

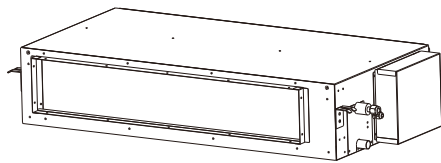
INSTALLATION AND MAINTENANCE MANUAL

HITACHI SPLIT AIR CONDITIONERS

Installation and Maintenance Manual

Models

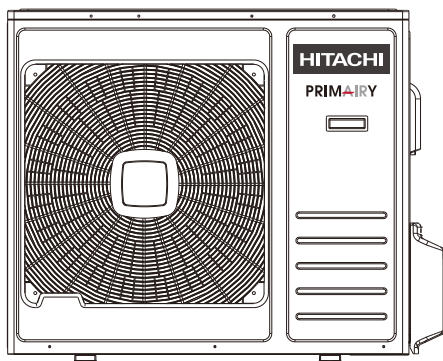
< Indoor Units >



Heat Pump Type
RPIL-1.0UNE1NH*
RPIL-1.5UNE1NH*
RPIL-2.0UNE1NH*
RPIM-3.0UNE1NH
RPIH-4.0UNE1NH
RPIH-5.0UNE1NH
RPIH-6.0UNE1NH
RPIH-6.5UNE1NH

Cooling Only Type
RPIL-1.0TNE1NH*
RPIL-1.5TNE1NH*
RPIL-2.0TNE1NH*
RPIM-3.0TNE1NH*
RPIH-4.0TNE1NH*
RPIH-5.0TNE1NH*
RPIH-6.0TNE1NH*
RPIH-6.5TNE1NH*

< Outdoor Units >



Heat Pump Type
RAS-1.0UNESNH1*
RAS-1.5UNESNH1*
RAS-2.0UNESNH1*
RAS-3.0UNESNH1
RAS-4.0UNESNH1
RAS-5.0UNESMH1
RAS-6.0UNESMH1
RAS-6.5UNESMH1

Cooling Only Type
RAS-1.0TNESNH1*
RAS-1.5TNESNH1*
RAS-2.0TNESNH1*
RAS-3.0TNESNH1*
RAS-4.0TNESNH1*
RAS-5.0TNESMH1*
RAS-6.0TNESMH1*
RAS-6.5TNESMH1*

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NOTE: ● *This air conditioner is designed for the following temperatures. Operate it within this range.*

Series	Mode	Outdoor operating temperature range	
		Maximum(°C)	Minimum(°C)
Heat Pump	Cooling Operation	48	-15
	Heating Operation	24	-15
Cooling Only	Cooling Operation	48	-15

● **Storage condition:** *Temperature -25~60°C
Humidity 30%~80%*

● **The numbers in the model represent the cooling capacity in HP. For example, RPIL-1.0UNE1NH or RAS-1.0UNESNH1 represent 1.0HP.**

Alert Symbols:

-  **DANGER** : The symbol refers to a hazard which can result in severe personal injury or death.
-  **WARNING** : The symbol refers to a hazard or an unsafe practice which may result in severe personal injury or death.
-  **CAUTION** : The symbol refers to a hazard or an unsafe practice which may result in personal injury, product or property damage.
- NOTE** : It refers to the remarks and instruction to the operation, maintenance, and service.

Caution Statements

- We recommend that this air-conditioner is installed properly by qualified personnel in accordance with the installation instructions provided with the unit.
- Before installation, check if the voltage of the power supply at installation site is the same as the voltage shown on the nameplate.

DANGER

- You must not carry on any alterations to this product, otherwise, it may cause water leakage, breakdown, short-circuit, electric shock, fire, and so on.
- Piping, welding and other such works should be carried out far away from the flammable explosive material vessels, including the air-conditioner refrigerant, to guarantee the safety of the site.
- To protect the air-conditioner from heavy corrosion, avoid installing the outdoor unit where sea water can splash directly onto it or in sulphurous air near a spa. Do not install the air-conditioner where excessively high heat-generating objects are placed.

WARNING

- If the supply cord is damaged, it must be replaced by the factory or its service department in case of danger.
- The place where this product is installed must have the reliable electrical grounding facility and protection. Please do not connect the grounding of this product to various kinds of air-feeding ducts, drain piping, lightning protection facility as well as other piping lines to avoid receiving an electric shock and damages caused by other factors.
- Wiring must be done by a qualified electrician. All the wiring must comply with the local electrical codes.
- Consider the capacity of the electric current of your electrical meter and socket before installation.
- The power wire where this product is installed is supposed to have the independent leakage protective device and the electric current over-load protection device which are provided for this product.
- This appliance is not intended for use by persons lack experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- Means for disconnection, which can provide full disconnection in all poles, must be incorporated in the fixed wiring in accordance with the wiring rules.

- **Read this manual carefully before using this air-conditioner. If you still have any difficulties or problems, consult your dealer for help.**
- **The air-conditioner is designed to provide you with comfortable room conditions. Use this unit only for its intended purpose as described in this instruction manual.**

WARNING

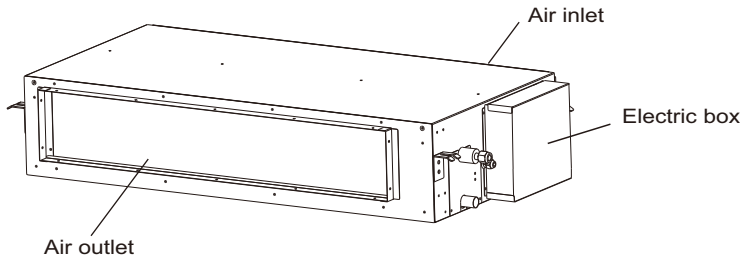
- Never use gasoline or other inflammable gas near the air-conditioner, which is very dangerous.
- When the air conditioner operation is abnormal, such as burnt smell, deformation, fire, smoke, and so on, it is forbidden to continue using the air conditioner, the main power switch of the air conditioner must be cut off immediately and the agent must be contacted.

CAUTION

- Do not turn the air-conditioner on and off from the main power switch. Use the ON/OFF operation button.
- Do not stick anything into the air inlet and air outlet of both the indoor and outdoor units. This is dangerous because the fan is rotating at a high speed.

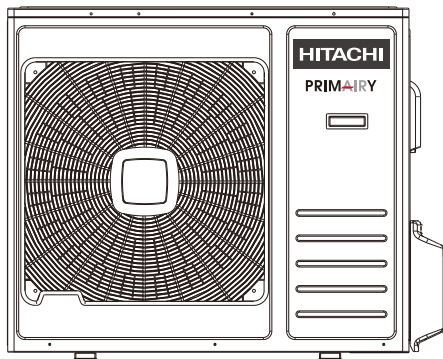
Composition of the Air-conditioner

Indoor Unit

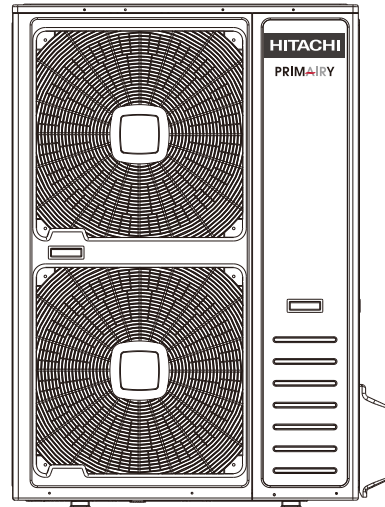


The conditioned air is blown out of the air-conditioner through this outlet.

