

Refrigerant R410A Cassette Type SPLIT TYPE AIR CONDITIONER INSTALLATION INSTRUCTION SHEET

(PART NO. 9374318070-02)

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 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.

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 0.8 mm (Nominal diameter is 3/8 in.), 1.0 mm (Nominal diameter is 5/8 in.) even when it is available on the market.

Table 1 Thicknesses of Annealed Copper Pipes

Pipe outside diameter	Thickness
9.52 mm (3/8 in.)	0.80 mm
15.88 mm (5/8 in.)	1.00 mm

For authorized service personnel only.

WARNING
① For the air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.
② Connect the indoor unit and outdoor unit with the 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 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 use an extension cord.
⑥ Do not turn on the power until all installation work is complete.

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.

- 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 instruction sheet because it is used when the air conditioner is serviced or moved.

SELECTING THE MOUNTING POSITION

INDOOR UNIT

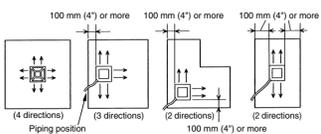
Install at a place that can withstand the weight of the indoor and outdoor units and install positively so that the units will not topple or fall.

CAUTION

- Do not install where there is the danger of combustible gas leakage.
- Do not install near heat sources.
- If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

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.



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
Blower cover insulation	2	For discharged air
Hook wire	2	For installing intake grille.
Blinder (small)	1	For fixing the remote controller cord
Remote controller	1	
Tapping screw (flush heads)	2	For installing the remote controller
Remote controller cord	1	For connecting the remote controller

INSTALLATION PROCEDURE

Install the air conditioner as follows:

1 INDOOR UNIT INSTALLATION

WARNING

- Install the air conditioner in a location which can withstand a load do at least five times the weight of the main unit and which will not amplify sound or vibration. If the installation location is not strong enough, the indoor unit may fall and cause injuries.
- If the job is done with the panel frame only, there is a risk that the unit will come loose. Please take care.

REMOVING THE INTAKE GRILLE

- Push the intake grille pushbuttons (two places).
- Open the intake grille.

Fig. 4

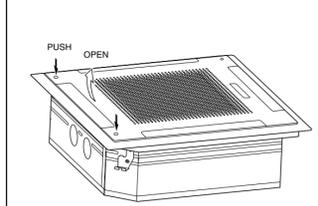
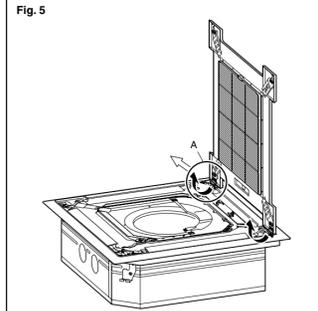
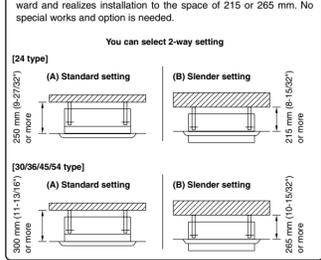


Fig. 5



This mechanism enables the cassette body to move 35 mm downward and realizes installation to the space of 215 or 265 mm. No special works and option is needed.



CONNECTION PIPE REQUIREMENT

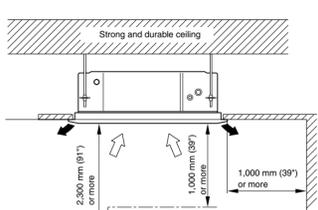
Diameter	Table 2	
	Small	Large
	9.52 mm (3/8 in.)	15.88 mm (5/8 in.)

- Use pipe with water-resistant heat insulation.

CAUTION

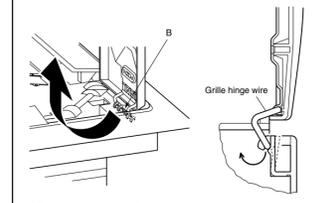
Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks. Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only) In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, 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).

Fig. 2



- Pull up while pressing the B section (Fig. 6).

Fig. 6 Part A detail view Fig. 7 Part A section view



- Remove the intake grille.

