Cooper & Hunter

SOPHIA

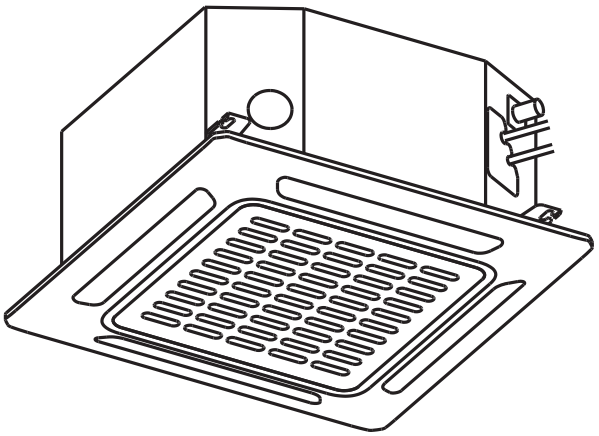
MULTI-ZONE
DUCTLESS INVERTER

SPLIT AIR CONDITIONER
WITH HEAT PUMP
CASSETTE TYPE

INSTALLATION MANUAL

INDOOR UNIT

Models:
CH-09MSPHCT-230VI
CH-12MSPHCT-230VI
CH-18MSPHCT-230VI
CH-24MSPHCT-230VI



IMPORTANT NOTE:

- Read this manual carefully before installing or operating your new air conditioning unit. Make sure to save this manual for future reference.
- This manual only describes the installation of outdoor unit. When installing the indoor unit, refer to the installation manual of indoor unit.

■ If you are using this as a MULTI unit, please refer to the installation & operation manuals that accompany the outdoor unit.

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PRECAUTIONS

- Keep this manual where the operator can easily find it.
- Read this manual attentively before starting the units.
- For safety reasons, the operator 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 you do not follow these instructions exactly, the unit may cause property damage, personal injury, or loss of life.

CAUTION

If you do not follow these instructions exactly, the unit may cause minor or 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 keep it maintained. Also, advise the customer to store this installation manual along with the user's manual for future reference.

WARNING

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

Improper installation, repair, or maintenance may result in short-circuiting, leaks, electrical shock, fire, or other damage to the equipment.

Install strictly according to these installation instructions. If installation is defective, water leakage, electrical shock, and fire will result.

When installing the unit in a small room, take measures to keep 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 can lead to an oxygen deficiency.

Use the attached accessories parts and specified parts for installation. Otherwise, the set may fall or water leakage, electrical shock, or fire may result.

Install the unit in a strong, firm location that can withstand the set's weight. If the strength is insufficient or installation is done improperly, the set will drop and cause injury.

The appliance must be installed 2.5 m (8.2 ft) above the floor.

The appliance must not be installed in a laundry room.

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 must be marked with the direction of the fluid flow by words or symbols.

For electrical work, follow 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 insufficient or defective, electrical shock or fire will result.

Tightly connect and clamp the specified cable so that no external force will be acted on the terminal. If the connection or fixing is not perfect, heat-up at the connection or fire will result.

Wiring routing must be arranged so that the control board cover is fixed properly. If it isn't, heat-up at the connection, electrical shock, or fire, will result.

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

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

When connecting the pipes, take care not to let air substances enter the refrigeration cycle to avoid lowered 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. Do not share the single outlet with other electrical appliances. This will cause electrical shock or fire.

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 keep the interconnection cable away from the copper tube.

After completing installation, 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.

CAUTION

Ground the air conditioner. Do not connect the ground wire to gas or water pipes, a lightning rod, or a telephone ground wire. Inappropriate grounding may result in electrical shock.

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

Connect the outdoor unit wires, then connect the indoor unit wires. Do not connect the air conditioner with the power supply until the wiring and piping are done.

Install drain piping to ensure proper drainage and insulate the piping to prevent condensation. Improper drain piping may result in water leakage and property damage.

The indoor and outdoor units, power supply wiring, and connecting wires should be at least 1 m away from televisions or radios to prevent image interference or noise. Depending on the radio waves, a distance of 1 m may not be sufficient to eliminate the noise.

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

Do not install the air conditioner in the following circumstances or locations:

- When petrolatum is in the area
- When the surrounding air is salty (near the coast)
- When caustic gas (such as sulfide) is in the air (near a hot spring)
- When the volt vibrates violently (in factories)
- In buses or cabinets
- In a kitchen full of oil or gas
- When there are strong electromagnetic waves in the air
- When there are inflammable materials or gas nearby
- When acid or alkaline liquid is evaporating
- When other special conditions exist

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

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

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

INSTALLATION INFORMATION

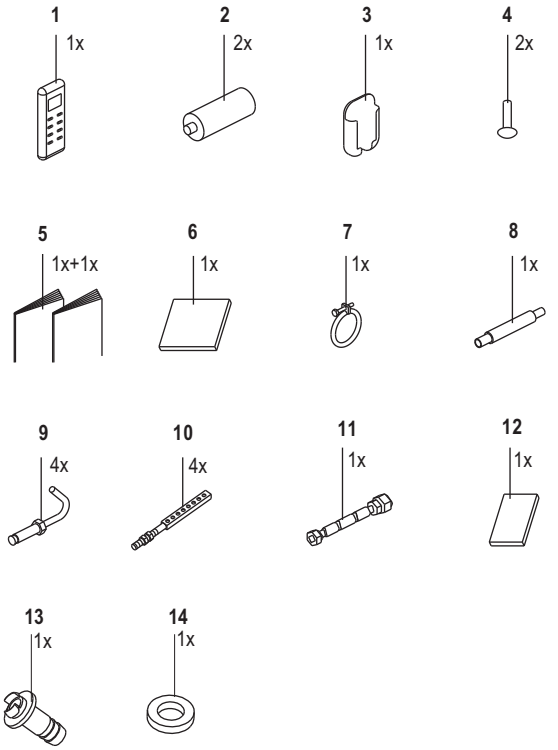
- To install properly, please read this installation manual first.
- The air conditioner must be installed by qualified persons.
- When installing the indoor unit or its tubing, please follow this manual as strictly as possible.
- If the air conditioner is installed on a metal part of a building, it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

Ensure that the following accessories are included with your unit:



1 Remote control

2 Batteries

3 Remote control holder (on some models)

4 Tapping screws (M3 x 10 mm) (on some models)

5 Installation and user's manual

6 Paper pattern for installation (on some models)

7 Metal champ (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 heat pump models) (with the outdoor unit)

14 Seal ring (only heat pump models) (with the outdoor unit)

Optional accessories

- This indoor unit requires installation of an optional decoration panel.

