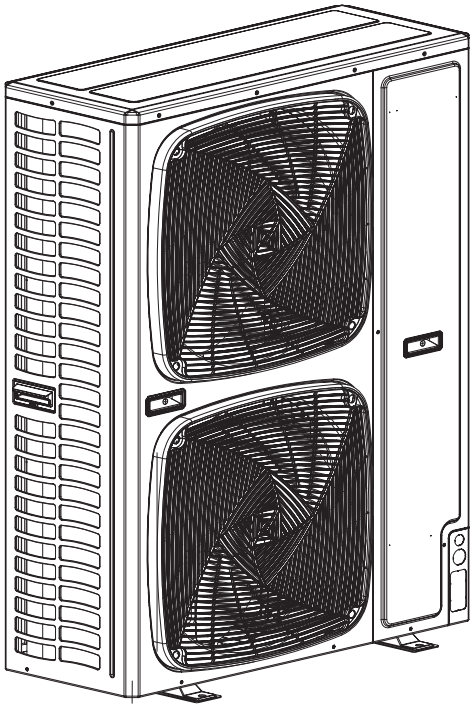
Installation Manual for Outdoor Unit



MVHP036MV2AA
MVHP048MV2AA
MVHP056MV2AA

No. 0150518852 D

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

User Manual

Contents

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 descriptionof 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.

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.

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: 90°F(32°C)	WB: 74°F(23°C)
		Min.	DB: 64°F(18°C)	WB: 57°F(14°C)
	Outdoor	Max.	DB: 115°F(48°C)	WB: 79°F(26°C)
		Min.	DB: 23°F(-15°C)	
Heating	Indoor	Max.	DB: 80°F(27°C)	
		Min.	DB: 59°F(15°C)	
	Outdoor	Max.	DB: 75°F(24°C)	WB: 59°F(15°C)
		Min.	DB: -4°F(-20°C)	

Product Features

- The outdoor uint 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 unit.
Please read the installation instructions carefully before installation, according to the instructions of the installation construction.

Safety precautions

- This manual should be saved and stored close to this air conditioning equipment.
- There are two types of indications, " ⚠ WARNING" and " ⚠ CAUTION" The indication preventing from death or heavy injury is lister as " ⚠ WARNING".Even the indication listed as " ⚠ CAUTION" may also cause serious accident. Both of them are related to safety, and should be strictly follwed.
- After installation and start-up, please give the manual to the user. The manual should be kept in safe place and close to the unit.

⚠WARNING

- Installation or maintenance should be performed by an authorized agency. Wrong operation of this air conditioning equipment may cause water leakage, electric shock or fire.
- Please install the unit on the top of a solid foundation or structure which is strong enough to support the unit.
- The installation of this air conditioning equipment should follow local construction codes.
- Use the right cable size, secure the terminal firmly, organize the cables neatly and make sure no tension is added on cables. Cable insulation should not be damaged. The incorrect installation may lead to overheating or fire.
- When installing or moving the unit, the refrigerant system should be vacuumed and recharged with R-410A refrigerant. If any other gas enters the system, it may lead to abnormal high pressure which may cause damage or injury.
- Please use the proper manifolds or branches during the system installation. The wrong parts may cause refrigerant leakage.
- Keep the drain pipe away from toxic gas vents to prevent possible pollution of indoor environment.
- During or after the installation, please check whether there is a refrigerant leakage. If any leakage, please take any measures for ventilation. The refrigerant may be toxic at some concentration levels.
- The unit is not explosion-proof. Please keep it away from flammable gases.
- The drain pipe should be installed per this manual to ensure proper drainage. The pipe should be well insulated to avoid condensation. Incorrect installation may lead to water leakage.
- Both liquid pipe and the gas pipe should be well insulated. Not enough insulation may lead to system performance deterioration or humidity formation.
- This air conditioning equipment is not intended to be operated by persons with lack of experience and training, unless they have supervision or instruction concerning use of this air condition equipment.
- Please keep children away from this air conditioning equipment.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent orsimilarly 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.

⃠ PROHIBIT

- This system uses R410A refrigerant, do not use oxygen, acetylene or any other flammable/toxic gases near the unit. These gases are dangerous and may cause explosion. It is recommended to use compressed air, nitrogen or refrigerant for such tests.
- Keep water away from the indoor and outdoor units. These products are equipped with electrical components, which may cause serious electric shock if exposed to water.
- Do not modify the safety devices in the indoor or outdoor unit. Modifying these devices can cause serious accidents.

Safety precautions

- The maintenance cover plate of the indoor or outdoor unit should not be removed when the main circuit power supply on. Shut off power before removing.
- Refrigerant leakage can cause breathing problems. In the event of a refrigerant leak, close the main valve, extinguish any flame and contact a local servicer immediately.
- Use the proper breaker and surge protector. If not used, an electric shock or fire may cause injury or damage.
- The installation and service technician shall ensure that refrigerant leaks comply with local laws and regulations.

⚠CAUTION

- Grounding wire should be connected with the grounding bar. The grounding wire can not be connected to the gas pipe, water pipe, lightening rod or the telephone grounding wire. Improper grounding may cause electric shock.
- Don't install the unit in a location with flammable gas or it may cause fire.
- Install the water drainage pipe according to the manual, improper installation will cause water leakage and damage.
- The outdoor fan should not blow towards gardens/vegetation or the air will dry out the plants.
- Please ensure proper clearances, if not, service technicians will not have room to service.
- When installing the unit on a roof or other high places, to prevent injury to the service technician, please set a fixed ladder and railing at the installation site.
- Use a wrench and fasten the nut. Use a torque wrench to tighten at at proper torque spec. Don't over tighten the nut or you risk damaging the flare. Will cause refrigerant leaks.
- Be sure to insulate the refrigerant pipe, or there will be water leakage or water dripping causing damage.
- After installing the refrigerant pipe, test for leaks by charging with nitrogen.
- Don't use the other refrigerants except for R410A. The R410A pressure is 1.6 times higher than R22 pressure. R410A tanks are marked with pink.
- We changed the stop valve diameter of the R410A unit to enhance the compression consistency. We also changed the flared pipe dimension. Adjust the R410A specially tools according to the below table.

	R410A specially tool	Remarks
1	gauge manifold	range: HP>652.5PSI(4.5MPa), LP>290PSI(2MPa)
2	charge hose	pressure: HP:768.5PSI(5.3MPa), LP:507.5PSI(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 in liquid state from the tank.
- When installing the power cord and the connecting line must be a 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 unit 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 unit, 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.

Transportation and Lifting

Lifting

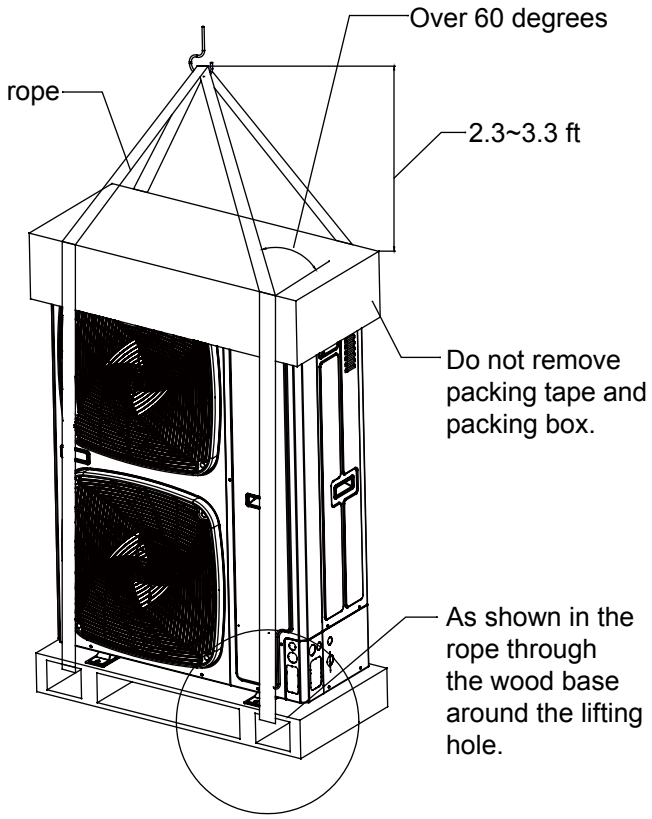
Please do not remove the packaging until the unit is close to the installation location.

⚠CAUTION
• Do not place anything on the device • Use two ropes for lifting the outdoor unit

Hoisting method

Hoist the unit slowly and ensure that it is level.
① Removal of the outer packing is strictly prohibited
② Hoist outdoor unit packaging as shown using two ropes.

