

AIR CONDITIONER INSTALLATION INSTRUCTION SHEET FOR INDOOR UNIT

(PART NO. 9374824014)



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.

CAUTION
This installation instruction sheet describes how to install the indoor unit only. To install the outdoor unit, refer to the installation instruction sheet included with the outdoor unit.

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 conventional refrigerant, 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 that in the Table 1 even when it is available on the market.

Table 1 Thicknesses of Annealed Copper Pipes		
Outer diameter mm (inch)	Thickness (mm)	
6.35 (1/4)	0.80	
9.52 (3/8)	0.80	
12.7 (1/2)	0.80	
15.88 (5/8)	1.00	

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.

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) (64 x 20) 	12	For wall hook bracket installation
Tapping screw (small) (63 x 12) 	2	For remote control unit holder installation
Air cleaning filter 	2	For indoor unit
Air cleaning filter frame 	2	For indoor unit

CONNECTION PIPE REQUIREMENT

Model	Diameter	
	Small	Large
18 TYPE	6.35 mm (1/4 in.)	12.7 mm (1/2 in.)
24, 30 TYPE	9.52 mm (3/8 in.)	15.88 mm (5/8 in.)

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.

ELECTRICAL REQUIREMENT

- Electric wire size and fuse capacity:

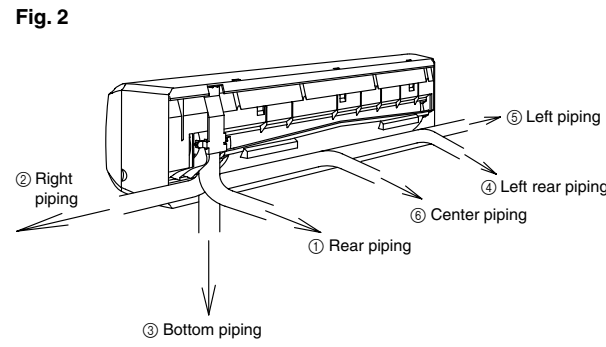
Connection cord (mm ²)	MAX.	2.5
	MIN.	1.5

- Install the disconnect device with a contact gap of at least 3 mm nearby the units. (Both indoor unit and outdoor unit)
- Always make the air conditioner power supply a special branch circuit and provide a special breaker.
- Always use H07RN-F or equivalent as the connection cord.

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. 2. 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.

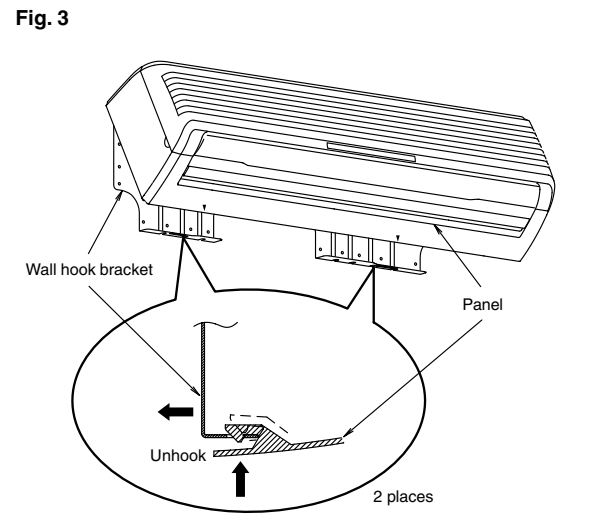


1. INSTALLING THE WALL HOOK BRACKET

[Removing THE WALL HOOK BRACKET]

Remove the wall hook bracket in the following order.

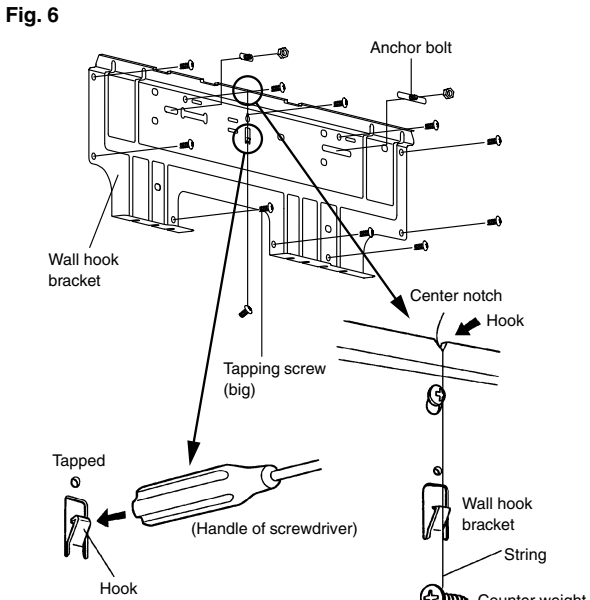
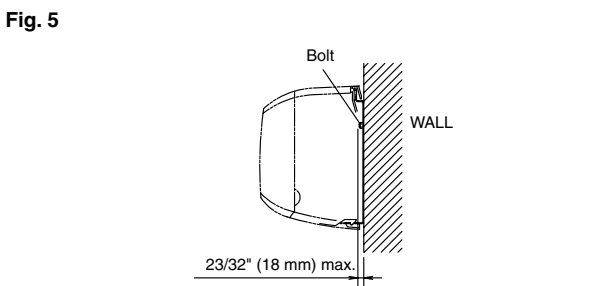
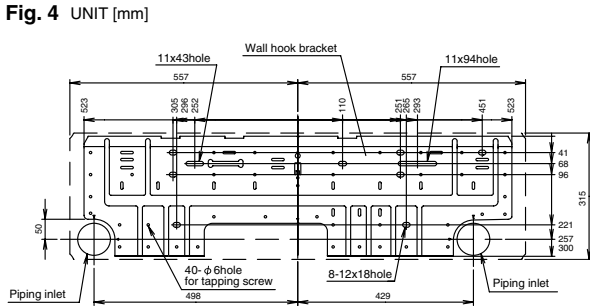
- Remove the hook inside the panel. (Fig. 3)
- Pull off the wall hook bracket.



