MDV04I-013aW

HIGH-STATIC PRESSURE DUCT SPLIT TYPE
AIR CONDITIONER

INSTALLATION MANUAL

2200019113

Please read this installation manual carefully before installationand keep this manual for future reference.

INSTALLATION PRECAUTION

- For correct installation, please read this in manual before installation.
- Installation should be done by professionals.
- Please follow this manual when installing indoor unit and its piping.
- Make sure that the piping and wiring are completed perfectly before electrifying the unit.
- This manual is subject to change without notice for further improvement.

⚠**CAUTION**: The installer should explain how to correctly use and maintain the air conditioner to users and remind the users of carefully reading and keeping both owner's manual and installation manual.

Note: When using duct type air conditioner, the malfunction is usually caused by incorrect installation which makes air conditioner working abnormally and costs too much. Please pay attention to the importance of installation.

CONTENTS

TEST RUNNING

Test running should be done according to “gist for test running” on the cover of electric control box.

CAUTION

1. Test running should not be done until the outdoor unit has been electrified for more than 12 hours.
2. All the valves should be opened before test running.
3. Start test running after finishing electric security-checking.
4. It is forbidden to make forced running. (Protection device does not work, which is very dangerous)

1. Carry out the test running after all the installation are completed.
2. Please confirm the following points before test running, and tick a √ in the blank.

- The indoor and outdoor units are installed correctly. ☐
- The refrigerant pipe system is leakage-checked. ☐
- Switch on the power to preheat the air conditioner. ☐
- The grounding wire has been correctly connected. ☐
- The heating insulation works well. ☐
- Piping and wiring are correct. ☐
- The drainage is unimpeded. ☐
- The power voltage fits the rated voltage of the air conditioner. ☐
- There is no obstacle at the outlet and inlet of the outdoor and indoor unit. ☐
- The length of piping and the added volume of refrigerant have been recorded. ☐
- The stop valves on both gas side and liquid side have been opened. ☐

3. Install the remote controller for the users and make sure that the remote controller’ signal can reach the indoor unit successfully.
4. Test running

Set the air conditioner under the mode of “COOLING” with remote controller or wire controller, and check the following items according to owner’ manual:(if there is malfunction, solve the problem according to “TROUBLES AND CAUSES” in indoor unit owner’ manual.)

- INDOOR UNIT

(1) Whether the switch on remote controller or wire controller works well.
(2) Whether the buttons on remote controller or wire controller work well.
(3) Whether the room temperature is adjusted well.
(4) Whether indicator light works normally.
(5) Whether the manual button works well.
(6) Whether the drainage is normal.
(7) Whether there is condensate on the connecting pipe or drainpipe because of untight binding.
(8) Open the grille to check whether there is leakage or infiltration, especially the draining plug.
(9) Whether there is vibration or abnormal noise.
(10) Whether the air conditioner works normally under the mode “HEATING”.

- OUTDOOR UNIT

(1) Whether there is vibration or abnormal noise.
(2) Whether the outlet wind, noise and condensed water influence your neighbors.
(3) Whether the refrigerant leaks.

Note: A protection device delays the start of compressor for about 3 minutes when it is restarted immediately after shutoff.

ACCESSORIES (INDOOR UNIT)

Note: If using wire controller, there will be no display board: remote controller and remote controller holder in accessories.

NAME	QUANTITY	OUTLINE	USAGE
Owner’s manual	1	——	——————
Installation manual	1	This manual	——————
Drain elbow	1	——	Connecting drainpipe
Display module	1	——	Receiving remote signal

Remote controller and its holder

① Remote controller·····1

② Remote controller holder·····1

③ Mounting screw ST2.9×10-C-H ·····2

④ Alkaline dry batteries ·····2

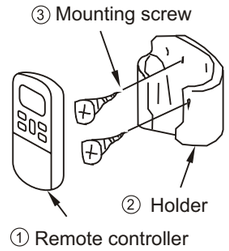


Chart 1

Caution for remote controller:

- Do not throw or beat the remote controller.
- Please operate the remote controller within the effective area where the indoor unit can receive the signal and aim the signal sending part at the infrared signal receiver on the indoor unit.
- Please keep the remote controller away from TV set or stereo equipment for more than 1m.
- Do not put the remote controller near damp place, heat source such as stove or expose it to the sunlight. Make sure to install the battery in correct direction.

INSTALLATION LOCATION

INDOOR UNIT

- Enough room for installation and maintenance.
- The ceiling is horizontal and it can afford the weight of the indoor unit.
- The air inlet and outlet are not impeded and not affected by outdoor air too much.
- The air flow can reach every part of the room.
- The connecting pipe and drainpipe can be easily extracted out.
- There is no direct radiation from heat source.

OUTDOOR UNIT

- Enough room for installation and maintenance.
- The air inlet and outlet are not impeded and does not affected by outdoor air too much.
- Dry and well ventilated place.
- The supporter is flat and horizontal and can afford the weigh of outdoor unit, without noise and vibration.
- The noise and the outlet air will not influence your neighbor.
- No combustible gas.
- Place convenient for piping and wiring.

⚠ CAUTION

- Please keep away from the following places, or malfunction may be caused.(if unavoidable, please consult the professionals):

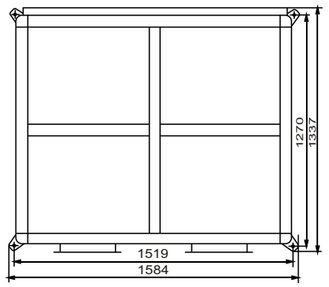
A. There is mineral oil like the oil of cutting machine.
B. There is much salty air. (Near the coast)
C. There is caustic gas such as sulfuric gas. (Near the hotspring.)
D. Factory where the voltage fluctuate greatly.
E. In the car or in the cabin.
F. In the kitchen or a place full of oil steam.
G. There is strong electromagnetic wave.
H. There is combustible gas or materials.
I. There is much evaporating acid or alkaline gas.
J. Other special areas.

