

DUCTLESS MINI SPLIT SYSTEM AIR CONDITIONER/HEAT PUMP

COMPACT CEILING CASSETTE



CAB/CYB Series

CAB: Cooling-Only Version

CYB: Cooling and Heating Version

Inverter+[®] and Inverter++[®] Models

9,000-18,000 BTU/hr



Installation Manual

IMPORTANT NOTICE:

Please read this manual carefully before installing or operating your new air conditioning system. Be sure to save this manual for future reference.



- If used as a MULTI Unit, please refer to the Installation & Operation Manuals packed with the Outdoor Unit.

CONTENTS

	Page
PRECAUTIONS.....	1
INSTALLATION INFORMATION.....	2
ACCESSORIES.....	3
INDOOR UNIT INSTALLATION.....	4
OUTDOOR UNIT INSTALLATION.....	7
INSTALLING THE REFRIGERANT PIPE.....	9
CONNECTING THE DRAIN PIPE.....	12
ELECTRICAL WIRING WORK.....	13
INSTALLATION OF THE DECORATION PANEL.....	15
TEST OPERATION.....	16

PRECAUTIONS

- Keep this manual in an easily accessible location.
- Read this manual extensively before starting up the units.
- For safety purposes, any unit operators must read the following cautions carefully.
- Installation must be performed in accordance with the requirement of NEC and CEC, by authorized personnel only.

The safety precautions listed here are divided into two categories.



WARNING

If these warnings are not adhered to, the unit may cause severe property damage, personal injury, or loss of life.



CAUTION

If these cautions are not adhered to, the unit may cause minor to moderate property damage or personal injury.

After completing the installation, make sure that the unit operates properly during the start-up operation. Please instruct the customer on how to operate the unit and on keeping it maintained. Also, inform customers that they should store this installation manual, along with the owner's manual, for future reference.



WARNING

Be sure to only hire trained and qualified service personnel to install, repair, or service the equipment.

Improper installation, repair, and maintenance may result in electric shocks, short-circuits, leaks, fire, or other damage to the equipment.

Install strictly according to these installation instructions. If installation is done improperly, it can lead to water leakage, electrical shock, and fire.

When installing the unit inside a small room, take measures to keep the refrigerant concentration from exceeding allowable safety limits, in the event of refrigerant leakage. Contact the place of purchase for more information. Excessive refrigerant in a closed ambient environment can lead to oxygen deficiency.

Use the attached accessories and specified parts lists for installation. Be sure this list is closely adhered to, otherwise, it can cause the set to fall, or result in water leakage, electrical shock, or fire.

Install in a strong, firm location that can withstand the entirety of the set's weight. If the structural integrity is insufficient, or installation is improperly done, the set can possibly drop to cause injury.

The appliance must be installed >2.5m/8.2 ft above the floor.

The appliance must not be installed in the laundry area.

Before obtaining access to terminals, all supply circuits must be disconnected.

The appliance must be positioned so that the plug is accessible.

The enclosure of the appliance should be marked by word, or by symbols, with the direction of the fluid flow.

For electrical work, follow all local and national wiring standards and regulations, as well as these installation instructions. An independent circuit and single outlet must be used. If the electrical circuit capacity is not enough, or there is a defect in the electrical work, it can lead to electrical shock or fire.

Use the specified cable, and tightly connect and clamp the cable so that no external force will be acted upon the terminal. If the connections or fixtures are not perfect, it can cause heat-up and eventual fire at the connection site.

Wiring routing must be properly arranged so that the control board cover is fixed properly. If the control board cover is not fixed perfectly, it might cause heat-up at connection point of terminal, fire, or electrical shock.

If the supply cord is damaged, it must be replaced by the manufacturer, service agent, or a similarly qualified person, in order to avoid a hazard.

An all-pole disconnection switch, having a contact separation of at least 3mm in all poles, should be connected to the fixed wiring.

When carrying out the piping connections, take care to not allow air particles infiltrate into refrigeration cycle. Otherwise, it can cause diminished capacity, abnormally high pressure in the refrigeration cycle, explosion, or injury.

Do not modify the length of the power supply cord, or use an extension cord, and do not share the isolated outlet with other electrical appliances. Otherwise, it can result in fire or electrical shock.

If the refrigerant leaks during installation, ventilate the area immediately.
Toxic gas may be produced if the refrigerant comes into contact with fire.

The temperature of the refrigerant circuit will be high, so please keep the interconnection cable away from the copper tube.

After completing the installation work, check that the refrigerant does not leak.

Toxic gas may be produced if the refrigerant leaks into the room and comes into contact with a source of fire, such as a fan heater, stove, or cooker.

- There are inflammable materials or gas.
- There is acid or alkaline liquid evaporating.
- Other special conditions.

The appliance shall be installed in accordance with national wiring regulations.

Do not operate your air conditioner in a wet room such as a bathroom or laundry room.

An all-pole disconnection device which has at least 3mm / 0.1in clearances in all poles, and have a leakage current that may exceed 10mA, the residual current device (RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.



CAUTION

Ground the air conditioner.

Do not connect the ground wire to any gas or water pipes, lightning rods, or telephone ground wires. Improper grounding may result in electric shocks.

Be sure to install an earth leakage breaker. Failure to install an earth leakage breaker may result in electrical shocks.

Connect the outdoor unit wires first before connecting the indoor unit wires.

It is not permitted to connect the air conditioner to the power supply until the wiring and piping is done.

While following the instructions in this installation manual, install the drain piping in order to ensure proper drainage, and insulate the piping in order to prevent condensation. Improper drain pipe configuration may result in water leakage and property damage.

Installing the indoor and outdoor units: power supply wiring and connecting wires should be at least 1 meter away from televisions or radios, in order to prevent image interference or noise.

Depending on the radio waves, a distance of 1 meter may not be sufficient to eliminate all noise interference.

The appliance is not intended for use by young children or infirm persons without supervision.

Don't install the air conditioner in the following scenarios:

- There is petrolatum present.
- There is high-salinity air in the surrounding area.
- There is caustic gas (sulfide, for example) present in the air (e.g. near hot springs).
- There are voltage fluctuations (like in factories).
- In buses or cabinets.
- In kitchens with a high presence of oily gases.
- Areas with strong electromagnetic waves

INSTALLATION INFORMATION

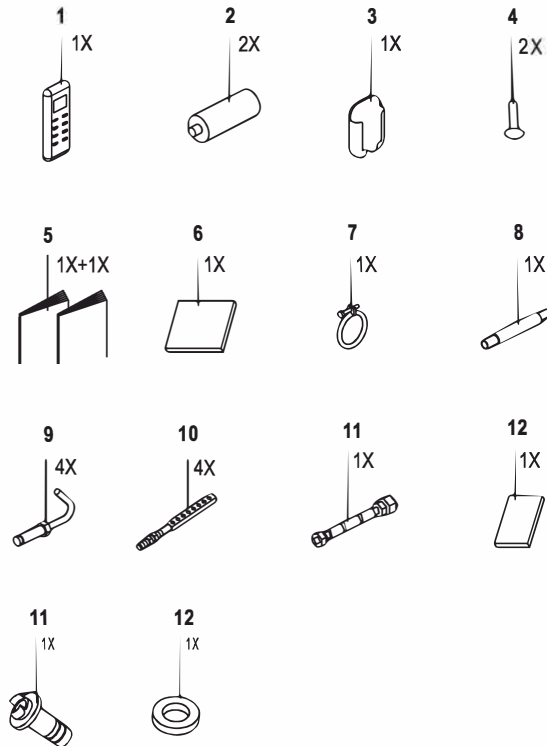
- To install properly, please read this "installation manual" at first.
- The air conditioner must be installed by qualified persons.
- When installing the indoor unit or its tubing, please follow this manual as strictly as possible.
- If the air conditioner is installed on a metal part of the building, it must be electrically insulated according to the relevant standards to electrical appliances.
- When all the installation work is finished, please turn on the power only after a thorough check.
- Regret for no further announcement if there is any change of this manual caused by product improvement.

