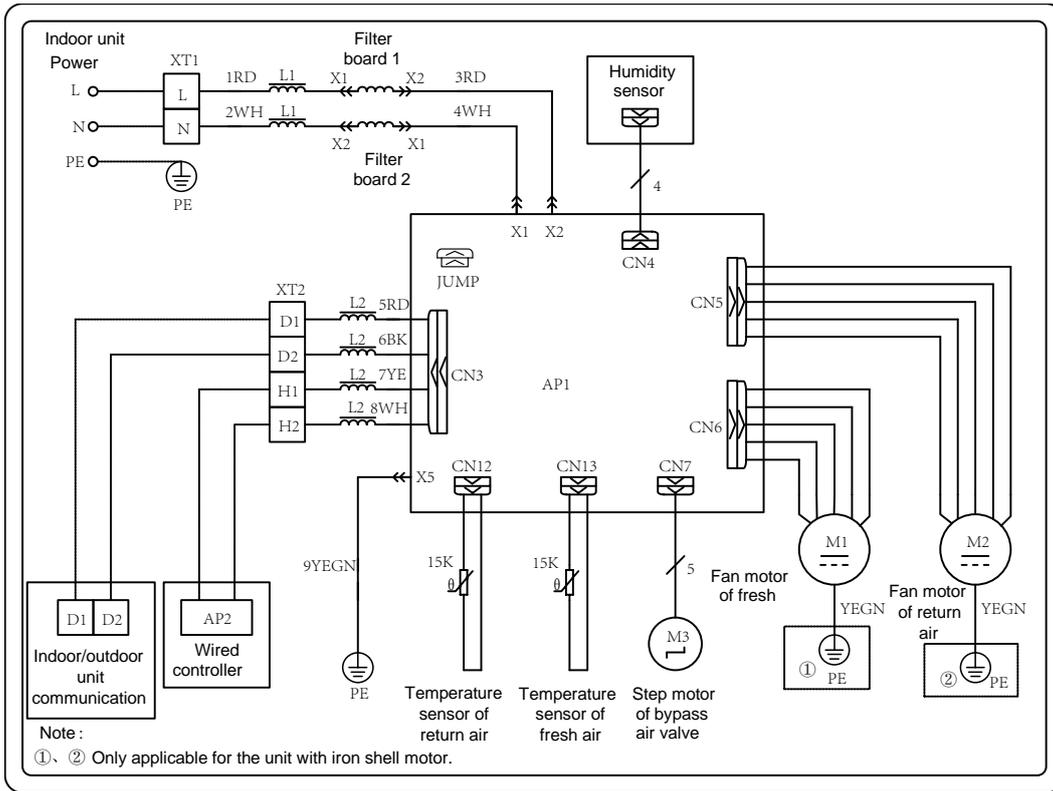
FHBQGL -D1.5DA-T、FHBQGL-D2.5DA-T、FHBQGL-D3.5DA-T、FHBQGL-D5DA-T

Fig. 12 External Wiring Diagram

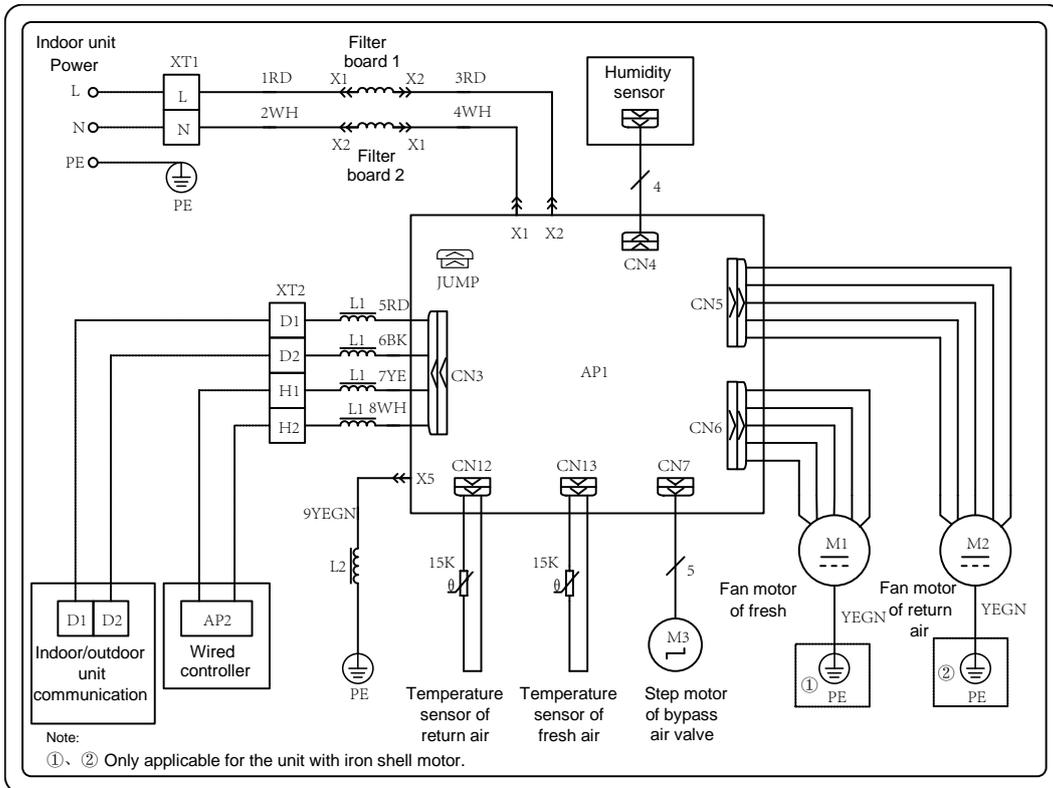
### 5.3 Wiring Diagram



FHBQGL-D1.5DA-T Internal Wiring Diagram, FHBQGL-D2.5DA-T Internal Wiring Diagram



FHBQGL-D3.5DA-T Internal Wiring Diagram



FHBQGL-D5DA-T Internal Wiring Diagram

Fig. 13 Internal Wiring Diagram



**NOTE!** On-site wiring shall subject to the wiring diagram pasted on the unit.

## 6 Installation of Communication System

### 6.1 Connection of Communication Wire Terminal

Unit communication wire shall be fixed by screw.

Communication cable between wired controller and unit shall be fixed with screw.

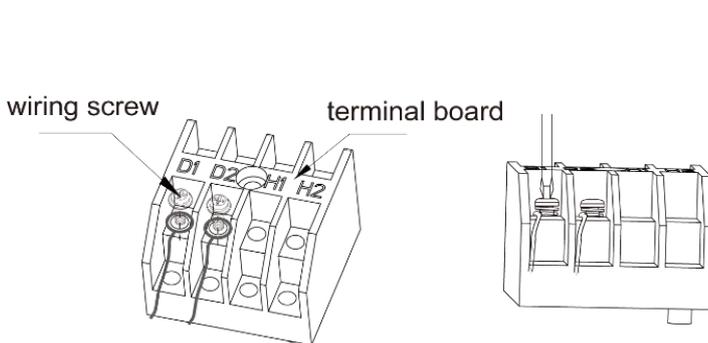


Fig. 14 Wiring Board

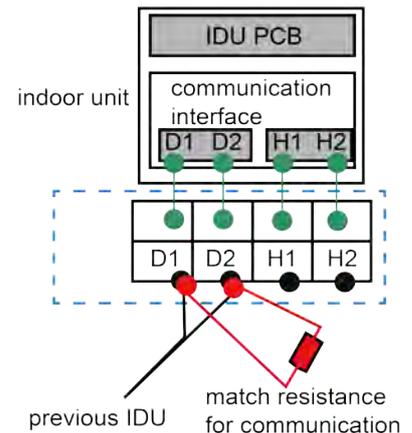


Fig. 15 Communication Wire Interface

### 6.2 Connection of Communication Wire

Detach the electric box cover:

- (1) Connect the communication wire to terminal H1 and H2 of indoor 4-bit wiring board, as shown in Fig. 14.
- (2) Fix the communication wire of wired controller with the wire clamp of electric box.
- (3) If the unit is equipped with air box, connect the communication wire of air box to terminal H1 and H2, and then fix the communication wire with the wire clamp (HBS network can connect 2 air boxes in maximum).
- (4) (when connecting to can1 network and linking to VRF are needed, please refer to this wiring diagram) Connect the communication wire to terminal D1 and D2 of indoor 4-bit wiring board, as shown in Fig. 14.
- (5) Fix the communication cable with clamp of electric box.