■ PRECAUTION BEFORE INSTALLATION

① Identify the correct transporting route.
② Move the air conditioner in its original package as possible as you can.
③ If the unit should be installed on the metal part of the building, electric insulation is necessary and make sure that it comply with the relevant technical standard of electric equipment.

INDOOR UNIT INSTALLATION

Installation space



Installation space

Make sure to leave necessary space for installation and maintenance.

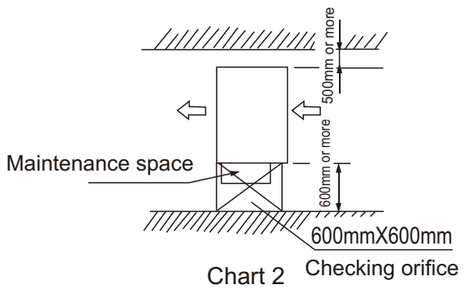


Chart 2

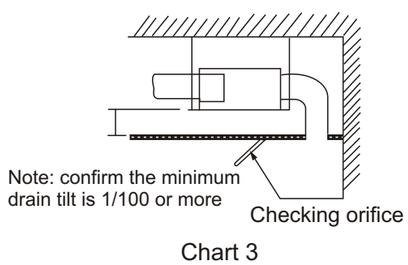


Chart 3

Install φ10 hanging screw bolt

Refer to the figure of indoor unit for the dimension size of hanging screw bolt.

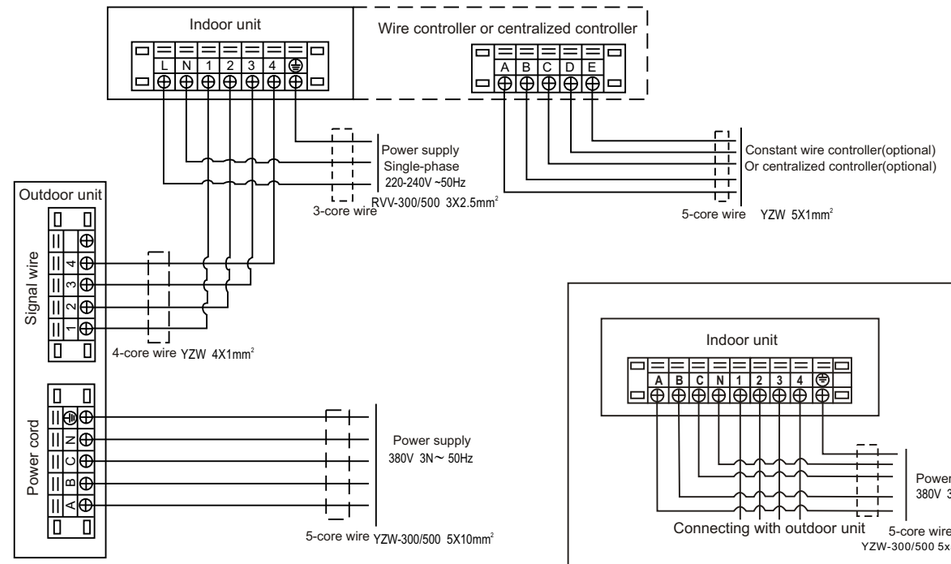
- Select the wire diameter

Power wiring refer to the main wire (a) connecting to branch box and the wiring (b) between branch box and power facilities. Please select the wire diameter according to the following requirement.

(1) Diameter of main wire (a)
Depends on the total horsepower of outdoor unit and Table 2.

(2) Wiring(b) between branch box and power equipment
Depends on the number of combined outdoor unit. If fewer than 5, the diameter is the same as that of main wire (a); if more than 6, there will be 2 electric control boxes, and the diameter of wiring depends on the total horsepower of outdoor units connecting to each electric control box and Table 2.

■ WIRING CHART



25、30kW
wiring chart without auxilary heater

25、30kW
wiring chart with auxilary heater

⚠CAUTION:

1. Make sure the phase sequence is correct, if not, the compressor will not work and the failure indicator light on electric control board of outdoor unit will be on. Please refer to “failure indicator light display ” on the cover of electric control box.
2. Change the phase sequence, switch on the power and check until the failure indicator light is off and the compressor works normally.

Name	Quantity	Size
Control wire for indoor/outdoor unit	4-core	1.0mm^2 ⩽ 50m

CAUTION

1. Please put the refrigerant piping system and the connecting control wire of indoor-outdoor unit together.
2. Do not put the power cord and control wire in the same wire tube and leave a certain distance between them.

Power wiring

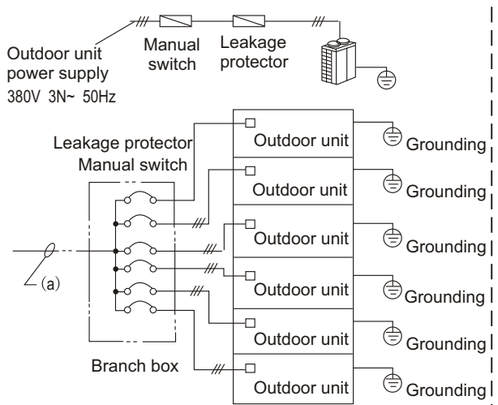
Power wiring is shown as follow:

