

# Installation Manual for Outdoor Unit

AV08NMTAIA

AV10NMTAIA

AV12NMTAIA

AV14NMTAIA

AV16NMTAIA

No.0150503814

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

# User Manual

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

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

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### Operation condition:

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

### Operating Range of Air Conditioner

cooling dry	indoor	max.	DB: 32 °C	WB: 23 °C
		min.	DB: 18 °C	WB: 14 °C
	outdoor	max.	DB: 43 °C	WB: 26 °C
		min.	DB: 18 °C	
heating	indoor	max.	DB: 27 °C	
		min.	DB: 15 °C	
	outdoor	max.	DB: 21 °C	WB: 15 °C
		min.	DB: -15 °C	

# Safety precaution

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

## WARNING

- The installation or the maintenance should be performed by the authorized agency. Or the non-specialized operation will cause water leakage, electric shock or fire etc accidents.
- The installation should be executed as per the manual, or the faulty installation will cause water leakage, electric shock or fire etc accidents.
- Please install the unit at the space which can bear the weight. Or the unit will drop down to cause the human injury.
- The installation should defend against the typhoon, and the earthquake etc. Abnormal installation will cause the unit fall down.
- Use the correct cable and make reliable earthing. Fix the terminal firmly and the loose connection will cause heating or fire etc accident.
- The wiring should be in shape and can not be raised. Be earthed firmly and can not be clipped by the electric box cover or the other plate. The incorrect installation will cause heating or fire.
- When setting or transferring the unit, there should not be other air into the refrigerant system except for R22. The gas mixture will cause the abnormal high pressure which will cause break or human injury etc accidents.
- When installation, please use the accessories with the unit or the special parts, or it will cause water leakage, electric shock, fire, refrigerant leakage etc accidents.
- Don't lead the water drainage pipe into the drainage groove with the poisonous gas, such as sulphur. Or the poisonous gas will enter indoor.
- In installation or after installation, please confirm if there is refrigerant leakage, please take measures for ventilation. The refrigerant will cause poisonous gas as meeting fire.
- Don't install the unit at the place where there may be flammable gas leakage. In case the gas leaks and gather around the unit, it will cause fire.
- The drainage pipe should be installed as per the manual to confirm the fluent drainage. Also take measures for heat insulation against dew drop. Incorrect water pipe installation will cause water leakage even and make the things wet.
- For the liquid pipe and the gas pipe, take measures for heat insulation too. If there is no heat insulation, the dew drop will wet the things.

# Safety precaution

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## CAUTION

- Execute earthing for the unit. But the earthing wire can not be connected to the gas pipe, water pipe, lightning rod or the telephone earthing wire. Improper earthing will cause electric shock.
- Don't install the unit at the place where leaks the flammable gas. Or it will cause fire.
- Execute the water drainage pipe according to the manual, improper installation will cause water leakage to wet the family things.
- The outdoor fan can not face to the flower or the other vegetable, or the blowing gas will make the flower dried up.
- Please ensure the maintenance room, if not, it will cause the maintenance person damaged.
- When installing the unit on the roof or the other high place, to prevent the person falling down, please set the fixed ladder and the railing at the passage.
- Use the two-end spanner, and fasten the nut at proper torque. Don't fasten the nut excessively against the flared setion broken. Or it will cause refrigerant leakage and lack of oxygen.
- Take measures for heat insulation to the refrigerant pipe, or there will be water leakage or dew drop to wet the family things.
- After finishing the refrigerant pipe, make leakage test by charging the nitrogen. In case the refrigerant leaks in a small room and exceeds the limited concentration, it will cause lack of oxygen.
- When charging refrigerant, the refrigerant must be taken out as liquid state from the tank.

# Installation instruction

In installation, please check specially the below items:

- Before installation, confirm if the models are correct and the combination complies with the 5 types in the manual.
- If the connected units quantity and the total capacity is in the allowable range?
- If the refrigerant pipe length is in the limited range?
- If the pipe size is proper? And if the pipe is installed horizontally?
- If the branch pipe is installed horizontally or vertically?
- When multiple modularity are installed, check if the outdoors are ranked as the capacity, and the larger capacity the closer to the main pipe of gather pipe.
- If the additional refrigerant is counted correctly and weighed by the standard balance?
- If there is refrigerant leakage?
- If all the indoor power supplies can be on/off simultaneously?
- If the power voltage is in compliance with the data marked on the rating label?
- If the address of indoors and outdoors has been set?

## (1) Before installation

1) Before installation, check if the model, power supply, pipe, wires and parts purchased respectively are correct.

2) Check if the indoors and outdoors can be combined as the following.

capacity	outdoor quantity					gather pipe connected to outdoor	allowable indoor quantity	allowable indoor total capacity (100KW)
	8HP	10HP	12HP	14HP	16HP			
8HP	1					—	13	110~290
10HP		1				—	16	140~360
12HP			1			—	19	165~435
14HP				1		—	20	200~520
16HP					1	—	20	225~585
18HP	1	1				HZG-22C	20	255~655
20HP		2				HZG-22C	20	280~725
22HP		1	1			HZG-22C	22	305~795
24HP		1		1		HZG-32C	32	340~880
26HP		1			1	HZG-32C	32	365~945
28HP			1		1	HZG-32C	32	390~1020
30HP				1	1	HZG-32C	32	425~1105
32HP					2	HZG-32C	32	450~1170
34HP		2		1		HZG-38C	34	480~1245
36HP		2			1	HZG-38C	36	505~1310
38HP		1	1		1	HZG-38C	38	530~1380
40HP		1		1	1	HZG-48C	40	565~1465
42HP		1			2	HZG-48C	40	590~1530
44HP			1		2	HZG-48C	40	615~1605
46HP				1	2	HZG-48C	40	650~1690
48HP					3	HZG-48C	40	675~1755

# Installation instruction

indoor capacity (100W)	total indoor capacity (100W)	branch pipe (optional)
22	less than 101	FQG-B120
28		
36	more than 101, less than 180	FQG-B180
40		
45	more than 180, less than 370	FQG-B370
56		
71	more than 370, less than 700	FQG-B700
80		
90	more than 700, less than 1100	FQG-B1100
112		
140	more than 1100	FQG-B1460

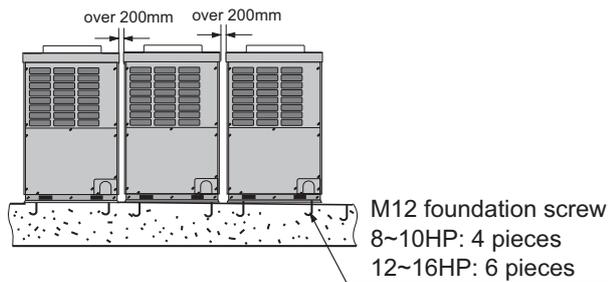
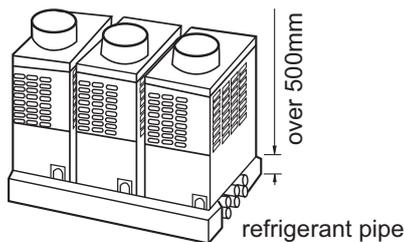
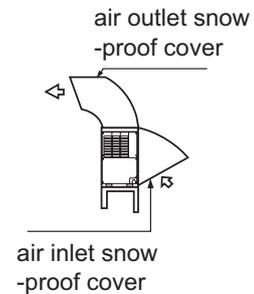
## (2) Installation place selection

<p>Air-conditioner can't be installed in the place with inflammable gas. Or it will cause fire hazard.</p> 	<p>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.</p> 	<p>The unit should be installed at the strong enough place. Or it will cause vibration and noise.</p> 
<p>The unit should be installed at the place where the cold/hot air or noise will not interfere the neighbours.</p> 	<p>The installation space refers to the latter info.</p> <ul style="list-style-type: none"> <li>• The place where the water can flow fluently.</li> <li>• The place where no other heat source will affect the unit.</li> <li>• Pay attention to the snow against clogging the outdoor.</li> <li>• In installation, install the anti-vibration rubber between the unit and the bracket.</li> </ul>	<ul style="list-style-type: none"> <li>• The unit is better not be installed at the below places, or it will cause damage.</li> <li>• The place where there is corrosive gas (spa area etc). The place blowing salty air (seaside etc).</li> <li>• Exsits the strong coal smoke.</li> <li>• The place with high humidity.</li> <li>• The place where there is device emitting Hertzian waves.</li> <li>• The place where voltage changes greatly.</li> </ul>

# Installation instruction

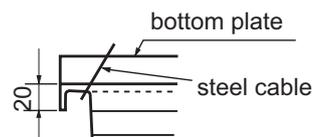
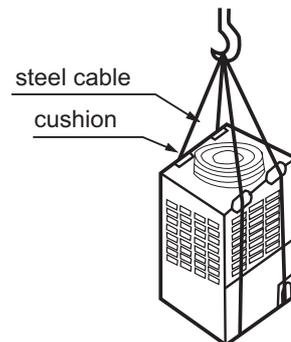
Note:

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

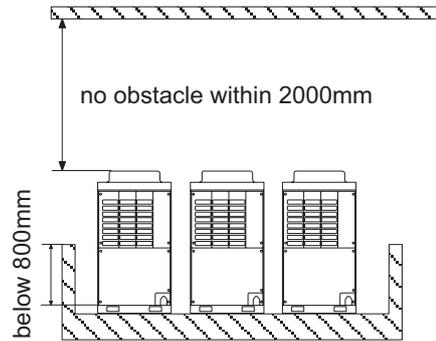
- In transportation, please don't dismantle the packaging, and move the unit to the installation location as closely as possible.
- If the packaging must be dismantled, hang up the unit with rope against damage.
- Don't hang the unit only at two points. When hanging the unit, don't sit on the unit. The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



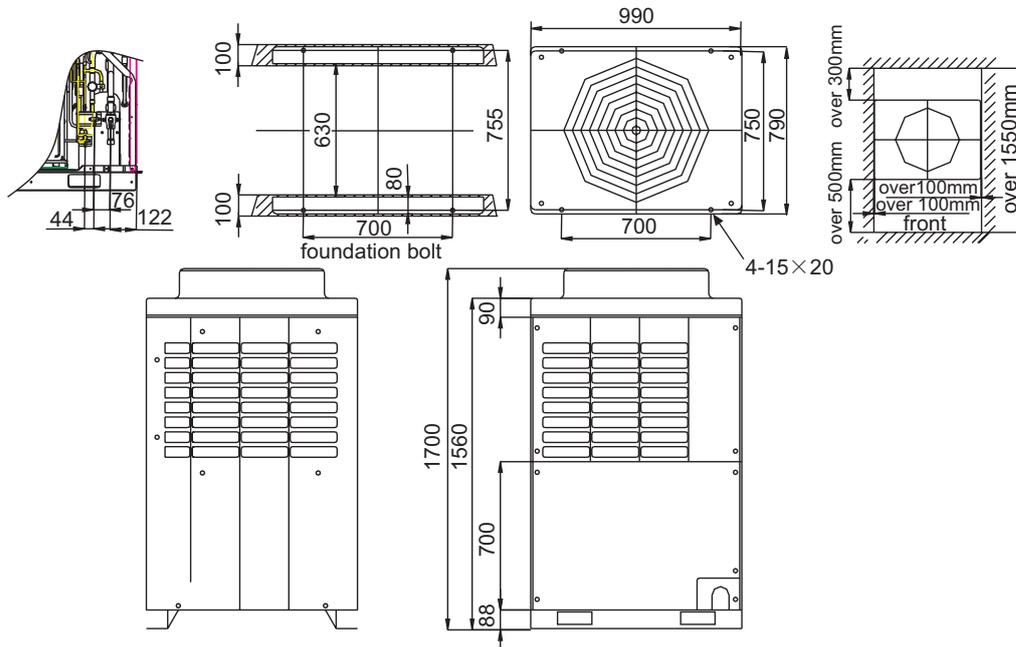
# Exterior and installation dimensions

Note:

There should be no obstacles in 2000mm above the top of outdoor unit;  
 Obstacles around outdoor should be less than 800mm to the bottom of unit.  
 Master unit should be the nearest one to the first gather pipe.

