

INSTALLATION&OPERATION INSTRUCTION MANUAL FOR

COMPRESSOR CONDENSING UNIT

(CCU)

Thank you for choosing our company products!

Air conditioning facilities are valuable products. In order to protect your legitimate rights and interests, please make sure that the installations are done by professional technicians. This manual is a general-purpose version for the conditioning systems manufactured by our CO., the one that you have chosen might be a little different in appearance from the ones described in the manual . But these differences will not have any impacts upon your operation and use of the system.

Please read the manual carefully before you operate the system and check to see if the model is identical to the one you have purchased, keep the manual properly in case you might refer to it in the future.

CONTENTS	PAGE
NOTICES TO USERS	1
PARTS NAME AND FUNCTION	3
SPECIFICATION	4
DEVICE IN PACKAGE	5
SYSTEM DIAGRAM	6
INSTALLATION OF THE UNIT	7
ELECTRIC WIRING	15
TROUBLE DISPLAY	21

NOTICES TO USERS

Safety Notices

" Important Safety Information " affords very important points about how to operate the unit safely. To prevent injury to the user or other people and property damage, the following instructions must be followed. Incorrect operation due to ignoring of instructions may cause harm or damage.

The safety precautions listed here are divided into two categories. In either case, important safety information is listed which must be read carefully.

WARNING



Failure to observe a warning may result in serious injury, grave accidents even death.

CAUTION



Failure to observe a caution may lead to injury or damage to the equipment.

Please read the mark of the unit carefully .If you detect any abnormality, such as abnormal noise, smell, fog, temperature rise, creepage, fire and so on; Please turn off the power supply immediately and call your dealer or local service center for instructions. Do not repair the unit by yourself. If necessary, call the local fire department or Emergency department for help.



WARNING

- This product is extensively applied in offices, restaurants, hotels, residence and so on.
- Be sure only trained and qualified service personnel to install, repair or service the equipment. Improper installation, repair, and maintenance may result in electric shocks, short-circuit, leaks, fire or other damage to the equipment.
- Install at a strong and firm location which is able to withstand the set's weight. If the strength is not enough or installation is not properly done, the set will drop to cause injury.
- While following the instructions in this installation manual, install drain piping in order to ensure proper drainage and insulate piping in order to prevent condensation. Improper drain piping may result in water leakage and property damage.

- Never use or stockpile some flammable objects such as hair spray, alcohol or paint near the unit. It may cause a fire.
- Cut off the power of the air conditioner in case of accidents, such as smelling something burning.
- Keep the air-conditioning room with good ventilation to avoid of oxygen deficiency.
- Do not insert fingers, rods or other objects into the air inlet or outlet. When the fan is rotating at high speed, it will cause injury.
- Never try to plug in or pull out the power plug for starting or shutting the air conditioner.
- Pay attention to the mounting support in case of damage for a long usage
- Ask your dealer or qualified service personnel for improvement, repair, and maintenance. Incomplete improvement, repair, and maintenance may result in a water leakage, electric shock, and fire.



CAUTION

- Before installing, check whether the power is safe and keep it accordance with its nameplate;
- Before operating, make sure that all connections of cables, drain pipes and other pipes are in good condition in case of water leakage, refrigerant leakage, electric shocks, fires.
- Be sure the air conditioner is grounded. In order to avoid electric shock, make sure that the unit is grounded and that the earth wire is not connected to gas or water pipe, lightning conductor or telephone earth wire.
- Keep the air conditioner running for 5 minutes at least before shutdown, otherwise, it will do bad to the oil return of the compressor.
- The child is not allowable to operate the air conditioner.
- Do not operate the air conditioner with a wet hand.
An electric shock may happen.
- Cut off the power of the air conditioner prior to cleaning the unit or replacing the air strainer;
- Cut off the power of the air conditioner before the unit being idle for a long time.
- Do not step on the outdoor unit or avoid placing any object on it.
Falling or tumbling may result in injury.
- Please electrify the unit and then carry out electric leakage test after the installation of electric devices;

