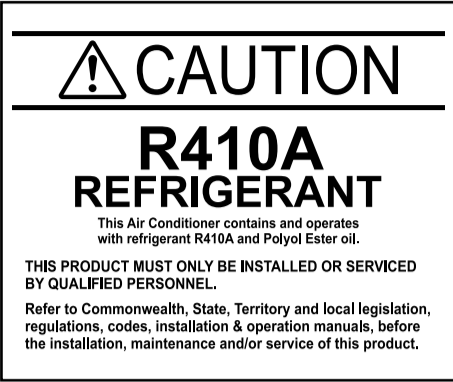


Refrigerant R410A

MULTI TYPE AIR CONDITIONER INSTALLATION INSTRUCTION SHEET

(PART NO. 9373498018)



For authorized service personnel only.

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:
- 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.
 - 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.]
 - 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.
 - 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.

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 3.9 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.

Nominal diameter (inch)	Outer diameter (mm)	Thickness (mm)
1/4	6.35	0.80
1/2	12.7	0.80

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.

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 air conditioner to operate satisfactorily, install 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) There is not extra refrigerant in the outdoor unit for air purging.
(8) Use a vacuum pump for R410A exclusively.
(9) Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.
(10) Use a clean gauge manifold and charging hose for R410A exclusively.
(11) 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 air conditioner is serviced or moved.

SELECTING THE MOUNTING POSITION

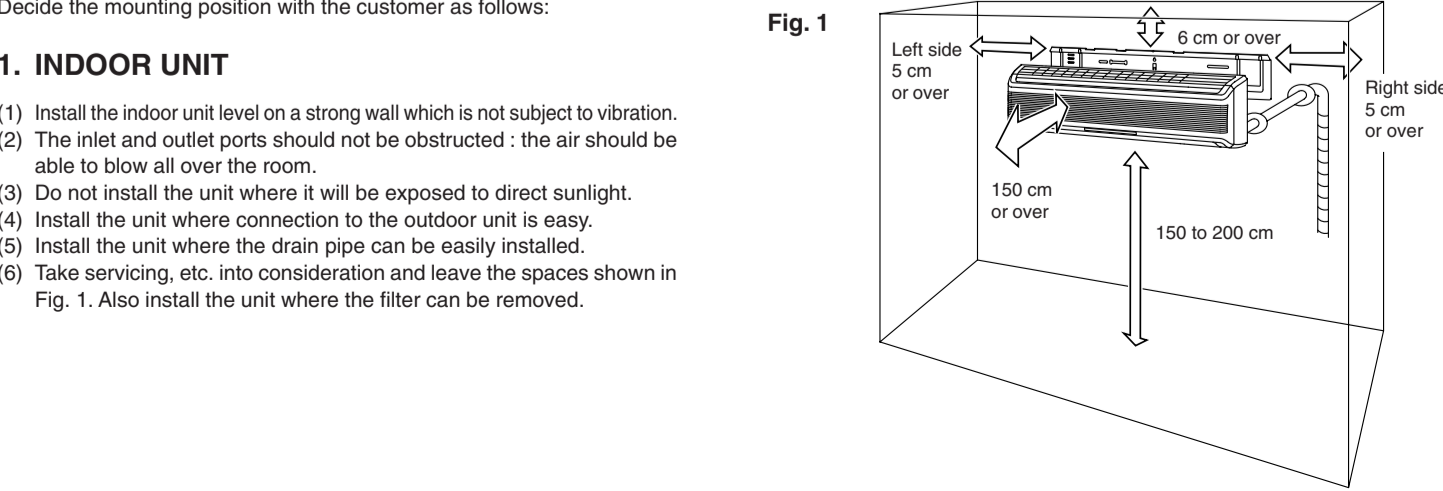
WARNING
Install at a place that can withstand the weight of the indoor and outdoor units and install positively so that the units will not topple or fall.

CAUTION
(1) 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:

1. INDOOR UNIT

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



STANDARD ACCESSORIES

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

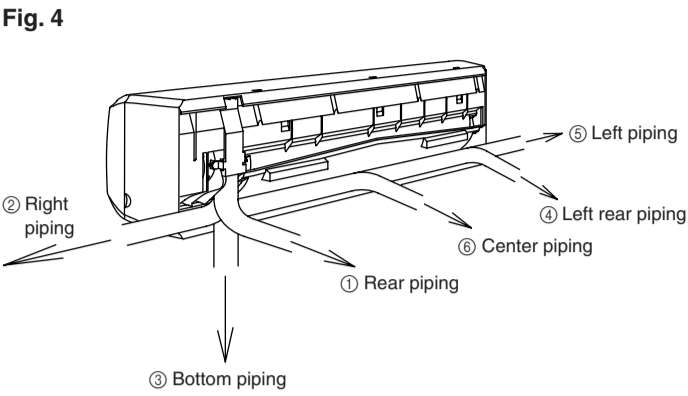
INDOOR UNIT ACCESSORIES

Name and Shape	Qty	Use
Wall hook bracket	1	For indoor unit installation
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
Tapping screw (big) (ø4 × 20)	12	For wall hook bracket installation
Tapping screw (small) (ø3 × 12)	2	For remote control unit holder installation
Air cleaning filter	2	For indoor unit
Air cleaning filter frame	2	For indoor unit