INSTALLATION ORDER

- Indoor unit installation;
- Outdoor unit installation;
- Install the refrigerant pipe;
- Connect the drain pipe ;
- Electric wiring work;
- Installation of the decoration panel;
- Test operation.

ACCESSORIES

Check if the following accessories are included with your unit.



- 1 Remote controller
- 2 Batteries
- 3 Remote controller holder (on some models)
- 4 Tapping screws (M3×10mm) (on some models)
- 5 Installation and Owner's Manual
- 6 Paper pattern for installation (on some models)
- 7 Metal Clamp (on some models)
- 8 Drain Hose (on some models)
- 9 Expansible Hooks (on some models)
- 10 Installation Hooks (on some models)
- 11 Throttle (on some models)
- 12 Anti-Shock Rubber (on some models)
- 13 Drain Plug (only heatpump models)(with the outdoor unit)
- 14 Seal Ring(only heatpump models)(with the outdoor unit)

Optional Accessories

- This indoor unit requires installation of an **separate** decoration panel.

For the following items, take special care during construction and check after installation is finished

Tick when checked	
<input type="checkbox"/>	Is the indoor unit fixed firmly? The unit may drop, vibrate, or make noise.
<input type="checkbox"/>	Is the gas leak test finished? It may result in insufficient cooling or heating.
<input type="checkbox"/>	Is the unit fully insulated? Condensate water may drip.
<input type="checkbox"/>	Does drainage flow smoothly? Condensate water may drip.
<input type="checkbox"/>	Does the power supply voltage correspond to that shown on the name plate? The unit may malfunction or components may burn out.
<input type="checkbox"/>	Are wiring and piping correct? The unit may malfunction or components may burn out.
<input type="checkbox"/>	Is the unit safely grounded? Dangerous if there is an electric leakage.
<input type="checkbox"/>	Is the wiring size according to specifications? The unit may malfunction or components may burn out.
<input type="checkbox"/>	Is nothing blocking the air outlet or inlet of either the indoor or outdoor units? It may result in insufficient cooling or heating.
<input type="checkbox"/>	Are refrigerant piping length and additional refrigerant charge noted down? The refrigerant charged in the system might not be clear.



NOTE

All pictures in this manual are for explanatory purposes only. There may be slightly differences from the air conditioner you purchased (depending on model). The actual shape will prevail.

1. INDOOR UNIT INSTALLATION

1.1 Selecting the Installation Site

When the conditions in the ceiling exceed 30°C/86°F and a relative humidity of 80%, or when fresh air is inducted into the ceiling, an additional insulation layer is required (minimum 10 mm / 0.4in thickness, polyethylene foam).

1) Select an installation site where the following conditions are fulfilled, and also that meets your customer's approval.

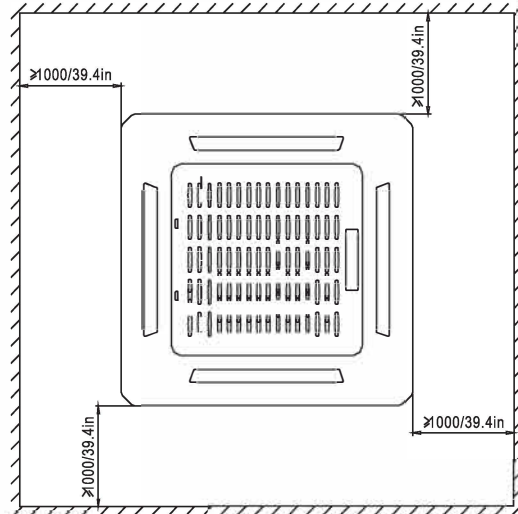
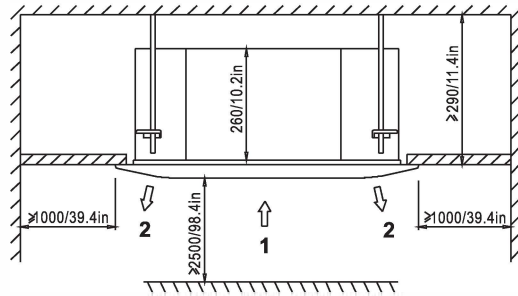
- Where optimum air distribution can be ensured.
- Where nothing blocks the air passage.
- Where condensate water can be properly drained.
- Where the false ceiling is not on on a considerable incline.
- Where sufficient clearance for maintenance and service can be ensured.
- Where there is no risk of flammable gas leaking.
- Where it will not be at risk of being near to potentially explosive atmospheres.
- Where piping between indoor and outdoor units is possible within the allowable limit. (Refer to the installation manual of the outdoor unit.)
- Keep indoor unit, outdoor unit, inter-unit wiring, and remote controller wiring at least 1 meter away from televisions and radios. This is to prevent image interference and noise in those electrical appliances. (Noise may be generated depending on the conditions under which the electric wave is generated, even if a 1 meter separation distance is kept.)
- When installing the wireless remote controller kit, the distance between the wireless remote controller and indoor unit might be shorter if there are fluorescent lights that are electrically started inside the room. The indoor unit must be installed as far away as possible from fluorescent lights.

2) Ceiling Height

Install this unit where the height of bottom panel is greater than 2.5m / 8.2ft above ground so that users do not easily touch it.

3) Use installation hooks for installation. Check whether the ceiling is strong enough to support the weight of the indoor unit. If there is a structural integrity risk, reinforce the ceiling before installing the unit.

Space required for installation: see the next figure (↑ : air flow direction)



- 1 Air Inlet
- 2 Air Outlet

Unit: mm



DANGER

Do not install the unit in an area where flammable materials are present due to risk of explosion, which can result in serious injury, or death.

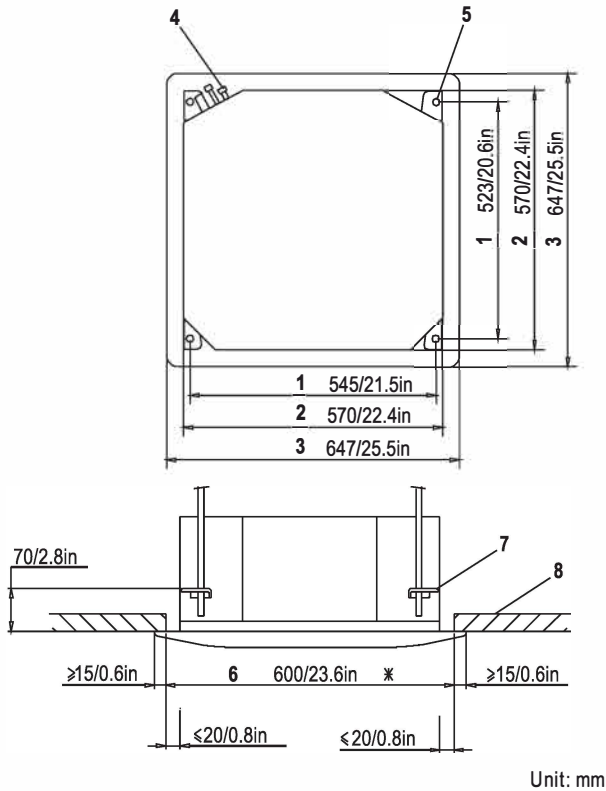


WARNING

If the base underneath the unit is not strong enough to support the weight of the unit, the unit could fall out of place and cause serious injury.

1.2 Preparations Before Installation

1) Relation of ceiling opening to unit and suspension bolt position.



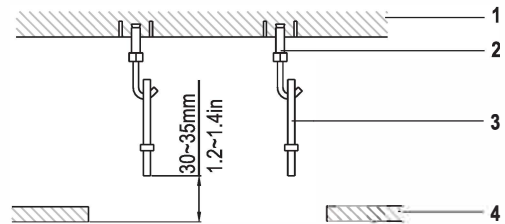
- 1 Installation Hook Pitch dimensions
- 2 Indoor Unit dimensions
- 3 Decoration Panel dimensions
- 4 Refrigerant Piping
- 5 Installation Hook (× 4)
- 6 Ceiling opening dimensions
- 7 Hanger Bracket
- 8 False Ceiling

2) Make the ceiling opening needed for installation where applicable. (For existing ceilings.)

