GREE
Change for life

Service Manual

Energy Recovery Ventilation System

Model:
FHBQGL-D8DA-K
FHBQGL-D10DA-K
FHBQGL-D15DA-K
FHBQGL-D20DA-K
FHBQGL-D8DA-S
FHBQGL-D10DA-S
FHBQGL-D15DA-S
FHBQGL-D20DA-S

Contents

Safety notices (please be sure to abide)

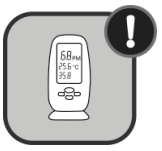
⚠ **WARNING**: If not abide strictly, it may cause severe damage to the unit or the people.

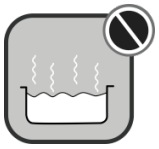
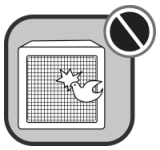
⚠ **NOTE**: If not abide strictly, it may cause slight or medium damage to the unit or the people.

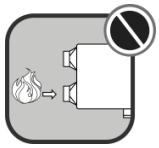
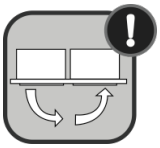
This sign indicates that the operation must be prohibited. Improper operation may cause severe damage or death to people.

This sign indicates that the items must be observed. Improper operation may cause damage to people or property.

Follow all the advisories below before using the product.

	Please install the unit according to the instructions in this manual. Read this manual carefully before starting up or checking the machine.		Installation should be performed by the distributor or qualified technicians. Do not install the product by yourself. Improper installation may result in water leakage, electric shock or fire hazard
	Before installation, please check the power cord if it is in accordance with the specifications on the nameplate. Make sure the power is safe.		The air conditioner must be properly grounded through a power receptacle to avoid electric shock. The grounding wire shouldn't be connected with a gas pipe, water pipe, lightning arrester or a telephone line.
	When installing, specialized accessories and parts must be used; otherwise water leakage, electric shock, fire hazard may occur.		A damaged power cord or connecting wire must be replaced with a specialized electric cable by a professional technician.
	If the power cord is to be connected, please put back the cover of electric box after connecting the cord to avoid danger.		For units that adopt wired control, do not connect power until the wired controller is well installed. Otherwise, the wired controller cannot be used.
	When installation is finished, please check and make sure the drain pipe, pipeline and electric wires are all well connected so as to avoid water leakage, refrigerant leakage, electric shock and fire hazard.		Due to the limitation of the detection principle of air quality detector, in places where humidifiers or aroma diffusers are used, the air quality detector will inevitably produce different deviations. This is a normal phenomenon.

	Please verify completely before using the appliance in special places (for example, places where there are precision instruments, food and art works).		Never put your finger or any object into the air outlet or air grille.
	Children under the age of 12 and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge shall not operate this appliance.		Do not operate the machine with wet hands.
	Please turn the unit off and unplug the unit before cleaning. Otherwise, it may cause electric shock or personal injury.		Do not spray water on this product or wash the inside of the unit with water; otherwise, it will cause malfunction or electric shock.
	Do not expose this product directly to water or place it in a damp or corrosive environment.		Do not repair this product by yourself. Incorrect work will cause electric shocks or fire. Please contact GREE service center for repairs.
	Volatile liquid like thinner or gasoline will damage the appearance of this product. (Please use soft dry cloth and wet cloth with mild detergent to clean the outer case of the machine.)		For non- professionals, never touch the fan volute or other movable parts, as it may result in injury.
	When an abnormality (such as a bad smell) occurs, stop the unit at once and disconnect power. Then contact GREE service center. If the unit continues to operate despite abnormal condition, it may be damaged and cause electric shocks or fire.		For safety concern, if the unit is not used for a long time, please remove the power plug.
	Please clean the air filter regularly. Keep the air filter clean.		Install a bird screen or a similar device at the external air vent.

	The outdoor air inlet must be far away from the exhaust port of flammable gas.		The air inlet must be located in a place where backflow of exhaust air will not occur.
	A service port of specific size must be reserved according to the instructions of installation.		In order to avoid incomplete combustion, which may lead to intoxication, keep heating appliances away from the air flow of the unit.
	For pipe fan and partition wall fan, mind the air from the open air duct or other appliances that produce open fire flowing back into the indoor side.		

1 Product introduction

1.1 Nomenclature

FH	B	Q	G	L	-	D	8	D	A	-	K
1	2	3	4	5	-	6	7	8	9		10

No.	Description	Options
1	Model name	FH: Energy recovery ventilation system
2	Energy recovery structure	B: plate-fin type L: recovery wheel R: heat pipe Omit: none
3	Energy recovery type	X: sensible heat Q: total heat Omit: none
4	Air filter	G: filter screen J: electrostatic filter Omit: none
5	Linkage control with VRF unit	L: with linkage control Omit: without linkage control
6	Mounting type	D: ceiling type L: floor type B: wall mounted
7	Air flow	Nominal airflow: number x 100 (m^3/h)
8	Motor	D: DC Omit: AC
9	Design series	A-Z alphabetic order
10	Power supply	K: 220-240VAC 50Hz S: 220-240VAC 50/60Hz

1.2 General introduction

The energy recovery ventilation system (ERV) is capable of giving preheat or precool treatment for fresh air in the outdoors, with purifying filter screens and heat exchange cores acting as the main role. When the ERV starts working, the outdoor fresh air and indoor return air are taken in the unit through its ducts. As air passes through the heat exchange cores, heat and humidity is transferred between the fresh air and the return air. This heat exchange process reduces fresh air load.

The unit adopts a DC motor that reduces energy consumption. Filters and switching cores have flexible structures easy to maintain. The inside of the insulation is sufficiently utilized, and the insulating layer also reduces noise within the unit.

FHBQGL-D8DA-K, FHBQGL-D10DA-K, FHBQGL-D15DA-K, FHBQGL-D20DA-K are subject to COMMISSION REGULATION (EU) No 1253/2014. FHBQGL-D8DA-S，FHBQGL-D10DA-S，FHBQGL-D15DA-S，FHBQGL-D20DA-S are tested under the same working conditions as the models with "-K" are.

Function list

Function	Model **FHBQGL-D8DA-K FHBQGL-D10DA-K FHBQGL-D15DA-K FHBQGL-D20DA-K FHBQGL-D8DA-S FHBQGL-D10DA-S FHBQGL-D15DA-S FHBQGL-D20DA-S**	Remarks
	√ : **Standard function** ○ : **Optional function**	
Operation control	√	
Linkage control	√	Used with multi VRF unit
Fan speed	√	
Heat exchange operation mode	√	
Bypass operation mode	√	
Auto operation mode	√	
Supply air mode	√	
Positive pressure mode	√	
Negative pressure mode	√	
Air filter	√	
Filter clean/replacement alarm	√	
Timer	√	
Group control	√	
Centralized control	√	
Centralized control	○	The function is available when used with Gree centralized controller.
Remote control	○	The function is available when used with Gree remote monitoring system.

1.3 Working principle

ERV is an equipment for comprehensively processing and supplying fresh air. The unit consists of air ducts (- fresh air side and exhaust side) in two sides. The exhaust fan provides power of the exhaust side. The indoor air passes through the filter, the heat exchange core, and then it is sent to the outdoor. The fresh air fan provides power on the fresh air side. Outdoor fresh air suction device. By filter, heat exchange core. Then send it to the room.

1.4 Performance data

Model	FHBQGL-D8DA-K	FHBQGL-D10DA-K	FHBQGL-D15DA-K	FHBQGL-D20DA-K
Power supply	220–240V AC			
Rated frequency (Hz)	50			
Power input (W)	440	540	800	1060
Fresh air input (m³/h)	800	1000	1500	2000
External static pressure (Pa)	100	100	100	100
Thermal exchange efficiency (%)	73	73	73	73
Sound power level (dB)	66	67	71	71.5
Net weight (kg)	82.5	90.5	196	214.5
Connection pipe size of duct type (mm)	250			

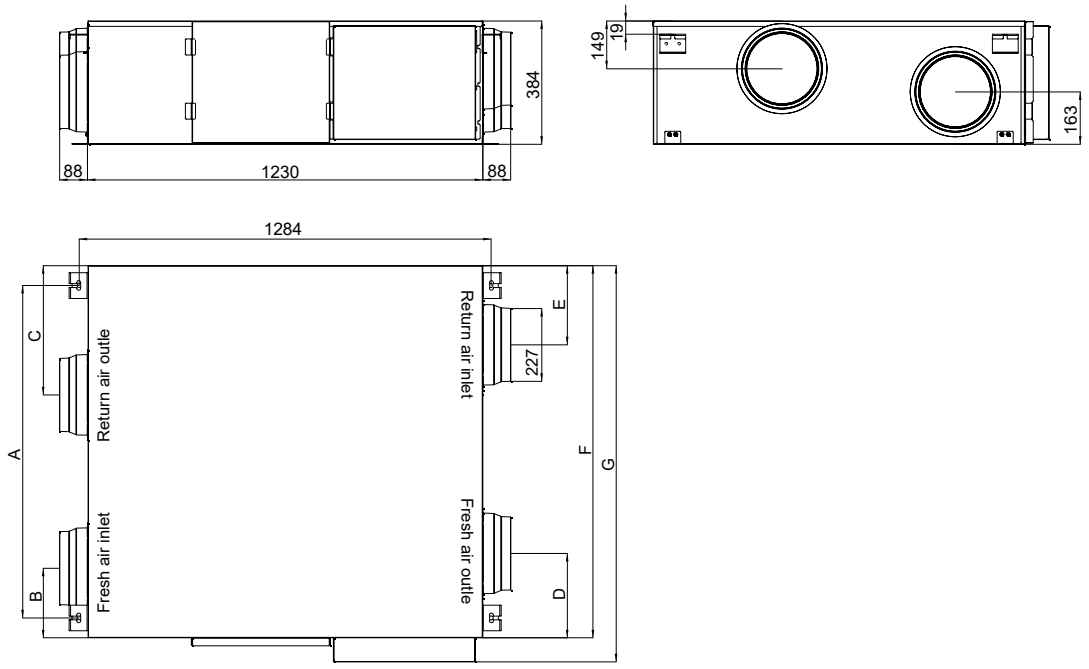
Model	FHBQGL-D8DA-S	FHBQGL-D10DA-S	FHBQGL-D15DA-S	FHBQGL-D20DA-S
Power supply	220–240V AC			
Rated frequency (Hz)	50/60			
Power input (W)	440	540	880	1060
Fresh air input (m³/h)	800	1000	1500	2000
External static pressure (Pa)	100	100	100	100
Thermal exchange efficiency (%)	73	73	73	73
Sound power level (dB)	66	67	71	71.5
Net weight (kg)	82.5	90.5	196	214.5
Connection pipe size of duct type (mm)	250			

⚠NOTE

- Airflow is tested under the condition of rated static pressure in high fan speed, subject to actual installation condition. There might be certain deviation.
- The nominal static pressure is the static pressure tested acquiescently when leaving the factory. Other high-level filter might affect unit performance parameters.

1.5 Outline dimensions

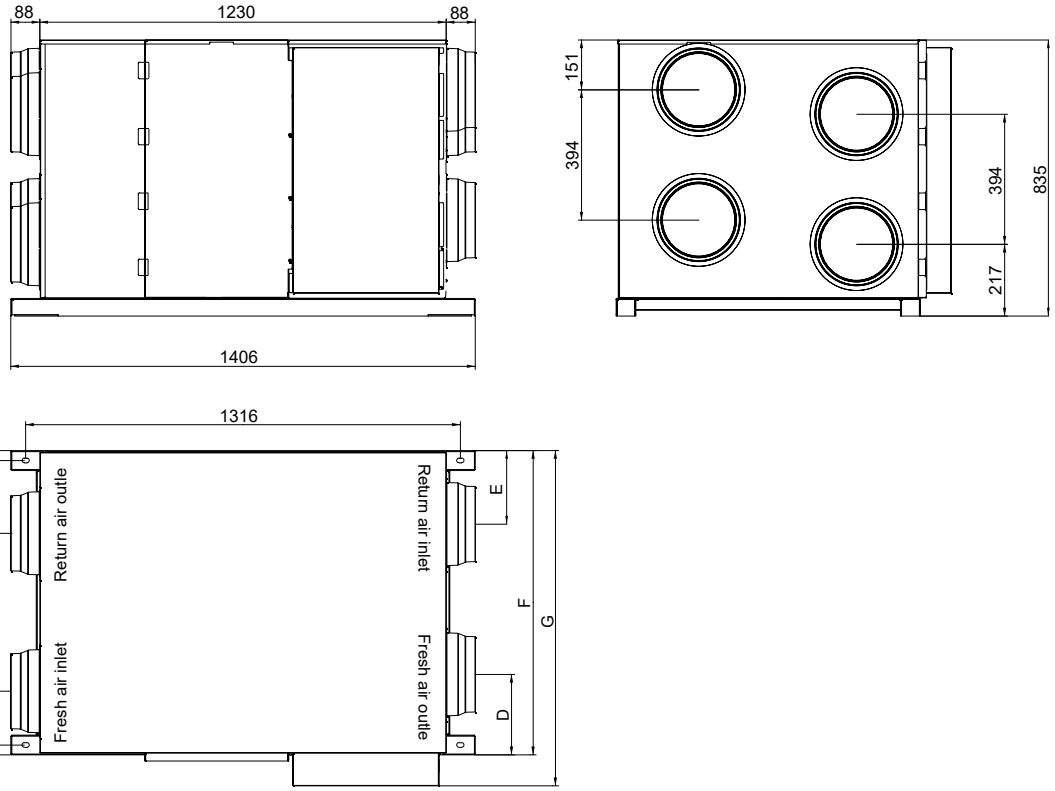
(1) Applicable models: FHBQGL-D8DA-K, FHBQGL-D10DA-K, FHBQGL-D8DA-S, FHBQGL-D10DA-S