PARTS NAME AND FUNCTION

■ Outdoor unit

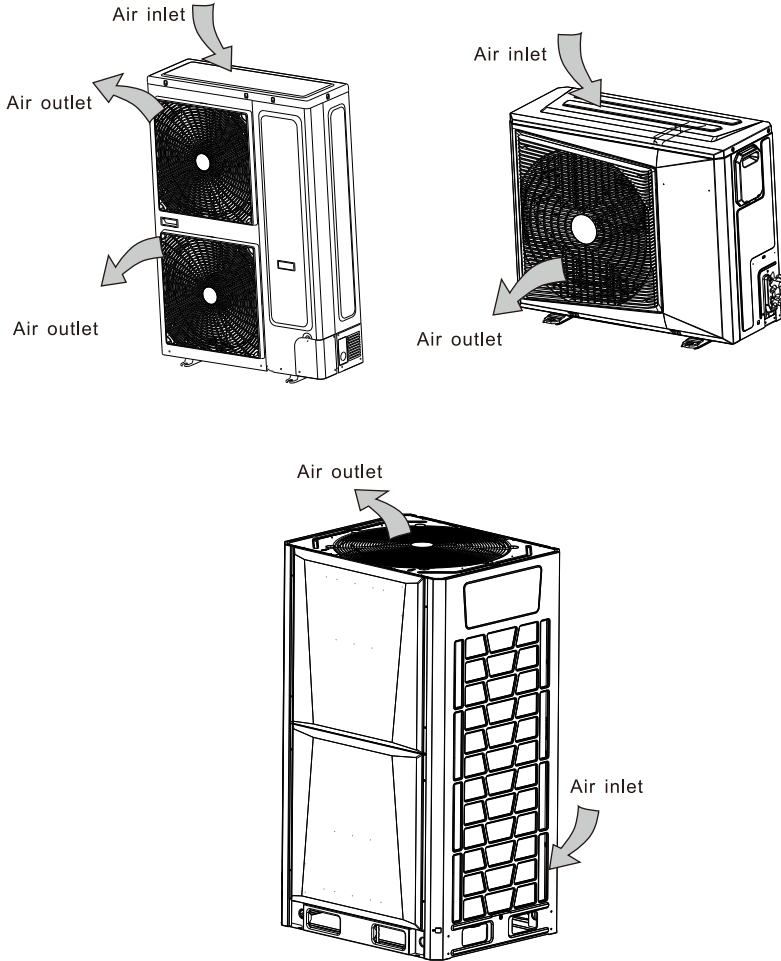


Fig 1



CAUTION

- All the pictures in this manual are for explanation purpose only. They may be slightly different from the air conditioner you purchased(depend on model). The actual shape shall prevail.
- This air conditioner just consists of indoor unit and outdoor unit, other than connecting pipes and ducts.

SPECIFICATION

Table 1

Model			12K	18K	24K	36K	48K
Capacity	Cooling	kBtu/h	12	18	24	36	48
Power supply		V-Hz-Ph	220-240,50,1	220-240,50,1	220-240,50,1	220-240,50,1	380-415,50,3
Compressor Brand			GREE	HIGHLY	GREE	GREE	MITSUBISHI
Performance	Air flow volume	m ³ /h	1600	2400	3300	4000	6000
	Noise level	dB (a)	55	55	56	56	60
Refrigerant	Type		R410A	R410A	R410A	R410A	R410A
	Charge volume	g	800	900	1400	2300	2700
Net dimension	W×H×D	mm	850×555×345	850×555×345	914×702×382	1015×810×445	911×1330×400
Packing dimension	W×H×D	mm	915×600×380	915×600×380	975×770×435	1075×890×495	964×1445×402
Net weight		kg	31	36	48	63	80
Gross weight		kg	33	38.5	51	68	89
Piping diameter	Liquid side	mm	φ 6.35	φ 6.35	φ 9.52	φ 9.52	φ 9.52
	Gas side	mm	φ 12.7	φ 12.7	φ 15.88	φ 19.05	φ 19.05
	Max. pipe length	m	15	15	20	20	20
	Max. difference in level	m	8	8	10	10	10

Table 2

Model			60K	75K	96K	120K	150K
Capacity	Cooling	kBtu/h	60	75	96	120	150
Power supply		V-Hz-Ph	380-415,50,3	380-415,50,3	380-415,50,3	380-415,50,3	380-415,50,3
Compressor Brand			GREE	HIGHLY	Panasonic	Panasonic	Panasonic
Performance	Air flow volume	m ³ /h	6000	9000	12000	12000	15000
	Noise level	dB (a)	60	58	64	64	65
Refrigerant	Type		R410A	R410A	R410A	R410A	R410A
	Charge volume	g	2500	5000	9000	9500	12000
Net dimension	W×H×D	mm	911×1330×400	1015×1430×450	990×1740×840	990×1740×840	1340×1740×840
Packing dimension	W×H×D	mm	964×1445×402	1095×1545×485	1060×1900×910	1060×1900×910	1410×1900×910
Net weight		kg	87.5	125.5	210	240	268
Gross weight		kg	97.5	140	220	250	278
Piping diameter	Liquid side	mm	φ 9.52	φ 9.52	φ 12.7	φ 12.7	φ 22
	Gas side	mm	φ 19.05	φ 19.05	φ 22	φ 28.6	φ 32
	Max. pipe length	m	20	20	50	50	50
	Max. difference in level	m	10	10	20	20	20

Optional device

Cooling only models

Table 3

Capacity	Outdoor unit		expansion valve		Indoor unit	
	sale model	Qty	Model	Qty	Indoor unit capacity	Qty
12kBtu/h	12K	*1	BAE 1 ½ Zw195	*1	10 ~ 14KBtu/h	*1
18kBtu/h	18K	*1	BAE 1 ½ Zw195	*1	16 ~ 19KBtu/h	*1
24kBtu/h	24K	*1	BAE 2 Zw195	*1	21.5 ~ 25KBtu/h	*1
36kBtu/h	36K	*1	BAE 3 Zw195	*1	32.5 ~ 38KBtu/h	*1
48kBtu/h	48K	*1	BAE 3 ½ Zw195	*1	43 ~ 50KBtu/h	*1
60kBtu/h	60K	*1	BAE 4 ½ Zw195	*1	55 ~ 63KBtu/h	*1
75kBtu/h	75K	*1	BAE 4 ½ Zw195	*1	70 ~ 80KBtu/h	*1
96kBtu/h	96K	*1	BAE 7 ½ Zw195	*1	87 ~ 100KBtu/h	*1
120kBtu/h	120K	*1	BAE 7 ½ Zw195	*1	110 ~ 155KBtu/h	*1
150kBtu/h	150K	*1	TFES 12 ZAA	*1	138 ~ 155KBtu/h	*1

Note:

Compressor Condensing Unit can be connected with other indoor units through a set of accessories shown in the fig 2. We advise to choose the volume and quantity of the indoor units as the Table so as to avoid malfunction. As for the specification of the expansion valve, please refer to the above table 3. Customers can purchase the same kind or same volume of expansion valve, dry filter and sight glass according to the actual needs. (Factory do not supply the expansion valve, dry filter and sight glass as spare parts.)