REMOVING THE PANEL FRAME

- Pull up the corner sections (A) of the panel frame as shown in Fig. 8 (4 locations).

Fig. 8 Part A detail view

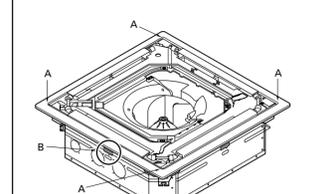
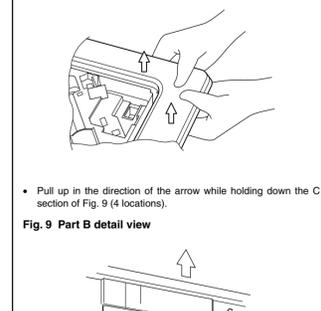


Fig. 9 Part B detail view



- Pull up in the direction of the arrow while holding down the C section of Fig. 9 (4 locations).

ELECTRICAL REQUIREMENT

- Electric wire size:

Connection cord (mm ²)	Table 3	
	MAX.	MIN.
	2.5	1.5

- Always use H07RN-F or equivalent to the connection cord.
- Install the disconnect device with a contact gap of at least 3 mm nearby the units (both indoor unit and outdoor unit).

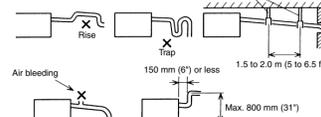
2 INSTALLING DRAIN PIPE

CAUTION

Install the drain pipe in accordance with the instructions in this installation instruction sheet 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 32 mm (1-1/4")) 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, rise it up to 800 mm (31") or less from the ceiling within a range of 150 mm (6") from the body. A rise dimension over this range will cause leakage.

Fig. 19



3 CONNECTING THE PIPING

CAUTION

- 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.
- While welding the pipes, be sure to blow dry nitrogen gas through them.

1. FLARING

- Cut the connection pipe to the necessary length with a pipe cutter.
 - Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
 - 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. When using the conventional flare tool, always use an allowance adjustment gauge and secure the A dimension shown in table 4.

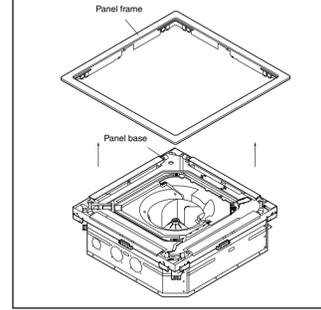
Fig. 20



Table 4 Pipe outside diameter

Pipe outside diameter	Dimension A (mm)	
	Flare tool for R410A, clutch type	
9.52 mm (3/8 in.)		0 to 0.5
15.88 mm (5/8 in.)		

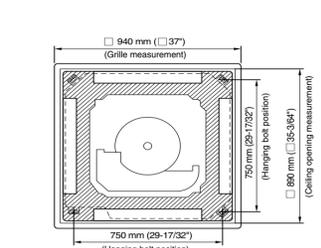
Fig. 10



CAUTION

1. POSITION THE CEILING HOLE AND HANGING BOLTS

Fig. 11



2. HANGING PREPARATIONS

- Firmly fasten the hanging bolts as shown in Fig. 12 or by another method.
- Install the hanging bolts at a place where they would be capable of holding a weight of at least 50 kgf per bolt.

Fig. 12

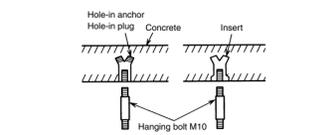
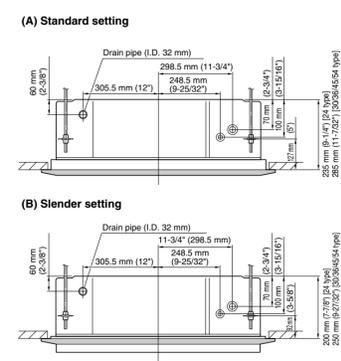


