

### SERVICE MANUAL TECHNICAL INFORMATION

**RAF-25RPA/RAC-25FPA  
RAF-35RPA/RAC-35FPA**

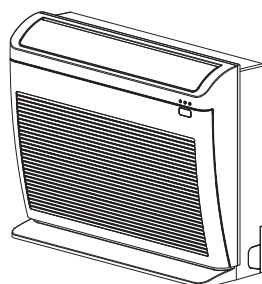
REFER TO THE FOUNDATION MANUAL

**FOR SERVICE PERSONNEL ONLY**

#### CONTENTS

SPECIFICATIONS	6
HOW TO USE	8
CONSTRUCTION AND DIMENSIONAL DIAGRAM	27
MAIN PARTS COMPONENT	29
WIRING DIAGRAM	31
WIRING DIAGRAM OF THE PRINTED WIRING BOARD	32
BLOCK DIAGRAM	35
BASIC MODE	36
REFRIGERATING CYCLE DIAGRAM	46
DISASSEMBLY & ASSEMBLY PROCEDURE	48
DESCRIPTION OF MAIN CIRCUIT OPERATION	54
SERVICE CALL Q&A	75
TROUBLE SHOOTING	78
PARTS LIST AND DIAGRAM	113

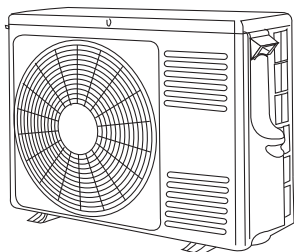
INDOOR UNIT



**RAF-25RPA  
RAF-35RPA**



OUTDOOR UNIT



**RAC-25FPA  
RAC-35FPA**

#### SPECIFICATIONS

TYPE		DC INVERTER			
		INDOOR UNIT	OUTDOOR UNIT	INDOOR UNIT	OUTDOOR UNIT
MODEL		RAF-25RPA	RAC-25FPA	RAF-35RPA	RAC-35FPA
POWER SOURCE		1 PHASE, 50Hz, 220V - 230V			
COOLING	TOTAL INPUT (W)	670 (250 ~ 1,290)		940 (250 ~ 1,400)	
	TOTAL AMPERES (A)	3.43- 3.59		4.31- 4.50	
	CAPACITY (kW)	2.5 (0.9 ~ 3.1)		3.5 (1.1 ~ 4.2)	
	(B.T.U./h)	8,530 (3,070 ~ 10,580)		11,942 (3,753 ~ 14,330)	
HEATING	TOTAL INPUT (W)	850 (115 ~ 1,250)		1,050 (250 ~ 1,800)	
	TOTAL AMPERES (A)	4.11 - 4.30		4.81 - 5.03	
	CAPACITY (kW)	3.4 (0.9 ~ 4.4)		4.2 (1.1 ~ 5.2)	
	(B.T.U./h)	11,601 (3,070 ~ 15,010)		14,330 (3,753 ~ 17,742)	
DIMENSIONS (mm)	W	760	750 (+91)※	760	750 (+91)※
	H	600	548	600	548
	D	235	288 (+47)※	235	288 (+47)※
NET WEIGHT (kg)		14	33	14	36

※After installation

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

## ROOM AIR CONDITIONER

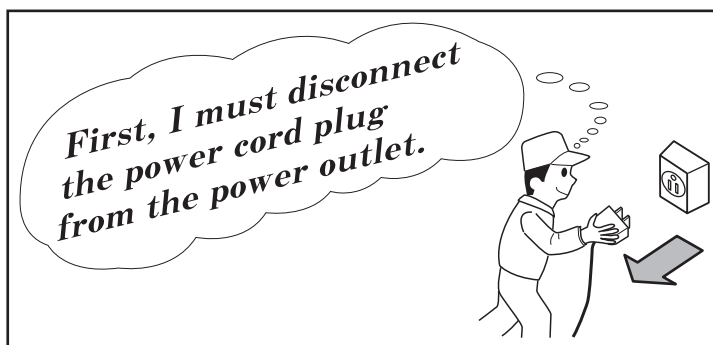
INDOOR UNIT + OUTDOOR UNIT

JULY 2013

Hitachi Household Appliances(Wuhu) Co., Ltd.

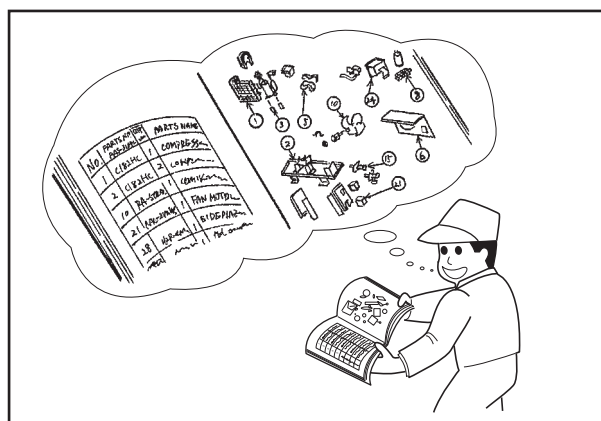
## SAFETY DURING REPAIR WORK

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 the 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 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 after reinforced or at a new location.
10. Any inflammable object must not 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

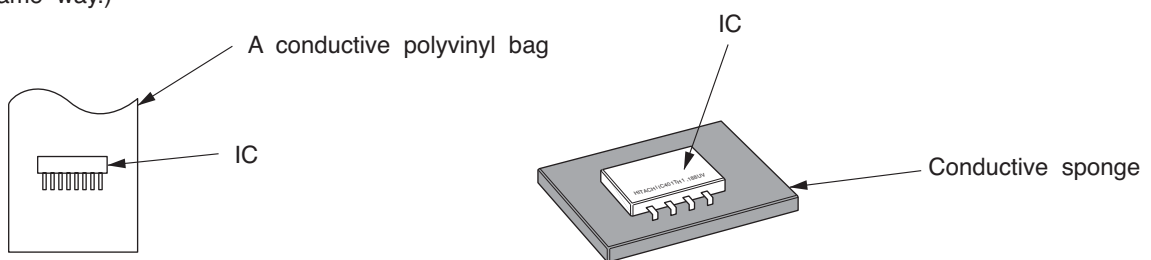
The standards provide for items to be generally observed in carrying and handling semiconductors in relative manufactures during maintenance and handling thereof. (They apply the same to handling of abnormal goods such as rejected goods being returned.)

## 2. Object parts

- (1) Microcomputer
- (2) Integrated circuits (I.C.)
- (3) Field effective transistor (F.E.T.)
- (4) P.C. boards or the like to which the parts mentioned in (1) and (2) of this paragraph are equipped.

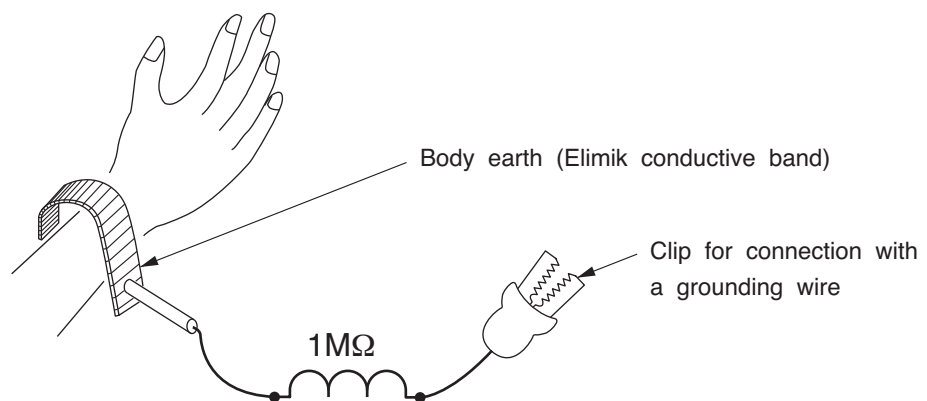
## 3. Items to be observed in handling

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



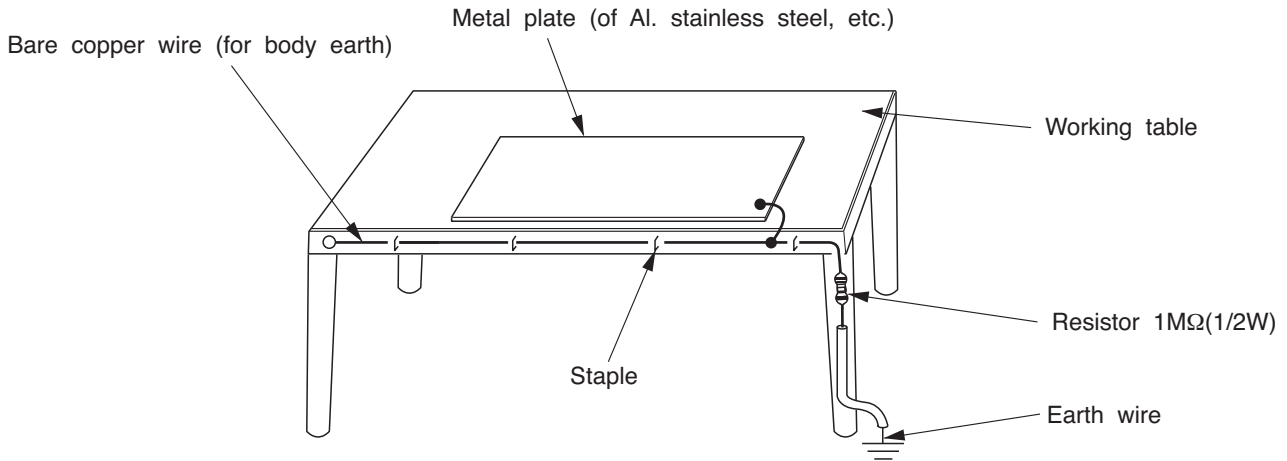
**Fig. 1 Conductive container**

- (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.

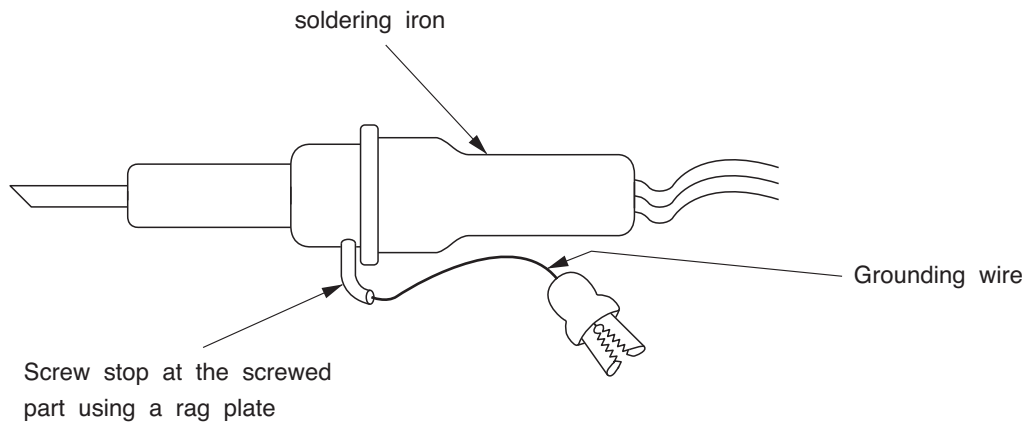


**Fig. 2 Body earth**

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



**Fig.3 Grounding of the working table**



**Fig.4 Grounding a solder 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 short circuit a load circuit or the like.

## **▲ CAUTION**

1. In quiet operation or stopping the running, its heard slight flowing noise of refrigerant in the refrigerating cycle occasionally, but this noise is not abnormal for the operation.
2. When it thunders near by, it is recommend to stop the operation and to disconnect the power cord plug from the power outlet for safety.
3. The room air conditioner dose not start automaticaly after recovery of the electric power failure for preventing fuse blowing. Re-press START / STOP button after 3 minutes from when unit stopped.
4. If the room air conditioner is stopped by adjusting thermostat, or missoperation, and re-start in a moment, there is occasion that the cooling and heating operation does not start for 3 minutes, it is not abnormal and this is the result of the operation of IC delay circuit. This IC delay circuit ensures that there is no danger of blowing fuse or damaging parts even if operation is restarted accidentally.
5. This room air conditioner should not be used at the cooling operation when the outside temperature is below  $-10^{\circ}\text{C}$  ( $14^{\circ}\text{F}$ ).
6. This room air conditioner (the reverse cycle) should not be used when the outside temperature is below  $-15^{\circ}\text{C}$  ( $5^{\circ}\text{F}$ ).  
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 front 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

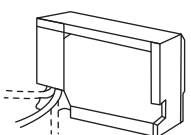
MODEL		RAF-25RPA RAF-35RPA	RAC-25FPA	RAC-35FPA
FAN MOTOR		20W (DC35V)	47W DC120-380V	
FAN MOTOR CAPACITOR		NO		
FAN MOTOR PROTECTOR		NO		
COMPRESSOR		———	ASD102CK-A7JK	
OVER HEAT PROTECTOR		NO	YES	
OVERLOAD RELAY		NO	YES	
FUSE (for MICRO COMPUTER)		NO	3.15A	
POWER RELAY, STICK RELAY		NO	G4A-1A	
POWER SWITCH		NO		
TEMPORARY SWITCH		YES	NO	
SERVICE SWITCH		NO	YES	
TRANSFORMER		NO	NO	
VARISTOR		NO	450NR	
NOISE SUPPRESSOR		NO	YES	
THERMOSTAT		YES (IC)	YES(IC)	
REMOTE CONTROL SWITCH (LIQUID CRYSTAL)		YES	NO	
REFRIGERANT CHARGING VOLUME (R410A)	UNIT	———	870g	1120g
	PIPES (MAX. 20m MIN. 5m)	WITHOUT REFRIGERANT BECAUSE COUPLING IS FLARE TYPE.		

Figure showing the installation of Indoor and Outdoor unit

MODEL RAF-25RPA/RAC-25FPA  
RAF-35RPA/RAC-35FPA

**[Indoor unit installation]**

**Direction of Piping**

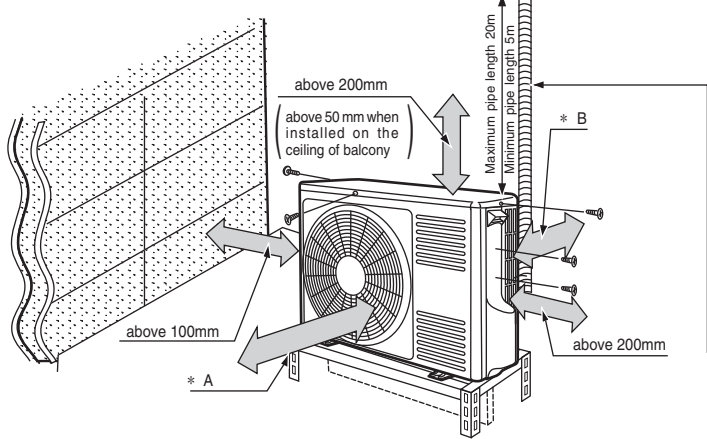
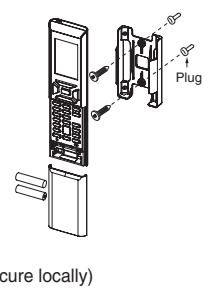
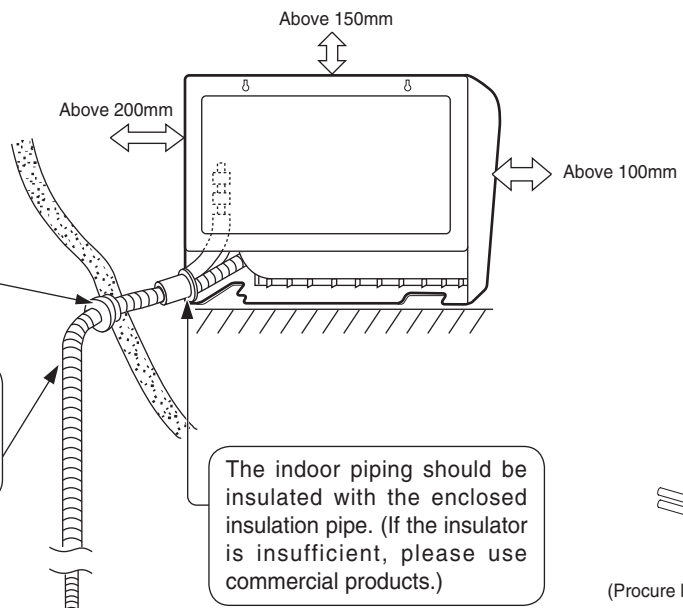


Piping con guration may be in three different directions: direct rear piping, right downward piping and right sideways piping.

Be sure to completely seal any gap with putty.

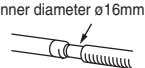
Drain pipe  
Must be installed separately.  
Insulate indoor part of pipe to prevent condensation.

The clearances of the unit from top, left, right and front are specified in figure below. At least three of the above sides must be open air.



- The refrigerating machine oil is easily affected by moisture. Use caution to prevent water from entering the cycle.
- The difference in height between the indoor and outdoor unit should be kept below 10m.
- The connecting pipe, no matter big or small, should all be insulated with insulation pipe and then wrapped with vinyl tape. (The insulator will deteriorate if it is not wrapped with tape.)

The connection of insulated drain hose.  
Please use insulated drain hose for the indoor piping (commercial product).



For outdoor unit installation, allow at least 2 sides of space around the unit to ensure ventilation ue.

	RAC-25FPA	RAC-35FPA
A	above 300mm	above 300mm
B	above 50mm	above 50mm



# 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 signs indicate the following meanings. (The following are examples of signs.)

- Make sure to connect earth line.
- The sign in the gure indicates prohibition.
- Indicates the instructions that must be followed.

- Please keep this manual after reading.

## PRECAUTIONS DURING INSTALLATION

<b>▲ WARNING</b>	<ul style="list-style-type: none"> <li>• Do not reconstruct the unit. Water leakage, fault, short circuit or fire may occur if you reconstruct the unit by yourself.</li> <li>• Please ask your sales agent or qualified technician for the installation of your unit.</li> <li>• Water leakage, short circuit or fire may occur if you install the unit by yourself.</li> <li>• 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.</li> <li>• Be sure to use the specified piping set for R410A. Otherwise, this may result in broken copper pipes or faults.</li> <li>• A circuit breaker should be installed depending on the mounting site of the unit. Without a circuit breaker, the danger of electric shock exists.</li> <li>• Do not install the unit near a location where there is flammable gas. The outdoor unit may catch fire if flammable gas leaks around it. Piping shall be suitable supported with a maximum spacing of 1m between the supports.</li> <li>• Please ensure smooth flow of water when installing the drain hose. If any failure is found in the drain path, water drops from the indoor and outdoor units, causing wet household effects.</li> <li>• Make sure that a single phase 230V power source is used. The use of other power sources may cause electrical components to overheat and lead to fire.</li> </ul>
<b>▲ CAUTION</b>	<ul style="list-style-type: none"> <li>•  Do not reconstruct the unit by yourself.</li> <li>•  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.</li> <li>•  Do not reconstruct the unit by yourself.</li> <li>•  Do not reconstruct the unit by yourself.</li> </ul>

## PRECAUTIONS DURING OPERATION

<b>▲ WARNING</b>	<ul style="list-style-type: none"> <li>• Do not use any conductor as fuse wire, this could cause fatal accident.</li> <li>•  During thunder storm, disconnect the plug top or turn off the circuit breaker.</li> <li>•  Spray cans and other combustibles should not be located within a meter of the air outlets of both indoor and outdoor units. As a spray can's internal pressure can be increased by hot air, a rupture may result.</li> <li>•  The product shall be operated under the manufacturer specification and not for any other intended use.</li> <li>•  Do not attempt to operate the unit with wet hands, this could cause fatal accident.</li> <li>•  When operating the unit with burning equipments, regularly ventilate the room to avoid oxygen insufficiency.</li> <li>•  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.</li> <li>• Please ensure that outdoor mounting frame is always stable, firm and without defect. If not, the outdoor unit may collapse and cause danger.</li> <li>•  Do not wash the unit with water or place a water container such as a vase on the indoor unit. Electrical leakage could be present and cause electric shock.</li> <li>•  Do not place plants or animals directly under the air flow as it is bad for the plants or animals.</li> <li>•  Do not climb on the outdoor unit or put objects on it.</li> </ul>
<b>▲ CAUTION</b>	<ul style="list-style-type: none"> <li>• 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.</li> <li>•  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.</li> <li>• This appliance especially indoor unit cleaning must be performed by authorized personnel only. Consult your sales agent. Using a commercially available detergent or similar can damage the plastic parts or clog the drain pipe, causing water to drip with potential electric shock hazard.</li> <li>•  Do not touch the air outlet, bottom surface and aluminum fin of the outdoor unit. You may get hurt.</li> <li>•  Do not touch the refrigerant pipe and connecting valve. Burns may result.</li> <li>• 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 this appliance safely.</li> <li>• Young children should be supervised to ensure that they do not play with the appliance.</li> </ul>

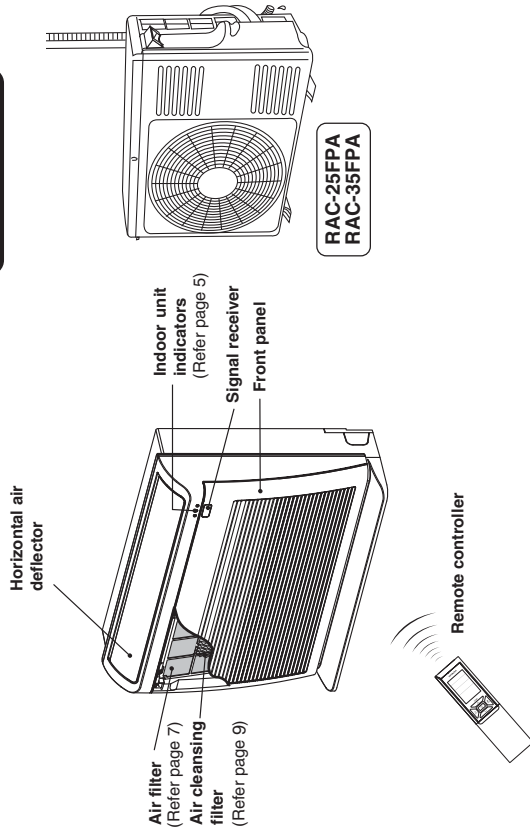
## PRECAUTIONS DURING SHIFTING OR MAINTENANCE

<b>▲ WARNING</b>	<ul style="list-style-type: none"> <li>• Should abnormal situation arise (like burning smell), please stop operating the unit and remove plug from the socket or 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.</li> <li>• Please contact your agent for maintenance. Improper self maintenance may cause electric shock and fire.</li> <li>• 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.</li> <li>• Avoid an extended period of direct air flow for your health.</li> <li>• Do not connect the power cable with an extension cable or do not plug too many leads of the other electric appliance into the socket where this cable is plugged. In addition, wire the cable with some allowances to prevent the cable from stretching. Not doing so will cause an electrical shock, heat generation or fire.</li> <li>• Do not bundle the power cable, pull it, put something on it, heat it, process it, or put it between things. Breackage of the power cable may result. Use of a damaged cable may cause an electrical shock or a fire.</li> <li>•  Do not put objects like thin rods into the panel of blower and suction side because the high-speed fan inside may cause danger.</li> </ul>
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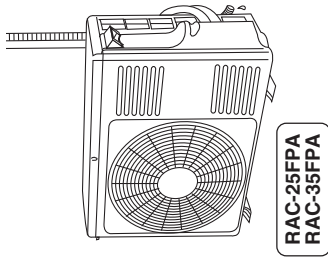


**NAMES AND FUNCTIONS OF EACH PART**

**INDOOR UNIT**



**OUTDOOR UNIT FOR SINGLE SPLIT MODEL**

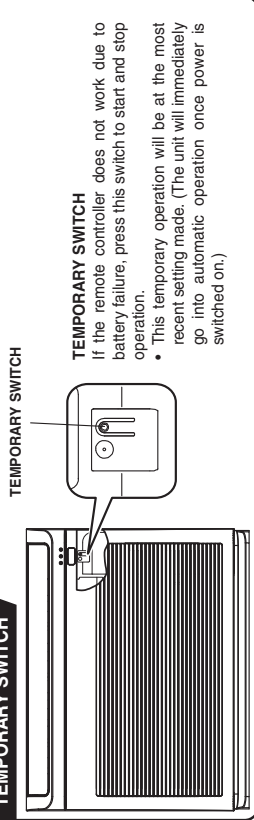


**MODEL NAME AND DIMENSIONS**

MODEL	WIDTH	HEIGHT	DEPTH
RAF-25RPA RAF-35RPA (INDOOR UNIT)	760mm	600mm	235mm
RAC-25FPA	750mm	548mm	288mm
RAC-35FPA	750mm	548mm	288mm

\* OUTDOOR UNIT for single split model.

**TEMPORARY SWITCH**

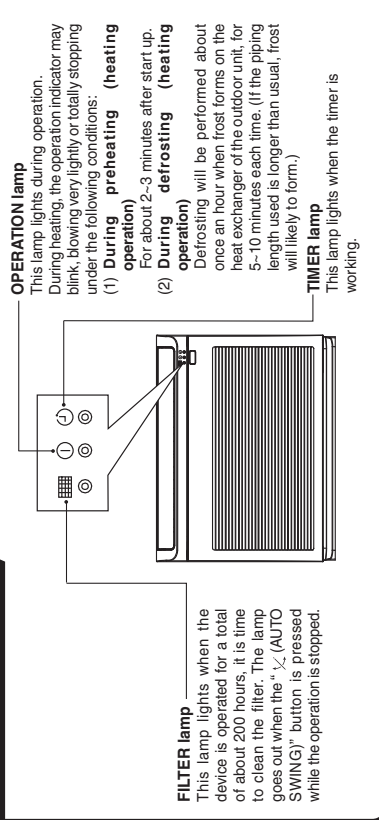


**TEMPORARY SWITCH**

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 most recent setting made. (The unit will immediately go into automatic operation once power is switched on.)

**INDOOR UNIT INDICATORS**



**FILTER lamp**  
This lamp lights when the device is operated for a total of about 200 hours, it is time to clean the filter. The lamp goes out when the "X (AUTO SWING)" button is pressed while the operation is stopped.

**OPERATION lamp**

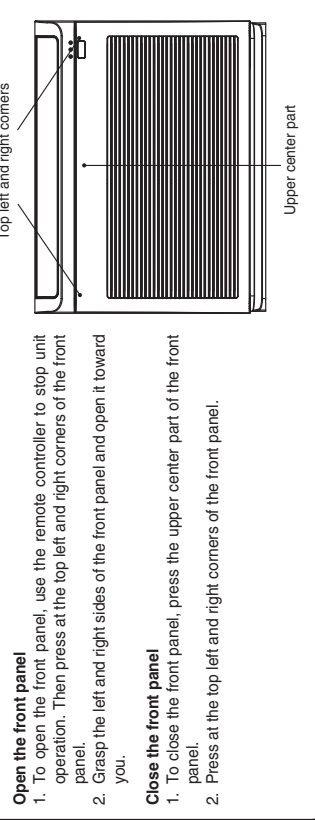
This lamp lights during operation. During heating, the operation indicator may blink, blowing very lightly or totally stopping under the following conditions:

- (1) During preheating (heating operation)  
For about 2-3 minutes after start up.
- (2) During defrosting (heating operation)  
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. (If the piping length used is longer than usual, frost will likely to form.)

**TIMER lamp**

This lamp lights when the timer is working.

**HOW TO OPEN OR CLOSE THE FRONT PANEL**



**Open the front panel**

1. To open the front panel, use the remote controller to stop unit operation. Then press at the top left and right corners of the front panel.
2. Grasp the left and right sides of the front panel and open it toward you.

**Close the front panel**

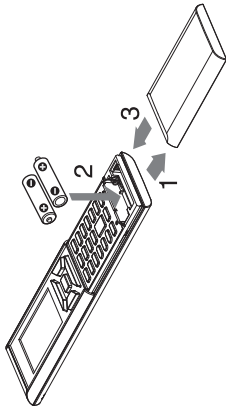
1. To close the front panel, press the upper center part of the front panel.
2. Press at the top left and right corners of the front panel.



## PREPARATION BEFORE OPERATION

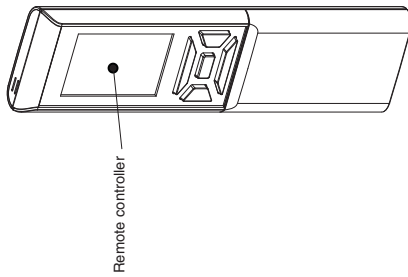
### To install the batteries

- Slide the cover to take it off.
- Install two dry batteries AAA, LR03 (alkaline). The direction of the batteries should match the marks in the case.
- Replace the cover at its original position.

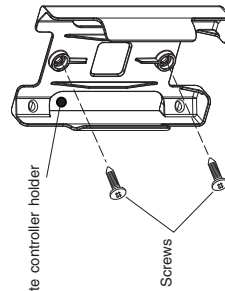


### To fix the remote controller holder to the wall

- Choose a place from where the signals can reach the unit.
- Fix the remote controller holder to a wall, a pillar or similar location with the provided screws.
- Place the remote controller in the remote controller holder.



Remote controller



Remote controller holder

Screws

### NOTE

#### Notes on batteries

- When replacing the batteries, use batteries of the same type, and replace both old batteries together.
- When the system is not used for a long time, take the batteries out.
- The batteries will last for approximately 1 year. However, if the remote controller display begins to fade and degradation of reception performance occurs within a year, replace both batteries with new size AAA, LR03 (alkaline).
- The attached batteries are provided for the initial use of the system.
- The usable period of the batteries may be short depending on the manufactured date of the air conditioner.

#### Notes on the remote controller

- Never expose the remote controller to direct sunlight.
- Dust on the signal transmitter or receiver will reduce the sensitivity. Wipe off dust with soft cloth.
- Signal communication may be disabled if an electronic-starter-type fluorescent lamp (such as inverter-type lamps) is in the room. Consult the shop if that is the case.
- If the remote controller signals happen to operate another appliance, move that appliance to somewhere else, or consult the service shop.
- When the remote controller is not in use, please close the slide cover to prevent failure.

## PREPARATION BEFORE OPERATION

### To set calendar and clock

- Press **RESET** (RESET) button when first time setting. "Year" blinks.
- Press **TIME** (TIME) button to set the current year.
- Press **CLOCK** (CLOCK) button. Next, "Day" and "Month" blink.
- Press **TIME** (TIME) button to set the current day and month.
- Press **CLOCK** (CLOCK) button. Next, "CLOCK" blinks.
- Press **TIME** (TIME) button to set the clock to the current time.
- Press **CLOCK** (CLOCK) button. Calendar and clock are set.

To modify the calendar and clock, press **CLOCK** (CLOCK) button. Then follow steps 1 to 7.

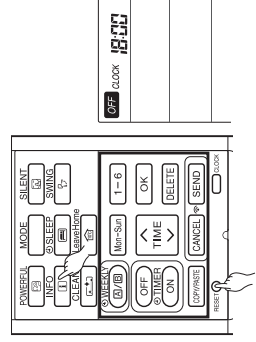
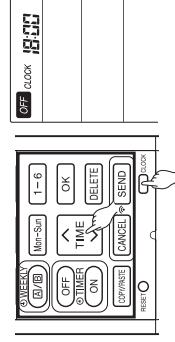
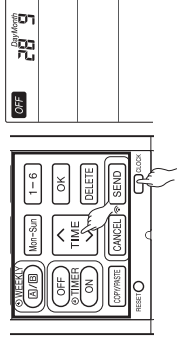
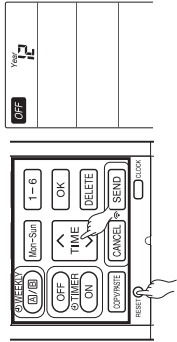
Calendar and clock shall be set again after changing batteries.

After changing the batteries,

- Press **RESET** (RESET) button.
- Direct remote control towards indoor unit and press **INFO** (INFO) button.
- The calendar and clock from indoor unit will be transmitted.

Calendar and clock will not be transmitted from indoor unit when the following occurs:

- When there is a power failure.
- When breaker is OFF by user (unit is not in STANDBY MODE).



### NOTE

Note on setting the calendar and clock

- If the calendar and clock are not set, the ON-timer, OFF-timer and Weekly Timer cannot be set.
- If the calendar and clock are not set correctly, the ON-timer, OFF-timer and Weekly Timer will not operate correctly.
- When the ON-timer, OFF-timer and Weekly Timer are set, the calendar and clock cannot be changed. If need to change the calendar and clock, ON-timer, OFF-timer and Weekly Timer need to be cancelled.



## NAMES AND FUNCTIONS OF REMOTE CONTROLLER

### 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 controller 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.
- When remote controller is not in use for about 3 minutes during OFF condition, indicated by **OFF** on the display, the LCD will turn off.
- During clock setting, the LCD will turn off about 10 minutes later if the remote controller is not in use.
- When pressing any button, the LCD will turn on.
- The LCD will not turn off during TIMER setting.

### Signal Transmitting/Receiving Window

Point this window towards the indoor unit when controlling it.

### Sensor

A temperature sensor inside the remote controller senses ambient temperature around the remote-controller.

### Display

This indicates the room temperature selected, current time, timer status, function and airflow rate selected.

### ROOM TEMPERATURE setting Buttons

Press these buttons to set the room temperature.

Press the [ **▲** ] button to raise the room temperature.

Press the [ **▼** ] button to lower the room temperature.

Keep pressing and the value will change more quickly.

### Transmission sign

The transmission sign lights up when a signal is sent.

### START/STOP button

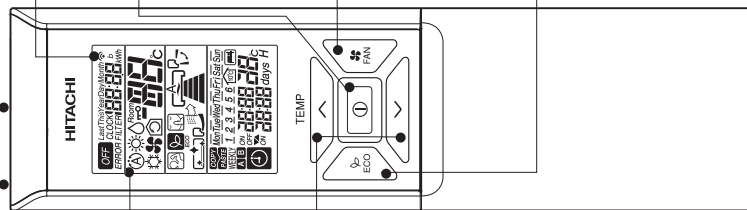
Press this button to start operation. Press it again to stop operation.

### FAN SPEED selector Button

This determines the fan speed. Every time you press this button the airflow rate will change from (AUTO) → (HIGH) → (MED) → (LOW) → (SILENT) (This button allows selection of optimal or preferred fan speed for each operation mode).

### ECO Button

Use this button to set the ECO mode.(▶ p.18)



## NAMES AND FUNCTIONS OF REMOTE CONTROLLER

### POWERFUL Button

Use this button to set the POWERFUL mode.(▶ p.16)

### INFORMATION Button

(▶ p.30)

### ONE TOUCH CLEAN Button

(▶ p.20)

### LEAVE HOME Button

(▶ p.19)

### SLEEP TIMER Button

Use this button to set the sleep timer. (▶ p.22)

### MODE selector Button

Use this button to select the operating mode. Every time you press this button, the mode will change from (AUTO) → (HEAT) → (COOL) → (DEHUMIDIFY) → (FAN) cyclically.

### SILENT Button

Use this button to set the SILENT mode.(▶ p.17)

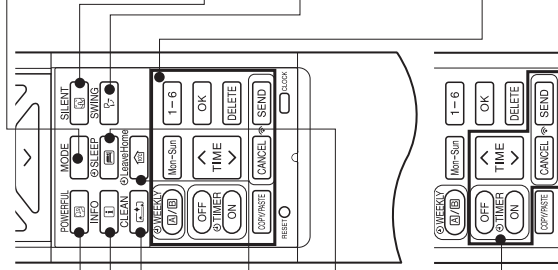
### AUTO SWING (Vertical) Button

Controls the angle of the horizontal air deflector.(▶ p.15)

FILTER lamp goes when the (AUTO SWING) button is pressed while the device is on "STANDBY MODE".

### WEEKLY TIMER setting Buttons

(▶ p.24)



### ON / OFF TIMER setting Buttons

(▶ p.21)

MODE SELECTOR	FAN	ON / OFF TIMER
AUTO	POWERFUL	TIME
HEAT	SILENT	OK
DEHUMIDIFY	INFO	DELETE
COOL	SLEEP TIMER	COPY/PASTE
FAN	LEAVE HOME	CANCEL
FAN SPEED	CLEAN	SEND
AUTO	DAY	CLOCK
SILENT	PROGRAM NO.	
LOW		
MED		
HI		
START / STOP		
ECO		

FAN	ON / OFF TIMER
POWERFUL	TIME
SILENT	OK
INFO	DELETE
SLEEP TIMER	COPY/PASTE
LEAVE HOME	CANCEL
CLEAN	SEND
DAY	CLOCK
PROGRAM NO.	

### 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 MODE 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 air flow direction.
- Note: 1. If you do not require Auto Restart Control, please consult your sales agent.  
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 or COOL 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 is connected to multi type outdoor unit.

**1** Press the MODE selector button so that the display indicates the (AUTO) mode of operation.

- When AUTO has been selected, the device will automatically determine the mode of operation, HEAT or COOL depending on the current room temperature. However the mode of operation will not change when indoor unit is 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).

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

→ (AUTO) → (HIGH) → (MED) ←  
← (SILENT) ← (LOW) ←

**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 depending on conditions.

**START/STOP**

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

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

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

Press the **FAN** (FAN SPEED) button to select AUTO, HI, MED, LOW or SILENT.



## 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 maintain reliability of the device, please use this device when outdoor temperature is above -15°C.

**1** Press the MODE selector button so that the display indicates (HEAT).

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

→ (AUTO) → (HIGH) → (MED) ←  
← (SILENT) ← (LOW) ←

**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 depending on conditions.

**START/STOP**

- As the settings are stored in the memory of the remote controller, you only have to press the (START/STOP) button next time.
- During AUTO fan, the fan speed automatically changes as below:
  - When the difference between room temperature and setting temperature is large, fan starts to run at HI speed.
  - After room temperature reaches the preset temperature, fan speed will be changed to lower speed to obtain optimum room temperature condition for natural healthy heating.

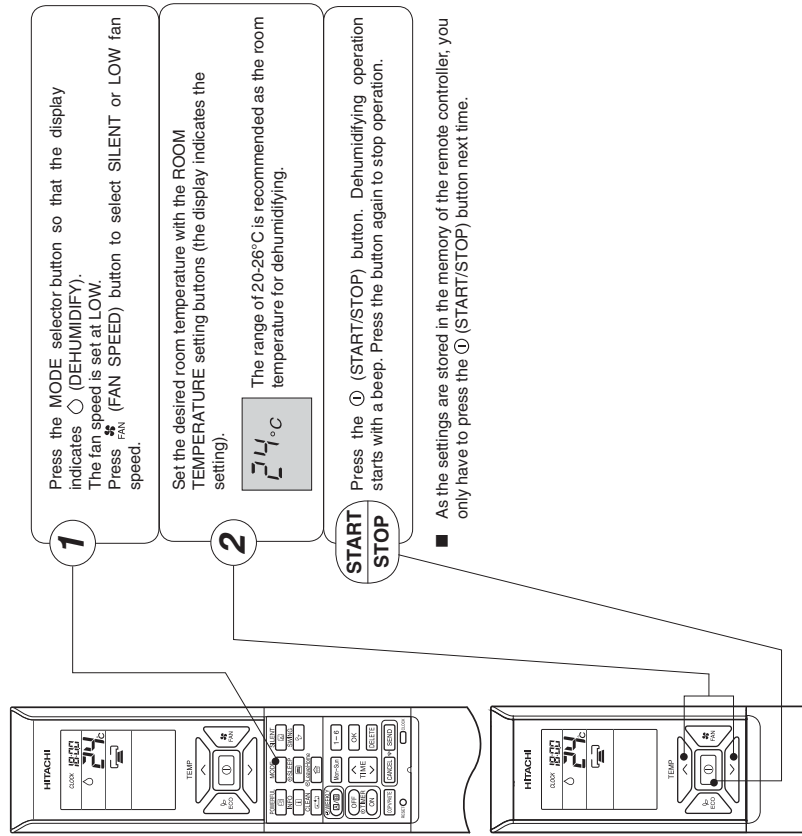
### Defrosting

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 a cycle of 3 seconds on and 0.5 second off. The maximum time for defrosting is 20 minutes.  
However, if the indoor unit 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 is likely to form.)



## DEHUMIDIFYING OPERATION

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

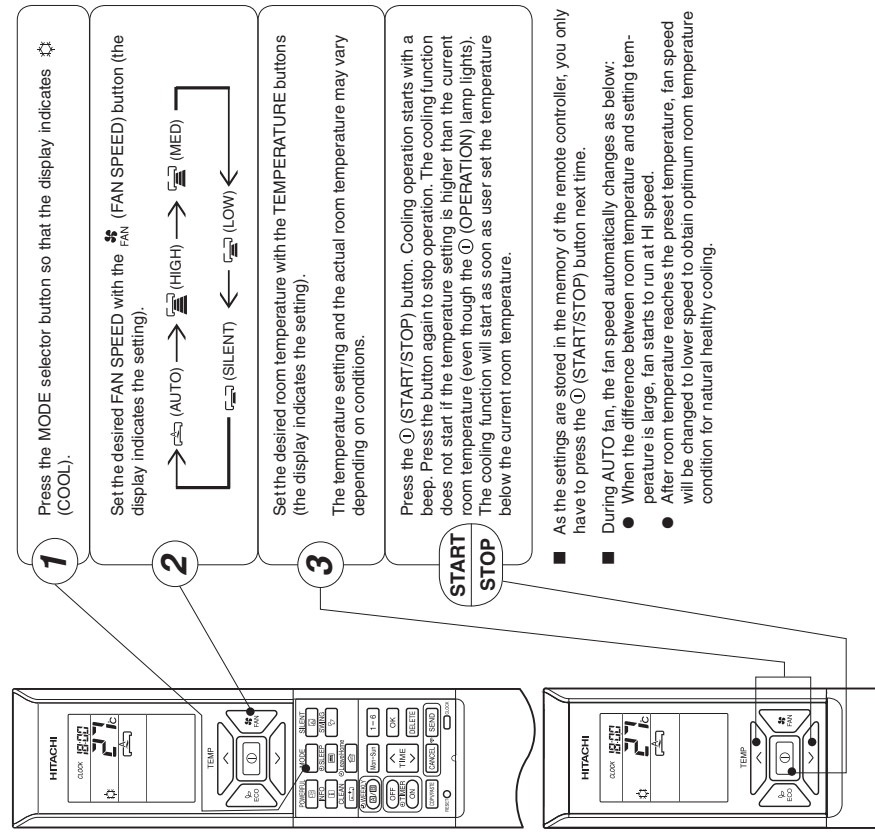


### Dehumidifying Function

- When the room temperature is higher than the temperature setting: The device will dehumidify the room, reducing the room temperature to the preset level.
- When the room temperature is lower than the temperature setting: Dehumidifying will be performed at the temperature setting slightly lower than the current room temperature, regardless of the temperature setting.
- The preset room temperature may not be reached depending on the number of people present in the room or other room conditions.

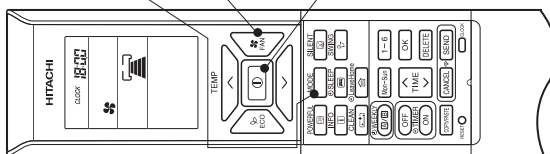
## COOLING OPERATION

Use the device for cooling when the outdoor temperature is -10~43°C. If indoors humidity is very high (80%), some dew may form on the air outlet grille of the indoor unit.



## FAN OPERATION

User can use the device simply as an air circulator.



**1** Press the **MODE** selector so that the display indicates **FAN**.

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

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

## AUTO SWING OPERATION

### To start Vertical Auto Swing

- Press **(AUTO SWING (VERTICAL))** button. The deflector(s) will start to swing up and down.

**(AUTO SWING)** is displayed on the LCD.

### To cancel Vertical Auto Swing

- Press **(AUTO SWING (VERTICAL))** button again. The deflector(s) will stop in the current position.

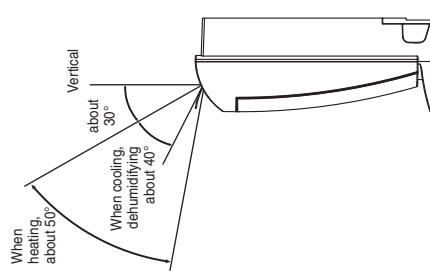
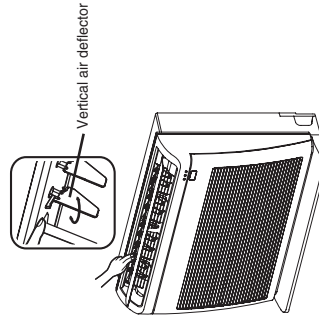
**(AUTO SWING)** disappeared from the LCD.

### NOTE

- During cooling and dehumidifying operation, do not keep the deflectors swinging or in the lower position (in the case of vertical auto swing) for a long time. It may cause dew condensation on the deflectors.

Adjustment of the conditioned air to the left and right.

Hold the vertical air deflector as shown in the figure and adjust the conditioned air to the left and right.

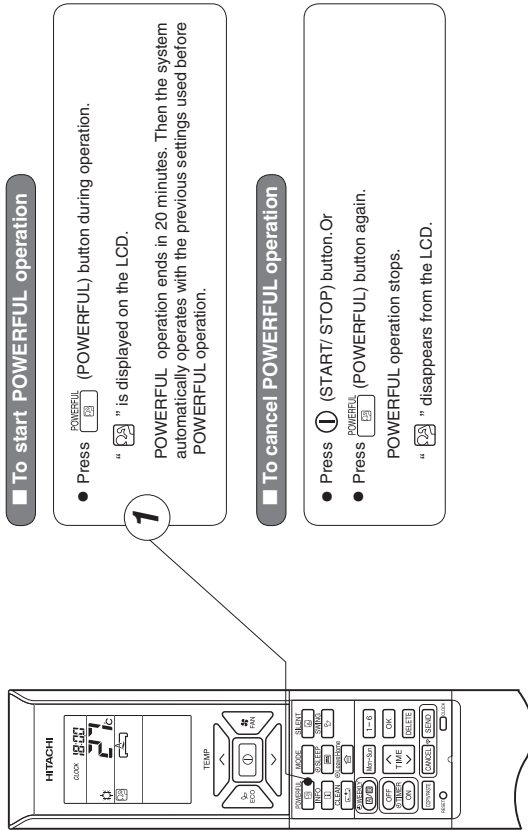


### CAUTION

- When operating the unit in cooling operation with the air deflector facing down and moving automatically for a long period of time, water will be condensed on the air deflector and drips down occasionally. This will wet your furniture.

## POWERFUL OPERATION

- By pressing **POWERFUL** (POWERFUL) button during AUTO, HEATING, DEHUMIDIFYING, COOLING or FAN operation, the air conditioner performs at the maximum power.
- During POWERFUL operation, cooler or warmer air will be blown out from indoor unit for COOLING or HEATING operation respectively.



### To start POWERFUL operation

- Press **POWERFUL** (POWERFUL) button during operation.

\* "POWERFUL" is displayed on the LCD.

POWERFUL operation ends in 20 minutes. Then the system automatically operates with the previous settings used before POWERFUL operation.

### To cancel POWERFUL operation

- Press **START/STOP** button.Or
- Press **POWERFUL** (POWERFUL) button again.

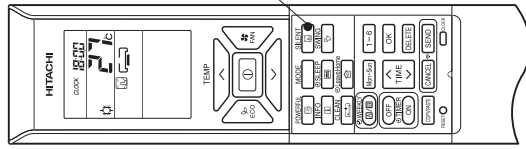
POWERFUL operation stops.  
\* "POWERFUL" disappears from the LCD.

## NOTE

- When SLEEP mode, ECO mode, SILENT mode or LEAVE HOME mode is selected, POWERFUL operation is cancelled.
- During POWERFUL operation, capacity of the air conditioner will not increase
  - if the air conditioner is already running at maximum capacity.
  - just before defrost operation (when the air conditioner is running in HEATING operation).
- After auto restart, POWERFUL operation is cancelled and previous operation shall start.
- For multi model connections, POWERFUL operation may not function depending on operation conditions.

## SILENT OPERATION

- By pressing **SILENT** (SILENT) button during AUTO, HEATING, DEHUMIDIFYING, COOLING or FAN operation, the fan speed will change to ultra slow.



### To start SILENT operation

- Press **SILENT** (SILENT) button during operation.

\* "SILENT" is displayed on the LCD. Fan speed will be ultra slow.

### To cancel SILENT operation

- Press **START/STOP** button.Or
- Press **SILENT** (SILENT) button again or **FAN SPEED** button.

Fan speed will return to previous fan speed before SILENT operation starts.  
SILENT operation stops.  
\* "SILENT" disappears from the LCD.

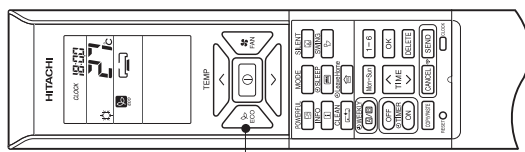
## NOTE

- When POWERFUL operation is selected, SILENT operation is cancelled. Fan speed will return to previous fan speed before SILENT operation.
- After auto restart, SILENT operation is cancelled. Fan speed will return to previous fan speed before SILENT operation.
- During any operation with fan speed **SILENT** (SILENT), if press **SILENT** (SILENT) button, fan speed will not change.



## ECO OPERATION

ECO operation is an energy saving function by changing set temperature automatically and by limiting the maximum power consumption value.



1

- By pressing the (ECO) button during AUTO, HEATING, DEHUMIDIFYING or COOLING operation, the air conditioner performs the "ECO" operation.

### To start ECO operation

- Press (ECO) button during operation.

"" is displayed on the LCD.

Energy saving operation will start by changing the set temperature higher or lower automatically and reducing operation power consumption. This function may vary based on the connected outdoor unit.

### To cancel ECO operation

- Press (START/STOP) button.Or
- Press (ECO) button again.

"" disappears from the LCD.

### NOTE

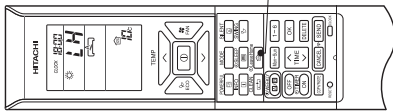
- ECO function will not be effective when power consumption is low.
- By pressing (POWERFUL) button, ECO operation is cancelled.
- After auto restart, ECO operation is cancelled and previous operation mode shall start.
- For multi model connections, energy saving operation shall only start by changing set temperature higher or lower automatically. However, effectiveness of ECO depends on operation conditions.



## LEAVE HOME(LH) OPERATION

Prevent the room temperature from falling too much by setting temperature 10°C. automatically when no one is at home. This operation is able to operate by "Continuous operation" or "Day timer operation". Please use "Day timer operation" to set the number of days up to 99 days.

### Continuous operation



### To start LEAVE HOME operation

#### Option 1. Continuous operation.

- Press (LEAVE HOME) button during stop or operation. Room temperature is set at 10°C and heating operation starts. "" is displayed on the LCD.

#### Option 2. Day timer operation.

- Press (LEAVE HOME) button during stop or operation. Room temperature is set at 10°C and heating operation starts. "" is displayed on the LCD.
- Set number of operation days (1 to 99 days), if needed.

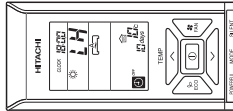
1

Press (TIME) button to select number of days.

Number of days blink.

- Press "" to set number of days from 1 day, 2 days, 3 days ..... 99 days, 99 days, 1 day and so on.
- Press "" to set number of days from 99 days, 98 days, 97 days ..... 3 days, 2 days, 1 day, 99 days and so on.
- Number of day is counted when clock indicates 0:00.

### Day timer operation



### To cancel LEAVE HOME operation

- Press (START/STOP) button.Or
- Press (LEAVE HOME) button again. Return to previous operation mode.<sup>0)</sup>
- Change to other operation mode by pressing (MODE) button.

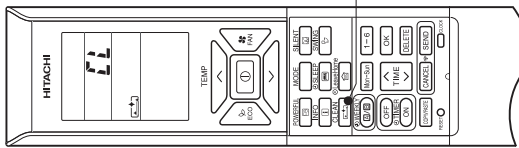
### NOTE

- After reaching the set number of operation days for Leave Home or by pressing the (Leave Home) button again, the unit will operate in previous mode.
- During Leave Home operation, fan speed and horizontal air deflector position cannot be changed.
- By pressing (Leave Home) button, implementation of Weekly Timer or One Timer only Timer is cancelled.
- In case of power supply shut down, after autorestart, all setting for number of days operation will be reset and unit shall be in continuous operation.
- For multi connections, when each room is running in different operation mode such as FAN only, COOLING, DEHUMIDIFYING or AUTO mode, Leave Home operation cannot operate even though it is possible to set Leave Home operation. In order to start Leave Home operation, all rooms are running HEATING operation, it is possible to operate Leave Home operation by pressing the (LEAVE HOME) button.
- For multi connections, when all rooms are running HEATING operation, it is possible to operate Leave Home operation by pressing the (LEAVE HOME) button.
- For multi connections, if two or more rooms are set to operate Leave Home operation, the capability to reach the set temperature at 10°C may not be possible. In addition, this also depends on outdoor temperature.
- POWERFUL, SILENT and ECO operations are not applicable during Leave Home.



## CLEAN (ONE TOUCH CLEAN) OPERATION

Drying indoor heat exchanger after cooling operation to prevent mildew.



### To start CLEAN operation

- Press **CLEAN** (CLEAN) button when unit is OFF.  
Total time taken for One Touch Clean operation is 60 minutes.  
During this operation, HEATING or FAN operation shall operate.  
During one touch clean, operation lamp is blinking.

"CLEAN" is displayed on the LCD.

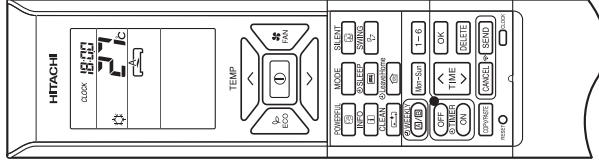
### To cancel CLEAN operation

- Press **STOP** (START/STOP) button.Or
- Press **CLEAN** (CLEAN) button again.

### NOTE

- When CLEAN operation finish, unit will switch OFF automatically.
- If Weekly Timer or Once Timer is set, there is a need to cancel those timer before operating CLEAN function.
- For multi connections, when pressing **CLEAN** (CLEAN) button, operation is limited to FAN operation.
- For multi connections, when one room operates CLEAN operation first, other rooms can operate COOLING, DEHUMIDIFYING or FAN operation. However, when other rooms need to operate HEATING operation, air conditioner will be in STANDBY mode. After CLEAN operation finish, HEATING operation will start.

## ONCE TIMER (ON/OFF TIMER) OPERATION



### OFF TIMER

The device can be set to turn off at a preset time.

- Press **OFF-TIMER** (OFF-TIMER) button. **OFF** and **0:00** blink on the display.
- Set the "turn-off time" with **TIME** (TIME) button.
- After setting, direct the remote controller towards the indoor and press **SEND** (SEND) button.  
**OFF** and "set time" lights up instead of blinking.  
A beep sound emitted from indoor unit and the (TIMER) lamp on the indoor unit lights up.

### ON TIMER

When (ON-TIMER) is set, the operation starts so that the preset temperature is reached at the preset time.  
The air conditioner starts operation a maximum 60 minutes before the preset time, depending on conditions including room temperature and preset temperature.

- Press **ON-TIMER** (ON-TIMER) button. **ON** and **0:00** blink on the display.
- Set the "turn-on time" with **TIME** (TIME) button.
- After setting, direct the remote controller towards the indoor and press **SEND** (SEND) button.  
**ON** and "set time" light up instead of blinking.  
A beep sound emitted from indoor unit and the (TIMER) lamp on the indoor unit lights up.

### ON/OFF TIMER

- The device will turn off and on at the designated time.
- The switching occurs first at the preset time that comes earlier.
- The arrow mark appears on the display to indicate the sequence of switching operations.

