# HITACHI Inspire the Next

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NO. 0466E

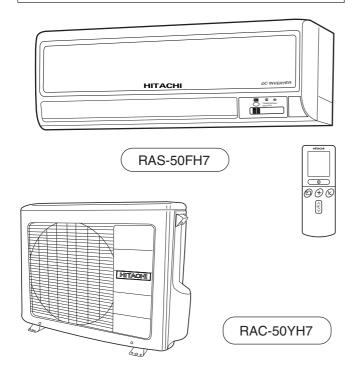
RAS-50FH7/RAC-50YH7

REFER TO THE FOUNDATION MANUAL

# **SERVICE MANUAL**

TECHNICAL INFORMATION

### FOR SERVICE PERSONNEL ONLY



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#### **SPECIFICATIONS**

TYPE			DC INVERTER (WALL TYPE)	
	1172		INDOOR UNIT	OUTDOOR UNIT
MODEL			RAS-50FH7	RAC-50YH7
POWER SOURCE			1 PHASE, 50/60 Hz, 220-240V	
	TOTAL INPUT	(W)	1,560 (155	5 ~ 2,200)
COOLING	TOTAL AMPERE	ES (A)	7.15 ~	- 6.56
OOOLING	CADACITY	(kW)	5.00 (0.9	9 ~ 5.2)
	CAPACITY	(B.T.U./h)	17,070 (3,07	72 ~ 17,754)
	TOTAL INPUT (W)		1,660 (155	5 ~ 2,200)
HEATING	TOTAL AMPERE	S (A)	7.60 ~	- 7.00
I III III III III III III III III III	CADACITY	(kW)	6.00 (0.9	9 ~ 8.1)
	CAPACITY	(B.T.U./h)	20,480 (3,07	72 ~ 27,649)
		W	780	850
DIMENSIONS (mm)		Н	280	650
		D	220	298
NET WEIGHT (kg)		(kg)	9.5	45

\* After installation

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

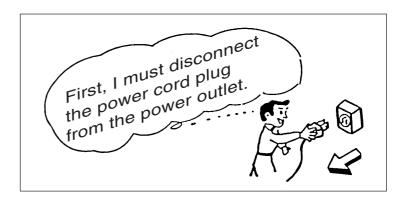
## ROOM AIR CONDITIONER

INDOOR UNIT + OUTDOOR UNIT

JANUARY 2010 Refrigeration & Air-Conditioning Division

### SAFETY DURING REPAIR WORK

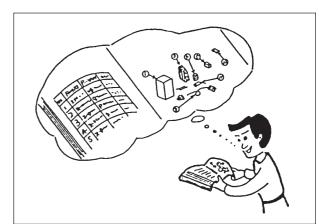
 In order to disassemble and repair the unit in question, be sure to disconnect the power cord plug from the power outlet before starting the work.



2. If it is necessary to replace any parts, they should be replaced with respective genuine parts for the unit, and the replacement must be effected in correct manner according to the instructions in the Service Manual of the unit.

If the contacts of electrical parts are defective, replace the electrical parts without trying to repair them.

- 3. After completion of repairs, the initial state should be restored.
- 4. Lead wires should be connected and laid as in the initial state.
- 5. Modification of the unit by user himself should absolutely be prohibited.



- 6. Tools and measuring instruments for use in repairs or inspection should be accurately calibrated in advance.
- 7. In installing the unit having been repaired, be careful to prevent the occurrence of any accident such as electrical shock, leak of current, or bodily injury due to the drop of any part.
- 8. To check the insulation of the unit, measure the insulation resistance between the power cord plug and grounding terminal of the unit. The insulation resistance should be  $1M\Omega$  or more as measured by a 500V DC megger.
- The initial location of installation such as window, floor or the other should be checked for being and safe enough to support the repaired unit again.
   If it is found not so strong and safe, the unit should be installed at the initial location reinforced or at a new location.
- Any inflammable thing should never be placed about the location of installation.
- 11. Check the grounding to see whether it is proper or not, and if it is found improper, connect the grounding terminal to the earth.



#### WORKING STANDARDS FOR PREVENTING BREAKAGE OF SEMICONDUCTORS

#### 1. Scope

The standards provide for items to be generally observed in carrying and handling semiconductors in relative manufacturers during maintenance and handling thereof. (They apply the same to handling of abnormal goods such as rejected goods being returned).

#### 2. Object parts

- (1) Micro computer
- (2) Integrated circuits (IC)
- (3) Field-effect transistors (FET)
- (4) P.C. boards or the like on which the parts mentioned in (1) and (2) of this paragraph are equipped.

#### 3. Items to be observed in handling

(1) Use a conductive container for carrying and storing of parts. (Even rejected goods should be handled in the same way).

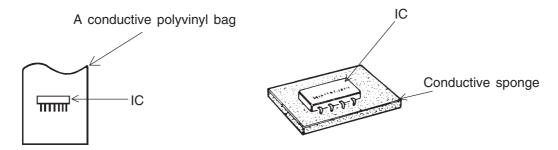


Fig. 1. Conductive Container

- (2) When any part is handled uncovered (in counting, packing and the like), the handling person must always use himself as a body earth. (Make yourself a body earth by passing one M ohm earth resistance through a ring or bracelet).
- (3) Be careful not to touch the parts with your clothing when you hold a part even if a body earth is being taken.
- (4) Be sure to place a part on a metal plate with grounding.
- (5) Be careful not to fail to turn off power when you repair the printed circuit board. At the same time, try to repair the printed circuit board on a grounded metal plate.

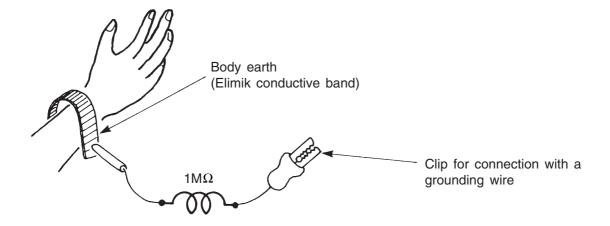


Fig. 2. Body Earth

(6) Use a three wire type soldering iron including a grounding wire.

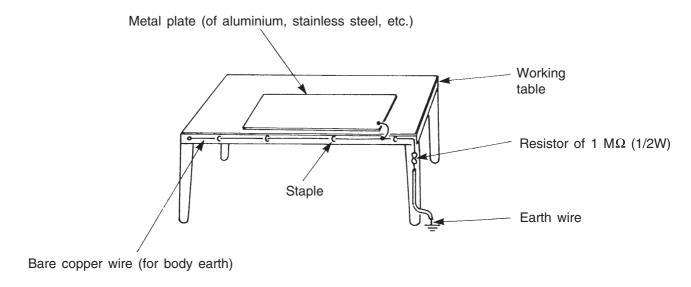


Fig. 3. Grounding of the working table

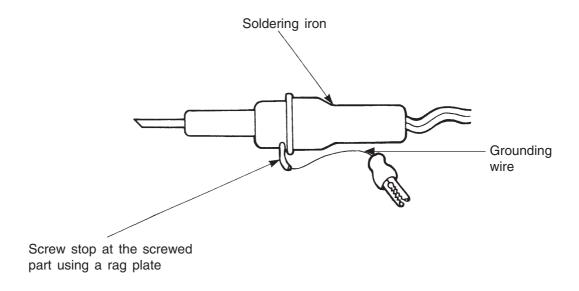


Fig. 4. Grounding a soldering iron

Use a high insulation mode (100V,  $10M\Omega$  or higher) when ordinary iron is to be used.

(7) In checking circuits for maintenance, inspection or some others, be careful not to have the test probes of the measuring instrument shortcircuit a load circuit or the like.

## **A** CAUTION

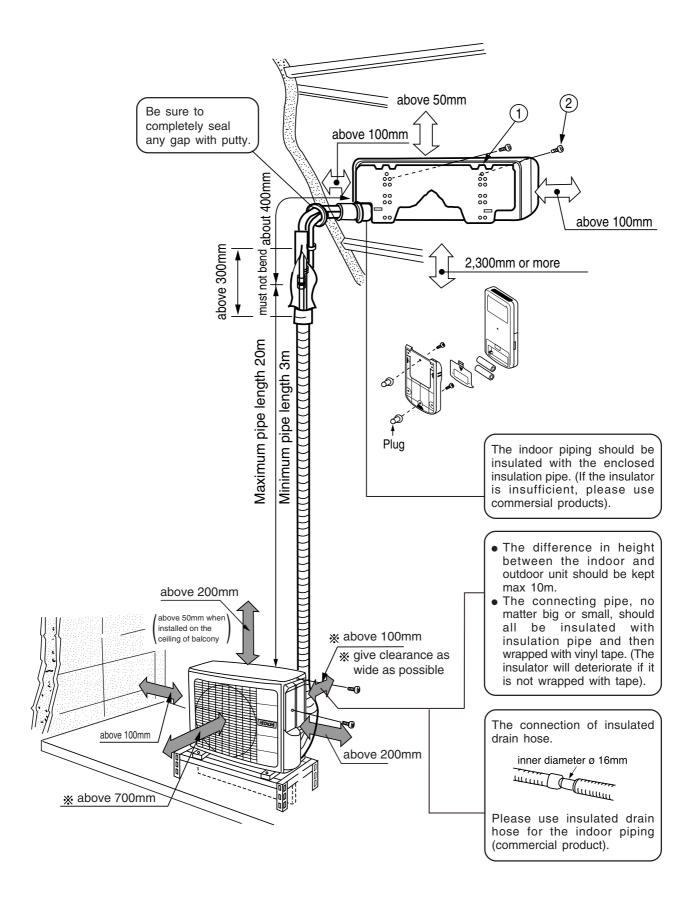
- 1. In quiet or stop operation, slight flowing noise of refrigerant in the refrigerating cycle is heard occasionally, but this noise is not abnormal for the operation.
- 2. When it thunders near by, it is recommend to stop the operation and to disconnect the power cord plug from the power outlet for safety.
- 3. In the event of power failure, the air conditioner will restart automatically in the previously selected mode once the power is restored. In the event of power failure during TIMER operation, the timer will be reset and the unit will begin or stop operating under a new timer setting.
- 4. If the room air conditioner is stopped by adjusting thermostat, or missoperation, and re-start in a moment, there is occasion that the cooling and heating operation does not start for 3 minutes, it is not abnormal and this is the result of the operation of IC delay circuit. This IC delay circuit ensures that there is no danger of blowing fuse or damaging parts even if operation is restarted accidentally.
- 5. This room air conditioner should not be used at the cooling operation when the outside temperature is below  $-10^{\circ}$ C (14°F).
- 6. This room air conditioner (the reverse cycle) should not be used when the outside temperature is below -15°C (5°F).

  If the reverse cycle is used under this condition, the outside heat exchanger is frosted and efficiency falls.
- 7. When the outside heat exchanger is frosted, the frost is melted by operating the hot gas system, it is not trouble that at this time fan stops and the vapour may rise from the outside heat exchanger.

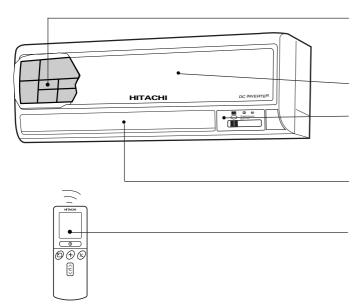
### **SPECIFICATIONS**

MODEL		RAS-50FH7	RAC-50YH7
FAN MOTOR		PWM DC35V	47 W
FAN MOTOR CAPACITOR		NO	NO
FAN MOTOR PROTECTOR		NO	NO
COMPRESSOR		_	JU1015DA
COMPRESSOR MOTOR CAP	ACITOR	NO	NO
OVERLOAD PROTECTOR		NO	YES (INTERNAL)
OVERHEAT PROTECTOR		NO	YES
FUSE (for MICROPROCESSOR)		NO	NO
POWER RELAY		NO	G4A
POWER SWITCH		NO	NO
TEMPORARY SWITCH		YES	NO
TEST/SERVICE SWITCH		NO	YES
TRANSFORMER		NO	NO
VARISTOR		NO	450NR
NOISE SUPPRESSOR		NO	YES
THERMOSTAT		YES(IC)	YES(IC)
REMOTE CONTROL SWITCH (LIQUID CRYSTAL)		YES	NO
REFRIGERANT CHARGING	UNIT		1600g
VOLUME (Refrigerant R410A)	PIPES (MAX. 20M) (MIN. 3M)	CHAR	GELESS

#### MODEL RAS-50FH7 / RAC-50YH7



### **INDOOR UNIT**



#### Air filter

To prevent dust from coming into the indoor unit. (Refer Instruction manual)

#### Front panel

#### Indoor unit indicators

Light indicator showing the operating condition. (Refer page 8)

Horizontal deflector ● Vertical deflector (Air Outlet)

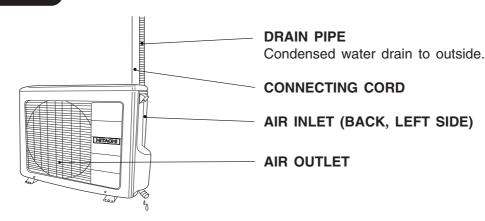
#### Remote controller

Send out operation signal to the indoor unit. So as to operate the whole unit. (Refer Instruction manual)

### NOTE

- Air cleansing filters are washable and can be use in 1 year time. Type number for this air cleansing filter is <SPX-CFH11>. Please use this number for ordering when you want to renew it.
- Air cleansing filter should be cleaned every month or sooner if noticeable loading occurs. When used overtime, it may loose its deodorizing function. For maximum performance, it is recommended to replace it every 1 year depending on application requirements.

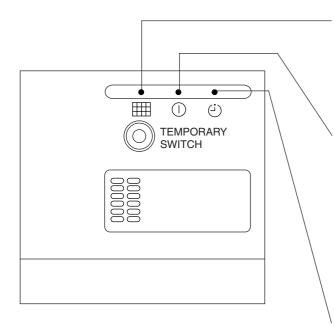
### **OUTDOOR UNIT**



### **MODEL NAME AND DIMENSIONS**

MODEL	WIDTH (mm)	HEIGHT (mm)	DEPTH (mm)
RAS-50FH7	780	280	220
RAC-50YH7	850	650	298

### **INDOOR UNIT INDICATORS**



#### **FILTER LAMP**

When the device is operated for a total of about 200 hours, the FILTER lamp lights to indicate that it is time to clean the filter. The lamp goes out when the "(AUTO SWING)" button is pressed while the device is on "STANDBY MODE".

#### **OPERATION LAMP**

This lamp lights during operation.

The OPERATION LAMP flashes in the following cases during heating.

### (1) During preheating

For about 2-3 minutes after starting up.

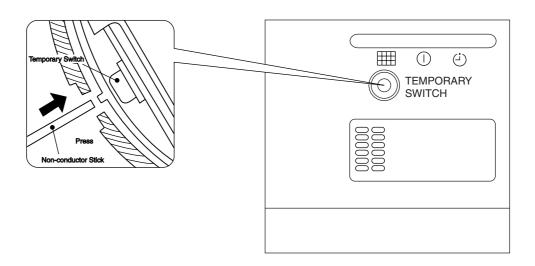
### (2) During defrosting

Defrosting will be performed about once every one hour when frost forms on the heat exchanger of the outdoor unit, for 5–10 minutes each time.

#### TIMER LAMP

This lamp lights when the timer is working.

### **OPERATION INDICATOR**



#### **TEMPORARY SWITCH**

Use this switch to start and stop when the remote controller does not work. [Use non-conductor stick (example: toothpick)]

- By pressing the temporary switch, the operation is done in previously set operation mode.
- When the operation is done using the temporary switch after the power source is turned off and turn on again, the operation is done in automatic mode.

### Note

 Avoid to use the room air conditioner for cooling operation when the outside temperature is below -10°C (14°F).

The recommended maximum and minimum operating temperatures of the hot and cold sides should be as below:

		Cooling		Heating	
		Minimum	Maximum	Minimum	Maximum
Indoor	Dry bulb °C	21	32	20	27
IIIdooi	Wet bulb °C	15	23	12	19
Outdoor	Dry bulb °C	21	43	2	21
Outdoor	Wet bulb °C	15	26	1	15



## SAFETY PRECAUTION

- Please read the "Safety Precaution" carefully before operating the unit to ensure correct usage of the unit.
- Pay special attention to signs of "A Warning" and "A Caution". The "Warning" section contains matters which, if not observed strictly, may cause death or serious injury. The "Caution" section contains matters which may result in serious consequences if not observed properly. Please observe all instructions strictly to ensure safety.
- The sign indicate the following meanings.

Make sure to connect earth line.

No The sign in the figure indicates prohibition.

Indicates the instructions that must be followed.

• Please keep this manual after reading.

### PRECAUTIONS DURING INSTALLATION



Do not reconstruct the unit.
 Water leakage, fault, short circuit or fire may occur if you reconstruct the unit by yourself.



Please ask your sales agent or qualified technician for the installation of your unit.
 Water leakage, short circuit or fire may occur if you install the unit by yourself.

Please use earth line.
 Do not place the earth line near water or gas pipes, lightning-conductor, or the earth line of telephone. Improper installation of earth line may cause electric shock.



• Be sure to use the specified piping set for R410A. Otherwise, this may result in broken copper pipes or faults.



• A circuit breaker should be installed depending on the mounting site of the unit. Without a circuit breaker, the danger of electric shock exists.



 Do not install near location where there is flammable gas. The outdoor unit may catch fire if flammable gas leaks around it.

• Please ensure smooth flow of water when installing the drain hose.

### PRECAUTIONS DURING SHIFTING OR MAINTENANCE

WARNING

A W

A

R

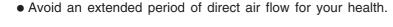
N I

N G • Should abnormal situation arises (like burning smell), please stop operating the unit and turn off the circuit breaker. Contact your agent. Fault, short circuit or fire may occur if you continue to operate the unit under abnormal situation.



- Please contact your agent for maintenance. Improper self maintenance may cause electric shock and fire.
- Please contact your agent if you need to remove and reinstall the unit. Electric shock or fire may occur if you remove and reinstall the unit yourself improperly.
- If the supply cord is damaged, it must be replaced by the special cord obtainable at authorized service/parts centers.

### PRECAUTIONS DURING OPERATION







- Do not insert a finger, a rod or other objects into the air outlet or inlet. As the fan is rotating at a high speed, it will cause injury. Before cleaning, be sure to stop the operation and turn the breaker OFF.
- Do not use any conductor as fuse wire, this could cause fatal accident.





• During thunder storm, disconnect and turn off the circuit breaker.

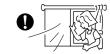
### PRECAUTIONS DURING OPERATION

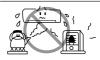
• The product shall be operated under the manufacturer specification and not for any other intended use.





- Do not attempt to operate the unit with wet hands, this could cause fatal accident.
- When operating the unit with burning equipments, regularly ventilate the room to avoid oxygen insufficiency.





- Do not direct the cool air coming out from the air-conditioner panel to face household heating apparatus as this may affect the working of apparatus such as the electric kettle, oven etc.
- Please ensure that outdoor mounting frame is always stable, firm and without defect. If not, the outdoor unit may collapse and cause danger.





- Do not splash or direct water to the body of the unit when cleaning it as this may cause short circuit.
- Do not use any aerosol or hair sprays near the indoor unit. This chemical can adhere on heat exchanger fin and blocked the evaporation water flow to drain pan. The water will drop on tangential fan and cause water splashing out from indoor unit.





- Please switch off the unit and turn off the circuit breaker during cleaning, the high-speed fan inside the unit may cause danger.
- Turn off the circuit breaker if the unit is not to be operated for a long period.





- Do not climb on the outdoor unit or put objects on it.
- Do not put water container (like vase) on the indoor unit to avoid water dripping into the unit. Dripping water will damage the insulator inside the unit and causes short-circuit.





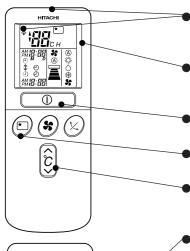
- Do not place plants directly under the air flow as it is bad for the plants.
- When operating the unit with the door and windows opened, (the room humidity is always above 80%) and with the air deflector facing down or moving automatically for a long period of time, water will condense on the air deflector and drips down occasionally. This will wet your furniture. Therefore, do not operate under such condition for a long time.
- If the amount of heat in the room is above the cooling or heating capability of the unit (for example: more people entering the room, using heating equipments and etc.), the preset room temperature cannot be achieved.
- This appliance is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure that they can use the appliance safely.
- Young children should be supervised to ensure that they do not play with the appliance.



### NAMES AND FUNCTIONS OF REMOTE CONTROL UNIT

#### REMOTE CONTROLLER

- This controls the operation of the indoor unit. The range of control is about 7 meters. If indoor lighting is controlled electronically, the range of control may be shorter.
  - This unit can be fixed on a wall using the fixture provided. Before fixing it, make sure the indoor unit can be controlled from the remote controller.
- Handle the remote controller with care. Dropping it or getting it wet may compromise its signal transmission capability.
- After new batteries are inserted into the remote controller, the unit will initially require approximately 10 seconds to respond to commands and operate.



#### Signal emitting window/transmission sign

Point this window toward the indoor unit when controlling it.

The transmission sign blinks when a signal is sent.

#### Display

This indicates the room temperature selected, current time, timer status, function and intensity of circulation selected.

### START/STOP button

Press this button to start operation. Press it again to stop operation.

#### SLEEP button

Use this button to set the sleep timer.

#### TEMPERATURE buttons

Use these buttons to raise or lower the temperature setting. (Keep pressed, and the value will change more quickly.)

#### TIME button

Use this button to set and check the time and date.

#### RESET buttons

#### FUNCTION selector

Use this button to select the operating mode. Every time you press it, the mode will change from a (AUTO) to \* (HEAT) to o (DEHUMIDIFY) to \* (COOL) and to \* (FAN) cyclically.

#### FAN SPEED selector

This determines the fan speed. Every time you press this button, the intensity of circulation will change from 6 (AUTO) to 2 (HI) to 3 (MED) to 3 (LOW) to 3 (SILENT) (This button allows selecting the optimal or preferred fan speed for each operation mode).

#### AUTO SWING button

Controls the angle of the horizontal air deflector.

#### TIMER control

Use this button to set the timer.

- OFF-TIMER button Select the turn OFF time.
- ON-TIMER button Select the turn ON time.
- ▶ RESERVE button Time setting reservation.
- CANCEL button Cancel time reservation.

# DEHUMIDIFY \* COOL

•>	FAN
	FAN SPEED - SILENT - LOW - MED - HI
*	SI FEPING

**AUTO** 

HEAT

Ä

①

PRESET

35 C

1 ×

ث	SLEEPING
0	STOP (CANCEL)
I	START (RESERVE)
1	START/STOP

<b>(</b>	TIME
Ċ	TIMER SET
9 <del>0</del> 0	TIMER SELECTOR ON TIMER OFF TIMER

### AUTO SWING

#### **Precautions for Use**

- Do not put the remote controller in the following places.
  - Under direct sunlight.
  - In the vicinity of a heater.
- Handle the remote controller carefully. Do not drop it on the floor, and protect it from water.
- Once the outdoor unit stops, it will not restart for about 3 minutes (unless you turn the power switch off and on or unplug the power cord and plug it in again).

