

INSTALLATION MANUAL

Refrigerant
R407C



Cassette Type

SPLIT TYPE AIR CONDITIONER

(PART NO. 9364130019)

This air conditioner uses new refrigerant HFC (R407C).

For authorized service personnel only.

 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.




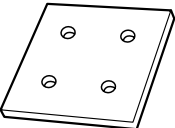
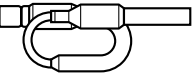
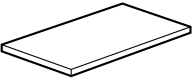
WARNING

- (1) For the air conditioner to operate satisfactorily, install it as outlined in this installation manual.
- (2) Connect the indoor unit and outdoor unit with the room air conditioner piping and cords available from our standard parts. This installation manual 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) 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.
- (5) Do not turn on the power until all installation work is complete.

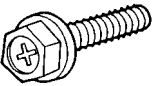



- Be careful not to scratch the air conditioner when handling it.
- After installation, explain correct operation to the customer, using the operating manual.
- Let the customer keep this installation manual because it is used when the air conditioner is serviced or moved.

STANDARD PARTS

The following installation parts are furnished.
Use them as required.

INDOOR UNIT ACCESSORIES		
Name and Shape	Q'ty	Application
Coupler heat insulation 	2	For indoor side pipe joint
Special nut A (large flange) 	4	For installing indoor unit
Special nut B (small flange) 	4	For installing indoor unit
Template 	1	For ceiling hole cutting
Indoor capillary tube 	1	
BR sheet 	2	65 x 130 x T5

GRILLE ACCESSORIES

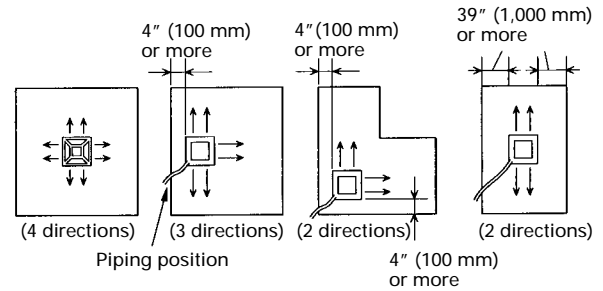
Bolt 	4	For mounting grille
Washer 	4	For mounting grille
Spring washer 	4	For mounting grille
Blower cover insulation 	2	For discharged air

SELECTING THE MOUNTING POSITION

Especially, the installation place is very important for the split type air conditioner because it is very difficult to move from place to place after the first installation. Decide the mounting position together with the customer as follows:

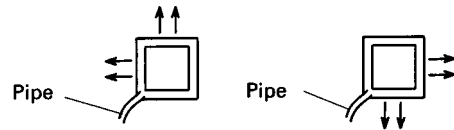
The discharge direction can be selected as shown below.

Fig. 1



CAUTION

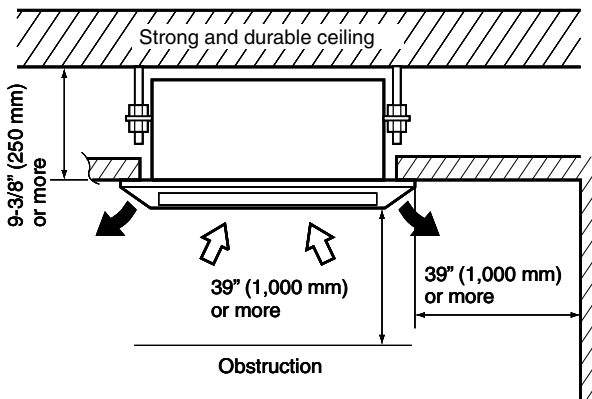
Since 2-way outlet as shown below causes performance problems, do not set it.



INDOOR UNIT

- (1) Install the indoor unit on a place having a sufficient strength so that it withstands against the weight of the indoor unit.
- (2) The inlet and outlet ports should not be obstructed; the air should be able to blow all over the room.
- (3) Leave the space required to service the air conditioner (Fig. 2).
- (4) The ceiling rear height is 9-3/8 inches (250 mm) or more.
- (5) A place from where the air can be distributed evenly throughout the room by the unit.
- (6) A place from where drainage can be extracted out doors easily.

Fig. 2



CONNECTION PIPE REQUIREMENT

Table 1

Diameter	
Small	Large
6.35 mm (1/4 in)	12.7 mm (1/2 in)

- ¥ Use 0.7 mm to 1.2 mm thick pipe.
- ¥ Use pipe with water-resistant heat insulation.
- ¥ Use pipe that can withstand a pressure of 3,040 kPa.

ELECTRICAL REQUIREMENT

Table 2

Connection cord (mm ²)	MAX	2.5
	MIN	1.5

- ¥ Always use H07RN-F or equivalent as the cord.
- ¥ Install the disconnection device with a contact gap of at least 3 mm nearby the units (Both indoor unit and outdoor unit).

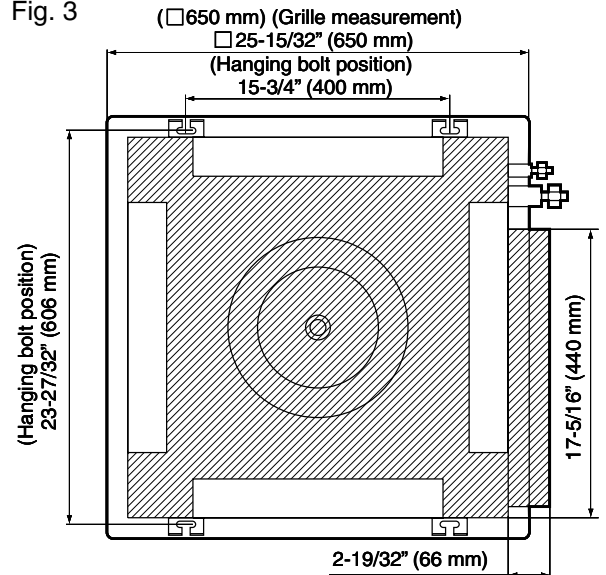
INSTALLATION PROCEDURE

Install the air conditioner as follows:

1. INDOOR UNIT INSTALLATION

1. POSITION THE CEILING HOLE AND HANGING BOLTS

Fig. 3



2. HANGING PREPARATIONS

Firmly fasten the hanging bolts as shown in Fig. 4 or by another method.