  - Press **OFF-TIMER** (OFF-TIMER) button so that **OFF** and **0:00** blink on the display.
  - Set the "turn-off" time with **TIME** (TIME) button. After setting, direct the remote controller towards the indoor and press **SEND** (SEND) button.
  - Press **ON-TIMER** (ON-TIMER) button so that **ON** and "set time" light up. The **OFF** and **0:00** blink.
  - Set the "turn-on" time with **TIME** (TIME) button.
  - After setting, direct the remote controller towards the indoor and press **SEND** (SEND) button.  
**ON** and "set time" light up instead of blinking.  
A beep sound emitted from indoor unit and the (TIMER) lamp on the indoor unit lights up.

The timer may be used in three ways: OFF-timer, ON timer and ON/OFF (OFF/ON)-timer. Set the current time first because it serves as a reference.

### To cancel Reservation

- Point the signal window of the remote controller towards the indoor unit and press **CANCEL** (CANCEL) button.  
**OFF** and "ON or OFF set time" goes out with a beep and the (TIMER) lamp on the indoor unit turns off.

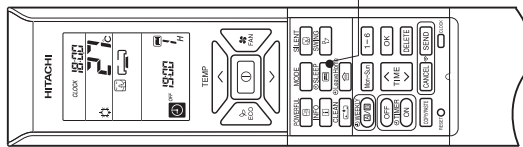
### NOTE

- User can set only one of the OFF-timer, ON-timer or ON/OFF-timer.
- If WEEKLY TIMER already set, by setting the ONCE TIMER, ONCE TIMER operation is prioritized. When ONCE TIMER operation is complete, WEEKLY TIMER operation will be activated.



## ECO SLEEP TIMER OPERATION

The timer can be set up to a duration of 7 hours.  
By pressing (SLEEP) button during AUTO, HEATING, DEHUMIDIFYING, COOLING or FAN operation, the unit shifts the room temperature and reduces the fan speed. It results in energy saving.  
Set the current time first before operating the ECO SLEEP TIMER operation.



### To start ECO SLEEP TIMER operation

Press (SLEEP) button during operation.

- "", "", "OFF", off time, "", and number of hour are displayed on the remote controller display.
- During ECO SLEEP TIMER operation, fan speed will be ultra slow.
- A beep sound emitted from indoor unit and the (TIMER) lamp on the indoor unit lights up.

Pressing (SLEEP) button repeatedly, the number of hours will change as below:



- During ECO SLEEP TIMER operation, air conditioner will continue to operate for the designated number of hours and then turn off.
- When the ECO SLEEP TIMER has been set, the display on the remote controller indicates the turn off time.

Example: If ECO SLEEP TIMER is set for 1 hour at 18:00, the switch off time will be at 19:00.



### To cancel ECO SLEEP TIMER operation

Press (START/STOP) button.

- Room air conditioner will switch off.
- Press (SLEEP) button again until "", "", off time, "", and number of hour disappear from the remote controller display.

Press (CANCEL) button.

- A beep sound emitted from indoor unit and the (TIMER) lamp on the indoor unit turns off.
- SLEEP TIMER operation is cancelled.



## ECO SLEEP TIMER OPERATION

### To set SLEEP TIMER and ON TIMER

The air conditioner will be turned off by ECO SLEEP TIMER and turned on by ON TIMER.

1. Set the ON TIMER.
2. Press (SLEEP) button and set ECO SLEEP TIMER.



Example:

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

### To cancel ECO SLEEP TIMER and ON TIMER operation

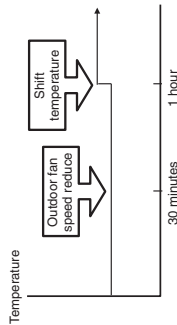
Direct the remote controller towards the indoor unit and press (CANCEL) button.

- "", "", "OFF", off time, "", number of hour, "ON" and ON TIMER set time disappear from the remote controller display.
- A beep sound emitted from indoor unit and the (TIMER) lamp on the indoor unit turns off.
- ECO SLEEP TIMER and ON TIMER reservations are cancelled.

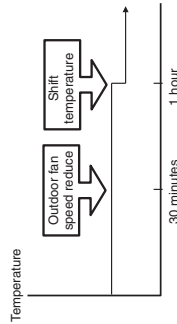
30 minutes after setting ECO SLEEP TIMER, outdoor fan speed will be reduced to lower the noise level and to have comfort operation.  
1 hour after setting ECO SLEEP TIMER, set temperature will be slightly shifted. Amount of temperature shifted depends on type of air conditioner.  
These automatic operation changes contribute to energy saving without losing comfort.

The level of energy consumption depends on outside temperature, room temperature, set temperature or air conditioner type.

Cooling operation [diagram representation for illustrative purpose only]



Heating operation [diagram representation for illustrative purpose only]



### NOTE

- If ECO SLEEP TIMER is set when OFF TIMER or ON/OFF TIMER has been set earlier, the ECO SLEEP TIMER becomes effective instead of the OFF TIMER or ON/OFF TIMER.

## WEEKLY TIMER OPERATION

- It is possible to select Mode A or Mode B. For each mode, up to 6 programs can be set per day. In total, a maximum of 42 programs can be set for a week for each mode.
- If calendar and clock are not set, the reservation setting for WEEKLY TIMER cannot be set.
- If calendar and clock are not set correctly, WEEKLY TIMER will not operate correctly.
- Reservation for calendar and clock shall be set first before operating WEEKLY TIMER.

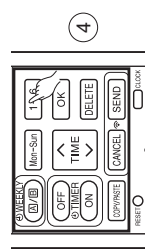
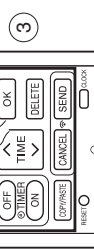
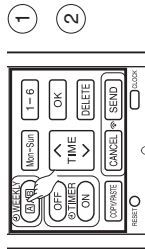
**Step 1: Set the reservation schedule to the remote controller. Send the registered reservation to indoor unit and then operate.**

**Step 2: Select Mode A or Mode B and activate or deactivate WEEKLY TIMER.**

**Step 3: Copy and cancel the reservation schedule.**

**Step 1: Set reservation schedule to the remote controller. Send the registered reservation to indoor unit and then operate.**

- How to set a WEEKLY TIMER.
  - Select Mode A or Mode B.
- Press **WEEKLY** (WEEKLY) button. WEEKLY lights up. **A** and **3** blink on the display. (Mode A is selected).
- Press **WEEKLY** (WEEKLY) button again. **B** and **6** blink on the display. (Mode B is selected).
  - If no reservation has been made, ON/OFF, **1**, **2**, **3**, **4**, **5**, **6** will not appear.
  - If reservation has been made, ON/OFF, **1**, **2**, **3**, **4**, **5**, **6** will not appear.
- Set a program.
  - Press **WEEKLY** (WEEKLY) button for about 3 seconds. The selection mode can be changed.
  - 6** day: Mon, program no. : 1, ON/OFF, setting time and setting temperature blink on the display.
- Select the desired day of the week.
  - Press **Mon-Sun** (DAY) button.
  - The day changes from Mon → Tue → Wed → Thu → Fri → Sat → Sun → Mon, Tue, Wed, Thu, Fri, Sat, Sun [Full days] → Mon, Tue, Wed, Thu, Fri [weekday] → Sat, Sun [weekend] → Mon → Tue ....
  - Select [Full days] for daily reservation.
  - Select [weekday] for Monday to Friday reservation.
  - Select [weekend] for Saturday and Sunday reservation.
  - After reservation has been set, it is easy to check and edit at the same time.



## WEEKLY TIMER OPERATION

- Press **ON** (ON-OFF TIMER) button to select ON TIMER or OFF TIMER reservation.
- Press **TIME** (TIME) button to set time reservation.
- Press (TEMP  $\wedge$  or  $\vee$ ) button to set temperature reservation.
- Press **OK** (OK) button. The reservations are set. Day, program number, ON reservation, setting temperature will light up. **6** will be continuously blinks. If reservation is not complete, settings will not be stored in memory.

To continue with the reservation, press **Mon-Sun** **1-6** **OFF** **ON** buttons. Follow step 3 to 8 for reservation.

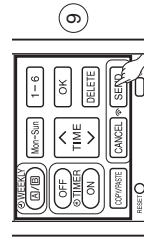
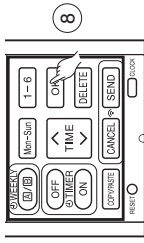
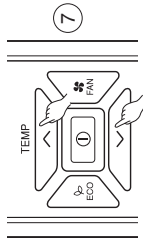
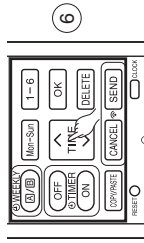
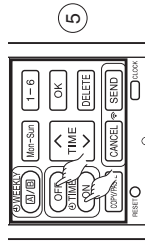
- After all the reservations have been set, press **SEND** (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds. Timer lamp on the indoor unit will blink rapidly. After beep sound emitted from indoor unit, TIMER lamp will light up.

**Please ensure that the TIMER lamp lights up.**

This indicates that the reservation has been stored in the indoor unit and Timer function has been completed.

The reservation contents will appear on the remote controller display.

- If TIMER lamp on the indoor unit does not light up, press **SEND** (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds.
- CAUTION 1** Do not press **CANCEL** (CANCEL) button during reservation setting because this will result in all reservation contents to be lost.
- The reservation contents will not stored in the indoor unit until **SEND** (SEND) button has been pressed.

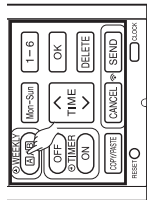


### NOTE

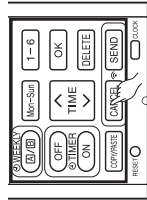
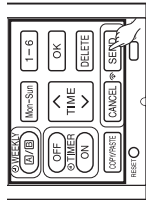
- Up to 6 programs can be set per day. Setting ON TIMER or OFF TIMER for each program number can be at random. When pressing **SEND** (SEND) button, the set ON TIMER or OFF TIMER for each program number will automatically arranged so that program number 1 shall have the earliest time and program number 6 shall have the latest time.
- CAUTION 1** If the remote controller is left idle and **SEND** (SEND) button is not pressed within 3 minutes after reservations have been made, all current reservations will be lost.

## WEEKLY TIMER OPERATION

### Step 2: Select Mode A or Mode B and activate or deactivate WEEKLY TIMER.



- How to select Mode A or Mode B of WEEKLY TIMER setting.
- Press **WEEKLY** (WEEKLY) button. **A** and **B** blink on the display. (Normally Mode A will blink first).
  - Press **WEEKLY** (WEEKLY) button again. **B** and **A** blink on the display.
  - Select Mode A or Mode B. Press **SEND** (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds. Timer lamp on the indoor unit will blink rapidly.  
After beep sound emitted from indoor unit, TIMER lamp will light up.  
**Please ensure that the TIMER lamp lights up.**  
This indicates that Mode A or Mode B selection and active WEEKLY TIMER have been confirmed.



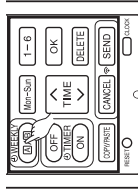
- Setting non-active WEEKLY TIMER .
- Direct the remote controller towards the indoor unit and press **CANCEL** (CANCEL) button.  
Beep sound will be emitted from indoor unit and TIMER lamp will be OFF. Reservation indication on remote display will also disappear.  
This indicates that non-active WEEKLY TIMER has been confirmed.
- To activate back the setting of WEEKLY TIMER , repeat the steps for "How to select Mode A or Mode B of WEEKLY TIMER setting".

#### NOTE

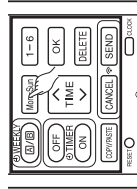
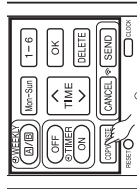
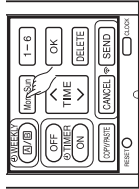
- When setting ONCE TIMER, operation of WEEKLY TIMER is interrupted. After ONCE TIMER operation is complete, WEEKLY TIMER operation will be activated.
- When ONCE TIMER is cancelled, operation of WEEKLY TIMER is also cancelled. Need to set WEEKLY TIMER operation for activation.
- After auto restart, WEEKLY TIMER operation is cancelled. Need to set WEEKLY TIMER operation for activation.

## WEEKLY TIMER OPERATION

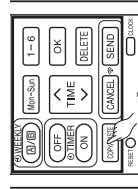
### Step 3: Copy and cancel the reservation schedule.



- How to copy and paste.
- Editing the reservation schedule is easy by copying data from one day to another day.
- Press **WEEKLY** (WEEKLY) button to select Mode A or Mode B.
  - Press **WEEKLY** (WEEKLY) button for about 3 seconds to start editing the reservation schedule.
  - Press **DAY** (DAY) button to select a day of the week to copy.
  - Press **COPY/PASTE** (COPY/PASTE) button. Then "PASTE" blinks on the display.  
\* Press **CANCEL** (CANCEL) button to cancel the COPY mode. Normal setting mode is activated.
  - Press **DAY** (DAY) button to select a day of the week to paste.
  - Press **COPY/PASTE** (COPY/PASTE) button one more time to paste. **OK** only blinks on the display.
  - To continue copying to other days, press **Mon-Sun** or **1-6** or **1-7** or **OFF** (OFF) button.



Then start from step 3.



- Alter copy and paste completed, press **SEND** (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds. Timer lamp on the indoor unit will blink rapidly.  
After beep sound emitted from indoor unit, TIMER lamp will light up.  
**Please ensure that the TIMER lamp lights up.**  
If TIMER lamp does not light up, Press **SEND** (SEND) button again.
- Reservation data will not change if **SEND** (SEND) button is not pressed.

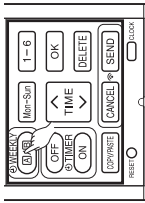
#### NOTE

- If there is no reservation data, copying data from one day to another day cannot be done.



## WEEKLY TIMER OPERATION

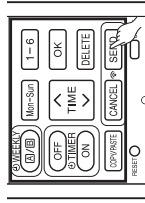
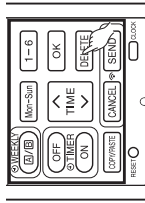
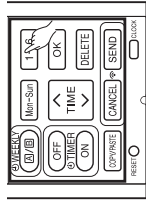
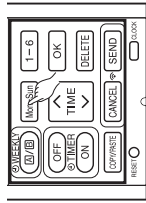
### Step 3: Copy and cancel the reservation schedule.



- How to delete WEEKLY TIMER data.

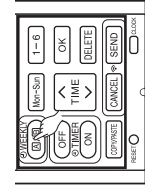
[Delete one program number reservation]

- Press **WEEKLY** (WEEKLY) button to select Mode A or Mode B.
  - Press **WEEKLY** (WEEKLY) button for 3 seconds to start editing the reservation schedule.
  - Press **Mem-Sun** (DAY) button to select a day of the week to edit.
  - Press **1-6** to select program number. Selected program number will blink.
  - Press **DELETE** (DELETE) button. Reservation of selected program number is deleted.
  - After deleting, press **SEND** (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds. Timer lamp on the indoor unit will blink rapidly.  
After beep sound emitted from indoor unit, **TIMER lamp** will light up.  
**Please ensure that the TIMER lamp lights up.**
- Reservation will not change if **SEND** (SEND) button is not pressed.



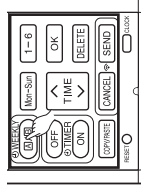
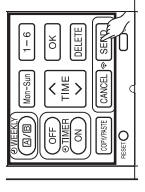
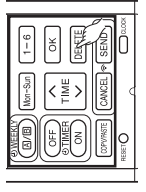
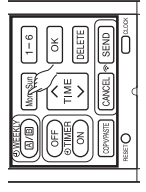
## WEEKLY TIMER OPERATION

### Step 3: Copy and cancel the reservation schedule.



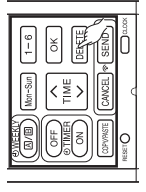
[Delete one day reservation]

- Press **WEEKLY** (WEEKLY) button to select Mode A or Mode B.
  - Press **WEEKLY** (WEEKLY) button for 3 seconds to start editing the reservation schedule.
  - Press **Mem-Sun** (DAY) button to select a day of the week to edit.
  - Press **DELETE** (DELETE) button for about 10 seconds. Reservations for all program numbers will be deleted.
    - If press for a short time, reservation for one program number will be deleted.
  - After deleting, press **SEND** (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds. Timer lamp on the indoor unit will blink rapidly.  
After beep sound emitted from indoor unit, **TIMER lamp** will light up.  
**Please ensure that the TIMER lamp lights up.**
- Reservation will not change if **SEND** (SEND) button is not pressed.



[Delete Mode A or Mode B]

- Press **WEEKLY** (WEEKLY) button to select Mode A or Mode B.
- Direct the remote controller towards the indoor unit and press **DELETE** (DELETE) button for about 10 seconds while Mode A or Mode B display blinks.  
After beep sound emitted from indoor unit, reservations for Mode A or Mode B will disappear.



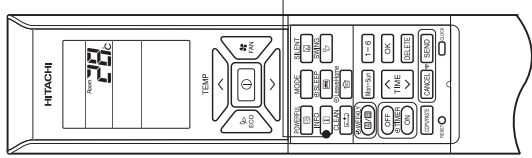
### NOTE

- If all reservations in the remote controller were deleted and pressed **SEND** (SEND) button, no signal will be transmitted to indoor unit. **TIMER lamp** will remain off and no changes will be done to the reservations stored in the indoor unit.



## INFO FUNCTION

- By pressing **INFO** (INFO) button, temperature around remote controller and monthly power consumption will be displayed on the remote controller.
- After changing the batteries, direct the remote controller towards the indoor unit and press **INFO** (INFO) button. Current calendar and clock will be transmitted from indoor unit.
- In order to receive information from indoor unit, the distance between remote controller and receiver of indoor units is within 2 meters.



### To check temperature around remote controller

Press **INFO** (INFO) button.  
Temperature will be displayed for 10 seconds.

### To check monthly power consumption

Direct the remote controller towards the receiver of indoor unit (within 2 meters in front of indoor unit) and press **INFO** (INFO) button. Wait for 2 seconds for signal transmission.

While temperature around remote controller is displayed, press **INFO** (INFO) button repeatedly. The display will show as below:  
this month power consumption amount for heating → last month power consumption amount for heating → this month power consumption amount for cooling → last month power consumption amount for cooling → temperature around remote control → this month power consumption amount for heating ..... cyclically.

- If indication is not given, bring remote controller closer to the receiver of the indoor unit.
- Indicated value shall be regarded as a guide only.

### Current calendar and clock can be retrieved from indoor unit

Direct the remote controller towards the receiver of indoor unit (within 2 meters in front of indoor unit) and press **INFO** (INFO) button. Wait for 2 seconds for signal transmission.

Once received the current calendar and clock, check whether they are correct or not by pressing **CLOCK** (CLOCK) button.

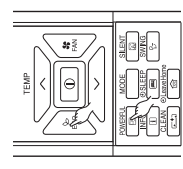
- If there is no power supply to indoor unit or calendar and clock have not been set, INFO function cannot be used for sending or receiving information.

#### NOTE

- In case failure occurs to the air conditioner, by pressing **INFO** (INFO) button, an error code will be displayed.  
Direct the remote controller towards the receiver of indoor unit (within 2 meters in front of indoor unit) and press **INFO** (INFO) button. Wait for 2 seconds for signal transmission.  
An error code will be displayed.  
Call service center and inform the error code.

## OPERATION MODE LOCK

The remote controller can be set to fix the HEATING mode (including FAN), COOLING mode (including FAN) and DEHUMIDIFYING mode (including FAN) operations.



- Method to lock HEATING mode (including FAN) operation.

Press **ECO** (ECO) and **POWERFUL** (POWERFUL) buttons simultaneously for about 5 seconds when remote controller is OFF.

"**HEATING**" and "**FAN**" will be displayed for about 10 seconds. Later, "**HEATING**" and "**FAN**" will remain.

This indicates that HEATING mode operation is locked.

When pressing **MODE** (MODE) button, "**HEATING**" or "**FAN**" will be displayed.

- Method to unlock HEATING mode (including FAN) operation.

Press **ECO** (ECO) and **POWERFUL** (POWERFUL) buttons simultaneously for about 5 seconds when the remote controller is OFF.

All operation mode symbols will appear on the display for about 10 seconds. After that, operation mode symbol before cancellation will be displayed. This indicates that HEATING mode operation is unlocked.

- Method to lock COOLING and DEHUMIDIFYING modes (including FAN) operations.

Press **ECO** (ECO) and **SILENT** (SILENT) buttons simultaneously for about 5 seconds when the remote controller is OFF.

"**COOLING**" and "**FAN**" will be displayed for about 10 seconds. Later, "**COOLING**" and "**FAN**" will remain.

This indicates that COOLING and DEHUMIDIFYING mode operation is locked.

When pressing **MODE** (MODE) button, "**COOLING**" or "**FAN**" will be displayed.

- Method to unlock COOLING and DEHUMIDIFYING modes (including FAN) operations.

Press **ECO** (ECO) and **SILENT** (SILENT) buttons simultaneously for about 5 seconds when the remote controller is OFF.

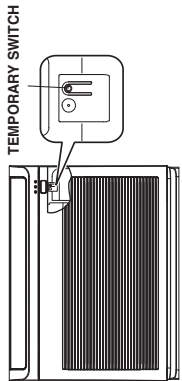
All operation mode symbols will appear on the display for about 10 seconds. After that, operation mode symbol before cancellation will be displayed. This indicates that COOLING and DEHUMIDIFYING modes operation is unlocked.

#### NOTE

- Operation Mode Lock function will not activate if TIMER reservations activate.
- TIMER reservations shall be deactivated first. Then, Operation Mode Lock function can be activated.
- HEATING, COOLING and DEHUMIDIFYING mode (including FAN) operations can be unlocked by pressing the **RESET** (RESET) button. However, by pressing the **RESET** (RESET) button, all the information stored in the remote controller will disappear. You may need to set the necessary information again.
- For multi connections, unit and mode which is set to lock HEATING and switched on first shall have higher priority. Other units which are chosen to operate at different modes shall be in STANDBY until either the first unit operation is switched off or the mode is selected to be same as the first unit.

## 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".

## HOW TO USE THE AIR CONDITIONER EFFECTIVELY

1. **An average room temperature setting is probably the best for you as well as being economical.**

- Excessive cooling or heating is not recommended for health reasons. High electricity bills may also result.
- Close the curtains or blinds to prevent heat from flowing into or escaping the room as well as to make more effective use of electricity.



2. **At intervals, the doors and windows should be opened to let fresh air in.**

- **CAUTION** Make sure the room is ventilated when operating the air conditioner at the same time as other heating appliances.



3. **Using the timer is recommended before going to sleep or going out.**



4. **The following must never be used for cleaning the indoor and outdoor units:**

- Benzine, thinner and scrub can damage plastic surfaces or coating.
- Hot water above 40°C can shrink the filter and deform plastic parts.



5. **Do not block the air intake and air outlet.**

- Do not block the air outlets and intakes of the indoor and outdoor units with curtains or other obstacles which could degrade air conditioner performance and cause unit failure.

## MAINTENANCE

### ▲ WARNING

- Before cleaning, stop unit operation with the remote controller and turn off the circuit breaker.

### ▲ CAUTION

- Do not expose the unit to water as it may cause an electric shock.
- For cleaning inside the air conditioner, consult your sales agent.
- Avoid using detergent when cleaning the heat exchanger of the indoor unit. Unit failure may result.
- When cleaning the heat exchanger with a vacuum cleaner, make sure to wear gloves so as not to injure your hands on the heat exchanger fins.

## 1. AIR FILTER

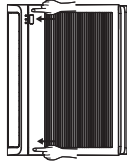
Clean the air filter, as it removes dust inside the room. Be sure to clean the filter once every two weeks so as not to consume electricity unnecessarily.

### PROCEDURE

### 1

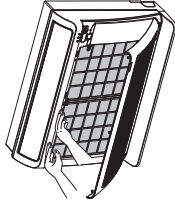
#### Open the front panel.

- To open the front panel, use the remote controller to stop unit operation. Then press at the top left and right corners of the front panel.
- Grasp the left and right sides of the front panel and open it toward you.



### 2

#### Remove the filters.



### 3

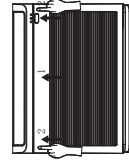
#### Remove dust of the filters using a vacuum cleaner.

- After using neutral detergent, wash with clean water and dry in shade.



### 4

#### Attach the filters.



### 5

#### Close the front panel.

1. To close the front panel, press the upper center part of the front panel.
2. Press at the top left and right corners of the front panel.

### 6

Filter lamp goes when the " (AUTO SWING)" button is pressed while the device is on "STANDBY MODE".

### ▲ CAUTION

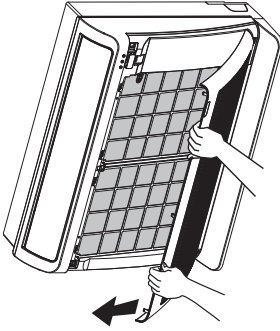
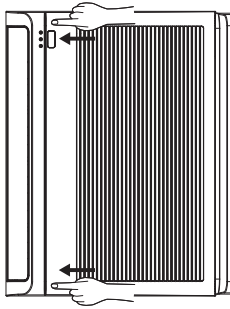
- Do not wash with hot water at more than 40°C. The filter may shrink.
- When washing it, shake off moisture completely and dry it in the shade; do not expose it directly to the sun. The filter may shrink. And also use a soft sponge to wash. Using a scrubber or brush cause the metal film on the surface to come off.
- Don't operate the unit without filter. Fault may occur if you continue.

## 2. HOW TO INSTALL AND REMOVE THE FRONT PANEL

- Be sure to use both hands to grasp the front panel when removing it or attaching it.

### Removing

1. Press at the top left and right corners of the front panel.
2. Grasp the left and right sides of the front panel and pull it up to remove.



### Attaching

1. Attach three front panel bearings to the axis of the front cover. (Set the hook to face up.)
2. Close the front panel.

## 3. CLEANING OF FRONT PANEL

The front panel can be washed in water. It can be kept clean at all times.

- Front panel can be removed and washed in water. Gently clean the front panel using a soft sponge.
- When the air conditioner is to be cleaned without removing the front panel, clean both the body and remote controller with a dry soft cloth.
- Wipe off water completely. If water remains on the display section or light receiver section, this could cause a malfunction.



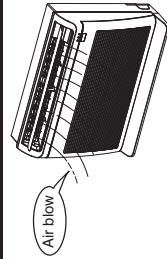
### CAUTION

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



## 4. MAINTENANCE AT BEGINNING OF LONG OFF PERIOD

- Activating air conditioner drying will keep the interior of the indoor unit dry and prevent mold formation.
- Turn off the circuit breaker.



## 5. AIR CLEANSING FILTERS (SPX-CFH15)

- When installing the air cleansing filters, remove the air filters and attach them onto the hooks of the front cover frame.
- 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.
- The air cleansing filters can be used for 2 years.





**INFORMATION**

**CAPABILITIES**

- Heating Capability**
- This room air conditioner utilizes a heat pump system that absorbs exterior heat and brings it into a room to be heated. As the ambient temperature gets lower, heating capability will also lower. In such a situation, the PAM and inverter work to increase compressor rpm to keep the unit's heating capability from decreasing. If the unit's heating performance is still unsatisfactory, other heating appliances should be used to augment this unit's performance.
  - The air conditioner is designed to heat an entire room so that it may take some time before you feel warm. Timer operation is recommended for effective preheating ahead of the desired time.
- Cooling and Dehumidifying Capabilities**
- If the heat present in a room exceeds the unit's cooling capacity (for example, if there are many people in the room or other heating appliances are used), the preset room temperature may not be reached.



**CAUTION**  
Do not use a stove or any other high-temperature devices in proximity to the indoor unit.

**VARIOUS FUNCTIONS**

- When fan speed, room temperature are set with the remote controller before starting manual operation and the buttons are released, the indication of settings will go off in 10 seconds and only the operation mode will be displayed.
- Pressing the button while the unit is in operation will let the protective circuit work so that the unit will not operate for approximately 3 minutes.
- During heating operation, the indoor unit's color indicator lamp may flash with no air emitted for a while.
- If you feel cold wind during warming operation with the (HI) fan speed or want to make the unit operation quieter after the room is heated, use of (AUTO) setting is recommended.
- With the (SILENT) setting, the unit's cooling capability will lower slightly.

**TIMER PROGRAMMING/SLEEP/TIMER OPERATION**

- When the timer has been programmed, the unit will not operate even if the set time is reached unless the unit receives a signal from the remote controller. Confirm that timer programming is complete (beep) and the TIMER lamp of the indoor unit lights.
- If the button is pressed while the ON/OFF timer is programmed, the sleep timer takes priority.
- During sleep timer operation, the fan speed sets to (SILENT) regardless of the preset speed. The remote controller display indication will remain unchanged even with the (SILENT) setting.

**REGULAR INSPECTION**

PLEASE CHECK THE FOLLOWING POINTS EVERY EITHER HALF YEARLY OR YEARLY. CONTACT YOUR SALES AGENT SHOULD YOU NEED ANY HELP.

1		<b>WARNING</b>	<p><b>Check to see if the unit's earth line has been connected correctly.</b> If the earth line is disconnected or faulty, unit failure or electric shock hazard may result.</p>
2		<b>WARNING</b>	<p><b>Check to see if the mounting frame has rusted excessively or if the outdoor unit has tilted or become unstable.</b> It could collapse or fall, causing injury.</p>

**AFTER SALES SERVICE AND WARRANTY**

**WHEN ASKING FOR SERVICE, CHECK THE FOLLOWING**


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"> <li>Do the batteries need replacement?</li> <li>Is the polarity of the inserted batteries correct?</li> </ul>
<p>When it does not operate.</p>	<ul style="list-style-type: none"> <li>Is the fuse all right?</li> <li>Is the voltage extremely high or low?</li> <li>Is the circuit breaker "ON"?</li> <li>Is the setting of operation mode different from other indoor units?</li> </ul>
<p>When it does not cool well. When it does not heat well.</p>	<ul style="list-style-type: none"> <li>Is the air filter blocked with dust?</li> <li>Is the set temperature suitable?</li> <li>Have the top and bottom air deflectors been adjusted to their correct positions according to the operation mode selected?</li> <li>Are the air inlets or air outlets of indoor and outdoor units blocked?</li> <li>Is the fan speed "LOW" or "SILENT"?</li> </ul>

■ The following phenomena do not indicate unit failure.

<p>&lt;Operation start&gt; The unit is preparing to blow warm air. Please wait. &lt;In operation&gt; The outdoor unit is defrosting. Please wait.</p>	<p>Refrigerant flow noise in the pipe or valve sound generated when flow rate is adjusted.</p>
<p>Hissing or fizzy sounds</p>	<p>Noise generated when the unit expands or contracts due to temperature changes.</p>
<p>Squeaking noise</p>	<p>Noise generated with the indoor unit fan's rpm changing such as operation start times.</p>
<p>Rustling noise</p>	<p>Noise of the motorized valve when the unit is switched on.</p>
<p>Clicking noise</p>	<p>Noise of the ventilation fan sucking in air present in the drain hose and blowing out dehumidifying water that had accumulated in the condensed water collector. For details, consult your sales agent.</p>
<p>Perking noise</p>	<p>Operation noise changes due to power variations according to room temperature changes.</p>
<p>Changing operation noise</p>	<p>Mist is generated as the air within the room is suddenly cooled by conditioned air.</p>

Steam emitted from the outdoor unit	Water generated during defrosting operation evaporates, and steam is emitted. Caused as the smells and particles of smoke, food, cosmetics, etc., present in room air become attached to the unit and blown off into the room again.
Odors	
The outdoor unit continues to operate even if operation is stopped	Defrosting is underway (as the heating operation is stopped, the microcomputer checks frost accumulated in the indoor unit and instructs the unit to perform automatic defrosting if necessary).
The OPERATION lamp is blinking	Shows preheating or defrosting operation is underway. As the protective circuit or preheat sensor operates when unit operation is stopped during preheating and then restarted, or when operation mode is switched from cooling to heating, the lamp continues to blink.
Does not reach the temperature setting	Actual room temperature may deviate slightly from the remote controller's temperature setting depending on the number of people in the room, indoor or outdoor conditions when the air conditioner is used for more than one room at the same time.


- If the unit still fails to operate normally after performing the above inspections, turn the circuit breaker off and contact your sales agent immediately.



**Contact your sales agent immediately if the following phenomena should occur:**

- The circuit breaker switches off or the fuse blows frequently.
- The switch operation is not stable.
- Foreign matter or water accidentally enters the unit interior.
- The power cord gets excessively hot or its insulation is torn or stripped.
- TIMER lamp on the indoor unit display blinks.

(As the nature of the failure can be identified by the blinking cycle, check the blinking cycle before turning off the circuit breaker.)



**Notes**

- In quiet operation or stopping the running, 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 please clean the air filter and the evaporator regularly 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.

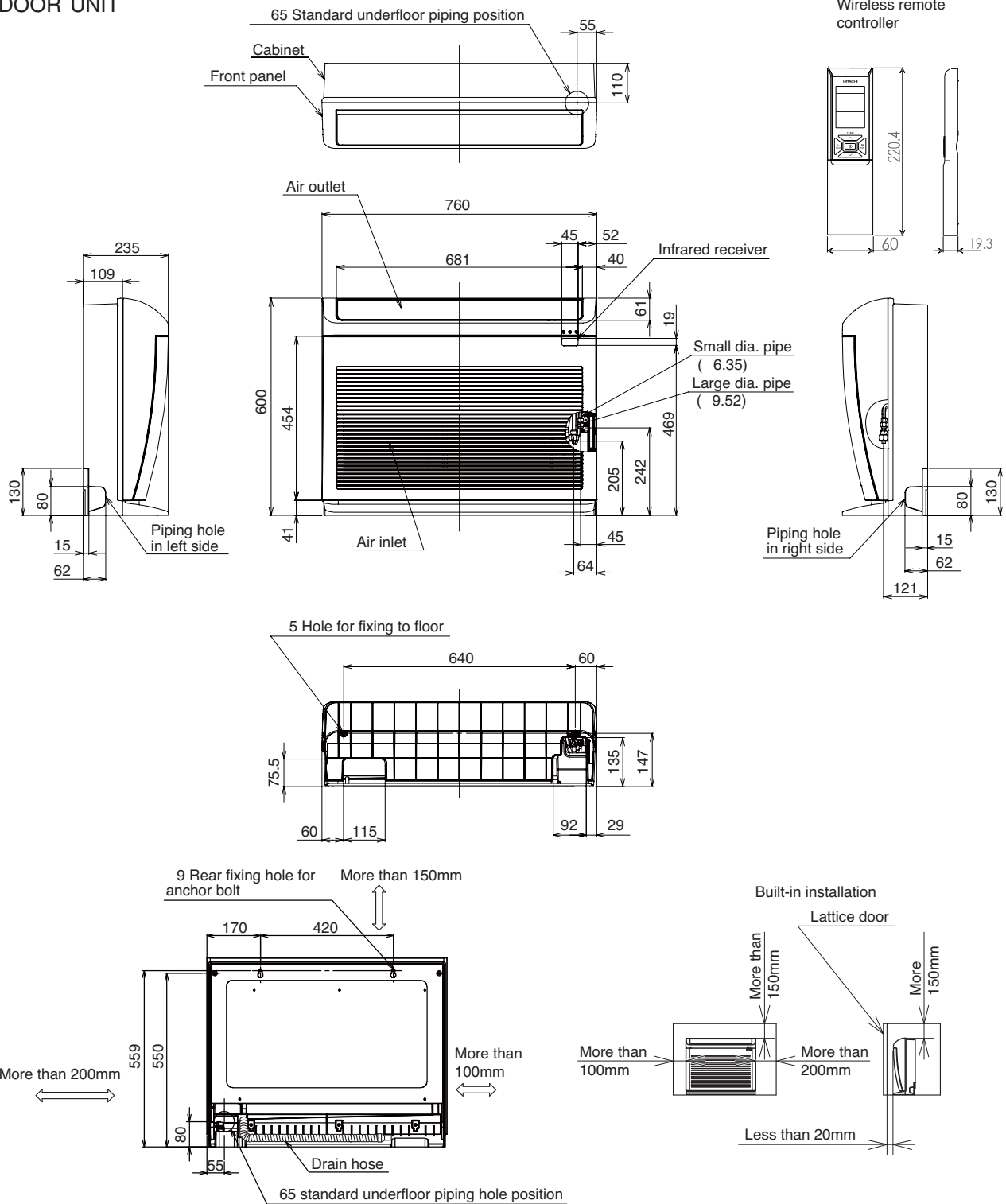
**Please note:**  
On switching on the equipment, particularly when the room light is dimmed, a slight brightness fluctuation may occur. This is of no consequence.  
The conditions of the local Power Supply Companies are to be observed.

# CONSTRUCTION AND DIMENSIONAL DIAGRAM

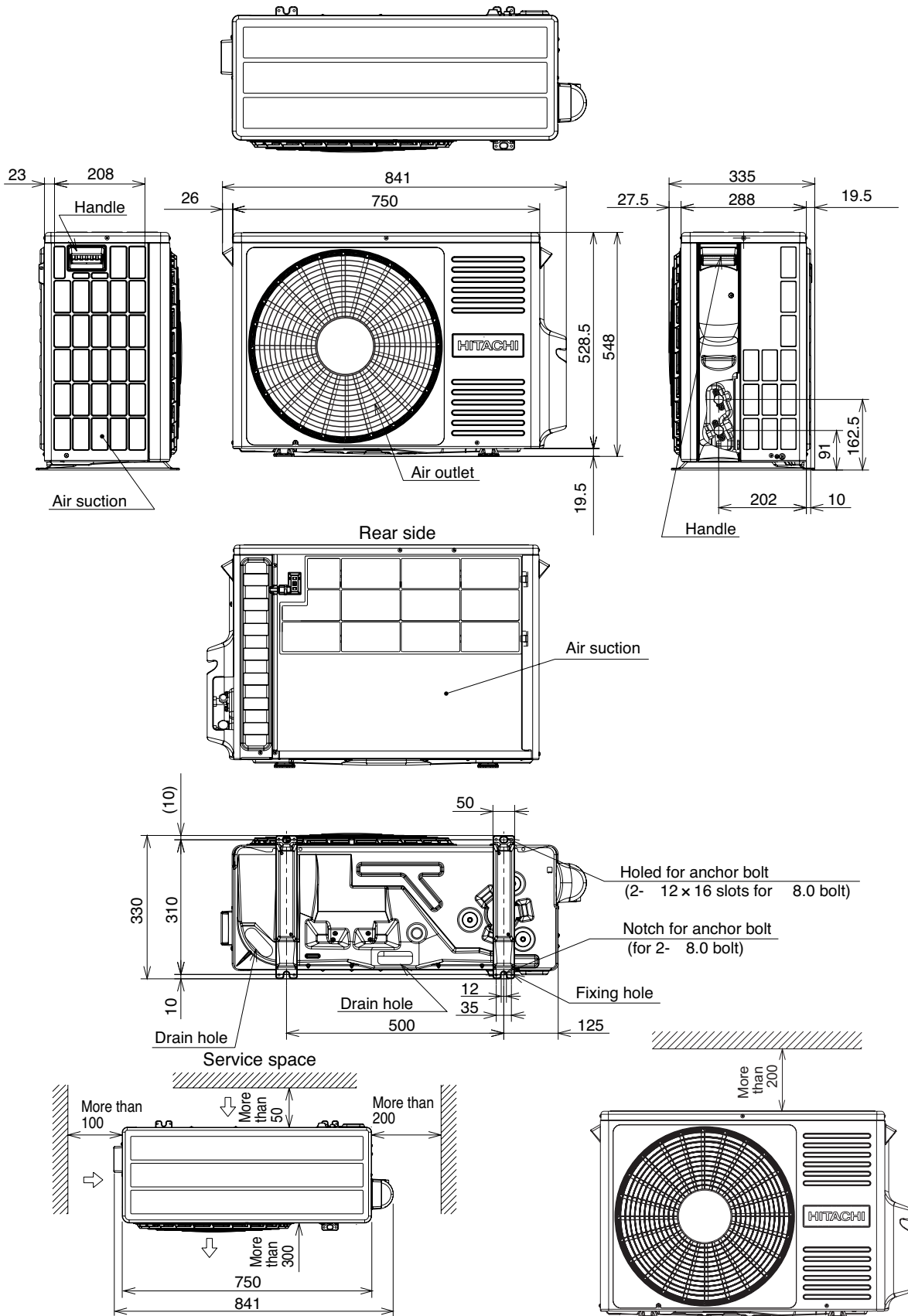
MODEL RAF-25RPA RAF-35RPA

Unit : mm

## INDOOR UNIT



- Cautions:
1. Use insulated pipes for both large and small diameters.
  2. Use pipes of no more than 20m length.
  3. Make sure the difference in heights between the indoor and outdoor units is 10m.
  4. For built-in installation, make sure that the infrared receiver and indicator are not blocked.
  5. Pipes can be laid out from the right, bottom or rear, when the unit is viewed from front.
  6. Keep the clearance shown by  $\longleftrightarrow$  for installation.
  7. For built-in installation, keep the vertical deflector at top air outlet as flat as possible.  
If it is inclined too much, heat will be trapped in the unit, which could cause faulty room temperature control.
  8. An F-cable 1.6mm or 2.0mm dia. x 2 (control side) is used for the connection cable.



NOTE:

1. For outdoor unit installation, allow at least 2 sides of space around the unit ensure ventilation flue.
2. The connecting pipe, should all the insulated with insulation pipe.
3. Piping length is within 20m.
4. Height different of the piping between the indoor unit and outdoor unit should be within 10m.

# MAIN PARTS COMPONENT

THERMOSTAT (Room temperature Thermistor)

## Thermostat Specifications

MODEL			RAF-25RPA RAF-35RPA		
THERMOSTAT MODEL			IC		
OPERATION MODE			COOL		HEAT
TEMPERATURE °C (°F)	INDICATION 16	ON	15.3 (62.1)		16.7 (62.1)
		OFF	15.0 (60.8)		17.3 (63.1)
	INDICATION 24	ON	23.3 (76.5)		24.7 (76.5)
		OFF	23.0 (75.2)		25.3 (77.5)
	INDICATION 32	ON	31.3 (90.9)		32.7 (90.9)
		OFF	31.0 (89.6)		33.3 (91.9)

## FAN MOTOR

### Fan Motor Specifications

MODEL	RAF-25RPA RAF-35RPA	RAC-25FPA RAC-35FPA
POWER SOURCE	DC : 35V	DC : 120 - 380V
OUT PUT	25W	47W
CONNECTION	<p>(Control circuit built in)</p>	

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

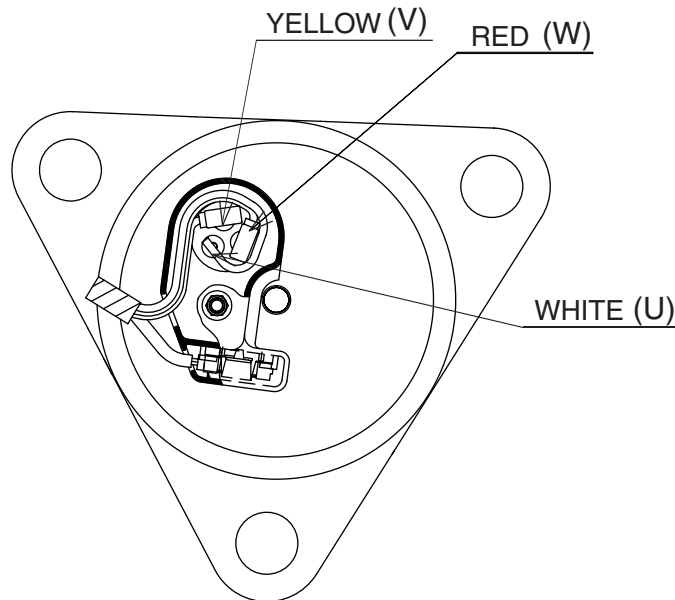
## MAIN ELECTRIC COMPONENTS FOR OUTDOOR UNIT

NAME	RATING	APPLICABLE MODELS
REVERSING VALVE COIL	135 Ω (20 °C)	RAC- 25/35FPA
REACTOR L1	13 (mH), 250mΩ	RAC-25/35FPA
REACTOR L2	25.5 (mH), 550mΩ	RAC-25/35FPA
FILM CAPACITOR	45 (μF)	RAC-25/35FPA

COMPRESSOR

Compressor Motor Specifications

MODEL	RAC-25FPA RAC-35FPA	
COMPRESSOR MODEL	5RS102ZBC21	
RATED VOLTAGE	DC 220 - 350 V	
CONNECTION		
RESISTANCE VALUE (Ω)	25 °C	2M= 0.875
	75 °C	2M= 1.043



**CAUTION**

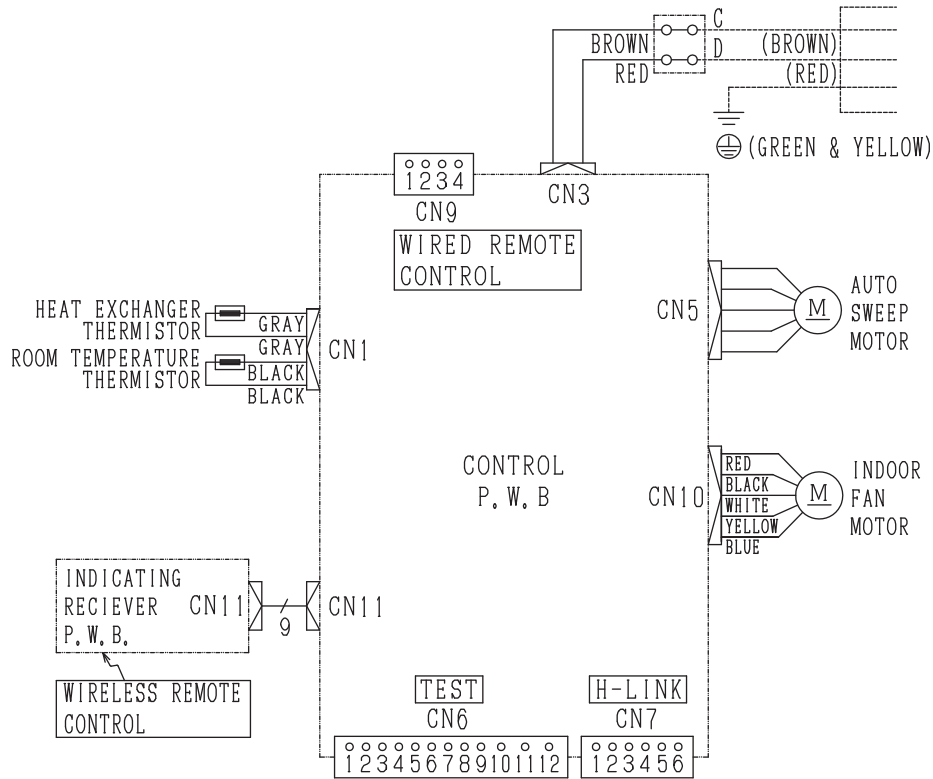
When the refrigerating cycle has been operated for a long time with the capillary tubes clogged or crushed or with too little refrigerant, check the color of the refrigerating machine oil inside the compressor. If the color has been changed conspicuously, replace the compressor.

# WIRING DIAGRAM

MODEL RAF-25RPA/ RAC-25FPA  
RAF-35RPA/ RAC-35FPA

INDOOR UNIT

**CAUTION**  
The marked parts  are very important ones for safety.

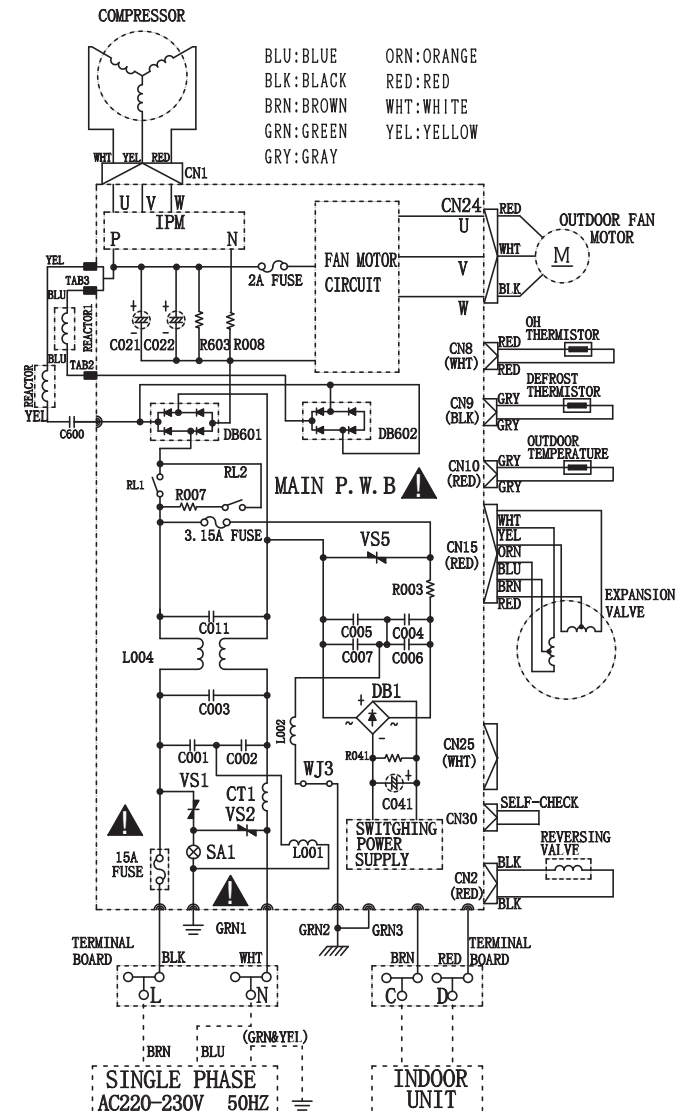


**NOTE**

1. Connecting cable 1.5mm dia.x2 (C D line) is used for the connection.

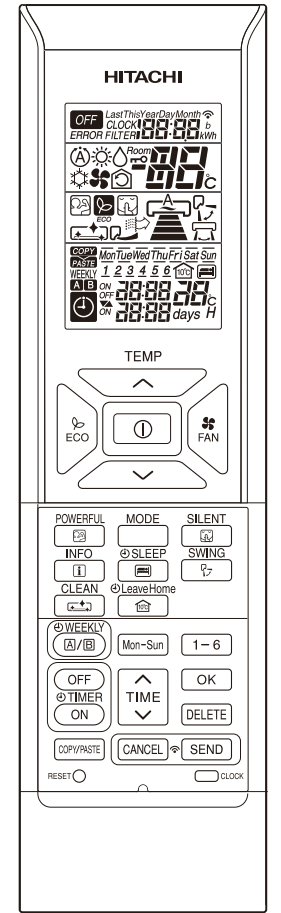
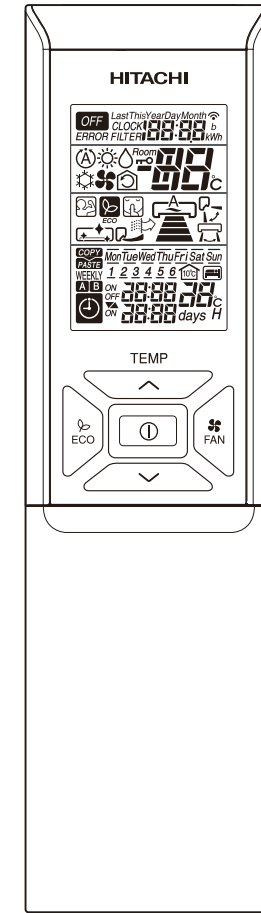
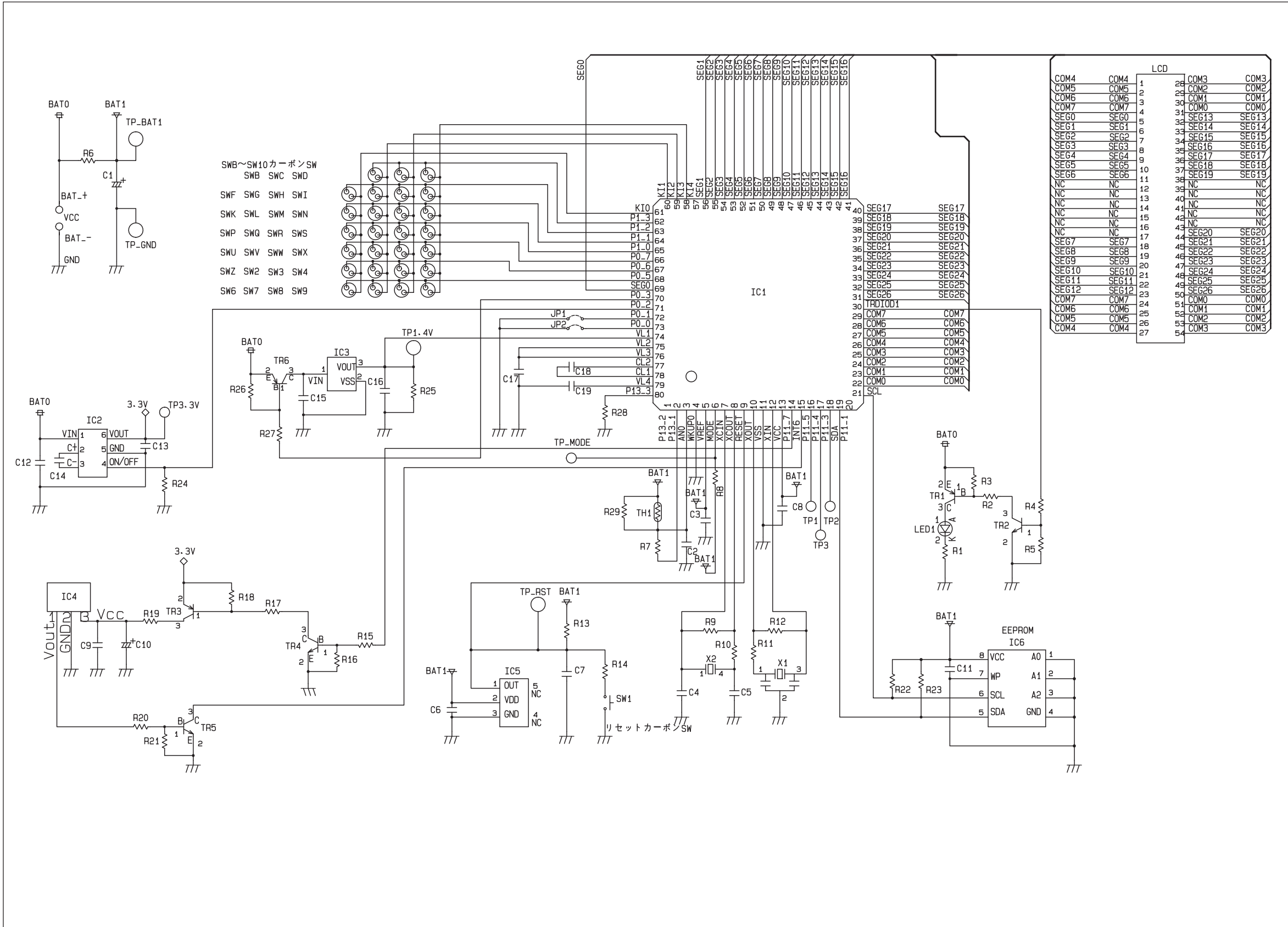
OUTDOOR UNIT