- (6) In order to ensure the reliability of communication between IDU and ODU and the communication among each IDU, add a matched resistance(supplied in a package before ex-factory) on the wiring board of the last indoor unit in a series connection. The matched resistance should be connected in parallel between terminal screw D1 and D2, as shown in Fig.15.



## NOTES!

- ① One energy recovery ventilation system can connect two wired controllers that must be set as master one and slave one, as shown in Fig. 16.

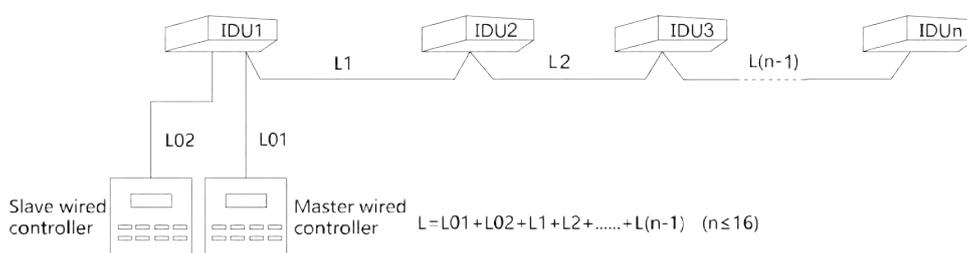


Fig. 16 Wiring Diagram of Wired Controller

- ② When the indoor unit is controlled by two wired controllers, the addresses of the two wired controllers should be different through address setting. Address 1 is for main wired controller; Address 2 is for slave wired controller. Detailed setting please refer to the owner's manual of wired controller.
- ③ One wired controller can control 16 fresh air units in maximum at the same time (this function is only available when the unit is connected to VRF system or virtual outdoor unit.).
- ④ If the fresh air units are not connected to VRF system, while the wired controller shall control several fresh air units, the fresh air units shall connect with virtual outdoor unit; connect one end of communication wire with the virtual outdoor unit and the other end to terminal D1 and D2; other units connect to terminal D1 and D2 through communication wire.

## 6.3 Installation and Removal Methods of Wired Controller

### 6.3.1 Installation Methods of Wired Controller

- (1) Select suitable signal wire for wired controller: two-core signal wire (wire diameter  $\geq 0.75\text{mm}$ , length  $< 30\text{m}$ , recommended length is 10m).

- (2) After making sure the IDU is de-energized, fix one end of signal wire of wired controller to the specialized wiring board for wired controller with screws. Make sure the signal wire is secured.

Detailed installation steps are as shown below:

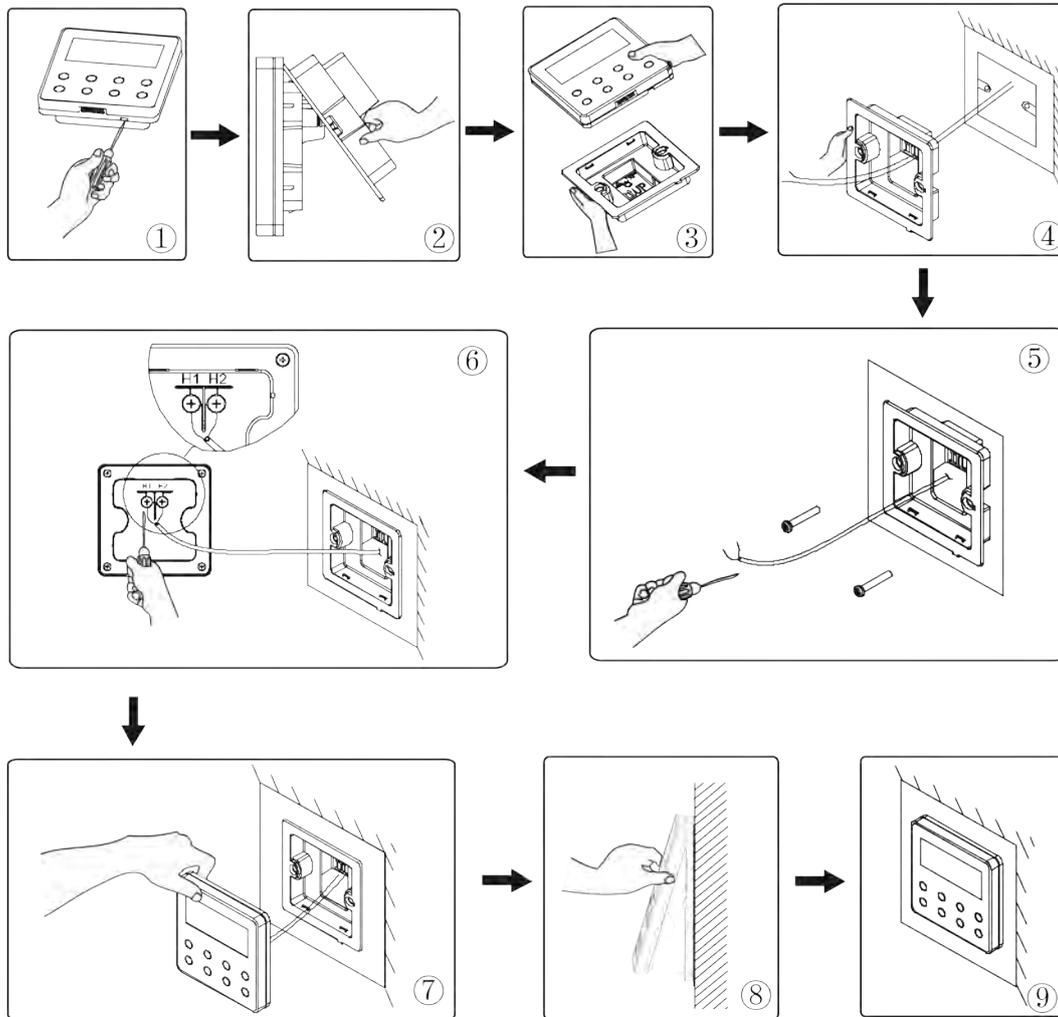


Fig. 17 Installation Diagram for Wired Controller

Simple Installation instructions of wired controller are as below:

- (1) Before installation, please cut off the power for indoor units.
- (2) Pull out the two-core twisted pair from the installation hole on wall, and then pull this wire through the connecting hole at the rear side of soleplate of wired controller.
- (3) Stick the soleplate of wired controller on the wall and then use screw M4×25 to fix the soleplate and installation hole on wall together.

- (4) Connect the two-core twisted pair to the two wiring columns at the back of wired controller and then tighten up the screws. These two wiring terminals do not have poles, but they cannot be connected to heavy current.
- (5) Bundle panel and soleplate of wired controller together and the installation is completed.

### 6.3.2 Disassembly of Wired Controller

Disassembly of wired controller is shown as below:

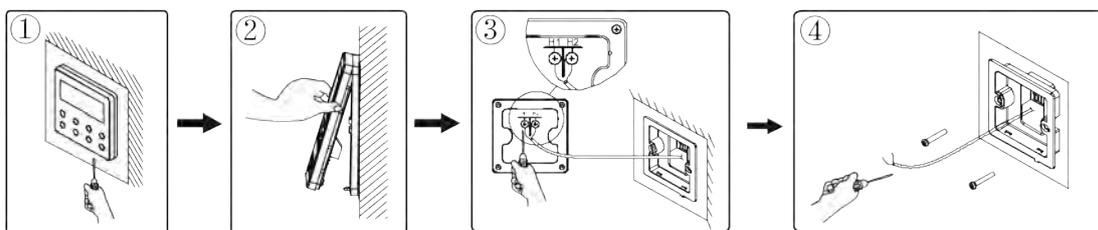


Fig. 18 Disassembly Diagram of Wired Controller

## 7 Installation Acceptance

Check the following items in the table to accept the installation after finishing installation.

