Installation Manual for Outdoor Unit

YCV280HR
YCV335HR
YCV400HR
YCV450HR

No. 0150514187

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

User Manual

This series is cooling and heating heat recovery models. Only when the system is equipped with VP device, indoor units under different VP device can achieve cooling and heating simultaneously. The modes of the indoors which under the same Valve Package (following text called VP) device should be the same. If the indoors connected without VP device, the indoors only can do cooling mode.

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.

Contents

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℃	WB:23℃
		Min.	DB:18℃	WB:14℃
	Outdoor	Max.	DB:43℃	
		Min.	DB:-5℃	
Heating	Indoor	Max.	DB:27℃	
		Min.	DB:15℃	
	Outdoor	Max.		WB:15.5℃
		Min.		WB:-15℃
Cooling and heating	Indoor	Max.	DB:27℃	
		Min.	DB:18℃	WB:14℃
	Outdoor	Max.		WB:18℃
		Min.		WB:-8℃

Safety

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

⚠WARNING

- The installation or the maintenance should be performed by an authorized agency. The wrong operation of this air condition 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 condition equipment should follow local construction codes.
- Use the right cable size, secure the terminal firmly, organize the cables well and make sure no tension is added on cables. Cable insulation should not be damaged. The incorrect installation may lead to overheat 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 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. Wrong installation may lead to water leakage.
- All of liquid pipe ,HP gas pipe and the suction gas pipe should be also well insulated. Not enough insulation may lead to system performance deterioration or humidity formation.
- This air condition 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 condition equipment.
- 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.

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.

⚠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.
- Units installed on roof should have appropriate access and handrail.
- Use the wrench to fasten the nut and flare at proper torque. Excessive torque may cause flared section to broke leading to refrigerant leakage.
- After refrigerant pipe installation, please take nitrogen leakage test to avoid refrigerant leakage.
- R-410A is the only permitted refrigerant.
- To avoid mischarging wrong refrigerant, the check valve diameter is changed for R-410A. To strengthen the pipe, the flared pipe dimension is also changed. Please use R-410A specified tools as shown below.

	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 weight for charging R410A	No other means permitted
4	Torque wrench	
5	Flare tool	
6	Copper pipe gauge for adjusting projecting margin	
7	Vacuum pump fitting	Vacuum pump must be equipped with check valve
8	Leakage detector	Only Helium detector permitted

- When charging refrigerant, the refrigerant must be in liquid state from the tank.
- To prevent EMC interference on other appliances, please keep indoor unit, outdoor unit, power cable and connecting wire at least 1m away from those appliances .
- Fluorescent lamp (reverse phase or rapid start type) may interfere the remote controller's signal. Please install indoor unit away from fluorescent lamp. The farther the better.
- Any indoor or outdoor unit which finishes the maintenance, must repower the unit system.

Installation instruction

For installation, please review the items below:

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

Before installation, read the manual for outdoors, indoors and VP units.

(1) Before installation

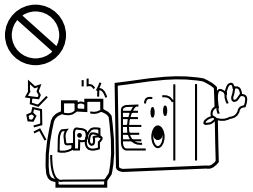
1) Before installation, check respectively if the model, power supply, pipe, wires and parts purchased are correct.
2) Check if the indoors and outdoors can be combined as the following.

Outdoor		Indoor		Gather pipe
Capacity (100W)	Combination type	Indoor Qty	Total indoor capacity (kBtu/h)	
280	Single (10HP)	16	140-364	
335	Single (12HP)	19	167-436	
400	Single (14HP)	23	200-520	
450	Single (16HP)	26	225-585	
560	Combination (280+280)	33	280-728	TAS20HR
615	Combination (335+280)	36	307-800	TAS20HR
680	Combination (400+280)	39	340-884	TAS20HR
730	Combination (450+280)	43	365-949	TAS20HR
800	Combination (400+400)	46	400-1040	TAS20HR
850	Combination (400+450)	50	425-1105	TAS20HR
900	Combination (450+450)	53	450-1170	TAS20HR
960	Combination (400+280+280)	56	480-1248	TAS30HR
1010	Combination (450+280+280)	59	505-1313	TAS30HR
1080	Combination (280+400+400)	63	540-1404	TAS30HR
1130	Combination (400+280+450)	64	565-1469	TAS30HR
1180	Combination (450+450+280)	64	590-1534	TAS30HR
1235	Combination (335+450+450)	64	617-1606	TAS30HR
1300	Combination (400+450+450)	64	650-1690	TAS30HR
1350	Combination (450+450+450)	64	675-1755	TAS30HR

Installation instruction

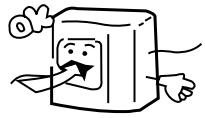
(2) Installation place selection

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 where the cold/hot air or noise will not interfere the neighbours.

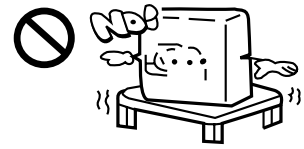
The unit should be installed at the place with good ventilation. No obstacle at the air inlet/outlet. And no strong wind blows the unit.



The installation space refers to the latter info.

- The 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 unit.
- In installation, install the anti-vibration rubber between the unit and the bracket.

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

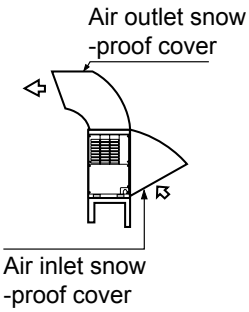


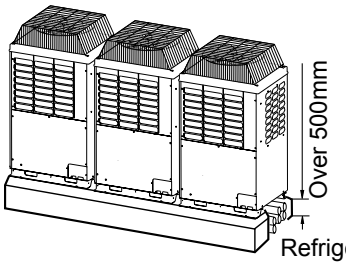
- The unit is better not be installed at the below places, or it will cause damage.
- The place where there is corrosive gas (spa area, etc).
- The place blowing salty air (seaside, etc).
- The place existing strong coal smoke.
- The place with high humidity.
- The place where there is device emitting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

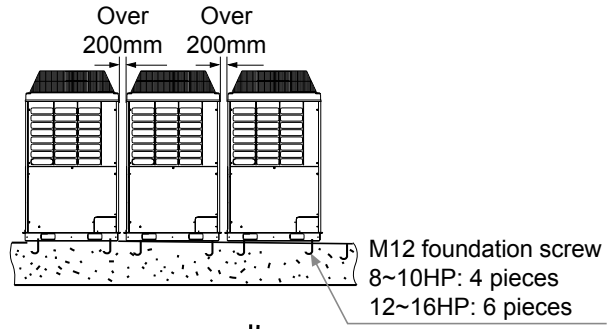
Installation instruction

Note:

1. Install adapter to change wind direction at the gas short circuit place.
2. When installing multiple units, there should be enough air inlet place against air in short circuit.
3. In snowy area, install the unit under the bracket or the snow-proof cover against the accumulative snow on the unit.
4. Do not install the unit at the place where the flammable gas will leak.
5. Install the unit at the strong enough place.
6. Install the unit at the flat place.
7. When the refrigerant pipe is leaded out from the bottom of the unit, the below section should be a bracket with over 500mm height, see below figure.
8. 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.
9. When opening the electric box cover for maintenance, please fix the cover with screw firmly.

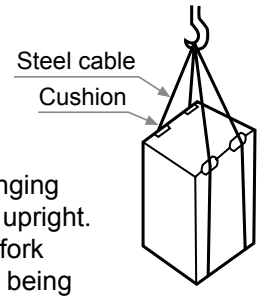


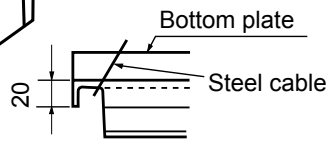




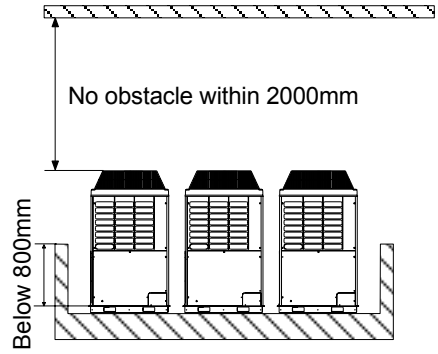
(3) Transportation

- In transportation, please don't dismantle the packaging, and move the unit to the installation location as closely as possible.
- 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.





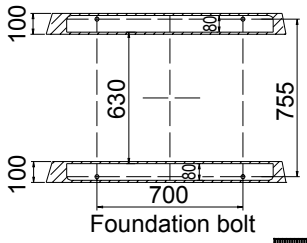
Note:
There should be no obstacles in 2000mm above the top of outdoor unit;
Obstacles around outdoor unit should be less than 800mm to the bottom of unit.

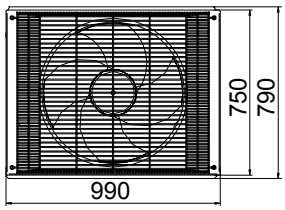


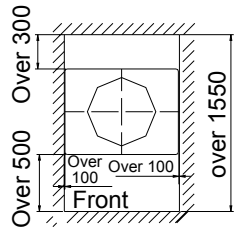
When multiple modules are installed, the outdoor unit should be in ranked as the capacity, the larger capacity is closer to the main pipe of gather pipe.

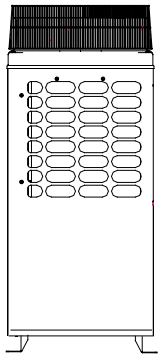
Exterior and installation dimensions

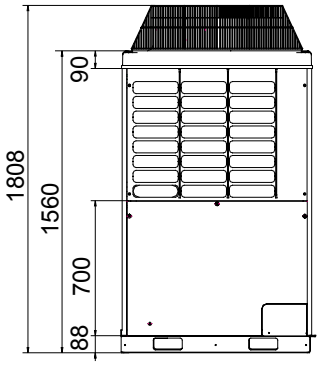
1. 8~10HP exterior and installation dimensions (AV08IMVUSA YCV280HR)



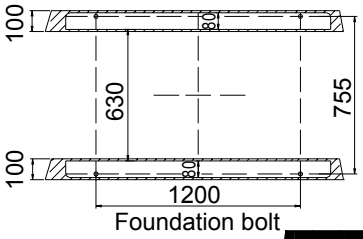


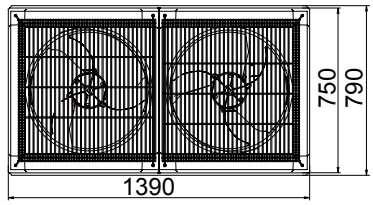


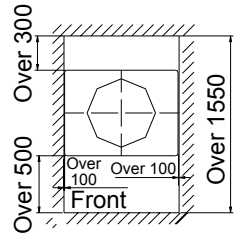


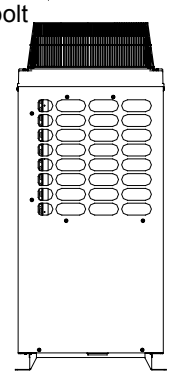


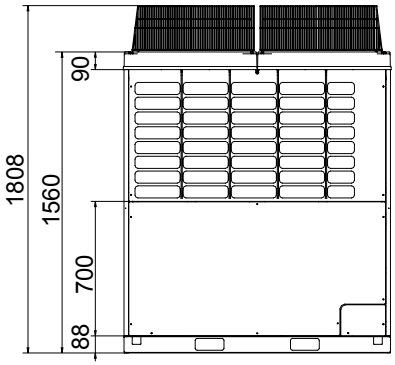
2. 12~16HP exterior and installation dimensions (YCV335HR YCV400HR YCV450HR)











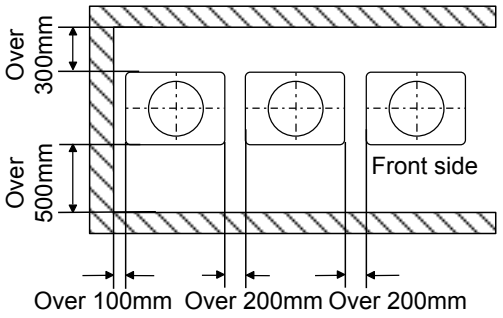
Note:
The distance between two outdoor units in the same line and the distance from unit to the wall can be increased for easy maintenance and better heat exchange if there is enough space.

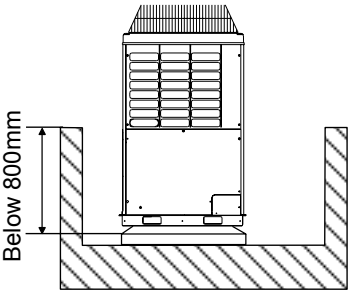
Exterior and installation dimensions

3. Combination installation dimensions

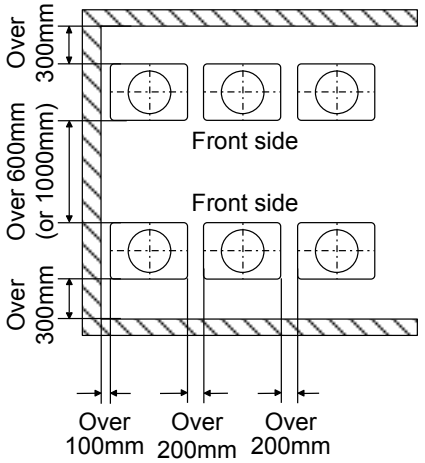
(1) When outer wall is lower than the outdoor condenser

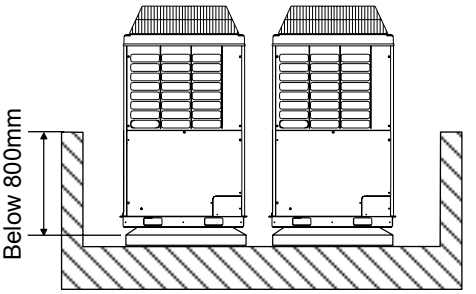
A. Sites for one-row layout



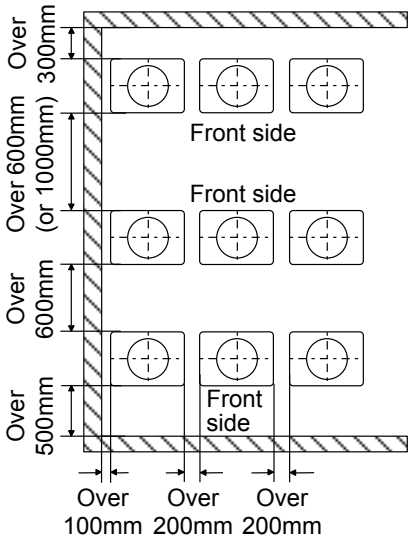


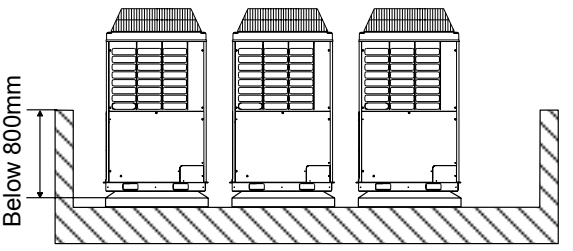
B. Sites for two-row layout





C. Sites for three-row layout





Exterior and installation dimensions

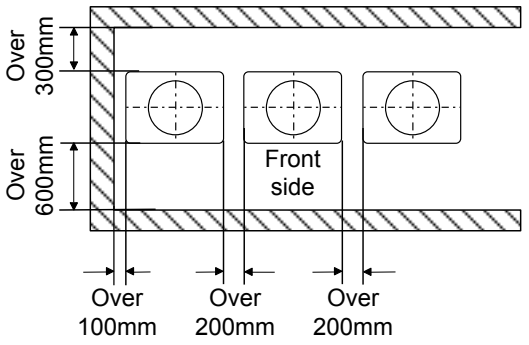
(2) Wall higher than the outdoor condenser

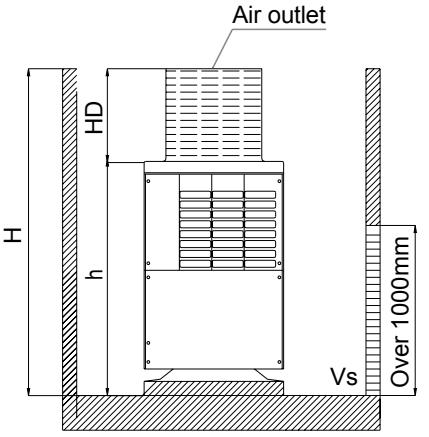
A. Place with air inlet hole

Notes:

a. Fan speed Vs at air inlet is 1.5m/s or below.

b. Air outlet height HD=H-h and below 1m.