[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 x 43 mm dia. and 11 x 94 mm dia. (Fig. 4)). Allow the anchor bolts to stick out at least 18 mm from the wall. (Fig. 5) 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. 6).
- Finally tighten the bolts and tapping screws after confirming, using the level indicator, that the clamp is horizontal.

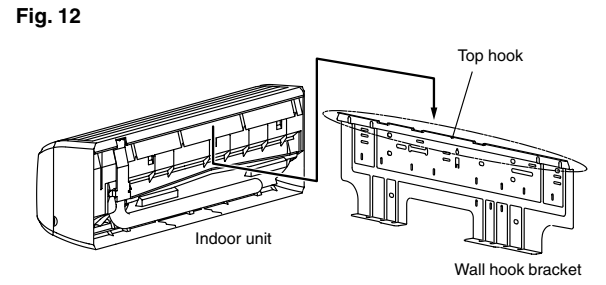
WARNING
(1) Install the wall hook bracket so that it is correctly positioned horizontally and vertically. If the wall hook bracket is tilted, water will drip to the floor.
(2) As the weight of the indoor unit is 15 to 18 kg (33 to 40 lbs), it should be installed after properly examining the place where 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.



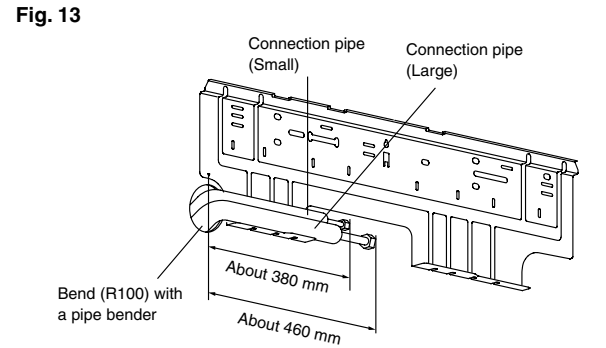
2. CUTTING THE HOLE IN THE WALL FOR THE CONNECTING PIPING

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

- 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.

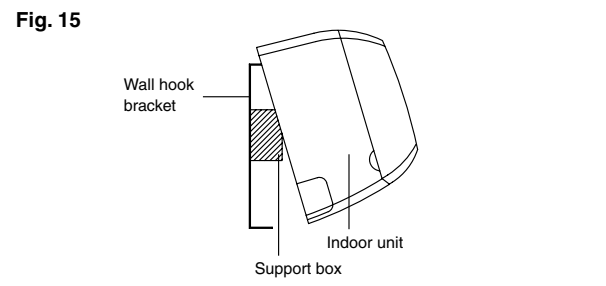
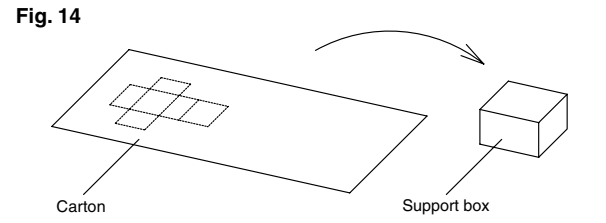


- [For ④ Left rear piping, ⑤ Left piping and ⑥ Center piping]
- For ④ Left rear piping, ⑤ Left piping and ⑥ Center piping, preset the end of the pipe to the dimensions shown in Fig. 13 and form the connection pipe.
- Bend the connection piping at a bend radius of at least 100 mm and position it no more than 50 mm from the wall.