This is to protect the device and does not indicate a failure.

 If you press the FUNCTION selector button during operation, the device may stop for about 3 minutes for protection.

### **VARIOUS FUNCTIONS**

### **■** Auto Restart Control

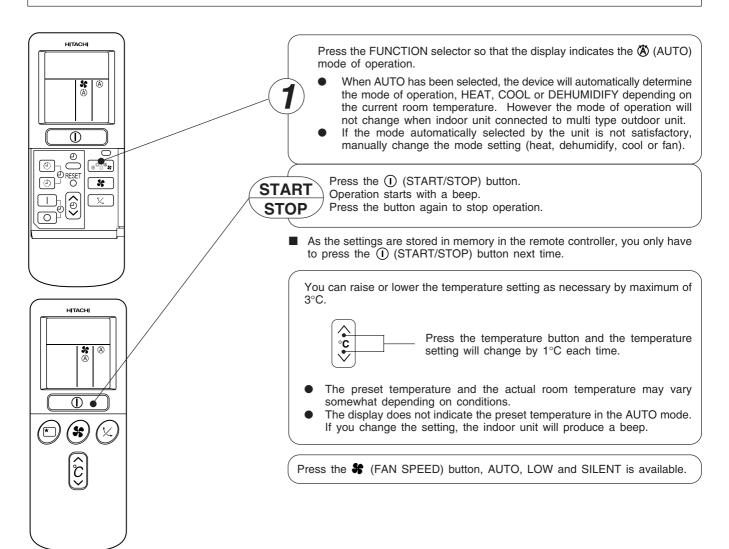
- If there is a power failure, operation will be automatically restarted when the power is resumed with previous operation mode and airflow direction.
  - (As the operation is not stopped by remote controller.)
- If you intend not to continue the operation when the power is resumed, switch off the power supply.
   When you switch on the circuit breaker, the operation will be automatically restarted with previous operation mode and airflow direction.

Note: 1. If you do not require Auto Restart Control, please consult your sales agent or OFF by remote control.

2. Auto Restart Control is not available when Timer or Sleep Timer mode is set.

## **AUTOMATIC OPERATION**

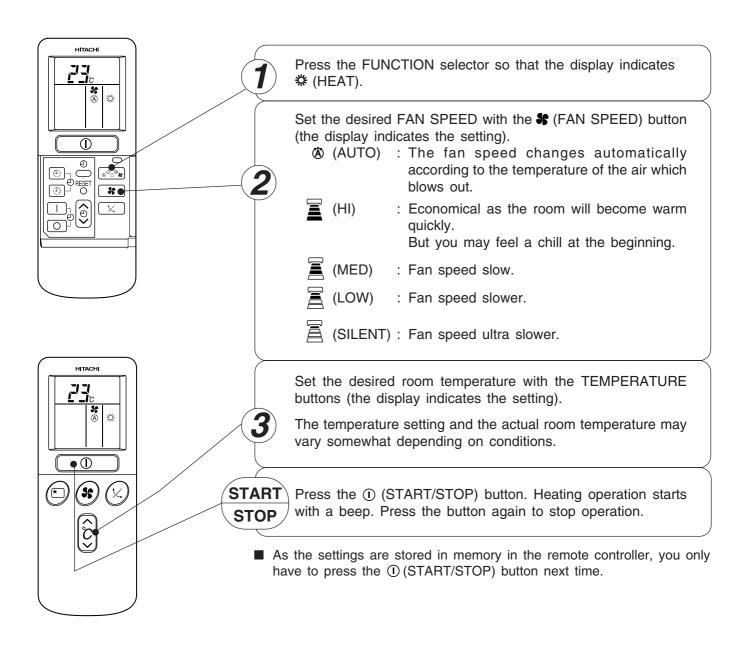
The device will automatically determine the mode of operation, HEAT, COOL or DEHUMIDIFY depending on the current room temperature. The selected mode of operation will change when the room temperature varies. However the mode of operation will not change when indoor unit connected to multi type outdoor unit.



### **HEATING OPERATION**

- Use the device for heating when the outdoor temperature is under 21°C.

  When it is too warm (over 21°C), the heating function may not work in order to protect the device.
- In order to keep reliability of the device, please use this device above -15°C of the outdoor temperature.



### ■ Defrosting

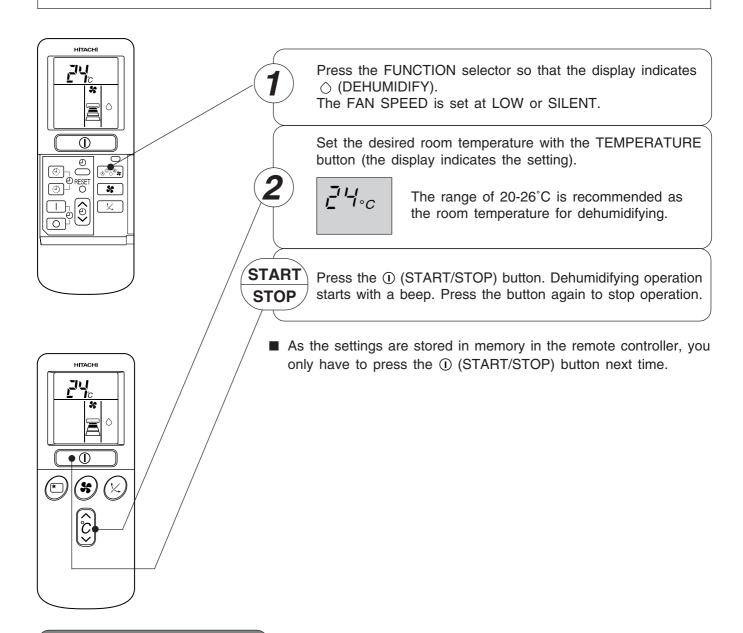
Defrosting will be performed about once an hour when frost forms on the heat exchange of the outdoor unit, for 5~10 minutes each time.

During defrosting operation, the operation lamp blinks in cycle of 3 seconds on and 0.5 second off. The maximum time for defrosting is 20 minutes.

However, if it is connected to multi type outdoor unit, the maximum time for defrosting is 15 minutes. (If the piping length used is longer than usual, frost will likely to form.)

### **DEHUMIDIFYING OPERATION**

Use the device for dehumidifying when the room temperature is over 16°C. When it is under 15°C, the dehumidifying function will not work.

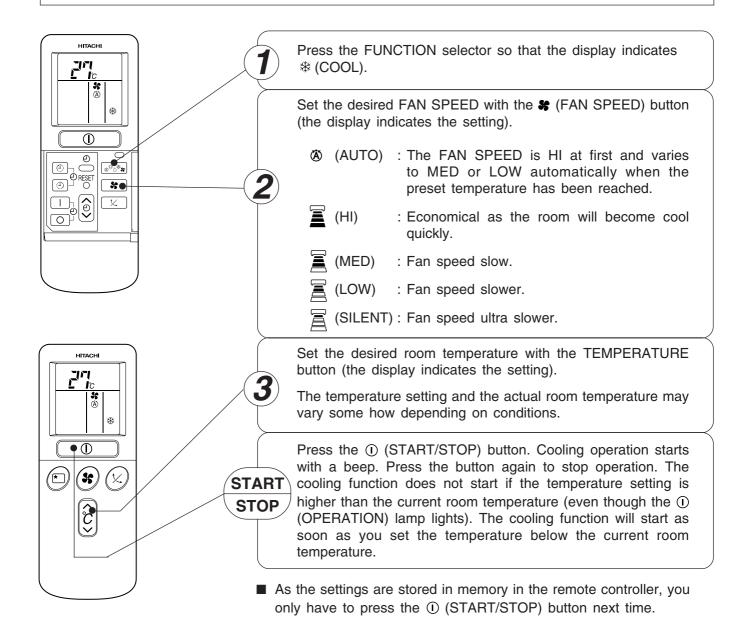


### **■** Dehumidifying Function

- When the room temperature is higher than the temperature setting: The device will dehumidify the room, reducing the room temperature to the preset level.
  - When the room temperature is lower than the temperature setting: Dehumidifying will be performed at the temperature setting slightly lower than the current room temperature, regardless of the temperature setting. The function will stop (the indoor unit will stop emitting air) as soon as the room temperature becomes lower than the setting temperature.
- The preset room temperature may not be reached depending on the number of people present in the room or other room conditions.

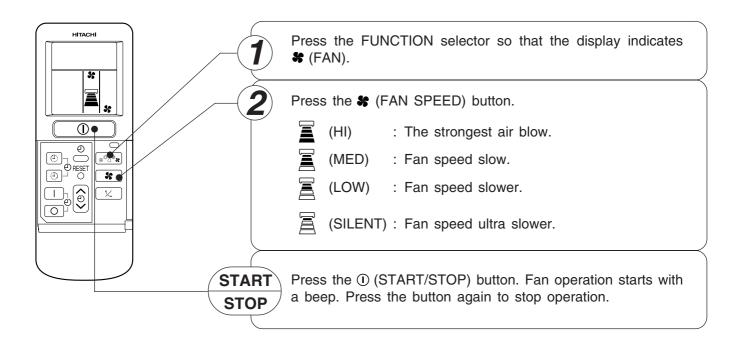
### **COOLING OPERATION**

Use the device for cooling when the outdoor temperature is  $-10^{\circ}$ C $\sim$ 43°C. If in doors humidity is very high (80%), some dew may form on the air outlet grille of the indoor unit.



### **FAN OPERATION**

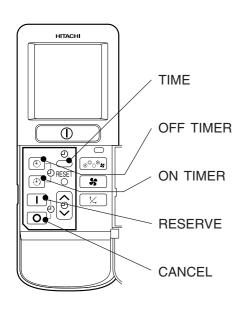
You can use the device simply as an air circulator. Use this function to dry the interior of the indoor unit at the end of summer.

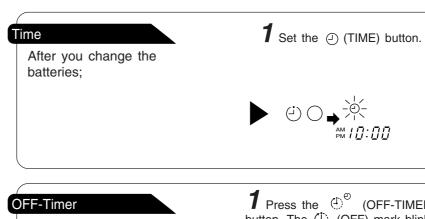


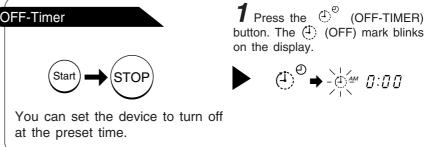
### **FAN SPEED (AUTO)**

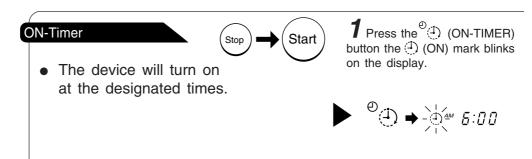
..... When the AUTO fan speed mode is set in the cooling/heating operation:

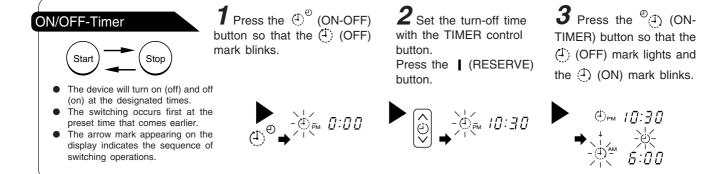
For the heating operation	<ul> <li>When the difference of room temperature and setting temperature is large, fan starts to run at HI speed.</li> <li>After room temperature reaches the preset temperature, the heating operation, which changes the fan speed and room temperature to obtain optimum conditions for natural healthful heating will be performed.</li> </ul>
For the cooling operation	<ul> <li>When the difference of room temperature and setting temperature is large, fan starts to run at HI speed.</li> <li>After room temperature reaches the preset temperature, the cooling operation, which changes the fan speed and room temperature to obtain optimum conditions for natural healthful cooling will be performed.</li> </ul>











### **How to Cancel Reservation**

Point the signal window of the remote controller toward the indoor unit, and press the  $\bigcirc$  (CANCEL) button

The ⊕ (RESERVED) sign goes out with a beep and the ⊕ (TIMER) lamp turns off on the indoor unit.

### NOTE

You can set only one of the OFF-timer, ON-timer and ON/OFF-timer.

**2** Press the ① (TIME) button.

 $oldsymbol{3}$  Set the current time with the TIMER control button.

4 Press the (TIME) button again. The time indication starts lighting instead of flashing.



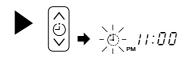


- The time indication will disappear automatically in 10 second.
- To check the current time setting, press the (1) (TIME) button twice.

The setting of the current time is now complete.

Example: The current time is 1:30 p.m.

2 Set the turn-off time with the TIMER control button.

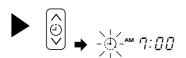


 $oldsymbol{3}$  Point the signal window of the remote controller toward the indoor unit, and press the I (RESERVE) button.

The (1) (OFF) mark starts lighting instead of flashing and the sign (2) (RESERVED) lights. A beep occurs and the ( (TIMER) lamp lights on the indoor unit.

The setting of turn-off time is now complete.

2 Set the turn-on time with the TIMER control button.



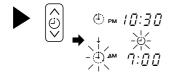
 $oldsymbol{3}$  Point the signal window of the remote controller toward the indoor unit, and press the [(RESERVE) button.

The (ON) mark starts lighting instead of flashing and the (RESERVED) sign lights. A beep occurs and the (1) (TIMER) lamp lights on the indoor unit.

4 Set the turn-on time with the TIMER control button.

**5** Point the signal window of the remote controller toward the indoor unit, and press the (RESERVE) button.

The (1) (ON) mark starts lighting instead of flashing and the (1) (RESERVED) sign lights. A beep occurs and the ( (TIMER) lamp lights on the indoor unit.



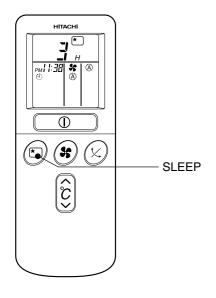
Example:

The device will turn off at 10:30 p.m. and it will be turned on at 7:00 a.m.

The settings of the turn-on/off times are now complete.

- The timer may be used in three ways: off-timer, on-timer, and ON/OFF (OFF/ON)-timer. Set the current time at first because it serves as a reference.
- As the time settings are stored in memory in the remote controller, you only have to press the I (RESERVE) button in order to use the same settings next time.

Set the current time at first if it is not set before (see the pages for setting the current time). Press the (SLEEP) button, and the display changes as shown below.



Mode	Indication
Sleep timer	1 hour → 2 hours → 3 hours → 7 hours → Sleep timer off

**Sleep Timer:** The device will continue working for the designated number of hours and then turn off.

Point the signal window of the remote controller toward the indoor unit, and press the SLEEP button.

The timer information will be displayed on the remote controller. The TIMER lamp lights with a beep from the indoor unit. When the sleep timer has been set, the display indicates the turn-off time.

Example: If you set 3 hours sleep time at 11:38 p.m., the turn-off time is 2:38 a.m.



The device will be turned off by the sleep timer and turned on by on-timer.

1 Set the ON-timer.

**2** Press the \* (SLEEP) button and set the sleep timer.



For heating:

In this case, the device will turn off in 2 hours (at 1:38 a.m.) and it will be turned on 6:00 next morning.

#### **How to Cancel Reservation**

Point the signal window of the remote controller toward the indoor unit, and press the  $\bigcirc$  (CANCEL) button

The ① (RESERVED) sign goes out with a beep and the ② (TIMER) lamp turns off on the indoor unit.

## HOW TO EXCHANGE THE BATTERIES IN THE REMOTE CONTROLLER



Remove the cover as shown in the figure and take out the old batteries.

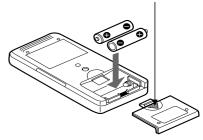
Push and pull to the direction of arrow





Install the new batteries.

The direction of the batteries should match the marks in the case.



### **A** CAUTION

- 1. Do not use new and old batteries, or different kinds of batteries together.
- 2. Take out the batteries when you do not use the remote controller for 2 or 3 months.

### **TEMPORARY SWITCH**

If the remote controller does not work due to battery failure, press this switch to start and stop operation.

• This temporary operation will be at the setting made most recently. (The unit will immediately go into automatic operation once power is switched on.)

### **CIRCUIT BREAKER**

When you do not use the room air conditioner, set the circuit breaker to "OFF".

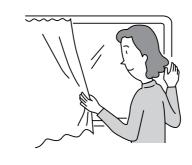
### **Suitable Room Temperature**



### **A** Warning

Freezing temperature is bad for health and a waste of electric power.

### Install curtain or blinds



It is possible to reduce heat entering the room through windows.

### **Ventilation**

#### **A** Caution

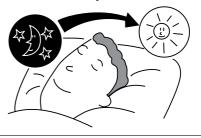
Do not close the room for a long period of time. Occasionally open the door and windows

to allow the entrance of fresh air.



### **Effective Usage Of Timer**

At night, please use the "OFF or ON timer operation mode", together with your wake up time in the morning. This will enable you to enjoy a comfortable room temperature. Please use the timer effectively.



## Do Not Forget To Clean The Air Filter

Dusty air filter will reduce the air volume and the cooling efficiency. To prevent from wasting electric energy, please clean the filter every 2 weeks.



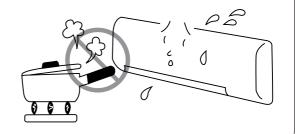
### **Please Adjust Suitable Temperature** For Baby And Children

Please pay attention to the room temperature and air flow direction when operating the unit for baby, children and old folks who have difficulty in movement.

### The Air Conditioner And The Heat Source In The Room

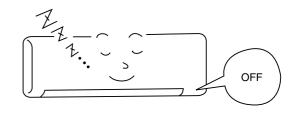
### **A** Caution

If the amount of heat in the room is above the cooling capability of the air conditioner (for example: more people entering the room, using heating equipments and etc.), the preset room temperature cannot be achieved.



### **Not Operating For A Long Time**

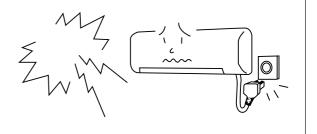
When the indoor unit is not to be used for a long period of time, please switch off the power from the mains. If the power from mains remains "ON", the indoor unit still consumes about 8W in the operation control circuit even if it is in "OFF" mode.



### When Lightning Occurs

### **A** Warning

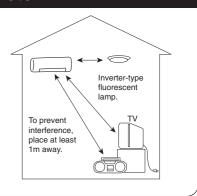
To protect the whole unit during lightning, please stop operating the unit and remove the plug from the socket.



### **Interference From Electrical Products**

### **A** Caution

To avoid noise interference, please place the indoor unit and its remote controller at least 1m away from electrical products.



### ATTACHING THE AIR CLEANSING FILTERS

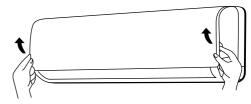
### **▲** CAUTION

Cleaning and maintenance must be carried out only by qualified service personal. Before cleaning, stop operation and switch off the power supply.



### Open the front panel.

 Pull up the front panel by holding it at both sides with both hands.





#### Remove the filter.

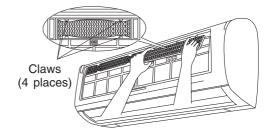
 Push upward to release the claws and pull out the filter.





### Attaching the air cleansing filters to the filter.

 Attach the air cleansing filters to the frame by gently compress its both sides and release after insertion into filter frame.



### **A** CAUTION

Do not bend the air cleansing filter as it may cause damage to the structure.

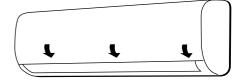






#### Attach the filters.

- Attach the filters by ensuring that the surface written "FRONT" is facing front.
- After attaching the filters, push the front panel at three arrow portion as shown in figure and close it.



### **NOTE**

- In case of removing the air cleansing filters, please follow the above procedures.
- The cooling capacity is slightly weakened and the cooling speed becomes slower when the air cleansing filters are used. So, set the fan speed to "HIGH" when using it in this condition.
- Do not operate the air conditioner without filter. Dust may enter the air conditioner and fault may occur.

### **MAINTENANCE**

### **A** CAUTION

Cleaning and maintenance must be carried out only by qualified service personal. Before cleaning, stop operation and switch off the power supply.

### 1. AIR FILTER III

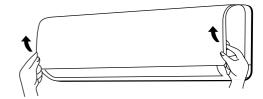
Clean the air filter, as it removes dust inside the room. In case the air filter is full of dust, the air flow will decrease and the cooling capacity will be reduced. Further, noise may occur. Be sure to clean the filter following the procedure below.

#### PROCEDURE



Open the front panel and remove the filter

 Gently lift and remove the air cleansing filter from the air filter frame.



Vacuum dust from the air filter and air cleansing filter using vacuum cleaner. If there is too much dust, air filter only rinse under running tap water and gently brush it with soft bristle brush. Allow filters to dry in shade.







- Re-insert the air cleansing filter to the filter frame. Set the filter with "FRONT" mark facing front, and slot them into the original state.
- After attaching the filters, push the front panel at three arrow portions as shown in figure and close it.



### **▲** CAUTION

- Do not wash with hot water at more than 40°C. The filter may shrink.
- When washing it, shake off moisture completely and dry it in the shade; do not expose it directly to the sun. The filter may shrink.
- Do not use detergent on the air cleansing filter as some detergent may deteriorate the filter electrostatic performance.

### 2. Washable Front Panel

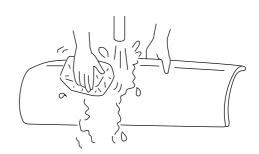
 Remove the front panel and wash with clean water.

Wash it with a soft sponge.

After using neutral detergent, wash thoroughly with clean water.

- When front panel is not removed, wipe it with a soft dry cloth. Wipe the remote controller thoroughly with a soft dry cloth.
- Wipe the water thoroughly.
   If water remains at indicators or signal receiver of indoor unit, it causes trouble.

Method of removing the front panel. Be sure to hold the front panel with both hands to detach and attach it.



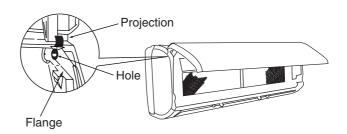


### Removing the Front Panel



 When the front panel is fully opened with both hands, push the right arm to the inside to release it, and while closing the front panel slightly, put it out forward.

### Attaching the Front Panel



 Move the projections of the left and right arms into the Flanges in the unit and securely insert them into the holes.

### **A** CAUTION

- Do not splash or direct water to the body of the unit when cleaning it as this may cause short circuit.
- Never use hot water (above 40°C), benzine, gasoline, acid, thinner or a brush, because they will damage the plastic surface and the coating.