Table 15 Engineering Acceptance List

No.	Installation content	Inspection item	Inspection result
1	Unit	● If the hanging level of unit comply with the requirement.	Qualified Unqualified
		● The unit has been taken sufficient protection measure and without damage.	Qualified Unqualified
2	Air duct, air port and other parts	● Connection at each joint of air duct is tight and without leakage.	Qualified Unqualified
		● If the location of air supply port is suitable and if the air port is blocked.	Qualified Unqualified
		● If the position and size of maintenance port are suitable, which makes it convenient for maintaining the unit.	Qualified Unqualified
3	Insulation parts	● If the insulation thickness of air duct comply with the requirement.	Qualified Unqualified
		● If the insulation of air duct is tight enough.	Qualified Unqualified
		● If the combustibility class of insulation material comply with related fire control requirement.	Qualified Unqualified

No.	Installation content	Inspection item	Inspection result
4	Electric parts	<ul style="list-style-type: none"> <li>If specialized power supply for fresh air unit is adopted.</li> </ul>	Qualified Unqualified
		<ul style="list-style-type: none"> <li>If the power cord and air switch comply with the requirement of unit.</li> </ul>	Qualified Unqualified
		<ul style="list-style-type: none"> <li>If the wire layout is reasonable and if the wire is laid in tube for protection.</li> </ul>	Qualified Unqualified
		<ul style="list-style-type: none"> <li>If the power cord and communication wire are laid separately.</li> </ul>	Qualified Unqualified
		<ul style="list-style-type: none"> <li>If the power cord, communication wire, grounding wire are connected properly according to the wiring diagram.</li> </ul>	Qualified Unqualified
Remark			

## Chapter IV Maintenance

### 1 Troubleshooting

#### 1.1 Error Codes

Table 15 Error Codes

Error code	Content	Error code	Content
L1	Motor protection	L4	Abnormal power supply for wired controller
L5	Freeze protection	L9	Quantity of group control indoor units setting error
LA	Indoor units incompatibility error	d1	Indoor PCB error
d3	Indoor ambient temperature sensor error (return air/inlet air temperature sensor error)	d9	Jumper cap error
dA	IDU network address error	dH	Wired controller PCB error
db	Project debugging	y7	Fresh air inlet temperature sensor error
y8	Main error of indoor air box sensor	b8	Malfunction of outdoor humidity sensor
C0	Communication error (including communication error between IDU and ODU, between IDU and wired controller, between wired controller and air box)	C5	IDU project code conflict
CF	Multiple master controlling units error	CP	Multiple master wired controllers error

## 1.2 Exception Analyzing and Troubleshooting

### 1.2.1“L1” Motor protection

Error display: IDU wired controller and IDU receive light board will display



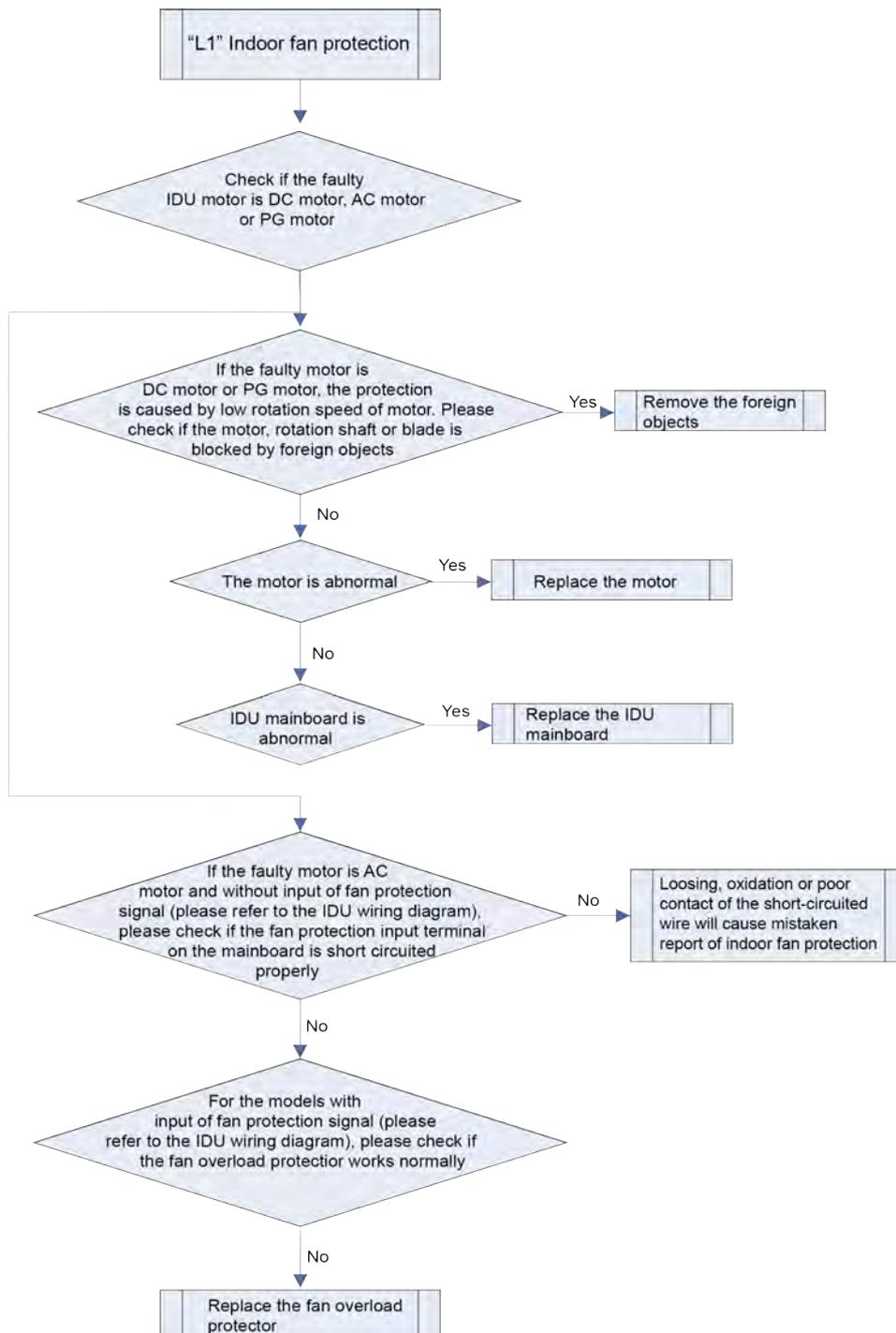
Error judgment condition and method:

Check if the rotation speed of IDU is too slow, or it stops rotation, or protection signal of outdoor fan is transferred. If yes, it is judged that indoor fan protection occurs.

Possible reason:

- Motor stops operation or it is blocked
- IDU mainboard is abnormal

Troubleshooting:



1.2.2 “L4” Abnormal power supply for wired controller

Error display: IDU wired controller and IDU receive light board will display



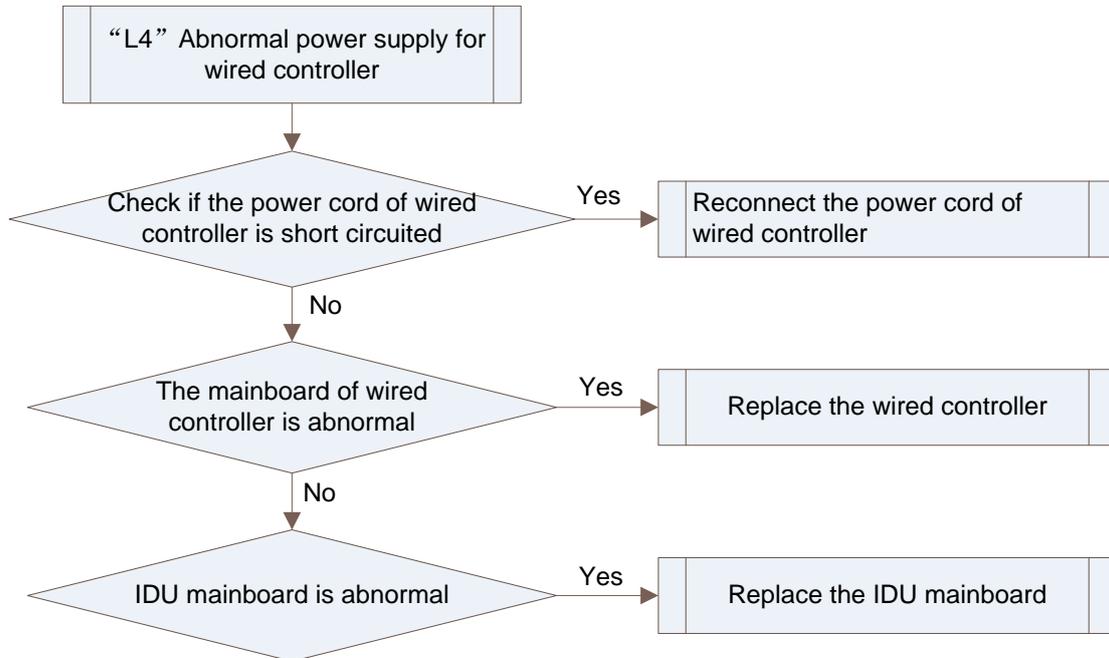
Error judgment condition and method:

Check if the power supply current from IDU to wired controller is normal. If power supply current is too big, it is judged that the current is abnormal.

