HITACHI

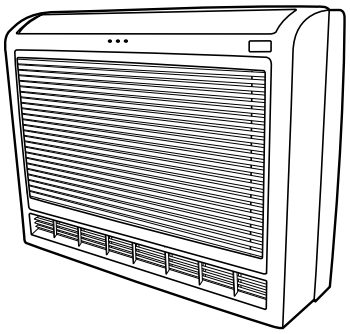
PM | NO. 0181E

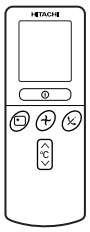
RAF-25NH4/RAC-25NH4
RAF-50NH4/RAC-50NH4

SERVICE MANUAL
TECHNICAL INFORMATION

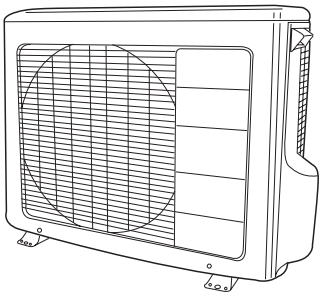
REFER TO THE FOUNDATION MANUAL

FOR SERVICE PERSONNEL ONLY





RAF-25NH4
RAF-50NH4



RAC-25NH4
RAC-50NH4

CONTENTS

SPECIFICATIONS

TYPE			DC INVERTER (CONSOLE)			
			INDOOR UNIT	OUTDOOR UNIT	INDOOR UNIT	OUTDOOR UNIT
MODEL			RAF-25NH4	RAC-25NH4	RAF-50NH4	RAC-50NH4
POWER SOURCE			1 PHASE, 50 Hz, 230V		1 PHASE, 50 Hz, 230V	
COOLING	TOTAL INPUT	(W)	695 (155~1,050)		1,780 (155~2,200)	
	TOTAL AMPERES	(A)	3.05		7.82	
	CAPACITY	(kW)	2.50 (0.90 ~ 3.00)		5.00 (0.90 ~ 5.20)	
		(B.T.U./h)	8,540		17,070	
HEATING	TOTAL INPUT	(W)	1,000 (115 ~ 1,400)		1,970 (115 ~ 2,100)	
	TOTAL AMPERES	(A)	4.4		8.65	
	CAPACITY	(kW)	3.90 (0.90 ~ 5.00)		6.70 (0.90 ~ 8.10)	
		(B.T.U./h)	13,300		22,200	
DIMENSIONS (mm)		W	750	750	750	850
		H	600	570	600	650
		D	215	280	215	298
NET WEIGHT		(kg)	15	38	15	60

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

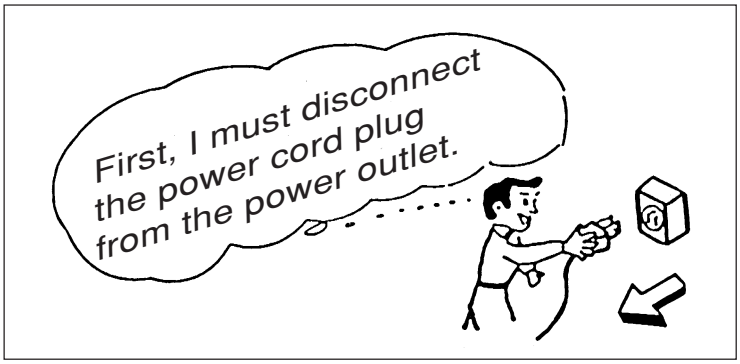
ROOM AIR CONDITIONER

INDOOR UNIT

AUGUST 2003 Refrigeration & Air-Conditioning Division

SAFETY DURING REPAIR WORK

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



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

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

3. After completion of repairs, the initial state should be restored.
4. Lead wires should be connected and laid as in the initial state.
5. Modification of the unit by user himself should absolutely be prohibited.
6. Tools and measuring instruments for use in repairs or inspection should be accurately calibrated in advance.
7. In installing the unit having been repaired, be careful to prevent the occurence 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 1MΩ or more as measured by a 500V DC megger.
9. The initial location of installation such as window, floor or the other should be checked for being and safe enough to support the repaired unit again.
   If it is found not so strong and safe, the unit should be installed at the initial location reinforced or at a new location.
10. Any inflammable thing should never be placed about the location of installation.
11. Check the grounding to see whether it is proper or not, and if it is found improper, connect the grounding terminal to the earth.