Outdoor Unit



1.0/1.5/2.0/3.0/4.0/5.0HP



6.0/6.5HP

Remote Controller (Optional)

You can control the air-conditioner with the wired controller or remote controller.

It is used for power ON/OFF, setting the operation mode, temperature, fan speed and other functions.

There are different types of remote controllers which can be used.

Operation instruction will be further specified in remote controller's manual.

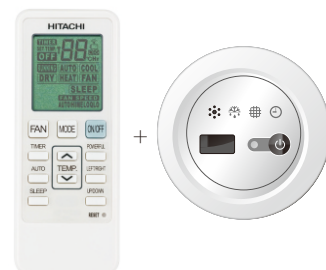
Please read it carefully before using this appliance and keep it for future reference.

Wired controller



HCWA21NEWH

Remote controller



HCRA31NEWH

Note: The figures are based on the external views of the standard model.

Consequently, the shape may differ for the air conditioner model you have selected.

Special Remarks

- 3 minutes protection after compressor stop
To protect compressor, it will be continue to be off for at least 3 minutes once it has stopped.
- 5 minutes protection
Compressor must run for at least 5 minutes once operational. In the 5 minutes, compressor will not stop even the room temperature reaches the setting temperature point unless you use remote controller to turn off the unit (all indoor unit can be turned off by user).
- Cooling operation
The fan of the indoor unit will never stop running in cooling operation. It continues to operate even if the compressor stops working.
- Heating operation
Heating capacity depends on external factors like outdoor unit temperature. Heating capacity might decrease if outdoor ambient temperature is too low.
- Anti-freezing function during cooling
When the temperature of the air from the indoor outlet is too low, the unit will run for some time under the fan mode, to avoid frost or ice forming on the indoor heat exchanger.
- Cold air prevention
In several minutes after the heating mode is started, the fan of the indoor unit will not run until the heat exchanger of the indoor unit reaches a certain temperature to prevent cold draft.
- Defrosting
When the outdoor temperature is too low, frost or ice may form on the outdoor heat exchanger, reducing heating performance. When this happens, a defrosting system of the air conditioner will operate. At the same time the fan in the indoor unit stops (or runs at a very low speed in some cases), to prevent cold draft. After defrosting is over, the heating operation and fan speed restart.
- Blowing out the residual heating air
When stopping the air conditioner in normal operation, the fan motor will run with low speed for a while to blow out the residual heating air.
- Auto re-start from of Power Break
When the power supply is recovered after power break, all presets are still effective and the air-conditioner will run according to the previous setting.

Trouble Shooting



1. If Trouble Persists

If the trouble persists even after checking the following, contact your dealer and inform them of the following items.

- (1) Unit Model Name
- (2) Content of Trouble

2. No Operation

Check whether the SET TEMP is set at the correct temperature.

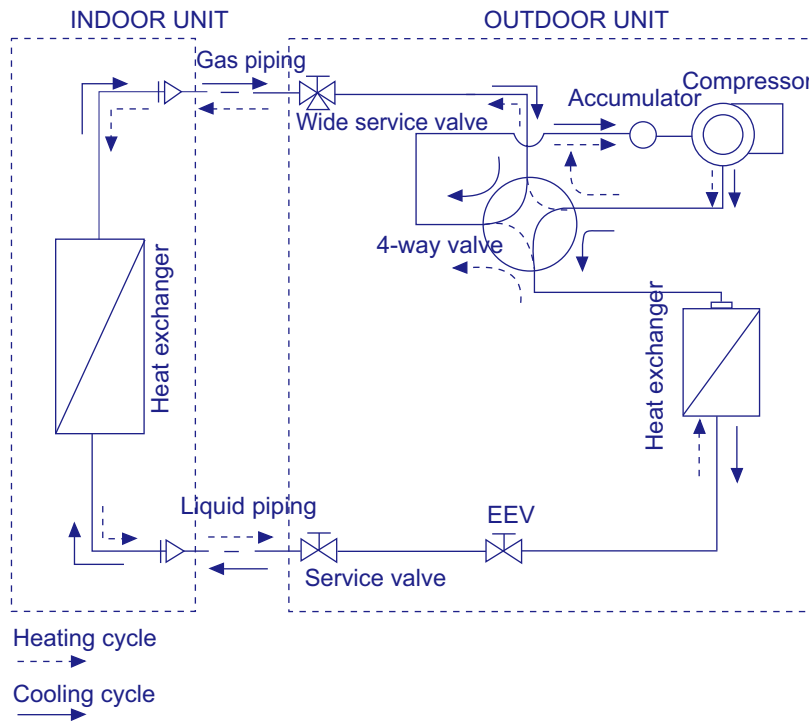
3. Not Cooling or Heating Properly

- Check for obstruction of air flow in indoor and outdoor units.
- Check if too many heating sources are located in the room.
- Check if the air filter is clogged with dust.
- Check if the doors or windows are open.
- Check if the temperature condition is not within the operation range.

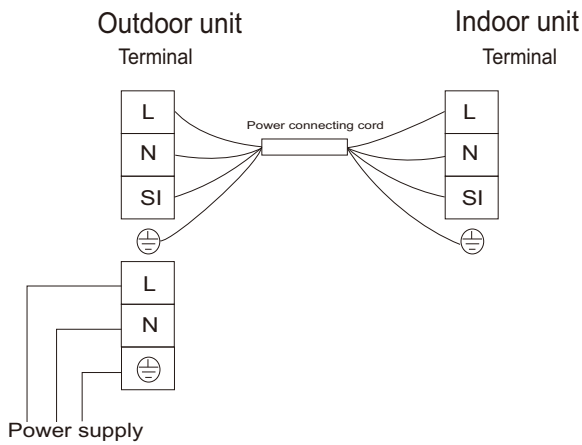
4. This is Not Abnormal

- Odour from indoor unit
Unpleasant odour diffuses from indoor unit after a long period of time. Clean the air filter and panels or allow a good ventilation.
- Sound from Deforming Parts
During system start or stop, a sound might be heard. However, this is due to thermal deformation of plastic parts. It is not abnormal.
- Steam from Outdoor Heat Exchanger
During defrosting operation, ice on the outdoor heat exchanger melts resulting in steam.
- Dew on Air Panel
When the cooling operation continues for a long period of time under high humidity conditions, dew may form on the air panel.
- Refrigerant Flow Sound
While the system is being started or stopped, sound from the refrigerant flow may be heard.