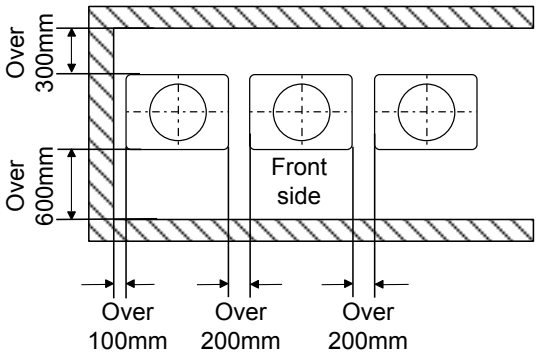


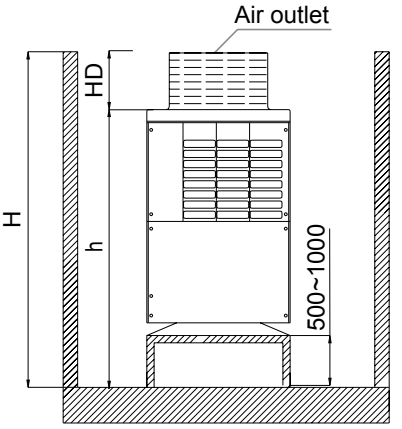
B. Place without air inlet hole

Notes:

a. Set a 500~1000mm bracket.

b. Air outlet height HD=H-h and below 1m.





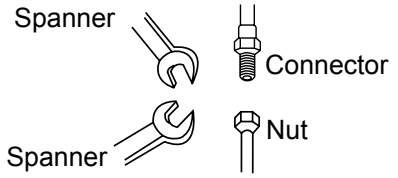
Installation procedure

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.
- Fastening torque please refers to "pipe specs and fastening torque" on page 21.
- Don't let the impurity such as sand, water etc into the pipe. Antifouling measures refer to Page 10.

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:

1. When welding the pipe with hard solder, charge nitrogen into the pipe against oxidation. The pressure gauge should be set at 0.02MPa.Perform the procedure with nitrogen circulation. Otherwise, the oxide film in the pipe may clog the capillary and expansion valve resulting in accident.
2. 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).
3. The piping installation should be executed after closing the stop valves.
4. When welding the valve and the pipe, cool down the valve with wet towel.
5. When the connection pipe and the branch pipe need to be cut down, please use the special shears and do not use the saw.
6. When welding copper pipe, use the phosphor copper welding rod without any welding flux. (welding flux will damage the piping system. The welding flux containing chlorine will corrode pipe, especially, the welding flux with fluorin will damage refrigeration oil.)

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 O-type, the pressure preservation will be bad, thus it must be 1/2H type and over the min. thickness.
3. The branch pipe and the gather 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.

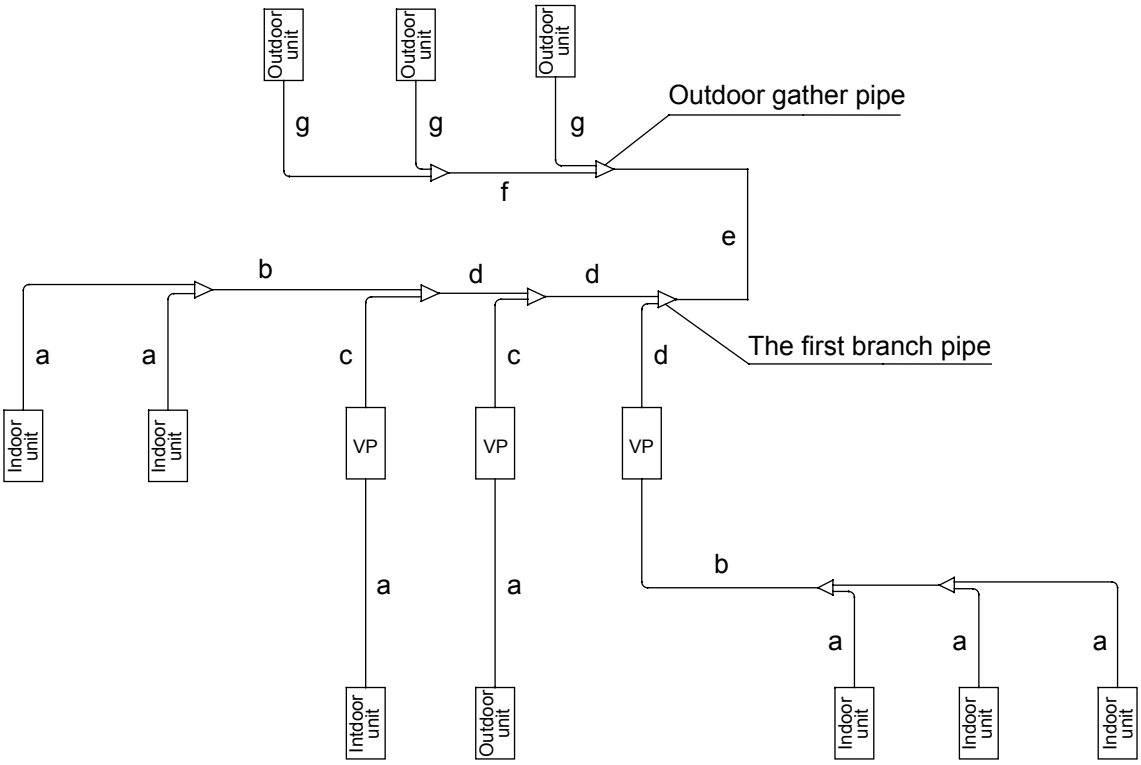
Installation procedure

Anti-fouling measures

First, clean the pipe.

Position	Installation period	Measures
Outdoor	More than 1 month	Flat the pipe end
	Less than 1 month	Flat the pipe end or seal with adhesive tape
Indoor	Nothing to do with period	

Pipe specification:



Installation procedure

1. Pipe "a" diameter (between indoor and branch pipe) (depends on indoor pipe)

Indoor (x100W)	Gas pipe (mm)	Liquid pipe (mm)
22~28	Ø9.52	Ø6.35
36~56	Ø12.7	Ø6.35
71~140	Ø15.88	Ø9.52

Note:
AS072 AS092 gas pipe: Ø12.7mm
AS182 gas pipe/ liquid pipe: Ø15.88mm/9.52mm

2. Pipe "b" diameter (between branch pipes)

Total indoor capacity after the branch pipe (kW)	Gas pipe (mm)	Liquid pipe (mm)
X<16.8kW	Ø15.88	Ø9.52
16.8kW≤X<22.4kW	Ø19.05	Ø9.52
22.4kW≤X<33.0kW	Ø22.22	Ø9.52
33.0kW≤X<47.0kW	Ø28.58	Ø12.7
47.0kW≤X<71.0kW	Ø28.58	Ø15.88
71.0kW≤X<101.0kW	Ø31.8	Ø19.05
≥101.0kW	Ø38.1	Ø19.05

Note:
Adjust the diameter on field (changing pipe is needed)
When the latter indoor total capacity is less than 14.0kw, pipe b will use the specs as the pipe a.

3. Pipe "c" diameter (between VP and branch pipe) (depends on VP pipe)

VP capacity	Suction gas pipe (mm)	HP gas pipe (mm)	Liquid pipe (mm)
4HP	Ø15.88	Ø12.7	Ø9.52
6HP	Ø15.88	Ø15.88	Ø9.52
10HP	Ø22.22	Ø19.05	Ø9.52

4. Pipe "d" diameter (between VP branch pipes)

Total indoor capacity after the branch pipe (KW)	Suction gas pipe (mm)	HP gas pipe (mm)	Liquid pipe (mm)
X<11.2kW	Ø15.88	Ø12.7	Ø9.52
11.2kW≤X<16.8kW	Ø15.88	Ø15.88	Ø9.52
16.8kW≤X<22.4kW	Ø19.05	Ø15.88	Ø9.52
22.4kW≤X<33.0kW	Ø22.22	Ø19.05	Ø9.52
33.0kW≤X<47.0kW	Ø28.58	Ø25.4	Ø12.7
47.0kW≤X<71.0kW	Ø28.58	Ø25.4	Ø15.88
71.0kW≤X<101.0kW	Ø31.8	Ø28.58	Ø19.05
≥101.0kW	Ø38.1	Ø31.8	Ø19.05

Installation procedure

5. Pipe "e" diameter (main pipe, between outdoor gather pipe and the first branch pipe)

Outdoor capacity (kW)	Main pipe			Enlarged main pipe		
	Suction gas pipe (mm)	HP gas pipe (mm)	Liquid pipe (mm)	Suction gas pipe (mm)	HP gas pipe (mm)	Liquid pipe (mm)
28.0	Ø22.2	Ø19.05	Ø9.52	Ø25.4	Ø19.05	Ø12.7
33.5	Ø25.4	Ø22.22	Ø12.7	Ø28.58	Ø22.22	Ø15.88
40.0	Ø25.4	Ø22.22	Ø12.7	Ø28.58	Ø22.22	Ø15.88
45.0	Ø28.58	Ø22.22	Ø12.7	Ø31.8	Ø22.22	Ø15.88
50.4	Ø28.58	Ø25.4	Ø15.88	Ø31.8	Ø25.4	Ø19.05
56.0	Ø28.58	Ø25.4	Ø15.88	Ø31.8	Ø25.4	Ø19.05
61.5	Ø28.58	Ø25.4	Ø15.88	Ø31.8	Ø28.58	Ø19.05
68.0	Ø28.58	Ø25.4	Ø15.88	Ø31.8	Ø28.58	Ø19.05
73.0	Ø31.8	Ø28.58	Ø19.05	Ø34.9	Ø31.8	Ø22.22
80.0	Ø31.8	Ø28.58	Ø19.05	Ø34.9	Ø31.8	Ø22.22
85.0	Ø31.8	Ø28.58	Ø19.05	Ø34.9	Ø31.8	Ø22.22
90.0	Ø31.8	Ø28.58	Ø19.05	Ø34.9	Ø31.8	Ø22.22
96.0	Ø34.9	Ø28.58	Ø19.05	Ø38.1	Ø31.8	Ø22.22
101.0	Ø34.9	Ø28.58	Ø19.05	Ø38.1	Ø31.8	Ø22.22
108.0	Ø38.1	Ø31.8	Ø19.05	Ø38.1	Ø31.8	Ø22.22
113.0	Ø38.1	Ø31.8	Ø19.05	Ø38.1	Ø31.8	Ø22.22
118.0	Ø38.1	Ø31.8	Ø19.05	Ø38.1	Ø31.8	Ø22.22
123.5	Ø38.1	Ø31.8	Ø19.05	Ø38.1	Ø31.8	Ø22.22
130.0	Ø38.1	Ø31.8	Ø19.05	Ø38.1	Ø31.8	Ø22.22
135.0	Ø38.1	Ø31.8	Ø19.05	Ø38.1	Ø31.8	Ø22.22

Note:
When the distance from outdoor to the longest indoor is over 90m, the main pipe should be the enlarged diameter.

6. Pipe "f" diameter (between gather pipes)

Total outdoor capacity before gather pipe (kW)	Liquid pipe (mm)	HP gas pipe (mm)	Suction gas pipe (mm)
~68.0	Ø15.88	Ø25.4	Ø28.58
68.0~90	Ø19.05	Ø28.58	Ø31.8

7. Pipe “g” diameter (between outdoor and the gather pipe)

Outdoor capacity	Suction gas pipe (mm)	HP gas pipe (mm)	Liquid pipe (mm)	Oil equalization pipe (mm)
10HP	Ø22.2	Ø19.05	Ø9.52	Ø9.52
12/14 HP	Ø25.4	Ø22.22	Ø12.7	Ø9.52
16HP	Ø28.58	Ø22.22	Ø12.7	Ø9.52

Installation procedure

Copper pipe selection:

Material	O type pipe: Soft pipe				
Pipe diameter (mm)	Ø6.35	Ø9.52	Ø12.7	Ø15.88	Ø19.05
Thickness(mm)	0.8	0.8	1.0	1.0	1.1

Material	Hard pipe							
Pipe diameter (mm)	Ø19.05	Ø22.22	Ø25.4	Ø28.58	Ø31.8	Ø34.9	Ø38.1	Ø41.3
Thickness(mm)	1.0	1.0	1.0	1.0	1.1	1.3	1.4	1.5

Long pipe and high drop

1. Applicable range

Item \ Model		All outdoors
Single way total pipe length		300m (correspond length)
Single way pipe length		Max. 175m (correspond length)
Main pipe beween outdoor to 1st branch		Max. 135m (correspond length)
Pipe length between outdoors		Less than 10m to 1st branch pipe
Height difference between indoor and outdoor	Outdoor is upper	Max. 50m
	Outdoor is lower	Max. 40m
Height difference between outdoors (in the same system)		Within 5m (better be horizontal)
Max. pipe length from 1st branch pipe to indoor		Max. 40m
Height difference between indoors		Max. 15m

When the pipe between the outdoor unit and its furthest indoor unit is longer than 90m, the specification of master pipe (Gas pipe/ Liquid pipe) between outdoor unit and the first Y joint should be upgraded for one level. For more details, please refer to "*Outdoor pipe selection table*"

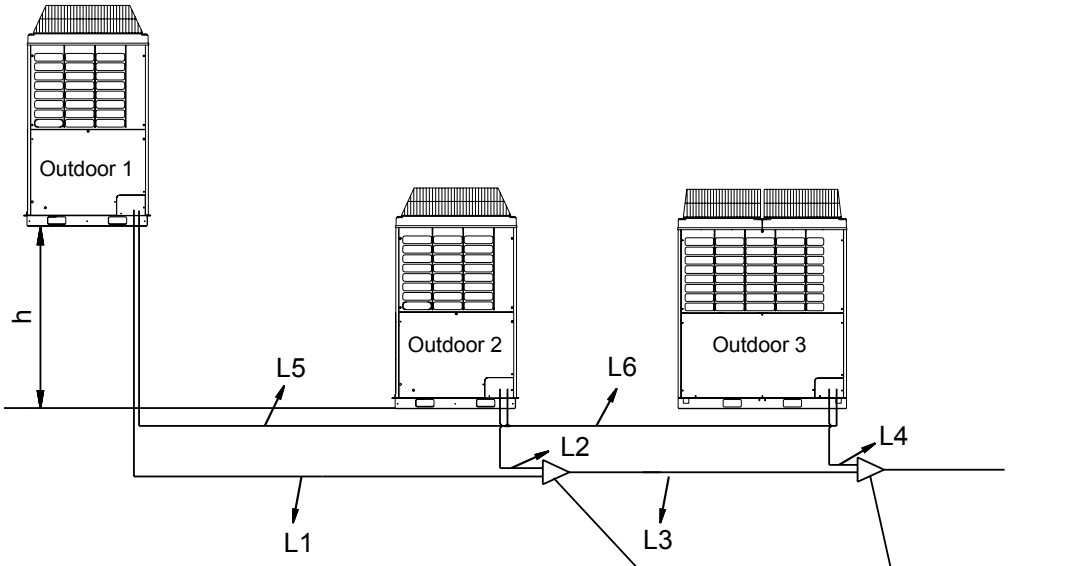
When the pipe between the first Y joint and its furthest indoor unit is longer than 40m,

(1) The specification of the master pipe (Gas pipe/ Liquid pipe) between the first Y joint and its furthest indoor unit should be upgraded for one level.