SYSTEM DIAGRAM

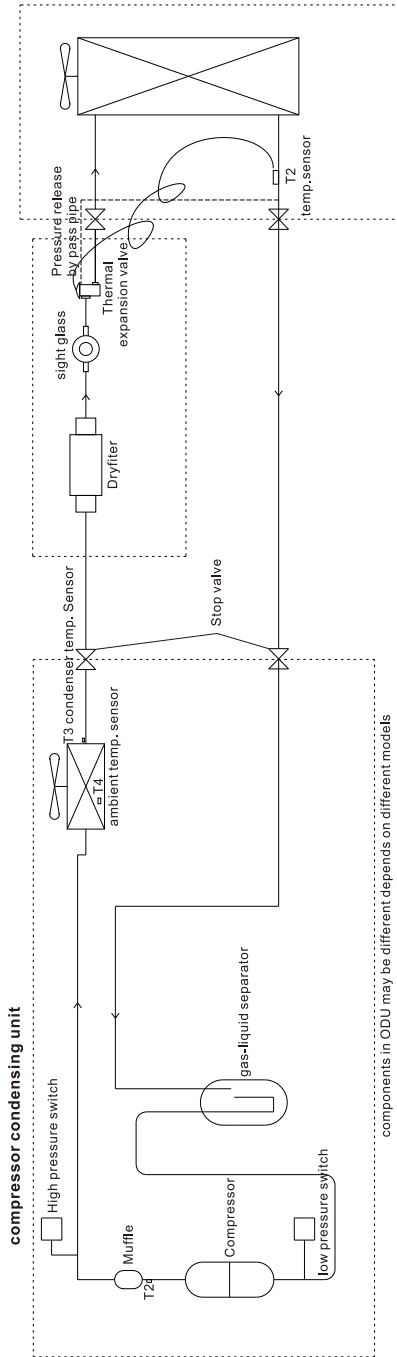


Fig 2

Connect the accessories according to the installation manual of each component.

INSTALLATION OF THE UNIT

1. Outline view and dimension of Outdoor units

■ Outline view and dimension of Outdoor units (Applicable for 12-36 series)

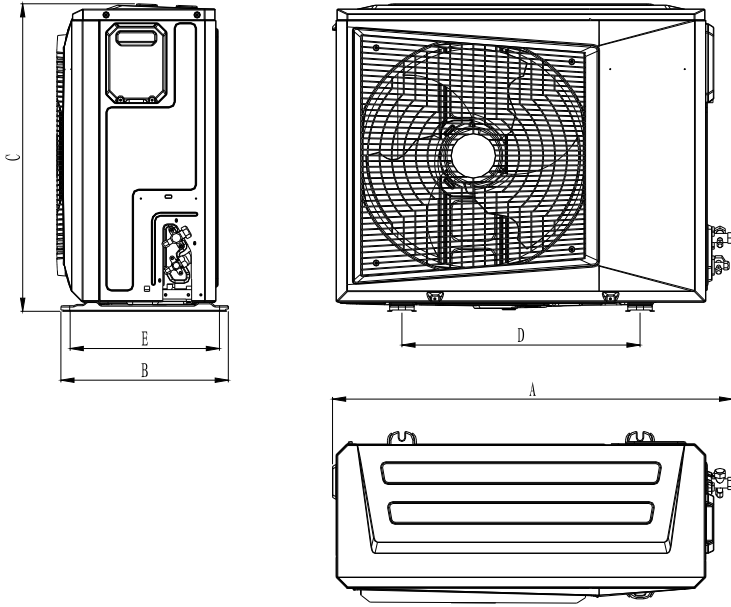


Fig 3

Table 4: unit :mm

Model (kBtu/h) \ Items	A	B	C	D	E
12/18	850	345	555	508	314
24	914	382	702	544	354
36	1015	445	810	670	400

■ Outline view and dimension of Outdoor units (Applicable for 48-75 series)

