# Refrigerant **R410A** Cassette Type **SPLIT TYPE AIR CONDITIONER** INSTALLATION INSTRUCTION SHEET

(PART NO. 9374318070-05)

lowever, pay careful attention to the following points:

<b>⚠ DANGER</b>	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.
<b>⚠ WARNING</b>	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
<b>⚠</b> CAUTION	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

**⚠** 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.

#### This air conditioner uses new refrigerant HFC (R410A). The basic installation work procedures are the same as conventional refrigerant models

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.]

3 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		
	Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other		
Causa manifold	refrigerants, the diameter of each port has been changed.		
Gauge manifold	It is recommended the gauge with seals –0.1 to 5.3 MPa (–76 cmHg to 53 kgf/cm²) for high pressure.		
	-0.1 to 3.8 MPa (-76 cmHg to 38 kgf/cm²) 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.		

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

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

#### STANDARD PARTS

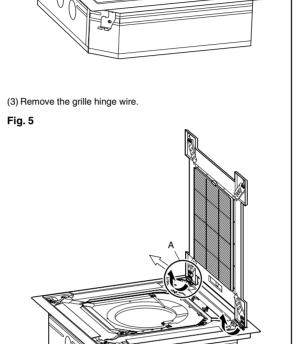
The following installation parts are furnished. Use them as required.

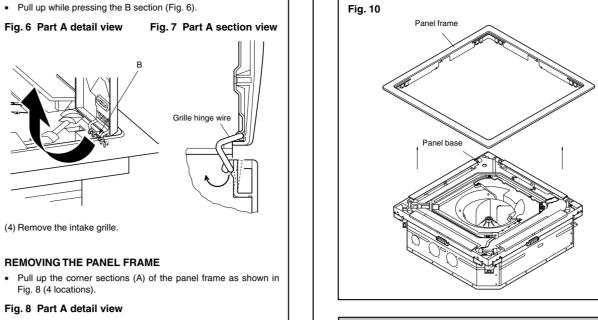
INDOOR UNIT ACCESSORIES			
Name and Shape	Q'ty	Application	
Coupler heat insulation	2	For indoor side pipe joint	
Special nut A (large flange)	4	For installing indoor unit	
Special nut B (small flange)	4	For installing indoor unit	
Template O O	1	For ceiling hole cutting	
Blower cover insulation	2	For discharged air	
Hook wire ————	2	For installing intake grille.	
Binder (small)	1	For fixing the remote controller cable	
Remote controller	1		
Tapping screw (flush heads)	2	For installing the remote controller	
Remote controller cable		For connecting the remote controller	

### **INSTALLATION PROCEDURE**

**INDOOR UNIT INSTALLATION** 

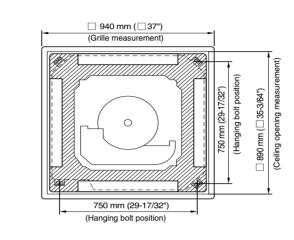
stand a load do at least five times the weight of the main unit and which will not amplify sound or vibration. If the installation location is not strong enough, the indoor unit may fall and cause injuries. If the job is done with the panel frame only, there is a risk that the unit will come loose. Please take care. REMOVING THE INTAKE GRILLE (1) Push the intake grille pushbuttons (two places) (2) Open the intake grille.





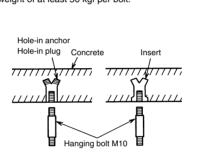
**⚠** CAUTION Always remove the panel frame after removing the intake

1. POSITION THE CEILING HOLE AND HANGING



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.