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

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

NOTE

All the pictures in this manual are for explanation purposes only. They may be slightly different from the air conditioner you purchased (depending on the model). The actual shape prevails.

1. INDOOR UNIT INSTALLATION

1.1 Selecting an 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 is required (min. 10 mm/0.4 in thickness, polyethylene foam).

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

- Optimum air distribution can be ensured.
- Nothing blocks air passage.
- Condensate water can be properly drained.
- The false ceiling is not on a noticeable incline.
- There is sufficient clearance for maintenance and service.
- There is no risk of flammable gas leaking.
- The atmosphere is not potentially explosive.

- Piping between the indoor and outdoor units is possible within the allowable limit. (Refer to the installation manual of the outdoor unit.)
- To prevent image interference and noise, keep the indoor unit, outdoor unit, inter-unit wiring, and remote control wiring at least 1 m away from televisions and radios. (Noise may be generated depending on the conditions under which the electric wave is generated, even if a distance of 1 m is maintained.)

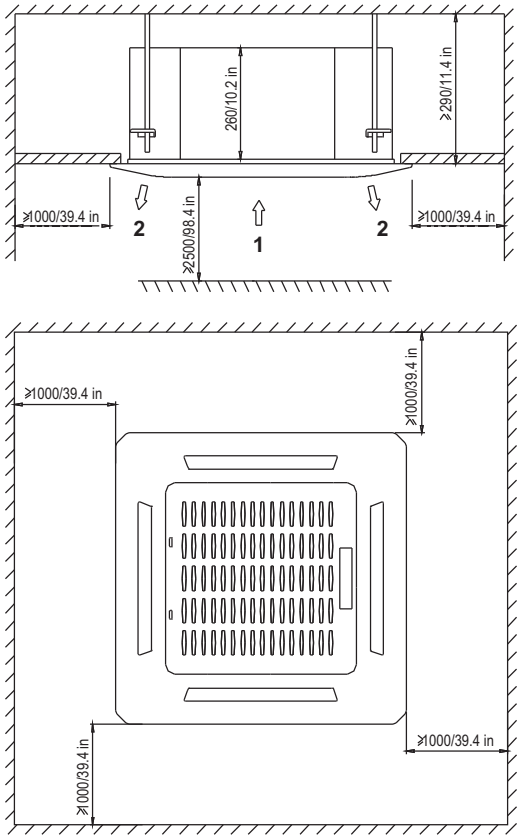
- When installing the wireless remote control kit, the distance between the wireless remote control and the indoor unit might be shorter if there are fluorescent lights that are electrically started in the room. The indoor unit must be installed as far as possible from fluorescent lights.

2) Ceiling height

Install the unit where the the bottom panel is higher than 2.5 m (8.2 ft) so the user cannot easily touch.

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

For the space required for installation, see the figure below.



Unit: mm

1 Air inlet
2 Air outlet

DANGER

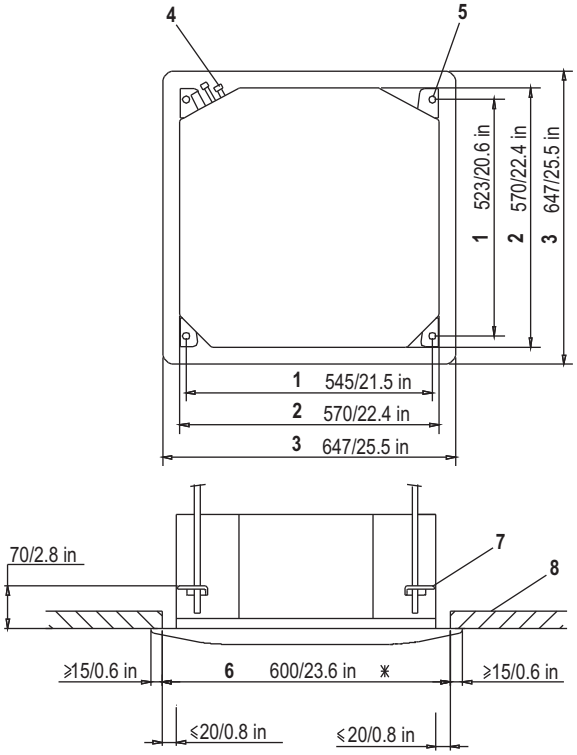
Do not install the unit in an area where flammable materials are present. This could cause an explosion, which could result in serious injury or death.

WARNING

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

1.2 Preparations before installation

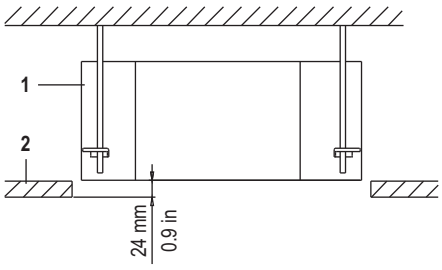
1) Relation of ceiling opening to unit and suspension bolt position



Unit: mm

1 Installation hook pitch dimensions
2 Indoor unit dimensions
3 Decoration panel dimensions
4 Refrigerant piping Installation
5 hook (x4)
6 Ceiling opening dimensions
7 Hanger bracket
8 False ceiling

■ **Adjust the position to ensure the gaps between the indoor unit and the four sides of the false ceiling are even. The indoor unit's lower part should sink into the false ceiling 24 mm (0.9 in).**



1 Indoor unit
2 False ceiling

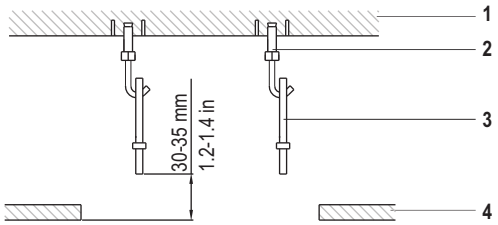
NOTE: Installation is possible with a ceiling dimension of 600 mm (23.6 in) (marked with *). However, to achieve a ceiling-panel overlapping dimension of 15 mm (0.6 in), the space between the ceiling and the unit should be 20 mm (0.8 in) or less. If the space between the ceiling and the unit is more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

2) Where applicable, create the ceiling opening that is necessary for installation (for existing ceilings)

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

3) Install the installation hooks (use either an M8 or M10 bolt)

Use expansible hooks, sunken anchors, or other field-supplied parts to reinforce the ceiling so that it can bear the weight of the unit. Adjust the clearance from the ceiling before proceeding. For an installation example, see the figure below.



