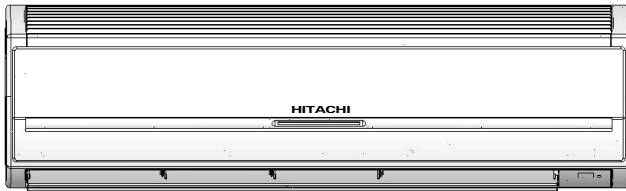


SERVICE MANUAL

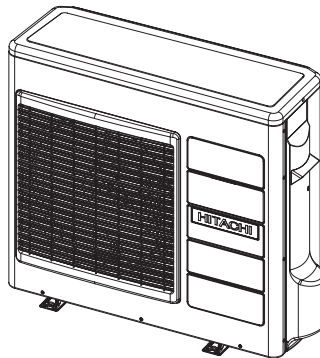
TECHNICAL INFORMATION

REFER TO THE FOUNDATION MANUAL

FOR SERVICE PERSONNEL ONLY



RAS-70YH7



RAC-70YH7

CONTENTS

CAUTION	4
SPECIFICATIONS	5
INSTALLATION	6
HOW TO USE	7
CONSTRUCTION AND DIMENSIONAL DIAGRAM	29
MAIN PARTS COMPONENT	31
WIRING DIAGRAM	33
CIRCUIT DIAGRAM	35
PRINTED WIRING BOARD LOCATION DIAGRAM	41
BLOCK DIAGRAM	44
BASIC MODE	45
REFRIGERATING CYCLE DIAGRAM	59
DESCRIPTION OF MAIN CIRCUIT OPERATION	61
SERVICE CALL Q & A	74
TROUBLE SHOOTING	78
PARTS LIST AND DIAGRAM	98

SPECIFICATIONS

TYPE		(WALL TYPE)	
		INDOOR UNIT	OUTDOOR UNIT
MODEL		RAS-70YH7	RAC-70YH7
POWER SOURCE		1 Ø, 50/60 Hz, 220-240V	
COOLING	TOTAL INPUT (W)	2,170 (200 – 2,820)	
	TOTAL AMPERES (A)	9.95	
	CAPACITY	(kW)	7.00 (1.50 – 8.00)
		(B.T.U./h)	23,900 (5,120 – 27,315)
HEATING	TOTAL INPUT (W)	2,200 (200 – 2,970)	
	TOTAL AMPERES (A)	10.10	
	CAPACITY	(kW)	8.00 (1.50 – 9.20)
		(B.T.U./h)	27,300 (5,119 – 31,396)
DIMENSIONS (mm)	W	1150	850
	H	333	800
	D	245	298
NET WEIGHT (kg)		15	55

※ After installation

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

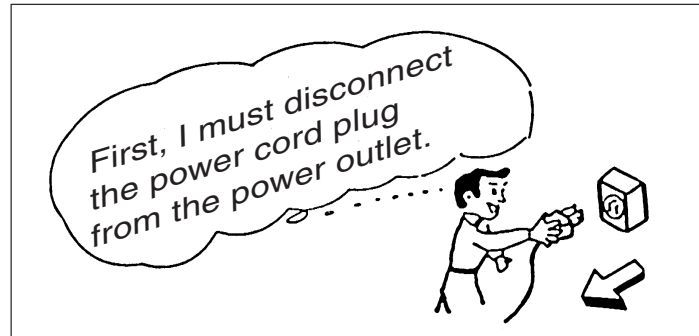
ROOM AIR CONDITIONER

INDOOR UNIT + OUTDOOR UNIT

JANUARY 2010 Refrigeration & Air-Conditioning Division

SAFETY DURING REPAIR WORK

1. 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.
9. 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.
10. 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).

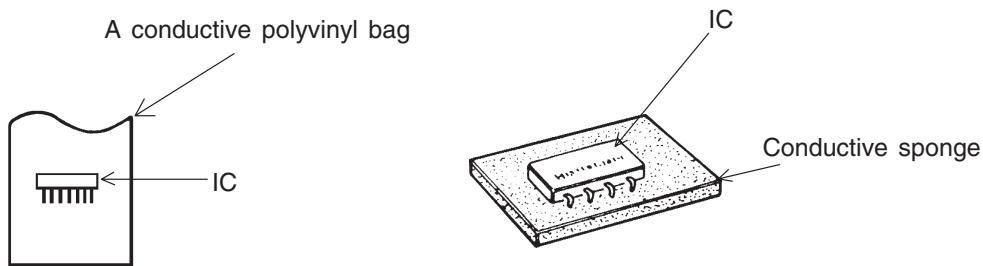


Fig. 1. Conductive Container

- (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.

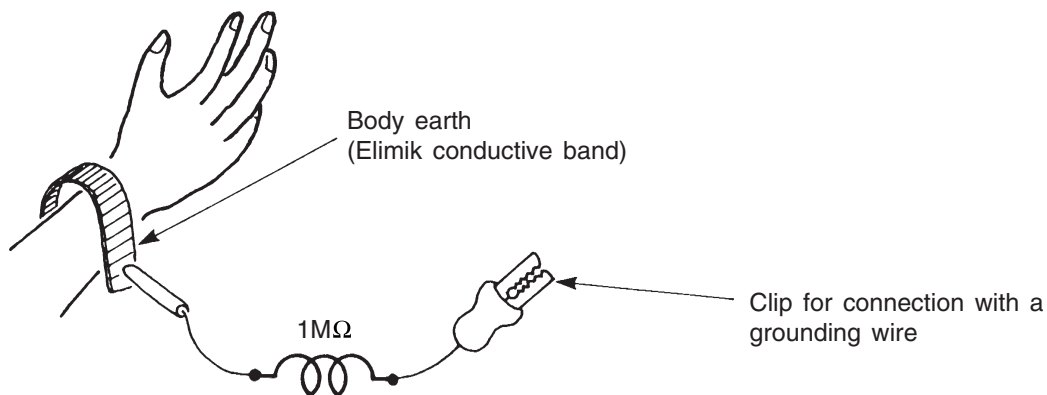


Fig. 2. Body Earth

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

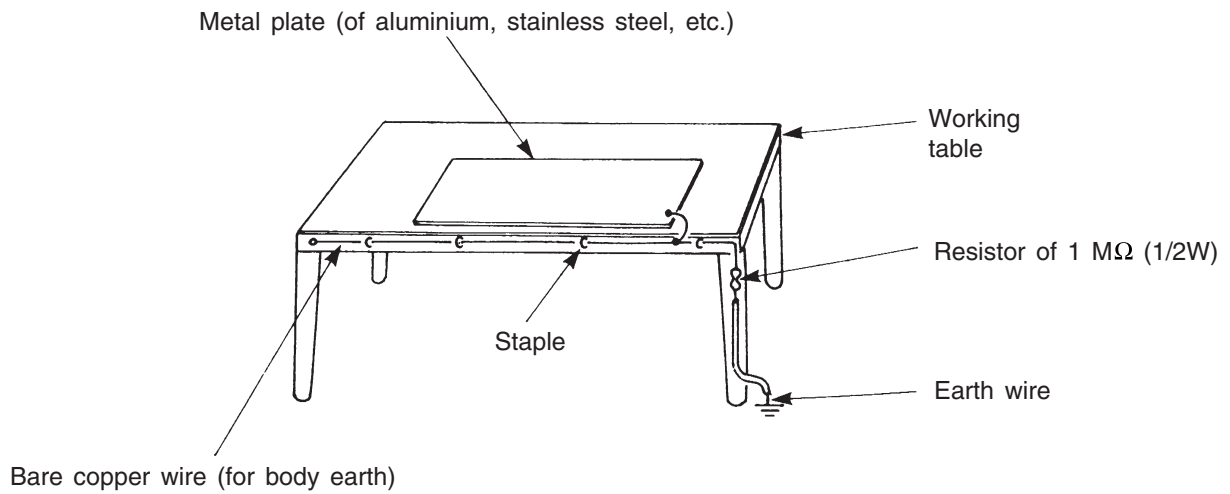


Fig. 3. Grounding of the working table

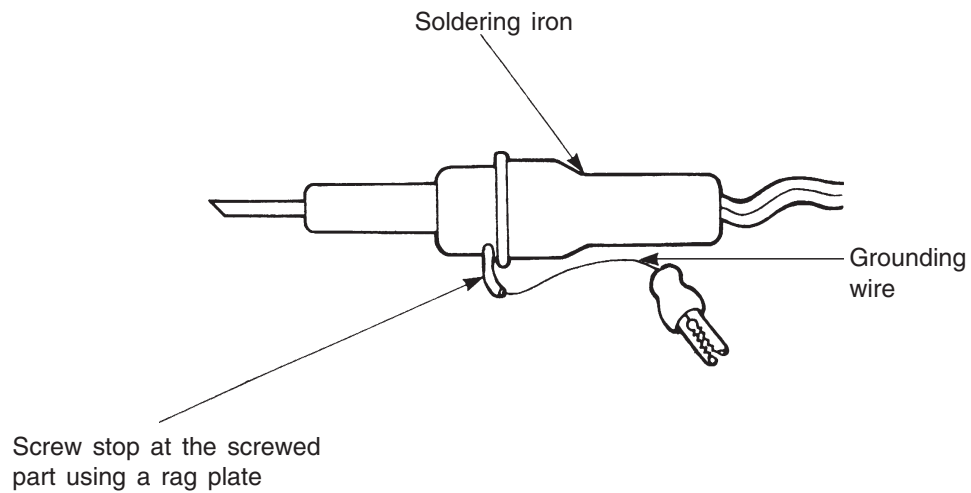


Fig. 4. Grounding a soldering iron

Use a high insulation mode (100V, 10MΩ 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.

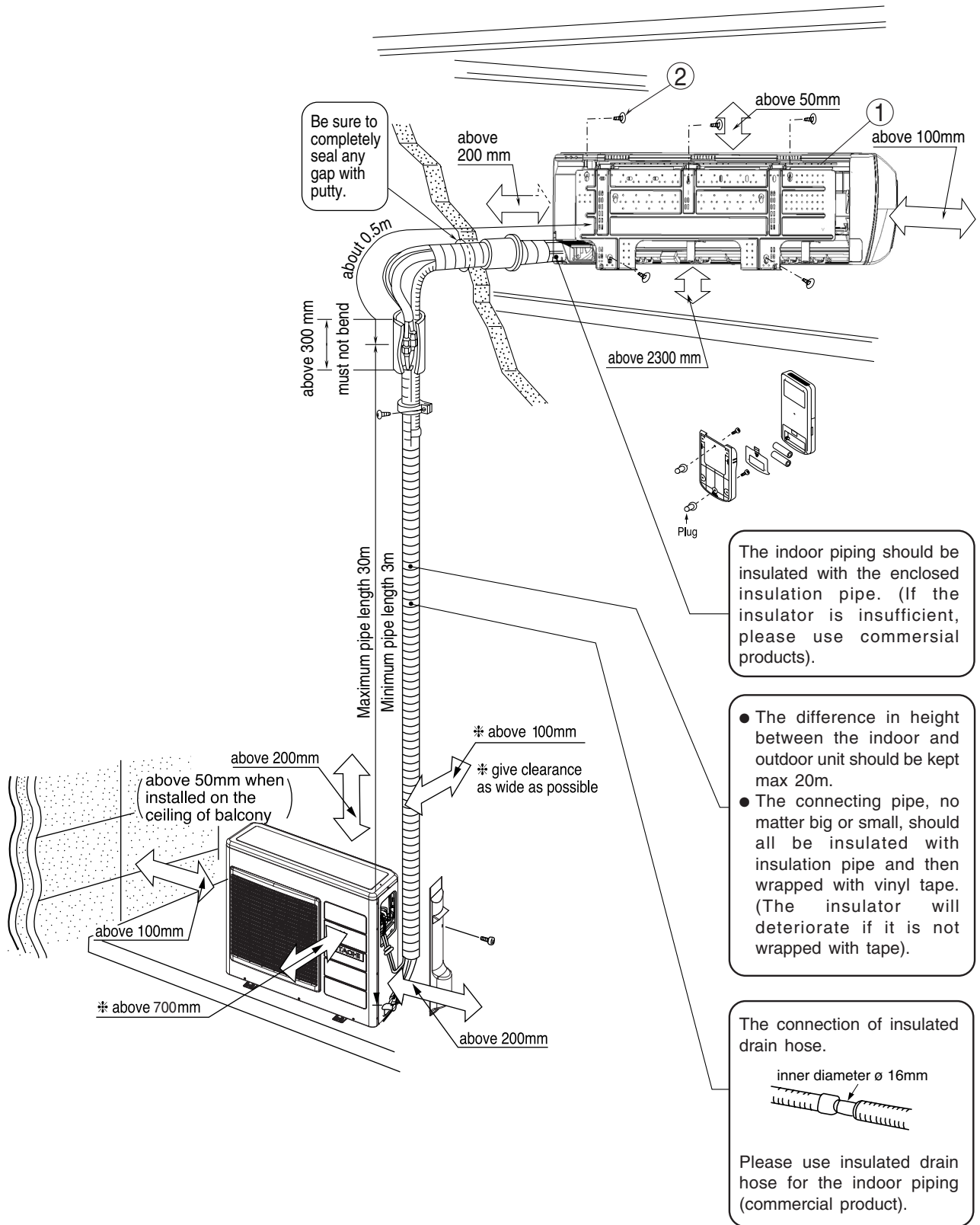
 **CAUTION**

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 recommended 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 airconditioner 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°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

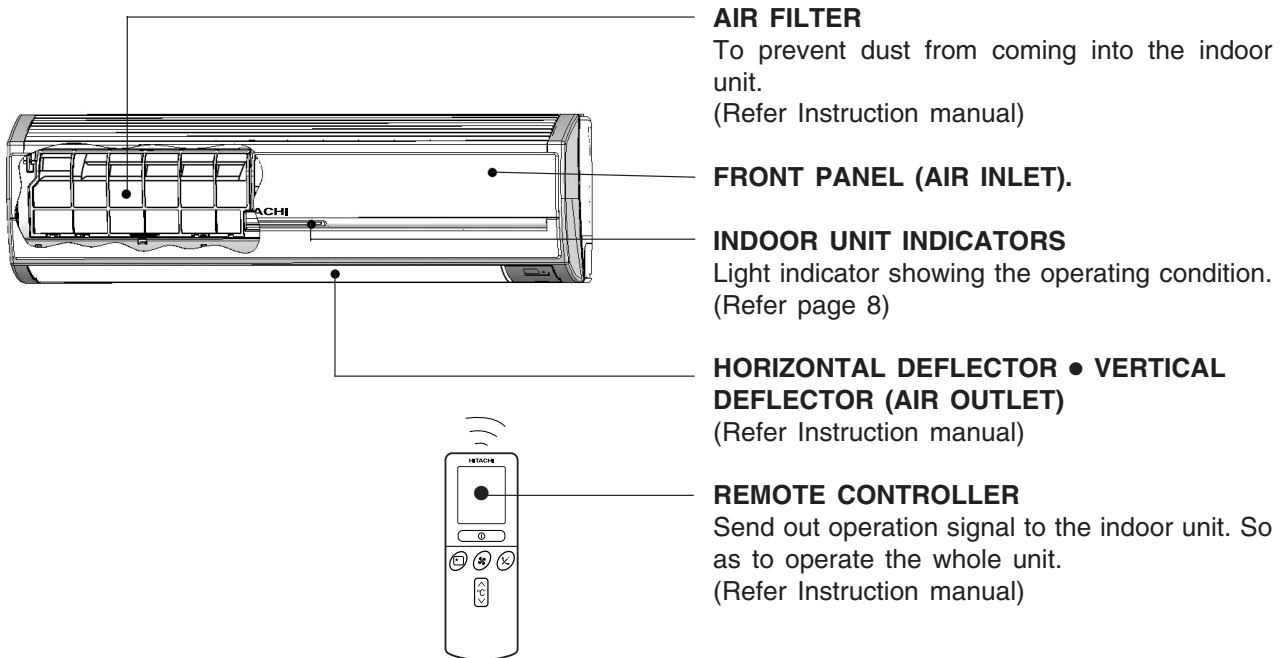
MODEL		RAS-70YH7	RAC-70YH7
FAN MOTOR		30 W	47 W
FAN MOTOR CAPACITOR		NO	NO
FAN MOTOR PROTECTOR		NO	NO
COMPRESSOR		-	JU1015D9
COMPRESSOR MOTOR CAPACITOR		NO	NO
OVERLOAD PROTECTOR		NO	NO
OVERHEAT PROTECTOR		NO	YES
FUSE (MICRO COMPUTER CIRCUIT)		3.15A	NO
POWER RELAY		G4A	G4A
POWER SWITCH		NO	NO
TEMPORARY SWITCH		YES	NO
TEST/SERVICE SWITCH		NO	YES
TRANSFORMER		NO	NO
VARISTOR		416NR	450NR
NOISE SUPPRESSOR		NO	NO
THERMOSTAT		YES(IC)	YES(IC)
REMOTE CONTROL SWITCH (LIQUID CRYSTAL)		YES	NO
FUSE CAPACITY		30 A TIME DELAY FUSE	
REFRIGERANT CHARGING VOLUME (Refrigerant R410A)	UNIT	-----	* 1850g
	PIPES (MAX. 30m) (MIN. 3m)	CHARGELESS	

Figure showing the installation of Indoor and Outdoor unit



NAMES AND FUNCTIONS OF EACH PART

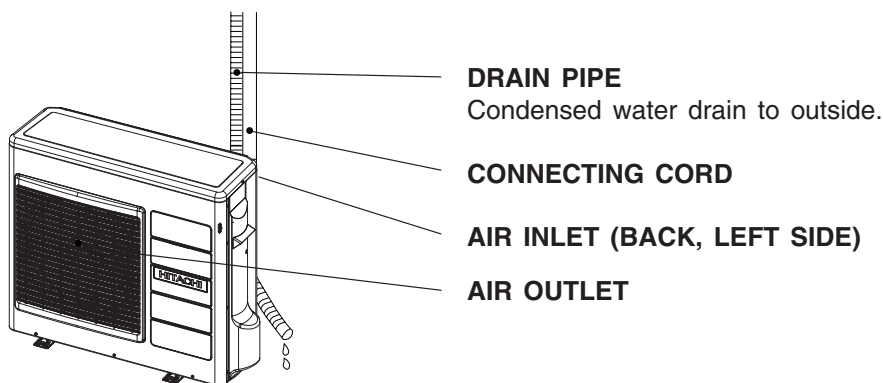
INDOOR UNIT



NOTE

- Air cleansing filters are not washable and can be use in 1 year time. Type number for this air cleansing filter is <SPX-CFH12>. 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.

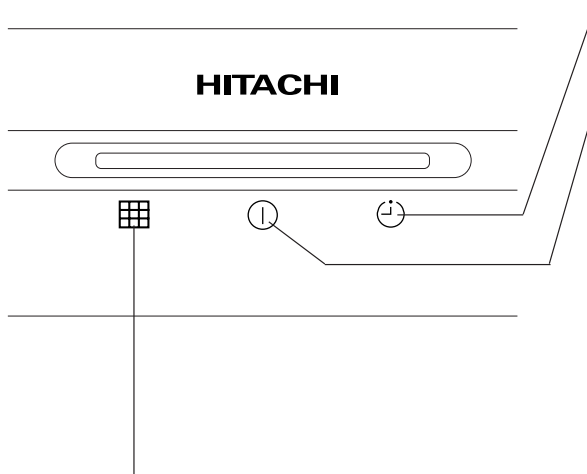
OUTDOOR UNIT



MODEL NAME AND DIMENSIONS

MODEL	WIDTH (mm)	HEIGHT (mm)	DEPTH (mm)
RAS-70YH7	1150	333	245
RAC-70YH7	850	800	298

INDOOR UNIT INDICATORS



TIMER LAMP

This lamp lights when the timer is working.

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.

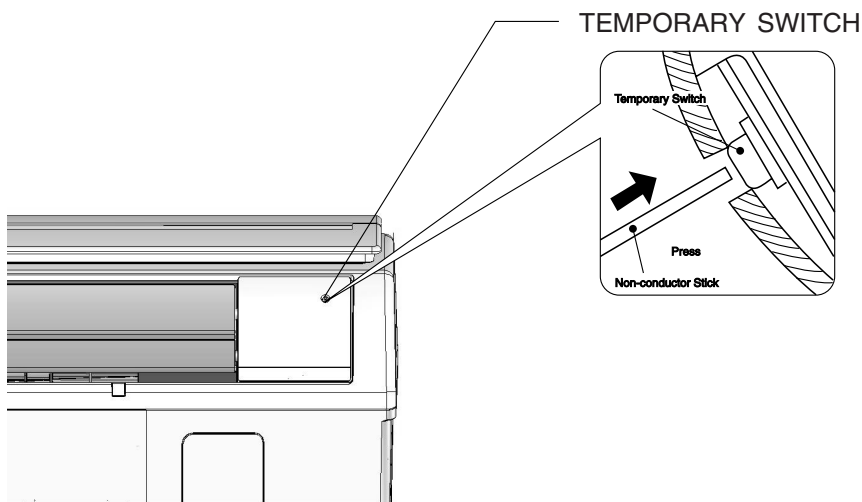
(2) During defrosting

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

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 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.






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 “**▲ Warning**” and “**▲ 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.	 The sign in the figure indicates prohibition.
 Indicates the instructions that must be followed.	

- Please keep this manual after reading.



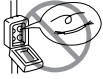

PRECAUTIONS DURING INSTALLATION

WARNING	<ul style="list-style-type: none"> ● Do not reconstruct the unit. Water leakage, fault, short circuit or fire may occur if you reconstruct the unit by yourself. 	
	<ul style="list-style-type: none"> ● 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. 	
	<ul style="list-style-type: none"> ● Be sure to use the specified piping set for R410A. Otherwise, this may result in broken copper pipes or faults. 	
CAUTION	<ul style="list-style-type: none"> ● A circuit breaker should be installed depending on the mounting site of the unit. Without a circuit breaker, the danger of electric shock exists. 	
	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● 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. 	 
	<ul style="list-style-type: none"> ● Please contact your agent for maintenance. Improper self maintenance may cause electric shock and fire. 	
	<ul style="list-style-type: none"> ● 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. 	
	<ul style="list-style-type: none"> ● If the supply cord is damaged, it must be replaced by the special cord obtainable at authorized service/parts centers. 	

PRECAUTIONS DURING OPERATION

WARNING	<ul style="list-style-type: none"> ● Avoid an extended period of direct air flow for your health. 	
	<ul style="list-style-type: none"> ● 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. 	
	<ul style="list-style-type: none"> ● Do not use any conductor as fuse wire, this could cause fatal accident. 	
	<ul style="list-style-type: none"> ● During thunder storm, disconnect and turn off the circuit breaker. 	

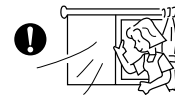
PRECAUTIONS DURING OPERATION

- 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.



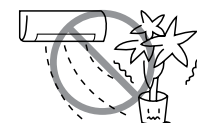
- Please switch off the unit and turn off the circuit breaker during cleaning, the high-speed fan inside the unit may cause danger.

- 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.

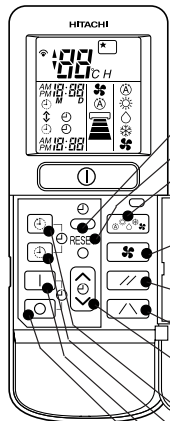
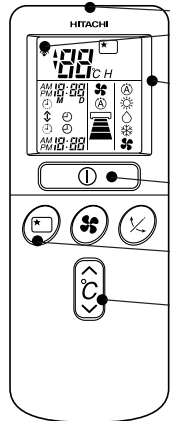


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NAMES AND FUNCTIONS OF REMOTE CONTROL UNIT

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 (AUTO) to (HEAT) to (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 (AUTO) to (HI) to (MED) to (LOW) to (SILENT) (This button allows selecting the optimal or preferred fan speed for each operation mode).
- **PARALLEL SWING button**
Controls the angle of the vertical air deflectors to parallel.
- **SYMMETRY SWING button**
Controls the angle of the vertical air deflectors to symmetry.
- **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.

	AUTO
	HEAT
	DEHUMIDIFY
	COOL
	FAN
	FAN SPEED SILENT LOW MED HI
	SLEEPING
	STOP (CANCEL)
	START (RESERVE)
	START/STOP
	TIME
	TIMER SET
	TIMER SELECTOR ON TIMER OFF TIMER
	PARALLEL SWING
	SYMMETRY 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

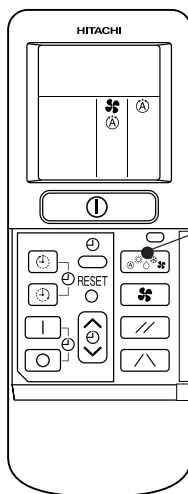
Auto Restart Control

- 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.



1

Press the FUNCTION selector so that the display indicates the **A** (AUTO) mode of operation.

- When AUTO has been selected, the device will automatically determine the mode of operation, HEAT, COOL or DEHUMIDIFY depending on the current room temperature. However the mode of operation will not change when indoor unit connected to multi type outdoor unit.
- If the mode automatically selected by the unit is not satisfactory, manually change the mode setting (heat, dehumidify, cool or fan).

START
STOP

Press the **I** (START/STOP) button.
Operation starts with a beep.
Press the button again to stop operation.

- As the settings are stored in memory in the remote controller, you only have to press the **I** (START/STOP) button next time.

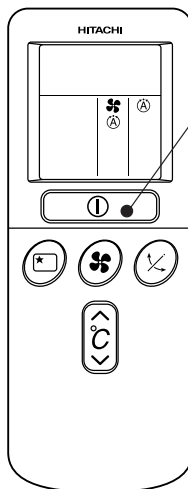
You can raise or lower the temperature setting as necessary by maximum of 3°C.



Press the temperature button and the temperature setting will change by 1°C each time.

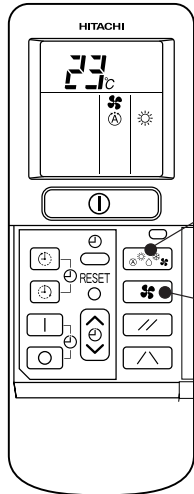
- The preset temperature and the actual room temperature may vary somewhat depending on conditions.
- The display does not indicate the preset temperature in the AUTO mode.
If you change the setting, the indoor unit will produce a beep.

Press the **F** (FAN SPEED) button, AUTO, LOW and SILENT is available.



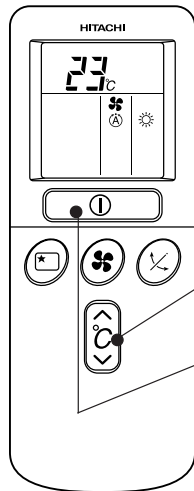
HEATING OPERATION

- 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.



1

Press the FUNCTION selector so that the display indicates ☀ (HEAT).



2

Set the desired FAN SPEED with the 🌀 (FAN SPEED) button (the display indicates the setting).

Ⓐ (AUTO) : The fan speed changes automatically according to the temperature of the air which blows out.

🌀 (HI) : Economical as the room will become warm quickly.
But you may feel a chill at the beginning.

🌀 (MED) : Fan speed slow.

🌀 (LOW) : Fan speed slower.

🌀 (SILENT) : Fan speed ultra slower.

3

Set the desired room temperature with the TEMPERATURE buttons (the display indicates the setting).

The temperature setting and the actual room temperature may vary somewhat depending on conditions.

**START
STOP**

Press the ⏻ (START/STOP) button. Heating operation starts with a beep. Press the button again to stop operation.

- As the settings are stored in memory in the remote controller, you only have to press the ⏻ (START/STOP) button next time.

■ 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.

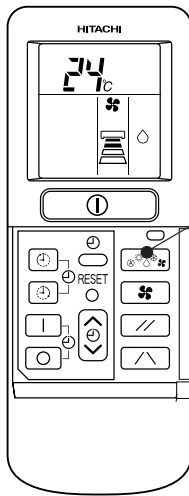
The maximum time for defrosting is 20 minutes.

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.

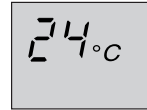


1

Press the FUNCTION selector so that the display indicates  (DEHUMIDIFY).
The FAN SPEED is set at LOW or SILENT.


2


Set the desired room temperature with the TEMPERATURE button (the display indicates the setting).

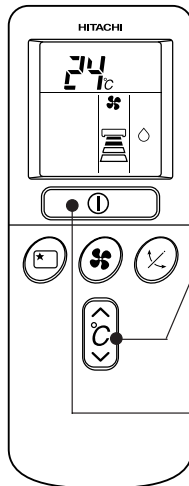


The range of 20-26°C is recommended as the room temperature for dehumidifying.

START
STOP

Press the  (START/STOP) button. Dehumidifying operation starts with a beep. Press the button again to stop operation.

- As the settings are stored in memory in the remote controller, you only have to press the  (START/STOP) button next time.

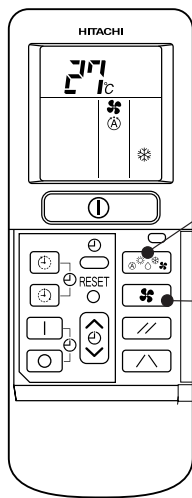


■ Dehumidifying Function

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



1

Press the FUNCTION selector so that the display indicates ❄️ (COOL).

2

Set the desired FAN SPEED with the 🌀 (FAN SPEED) button (the display indicates the setting).

⏸️ (AUTO) : The FAN SPEED is HI at first and varies to MED or LOW automatically when the preset temperature has been reached.

🌀 (HI) : Economical as the room will become cool quickly.

🌀 (MED) : Fan speed slow.

🌀 (LOW) : Fan speed slower.

🌀 (SILENT) : Fan speed ultra slower.

3

Set the desired room temperature with the TEMPERATURE button (the display indicates the setting).

The temperature setting and the actual room temperature may vary some how depending on conditions.

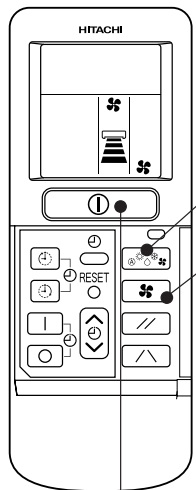
START
STOP


Press the ⏸️ (START/STOP) button. Cooling operation starts with a beep. Press the button again to stop operation. The cooling function does not start if the temperature setting is higher than the current room temperature (even though the ⏸️ (OPERATION) lamp lights). The cooling function will start as soon as you set the temperature below the current room temperature.


■ As the settings are stored in memory in the remote controller, you only have to press the ⏸️ (START/STOP) button next time.





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.



1 Press the FUNCTION selector so that the display indicates  (FAN).

2 Press the  (FAN SPEED) button.

-  (HI) : The strongest air blow.
-  (MED) : Fan speed slow.
-  (LOW) : Fan speed slower.
-  (SILENT) : Fan speed ultra slower.

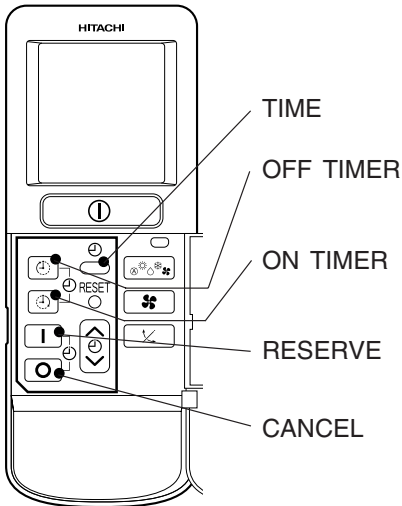
START STOP Press the  (START/STOP) button. Fan operation starts with a beep. Press the button again to stop operation.