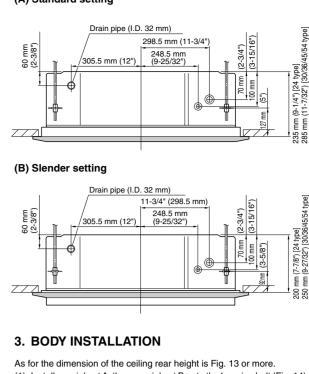
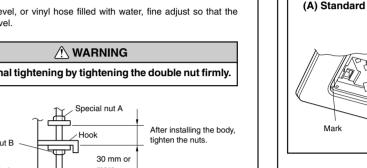
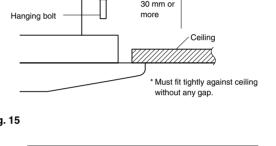


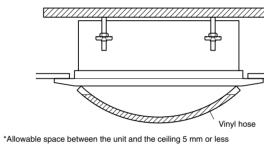
Fig. 13

(1) Install special nut A, then special nut B onto the hanging bolt (Fig. 14). (2) Rise the body and mount its hooks onto the hanging bolt between the special nuts (Fig. 14). (3) Turn special nut B to adjust the height of the body (Fig. 14).

Using a level, or vinyl hose filled with water, fine adjust so that the



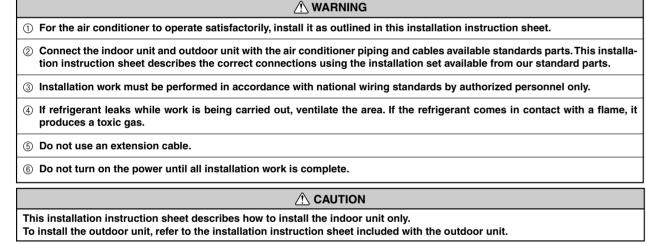




With slender setting, turn the panel frame 90° as shown in the dia Grille setting method has been changed at the marked posi tions on the panel frame and panel base. (Example)

**INSTALLING THE PANEL FRAME** 

### For authorized service personnel only.



 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**

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

#### **⚠** CAUTION Do not install where there is the danger of combustible

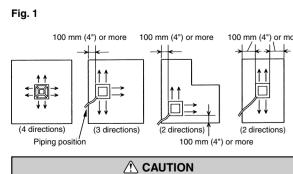
gas leakage. Do not install near heat sources. If children under 10 years old may approach the unit,

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:

take preventive measures so that they cannot reach

The discharge direction can be selected as shown below.



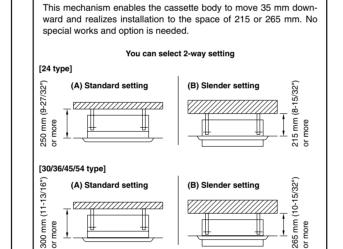
Since 2-way outlet as shown below causes performa

(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 as shown in Fig. 3. (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 outdoors easily. (7) Install the unit where noise and vibrations are not amplified.

Strong and durable ceiling



### CONNECTION PIPE REQUIREMENT

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

### **ELECTRICAL REQUIREMENT**

• Electric wire size:

• Use conformed cable with Type 245 IEC57.

• Install the disconnect device with a contact gap of at least 3 mm in all NOTE: Install the drain pipe. poles nearby the units (both indoor unit and outdoor unit).

### **INSTALLING DRAIN PIPE**

Pull up in the direction of the arrow while holding down the C

section of Fig. 9 (4 locations)

Fig. 9 Part B detail view

**⚠** CAUTION

nstall 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.

 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.

rise dimension over this range will cause leakage.

• 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

# 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.

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

#### 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 (3) Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare

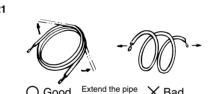
processing with a flare tool. Use the special R410A flare tool, or the conventional flare tool. When using the conventional flare tool, always use an allowance adjustment gauge and secure the A dimension shown in table 4. Check if [L] is flared uniformly

and is not cracked or scratched

Pipe outside diameter 9.52 mm (3/8 in.) 0 to 0.5

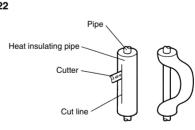
### 2. BENDING PIPES

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



Do not bend the pipes in an angle more than  $90^{\circ}$ . 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.