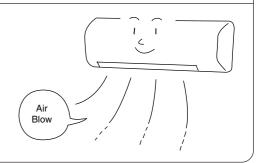


### **A** CAUTION

Cleaning and maintenance must be carried out only by qualified service personal. Before cleaning, stop operation and switch off the power supply.

### 3. MAINTENANCE AT BEGINNING OF LONG OFF PERIOD

- Running the unit setting the operation mode to \$\mathbb{s}\$
   (FAN) and the fan speed to HI for about half a day
   on a fine day, and dry the whole of the unit.
- Switch off the power plug.



### **REGULAR INSPECTION**

PLEASE CHECK THE FOLLOWING POINTS BY QUALIFIED SERVICE PERSONAL EITHER EVERY HALF YEARLY OR YEARLY. CONTACT YOUR SALES AGENT OR SERVICE SHOP.

1		Is the earth line disconnected or broken?
2		Is the mounting frame seriously affected by rust and is the outdoor unit tilted or unstable?
3	Confirm	Is the plug of power line firmly plugged into the socket? (Please ensure no loose contact between them).

### WHEN ASKING FOR SERVICE, CHECK THE FOLLOWING POINTS.

CONDITION	CHECK THE FOLLOWING POINTS	
If the remote controller is not transmitting a signal.  Remote controller display is dim or blank.)	<ul> <li>Do the batteries need replacement?</li> <li>Is the polarity of the inserted batteries correct?</li> </ul>	
When it does not operate	<ul> <li>Is the fuse all right?</li> <li>Is the voltage extremely high or low?</li> <li>Is the circuit breaker "ON"?</li> <li>Is the setting of operation mode different from other indoor units?</li> </ul>	
When it does not cool well When it does not hot well	<ul> <li>Is the air filter blocked with dust?</li> <li>Does sunlight fall directly on the outdoor unit?</li> <li>Is the air flow of the outdoor unit obstructed?</li> <li>Are the doors or windows opened, or is there any source of heat in the room?</li> <li>Is the set temperature suitable?</li> <li>Are the air inlets or air outlets of indoor and outdoor units blocked?</li> <li>Is the fan speed "LOW" or "SILENT"?</li> </ul>	



#### **Notes**

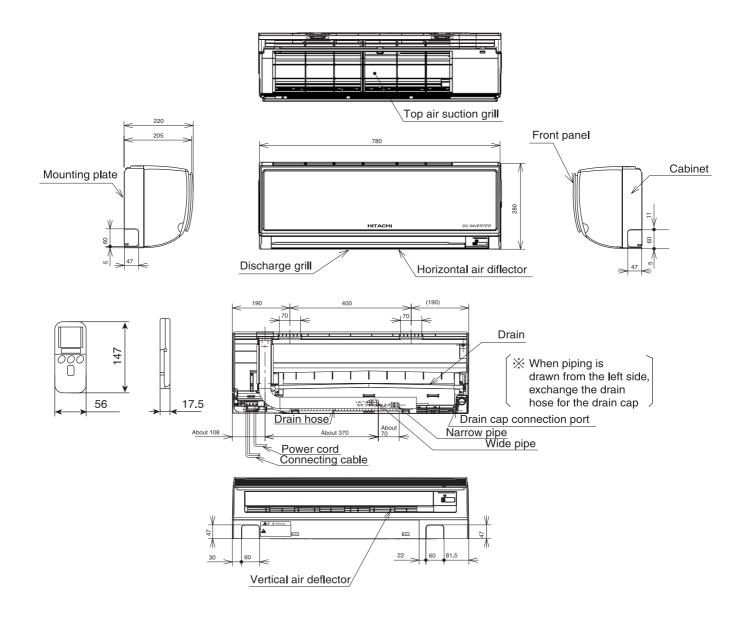
- In quiet operation or stopping the operation, the following phenomena may occassionally occur, but they are not abnormal for the operation.
  - (1) Slight flowing noise of refrigerant in the refrigerating cycle.
  - (2) Slight rubbing noise from the fan casing which is cooled and then gradually warmed as operation stops.
- The odor will possibly be emitted from the room air conditioner because the various odor, emitted by smoke, foodstuffs, cosmetics and so on, sticks to it. So the air filter and the evaporator regularly must be cleaned to reduce the odor.
- Please contact your sales agent immediately if the air conditioner still fails to operate normally after the above inspections. Inform your agent of the model of your unit, production number, date of installation. Please also inform him regarding the fault.
- Power supply shall be connected at the rated voltage, otherwise the unit will be broken or could not reach the specified capacity.

#### NOTE:

- If the supply cord is damaged, it must be replaced by the special cord obtainable at authorized service parts centers.
- On switching on the equipment, particularly when the room light is dimmed, a slight brightness fluctuation may occur. This is of no consequence.
  - The conditions of the local Power Supply Companies are to be observed.

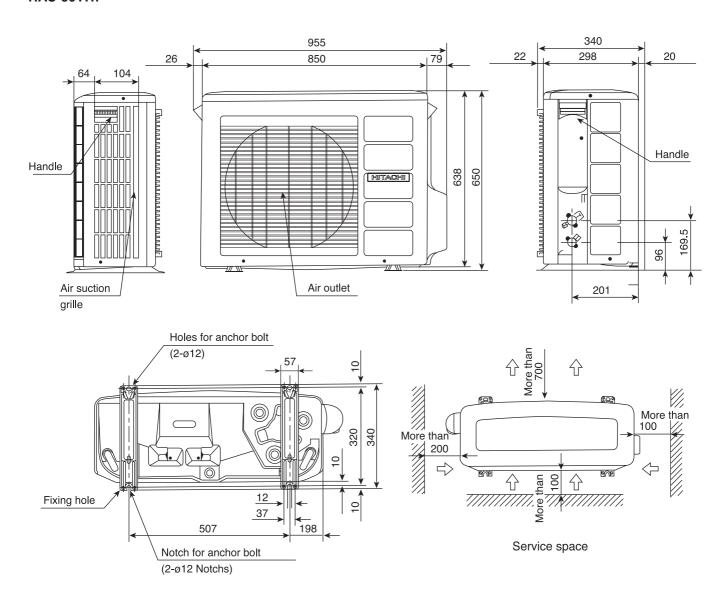
### CONSTRUCTION AND DIMENSIONAL DIAGRAM

### MODEL RAS-50FH7



### CONSTRUCTION AND DIMENSIONAL DIAGRAM FOR OUTDOOR

### RAC-50YH7



### MAIN PARTS COMPONENT

### **THERMOSTAT** (Room Temperature Thermistor)

Thermostat Specifications

MODEL			RAS-50FH7	
THERMOSTAT MODEL			IC	
OPERATION MODE			COOL	HEAT
TEMPERATURE °C (°F)	INDICATION 16	ON	16.7 (62.1)	20.0 (68.0)
		OFF	16.0 (60.8)	20.7 (69.3)
	INDICATION 24	ON	24.7 (76.5)	28.0 (82.4)
		OFF	24.0 (75.2)	28.7 83.7)
	INDICATION 32	ON	32.7 (90.9)	36.0 (96.8)
		OFF	32.0 (89.6)	36.7 (98.1)

### **INDOOR FAN MOTOR**

Fan Motor Specifications

MODEL	RAS-50FH7	
POWER SOURCE	DC: 5 ~ 35V	
ОИТРИТ	25W	
CONNECTION	35V O BLK 0V O WHT 5V O YEL 0 ~ 5V O BLU FG O BLU (Control circuit built in)	

### **OUTDOOR FAN MOTOR**

Fan Motor Specifications

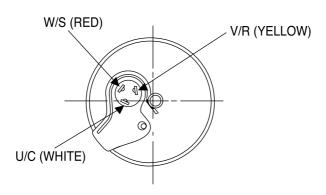
ITEM	MODEL	RAC-50YH7	
POWER SOURCE		DC: 120 ~ 380V	
OUTPUT (W) MAX		47	
COIL		RED (U)  M  M  M  WHITE (V)	
RESISTANCE VALUE ( $\Omega$ )	20°C 2M	U-V 35 ± 2.5	

BLU : BLUE YEL : YELLOW BRN : BROWN
GRY : GRAY ORN : ORANGE GRN : GREEN
BLK : BLACK PNK : PINK VIO : VIOLET WHT: WHITE RED : RED

### **COMPRESSOR MOTOR**

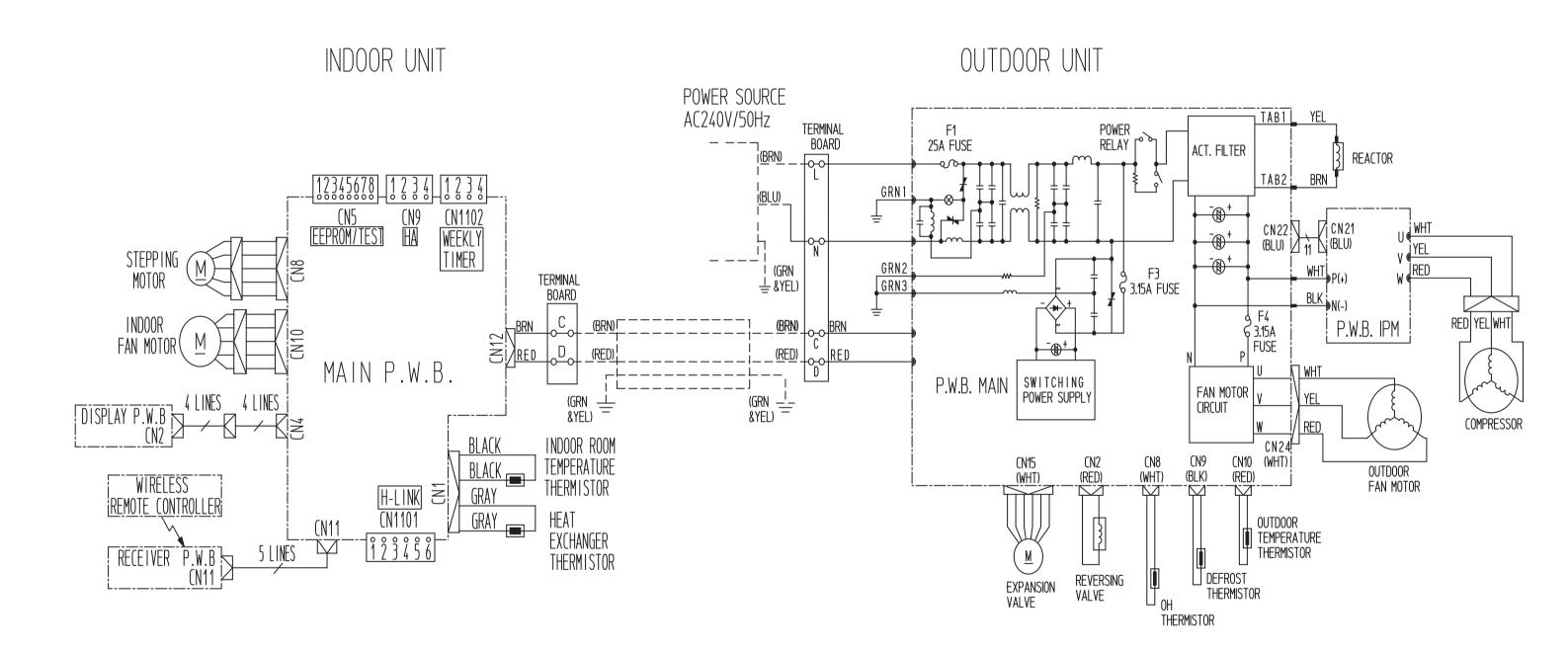
### Compressor Motor Specifications

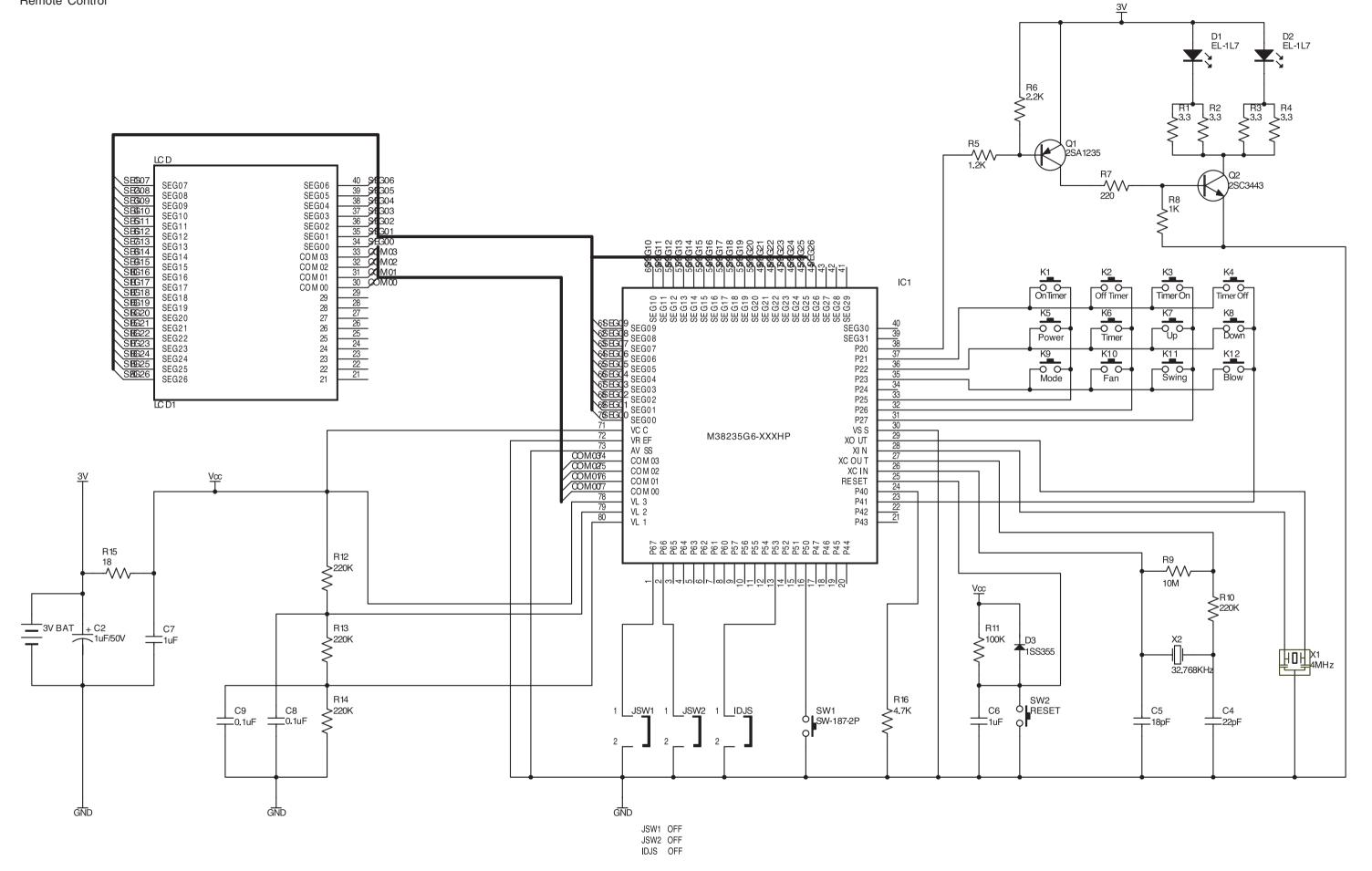
MODEL		RAC-50YH7	
COMPRESSOR MODEL		JU1015DA	
PHASE		SINGLE	
RATED VOLTAGE		AC 220 ~ 240 V	
RATED FREQUENCY		50/60 Hz	
POLE NUMBER		4	
CONNECTION		WHITE  M  M  YELLOW   RED	
RESISTANCE VALUE $(\Omega)$	20°C (68°F)	2M = 1.579	
	75°C (167°F)	2M = 2.149	

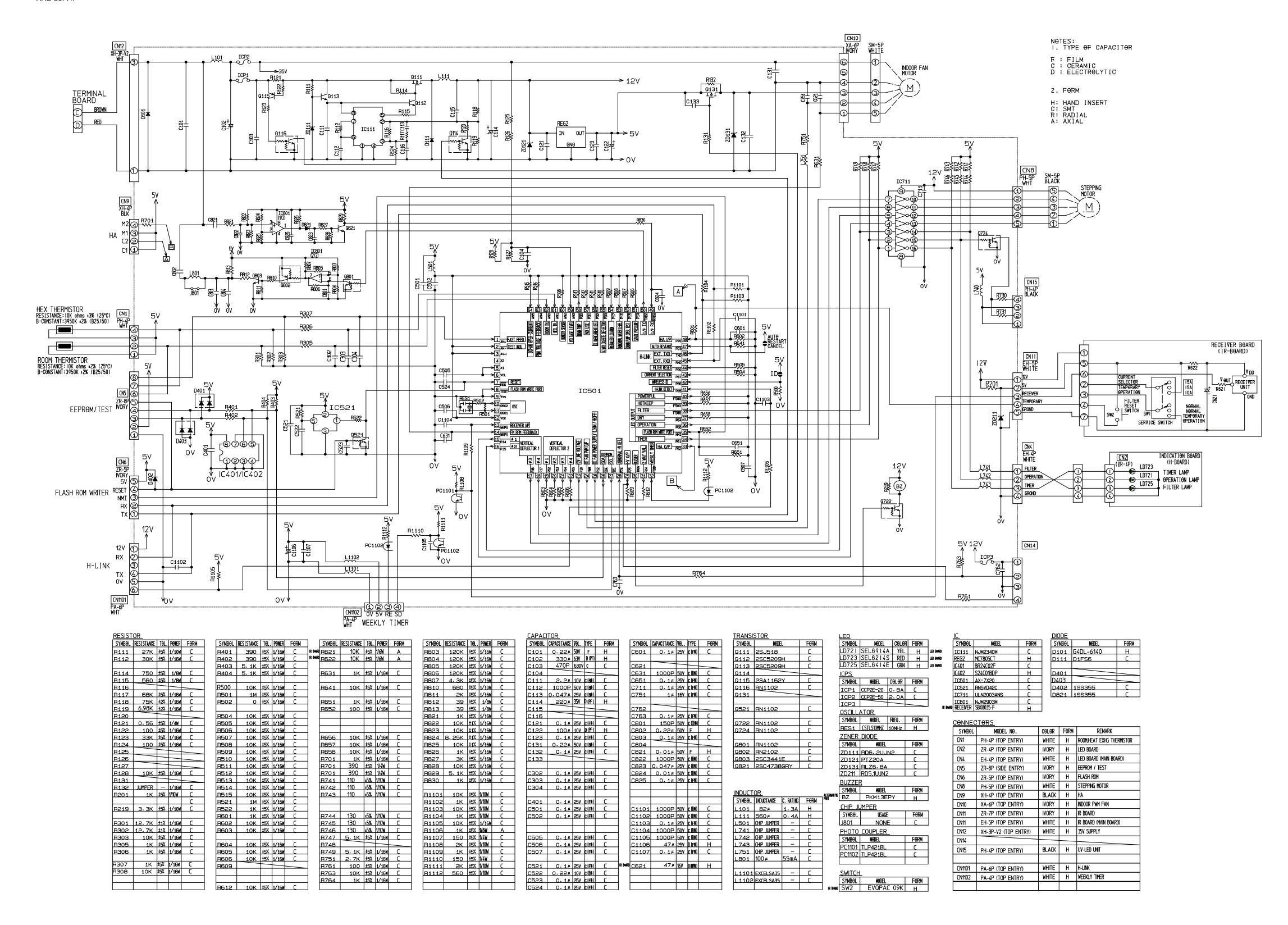


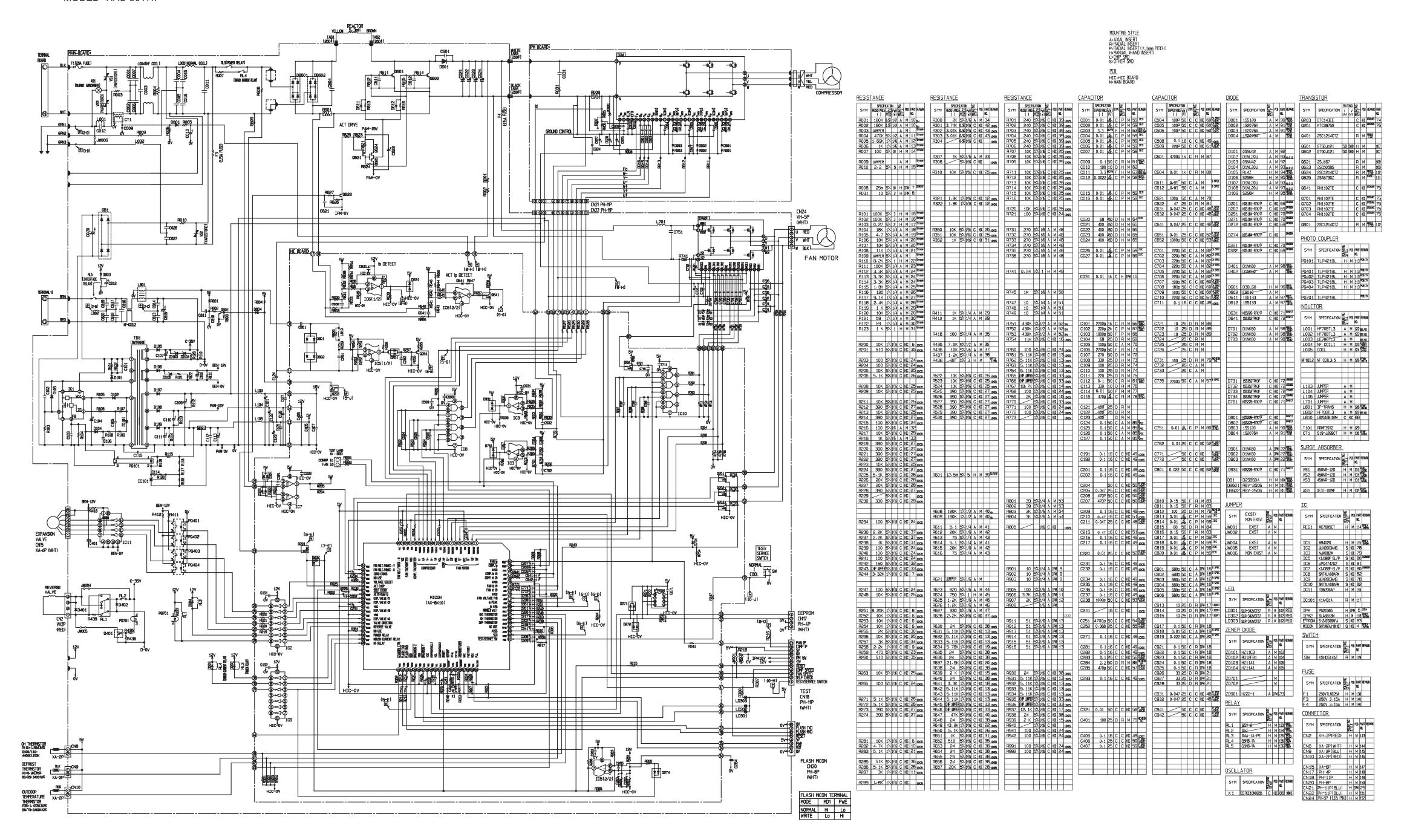
### **A** CAUTION

When the Air Conditioner has been operated for a long time with the capillary tubes clogged or crushed or with too little refrigerant, check the color of the refrigerant oil inside the compressor. If the color has been changed conspicuously, replace the compressor.









