Installation and Operation Manual

Ducted Split Type Air-Conditioning Units

Applicable Models :
FG(R)20/B-G,FG(R)25/B-G
FG(R)30/B-G,FG(R)40/B-G
FG(R)50/B(2)-G,FG(R)60/B(2)-G
FG(R)55/B-G,FG(R)65/B-G

Please read this manual carefully before using this product and keep it properly for future reference.

Preface

FG(R) series ducted air-conditioning units are elaborately designed and produced with high quality, reliability and adaptability.

Please read this instruction thoroughly before operation and maintenance.

◆ The installation should be carried out by the qualified service technicians.

◆ C&H will not be responsible for the personal injury or property damage resulting from improper installation and adjustment, unnecessary maintenance and those do not follow the instructions in this manual.

The scope of guarantee must accord with the following items:

◆ The first start-up should be carried out by qualified service technicians appointed by the service center of C&H.

◆ The components of air-conditioning units should only be provided by C&H Company. The specified time and frequency of the operation and maintenance items in this manual should be strictly executed.

Any violation of the precedent items will lead to the invalidation of guarantee.

All of the figures and messages are for reference only. Since The C&H ELECTRIC APPLICANCES has a policy of continuous product improvement, he reserves the right to change design and specifications of the products at any time without notice.

CONTENTS

1 Working temp. range and working principle of air-conditioning unit

1.1 Working temp. range

	Indoor unit dry / wet bulb Temp.(℃)	Outdoor unit dry / wet bulb Temp.(℃)
Max. Cooling	32/23	43/26
Min. Cooling	21/15	21/15
Max. Heating	27/-	24/18
Min. Heating	20/-	-5/-6

1.2 Working principle of ducted air-conditioning unit

1.2.1 Heat pump ducted air-conditioning unit

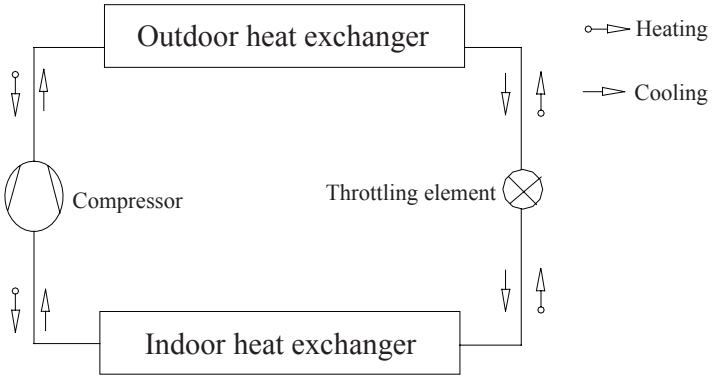


Fig.1 Working principle digram of heat pump ducted air-conditioning unit

The working principle diagram of heat pump ducted air-conditioning unit is shown in Fig. 1. When the system operates in cool mode, the compressor sucks low-temperature, low-pressure refrigerant gas and then discharges high-temperature, high-pressure refrigerant gas into outdoor heat exchanger. With the help of axial flow fan, the gas transfers its latent heat into outdoor air and becomes high-pressure refrigerant liquid. The liquid is throttled by throttling element and changes into low-temperature and low-pressure liquid and then flows into indoor heat exchanger. With the help of centrifugal fan, the liquid evaporates into low-temperature and low-pressure refrigerant gas and indoor air is cooled down. The refrigerant gas is sucked into the compressor and the cycle introduced above goes on and on, and the demanded low temperature environment is maintained. When the system operates in heat mode, the refrigerant flows in the reversible cycle as the cool mode. The refrigerant discharges its latent heat in the indoor heat exchanger (the electric heater operates under some special conditions), and sucks heat from outdoor heat exchanger and forms the heat pump cycle as shown in Fig. 1. This cycle goes on and on, and the demanded high temperature environment is maintained.

1.2.2 Cooling only ducted air-conditioning unit

The working principle of cooling only ducted air-conditioning unit is the same as the working principle of the cool mode introduced above.

2 Structure and components

The ducted air-conditioning unit is composed of an indoor unit, an outdoor unit and two connecting lines as shown in Fig. The one outdoor unit with one indoor unit systems are: FG(R)20/B-G,FG(R)25/B-G,FG(R)30/B-G,FG(R)40/B-G,FG(R)55/B-G,FG(R)65/B--G;

While the two outdoor units with one indoor unit systems are :FG(R)50/B(2)-G,FG(R)60/B(2)-G.

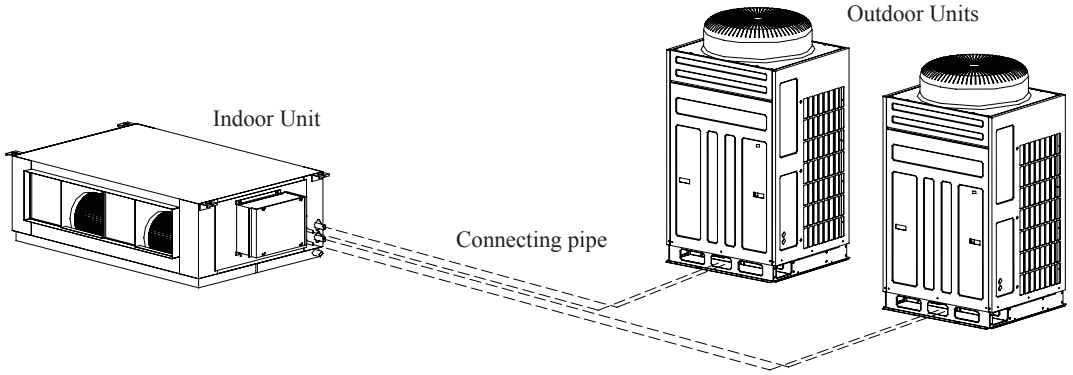


Fig.2 Structure of the unit

3 Safety precautions

3.1 Safety notice

Before using the appliance, read this manual thoroughly and operate under its direction.

"WARNING" and "ATTENTION" have the following meanings in these instructions:

⚠ WARNING This mark indicates procedures, which if improperly performed, might lead to the death or serious injury of the users.

⚠ ATTENTION This mark indicates procedures, which if improperly performed, might possibly result in personal injury to the user, or damage to property.

⚠ WARNING

◆ Do not use or place combustible and explosive gas or liquid near the air conditioner.

◆ To optimize the life of the appliance, do not install the air-conditioning unit by yourself.

◆ Do stop operation and turn off the power supply immediately in the event of a malfunction (burning smell, etc.).

◆ Don't remove the fan guard and not insert fingers or objects into the outlet ports of the indoor and outdoor unit.

◆ Do not check or fix the air-conditioning unit while it is running.

◆ Do not pour water into the air-conditioning unit and not operate it with a wet hand.

◆ The air-conditioning unit is not equipped with a device to suck fresh air from the outdoors, so when you are using gas or petrol in the same room, or you feel the room air is dirty, please open the door or window to exchange the air, but this can affect the adjustment of air conditioning.

⚠ ATTENTION

◆ Ensure the power supply correspond to the nameplate and check the security of the power source before installation.

◆ Make sure that the wires, pipes and drain hose are properly connected before operation to avoid a fire or electric shock.

◆ Don't let children operate the ducted air-conditioning unit.

◆ Turn off the power supply whenever cleaning the air-conditioning unit or changing the air filter.

◆ Switch off power source when the units will not be operated for a long period.

◆ Do not step or place objects on the air-conditioning unit.

3.2 Power supply demand

1) Provided sufficient capacity of power supply and the cross area of electrical wires.

2) Confirm the reliable earth connection, and the earth wire should be connected to special device of the building. Never connect the earth wire to the gas pipe, water pipe, the earth wires of telephone and lighting rod.

3) Make sure that the wiring is done by the qualified technicians according to the relevant regulations.

4) In fixed circuit, there must be electricity leakage protection switch of enough power capacity and air switch with enough space.

4 Wired remote control operation procedure

4.1 Control Panel

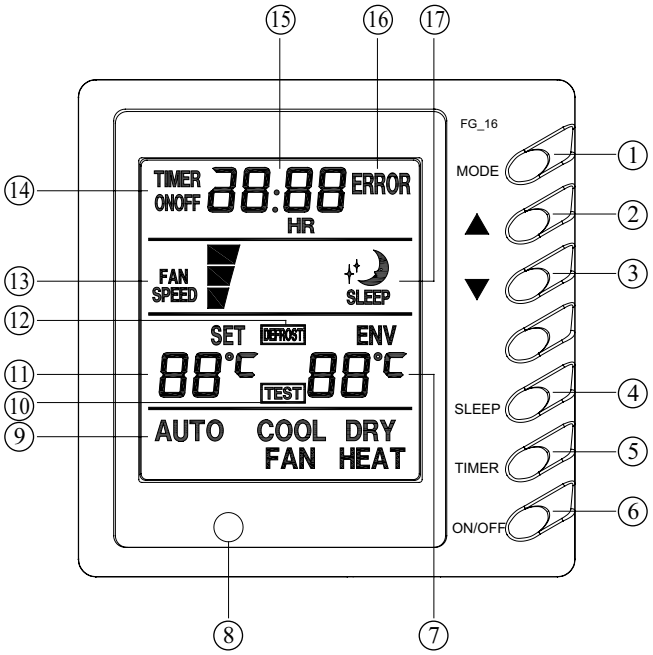


Fig.3 Control panel

CONTROL PANEL COMPONENT			
Button			
1	Mode selection button	2	TEMP/ Timer rising button
3	TEMP/ Timer reducing button	4	Sleep button
5	Timer button	6	ON/OFF button
8	Signal receptor		
Liquid crystal display			
7	Indoor TEMP display	9	Operation mode display
10	Test display	11	Set TEMP
12	Melt [DEFROST]	13	Fan speed (High speed)
14	Timer ON/OFF	15	Timer display
16	Error display	17	Sleep display

4.2 Operation indication

4.2.1 ON/OFF

Press the “ON/OFF” button, the ducted air-conditioning unit will start operating. (Fig. 4).

Press the “ON/OFF” button again, then the ducted air-conditioning unit will stop operating.

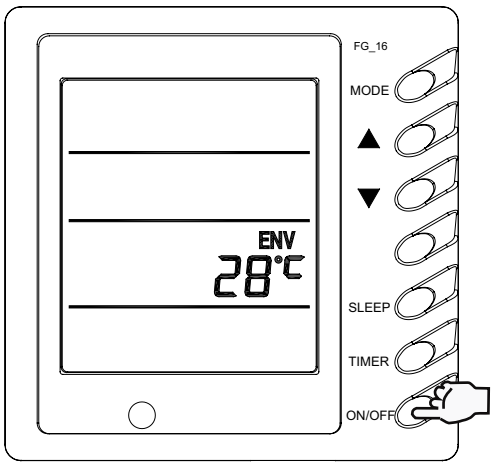


Fig. 4 ON/OFF

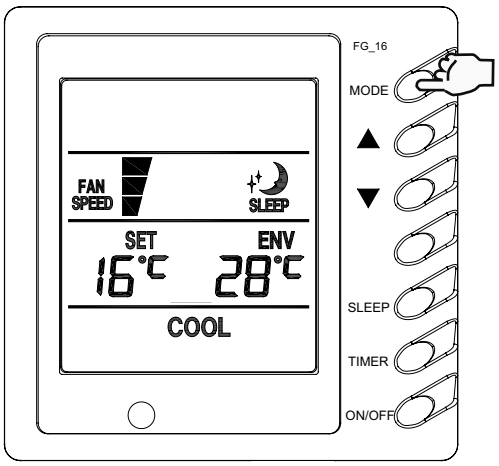


Fig. 5 Selecting COOL mode

4.2.2 COOL mode

Press “MODE” button to change the operating mode in order. In “COOL” mode, “COOL” will be shown on the control panel (Fig.5). In the meantime, press “▲” or “▼” button to set suitable temperature, and the temp. can range from 16 to 30℃ ; Press “▲” to increase the temp.; Press “▼” to decrease the temp. (Fig. 6). If set temp. is higher than the room temp., the unit will operate in the FAN mode instead of the COOL mode.