Possible reason:

- Power supply conducting wire of wired controller is short circuited
- IDU mainboard is abnormal
- Mainboard of wired controller is abnormal

Troubleshooting:



### 1.2.3 “L5” Freeze protection



Error display: IDU wired controller and IDU receive light board will display

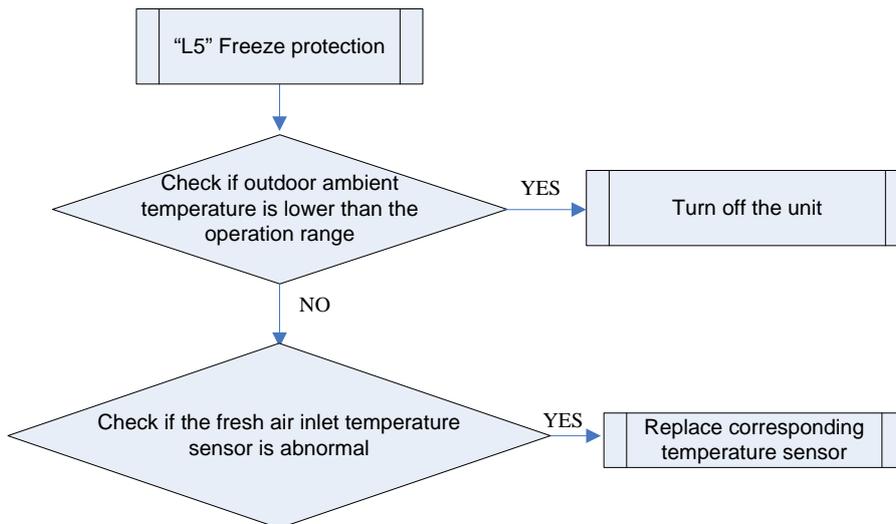
Error judgment condition and method:

Check fresh air inlet temperature. When fresh air inlet temperature is too low, freeze protection will be activated to prevent freezing damage of unit.

Possible reason:

- Outdoor ambient temperature is too low
- Fresh air inlet temperature sensor is abnormal

Troubleshooting:



### 1.2.4 “L9” Quantity of group control indoor units setting error

Error display: IDU wired controller and IDU receive light board will display



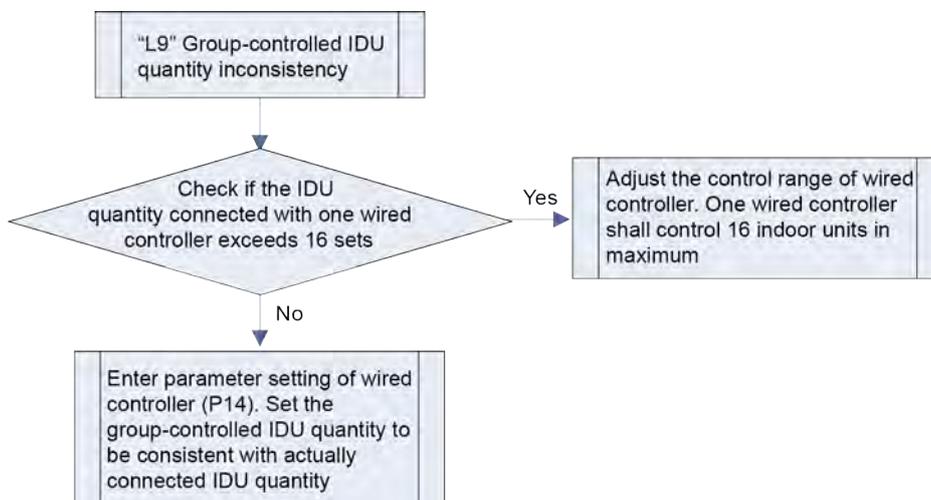
Error judgment condition and method:

If the IDU quantity connected with wired controller exceeds 16 sets or actually connected IDU quantity is inconsistent with the set group-controlled IDU quantity.

Possible reason:

- IDU quantity connected with one wired controller exceeds 16 sets
- Actually connected IDU quantity is inconsistent with the set group-controlled IDU quantity

Troubleshooting:



### 1.2.5 “LA” Indoor units incompatibility error

Error display: IDU wired controller and IDU receive light board will display



Error judgment condition and method:

Wired controller detects that the IDUs connected with itself belong to different series.

Possible reason:

- IDUs connected with one wired controller belong to different series

Troubleshooting:

Make sure the IDUs connected with one wired controller belong to the same series.

### 1.2.6 “d1” Indoor circuit board error

Error display: IDU wired controller and IDU receive light board will display



Error judgment condition and method:

Check if the reading of address chip and memory chip of IDU mainboard is normal. If the data of address chip and memory chip cannot be read, it is abnormal.

Possible reason:

- Address chip is abnormal
- Memory chip is abnormal. Replace main control board directly

Troubleshooting:

Replace main control board directly.

### 1.2.7 “d3” Indoor ambient temperature sensor error

Error display: IDU wired controller and IDU receive light board will display



Error judgment condition and method:

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value, If the sampling AD value exceeds upper limit and lower limit in 5 seconds continuously, report the error.

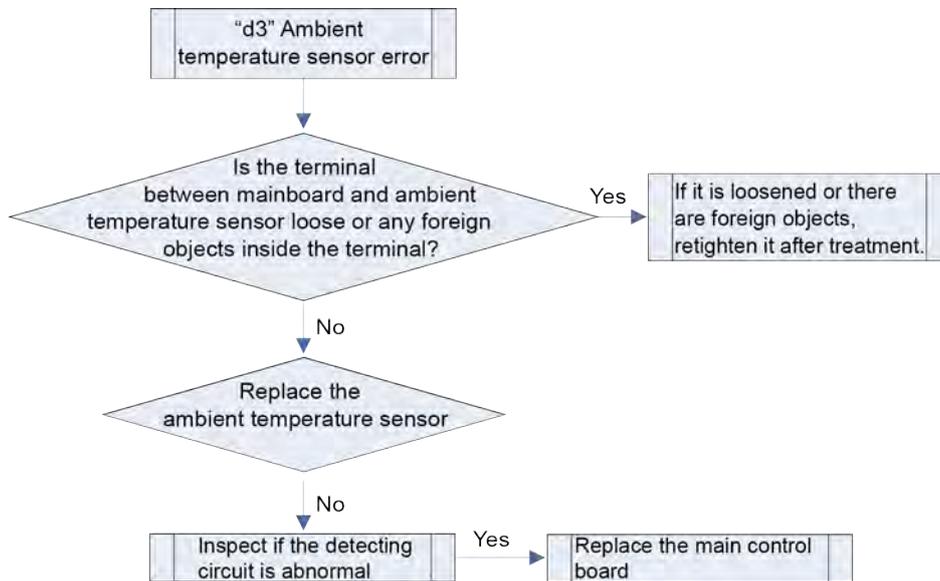
Possible reason:

- Poor contact between ambient temperature sensor and terminal in mainboard interface

■ Ambient temperature sensor is abnormal

■ Detecting circuit is abnormal

Troubleshooting:



### 1.2.8 “d9” Jumper cap error

Error display: IDU wired controller and IDU receive light board will display



Error judgment condition and method:

Possible reason:

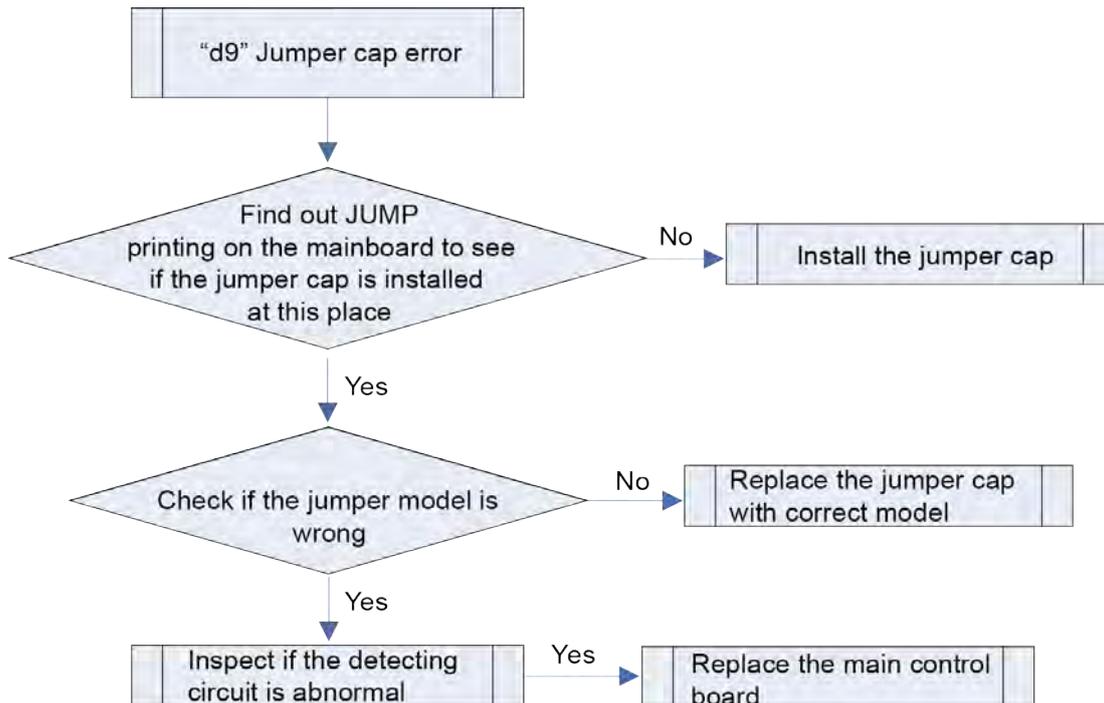
If jumper cap model doesn't match with mainboard, report the error.

■ Jumper cap is not installed

■ Jumper cap model is wrong

■ Detecting circuit is abnormal

Troubleshooting:



### 1.2.9 “dA” IDU network address error

Error display: IDU wired controller and IDU receive light board will display



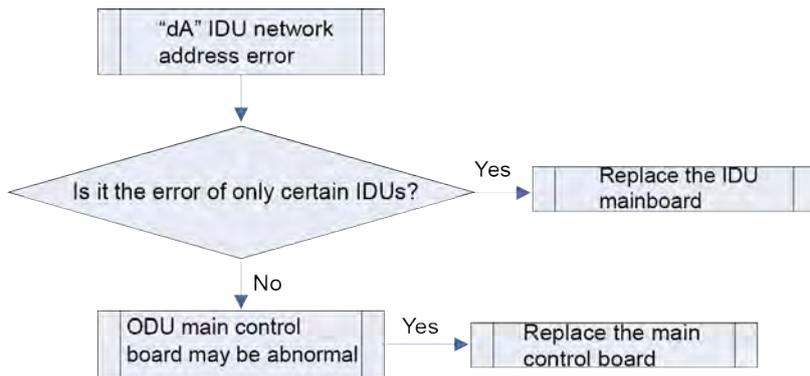
Error judgment condition and method:

Through testing the IDU address chip and IP address, if address chip cannot be read, IDU IP is 0 or IP is in conflict, report the error.

Possible reason:

- ODU allocated address is wrong
- IDU treatment is wrong
- Address chip is abnormal

Troubleshooting:



### 1.2.10 “dH” wired controller circuit board error

Error display: IDU wired controller and IDU receive light board will display



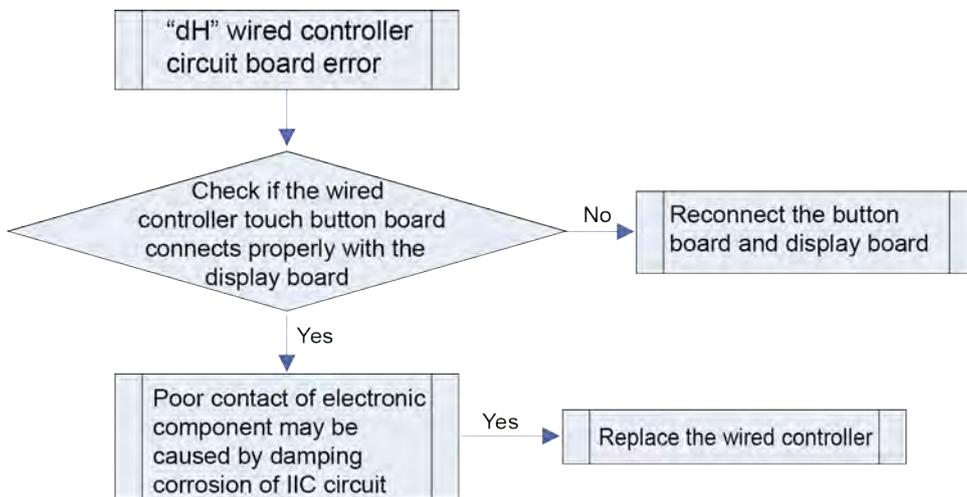
Error judgment condition and method:

Wired controller IIC communication is abnormal.

Possible reason:

- Communication of wired controller touch button board and display board IIC is abnormal
- Read and write of wired controller memory chip IIC is abnormal (when memory chip is existed)

Troubleshooting:



### 1.2.11 “db” Project debugging

Error display: IDU wired controller and IDU receive light board will display



Error judgment condition and method:

This is a status code of project debugging, not an error code. When IDU or ODU displays this code, it means the unit is under debugging status and the IDU cannot be operated.

Possible reason: ——

Troubleshooting: ——

### 1.2.12 “y7” Fresh air inlet temperature sensor error



Error display: IDU wired controller and IDU receive light board will display

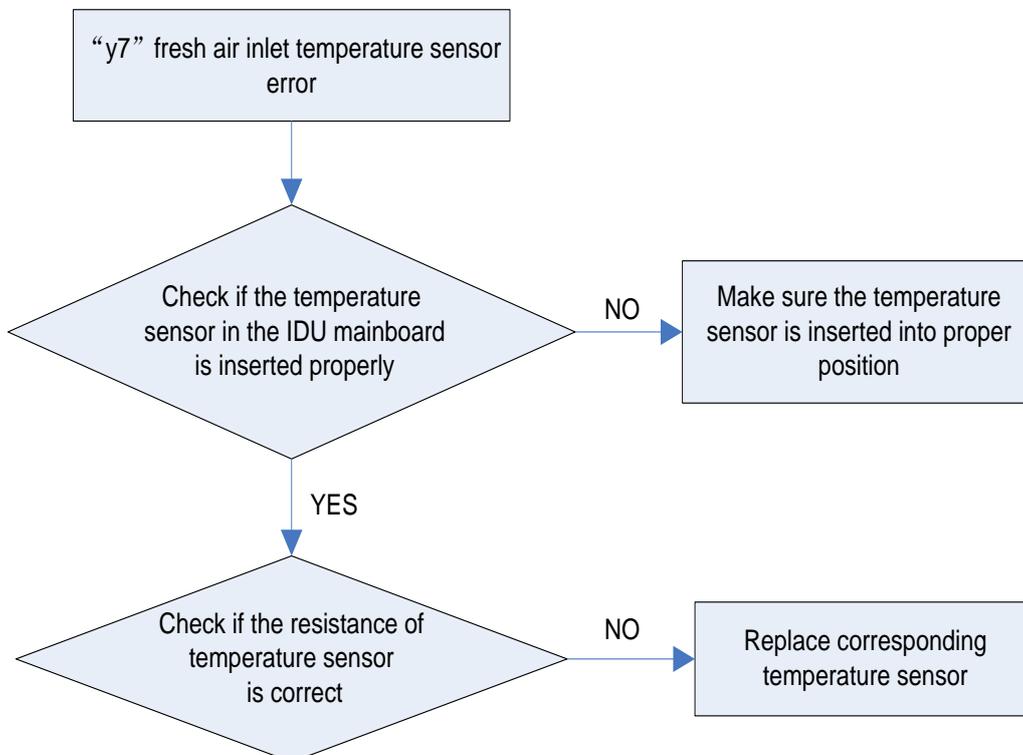
Error judgment condition and method:

When the wired controller displays y7 and the fan stops operation, we can judge that it is temperature sensor error.