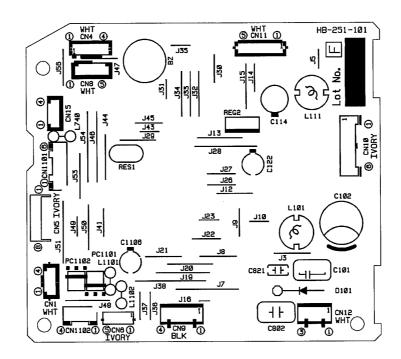
# PRINTED WIRING BOARD LOCATION DIAGRAM

RAS-50FH7

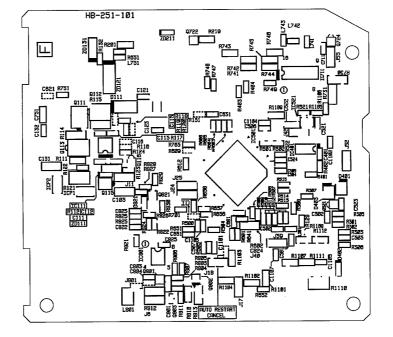
# MAIN P.W.B.

Marking on P.W.B.

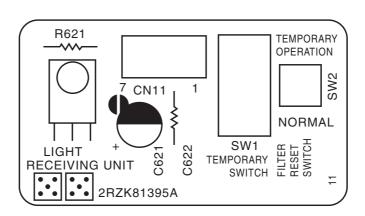
COMPONENT SIDE



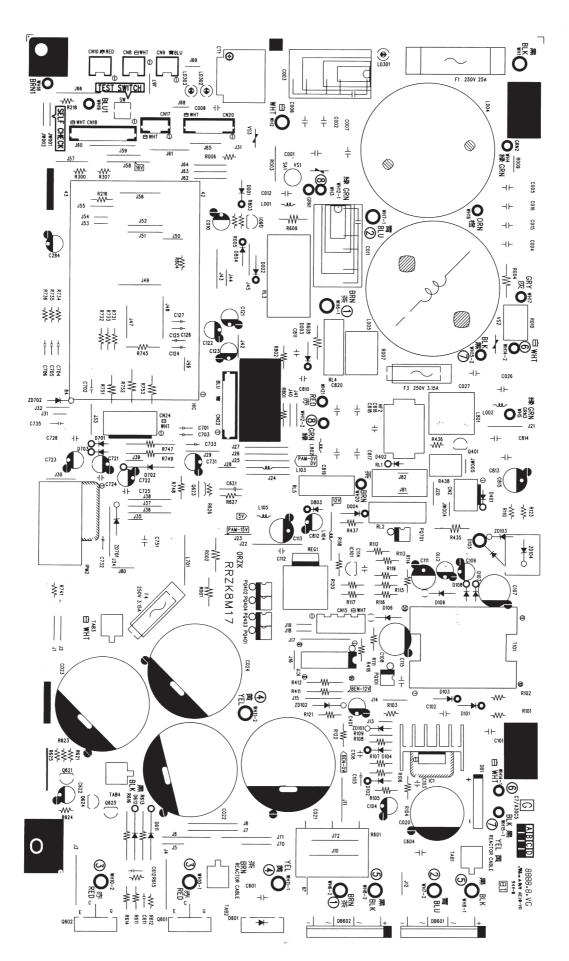
SOLDERING SIDE

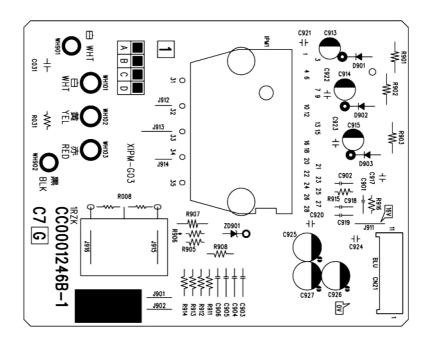


**RECEIVING P.W.B.**Marking on P.W.B.

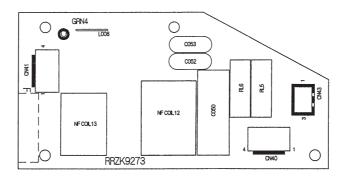


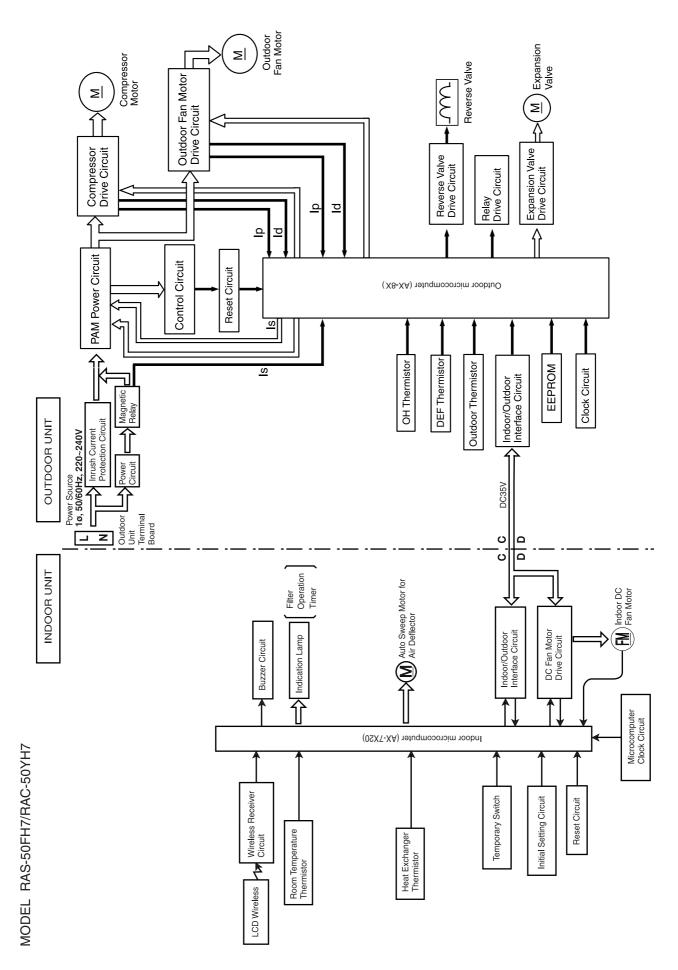
# P.W.B. MAIN





# P.W.B. NF-BOARD





# **BASIC MODE**

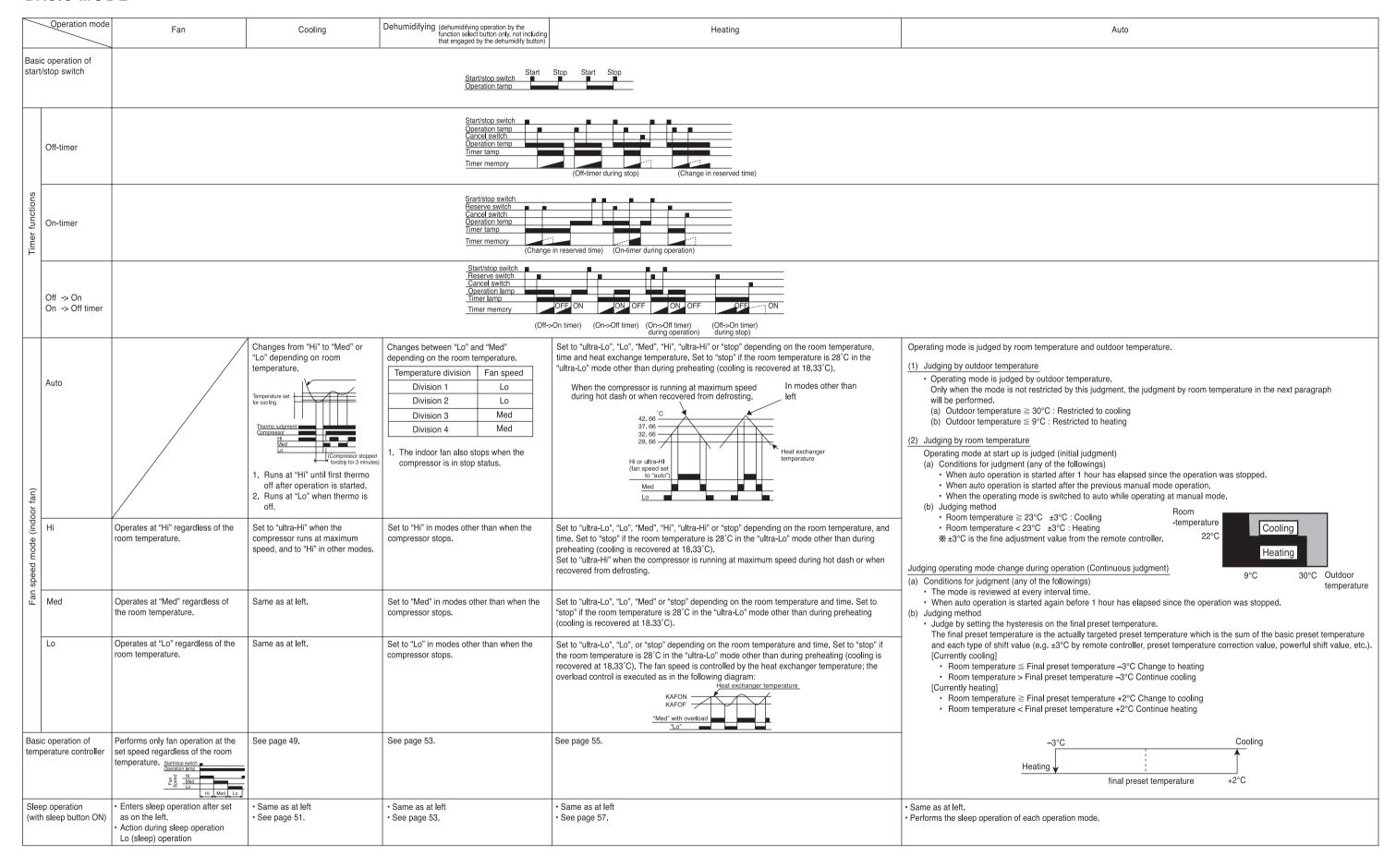
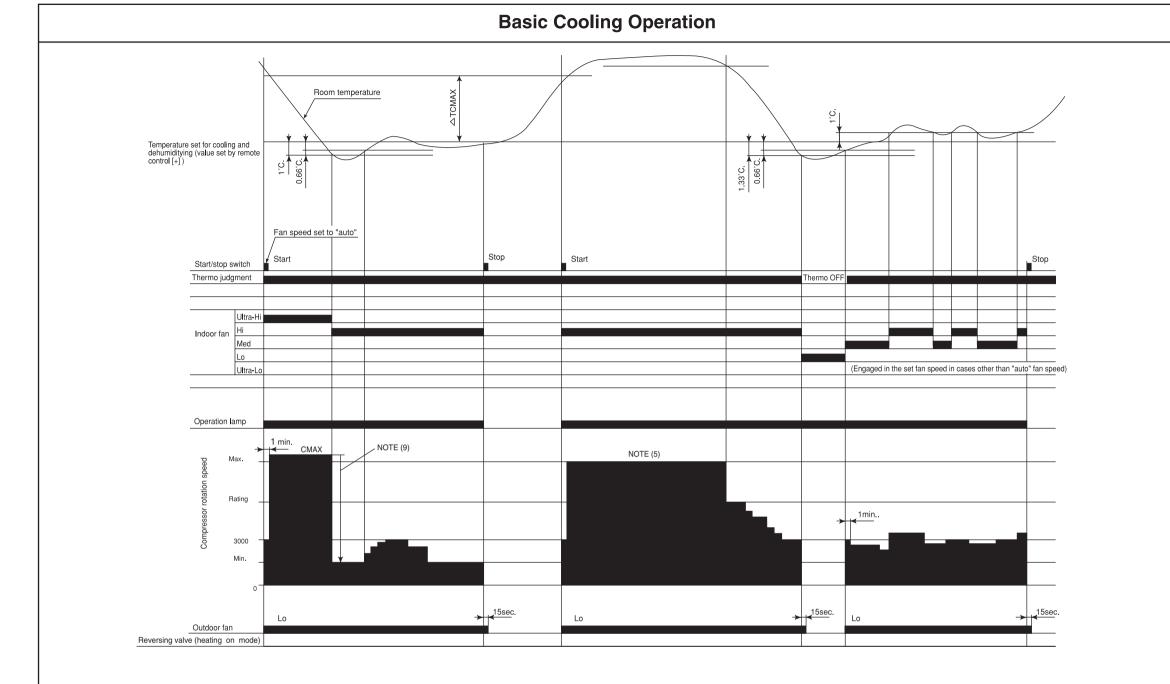


Table 1 Mode data file

	RAS-50FH7
LABEL NAME	VALUE
WMAX	4400 min <sup>-1</sup>
WMAX2	4400 min <sup>-1</sup>
WSTD	4000 min <sup>-1</sup>
WBEMAX	2600 min <sup>-1</sup>
CMAX	4400 min <sup>-1</sup>
CSTD	4100 min <sup>-1</sup>
CKYMAX	2500 min <sup>-1</sup>
CJKMAX	2900 min <sup>-1</sup>
CBEMAX	2500 min <sup>-1</sup>
WMIN	1200 min <sup>-1</sup>
CMIN	1500 min <sup>-1</sup>
STARTMC	60 Seconds
DWNRATEW	80%
DWNRATEC	80%
SHIFTW	0.00°C
SHIFTC	0.33°C
CLMXTP	30.00°C
YNEOF	28.00°C
TEION	2.00°C
TEIOF	9.00°C
SFTDSW	1.00°C
DFTIM_OTP0	50 Minutes
DFTIM_OTPI0	60 Minutes

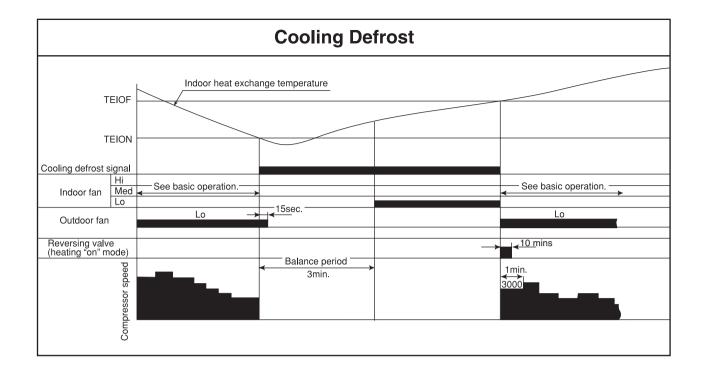


#### Notes:

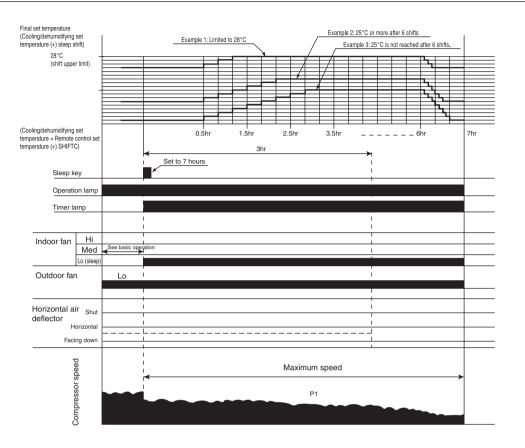
- (1) Condition for entering into Cool Dashed mode. When fan set to "Hi" or "Auto mode" and temperature difference between indoor temperature and set temperature has a corresponding compressor rpm (calculated value in Table 2) larger than CMAX.
- (2) Cool Dashed will release when i) a maximum 25 minutes is lapsed and ii) room temperature is lower than set temperature –3°C (thermo off) and iii) when room temperature has achieved setting temperature –1°C then maximum Cool Dashed time will be revised to 20 minutes. And iv) indoor fan is set to Lo and Med fan mode and v) change operation mode.
- (3) During Cool Dashed operation, thermo off temperature is set temperature (with shift value) -3°C. After thermo off, operation continue in Fuzzy control mode.
- (4) Compressor minimum "ON" time and "OFF" time is 3 minutes.
- (5) During normal cooling mode, compressor maximum rpm CMAX will maintain for 60 minutes if indoor temperature is lower than CLMXTP. No time constrain if indoor temperature is higher than CLMXTP.
- (6) When fan is set to "Hi", compressor rpm will be limited to CKYMAX.
- (7) When fan is set to "Med", compressor rpm will be limited to CJKMAX.
- (8) When fan is set to "Lo", compressor rpm will be limited to CBEMAX.
- (9) During Cool Dashed, when room temperature reaches set temperature -1°C compressor rpm is actual rpm x DWNRATEC.

Table 2 ∆TCMAX

Table 2 ATOMA	
Temperature	Calculated
difference	compressor rpm
1.66	2265 min <sup>-1</sup>
2	2435 min <sup>-1</sup>
2.33	2600 min <sup>-1</sup>
2.66	2765 min <sup>-1</sup>
3	2935 min <sup>-1</sup>
3.33	3100 min <sup>-1</sup>
3.66	3265 min <sup>-1</sup>
4	3435 min <sup>-1</sup>
4.33	3600 min <sup>-1</sup>
4.66	3765 min <sup>-1</sup>
5	3935 min <sup>-1</sup>
5.33	4100 min <sup>-1</sup>
5.66	4265 min <sup>-1</sup>
6	4435 min <sup>-1</sup>
6.33	4600 min <sup>-1</sup>
6.66	4765 min <sup>-1</sup>
7	4935 min <sup>-1</sup>
7.33	5100 min <sup>-1</sup>
7.66	5265 min <sup>-1</sup>
8	5435 min <sup>-1</sup>
8.33	5600 min <sup>-1</sup>
8.66	5765 min <sup>-1</sup>
9	5935 min <sup>-1</sup>
9.33	6100 min <sup>-1</sup>
9.66	6265 min <sup>-1</sup>
10	6435 min <sup>-1</sup>
10.33	6600 min <sup>-1</sup>
10.66	6765 min <sup>-1</sup>
11	6935 min <sup>-1</sup>



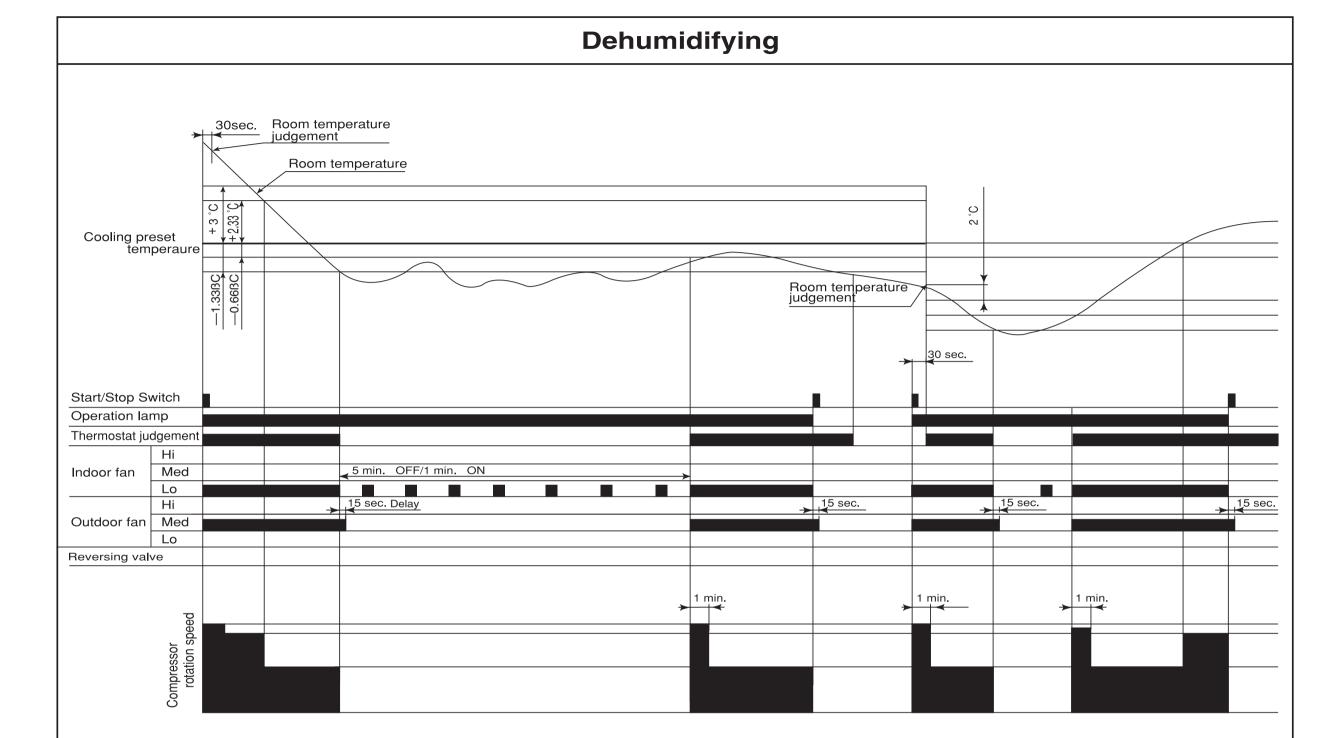
# **Cooling Sleep Operation**



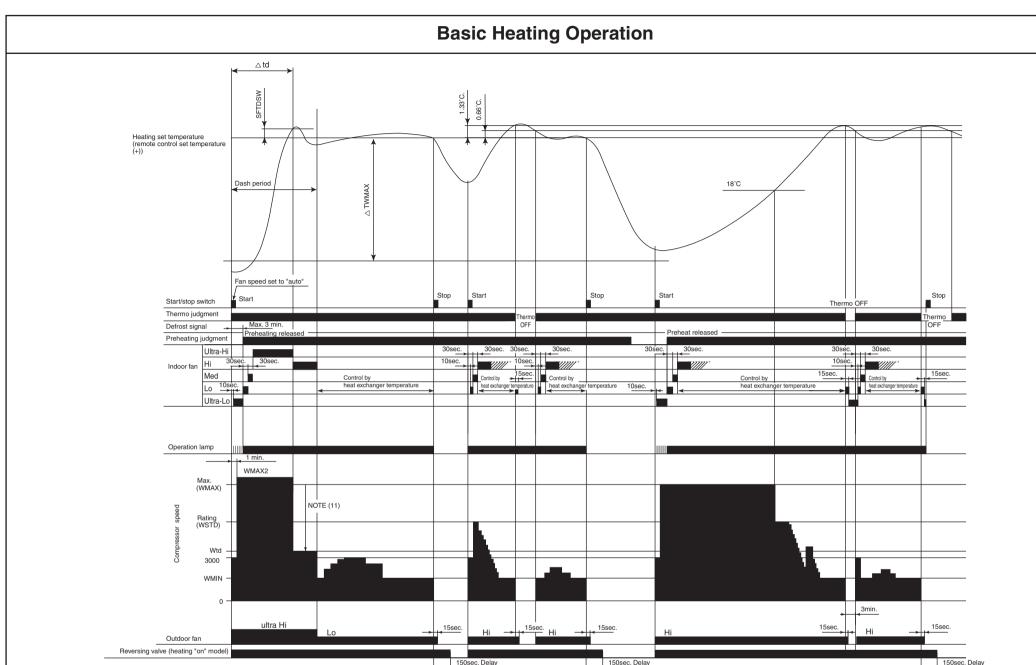
#### Notes:

- (1) The sleep operation starts when the sleep key is pressed.
- (2) When the sleep key is set, the maximum compressor speed is limited, and the indoor fan is set to "sleep Lo".
- (3) 30 minutes after the sleep key is set, the sleep shift of temperature starts, and upper shift is made at least 6 times. If 25°C is not reached after 6 shifts, shifts repeat unit 25°C is reached.
- (4) The sleep shift upper value of set temperature is 28°C.
- (5) After 6 hours, a shift down to the initial set temperature is made at a rate of 0.33°C/5 min.
- (6) If the operation mode is changed during sleep operation, the set temperature is cleared, and shift starts from the point when switching is made.
- (7) The indoor fan speed does not change even when the fan speed mode is changed.
- (8) When operation is stopped during sleep operation, the set temperature when stopped, as well as the time, continue to be counted
- (9) If the set lime is changed during sleep operation, all data including set temperature, time, etc. is cleared and restarted.
- (10) If sleep operation is canceled by the cancel key or sleep key, all data is cleared.