- Create the ceiling opening required for installation. From the side of the opening to the casing outlet, implement the refrigerant and drain piping and wiring for remote controller (unnecessary for wireless type). Refer to each piping or wiring section.
- After making an opening in the ceiling, it may be necessary to reinforce ceiling beams to keep the ceiling level, and to prevent it from vibrating. Consult the builder for details.

3) Install the installation hooks. (Use either a M8 or M10 size bolt.)

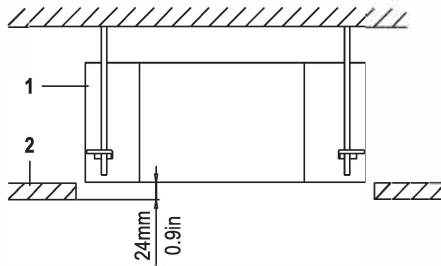
Use expansible hooks, sunken anchors, or other field supplied parts to reinforce the ceiling in order to bear the weight of the unit. Adjust clearance from the ceiling before proceeding further. Installation example: see figure below.



- 1 Ceiling slab
- 2 Expansible hook (optional)
- 3 Installation hook (optional)
- 4 False ceiling

NOTE ■ For other non-standard installations, contact your dealer for details.

- Adjust positions to ensure the gaps between the indoor unit and the four sides of false ceiling are even. The indoor unit's lower part should sink into the false ceiling for 24mm / 0.9in.



- 1 Indoor Unit
- 2 False Ceiling

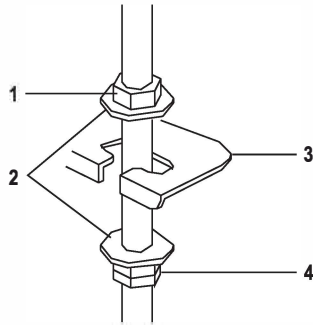
NOTE: Installation is possible with a ceiling dimension of 600 mm / 23.6in (marked with *). However, to achieve a ceiling-panel overlapping dimension of 15 mm / 0.6in, the spacing between the ceiling and the unit should be 20 mm / 0.8in or less. If the spacing between ceiling and the unit is over 20 mm / 0.8in, attach sealing material in the part or recover the ceiling.

1.3 Installing the Indoor Unit

When installing optional accessories, read the installation manual of the optional accessories as well. Depending on the field conditions, it may be easier to install optional accessories before the indoor unit is installed (except for the decoration panel). However, for an existing ceiling, install a fresh air inlet component kit and branch duct before installing the unit.

1) Install the indoor unit temporarily.

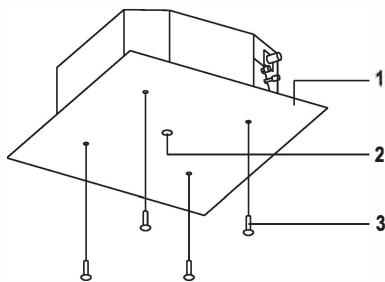
- Attach the hanger bracket to the suspension bolt. Be sure to fix it securely by using a nut and washer from the upper and lower sides of the hanger bracket.
- Securing the hanger bracket: see figure below.



- 1 Nut (field supply)
- 2 Washer (field supply)
- 3 Hanger Bracket
- 4 Double Nuts (field supply, tighten)

2) Fix the paper pattern for installation. (For new ceilings only)

- The paper pattern for installation corresponds with the measurements of the ceiling opening. Consult the builder for details.
- The centre of the ceiling opening is indicated on the paper pattern for installation.
- After removing the packaging material from the paper pattern for installation, attach the paper pattern for installation to the unit with the attached screws as shown in figure below.



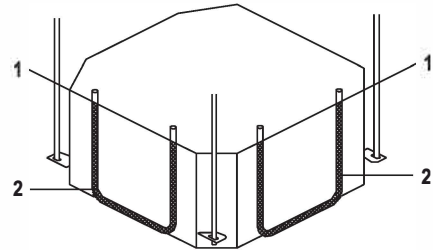
- 1 Paper Pattern for Installation (on some models)
- 2 Center of the Ceiling Opening
- 3 Screws (supplied with the decoration panel)

3) Adjust the unit to the correct position for installation.

(Refer to the chapter "Preparations before Installation" on page 5.)

4) Check that the unit is horizontally levelled.

- Do not install the unit tilted. The indoor unit is equipped with a built-in drain pump and float switch. (If the unit is tilted against the direction of the condensate flow (the drain piping side is raised), the float switch may malfunction and cause water to drip.)
- Check that the unit is levelled at all four corners using a water level, or a water-filled vinyl tube, as shown in figure below.



- 1 Water level
- 2 Vinyl Tube

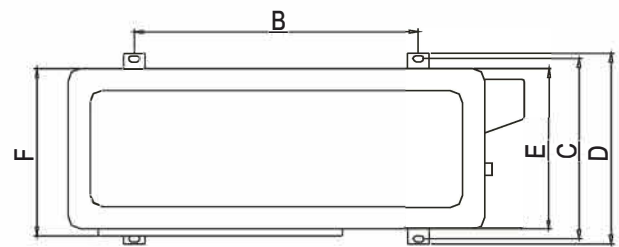
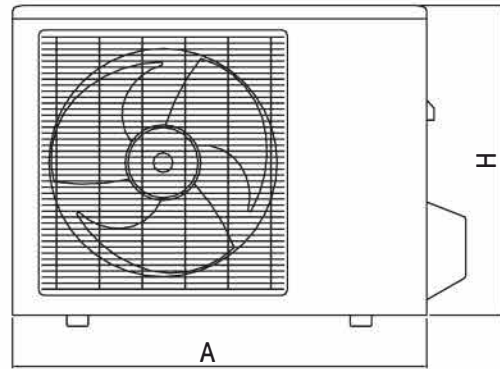
5) Remove the paper pattern for installation. (For new ceiling only).

2.2 Figure of Body Size

2. OUTDOOR UNIT INSTALLATION

2.1 Precautions for Location Selection

- 1) Choose a place sturdy enough to bear the weight and vibrations of the unit, and where the operation noise will not be amplified.
- 2) Choose a location where neither the hot air discharged from the unit nor the operation noise will cause a nuisance to the neighbors of the user.
- 3) Avoid places near bedrooms and the like, so that the operation noise will cause no disturbances.
- 4) There must be sufficient space for carrying the unit into and out from the site.
- 5) There must be sufficient space for air passage, and no obstructions around the air inlet and the air outlet.
- 6) The site must be free from the possibility of flammable gas leakage in a nearby place.
- 7) Install units, power cords, and inter-unit wire at least 3m away from television and radio sets. This is to prevent interference from images and sounds. (Noises may be heard even if they are more than 3m away, depending on radio wave conditions.)
- 8) In coastal areas, or other places with salty atmosphere, or sulfate gas, corrosion may shorten the life of the air conditioner.
- 9) Since drain flows out of the outdoor unit, do not place anything underneath the unit that must be kept away from moisture.



Unit:mm

MODEL	A	B	C	D	E	F	H
9K~18K	780	548	266	300	241	250	540
	760	530	290	315	270	285	590
	810	549	325	350	305	310	558
	845	560	335	360	312	320	700

(in=mm/25.4)

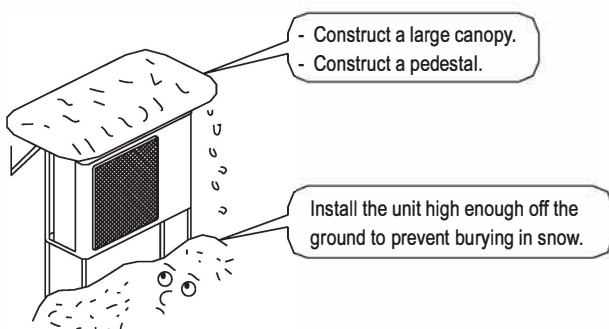
NOTE: Cannot be installed hanging from ceiling, or stacked.



