

HITACHI Inspire the Next INVERTER SYSTEM MULTI TYP INSTALLATION MANUAL

INDOOR UNIT RAF-25RPA RAF-35RPA RAF-50RPA

- Carefully read through the procedures of proper installation before starting installation work.
 - The sales agent should inform customers regarding the correct operation of installation.
 - Explanation for outdoor unit is in the "How To Use" (Instruction Manual) that packed with outdoor unit.
- Tools Needed For Installation Work**
(Mark ⊕ is exclusive use tool for R410A) ⊕ ⊕ ⊕ Screw-driver • Measuring Tape • Knife • Saw • ø65mm Power Drill • Hexagonal Wrench Key (21.4mm) • Wrench (14, 17, 19, 22, 26, 27mm) ⊕ Gas leakage Detector • Pipe Cutter • Putty • Vinyl Tape • Pliers • Flare Tool • Vacuum Pump Adapter • Manifold Valve • Charge Hose • Vacuum Pump

SAFETY PRECAUTION

- Read the safety precautions carefully before operating the unit.
 - The contents of this section are vital to ensure safety. Please pay special attention to the following sign.
 - ⚠ **WARNING** Incorrect methods of installation may cause death or serious injury.
 - ⚠ **CAUTION** Improper installation may result in serious consequence.
 - ⚡ **Make sure to connect earth line.**
 - 🚫 **This sign in the figures indicates prohibition.**
- Be sure that the unit operates in proper condition after installation. Explain to customer the proper operation and maintenance of the unit as described in the user's guide. Ask customers to keep this installation manual together with the instruction manual.

WARNING

- Please request your sales agent or qualified technician to install your unit. Water leakage, short circuit or fire may occur if you do the installation work yourself.
- Please observe the installation stated in the installation manual during the process of installation. Improper installation may cause water leakage, electric shock and fire.
- Make sure that the units are mounted at locations which are able to provide full support to the weight of the units. If not, the units may collapse and impose danger.
- Observe the rules and regulations of the electrical installation and the methods described in the installation manual when dealing with the electrical work. Use cables which are approved official in your country. Be sure to use the specified circuit. A short circuit and fire may occur due to the use of low quality wire or improper work.
- Be sure to use the specified cables for connecting the indoor and outdoor units. Please ensure that the connections are tight after the conductors of the wire are inserted into the terminals to prevent the external force is being applied to the connection section of the terminal base. Improper insertion and loose contact may cause over-heating and fire.
- Please use the specified components for installation work. Otherwise, the unit may collapse or water leakage, electric shock, fire or stronger vibration may occur.
- Be sure to use the specified piping set for R410A. Otherwise, this may result in broken copper pipes or faults.
- When installing or transferring an air conditioner to another location, make sure that air other than the specified refrigerant (R410A) does not enter the refrigeration cycle. If other air should enter, the pressure level of the refrigeration cycle may increase abnormally which could result in a rupture and injury.
- Be sure to ventilate fully if a refrigerant gas leak while at work. If the refrigerant gas comes into contact with fire, a poisonous gas may occur.
- After completion of installation work, check to make sure that there is no refrigeration gas leakage. If the refrigerant gas leaks into the room, coming into contact with fire in the fan-driven heater, space heater, etc., a poisonous gas may occur.
- Unauthorized modifications to the air conditioner may be dangerous. If a breakdown occurs please call a qualified air conditioner technician or electrician. Improper repairs may result in water leakage, electric shock and fire, etc.
- Be sure to connect the earth line from the power supply wire to the outdoor unit and between the outdoor and indoor unit. Do not connect the earth line to the gas tube, water pipe, lighting rod or the earth line of the telephone unit. Improper earthing may cause electric shocks.
- When finishing the refrigerant collection (pumping down), stop the compressor and then remove the coolant pipe. If you remove the refrigerant pipe while the compressor is operating and the service valve is released, air is sucked and a pressure in the freezing cycle system will build up steeply, causing an explosion or injury.
- When installing the unit, be sure to install the refrigerant pipe before starting the compressor. If the refrigerant pipe is not installed and the compressor is operated with the service valve released, air is sucked and the pressure level of the refrigeration cycle may increase abnormally which could result in a rupture and injury.

CAUTION

- A circuit breaker must be installed in the house distribution box for the direct connected power supply cables to the outdoor unit. In case of other installations a main switch with a contact gap or more than 3mm has to be installed. Without a circuit breaker, the danger of electric shock exists.
- Do not install the unit near a location where there is flammable gas. The outdoor unit may catch fire if flammable gas leaks around it.
- Please ensure smooth flow of water when installing the drain hose. Improper installing may wet your furniture.
- An IEC approved power cord should be used. Power cord type: NYM.

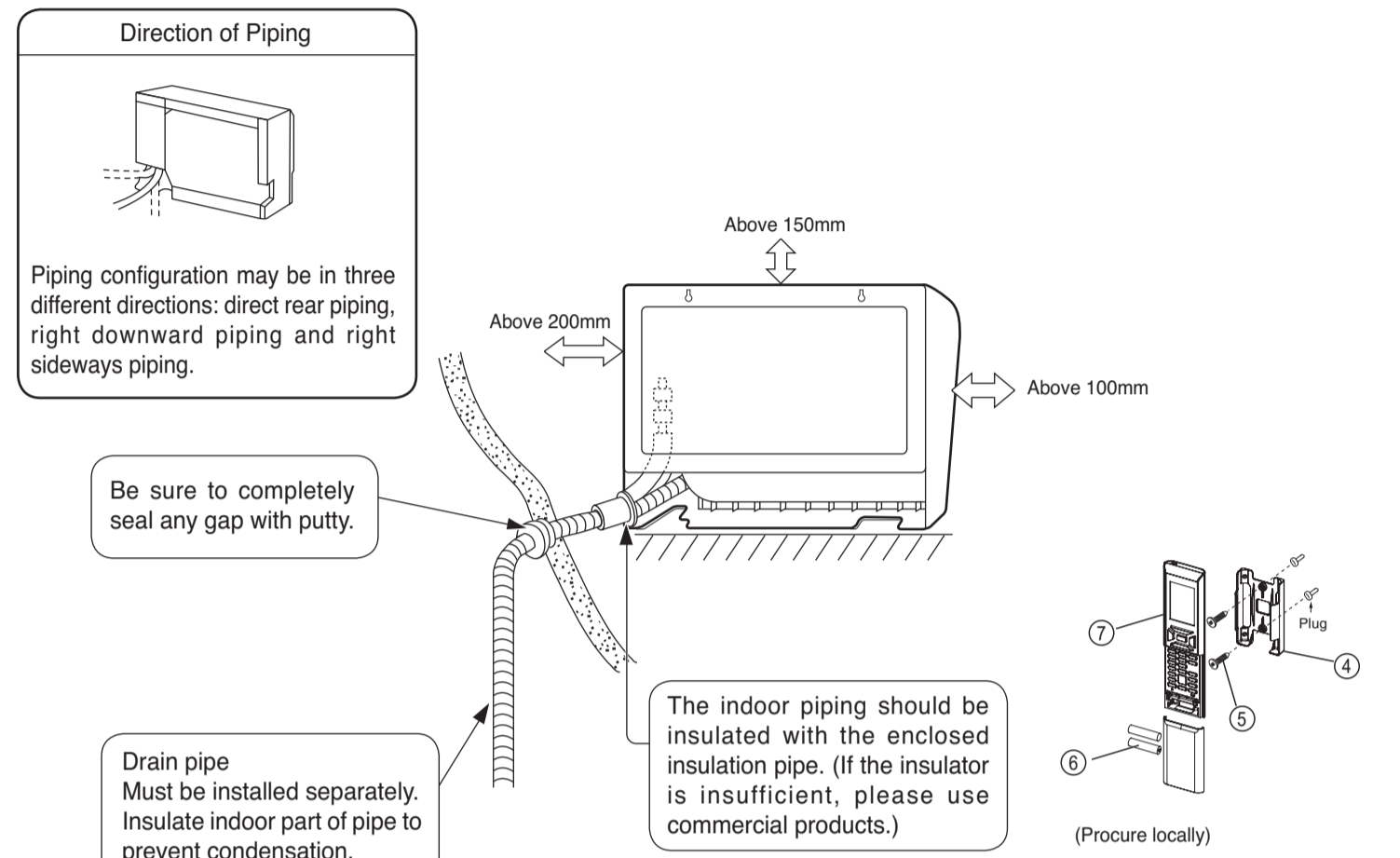
THE CHOICE OF MOUNTING SITE

(Please note the following matters and obtain permission from customer before installation.)

- ⚠ **WARNING**
 - The unit should be mounted at stable, non-vibratory location which can provide full support to the unit.
- ⚠ **CAUTION**
 - No nearby heat source and no obstruction near the air outlet is allowed.
 - The clearance distances from top, right and left are specified in figure below.
 - The location must be convenient for water drainage and pipe connection with the outdoor unit.
 - To avoid interference from noise, please place the unit and its remote controller at least 1m from the radio and television.
 - To avoid any error in signal transmission from the remote controller, please put the controller far away from high-frequency machines and high-power wireless systems.