INSTALLATION PROCEDURE

1 INDOOR UNIT INSTALLATION

The piping can be connected in the six directions indicated by ①, ②, ③, ④, ⑤ and ⑥ in Fig. 4. When the piping is connected in direction ② or ③, cut along the piping groove in the side of the front panel with metal shears. When connecting the piping in direction ③, cut along the piping groove at the bottom of the front panel.

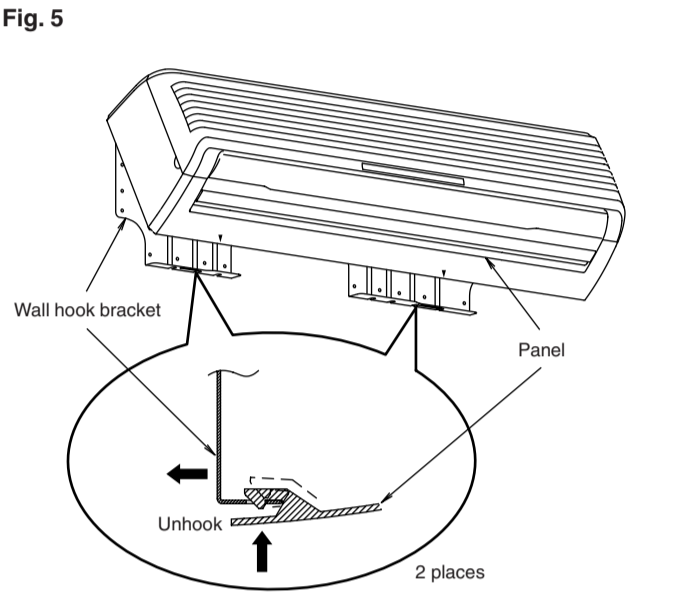


1. INSTALLING THE WALL HOOK BRACKET

[Removing THE WALL HOOK BRACKET]

Remove the wall hook bracket in the following order.

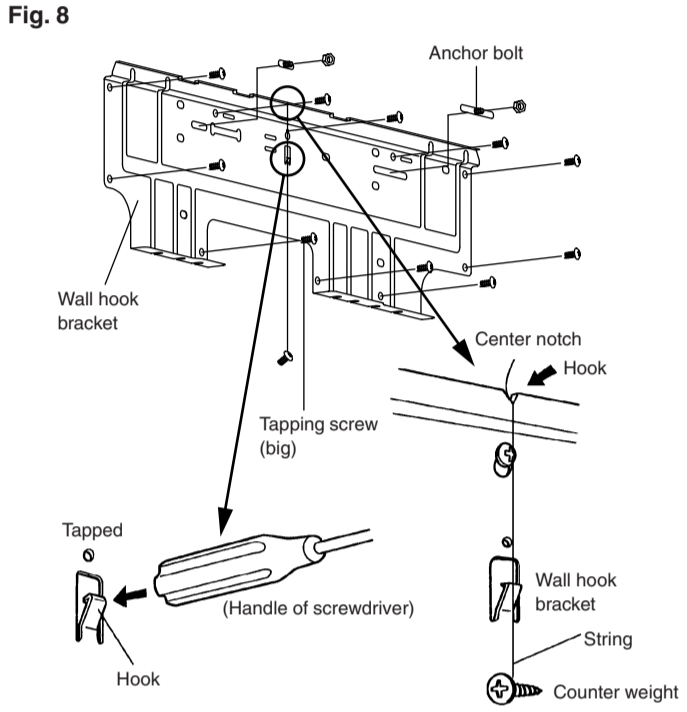
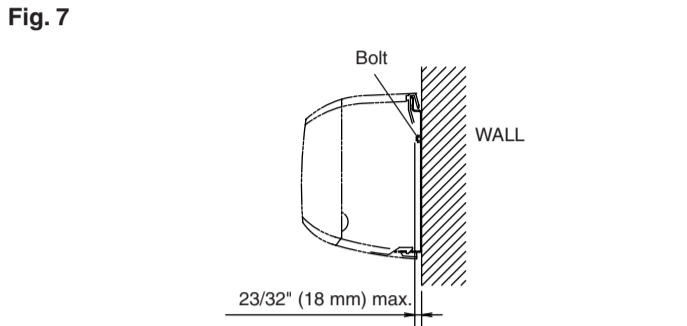
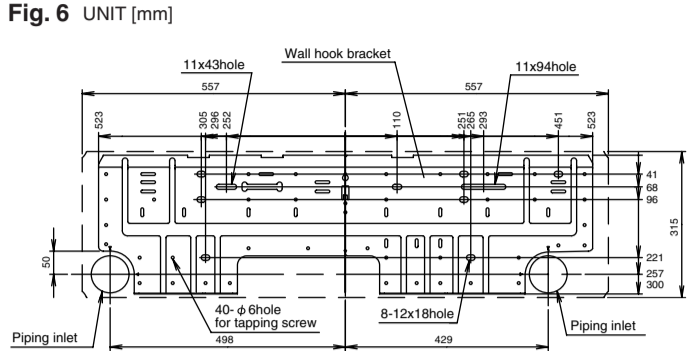
- Remove the hook inside the panel. (Fig. 5)
- Pull off the wall hook bracket.