(2) The distance between the furthest indoor unit and the nearest one ≤ 40m.

Installation procedure

2. Pipe length between outdoors



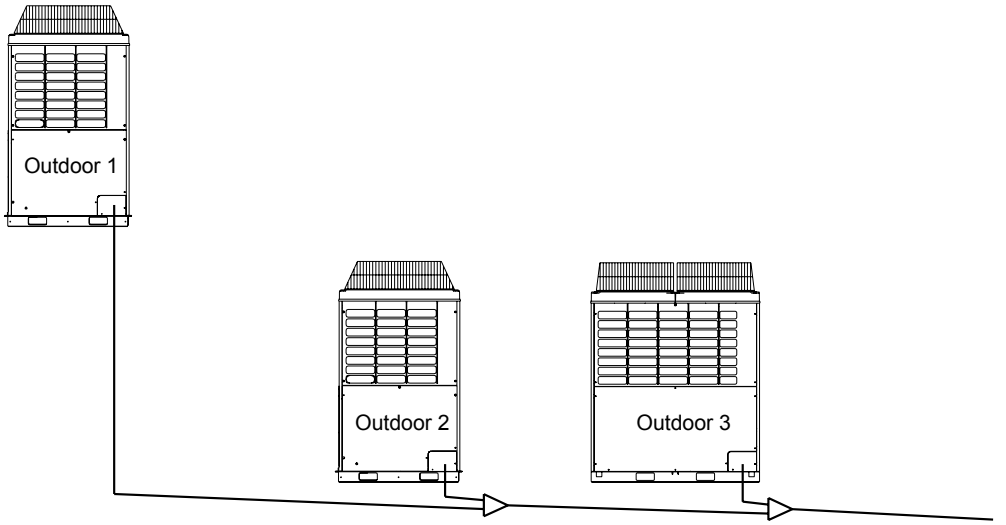
Gas/Liquid pipe: L1+L3<10m, L2+L3<10m
Oil equalization pipe: L5+L6<10m
Height difference between outdoors: h<5m

Note:

a. TAS30HR includes TAS20HR;

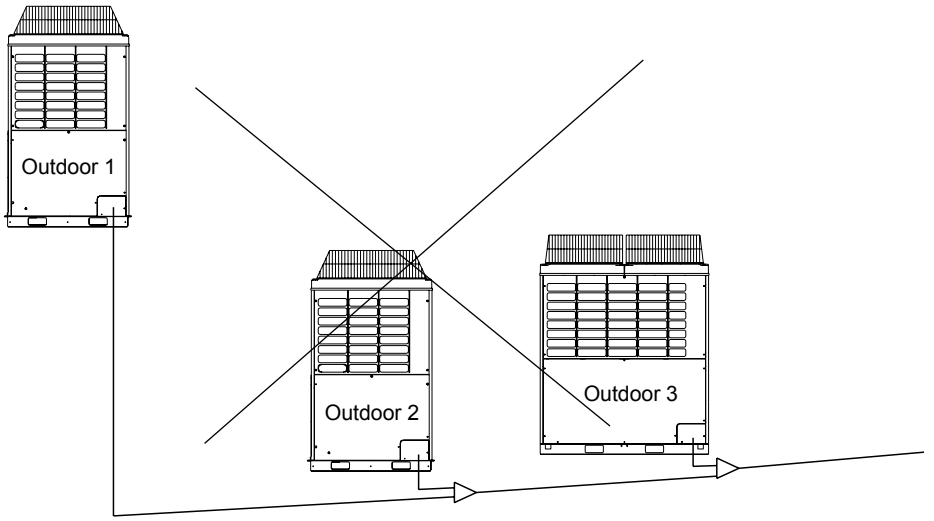
b. The connection pipe among outdoors can not be higher than the stop valve position;

c. The connection pipe among outdoors should be horizontal or be in a certain angle as the below figure (less than 15 degree).

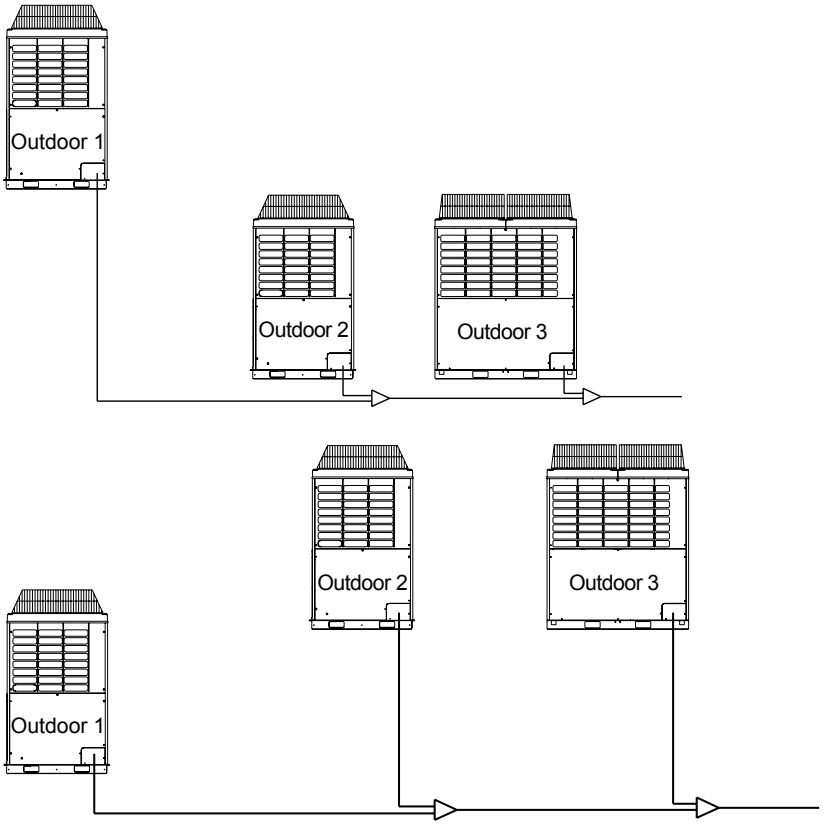


Installation procedure

Piping installation with positive slope is not allowed

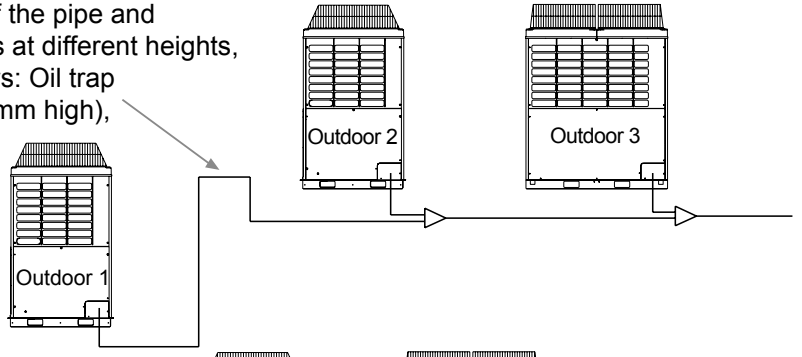


d. For installations with outdoors at different heights ,please follow either of the lay out below:

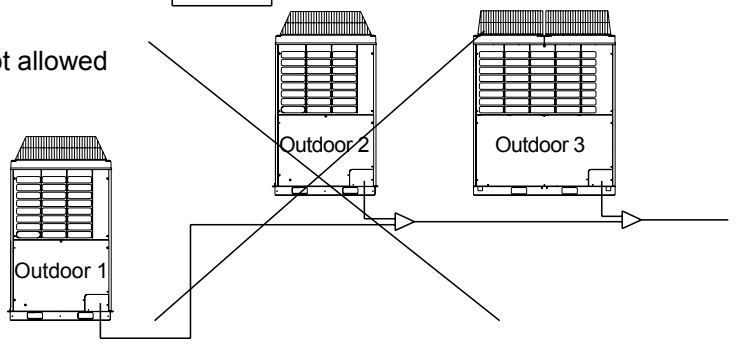


Installation procedure

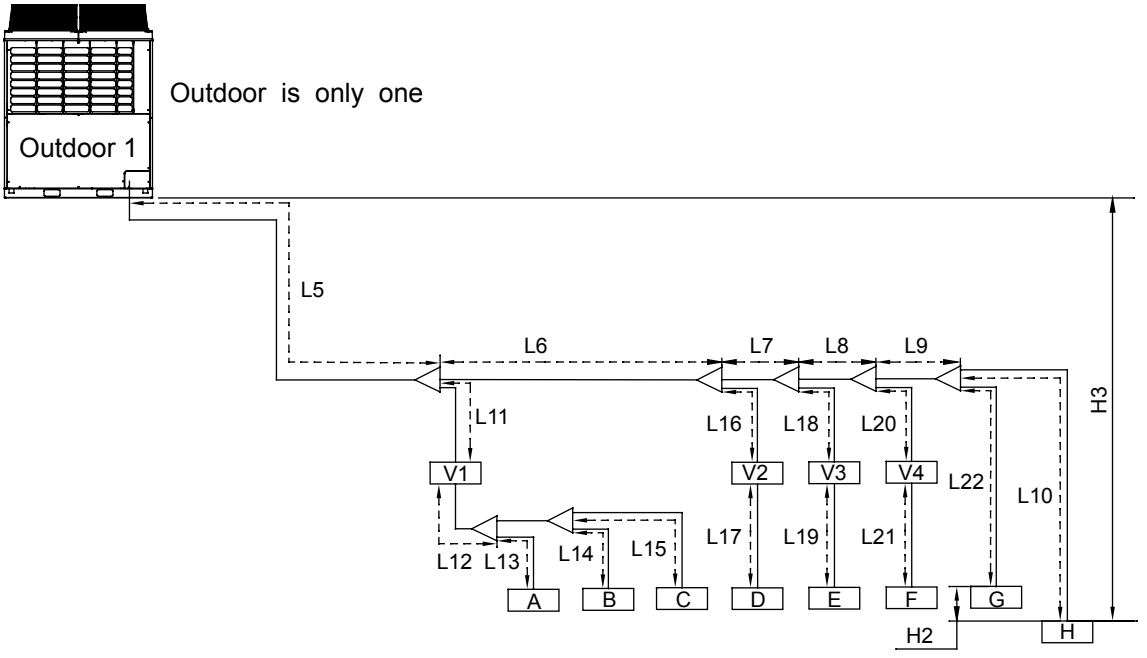
When changing the height of the pipe and connecting different outdoors at different heights, please do as the figure shows: Oil trap (upright projecting pipe, 200mm high), for maximum outdoor unit height difference, please refer to Page 17



Installation below is not allowed



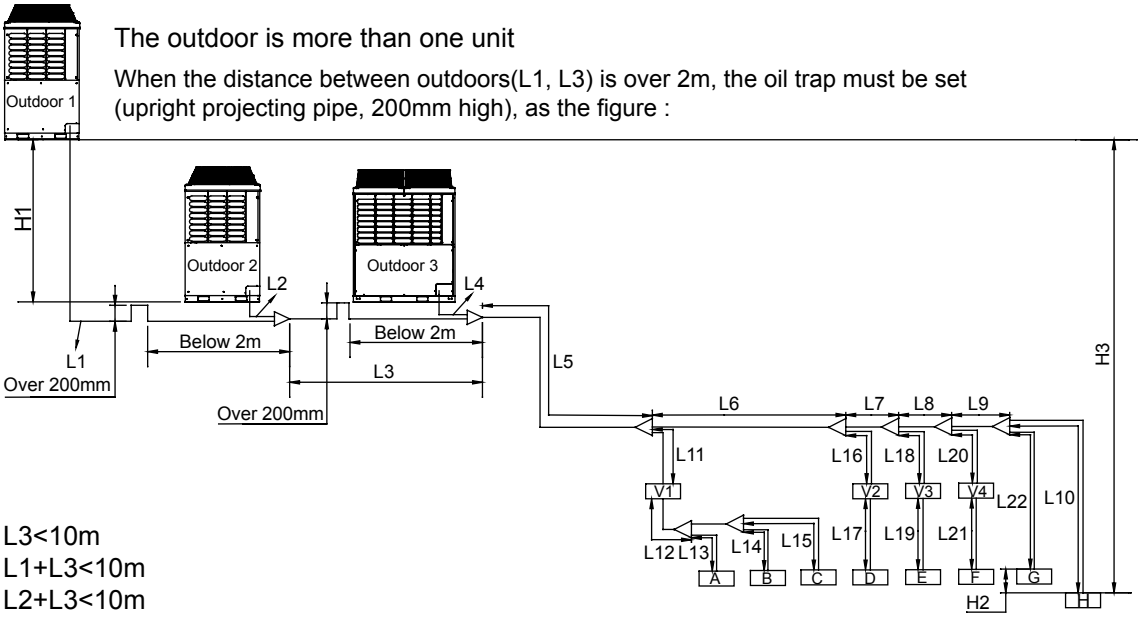
3. Allowable piping length and drop between indoor and outdoor



Installation procedure

The outdoor is more than one unit

When the distance between outdoors(L1, L3) is over 2m, the oil trap must be set (upright projecting pipe, 200mm high), as the figure :



L3<10m
L1+L3<10m
L2+L3<10m

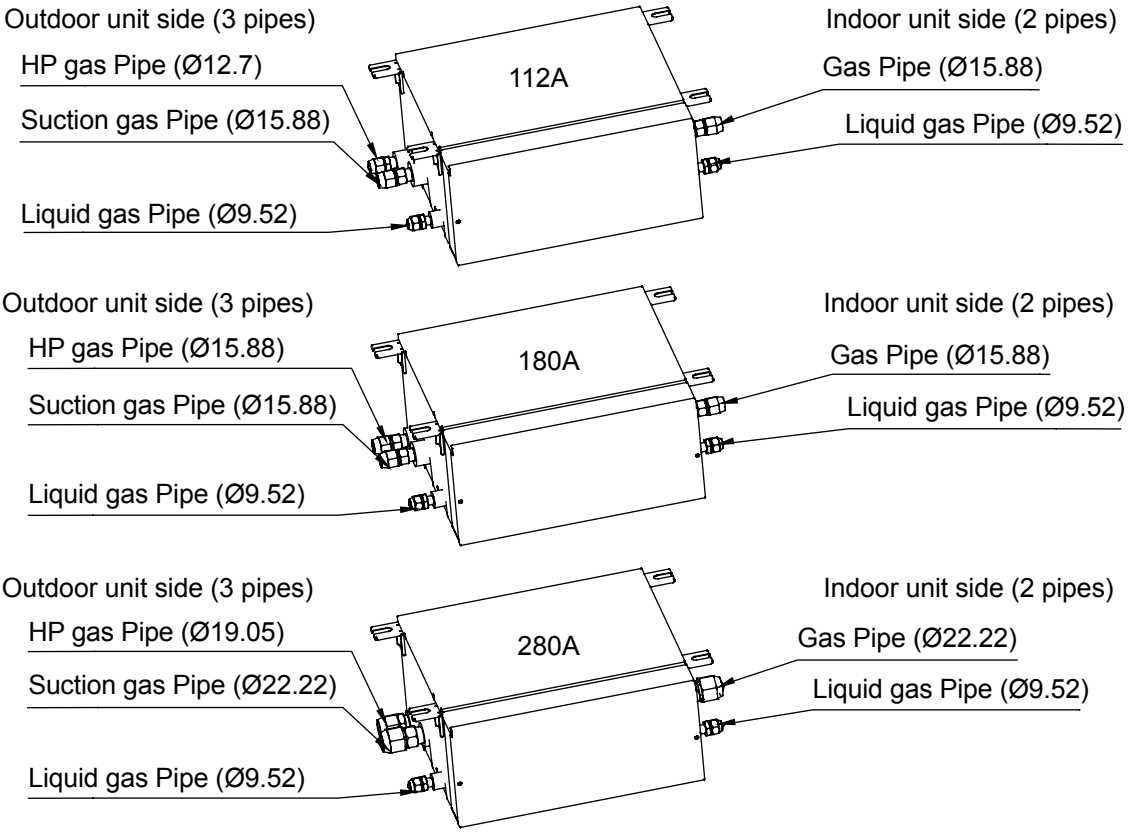
Note:
V1---V4: VP unit
A---F: indoors (cool/heat selection possible)
G---H: indoors (cooling only)