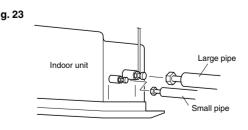
When bending the pipe, do not bend it as is. The pipe will be collapsed. In this case, cut the heat insulating pipe with a sharp cutter as shown in Fig. 22, and bend it after exposing the pipe. After bending the pipe as you want, be sure to put the heat insulating pipe back on the pipe, and secure



**↑** CAUTION To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or

② If the pipe is bent repeatedly at the same place, it will

## 3. CONNECTION PIPES

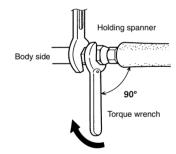


Be sure to apply the pipe against the port on the in-

door 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

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. 24). Fig. 24



To prevent gas leakage, coat the flare surface with alkylbenzene oil (HAB).

**↑** CAUTION Hold the torque wrench at its grip, keeping it in the right angle with the pipe as shown in Fig. 24, in order to tighten the flare nut correctly.

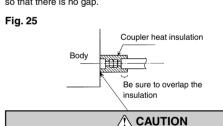
# Table 5 Flare nut tightening torque

Tightening torque 9.52 mm (3/8 in.) dia. 33 to 42 N·m (330 to 420 kgf·cm) 15.88 mm (5/8 in.) dia. 63 to 77 N·m (630 to 770 kgf·cm) Do not remove the cap from the connection pipe before connecting

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

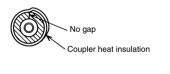
### **INSTALLING THE COUPLER HEAT INSULATION**

After checking for gas leaks, insulate by wrapping insulation around the two parts (large and small) of the indoor unit coupling, using the coupler After installing the coupler heat insulation, wrap both ends with vinyl tape



Appearance of slender setting

Must fit tightly against body without any gap.



- Continued on back -

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9/2/10, 10:54

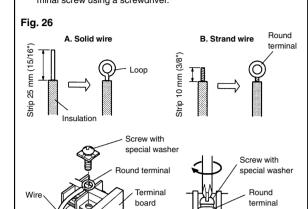
4) Shape the loop wire properly, place it on the terminal board and

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") of expose the strand wiring. 2) Using a screwdriver, remove the terminal screw(s) on the termina

(3) 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 ter minal screw using a screwdriver.



#### 2. INDOOR UNIT SIDE

Indoor unit

side termina

1. CONNECTION DIAGRAMS

Fig. 27

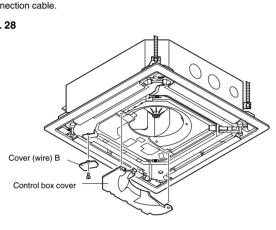
**MARNING** Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.

Match the terminal board numbers and connection cable colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric

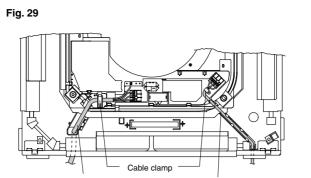
Connect the connection cable firmly to the terminal board. Imperfect installation may cause a fire. Always fasten the outside covering of the connection cable with the cable clamp. (If the insulator is chafed,

electric leakage may occur.) S Always connect the ground wire.

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



#### (2) After wiring is complete, clamp the remote controller cable and connection cable with the cable clamp. (3) Install the control box cover and cover (wire) B.

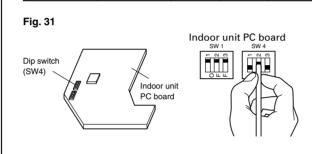


(To the outdoor unit) Fig. 30

Ceiling height setting

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

Table 6					
Ceiling height		DIP-SW4			
(m)		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	



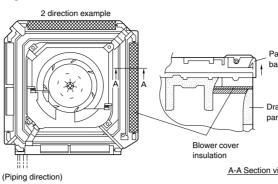
**↑** CAUTION ① If the setting for a low ceiling is selected, the capacity of the air conditioner decreases slightly.

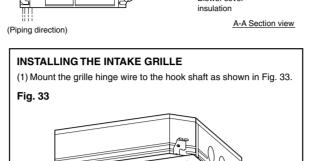
Do not set any switches other than those specified in this sheet. The air conditioner may not operate correctly if any switches other than those specified are changed.