[Installation directly to a wall]

- Before fastening the wall hook bracket to the wall with the screws, level it by tapping 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 and anchor bolts through the holes near the outer edge of the bracket.
 - Do not install the wall hook bracket at only one place or at an angle. For a concrete wall, embed anchor bolts (10 mm dia.) into the wall at the wall hook bracket holes (11 × 43 mm dia. and 11 × 94 mm dia. (Fig. 6)). Allow the anchor bolts to stick out at least 18 mm from the wall. (Fig. 7) Install the unit to the anchor bolts with nuts through the wall hook bracket. Use 2 bolts for concrete wall and 4 bolts for blister concrete wall (Fig. 8).
 - Finally tighten the bolts and tapping screws after confirming, using the level indicator, that the clamp is horizontal.

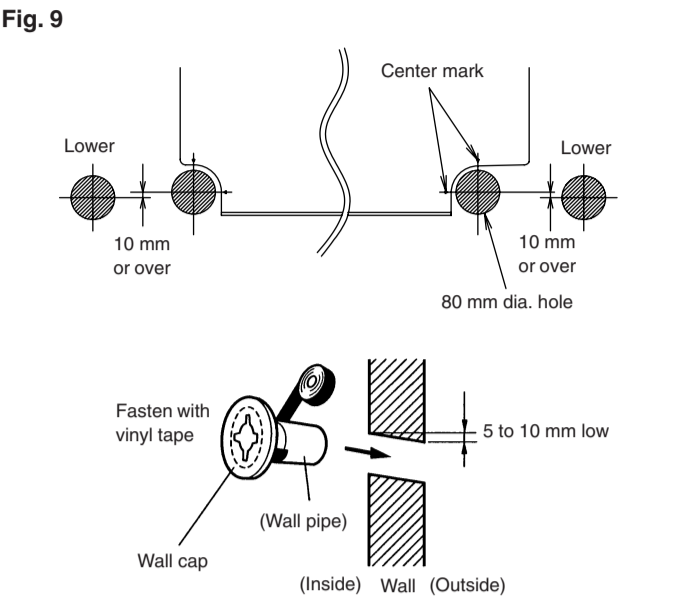
WARNING
(1) Install the wall hook bracket so that it is correctly positioned horizontally and vertically. If the wall hook bracket is tilted, water will drip to the floor.
(2) As the weight of the indoor unit is 15 to 18 kg (33 to 40 lbs), it should be installed after properly examining the place where it is intended to be installed. If the place is not strong enough, a plank or girder should be used to make the place sufficiently strong so that the wall can support the weight.



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.

- Cut a 80 mm diameter hole in the wall at the position shown in Fig. 9.
- 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.
- Cut the hole so that the outside end is lower (5 to 10 mm) than the inside end.
- Always align the center of the wall hole. If misaligned, water leakage will occur.
- Cut the wall pipe to match the wall thickness, stick it into the wall cap, fasten the cap with vinyl tape, and stick the pipe through the hole. (The connection pipe is supplied in the installation set.) (Fig. 9).
- For ③ left piping and ② right piping, cut the hole a little lower so that drain water will flow freely (Fig. 9).



3. ATTACH THE DRAIN HOSE

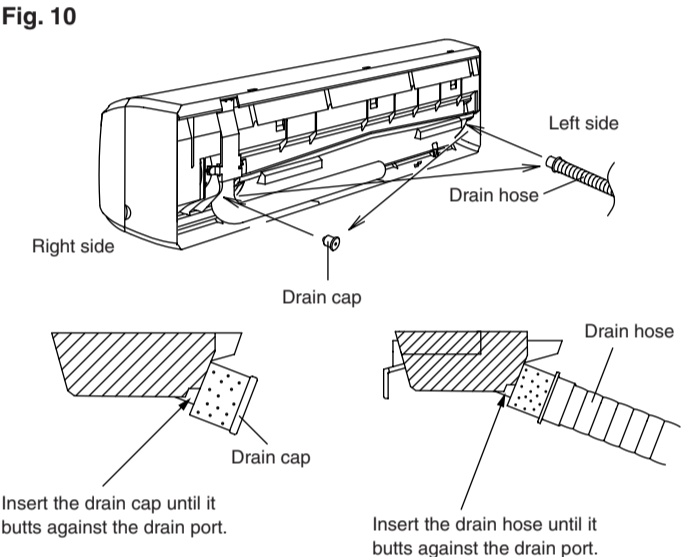
CAUTION
Insert the drain hose and drain cap into the drain port, making sure that it comes in contact with the back of the drain port, and then mount it. If the drain hose is not connected properly, leaking will occur.