	Max.length	Pipe in above figure
Single way total pipe length	300 (correspond length)	L1+L2+L3……+L22
Single way max. pipe length	175 (correspond length)	L1+L3+ L5+L6+L7+L8+L9+L10
Max.pipe length after 1st branch pipe	40	L6+L7+L8+L9+L10
Main pipe actual length	135 (correspond length)	L5
Height difference between indoors	15	H2
Height difference between outdoors	5	H1
Height difference between outdoors and indoors	50 40	H3 when outdoor is upper H3 when outdoor is lower
Max.pipe length between indoors and the nearest branch pipe	30	---

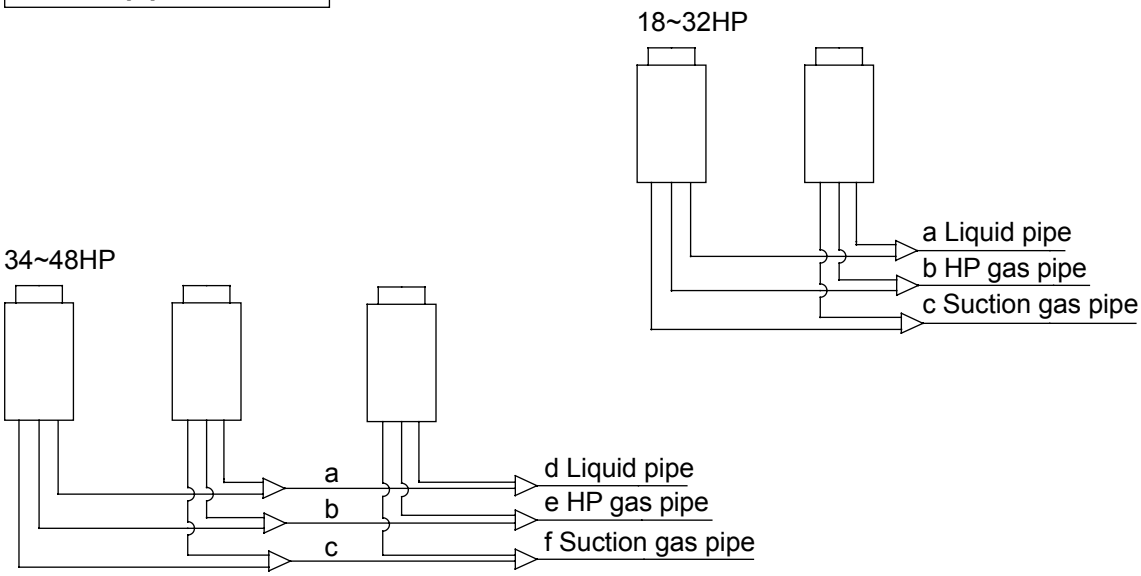
When outdoor is only one, Single way max. pipe length = L5+L6+L7+L8+L9+L10≤175m
Single way total pipe length = L5+L6……+L22

Installation procedure

4. Example of connection



Outdoor pipe dimension



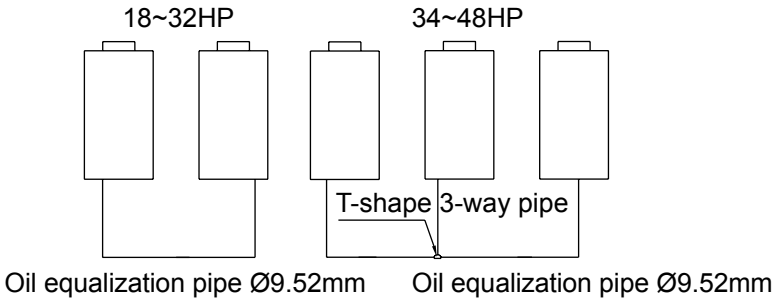
Installation procedure

The pipe "a, b, c, d, e, f" should be confirmed as to the below table.

Total outdoor capacity before the gather pipe (kW)	Suction gas pipe (c,f) (mm)	HP gas pipe (b,e) (mm)	Liquid pipe (a,d) (mm)
X ≤ 68	Ø28.58	Ø28.58	Ø15.88
68 < X < 96	Ø31.8	Ø28.58	Ø19.05
96 ≤ X ≤ 101	Ø34.9	Ø28.58	Ø19.05
X > 101	Ø38.1	Ø31.8	Ø19.05

Note: When the single pipe length is over 90m, the above pipe should be enlarged as the former information.

Oil equalization pipe connection



Unit pipe spec and connection method (unit: mm)

A. Outdoor unit

Model	Suction gas pipe side		Liquid pipe side	
	Diameter (mm)	Connecting method	Diameter (mm)	Connecting method
				Flared
YCV280HR	Ø22.22	Braze	Ø9.52	
YCV335HR	Ø25.4		Ø12.7	
YCV400HR	Ø25.4		Ø12.7	
YCV450HR	Ø28.58		Ø12.7	

Model	HP gas pipe side		Oil pipe side	
	Diameter (mm)	Connecting method	Diameter (mm)	Connecting method
		Flared		Flared
YCV280HR	Ø19.05		Ø9.52	
YCV335HR	Ø22.22	Braze	Ø9.52	
YCV400HR	Ø22.22		Ø9.52	
YCV450HR	Ø22.22		Ø9.52	

Installation procedure

B. Indoor unit

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

Note:
AS072, AS092 gas pipe: Ø12.7mm; AS182 gas pipe/ liquid pipe: Ø15.88/9.52mm

C. Pipe spec and the torque

Diameter (mm)	Torque(N·m)
Ø6.35	16~20
Ø9.52	40~50
Ø12.7	40~50
Ø15.88	90~120
Ø19.05	100~140
Not less than Ø22.22	No requirement, due to braze connector

Branch pipe

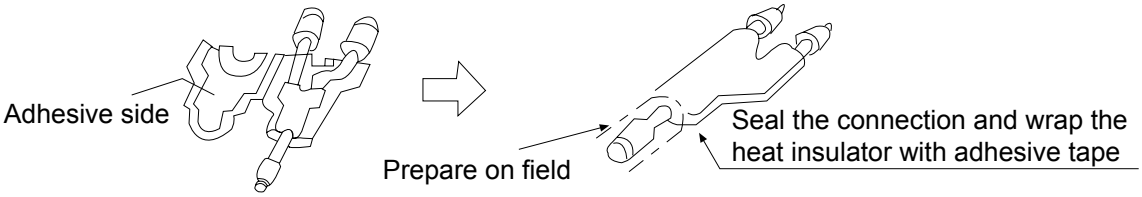
Branch pipe selection:

Total indoor capacity (100W)	Model(optional)	
	3 pipes	2 Pipes
X < 335	TAU335HR	TAU335
335 ≤ X < 506	TAU506HR	TAU506
506 ≤ X < 730	TAU730HR	TAU730
X ≥ 730	TAU1350HR	TAU1350

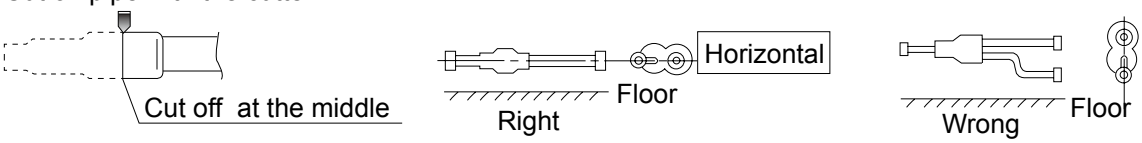
Outdoor unit type
The master unit will choose the closest one to the 1st branch pipe.

Installation procedure

Note:
1. When connecting the outdoor branch pipe and the outdoor, please pay attention to the outdoor pipe dimension.
2. When adjusting the diameter among outdoor branch pipe and among the units, please do execute at the branch pipe side.
3. Please install the outdoor branch pipe (suction gas/HP gas/liquid side) in horizontal or vertical direction.
4. When welding with hard solder, please do blow nitrogen. If not, a number of oxides will be produced and cause heavy damage.Besides, prevent water and dust going into the pipe, please make the brim as outer roll.



Cut off pipe with the cutter

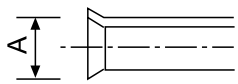


Pipe installation

When doing the piping connection, please do the following:

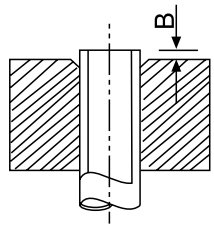
- Please don't let the pipe and the parts in the unit collide each other.
- When connecting the pipes, close the valves fully.
- Protect the pipe end against and water, impurities (welding after being flatted, or being sealed with adhesive tape).
- Bend the pipe as large semi-diameter as possible(over 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)



Pipe outer diameter (mm)	A $^{0}_{-0.4}$
Ø6.35	9.1
Ø9.52	13.2
Ø12.7	16.6
Ø15.88	19.7

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



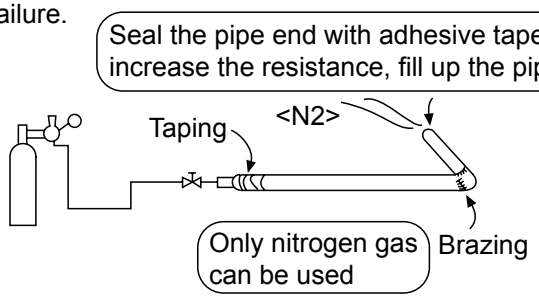
Pipe outer diameter (mm)	When it is hard pipe	
	Special tool for R410A	The former tool
Ø6.35	0-0.5	1.0-1.5
Ø9.52		
Ø12.7		
Ø15.88		

Installation procedure

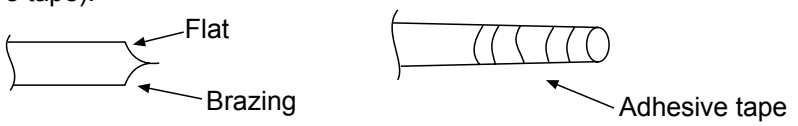
- The outdoor suction gas pipe /HP gas pipe and the refrigerant distributing pipe, as well as the refrigerant distributing pipe and the branch pipe should be welded with hard solder.
- When doing the braze connection, please do the following: Braze the pipe while charging the nitrogen. Or it will cause a number of impurities (a film of oxidation) to clog the capillary and the expansion valve, further cause the deadly failure.

Operation procedure

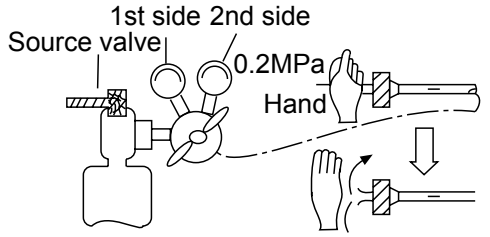
- Braze the pipe and charge the nitrogen at the same time. Or it will cause a number of impurities (a film of oxidation) to clog the capillary and the expansion valve, further cause the deadly failure.



- Protect the pipe end against water and impurities (welding after being flatted, or being sealed with adhesive tape).



- The refrigerant pipe should be clean. 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).

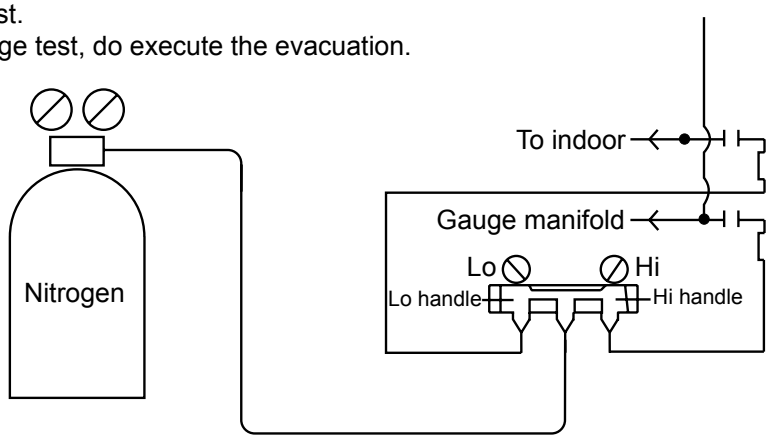


- When connecting the pipes, close the valves fully.
- When welding the valve and the pipes, use the wet cloth to cool down the valve and the pipes.

Installation procedure

B. Leakage test

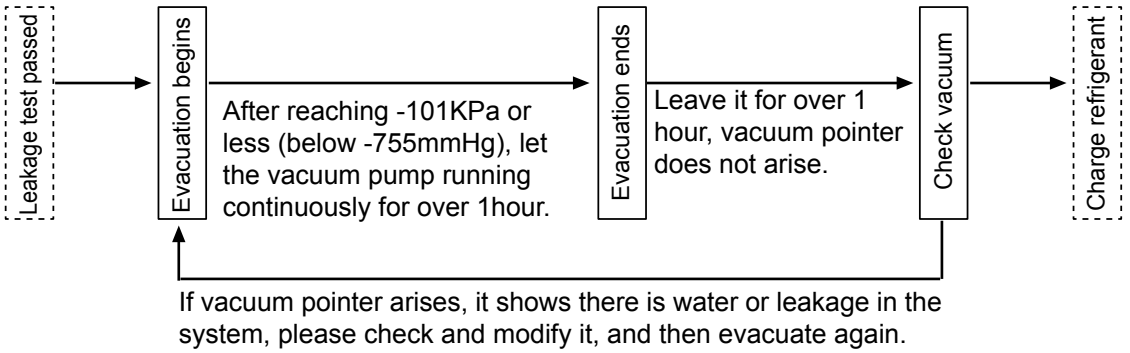
1. The outdoor unit has been executed the leakage test in the factory. The pipe should be executed leakage test individually and forbidden to test after connecting with stop valve.
2. Refer to the below figure to charge the nitrogen into the unit to take a test. Never use the chlorin, oxygen, flammable 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 (4.15MPa), record the temp. and the pressure.
   d. Leave it at 4.15MPa 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, do execute the evacuation.



C. Evacuation

Evacute at the check valve of liquid stop valve and both sides of the gas stop valve. The oil equalization pipe also must be vacuum (executed at the oil equalization pipe and check valve respectively).

Operation procedure:



Installation procedure

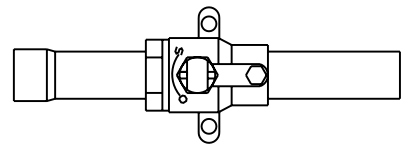
Because the unit is with refrigerant R410A, the below issues should be paid attention:

- To prevent the oil going into the pipe, please use the special tool for R410A, especially for gauge manifold and charging hose.
- To prevent the oil going into the refrigerant cycle, please use the anti-counter-flow adapter.
- When maintaining the outdoor, release refrigerant from check valve. When taking vacuum evacuation, set the relative dip switch. The details refer to Page38.

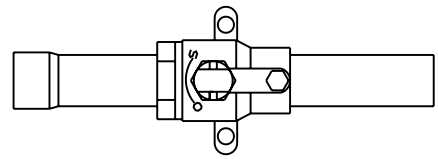
D. Check valve operation

Open/ close method: (The suction gas pipe stop valve for AV08IMVUSA, YCV280HR, YCV335HR, YCV400HR, YCV450HR)

- Take down the valve cap, suction gas pipe, HP gas pipe turns to "open"
- Turn the liquid pipe and the oil equalization pipe with hexangular spanner until it stops. If opening the valve strongly, the valve will be damaged.
- Tighten the valve cap.