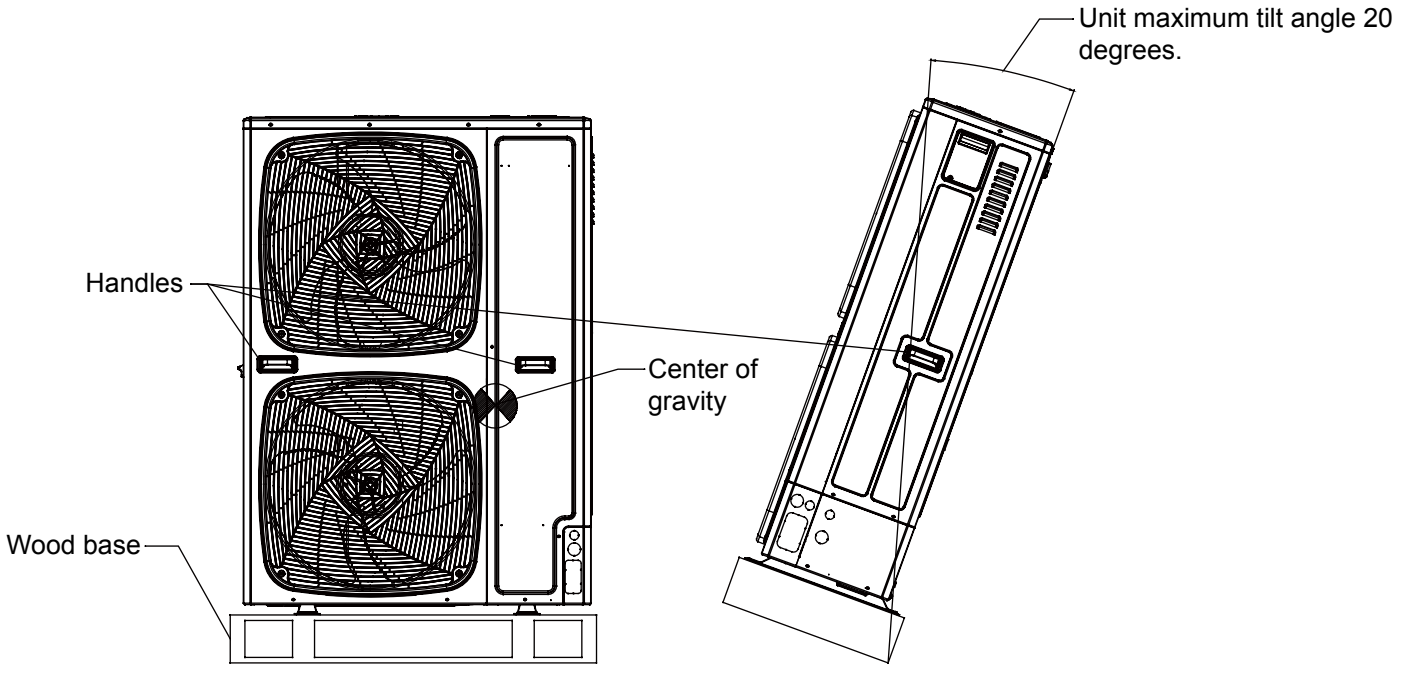
⚠CAUTION
• To ensure safety, slowly lift while keeping the unit level. • Do not use a forklift to move the unit without the unit packaging. • Padding should be used to protect the unit while lifting it.



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.

Follow these points when moving the unit by hand:
① Do not destroy the wood base.
② In order to prevent the outdoor unit from tipping note the units center of gravity as shown in the figure.
③ Use two or more people to carry and move the outdoor unit.



Outdoor unit installation

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 horinzontally 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 (1000Btu/h)	Combination type	Indoor qty	Total indoor capacity (1000Btu/h)
36	Single	6	18-46
48	Single	8	24-62
56	Single	9	27-72

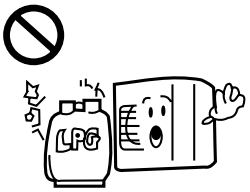
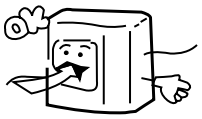
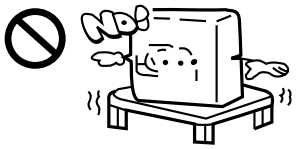
Notice:
Total capacities of indoor units being used ≤ 100% of rated capacities of outdoor unit.

Indoor capacity (1000Btu/h)
07
09
12
18
24
32
36
42
48

total indoor capacity (1000Btu/h)	branch pipe (optional)
less than 114	FQG-B335A

Notice:
The branch pipe should be installed horizontally, the maximum error angle should not exceed 10 degrees.

(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. 
The unit should be installed in a place where the cold/hot air or noise will not interfere with the neighbors. 	• A place where the water can drain easily. • A place where no other heat sources will affect the unit. • Consider snow depth when installing outdoor unit. • Install the anti-vibration rubber between the unit and the bracket.	• The unit should not be installed at the below places or it will cause damage. • A place where there is corrosive gas (spa area etc). A place blowing salty air (seaside etc). • A place with strong coal smoke. • A place with high humidity. • A place where there is device emitting electrical interference. • A place where voltage fluctuations • occur.

Installation instruction

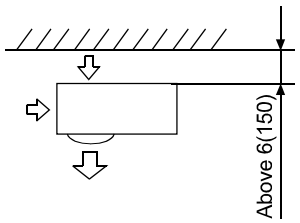
Note:
1. In snowy areas, install the unit on a bracket or under a snow-proof cover to prevent the accumulation of snow.
2. Do not install the unit at a place where flammable gas exists.
3. Install the unit in a sturdy location.
4. Install the unit in a level location.
5. When being installed in a location with strong winds, set the air outlet of the unit perpendicular to the wind direction. Also secure the unit with the bolts.
6. When opening the electric box cover for maintenance, please secure the cover with screws.

(3) Installation and maintenance space

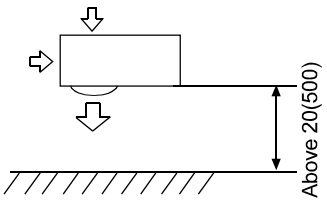
Selection of installation location of outdoor

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

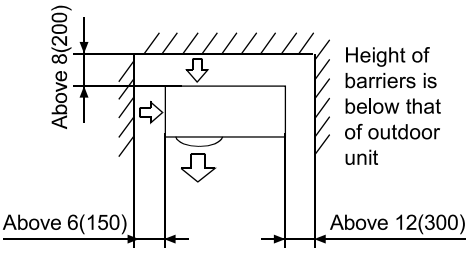
Back



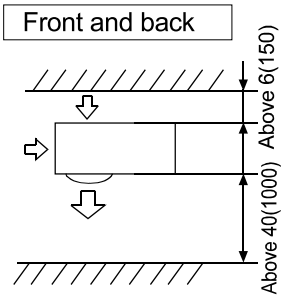
Front



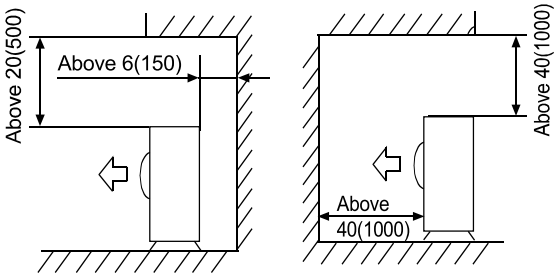
Back and side



Front and back



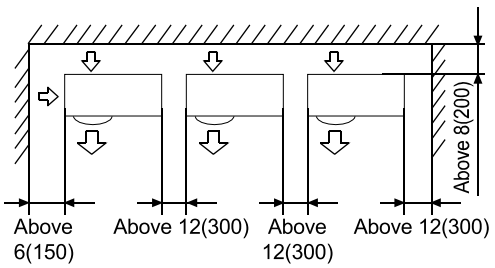
When barriers exist above the unit



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.

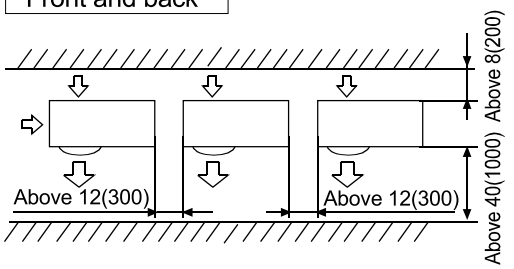
(2) Multi-unit installation (unit: in.(mm))

Back and side



Height of barriers is below that of outdoor unit

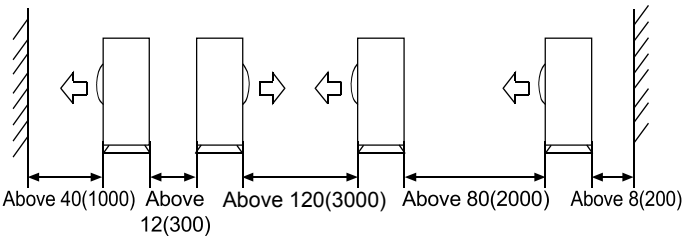
Front and back



Installation instruction

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

Standard



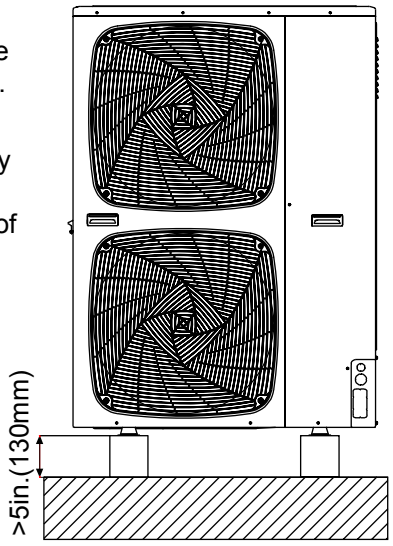
The top and two side surfaces must be exposed to open space, and barriers on at least one side of the front and back shall be lower than the outdoor unit.

- 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

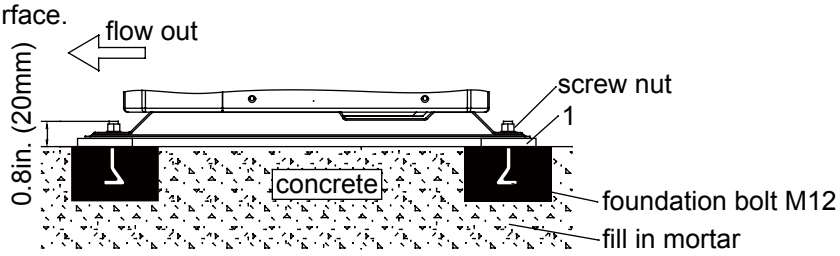
NOTICE

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 5in.(130mm) under the outdoor unit.