CAUTION

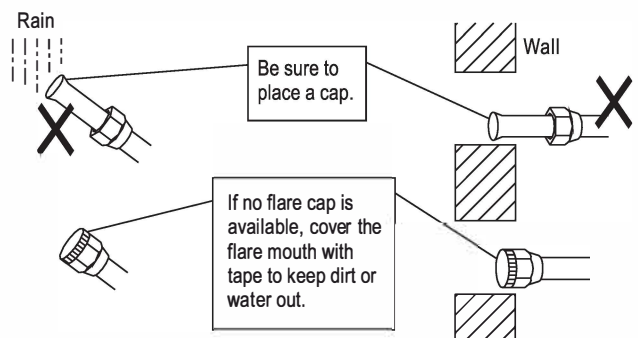
When operating the air conditioner in a low outdoor ambient temperature, be sure to follow the instructions described below.

- To prevent exposure to wind, install the outdoor unit with its suction side facing the wall.
- Never install the outdoor unit in a site where the suction side may be exposed directly to wind.
- To prevent exposure to wind, it is recommended to install a baffle plate on the air discharge side of the outdoor unit.
- In heavy snowfall areas, select an installation site where the snow will not affect the unit.



1) Caution on pipe handling

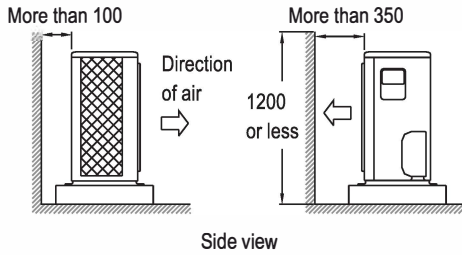
- Protect the open end of the pipe against dust and moisture.
- All pipe bends should be as gentle as possible. Use a pipe bender for bending.



2.3 Installation Guidelines

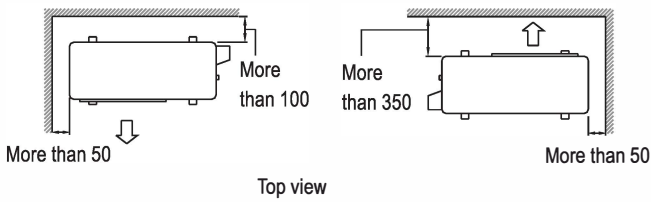
- When a wall, or other obstacle, is in the path of outdoor unit's inlet or outlet airflow, follow the installation guidelines below.
- For any of the below installation patterns, the wall height on the outlet side should be 1200mm/47.2in, or less.

Against a straight wall



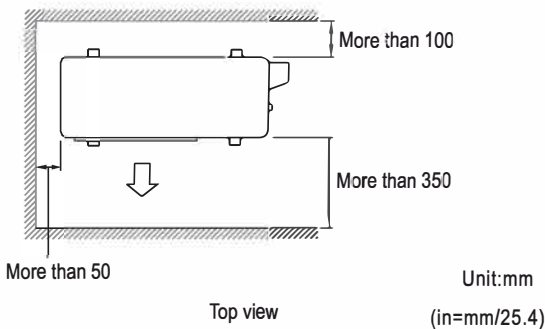
Side view

Against corner wall



Top view

Against 3-sided wall



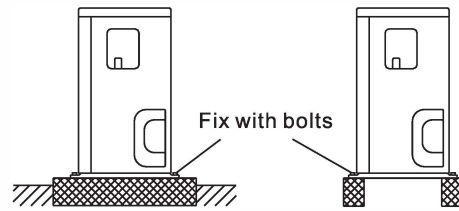
Top view

Unit:mm
(in=mm/25.4)

2.4 Outdoor Unit Installation

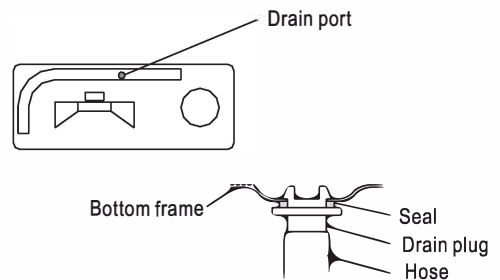
1) Installing Outdoor Unit:

- When installing the outdoor unit, refer to "Precautions for Location Selection".
- Check the sturdiness of the installation ground so that the unit will not cause any operating vibration or noise once installation is complete.
- Fix the unit securely by means of foundation bolts. (Prepare 4 sets of M8 or M10 foundation bolts, nuts, and washers, each which are available on the market.)



2) Drain Work

- If drain work is necessary, follow the procedures below.
- Use a drain plug for drainage.
- If the drain port is covered by a mounting base or floor surface, place additional foot bases, of at least 30mm/1.2 in in height, underneath the outdoor unit's feet.
- In cold areas, do not use a drain hose with the outdoor unit. (Otherwise, the drain water may freeze, impairing heating performance.)

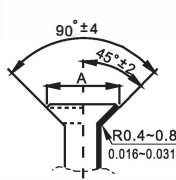


3 INSTALLING THE REFRIGERANT PIPE

! All field piping must be provided by a licensed refrigeration technician, and must comply with all relevant local and national codes.

Precautions

- Execute heat insulation work to completion on both sides of the gas piping and liquid piping. Otherwise, it can sometimes result in water leakage.
(When using a heat pump, the temperature of the gas piping can reach up to approximately 120°C/248°F. Use insulation that has sufficient resistance.)
- Also, in cases where the temperature and humidity of the refrigerant piping sections might exceed 30°C/86°F or Rh80%, reinforce the refrigerant insulation (by 20mm/0.8in, or thicker). Condensation may form on the surface of the insulating material.
- Before rigging tubes, check which type of refrigerant is used.
- Use a pipe cutter and flare suitable for used refrigerant.
- Only use annealed material for flare connections.
- Do not mix anything other than the specified refrigerant, such as air, etc., into the refrigerant circuit.
- If the refrigerant gas leaks during the work, ventilate the area. A toxic gas is at risk of being emitted by the refrigerant gas if exposed to a fire.
- Make sure there is no refrigerant gas leak. A toxic gas may be released by the refrigerant gas leaking indoors and being exposed to flames from an area heater, cooking stove, etc.
- Refer to the table below for the dimensions of flare nuts spaces and the appropriate tightening torque. (Overtightening may damage the flare, and cause leaks.)

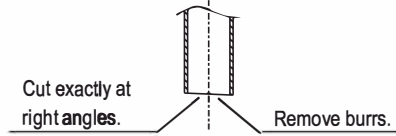
Pipe gauge (mm)	Tightening torque	Flare dimension A (mm)	Flare shape
Ø6.35(1/4 in)	15~16 N. m (153~163 kgf.cm)	8.3~8.7 0.327~0.343in	
Ø9.52(3/8in)	25~26 N. m (255~265 kgf.cm)	12.0~12.4 0.472~0.488in	
Ø12.7(1/2in)	35~36 N. m (357~367 kgf.cm)	15.4~15.8 0.606~0.622in	
Ø15.9(5/8in)	45~47 N. m (459~480 kgf.cm)	18.6~19.0 0.732~0.748in	

- Check whether the height drop between the indoor unit and outdoor unit, as well as the length of refrigerant pipe, meet the following requirements:

Model Type	Capacity (Btu/h)	Max. allowable piping length	Max. allowable piping height
R410A inverter Split type air conditioner	9K~12K	25m/82ft	10m/33ft
	18K	30m/100ft	20m/66ft

3.1 Flaring the Pipe Ends

- Cut the pipe end with a pipe cutter.
- Remove burrs with the cut surface, facing downward so that the chips do not enter the pipe.

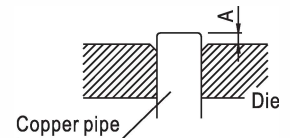


- Put the flare nut onto the pipe.
- Flare the pipe.