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

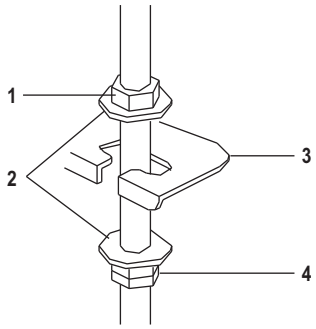
NOTE ■ For details about installation other than standard installation, contact your dealer.

1.3 Install the indoor unit

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

1) Install the indoor unit temporarily

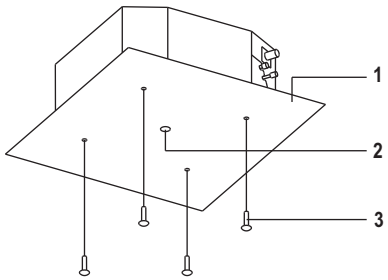
Attach the hanger bracket to the suspension bolt. Be sure to fix it securely by using a nut and washer on the upper and lower sides of the hanger bracket, as shown in the figure below.



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 center of the ceiling opening is indicated on the paper pattern for installation.
- After removing the packaging material from the paper patten for installation, attach it to the unit with the attached screws, as shown in the figure below.



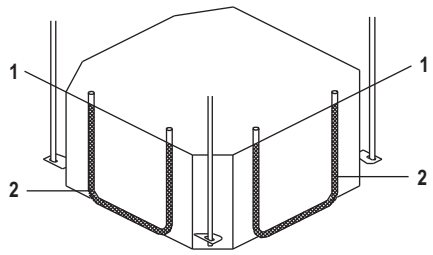
1 Paper pattern for installation (on some models)
2 Center of the ceiling opening
3 Screws (supplied with the decoration panel)

3) Adjust the unit to the right position for installation

Refer to "Preparations before installation" on page 5.

4) Check if the unit is horizontally level

- 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.
- With a water level or water-filled vinyl tube, check if the unit is level at all four corners, as shown in the figure below.



1 Water level
2 Vinyl tube

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

2. OUTDOOR UNIT INSTALLATION

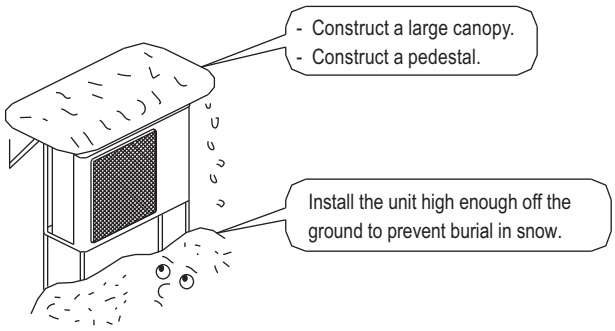
2.1 Precautions for selecting the location

1) Choose a place solid enough to bear the weight and vibration of the unit, where operation noise will not be amplified.
2) Choose a location where the hot air discharged from the unit or the operation noise will not be a nuisance to neighbors.
3) To lessen the irritation of the operation noise, avoid placing the unit near bedrooms and the like.
4) There must be sufficient space for carrying the unit into and out of the site.
5) Remove obstructions around the air inlet and outlet to allow sufficient space for air passage.
6) There must not be the possibility of flammable gas leakage near the installation site.
7) Install units, power cords, and inter-unit wire at least 3 m away from television and radio sets. This is to prevent interference of images and sounds. (Noises may be heard even if they are more than 3 m away, depending on radio wave conditions.)
8) In coastal areas or other places with a salty atmosphere of sulfate gas, corrosion may shorten the life of the air conditioner.
9) Since drain flows out of the outdoor unit, do not place anything under the unit that must be kept away from moisture.

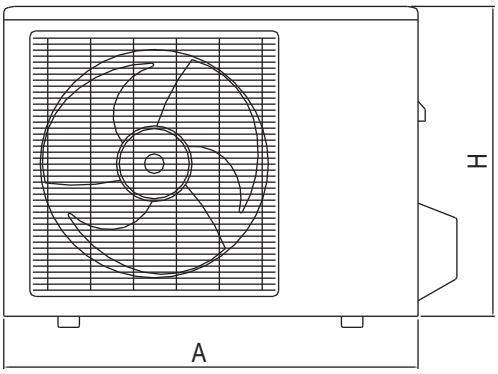
NOTE: The unit cannot be hung from a ceiling or stacked.

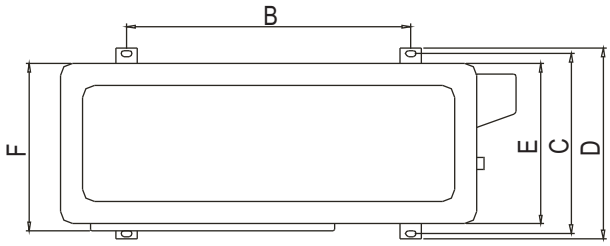
CAUTION

When operating the air conditioner in a low outdoor ambient temperature, be sure to follow the instructions below:
- To prevent exposure to wind, install the outdoor unit with its suction side facing the wall.
- Never install the outdoor unit at a site where the suction side may be exposed directly to wind.
- To prevent exposure to wind, install a baffle plate on the air discharge side of the outdoor unit.
- In areas with heavy snowfall, select an installation site where the snow will not affect the unit.



2.2 Figure of body size





Unit: mm

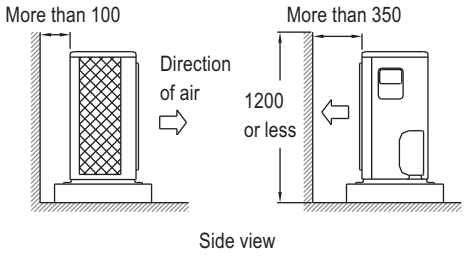
MODEL	A	B	C	D	E	F	H
9K-18K	780	548	266	300	241	250	540
	760	530	290	315	270	285	590
	810	549	325	350	305	310	558
	845	560	335	360	312	320	700

(1 in = 25.4 mm)

2.3 Installation guidelines

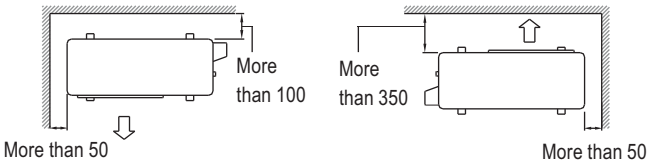
- When a wall or other obstacle is in the path of the outdoor unit inlet or outlet airflow, follow the installation guidelines below.
- For any of the below installation patterns, the wall height on the outlet side should be 1200 mm (47.2 in) or less.