INDOOR UNIT

[Indoor unit installation]

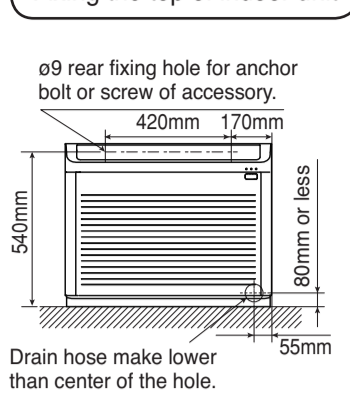


Names of Indoor Components

No.	Item	Qty	No.	Item	Qty
1	Flare Insulator	1	6	AAA size Battery	2
2	Binder	2	7	Remote Controller	1
3	Screw for Overturn Prevention (4.1 x 63)	2	8	Insulator	1
4	Holder for Remote Controller	1	9	Screw for Overturn Prevention (4.0 x 34)	2
5	Screw for holder of Remote Controller (3.1 x 16)	2	10	Insulator (20 x 30 x 300)	1
			11	Air cleansing filters	1

3. Fixing the indoor unit

Fixing the top of indoor unit



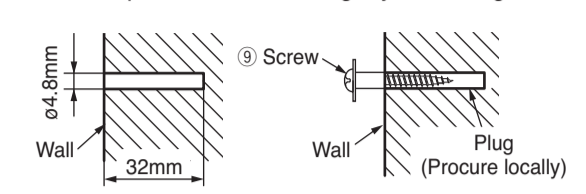
WARNING

- Even if there is space between the indoor unit and the back wall, make sure to securely attach the indoor unit to the wall, ceiling or floor using wire to prevent it from falling.

In the case of fixing by the anchor bolt
Bury the ø6 anchor bolt into the wall as shown in below. Lift up the indoor unit slightly and hang.

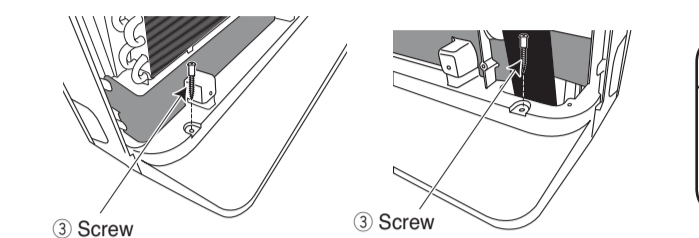
In the case of fixing by the screw of accessory

Bury the plug into the wall as shown in below to attach the screw ③. Lift up the indoor unit slightly and hang.



Fixing the base of indoor unit

- Fix the base of indoor unit on the floor with 4.1 x 63mm screws. (Right and left)

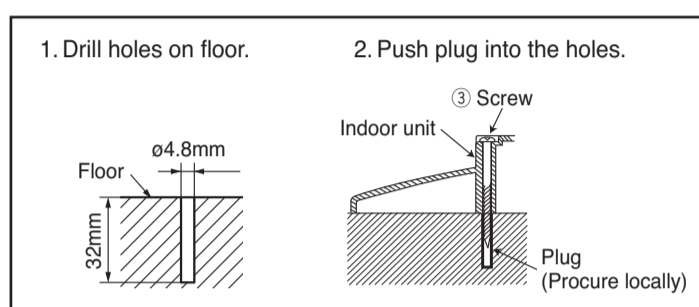


WARNING

Be sure to attach screw ③ to prevent the indoor unit from overturn.

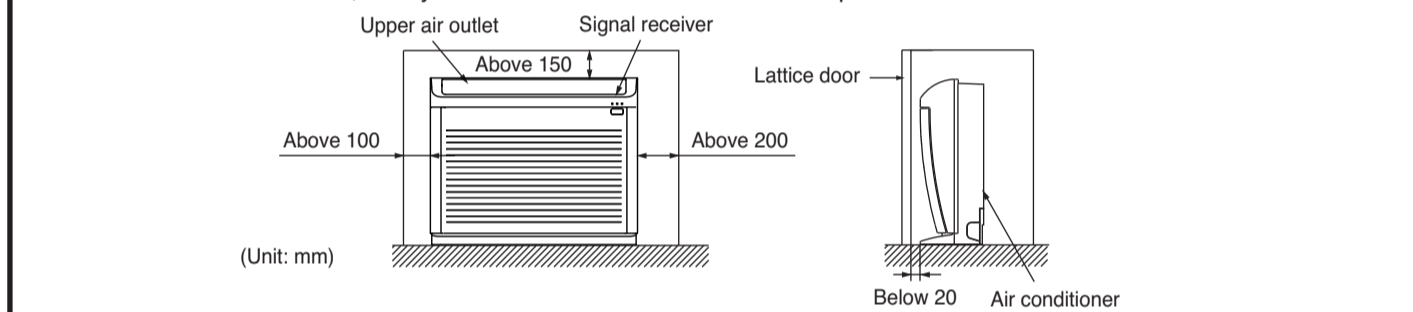
- When fixing the indoor unit above the ground, be sure to fix an L-angle at the bottom to support it.

- Drill holes.



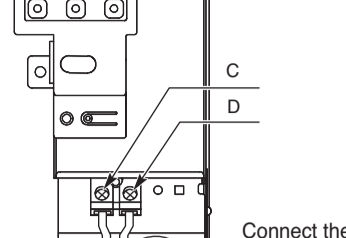
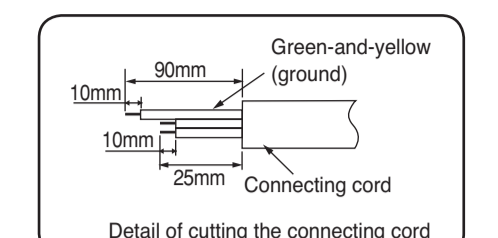
BUILT-IN INSTALLATION

- If air outlet is covered with the lattice door, room temperature may not be controlled properly. Therefore, air outlet must be open as much as possible.
- If air deflector of air outlet is adjusted too much upward, room temperature may not be controlled properly due to the heat inside the lattice door. Therefore, the deflector must be adjusted to nearly horizontal angle.
- If signal receiver is covered with the lattice door, signal receiving distance or range (angle) becomes smaller. Therefore, signal receiver must not be covered with the lattice door.
- Only the vertical lattice door may be used. Be sure to use a lattice door with an open area ratio of 75% or more. If another lattice door or one with an open area ratio of less than 75% is used, maximum performance may not be obtained.
- With a built-in installation, it may take more time to reach the set temperature after the unit is switched on.



4. Connection of the connecting cord

- Remove the cover of the electric box.
- Connect the connecting cords.
- Assemble the cover of electric box.



WARNING

- THIS APPLIANCE MUST BE EARTHED.

WARNING

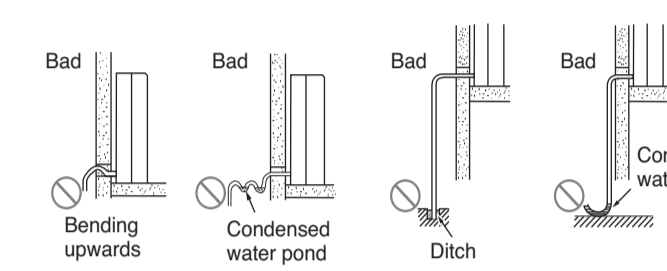
- Leave some space in the connecting cord for maintenance purpose and be sure to secure it with the cord band.
- Secure the connecting cord along the coated part of the wire using the cord band. Do not exert pressure on the wire as this may cause overheating or fire.

Connection of the connecting cord

- Securely screw in the connecting cord so that it will not get loose or disconnect.
- Tightening torque reference value: 1.2 to 1.6 N·m (12 to 16 kgf·cm)
- Excessive tightening may damage the interior of the cord requiring replacement.

5. Checking of drawing drain hose

- Connect the separate drain hose to the drain hose that is attached to the indoor unit.
- For keeping the smooth flowing of condensed water the drain hose should be inclined as shown in figure below.



WARNING

- Be sure that the hose is not loosely connected or bent.