Unit: mm

Model	A	B	C	D	E	F	G
FHBQGL-D8DA-K	791	187	245	238	217	910	1008
FHBQGL-D10DA-K	1036	217	403	263	247	1160	1258
FHBQGL-D8DA-S	791	187	245	238	217	910	1008
FHBQGL-D10DA-S	1036	217	403	263	247	1160	1258

(2) Applicable models: FHBQGL-D15DA-K, FHBQGL-D20DA-K, FHBQGL-D15DA-S, FHBQGL-D20DA-S



Unit: mm

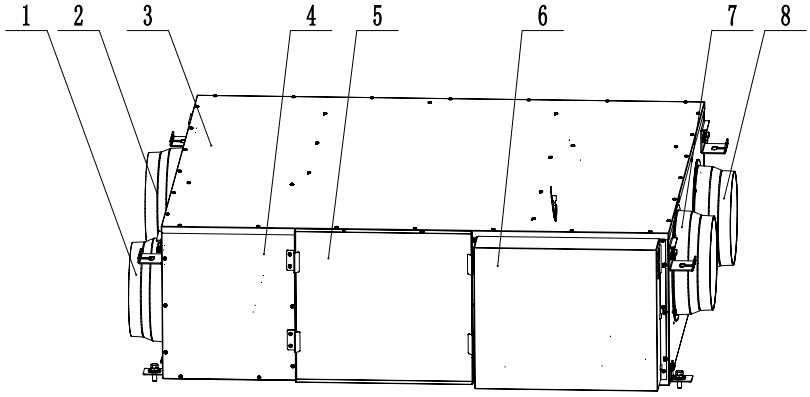
Model	A	B	C	D	E	F	G
FHBQGL-D15DA-K	861	193	251	244	223	921	1091
FHBQGL-D20DA-K	1111	223	409	269	253	1171	1341
FHBQGL-D15DA-S	861	193	251	244	223	921	1091
FHBQGL-D20DA-S	1111	223	409	269	253	1171	1341

⚠NOTE

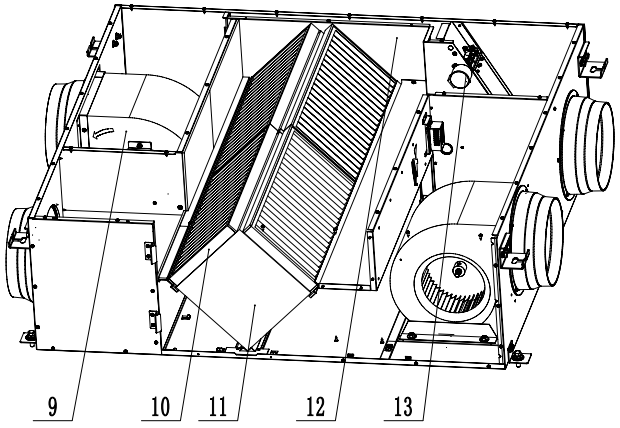
Due to individual differences in production assembly, above figures may vary from those of the present products. Please refer to the actual dimensions of your product.

1.6 Major components

The following diagrams display FHBQGL-D8DA-K, FHBQGL-D10DA-K, FHBQGL-D8DA-S and FHBQGL-D10DA-S. Subject to the basic framework of these four models, FHBQGL-D15DA-K, FHBQGL-D20DA-K, FHBQGL-D15DA-S and FHBQGL-D20DA-S are double-layered.



No.	Name
1	Fresh air inlet
2	Return air outlet
3	Cover panel
4	Left-side panel
5	Access door
6	Electric box
7	Fresh air outlet
8	Return air inlet



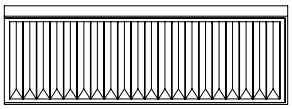
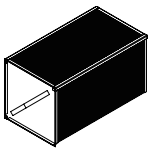
No.	Name
9	Fan
10	Primary filter
11	Heat exchange core
12	Clapboard
13	Stepping motor

Performance parameter of filter core

Unit: mm

Model	FHBQGL-D8DA-K FHBQGL-D15DA-K FHBQGL-D8DA-S FHBQGL-D10DA-S	FHBQGL-D10DA-K FHBQGL-D20DA-K FHBQGL-D15DA-S FHBQGL-D20DA-S	Washable	Recyclable	Suggested replacement time
Rough filter	420X230X28	540X230X28	Yes	No	Refer to the tips of wired controller after cleaning for 3 times
Heat exchanger core	405X250X250	530X250X250	No	No	2 years

Filter and heat exchange

Rough filter (standard configuration)

Heat exchange core


Note: Conduct cleaning and maintenance periodically for the fresh air side of filter and discharge side of filter.

No.	Name	Description
1	Exhaust fan	Discharge the indoor exhaust air to the outside.
2	Fresh air fan	Draw the outdoor fresh air into the room.
3	Filter	Protect the heat exchange core. Remove the large particles from the air.
4	Heat exchange core	Recover the energy of exhaust air. Improve energy efficiency.

1.7 List of accessories

List of accessories

No.	Name	FHBQGL-D8DA-K, FHBQGL-D10DA-K, FHBQGL-D8DA-S, FHBQGL-D10DA-S
1	Nut with washer M10×8	4
2	Nut M10	4
3	Washer 10 (spring washer M10×2.6)	4
4	Washer 10 (big washer M10×Φ30×2.5)	4
5	Wired controller	1
6	Mounting cardboard	1

No.	Name	FHBQGL-D15DA-K, FHBQGL-D20DA-K, FHBQGL-D15DA-S, FHBQGL-D20DA-S
1	Washer 12 (plain washer M12×Φ24×2.5)	8
2	Nut M12 (Hexagon nut M12×10.8)	8
3	Wired controller	1
4	Mounting cardboard	1

Note: The package base can be used to locate the unit during installation.

1.8 Operating limits

The recommended outdoor temperature range for operation is -15°C~50°C.

If the temperature of outdoor fresh air is over 50°C or less than -15°C, the inhaled fresh air may damage the internal components of unit. For instance, the heat exchange core will be frozen, the internal structure of the unit body and the sensor will be damaged.

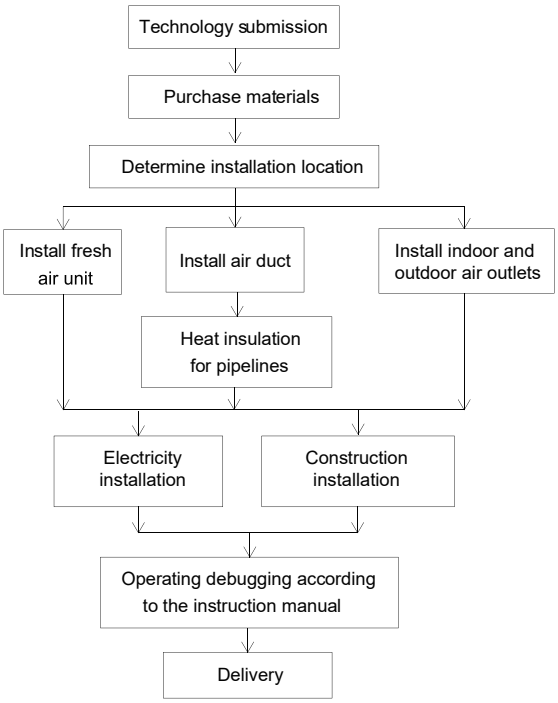
2 Product installation

2.1 General specification

Equipment model selection and engineering design should be conducted by professional HVAC engineer; the installation should be completed by experienced installer as well.

This series of unit shall be used with multi VRF unit. It can be connected to the system by means of mixed connection. To avoid affecting the performance of indoor unit, the capacity sum of the connected fresh air unit and normal indoor unit shall between 50% and 100% of the capacity of outdoor unit. Among which, the capacity of the connected fresh air unit shall not exceed 30% of the capacity of outdoor unit; otherwise, it will affect user comfort, or even damage the unit.

2.2 Flow chart for engineering installation



2.3 Preparation for installation

2.3.1 Safety requirements

⚠WARNING

- Before the construction, all safety and related safety assessments must be carried out for all personnel involved in the installation and construction. In the event of violations, the relevant personnel must bear the responsibility.
- During the entire installation and construction process, personal and property safety must always be placed first. The construction process must comply with relevant national safety regulations to avoid personal injury or property damage.

2.3.2 Importance of installation

Multi VRF fresh air system is a residential central air conditioning fresh air system. Some issues for the installation of the system may also impact the operating effect of the unit. Some problems that may occur during the installation are:

Feedback table for problems of installation

No.	Possible problems	Impact
1	There are debris in the air duct (sands, dusts, etc.)	Impair the service life of filter and increase the initial resistance of air duct and filter.
2	Improper fixture of air duct or distortion	There is vibration or noise during operation of unit.
3	Heat insulation for air duct has not been well conducted.	Regions, condensation is likely to occur when the temperature difference between indoor and outdoor is large.
4	Installation space and inhalation space for fresh air unit is not sufficient.	Filter or maintaining motor may damage the indoor decoration or impact the air switch performance of unit due to sufficient space for maintenance.
5	Improper position of air inlet and outlet of fresh air unit.	Not conducive to the arrangement of fresh air exhaust flow field
6	Wrong wire connection or invalid connection of linkage communication wire.	System cannot report error normally and the unit cannot start up the linkage control.
7	Improper protection of linkage communication wire.	Communication wire is short-circuited or open-circuited, the unit reports communication error.

In order to ensure the quality, it is necessary to know whether the unit has special requirements for installation before installation. The relevant installer should have the corresponding engineering construction qualification. Otherwise, it must be trained by the professional technicians of the manufacturer and reach the standard before construction.

An electrician engaged in special operations during construction must have an operation permit and a corresponding vocational skill qualification certificate.

2.3.3 Cooperation

Quality of the engineering installation is inseparable from the cooperation with various professional personnel, which should be coordinated and meticulously organized with various fields such as architecture, structure, electrical, fire protection and decoration.When arranging the pipe, it is necessary to avoid the automatic water sprinkler, and reasonably arrange it according to electric, lighting device and decorative surface.

(3) Requirements for construction

1) Special pipeline wells and wind shafts should be reserved, and the space for installation of equipment and related pipelines should be reserved as much as possible so that the equipment shall be installed in the ceiling as much as possible.

2) Reserve holes and casings, pre-embedded pipe installation positions, etc.

3) The thread-through position of the duct pipe wall shall be reserved with holes or casing. Bearing girder must be laid with steel casing.

(4) Cooperation requirements for decoration engineering

1) Installation of the unit should not destroy the bearing structure and decorative style of the construction.

2) Style of air outlets and service accesses should comply with the decorative style.

3) Reserve installation space for indoor unit, air duct, air outlets, service accesses, wired controller, etc., the air supply or air return outlets should not be shielded; air supply outlet or air return outlet should not be unreasonably closed; maintenance port should be accessible; position of wired controller (if necessary) should be convenient to operate.

4) Indoor pipelines should adopt concealed installation by laying out inside the ceiling; all installation of pipelines should reduce the installation space as much as possible to avoid conflicting the decoration.

(5) Cooperation requirements for electricity

1) Reserve special route for electric wires, model of power supply and power consumption capacity should meet the using requirements;

2) The air switch should satisfy the requirements of unit or related national safety regulations.

3) The regional power supply quality (including voltage fluctuation and interference clutter) should meet the requirements of related national standard.

2.3.4 On-site review of design drawings

The installation personnel should carefully read the design and drawings provided by the engineering designer, understand the design intent, review it according to the site conditions, and then write a detailed installation process.

On-site review

No.	Contents for confirmation	Results
1	Capacity ratio of fresh air unit should not exceed 30% of the rated capacity of the outdoor unit. The total rated capacity of the indoor unit and the fresh air unit should be within 50% to 135% of the rated capacity of outdoor unit. If the rated capacity of the indoor units that are running at the same time exceeds 100% of the rated capacity of the outdoor unit, the actual capacity requirement cannot be met. Note: Exceedance of capacity will affect the using experience of users. The more Exceedance, the worse the system adjustment capability will be. When it exceeds 135% of configuration, it will even affect the reliability of the system. Please strictly comply with the capacity limit regulations.	
2	Whether the total length of fresh air pipeline meets the design requirements of unit.	

No.	Contents for confirmation	Results
3	Whether the installation position meets the installation space requirement of unit.	
	Whether the installation position of air outlets are reasonable; whether the position is conductive to the flow field distribution.	
	Whether sufficient space for maintenance has been reserved.	
4	Whether the installation of air duct meets the requirements (heat insulation, securement, etc.).	
5	Whether the air switch, specification of power cord, model, etc. satisfy the safety requirements of unit.	
6	Whether the manufacture, total length and control method of control wire meet the design requirements of unit.	