FAN SPEED (AUTO)

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

For the heating operation	<ul style="list-style-type: none"> ● When the difference of room temperature and setting temperature is large, fan starts to run at HI speed. ● 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.
For the cooling operation	<ul style="list-style-type: none"> ● When the difference of room temperature and setting temperature is large, fan starts to run at HI speed. ● 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.

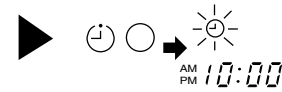
HOW TO SET THE TIMER



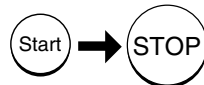
Time

After you change the batteries;

1 Set the ⊕ (TIME) button.

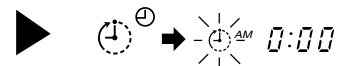


OFF-Timer

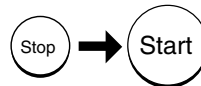


You can set the device to turn off at the preset time.

1 Press the ⊕ (OFF-TIMER) button. The ⊖ (OFF) mark blinks on the display.



ON-Timer

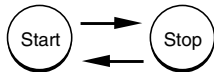


- The device will turn on at the designated times.

1 Press the ⊕ (ON-TIMER) button the ⊖ (ON) mark blinks on the display.

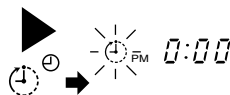


ON/OFF-Timer



- The device will turn on (off) and off (on) at the designated times.
- The switching occurs first at the preset time that comes earlier.
- The arrow mark appearing on the display indicates the sequence of switching operations.

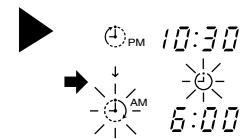
1 Press the ⊕ (ON-OFF) button so that the ⊖ (OFF) mark blinks.



2 Set the turn-off time with the TIMER control button. Press the I (RESERVE) button.



3 Press the ⊕ (ON-TIMER) button so that the ⊖ (OFF) mark lights and the ⊖ (ON) mark blinks.




How to Cancel Reservation

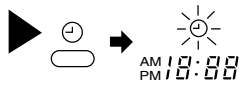
Point the signal window of the remote controller toward the indoor unit, and press the ○ (CANCEL) button.

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

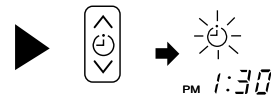
NOTE


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

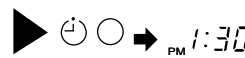
2 Press the  (TIME) button.




3 Set the current time with the TIMER control button.



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

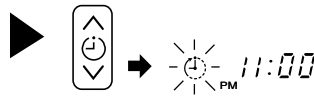



- The time indication will disappear automatically in 10 second.
- To check the current time setting, press the  (TIME) button twice.




The setting of the current time is now complete.

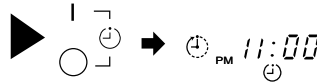
Example: The current time is 1:30 p.m.

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



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

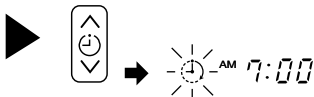
The  (OFF) mark starts lighting instead of flashing and the sign  (RESERVED) lights. A beep occurs and the  (TIMER) lamp lights on the indoor unit.







Example: The device will turn off at 11:00p.m.

The setting of turn-off time is now complete.

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



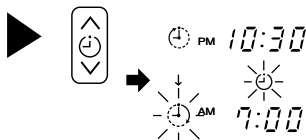
3 Point the signal window of the remote controller toward the indoor unit, and press the  (RESERVE) button.


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






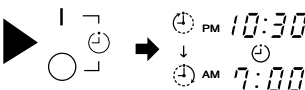
Example:
The device will turn on at 7:00 a.m.
The setting of the turn-on time is now complete.

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

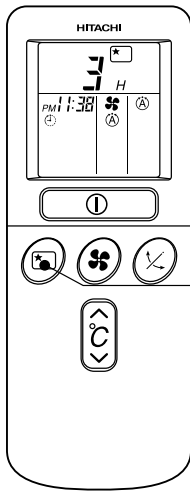


Example:
The device will turn off at 10:30 p.m. and it will be turned on at 7:00 a.m.
The settings of the turn-on/off times are now complete.

- 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  (RESERVE) button in order to use the same settings next time.

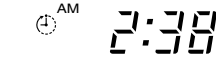
HOW TO SET THE SLEEP TIMER

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.

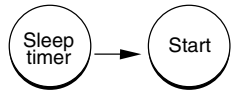


Mode	Indication
Sleep timer	

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.




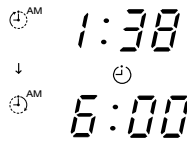
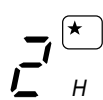
Example: If you set 3 hours sleep time at 11:38 p.m., the turn-off time is 2:38 a.m.



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  (CANCEL) button.

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

HOW TO EXCHANGE THE BATTERIES IN THE REMOTE CONTROLLER

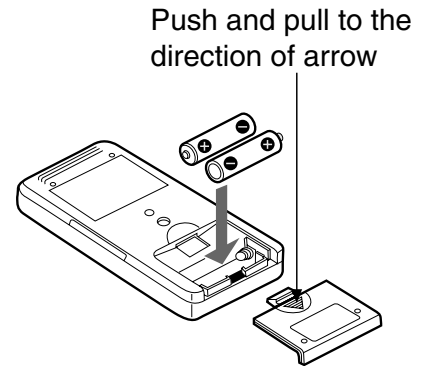
1 Remove the cover as shown in the figure and take out the old batteries.



2 Install the new batteries.
The direction of the batteries should match the marks in the case.

⚠ 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.

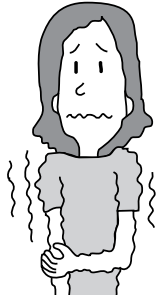
- This temporary operation will be at the setting made most recently. (The unit will immediately go into automatic operation once power is switched on.)

CIRCUIT BREAKER

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

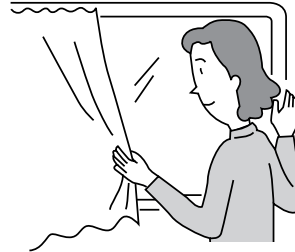
THE IDEAL WAYS OF OPERATION

Suitable Room Temperature



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.

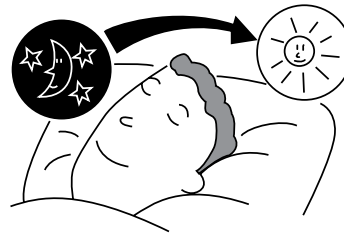
Ventilation

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.



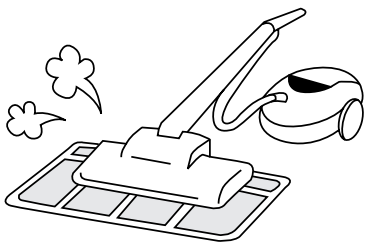
Effective Usage Of Timer

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.



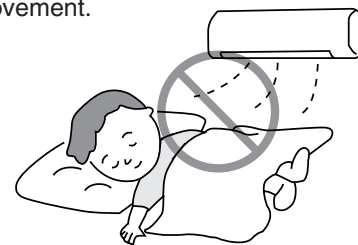
Do Not Forget To Clean The Air Filter

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.

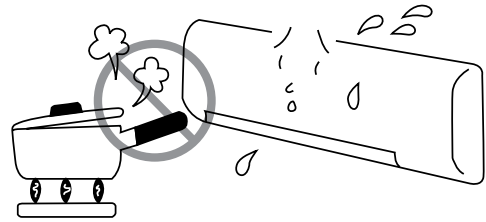


FOR USER'S INFORMATION

The Air Conditioner And The Heat Source In The Room

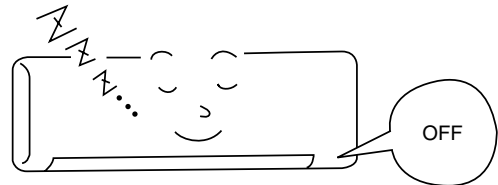
⚠ Caution

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

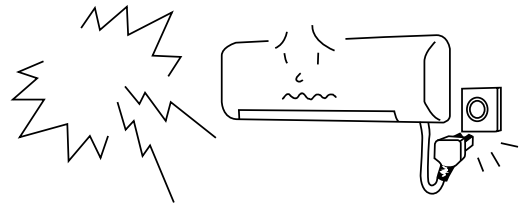
When the indoor unit is not to be used for a long period of time, please switch off the power from the mains. If the power from mains remains "ON", the indoor unit still consumes about 8W in the operation control circuit even if it is in "OFF" mode.



When Lightning Occurs

⚠ Warning

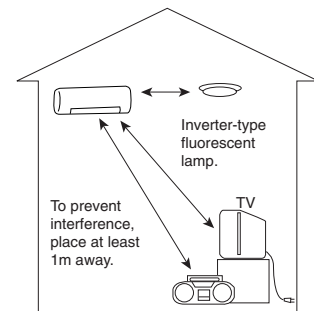
To protect the whole unit during lightning, please stop operating the unit and remove the plug from the socket.



Interference From Electrical Products

⚠ 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.

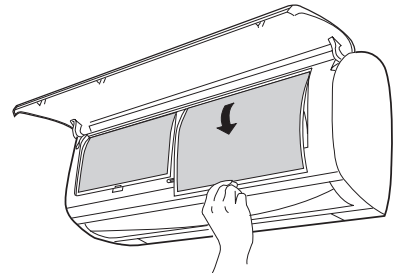
1 Open the front panel.

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



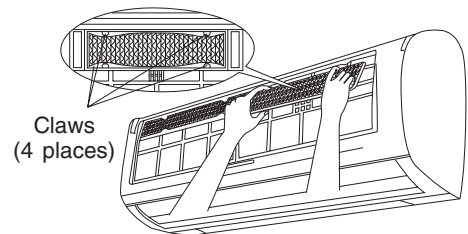
2 Remove the filter.

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



3 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.



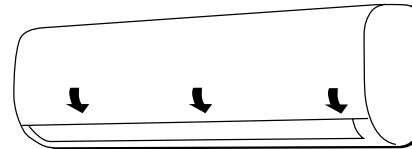
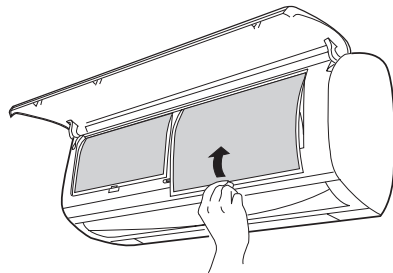
⚠ CAUTION

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



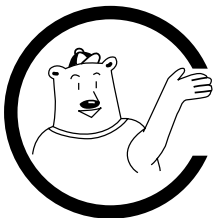
4 Attach the filters.

- 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

CAUTION

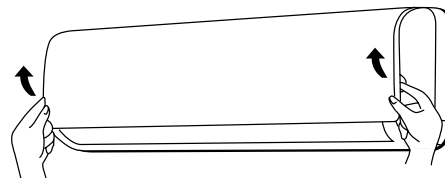
Cleaning and maintenance must be carried out only by qualified service personal. Before cleaning, stop operation and switch off the power supply.

1. AIR FILTER

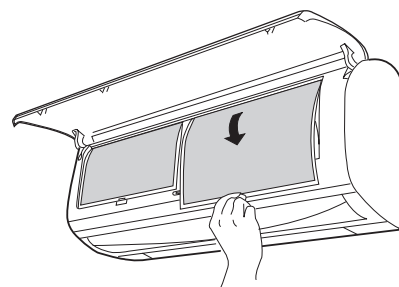
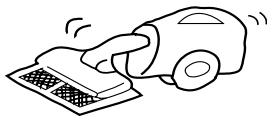
Clean the air filter, as it removes dust inside the room. In case the air filter is full of dust, the air flow will decrease and the cooling capacity will be reduced. Further, noise may occur. Be sure to clean the filter following the procedure below.

PROCEDURE

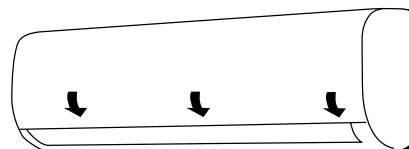
- 1** Open the front panel and remove the filter
 - Gently lift and remove the air cleansing filter from the air filter frame.



- 2** 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.



- 3**
 - 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.



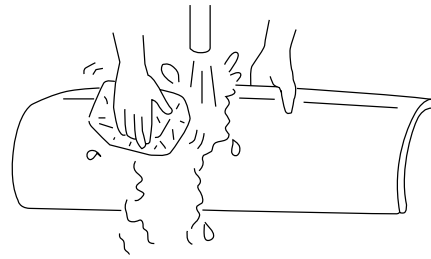
CAUTION

- 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.

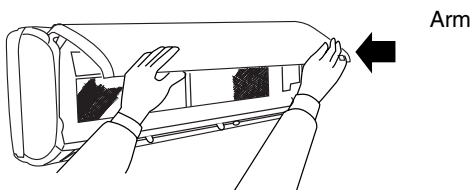
2. Washable Front Panel

- 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.

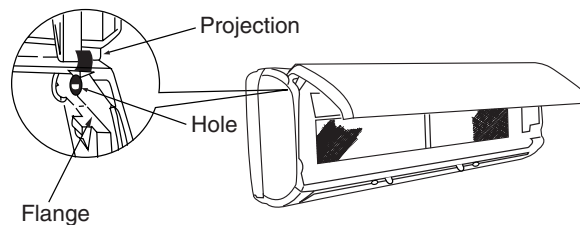


Removing the Front Panel



- 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.

⚠ 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.

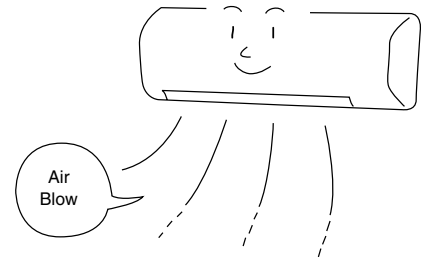


⚠ CAUTION

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

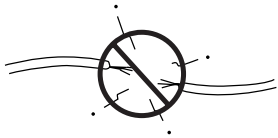
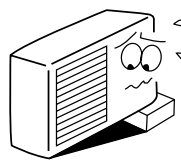
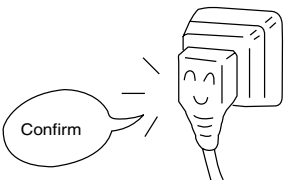
3. MAINTENANCE AT BEGINNING OF LONG OFF PERIOD

- Running the unit setting the operation mode to  (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.



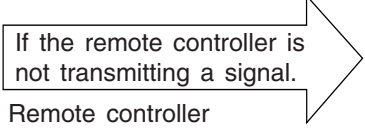
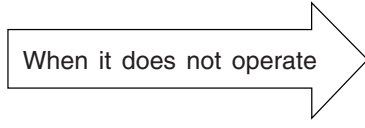
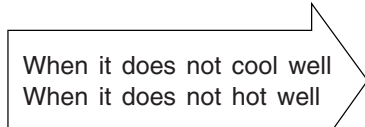
REGULAR INSPECTION

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		Is the plug of power line firmly plugged into the socket? (Please ensure no loose contact between them).

AFTER SALE SERVICE AND WARRANTY

WHEN ASKING FOR SERVICE, CHECK THE FOLLOWING POINTS.

CONDITION	CHECK THE FOLLOWING POINTS
 <p>If the remote controller is not transmitting a signal. (Remote controller display is dim or blank.)</p>	<ul style="list-style-type: none"> ● Do the batteries need replacement? ● Is the polarity of the inserted batteries correct?
 <p>When it does not operate</p>	<ul style="list-style-type: none"> ● Is the fuse all right? ● Is the voltage extremely high or low? ● Is the circuit breaker "ON"? ● Is the setting of operation mode different from other indoor units?
 <p>When it does not cool well When it does not heat well</p>	<ul style="list-style-type: none"> ● Is the air filter blocked with dust? ● Does sunlight fall directly on the outdoor unit? ● Is the air flow of the outdoor unit obstructed? ● Are the doors or windows opened, or is there any source of heat in the room? ● Is the set temperature suitable? ● Are the air inlets or air outlets of indoor and outdoor units blocked? ● Is the fan speed "LOW" or "SILENT"?

Notes



- In quiet operation or stopping the operation, the following phenomena may occasionally 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.

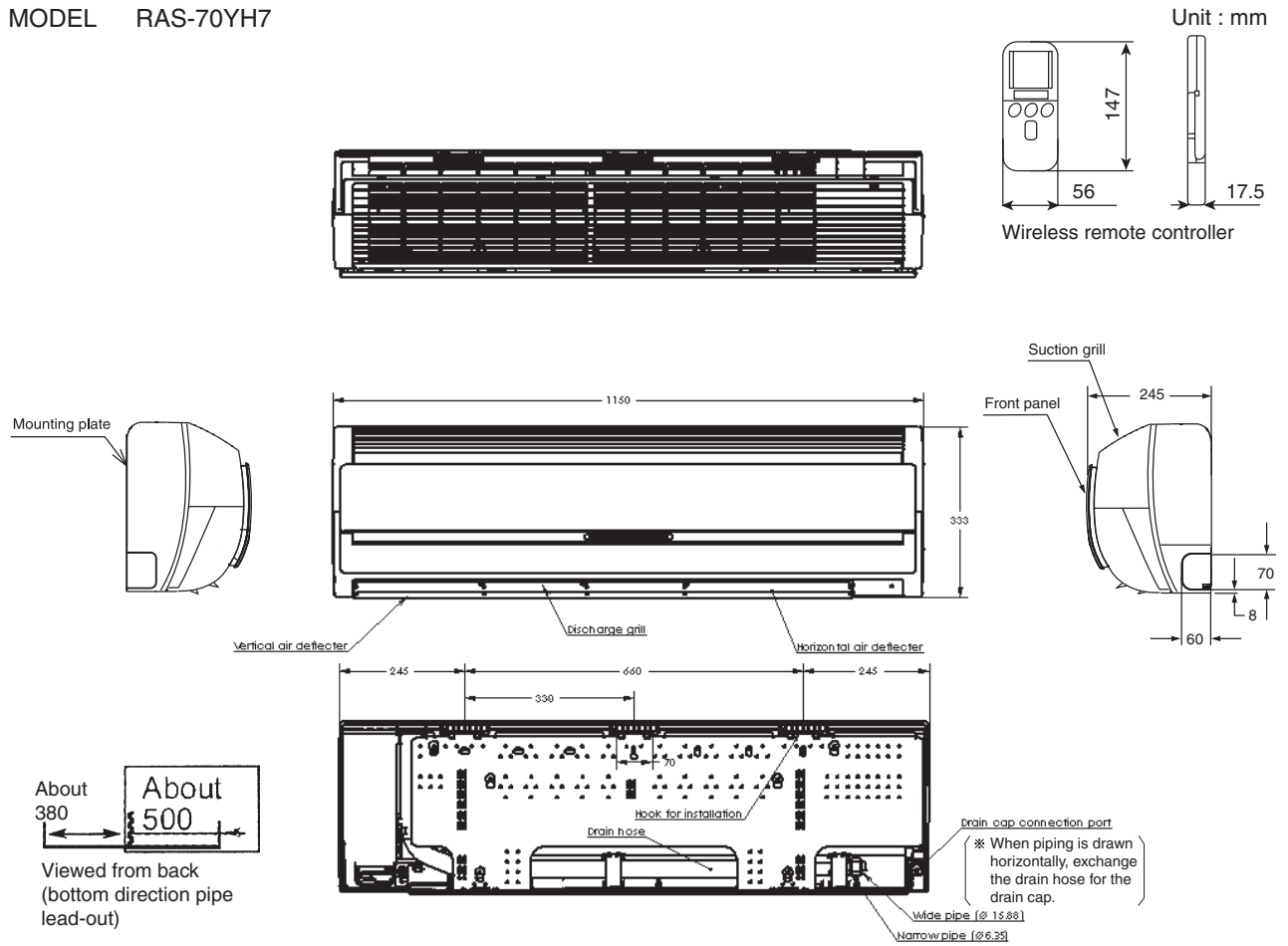
NOTE:

- 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

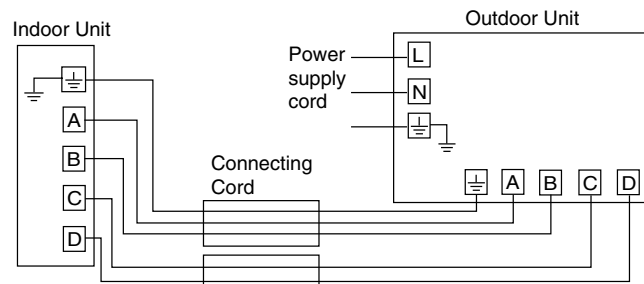
MODEL RAS-70YH7

Unit : mm

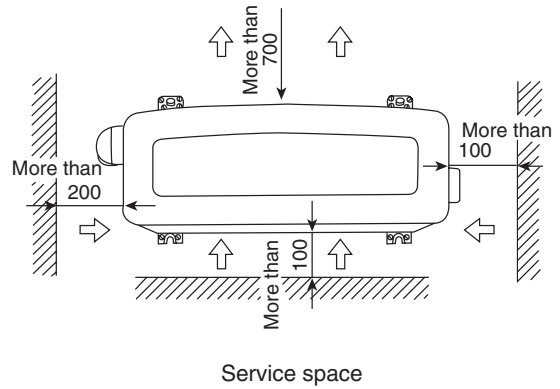
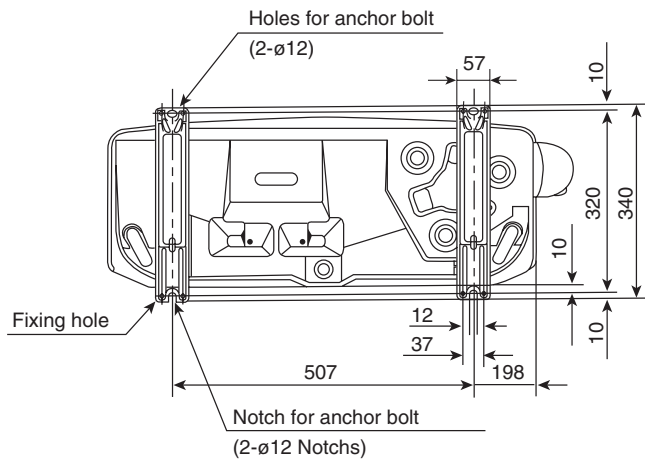
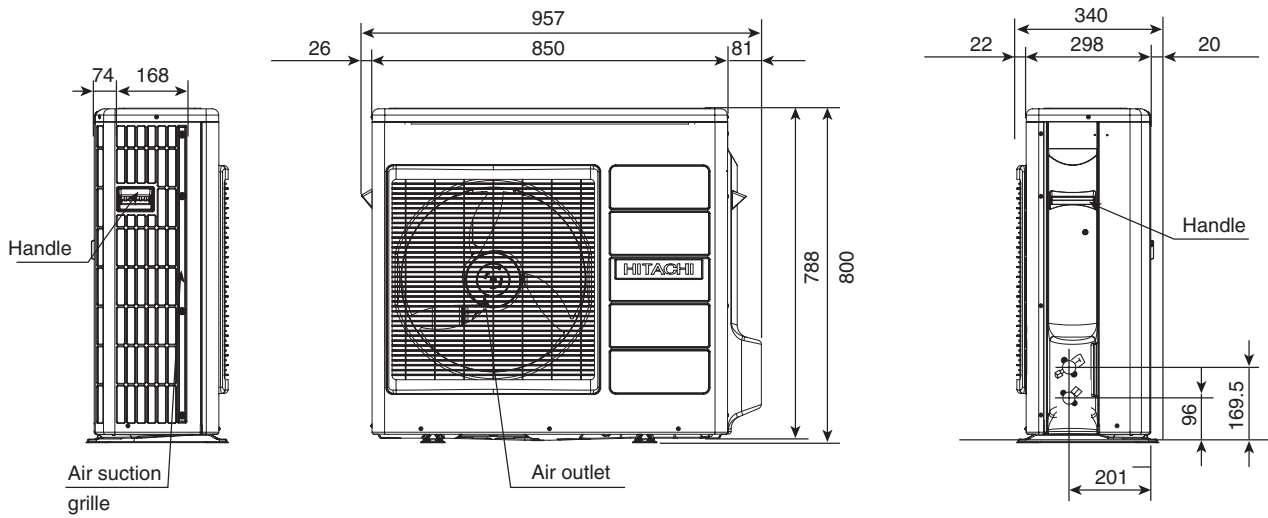


Note:

1. Service space (free space needed for servicing) is 200mm on the right, 100mm on the left and 50mm on top.
2. The wide and narrow pipes must be thermally insulated.
3. Piping length is within 30m
4. Height different of the piping between the indoor unit and the outdoor unit should be within 20m.
5. Power supply cord length is about 2m
6. Connecting cable 2.5mm dia. x 3 (AB Line), 1.6mm dia. x 2 (CD Line) is used for the connection.



MODEL RAC-70YH7



MAIN PARTS COMPONENT

THERMOSTAT (Room Temperature Thermistor)

Thermostat Specifications

MODEL			RAS-70YH7	
THERMOSTAT MODEL			IC	
OPERATION MODE			COOL	HEAT
TEMPERATURE °C (°F)	INDICATION 16	ON	15.6 (60.1)	20.0 (68.0)
		OFF	15.3 (59.5)	20.7 (69.3)
	INDICATION 24	ON	23.6 (74.5)	28.0 (82.4)
		OFF	23.3 (73.9)	28.7 (83.7)
	INDICATION 32	ON	31.6 (88.9)	36.0 (96.8)
		OFF	31.3 (88.3)	36.7 (98.1)

INDOOR FAN MOTOR

Fan Motor Specifications

MODEL	RAS-70YH7
POWER SOURCE	DC: 100 ~ 322V
OUTPUT	30W
CONNECTION	<p>(Control circuit built in)</p>

OUTDOOR FAN MOTOR

Fan Motor Specifications

ITEM \ MODEL	MODEL		RAC-70YH7		
POWER SOURCE			DC: 120 ~ 380V		
OUTPUT	(W) MAX		47		
COIL					
RESISTANCE VALUE (Ω)	20°C	2M	U-V 35 ± 2.5	V-W 35 ± 2.5	W-U 35 ± 2.5

BLU : BLUE
GRY : GRAY
BLK : BLACK

YEL : YELLOW
ORN : ORANGE
PNK : PINK

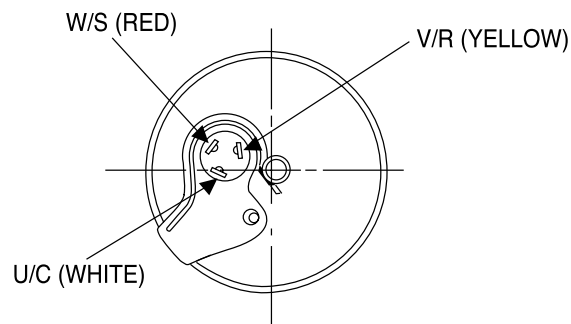
BRN : BROWN
GRN : GREEN
VIO : VIOLET

WHT : WHITE
RED : RED

COMPRESSOR MOTOR

Compressor Motor Specifications

MODEL	RAC-70YH7	
COMPRESSOR MODEL	JU1015D9	
PHASE	SINGLE	
RATED VOLTAGE	AC 220 ~ 240 V	
RATED FREQUENCY	50/60 Hz	
POLE NUMBER	4	
CONNECTION		
RESISTANCE VALUE (Ω)	20°C (68°F)	2M = 1.2984
	75°C (167°F)	2M = 1.7671



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.

