



Service Manual



FCAC SERIES
FLOOR & CEILING UNIT
ON-OFF

Content

Part 1 General Information	01
Part 2 Floor&Ceiling Type	05
Part 3 Installation.....	17
Part 4 Controller	30
Part 5 Troubleshooting	36




2. Model Names of Indoor/Outdoor Units

2.1 Indoor units

Model name	Dimension (W×H×D) (mm)	Net/Gross weight (kg)	Power supply
Floor & Ceiling			
FCAC-24	1050×235×675	26.5/31	208~230V/1Ph/60Hz
FCAC-36	1250×235×675	32/37	208~230V/1Ph/60Hz
FCAC-60	1670×235×675	40/46	208~230V/1Ph/60Hz

3. External Appearance

3.1 Indoor Units

Floor & Ceiling	
 <p>24K</p>	 <p>36K</p>
 <p>60K</p>	

4. Features

4.1 High quality coils

The coil is constructed of advanced inner grooved copper tube and aluminum fins.



4.2 Low operation sound level:

- (1) Well-known stable and quiet running fan motor.
 - (2) Well-known compressor, Sanyo & GMCC & Highly.
 - (3) Compact design: Smaller dimension and larger stuffing capacity.
 - (4) Universal outdoor unit design
 - (5) Compact size design; Slim body, less installation space
 - (6) Metal casing, more durable
 - (7) Centrifugal fan, supplying strong air flow(Max 15-meter air flow distance)
 - (8) 3D air flow, supply cold air to each corner
 - (9) Bigger screen and bigger buttons
 - (10) New air flow system with incline evaporator, having a large heat-exchange area in limited space
- Suction structure, faster heat exchange

Floor & Ceiling Type

1. Features
2. Specifications
3. Dimensions
4. Service Space
5. Wiring Diagrams
6. Electric Characteristics
7. Sound Levels
8. Accessories
9. The Specification of Power
10. Field Wiring
11. Explosive View
12. Troubleshooting

1. Features

1.1 Flexible installation

Ceiling suspended and floor standing.



1.2 Auto-swing function

Built-in two louver motor, vertical and horizontal air-flow adjustment.



1.3 LED display is optional, in the middle or on the right side.

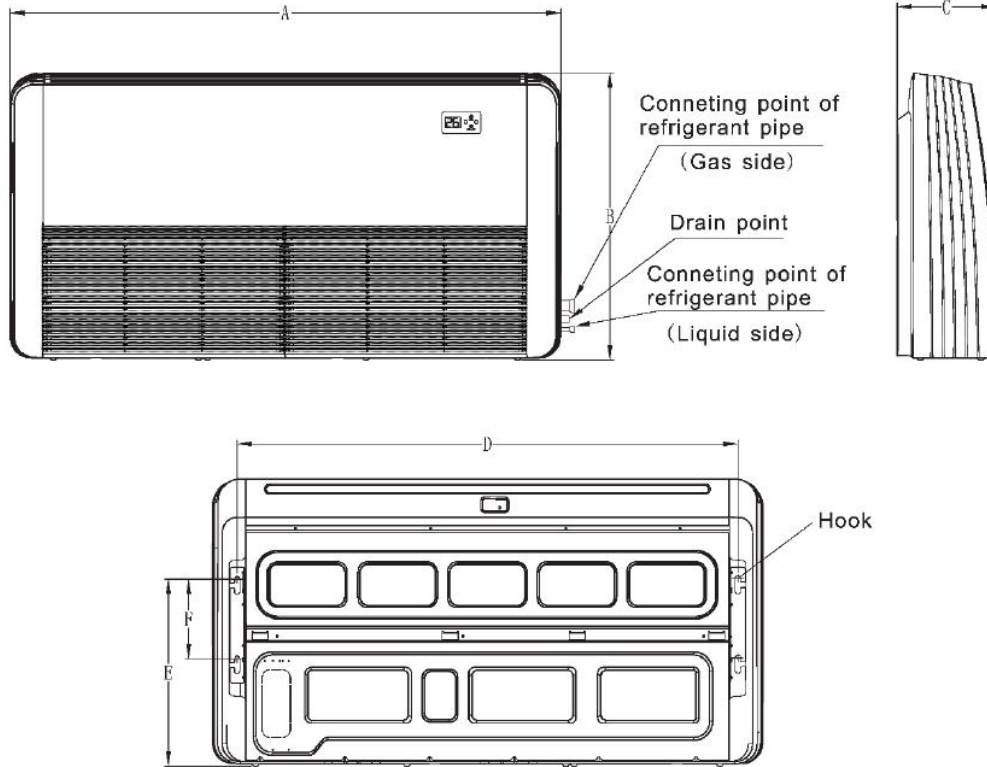
It is more intuitive and simple, and error code can be shown in the display.



1.4 New upper and lower buckle type wheel case.

The upper wheel case can be removed alone, which is convenient adjust the wheel motor.

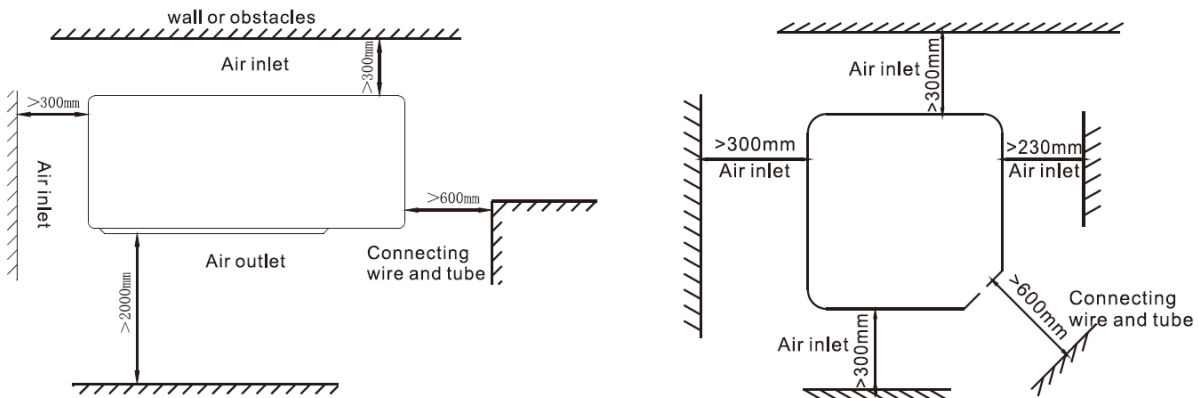
3. Dimensions



Model(kBtu/h)	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)
24	1050	675	235	933	440	188
36	1250	675	235	1185	440	188
60	1670	675	235	1553	440	188

4. Service Space

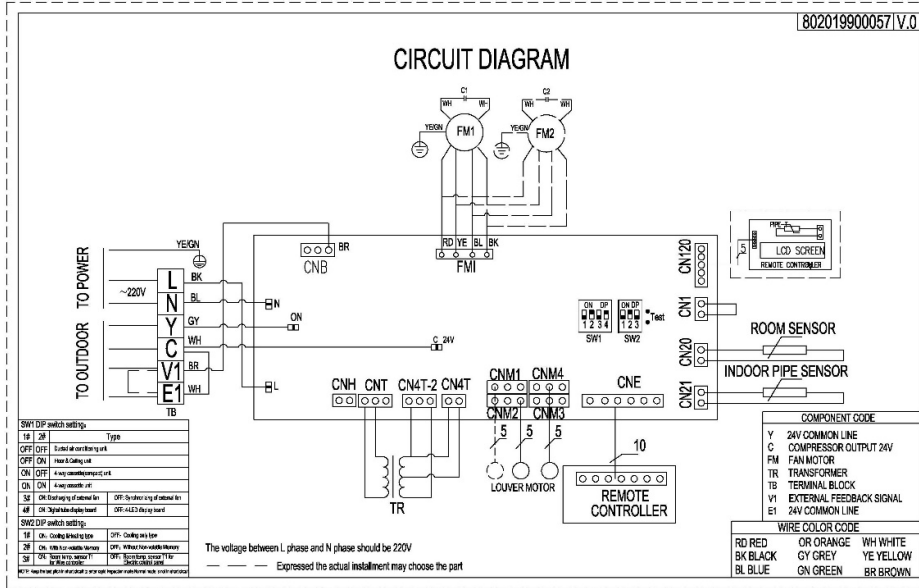
Ensure enough space required for installation and maintenance.



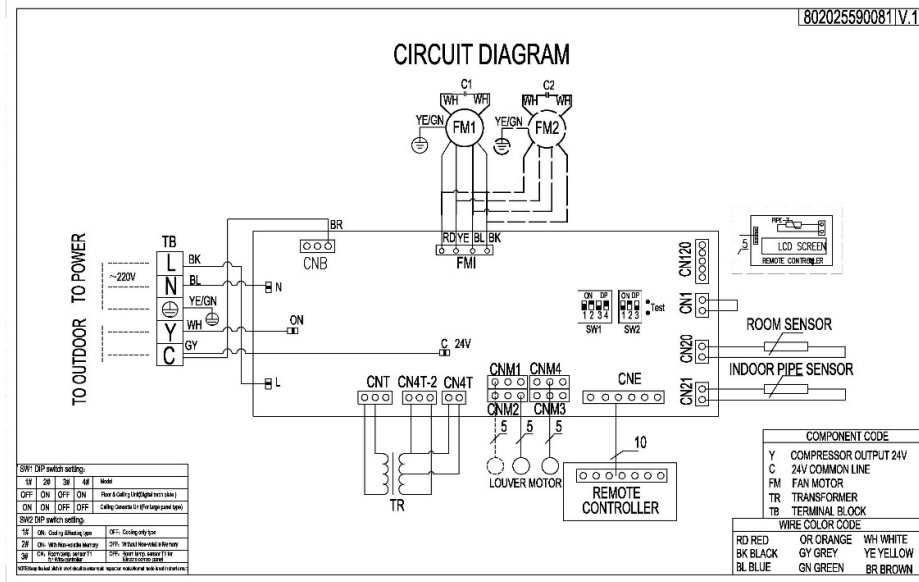
There is enough space for installation and maintenance. The ceiling is horizontal, and its structure can endure the weight of the indoor unit. The outlet and the inlet are not impeded, and the influence of external air is the least. The air flow can reach throughout the room. The connecting pipe and drainpipe could be extracted out easily.