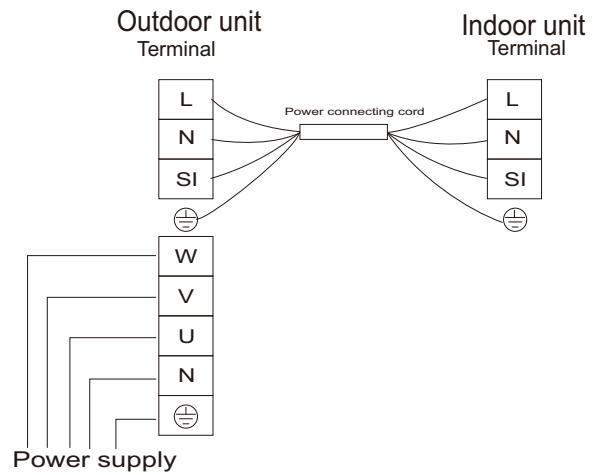
1. Refrigerant Flow Diagram



2. Electrical Wiring Diagram



1. 0/1.5/2.0/3.0/4.0HP



5.0/6.0/6.5HP

1. Safety Notice

WARNING

- Installation should be performed by a qualified personnel. (Improper installation may cause water leakage, electrical shock or fire.)
- Install the unit according to the instructions given in this manual. (Incomplete installation may cause water leakage, electrical shock or fire).
- Be sure to use the supplied or specified installation parts. (Use of other parts may cause the unit to get loosened, water leakage, electrical shock or fire).
- Install the air conditioner on a solid base that can support the unit weight. (An inadequate base or incomplete installation may cause injury if the unit falls off the base).
- Electrical work should be carried out in accordance with the installation manual and the local national electrical wiring rules or code of practice.
(Insufficient capacity or incomplete electrical work may cause electrical shock or fire).
- Be sure to use a dedicated power circuit. (Never use a power supply shared by another appliance).
- For wiring, use a cable long enough to cover the entire distance. Do not use an extension cord.
- Do not put other loads on the power supply, use a dedicated power circuit.
- Use the specified types of wires for electrical connections between the indoor and outdoor units. (Firmly clamp the interconnecting wires so their terminals receive no external stresses).
- Incomplete connections or clamping may cause terminal overheating or fire.
- After connecting all the wires be sure to fix the cables so that they do not put undue force on the electrical covers or panels. (Install covers over the wires, incomplete cover installation may cause terminal overheating, electrical shock or fire).
- When installing or relocating the system, be sure to keep the refrigerant circuit free from air (Air in the refrigerant circuit may cause an abnormal pressure rise or rupture, resulting in injury).
- If any refrigerant has leaked out during the installation work, ventilate the room.
- After all installation is completed, check to make sure that no refrigerant is leaking out. (The refrigerant produces a toxic gas if exposed to flames).
- When carrying out piping connection, take care not to let air substances other than the specified refrigerant get into refrigeration cycle. (Otherwise, it will cause lower performance, abnormal high pressure in the refrigeration cycle, explosion and injury).
- Make sure that the installation is properly grounded. Do not ground the unit to a utility pipe, lightning arrester, or telephone grounding. Incomplete grounding may cause electrical shock. (A high surge current from lightning or other sources may cause damage to the air conditioner).
- An earth leakage circuit breaker may be required depending on the site condition to prevent electrical shock.
- Disconnect the power supply before wiring, piping, or checking the unit.
- When moving the indoor unit and outdoor unit, please be careful, do not make the outdoor unit incline over 45 degree. Pay attention to the sharp edges of the air conditioner to avoid any injury.
- During remote controller installation, ensure that the length of the wire between the indoor unit and remote controller is within 40 meters.

CAUTION

- Do not install the air conditioner in a place where there is danger of exposure to inflammable gas leakage. (If the gas leaks and builds up around the unit, it may catch fire).
- Establish drain piping according to the instructions in this manual. (Inadequate piping may cause flooding).
- Tighten the flare nut according to the specifications with a torque wrench. (If the flare nut is tightened beyond specified torque, the flare nut may crack after a long time and cause refrigerant leakage).

2. The Tools and Instruments for Installation

Number	Tool	Number	Tool
1	Standard screwdriver	8	Knife or wire stripper
2	Vacuum pump	9	Leveller
3	Charge hose	10	Hammer
4	Pipe bender	11	Churn drill
5	Adjustable wrench	12	Tube expander
6	Pipe cutter	13	Inner hexagon spanner
7	Cross head screw-driver	14	Measuring tape

3. The Installation of the Indoor Unit

CAUTION

During installation, do not damage the insulation material on the surface of the indoor unit.

3.1 The Initial Check

CAUTION

- When moving the unit after unpacking, make sure to lift it by holding its lifting lugs. Do not exert any pressure on other parts, especially the refrigerant piping, drain piping and flange parts.
- Wear protective gears when installing the unit.

DC INVERTER UNITARY TYPE:

(unit: mm)

Model Capacity(HP)	h
1.0/1.5/2.0	190
3.0	270
4.0/5.0/6.0/6.5	350

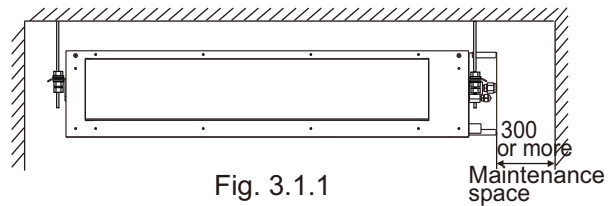


Fig. 3.1.1

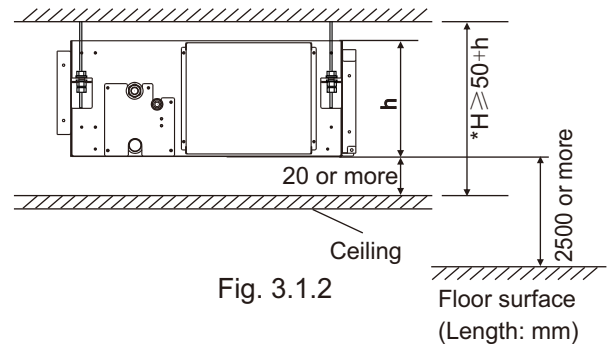


Fig. 3.1.2

- Optimum air distribution is ensured.
- The air path is not blocked.
- Condensation can drain properly.
- The ceiling is strong enough to bear the weight of the indoor unit.
- A false ceiling does not seem to be at an incline.
- Sufficient clearance for maintenance and servicing is ensured. (See Fig 3.1.1, Fig 3.1.2)
- Piping between the indoor and outdoor units is within the allowable limits. (refer to the installation of the outdoor unit)
- The indoor unit, outdoor unit, power supply wiring and transmission wiring must be kept at least 1 meter away from televisions and radio, which prevents 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 one-meter allowance is maintained).
- Do not install the indoor unit in a machinery shop or kitchen where vapor from oil or its mist flows to the indoor unit. The oil will deposit on the heat exchanger, thereby reducing the performance of the indoor unit, and may deform and in the worst case, break the plastic parts of the indoor unit.
- Use suspension bolts to install the unit, check whether or not the ceiling is strong enough to support the weight of the unit. If there is a risk that the ceiling is not strong enough, reinforce the ceiling before installing the unit. For bottom intake, replace the chamber lid and the intake-side flange in the procedure listed in below figures.

- (1) Remove the intake-side flange, then remove the chamber lid. Refer to Fig. 3.1.3 for the directions.
- (2) Reattach the removed chamber lid in the orientation shown in Fig. 3.1.4, reattach the removed intake-side flange in the orientation as shown in Fig. 3.1.4

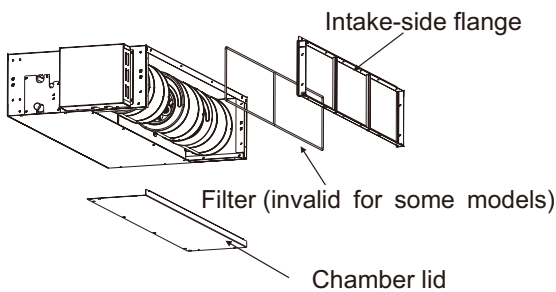


Fig. 3.1.3

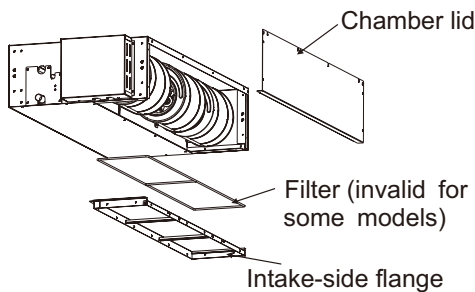


Fig. 3.1.4

3.2 Installation

3.2.1 Suspension bolts

- (1) Consider the pipe direction, wiring and maintenance carefully, and choose the proper direction and location for installation.
- (2) Install the suspension bolts as shown in Fig. 3.2.1 below.