WORKING STANDARDS FOR PREVENTING BREAKAGE OF SEMICONDUCTORS

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

2. Object parts

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

3. Items to be observed in handling

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

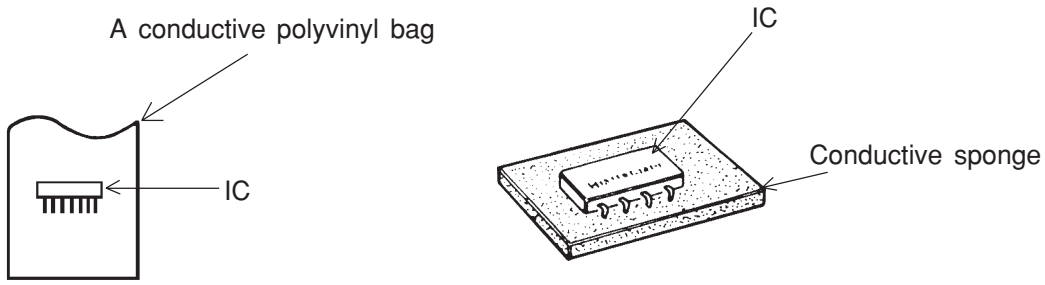


Fig. 1. Conductive Container

   (2) When any part is handled uncovered (in counting, packing and the like), the handling person must always use himself as a body earth. (Make yourself a body earth by passing one M ohm earth resistance through a ring or bracelet).

   (3) Be careful not to touch the parts with your clothing when you hold a part even if a body earth is being taken.

   (4) Be sure to place a part on a metal plate with grounding.

   (5) Be careful not to fail to turn off power when you repair the printed circuit board. At the same time, try to repair the printed circuit board on a grounded metal plate.