5. Wiring Diagrams

FCAC-24 FCAC-60



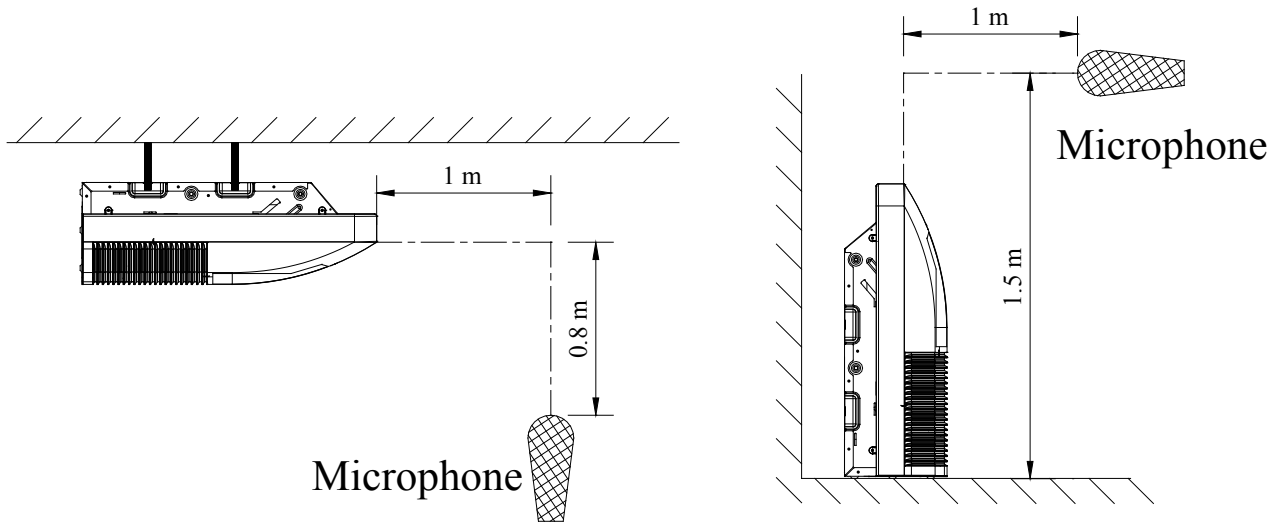
FCAC-36



6. Electric Characteristics

Model	Indoor Units			
	Hz	Voltage	Min.	Max.
FCAC-24	60	230V	198V	254V
FCAC-36	60	230V	198V	254V
FCAC-60	60	230V	198V	254V

7. Sound Levels



Model	Noise level dB(A)		
	High	Medium	Low
FCAC-24	50	48	45
FCAC-36	57	54	51
FCAC-60	57	54	51

8. Accessories

Name	Shape	Quantity
1.blank self-sealing bag		2
2.Service Manual	/	1
3.insulating pipe (φ30×φ48×135)		2
4.insulating pipe (φ40×φ56×175)		2
5.drain-pipe		1
6. Remote controller		1
7. Dry batteries		2
8.Instulation assy	/	1

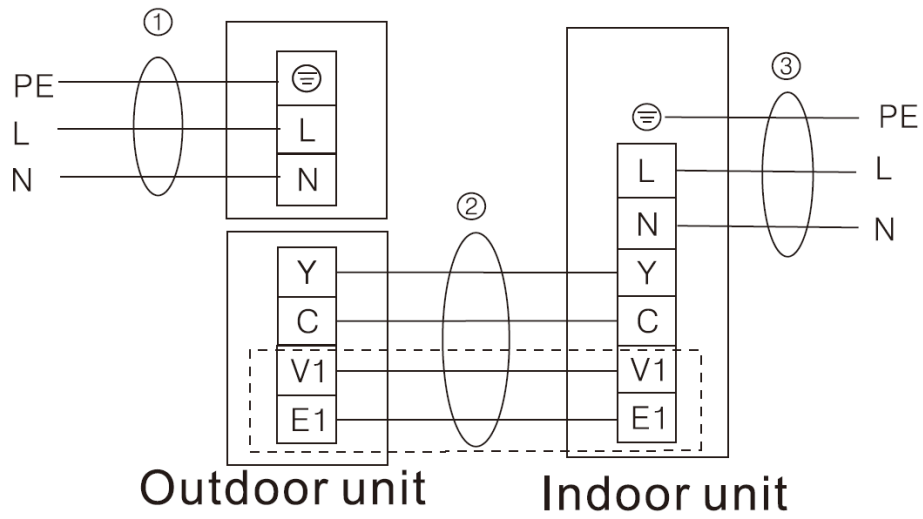
9. The Specification of Power

Cooling only

Type		FCAC-24	FCAC-36	FCAC-60
Indoor unit	Phase	1-phase	1-phase	1-phase
	Frequency and Voltage	60Hz,220V	60Hz,220V	60Hz,220V
	Power Wiring(mm ²)	1.0	1.0	1.0
	Ground Wiring(mm ²)	1.0	1.0	1.0
Signal Wiring(mm ²)		0.75	0.75	0.75