<Outdoor unit>

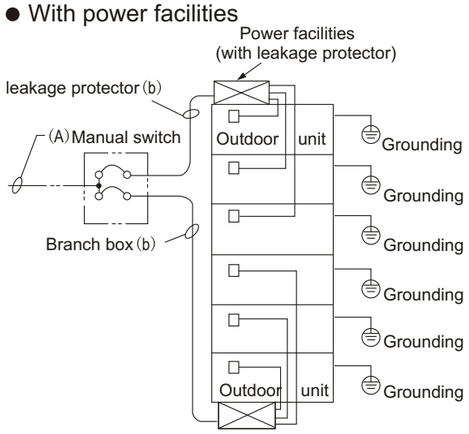
● Separate power supply (without power facilities) (Table 1)

Item / Model	Power supply	Min. Power wire diameter (mm)^2 (Wiring of mental and synthetic resin)		Manual switch(A)		Leakage protector
		Length (m)	Grounding wire	Capacity	Fuse	
25、30 kW	380V 3N~ 50Hz	10	5	60	50	100mA 0.1sec or less

Note: The wiring diameter and the length in the table indicate the condition that the voltage dropping range is within 2%. If the length exceeds the above figure, please select the wire diameter according to relevant standard.



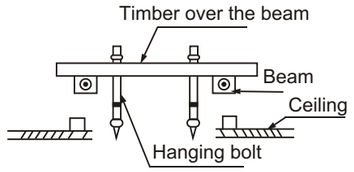
● With power facilities



1. Please use the bolt whose size is bigger than Φ10. The bolt is made of nice carbon steel (covered with zincification or treated to prevent rust) or stainless steel.
2. Consult the architect about the treatment of ceiling.
3. Fix the hanging bolt according to actual situation and make sure it is firm.
4. Install the hanging bolt in following different situation:

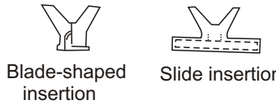
Wooden structure

Put a timber across the beams and install the bolts.



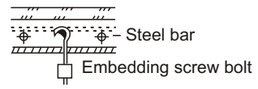
New concrete bricks

Install with insertion or embedding screw.



Original concrete bricks

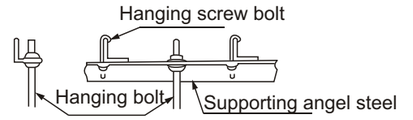
Install with embedding bolt and embedding plug.



(Pipe hanging and embedding screw bolt))

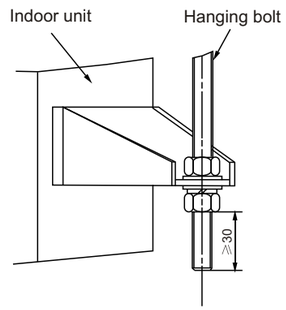
Steel roof beam structure

Install the supporting angle steel



Overhang the indoor unit

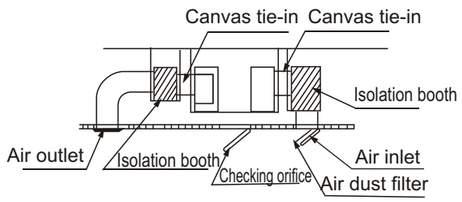
Lift the indoor unit and aim the installation hole at hanging bolts, then fasten the bolts.



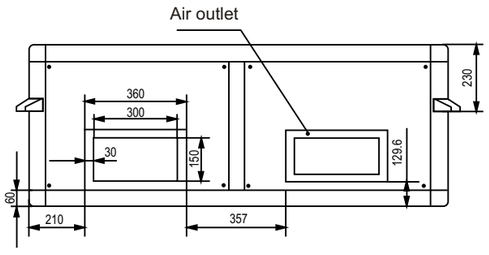
Duct design and connection

1. Duct design should accord with national heating&air-conditioner design criterion.
2. Duct accessories and materials should be produced by specialized manufacturer.
3. Air inlet and outlet ducts should be apart far enough to avoid the break of airflow.
4. Since there is no dust filter in the indoor unit, other places which are convenient to maintaining such as inhalant duct should be installed with dust filter. (Without dust filter, dust adherent to the air heat exchanger may cause malfunction and water-leakage.
5. In order to weaken the noise, muffle and noise-proof device should be installed, especially in the places like meeting room where noise is easy to be perceived.
6. The noncombustible canvas should be used in the connection of flange parts to avoid vibration, whose size is shown in the outline of indoor unit. The bolt of M6×20 is used. (Prepared on the spot)
7. All the ducts must be connected firmly to prevent air leakage and be heat insulated to avoid condensed water.

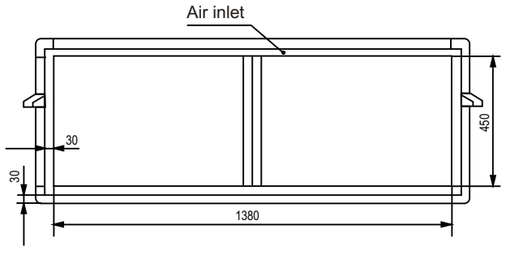
Key points in duct connection



Note: All components except main unit should be prepared on the spot



Direction A



ELECTRIC CONNECTION

■ Electric wiring

⚠ CAUTION:

1. The indoor and outdoor units should use separate power supply with rated voltage.
2. The power supply of outdoor unit should equipped with grounding wire, which should be firmly connected with the grounding wire of indoor unit.
3. Wiring must be done by professionals and accord with circuit chart.
4. Install the leakage protector according to relevant technical standard of national electric equipment.
5. Arrange the power cord and signal wire well to avoid disturbance and contact with connecting pipe and valve body.
6. Power cord is not supplied with the air conditioner. Please refer to the specification of power supply to select the power cord. Do not connect two wires together.
7. Do not switch on the power until you have checked carefully after wiring.