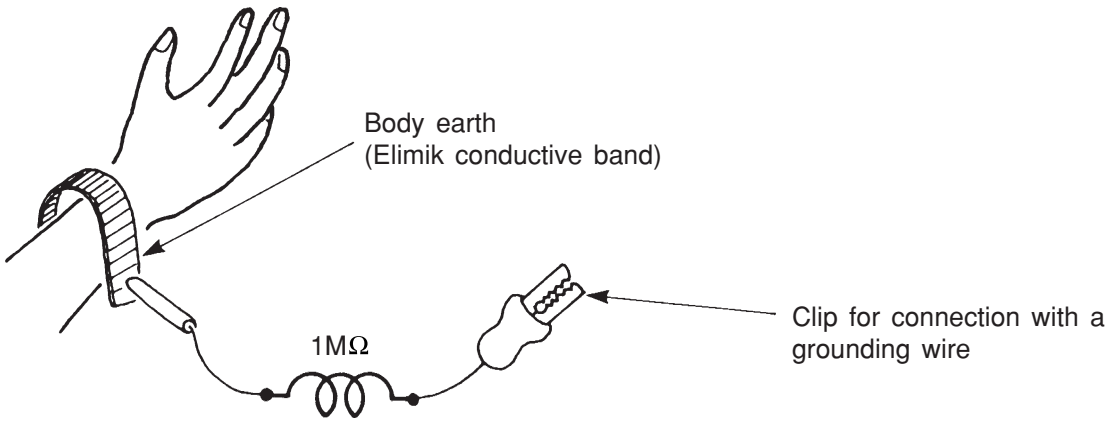


Fig. 2. Body Earth

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

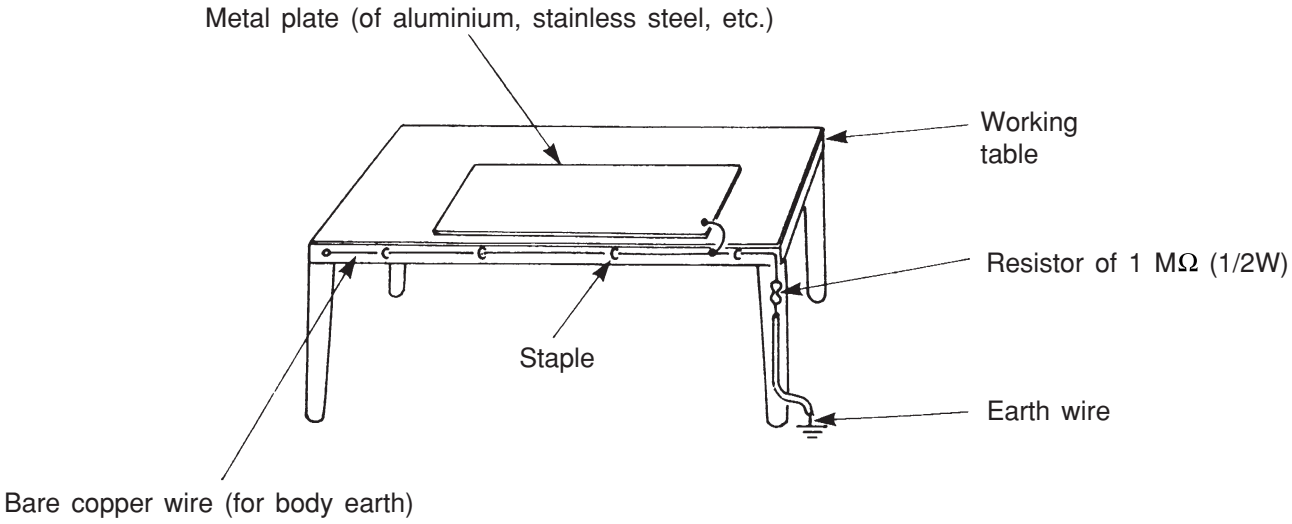


Fig. 3. Grounding of the working table

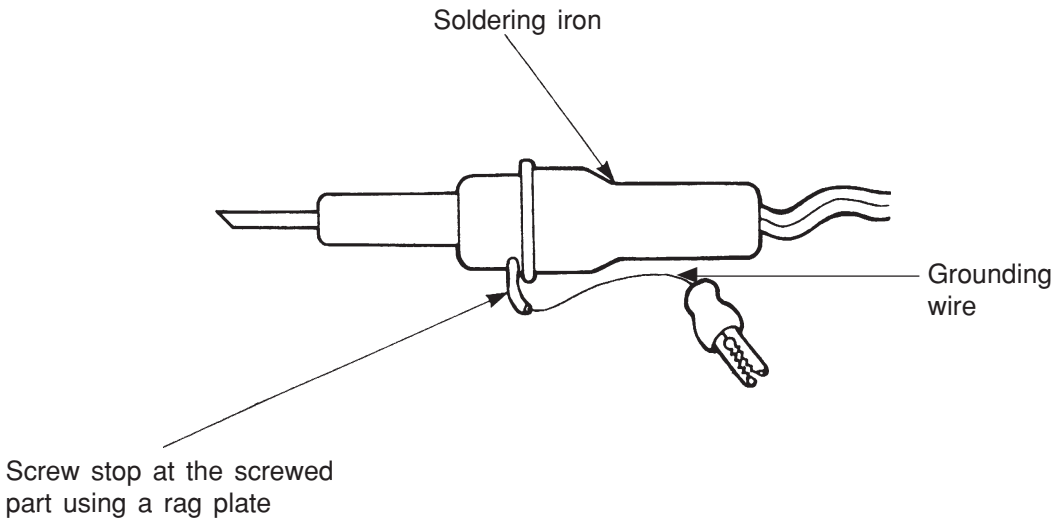


Fig. 4. Grounding a soldering iron

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

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

⚠ CAUTION

1. In quiet or stopping operation, slight flowing noise of refrigerant in the refrigerating cycle is heard occasionally, but this noise is not abnormal for the operation.

2. When it thunders near by, it is recommend to stop the operation and to disconnect the power cord plug from the power outlet for safety.

3. In the event of power failure, the air conditioner will restart automatically in the previously selected mode once the power is restored. In the event of power failure during TIMER operation, the timer will be reset and the unit will begin or stop operating under a new timer setting.

4. If the room air conditioner is stopped by adjusting thermostat, or missoperation, and re-start in a moment, there is occasion that the cooling and heating operation does not start for 3 minutes, it is not abnormal and this is the result of the operation of IC delay circuit. This IC delay circuit ensures that there is no danger of blowing fuse or damaging parts even if operation is restarted accidentally.