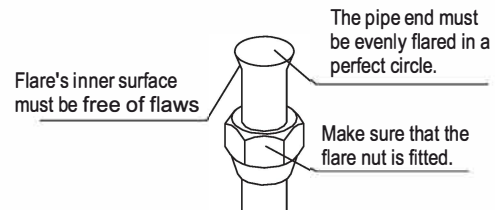
(in=mm/25.4)

Outer diam. (mm)	A(mm)	
	Max.	Min.
Ø6.35(1/4 in)	1.3	0.7
Ø9.52(3/8in)	1.6	1.0
Ø12.7(1/2in)	1.8	1.0
Ø15.9(5/8in)	2.2	2.0

Set exactly at the position shown below.



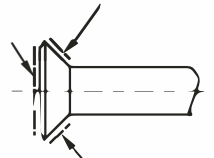
- Check that the flaring is properly made.



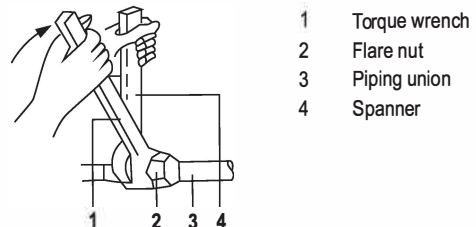
3.2 Refrigerant Piping

- Coat the flare, both inside and outside, with ether oil or ester oil

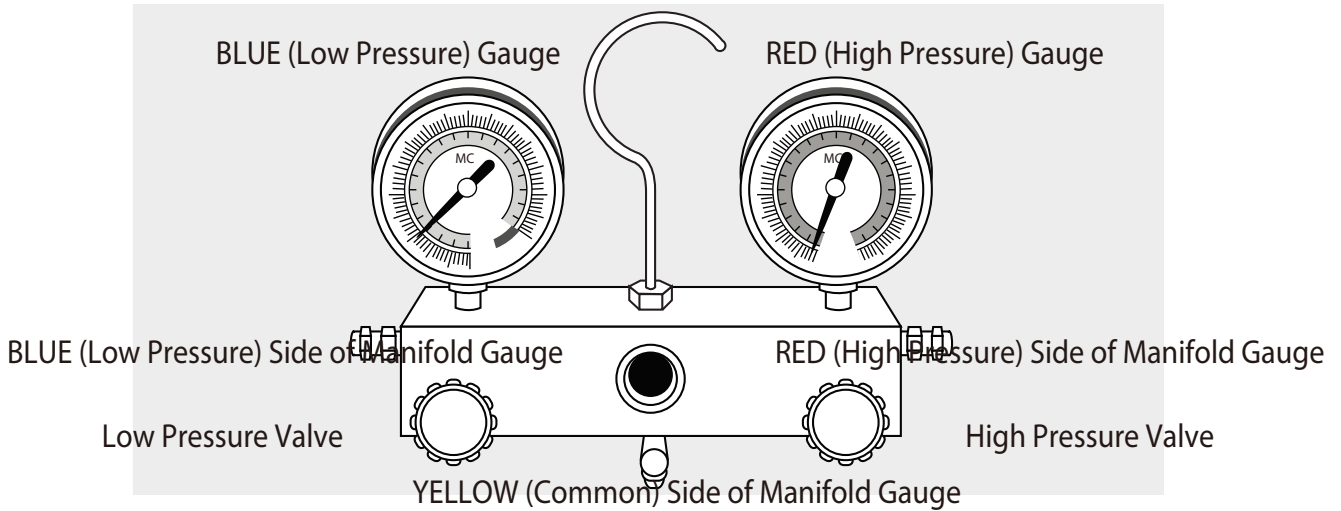
Coat here with ether oil or ester oil



- Align the centres of both flares, and tighten the flare nuts 3 or 4 turns by hand. Then tighten them fully with the torque wrenches.



- Torque wrench
- Flare nut
- Piping union
- Spanner



Caution: Systems are precharged with refrigerant (entire amount necessary for the system set has been charged into the outdoor section). The line sets and the indoor units are not charged, and must be evacuated prior to releasing the refrigerant from the outdoor unit to the rest of the system. Do NOT open the valves of the 2 service ports on your outdoor unit until the air evacuation is completed successfully, and the system passes leak checks. BOTH of those Service valves MUST BE OPENED to release the refrigerant before turning the system ON. Operating the system with service valves closed will result in compressor damage.

Preparations and Precautions

Air and foreign matter in the refrigerant circuit can cause abnormal rises in pressure, which can damage the air conditioner, reduce its efficiency, and cause injury. Use a vacuum pump and manifold gauge to evacuate the line set and the indoor unit, removing any non-condensable gas and moisture from the system.

Evacuation should be performed upon initial installation, and when unit is relocated.

BEFORE PERFORMING EVACUATION

- Check to make sure that both LIQUID SIDE and GAS SIDE pipes between the indoor and outdoor units are connected properly, in accordance with the Refrigerant Piping Connection section of this manual.
- Check to make sure all wiring is connected properly.

Before using the manifold gauge and vacuum pump, read their operation manuals to familiarize yourself with how to use them properly.

Evacuation Instructions

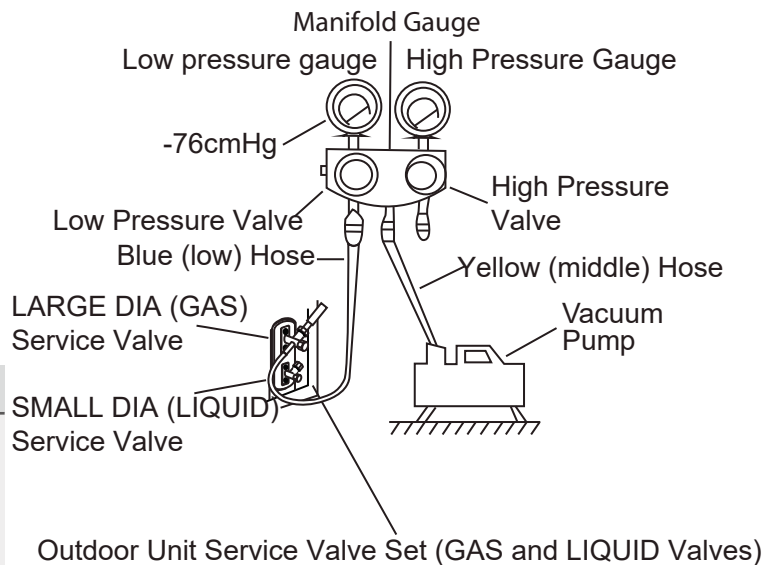
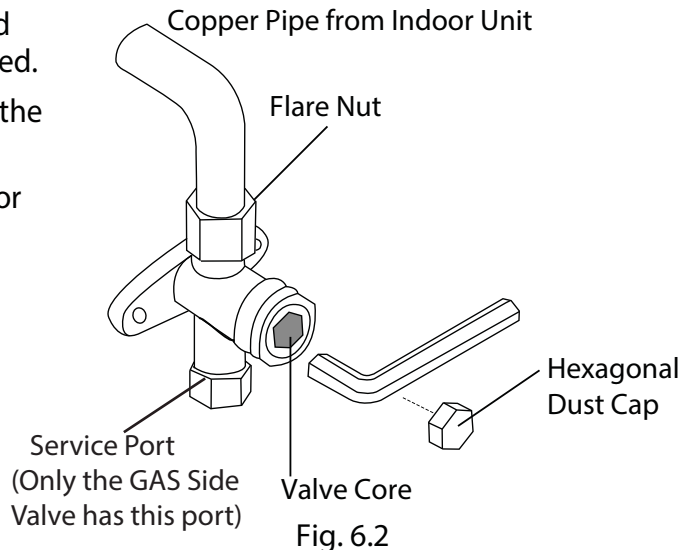


Fig. 6.1

1. Connect the blue (low side) hose of the manifold gauge to the service port on the outdoor unit's GAS SIDE valve (use a 1/4" to 5/16" port adapter if needed, which is sold separately)
2. Connect the yellow (middle or common) hose from the manifold gauge to the vacuum pump.