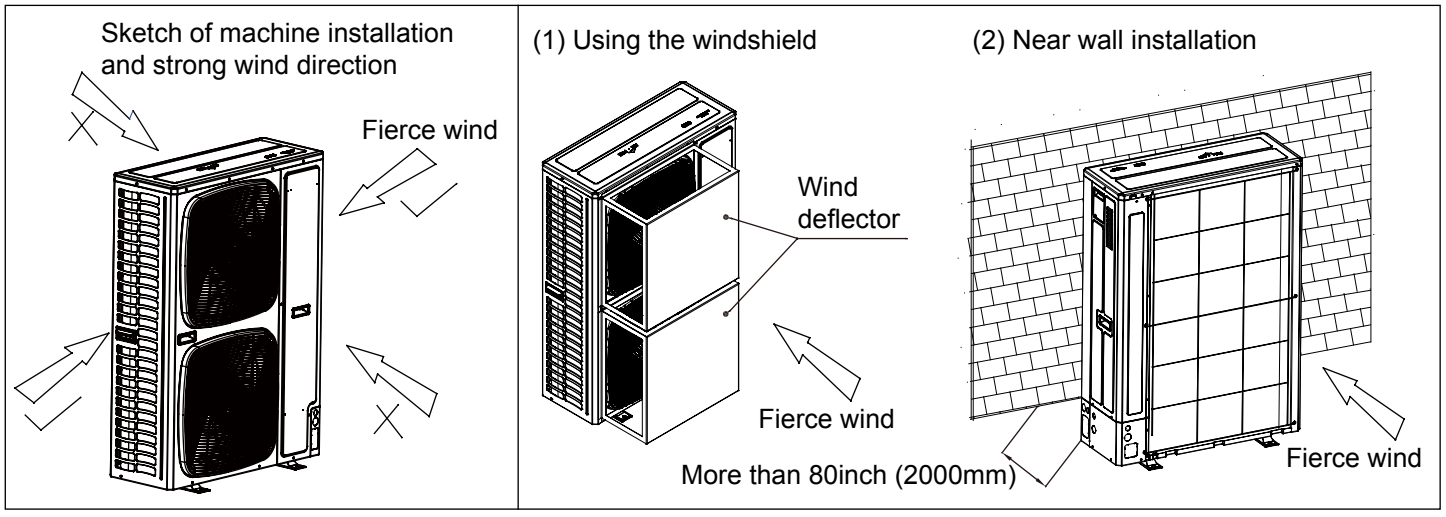


Foundation work

- 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 0.8in.(20mm) from the foundation surface.

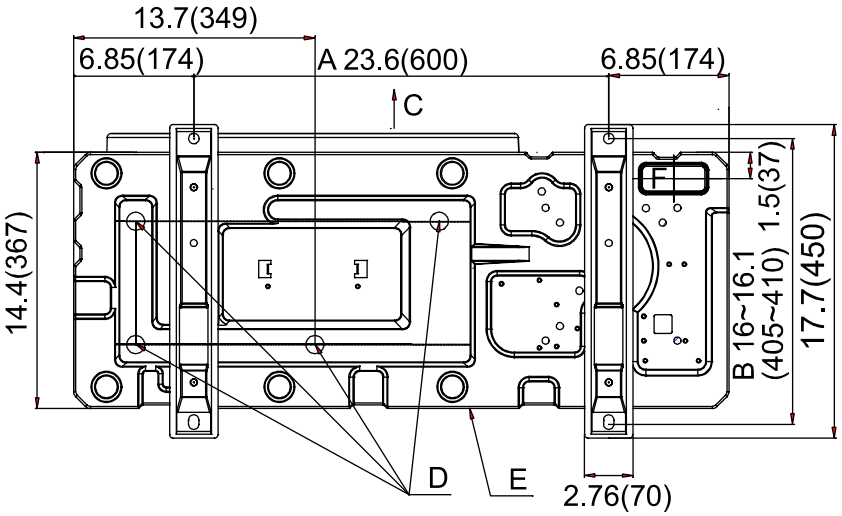


- Fix the outdoor unit to the foundation bolts using nuts with resin washers(1) as shown in the figure.
- Avoid strong wind blowing directly to the outdoor fan and heat exchanger.If there is no need to install the outdoor machine in the open space of the building or the enclosure, the following two ways 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 (bottom view) (unit of measurement: mm)



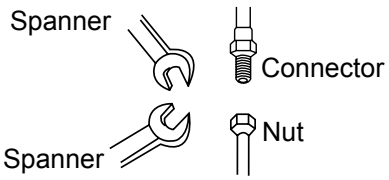
A leg pitch1
B leg pitch2
C Front grill (air outlet side)
D Drain hole
E Bottom frame
F Knock-out hole (for piping line)

(5) Refrigerant pipe connection

Pipe connection method:

- To ensure correct efficiency, the pipe should be as short as possible.
- Coat refrigerant oil on the connector and the flare nut.
- When bending the pipe, the bend diameter should be as large as possible to prevent the pipe from breaking or kinking.
- When connecting the pipe, center it and thread the nut by hand.
- Then tighten it with the double spanners.
- Don't let any debris such as sand, water etc into the pipe.

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



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

Cautions in piping installation:

- When welding the connector use hard solder, charge nitrogen into the pipe to prevent oxidation. If not the oxygen film in the pipe will clog the capillary and the expansion valve. May even cause a deadly accident.
- The refrigerant pipe should be clean. If water or any other impurities enter the pipe, charge with nitrogen to clean the pipe. The nitrogen should flow around the pressure of 72.5PSI(0.5Mpa). When charging the nitrogen, stop up the end of the pipe by hand to enhance the pressure in the pipe, then move your hand to stop up the other end of the pipe.
- The piping installation should be done while the stop valves are closed.
- Before welding the valve and the pipes, use a wet cloth to cool down the valve and the pipes.
- When the connection pipe and branch pipe need to be shortened, please use special shears. Do not use a saw.

Pipe material and specs selection

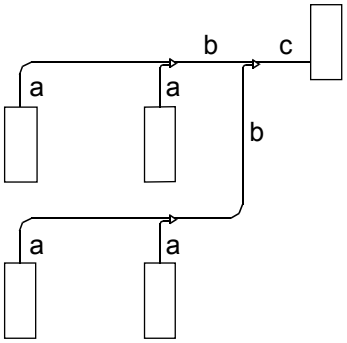
1. Please select the refrigerant pipe of the below material.
   Material: the phosphoric oxidize seamless copper pipe, model: C1220T-1/2H (diameter is over 19.05); C1220T-0 (diameter is below 15.88).
2. Thickness and specs:
   Confirm the pipe thickness and specs according to the pipe selection method(the 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.
3. The branch pipe must be from Haier.
4. When installing the stop valve, refer to the relative operation instruction.
5. The pipe installation should be in the allowable range.
6. 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.

Installation instruction

Pipe specification:



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

Total indoor capacity after the branch pipe (x1000Btu/h)	Gas pipe (in)	Liquid pipe (in)
X<38	Ø5/8	Ø3/8
38≤X< 80	Ø3/4	Ø3/8

3. Pipe "c" diameter (outdoor pipe diameter)

Outdoor capacity (x1000Btu/h)	Gas pipe (in)	Liquid pipe (in)
36	Ø5/8	Ø3/8
48	Ø5/8	Ø3/8
56	Ø5/8	Ø3/8

Note:
- When the distance from outdoor to the longest indoor is over 98ft, the main pipe should be the enlarged diameter.
- If pipe b diameter is larger than main pipe c,enlarge main pipe c diameter to be the same as pipe b.

Copper pipe selection:

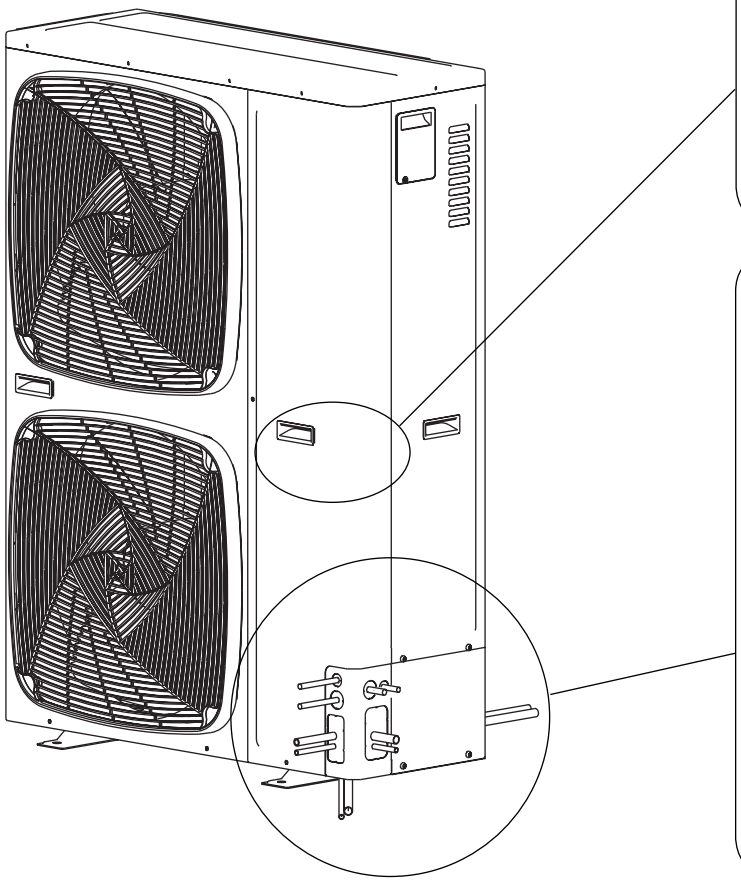
hardness	softness			
Outer diameter (in)	Ø1/4	Ø3/8	Ø1/2	Ø5/8
Min. thickness (in)	0.031	0.031	0.039	0.039