⚠WARNING

Construction workers should strictly follow the design drawings. In the process of construction, if it is unable to meet the design requirements, it must be approved by the designer and form a written document (design change record).

2.3.5 Selection of installation materials

Materials and equipment used in the construction shall have a certificate of conformity and a test report. Products with fire protection requirements shall have fire test certificates and comply with the relevant national and relevant mandatory standards. In addition, if the user requests the use of environmentally friendly materials, all materials must comply with the relevant applicable environmental requirements and provide relevant certification.

◆ Preparation of tools

(1) The tools used for installation of ventilation ducts and unit are divided into: general electric tools, electric machinery and common tools for ventilation and air-conditioning. General electric tools include the following:

1) Hand drill

Purpose: Hand drill is the most widely used tool. It is equipped with a twist drill, which is mainly used for drilling metal parts, and is also suitable for drilling wood, plastic parts, etc.

2) Electric hammer

Purpose: With hard alloy electric hammer drill bit to drill, groove, and chisel the concrete, rock, brick wall, etc.

3) Impact drill

Purpose: Impact drill has two motion forms. When adjusted to the rotating state, the twist drill can be used with the impact drill as an electric drill; when it is adjusted to the rotating and impact state, it can be equipped with a hard alloy impact drill, which is suitable for drilling brittle materials such as brick, concrete and ceramics.

4) Polisher (grinding machine)

Purpose: With fiber-reinforced linear grinding wheels for the grinding of metal parts and cutting of profiles, opening of the groove before welding and cleaning of the work piece burrs; with diamond cutting pieces, it can cut non-metallic materials, such as tiles, stones, etc.; with special grinding wheel can grind glass; with wire brush for rust removal; with rubber pad and round sandpaper for sanding.

◆ Preparation of materials

(1) Pipe material

Pipe material of fresh air duct can select PVC pipe and PE pipe. Common size for air duct: Φ75mm, Φ110mm, Φ160mm, Φ200mm, 250mm.

(2) Sheet metal material

Sheet materials are also the major materials for the production of duct components, usually galvanized steel, ordinary low carbon steel, stainless steel, aluminum and so on.

1) Galvanized steel sheet

Performance: the galvanized steel sheet is galvanized as a protective layer on ordinary steel Q195, Q235A sheet, and its specifications are the same as ordinary steel sheets, and the thickness is generally 0.5 to 1.5 mm. Because the surface of the galvanized sheet is silver-white, commonly known as “white iron”, its surface is corrosion-resistant, generally needs not to paint, and usually used in the air duct system in the humid environment without acid mist.

2) Ordinary low carbon steel sheet

Performance: ordinary low carbon steel plate is Q235-B (GB700-1988) steel, which is supplied by sheet and coil after cold rolling or hot rolling. It has good plasticity and processing properties, commonly known as “black iron”, which is easy to process and can be welded, but it is easy to rust and often needs to be painted to prevent corrosion.

3) Stainless steel sheet

Performance: stainless steel plates contain a lot of chromium, nickel, and some also contain copper. It has high temperature resistance and corrosion resistance, and its surface is generally white. Stainless steel contains different alloying elements and different corrosion resistance to different media. Suitable stainless steel materials can be selected according to the corrosive medium. Stainless steel sheets are often used in ducted systems that require corrosion resistance in chemical environments.

4) Aluminum sheet

Performance: aluminum plates are divided into industrial pure aluminum plate and aluminum alloy plate. Aluminum plate has light weight, and the surface is covered by a dense layer of aluminum oxide film, the color is silver-white. Aluminum has good plasticity, strong acid resistance, and is easy to be corroded by alkali and salt, which is often used in ventilation ducts for acid-resistant environments. The aluminum plate is soft and does not easily generate sparks during collision. It is mostly used for ventilation pipes with explosion-proof requirements.

(3) Insulation materials

Main functions of insulation materials are cold insulation or heat insulation. Loose fibers and porous materials are often used as insulation materials. At present, the commonly used insulation materials are polystyrene (self-extinguishing type), that is, PE insulation board and foam rubber insulation material.

1) Polyethylene foam (PEF):

Features: it adopts the most advanced foaming technology in the country, with excellent thermal insulation performance and is soft, light, fireproof and corrosion resistant. It is mostly used in the insulation materials for construction, refrigeration storage, air conditioning and other equipment and low temperature pipeline; construction is simple and convenient.

2) Rubber and plastic insulation cotton:

Features: the product is made of high-quality nitrile rubber PVC as the main material and a variety of high-quality auxiliary materials foamed by special process. This product is a high foaming closed-cell structure with soft texture, low density, low thermal conductivity, good weathering resistance, wide temperature range, shock absorption, sound absorption, flame retardant, waterproof, etc., no pollution is generated during production and use. It is a green product.

Specification requirements for rubber foam tube

<table>
<tr><td>Air duct</td><td>Heat insulation thickness</td><td>Material</td></tr>
<tr><td>Pipe diameter</td><td>≥15</td><td rowspan="2">Rubber foam tube, flame retardant grade B1 or above</td></tr>
<tr><td colspan="2">Installation in the wet environment should increase the thickness of the insulation material.</td></tr>
</table>

(4) Specification requirements of boom and support (please take damping measures when connecting pipes):

1) Boom: M10 (the same size as the standard fitting nut of fresh air unit)

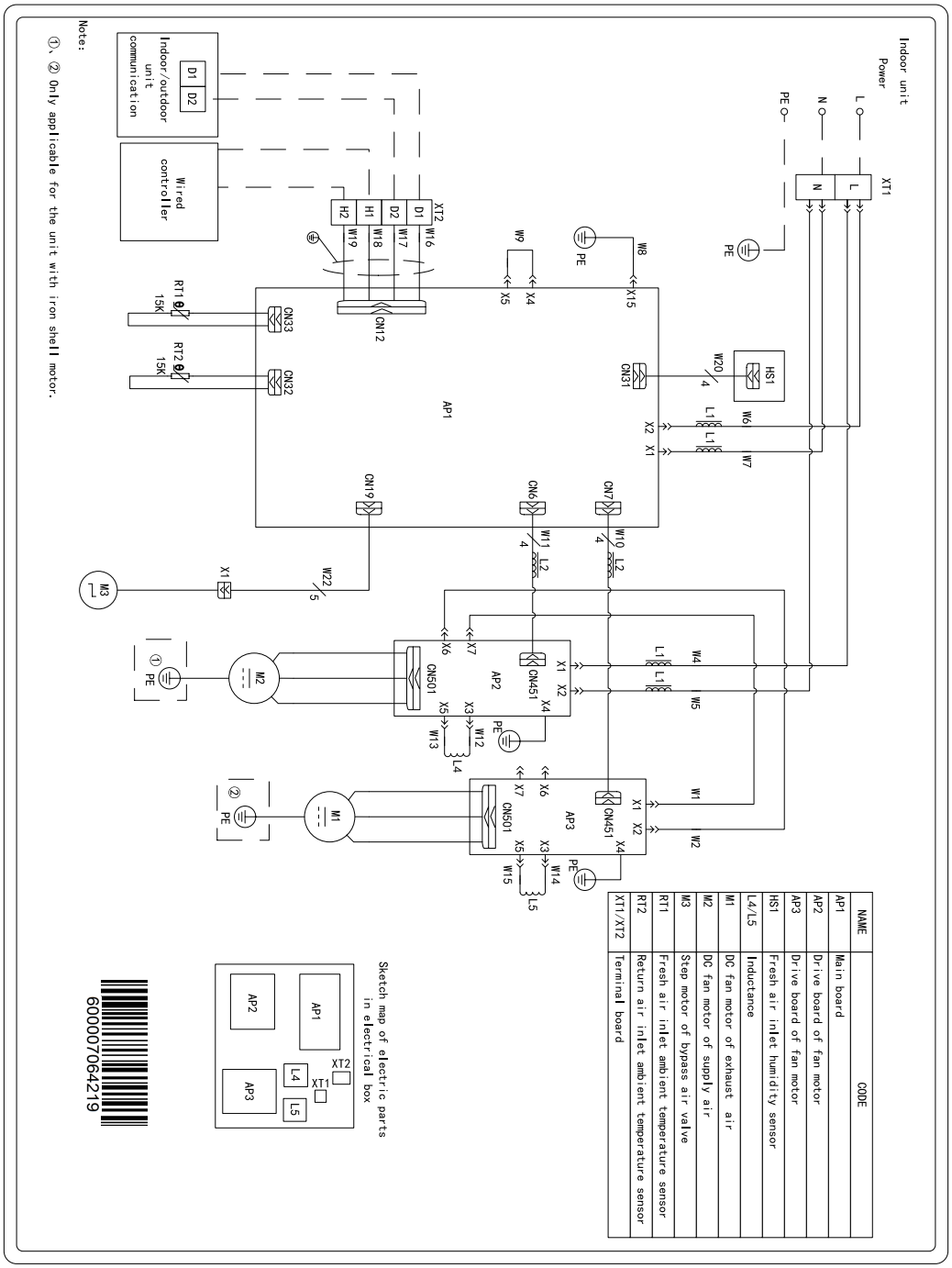
2) Channel steel: 5# or above

3) Angle steel: equal sides 30mm×30mm×3mm or above

4) Round steel: over Φ10mm

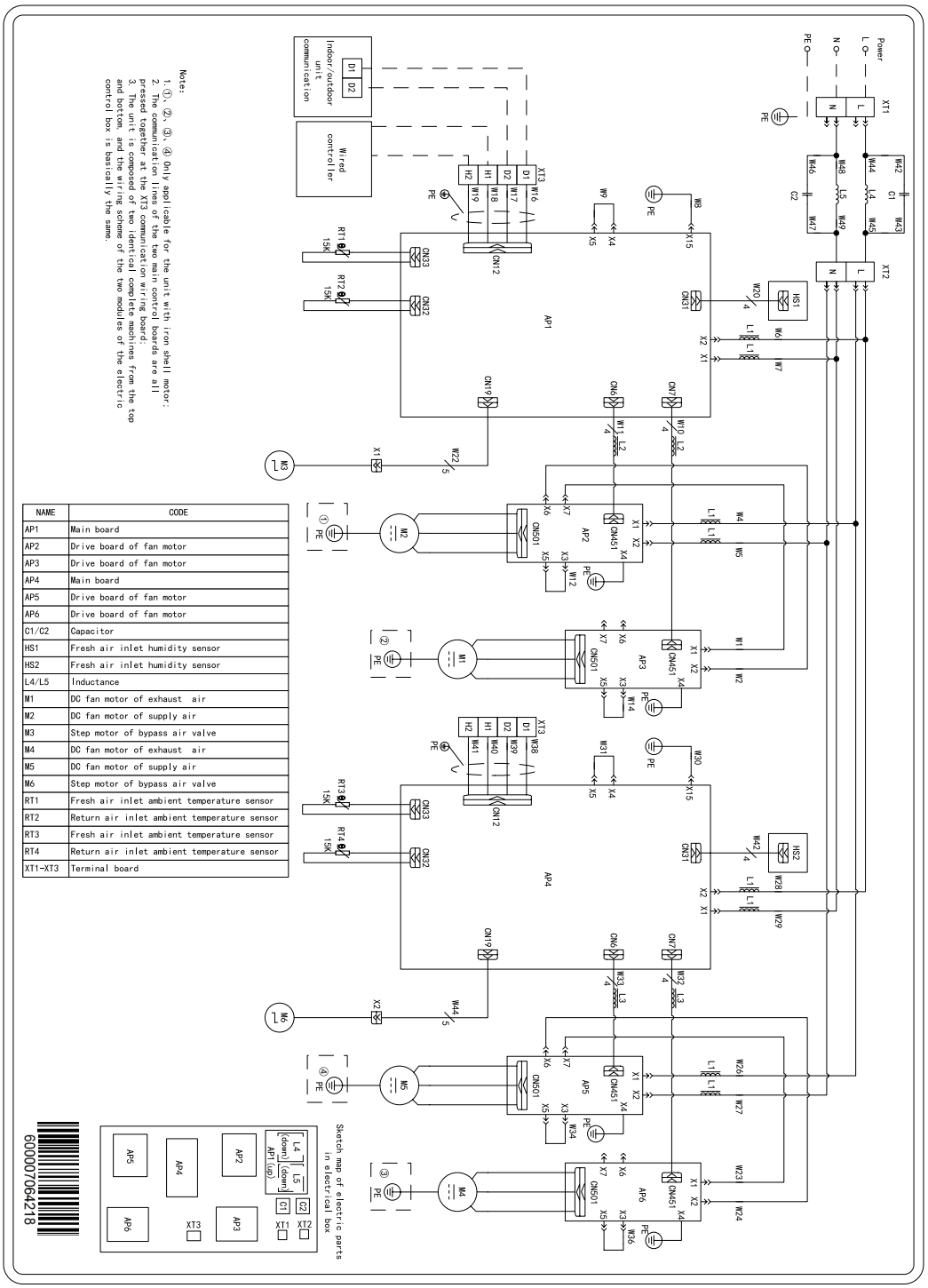
2.4 Electrical connection

(1) Applicable models: FHBQGL-D8DA-K, FHBQGL-D10DA-K, FHBQGL-D8DA-S, FHBQGL-D10DA-S



NAME	CODE
AP1	Main board
AP2	Drive board of fan motor
AP3	Drive board of fan motor
HS1	Fresh air inlet humidity sensor
L4/L5	Inductance
M1	DC fan motor of exhaust air
M2	DC fan motor of supply air
M3	Step motor of bypass air valve
RT1	Fresh air inlet ambient temperature sensor
RT2	Return air inlet ambient temperature sensor
XT1/XT2	Terminal board

(2) Applicable models: FHBQGL-D15DA-K, FHBQGL-D20DA-K, FHBQGL-D15DA-S, FHBQGL-D20DA-S



NAME	CODE
AP1	Main board
AP2	Drive board of fan motor
AP3	Drive board of fan motor
AP4	Main board
AP5	Drive board of fan motor
AP6	Drive board of fan motor
C1/C2	Capacitor
HS1	Fresh air inlet humidity sensor
HS2	Fresh air inlet humidity sensor
L4/L5	Inductance
M1	DC fan motor of exhaust air
M2	DC fan motor of supply air
M3	Step motor of bypass air valve
M4	DC fan motor of exhaust air
M5	DC fan motor of supply air
M6	Step motor of bypass air valve
RT1	Fresh air inlet ambient temperature sensor
RT2	Return air inlet ambient temperature sensor
RT3	Fresh air inlet ambient temperature sensor
RT4	Return air inlet ambient temperature sensor
XT1-XT3	Terminal board

2.4.1 Requirements for electricity installation

(1) Install units according to national wiring codes.