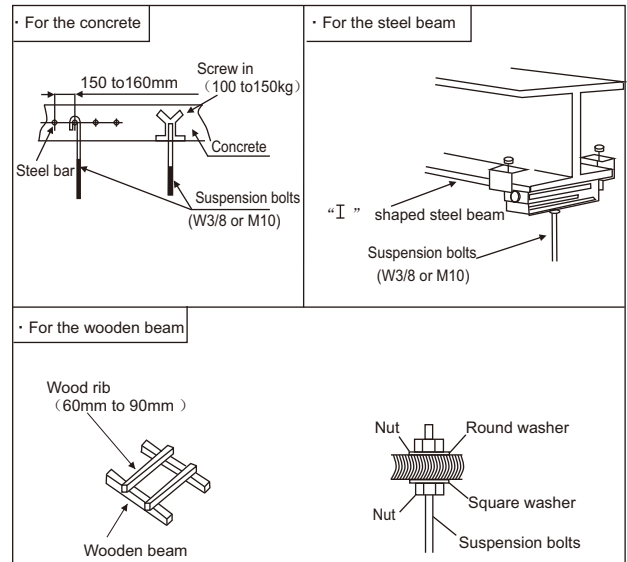
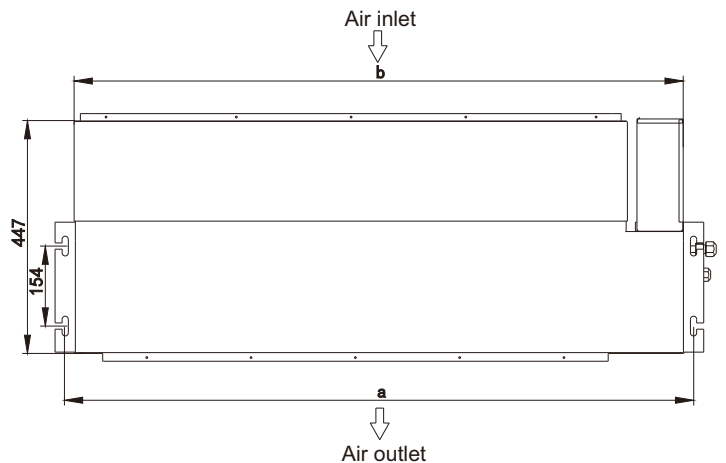


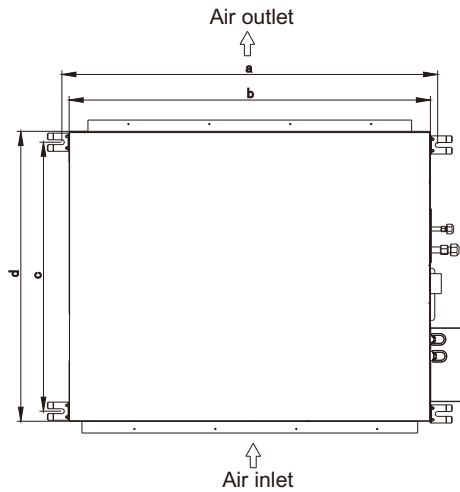
Fig. 3.2.1 Fixing the suspension bolts

3.2.2 The position of the suspension bolts and the pipes

- (1) Mark the positions of the suspension bolts, the positions of the refrigerant pipes and the drain pipes.
- (2) The dimensions are shown below.



Model Capacity (HP)	a	b
1.0/1.5	937	900
2.0	1207	1170



(Unit: mm)

Model Capacity (HP)	a	b	c	d
3.0	934	900	669	720
4.0/5.0/6.0/6.5	1334	1300	756	800

Fig. 3.3 Suspension bolts

3.2.3 Install the indoor unit.

The installation of the indoor unit is shown in Fig. 3.4.

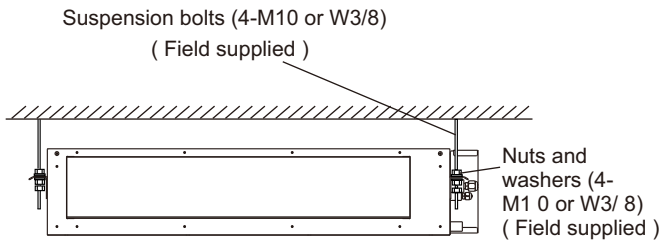


Fig. 3.4 The installation of the indoor unit

(1) How to fix the suspension bolts and the nuts
As shown in Fig. 3.5, the nuts are fixed by four bolts.

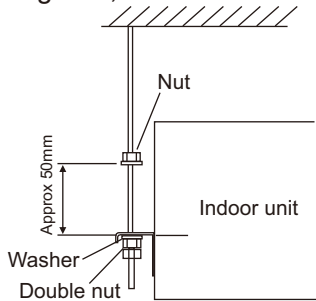


Fig. 3.5 Suspension bolts and nuts

(2) Install the indoor unit

- As shown in the following figure, place the left hanger bracket on the nuts and washers of the suspension bolts.
- Make sure that the left hanger bracket has been fixed on the nuts and washers securely, install the right hanger bracket suspension hook on the nuts and washers.
(When installing the indoor unit, you can slightly remove the suspension bolts.)

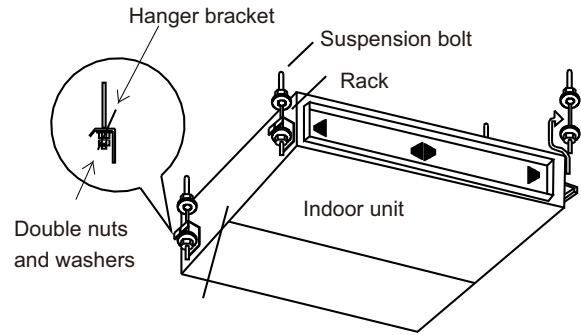


Fig. 3.6

3.2.4 The horizontal adjustment of the indoor unit

- (1) Make sure that the hanger bracket is fixed by the nuts and the washers.
- (2) Adjust the height of the unit.
- (3) Check if the unit is positioned horizontally.

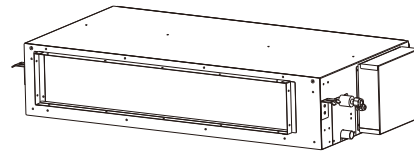


Fig. 3.7

- (4) After the adjustment, tighten the nuts and wear the thread locker on the suspension to prevent the nuts from loosening.

▲ CAUTION

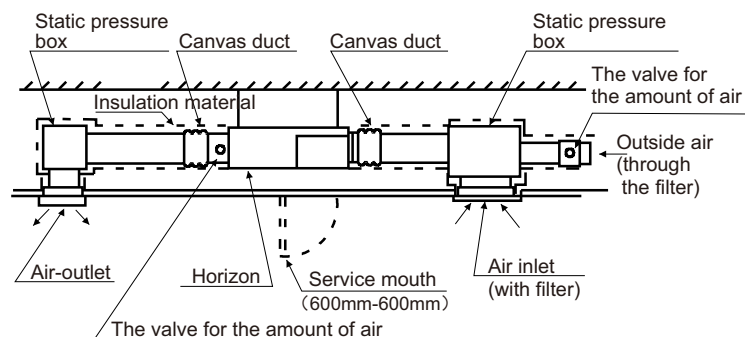
- (1) During the installation, please cover the unit with the plastic cloth to keep it clean.
- (2) Make sure that the unit is installed level by using a level or a plastic tube filled with water in instead of a level, adjust the top surface of the unit to the surface of the water at both ends of the plastic tube and adjust the unit horizontally. (one thing to watch out for in particular is if it is installed so that the slope is not in the direction of the drain piping, as this might cause leaking.)