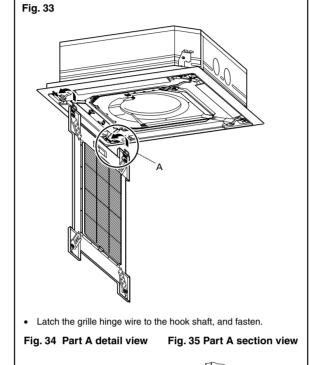
### **GRILLE INSTALLATION**

### **BLOWER COVER INSULATION**

Install the blower cover insulation only when the outlet direction is not specified. Two blower cover insulations are packed with the indoor unit. Install the blower cover insulation at the diffuser position shown in Fig. 32. At this time, use the piping position as the criteria.







failure etc., it restarts automatically after the power recovers.

Indoor unit

DIP Switch

: Factory setting

(Operated by setting before the power failure)

The auto restart function can be

(1) DIP switch setting (indoor unit)

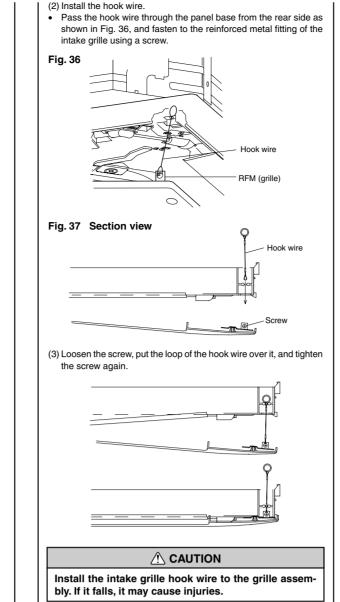
function will be canceled.

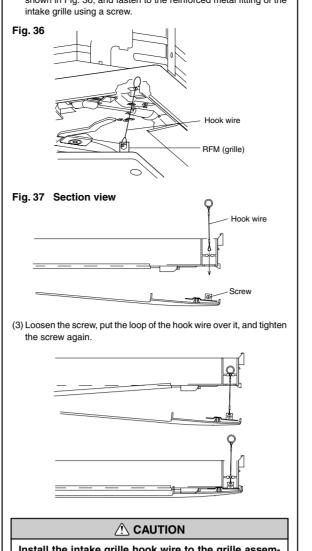
[DIP-SWITCH SETTING]

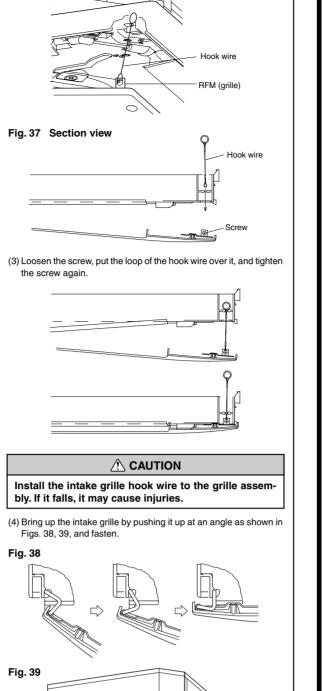
Change the DIP switch (SW1-1)

on the indoor unit circuit board

from ON to OFF. The auto restart







### REMOTE CONTROLLER SETTING

Not directly exposed to the outlet air from the air-

· Away from the influence of other heat sources.

When installing the remote controller and cable near a

source of electromagnetic waves, separate the remote

controller from the source of the electromagnetic waves

Do not touch the remote controller PC board and PC

the following conditions.

being airconditioned.

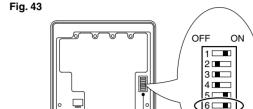
· Out of direct sunlight.

and use shielded cable.

conditioner.

#### Fig. 42 **⚠** CAUTION (Example) When detecting the room temperature Temperature sensor using the remote controller, please set up the remote controller according to If the remote controller is not well set, the correct room temperature will not be detected, and thus the abnormal conditions like "not cooled" or "not heated" will occur even if the air conditioner is running normally. · A location with an average temperature for the room

3. SETTING THE DIP SWITCHES



board parts directly with your hands.