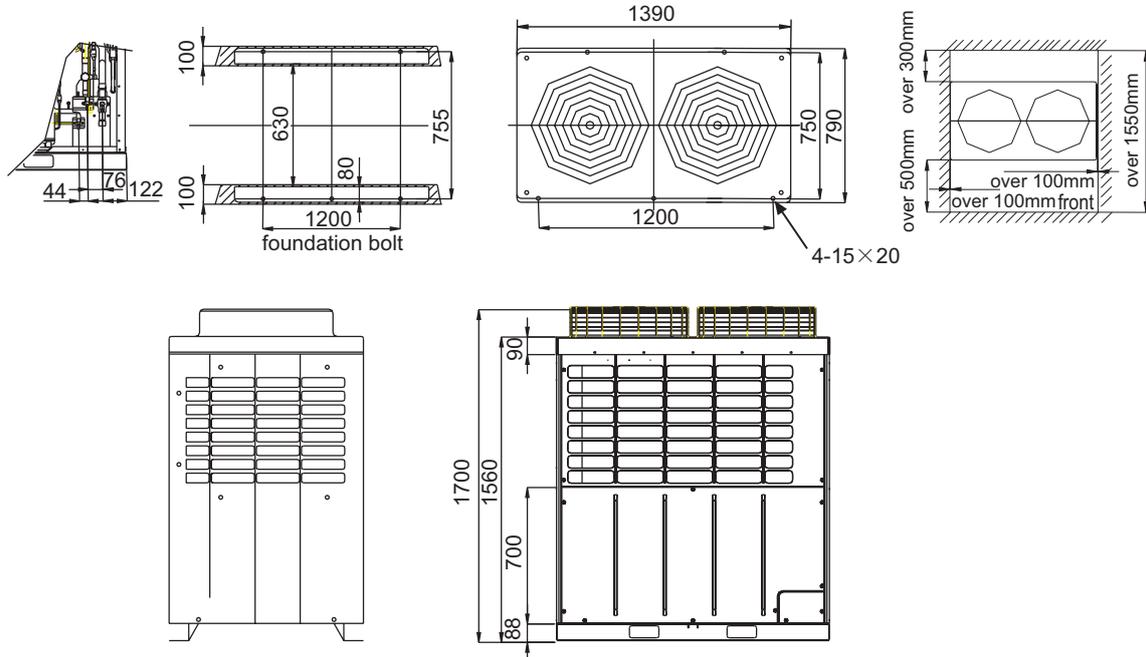


## 1.8~10HP exterior and installation dimensions



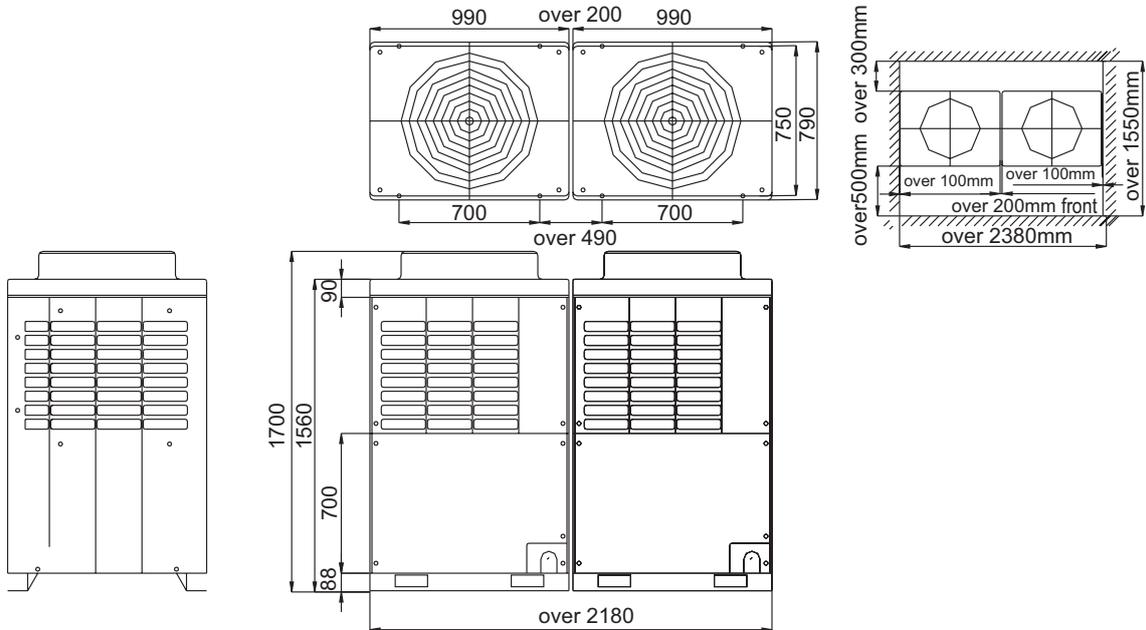
# Exterior and installation dimensions

## 2.12~16HP exterior and installation dimensions



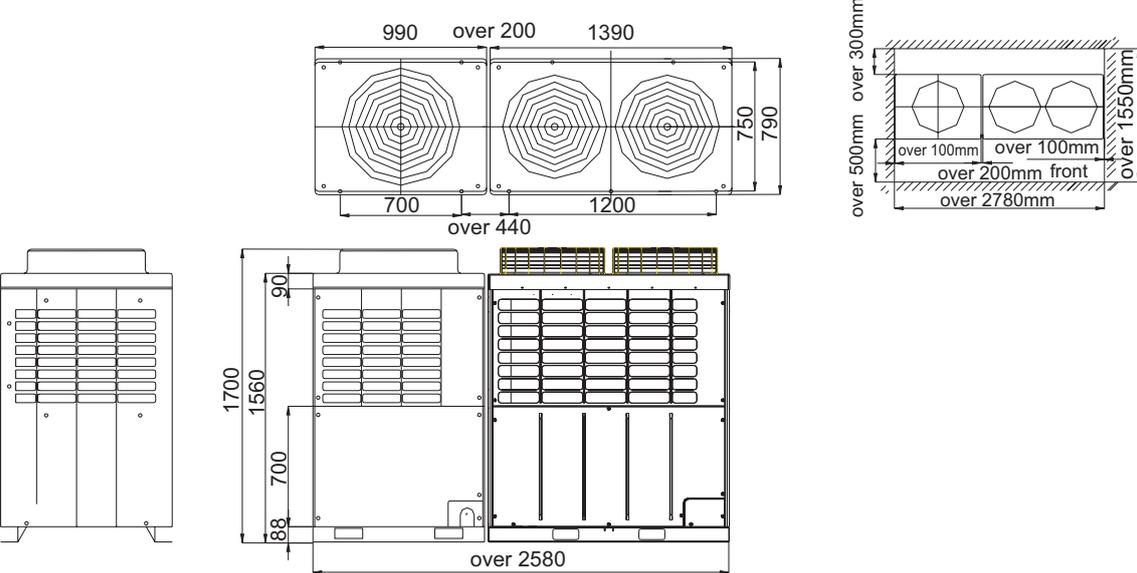
## 3.18~20HP exterior and installation dimensions

Note: When multiple modulares are installed, check if the outdoors are ranked as the capacity, and the larger capacity the closer to the main pipe of gather pipe.

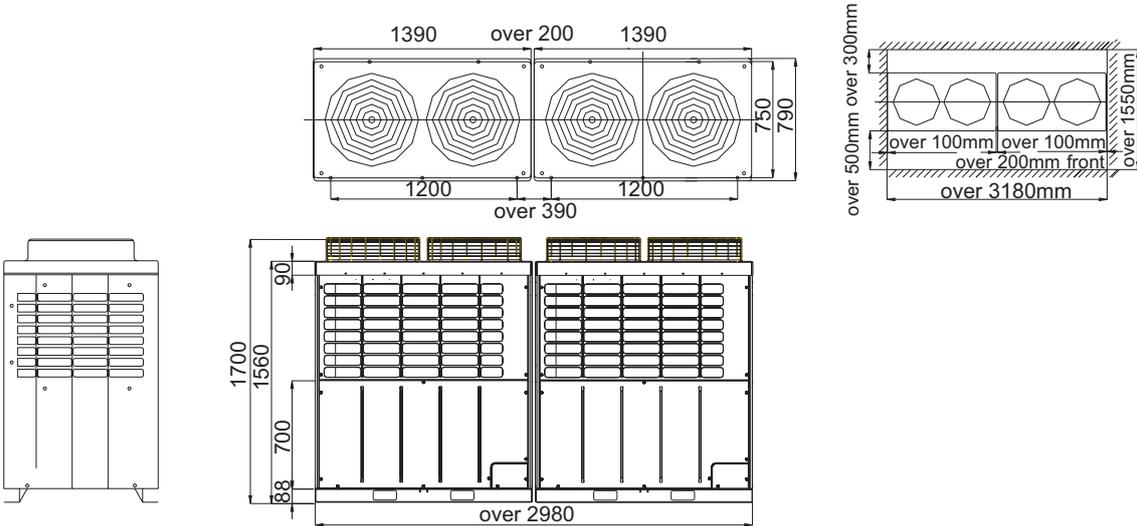


# Exterior and installation dimensions

## 4.22~26HP exterior and installation dimensions

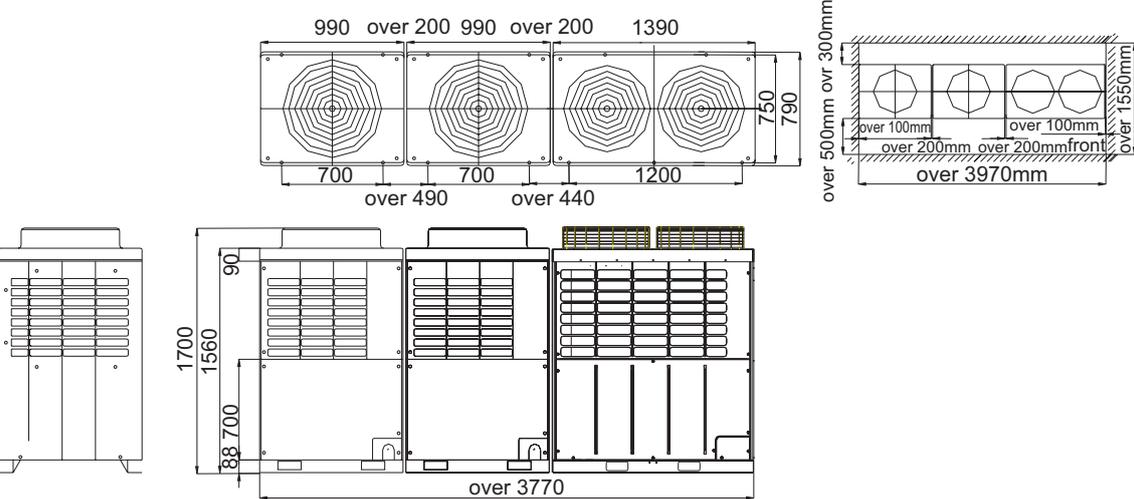


## 5.28~32HP exterior and installation dimensions

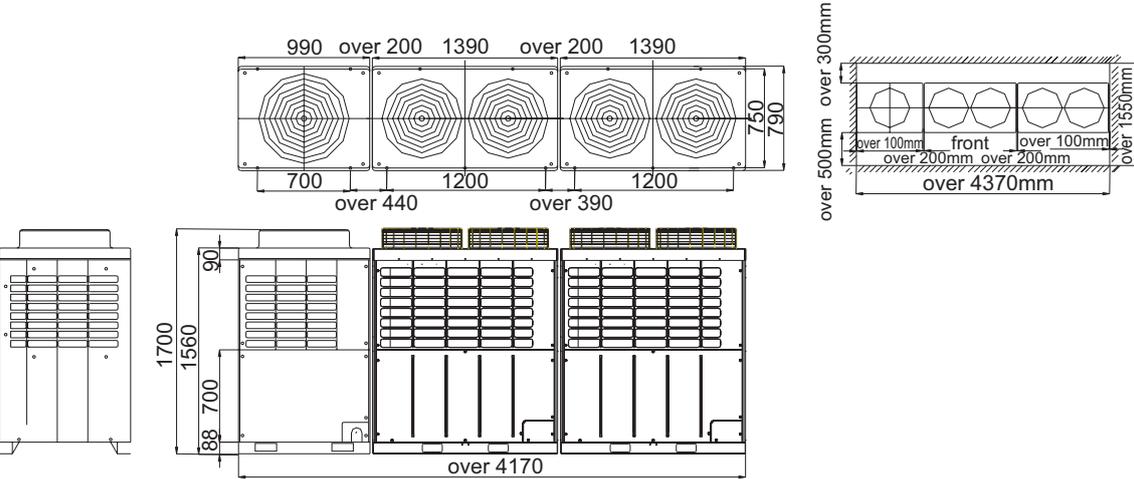


# Exterior and installation dimensions

## 6.34~36HP exterior and installation dimensions

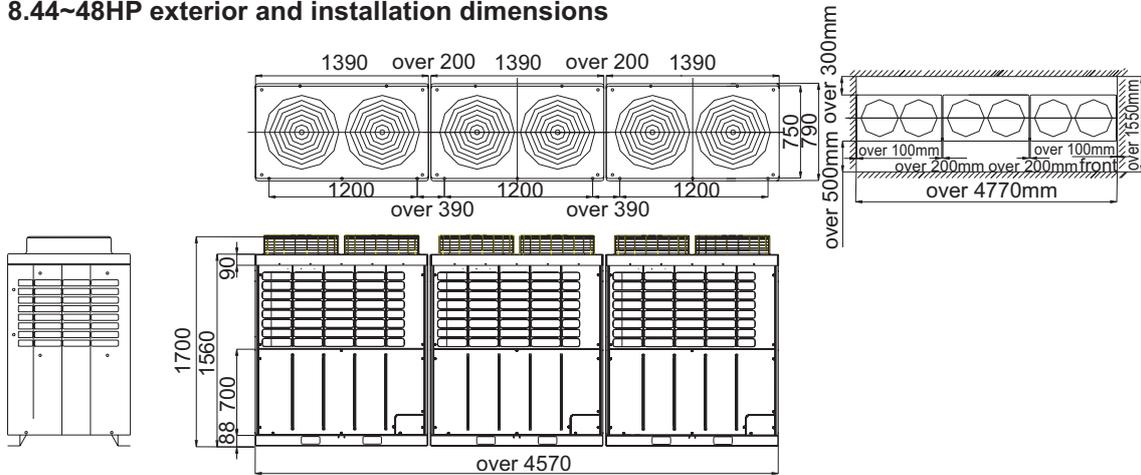


## 7.38~42HP exterior and installation dimensions



# Exterior and installation dimensions

## 8.44~48HP exterior and installation dimensions



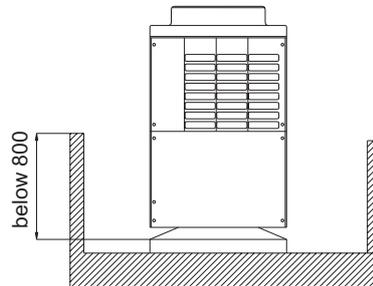
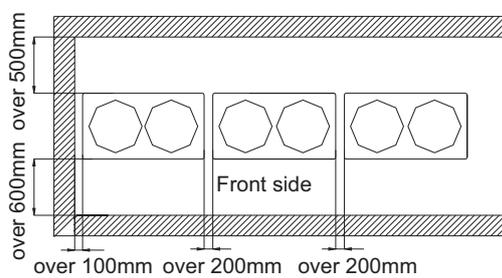
**Note:**

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.