# WIRING DIAGRAM

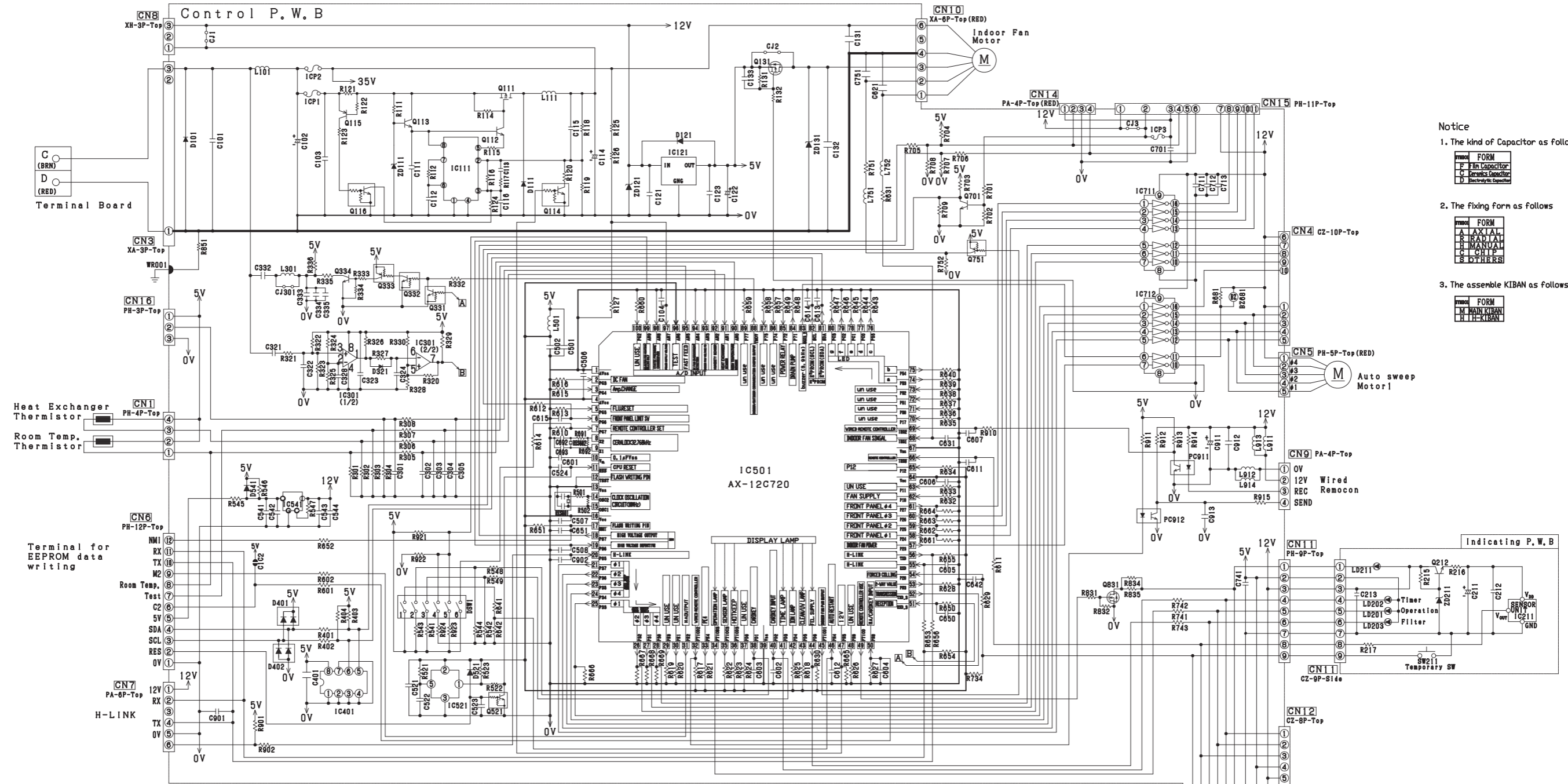


# WIRING DIAGRAM OF THE PRINTED WIRING BOARD

[Remote controller] RAR-5E2







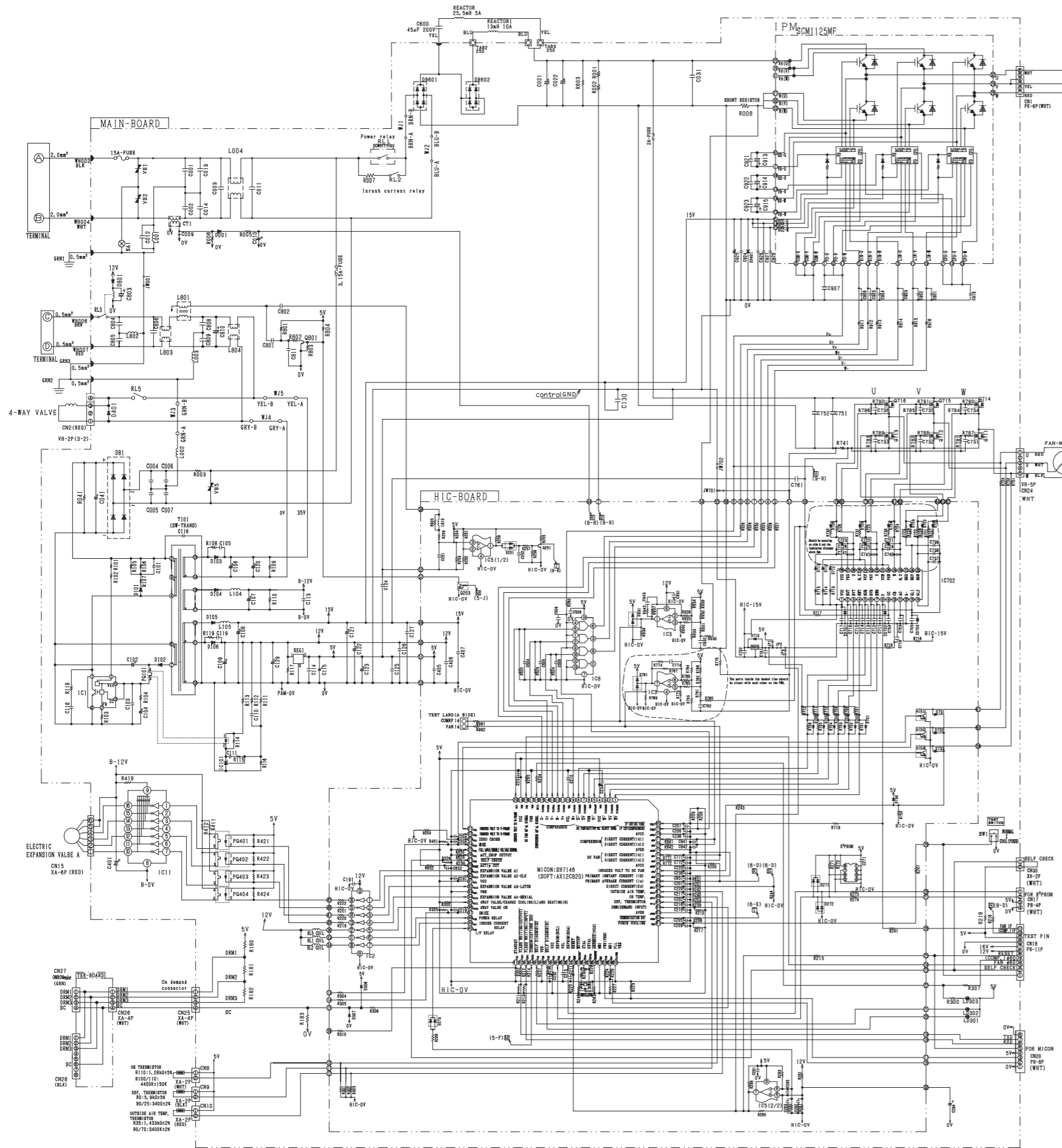
- Notice
1. The kind of Capacitor as follows  

FORM	FORM
AXIAL	Radial Capacitor
MANUAL	Manual Capacitor
OTHERS	Others Capacitor
  2. The fixing form as follows  

FORM	FORM
AXIAL	AXIAL
MANUAL	MANUAL
OTHERS	OTHERS
  3. The assemble KIBAN as follows  

FORM	FORM
MAIN KIBAN	MAIN KIBAN
THE KIBAN	THE KIBAN

RESISTOR			Capacitor			Diode			IC			Oscillator			CONNECTER			Photo Unit			Zener Diode			LED			Photo Coupler		
R001	10k	1/10	C001	10uF	50V	D001	1N4148	100	IC101	7805	500	OC101	100k	PH101	100k	ZD001	5.1	LD001	5mm	VD001	1N4733	PC001	PC001	PC001					
R002	100k	1/10	C002	100uF	50V	D002	1N4007	100	IC102	7805	500	OC102	100k	PH102	100k	ZD002	5.1	LD002	5mm	VD002	1N4733	PC002	PC002	PC002					



Mounting form  
 A: Axial insertion H: Hand insertion  
 R: Radial insertion C: Chip surface mounting  
 P: Parallel insertion S: In addition surface mounting  
 (7: 0.5mm pitch)

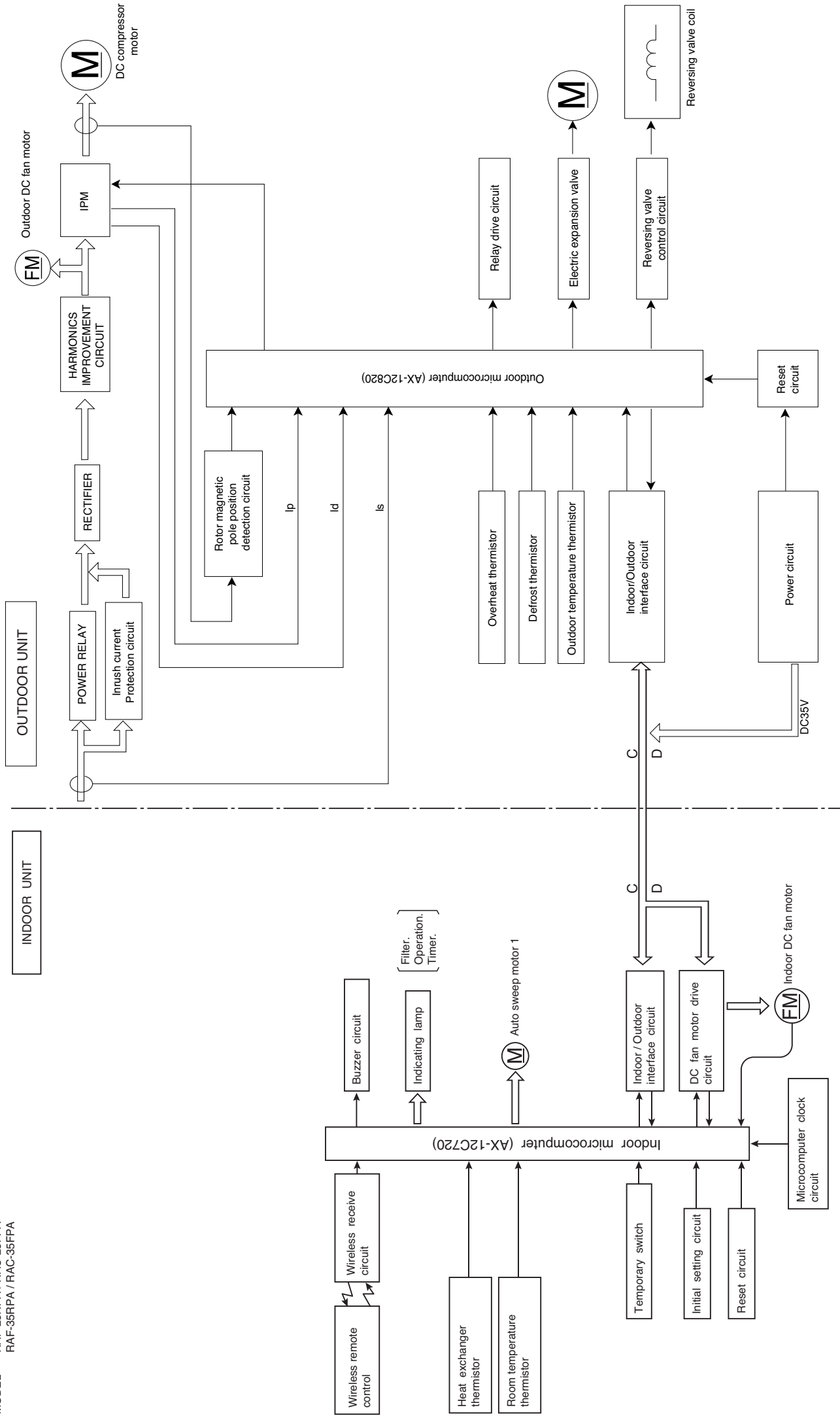
Mounting Board  
 M: M Board

CAPACITORS TYPE  
 C: CERAMIC  
 P: POLYESTER  
 E: ELECTROLYTICAL

RESISTORS		RESISTORS		RESISTORS		CAPACITORS		CAPACITORS		DIODES		TRANSISTORS	
SYMBOL	HEATING VALUE	SYMBOL	HEATING VALUE	SYMBOL	HEATING VALUE	SYMBOL	RATING	SYMBOL	RATING	SYMBOL	MODEL	SYMBOL	MODEL
R001	10K 1/4W C B102	R300	10K 1/4W C B102	R701	10K 1/4W C B102	C001	0.1uF C F M 100V	C001	0.1uF C F M 100V	D001	1N4148	Q101	2N4398
R002	10K 1/4W C B102	R301	10K 1/4W C B102	R702	10K 1/4W C B102	C002	0.1uF C F M 100V	C002	0.1uF C F M 100V	D002	1N4148	Q102	2N4398
R003	10K 1/4W C B102	R302	10K 1/4W C B102	R703	10K 1/4W C B102	C003	0.1uF C F M 100V	C003	0.1uF C F M 100V	D003	1N4148	Q103	2N4398
R004	10K 1/4W C B102	R303	10K 1/4W C B102	R704	10K 1/4W C B102	C004	0.1uF C F M 100V	C004	0.1uF C F M 100V	D004	1N4148	Q104	2N4398
R005	10K 1/4W C B102	R304	10K 1/4W C B102	R705	10K 1/4W C B102	C005	0.1uF C F M 100V	C005	0.1uF C F M 100V	D005	1N4148	Q105	2N4398
R006	10K 1/4W C B102	R305	10K 1/4W C B102	R706	10K 1/4W C B102	C006	0.1uF C F M 100V	C006	0.1uF C F M 100V	D006	1N4148	Q106	2N4398
R007	10K 1/4W C B102	R306	10K 1/4W C B102	R707	10K 1/4W C B102	C007	0.1uF C F M 100V	C007	0.1uF C F M 100V	D007	1N4148	Q107	2N4398
R008	10K 1/4W C B102	R307	10K 1/4W C B102	R708	10K 1/4W C B102	C008	0.1uF C F M 100V	C008	0.1uF C F M 100V	D008	1N4148	Q108	2N4398
R009	10K 1/4W C B102	R308	10K 1/4W C B102	R709	10K 1/4W C B102	C009	0.1uF C F M 100V	C009	0.1uF C F M 100V	D009	1N4148	Q109	2N4398
R010	10K 1/4W C B102	R309	10K 1/4W C B102	R710	10K 1/4W C B102	C010	0.1uF C F M 100V	C010	0.1uF C F M 100V	D010	1N4148	Q110	2N4398
R011	10K 1/4W C B102	R310	10K 1/4W C B102	R711	10K 1/4W C B102	C011	0.1uF C F M 100V	C011	0.1uF C F M 100V	D011	1N4148	Q111	2N4398
R012	10K 1/4W C B102	R311	10K 1/4W C B102	R712	10K 1/4W C B102	C012	0.1uF C F M 100V	C012	0.1uF C F M 100V	D012	1N4148	Q112	2N4398
R013	10K 1/4W C B102	R312	10K 1/4W C B102	R713	10K 1/4W C B102	C013	0.1uF C F M 100V	C013	0.1uF C F M 100V	D013	1N4148	Q113	2N4398
R014	10K 1/4W C B102	R313	10K 1/4W C B102	R714	10K 1/4W C B102	C014	0.1uF C F M 100V	C014	0.1uF C F M 100V	D014	1N4148	Q114	2N4398
R015	10K 1/4W C B102	R314	10K 1/4W C B102	R715	10K 1/4W C B102	C015	0.1uF C F M 100V	C015	0.1uF C F M 100V	D015	1N4148	Q115	2N4398
R016	10K 1/4W C B102	R315	10K 1/4W C B102	R716	10K 1/4W C B102	C016	0.1uF C F M 100V	C016	0.1uF C F M 100V	D016	1N4148	Q116	2N4398
R017	10K 1/4W C B102	R316	10K 1/4W C B102	R717	10K 1/4W C B102	C017	0.1uF C F M 100V	C017	0.1uF C F M 100V	D017	1N4148	Q117	2N4398
R018	10K 1/4W C B102	R317	10K 1/4W C B102	R718	10K 1/4W C B102	C018	0.1uF C F M 100V	C018	0.1uF C F M 100V	D018	1N4148	Q118	2N4398
R019	10K 1/4W C B102	R318	10K 1/4W C B102	R719	10K 1/4W C B102	C019	0.1uF C F M 100V	C019	0.1uF C F M 100V	D019	1N4148	Q119	2N4398
R020	10K 1/4W C B102	R319	10K 1/4W C B102	R720	10K 1/4W C B102	C020	0.1uF C F M 100V	C020	0.1uF C F M 100V	D020	1N4148	Q120	2N4398
R021	10K 1/4W C B102	R320	10K 1/4W C B102	R721	10K 1/4W C B102	C021	0.1uF C F M 100V	C021	0.1uF C F M 100V	D021	1N4148	Q121	2N4398
R022	10K 1/4W C B102	R321	10K 1/4W C B102	R722	10K 1/4W C B102	C022	0.1uF C F M 100V	C022	0.1uF C F M 100V	D022	1N4148	Q122	2N4398
R023	10K 1/4W C B102	R322	10K 1/4W C B102	R723	10K 1/4W C B102	C023	0.1uF C F M 100V	C023	0.1uF C F M 100V	D023	1N4148	Q123	2N4398
R024	10K 1/4W C B102	R323	10K 1/4W C B102	R724	10K 1/4W C B102	C024	0.1uF C F M 100V	C024	0.1uF C F M 100V	D024	1N4148	Q124	2N4398
R025	10K 1/4W C B102	R324	10K 1/4W C B102	R725	10K 1/4W C B102	C025	0.1uF C F M 100V	C025	0.1uF C F M 100V	D025	1N4148	Q125	2N4398
R026	10K 1/4W C B102	R325	10K 1/4W C B102	R726	10K 1/4W C B102	C026	0.1uF C F M 100V	C026	0.1uF C F M 100V	D026	1N4148	Q126	2N4398
R027	10K 1/4W C B102	R326	10K 1/4W C B102	R727	10K 1/4W C B102	C027	0.1uF C F M 100V	C027	0.1uF C F M 100V	D027	1N4148	Q127	2N4398
R028	10K 1/4W C B102	R327	10K 1/4W C B102	R728	10K 1/4W C B102	C028	0.1uF C F M 100V	C028	0.1uF C F M 100V	D028	1N4148	Q128	2N4398
R029	10K 1/4W C B102	R328	10K 1/4W C B102	R729	10K 1/4W C B102	C029	0.1uF C F M 100V	C029	0.1uF C F M 100V	D029	1N4148	Q129	2N4398
R030	10K 1/4W C B102	R329	10K 1/4W C B102	R730	10K 1/4W C B102	C030	0.1uF C F M 100V	C030	0.1uF C F M 100V	D030	1N4148	Q130	2N4398
R031	10K 1/4W C B102	R330	10K 1/4W C B102	R731	10K 1/4W C B102	C031	0.1uF C F M 100V	C031	0.1uF C F M 100V	D031	1N4148	Q131	2N4398
R032	10K 1/4W C B102	R331	10K 1/4W C B102	R732	10K 1/4W C B102	C032	0.1uF C F M 100V	C032	0.1uF C F M 100V	D032	1N4148	Q132	2N4398
R033	10K 1/4W C B102	R332	10K 1/4W C B102	R733	10K 1/4W C B102	C033	0.1uF C F M 100V	C033	0.1uF C F M 100V	D033	1N4148	Q133	2N4398
R034	10K 1/4W C B102	R333	10K 1/4W C B102	R734	10K 1/4W C B102	C034	0.1uF C F M 100V	C034	0.1uF C F M 100V	D034	1N4148	Q134	2N4398
R035	10K 1/4W C B102	R334	10K 1/4W C B102	R735	10K 1/4W C B102	C035	0.1uF C F M 100V	C035	0.1uF C F M 100V	D035	1N4148	Q135	2N4398
R036	10K 1/4W C B102	R335	10K 1/4W C B102	R736	10K 1/4W C B102	C036	0.1uF C F M 100V	C036	0.1uF C F M 100V	D036	1N4148	Q136	2N4398
R037	10K 1/4W C B102	R336	10K 1/4W C B102	R737	10K 1/4W C B102	C037	0.1uF C F M 100V	C037	0.1uF C F M 100V	D037	1N4148	Q137	2N4398
R038	10K 1/4W C B102	R337	10K 1/4W C B102	R738	10K 1/4W C B102	C038	0.1uF C F M 100V	C038	0.1uF C F M 100V	D038	1N4148	Q138	2N4398
R039	10K 1/4W C B102	R338	10K 1/4W C B102	R739	10K 1/4W C B102	C039	0.1uF C F M 100V	C039	0.1uF C F M 100V	D039	1N4148	Q139	2N4398
R040	10K 1/4W C B102	R339	10K 1/4W C B102	R740	10K 1/4W C B102	C040	0.1uF C F M 100V	C040	0.1uF C F M 100V	D040	1N4148	Q140	2N4398
R041	10K 1/4W C B102	R340	10K 1/4W C B102	R741	10K 1/4W C B102	C041	0.1uF C F M 100V	C041	0.1uF C F M 100V	D041	1N4148	Q141	2N4398
R042	10K 1/4W C B102	R341	10K 1/4W C B102	R742	10K 1/4W C B102	C042	0.1uF C F M 100V	C042	0.1uF C F M 100V	D042	1N4148	Q142	2N4398
R043	10K 1/4W C B102	R342	10K 1/4W C B102	R743	10K 1/4W C B102	C043	0.1uF C F M 100V	C043	0.1uF C F M 100V	D043	1N4148	Q143	2N4398
R044	10K 1/4W C B102	R343	10K 1/4W C B102	R744	10K 1/4W C B102	C044	0.1uF C F M 100V	C044	0.1uF C F M 100V	D044	1N4148	Q144	2N4398
R045	10K 1/4W C B102	R344	10K 1/4W C B102	R745	10K 1/4W C B102	C045	0.1uF C F M 100V	C045	0.1uF C F M 100V	D045	1N4148	Q145	2N4398
R046	10K 1/4W C B102	R345	10K 1/4W C B102	R746	10K 1/4W C B102	C046	0.1uF C F M 100V	C046	0.1uF C F M 100V	D046	1N4148	Q146	2N4398
R047	10K 1/4W C B102	R346	10K 1/4W C B102	R747	10K 1/4W C B102	C047	0.1uF C F M 100V	C047	0.1uF C F M 100V	D047	1N4148	Q147	2N4398
R048	10K 1/4W C B102	R347	10K 1/4W C B102	R748	10K 1/4W C B102	C048	0.1uF C F M 100V	C048	0.1uF C F M 100V	D048	1N4148	Q148	2N4398
R049	10K 1/4W C B102	R348	10K 1/4W C B102	R749	10K 1/4W C B102	C049	0.1uF C F M 100V	C049	0.1uF C F M 100V	D049	1N4148	Q149	2N4398
R050	10K 1/4W C B102	R349	10K 1/4W C B102	R750	10K 1/4W C B102	C050	0.1uF C F M 100V	C050	0.1uF C F M 100V	D050	1N4148	Q150	2N4398
R051	10K 1/4W C B102	R350	10K 1/4W C B102	R751	10K 1/4W C B102	C051	0.1uF C F M 100V	C051	0.1uF C F M 100V	D051	1N4148	Q151	2N4398
R052	10K 1/4W C B102	R351	10K 1/4W C B102	R752	10K 1/4W C B102	C052	0.1uF C F M 100V	C052	0.1uF C F M 100V	D052	1N4148	Q152	2N4398
R053	10K 1/4W C B102	R352	10K 1/4W C B102	R753	10K 1/4W C B102	C053	0.1uF C F M 100V	C053	0.1uF C F M 100V	D053	1N4148	Q153	2N4398
R054	10K 1/4W C B102	R353	10K 1/4W C B102	R754	10K 1/4W C B102	C054	0.1uF C F M 100V	C054	0.1uF C F M 100V	D054	1N4148	Q154	2N4398
R055	10K 1/4W C B102	R354	10K 1/4W C B102	R755	10K 1/4W C B102	C055	0.1uF C F M 100V	C055	0.1uF C F M 100V	D055	1N4148	Q155	2N4398
R056	10K 1/4W C B102	R355	10K 1/4W C B102	R756	10K 1/4W C B102	C056	0.1uF C F M 100V	C056	0.1uF C F M 100V	D056	1N4148	Q156	2N4398
R057	10K 1/4W C B102	R356	10K 1/4W C B102	R757	10K 1/4W C B102	C057	0.1uF C F M 100V	C057	0.1uF C F M 100V	D057	1N4148	Q157	2N4398
R058	10K 1/4W C B102	R357	10K 1/4W C B102	R758	10K 1/4W C B102	C058	0.1uF C F M 100V	C058	0.1uF C F M 100V	D058	1N4148	Q158	2N4398
R059	10K 1/4W C B102	R358	10K 1/4W C B102	R759	10K 1/4W C B102	C059	0.1uF C F M 100V	C059	0.1uF C F M 100V	D059	1N4148	Q159	2N4398
R060	10K 1/4W C B102	R359	10K 1/4W C B102	R760	10K 1/4W C B102	C060	0.1uF C F M 100V	C060	0.1uF C F M 100V	D060	1N4148	Q160	2N4398
R061	10K 1/4W C B102	R360	10K 1/4W C B102	R761	10K 1/4W C B102	C061	0.1uF C F M 100V	C061	0.1uF C F M 100V	D061	1N4148	Q161	2N4398
R062	10K 1/4W C B102	R361	10K 1/4W C B102	R762	10K								

# BLOCK DIAGRAM

MODEL RAF-25RPA / RAC-25FPA  
 RAF-35RPA / RAC-35FPA



# BASIC MODE

MODEL RAF-25RPA, RAF-35RPA

Operation mode	n a F	g n i l o	o C	g n i y f i d i m u h e D	g n i t a e H	Auto
Basic operation of start / stop switch				Start / stop switch Operation lamp	Start / stop switch Operation lamp	
Off-timer				Start / stop switch Reserve switch Cancel switch Operation lamp Timer lamp Timer memory	Start / stop switch Reserve switch Cancel switch Operation lamp Timer lamp Timer memory	
On-timer				Start / stop switch Reserve switch Cancel switch Operation lamp Timer lamp Timer memory	Start / stop switch Reserve switch Cancel switch Operation lamp Timer lamp Timer memory	
Auto		Changes from "Hi" to "Med" or "Lo" depending on room temperature.			Set to "Silent", "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 18°C in the "Silent" mode other than during preheating (cooling is recovered at 18.33°C).	Operating mode is judged by room temperature. (1) Judging by room temperature Operating mode at start up is judged (initial judgment). (a) Conditions for judgment (any of the followings). · When auto operation is started after the previous auto mode operation. · When auto operation is started after the previous manual mode operation. · When the operating mode is switched to auto while operating at manual mode. (b) Judging method · [Cooling] : Room temperature $\geq$ Remote controller setting · [Heating] : Room temperature < Remote controller setting [ Room temperature setting of remote controller ]
Hi	Operates at "Hi" regardless of the room temperature.	1. Runs at "Hi" until first thermo off after operation is started. 2. Runs at "Lo" when thermo is off.			Set to "Silent", "Lo", "Med", "Hi", "Ultra-Hi" or "Stop" depending on the room temperature and time. Set to "Stop" if the room temperature is 18°C in the "Silent" 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.	(2) Judging operating mode change during operation (Continuous judgment). (a) Conditions for judgment · The mode is reviewed at interval time. · Interval time as below · The first interval time : 30 minutes · The second interval time : 50 minutes · On and after the third interval time : 55 minutes (b) Judging method · Judge by setting the hysteresis on the final preset temperature. The final preset temperature is the actually targeted preset temperature which is sum of basic preset temperature and each type of shift value. (e.g. preset temperature correction value, powerful shift value, eco shift value, eco sleep shift value, etc.) [ Currently cooling ] · Room temperature $\leq$ Final preset temperature -2 Change to heating · Room temperature > Final preset temperature -2 Continue cooling [ Currently heating ] · Room temperature $\geq$ Final preset temperature +3 Change to cooling · Room temperature < Final preset temperature +3 Continue heating
Med	Operates at "Med" regardless of the room temperature.	Same as at left.			Set to "Silent", "Lo", "Med" or "Stop" depending on the room temperature and time. Set to "Stop" if the room temperature is 18°C in the "Silent" 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 "Silent", "Lo", "Med" or "Stop" depending on the room temperature and time. Set to "Stop" if the room temperature is 18°C in the "Silent" mode other than during preheating (cooling is recovered at 18.33°C).	
Silent	Operates at "Silent" regardless of the room temperature.	Same as at left.		Set to "Silent" in modes other than when the compressor stops.	Set to "Silent", "Lo", "Med" or "Stop" depending on the room temperature and time. Set to "Stop" if the room temperature is 18°C in the "Silent" 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 38.		See page 40.	See page 42.	
Sleep operation (with sleep button ON)	Enters sleep operation after set as on the left. Action during sleep operation silent (sleep) operation.	• Same as at left. • See page 40.		• Same as at left. • See page 40.	• Same as at left. • See page 42.	• Same as at left. • Performs the sleep operation of each operation mode.
Leave home						

Notes:

- The speed set of rotation for the fan motor in each operation mode are as shown in Table 1.
- The set room temperatures in the diagram include the shift values in Table 2.

Mode data file

LABEL NAME	REQUIRED VALUE OF UNIT SIDE	
	RAF-25RPA	RAF-35RPA
WMAX	5000 min <sup>-1</sup>	5800 min <sup>-1</sup>
WMAX2	4700 min <sup>-1</sup>	5800 min <sup>-1</sup>
WSTD	3800 min <sup>-1</sup>	4700 min <sup>-1</sup>
WJKMAX	3150 min <sup>-1</sup>	4300 min <sup>-1</sup>
WBEMAX	3150 min <sup>-1</sup>	3500 min <sup>-1</sup>
WSZMAX	3150 min <sup>-1</sup>	3200 min <sup>-1</sup>
CMAX	3000 min <sup>-1</sup>	5100 min <sup>-1</sup>
CSTD	2800 min <sup>-1</sup>	4000 min <sup>-1</sup>
CJKMAX	2350 min <sup>-1</sup>	3500 min <sup>-1</sup>
CBEMAX	2350 min <sup>-1</sup>	3000 min <sup>-1</sup>
CSZMAX	2350 min <sup>-1</sup>	2400 min <sup>-1</sup>
SDMAX	2500 min <sup>-1</sup>	2800 min <sup>-1</sup>
SDRPM	2000 min <sup>-1</sup>	2000 min <sup>-1</sup>
WMINHI	2000 min <sup>-1</sup>	2300 min <sup>-1</sup>
WMIN	2000 min <sup>-1</sup>	2000 min <sup>-1</sup>
CMINHI	2000 min <sup>-1</sup>	2000 min <sup>-1</sup>
CMIN	2000 min <sup>-1</sup>	2000 min <sup>-1</sup>
DMIN	2000 min <sup>-1</sup>	2000 min <sup>-1</sup>
STAROTP	10	10
STARCP1	2700 min <sup>-1</sup>	2500 min <sup>-1</sup>
STARCPH	3700 min <sup>-1</sup>	2500 min <sup>-1</sup>
STARCP2	250 min <sup>-1</sup>	300 min <sup>-1</sup>
STARCP3	0 min <sup>-1</sup>	0 min <sup>-1</sup>
STARTMW	60 sec.	60 sec.
STARTMC	90 sec.	90 sec.
STARTMD	90 sec.	80 sec.
STARTM2	0 sec.	0 sec.
STARTM3	0 sec.	0 sec.
PKOU	500 min <sup>-1</sup>	500 min <sup>-1</sup>
FZZY_GN	1	1
FZZYTM	3 min.	3 min.
SHIFTW	0.33	0.33
SFTSZW	0.33	0.33
SFTOYW1	0.66	0.66
SHIFTC	0	0
SHIFTD	0	0
CMNLMT	2000 min <sup>-1</sup>	2000 min <sup>-1</sup>
TEION	2.00	2.00
TEIOF	9.00	9.00
DFTIM_COL	35 min.	35 min.
DFTIM_FST	43 min.	43 min.
DFTIM_OTP0	43 min.	43 min.
DFTIM_OTP5	50 min.	50 min.
DFTIM_OTP10	50 min.	50 min.
TDF411	40 sec.	60 sec.
TDF412	20 sec.	30 sec.
TDF413	20 sec.	60 sec.
DFRPM3	2200 min <sup>-1</sup>	2000 min <sup>-1</sup>
STARCPDL	2000 min <sup>-1</sup>	2000 min <sup>-1</sup>
STARCPDH	2000 min <sup>-1</sup>	2000 min <sup>-1</sup>
STARCPD2	200 min <sup>-1</sup>	200 min <sup>-1</sup>
STARTDF1	50 sec.	60 sec.
STARTDF2	50 sec.	90 sec.
DFMXTM	20 min.	20 min.
DFMAX	4000 min <sup>-1</sup>	6000 min <sup>-1</sup>
TDF431	80 sec.	60 sec.
TDF431_CHG	30 sec.	30 sec.
DEFCOL	8 min.	8 min.
CLNTMW	38 min.	38 min.
CLNTMS	22 min.	22 min.
CLNCPW	2200 min <sup>-1</sup>	2200 min <sup>-1</sup>
CLNEVP	40	40.00
FWSS_P	250 min <sup>-1</sup>	250 min <sup>-1</sup>
FWSOY_P	450 min <sup>-1</sup>	450 min <sup>-1</sup>
FWS_P	550 min <sup>-1</sup>	620 min <sup>-1</sup>
FWKAF_P	650 min <sup>-1</sup>	700 min <sup>-1</sup>
FWL_P	650 min <sup>-1</sup>	750 min <sup>-1</sup>

LABEL NAME	REQUIRED VALUE OF UNIT SIDE	
	RAF-25RPA	RAF-35RPA
FWAH_P	750 min <sup>-1</sup>	820 min <sup>-1</sup>
FWH_P	820 min <sup>-1</sup>	980 min <sup>-1</sup>
FWAHH_P	870 min <sup>-1</sup>	1000 min <sup>-1</sup>
FWHH_P	960 min <sup>-1</sup>	1000 min <sup>-1</sup>
FCSOY_P	500 min <sup>-1</sup>	450 min <sup>-1</sup>
FCS_P	600 min <sup>-1</sup>	600 min <sup>-1</sup>
FCL_P	650 min <sup>-1</sup>	700 min <sup>-1</sup>
FCAH_P	730 min <sup>-1</sup>	820 min <sup>-1</sup>
FCH_P	790 min <sup>-1</sup>	950 min <sup>-1</sup>
FCHH_P	960 min <sup>-1</sup>	1050 min <sup>-1</sup>
FDSOY_P	450 min <sup>-1</sup>	450 min <sup>-1</sup>
FDS1_P	550 min <sup>-1</sup>	550 min <sup>-1</sup>
FDS2_P	600 min <sup>-1</sup>	600 min <sup>-1</sup>
WLHMAX	3600 min <sup>-1</sup>	5800 min <sup>-1</sup>
WMIN_LH	2000 min <sup>-1</sup>	2000 min <sup>-1</sup>
STARCP1_LH	2000 min <sup>-1</sup>	2000 min <sup>-1</sup>
STARCP2_LH	100 min <sup>-1</sup>	100 min <sup>-1</sup>
STARCP3_LH	100 min <sup>-1</sup>	100 min <sup>-1</sup>
STARTMW_LH	20 sec.	20 sec.
STARTM2_LH	30 sec.	30 sec.
STARTM3_LH	40 sec.	40 sec.
SFTLVHM	2	0
FWLVHM_P	800 min <sup>-1</sup>	1000 min <sup>-1</sup>
FAN_LH_H	510 min <sup>-1</sup>	700 min <sup>-1</sup>

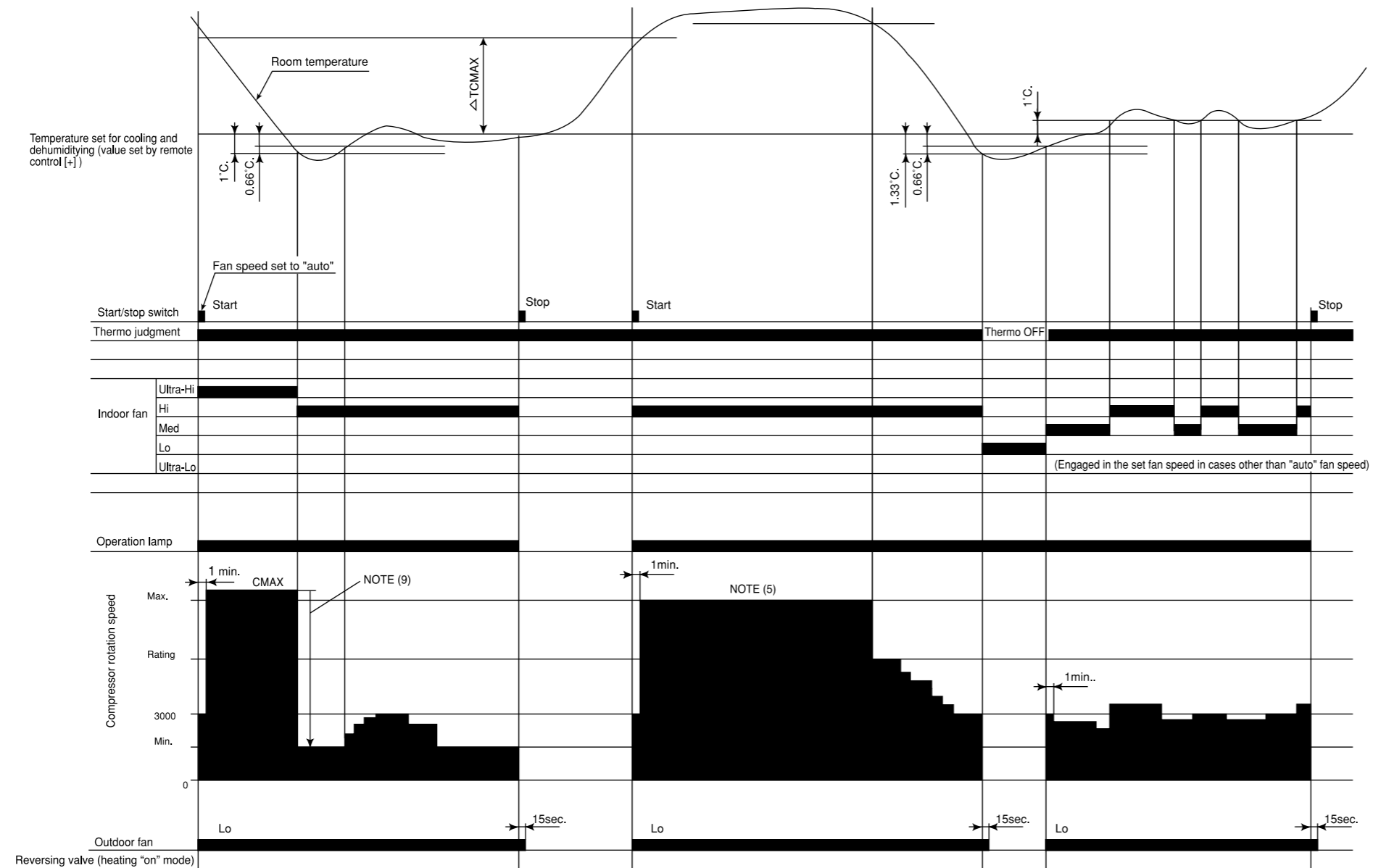
Table 1 Fan speed by mode

Operation mode	Fan speed mode	Label name
Heating operation	Ultra Lo	FWSS_P
	Silent, Sleep	FWSOY_P
	Lo	FWS_P
	Overload	FWKAF_P
	Med	FWL_P
	Hi	FWAH_P
	Ultra Hi	FWAHH_P
Cooling operation	Hi	FWH_P
	Ultra Hi	FWHH_P
	Silent, Sleep	FCSOY_P
	Lo	FCS_P
	Med	FCL_P
Dehumidifying operation	Hi	FCAH_P
	Hi	FCH_P
	Ultra Hi	FCHH_P
	Silent, Sleep	FDSOY_P
	Lo 1	FDS1_P
	Lo 2	FDS2_P

Table 2 Room temperature shift value

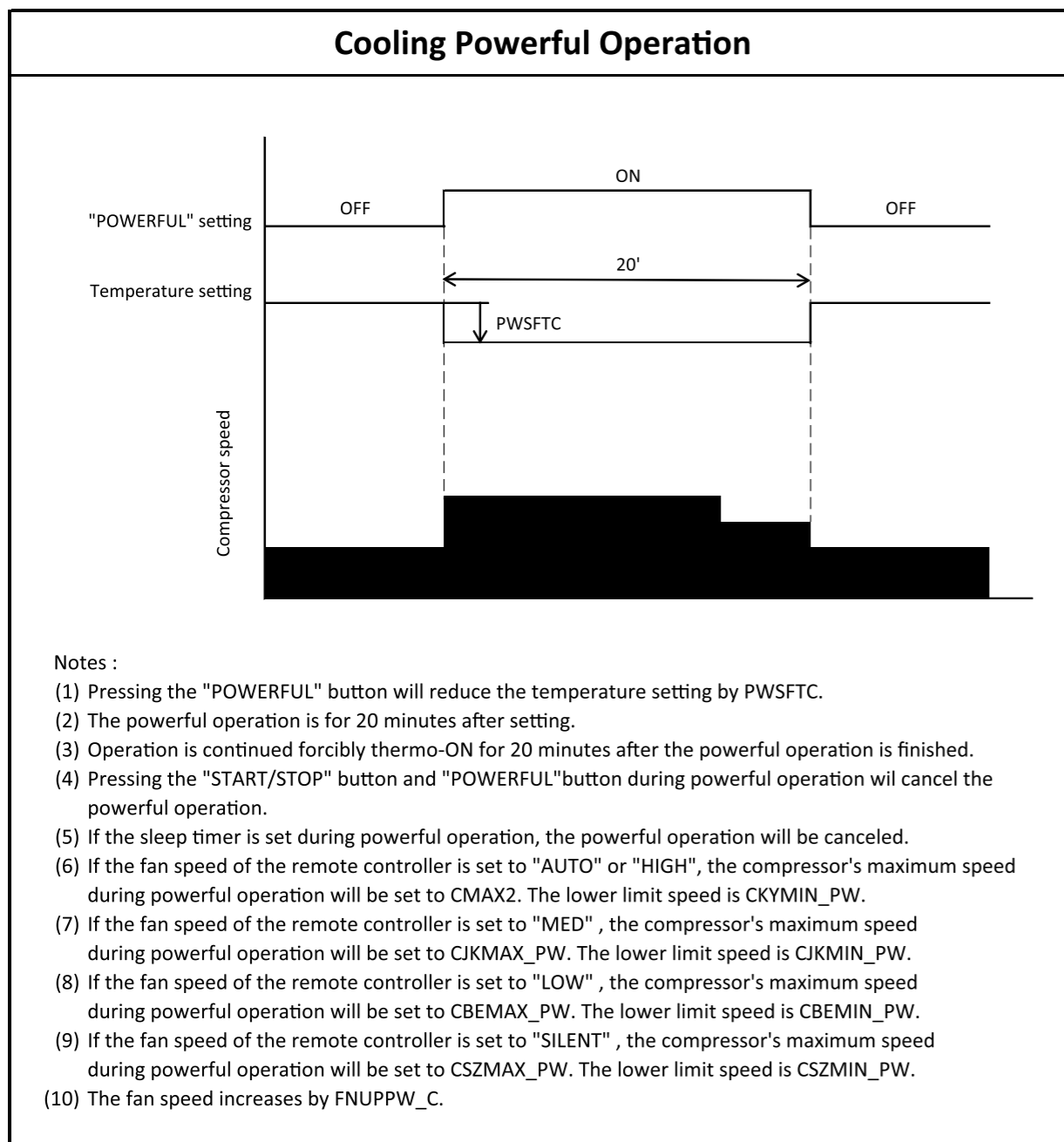
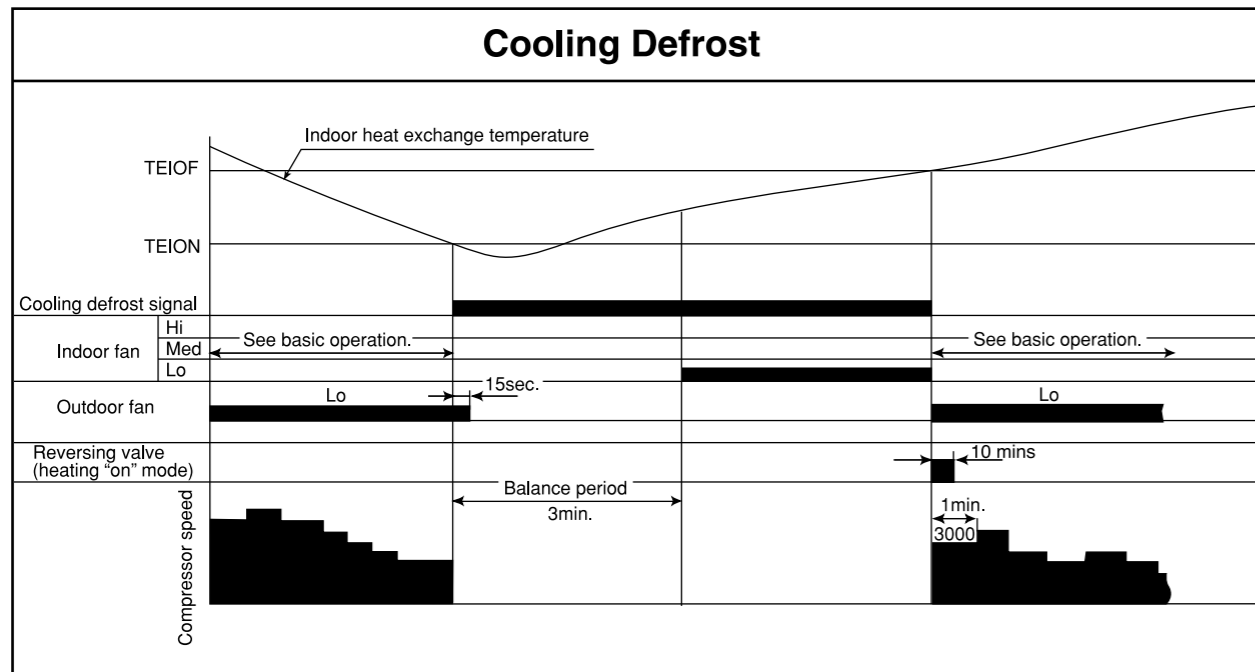
Operation mode	Fan speed mode	Shift value
Heating operation	Fan speed "AUTO, Hi, Med"	SHIFTW
	Fan speed "Lo, Silent, Sleep"	SFTSZW
Cooling operation		SHIFTC
Dehumidifying operation		SHIFTD

## Basic Cooling Operation

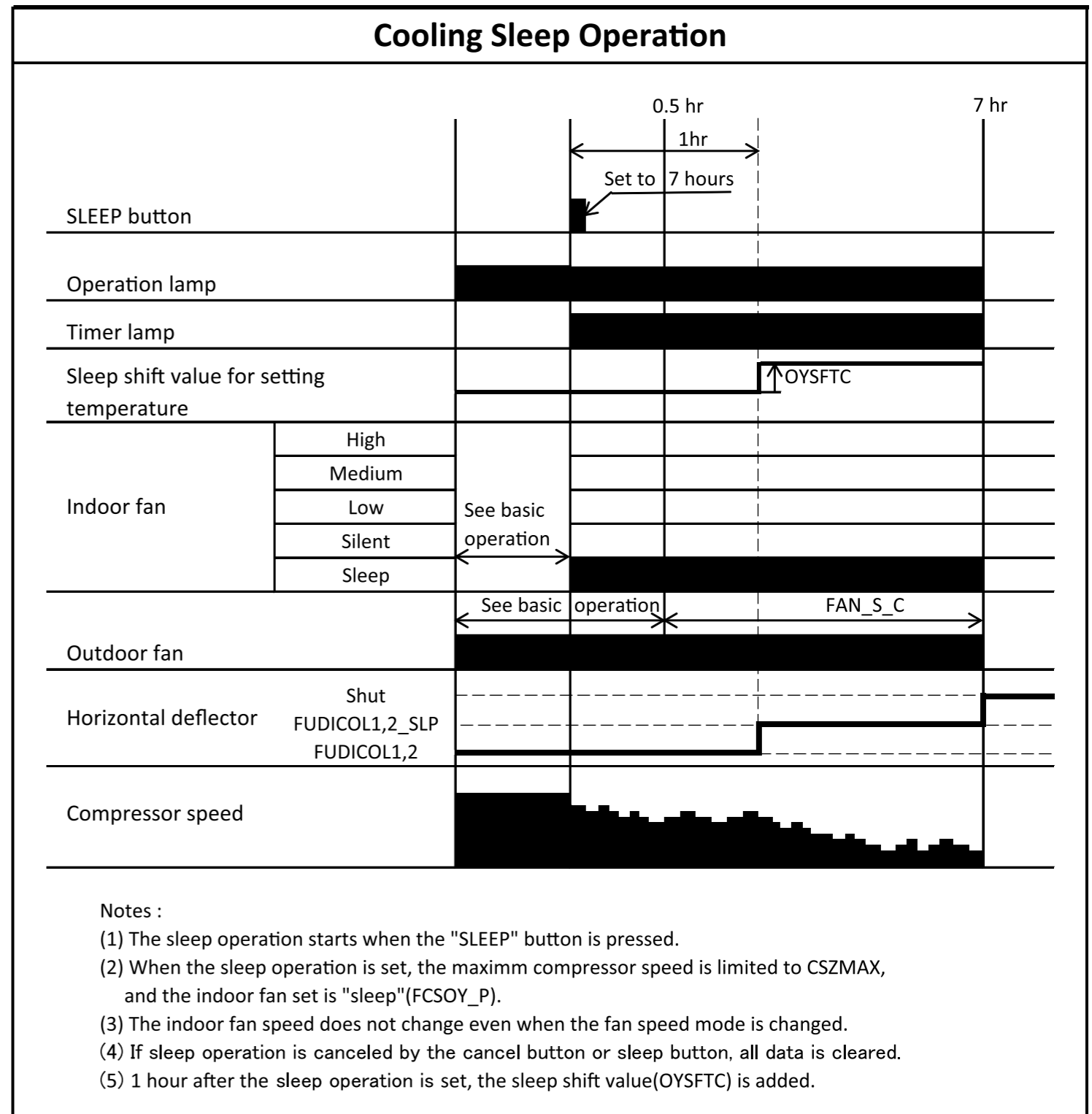


### Notes:

- (1) Condition for entering into Cool Dashed mode. When fan set to "Hi" or "Auto" and when the compressor speed (P section) due to temperature difference between setting temperature (including the correction shift only) and room temperature is CMAX or higher.
- (2) Cool Dashed will release when i) a maximum 25 minutes is lapsed and ii) room temperature is lower than set temperature  $-3^{\circ}\text{C}$  (thermo off) and iii) when room temperature has achieved setting temperature  $-1^{\circ}\text{C}$  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)  $-3^{\circ}\text{C}$ . 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 CSTD.
- (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  $-1^{\circ}\text{C}$  compressor rpm is actual rpm x DWNRATEC.

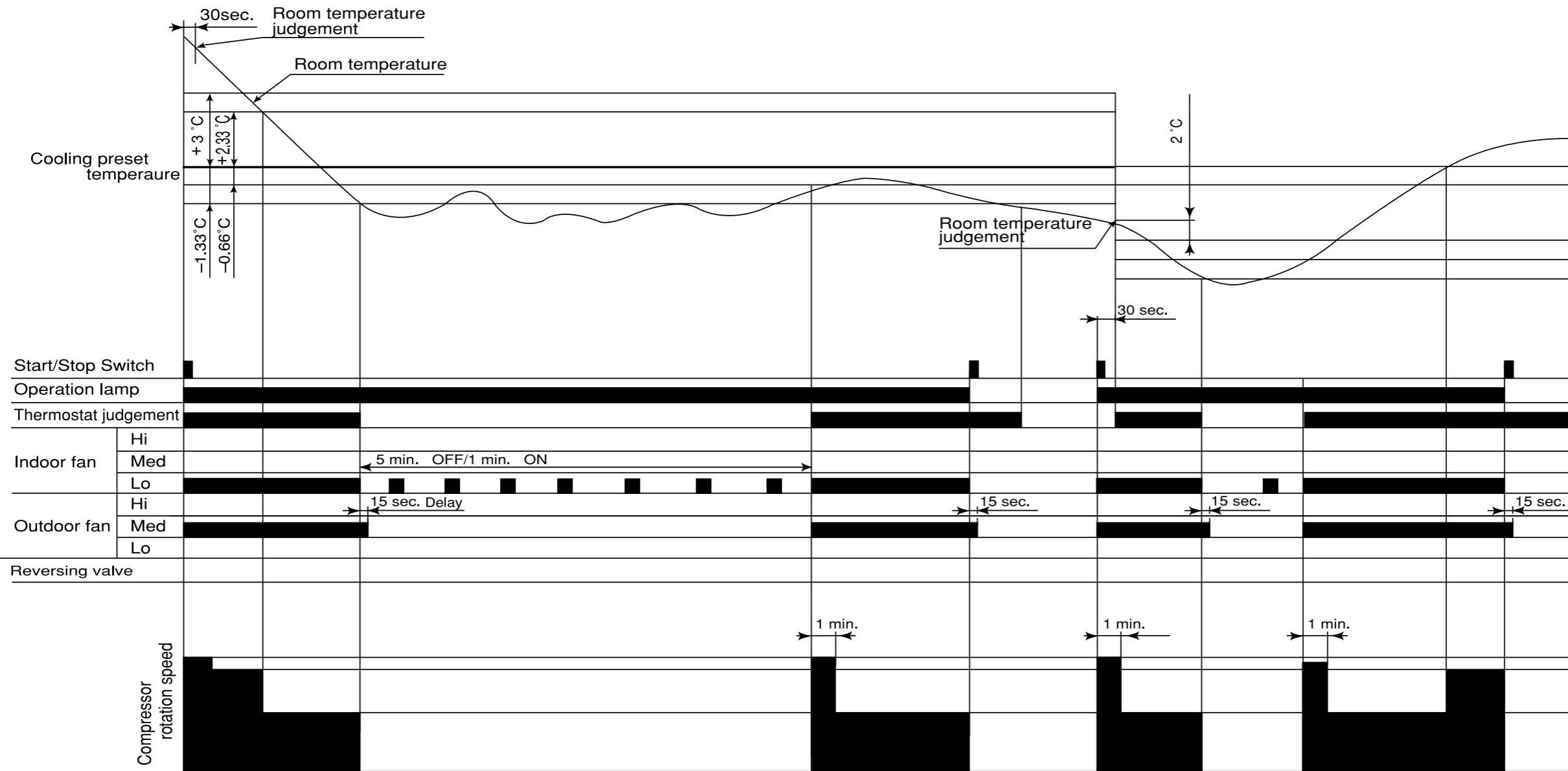


- Notes :
- (1) Pressing the "POWERFUL" button will reduce the temperature setting by PWSFTC.
  - (2) The powerful operation is for 20 minutes after setting.
  - (3) Operation is continued forcibly thermo-ON for 20 minutes after the powerful operation is finished.
  - (4) Pressing the "START/STOP" button and "POWERFUL" button during powerful operation will cancel the powerful operation.
  - (5) If the sleep timer is set during powerful operation, the powerful operation will be canceled.
  - (6) If the fan speed of the remote controller is set to "AUTO" or "HIGH", the compressor's maximum speed during powerful operation will be set to CMAX2. The lower limit speed is CKYMIN\_PW.
  - (7) If the fan speed of the remote controller is set to "MED", the compressor's maximum speed during powerful operation will be set to CJKMAX\_PW. The lower limit speed is CJKMIN\_PW.
  - (8) If the fan speed of the remote controller is set to "LOW", the compressor's maximum speed during powerful operation will be set to CBEMAX\_PW. The lower limit speed is CBEMIN\_PW.
  - (9) If the fan speed of the remote controller is set to "SILENT", the compressor's maximum speed during powerful operation will be set to CSZMAX\_PW. The lower limit speed is CSZMIN\_PW.
  - (10) The fan speed increases by FNUPPW\_C.