■ Specification of power supply

Model		25、30kW		
		With auxiliary heater	Without auxiliary heater	
Power supply		220-240V～ 50Hz	380V 3N～ 50Hz	380V 3N～ 50Hz
Main switch/fuse（A）		40/32	50/40	60/50
Indoor(outdoor) unit power cord	Dimension (Mm^2)	2.5	5.0	10
Circuit	Grounding wire （mm^2）	2.5	5.0	5
	Indoor/outdoor connecting wire (mm^2)	Strong electricity signal wire 0.75 ~1.0		

Table 5

Electric wire diameter (≥)(Table 2) （Unit : mm^2）

Total horsepower	≤20m	≥50m
10	6	10
20	10	20
30	16	30
40	20	40
50	25	50

Total horsepower, capacity of manual switch and fuse (Table 3)

Total horsepower	Manual switch(A)	Fuse (A)
10	50	30
20	75	60
30	100	90
40	150	120
50	150	150

- Select the capacity of manual switch and fuse of the branch box
  (1) See Table 1 when without power facilities, depends on the outdoor unit it connecting to.
  (2) See Table 3 when there is power facility, depends on the total horsepower.

- Dimension and the quantity of electric wire

INSTALL THE DRAINPIPE

1. Install the indoor unit drainpipe

- Install a drain stream trap in the drainpipe to prevent water from overflowing. (The drainpipe absorbs the odor. When the outside static pressure is high (especially the air inlet),it is difficult to drain the water.)
- Drainage should be natural. When constructing, the outside pipe of outdoor unit should be inclined (1/50~1/100).
- The bending part of drainpipe should be fewer than 2. Furthermore, to reduce the depositing dust, avoid bending the pipe as possible as you can.
- Make sure there is no dust or rubbish falling into indoor unit drain elbow and drainpipe.
- After installation, remove the checking panel, pour some water in the drain elbow to see whether it drains smoothly.

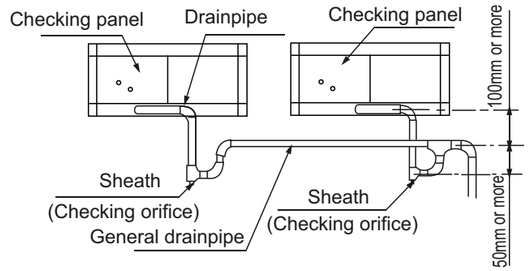


Chart 25

CAUTION

Rubbish is easy to accumulate at drain stream trap. Make sure to install a plug or other things which is easy to clean.

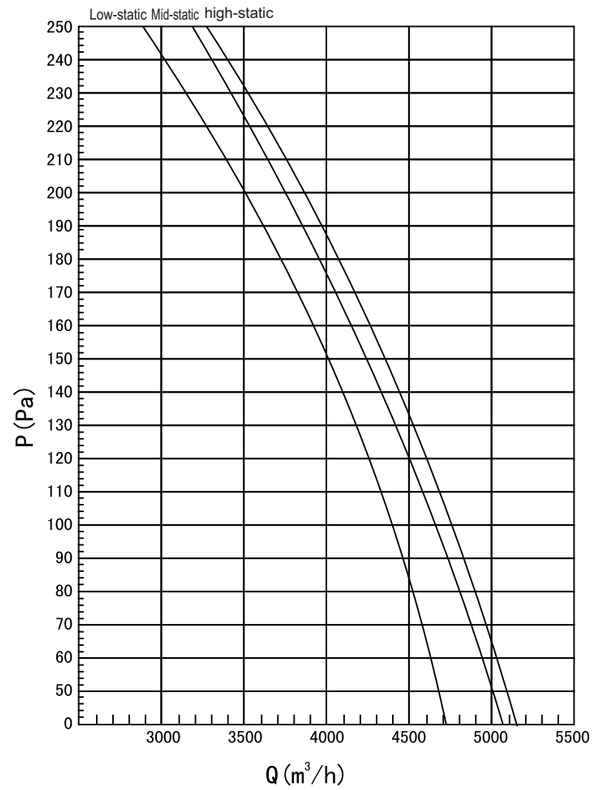
2. Test draining

- Open the clapboard of indoor unit, pour the water in to see whether it drain smoothly and whether there is water leakage.

3. Heat insulation

- After confirming that drainage is smoothly and there is no leakage, wrap the drainpipe with insulation material, or there will be condensed water.

Indoor unit blast volume-static pressure curve



OUTDOOR UNIT INSTALLATION

KEY POINTS IN INSTALLATION

Installation

- Confirm the model and the name of air conditioner to avoid mistakes in installation.

Refrigerant piping

- Refrigerant piping should accord with specified diameter.
- Charge nitrogen with certain pressure into refrigerant piping before welding.
- Heat insulation treatment should be done to refrigerant piping.
- After installation of refrigerant piping, do not electrify the indoor unit before airtight test and vacuuming.

Airtight test

- Refrigerant piping must be tested for gas proof.[2.94MPa(30kg/cm^{2}G) nitrogen]

Vacuuming

- Vacuum pump must be used and vacuuming should be done from gas side and liquid side simultaneously.

Add refrigerant

- When the actual pipe is longer than the fiducial length, the added refrigerant volume of every outdoor unit depends on the calculation base on the actual length.
- Fill in the form on the outdoor unit with the added volume, actual length of pipes and the relative height drop between outdoor unit and indoor unit for future reference.

Electric wiring

- Choose power capacity and wire diameter according to the design manual. The power cord of the air conditioner should be wider than that of ordinary motor.
- Do not twist or cross the power cord (380V 3N~50Hz) with wiring (low voltage) between indoor and outdoor unit, or mishandling may occur.
- Electrify the indoor unit after airtight test and vacuuming.