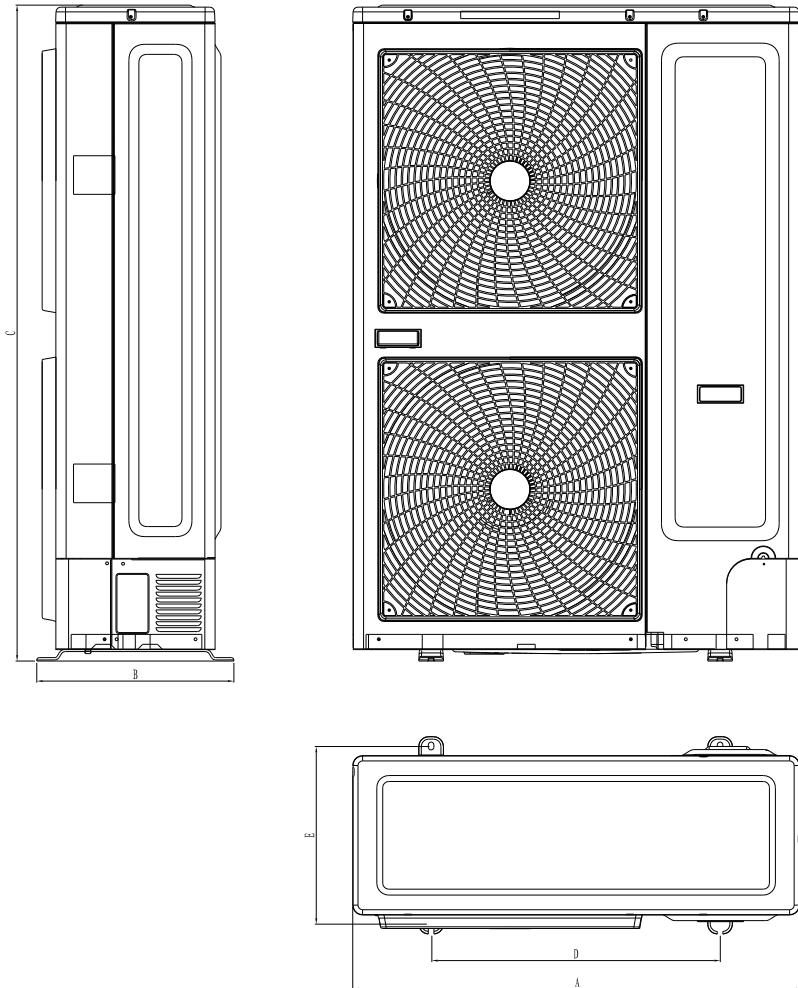


Fig 4

Table 5: unit : mm

Model (kBtu/h) \ Items	A	B	C	D	E
48/60	911	400	1330	585	360
75	1015	450	1430	636	417

■ Outline view and dimension of Outdoor units (Applicable for 96-150 series)

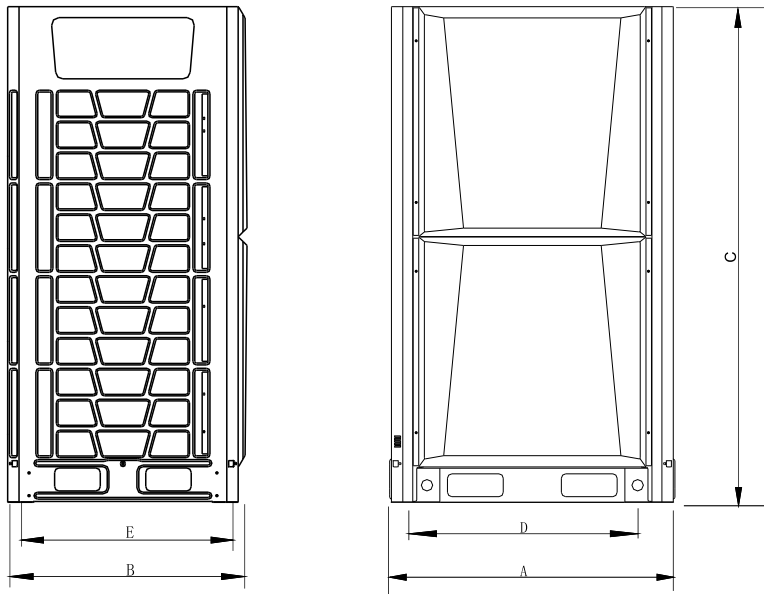


Fig 5

Table 6: unit : mm

Model (kBtu/h) \ Items	A	B	C	D	E
96/120	990	840	1740	720	774
150	1340	840	1740	1070	774

2. Installation dimensions of Outdoor unit

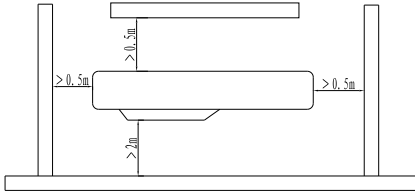


Fig 6

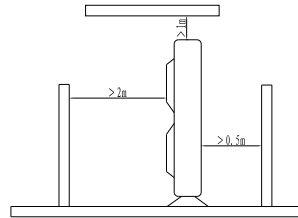


Fig 7

The outdoor unit should be installed in the location that meets the following requirements:

- There is enough room for installation and maintenance and make sure the exhaust does not flow back;
- The place where there is a good ventilation so that the unit can suck or drain out sufficient airflow. Besides, make sure that air outlet and air inlet are not impeded, otherwise, please remove the obstacles
- The support is flat and horizontal and can stand the weight of the outdoor unit, and the installation site has sound proofing and damping function so that the neighborhood will not feel uncomfortable with the noise or expelled air,
- In case of exposure to direct sunlight, you'd better install an awning.
- Make sure that the installation site can drain out the rain and condensate water;
- Select the position where it will not be subject to snow drifts, rubbish or oil smog. If unavoidable, please cover it with a shelter.
- Locate the outdoor unit in the place not facing the strong wind directly.

3. Hoisting and fixing of the equipment

Each set of air - conditioning unit has been strictly inspected and tested before delivery at the factory so as to guarantee the quality and performances of the unit . Therefore , much care shall be taken during the installation of the unit to avoid of damage to the control system and the pipeline.