Wall facing one side



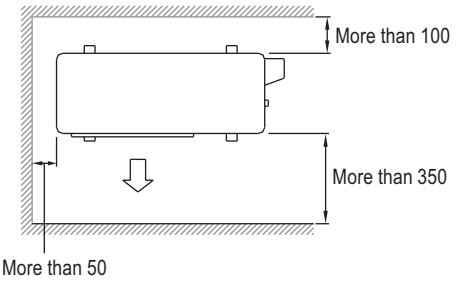
Side view

Walls facing two sides



Top view

Walls facing three sides



Top view

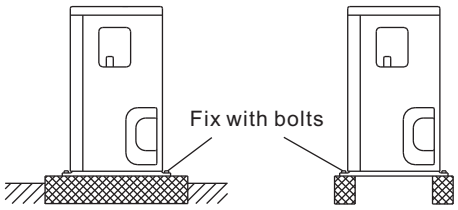
Unit: mm

(in = 25.4 mm)

2.4 Outdoor unit installation

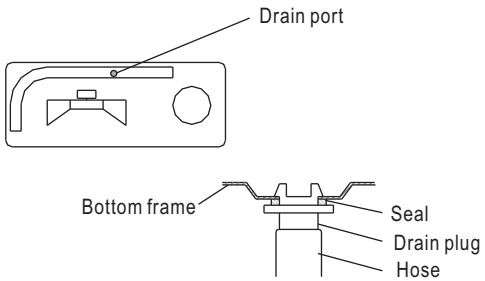
1) Installing the outdoor unit

- When installing the outdoor unit, refer to "Precautions for selecting the location."
- Check the strength and level of the installation ground so that the unit will not cause any operating vibration or noise after it is installed.
- Fix the unit securely by means of the foundation bolts. (Prepare 4 sets each of M8 or M10 foundation bolts, nuts, and washers, 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 1.2 in (30 mm) in height under the outdoor unit's feet.
- In cold areas, do not use a drain hose with the outdoor unit. (Otherwise, drain water may freeze, impairing heating performance.)

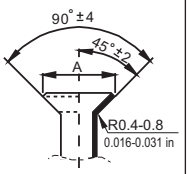


3 INSTALLING THE REFRIGERANT PIPE

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

Precautions

- Execute heat insulation work completely on both sides of the gas piping and liquid piping. Otherwise, water leakage may result. (When using a heat pump, the temperature of the gas piping can reach approximately 120°C/248° F. Use insulation that is sufficiently resistant.)
- In cases where the temperature and humidity of the refrigerant piping sections might exceed 30°C/86°F or Rh 80%, reinforce the refrigerant insulation (0.8in (20 mm) 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 the refrigerant.
- Only use annealed material for flare connections.
- Do not mix anything other than the specified refrigerant, such as air, inside the refrigerant circuit.
- If refrigerant gas leaks while you are working, ventilate the area. Toxic gas may be emitted when the refrigerant gas is exposed to a fire.
- Make sure there is no refrigerant gas leak. Toxic gas may be released when the refrigerant gas is exposed to flames from an area heater, cooking stove, etc.
- Refer to the table below for the dimensions of flare nut spaces and the appropriate tightening torque. (Over-tightening may damage the flare and cause leaks.)

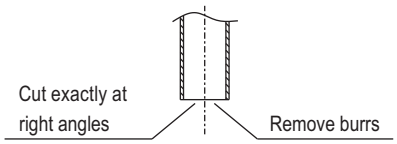
Pipe gauge (mm)	Tightening torque	Flare dimension A (mm)	Flare shape
Ø 6.35 (1/4 in)	15-16 N. m (153-163 kgf. cm)	8.3-8.7 0.327-0.343 in	
Ø 9.52 (3/8 in)	25-26 N. m (255-265 kgf. cm)	12.0-12.4 0.472-0.488 in	
Ø 12.7 (1/2 in)	35-36 N. m (357-367 kgf. cm)	15.4-15.8 0.606-0.622 in	
Ø 15.9 (5/8 in)	45-47 N. m (459-480 kgf. cm)	18.6-19.0 0.732-0.748 in	

- Ensure that the height drop between the indoor and outdoor units and the length of the refrigerant pipe meet the following requirements:

Types of models	Capacity (Btu/h)	Max. allowable piping length	Max. allowable piping height
T1 condition Split-type air conditioner	9K - 12K	15 m (49.2 ft)	8 m (26.2 ft)
	18K	25 m (82 ft)	15 m (49.2 ft)
R410A inverter Split-type air conditioner	9K - 12K	25 m (82 ft)	10 m (32.8 ft)
	18K	30 m (98.4 ft)	20 m (65.6 ft)
T3 condition (outdoor unit down)	9K - 12K	25 m (82 ft)	10 m (32.8 ft)
	18K	30 m (98.4 ft)	15 m (49.2 ft)
T3 condition (outdoor unit up)	9K - 12K	25 m (82 ft)	15 m (49.2 ft)
	18K	30 m (98.4 ft)	20 m (65.6 ft)

3.1 Flaring the pipe end

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

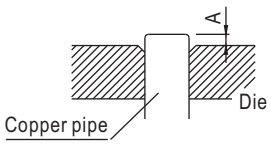


3) Put the flare nut on the pipe.
4) Flare the pipe.

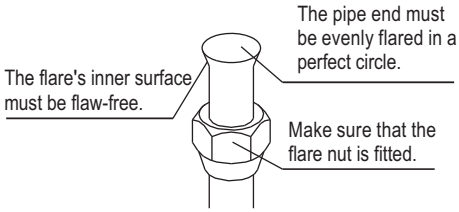
(in = 25.4 mm)

Outer diam. (mm)	A (mm)	
	Max.	Min.
Ø 6.35 (1/4 in)	1.3	0.7
Ø 9.52 (3/8 in)	1.6	1.0
Ø 12.7 (1/2 in)	1.8	1.0
Ø 15.9 (5/8 in)	2.2	2.0

Set exactly at the position shown below.