"open"state



"close"state

Tighten torque as the table below:

Tighten torque N·m			
	Shaft (valve body)	Cap (cover)	T-shape nut (check joint)
For suction gas pipe and HP gas pipe	Less than 7	Less than 30	13
For liquid pipe	7.85 (MAX15.7)	29.4 (MAX39.2)	8.8 (MAX14.7)
For oil equalization pipe	4.9 (MAX11.8)	16.2 (MAX24.5)	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).

The unit is charged only part of the refrigerant at the factory, also need additional refrigerant at the installation site.
W1: Refrigerant charging volume to outdoor unit at factory.
W2: Refrigerant charging volume to outdoor unit on site.
W3: Refrigerant charging volume to liquid pipe base on different piping length calculation.
W3=actual length of liquid pipe×additional amount per meter liquid pipe=
L1×0.35+L2×0.25+L3×0.17+L4×0.11+L5×0.054+L6×0.022

Installation procedure

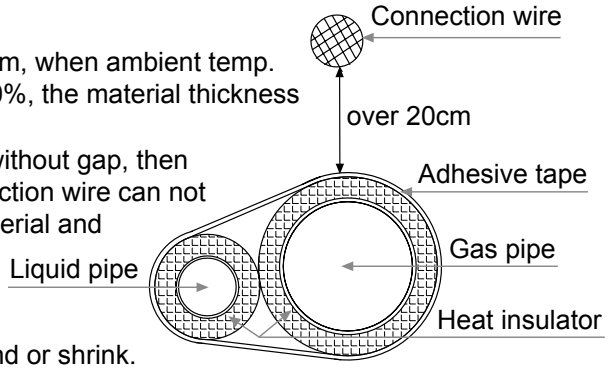
L1: Total length of 22.22 liquid pipe;
L2: Total length of 19.05 liquid pipe;
L3: Total length of 15.88 liquid pipe;
L4: Total length of 12.7 liquid pipe;
L5: Total length of 9.52 liquid pipe;
L6: Total length of 6.35 liquid pipe;
Total refrigerant volume charging on site during installation=W2+W3
W: Total refrigerant volume charging on site for maintenance.

Refrigerant record form						
Model	W1: Refrigerant charging volume to outdoor unit at factory	W2: Refrigerant charging volume to outdoor unit on site	W3: Refrigerant charging volume to liquid pipe base on different piping length calculation		Total refrigerant volume charging on site during installation	W: Total refrigerant volume charging on site for maintenance
			Liquid pipe diameter (mm)	Additional refrigerant amount (kg)		
AV08IMVUSA	10kg	1kg	Ø6.35	0.022kg/m×__m=__kg	W2+W3=___kg	W1+W2+W3=___kg
	10kg	1kg	Ø9.52	0.054kg/m×__m=__kg		
YCV335HR	10kg	4.5kg	Ø12.7	0.11kg/m×__m=__kg		
YCV400HR	10kg	4.5kg	Ø15.88	0.17kg/m×__m=__kg		
YCV450HR	10kg	4.5kg	Ø19.05	0.25kg/m×__m=__kg		
			Ø22.22	0.35kg/m×__m=__kg		
			W3=___kg			

Note:
- To prevent the oil going 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.

Heat insulation

- HP gas pipe, Suction gas pipe and liquid pipe should be heat insulated separately.
- The material for HP gas pipe and Suction 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 20mm.
- 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.

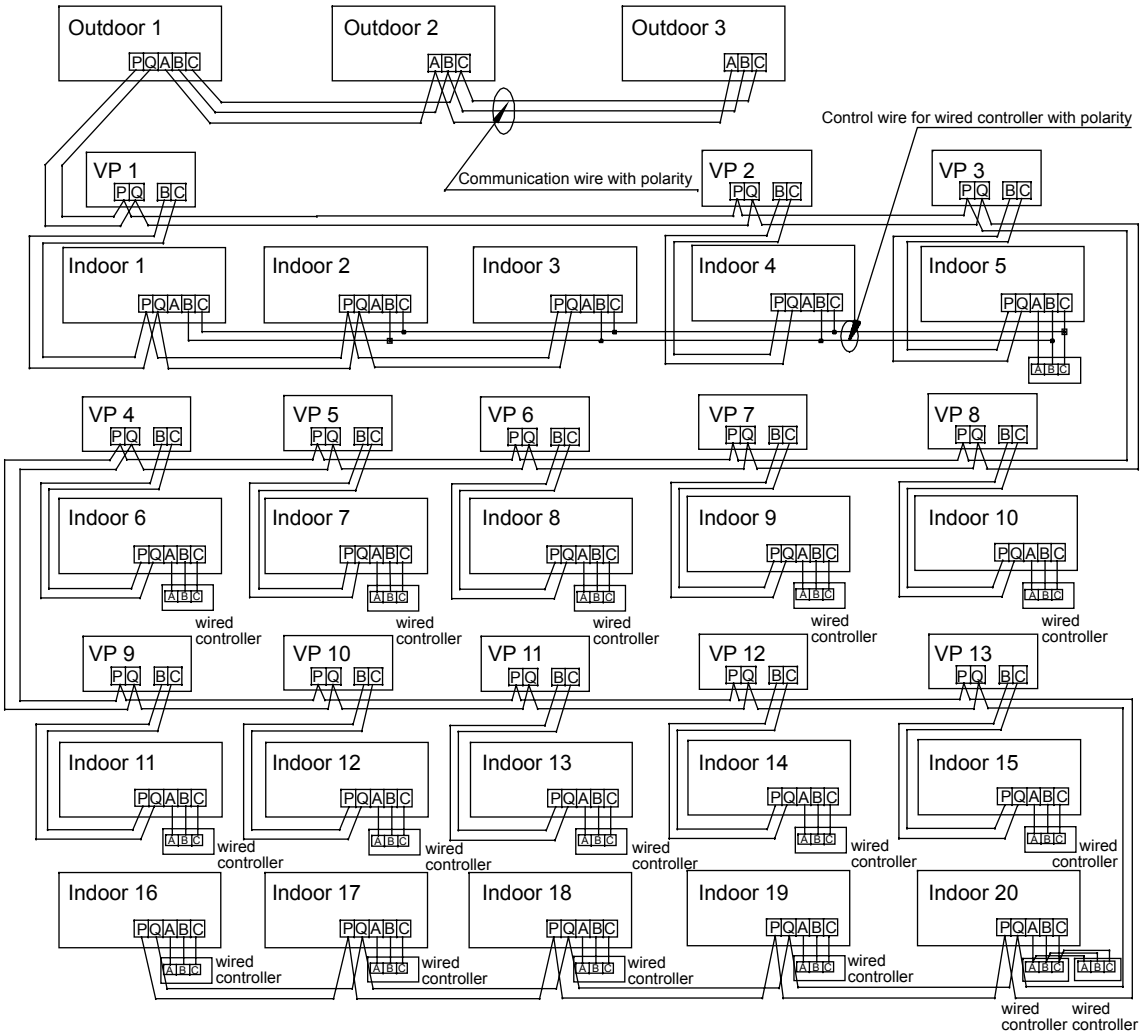


Fix the refrigerant pipe

- 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



Outdoor units are in parallel through 3 polar wires. The outdoor and all VP (cooling and heating switching device) and all indoor units are in parallel through 2 non-polar wires.

Each VP can be connected to 1~8 indoor units. For the wiring, please refer to the above picture: VP1 is connected to Indoor 1~3, and the capacity of all the indoor units can not be more than the VP's. Indoor units which are not connected to VP just have cooling operation, and the wiring can be referred to Indoor 16~20 on the above picture.

Three wiring methods between wired controller and indoor unit:

A. 1 to multi (group control): one wired controller controls 2~16 indoors, as shown in above figure, indoor 1~indoor 5: indoor 5 is wired control master unit, the others are wired control slave units. Wired controller and the master indoor (directly connected to wired controller) are connected by 3 polar wires; the other indoors and the master indoors are connected by 2 polar wires.

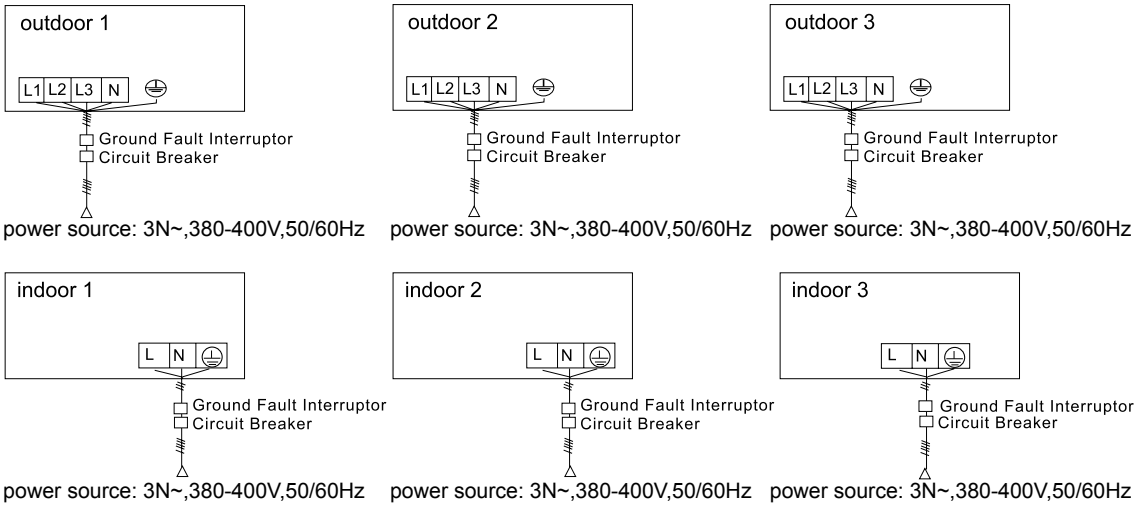
B. 1 to 1 (one wired controller controls one indoor): as shown in above figure, indoor 6~ indoor 19, indoor and wired controller are connected by 3 polar wires.

Electric wiring and the application

C. 2 to 1 (two wired controller controls one indoor): as shown in above figure, indoor 20. One 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 don't need wires and connection with the wired controller.

Power wiring figure

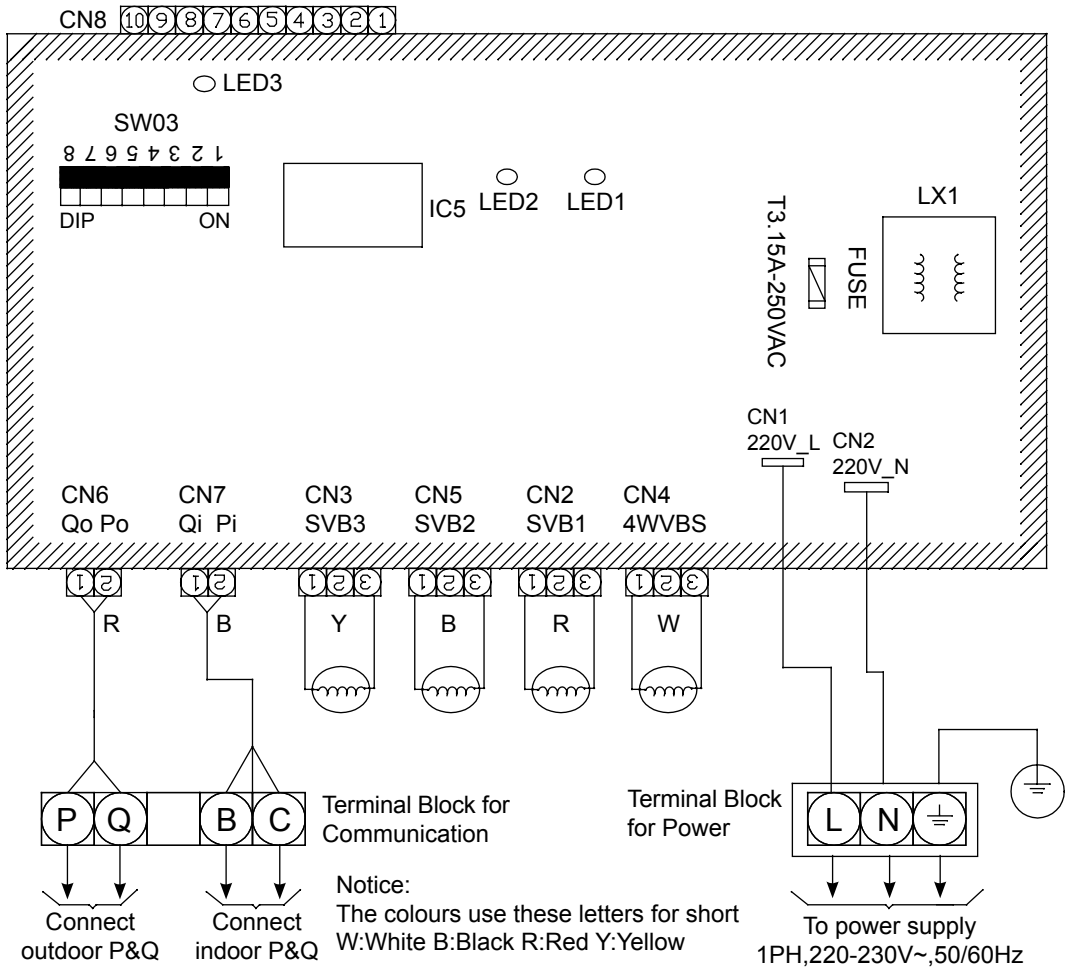
Please make sure that when the unit is running, the input voltage is no less than 380V;
if it is lower than 380V,the unit may run abnormal.



- Indoor and outdoor use their individual power source.
- All indoors use one power source.
- The leakage breaker and the over current breaker must be installed, or electric shock will occur.