The installation of the indoor units or the outdoor units must be taken care the different of the left side and the right side . In the event that indoor units or outdoor units are too big to be moved due to its large dimensions or the limitation of small space , hoisting installation may be considered.

- General requirements for hoisting are as follows:
 1. The gradient of the outdoor unit shall not exceed 20° ;
 2. The damage to the units shall be avoided by putting soft materials, such as

Cloth, between the rope and the unit during hoisting;

3. Take care when handling and hoisting ,the force in each point of hoisting must be uniform.

■ The following methods in hoisting are for your reference:

1. Hoisting by hand, hoisting by forklift;

2. Putting round logs (or pipes) under the unit for movement by worker with hands.

■ **Fixing up the unit**

The following work must be done after hoisting is completed:

1. After hoisting the unit on the base, please adjust the unit as level as possible with the gradient error no more than 0.1%.

2. Fixing up the unit with the force on each fixing point uniform when the unit is in a proper level .

4. Connect and install refrigerant pipes

4.1 Inspection of pipes:

The inspection of pipes must be carried out accordance with the following requirements before connection of the pipes.

■ Keep the pipes inside clean;

■ The flares in both ends and the nuts must be complete.

4.2 Connection of pipes

Connect refrigerant pipes of indoor units as quickly as possible. For field installation, the time for connecting two pipes shall not exceed 5 minutes.

■ When connecting flared connectors , the two pipes must be aligned with the same center. Then put on the nut and revolve it in and then tighten it with two spanners , see Fig 10.

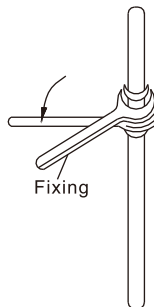


Fig 8

Note:

Two spanners must be used: One is normal spanner, the other is torque spanner.

When connecting the copper pipes, please adjust the torque spanner according to the following torque parameters in Table 9 before operation.

Table 7

Pipe Diameter ϕ (mm)	Tiorque force (kgf · m)
6.35	1.4~1.7
9.52	1.4~1.7
12.7	4.8~6.2
15.88	4.8~6.2
19.05	6.9~9.9

■ Getting through the wall:

When getting pipes of the outdoor and indoor units through the wall, the sleeve must be used in order to protect the pipe and cables shown as Fig 11:

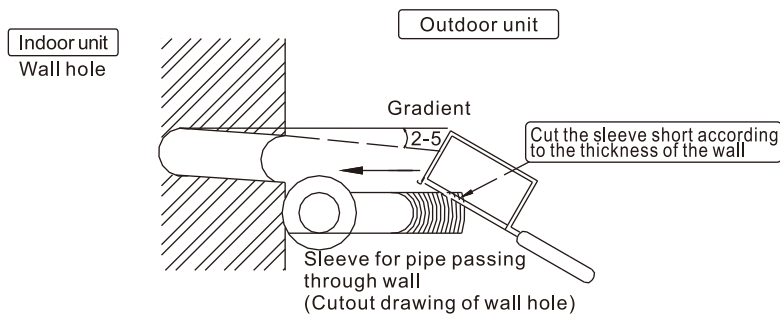


Fig 9

■ Pressure test, vacuumize and leakage check for connection pipes and indoor pipeline:

After installing the units and connection ducts, keep filling the connection duct and the pipeline of the indoor units with nitrogen gas until the pressure in the duct reach 2.4~3.0MPa (absolute pressure); Maintain this pressure for about 24 hours with the value change no less than 0.03Mpa. Meanwhile, the leak test should be carried out to each joint and weld points by using soap bubble, if there is no leak point, please discharge the nitrogen gas until the pressure reduces to 130Pa (absolute pressure), and maintain this pressure value for about 24 hours with the value change no less than 20pa. At last, open the valve of the main machine to start the commission. If the refrigerant pipe is longer than the stated one, please charge more refrigerant R410A according to the following experienced formula:

$$R = L1 \times 0.023 \text{kg/m} + L2 \times 0.060 \text{kg/m} + L3 \times 0.120 \text{kg/m} + L4 \times 0.180 \text{kg/m} + L5 \times 0.270 \text{kg/m} + L6 \times 0.380 \text{kg/m} + L7 \times 0.520 \text{kg/m} + L8 \times 0.680 \text{kg/m}$$

Remarks:

R--Total charging amount of refrigerant;

L1 --Total length of ϕ 6.4 Liquid pipe

L2 --Total length of ϕ 9.5 Liquid pipe

L3 --Total length of ϕ 12.7 Liquid pipe

L4 --Total length of ϕ 16.9 Liquid pipe

L5 --Total length of ϕ 19.1 Liquid pipe

L6 --Total length of ϕ 22.2 Liquid pipe

L7 --Total length of ϕ 25.4 Liquid pipe

L8 --Total length of ϕ 28.6 Liquid pipe



CAUTION

Please vacuumize its pipeline with a vacuum pump prior to installation, for the refrigerant in the pipeline of the outdoor unit is not emptied before delivery.

■ Heat Insulation:

When everything is normal after leakage inspection and pressure testing, carry out heat insulation operation accordance with the requirements as below:

- ① The insulated material must be wrapped tightly without any cracks ;
- ② The thickness of the insulated material is no less 8 mm .
- ③ After wrapping with insulated material, please carry on rainproof and dampproof treatment for the surface, such as wrap it with some bands.
- ④ Condensation on the surface of the copper pipes is not allowed during cooling operation.