[For ① Rear piping, ② Right piping and ③ Bottom piping]

- The drain hose and drain cap are used as they are.

[For ④ Left rear piping, ⑤ Left piping and ⑥ Center piping]

- Remove the drain cap and drain hose. Mount the drain cap and drain hose to the drain port on its opposite side.



- Piping work can be made easier by laying out, shaping, and temporarily fastening the connection pipe and connection cord as shown in Fig. 18 beforehand.

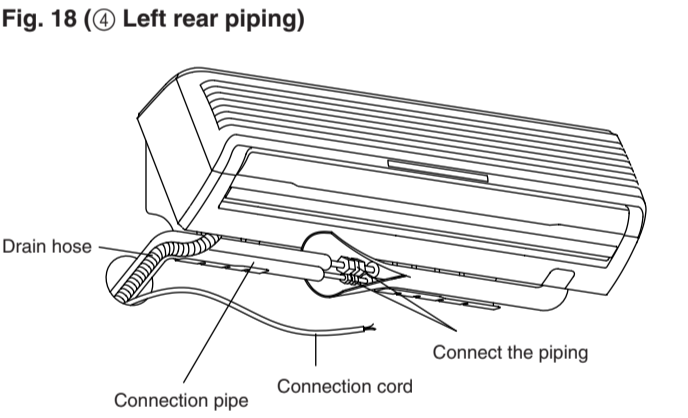
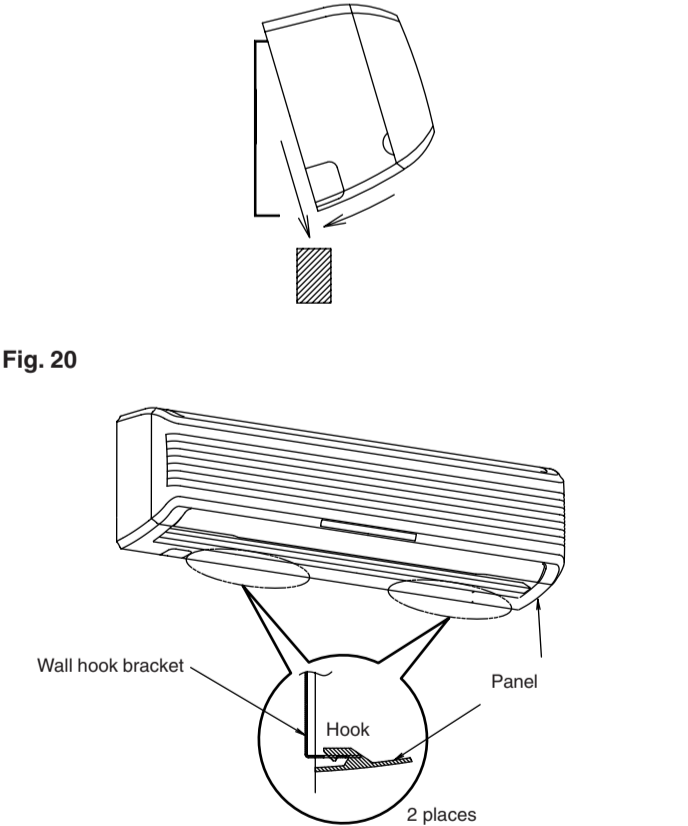


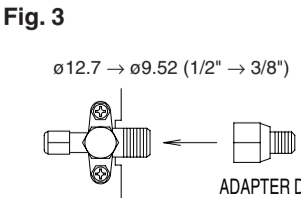
Fig. 19



- Method B
- Open the screw cover and intake grille. (Fig. 21)
 - Remove the seven tapping screws. (Fig. 22)
 - Remove the panel. (Fig. 23)
 - Mount the indoor unit to the wall hook bracket.
 - Apply a coat of refrigeration oil to the threaded connection port of the outdoor unit where the flare nut comes in.
 - Use an appropriate wrenches to avoid damaging the connection thread by overtightening the flare nut.
 - Apply wrenches on both of flare nut (local part), and ADAPTER to tighten them.