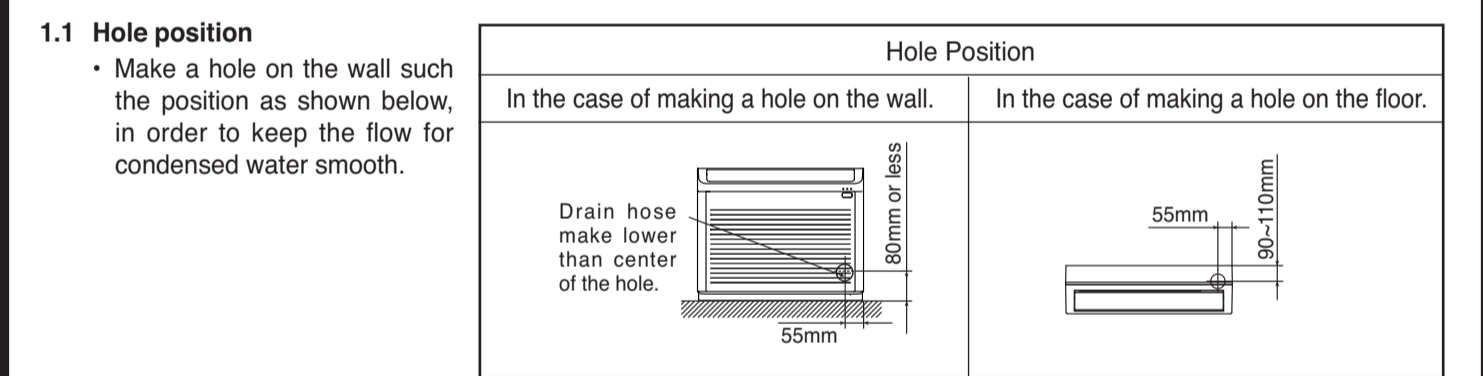
CAUTION

Please ensure the smooth flow of condensed water of the Indoor unit during installation. (Carelessness may result in water leakage.)

6. Installation of remote controller

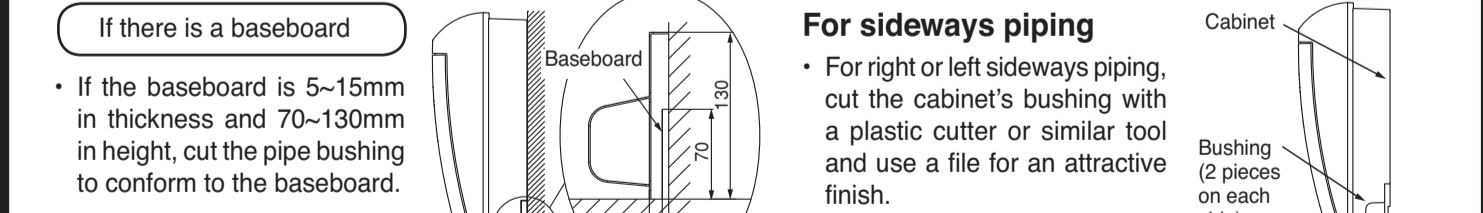
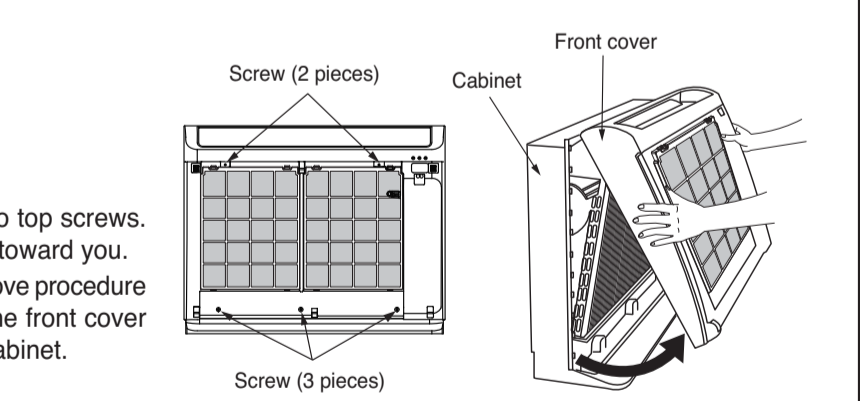
- The remote controller can be placed in its holder which is fixed on wall or beam.
 - To operate the remote controller at its holder, please ensure that the unit can receive signal transmitted from the controller at the place where the holder is to be fixed. The unit will beep when signal is received from the remote controller. The signal transmission is weakened by the fluorescent light. Therefore, during the installation of the remote control holder, please switch on the light, even during day time, to determine the mounting location of the holder.
- The remote controller must be slide in the remote controller holder, in the direction as shown in the figure, until it hooks at the lower end of the remote controller holder.
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1. Installation of wall penetration and installation of protection pipe



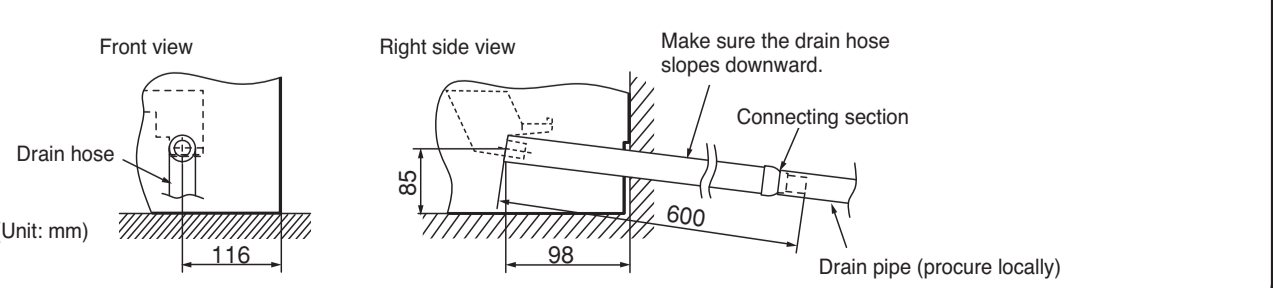
1.2 Wall penetration and installation of protection pipe

- Drill a ø65mm hole on wall which is slightly tilted towards the outdoor side. Drill the wall at a small angle.
 - Cut the protection pipe according to the wall thickness.
 - Empty gap in the sleeve of protection pipe should be completely sealed with putty to avoid dripping of rain water into the room.
- CAUTION**
Be sure that the wire is not in contact with any metal in the wall. Please use the protection pipe as wire passing through the hollow part of the wall so as to prevent the possibility of damaged by mouse.



2.2 Drain pipe

- Make sure drain pipe slopes downward so that drain flows smoothly without being trapped in the middle.
- The drain hose (connecting port outer diameter: 16mm or 20mm, length: 600mm) is included in the indoor unit. Prepare a drain pipe as shown in the following figure.
- To prevent condensation, the indoor drain pipe should be covered with heat insulation material with a thickness of more than 10mm.
- After piping is completed, check to make sure that drain discharges smoothly. Seal the drain pipe tightly with tape to keep dirt out.

