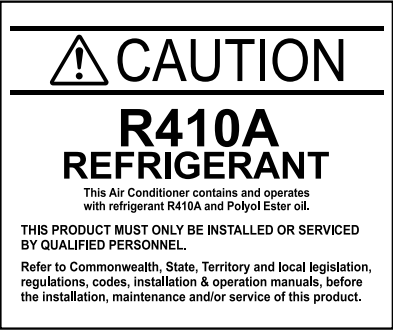


ROOM AIR CONDITIONER INSTALLATION INSTRUCTION SHEET



(PART NO. 9374992010-02)

| | |
|----------------|--|
| DANGER | This mark indicates procedures which, if improperly performed, are most likely to result in the death of or serious injury to the user or service personnel. |
| WARNING | This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user. |
| CAUTION | This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property. |

This air conditioner uses new refrigerant HFC (R410A).

The basic installation work procedures are the same as conventional refrigerant models. However, pay careful attention to the following points:

- (1) Since the working pressure is 1.6 times higher than that of conventional refrigerant models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.
- (2) Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]
- (3) Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with conventional refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.
- (4) When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.

Special tools for R410A

| Tool name | Contents of change |
|----------------------|---|
| Gauge manifold | Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals -0.1 to 5.3 MPa (-76 cmHg to 53 kgf/cm ²) for high pressure. -0.1 to 3.8 MPa (-76 cmHg to 38 kgf/cm ²) for low pressure. |
| Charge hose | To increase pressure resistance, the hose material and base size were changed. |
| Vacuum pump | A conventional vacuum pump can be used by installing a vacuum pump adapter. |
| Gas leakage detector | Special gas leakage detector for HFC refrigerant R410A. |

Copper pipes

It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants. As an air conditioner using R410A incurs pressure higher than when using R22, it is necessary to choose adequate materials. Thicknesses of copper pipes used with R410A are as shown in Table 1. Never use copper pipes thinner than 0.8 mm even when it is available on the market.

Table 1 Thicknesses of Annealed Copper Pipes

| Nominal diameter (inch) | Outer diameter (mm) | Thickness (mm) |
|-------------------------|---------------------|----------------|
| 1/4 | 6.35 | 0.80 |
| 3/8 | 9.52 | 0.80 |

STANDARD ACCESSORIES

The following installation accessories are supplied. Use them as required.

INDOOR UNIT ACCESSORIES (7000, 9000 and 12000 BTU Wall Mounted type)

| Name and Shape | Qty | Use |
|---------------------------------|-----|---|
| Wall hook bracket | 1 | For indoor unit installation |
| Wall cap-B | 1 | For through hole connection pipe protection |
| Remote control unit | 1 | Use for air conditioner operation |
| Battery (penlight) | 2 | For remote control unit |
| Remote control unit holder | 1 | Use as remote control unit holder |
| Cloth tape | 1 | For indoor unit installation |
| Tapping screw (big) (s4 x 25) | 8 | For wall hook bracket installation |
| Tapping screw (small) (e3 x 12) | 2 | For remote control unit holder installation |
| Air cleaning filter | 2 | For indoor unit |
| Air cleaning filter frame | 2 | For indoor unit |

This installation manual refers to following installation parts.

| Name | Q'ty |
|-------------------------------|-------|
| Connection pipe assembly | 1 |
| Connection cord (4-conductor) | 1 |
| Wall pipe | 1 |
| Decorative tape | 1 |
| Vinyl tape | 1 |
| Wall cap | 1 |
| Saddle | 1 set |
| Drain hose | 1 |
| Tapping screws | 1 set |

ELECTRICAL REQUIREMENT

- Electric wire size and fuse capacity:

| Table 2 | | |
|------------------------------------|------|------|
| Connection cord (mm ²) | MAX. | MIN. |
| | 2.5 | 1.5 |

Always make the air conditioner power supply a special branch circuit and provide a special switch and receptacle. Do not extend the power cord.

CONNECTION PIPE REQUIREMENTS

CAUTION
Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks. In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker. If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation. In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

Connect the connection pipes according to ■ CONNECTING THE PIPING in this installation instruction sheet.