HOW TO USE ADAPTER (Connections port of outdoor unit)

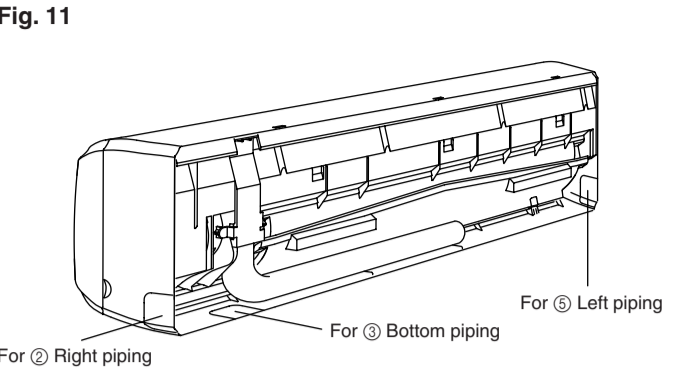
- When using the ADAPTER, be careful not to overtighten the nut, or the smaller pipe may be damaged.
- Apply a coat of refrigeration oil to the threaded connection port of the outdoor unit where the flare nut comes in.
- Use an appropriate wrenches to avoid damaging the connection thread by overtightening the flare nut.
- Apply wrenches on both of flare nut (local part), and ADAPTER to tighten them.



4. CUT-OUT FOR PIPING ON FRONT PANEL

[For ② Right piping, ③ Bottom piping and ⑥ Left piping]

- Use a metal shears or other cutting tool to cut along the groove in the plastic for the piping that will coming out of the front panel.

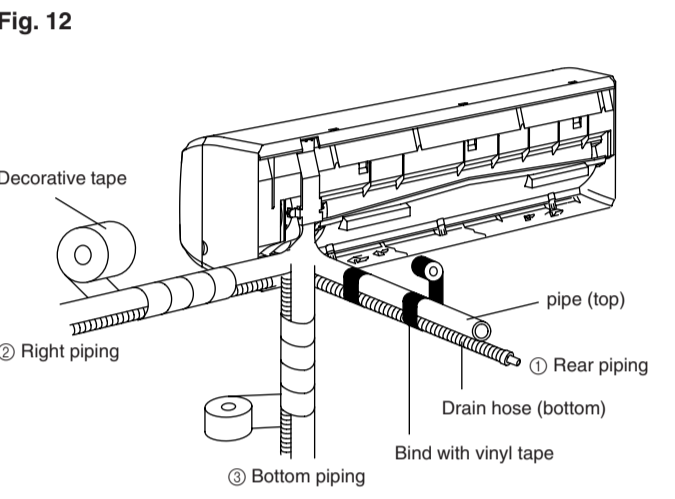


5. FORMING THE DRAIN HOSE AND PIPE

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 100 mm or over.
(3) If the pipe is bent repeatedly at the same place, it will break.

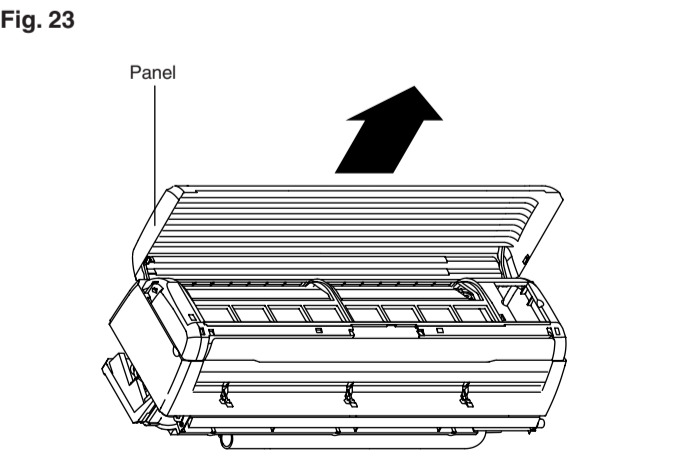
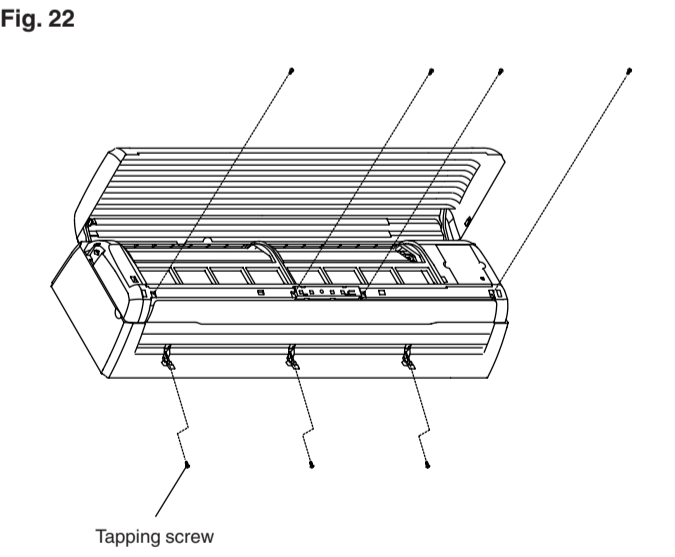
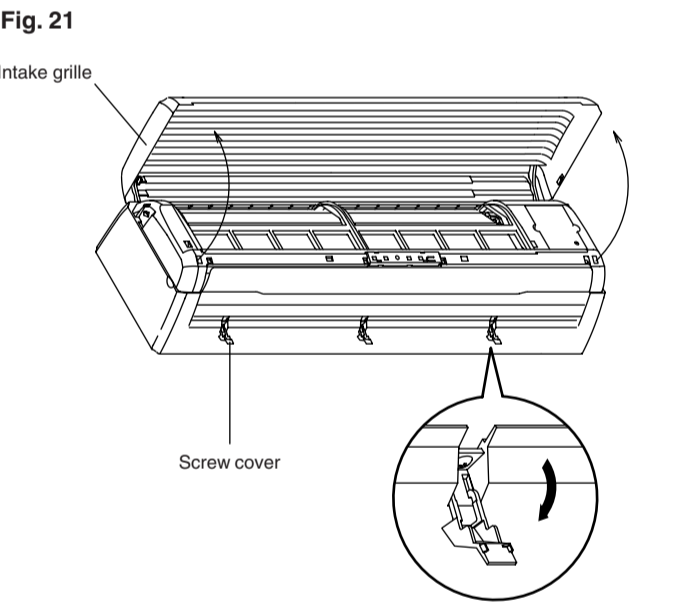
[For ① Rear piping, ② Right piping and ③ Bottom piping]