3. Open the BLUE (Low Pressure) valve of Manifold Gauge. Keep the RED (High Pressure) valve closed.
4. Turn the vacuum pump ON to start evacuating the air from the line set and indoor unit circuits.
5. Run the vacuum pump for at least 15 minutes, or until the Low Pressure Gauge reads -76cmHG (-100 kPa or -30 In Hg). (Negative value)
6. Close the Blue (Low Pressure) valve of Manifold Gauge, then turn the vacuum pump OFF.
7. Wait for 5 minutes, then check that there has been no rise in Low Pressure Gauge reading.
8. If there is a rise (Vacuum Loss), refer to the Gas Leak Check section for information on how to check for leaks. If there is no change in vacuum reading, unscrew the cap from the LIQUID Side Service Valve (Fig. 6.2)
9. Insert a hexagonal wrench into the service valve (LIQUID Side Valve), and open the valve by turning the wrench in a 1/4 counterclockwise turn. Listen for the sound of gas exiting the system, then close the valve after 5 seconds.
10. The Low Pressure Gauge should now show a positive pressure value (Above Zero). Watch the Pressure Gauge for a few minutes, to make sure that there is no drop in the pressure value (indicating a leak)



11. Using a hexagonal wrench, fully open both the LIQUID side and GAS side Service Valves.
12. Remove the charging hose from the service port.
13. Tighten valve caps on all three valves (service port, liquid side, gas side) by hand. Then, tighten it further using a torque wrench, if needed.

! OPEN VALVE STEMS GENTLY

When opening valve stems, turn the hexagonal wrench until it seats against the stopper. Do not try to force the valve to open further.

Note on Adding Refrigerant

Some systems require additional charging depending on pipe lengths. The pipe length varies according to locations of the indoor and outdoor units. The system has been factory charged with sufficient R410a refrigerant for the standard pipe length of 5m (~16'). The additional refrigerant to be charged can be calculated using the following formula. This is necessary only if the length exceeds 7.5m (25 feet).

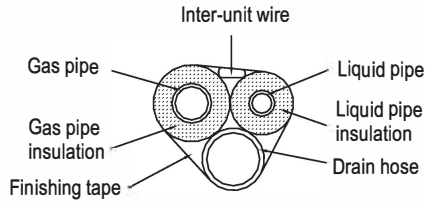
ADDITIONAL REFRIGERANT PER PIPE LENGTH

Connective Pipe Length (m)	Air Purging Method	Additional Refrigerant	
≤ Standard pipe length	Vacuum Pump	N/A	
> Standard pipe length (5m/~16')	Vacuum Pump	Liquid Side: Ø 6.35 (ø 1/4") Gas side either Ø 9.52 (ø 3/8") or Ø 12.7 (ø 1/2") Add for lengths beyond 5m (16 feet) (Per additional meter) x 15g /m (Per additional foot) x 0.16 oz/ft	Liquid Side: Ø 9.52 (ø 3/8") Gas side either Ø 15.87 (ø 5/8") or Ø 19.05 (ø 3/4") Add for lengths beyond 5m (16 feet) (Per additional meter) x 30 g/m (Per additional foot) x 0.32 oz/ft

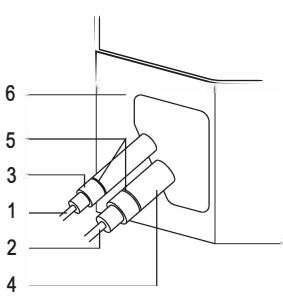
! CAUTION

DO NOT mix refrigerant types. Be sure to use only the same type of refrigerant (R410a).

2) Be sure to insulate both the gas and liquid piping. Use separate thermal insulation pipes for gas and liquid refrigerant pipes. See the figure below.



3) Finally, insulate as shown in the figure below.

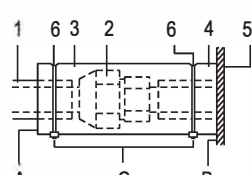
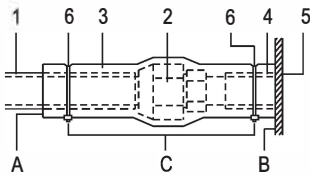


- 1 Liquid pipe
- 2 Gas pipe
- 3 Insulation for liquid pipe fitting
- 4 Insulation for gas pipe fitting
- 5 Clamps (use 2 clamps per insulation)
- 6 Indoor unit

Piping insulation procedure

Gas piping

Liquid piping

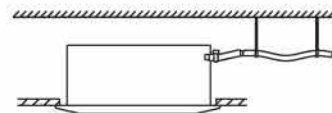
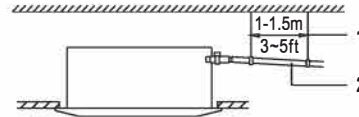


- 1 Piping insulation material(field supply)
- 2 Flare nut connection
- 3 Insulation for fitting (field supply)
- 4 Piping insulation material (main unit)
- 5 Indoor unit
- 6 Clamp (field supply)
- A Turn seams up
- B Attach to base
- C Tighten the part other than the piping insulation material

4 CONNECT THE DRAIN PIPE

4.1 Installation of Drain Piping

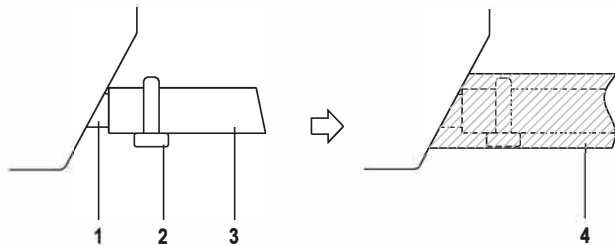
Install the drain piping as shown in figure below, and take measures against condensation. Improperly rigged piping could lead to leaks, and eventually wet furniture and belongings.



- 1 Hanging bar
- 2 1/100 gradient

4.2 Install the drain pipes.

- Keep piping as short as possible, and slope it downwards at a gradient of at least 1/100 so that air may not remain trapped inside the pipe.
- Keep pipe size equal to or greater than that of the connecting pipe (PVC pipe, nominal diameter 20mm/0.8in, outside diameter 25mm/1in).
- Push the drain hose as far as possible over the drain socket, and tighten the metal clamp securely.



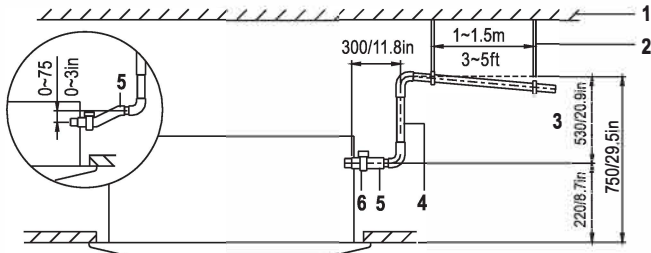
- 1 Drain socket (attached to the unit)
- 2 metal clamp
- 3 Drain hose
- 4 Insulation (field supply)

- Insulate the drain hose inside the building.
- If the drain hose cannot be sufficiently set on a slope, fit the hose with drain raising piping (field supply).
- Make sure that heat insulation work is executed on the following 2 spots to prevent any possible water leakage due to dew condensation.
 - 1 Indoor drain pipe.
 - 2 Drain socket.



- For local insulation, be sure to insulate local piping all the way into the pipe connections inside the unit. Exposed piping may cause condensation, or may cause burns when touched.
- Make sure that no oil remains on plastic parts of the decoration panel (optional equipment). Oil may cause degradation and damage to plastic parts.