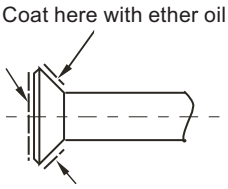


5) Ensure that the flaring is made properly.

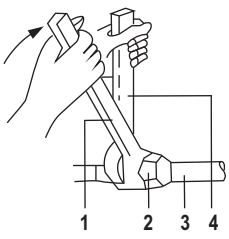


3.2 Refrigerant piping

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

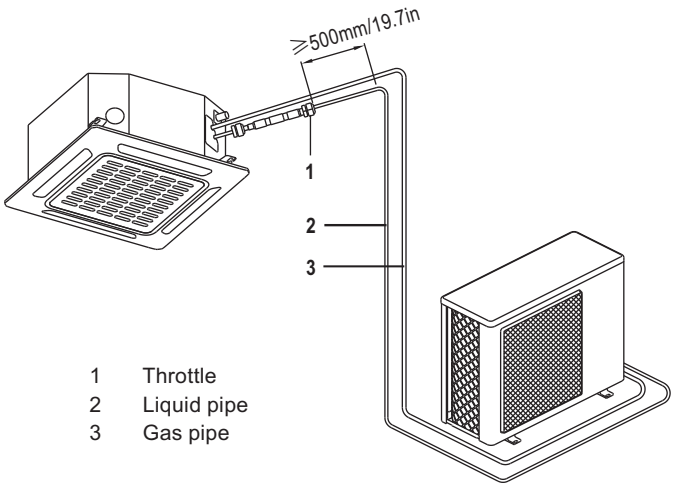


- Align the centers of both flares and tighten the flare nuts 3 or 4 turns by hand. Then tighten them fully with the torque wrenches.



1 Torque wrench
2 Flare nut
3 Piping union
4 Spanner

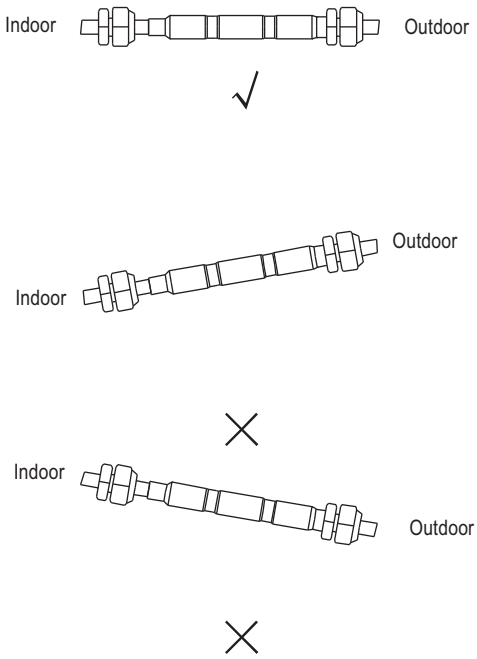
3.3 Installation of the throttle (for some models)



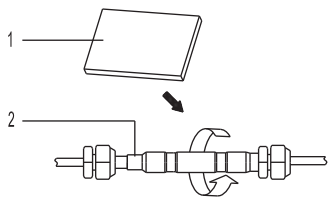
1 Throttle
2 Liquid pipe
3 Gas pipe

■ **Precautions**

- To ensure throttle efficiency, mount the throttle as horizontally as possible.



- Wrap the supplied anti-shock rubber on the outside of the throttle to limit noise.



1 Anti-shock rubber
2 Throttle

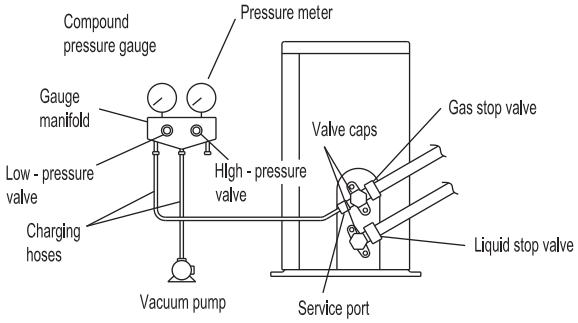
3.4 Purging air and checking gas leakage

- When piping work is completed, purge the air and check for gas leakage.

WARNING

- Do not mix any substance other than the specified refrigerant into the refrigeration cycle.
- When refrigerant gas leaks, ventilate the room as soon as possible.
- The specified refrigerant should always be recovered and should never be released directly into the environment.
- Use a vacuum pump for the specified refrigerant. Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.

- If using additional refrigerant, perform air purging from the refrigerant pipes and the indoor unit using a vacuum pump, then charge the additional refrigerant.
- Use a hexagonal wrench (4 mm/0.2 in) to operate the stop valve rod.
- All refrigerant pipe joints should be tightened with a torque wrench at the specified tightening torque.



1) Connect the projection side of the charging hose (which comes from the gauge manifold) to the gas stop valve's service port.
2) Fully open the gauge manifold's low-pressure valve (Lo) and completely close its high-pressure valve (Hi).
(The high-pressure valve requires no operation.)
3) Perform vacuum pumping and make sure that the compound pressure gauge reads -0.1 MPa (-76 cmHg).*1
4) Close the gauge manifold's low-pressure valve (Lo) and stop the vacuum pump.
(Maintain this state for a few minutes to make sure the compound pressure gauge pointer does not swing back.)*2
5) Remove the caps from the liquid and gas stop valves.
6) Turn the liquid stop valve's rod 90 degrees counterclockwise with a hexagonal wrench to open the valve. Close it after 5 seconds and check for gas leakage. Using soapy water, check for gas leakage from the indoor unit's flare and the outdoor unit's flare and valve rods. After the check is complete, wipe off all soapy water.
7) Disconnect the charging hose from the gas stop valve's service port, then fully open the liquid and gas stop valves. (Do not attempt to turn the valve rod beyond its stop.)
8) Tighten the valve and service port caps for the liquid and gas stop valves with a torque wrench at the specified torques.

*1. Pipe length vs. Vacuum pump run time

Pipe length	Up to 15 m (49.2 ft)	More than 15 m (49.2 ft)
Run time	Not less than 10 min	Not less than 15 min

*2. If the compound pressure gauge pointer swings back, the refrigerant may contain water content or a pipe joint may be loose. Check all pipe joints and retighten nuts as needed, then repeat steps 2 through 4.