- Install the indoor unit piping in the direction of the wall hole and bind the drain hose and pipe together with vinyl tape (Fig. 12).
- Install the piping so that the drain hose is at the bottom.

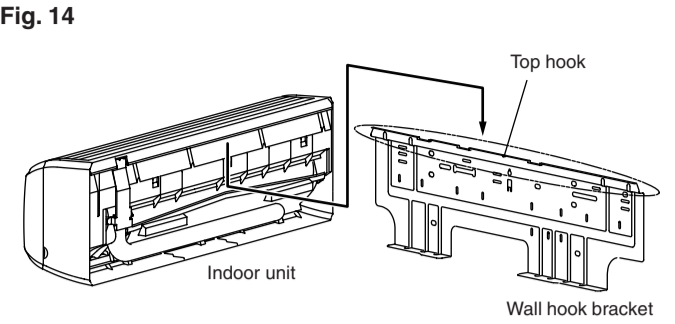


CAUTION
Do not wrap the tape too tightly on drain hose. If the tape is too tight (as shown in the Figure below) the insulation effect will be lost and the moisture from condensation may accumulate.

Fig. 13 Bad Example

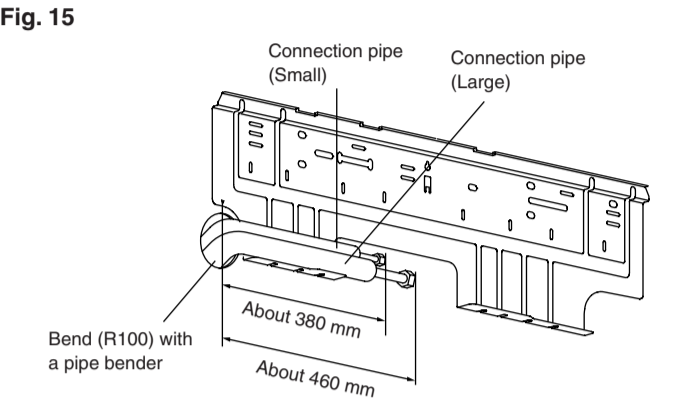


- Perform "ELECTRICAL WIRING" before performing this piping.
- Wrap the pipes of the indoor unit that are visible from the outside with decorative tape.
- After passing the indoor piping and drain hose through the wall hole, hang the indoor unit on the hooks at the top of the wall hook bracket.

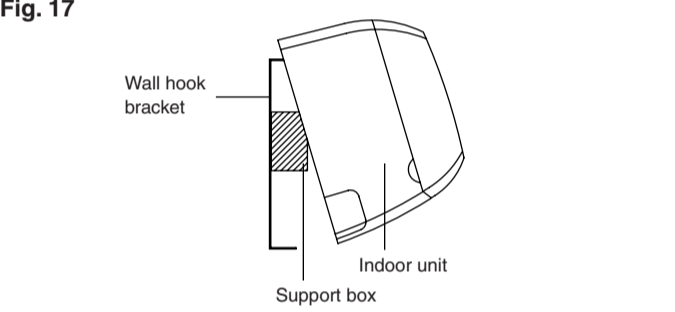
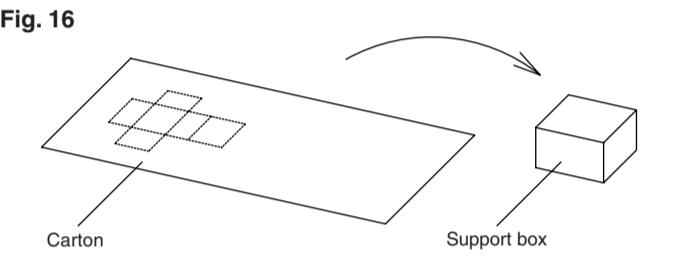
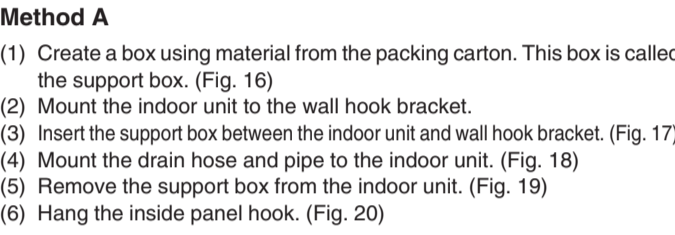