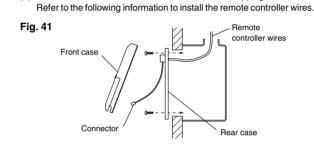
#### 1. INSTALLING THE REMOTE CONTROLLER

(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.



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.



#### 2. ROUTING THE REMOTE CONTROLLER WIRES

(1) Install the remote controller wires to the terminals on the top of the rear case as shown in the following figure. (2) Fasten the wires with the binder.

Install the remote controller wires so as not to be direct touched with

When using a battery (memory backup)

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.

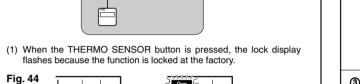
If batteries are not used, all of the settings stored in memory will be deleted if there is a power failure. 4. SETTING THE ROOM TEMPERATURE DETEC-

TION LOCATION The detection location of the room temperature can be selected from the following three examples. Choose the detection location that is best for

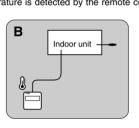
the installation location.

A. Indoor unit setting (factory setting)

The room temperature is detected by the indoor unit temperature sensor.



B. Remote controller setting The room temperature is detected by the remote controller temperature



on when the function is locked. (4) Make sure that the function is locked 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

(1) Press the THERMO SENSOR button for 5 Fig. 45

(2) Press the THERMO SENSOR button. The thermo sensor display ap-

(3) Press the THERMO SENSOR button again for 5 seconds or more to

lock the function. The thermo sensor display flashes and then remains

seconds or more to unlock the function. The thermo sensor display flashes and then dis-

(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.

(2) Press the THERMO SENSOR button to select the temperature sensor of the indoor unit or the remote controller



### **↑** CAUTION



When select the "Remote controller setting", if the detected temperature value between the temperature sensor of the indoor unit and the temperature sensor of

the remote controller varies significantly, it is likely to return to the control status of temperature sensor of the indoor unit temporarily. 2 As the temperature sensor of remote controller detects the temperature near the wall, when there is a

certain difference between the room temperature and the wall temperature, the sensor will not detect the room temperature correctly sometimes. Especially when the outer side of the wall on which the sensor is positioned is exposed to the open air, it is recommended to use the temperature sensor of the indoor unit to detect the room temperature when the indoor and outdoor temperature difference is

3 The temperature sensor of the remote controller is not only used when there is a problem in the detection of the temperature sensor of the indoor unit.

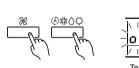
#### NOTES

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.

# **TEST RUN**

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

(1) Stop the air conditioner operation. (2) Press the MODE button and the FAN button simultaneously for 2 seconds or more to start the test run.





### (3) Press the START/STOP button to stop the test run.

### [SELF-DIAGNOSIS]

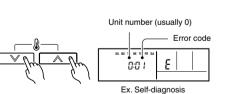
When the error indication "E:EE" is displayed, follow the following items to perform the self-diagnosis. "E:EE" indicates an error has occurred.

#### 1. REMOTE CONTROLLER DISPLAY (1) Stop the air conditioner operation.

(2) Press the SET TEMP. buttons  $\Lambda/V$  simultaneously for 5 seconds or more to start the self-diagnosis. Refer to the following tables for the description of each error code.

## Fig. 48

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(3) Press the SET TEMP. buttons  $\Lambda/V$  simultaneously for 5 seconds or more to stop the self-diagnosis.

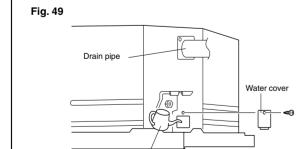
Table 7
Error o
nication error

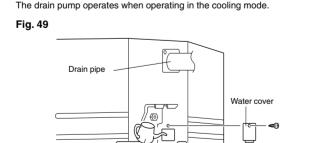
Error code	Error contents
00	Communication error (indoor unit remote controller)
01	Communication error (indoor unit — outdoor unit)
02	Room temperature sensor open
03	Room temperature sensor short-circuited
04	Indoor heat exchanger temperature sensor open
05	Indoor heat exchanger temperature sensor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

Error contents 13 Excessive outdoor pressure (permanent stop) Compressor temperature sensor 15 Pressure switch error CT error 18 Active filter module (AFM) error Compressor does not operate Outdoor unit fan error Communication error (inverter -- multicontroller) 2 way valve sensor error 1d Expansion valve error Connection indoor unit error

### 2. CHECKING DRAINAGE

To check the drain, remove the water cover and fill with 2 to 3  $\ell$  of water as shown in Fig. 49. The drain pump operates when operating in the cooling mode.