**–** 51 **–** 



- (1) If the room temperature is (cooling preset temperature) (1.33°C) or less after 30 seconds from starting the operation, the operation is done assuming as the preset temperature = (room temperature at the time) (2°C).
  (2) The indoor fan is operated in the "Lo" mode. During thermo OFF indoor fan will be OFF for 5 minutes and ON for 1 minute.
  (3) When the operation is started by the themostat turning ON, the start of the indoor fan is delayed 32 seconds after the start of compressor operation.
  (4) The compressor is operated forcedly for 3 minutes after operation is started.
  (5) The minimum ON time and OFF time of the compressor are 3 minutes.



#### Notes:

- (1) Condition for entering into Hot Dashed mode. When fan set to "Hi" or "Auto mode" and i) Indoor temperature is lower than 18°C, and ii) outdoor temperature is lower than 10°C, and iii) Temperature difference between indoor temperature and set temperature has a corresponding compressor rpm (calculated value in Table 3) larger than WMAX.
- (2) Hot Dashed will release when i) Room temperature has achieved the set temperature + SFTDSW. ii) Thermo off.
   (3) During Hot Dashed operation, thermo off temperature is set temperature (with shift value) +3°C. After thermo off, operation continue in Fuzzy control mode.
- (4) Compressor minimum "ON" time and "OFF" time is 3 minutes.
- (5) During normal heating mode, compressor maximum rpm WMAX will maintain for 120 minutes if indoor temperature is higher than 18°C. No time limit constrain if indoor temperature is lower than 18°C and outdoor temperature is lower than 2°C.
- (6) During Hotkeep or Defrost mode, indoor operation lamp will blink at interval of 3 seconds "ON" and 0.5 second "OFF".
- (7) When heating mode starts, it will enter into Hotkeep mode if indoor heat exchanger temperature is lower than YNEOF + 0.33°C.
- (8) When fan is set to "Med" or "Lo", compressor rpm will be limited to WBEMAX.
- (9) In "Ultra-Lo" fan mode, if indoor temperature is lower than 18°C, indoor fan will stop. If indoor temperature is higher than 18°C + 0.33°C, fan will continue in "Ultra-Lo" mode.

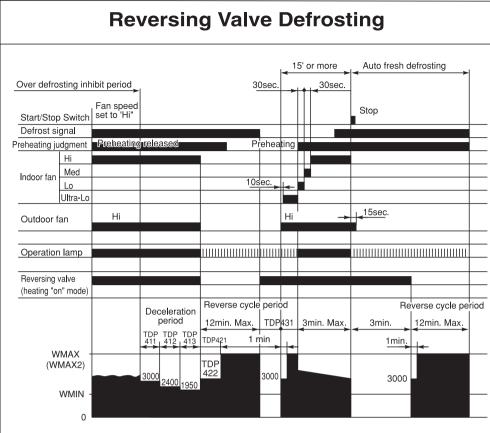
  During Hotkeep or Defrost mode, fan will continue in "Ultra-Lo" mode.
- (10) During Hot Dashed or outdoor temperature is lower than -5°C, compressor rpm is WMAX2.
- (11) During Hot Dashed, when room temperature reaches set temperature + SFTDSW compressor rpm is actual rpm x DWNRATEW.

Table 3 ∆TWMAX

Temperature	Calculated
difference	compressor rpm
1.66	1965 min <sup>-1</sup>
2	2135 min <sup>-1</sup>
2.33	2300 min <sup>-1</sup>
2.66	2465 min <sup>-1</sup>
3	2635 min <sup>-1</sup>
3.33	2800 min <sup>-1</sup>
3.66	2965 min <sup>-1</sup>
4	3135 min <sup>-1</sup>
4.33	3300 min <sup>-1</sup>
4.66	3465 min <sup>-1</sup>
5	3635 min <sup>-1</sup>
5.33	3800 min <sup>-1</sup>
5.66	3965 min <sup>-1</sup>
6	4135 min <sup>-1</sup>
6.33	4300 min <sup>-1</sup>
6.66	4465 min <sup>-1</sup>
7	4635 min <sup>-1</sup>
7.33	4800 min <sup>-1</sup>
7.66	4965 min <sup>-1</sup>
8	5135 min <sup>-1</sup>
8.33	5300 min <sup>-1</sup>
8.66	5465 min <sup>-1</sup>
9	5635 min <sup>-1</sup>
9.33	5800 min <sup>-1</sup>
9.66	5965 min <sup>-1</sup>
10	6135 min <sup>-1</sup>
10.33	6300 min <sup>-1</sup>
10.66	6465 min <sup>-1</sup>
11	6635 min <sup>-1</sup>

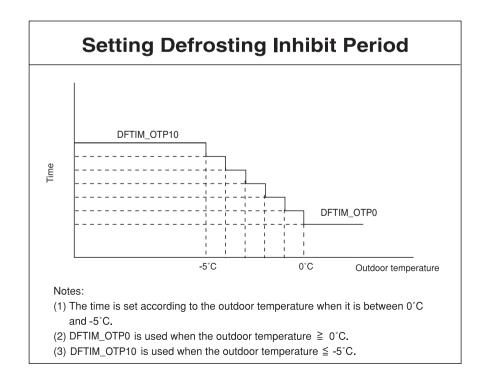
# Notes:

1. See the data in Table 1 on page 47 for each constant in capital letters in the diagrams.

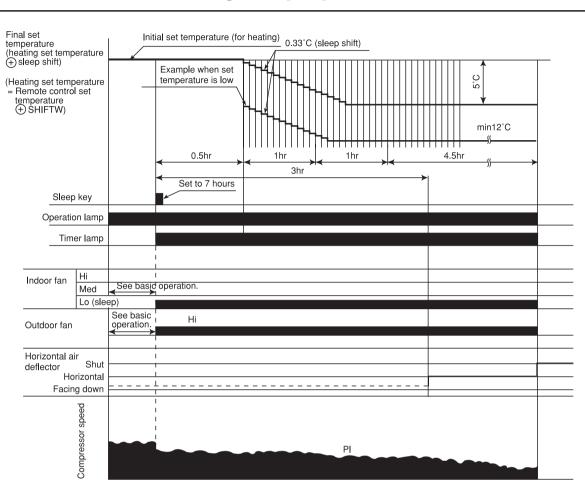


#### Notes

- (1) The defrosting inhibit period is set as shown in the diagram below. When defrosting has finished once, the inhibit period is newly set, based on the outdoor temperature when the compressor was started. During this period, the defrost signal is not accepted.
- (2) If the difference between the room and outdoor temperature is large when defrosting is finished, the maximum compressor speed (WMAX) or (WMAX2) can be continued for 120 minutes maximum.
- (3) The defrosting period is 12 minutes maximum.
- (4) When operation is stopped during defrosting, it is switched to auto refresh defrosting.
- (5) Auto refresh defrosting cannot be engaged within 15 minutes after operation is started or defrosting is finished.



# **Heating Sleep Operation**



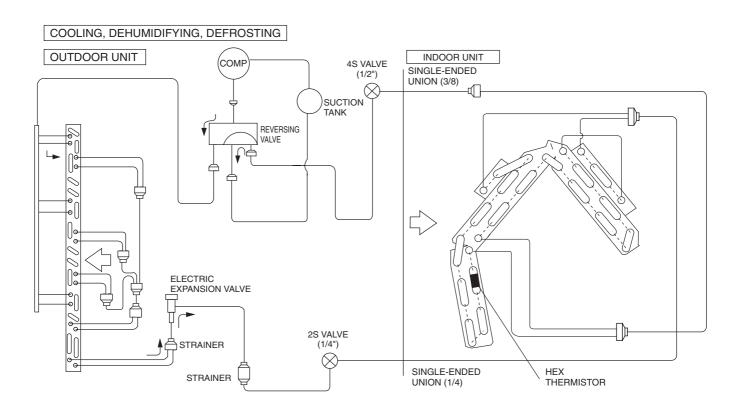
#### Notes

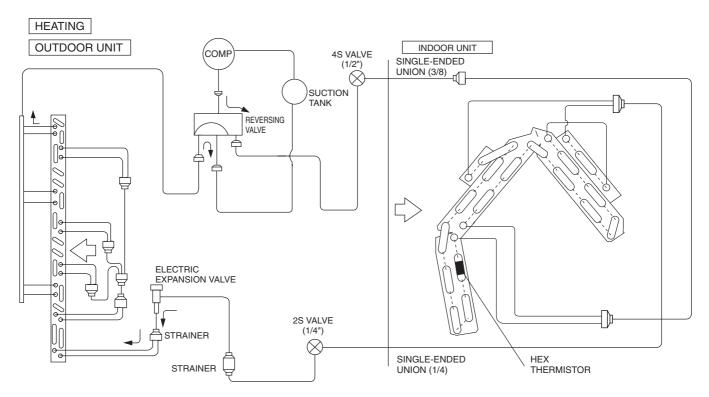
- (1) The sleep operation starts when the sleep key is pressed.
- (2) When the sleep key is set, the maximum compressor speed is limited to WSTD+2000/2, and the indoor fan is set to "sleep Lo".
- 3) 30 minutes after the sleep key is set, the sleep shift of set temperature starts.
- (4) The maximum sleep shift of set temperature is 5°C, and the minimum is 12°C.
- (5) If the operation mode is changed during sleep operation, the changed operation mode is set and sleep control starts.
- (6) The indoor fan speed does not change even when the fan speed mode is changed. (Lo)
- (7) When defrosting is to be set during sleep operation, defrosting is engaged and sleep operation is restored after defrosting.
- (8) When operation is stopped during sleep operation, the set temperature when stopped, as well as the time, continue to be counted.
- 9) If the set time is changed during sleep operation, all data including set temperature, time, etc. is cleared and restarted.
- (10) If sleep operation is canceled by the cancel key or sleep key, all data is cleared.

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# REFRIGERATING CYCLE DIAGRAM

MODEL RAS-50FH7 / RAC-50YH7





# **AUTO SWING FUNCTION**

		PRESENT CONDITION	NOI		
INPUT SIGNAL	OPERATION	OPERATION MODE	AIR DEFLECTOR	OPERATING SPECIFICATION	KETEKENCE
KEY INPUT	STOP	EACH MODE	STOP	ONE SWING (CLOSING AIR DEFLECTOR)  ① DOWNWARD ② UPWARD	INITIALIZE AT NEXT OPERATION.
			DURING ONE SWING	STOP AT THE MOMENT.	
		AUTO COOL COOL FAN AUTO DRY DRY	STOP	START SWINGING  ① DOWNWARD ② UPWARD ③ DOWNWARD	
	DURING		DURING SWINGING	STOP AT THE MOMENT.	
	OPERATION	AUTO HEAT HEAT CIRCULATOR	STOP	START SWINGING  ① DOWNWARD ② UPWARD ③ DOWNWARD	
			DURING SWINGING	STOP AT THE MOMENT.	
THERMO. ON (INTERNAL FAN ON)	!	AUTO DRY DRY	TEMPORARY STOP	START SWING AGAIN.	
THERMO. ON (INTERNAL FAN OFF)	DURING	AUTO HAET HEAT CIRCULATOR	DURING SWINGING	STOP SWINGING TEMPORARILY. (SWING MODE IS CLEARED IF SWING COMMAND IS TRANSMITTED DURING TEMPORARY STOP.)	
MAIN SWITCH	STOP	COOL FAN DRY	STOP DURING ONE SWING	INITIALIZE  ① DOWNWARD ② UPWARD	
5		HEAT CIRCULATOR	STOP DURING ONE SWING	INITIALIZE  ① DOWNWARD	
MAIN SWITCH OFF	DURING OPERATION	EACH MODE	STOP DURING SWINGING DURING	ONE SWING (CLOSING AIR DEFLECTOR)  ① DOWNWARD ② UPWARD	INITIALIZE AT NEXT OPERATION.
			STOP	INITIALIZING CONDITION OF EACH MODE.	
CHANGE OF OPERATION	DURING OPERATION	EACH MODE	DURING SWINGING	STOP SWINGING AND MODE BECOMES INITIALIZING CONDITION.	

# DESCRIPTION OF MAIN CIRCUIT OPERATION

MODEL RAS-50FH7

# 1. Reset Circuit

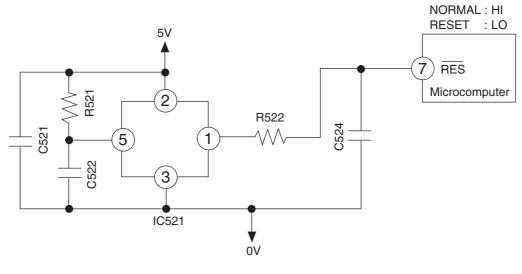


Fig. 1-1

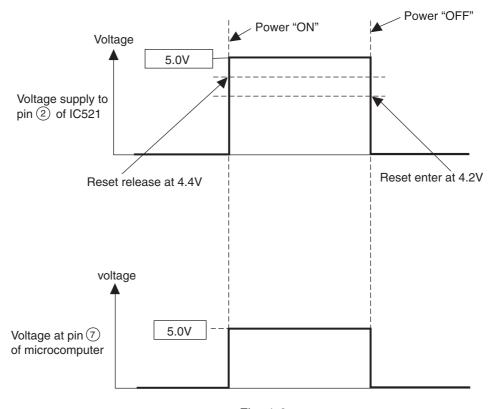


Fig. 1-2

- The reset circuit initializes the microcomputer program when power is ON or OFF.
- Low voltage at pin 7 resets the microcomputer and Hi activates the microcomputer.
- When power "ON" 5V voltage rises and reaches 4.4V, pin ① of IC521 is set to "Hi". At this time the microcomputer starts operation.
- When power "OFF" voltage drops and reaches 4.2V, pin ① of IC521 is set to "Low". This will RESET the microcomputer.

# 2. Receiver Circuit

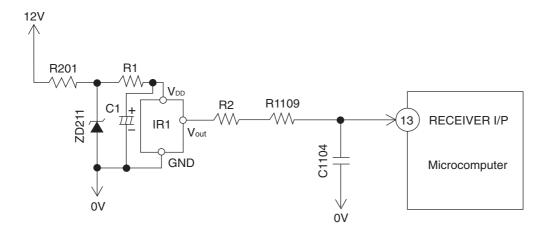


Fig. 2-1

• The light receiver unit receives the infrared signal from the wireless remote control. The receiver amplifies and shapes the signal and outputs it.

# 3. Buzzer Circuit

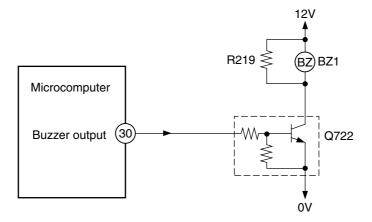


Fig. 3-1 Buzzer Circuit

• When the buzzer sounds, an approx. 3.9kHz square signal is output from buzzer output pin ③ of the microcomputer. After the amplitude of this signal has been set to 12Vp-p by a transistor, it is applied to the buzzer. The piezoelectric element in the buzzer oscillates to generate the buzzer's sound.

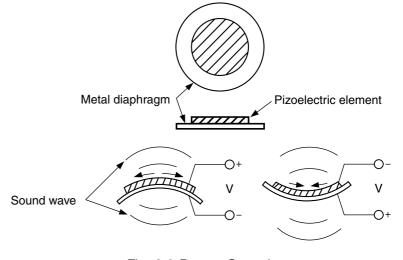


Fig. 3-2 Buzzer Operation

# 4. Auto Sweep Motor Circuit

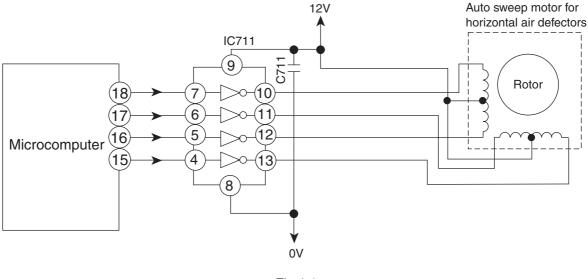


Fig.4-1

• Fig. 4-1 shows the Auto sweep motor drive circuit; the signals shown in Fig.4-2 are output from pins (15) - (18) of microcomputer.

Microcomputer pins			Step w	idth		H def	lorizontal lectors: 1	air Oms.
Horizontal air deflectors	1	   2 	   3 	   4 	   5 	   6	7	8
(15)					 			
(16)			   	     	   	     		
17)		 		 				
(18)		     		     	     		   	

Fig.4-2 Microcomputer Output Signals

• As the microcomputer's outputs change as shown in Fig.4-2, the core of the auto sweep motor is excited to turn the rotor. Table 4-1 shows the rotation angle of horizontal air deflectors.

Table 4-1 Auto sweep Motor Rotation

	Rotation angle per step (°)	Time per step (ms.)
Horizontal air deflectors	0.0882	10

# 5. Room Temperature Thermistor Circuit

- Fig. 5-1 shows the room temperature thermistor circuit.
- The voltage at (A) depends on the room temperature as shown in Fig. 5-2.

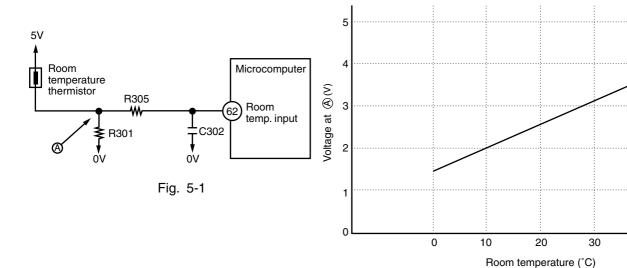


Fig. 5-2

40

# 6. Heat exchanger temperature thermistor circuit

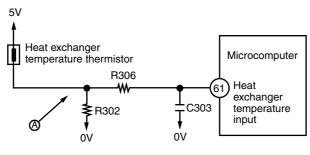


Fig. 6-1

- The circuit detects the indoor heat exchanger temperature and controls the following.
  - (1) Preheating.
  - (2) Low-temperature defrosting during cooling and dehumidifying operation.
  - (3) Detection of the reversing valve non-operation or heat exchanger temperature thermistor open.

The voltage at (A) depends on the heat exchanger temperature as shown in Fig. 6-2.

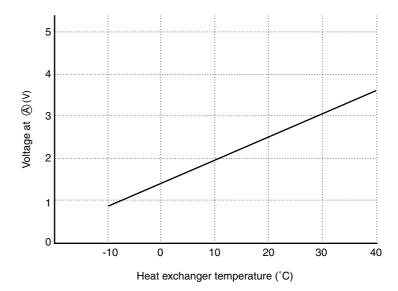


Fig. 6-2

# 7. Initial Setting Circuit (IC401)

- When power is supplied, the microcomputer reads the data in IC401 or IC402 (E²PROM) and sets the preheating activation value and the rating and maximum speed of the compressor, etc. to their initial values.
- Data of self-diagnosis mode is stored in IC401 or IC402; data will not be erased even when power is turned off.

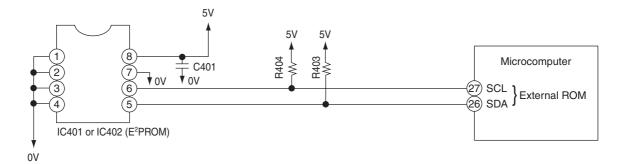


Fig. 7-1

# **DESCRIPTION OF MAIN CIRCUIT OPERATION**

MODEL RAC-50YH7

# 1. Power Circuit

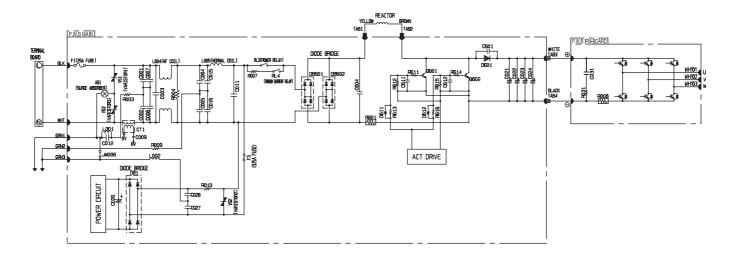


Fig 1-1

\*\* This circuit full-wave rectifies 220-240VAC applied between terminals L and N and boosts it to a required voltage with the IPM to create a DC voltage.