Fig. 4

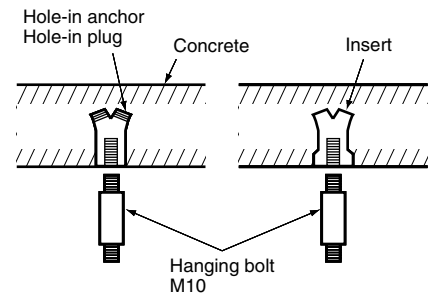
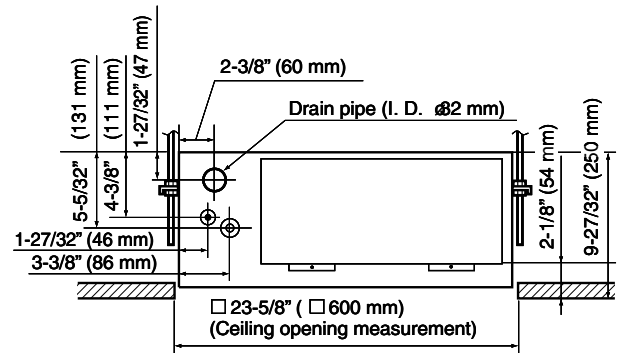


Fig. 5



3. BODY INSTALLATION

- (1) Install special nut A, then special nut B onto the hanging bolt (Fig. 6).
- (2) Raise the body and mount its hooks onto the hanging bolt between the special nuts (Fig. 6).
- (3) Turn special nut B to adjust the height of the body (Fig. 6).
- (4) Leveling
Using a level, or vinyl hose filled with water, fine adjust so that the body is level.

WARNING

Perform final tightening by tightening the double nut firmly.

Fig. 6

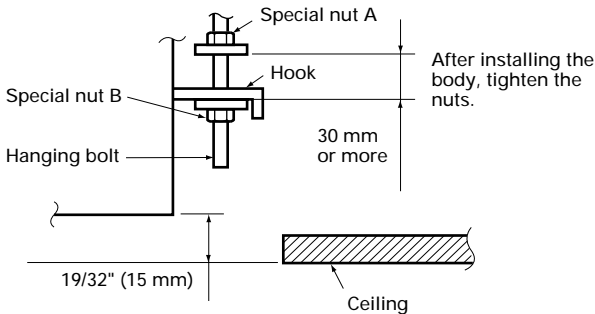
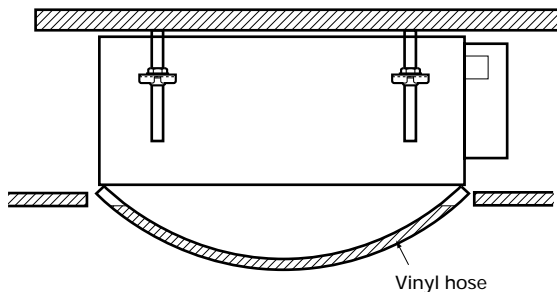


Fig. 7



2. INSTALLING DRAIN PIPE

WARNING

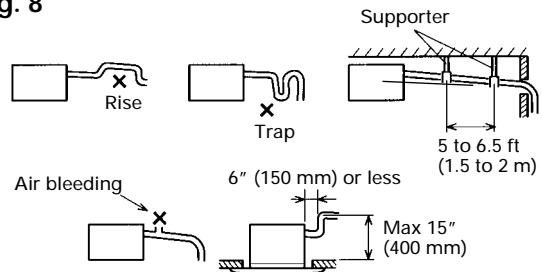
Install the drain pipe in accordance with the instructions in this installation manual and keep the area warm enough to prevent condensation. Problems with the piping may lead to water leaks.

NOTE : Install the drain pipe.

- Install the drain pipe with downward gradient (1/50 to 1/100) and so there are no rises or traps in the pipe.
- Use general hard polyvinyl chloride pipe (VP25) [outside diameter 1-1/4" (32 mm)] and connect it with adhesive (polyvinyl chloride) so that there is no leakage.

- When the pipe is long, install supporters.
- Do not perform air bleeding.
- Always heat insulate the indoor side of the drain pipe.
- When desiring a high drain pipe height, raise it up to 15" (400 mm) or less from the ceiling within a range of 6" (150 mm) from the body. A rise dimension over this range will cause leakage.

Fig. 8



3. CONNECTING THE PIPING

CAUTION

- (1) Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.
- (2) Never use piping which has been used for previous installations. Only use parts which are delivered with the unit.
- (3) While welding the pipes, be sure to blow dry nitrogen gas through them.

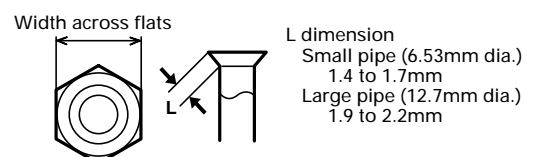
1. FLARE PROCESSING

- (1) Cut the connection pipe with pipe cutters so that the pipe is not deformed.
- (2) Holding the pipe downward so that cuttings cannot enter the pipe, remove the burrs.
- (3) Remove the flare nut from the indoor unit pipe and outdoor unit and assemble as shown in (Table 3) and insert the flare nut onto the pipe, and flare with a flaring tool.
- (4) Check if the flared part "L" (Fig. 9) is spread uniformly and that there are no cracks.