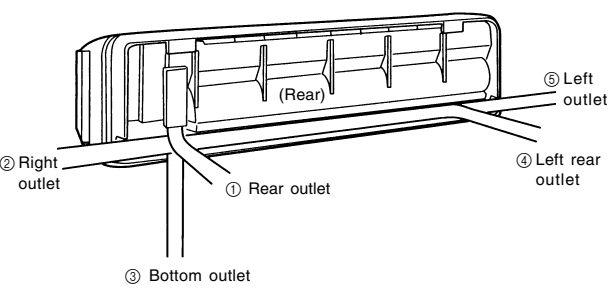
CONNECTION PIPE SIZE

| Model | 7000, 9000, and 12000 BTU models only |
|----------|--|
| Diameter | Small 6.35 mm (1/4 in.) Large 9.52 mm (3/8 in.) |

INSTALLATION PROCEDURE

1 INDOOR UNIT INSTALLATION

The piping can be connected in the five directions indicated by ①, ②, ③, ④, and ⑤. When the piping is connected in direction ② or ⑤, cut along the piping groove in the side of the front cover with a hacksaw. When connecting the piping in direction ③, cut a notch in the thin wall at the front bottom of front cover.



1. INSTALLING THE WALL HOOK BRACKET

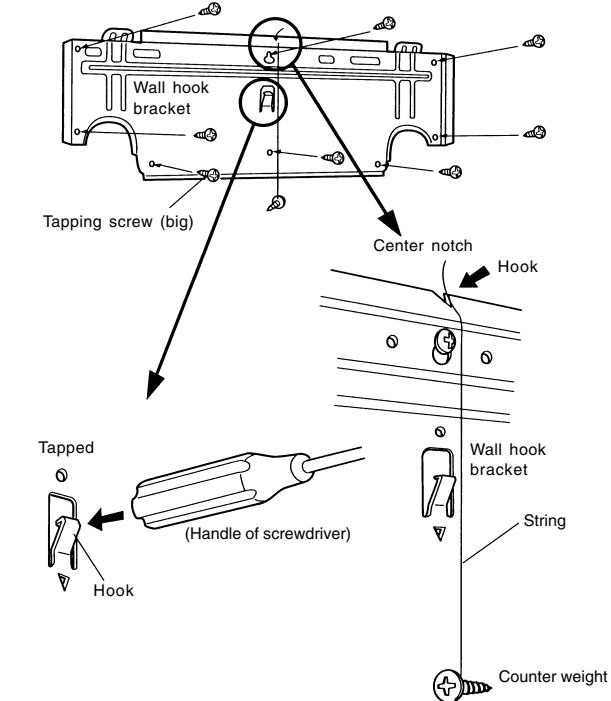
CAUTION
Install the wall hook bracket horizontally and perpendicularly. If the wall hook bracket is tilted, water will drip to the floor.

Install the wall hook bracket so that it is strong enough to withstand the weight of an adult.

[Installation directly to a wall]

Before fastening the wall hook bracket to the wall with the screws, level it by taping the hook at the center of bracket to the wall with the handle of a screwdriver.

- Fasten the wall hook bracket to the wall with 6 or more screws through the holes near the outer edge of the bracket.
- Check that there is no rattle at the wall hook bracket.

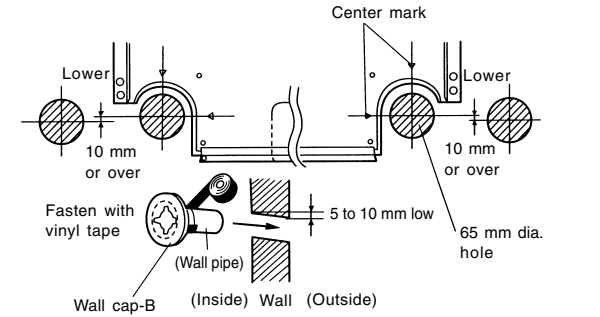


2. CUTTING THE HOLE IN THE WALL FOR THE CONNECTING PIPING

WARNING

If the wall pipe is not used, the cord interconnecting the indoor and outdoor units may touch metal and cause electric leakage.

- (1) Cut a 65 mm diameter hole in the wall at the position shown in.
- (2) When cutting the wall hole at the inside of the installation frame, cut the hole to a point of intersection of center marks. When cutting the wall hole at the outside of the installation frame, cut the hole at least 10 mm below less.
- (3) Cut the hole so that the outside end is lower (5 to 10 mm) than the inside end.
- (4) Always align the center of the wall hole. If misaligned, water leakage will occur.
- (5) Cut the wall pipe to match the wall thickness, stick it into the accessory wall cap-B, fasten the cap with vinyl tape, and stick the pipe through the hole. (The connection pipe is supplied in the installation set.)



- (6) For ③ left piping and ④ right piping, cut the hole a little lower so that drain water will flow freely.