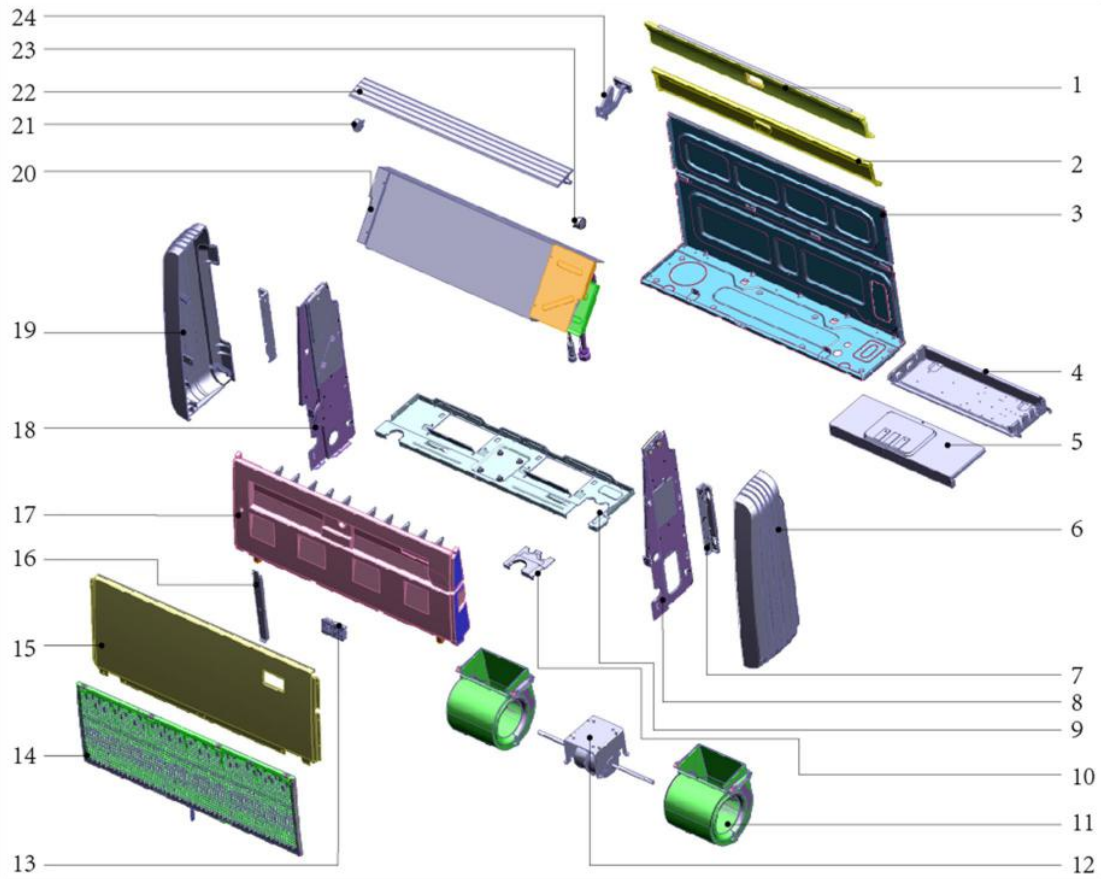
10. Field Wiring

FCAC-24 FCAC-36 FCAC-60



11. Explosive View

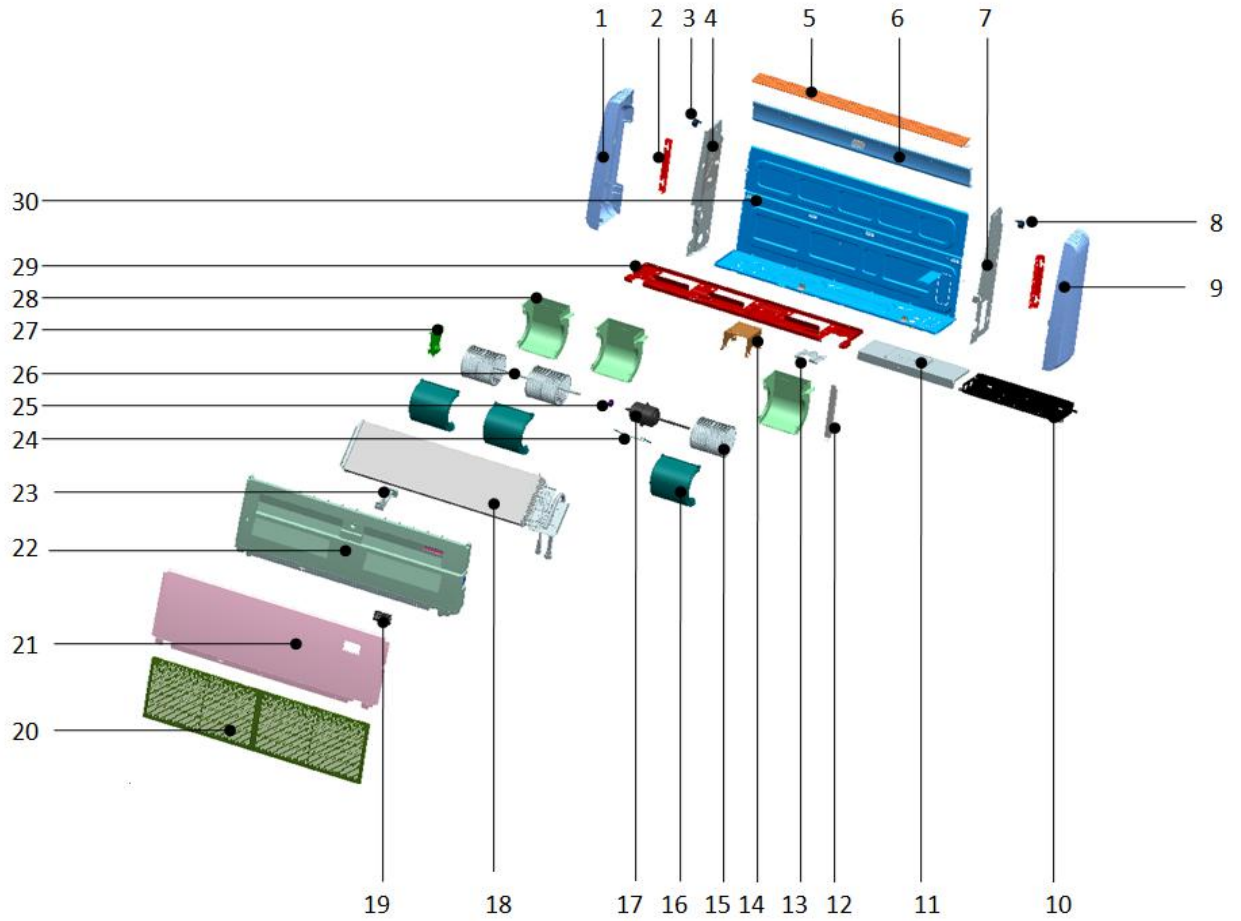
(1) FCAC-24



R410A 60Hz EER 2.36 Series Service Manual

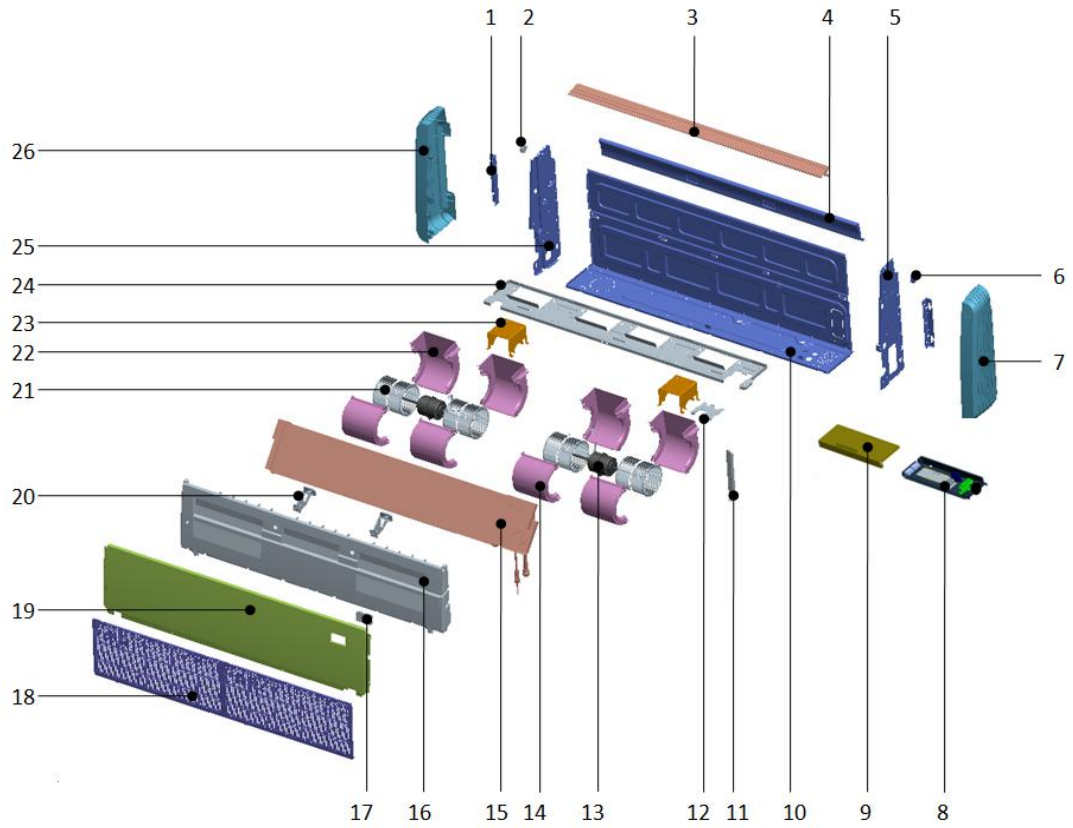
No.	Part Name	Quantity	No.	Part Name	Quantity
1	Chassis foam assembly	1	13.2	Display film	1
2	Rear cover	1	13.3	Display board mounting box	1
3	Chassis assembly	1	14	Air inlet grille	1
4	Indoor PCB assembly	1	15	Top Cover assembly	1
4.1	E-part box	1	16	Supporting board	1
4.2	Indoor PCB	1	17.1	Drip tray foam	1
4.3	Fan capacitor	1	17.2	Louver connecting rod fixed structure class1	1
4.4	Transformer	1	17.3	Louver connecting rod fixed structure class2	1
4.5	Temperature sensors (indoor)	1	17.4	Driving lever for louver	1
4.6	Terminal	1	17.5	Louver holder	1
5	E-part box cover	1	17.6	Guard vane	9
6	Left cover	1	18	Right separating board	1
7	Hoisting pate	2	19	Right cover	1
8	Lelf separating board	1	20	Evaporator component	1
9	Weld assembly for intermediate transverse girder	1	20.1	Evaporator assembly	1
10	Pipe clamp	1	20.2	Evaporator output tube assembly	1
11.1	Centrifugal fan blade	2	20.3	Evaporator input tube assembly	1
11.2	Upper volute	2	20.4	Under the right mounting plate of the evaporator	1
11.3	Lower volute	2	20.5	Under the left mounting plate of the evaporator	1
12.1	The motor bracket	1	20.6	Upper the right mounting plate of the evaporator	1
12.2	Motor shaft sleeve right gland	1	20.7	Upper the left mounting plate of the evaporator	1
12.3	Motor shaft sleeve left gland	1	21	Step motor	1
12.4	Motor separating board	1	22	Horizontal louver assembly	1
12.5	Indoor fan motor	1	23	Step motor	1
13	Display panel assembly	1	24	Air guide bracke	1
13.1	Display panel components	1			

(2) FCAC-36



No.	Part Name	Quantity	No.	Part Name	Quantity
1	Left cover	1	18.2	Temperature Sensor	1
2	Install lifting ears	2	18.3	Under the right mounting plate of the evaporator	1
3	Stepper motor	1	18.4	Under the left mounting plate of the evaporator	1
4	Left panel assembly	1	18.5	Upper the right mounting plate of the evaporator	1
5	Air guide assembly	1	18.6	Upper the left mounting plate of the evaporator	1
6	Rear Cover	1	19	Display panel components	1
7	Right panel assembly	1	19.1	Digital Tube	1
8	Stepper motor	1	19.2	Show mask	1
9	Right cover	1	19.3	Display board mounting box	1
10	Electro Control Box assembly	1	20	Back style grille assembly	2
10.1	Electro Control Board	1	20.1	Back style grille	2
10.2	Electro Control Box	1	20.2	Dust filter	2
10.3	Temperature Sensor	1	20.3	Grille buckle	4
10.4	Terminal	1	20.4	Grille screw cover	6
10.5	Short circuit Cable	1	21	Top cover parts	1
10.6	PC board isolation column	1	22	Drip tray assembly	1
10.7	Transformer	1	22.1	Drip tray foam	1
10.8	Fan Capacitor	1	22.2	Horizontal swing leaf mounting 1	1
10.9	Light board cable group	1	22.3	Horizontal swing leaf mounting 2	1
11	Electro Control Box Cover	1	22.4	Horizontal swing leaf active rod	1
12	Support bar	1	22.5	Horizontal swing leaf connecting rod 1	1
13	Piping plate	1	22.6	Wind guide blade	10
14	Motor bracket	1	22.7	Stepper motor	1
15	Centrifugal fan blade	2	23	Air guide bracket	1
16	Upper volute	3	24	Motor hoard	1
17	Fan Motor	1	25	Coupling	1
18	Evaporator component	1	26	Connecting shaft	1
18.1	Evaporator pre-welded components	1	27	Motor support assembly	1
18.1.1	Evaporator assembly	1	28	Lower volute	3
18.1.2	Evaporator output tube assembly	1	29	Middle beam welding assembly	1
18.1.3	Evaporator input tube assembly	1	30	Base assy	1

(3) FCAC-60



	Part Name	Quantity	No.	Part Name	Quantity
1	Right mounting plate of evaporator	1	15.7	Evaporator left lower mounting plate	1
2	Horizontal step motor	1	16	Water tray assy	1
3	Wind guide assembly	1	16.1	Water tray foam assembly	1
4	Rear cover with cotton	1	16.2	Horizontal swing leaf mount 1	1
5	Right side board assembly	1	16.3	Horizontal swing leaf mount 2	1
6	Horizontal step motor	1	16.4	Horizontal swing leaf active rod	1
7	Right cover	1	16.5	Horizontal swing leaf connecting rod 1	1
8	Indoor PCB assembly	1	16.6	Horizontal swing leaf connecting rod 2	1
8.1	E-part box	1	16.7	Wind guide blade	1
8.2	Indoor PCB	1	16.8	Vertical stepper motor	1
8.3	Terminal	1	17	Display panel assembly	1
8.4	Transformer	1	17.2	Show mask	1
8.5	Blade fan capacitor	2	17.3	Display board mounting box	1
9	Electric box cover	1	18	Back style assembly	2
10	Chassis assembly	1	18.1	Back style	2
11	Support bar	1	18.2	Filter	2
12	Pipe plate	1	18.3	Grille buckle	6
13	Indoor fan motor	2	18.4	Grille screw cover	6
14	Upper volute	4	19	Top cover assy	1
15	Evaporator assy	1	20	Wind guide bracket	2
15.1	Evaporator assembly	1	21	Centrifugal fan blade	4
15.2	Evaporator return header assembly	1	22	Lower volute	4
15.3	Evaporator splitter capillary assembly	1	23	Motor bracket	2
15.4	Evaporator right mounting plate	1	24	Middle beam welding assembly	1
15.5	Evaporator left mounting plate	1	25	Left side board assembly	1
15.6	Evaporator right lower mounting plate	1	26	Left cover	1