Table 3

Pipe	Flare nut
Small pipe (6.35 mm dia.)	Small (width across flats 17 mm)
Large pipe (12.7 mm dia.)	Large (width across flats 24 mm)

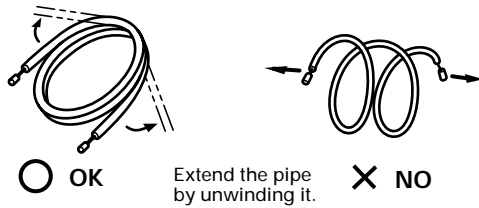
Fig. 9



2. BENDING PIPES

The pipes are shaped by your hands. Be careful not to collapse them.

Fig. 10

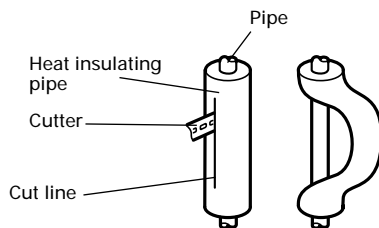


Do not bend the pipes in an angle more than 90°.

When pipes are repeatedly bent or stretched, the material will harden, making it difficult to bent or stretch them any more. Do not bent or stretch the pipes more than three times.

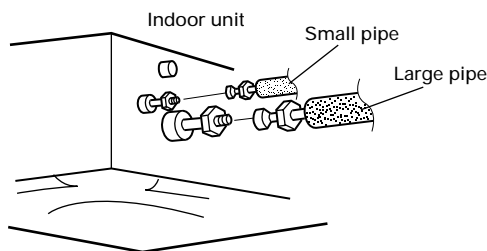
When bending the pipe, do not bend it as is. The pipe will be collapsed. In this case, cut the heat insulating pipe with a sharp cutter as shown in Fig. 11, and bend it after exposing the pipe. After bending the pipe as you want, be sure to put the heat insulating pipe back on the pipe, and secure it with tape.

Fig. 11



3. CONNECTION PIPES

Fig. 12

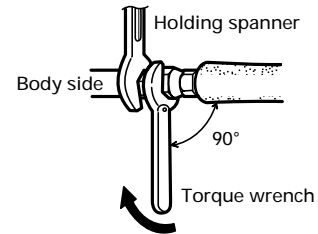


CAUTION

- (1) Be sure to apply the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.
- (2) Do not remove the flare nut from the indoor unit pipe unit immediately before connecting the connection pipe.

When the flare nut is tightened properly by your hand, hold the body side coupling with a separate spanner, then tighten with a torque wrench (Fig. 13).

Fig. 13



CAUTION

Hold the torque wrench at its grip, keeping it in the right angle with the pipe as shown in Fig. 13, in order to tighten the flare nut correctly.

Table 4 : Flare nut tightening torque

Flare nut	Tightening torque
Small pipe (6.35 mm dia.)	14.7 to 19.6 N · m (150 to 200 kgf · cm)
Large pipe (12.7 mm dia.)	49.0 to 53.9 N · m (500 to 550 kgf · cm)

CAUTION

Be sure to connect the large pipe after connecting the small pipe completely.

4. CONNECTING AN INDOOR CAPILLARY TUBE

Installation Procedure

- (1) Braze each part (connection pipe, indoor capillary tube, and branch liquid pipe) as shown in Fig. 14.
- (2) Wrap the two BR sheets around the indoor capillary tube as shown in Fig. 15.
- (3) Cover the indoor capillary tube and the branch liquid pipe with insulation (Fig. 16) and affix the insulation with tape.
- (4) Secure the insulation using the binders (Fig. 17).
 - If the joint pipe must be installed, refer to the installation manual for the outdoor unit for details.