5. This room air conditioner should not be used at the cooling operation when the outside temperature is below 10°C (50°F).

6. This room air conditioner (the reverse cycle) should not be used when the outside temperature is below –15°C (5°F).
   If the reverse cycle is used under this condition, the outside heat exchanger is frosted and efficiency falls.

7. When the outside heat exchanger is frosted, the frost is melted by operating the hot gas system, it is not trouble that at this time fan stops and the vapour may rise from the outside heat exchanger.

SPECIFICATIONS

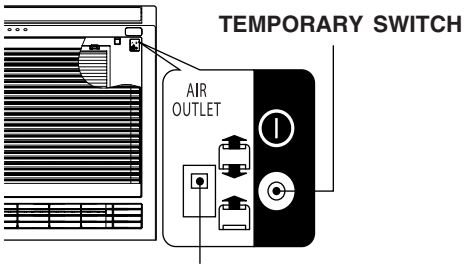
MODEL		RAF-25NH4 RAF-50NH4	RAC-25NH4	RAC-50NH4
FAN MOTOR		20W(DC35V)	40W	
FAN MOTOR CAPACITOR		NO	NO	
FAN MOTOR PROTECTOR		NO	NO	
COMPRESSOR		NO	JU1012D	JU1013D
COMPRESSOR MOTOR CAPACITOR		NO	NO	
OVERLOAD PROTECTOR		NO	YES	
OVERHEAT PROTECTOR		NO	YES	
FUSE (for MICROPROCESSOR)		NO	3.0A	
POWER RELAY		NO	G4A	
POWER SWITCH		NO	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(RAR-2P2)	NO	
REFRIGERANT CHARGING VOLUME (Refrigerant 410A)	UNIT	----------	1150g	1400g
	PIPES (MAX. 20m)	WITHOUT REFRIGERANT BECAUSE COUPLING IS FLARE TYPE.		

MODEL RAF-25NH4, RAF-50NH4

1. Top and Bottom Air Blow System
   During heating, this air conditioner blows warm air from the bottom as well as from the top outlet as in previous models.
   When the fan speed is set to "HI" or "AUTO" for cooling, the air conditioner blows cool air from both top and bottom, which allows rapid cooling. (This top/bottom cool air blow is possible for up to 25 minutes with the fan speed set to AUTO or HI. When the set room temperature is reached, the unit automatically switches to top blow only.)

(1) AIR OUTLET SWITCH

AIR OUTLET SWITCH IS SET TO



COOLING OPERATION

- If cooling is started at an AUTO or HI fan speed setting, and if a considerable difference is present between the room temperature and preset temperature, the damper inside of the bottom air outlet will automatically open to allow cold air to also be directed out of the bottom side air outlet.
  When the room temperature reaches the preset temperature or after approximately 30 minutes have elapsed from starting operation, cold air will automatically be directed only from the top side air outlet.
- When it is desirable to direct cold air from the bottom side air outlet for a longer period of time, set the temperature at 16˚C and fan speed at HIGH. When the room temperature is more than 8˚C above the preset temperature (16˚C), cold air will continuously blow from the bottom side air outlet.

HEATING OPERATION

- As operation starts, warm air is automatically discharged from top and bottom side air outlets.
- When the room temperature reaches the preset temperature, air is directed only from top side air outlet at the LOW fan speed.

DEHUMIDIFYING OPERATIONN

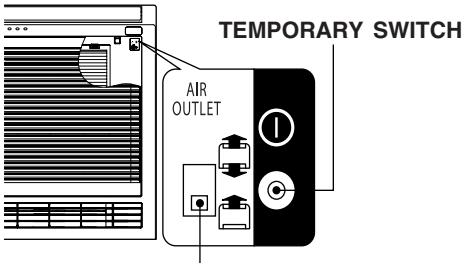
- For more efficient dehumidifying, the bottom side air outlet will remain closed.

FAN OPERATION

- Air blows out only from top side air outlet.

AIR OUTLET SWITCH IS SET TO

- Air blows out only from top side air outlet in both heating and cooling operation.
- Air can be blown only from top side air outlet, to prevent blowing air striking your face during sleep, etc.
- If air blows out only from the top side air outlet, it takes more time to reach the set temperature when compared to air blowing from both top and bottom side air outlets. Also, temperature distribution within the room may be adversely affected. It is therefore recommended to use both top and bottom side air outlets whenever possible.



