## SPLIT TYPE ROOM AIR CONDITIONER

## **Cassette Type** INSTALLATION MANUAL

(PART NO. 9359992011-03)

For authorized service personnel only.

## **!** WARNING 1) For the room 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 standerd 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) 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.
- The maximum length of the piping is shown in Table 1. If the units are further apart than this, correct operation cannot be guaranteed.

**INDOOR UNIT** 

room by the unit.

**OUTDOOR UNIT** 

(1) Install the indoor unit on a place having a sufficient strength so that

(2) The inlet and outlet ports should not be obstructed; the air should

(5) A place from where the air can be distributed evenly throughout the

39" (1.000 mi

or more

(3) Leave the space required to service the air conditioner. (Fig. 2)

(6) A place from where drainage can be extracted outdoors easily.

(4) The ceiling rear height is 9-3/8" inches (250 mm) or more.

Strong and durable ceiling

39" (1,000 mm)

Obstruction

**WARNING** 

Install the unit where it will not be tilted by more than 5°

2) When installing the outdoor unit where it may

(1) If possible, do not install the unit where it will exposed to direct

(2) Install the outdoor unit in a place where it will be free from being

(5) Take the air conditioner weight into account and select a place

(6) Select a place so that the warm air and noise from the air conditioner

(7) Provide the space shown in Fig. 3 so that the air flow is not blocked.

(8) During heating operation, drain water flows from the outdoor unit.

2' (60 cm)

flow will not be obstructed. (Reverse cycle model only)

Also for efficient operation, leave open three of the four directions

Therefore, install the outdoor unit in a place where the drain water

1' 4" (40 cm) or more

sunlight. (If necessary, install a blind that does not interfere with the

exposed to strong wind, fasten it securely.

dirty or getting wet by rain as much as possible.

where noise and vibration are small.

do not disturb neighbors.

front, rear, and both sides.

(3) Install the unit when connection to the indoor unit is easy.

(4) Do not place animals and plants in the path of the warm air.

or more

it withstands against the weight of the indoor unit.

be able to blow all over the room.

### 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
Remote control unit	1	Use for air conditioner operation
Battery (penlight)	4	For remote control unit
Remote control unit holder	1	For mounting the remote control unit
Tapping screw (ø3 x 12)	3	For remote control unit holder installation

## **OUTDOOR UNIT ACCESSORIES**

Hexagon wrench		1	For air purge
Pipe(drain)	F	1	For outdoor unit drain piping work (Heat & Cool model only)
Flexible tube		1	For outdoor unit drain piping work (Heat & Cool model only)
Cap(drain)		2	For outdoor unit drain piping work (Heat & Cool model only)

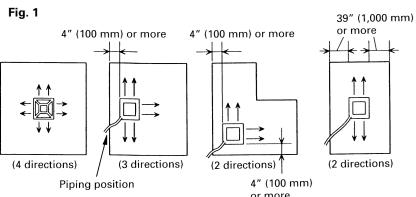
## **GRILLE ACCESSORIES**

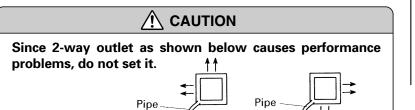
Bolt	4	For mounting grille
Washer	4	For mounting grille
Spring washer	4	For mounting grille
Blower cover insulation	2	For discharged air

## **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 after the Decide the mounting position together with the customer as follows:

The discharge direction can be selected as shown below.





## CONNECTION PIPE REQUIREMENT 2

rable i					
Diameter		Maximum	Maximum height (between indoor		
Small	Large	length	and outdoor)		
6.35 mm (1/4 in)	12.7 mm (1/2 in)	20 m (66 ft)	8 m (26 ft)		

- 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 PIPE REQUIREMENT**

Table 2

Electric wire size and fuse capacity;