5. Dispose tubing

Because of the different installation positions of the air-conditioners, the accessory pipe for the piping is varied in length. The longer the pipe is, the more the refrigerant is needed, therefore, please select the proper pipe as short as possible according to Table 10

5. 1 The most working distance of the piping:

Table 8

Rated refrigeration (KBtu/h) Value	<24	24~60	≥96
Max. length (m)	15	20	50
Max. Height (m)	8	10	20
Max. number of bends(piece)	10	10	10



CAUTION

Under the conditions to guarantee 80% cooling capacity, the parameters above mentioned are obtained considering the loss of refrigeration and oil return.

5.2 Allocate oil loops and non-return bends

When the difference of heights between outdoor unit and indoor unit is great, allocate some loops in the pipeline for easy oil return. For actual operation, the typical installation methods may be used as shown in Fig 12:

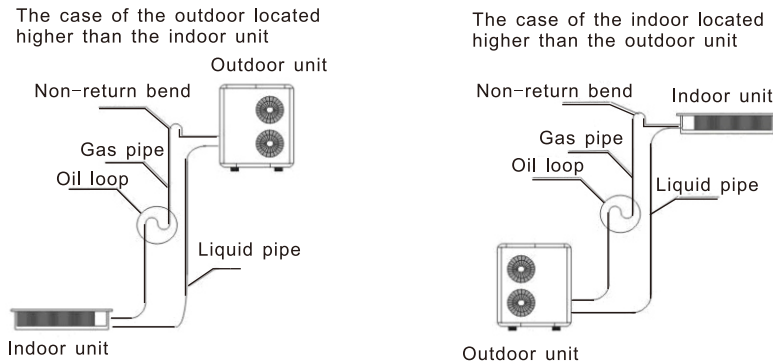


Fig 10



CAUTION

- The radius of oil loops shall be as small as possible and one is allocated every 5 meters as shown in the above figures.
- When the height difference is more than 5 meters between the indoor unit and the outdoor unit, some oil loops or non-return bends need to be installed in the pipeline system.
- The figures above are just for the multi-connecting unit with one indoor unit, it is the same with ones with several indoor units.

ELECTRIC WIRING

1. Connect wires to amphenol connectors



CAUTION

- Make sure that the power specification is of accordance with one listed on the nameplate;
- Make sure that the capacity of power supply is proper and the section-cross-area of room wires is more than 2.5mm²;
- Wiring construction must be carried out by professional;
- As for fixed lines, the leakage protective switch and air switch should be allocated and make sure that the distance between electrode tips is more than 3 mm;
- Solid cable wiring:
 - a. Strip off the insulating material with wire stripper about 25 mm at the end of the solid cable;
 - b. Take down screws of the air-conditioner terminal;
 - c. Make the end of solid cable into a ring with size as large as screws with the clamp;
 - d. Get screws through the ring and then fix it on the terminal;
- Stranded wire wiring:
 - a. Strip off the insulating material with wire stripper about 10 mm at the end of the stranded wire;
 - b. Then put the corresponding number tubes on the stripped wires (Pay attention to the terminal number of indoor unit and outdoor unit)
 - c. Insert the stranded wire into connector with size as large as screws with the clamp;
 - d. Take down screws of the air-conditioner terminal;
 - e. Get screws through the connector of the stranded wire and then fix it on the terminal;

NOTE: Please connect power wires and connecting wires to corresponding connectors.



WARNING

If supply cords and signal wires are broken, please replace them with special cords.

- Prior to wiring, affirm voltages of all parts listed on the nameplate and then carry out the wiring construction according to Electric wiring diagram;
- The air-conditioner should apply special power supply, leakage protective switch and air switch in case of overload trouble.
- In case of electric shock, get the air conditioner grounded unfailingly;
- All wires should apply with clamping connectors or solid cable. If stranded wires is connected to terminal, it may lead to fires.

- In case of air conditioner breakdown or damage, the wiring construction will be firmly conformed to the electric wiring diagram;
- Never get the cables in touch with refrigerant pipe, compressor, fan or other operating parts;
Not remove wires of the air conditioner, or it may lead to damage or breakdown and the manufacturer will not take responsibility for the aftermath.

2. Power wires connection

2.1 Connect power wires to outdoor units

- Take down the front end board or the large handle;
- Connect power wires to L connector and N connector(or L1, L2, L3 and N connector) and grounding screws;
- Fix power wires with cable clip.

2.2 Connect power wires to indoor units

- Take down the electric control box of indoor units;
- Connect power wires to L connector and N connector(or L1, L2, L3 and N connector) and grounding screws;
- Fix power wires with cable clip.

3. Signal wires connection of wire controller

- Take down the electric control box of indoor units;
- Get the signal wires through the rubber ring;
- Insert the signal wires into five-needlebar on the electric control panel of indoor units.



CAUTION

In case of Electromagnetic interference (EMI), pay attention to the following wiring operation:

- Separate signal wires from power wires and connecting wires of indoor units and outdoor units;
- When the air conditioner is installed in the place where there is EMI, take shielded wires and twisted pair as signal wires.