- Notes :
- (1) The sleep operation starts when the "SLEEP" button is pressed.
  - (2) When the sleep operation is set, the maximum compressor speed is limited to CSZMAX, and the indoor fan set is "sleep"(FCSOY\_P).
  - (3) The indoor fan speed does not change even when the fan speed mode is changed.
  - (4) If sleep operation is canceled by the cancel button or sleep button, all data is cleared.
  - (5) 1 hour after the sleep operation is set, the sleep shift value(OYSFTC) is added.

# Dehumidifying

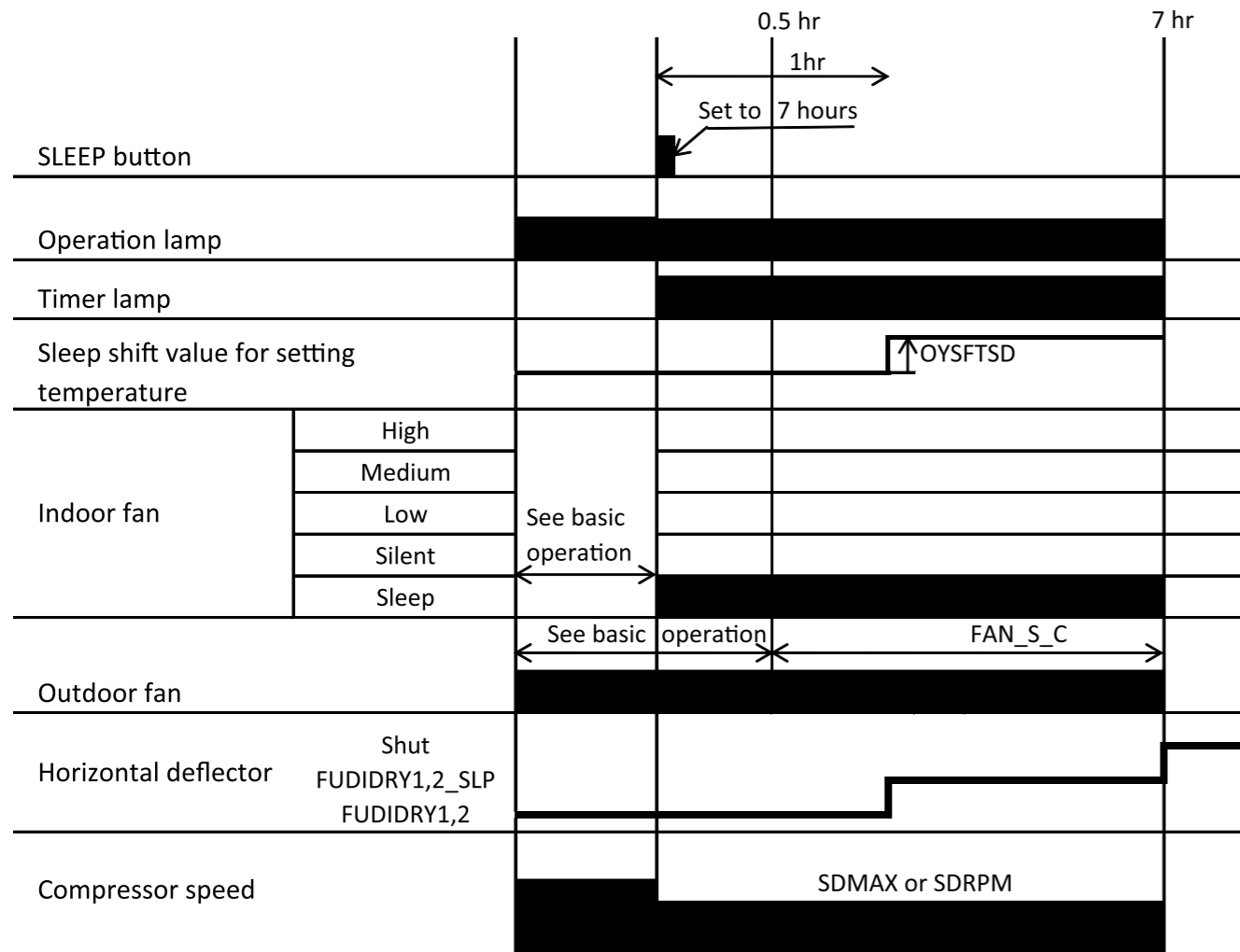


**Notes:**

- (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.



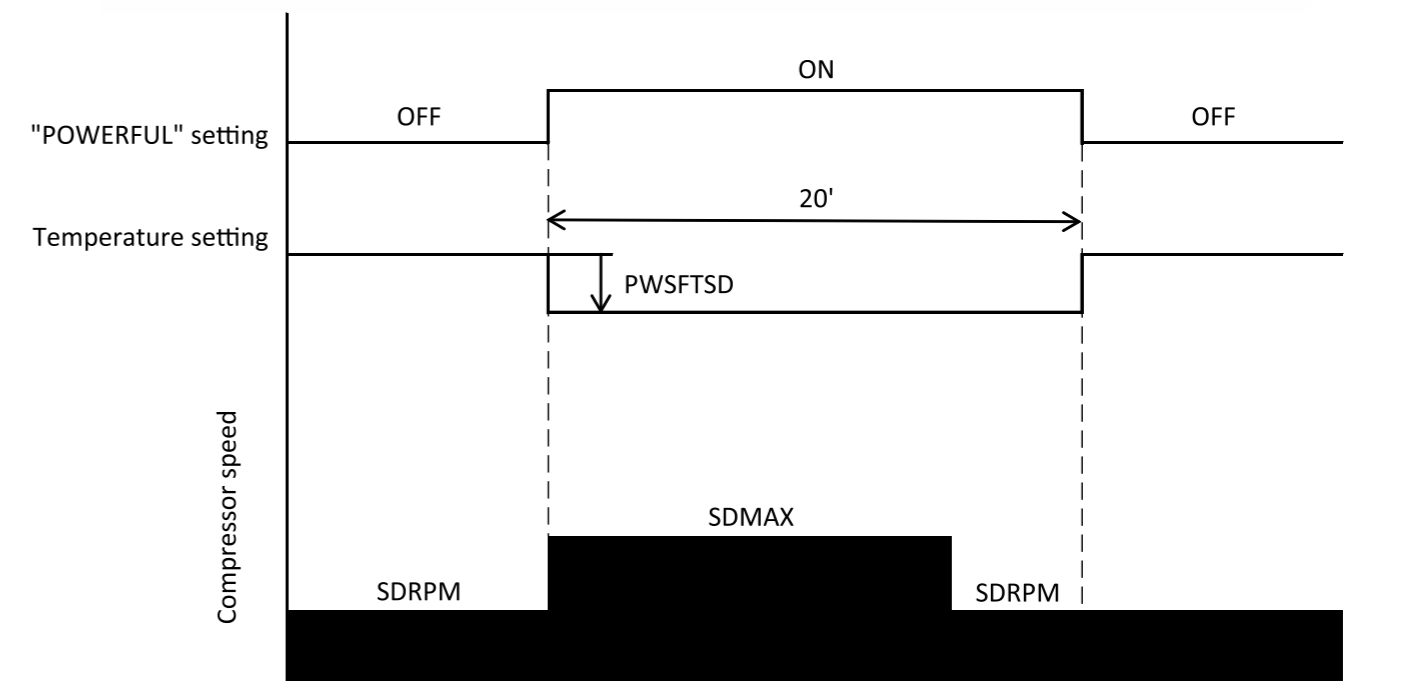
## Dehumidifying Sleep Operation



### Notes :

- (1) The sleep operation starts when the "SLEEP" button is pressed.
- (2) When the sleep operation is set, the indoor fan set is "sleep"(FDOY\_P).
- (3) The indoor fan speed does not change even when the fan speed mode is changed.
- (4) If sleep operation is canceled by the cancel button or sleep button, all data is cleared.
- (5) 1 hour after the sleep operation is set, the sleep shift value(OYSFTSD) is added.

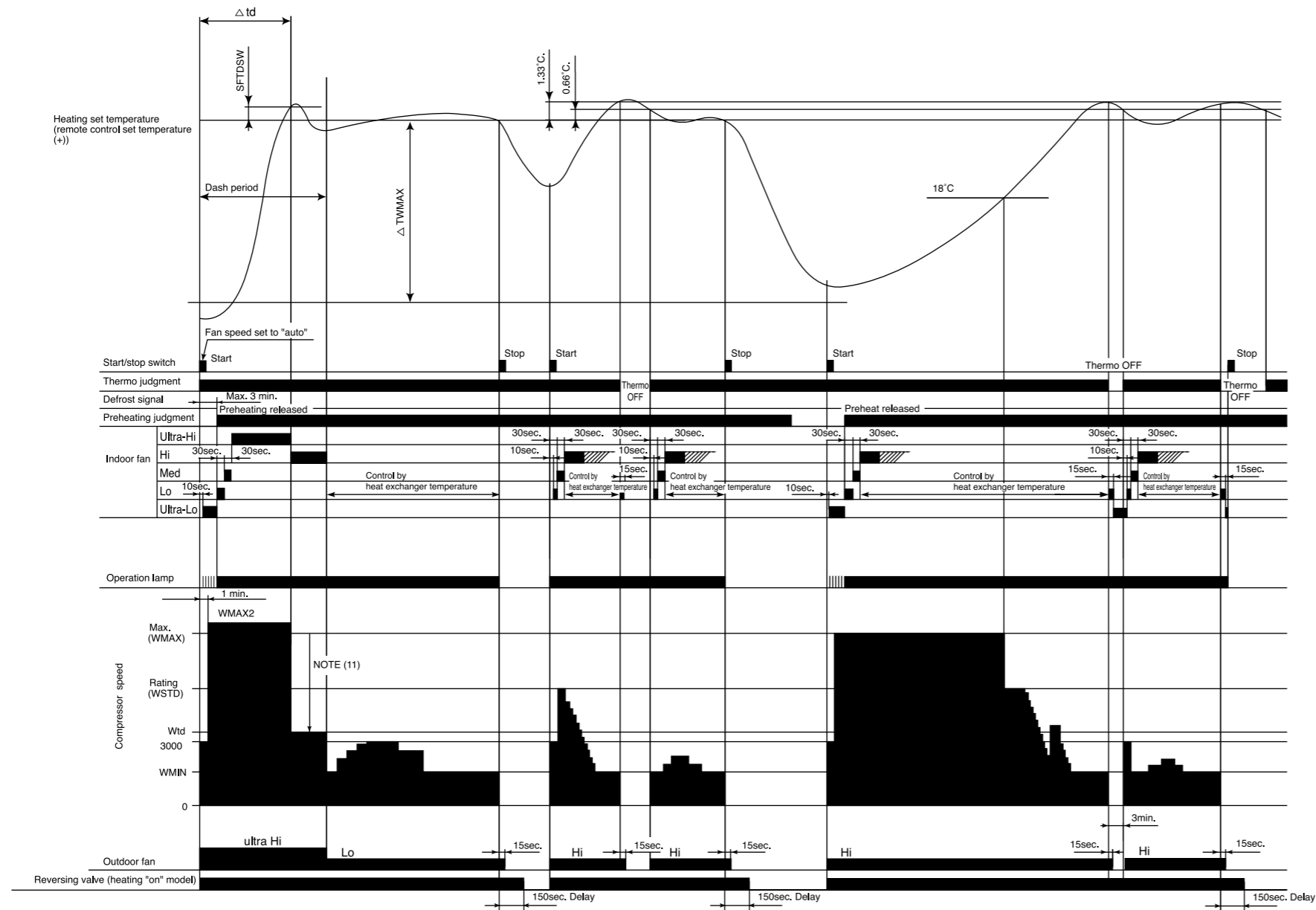
## Dehumidifying Powerful Operation



### Notes :

- (1) Pressing the "POWERFUL" button will reduce the temperature setting by PWSFTSD.
- (2) The powerful operation is for 20 minutes after setting.
- (3) Operation is continued forcibly thermo-ON for 20 minutes after the powerful operation is finished.
- (4) Pressing the "START/STOP" button and "POWERFUL" button during powerful operation will cancel the powerful operation.
- (5) If the sleep timer is set during powerful operation, the powerful operation will be canceled.
- (6) If the differential (the room temperature - the temperature setting) is "the differential  $\geq 3^{\circ}\text{C}$ " after powerful setting, the compressor's maximum speed during powerful operation will be set to SDMAX. Then the differential reduce "the differential  $\leq 2.33^{\circ}\text{C}$ " during powerful operation, the compressor's speed will be set to SDRPM. If the differential (the room temperature - the temperature setting) is "the differential  $< 3^{\circ}\text{C}$ " after powerful setting, the compressor's minimum speed during powerful operation will be set to SDRPM.
- (7) The fan speed increases by FNUPPW\_D.

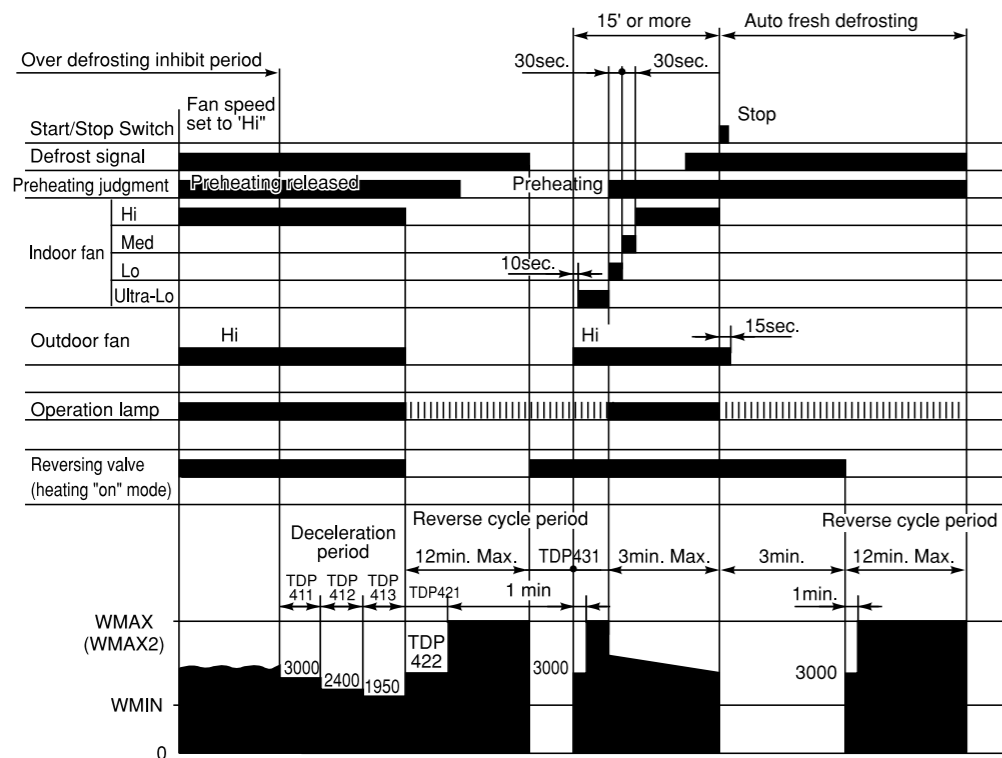
## Basic Heating Operation



### Notes:

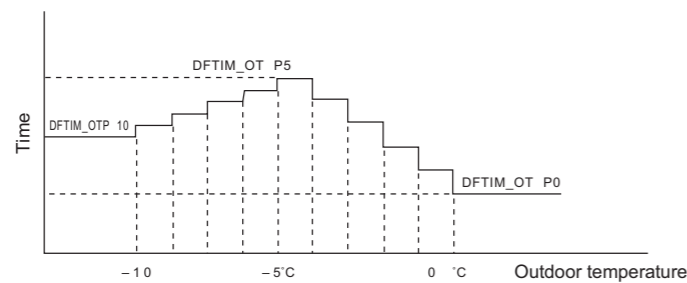
- (1) Condition for entering into Hot Dashed mode. When fan set to "Hi" or "Auto mode" and i) Indoor temperature is lower than 18°C, and ii) outdoor temperature is lower than 10°C, and iii) compressor speed (P section) due to temperature difference between setting temperature (including the correction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

## Reversing Valve Defrosting



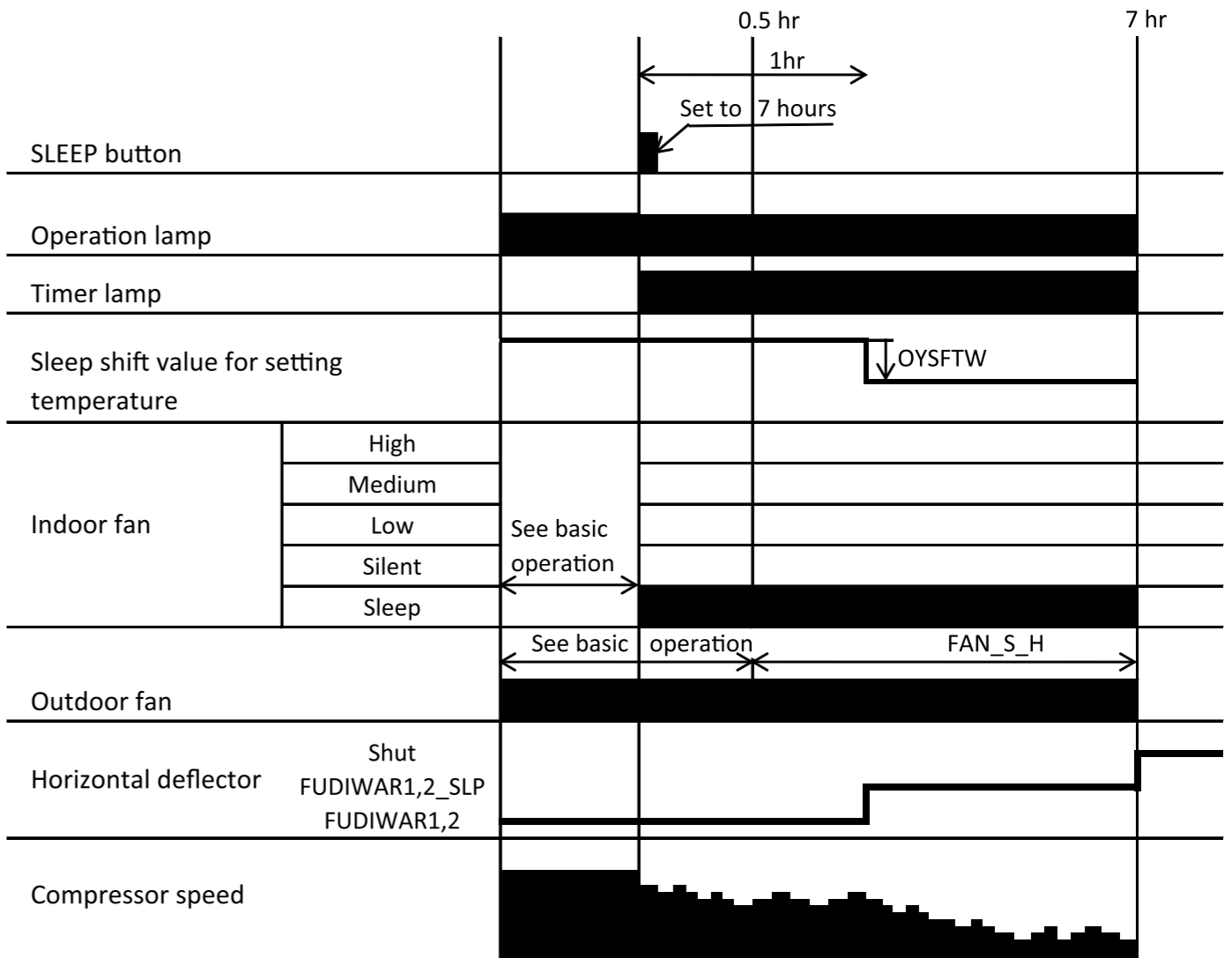
- Notes:
- (1) The defrosting inhibit period is set as shown in the diagram below. When defrosting has finished once, the inhibit period is newly set, based on the outdoor temperature when the compressor was started. During this period, the defrost signal is not accepted.
  - (2) If the difference between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

## Setting Defrosting Inhibit Period



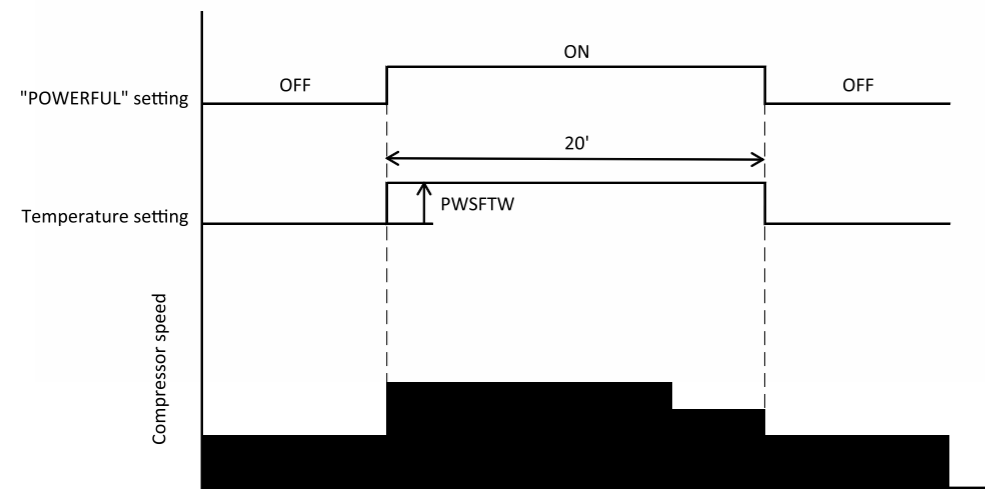
- Notes:
- (1) The first inhibit time after operation start is set to DFTIM\_FST.
  - (2) From the second time onwards, the inhibit time is set according to the time required for defrosting.  
Reverse cycle operation time [DEFCOL] : DEFTIM\_COL is set.  
Reverse cycle operation time < [DEFCOL] : The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

## Heating Sleep Operation



- Notes :
- (1) The sleep operation starts when the "SLEEP" button is pressed.
  - (2) When the sleep operation is set, the maximum compressor speed is limited to WMAX, and the indoor fan set is "sleep"(FWSOY\_P).
  - (3) The indoor fan speed does not change even when the fan speed mode is changed.
  - (4) If sleep operation is canceled by the cancel button or sleep button, all data is cleared.
  - (5) 1 hour after the sleep operation is set, the sleep shift value(OYSFTW) is reduced.

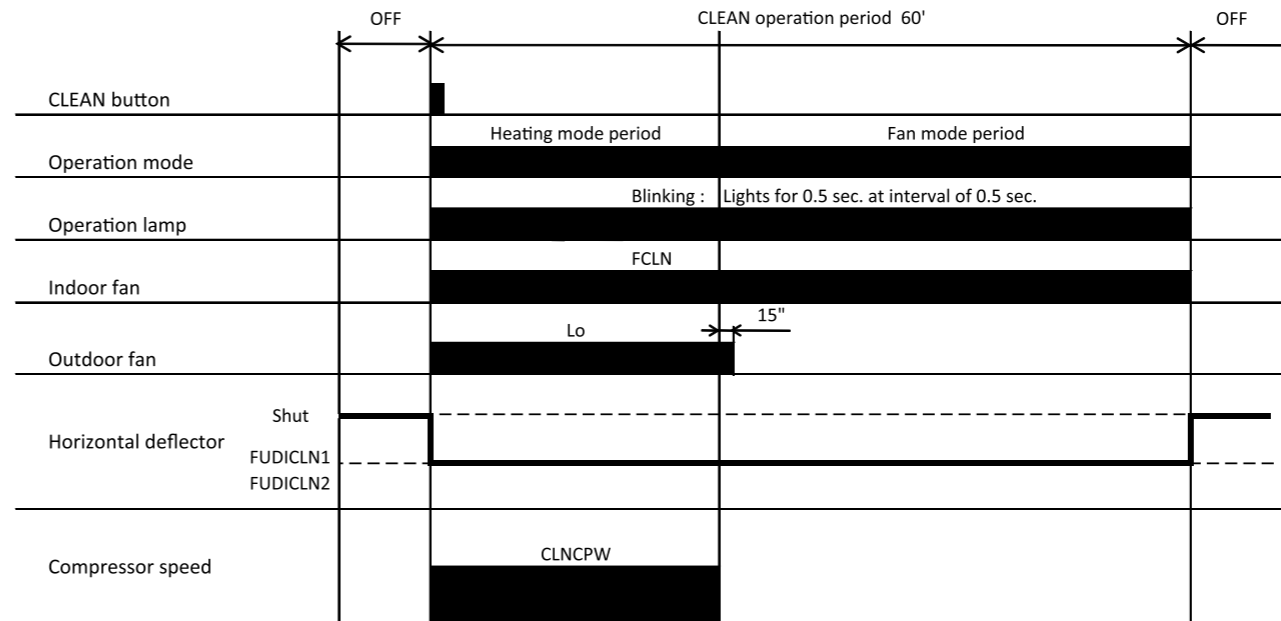
## Heating Powerful Operation



### Notes :

- (1) Pressing the "POWERFUL" button will reduce the temperature setting by PWSFTW.
- (2) The powerful operation is for 20 minutes after setting.
- (3) Operation is continued forcibly thermo-ON for 20 minutes after the powerful operation is finished.
- (4) Defrost is inhibited for 20 minutes after the start of the powerful operation.
- (5) Pressing the "START/STOP" button and "POWERFUL" button during powerful operation will cancel the powerful operation.
- (6) If the sleep timer is set during powerful operation, the powerful operation will be canceled.
- (7) If the fan speed of the remote controller is set to "AUTO" or "HIGH", the compressor's maximum speed during powerful operation will be set to WMAX2. The lower limit speed is WKYMIN\_PW.
- (8) If the fan speed of the remote controller is set to "MED", the compressor's maximum speed during powerful operation will be set to WJMAX\_PW. The lower limit speed is WJKMIN\_PW.
- (9) If the fan speed of the remote controller is set to "LOW", the compressor's maximum speed during powerful operation will be set to WBEMAX\_PW. The lower limit speed is WBEMIN\_PW.
- (10) If the fan speed of the remote controller is set to "SILENT", the compressor's maximum speed during powerful operation will be set to WSZMAX\_PW. The lower limit speed is WSZMIN\_PW.
- (11) The fan speed increases by FNUPPW\_W.

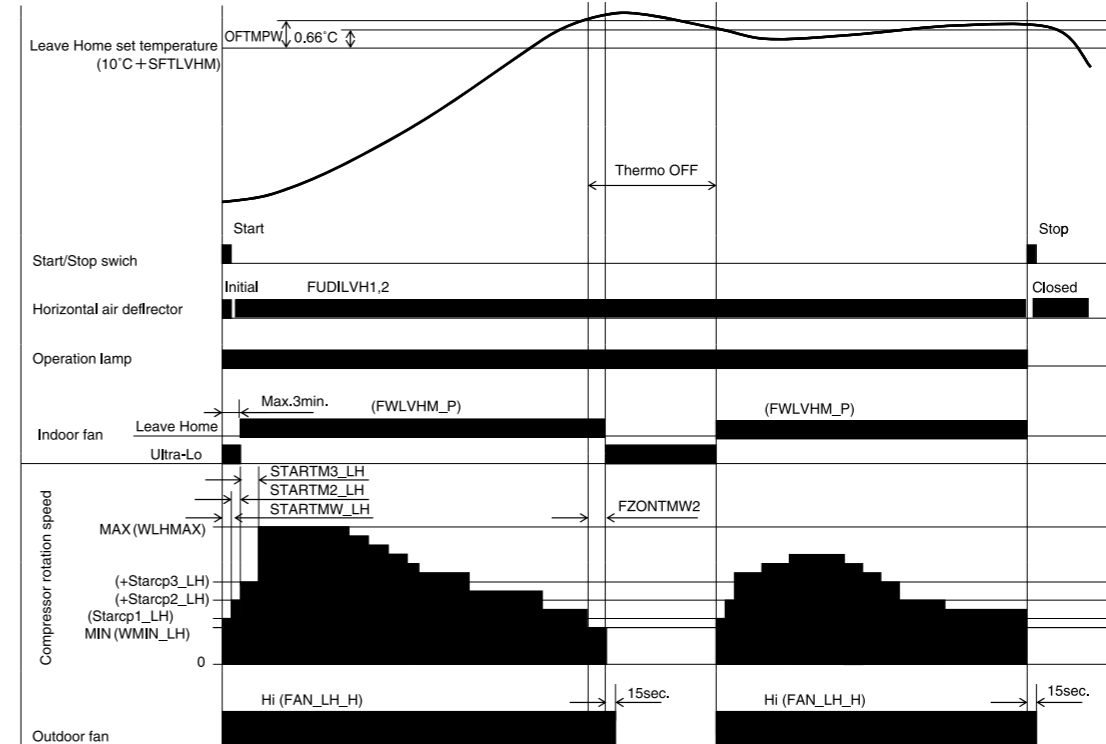
## Clean Operation



### Notes :

- (1) During CLEAN operation period, heating mode will change to fan mode when HEX temperature is "CLNEVP" or more except for 3 minutes operation.
- (2) For multi connections, CLEAN operation is limited to fan mode.

## Leave Home

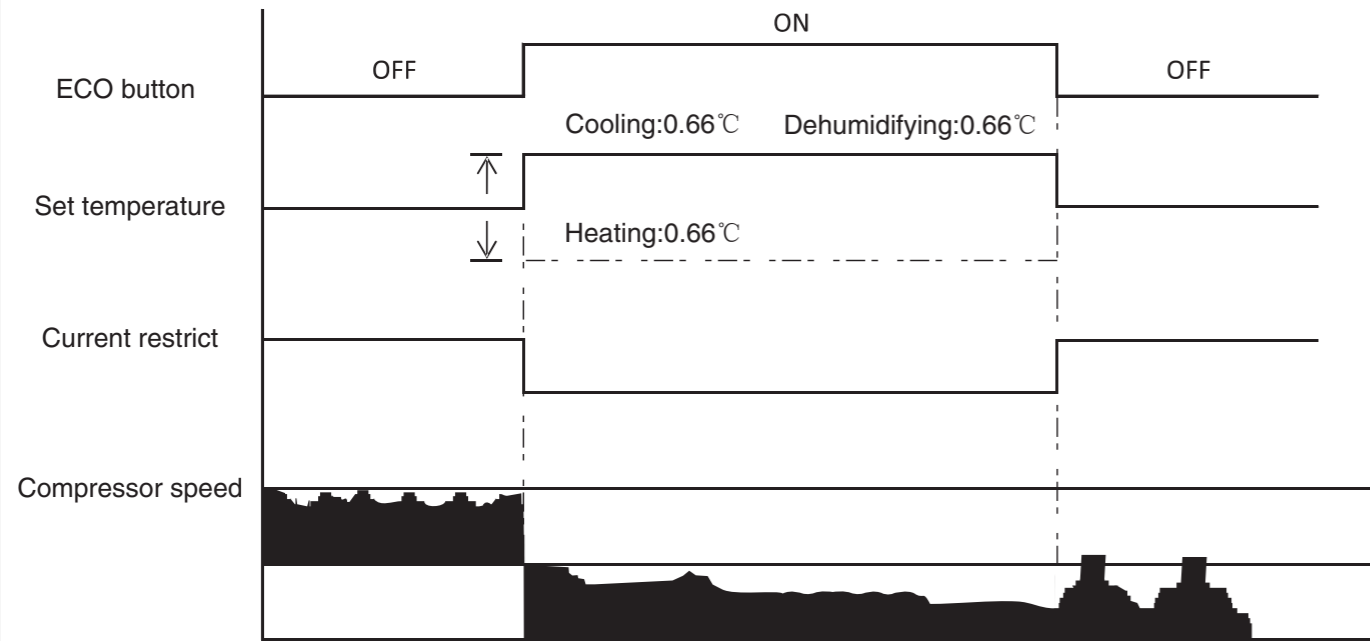


### Notes:

Perform Leave Home operation according to the following control contents.

- ① Operation mode : Heating
  - ② Temperature set : 10°C
  - ③ Temperature setting correction shift : + 『SFTLVHM』
  - ④ Indoor fan : 『FWLVHM\_P』
  - ⑤ Outdoor fan : 『FAN\_LH\_H』
  - ⑥ Compressor start control : Set the start control using the special value for the Leave Home mode.
  - ⑦ Compressor rotation speed : Upper limit speed by fuzzy control 『WLHMAX』  
Lower limit speed by fuzzy control 『WMIN\_LH』
  - ⑧ Operation lamp : The timer lamp lights up when the timer for the desired number of days is set.
- ※ The vertical air deflection plate is initially operated when the Leave Home mode is activated; this serves as a notification that the Leave Home mode has been set.

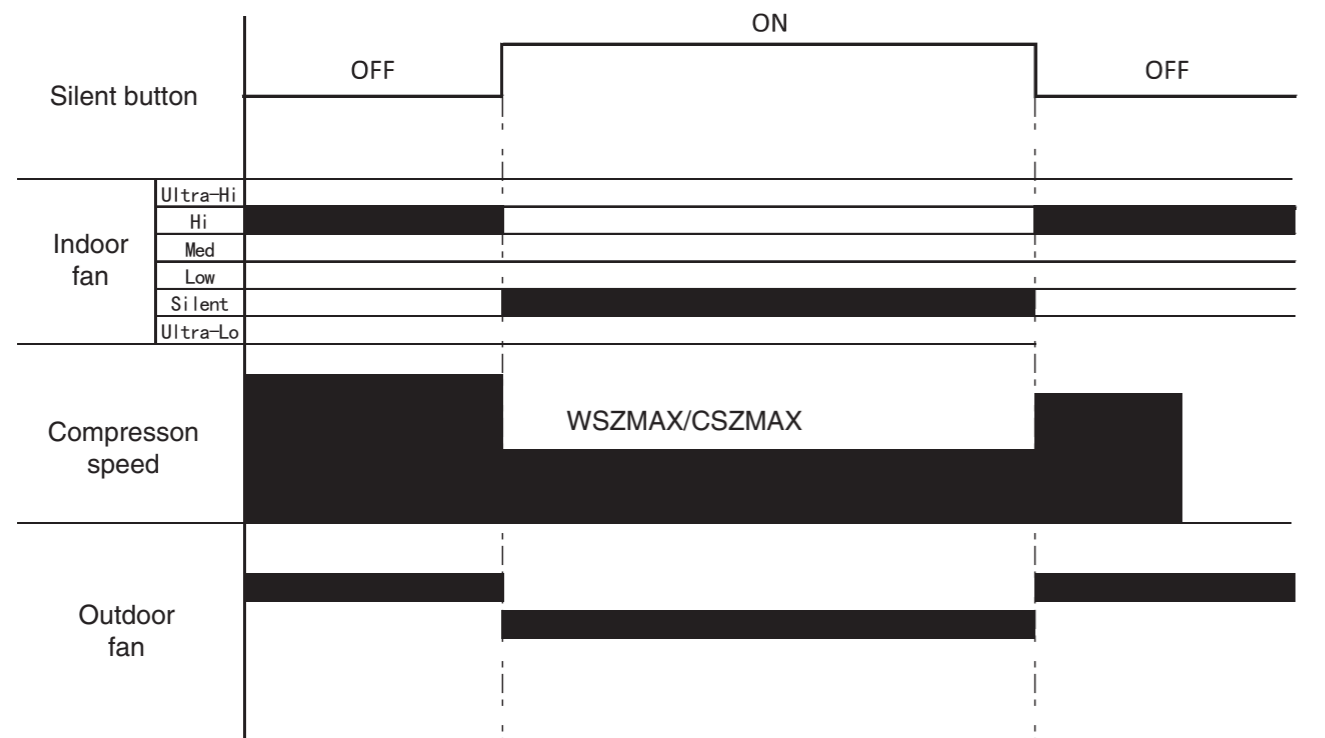
## ECO



Notes:

- Can't set POWERFUL and ECO at the same time.
- During FAN operation, can't set ECO.

## SILENT

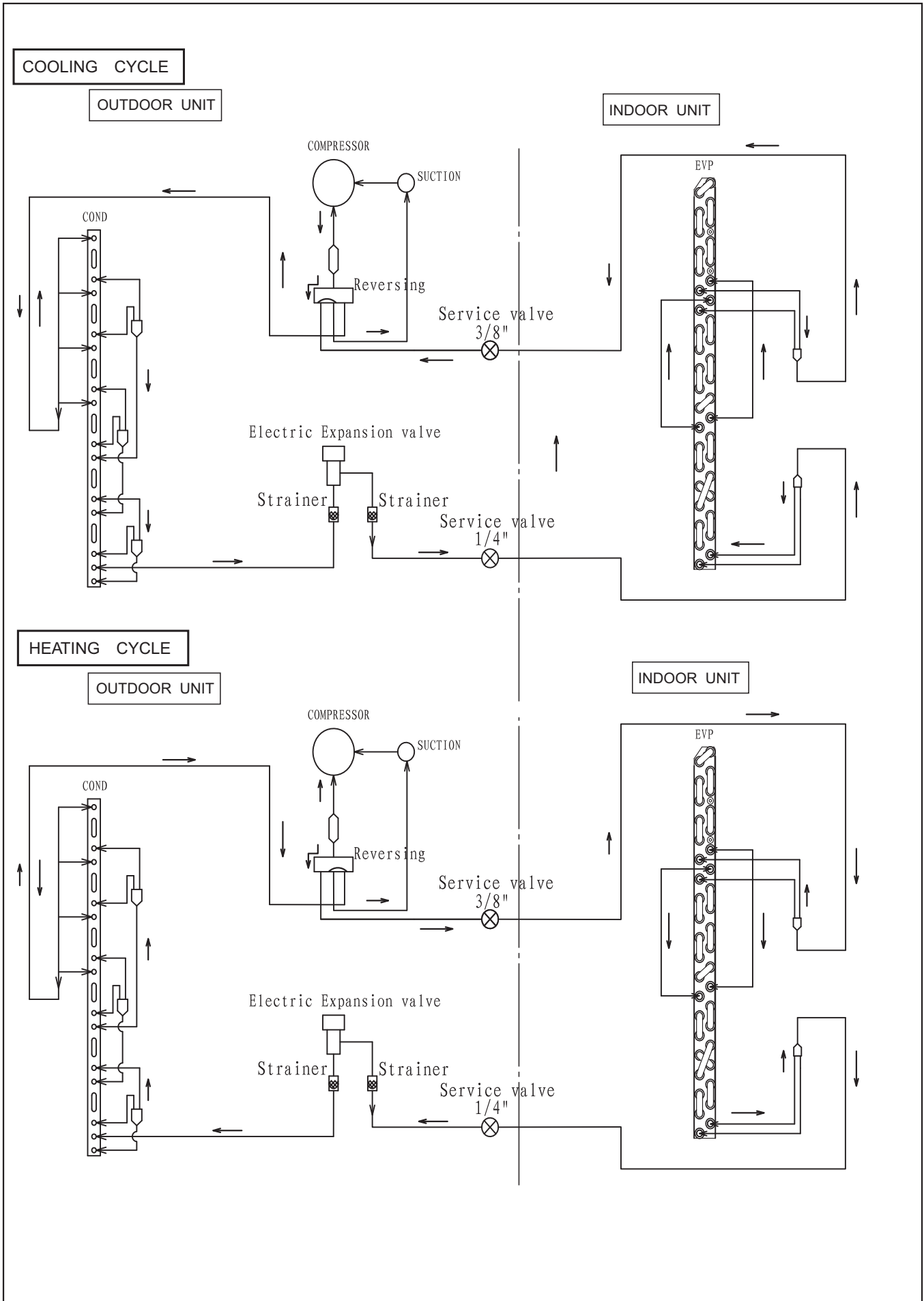


Notes:

- Can't set POWERFUL and SILENT at the same time.

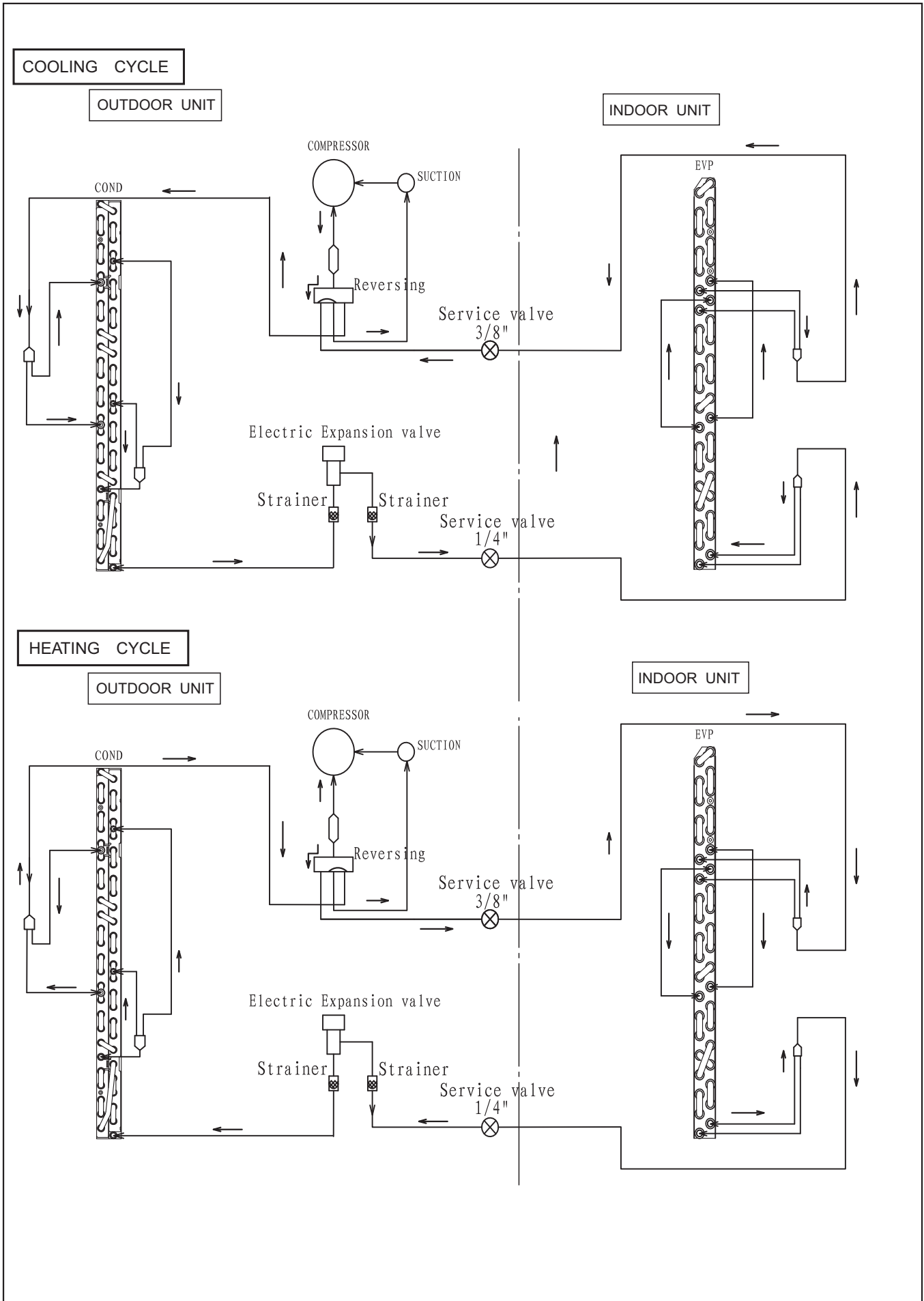
# REFRIGERATING CYCLE DIAGRAM

MODEL RAF-25RPA/RAC-25FPA



# REFRIGERATING CYCLE DIAGRAM

MODEL RAF-35RPA/RAC-35FPA



## DISASSEMBLY & ASSEMBLY PROCEDURE

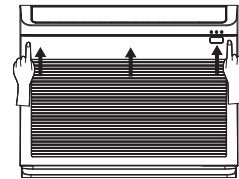
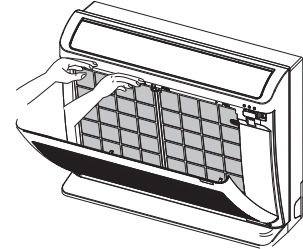
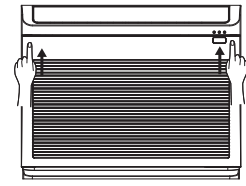
### 1. AIR FILTER

Clean the air filter, as it removes dust inside the room.

Be sure to clean the filter once every two weeks so as not to consume electricity unnecessarily.

#### PROCEDURE

- 1** **Open the front panel.**
  - To open the front panel, use the remote controller to stop unit operation. Then press at the top left and right corners of the front panel.
  - Grasp the left and right sides of the front panel and open it toward you.
- 2** **Remove the filters.**
- 3** **Remove dust of the filters using a vacuum cleaner.**
  - After using neutral detergent, wash with clean water and dry in shade.
- 4** **Attach the filters.**
- 5** **Close the front panel.**
  1. To close the front panel, press the upper center part of the front panel.
  2. Press at the top left and right corners of the front panel.

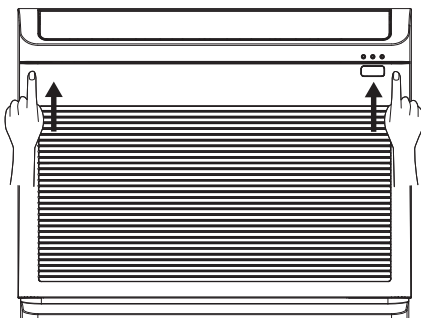


### 2. HOW TO INSTALL AND REMOVE THE FRONT PANEL

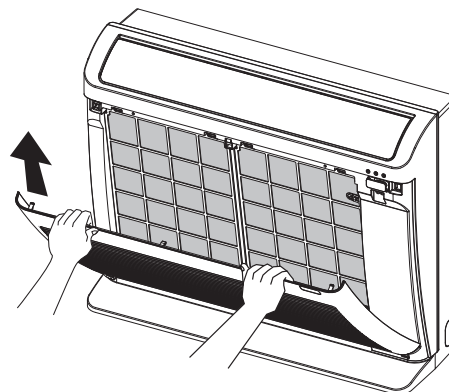
•Be sure to use both hands to grasp the front panel when removing it or attaching it.

#### Removing

Press at the top left and right corners of the front panel.



Grasp the left and right sides of the front panel and pull it up to remove.



#### Attaching

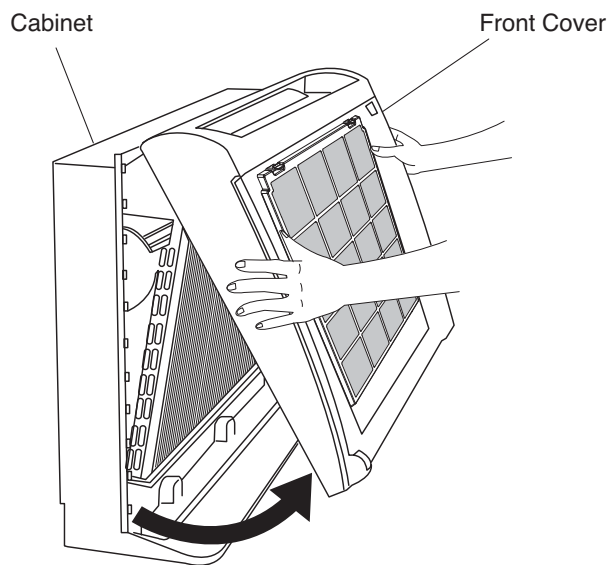
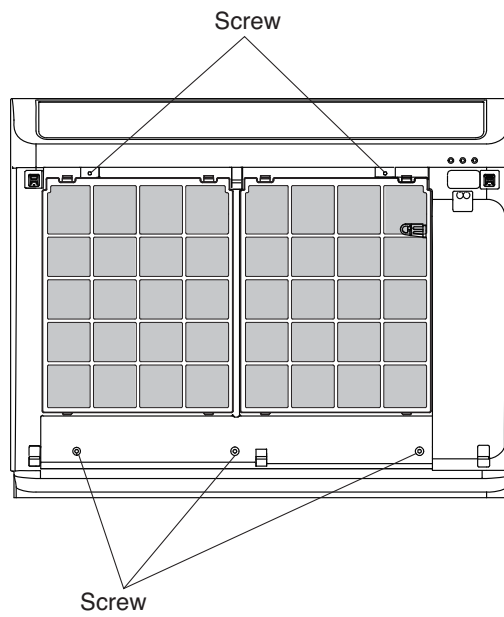
Attach three front panel bearings to the axis of the front cover. (Set the hook to face up.)

Close the front panel.



### 3. FRONT COVER

- (1) Remove the front panel.
- (2) Remove the front cover.  
Remove the 3 bottom screws and 2 top screws.  
Pull the front cover approximately 30mm toward you.

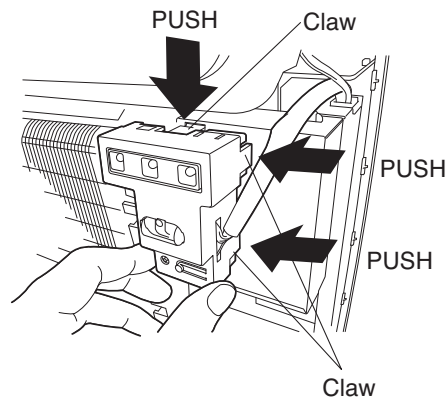


### ATTACHING

When attaching the front cover, follow the above procedure in reverse order. Make sure the hooks at the front cover top surface are securely inserted into the cabinet.

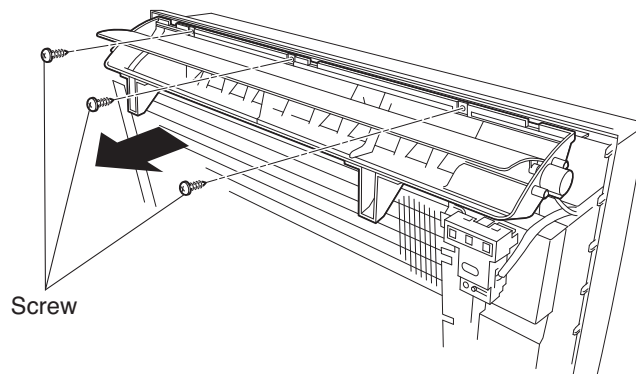
#### 4. INDICATING P.W.B.

- (1) Remove the front panel and the front cover.
- (2) Remove the indicating P.W.B. case.



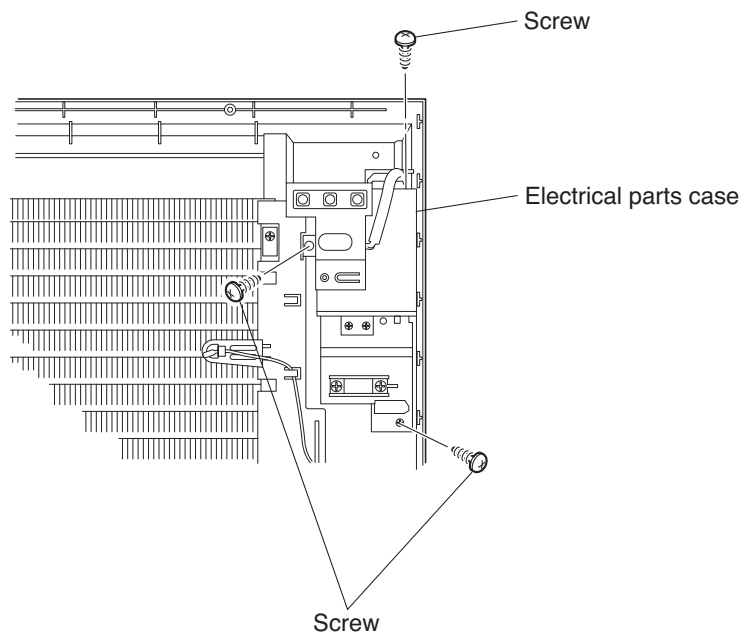
#### 5. DISCHARGE FRAME

- (1) Remove the front panel and the front cover.
- (2) Remove the 3 fixing screws of the discharge frame, and then pull out the discharge frame toward you.



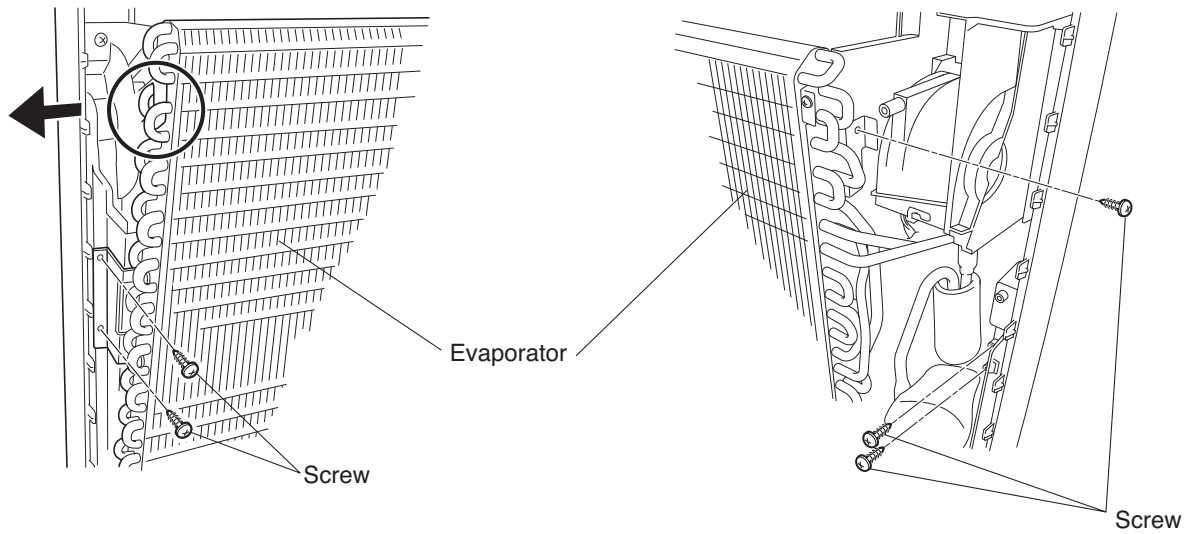
## 6. ELECTRICAL PARTS CASE

- (1) Remove the front panel and the front cover.
- (2) Remove the 3 fixing screws of the electrical parts case.

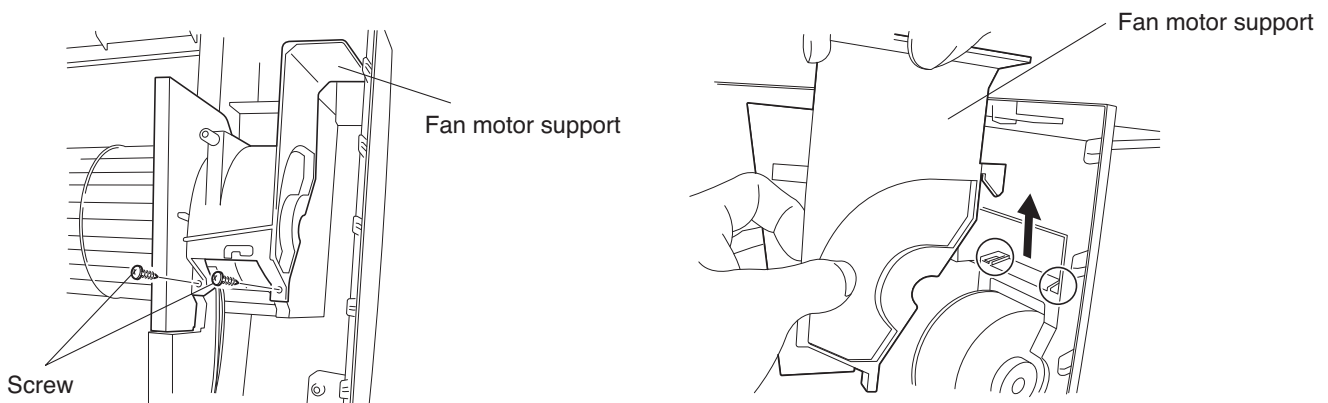


## 7. FAN MOTOR AND TANGENTIAL AIR FLOW FAN

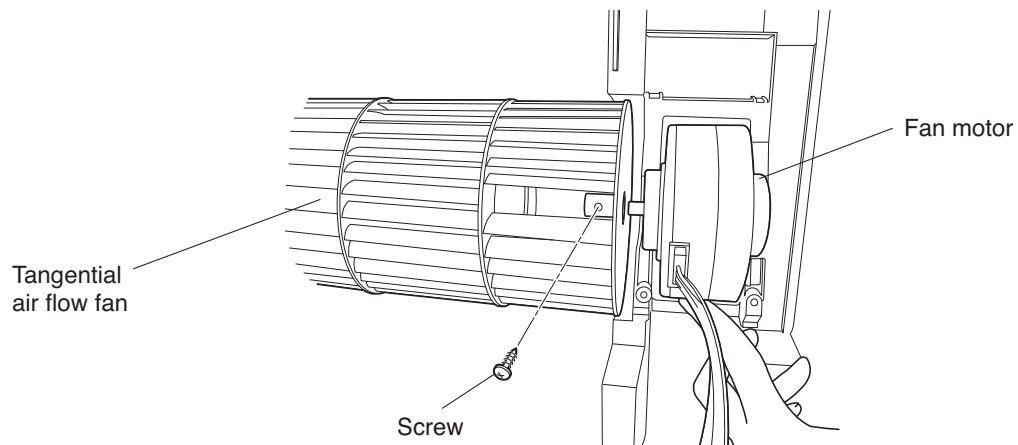
- (1) 5 screws that are the fixation of evaporator are removed.
- (2) The tab where the left side of evaporator is fixed is removed.
- (3) Evaporator is lifted up and removed.



