

AIR CONDITIONER

(Installation Manual)

A

- Please read and save this manual in a safe place for future reference.
- For correct installation, read this manual before starting installation.
- Only trained and qualified service personnel should install, repair or service air conditioning equipment. Users should not install the air conditioner by themselves.
- The charts in this manual is based on MS2G-21HRN2 type. So, a little differences may exit on the outlook and fuctions from yours.

INSTALLATION PRECAUTION

Installation in the following places may cause trouble. If it is unavoidable, please consult with the local dealer.

- A place full of machine oil.
- A saline place such as coast.
- A place full of sulfide gas such as hot-spring resort.
- Places where there are high frequency machines such as wireless equipment, welding machine, and medical facility.
- A place of special environmental conditions.

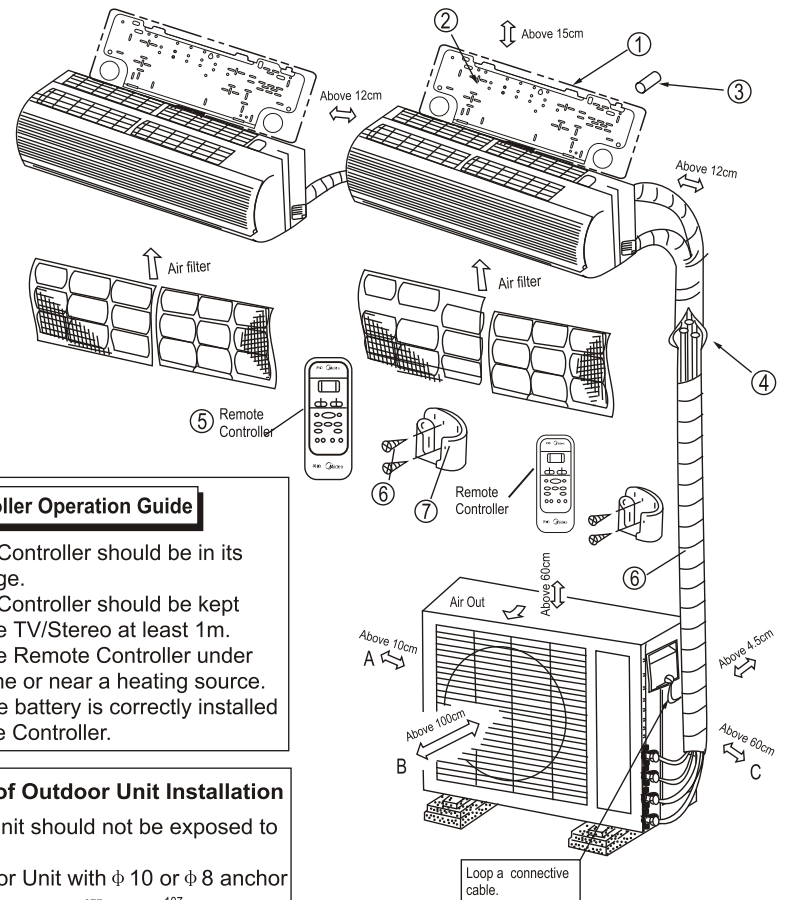
Indoor Unit

- A place where is no obstacle near the inlet and outlet area.
- A place which can bear the weight of the indoor unit.
- A place which allows the air filter to be removed.
- A place where the reception range is not exposed to direct sunlight.
- A place where the connective pipe and drain hose is easy to led out.
- A place 1m or more to TV, radio instrument, in the center of the room is perfect.

Outdoor Unit

- A place, which is convenient to installation and not exposed to a strong wind. A place that is dry and ventilated.
- A place can bear the weight of the outdoor unit and where the outdoor unit can be held in the horizontal position.
- A place which does not allow an increase in noise level and vibration.
- A place where the operation noise and discharge air do not disturb your neighbor.
- A place free of a leakage of combustible gases.
- An allowable head level at the connective piping is less than 5m and length of the connective piping is up less than 10m.
- No any obstacle which block radiated air.

Indoor/Outdoor Unit Installation Illustration

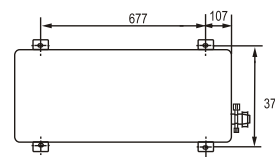


Remote Controller Operation Guide

- The Remote Controller should be in its receiving range.
- The Remote Controller should be kept away from the TV/Stereo at least 1m.
- Do not put the Remote Controller under direct sunshine or near a heating source.
- Make sure the battery is correctly installed in the Remote Controller.

