FOR SERVICE PERSONNEL ONLY

HITACHI

INVERTER SYSTEM MULTI TYPE INDOOR UNIT INSTALLATION MANUAL

MODEL HFC R410A **RAF-25NH4 RAF-50NH4**

- 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) • ⊕⊖ Screwdriver • Measuring Tape • Knife • Saw • ø65mm Power Drill • Hexagonal Wrench Key (4mm) • Wrench (14,17,22,26,27mm) ⦿ 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.

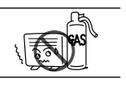
Be sure that the unit operates in proper condition after installation. Explain to customer the proper watt of operating the unit as described in the user's guide.

⚠ 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 instructions 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 wire which are approved official in your country. A short circuit and fire may occur due to the use of low quality wire or improper work.
- Be sure to use the specified wire 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. 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 and fire may occur.
- 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 use the specified piping set for R410A. Otherwise, this may result in broken copper pipes or faults.
- When installing or removing an air conditioner, do not allow air or moisture to remain in the refrigeration cycle. Otherwise, pressure in the refrigeration cycle may become abnormally high so that a rupture may be caused.
- 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. Improper earthing may cause electric shock.

⚠ CAUTION

- A circuit breaker must be installed in the house distribution box for the direct connected power supply wire 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. Piping shall be suitable supported with a maximum spacing of 1m between the supports.



- Please ensure smooth flow of water when installing the drain hose.
- 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.)

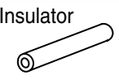
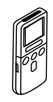
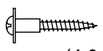
⚠ WARNING

- The unit should be mounted at stable, non-vibratory location which can provide full support to the unit.

⚠ CAUTION

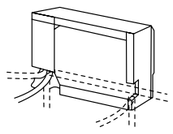
- No nearby heat source and no obstruction near the air outlet is allowed.
- The clearance distances from top, right and left are specified in figure below.
- The location must be convenient for water drainage and pipe connection with the outdoor unit.
- To avoid interference from noise, please place 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.

Names of Indoor Components

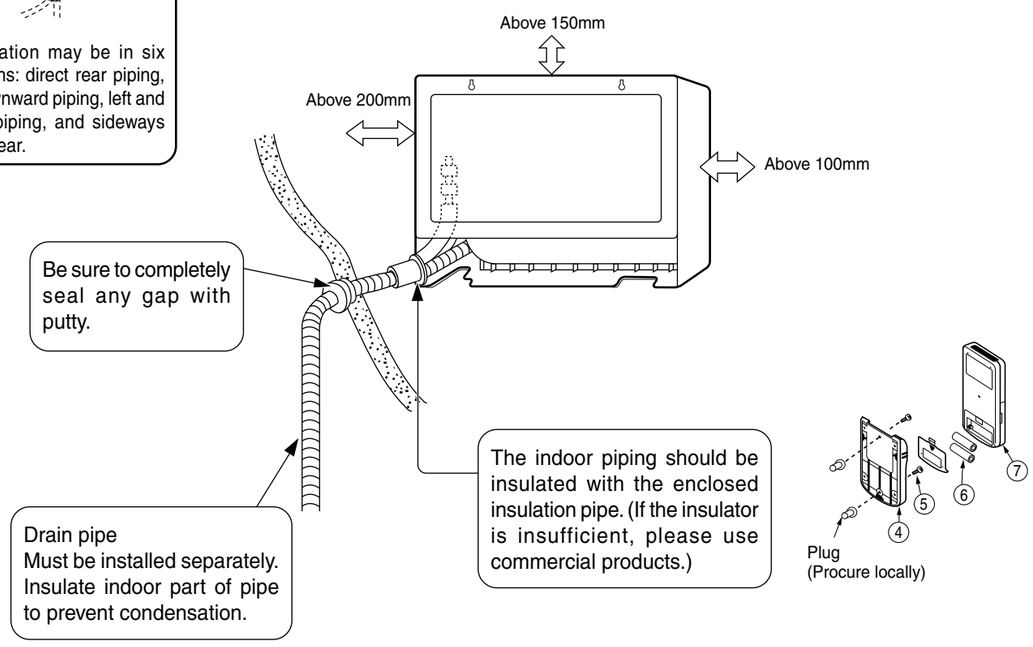
No.	Item	Qty
①	Flare Insulator 	1
②	Binder 	2
③	Screw for Overturn Prevention (4.1 × 32)	2
④	Holder for Remote Controller 	1
⑤	Screw for holder of Remote Controller (3.1 × 16)	2
⑥	AAA size Battery 	2
⑦	Remote Controller 	1
⑧	Insulator (t3 × 160 × 600)	1
⑨	Screw for Overturn Prevention  (4.0 × 34)	2
⑩	Insulator  (20 × 30 × 300)	1

[Indoor unit installation]

Direction of Piping



Piping configuration may be in six different directions: direct rear piping, left and right downward piping, left and right sideways piping, and sideways piping from the rear.