Test running

- Test running can not begin until the out door unit has been electrified for 12 hours.

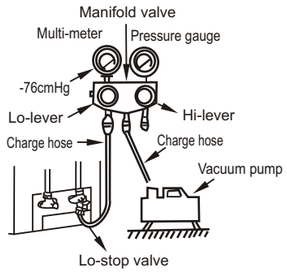
■ Expel the air with vacuum pump (chart 22)

(Please refer to the manual for the operation of manifold valve)

1. Loosen and remove the maintenance nut of stop valve A and connect the charge hose of the manifold valve with the maintenance mouth of stop valve A. (Make sure the stop valves A and B are both closed)
2. Connect the charge hose with vacuum pump.
3. Open the Lo-lever of the manifold valve completely.
4. Turn on the vacuum pump. At the beginning of pumping, loosen the maintenance nut of stop valve B a little to check whether the air comes in (the sound of the pump changes and the indicator of multi-meter turns from minus to 0). Then fasten the maintenance nut.
5. When the vacuuming has been finished, close the Lo-lever of manifold valve completely and turn off the vacuum pump.

- When you have pumped for more than 15 minutes, please confirm that the indicator of multi-meter points to -1.0×10^{5}Pa(-76cmHg).

6. Loosen and remove the quadrangle covers of stop valves A and B. Open the stop valves A and B completely then fasten the quadrangle covers.
7. Disassemble the charge hose from the maintenance mouth of stop valve A and fasten the nut.

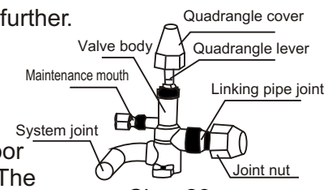


Chat 22

■ Operate the stop valve

- Open the valve stem until it reaches the limitator. Do not open it any further.
- Fasten the nuts with wrench or such tools.
- The wrench torque is listed in the Table 2.

All the stop valves should be opened before test running. Each air conditioner has two stop valves of different sizes on the side of outdoor unit which operates as Lo-stop valve and Hi-stop valve respectively. The ON/OFF operation is shown in the right Chart 23..



Char 23

1) ON operation: take off the quadrangle cover, clip the quadrangle head with a wrench and turn it anticlockwise to the end. Then fasten the quadrangle cover.
2) OFF operation: the process is the same as the ON operation, but you should turn the quadrangle head clockwise.

❖ Check the leakage

Check all the joints with the leakage detector or soap water.

❖ Insulation

- All the exposed parts of flaring pipe joints and refrigerant pipe on the liquid side and the gas side should be wrapped with insulation material. Make sure that there is no gap between them.
- Imperfect insulation may cause condensed water.

❖ Expel the air

■ Expel the air according to the following table

Length of connecting pipe (one-way)	Method
＜5m	Use refrigerant in outdoor unit
5~15m	Use vacuum pump or refrigerant container

● If moving the air conditioner to another place, please do vacuuming with vacuum pump or refrigerant container.

■ Expel the air with refrigerant in outdoor unit (refer to Chart 20 and Chart 21)

1. Fasten the joint nuts of A, B, C and D completely.
2. Loosen and remove the quadrangle covers of stop valves A and B. Turn the valve stem of stop valve B anticlockwise to 45° for about 10 seconds, then close the valve stem of stop valve B.
3. Check all the joints on A, B, C and D. Make sure that there is no leakage, then open the maintenance nut of stop valve A. After the air has come out completely, fasten it.
4. Open the valve stems of stop valves A and B completely.
5. Fasten the quadrangle covers of stop valves A and B.

Note: the copper tube for connection is Φ19 on gas side, Φ9.53 on liquid side. Two sets , or 4 connection pipes.

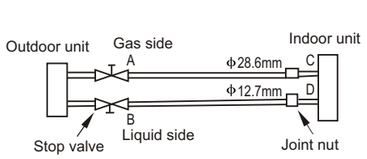


Chart 20

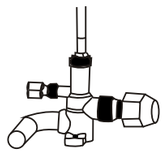


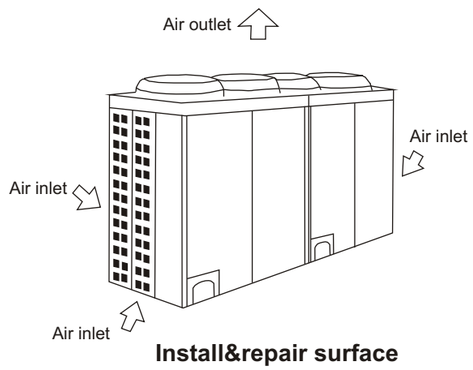
Chart 21

■ Expel the air refrigerant container (refer to Chart 20 and Chart 21)

1. Fasten the joint nuts of A, B, C and D completely.
2. Loosen and remove the quadrangle covers and maintenance nuts of stop valves A and B.
3. Connect the charge hose of refrigerant container with the maintenance mouth of stop valve A.
4. Loosen the valve of refrigerant container and charge the refrigerant for 6 seconds to expel the air, then fasten the nut of stop valve B quickly.
5. Loosen the valve of refrigerant container again and charge the refrigerant for 6 seconds. Check all the joints on A, B, C and D. Make sure that there is no leakage, then remove the charge hose. Fasten the maintenance nut of stop valve A as soon as all the charged refrigerant has been expelled.
6. Open the valve stems of stop valves A and B completely.
7. Fasten the quadrangle covers of stop valves A and B.