4.2.3 HEAT mode

Press “MODE” button to set “HEAT” operation mode and “HEAT” will be shown on the control panel. In the meantime, press “▲” or “▼” to set suitable temp., and the temp. can range from 16 to 30℃ . Press “▲” to increase the temp.; Press “▼” to decrease the temp. If set temp. is lower than the room temp., the unit can not operate in the HEAT mode. In HEAT mode, outdoor unit will frost and reduce the heating efficiency while outdoor temp. is fairly low and the humidity is fairly high. In that case, the unit will automatically operate in “MELT[DEFROST]” mode and “MELT[DEFROST]” on the control panel will be shown (Fig. 6).

NOTICE: Cooling only unit cannot be operated in HEAT mode.

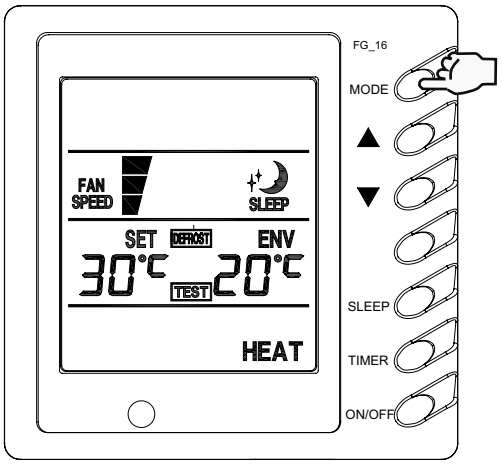


Fig. 6 MELT [DEFROST]

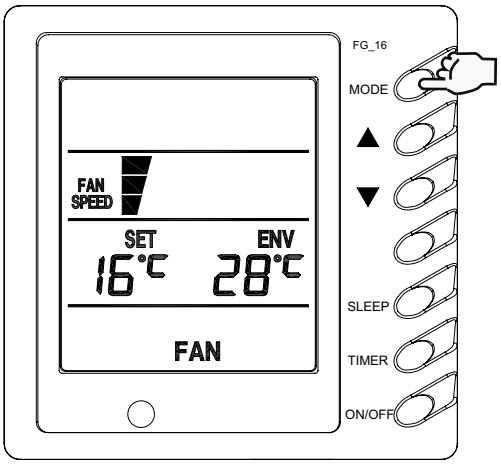


Fig. 7 Selecting FAN Mode

4.2.4 Fan Mode

Press “MODE” button to set “FAN” operation mode and “FAN” will be shown on the control panel. In the mean time, indoor unit can only run at high fan speed mode and cann’t adjust the indoor temp. while the indoor actual temp will also be displayed on the LCD board. When the fan is running, fan speed part will dynamically show running state of the fan; When this part disappears, it means the fan hasn’t been started or under off mode. (Fig. 7).

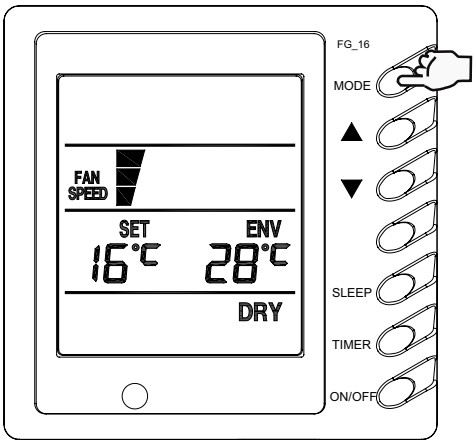


Fig. 8 Selecting DTY Mode

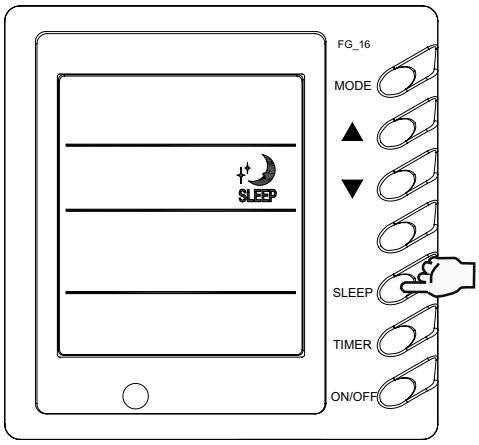


Fig.9 Set SLEEP

4.2.5 DRY mode

Press “MODE” button to set “DRY” operation mode and “DRY” will be shown on the control panel. In the meantime, the indoor fan will run and the room temp. that ranges from 16 to 30℃ can be adjusted by pressing “▲”or “▼”button. The dehumidifying effect is more efficient when the conditioner operates in DRY mode than in COOL mode, furthermore, the energy saving is more efficient. (Fig. 8).

4.2.6 SET SLEEP

When the ducted type air-conditioning unit operating in COOL and HEAT mode, press “SLEEP” button to set the SLEEP function (Fig. 9).

In COOL mode, if “SLEEP” button is pressed, the preset temp. will be increased 1℃ in 1 hour and 2℃ in 2 hours, and then the unit will operate in COOL mode with this increased temp..

In HEAT mode, if “SLEEP” button is pressed, the preset temp. will be decreased 1℃ in 1 hour and 2℃ in 2 hours, and then the unit will operate in HEAT mode with this decreased temp..

4.2.7 SET TIMER

At unit turned off, the timer on could be set up, at unit turned on, the timer off could be set up. After pressed the “TIMER” button, the unit could be set up, and the TIMER icon flashes, by pressing the buttons“▲”,“▼” could increase or decrease the time of timer, when repress the “TIMER” button, the Timer is valid, the units will start calculate the time. When the unit is in the TIMER, press the “TIMER” button could cancel the time. The timer setting range is 0.5~24 hours.

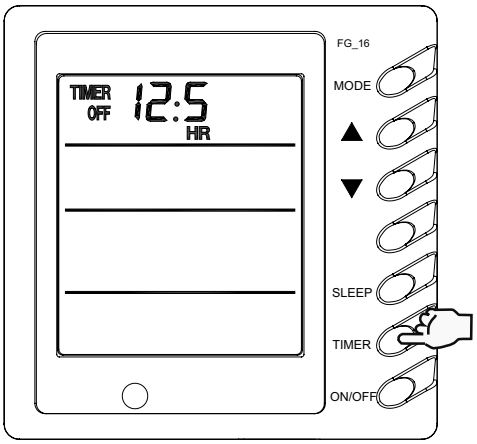


Fig.10 Set TIMER

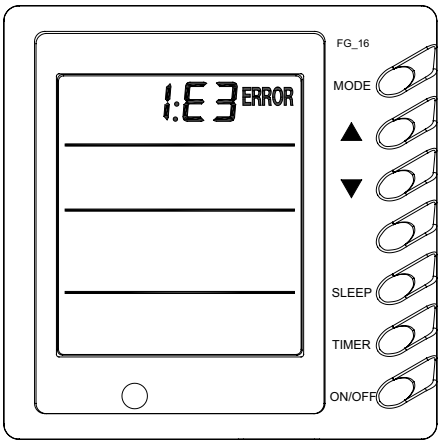


Fig. 11 Malfunction code display

4.2.8 AUTO mode.

Press “MODE” button to set “AUTO” operation mode and “AUTO” will be shown on the control panel. In the meantime, the ducted air-conditioning unit will operate according to the following conditions.

For heat pump type:

If the room temp ＞ 26, the unit will operate in COOL mode;

If the room temp ＜ 20℃, the unit will operate in HEAT mode;

If the room temp ≥ 24℃,the unit will quit HEAT mode;

If 20℃ ≤ room temp ≤ 26℃, the unit will operate in DRY mode.

For cooling only type:

If the room temp ＜ 20℃,the unit will operate in FAN mode;

If the room temp ≥ 24℃the unit will quit FAN mode.

4.2.9 Subroom ON/OFF function

If manual controller is on while the subrooms(up to 16) are off, it indicates the unit is under standby state. Under standby state, the manual controller will display FF at the position displaying error code, furthermore, mode and setting temp can be adjusted. In this case, the system can be started only after startup of the subroom,and ambient temp is normally displayed. The system can be stopped after stop of manual controller or all subrooms.

4.2.10 Button lock function

When the ▲and ▼buttons are pressed simultaneously for 5 seconds, “EE” will appear at the PRESET temperature display location. If presses the ▲and ▼buttons simultaneously for 5 seconds again, the button locked function will be released. When the long-distance monitor or the central controller has locked the control panel, the buttons of the control panel will be disabled, and “CC” will appear at the PRESET temperature display location.

4.2.11 Memory function

The controller will remember the previous MODE setting such as ON/OFF, TIMER, FAN, MODE and TEMP. If the power supply is cut off accidentally while the ducted air-conditioning unit is running.

4.2.12 Malfunction code display

If there is something wrong with the conditioner, a malfunction code will be shown on the control panel as shown in Fig.11 The malfunction codes are shown in the following tables.

Code	Information	Code	Information
1:E1	Comp 1 high pressure protection	2:E1	Comp 2 high pressure protection
1:E2	System 1 Anti-freeze protection	2:E2	System 1 Anti-freeze protection
1:E3	Comp 1 low pressure protection	2:E3	Comp 2 low pressure protection
1:E4	Comp 1 discharge protection	2:E4	Comp 2 discharge protection
1:E5	Comp 1 overloading protection	2:E5	Comp 2 overloading protection
1:E6	System 1 communication error	2:E6	System 2 communication error
1:F1	Evaporator 1 Temp sensor error	2:F1	Evaporator 2 Temp sensor error
1:F2	Condenser 1 Temp sensor error	2:F2	Condenser 2 Temp sensor error
1:F3	Outdoor environment temp sensor error	2:F4	Gas Discharge 2 temp sensor error
1:F4	Gas Discharge 1 temp sensor error	FF	Subroom closed
1:F0	Indoor environment temp sensor error	E8	Indoor fan motor overloading
		EH	Electric heater error

Notice: Please press the ON/OFF button to stop the buzzer if the alarm buzzer calls accompanying the Malfunction code.

5 Remote controller for operation procedure

5.1 Names and functions of buttons

NOTE:

◆ The remote controller is a general controller, which is suitable for many kinds of air conditioners, and the functions of buttons not applicable to models described in this manual are not explained below.

◆ Be sure that there are no obstructions between the remote controller and the signal receiver.

◆ The remote control signal can be received at a distance of up to 8 meters.

◆ Don't drop or throw the remote controller.

◆ Don't let any liquid in the remote controller and put the remote controller directly under the sunlight or any place where it is very hot.