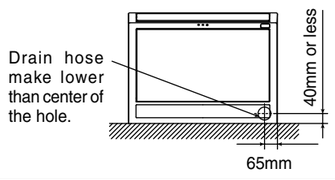
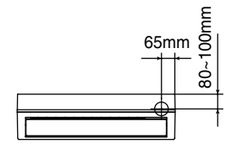


1. Installation of wall penetration and installation of protection pipe

1.1 Hole position

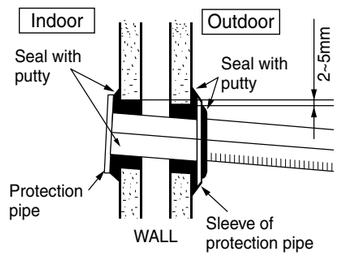
- Make a hole on the wall such the position as shown below, in order to keep the flow for condensed water smooth.

Hole Position

In the case of making a hole on the wall.	In the case of making a hole on the floor.
	

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. Installation of the indoor unit

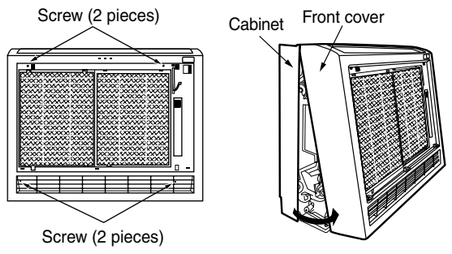
2.1 How to remove the front cover

(1) Remove the front panel (refer to instructions on the reverse of this sheet).

(2) Remove the front cover.

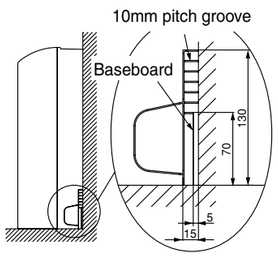
- Remove the two bottom screws and two top screws. Pull the front cover approximately 30mm toward you.

※ When attaching the front cover, follow the above procedure in reverse order. Make sure the hooks at the front cover top surface are securely inserted into the cabinet.



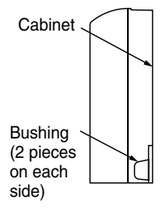
If there is a baseboard

- If the baseboard is 5~15mm in thickness and 70~130mm in height, cut the pipe bushing to conform to the baseboard.



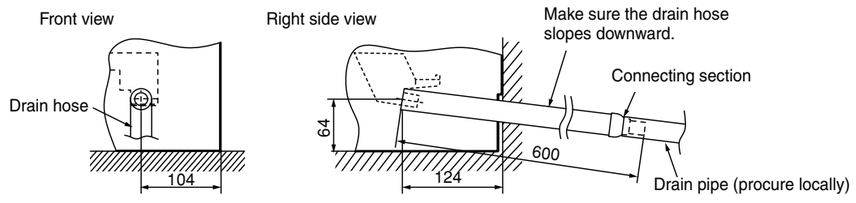
For sideways piping

- For right or left sideways piping, cut the cabinet's bushing with a plastic cutter or similar tool and use a file for an attractive finish.



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.



(Unit: mm)

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.

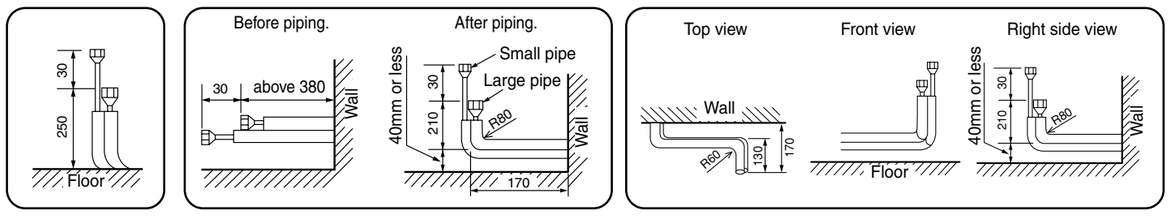
⚠ WARNING

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.