Fig. 13



3. BODY INSTALLATION

- As for the dimension of the ceiling rear height is Fig. 13 or more.
- Install special nut A, then special nut B onto the hanging bolt (Fig. 14).
 - Rise the body and mount its hooks onto the hanging bolt between the special nuts (Fig. 14).
 - Turn special nut B to adjust the height of the body (Fig. 14).
 - 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. 14

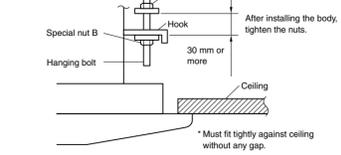
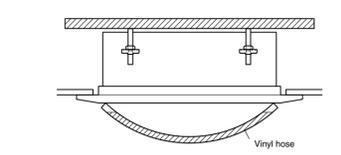


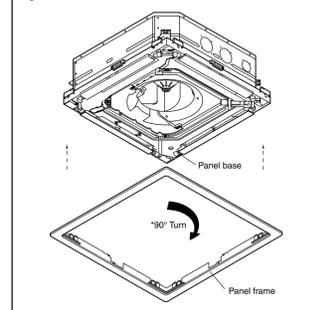
Fig. 15



* Allowable space between the unit and the ceiling 5 mm or less

INSTALLING THE PANEL FRAME

Fig. 16



- With slender setting, turn the panel frame 90° as shown in the diagram above.

Grille setting method has been changed at the marked positions on the panel frame and panel base.

Fig. 17

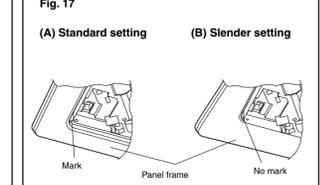
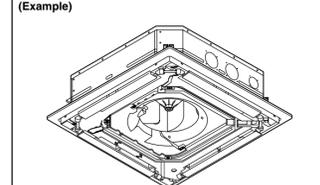


Fig. 18 (Example)

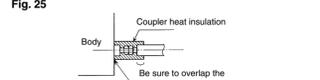


* Appearance of slender setting

4 INSTALLING THE COUPLER HEAT INSULATION

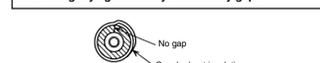
After checking for gas leaks, insulate by wrapping insulation around the two parts (large and small) of the indoor unit coupler, using the coupler heat insulation. After installing the coupler heat insulation, wrap both ends with vinyl tape so that there is no gap.

Fig. 25



CAUTION

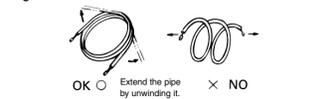
Must fit tightly against body without any gap.



2. BENDING PIPES

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

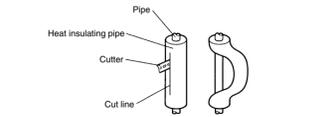
Fig. 21



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 bend or stretch them any more. Do not bend or stretch the pipes more than three times.

When bending the pipe, do not bend it as it is. The pipe will be collapsed. In this case, cut the heat insulating pipe with a sharp cutter as shown in Fig. 22, 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. 22



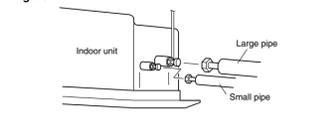
CAUTION

- To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or over.
- If the pipe is bent repeatedly at the same place, it will break.

3. CONNECTION PIPES

Indoor unit side

Fig. 23



CAUTION

- 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.
- Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.

5 ELECTRICAL WIRING

HOW TO CONNECT WIRING TO THE TERMINALS

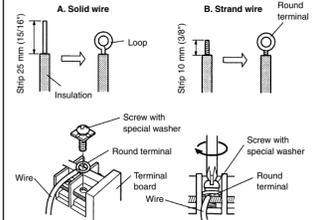
A. For solid core wiring (or F-cable)

- Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (1 5/16") of expose the solid wire.
- Using a screwdriver, remove the terminal screw(s) on the terminal board.
- Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
- 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

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

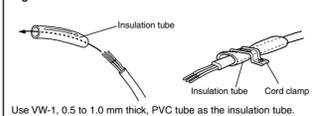
Fig. 26



HOW TO FIXED CONNECTION CORD AND POWER CORD AT THE CORD CLAMP

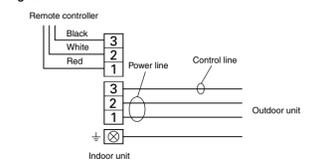
After passing the connection cord and power cord through the insulation tube, fasten it with the cord clamp.