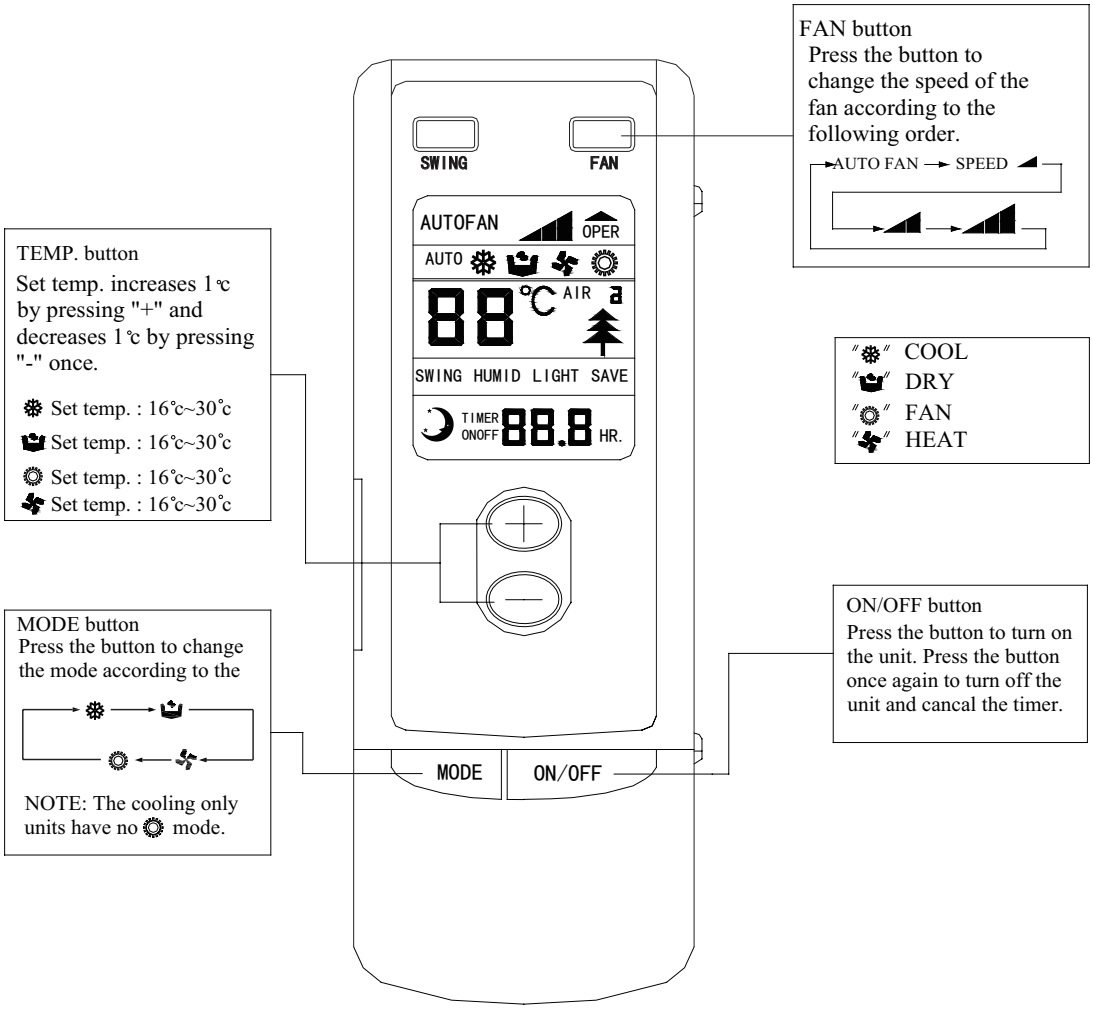


Fig. 12 Remote controller

5.2 Cool mode operation procedure

Connect power, then press ON/OFF key. Press MODE key to select the COOL mode. Press temp adjusting key to setup the required temp. Refer to Fig.13.

5.3 Heat mode operation procedure

Connect power, then press ON/OFF key. Press MODE key to select the HEAT mode. Press temp adjusting key to setup the required temp. Refer to Fig.14.

In the HEAT mode, the unit will work under the chilled air protection and blowing left heat function, which means after the unit is turned on, the indoor fan won't work immediately till 30 seconds later or the temp of evaporator is over 30℃, so as to avoid chilled air blew out; When the unit is turned off, the indoor fan will continue to work for 60 seconds before stop.

5.4 Dehumidify mode operation procedure

Connect power, then press ON/OFF key. Press MODE key to select the DEHUMIDFY mode. Press temp adjusting key to setup the required temp. Refer to Fig.15.

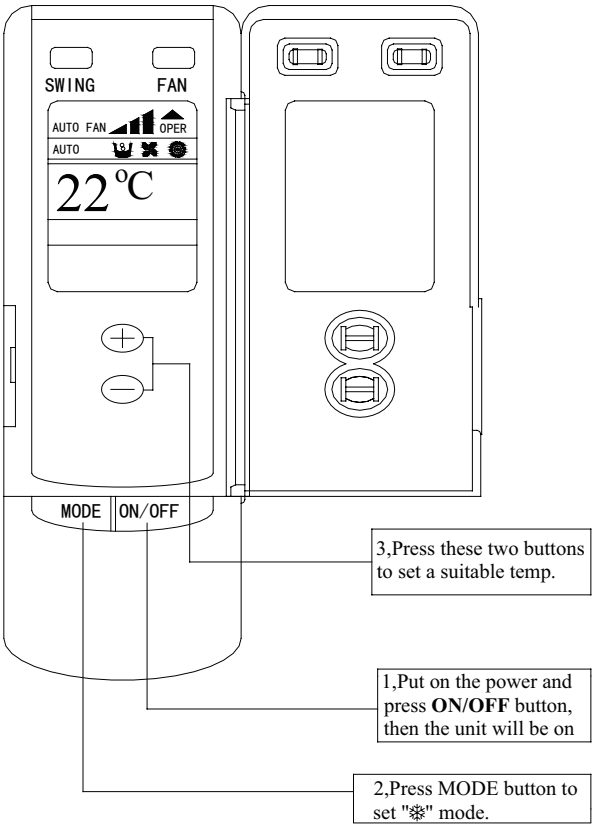


Fig 13 Cooling mode

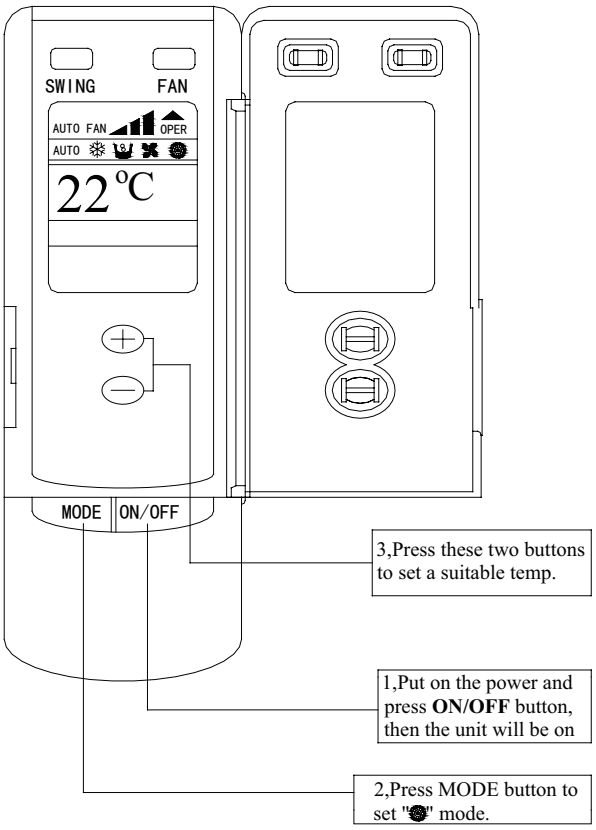


Fig 14 Heating mode

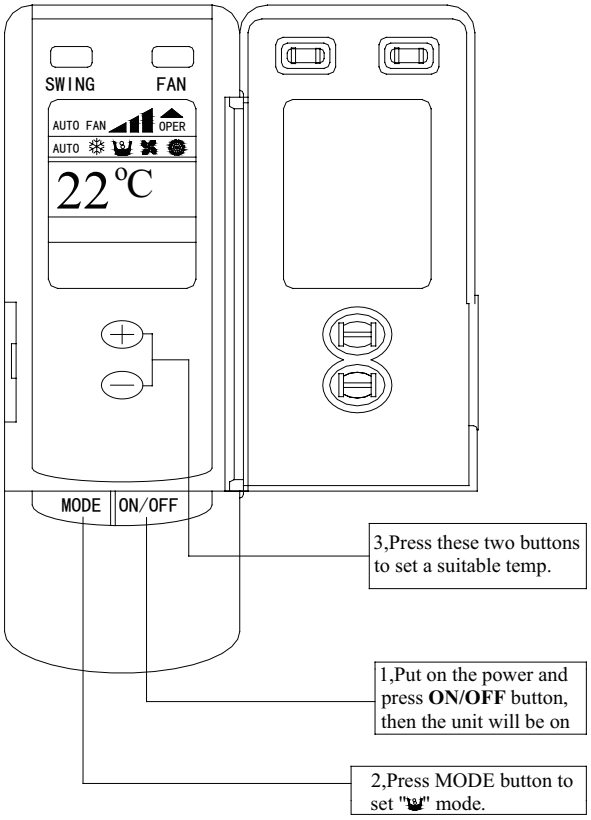


Fig 15 Dehumidify

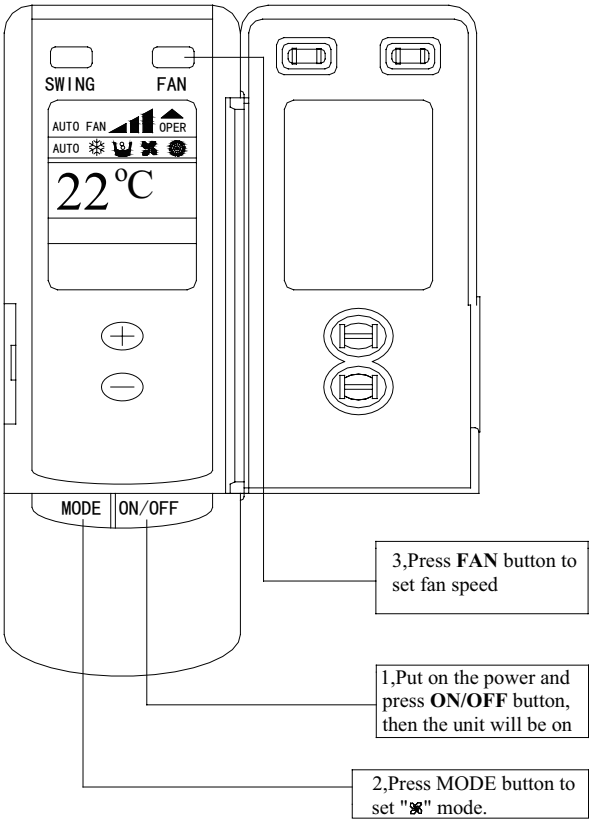


Fig 16 Fan mode

5.5 Fan operation

After energization, press ON/OFF key and then press MODE key to select the FAN mode.There is only one speed for it and the buzzer will beep when the fan is operated by the remote controller. Fig.16.