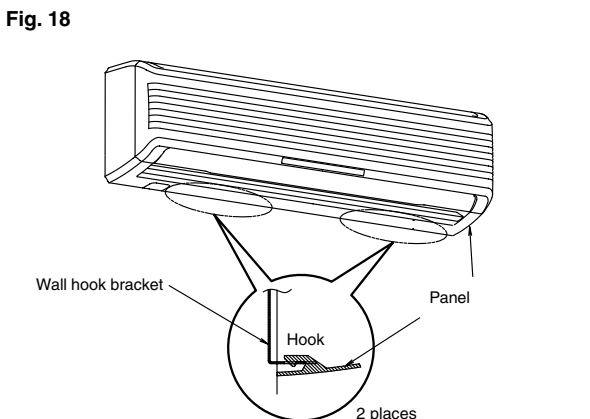
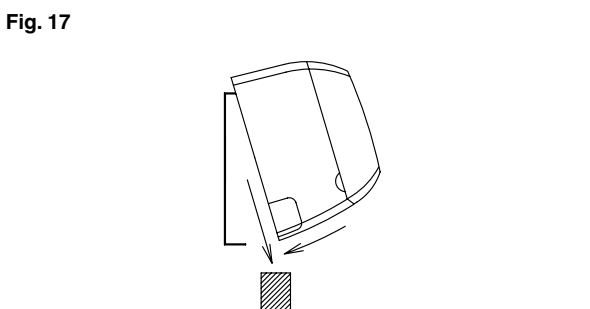
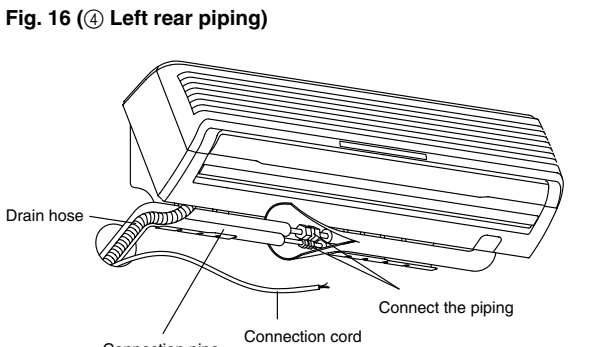


- The two methods for mounting the drain hose and piping ③, ④ and ⑤ are as shown below. Please choose the most efficient method of installation. Method A : Floating the panel method. Method B : Removing the panel.

Method A
(1) Create a box using material from the packing carton. This box is called the support box. (Fig. 14)
(2) Mount the indoor unit to the wall hook bracket.
(3) Insert the support box between the indoor unit and wall hook bracket. (Fig. 15)
(4) Mount the drain hose and pipe to the indoor unit. (Fig. 16)
(5) Remove the support box from the indoor unit. (Fig. 17)
(6) Hang the inside panel hook. (Fig. 18)

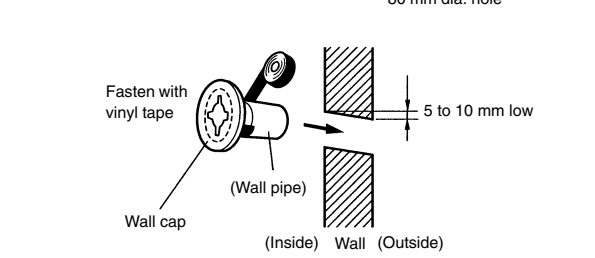
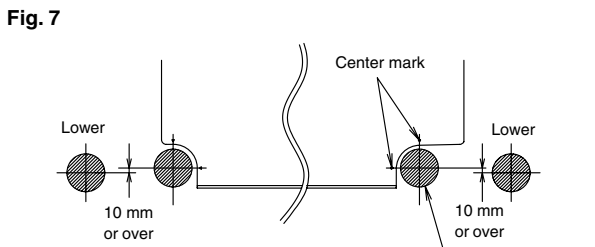


- Piping work can be made easier by laying out, shaping, and temporarily fastening the connection pipe and connection cord as shown in Fig. 16 beforehand.



Method B
(1) Open the screw cover and intake grille. (Fig. 19)
(2) Remove the seven tapping screws. (Fig. 20)
(3) Remove the panel. (Fig. 21)
(4) Mount the indoor unit to the wall hook bracket.
(5) Mount the drain hose and pipe to the indoor unit. (Fig. 22)
(6) Hang the inside panel hook and then mount the panel and secure it with seven tapping screws. (Fig. 23)

- Cut a 80 mm diameter hole in the wall at the position shown in Fig. 7.
- 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. 7).
- For ⑤ left piping and ⑥ right piping, cut the hole a little lower so that drain water will flow freely (Fig. 7).