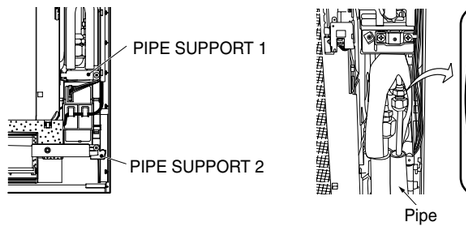
- In the case of make a hole on the floor.
- In the case of make a hole on the wall.
- Sideways piping

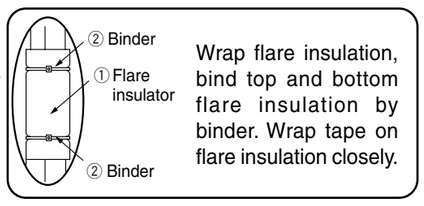
(Unit: mm)



- Remove PIPE SUPPORT 1 and PIPE SUPPORT 2.
- Insert the drain hose into the hole in the wall.
- Winding insulation pipe for drain hose and taping 4 or 5 places to fix.

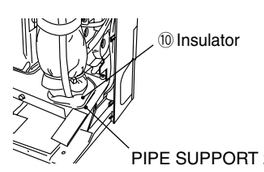
- Connect the pipe to the Indoor unit.
- After completing the piping connection, cover the connector with the insulator.
- Connect the cord (follow instructions in the section "5. Connection of the connecting cord" on the reverse of this sheet).





Wrap flare insulation, bind top and bottom flare insulation by binder. Wrap tape on flare insulation closely.

- Since there is some space between PIPE SUPPORT 2 and the pipe, affix the insulator ⑩ to the PIPE SUPPORT 2. As shown in the figure on the right, affix the insulator ⑩ to the PIPE SUPPORT 2 to sandwich it.

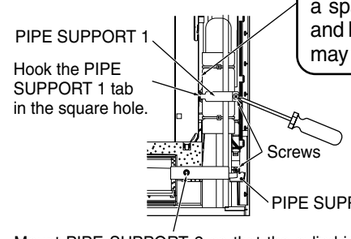


- After connecting the pipes and connecting cord, be sure to screw PIPE SUPPORT 1, PIPE SUPPORT 2 tightly and fix the pipes and connecting cord.
- Position the easy-to-attach side of PIPE SUPPORT 2 (after aligning it with the pipe) to face the front and secure it with a screw. (Be sure to install PIPE SUPPORT 2 to prevent rodents from entering the indoor unit.)

- 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.

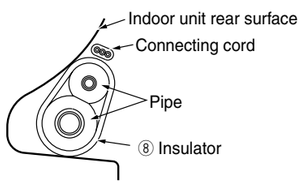
⚠ CAUTION

When mounting the flare insulator ①, make sure there is a space between the insulator and left of resin part. Otherwise, may cause water dripping.

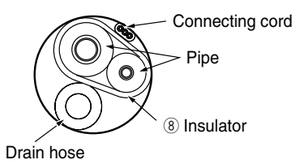


Mount PIPE SUPPORT 2 so that the cylindrical portion of the drain pan passes through its hole and secure it with screws located at the right back corner.

Pipe layout of the unit rear surface

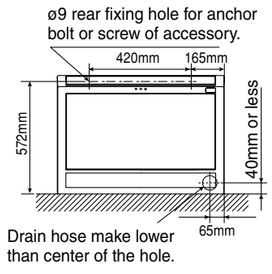


Pipe/drain hose layout when passing through the file in a wall



3. Fixing the indoor unit

Fixing the top of indoor unit



⚠ WARNING

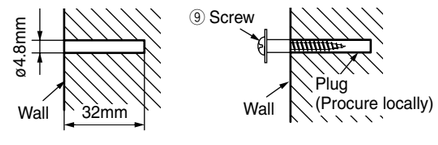
Even if there is space between the indoor unit and the back wall, make sure to securely attach the indoor unit to the wall, ceiling or floor using wire to prevent it from falling.

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.