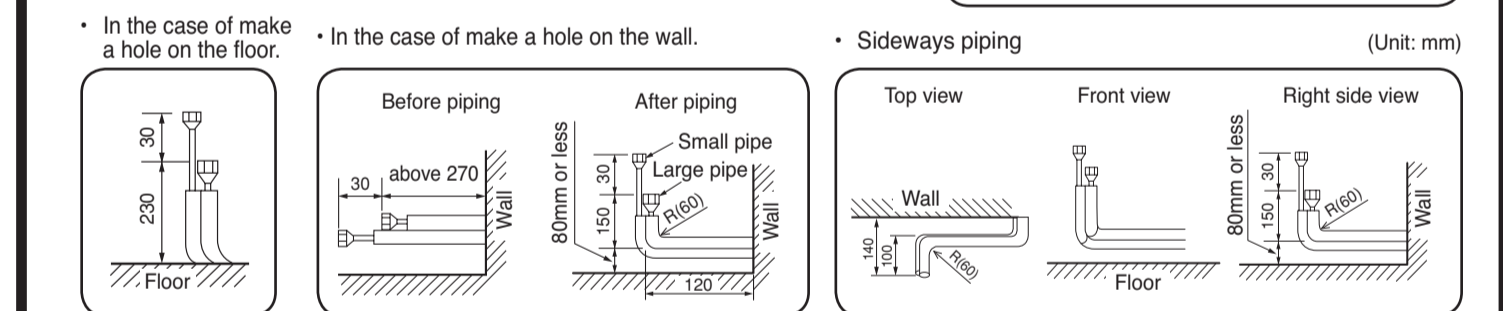


2.3 Connecting the pipe to indoor unit

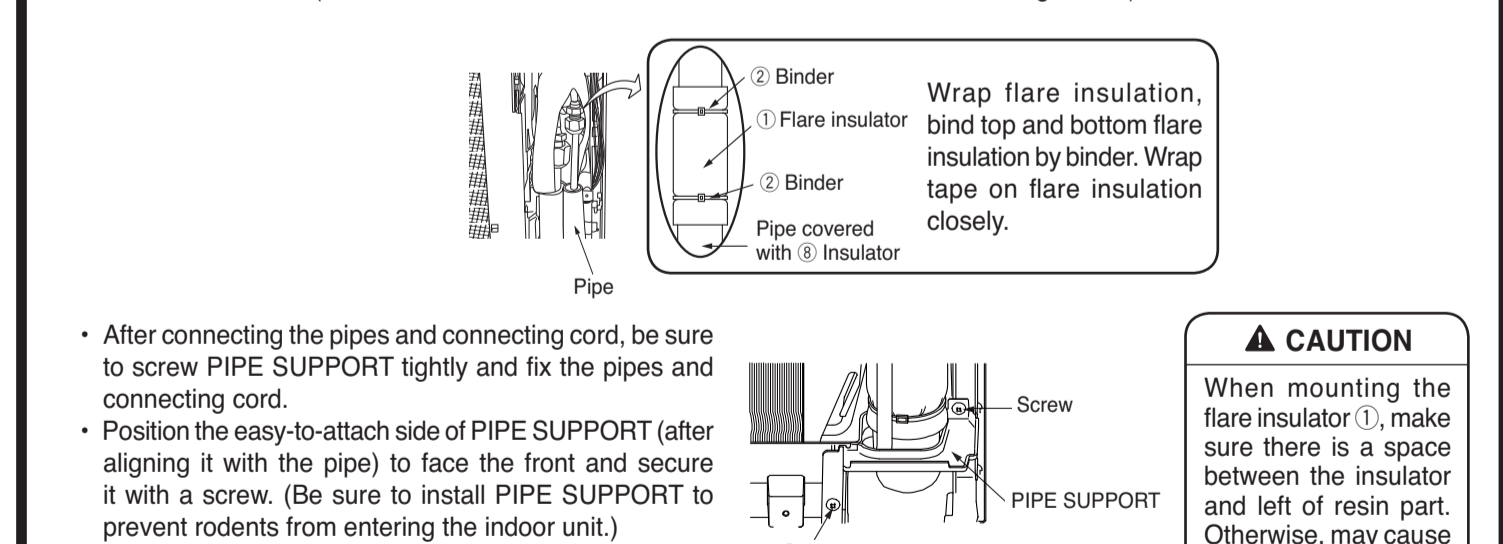
- Draw in the pipes through the hole of the wall or the floor to indoor.
- Arrange the pipe shown below. In the case that large pipe and small pipe arrange to make in front and behind.
- The indoor piping should be insulated with the enclosed insulation pipe.
- The pipe should first be cut longer than the length shown below.
- The excess section of the pipe should be cut off during pipe connection.

WARNING

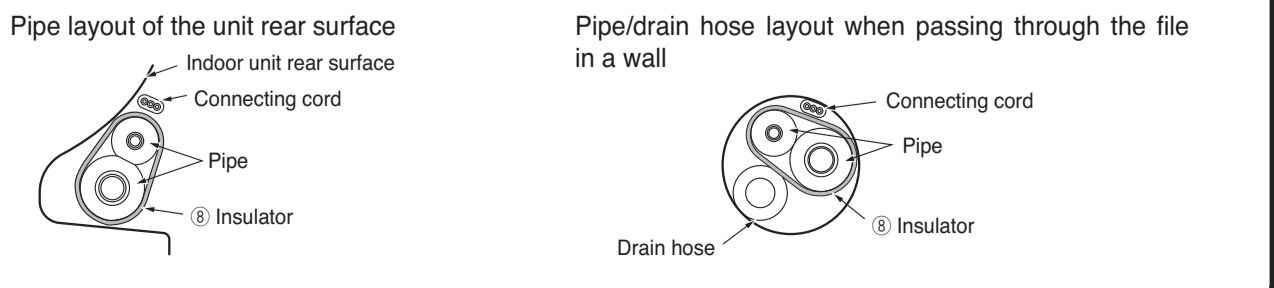
For sideways piping, do not install the drain hose sideways. Connect the drain hose so that it comes out directly. Sideways installation of the drain hose will prevent it from sloping downward, causing water leakage. To avoid dripping, make sure to pass the drain hose under the pipe.



- Remove PIPE SUPPORT.
- Insert the drain hose into the hole in the wall.
- Winding insulation pipe for drain hose and taping 4 or 5 places to fix.
- Connect the pipe to the Indoor unit.
- After completing the piping connection, cover the connector with the insulator ⑧ and ①.
- Connect the cord (follow instructions in the section "4. Connection of the connecting cord".)

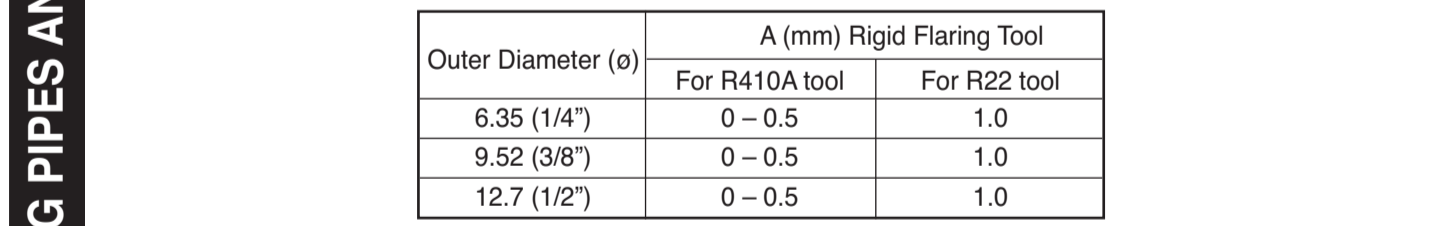


- After connecting the pipes and connecting cord, be sure to screw PIPE SUPPORT tightly and fix the pipes and connecting cord.
- Position the easy-to-attach side of PIPE SUPPORT (after aligning it with the pipe) to face the front and secure it with a screw. (Be sure to install PIPE SUPPORT to prevent rodents from entering the indoor unit.)
- Since there is some space between PIPE SUPPORT and the pipe, affix the insulator ⑧ to the PIPE SUPPORT to sandwich it.
- To prevent the pipe connector from contacting the front cover, push the connector as far as it goes.
- Arrange the connecting cord, pipes and drain hose neatly and store them in the bottom section of the rear surface of the indoor unit.



7. Installation of refrigerating pipes and air removal

- #### 7.1 Preparation of pipe
- Use a pipe cutter to cut the copper pipe.
- CAUTION**
- Jagged edge will cause leakage.
 - Point the side to be trimmed downwards during trimming to prevent copper chips from entering the pipe.
- Before flaring, please put on the flare nut.
- Please use exclusive tool.
- | Outer Diameter (ø) | A (mm) Rigid Flaring Tool | |
|--------------------|---------------------------|--------------|
| | For R410A tool | For R22 tool |
| 6.35 (1/4") | 0 - 0.5 | 1.0 |
| 9.52 (3/8") | 0 - 0.5 | 1.0 |
| 12.7 (1/2") | 0 - 0.5 | 1.0 |



7.2 Pipe connection

- In case of removing flare nut of an indoor unit, first remove a nut of small diameter side, or a seal cap of big diameter side will fly out. Free from water into the piping when working.
- Be sure to tighten the flare nut to the specified torque with a torque wrench. If the flare nut is overtightened, the nut may be split after a long period has passed, and may cause a refrigerant leak.
- Please be careful when bending the copper pipe.
- Screw in manually while adjusting the center. After that, use a torque wrench to tighten the connection.

		Outer diameter of pipe (ø)		Torque N·m (kgf·cm)
		Small diameter side	Large diameter side	
Valve head cap	Small diameter side	6.35 (1/4")	19.6 - 24.5 (200 - 250)	
	Large diameter side	9.52 (3/8")	19.6 - 24.5 (200 - 250)	
Valve core cap	Small diameter side	6.35 (1/4")	12.3 - 15.7 (125 - 160)	
	Large diameter side	9.52 (3/8")	12.3 - 15.7 (125 - 160)	

- #### Gas leakage inspection
- Please use gas leakage detector to check if leakage occurs at connection of flare nut as shown on the right.
- If gas leakage occurs, further tighten the connection to stop leakage. (Use the detector provided for R410A.)
-

FINAL STAGE OF INSTALLATION

8. Final stage of installation

- #### 8.1 Insulation and maintenance of pipe connection
- The connected terminals should be completely sealed with heat insulator and then tied up with rubber strap.
 - Please tie the pipe and power line together with vinyl tape as shown in the figure showing the installation of Indoor and Outdoor units. Then fix their position with holders.
 - To enhance the heat insulation and to prevent water condensation, please cover the outdoor part of the drain hose and pipe with insulation pipe.
 - Completely seal any gap with putty.
-

8.2 Operation test

- Please ensure that the air conditioner is in normal operating condition during the operation test.
- Explain to your customer the proper operation procedures as described in the user's manual.
- If the indoor unit does not operate, check to see that the connections are correct.

CAUTION

Trial run should be conducted on one unit at a time to check for incorrect wiring of connecting cord.