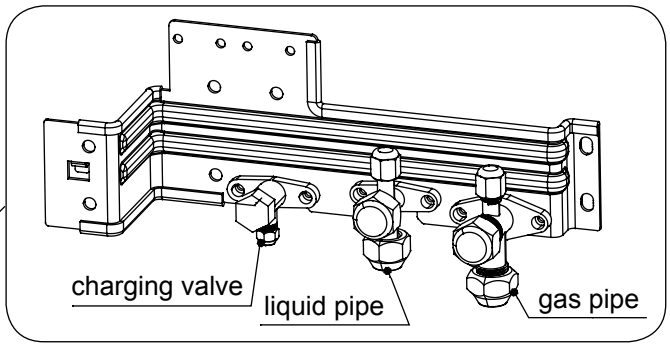
hardness	Half-hardness			
Outer diameter (in)	Ø3/4	Ø7/8	Ø1	Ø1 1/8
Min. thickness (in)	0.039	0.043	0.047	0.055

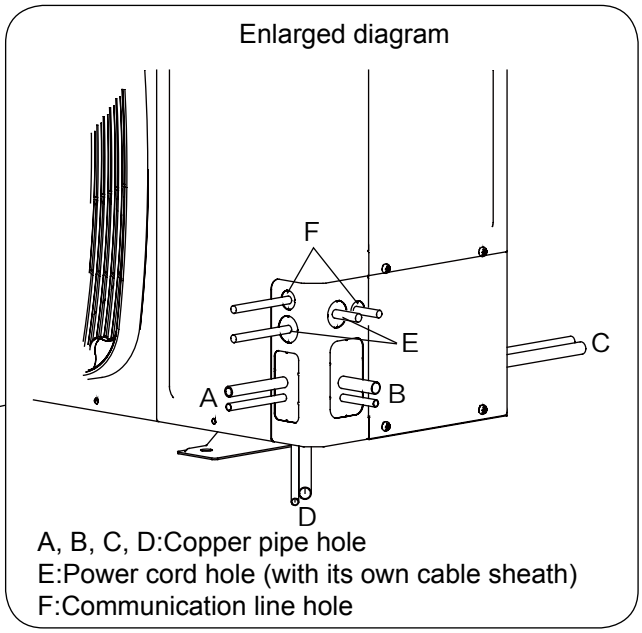
Note: If the copper pipe with outer diameter 19.05 is coil pipe, the thickness should be over 1.1.

Piping connection method:

Pipes can be connected in four directions





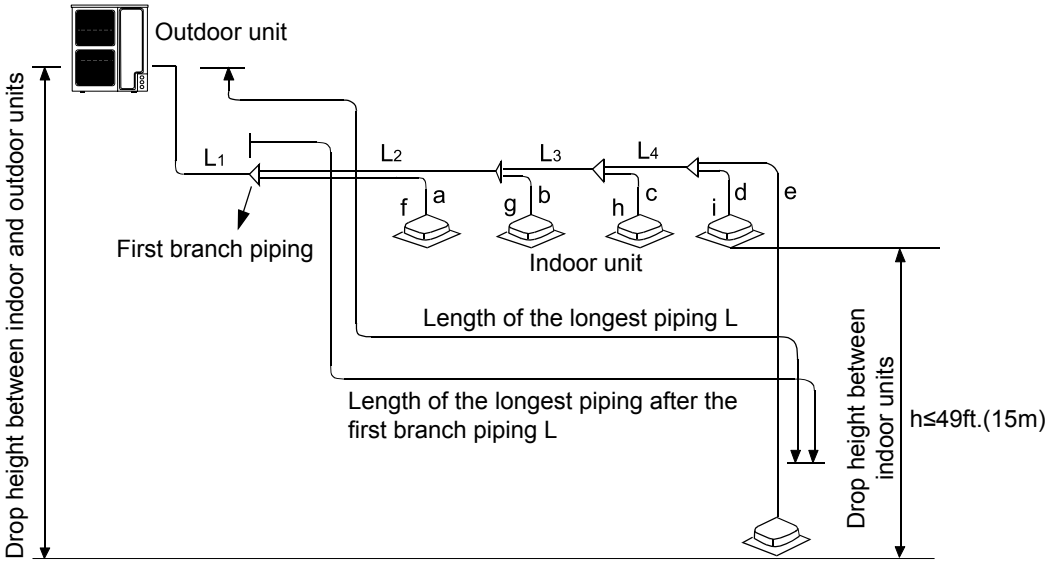


As shown in the figure, the piping can be connected from four directions. Through the front / rear hole piping piping on the cover hole or crack directly across the floor.
From the outdoor machine unloading piping cover with a screwdriver and hammer knock off holes along the guide wire break. Then, trim the edges of the holes, and mounted on the insulating sleeve (site) to protect the piping and wiring.

Installation instruction

Long pipe and high drop

1. Allowable pipe length and height difference



Maximal length and drop height permissible of refrigerant piping

			Permissible value	Piping part
Piping length	Total length of piping (actual length)		492ft.(150m)	L1+L2+L3+L4+a+b+c+d+e
	Longest piping L	Actual length	230ft.(70m)	L1+L2+L3+L4+e
	Piping length of indoor unit which is furthest to the first branch piping L (*)		131ft.(40m)	L2+L3+L4+e
Drop height	Drop height between indoor and outdoor unit H	Up outdoor	98ft.(30m)	——
		Under outdoor	66ft.(20m)	——
	Drop height between indoor units h		49ft.(15m)	——

Unit pipe spec and connection method (unit: in.(mm))

A. Outdoor unit

Model	Gas pipe side		Liquid pipe side	
	Diameter	Connecting method	Diameter	Connecting method
MVHP036MV2AA	Ø5/8"15.88	Flared joint	Ø3/8"9.52	Flared joint
MVHP048MV2AA	Ø5/8"15.88		Ø3/8"9.52	
MVHP056MV2AA	Ø5/8"15.88		Ø3/8"9.52	

B. Indoor unit
Please refer to the indoor air conditioner manul.
Connecting method: Flared joint

C. Pipe spec and the torque

Diameter	Thickness	Torque
Ø1/4(6.35)	3/95"(0.8)	126~152lb.in(14.2~17.2N.m)
Ø3/8"(9.52)	3/95"(0.8)	289~353lb.in(32.7~39.9N.m)
Ø1/2"(12.7)	1/25"(1.0)	438~534lb.in(49.5~60.3N.m)
Ø5/8"(15.88)	1/25"(1.0)	547~667lb.in(61.8~75.4N.m)

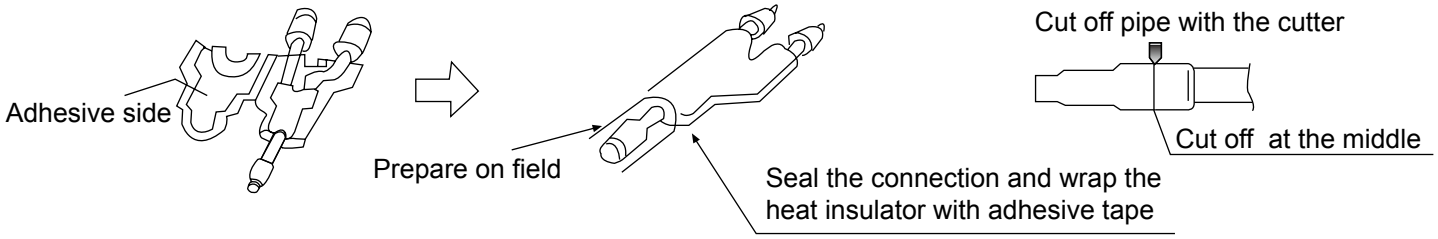
Branch pipe

Outdoor unit type
Branch pipe selection:

total indoor capacity(1000Btu)	Model (optional)
less than 114.3	FQG-B335A

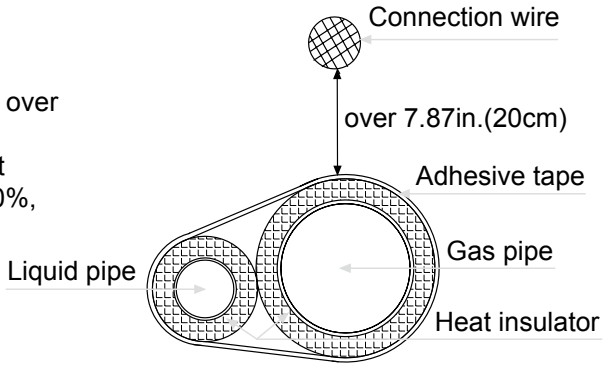
Installation instruction

Note:
1. When connecting the pipe to the outdoor unit, please pay attention to the outdoor pipe dimension.
2. When changing the diameter between pipes and between the units, please change on the branch pipe side.
3. Be sure to blow nitrogen when welding. If not, oxides will be produced and cause heavy damage. Take precautions to prevent water and dust from getting into the pipe.



Insulation:

- Gas pipe and liquid pipe should be insulated separately.
- The insulation material for gas pipe should be rated for temperatures over 248°F (120°C). The liquid pipe should be for over 158°F (70°C).
- The insulation should be over 0.39in.(10mm) thick, when the ambient temp. is 86°F (30°C)When the relative humidity is over Liquid pipe 80%, the insulation thickness should be over 0.59in. (15mm).
- The material should be snug against the pipe without a gap, then be wrapped with adhesive tape. The connection wire can not be wrapped with the insulation material and should be at least 7.87in.(20cm) from the insulation.



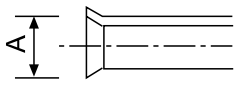
Secure refrigerant piping

- During operation, the pipe will vibrate, expand or shrink. If not being secured, the refrigerant will focus on one part and cause the pipe to break.
- To prevent stressing the pipe, secure the pipe every 6.56-9.84ft.(2-3m).

Pipe installation

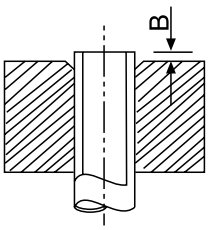
When doing the piping connection, please do the following:

- Be careful not to damage any parts or pipes while connecting to the unit.
- Close the valves fully when connecting the pipes
- Protect the pipe from getting water or other impurities in them (welding after being laid down, or being sealed with adhesive tape).
- Use large diameter bends when possible(over 4 times of the pipe diameter).
- The connection between outdoor liquid pipe and the distributing pipe is flared type. Please flare the pipe with a tool used with R410A after installing the flare nut. If the pipe length has been adjusted with the copper pipe gauge, you can use the original tool to flare the pipe.
- The oil is ester oil, not the mineral oil, since the unit uses R410A.
- When connecting the pipe, fasten the pipes using a spanner. The torque refers to the former info.