Fig. 27



1. CONNECTION DIAGRAMS

Fig. 28



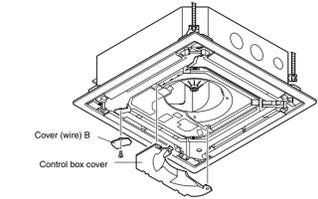
2. INDOOR UNIT SIDE

WARNING

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

(1) Remove the control box cover and cover (wire) B and install the connection cord.

Fig. 29



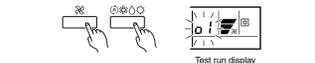
8 TEST RUN

CAUTION

Supply power to the crankcase heater for at least 12 hours before the start of operation in winter.

- Stop the air conditioner operation.
- Press the master control button and the fan control button simultaneously for 2 seconds or more to start the test run.

Fig. 48



Press the start/stop button to stop the test run.

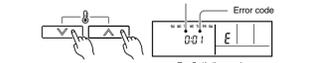
[SELF-DIAGNOSIS]

When the error indication "E.EE" is displayed, follow the following items to perform the self-diagnosis. "E.EE" indicates an error has occurred.

1. REMOTE CONTROLLER DISPLAY

- Stop the air conditioner operation.
- Press the set temperature buttons Δ / ∇ simultaneously for 5 seconds or more to start the self-diagnosis. Refer to the following tables for the description of each error code.

Fig. 49



- Press the set temperature buttons Δ / ∇ simultaneously for 5 seconds or more to stop the self-diagnosis.

Table 7

Error code	Error contents
00	Communication error (indoor unit ↔ remote controller)
01	Communication error (indoor unit ↔ outdoor unit)
02	Room temperature sensor open
03	Room temperature sensor short-circuited
04	Indoor heat exchanger temperature sensor open
05	Indoor heat exchanger temperature sensor short-circuited
06	Outdoor heat exchanger temperature sensor
08	Power source connection error
09	Floater switch operated
0A	Outdoor temperature sensor
0c	Discharge pipe temperature sensor
11	Model abnormal
12	Indoor fan abnormal

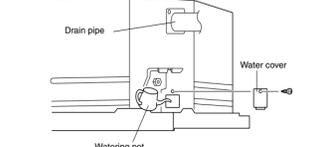
Table 8

Error code	Error contents
13	Outdoor signal abnormal
14	Excessive outdoor pressure (permanent stop)
15	Compressor temperature sensor
16	Pressure switch error
17	IPM error
18	CT error
19	Active filter module (AFM) error
1A	Compressor does not operate
1b	Outdoor unit fan error
1c	Communication error (inverter → multicontroller)
1d	2 way valve sensor error
1E	Expansion valve error
1F	Connection indoor unit error

2. CHECKING DRAINAGE

To check the drain, remove the water cover and fill with 2 to 3 l of water as shown in Fig. 50. The drain pump operates when operating in the cooling mode.

Fig. 50



6 GRILLE INSTALLATION

(2) After wiring is complete, clamp the remote controller cord and connection cord with the cord clamp.

- Install the control box cover and cover (wire) B.

Fig. 30

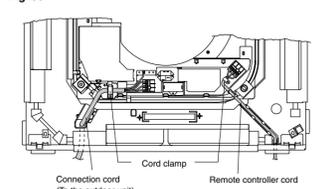
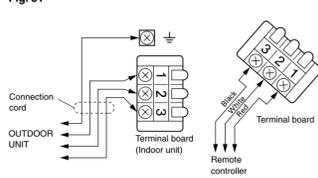


Fig. 31

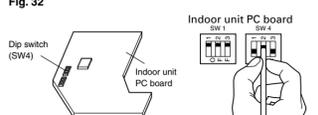


Ceiling height setting

Set the DIP switch for the ceiling height according to the table below.