5.6 Auto mode

Connect power, then press ON/OFF key. Press MODE key to select the AUTO mode, Fig 17.Micro-processor will auto control the running mode by the signal from the temp sensor. In this condition, the unit will run at cooling mode if the environment temp is over 26℃ and at HEAT mode if the environment temp is below 20℃; at DRY mode if the 20℃ ≤ environment temp ≤ 26℃;

For the cooling only unit, when temp is below < 20℃, it will run at AUTO FAN mode; when temp is ≥ 24℃, running at COOL Model.

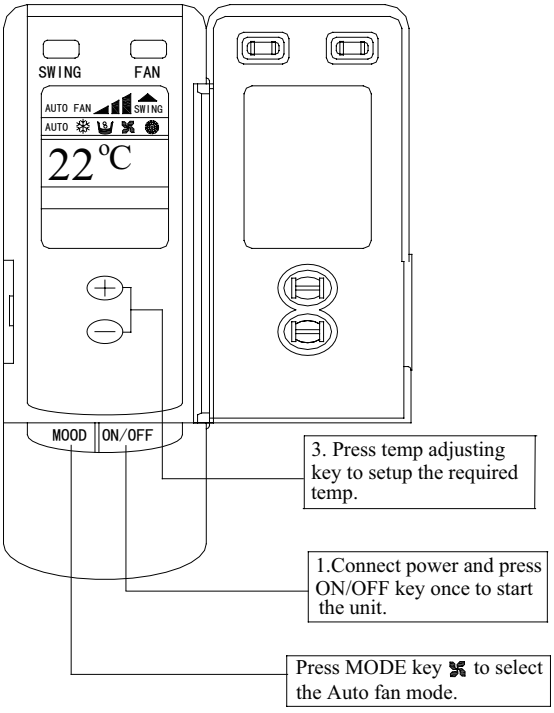


Fig 17 Auto mode

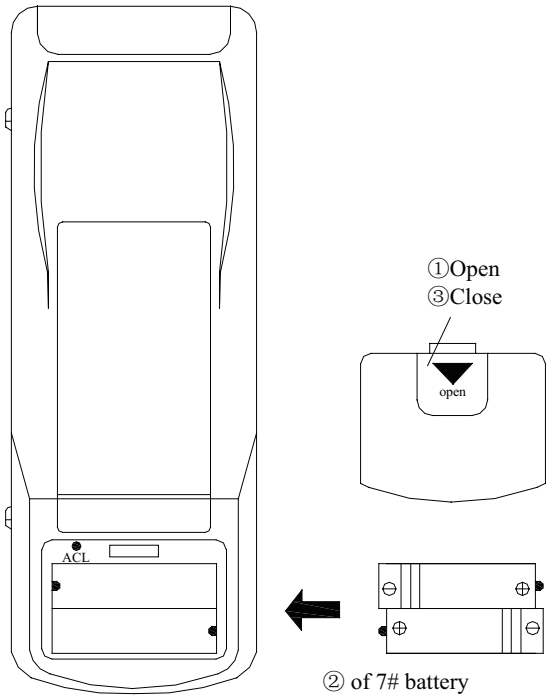


Fig. 18 Change the battery

5.7 Change the battery

Please see the procedure in Fig. 18.

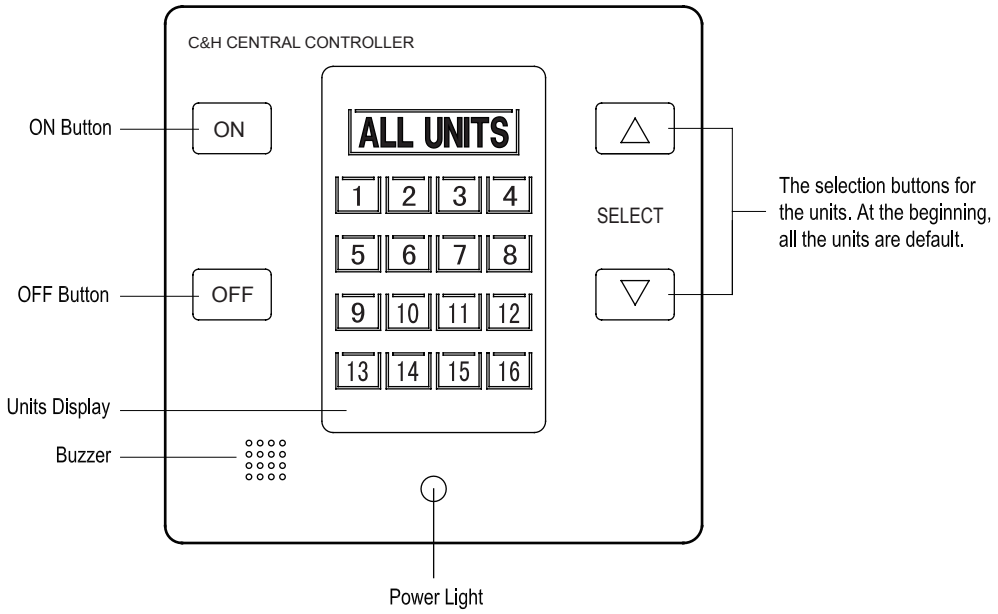
◆ All functional graphs and alphabetic codes will be displayed on the screen after inserting the batteries and the remote controller can be used.

◆ The lifetime of the battery is about one year.

◆ Never mix the old and new or different type of batteries.

◆ Remove batteries when the remote controller is not in use for a longtime.

6 Central Control Introduction



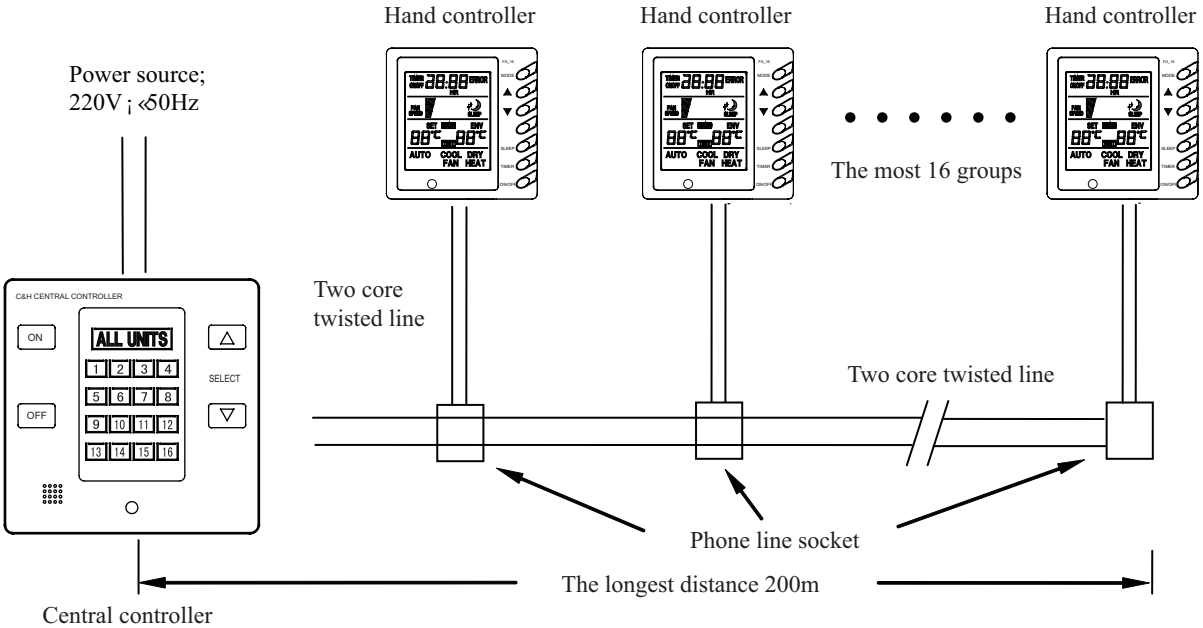
This central controller adopts 485-style and hand controller communication of each ducted-type unit, the max. number of control units is 16 pcs and the longest communication distance is 200m. After power is on, the central controller can display all the connection units (The unit code is decided by the location of code switch on the ducted type hand controller.). The central controller can control the starting/stopping of each ducted-type unit. The mode selection, temperature adjustment, etc. for each unit can be implemented through the hand controller, which is provided along with the unit.

1) The controlled unit can be selected by pressing △ or ▽ button and the selection can be ranged from 1 to 16. Including all the units are selected, the selection modes are 17.

2) If one unit is selected (or all the units are selected), the corresponding code will flash, then press ON button to start the unit. At the same time, the outline border of the corresponding code will show.

3) Press “OFF” button to stop the corresponding unit, In this case, the outline border of the corresponding code will not show.

4) The connections between this central controller and hand controller are shown as the following figure:



5) Each unit will have an address in the central controller, which can be set at the back of the wired controller. There are four code switch, at the part “ON”, it will be “0”; while at “OFF”, it will be “1”.

Switch	Ordinal	Switch	Ordinal	Switch	Ordinal	Switch	Ordinal
0000	1	0100	5	1000	9	1100	13
0001	2	0101	6	1001	10	1101	14
0010	3	0110	7	1010	11	1110	15
0011	4	0111	8	1011	12	1111	16

Example: Address code is “0111”, means the Ordinal NO is “8”. The first switch from left to right will be at “ON”, the last three switches at “OFF”.

Example 2: Address code is “1010”, means the Ordinal NO is “11”. The switches from left to right will be at “OFF”,“ON”, “OFF”,“ON”.

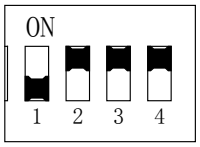
As in the following Fig:

Unit address(Ordinal):1

0000

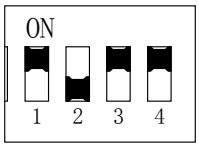
Unit address(Ordinal):2

0001



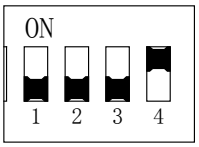
Unit address(Ordinal):3

0010



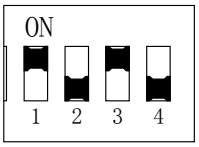
Unit address(Ordinal):8

0111



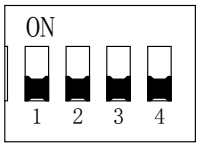
Unit address (Ordinal):11

1010



Unit address (Ordinal):16

1111



Note: As the upper unit will keep on detect the data of the sub unit, there might be 16s delay at the most.

Function:

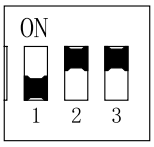
If choose “select all” item, press ON key, then all the sub units will be started, there will be 10s gap between the startup of each unit. No such time gas when shot all the unit down.If just choose the exact unit at “1”, press ON/OFF key then just the choosing one will be opened or shut down.

Set up the outdoor unit address

The outdoor address is composed of several units, which must be separated by setup the code switch. All the code switches are composed of three position switch (SW2), on which the main unit and sub units can be separated. When the “1” one is at “OFF” part, it means main unit; at “ON” part means sub unit.

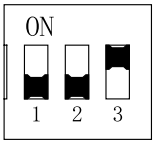
Main unit’s “2” and “3” switch will show the number of the system. Single system has no sub unit, Dual system has one sub unit.