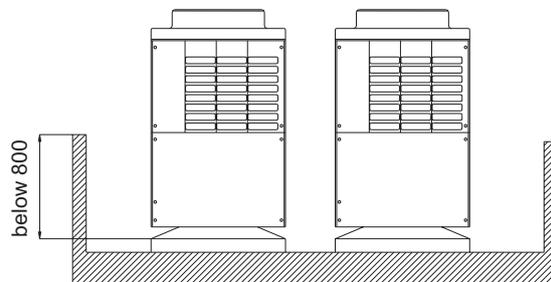
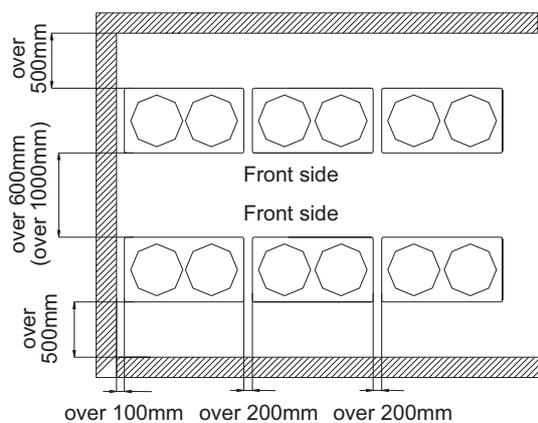
## 9. Combination installation dimensions

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

### A. Sites for one-row layout

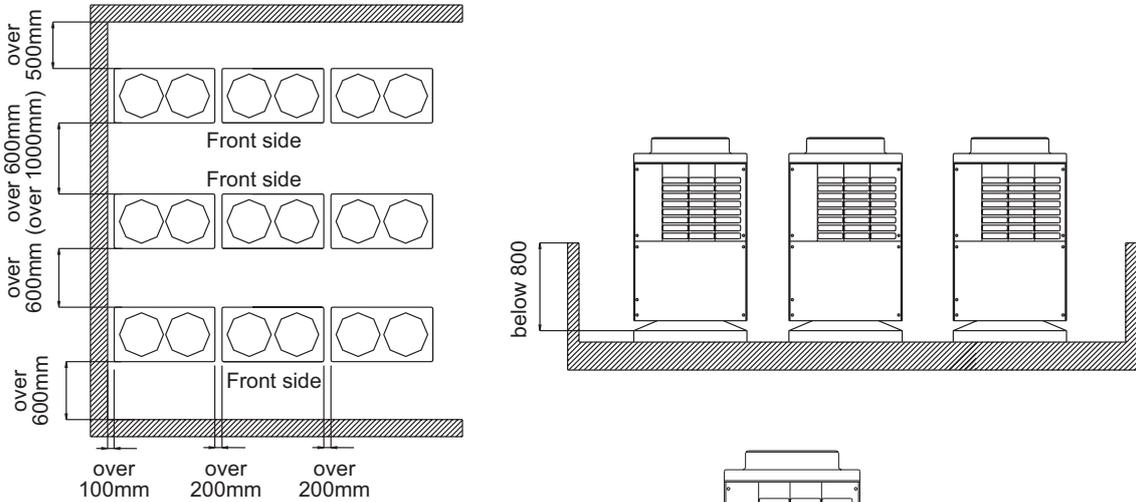


### B. Sites for two-row layout

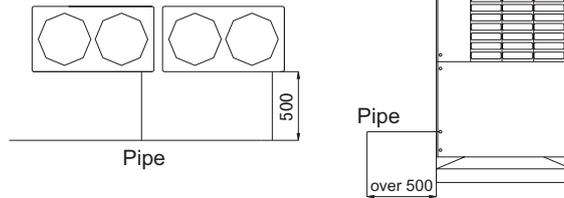


# Exterior and installation dimensions

## C. Sites for three-row layout



## D. Pipe

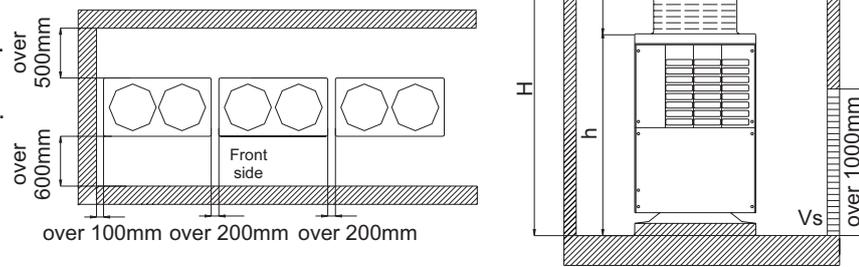


## 10. Wall higher than the outdoor condenser

### A. Place with air inlet hole

Notes:

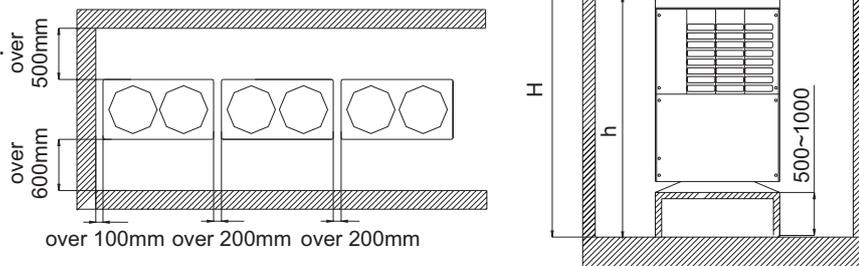
- Fan speed  $V_s$  at air inlet is 1.5m/s or below.
- Air outlet height  $HD=H-h$  and below 1m.



### B. Place without air inlet hole

Notes:

- Set a 500~1000mm bracket.
- Air outlet height  $HD=H-h$  and below 1m.



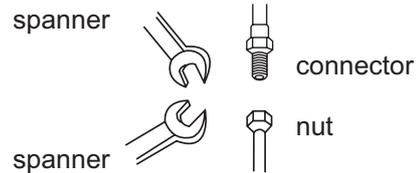
# Installation procedure

## 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.
- Don't let the impurity such as sand, water etc into the pipe.

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



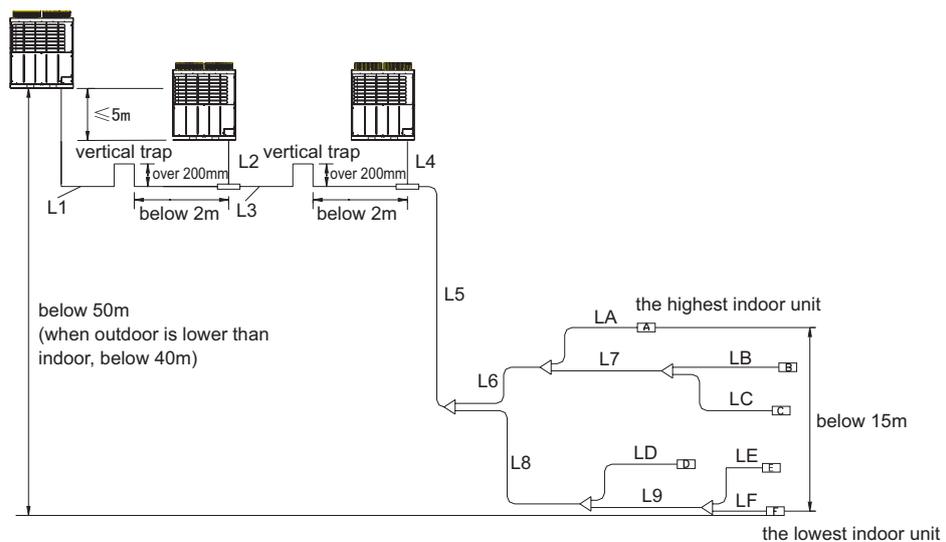
If threading the nut as not aiming at the center, the screw thread will be damaged, further it will cause leakage.

### Cautions in piping installation:

1. When welding the connector with hard solder, charge nitrogen into the pipe against oxidation. Or the oxygen film in the pipe will clog the capillary and the expansion valve, even cause the deathly accident.
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 the stop valves are closed.
4. Before welding the valve and the pipes, use the wet cloth to cool down the valve and the pipes.
5. When the connection pipe and the branch pipe need to be cut down, please use the special shears and cannot use the saw.

### Max. permissible length and height difference of refrigerant pipes

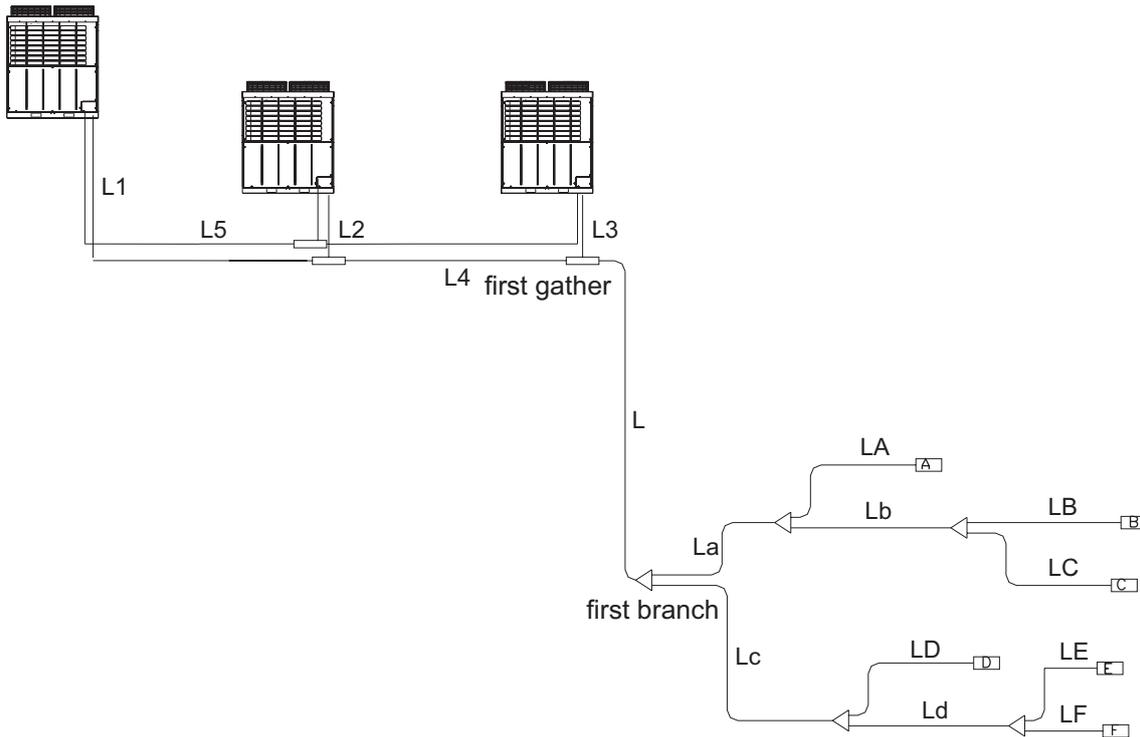
Max. permissible length and height difference of refrigerant pipes (NB: Oil pipes are not stated in the following figure.)