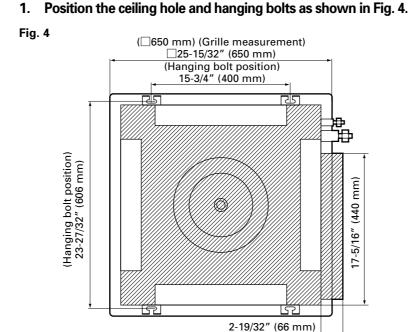
		12,000/14,000 BTU/h class	18,000 BTU/h class
POWER	MAX	3.0	3.0
CORD (mm²)	MIN	1.5	2.5
Connection	MAX	3.0	3.0
cord (mm²)	MIN	1.5	2.5
Fuse capac	ity (A)	15	20

• Always use H07RN-F or equivalent as the connection cord. • Install the circuit breaker nearby the units. (Both indoor unit and outdoor unit)

## **INSTALLATION PROCEDURE**

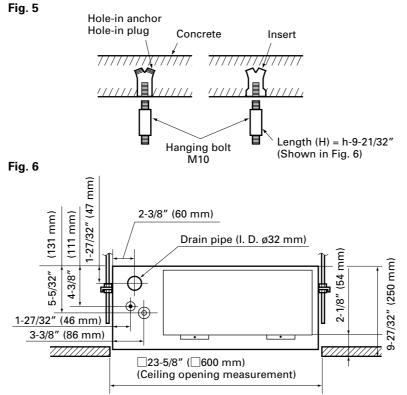
Install the room air conditioner as follows:

## **INDOOR UNIT INSTALLATION**



2. Hanging preparations

Firmly fasten the hanging bolts as shown in Fig.5 or by another method.



3. Body installation

body is level.

(1) Install special nut A, then special nut B onto the hanging bolt. (Fig. 7) (2) Raise the body and mount its hooks onto the hanging bolt between the special nuts. (Fig. 7)

(3) Turn special nut B to adjust the height of the body. (Fig. 7) (4) Leveling Using a level, or vinyl hose filled with water, fine adjust so that the

**⚠** WARNING

## Perform final tightening by tightening the double nut After installing the body, tighten the nuts. Hanging bolt-19/32" (15 mm) Fig. 8

## **INSTALLING DRAIN PIPE**

### Note: Install the drain pipe

reote: matan 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

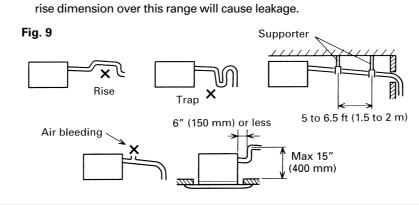
that there is no leakage. When the pipe is long, install supporters.

commercial 16 mm hose.

Do not perform air bleeding.

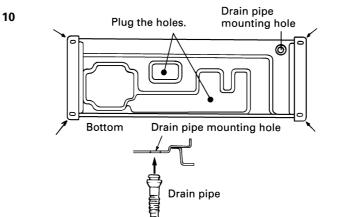
 Always heat insulate the indoor side of the drain pipe. • When desiring a high drain pipe height, raise it up to 15" (400 mm) or

less from the ceiling within a range of 6" (150 mm) from the body. A



## **OUTDOOR UNIT INSTALLATION**

- (1) When the outdoor unit will be exposed to strong wind, fasten it with bolts at the places indicated by the arrows. (Fig. 10) (2) Since the drain water flows out of the outdoor unit during heating operation, install the drain pipe and connect it to an
- (3) When installing the drain pipe, plug all the holes (● holes at two places) other than the drain pipe mounting hole in the bottom of the outdoor unit with putty so there is no water leakage. (Fig.



Installation in cold regions. Do not use the accessory drain pipe. (If the drain pipe is used, the drain water in the pipe may freeze in extremely cold weather.)

## **CONNECTING THE PIPING**

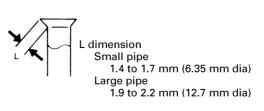
## 1. Flare processing

- (1) Cut the connection pipe with pipe cutters so that the pipe is not (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. 11) is spread uniformly and that there are no cracks.

## Table 3

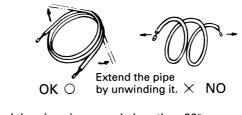
Pipe	Flare nut
Small pipe	Small (width across flats 17 mm)
Large pipe	Large (width across flats 24 mm)

# Width across flats



## 2. Bending pipes

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



Do not bend the pipes in an angle less than 90°. When the pipes are bent and stretched repeatedly, the material will be hardened, causing the pipes no longer be bent or stretched. Be sure to limit number of bendings and stretchings to three times.