- (4) Two screws that is the fixation of fan-motor support is removed, and fan motor support is removed.



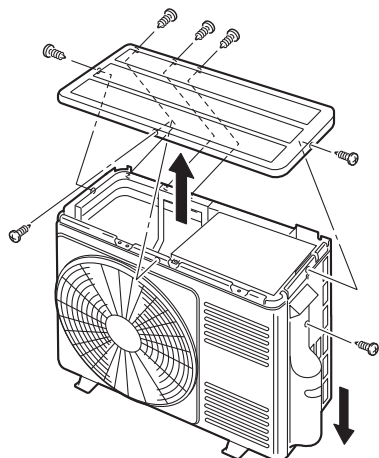
- (5) The tangential air flow fan and fan motor are fixed with screw. Please loosen screw when you remove.



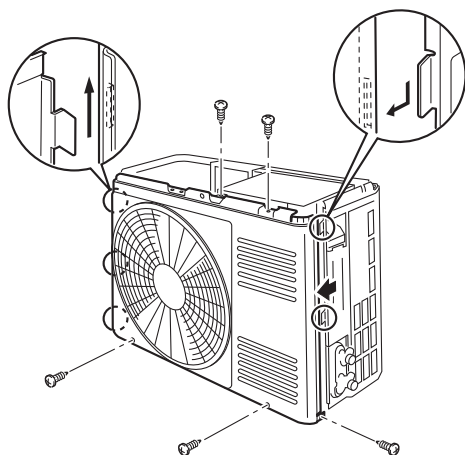
**OUTDOOR UNIT MODEL RAC-25/35FPA**

**1. Electrical parts**

- (1) Remove the service value cover lock screws and lower the cover to remove it.
- (2) Remove the top cover lock screw and raise the cover to remove it.



- (3) Remove the front cover lock screw.
- (4) Lower the right side of the front cover and pull it forward. Then, remove the cover from the hook.
- (5) Pull the right side of the front cover a little and pull up the left side to remove it from the hook.



- (6) Remove each connector and earth cable from the lead wire. Then, remove the electrical box.

# DESCRIPTION OF MAIN CIRCUIT OPERATION

## MODEL RAF-25RPA RAF-35RPA

### 1. Power circuit

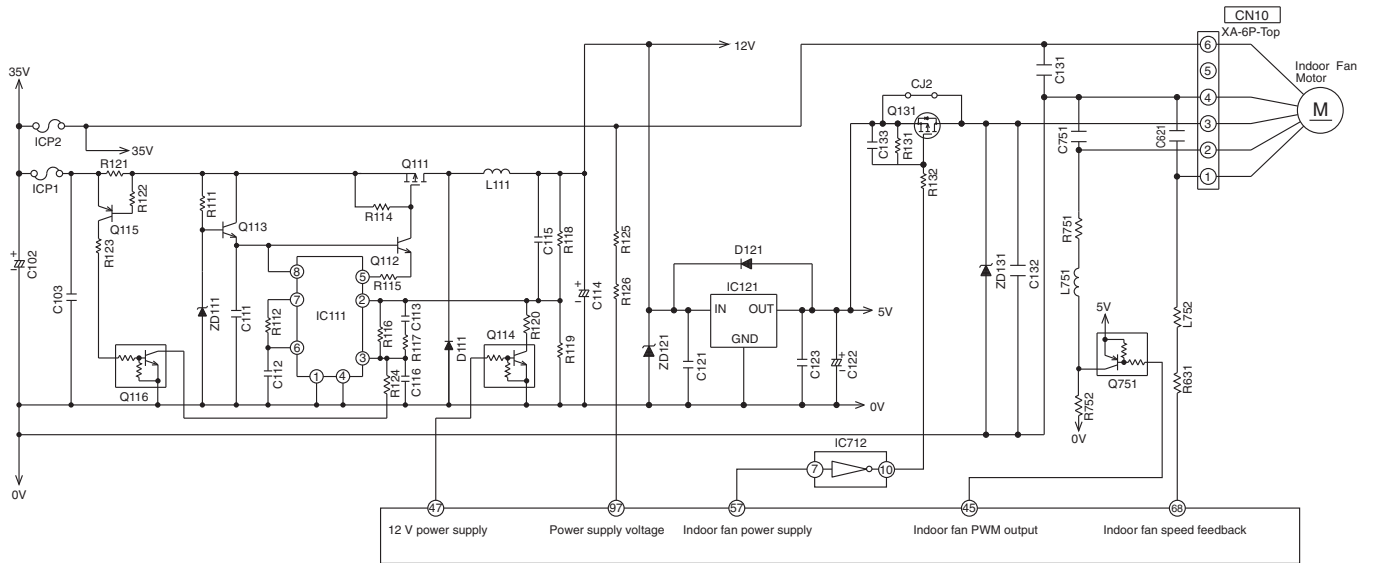


Fig. 1-1

Power to operate indoor unit (DC35V) is generated at the power supply in outdoor unit and it is sent to indoor unit through the connecting cord C and D.

Then, DC 12V (12V line) is generated using DC/DC converter from the voltage sent from outdoor unit, as the control voltage of 12V is required to drive the auto sweep motor and others.

Furthermore, 5V (5V line), which is necessary to drive the microcomputer and to control the fan motor, is generated using three-terminal regulator IC121.

## 2. Reset Circuit

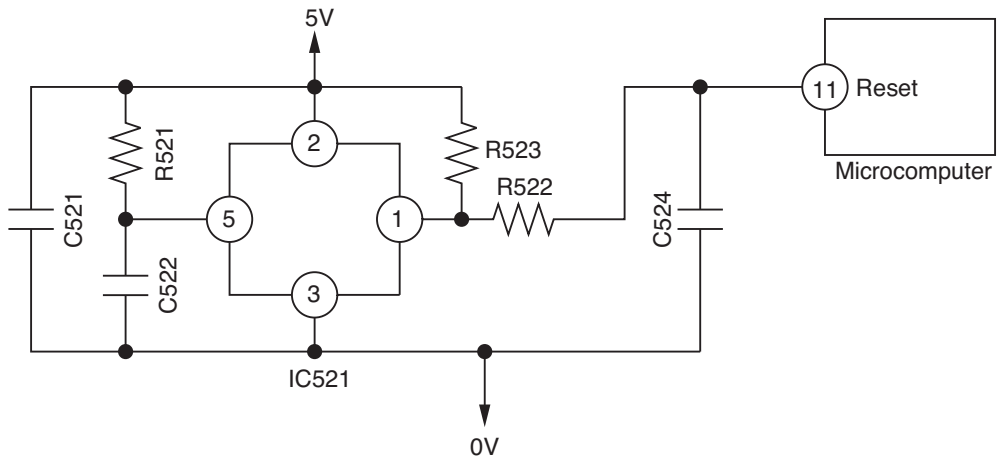


Fig.2-1

### Timing chart

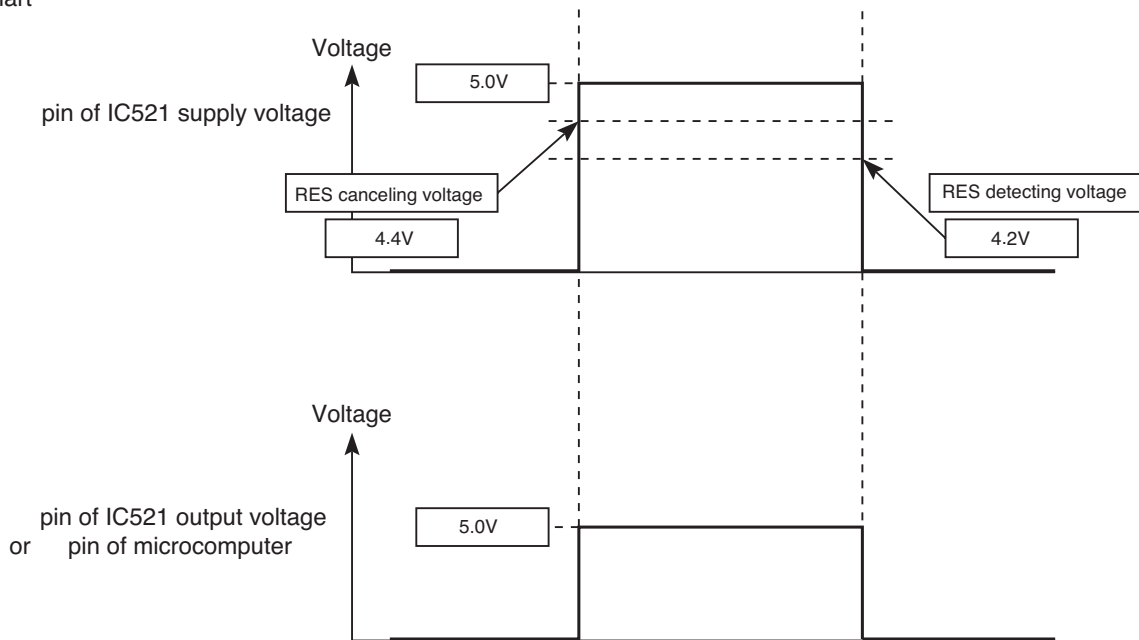


Fig.2-2

- Reset circuit is to initialize the indoor unit microcomputer when switching ON the power or after recovering from power failure.
- Microcomputer operates when pin of the indoor unit microcomputer (reset input) is "Lo" for resetting and "Hi" for heating.
- Waveform of each part when switching ON the power and when shutting down is shown in the Fig. 2-2.
- After switching ON the power, pin of IC521 supply voltage and pin of microcomputer becomes Hi when DC5V line rises and reaches approximately 4.4V or higher. Then, resetting will be cancelled and microcomputer starts operating.
- After shutting down the power, pin of IC521 supply voltage and pin of microcomputer becomes Lo when DC5V line falls and reaches approximately 4.2V or lower. Then, the microcomputer will be in reset condition.

### 3. Fan Motor Drive Circuit

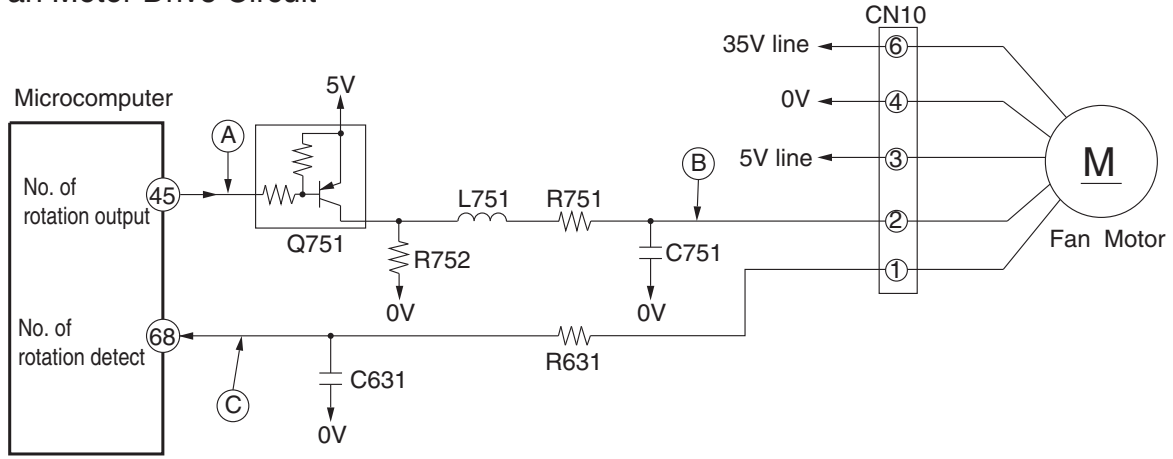


Fig. 3-1

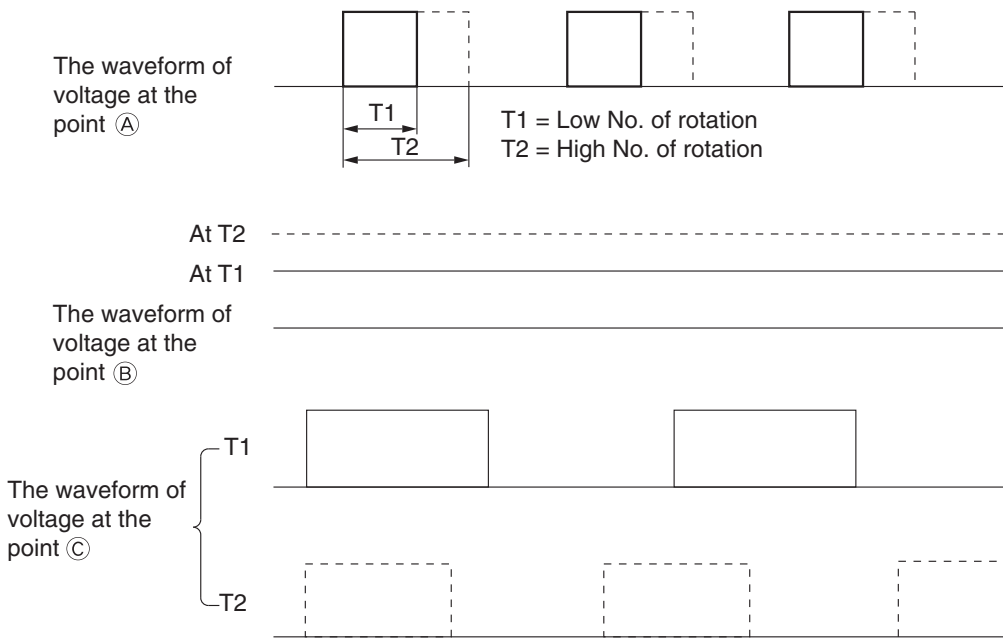


Fig. 3-2

- The 610Hz PWM pulse shown in Fig. 3-2 from the microcomputer pin 45 is output to point A. The width of this pulse changes with instruction number of rotations.
- This pulse changes to analog voltage by R751 and C751 and it is applied to the fan motor as instruction voltage number of rotations. The relationship between the voltage of point B and number of rotations becomes as shown in Fig. 3-3. (The gap may arise depending on the condition of unit.)
- The feedback pulse of number of rotation is outputted from the fan motor and input to micro computer pin 68. The frequency of this pulse is 12/60 of the number of rotations. (Ex:  $1000\text{min}^{-1} \times 12/60 = 200\text{Hz}$ ) The microcomputer observes this frequency and to make it as the instruction number of rotation all the time, adjusts the output pulse width of pin 45.
- If the feedback pulse becomes lower than  $100\text{min}^{-1}$  caused by lock or failure of a fan motor, the fan output stops temporary as the fan lock is faulty. The pulse will output again after 10 seconds. If the abnormal in fan lock is detected twice in 10 minutes, the unit is completely stopped and change to the fault mode which the timer lamp blinks 10 times.

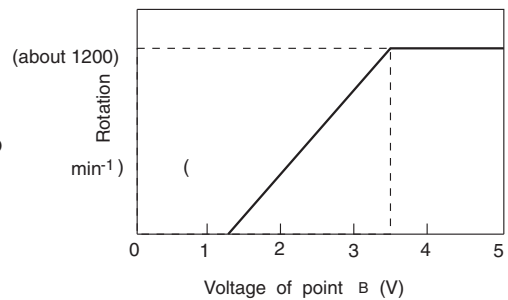


Fig. 3-3



## 4. Buzzer Circuit

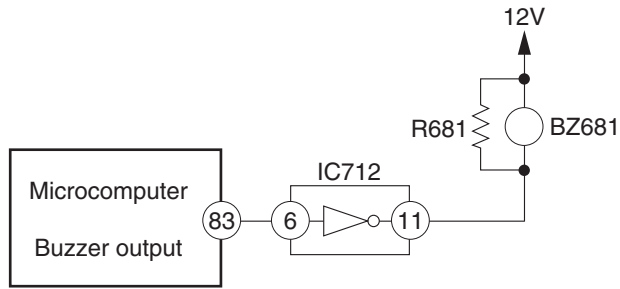


Fig.4-1 Buzzer Circuit

- When the buzzer sounds, an approx. 3.9kHz square signal is output from buzzer output pin (83) of the micro computer. After the amplitude of this signal has been set to 12Vp-p by a transistor, it is applied to the buzzer. The piezoelectric element in the buzzer oscillates to generate the buzzer's sound.

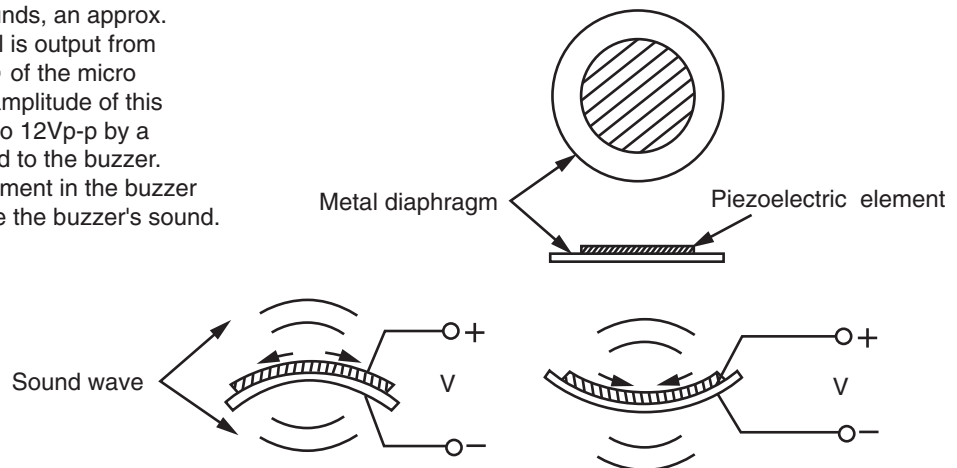


Fig.4-2 Buzzer Operation

## 5. Receive Circuit

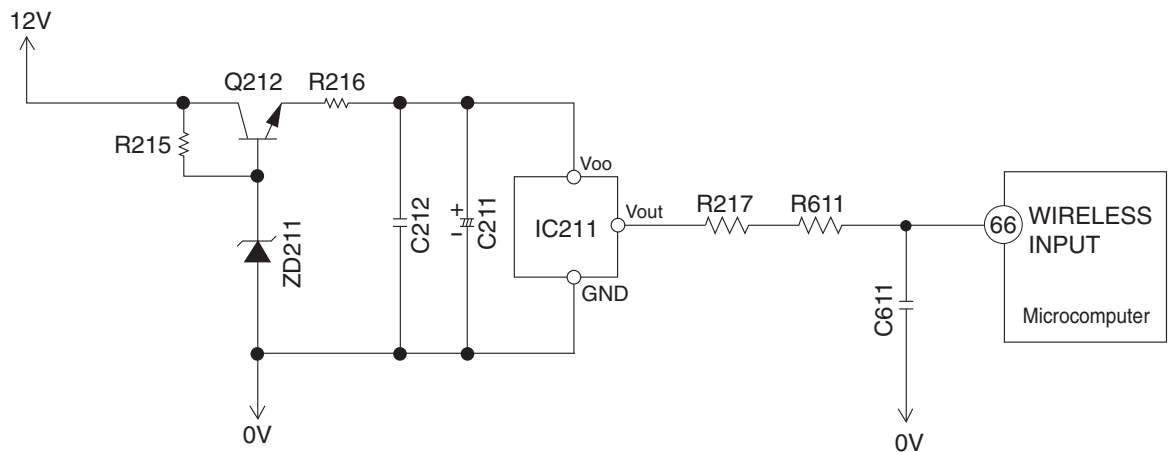


Fig.5-1

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

## 6. Initial Setting Circuit (IC401)

- When power is supplied, the microcomputer reads the data in IC401 (E<sup>2</sup>PROM) and sets the preheating activation value and the rating and maximum speed of the compressor, etc. to their initial values.
- Data of self-diagnosis mode is stored in IC401; data will not be erased even when power is turned off.

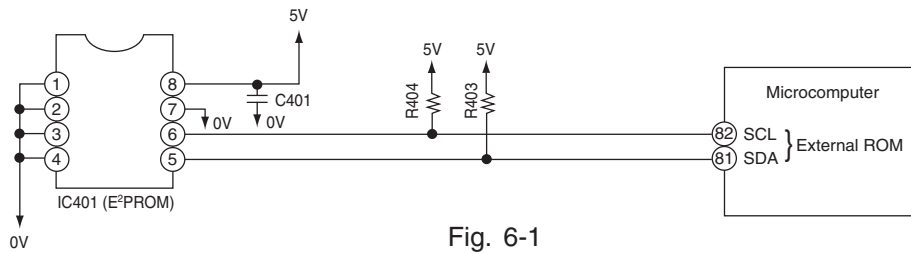


Fig. 6-1

## 7. Temporary Switch Circuit

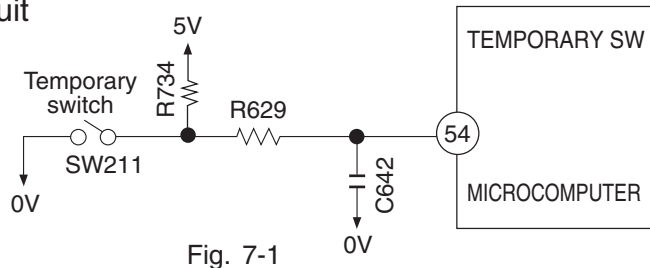


Fig. 7-1

- 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.

## 8. Room Temperature Thermistor Circuit

A room temperature thermistor circuit is shown in Fig. 8-1.

According to room temperature, the voltage of point A becomes as it is shown in Fig.8-2.

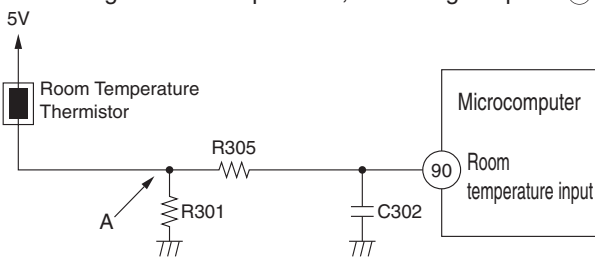


Fig. 8-1

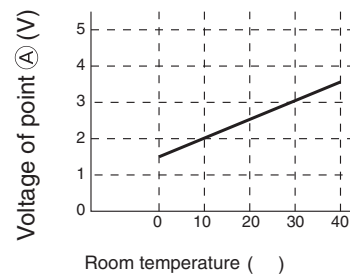


Fig. 8-2

## 9. Heat Exchanger Thermistor Circuit

Heat exchanger temperature is noticed inside the room

- (1) Preheating
- (2) Low-temperature defrosts at cooling and dehumidification operation time.
- (3) Not working of reversing valve or detection of opening of heat exchange thermistor is controlled.

According to heat exchange temperature, the voltage of point A becomes as it is shown in Fig. 9-2.

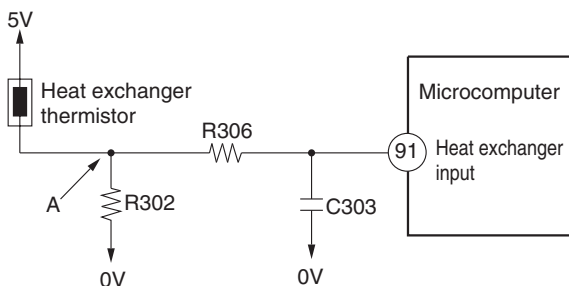


Fig. 9-1

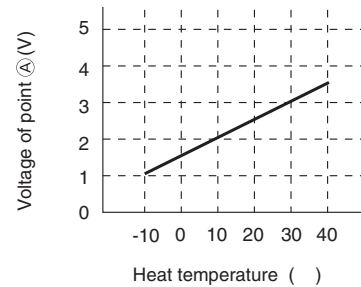


Fig. 9-2

## 10. Dip-switch

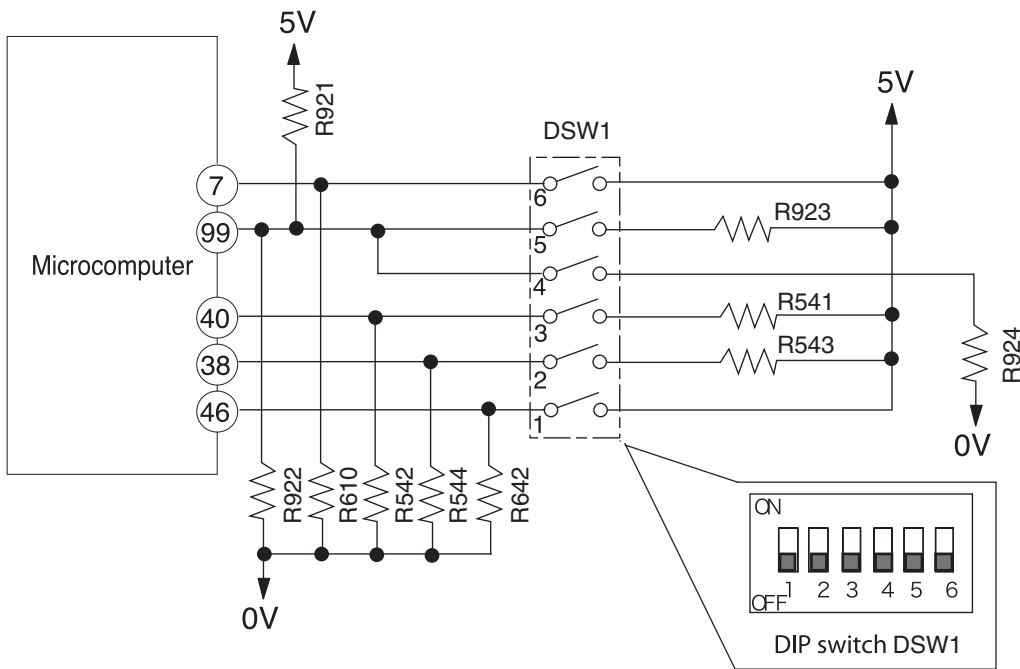


Fig.10-1 Dip switch Circuit

- Fig.8-1 shows the dip switch circuit; the table shown in Fig.10-2 are function and setting position from ① – ⑥ of the switch no.

Switch No.	FUNCTION	Switch Position/Setting.					
		OFF*	ENABLE	ON	DISABLE	-----	
1	AUTO RESTART	OFF*	ENABLE	ON	DISABLE	-----	
2	CARD KEY MODE	OFF*	DISABLE	ON	ENABLE	-----	
3	CARD KEY LOGIC SELECT	OFF*	INPUT HIGH ACTIVE	ON	INPUT LOW ACTIVE	-----	
4	HEATING/COOLING ONLY MODE SELECT	OFF*	NORMAL (HEAT AND COOL)	OFF		ON	COOLING ONLY
5	HEATING/COOLING ONLY MODE SELECT	OFF*		ON		OFF	
6	REMOCON ID SELECT ※ 1	OFF*	SELECT ID A	ON	SELECT ID B	-----	

Fig.10-2 Functions of Dip switch

NOTE:

\* Marking is position of shipping [FACTORY default setting]

※ 1 Weekly Timer wireless remocon for new model have function of setting remocon ID A or B. This remocon using model can not operate “DIP SWITCH 6” (disabled by EEPROM data flag.)

- If the dip switch is set to “Heating mode only” or “Cooling mode only”, the wireless remote controller must be set to operation mode lock setting as indicated on page 100.

# MODEL RAC-25FPA, RAC-35FPA

## 1. Power circuit

This circuit rectifies the 230 V AC voltage applied between terminals A and B of the terminal board to produce a DC voltage. However, the DC voltage rises to approximately 280 to 350 V at the time of compressor operation.

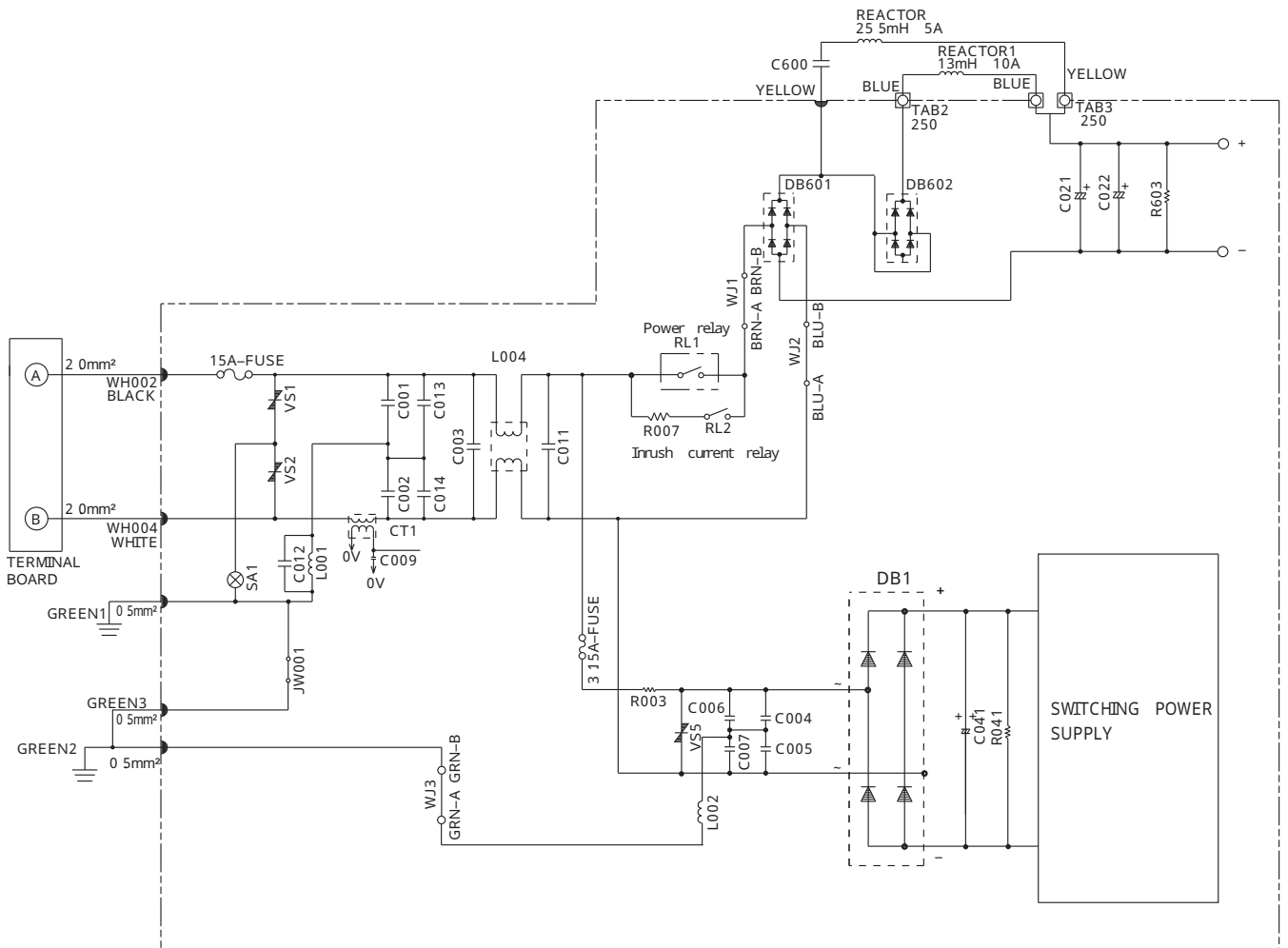


Fig. 1-1

## Main parts

(1) DB601 DB1

This operates to rectify the AC voltage applied between terminals A and B of the terminal board to a DC voltage.

(2) C021 and C022

This smoothes the voltage rectified for operating the compressor.

When the input voltage is taken for the sine wave as shown in the top of Fig. 1-2, it is rectified by the DB601 and becomes the waveform as shown in the middle of Fig.1-2. After that, the voltage is smoothed by the C021 and C022, and becomes the waveform shown in the bottom of Fig.1-2.

(3) DB1 and C041

The DB1 rectifies the input voltage and the C041 smoothes it for the control power supply.

If the units above have any failure, the control power supply won't operate. In such a case, replace the main P.W.B.

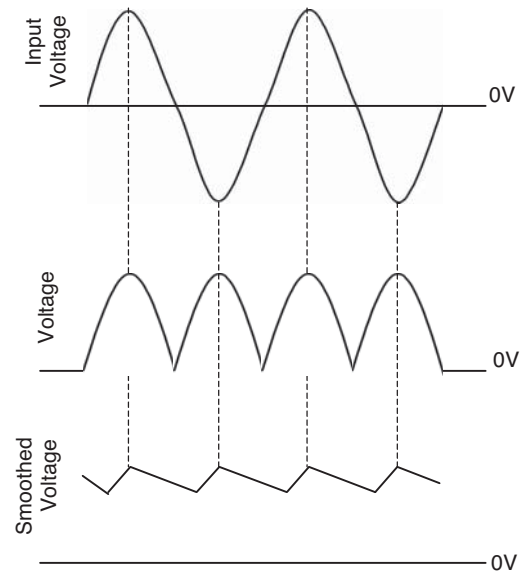


Fig. 1-2

(4) C001, C002, C003, C011, C013, C014, L004

Together with suppressing the electrical noise generated at the time of compressor operation, the external noise entering via the power supply line is absorbed as well, protecting the electronic parts of the system.

(5) SA1, VS1, VS2, VS5

This operates to suppress external surges from indirect lightning etc.

## 2. Power circuit for P.W.B.

- The voltage specification of the power circuit is as follows.

<Check points>

Output	Voltage spec.	Main load	Measuring points		Potential failure modes
			+	-	
12V	11-13V	MAIN P.W.B.	R117 ("12V" display)	R117 ("0V" display)	The unit won't operate MAIN P.W.B. error
5V	4.5-6V	MAIN P.W.B.	R424 ("5V" display)	R117 ("0V" display)	The unit won't operate MAIN P.W.B. error
B-12V	11-16V	Expansion valve	L104 ("B-12V" display)	R110 ("B-0V" display)	LD301 blinks 5 times; Expansion valve error
15V	14-17V	DC fan motor (CN24) MAIN P.W.B.	L105 ("15V" display)	R117 ("0V" display)	LD301 blinks 3 times, Abnormal low speed rotation
35V	33.5-38V	Indoor unit electrical parts (Terminal C,D) Reversing valve (CN2)	D103 ("C-35V" display) Terminal C (blown line)	R109 ("0V-35V" display) Terminal D (red line)	Indoor unit won't operate

- Check each voltage. If each voltage meets the voltage specification above, the power circuit is normal.
- If any error is found after checking, remove all loads and recheck each voltage.  
If no error is found in this step, the power circuit is normal. Check the removed loads.  
If any error is found in this step, the power circuit has any failure. Replace the power circuit for P.W.B.
- \* A short-circuited load may cause an output error not only in the load but also in the others. Be sure to check all outputs of the loads.
- \* Be sure to wait 15 minutes or more in order to discharge all the remaining voltage in the circuit to connect/disconnect the wiring, other wise, the components may be damaged.
- The failures of the loads are as follows.

Failed output	Possible causes	Criterion
35V	Reversed connection of the cable. Electrical part for the indoor unit has a failure.  Short-circuited reversing valve	Connect the cable correctly. Remove the connection cable and measure the voltage. If the voltage is correct, check the electrical parts for the indoor unit. Remove the CN2 and measure the voltage. If the voltage is correct, check the reversing valve.
15V	DC fan motor error  Main P.W.B. error	Remove the CN24 and measure the voltage. If the voltage is correct, check the DC fan motor. Also, check the main P.W.B. 1 A fuse for blow out in this step.
12V, 5V	Main P.W.B. error	Check the main P.W.B.

### 3. Indoor/Outdoor Interface Circuit

The interface circuit superimposes an interface signal on the DC 35V line to perform communications between indoor and outdoor units. This circuit consists of a transmitting circuit which superimposes an interface signal transmit from the microcomputer on the DC 35V line and a circuit which detects the interface signal on the DC 35V line.

Communications are performed alternatively transmitting and receiving.

3-1 Communication signal from outdoor microcomputer to indoor microcomputer.

At first outdoor microcomputer will send a request signal (SDO) to indoor microcomputer.

38 KHz of carrier signal is generated and modulated by microcomputer pin 44 .the request signal (SDO) from the outdoor

This signal is superimposed to DC 35V line via C801 and L801.

To prevent erroneous reception, the outdoor microcomputer is designed so that it cannot receive a signal while it is outputting a request signal.

The receiving circuit in the indoor unit consists of a comparator and transistor. The interface signal from the outdoor unit on the DC 35V line is supplied to C321, where DC components are eliminated, and isthen shaped by the comparator. The shaped signal is detected by diode, amplified by amp, and output to pin 51 of the indoor microcomputer.

Fig. 3-2 shows the waveforms at each component when data is transferred from the outdoor microcomputer to the indoor microcomputer.

3-2 Communication signal from indoor microcomputer to outdoor microcomputer.

The request signal (SDO) generates by indoor microcomputer is output to pin 52, and amplifies by Q331.

I/F signal approx. 38 kHz is generated by pin 88 of indoor microprocessor.

This I/F signal is then amplified and superimposed to DC 35V line via L301 and C332 of indoor interface circuit.

Fig. 3-3 shows the waveforms at each component when data is transferred from indoor microcomputer to outdoor microcomputer.

The circuit operation of the outdoor receiving circuit is same as indoor receiving circuit.

- Fig. 3-1 shows the interface circuit used for the indoor and outdoor microcomputers to communicate with each other.

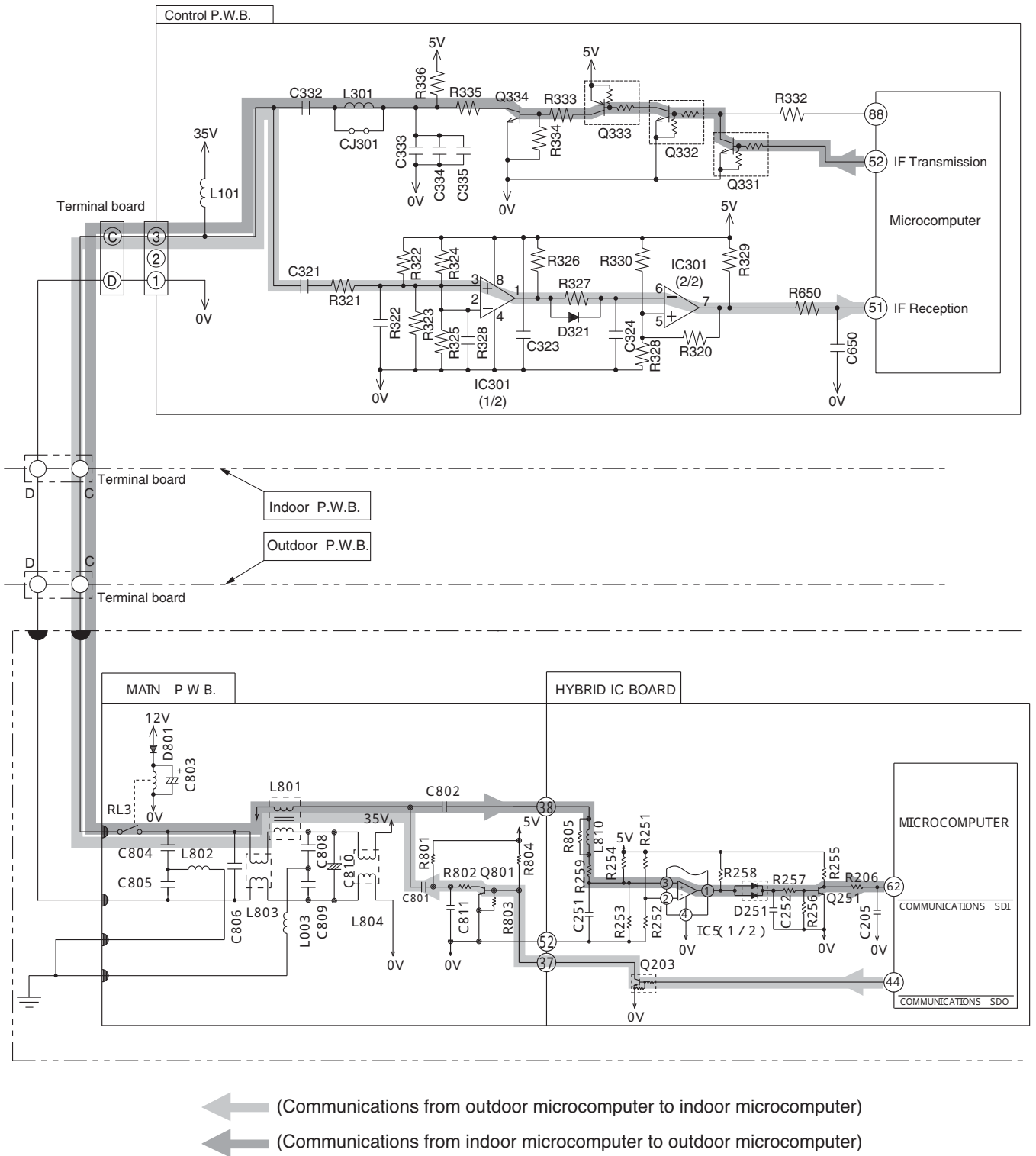


Fig. 3-1 Indoor/outdoor interface Circuit



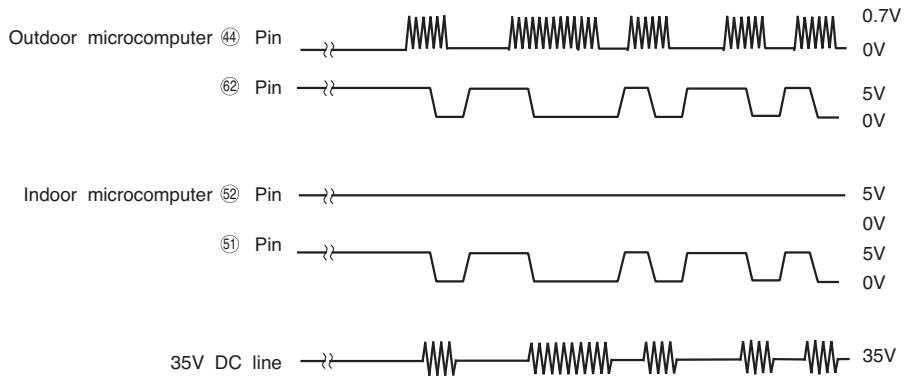


Fig. 3-2 Voltages Waveforms of indoor / Outdoor Microcomputers (Outdoor to Indoor Communications)

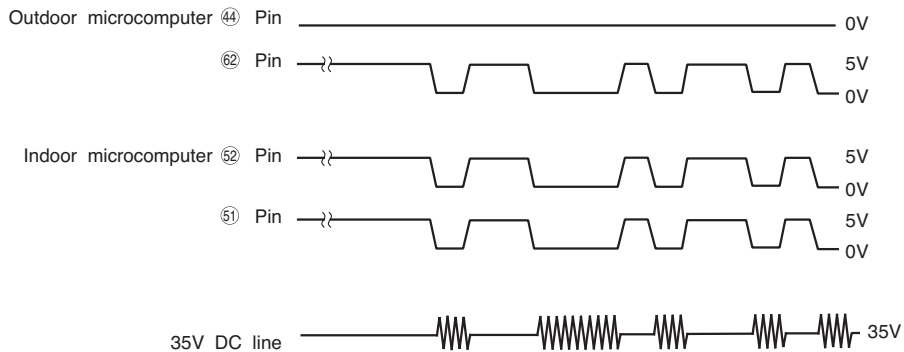


Fig. 3-3 Voltages Waveforms of indoor / Outdoor Microcomputers (Indoor to Outdoor Communications)

#### 4. Reset Circuit

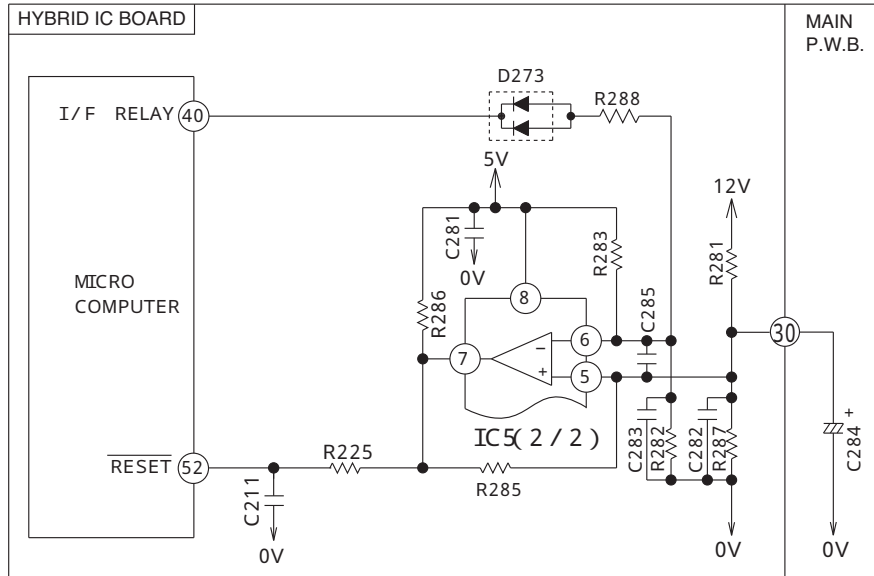


Fig. 4-1

The reset circuit initializes the microcomputer program when Power is "ON" from "OFF". Low voltage at pin 52 resets the microcomputer, and HI activates the microcomputer. Fig. 4-1 shows the reset circuit and Fig. 4-2 shows waveform at each point when power is turned on and off.

When power is turned on, 12V line and 5V line voltages rise and 12V line voltage reaches 10.9V and a reset voltage input to pin 52 of microcomputer is set to Hi. Reset voltage will be hold "Hi" until the 12V line voltage drops to 9.9V even though the power shuts down.

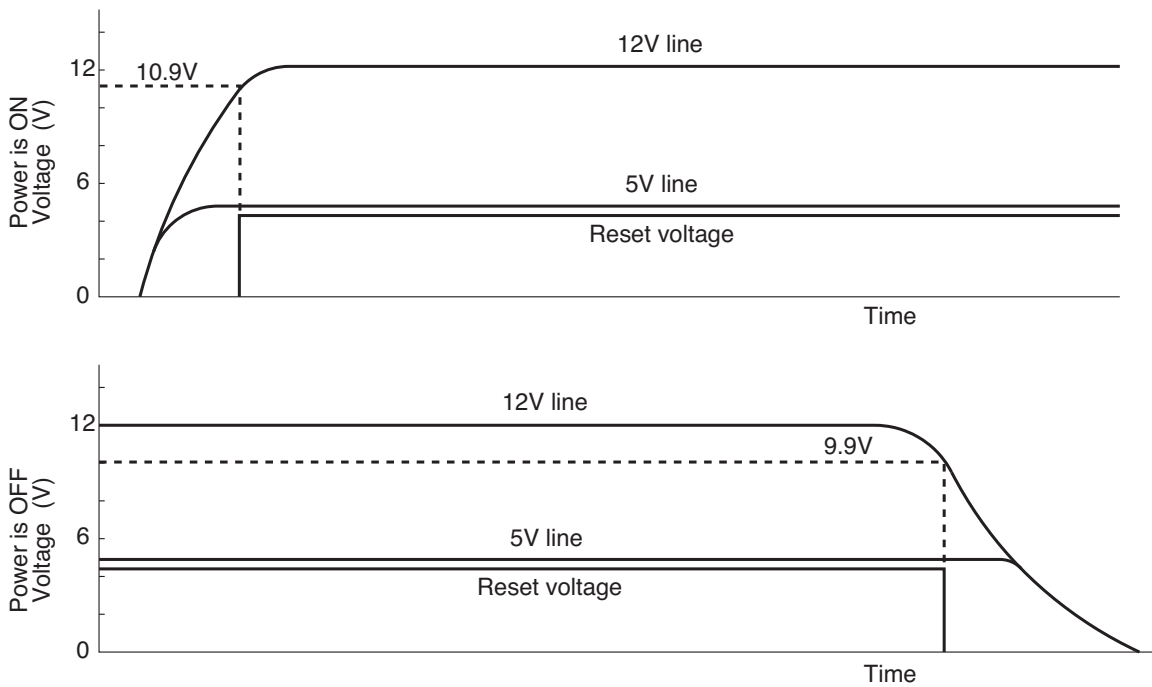


Fig. 4-2

## 5. Temperature Detection Circuit

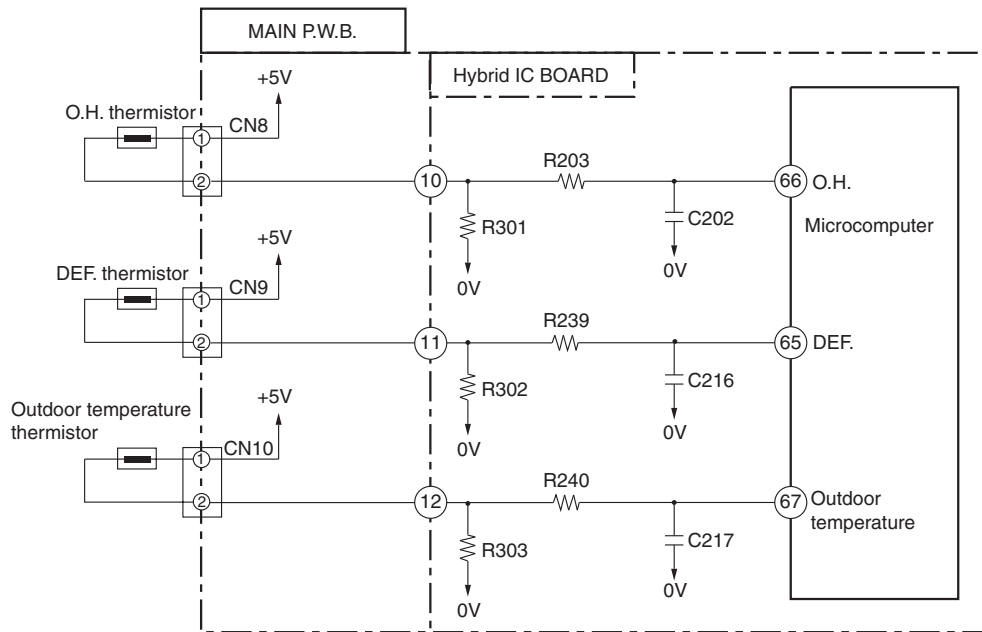


Fig. 5-1

The Over heat thermistor circuit detects the temperature at the surface of the compressor head, the Defrost thermistor circuit detects the defrosting operation temperature.

A thermistor is a negative resistor element which has the characteristics that the higher (lower) the temperature, the lower (higher) the resistance.

When the compressor is heated, the resistance of the Over heat thermistor becomes low and voltage to a pin 66 of microcomputer is increased.

Microcomputer compares the voltage at pin 66 with the internal set value, if it is exceeded the set value microcomputer judges that the compressor is overheated and stops operation.

When frost forms on the outdoor heat exchanger, the temperature at the exchanger drops abruptly. Therefore the resistance of the Defrost thermistor becomes high and the voltage at pin 65 of microcomputer drops.

If this voltage becomes lower than the set value stored inside, the microcomputer starts defrosting control. During defrosting operation the microcomputer transfers the defrosting condition command to the indoor microcomputer via the circuit interface.

The microcomputer always reads the outdoor temperature via a thermistor (microcomputer pin 67), and transfers it to the indoor unit, thus controlling the compressor rotation speed according to the value set at the EEPROM in the indoor unit, and switching the operation status (outdoor fan on/off, etc.) in the dehumidifying mode.

The following shows the typical values of outdoor temperature in relation to the voltage:

Table 5-1

Outdoor temperature ( )	-10	0	10	20	30	40
R303 Voltage (V)	1.19	1.69	2.23	2.75	3.22	3.62

### <Reference>

When the thermistor is open, in open status, or is disconnected, microcomputer pins 65 - 67 are approx. 0V; when the thermistor is shorted, they are approx. 5 V, and LD301 blinks seven times.

However, an error is detected only when the OH thermistor is shorted; in such a case, the blinking mode is entered 12 minutes after the compressor starts operation.

## 6. Reversing valve control circuit

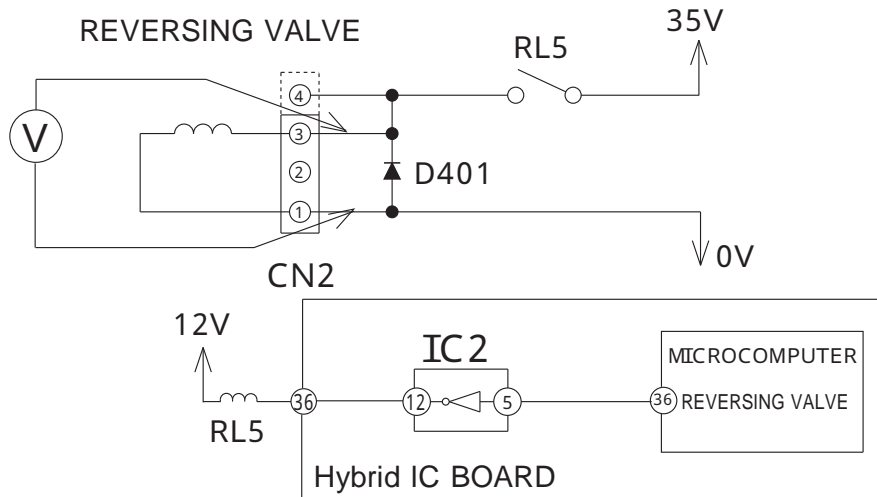


Fig. 6-1

Reversing valve control circuit will switch reversing valve ON/OFF according to instruction from indoor microcomputer depending on the operation condition shows in Table 6-1.

Voltage at D401 (between anode and cathode) in each operation condition is approximately as shown in Table 6-1 when measured by multimeter.