3.2.5 Installing the duct

▲ CAUTION

- Make sure the external static pressure of the unit is within the range.
- Connect the duct and intake-side flange.
- Connect the duct and outlet-side flange.
- The connection of indoor unit and air duct must be well sealed and kept warm with insulation material.

<Example>



4. Refrigerant Piping

⚠ DANGER

Use the refrigerant according to outdoor nameplate. When carrying on the leakage check and test, do not mix in the oxygen, the acetylene and flammable and the reactive gas, these gases are quite dangerous, and may possibly cause explosion. It is suggested that the compressed air, the nitrogen or the refrigerant is used to perform these experiments.

4.1 The Pipe Material

- (1) Prepare the copper pipe on the spot.
- (2) Choose dustless, non-humid, clean copper pipe. Before installing the pipe, use nitrogen or dry air to blow away the tube dust and impurity.
- (3) Choose the copper pipe according to Fig. 4.2.

4.2 Piping Connection

- (1) The connection positions of the pipe are shown in Fig. 4.1 and Fig. 4.2.

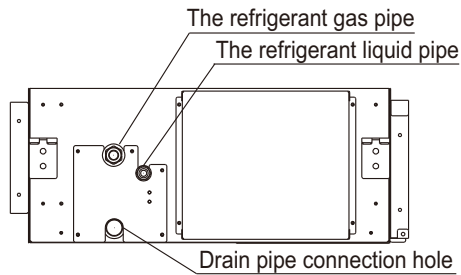


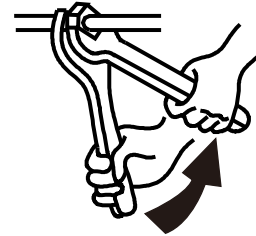
Fig. 4.1 The connection positions of the tube

(Unit: mm)

Model Capacity (HP)	Gas Pipe	Liquid Pipe
1.0/1.5	φ 9.52	φ 6.35
2.0	φ 12.7	φ 6.35
3.0	φ 15.88	φ 9.52
4.0/5.0/ 6.0/6.5	φ 19.05	φ 9.52

Fig. 4.2 The pipe diameter

- (2) As shown in Fig. 4.3, tighten the nuts with 2 spanners.



Tube size	Torque (N.m)
φ 6.35mm	20
φ 9.52mm	40
φ 12.7mm	60
φ 15.88mm	80
φ 19.05mm	100

Fig. 4.3 Tightening torque for the nut

- (3) After finishing connecting the refrigerant pipes, keep it warm with the insulation material.

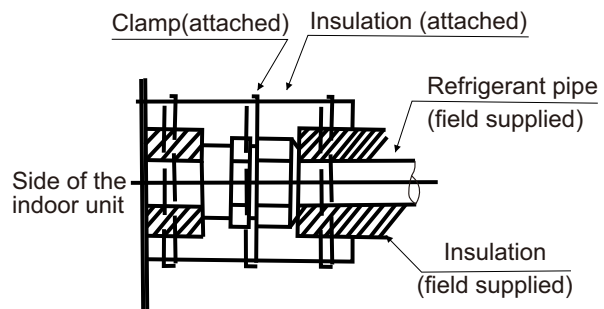
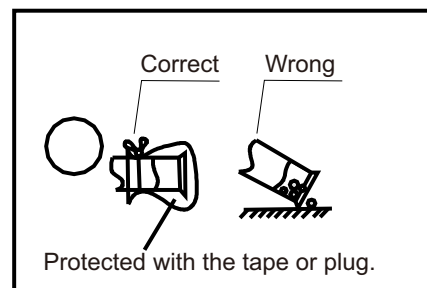


Fig. 4.4 Piping insulation procedure

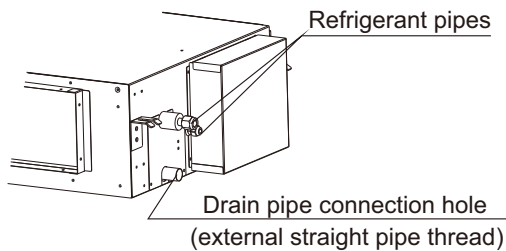
⚠ CAUTION

- The pipe goes through the hole with the seal.
- Do not place the pipes directly on the floor.

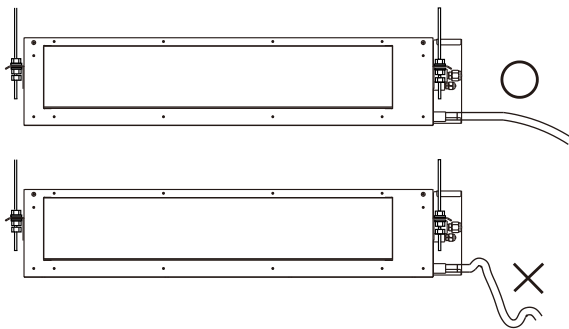


5. Drain Piping

- Install the drain piping

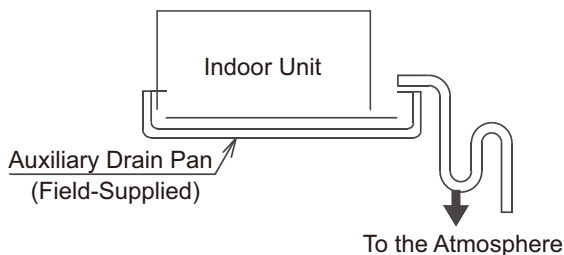


- Make sure the drain works properly.
- Prepare polyvinyl chloride pipe with a 32mm outer diameter.
- The diameter of drain pipe connection hole should be same as that of the drain pipe.
- Keep the drain pipe short and sloping downwards at a gradient of at least 1/100 to prevent air bubbles.



NOTE

When the relative humidity of inlet or ambient air exceeds 80%, apply an (field-supplied) auxiliary drain pan beneath the indoor unit as shown below.

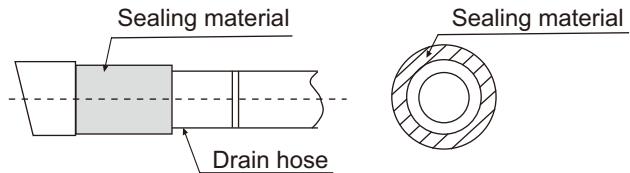


CAUTION

Water accumulating in the drain piping can cause the drain to clog.

- To keep the drain pipe from sagging, space hanging wires every 1 to 1.5 m.
- Use the drain hose and the clamp. Insert the drain hose fully into the drain socket and firmly tighten the drain hose and insulation material with the clamp.
- The two areas below should be insulated because condensation may happen causing water leakage.

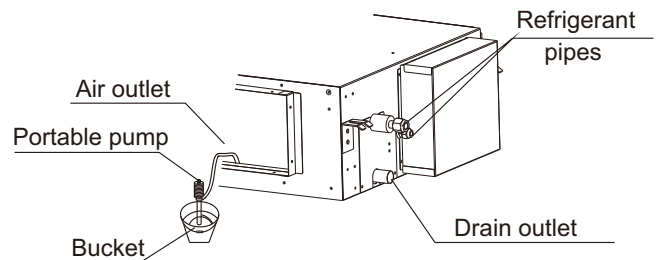
- Drain pipes passing indoors
- Drain sockets.
- Referring the figure below, insulate the drain socket and drain hose using the included large sealing pad.