2. Damper state in each operation mode

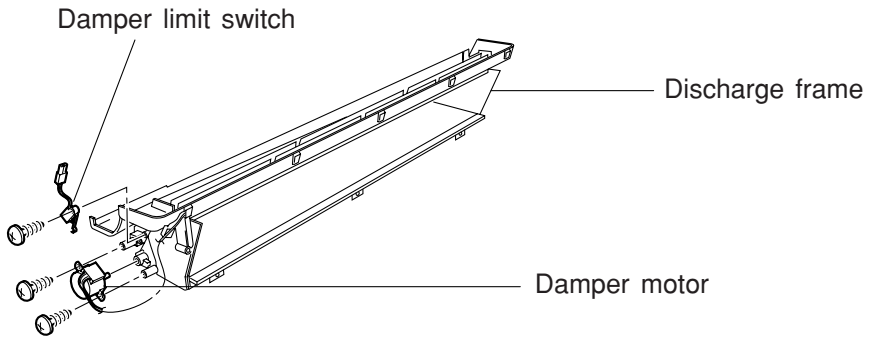
- If the Air outlet switch is set to , the damper at the bottom air outlet and air flow from the bottom will be as follows according to the settings of the operation switch and fan speed select buttons:

Operation	Fan speed	Damper and bottom blow-out states	When the set room temperature is reached
Cooling	AUTO	Damper opens for 25 minutes maximum and air blows from bottom. (But room temperature is more than 10˚C higher than the set temperature.)	Damper closes and no air blows from bottom.
	HI	Damper opens for 25 minutes maximum and air blows from bottom. (But room temperature is more than 9˚C higher than the set temperature.) However, if the temperature and fan speed are set to "16˚C" and "HI" respectively, air continuously blows out from the bottom while the room temperature is more than 8˚C higher than the preset temperature "16˚C".	Damper closes and no air blows from bottom.
	MED or LOW	Damper stays closed and no air blows from bottom.	———
Heating	Each speed including AUTO	Damper opens and air also blows from bottom.	Damper closes and air blows from top in ultra-low fan speed mode.
Sensor dry	Each speed including AUTO	Damper stays closed and no air blows from bottom.	The upper fan also stops.
Fan	Each speed including AUTO	Damper stays closed and no air blows from bottom.	———
Preheating / Defrosting	Each speed including AUTO	When the HOT KEEP lamp is lit, the damper closes and no air blows from bottom.	———

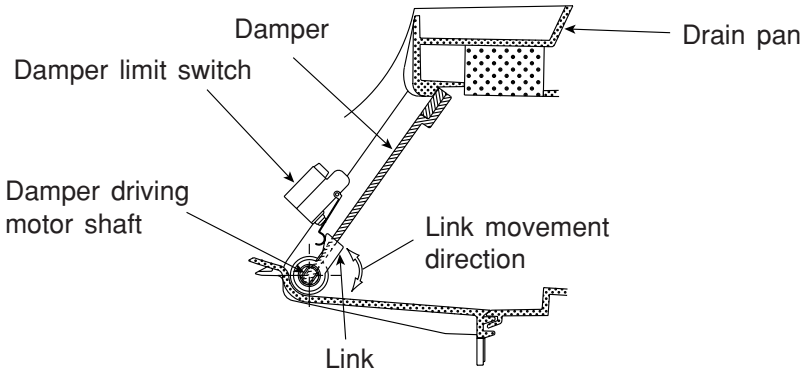
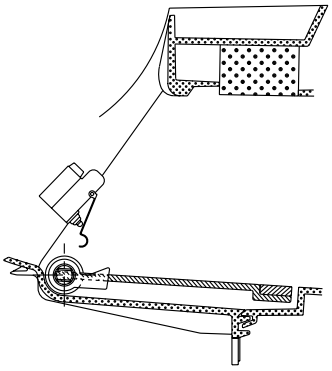
- The ratio of air discharge volume is: Upper: About 60% and Lower: About 40%.

2. Damper Mechanism

(1) Disassembly diagram of damper mechanism



(2) Damper operation theory
The damper and the link connected to the damper moves at the same time by turning the motor.