(2) Power cord must be reliably secured to avoid stress on wire terminal. Please connect wire according to the standard and make sure the unit operate normally. The connection wire between indoor unit and outdoor unit must apply the required electric wire and avoid stress on wire terminal, otherwise fire hazard may be caused.

(3) If the power cord and connection wire are damaged, it shall be replaced by the professionals with specialized wire.

(4) The wire shall not touch the refrigerant pipe, the fan or other parts.

(5) All electric installation must be performed by qualified personnel in accordance with local laws, regulations and this manual.

(6) Units must be properly grounded to specialized grounding device in the building. Please ask professionals to install.

(7) Air switch and circuit breaker that can disconnect power of the whole system must be installed.

(8) During installation, please install all-pole disconnection device with contact separation not less than 3mm in the power supply circuit.

(9) The circuit breaker should have both magnetic trip and thermal trip functions so as to protect the unit when short circuit or overload occurs.

2.4.2 Grounding requirements

(1) Reliable grounding must be ensured. The yellow-green wire inside the unit is a ground wire, so it shall not be used for other purposes nor shall it be cut. Do not tighten it with tapping screws; otherwise it will cause risk of electric shock.

(2) Power supply must provide reliable grounding terminal. Do not connect the ground wire to the following:

1) Water pipe

2) Gas pipe

3) Drain pipe

4) Other places that are deemed as not reliable by professional personnel

⚠WARNING

Before installation and maintenance, please cut off power supply to avoid electric shock. Please use the wire according to related configuration requirement. Otherwise it may lead to unit malfunction and hazards such as electric shock and fire hazard.

If the users alter the electric control system by themselves without prior consent of our company, our company will not bear any responsibility for the abnormal results caused by this.

2.4.3 Wire specification

Model	Power specification	Circuit breaker capacity (A)	Power cable size (mm²)
FHBQGL-D8DA-K	220–240V AC 50Hz	6	3x1.0
FHBQGL-D10DA-K			
FHBQGL-D15DA-K		16	3X2.5
FHBQGL-D20DA-K			

Model	Power specification	Circuit breaker capacity (A)	Power cable size (mm²)
FHBQGL-D8DA-S	220–240V AC 50/60Hz	6	3x1.0
FHBQGL-D10DA-S			
FHBQGL-D15DA-S		16	3X2.5
FHBQGL-D20DA-S			

Notes:

(a) Selection of circuit breaker and power cord in the above table is based upon unit's maximum power (maximum current).

(b) Specification of power cord is based on the working condition where ambient temperature is 40°C and multi-core copper cable (working temperature is 90℃ , e.g. power cable with YJV cross-linked copper, insulated PE and PVC sheath) is lying on the surface of slot (IEC 60364-5-52). If working condition is changed, please adjust the specification according to national standard.

(c) Specification of circuit breaker is based on the working condition where ambient temperature of circuit breaker is 40°C. If working condition is changed, please adjust the specification accordingly.

(d) Install cut-off device near the unit. The minimum distance between each stage of cut-off device should be 3mm.

2.4.4 Requirements for wiring

(1) The unit must be grounded securely, or it may cause electric shock.

(2) The capacity of power supply must be sufficient. The sectional area of wires in the room should comply with relevant selection requirements and be installed with circuit breaker for branch circuit.

(3) The unit should be powered by independent circuit and specific socket.

(4) Install circuit breaker for branch circuit according to related regulations and electrical standards.

(5) All wiring must use pressure terminal or single wire. Multi-twisted wire that connects directly to the wiring board may cause fire hazard.

(6) Keep cable away from fan and other motional parts.

(7) Do not alter the inner wires of unit. Manufacturer does not assume responsibility for damage or abnormal operation due to this reason.

(8) If the unit is installed in places with strong electromagnetic interference, it's recommended to use twin-twisted shield wire. During wire connection, please pay attention that the metal shield layer of the twin-twisted wire must be grounded(outer case) in order to prevent the unit from electromagnetic interference.

(9) The communication wires should be separated from power cord and connection wire between indoor unit and outdoor unit.

2.4.5 Connection of wires and wiring board terminals

(1) Connection of single-core wire

1) Use a stripper to strip away about 25mm of the insulation layer at the end of single branch line so that the single-core wire can be exposed.

2) Remove the wiring screws on the patch board.

3) Shape the tail of wire into ring by needle nose pliers, and keep the gauge of ring in accordance with screw.

4) Lead the screw across the circle of the single branch line and fix it on the wiring board.

(2) Connection of multi-core wires

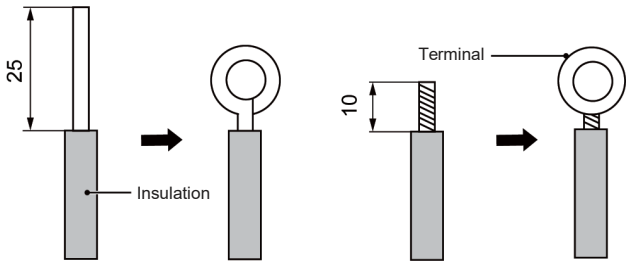
1) Use a wired stripper to strip away about 10mm of the insulation layer at the end of multi-core wire.

2) Remove the screws on wiring board.

3) Use a round terminal fastener or pliers to securely fasten the round terminal with each core wire of the multi-core wire.

4) Confirm the position of each core wire on the round terminal and then use a screwdriver to tighten the terminal screw.

Unit: mm



Single-core wire **Multiple-core wires**

2.4.6 Connection of power cord

(1) The unit must be installed with circuit breaker independently which is used for short circuit protection and overload protection. The circuit breaker shall be closed in normal times.

(2) During operation, all outdoor units, fresh air units and outdoor units in the same system must be kept energized. Otherwise, the system cannot operate normally.

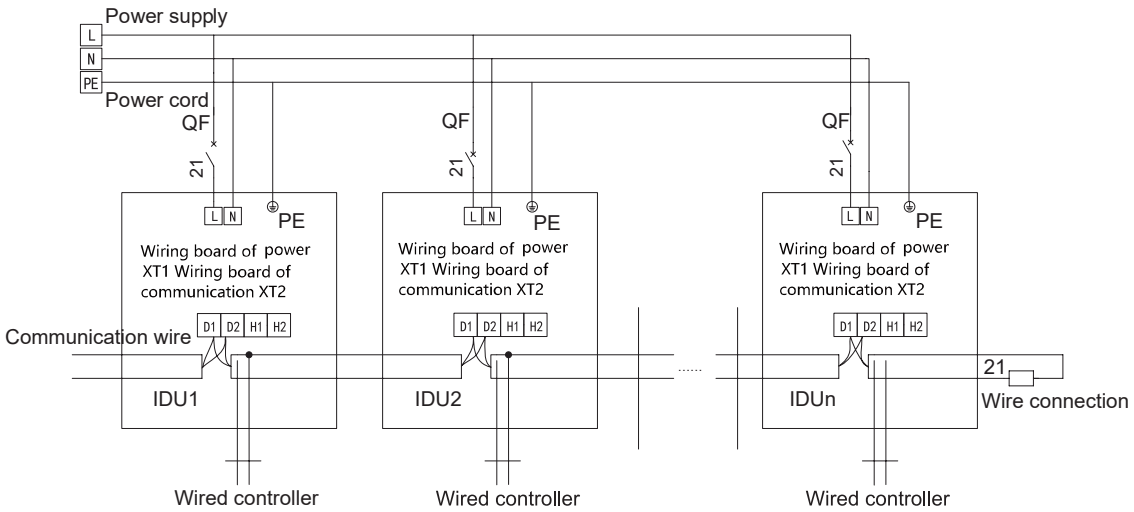


Diagram for system electric wiring

⚠NOTE
Max indoor unit quantity n is according to the outdoor unit capacity.

For more details, please refer to the unit capacity configuration.

2.4.7 Selection of communication wire

(1) Selection of wired controller communication wire

Selection of wired controller communication wire

Wire material type	Total length of communication line between indoor unit and wired controller L (m)	Wire size (mm^2)	Remarks
Light/ordinary PVC sheathed twisted-pair copper core wire (PVVS)	L01 or L02≤10	2×0.75-2×1.25	• Total length of communication wire between unit and wired controller cannot exceed 10m. • Total length of communication wire can't exceed 250m.
	L≤250m		
Shielded light/ ordinary PVC sheathed twisted-pair copper core wire (RVVSP)	L≤250m	2×0.75-2×1.25	If unit is installed in places with intense magnetic field or strong interference, it is necessary to use shielded wire.

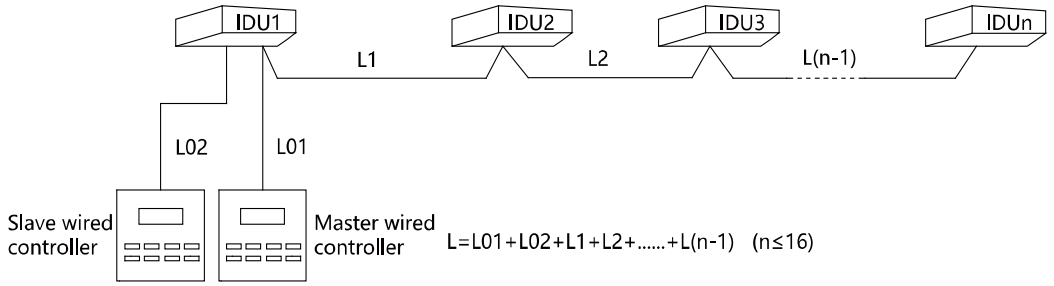


Diagram of Wired controller control connection

(2) Selection of communication wire between unit and VRF ODU

Selection of communication wire among units

Material Type	Total length L (m) of communication cable among units	Wire size (mm^2)	Remarks
Light/Ordinary PVC sheathed twisted-pair copper core wire (PVVS)	L≤1000m	≥2×0.75	The communication wire can be prolonged if the wire diameter is 2×1mm^2. But the total length of communication wire can't exceed 1500m.
Shielded light/ordinary PVC sheathed twisted-pair copper core wire (RVVSP)	L≤1000m	≥2×0.75	If unit is installed in places with intense magnetic field or strong interference, it is necessary to use shielded wire.

2.4.8 Connection of communication wire

Remark: When installing electrical wires, you need to replace the rubber ring on the electrical box with the over-the-line rubber ring in the packaged parts.

Follow the steps below to connect indoor units and outdoor units.

(1) Detach the electric box cover of indoor units.

(2) Pass the communication wire through the rubber ring and tie it tightly with the wire.

(3) Connect the communication wire to terminal D1 and D2 of indoor 4-bit wiring board, as shown in the following figure.

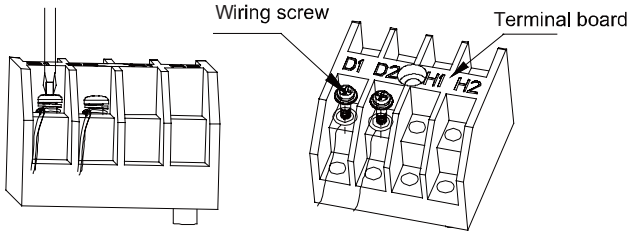


Diagram 1 of wiring board

(4) Fix the communication cable with clamp of electric box.

(5) 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) 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 the following diagram.