Anchor Bolts of Outdoor Unit Installation

- The outdoor unit should not be exposed to strong wind.
- Fix the Outdoor Unit with $\phi 10$ or $\phi 8$ anchor bolts.



- If need suspending installation, consults the corresponding requirement.

Accessories

Please install the accessories attached with unit correctly according to this installation manual.

Note: 1. At least of A, B, C

Aspects are free from blocking.

2. When the Outdoor Unit is higher than the

Indoor Units, to prevent the rain from flowing into the indoor along the connection pipe, a downward tipping arc should be made before the connection pipe entering the wall to indoor to ensure the lowest point on the connection pipe is at outdoor.

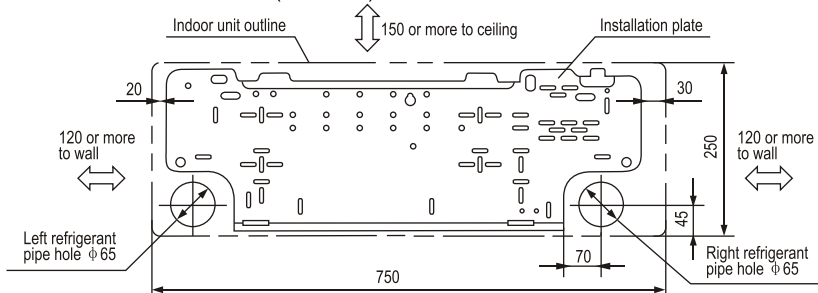
3. The illustration above is only a sketch. Different models would be slightly different.

Number	Name	
1	Installation plate	
2	Self-tapping screw ST3.9×25	
3	Plastic Expansion Pipe	
4	Connection Pipe Ass.	Liquid side $\phi 6.35$
		Gas side $\phi 9.53/\phi 12.7$
5	Remote controller	
6	Mounting screw ST2.9X10	
7	Remote controller holder	
8	Seal	
9	Drain elbow	

① INDOOR UNIT INSTALLATION

1. Drilling A Hole and Mounting Installation Plate

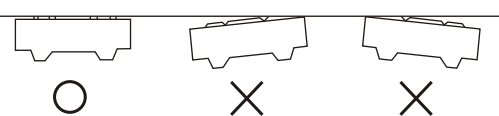
Installation Plate and Its Direction (unit: mm)



1. Fix the installation plate.

1. Install the installation plate horizontally on structural parts in the wall with the spaces provided around the plate.
2. In case of brick, concrete or similar type walls, make 5mm dia. holes in the wall. Insert clip anchors for appropriate mounting screws.
3. Fix the installation plate on the wall.

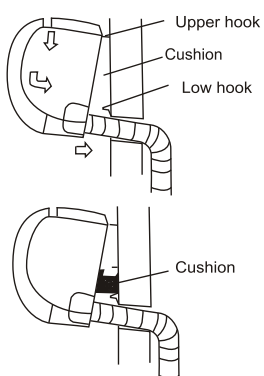
Installation Plate



2. Drilling a hole.

- As diagram above determine the pipe hole position using the installation plate, drill the pipe hole ($\phi 65$ mm) so it slants slightly downward.

3. Indoor Unit Installation

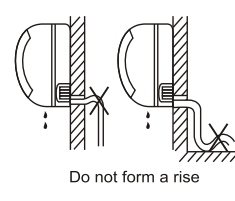


1. Pass the piping through the hole in the wall.
2. Put the upper claw at the back of the indoor unit on the Upper Hook of the installation plate, move the Indoor Unit from side to side to see that it is securely hooked.
3. Piping can easily be made by lifting the indoor unit with a cushion material between the indoor unit and the wall. Get it out after finishing piping.
4. Push the lower part of the Indoor Unit up on the wall, Then move the Indoor Unit from side to side, up and down to check if it is hooked securely.

2. Connective Pipe and Drainage Installation

1. Drainage

1. Run the drain hose sloping downward. Do not install the drain hose as illustrated below.

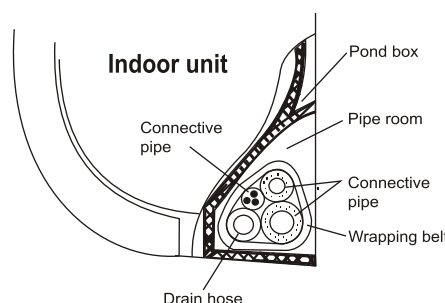


2. When connection extension drain hose, insulate the connecting part of extension drain hose with a shield pipe

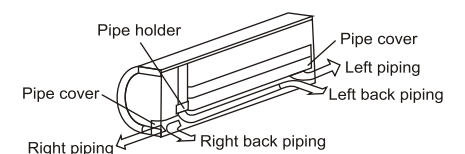
3. Piping and bandaging

Wind the connective cable, drain hose and wiring with tape securely, evenly as shown below.