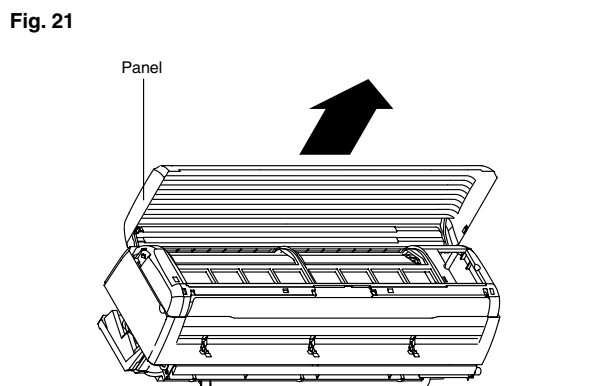
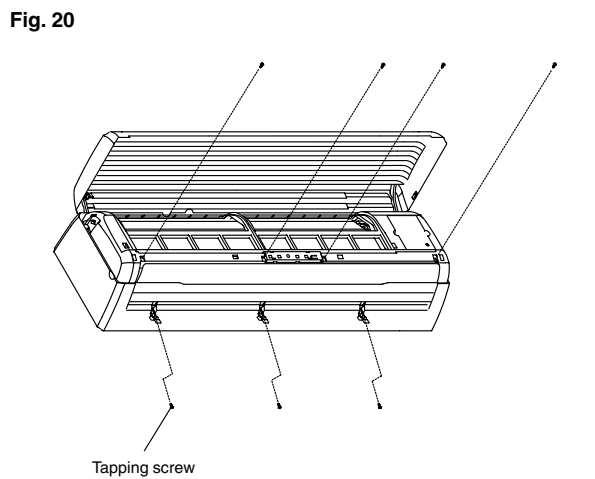
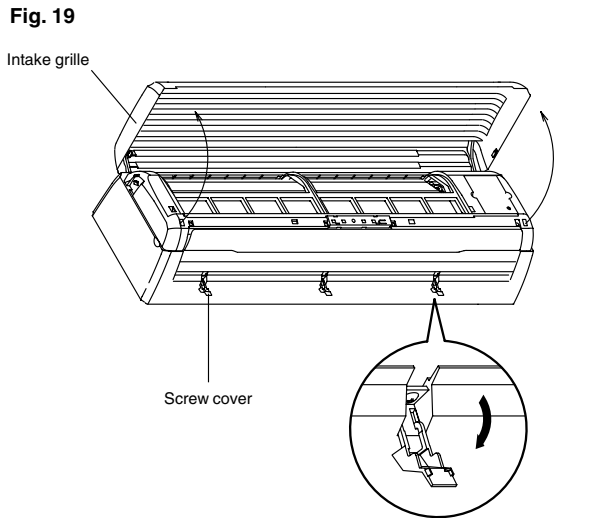
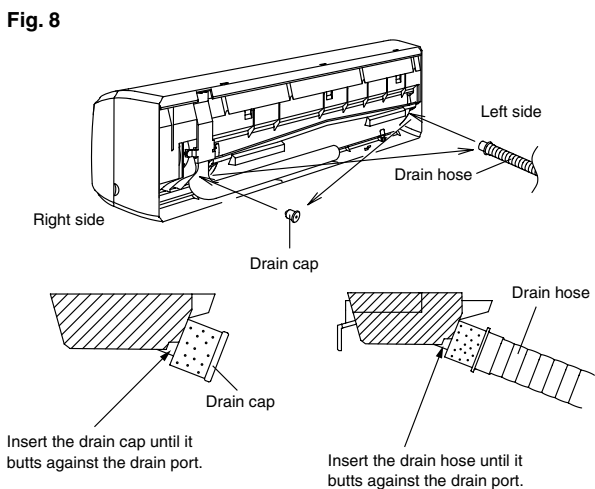


3. ATTACH THE DRAIN HOSE

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.

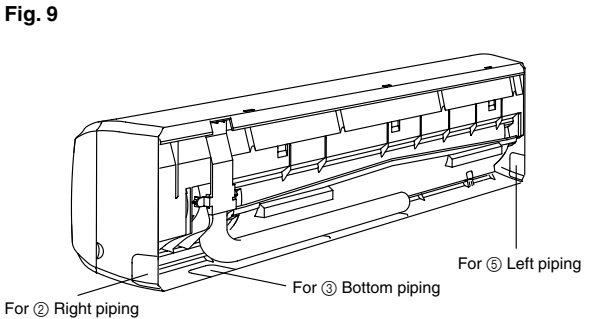
- [For ① Rear piping, ② Right piping and ③ Bottom piping]
- The drain hose and drain cap are used as they are.

- [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.



4. CUT-OUT FOR PIPING ON FRONT PANEL

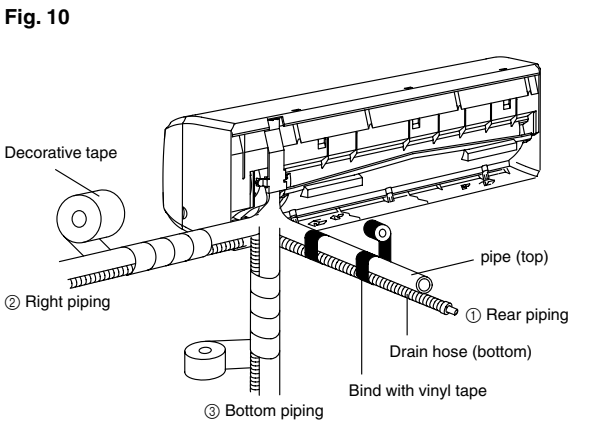
- [For ② Right piping, ③ Bottom piping and ④ Left piping]
- Use a metal shears or other cutting tool to cut along the groove in the plastic for the piping that will coming out of the front panel.