[For ④ Left rear piping, ⑤ Left piping and ⑥ Center piping]

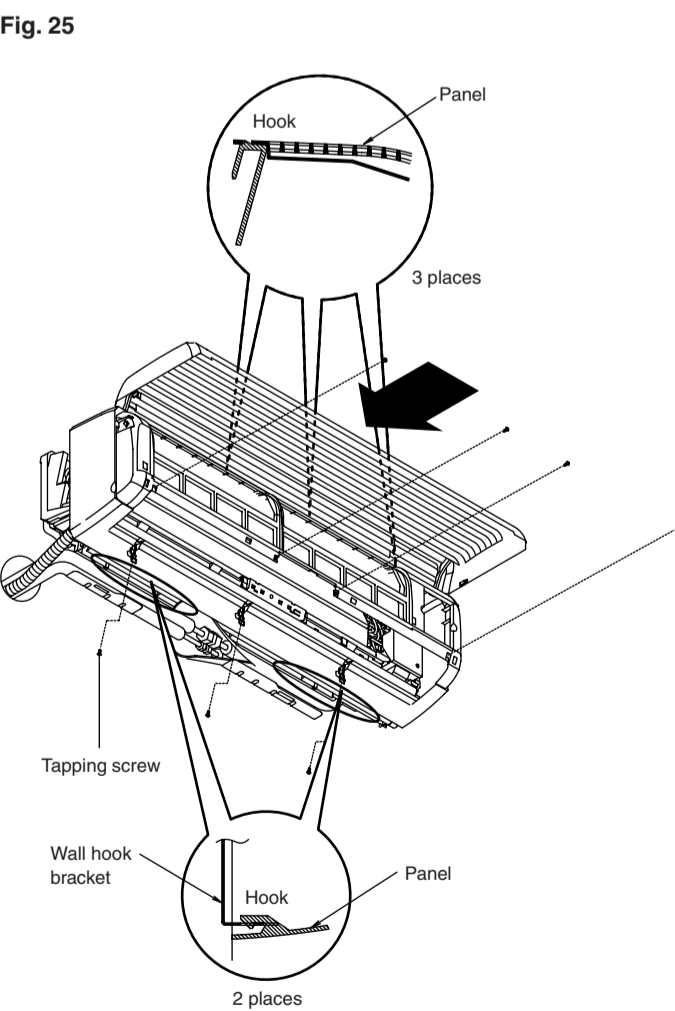
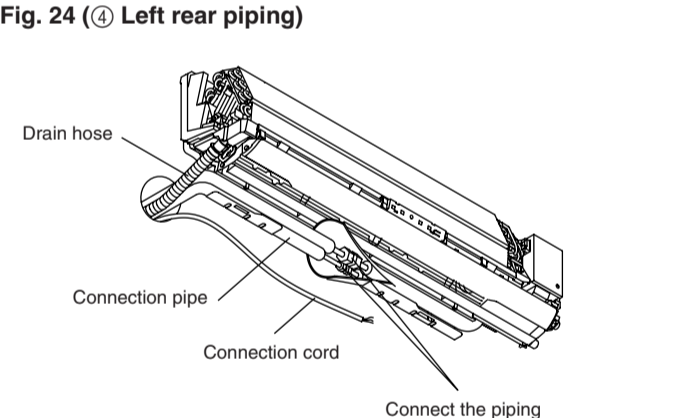
- For ④ Left rear piping, ⑤ Left piping and ⑥ Center piping, preset the end of the pipe to the dimensions shown in Fig. 15 and form the connection pipe.
- Bend the connection piping at a bend radius of at least 100 mm and position it no more than 50 mm from the wall.



- The two methods for mounting the drain hose and piping ③, ⑤ and ⑥ are as shown below. Please choose the most efficient method of installation.
Method A : Floating the panel method.
Method B : Removing the panel.



- Piping work can be made easier by laying out, shaping, and temporarily fastening the connection pipe and connection cord as shown in Fig. 24 beforehand.



⚠ CAUTION

The maximum lengths of this product are shown in Table 2 in outdoor unit's installation inspection sheet. If the units are further apart than this, correct operation can not be guaranteed.

- (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.

Check if [L] is flared uniformly and is not cracked or scratched.