Table 6-1

Operation condition		Collector voltage of D401
Cooling	General operation of Cooling	About 35V
Heating	In normal heating operation	About 0V
	MAX. rotation speed instructed by indoor microcomputer after defrost is completed	About 0V
	Defrosting	About 35V
Dehumidifying	Sensor dry	About 35V

## 7. Electric expansion valve control circuit

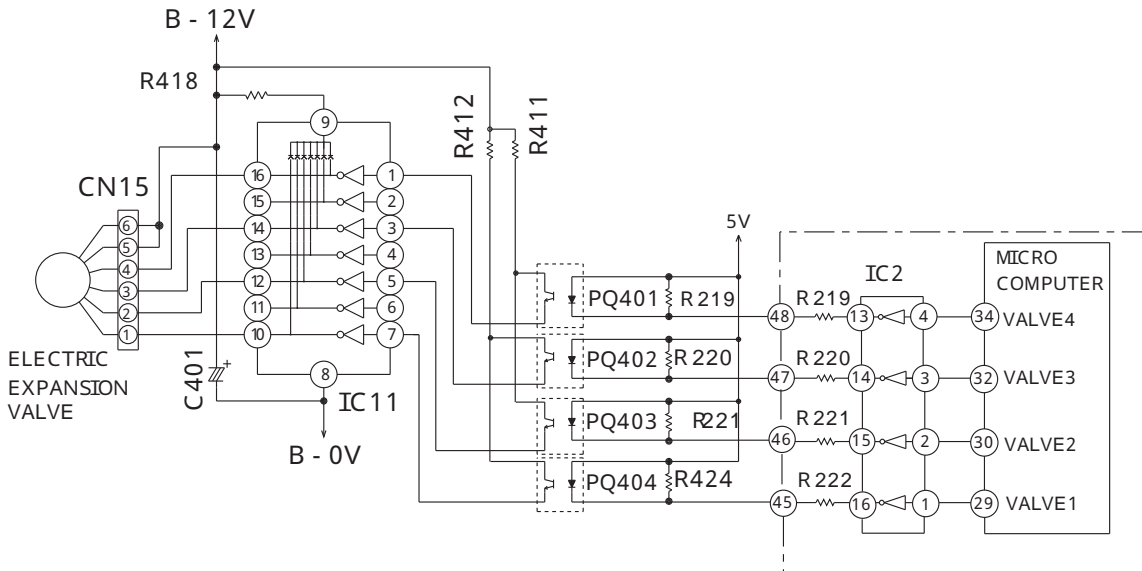


Fig. 7-1

- To drive the expansion valve, use the B-12V output. Use a 4-phase coil and feed power to the phases 1 and 2, then switch over the filed poles to control the opening of the valve.
- The reference between conducting phase switch over direction and the open/close direction are shown in Table 7-1. When the power is turned on, approx. 0.9 V is applied to the CN15 and the pins ( to ) and when no power is supplied, 12 V is applied. When the power is reset, the expansion valve starts initial operation for 5 to 10 seconds.
- During the initial operation, measure each pin of the CN15 ( to ) with a multimeter. If no change is found around 0.9 V or 12V in this step, the expansion valve or the microcomputer has failure.
- The logic waveform during the operating of the expansion valve is shown in Fig. 7-2.

Table 7-1

CN15 pin#	Lead wire	Driving state							
		1	2	3	4	5	6	7	8
	White	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
	Yellow	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
	Orange	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
	Blue	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									

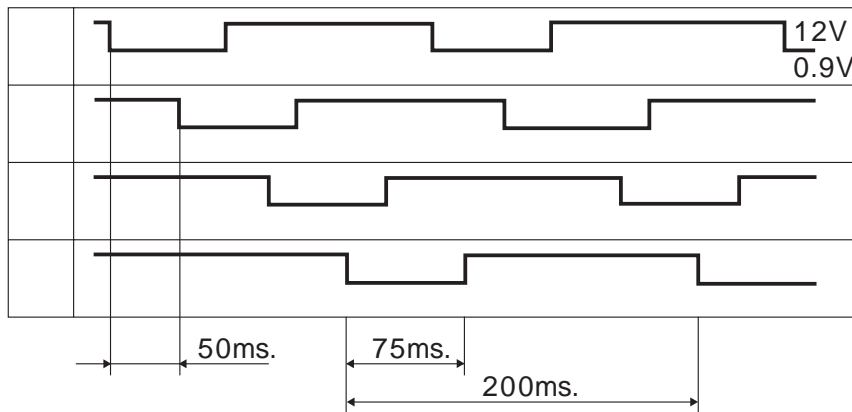


Fig.7-2

## 8. Outdoor DC Fan Motor control circuit

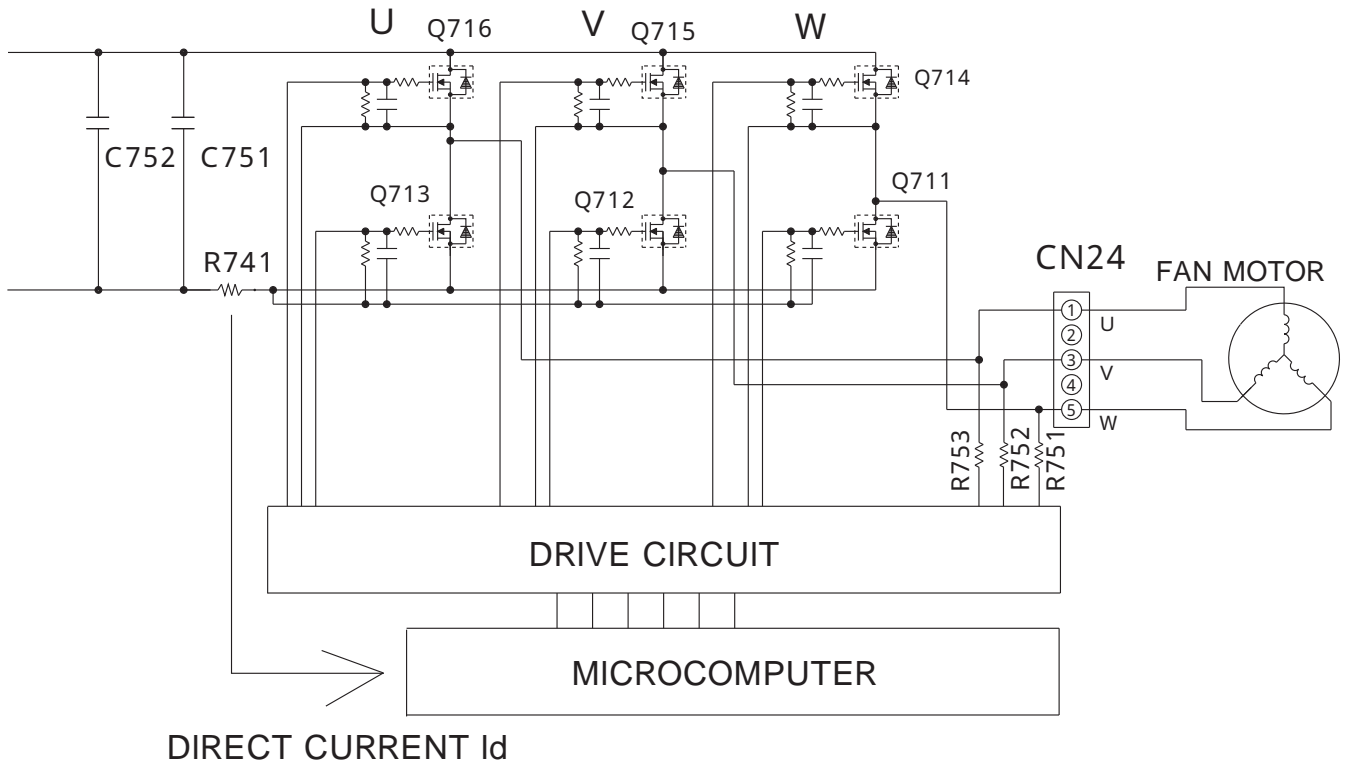


Fig. 8-1

The external fan motor is controlled by the outdoor microcomputer. This outdoor fan motor estimates the actual speed, based on the DC current flowing to R741; it then adjusts this value as necessary, so that it becomes the speed corresponding to the operation command transmitted from the indoor unit. In addition, overcurrent detection and other fault detection is performed, based on the DC current.

< Reference >

When operation stop with LD301 blinks 12 times, it may be caused by faulty DC fan motor.

In this case, please check CN24 connection first. It makes Fan Motor Lock also if those connectors are in misconnection.

DC Fan Motor has broken invites 2A Fuse burned. Please replace both DC Fan Motor and 2A Fuse together.

It will makes "Fan Lock Stop" when something has disturb the Fan rotation by inserting materials into propeller fan or ice has growing inside of outdoor unit by snowing.

It may make "Fan Lock Stop" by strong wind (ex. 17m/sec. or above) against the Fan rotation. In this case unit will be restart again after a while.

In case of " Fan Lock Stop" even though the DC Fan Motor is rotating correctly, the possible cause in Fan Motor problem or control board problem. Stop after the Fan motor runs 2 minutes, Fan Motor may be broken.

< Caution >

Please take care for the electrical shock by high voltage of DC Fan Motor power source which is common with compressor when you are servicing this unit.

You can not confirm the coil and wiring of Motor directly due to the built in control circuit in Fan Motor.

## 9. Intelligent power module circuit (IPM circuit)

Fig. 9-1 shows peripheral circuits of intelligent power module (IPM).

In the diagram, U<sup>+</sup>, V<sup>+</sup> and W<sup>+</sup> are called the "upper arm", U<sup>-</sup>, V<sup>-</sup> and W<sup>-</sup>, the "lower arm".

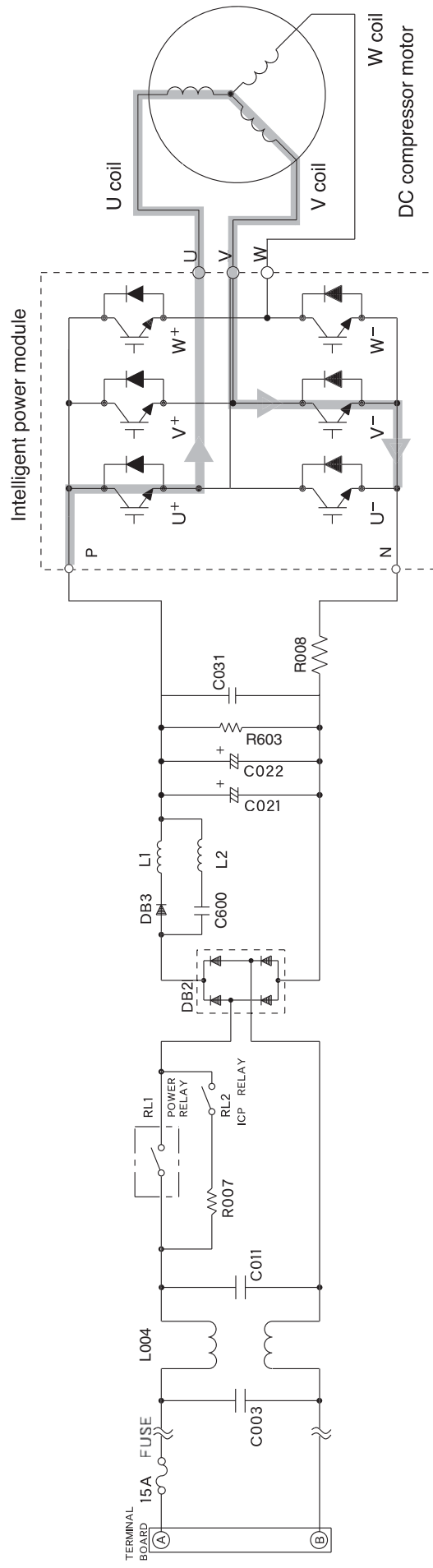


Fig. 9-1 System power module circuit (U<sup>+</sup> is ON, V<sup>-</sup> is ON)



Intelligent power module switches power supply current according to position of the compressor motor rotor.

The switching order is as shown in Fig. 9-2.

At point ⑤: U<sup>+</sup> is ON, V<sup>-</sup> is ON (circuit in Fig. 9-1)

At point ⑥: U<sup>+</sup> is chopped (OFF), V<sup>-</sup> is ON (circuit in Fig. 9-4)

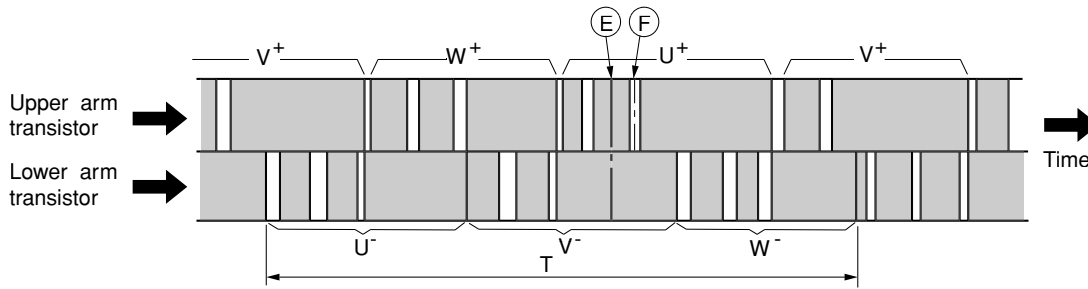


Fig. 9-2 Switching order of power module

Upper arm transistor is controlled to ON/OFF by 2.5kHz-5kHz chopper signal. Rotation speed of the compressor is proportional to duty ratio (ON time/ ON time + OFF time) of this chopper signal.

Time T in Fig. 9-2 shows the switching period, and relation with rotation speed (N) of the compressor is shown by formula below;

$$N = 60/2 \times 1/T$$

Fig. 9-3 shows voltage waveform at each point shown in Figs. 9-1 and 9-4. First half of upper arm is chopper, second half is ON, and first half of lower arm is chopper, second half is ON.

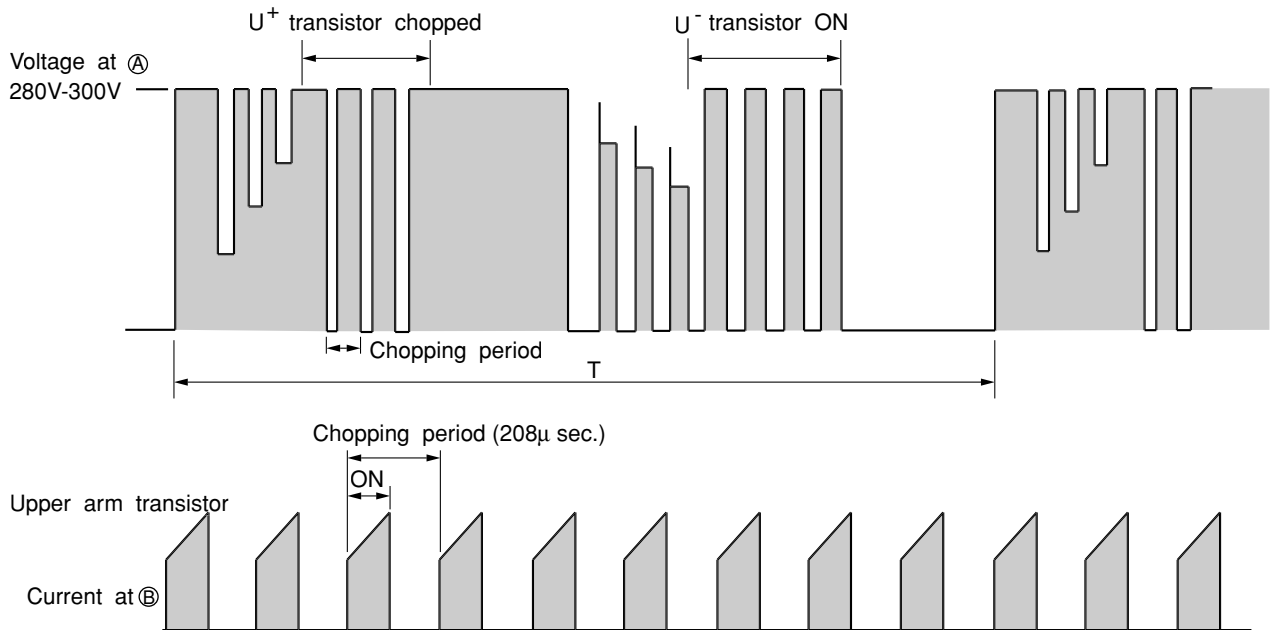


Fig. 9-3 Voltage waveform at each point

When power is supplied U<sup>+</sup> → V<sup>-</sup>, because of that U<sup>+</sup> is chopped, current flows as shown below;

- (1) When U<sup>+</sup> transistor is ON: U<sup>+</sup> transistor → U coil → V coil → V<sup>-</sup> transistor → DC current detection resistor → Point ⑥ (Fig. 9-3)
- (2) When U<sup>+</sup> transistor is OFF: (by inductance of motor coil) U coil → V coil → V<sup>-</sup> transistor → U<sup>-</sup> diode → Point ⑤ (Fig. 9-4)

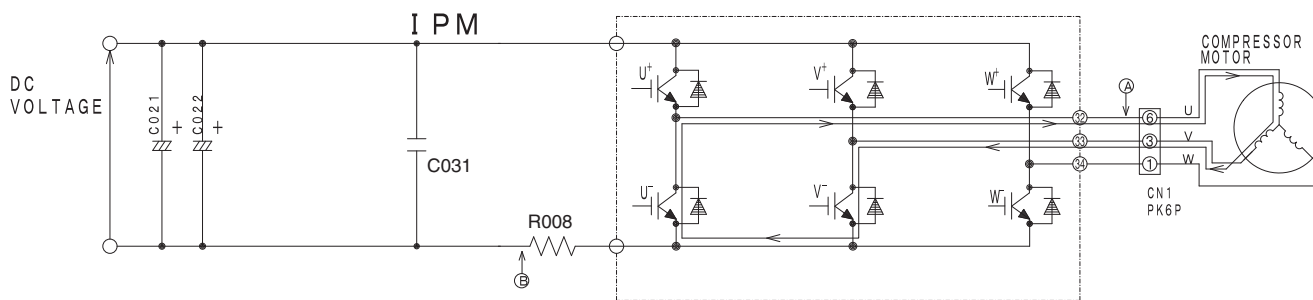


Fig. 9-4 Power module circuit (U<sup>+</sup> is OFF, V<sup>-</sup> is ON)

Since current flows at point ② only when U<sup>+</sup> transistor and V<sup>-</sup> transistor are ON, the current waveform at point ② becomes intermittent waveform as shown in Fig.9-3. Since current at point ② is approximately proportional to the input current of the air conditioner, input current is controlled by using DC current (I<sub>d</sub>) detection resistor.

<Reference>

If power module is defected, self diagnosis lamps on the MAIN P.W.B. may indicate as shown below:

Table 9 -1

Self-diagnosis	Self-diagnosis lamp and mode	
I <sub>p</sub> (peak current cut)	LD301	Blinks 2 times
Abnormal low speed rotation	LD301	Blinks 3 times
Switching incomplete	LD301	Blinks 4 times

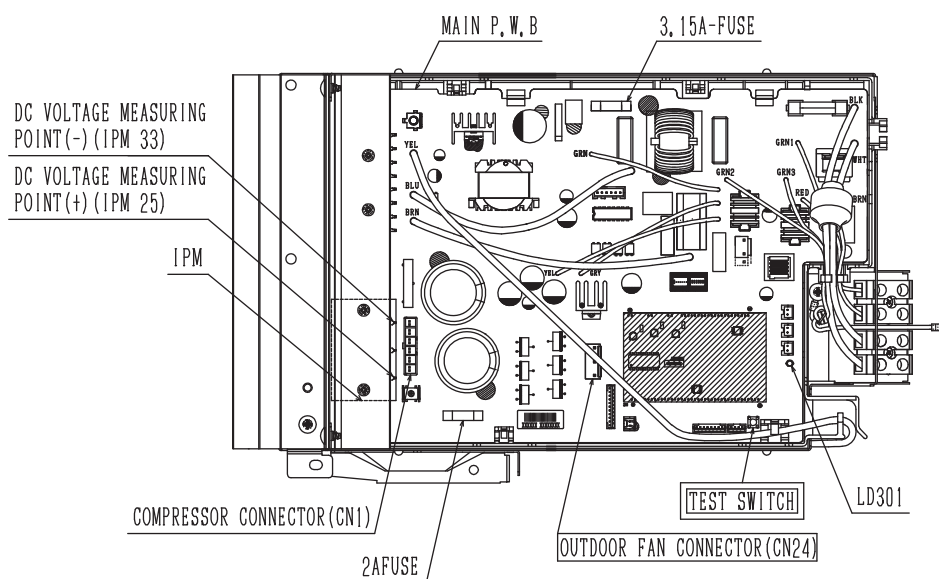
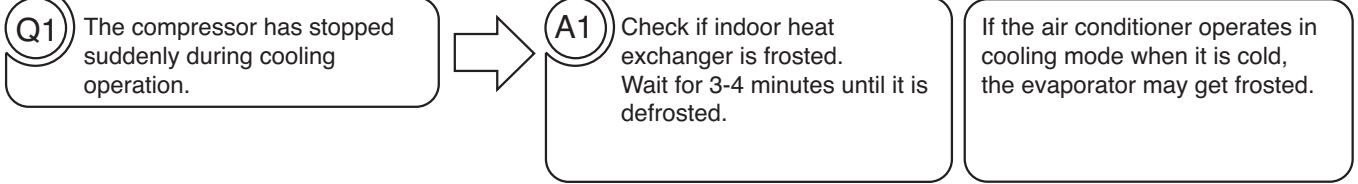


Fig. 95

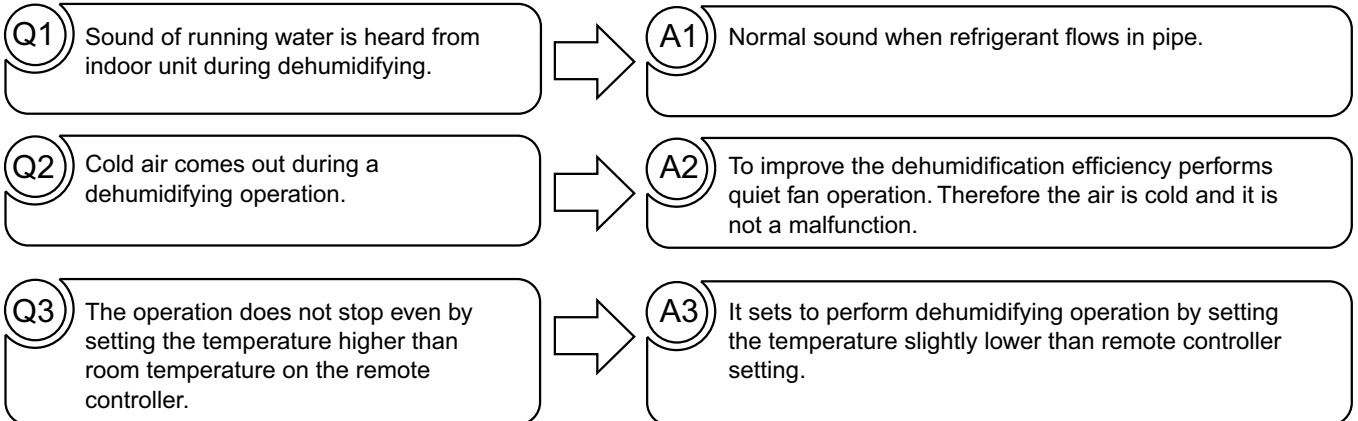
## SERVICE CALL Q&A

MODEL RAF-25RPA / RAC-25FPA  
RAF-35RPA / RAC-35FPA

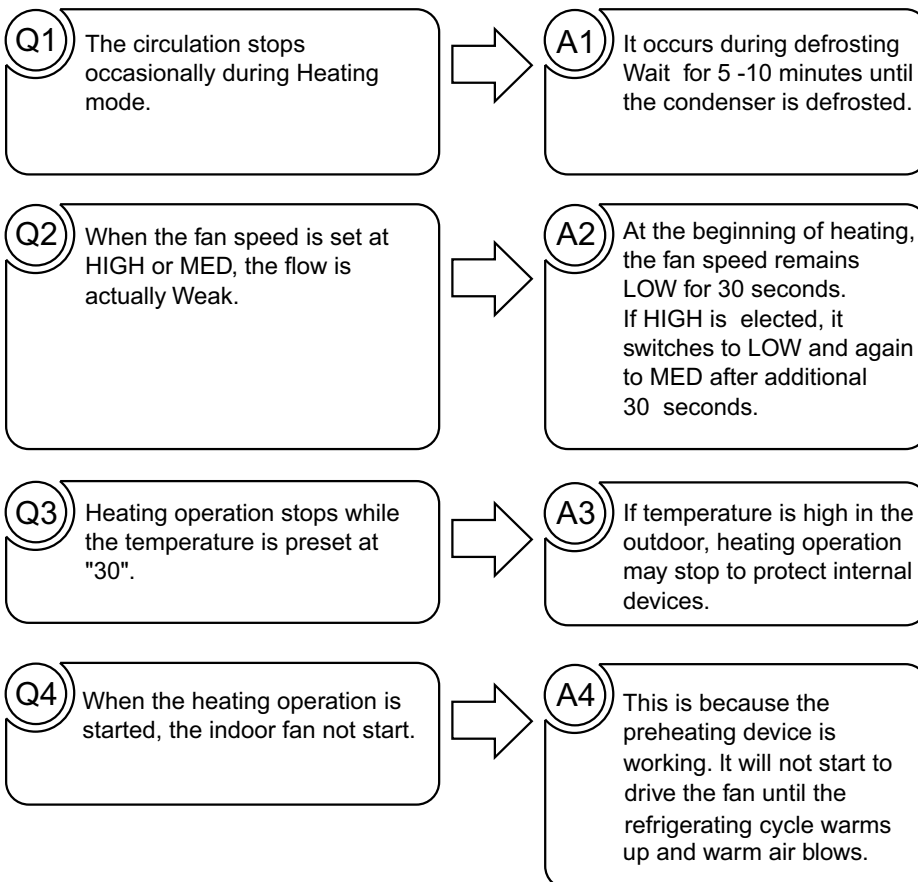
### COOLING MODE



### 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, heating or cooling operation is automatically selected. Refer to the basic operation section.

## 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 starts 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.



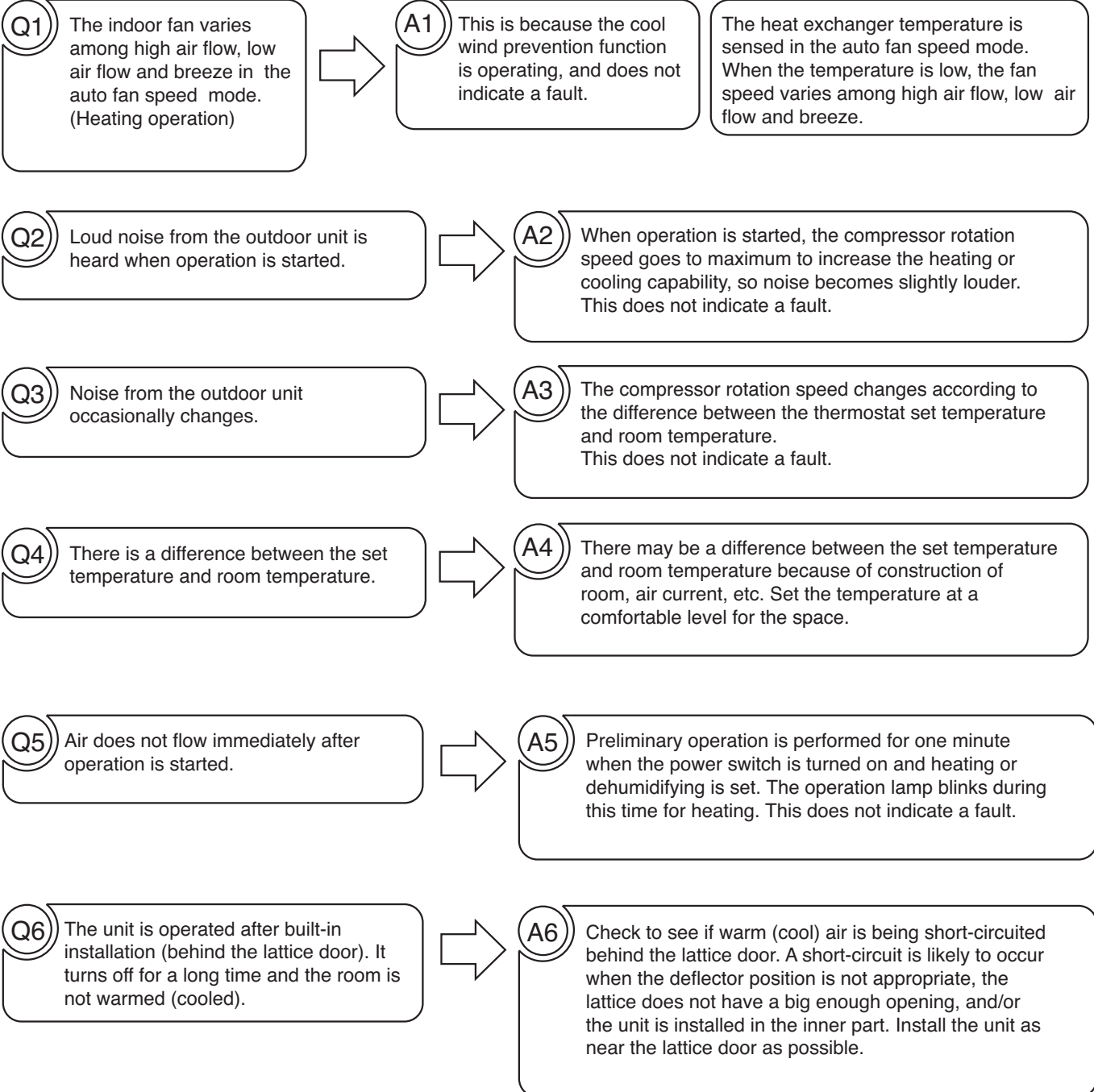
**A3** This is because "Nice temperature reservation" function is operating. The start time varies according to the load of room. Since load varies greatly during heating, the operation start time is corrected, so it will vary each day.

**Q4** When does "Nice temperature reservation" not work.



**A4** In case of weekly timer operation has been preset, "Nice temperature reservation" not work.

## OTHERS



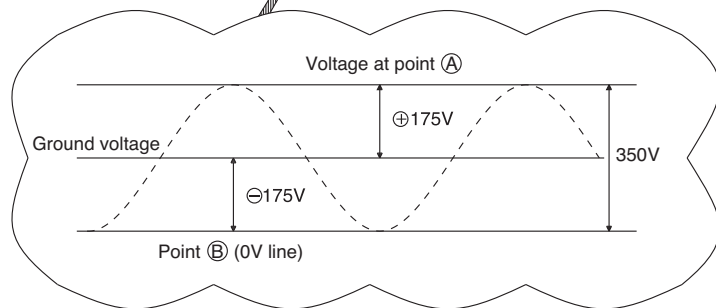
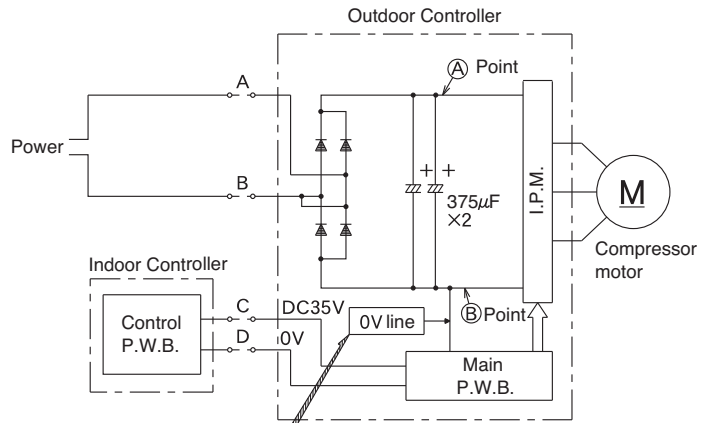
# TROUBLE SHOOTING

MODEL RAC-25FPA, RAC-35FPA

## PRECAUTIONS FOR CHECKING

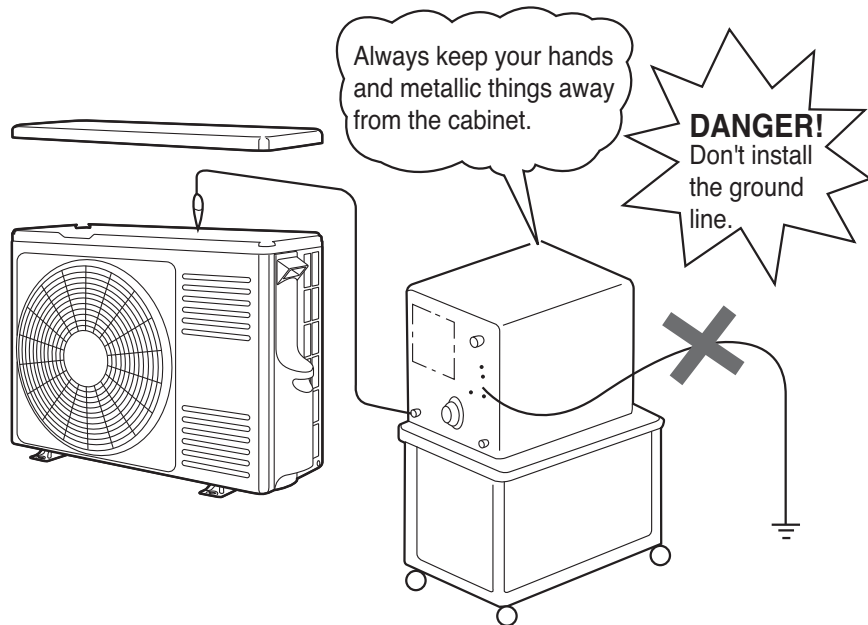
### WARNING

Remember that voltage of 175 V is applied to the 0V line on the P.W.B. or the like as shown in the right diagram.



### WARNING

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



# DISCHARGE, PROCEDURE AND POWER SHUT OFF METHOD FOR POWER CIRCUIT



**WARNING**



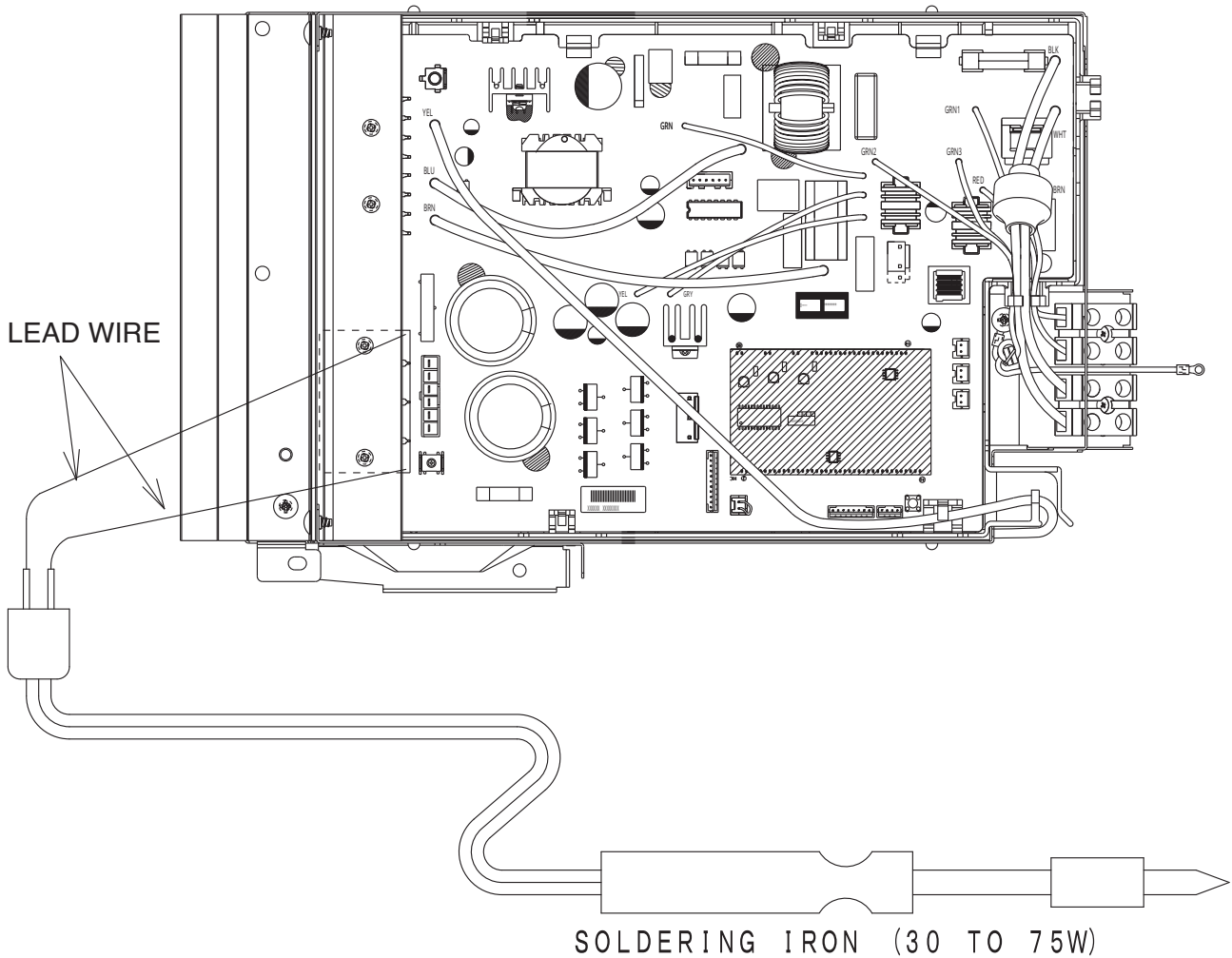
## Caution

- Voltage of about 350 V is charged between the terminal of smoothing capacitors (375F x 2).
- During continuity check for each circuit part of the outdoor unit, be sure to discharge the smoothing capacitors.

## Discharge Procedure

1. Turn off the power.
2. After power is turned off, wait for 10 minutes or more. Then, remove electrical parts cover and apply soldering iron of 30 to 75 W for 15 seconds or more to IPM(25) and IPM(33) terminals on the main P.W.B. as shown in the figure below, in order to discharge voltage in smoothing capacitor.

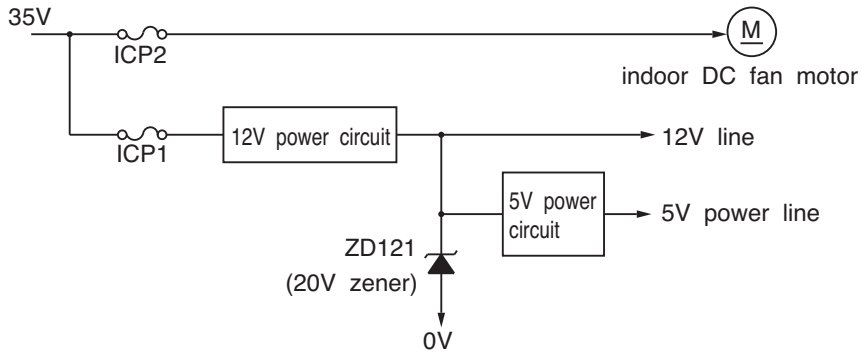
Do not use a soldering iron with transformer: Otherwise, thermal fuse inside transformer will be blown.



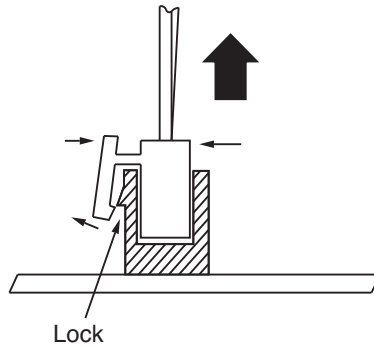
[ Other Caution ]

1. Cautions for ICP (IC protector)

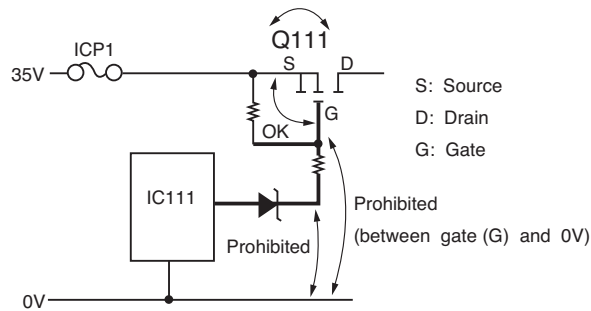
- (1) Be careful not to short-circuit during servicing.  
If short-circuited, ICP will instantaneously open.
- (2) If ICP Opens, remove cause, and then replace ICP.  
If repair is incomplete, ICP may open again.



2. CN3 (Power), CN10 (Fan Motor), are connectors with lock mechanism: Release lock with finger before disconnecting.



3. Do not touch the following parts during voltage and waveform check; ICP1 may be blown or Q111 may be damaged:



Q111 is MOS-FET and its gate terminal is a high input resistor, If tester probe, etc, touches gate (G), gate drive circuit and 0V line, Q111 will be turned on continuously, over-current will flow, and ICP1 may be blown, causing trouble in Q111.

When switching waveform of Q111 is to be observed, measure gate (G) and drain (D) with source (S) as base point.



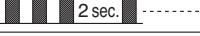





4. Do not connect/disconnect CN10 (Fan Motor) when power is being supplied to P.W.B.: Over-current will flow to fan motor and P.W.B. (Microcomputer, IC, etc.) and cause malfunction. Always connect/disconnect CN10 with power turned off.




## TROUBLE SHOOTING WHEN THE TIMER LAMP BLINKS

MODEL RAF-25RPA, RAF-35RPA

When the timer lamp on the display section of the indoor unit blinks, refer to the following table.

Lamp blinking mode	Main defective
 ONCE	Reversing valve defective
 2 Times	Forced operation of outdoor unit
 3 Times	Indoor/Outdoor interface defective
 4 Times	Outdoor defective indication
 9 Times	Indoor sensor defective
 10 Times	Abnormal rotating numbers of DC fan motor
 12 Times	Interface voltage error
 13 Times	IC401 defective

(  ..... Lights for 0.35 sec. at interval of 0.35 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 if the connecting cable is connected to the outdoor unit.

# SELF-DIAGNOSIS LIGHTING MODE

MODEL RAC-25FPA, RAC-35FPA

**⚠ DANGER (DC350V)**

- CUT THE POWER SOURCE AND WAIT MORE THAN 10 MINUTES BEFORE SERVICE WORK.
- CONFIRM THE DC VOLTAGE AT THE MEASURING POINT SHOWN IN BELOW FIGURE MUST BE LESS THAN 10V.

DURING STOP	
LD301	CONTENTS
LIGHT	NORMAL OPERATION
2 SEC LIGHTING AND 0.3 SEC LIGHTS OUT REPETITION	OVERLOAD OPERATION(NORMAL OPERATION)

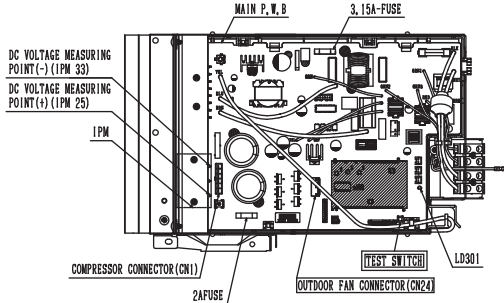
**SURVIVE OPERATION**

PROCEDURE OF COLLECTING REFRIGERANT PUMP DOWN OR INDEPENDENT OPERATION OF OUTDOOR UNIT.  
 1. CUT OFF THE POWER SOURCE ONCE THEN ON AGAIN.  
 2. WAIT 1 MINUTE AT LEAST.  
 3. PRESS THE TEST SWITCH (WHICH IS ON THE PWB) MORE THAN 1 SECOND. SERVICE OPERATION WILL BE STARTED. TO STOP THIS OPERATION, PRESS THE TEST SWITCH AGAIN (MORE THAN 1 SECOND).  
 TO RESUME TO NORMAL OPERATION, CUT THE POWER SOURCE ONCE THEN ON AGAIN. IN ORDER TO PROTECT THE DAMAGE OF COMPRESSOR, DO NOT OPERATE MORE THAN 5 MINUTES WITH SERVICE VALVE CLOSE.

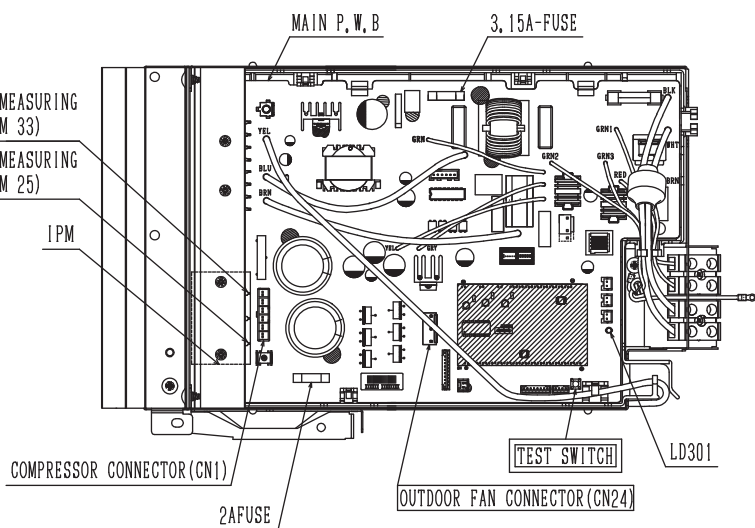
**OUTDOOR FAN MOTOR CHECK DIAGNOSIS METHOD**

1. PUT THE POWER OFF
  2. REMOVE THE OUTDOOR FAN MOTOR'S CONNECTOR FROM CN24\*
  3. ROTATE THE FAN MOTOR BY HAND AND CHECK WHETHER THE FAN MOTOR IS LOCKED OR NOT.
  4. MEASURE THE RESISTANCE BETWEEN EACH TERMINAL OF THE FAN MOTOR CONNECTOR
- NORMAL RESISTANCE BETWEEN EACH TERMINAL: 20~50Ω  
 \*INSERT THE FAN MOTOR'S CONNECTOR AFTER FINISHING STEPS 1 TO 4.

- OTHERS CHECK POINTS**
1. DIAGNOSIS FOR [REVERSING VALVE OPERATION ERROR] ;  
 ⇒ CHECK REVERSING VALVE WIRE CONNECTION EITHER WIRE BROKEN OR NOT. IF OK CHECK 3.15A FUSE. IF BROKEN REPLACE FUSE
  2. [WHEN DISPLAY THE COMMUNICATION ERROR OR THE OUTDOOR DO NOT RUN AT ALL].  
 ⇒ PLEASE CHECK THE CONTINUITY OF THE INDOOR ↔ OUTDOOR CONNECTING CORD (F CABLE).



DURING STOP			
SELF-DIAGNOSIS BLINKING MODE			◻:BLINK □:OFF
LD301 (RED)	SELF DIAGNOSIS CONTENTS	MAIN CHECK POINT	HOW TO REPAIR
□ OFF	NORMAL STOP (STOPPED BY INDOOR THERMISTAT OR MAIN OPERATION OFF)	1. NO NEED TO CHECK	1. NOT ANY MALFUNCTION
◻ ONCE	FAN MODE OPERATION, RESET STOP	1. INDOOR AIR CLEAN OPERATION 2. OTHER CASE	1. NOT ANY MALFUNCTION 2. CHANGE ODU CONTROLLER
◻ 2 TIMES	PEAK CURRENT CUT	1. ODU CONTROLLER DEFECTIVE 2. COMPRESSOR ABNORMAL LOAD	1. CHANGE ODU CONTROLLER 2. CHECK THE COMPRESSOR
◻ 3 TIMES	ABNORMAL LOW SPEED ROTATION	1. ODU CONTROLLER DEFECTIVE 2. COMPRESSOR ABNORMAL LOAD	1. CHANGE ODU CONTROLLER 2. CHECK THE COMPRESSOR
◻ 4 TIMES	SWITCHING FAILURE	1. COMPRESSOR CONNECTOR OPEN 2. COMPRESSOR ABNORMAL LOAD 3. ODU CONTROLLER DEFECTIVE	1. INSERT THE CONNECTOR 2. CHECK THE COMPRESSOR 3. CHANGE ODU CONTROLLER
◻ 5 TIMES	OVERLOAD LOWER LIMIT CUT	1. OBSTACLE SURROUND THE ODU MAY CAUSE 2. OTHER CAUSE	1. REMOVE THE OBSTRUCTION 2. CHECK CYCLE PIPE
◻ 6 TIMES	OH THERMISTOR TEMPERATURE RISE	1. DUE TO OPEN CONNECTOR 2. LEAKAGE OF REFRIGERANT 3. OTHER CAUSE	1. INSERT THE CONNECTOR 2. CHECK THE CYCLE PIPE AND RECHARGE THE REFRIGERANT 3. CHANGE ODU CONTROLLER
◻ 7 TIMES	THERMISTOR ABNORMAL	1. CONNECTOR INSERT MISS 2. OPEN CIRCUIT/SHORT CIRCUIT OF THERMISTOR WIRE 3. ODU CONTROLLER DEFECTIVE	1. INSERT PROPERLY 2. CHANGE THE THERMISTOR 3. CHANGE ODU CONTROLLER
◻ 9 TIMES	COMMUNICATIONS ERROR	1. F CABLE MISS CONNECTION 2. F CABLE DISCONNECTION 3. ODU CONTROLLER DEFECTIVE	1. F CABLE CONNECT PROPERLY 2. CHANGE THE F CABLE 3. CHANGE ODU CONTROLLER
◻ 10 TIMES	ABNORMAL POWER SOURCE	1. REACTOR IS UNCONNECTED 2. ABNORMAL AC INPUT: OUT OF THE RANGE (230±10%) 3. AC INPUT IS NORMAL	1. CONNECT REACTOR PROPERLY 2. CONNECT TO NORMAL AC POWER SOURCE 3. CHANGE ODU CONTROLLER
◻ 11 TIMES	ODU FAN STOP BY STRONG REVERSE WIND	1. OUTDOOR FAN STOP BY STRONG REVERSE WIND	1. IT WILL RE-START AFTER THE WIND BECOME WEAK
◻ 12 TIMES	OUTDOOR FAN LOCK ERROR	1. OUTDOOR FAN STOP BY STRONG REVERSE WIND 2. PROPELLER FAN LOCK 3. OUTDOOR FAN MOTOR LOCK 4. OUTDOOR FAN MOTOR OK	1. AUTOMATICALLY RE-START AFTER WIND BECOME WEAK 2. REMOVE THE OBSTRUCTION 3. CHANGE THE FAN MOTOR 4. CHANGE ODU CONTROLLER
◻ 13 TIMES	EEPROM READ ERROR	-	- CHANGE OUTDOOR UNIT CONTROLLER
◻ 14 TIMES	ACTIVE VOLTAGE ABNORMAL	1. ABNORMAL OUTDOOR CONTROLLER 2. ABNORMAL COMPRESSOR LOAD	1. CHANGE ODU CONTROLLER 2. CHECK THE COMPRESSOR
◻ 16 TIMES	HIGH LOAD STOP	1. SERVICE VALVE CLOSE 2. OBSTACLE SURROUND THE ODU UNIT MAY CAUSE 3. CLOGGED FILTER IN INDOOR UNIT CAUSE.	1. CHECK SERVICE VALVE 2. REMOVE THE OBSTRUCTION 3. CHECK FILTER



## Self Diagnosis Memory Function

Defective modes stored in the non-volatile memory of the indoor unit are re-indicated by the remote controller operation. This is useful to check the defective mode when switching OFF the power or restarting the unit operation without checking the number of blinking of the defective indication lamp. (The defective mode which occurred the last is memorized.)

Defective modes of which occurrence frequency is too low to indicate on the indoor unit are also stored in the memory, thus defective phenomenon which was not checked at the visit can be found by clearing the memory and rechecking the memory contents later on.

Re-indication method for defective mode .

1. Turn the circuit breaker OFF and set the remote controller STOP position.
  2. Turn the circuit breaker ON.
  3. Set the remote control to "Cooling" and the set temperature to "32".
  4. Set the blower speed according to the indicated failure condition. (Refer to the corresponding table.)
  5. Press the [ ] button while pressing the temperature setting button [ ① ] (Transmission is performed.)
  6. The main unit makes the receiving sound [ Pi- ] and becomes the defective indication mode. (Timer lamp goes on and off, but if the unit has no memory, the indication is not shown.)
- Error codes can also be displayed with the remote controller.  
For details regarding the contents of error codes displayed with the remote controller, refer to "Displaying Error Codes with the Remote Controller."
7. Finish after turning the circuit breaker OFF. (Please turn OFF once without fail.)

Failure data blower speed setting

Blower speed	Data
Auto	Newest
Strong	2nd newest
Weak	3rd newest
Very low	4th newest
Quiet	Oldest

Clear method for data of defective mode.

1. Proceed the re-indication of defective mode. (proceed without fail, after having the re-indication, do not operate the remote controller except for indicated ones.)
2. Turn the circuit breaker OFF. (Continue OFF more than 5 seconds.)
3. Turn the circuit breaker ON.
4. Set the remote controller HEAT and to be set 16 and press the [ ① ] button while pressing the [ ] of temperature buttons. ⇒ Transmission.
5. Finish the clear after having the receiving sound [ Pii- ] of one second.
6. Turn the circuit breaker OFF and finish. ( Please turn OFF once without fail.)

### Notes

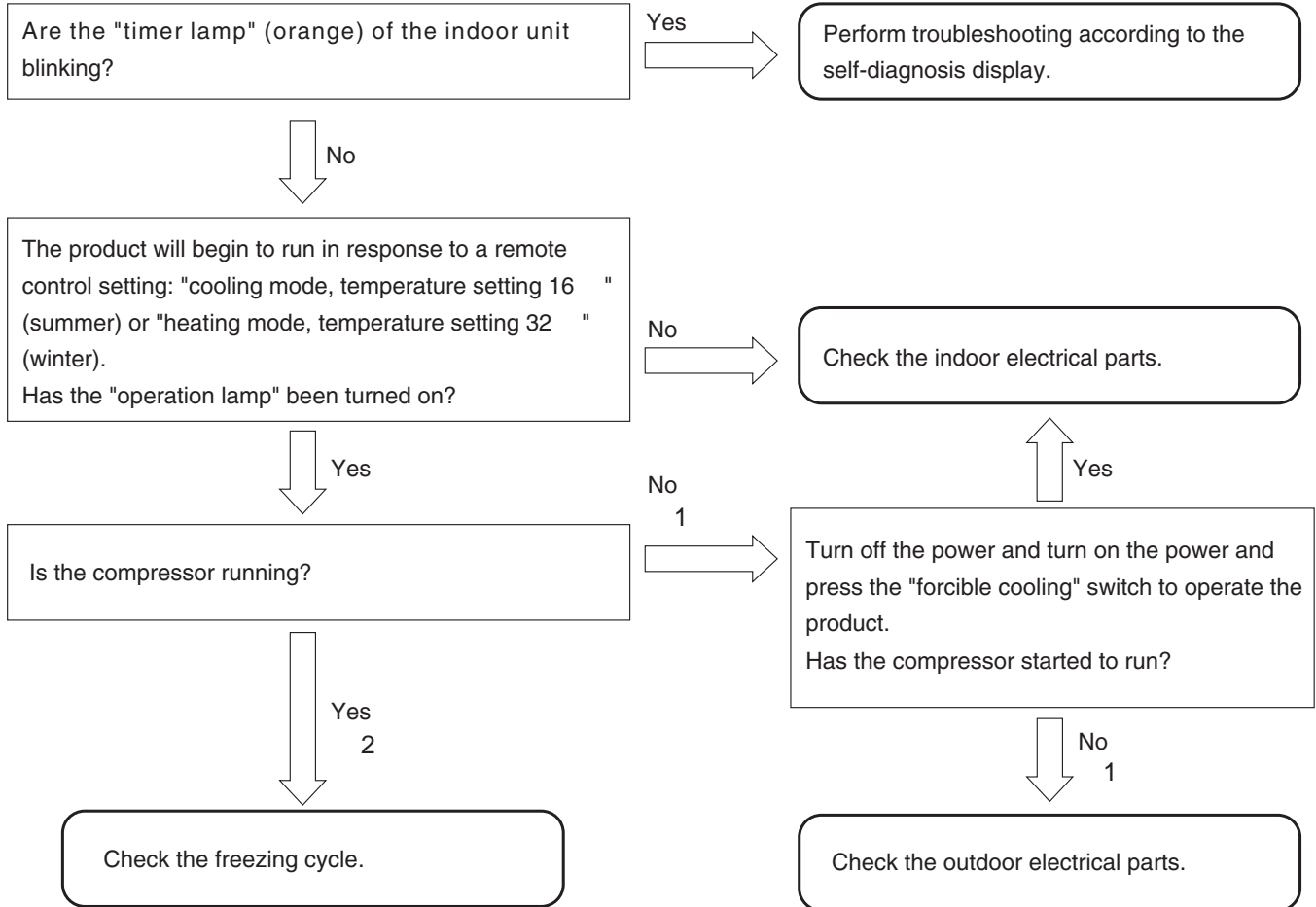
- This function is valid only once right after switching ON the power and does not work if other remote controller operation was made prior to it.  
Take note that this function may not work when not following the above procedures.  
(If it does not work, switch OFF the power and try again.)
- If nothing is stored in the memory, the lamp does not blink even if re-indication operation is carried out.
- After carrying out re-indication operation, the remote controller operation will not be accepted once the data has been cleared. To carry out normal operation, switch OFF the power beforehand.