5. FORMING THE DRAIN HOSE AND PIPE

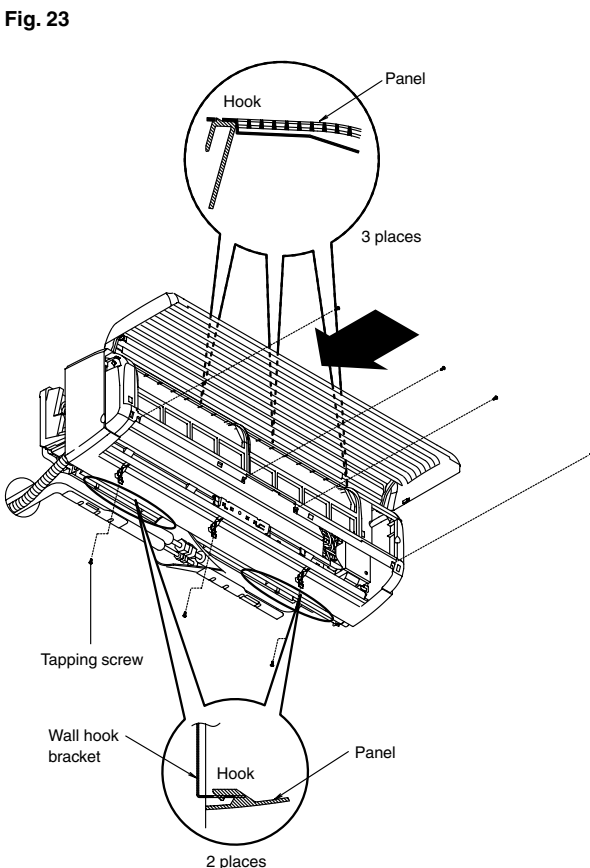
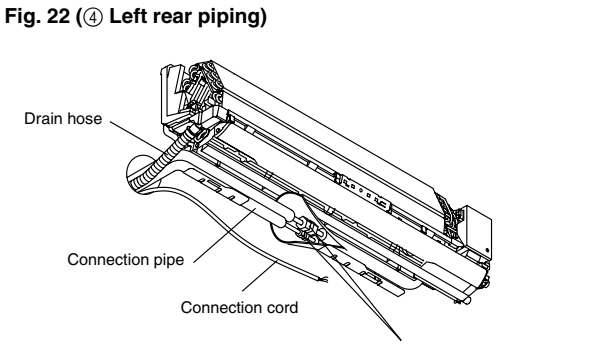
CAUTION
(1) Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.
(2) To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 100 mm or over.
(3) If the pipe is bent repeatedly at the same place, it will 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. 10).
- 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. 11 Bad Example
Vinyl Tape Too Tight

- Piping work can be made easier by laying out, shaping, and temporarily fastening the connection pipe and connection cord as shown in Fig. 22 beforehand.



2 CONNECTING THE PIPING

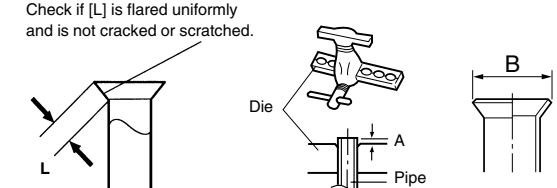
CAUTION

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. 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.

Fig. 24



Pipe outside diameter	B $\frac{1}{8}$ (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
15.88 mm (5/8 in.)	19.7

When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in Table 5 (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

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
15.88 mm (5/8 in.)	0 to 0.5

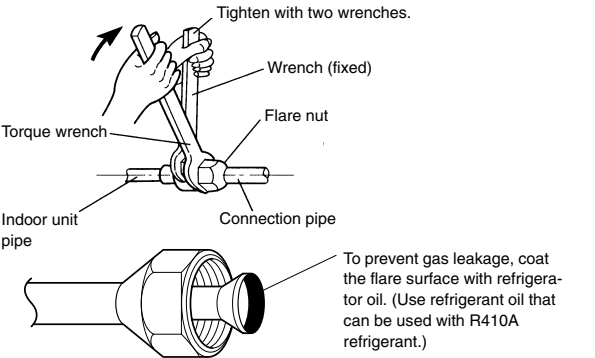
2. BENDING

- (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.)

Fig. 25



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)
12.7 mm dia.	50 to 62 N·m (500 to 620 kgf·cm)
15.88 mm dia.	63 to 77 N·m (630 to 770 kgf·cm)

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

3 ELECTRICAL WIRING

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.