12. Troubleshooting

Fault Code Table

4LED Faults	Digital display	Failure description
Timer light flashing	E2	Ambient temperature sensor (T1) failure
Running light flashing	E3	Evaporator pipe temperature sensor (T2) failure
Defrost light flashing	E5	Condenser pipe temperature sensor (T3) failure
Warning light flashing	F5	Water fulfilled protection
Running light, defrost light flashing	E1	Indoor unit and wire controller communication failure
Running light, timer light flashing	P6	Indoor unit EEPROM failure
Defrost light, timer light flashing	F0	Indoor fan stall protection (DC Motor)
Defrost light, warning light flashing	F2	Outdoor protection (220V Communication control)
	F7	Outdoor unit over-current protection (Reserve)
Timer light, warning light flashing	E0	Indoor unit and outdoor unit communication failure (RS485 Communication control)
Running light, defrost light, timer light flashing	F3	High pressure protection (RS485 Communication control)
Defrost light, timer light, warning light flashing	F4	Low pressure protection (RS485 Communication control)
Running light, timer light, warning light flashing	F8	Outdoor unit exhaust temperature over-high protection (RS485 Communication control)
Running light, defrost light, timer light, warning light flashing	F9	Three-phase electricity phase sequence failure (RS485 Communication control)
Note: the flashing frequency for all above indication lights is 1HZ		

Part 4 Installation

1. Precaution on Installation
2. Vacuum Dry and Leakage Checking
3. Additional Refrigerant Charge
4. Water Drainage
5. Insulation Work
6. Test Operation
7. Install of indoor units

1. Precaution on Installation

1.1. Measure the necessary length of the connecting pipe, and make it by the following way.

a. Connect the indoor unit at first, then the outdoor unit.

Bend the tubing in proper way. Do not harm them.

CAUTIONS:

- Daub the surfaces of the flare pipe and the joint nuts with frozen oil, and wrench it for 3~4 rounds
- With hands before fasten the flare nuts.

Be sure to use two wrenches simultaneously when you connect or disconnect the pipes.

Pipe gauge	Tightening torque	Flare dimension A		Flare shape
		Min (mm)	Max	
Φ6.4	15~16N.m (153~163 kgf.cm)	8.3	8.7	
Φ9.5	25~26N.m (255~265kgf.cm)	12.0	12.4	
Φ12.7	35~36N.m (357~367kgf.cm)	15.4	15.8	
Φ15.9	45~47N.m (459~480 kgf.cm)	18.6	19.1	
Φ19.1	65~67N.m (663~684kgf.cm)	22.9	23.3	

- b. The stop value of the outdoor unit should be closed absolutely (as original state). Every time you connect it, first loosen the nuts at the part of stop value, then connect the flare pipe immediately (in 5 minutes). If the nuts have been loosened for a long time, dusts and other impurities may enter the pipe system and may cause malfunction later. So please expel the air out of the pipe with refrigerant before connection.
- c. Expel the air after connecting the refrigerant pipe with the indoor unit and the outdoor unit. Then fasten the nuts at the repair-points.

1.2. Locate The Pipe

- a. Drill a hole in the wall (suitable just for the size of the wall conduit), then set on the fittings such as the wall conduit and its cover.
- b. Bind the connecting pipe and the cables together tightly with binding tapes. Do not let air in, which will cause water leakage by condensation.
- c. Pass the bound connecting pipe through the wall conduit from outside. Be careful of the pipe allocation to do no damage to the tubing.

1.3. Connect the pipes.

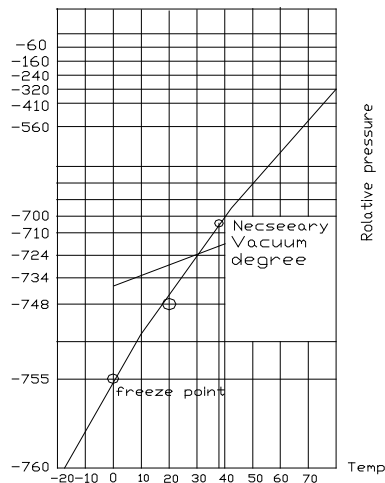
1.4. Then, open the stem of stop values of the outdoor unit to make the refrigerant pipe connecting the indoor unit with the outdoor unit in fluent flow.

1.5. Be sure of no leakage by checking it with leak detector or soap water.

1.6. Cover the joint of the connecting pipe to the indoor unit with the soundproof / insulating sheath (fittings), and bind it well with the tapes to prevent leakage.

2. Vacuum Dry and Leakage Checking

2.1 Vacuum Dry: use vacuum pump to change the moisture (liquid) into steam (gas) in the pipe and discharge it out of the pipe to make the pipe dry. Under one atmospheric pressure, the boiling point of water (steam temperature) is 100°C. Use vacuum pump to make the pressure in the pipe near vacuum state, the boiling point of water falls relatively. When it falls under outdoor temperature, the moisture in the pipe will be vaporized.

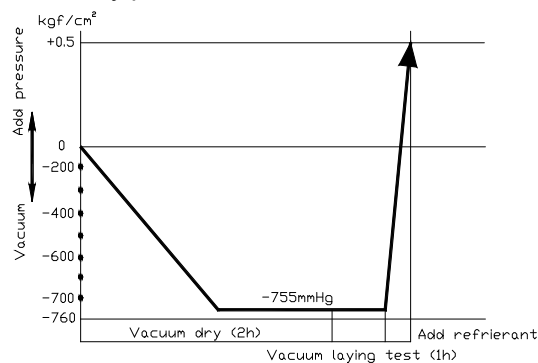


2.2 Vacuum dry procedure

There are two methods of vacuum dry due to different construction environment: common vacuum dry, special vacuum dry.

①. Common vacuum dry procedure

- Vacuum dry (for the first time)---connect the all-purpose detector to the inlet of liquid pipe and gas pipe, and run the vacuum pump more than two hours (the vacuum pump should be below -755mmHg)
- If the pump can't achieve below -755mmHg after pumping 2 hours, moisture or leakage point will still exist in the pipe. At this time, it should be pumped 1 hour more.
- If the pump can't achieve -755mmHg after pumping 3 hours, please check if there are some leakage points.
- Vacuum placement test: place 1 hour when it achieves -755mmHg, pass if the vacuum watch shows no rising. If it rises, it shows there's moisture or leakage point.
- Vacuuming from liquid pipe and gas pipe at the same time.
- Sketch map of common vacuum dry procedure.



②. Special vacuum dry procedure

- This vacuum dry method is used in the following conditions:
- There's moisture when flushing the refrigerant pipe.
- Rainwater may enter into the pipe.
- Vacuum dry for the first time 2h pumping

③. Vacuum destroy for the second time Fill nitrogen to 0.5Kgf/cm²
 Because nitrogen is for drying gas, it has vacuum drying effect during vacuum destroy. But if the moisture is too much, this method can't dry thoroughly. So, please pay more attention to prevent water entering and forming condensation water.

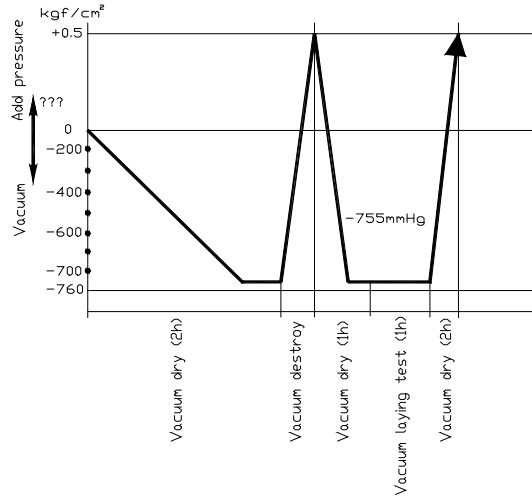
④. Vacuum dry for the second time.....1h pumping

Determinant: Pass if achieving below -755mmHg.

If -755mmHg can't be achieved in 2h, repeat procedure ③ and ④.

⑤. Vacuum placing test 1h

⑥. Sketch map of special vacuum dry procedure



3.Additional Refrigerant Charge

Caution

- Refrigerant cannot be charged until field wiring has been completed.
- Refrigerant may only be charged after performing the leak test and the vacuum pumping.
- When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of the danger of liquid hammer.
- Charging with an unsuitable substance may cause explosions and accidents, so always ensure that the appropriate refrigerant is charged.
- Refrigerant containers shall be opened slowly.
- Always use protective gloves and protect your eyes when charging refrigerant.

The outdoor unit is factory charged with refrigerant. Calculate the added refrigerant according to the diameter and the length of the liquid side pipe of the outdoor unit/indoor unit

R(g)	D(mm)	φ6.4	Φ9.5	Φ12.7
L(m)				
Less than 5m (One-way)		—	—	—
Added Refrigerant When Over 5m(One-way)		30g/m×(L-5)	65g/m×(L-5)	120g/m×(L-5)

Remark:

R (g): Additional refrigerant to be charged
 L (m): The length of the refrigerant pipe (one-way)
 D (mm): Liquid side piping diameter

4. Water Drainage

4.1 Gradient and Supporting

4.1.1 Keep the drainpipe sloping downwards at a gradient of at least 1/100. Keep the drainpipe as short as possible and eliminate the air bubble.

4.1.2 The horizontal drainpipe should be short. When the pipe is too long, a prop stand must be installed to keep the gradient of 1/100 and prevent bending. Refer to the following table for the specification of the prop stand.

	Diameter	Distance between the prop stands
Hard PVC pipe	25~40mm	1~1.5m

4.1.3. Precautions

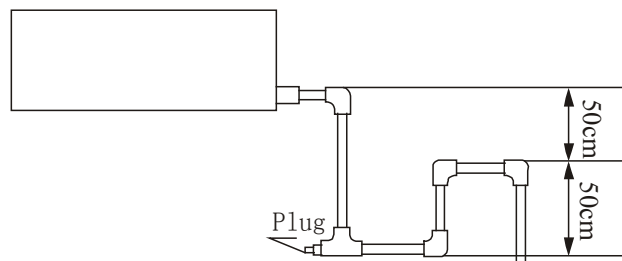
- ① The diameter of drainpipe should meet the drainage requirement at least.
- ② The drainpipe should be heat-insulated to prevent atomization.
- ③ Drainpipe should be installed before installing indoor unit. After powering on, there is some water in water-receiver plate. Please check if the drain pump can operate correctly.
- ④ All connection should be firm.
- ⑤ Wipe color on PVC pipe to note connection.
- ⑥ Climbing, horizontal and bending conditions are prohibited.
- ⑦ The dimension of drainpipe can't less than the connecting dimension of indoor drainpipe.
- ⑧ Heat-insulation should be done well to prevent condensation.
- ⑨ Indoor units with different drainage type can't share one convergent drainpipe.