# Installation procedure

Items	Max. length	Pipe in above figure
Single way total pipe length	300	$L1+L2+L3+L4+L5+L6+L7+L8+L9+LA+LB+LC+LD+LE+LF$
Single way max. pipe length	Actual length: 150	$L1+L2+L3*L4+L5+L8+L9+LF$
	Equivalent length: 175	
Distance from outdoor to the 1st gather pipe	Actual length: 10	$L1+L3$
	Equivalent length: 13	
Max. pipe length after 1st branch pipe	40	$L8+L9+LF$
Main pipe actual length	110	$L5$
Height difference between indoor and outdoor	50 (when outdoor is lower than indoor: 40)	—
Height difference between indoors	15	—
Height difference between outdoors	5	—

## Pipe material and specs selection



# Installation procedure

## 1. Indoor pipe: LA, LB, LC, LD, LE, LF

Model Capacity	Gas pipe side		Liquid pipe side	
	Diameter	Connecting method	Diameter	Connecting method
07	Ø12.7	Flared joint	Ø6.35	Flared joint
09	Ø12.7		Ø6.35	
12	Ø12.7		Ø6.35	
14	Ø12.7		Ø6.35	
16	Ø12.7		Ø6.35	
18	Ø15.88		Ø9.52	
24	Ø15.88		Ø9.52	
28	Ø15.88		Ø9.52	
30	Ø15.88		Ø9.52	
38	Ø19.05		Ø9.52	
48	Ø19.05		Ø9.52	

### Pipe spec and the torque

external diameter (mm)	Thickness(mm)	Tightening Torques for Connecting Nuts
6.35	coil pipe: over 0.8	14-18N.m(1.1-1.8kg.m)
9.52	coil pipe: over 0.8	34-42N.m(3.4-4.2kg.m)
12.7	coil pipe: over 0.8	34-42N.m(3.4-4.2kg.m)
15.88	coil pipe: over 1.0	68-82N.m(6.8-8.2kg.m)
19.05	staight pipe: over 1.0	100-120N.m(10-12kg.m)
	coil pipe: over 1.1	
22.22	staight pipe: over 1.0	—
25.4	staight pipe: over 1.0	—
28.58	staight pipe: over 1.0	—
31.8	staight pipe: over 1.1	—
34.9	staight pipe: over 1.3	—
38.1	staight pipe: over 1.4	—
Not less than 41.3	staight pipe: over 1.5	—

### 2. diameter between branch pipes: La, Lb, Lc, Ld (calculated due to the total indoor capacity after the pipe)

total indoor capacity (100W)	Gas pipe	Liquid pipe
~101	Ø15.88	Ø9.52
101~180	Ø19.05	Ø9.52
180~370	Ø28.58	Ø12.7
370~540	Ø31.8	Ø15.88
540~700	Ø38.1	Ø19.05
700~1100	Ø44.4	Ø22.22
1100~1300	Ø50.8	Ø22.22
More than 1300	Ø54.1	Ø25.4

# Installation procedure

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Note:

- a. When adjusting the bore between branch distributing pipes and unit, please adjust the bore at the side of branch distributing pipes.
- b. Select distributing pipes and branch pipes according to total downstream capacity of distributing pipes and branch distributing pipes of indoor units.

3. Main pipe diameter between the 1st gather pipe and the 1st branch pipe: L (calculated due to the total outdoor capacity)

Outdoor capacity	pipe selection		
	Gas pipe	Enlarged Gas pipe	Liquid pipe
22.6KW	Ø25.4	Ø28.58	Ø12.7
28.0KW	Ø28.58	Ø31.8	Ø12.7
33.5KW	Ø31.8	Ø34.9	Ø15.88
40.0KW	Ø34.9	—	Ø15.88
45.0KW	Ø34.9	—	Ø15.88
50.6KW	Ø34.9	—	Ø19.05
56.0KW	Ø34.9	—	Ø19.05
61.5KW	Ø38.1	—	Ø19.05
68.0KW	Ø44.4	—	Ø19.05
73.0KW	Ø44.4	—	Ø19.05
78.5KW	Ø44.4	—	Ø22.22
85.0KW	Ø44.4	—	Ø22.22
90.0KW	Ø44.4	—	Ø22.22
96.0KW	Ø50.8	—	Ø22.22
101.0KW	Ø50.8	—	Ø22.22
106.5KW	Ø50.8	—	Ø22.22
113.0KW	Ø50.8	—	Ø22.22
118.0KW	Ø50.8	—	Ø22.22
123.5KW	Ø50.8	—	Ø25.4
130.0KW	Ø54.1	—	Ø25.4
135.0KW	Ø54.1	—	Ø25.4

Note: when the largest pipe length (from outdoor to the farthest indoor) is over 90m (equivalent length), the main pipe should be enlarged to the larger class for AV08NMTAIA, AV10NMTAIA, AV12NMTAIA.

4. Outdoor pipe: L1, L2, L3

Outdoor capacity	pipe selection	
	Gas pipe	Liquid pipe
8HP	Ø25.4	Ø12.7
10HP	Ø28.58	Ø12.7
12HP	Ø31.8	Ø15.88
14HP	Ø34.9	Ø15.88
16HP	Ø34.9	Ø15.88

# Installation procedure

5. Pipe between gather pipes: L4 (depend on the total outdoor capacity before the gather pipe).

Outdoor capacity	pipe selection	
	Gas pipe	Liquid pipe
18HP	Ø34.9	Ø19.05
20HP	Ø34.9	Ø19.05
22HP	Ø38.1	Ø19.05
24HP	Ø44.4	Ø19.05
26HP	Ø44.4	Ø19.05
28HP	Ø44.4	Ø22.22
30HP	Ø44.4	Ø22.22
32HP	Ø44.4	Ø22.22

6. Oil equalization pipe: L5: Ø9.52

Note: The gas pipe valve is equipped with an auxiliary pipe. When welding the pipe in installation, cut away the auxiliary pipe. For some outdoors, you need weld the changing pipe (connected to the gas pipe valve) in the accessories. There is T-shape 3-way pipe (connected to oil equalization pipe) in every outdoor accessories.

## Branch Pipe

As branch pipe sizes change with the connection capacities (total downstream capacity) of indoor & outdoor units, please refer to the technical information.

For the specifications of branching joints and reducing couplings, please refer to Branch Pipe Kits, which is sold individually attached with the operation manual.

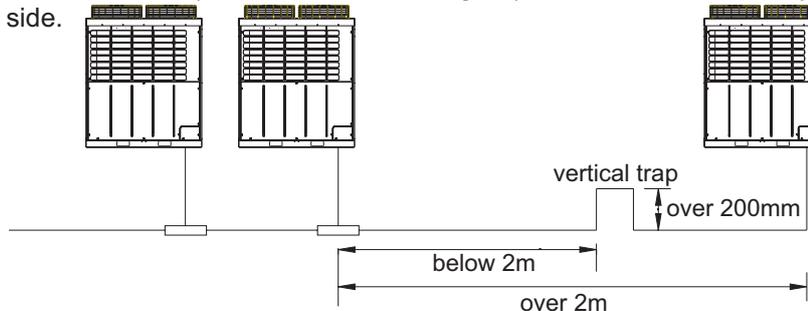
Note:

- Appropriate reducing couplings should be used between branching joints and indoor units to match with the pipe sizes of the indoor units.
- Adjust the bores of branching joint and indoor unit at the branching joint side if necessary.
- Mount the branching joints at both sides of gas pipe and liquid pipe horizontally or vertically (refer to Branch Pipe Manual)



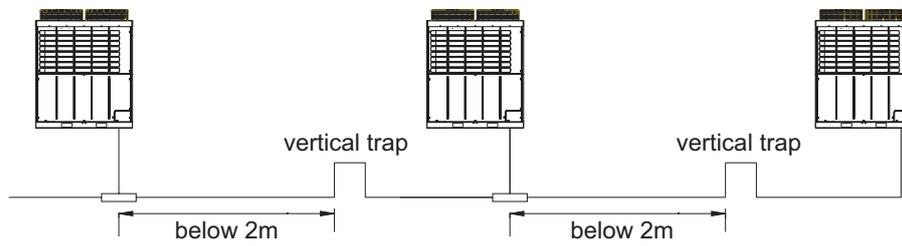
## Gather pipe design

1. When the distance between gather pipes or between gather pipe and outdoor is over 2m, the vertical trap should be set (over 200mm as the figure) and be within 2m away from the gather pipe at gas side.

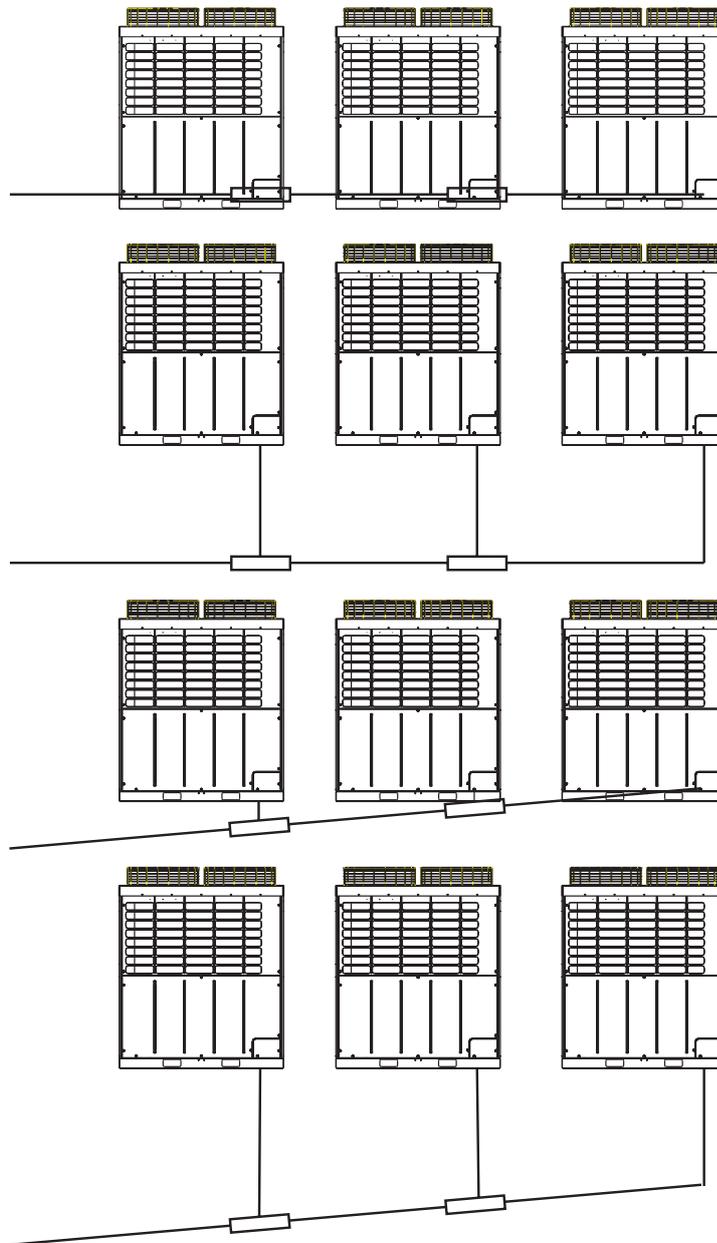


# Installation procedure

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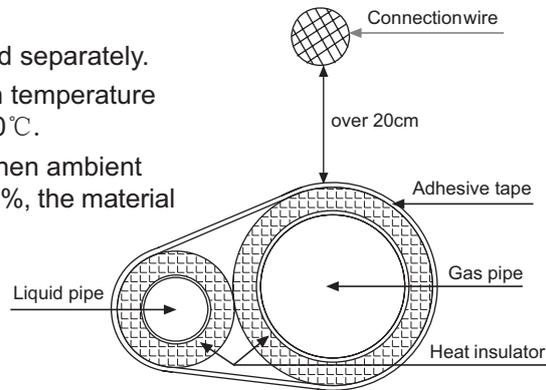
2. Pipe between outdoors should be horizontal or upwards in case that refrigerant oil stay at the pipe side.



# Installation procedure

## Heat insulation

- Gas pipe and liquid pipe should be heat insulated separately.  
The material for gas pipe should endure the high temperature over 120°C. That for liquid pipe should be over 70°C.
- The material thickness should be over 10mm, when ambient temp. is 30°C, and the relative humidity is over 80%, the material thickness should be over 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.

## B. Leakage test

After connecting refrigerant pipes, the leak test should be made.

The leak test should be made by applying pressure to the pipes with a nitrogen tank.

- The gas and liquid valves should be in closing state. ("O" at left side of gas pipe valve shows open; "S" at right side shows close). To prevent the nitrogen flowing into outdoor, keep pressure for indoor with nitrogen individually. Connect the charging pipe to indoor pipe, and seal all the connectors outside that of outdoor, then charge nitrogen.
- Each refrigerating systems should be pressurized slowing from gas & liquid valves according to the procedures.  
Attention should be paid to applying pressure from gas & liquid valves at the same time.