WIRING DIAGRAM

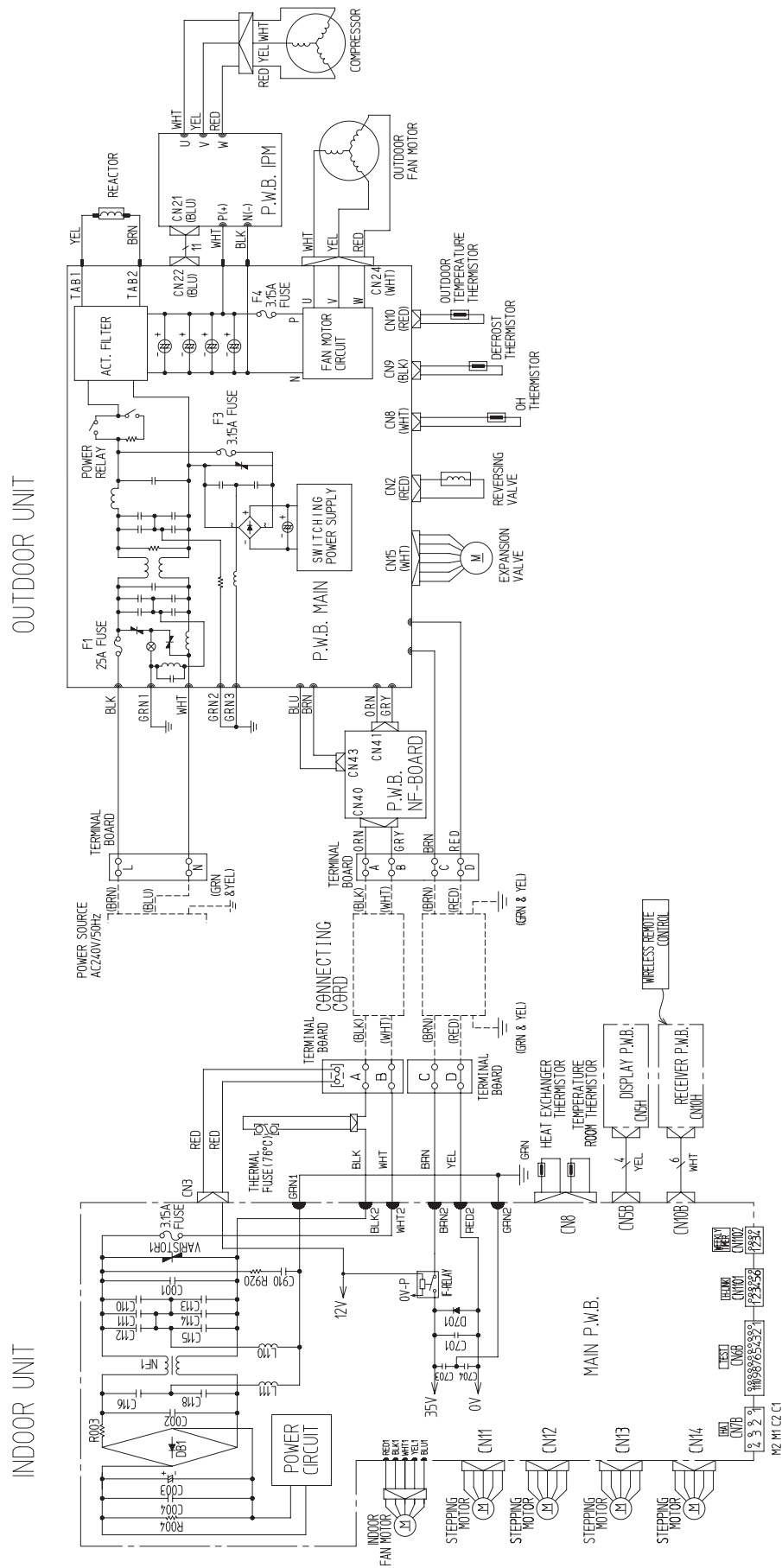
MODEL RAS-70YH7 / RAC-70YH7

BLU : BLUE
 GRN : GRAY
 BLK : BLACK

YEL : YELLOW
 ORN : ORANGE
 PNK : PINK

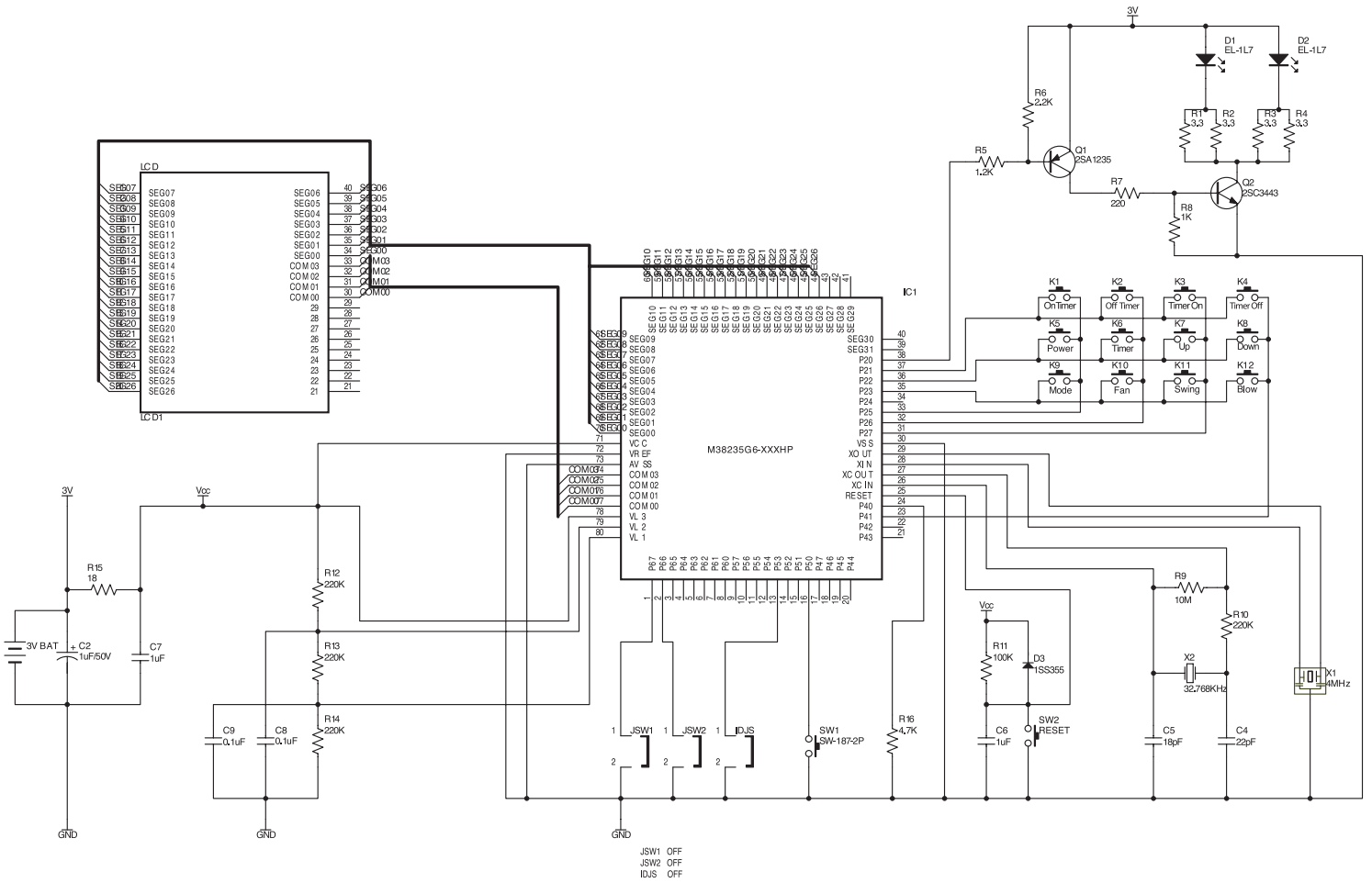
BRN : BROWN
 GRN : GREEN
 VIO : VIOLET

WHT : WHITE
 RED : RED
 IVO : IVORY

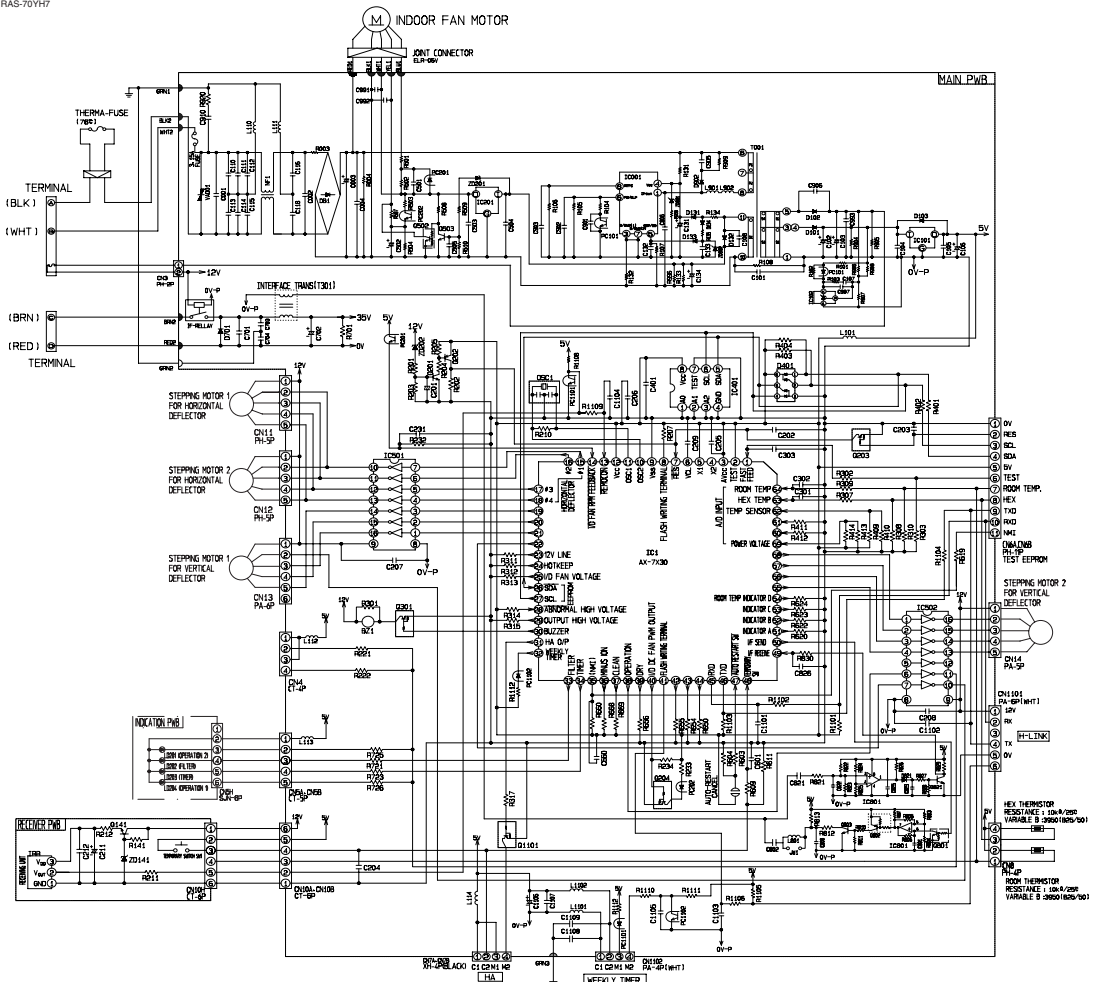


CIRCUIT DIAGRAM

Remote Control



CIRCUIT DIAGRAM
MODEL RAS-70YH7



RESISTOR

SYMBOL	RES	TOLER	Coeff. Temp
R101	100K	A	±50
R102	10K	A	±50
R103	100	A	±50
R104	1K	A	±50
R105	100	A	±50
R106	10K	A	±50
R107	100	A	±50
R108	100	A	±50
R109	100	A	±50
R110	100	A	±50
R111	100	A	±50
R112	100	A	±50
R113	100	A	±50
R114	100	A	±50

CAPACITOR

SYMBOL	TYPE	VAL	TOLER	Coeff. Temp
C101	Elect	100μ	±50	±50
C102	Elect	100μ	±50	±50
C103	Elect	100μ	±50	±50
C104	Elect	100μ	±50	±50
C105	Elect	100μ	±50	±50
C106	Elect	100μ	±50	±50
C107	Elect	100μ	±50	±50
C108	Elect	100μ	±50	±50
C109	Elect	100μ	±50	±50
C110	Elect	100μ	±50	±50

DIODE

SYMBOL	MODEL	TYPE	VAL	TOLER	Coeff. Temp
D101	1N4148	Diode	0.1A	±50	±50
D102	1N4148	Diode	0.1A	±50	±50
D103	1N4148	Diode	0.1A	±50	±50
D104	1N4148	Diode	0.1A	±50	±50
D105	1N4148	Diode	0.1A	±50	±50
D106	1N4148	Diode	0.1A	±50	±50
D107	1N4148	Diode	0.1A	±50	±50
D108	1N4148	Diode	0.1A	±50	±50
D109	1N4148	Diode	0.1A	±50	±50
D110	1N4148	Diode	0.1A	±50	±50

RELAY

SYMBOL	MODEL	TYPE	VAL	TOLER	Coeff. Temp
RE101	12VDC	Relay	12V	±50	±50
RE102	12VDC	Relay	12V	±50	±50

Buzzer

SYMBOL	MODEL	TYPE	VAL	TOLER	Coeff. Temp
B101	5V	Buzzer	5V	±50	±50
B102	5V	Buzzer	5V	±50	±50

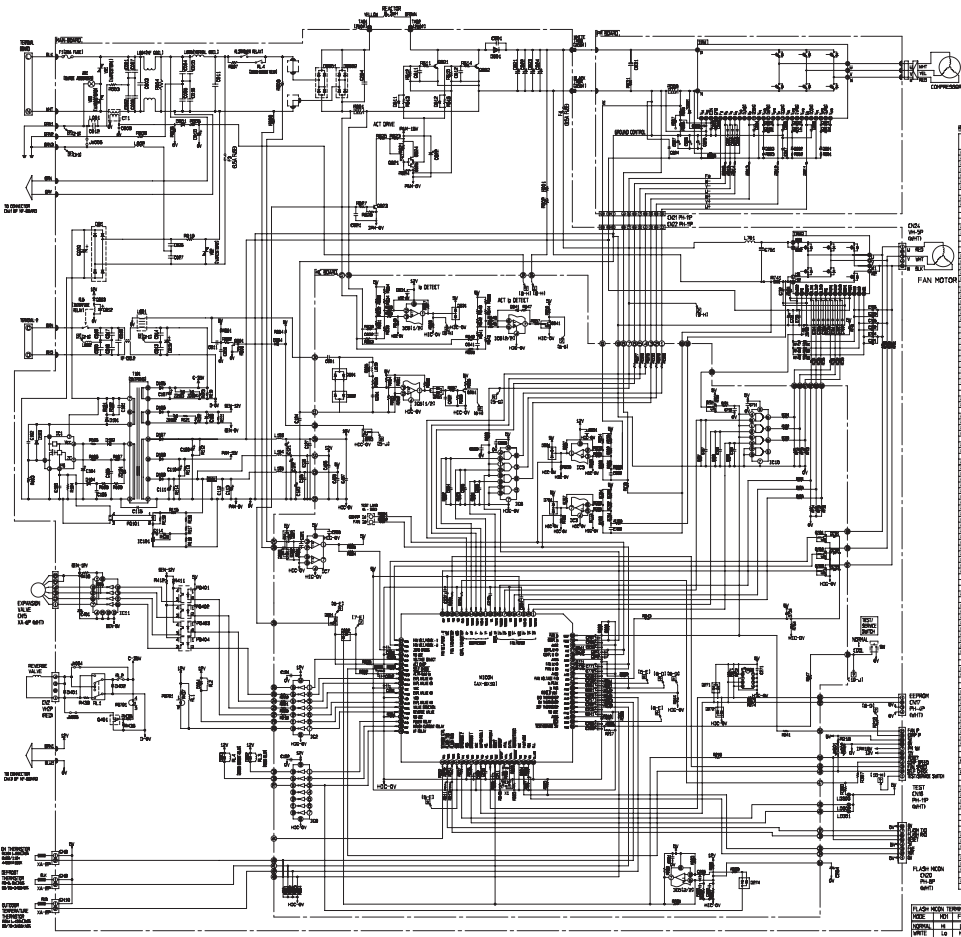
LED

SYMBOL	MODEL	TYPE	VAL	TOLER	Coeff. Temp
L101	100mW	LED	100mW	±50	±50
L102	100mW	LED	100mW	±50	±50

ZENNER DIODE

SYMBOL	MODEL	TYPE	VAL	TOLER	Coeff. Temp
Z101	5.1V	Zener	5.1V	±50	±50
Z102	5.1V	Zener	5.1V	±50	±50

CIRCUIT DIAGRAM
MODEL RAC-70YH7



RESISTANCE	RESISTANCE	RESISTANCE	CAPACITOR	CAPACITOR	DIODE	TRANSISTOR
1R1	1R2	1R3	1C1	1C2	1D1	1Q1
1R4	1R5	1R6	1C3	1C4	1D2	1Q2
1R7	1R8	1R9	1C5	1C6	1D3	1Q3
1R10	1R11	1R12	1C7	1C8	1D4	1Q4
1R13	1R14	1R15	1C9	1C10	1D5	1Q5
1R16	1R17	1R18	1C11	1C12	1D6	1Q6
1R19	1R20	1R21	1C13	1C14	1D7	1Q7
1R22	1R23	1R24	1C15	1C16	1D8	1Q8
1R25	1R26	1R27	1C17	1C18	1D9	1Q9
1R28	1R29	1R30	1C19	1C20	1D10	1Q10
1R31	1R32	1R33	1C21	1C22	1D11	1Q11
1R34	1R35	1R36	1C23	1C24	1D12	1Q12
1R37	1R38	1R39	1C25	1C26	1D13	1Q13
1R40	1R41	1R42	1C27	1C28	1D14	1Q14
1R43	1R44	1R45	1C29	1C30	1D15	1Q15
1R46	1R47	1R48	1C31	1C32	1D16	1Q16
1R49	1R50	1R51	1C33	1C34	1D17	1Q17
1R52	1R53	1R54	1C35	1C36	1D18	1Q18
1R55	1R56	1R57	1C37	1C38	1D19	1Q19
1R58	1R59	1R60	1C39	1C40	1D20	1Q20
1R61	1R62	1R63	1C41	1C42	1D21	1Q21
1R64	1R65	1R66	1C43	1C44	1D22	1Q22
1R67	1R68	1R69	1C45	1C46	1D23	1Q23
1R70	1R71	1R72	1C47	1C48	1D24	1Q24
1R73	1R74	1R75	1C49	1C50	1D25	1Q25
1R76	1R77	1R78	1C51	1C52	1D26	1Q26
1R79	1R80	1R81	1C53	1C54	1D27	1Q27
1R82	1R83	1R84	1C55	1C56	1D28	1Q28
1R85	1R86	1R87	1C57	1C58	1D29	1Q29
1R88	1R89	1R90	1C59	1C60	1D30	1Q30
1R91	1R92	1R93	1C61	1C62	1D31	1Q31
1R94	1R95	1R96	1C63	1C64	1D32	1Q32
1R97	1R98	1R99	1C65	1C66	1D33	1Q33
1R100	1R101	1R102	1C67	1C68	1D34	1Q34
1R103	1R104	1R105	1C69	1C70	1D35	1Q35
1R106	1R107	1R108	1C71	1C72	1D36	1Q36
1R109	1R110	1R111	1C73	1C74	1D37	1Q37
1R112	1R113	1R114	1C75	1C76	1D38	1Q38
1R115	1R116	1R117	1C77	1C78	1D39	1Q39
1R118	1R119	1R120	1C79	1C80	1D40	1Q40
1R121	1R122	1R123	1C81	1C82	1D41	1Q41
1R124	1R125	1R126	1C83	1C84	1D42	1Q42
1R127	1R128	1R129	1C85	1C86	1D43	1Q43
1R130	1R131	1R132	1C87	1C88	1D44	1Q44
1R133	1R134	1R135	1C89	1C90	1D45	1Q45
1R136	1R137	1R138	1C91	1C92	1D46	1Q46
1R139	1R140	1R141	1C93	1C94	1D47	1Q47
1R142	1R143	1R144	1C95	1C96	1D48	1Q48
1R145	1R146	1R147	1C97	1C98	1D49	1Q49
1R148	1R149	1R150	1C99	1C100	1D50	1Q50

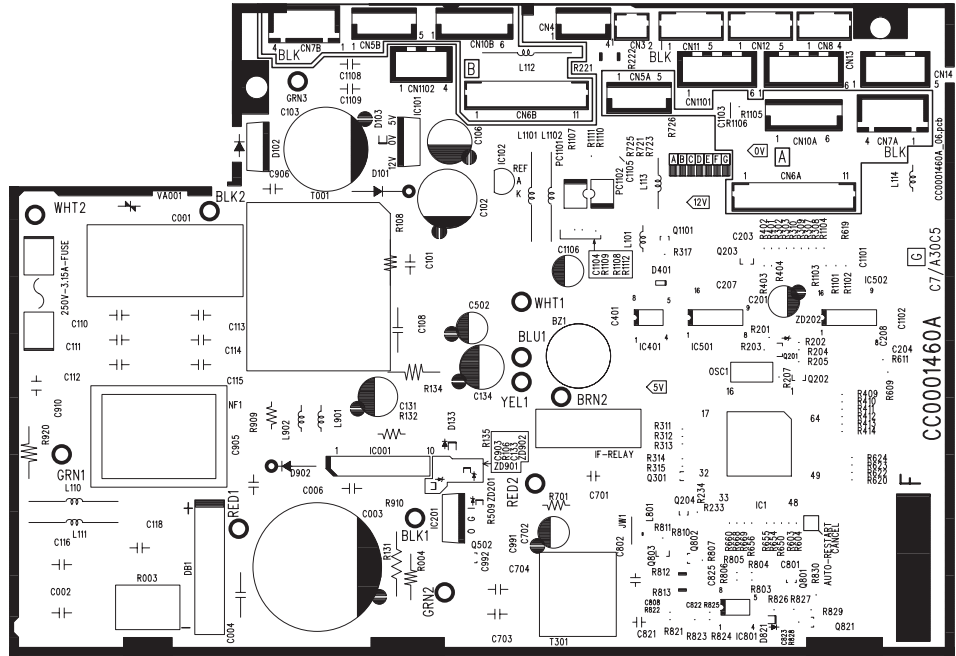
PRINTED WIRING BOARD LOCATION DIAGRAM

MODEL RAS-70YH7

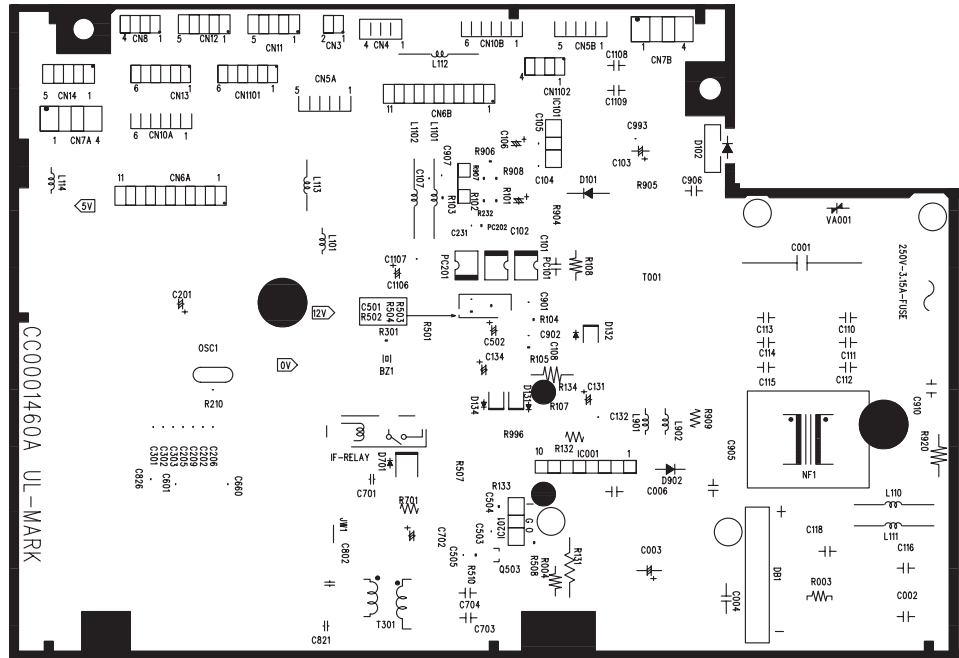
MAIN P.W.B.

Marking on P.W.B

COMPONENT SIDE

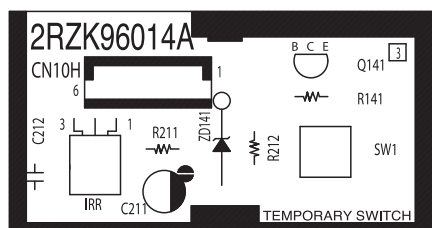


SOLDERING SIDE



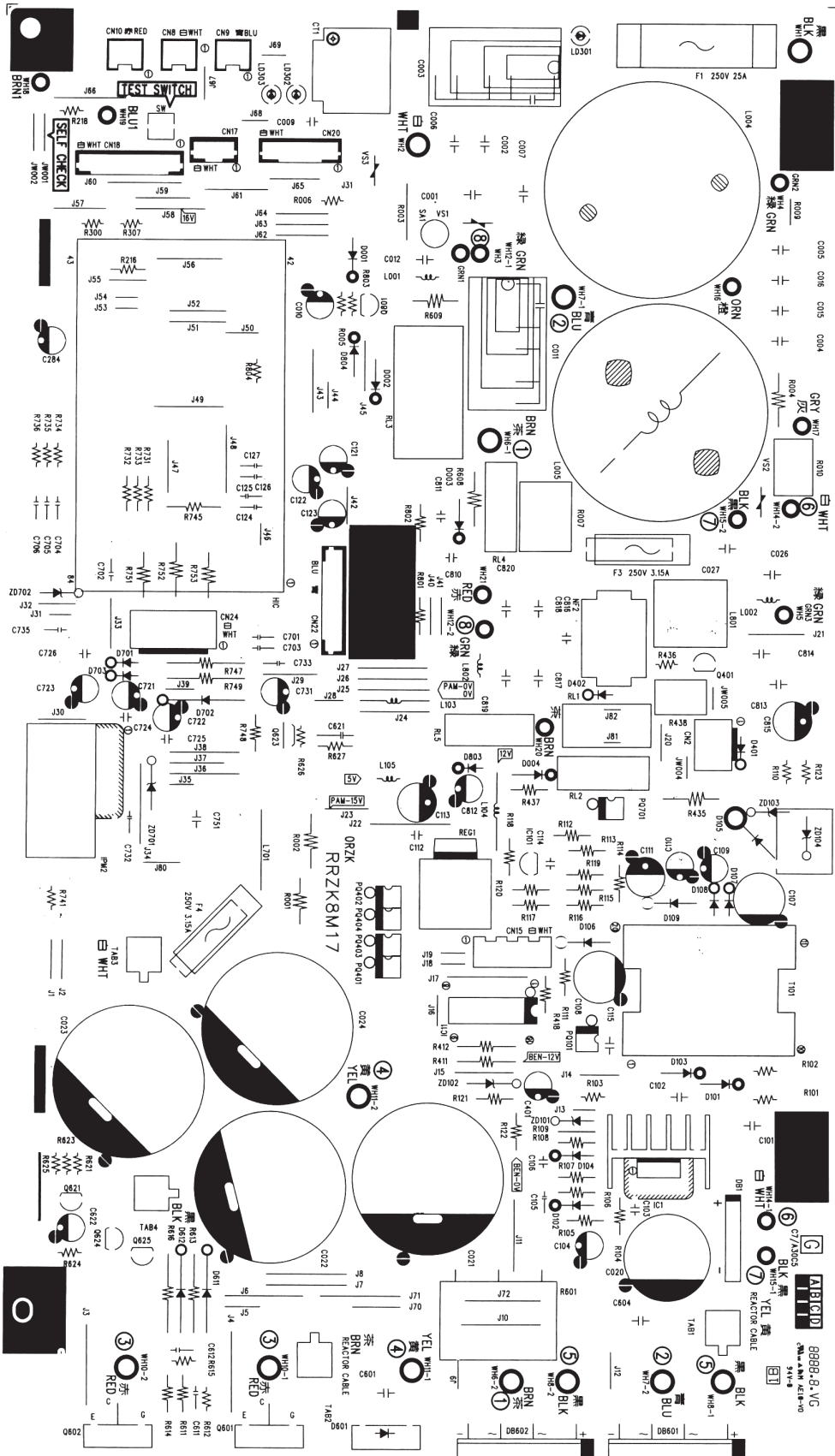
RECEIVING P.W.B.