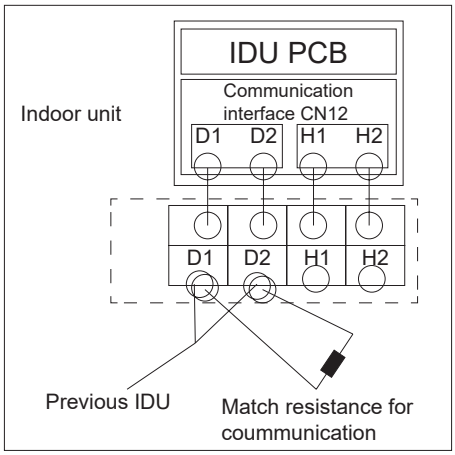


Diagram 2 of wiring board

Follow the steps below to connect wired controllers.

(1) Detach the electric box cover of indoor unit.

(2) Let the communication wire of wired controller go through the rubber ring.

(3) Connect the communication wire of wired controller to terminal H1 and H2 of indoor 4-bit wiring board.

(4) Fix the communication cable of wired controller with clamp.

Follow the steps below to connect wired controllers and IDU networks.

(1) The communication between IDU and ODU and the communication among each IDU shall connect with D1 and D2.

(2) The communication between IDU and wired controller shall connect with H1 and H2.

(3) One indoor unit can connect two wired controllers (master wired controller and slave wired controller).

(4) One wired controller can control 16 indoor units in maximum at the same time.

Notes:

(a) When one wired controller controls several indoor units at the same time, the indoor unit types must be identical.

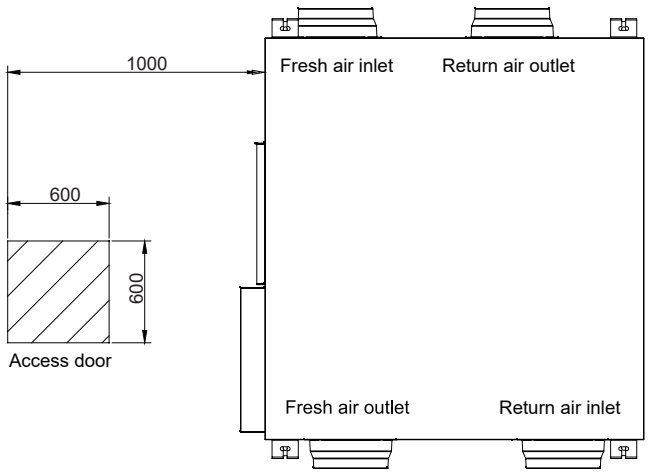
(b) When the indoor unit is controlled by two wired controllers, the addresses of the two wired controllers should be different through address setting. Address 1 is for master wired controller; Address 2 is for slave wired controller. Detailed setting please refer to the owner's manual of wired controller.

2.5 Location requirements

(1) Dimensinal data

The inner filter and heat exchange filter core of the unit should be replaced periodically. To facilitate the maintenance of the key parts of the unit, please reserve some space for maintenance according to the following diagram. Dimensions of the maintenance space are as below.

Unit: mm

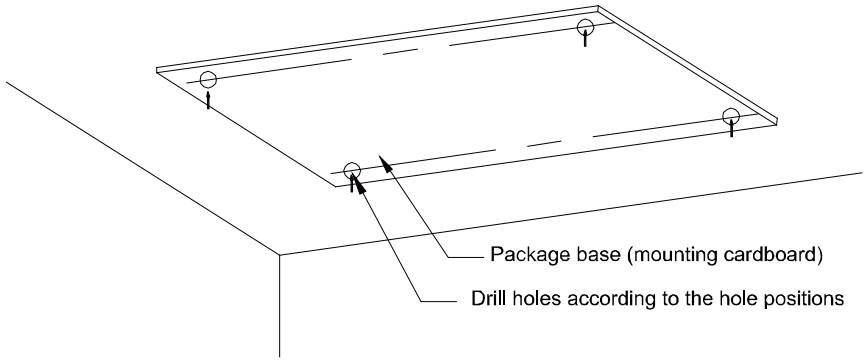


Installation diagram of FHBQGL-D

⚠NOTE
Some parts of the unit may get loose during transport, so please check the screws of each part of the unit carefully before hoisting the unit, especially the movable parts.

(2) Position

You may place the package base (mounting cardboard) flat against the installation position. Install the unit according to the hole positions on the cardboard, as shown below.



Hole positions

Notes:

(a) Make sure the installation location is strong enough to withstand the weight of the unit.

(b) Add a spring rubber damping cushion if necessary.

(c) If the unit is installed in a place where there is oil mist, oil gas or risk of leakage of inflammable gas, such as a kitchen, fire hazard may occur.

(d) If the unit is installed in a humid place or near a bathroom, electric leakage or electric shocks may occur.

(e) If radioactive or electromagnetic equipment is placed near the installation location, the unit may fail to work.

(f) If the unit is installed in a place with high pH value or large voltage fluctuation, it may be damaged.

(g) Power cables of indoor and outdoor units as well as connecting wires should be at least 1m away from TV and radios. This is to prevent the electric appliances from having image interference and noise. (If interference still occurs at a distance of 1m, please increase the distance or ask for professional help.).

(h) Installers must be equipped with gloves to protect them from sharp objects.

2.6 Requirements for air ducts

This product requires the user to prepare PVC ventilating ducts for outdoor air suction and indoor air discharge. Our unit adopts constant air volume control to ensure constant air volume within a certain range of pipe resistance. If the pipe resistance is beyond the designed value, air supply volume will be insufficient. Therefore, in order to prevent performance degrading due to improper pipeline design, please follow the principles recommended below during installation design.

(1) The total length of air ducts should be based on the features of the using environment. The resistance of air ducts should not exceed the requirement for static pressure. Use non-flammable or in-combustible material.

(2) Set as few bends as possible in the pipeline. For each pipeline, try to limit the number of bends under three. Each bend should have a round curve instead of a right angle of 90°.

(3) The inner surface of the pipeline is smooth, free of dust and wrinkles. The outdoor air inlet should be set in a place that is convenient for maintenance.

(4) If you want the indoor noise to be as low as possible, you may add a silencer in the air ducts. The type of silencer should be selected based on actual requirements. Please consult professionals to select an applicable silencer. If the air ducts are equipped with a silencer, the air outlet noise will be lowered by 4~6 decibels.

(5) When the unit is used in winter, the outside of the pipeline will be frosted after the dry and cold air enters the ducts; on the other hand, the inside of the pipeline will get easily frosted after the wet and warm air of the exhaust outlet enters the ducts.

(6) The connecting ducts should be set with an inclination of not less than 0.03. The ducts should slant down to the outdoor side so that condensate and rainwater will not enter the unit.

(7) If the unit is used in alpine regions or the air outlet is set in a place that faces the wind, please add an air damper to prevent the cold air from entering into the room.

(8) Make sure the weight of air ducts will not be borne by the unit.

(9) If necessary, use an air hose to connect the air suction duct and air discharge duct during engineering installation. When installing the hose, be sure it is smooth with no folds or sharp turns.

(10) Do not use the unit when the outlet air resistance differential is over range.

3 Product control

3.1 Control method

Set two control methods for unit, which are operating control mode and linkage control mode.

When conducting operating control mode, the unit will operate according to the command input by the wired controller.

When conducting linkage control mode, the unit should be connected into the control network of multi VRF unit, then the unit will conduct linkage operation according to the operating status of multi VRF unit.

3.2 Operating mode

According to the actual using working conditions, and protect the internal components at the same time, this unit has multiple operating modes for satisfying the using demands under different environmental conditions.

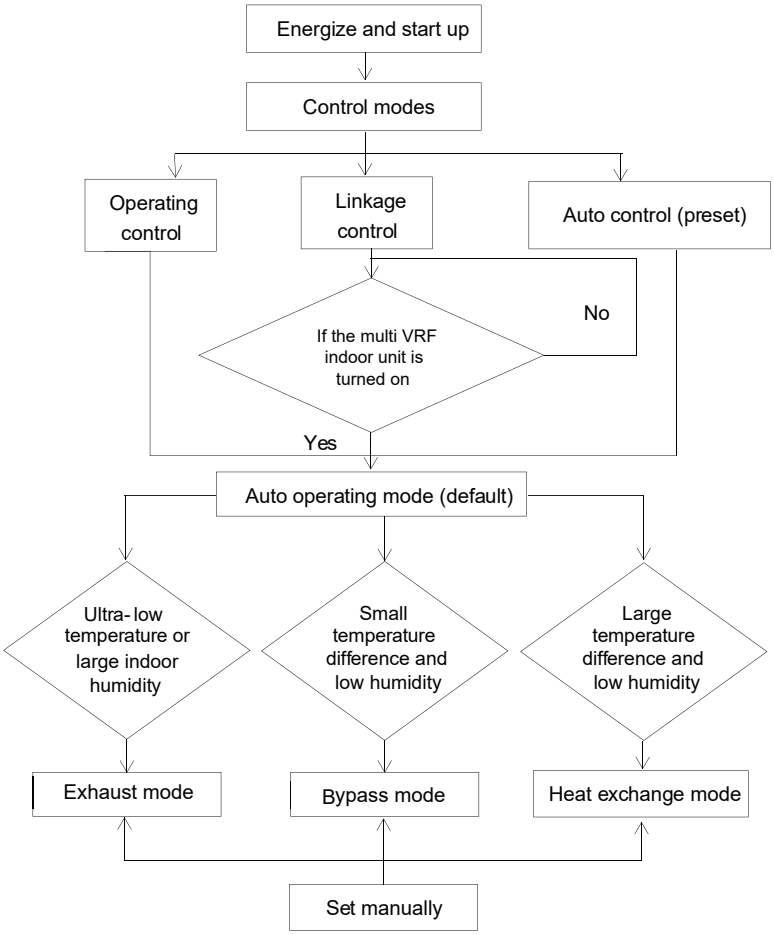
(1) Heat exchange mode: when the unit detects that the indoor and outdoor ambient temperature difference is large and the outdoor humidity is lower, the unit will activate heat exchange mode. Under such mode, fresh air and exhaust air conduct normal heat exchange.

(2) By-pass mode: when the unit detects that the indoor and outdoor ambient temperature difference is small and the outdoor humidity is lower, the unit will activate by-pass mode. Under such mode, the unit will not conduct heat exchange.

(3) Auto mode: the unit will determine to operate heat exchange mode, by-pass mode or other modes (default mode) according to the detected temperature and humidity.

(4) Air supply mode: dry mode of general air conditioner.

3.3 Flow chart for operation of unit



4 Test operation, troubleshooting and maintenance

4.1 Check before startup

After finish installation, please arrange running test to the unit before start operation.

(1) Check if the arrangement of ducts are correct according to this owner's manual.

(2) Check if the equipment is hung reliably; if the hanging frame is coated with anti-rust paint.

(3) Check if there is sufficient space in the unit for replacing filter; if the installation location of duct mufflers comply with the instructions besides this manual.

(4) Check if there is foreign objects or installation tools inside the duct or unit or at the top of the duct or unit; check if the air ports are insulated completely or if the duct connection is reliable.

(5) According to the electric wiring diagram in this manual, check if the power cord complies with related requirements, if the wiring way is correct, if the joint is secured, if the power voltage is normal.

4.2 Commissioning

(1) Turn on the unit for running test after connecting power. Please pay attention that if there is abnormal noise in the pipeline during actual operation and if the unit has abnormal vibration or abnormal noise.

(2) Make sure if the unit installation ceilings, hanging rods and steel channels can withstand unit's weight during normal operation. Spring vibration absorber can be installed in the hanging rod if necessary, in order to prevent vibration transmitting to the floor.

(3) If there is abnormal operation, please cut off power immediately and refer to the troubleshooting.

4.3 Operation

(1) Pollution level setting and filter replacement reminder

During equipment operation process, the unit will calculate the accumulative operation time automatically according to the set outdoor pollution level and remind the user to replace the consumable items. However, the ambient condition of actual usage is complex, to enable the user to obtain correct replacement and cleaning reminder, the user shall conduct setting for the outdoor pollution level under actual usage condition.

Under startup or shutdown status, enter "Project setting" from the "Setting" interface of wired controller menu directly, inquire "Outdoor pollution level setting" in project setting to conduct setting for outdoor pollution level of the unit.

Parameter setting of outdoor pollution level [default-02]	01: Excellent 02: Good 03: Mild pollution 04: Moderate pollution 05: Severe pollution 06: Serious pollution	It is used to calculate the time for cleaning and replacement reminder.

Note: If need to clean or replace the filter at fresh air side or discharge side of filter, the wired controller will display the corresponding cleaning replacement hint in text.

(2) Positive and negative setting

If the user has special requirement on indoor supply air, conduct pertinent setting in project parameter for different supply air mode.

Positive and negative setting	Balanced (defaulted)	Under this mode, the fan speed setting of fresh air and discharge is consistent with wired controller
	Positive pressure	Under this mode, the fan speed setting of wired controller is fresh air, the fan speed of fresh air is higher than that of discharge
	Negative pressure	Under this mode, the fan speed setting of wired controller is discharge, the fan speed of discharge is higher than that of fresh air

Note: Detailed setting method shall refer to the specification of wired controller.