Fig. 14

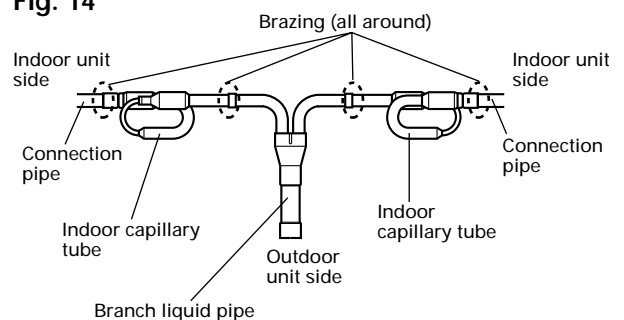


Fig. 15

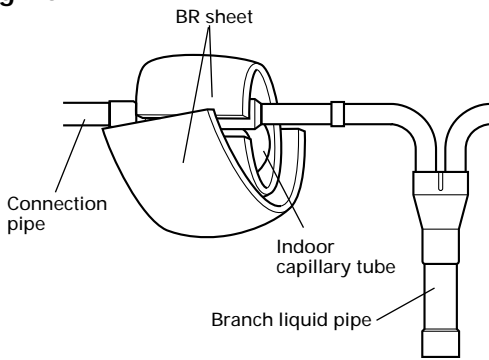


Fig. 16

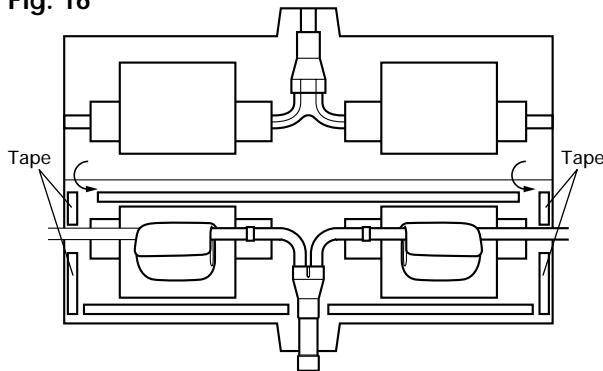
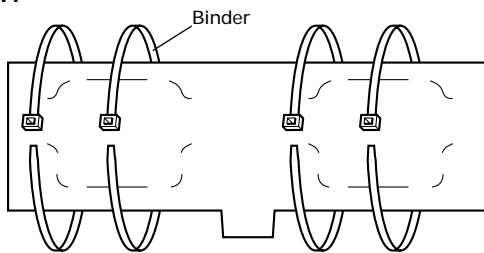


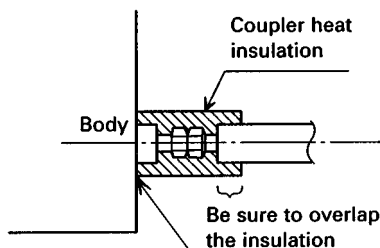
Fig. 17



4. INSTALLING THE COUPLER HEAT INSULATION

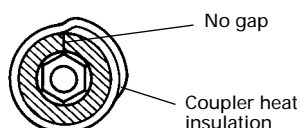
After checking for gas leaks, insulate by wrapping insulation around the two parts (large and small) of the indoor unit coupling, using the coupler heat insulation.

Fig. 18



⚠ CAUTION

Must fit tightly against body without any gap.



5. ELECTRICAL WIRING

HOW TO CONNECT WIRING TO THE TERMINALS

1. IF ONE WIRE IS CONNECTED TO ONE TERMINAL BLOCK

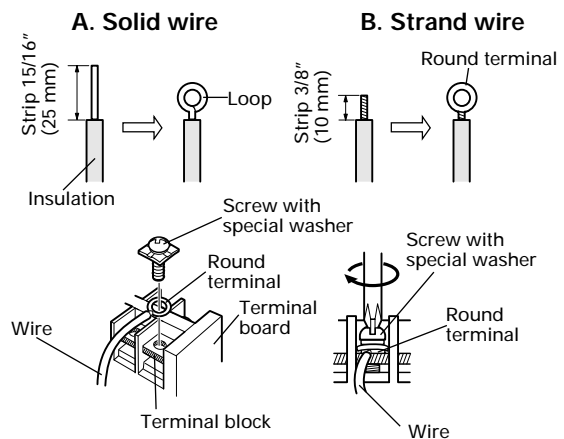
A. For solid core wiring (or F-cable)

- (1) Cut the wire and with a wire cutter or wirecutting pliers, then strip the insulation to about 15/16" (25 mm) 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 and with a wire cutter or wirecutting pliers, then strip the insulation to about 3/8" (10 mm) 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. 19

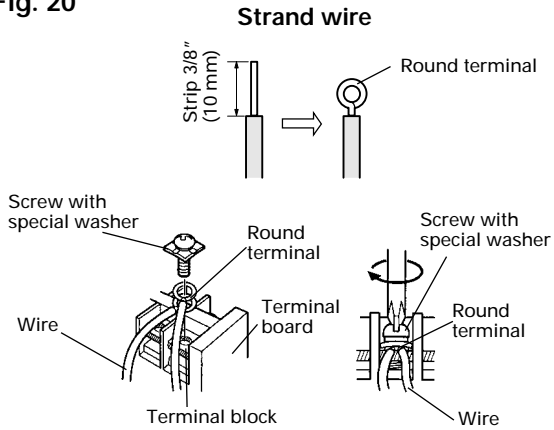


2. IF TWO WIRES ARE CONNECTED TO ONE TERMINAL BLOCK

A. As a rule, round terminal should be used to connect to the terminal block.

- (1) Cut the wire and with a wire cutter or wirecutting pliers, then strip the insulation to about 3/8" (10 mm) 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. 20



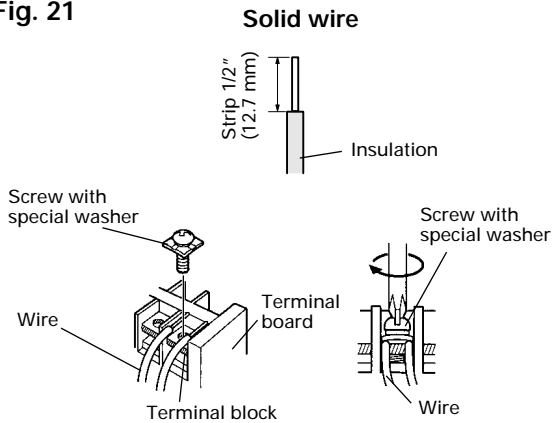
B. If round terminal cannot be used, the following items should be followed.

For solid core wiring (or F-cable)

- (1) Cut the wire and with a wire cutter or wirecutting pliers, then strip the insulation to about 1/2" (12.7 mm) to expose the solid wire.
- (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
- (3) Wires with the same diameter should be connected on both sides as shown in Fig. 21.

Since connecting wires with different diameters causes the wires to heat up due to loose connections, this method should not be used.

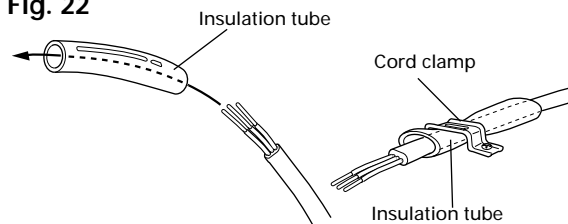
Fig. 21



HOW TO FIX THE CONNECTION CORD

After passing the connection cord through the insulation tube, fasten it with the cord clamp.

