

Installation Manual for Outdoor Unit

AU282FHERRA(H)

AU482FIERRA(H)

AU48NFIERRA(H)

AU602FIERRA(H)

AU60NFIERRA(H)

No. 0150520741 C

- Please read this manual carefully before using.
- Keep this operation manual for future reference.

Original instructions

User Manual

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The outdoor unit adopts "simultaneous control" type, all indoors should be heating or cooling simultaneously.

To protect compressor, before startup, the unit should be electrified for over 12 hours. If the unit is not used for a long time, please cut off the power to save energy, or the unit will consume the power.

Warning

- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- The appliances are not intended to be operated by means of an external timer or separate remote-control system.
- Keep the appliance and its cord out of reach of children less than 8 years.

Important matters

- The company does not assume any responsibility for the accidental damage caused by the operation of the air conditioner in a particular environment.
- The air conditioner can only be used as an ordinary air conditioner.
- Do not use this heat pump air conditioner for dry clothing, frozen food, cooling or heating, etc.
- No part of this manual may be copied without permission.
- Bold text (warning, prohibition, attention) used to indicate the degree of risk. The following is a description of the text and symbols in the explanatory notes:

	WARNING: Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.
	PROHIBIT: Do not carry out the operation.
	CAUTION: Sometimes it can cause serious accidents.

- If you have any questions, please contact the dealer or the service center designated by our company.
- Please install air conditioning in accordance with local standards.

Operation condition:

To use the air conditioner normally, please perform as to the below conditions.

Operating Range of Air Conditioner

Cooling dry	Indoor	Max.	DB:32°C	WB:23°C
		Min.	DB:18°C	WB:14°C
	Outdoor	Max.	DB:48°C	WB:26°C
		Min.	DB:-5°C	
Heating	Indoor	Max.	DB:27°C	
		Min.	DB:15°C	
	Outdoor	Max.	DB:21°C	WB:15°C
		Min.	DB:-15°C	

Product Features

- The outdoor unit adopts "simultaneous control" type, all indoors should be heating or cooling simultaneously.
- To protect compressor, before startup, the unit should be electrified for 12 hours. If the unit is not used for a long time, please cut off the power to save energy, or the unit will consume the power.

This manual describes the installation and installation of outdoor units. For the installation of the indoor machine, please refer to the instruction manual of the indoor machine.

Please read the installation instructions carefully before installation, according to the instructions of the installation construction.

Safety

- If the air conditioner is transferred to the others, this manual should be transferred together.
- Before installation, please read "Safety precaution" carefully to confirm the correct installation.
- The mentioned precaution includes "⚠WARNING" and "⚠CAUTION". The precaution caused death or heavy injury for faulty installation will be listed in "⚠WARNING". Even the cautions listed in "⚠CAUTION" also may cause serious accident. So both of them are related to the safety, and should be executed severely.
- After installation, perform a trial and confirm everything normal, then introduce the operation manual to the user. Besides, put the manual to the user and ask them to preserve it carefully.

⚠WARNING

- The installation or the maintenance should be performed by the authorized agency. Or the non-specialized operation will cause water leakage, electric shock or fire etc accidents.
- The installation should be executed as per the manual, or the faulty installation will cause water leakage, electric shock or fire etc accidents.
- Please install the unit at the space which can bear the weight. Or the unit will drop down to cause the human injury.
- The installation should defend against the typhoon, and the earthquake etc. Abnormal installation will cause the unit fall down.
- Use the correct cable and make reliable earthing. Fix the terminal firmly and the loose connection will cause heating or fire etc accident.
- The wiring should be in shape and can not be raised. Be earthed firmly and can not be clipped by the electric box cover or the other plate. The incorrect installation will cause heating or fire.
- When setting or transferring the unit, there should not be other air into the refrigerant system except for R410A. The gas mixture will cause the abnormal high pressure which will cause break or human injury etc accidents.
- When installation, please use the accessories with the unit or the special parts, or it will cause water leakage, electric shock, fire, refrigerant leakage etc accidents.
- Don't lead the water drainage pipe into the drainage groove with the poisonous gas, such as sulphur. Or the poisonous gas will enter indoor.
- In installation or after installation, please confirm if there is refrigerant leakage, please take measures for ventilation. The refrigerant will cause poisonous gas as meeting fire.
- Don't install the unit at the place where there may be flammable gas leakage. In case the gas leaks and gather around the unit, it will cause fire.
- The drainage pipe should be installed as per the manual to confirm the fluent drainage. Also take measures for heat insulation against dew drop. Incorrect water pipe installation will cause water leakage even and make the things wet.
- For the liquid pipe and the gas pipe, take measures for heat insulation too. If there is no heat insulation, the dew drop will wet the things.

Safety

⚠CAUTION

- Execute earthing for the unit. But the earthing wire can not be connected to the gas pipe, water pipe, lightning rod or the telephone earthing wire. Improper earthing will cause electric shock.
- Don't install the unit at the place where leaks the flammable gas. Or it will cause fire.
- Execute the water drainage pipe according to the manual, improper installation will cause water leakage to wet the family things.
- The outdoor fan can not face to the flower or the other vegetable, or the blowing gas will make the flower dried up.
- Please ensure the maintenance room, if not, it will cause the maintenance person damaged.
- When installing the unit on the roof or the other high place, to prevent the person falling down, please set the fixed ladder and the railing at the passage.
- Use the two-end spanner, and fasten the nut at proper torque. Don't fasten the nut excessively against the flared setion broken. Or it will cause refrigerant leakage and lack of oxygen.
- Take measures for heat insulation to the refrigerant pipe, or there will be water leakage or dew drop to wet the family things.
- After finishing the refrigerant pipe, make leakage test by charging the nitrogen. In case the refrigerant leaks in a small room and exceeds the limited concentration, it will cause lack of oxygen.
- Don't use the other refrigerant except for R410A. The R410A pressure is 1.6 times higher than R22 pressure. The refrigerant R410A tank is marked with pink sign.
- Against charging different refrigerant, we changed the stop valve diameter of the R410A unit. To enhance the compression consistence, we also changed the flared pipe dimension. Prepare the R410A specially tools according to the below table.

	R-410A specified tools	Remarks
1	Gauge manifold	Range: HP > 4.5MPa, LP > 2MPa
2	Charge hose	Pressure: HP: 5.3MPa, LP: 3.5MPa
3	Electronic balance for charging R410A	Can not use the measurable charging tank
4	Torque spanner	
5	Flare tool	
6	Copper pipe gauge for adjusting projecting margin	
7	Vacuum pump adapter	Must be with reverse stop valve
8	Leakage detector	Can not use freon leakage detector, but the He detector

- When charging refrigerant, the refrigerant must be taken out as liquid state from the tank.
- When installing the power cord and the connecting line must be at least 1m from the TV or radio, so as to avoid image interference or noise.
- In the room with fluorescent lamp (reverse or fast start type), remote control signal transmission distance may not reach the predetermined value, so the indoor machine installed away from the fluorescent lamp as far as possible.
- Please use the fuse to meet the capacity requirements.
- To prevent the destruction of wires, electrical components, etc. by rats or other animals.
- Recommended room ventilation every 3 to 4 hours.

Arrival inspection

- After receiving the machine, should check whether there is transport damage. If any damage is found on the surface or inside, it shall be reported immediately to the shipping company in writing.
- Check the product model, electrical parameters (power supply, voltage, frequency) and accessories to determine whether they meet the requirements.

Transportation and Lifting

Lifting

In front of the unit shipped from unpacking location as close as possible.

⚠ CAUTION

- Do not place anything on the device.
- Two ropes shall be used for lifting the outdoor unit.

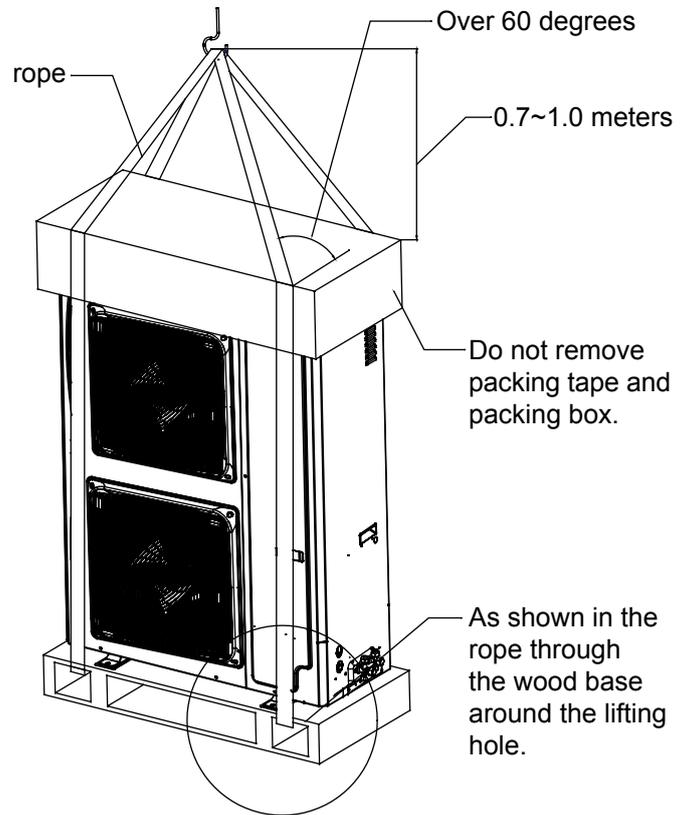
Hoisting method

Hoisting to ensure that the level of outdoor machine, slowly lifting.