Damper closed state		Damper limit switch is set to ON.
Damper open state		Damper limit switch is set to OFF.

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.)

⃠ The sign in the figure indicates prohibition.	❗ Indicates the instructions that must be followed.

Please keep this manual after reading.

PRECAUTIONS DURING INSTALLATION

⚠ WARNING

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


PROHIBITION

- Please ask your sales agent or qualified technician for the installation of your unit.
  Water leakage, short circuit or fire may occur if you install the unit by yourself.
- Please use earth line.
  Do not place the earth line near water or gas pipes, lightning-conductor, or the earth line of telephone. Improper installation of earth line may cause electric shock.


CONNECT EARTH LINE

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

⚠ CAUTION

- A circuit breaker should be installed depending on the mounting site of the unit.
  Without a circuit breaker, the danger of electric shock exists.
- Do not install 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.

PROHIBITION

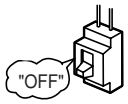
- Please ensure smooth flow of water when installing the drain hose.
- Make sure that a single phase 230V power source is used.
  The use of other power sources may cause electrical components to overheat and lead to fire.


PROHIBITION

PRECAUTIONS DURING SHIFTING OR MAINTENANCE

⚠ WARNING

- Should abnormal situation arise (like burning smell), please stop operating the unit and remove plug from the socket. Contact your agent. Fault, short circuit or fire may occur if you continue to operate the unit under abnormal situation.



- Please contact your agent for maintenance. Improper self maintenance may cause electric shock and fire.
- Please contact your agent if you need to remove and reinstall the unit. Electric shock or fire may occur if you remove and reinstall the unit yourself improperly.

PRECAUTIONS DURING OPERATION

⚠ WARNING

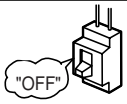
- Avoid an extended period of direct air flow for your health.


PROHIBITION


PROHIBITION

- Do not put objects like thin rods into the panel of blower and suction side because the high-speed fan inside may cause danger.
- Do not use any conductor as fuse wire, this could cause fatal accident.


PROHIBITION



- During thunder storm, disconnect the plug top and turn off the circuit breaker.
- 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.


PROHIBITION

PRECAUTIONS DURING OPERATION

⚠ CAUTION

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


PROHIBITION


DON'T WET

- Do not attempt to operate the unit with wet hands, this could cause fatal accident.

- When operating the unit with burning equipments, regularly ventilate the room to avoid oxygen insufficiency.


STRICTLY OBSERVE PRECAUTIONS


PROHIBITION

- Do not direct the cool air coming out from the air-conditioner panel to face household heating apparatus as this may affect the working of apparatus such as the electric kettle, oven etc.

- Please ensure that outdoor mounting frame is always stable, firm and without defect. If not, the outdoor unit may collapse and cause danger.

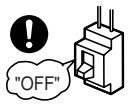

PROHIBITION


PROHIBITION

- 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.

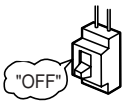
- Do not place plants directly under the air flow as it is bad for the plants.


PROHIBITION



- Be sure to stop the operation by using the remote controller and turn off the circuit breaker during cleaning, the high-speed fan inside the unit may cause danger.

- Turn off the circuit breaker if the unit is not be operated for a long period.




PROHIBITION

- Do not climb on the outdoor unit or put objects on it.

- 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.


PROHIBITION


PROHIBITION

- 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.

- 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.