How to install and remove the front panel

- Be sure to use both hands to grasp the front panel when removing it or attaching it.
- Removing**
- Press at the top left and right corners of the front panel.
 - Grasp the left and right sides of the front panel and pull it up to move.
-
- Attaching**
- Attach three front panel bearings to the axis of the front cover.
 - Close the front panel.
-

How to connect the optional parts (RAC Adapter, Weekly Timer Remote Control, Wired Remote Control)

- For cable connection to control P.W.B., you need to remove front cover and electrical box cover. Each connecting location is as below.
 - ① RAC Adapter: CN7
 - ② Weekly Timer Wired Remote Control: CN9
 - ③ Wired Remote Control: CN9
 - Please check and confirm manuals attached to each optional parts for more connection details.
 - You can refer to this installation manual how to remove and re-attach the front cover.
 - Please be careful not to damage lead wires by edge of plate when connecting the optional parts.
-

FOR SERVICE PERSONNEL ONLY

HITACHI
Inspire the Next
HITACHI SPLIT UNIT AIR CONDITIONER
INSTALLATION MANUAL

OUTDOOR UNIT
RAC-25FPA
RAC-35FPA
RAC-50FPA

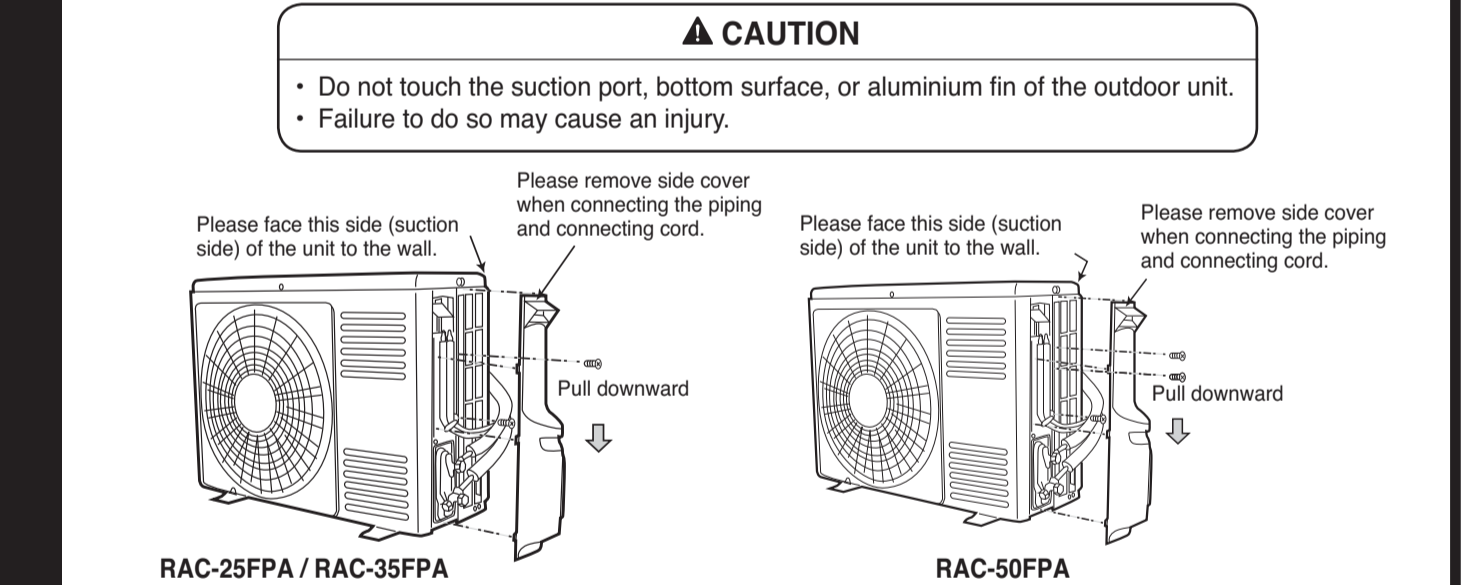
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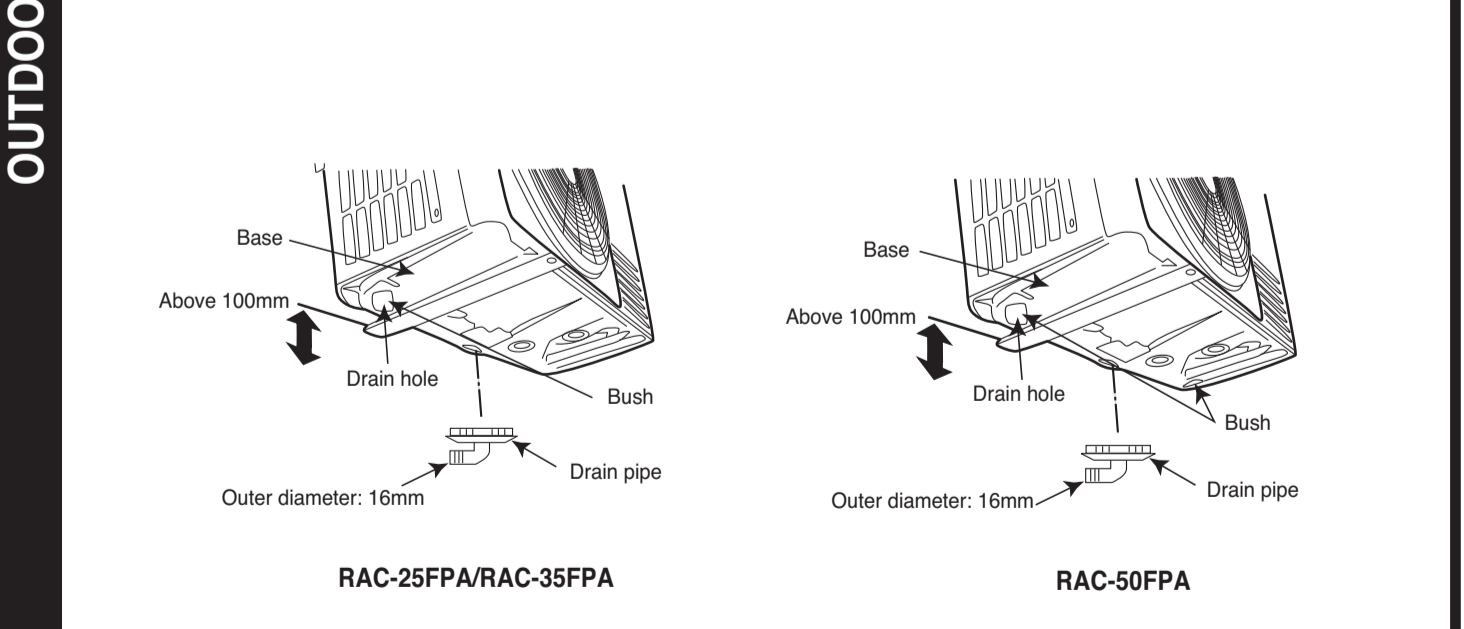
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 - Do not install the unit near a location where there is flammable gas. The outdoor unit may catch fire if flammable gas leaks around it.
 - Please ensure smooth flow of water when installing the drain hose. Improper installing may wet your furniture.
 - An IEC approved power cord should be used. Power cord type: NYM.

- Please mount the outdoor unit on stable ground to prevent vibration and increase of noise level.
- Decide the location for piping after sorting out the different types of pipe available.
- When removing side cover, please pull the handle after undoing the hook by pulling it downward. Reinstall the side cover in reverse order of the removal.