1. Removal of outer packing is strictly prohibited
2. As shown by two ropes hoist with outdoor machine packaging.

⚠ CAUTION

- In order to ensure safety, maintain the level of lifting, slowly lifting.
- Do not lift the elevator to the packing and outer packing of the equipment.
- External protection should be used when lifting, such as cloth or cardboard.



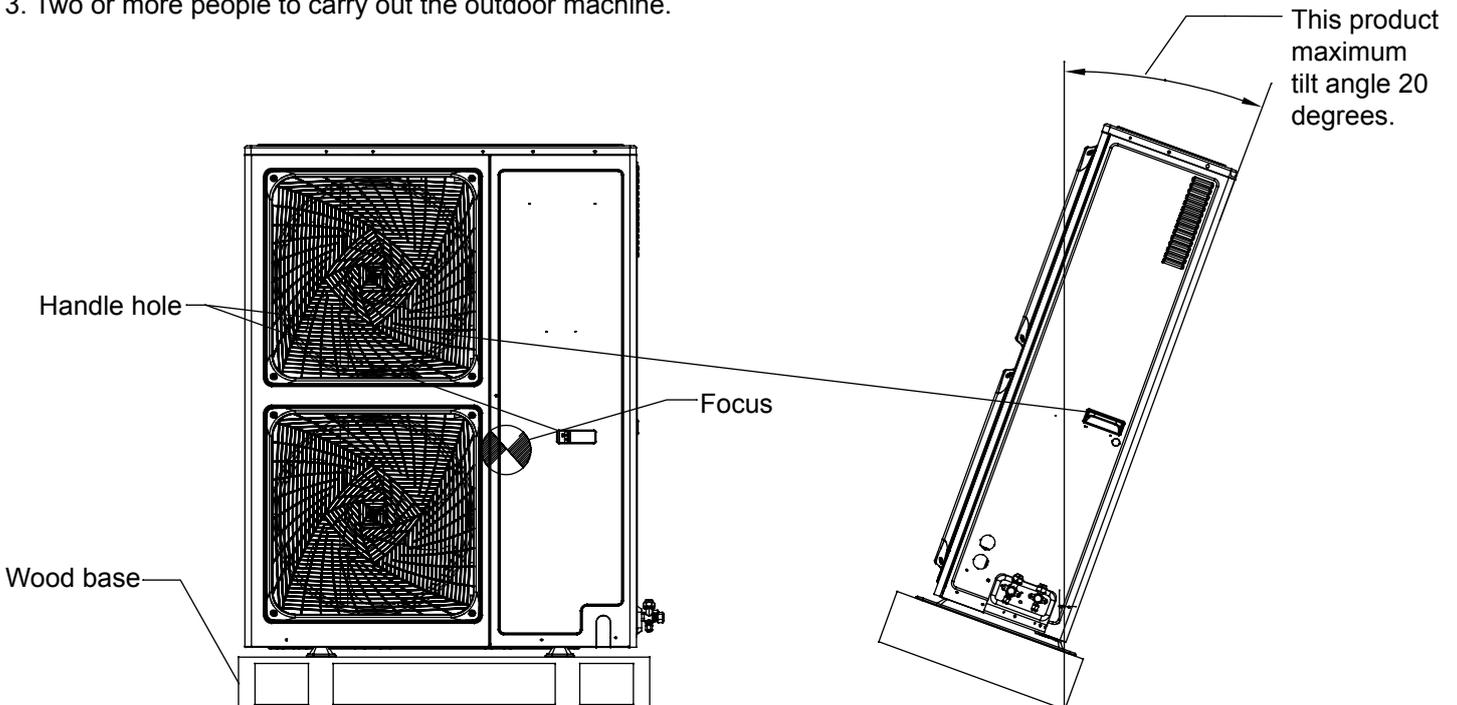
Manual handling

⚠ CAUTION

- In the installation and commissioning, the outdoor machine do not put any irrelevant material, to ensure that there is no debris inside the machine, or there may be a fire or accident.

Pay attention to the following points when handling the equipment manually:

1. No demolition wood base.
2. In order to prevent the dumping of the outdoor machine, the center of gravity of the unit should be noted as shown in the figure.
3. Two or more people to carry out the outdoor machine.



Installation instruction

In installation, please check specially the below items:

- If the connected units quantity and the total capacity is in the allowable range?
- If the refrigerant pipe length is in the limited range?
- If the pipe size is proper? And if the pipe is installed horizontally?
- If the branch pipe is installed horizontally or vertically?
- If the additional refrigerant is counted correctly and weighed by the standard balance?
- If there is refrigerant leakage?
- If all the indoor power supplies can be on/off simultaneously?
- If the power voltage is in compliance with the data marked on the rating label?
- If the address of indoors has been set?

(1) Before installation

- 1) Before installation, check if the model, power supply, pipe, wires and parts purchased respectively are correct.
- 2) Check if the indoors and outdoors can be combined as the following.

Outdoor		Indoor	
Capacity (100w)	Combination type	Indoor qty	Total indoor capacity (100w)
80	Single	5	40-104
150	Single	8	75-195
180	Single	9	90-234

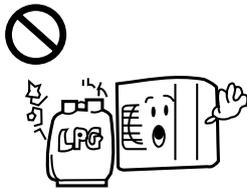
Notice:

Total capacities of indoor units being used \leq 100% of rated capacities of outdoor unit.

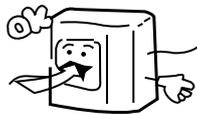
indoor capacity (100W)		
22	total indoor capacity (100W)	branch pipe (optional)
28		
36	less than 335	FQG-B335A
40		
45		
56		
71		

(2) Installation place selection

Air-conditioner can't be installed in the place with inflammable gas. Or it will cause fire hazard.



The unit should be installed at the place with good ventilation. No obstacle at the air inlet/outlet. And no strong wind blows the unit.



The installation space refers to the latter info.

The unit should be installed at the strong enough place. Or it will cause vibration and noise.



Installation instruction

The unit should be installed at the place where the cold/hot air or noise will not interfere the neighbours.



- The place where the water can flow fluently.
- The place where no other heat source will affect the unit.
- Pay attention to the snow against clogging the outdoor.
- In installation, install the anti-vibration rubber between the unit and the bracket.

- The unit is better not be installed at the below places, or it will cause damage.
- The place where there is corrosive gas (spa area etc).
- The place blowing salty air (seaside etc).
- Exsits the strong coal smoke.
- The place with high humidity.
- The place where there is device emitting Hertzian waves.
- The place where voltage changes greatly.

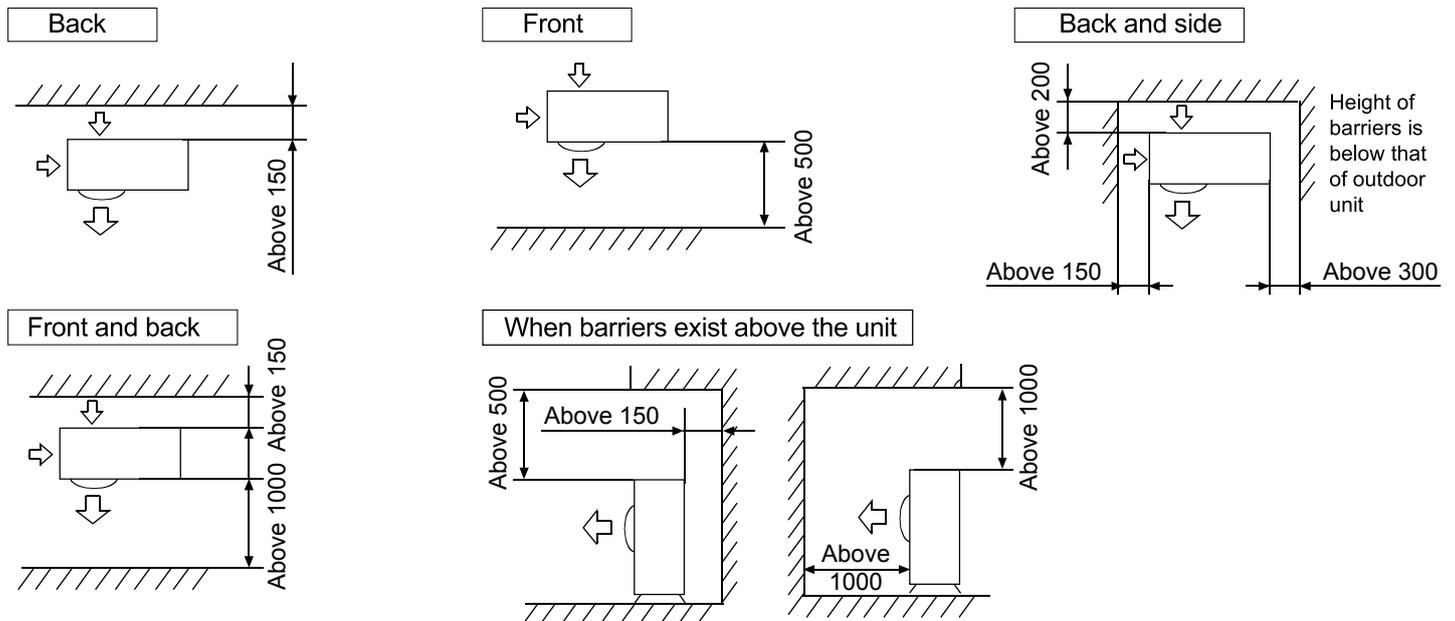
Note:

1. In snowy area, install the unit under the bracket or the snow-proof cover against the accumulative snow on the unit.
2. Do not install the unit at the place where the flammable gas will leak.
3. Install the unit at the strong enough place.
4. Install the unit at the flat place.
5. When being installed at the place with strong wind, set the air outlet of the unit and the wind direction vertical. Also fix the unit with the screw.
6. The installation site should be far away from the place where the noise is higher. At the same time for the noise of higher places should ensure that the outdoor machine vibration and wall insulation measures to prevent vibration caused by thin wall or acoustic noise problems.
7. Aluminum foil fin is very sharp, pay attention to prevent scratches.
8. In addition to the maintenance of the roof, or the installation of outdoor machines, other people can not contact the outdoor machine.