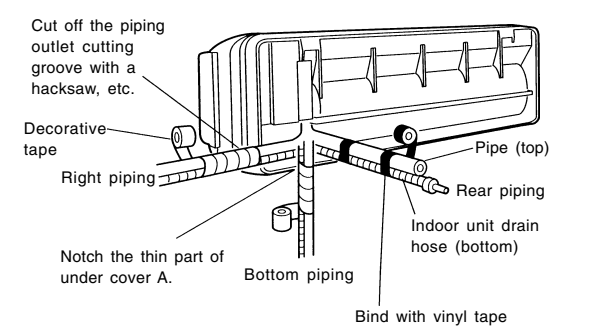
3. FORMING THE DRAIN HOSE AND PIPE

CAUTION

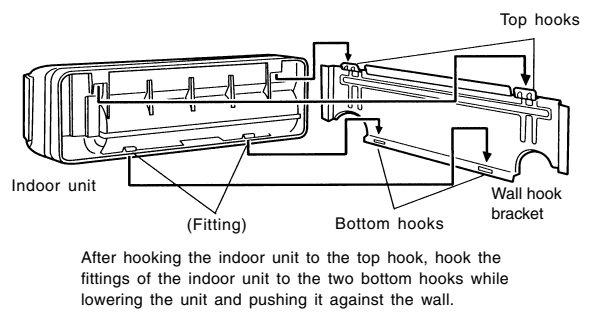
- ① Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.
- ② To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 70 mm or over.
- ③ If the pipe is bent repeatedly at the same place, it will break.

[③ Rear piping, ④ Right piping, ⑤ Bottom piping]

- Install the indoor unit piping in the direction of the wall hole and bind the drain hose and pipe together with vinyl tape.
- Install the piping so that the drain hose is at the bottom.

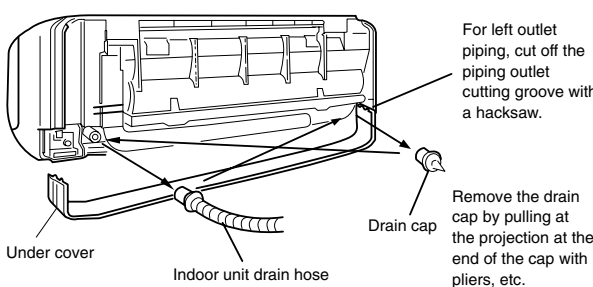


- Perform ■ INDOOR UNIT WIRING* before performing this piping.
- Wrap the pipes of the indoor unit that are visible from the outside with decorative tape.
- After passing the indoor piping and drain hose through the wall hole, hang the indoor unit on the hooks at the top and bottom of the wall hook bracket.



[For ④ Left rear piping, ⑤ Left piping]

Interchanging the drain hose and the drain hose.

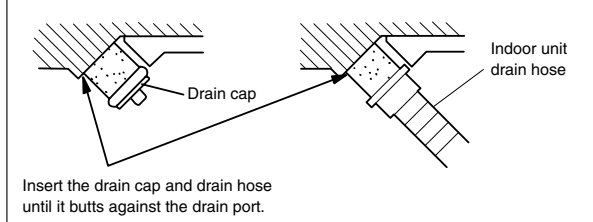


Removing the drain hose

CAUTION

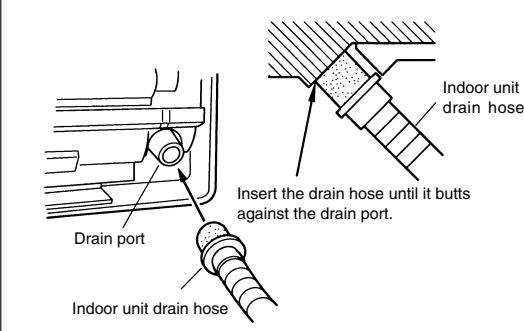
After removing the drain hose, do not forget to install the drain cap.

Remove the under cover A and pull off the drain hose.

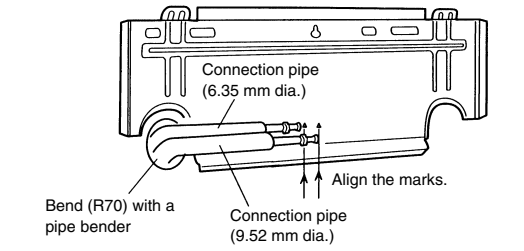


Installing the drain hose

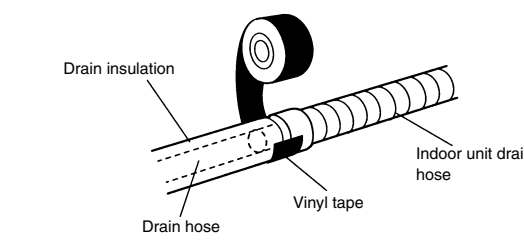
Insert the drain hose into the drain port.



- For left piping and left rear piping, align the marks on the wall hook bracket and shape the connection pipe.
- Bend the connection piping at a bend radius of 70 mm or more and install no more than 35 mm from the wall.