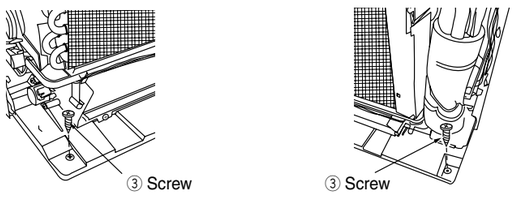
In the case of fixing by the screw of accessory

Bury the plug into the wall as shown in below to attach the screw ⑨. 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 × 32mm screws. (Right and left)



⚠ WARNING

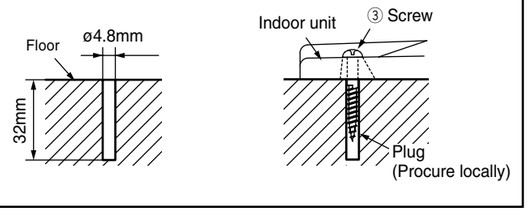
Be sure to attach screw ③ to prevent the indoor unit from overturn.

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

- To drill holes, either Case 1 or 2 may be used.

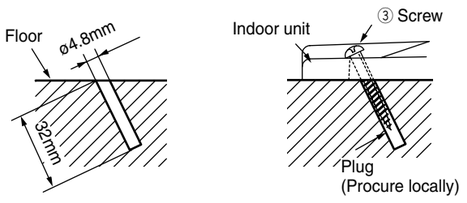
Case 1

1. Drill holes on floor.
2. Push plug into the holes.



Case 2

1. Drill holes on floor.
2. Push plug into the holes.



(The plug can be secured diagonally with a screw as shown above.)

BUIIT-IN INSTALLATION

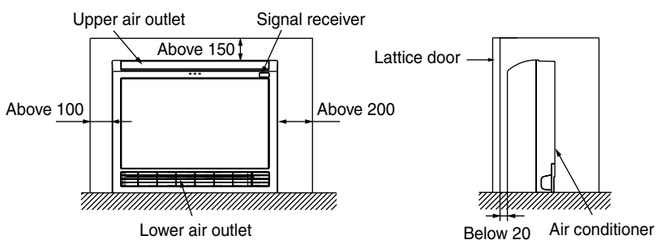
① If upper or lower air outlet is covered with the lattice door, room temperature may not be controlled properly. Therefore, air outlet must be open as much as possible.

② If air deflector of upper 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.

③ 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.

④ 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.

⑤ With a built-in installation, it may take more time to reach the set temperature after the unit is switched on.

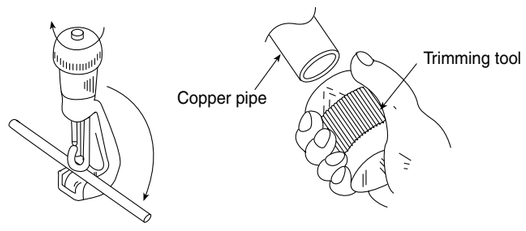


(Unit: mm)

4. Installation of refrigerating pipes and air removal

4.1 Preparation of pipe

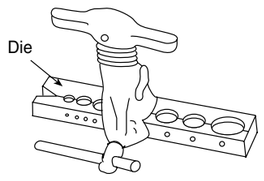
- Use a pipe cutter to cut the copper pipe.

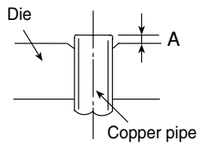


⚠ CAUTION

- 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.

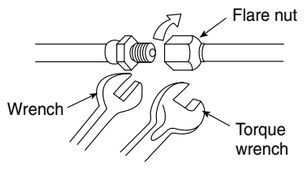
Outer Diameter (ø)	A (mm) Rigid Flaring Tool	
	For R410A tool	For R22 tool
6.35 (1/4")	0 – 0.5	1.0
9.52 (3/8")	0 – 0.5	1.0
12.7 (1/2")	0 – 0.5	1.0

4.2 Pipe connection

⚠ CAUTION

In case of removing flare nut of a 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.

- 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.