4.4 Diagnostics

After commissioning and trial run, the unit might involve some problems. If the following errors occur, before contacting the after-sales service department of Gree, you need to conduct troubleshooting on your own according to the following table.

Abnormality	Possible causes	Solution
Airflow of supply air outlet is decreased obviously after a period of time.	Too much dust accumulated in air filter	Replace or clean the filter.
Wind noise is heard at the air outlet.	The installation of air outlet is loose.	Re-tighten the installation location of air outlet.
The device cannot be started.	Power off	Check the circuit or to see if the reset switch of protective plug for electric leakage is abnormal.
	Transformer terminal on main board is loose.	Insert and connect the transformer terminal.
	No cooling or heating	Check if refrigerant pipeline is leaked or if the valve of outdoor unit is opened.
	Communication error (C0)	Check the connection wire of wired controller and main board, or the connection wire of the unit and outdoor unit.

4.5 Error code

During operation, if errors occur, error code will be displayed. Error code is as follow:

Displayed code	Description	Displayed code	Description
d1	Faulty circuit board of indoor unit	L0	Indoor unit error
d3	Ambient temperature sensor error	L1	Motor protection for fresh air
d9	Jumper error	L5	Anti freezing protection
dL	Fresh air outlet temperature sensor error	L9	Inconsistent number of multi-split indoor unit
LA	Inconsistent series of multi-split indoor unit	yC	Return air and temperature air inlet sensor error
Ld	Air exhaust motor protection	y7	Fresh air and air inlet humidity sensor error

Note: Please contact local Gree after-sales company if the codes above are displayed on wired controller. Don’t handle it by yourself.

4.6 Troubleshooting

(1) “d1”: IDU circuit board error

Fault judgment condition and method: By detecting whether the address chip and the memory chip of the mainboard of indoor unit are read normally, if the address chip and memory chip cannot be read, the data is interpreted as abnormal.

Possible causes:

a. Address chip fault

b. Memory chip fault

Solutions: Replace the mainboard directly.

(2) “d3”: ambient temperature sensor error

Fault judgment condition and method: By sampling AD value of temperature sensor via temperature sensor detecting circuit to estimate the range of AD value, after continuously sampling for 5 seconds and the AD value is out of the upper limit and lower limit, it will report the error.

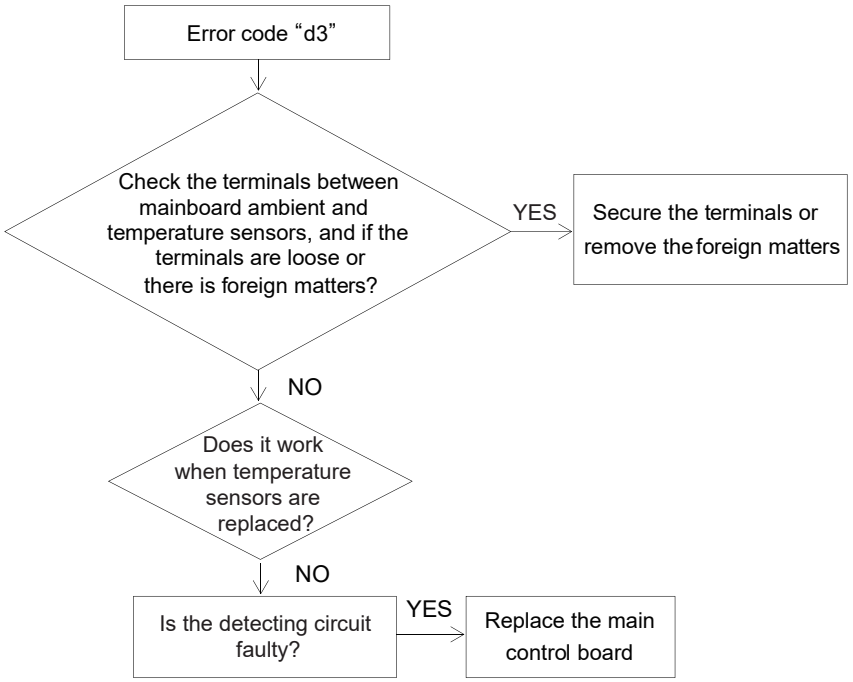
Possible causes:

a. Poor contact between the ambient temperature sensor and the mainboard terminal

b. Ambient temperature sensor error

c. Detecting circuit fault

Solutions: Follow the flowchart below to address malfunction.



(3) “d4”: the main control board fault

Fault judgment condition and method: By sampling AD value of temperature sensor via temperature sensor detecting circuit to estimate the range of AD value, after continuously sampling for 5 seconds and the AD value is out of the upper limit and lower limit, it will report the error.

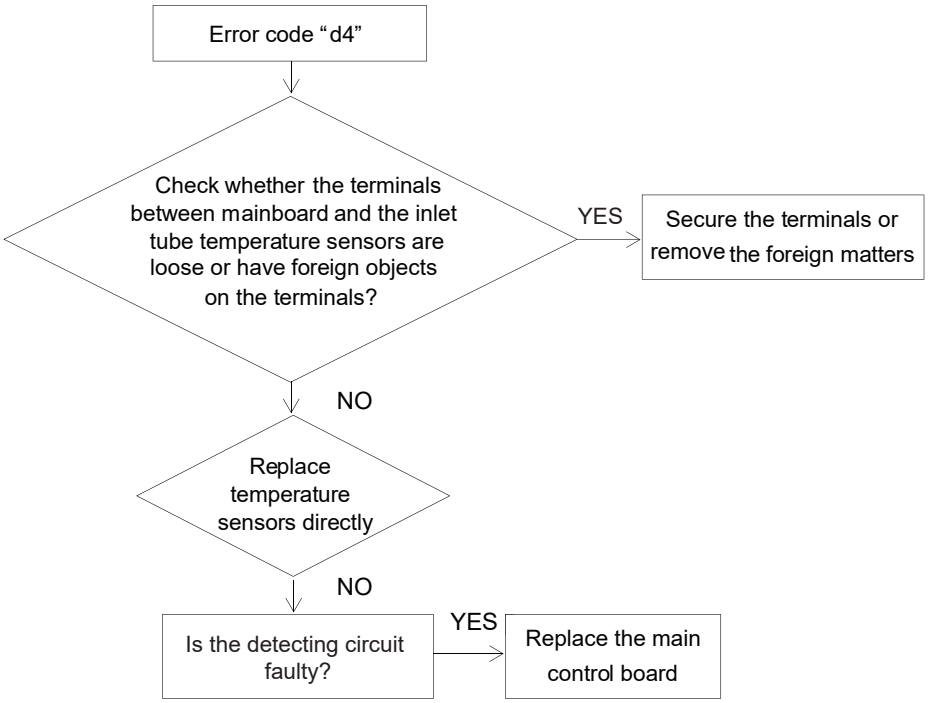
Possible causes:

a. Poor contact between the inlet tube temperature sensor and the mainboard terminal

b. Inlet tube temperature sensor error

c. Detecting circuit fault

Solutions: Follow the flowchart below to address malfunction.



(4) “d6”: outlet tube temperature sensor error

Fault judgment condition and method: By sampling AD value of temperature sensor via temperature sensor detecting circuit to estimate the range of AD value, after continuously sampling for 5 seconds and the AD value is out of the upper limit and lower limit, it will report the error.

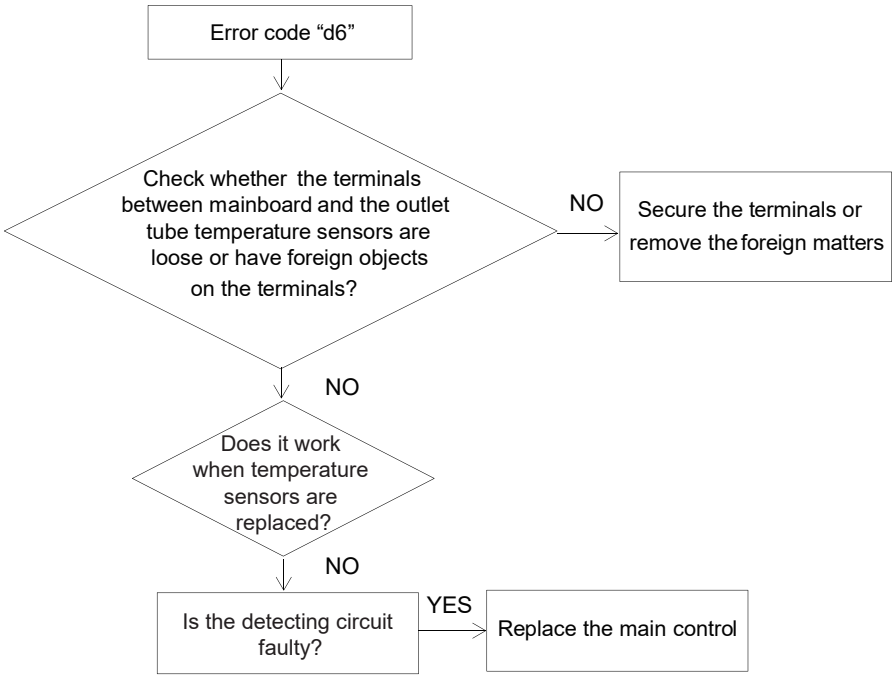
Possible causes:

a. Poor contact between the ambient temperature sensor and the mainboard terminal

b. Temperature sensor fault

c. Detecting circuit fault

Solutions: Follow the flowchart below to address malfunction.



(5) “d9”: jumper cap error

Fault judgment condition and method: Model of jumper cap is inconsistent with the mainboard, it will report the error.

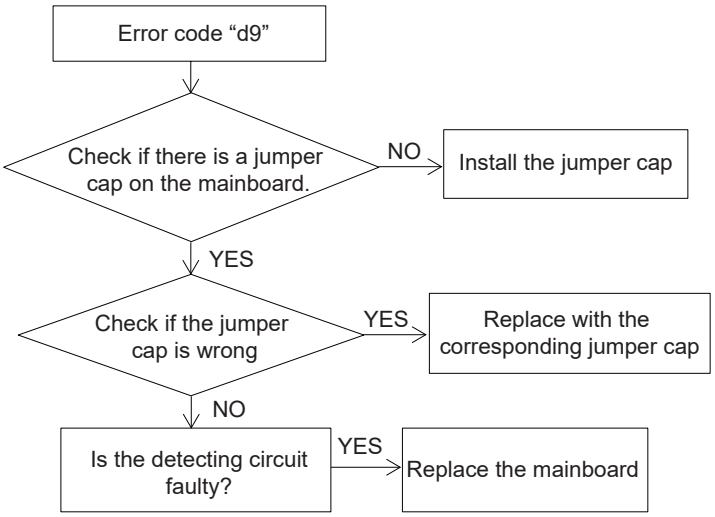
Possible causes:

■Jumper cap has not been installed

■Number of jumper cap is wrong (ERV+DX coil series is number 1~3)

■Detecting circuit is faulted

Troubleshooting:



(6) “dA”: indoor unit network address error

Fault judgment condition and method: Detect the address chip and IP address of indoor unit, if the address chip cannot be read, IP of indoor unit is 0, or IP confliction, it will report the error.

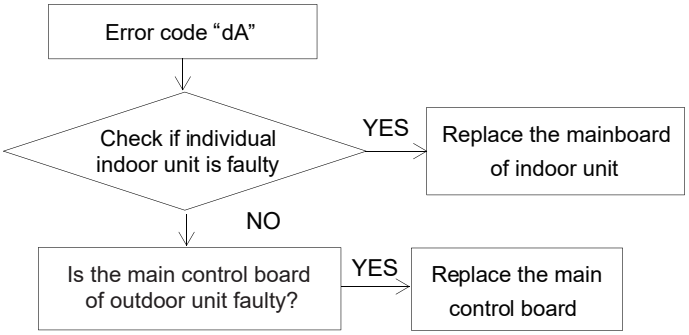
Possible causes:

a. Assigned address of outdoor unit is wrong.

b. Indoor unit processing error

c. Address chip error

Solutions: Follow the flowchart below to address malfunction.



(7) “dL”: fresh air-out temperature sensor error

Fault judgment condition and method: By sampling AD value of temperature sensor via temperature sensor detecting circuit to estimate the range of AD value, after continuously sampling for 5 seconds and the AD value is out of the upper limit and lower limit, it will report the error.