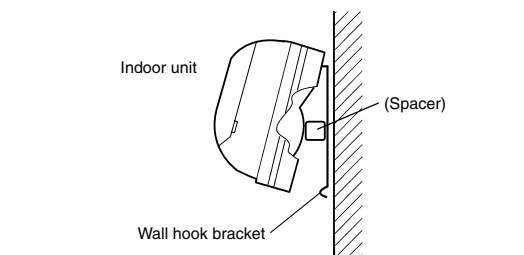
- When extending the drain hose at the indoor unit, install the accessory drain insulation.



- Place the indoor unit drain hose behind the piping.

[Installing the indoor unit]

- Hang the indoor unit from the hooks at the top of the wall hook bracket.
- Insert the spacer, etc. between the indoor unit and the wall hook bracket and separate the bottom of the indoor unit from the wall.



SELECTING THE MOUNTING POSITION

WARNING

Install at a place that can withstand the weight of the indoor and outdoor units and install positively so that the units will not topple or fall.

CAUTION

Do not install where there is the danger of combustible gas leakage.

- ② Do not install near heat sources.

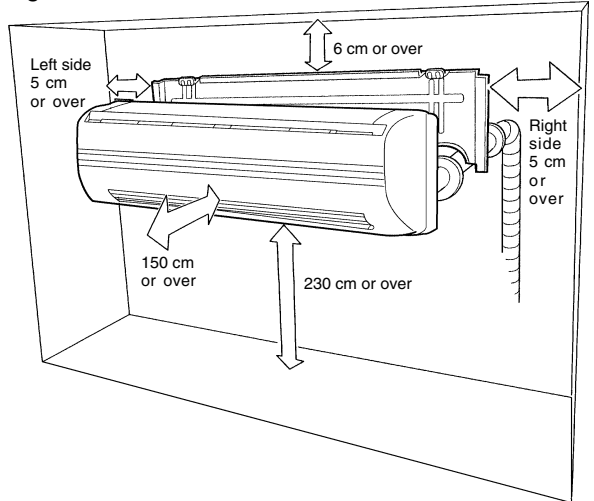
- ③ If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

Decide the mounting position with the customer as follows:

INDOOR UNIT

- (1) Install the indoor unit level on a strong wall which is not subject to vibration.
- (2) The inlet and outlet ports should not be obstructed : the air should be able to blow all over the room.
- (3) Do not install the unit where it will be exposed to direct sunlight.
- (4) Install the unit where connection to the outdoor unit is easy.
- (5) Install the unit where the drain pipe can be easily installed.
- (6) Take servicing, etc. into consideration and leave the spaces shown in (Fig. 1). Also install the unit where the filter can be removed.

Fig. 1



WARNING

- ① Do not use the existing (for conventional refrigerant) piping and flare nuts.
 - If the existing materials are used, the pressure inside the refrigerant cycle will rise and cause breakage, injury, etc. (Use the special R410A materials.)
- ② When installing and relocating the air conditioner, do not mix gases other than the specified refrigerant (R410A) to enter the refrigerant cycle.
 - If air or other gas enters the refrigerant cycle, the pressure inside the cycle will rise to an abnormally high value and cause breakage, injury, etc.

For authorized service personnel only.

DANGER

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 5 minutes or more before touching electrical components.

WARNING

- ① For the room air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.
- ② Connect the indoor unit and outdoor unit with the room air conditioner piping and cords available standards parts. This installation instruction sheet describes the correct connections using the installation set available from our standard parts.
- ③ Installation work must be performed in accordance with national wiring standards by authorized personnel only.
- ④ Also, do not use an extension cord.
- ⑤ Do not turn on the power until all installation work is complete.
- ⑥ Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation.
- ⑦ Use a vacuum pump for R410A exclusively.
- ⑧ Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.
- ⑨ Use a clean gauge manifold and charging hose for R410A exclusively.
- ⑩ If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.

- Be careful not to scratch the room air conditioner when handling it.
- After installation, explain correct operation to the customer, using the operating manual.
- Let the customer keep this installation instruction sheet because it is used when the room air conditioner is serviced or moved.

SAFETY PRECAUTIONS

WARNING

- ① During installation, make sure that the refrigerant pipe is attached firmly before you run the compressor. Do not operate the compressor under the condition of refrigerant piping not attached properly with 2-way or 3-way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.
- ② During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping. Do not remove the connection pipe while the compressor is in operation with 2-way or 3-way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.
- ③ When installing and relocating the air conditioner, do not mix gases other than the specified refrigerant (R410A) to enter the refrigerant cycle. If air or other gas enters the refrigerant cycle, the pressure inside the cycle will rise to an abnormally high value and cause breakage, injury, etc.