Fig. 22



Use VW-1, 0.5 to 1.0 mm thick, PVC tube as the insulation tube.

⚠ WARNING

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

Remove the control box cover and install the connection cord (Fig. 23 and 24).

Fig. 23

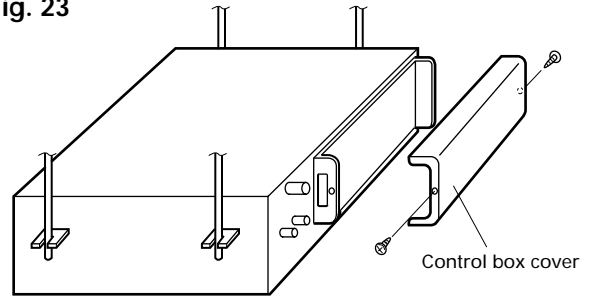
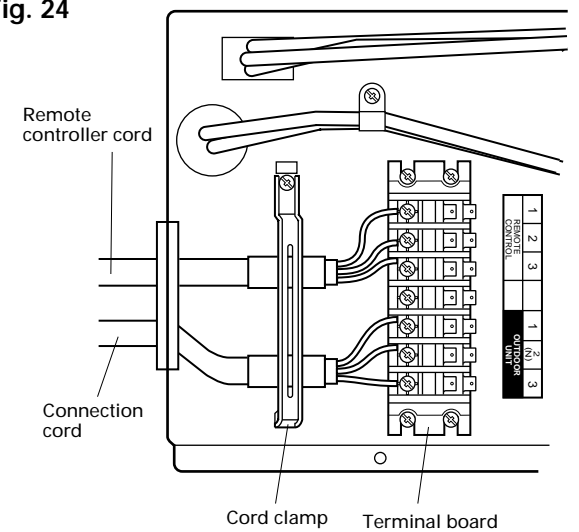


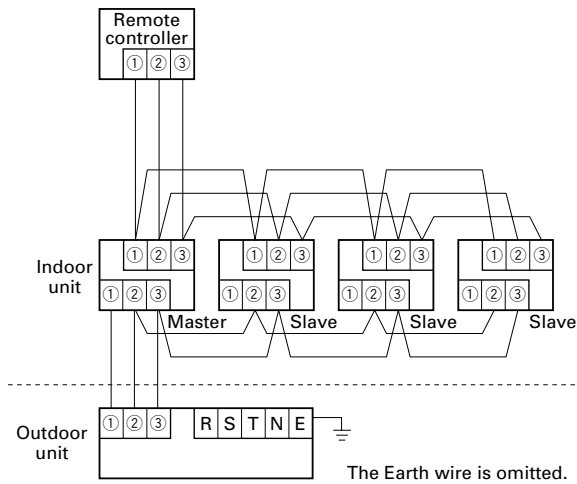
Fig. 24



CONNECTION CORD

A. Simultaneous operation for buildings

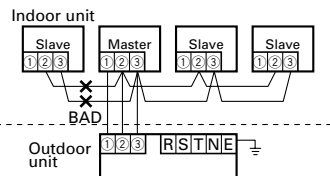
Fig. 25



CAUTION

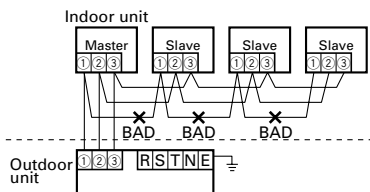
- Connect a maximum of 2 wires on a single terminal block. (If 3 or more wires are connected, they could become loose and cause heating.)

Fig. 26



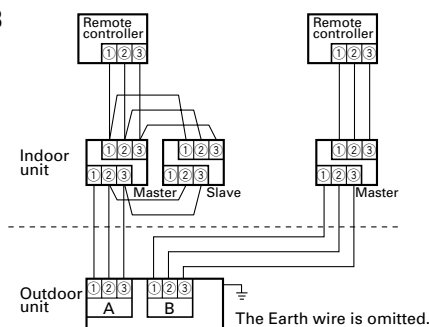
- Crossovers as in (1) should not be connected when connecting wires between the master unit and slave units, and from slave unit to slave unit. (The system will not operate correctly.)

Fig. 27



B. Individual operation for buildings

Fig. 28



6. GRILLE INSTALLATION

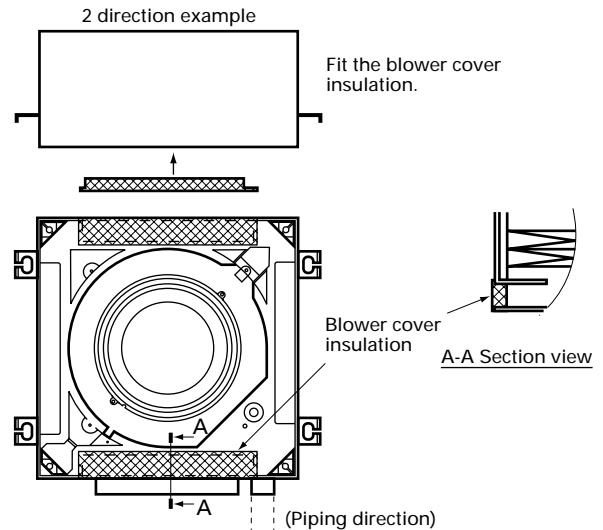
1. BLOWER COVER INSULATION

Install the blower cover insulation only when the outlet direction is not specified.

Two blower cover insulations are packed with the grille assembly.