4. Power wiring diagram

There are many kinds of power wiring diagram for different user powers and models, make sure the section-cross area of wire that users purchased is not less than those specifications list in the following figures:

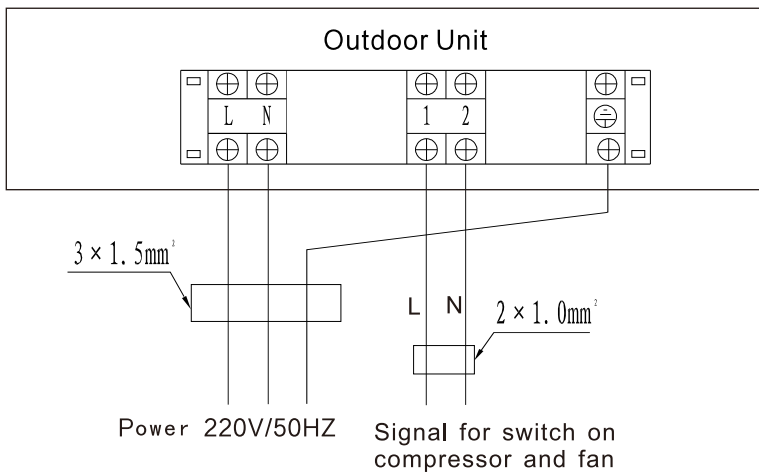


Fig 11 12K、18K

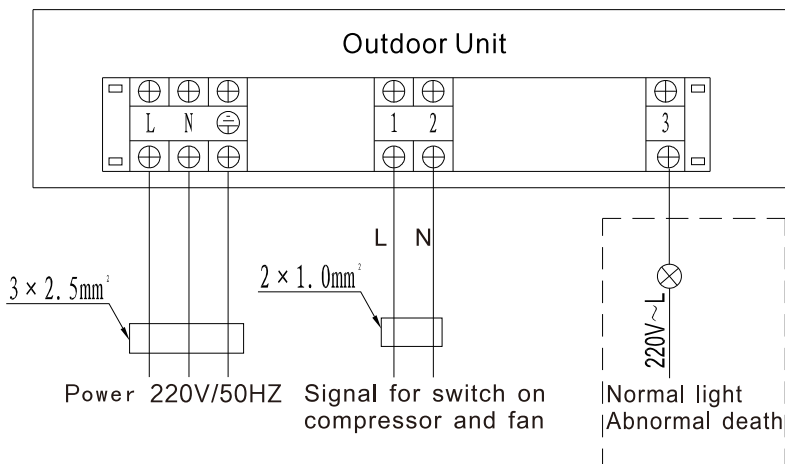


Fig 12 24K

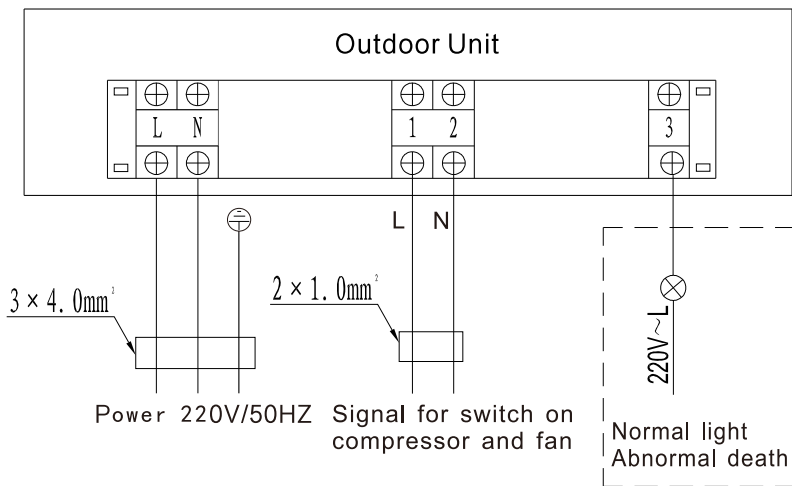


Fig 13 36K

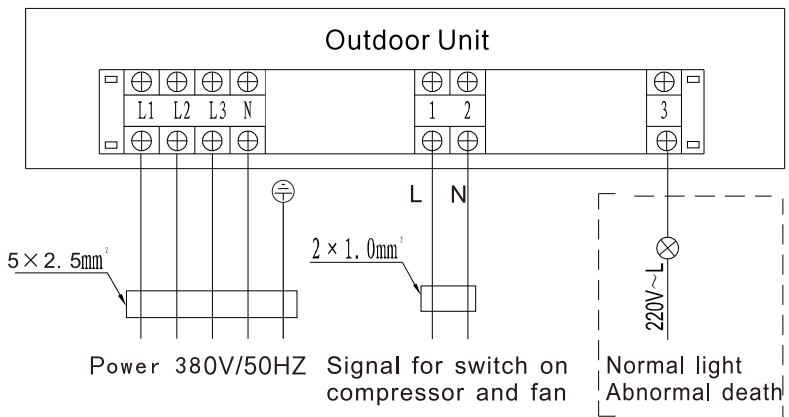


Fig 14 48K、60K

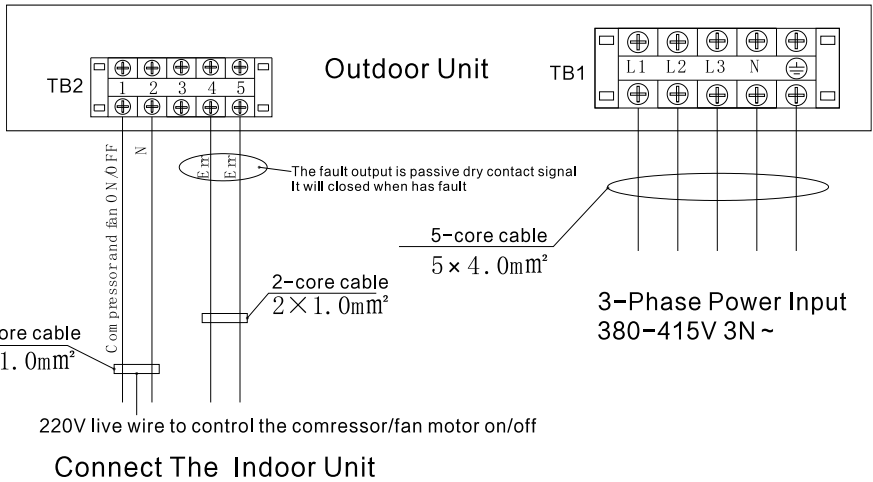


Fig 15 75K

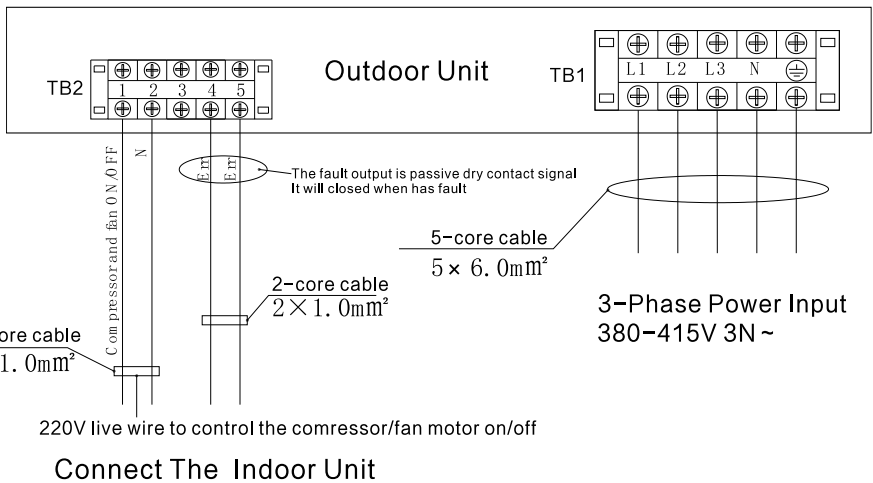


Fig 16 96K, 120K

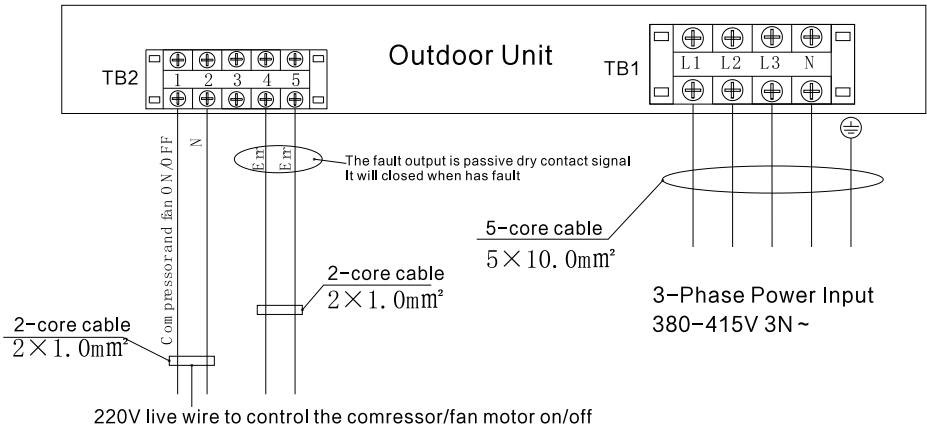


Fig 17 150K

TROUBLE DISPLAY

1、Fault codes table(12K、18K、24K、36K、48K、60K)

Table 9

Type	LED1	Remarks
Run mode	◆	
Phase sequence protection	☆4	Manual reset
Outdoor condenser temp. sensor error. Protection of condenser hi-temp.	☆2	
Protection of low pressure Protection of high pressure	☆1	Reported three times within an hour of failure is necessary to manually reset
Protection of over-current	☆3	
Protection of dis hi-temp	☆5	
disp temp. sensor error.	☆6	

Note:

☆4: Lamp flashes at the speed of 5HZ for 4 times.

◆: Light;

2、Fault codes table(75K、96K、120K、150K)

Errors of the units, check the LED lights on PCB:

Table 10

Type	LED1 RED	LED2 YELLOW	LED3 GREEN	Remarks
Standby	★	★	★	
Run mode	◆	◆	◆	
Phase sequence protection	☆	☆	☆	Manual reset
Outdoor condenser temp. sensor error. Protection of condenser hi-temp.	◇	☆	☆	
Outdoor ambient temp. sensor error	◇	◇	☆	
Protection of low pressure	☆	◇	◇	Reported three times within an hour of failure is necessary to manually reset
Protection of high pressure	☆	◇	☆	
Protection of over-current	◇	☆	◇	

Note:

☆: Light for 0.5 second, extinguish for 0.5 second;

◆: Light;

◇: Extinguish;

★: Light for 2 second, extinguish for 2 second.

A-CTDTENG01-1
802036000209