(3) Installation and maintenance space

Selection of installation location of outdoor

(1) Single-unit installation (unit: mm)

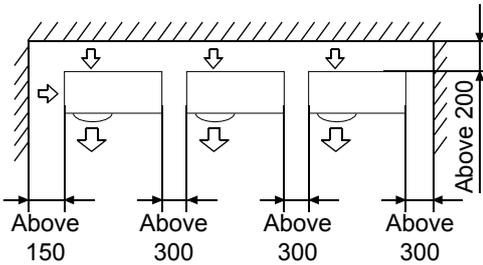


The top and two side surfaces must be exposed to open space, and barriers on at least one side of the front and back shall be lower than the outdoor unit.

Installation instruction

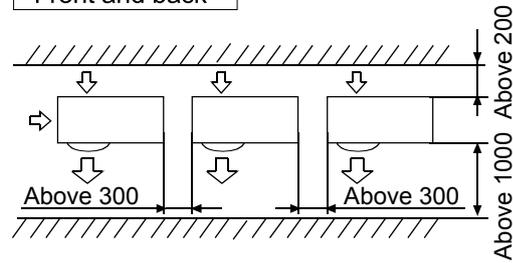
(2) Multi-unit installation (unit: mm)

Back and side



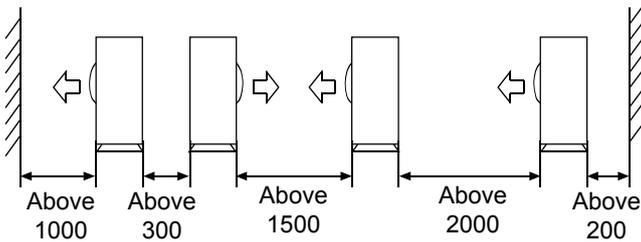
Height of barriers is below that of outdoor unit

Front and back



(3) Multi-unit installation in front and back (unit: mm)

Standard



The top and two side surfaces must be exposed to open space, and barriers on at least one side of the front and back shall be lower than the outdoor unit.

- The installation service spaces shown in the illustrations are based on an air intake temperature of 95°F(35°C)(DB) for COOL operation. In regions where the air intake temperature regularly exceeds 95°F(35°C)(DB), or if the heat load of outdoor units is expected to regularly exceed the maximum operating capacity, reserve a larger space than that indicated at the air intake side of units.
- Regarding the required air outlet space, position the units with consideration to the space required for the onsite refrigerant piping work as well. Consult your dealer if the work conditions do not match those in the drawings.

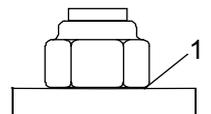
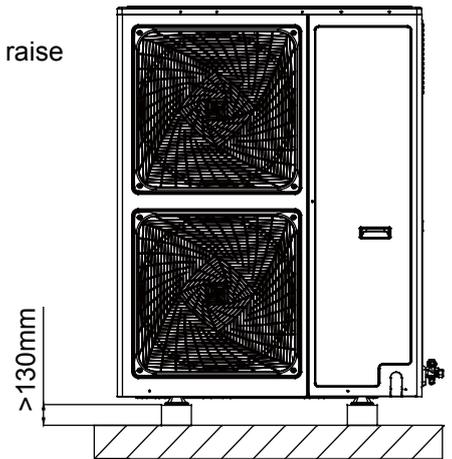
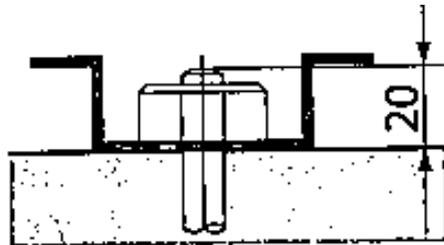
(4) Precautions on installation

NOTICE

If drain holes of the outdoor unit are covered by a mounting base or by floor surface, raise the unit in order to provide a free space of more than 130mm under the outdoor unit.

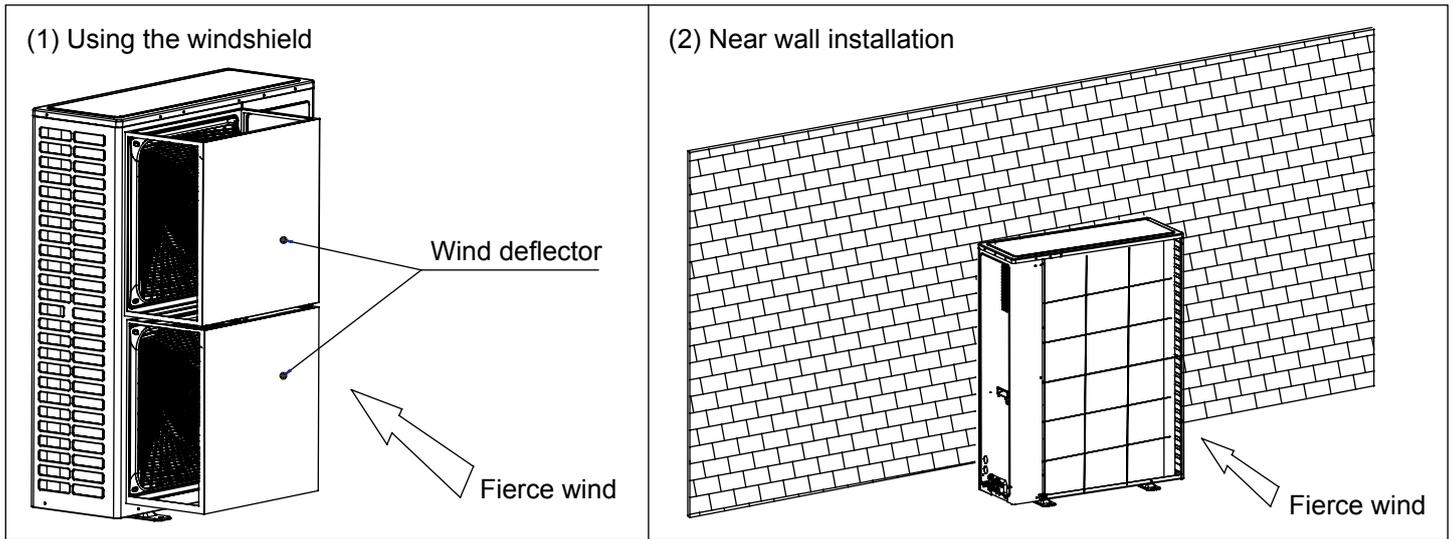
Foundation work

- Check the strength and level of the installation ground so that the unit will not cause any operating vibration or noise after installation.
- In accordance with the foundation drawing in the figure, fix the unit securely by means of the foundation bolts.
- It is best to screw in the foundation bolts until their length are 20mm from the foundation surface.

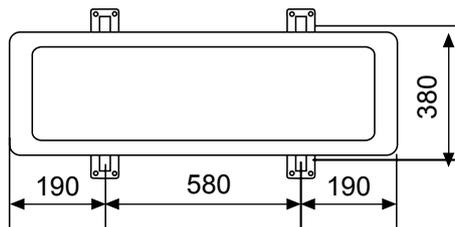


- Fix the outdoor unit to the foundation bolts using nuts with resin washers(1) as shown in the figure.
- If there is no need to install the outdoor machine in the open space of the building or the enclosure, the following two ways can be used to avoid the fan reversal or damage caused by strong wind blowing.

Installation instruction



- If the coating on the fastening area is stripped off, the nuts rust easily.
- Dimensions (top view) (unit of measurement: mm)



(5) Transportation

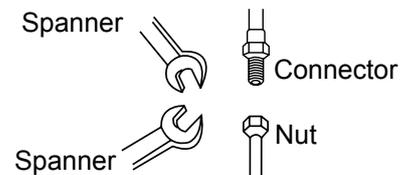
- In transportation, please don't dismantle the packaging, and move the unit to the installation location as closely as possible.
- If the packaging must be dismantled, hang up the unit with rope against damage.
- Don't hang the unit only at two points. When hanging the unit, don't sit on the unit. The unit should be upright.
- When removing the unit with the forklift, put the fork into the special hole at bottom of the unit.
- When being hanged, the rope should be 4 pieces of steel cable with over 6mm diameter.
- Put the cushion at the contact section between steel cable and the unit against the distortion or damage.

A. Refrigerant pipe connection

Pipe connection method:

- To ensure the efficiency, the pipe should be as short as possible.
- Daub the refrigerant oil on the connector and the flare nut.
- When bending the pipe, the bending semi-diameter should be as large as possible against the pipe being broken or bent.
- When connecting the pipe, aim at the center to thread the nut by hand and tighten it with the double spanners.
- Don't let the impurity such as sand, water etc into the pipe.

When fastening and loosening the nut, operate with double spanners, because only one spanner cannot execute firmly.