Install the blower cover insulation at the diffuser position shown in Fig. 29. At the time, use the piping position as the criteria.

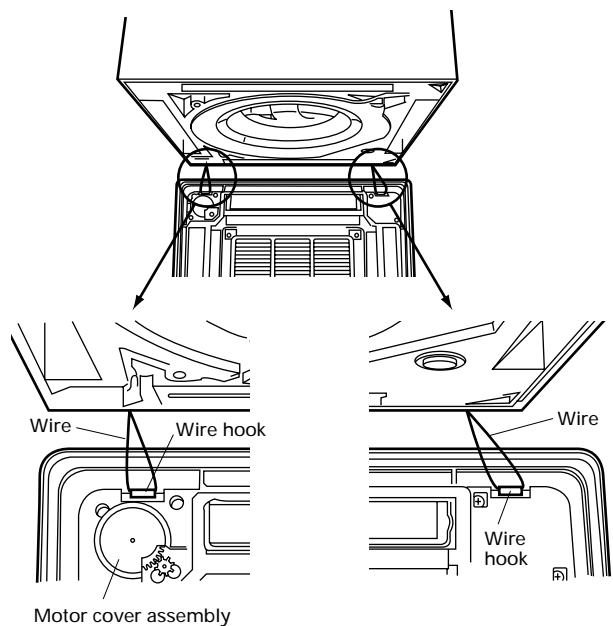
Fig. 29



2. INSTALLING GRILLE ASSEMBLY TO BODY

Hang the grille assembly on the wires attached to the indoor unit as shown in Fig. 30.

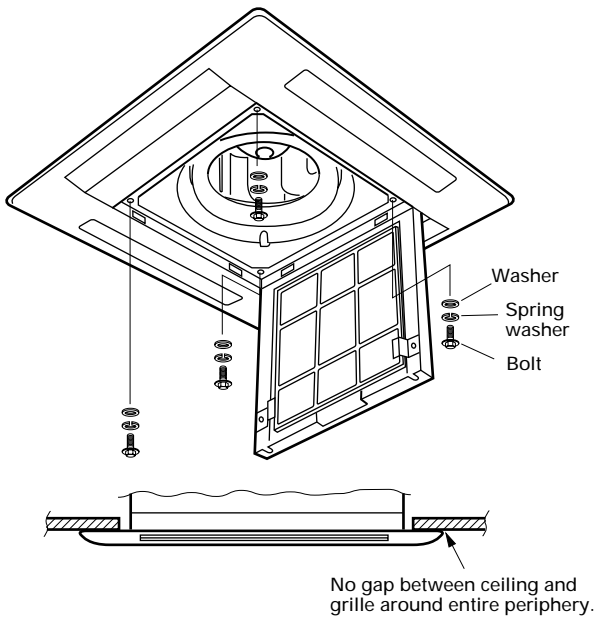
Fig. 30



Bolting the grille assembly to the body

Install the grille assembly to the body with the four bolts, spring washers, and washers.

Fig. 31



Wireless unit connection wire wiring

Connect the connector in accordance part A detail view. Then clamp the lead wire with clamp so that it does not touch the rotating parts.

Fig. 32

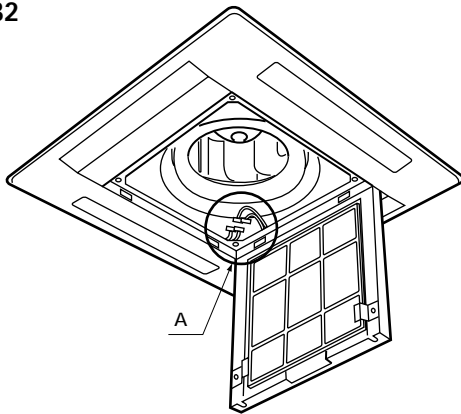
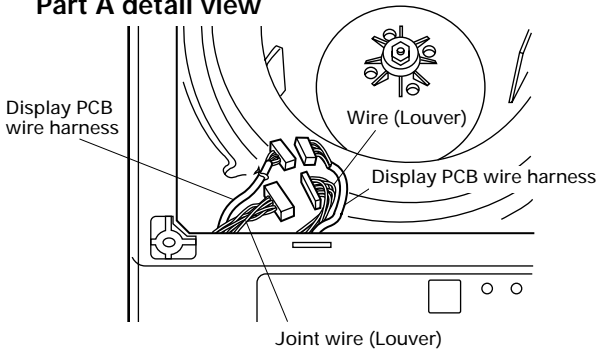


Fig. 33
Part A detail view

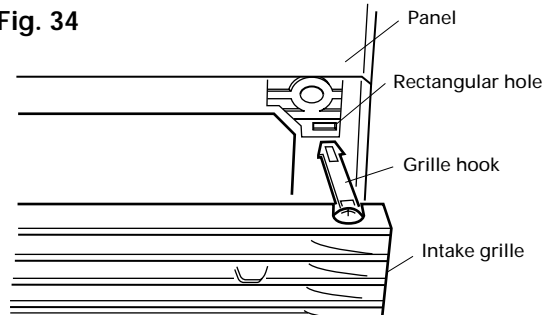


INSTALLING/REMOVING THE INTAKE GRILLE

1. INSTALLING THE INTAKE GRILLE

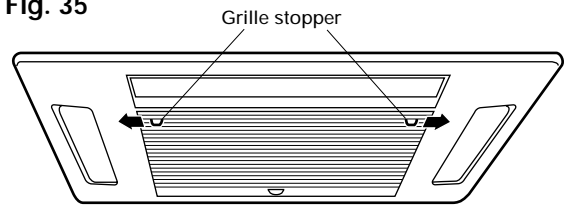
(1) Fully insert the intake grille hooks into the rectangular holes in the panel.