Contents of Error Codes

MAIN CAUSE	INFO function Indication【Error code】
Refrigerant cycle defective	Error code [01] Indoor error [00]
Communication error between indoor and out door units.	Error code [03] Indoor error [00]
Indoor thermistor defective	Error code [09] Indoor error [00]
Abnormal rotating numbers of DC fan motor	Error code [10] Indoor error [00]
High voltage generator defective (When reading diagnosis memory only)	Error code [11] Indoor error [00]
Outdoor power defective	Error code [12] Indoor error [00]
IC401 data reading error	Error code [13] Indoor error [00]
Peak current cut	Error code [02] Outdoor error [01]
Compressor abnormal low speed rotation	Error code [03] Outdoor error [01]
Compressor switching failure	Error code [04] Outdoor error [01]
Overload lower limit cut	Error code [05] Outdoor error [01]
OH thermistor temperature rise (When reading diagnosis memory only)	Error code [06] Outdoor error [01]
Abnormal outdoor thermistor	Error code [07] Outdoor error [01]
Acceleration defective	Error code [08] Outdoor error [01]
Communication error (When reading diagnosis memory only)	Error code [09] Outdoor error [01]
Abnormal power source (When reading diagnosis memory only)	Error code [10] Outdoor error [01]
Fan stop for strong wind (When reading diagnosis memory only)	Error code [11] Outdoor error [01]
Fan lock error	Error code [12] Outdoor error [01]
EEPROM reading error	Error code [13] Outdoor error [01]
Active converter defective	Error code [14] Outdoor error [01]
Abnormal P.W.B. circuit	Error code [15] Outdoor error [01]
Software peak current cut (When reading diagnosis memory only)	Error code [16] Outdoor error [01]

## Diagnosis and troubleshooting of indoor electric parts, outdoor electric parts and refrigerating cycle

### Initiating troubleshooting



### < Troubleshooting by using the self-diagnosis memory function >

- By using the self-diagnosis memory function, you can check the failure mode ( 1 ) occurring in the outdoor electrical parts on the indoor unit side.

- Steps
1. Clear the troubleshooting data.
  2. Run the product for several minutes under the conditions where the compressor runs.
  3. Redisplay and check the data written in the self-diagnosis memory.

- The self-diagnosis memory function can also be used to catch sporadic failure phenomena.

- Steps
1. Clear the troubleshooting data.
  2. Have the user use the product as usual until a failure phenomenon occurs.  
(The period depends on the incidence of the phenomenon.)
  3. At a later date, redisplay and check the data written in the self-diagnosis memory.

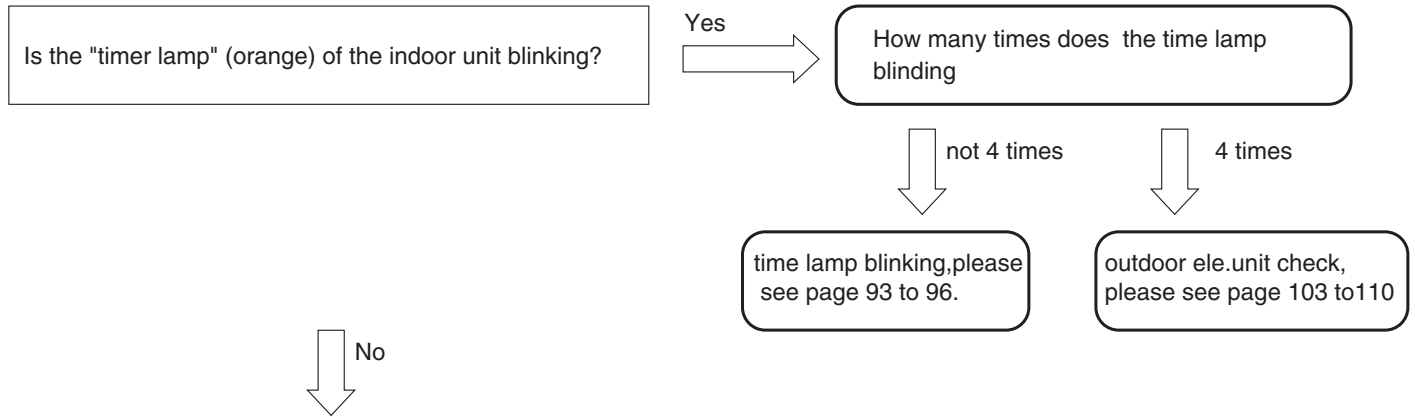
- For the outdoor self-diagnosis display (OH thermistor heat-up, overload lower limit cut) stemming from the freezing cycle or operating condition, the time lag is long from operation startup to the emergence of the phenomenon. Moreover, it is affected by the temperature, sunshine, operating hours, and other factors of the day, so that the phenomenon may not be able to be identified at the time of a repair service visit. In that case too, use the self-diagnosis memory function ( 2 ).
- The outdoor self-diagnosis display "overload lower limit cut" and "OH thermistor heat-up" can be identified only when you are using the self-diagnosis lamp of the outdoor unit and the self-diagnosis memory function of the indoor unit. Note that this will not be automatically displayed on the indoor unit side.

## Checking the indoor unit electrical parts

### Introduction

First check the failure phenomenon and status, and then move on to elaborate diagnosis.

#### Initiating troubleshooting



Turn off the power, wait at least 5 seconds, turn it back on, and observe the way the horizontal vanes move for about 30 seconds.

Check 1: Have the horizontal vanes moved? (Yes/No)



Set the remote control unit to cooling mode, temperature setting 16°C (summer), heating mode, temperature setting 32°C (winter) and operate the product.

Check 2: Has the product received the remote control signal and has the "operation lamp" gone on? (Yes/No)

If you responded "Yes" to Check 2:

Check 3: Is the compressor of the outdoor unit running? (Yes/No)

If you responded "No" to Check 2:

Check 4: Does the "emergency operation switch" work? (Yes/No)

#### Check results and next check items

Check 1	Check 2	Check 3	Check 4	Next check item
No	No	—	No	Go on to "The power will not become turned on". (page 85)
Yes	No	—	Yes	Go on to "The product will not receive the remote control signal". (page 86)
Yes	Yes	No	—	Go on to "The compressor will not run". (page 89)

# 1. Failure phenomenon: The power will not become turned on.

[Situation ] Neither initialization, remote control, nor any other step works on the vane position at power-on.

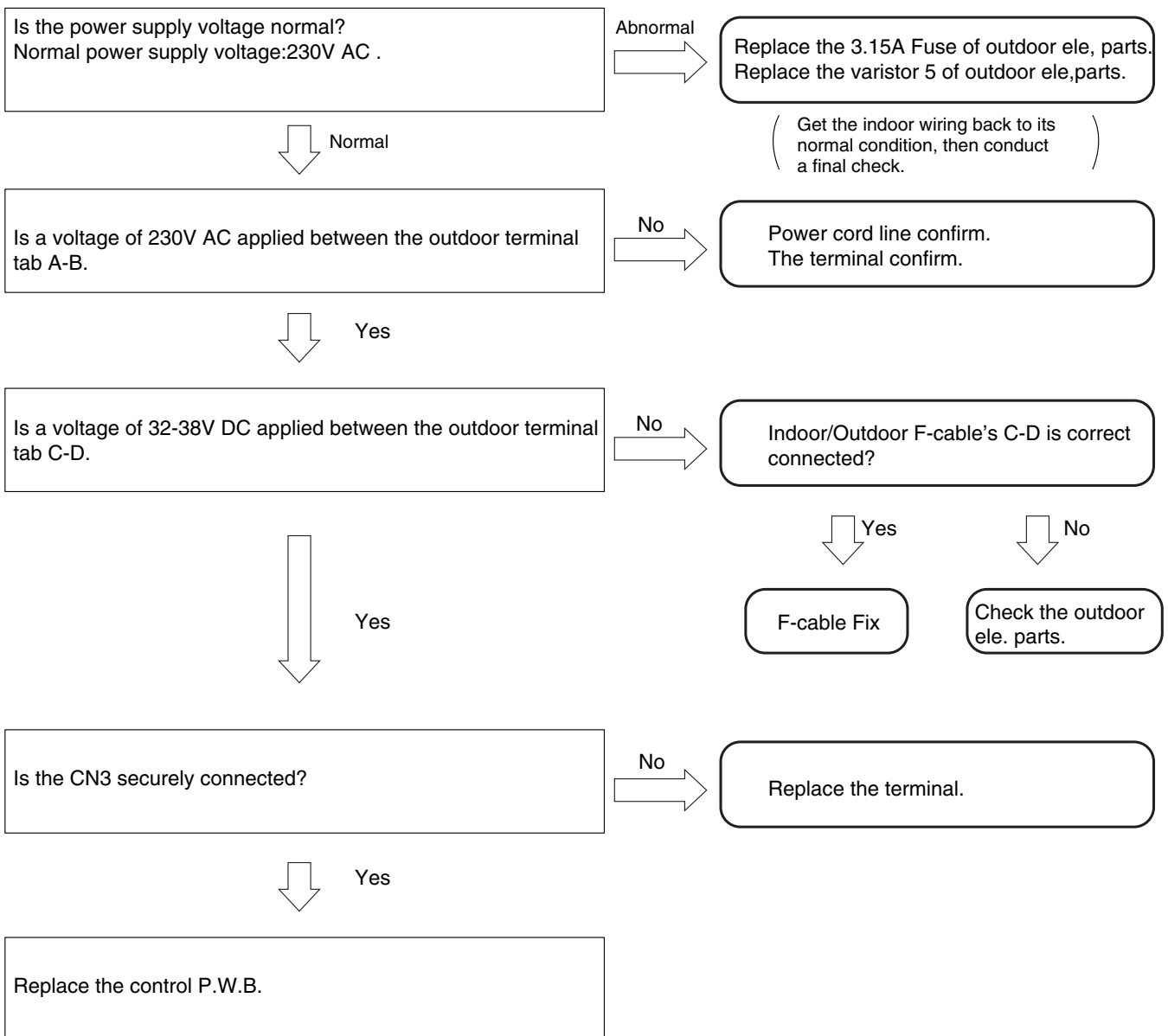
[ Estimated failure locations ]	<ul style="list-style-type: none"> <li>• 3.15 A fuse blown out</li> <li>• Control power circuit</li> <li>• Connector loose, wire break</li> </ul>	Estimated cause of fuse blowout <ul style="list-style-type: none"> <li>• Abnormally high voltage applied to the power supply</li> <li>• Indoor fan motor out of order</li> <li>• Power circuit out of order</li> </ul>
---------------------------------	---	--

[Cautions ]

- Before work, check the power supply voltage. An abnormal voltage may be being supplied in some rare occasions due to a defect in the indoor wiring (a wire break in the neutral wire of the single-phase 3-wire power supply).
- If the 3.15 A fuse has blown out, eliminate the cause of the fuse blowout. Otherwise, there will occur another fuse blowout.
- If the 3.15 A fuse has blown out due to an abnormally high voltage to the power supply, the varistor (VA001) will deteriorate and become destroyed as well.
- On a repair service visit due to the failure phenomenon of "The power will not become turned on", take a "3.15 A fuse" and a "varistor" with you.

## [Diagnosis flow ]

### Initiating troubleshooting



## 2.Failure phenomenon: The product will not receive a remote control signal.

[ Situation ] The product does not receive a remote control signal. It is not very responsive.

(The product does run normally in response to the emergency operation switch.)

[ Estimated failure locations ]

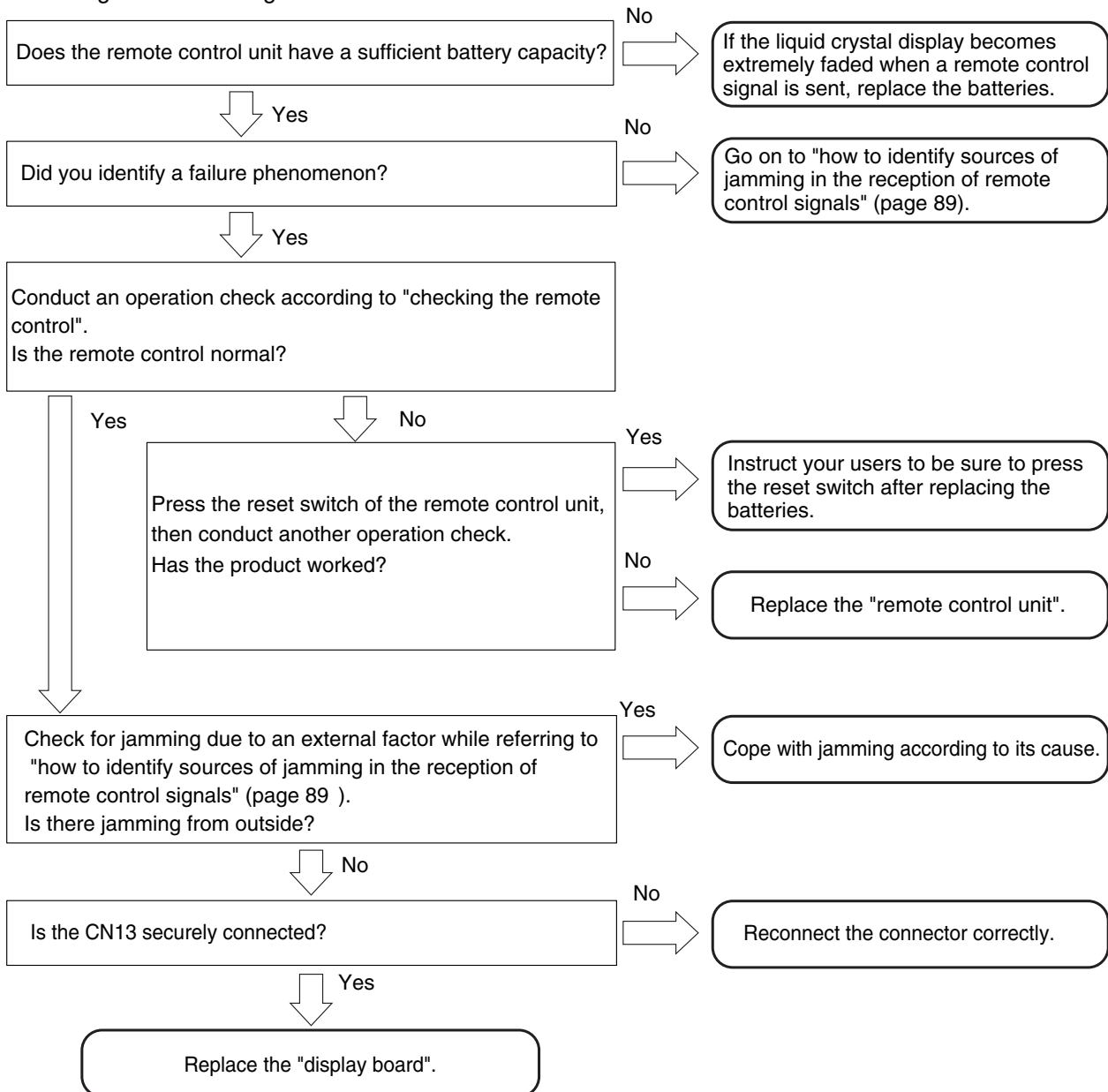
- Remote control failure, remote control low battery level, remote control poorly set
- Remote control light-receiving unit
- Connector loose, wire break
- Normal product (external factors: the remote control units for lighting equipment and other equipment, electrical noise, etc.)

[ Cautions ]

- Even if the product is trouble-free, a factor coming from outside the product may hamper the reception of signals from the remote control unit.
- Batteries may decline in capacity at low temperatures. Old batteries decline particularly much in voltage in the morning and evening of winter, resulting in the poor arrival of remote control signals. Instruct your users to use new alkaline batteries.

[ Diagnosis flow ]

Initiating troubleshooting



[Cautions in replacing the display board] Be sure to replace the indicating P.W.B. components.



## How to identify sources of jamming in the reception of remote control signals

[ Situation ] The product may become poorly responsive to remote control signals due to external factors even though the product itself is trouble-free.

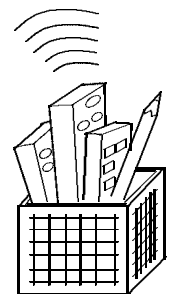
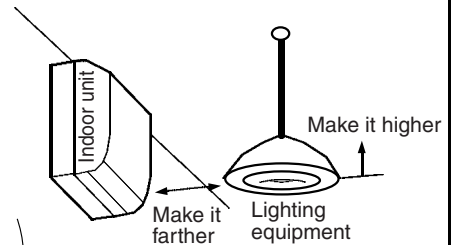
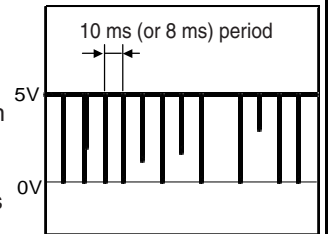
[ Estimating sources of jamming ] Identify the installation status of the air-conditioner and the indoor and outdoor environments to identify possible causes of the jamming.

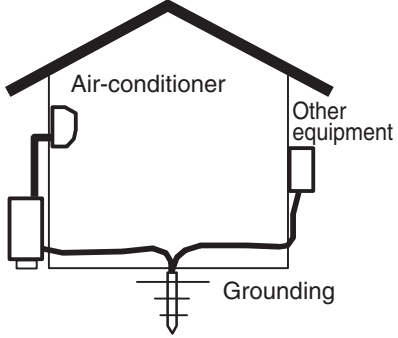
- Indoor lighting equipment (quantity, type, location)
- Remote control units of other electrical products and equipment
- Is the grounding for the air-conditioner shared with other equipment?
- Are the surroundings of the air-conditioner clear of wireless antenna?
- Is the remote control light-receiving unit protected from direct sunlight?

[ Checking and actions ]

<p>Effects of lighting equipment (fluorescent lamps)</p>	<p><u>Checking points</u></p> <ul style="list-style-type: none"> <li>• Turn on and off the lighting equipment and check for its effects on the reception of remote control signals.</li> <li>• When cold, the fluorescent lamp tends to emit infrared rays with wavelengths close to those used in remote control.</li> </ul> <p>If you cannot detect the phenomenon about which your user is complaining at the time of your visit, such as "the product sometimes fails to receive remote control signals" and "the product fails to receive remote control signals in the morning alone", then turn off the lighting for about 20-30 minutes and wait for the fluorescent lamps to cool down before conducting another check.</p> <p>There are even cases where the product fails to receive remote control signals for 1 to 2 minutes only after the lighting equipment is turned on.</p> <ul style="list-style-type: none"> <li>• The noise status may vary with the dimming of the lighting equipment. In the case of lighting equipment with a dimmer, therefore, conduct a check with all the light intensities.</li> <li>• If the lighting equipment is the source of the jamming, the remote control light-receiving unit output usually shows a noise waveform as shown in the right-hand figure. In the case of slight jamming, this kind of waveform will not cause practical problems. However, intense degrees of jamming will disable the reception of remote control signals.</li> <li>• When the fluorescent lamp is old and is flickering, it may cause disorders in the reception of remote control signals.</li> </ul> <p><u>Actions proposed</u></p> <ol style="list-style-type: none"> <li>1. Make it hard for light of the lighting equipment to enter the remote control light-receiving unit. <ul style="list-style-type: none"> <li>• Separate the lighting equipment from the indoor unit.</li> <li>• Raise the lighting equipment.</li> <li>• Cover the upper half of the light-receiving panel from its rear side with aluminum tape or black vinyl tape.</li> </ul> <p>( This will also affect the reception of remote control signals. Therefore, set the range to be covered with tape to a range that is problem-free in practice, while checking the reception status. )</p> </li> <li>2. Add an interference filter to the front panel of the remote control light-receiving unit.</li> </ol> <p>Lighting equipment that produces strong jamming exists although rarely. Some problems may therefore be unsolvable by managing the air-conditioner side alone.</p>
<p>Effects of the remote control units of other equipment</p>	<p><u>Checking points</u></p> <ul style="list-style-type: none"> <li>• If, on the remote control unit of a TV or audio equipment, its sound volume key or something similar is left pressed, infrared signals become continuously sent, thereby jamming the reception of remote control signals.</li> <li>• Check how the remote control unit and related components are stored, thereby checking if there is any possibility that a button may be inadvertently left pressed on the remote control unit of other equipment.</li> </ul> <p><u>Actions proposed</u></p> <p>If there is any such possibility, give explanations to your users to that effect and instruct them to exercise caution.</p>

Output waveform of the remote control light-receiving unit



<p>Effects of other electrical products</p>	<p><u>Checking points</u></p> <ul style="list-style-type: none"> <li>• Check the effects of light and power noises coming from other electrical products.</li> <li>• Turn on and off the electrical products, turn off the power and turn on the power, and check their effects on the reception of remote control signals.</li> <li>• For products whose operating states change, check the effects of each state.</li> </ul> <p><u>Actions proposed</u></p> <ul style="list-style-type: none"> <li>• Change the location relationship between the air-conditioner and the target products.</li> <li>• Use a different wall outlet for the target products.</li> </ul>
<p>Sharing a grounding</p>	<p><u>Checking points</u></p> <ul style="list-style-type: none"> <li>• Check for effects of electrical noises coming into the air-conditioner through grounding wires.</li> <li>• Check if the grounding works is for the air-conditioner alone or shared with other equipment. If there is any equipment that shares it, turn on and off that equipment and detach and reattach the power plugs and examine their effects on the reception of remote control signals.</li> </ul> <p><u>Actions proposed</u></p> <ul style="list-style-type: none"> <li>• Establish an independent grounding for the air-conditioner.</li> </ul> 
<p>Effects of radio waves</p>	<p><u>Checking points</u></p> <ul style="list-style-type: none"> <li>• Using a wireless transmitter near the air-conditioner may affect the reception of remote control signals.</li> <li>• Have your users try sending signals with a wireless transmitter and examine their effects on the reception of remote control signals.</li> </ul> <p><u>Actions proposed</u></p> <ul style="list-style-type: none"> <li>• Add a ferrite core to the power cord and F cable.</li> <li>• Add a ferrite core to the internal wiring of the indoor unit.</li> <li>• Move the wireless antenna.</li> </ul>
<p>Effects of direct sunlight</p>	<p><u>Checking points</u></p> <ul style="list-style-type: none"> <li>• Direct sunlight and other intense light make the remote control light-receiving unit less sensitive.</li> <li>• Check for any time zone where the remote control light-receiving unit of the indoor unit is affected by direct sunlight depending on the location of the sun and mirror reflection.</li> </ul> <p><u>Actions proposed</u></p> <ul style="list-style-type: none"> <li>• Block the sunlight to protect against direct sunlight.</li> </ul>

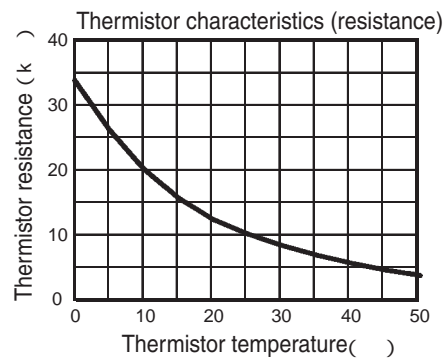
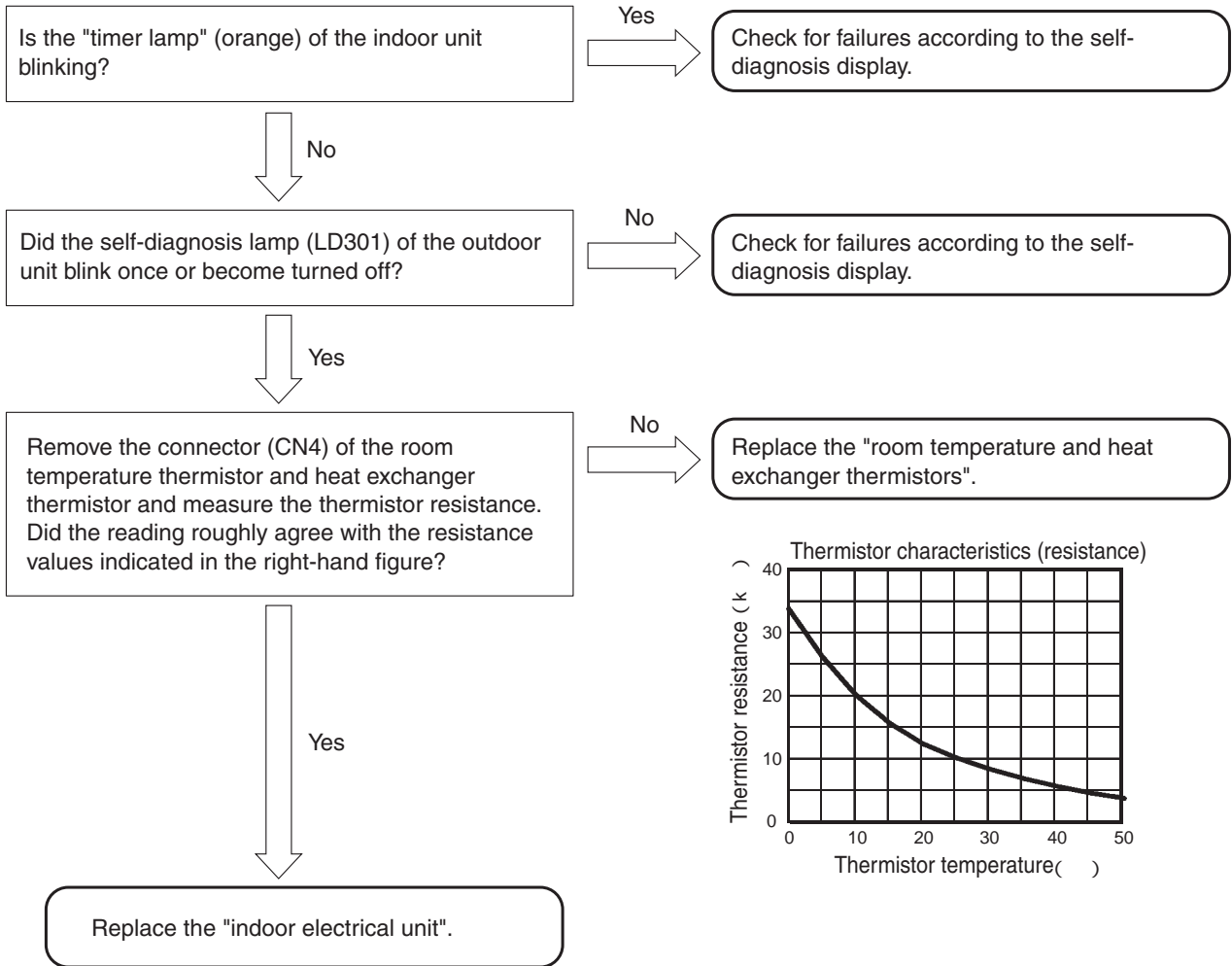
### 3. Failure phenomenon: The compressor will not run.

[ Situation ] The compressor will not run (the same state as the thermometer turned off), the product receives remote control signals normally. The self-diagnosis lamp (LD301) of the outdoor unit blinks once or becomes turned off.

[ Estimated failure locations ]

- Room temperature thermistor, heat exchanger thermistor
- Microcomputer peripheral circuit

[ Diagnosis flow ]  
Initiating troubleshooting



#### 4. Failure phenomenon: The fan motor will not stop.

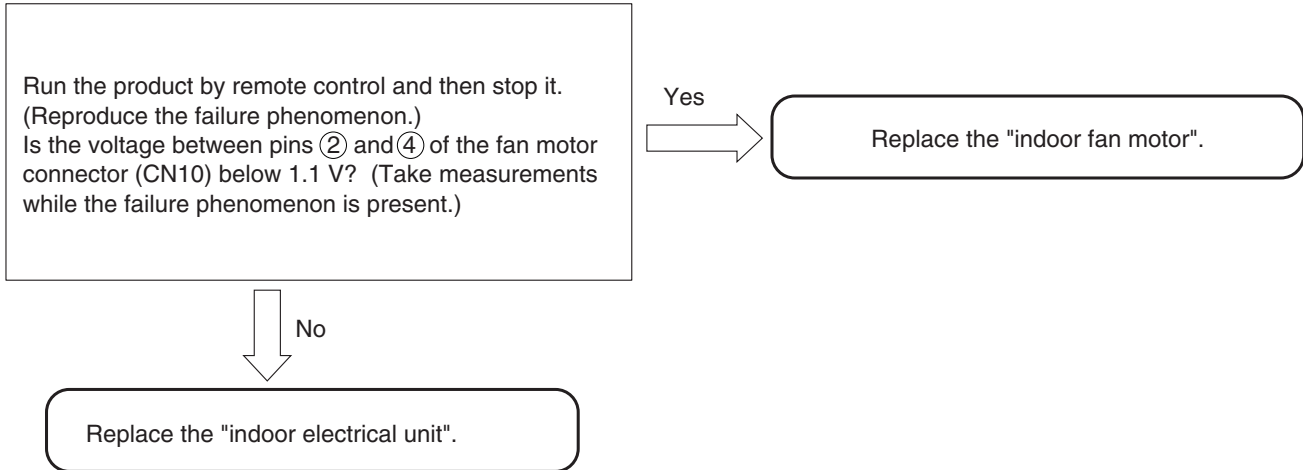
[Situation ] I have conducted the stop operation on the product by remote control, but the indoor fan motor will not stop.

[Estimated failure locations ]

- Indoor fan motor
- Fan motor drive circuit

[Diagnosis flow ]

Initiating troubleshooting



### 5. Timer lamp blinking: blinking once

[Situation] The timer lamp blinks one time and the product will not operate.  
(This is not a sign of a breakdown.)

[Estimated failure locations] • Reversing valve defective.  
• The refrigerating cycle block gas leak.

[Diagnosis flow]

Please see the main circuit presentation of page 71

### 6. Timer lamp blinking: blinking twice

[Situation] The product is giving a display to indicate that it is performing forcible cooling.  
(This is not a sign of a breakdown.)

### 7. Timer lamp blinking: blinking three times

[Situation] The timer lamp blinks three times and the product will not operate.

[Estimated failure locations] • Meltdown of the terminal board temperature fuse (the terminal board poorly inserted into the F cable)  
• Outdoor communication circuit out of order

[Cautions] • If a terminal board is replaced to counter the meltdown of the terminal board temperature fuse, ensure that the F cable to be inserted into the terminal board has the appropriate dimension for peeling the insulation sheathing and that the insertion region is unbent before inserting it into the terminal board securely.

[Diagnosis flow] • Replace the indoor control P.W.B.

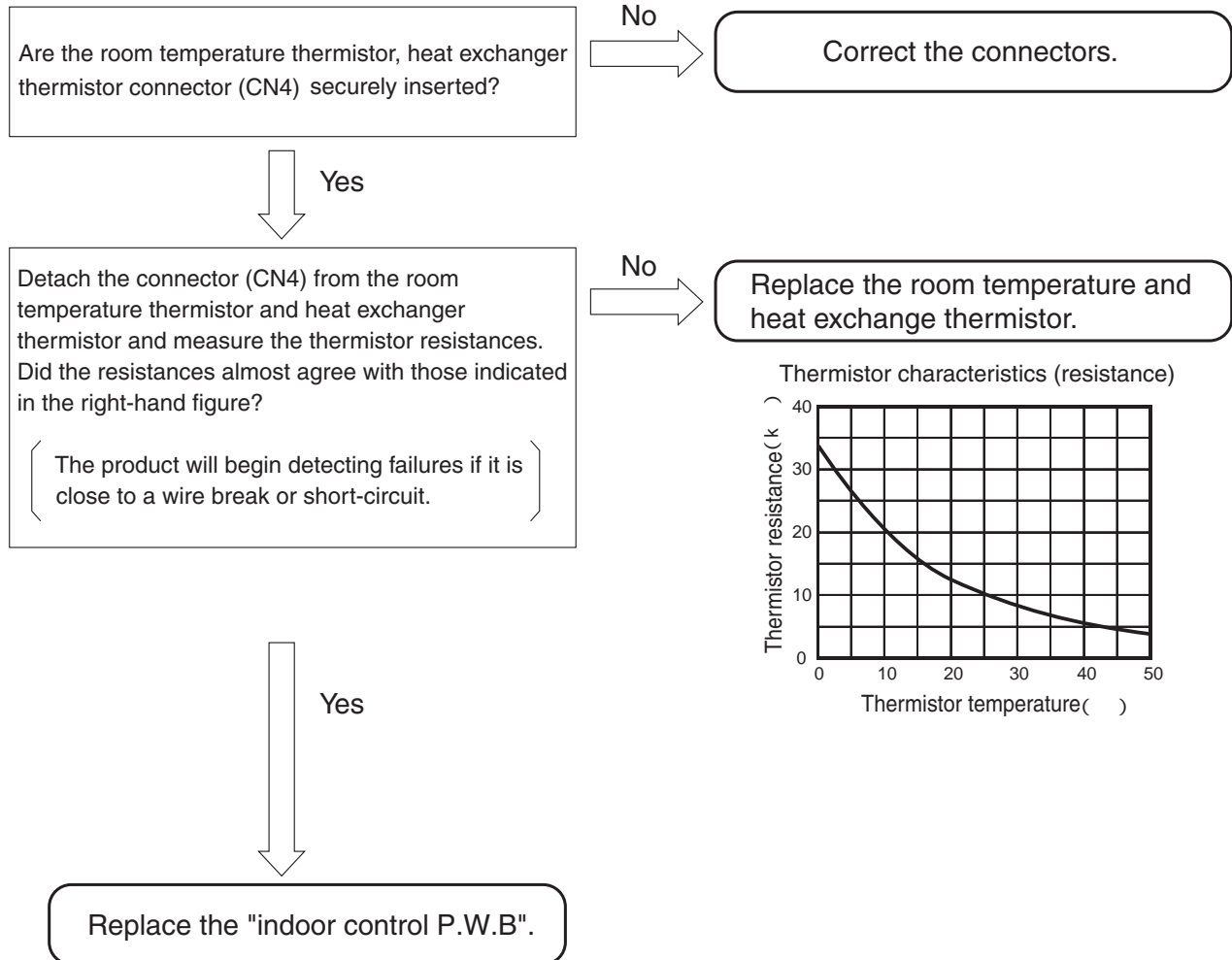
## 8. Timer lamp blinking: blinking 9 times

[Situation] The timer lamp blinks 9 times and the product will not run.

[Estimated failure location] • Loose connector, wire break, or short-circuit in the room temperature thermistor, heat exchanger thermistor.

[Cautions] • Starting the product by remote control will initiate failure detection.  
(Merely turning on the power will not activate the failure detection function.)

[Diagnosis flow]  
Initiating troubleshooting



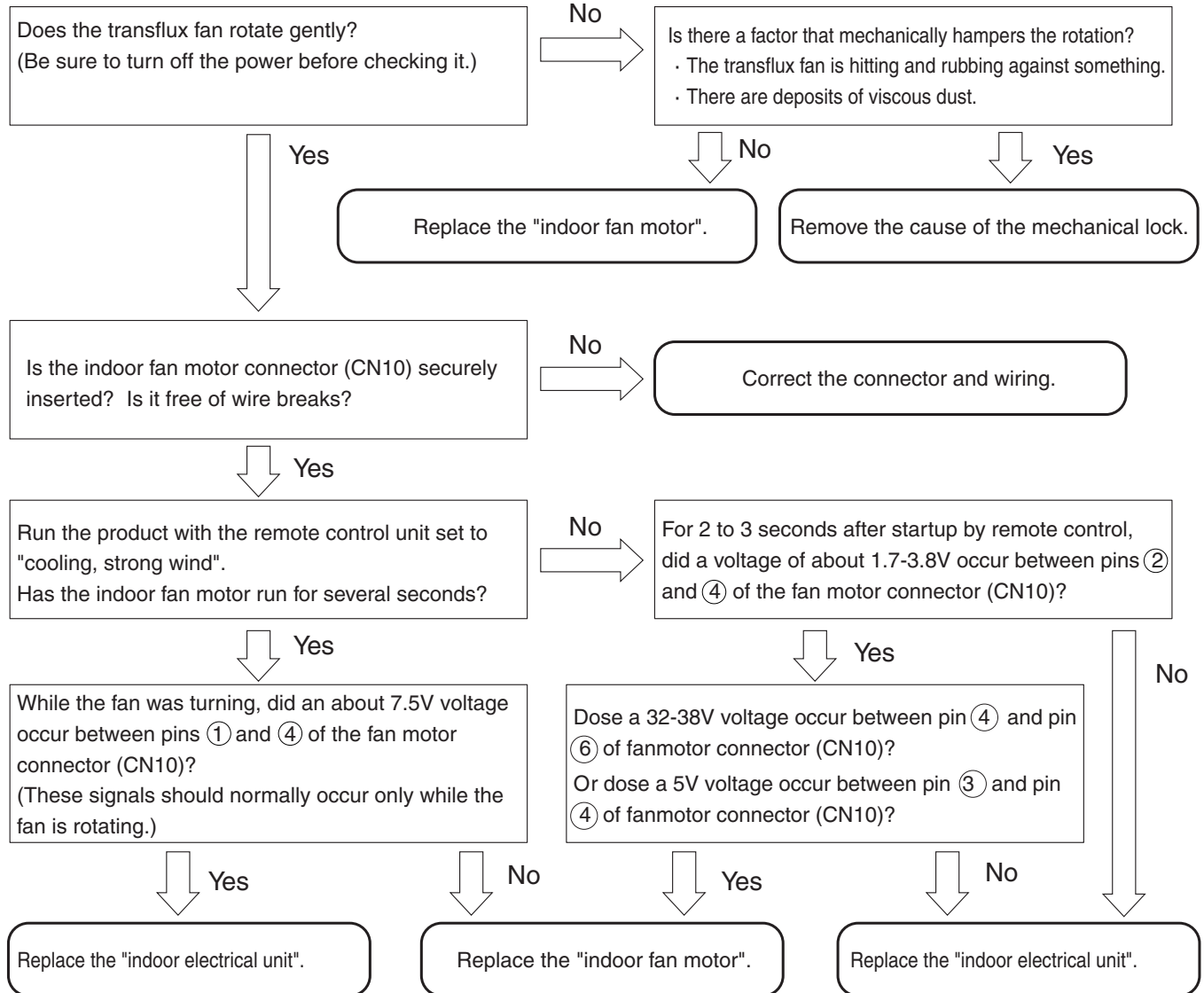
## 9 . Timer lamp blinking: blinking 10 times

[Situation] The timer lamp blinks 10 times and the product will not run.

- [Estimated failure locations]
- Loose connector or wire break in the indoor fan motor
  - Indoor fan motor mechanically locked
  - Indoor fan motor
  - Indoor fan motor drive circuit

[Diagnosis flow]

Initiating troubleshooting



10. Timer lamp blinking: blinking 12 times

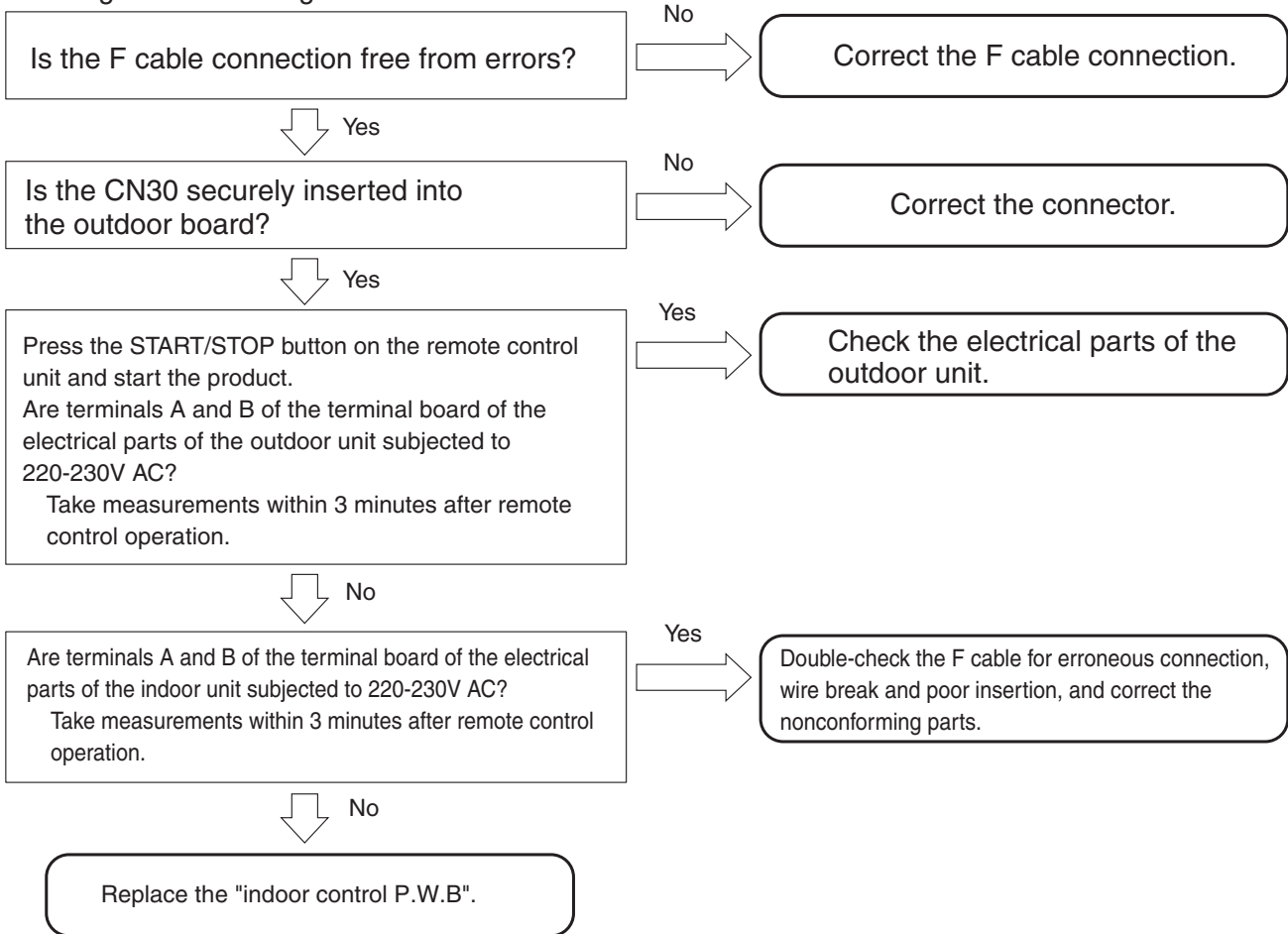
[Situation] The timer blinks 12 times and the product will not run.

- [Estimated failure locations]
- Erroneous connection in the indoor-outdoor connection line (F cable)
  - Power relay open
  - Forget to connect CN30 of outdoor P.W.B
  - Wire break or poor insertion of the indoor-outdoor connection line (F cable)
  - Electrical parts in the outdoor unit (communication circuit, power circuit error)
  - Communication error due to noise in other home electronics
- This does not constitute a failure in the air-conditioner

- [Cautions]
- When lines A and B of F cable are erroneously connected (crossed), the product may not enter self-diagnosis display mode. If the self-diagnosis memory stores data about "timer lamp blinked 12 times", then, just in case, check if the F cable is not erroneously connected.
  - Detecting this failure mode turns off the power relay 3 minutes later and blocks the power supply to the outdoor unit.

[Diagnosis flow]

Initiating troubleshooting



11. Timer lamp blinking: blinking 13 times

[Situation] The timer lamp blinks 13 times and the product will not run.

[Estimated failure location] • EEPROM, microcomputer

[Diagnosis flow]

Replace the "indoor control P.W.B".





**WARNING**



### PRECAUTIONS FOR SERVICING

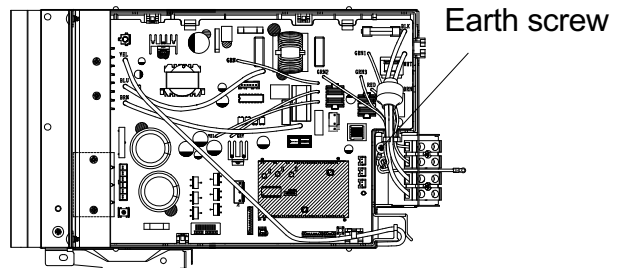
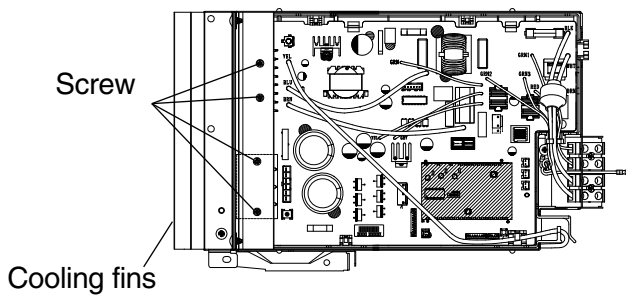
Be sure that the power switch is turned off or the power cable is disconnected before servicing.

### Removing the P.W.B.s.

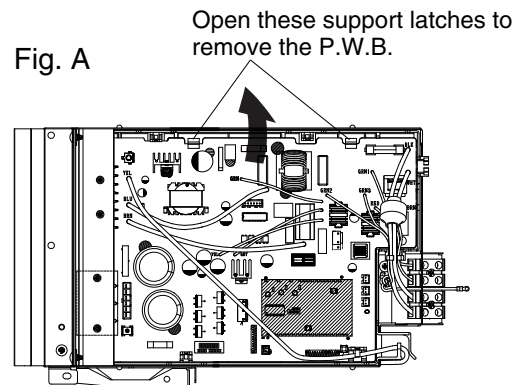
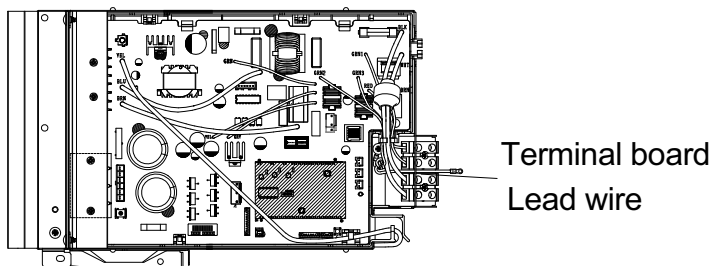
※ When replacing any P.W.B., disconnect all the cables (including ground wires).

[ Main P.W.B.]

- 1 Remove four screws securing the main P.W.B. to the cooling fins, and remove the main P.W.B. from the cooling fins.
- 2 Remove the earth screw from the electrical box.



- 3 Remove screws fastening the lead wires which are connected to the terminal board, and remove the lead wires from the terminal board.
- 4 Open these support latches to remove the main P.W.B. in the direction of the arrow as shown in Fig A.



## HOW TO CHANGE THE SHIFT VALUE SETTING TEMPERATURE

The shift value setting temperature for Cooling and Heating mode operation can be changed using the remote controller. (This procedure shall be implemented strictly by service personnel only.)

(For initial shift value temperature setting for Cooling mode (SHIFTC) and Heating operation mode (SHIFTW) : Please refer to page 36)

### PROCEDURES

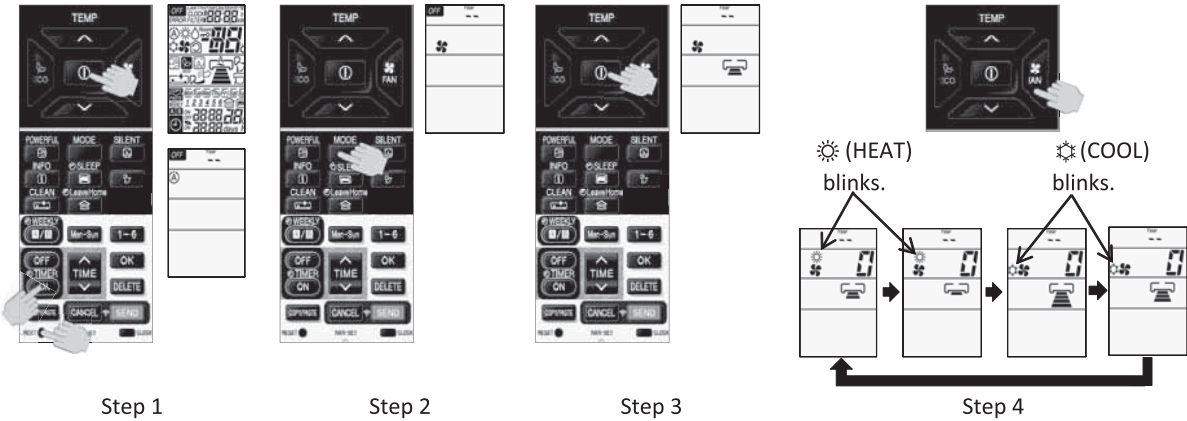
1. While pressing and holding the **⏻** (START/STOP) button and the **⌚** (ON) button, press the **⏻** [RESET] button on the same. Release the **⏻** [RESET] button only and make sure that all marks on the remote controller display are indicated, then release the **⏻** (START/STOP) button and the **⌚** [ON] button. Remote controller now enters "Shift Value Change Mode".

2. Press the **MODE** selector button so that the display indicates **FAN** mode.

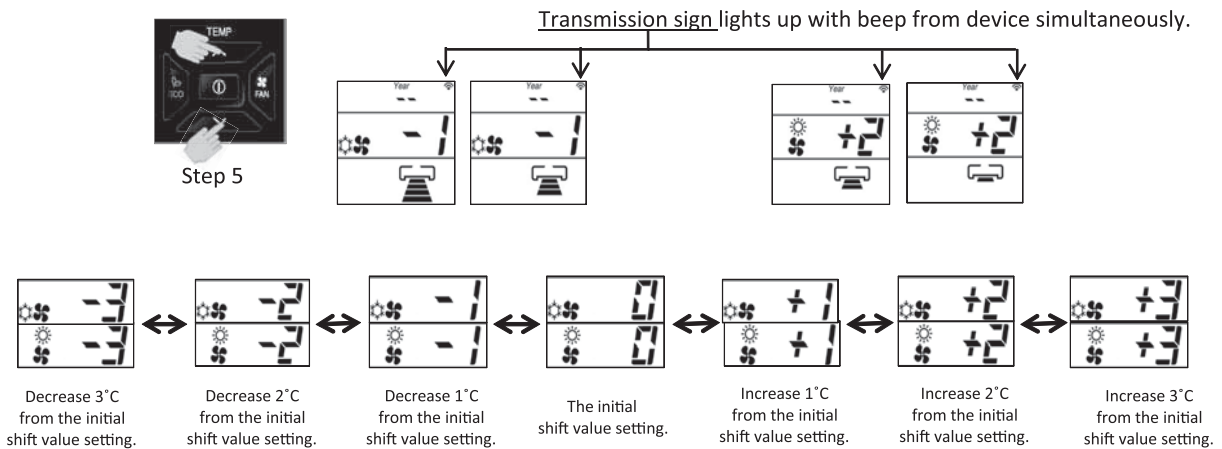
3. Press the **⏻** (START/STOP) button and FAN operation will be started.

4. Set the FAN SPEED with the **FAN** (FAN SPEED) button according to the following FAN speed setting in order to choose the desired operation mode that is required for shift value setting temperature modification.

- To change the shift value for COOLING mode operation, select either **HIGH** or **MED** FAN SPEED.
- To change the shift value for HEATING mode operation, select either **LOW** or **SILENT** FAN SPEED.



5. Press the **TEMP** (down or up) button to change the shift value. (The shift value changed with device beep sound.)



### NOTE :

- (1) The displayed shift value, **HEAT** and **COOL** symbol on the remote controller display will disappear after 10 seconds.
- (2) The changed shift value will remain unchanged after turned off the power.
- (3) If "0" is displayed on the remote controller display, it indicates the shift value is now at the initial setting.

## SETTING THE PREVENTION OF MUTUAL INTERFERENCE FOR REMOTE CONTROLLER

( Applicable for Remote controller model : RAR-5E1, RAR-5E2, RAR-5E3, RAR-5E4 and RAR-5E5 )

Case : 2 sets of indoor units installed near to each other.

If both indoor units can receive the same remote controller signal, please set the remote controller as below. ( This setting will change the signal address of each remote controller.)

Initial remote controller signal address setting is **A**.

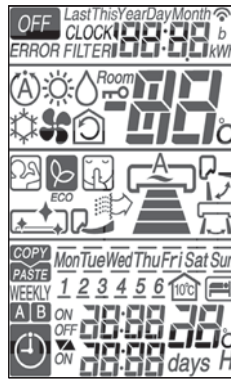
This procedure change the remote controller signal address from **A** to **B**.

1. The circuit breaker for the other unit shall be OFF.



2. Slide the remote controller cover to take it off.

3. While directing the remote controller towards the receiver of the indoor unit, press **1-6** button, **ON** (ON TIMER) button and **RESET** (RESET) button simultaneously. (The remote controller perform signal transmission with the device.)



Signal transmission : From A to B



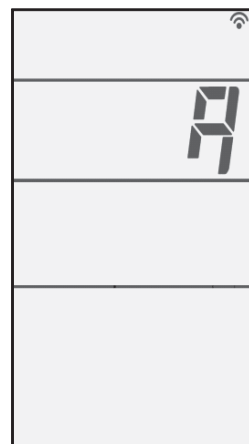
4. The indoor unit beeps [Pip] to indicate that it has just received the signal from remote controller.



5. Please check the usability of each set of indoor unit using its own remote controller.

Note : If indoor unit still not receive the correct signal from the correct remote controller, setting shall be made again.  
By setting again for the 2nd time, the signal address will change from **B** to **A**. Then, if repeat again for the 3rd time, the remote controller signal address will change from **A** to **B**.

Signal transmission : From B to A









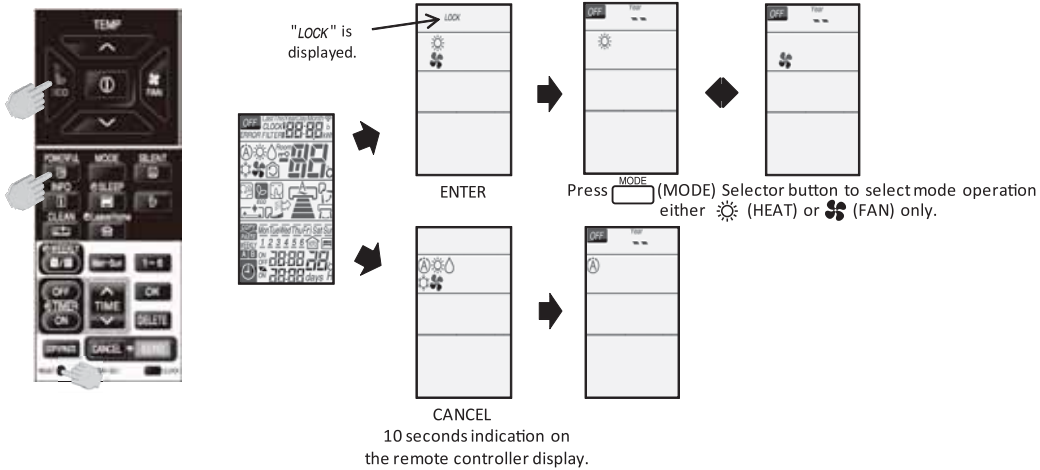
# OPERATION MODE LOCK SETTING

If Dip switch position is set at "Heating mode only" or "Cooling mode only" as mentioned on page 59, it is required to set the remote controller into operation mode lock setting. Without setting the remote controller, it will caused unmatch signal transmission between indoor unit and remote controller.