When bending the pipe, do not bend Fig. 13 it as is. The pipe will be collapsed. In this case, cut the heat insulating pipe

Heat insulating with a sharp cutter as shown in Fig. pipe Cutter 13, and bend it after exposing the pipe. After bending the pipe as you Cut line want, be sure to put the heat insulating pipe back on the pipe, and secure it with tape.

!\ CAUTION

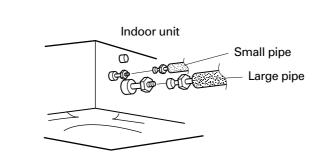
1 To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or

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

### 3. Connection pipes

(1) Indoor unit side

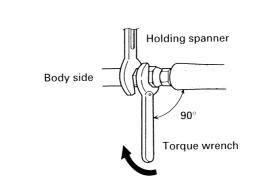
Fig. 14



#### **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 unit 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. 15)



#### !\ CAUTION

Hold the torque wrench at its grip, keeping it in the right angle with the pipe as shown in Fig. 15, 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

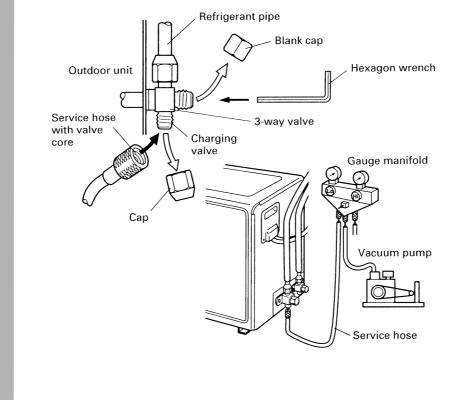
Be sure to connect the large pipe after connecting the small pipe completely

Tighten the flare nut of the connection pipe at the outdoor unit valve connector. The tightening method is the same as that as at

## the indoor side. Connection pipe (Large pipe) (Small pipe)

## **AIR PURGE**

- (1) Remove the cap, and connect the gauge manifold and the vacuum
- pump to the charging valve by the service hoses. (2) Vacuum the indoor unit and the connecting pipes until the pressure
- in them lowers to below 1.5 mmHg. (3) Disconnect the service hoses and fit the cap to the charging valve
- (Tightening torque: 70 to 90 kgf cm). (4) Remove the blank caps, and fully open the spindles of the 2-way and 3-way valves with a hexagon wrench (Torque: 2-way valve: 70 to 90 kgf • cm, 3-way valve: 100 to 120 kgf • cm).
- (5) Tighten the blank caps of the 2-way valve and 3-way valve to the specified torque (200 to 250 kgf • cm).



#### 2. Additional charge

- Refrigerant suitable for a piping length of 5 m is charged in the outdoor
- When the piping is longer than 5 m, additional charging is necessary. For the additional amount, see the table below.

#### Table 5

	I able 5						
Additional	Pipe length	16 ft (5 m)	23 ft (7 m)	33 ft (10 m)	49 ft (15 m)	66 ft (20 m)	oz / ft (g / m)
refrigerant		(5 111)	(7 111)	(10 111)	(13 111)	(20 111)	(9 / 111)
Cooling model	12,000 BTU/h class 14,000 BTU/h class	None	0.7 oz (20 g)	1.8 oz (50 g)	3.5 oz (100 g)	5.3 oz (150 g)	0.35 oz/3.3 ft (10 g/m)
	18,000 BTU/h class	None	1.1 oz (30 g)	2.6 oz (75 g)	5.3 oz (150 g)	7.9 oz (225 g)	0.53 oz/3.3 ft (15 g/m)
Heat & Cool model (Reverse	12,000 BTU/h class 14,000 BTU/h class	None	1.1 oz (30 g)	2.6 oz (75 g)	5.3 oz (150 g)	7.9 oz (225 g)	0.53 oz/3.3 ft (15 g/m)
cycle)	18,000 BTU/h class	None	2.1 oz (60 g)	5.3 oz (150 g)	10.6 oz (300 g)		1.06 oz/3.3 ft (30 g/m)

#### **CAUTION**

When moving and installing the air conditioner, do not mix gas other than the specified refrigerant (R22) inside the refrigerant cycle.