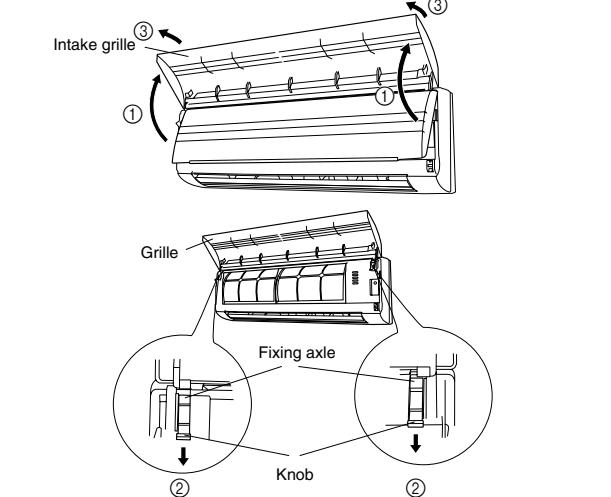
THE FRONT PANEL REMOVAL

- (1) Turn the wind guide and remove two screws at two sides of air outlet.
- (2) Take out the air outlet part of the front panel, then lift the whole front panel up to remove it.

FRONT PANEL REMOVAL AND INSTALLATION

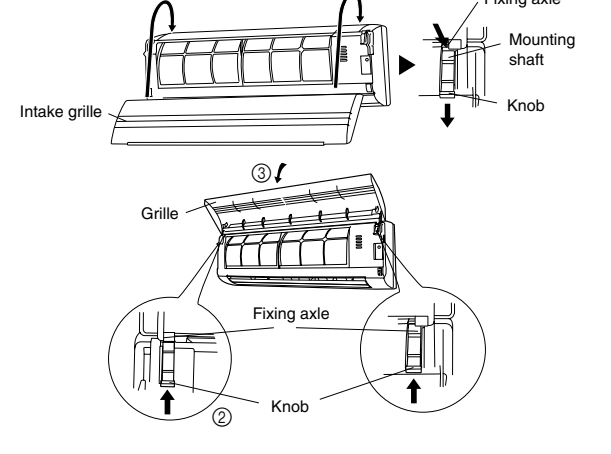
THE INTAKE GRILLE REMOVAL

- (1) Open the intake grille.
- (2) Pull down the knob.
- (3) Open the intake grille, and lift the intake grille upward, until the axle at the top of the intake grille is removed.



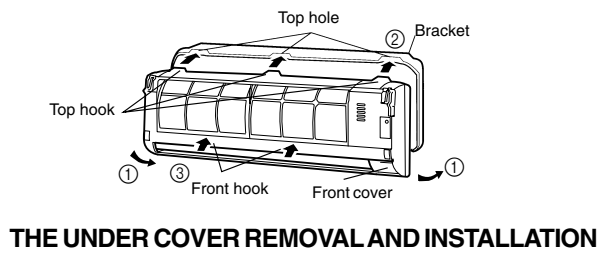
THE INTAKE GRILLE INSTALLATION

- (1) The fixing axle of the intake grille is installed on the front panel.
- (2) Push the knob up to the position.
- (3) Lay down the intake grille.



THE FRONT PANEL INSTALLATION

- (1) Firstly fit the lower part of the front panel to the air outlet part and insert its lower edge into the slot of the lower cover.
- (2) Insert three hooks on the upper side of the front panel into the slot of bracket.
- (3) Turn the wind guide, tighten the screws, and then turn the wind guide back to its original position.

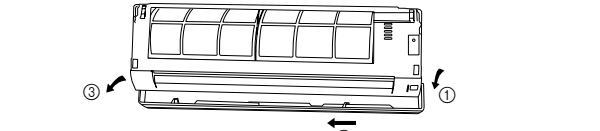


THE UNDER COVER REMOVAL AND INSTALLATION

The under cover removal should be done after the panel has been removed beforehand, or the parts may be damaged. The under cover should be installed before the fixing of the panel, or it may result in poor installation.

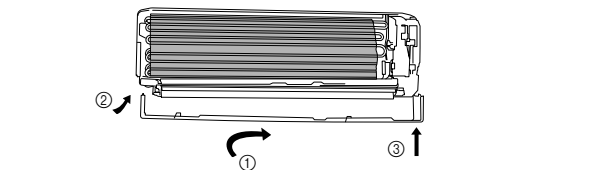
THE UNDER COVER REMOVAL

- (1) While pressing the joint part between the right part of the under cover and the bracket, pull it out of the slot.
- (2) Hold two sides of the under cover and slide it to the left. Make sure its under part getting out of the slot.
- (3) Turn the right part of the under cover under-left to separate the left slot of the under cover from the bracket.