Cautions in piping installation:

- When welding the connector with hard solder, charge nitrogen into the pipe against oxidation. Or the oxygen film in the pipe will clog the capillary and the expansion valve, even cause the deathly accident.
- The refrigerant pipe should be clean. If the water and the other impurity enter the pipe, charge the nitrogen to clean the pipe. The nitrogen should flow under the pressure of about 0.5Mpa and when charging the nitrogen, stop up the end of the pipe by hand to enhance the pressure in the pipe, then loose the hand (meanwhile stop up the other end).
- The piping installation should be executed after the stop valves are closed.
- Before welding the valve and the pipes, use the wet cloth to cool down the valve and the pipes.
- When the connection pipe and the branch pipe need to be cut down, please use the special shears and cannot use the saw.

If threading the nut as not aiming at the center, the screw thread will be damaged, further it will cause leakage.

Installation instruction

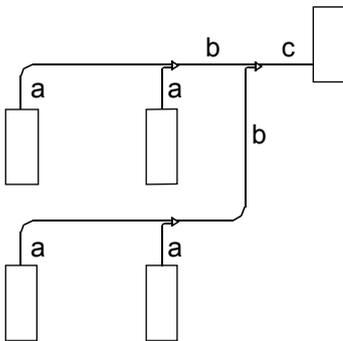
Pipe material and specs selection

- Please select the refrigerant pipe of the below material.
Material: the phosphoric oxidize seamless copper pipe, model: C1220T-1/2H (diameter is over 19.05); C1220T-0(diameter is below 15.88).
- Thickness and specs:
Confirm the pipe thickness and specs according to the pipe selection method(the unit is with R410A, if the pipe over 19.05 is 0-type, the pressure preservation will be bad, thus it must be 1/2H type and over the min. thickness).
- The branch pipe must be from Haier.
- When installing the stop valve, refer to the relative operation instruction.
- The pipe installation should be in the allowable range.
- The installation of branch pipe and gather pipe should be performed according to the relative manual.

Drain pipe disposal

- Make sure the drain works properly.
- In regions where buildups of snow can be expected, the accumulation and freezing of snow in the space between the heat exchanger and external plate may lower operating efficiency.
- After punching the knock-out hole, the application of repair-type paint on the surface around the edge sections is recommended to prevent rust.

Pipe specification:



- Pipe "a" diameter (between indoor and branch pipe) (depends on indoor pipe)
Please refer to the indoor air conditioner manual.
- Pipe "b" diameter (between branch pipes)

Total indoor capacity after the branch pipe (x100W)	Gas pipe (mm)	Liquid pipe (mm)
X<112	Ø15.88	Ø9.52
112≤X< 234	Ø19.05	Ø9.52

- Pipe "c" diameter (outdoor pipe diameter)

Outdoor capacity(100W)	Gas pipe (mm)	Liquid pipe (mm)
80	Ø15.88	Ø9.52
150	Ø19.05	Ø9.52
180	Ø19.05	Ø9.52

Note:
When the distance from outdoor to the longest indoor is over 30m, the main pipe should be the enlarged diameter.

Copper pipe selection:

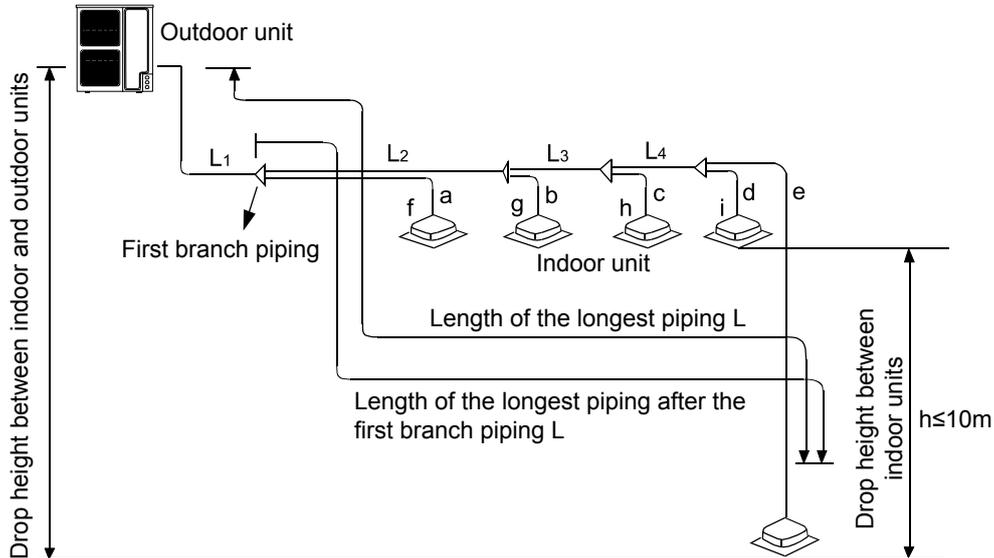
hardness	softness				Half-hardness			
Outer diameter (mm)	Ø6.35	Ø9.52	Ø12.7	Ø15.88	Ø19.05	Ø22.22	Ø25.24	Ø28.58
Min. thickness (mm)	0.8	0.8	1.0	1.0	1.0	1.1	1.2	1.4

Note: If the copper pipe with outer diameter 19.05 is coil pipe, the thickness should be over 1.1.

Installation instruction

Long pipe and high drop

1. Allowable pipe length and height difference



AU282 type: Maximal length and drop height permissible of refrigerant piping

		Permissible value	Piping part	
Piping length	Total length of piping (actual length)	100m	L1+L2+L3+L4+a+b+c+d+e	
	Longest piping L	50m	L1+L2+L3+L4+e	
	Piping length of indoor unit which is furthest to the first branch piping L (*)	30m	L2+L3+L4+e	
Drop height	Drop height between indoor and outdoor unit H	Up outdoor	30m	—
		Under outdoor	20m	—
	Drop height between indoor units h	10m	—	

AU48~60 type: Maximal length and drop height permissible of refrigerant piping

		Permissible value	Piping part	
Piping length	Total length of piping (actual length)	150m	L1+L2+L3+L4+a+b+c+d+e	
	Longest piping L	70m	L1+L2+L3+L4+e	
	Piping length of indoor unit which is furthest to the first branch piping L (*)	40m	L2+L3+L4+e	
Drop height	Drop height between indoor and outdoor unit H	Up outdoor	30m	—
		Under outdoor	20m	—
	Drop height between indoor units h	10m	—	

Unit pipe spec and connection method (unit: mm)

A. Outdoor unit

Model	Gas pipe side		Liquid pipe side	
	Diameter (mm)	Connecting method	Diameter (mm)	Connecting method
AU282FHERA(H)	Ø15.88	Flared joint	Ø9.52	Flared joint
AU482FIERA(H)	Ø19.05		Ø9.52	
AU48NFIERA(H)	Ø19.05		Ø9.52	
AU602FIERA(H)	Ø19.05		Ø9.52	
AU60NFIERA(H)	Ø19.05		Ø9.52	

Installation instruction

B. Indoor unit

Model Capacity	Gas pipe side		Liquid pipe side	
	Diameter (mm)	Connecting method	Diameter (mm)	Connecting method
09	Ø9.52	Flared joint	Ø6.35	Flared joint
12	Ø12.7		Ø6.35	
16	Ø12.7		Ø6.35	
18	Ø12.7		Ø6.35	
24	Ø15.88		Ø9.52	

C. Pipe spec and the torque

Diameter (mm)	Thickness (mm)	Torque (N.m)
Ø6.35	0.8	16~20
Ø9.52	0.8	40~50
Ø12.7	1.0	
Ø15.88	1.0	90~120
Ø19.05	1.0	100~140
Ø22.22	1.1	—
Ø25.4	1.2	—
Not less than Ø28.58	More than 1.4	—

Note: If the copper pipe with outer diameter 19.05 is coil pipe, the thickness should be over 1.1.

Branch pipe

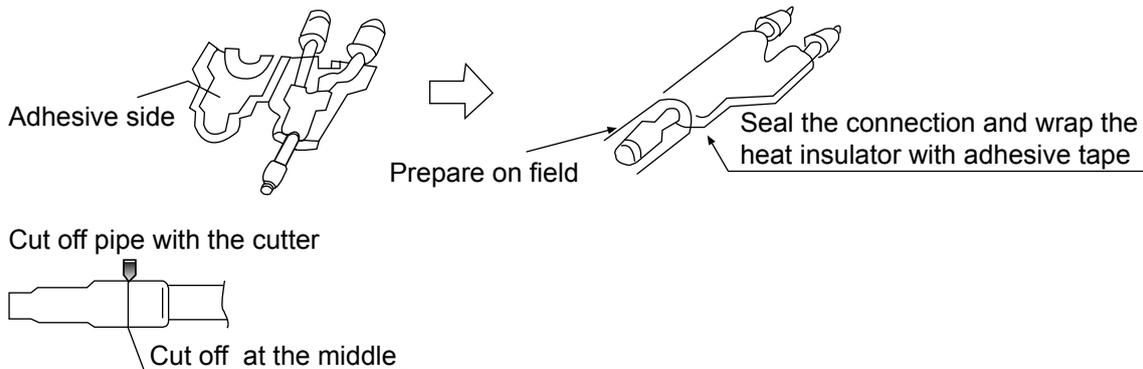
Outdoor unit type

Branch pipe selection:

Total indoor capacity (100W)	Model (optional)
Less than 335	FQG-B335A

Note:

1. When connecting the pipe and the outdoor, please pay attention to the outdoor pipe dimension.
2. When adjusting the diameter among pipes and among the units, please must execute at the branch pipe side.
3. When welding with hard solder, please must blow nitrogen. If not, a number of oxide will be produced and cause heavy damage. Besides, to prevent water and dust into the pipe, please make the brim as outer roll.