HOW TO CONNECT WIRING TO THE TERMINALS

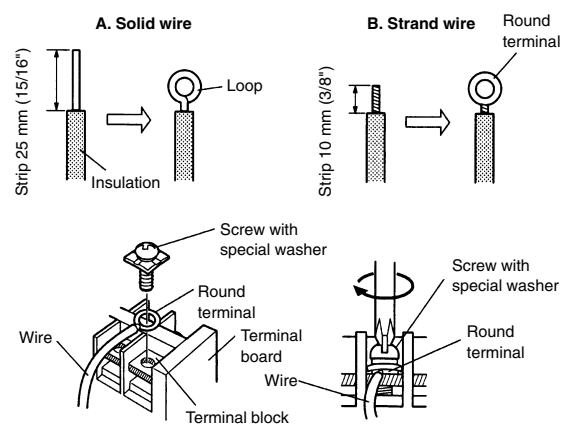
A. For solid core wiring (or F-cable)

- (1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (1 5/16") 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.

B. For strand wiring

- (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.

Fig. 26



- (1) Open the intake grille. Remove the tapping screw for the control box cover and remove the control box cover. (Fig. 27)
- (2) Remove the tapping screw and while minding the cord holder hook, remove the cord holder. (Fig. 28)
- (3) Connect the end of the connection cord fully into the terminal block. (Fig. 29)

Fig. 27

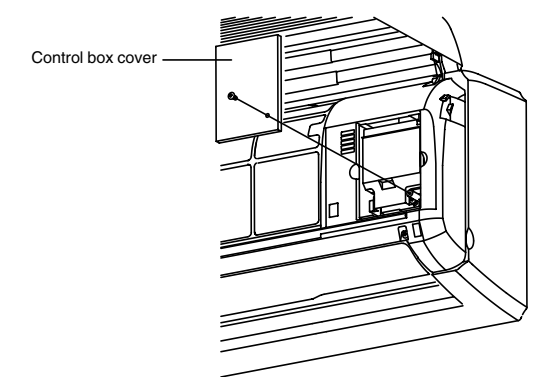


Fig. 28

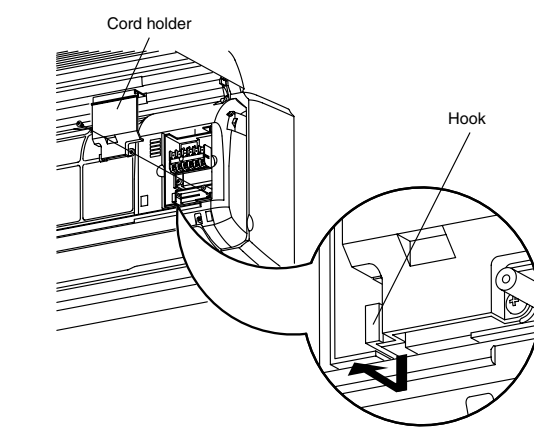
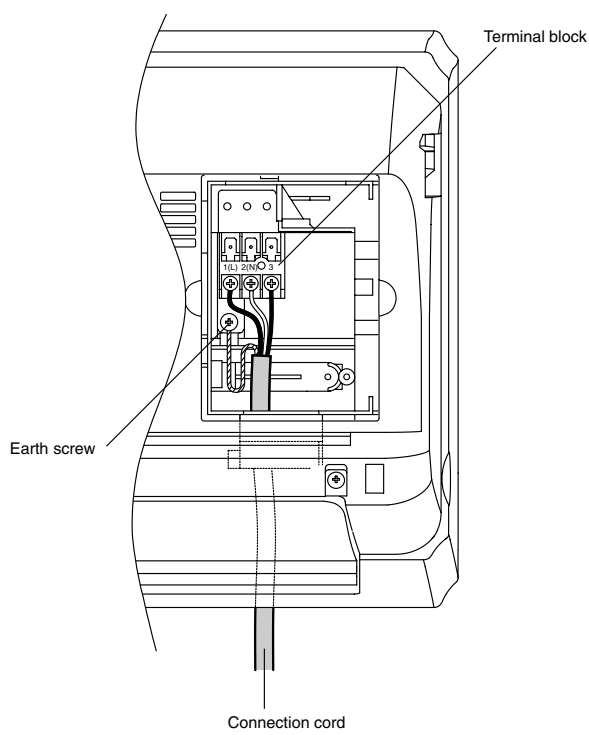