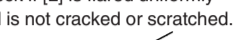


Diagram illustrating the inspection of a pipe end. The pipe is shown with a flared end. A dimension line labeled 'L' indicates the length of the flared section. A callout points to the flared edge with the text "Check if [L] is flared uniformly and is not cracked or scratched." To the right, a side view of the pipe shows a "Die" being used to flare the end. The die has a width 'B' and the pipe has a diameter 'A'.

Pipe outside diameter	B ^{+0 -0.4} (mm)
6.35 mm (1/4 in.)	9.1
9.52 mm (3/8 in.)	13.2
12.7 mm (1/2 in.)	16.6

Pipe outside diameter	A (mm)
	Flare tool for R410A, clutch type
6.35 mm (1/4 in.)	0 to 0.5
9.52 mm (3/8 in.)	0 to 0.5
12.7 mm (1/2 in.)	0 to 0.5

- (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.

- (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 by 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.)

Tighten with two wrenches.

Wrench (fixed)

Torque wrench

Flare nut

Indoor unit pipe

Connection pipe

CAUTION
R410A REFRIGERANT

To prevent gas leakage, coat the flare surface with refrigerant oil. (Use refrigerant oil that can be used with R410A refrigerant.)

Flare nut	Tightening torque
6.35 mm dia.	16 to 18 N-m (160 to 180 kgf-cm)
9.52 mm dia.	30 to 42 N-m (300 to 420 kgf-cm)
12.7 mm dia.	50 to 62 N-m (500 to 620 kgf-cm)

CAUTION

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

-
- the battery compartment lid.

- **Test running**
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 8) according to the error contents.

Error contents	Error display		
	OPERATION (RED)	TIMER (GREEN)	SWING (ORANGE)
Outdoor unit piping sensor error	○	● 3 times	—
Outdoor unit outdoor temperature sensor error	○	● 4 times	—
Outdoor unit discharge temperature sensor error	○	● 5 times	—
Outdoor unit IPM error	○	● 10 times	—
Outdoor unit Current Trance error	○	● 11 times	—
Outdoor unit Active filter error	○	● 12 times	—
Outdoor unit fan motor error	○	● 14 times	—
Outdoor unit 2-way valve sensor error	○	—	● 2 times
Connecting indoor unit information error	○	—	● 4 times
Outdoor unit circuit board error	○	—	● 5 times
Indoor unit room temperature sensor error	● 2 times	○	—
Indoor unit piping sensor error	● 3 times	○	—
Outdoor unit circuit board error or miss wiring between outdoor unit and indoor unit	● 5 times	○	—
Indoor unit fan motor error	● 6 times	○	—

- (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?

- 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.

 WARNING	
(1)	Before starting work, check that power is not being supplied to indoor unit and the outdoor unit.
(2)	Match the terminal block numbers and connection cord colors of the indoor unit and 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) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (15/16") to expose the solid wire.
- (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
- (3) Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
- (4) Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

- (1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm (3/8") to expose the strand wiring.
- (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
- (3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
- (4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

A. Solid wire

Strip 25 mm (1 5/16")

Insulation

Loop

B. Strand wire

Strip 10 mm (3/8")

Round terminal

Screw with special washer

Wire

Terminal block

Terminal board

Wire

Round terminal

Screw with special washer

Control box cover

Diagram illustrating the internal wiring connections. The connection cord is plugged into the terminal block. The earth screw is connected to the ground terminal.

- (1) Insulate between pipes.
 - For ① Rear, ② Right, and ③ 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. (Fig. 32)
 - For ④ Left rear and ⑤ Left piping, butt the connection pipe heat insulation and indoor unit pipe heat insulation together and bind them with vinyl tape so that there is no gap. (Fig. 33)

Overlap the insulation.

Connection pipe (heat insulation)

Indoor unit pipe (heat insulation)

Vinyl tape

Bind the pipes together so that there is no gap.

- For ④ Left rear piping, ⑤ Left piping and ⑥ Center piping, wrap the area which accommodates the rear piping housing section with cloth tape.

- For ④ Left rear piping, ⑤ Left piping and ⑥ Center piping bind the connection cord to the top of the pipe with vinyl tape.

A diagram illustrating the connection of a connection cord to a pipe. The connection cord is shown entering the pipe and is secured by a band of vinyl tape wrapped around the pipe's exterior.

Check that:

- When connected from the left rear, the drain hose is at the bottom left of the wall pipe.

(For connection from the left rear)

(View from indoors)

Connection cord

Drain hose

Wall pipe

Connection pipe

⚠ CAUTION

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

- 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 (Fig. 42).

Remote control unit holder fixing

Remote control unit holder

Tapping screw (small)

Remote control unit mounting

① Set

② Push

Remote control unit

Fig. 43

Indoor unit circuit board

DIP-SW

1

2

3

4

OFF ON

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 manual and installation instruction sheet to the customer.

DIP-SW		Remote control unit signal code
DIP-SW3	DIP-SW4	
ON	ON	A (Primary setting)
OFF	ON	B
ON	OFF	C
OFF	OFF	D