Installation instruction

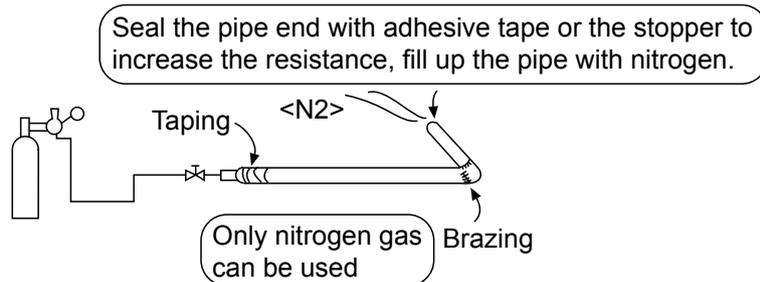
Pipe installation

When doing the piping connection, please do the following:

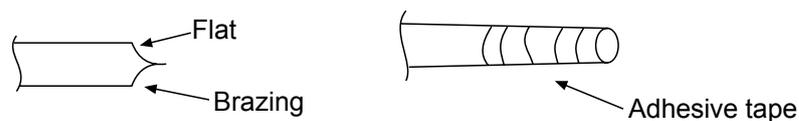
- Please don't let the pipe and the parts in the unit collide each other.
- When connecting the pipes, close the valves fully.
- Protect the pipe end against and water, impurities (welding after being flatted, or being sealed with adhesive tape).
- Bend the pipe as large semi-diameter as possible(over 4 times of the pipe diameter).
- The connection between outdoor liquid pipe and the distributing pipe is flared type. Please expand the pipe with the special tool for R410A after installing the expanding nut. But if the projecting pipe length has been adjusted with the copper pipe gauge, you can use the original tool to expand the pipe.
- Since the unit is with R410A, the expanding oil is ester oil, not the mineral oil.
- When doing the flare connection, please do the following: When connecting the expanding pipe, fasten the pipes with double-spanner. The torque refers to the former info.

Expanding pipe: A(mm)		Projecting length of pipe to be expanded: B(mm)		
Pipe outer diameter (mm)	A 0 -0.4	Pipe outer diameter (mm)	When it is hard pipe	
Ø6.35	9.1		Special tool for R410A	The former tool
Ø9.52	13.2		0-0.5	1.0-1.5
Ø12.7	16.6			
Ø15.88	19.7			

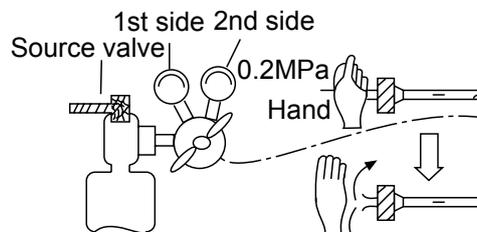
- The outdoor gas pipe and the refrigerant distributing pipe, as well the refrigerant distributing pipe and the branch pipe should be welded with hard solder.
- Weld the pipe at the same time charge the nitrogen. Or it will cause a number of impurity (a film of oxidation) to clog the capillary and the expansion valve, further cause the deadly failure.



- Protect the pipe end against the water, impurity into the pipes (welding after being flat, or being sealed with adhesive tape).



- The refrigerant pipe should be clean. The nitrogen should flow under the pressure of about 0.2MPa and when charging the nitrogen, stop up the end of the pipe by hand to enhance the pressure in the pipe, then loose the hand (meanwhile stop up the other end).

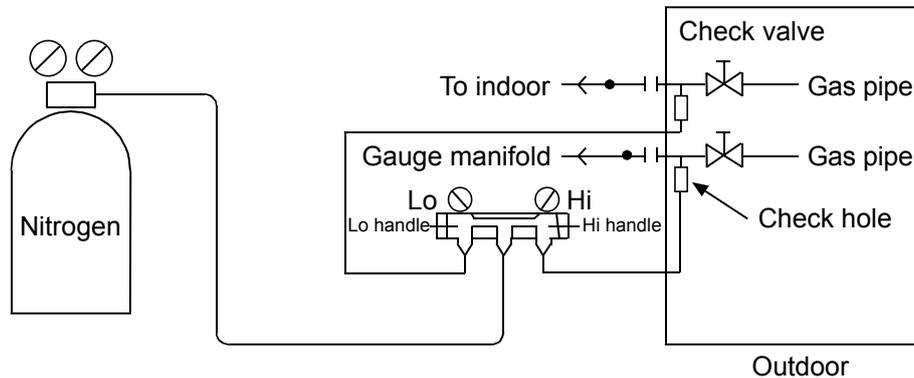


- When connecting the pipes, close the valves fully.
- When welding the valve and the pipes, use the wet cloth to cool down the valve and the pipes.

Installation instruction

B. Leakage test

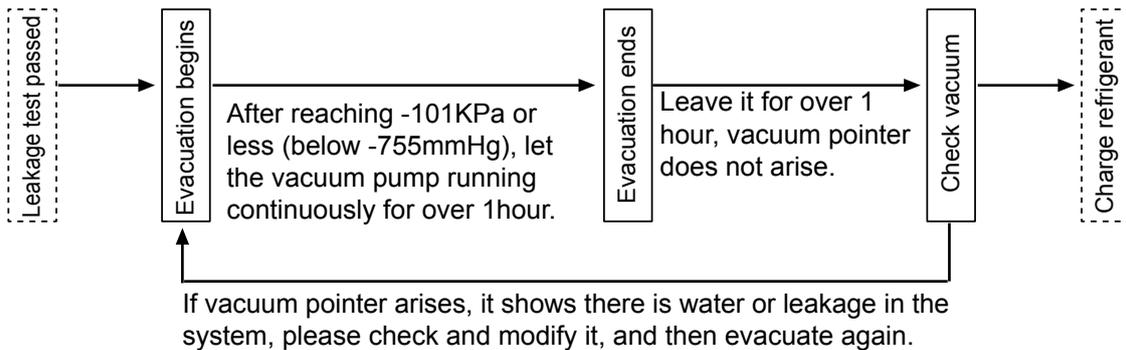
1. The outdoor unit has been executed the leakage test in the factory. After connecting the distributing pipe, execute the leakage test from the outdoor check valve and the indoor. Besides, while testing, the valves should be close.
2. Refer to the below figure to charge the nitrogen into the unit to take a test. Never use the chlorin, oxygen, flammable gas in the leakage test. Apply pressure both on the gas pipe and the liquid pipe.
3. Apply the pressure step by step to the target pressure.
 - a. Apply the pressure to 0.5MPa for more than 5 minutes, confirm if pressure goes down.
 - b. Apply the pressure to 1.5MPa for more than 5 minutes, confirm if pressure goes down.
 - c. Apply the pressure to the target pressure (4.0MPa), record the temp. and the pressure.
 - d. Leave it at 4.0MPa for over 1 day, if pressure does not go down, the test is passed. Meanwhile, when the temp. changes for 1degree, pressure will change 0.01MPa as well. Correct the pressure.
 - e. After confirmation of a~d, if pressure goes down, there is leakage. Check the brazing position, flared position by laying on the soap. modify the leakage point and take another leakage test.
4. After leakage test, must execute the evacuation.



C. Evacuation

Evacuate at the check valve of liquid stop valve and both sides of the gas stop valve.

Operation procedure:



Because the unit is with refrigerant R410A, the below issues should be paid attention:

- To prevent the different oil into the pipe, please use the special tool for R410A, especially for gauge manifold and charging hose.
- To prevent the compressor oil into the refrigerant cycle, please use the anti-counter-flow adapter.

D. Check valve operation

Open/close method:

- Take down the valve cap.
- Turn the liquid stop valve and the gas stop valve with hexangular spanner until it stops. If opening the valve strongly, the valve will be damaged.
- Tighten the valve cap.

Installation instruction

Tighten torque as the table below:

Tighten torque N.m			
	Shaft (valve body)	Cap (cover)	T-shape nut (check joint)
For gas pipe	Less than 7	Less than 30	13
For liquid pipe	7.85 (MAX15.7)	29.4 (MAX39.2)	8.8 (MAX14.7)

E. Additional refrigerant charging

Charge the additional refrigerant as liquid state with the gauge.

If the additional refrigerant can not be charged totally when the outdoor stops, charge it at the trial mode.

If the unit runs for a long period in the state of lack of refrigerant, compressor will occur failure.

(the charging must be finished within 30 minutes especially when the unit is running, meanwhile charging the refrigerant).

A. Charging amount when out of factory excludes the refrigerant in the pipe.

B. The unit only is charged the standard volume of refrigerant (distributing pipe length is 0m).

Additional charging amount=actual length of liquid pipe x additional amount per meter liquid pipe

Additional charging amount=L1×0.35+L2×0.25+L3×0.17+L4×0.11+L5×0.054+L6×0.022

L1: total length of 22.22 liquid pipe L2: total length of 19.05 liquid pipe

L3: total length of 15.88 liquid pipe L4: total length of 12.7 liquid pipe

L5: total length of 9.52 liquid pipe L6: total length of 6.35 liquid pipe

C. Refrigerant charging and additional charging

Model	Additional refrigerant charging per meter(kg/m)						Charge when out of factory
	Ø22.22	Ø19.05	Ø15.88	Ø12.7	Ø9.52	Ø6.35	
AU282FHERA(H)	0.35	0.25	0.17	0.11	0.054	0.022	Refer to label
AU482FIERA(H)							
AU48NFIERA(H)							
AU602FIERA(H)							
AU60NFIERA(H)							

Note:

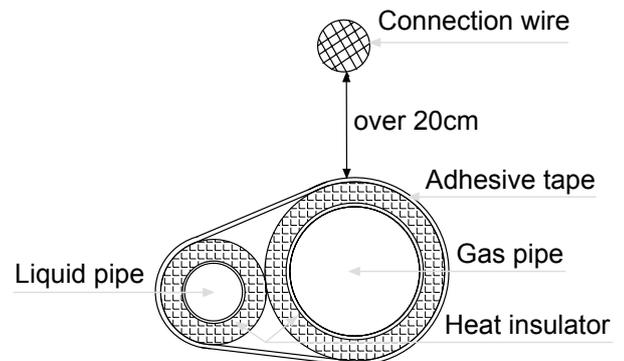
- To prevent the different oil into the pipe, please use the special tool for R410A, especially for gauge manifold and charging hose.
- Mark the refrigerant type in different colour on the tank. R410A is pink.
- Must not use the charging cylinder, because the R410A will change when transferring to the cylinder.
- When charging refrigerant, the refrigerant should be taken out from the tank as liquid state.
- Mark the counted refrigerant volume due to the distributing pipe length on the label.