THE UNDER COVER INSTALLATION

- (1) Hold two sides of the under cover and align it to the side of the bracket. Firstly match the left slot on the under cover to the bracket.
- (2) Make five slots on the under cover fit into the fixing plate of the body, then slide it to the right until the left side of the under cover align to the bracket.
- (3) Push the right part of the under cover inward to make the slot and bracket engaged with each other completely.



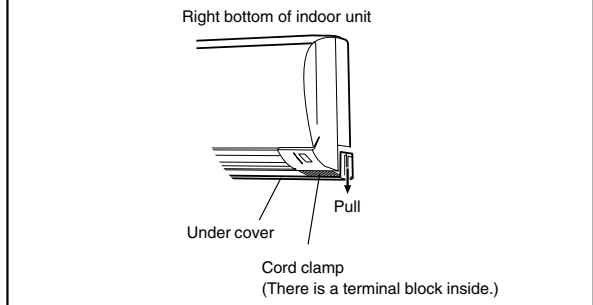
3 INDOOR UNIT WIRING

CAUTION

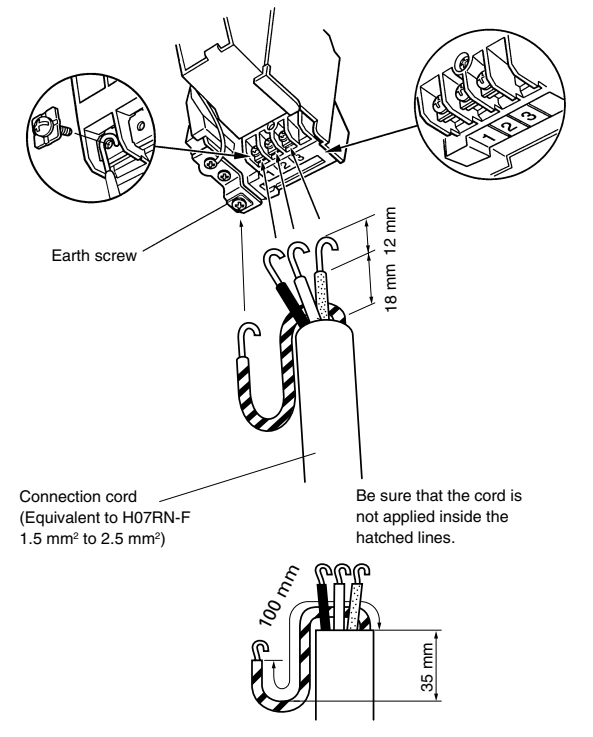
- ① Before starting work, check that power is not being supplied to indoor units and the outdoor unit.
- ② Match the terminal block numbers and connection cord colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.
- ③ Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire.
- ④ Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)
- ⑤ Always connect the ground wire.

- (1) Remove the front panel. (To remove the front panel, refer to ■ FRONT PANEL AND UNDER COVER REMOVAL* in this installation instruction sheet.)
- (2) Remove the under cover.

Removing the UNDER COVER



- (3) Remove the cord clamp.
- (4) Bend the end of the connection cord as shown in the figure.
- (5) Connect the end of the connection cord fully into the terminal block.



- Continued on back -

4 CONNECTING THE PIPING

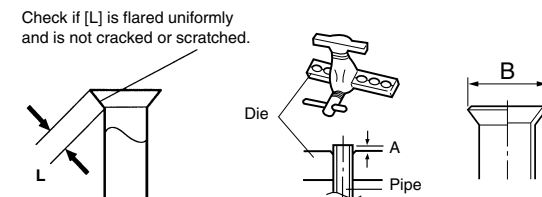
CAUTION

The maximum pipe length varies with the outdoor unit that is connected.

1. FLARING

- (1) Cut the connection pipe to the necessary length with a pipe cutter.
- (2) Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
- (3) Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool.

Use the special R410A flare tool, or the conventional flare tool.



Flaring dimension: B

| Pipe outside diameter | B ϕ_A (mm) |
|-----------------------|-----------------|
| 6.35 mm (1/4 in.) | 9.1 |
| 9.52 mm (3/8 in.) | 13.2 |

When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in Table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

Pipe outside diameter

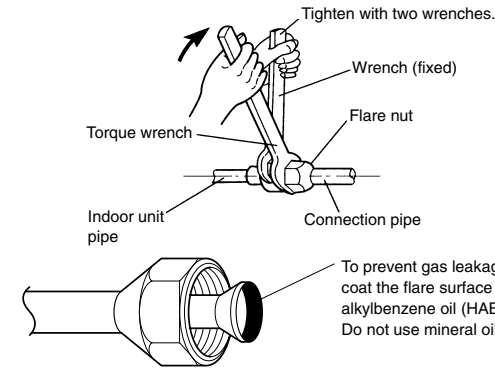
| Pipe outside diameter | A (mm) |
|-----------------------|----------|
| 6.35 mm (1/4 in.) | 0 to 0.5 |
| 9.52 mm (3/8 in.) | 0 to 0.5 |

2. BENDING

- (1) When bending the pipe, be careful not to crush it.
- (2) To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 70 mm or over.
- (3) If the copper pipe is bent or pulled to often, it will become stiff. Do not bend the pipe more than three times at one place.