Expanding pipe: A(in.(mm))

Pipe outer diameter	A $^{0}_{-0.4}$
Ø1/4(6.35)	0.36(9.1)
Ø3/8"(9.52)	0.52(13.2)
Ø1/2"(12.7)	0.65(16.6)
Ø5/8"(15.88)	0.78(19.7)



Projecting length of pipe to be expanded: B(mm)

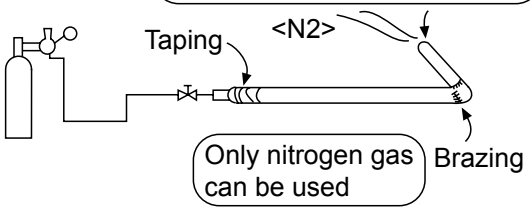
Pipe outer diameter	When it is hard pipe	
	Special tool for R410A	The former tool
Ø1/4(6.35)	0-1/51" (0-0.5)	1/25"-1/17" (1.0-1.5)
Ø3/8"(9.52)		
Ø1/2"(12.7)		
Ø5/8"(15.88)		

- 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.

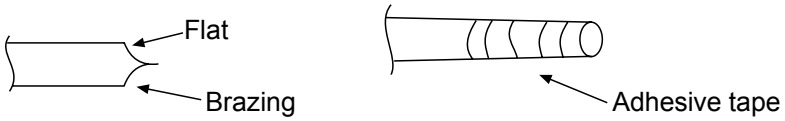
Installation instruction

- Weld the pipe while charging with nitrogen or it will cause impurities (including a film of oxidation) to clog the capillary and the expansion valve which may lead to deadly accidents.

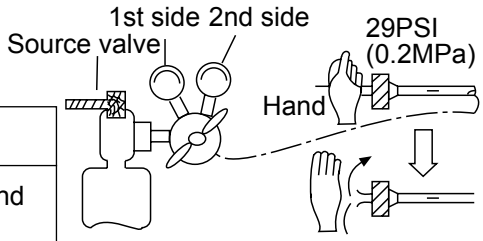
Seal the pipe end with adhesive tape or the stopper to increase the resistance, fill up the pipe with nitrogen.



- Protect the pipe ends from getting water and other impurities into the pipes (from welding, filed or being sealed with adhesive tape).



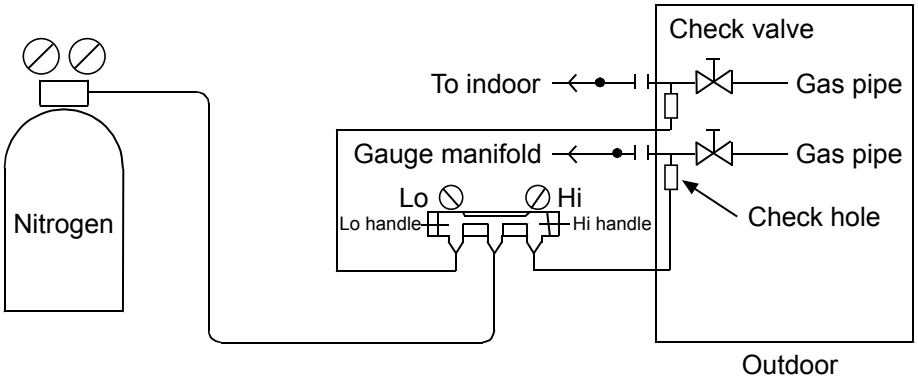
- The refrigerant pipe should be clean. The nitrogen should flow at pressure around 29PSI(0.2Mpa) and when charging the nitrogen, stop up the end of the pipe by hand to increase the pressure in the pipe, then move your hand and stop up the other end.



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

(6) Leakage test

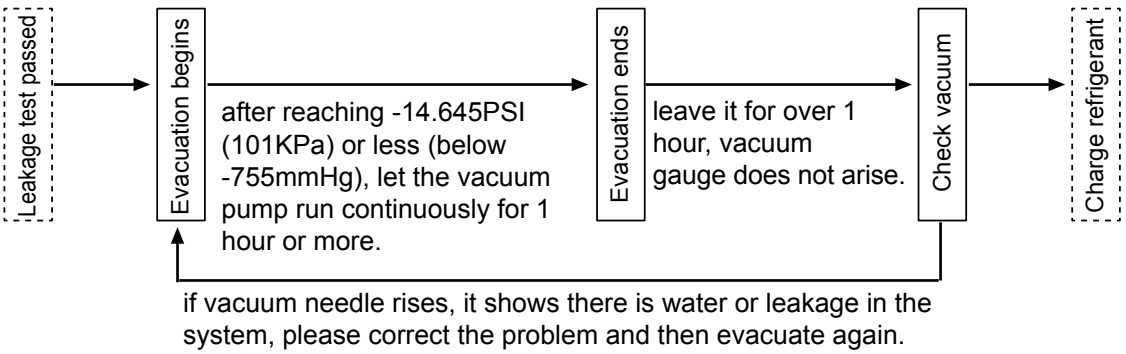
1. The outdoor unit has been tested for leakages from the factory. After connecting the distributing pipe, test for leakages from the outdoor check valve and the indoor pipe. While testing, the valves should be close.
2. Refer to the below figure to charge nitrogen into the unit to test. Never use chlorine, oxygen, flammable gas for the leakage test. Apply pressure on both the gas pipe and the liquid pipe.
3. Apply the pressure step by step to the target pressure.
   a. Pressurize to 72.5PSI(0.5MPa) for more than 5 minutes, check if pressure goes down.
   b. Pressurize to 217.5PSI(1.5MPa) for more than 5 minutes, check if pressure goes down.
   c. Pressurize to the target pressure 580PSI(4.0MPa), record the temp. and the pressure.
   d. Leave it at 4.0MPa for 1 day or more, if the pressure does not go down, the test is complete.
      Note that when the temp. changes by 1degree, pressure will change 1.45PSI(0.01MPa). Correct the pressure as needed.
   e. After performing a~d, if the pressure goes down, there is leakage. Check any brazed and flared connections using soapy water. Fix the leakage and perform test again.
4. After the leakage test evacuate the system.



(7) Evacuation

Evacute at the liquid service valve and both sides of the gas service valve.

Operation procedure:



Installation instruction

The unit is charged with R410A refrigerant. The details below should be paid attention to:
- To prevent different oils from getting into the pipe, please use the specific tool for R410A, especially for manifold gauge and charging hose.
- To prevent the compressor oil from getting into the refrigerant cycle, please use the anti-counter-flow adapter.

(8) Check vale operation

- Remove the valve cap.
- Turn the liquid stop valve and the gas stop valve with hexangular spanner until it stops. If the valve is opened with too much force the valve will be damaged.
- Tighten the valve cap.

Tighten as per the torque table below:

Tighten torque lb.in(N.m)			
	Shaft (valve body)	Cap (cover)	T-shape nut (check joint)
For gas pipe	less than 61.9(7)	less than 265.2(30)	114.9(13)
For liquid pipe	69.4(7.85) (MAX138.8(15.7))	260(29.4)(MAX346.5(39.2))	77.8(8.8) (MAX130(14.7))

(9) Additional refrigerant charging

Add additional refrigerant under the liquid state with the gauge.
If the additional refrigerant can not all be added, when the outdoor stops, charge it using trial mode.
If the unit runs for a long period undercharged, the compressor will eventually fail.(charging must be finished within 30 minutes especially when the unit is running while charging).

A. Charge amounts from the factory exclude the refrigerant in the pipes.
B. The unit is charged with a standard amount of refrigerant (distributing pipe length is 0).
Additional charge amount=actual length of liquid pipe x additional amount per meter liquid pipe
Additional charge amount=L1×0.113+L2×0.073+L3×0.037+L4×0.015
L1: total length of 5/8"(15.88) liquid pipe L2: total length of 1/2"(12.7) liquid pipe
L3: total length of 3/8"(9.52) liquid pipe L4:total length of 1/4"(6.35) liquid pipe
C. Refrigerant charging and additional charge

Additonal refrigerant charging per lb (lb/ft.)						Charge when out of factory
Ø5/8"	Ø1/2"	Ø15.88	Ø3/8"	Ø1/4"	Ø6.35	
0.113	0.073	0.037	0.11	0.015	0.022	Refer to label

Note:
- To prevent adding different oils into the pipe, please only use a gauge manifold and charging hose for R410A.
- Tank color for R410A is pink.
- Do not use a charging cylinder because 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 refrigerant amount added that was calculated by the pipe length on the unit label.

Secure refrigerant piping
- During operation, the pipe will vibrate, expand or shrink. If not being secured, the refrigerant will focus on one part and cause the pipe to break.
- To prevent stressing the pipe, secure the pipe every 6.56-9.84ft.(2-3m).

GWP: 2088
The product contains fluorinated greenhouse gases and its functioning relies upon such gases.

(10) Refrigerant recovery

- Start: press Start and Stop keys on the main control board at the same time for 5 seconds. The unit will start automatic recovery mode. The compressor starts, the right side of the unit C0 and Ps LEDs start flashing, runs for around 3 minutes.
- Operation: when the LEDs C1 and Ps alternately flash, manually shut off the liquid pipe valve
- Off valve: when Ps < 1kg, LED displays C2, quickly close the shut-off valve, after 5 seconds the system will shut down.
- End: manually power down the system to reset the program.
- Note: in heating, standby or while shutdown: the outdoor unit is forced into refrigeration operation.