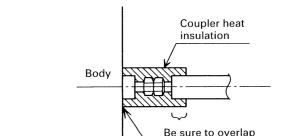
- When adding refrigerant, add the refrigerant from the charging valve at the completion of work.
- The maximum length of the piping is 20 m. If the units are further apart than this, correct operation can not be guaranteed.

## **INSTALLING THE COUPLER HEAT INSULATION**

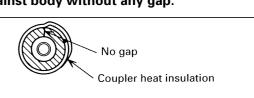
6

Fig. 18

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.



**!** CAUTION Must fit tightly against body without any gap.



the insulation

## **ELECTRICAL WIRING**

## **HOW TO CONNECT WIRING TO THE TERMINALS**

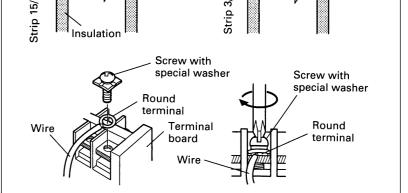
## A. For solid core wiring (or F-cable)

- (1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 15/16" (25 mm) of 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 screw

## B. For strand wiring

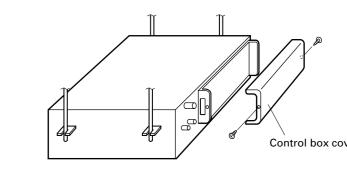
- (1) Cut the wire and with a wire cutter or wire-cutting pliers, then strip the insulation to about 3/8" (10 mm) of expose the strand wiring.
- (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
- (3) Using a round terminal fastener or pliers, securely clamp a round terminal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

## the terminal screw using a screwdriver.



## 1. Indoor unit side

(1) Remove the control box cover and install the connection cord. (Fig. 20 and 21) Fig. 20

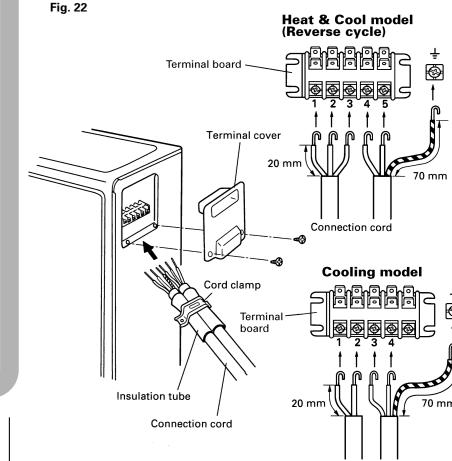


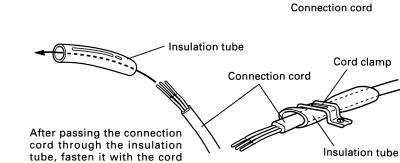
# (Reverse cycle) Cord clamp Cooling model

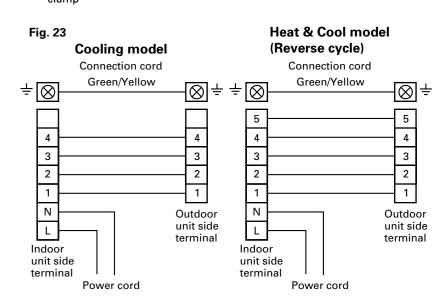
#### 2. Outdoor unit side

Heat and cool mode

- (1) Remove the terminal cover of the outdoor unit, and insert the end of the connection cord and the power cord into the terminal
- (2) Fasten the connection cord with the cord clamps, and install the terminal cover.