3.5 Additional refrigerant charge

CAUTION

- Refrigerant should only be charged after the leak test and vacuum pumping are performed.
- Check the type of refrigerant to be used on the machine nameplate. Charging with an unsuitable refrigerant may cause explosions and accidents, so always ensure that the appropriate refrigerant is charged.
- Refrigerant containers must be opened slowly.

- The outdoor unit is factory charged with refrigerant. Calculate the added refrigerant necessary according to the diameter and length of the liquid pipe of the outdoor/indoor unit connection.

Pipe length and refrigerant amount:

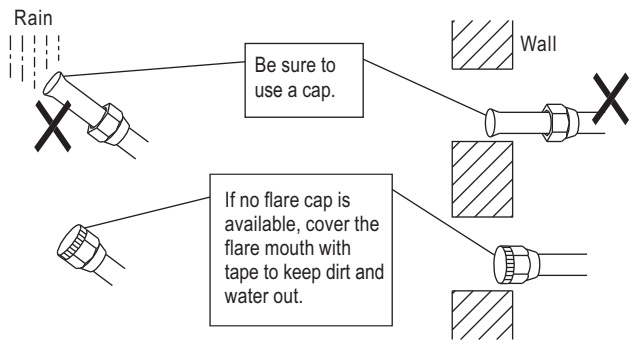
Connective pipe length	Air purging method	Additional amount of refrigerant to be charged
Less than 7.5 m	Use a vacuum pump	_____
More than 7.5 m	Use a vacuum pump	Liquid side: ϕ 6.35 mm (1/4 in) R410A: (Pipe length: 7.5(25))x15g/m(0.16oz/ft)
		Liquid side: ϕ 9.52 mm (3/8 in) R410A: (Pipe length: 7.5(25))x30g/m(0.32oz/ft)

- Be sure to add the proper amount of additional refrigerant. Failure to do so may result in reduced performance.

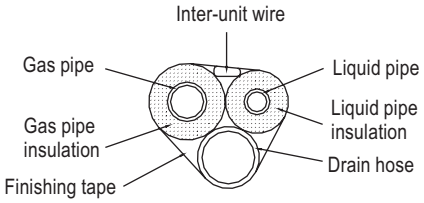
3.6 Refrigerant piping work

1) Caution on pipe handling

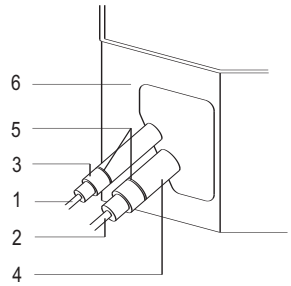
- Protect the open end of the pipe against dust and moisture.
- All pipe bends should be done as gently as possible with a pipe bender.



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



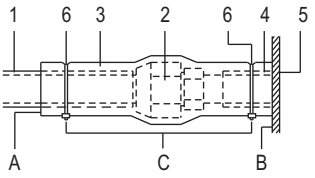
3) Insulate as shown in the figure below



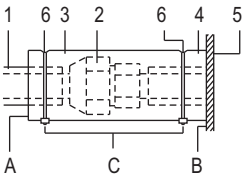
1 Liquid pipe
2 Gas pipe
3 Insulation for liquid pipe fitting
4 Insulation for gas pipe fitting
5 Clamps (use 2 clamps per insulation)
6 Indoor unit

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)

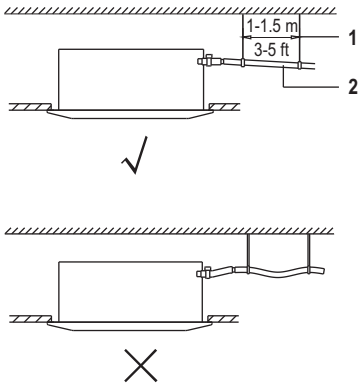
A Turn seams up
B Attach to the base
C Tighten the part other than the piping insulation material

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

4 CONNECTING THE DRAIN PIPE

4.1 Installation of drain piping

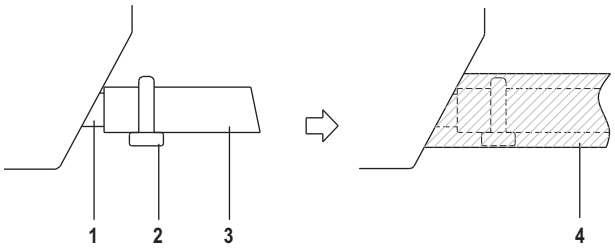
Install the drain piping as shown in the figure below and take measures against condensation. Improperly rigged piping could lead to leaks and, eventually, wet furniture and belongings.



1 Hanging bar
2 ⩾1/100 gradient

4.2 Install the drain pipes

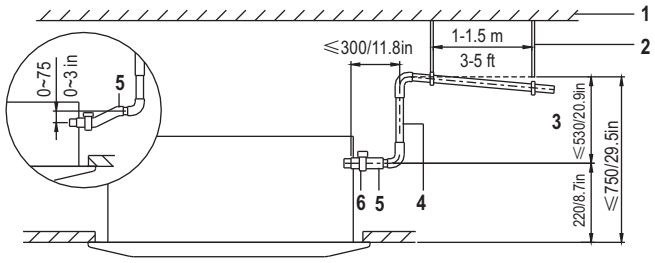
- Keep the piping as short as possible and slope it downward at a gradient of at least 1/100 so that air cannot stay trapped inside the pipe.
- Keep the pipe size equal to or greater than that of the connecting pipe (PVC pipe, nominal diameter 20 mm/0.8 in, outside diameter 25 mm/1 in).
- Push the drain 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

4.3 How to perform piping



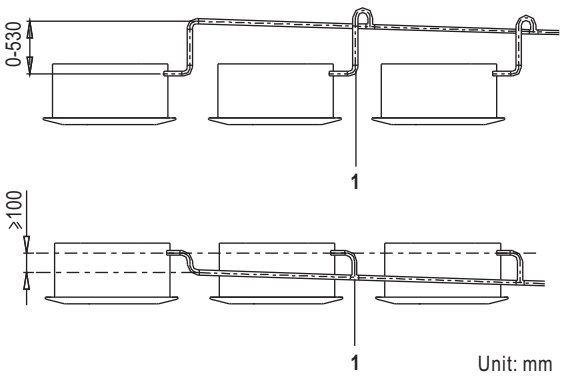
Unit: mm

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 of less 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 levelly or slightly tilted up (<–75 mm/3 in).
The incline of the drain hose should be 75 mm (3 in) or less so the drain socket does not have to withstand unnecessary force.
To ensure a downward slope of 1:100, install hanging bars every 1 m (3.3 ft) to 1.5 m (4.9 ft).
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