Marking on P.W.B

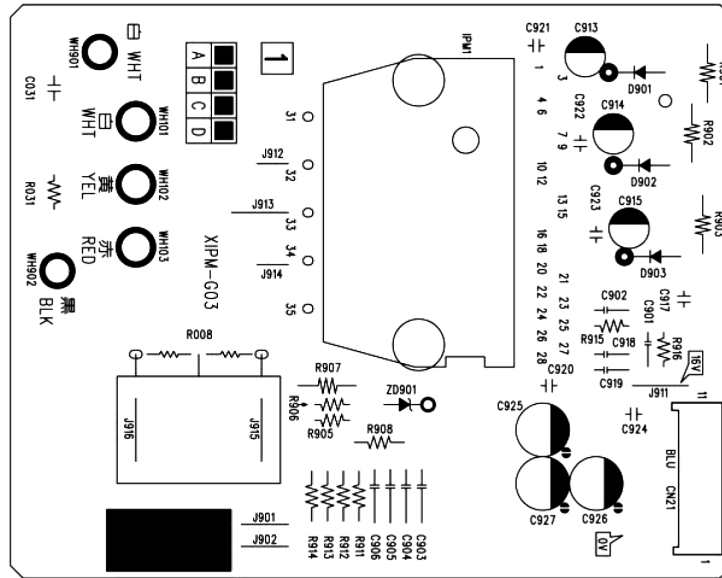


MODEL RAC-70YH7

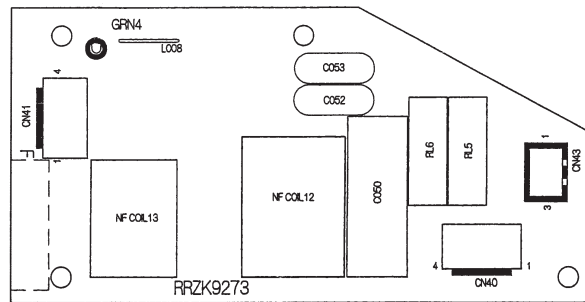
P.W.B. MAIN



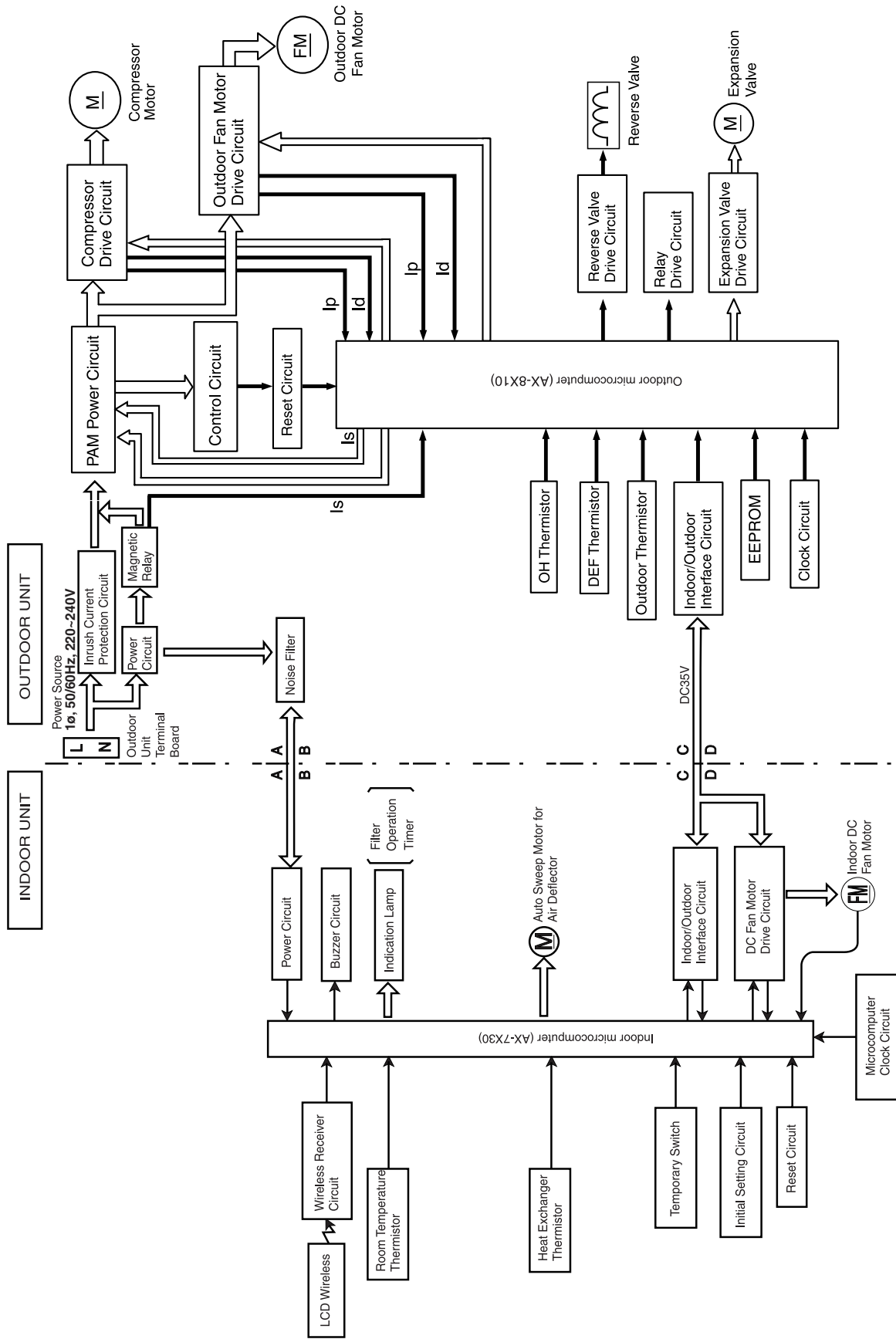
P.W.B. IPM-BOARD



P.W.B. NF-BOARD



BLOCK DIAGRAM
 MODEL RAS-70YH7/RAC-70YH7



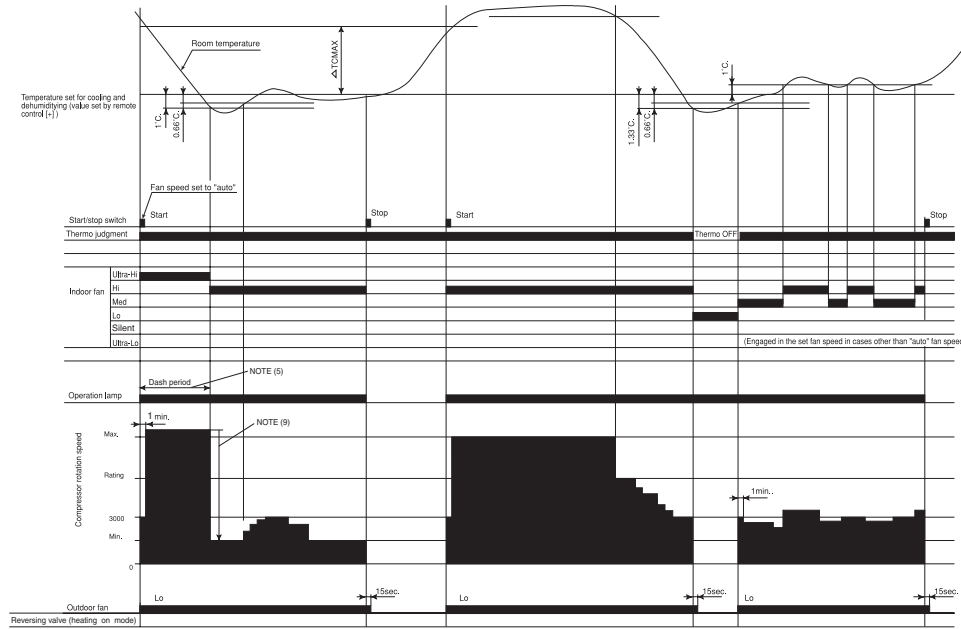
BASIC MODE

Operation mode	Fan	Cooling	Dehumidifying (dehumidifying operation by the function select button only, not including that engaged by the dehumidity button)	Heating	Auto										
Basic operation of start/stop switch															
Timer functions	Off-timer														
	On-timer														
	Off -> On On -> Off timer														
Fan speed mode (indoor fan)	Auto	<p>Changes from "Hi" to "Med" or "Lo" depending on room temperature.</p> <p>1. Runs at "Hi" until first thermo off after operation is started, 2. Runs at "Lo" when thermo is off.</p>	<p>Changes between "Lo" and "Med" depending on room temperature.</p> <table border="1"> <thead> <tr> <th>Temperature division</th> <th>Fan speed</th> </tr> </thead> <tbody> <tr> <td>Division 1</td> <td>Lo</td> </tr> <tr> <td>Division 2</td> <td>Lo</td> </tr> <tr> <td>Division 3</td> <td>Med</td> </tr> <tr> <td>Division 4</td> <td>Med</td> </tr> </tbody> </table> <p>1. The indoor fan also stops when the compressor is in stop status.</p>	Temperature division	Fan speed	Division 1	Lo	Division 2	Lo	Division 3	Med	Division 4	Med	<p>Set to "ultra-Lo", "Lo", "Med", "Hi", "ultra-Hi" or "stop" depending on the room temperature, time and heat exchange temperature. Set to "stop" if the room temperature is 25°C in the "ultra-Lo" mode other than during preheating (cooling is recovered at 18.33°C).</p> <p>When the compressor is running at maximum speed during hot dash or when recovered from defrosting.</p> <p>In modes other than left</p>	<p>Operating mode is judged by room temperature and outdoor temperature.</p> <p>(1) Judging by outdoor temperature</p> <ul style="list-style-type: none"> Operating mode is judged by outdoor temperature. Only when the mode is not restricted by this judgment, the judgment by room temperature in the next paragraph will be performed. (a) Outdoor temperature $\geq 30^\circ\text{C}$: Restricted to cooling (b) Outdoor temperature $\leq 9^\circ\text{C}$: Restricted to heating <p>(2) Judging by room temperature</p> <p>Operating mode at start up is judged (initial judgment)</p> <p>(a) Conditions for judgment (any of the followings)</p> <ul style="list-style-type: none"> When auto operation is started after 1 hour has elapsed since the operation was stopped. When auto operation is started after the previous manual mode operation. When the operating mode is switched to auto while operating at manual mode. <p>(b) Judging method</p> <ul style="list-style-type: none"> Room temperature $\geq 23^\circ\text{C}$ $\pm 3^\circ\text{C}$: Cooling Room temperature $< 23^\circ\text{C}$ $\pm 3^\circ\text{C}$: Heating $\pm 3^\circ\text{C}$ is the fine adjustment value from the remote controller.
	Temperature division	Fan speed													
	Division 1	Lo													
	Division 2	Lo													
Division 3	Med														
Division 4	Med														
Hi	Operates at "Hi" regardless of the room temperature.	Set to "ultra-Hi" when the compressor runs at maximum speed, and to "Hi" in other modes.	Set to "Hi" in modes other than when the compressor stops.	Set to "ultra-Lo", "Lo", "Med", "Hi", "ultra-Hi" or "stop" depending on the room temperature, and time. Set to "stop" if the room temperature is 25°C in the "ultra-Lo" mode other than during preheating (cooling is recovered at 18.33°C). Set to "ultra-Hi" when the compressor is running at maximum speed during hot dash or when recovered from defrosting.	<p>Judging operating mode change during operation (Continuous judgment)</p> <p>(a) Conditions for judgment (any of the followings)</p> <ul style="list-style-type: none"> The mode is reviewed at every interval time. When auto operation is started again before 1 hour has elapsed since the operation was stopped. <p>(b) Judging method</p> <ul style="list-style-type: none"> Judge by setting the hysteresis on the final preset temperature. The final preset temperature is the actually targeted preset temperature which is the sum of the basic preset temperature and each type of shift value (e.g. $\pm 3^\circ\text{C}$ by remote controller, preset temperature correction value, powerful shift value, etc.). (Currently cooling) <ul style="list-style-type: none"> Room temperature \leq Final preset temperature -3°C Change to heating Room temperature $>$ Final preset temperature -3°C Continue cooling (Currently heating) <ul style="list-style-type: none"> Room temperature \geq Final preset temperature $+2^\circ\text{C}$ Change to cooling Room temperature $<$ Final preset temperature $+2^\circ\text{C}$ Continue heating 										
Med	Operates at "Med" regardless of the room temperature.	Same as at left.	Set to "Med" in modes other than when the compressor stops.	Set to "ultra-Lo", "Lo", "Med" or "stop" depending on the room temperature and time. Set to "stop" if the room temperature is 25°C in the "ultra-Lo" mode other than during preheating (cooling is recovered at 18.33°C).											
Lo	Operates at "Lo" regardless of the room temperature.	Same as at left.	Set to "Lo" in modes other than when the compressor stops.	Set to "ultra-Lo", "Lo", or "stop" depending on the room temperature and time. Set to "stop" if the room temperature is 25°C in the "ultra-Lo" mode other than during preheating (cooling is recovered at 18.33°C). The fan speed is controlled by the heat exchanger temperature; the overload control is executed as in the following diagram:											
Basic operation of temperature controller	Performs only fan operation at the set speed regardless of the room temperature.	See page 49.	See page 53.	See page 55.											
Sleep operation (with sleep button ON)	<ul style="list-style-type: none"> Enters sleep operation after set as on the left. Action during sleep operation Lo (sleep) operation 	<ul style="list-style-type: none"> Same as at left See page 51. 	<ul style="list-style-type: none"> Same as at left See page 53. 	<ul style="list-style-type: none"> Same as at left See page 57. 	<ul style="list-style-type: none"> Same as at left. Performs the sleep operation of each operation mode. 										

Table 1 Mode data file

	RAS-70YH7
LABEL NAME	VALUE
WMAX	5700 min ⁻¹
WMAX2	5700 min ⁻¹
WSTD	5400 min ⁻¹
WBEMAX	4000 min ⁻¹
CMAX	5200 min ⁻¹
CSTD	4900 min ⁻¹
CKYMAX	4000 min ⁻¹
CJKMAX	4000 min ⁻¹
CBEMAX	2300 min ⁻¹
WMIN	1200 min ⁻¹
CMIN	1200 min ⁻¹
STARTMC	60 Seconds
DWNRATEW	100%
DWNRATEC	100%
SHIFTW	0.00°C
SHIFTC	1.00°C
CLMXTP	30.00°C
YNEOF	25.00°C
TEION	2.00°C
TEIOF	9.00°C
SFTDSW	0.66°C
DFTIM_OTP0	50 Minutes
DFTIM_OTP10	50 Minutes
DFTIM_OTP5	60 Minutes
STARCP	1600 min ⁻¹

Basic Cooling Operation



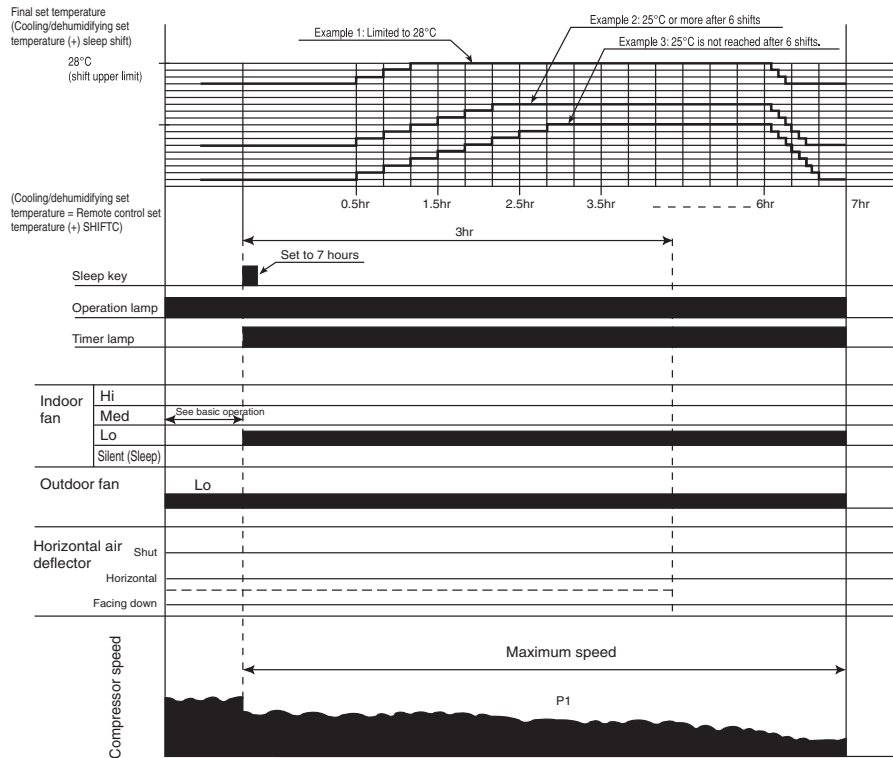
Notes:

- (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 ΔTCMAX

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

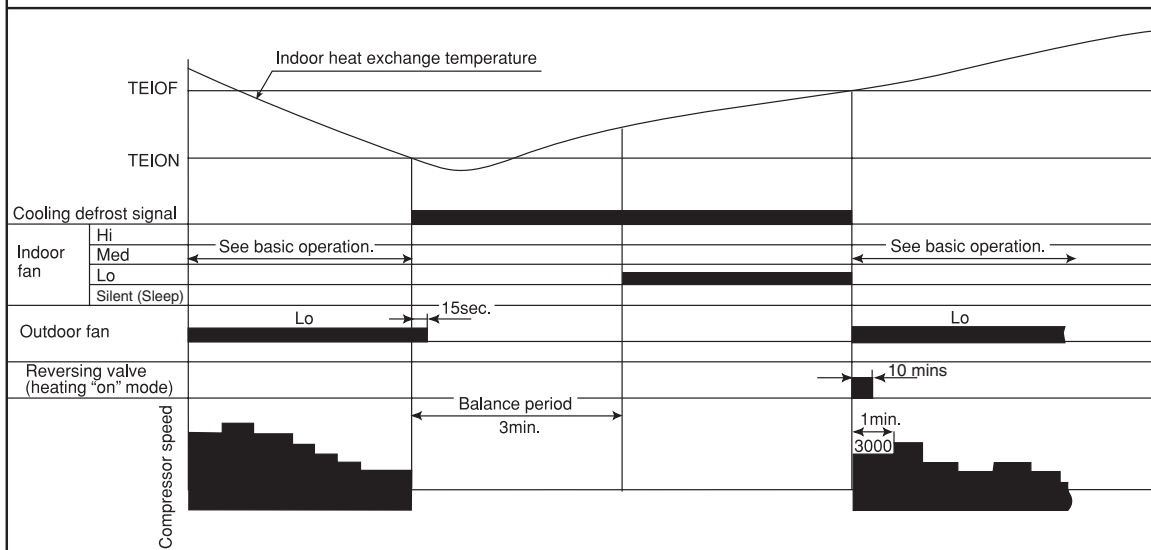
Cooling Sleep Operation



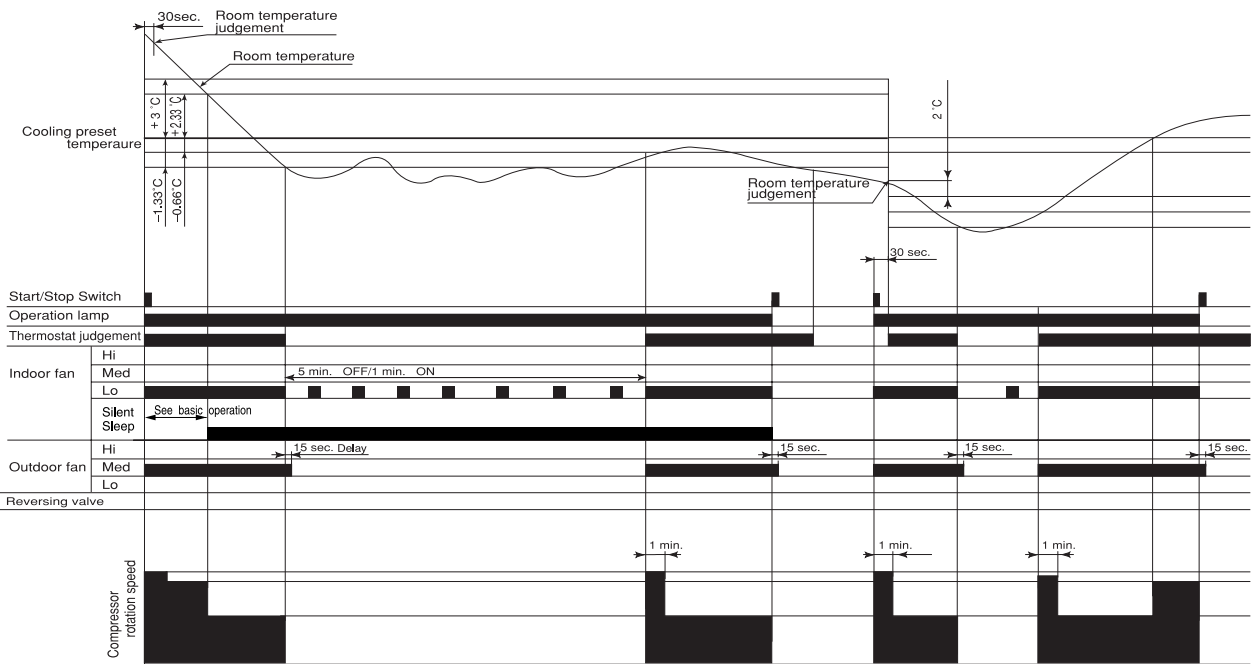
Notes:

- (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 until 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 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.

Cooling Defrost



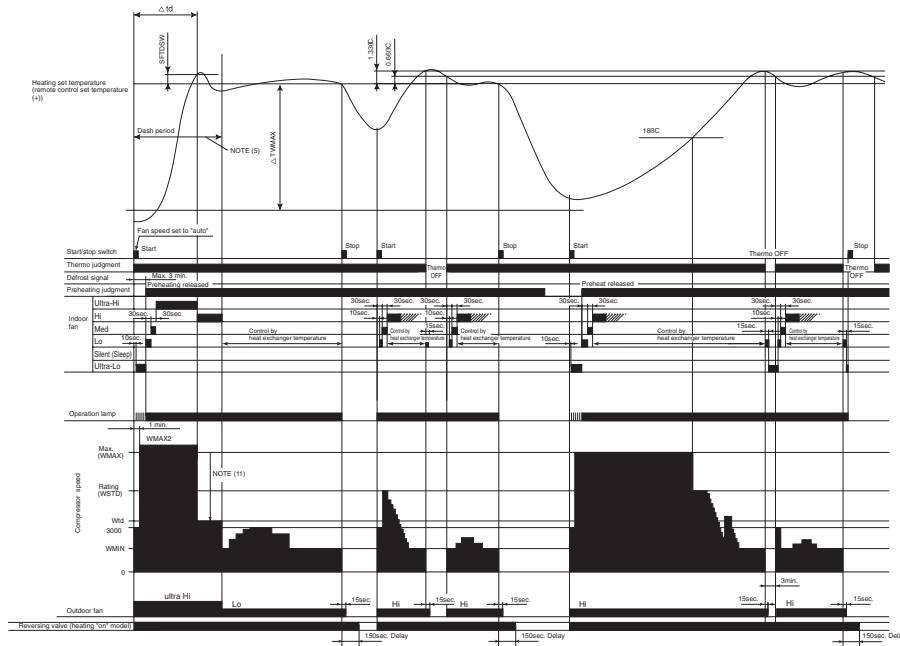
Dehumidifying



Notes:

- (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 thermostat 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.

Basic Heating Operation



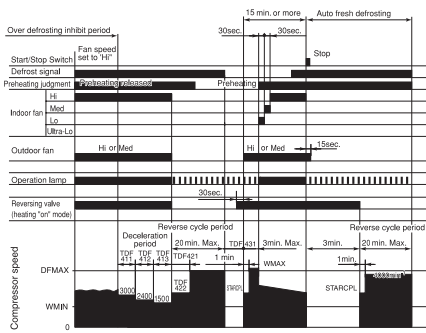
- Notes:**
- (1) Condition for entering into Hot Dashed mode. When fan set to "HI" or "Auto mode" and i) Indoor temperature is lower than 18°C, and ii) outdoor temperature is lower than 10°C, and iii) Temperature difference between indoor temperature and set temperature has a corresponding compressor 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 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 ΔTWMAX

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

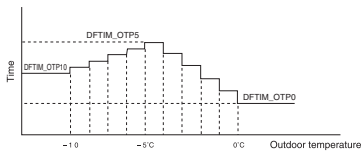
- Notes:**
1. See the data in Table 1 on page 47 for each constant in capital letters in the diagrams.

Reversing Valve Defrosting



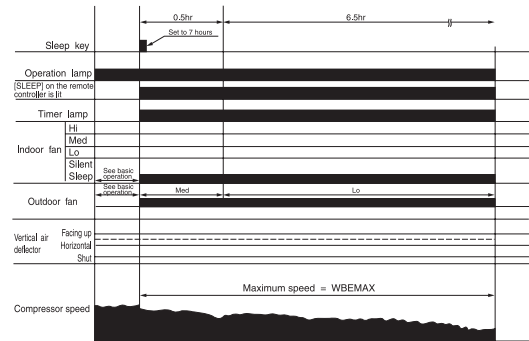
- Notes:
- (1) The defrosting inhibit period is set as shown in the diagram below. When defrosting has finished once, the inhibit period is newly set, based on the outdoor temperature when the compressor was started. During this period, the defrost signal is not accepted.
 - (2) If the difference between the room and outdoor temperatures 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 20 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.

Setting Defrosting Inhibit Period



- Notes:
- (1) The first inhibit time after operation start is set to DFTIM_OTP0.
 - (2) From the second time onwards, the inhibit time is set according to the time required for defrosting.
Reverse cycle operation time \geq [DEFCOL] : DFTIM_OTP0 is set.
Reverse cycle operation time $<$ [DEFCOL] : The time corresponding to outdoor temperature is set.

Heating Sleep Operation

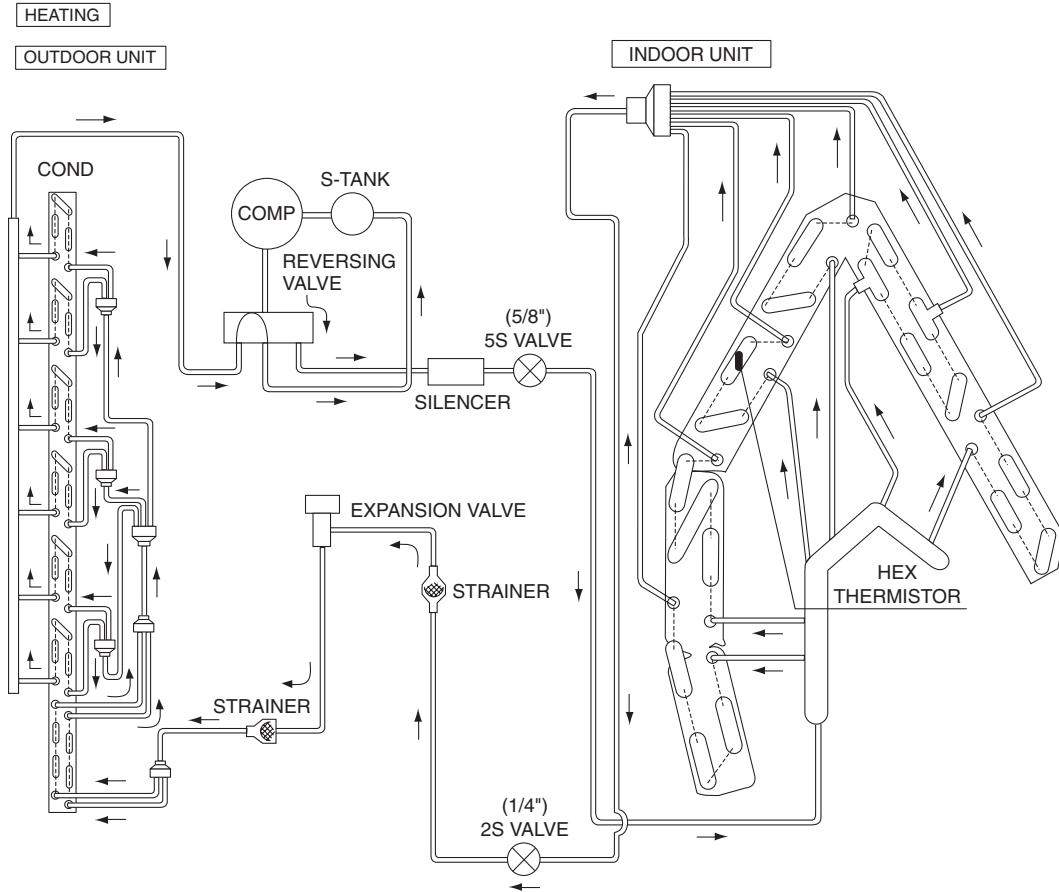
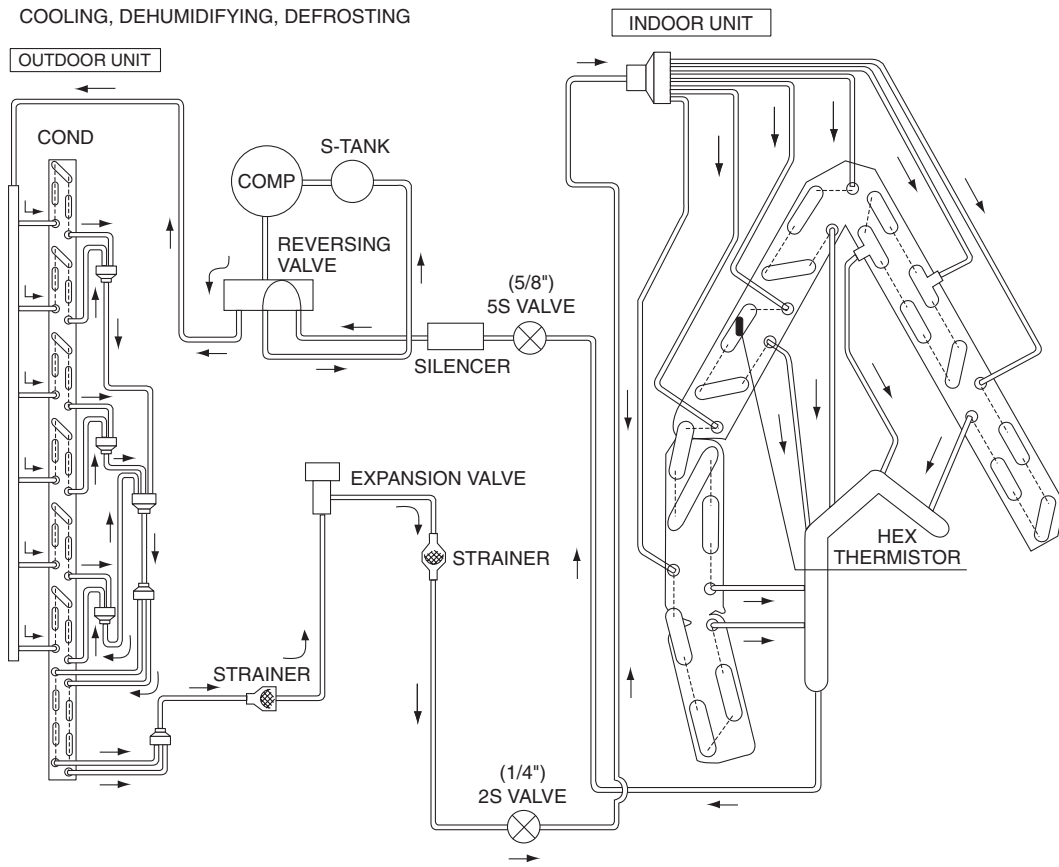


- Notes:
- (1) The sleep operation starts when the sleep key is pressed.
 - (2) When the sleep key is set, the maximum compressor speed is limited to WBEMAX, and the indoor fan is set to "Sleep Silent" (FWSQY).
 - (3) If the operation mode is changed during sleep operation, the changed operation mode is set and sleep control starts.
 - (4) The indoor fan speed does not change even when the fan speed mode is changed. (Lo)
 - (5) When defrosting is to be set during sleep operation, defrosting is engaged and sleep operation is restored after defrosting.
 - (6) When operation is stopped during sleep operation, the set temperature when stopped, as well as the time, continue to be counted.
 - (7) If the set time is changed during sleep operation, all data including set temperature, time, etc. is cleared and restarted.
 - (8) If sleep operation is cancelled by the cancel key or sleep key all data is cleared.
 - (9) There is no preset temperature shift due to time elapse.

- NOTE
1. Refer to the Table 1 Mode data file on page 47 for the constants expressed by capital alphabet letters in the drawing.

REFRIGERATING CYCLE DIAGRAM

MODEL RAS-70YH7/RAC-70YH7



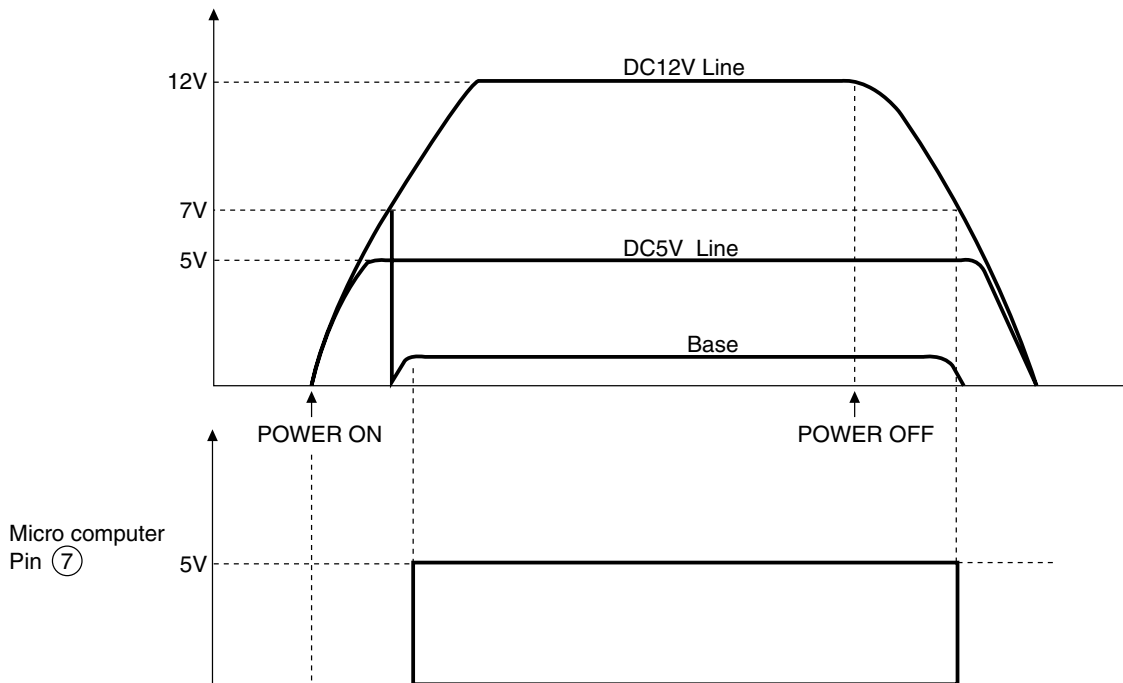
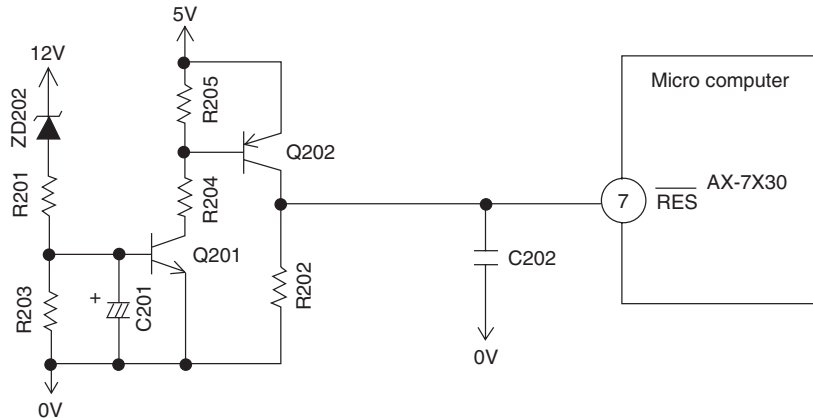
AUTO SWING FUNCTION

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

DESCRIPTION OF MAIN CIRCUIT OPERATION

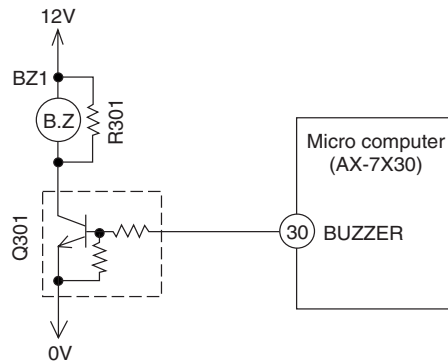
RAS-70YH7

1. Reset Circuit



- The reset circuit is used to reset the program to its initial settings when the power is turned on or when the power is recovered after a power failure.
- The micro computer is reset when the reset input is “Hi”, and operation is possible when the reset input is “Lo”.
- The waveforms at each point when the power is turned on and off are shown in the diagrams.
- When the power is turned on, the voltages of the DC 12V line and DC 5V lines are increased. When the voltage of DC 12V lines reaches about 7V, ZD202 is turned ON, the potential of Q201’s base rises and Q202 is turned ON. Since Q202’s collector is set to “LO” at this time, Q202 is turned OFF and the reset input of the micro computer is set to “Lo”. The DC 5V line voltage has already become 5V at this time and the micro computer starts operation.
- When the power is turned OFF, the voltage of the DC 12V line decreases. When it becomes about 7V, ZD202 is turned OFF, then Q201 is turned OFF, Q202 is turned ON the reset input of the micro computer is set to “Hi” and the micro computer is set to the reset mode.