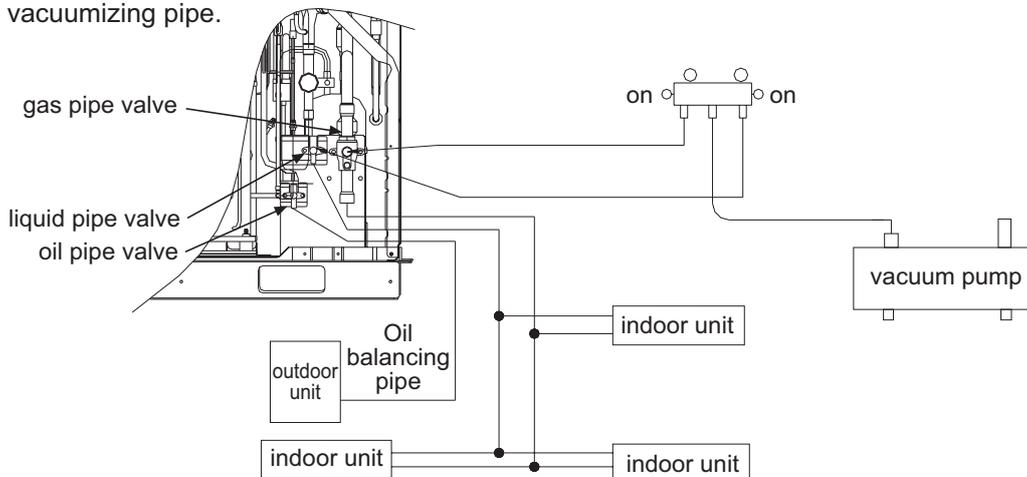
Notes:

- When making the leak test, oxygen, flammable gases, toxic gases and refrigerant shouldn't be used.
- Apply pressure with nitrogen with the pressure of 30kgf/cm<sup>2</sup>.  
Step 1: 0.3MPa (3.0 kgf/cm<sup>2</sup>) for over 3 minutes;  
Step 2: 1.5MPa (15 kgf/cm<sup>2</sup>) for over 3 minutes; Major leakage can be found.  
Step 3: 3.0MPa (30 kgf/cm<sup>2</sup>) for about 24 hours. Minor leakage can be found.
- Test if the pressure drops down.  
The connection is qualified if the pressure doesn't drop.  
If the pressure drops down, check the leaking points.  
After beginning to apply pressure, each 1°C of ambient temperature difference after 24 hours will generate a pressure change of 0.01MPa (0.1 kgf/cm<sup>2</sup>), which should be modified while testing.
- Inspection of Leaking Points:  
In the condition of pressure drops as in 1-3 test steps, test the leakage at each joints by sense of hearing, sense of feeling and vesicant. Weld the leakage points again or retighten the nut.

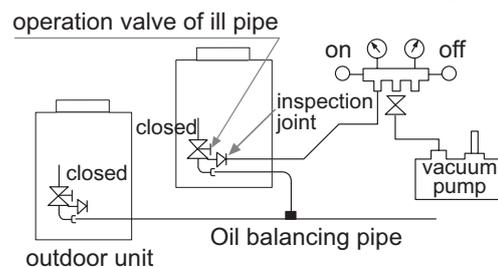
# Installation procedure

## C. Vacuumization of Pipes

- Vacuumization should be done with the vacuum pump. Refrigerant shouldn't be used to eliminate air in the system.
- After finishing the leak test and discharging nitrogen, close the valve of instrument shunt and connect the system to the vacuum pump as shown in the figure.
- Vacuumization should be done from both sides of gas and liquid valves. By vacuumize both access joints of the liquid pipe stop valve and the gas pipe stop valve, vacuumization can be done as soon as possible. If vacuumization is only done from the access joint of liquid pipe stop valve, at least one electronic expansion valve of the indoor unit should be ensured to be open. After finishing vacuumization, make sure that the stop valves are full opening and then unscrew the vacuumizing pipe.



- Select the vacuum pump with high degree of vacuum (below -755mmHg) and big pneumatic exhaust capability (over 40L/minute).
- Generally, the vacuumizing period is 2-3 hours, related to the pipe length. When vacuumization, make sure that the triple valves at both sides of gas pipe and liquid pipe are closed.
- If the vacuumization has been done for more than 2 hours but can't meet the vacuum degree of less than -755mmHg, proceed to do for another 1 hour.
- If the vacuumization has been done for more than 3 hours but still can't meet the vacuum degree of less than -755mmHg, check if there is any leaking point and modify the leaking point.
- If the vacuumization has been done for more than 2 hours and meets the vacuum degree of less than -755mmHg, close the valves VL and VH on the instrument shunt and stop vacuumization. After one hour, confirm if there is any change in the vacuum degree. The change of the vacuum degree indicates that there are leaking points, which should be checked and mended.
- Evacuation of oil equalization pipe: if two or more than two outdoors are connected, evacuate the oil equalization pipe by the check joint. After evacuation, open the valve with inner hexangular wrench, then remove the vacuum pipe quickly, and ensure the stop valve is open fully. (when there is only one outdoor, this evacuation is unnecessary. Please ensure the oil equalization valve is close fully in case of refrigerant or refrigerant oil leakage.)
- After finishing the above operations, replace the vacuum pump with the refrigerant pump to charge the additional refrigerant.



# Installation procedure

## D. Charging of Refrigerant

After vacuumization, replace the vacuum pump with refrigerant pump to charged the refrigerant. While charging the refrigerant, use the weighing scale to measure the filled refrigerant amount. The running for a long period with insufficient refrigerant will lead to failure of compressor.

Calculation of additive refrigerant amount:

The additional refrigerant before delivery is excluded in the refrigerant needed to fill in the pipes on the field operation.

The refrigerant needed in the pipes should be charged according to the calculating results.

The refrigerant amount charged before delivery:

model	AV08NMTAIA	AV10NMTAIA	AV12NMTAIA	AV14NMTAIA	AV16NMTAIA
refrigerant charge(kg)	8	10	14	16	16

(Calculation Formula)

The additive amount is calculated according to the length of the liquid pipe.

$\text{Additive Refrigerant Amount on Site} = \text{Actual Length of Liquid Pipe} \times \text{Refrigerant Weight to Be charged for per Meter Liquid Pipe}$
---

For example:

$$\text{additive refrigerant amount } R(\text{kg}) = L1 \times 0.030\text{kg/m} + (L2 \times 0.06\text{kg/m} + \dots + (L7 \times 0.53\text{kg/m}))$$

In which:

- L1 – actual length of Ø6.35 liquid pipe (m);
- L2 – actual length of Ø9.52 liquid pipe (m);
- L3 – actual length of Ø12.7 liquid pipe (m);
- L4 – actual length of Ø15.88 liquid pipe (m);
- L5 – actual length of Ø19.05 liquid pipe (m);
- L6 – actual length of Ø22.22 liquid pipe (m);
- L7 – actual length of Ø25.4 liquid pipe (m);

Additive Refrigerant Amount per Meter Pipe						
Ø6.35mm	Ø9.52mm	Ø12.7mm	Ø15.88mm	Ø19.05mm	Ø22.22mm	Ø25.4mm
0.03kg	0.06kg	0.12kg	0.2kg	0.28kg	0.4kg	0.53kg

### Charging Refrigerant

- When the valves of outdoor units are closed, charge refrigerant from service valve ports of stop valves of gas & liquid pipes.
- If the refrigerant with specified weight can't be charged, open all valves of gas & liquid pipes of outdoor units, slightly close the stop valve of gas pipe to run the compressor and charge the refrigerant from the service valve port of stop valve of gas pipe. At this time, adjust the rate of flow of refrigerant by the valve of gas tank to aerify refrigerant for absorption by the system.
- If there is insufficient refrigerant in the system caused from refrigerant leakage, reclaim the refrigerant in the system and renew the refrigerant with specified weight.

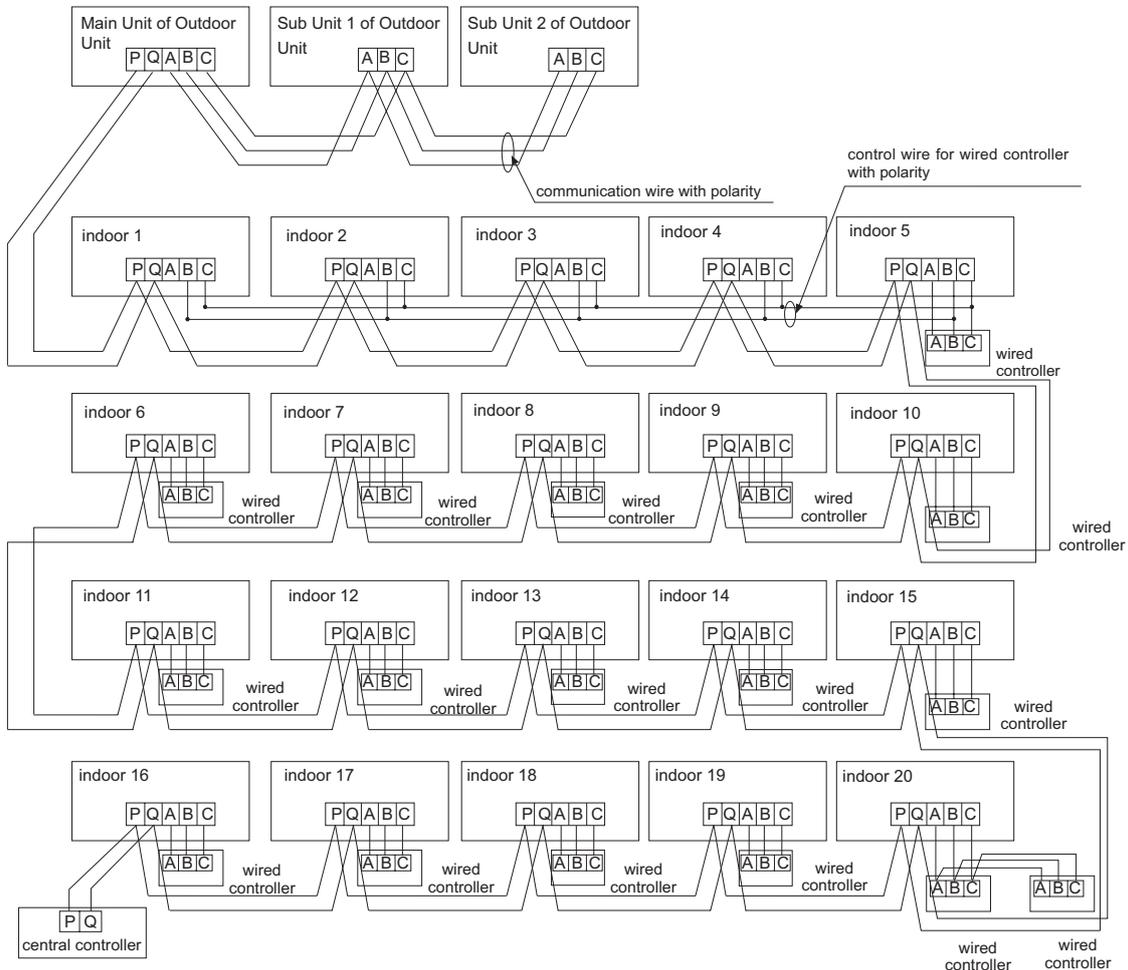
### Full Opening of Valves

- Fully open all valves of outdoor units.

NB: When connected to one main unit, i.e., without any sub unit, the stop valve of oil balancing pipe should be fully closed.

# Electric wiring and the application

## Communication wiring figure



Outdoor units are in parallel through 3 polar wires. The outdoor and all indoor units are in parallel through 2 non-polar wires.

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) is connected by 3 polar wires; the other indoors and the master indoors are connected by 2 polar wires.

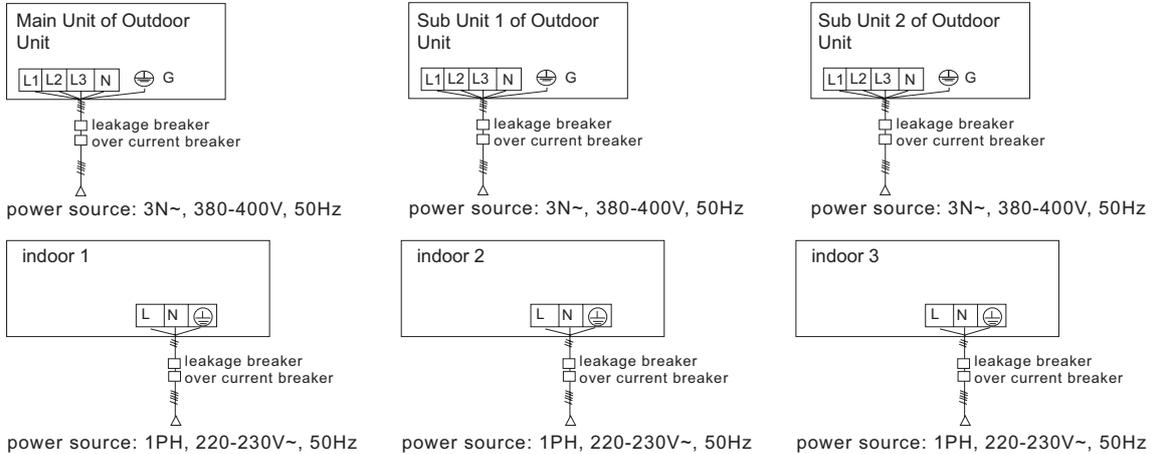
B. 1 to 1 (one wired controller controls one indoor): as shown in above figure, indoor 6~ indoor 19, indoor and wired controller are connected by 3 polar wires.