Ceiling height (m)	DIP-SW4		
	1	2	3
2.5 - 3.0	Normal	OFF	OFF
3.0 - 3.5	High ceiling 1	ON	OFF
More than 3.5	High ceiling 2	OFF	ON
Less than 2.5	Low ceiling	ON	ON

Fig. 32



CAUTION

- If the setting for a low ceiling is selected, the capacity of the air conditioner decreases slightly.
- Do not set any switches other than those specified in this sheet. The air conditioner may not operate correctly if any switches other than those specified are changed.

7 REMOTE CONTROLLER SETTING

(2) Install the hook wire.

- Pass the hook wire through the panel base from the rear side as shown in Fig. 37, and fasten to the reinforced metal fitting of the intake grille using a screw.

Fig. 37

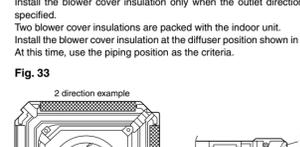
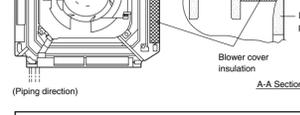
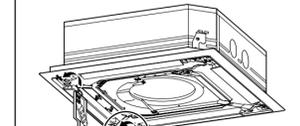


Fig. 38 Section view



(3) Loosen the screw, put the loop of the hook wire over it, and tighten the screw again.

Fig. 39

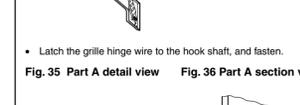


CAUTION

Install the intake grille hook wire to the grille assembly. If it falls, it may cause injuries.

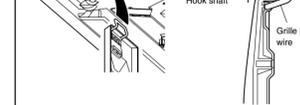
(4) Bring up the intake grille by pushing it up at an angle as shown in Figs. 39, 40, and fasten.

Fig. 40



Latch the grille hinge wire to the hook shaft, and fasten.

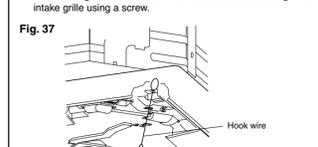
Fig. 35 Part A detail view Fig. 36 Part A section view



8 INSTALLING THE INTAKE GRILLE

(1) Mount the grille hinge wire to the hook shaft as shown in Fig. 34.

Fig. 34



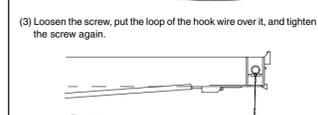
CAUTION

When installing the remote controller, remove the connector from the front case. The wires may break if the connector is not removed and the front case hangs down.

When installing the front case, connect the connector to the front case.

(2) Install the rear case to the wall, etc. with the two tapping screws.

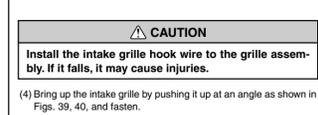
Fig. 41



Change the DIP switch setting to use batteries. (The DIP switch is not set to use batteries at the factory.)

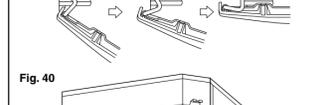
Change DIP switch No. 6 from OFF to ON. If batteries are not used, all of the settings stored in memory will be deleted if there is a power failure.

Fig. 42



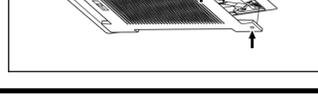
(1) Press the THERMO SENSOR button for 5 seconds or more to unlock the function. The thermo sensor display flashes and then disappears when the function is unlocked.

Fig. 43 (Example)



(2) Press the THERMO SENSOR button again for 5 seconds or more to lock the function. The thermo sensor display flashes and then remains on when the function is locked.

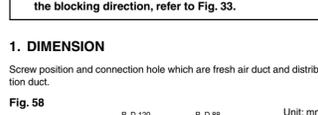
Fig. 44



1. INSTALLING THE REMOTE CONTROLLER

(1) Open the operation panel on the front of the remote controller, remove the two screws indicated in the following figure, and then remove the front case of the remote controller.