Fig. 34



(2) Close the intake grille, then slide the two grille stoppers outward.

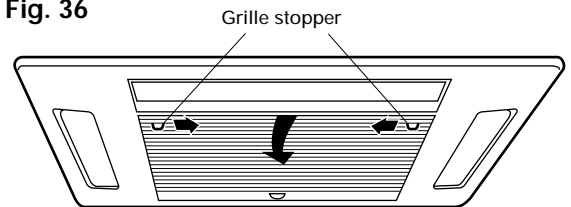
Fig. 35



2. REMOVING THE INTAKE GRILLE

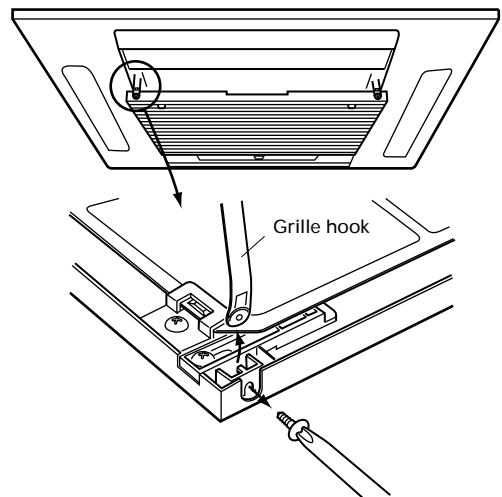
(1) Slide the two grille stoppers inward, then open the intake grille.

Fig. 36



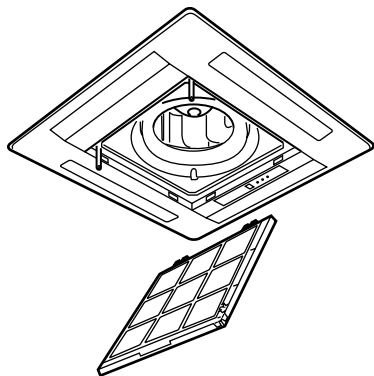
(2) Remove the grille hook screws, then open the intake grille.

Fig. 37



- (3) Open the intake grille so that it is at an angle of 20° to 40°, then remove the grille.

Fig. 38

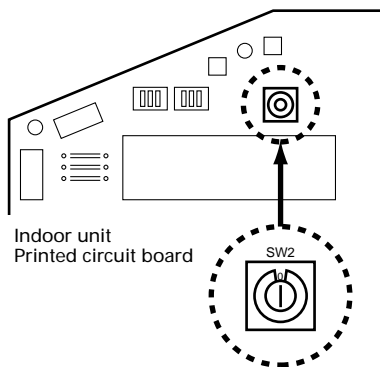


CAUTION

- (1) The louver angle cannot be changed if the power is not on, (if moved by hand, it may be damaged.)
- (2) The grille assembly is directional relative to the air conditioner body.
- (3) Install so that there is no gap between the grille assembly and the air conditioner body.

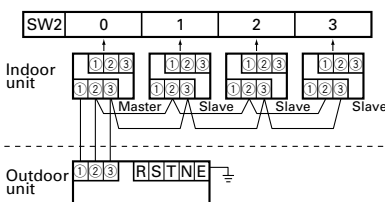
7. MASTER/SLAVE SELECT SWITCH

Fig. 39



- For the master unit, set SW2 on "0". For a slave unit, set SW2 on "1-3".

Fig. 40 [Example]

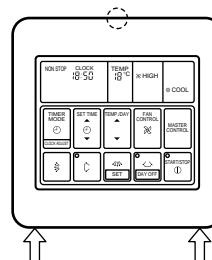


- A master unit is an indoor unit with the power line connected directly from the outdoor unit.

8. REMOTE CONTROLLER INSTALLATION

- Insert the end of a flat blade screwdriver at the arrow parts of the groove at the side of the remote controller case and remove the remote controller case top by turning the screwdriver.
- Disconnect the remote controller cord from the remote controller terminal board.

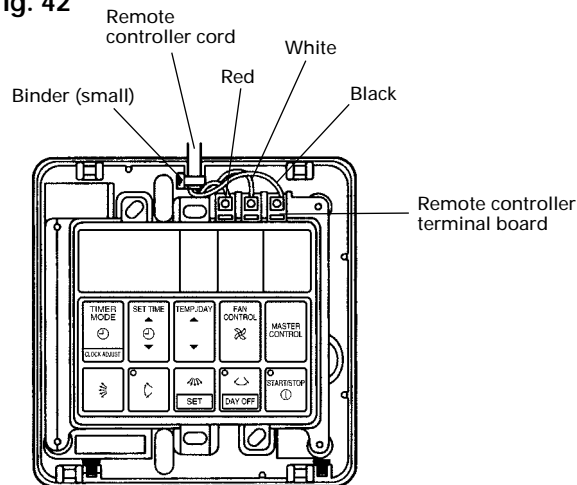
Fig. 41



- (1) When remote controller exposed

- 1) Make a notch in the thin part (○ part of Fig. 41) at the remote controller case top and bottom with nippers, file, etc.
- 2) Connect the remote controller cord to the remote controller terminal board specified in (Fig. 42).
- 3) Clamp the remote controller cord sheath with the binder (small) as shown in Fig. 42.
- 4) Cut off the excess binder.