C. 2 to 1 (two wired controller controls one indoor): as shown in above figure, indoor 20. Either of wired controllers can be set as master wired controller, and the other is slave wired controller. Master/slave wired controller, and master/indoor are connected by 3 polar wires.

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

# Electric wiring and the application

## Power wiring figure



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

## Specs for power cable and communication wire

### 1. Outdoor power source and power cable

model \ item		power source	power cable section (mm <sup>2</sup> )	wire length (m)	circuit breaker (A)	rated current of residual current circuit breaker(A) leakage current (mA) response time(s)	earthing wire	
							section (mm <sup>2</sup> )	screw
individual power	AV08NMTAIA	3N~, 380-400V, 50Hz	6	60	40	40A 30mA below 0.1S	3.5	M5
	AV10NMTAIA		10	60	40	40A 30mA below 0.1S	3.5	M5
	AV12NMTAIA		10	60	60	60A 30mA below 0.1S	3.5	M5
	AV14NMTAIA		14	60	100	100A 100mA below 0.1S	3.5	M5
	AV16NMTAIA		18	60	100	100A 100mA below 0.1S	3.5	M5

- The Supply line should be fixed.
- All outdoor units should be grounded.
- When the length of the supply line exceeds the specified range, the supply line should be enlarged.
- Connect all shielding layers of signal lines of indoor units and outdoor units, and get the shielding layer of the signal line of the outdoor unit grounded individually.

# Installation procedure

Switching Mode of Wire-Controlled Main Unit/ Wire-Controlled Sub Units/ Remote-Controlled Types can be used for switching over

Control Mode Socket/Code	Wire-Controlled Main Unit	Wire-Controlled Sub Unit	Type Switching Mode of Remote Control
CN23	strapping	no strapping	no strapping
CN30	strapping	strapping	no strapping
CN21	null	null	connected to receiving plank of remote control
SW08-[6]	ON	ON	OFF
Signal Terminals	A,B,C are connected to wired controller	B,C are connected to wired controller	A,B,C are not connected to wired controller

NB: The default setup is ON for SW08-[6] before delivery.

## 2. Communication wire for wired controller

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

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

## Indoor central control address setting method

No.	setting type	setting method	remarks
1	Set by hand	1.SW02 on indoor PCB is ON (upper); 2. The detailed position refers to the below table.	set on field
2	Set by wired controller	1. SW02 on indoor PCB is OFF(down), set when out of factory. 2. Press "FILTER" on wired controller continuously for 10 seconds into central control setting mode, and select the indoor central control address by "TEMP+/-". 3. Temp. area indicates: system address+XX, press "TEMP+/- ", the unit number will change "00~3F" (00 is No.1, 3F is No.64), and the initialization is 00. 4. After selecting the number, press "SET" to save it; if pressing other buttons or no pressing within 15 seconds, it will quit automatically and keep the former setting.	set on field

# Installation procedure

Indoor central control address table (set by hand)

SW02								central control address	SW02								central control address	SW02								central control address
1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	
1	0	0	0	0	0	0	0	1	1	0	0	1	0	1	1	0	23	1	0	1	0	1	0	1	1	44
1	0	0	0	0	0	0	1	2	1	0	0	1	0	1	1	1	24	1	0	1	0	1	1	0	0	45
1	0	0	0	0	0	1	0	3	1	0	0	1	1	0	0	0	25	1	0	1	0	1	1	0	1	46
1	0	0	0	0	0	1	1	4	1	0	0	1	1	0	0	1	26	1	0	1	0	1	1	1	0	47
1	0	0	0	0	1	0	0	5	1	0	0	1	1	0	1	0	27	1	0	1	0	1	1	1	1	48
1	0	0	0	0	1	0	1	6	1	0	0	1	1	0	1	1	28	1	0	1	1	0	0	0	0	49
1	0	0	0	0	1	1	0	7	1	0	0	1	1	1	0	0	29	1	0	1	1	0	0	0	1	50
1	0	0	0	0	1	1	1	8	1	0	0	1	1	1	0	1	30	1	0	1	1	0	0	1	0	51
1	0	0	0	1	0	0	0	9	1	0	0	1	1	1	1	0	31	1	0	1	1	0	0	1	1	52
1	0	0	0	1	0	0	1	10	1	0	0	1	1	1	1	1	32	1	0	1	1	0	1	0	0	53
1	0	0	0	1	0	1	0	11	1	0	1	0	0	0	0	0	33	1	0	1	1	0	1	0	1	54
1	0	0	0	1	0	1	1	12	1	0	1	0	0	0	0	1	34	1	0	1	1	0	1	1	0	55
1	0	0	0	1	1	0	0	13	1	0	1	0	0	0	1	0	35	1	0	1	1	0	1	1	1	56
1	0	0	0	1	1	0	1	14	1	0	1	0	0	0	1	1	36	1	0	1	1	1	0	0	0	57
1	0	0	0	1	1	1	0	15	1	0	1	0	0	1	0	0	37	1	0	1	1	1	0	0	1	58
1	0	0	0	1	1	1	1	16	1	0	1	0	0	1	0	1	38	1	0	1	1	1	0	1	0	59
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1	0	0	1	0	0	1	0	19	1	0	1	0	1	0	0	0	41	1	0	1	1	1	1	0	1	62
1	0	0	1	0	0	1	1	20	1	0	1	0	1	0	0	1	42	1	0	1	1	1	1	1	0	63
1	0	0	1	0	1	0	0	21	1	0	1	0	1	0	1	0	43	1	0	1	1	1	1	1	1	64
1	0	0	1	0	1	0	1	22																		

Communication address between indoor and outdoor setting by hand:

1st, 2nd bit of SW03 are ON, the latter six bits can confirm the communication address, the address setting refers to the "central control address setting table". For example, the communication address is 8, the dip switch of SW03 is 11000111.

## Indoor control type selection

indoor PCB	wired control master unit	wired control slave unit	remote control	remarks
CN23	short connected	disconnected	disconnected	1. The communication address between master/slave wired controller and the outdoor is different. 2. If central control is necessary, all indoor central control addresses in one group are identical, while the indoor address in different groups is different too.
CN30	short connected	short connected	disconnected	
CN21	blank	blank	to remote receiver	
SW08-[6]	ON	ON	OFF	
SW01	"0"	1~15 (different dialing setting on SW01 for the slave units in one group)	"0"	
signal terminal block	A,B,C to wired controller	B,C to wired controller	A,B,C not to wired controller	

Note: In the above figure, the state in the frame is set when out of factory.

# Installation procedure

## Dip switch definition

Dip switch of communication chip: (ON is low level) (dip switch on 0010451150C connecting PCB)

SW01-1, 2, 3, 4 used for model selection:

		SW01-1	SW01-2	description
SW01-1	piping length selection	OFF	OFF	medium piping length
		ON	OFF	short piping length
SW01-2		OFF	ON	long piping length
SW01-3	Pre-set			
SW01-4	Pre-set			

SW01-5, 6, 7, 8 used to set outdoor unit No. and outdoor unit No. lock

outdoor unit No.		SW01-6	SW01-7	SW01-8
0		OFF	OFF	OFF
1		OFF	OFF	ON
2		OFF	ON	OFF
SW01-5	searching outdoor after being electrified	OFF	begin to search outdoor	
		ON	stop searching outdoor and lock the outdoor quantity	

Note: When being electrified for the first time, or changing EEPROM, or changing connecting board, or outdoor quantity changes, outdoor number needs to be re-set, after setting the number, set SW01-5 on connecting board of master unit at OFF, then power on. Outdoor unit will begin to search the slave unit, LED1-4 will display slave unit quantity. If displaying 0000, shows only master unit is found; if displaying 1111, shows master unit and No.1 slave unit; if displaying 2222, shows master unit, No.1 slave unit and No.2 slave unit. If the found outdoor quantity is identical with the actual, set SW01-5 at ON. Then stop to search outdoor and lock the outdoor quantity. If the searched outdoor quantity changes after being locked, the master unit will occur failure 1004.

LED on inverter board description (0010451151B)

LED	description	normal state	abnormal state
LED1	receiving lamp of communication between inverter board and connecting board	sending lamp and receiving lamp will flash in turn at interval of 0.5 second.	not flash or constant-on or constant off, which shows communication between inverter board and connecting board is failure. Check the wires between them and if the inverter board is damaged.
LED5	sending lamp of communication between inverter board and connecting board		
LED6	alarm lamp	OFF	flashing 9 times is power module protection; flashing 6 times is over current; flashing 7 times shows communication failure, flashing 12 times shows communication abnormal.
LED4	power supply lamp	ON constantly	if it is not light, check power supply and the fuse

# Trial operation and the performance

LED on connecting board description (0010451150C)

LED	description	normal state	abnormal state
LED1	receiving lamp of communication with indoor	sending lamp and receiving lamp will flash in turn at interval of 0.5 second.	not flash or constant-on or constant off, which shows communication is failure. Check the communication wires or if there is too strong interference, or if the PCB is damaged.
LED2	sending lamp of communication with indoor		
LED3	receiving lamp of communication with slave unit	sending lamp and receiving lamp will flash in turn at interval of 0.5 second.	not flash or constant-on or constant off, which shows communication is failure. Check the communication wires or if there is too strong interference, or if the PCB is damaged.
LED4	sending lamp of communication with slave unit		

Note: Other functions of LED

a. If SW01-4 is ON, flash times of LED2 is the first number of the current failure code; flash times of LED1 is the second number of the current failure code; flash times of LED4 is failure code of the current faulty slave unit. If SW01-4 is OFF, the above LEDs will be communication lamp.

b. If SW01-3 is ON, flash times of LED3 shows outdoor capacity. 8HP: flash once; 10HP: flash twice; 12HP: flash 3 times; 14HP: flash 4 times; 16HP: flash 5 times, the other capacity: not flash. Switch SW01-3 at OFF again, the lamp will become receiving lamp of communication with slave unit.

LED	description	set	flash meaning	remarks
LED3	receiving from 849	SW01-4 at ON	faulty outdoor address	read only after re-startup
LED1	1007 receiving	SW01-4 at ON	the second number of failure code	read only after re-startup
LED2	1007 sending	SW01-4 at ON	the first number of failure code	read only after re-startup
LED4	sending to 849	SW01-3 at ON	outdoor capacity	read only after re-startup

Dip switch definition on control chip: (dip switch on 0010451150C connecting PCB)

SW02-1, SW02-2, SW02-3 used to select horse power

SW02-1	SW02-2	SW02-3	outdoor HP
OFF	OFF	OFF	8HP
OFF	OFF	ON	10HP
OFF	ON	OFF	12HP
OFF	ON	ON	14HP
ON	OFF	OFF	16HP

# Trial operation and the performance

SW02-4, SW02-5, SW02-6, SW02-7 used to select function set

SW02-4	SW02-5	defrosting constant
OFF	OFF	8
OFF	ON	6
ON	OFF	10

SW02-6	wait for 4 hours when being electrified for the first time
OFF	yes
ON	no
SW02-7	forbidden to start up at 25degree in heating mode
OFF	yes
ON	no
SW02-8	pre-set
OFF	pre-set
ON	pre-set

## Setting state and the function definition of PCB and wired controller when out of factory

Type	Name	Factory Setting	Function	Remarks
PCB of Indoor Unit	Dip Switch	SW01	0	1. When one line control controls one indoor unit, multiple line controls control one indoor unit or the remote control is used, the codes needn't be moved; 2. When one line control controls multiple indoor units, "0" position is used for main unit and different positions of 1-15 for sub units.
		SW02	OFF	1. The codes needn't be moved when central control addresses of indoor units are set with line control; 2. When set indoor central control address by hand, please refer to set method of indoor central control address.
		SW03	OFF	1. When setting communication addresses of indoor & outdoor units automatically, the codes needn't be moved 2. Set the communication address between indoor and outdoor by hand or by wired controller