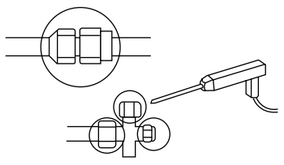


		Outer diameter of pipe (ø)	Torque N·m (kgf·cm)
Small diameter side		6.35 (1/4")	13.7 – 18.6 (140 – 190)
Large diameter side		9.52 (3/8")	34.3 – 44.1 (350 – 450)
		12.7 (1/2")	44.1 – 53.9 (450 – 550)
Valve head cap	Small diameter side	6.35 (1/4")	19.6 – 24.5 (200 – 250)
	Large diameter side	9.52 (3/8")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

Gas leakage inspection

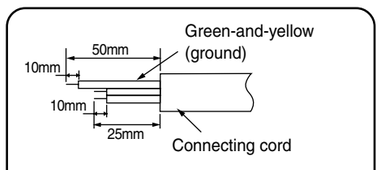
Please use gas leakage detector to check if leakage occurs at connection of flare nut as shown on the right.

If gas leakage occurs, further tighten the connection to stop leakage. (Use the detector provided for R410A.)

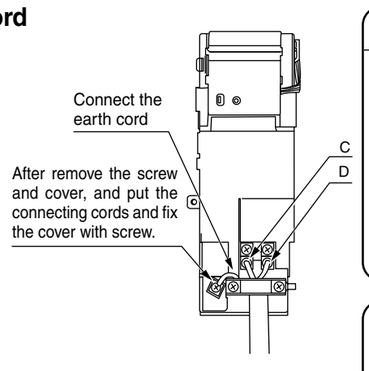


5. Connection of the connecting cord

(1) Remove the cover of the electric box.
(2) Connect the connecting cords.
(3) Assemble the cover of electric box.

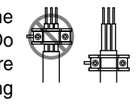


Detail of cutting the connecting cord



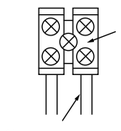
⚠ WARNING

- 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.



⚠ WARNING — • THIS APPLIANCE MUST BE EARTHED.

Connection of the connecting cord



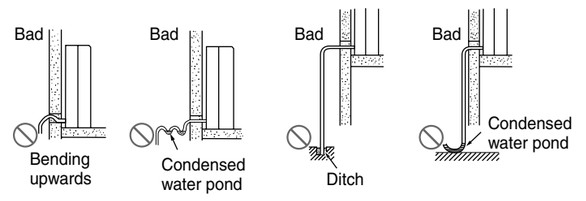
Securely screw in the connecting cord so that it will not get loose or disconnect.

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.

6. Checking of drawing drain hose

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



⚠ WARNING

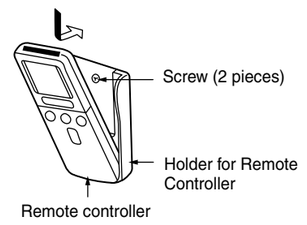
Be sure that the hose is not loosely connected or bent.

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

7. 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 weaken 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.

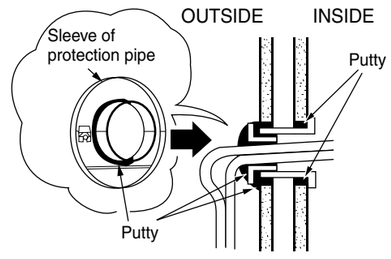
The controller must be hooked onto the hook at the lower part of the holder. Push in the remote controller in the direction as shown in figure below.



8. Final stage of installation

8.1 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.



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.

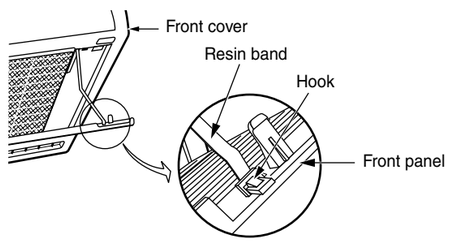
How to install and remove the front panel

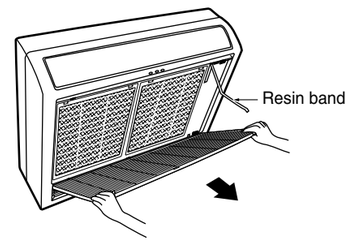
- Be sure to use both hands to grasp the front panel when removing it or attaching it.
- The front panel may be installed up or down to suit user preference.

Removing

① Press the hook found at the tip of the resin band installed inside the front panel's right section to remove the resin band.

② Pull the front panel down toward you and once fully open, pull it to remove.





Attaching

① Attach three front panel bearings to the axis of the front cover.

② Insert the tip of the resin band into the hole of the protrusion inside the right section of the front panel.