GWP: 2088

The product contains fluorinated greenhouse gases and its functioning relies upon such gases.

Heat insulation

- Gas pipe and liquid pipe should be heat insulated separately.
- The material for gas pipe should endure the high temperature over 120°C. That for liquid pipe should be over 70°C.
- The material thickness should be over 10mm, when ambient temp. is 30°C, and the relative humidity is over 80%, the material thickness should be over 15mm.
- The material should cling the pipe closely without gap, then be wrapped with adhesive tape. The connection wire can not be put together with the heat insulation material and should be far at least 20cm.

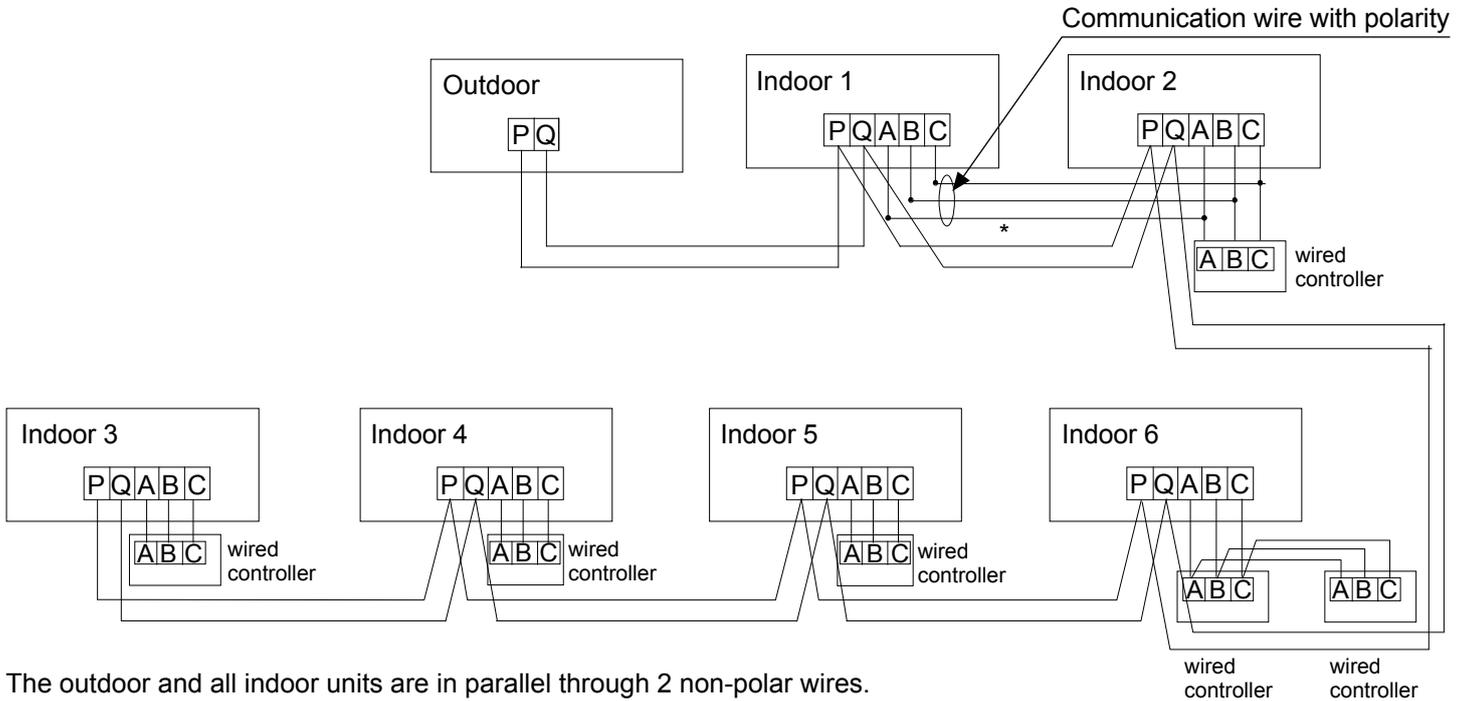


Fix the refrigerant pipe

- In operation, the pipe will vibrate and expand or shrink. If not being fixed, the refrigerant will focus on one part to cause the broken pipe.
- To prevent the central stress, fix the pipe for every 2-3m.

Electric wiring and the application

Communication wiring figure



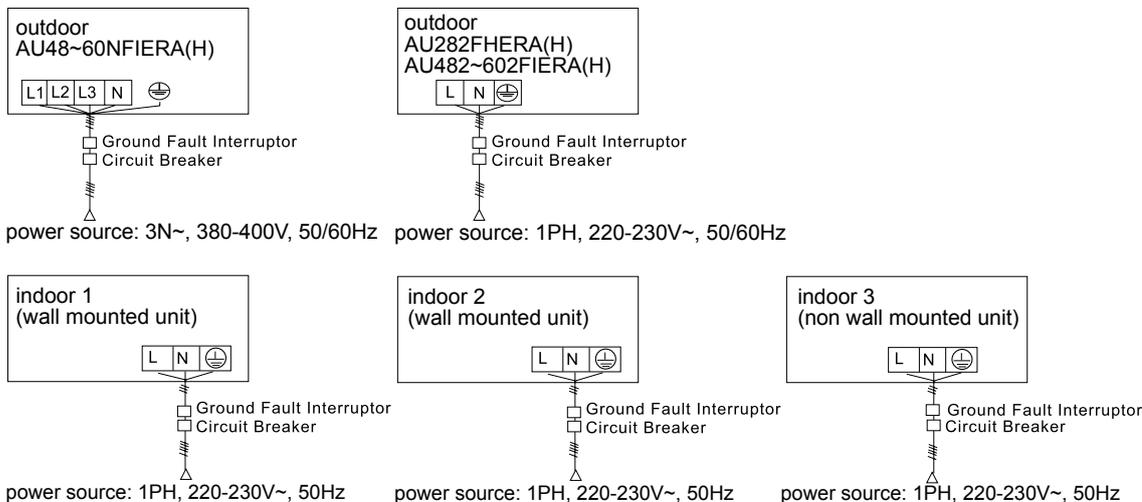
The outdoor and all indoor units are in parallel through 2 non-polar wires.

Three wiring methods between wired controller and indoor unit:

- 1 to multi (group control): one wired controller controls 2~16 indoors, as shown in above figure, indoor 1~indoor 2: indoor 2 is wired control master unit, the others are wired control slave units. Wired controller and the master indoor (directly connected to wired controller) is connected by 3 polar wires; the other indoors and the master indoors are connected by 2 or 3 polar wires, AC indoors wired "B" "C" polar wires, DC indoors wired "A" "B" "C" polar wires*.
- 1 to 1 (one wired controller controls one indoor): as shown in above figure, indoor 3~ indoor 4, indoor and wired controller are connected by 3 polar wires.
- 2 to 1 (two wired controller controls one indoor): as shown in above figure, indoor 6. Either of wired controllers can be set as master wired controller, and the other is slave wired controller. Master/slave wired controller, and master/indoor are connected by 3 polar wires.

When indoor is controlled by remote controller, refer to the "wired control master unit/wired control slave unit/remote control unit table". A, B, C on signal terminal block need not wires and not connect the wired controller.

Power wiring figure



Indoor and outdoor use their individual power source. All indoors use one power source. Must install the leakage breaker and the over current breaker, or electric shock will occur.

Electric wiring and the application

Outdoor power source and power cable

Item		Power source	Power cable section (mm ²)	Circuit breaker (A)	Rated current of residual circuit breaker (A) Ground fault interruptor (mA) response time (S)	Ground wire	
						Section (mm ²)	Screw
Model							
Individual power	AU282FHERA(H)	1PH, 220-230V~, 50/60Hz	6	25	25A 30mA below 0.1S	6	M5
	AU482FIERA(H)		16	50	50A 30mA below 0.1S	16	M5
	AU602FIERA(H)		16	50	50A 30mA below 0.1S	16	M5
	AU48NFIERA(H)	3N~, 380-400V, 50/60Hz	4	20	20A 30mA below 0.1S	4	M5
	AU60NFIERA(H)		4	20	20A 30mA below 0.1S	4	M5

- Power cable must be fixed firmly.
- Each outdoor must be earthed well.
- When power cable exceeds the range, thicken it appropriately.