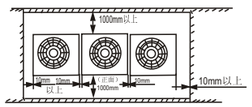
Installation space

1. When installing outdoor unit, enough repairing space shown below should be left and the power device should be put at the side of outdoor unit. Refer to relevant manual.
2. Please make sure to left enough space for installation and maintenance. (Refer to chart below)



Install&repair surface

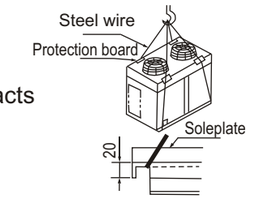
Outdoor unit planform



Note: 1. Keep the obstacle above the outdoor unit at least 2000mm.
2. The top of any pile around the outdoor unit should be at least 400mm below the top of unit.

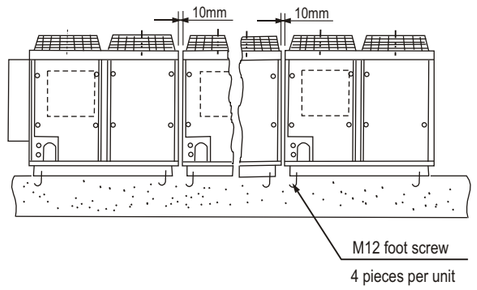
MOVING THE OUTDOOR UNIT

1. Sling the outdoor unit and carry it with 4 steel wire (Φ 6mm or more)
2. Use soft board to protect the unit surface that contacts the steel wires from scratch or distortion.
3. Remove the soleplate.

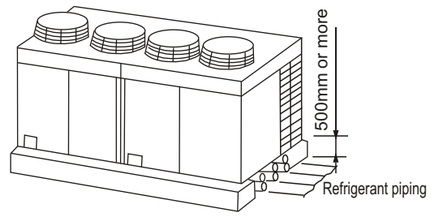


OUTDOOR UNIT INSTALLATION

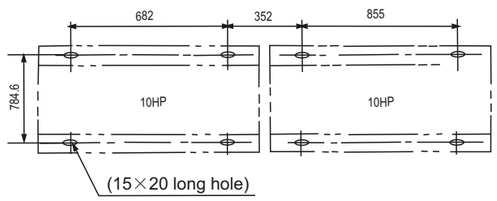
1. A 10mm's distance should be left between outdoor units.



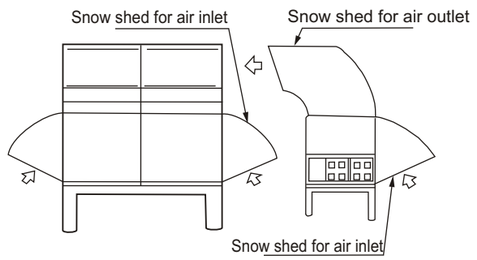
2. When the refrigerant piping is led from the bottom, the foundation of beam should be thicker than 500mm.



●Distance between foot screw is shown below:

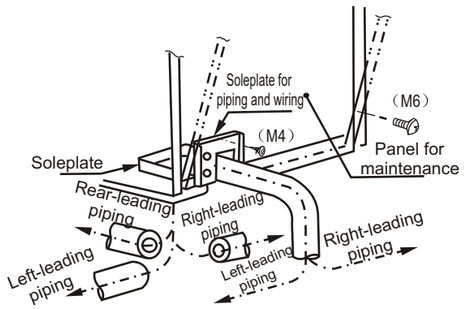


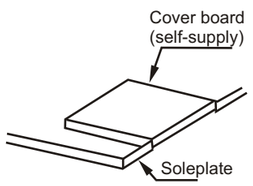
3. In snowy areas, facilities should be installed to prevent snow. (Refer to the chart below)(defective facilities may cause malfunction.) Please lift the bracket higher and install snow shed at the air inlet and air outlet.



REFRIGERANT PIPING

1. Refrigerant piping connection is inside the outdoor unit, please remove the front-left clapboard. (M6:4 pieces; M4: 1 piece)
2. The piping can be led through the down-left of the outdoor unit or the soleplate gap.
3. When through the front, piping is led by wiring from the panel.
4. When through the soleplate gap, install the refrigerant piping towards left, right or back.
5. If through the front, please seal the soleplate gap with a cover board to prevent the dust or rubbish.





CAUTION

To prevent the inside of piping from oxidizing when welding, it is necessary to charge nitrogen, or oxide may block the circulation.

■ Use the brass pipe from market

●Make sure to use the same insulation material when you buy brass pipe in the market. (Thicker than 9mm)

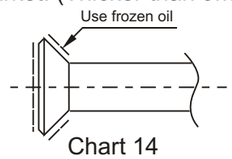


Chart 14

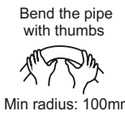


Chart 15

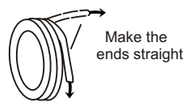


Chart 16

2. Arrange the pipeline
1) Drill a hole in the wall and set the accessories such as wall conduit and its cover.
2) Put the connecting pipe and wiring between outdoor and indoor units together and bind them tightly with binding tapes. Do not let air int, or the condensed water may cause leakage.
3) Pass the connecting pipe through wall conduit from outdoors. Arrange the pipe carefully and do not damage the pipe
3. Connect the pipes and do vacuuming.
4. Open the valve stem of outdoor unit stop valve to make the refrigerant pipe between indoor and outdoor units unblocked.
5. Check the leakage with leakage detector or soap water.
6. Cover the joint of connecting pipe of indoor unit with sound proof/insulating sheath (accessories), and bind it with binding tapes to prevent leakage.