4.2 Drainpipe Trap

4.2.1. If the pressure at the connection of the drainpipe is negative, it needs to design drainpipe trap.

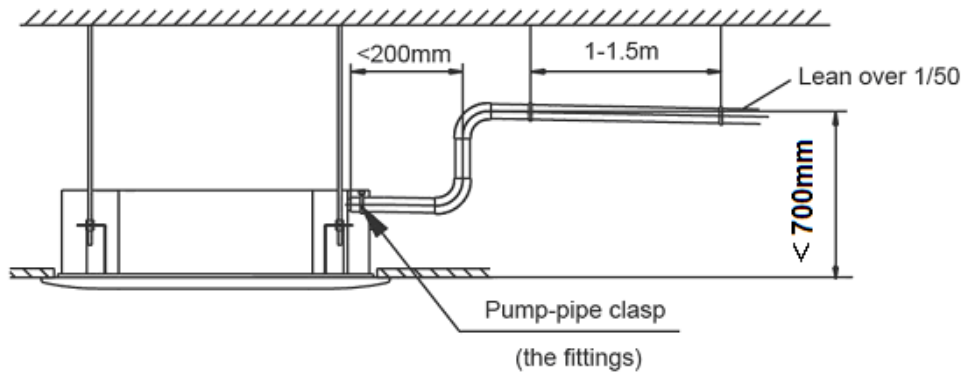
4.2.2. Every indoor unit needs one drainpipe trap.

4.2.3. A plug should be designed to do cleaning.

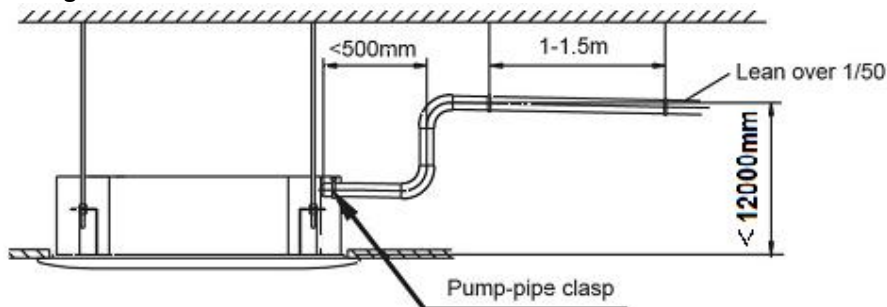


4.3 Upwards drainage (drain pump)

Ceiling cassette (compact)



Ceiling cassette



4.4 Convergent drainage

4.4.1. The number of indoor units should be as small as possible to prevent the traverse main pipe overlong.

4.4.2. Indoor unit with drain pump and indoor unit without drain pump should be in different drainage system.



4.4.3. Selecting the diameter

Number of connecting indoor units → Calculate drainage volume → Select the diameter

Calculate allowed volume = Total cooling capacity of indoor units (HP) × 2 (l/ hr)

	Allowed volume (lean 1/50) (l/ hr)	I.D. (mm)	Thick
Hard PVC	$s \leq 14$	∅ 25	3.0
Hard PVC	$14 < s \leq 88$	∅ 30	3.5
Hard PVC	$88 < s \leq 334$	∅ 40	4.0
Hard PVC	$175 < s \leq 334$	∅ 50	4.5
Hard PVC	$334 < s$	∅ 80	6.0

4.5 Drainage test

4.5.1 Drainage without drain pump

After finishing drainpipe installation, pour some water into the water receiver plate to check if the water flows smoothly.

4.5.2 Drainage with drain pump

- ① Poke the Water Level Switch, remove the cover, use water pipe to pour 2000ml water into the water receipt plate through the water inlet.
 - ② Turn on the power to Cooling operation. Check the pump's operation and switch on the Water Level Switch. Check the pump's sound and look into the transparent hard pipe in the outlet at the same time to check if the water can discharge normally.
- Stop the air conditioner. After 3 minutes, check if it has abnormality. If the collocation of drainpipes is illogical, the water will flow back overfull, which will cause the alarm lamp flashes, even overflow from the water receipt plate.
 - Keep on pouring water until it gives an alarm signal for high water level, check if the pump drains water at once. If the water level can't fall below the alarmed water level after 3 minutes, the air conditioner will stop. Turn off the power and drain the remained water, and then turn on the air conditioner.

Note: the drain stuff in the main water receipt plate is for maintenance. Stuff up the drain stuff to prevent water leakage.

- ③ Stop the air conditioner running, turn off the power, and put back the cover.
- Stop the air conditioner. After 3 minutes, check if it has abnormality. If the collocation of drainpipes is illogical, the water will flow back overfull, which will cause the alarm lamp flashes, even overflow from the water receipt plate.
 - Keep on pouring water until it gives an alarm signal for high water level, check if the pump drains water at once. If the water level can't fall below the alarmed water level after 3 minutes, the air conditioner will stop. Turn off the power and drain the remained water, and then turn on the air conditioner.

Note: the drain stuff in the main water receipt plate is for maintenance. Stuff up the drain stuff to prevent water leakage.

5. Insulation Work

5.1 Insulation material and thickness

5.1.1. Insulation material

Insulation material should adopt the material which is able to endure the pipe's temperature: no less than 70°C in the high-pressure side, no less than 120°C in the low-pressure side (For the cooling type machine, no requirements at the low-pressure side.)

- ◆ Example: Heat pump type----Heat-resistant Polyethylene foam (withstand above 120°C)
Cooling only type----Polyethylene foam (withstand above 100°C)

5.1.2. Thickness choice for insulation material

Insulation material thickness is as follows:

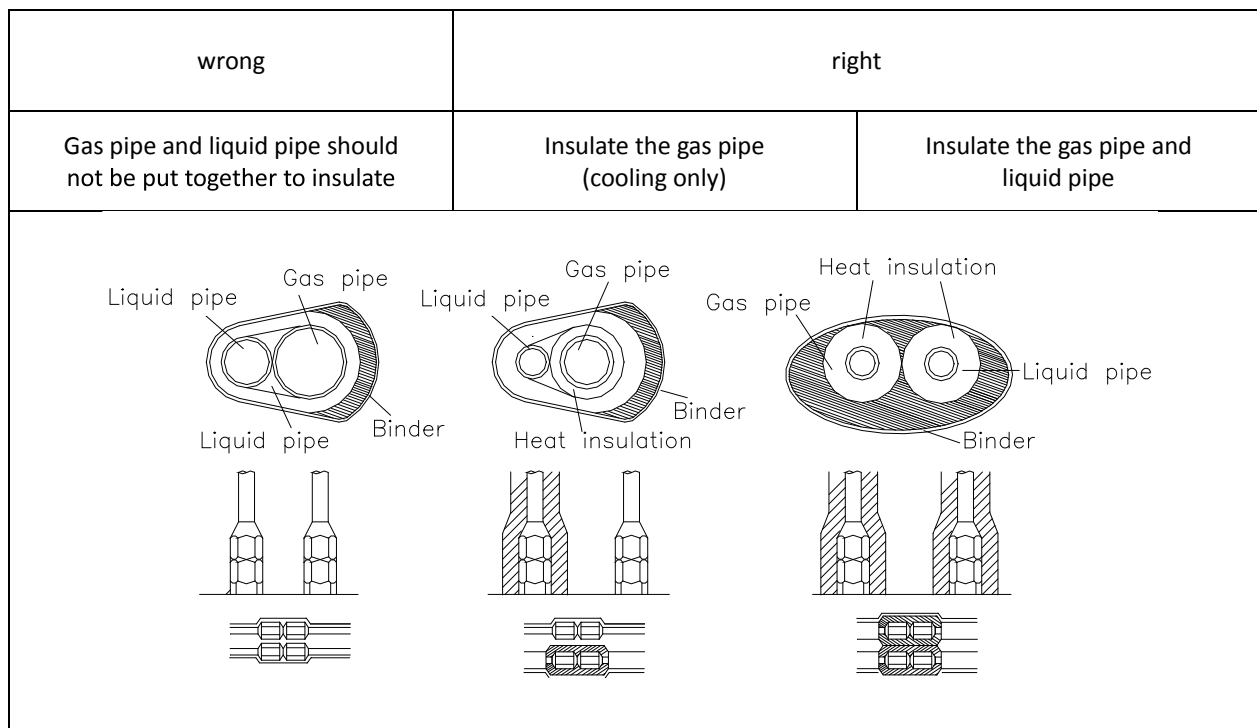
	Pipe diameter (mm)	Adiabatic material thickness
Refrigerant pipe	Φ6.4—Φ25.4	10mm
	Φ28.6—Φ38.1	15mm
Drainage pipe	Inner diameterΦ20—Φ32	6mm

5.2 Refrigerant pipe insulation

5.2.1. Work Procedure

- ① Before laying the pipes, the non-jointing parts and non-connection parts should be heat insulated.
- ② When the gas proof test is eligible, the jointing area, expanding area and the flange area should be heat insulated

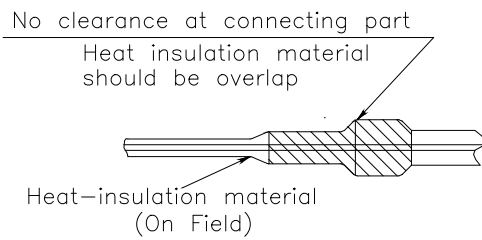
5.2.2. Insulation for non-jointing parts and non-connection parts



For construction convenience, before laying pipes, use insulation material to insulate the pipes to be dealt with, at the same time, at two ends of the pipe, remain some length not to be insulated, in order to be welded and check the leakage after laying the pipes.

5.2.3. Insulate for the jointing area, expanding area and the flange area

- ① Insulate for the jointing area, expanding area and the flange area should be done after checking leakage of the pipes
- ② Make sure there's no clearance in the jointing part of the accessory insulation material and local preparative insulation material.



5.3 Drainage pipe insulation

The connection part should be insulated, or else water will be condensing at the non-insulation part.