Indoor power source and communication wiring

Item	Power cable section (mm ²)	Wire length (m)	Rated current of overcurrent breaker (A)	Rated current of residual circuit breaker(A) Ground fault interruptor(mA) response time(S)	Communication wire section	
					Outdoor/indoor (mm ²)	Indoor/indoor (mm ²)
Indoor total current (A)						
<10	2	23	20	20A, 30mA, below 0.1s	2-core × (0.75-2.0mm ²) shielded wire	
≥10 and <15	3.5	24	30	30A, 30mA, below 0.1s		
≥15 and <22	5.5	27	40	40A, 30mA, below 0.1s		
≥22 and <27	10	42	50	50A, 30mA, below 0.1s		

- Power cable and communication wire must be fixed firmly.
- Each indoor must be grounded well.
- When power cable exceeds the range, increase the gauge appropriately.
- Shielded layer of communication wires must be connected together and be earthed at single point.
- The total length of communication wire cannot exceed 1000m.

Communication wire for wired controller

Length of Signal Line (m)	Wiring Dimensions
≤250	0.75mm ² × 3 core shielding line

- The shielding lay of the signal line must be grounded at one end.
- The total length of the signal line shall not be more than 250m.

Electric wiring and the application

Method of installation and trial run

SW01	SW02	Display of numeral pipe light with seven segments
0	0	Error code display(Before indoor unit locked, the following sequences flash:"U"+indoor num., e.g.: "U16"means the outdoor unit connecting 16 indoor units; outdoor unit code; "220"or "380" means single-phase power source or three-phase power source.)
	1	Operation mode of outdoor units(Stopping :OFF, Cooling: CCC, Heating: HHH
	2	Program version(one decimal)
	3	E2 version
	4	Target operating frequency of compressor(Press "Start" 5 seconds to enter the manual frequency control, Up / Down to adjust the frequency, press "Stop" 5 seconds to exit manual frequency control; Frequency flashes when manual control, while non-manual control, frequency displays normally)
	5	Actual frequency of compressor
	6	Indoor units num.
	7	Running indoor units num.
	8	Outdoor unit code
	9	Rotating speed of outdoor unit Fan1 (unit: rpm, max:999)
	A	Rotating speed of outdoor unit Fan2 (unit: rpm, max:999)
	B	Target indoor unit average temp. sensor TC2(unit:℃)
	C	Actual indoor unit average temp. sensor TC2(unit:℃)
	D	Target overheat value of PMW when heating(unit:℃)
	E	Special operating mode of outdoor unit: First num.: power source type(0-single phase,1-three phase) Second num.: silent operation (0-off, 1-on) Third num.: gas recovery operating(0-off, 1-on) (“101” means the outdoor unit has three phrase power source, silent operation off and gas recovery on)
	F	Forced fan operation, when unforced display “Fan”(Press “Start” 5 seconds to enter manual fan control, Up / Down to adjust fan speed, press “Stop” 5 seconds to exit manual fan control), when forced flashes “0-15”. This function can't be affected by the failures of outdoor unit.
1	0	Discharge temp. sensor Td (unit:℃)
	1	Outdoor unit ambient temp. sensor TA (unit: ℃)
	2	Suction temp. sensor Ts (unit: ℃)
	3	Defrost temp. sensor Te (unit:℃)
	7	Outdoor unit PMV opening
	8	Valve state First num.:4WV(0-off, 1-on) Second num.:SV1(0-off, 1-on) Third num.: SV2(0-off, 1-on) (101 means 4WV on, SV1 off, SV2 on)
	9	First num.: High pressure switch HPS(0-off, 1-on) Second num.: Low pressure switch LPS(0-off, 1-on) Third num.: Heating belt(0-off, 1-on) (101 means HPS on, LPS off and heating belt on)
	A	Module temp. sensor Tfin(unit: ℃)
	B	Compressor current(unit: A, one decimal)
	C	Coil temp. sensor Tc(unit:℃)
	D	Module DC voltage(unit: V)
	E	Air conditioner current value CT(unit: A) Display “CCC” alternately in forced cooling mode.(Pressing “Start” 5 seconds, all indoor units enter cooling mode, they exit when pressing “Stop” 5 seconds)
	F	Display “HHH” in forced heating mode.(Pressing “Start” 5 seconds, all indoor units enter heating mode, they exit when pressing “Stop” 5 seconds),display “---” when unforced

Electric wiring and the application

SW01	SW02	Display of numeral pipe light with seven segments
2	0-F	Display indoor unit program version when communication is normal or else display "---"
3	0-F	Indoor unit types(0:Ordinary indoor unit,1:Wall mounted,2:Fresh air unit,3:Heat reclaim ventilation,4-7:Ordinary indoor unit)
4	0-F	Display failure code when suffers failure ,or else display "---"
5	0-F	Indoor unit horse power(one decimal)
6	0-F	First and second num.: Current operation mode of the indoor unit(00:Off,01:Fan, 02:Cooling,03: Dehumidification,04:Heating) Third num.: Capacity requirement of the outdoor unit(0-no,1-yes)(e.g.:"021" means cooling and capacity requirement of the outdoor unit,"040" means heating and no capacity requirement of the outdoor unit)
7	0-F	Indoor unit PMV opening(unit:pls,max:999)
8	0-F	Indoor unit: First num.: Floater switch(0-off,1-on), Second num.: Pump(0-off,1-on),Third num.: Electric heater:(0-off,1-on)("110" means floater on, pump on and electric heater off)
9	0-F	Indoor unit: Ambient temp. sensor TA(unit:℃)
A	0-F	Indoor unit: Gas pipe temp. sensor TC1(unit:℃)
B	0-F	Indoor unit: Liquid pipe temp. sensor TC2(unit:℃)
C	0-F	Indoor unit: Fan speed(0-stop,1-low,2-middle,3-high)
E	0-F	Display "CCC" in forced cooling mode.(Pressing "Start" 5 seconds, indoor units enter cooling mode, they exit when pressing "Stop" 5 seconds),Display "---" without forced.
F	0-F	Display "HHH" in forced heating mode.(Pressing "Start" 5 seconds, indoor units enter heating mode, they exit when pressing "Stop" 5 seconds),Display "---" without forced.

Outdoor unit PCB dipswitch setting (attention the different PCB version.)

In the following table, 1 is ON, 0 is OFF.

- Defined principles of dial switch:

BM1 puts emphasis on setting or debugging during the project, while BM2 during factory production.

① BM1 introduction

BM1_1	Lock indoor quantity	[1]	Lock indoor quantity
		0	Begin to search indoor
		1	Stop searching indoor and lock quantity
BM1_2	Reserved	[2]	Reserved
		0	Reserved (default)
		1	Reserved
BM1_3	Fan selection	[3]	Fan selection
		0	All AC
		1	All DC (default)
BM1_4	Energy saving or refrigeration effect priority	[4]	Energy saving or refrigeration effect priority
		0	Energy saving priority
		1	Refrigeration effect priority
BM1_5	Indoor simultaneous control	[5]	Indoor simultaneous control
		0	No
		1	Yes
BM1_6	Defrosting condition selection	[6]	Defrosting condition selection
		0	Not easy to frost area(default)
		1	Easy to frost area
BM1_7	Defrosting level	[7]	Defrosting level
		0	Ordinary(default)
		1	Strengthen

Electric wiring and the application

BM1_8	Silent operation selection	[8]	Silent operation selection	
		0	Without silent operation(default)	
		1	Silent operation	

② BM2 introduction

BM2_1	Cold only or heat pump	[1]	Cold only or heat pump		
		0	Heat pump(default)		
		1	Cold only		
BM2_2 BM2_3 BM2_4	Outdoor unit type selection	[2]	[3]	[4]	Outdoor unit type selection
0		0	0	AU28	
1		0	1	AU48	
		1	1	0	AU60
BM2_5	Power source selected	[5]	Power source selected		
		0	Single-phase		
		1	Three-phase		
BM2_7 BM2_8	Running mode preference	[7]	[8]	Running mode preference	
0		0	Start first(default)		
0		1	Later start first		
1		0	Cooling first		
1		1	Heating first		

- Note:
1. Either indoor unit unlocked or the locked quantity different with actual connecting number, it cannot run.
 2. The fifth number of the outdoor model represents power source, "2" means single-phase, "N" means three-phase, e.g., AU482FIERA(H) is single-phase type.

Bridge instruction

CJ1:
Short it before power ON-- PCB check its function (used for factory production).
Short it after power ON-- time short function, 60 seconds become to 1 second.
CJ2: Reserved

Failure code

Inverter outdoor unit failure code

Digital tube indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
20	20-0	Defrosting temp. sensor Te failure	AD value is below 11(open circuit) or over 1012(short circuit) for 60seconds, in cooling mode, if the sensor is abnormal, the unit does not deal with it, besides, in defrosting and within 3 minutes after defrosting, no alarm	Resumable
20	20-1	Defrosting temp. sensor Tc failure		
21	21	Ambient temp. sensor Ta failure	AD value is below 11(open circuit) or over 1012(short circuit) for 60seconds, in defrosting and within 3 minutes after defrosting, no alarm	Resumable
22	22	Suction temp. sensor Ts failure	AD value is below 11(open circuit) or over 1012(short circuit) for 60seconds, in defrosting and within 3 minutes after defrosting, no alarm	Resumable
23	23	Discharging temp. sensor Td failure	After compressor is running for 5 minutes, AD value is below 11(open circuit) or over 1012(short circuit) for 60seconds, in course of startup, defrosting and within 3 minutes after defrosting, no alarm	Resumable
26	26-0	Indoor communication failure	For continuous 200 cycles, can not find connected indoors	Resumable
26-1	26-1		For continuous 300seconds, the searched indoor quantity is less than the set quantity.	
26-2	26-2		For continuous 300seconds, the searched indoor quantity is more than the set quantity.	
30	30	High pressure switch HPS failure	If disconnect for 50ms continuously, alarm. If alarm 3 times in an hour, confirm the failure	Once confirmation, un-resumable
33	33	EEPROM failure	EEPROM failure	Once confirmation, un-resumable
34	34	Discharging temp. too high protection (Td)	$T_d \geq 115^{\circ}\text{C}$ at interval of 25msec for twice continuously, and over the set value, then stop and alarm; 3 minutes later, resume automatically. If it occurs 3 times in an hour, confirm the failure.	Once confirmation, un-resumable
35	35	4-way valve reversing failure	If the compressor continuously runs 10 minutes without 4-way valve reversing failure, three minutes later, resume automatically. If it occurs 3 times in an hour, confirm the failure.	Once confirmation, un-resumable
43	43	Discharging temp. sensor Td too low protection	In normal operation, if $T_d < CT + 10^{\circ}\text{C}$ for continuous 5 minutes, the unit stops and alarms. 2 minutes and 50 seconds later, resume automatically. If it occurs 3 times in an hour, confirm the failure. After fixed frequency compressor alarms, inverter compressor will continue to run. If fixed frequency compressor has been locked for 3 times, the unit will stop and alarm.	Once confirmation, un-resumable
46	46	Communication with inverter board failure	No communication within 30 seconds continuously	Resumable
49	49	Low pressure switch LPS failure	If disconnect for 50ms continuously, alarm. If alarm 3 times in an hour, confirm the failure	Once confirmation, un-resumable