Flaring

① Cut the piping with a pipe cutter

② Insert a flare nut into the pipe and flare the pipe

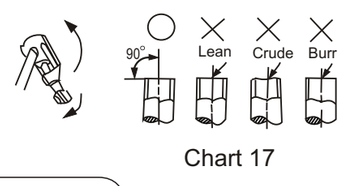


Chart 17

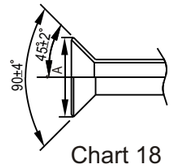


Chart 18

Outside diameter	Torque
ϕ9.53mm	3270 ~3990 (333 ~407kgf.cm)
ϕ 19mm	9720 ~ 11860 (990 ~1210kgf.cm)

Table 2

Fasten the nut

●Put the connecting pipe at the proper position
Wrench the nut with hands, then fasten it with a wrench. (Refer to Chart 19)

⚠ CAUTION
Too large torque will damage the bell mouthing and too small will cause leakage. Please choose the torque according Table 2.

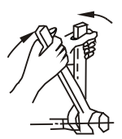


Chart 19

The added amount of refrigerant

① When the one-way pipe is shorter than 5m, there is no need to add refrigerant. (It has been charged before delivery.
② When the one-way pipe is longer than 5m, the added amount of refrigerant is :
0.115×(L-5) (unit: kilogram) (piping diameter on liquid side is ϕ12.7)
0.065×(L-5) (unit: kilogram) (piping diameter on liquid side is ϕ9.53)
Please record the added amount of refrigerant carefully for future use.

INSTALL THE CONNECTING PIPE

Check whether the height drop between indoor unit and outdoor unit, the length of refrigerant piping, and the quantity of the bends meet the following requirements:

The Max. Height drop----------20m

(if longer than 5m, outdoor unit should be above the indoor unit)

The length of refrigerant piping----------shorter than50m

The quantity of bends----------fewer than 15

- Do not let air, dust, moisture or other impurities fall in the piping system during installation.
- Fix the indoor unit before installing the refrigerant piping.
- During installation, make sure to keep the piping dry and do not let water in.

The procedures for connecting pipe

1. Measure the connecting pipe and make it as follows:

1) Connect the indoor unit first, then the outdoor unit.

- Bend the piping carefully and do not damage the piping

⚠ CAUTION

- Daub the surface of the flare pipe and the joint nuts with frozen oil, and wrench it for 3~4 rounds with hands before fasten the flare nuts. (Refer to Chart 14)
- Use two wrenches simultaneously when connecting or disassembling the pipes.
- Do not load the indoor unit with the weight of connecting pipe. If the indoor unit is overloaded, it will be distorted, reducing the cooling (heating) capacity.

2) The stop valve of outdoor unit should be closed absolutely (as original state). Every time you connect it, remove the nuts of stop valve then connect the flare pipe immediately (within 5 minutes). If the nut of stop valve has been removed and left for a long time, dust and other impurities may enter the pipe, causing malfunction. So please expel the air with refrigerant (R22) before connection.

3) Expel the air (refer to “Exple the air”)after connecting the refrigerant pipe between indoor and outdoor units. Then fasten the maintenance nut.

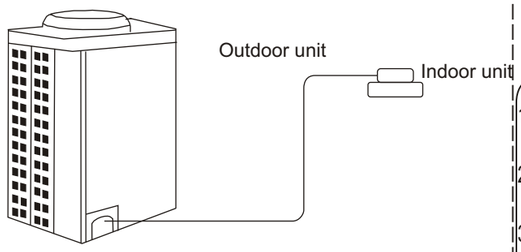
■ Notice for flexible pipe:

- The bending angle should not exceed 90°.
- The bending part is preferably in the middle of the pipe, the bigger the bending radius, the better it is.
- Do not bend the pipe more than 3 times.

■ Bending the connecting pipe of thin wall.

- Cut out a desired concave at the bending part of the insulating pipe and expose the pipe. (Bind the pipe with binding tapes after bending)
- To avoid distortion or damage, please bend the pipe at its biggest radius.
- Use bender to get a pipe with small radius.

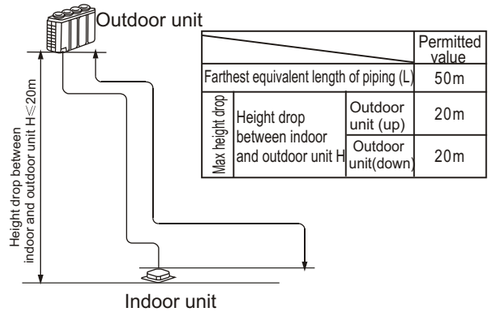
Piping size and connecting method



Piping size and connecting method for outdoor unit

Model	Gas side	Liquid side
"-A" Outdoor unit	28.6 (Flare nut)	12.7 (Flare nut)
"-B" Outdoor unit	19 (Flare nut) X2	9.53 (Flare nut) X2

Length and height drop permitted of refrigerant piping



			Permitted value
Farthest equivalent length of piping (L)			50m
Max height drop	Height drop between indoor and outdoor unit H	Outdoor unit (up)	20m
		Outdoor unit(down)	20m

Airtight test

Charge pressurized nitrogen after connecting the piping of indoor and outdoor unit to do airtight test.

CAUTION

1. Pressurized nitrogen[2.94MPa(30kg/cmG)]should be used in airtight test.
2. Fasten the valve cores of high/low pressure valves before pressurizing the nitrogen.
3. Please pressurize the nitrogen from air vents of low pressure valves.
4. High/ low pressure valves are closed when pressurizing nitrogen.
5. It is forbidden to use oxygen, flammable gas or poisonous gas in airtight test.

Vacuuming with vacuum pump

- Please vacuum with vacuum pump rather than refrigerant to expel the air.
- Vacuuming should be done from the gas side.