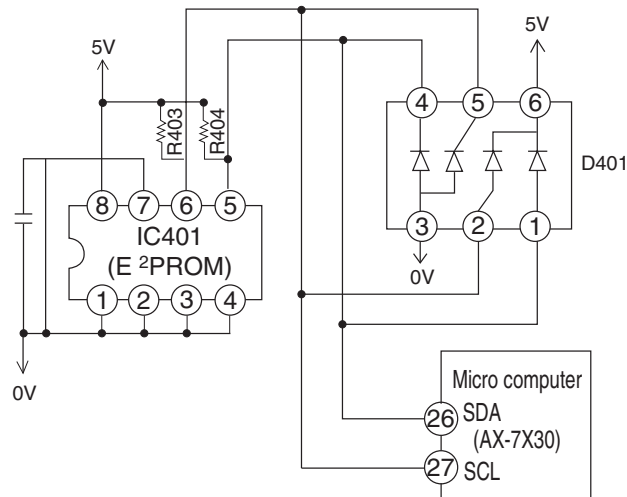
2. Buzzer Circuit



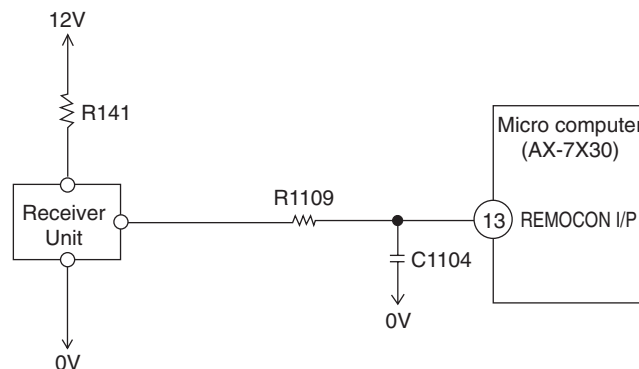
When the buzzer is to be activated, buzzer output pin ③⑩ of the micro computer alternates between ON and OFF repeatedly at 4kHz and Q301 is turned ON/OFF accordingly. A 4kHz voltage/frequency is applied to the buzzer and the diaphragm of the buzzer vibrates to output 4kHz sound.

3. Initial setting (IC401)

The pre-heating operation start value, ratings of the compressor, maximum rotation speed, etc. are preset in the micro computer.



4. Receive circuit



Infrared signals from the wireless remote controller are received by the light receiving unit and output after being amplified and shaped.

5. Auto Sweep Motor Circuit

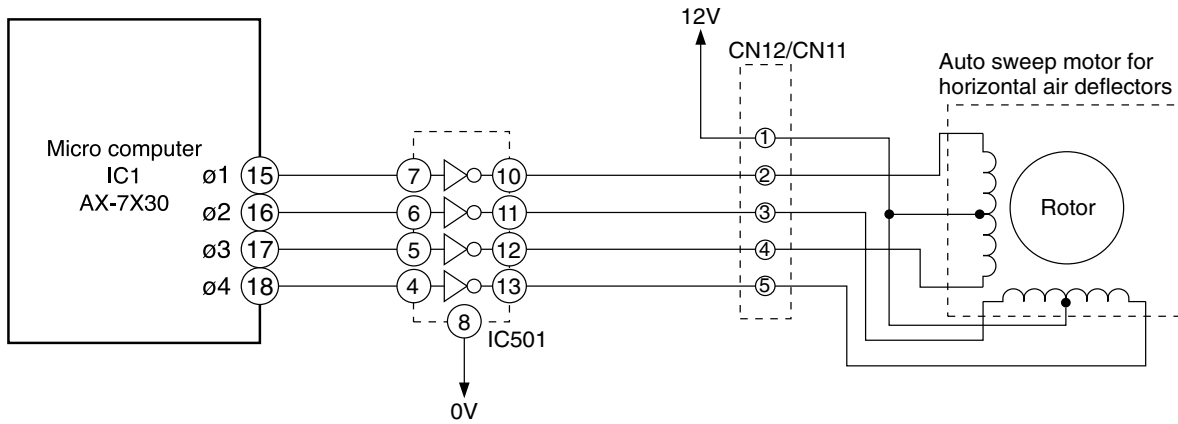


Fig. 5-1 Auto Sweep Motor Circuit (Horizontal air deflectors only)

- Fig. 5-1 shows the Auto sweep motor drive circuit; the signals shown in Fig. 5-2 are output from pins ⑩–⑬ of the micro computer.

Micro computer pins	Step width								Horizontal air deflectors: 10ms.
Horizontal air deflectors	1	2	3	4	5	6	7	8	
⑩	High			Low					
⑪	High	Low					High	High	
⑫	Low				High				
⑬	Low			High			Low		

Fig. 5-2 Micro computer Output Signals

- As the micro computer's outputs change as shown in Fig. 5-2, the core of the auto sweep motor is excited to turn the rotor. Table 5-1 shows the rotation angle of horizontal air deflectors.

Table 5-1 Auto sweep Motor Rotation

	Rotation angle per step (°)	Time per step (ms)
Horizontal air deflectors	0.0879	10

6. Room Temperature Thermistor Circuit

- Fig. 6-1 shows the room temperature thermistor circuit.

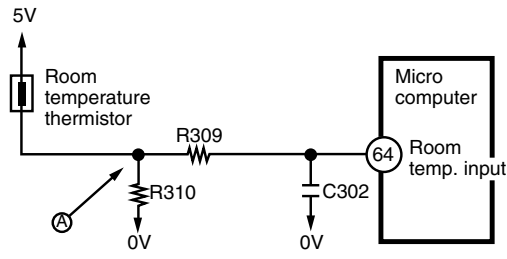


Fig. 6-1

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

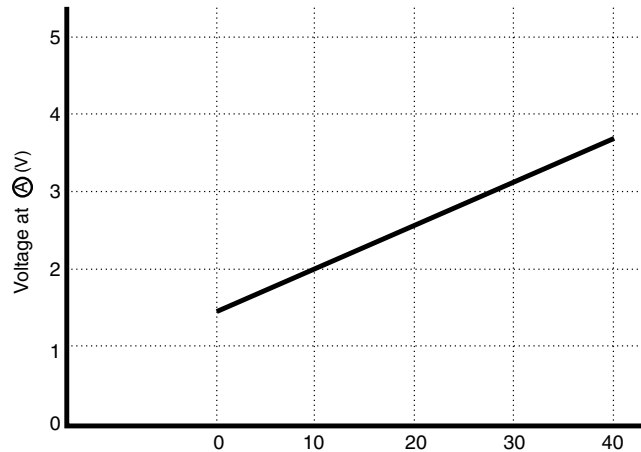


Fig. 6-2

7. Heat exchanger temperature thermistor circuit

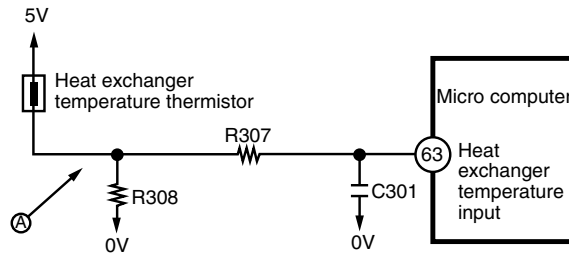


Fig. 7-1

- The circuit detects the indoor heat exchanger temperature and controls the following.
 - Low-temperature defrosting during cooling and dehumidifying operation.

The voltage at (A) depends on the heat exchanger temperature as shown in Fig. 7-2.

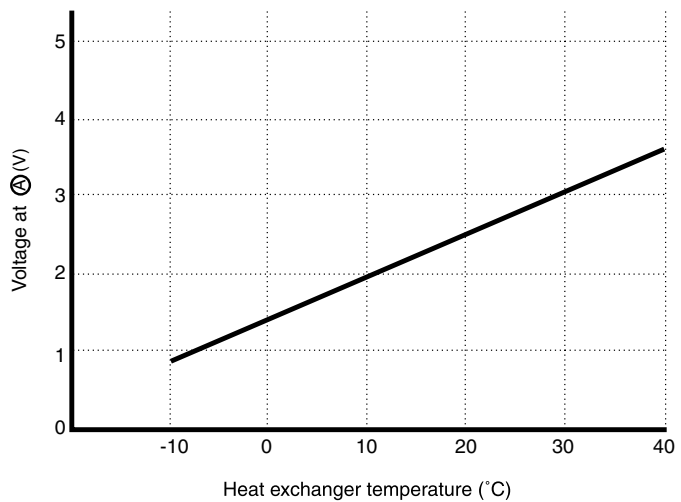


Fig. 7-2

8. Temporary Switch

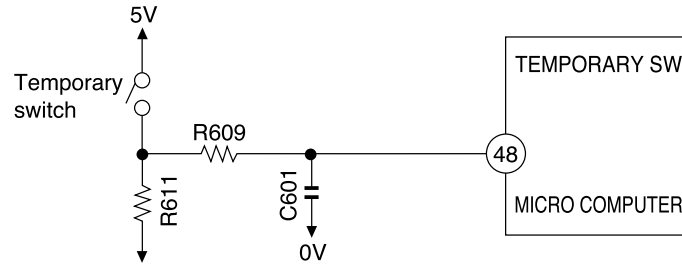


Fig. 8-1

- The temporary switch is used to operate the air conditioner temporarily when the wireless remote control is lost or faulty.
- The air conditioner operates in the previous mode at the previously set temperature. However, when the power switch is set to OFF, it starts automatic operation.

9. Indoor Fan Motor Feedback Circuit

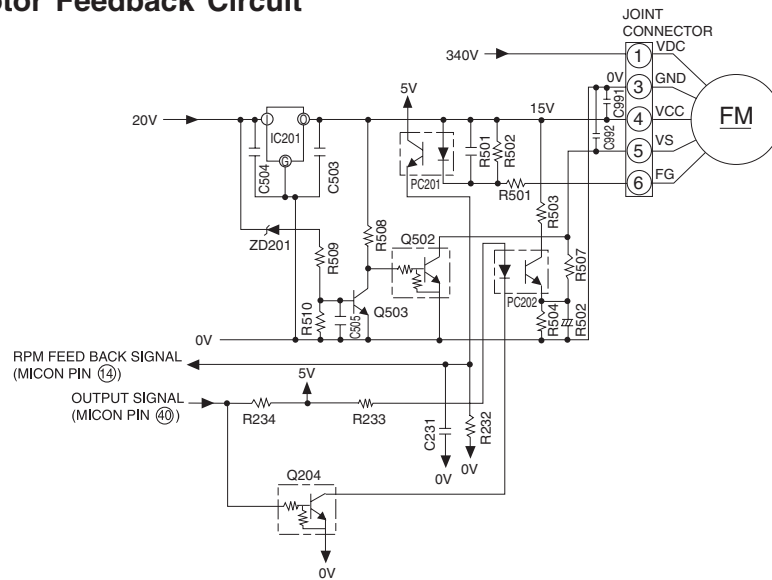


Fig. 9-1

- <Exp. of circuit wave>

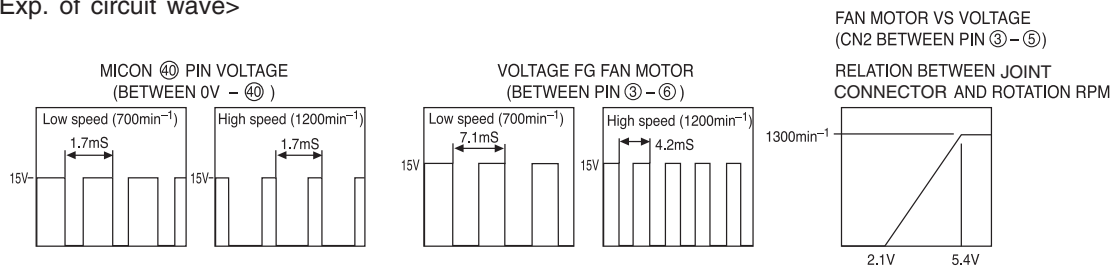


Fig. 9-2

- Fan motor will receive signal thru Joint Connector with VDC (Motor Drive Voltage), VCC (Motor Controller Power Supply), VSC (RPM Instruction) motor WCC return the FG signal under frequency RPM.
- The circuit produces fan motor drive from 340V DC supplied from the indoor unit and controls the fan motor speed.

CAUTION 1

Indoor fan motor circuit will be connected with primary power source line and please take care of the electrical shock.

CAUTION 2

Please do not disconnect the fan motor connector during running due to the high voltage supply, it will cause the damage at fan motor and PWB.

RAC-70YH7

1. Power Circuit

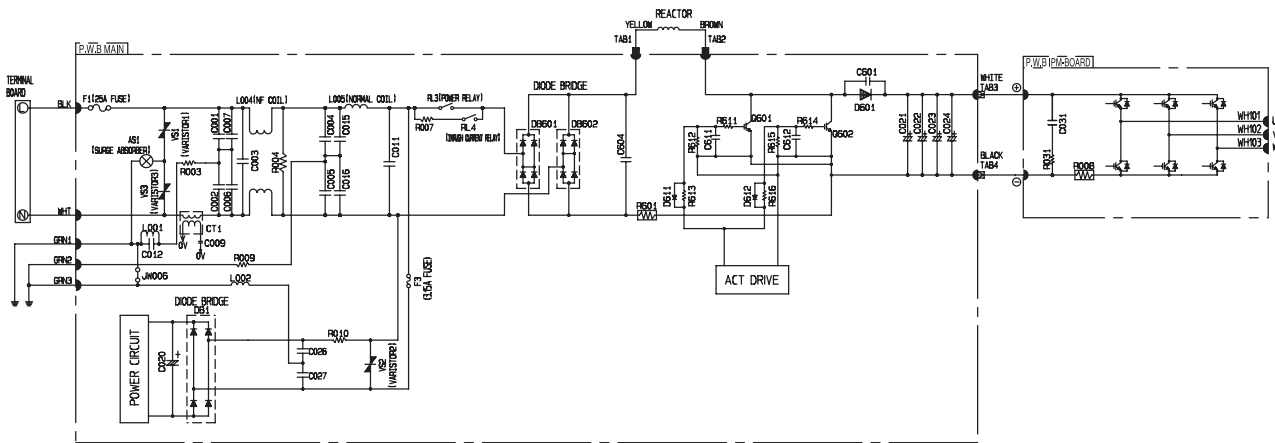


Fig 1-1

※ 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.

※ 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 (C021~C024, 400 μ F, 450V)

This smoothes (averages) the voltage rectified by the diode stack.

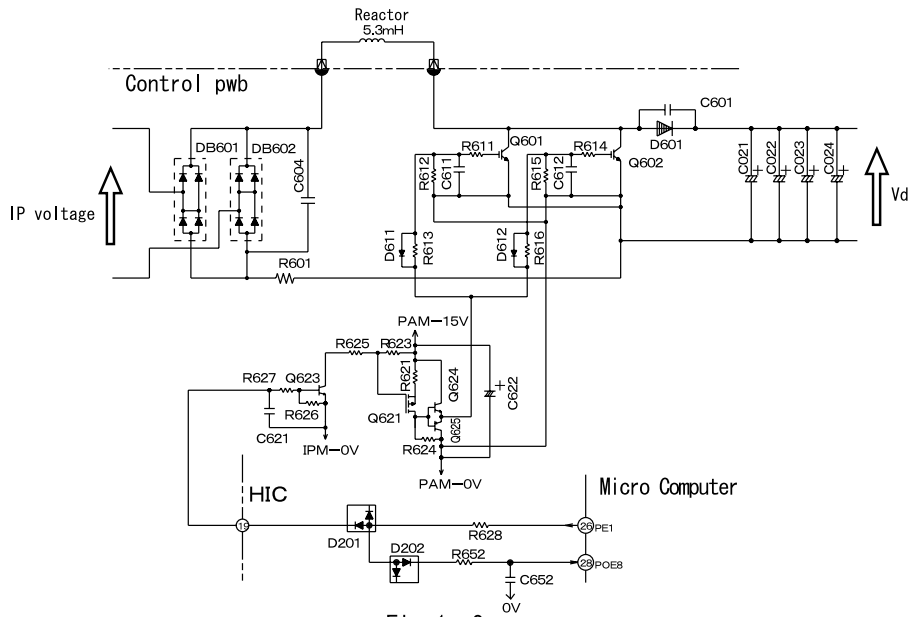


Fig.1-2

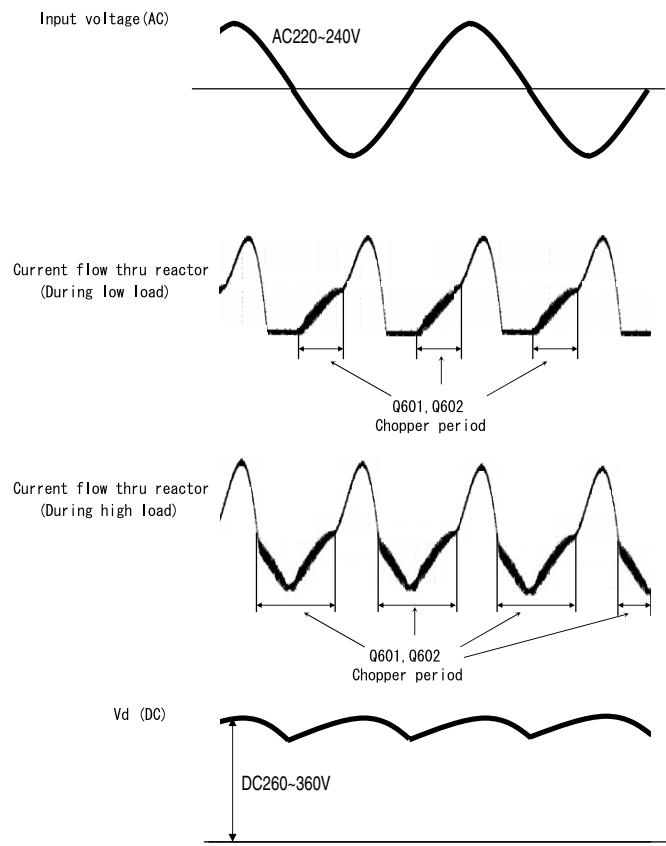


Fig.1-3

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

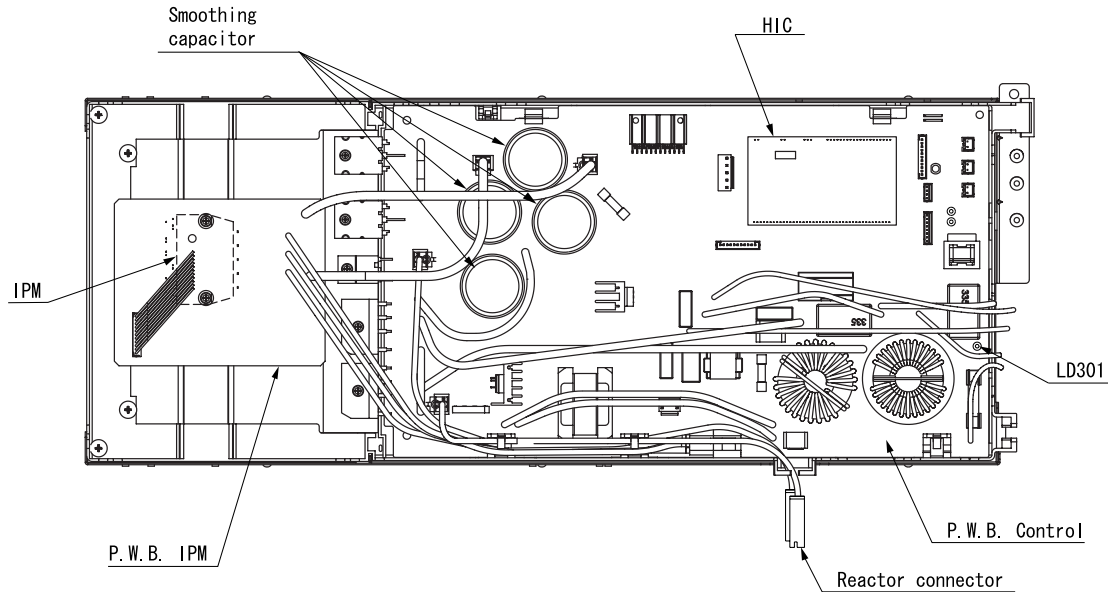
It will improve the efficiency during compressor load become heavy when current flow thru the chopper period of Q601, Q602.

(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 absorb 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 damaged.

2. PWB for power circuit

Voltage specification of power circuit as shown in below table.

<Checking point>

Output	Spec	Main load	Measuring point	Example of possible failure mode.
5V O/P	$5 \pm 0.4V$	Micon, Thermistor	Tester⊕ : L105 (5V) Tester⊖ : J25 (0V)	Outdoor not operate, no blinking indication
12V O/P	$12 \pm 1V$	Micon, IC2, 3, 4 Relay circuit	Tester⊕ : L104 (12V) Tester⊖ : J25 (0V)	Outdoor not operate, no blinking indication
16V O/P	$15.5 \pm 1.5V$	IPM for Comp IPM for DC fan	Tester⊕ : J58 (16V) Tester⊖ : J25 (0V)	Stop : LD301 3, 4 or 12 times blinking
PAM-15V O/P	$15 \pm 1.5V$	ACT circuit	Tester⊕ : J23 (PAM-15V) Tester⊖ : J25 (0V)	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

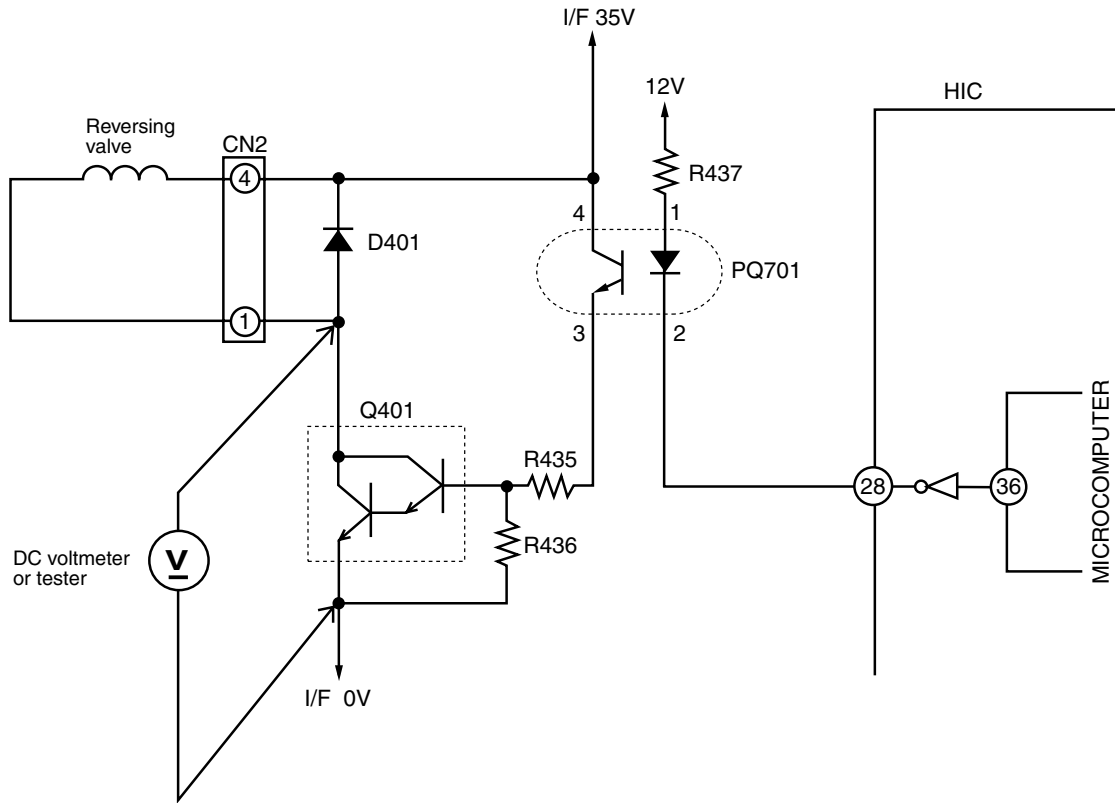


Fig. 3 – 1

- 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

Operation condition		Collector voltage of Q401
Cooling	General operation of Cooling	About 0.8V
Heating	In normal heating operation	About 35V
	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

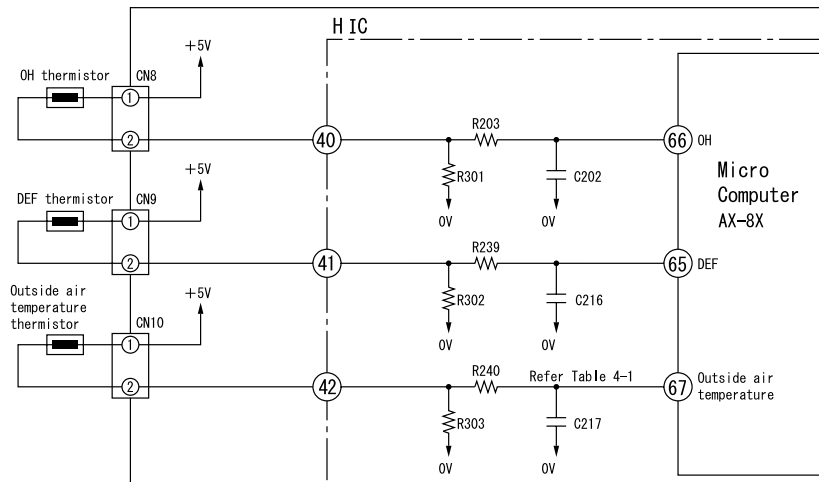


Fig. 4-1

- * 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 65~67 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

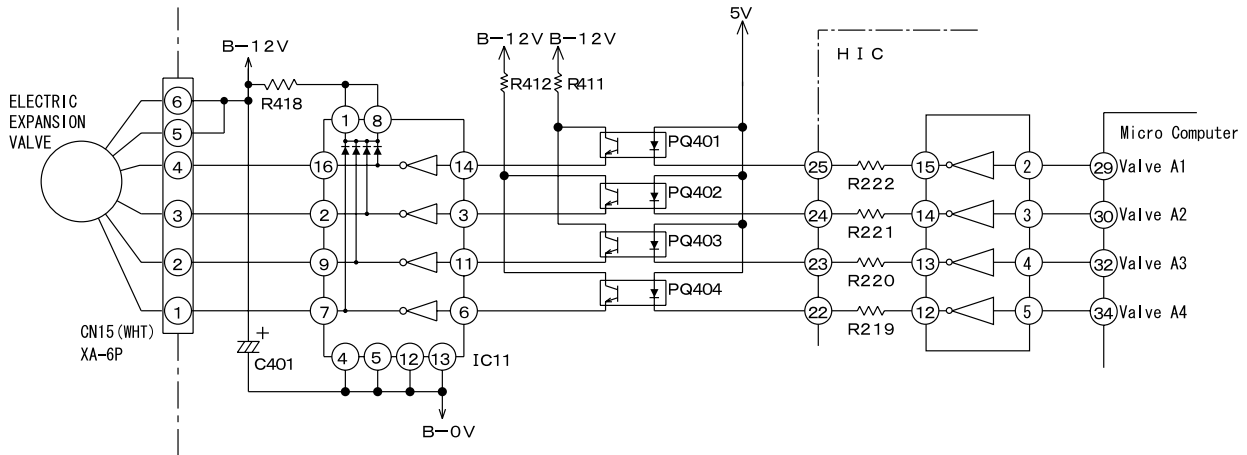


Fig.5-1

- * 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 5-1

CN15 pin no.	Wire	Drive status							
		1	2	3	4	5	6	7	8
①	WHT	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
②	YEL	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
③	ORG	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
④	BLU	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

Operation mode
 1→2→3→4→5→6→7→8 VALVE CLOSE
 8→7→6→5→4→3→2→1 VALVE OPEN

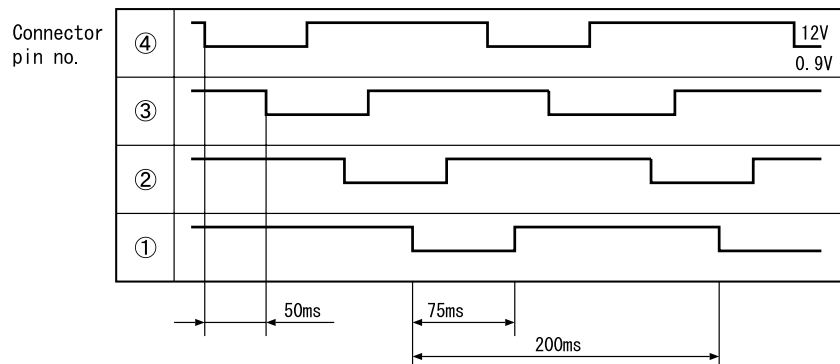


Fig.5-2

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.

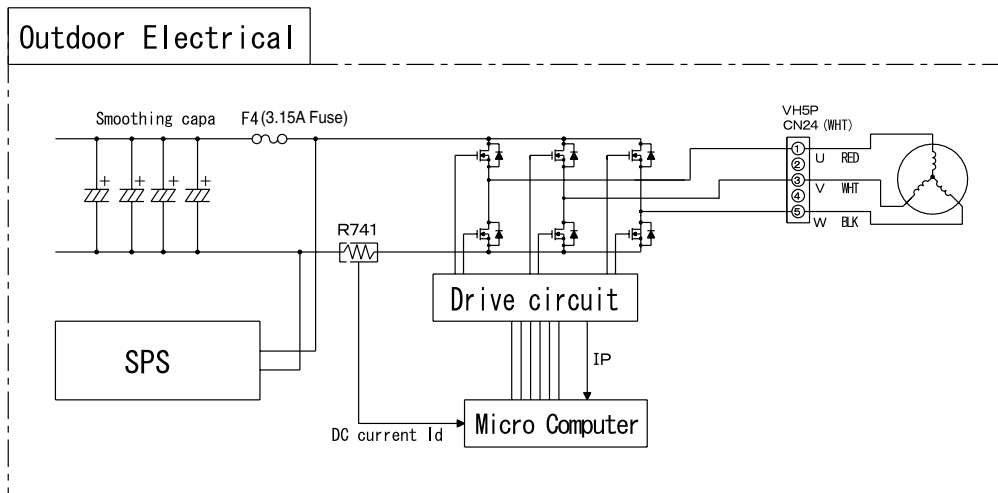


Fig 6-1

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

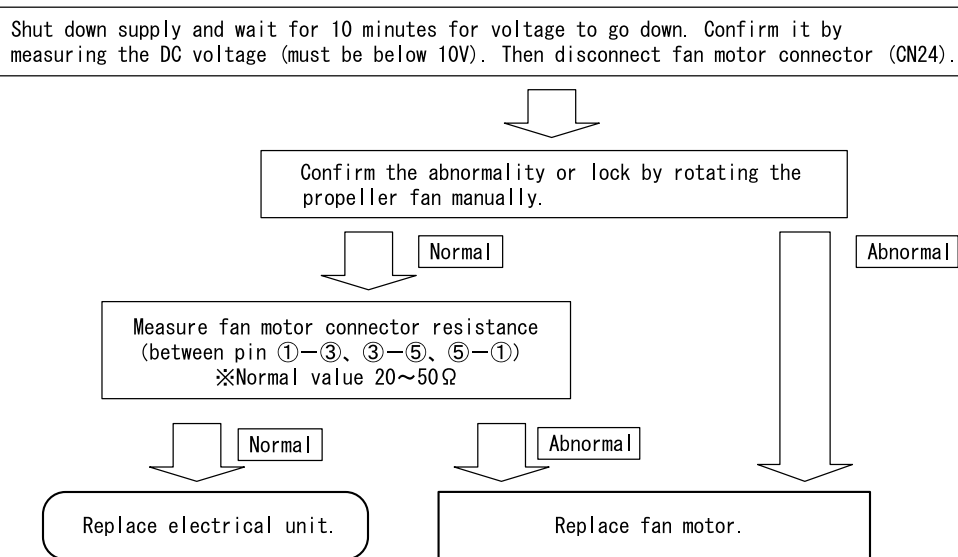
There is a case where fan rpm is reducing during rotating caused by interference of strong wind. If this condition continue in long period, fan will stop rotating. (LD301 : 11 times blinking)
The unit will restart according to control as per during start (1).