Fig. 45



B. Remote controller setting (room temperature sensor selection)

The room temperature is detected by the remote controller temperature sensor.

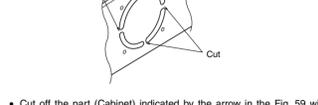
Fig. 46



C. Indoor unit/remote controller setting (room temperature sensor selection)

The temperature sensor of the indoor unit or the remote controller can be used to detect the room temperature.

Fig. 47



NOTES

If the function to change the temperature sensor is used as shown in examples A and B (other than example C), be sure to lock the detection location. If the function is locked, the lock display will flash when the THERMO SENSOR button is pressed.

9 SPECIAL INSTALLATION METHODS

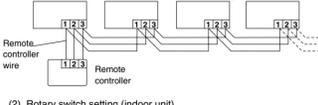
CAUTION

- When setting the rotary switch and DIP switches, do not touch any other parts on the circuit board directly with your bare hands.
- Be sure to turn off the main power.

1. GROUP CONTROL SYSTEM

A number of indoor units can be operated at the same time using a single remote controller.

Fig. 51



2. DUAL REMOTE CONTROLLERS (OPTIONAL)

Two separate remote controllers can be used to operate the indoor units.

Fig. 52



Fig. 53

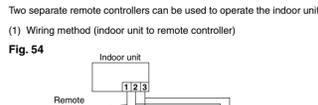


Table 8

Number of remote controllers	Master unit		DIP-SW No. 2
	DIP-SW No. 1	DIP-SW No. 2	
1 (Normal)	ON	OFF	
2 (Dual)	OFF	OFF	

Table 9

Number of remote controllers	Slave unit	
	DIP-SW No. 1	DIP-SW No. 2
1 (Normal)	—	—
2 (Dual)	ON	ON

3. AUTO RESTART

When the air conditioner power was temporarily turned off by a power failure etc., it restarts automatically after the power recovers. (Operated by setting before the power failure)

The auto restart function can be canceled.

Fig. 54



[DIP-SWITCH SETTING]

Indoor unit

NO.	SW state		Detail
	OFF	ON	
DIP-Switch 1	1	Invalidity	Validity * Auto restart setting
	2	—	— * Temperature correction setting
	3	—	— * Remote controller setting
DIP-Switch 4	1	—	— * Air flow setting
	2	—	— * Memory backup setting

Remote controller

NO.	SW state		Detail	
	OFF	ON		
DIP-Switch	1	—	— * Dual remote controller setting	
	2	—	— * Group control setting	
	3	One unit *	Multiple unit	Model setting
	4	Invalidity	Validity *	Auto autoover setting
	5	Invalidity	Validity *	Memory backup setting
	6	Invalidity	Validity *	Memory backup setting

* : Factory setting

10 OPENING THE DUCT CONNECTION HOLE

CAUTION

When performing hole opening work, be careful not to damage the drain pan.

When connecting the distribution duct, to make the air flow easily, block the outlet port with the blower cover insulation as shown by the hatched lines in Fig. 57. For the blocking direction, refer to Fig. 33.

1. DIMENSION

Screw position and connection hole which are fresh air duct and distribution duct.

Fig. 58



2. DISTRIBUTION DUCT AND FRESH AIR DUCT HOLE PROCESSING

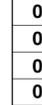
Use the distribution duct hole and fresh air duct hole by removing the insulation material as shown below.

Fig. 59



Cut off the part (Cabinet) indicated by the arrow in the Fig. 59 with nippers, needle nose pliers, etc.

Fig. 60



Open the holes and cut the insulation with a knife.

- Be careful not to damage the internal parts.
- Be careful not to cut yourself on the cutout in the metal plate.
- Please remove the insulation (inner box) left over after cutting.
- Connect the distribution duct.
- * When mounting the duct, block the gap so that there is no cold air leakage.
- Insulate the duct and cut connection.

CAUTION

The air conditioner cannot take in fresh air by itself. When connecting a fresh air duct, always use a duct fan.