3. CONNECTION

- (1) Install the outdoor unit wall cap (supplied with the optional installation set or procured at the site) to the wall pipe.
- (2) Connect the outdoor unit and indoor unit piping.
- (3) After matching the center of the flare surface and tightening the nut hand tight, tighten the nut to the specified tightening torque with a torque wrench. (Tighten the flare nut of the outdoor unit 3-way valve after air purging.)



Flare nut tightening torque

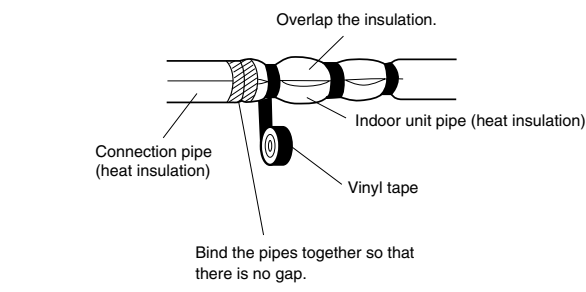
| Flare nut | Tightening torque |
|--------------|-------------------------------------|
| 6.35 mm dia. | 14 to 18 N·m (140 to 180 kgf·cm) |
| 9.52 mm dia. | 33 to 42 N·m (330 to 420 kgf·cm) |

Do not remove the cap from the connection pipe before connecting the pipe.

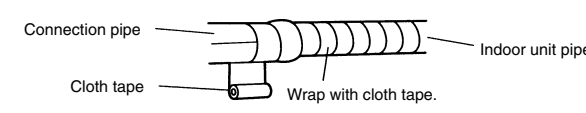
5 FINISHING

(1) Insulate between pipes.

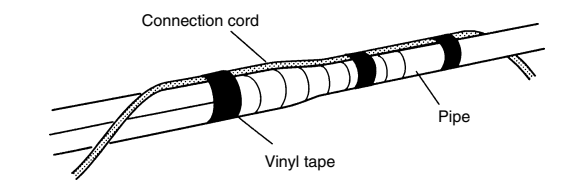
- For rear, right, and bottom piping, overlap the connection pipe heat insulation and indoor unit pipe heat insulation and bind them with vinyl tape so that there is no gap.
- For left and left rear piping, butt the connection pipe heat insulation and indoor unit pipe heat insulation together and bind them with and vinyl tape so that there is no gap.



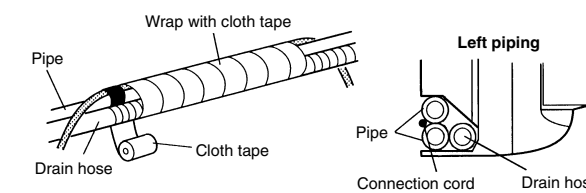
- For left and left rear piping, wrap the area which accommodates the rear piping housing section with cloth tape.



- For left and left rear piping, bind the connection cord to the top of the pipe with vinyl tape.

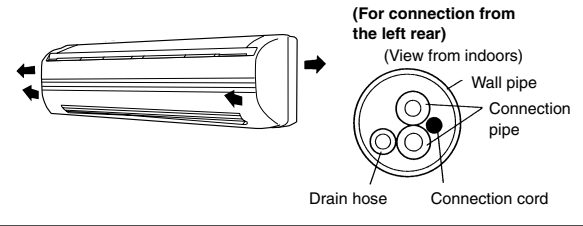


- For left and left rear piping, bundle the piping and drain hose together by wrapping them with cloth tape over the range within which they fit into the rear piping housing section.

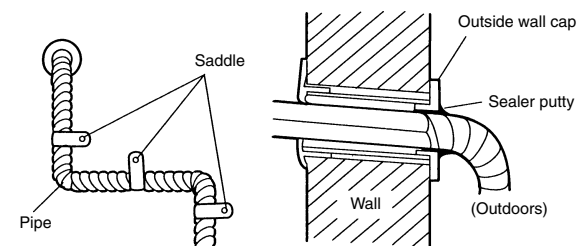


Check that:

- The top and bottom hooks are hooked firmly and the indoor unit does not move to the front and rear or left and right.
- The indoor unit is accurately positioned horizontally and vertically.
- When connected from the left rear, the drain hose is at the bottom left of the wall pipe.