Possible reason:

- Connection between temperature sensor insert and mainboard is abnormal
- Temperature sensor is broken

Troubleshooting:



### 1.2.13 “y8” Main error of indoor air box sensor



Error display: IDU wired controller and IDU receive light board will display

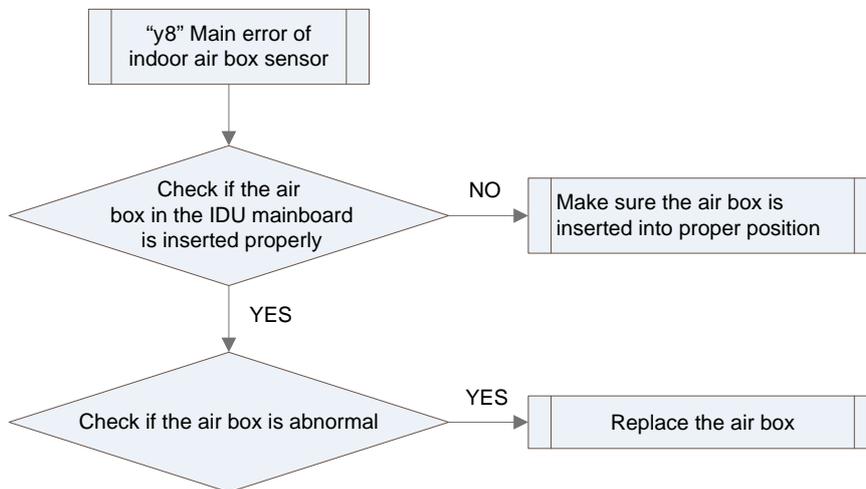
Error judgment condition and method:

When the wired controller displays y8 and the fan stops operation, we can judge that it is main error of indoor air box sensor.

Possible reason:

- Connection between air box insert and mainboard is abnormal
- Air box is broken

Troubleshooting:



### 1.2.14 “b8” Malfunction of outdoor humidity sensor



Error display: IDU wired controller and IDU receive light board will display

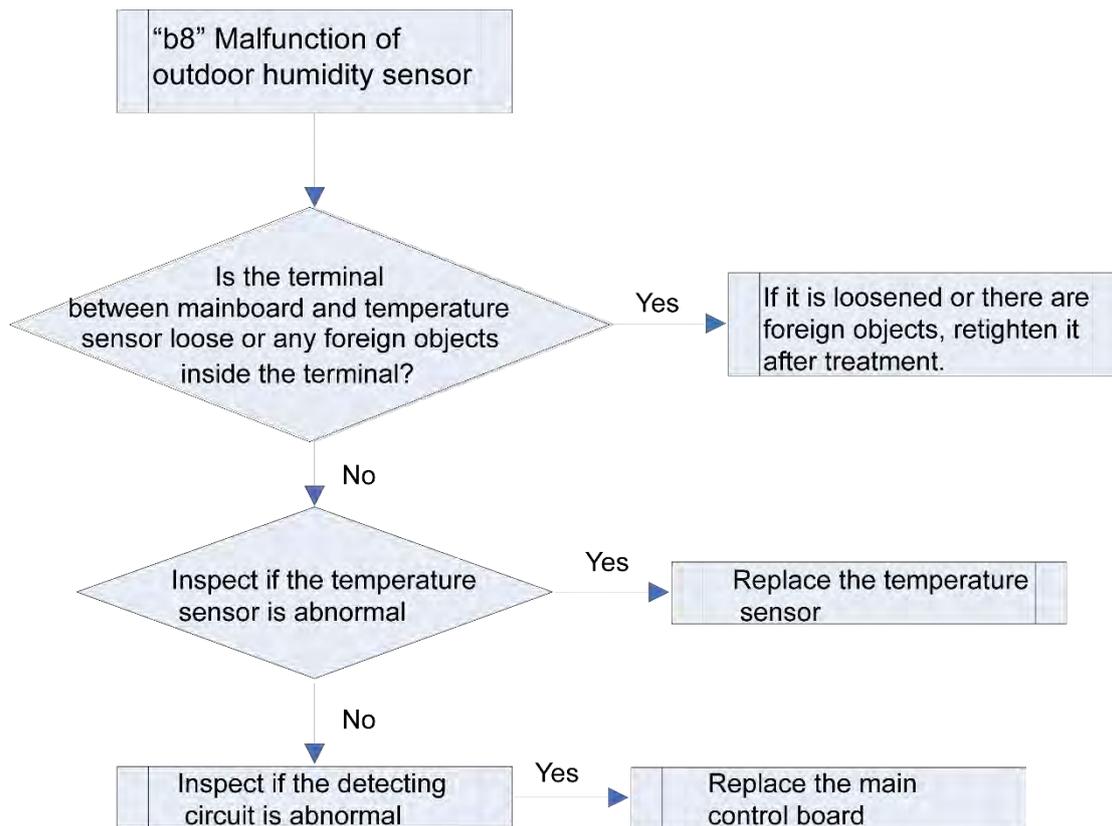
Error judgment condition and method:

Sample the AD value of temperature sensor through temperature sensor detecting circuit and judge the range of AD value; if the sampled AD value exceeds upper limit and lower limit in 30 seconds continuously, report the error.

Possible reason:

- Poor contact between temperature sensor and terminal in mainboard interface
- Temperature sensor is abnormal
- Detecting circuit is abnormal

Troubleshooting:



### 1.2.15“C0” Communication error



Error display: IDU wired controller and IDU receive light board will display

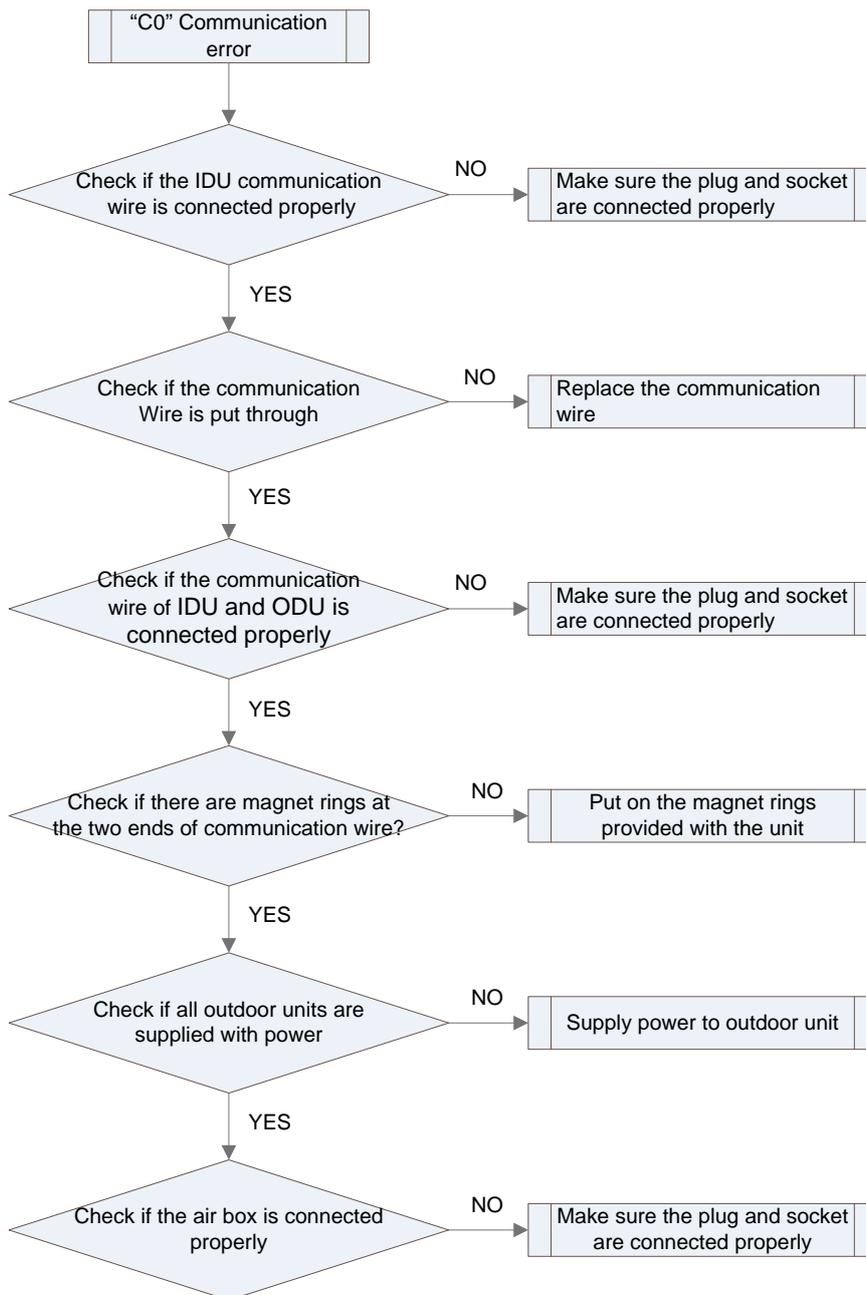
Error judgment condition and method:

When the wired controller displays C0 and the fan stops operation, we can judge that it is communication error.