# The voltage become 320-360V when the compressor is operated.

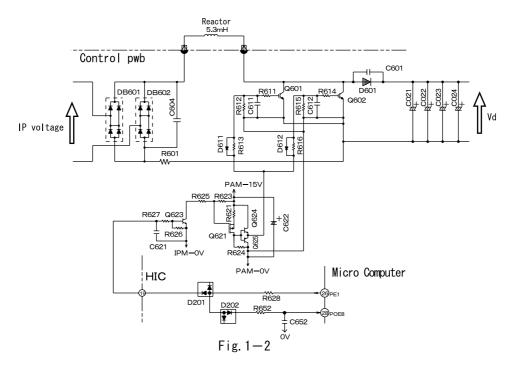
- **X** Importance component
- (1) Intelligence Power Module (IPM)A module that constitute by an inverter part.
- (2) Diode Stack (DB1, DB601, DB602)These rectify the 220-240VAC from terminal L and N to a DC power supply.

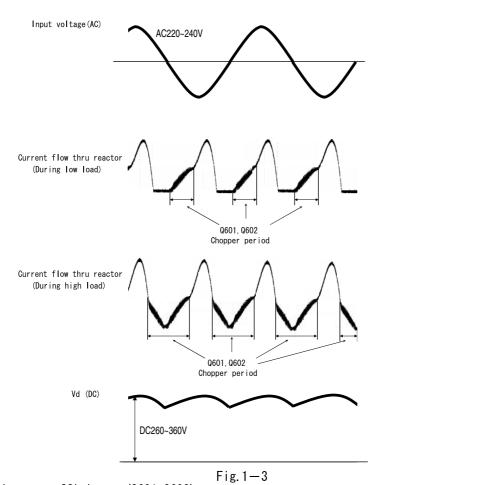
## <Reference>

In case of Intelligence Power Module malfunction or connection failure immediately after compressor starts, its may stop due to error of [abnormal low speed], [switching failure],[lp stop] and others.

# <Reference>

If diode stack (DB601,DB602) are faulty, DC voltage may not be generated and the compressor may not operate at all. Also be aware that the 3.15A fuse might have blown. (3) Smoothing capacitors (CO21  $\sim$  CO24, 400  $\mu\,\rm F,$  450V) This smoothes (averages) the voltage rectified by the diode stack.





(4) IGBT to improve efficiency (Q601, Q602)

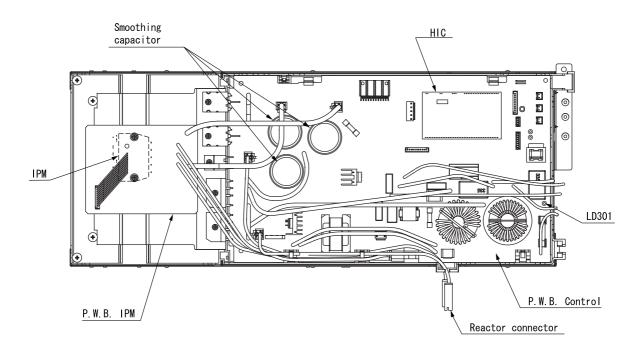
It will improve the efficiency during compressor load become heavy when current flow thru the chopper period of Q601, Q602.

# (5) C001 ~ C007, C015, C016, C026, C027, L004, L005

These absorb electrical noise generated during operation of compressor and also absorb external noise entering from power line to protect electronic parts.

# (6) Surge Absorber, Varistor1, 2, 3

These absorbs external power surge.



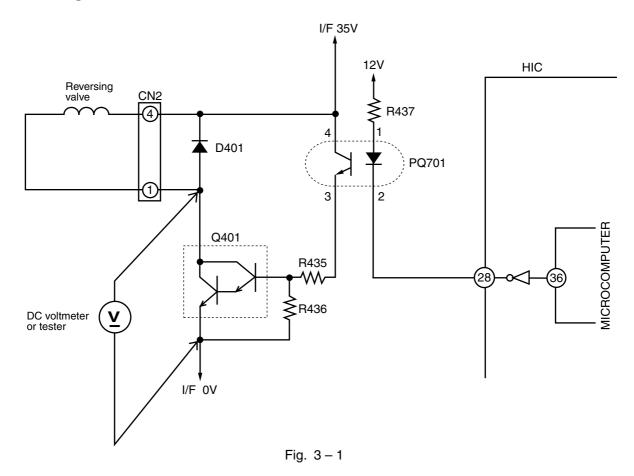
\*\*Be careful to avoid an electric shock as a high voltage is generated. Also take care not to cause a short-circuit through incorrect connection of test equipment terminals. The circuit board can be damage.

# 2. PWB for power circuit

Output	Spec	Main load	Measuring point	Example of possible failure mode.
5V 0/P	5 ±0.4 <b>V</b>	Micon, Thermistor	Tester⊕ : L105(5V) Tester⊖ : J25(0V)	Outdoor not operate, no blinking indication
12V 0/P	12 ±1 V	Micon, IC2,3,4 Relay circuit	Tester⊕ : L104(12V) Tester⊖ : J25(0V)	Outdoor not operate, no blinking indication
16V 0/P	15. 5±1.5V	IPM for Comp IPM for DC fan	Tester⊕ : J58 (16V) Tester⊖ : J25 (0V)	Stop : LD301 3,4 or 12 times blinking
PAM-15V 0/P	15 ±1. 55 <b>V</b>	ACT circuit	Tester⊕ : J23 (PAM-15V) Tester⊖ : J25 (OV)	Stop : LD301 14 times blinking

\*\* Power circuit for pwb can consider normal if the result is satisfied with above specification.

# 3. Reversing valve control circuit



• Reversing valve control circuit can switch reversing valve ON/OFF according to instruction from indoor microcomputer depending on the operation condition shows in Table 3-1.

Voltage at each point in each operation condition is approximately as shown below when measured by tester. (When collector voltage of Q401 is measured)

Table 3-1

Ор	peration condition	Collector voltage of Q401			
Cooling	General operation of Cooling	About 0.8V			
	In normal heating operation	About 35V			
Heating	MAX. rotation speed instructed by indoor microcomputer after defrost is completed	About 35V			
	Defrosting	About 0.8V			
Dehumidifying	Sensor dry	About 0.8V			

# 4. Temperature Detection Circuit

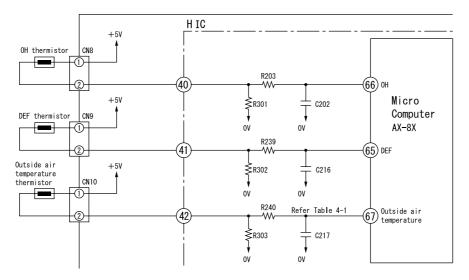


Fig. 4-1

- \* OH thermistor circuit detect the temperature at the surface of compressor head, DEF thermistor circuit detect the defrosting operation temperature.
- \* A thermistor is a negative resistor element which has characteristics that the higher(lower) the temperature, the lower(higher) the resistance.
- \* When the compressor is heated, the resistance of the OH thermistor becomes low and  $\oplus$  5V is divided by OH thermistor and R301 and the voltage at pin 66 of microcomputer.
- \* Compare the voltage at microcomputer pin 66 and setting value stored inside. If the value exceed the set value, microcomputer will judge that the compressor is overheated and stop the operation.
- \* When frost is formed on the outdoor heat exchanger, the temperature at the exchanger drops abruptly. Therefore the resistance of the DEF thermistor becomes high and the voltage at pin 65 of micro computer drops. If this voltage becomes lower than the set value stored inside, microcomputer will enter the defrost control.
- \* During defrost operation, the microcomputer will transfer the defrosting condition command to indoor unit via SDO pin of interface of IF transmission output.
- \* The microcomputer read the outdoor temperature by Outside Air thermistor and transfer it to the indoor unit, thus controlling the compressor rotation speed according to the set value in the EEPROM of indoor unit and switching the operation mode (outdoor fan on/off etc.) to DRY mode.

Below table show the typical values of outdoor temperature in relation to the voltage.

Table 4-1

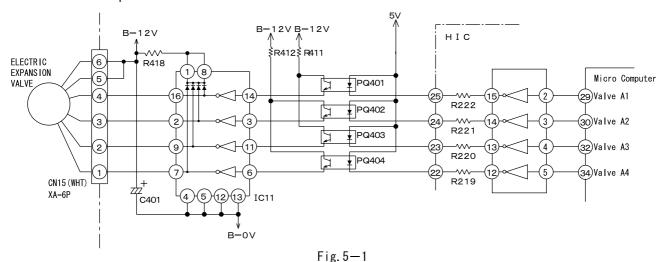
Outside Air Temperature (°C)	-10	0	10	20	30	40
Voltage at both side of R303 (V)	1.19	1. 69	2. 23	2. 75	3. 22	3.62

# <Reference>

When the thermistor is open open condition or disconnect, microcomputer pin  $65\sim67$  are approx. 0V; When thermistor is shorted, they are approx. 5V and LD301 will blink 7 times.

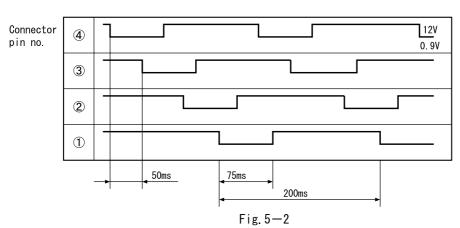
However, an error is detected when only the OH thermistor is shorted and will enter blinking mode after 12 minutes start the compressor operation.

# 5. Electric expansion valve circuit



- \* The electric expansion valve is driven by DC12V. Power is supplied to 1 or 2 phases of 4-phase winding to switch magnetic pole of winding in order to control the opening degree.
- \* Relationship between power switching direction of phase and open/close direction is shown below. When power is supplied, voltages at pins 4 to 1 of CN15 are about 0.9V and 12V when no power is supplied. When power is reset, initial operation is performed for 10 or 20 seconds. During initial operation, measure all voltages at pin 4 to 1 of CN15 by using a multimeter. If there is any pin with voltage that has not changed from 0.9V or 12V, expansion valve or micro computer is broken.
- \* Fig. 5-1 shows logic waveform when expansion valve is operating.

				Table	5 <b>—</b> 1				
CN15	Wire		Drive status						
pin no	WITE	1	2	5	6	7	8		
1	WHT	ON	ON	0FF	0FF	0FF	0FF	0FF	ON
2	YEL	0FF	ON	ON	ON	0FF	0FF	0FF	0FF
3	ORG	0FF	0FF	0FF	ON	ON	ON	0FF	0FF
4	BLU	0FF	0FF	0FF	0FF	0FF	ON	ON	ON
Operation mode									
$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8$ VALVE CLOSE									
8→7→6	→5→4	→3→2-	→1 VAI	LVE OPE	N				



nansion valve control opening degree is adjusted to stabilize target te

With expansion valve control, opening degree is adjusted to stabilize target temperature by detecting compressor head temperature. The period of control is about once per 20 seconds and output a few pulse.

### 6. Outdoor DC fan motor control circuit

\* This model is built with DC fan motor control circuit inside outdoor electrical unit.

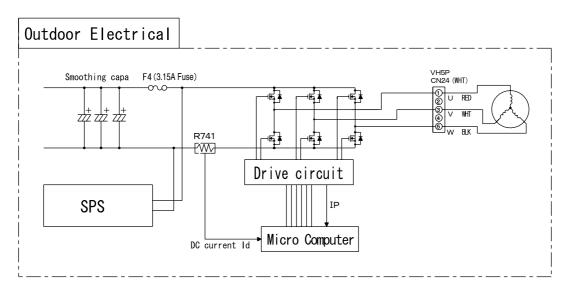


Fig 6-1

This DC fan motor is control by outdoor micro computer that follow the operating instruction received from indoor micro computer. The DC current that flow from R741 will presume actual operation speed and control the rotation to follow the operating instruction. Based on this DC current it will detect a over current and other fan motor failure.

# (1) Fan motor speed controller during starting

Due to the interference of strong wind etc., operation movement is changed based on fan direction and rotation speed as shown below during starting of operation.

In addition, the fair wind is define as wind that blow to outside direction using Mouth Ring part. At strong and contrary wind ... The rotational speed is not controlled as to protect the equipment

and fan will rotate reversely depend on the wind. Automatically

start when wind condition become weak.

At contrary wind .... The rotational speed is controlled in fair wind direction after it

slowly reduce the speed and finally stop.

At fair wind .... The rotational speed is controlled as it is.

At strong fair wind ... The rotational speed is not controlled as to protect the equipment

and fan will rotate reversely depend on the wind. Automatically

start when wind condition become weak.

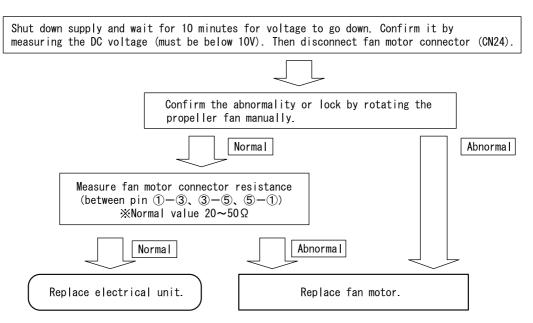
# (2) Fan motor speed controller during unit operating

There is a case where fan rpm is reducing during rotating caused by interference of strong wind If this condition continue in long period, fan will stop rotating. (LD301 : 11 times blinking) The unit will restart according to control as per during start (1).

- (3) Method of confirming self diagnosis LD301 lamp: 12 times blinking

  If the unit stop and LD301 on the pwb blinking 12 times [fan lock stop is detected], follow below steps to confirm it.
  - Fan lock stop is detected when something has disturb the fan rotation by inserting material into propeller fan or ice has growing inside outdoor unit caused by snow.
     Remove it if found something is bloking the fan.
  - 2. Confirmed that CN24 connector is securely inserted. Fan lock stop is detected also when connector is not properly inserted. Please securely insert if found any disconnection.
  - 3. Fan lock stop also can be detected where strong wind blown surrounding the unit. Please confirm after restart the unit. (It may take few minutes to operate the compressor) It is not a malfunction of electrical unit or fan motor if the unit run continuesly after restart the unit.
  - 4. Check fan motor condition as below procedure.

# [Checking Fan Motor] procedure



- 5. Reconnect again fan motor connector (CN24).
  - \*\*Please confirm above checking procedure if found F4(3.15A fuse) blown.

    If fan motor is broken, replace both electrical unit and fan motor.

    Reference
  - No power is sup∏ied to the outdoor unit if F4(3.15A Fuse) is blown.

    Both DC fan motor and switching power supply is using same fuse.

    Caution
  - \*\*Beware of electric shock due to high voltage when conducting an operation check. Power supply for DC fan motor and compressor is common (DC260~360V).

# SERVICE CALL Q & A

# COOLING MODE

The compressor has stopped suddenly during cooling operation.

Check if indoor heat exchanger is frosted.

Wait for 3-4 minutes until it is defrosted.

If the air conditioner operates in cooling mode when it is cold, the evaporator may get frosted.

# **DEHUMIDIFYING MODE**

Q1) Sound of running water is heard from indoor unit during dehumidifying.

 $\rightarrow$   $\bigcirc$   $\bigcirc$   $\bigcirc$   $\bigcirc$   $\bigcirc$ 

Normal sound when refrigerant flows in pipe.

Compressor occasionally does not operate during dehumidifying.

Compressor may not operate when room temperature is 10°C or less. It also stops when the humidity is preset humidity or less.

Cold air comes out during a dehumidifying operation.



To improve the dehumidification efficiency performs quiet fan operation. Therefore the air is cold and it is not a malfunction.

The operation does not stop even by setting the temperature higher than room temperature on the remote controller.



It sets to perform dehumidifying operation by setting the temperature slightly lower than remote controller setting.

# **HEATING MODE**

The circulation stops occasionally during Heating mode.

A1

) It occurs during defrosting Wait for 5 -10 minutes until the condenser is defrosted.

When the fan speed is set at HIGH or MED, the flow is actually Weak.

At the beginning of heating, the fan speed remains LOW for 30 seconds. If HIGH is selected, it switches to LOW and again to MED after additional 30 seconds.

Heating operation stops while the temperature is preset at "30".

If temperature is high in the outdoor, heating operation may stop to protect internal devices.

# **AUTO FRESH DEFROSTING** After the ON/OFF button is pressed Auto Fresh Defrosting is carried out : to stop heating, the outdoor unit the system checks the outdoor heat exchanger is still working with the OPERATION and defrosts it as necessary before stopping lamp lighting. **AUTO OPERATION** Fan speed does not change when Q1 At this point fan speed is automatic. fan speed selector is changed during auto operation. How is the automatic operation According to the room temperature and mode determined? outside temperature, heating or cooling operation is automatically selected. Refer to the basic operation section. The room temperature cannot be It is automatically set as follows. controlled at an automatic At cooling: and heating: Set at 22°C °C operation. The room temperature setting can be raised 3°C by " $\wedge$ " or lowered 3°C by " $\vee$ ". NICE TEMPERATURE RESERVATION $\mathbf{Q1}$ When on-timer has been programmed, This is because "Nice temperature operation starts before the preset reservation"function is operating. This time has been reached. function start operation earlier so the preset temperature is reached at the preset time. Operation may start maximum 60 minutes before the preset time. Does "Nice temperature reservation" It does not work. It works only during function operate during cooling and heating. dehumidifying?

Even if the same time is preset,

the operation start time varies.

This is because "Nice temperature

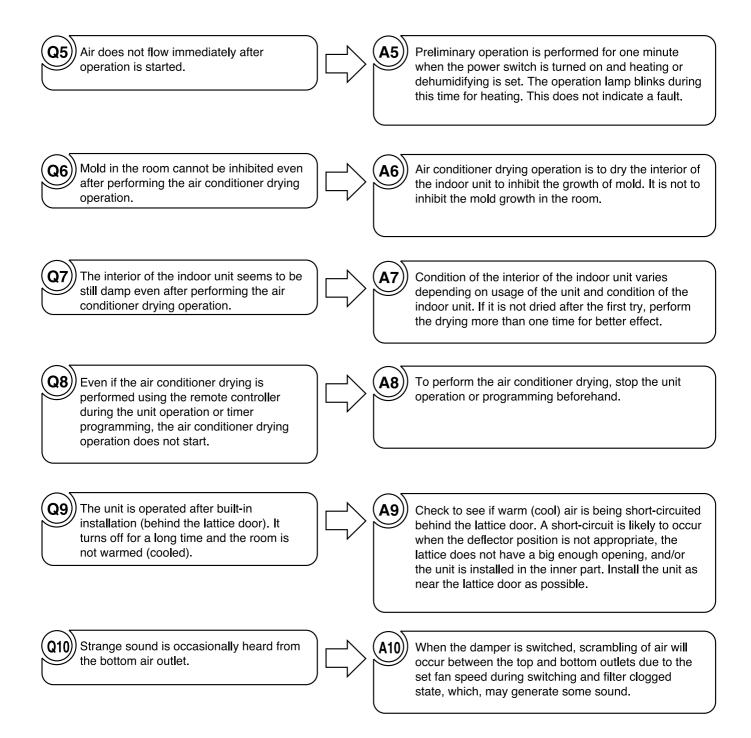
varies each day.

reservation"function is operating. The start

time varies according to the load of room. Since load varies greatly during heating,the operation start time is corrected, so it will

# AT STARTING OPERATION

Q1 When only the power switch is turned To ensure correct opening and closing of the damper, on, the damper at the bottom air outlet the damper will move when power is turned on or the moves even if the START/STOP unit is to be operated in order to check its fully opened button is not pressed. and closed positions. This is because the preheating device is working. When the heating operation is started, It will not start to drive the fan until the refrigerating the indoor fan does not start cycle warms up and warm air blows. Wait for a while. immediately and the damper at the The damper does not open either during preheating bottom air outlet occasionally does not or for one minute after preheating is finished. open. Such a phenomenon may occur with built-in When the unit built behind the gallery installation where heat is likely to be stuffy. Install the (lattice door) is to be started unit as near to the lattice door as possible so that air is immediately after it has stopped, the not short-circuited, or provide a partition between the unit occasionally will not start. unit and lattice door. **OTHERS** The indoor fan varies This is because the cool The heat exchanger temperature is among high air flow, low wind prevention function sensed in the auto fan speed mode. air flow and breeze in the is operating, and does not When the temperature is low, the fan auto fan speed mode. indicate a fault. speed varies among high air flow, low air flow and breeze. (Heating operation) When operation is started, the compressor rotation Loud noise from the outdoor unit is speed goes to maximum to increase the heating or heard when operation is started. cooling capability, so noise becomes slightly louder. This does not indicate a fault. **A3** The compressor rotation speed changes according to Noise from the outdoor unit the difference between the thermostat set temperature occasionally changes. and room temperature. This does not indicate a fault. There may be a difference between the set temperature There is a difference between the set and room temperature because of construction of temperature and room temperature. room, air current, etc. Set the temperature at a comfortable level for the space.

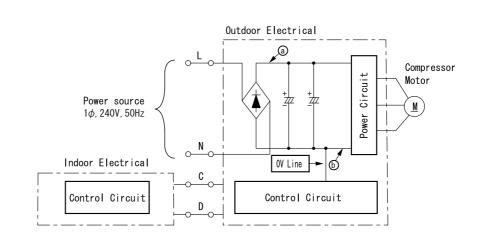


# PRECAUTIONS FOR CHECKING

# <u>î</u> Caution

- Remember that the OV line is biased to 320 - 360V in reference to the ground level.
- 2. Also note that it takes about 10 minutes until the voltage fall after the power switch is turned off.



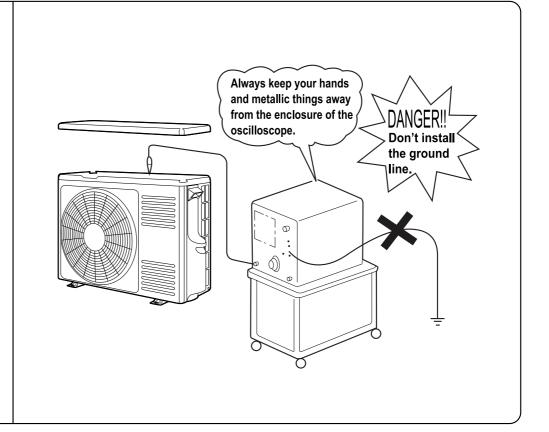


Across a - b (OV line) -----approx 320 - 360V Across a - ground -----approx 155 - 170V Across b (OV line) - ground -----approx 155 - 170V

# **A**CAUTION

When using an oscilloscope, never ground it. Don't forget that high voltages as noted above may apply to the oscilloscope.