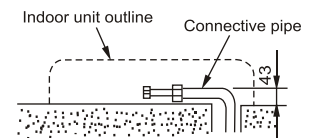
- Because the condensed water from rear of the indoor unit is gathered in Pond Box and is piped out of room. Do not put anything else in the box.



2. Connection pipe



1. For the left-hand and right-hand piping, remove the rear plate bushing from the left side of the rear plate.
 - Explain to clients that the pipe cover must be kept as it may be used when relocate the air conditioner to any other place.
2. For the left-hand and rear-left-hand piping, install the piping as shown. Bend the connective pipe to be laid at 43mm height or less from the wall.



3. Fix the end of the connective pipe. (Refer to Tightening Connection in REFRIGERANT PIPING CONNECTION)

CAUTION

- Connect the indoor unit first then the outdoor unit and bend and arrange the pipe carefully.
- Do not allow the piping to let out from the back of the indoor unit.
- Be careful not to let the drain hose slack.
- Insulate both of the auxiliary piping.
- Banding the drain hose under the auxiliary pipe.
- Do not allow the piping to let out from the back of the indoor unit.

4. Wiring

Prepare the power source for exclusive with the air conditioner.
The supply voltage must comply with the rated voltage of the air conditioner:

Power Source	Plug socket and Fuse rating	Outdoor Power Cord Specification	Outdoor/Indoor Connection Wire Specification
50Hz 220-240V~	16A	3×2.5mm ²	3×1.5mm ²

CAUTION

- Perform the wiring with sufficient capacity. Installation places legally require a short circuit isolator to be attached to prevent electrical shock.
- Do not extend the power cable code by cutting.
- Power voltage should be in the range of 90%~110% of rated voltage.
- The plug of the air conditioner takes a grounding leg, so clients should use a grounding socket so that the air conditioner can be grounded efficiently.

INDOOR UNIT INSTALLATION

NOTE: Remark per EMC Directive 89/336/EEC

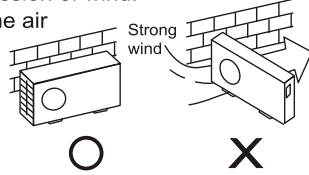
For to prevent flicker impressions during the start of the compressor (technical process), following installation conditions do apply.

- The power connection for the air conditioner has to be done at the main power distribution. The distribution has to be of a low impedance, normally the required impedance reaches at a 32 A fusing point.
- No other equipment has to be connected with this power line,.
- For detailed installation acceptance, please refer to your contract with the power supplier if restrictions do apply for products like washing machines, air conditioner or electrical ovens.
- For power details of the air conditioner, refer to the rating plate of the product.
- For any question contact your local dealer.

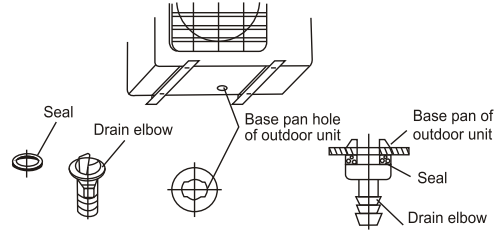
② OUTDOOR UNIT INSTALLATION

1. OUTDOOR INSTALLATION PRECAUTION

- Install the outdoor unit on a rigid base to prevent increasing noise level and vibration.
- Determine the air outlet direction where the discharged air is not blocked.
- In the case that the installation place is exposed to strong wind such as a seaside operation by putting the unit lengthwise along the wall or using a dust or shield plates.
- Specially in windy area, install the unit to prevent the admission of wind. The connection between bracket and wall, bracket and the air conditioner should be firm, stable and reliable.
- If need suspending installation, the installation bracket should accord with technique requirement in the installation bracket diagram.