Single system outdoor unit code switch:

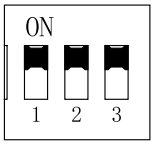


Main unit code switch

Dual system has two outdoor units, one main unit and one sub unit:



Main unit code switch



Sub unit code switch

Note:

No matter multi-outdoor or single outdoor system it is, ONLY ONE main system must be set up. Please follow the previous information strictly while setting the outdoor unit address and make sure there is no mistake. Or it might cause communication errors.

7 Installation instruction

7.1 Selection proper installation location

The installation must accord with local regulation, and must be carried out by the professionals. Never carry out the work by yourself without the help of professionals. And don't supply power, until all the work is finished according to the user's manual.

7.1.1 Selection the proper location for indoor unit

◆ Avoid the direct sunshine.

◆ Make sure the suspension bracket is strong enough to withstand the unit's weight.

◆ Select a place for easily connection of the drain hose.

◆ The inlet and outlet ports should not be obstructed so that the indoor air circulates well.

◆ Make sure the convenient connect of the connection pipes.

◆ Selection a location that is far away from the combustible or explosive material and gas.

◆ Selection a location that is far away from the cankerous material, frog, dusk or moist.

7.1.2 Selection the proper location for outdoor unit

◆ Outdoor unit should be installed in a steady and stable place.

◆ To reduce the length of the refrigerant pipe and bend number, make sure the indoor unit and outdoor unit be close to each other.

◆ Ensure the operation noise do not disturb neighbors and passerby.

◆ Do not install the unit where it will be exposed to direct sunlight or other radiation heat source, or the awning or a rainproof cloth should be utilized.

◆ The inlet and outlet port should not be blocked.

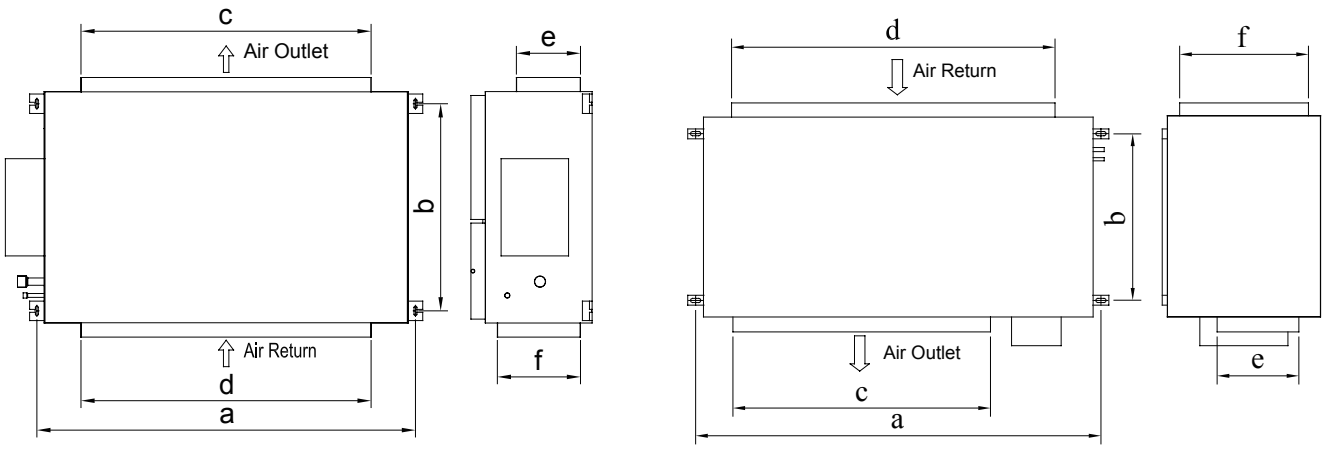
◆ Make sure the well air circulation.

◆ Selection a location that is far away from combustible or explosive material, dust, fog or moist.

Don't connect any air leading duct to the outdoor unit, at neither the air inlet nor the air outlet. The outdoor unit will drop condensate while running at heat mode. If the temp is minus, it will form ice. Don't let the rain proof interfere the ventilation of outdoor unit.

7.2 Install the indoor unit

7.2.1 The dimensions of installation hole and the intake/outlet port are shown in Fig. 19 and Table 1.



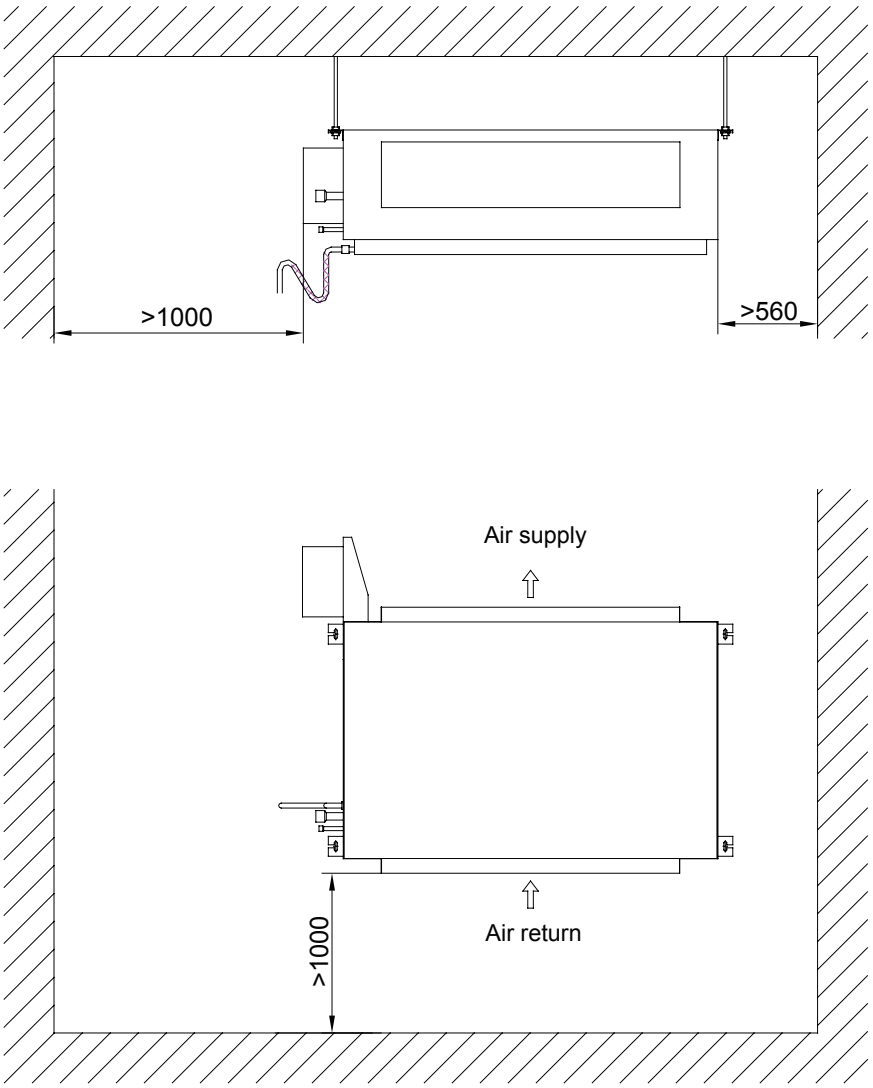
a. less than 35 kW b. larger than 35kW

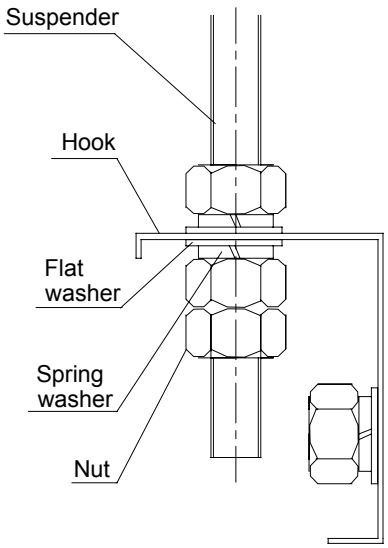
Fig. 19 Indoor unit installation position and dimension

Table 1 Outlines and dimension of the unit Unit: mm

Model	a	b	c	d	e	f
FG(R)20/B-G(I) FG(R)25/B-G(I) FG(R)30/B-G(I)	1560	910	1194	1194	292	342
FG(R)40/B-G(I)	1780	1040	868	1450	347	555
FG(R)50/B(2)-G(I) FG(R)55/B-G(I)	1980	1040	1120	1650	347	600
FG(R)60/B(2)-G(I) FG(R)65/B-G(I)	1980	1040	1120	1650	347	755

7.2.2 Main body of the indoor unit The indoor unit should be installed horizontally and the demand of installation space is shown in Fig. 19. To install an indoor unit needs 4 hanging rods, and each hanging rod should at least withstand four times of the unit's weight.





Installation of suspender

Fig.20 Schematic for the indoor unit

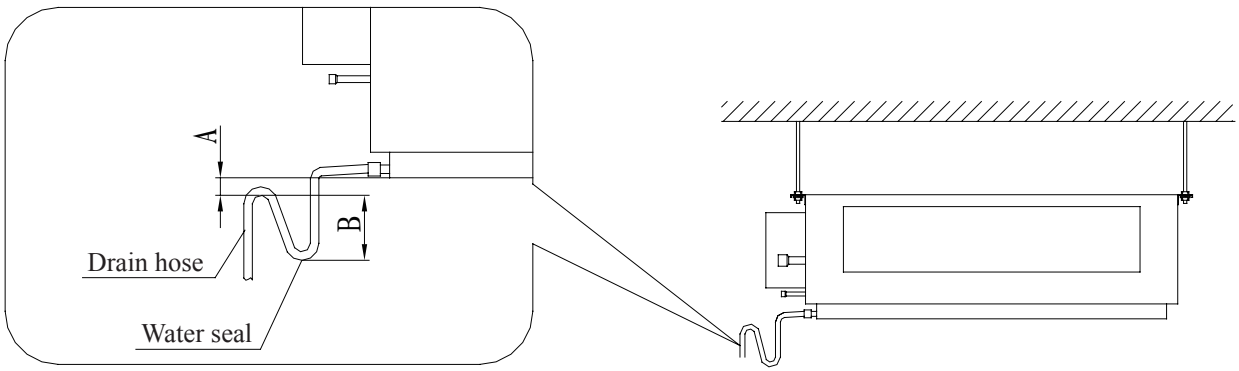
7.2.3 Drain hose

For easy drainage of the condensation water, the should be installed with a downward gradient. To avoid the condensation, the connection pipe joint should be insulated with thermal insulation material. A water seal should be employed as shown in Fig. 19 and the height of the water seal could be determined by the pressure of the drain hose.

Drain hose is in negative pressure state: $A = B \geqslant P/10+20$ (mm)

Drain hose is in positive pressure state: $A \geqslant 30$mm, $B \geqslant P/10+20$ (mm)

Note: P is the absolute pressure of the drain hose position, Pa



7.2.4 Refrigerant pipe insulation layer

To avoid condensation of drew and water leakage, gas pipe and liquid pipe of refrigerant should be insulated with thermal insulation material and adhesive tape.

7.2.5 Install the Electrical Box.

In order to ease the maintaining work, we recommend to get of the electrical box part of the indoor unit to refix it at the air outlet part. Please see following Fig 21.