5.4 Note

5.4.1 The jointing area, expanding area and the flange area should be heat insulated after passing the pressure test

5.4.2 The gas and liquid pipe should be heat insulated individually, the connecting part should be heat insulated individually.

5.4.3 Use the attached heat-insulation material to insulate the pipe connections (pipes' tie-in , expand nut) of the indoor unit

6. Test Operation

The indoor unit and outdoor unit are installed properly.

- Tubing and wiring are correctly completed.
- The refrigerant pipe system is leakage-checked.
- The drainage is unimpeded.
- The ground wiring is connected correctly.
- The length of the tubing and the added stow capacity of the refrigerant have been recorded.
- The power voltage fits the rated voltage of the air conditioner.
- There is no obstacle at the outlet and inlet of the outdoor and indoor units.
- The gas-side and liquid-side stop valves are both opened.
- The air conditioner is pre-heated by turning on the power.

(3) According to the user's requirement, install the remote controller when the remote controller's signal can reach the indoor unit smoothly.

(4) Test operation

Set the air conditioner under the mode of "COOLING" with the remote controller, and check the following points.

Indoor unit

- Whether the switch on the remote controller works well.
- Whether the buttons on the remote controller works well.
- Whether the air flow louver moves normally.
- Whether the room temperature is adjusted well.
- Whether the indicator lights normally.
- Whether the temporary buttons works well.
- Whether the drainage is normal.
- Whether there is vibration or abnormal noise during operation.

Outdoor unit

- Whether there is vibration or abnormal noise during operation.
- Whether the generated wind, noise, or condensed of by the air conditioner have influenced your neighborhood.
- Whether any of the refrigerant is leaked.

7. Install of indoor units

7.1 Install M10 hanging screw bolts.(4bolts):

- Please refer to the following figure for the distance measurement between the screw bolts.
 - Please install with M10 hanging screw bolts.
 - The handling to the ceiling varies from the construction, consult the construction personnel for the specific procedures.
- 1) The size of the ceiling to be handled... do keep the ceiling flat. Consolidate the roof beam for possible vibration.
 - 2) Cut off the roof beam.
 - 3) Strengthen the place cut off and consolidate the roof beam.
- Carry out the pipeline operation in the ceiling after finishing the installation of the main body. While choosing where to start the operation, determine the direction of the pipes to be drawn out. Especially in case of there is a ceiling, position the refrigerant pipes, drain pipes, indoor & outdoor lines to the connection places before hanging up the machine.
 - The installation of hanging screw bolts

■ Wooden construction

Put the square timber cross the roof beam, then install the hanging screw bolts (Refer to Fig 7)

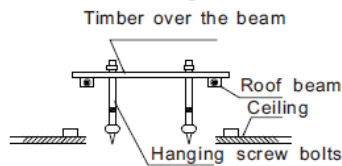


Fig 7

■ New concrete bricks

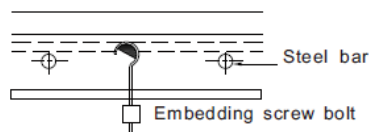
Inlaying or embedding the screw bolts (Refer to Fig 8)



Fig 8

■ For Original concrete bricks

Use embedding screw bold, crock and stick harness (Refer to Fig 9)



(Pipe hanging and embedding screw bolt)

Fig 9

■ Steel roof beam structure

Install and use directly the supporting angle steel (Refer to Fig 10)

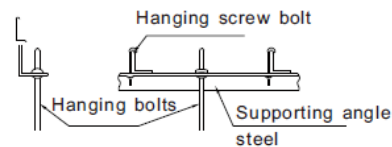
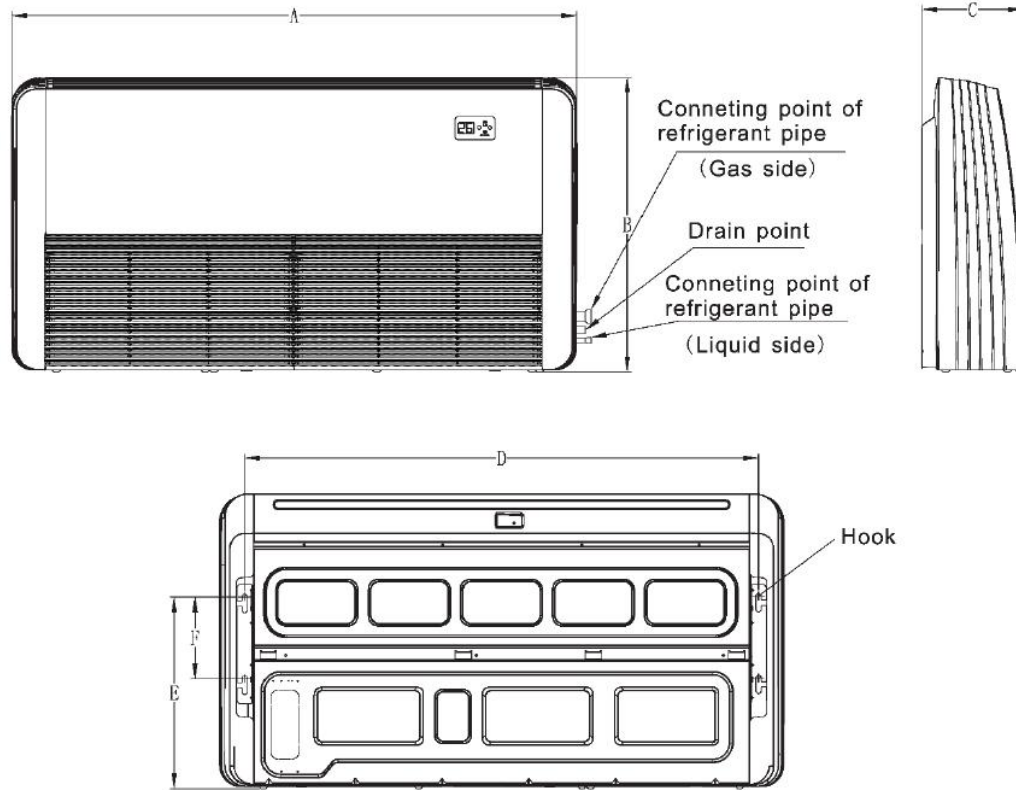
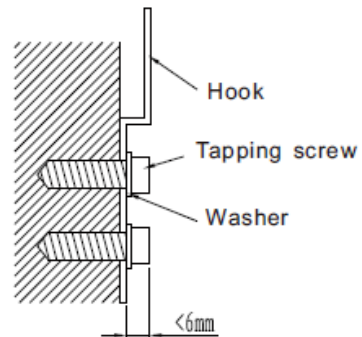


Fig 10

7.2 Wall Mounting Installation



- Fix the hook with tapping screw onto the wall (Refer to Fig 12)
- Hang the indoor unit on the hook



7.3 Ceiling Installation

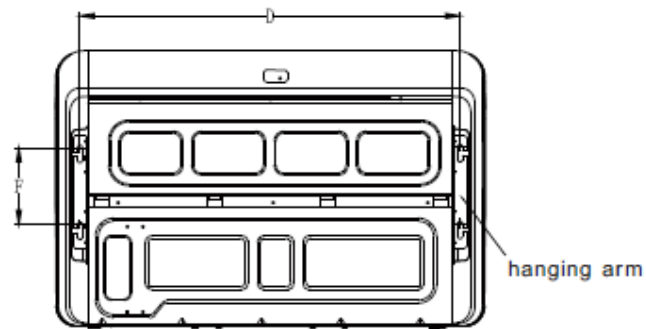


Fig 13

- Remove the side board. (Refer to Fig14)

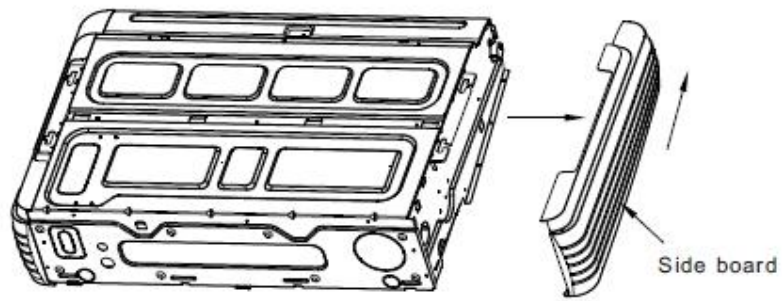


Fig14

- Locate the hanging arm on the hanging screw bolt (Refer to Fig15)

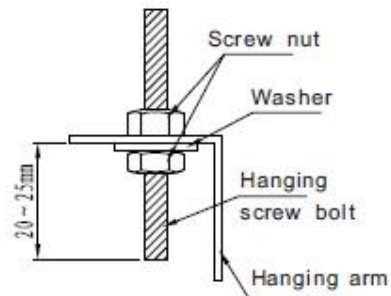


Fig15

- Hang the unit on the hanging arm by sliding backward. Securely tighten the mounting bolts on both sides (Refer to Fig 16)