PROHIBITION


DON'T TOUCH

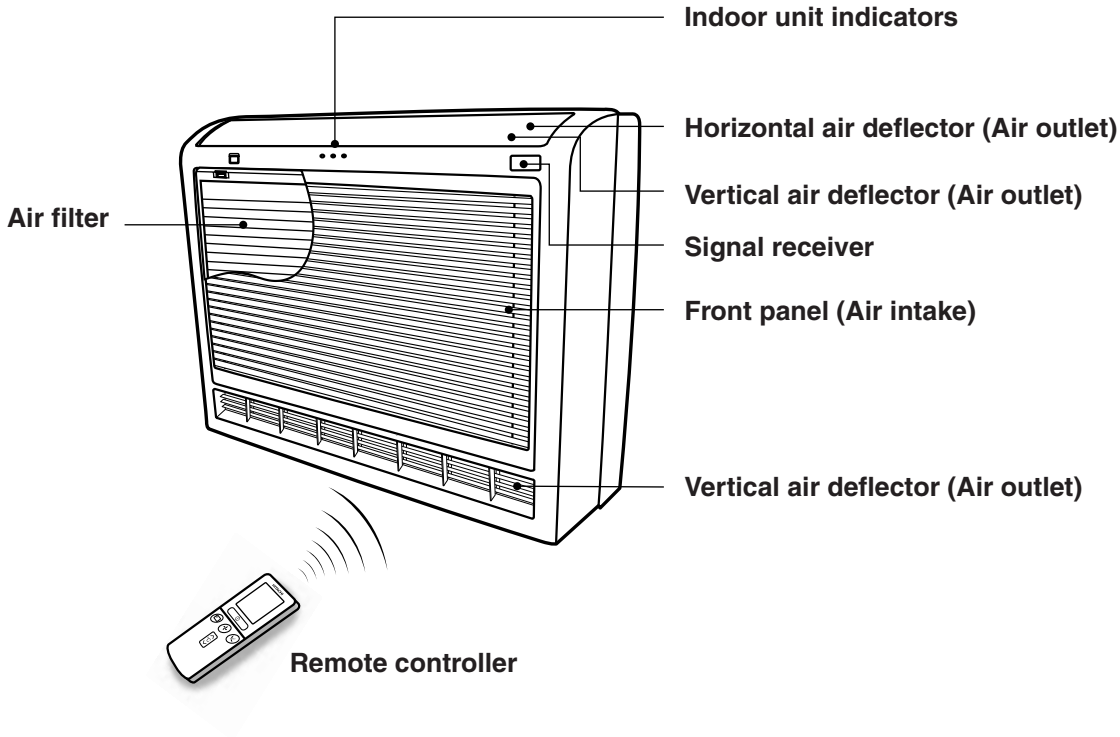
- Do not touch the air outlet, bottom surface and aluminum fin of the outdoor unit.
  You may get hurt.

- Do not touch the refrigerant pipe and connecting valve.
  Burns may result.

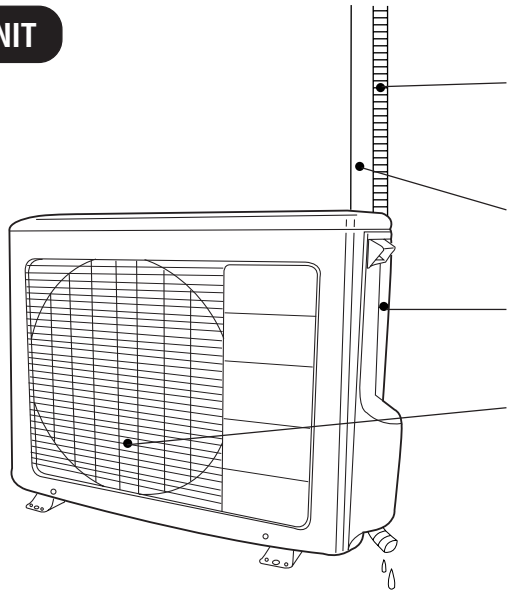

DON'T TOUCH

NAMES AND FUNCTIONS OF EACH PART

INDOOR UNIT



OUTDOOR UNIT



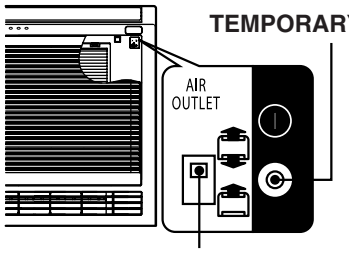
⚠ CAUTION

- When heating operation, drain or defrosted water flows out from outdoor unit. Don't close drain outlet portion in chilly area so as not to freeze these.

MODEL NAME AND DIMENSIONS

MODEL	WIDTH (mm)	HEIGHT (mm)	DEPTH (mm)
RAF-25NH4, RAF-50NH4	750	600	215
RAC-25NH4	750	570	280
RAC-50NH4	850	650	298

INDOOR UNIT CONTROL PANEL



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.)