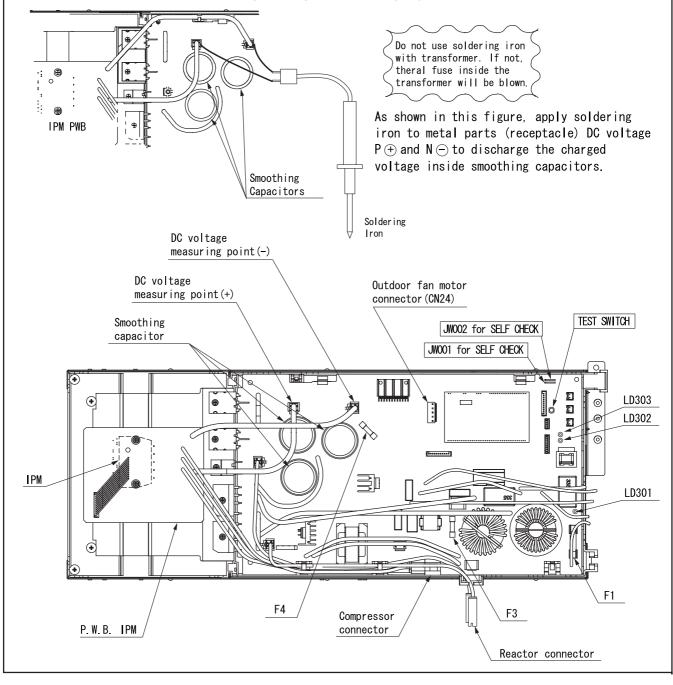


# DISCHARGE PROCEDURE AND METHOD TO STOP ENERGIZE THE POWER CIRCUIT

# ⚠ WARNING 🖄

### Caution

- Voltage of about 300-330V is charged between both ends of smoothing capacitors.
- During continuity check for each part of circuit in outdoor electrical parts, be sure to discharge smoothing capacitor to prevent secondary trouble.
- 1. Turn OFF power supply to the outdoor unit.
- 2. After power is turned OFF, wait for 15 minutes or more. Then remove electrical parts cover and apply soldering iron of 30 to 75W for 15 seconds or more to DC voltage  $\oplus$  and DC voltage  $\bigcirc$  terminals in order to discharge voltage in smoothing capacitors.

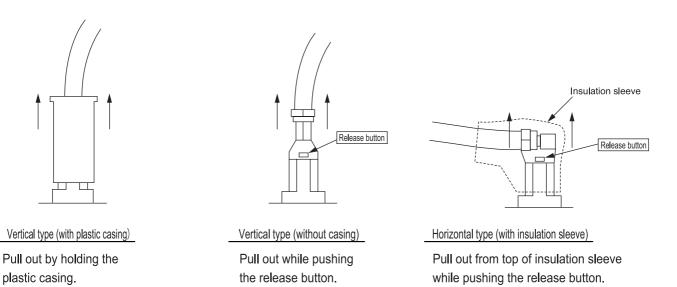


# [Other cautions]

# (1) Disconnection of tab terminal receptacle

All receptacle used to connect with tab terminal are built with lock mechanism. Please take note that by using a force to pull out the receptacle without releasing the lock, can cause a damage. Furthermore, during connecting the receptacle back make sure to securely insert until end.

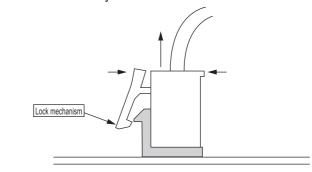
# \* Receptacle type and procedure to releasing the lock



# (2) Disconnecting on board connector

On board connector with lock machanism are widely used. Please take note that by using a force to pull out with out releasing the lock mechanism, can cause a damage.

Furthermore, during inserting back the connector make sure it surely done.



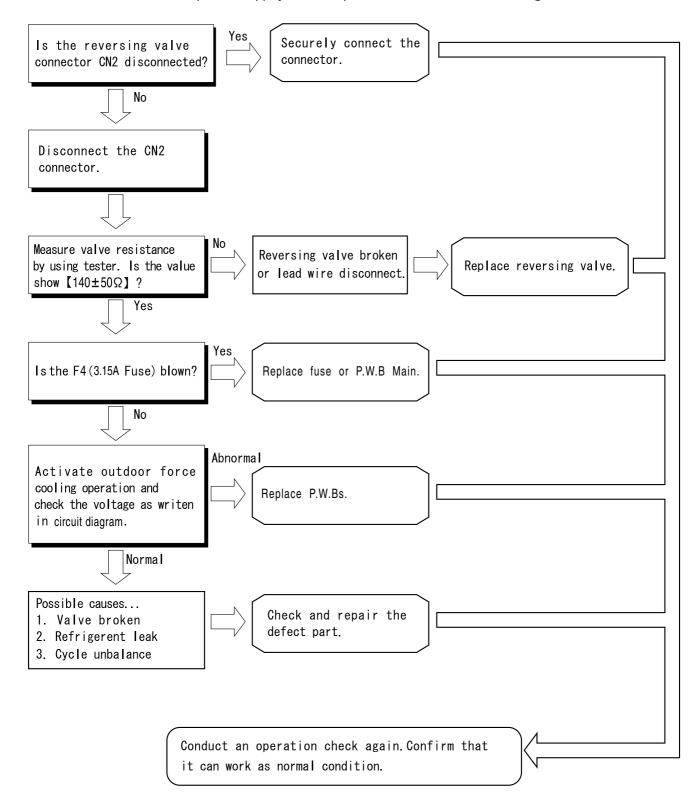
Release lock with finger before disconnecting.

# (3) Connector disconnection during discharge is prohibited

Disconnecting connector during discharge is extremely prohibited. Component on board and fan motor will damage. Proceed trouble shooting process after confirming smoothing capacitor of indoor & outdoor pwb has been discharge.

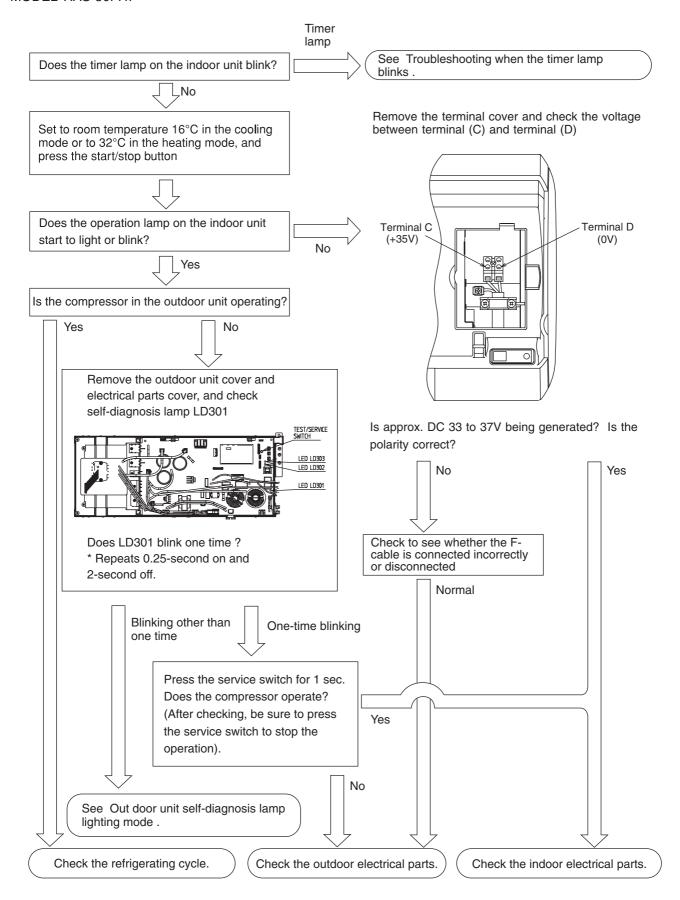
# CHECKING THE INDOOR TIMER LAMP IF BLINKING 1 TIME

<Caution> Please turn OFF power supply before proceed with below checking flow.



# CHECKING THE INDOOR/OUTDOOR UNIT ELECTRICAL PARTS AND REFRIGERATING CYCLE

MODEL RAS-50FH7



### TROUBLESHOOTING WHEN TIMER LAMP BLINKS.

### MODEL RAS-50FH7

Perform troubleshooting according to the number of times the indoor timer lamp and outdoor LD301 blink.

### SELF-DIAGNOSIS LIGHTING MODE

No.	Blinking of Timer lamp	Reason for indication	Possible cause
1		Reversing valve defective When the indoor heat exchanger temperature is too low in the heating mode or it is too high in the cooling mode.	<ul> <li>(1) Reversing valve defective</li> <li>(2) Heat exchanger thermistor disconnected         (only in the heating mode)</li> <li>(Note)</li> <li>The malfunction mode is entered the 3rd time this abnormal indication appears (read every 3 minutes).</li> </ul>
2		Outdoor unit forced operation When the outdoor unit is in forced operation or balancing operation after forced operation	Electrical parts in the outdoor unit
3		Indoor/outdoor interface defective When the interface signal from the outdoor unit is interrupted.	<ul><li>(1) Indoor interface circuit</li><li>(2) Outdoor interface circuit</li></ul>
4		Outdoor electrical assembly defective.	Please check at the outdoor electrical led lamp blinking (LD301) and refer to self diagnosis lighting mode for outdoor unit.
5		Room thermistor or heat exchanger thermistor is faulty When room thermistor or heat exchanger thermistor is opened circuit or short circuit.	<ul><li>(1) Room thermistor</li><li>(2) Heat exchanger thermistor</li></ul>
6		Over-current detection at the DC fan motor when over-current is detected at the DC fan motor of the indoor unit.	<ul><li>(1) Indoor fan locked</li><li>(2) Indoor fan motor</li><li>(3) Indoor control P.W.B.</li></ul>
7		IC401 or IC402 data reading error When data read from IC401 or IC402 is incorrect.	IC401 or IC402 abnormal

(  $\blacksquare$  -- Lights for 0.5 sec. at interval of 0.5 sec..)

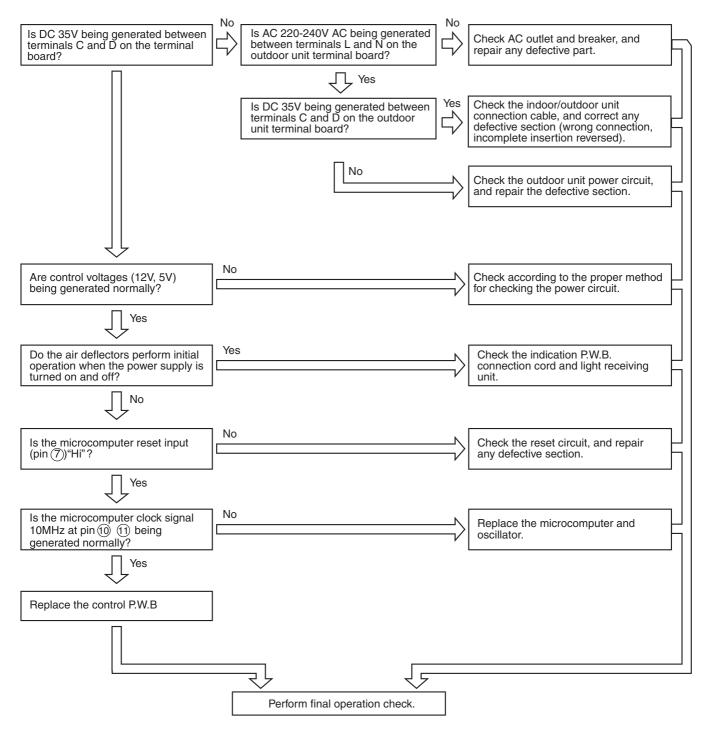
### <Cautions>

- (1) If the interface circuit is faulty when power is supplied, the self-diagnosis display will not be displayed.
- (2) If the indoor unit does not operate at all, check to see if the F-cable is connected or disconnected.
- (3) To check operation again when the timer lamp is blinking, you can use the remote control for operation (except for mode mark %1).

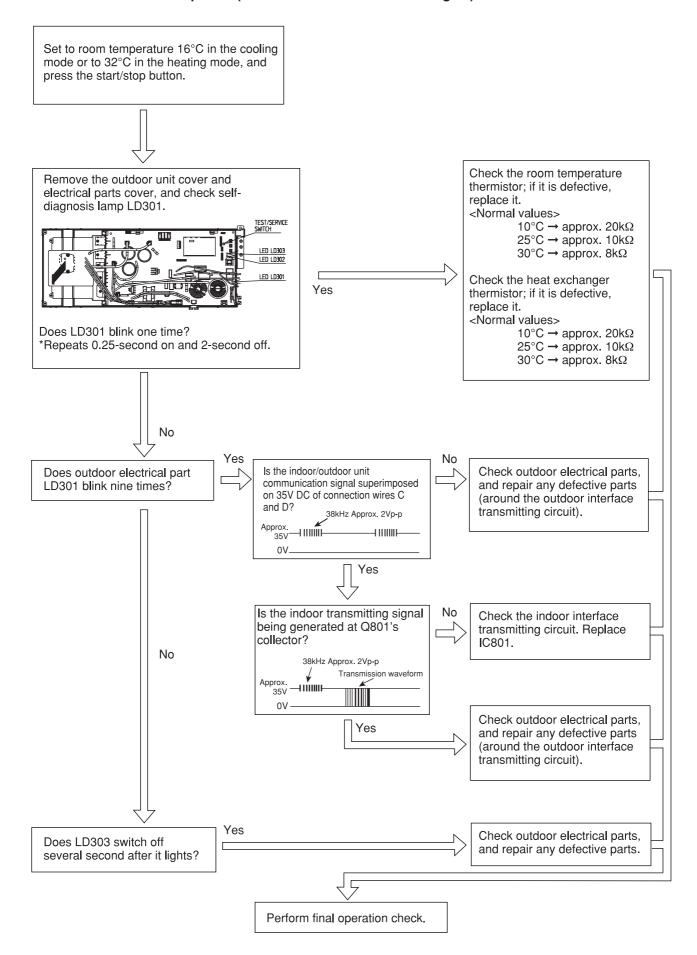
# CHECKING INDOOR UNIT ELECTRICAL PARTS

MODEL RAC-50YH7

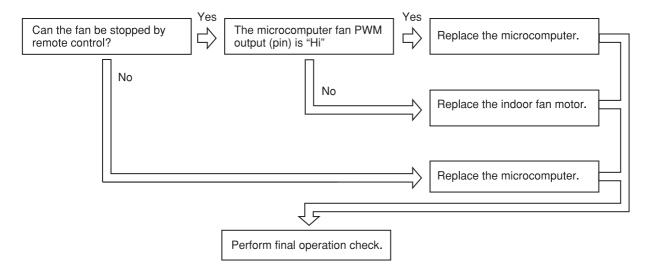
### 1. Power does not come on (no operation)



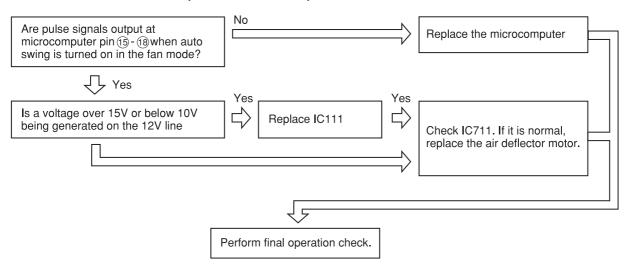
### 2. Outdoor unit does not operate (but receives remote infrared signal)



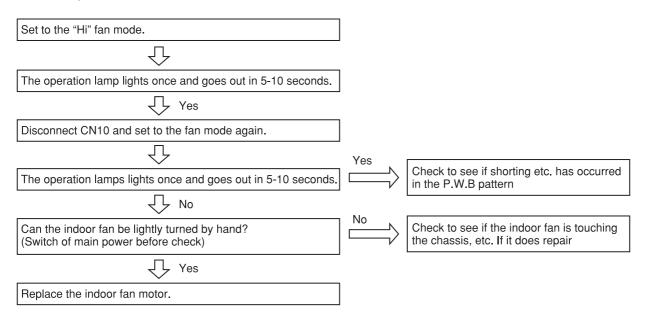
### 3. Only indoor fan does not operate (other is normal)



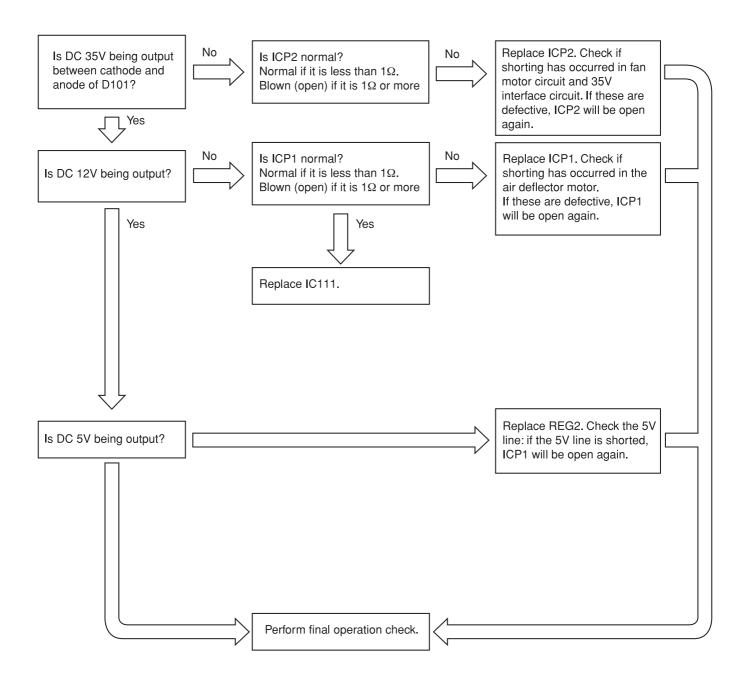
### 4. Air deflector does not move (others are normal)



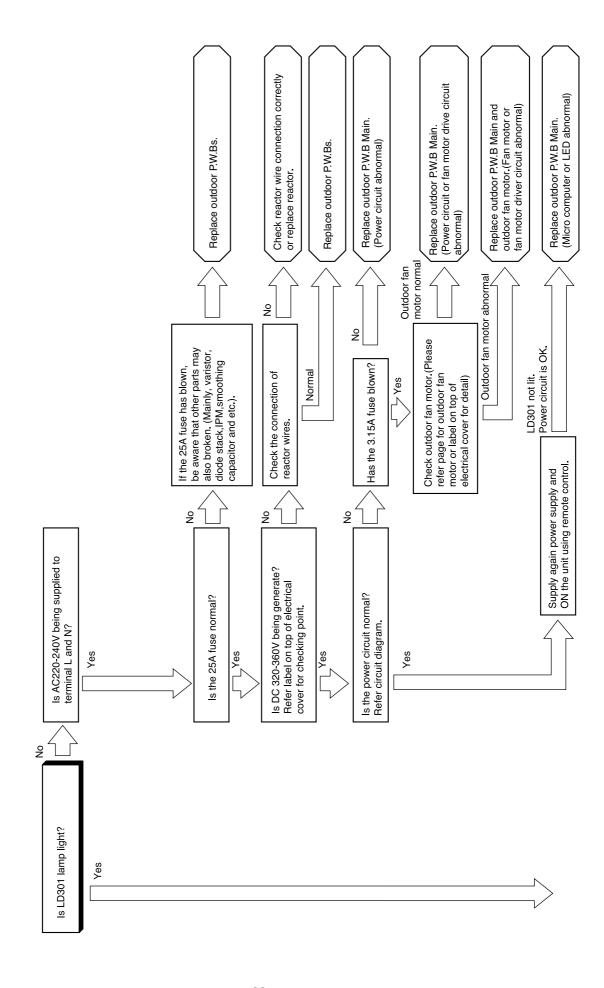
# 5. All systems stop from several seconds to several minutes after operation is started (all indicators are also off)

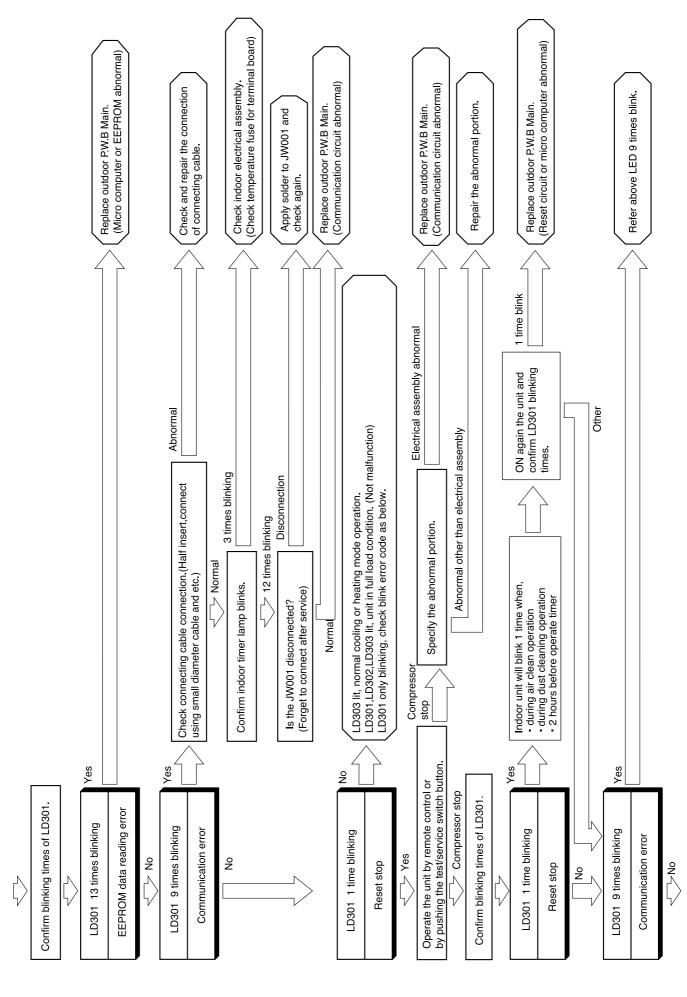


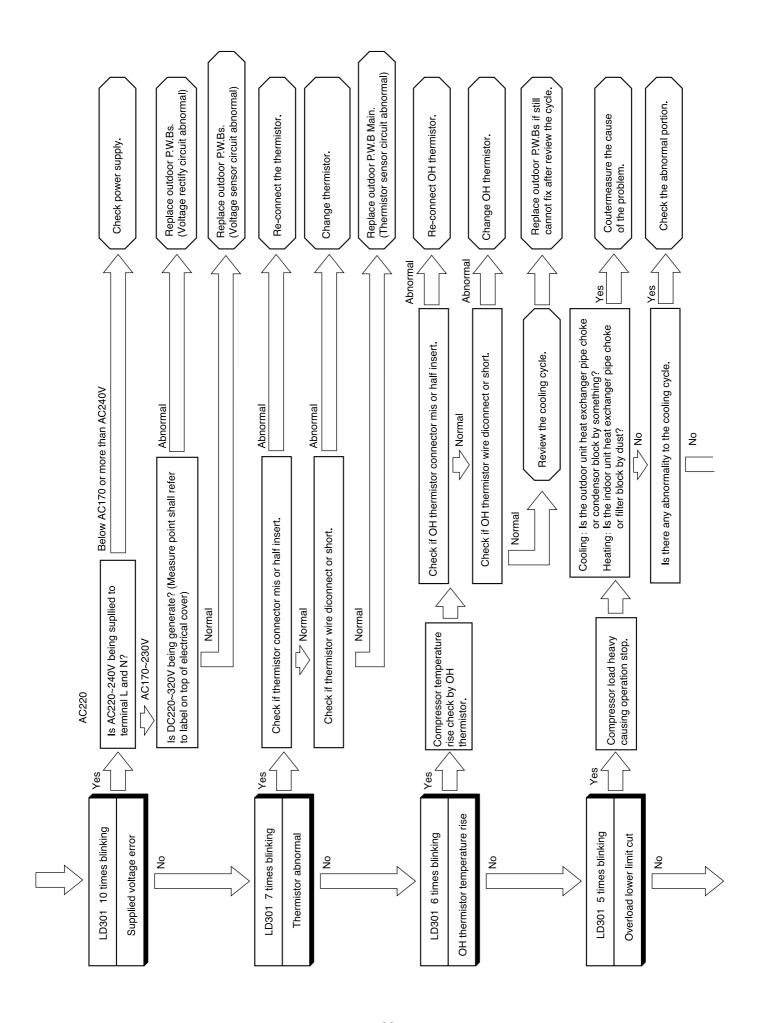
### 6. Check the main P.W.B (power circuit)