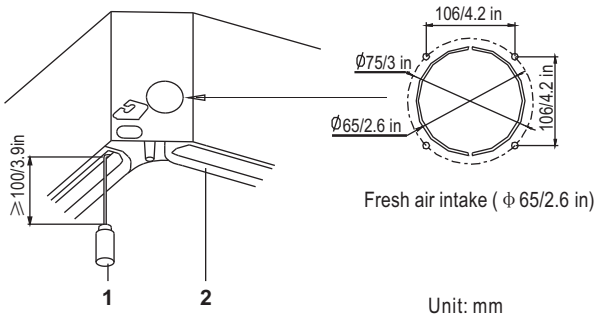
■ Drain piping connections
Do not connect the drain piping directly to sewage pipes that smell of ammonia. The ammonia in the sewage might enter the indoor unit through the drain pipes and corrode the heat exchanger.

■ Keep in mind that water collecting on the drain pipe will block the drain pipe.

4.4 Testing of drain piping

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

- Gradually add approximately 1 L of water through the air discharge outlet.
  See the figure below for how to add water.



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

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

5 ELECTRIC WIRING WORK

General instructions

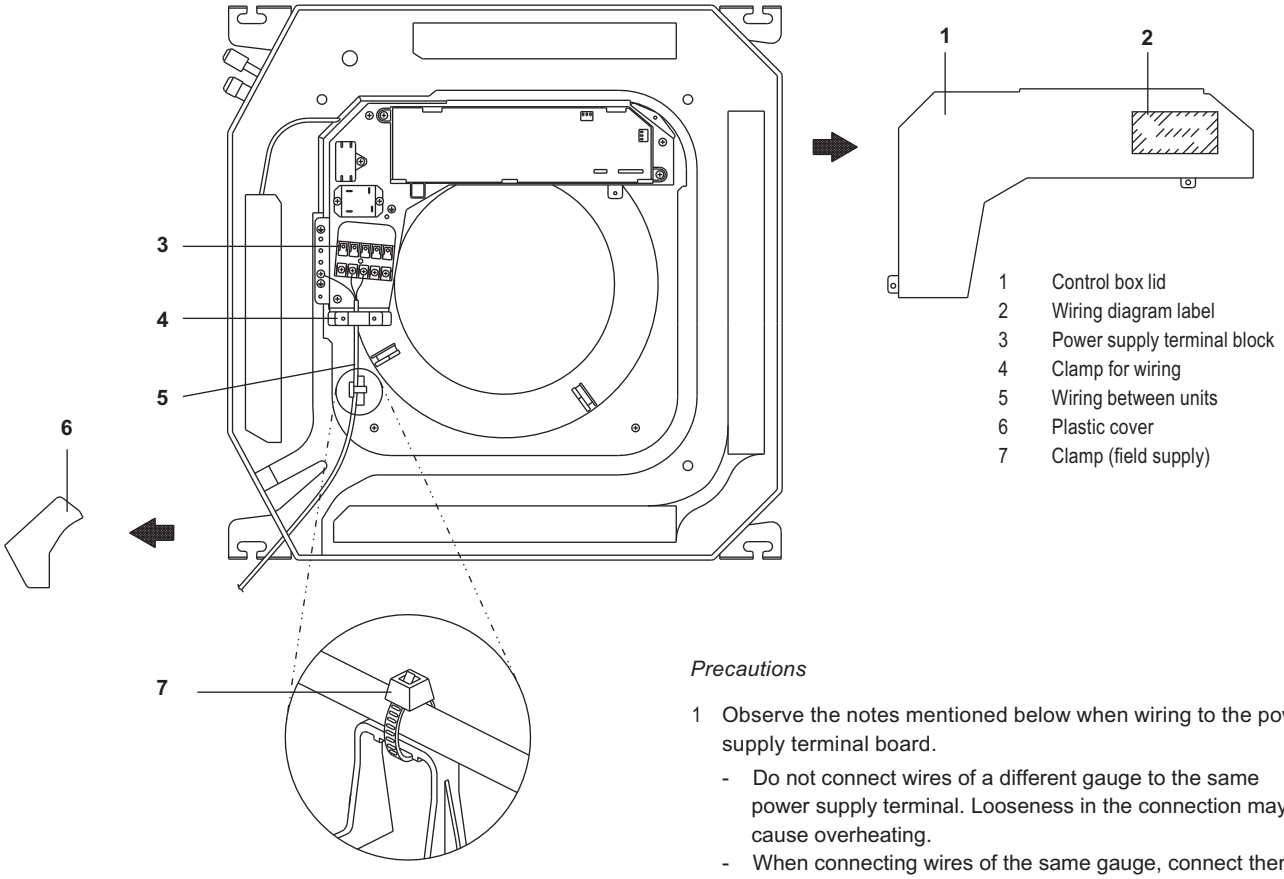
- All field wiring and components must be installed by a licensed electrician and must comply with relevant European and national regulations.
- Use copper wire only.
- Follow the "Wiring diagram" attached to the unit body to wire the outdoor unit, indoor units, and remote control.
- Install a circuit breaker capable of shutting down the power supply to the entire system.
- 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 electric potential in the ground during lightning storms.

The specification of power

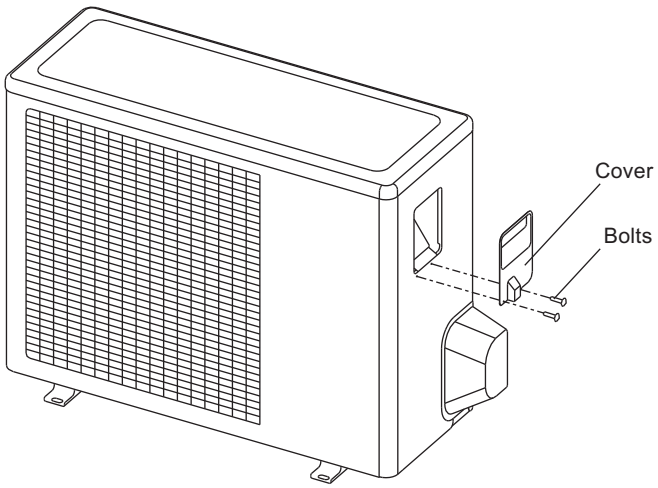
Power			
Model	Phase	Frequency and volt	Circuit breaker/Fuse (A)
9K-18K	1 Phase	208-240V	20/16

How to connect 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 remote control.
  Securely fix the wires with a field-supplied clamp.
- Attach the cover of the outdoor unit.