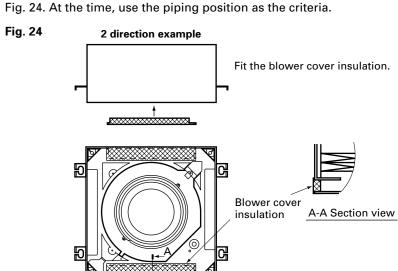




## **GRILLE INSTALLATION**

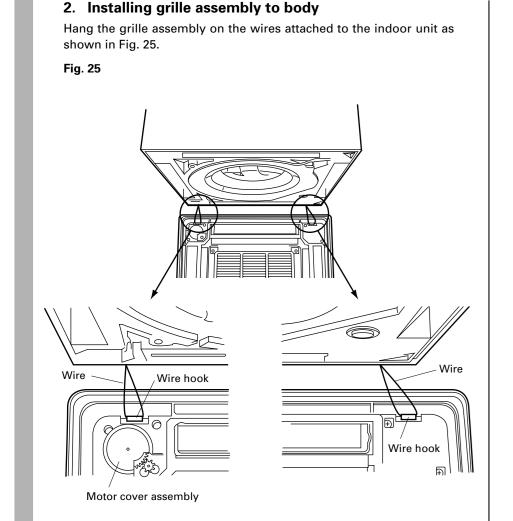
## 1. Blower cover insulation

Install the blower cover insulation only when the outlet direction is Two blower cover insulations are packed with the grille assembly. Install the blower cover insulation at the diffuser position shown in

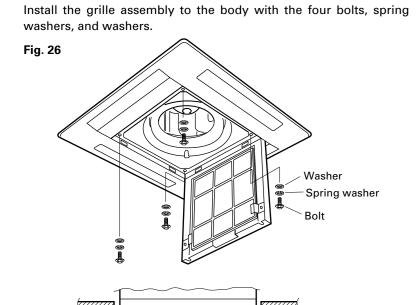


nsulation A-A Section view

## - Continued on back -

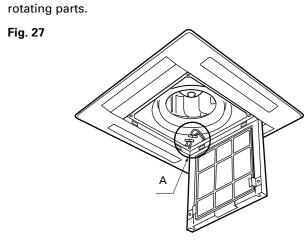


## Bolting the grille assembly to the body

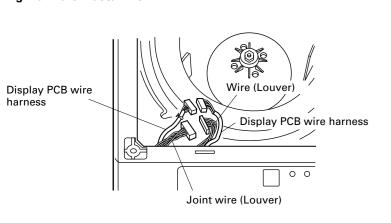


No gap between ceiling and grille around entire periphery.

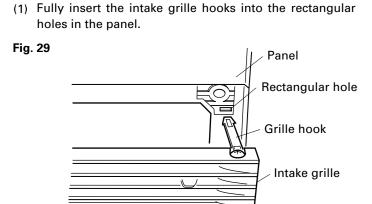
#### Wireless unit connection wire wiring Connect the connector in accordance part A detail view. Then clamp the lead wire with clamp so that it does not touch the



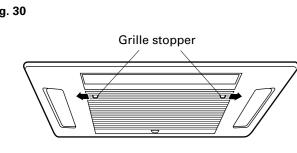
## Fig. 28 Part A detail view



## INSTALLING/REMOVING THE INTAKE GRILLE 1. Installing the intake grille



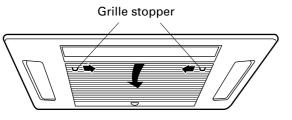
(2) Close the intake grille, then slide the two grille stoppers outward.



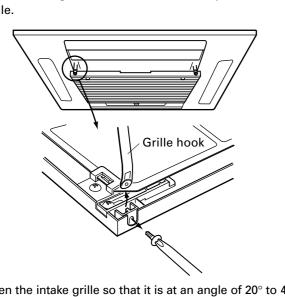
#### 2. Removing the intake grille

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

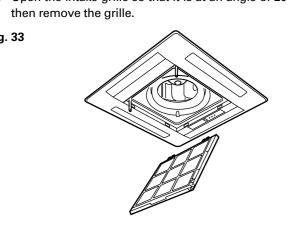
Fig. 31



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



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



A	CAUTION

- 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.

**REMOTE CONTROL UNIT** 

Install the remote control unit so that the front is facing the pho-

• Install the remote control unit with a distance of 5 m between

Install the remote control unit holder to a wall, pillar, etc. with

1) Mount the Holder. 2) Set the Remote Control 3 To remove the Remote

Control Unit (when use

the remote control unit and the grille photocell as the criteria. However, when installing the remote control unit, check that it

Remote control unit —

INSTALLATION

tocell. (Fig. 34)

the tapping screw (Fig.35).