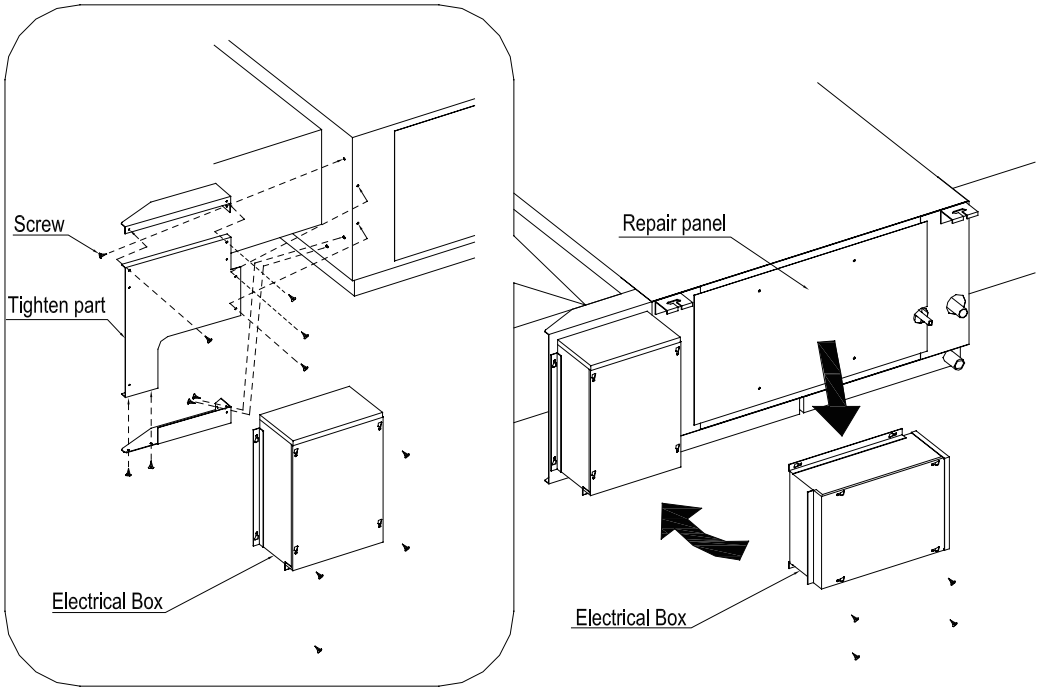


Fig. 21 Schematic for the Electrical Box part

7.2.6 Install the wired remote controller

◆ A pit or a hole in the suitable position of the wall should be reserved for the connection signal cables.

◆ The connection wire between indoor unit and controller can be laid in the pit with 1# PVC pipe for direct installation (Figure 22). For concealed installation, 1# PVC can also be utilized (Figure 23).

◆ Both Cable of direct installation and the concealed one, please drill two horizontal hole on the wall and insert two wooden plug. Then fix the soleplate on the wall and insert the signal wire pin into the plug as showed in Figure 24, finally fix the controller to the wall..

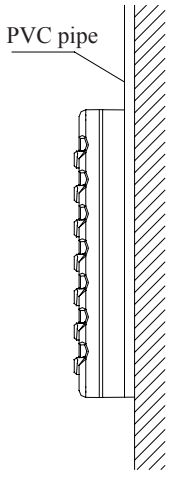


Fig. 22 Cable of direct installation

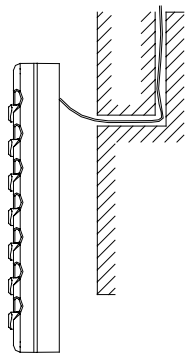


Fig.23 Cable of concealed installation

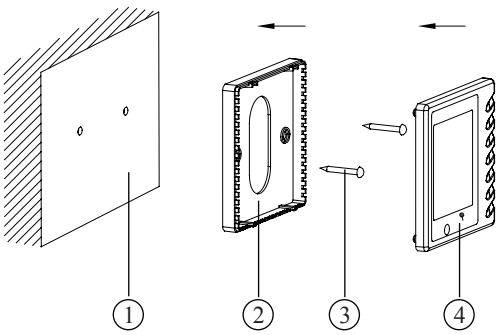


Fig.24 Schematic

Serial	1	2	3	4
Name	Wall	Soleplate	Screw M4X10	Controller Panel

7.2.7 Connection of the signal wire

- ◆ Open the electrical box;
- ◆ Plug the wire through the PVC pipe;
- ◆ Plug the wire onto the four-nail sea;
- ◆ Tighten the wire;
- ◆ The max length between controller and the PCB board is 20m.

7.2.8 Take off the controller:

Wrong way

Disassembly from top

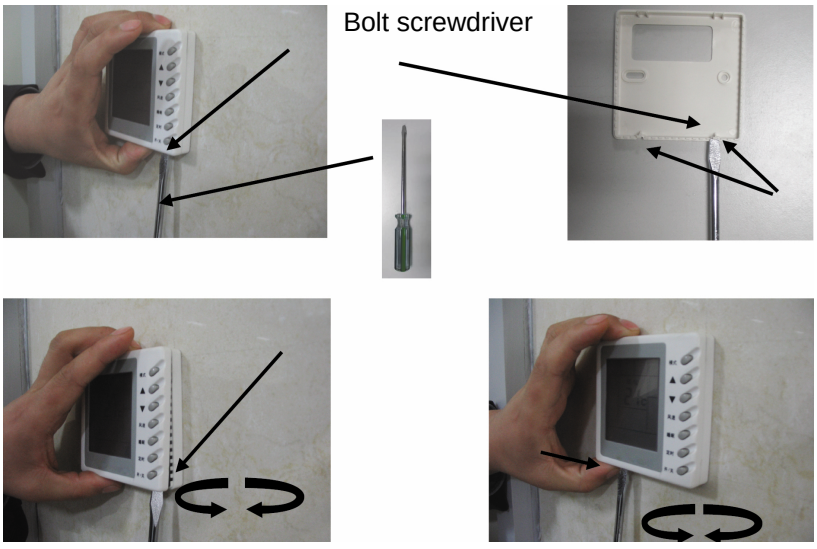
Disassembly from

Disassembly from right side

Disassembly from left

It will break the lock part, please use some device to help.

Correct way



Use screwdriver to plunge in this position,Rotate diesel or anti- deasil direction, the panel can be take off.Do the same to another lock and display panel is separated from bottom case.

Separate display board and bottom case, Raise the display board and unhitch the upper lock.

Note:The pictures are just for helping the explanation

7.2.9 Adjust the tightness of the belt of the fan unit

The rotation of the fan is achieved by the transmission of the belt. The velocity and stability of the fan is associated with the tightness of the belt and the tightness should be adjusted after a period of time. For a new belt, the tightness should be adjusted for at least twice within 24 hours.

After one week running, the tightness of the belt should be adjusted again, we should routinely check it every 1-2 months; also ensure the test results complying with Table 2.

The adjustment of the tightness of the belt is shown in Fig. 25. Loosen screws fixing motor on the base, move motor along the direction of arrow as shown in the picture, then fix the screw again.

The tightness level of belt is tested by tensiometer as shown in Fig. 26, when △ reaches the deviation length(Deviation=The total length beit/64) ,read the value on the meter, the value should be in the category specified in Table 2.

Table.2 Tension range of the belt

Section area of the belt	Diameter of the small belt (mm)	Tension (N)	
		Min	Max
SPA	Φ80	7.5	10.9
SPZ	Φ80	7.2	8.3
	Φ71	5.8	6.6
	Φ67	7.8	9.0