Condensed water disposal of outdoor unit

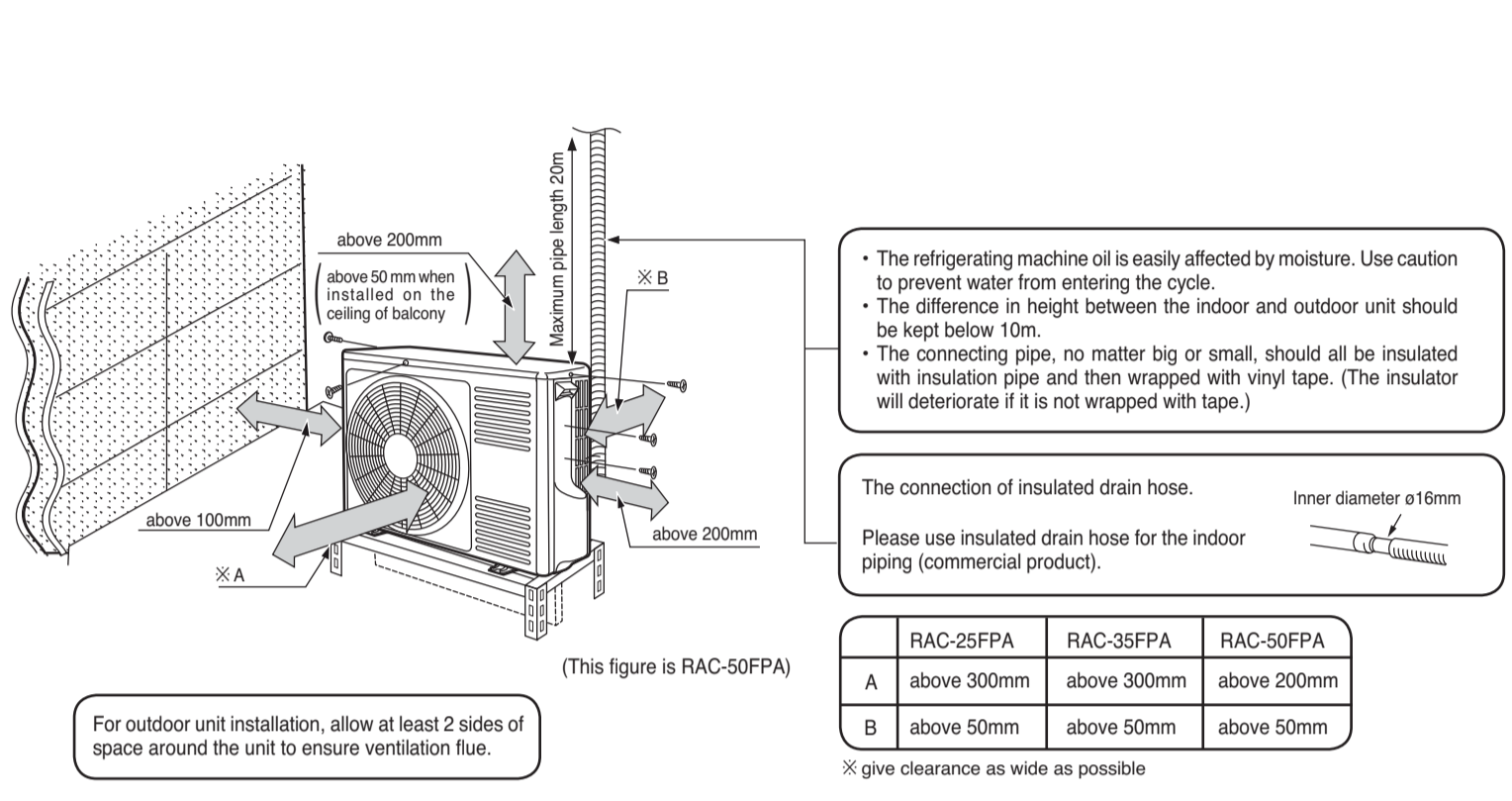
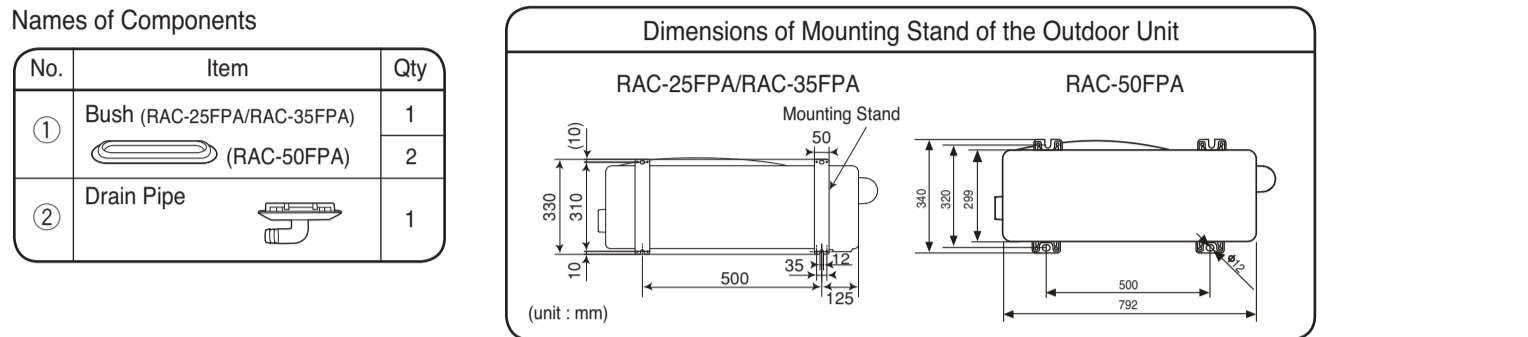
- There is a hole on the base of outdoor unit for condensed water to exhaust.
- In order to flow condensed water to the drain, the unit is installed on a stand or a block so that the unit is 100mm above the ground as shown figure. Join the drain pipe to one hole.
- Cover the drain hole with a bush. To install the bush, put it on the drain hole as shown in the figure and press the both sides of the bush to fit into the hole. After installation, check whether the drain pipe and bush cling to the base firmly.



- Install the outdoor unit horizontally and make sure that condensate drains away.
- In case of using in cold weather area
Especially when there are heavy snows in cold weather area, condensed water freezes on the base and may not drain. In this case, please remove the bush and the drain pipe at the bottom of the unit (left and centre near discharge portion of air, each 1 place) to restore smooth drainage. Ensure that the distance from the drain hole to the ground is 250mm or more.

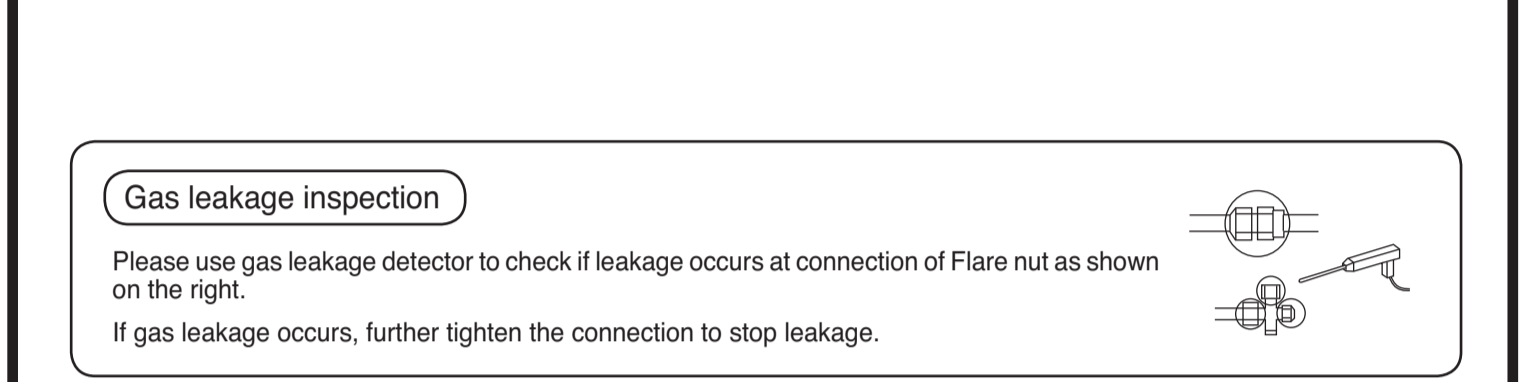
THE CHOICE OF MOUNTING SITE (Please note the following matters and obtain permission from customer before installation.)

- WARNING**
- The outdoor unit must be mounted at a location which can support heavy weight. Otherwise, noise and vibration will increase.
- CAUTION**
- Do not expose the unit under direct sunshine or rain. Besides, ventilation must be good and clear of obstruction.
 - The air blown out of the unit should not point directly to animals or plants.
 - The clearances of the unit from top, left, right and front are specified in figure below. At least two of the above sides must be open air.
 - Be sure that the hot air blown out of the unit and noise do not disturb the neighbourhood.
 - Do not install at a location where there is flammable gas, steam, oil and smoke.
 - The location must be convenient for water drainage.
 - Place the outdoor unit and its connecting cord at least 1m away from the antenna or signal line of television, radio or telephone. This is to avoid noise interference.