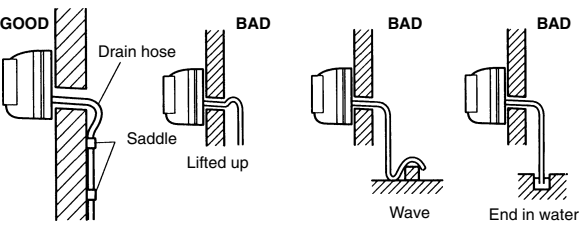


- (2) Temporarily fasten the connection cord along the connection pipe with vinyl tape. (Wrap to about 1/3 the width of the tape from the bottom of the pipe so that water does not enter.)
- (3) Fasten the connection pipe to the outside wall with a saddle, etc.
- (4) Fill the gap between the outside wall pipe hole and the pipe with sealer so that rain water and wind cannot blow in.



- (5) Fasten the drain hose to the outside wall, etc.

Check the following:

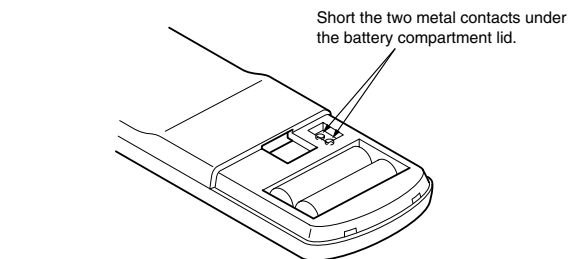


6 TEST RUNNING

CAUTION

Always turn on the power 4 hours prior to the start of the operation in order to ensure compressor protection.

- Perform test operation and check items 1 and 2 below.
 - For the operation method, refer to the operating manual.
 - The outdoor unit may not run, depending on the room temperature.
- In this case, the 'TEST RUN' signal is received during air conditioner operation (use a metallic object to short the two metal contacts under the battery compartment lid and send the 'TEST RUN' signal from the remote control unit).



Operation can be checked by lighting and flashing of the display section OPERATION and TIMER lamps.

Perform judgement in accordance with the following.

- Test running
 - Error
- When the air conditioner is run by pressing the remote control unit test run button, the OPERATION and TIMER lamps flash slowly at the same time.
- The OPERATION, TIMER and SWING lamps operate as follows (Table 6-1) according to the error contents.

Table 6-1

| Error contents | Error display | | |
|--|-----------------|---------------|----------------|
| | OPERATION (RED) | TIMER (GREEN) | SWING (ORANGE) |
| Indoor unit circuit board error | ○ | ○ | — |
| Room temperature thermistor or piping thermistor error (wire disconnected or broken) | 2 times ● | ○ | — |
| Indoor unit-outdoor unit miswiring | 5 times ● | ○ | — |
| Indoor unit fan error | 6 times ● | ○ | — |

○ : Fast flashing ● : Slow flashing — : Off

CAUTION

If the indoor units are connected with a capacity outside of the recommended range, the indoor units will not function and the indoor unit lamps will flash in the following error patterns.

7, 9, 12 type: OPERATION LAMP (red)....flashes fast, TIMER LAMP (green)....flashes 4 times slowly and goes off repeatedly

CHECK ITEMS

(1) INDOOR UNIT

- (1) Is operation of each button on the remote control unit normal?
- (2) Does each lamp light normally?
- (3) Do not air flow direction louvers operate normally?
- (4) Is the drain normal?
- (5) Is there any abnormal noise and vibration during operation?

(2) OUTDOOR UNIT

- (1) Is there any abnormal noise and vibration during operation?
- (2) Will noise, wind, or drain water from the unit disturb the neighbors?
- (3) Is there any gas leakage?

- Do not operate the air conditioner in the test running state for a long time.
- For the operation method, refer to the operating manual and perform operation check.

7 CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operating manual:

- (1) Starting and stopping method, operation switching, temperature adjustment, timer, air flow switching, and other remote control unit operations.
- (2) Air filter removal and cleaning, and how to use the air louvers.
- (3) Give the operating and installation instruction sheets to the customer.

8 REMOTE CONTROL UNIT INSTALLATION

CAUTION

① Check that the indoor unit correctly receives the signal from the remote control unit, then install the remote control unit holder.

- ② Select the remote control unit holder selection site by paying careful attention to the following: Avoid places in direct sunlight. Select a place that will not be affected by the heat from a stove, etc.

1. REMOTE CONTROL UNIT HOLDER INSTALLATION

- Install the remote control unit with a distance of 7 m between the remote control unit and the photocell as the criteria. However, when installing the remote control unit, check that it operates positively.
- Install the remote control unit holder to a wall, pillar, etc. with the tapping screw.