(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.

1. 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 supplied to the outdoor unit if F4(3.15A Fuse) is blown.

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

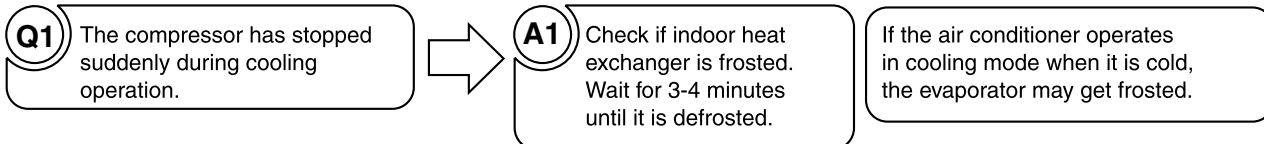
Caution

※Beware of electric shock due to high voltage when conducting an operation check.

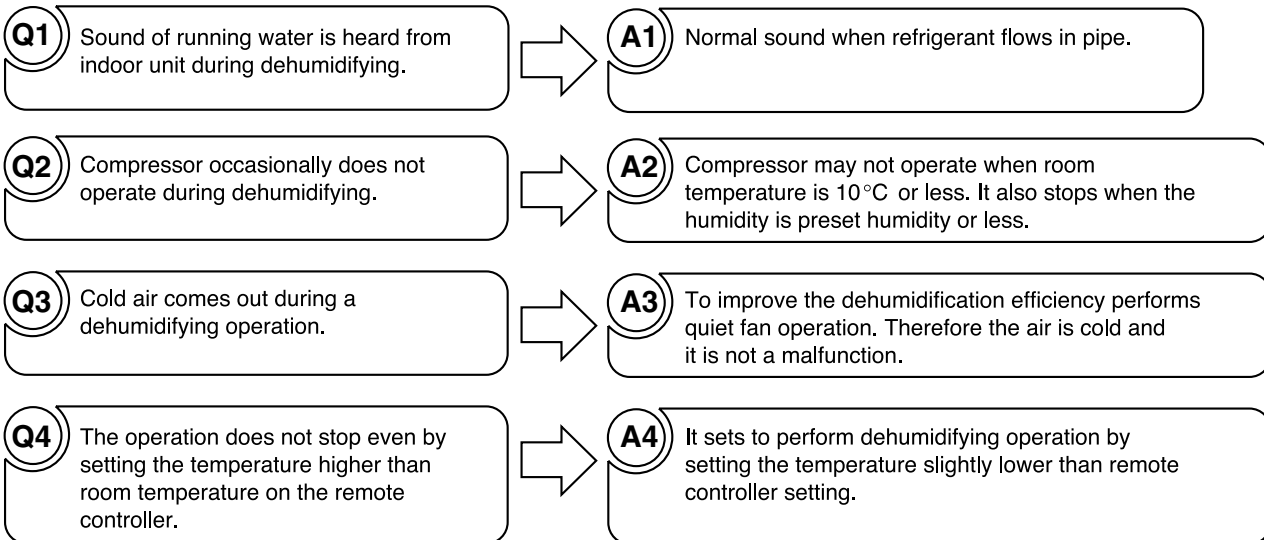
Power supply for DC fan motor and compressor is common (DC260~360V).

SERVICE CALL Q & A

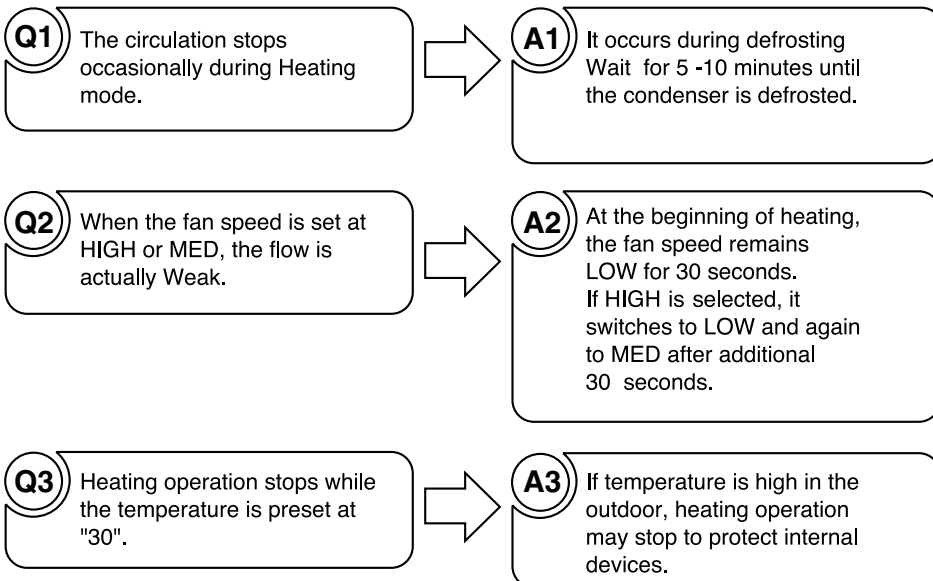
COOLING MODE



DEHUMIDIFYING MODE



HEATING MODE



AUTO FRESH DEFROSTING

Q1 After the ON/OFF button is pressed to stop heating, the outdoor unit is still working with the OPERATION lamp lighting.



A1 Auto Fresh Defrosting is carried out : the system checks the outdoor heat exchanger and defrosts it as necessary before stopping operation.

AUTO OPERATION

Q1 Fan speed does not change when fan speed selector is changed during auto operation.



A1 At this point fan speed is automatic.

Q2 How is the automatic operation mode determined?



A2 According to the room temperature and outside temperature, heating or cooling operation is automatically selected. Refer to the basic operation section.

Q3 The room temperature cannot be controlled at an automatic operation.



A3 It is automatically set as follows.
At cooling: and heating: Set at 22°C °C
The room temperature setting can be raised 3°C by “^” or lowered 3°C by “v” .

NICE TEMPERATURE RESERVATION

Q1 When on-timer has been programmed, operation starts before the preset time has been reached.



A1 This is because "Nice temperature reservation"function is operating. This function start operation earlier so the preset temperature is reached at the preset time. Operation may start maximum 60 minutes before the preset time.

Q2 Does "Nice temperature reservation" function operate during dehumidifying?



A2 It does not work. It works only during cooling and heating.

Q3 Even if the same time is preset, the operation start time varies.



A3 This is because "Nice temperature 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 vary each day.

AT STARTING OPERATION

Q1 When only the power switch is turned on, the damper at the bottom air outlet moves even if the START/STOP button is not pressed.



A1 To ensure correct opening and closing of the damper, the damper will move when power is turned on or the unit is to be operated in order to check its fully opened and closed positions.

Q2 When the heating operation is started, the indoor fan does not start immediately and the damper at the bottom air outlet occasionally does not open.



A2 This is because the preheating device is working. It will not start to drive the fan until the refrigerating cycle warms up and warm air blows. Wait for a while. The damper does not open either during preheating or for one minute after preheating is finished.

Q3 When the unit built behind the gallery (lattice door) is to be started immediately after it has stopped, the unit occasionally will not start.



A3 Such a phenomenon may occur with built-in installation where heat is likely to be stuffy. Install the unit as near to the lattice door as possible so that air is not short-circuited, or provide a partition between the unit and lattice door.

OTHERS

Q1 The indoor fan varies among high air flow, low air flow and breeze in the auto fan speed mode. (Heating operation)



A1 This is because the cool wind prevention function is operating, and does not indicate a fault.

The heat exchanger temperature is sensed in the auto fan speed mode. When the temperature is low, the fan speed varies among high air flow, low air flow and breeze.

Q2 Loud noise from the outdoor unit is heard when operation is started.



A2 When operation is started, the compressor rotation speed goes to maximum to increase the heating or cooling capability, so noise becomes slightly louder. This does not indicate a fault.

Q3 Noise from the outdoor unit occasionally changes.



A3 The compressor rotation speed changes according to the difference between the thermostat set temperature and room temperature. This does not indicate a fault.

Q4 There is a difference between the set temperature and room temperature.



A4 There may be a difference between the set temperature and room temperature because of construction of room, air current, etc. Set the temperature at a comfortable level for the space.

Q5 Air does not flow immediately after operation is started.



A5 Preliminary operation is performed for one minute when the power switch is turned on and heating or dehumidifying is set. The operation lamp blinks during this time for heating. This does not indicate a fault.

Q6 Mold in the room cannot be inhibited even after performing the air conditioner drying operation.



A6 Air conditioner drying operation is to dry the interior of the indoor unit to inhibit the growth of mold. It is not to inhibit the mold growth in the room.

Q7 The interior of the indoor unit seems to be still damp even after performing the air conditioner drying operation.



A7 Condition of the interior of the indoor unit varies depending on usage of the unit and condition of the indoor unit. If it is not dried after the first try, perform the drying more than one time for better effect.

Q8 Even if the air conditioner drying is performed using the remote controller during the unit operation or timer programming, the air conditioner drying operation does not start.



A8 To perform the air conditioner drying, stop the unit operation or programming beforehand.

Q9 The unit is operated after built-in installation (behind the lattice door). It turns off for a long time and the room is not warmed (cooled).



A9 Check to see if warm (cool) air is being short-circuited behind the lattice door. A short-circuit is likely to occur when the deflector position is not appropriate, the lattice does not have a big enough opening, and/or the unit is installed in the inner part. Install the unit as near the lattice door as possible.

Q10 Strange sound is occasionally heard from the bottom air outlet.



A10 When the damper is switched, scrambling of air will occur between the top and bottom outlets due to the set fan speed during switching and filter clogged state, which, may generate some sound.

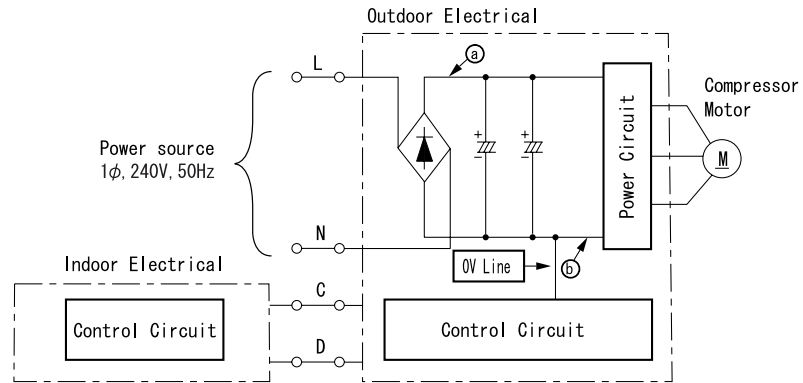
TROUBLE SHOOTING

PRECAUTIONS FOR CHECKING



CAUTION

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

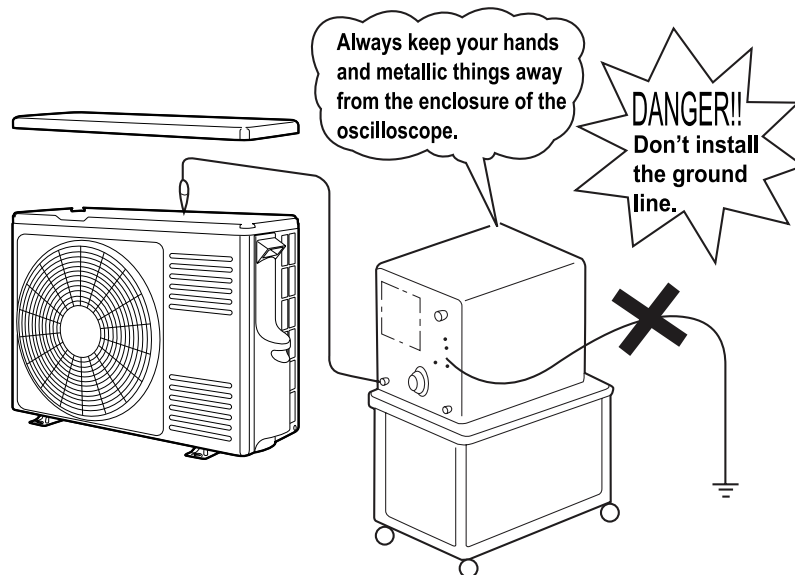


Across a - b (OV line) ----- approx 320 - 360V
 Across a - ground ----- approx 155 - 170V
 Across b (OV line) - ground ----- approx 155 - 170V



CAUTION

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



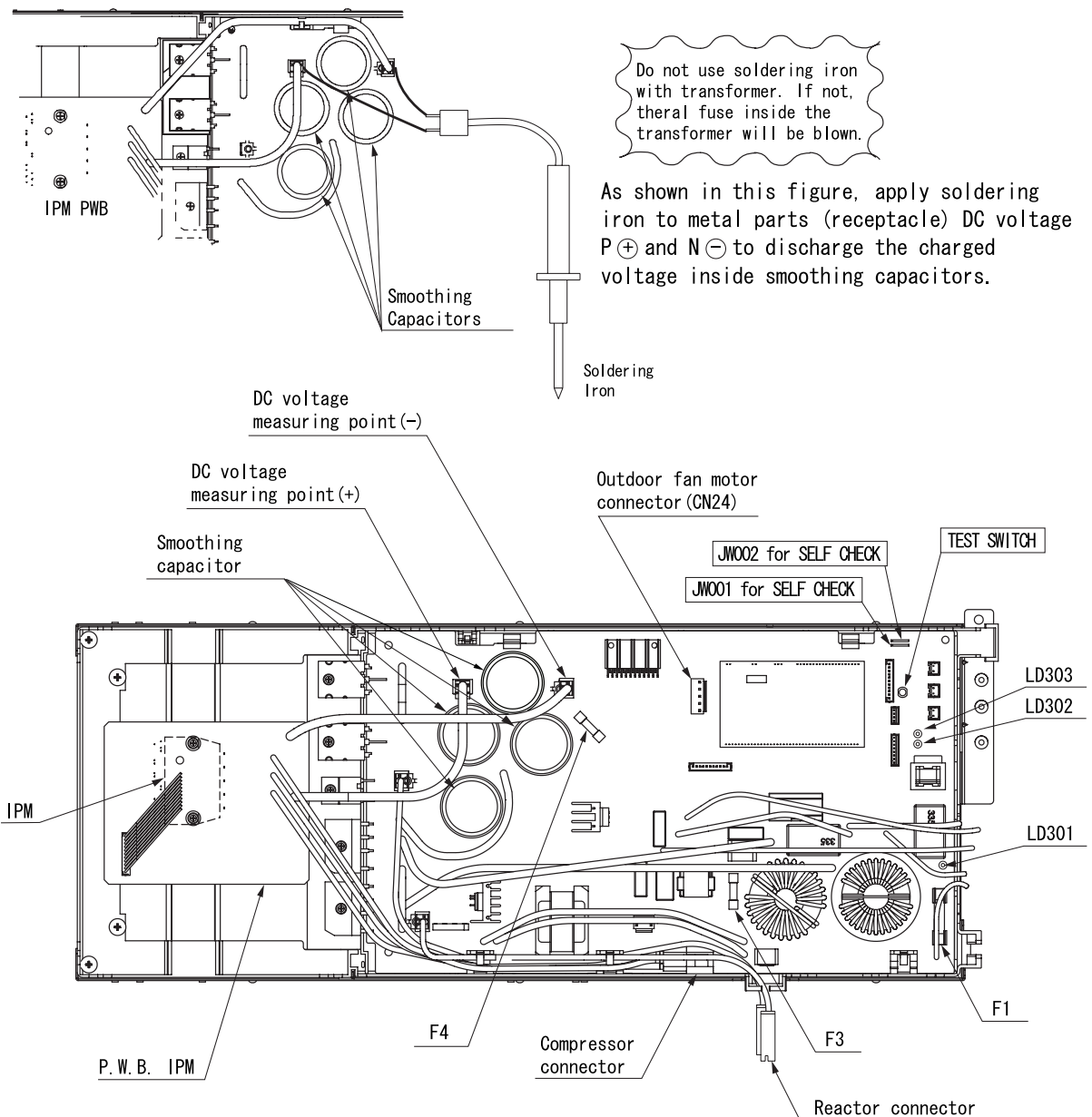
DISCHARGE PROCEDURE AND METHOD TO STOP ENERGIZE THE POWER CIRCUIT

⚠ 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 ⊕ and DC voltage ⊖ terminals in order to discharge voltage in smoothing capacitors.

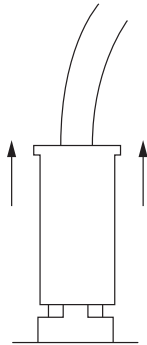


[Other cautions]

(1) Disconnection of tab terminal receptacle

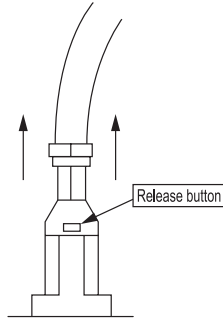
All receptacle used to connect with tab terminal are built with lock mechanism. Please take note that by using a force to pull out the receptacle without releasing the lock, can cause a damage. Furthermore, during connecting the receptacle back make sure to securely insert until end.

* Receptacle type and procedure to releasing the lock



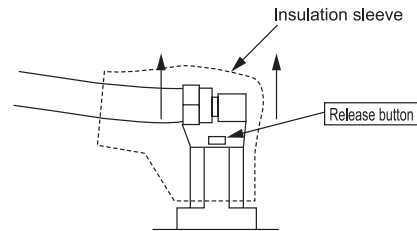
Vertical type (with plastic casing)

Pull out by holding the plastic casing.



Vertical type (without casing)

Pull out while pushing the release button.



Horizontal type (with insulation sleeve)

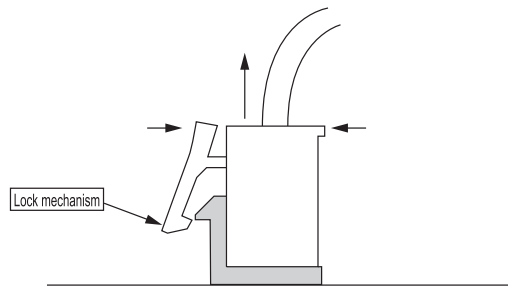
Pull out from top of insulation sleeve while pushing the release button.

(2) Disconnecting on board connector

On board connector with lock mechanism 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.

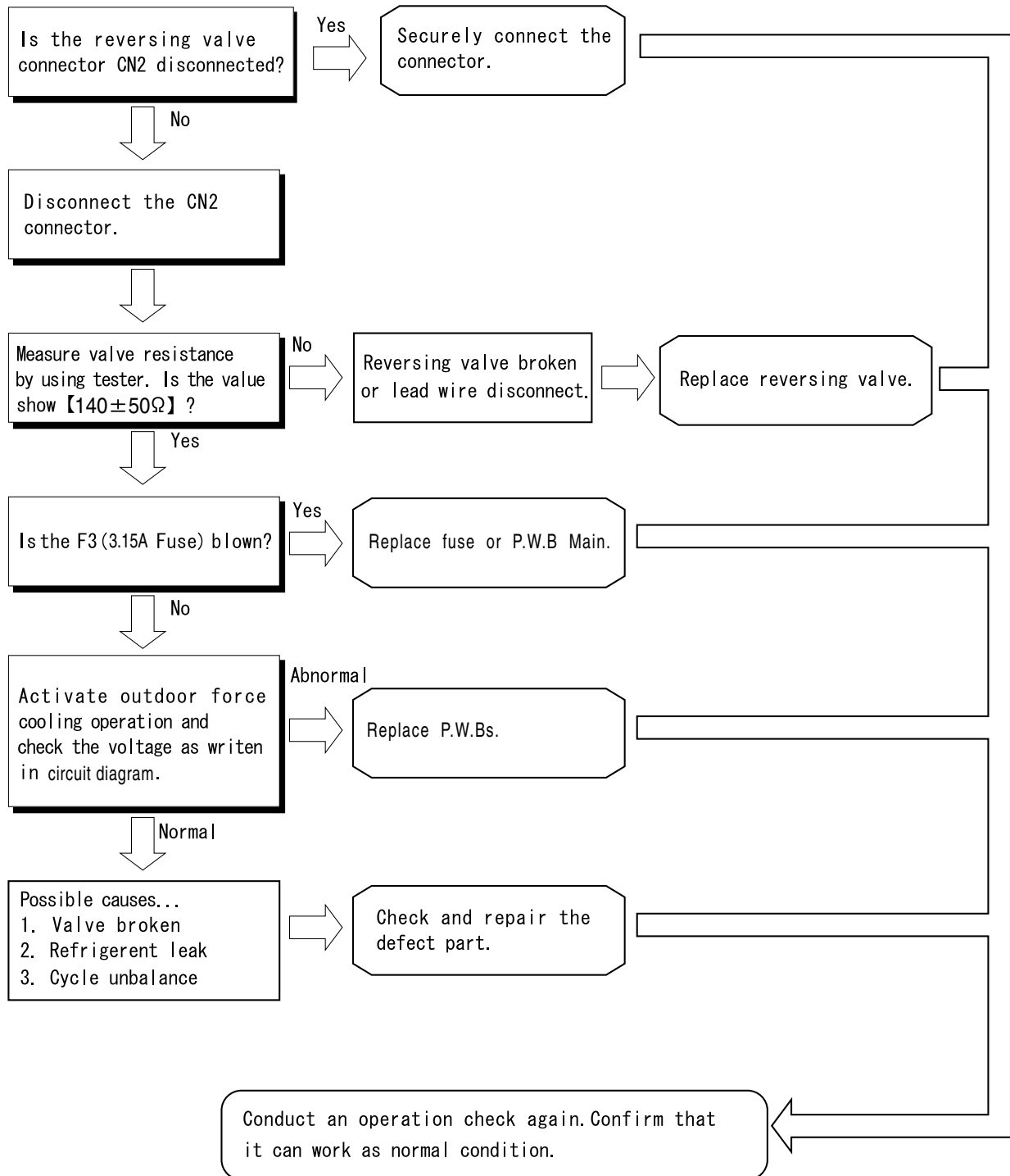


(3) Connector disconnection during discharge is prohibited

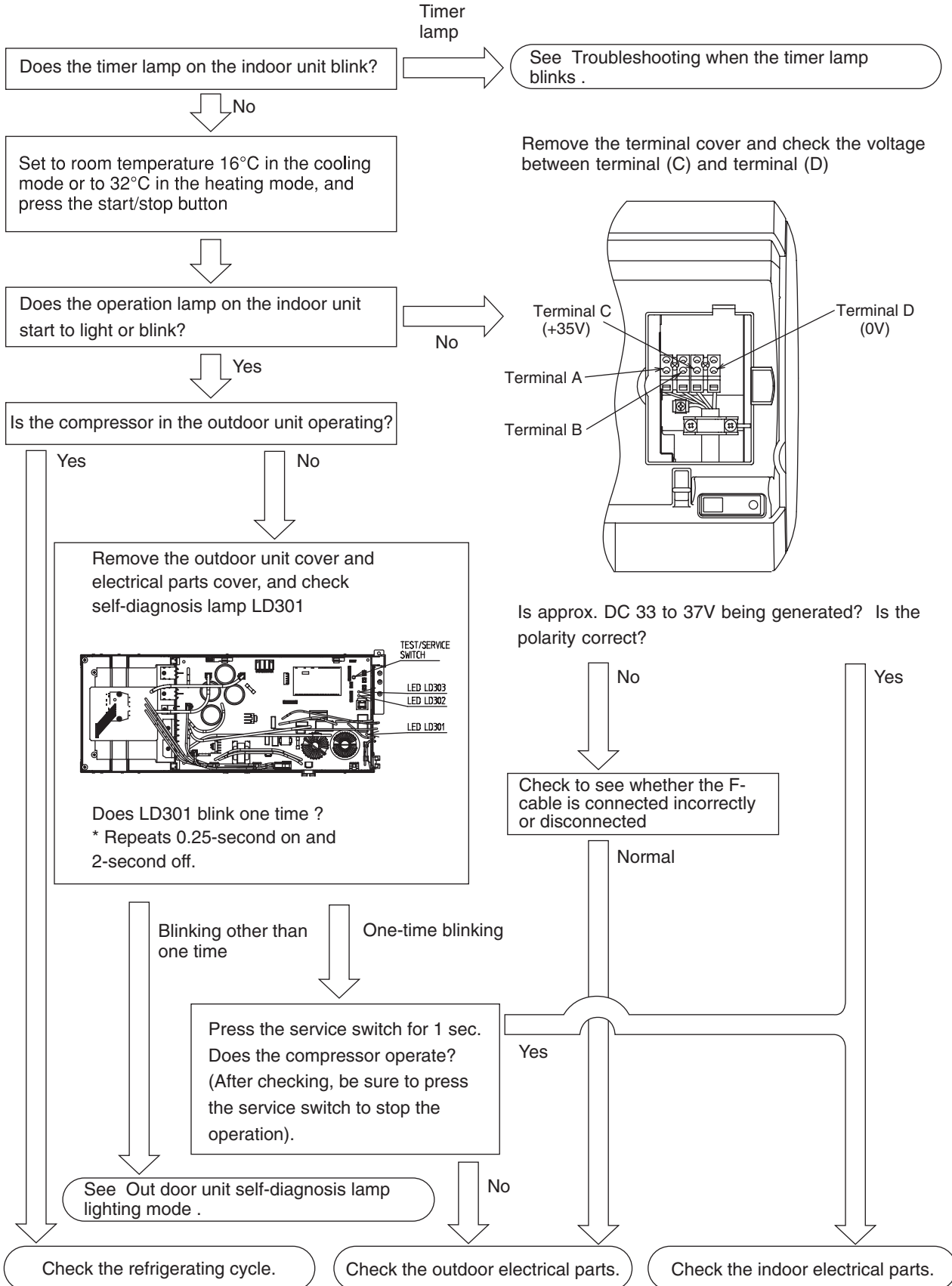
Disconnecting connector during discharge is extremely prohibited. Component on board and fan motor will damage. Proceed trouble shooting process after confirming smoothing capacitor of indoor & outdoor pwb has been discharge.

CHECKING THE INDOOR TIMER LAMP IF BLINKING 1 TIME

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



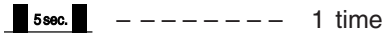
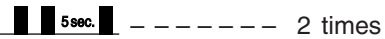
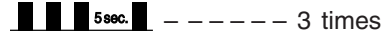




CHECKING THE INDOOR/OUTDOOR UNIT ELECTRICAL PARTS AND REFRIGERATING CYCLE




TROUBLESHOOTING WHEN TIMER LAMP BLINKS.

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	 1 time	<u>Reversing valve defective</u> When the indoor heat exchanger temperature is too low in the heating mode or it is too high in the cooling mode.	(1) Reversing valve defective (2) Heat exchanger thermistor disconnected (only in the heating mode) (Note) The malfunction mode is entered the 3rd time this abnormal indication appears (read every 3 minutes).
2	 2 times	<u>Outdoor unit forced operation</u> When the outdoor unit is in forced operation or balancing operation after forced operation	Electrical parts in the outdoor unit
3	 3 times	<u>Indoor/outdoor interface defective</u> When the interface signal from the outdoor unit is interrupted.	(1) Indoor interface circuit (2) Outdoor interface circuit
4	 4 times	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	 9 times	<u>Room thermistor or heat exchanger thermistor is faulty</u> When room thermistor or heat exchanger thermistor is opened circuit or short circuit.	(1) Room thermistor (2) Heat exchanger thermistor
6	 10 times	<u>Over-current detection at the DC fan motor</u> when over-current is detected at the DC fan motor of the indoor unit.	(1) Indoor fan locked (2) Indoor fan motor (3) Indoor control P.W.B.
※1 7	 13 times	<u>IC401 or IC402 data reading error</u> When data read from IC401 or IC402 is incorrect.	IC401 or IC402 abnormal

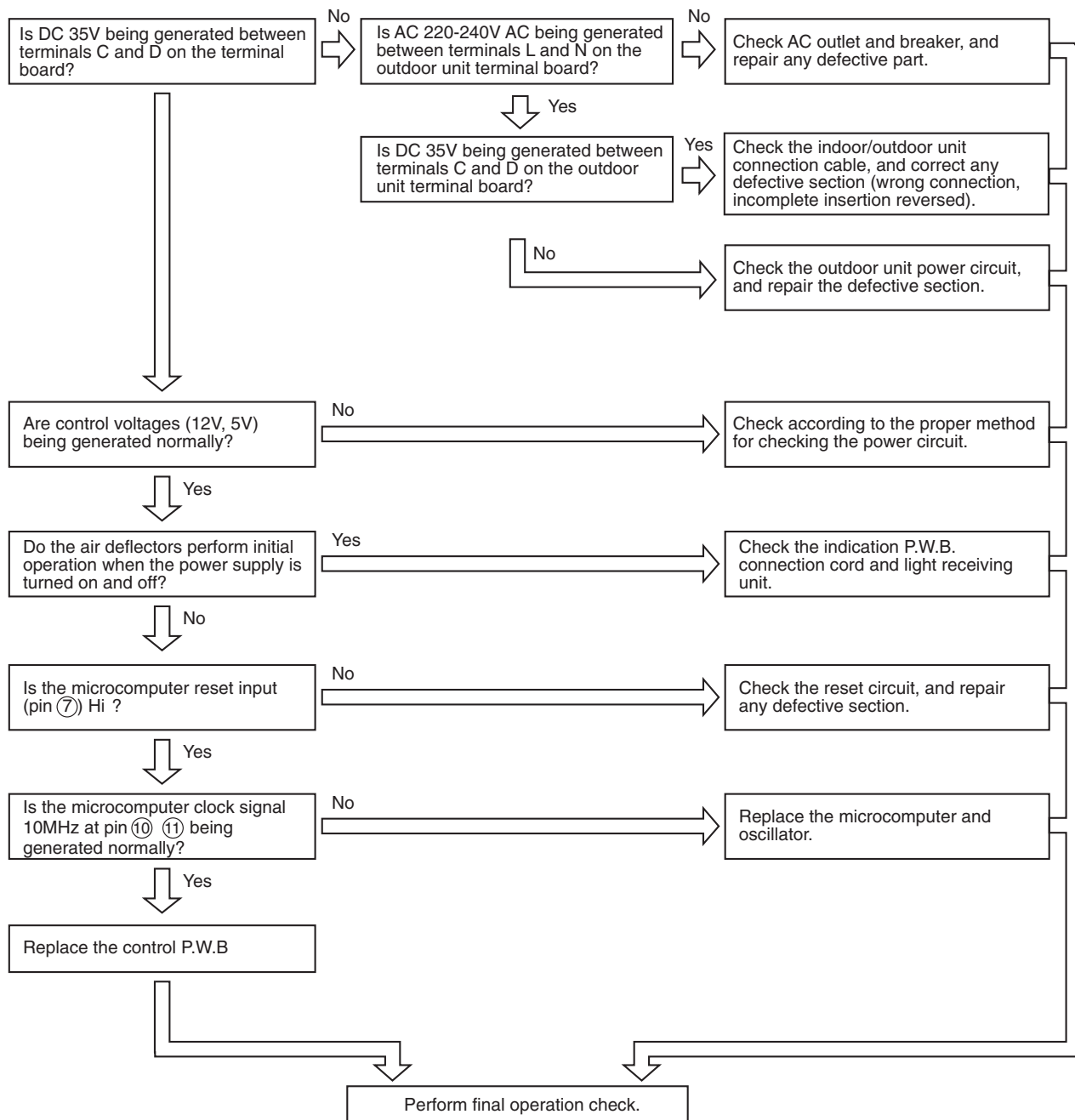
( -- Lights for 0.5 sec. at interval of 0.5 sec..)