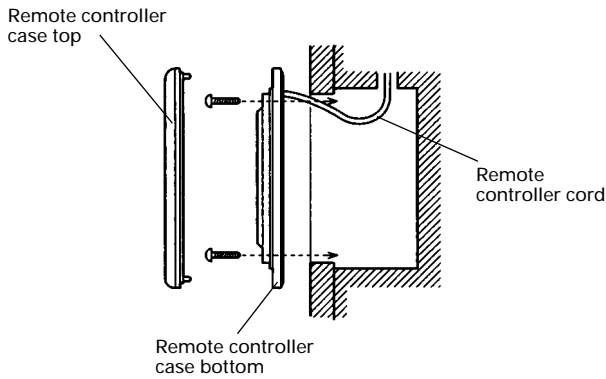
Fig. 42



- (2) When remote controller cord embedded

- 1) Embed the remote controller cord and box.
- 2) Pass the remote controller cord through the hole at the remote controller case bottom and install the cord to the box (Fig. 43).
- 3) Connect the remote controller cord to the remote controller terminal board specified in (Fig. 42).

Fig. 43 [Example]



- After wiring work is complete, return the remote controller case top to its original state.

CAUTION

- (1) Do not bundle the remote controller cord, or wire the remote controller cord in parallel, with the indoor unit connection wire (to the outdoor unit) and the power supply cord. It may cause erroneous operation.
- (2) When installing the remote controller and cord near a source of electromagnetic waves, separate the remote controller from the source of the electromagnetic waves and use shielded cord.
- (3) Do not touch the remote controller PC board and PC board parts directly with your hands.

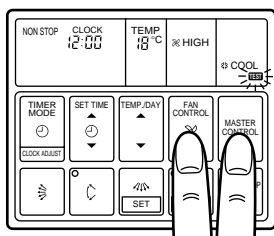
9. TEST RUNNING

REMOTE CONTROLLER

- Supply power to the crankcase heater 12 hours before the start of operation in the winter.
- For test running, when the remote controller FAN CONTROL button and MASTER CONTROL button are pressed simultaneously for more than three seconds when the air conditioner is not running, the air conditioner starts and TEST is displayed on the remote controller display.

However, the SET TEMP./DAY setting button does not function, but all other buttons, displays, and protection functions operate (Fig. 44).

Fig. 44



- When EE : EE blinks at the current time display, there is an error inside the air conditioner. If the SET TIME button (▼) and SET TEMP./DAY button (▼) are pressed simultaneously for more than three seconds, the self diagnosis check will start and the error contents will be displayed at the current time display. (Fig. 45) When the operation lamp lights, press the START/STOP button and after operation lamp goes off, perform the same operation. (Fig. 45) Process the error contents by referring to (Table 5).

Fig. 45

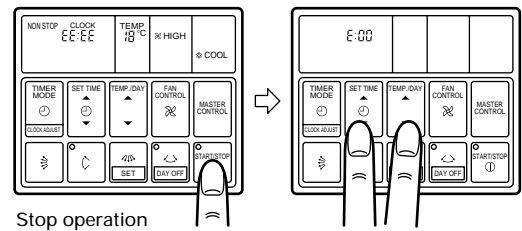


Table 5

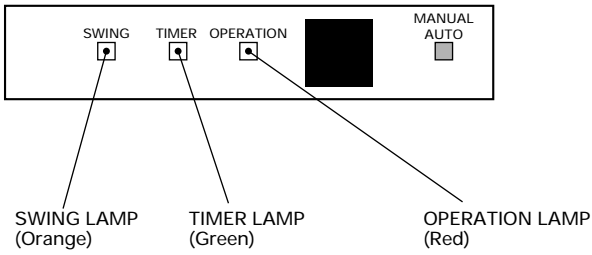
Error cord	Error contents
E:00	Communication error (indoor unit → remote controller)
E:01	Communication error (indoor unit ↔ outdoor unit)
E:02	Room temperature sensor open
E:03	Room temperature sensor shorted
E:04	Indoor heat exchanger temperature sensor open
E:05	Indoor heat exchanger temperature sensor shorted
E:06	Outdoor heat exchanger temperature sensor open
E:07	Outdoor heat exchanger temperature sensor shorted
E:08	Power source connection error
E:09	Float switch operated
E:0A	Outdoor temperature sensor open
E:0b	Outdoor temperature sensor shorted
E:0c	Discharge pipe temperature sensor open
E:0d	Discharge pipe temperature sensor shorted
E:0E	Outdoor low pressure abnormal
E:0F	Discharge pipe temperature abnormal
E:11	Model abnormal
E:12	Indoor fan abnormal
E:13	Outdoor signal abnormal
E:14	Outdoor EEPROM abnormal

- To stop test running, press the START/STOP button.
- For the operation method, refer to the operating manual and perform operation check.
- Check that there are no abnormal sounds or vibration sounds during test running.

10. AN ERROR DISPLAY

- Run the air conditioner in accordance with the operating manual.

Fig. 46



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

Perform judgment in accordance with the following.

- Test running

When the air conditioner is run by pressing the remote controller test run button, the OPERATION and TIMER lamps flash slowly at the same time.

- Error

The OPERATION and TIMER lamps operate as follows (Table 6) according to the error contents.

Table 6

Error display	Error contents
<p>OPERATION LAMP: Two quick flashes (0.5 sec ON, 5 sec OFF) repeated</p> <p>TIMER LAMP: 0.1 sec ON/OFF repeated</p>	Room temperature thermistor abnormal temperature detected
<p>OPERATION LAMP: Three quick flashes (0.5 sec ON, 5 sec OFF) repeated</p> <p>TIMER LAMP: 0.1 sec ON/OFF repeated</p>	Piping thermistor abnormal temperature detected
<p>OPERATION LAMP: Four quick flashes (0.5 sec ON, 5 sec OFF) repeated</p> <p>TIMER LAMP: 0.1 sec ON/OFF repeated</p>	Float switch ON for 3 minutes or longer