2. DRAIN ELBOW INSTALLATION

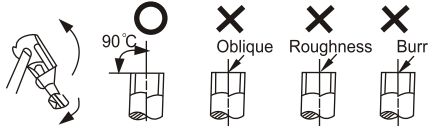


Fit the seal into the drain elbow, then insert the drain elbow into the base pan hole of outdoor unit, rotate 90° to securely assemble them. Connecting the drain elbow with an extension drain hose (Locally purchased), in case of the water draining off the outdoor unit during the heating mode.

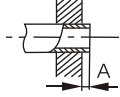
3. REFRIGERANT PIPING CONNECTION

1. Flaring

- Cut a pipe with a pipe cutter.

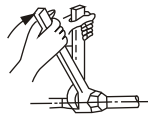


- Insert a flare nut into a pipe and flare the pipe.



2. Tightening Connection

- Align pipes to be connected.
- Sufficiently tighten the flare nut with fingers, and then tighten it with a spanner and torque wrench as shown.



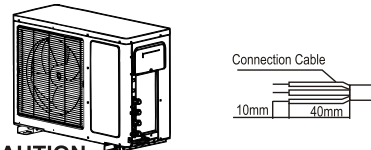
CAUTION

- Excessive torque can break nut depending on installation conditions.

Outer diam. (mm)	A(mm)	
	Max.	Min.
φ 6.35	1.3	0.7
φ 9.53	1.6	1.0
φ 12.7	1.8	1.0

Outer diam.	Tightening torque(N.cm)	Additional tightening torque(N.cm)
φ 6.35mm	1570 (160kgf.cm)	1960 (200kgf.cm)
φ 9.53mm	2940 (300kgf.cm)	3430 (350kgf.cm)
φ 12.7mm	3500 (400kgf.cm)	4410 (450kgf.cm)

4. WIRING CONNECTION



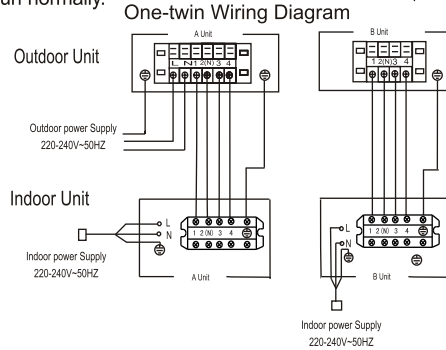
CAUTION

- Do not touch the capacitor even if you have disconnected the power for there is still high voltage power on it, or electric shock hazard may occur. For your safety, you should start repairing at least 5 minutes later after the power is disconnected.
- The power is supplied from the Outdoor Unit. The two (three) Indoor Unit are connected with a signal wire with the Outdoor Unit. Please make sure that the signal wires or power cords are connected reliably and correctly, or the air conditioner could not run normally.

- Remove the electric parts cover from the outdoor unit.
- Connect the connection cables to the terminals as identified with their respective matched numbers on the terminal block of indoor and outdoor units.
- To prevent the ingress of water, make a loop of the connection cable as illustrated in the installation diagram of indoor and outdoor units.
- Insulate unused cords (conductors) with Wire Insulation Sheath. Process them so they do not touch any electrical or metal parts.

CAUTION

Wrong wiring connections may cause some electrical parts to malfunction. A disconnection device having an air gap contact separation in all active conductors should be incorporated in the fixed wiring according to the National Wiring Regulation.



③ AIR PURGE AND TEST OPERATION

1. AIR PURGE

Choose purge method from the table:

Connective pipe length	Air purging method	Additional amount of refrigerant to be charged
Less than 5m	Use vacuum pump	
5 ~ 10m	Use vacuum pump	(Pipe length-5)×15g

Permitted Length and Height Drop of Refrigerant Pipe:

The Max. Length(L)		Permitted Value
		10m
Max. Height Drop	Indoor/Outdoor Unit Height Drop	10m
	Indoor/Indoor Unit Height Drop	5m

CAUTION IN HANDLING THE PACKED VALVE

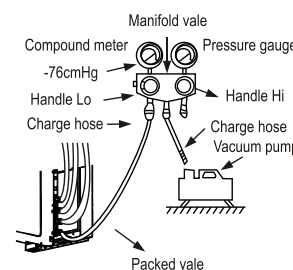
- Open the valve stem until it hits against the stopper. Do not try to open it further.
- Securely tighten the valve stem cap with a spanner or the like.
- Valve stem cap tightening torque.
Gas pipe side (φ 9.53): 2940N.cm (300kgf.cm)
Liquid pipe side (φ 6.35): 1570N.cm (160kgf.cm)

Using the Vacuum Pump

(For how to use a manifold valve, refer to its Owner's Manual)