<Cautions>

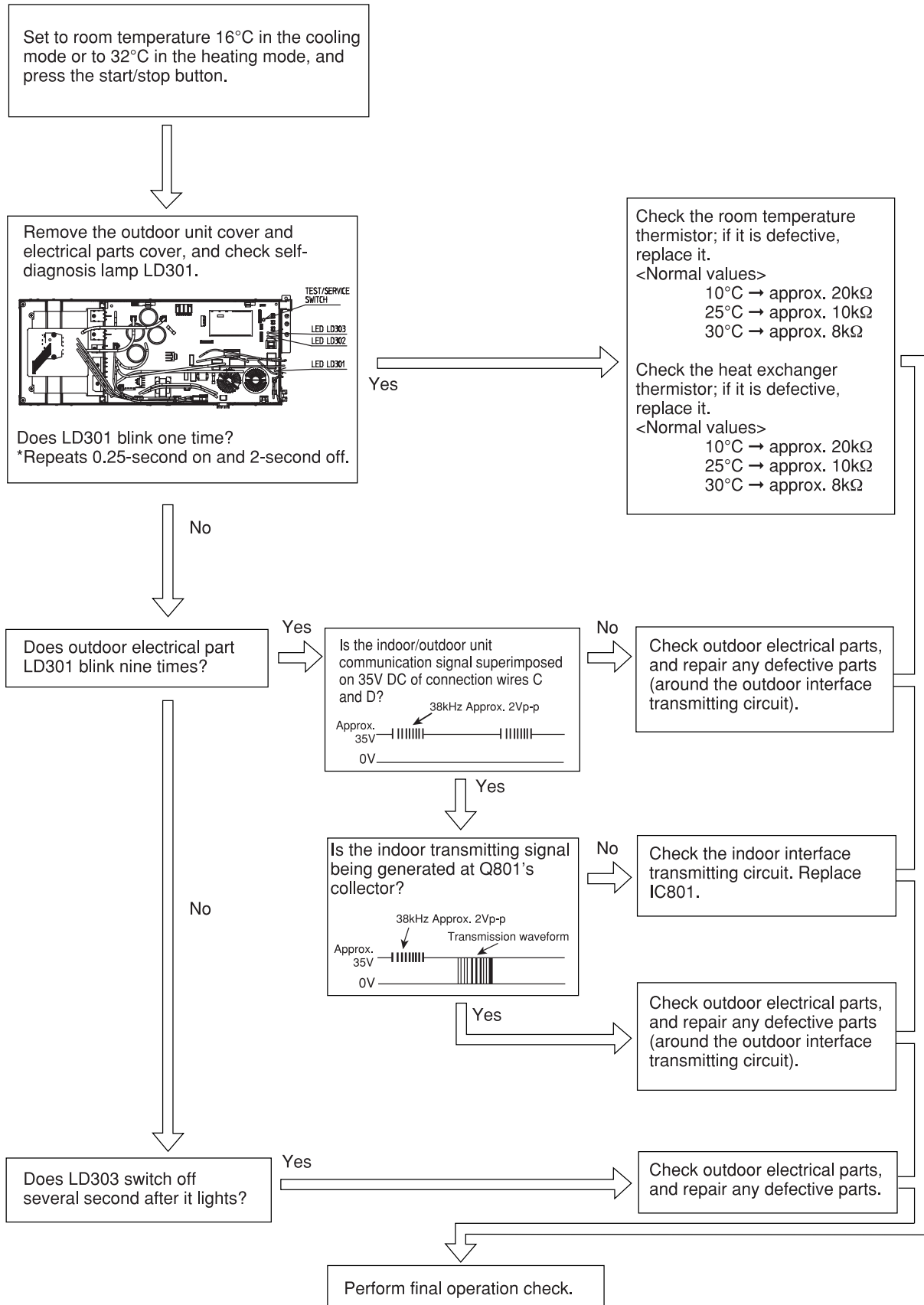
- (1) If the interface circuit is faulty when power is supplied, the self-diagnosis display will not be displayed.
- (2) If the indoor unit does not operate at all, check to see if the F-cable is connected or disconnected.
- (3) To check operation again when the timer lamp is blinking, you can use the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

CHECKING INDOOR UNIT ELECTRICAL PARTS

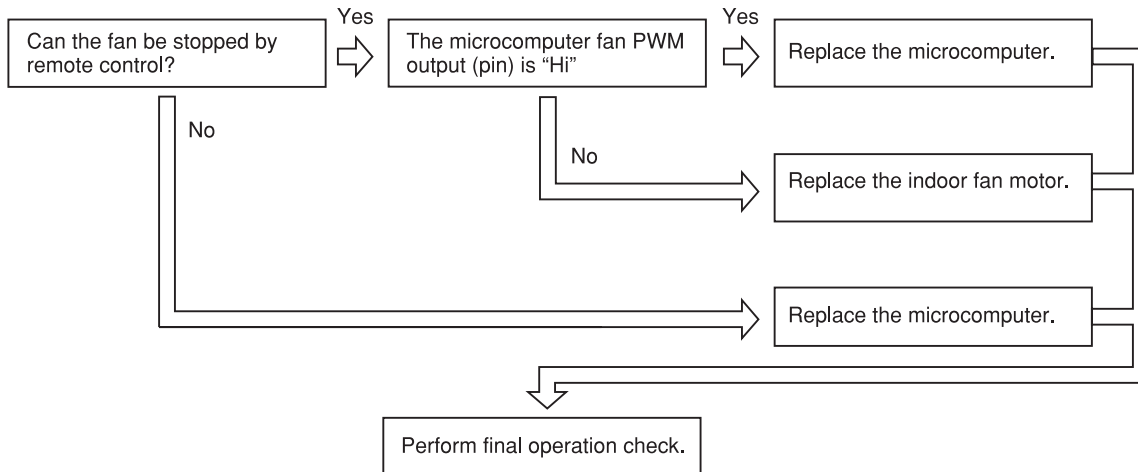
1. Power does not come on (no operation)



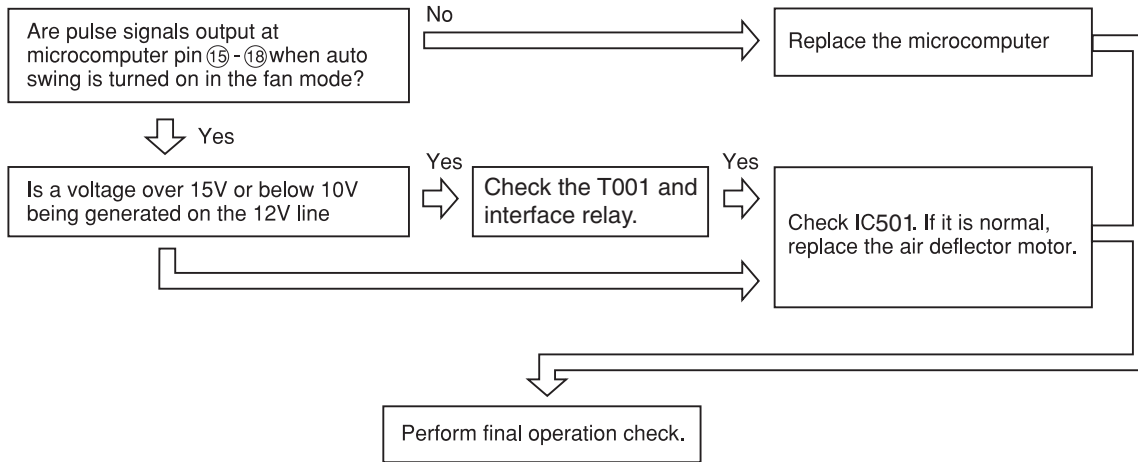
2. Outdoor unit does not operate (but receives remote infrared signal)



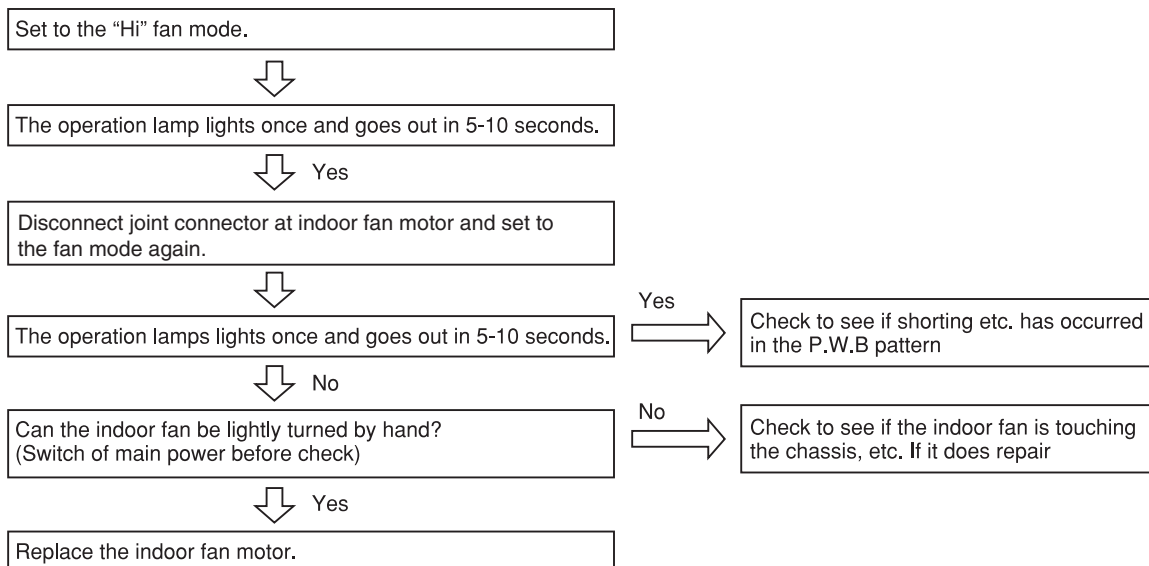
3. Only indoor fan does not operate (other is normal)



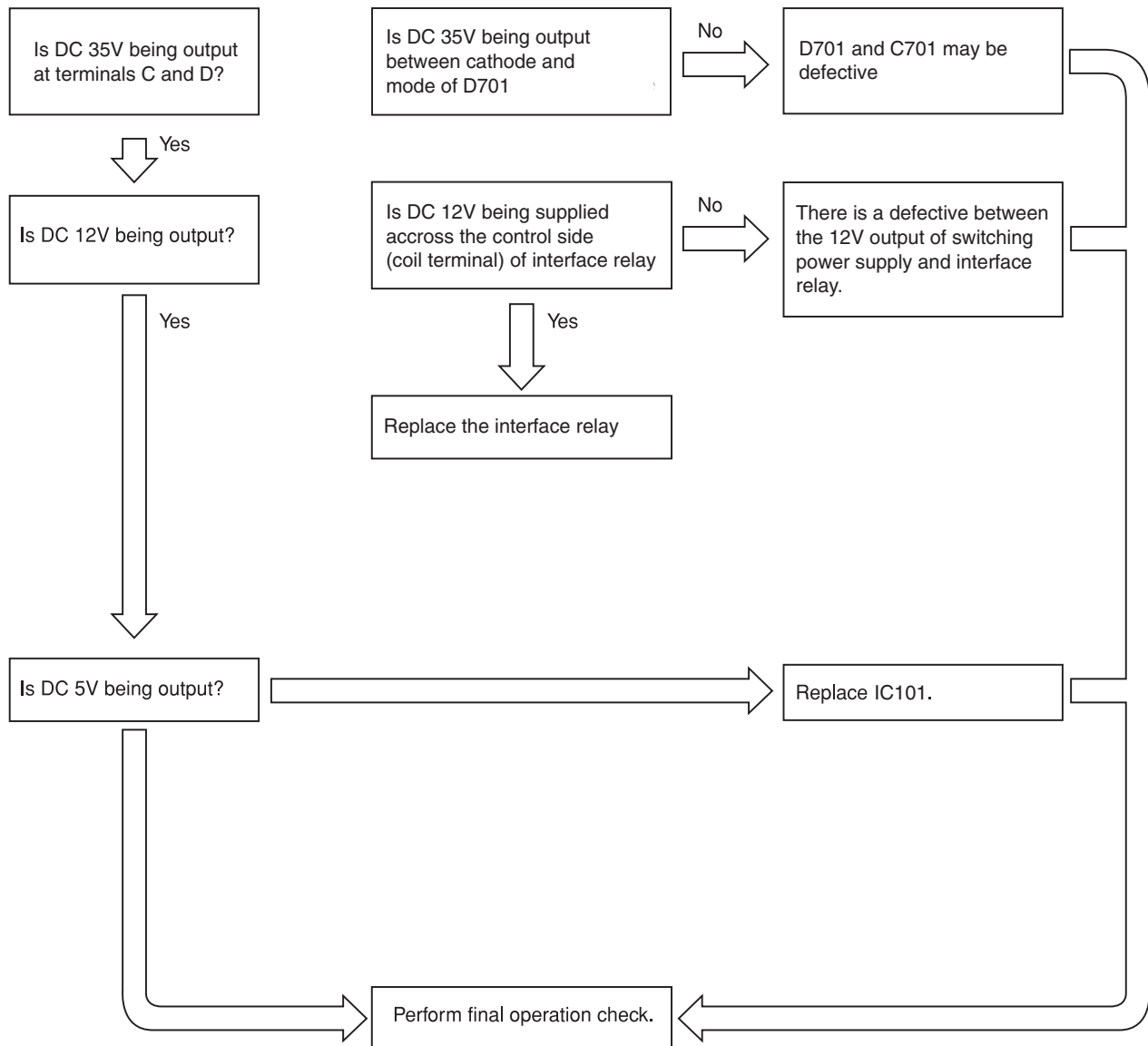
4. Air deflector does not move (others are normal)



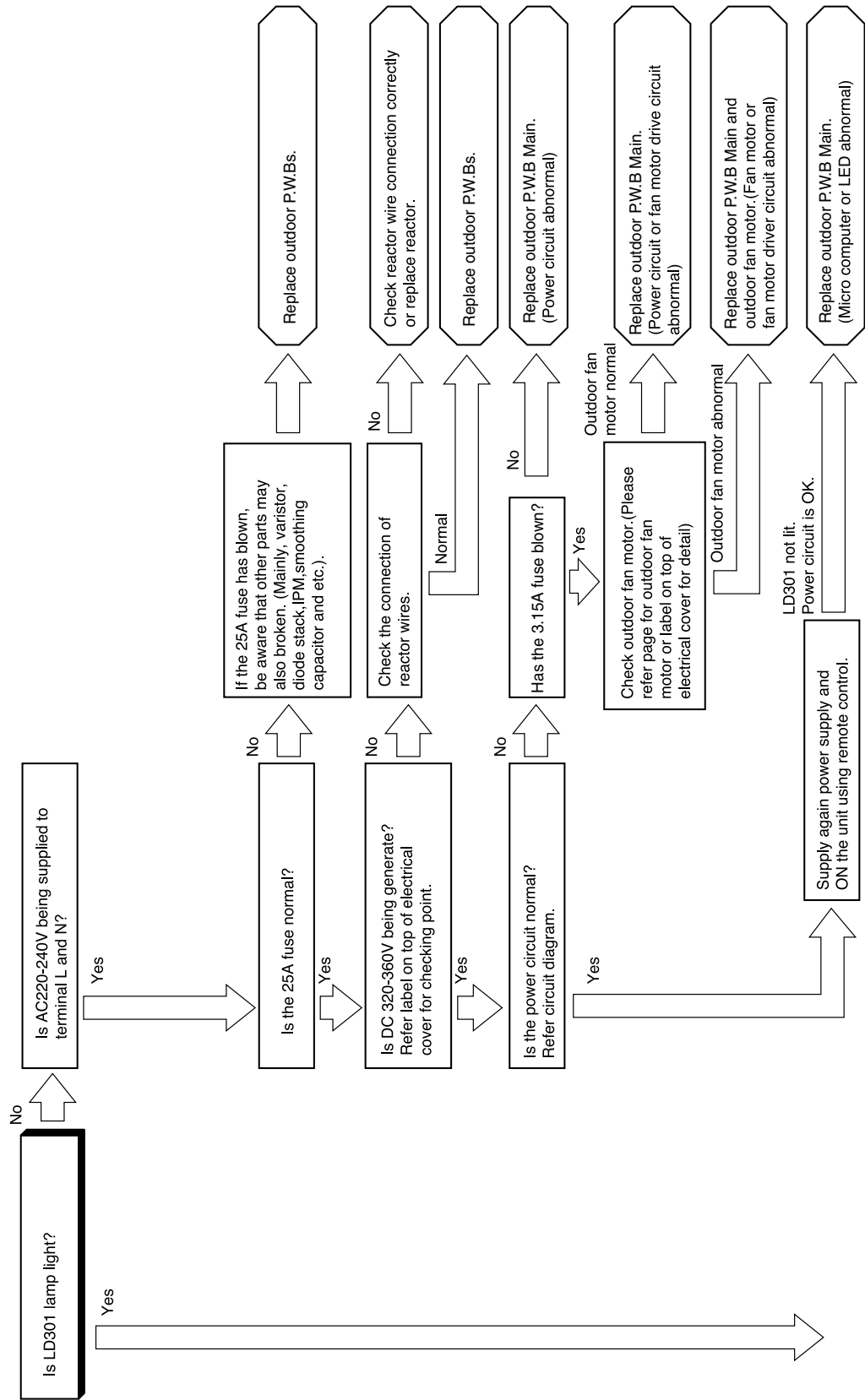
5. All systems stop from several seconds to several minutes after operation is started (all indicators are also off)

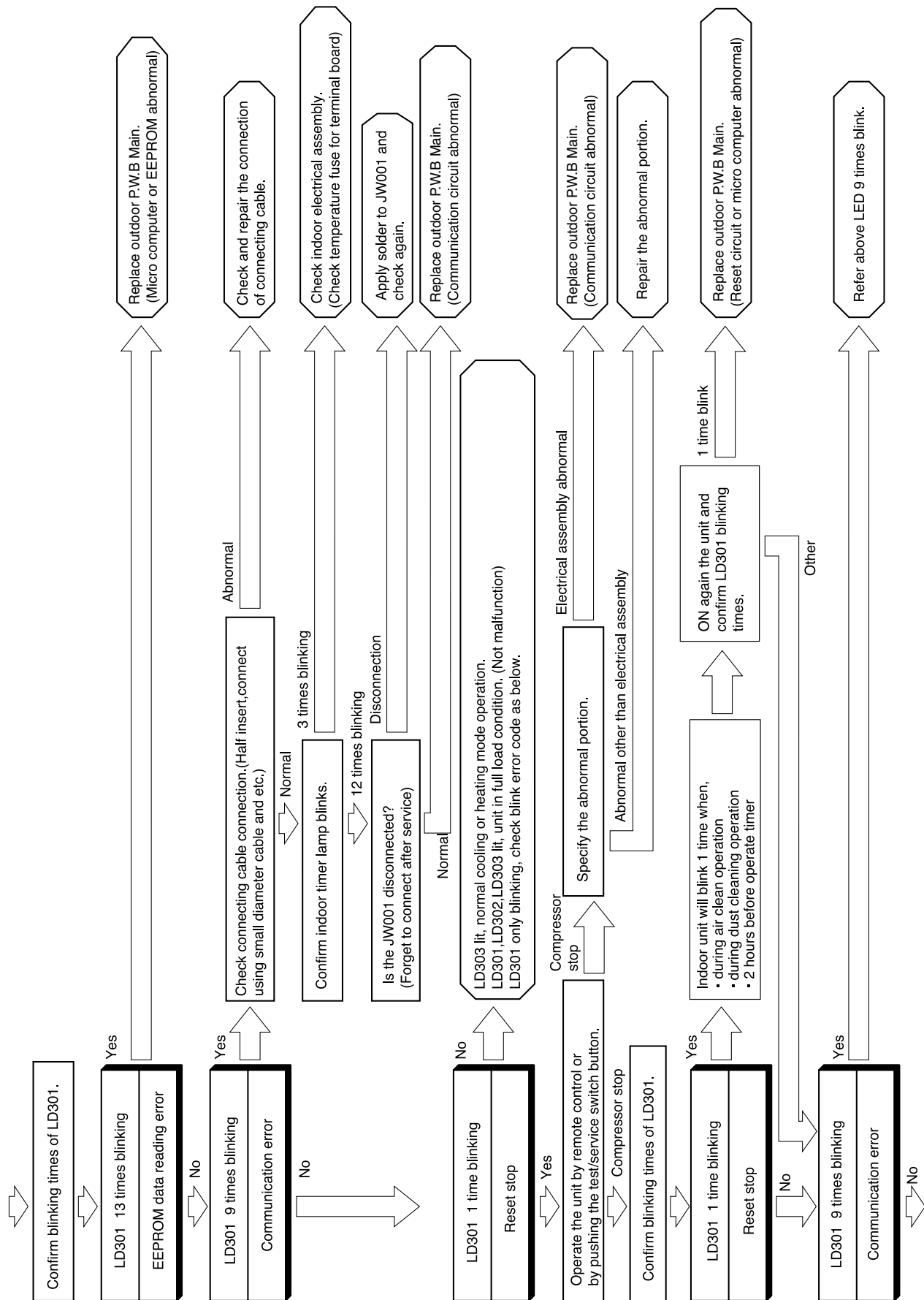


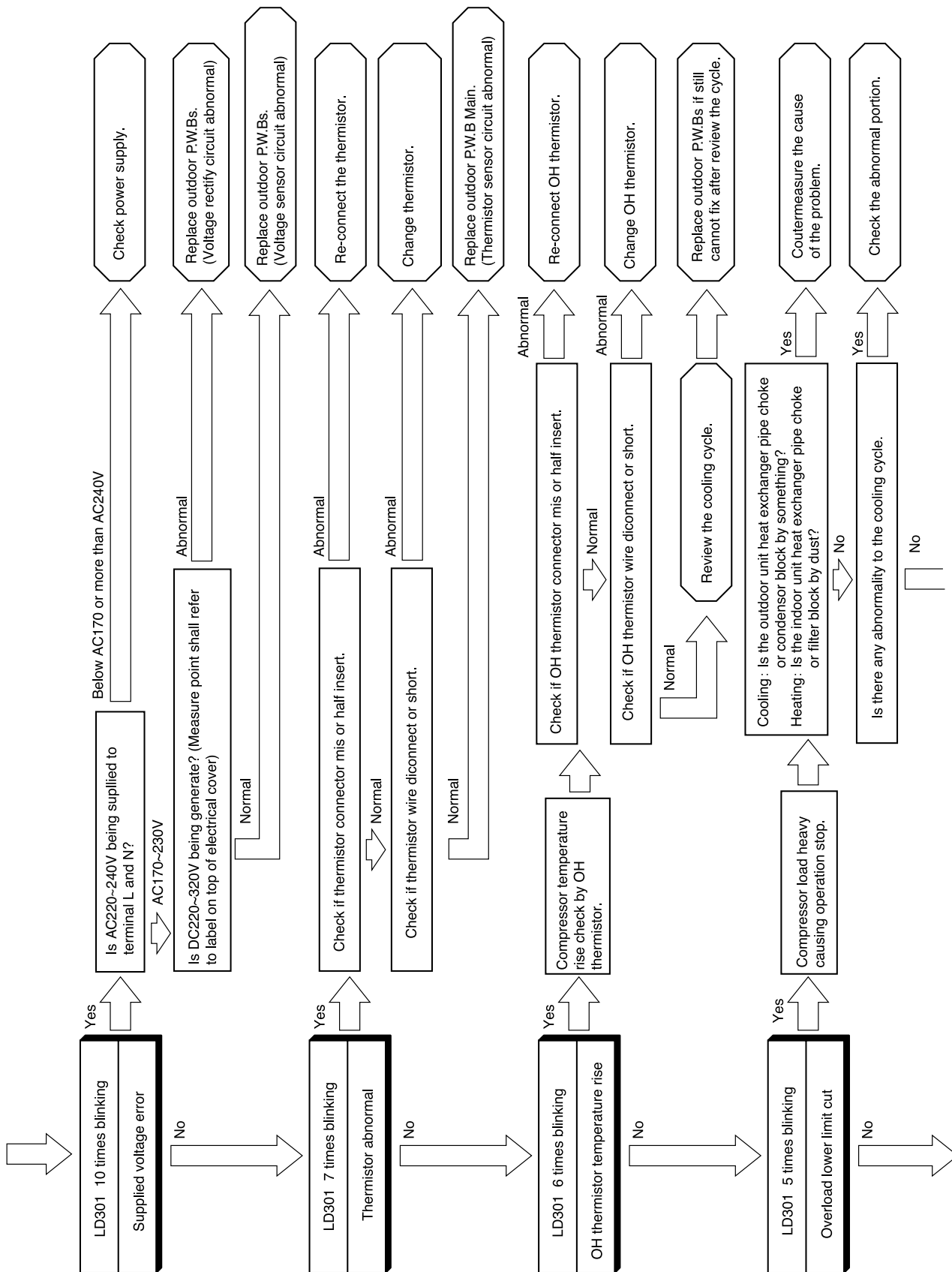
6. Check the main P.W.B (power circuit)

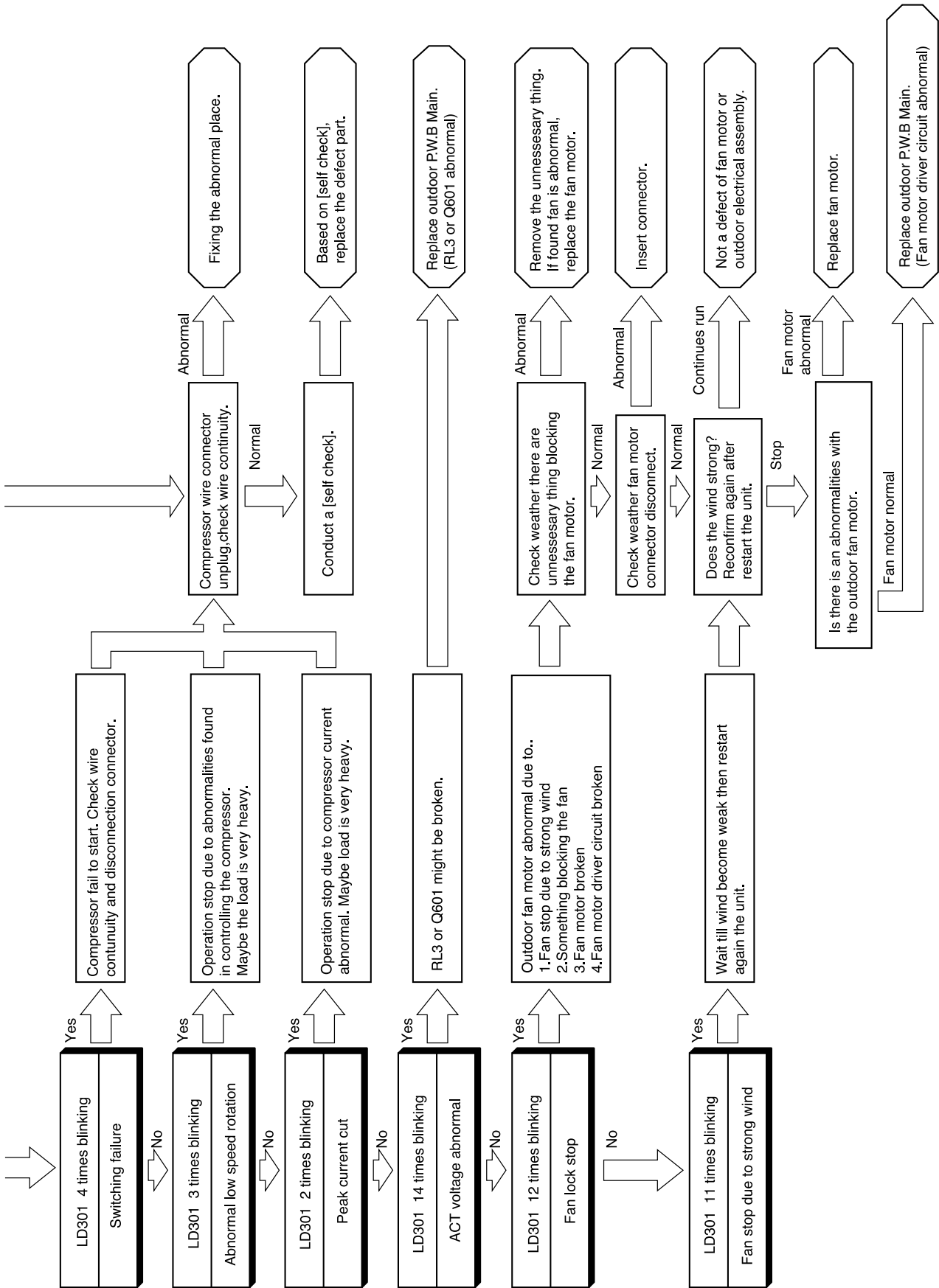


CHECKING THE OUTDOOR UNIT ELECTRICAL PART









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			<input checked="" type="checkbox"/> LIT	<input checked="" type="checkbox"/> BLINKING	<input type="checkbox"/> OFF		
LD301	LD302	LD303				SELF-DIAGNOSIS RESULT	REPAIR METHOD
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				ELECTRICAL OK	① CHANGE COMPRESSOR
1 TIME							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				PEAK CURRENT CUT OFF	① CHANGE P.W.B.s
2 TIMES							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				COMPRESSOR CURRENT ABNORMAL	① IF COMPRESSOR CONNECTOR LOOSE OR NG - CHECK CONNECTOR CONDITION ② IF COMPRESSOR CONNECTOR OK, - CHECK COMPRESSOR, CHANGE P.W.B.s
7 TIMES							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				DC VOLTAGE ABNORMAL	① IF AC VOLTAGE INPUT ABNORMAL (OVER STANDARD VOLTAGE $\pm 10\%$), - FOLLOW STANDARD AC VOLTAGE INPUT ② IF AC VOLTAGE INPUT IS NORMAL (WITHIN $\pm 10\%$), - CHANGE P.W.B.s
10 TIMES							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				EEPROM READING ERROR	① CHANGE P.W.B. MAIN
13 TIMES							

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).

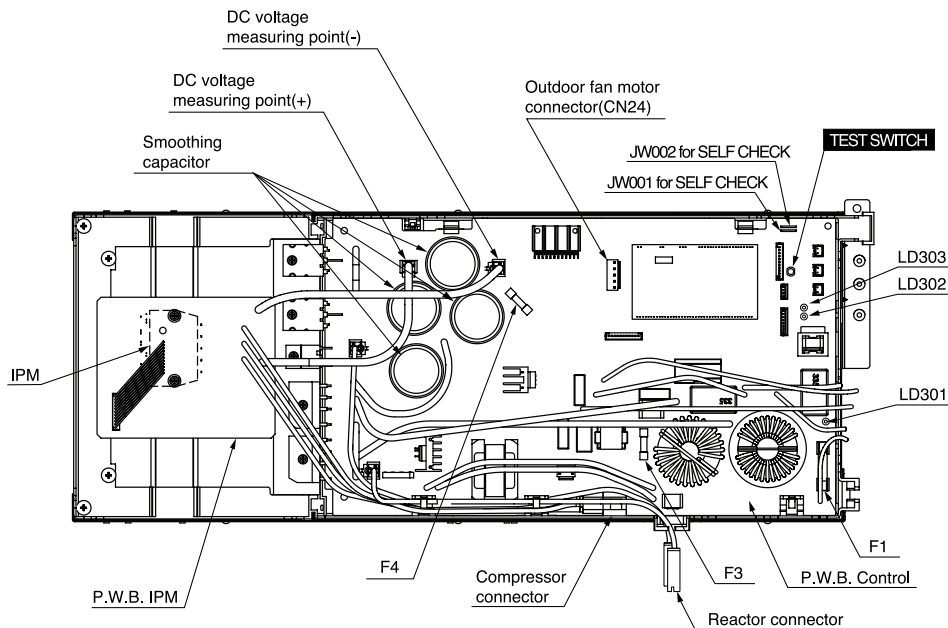
Case 3:

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 initializing of the expansion valve)
5. Press again the TEST SWITCH for about 1 minute or more to stop the force cooling operation.