Electric wiring and the application

⚠ WARNING
• Turn off the main power switch of the indoor and outdoor unit for 1 minute or more before wiring or servicing. • To prevent damaging the wires and electrical components, avoid installing around animals. It may lead to the occurrence of fire. • To prevent damaging the wires, avoid contact with refrigerant pipes, steel edges and electrical components. It may lead to the occurrence of fire.

⚠ CAUTION
• Secure the power cord with a wire tie in the unit.

Note:
when the outdoor unit is not using a circuit, it should be sealed with a rubber blocker.

⚠ CAUTION
• When using 3 phase 5 wire power, the power supply of the indoor machine must be connected using L1 and N. Do not use L1-L2, L1-L3, otherwise the unit electrical components will be damaged.

Signal wiring:

The outdoor unit and all the indoor units are connected in parallel through with shielded two wire cord.

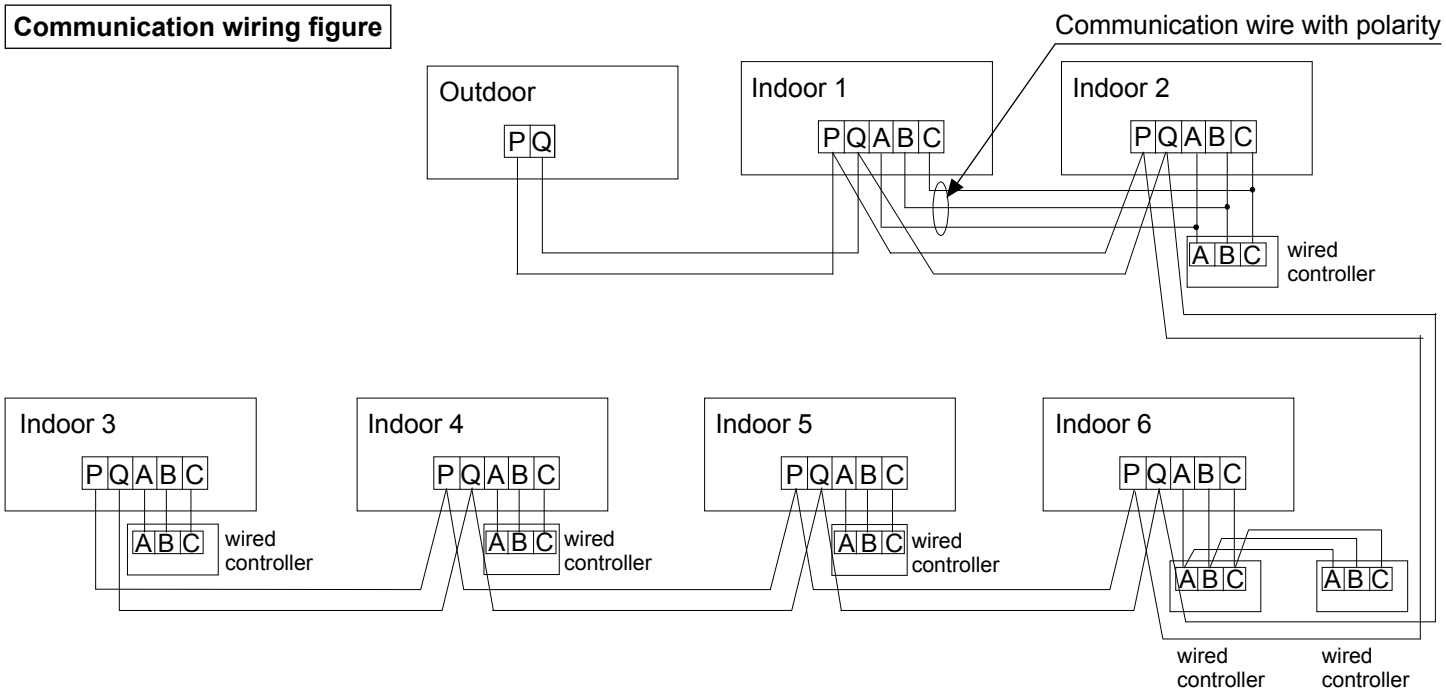
Inspect

- Confirm that the electrical equipment used on the installation site
- (main power switch, circuit breaker, wire, conduit and wiring terminals, etc.) have been selected according to current data, to ensure that the device in line with national standards.
- Confirm that the power supply voltage is within +/-10% of the rated voltage and that the unit is properly grounded to prevent damage to the electrical components.
- Check for correct voltage. Otherwise, the compressor will not start if the voltage is too low.
- Measure the resistance between the ground and the electrical terminals and ensure that there is more than 1MΩ. Otherwise, the system will not start. Fix the issue prior to operating the system.

Connection

- Connect the power cord to the terminal of the indoor unit and the outdoor electrical box, connect the ground wire to the grounding bolt of the outdoor unit and the indoor electrical box.
- Connect the outdoor and indoor communication wire to the 1 and 2 terminals on the terminal block. If the power cord is connected to the communication terminals, the circuit board will be damaged.
- Use shielded twisted pair wire.
- Do not screw to the front of the cover.
- The power wire must be made of copper wire, and the power supply must conform with IEC 60245 requirements. If the power cord length exceeds 20m
- use a larger gauge wire.
- Use a round terminal connection on the wire with an insulating protective sleeve.
- Secure the wire away from any sharp edges and materials that may damage the wire to prevent damage and causing a fire or damage.

Communication wiring figure



Electric wiring and the application

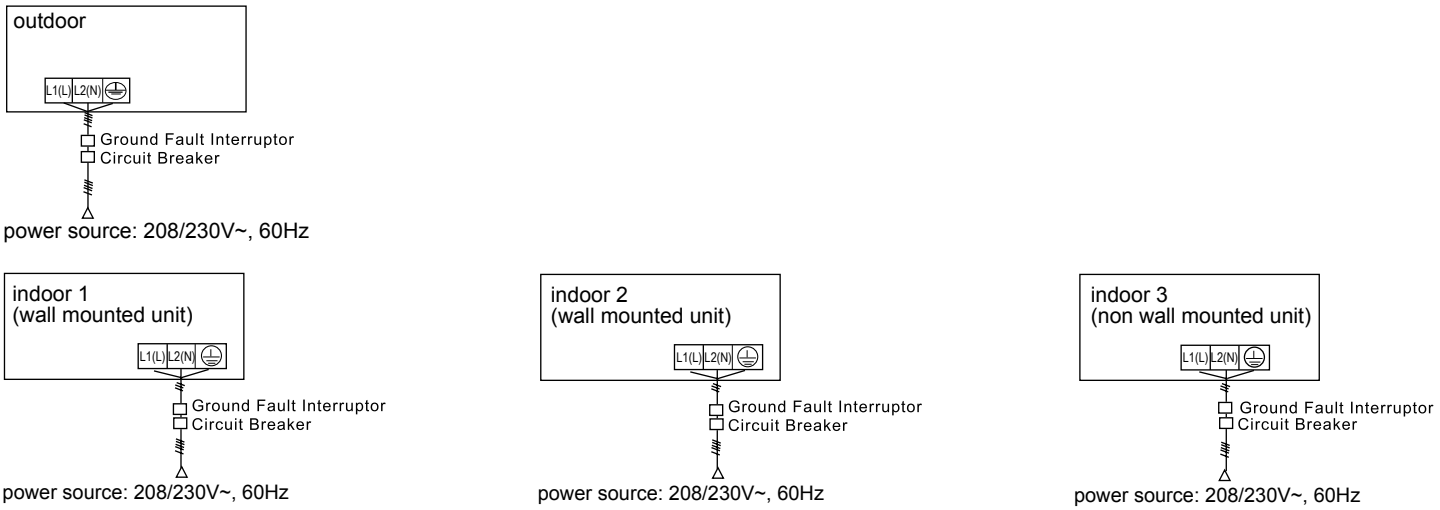
The outdoor and all indoor units are connected in parallel through 2 non-polar wires. Three wiring options between the wired controller and indoor unit:

A. One wired control to control multiple units, i.e. 2-6 indoor units, as shown in the above figure, (1-2 indoor units). The indoor unit 2 is the wire controlled main unit and others are the wired controlled sub units. The remote control and the main unit (directly connected to the indoor unit of wired control) are connected via three wires with polarity.

B. One wired control controls one indoor unit, as shown in the above figure (indoor unit 3-5). The indoor units and the wired control are connected via three lines with polarity.

C. Two wired controls control one indoor unit, as shown in the figure (indoor unit 6). Either of the wired controls can be set to be the master wired control while the other is set to be the auxiliary wired control. The master wired control and indoor units, and the master and auxiliary line controls are connected via three lines with polarity.

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.

Outdoor power source and power cable

Item / Model		Power source	Power cable section	Circuit breaker (A)	Rated current of residual circuit breaker (A) Ground fault interruptor (mA) response time (S)	Ground wire	
						Section (mm^2)	Screw
Individual power	MVHP036MV2AA MVHP048MV2AA MVHP056MV2AA	208/230V~, 60Hz	7AWG	50	50A 30mA below 0.1S	7AWG	3/16” (M5)

- Power cable must be fixed firmly.
- To avide electrical shock, make sure to disconnect the power supply 1 minute or more before servicing the electrical parts.Even after 1 minute,always measure the voltage at the terminals of main circuit capacitors or electrical parts and before touching, make sure that those voltages are 50VDC or less.
- To persons in charge of electrical wiring work: Do not oerate the unit until the refrigerant piping is complete.(Running it before the piping is ready will break the compressor)
- Each outdoor must be earthed well.
- When power cable exceeds the range, thichen it appropriately.
- The appliance shall be installed in accordance with national wiring regulations.
- All wiring must be performed by an authorized electrician.
- Be sure to install an earth leakage circuit breaker in accordance with applicable legislation.Failure to do so many cause electrical shock.