Possible causes:

- Connection of communication wire is abnormal
- Communication is disturbed by heavy current
- Model of wired controller is wrong
- Mainboard error
- Connection of air box is abnormal

Troubleshooting:



**1.2.16“C5” IDU project code conflict**



Error display: debugging software and long-distance monitoring software will display

Error judgment condition and method:

Check IDU project code. All IDUs with the same project codes will report this error. But this error will be displayed and require elimination only when debugging software, central controller and long-distance monitoring software are connected.

When it is not in central control, it will not affect the operation of this indoor unit and the whole unit even if there is project code conflict.

Possible reason:

- Project code settings are identical
- IDU mainboard is replaced by the mainboard that is ever used in other system

Troubleshooting:

You can reset the conflict IDU project codes through the following ways:

Reset project codes through debugging software.

Reset project codes through wired controller.

Reset project codes through debugging remote controller.

Reset this mainboard through the reset button on IDU mainboard and let the system reallocate the code.

### 1.2.17 “CF” Multiple master controlling units error



Error display: IDU wired controller and IDU receive light board will display

Error judgment condition and method:

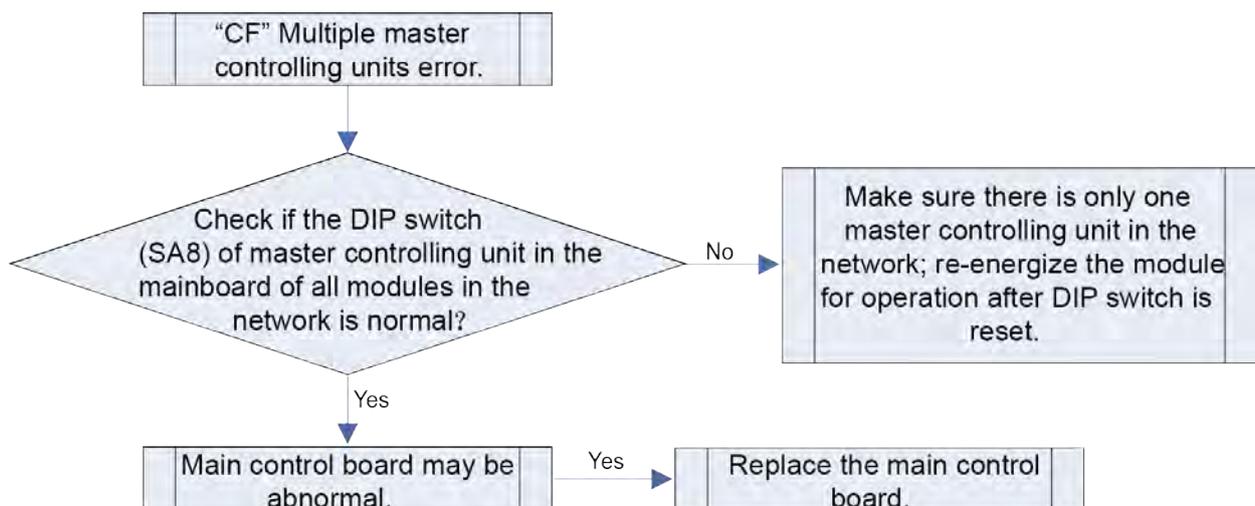
Mainboard detects the DIP switch (SA8) of master controlling unit to judge if it is master controlling unit. When multiple master controlling units are detected in the communication network of multiple modules system, it will report this error.

Possible reason:

■ DIP switch of master controlling unit is abnormal; there are multiple master controlling units in the network

■ Detecting circuit is abnormal

Troubleshooting:



### 1.2.18“CP” Multiple master wired controllers error



Error display: IDU wired controller and IDU receive light board will display

Error judgment condition and method:

There are two or more wired controllers in one HBS network are set as the master wired controller.

Possible reason:

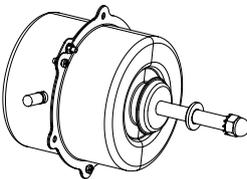
■When two (or more) wired controllers control one or several IDUs simultaneously, the two (or more) wired controller are master wired controller

Troubleshooting:

Make sure there are two wired controllers in maximum to control one or several IDUs; when two wired controllers control one or several IDUs, enter wired controller parameter setting (P13) to set the address of one wired controller as 02, that is slave wired controller.

## 2 Maintenance of Key Components

### 2.1 Introduction of Key Components

Picture	Name	Function
	<p>Motor</p>	<p>Fresh air power source, make the fan blade operate and send fresh air to the destination.</p>

### 2.2 Disassembly of Key Components

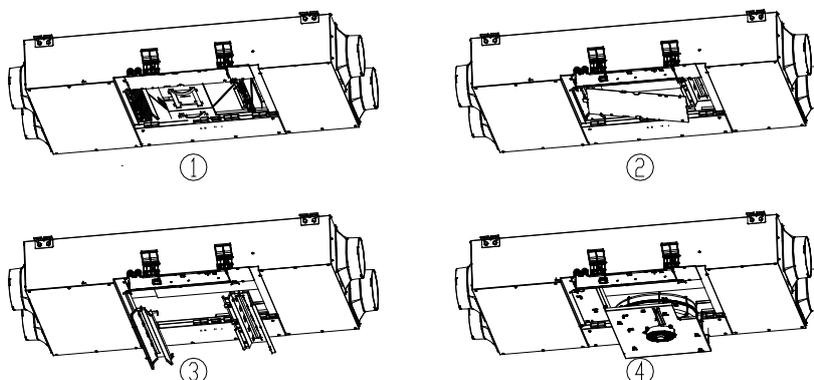


Fig. 19 Disassembly Diagram of Component

Method for repairing motor: after main power supply is cut off for 5mins, open and remove maintenance panel ①, remove energy recovery cores and filters → remove electric box ②, pull out the motor wiring terminal on the mainboard → remove filter installation plate ③ → pull out the motor installation plate ④.

## 2.3 Maintenance of Unit

- (1) The filter of indoor unit shall be cleaned and replaced periodically.
- (2) If the unit has abnormal noise, please stop the unit and ask after-sales personnel to check the unit. The unit can be operated again when troubleshooting is finished.
- (3) Methods for replacing filter:

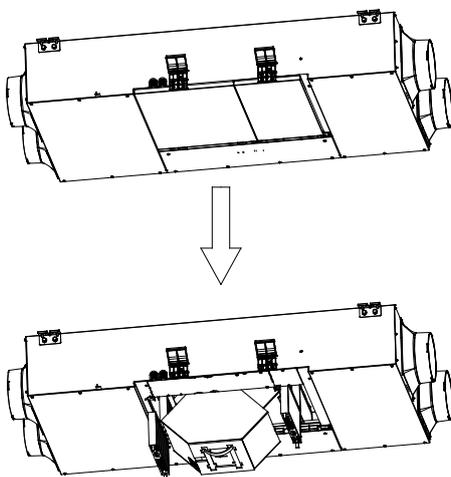


Fig. 20 Disassembly Diagram of Filter and Energy recovery Core

Method for replacing energy recovery core and filter as shown in the figure, open the limiting sheet of maintenance panel; open the clasp and take off maintenance panel 1 and 2(for model FHBQGL-D1.5DA-T and FHBQGL-D2.5DA-T, remove the fixing screw of maintenance panel 2 with a screwdriver); rotate filter damper to replace filter; loosen the limiting sheet of core with a screwdriver and pull away the sheet to replace the energy recovery core.