# Electric wiring and the application

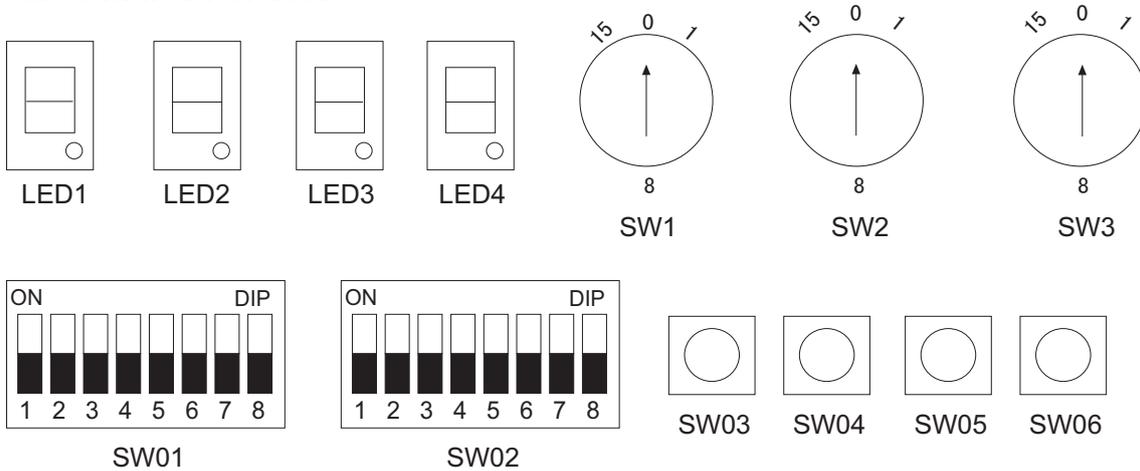
Type	Name	Factory Setting	Function	Remarks			
PCB of Indoor Unit	Jumper	CN23	strapping	Strapping is used with line control while disconnection used with remote controller.			
		CN25	disconnection				
		CN26	disconnection	Serial output, connected to test fixture			
		CN27	disconnection	Strapping after powered on; full opening of electronic expansion valve of indoor units for 2 minutes			
		CN28	disconnection	Strapping after powered on; schedule compression for indoor units			
		CN29	disconnection	Strapping after powered on; full closing of electronic expansion valve of indoor units for 2 minutes			
		CN30	strapping	Strapping is used with wired controller while disconnection used with remote controller.			
		CN31	disconnection	Test run for indoor units.			
	Dip Switch	SW06-[8]	ON	setting of corrected value of inlet air temperature TA			
				SW06-[8]		SW06-[7]	TA corrected value
		SW06-[7]	ON	OFF		OFF	12°C
				OFF		ON	8°C
				ON		OFF	4°C
				ON		ON	0°C (values at factory setting)
	SW06-[1]	ON	At "ON" position, the fan can be switched over between high, middle and low speeds while at "OFF" position the air quantity is fixed, which is suitable for blast pipe units.				
	SW08-[6]	ON	With wired controller, it is set to "ON" position; with remote controller, it is set to "OFF" position.				
	Indicator	LED1	red	With communication indicator of wired controller, it indicates that indoor units send signals to wired controller.			
		LED2	green	With communication indicator of wired controller, it indicates that indoor units receive signals from wired controller.			
				LED1 works with LED2. If the communication between line control and indoor units, LED1 and LED2 flash regularly; if it has line-controlled sub units, LED1 of sub units flashes with low frequency.			

# Electric wiring and the application

Type	Name	Factory Setting	Function		Remarks	
PCB of Indoor Unit	Indicator	LED3	red	With communication indicator of outdoor units, it indicates that indoor units send signals to indoor units.		Only when two wired controllers control one indoor unit can either of the wired controllers be used as the auxiliary wired controller.
		LED4	green	With communication indicator of outdoor units, it indicates that indoor units receive signals from indoor units.		
				LED3 works with LED4. If the communication between outdoor units and indoor units, LED3 and LED4 flash regularly. The flashing frequency of red indicator is lower than that of green one.		
		LED5	Fault indicator	It doesn't flash at normal condition. Faults can be determined by the flashing times of indicator.		
		LED6	yellow	It doesn't flash at normal condition except when fully opening or closing electronic expansion valve.		
Wired Controller	Dip Switch	SW01-1	OFF	Switchover between main & auxiliary line controls	ON	Auxiliary wired controller is set.
					OFF	Main wired controller is set.
		SW01-2	OFF	Temperature switchover between Centigrade and Fahrenheit	ON	Indicating Fahrenheit
					OFF	Indicating Centigrade
	Resistance	J03	1	Selecting room temperature indication	0	Without indication
					1	With indication
		J06	1	position selection of room temp. sensor	0	adopt the room temp. sensor in indoor
					1	adopt the room temp. sensor in wired controller
	Diode	J07	0	auto restart selection	0	with auto restart function
					1	without auto restart function
		D1	OFF	Schedule compression function	ON	Done by indoor units
					OFF	Normal control
		D2	OFF	Compulsive defrosting	ON	Send "Compulsive Defrosting" signal to indoor units
					OFF	Normal control

# Electric wiring and the application

## Indications of system operating parameters --Comparison table of nixie tubes indication data



Rotary switch

SW01, SW02, SW03: set rotary switch from 0 to 15

LED1, LED2, LED3, LED4: 7-segment digital tube 4 bits display

Press switch: SW03, SW04, SW05, SW06, their functions are as follow:

press switch	description
SW03	communication chip(IC2) START (up)
SW04	communication chip(IC2) STOP (down)
SW05	control chip(IC1) STOP (down)
SW06	control chip(IC1) START (up)

### Display and function of digital indicating board

Connecting method:

Connect CN2 on digital indicating board and CN31 on connecting board, and confirm it in good condition. Then connect CN1 and CN30, CN3 and CN32.

Outdoor needs not restart up, you can check the parameters from digital indicating board.

### Indoor parameters

check the parameters of indoor units from No.1 to No.64.

SW3: number range from 3 to 15. shows indoor parameters.

SW1, SW2: indoor number.

SW1	SW2	address
0	0-15	1~16
1		17~32
2		33~48
3		49~64

# Electric wiring and the application

SW3	description	normal state
3	indoor communication inspection	LED1, LED2, LED3, LED4 display 1111; if there is no this indoor or no communication, display ----
4	indoor failure	display indoor failure code
5	indoor capacity	LED3, LED4, 1.5HP: display 1.5, display indoor capacity
6	indoor PMV open angle	LED2, LED3, LED4 display valve open angle
7	air inlet temp.	LED2, LED3, LED4 display air inlet temp.
8	indoor gas pipe temp.	LED2, LED3, LED4 display gas pipe temp.
9	indoor liquid pipe temp.	LED2, LED3, LED4 display liquid pipe temp.
10	display current state	display current state

## Outdoor parameter

SW3: display range: 0~2, shows outdoor parameter.

SW1: used to outdoor number, SW1 at 0 shows check parameter of outdoor No. 0(master unit); SW1 at 1 shows check parameter of outdoor No. 1; SW1 at 2 shows check parameter of outdoor No.2.

SW1	SW2	SW3	function	description
No. 0~2	0	0	display outdoor failure code	outdoor bus line transmits failure code
	2	0	display running mode	HEAT or COOL
	3	0	outdoor capacity	16.0: 16HP; 8.0: 8HP
	4	0	outdoor total running frequency	210 shows 210Hz(No.0 unit displays total running frequency. non-No.0 unit display its own running frequency)
	5	0	slave unit running frequency	running frequency of inverter compressor
	6	0	outdoor motor running speed	4 shows 4-speed
	7	0	outdoor backup running	0001 inverter unit in backup running 0010 fixed frequency unit 1 in backup running 0100 fixed frequency unit 2 in backup running ---- in normal operation
	8	0	outdoor valve state	LED1: 1 ON; 4WV: 0 OFF LED2: 1 ON; SV1: 0 OFF LED3: 1 ON; SV2: 0 OFF LED4: 1 ON; SV3: 0 OFF
	9	0	outdoor valve state	LED1: 1 ON; SV4: 0 OFF LED2: 1 ON; SV5: 0 OFF LED3: 1 ON; SV6: 0 OFF LED4: 1 ON; CH1: 0 OFF
	10	0	outdoor PMV1 open angle	0-480 step
	11	0	outdoor PMV2 open angle	0-480 step

# Electric wiring and the application

SW1	SW2	SW3	function	description
	12	0	fixed frequency compressor state	LED1: 1 ON; 0 OFF(fixed frequency compressor 1) LED2: 1 with; 0 without(fixed frequency compressor 1) LED3: 1 ON; 0 OFF(fixed frequency compressor 2) LED4: 1 with; 0 without(fixed frequency compressor 2)
	13	0	outdoor valve state and electric heater	LED1: 1 ON; CH2 0 OFF LED2: 1 ON; CH 0 OFF

SW1	SW2	SW3	function	description
No. 0~2	0	1	Pd pressure	kg
	1	1	Ps pressure	kg
	2	1	TD1 inverter discharging temp.	LED1, LED2, LED3 will display. For example, -15 degree
	3	1	TS suction temp.	LED1, LED2, LED3 will display. For example, -15 degree
	4	1	TE defrosting temp.	LED1, LED2, LED3 will display. For example, -15 degree
	5	1	TA ambient temp.	LED1, LED2, LED3 will display. For example, -15 degree
	6	1	TD fixed frequency1 discharging temp.	LED1, LED2, LED3 will display. For example, -15 degree
	9	1	TD fixed frequency2 discharging temp.	LED1, LED2, LED3 will display. For example, -15 degree
	10	1	current of fixed frequency1	LED1, LED2, LED3 will display. For example, 530
	11	1	current of inverter compressor	LED1, LED2, LED3 will display. For example, 25.5
	12	1	current of fixed frequency2	LED1, LED2, LED3 will display. For example, 25.5
	15	1	defrosting compensation	10, 8, 6

## Information center of master unit: display data of the whole system

SW1	SW2	SW3	function	description
0	0	2	refrigerant type	407 stands for R407C 410 stands for R410A ; default display R22 shows R22 refrigerant
0	1	2	outdoor total capacity	40.0 stands for 40HP

# Electric wiring and the application

SW1	SW2	SW3	function	description
0	2	2	outdoor QTY in one system	e.g.: 4 outdoors (excluding inverter outdoor)
0	3	2	indoor QTY in one system	e.g.: 64 indoors
0	4	2	running indoor QTY	depend on if thermostat is ON
0	5	2	indoor QTY whose operation modes are as the same as that of outdoor	e.g.: 13 indoors
0	6	2	capacity correction class	0: short piping length; 1: medium piping length; 2: long piping length
0	7	2	over match inspection	135: max. limitation; 0: no limitation
0	8	2	over match inspection	pre-set
0	9	2	over match inspection	pre-set
0	10	2	over match inspection	pre-set
0	11	2	over match inspection	pre-set
0	12	2	indoor valves open fully	press SW04, displays 1111, indoor valves open 2 minutes fully
0	13	2	all indoors running in cooling mode	press SW04 for 2 seconds to start and press SW03 for 2 seconds to stop, all indoors will start up as cooling mode (ignore air inlet temp.) and run as compulsory cooling mode. PMV open angle is at the standard position. Digital tube displays PS low pressure. Outdoor is in normal control, and indoors are all running in cooling mode. Note: in compulsory condition, indoor capacity code will be maximum, and thermostat will not be OFF, the unit will work all the way.
0	14	2	all indoors running in heating mode	press SW04 for 2 seconds to start and press SW03 for 2 seconds to stop, all indoors will start up as heating mode (ignore air inlet temp.) and run as compulsory heating mode. PMV open angle is at the standard position. Digital tube displays PD low pressure. Outdoor is in normal control, and indoors are all running in heating mode. Note: in compulsory condition, indoor capacity code will be maximum, and thermostat will not be OFF, the unit will work all the way.

# Electric wiring and the application

SW1	SW2	SW3	function	description
0	15	2	rated operation	according to indoor mode, press SW04 for 2 seconds, display "yes" shows the unit enters rated operation. Press SW03 for 2 seconds, display ---- shows the unit quits rated operation. Outdoor control: outdoor will make rated operation according to indoor mode after startup and the horse power at startup, frequency of 1HP is 12Hz. The others will be controlled automatically. Frequency will be counted due to indoor capacity, not from pressure.

## Inspection of outdoor control parts

SW1	SW2	SW3	function	description
6	6	2	PMV1/PMV2 open fully	press SW04 for 2 seconds, PMV1/PMV2 will open, and display 1111. 2 minutes later, it is close; or press SW03, PMV1 will close, and display ----
6	7	2	fan motor runs from high speed to low speed	press SW04 to enter and display FAN, outdoor motor has 4-speed control, and run at high speed. Press SW5, SW6 to adjust fan speed by hand. Press SW03 to quit, fan motor stops, and display OFF
6	8	2	outdoor compulsory startup at cooling from 80Hz and adjust due to compressor	press SW04 for 4 seconds and display COOL, enter cooling mode, inverter compressor starts; press SW03, 2 seconds later, it is OFF and display ----.Outdoor control: outdoor enters rated operation, primary running frequency is 10P, and be adjusted due to pressure. The others are controlled automatically.
6	9	2	outdoor compulsory startup at heating from 80Hz and adjust due to compressor	press SW04 for 2 seconds and display HEAT, enter heating mode, inverter compressor starts; press SW03, 2 seconds later, it is OFF and display ----.Outdoor control: outdoor enters rated operation, primary running frequency is 10P, and be adjusted due to pressure. The others are controlled automatically.

# Electric wiring and the application

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SW1	SW2	SW3	function	description
6	10	2	compulsory cooling in rated condition	press SW04 for 2 seconds and display COOL, enter cooling mode, inverter compressor starts; press SW03, 2 seconds later, it is OFF and display ----.Outdoor control: outdoor enters rated operation, primary running frequency is 80Hz, and can be adjusted manually by SW05,SW06, not be adjusted due to horse power of indoor running units. The others are controlled automatically.
6	11	2	compulsory heating in rated condition	press SW04 for 2 seconds and display HEAT, enter heating mode, inverter compressor starts; press SW03, 2 seconds later, it is OFF and display ----.Outdoor control: outdoor enters rated operation, primary running frequency is 80Hz, and can be adjusted manually by SW05,SW06, not be adjusted due to horse power of indoor running units. The others are controlled automatically.