Fig. 29

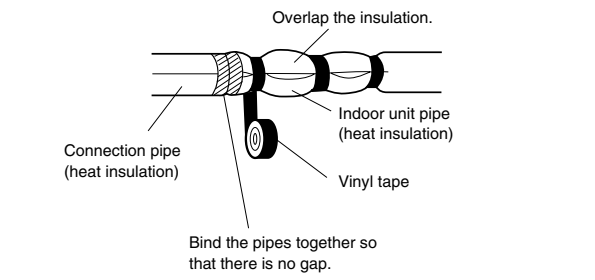


4 FINISHING

1. CONNECTION PIPE, CORD AND DRAIN HOSE

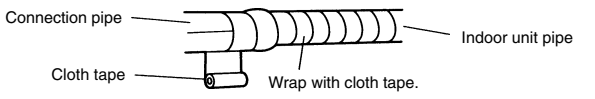
- (1) Insulate between pipes.
 - For ① Rear, ② Right, and ③ Bottom piping, overlap the connection pipe heat insulation and indoor unit pipe heat insulation and bind them with vinyl tape so that there is no gap. (Fig. 30)
 - For ④ Left rear and ⑤ Left piping, butt the connection pipe heat insulation and indoor unit pipe heat insulation together and bind them with vinyl tape so that there is no gap. (Fig. 31)

Fig. 30 ① Rear, ② Right, and ③ Bottom piping



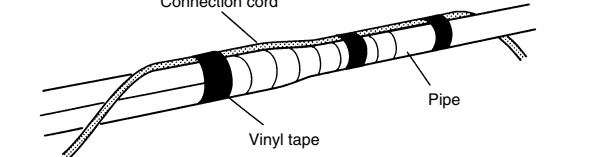
- For ④ Left rear piping, ⑤ Left piping and ⑥ Center piping, wrap the area which accommodates the rear piping housing section with cloth tape.

Fig. 31 ④ Left rear piping, ⑤ Left piping and ⑥ Center piping



- 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.

Fig. 32

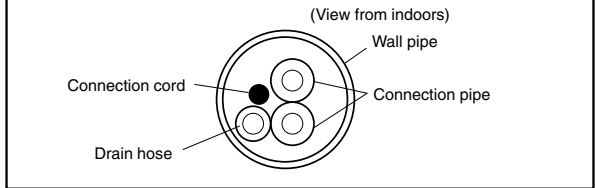


Check that:

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

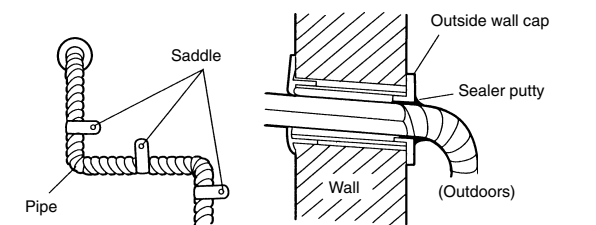
Fig. 33

(For connection from the left rear)



- (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.

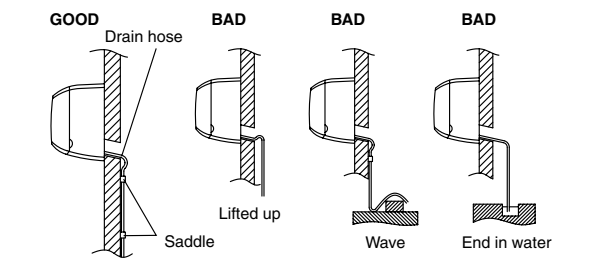
Fig. 34



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

Fig. 35

Check the following:



2. INSTALLING FINAL PARTS

- (1) Secure the cord holder with lapping screw. (Fig. 34)
- (2) Secure the control box cover and lapping screw. (Fig. 36)
- (3) Close the intake grille. (Fig. 37)

Fig. 36 ① Rear piping

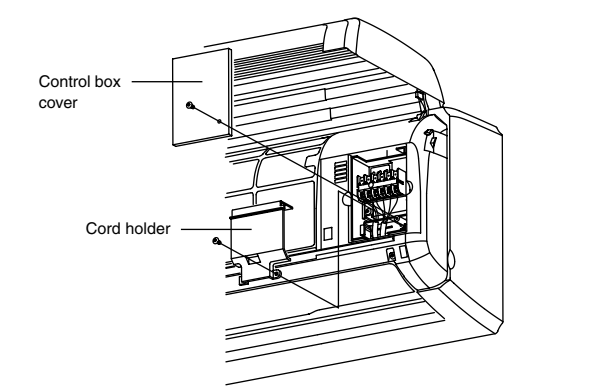
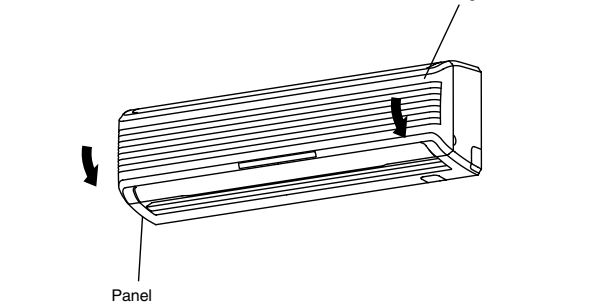


Fig. 37



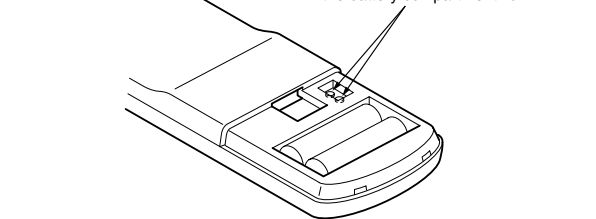
5 TEST RUNNING

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).