4.3 How to Perform Pipework



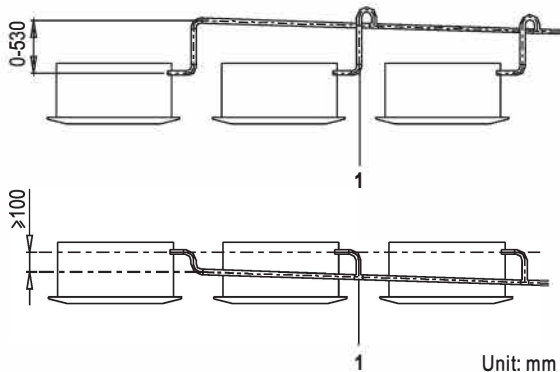
Unit: mm

- 1 Ceiling Slab
- 2 Hanger Bracket
- 3 Adjustable Range
- 4 Drain Raising Pipe
- 5 Drain Hose
- 6 Metal Clamp

- Connect the drain hose to the drain raising pipes, and insulate them.
- Connect the drain hose to the drain outlet on the indoor unit, and tighten it with the clamp.

■ Precautions

- Install the drain raising pipes at a height lower than 530 mm/20.9 in.
- Install the drain raising pipes at a right angle to the indoor unit, and no more than 300 mm/11.8 in. from the unit.
- To prevent air bubbles, install the drain hose level, or slightly tilted up (≤ 75 mm/3 in.).
- The incline of the drain hose should be 75 mm/3 in. or less, so that the drain socket does not have to withstand additional force.
- To ensure a downward slope of 1:100, install hanging bars every 1m/3.3ft to 1.5 m/4.9ft.
- When unifying multiple drain pipes, install the pipes as shown in the figure below. Select converging drain pipes whose gauge is suitable for the operating capacity of the unit.



Unit: mm

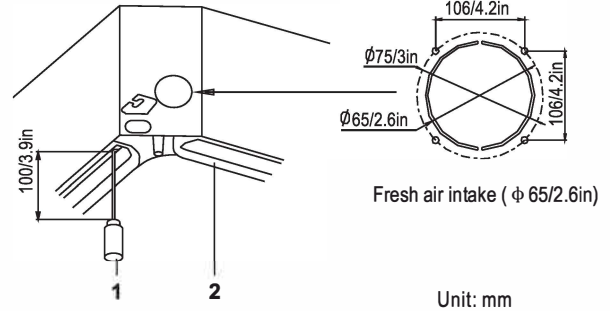
- 1 T-joint converging drain pipes

4.4 Testing of Drain Piping

After the piping work is finished, check if drainage flows smoothly.

- Add approximately 1L of water gradually through the air discharge outlet.

Method of adding water (see the figure below):



Unit: mm

- 1 Plastic watering can (tube should be about 100 mm/3.9 in long)
- 2 Water-receiver

- When electric wiring work is finished, check drainage flow during COOL running mode, explained in "Test Operation" on page 16.

5 ELECTRICAL WIRING WORK

General Instructions

- All field wiring and components must be installed by a licensed electrician and must comply with relevant European and national regulations.
- Use copper wire only.
- Follow the 'Wiring diagram' attached to the unit body to wire the outdoor unit, indoor units, and the remote controller.
- A circuit breaker capable of shutting down the power supply to the entire system must be installed.
- Note that the operation will restart automatically if the main power supply is turned off and then turned back on again.
- Be sure to ground the air conditioner.
- Do not connect the ground wire to gas pipes, water pipes, lightning rods, or telephone ground wires.
 - Gas pipes: might cause explosions or fire if gas leaks.
 - Water pipes: no grounding effect if hard vinyl piping is used.
 - Telephone ground wires or lightning rods: might cause abnormally high electrical potential in the ground during lightning storms.

Power Specifications

Power			
Model	Phase	Frequency and volt	Circuit breaker/Fuse(A)
9K~18K	1Phase	208-240V	20/16



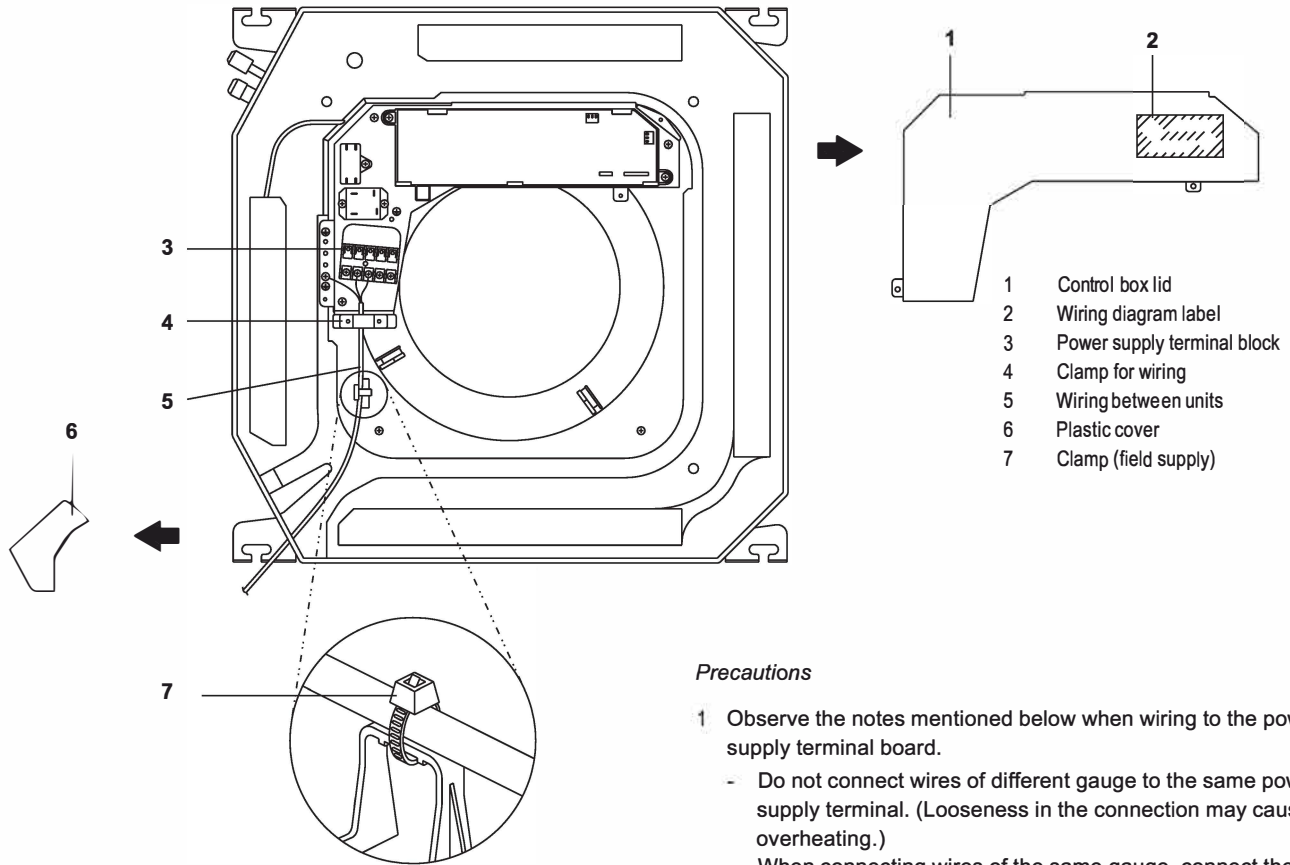
- Drain piping connections
Do not connect the drain piping directly to sewage pipes that smell of ammonia. The ammonia in the sewage might enter the indoor unit through the drain pipes, and corrode the heat exchanger.
- Keep in mind that it will be the cause of the drain pipe getting blocked if water collects on drain pipe.

How to Connect the Wiring

- Remove the control box lid of the indoor unit.
Remove the cover of the outdoor unit.

- Follow the "Wiring diagram label" attached to the indoor unit's control box lid to wire the outdoor unit, indoor unit, and the remote controller.
Securely fix the wires with a field supplied clamp.

- Reattach the cover of the outdoor unit.



Precautions

- 1 Observe the notes mentioned below when wiring to the power supply terminal board.
 - Do not connect wires of different gauge to the same power supply terminal. (Looseness in the connection may cause overheating.)
 - When connecting wires of the same gauge, connect them according to the figure.