Electric wiring and the application

VP Wiring nameplate



Outdoor power source and power cable

Item / Model		Power source	Power cable section (mm^2)	Wire length (m)	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	AV08IMVUSA	3N~, 380-400V, 50/60 Hz	6	60	40	40A 30mA below 0.1S	3.5	M5
			10	60	40	40A 30mA below 0.1S	3.5	M5
	YCV335HR		10	60	60	60A 30mA below 0.1S	3.5	M5
	YCV400HR		16	60	60	60A 30mA below 0.1S	3.5	M5
	YCV450HR		16	60	70	70A 30mA below 0.1S	3.5	M5

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

Electric wiring and the application

Indoor power source and communication wiring

Item Indoor total current (A)	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)
<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		

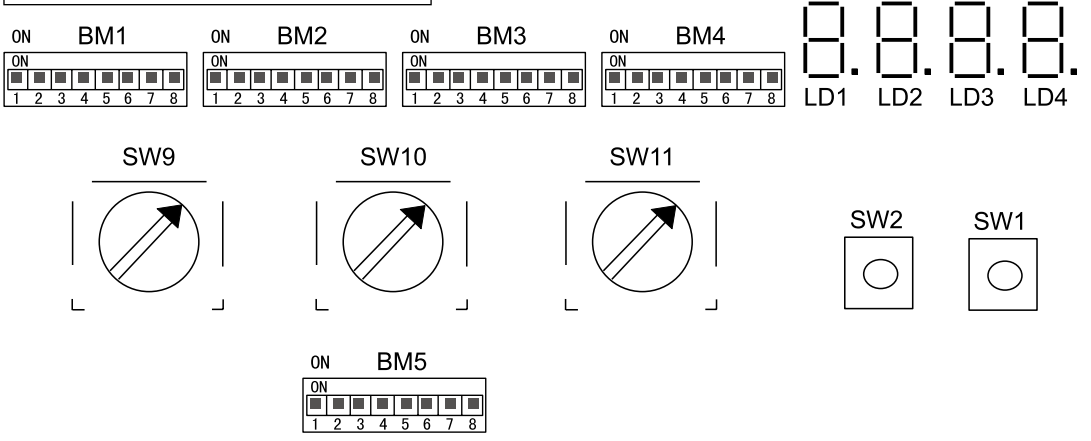
- Power cable and communication wire must be fixed firmly.
- Each indoor must be grounded well.
- When power cable exceeds the range, increase the gauge appropriately.
- Shielded layer of communication wires must be connected together and be earthed at single point.
- The total length of communication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

Communication wire for wired controller

Wire length(m)	Wire spec	Wire length(m)	Wire spec
<100	0.3mm^2 ×(3-core) shielded wire	≥300 and <400	1.25mm^2 ×(3-core) shielded wire
≥100 and <200	0.5mm^2 ×(3-core) shielded wire	≥400 and <600	2mm^2 ×(3-core) shielded wire
≥200 and <300	0.75mm^2 ×(3-core) shielded wire		

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

Selection switch and the display



Introduction of dip switch on outdoor connecting board:
BM1,BM2,BM3,BM4,BM5: 8-bit dip switch

Electric wiring and the application

Identification:

- Master unit: by setting dip switch, the unit number is 0. It is used to communicate with indoor unit, also it is the organizer of outdoor communications as communication master unit.
- Slave unit: by setting dip switch, the unit number is not 0.
- Dip switch definition:
  BM1 is usually set by the personnel on site; BM2, BM3, BM4 are pre-set in the factory.
  BM1_1: Master outdoor unit searches the total outdoor units after power ON at first time. The quantity of total outdoor units is floating from right to left on LED. "1=0" is one outdoor unit, "2=01" is two outdoor units, "3=012" is three outdoor units.
  BM1_2: Master outdoor unit searches the total indoor units after power ON at first time. The quantity of total indoor units is floating from right to left on LED. "-04-" is 4 indoor units, "-06-" is 6 indoor units, "-15-" is 15 indoor units.
  BM1_3: The setting is 0 or 1.Default is 0. Once power off,unit software shall reset to "OFF" automatically ignoring BM1_3 setting.

① BM1 introduction

<table>
<tr><td rowspan="2">BM1_1</td><td rowspan="2">Outdoor searching After startup</td><td>0</td><td colspan="3">Begin to search outdoor</td></tr>
<tr><td>1</td><td colspan="3">Stop searching outdoor and lock the quantity</td></tr>
<tr><td rowspan="2">BM1_2</td><td rowspan="2">Indoor searching After startup</td><td>0</td><td colspan="3">Begin to search indoor and VP device</td></tr>
<tr><td>1</td><td colspan="3">Stop searching indoor and VP device and lock the quantity</td></tr>
<tr><td rowspan="2">BM1_3</td><td rowspan="2">Start up after preheating for 6 hours</td><td>0</td><td colspan="2">Allow(must be electrified for 6 hours or oil temperature should reach the standard starting value)</td><td rowspan="2">Group class (physical master unit is valid)</td></tr>
<tr><td>1</td><td colspan="2">Forbidden(it can start up when the oil temperature reaches the reduced allowable starting valve)</td></tr>
<tr><td rowspan="2">BM1_4</td><td rowspan="2">Heating when outdoor temperature over 25degree</td><td>0</td><td colspan="2">Allow</td><td rowspan="2">Group class (physical master unit is valid)</td></tr>
<tr><td>1</td><td colspan="2">Forbidden</td></tr>
<tr><td rowspan="2">BM1_5</td><td rowspan="2">Over match setting</td><td>0</td><td colspan="2">Allow</td><td rowspan="2">Group class (physical master unit is valid)</td></tr>
<tr><td>1</td><td colspan="2">Forbidden</td></tr>
<tr><td rowspan="2">BM1-6</td><td rowspan="2">Pre-set</td><td>0</td><td colspan="2">Pre-set (default)</td><td rowspan="2">Group class (physical master unit is valid)</td></tr>
<tr><td>1</td><td colspan="2">Pre-set</td></tr>
<tr><td rowspan="5">BM1_7
BM1_8</td><td rowspan="5">Address setting</td><td>BM1_7</td><td>BM1_8</td><td colspan="2">Unit number</td></tr>
<tr><td>0</td><td>0</td><td colspan="2">0# (physical master unit)</td></tr>
<tr><td>0</td><td>1</td><td colspan="2">1#</td></tr>
<tr><td>1</td><td>0</td><td colspan="2">2#</td></tr>
<tr><td>1</td><td>1</td><td colspan="2">3#</td></tr>
</table>

Electric wiring and the application

② BM2 introduction

BM2_1	Silent operation setting	0	Without silent operation		Group class (physical master unit is valid)
		1	With silent operation		
BM2_2	Snow-proof operation setting	0	Without snow-proof		Group class (physical master unit is valid)
		1	With snow-proof		
BM2_3 BM2_4	Pre-set	No definition			
BM2_5 BM2_6	Defrosting condition “α” Selection	BM2_5	BM2_6	Selection item	Group class (physical master unit is valid)
		0	0	8（E）	
		0	1	10（E）	
		1	0	6（E）	
		1	1	8（E）	
BM2_7 BM2_8	Piping length selection (Generally, the target valve is revised with the ambient temperature)	BM2_7	BM2_8	Selection item	Group class (physical master unit is valid)
		0	0	Medium piping length: cooling 7.5kg, heating 28.0kg	
		0	1	Long piping length: cooling 7.0kg, heating 30.0kg	
		1	0	Short piping length: cooling 8.3kg, heating 26.0kg	
		1	1	Medium piping length	

③ BM3 introduction

BM3_1 BM3_2 BM3-3	No definition	Default is 0; 1 is forbidden.				Local class
		Default is 0; 1 is forbidden.				
		Default is 0; 1 is forbidden.				
BM3-4	3 phase-50/60Hz selection	0	For counties use power 50 Hz			Local class
		1	For counties use power 60 Hz			
BM3_5 BM3_6 BM3_7 BM3_8	HP setting of outdoor units	BM3_5	BM3_6	BM3_7	BM3_8	HP of outdoor units
		0	0	0	0	6HP
		0	0	0	1	8HP
		0	0	1	0	10HP
		0	0	1	1	12HP
		0	1	0	0	14HP
		0	1	0	1	16HP

Electric wiring and the application

④ BM4 introduction

BM4_1	Drop selection of indoor units	Default is 0; 1 is forbidden.		
BM4-2	Stopped fan operation setting when heating host is running	Default is 0; 1 is forbidden.		
BM4_3	Static pressure setting of outdoor unit	0	Highest speed is 14 for outdoor unit fan.（default）	Local class
		1	Highest speed is 14 for outdoor unit fan. (static pressure: 82Pa)	
BM4_4 BM4_5 BM4_6 BM4_7 BM4_8	Pre-set	No definition		

⑤ BM5 introduction

BM5_1 ~ BM5_4	Outdoor motor selection	BM5_1	BM5_2	BM5_3	BM5_4	Selection item
		1	1	0	0	Dual fan motor(375W)
		0	0	1	1	Single fan motor(750W)
BM5_5 ~ BM5_8	Inverter board selection	BM5_5	BM5_6	BM5_7	BM5_8	Selection item
		0	0	1	1	180° inverter board

Monitor tools

Monitor code is as following:
Press button: SW2(UP), SW1(DOWN) are the button swicthes
Rotary switch: SW9, SW10, SW11 are setable from 0 to 15.
(Note: on code wheel with letters, A for 10, B for 11, C for 12, D for 13, E for 14, F for 15)
Display part: LED1, LED2, LED3, LED4, 4 digital tubes are ranked from left to right.
Display contents are as follow:

1. Indoor unit parameters observation

The parameters of indoor unit address 1-64 can be observed: SW9 and SW10 are indoor unit numbers; the range of SW11 is 3-14, regarding indoor unit parameters.

SW9	SW10	System address
0	0-15	Unit 1-16 （indoor unit PCB address dial-up 0#-15#）
1		Unit 17-32（indoor unit PCB address dial-up 16#-31#）
2		Unit 33-48（indoor unit PCB address dial-up 32#-47#）
3		Unit 49-64（indoor unit PCB address dial-up 48#-63#）

Electric wiring and the application

SW11	Function	Display with digital tube LED1 ～ 4
3	Indoor unit communication checking and program version	If communication is normal, show the indoor unit program version (one decimal). If communication stops, normally show “0000”（failing communication for 5 consecutive rounds）. If communication has been abnormal, show “----”. For example,“U4.2” means indoor unit version is V4.2.
4	Indoor unit fault	Show indoor unit fault code. If no fault, show 0.
5	Indoor unit capacity	Indoor unit capacity（Unit: HP，one decimal），1.5 HP show 1.5
6	Indoor unit expansion valve open angle	Expansion open angle（Unit: pls）
7	Indoor unit environment temp. Tai	Ambient temperature（Unit: ℃）
8	Indoor unit gas pipe temp. Tc1	Gas pipe temperature（Unit: ℃）
9	Indoor unit liquid temp. Tc2	Liquid pipe temperature（Unit: ℃）
10	Indoor unit startup mode, actual running speed and SCODE code	LED1 means startup mode, O：stop/ C：cooling/ H：heating LED2 means indoor units actual running speed（0-stop，1-low speed，2-medium speed，3-high speed）， LED3 and LED4 means SCODE code（0 ～ 15）. For example, C311 mean high cooling speed，SCODE is 11.
11	Indoor Unit temp. setting Tset	Temperature setting（Unit: ℃）
12	Wrong wiring inspection	0 means no failure，79 means wiring connection failure（indoor no display）
13	Connected valve box number	“----” means connecting to the valve box failed. Press SW2(UP) for 2 seconds，show “CCCC”，forcible indoor cooling start up Press SW1(DOWN) for 2 seconds，show “OFF”，forcible indoor shutdown
14	Solenoid valve status of connected valve box	LED1： BS4WV ： 1 ON 0 OFF——Far left LED2： BSSV1 ： 1 ON 0 OFF LED3： BSSV2 ： 1 ON 0 OFF LED4： BSSV3 ： 1 ON 0 OFF Showing “----”means not connected to the valve box; Showing“E-”+failure code means there is failure. Press SW2(UP) for 2 seconds，show“HHHH”，forcible indoor heating start up; Press SW1(DOWN) for 2 seconds，show“OFF”，forcible indoor shutdown

Electric wiring and the application

2. Valve box parameters observation

The parameters of indoor unit address 1-64 can be observed: SW9 and SW10 are valve box numbers; the range of SW11 is 3-14, regarding observed valve box parameters.

SW9	SW10	System address
7	0-15	Unit 1-16 （valve box PCB address dial-up 0#-15#）
8		Unit 17-32（valve box PCB address dial-up 16#-31#）
9		Unit 33-48（valve box PCB address dial-up 32#-47#）
10		Unit 49-64（valve box PCB address dial-up 48#-63#）

SW11	Function	Display with digital tube LED1 ～ 4
3	Valve box program version	If communication is normal, show the indoor unit program version (one decimal). If communication stops, normally show “0000”（failing communication for 5 consecutive rounds）. If communication has been abnormal, show “----”. For example,“F0.1” means valve box version is V0.1
4	Valve box mode and failure	LED1: show valve box mode O：Stop C：Cooling H：Heating LED2: show“-” LED3-4: show valve box failure code, if there is no fault, show 0. For example,“H-01”，means the valve box current mode is heating; if there is failure, show code “01”.
5	Solenoid valve status of valve box	LED1： BS4WV ： 1 ON 0 OFF——Far left LED2： BSSV1 ： 1 ON 0 OFF LED3： BSSV2 ： 1 ON 0 OFF LED4： BSSV3 ： 1 ON 0 OFF
6	Total indoor units connected to the valve box	Note: 8 units as maximum
7	Address of 1st indoor unit connected to valve box	“----”means be connected failed.
8	Address of 2nd indoor unit connected to valve box	“----”means be connected failed.
9	Address of 3rd indoor unit connected to valve box	“----”means be connected failed.
10	Address of 4th indoor unit connected to valve box	“----”means be connected failed.
11	Address of 5th indoor unit connected to valve box	“----”means be connected failed.
12	Address of 6th indoor unit connected to valve box	“----”means be connected failed.
13	Address of 7th indoor unit connected to valve box	“----”means be connected failed.
14	Address of 8th indoor unit connected to valve box	“----”means be connected failed.

3. Outdoor unit parameters observation

0~3 of SW9 is used to select outdoor unit number, selecting the numbers of different outdoor units. The range of SW11 is 0, 1, 15, meaning observed outdoor units parameters.
(The host can show the parameters of other outdoor units and indoor units. Submachine can only show its own parameters, 0 for SW9.)
Note: When the host SW9/SW10/SW11 are 0/0/0,

(1)Starting up for the first time, search the submachine first, showing 1:0 circularly from left to right. If one submachine is searched, show 2:01. If two sub-machines are searched, show 3:012. “3:012” means there are 3 outdoor units in the system, and 012 means the addresses for each outdoor unit. (actually,“:”show“=”)

(2)When the numbers of outdoor units is locked, searching the numbers of indoor unit and valve box, showing “-number of valve box-number of indoor unit” circularly from left to right. For example, “-2-6-” means there are two valve boxes and six indoor units connected to the system.

(3)When the numbers of indoor unit and valve box are locked, showing “-number of valve box-number of indoor unit” sparklingly, which means each valve box is confirming which indoor units it is connected and then send this message to the outdoor unit.

(4)After finishing confirming connecting information, enter the normal display.

(5)If there is failure during searching, show the outdoor unit failure code as the priority. If there is failure in outdoor unit after searching, show the outdoor unit failure code, and 0 for no failure.