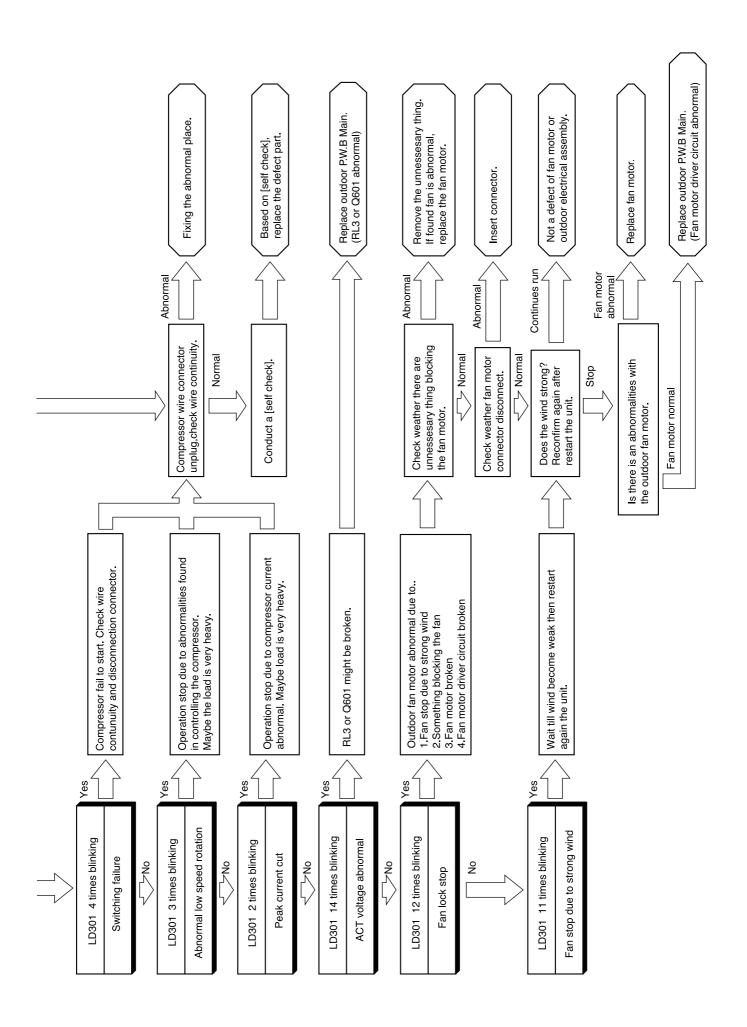


# CHECKING THE OUTDOOR UNIT ELECTRICAL PART









# **SELF CHECK**

When self-diagnosis lamp blinks 2,3,4 and 5 times happen, to determine whether compressor faulty or electrical unit faulty, please conduct a SELF CHECK as below.

- 1. Switch OFF main power supply.
- 2. Short circuit between JW001 and JW002.
- 3. Switch ON main power supply LD302 will blink 1 time.
- 4. (Within 3 minutes) Press Test/Service Switch for 1 second or more.
- 5. Self-diagnosis result will be shown LD303 will ON (LIT) and LD301 will be blinking. Then refer to diagnosis table 2.
- 6. Switch OFF main power supply. Then release back JW001 and JW002 to original condition (no short circuit condition).
- \* If step No. 6 is not carried out, the system will not operate properly until 3 minutes has lapsed after restore the power supply.

### \* SELF CHECK diagnosis result

SELF-DIAGNOSIS LIGHTING MODE ■ LIT ☑ BLINKING □ OFF						
L L L D D D 3 3 3 3						
0 0 0 1 2 3 RED RED RED	SELF-DIAGNOSIS RESULT	REPAIR METHOD				
□ □ ■ 1 TIME	ELECTRICAL OK	① CHANGE COMPRESSOR				
□ □ ■ 2 TIMES	PEAK CURRENT CUT OFF	① CHANGE P.W.B.s				
7 TIMES	COMPRESSOR CURRENT ABNORMAL	IF COMPRESSOR CONNECTOR LOOSE OR NG     CHECK CONNECTOR CONDITION     IF COMPRESSOR CONNECTOR OK,     CHECK COMPRESSOR, CHANGE P.W.B.s				
10 TIMES	DC VOLTAGE ABNORMAL	IF AC VOLTAGE INPUT ABNORMAL     (OVER STANDARD VOLTAGE ±10%),     - FOLLOW STANDARD AC VOLTAGE     INPUT     IF AC VOLTAGE INPUT IS NORMAL     (WITHIN ±10%), - CHANGE P.W.B.s				
☐ ☐ ■ 13 TIMES	EEPROM READING ERROR	© CHANGE P.W.B. MAIN				

In case abnormalities found in measurement result, change the defect part.

In case electrical is normal and before it can be use, modify back

JW001 and JW002 as normal condition (before conduct a self check).

In case of service person forgot to release JW001 and JW002 to original condition;

### Case 1:

If main power supply continuously ON, outdoor microcomputer will keep showing diagnosis result (LD303 will ON and LD301 will blinks).

### Case 2:

If main power supply OFF at once, then switch ON again:

a) Outdoor microcomputer will wait the self check command (by pressing test/service switch) within 3 minutes (LD302 blinks 1 time).

If test/service signal input is not received, unit will return to normal operation mode after this 3 minutes has lapsed. (LD302 OFF and LD301 blinks 1 time).

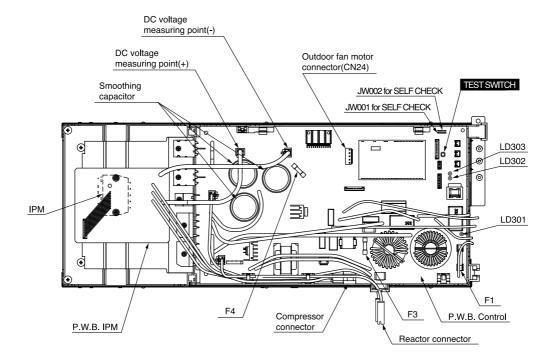
### Case 3:

If main power supply OFF at once, then switch ON again and on indoor unit by remote control;

- a) Indoor unit will receive remote control signal and send signal to outdoor unit. For the first 3 minutes, outdoor micro-computer will ignore this indoor signal (LD302 blinks 1 time).
- b) After 3 minutes has lapsed (LD302 OFF and LD301 blinks 1 time), unit will return to normal operation mode.

# HOW TO OPERATE USING OUTDOOR UNIT TEST SWITCH

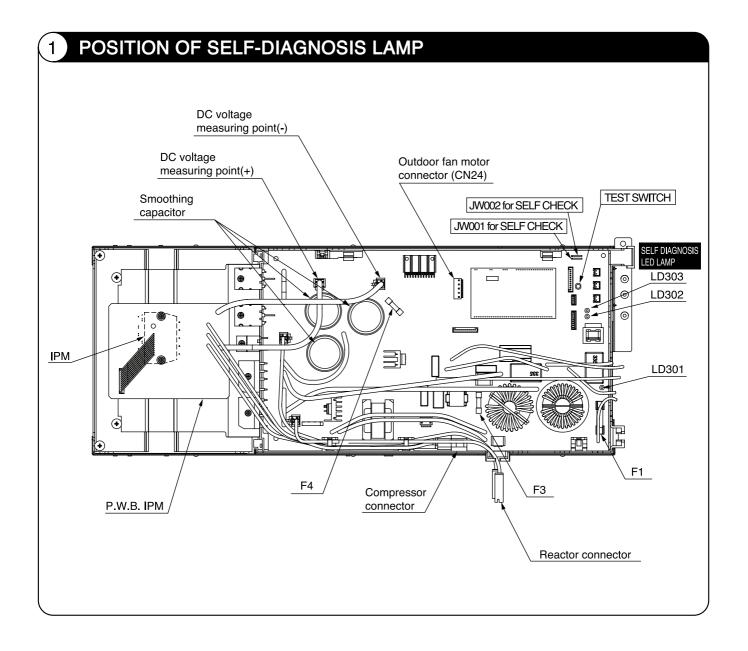
- 1. Pull out power cord plug and wait for 1 minute before plug in again.
- 2. Remove outdoor electrical cover and confirm that LD301 will blink 1 time.
- 3. Force cooling operation is start when TEST SWITCH is pressed for 1 second or more.
  - \* (There is a case where operation will only start after 1 minute after pressing the TEST SWITCH due to initilizing of the expansion valve)
- 5. Press again the TEST SWITCH for about 1 minute or more to stop the force cooling operation.



### **%** Caution

- 1. Turn OFF the breaker first before can start servicing.
- 2. Never operate the unit in this condition for more than 5 minutes.
- 3. If the checking is done with the compressor connector disconnected, the unit will continue normal operation when electrical part are normal, or it will repeat operating for approximate 1 minute and stop due to overload power limit cut
- 4 If interface signal (DC35V) terminal C and D are not connected when the outdoor unit TEST SWITCH is used for checking,LD301 will blink 9 times after operation to indicate a communication error.
- 5. To proceed with TEST SWITCH operation again, breaker must be turn OFF and ON it again. (TEST SWITCH will operate 1 time only once power is supplied)
- 6 When service operation is completed, restore the connection as original condition.

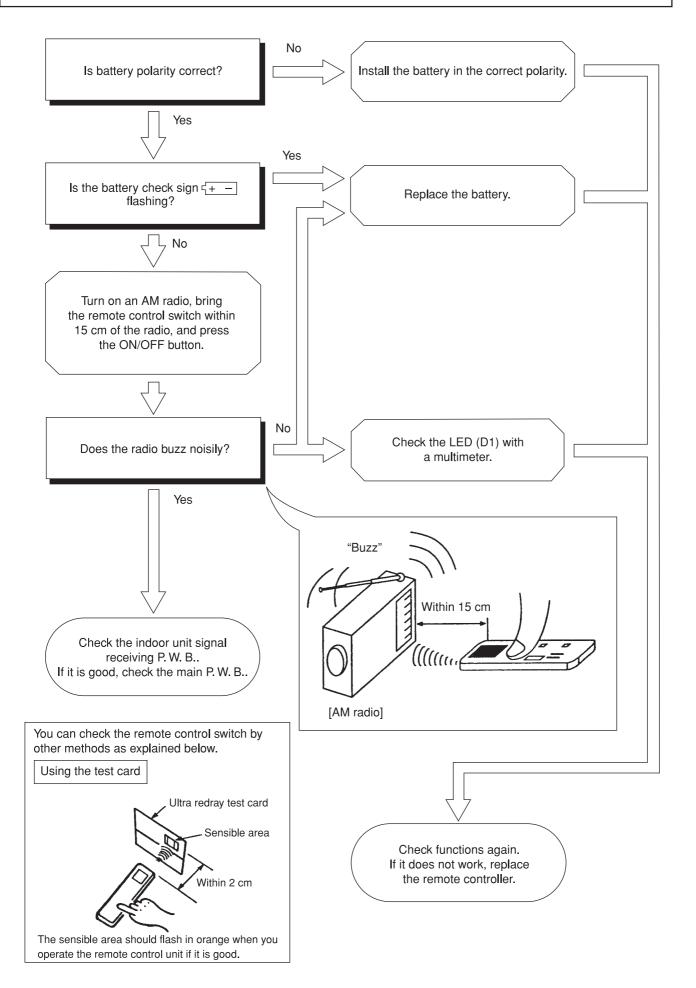
# LIGHTING MODE OF SELF-DIAGNOSIS LAMP



# LIGHTING MODE SELF-DIAGNOSIS LAMP



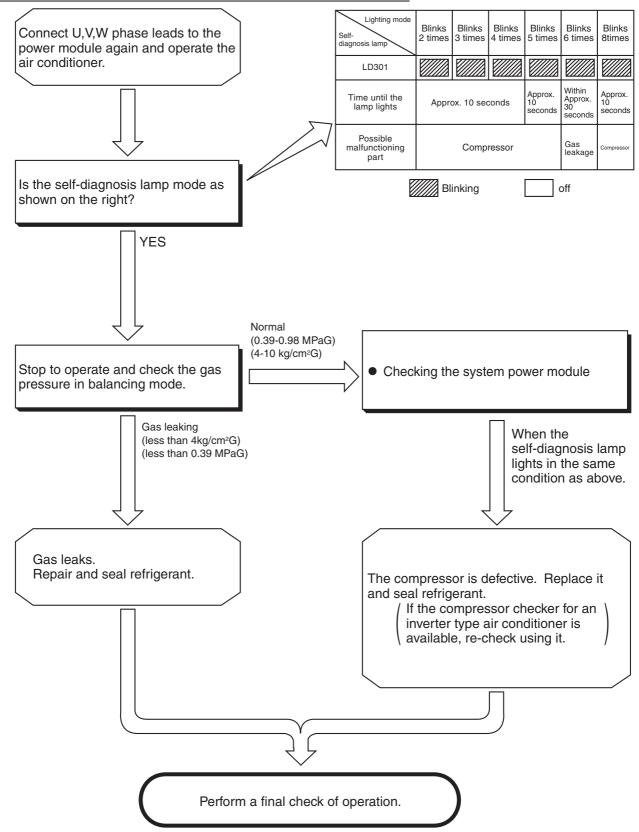
# CHECKING THE REMOTE CONTROLLER



# CHECKING THE REFRIGERATING CYCLE

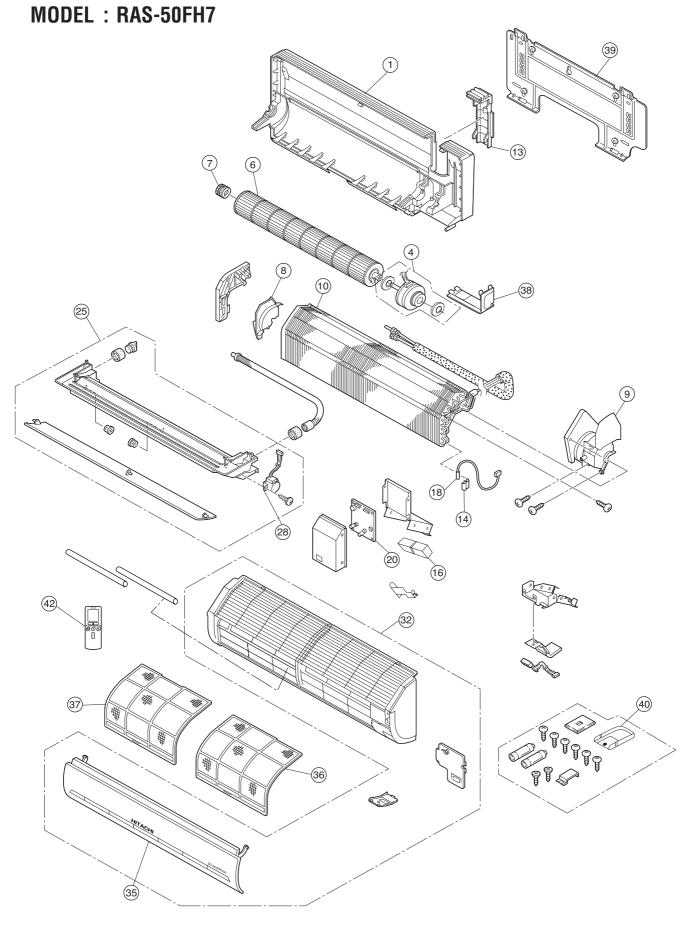
# (JUDGING BETWEEN GAS LEAKAGE AND COMPRESSOR DEFECTIVE)

## 1. Troubleshooting procedure (No operation, No heating, No cooling)



# PARTS LIST AND DIAGRAM

**INDOOR UNIT** 

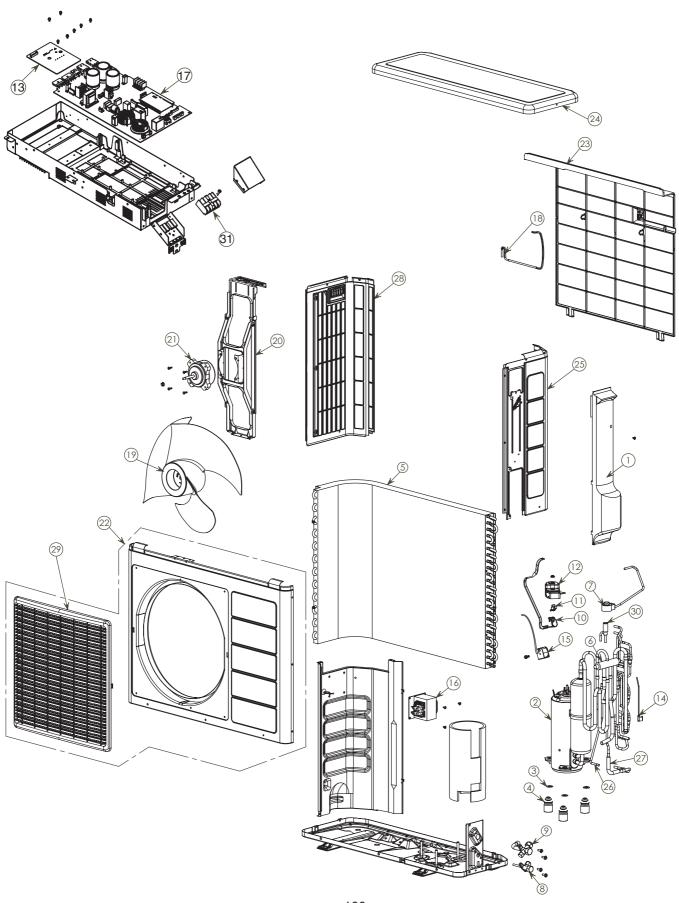


# **MODEL RAS-50FH7**

NO.	PART N0. RAS-50FH7		Q'TY / UNIT	PARTS NAME
1	PMRAS-07GH4	901	1	CABINET
4	PMRAS-25YH4	S04	1	FAN MOTOR
6	PMRAS-260GA	R01	1	TANGENTIAL AIR FLOW FAN
7	PMRAS-25YH4	908	1	FAN SUPPORT ASSEMBLY
8	PMRAS-25YH4	909	1	FAN COVER
9	PMRAS-25YH4	910	1	FAN MOTOR SUPPORT
10	PMRAS-X13CX	002	1	CYCLE ASSY
13	PMRAS-S13CY	002	1	PIPE SUPPORT
14	PMRAS-25YH4	S15	1	SPRING
16	PMWS1450SI	R07	1	TERMINAL BOARD
18	PMRAS-260GHA	R01	1	THERMISTOR ASSY.
20	PMRAS-50FH6	R01	1	P.W.B (MAIN)
25	PMRAS-S10CY	005	1	DRAIN PAN ASSY.
28	PMRAS-25YH4	S29	1	AUTO SWEEP MOTOR
32	PMRAK-18NH6	002	1	FRONT COVER ASSEMBLY
35	PMRAK-18NH6	003	1	FRONT PANEL
36	PMRAK-25N6	R05	1	AIR FILTER (R)
37	PMRAK-25N6	R04	1	AIR FILTER (L)
38	PMRAS-X10CY	006	1	LOW COVER
39	PMRAS-25YH4	S40	1	MOUNTING PLATE
40	PMRAS-10C3M	003	1	REMOTE CONTROL SUPPORT
42	PMRAK-18NH6A	R02	1	REMOTE CONTROL ASSEMBLY

# PARTS LIST AND DIAGRAM

OUTDOOR UNIT MODEL: RAC-50YH7



# MODEL RAC-50YH7

NO.	PART NO. RAC-50YH7		Q'TY / UNIT	PARTS NAME
1	PMRAC-X18CXT	906	1	SV-COVER-AS
2	PMRAC-50YH7	S03	1	COMPRESSOR
3	KPNT1	001	4	PUSH NUT
4	RAC-2226HV	805	3	COMPRESSOR RUBBER
5	PMRAC-50NH4	S02	1	CONDENSER
6	PMRAC-70YHA1	999	1	REVERSING VALVE
7	PMRAC-25NH4	S03	1	ELECTRICAL EXPANSION COIL
8	PMRAC-50NH4	S03	1	VALVE (2S)
9	PMRAC-50NH4	S04	1	VALVE (4S)
10	PMRAC-40CNH2	S14	1	THERMISTOR (OH)
11	PMRAC-25NH4	S09	1	OVERHEAT THERMISTOR SUPPORT
12	PMRAC-X13CX	906	1	OVERLOAD RELAY COVER
13	PMRAC-50YH7	S02	1	P.W.B (IPM)
14	PMRAC-50YHA2	S07	1	THERMISTOR (DEFROST)
15	PMRAC-50YHA2	S09	1	COIL (REVERSING VALVE)
16	PMRAC-18SH4	S01	1	REACTOR
17	PMRAC-50YH7	S01	1	P.W.B (MAIN)
18	PMRAC-50YHA2	S08	1	THERMISTOR (OUTSIDE TEMPERATURE)
19	PMRAC-70YHA	907	1	PROPELLER FAN
20	PMRAC-40CNH2	S18	1	SUPPORT (FAN MOTOR)
21	PMRAC-50YHA2	S03	1	FAN MOTOR
22	PMRAC-50YH7	S04	1	CABINET
23	PMRAC-40CNH2	921	1	NET
24	PMRAC-40CNH2	922	1	TOP COVER
25	PMRAC-19JHP4	S05	1	SIDE PLATE-R
26	PMRAC-50NH4	906	1	STRAINER (PIPE)
27	PMRAC-50YHA2	S06	1	STRAINER (COND)
28	PMRAC-40CNH2	926	1	SIDE PLATE-L
29	PMRAM-52QH5	S03	1	GRILL
30	PMRAC-25NH4	S16	1	EXPANSION VALVE
31	PMRAC-25NH4	S13	1	TERMINAL BOARD (4P)