Failure code

Digital tube indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
53	53	CT current is too low or current sensor fault	3 minutes after recovery	3 times in an hour, confirm failure; once confirmation, un-resumable
64	64	CT current is too high	CT current exceeds specified value, 3 minutes after recovery	3 times in an hour, confirm failure; once confirmation, un-resumable
71-0	71-0	Upper DC motor blocked	Running at speed below 20rpm for 30s, or at speed of 70% lower than the target for 2 minutes, 2 minutes and 50 seconds later after stop, resume automatically. It occurs 3 times in an hour, confirm the failure.	Once confirmation, un-resumable
71-1	71-1	Lower DC motor blocked		
81	81	IPM modular temp. too high protection	IPM modular temp. $\geq 85^{\circ}\text{C}$	3 times in an hour, confirm failure; once confirmation, un-resumable
82	82	Compressor current protection	Compressor current exceeds specified value, 3 minutes after recovery	3 times in an hour, confirm failure; once confirmation, un-resumable
83	83	Outdoor model set error	Model and the number of fans do not match	Un-resumable
108	108	Transient over current in IPM module rectifier side software	Transient over current in IPM module rectifier side software	3 times in an hour, confirm failure; once confirmation, un-resumable
109	109	Current detection circuit abnormality	Current detection circuit abnormality	3 times in an hour, confirm failure; once confirmation, un-resumable
110	110	IPM modular protection (F0)	IPM modular over current, in short circuit, over heat, voltage too low of control circuit.	3 times in an hour, confirm failure; once confirmation, un-resumable
111	111	Compressor out of control	In the course of compressor startup or running, the unit can not detect the rotor position, or not connecting compressor.	
112	112	Radiator of transducer temp. too high	Radiator temp. too high	
113	113	Transducer overload	Output current of transducer is too high	
114	114	Voltage too low of DC bus line of transducer	Voltage of power source is too low	

Failure code

Digital tube indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
115	115	Voltage too high of DC bus line of transducer	Voltage of power source is too high	3 times in an hour, confirm failure; once confirmation, un-resumable
116	116	Communication abnormal between transducer and control PCB	Communication is disconnected	Resumable
117	117	Transducer over current (software)	Compressor startup fails for 5 times continuously, or compressor is running down till stops caused by over current or over heat	3 times in an hour, confirm failure; once confirmation, un-resumable
118	118	Compressor startup failure	The sensor used for current detecting of transducer is abnormal, disconnected or incorrectly connection	
119	119	Detecting circuit of transducer current is abnormal	Current detection sensor of frequency controller is abnormal or unconnected or connected wrongly.	
120	120	Power supply of transducer abnormal	Power supply of transducer is broken down instantly	
121	121	Power supply of inverter board is abnormal	Power supply of inverter board is broken down instantly	
122	122	Radiator temp. sensor of transducer abnormal	Resistor of temp.sensor abnormal or temp.sensor disconnected	3 times in an hour, confirm failure; once confirmation, un-resumable
123	123	Transient over current in IPM module rectifier side hardware	Transient over current in IPM module rectifier side hardware	

When there is no failure, if the starting condition can not be met, digital tube on master unit will display stand-by code:

555	Standby state of capacity overmatch	When capacity is over 130% or lower than 50%, the system is standby.	Resumable
555.1	Outdoor ambient temperature too high (heating)	Ta>27°C, Standby	
555.3	Outdoor ambient temperature too high or too low (cooling)	Ta>54°C or Ta<-10°C, Standby	

Failure code

Indoor failure code list

Indication on master unit	Indication on wired controller	Flash times of LED5 on indoor PCB/timer LED on remote receiver	Failure code definition
01	01	1	Indoor ambient temp. sensor Ta failure
02	02	2	Indoor coil temp. sensor Tc1 failure
03	03	3	Indoor coil temp. sensor Tc2 failure
04	04	4	Indoor TW sensor failure
05	05	5	Indoor EEPROM failure
06	06	6	Communication between indoor and outdoor failure
07	07	7	Communication between indoor and wired controller failure
08	08	8	Indoor drainage failure
09	09	9	Indoor repeated address
0A	0A	10	Indoor repeated central control address
Outdoor failure code	Outdoor failure code	20	Outdoor corresponding failure

Trial operation and the performance

5-minute delay function

- If starting up the unit after being powered off, the compressor will run about 5 minutes later against being damaged.

Cooling/heating operation

- Indoor units can be controlled individually, but cannot run in cool and heat mode at the same time. If the cool mode and the heat mode are existing simultaneously, the unit set latter will be standby, and the unit set earlier will run normally. If the A/C manager sets the unit at cooling or heating mode fixedly, the unit can not run at the other modes.

Heating mode characteristic

- In operation if outdoor temp. arises, indoor fan motor will turn to low speed or stop.

Defrosting in heating mode

- In heating mode, outdoor defrosting will affect the heating efficiency. The unit will defrost for about 2~10 minutes automatically, at this time, the condensate will flow from outdoor, also in defrosting, the vapour will appear at outdoor, which is normal. Indoor motor will run at low speed or stop, and outdoor motor will stop.

The unit operation condition

- To use the unit properly, please operate the unit under the allowed condition range. If operating beyond the range, the protection device will act.
- The relative humidity should be lower than 80%. If the unit runs at the humidity over 80% for a long period, the dew on the unit will drop down and the vapour will be blown from air outlet.

Protection device (such as high pressure switch)

- High pressure switch is the device which can stop the unit automatically when the unit runs abnormally. When the high pressure switch acts, the cooling/heating mode will stop but the running LED on wired controller will be light still. The wired controller will display failure code.
When the following cases occur, the protection device will act:
In cooling mode, air outlet and air inlet of outdoor are clogged.
In heating mode, indoor filter is sticked with duct; indoor air outlet is clogged.
When protection device acts, please cut off the power source and re-start up after eliminating the trouble.

When power failure

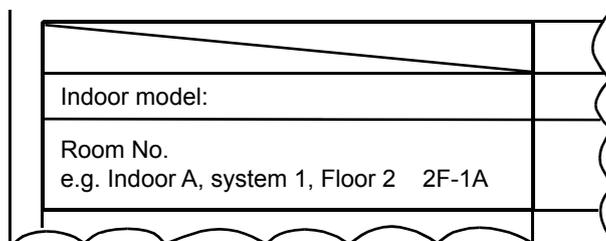
- When power is failure in running, all the operations will stop.
- After being electrified again, if with re-satrt up function, the unit can resume to the state before power off automatically; if without re-satrt up function, the unit needs to be switched on again.
- When abnormal occurs in running because of the thunder, the lightning, the interference of car or radio, etc, please cut off the power source, after eliminating the failure, press "ON/OFF" button to start up the unit.

Heating capacity

- The heating mode adopts the heat pump type that absorbs outdoor heat energy and releases into indoor. So if outdoor temperature goes down, the heating capacity will decrease.

System marks

- On the condition that multi Outdoor systems are installed, in order to confirm the relationship between outdoor and indoor, please make marks on outdoor electric control box cover to indicate the connected indoor unit. As the below figure:



Trial operation and the performance

Trial operation

- Before trial operation:
 - Before being electrified, measure the resistor between power terminal block (live wire and neutral wire) and the earthed point with a multimeter, and check if it is over 1M^{*}. If not, the unit can not operate.
 - To protect compressor, electrify the outdoor unit for at least 12 hours before the unit runs. If the crankcase heater is not electrified for 6 hours, the compressor will not work.
 - Confirm the compressor bottom getting hot.
 - Except for the condition that there is only one master unit connected (no slave unit), under the other conditions, open fully the outdoor operating valves (gas side, liquid side). If operating the unit without opening the valves, compressor failure will occur.
 - Confirm all indoor units being electrified. If not, water leakage will occur.
 - Measure the system pressure with pressure gauge, at the same time, operate the unit.
- Trial operation
 - In trial operation, refer to the information of performance section. When the unit can not start up at the room temperature, make trial operation for outdoor.

Move and scrap the air conditioning

- When moving, to disassemble and re-install the air conditioning, please contact your dealer for technical support.
- In the composition material of air conditioning, the content of lead, mercury, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers are not more than 0.1% (mass fraction) and cadmium is not more than 0.01% (mass fraction).
- Please recycle the refrigerant before scrapping, moving, setting and repairing the air conditioning; for the air conditioning scrapping, should be dealt with by the qualified enterprises.

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