SW9	SW10	SW11	Function	Display with digital tube LED1~4
Unit No. 0-3	0	0	Show the outdoor unit failure code	Failure code is transmitted by outdoor bus data. If no failure, displaying electric heating 6 hours countdown time as second. Press SW2(UP) for 2 seconds, showing 1111, then enter the historical failure inquiry condition and the latest 10 failures can be inquired. Sparklingly showing failure serial number and failure code. The serial number will add 1 each time pressing the SW2(UP). The serial number will plus 1 each time pressing the SW1(DOWN). The setting condition will quit automatically after 2 minutes. Press SW1(DOWN) for 2 seconds, showing 0000, then quit the inquiry condition and stop sparklingly display. When dial-up wheel on 13,0,0, press SW2(UP) for 2 seconds, showing 1111, then all the failure record will be deleted.
	1	0	Show the outdoor unit priority and capacity	LED1 shows the outdoor priority level; LED2 shows “-”, LED3-4 show the outdoor capacity (Unit: HP)
	2	0	Show the running mode and outdoor capacity output ratio	LED1 shows O: Stop C: Cooling H: Heating LED2-LD4 60 show 60% of capacity output

Electric wiring and the application

SW9	SW10	SW11	Function	Display with digital tube LED1~4
	3	0	Speed of outdoor fan motor 1	345 means 345rpm. Press SW2(UP) for 2 seconds, showing 1111, then enter the settable condition. Sparklingly display: Speed grade will go up a level each time pressing SW2(UP); speed grade will go down a level each time pressing SW1(DOWN). The setting condition will quit automatically after 5 minutes. Press SW1(DOWN) for 2 seconds, showing 0000, then quit the inquiry condition and stop sparklingly display.
	4	0	Speed of outdoor fan motor 2	
	5	0	Current frequency of inverter compressor INV	110.0 means 110.0Hz Press SW2(UP) for 2 seconds, showing 1111, then enter the settable condition. Sparklingly display: The frequency will go up 1 Hz each time pressing SW2(UP); frequency will decrease 1 Hz each time pressing SW1(DOWN). The setting condition will quit automatically after 5 minutes. Press SW1(DOWN) for 2 seconds, showing 0000, then quit the inquiry condition and stop sparklingly display. (when system failures, compressor is forbidden to start up.)
	6	0	Fixed frequency compressor status	00—Fixed frequency compressor 1# OFF, Fixed frequency compressor 2# OFF 01—Fixed frequency compressor 1# ON, Fixed frequency compressor 2# OFF 10—Fixed frequency compressor 1# OFF, Fixed frequency compressor 2# ON 11—Fixed frequency compressor 1# ON, Fixed frequency compressor 2# ON
	7	0	Outdoor unit LEVa1 valve open angle	0---470 step Press SW2(UP) for 2 seconds, showing 1111, then enter the settable condition. Sparklingly display: Press SW2(UP), the valve open entirely. Press SW1(DOWN), the valve close entirely. The setting condition will quit automatically after 2 minutes. Press SW1(DOWN) for 2 seconds, showing 0000, then quit the inquiry condition and stop sparklingly display.
	8	0	Outdoor unit LEVa2 valve open angle	
	9	0	Outdoor unit LEVb valve open angle	
	10	0	Outdoor unit LEVc valve open angle	
	11	0	Outdoor unit solenoid valve output indication	LED1: 4WV : 1 ON 0 OFF——Far left LED2: SV1: 1 ON 0 OFF LED3: SV3i : 1 ON 0 OFF LED4: SV31 : 1 ON 0 OFF

Electric wiring and the application

SW9	SW10	SW11	Function	Display with digital tube LED1~4
	12	0	Outdoor unit solenoid valve output indication	LED1: SV6: 1 ON 0 OFF——Far left LED2: SV9: 1 ON 0 OFF LED3: SV10: 1 ON 0 OFF LED4: SV11: 1 ON 0 OFF
	13	0	Outdoor unit solenoid valve output indication	LED1: SV18i: 1 ON 0 OFF——Far left LED2: SV181: 1 ON 0 OFF LED3: SV21: 1 ON 0 OFF LED4: WV42: 1 ON 0 OFF
	14	0	Heater output	LED1: CHi: 1 ON 0 OFF——Far left LED2: CH1: 1 ON 0 OFF LED3: CH2: 1 ON 0 OFF LED4: Cha: 1 ON 0 OFF
	15	0	Program version	1.0 means Ver1.0

SW9	SW10	SW11	Function	Display with digital tube LED1 ～ 4
Unit No. 0-3	0	1	Pd pressure	Unit: kg, 2 decimal
	1	1	Ps pressure	
	2	1	Tdi discharging temp.	Unit: °C
	3	1	Td1 discharging temp.	
	4	1	Td2 discharging temp.	
	5	1	Tdef1 defrosting temp.	
	6	1	Tdef2 defrosting temp.	
	7	1	Toil temp.	
	8	1	Tao ambient temp.	
	9	1	Toci1 temp.	
	10	1	Toci2 temp.	
	11	1	Tsi temp.	
	12	1	Reservation	
	13	1	Tdp temp.	
	14	1	Tsacc temp.	
	15	1	Toilp temp.	

SW9	SW10	SW11	Function	Display with digital tube LED1~4
Unit No. 0-3	0	15	PI pressure	Unit: kg, 2 decimal
	1	15	Pi_temp pressure temp.	25 Unit：℃
	2	15	Pd_temp pressure temp.	
	3	15	Ps_temp pressure temp.	
	4	15	Tliqsc temp.	
	5	15	Tsco temp.	
	6	15	Inverter compressor INV ON/OFF time	Unit：minute
	7	15	Inverter power current	Unit：A,1 decimal
	8	15	Inverter compressor current	
	9	15	Fixed frequency compressor 1# current	
	10	15	Fixed frequency compressor 2# current	
	11	15	Inverter compressor DC voltage	Unit：V
	12	15	Inverter compressor module temp.	Unit：℃
	13	15	Inverter compressor running condition and stop reason	LED1/ LED2：Inverter compressor running condition (hex) LED3/ LED4：Inverter compressor stop reason (hex)
	14	15	Fixed frequency compressor 1 ON/ OFF time	Unit：minute
	15	15	Fixed frequency compressor 2 ON/ OFF time	Unit：minute

4. Host information center: showing data and control of the whole system

SW9	SW10	SW11	Function	Operational approach
0	0	2	Refrigerant type	410A means 410A refrigerant
0	1	2	Total quantity and capacity for the same system	LED1: Outdoor unit quantity LED2: Show“-” LED3/ LED4: Outdoor total capacity (Unit: HP) For example, 3-48 means capacity of 3 outdoor units is 48HP
0	2	2	Indoor unit capacity	50.0 means 50 HP
0	3	2	Quantity of valve box and indoor unit in the same system	LED1/ LED2: Valve box quantity LED3/ LED4: Indoor unit quantity For example, 0206 means 2 valve boxes and 6 indoor units

Electric wiring and the application

SW9	SW10	SW11	Function	Operational approach
0	4	2	Quantity and capacity of cooling indoor unit temp. sensor ON	LED1/ LED2: Quantity of cooling indoor unit temp. sensor ON LED3/ LED4: Capacity of cooling indoor unit temp. sensor ON (Unit: HP) For example, 0312 means there are 3 cooling indoor units temp. sensor ON with capacity of 12 HP.
0	5	2	Quantity and capacity of heating indoor unit temp. sensor ON	LED1/ LED2: Quantity of heating indoor unit temp. sensor ON LED3/ LED4: Capacity of heating indoor unit temp. sensor ON (exclude the capacity revise of temp. sensor OFF, unit: HP) For example, 0624 means there are 6 heating indoor units temp. sensor ON with capacity of 24 HP.(exclude the capacity revise of temp. sensor OFF)
0	6	2	Cooling target temp.	Unit: ℃
0	7	2	Heating target temp.	
0	8	2	Refrigerant evacuating setting *Only for evacuated outdoor units. If only indoor unit is evacuated, no need to set up. When it finished, cancel the setting or re-electricity.	Press SW2(UP) for 2 seconds, showing 1111, start up and the digital tube show “YES”. Detailed response: SV9, SV10, SV11 open; LEVa1, 2, LEVb open for 100pls; The other valves close compulsorily. SV21 open and LEVc open for 470. Press SW1(DOWN)for 2 seconds, showing 0000, stop. (setting is invalid when unit is running.)
0	9	2	Refrigerant charging setting * Only for gas charged outdoor units. If only indoor unit is charged, no need to set up. When it finished, cancel the setting or re-electricity.	Press SW2(UP) for 2 seconds, showing 1111, start up and the digital tube show “YES”. Detailed response: LEVa1,2 open for 470pls; The other valves close compulsorily. SV21open and LEVc open for 470. Press SW1(DOWN)for 2 seconds, showing 0000, stop. (setting is invalid when unit is running.)

Electric wiring and the application

SW9	SW10	SW11	Function	Operational approach
0	10	2	Wrong wiring inspection in cooling	Press SW2(UP) for 2 seconds, showing 1111, then start up and digital tube displays the judging time by counting down. “00.00”means the result is in conformity with the actual connection; “01.05”means one outdoor unit and 5 indoor units are abnormal, to check the abnormal units by digital tube (indoor:X_X_12, outdoor:X_0_0). Press SW1(DOWN) for 2 seconds, showing 0000, stop.
0	11	2	Wrong wiring inspection in heating	
0	12	2	Indoor expansion valve open fully	Press SW2(UP) for 2 seconds, showing 1111, and indoor valves open fully for 2 minutes, then indoor valves close automatically.
0	13	2	All indoor units running in cooling	Press SW2(UP) for 2 seconds, showing 1111, open fully; Press SW1(DOWN)for 2 seconds, showing 0000, close fully.
0	14	2	All indoor units running in heating	
0	15	2	Cancel all manual controls (running type)	Press SW2(UP) for 2 seconds, showing 1111, cancel; or press SW1(DOWN)for 2 seconds, showing 0000, cancel. Cancel content: Wrong wiring inspection in cooling and heating, indoor units open/close fully, operate compulsively and rated operating, etc.

SW9	SW10	SW11	Function	Operational approach
15	0	2	BM1and BM2 setting condition	Hex display. BM1：Use LED1and LED2to display，BM2：Use LED3and LED4 to display
15	1	2	BM3and BM4 setting condition	Hex display. BM3：Use LED1and LED2to display，BM4：Use LED3and LED4 to display
15	2	2	Capacity correction class	0 means short piping length； 1 means medium piping length, 2 means long piping length.
15	3	2	Defrosting compensation	10、8、6
15	4	2	BM5 setting condition	Hex display. Use LED3 and LED4 to display.
15	5	2	Over match inspection	135 stands for limitation;0: without limitation.
15	6	2	Heating limit when outdoor temp. over 25℃	25 stands for limitation; 0: without limitation.
15	7	2	Silent operation setting	0:without silent operation; 1: with silent operation

Electric wiring and the application

SW9	SW10	SW11	Function	Operational approach
15	8	2	Snow-proof operation setting	0:without snow-proof operation; 1: with snow-proof operation
15	9	2	The FAN speed setting of Thermo Off Submachine when heating host running	0: not running; 1: running
15	10	2	Drop selection between indoor units	0—No drop between indoor units; 1—There is drop between indoor units.
15	11	2	Reservation	
15	12	2	Power supply setting of 50/60Hz	50 means 50Hz，60 means 60Hz
15	13	2	Inverter board selection	0 means self-regulating inverter board; 1 means APY inverter board.
15	14	2	Outdoor type setting	0-3 pipe type
15	15	2	Reservation	

SW9	SW10	SW11	Function	Operational approach
1	0	2	Communication baud rate of indoor and outdoor units	9600bps
1	1	2	Number of cyclical valve boxes connected to indoor unit accurately for 1 round	LED1/ LED2：Number of valve boxes LED3/ LED4：Number of indoor units For example, 0206 means 2 valve boxes and 6 indoor units
1	2	2	Top 2 number： the percentage of inconformity for indoor units and the number of E2 Low 2 number: real-time indoor unit number	For example, 0522 means currently there are 22 indoor units, and the percentage of inconformity for indoor units and the number of E2 is 5%.
1	3	2	Number of valve boxes which can communicate with indoor units (exclude indoor units failing communicating for continuous 5 times.)	LED1/ LED2：Number of valve boxes LED3/ LED4：Number of indoor units For example, 0206 means 2 valve boxes and 6 indoor units
1	4-15	2	Reservation	

Electric wiring and the application

5. Control of valve component of outdoor unit (Local)

SW9	SW10	SW11	Function	Operational approach
6	0	2	Manual control 4WV ON/OFF	Show the component current condition：1 means ON, 0 means OFF. Press SW2(UP) for 2 seconds，showing 1111，then enter the settable condition. Sparklingly display: press SW2(UP) to start and press SW1(DOWN) to shutdown. The setting condition will quit automatically after 2 minutes. Press SW1(DOWN) for 2 seconds, showing 0000, then quit the inquiry condition and stop sparklingly display. (the compressor is forbidden to startup when there is failure in system.)
6	1	2	Manual control SV1 ON/OFF	
6	2	2	Manual control SV3i ON/OFF	
6	3	2	Manual control SV31 ON/OFF	
6	4	2	Manual control SV6 ON/OFF	
6	5	2	Manual control SV9 ON/OFF	
6	6	2	Manual control SV10 ON/OFF	
6	7	2	Manual control SV11 ON/OFF	
6	8	2	Manual control SV18i ON/OFF	
6	9	2	Manual control SV181 ON/OFF	
6	10	2	Manual control SV21 ON/OFF	
6	11	2	No definition	
6	12	2	No definition	
6	13	2	Manual control CHi ON/OFF	
6	14	2	Manual control 4WV2 ON/OFF	
6	15	2	Cancel all manual control （for component）	Press SW2(UP) for 2 seconds，showing 1111，cancel；or press SW1(DOWN)for 2 seconds, showing 0000，cancel. Cancel content： The manual control of all the moving components of the outdoor unit, such as compressor, fan, electronic expansion valve LEV, solenoid valve SV, etc. (Iincluding discharging setting and gas injecting setting; excluding running setting, such as rated setting/ compulsive setting/ indoor unit and outdoor unit ON/OFF setting)

Electric wiring and the application

6. Parameters of phase order detect (Local):

SW9	SW10	SW11	Function	Operational approach
11	0	0	Times of ok for phase S（20 times as normal, alarm 37-1 when lower than 16 times）	
11	1-10	0	Observe the time of low level for phase S 10ms Unit：0.1ms	
11	0	1	Times of ok for phase S（20 times as normal, alarm 37-1 when lower than 16 times）	
11	1-10	1	Observe the period of phase S 20ms Unit：0.1ms	
11	0	2	Times of ok for phase T（20 times as normal, alarm 37-2 when lower than 16 times）	
11	1-10	2	Observe the time of low level for phase T 10ms Unit：0.1ms	
11	0	3	Times of ok for phase T（20 times as normal, alarm 37-2 when lower than 16 times）	
11	1-10	3	Observe the period of phase T 20ms Unit：0.1ms	
11	0	4	Times of ok for phase S/T order T（10 times as normal, alarm 37-3 when lower than 7 times）	

7. Examination of local ee data:

SW9	SW10	SW11	Function	Display with digital tube LED1 ～ 4
12	0	0	The EE data of address 000H（Version E2）	The first 256 bytes data display of local EE（system parameters information） Calculating address：addr=SW10 × 16 ＋ SW11 Data display：hex display, H means hex number
	0	1	The EE data of address 001H	
	…	…	…	
	0	15	The EE data of address 00FH	
	1	0	The EE data of address 010H	
	…	…	…	
	1	15	The EE data of address 01FH	
	…	…	…	
	15	15	The EE data of address FFH	
13	0	0	The EE data of address 100H	The last 256 bytes data display of local EE（Failure information） Calculating address：addr=SW10 × 16 ＋ SW11 Data display：hex display, H means hex number. When the dial-up wheel is on 13 0 0，press SW2(UP) for 2 seconds, then the last 256 bytes of EE will be cleared.
	0	1	The EE data of address 101H	
	……	……	……	
	1	15	The EE data of address 11FH	
	……	……	……	
	15	15	The EE data of address 1FFH	

Failure code

Failure code

Failure code description: (failure code of the whole system is showed as 8 bits, so totally 256 codes. Indoor failure code should be judged by the table and the unit number)

- Outdoor failure code exists in EEPROM, in which 5 failure codes can be kept.
- Indoor failure code exists in EEPROM, in which 5 failure codes can be kept.
- Clear failure code by indoor or outdoor.

Failure codes are distributed as follows:
0~19: indoor failure code
20~99: outdoor failure code
100~109: DC motor failure code
110~125: inverter module failure code
126~127: software auto-check failure code

Physical master unit:
Dip swiches SW9, SW10, SW11 are at 0, 0, 0, LD displays failure code 20~127, it is the master failure code.
Dip swiches SW9, SW10, SW11 are 1, 0, 0, LD displays failure code 20~127, it is failure code of No. 1 slave unit.
Dip swiches SW9, SW10, SW11 are 2, 0, 0, LD displays failure code 20~127, it is failure code of No. 2 slave unit.
Physical slave unit:
Dip swiches SW9, SW10, SW11 are at 0, 0, 0, LD displays failure code 20~127, it is single slave unit failure code.

Outdoor failure code display principle on wired controller:
When outdoor compressor is running, indoor wired controller will display the failure code of outdoor with higher priority. When compressor stops, it displays all indoor failures. The indoor failures will be classified as below: sensor failure, inverter board failure, fan motor driving board failure, any protections etc.