**PROCEDURE**

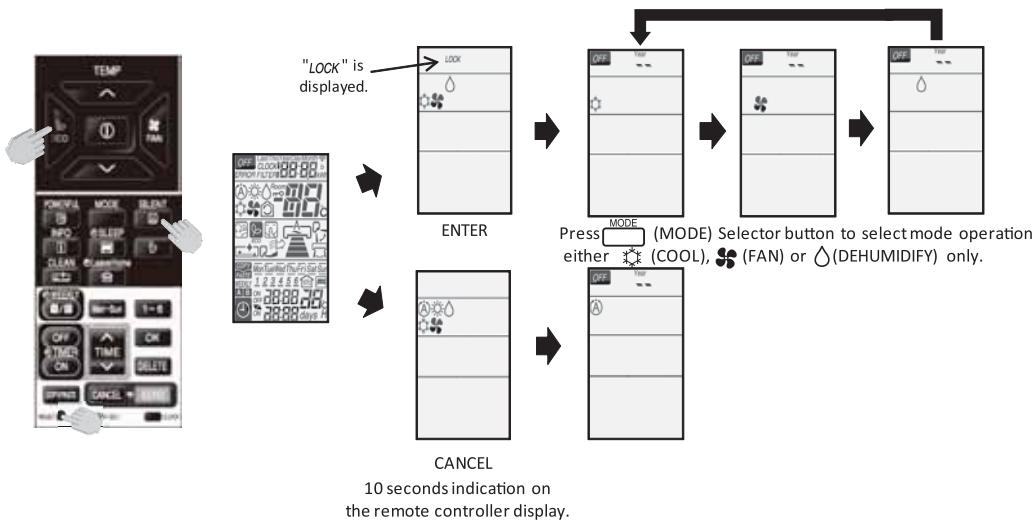
**1. Heating operation mode lock setting**

- (a) While pressing and holding  (ECO) button and  (POWERFUL) button, press  (RESET) button on the same time. Release  (RESET) button only and make sure that all marks on the remote controller display are indicated, then release the  (ECO) button and  (POWERFUL) button. Remote controller now enters "Heating operation mode lock".
- (b) To cancel the "Heating operation mode lock", repeat the above procedure (1(a)).








**2. Cooling operation mode lock setting**

- (a) While pressing and holding  (ECO) button and  (SILENT) button, press  (RESET) button on the same time. Release  (RESET) button only and make sure that all marks on the remote controller display are indicated, then release the  (ECO) button and  (SILENT) button. Remote controller now enters "Cooling operation mode lock".
- (b) To cancel the "Cooling operation mode lock", repeat the above procedure (2(a)).











**NOTE :**

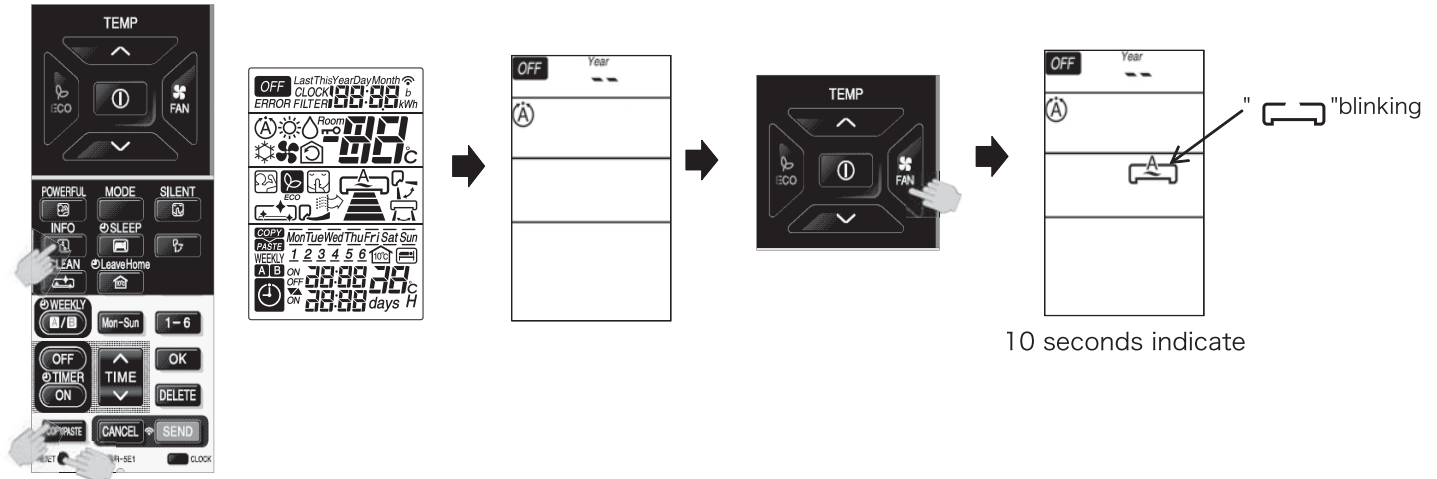
- (1) The indication of " LOCK " and ("  " (HEAT), "  " (COOL), "  " (FAN) or "  " (DEHUMIDIFY)) mode operation symbol on the remote controller display will disappear after 10 seconds and it will enters to OFF condition indicated by  on the display.
- (2) The OPERATION MODE LOCK setting will remain in the remote controller memory eventhough the remote controller is ran out of battery.



# DISPLAY OPERATION MODE SETTING

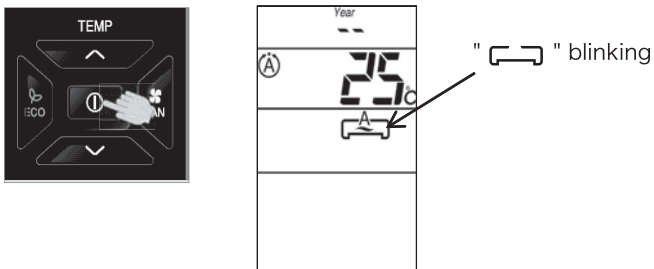
For operating indoor unit independently (without outdoor unit connection), remote controller has to be set according to below procedures before send the signal to the indoor unit. New communication format between indoor and outdoor is required to communicate with outdoor unit.

## PROCEDURE

- While pressing and holding  (INFO) button and  (COPY/PASTE) button, press  (RESET) button on the same time. Release  (RESET) button only and make sure that all marks on the LCD display are indicated, then release the  (INFO) button and  (COPY/PASTE) button. Remote controller now enters "DISPLAY OPERATION MODE" for the indoor unit to run independently. Please ensure that when pressing  (FAN) button, " will blinking.



- Press the  (MODE) selector button to choose the desired operation mode.
- Press  (START/STOP) button. Then, the indoor unit will starts to operate independently accoring the selected operation mode.



## NOTE :

- (1) During "DISPLAY OPERATION MODE", " blinks on LCD of remote controller.
- (2) When operation stons. "DISPI AY OPERATION MODE" is canceled.

# 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?

Lighting mode Self-diagnosis lamp	Blinks 2 times	Blinks 3 times	Blinks 4 times	Blinks 5 times	Blinks 6 times	Blinks 8 times
	[Hatched]	[Hatched]	[Hatched]	[Hatched]	[Hatched]	[Hatched]
LD301	[Hatched]	[Hatched]	[Hatched]	[Hatched]	[Hatched]	[Hatched]
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	

[Hatched] Blinking [White] off

Outdoor air temperature (°C)	Charge port pressure	
	MPa(G)	{kgf/cm <sup>2</sup> (G)}
50	2.96	{30.14}
45	2.62	{26.72}
40	2.31	{23.58}
35	2.03	{20.73}
30	1.78	{18.14}
25	1.55	{15.79}
20	1.34	{13.66}
15	1.15	{11.74}
10	0.98	{10.02}
5	0.83	{8.48}
0	0.70	{7.10}
-5	0.58	{5.89}
-10	0.47	{4.81}

(R410 A)  
The values above are the theoretical ones.

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

Normal

● Checking the IPM (main P.W.B.)

Error (Gas leaking)

Gas leaks.  
Repair and seal refrigerant.

When the self-diagnosis lamp lights in the same condition as above.

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.

# CHECKING OUTDOOR UNIT ELECTRICAL PARTS

[No operation or abnormal operation]

Is 220-230V being generated at terminals A and B?

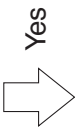


Are the connections for terminals C and D correct?



Correct properly.  
(Be sure to turn the power off before correcting the connection.)

(The SW power supply's overcurrent protection is activated, disabling the microcomputer.)



Is the 15A fuse normal?



If the 15A fuse has blown, be aware that other parts may also be defective.  
(mainly, varistor, 3.15A fuse, smoothing capacitors, IPM, etc.)



Is the power circuit normal?  
See the description on power circuit for details.



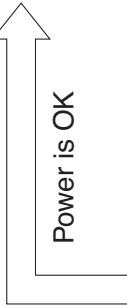
Replace defective parts.



Is 5V being generated between Pin (0V) and Pin (5V) at CN 18 (test pin)?



Is the switching power circuit OK?  
Has the 3.15A fuse blown?



Check to see if C and D cables are connected correctly.  
If reversed or incompletely inserted, correct the cable connection.

Replace any defective parts.

(Fuse blown)  
(If the 3.15A fuse has blown, the varistor, etc. may also be defective.)

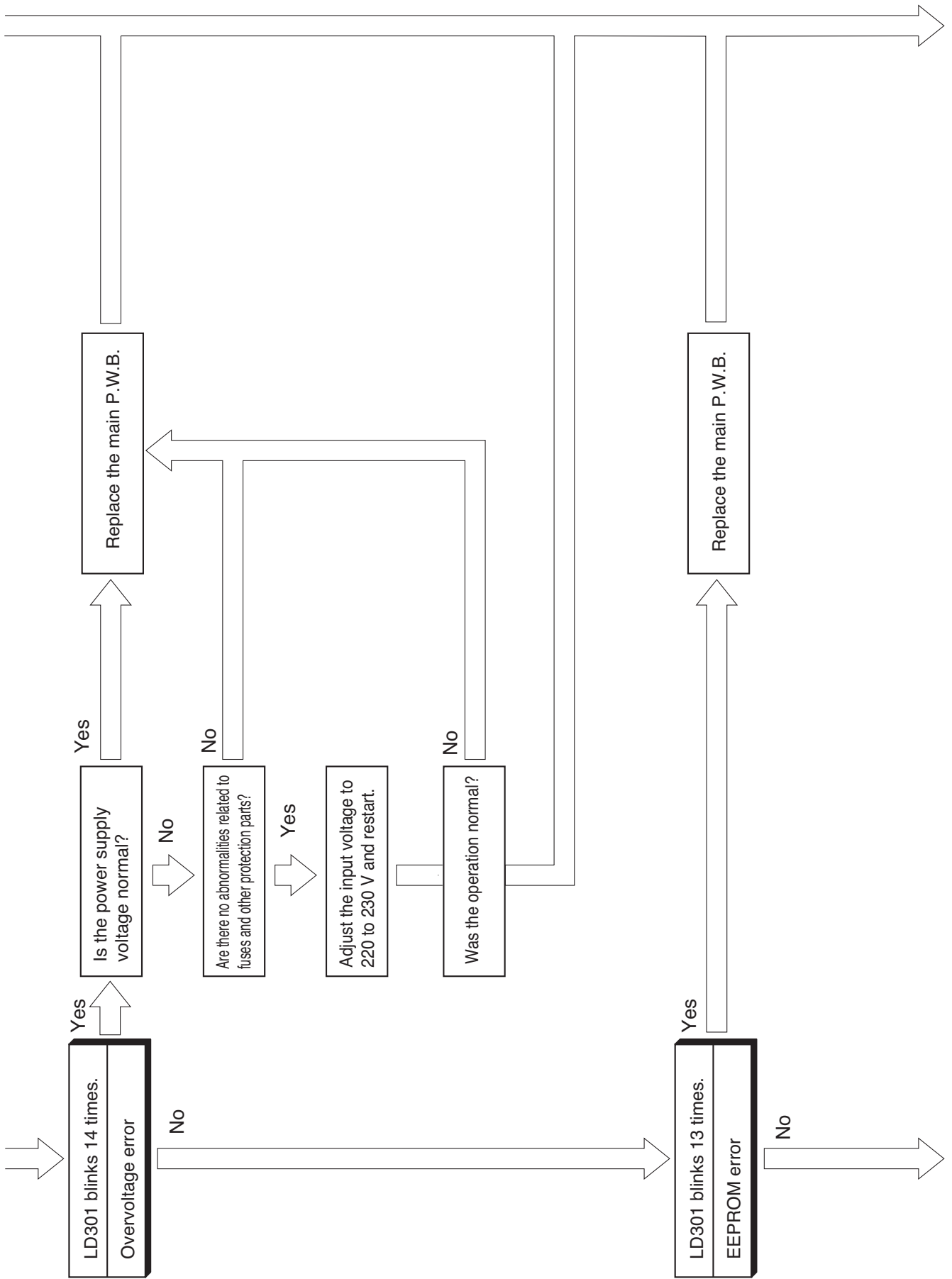


With the piping and lines (A, B, C, D) connected, operate the unit in the forced cooling mode using the outdoor unit service switch.

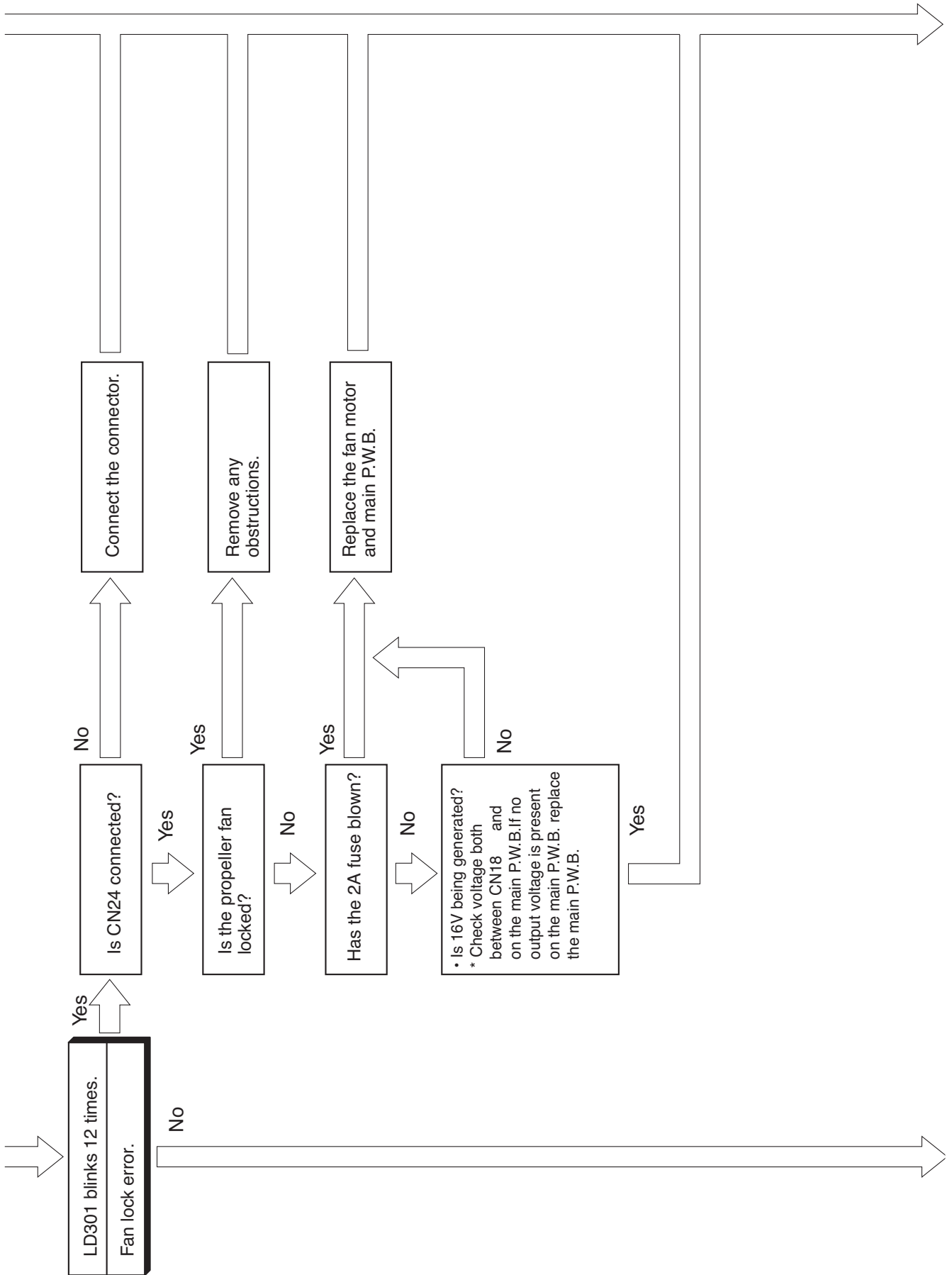


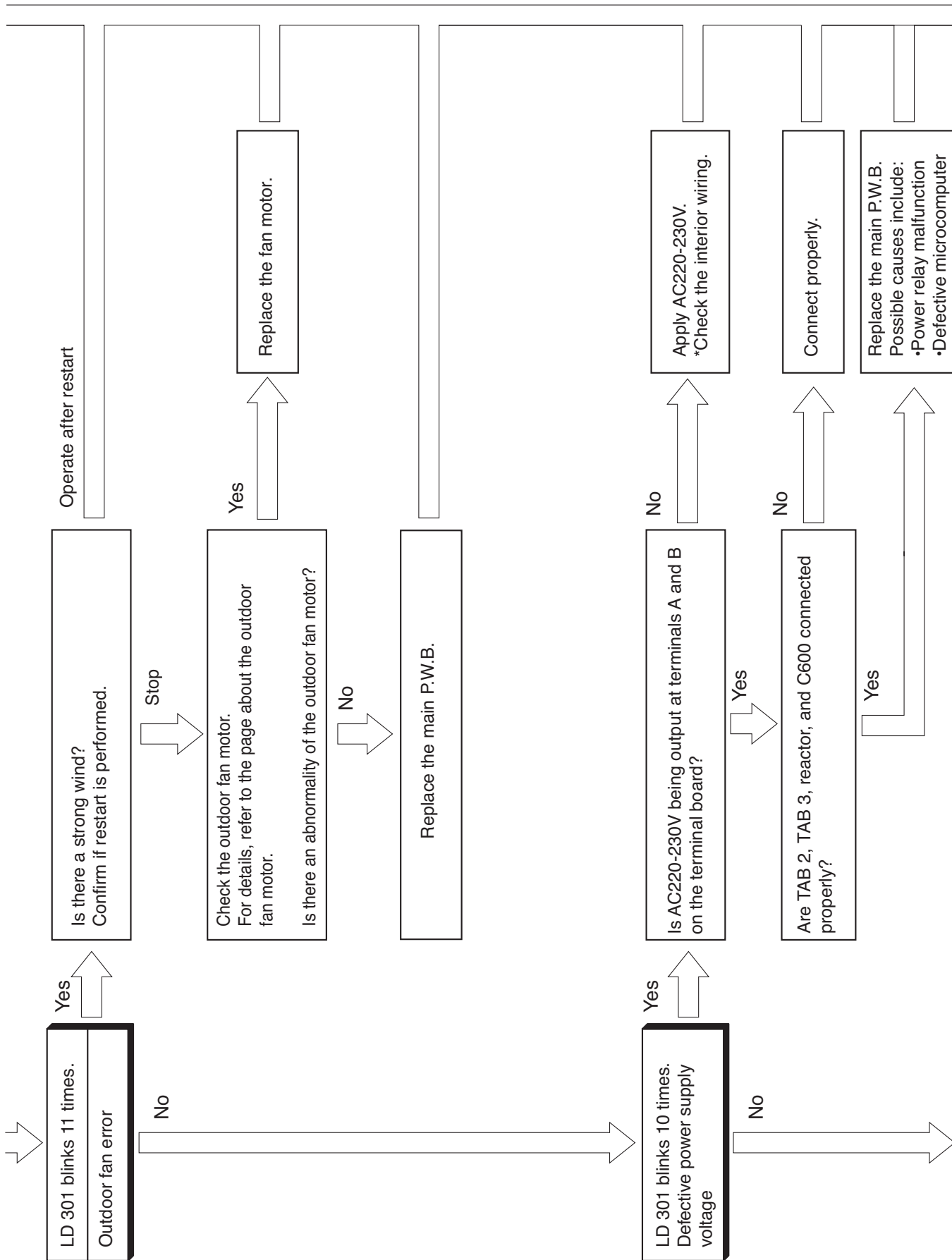
How did the self-diagnosis lamp (LD301) blink?

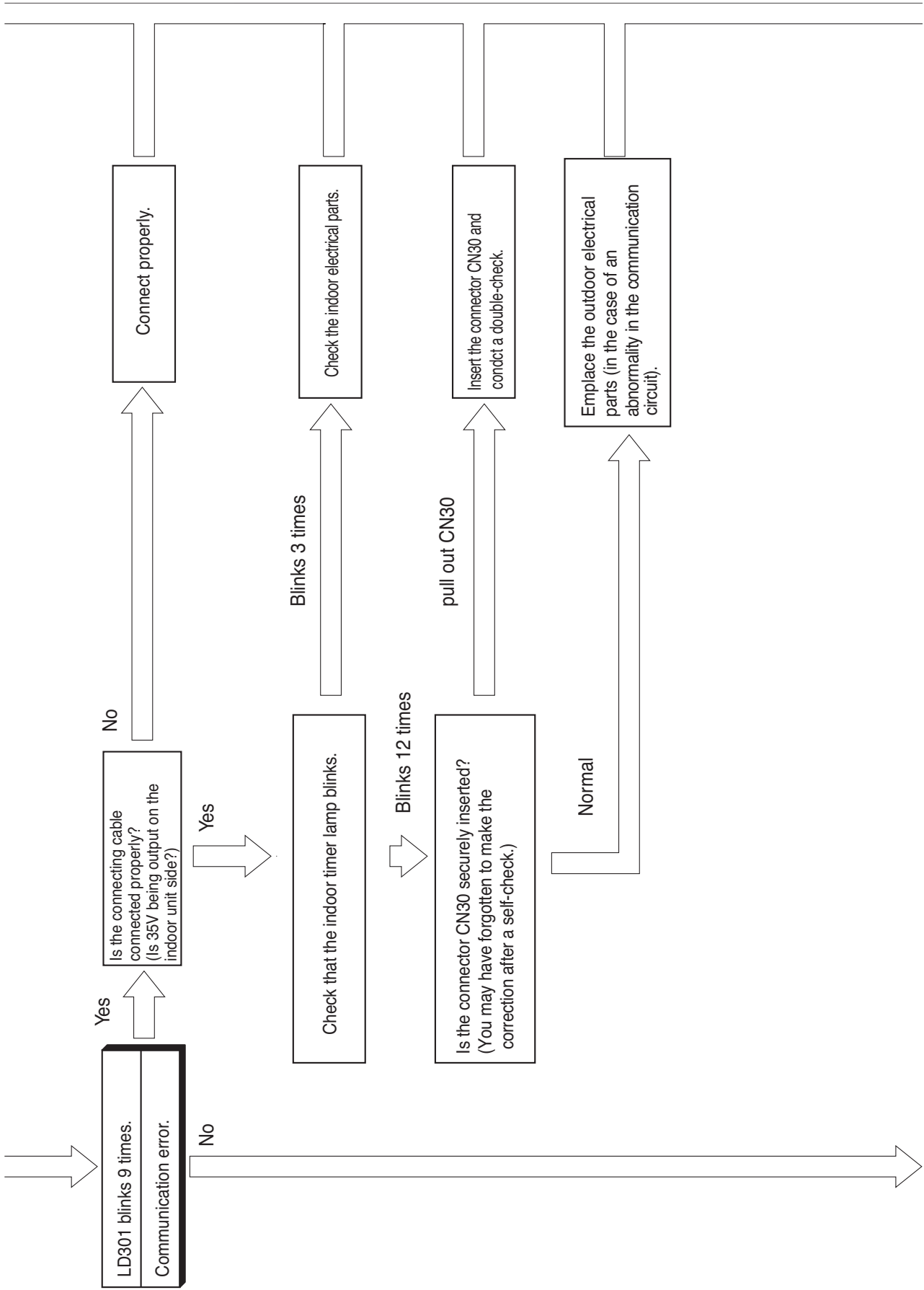
See the self-diagnosis lamp mode.

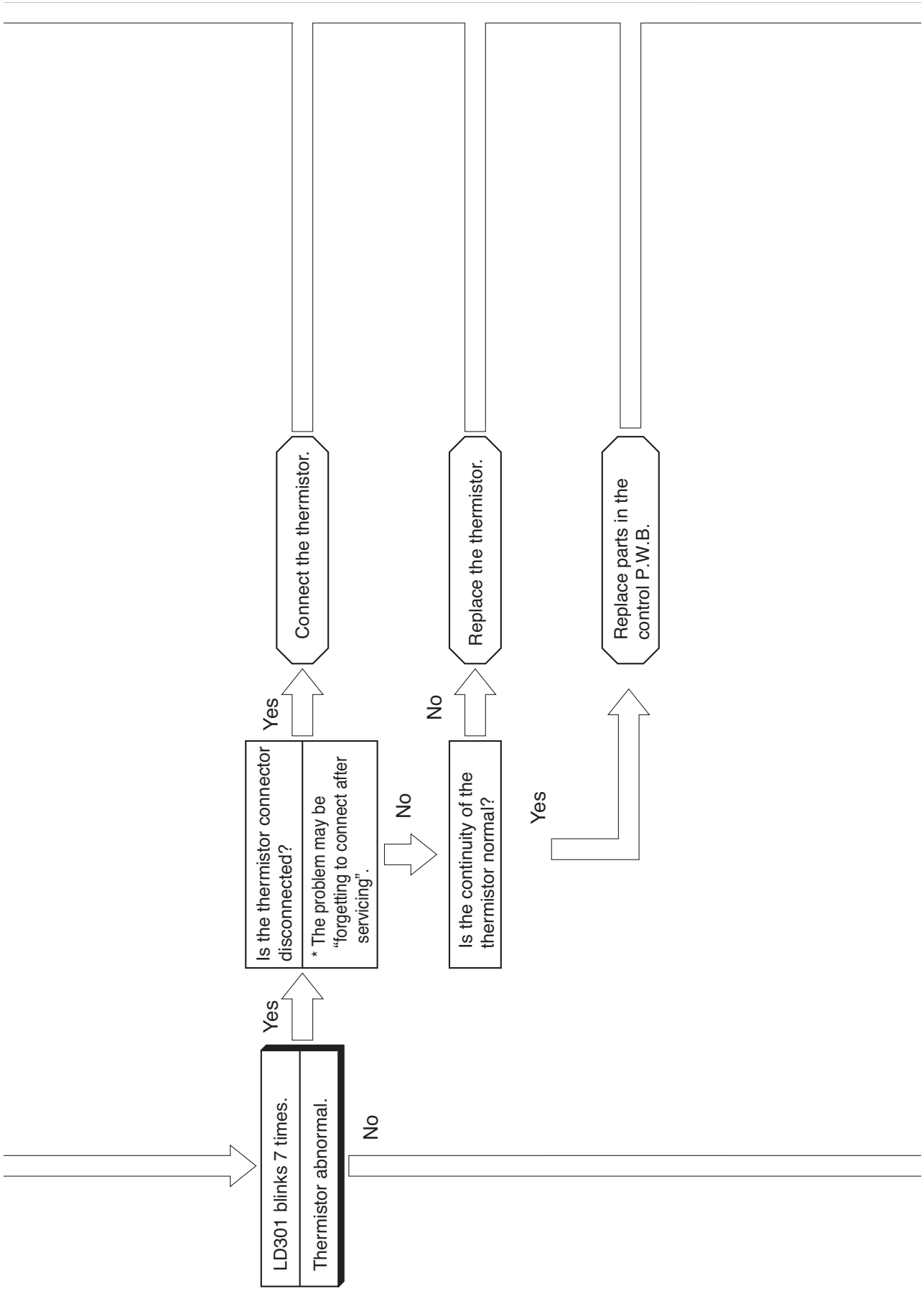


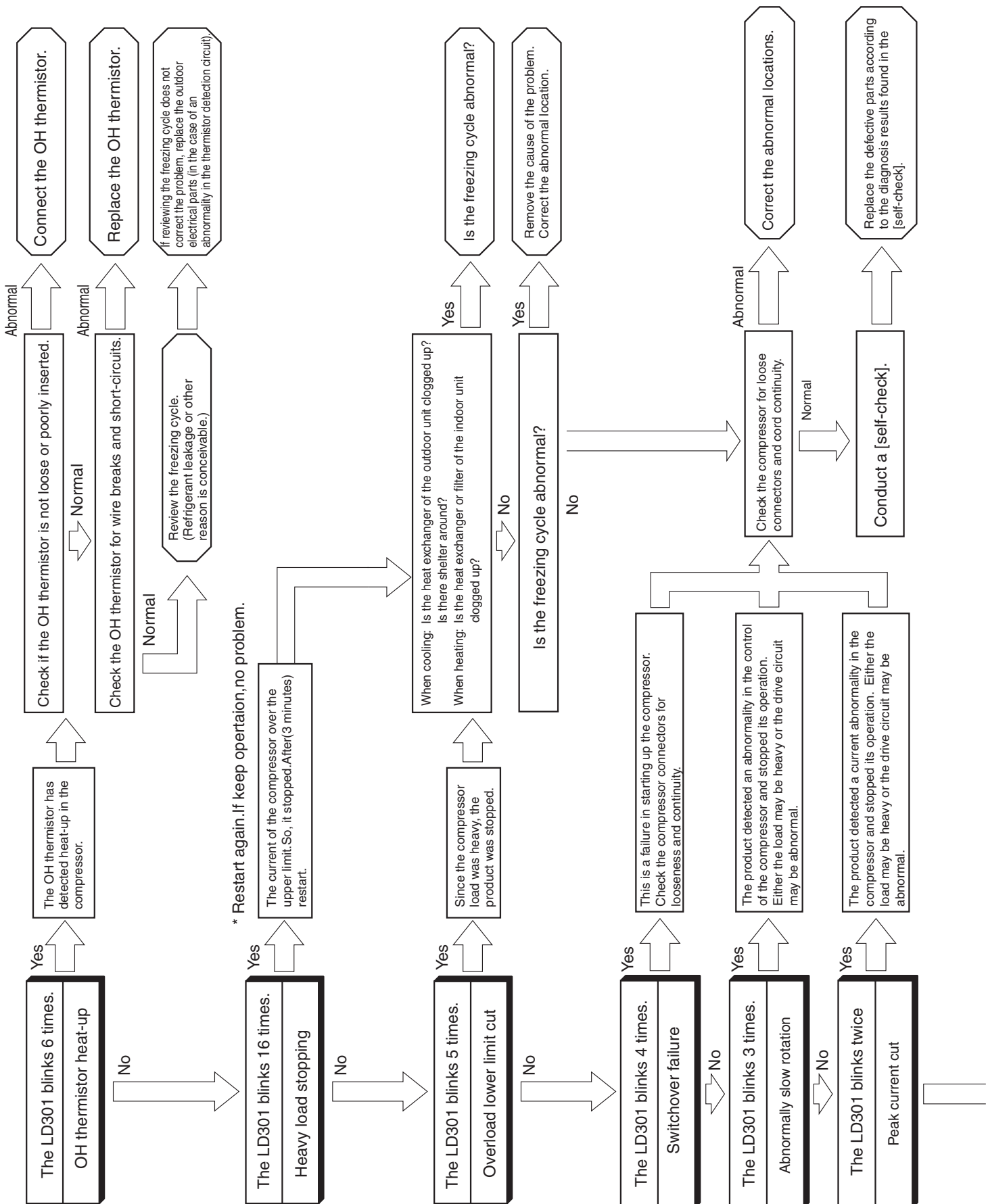


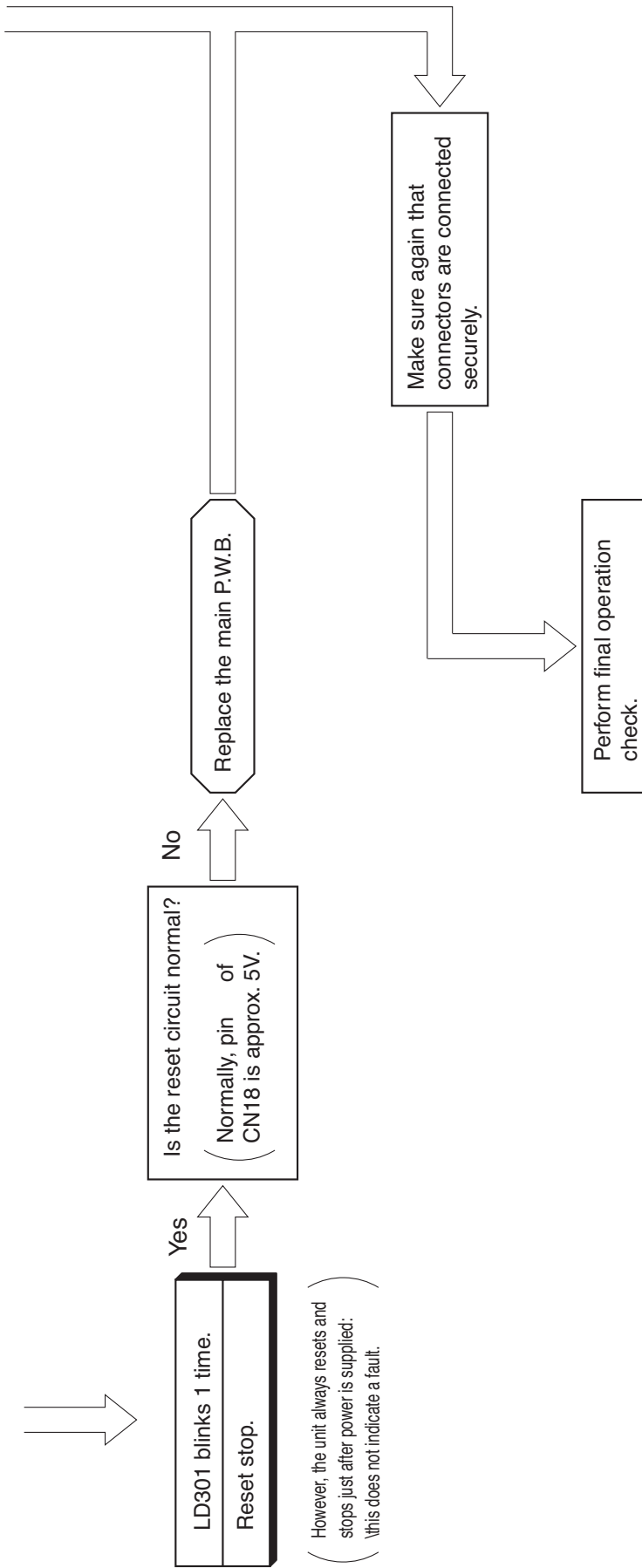












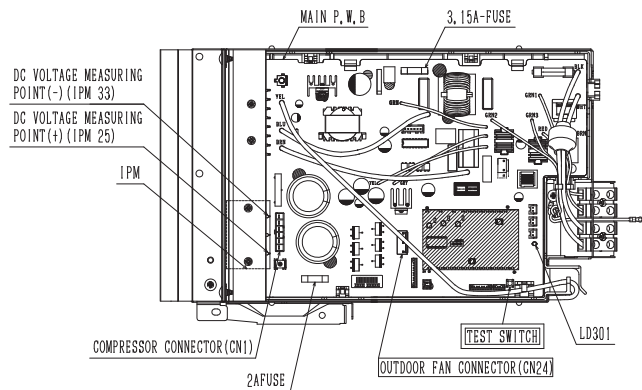
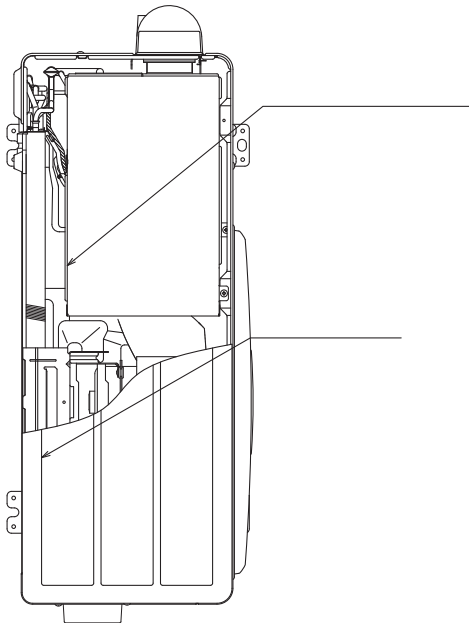
# HOW TO OPERATE USING THE TEST SWITCH THE OUTDOOR UNIT

MODEL RAC-25FPA/RAC-35FPA

1. Turn off the power supply.
2. Remove the electrical box cover.
3. Turn on the power switch
4. After waiting for 30 seconds, push the test switch for a second.

**LD301(red) will light and the unit will operate in the forced cooling mode at this time.**

Never operate the unit for more than 5 minutes.



(Cautions)

- (1) If interface signal (DC 35V) terminals C and D are not connected when the outdoor unit is in forced cool mode, the outdoor unit defect indicator (LD301) will blink 9 times during operation to indicate communication error.
- (2) If checking is done with the compressor connector disconnected, the unit will stop and LD301 will blink 4 times.

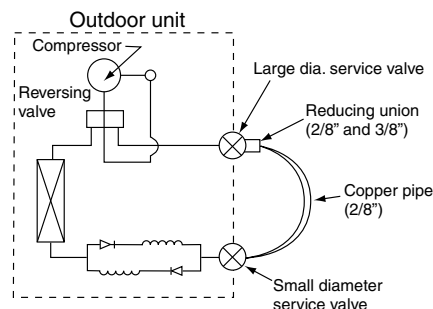
Be sure to push the test switch for a second again to stop the forced cool operation.

## HOW TO OPERATE THE OUTDOOR UNIT INDEPENDENTLY

1. Connect the large dia. pipe side and small dia. pipe side service valve using a pipe.

Connect the small diameter service valve and the large diameter service valve using the reducing union and copper pipe as shown on the right.

Charge refrigerant of 300g after vacuuming (\*1)



Parts to be prepared

- (1) Reducing union  
2/8" (6.35 mm)  
3/8" (9.52 mm)
- (2) Copper pipe (2/8" and 3/8")

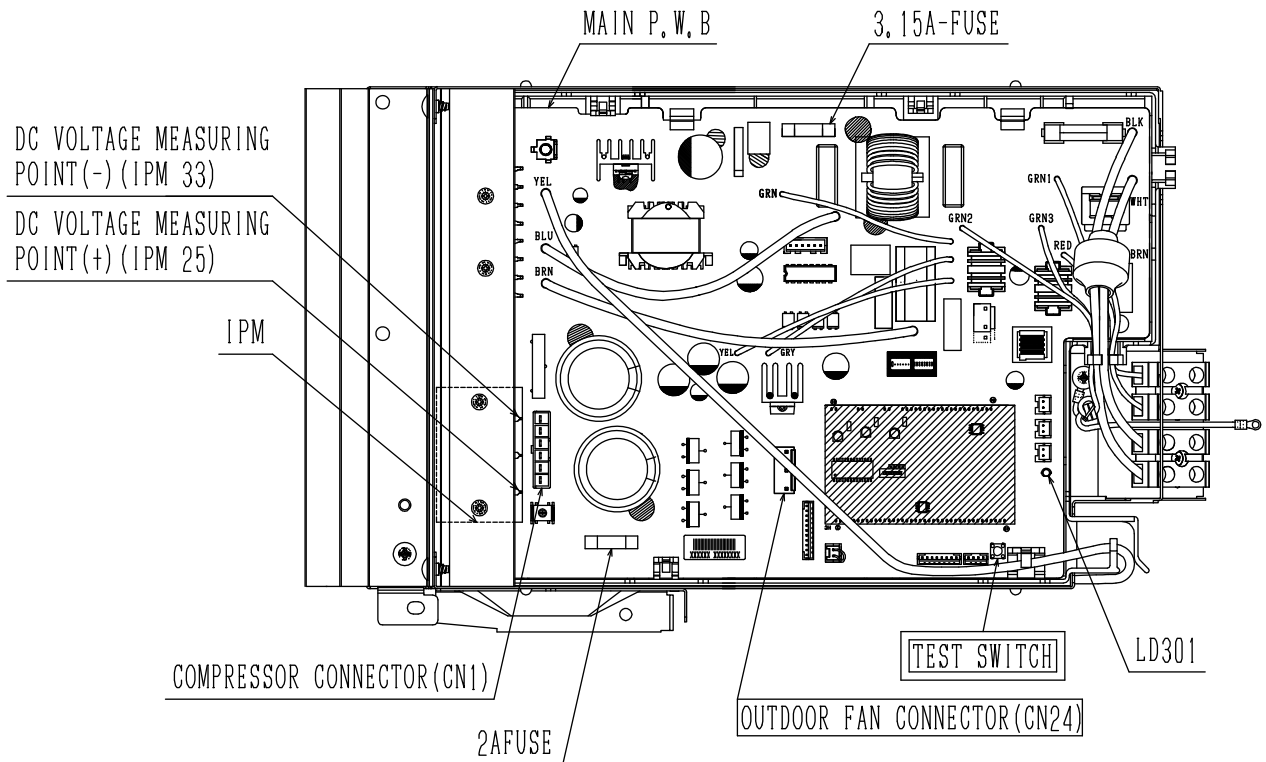
**Do not operate for more than 5 minutes**

The operation method is the same as "How to operate using the connector to servicing the outdoor unit".

\*1 The charging amount of 200g is equivalent to the load in normal operation.

# Lighting mode of the self-diagnosis lamp

## 1 Mounting location of the self-diagnosis lamp



### WARNING

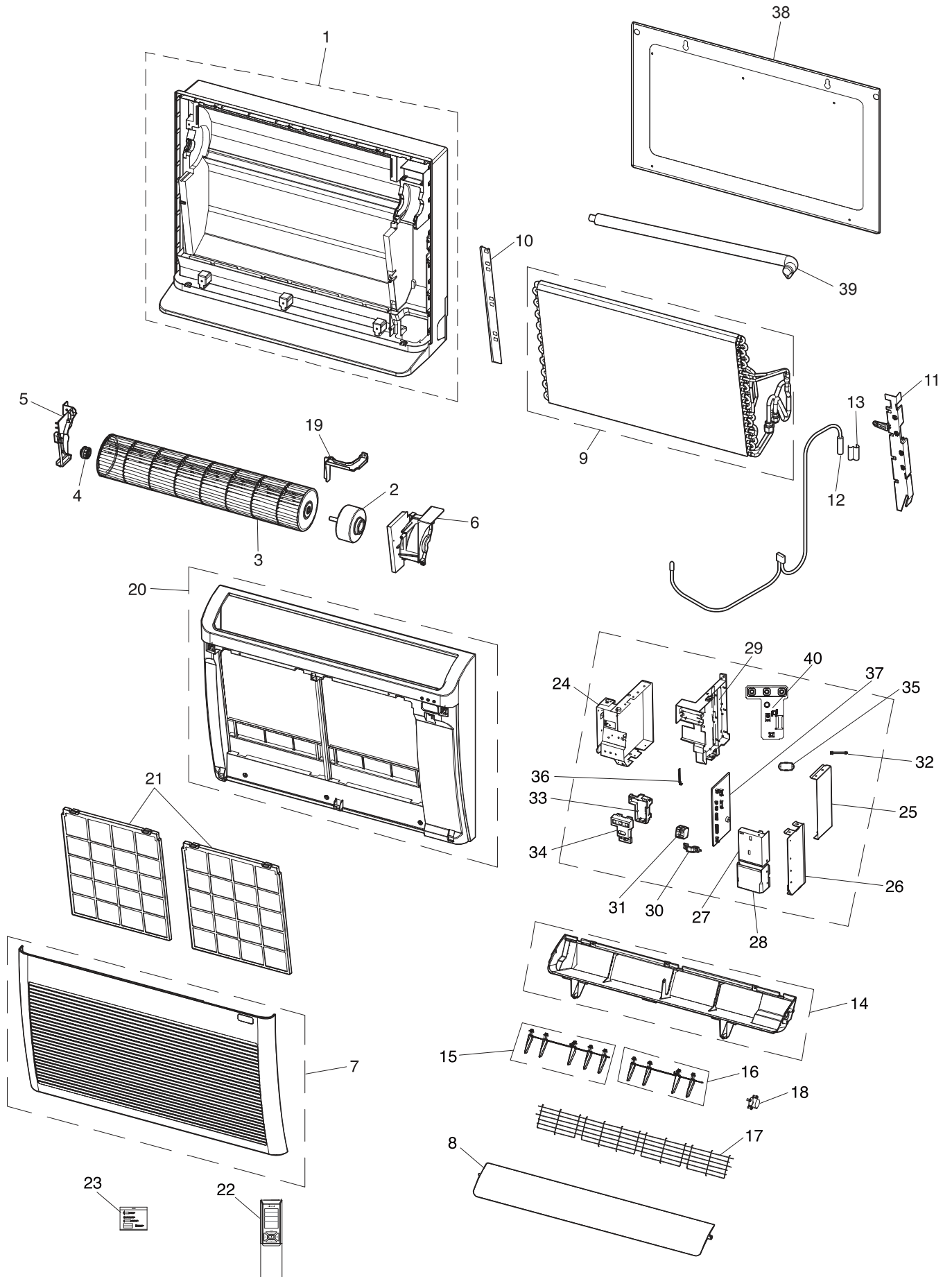
When you start the selfcheck, please confirm that the pin ②5 pin ③3 do not short with the pin ②6 , pin ②9 , pin ③2 of the IPM.



# PARTS LIST AND DIAGRAM

## INDOOR UNIT

MODEL: RAF-25/35RPA

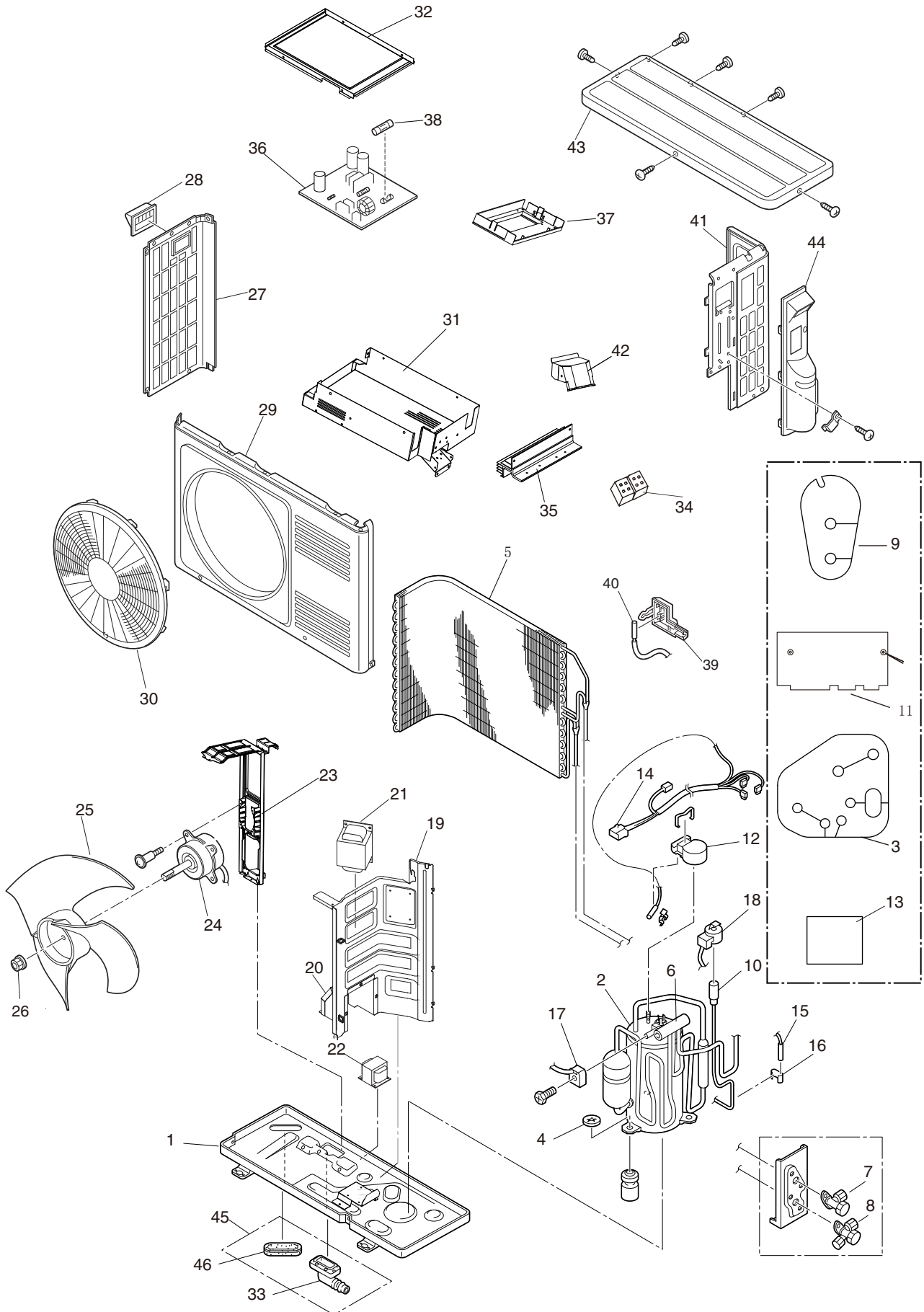


INDOOR UNIT

NO	HHAW PARTS NO		Q' TY	PARTS NAME
	RAF-25RPA	RAF-35RPA		
1	HWRAF-50NX2 A01		1	CABINET
2	HWRAF-50NX2 A02		1	PWM-MOTOR
3	HWRAF-50NX2 A03		1	TANGENTIAL AIR FLOW FAN
4	HWRAF-50NX2 A04		1	FAN SUPPORT ASSEMBLY
5	HWRAF-50NX2 A05		1	FAN COVER
6	HWRAF-50NX2 A06		1	FAN MORTOR SUPPORT
7	HWRAF-50NX2 A07		1	#F-PANELAS
8	HWRAF-50NX2 A08		1	DEFLECT
9	HWRAF-50NX2 A09		1	EVAPORATOR ASSEMBLY
	HWRAF-25NX2 A01		1	EVAPORATOR ASSEMBLY
10	HWRAF-50NX2 A10		1	P-COVER-L
11	HWRAF-50NX2 A11		1	P-COVER-R
12	HWRAF-25FPA A01		1	THERMISTOR ASSEMBLY
13	RAS-25DVX 002		1	SPRING
14	HWRAF-50NX2 A14		1	DRAIN PAN
15	HWRAF-50NX2 A15		1	#L-DEF-AS
16	HWRAF-50NX2 A16		1	#R-DEF-AS
17	HWRAF-50NX2 A17		1	GUARD
18	HWRAF-50NX2 A18		1	AUTO SWEEP MOTOR
19	HWRAF-50NX2 A19		1	BOARD
20	HWRAF-50NXA1 A01		1	FRONT COVER ASSEMBLY
21	HWRAF-50NX2 A21		2	FILTER
22	HWRAF-25RPA A02		1	REMOTE CONTROL ASSEMBLY
23	HWRAF-50NX2 A22		1	SCREW ASSEMBLY
24	HWRAF-50NX2 A23		1	#ELE-PLATE
25	HWRAF-50NX2 A24		1	ELE-COV-1
26	HWRAF-50NX2 A25		1	ELE-COV-2
27	HWRAF-50NX2 A26		1	TERM-COV-1
28	HWRAF-50NX2 A27		1	TERM-COV-2
29	HWRAF-25RPA A03		1	M-PWB-SUP
30	HWRAF-50NX2 A29		1	BAND
31	HWRAF-50NX2 A30		1	2PTERMINAL
32	HWRAF-25RPA A04		1	#2PCORD-AS
33	HWRAF-50NX2 A32		1	IRR-SUP
34	HWRAF-50NX2 A33		1	IRR-COV1
35	HWRAF-50NX2 A34		1	LENS-COVER
36	HWRAF-25RPA A05		1	#9PCORD-AS
37	HWRAF-25RPA A06	HWRAF-35RPA A01	1	P. W. B. (MAIN)
			1	P. W. B. (MAIN)
38	HWRAF-50NX2 A38		1	BOARD
39	HWRAF-50NX2 A39		1	DRAIN-HOSE
40	HWRAF-25RPA A07		1	#HBOARD-AS

# OUTDOOR UNIT

## MODEL: RAC-25/35FPA



**OUTDOOR UNIT**

NO	HHAW PARTS NO		Q' TY/UNIT	PARTS NAME
	RAC-25FPA	RAC-35FPA		
1	HWRAC-25WXA A01		1	BASE
2	HWRAC-14EH4A02		1	COMPRESSOR 0.7KW, 8.2kg
3	HWRAC-14EH4A04		1	SOUND PROOF COVER ASSEMBLY
4	HWRAC-25YH4 A04		3	PUSH NUT
5	RAC-35AVZ003	HWRAC-SX10HAK A05	1	CONDENSER
6	HWRAC-25WXA A02	HWRAC-14EH4A03	1	REVERSING VALVE
7	RAC-A25BXA061		1	2S-VALVE
8	RAC-A25BXA060		1	3S-VALVE
9	HWRAC-SX10HAKA09		1	SOUND PROOF COVER ASSEMBLY
10	HWRAC-25WXA A03	HWRAC-35YHA4A03	1	ELECTRIC EXPANSION VALVE
11	HWRAC-SX10HAK A10		1	SOUND PROOF COVER ASSEMBLY
12	HWRAC-14EH4A05		1	COIL(EXPANSION VALVE)
13	HWRAC-25WXA A04		1	SOUND PROOF COVER ASSEMBLY
14	HWRAC-14EH4A06		1	CONNECTING CORD(COMPRESSOR)
15	HWRAC-25WXA A05		1	THERMISTOR (DEFROST)
16	HWRAC-D10EXA08		1	THERMISTOR SUPPORT
	HWRAC-25WX8 A02		1	THERMISTOR SUPPORT
17	HWRAC-E14H3904		1	COIL(REVERSING VALVE)
18	HWRAC-E14H3905	HWRAC-35YHA4A04	1	COIL(EXPANSION VALVE)
			1	
19	HWRAC-25YH4 A17	HWRAC-35WXA A01	1	PARTITION
			1	
20	HWRAC-25YH4A18		1	REACTOR COVER
21	HWRAC-E14H3906		1	REACTOR 1
22	HWRAC-25YH4 A20		1	REACTOR 2
23	HWRAC-25WXA A06	HWRAC-14EH4 A08	1	FAN MOTOR SUPPORT
			1	
24	HWRAC-50NX2 A23		1	FAN MOTOR 40W 1.5kg
25	HWRAC-14EH4 A09		1	PROPELLER FAN
26	HWRAC-25YH4 A24		1	NUT (PROPELLER, FAN)
27	HWRAC-25YH4 A25		1	SIDE COVER (L)
28	HWRAC-25YH4 A26		1	HANDLE
29	HWRAC-25WXA A07		1	FRONT COVER
30	HWRAC-E14H3 909		1	DISCHARGE GRILL
31	HWRAC-35WEA A04		1	ELECTRIC PARTS PLATE
32	HWRAC-14EH4 A13		1	ELECTRIC PARTS COVER
33	HWRAC-25YH4 A50		1	DRAIN PIPE
34	HWRAC-25YH4 A32		1	TERMINAL BOARD (2P)
35	HWRAC-25YHA3A09		1	HEAT SINK(REGURATOR 1)
36	HWRAC-25FPA A01	HWRAC-35FPA A01	1	P. W. B. (POWER)
			1	
37	HWRAC-25WXA A32		1	SUPPORT (P. W. B. )
38	HWRAC-E08H A11		1	FUSE (15A)
39	HWRAC-10EH4A13		1	COVER(OUT DOOR THERMISTOR)
40	HWRAC-25WXA A34		1	THERMISTOR(OUTDOOR TEMPERATURE)
41	HWRAC-25WXA A35		1	SIDE COVER (R)
42	HWRAC-25WXA A36		1	TERMINAL COVER
43	HWRAC-25YH4 A46		1	TOP COVER
44	HWRAC-25YH4 A47		1	SERVICE VALVE COVER
45	HWRAC-25YH4 A48		1	BUSH ASSEMBLY
46	HWRAC-25YH4 A49		1	BUSH

# HITACHI

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**RAF-25RPA / RAC-25FPA  
RAF-35RPA / RAC-35FPA**

**HHAW NO. 0069E-2**