Fig. 39



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

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.

- Error

The OPERATION, TIMER and SWING lamps operate as follows (Table 7) 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 pressure switch error	○	● 5 times	—
Outdoor unit IPM error	○	● 10 times	—
Outdoor unit fan motor error	○	● 14 times	—
Outdoor unit 2-way valve sensor error	○	—	● 2 times
Outdoor unit 3-way valve sensor error	○	—	● 3 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	○	—

○ : Fast flashing ● : Slow flashing — : Off

CHECK ITEMS

- (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.

6 REMOTE CONTROL UNIT INSTALLATION

CAUTION

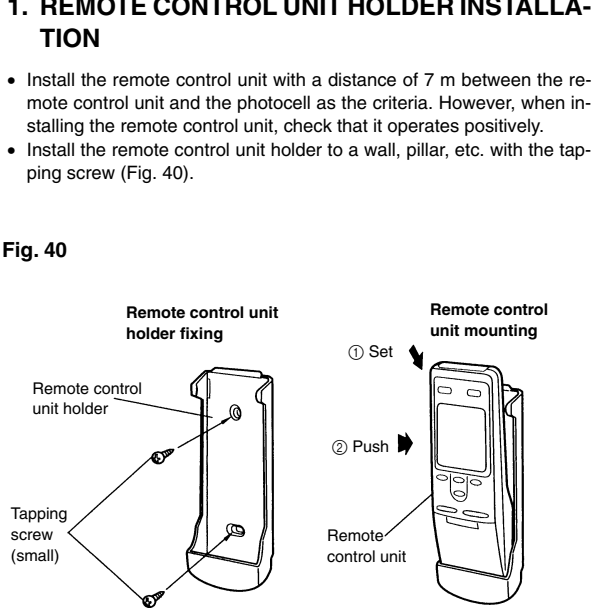
(1) Check that the indoor unit correctly receives the signal from the remote control unit, then install the remote control unit holder.

(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 (Fig. 40).

Fig. 40



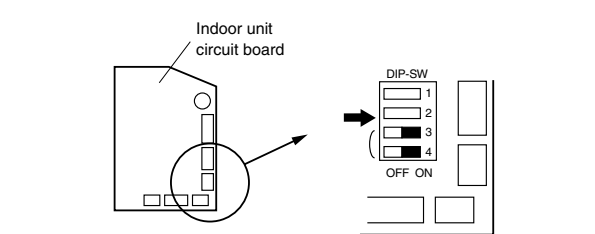
2. SWITCHING REMOTE CONTROL UNIT SIGNAL CODES

• Air conditioner settings

- Confirm the setting of the remote control unit signal code and the printed circuit board setting. If these are not confirmed, the remote control unit cannot be used to operate for the air conditioner.

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

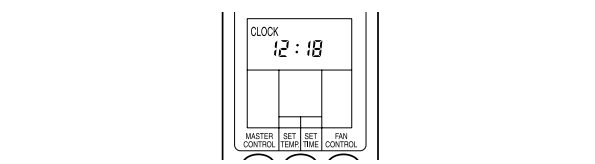
Fig. 41



• Remote control unit settings

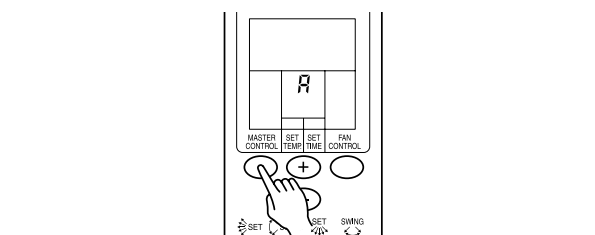
- (1) Press the START/STOP button and display only the clock.

Fig. 42



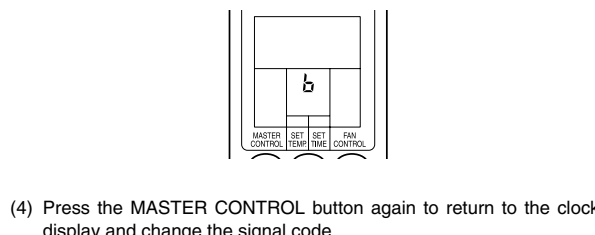
- (2) Press the MASTER CONTROL button continuously for more than five seconds to display the current signal code.

Fig. 43



- (3) Change the signal code with the < > button (A - B - C - D).

Fig. 44



- (4) Press the MASTER CONTROL button again to return to the clock display and change the signal code.

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 manual and installation instruction sheet to the customer.