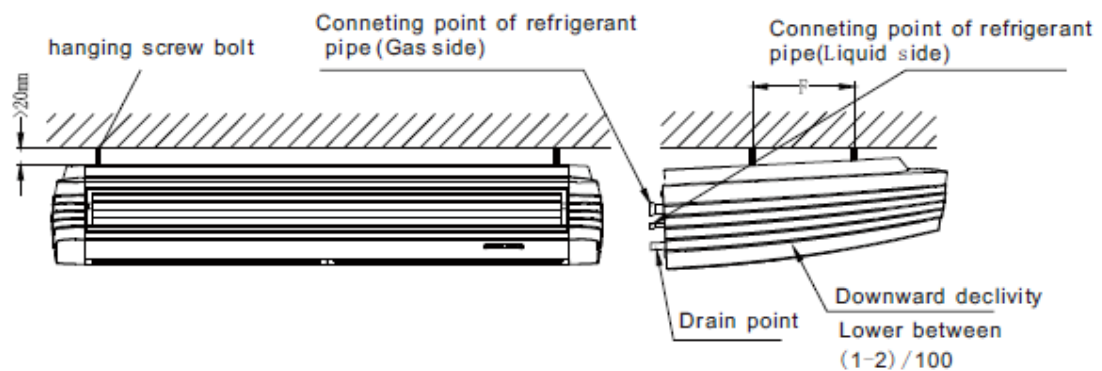


Fig 16

Controller

1. Remote Controller

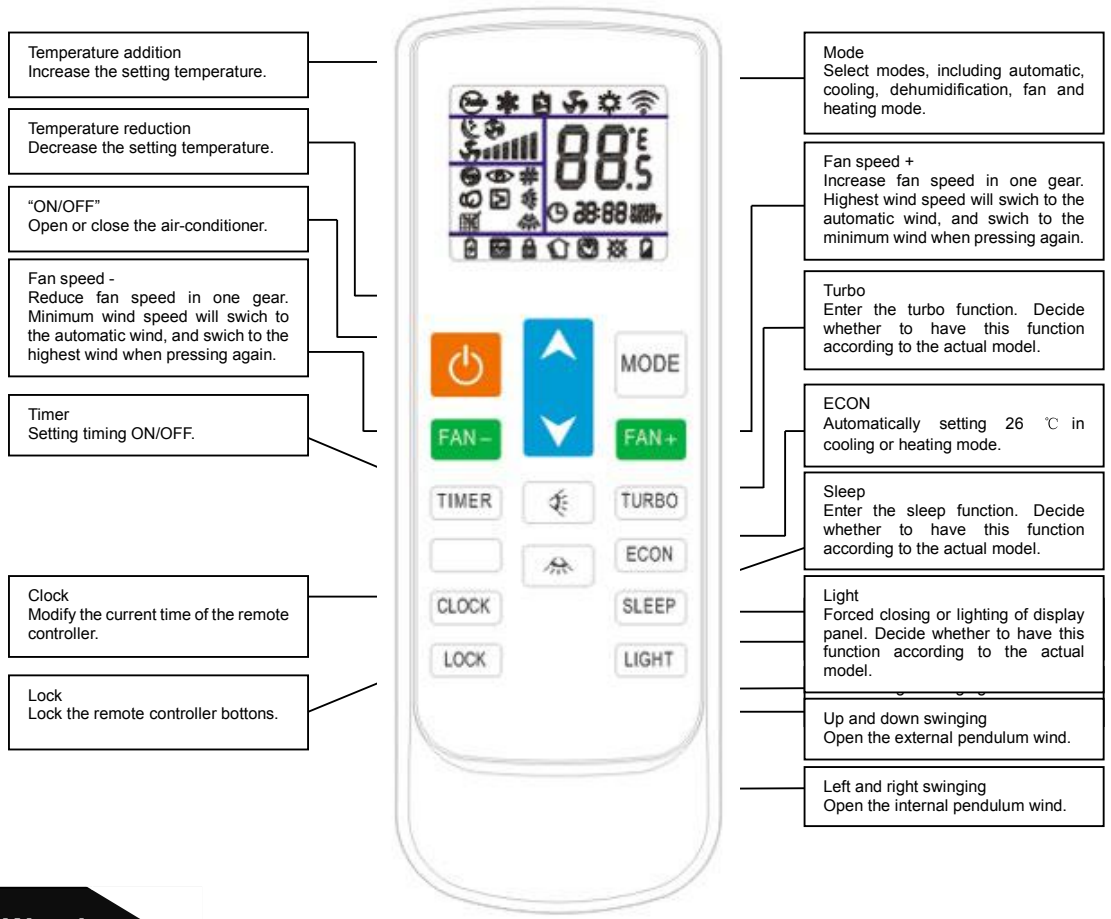
Instructions of remote controller

“HVAC No.2” remote controller (compatibility with wire controller or lamp board): extension code, applicable to most VRV models.

“HVAC No.3” remote controller (compatibility with wire controller or lamp board): general code, applicable to all models (except of Window machine).

Warning

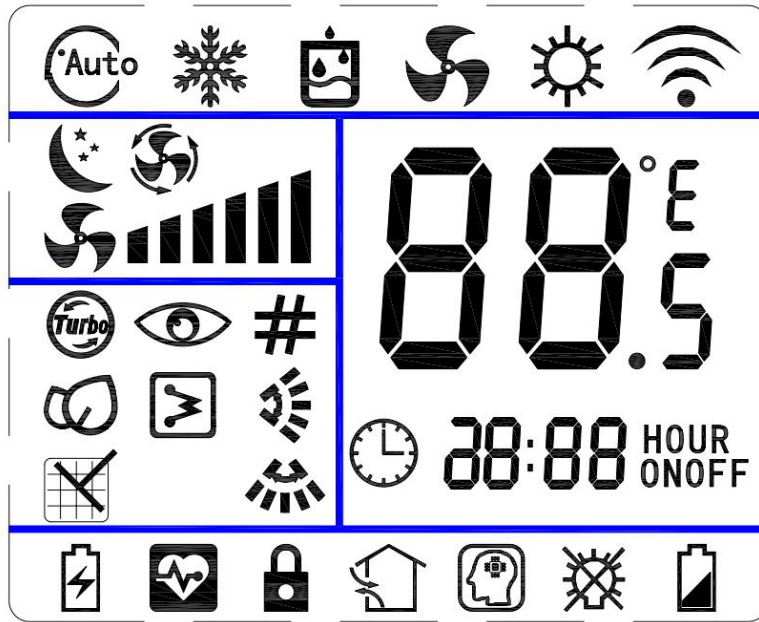
- Do not place remote controller near heat sources such as electric blankets or heating furnaces.
- Do not place remote controller in direct sunlight.
- Be careful not to drop, otherwise it may cause damage.
- No obstacle between the signal receiver and the remote controller, so as not to affect the transmission and reception of the signal.
- Do not splash water or other liquids onto the remote controller.



Warning









- Point the remote controller to the air conditioner, press the button on the remote controller, and send the command signal to the air conditioner.
- If the signal is received correctly, the air conditioner will issue a "beep" prompt.
- If the remote controller is not available, please replace the new battery and try again. But if the problem persists, please contact the seller or our authorized service center.

The icon meaning of remote controller



- 1) The remote controller is equipped with 15 buttons, and the LCD is newly made. All the icons are kept in touch with the touch-screen remote controller.
- 2) At the first power on, the LCD of the remote controller displays all the icons first and then enters the standby state, displaying only the clock 12:00 and the light icon.
- 3) Introduction of LCD screen icon:

Type	Function	Icon
Mode display	fan	
	automatic	
	cooling	
	heating	
	dehumidification	
Temperature display	displays temperature, which range between 16 ~ 32°C or 61 ~ 90°F	
Wind speed display	wind speed	
	automatic wind speed	
Swinging display	external pendulum wind	
	internal pendulum wind.	
Timer display	TIME ON	
	TIME OFF	
Other display	clock	
	sleep	
	TURBO	
	ECON	
	cleaning	
	electric heating	

	address	#
	lock	
	lack of electricity	
Reservation function	Auto Config	
	power saving	
	healthy	
	new wind	
	intelligence	
	lamplight	

Button function of remote controller

ON/OFF

When pressing this key, the remote controller switches by "on, off, on" circularly.

When the first power on, the working state is set by default: setting temperature 25°C (77°F), automatic mode, automatic fan speed, internal and external pendulum wind, no TURBO, no sleep, no timer, no lock).

When the power on is not the first time, the state before shutdown is recovered. After shutdown, the sleep, TURBO, ECON and timer functions will be canceled.

Mode

When pressing this key, the remote controller switches by "automatic, cooling, dehumidification, fan, heating, automatic" circularly.

The dehumidification mode is locked at 25°C and the temperature can not be adjusted. The internal pendulum wind stays unchanged according to the state before switching, but the external pendulum wind is forced to close.

Temperature reduction ▼

Temperature setting: when pressing this key, the setting temperature will be reduced by 1. The temperature of centigrade model will be reduced progressively by "32°C, 31°C,, 17°C, 16°C". The temperature of fahrenheit model will be reduced progressively by "90°F, 89°F,, 62°F, 61°F". When pressing this key in dehumidification and fan mode, the temperature will not change.

In the clock setting state (the clock icon will flicker to show the prompt), this key is used to set the clock time.

Keep pressing will continuously change the temperature.

Temperature addition ▲

Temperature setting: when pressing this key, the setting temperature will be added by 1. The temperature of centigrade model will be added progressively by "16°C, 17°C,, 31°C, 32°C". The temperature of fahrenheit model will be added progressively by "61°F, 62°F,, 89°F, 90°F". When pressing this key in dehumidification and fan mode, the temperature will not change.

In the clock setting state (the clock icon will flicker to show the prompt), this key is used to set the clock time.

Keep pressing will continuously change the temperature.

Up and down swinging (External pendulum wind)

Pressing this key in the dehumidification mode, the external pendulum wind is forced to close.

Pressing this key in the other modes, the external pendulum switches by "swing, fixed wind, swing" circularly.

Left and right swinging (Internal pendulum wind)

Pressing this key in the dehumidification mode, the internal pendulum wind stays unchanged according to the state before switching.

Pressing this key in the other modes, the internal pendulum switches by "swing, stop, swing" circularly.

"FAN -"

When the first power on, the remote controller is set to the automatic wind speed by default. In dehumidification mode, the wind speed is fixed to low wind and is not adjustable. By pressing the wind speed key, there is no response to the remote controller.

Pressing this key in the other modes, the wind speed switches by "automatic wind speed, high speed, middle speed, low speed, automatic wind speed " circularly.

"FAN +"

When the first power on, the remote controller is set to the automatic wind speed by default. In dehumidification mode, the wind speed is fixed to low wind and is not adjustable. By pressing the wind speed key, there is no response to the remote controller.

Pressing this key in the other modes, the wind speed switches by "automatic wind speed, low speed, middle speed, high speed, automatic wind speed " circularly.

Timer

Under the shutdown state, press this key to set the opening time, range from 1 hour to 24 hour.

Under the boot state, press this key to set the shutdown time, range from 1 hour to 24 hour.

The timing time is according to the cycle of "1h, 2h,, 23h, 24h, cancel, 1h".

Exit timing adjustment after 3 seconds without key pressing.

TURBO

Extension code remote controller has the effect. The remote controller is no TURBO by default, and the TURBO key will not work in automatic mode, dehumidification mode and fan mode.

Pressing this key in the cooling or heating mode, the TURBO mode switches between opening and closing. When in the TURBO mode, it does not display the wind speed. Switching mode or entering sleep function will close TURBO mode.

If the air conditioner has four gear wind speeds, the TURBO icon will light up and the fan will run in the fourth gear wind speed by pressing this key.