Electric wiring and the application

Indoor power source and communication wiring

⚠ WARNING
• Power lines must be copper wire. • All indoor and outdoor units must be grounded properly. The ground wire must not be grounded using a gas pipe, water pipe, lightning rod or telephone wire. If the grounding is correct it may cause electric shock or fire. • Power supply must be installed with an earth leakage circuit breaker, otherwise it may cause electrical shock or fire. • The operation and maintenance of the electrical equipment shall be carried out with the power supply off. • The indoor and outdoor units each get their own independent power supply. • The communication line and the power line must be separate.

Item / Indoor total current (A)	Power cable section	Wire length ft.(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	Indoor/indoor
<10	14AWG	75.5(23)	20	20A, 30mA, below 0.1s	2-core × (18-14AWG) shielded wire	
≥10 and <15	11AWG	78.7(24)	30	30A, 30mA, below 0.1s		
≥15 and <22	9AWG	88.6(27)	40	40A, 30mA, below 0.1s		
≥22 and <27	7AWG	137.8(42)	50	50A, 30mA, below 0.1s		

- Power cable and communication wire must be firmly connected.
- Each indoor unit must be properly grounded.
- When power cable exceeds the range, use a larger gauge as required.
- The Shielded layer of the communication wires must be connected together and be grounded at at each point.
- Communication wire total length cannot exceed 1000m.

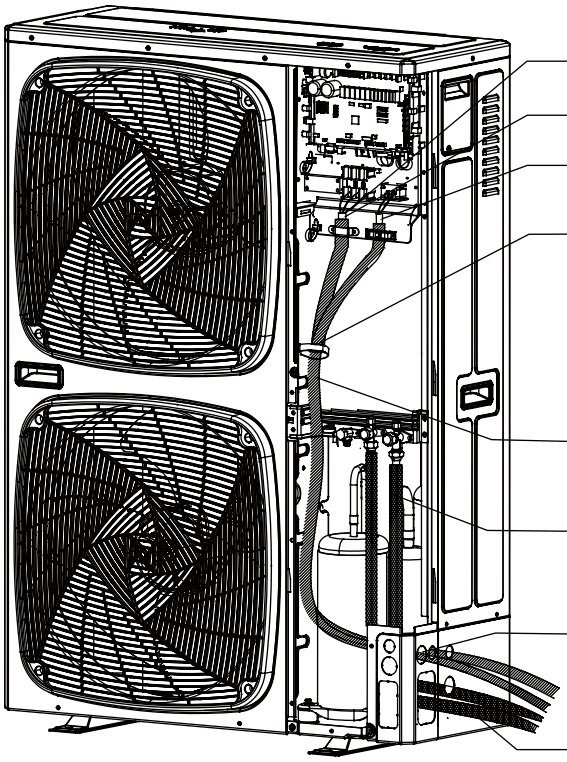
Communication wire for wired controller

Wire length (ft.(m))	Wire spec	Wire length(m)	Wire spec
<328(100)	22AWG ×(3-core) shielded wire	≥984(300)and <1312(400)	16AWG ×(3-core) shielded wire
≥328(100) and <656(200)	19AWG×(3-core) shielded wire	≥1312(400) and <1968(600)	14AWG ×(3-core) shielded wire
≥656(200) and <984(300)	18AWG ×(3-core) shielded wire		

- Shielded layer of communication wire must be grounded at one end.
- The total length cannot exceed 600m.

Electric wiring and the application

Outdoor unit electrical wiring diagram



Ground wire

Power cord

Communication line

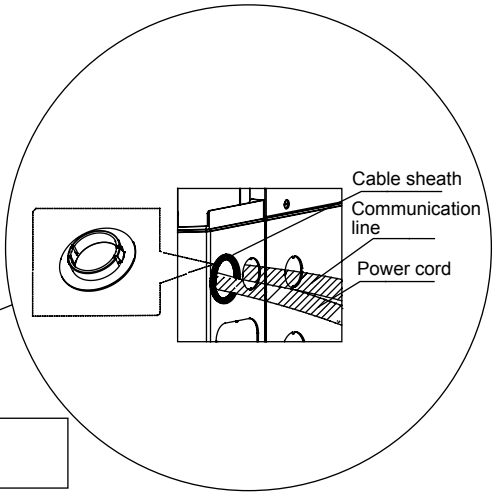
Secure the power line and communication line with a wire clip on the terminal block

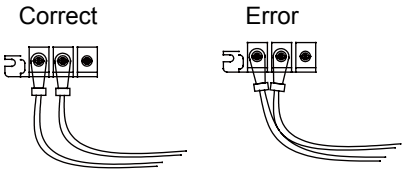
Power lines and communication lines need to be flame retardant and use high temperature resistant insulation

Use plastic pipe insulation on the refrigerant pipe

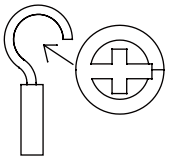
Protect the power line and communication line hole with a wire sheath

Power line and piping need to be wrapped with flame retardant tape





When using a single terminal without a terminal connector, the wire can not be directly connected without flux. It will cause abnormal heating of the terminal connector. If a single core wire is used for the wiring, it can be connected directly as shown in the diagram.



Installation and debugging

1. Installation and debugging method of outdoor machine

SW01	SW02	Seven segment digital tube display content
0	0	Outdoor machine fault code The machine units are not locked and no fault, in turn cycle "in the machine number, machine capacity, power supply type". (1) The connection machine number: display "U" + machine units. Such as "U08" means that the machine is connected to the 8 internal machine . (2) Outdoor mechanism cold capacity: such as 48 machine display 48(uint:KBtu/h). (3) Power supply type: 1PH represents a single phase, and the 3PH represents a three-phase).
	1	Outdoor operation mode (stop: OFF, refrigeration: CCC, heating: HHH)
	2	Program version
	3	E2 Edition
	4	Compressor target frequency.(according to Start 5 seconds, into the manual frequency control, Up/ Down adjustment frequency, according to Stop for 5 seconds, exit the manual frequency control. Manual control, the frequency of flashing display, non manual control, the frequency of normal display.
	5	Actual frequency of compressor
	6	In machine units
	7	The machine units
	8	Outdoor machine capacity (unit:KBtu/h)
	9	External fan 1 (FAN1) speed (unit: RPM, maximum display of 999)
	A	External fan 2 (FAN2) speed (unit: RPM, maximum display of 999)
	B	The average Tc2 temperature of the internal machine (unit: Fahrenheit)
	C	The actual average Tc2 temperature of the unit (unit: Fahrenheit)
	D	Superheat of heating target (unit: Fahrenheit)
	E	Special running state of the mach: First bit: power supply type (0- single phase 1- three-phase); Second place: Mute (0- off, 1- open);Third place: the air to run (0- off, 1- open) (101: three phase power supply, mute off, open the gas)
	F	Forced fan running, no mandatory display "FAN" (according to Start 5 seconds into the fan manual control, Up/ Down adjust the fan gear, according to the Stop 5 seconds, exit fan manual control), mandatory display "0-15", this function is not affected by external fault influence
1	0	Td: exhaust gas sensor (unit: Fahrenheit)
	1	Ta: ring temperature sensor (unit: Fahrenheit)
	2	Ts: suction sensor (unit: Fahrenheit)
	3	Te: defrost sensor (unit: Fahrenheit)
	5	Pd: High pressure pressure (unit: psi)
	6	Ps: Low pressure (unit: psi)
	7	Outdoor machine PMV opening (unit: pls, maximum display 999)
	8	Valve state First bit: 4WV (0- closed, 1- open); Second bit: SV1 (0- closed, 1- open); the third bit: SV2 (0- off, 1- open) (example 101 indicates that the 4WV is turned on, the SV1 is turned off, the SV2 is turned on)
	9	First:high voltage switch HPS (0-disconnect,1-closed); second:low voltage switch LPS (0-disconnect,1-closed);third:heating belt(0-closed,1-open)(101:HPS LPS closed off, open the heating zone)
	A	Tfin: module temperature (unit: Fahrenheit)
	B	Press current (unit: A, 1 decimal)
	D	Module DC voltage (unit: V)
	E	CT current (unit: A, 1 decimal) Forced refrigeration alternately display "CCC" (press Start 5 seconds to enter, all internal cooling operation, according to Stop 5 seconds exit).

SW01	SW02	Seven segment digital tube display content
1	F	Forced heat alternating display "HHH" (according to Start 5 seconds to enter, all the internal mechanism of hot running, press Stop to exit for 5 seconds).
2	0-F	Communication shows the program version (1 decimal), or "---"
3	0-F	The machine type: (0:common indoor machine; 1:wall hanging; 2:Fresh air machine ; 3:heat exchanger, 4/5/6/7:common indoor machine).
4	0-F	If there is a failure to show the internal fault code, otherwise, "---"
5	0-F	Indoor machine capability (unit:KBtu/h)
6	0-F	First and the second: indoor machine current mode of operation, (00: off, 01: air supply, 02: cooling, 03: dehumidification, 04: heating) , the third: external machine capacity requirements (0: No, 1: Yes)
7	0-F	Indoor machine PMV opening (unit: pls, maximum display 999)
8	0-F	Indoor unit of air conditioner: First: float switch (0- disconnect, 1- closed) Second place: water pump (0- closed, 1- open) Third place: electric heating (0- closed, 1- open) (110 float switch is closed, the water pump is opened, the electric heating off)
9	0-F	Indoor machine TA: ambient temperature value (unit: Fahrenheit)
A	0-F	Indoor TC1: air temperature value (unit: Fahrenheit)
B	0-F	Indoor machine TC2: liquid pipe temperature (unit: Fahrenheit)
C	0-F	Indoor machine motor: room running wind speed (0- stop, 1- low wind, 2- stroke, 3- high wind)