Open all valves

Refrigerant amount to be added

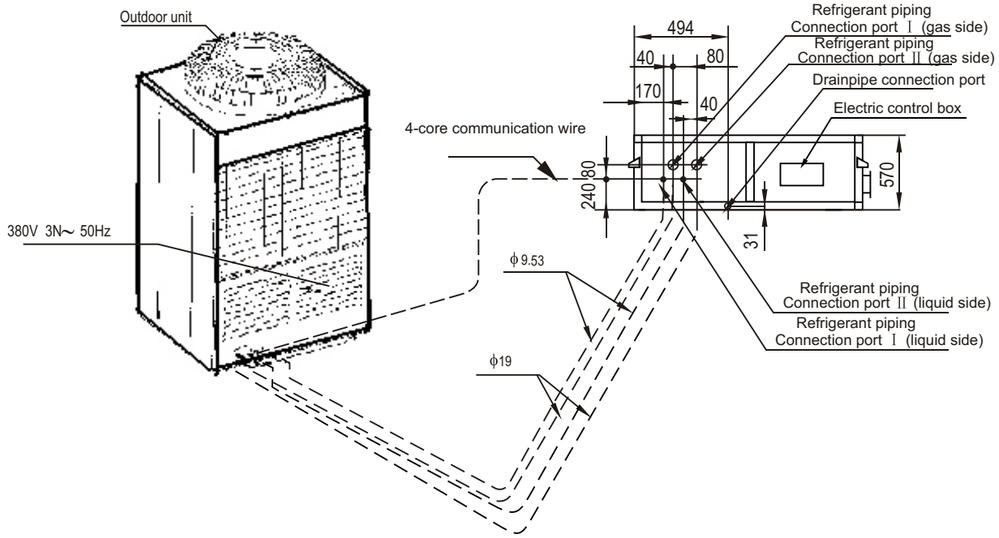
Calculate the amount according to the diameter and the length of the liquid side piping between outdoor/indoor units. The type of refrigerant is R22.

Liquid side piping diameter	Refrigerant to be added per meter piping
12.7	0.115kg
9.53	0.065kg

Remove dirt or water in the piping

- Make sure there is no any dirt or water in the piping before connecting it to the outdoor unit.
- Please clean the piping with high-pressure nitrogen rather than refrigerant of outdoor unit.

Indoor-outdoor unit connection chart

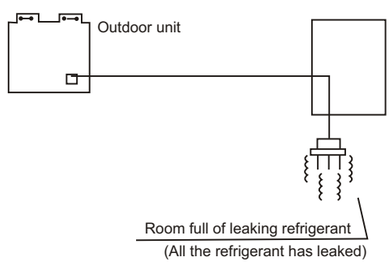


Note: Refrigerant piping connection port Ⅰ and Ⅱ (gas side liquid side)of indoor unit belong to different evaporator systems.When connecting, the connection port Ⅰ and Ⅱ should be connected to corresponding system. The two valves on left valve panel and the two on the right of outdoor unit belong to different systems.

CAUTION ON REFRIGERANT LEAKAGE

This air conditioner adopts R22 as refrigerant, whichis safe and noncombustible. The room for air conditioner should be big enough that refrigerant leakage can not reach the critical thickness. Besides this, you can take some action on time.

- Critical thickness— the max thickness of Freon without any harm to person. R22 critical thickness:0.3 [kg/m^3]



Calculate the critical thickness through following steps, and take necessary actions.

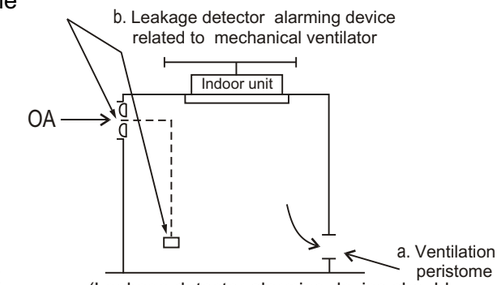
1. Calculate the sum of the charge volume (A[kg])

   Total refrigerant volume of 10HP= refrigerant volume when delivered+superaddition
2. Calculate the indoor cubage (B[m^3]) (as the minimum cubage)
3. Calculate the refrigerant thickness

$$\frac{A\,[kg]}{B\,[m^3]} \leqslant \text{Critical thickness：}0.3\,[kg/m^3]$$

Countermeasure against overhigh thickness

1. Install mechanical ventilator to reduce the refrigerant thickness under critical level. (ventilate regularly)
2. Install leakage detector alarming device related to mechanical ventilator if you can not regularly ventilate.



(Leakage detector alarming device should be installed in places easily keeping refrigerant)

FILLING THE NAME OF CONNECTION SYSTEM

To clearly identify the connection systems between indoor unit and outdoor unit, selects names for every system and records them on the nameplate on the outdoor electric control box cover.

Model of indoor unit	
Room Name For example: Indoor unit (A) of the first system on second floor is record as:—2F—1A.	

INSULATE THE PIPING

Insulate the piping

To prevent the malfunction caused by condensate on the refrigerant piping and drainpipe, please do insulation treatment.

CAUTION

Supposing the temperature and the humidity in the ceiling is high (dew point is above 23℃), (e.g.:the ceiling which is made of flagstone or the inside of the ceiling and the outdoors share the same condition),besides ordinary insulation materials, insulation sponge(16~20kg/m^2) with more than 10mm’ thickness should be used. The joints of all the piping should be wrapped with insulation materials as well.

Insulate the drainpipe

- If the drainpipe is arranged through the building, please wrap it with insulation material.
- It is necessary to insulate the drainpipe.

Insulate the refrigerant piping

- Please use material with heat durability for gas side piping. (E.g. EPT)
- The piping on gas side and liquid side should be wrapped with insulation materials respectively. The water drop should not drip outside the unit.

Besides insulation material, use ethylenic resin tapes to seal them to prevent leakage.