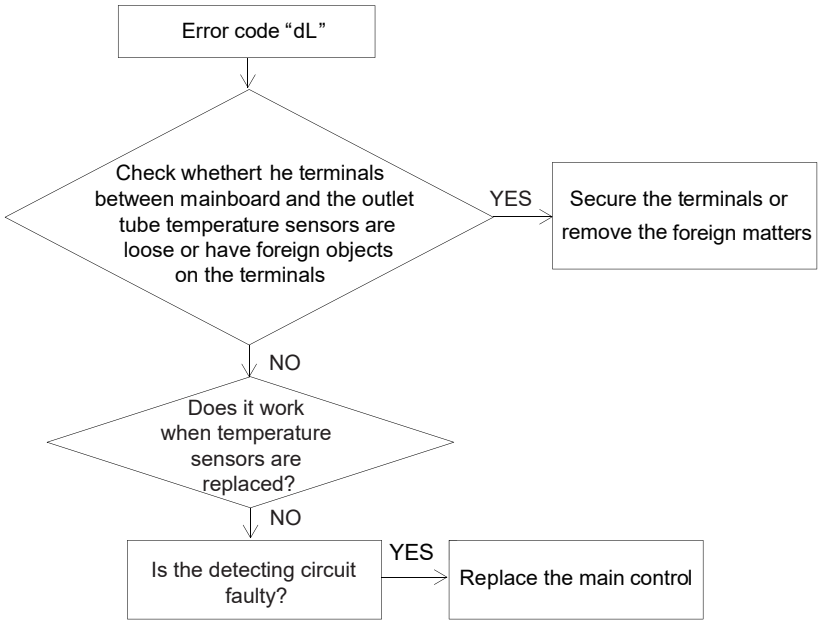
Possible causes:

a. Poor contact between the ambient temperature sensor and the mainboard terminal

b. Ambient temperature sensor error

c. Detecting circuit fault

Solutions: Follow the flowchart below to address malfunction.



(8) “Ld”: exhaust motor protection

Fault judgment condition and method: Check if the revolving speed of fan is too low or the fan stops operation, if yes, it is exhaust fan protection.

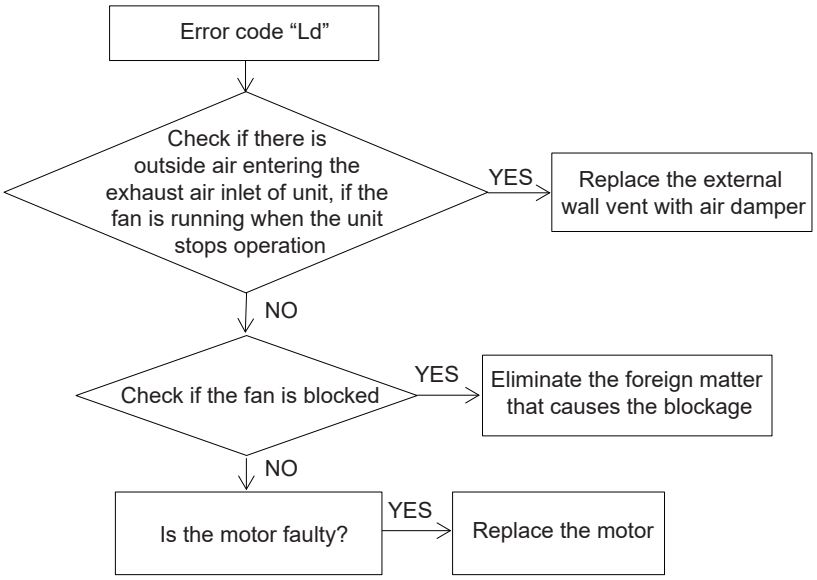
Possible causes:

a. Motor stops operation or the motor is blocked

b. Mainboard of indoor unit is faulty.

c. The fan is started under non-stationary status.

Solutions: Follow the flowchart below to address malfunction.



(9) “L0”: indoor unit malfunction

Possible cause: The indoor unit goes wrong.

Solution: find the corresponding indoor unit of fault through the “indoor unit number query and faulted indoor unit positioning” function of the indoor unit, and then confirm the error code.

(10) “L1”: fresh air motor protection

Fault judgment condition and method: Check if the revolving speed of fan is too low or the fan stops operation, if yes, it is fresh air fan protection.

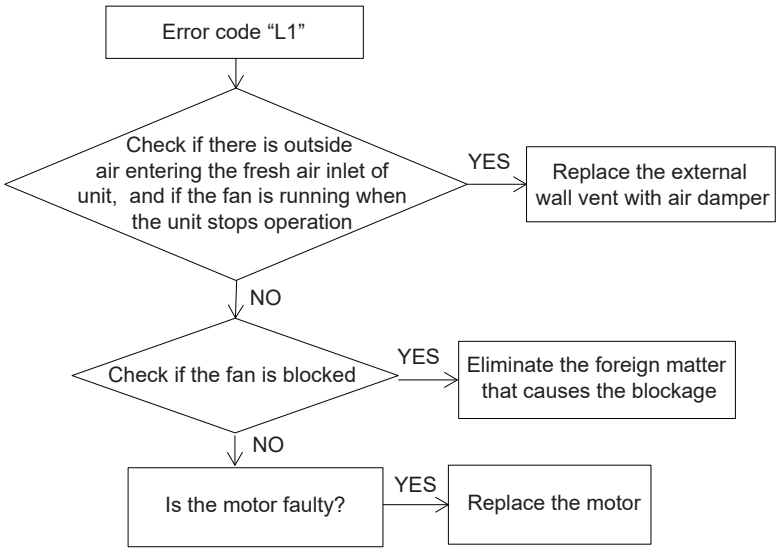
Possible causes:

a. Motor stops operation or the motor is blocked

b. Mainboard of indoor unit is faulty.

c. The fan is started under non-stationary status

Solution: Follow the flowchart below to address malfunction.



(11) “L4”: power supply overcurrent protection

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.

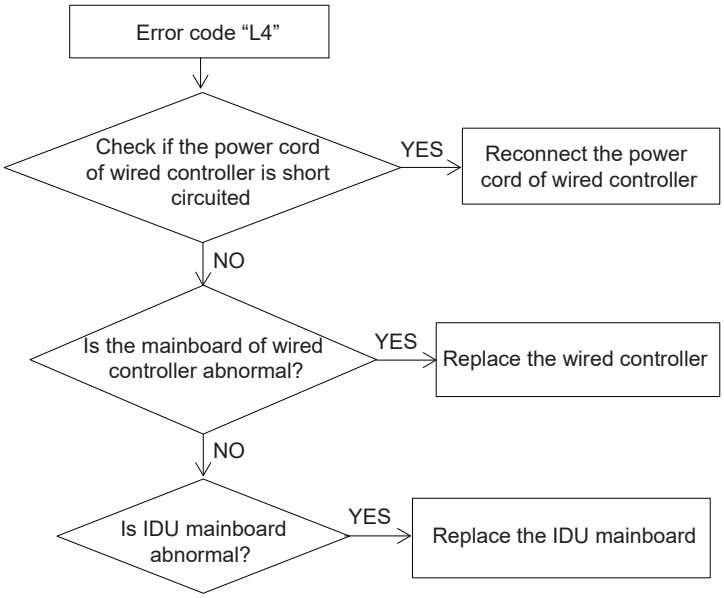
Possible reason：

a. Power supply conducting wire of wired controller is short circuited

b. IDU mainboard is abnormal

c. Mainboard of wired controller is abnormal

Solution: Follow the flowchart below to address malfunction.



(12) “L5”: anti-freeze protection

Fault judgment condition and method: Detect the pipe temperature of indoor unit, if the pipe temperature is too low, the unit will conduct anti-freeze protection to prevent the evaporator from being frozen.

Possible causes:

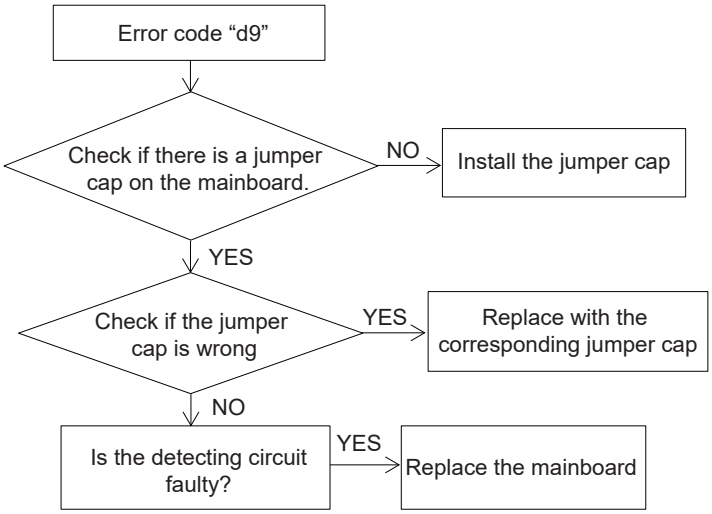
a. Filter of indoor unit or the evaporator is dirty.

b. Motor of indoor unit is blocked.

c. Refrigerant of system is insufficient.

d. Ambient temperature of indoor unit and outdoor unit is too low.

Solution: Follow the flowchart below to address malfunction.



(13) “L9”: inconsistent quantity of indoor unit

Fault judgment condition and method: quantity of indoor units connected to the wired controller is over 16, or the actually connected quantity of indoor units is inconsistent with the set quantity of group control indoor units.

Possible cause:

a. The quantity of indoor units connected to one wired controller is over 16

b. The actually connected quantity of indoor units for one wired controller is inconsistent with the set quantity of group control indoor units.

Solutions:

a. Troubleshooting: if the quantity of indoor units connected to wired controller is over 16, adjust the control range of the wired controller, one wired controller can control 16 indoor units at most.

b. If the quantity of indoor units connected to wired controller is less than 16, please enter the parameter setting to set the quantity of group control indoor units is the same with that of the actually connected indoor unit.

(14) “yC”: air return inlet temperature sensor error

Fault judgment condition and methodBy sampling AD value of temperature sensor via temperature sensor detecting circuit to estimate the range of AD value, after continuously sampling for 5 seconds and the AD value is out of the upper limit and lower limit, it will report the error.

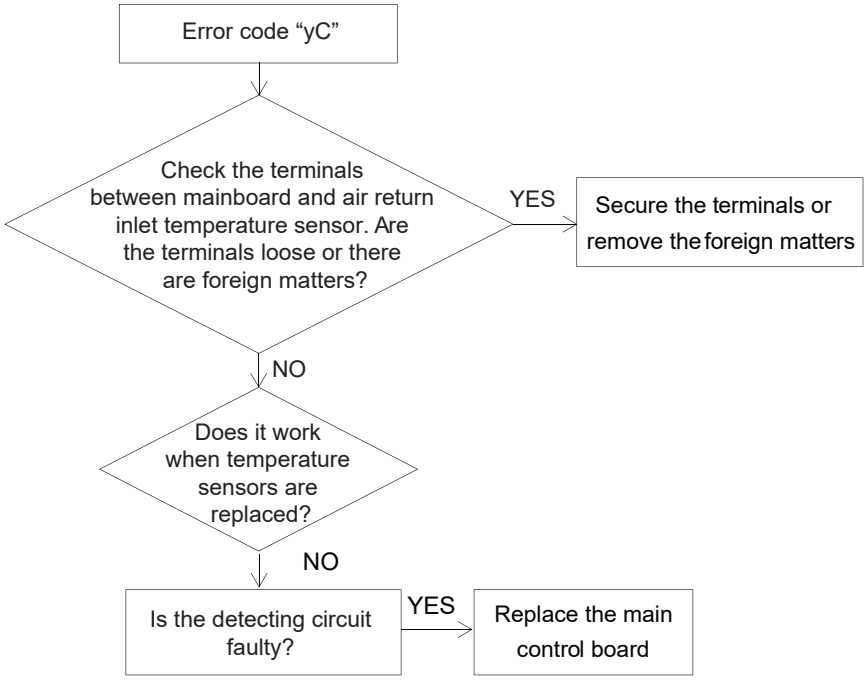
Possible causes:

a. Poor contact between the air return inlet temperature sensor and the mainboard terminal

b. Air return inlet temperature sensor fault

c. Detecting circuit fault

Solution: Follow the flowchart below to address malfunction.



(15) “y7”: fresh air inlet humidity sensor error

Possible causes: By sampling AD value of temperature sensor via temperature sensor detecting circuit to estimate the range of AD value, after continuously sampling for 5 seconds and the AD value is out of the upper limit and lower limit, it will report the error.

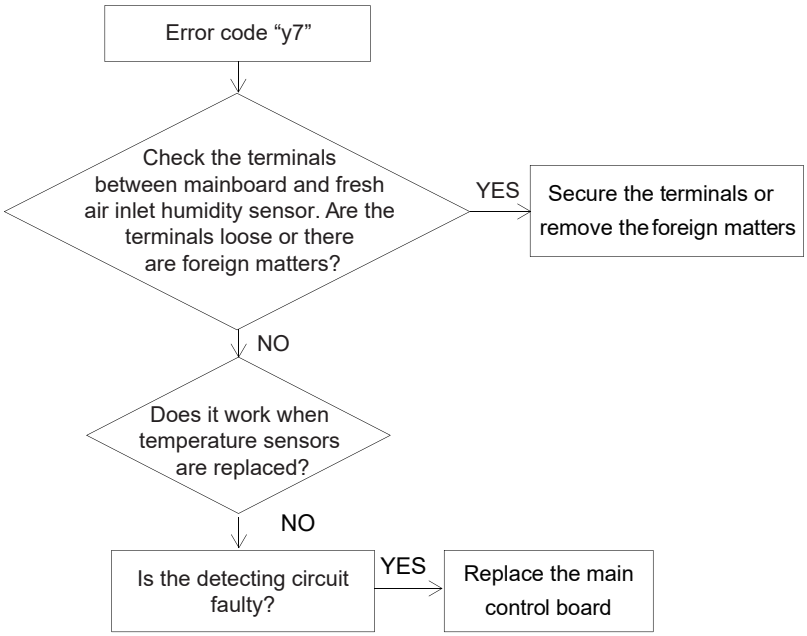
Possible causes:

a. Poor contact between the fresh air inlet humidity sensor and the mainboard terminal

b. Fresh air inlet humidity sensor error

c. Detecting circuit fault

Solution: Follow the flowchart below to address malfunction.