Failure code

Inverter outdoor unit failure code indication on master unit

LED indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
20-0	14	Defrosting temp. sensor Tdef1 failure	AD value is below 11 (open circuit) or over 1012 (short circuit) for 60 seconds, sensor has no alarm when abnormal in cooling mode.	Resumable
20-1	14	Defrosting temp. sensor Tdef2 failure		
21	15	Ambient temp. sensor Tao failure	AD value is below 11 (open circuit) or over 1012 (short circuit) for 60 seconds.	Resumable
22-0	16	Suction temp. sensor Tsi failure		
22-1	16	Suction temp. sensor Tsacc failure	AD value is below 11 (open circuit) or over 1012 (short circuit) for 60 seconds, sensor has no alarm when abnormal in cooling mode.	
23-0	17	Discharging temp. sensor Tdi failure	AD value is below 11 (open circuit) or over 1012 (short circuit) for 60 seconds. If Tao≤0℃ , no need to detect the open circuit failure (AD value is below 11.)	Resumable
23-1	17	Discharging temp. sensor Td1 failure		
24-0	18	Oil temp. sensor Toilp failure	If AD value is below 11 (open circuit) or over 1012 (short circuit) for 60 seconds, alarm. If Tao<0℃ , there is no open circuit alarm. If Tao>=0℃ and ET>=0℃ , no open circuit alarm within 5 minutes.	Resumable
24-1	18	Oil temp. sensor Toili failure	If AD value is below 11 (open circuit) or over 1012 (short circuit) for 60 seconds, alarm. If Tao<0℃ or not normal running, no open circuit alarm.	
25-0	19	Heat exchanger inlet temp. Toci1 failure	AD value is below 11 (open circuit) or over 1012 (short circuit) for 60 seconds, sensor has no alarm when abnormal in cooling mode.	Resumable
25-1	19	Heat exchanger inlet temp. Toci2 failure		

Failure code

LED indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
26-0	1A	Outdoor unit and indoor unit communication failure	Not finding connected indoor units for continuous 200 cycles	Resumable
26-1	1A		The searched indoor unit quantity is less than the set quantity for continuous 270 seconds	
26-2	1A		The searched indoor unit quantity is more than the set quantity for continuous 170 seconds	
26-3	1A		The searched valve box BS quantity is less than set quantity for continuous 5 minutes	
26-4	1A		The searched valve box BS quantity is more than set quantity for continuous 5 minutes	
26-5	1A		After powered on the outdoor units, the detected quantity of the indoor units which connected with the valve box is inconsistent with the actual quantity	
27	1B	Oil temp. too high protection （Toili）	Toili ≥120℃（E）at interval 25msec, continuous 2sec, and over the set value, then stop and alarm. The oil temp. 10℃ lower than the alarm condition for 3 minutes after stop. If it occurs 4 times in an hour, confirm the failure. (the same as Td too high protection.)	Once confirmed, un-resumable
28	1C	High pressure sensor Pd failure	If AD value is below 11 (open circuit) or over 1012 (short circuit) for 60 seconds, alarm.	Resumable
29	1D	Low pressure sensor Ps failure		
30-0	1E	High pressure switch HPSi failure	When power on, the confirmation of OFF for continuous 2sec, alarm. If it occurs 4 times in an hour, confirm the failure.	Once confirmed, un-resumable
30-1	1E	High pressure switch HPS1 failure		
32-0	20	Heat exchanger outlet temp. Tsco failure	If AD value is below 11 (open circuit) or over 1012 (short circuit) for 60 seconds, alarm, sensor has no alarm when abnormal in heating mode.	Resumable
32-1	20	Liquid pipe SC temp. of subcooler Tliq failure		

Failure code

LED indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
33-0	21	EEPROM (AT24C04) failure	EEPROM communication failure	Un-resumable
33-1			EEPROM data check failure(model code, check, etc.)	
33-2			EEPROM data logistic failure(data beyond limit, reverse sequence, etc.)	
34-0	22	Discharging temp. too high protection（Tdi）	Tdi / Td1≥130℃（E）at interval 25msec, continuous 2sec, and over the set value, then stop and alarm. The oil temp. 10℃ lower than the alarm condition for 3 minutes after stop, then resume automatically. If it occurs 4 times in an hour, confirm the failure.	Once confirmed, un-resumable
34-1	22	Discharging temp. too high protection （（Td1）		
35-0	23	4-way valve reversing failure	After the 4-way valve is electrified for 3 minunts, if the below conditions can be met for continuous 10 seconds, that is conversing successfully: ┌This outdoor unit compressor is running normally ┌Tdp － Tdef1≥10℃ └Tdp － Tdef2≥10℃ └Pd － Ps≥β MPa ※Otherwise, stop protection. （Tao ＞ -10℃，β=0.60；Tao≤-10℃，β=0.40） ∗4-way valve OFF starts up again after 3 minutes ∗If Thermo. OFF for 2 continuous times, Error stop.	Once confirmed, un-resumable
35-1	23	4-way valve reversing failure	If there is 4-way valve of submachine not electrified after host heating detection starts up for 20 min, alarm 35-1 failure.	
36	24	Oil temp. too low protection （Toili）	In normal operation (exclude start up, defrosting, oil return, remain, stop), if Toil ＜ CT+10℃ for continuous 5 minutes, the unit stops for 170 seconds and then resumes automatically. If it occurs 3 time in an hour, lock the alarm. ∗The same as Td too low protection	Once confirmed, un-resumable

Failure code

LED indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
37-1	25	Lack of phase of 3N power supply or wrong phase sequence	S phase lack	Once confirmed, un-resumable
37-2			T phase lack	
37-3			S phase & T phase normal, but phase sequency wrong	
37-4			Wrong voltage frequency. check BM3-4 setting	
38	26	High pressure sensor Pd too low protection	Not applicable for this mode	Once confirmed, un-resumable
39-0	27	Low pressure sensor Ps too low protection	After compressor is running(except for residual operation), if in cooling, Ps<0.10MPa; in heating, Ps< 0.05MPa, in oil return, Ps<0.03MPa for continuous 5 minutes, stop and alarm. 170 seconds later, resume automatically. If it occurs 3 times in an hour, confirm the failure.	Once confirmed, un-resumable
39-1	27	Compressor ratio ε too high protection	After compressor is running, compression ratio ε ＞ 8.0 for continuous 5 minute, then stop and alarm. If in cooling, compression ratio ε ＞ 9.0 for continuous 1 minute or in heating, compression ratio ε ＞ 8.5 for continuous 1 minute or in heating, stop and alarm. 170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure.	
39-2	27	Compressor ratio ε too low protection	In normal operation (exclude start up, defrosting, oil return, remain, stop), if compression ratio ε<1.8 for continuous 5 minutes, then stop and alarm. Or ε<1.5 for continuous 1 minute, then stop and alarm. 170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure.	
40	28	High pressure sensor Pd too high protection	After compressor is running, if continuous 2 sec Pd≥4.15MPa, stop and alarm.170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure. (Like high pressure switch alarm)	Once confirmed, un-resumable

Failure code

LED indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
43-0	2B	Discharging temp. sensor Tdi too low protection	After 10 minutes for normal operation (exclude start up, defrosting, oil return, remain, stop), if Td ＜ CT+10℃ for continuous 5 minutes, stop and alarm. If it occurs 3 times in an hour, lock the alarm.	Once confirmed, un-resumable
43-1	2B	Discharging temp. sensor Td1 too low protection		
44	2C	Low pressure sensor Ps too high protection	Not applicable for this mode	Once confirmed, un-resumable
45	2D	Communication failure among outdoor units	No communication within 30 seconds continuously (E)	Resumable
46	2E	Communication with INV board failure	No communication within 30 seconds continuously (E)	
53-0	35	Current detector CT failure	Detect before starting up, show incorrect voltage of sensor, stop for 3 minutes, resume to be normal automatically	Resumable
64-0	40	Current detector CT over current failure	Current of fixed compressor at interval 25msec exceed the current limit for 2 times and then stop. Stop for 3 minutes, then resume to be normal automatically. If it occurs 4 times in an hour, lock the alarm. ＊ But, in 4 seconds after startup, not detected.	Once confirmed, un-resumable
67	43	Communication with motor driving board failure	Without communication for 4 minutes.	Resumable
71-0	47	Fan 1 locked-rotor（Left）	Running at speed below 20rpm for 30s, or at speed of 70% lower than target for 2 minutes, stop. 170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure.	Once confirmed, un-resumable
71-1	47	Fan 2 locked-rotor（Right）		
75-0	4B	No pressure drop between high pressure and low pressure	In 1 minute after INV compressor starts up, Pd-Ps≤0.1MPa,then stop. 170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure.	Once confirmed, un-resumable

Failure code

LED indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
75-4	4B	Too small pressure drop between high pressure and low pressure	If Pd-Ps≤0.4MPa for 3 minutes, the outdoor unit protection stop. ・5 minutes after stopping protection, restart. ・If there are more than 6 times of stopping protecting within 2 hours, Error stop.	Once confirmed, un-resumable
76-0	4C	Incorrect outdoor unit quantity, address or capacity setting	Submachine quantity setting are not in conformance with data in EEPROM of the host.	Reset
76-1			Submachine address setting are not in conformance with data in EEPROM of the host.	
76-2			Submachine capacity setting are not in conformance with data in EEPROM of the host.	
77	4D	Oil equalization protection among outdoor units	If ToilpB-ToilpA≤10℃ , alarm and stop. Not detecting in the course of startup, defrosting and oil return and in 10 minutes after oil return finishes.170 seconds later, resume automatically. If it occurs 2 times in an hour, lock the failure.	Once confirmed, un-resumable
78-0	4E	Lack of gas alarm in cooling	When cooling compressor runs, Ps<0.1MPa for 30 minutes.	Resumable
78-1	4E	Lack of gas alarm in heating	When heating compressor runs, Ts1-ET>20 & Ts1-ET>20 & LEV open fully for 60 minutes, output the lack of gas alarm signal and not stop.	
80	50	Capacity not match to the outdoor units	In VRF system, the difference of capacity between submachine and host is more than 6HP, confirm the failure.	Un-resumable
100	64	DC fan driving board IPM alarm	DC fan driving board IPM alarm because of over current or too high temp. of modular.170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure.	Once confirmed, un-resumable
101	65	DC fan driving board detecting out of control	DC fan driving board detecting is out of control. 170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure.	
102	66	DC fan driving board Eeprom faulty	DC fan driving board Eeprom data is wrong. 170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure.	

Failure code

LED indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
103	67	DC fan driving board over current or current detector damaged	DC fan driving board over current is over 5A, then alarm.170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure.	
104	68	Voltage too low protection of DC fan driving board	Voltage of DC fan driving board is lower than 280V, then alarm.170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure.	
105	69	Overvoltage protection of DC fan driving board	Voltage of DC fan driving board is more than 400V, then alarm.170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure.	
106	6A	DC fan driving board locked-rotor	Fan speed can not be detected.170 seconds later, resume automatically. If it occurs 4 times in an hour, confirm the failure.	
107	6B	Over speed protection of DC fan	If it occurs 4 times in an hour, lock the alarm.	
110	6E	IPM modular protection（FO）	IPM modular over current, in short circuit, over heat, voltage too low of control circuit.	If it occurs 4 times in an hour, confirm the failure. Once confirmed, un-resumable.
111	6F	INV compressor out of control	In the course of compressor startup or running, the unit can not detect the rotor position for 6 times, stop for 5s and then the INV control board resumes automatically.	
112	70	Modular radiator temp. too high	If temp. ＞ 94℃ , alarm. If temp.≤94℃ , INV control board resumes automatically.	
113	71	Inverter controller overload	The output current of inverter controller is too high continually.	
114	72	Voltage too low of modular DC	If power voltage ＜ DC420V, alarm. If voltage≥DC420V, INV control board resumes automatically.	

Failure code

LED indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
115	73	Voltage too high of modular DC	If power voltage ＞ DC642V, alarm. If voltage≤DC642V, INV control board resumes automatically.	
116	74	Communication with modular abnormal	If communication signal can not be detected for continuous 30 seconds, alarm. After it can be detected, INV control board resumes automatically.	
117	75	Modular software over current	Modular software over current.	
118	76	Modular startup failure	Compressor starts up fail for continuous 5 times.	
119	77	Current detecting circuit abnormal of INV controller	Sensor for detecting current of inverter controller is abnormal. Cannot be connected or wrong connection.	
120	78	Inverter controller power supply abnormal	Power supply of inverter controller stops suddenly.	
121	79	Power supply of inverter controller board is abnormal	Power supply of inverter controller board is broken down instantly.	If it occurs 4 times in an hour, confirm the failure. Once confirmed, un-resumable.
122	7A	Radiator temp. sensor of inverter controller is abnormal.	Resistor of temp. sensor abnormal or temp. sensor disconnected.	
125	7D	Compressor frequency un-match	(Current frequency≥INV target frequency+3Hz) or （target frequency>0 & actual frequency=0）for continuous 2 minutes	Resumable

Failure code

LED indication on master unit	Indication on wired controller (hex)	Failure code definition	Failure description	Remarks
127	7F	MCU reset failure	If the host inspects that MCU of submachine is reset, and the submachine is running, the host alarm MCU reset failure, then the whole system stop. In heating mode, when restart up, 4WV will not be electrified, and the whole system will execute 4WV reversing operation again. If it occurs 4 times in one hour, confirm the failure.	Once confirmed, un-resumable.

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

555.0	Stand-by state of capacity overmatch	When capacity is over 135% or lower than 50%, the system is standby.	Once confirmed, un-resumable.
555.1	Stand-by state of 26℃ of heating mode	When it is in heating mode with ambient temp. over 26℃ ,the system is standby.	
555.2	Stand-by state of low pressure (lack of gas)	When the unit starts in cooling Ps<0.23MPa or heating Ps<0.12MPa, the system is standby.	
555.3	Stand-by state of 54℃ of cooling mode	For high ambient models, the unit can not open if ambient temp. over 54℃ in cooling mode, and the digital tube display: “555.3”	

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
0C	0C	12	50Hz zero failure
Outdoor failure code	Outdoor failure code	20	Outdoor corresponding failure

VP device failure code list

Failure code	Failure code definition	Judgment method	Remarks
5	VP device EEPROM date failure		Un-resumable
6	Communication between VP device and outdoor failure	No communication with the outdoor unit for continuous 120 seconds	Resumable
7	Communication between VP device and indoor failure	When detecting the connected indoor units, the indoor unit quantity is zero.	Resumable
9	VP device repeated address		Resumable
20	Outdoor corresponding failure		Resumable

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. Indoor units under different VP can achieve cooling and heating simultaneously.
- Indoor units connected to the same VP can not achieve cooling and heating simultaneously or can not do heating mode. If cooling and heating simultaneously, the later set indoor unit will be in stand-by status, and the earlier set indoor unit can run normally. If the indoor units are not connected to the VP device, it can only do the cooling mode.
- When the system manager fixes the operating mode on cooling or heating, the units can not run in other mode.

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 blowed 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.

Trial operation and the performance

When power failure

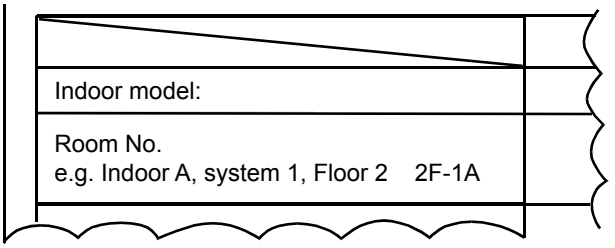
- When power is failure in running, all the operations will stop.
- After being electrified again, if with re-satrt up function, the unit can resume to the state before power off automatically; if without re-satrt up function, the unit needs to be switched on again.
- When abnormal occurs in running 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 MRV II 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

- Before trial operation:
  Before being energized, measure the resistor between power terminal block (live wire and neutral wire) and the grounded point with a multimeter, and check if it is over 1M * . If not, the unit can not operate.
  To protect compressor, energize the outdoor unit for at least 12 hours before the unit runs.If the crankcase heater is not energized 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, oil equalization pipe, HP gas 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.