### 3 Unit Explosion View and Parts List

#### 3.1 Explosion View and Parts List

Explosion View:

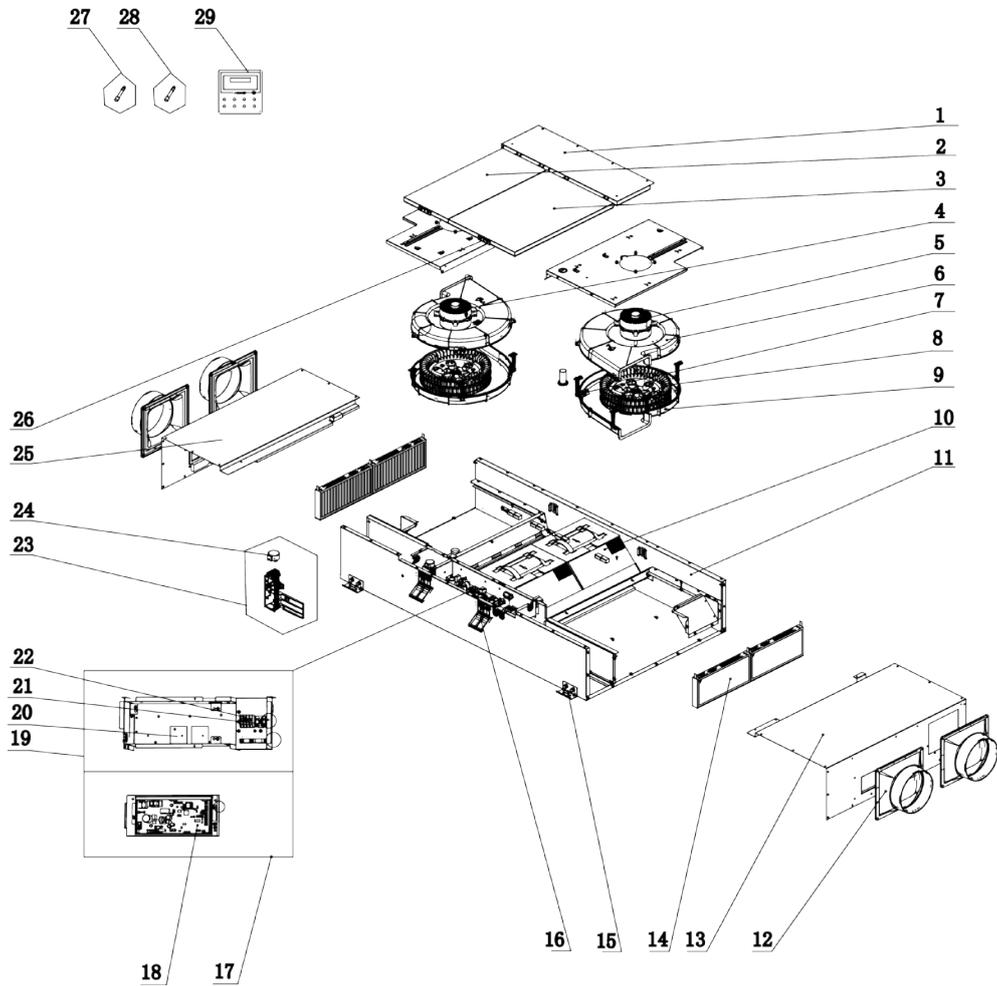


Fig. 21 Explosion View

Explosion View:

Model: FHBQGL-D1.5DA-T

Product code: EH01300060

No.	Name	Code	Quantity
29	Display Board	'300001000231	1
28	Ambient Temperature Sensor	'39000198G	1
27	Ambient Temperature Sensor	'39000206	1
26	Fastener	'02206000009	1
25	Cover Plate Assy	'000114000030	1
24	Stepping Motor	'1521240206	1
23	Air valve assy	'000214000001	1
22	Terminal Board	'4201800002601	1
21	Terminal Board	'42011106	1
20	Filter Board	'30226000065	1
19	Electric Box Assy	'100002003588	1
18	Main Board	'300002000342	1
17	Electric Box Assy 2	'100002001603	1
16	Fastener	'02206000010	2
15	Hook	'0211246601P02	4
14	Mid-effect filter	'710022000007	4
13	Cover Plate Assy	'000114000029	1
12	Air Outlet Sub-Assy	'01376000017	4
11	Base Plate Assy	'011007000043	1
10	Total heat exchange core assy	'812036000006	2
9	Propeller Housing 1	'200230000010	2
8	Centrifugal Fan	'103003000014	2
7	Humidity Sensor	'30116072	1
6	Propeller Housing 2	'200230000011	2
5	Brushless DC Motor	'1570600005301	1
4	Brushless DC Motor	'1570600005303	1
3	Cover Plate Assy	'000114000050	1
2	Cover Plate Assy	'000114000048	1
1	Cover Plate Assy	'000114000049	1

Above data is subject to change without notice, pls reference the SP in global service website.

Model: FHBQGL-D2.5DA-T

Product code: EH01300080

No.	Name	Code	Quantity
29	Display Board	'300001000231	1
28	Ambient Temperature Sensor	'39000198G	1
27	Ambient Temperature Sensor	'39000206	1
26	Fastener	'02206000009	1
25	Cover Plate Assy	'000114000030	1
24	Stepping Motor	'1521240206	1
23	Air valve assy	'000214000001	1
22	Terminal Board	'4201800002601	1
21	Terminal Board	'42011106	1
20	Filter Board	'30226000065	1
19	Electric Box Assy	'100002003588	1
18	Main Board	'300002000342	1
17	Electric Box Assy 2	'100002001603	1
16	Fastener	'02206000010	2
15	Hook	'0211246601P02	4
14	Mid-effect filter	'710022000007	4
13	Cover Plate Assy	'000114000029	1
12	Air Outlet Sub-Assy	'01376000017	4
11	Base Plate Assy	'011007000043	1
10	Total heat exchange core assy	'812036000006	2
9	Propeller Housing 1	'200230000010	2
8	Centrifugal Fan	'103003000014	2
7	Humidity Sensor	'30116072	1
6	Propeller Housing 2	'200230000011	2
5	Brushless DC Motor	'1570600005302	1
4	Brushless DC Motor	'1570600005304	1
3	Cover Plate Assy	'000114000050	1
2	Cover Plate Assy	'000114000048	1
1	Cover Plate Assy	'000114000049	1

Above data is subject to change without notice, pls reference the SP in global service website.

Model: FHBQGL-D3.5DA-T

Product code: EH01300070

No.	Name	Code	Quantity
29	Display Board	'300001000231	1
28	Ambient Temperature Sensor	'39000198G	1
27	Ambient Temperature Sensor	'39000206	1
26	Fastener	'02206000009	1
25	Cover Plate Assy	'000114000020	1
24	Stepping Motor	'1521240206	1
23	Air valve assy	'000214000001	1
22	Terminal Board	'4201800002601	1
21	Terminal Board	'42011106	1
20	Filter Board	'30226000065	2
19	Electric Box Assy	'100002003481	1
18	Main Board	'300002000342	1
17	Electric Box Assy 2	'100002001603	1
16	Fastener	'02206000010	2
15	Hook	'0211246601P02	4
14	Mid-effect filter	'710022000005	4
13	Cover Plate Assy	'000114000021	1
12	Air Outlet Sub-Assy	'01376000017	4
11	Base Plate Assy	'011007000044	1
10	Total heat exchange core assy	'812036000004	2
9	Propeller Housing 1	'200230000010	1
		'200230000011	1
8	Centrifugal Fan	'103003000012	1
		'103003000014	1
7	Humidity Sensor	'30116072	1
6	Propeller Housing 2	'200230000008	1
		'200230000009	1
5	Brushless DC Motor	'150104000011	1
4	Brushless DC Motor	'1570600005305	1
3	Cover Plate Assy	'000114000040	1
2	Cover Plate Assy	'000114000041	1
1	Cover Plate Assy	'000114000051	1

Above data is subject to change without notice, pls reference the SP in global service website.

Model: FHBQGL-D5DA-T

Product code: EH01300050

No.	Name	Code	Quantity
29	Display Board	'300001000231	1
28	Ambient Temperature Sensor	'39000198G	1
27	Ambient Temperature Sensor	'39000206	1
26	Fastener	'02206000009	1
25	Cover Plate Assy	'000114000017	1
24	Stepping Motor	'1521240206	1
23	Air valve assy	'000214000001	1
22	Terminal Board	'4201800002601	1
21	Terminal Board	'42011106	1
20	Filter Board	'30226000065	2
19	Electric Box Assy	'100002003481	1
18	Main Board	'300002000342	1
17	Electric Box Assy 2	'100002001603	1
16	Fastener	'02206000010	2
15	Hook	'0211246601P02	4
14	Mid-effect filter	'710022000006	4
13	Cover Plate Assy	'000114000043	1
12	Air Outlet Sub-Assy	'017130000005	4
11	Base Plate Assy	'011007000041	1
10	Total heat exchange core assy	'812036000003	2
9	Propeller Housing 1	'200230000009	2
8	Centrifugal Fan	'103003000012	2
7	Humidity Sensor	'30116072	1
6	Propeller Housing 2	'200230000008	2
5	Brushless DC Motor	'150104000011	1
4	Brushless DC Motor	'15010400001101	1
3	Cover Plate Assy	'000114000035	1
2	Cover Plate Assy	'000114000019	1
1	Cover Plate Assy	'000114000044	1

Above data is subject to change without notice, pls reference the SP in global service website.



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