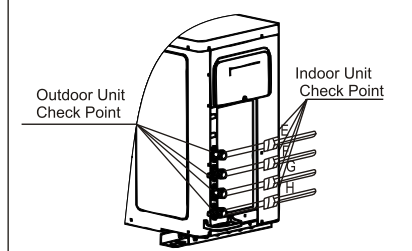
- Connect the Manifold Valve Charge Hose to the Low Pressure Valve Charge Hole (With all the Low/High Pressure Valves tightened)
- Connect the Charge Hose to the Vacuum Pump.
- Fully open the Handle Lo of the Manifold Valve.
- Start the Vacuum pump. Slightly loose the Flare Nut of the Low Pressure Valve to check if there is any air leakage. (Sound of the Vacuum Pump changed and the Compound Meter indicates "o" instead of minus). Then tighten the Flare Nut.
- After the evacuation is complete, full close the handle Lo of the manifold valve and stop the operation of the vacuum pump.

- Make evacuation for 15 minutes and more and check that the compound meter indicates -76cmHg (-1.0x10⁵Pa).
- Fully open the Low/High Pressure Valve.
- Remove the Charge Hose from the Low Pressure Charge Hose.
- Tighten the stem cap of the Low Pressure Valve.
- Do the above on every Low Pressure Valve.



2. GAS LEAK CHECK

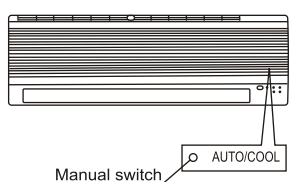
Make sure no gas come out from connections with leak detector or soap water. The following is One-twin type air conditioner gas leakage check illustration. For one-three type air conditioner gas leakage check, the valve connections other than the illustrated should be checked in a familiar way.



3. TEST OPERATION

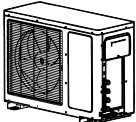
Perform test operation after completing gas leak check at the flare nut connections and electrical safety check.

- Connect the unit to power, then push the ON/OFF button on the Remote controller to start the test operation.
- Press the MODE button to check if the unit runs normally on every mode.
- Test operation according to the following procedure when you could not find the Remote Controller.
 - Open the panel, move the Manual switch on the control panel to COOL.
- Press COOL again after test operation.

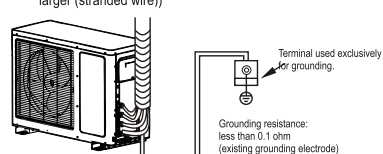


GROUNDING WORK

- A grounding terminal can be found on the outdoor unit as illustrated.

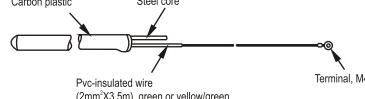


- When an existing grounding terminal is available. (Grounding wire of φ1.6mm or larger (solid wire) or 2mm² or larger (stranded wire))

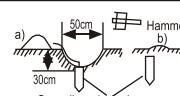


- Use of a grounding electrode.

- Specification of grounding electrode.



- Grounding procedure
Carry out the grounding work according to the procedure explained below.

Step	Job	Explanation	Precautions
1	Determine the grounding position.	Suitable location a)Place that is always dank. b)Hard soil rather than loose sandy soil. Unsuitable location a)Where there are under-ground structures or facilities such as gas pipes, water pipes, telephone lines. b)A place 2m or less from the lightning arrester grounding electrode and its cable.	o Avoid sandy or gravelly soil as its grounding resistance is high. o The grounding wire for the telephone line cannot be used for the grounding of the air conditioner. o When the grounding electrode is to be installed under a place with heavy traffic, its wire must be connected firmly with the utmost care.
2	Drive the grounding electrode into position.	a)Dig a hole to the size illustrated, and drive in the grounding electrode. b)Cover the top of the grounding electrode with excavated soil.	
3	Put the grounding wire in order.	a)If the grounding wire is too short, connect an extension lead to it. b)Fasten the grounding wire with staples.	o The grounding wire should be a green insulated wire of φ 1.6mm or 2mm ² or larger. o The soldered joint should not be buried underground.
4	Check the workmanship, and provide corrective measures if necessary.	a)After grounding work, measure the grounding resistance with a grounding resistance tester. b)If the resistance is above a specified level, drive in the grounding electrode deeper or increase the number of grounding electrodes.	
5	Connect the grounding wire to the grounding terminal of the air conditioner.	Secure the grounding wire to the grounding terminal of the air conditioner.	