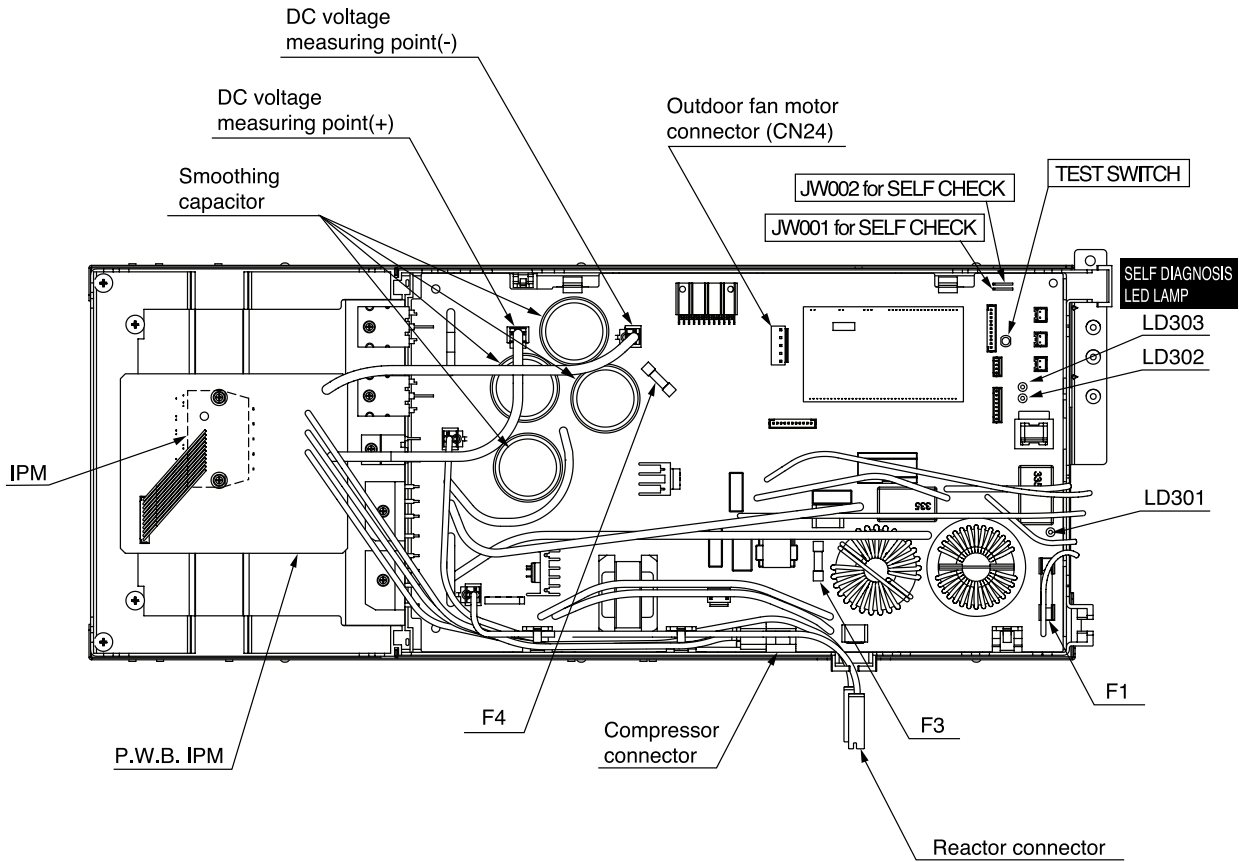


※ Caution

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

1 POSITION OF SELF-DIAGNOSIS LAMP



LIGHTING MODE SELF-DIAGNOSIS LAMP

2 LIGHTING MODE SELF-DIAGNOSIS LAMP

⚠ DANGER (DC360V)

- SWITCH OFF MAIN POWER SUPPLY TO THE OUTDOOR UNIT AT LEAST 5 MINUTES BEFORE START THE SERVING WORK.
- MAKE SURE THE LEVEL DC VOLTAGE BETWEEN PMS/WHIT1 AND TAB 4(BLUE) IS LESS THAN 10V.

SELF-DIAGNOSIS LIGHTING MODE
 LIT BLINKING OFF

SELF-DIAGNOSIS LIGHTING MODE	DETAILS	MAIN CHECK POINT
1. <input type="checkbox"/> NORMAL OPERATION	1. <input type="checkbox"/> COMPRESSOR OPERATION	1. <input type="checkbox"/> NOT MALFUNCTION
2. <input type="checkbox"/> OVERLOAD	2. <input type="checkbox"/> OVERLOAD (1) SET VALUE	2. <input type="checkbox"/> THIS SHORT AN OVERLOAD (1) MALFUNCTION
3. <input type="checkbox"/> OVERLOAD (2)	3. <input type="checkbox"/> OVERLOAD (2) SET VALUE	3. <input type="checkbox"/> THIS SHORT AN OVERLOAD (2) MALFUNCTION
4. <input type="checkbox"/> OVERLOAD (3)	4. <input type="checkbox"/> OVERLOAD (3) SET VALUE	4. <input type="checkbox"/> THIS SHORT AN OVERLOAD (3) MALFUNCTION

1) DURING OPERATION

<input type="checkbox"/> NORMAL STOP	MOTOR REVERSAL OFF, FAN OPERATED OFF.	<input type="checkbox"/> NOT MALFUNCTION.
<input type="checkbox"/> 1 TIME STOP	RESET. REVERSE MAIN POWER HAS BEEN TURNED ON.	<input type="checkbox"/> PMS/PS POWER CIRCULATING ETC.
<input type="checkbox"/> 2 TIMES CUT	OVER CURRENT IS DETECTED.	<input type="checkbox"/> COMPRESSOR
<input type="checkbox"/> 3 TIMES PROTECTION	PROTECTION SIGNAL IS NOT INPUT DURING OPERATION.	<input type="checkbox"/> PMS/PS COMPRESSOR
<input type="checkbox"/> 4 TIMES SWITCHING FAILURE	THE REVERSE SIGNAL POSITION DETECTION SYNC. POSITION DETECTION SYNC.	<input type="checkbox"/> PMS/PS COMPRESSOR
<input type="checkbox"/> 5 TIMES LOWER LIMIT CUT	OVERLOAD CONDITION STILL EXISTS. ROTATION SPEED IS BELOW THE LOWER RPM LIMIT.	<input type="checkbox"/> PMS/PS COMPRESSOR

SELF-DIAGNOSIS LIGHTING MODE
 LIT BLINKING OFF

SELF-DIAGNOSIS LIGHTING MODE	DETAILS	MAIN CHECK POINT
1. <input type="checkbox"/> ON	1. <input type="checkbox"/> THERMOSTAT	1. <input type="checkbox"/> LEAK OF REFRIGERANT
2. <input type="checkbox"/> 6 TIMES TEMP. RISE	2. <input type="checkbox"/> THERMOSTAT IS OPERATING	2. <input type="checkbox"/> THERMOSTAT ERROR
3. <input type="checkbox"/> 7 TIMES ABNORMAL	3. <input type="checkbox"/> THERMOSTAT IS OPENED OR SHUTTED.	3. <input type="checkbox"/> THERMOSTAT IS FAULTY
4. <input type="checkbox"/> 8 TIMES REVERSE ERROR	4. <input type="checkbox"/> REVERSE ERROR IS OCCURRED WHEN INDOOR UNIT IS NOT STARTED.	4. <input type="checkbox"/> THERMOSTAT IS FAULTY
5. <input type="checkbox"/> 9 TIMES OUTDOOR	5. <input type="checkbox"/> REVERSE ERROR IS OCCURRED BETWEEN INDOOR AND OUTDOOR UNIT.	5. <input type="checkbox"/> THERMOSTAT IS FAULTY
6. <input type="checkbox"/> 10 TIMES POWER SUPPLY VOLTAGE ERROR	6. <input type="checkbox"/> POWER SUPPLY VOLTAGE IS INCORRECT.	6. <input type="checkbox"/> POWER SUPPLY VOLTAGE IS FAULTY. PIN IS NOT PROPERLY INSERTED.
7. <input type="checkbox"/> 11 TIMES FAN MOTOR OVERLOAD	7. <input type="checkbox"/> FAN MOTOR LOAD TOO HEAVY AND FAN MOTOR IS OVERHEATED.	7. <input type="checkbox"/> FAN MOTOR OVERLOAD CONDITION (WIND) IS OCCURRED.
8. <input type="checkbox"/> 12 TIMES FAN LOCK	8. <input type="checkbox"/> FAN MOTOR IS NOT ROTATING AS INTENDED RPM.	8. <input type="checkbox"/> FAN MOTOR OVERLOAD CONDITION
9. <input type="checkbox"/> 13 TIMES EEPROM READING ERROR	9. <input type="checkbox"/> EEPROM READING METHOD/CIRCUIT CANNOT BE USED.	9. <input type="checkbox"/> PMS/PS MAIN
10. <input type="checkbox"/> 14 TIMES ACTIVE CONVERTER OVER VOLTAGE IS DETECTED.	10. <input type="checkbox"/> ACTIVE CONVERTER OVER VOLTAGE IS DETECTED.	10. <input type="checkbox"/> PMS/PS COMPRESSOR
11. <input type="checkbox"/> 15 TIMES ACTIVE CONVERTER OVER CURRENT IS DETECTED.	11. <input type="checkbox"/> ACTIVE CONVERTER OVER CURRENT IS DETECTED.	11. <input type="checkbox"/> PMS/PS

2) DURING STOP

<input type="checkbox"/> NORMAL STOP	MOTOR REVERSAL OFF, FAN OPERATED OFF.	<input type="checkbox"/> NOT MALFUNCTION.
<input type="checkbox"/> 1 TIME STOP	RESET. REVERSE MAIN POWER HAS BEEN TURNED ON.	<input type="checkbox"/> PMS/PS POWER CIRCULATING ETC.
<input type="checkbox"/> 2 TIMES CUT	OVER CURRENT IS DETECTED.	<input type="checkbox"/> COMPRESSOR
<input type="checkbox"/> 3 TIMES PROTECTION	PROTECTION SIGNAL IS NOT INPUT DURING OPERATION.	<input type="checkbox"/> PMS/PS COMPRESSOR
<input type="checkbox"/> 4 TIMES SWITCHING FAILURE	THE REVERSE SIGNAL POSITION DETECTION SYNC. POSITION DETECTION SYNC.	<input type="checkbox"/> PMS/PS COMPRESSOR
<input type="checkbox"/> 5 TIMES LOWER LIMIT CUT	OVERLOAD CONDITION STILL EXISTS. ROTATION SPEED IS BELOW THE LOWER RPM LIMIT.	<input type="checkbox"/> PMS/PS COMPRESSOR

TABLE 2 : DURING SELF-DIAGNOSIS COMPLETED

SELF-DIAGNOSIS LIGHTING MODE	REPAIR METHOD
1. <input type="checkbox"/> LIT	<input type="checkbox"/> LIT <input type="checkbox"/> BLINKING <input type="checkbox"/> OFF
2. <input type="checkbox"/> 6 TIMES TEMP. RISE	<input type="checkbox"/> CHANGE COMPRESSOR
3. <input type="checkbox"/> 7 TIMES ABNORMAL	<input type="checkbox"/> CHANGE PMS/PS
4. <input type="checkbox"/> 8 TIMES REVERSE ERROR	<input type="checkbox"/> IF COMPRESSOR CONNECTOR LOOSE OR NG - CHECK COMPRESSOR CONNECTOR. <input type="checkbox"/> IF COMPRESSOR CONNECTOR OK - CHECK COMPRESSOR. CHANGE P.M.B.s
5. <input type="checkbox"/> 9 TIMES OUTDOOR	<input type="checkbox"/> IF AC VOLTAGE INPUT ABNORMAL (OVER STANDARD VOLTAGE +10%) - CHANGE P.M.B.s <input type="checkbox"/> IF AC VOLTAGE INPUT IS NORMAL (WITHIN +10%) - CHANGE P.M.B.s
6. <input type="checkbox"/> 10 TIMES POWER SUPPLY VOLTAGE ERROR	<input type="checkbox"/> CHANGE P.M.B. MAIN
7. <input type="checkbox"/> 11 TIMES FAN MOTOR OVERLOAD	<input type="checkbox"/> FAN MOTOR OVERLOAD CONDITION
8. <input type="checkbox"/> 12 TIMES FAN LOCK	<input type="checkbox"/> FAN MOTOR OVERLOAD CONDITION
9. <input type="checkbox"/> 13 TIMES EEPROM READING ERROR	<input type="checkbox"/> EEPROM READING ERROR
10. <input type="checkbox"/> 14 TIMES ACTIVE CONVERTER OVER VOLTAGE IS DETECTED	<input type="checkbox"/> OUTDOOR FAN MOTOR INSPECTION (SELF-DIAGNOSIS)
11. <input type="checkbox"/> 15 TIMES ACTIVE CONVERTER OVER CURRENT IS DETECTED	<input type="checkbox"/> OUTDOOR FAN MOTOR INSPECTION (SELF-DIAGNOSIS)

STRUCTURE OF ELECTRICAL

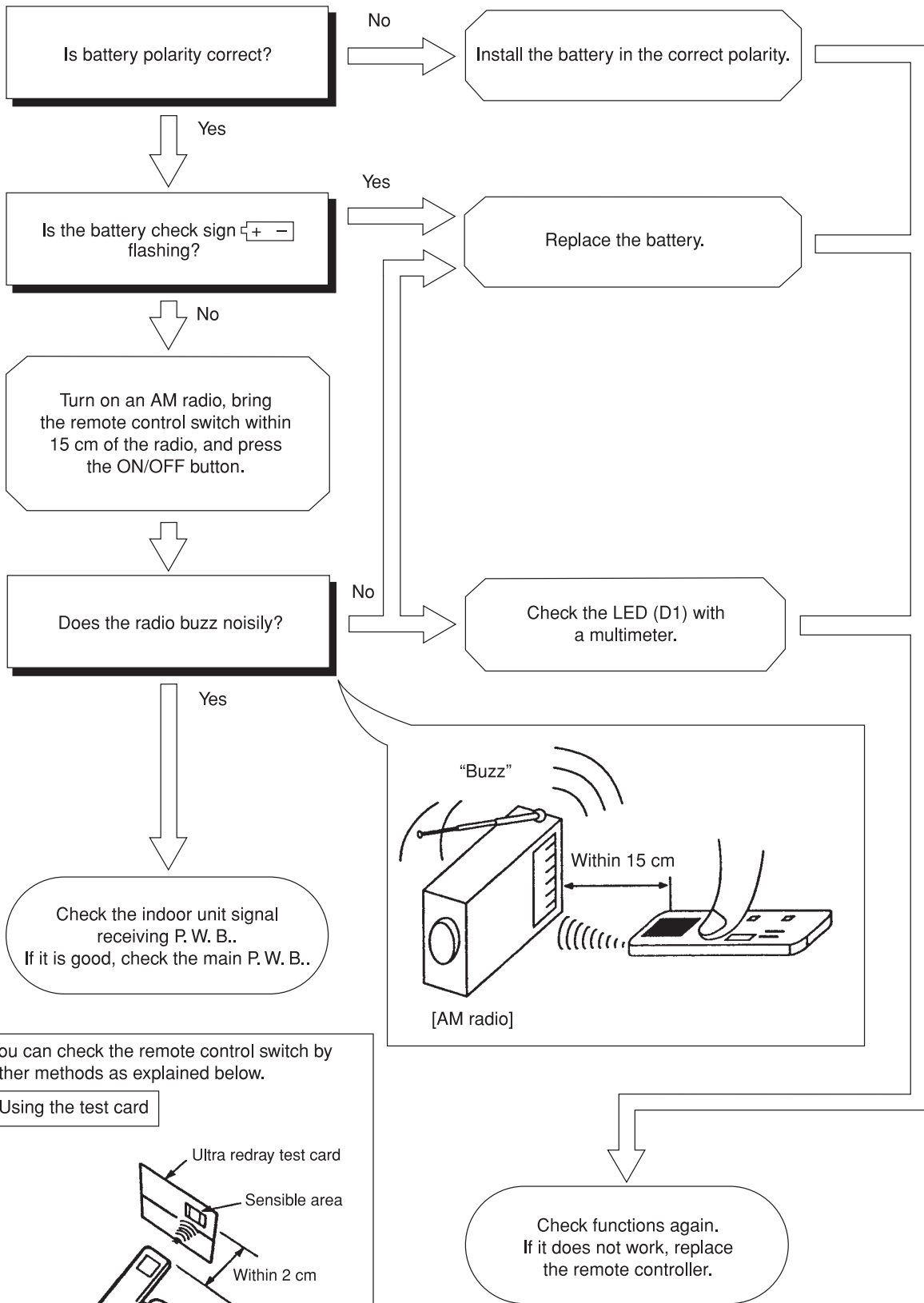
SELF-DIAGNOSIS BLINKS 2, 3, 4, AND 5 TIMES HAPPEN TO DETERMINE WHETHER COMPRESSOR OR ELECTRICAL UNIT FAULTY; BELOW DIAGNOSIS CAN BE FOLLOWED.

SELF-DIAGNOSIS METHOD

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.

CHECKING THE REMOTE CONTROLLER



You can check the remote control switch by other methods as explained below.

Using the test card

Ultra redray test card
Sensible area
Within 2 cm

The sensible area should flash in orange when you operate the remote control unit if it is good.

CHECKING THE REFRIGERATING CYCLE

(JUDGING BETWEEN GAS LEAKAGE AND COMPRESSOR DEFECTIVE)

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

Connect U,V,W phase leads to the power module again and operate the air conditioner.



Is the self-diagnosis lamp mode as shown on the right?

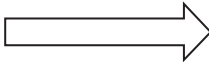
Self-diagnosis lamp	Lighting mode					
	Blinks 2 times	Blinks 3 times	Blinks 4 times	Blinks 5 times	Blinks 6 times	Blinks 8 times
LD301						
Time until the lamp lights	Approx. 10 seconds		Approx. 10 seconds	Within Approx. 30 seconds	Approx. 10 seconds	
Possible malfunctioning part	Compressor			Gas leakage	Compressor	

Blinking off

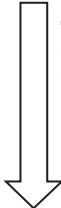


Stop to operate and check the gas pressure in balancing mode.

Normal
(0.39-0.98 MPaG)
(4-10 kg/cm²G)



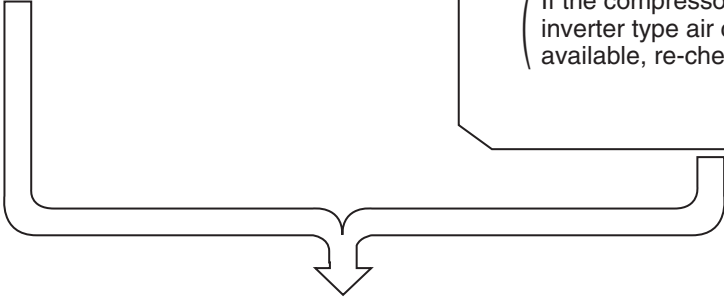
● Checking the system power module



Gas leaks.
Repair and seal refrigerant.



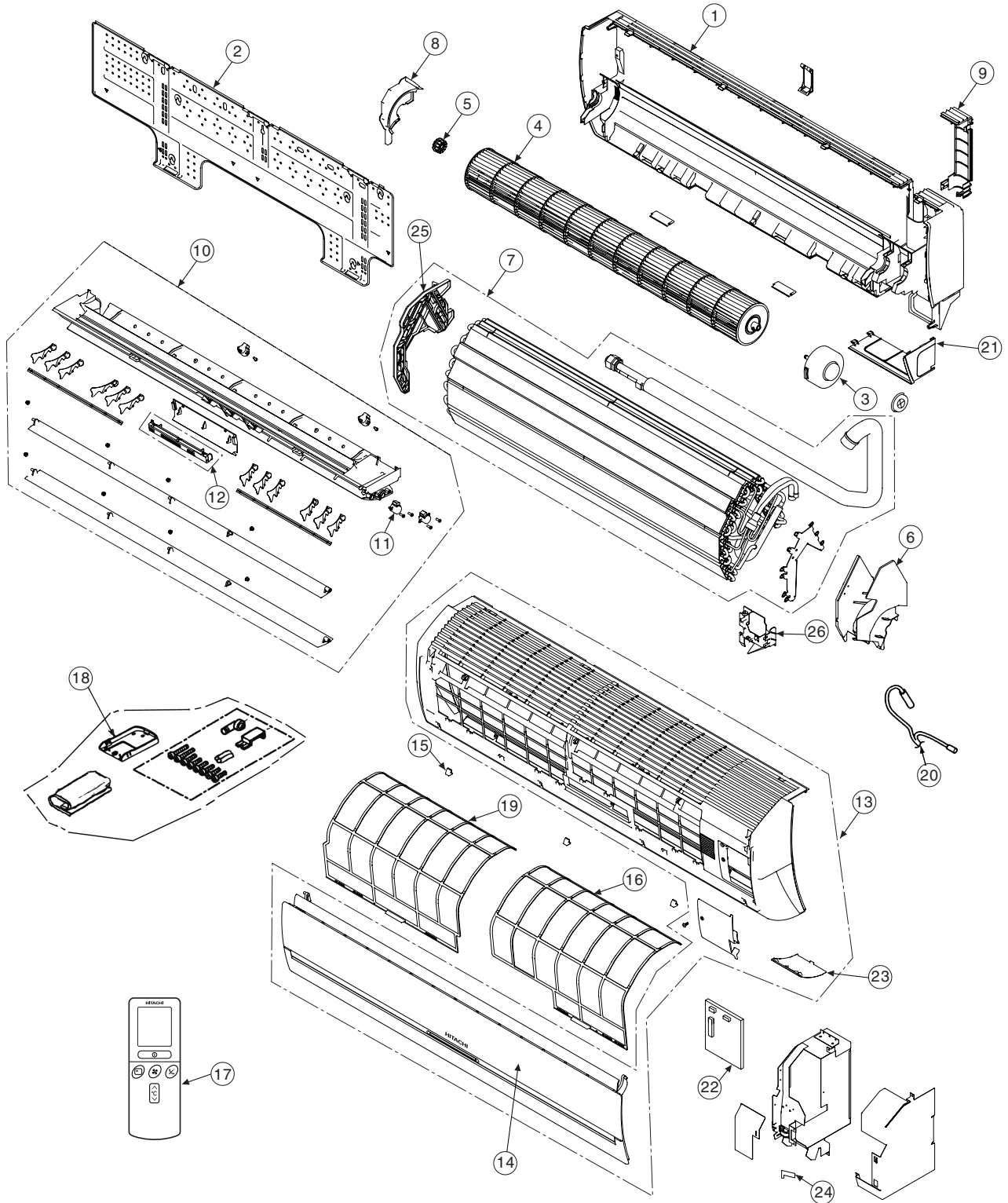
The compressor is defective. Replace it and seal refrigerant.
(If the compressor checker for an inverter type air conditioner is available, re-check using it.)



Perform a final check of operation.

PARTS LIST AND DIAGRAM

INDOOR UNIT MODEL : RAS-70YH7



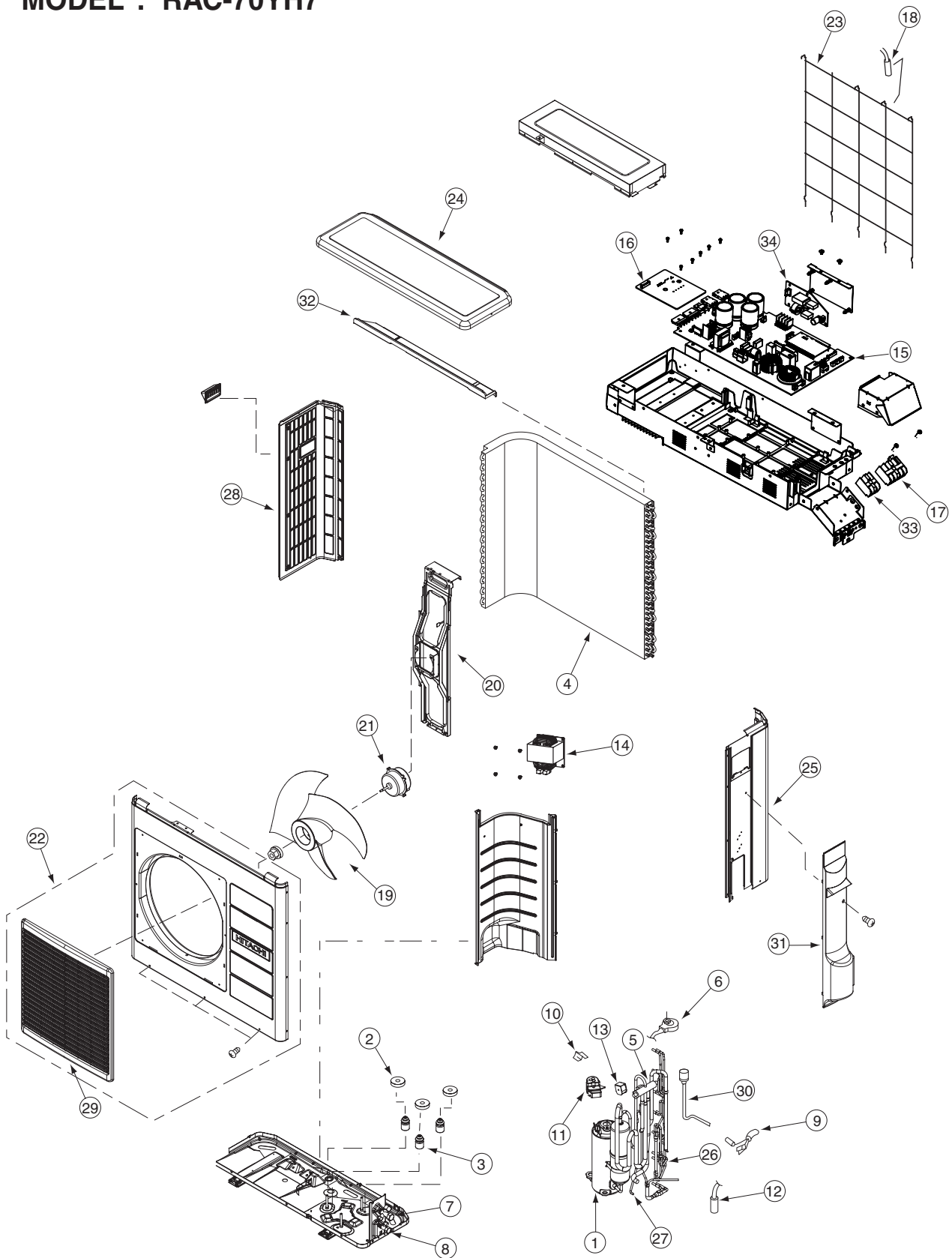
MODEL RAS-70YH7

NO.	PART NO.	Q'TY / UNIT	PARTS NAME
1	PMRAS-30CHP6 002	1	CABINET ASSY
2	PMRAS-72CHA3 013	1	MOUNTING PLATE
3	PMRAS-80YHA R01	1	FAN MOTOR
4	PMRAS-80YHA R04	1	TANGENTIAL FAN
5	PMRAS-72CHA3 017	1	P-BEARING ASSY
6	PMRAS-72CHA3 007	1	FAN MOTOR SUPPORT
7	PMRAS-70YH7 R03	1	CYCLE ASSY
8	PMRAS-72CHA3 005	1	BEARING COVER
9	PMRAS-24CE9G 004	1	PIPE SUPPORT (U-COVER)
10	PMRAS-80YHA R05	1	DRAIN PAN ASSY
11	PMRAS-72CHA3 R01	4	AUTO SWEEP MOTOR
12	PMRAS-70YH7 R04	1	P.W.B (LED)
13	PMRAS-80YH5 003	1	FRONT COVER ASSY
14	PMRAS-80YH5 002	1	FRONT PANEL
15	PMRAS-10C7M 008	3	CAP
16	PMRAS-72CHA3 009	1	FILTER (R)
17	PMRAS-70YH7 R02	1	REMOTE CONTROL ASSY
18	PMRAS-10C3M 003	1	REMOTE CONTROL SUPPORT
19	PMRAS-72CHA3 008	1	FILTER (L)
20	PMRAS-72CHA3 R22	1	THERMISTOR
21	PMRAS-70YHA1 006	1	S-COVER R
22	PMRAS-70YH7 R01	1	P.W.B (MAIN)
23	SVP-2WDS62329A	1	SE-COVER
24	PMRAS-72CHA3 015	1	P.W.B (RECEIVER)
25	PMRAS-72CHA3 024	1	FAN COVER
26	PMRAS-72CHA3 018	1	PIPE SUPPORT

PARTS LIST AND DIAGRAM

OUTDOOR UNIT

MODEL : RAC-70YH7



MODEL RAC-70YH7

NO.	PART NO.	Q'TY / UNIT	PARTS NAME
1	PMRAC-60YH7 S01	1	COMPRESSOR
2	KPNT1 001	6	PUSH NUT
3	RAC-2226HV 805	3	COMPRESSOR RUBBER
4	PMRAC-70YHA S03	1	CONDENSER
5	PMRAC-70YHA1 999	1	REVERSING VALVE
6	PMRAC-25NH4 S03	1	ELECTRICAL EXPANSION COIL
7	PMRAC-80YHA 905	1	VALVE (5S)
8	PMRAC-50NH4 S03	1	VALVE (2S)
9	PMRAM-72Q8 S03	1	THERMISTOR (OH)
10	PMRAC-25NH4 S09	1	OVERHEAT THERMISTOR SUPPORT
11	PMRAC-X13CX 906	1	OVERLOAD RELAY COVER
12	PMRAC-50YHA2 S07	1	THERMISTOR (DEFROST)
13	PMRAC-50YHA2 S09	1	COIL (REVERSING VALVE)
14	PMRAC-50YHA2 S04	1	REACTOR
15	PMRAC-70YHA2 S01	1	P.W.B (MAIN)
16	PMRAC-70YHA2 S02	1	P.W.B (IPM)
17	PMRAS-25NH4 S13	1	TERMINAL BOARD (4P)
18	PMRAM-72Q8 S03	1	THERMISTOR (OUTSIDE TEMPERATURE)
19	PMRAC-70YHA 907	1	PROPELLER FAN
20	PMRAC-70YHA S12	1	SUPPORT (FAN MOTOR)
21	PMRAC-70YHA2 S05	1	FAN MOTOR
22	PMRAC-70YHA S01	1	CABINET
23	PMRAC-70YHA S06	1	NET
24	PMRAC-24CP5 905	1	TOP COVER
25	PMRAC-70YHA S09	1	SIDE PLATE-R
26	PMRAC-70YHA2 S04	1	STRAINER (COND)
27	PMRAC-70YHA 910	1	STRAINER (PIPE)
28	PMRAC-70YHA 908	1	SIDE PLATE-L
29	PMRAC-70YHA S05	1	GRILL
30	PMRAC-80YHA 906	1	EXPANSION VALVE
31	PMRAC-70YHA 915	1	SV-COVER
32	PMRAC-70YHA 916	1	NET COVER
33	PMRAC-63CA1 S02	1	TERMINAL BOARD (2P)
34	PMRAC-70YHA2 S03	1	P.W.B (NF-BOARD)

HITACHI

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