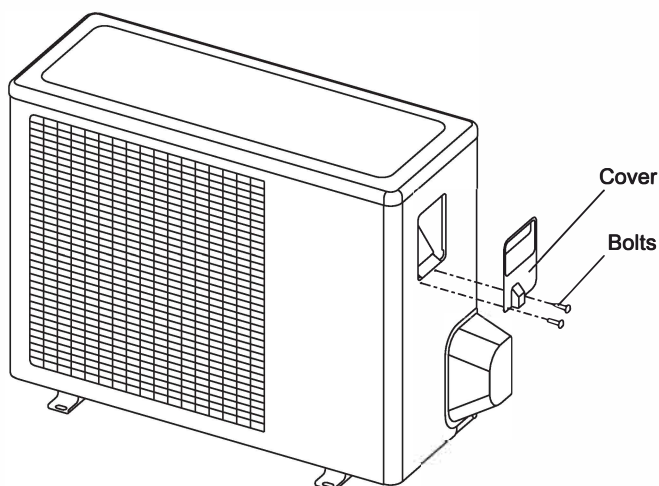


Use the specified electric wire. Connect the wire securely to the terminal. Lock the wire down without applying excessive force to the terminal. (Tightening torque: $1.31\text{N}\cdot\text{m} \pm 10\%$).

- When attaching the control box lid, make sure not to pinch any wires.
- After all wiring connections are done, fill in any gaps in the casing wiring holes with putty or insulation material (field supply) to prevent small animals or dirt from entering the unit from outside and causing short circuits in the control box.

- 2 Do not connect wires of different gauge to the same grounding terminal. Looseness in the connection may deteriorate the protection.

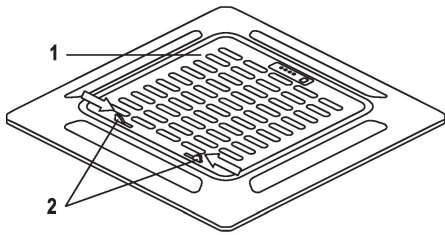
- 3 Use only specified wires and tightly connect wires to the terminals. Be careful that wires do not place external stress on the terminals. Keep wiring in neat order so that they do not obstruct other equipment, such as popping open the service cover. Make sure the cover closes tight. Incomplete connections could result in overheating, and in the worst case, electric shock or fire.



6 INSTALLATION OF THE DECORATION PANEL

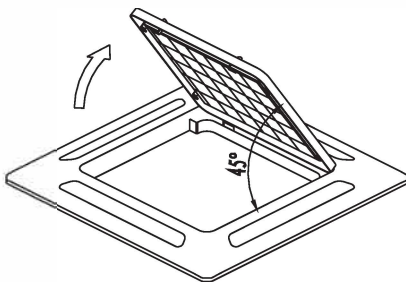
■ Detach the intake grille.

- Slide the 2 grille hooks toward the middle of the decoration panel.



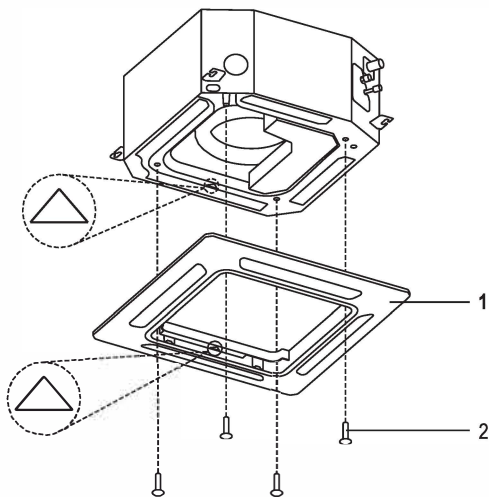
- 1 Intake Grille
- 2 Grille Hook

- Open the intake grille at the angle shown below and remove it.



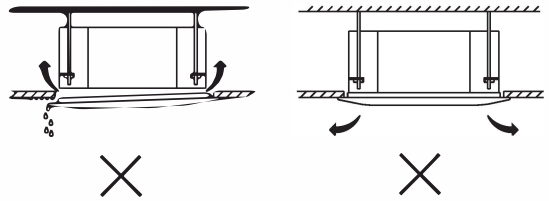
■ Install the Decoration Panel

- Align the indicated " " on the decoration panel to the indicated " " markings on the unit
- Attach the decoration panel to the unit with the supplied screws as shown in figure below.



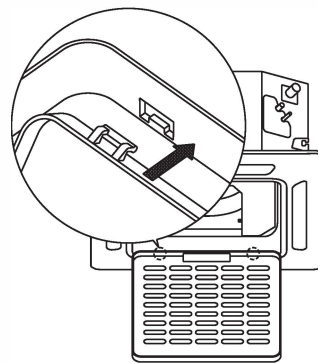
- 1 Decoration Panel
- 2 Screws (M5)(supplied with the panel)

- After installing the decoration panel, ensure that there is no space between the unit body and decoration panel. Otherwise, air may leak through the gap and cause dewdrops. (See figure below)

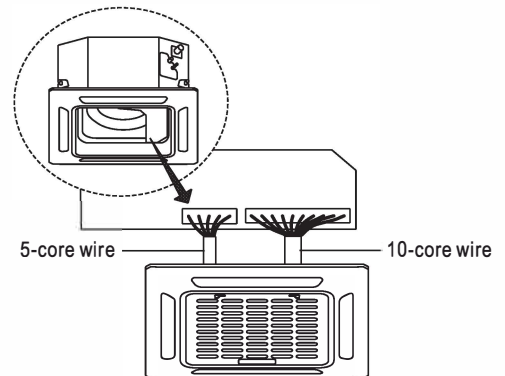


■ Mount the Intake Grille.

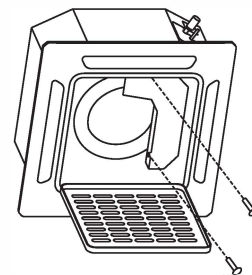
- Ensure that the buckles at the back of the grille be properly seated into the groove of the panel.



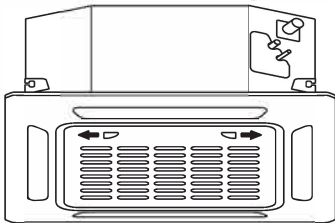
■ Connect the 2 wires of the decoration panel to the mainboard of the unit.



■ Fasten the control box lid with 2 screws .



- Close the intake grille, and slide the 2 grille hooks back.



7 TEST OPERATION

Make sure the control box lids are closed on the indoor and outdoor units.

Refer to "For the following items, take special care during construction and check after installation is finished" on page 2.

After finishing the construction of refrigerant piping, drain piping, and electric wiring, conduct a test operation accordingly to protect the unit. *Test operation after installing decoration panel*

- 1 Open the gas side stop valve.
- 2 Open the liquid side stop valve.
- 3 Electrify the crank case heater for 6 hours.
- 4 Set to cooling operation with the remote controller, and start operation by pushing the ON/OFF button.
- 5 Check the following points. If there is any malfunction, please resolve it according to the chapter "Troubleshooting" in the "Owner's Manual".
 - The indoor unit:
 - Whether the switch on the remote controller works well.
 - Whether the buttons on the remote controller work well .
 - Whether the air flow louver moves normally.
 - Whether the room temperature is adjusted well.
 - Whether the indicator lights up normally.
 - Whether the temporary buttons work well.
 - Whether there is vibration or abnormal noise during operation.
 - Whether the drainage flows smoothly.
 - The outdoor unit:
 - Whether there is vibration or abnormal noise during operation.
 - Whether the generated wind, noise, or condensed of by the air conditioner have generated excessive noise in your neighborhood.
 - Whether any of the refrigerant is leaked.
- 6 Turn off the main power supply after operation.



A protection feature prevents the air conditioner from being activated for approximately 3 minutes when it is restarted immediately after shut off.