ECON

The remote controller is no ECON by default, and the ECON key will not work in automatic mode, dehumidification mode and fan mode.

Pressing this key in the cooling or heating mode, the ECON mode switches between opening and closing. When in the ECON mode, the setting temperature is set to 26°C (77°F) and other settings are unchanged. If closing ECON mode, the remote controller will recover to the setting before opening ECON mode. Switching mode will close ECON mode.

Sleep

Pressing this key in the modes except of the fan mode, the sleep function switches between opening and closing. Switching mode will cancel sleep function.

When pressing this key, the wind speed is automatically switched to low wind. However, the wind speed can be adjusted according to the wind speed key (except of the dehumidification mode).

Light

When the first power on, there is no lamplight by default. Pressing this key force to turn off or turn on the lamplight. Decide whether to have this function according to the actual model.

Clock

This key is used to set the clock. Pressing enters the hour adjustment state, and the hour digital tube on the LCD is flickering at the same time. The hour can be set by temperature addition or reduction keys, and it ranges from 0 to 23.

When the hour is set, press this key again to enter the minute adjustment state, and the minute digital tube on the LCD is flickering at the same time. The minute can be set by temperature addition or reduction keys, and it ranges from 00 to 59.

After adjusting, press the clock key again to confirm the setting and the adjustment state exits. If do not press the clock key again to confirm, the time adjustment state will exit after 3 seconds, and recover the clock before the adjustment.

Lock

There is no lock by default. Pressing this key, the lock function switches between opening and closing.

When it is locked, the remote controller does not work except the lock key.

Combinatorial key: "FAN -" + "FAN +"

Extension code remote controller has the effect. Switch 3 gear wind and 6 gear wind. There is 6 gear wind on the LCD. If the 3 gear wind is switched, the first and second gear wind will be "low wind"; the third and fourth gear wind will be "middle wind"; the fifth and sixth gear wind will be "high wind".

Combinatorial key: "Mode" + "Lock"**Enter address setting**

On the shutdown interface, press the combinatorial key on the remote controller for 5 seconds to enter the address setting interface.

The last address (when the first power on, 00 is displayed) and the "#" icon are displayed and flickering.

The step instructions of setting address

At the address setting interface, press the temperature addition or reduction to adjust the setting address, and it ranges from 00 to 63.

When the first time entering the interface or pressing the temperature addition or reduction key, the address display flickers for 3 seconds and then does not flicker.

Press the ON / OFF key to enter the sending state and send the address setting code.

The step instructions of inquiring address

At the address setting interface, press the mode key to send the query code.

At this time, the "#" icon flickers. 3 seconds later, it normally displays the last setting addresses and the "#" icon

does not flicker.


Exit setting

Pressing the mode key and lock key at the same time can exit the address setting interface.

If there is no key pressing associated with address setting for more than 30 minutes, the remote controller will exit the address setting interface.

Battery replacement

- 1) If the air conditioner is unable to receive the signal from the wire controller, or the LCD of wire controller is blurred, it means that the battery is depleted and needs to be replaced.
- 2) Take off the back cover and remove the old batteries. When replacing batteries, please pay attention to the "+" and "-" marking on the battery.
- 3) Install the back cover and set the current time.

 **Warning**

- Do not mix old and new batteries together.
- When the wire controller is idle for a long time, the battery should be removed.
- In general, the service life of a dry battery that meets the JIS or IEC standards can be up to 6-12 months, but if it exceeds the use time or not in conformity with above specifications, the dry battery may leak and may even cause the wire controller operation to be invalid.
- The recommended service life is marked on the battery, but the actual service life may be shorter.

12. Troubleshooting

Fault Code Table

Our company will provide convenient service to our customers, and install all kinds of judgement system, which can display the abnormal function of the unit.

Indoor fault codes table

4LED Faults	Digital display	Failure description
Timer light flashing	E2	Ambient temperature sensor (T1) failure
Running light flashing	E3	Evaporator pipe temperature sensor (T2) failure
Defrost light flashing	E5	Condenser pipe temperature sensor (T3) failure
Warning light flashing	F5	Water fullfilled protection
Running light , defrost light flashing	E1	Indoor unit and wire controller communication failure
Running light , timer light flashing	P6	Indoor unit EEPROM failure
Defrost light, timer light flashing	FO	Indoor fan stall protection (DC Motor)
Defrost light , warning light flashing	F2	Outdoor protection (220V Communication control)
	F7	outdoor unit over-current protection (Reserve)
Timer light , warning light flashing	EO	Indoor unit and outdoor unit communication failure
Running light, defrost light, timer light flashing	F3	High pressure protection (RS485 Communication control)
Defrost light , timer light , warning light flashing	F4	Low pressure protection (RS485 Communication control)
Running light , timer light , warning light flashing	F8	Outdoor unit exhaust temperature over - high protection (RS485 Communication control)
Running light, defrost light , timer light , warning light flashing	F9	Three-phase electricity phase sequence failure (RS485 Communication control)
Note: the flashing frequency for all above indication lights is 1HZ		

1) E2: Indoor ambient temp. sensor fault (T1 sensor)

Solution:

- Check the T1 sensor connection loosen or not, inset it firmly, if not solve, go to next step;
- Take out the sensor, measure the resistance of the sensor, it is about $5K\Omega$ at 25°C , if not, replace it; if resistance normally, change the indoor main board

2) E3: Indoor evaporator pipe temperature sensor (T2) failure

Solution:

- Check the T2 sensor connection loosen or not, inset it firmly, if not solve, go to next step;
- Take out the sensor, measure the resistance of the sensor, it is about $5K\Omega$ at 25°C , if not, replace it; if resistance normally, change the indoor main board

3) E5: Outdoor condenser pipe temperature sensor (T3) failure

Solution:

- Check the T3 sensor connection loosen or not, inset it firmly, if not solve, go to next step;
- Take out the sensor, measure the resistance of the sensor, it is about $5K\Omega$ at 25°C , if not, replace it; if resistance normally, change the main board

4) E1/E9: Indoor unit and wire controller communication failure

Solution:

- Check the connection between wired controller and main board is loosen or not, inset it firmly
- Connect with a new wired controller, if not solve, change with a new communication cable

If all above steps done, it still not solves, change the indoor main board or transformer.

5) P6: Indoor unit EEPROM failure

Solution:

Change the indoor main board.

6) F0: The protection for the stall of indoor fan motor (only for DC motor)

Solution:

- Check the connection between motor and main board is loosen or not, inset it firmly
- Check that is something blocked the motor or fan blade, if it is, remove it; if not, change the indoor main board or DC motor

7) F2: Outdoor unit protection

Solution:

- Follow the F3/F4/F8/F9.

8) E0: Indoor unit and outdoor unit communication failure

Solution:

- Check the communication cable between indoor unit and outdoor unit, if it is short connection or broken;
- Check the communication cable is connected corrected or not, if not, correct it;
- If the cable and connection are both correct, check the connected lines from communication terminal to main board are corrected or not, if not, correct it
- If all the above steps are done, still not solve change the indoor or outdoor main board

9) F3: High pressure protection

Solution:

- If the unit does not have high pressure switch, change the outdoor main board; if it has, go to next step
- Take out the high-pressure switch, measure its resistance, it is about 0Ω , if not, replace it; otherwise go to next step;
- Short connect the high-pressure switch port on the outdoor board, if it still shows P1, replace the outdoor main board; otherwise go to next step;
- Connect the pressure gauge to test the high pressure, if it is real too high, may be cause by too much refrigerant or other gas getting inside the system

10) F4: Low pressure protection

Solution:

- If the unit does not have low pressure switch, change the outdoor main board; if it has, go to next step
- Take out the low-pressure switch, measure its resistance, it is about 0Ω , if not, replace it; otherwise go to next step;
- Short connect the low-pressure switch port on the outdoor board, if it still shows P2, replace the outdoor main board; otherwise go to next step;

Connect the pressure gauge to test the low pressure, if it is real too low, may be cause by lack of refrigerant or leakage in the refrigerant system

11) F8: Outdoor unit exhaust temperature over-high protection

Solution:

- Check the T5 sensor connection loosen or not, inset it firmly, if not solve, go to next step;
- Take out the exhaust sensor (T5) from main board, measure its resistance, it is about $50K\Omega$ at 25°C , if not, change the sensor; if it is, go to next step
- Remove the sensor from the compressor, if it still not solves, change the main board
- If all above steps done normally, it may be caused lack of refrigerant or damaged compressor or refrigerant system blocked or dirty or other gas get inside the system

12) F9: Three-phase electricity power phase sequence failure

Solution:

- Check the 3-phase power connection lines are connected well or not
- Using the meter to measure the voltage (L1&N, L2&N, L3&N), all of them should be 220V, if not, correct the power supply, otherwise go to nest step;

If the power supply is corrected, change the main board

Outdoor fault codes table(1) (Only the green- light)

Faults	LED
High or low pressure failure	Green light flashes once every 5s
Temperature sensorT3 failure	Green light flashes 2 times every 5s
Overflow test failure	Green light flashes 3 times every 5s
Phase sequence test failure	Green light flashes 4 times every 5s
Exhaust temperature over-high failure	Green light flashes 5 times every 5s
Exhaust temperature sensor failure	Green light flashes 6 times every 5s

Outdoor fault codes table(2) (The two light -Green and Yellow)

Faults	LED
High pressure failure	Green light flashes once every 5s
Temperature sensorT3 failure	Green light flashes 2 times every 5s
Overflow test failure	Green light flashes 3 times every 5s
Phase sequence test failure	Green light flashes 4 times every 5s
Exhaust temperature over -high failure	Green light flashes 5 times every 5s
Low pressure failure	Green light flashes 6 times every 5s
Outdoor fan stall protection (DC Motor)	Green light flashes 7 times every 5s
Normal communication receiving	Yellow light keeps constant on
No communication receiving	Yellow light extinguishes
Communication failure warning	Yellow light flashes

Following cases are not air conditioner troubles

- 1.Sometimes , air conditioner may give off odours, for the unit can absorb the smell of rooms, furniture, cigarettes, makeup , etc., and then emit it again
- 2.A continuous low hissing sound is heard when the system is in operation. This is the sound of refrigerant gas flowing through both indoor and outdoor units .

When starting up or stopping the air conditioner , you can hear " cracking" sound from the air conditioner , this sound is produced by the contraction or the expansion of the structural part of the air conditioner, which is caused by temperature change .