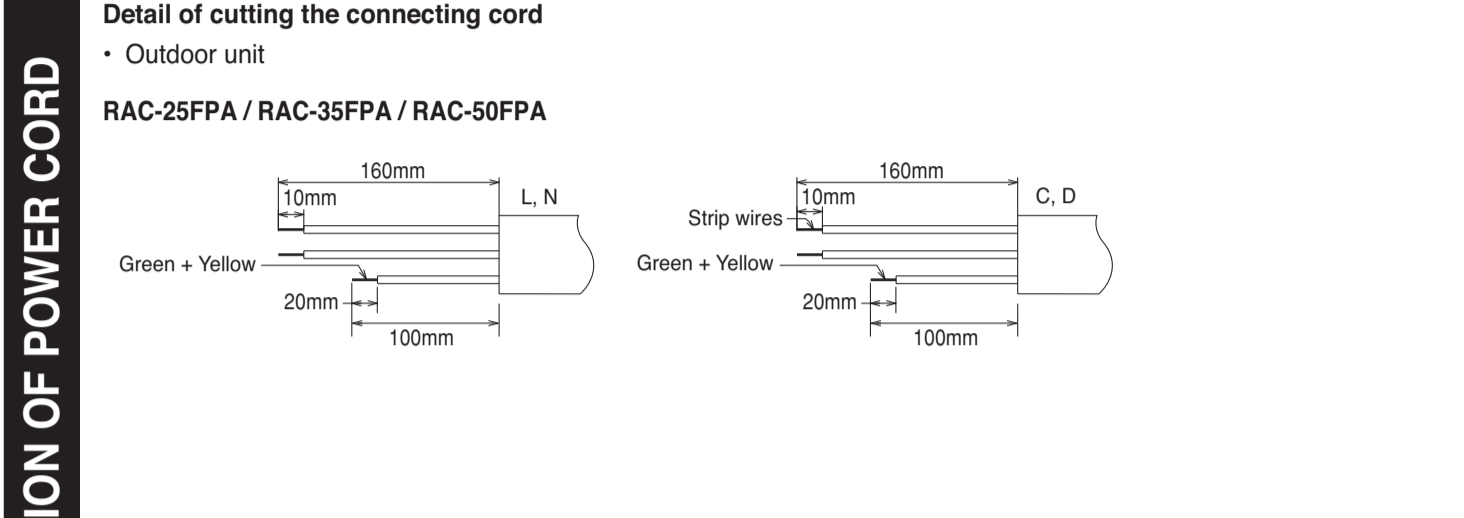
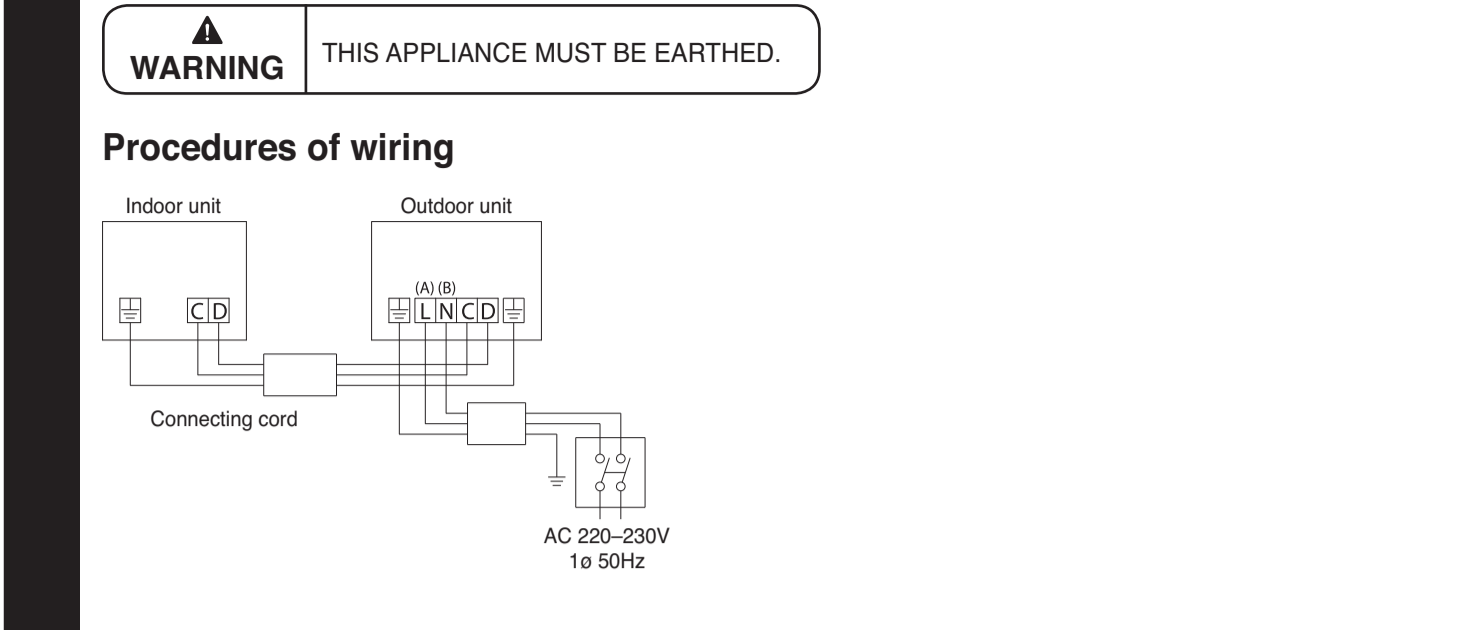


3. Remove of air from the pipe and gas leakage inspection

- Procedures of using vacuum pump for air removal**
- Remove the cap of valve core. Then, connect the charge hose. Remove the cap of valve head. Connect the vacuum pump adapter to the vacuum pump and connect the charge hose to the adapter.
 - Fully tighten the "Hi" shuttle of the manifold valve and completely unscrew the "Lo" shuttle. Run the vacuum pump for about 10-15 minutes, then completely tighten the "Lo" shuttle and switch off the vacuum pump.
 - Loosen the spindle of the service valve with small diameter by 1/4 turn and tighten the spindle immediately after 5 to 6 seconds.
 - Remove the charging hose from the service valve.
 - Completely unscrew the spindle of the service valve (at 2 places) in anticlockwise direction to allow the flow of refrigerant (using Hexagonal Wrench key).
 - Tighten the cap of valve head. Check the cap's periphery if there is any gas leakage. The task is then completed.



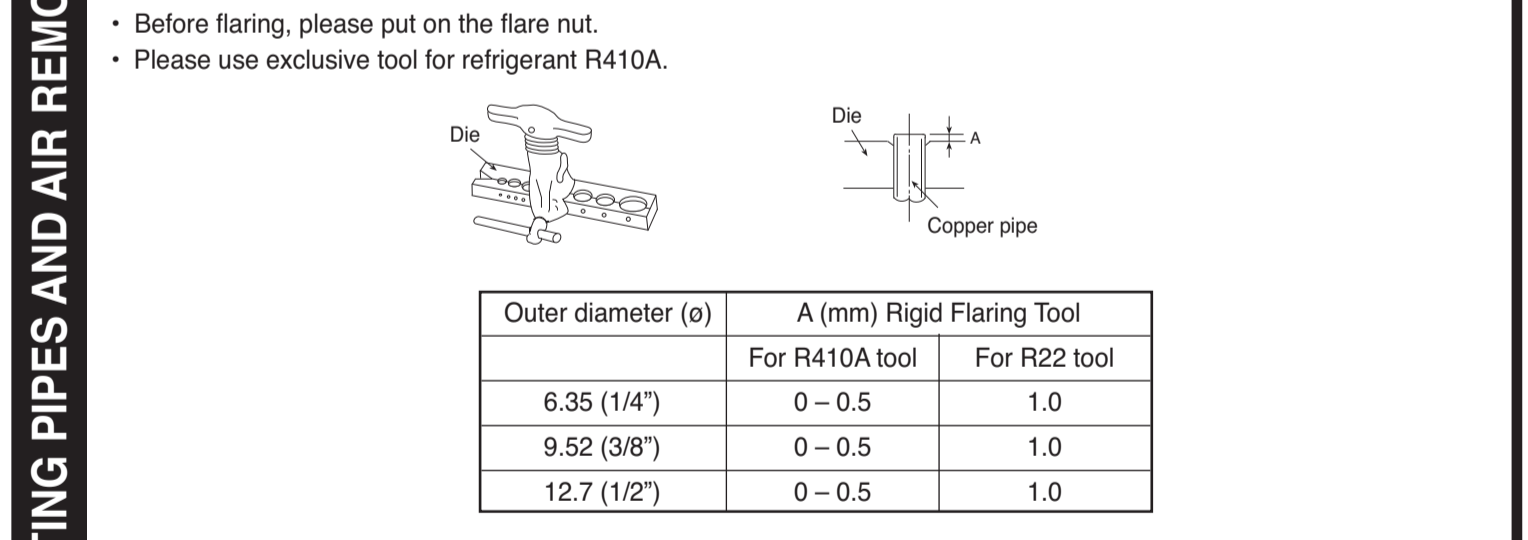
WARNING THIS APPLIANCE MUST BE EARTHED.



- WARNING**
- The naked part of the wire core should be 10mm fix it to the terminal tightly. Then try to pull the individual wire to check if the contact is tight. Improper insertion may burn the terminal.
 - Be sure to use only wire specified for the use of air-conditioner.
 - Please refer to the manual for wire connection and the wiring technique should meet the standard of the electrical installation.
 - Leave some space in the connecting cord for maintenance purpose and be sure to secure it with the cord band.
 - Secure the connecting cord along the coated part of the wire using the cord band. Do not exert pressure on the wire as this may cause overheating or fire.

1. Preparation of pipe

- Use a pipe cutter to cut the copper pipe and remove burr.
- CAUTION**
- Remove burr and jagged edge will cause leakage.
 - Point the side to be trimmed downwards during trimming to prevent copper chips from entering the pipe.



2. Pipe connection

- CAUTION**
- In case of removing flare nut of an indoor unit, first remove a nut of small diameter side, or a seal cap of big diameter side will fly out. Free from water into the piping when working.
 - Be sure to tighten the flare nut to the specified torque with a torque wrench. If the flare nut is overtightened, the nut may be split after a long period has passed, and may cause a refrigerant leak.
- Please be careful when bending the copper pipe.
- Screw in manually while adjusting the center.
- After that, use a torque wrench to tighten the connection.