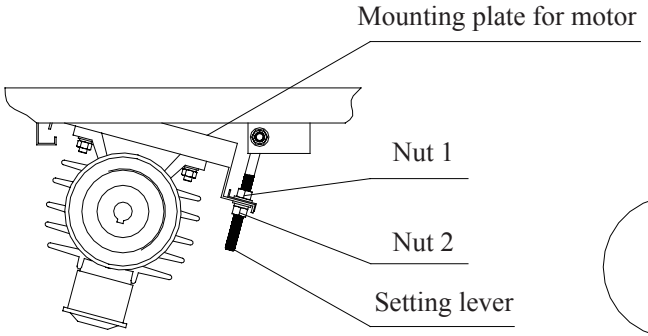


Fig. 25 Adjust the tightness of the belt

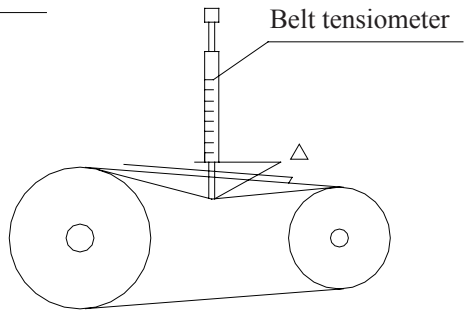


Fig. 26 Utilization of the belt tensiometer

7.3 Install the outdoor unit

7.3.1 Outline and dimension of the outdoor unit

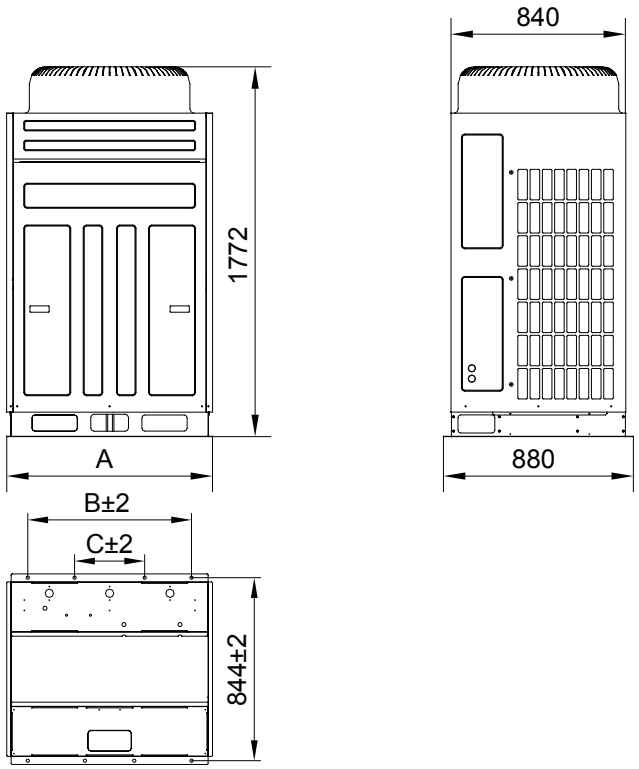


Fig 27 Schematic of the Outdoor unit

Table.3 Outlines and dimension of the unit Unit: mm

Model	A	B	C
FG(R)20/B-G(O),FG(R)25/B-G(O),FG(R)30/B-G(O)	990	787	337
FG(R)40/B-G(O)	1290	1160	850

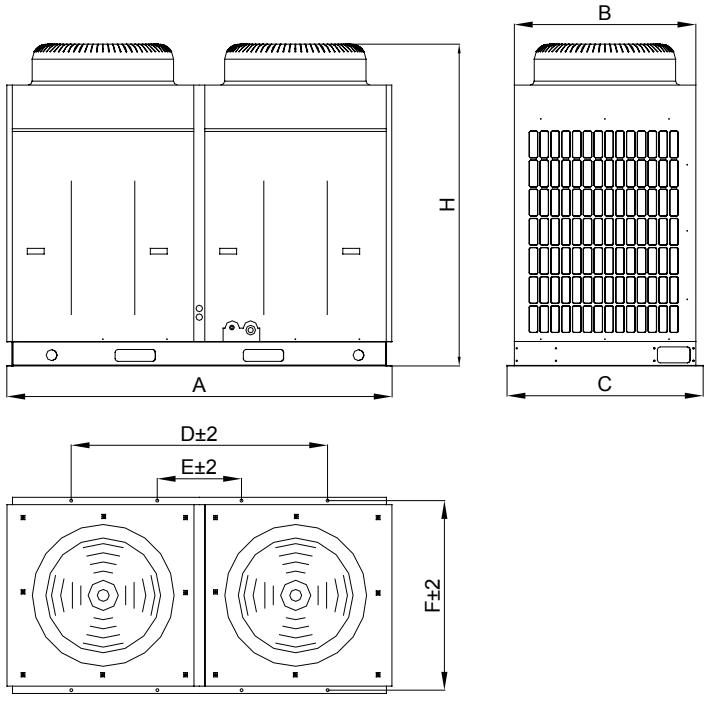


Fig 28 Schematic of the Outdoor unit

Table.3 Outlines and dimension of the unit Unit: mm

Model	A	B	C	D	E	F	H
FG(R)55/B-G(O),FG(R)65/B-G(O)	1980	840	920	1400	460	880	1760

7.3.2 Installation position

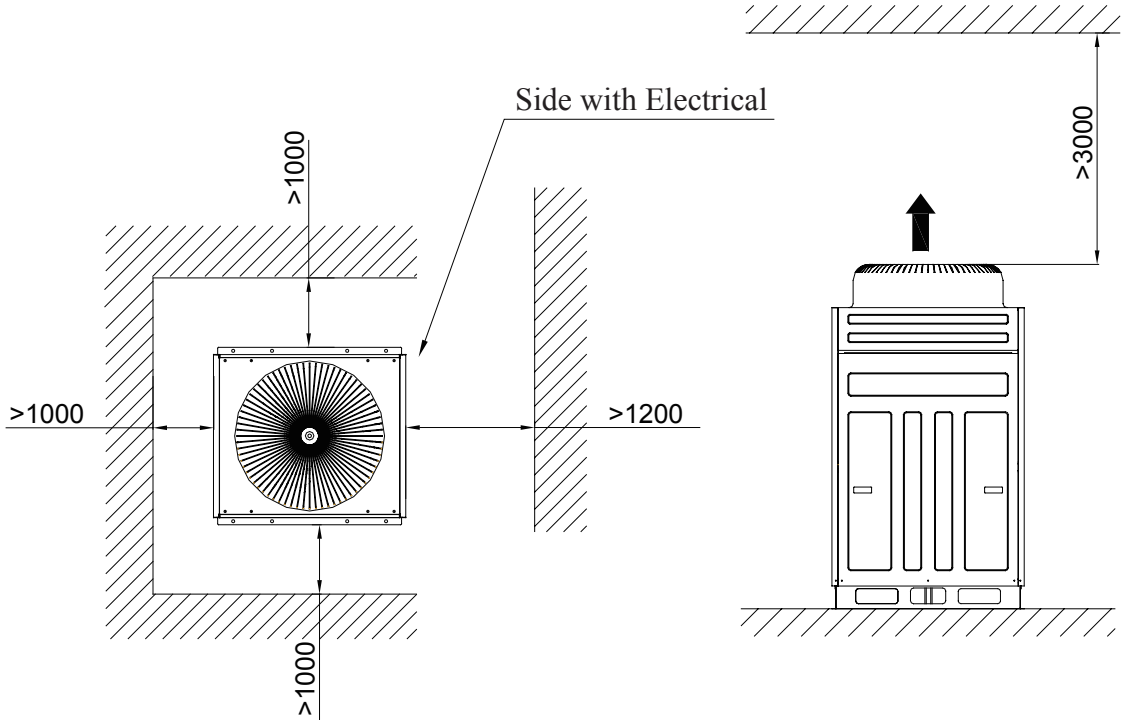


Fig 29 Schematic for the installation of the outdoor unit

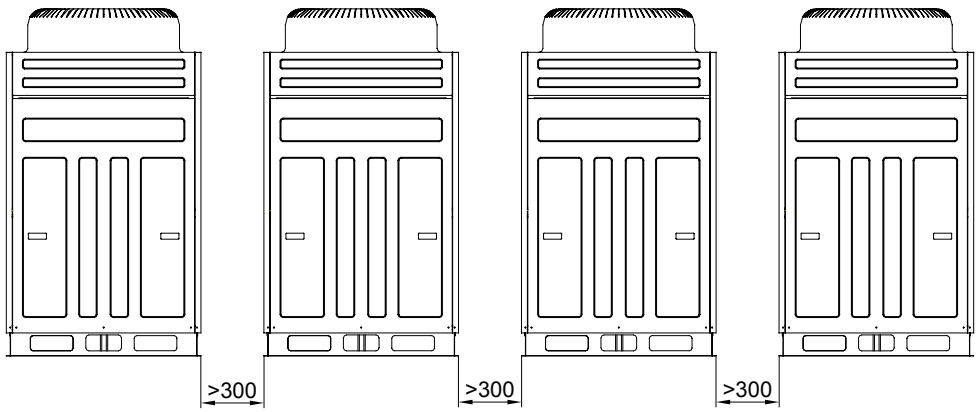


Fig 30 Schematic for the installation of the outdoor unit

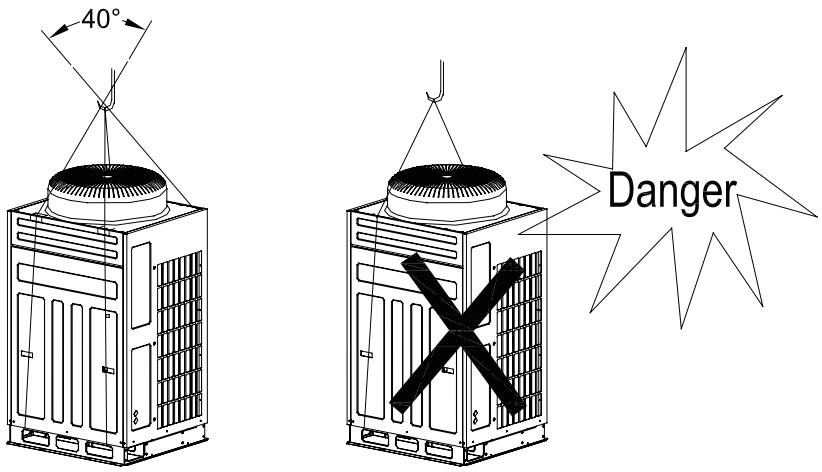


Fig 31 Crane way schematic

When removing the outdoor unit, two ropes are needed to hang the unit along the four ways. In order to avoid the excursion, the angle between the ropes should be less than 40 degree.

Please use M12 to tight the support fundus.

7.3.3 Refrigerant pipe connection

Note:Do not loosen the cap of the pipes when connecting the pipes between the indoor unit and the outdoor unit. Connecting the pipes as soon as possible after loosening the cap of the pipes to avoid the entering of water and dusk. A metal pipe should be utilized if a pipe should be installed through a wall.

◆ The connection of the pipes should confirm to the following principles:

◆ Make sure to lessen the length of connecting pipe, the height difference between the indoor and outdoor unit, and the number of bends, and enlarge the diameter of bends.

The permitted maximum value of each case:

Height difference between the indoor and outdoor unit	＜30m
90^{o} Number of bends	＜12
Length of connecting pipes	＜70m

◆ The pipe meld type could be employed for the connection of the pipes between the indoor and outdoor units.

◆ The pipe joint should be tightly connected when a pipe joint is employed between two pipes. It is better to use only one connecting pipe if the distance is not far.

◆ The pipes should not be shriveled when the pipes are connecting. The bend diameter should be longer than 200 millimeter. The connecting pipes should not be extended or curved frequently and the curving process should not be larger than 3 times in the same bending position.

7.3.4 Vacuum evacuating, leakage testing and refrigerant charging

◆ The system is charged with nitrogen gas from the low-pressure valve until the pipe pressure increasing to 1Mpa, and the leakage is examined at the connecting or welding position with soap water. The air is evacuated in the pipe from the check valve with a vacuum pump if no leakage exists, then loosens the cores of the liquid valve and gas valve and clears the soap water with dry cloth.

◆ If the vacuum pumps and high-pressure nitrogen are not available, we can operate as following:

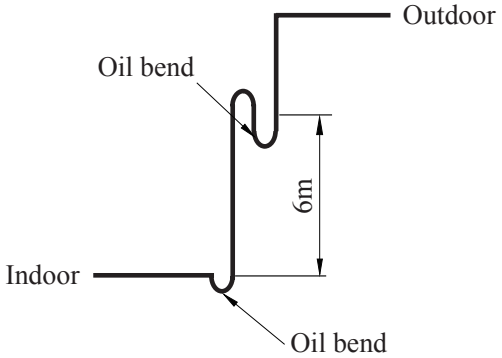
Remove the cores of the liquid valve and gas valve and loosen the cores of check valve on the gas valve and the gas will exhaust. Keep exhausting for 15 seconds, tightening the check valve as refrigerant gas coming out.

Loosen the liquid valve and gas valve.

Tighten the bonnet of the valve, and examine the air leakage at the connecting position with soap water or gas leakage detector, then clear the soap water with dry cloth.

◆ Wrap the flare nut with insulation material to avoid the condensation dropping after finishing the preceding procedure.

The refrigerant in the conditioner unit is enough for the connecting pipes of 7.5 meters, if the pipe is longer than 7.5 meters, additional supplement refrigerant should be supplied. The maximum pipe length is 70 meters. When the height difference between the indoor unit and outdoor unit is larger than 10 meters, an oil bend should be employed for every 6 meters.



Additional supplement refrigerant as per the extended connection pipe:

Outdoor unit model	FG(R)20/B-G(O) FG(R)25/B-G(O)	FG(R)30/B-G(O) FG(R)40/B-G(O)	FG(R)55/B-G(O) FG(R)65/B-G(O)
Additional supplement refrigerant g/m	180		350

7.4 Electric wiring

◆ All of the supplied components, material, and electric operation should be accorded with the local principles.

◆ The power supply should adopt the rated voltage and special circuit for the ducted air-conditioning unit.

◆ About the electric working, please refer to the “circuit diagram” adhering to the unit.

◆ All the connection of the circuit should be carried out by the qualified electrician.

◆ A circuit breaker that can cut all the power supply of the system should be installed. Wiring diagram of the ducted air-conditioning unit is shown in Fig. 32.

◆ The units should be well earthing to the ground by professionals.

◆ Install a central switch which can cut all the power switch and air switch of the system.

◆ The air switch should have hot and magnetic auto-turn-off function to protect the system from overloading or short power.

◆ Please accord to electrical diagram on the unit when connecting the wires.

1) Open indoor electric box and outdoor electric box respectively and put the wires cross the electric boxes. Please choose the specification of the power cables according to the power capacity and the installation conditions of the unit. Fix the wires with wire clamp and assemble the electric cover after confirmation.

2) If ON/OFF function of the sub room unit is needed, the short wiring between L3 and A should be taken off and wired according to the dashed frame. If all of the sub rooms are turned off, the unit will be switched off, or you can turn off the unit from the control panel directly. In the meantime, you can set the parameters on the control panel.

3) The wiring schematic of the outdoor unit, please refer to Fig 32, while the power cord standard and air-switch type, please refer to recommending table 4.