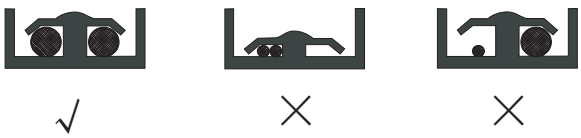


1 Control box lid
2 Wiring diagram label
3 Power supply terminal block
4 Clamp for wiring
5 Wiring between units
6 Plastic cover
7 Clamp (field supply)



Precautions

1 Observe the notes mentioned below when wiring to the power supply terminal board.
- Do not connect wires of a 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 following 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 N.m±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 supplied) to prevent small animals or dirt from entering the unit and causing short circuits in the control box.

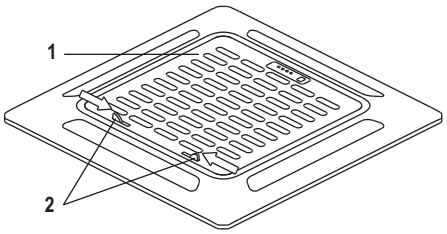
2 Do not connect wires of a different gauge to the same grounding terminal. Looseness in the connection may deteriorate the protection.

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

6 INSTALLATION OF THE DECORATION PANEL

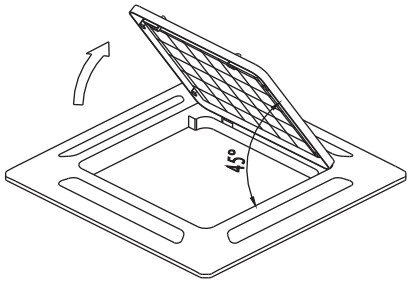
■ **Detach the intake grille**

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



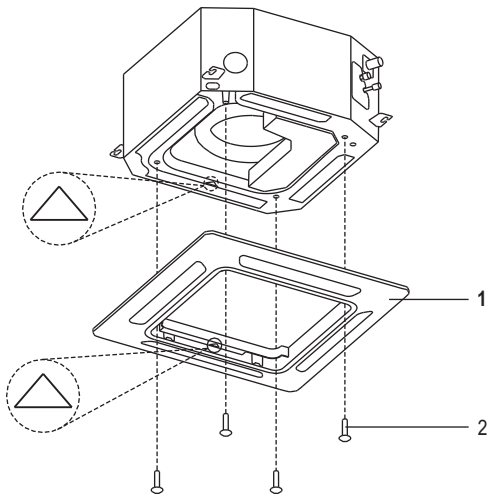
1 Intake grille
2 Grille hook

- Open the intake grille and remove.



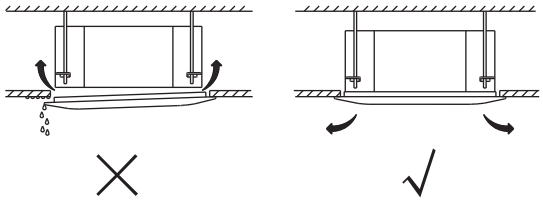
■ **Install the decoration panel**

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



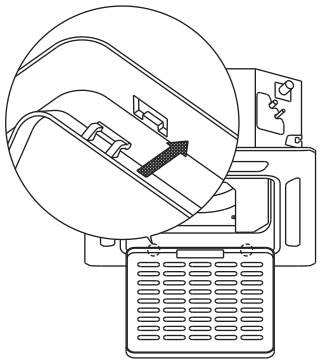
1 Decoration panel
2 Screws (M5) (supplied with the panel)

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

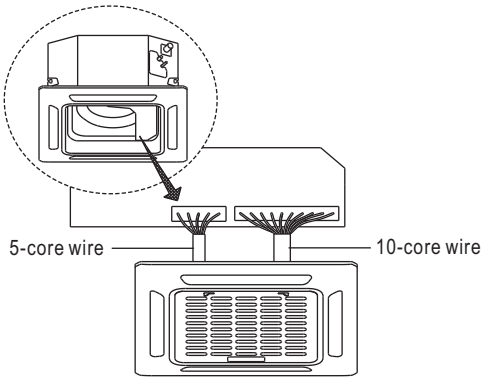


■ **Mount the intake grille**

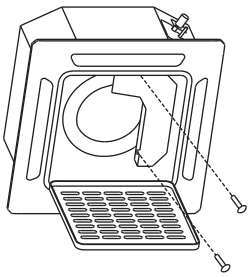
Ensure that the buckles at the back of the grille are properly seated in the groove of the panel.



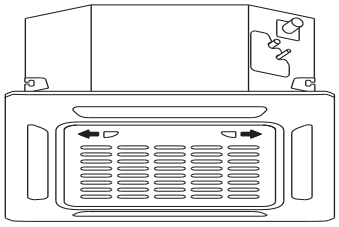
■ **Connect the 2 wires of the decoration panel to the mainboard of the unit**



■ **Fasten the control box lid with 2 screws**



■ **Close the intake grille and the 2 grille hooks**



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 3.
After finishing the construction of the refrigerant piping, drain piping, and electric wiring, conduct the test operation accordingly to protect the unit. *Test operation after installing the 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 the unit to cooling operation with the remote control 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 "Troubleshooting" chapter in the user's manual.
   - ■ The indoor unit
     - The switch on the remote control works well
     - The buttons on the remote control work well
     - The air flow louver moves normally
     - The room temperature is adjusted well
     - The indicator lights normally
     - The temporary buttons work well
     - There is no vibration or abnormal noise during operation
     - The drainage flows smoothly
   - ■ The outdoor unit
     - There is no vibration or abnormal noise during operation
     - The generated wind, noise, or condensation caused by the air conditioner have not influenced your neighborhood
     - The refrigerant has not 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 being shut off.

The design and specifications are subject to change without prior notice for product improvement. Consult with the sales agency or manufacturer for details.