CAUTION

Drain piping connections

- Do not connect the drain pipes directly to sewage pipes to avoid ammonia odour. The ammonia in the sewage might enter the indoor unit through the drain pipes and corrode the heat exchanger.
- Do not twist or bend the drain hose, doing so applies excessive force applied on it and may also cause leakage.
- After piping work is finished, check if drainage flows smoothly.
- Gradually pour approximately 1000 cc of water from the outlet hole into the drain pan to check drainage flow.
- Check the drainage as shown below:



6. Electrical Wiring

6.1 General Check

CAUTION

- When clamping the wiring, use the included clamping material as shown in the Fig.6.1 to prevent external pressure being exerted on the wiring connections and clamp firmly.
- While performing wiring work, make sure the wiring is proper and does not cause the control box lid to stick up, then close the cover firmly. When attaching the control lid, make sure you do not pinch any wires.
- Outside the indoor unit and outdoor unit, separate the weak wiring (remote controller and transmission wiring) and strong wiring (ground and power supply wiring) at least 50 mm so that they do not pass through the same place together. Proximity may cause electrical interference malfunction and breakage.

WARNING

- If the fuses burn up, please call the authorized service dealer. Please do not replace it by yourself, as it may result in accident or electric shock.
- (1) As shown in Fig. 6.1, remove the screws on the control box.
 - (2) Connect the power cord and ground wire to the main terminal.
 - (3) Connect the remote control wire to the subsidiary terminal box.
 - (4) Connect the power supply of the indoor and outdoor units to the main terminal.
 - (5) Tie the wire in the control box with the clamp tightly.
 - (6) After completing the wiring, seal the wiring hole with the sealing material (with the lid) to prevent the condensation and insects entering the control box.

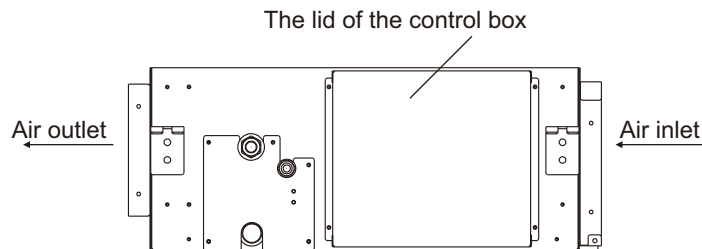


Fig.6.1 Remove the screws on the control box

6.2 Change of Static Pressure

The external static pressure of the indoor unit can be chosen.

6.2.1 For AC MOTOR Type:

You can change the static pressure by changing the fan motor terminal referring to the following Fig 6. 2. 1.

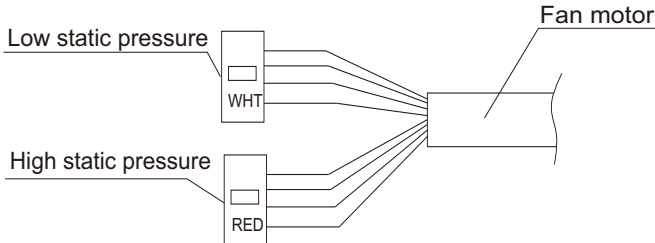


Fig.6.2.1

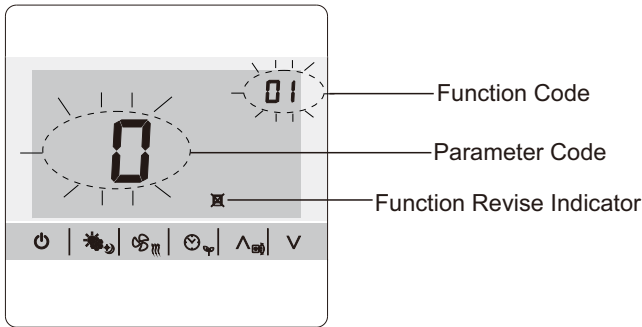
Model	Low static pressure	High static pressure
2.0HP	10Pa*	30Pa

Note: Default factory setting is low static pressure.

The noise under high static pressure is higher than low static pressure.

6.2.2 For DC MOTOR Type :

The static pressure can be freely adjusted by using specific wired remote controller.



HCWA21NEWH

Model Capacity (HP)	The range of static pressure	Function code set
1.0/1.5	0-50 Pa	1-50, more than 50 is 50 Pa, [default: 0 (0Pa)]
3.0	0-80 Pa	1-80, more than 80 is 80 Pa, [default: 0 (25Pa)]
4.0	0-120 Pa	1-120, more than 120 is 120 Pa, [default: 0 (47Pa)]
5.0/6.0/6.5	0-120 Pa	1-120, more than 120 is 120 Pa, [default: 0 (60Pa)]

Static Pressure Setting (HCWA21NEWH):

- 1 Press and hold both “”, “” & “” buttons for 5 seconds, symbol “” and parameter code starts blinking at the same time.
- 2 Press “/ ” button to adjust parameter number until “17” is displayed, and press “” button to enter system parameter adaption state, symbol “” stops blinking.
- 3 Select desired parameter code 10 by pressing “/ ” button, and press “” button to confirm.
- 4 Select desired function code to rewrite the parameter values by pressing “/ ” button, and press “” button to confirm.
- 5 Press “” button to quit.

If you still have any trouble, please contact local service center of our company for further information.

7. The Installation of the Outdoor Unit

7.1 Installation Sites

Avoid

- Direct sunlight
- Thick Oil fog
- Container With Flammable materials
- Near Heat Source/ventilation fan
- Aisle Or sideway
- Wet Or Uneven place

You should

- Place it in cool temperature.
- Place it in an area with good ventilation.
- Have required space for air inlet, outlet and maintenance. (Fig 7.1)
- Make a strong base (10X40cm² board made of concrete or similar). The appliance should be placed not less than 10 cm high to avoid being wet or corroded. Otherwise, it may cause damage to the appliance or reduce its life time. (Fig 7.2)
- Fix the base with hook bolts to reduce vibration and noise.

If the total piping length is between 5m and 50m (Max. length), an additional refrigerant must be added. It is not necessary to add compressor oil.