2. Supercooling valve plate module parameter display

SW01	SW02	Seven segment digital tube display content
D	0	Over cooling valve plate failure code (cold plate module sent)
	1	Super cooled valve plate program version (1 decimal)
	2	Target opening of the expansion valve of the supercooling valve plate(unit: pls, max: 999)
	3	The current opening of the expansion valve of the cold valve plate (unit: pls, max: 999)
	4	Tc1 temperature of supercooling valve plate (unit: Celsius)
	5	Tc2 temperature of supercooling valve plate (unit: Celsius)
	6	Set aside (display "---")
	7	Set aside (display "---")
	8	Set aside (display "---")
	9	Set aside (display "---")

Installation and debugging

3. Outdoor unit PCB dipswitch setting(Pay attention to the identification of the computer board).

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

BM1 introduction

BM1_1	Indoor searching after startup	0	Begin to search indoor
		1	Stop searching indoor and lock the quantity
BM1_2	Celsius/Fahrenheit area selection	0	Celsius area
		1	Fahrenheit area
BM1_3	External static pressure	0	High
		1	Low
BM1_4	Energy saving or refrigeration effect priority	0	Energy saving priority
		1	Refrigeration effect priority
BM1_5	Indoor simultaneous control	0	No
		1	Yes
BM1_6	Defrosting condition selection	0	Not easy to frost area
		1	Easy to frost area
BM1_7	Defrosting level	0	Ordinary
		1	Strengthen
BM1_8	Silent operation selection	0	Forbidden(without silent operation)
		1	Allow (with silent operation)

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 horse power selection	[2]	[3]	[4]	Outdoor horse power selection
		1	0	0	36
		1	0	1	48
		1	1	0	56
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: Either indoor unit unlocked or the locked quantity different with actual connecting number, it cannot run.

4. 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 Te1 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 operate in defrosting and within 3 minutes after defrosting, no alarm	Resumable
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.	
28	28	High pressure sensor Pd failure	AD value is below 11(open circuit) or over 1012(short circuit) for 30seconds, in defrosting and within 3 minutes after defrosting, no alarm	Resumable
29	1D	Low pressure sensor Ps failure	AD value is below 11(open circuit) or over 1012(short circuit) for 30seconds, in defrosting and within 3 minutes after defrosting, no alarm	Resumable
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)	Td≥239°F(115°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	After 4-way valve is electrified for 3 minutes, if the below conditions can be met for continous 10 seconds, that is conversing successfully: 1. this outdoor compressor is running normally 2. Pd-Ps≥87PSI(0.6MPa), Otherwise, the system alarms reversing failure.	Once confirmation, un-resumable
39-0	39-0	Low pressure sensor Ps too low protection	After compressor is running (except for residual operation), if in cooling, Ps<0.05Mpa; in heating, Ps<0.03Mpa; in oil return, Ps<0.03Mpa for continuous 5 minutes, alarm and stop. 2 minutes and 50 seconds later, resume automatically, if it occurs 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
39-1	39-1	Compression ratio too high protection	After compressor is running, compression ratio 8. for continuous 5 minutes stop and alarm.2 minutes and 50 seconds later, resume automatically, if it occurs 3 times in an hour, confirm the failure.	Once confirmation, un-resumable
39-2	39-2	Compression ratio too low protection	In normal operation, compression ratio <1.8 for continuous 5 minutes stop and alarm.2 minutes and 1 seconds later, resume automatically, if it occurs 3 times in an hour, confirm the failure.	Once confirmation, un-resumable
40	40	High pressure sensor Pd too high protection	In normal operation, Pd>=4.15Mpa for continuous 50ms, alarm and stop. 2 minutes and 50 seconds 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 Td<CT+50°F (10°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
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
54	54	Valve plate module communication fault	Cannot receive valve plate module signal in 200 continuous rounds or receive wrong data,recover automatically when received right data.	Resumable
57	57	Communication failure between valve plate module and host computer(sending by valve plate)	Communication failure between valve plate module and host computer	Resumable
58	58	Tc1 temp sensor of valve plate error(sending by valve plate)	Tc1 temp. sensor cannot connect with valve plate module	Resumable
59	59	Tc2 temp sensor of valve plate error(sending by valve plate)	Tc2 temp. sensor cannot connect with valve plate module	Resumable
60	60	Valve plate module error(sending by valve plate)	Reserved	Resumable
61	61	Valve plate module error(sending by valve plate)	Reserved	Resumable

Failure code

Digital tube indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
62	62	Valve plate module error(sending by valve plate)	Reserved	Resumable
63	63	Valve plate dial setting error	No valve plate module dial but the valve plate module is detected.	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		
75	75-0	No pressure drop between high pressure and low pressure	In 1 minute after INV compressor starts up, Pd-Ps≤0.1MPa, then stop. 180 seconds later, resume automatically. If it occurs 3 times in an hour, confirm the failure.	Once confirmed, unresumable
75-4	75-4	Too small pressure drop between high pressure and low pressure	If Pd-Ps≤0.2MPa for 5 minutes, the outdoor unit protection stop. • 3 minutes after stopping protection, restart. If it occurs 3 times in an hour, confirm the failure.	Once confirmed, unresumable
78	78	Lack of refrigerant	Compressor running in cooling mode, Ps<0.2MPa for 30 minutes; compressor running in heating mode, Tsi - ET>20; LEV will fully open for 60 minutes, the unit will output lack of refrigerant alarm,unit will not stop.	--
81	81	IPM modular temp. too high protection	IPM modular temp.≥185°F(85°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	
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	
110	110	IPM modular protection (F0)	IPM modular over current, in short circuit, over heat, voltage too low of control circuit.	
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	

Failure code

Digital tube indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
114	114	Voltage too low of DC bus line of transducer	Voltage of power source is too low	3 times in an hour, confirm failure; once confirmation, un-resumable
115	115	Voltage too high of DC bus line of transducer	Voltage of power source is too high	
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	3 times in an hour, confirm failure; once confirmation, un-resumable
122	122	Radiator temp.sensor of transducer abnormal	Resistor of temp.sensor abnormal or temp.sensor disconnected	
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:

555.0	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>80.6°F, Standby	
555.3	Outdoor ambient temperature too high or too low (cooling)	Ta>129.2°F or Ta<14°F, Standby	

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

Confirm the type of outdoor machine and the number of inside machine

- After installation, please confirm that the outdoor computer board BM1_1 is in the 0 state and then check the digital display. If the number of indoor units, the outdoor unit type and the power supply voltage is correct, change the BM1_1 dial to the 1 state. If it is not correct, please check the dial machine communication code and models, do not force the BM1_1 dial to the 1 state, it may cause system failure.

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 cool mode and the heat mode set at the same time, the unit set last will be set to standby, and the unit set first will run normally. If the A/C manager sets the unit to allow only cooling or only heating mode, the unit can not run at the other modes.

Heating mode characteristic

- While operating, if the outdoor temp. rises, the indoor fan motor will run at a low speed or stop.

Defrosting in heating mode

- In heating mode, defrosting will affect the heating efficiency. The unit will defrost for about 2~10 minutes automatically. During defrost, any frost will melt and condensate will flow from outdoor unit. While defrosting vapor will appear at the outdoor unit, which is normal. The indoor motor will run at low speed or stop, and the outdoor motor will stop.

The unit operation condition

- Please only operate the unit under the specified temperature range. If operating outside of the range, protection modes will cause the unit to stop operating.
- The relative humidity should be lower than 80%. If the unit runs while the humidity is over 80% for a long period, the dew on the unit will drop down and vapor will be blown from air outlet.

Protection device (such as high pressure switch)

- The unit has a high pressure switch which can stop system operation to protect the unit from damage. When the high pressure switch activates, cooling/heating mode will stop but the running LED on the wired controller will still be lit. The wired controller will also display an error code. The high pressure switch can be triggered by the following:
  In cooling mode, air outlet and air inlet of the outdoor unit are clogged.
  In heating mode, the indoor filter is full of dust; indoor air outlet is clogged.
  When the protection mode goes off, please turn off the power and re-start the unit after eliminating the problem.

When power failure

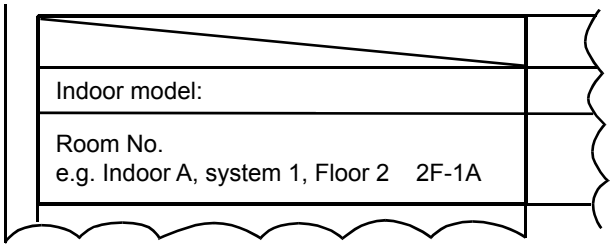
- When there is a power failure while the unit is running, all the operations will stop.
- After being powered again, if the re-start up function is enabled, the unit can resume to the last state before losing power; if the re-satrt up function is disabled, the unit needs to be switched on again manually.
- When abnormal operation occurs while running because of the storms, radio interference, etc, please turn off the power source. After eliminating the interference, press the "ON/OFF" button to start up the unit again.

Heating capacity

- A heat pump in heating mode absorbs the outdoor heat energy and releases it indoor. As the outdoor temperature goes down, the heating capacity will decrease.

System marks

- When multiple MRVII-S systems are installed, to identify the matching outdoor and indoor, please label on the outdoor electric control box cover to indicate the connected indoor unit as shown in the below figure:



Trial operation and the performance

Trial operation

- Before trial operation:
  Before being powered on, measure the resistance between the power terminal block (live wire and neutral wire) and the ground point with a multimeter. Check if it is over 1M Ω. If it is not, the unit will not operate.
  To protect the compressor, power the outdoor unit for at least 12 hours before running the unit. If the crankcase heater is not powered on for 6 hours, the compressor will not work.
  Confirm the bottom of the compressor is getting hot.
  Except for when there is only one master unit connected (no slave unit), for all other conditions, fully open the outdoor service valves (gas side, liquid side). If the unit is operated without opening the valves, compressor failure will occur.
  Confirm all indoor units are powered. If not, water leakage will occur.
  Measure the system pressure while the unit is operating.
- Trial operation
  During trial operation, refer to the information in the performance section. If the unit can not start up at the current room temperature, enter trial operation at the outdoor unit.

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