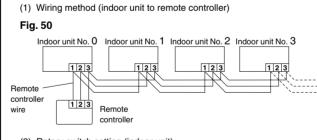


### **SPECIAL INSTALLATION METHODS**

**↑** 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.

. GROUP CONTROL SYSTEM



(2) Rotary switch setting (indoor unit) Set the unit number of each indoor unit using the rotary switch on the indoor unit circuit board.

The rotary switch is normally set to 0. (3) DIP switch setting (remote controller) Change DIP switch No. 3 on the remote controller from OFF to ON.

Rotary Switch

ON DIP Switch

2. DUAL REMOTE CONTROLLERS (OPTIONAL) Two separate remote controllers can be used to operate the indoor units.

(1) Wiring method (indoor unit to remote controller) Fig. 53

(2) DIP switch setting (remote controller) Set the remote controller DIP switch Nos. 1 and 2 according to the

following to	able.		=	
	Table 8		Fig. 54	
umber of	Maste	er unit	Remote controller	
mote introllers	DIP-SW No. 1	DIP-SW No. 2	OFF ON	
(Normal)	ON	OFF	OFF ON	
2 (Dual)	OFF	OFF	3 -	
	Table 9		5 💷	
umber of	Slave unit		6==	
mote introllers	DIP-SW No. 1	DIP-SW No. 2	DIP Switch	
(Normal)	-	_		
2 (Dual)	ON	ON		

### 3. AUTO RESTART When the air conditioner power was temporarily turned off by a power

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

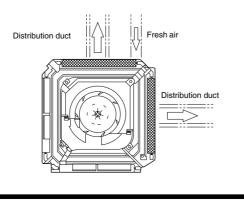
SW state Detail OFF ON Invalidity | Validity \* Auto restart setting \_ \* Temperature correction \_ \_ \* setting — ★ — Remote controller setting - \* -Air flow setting - \* -

Fig. 56

Remote controller					
Table 11					
	NO.	SW state		D-4-il	
		OFF	ON	Detail	
	1		*	Dual remote controller	
	2	*		setting	
DIP-Switch	3	One unit *	Multiple unit	Group control setting	
	4	Heat & Cool model	Cooling only model	Model setting	
	5	Invalidity	Validity *	Auto changeover setting	
	6	Invalidity*	Validity	Memory backup setting	

Table 10

**OPENING THE DUCT CONNECTION HOLE** 

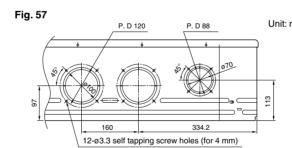


### **↑** CAUTION When performing hole opening work, be careful not to

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. 56. For the blocking direction, refer to Fig. 32.

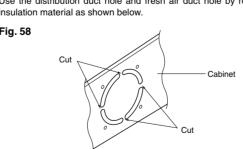
1. DIMENSION

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

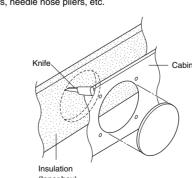


2. DISTRIBUTION DUCT AND FRESH AIR DUCT HOLE PROCESSING

Use the distribution duct hole and fresh air duct hole by removing the



• Cut off the part (Cabinet) indicated by the arrow in the Fig. 58 with nippers, needle nose pliers, etc.



. 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.

When mounting the duct, block the gap so that there is no cold air leakage.

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

Connect the distribution duct.

\* Insulate the duct and cut connection

9/2/10, 10:56

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