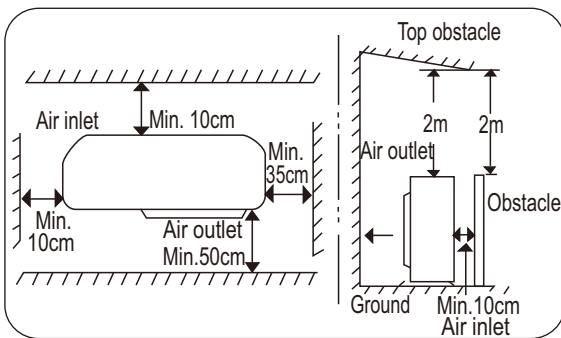


Fig.7.1

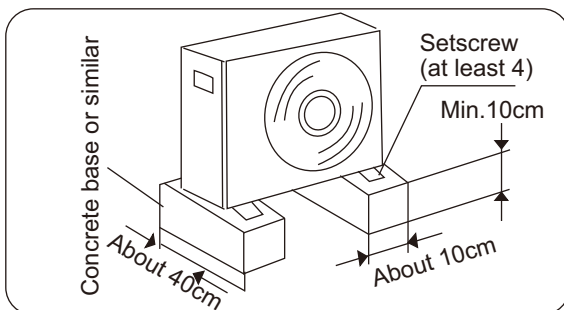


Fig.7.2

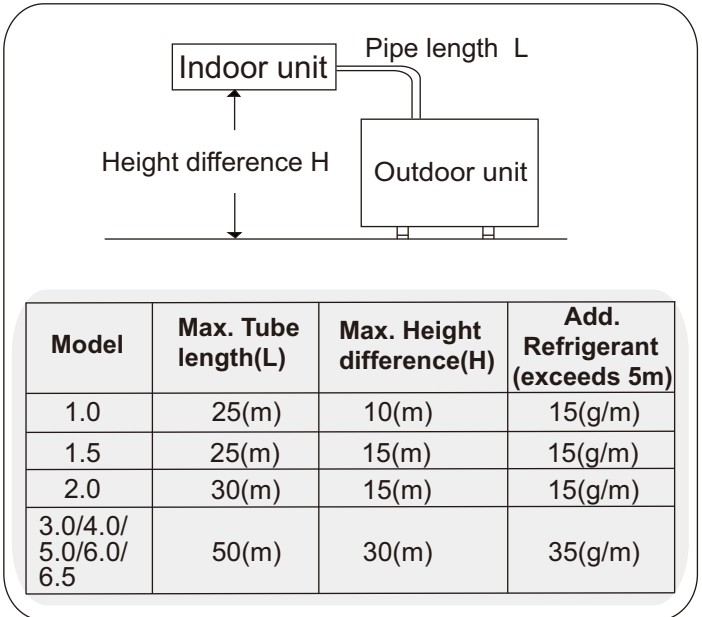


Fig.7.3

7.2 Installation of the Outdoor Unit

Firstly select the installation site and fix the outdoor unit. If it needs to be fixed onto the wall, make sure that the wall and the supporting rack is strong enough to hold the weight of the appliance.

Wiring instruction for outdoor unit

- Release the set screws of the electric cover, remove the electric cover (if the valve cover is there either, please release it).
- Connect the indoor unit wiring to the outdoor unit panel according to the electric wiring diagrams.
- Be sure to make each wire allowing 10cm longer than the required length for wiring.
- Ground the unit following local electrical regulations.
- Check the wiring with the wiring diagrams and make sure it is well connected. Fix the wiring with clips and reinstall the electric cover.

- Fix the unit with wire ropes to prevent overturning in case a seasonal strong wind blows against the unit .

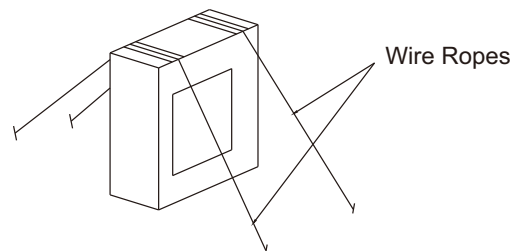


Fig.7.4

8. Refrigerant Piping

8.1 Flaring with Pipe Expander

Note: A good flare will have the following characteristics:

- Inside surface is glossy and smooth.
- Edge is smooth.
- Tapered sides are of uniform length.

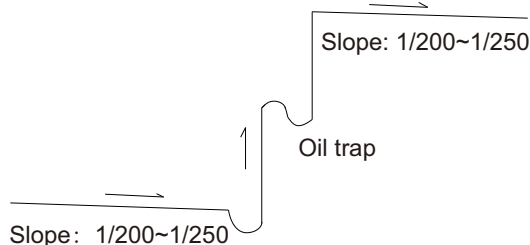
- Remove the burrs at the end of the copper pipe with a pipe reamer or file. When reaming, hold the pipe bend downwards and be sure that no copper scraps fall into the pipe. This process is important and should be done carefully to make a good flare. (Fig 8.1, 8.2)
- Remove the flare nut from the unit and be sure to mount it on the copper pipe.
- Make a flare at the end of copper pipe with a flaring tool. (Fig 8.3)

8.2 Connecting Piping between Indoor and Outdoor Units

- Be sure to apply a sealing cap or water-proof tape to prevent dust or water from getting into the pipes before they are used.
- Be sure to apply refrigerant lubricant on the surfaces of the flare and union before connecting them together to reduce gas leak effectively. (Fig 8.4)
- For proper connection, align the union pipe and flare pipe straight with each other, then tighten the flare nut lightly to obtain a smooth match. (Fig 8.5)
- Tighten the set screw with torque wrench to prevent leak of refrigerant. Carefully test for leakage before starting the appliance.

Oil trap

When the indoor unit is lower than outdoor unit and height is larger than 5m, install an oil trap every 5m (height difference) on suction piping.



- To avoid storing too much oil in the oil trap, the oil trap should be as short as possible.
- The horizontal piping should be slope down along the refrigerant flow direction, to bring the oil back to compressor, the slope is about 1/200 to 1/250.
- In order to ensure cooling/heating performance better, the refrigerant piping should be as short and straight as possible.

8.3 Heat Insulation of the Refrigerant Pipe

To avoid loss of heat and in prevention of the ground being wet by condensed water, all refrigerant pipes must be insulated with suitable insulating materials with minimum thickness of 6mm. (See Fig 8.6)

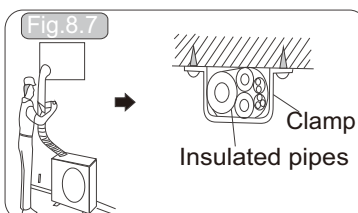
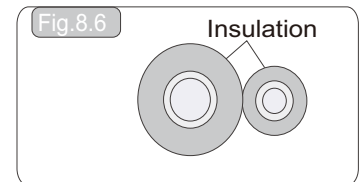
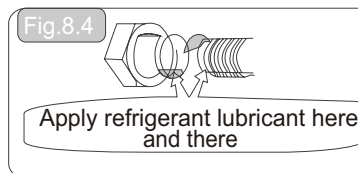
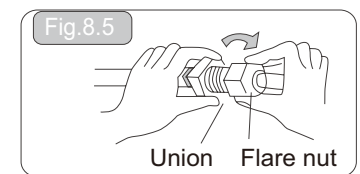
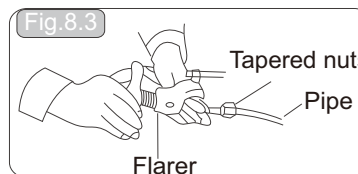
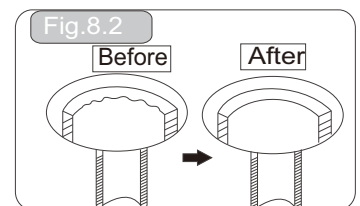
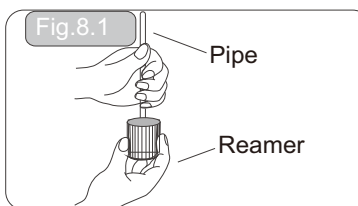
8.4 Sealing the Pipes

Note: Do not bind the armoring tape too tightly because this will decrease the heat insulation effect. Also ensure that the condensed drain hose splits away from bundle and drips smoothly from the unit and the piping.

- The two refrigerant pipes (and electrical wire if local codes permit) should be taped together with white armoring tape. The drain hose may also be included and taped together as a bundle with the tubing. Wrap the tape from the bottom of the outdoor unit to the top of the piping where it enters the wall. As you wrap the piping, overlap half of each previous tape. (See Figure 8.7)
- Clamp the piping bundle to the wall, using one clamp approx. every 120cm.

8.5 Finishing the Installation

After completion of wrapping and insulation, seal the hole on the wall with suitable seal against wind and rain.



9. Vacuuming and Test Run

Air and moisture remaining in the refrigerant system have undesirable effects.

Therefore, they must be removed completely with the following steps.