Table.4 Power cord standard and air switch recommending table

Model	Power Supply	Air Switch (A)	Earthing section(mm^2)	Permit Min section (mm^2)
FGR20/B-G(I)	380V 3N~ 50Hz	16	2.5	2.5
FGR25/B-G(I)	380V 3N~ 50Hz	16	2.5	2.5
FGR30/B-G(I)	380V 3N~ 50Hz	20	4.0	4.0
FGR40/B-G(I)	380V 3N~ 50Hz	25	6.0	6.0
FGR50/B(2)-G (I)	380V 3N~ 50Hz	25	6.0	6.0
FGR55/B-G (I)	380V 3N~ 50Hz	25	6.0	6.0
FGR60/B(2)-G (I)	380V 3N~ 50Hz	25	6.0	6.0
FGR65/B-G (I)	380V 3N~ 50Hz	25	6.0	6.0
FG20/B-G (I)	380V 3N~ 50Hz	10	1.5	1.5
FG25/B-G (I)	380V 3N~ 50Hz	10	1.5	1.5
FG30/B-G (I)	380V 3N~ 50Hz	10	1.5	1.5
FG40/B-G (I)	380V 3N~ 50Hz	10	1.5	1.5
FG50/B(2)-G (I)	380V 3N~ 50Hz	16	2.5	2.5
FG55/B-G (I)	380V 3N~ 50Hz	16	2.5	2.5
FG60/B(2)-G (I)	380V 3N~ 50Hz	16	2.5	2.5
FG65/B-G (I)	380V 3N~ 50Hz	16	2.5	2.5
FG(R)20/B-G (O)	380V 3N~ 50Hz	25	6.0	6.0
FG(R)25/B-G (O)	380V 3N~ 50Hz	32	6.0	6.0
FG(R)30/B-G (O)	380V 3N~ 50Hz	32	6.0	6.0
FG(R)40/B-G (O)	380V 3N~ 50Hz	40	10.0	10.0
FG(R)55/B-G (O)	380V 3N~ 50Hz	50	16.0	16.0
FG(R)65/B-G (O)	380V 3N~ 50Hz	63	25.0	25.0

Wiring schematic for outside the unit

Models：	Quantity
FG(R)20/B-G, FG(R)25/B-G,FG(R)30/B-G, FG(R)40/B-G, FG(R)55/B-G,FG(R)65/B-G,	1
FG(R)50/B(2)-G、FG(R)60/B(2)-G	2

Note:Please setup the code switch on the outdoor unit according to single system or multi system. Please refer to the “Outdoor unit address setup” chapter for detail information.

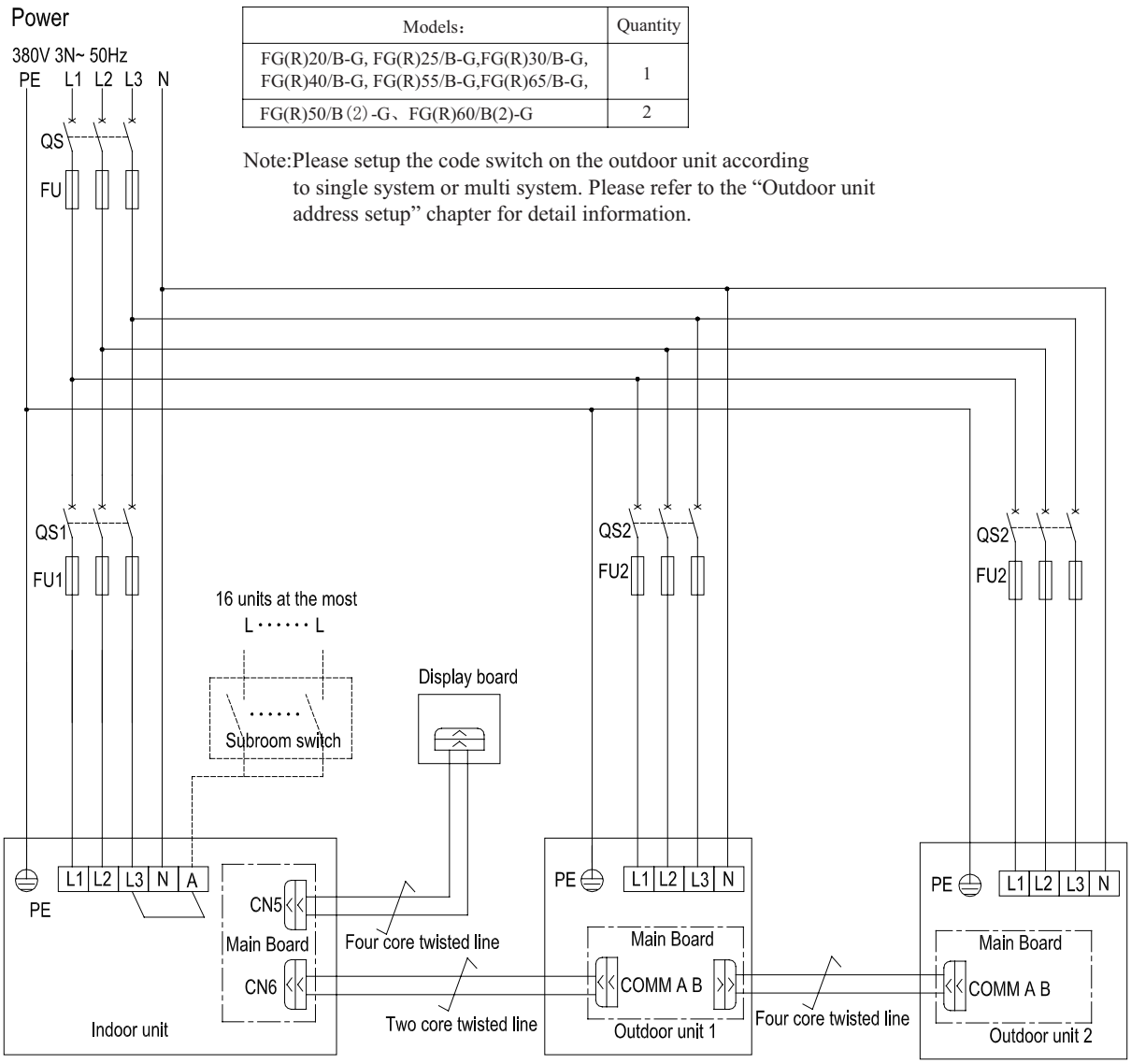


Fig.32 wiring schematic of the outdoor unit

* The power cord must be copper inside, while the working temp. can not be over its standard one.
* If the total length of the power cord is over 15m, please increase the size by certain degree.
* Please confirm the other wire according to the actual need.

8 Trial run and installation checking

8.1 Trial run

8.1.1 Preparation for trial run

The power supply should be turned on only after finishing all the installation.
All the control wires and cables are connected correctly and safely.
Open the cut-off valves in the gas and liquid pipes.
All the objects like screws and wires etc that remained in the machine should be cleared after installation.

8.1.2 Trial run

Switch on power supply and press the ON/OFF button to start operation.
Select FAN mode to check if the phases of the indoor motor are correct.
Select COOL, HEAT and FAN mode and check if the machine operates normally.

8.2 Checking items after installation

Item Possible defects Checking	Has it been fixed firmly?
How is the installation?	The unit may drop, shake or emit noise.
Have you done the refrigerant leakage test?	It may cause insufficient refrigerating capacity.
Is heat insulation sufficient?	It may cause condensation and dripping.
Does the unit drain well?	It may cause condensation and dripping.
Is the voltage in accordance with the rated voltage marked on the nameplate?	It may cause electric malfunction or damage the part.
Is the electric wiring and piping connection installed correctly and securely?	It may cause electric malfunction or damage the part.
Has the unit been connected to a secure earth connection?	It may cause electrical leakage.
Is the power cord specified?	It may cause electric malfunction or damage the part.
Has the inlet and outlet been covered?	Insufficient refrigerating capacity.
Has the length of connection pipes and refrigerant capacity been recorded?	The refrigerant capacity is not accurate.

8.3 Checking items after installation

Malfunction	Possible cause	Solution
Ducted air conditioning unit can not start-up	1. The power supply does not connect or improper phase sequence. 2.The electricity leakage switch is switching off for the leakage of electricity from the air conditioner units 3. The voltage is too low 4. The operating button is closed 5.The control system is in malfunction	1. Connect the power supply or change two random phase 2. Contact the service center of C&H 3. Contact the dealer 4. Press ON/OFF button again 5. Contact the service center of C&H
Ducted air conditioning unit stops shortly after start-up	Air outlet port or intake port of indoor unit or outdoor unit is blocked The abnormity of control system The operation of pressure switch Indoor room temperature is lower than 18 Tube sensor does not connect properly Tube sensor is broken	1. Move the obstacles 2. Contact the service center of C&H 3. Contact the service center of C&H 4. Check if it's necessary to operate the air conditioner 5. Connect it properly 6. Contact the service center of C&H
Heating is not sufficient	1. Air filter is blocked 2. Air outlet port or intake port of indoor unit or outdoor unit is blocked 3. Doors or windows are open 4. Refrigerant leakage 5. The outdoor temperature is lower than –5 6. Abnormal operation of the control system	1. Clean air filter 2. Move the obstacles 3. Close windows and doors 4. Contact the service center of C&H 5.The performance of the unit is affected 6. Contact the service center of C&H
Cooling is not sufficient	1. Air filter is dirty 2. Air outlet port or intake port of indoor unit or outdoor unit is blocked 3. Too many persons or a heat source in the room 4. Doors or windows are open 5. Too high temperature setting 6. Refrigerant leakage 7. Poor performance of room sensor	1. Clean air filter 2. Move the obstacles 3. If possible, clear heat sources 4. Close windows and doors 5. Lower set temp. 6. Contact the service center of C&H 7. Change room sensor

Note: Check the previous items, please contact the nearest service center of C&H and depict the air conditioner model and its symptom if the problem cannot be solved.

9 Care and Maintenance

To ptimize the life of the air-conditioning unit, check and maintain the unit regularly with specialized person.

1) Air filter Air filter is made by washable nylon, if you want to clean it, you can put it on a harder plate, then tap it gently to move bigger particles. If necessary, you can wash it in water with mild detergent, then dry it naturally.

2) Outdoor heat exchanger Outdoor heat exchanger must be cleaned regularly, at least once every two months. You can clean the surface with vacuum cleaner or nylon brush, please do not wash it with water.

3) Belt The indoor units are driven by belt, you should check the tightness of the belt after operating for a period of time.

4) Drainage pipe Check the drainage pipe regularly so as to confirm the fluency flow of condensate.

5) Running cautions of machine as operating season coming

◆ Check if air intake and outlet port is blocked.

◆ Check if the earth connection of the machine is reliable.

◆ Check if the air filter is installed properly.

◆ After a long period of stop, we should switch on the power supply for 8 hours to preheat the crankcase of compressor before operating the machine.

6) Maintenance at the end of operating seasons

◆ Clean the air filter, indoor unit body and outdoor unit body.

◆ Cut off power supply.

◆ Clean the dust on outdoor unit.

7) Components replacement The components are available at local service center of C&H or C&H dealer.

Attention: When you perform leakage test, please do not charge oxygen or acetylene into the system, use nitrogen gas or the refrigerant instead. Service If there is any problem with C&H ducted air-conditioning units, please contact the local service center or C&H .