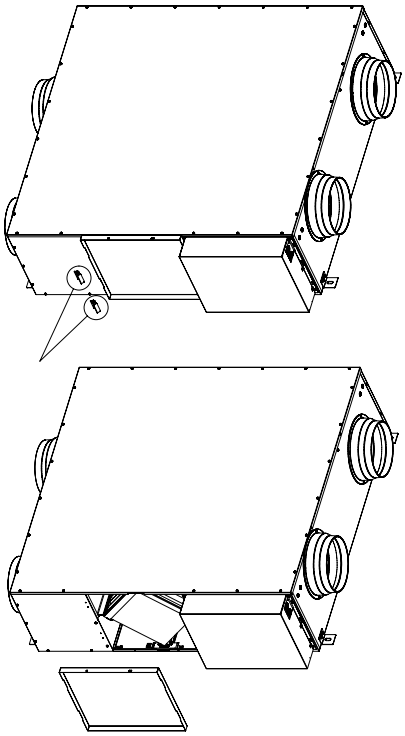
4.7 Maintenance

4.7.1 Replacement of heat exchange core and filter

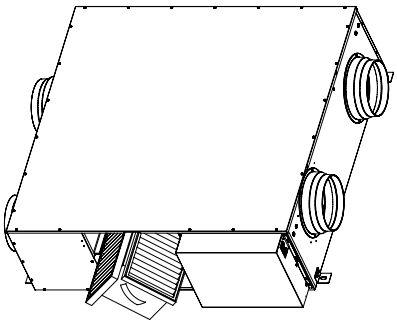
Refer to **1.6 Major components** for description of filters and heat exchange cores.

Follow the steps below to replace the heat exchange core and filter.

(1) Loosen the screws or bolts of access panel and disassemble the side access panel.

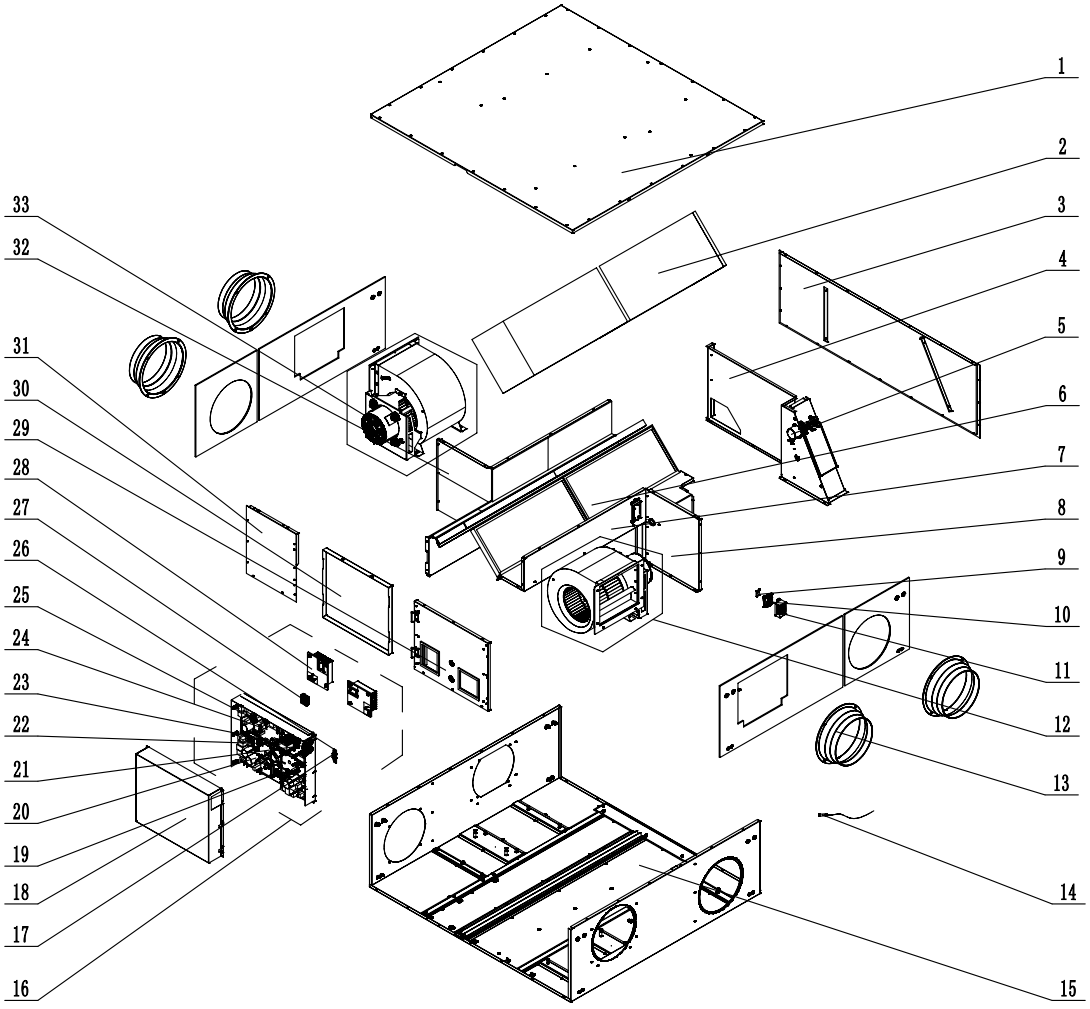


(2) Dismantle the heat exchange core and filter.



4.7.2 Explosive view

(1) Applicable models: FHBQGL-D8DA-K, FHBQGL-D10DA-K, FHBQGL-D8DA-S, FHBQGL-D10DA-S

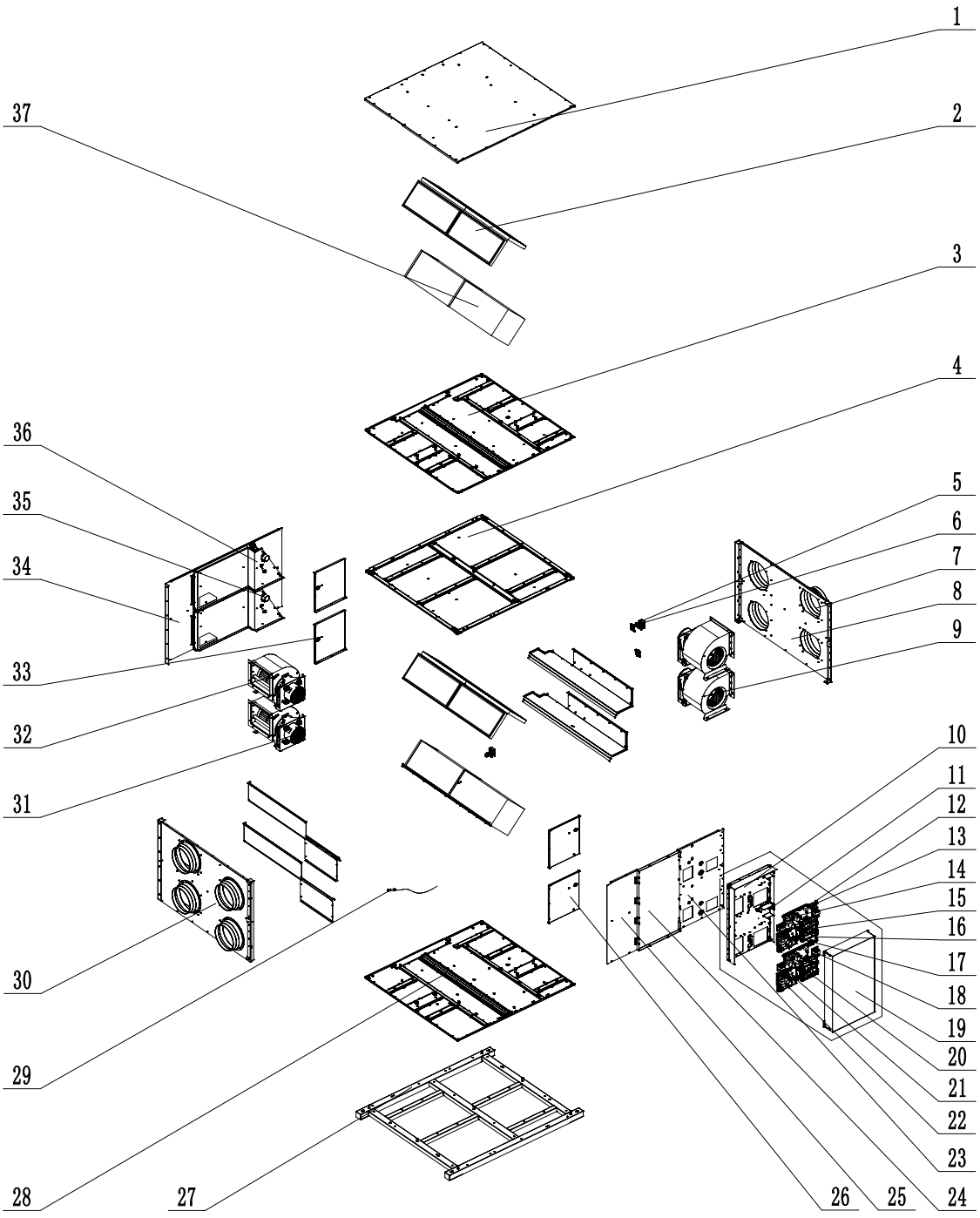


Parts list (code: EH01100160, EH01100170, EH01100340，EH01100350)

No.	Name	Quantity
1	Cover Plate Sub-Assy	1
2	Total Heat Exchange Core Assy	2
3	Backward End Wall Assy	1
4	Barrier Assy	1
5	Stepper Motor	1
6	Low Efficient Filter	4
7	Support Assy Assy	1
8	Barrier Duct	1
9	Access Plate	1
10	Humidity Sensor S upport	1
11	Support	1
12	Centrifugal Fan Assy	2
13	Air Inlet	4

No.	Name	Quantity
14	Thermometer Bulb	2
15	Base Deck Assy	1
16	Electrical Box Assy	1
17	Wire Clamp	1
18	Electric Box Cover	1
19	Cable cross loop	5
20	Main Board	2
21	Wire Gasket Ring	2
22	Reactor	2
23	Apparatus Retaining Plate	2
24	Main Board	1
25	Terminal Board	1
26	Insulated Gasket	1
27	Terminal Board	1
28	Radiator	2
29	Right Side Plate Assy	1
30	Access Door	1
31	Left Side Plate Assygirl	1
32	Support Assy Assy	1
33	Brushless DC Motor	2

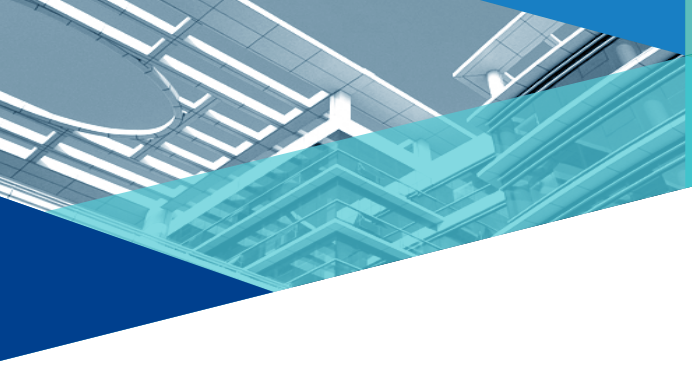
(2) Applicable models: FHBQGL-D15DA-K, FHBQGL-D20DA-K, FHBQGL-D15DA-S, FHBQGL-D20DA-S



Parts list (code: EH01100180, EH01100190, EH01100330，EH01100320)

No.	Name	Quantity
1	Cover Plate Sub-Assy	1
2	Primary filter	8
3	Seat Board Sub-Assy	1
4	Cover Plate Sub-Assy	1

No.	Name	Quantity
5	Humidity sensor supporter	2
6	Detecting Plate	2
7	Air Opening	8
8	Side Plate	1
9	Centrifugal fan assy	2
10	Base Frame Sub-Assy	1
11	Cable Cross Loop	2
12	Terminal Board	1
13	Wire Clamp	1
14	Main Board	2
15	Main Board	2
16	Insulation Gasket	2
17	Terminal Board	1
18	Reactor	4
19	Electric Box Cover	1
20	Mounting Plate	2
21	Radiator	4
22	Main Board	2
23	Right Side Plate Sub-Assy	1
24	Access door	1
25	Left Side Plate Sub-Assy	1
26	Clapboard	2
27	Hange frame sub-assy	1
28	Seat Board Sub-Assy	1
29	Temperature Sensor	1
30	Side Plate	1
31	Brushless DC Motor	2
32	Centrifugal fan assy	2
33	Clapboard	2
34	Rear Side Plate Sub-Assy	1
35	Stepping Motor	2
36	Clapboard Assy	2
37	Total Heat Exchange Core Assembly	4



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