9.1 Vacuuming with a Vacuum Pump (See Fig 9.1, Fig 9.2)

- (1) Check that each pipe (both narrow and wide pipes between the indoor and outdoor units) have been properly connected and all wiring for the test run has been completed. Note that both narrow and wide pipe valves on the outdoor unit are kept closed at this stage.
- (2) Using an adjustable wrench or box wrench, remove the bonnet from the service valve.
- (3) Connect a vacuum pump and service valve together tightly.
- (4) Turn on the vacuum pump with the pressure is lower than 15Pa (or 1.5×10^{-4} bar) for 5 minutes.
- (5) With the vacuum pump still running, disconnect pipe of vacuum pump from the service valve. Then stop the vacuum pump.
- (6) Replace the bonnet on the service valve and fasten it securely with an adjustable wrench or box wrench.
- (7) Using an adjustable wrench or box wrench, remove the bonnet of both narrow and wide valve.
- (8) With the hex wrench, turn the wide and narrow pipe valves stem counter clockwise to fully open the valves.
- (9) Replace the bonnets on the wide and narrow valves and fasten it securely with an adjustable wrench or box wrench.

9.2 Leak Test

- Leak test all joints and valves of the indoor unit and outdoor unit with liquid soap. Checking of the orifice cap should not be less than 30 seconds. Clean the liquid soap after the test to avoid color change or erosion of copper pipe.

9.3 Cleaning the Piping

- If the leak test turns out to be all right, preserve heat joints of the indoor unit.
- Straighten the connecting pipes and make them flush and fixed to the wall. Seal the space around the hole in the wall with gypsum through which the pipes come out.

9.4 Test Run

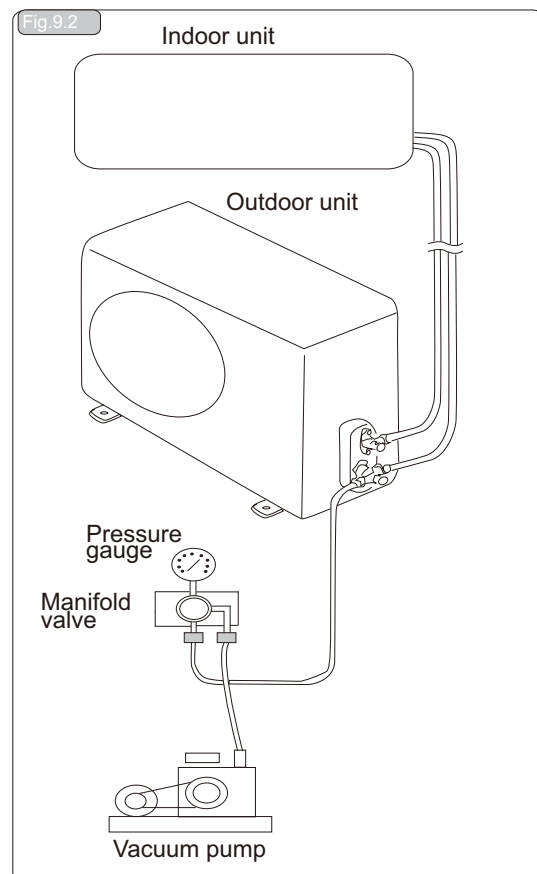
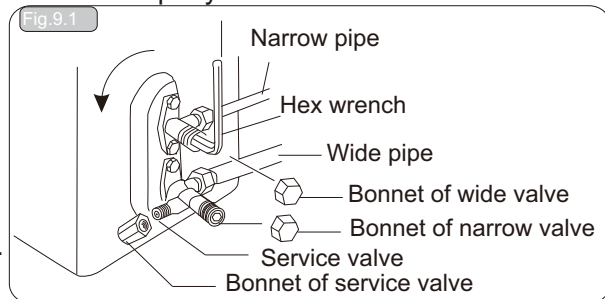
The trial should be carried out according to the installation and maintenance manual.

⚠ WARNING

- Only after all the check points have been checked the unit can be operated.
- (A) Check and make sure that the resistance of the terminal to ground is more than $2M\Omega$, otherwise, you cannot operate the unit before the electricity leakage point is found and repaired.
- (B) Check and make sure that the stop valve has been opened before operating the unit.

- Make sure that the power supply and the unit are fine before plugging into the power cord.
- Turn on the appliance and adjust it to cooling, dehumidifying and heating mode according to the room temperature. Check if the appliance can operate smoothly.

Installation of the appliance is generally finished after the above operations are done. If you still have any trouble, please contact local technical service center of our company for further information.



9.5 Electrical Installation



- Use an ELB (Electric Leakage Breaker). If not used, it may cause an electric shock or a fire.
- Do not operate the system until all the check points have been cleared.
 - (A) Check to ensure that the insulation resistance is more than $2M\Omega$, by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired.
 - (B) Check to ensure that the stop valves of the outdoor unit are fully opened and then start the system.
- Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 90°C .

Model Capacity(HP)	Power Supply	ELB		Power Source Cable Size	Transmitting Cable Size
		Nominal Current(A)	Nominal Sensitive Current (mA)	EN60335-1	EN60335-1
1.0	220~240~, 50Hz	20	30	$3 \times 1.5\text{mm}^2$	$4 \times 1.5\text{mm}^2$
1.5	220~240~, 50Hz	20	30	$3 \times 1.5\text{mm}^2$	$4 \times 1.5\text{mm}^2$
2.0	220~240~, 50Hz	20	30	$3 \times 2.5\text{mm}^2$	$4 \times 1.5\text{mm}^2$
3.0	220~240~, 50Hz	32	30	$3 \times 2.5\text{mm}^2$	$4 \times 1.5\text{mm}^2$
4.0	220~240~, 50Hz	40	30	$3 \times 4.0\text{mm}^2$	$4 \times 1.5\text{mm}^2$
5.0/6.0/6.5	380~415V 3N~, 50Hz	32	30	$5 \times 2.5\text{mm}^2$	$4 \times 1.5\text{mm}^2$

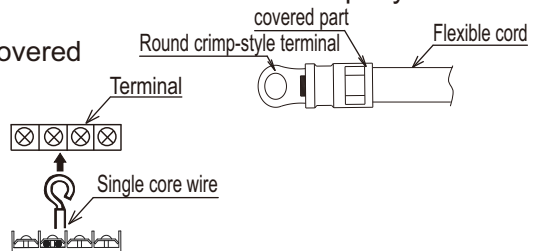
Max. Running Current(A):REFER TO NAMEPLATE

NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) The wire sizes marked in the table are selected at the maximum current of the unit according to the European Standard, EN60335-1. Use the wires which are not lighter than the ordinary polychloroprene sheathed flexible cord (code designation H07RN-F).

When connecting the terminal block using flexible cord, make sure to use the round crimp-style terminal for connection to the power supply terminal block.

Place the round crimp-style terminals on the wires up to the covered part and secure in place.



When connecting the terminal block using a single core wire, be sure to perform curing.

- 3) When transmitting cable length is more than 15 meters, a larger wire size should be selected.
- 4) Use a shielded cable for the transmitting circuit and connect it to ground.
- 5) If power cables are connected in series, add each unit maximum current and select wires below.

Selection According to EN60335-1

Current i(A)	Wire Size(mm ²)
$i \leq 6$	0.75
$6 < i \leq 10$	1
$10 < i \leq 16$	1.5
$16 < i \leq 25$	2.5
$25 < i \leq 32$	4
$32 < i \leq 40$	6
$40 < i \leq 63$	10
$63 < i$	*

* If current exceeds 63A, do not connect cables in series.



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The restriction note: * models so marked are not Eurovent certified.



Correct Disposal of this product

This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

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