	Outer diameter of pipe (ø)	Torque N·m (kgf·cm)
Small diameter side	6.35 (1/4")	13.7 - 18.6 (140 - 190)
	9.52 (3/8")	34.3 - 44.1 (350 - 450)
	12.7 (1/2")	44.1 - 53.9 (450 - 550)
Large diameter side	Small diameter side	6.35 (1/4") 19.6 - 24.5 (200 - 250)
	Large diameter side	9.52 (3/8") 19.6 - 24.5 (200 - 250)
Valve head cap	Small diameter side	6.35 (1/4") 19.6 - 24.5 (200 - 250)
	Large diameter side	9.52 (3/8") 29.4 - 34.3 (300 - 350)
Valve core cap	12.7 (1/2")	12.3 - 15.7 (125 - 160)

Wiring of the outdoor unit

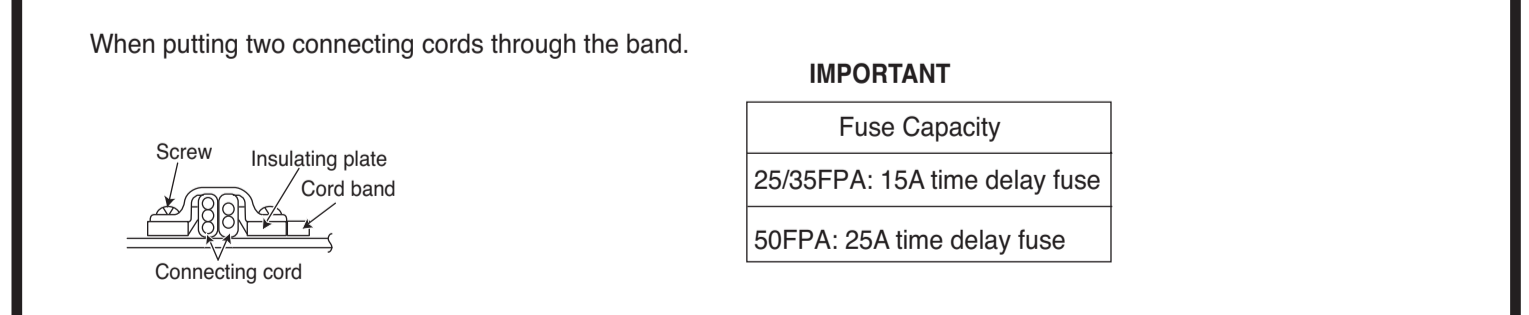
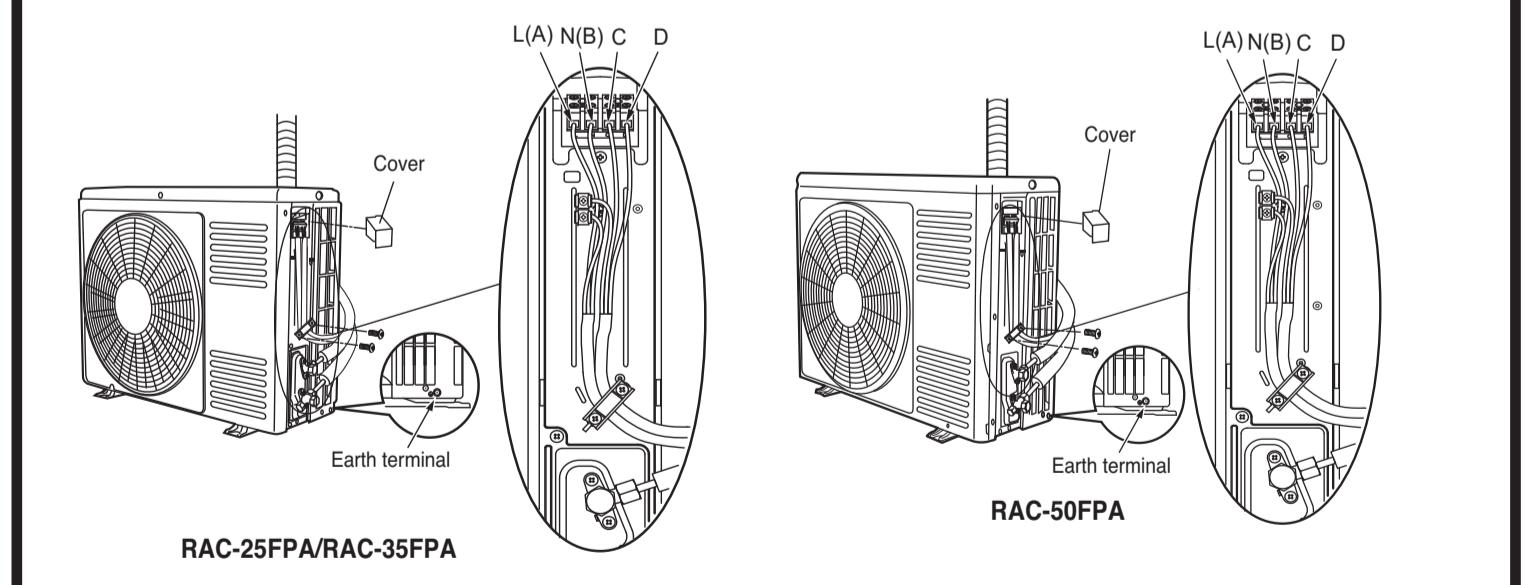
- Please remove the side cover for wire connection.
- WARNING**
- If you cannot attach the side plate due to the connection cord, please press the connecting cord in the direction to the front panel to fix it.
 - Be sure that the hooks of the side cover fixed in certainly. Otherwise water leakage may occur and this causes short circuit or faults.
 - The connecting cord should not touch to service valve and pipes. (It becomes high temperature in heating operation.)

Checking for the electric source and the voltage range

Before installation, the power source must be checked and necessary wiring work must be completed. To make the wiring capacity proper, use the wire gauge list below for the wiring from house distribution fuse box to the outdoor unit in consideration of the blocked rotor current.

IMPORTANT

	Wire length	Wire gauge
L, N	up to 6m	1.5mm ²
	up to 15m	2.5mm ²
	up to 20m	4.0mm ²
C, D	up to 6m	1.5mm ²
	up to 20m	2.5mm ²



- Investigate the power supply capacity and other electrical conditions at the installing location.
- Depending on the model of room air conditioner to be installed, request the customer to make arrangements for the necessary electrical work etc.
- The electrical work includes the wiring work up the outdoor unit. In localities where electrical conditions are poor, use of a voltage regulation is recommended.
- Install outdoor for the room air conditioner within the reaching range of the line cord.

1. Operation test

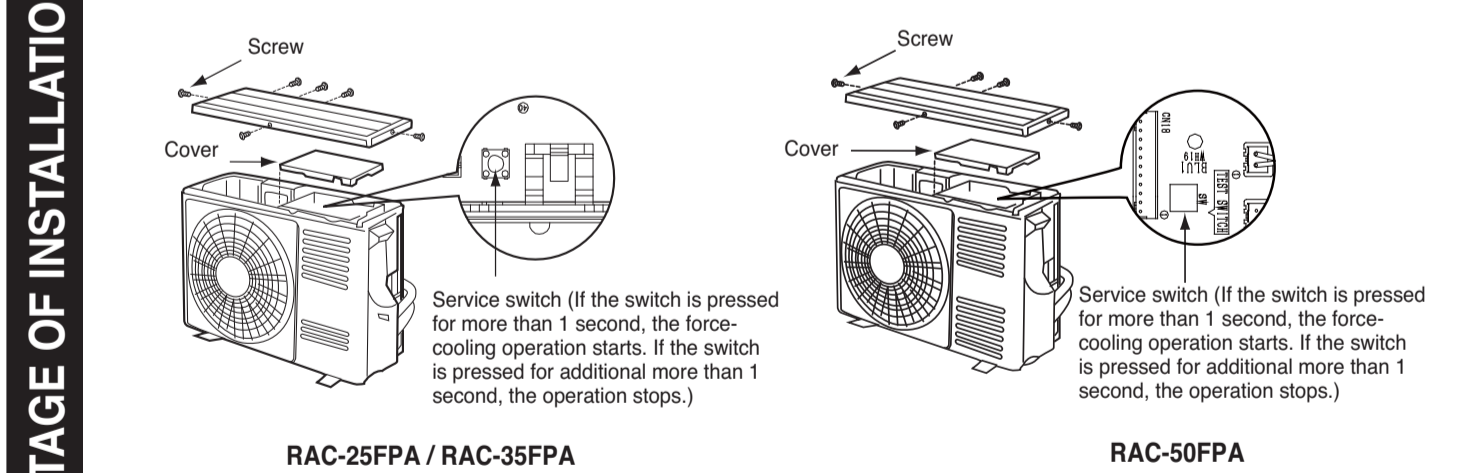
- Please ensure that the air conditioner is in normal operating condition during the operation test.
- Explain to your customer the proper operation procedures as described in the user's manual.
- If the indoor unit does not operate, check to see that the connections are correct.
- Turn on the lamp in the room where the indoor unit is installed and check the remote controller for normal operation.

Insulation and maintenance of pipe connection

- The connected terminals should be completed sealed with heat insulator and then tied up with rubber strap.
- Please tie the pipe and power line together with vinyl tape as shown in the figure showing the installation of Indoor and outdoor units. Then fix their position with holders.
- To enhance the heat insulation and to prevent water condensation, please cover the outdoor part of the drain hose and pipe with insulation pipe.
- Completely seal any gap with putty.

Force-cooling operation

- When the service switch of the outdoor unit is pressed for 1 or more seconds, the force-cooling operation starts. Use this mode when performing the failure diagnosis or collecting refrigerant into the outdoor unit.



- CAUTION**
- Do not operate the unit for more than 5 minutes while the spindle of the service valve is closed.