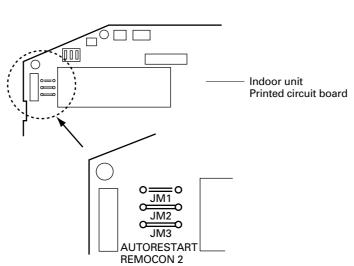
For use as Handy Type

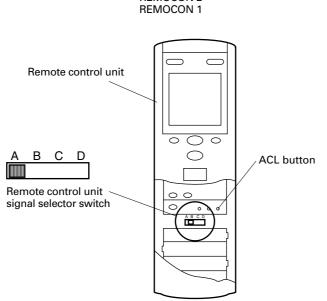
For use as Wall Fixing Type

Fig. 34

Fig. 35

## Remote control unit code switching.





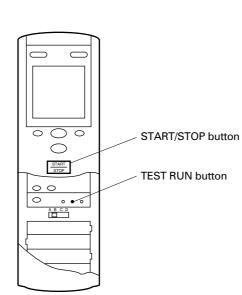
Confirm the remote control unit signal selector switch selection and printed circuit board setting. If these are not confirmed, the remote control unit cannot be operated for the air conditioner.

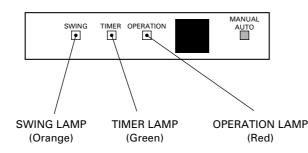
Table 6	

Jump	er wire	Remote control unit	
JM 2	JM 3	signal selector switch	
Connect	Connect	A(Primary setting)	
Connect	Disconnect	В	
Disconnect	Connect	С	
Disconnect	Disconnect	D	

## After setting the remote control unit signal selector switch, press the ACL button.

- Press the remote control unit test run button while the air
- At the end of test running, press the remote control unit start-



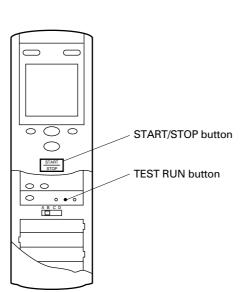


When the air conditioner is run by pressing the remote control unit test run button, the OPERATION and TIMER lamps flash slowly at the same time.

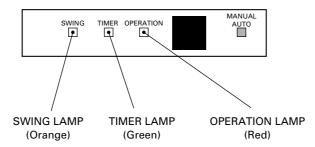


## **TEST RUNNING**

- conditioner is running. stop button. (Fig. 37)



Run the air conditioner in accordance with the operating manual.

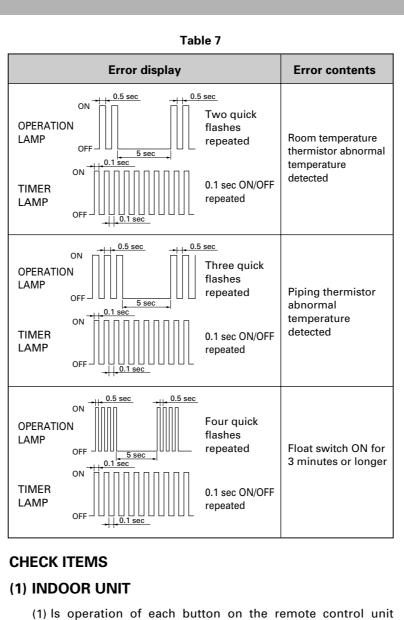


Operation can be checked by lighting and flashing of the grille display section OPERATION and TIMER lamps. Perform judgment in accordance with the following.

Test running

Error

The OPERATION and TIMER lamps operate as follows (Table 7) according to the error contents.



- nomal?
- (2) Does each lamp light normally?
- (3) Do not air flow direction louvers operate normally? (4) Is the drain normal?
- (5) Is there any abnormal noise and vibration during operation?

#### (2) OUTDOOR UNIT

- (1) Is there any abnormal noise and vibration during operation? (2) Will noise, wind or drain water from the unit disturb the neighbors?
- (3) Is there any gas leakage?
- Do not operate the air conditioner in the test running state for a
- For the operation method, refer to the operating manual and perform operation check.

PART NO. 9359992011-03