# Failure code

## Outdoor control failure code

Trouble shooting for main control chip of connecting board

failure code	judgement		remarks
20	discharging sensor circuit abnormal of inverter compressor	after compressor has running for 5 minutes, detect that sensor resistor is below 20 or over 1000 for 60 seconds, no alarm in defrosting or within 3 minutes after defrosting.	resumable
21	suction temp. sensor circuit abnormal	detect that sensor resistor is below 20 or over 1000 for 60 seconds, no alarm in defrosting or within 3 minutes after defrosting.	resumable
22	defrosting coil temp. sensor circuit abnormal	detect that sensor resistor is below 20 or over 1000 for 60 seconds, no alarm in defrosting or within 3 minutes after defrosting.	resumable
23	ambient temp. sensor circuit abnormal	detect that sensor resistor is below 20 or over 1000 for 60 seconds, no alarm in defrosting or within 3 minutes after defrosting.	resumable
24	high pressure sensor circuit abnormal	detect that sensor resistor is below 20 or over 1000 for 60 seconds, no alarm in defrosting or within 3 minutes after defrosting.	resumable
25	low pressure sensor circuit abnormal	detect that sensor resistor is below 20 or over 1000 for 60 seconds, no alarm in defrosting or within 3 minutes after defrosting.	resumable
26	communication with indoor abnormal	no communication with indoor for 4 minutes	resumable
27	discharging temp.too low of inverter compressor	after compressor has running for 10 minutes, $T_d < P_d + 15^{\circ}$ for 5 minutes, unit stops or $T_d < P_d + 20^{\circ}$ for 10 minutes, alarm 3 times within 2 hours, and lock the alarm. No alarm in defrosting or in 5 minutes after defrosting; no alarm in oil return or in 5 minutes after oil return, compressor stops for 2 minutes and 50 seconds when failure not being confirmed, resume automatically.	non-resumable after confirmation
28	high pressure too high	after compressor starts up, high pressure is higher than 27.6kg(E) for 5 seconds, unit stops and alarms. Failure will be confirmed if occurs 3 times in 1 hour. When not being confirmed, compressor stops for 2 minutes and 50 seconds, resume automatically.	non-resumable after confirmation
29	low pressure too low	after compressor starts up, low pressure is lower than 0.5kg(E) for 5 seconds, unit stops and alarms. Failure will be confirmed if occurs 3 times in 1 hour. When not being confirmed, compressor stops for 2 minutes and 50 seconds, resume automatically.	non-resumable after confirmation

# Failure code

failure code		judgement	remarks
30	high pressure switch protection	when compressor starts up, switch is cut off for 5 seconds, unit will alarm, if it occurs 3 times in 1 hour, confirm the failure. When not being confirmed, compressor stops for 2 minutes and 50 seconds, resume automatically.	non-resumable after confirmation
31	IPM protection	IPM overcurrent, in short circuit, temp. too high, or voltage too low, 3 minutes later after protection alarms, resume automatically.	resumable
32	overcurrent protection of inverter compressor or current detector damaged, no output at power module	after compressor starts up, current is over max. value for 5 seconds, or less than 1A, if it occurs 3 times in 1 hour, not resume. Compressor stops for 2 minutes and 50 seconds when failure not being confirmed, resume automatically.	non-resumable
33	connecting board chip 849 no communication	alarm if no communication for 4 minutes between main control chip and communication chip	resumable
34	no communication between connecting board and power module board	alarm if no communication for 4 minutes between connecting board and power module board	resumable
35	EEPROM on connecting board failure	After being electrified, Eeprom 0F0H_0FFH will display, if not, alarm	non-resumable
36	EEPROM on power module board failure	receiving communication failure from inverter board	non-resumable
37	lack of phase or phase sequence incorrect	one phase or two phases in U, V, W not connected or connected reversely	non-resumable
38	lack of refrigerant	In course of stop, the whole system will stop more than 30 minutes, or low pressure of any modular $\leq TA-10$ degree; it occurs failure of lack of refrigerant. running for 30 minutes in cooling mode, $P_s < 0.1$ MPa, the unit occurs failure; if running in heating mode, $T_s - P_s > 15$ degree, and PMV open fully for 60 minutes.	non-resumable
39	model set by dip switch not matches the actual equipment	model set by dip switch not fits the actual equipment (8HP model set by dip switch connects with TD1 or TD2)	non-resumable

# Failure code

failure code	judgement		remarks
44	discharging sensor circuit abnormal of fixed frequency compressor1	after compressor has running for 5 minutes, detect that sensor resistor is below 20 or over 1000 for 60 seconds, no alarm in defrosting or within 3 minutes after defrosting.	resumable
45	discharging sensor circuit abnormal of fixed frequency compressor2	after compressor has running for 5 minutes, detect that sensor resistor is below 20 or over 1000 for 60 seconds, no alarm in defrosting or within 3 minutes after defrosting.	resumable
46	discharging temp. too high of fixed frequency compressor1	after compressor starts up, detect that discharging temp. is over 120 degree(E) for 10 seconds, compressor stops. Failure will be confirmed if occurs 3 times in 1 hour. When not being confirmed, compressor stops for 2 minutes and 50 seconds, resume automatically.	non-resumable after confirmation
47	discharging temp. too high of fixed frequency compressor2	after compressor starts up, detect that discharging temp. is over 120 degree(E) for 10 seconds, compressor stops. Failure will be confirmed if occurs 3 times in 1 hour. When not being confirmed, compressor stops for 2 minutes and 50 seconds, resume automatically.	non-resumable after confirmation
48	overcurrent protection of fixed frequency compressor1	If compressor starting current is over the set limitation for 5 seconds, it will alarm; if it occurs 3 times in 1 hour, confirm this failure. Compressor stops for 2 minutes and 50 seconds when failure not being confirmed, resume automatically.	non-resumable after confirmation
49	overcurrent protection of fixed frequency compressor2	after compressor starts up, current is over max. value for 5 seconds, or over than B (max. [EE]-2A[EE], if it occurs 3 times in 1 hour, not resume. Compressor stops for 2 minutes and 50 seconds when failure not being confirmed, resume automatically.	non-resumable after confirmation
50	CT in open circuit or in short circuit of fixed frequency compressor1	After the fixed frequency compressor 1 is running for 30 seconds, it will alarm if the sensor current is below 20(in short circuit) or over 1000 for 10 seconds continuously, no alarm in defrosting and in 3 minutes after defrosting	resumable
51	CT in open circuit or in short circuit of fixed frequency compressor2	After the fixed frequency compressor 2 is running for 30 seconds, it will alarm if the sensor current is below 20(in short circuit) or over 1000 for 10 seconds continuously, no alarm in defrosting and in 3 minutes after defrosting	resumable

# Failure code

failure code	judgement		remarks
52	discharging temp. too high of inverter compressor	after compressor starts up, detect that discharging temp. is over 120 degree(E) for 10 seconds, compressor stops. Failure will be confirmed if occurs 3 times in 1 hour. When not being confirmed, compressor stops for 2 minutes and 50 seconds, resume automatically.	non-resumable after confirmation

Note:

On the condition that multiple compressors are abnormal, failure code of inverter compressor will be displayed with priority. If there are fixed frequency compressors, fixed frequency compressor 1 has higher priority;

The failure code on wired controller is the hex value of failure code of indoor or outdoor.

failure code	judgement		remarks
1001	EEPROM failure	wrong inspection	non-resumable
1002	communication with indoor failure	no communication with indoor for 4 minutes	non-resumable
1003	communication failure with 849 on master unit PCB	no communication with main control chip for 4 minutes	non-resumable
1004	communication failure with 849 on the other unit PCB	no communication with the other communication chip for 4 minutes	non-resumable
1005	capacity limitation	indoor over capacity, beyond the range(50-135%)	non-resumable
1006/ 1007	4-way valve switchover failure	master unit sends order, slave unit no respond	non-resumable

Note:

system failure code as follow:

When dip switch SW1, SW2, SW3 are on 0,0,0, the failure code 20~80 is the failure of outdoor No.0;

When dip switch SW1, SW2, SW3 are on 1,0,0, the failure code 20~80 is the failure of outdoor No.1;

When dip switch SW1, SW2, SW3 are on 2,0,0, the failure code 20~80 is the failure of outdoor No.2.

# Failure code

## Indoor failure code list

indication on wired controller	flash times of LED5 on indoor PCB/timer LED on remote receiver	flash times of health LED on remote receiver	failure code definition	reason
01	1	--	indoor ambient temp. sensor Ta failure	the sensor in short circuit or in open circuit or inserted badly
02	2	--	indoor gas pipe temp. sensor Tc1 failure	the sensor in short circuit or in open circuit or inserted badly
03	3	--	indoor liquid pipe temp. sensor Tc2 failure	the sensor in short circuit or in open circuit or inserted badly
04	4	--	indoor ambient temp. sensor failure	the sensor in short circuit or in open circuit or inserted badly
05	5	--	indoor EEPROM failure	indoor EEPROM inserted reversely or not inserted or with wrong model
06	6	--	communication between indoor and outdoor failure	communication between indoor and outdoor disconnected for over 4 min.
07	7	--	communication between indoor and wired controller failure	communication disconnected for over 4 min.
09	9	--	indoor repeated address failure	indoor address repeated
0A	10	--	indoor repeated central control address failure	central control address repeated
20~87	20	--	outdoor corresponding failure	refer to outdoor failure code list
--	--	1	wall mounted unit P/G motor failure	P/G motor broken down or motor wires damaged
--	--	2	EEPROM of wall mounted unit board A failure	EEPROM on PCB A inserted reversely or not inserted
--	--	3	communication between wall mounted board A and wired controller failure	communication disconnected for over 4 min.
--	--	4	serial communication failure between wall mounted board A and B	wires in series not inserted or not fixed well
--	--	5	set modes of wall mounted board A and B conflict	the jumper is wrong or the resistor of function setting is wrong

Note: When indoor units occur abnormal modes, the earlier entering mode will be prior, and the latter operated unit will be standby. If the unit is remote control type, the buzzer will sound twice, and the sent signal will not be received. It is not failure.

# Trial operation and the performance

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## **3-minute delay function**

- If starting up the unit after being powered off, the compressor will run about 3 minutes later against being damaged.

## **Cooling/heating operation**

- Indoor units can be controlled individually, but cannot run in cool and heat mode at the same time. If the cool mode and the heat mode are existing simultaneously, the unit set latter will be standby, and the unit set earlier will run normally.
- If the A/C manager sets the unit at cooling or heating mode fixedly, the unit can not run at the other modes.  
In operation if outdoor temp. arises, indoor fan motor will turn to low speed or stop.

## **Heating mode characteristic**

- When outdoor ambient is over 25 degree, the unit cannot run in heating mode, and indoor will be standby.

## **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 stucked with duct; indoor air outlet is clogged.

When protection device acts, please cut off the power source and re-start up after eliminating the trouble.

## **When power is 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.

# Trial operation and the performance

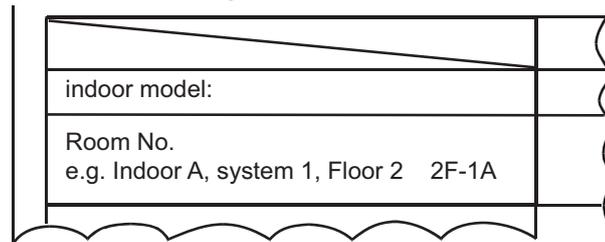
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## Heating capacity

- 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:

- In the trial operation, confirm if the stop valves open fully (gas side, liquid side, oil equalization pipe). If there is only one outdoor, the oil equalization pipe should keep close, otherwise the compressor will be damaged.
- Firstly connect the power cable and the communication wire due to the request. Then set the outdoor No. (master unit is 0, the slave units are respectively No. 1, No. 2), then set SW01-5 at OFF.
- According to the actual pipe length, set SW01-1 and SW01-2. (Set as middle piping length when out of factory)
- Insert the digital indicator on the main PCB, and set SW1/SW2/SW3 on digital indicator at 0.
- Before being electrified, measure the resistor between the power terminal block (L, N) and the earthing point with 500V ohmmeter. Confirm that the resistor should be over 1M ohm, if not, the unit can not work.
- After the communication wire between indoor and outdoor is disconnected from PCB, check the power source. Observe the information on digital indicator. If it is 0000, that shows only master unit can be found; if it is 1111, that shows the master unit and No. 1 slave unit are found; 2222 shows the master unit and No. 1, No. 2 slave units are found. If the outdoor unit quantity is as the same as the actual, set SW01-5 at ON.
- Check if the current parameters are correct by the digital indicator. SW1 is at 0, which will show the parameters and the failure code of main unit; SW1 at 1 will show the parameters and the failure code of No.1 slave unit; SW1 at 2 will show the parameters and the failure code of No.2 slave unit.
- Connect the indoor communication wire, then check if the indoor quantity showed in digital indicator is identical with the actual. Confirm the power source of all indoors is connected and use one power source. If power source of some indoors does not connect or use multiple power sources, electricity leakage or the other mechanical failure will occur.
- Disconnect the communication wire between indoor and outdoor from PCB, and confirm the bottom of compressor become hot. In order to protect compressor, perform the trial operation after being electrified for 12 hours.

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.







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