AIR OUTLET SWITCH

AIR OUTLET SWITCH IS SET TO

COOLING OPERATION

- If cooling is started at an AUTO or HI fan speed setting, and if a considerable difference is present between the room temperature and preset temperature, the damper inside of the bottom air outlet will automatically open to allow cold air to also be directed out of the bottom side air outlet. When the room temperature reaches the preset temperature or after approximately 30 minutes have elapsed from starting operation, cold air will automatically be directed only from the top side air outlet.
- When it is desirable to direct cold air from the bottom side air outlet for a longer period of time, set the temperature at 16˚C and fan speed at HI. When the room temperature is more than 8˚C above the preset temperature (16˚C), cold air will continuously blow from the bottom side air outlet.

HEATING OPERATION

- As operation starts, warm air is automatically discharged from top and bottom side air outlets.
- When the room temperature reaches the preset temperature, air is diected only from top side air outlet at the LOW fan speed.

DEHUMIDIFYING OPERATION

- For more efficient dehumidifying, the bottom side air outlet will remain closed.

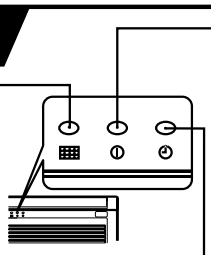
FAN OPERATION

- Air blows out only from top side air outlet.

AIR OUTLET SWITCH IS SET TO

- Air blows out only from top side air outlet in both heating and cooling operation.
- Air can be blown only from top side air outlet, to prevent blowing air striking your face during sleep, etc.
- If air blows out only from the top side air outlet, it takes more time to reach the set temperature when compared to air blowing from both top and bottom side air outlets. Also, temperature distribution within the room may be adversely affected. It is therefore recommended to use both top and bottom side air outlets whenever possible.

INDOOR UNIT INDICATORS



FILTER lamp

This lamp lights when the device is operated for a total of about 100 hours, it is time to clean the filter. The lamp goes out when the " (AUTO AWING)" button is pressed while the operation is stopped.

TIMER lamp

This lamp lights when the timer is working.

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.)

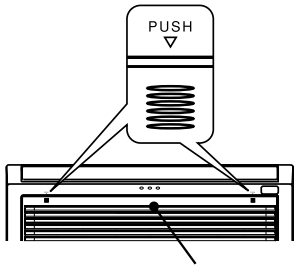
HOW TO OPEN OR CLOSE THE FRONT PANEL

Open the front panel

- To open the front panel, use the remote controller to stop unit operation. Then press the two " " sections below PUSH 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.

Close the front panel

- To close the front panel, press the two " " sections below PUSH at the top left and right corners of the front panel.
- Press the upper center part of the front panel to close properly.

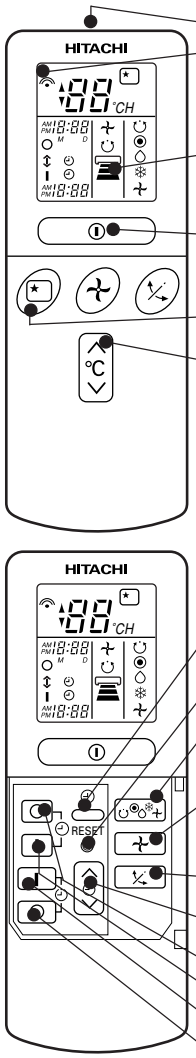


Upper center part

NAMES AND FUNCTIONS OF REMOTE CONTROL UNIT

REMOTE CONTROLLER

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



- **Signal emitting window/transmission sign**
  Point this window toward the indoor unit when controlling it.
  The transmission sign blinks when a signal is sent.
- **Display**
  This indicates the room temperature selected, current time, timer status, function and intensity of circulation selected.
- **START/STOP button**
  Press this button to start operation. Press it again to stop operation.
- **SLEEP button**
  Use this button to set the sleep timer.
- **TEMPERATURE buttons**
  Use these buttons to raise or lower the temperature setting. (Keep pressed, and the value will change more quickly.)
- **TIME button**
  Use this button to set and check the time and date.
- **RESET buttons**
- **FUNCTION selector**
  Use this button to select the operating mode. Every time you press it, the mode will change from ↻ (AUTO) to ◉ (HEAT) to ◇ (DEHUMIDIFY) to ❄ (COOL) and to ✣ (FAN) cyclically.
- **FAN SPEED selector**
  This determines the fan speed. Every time you press this button, the intensity of circulation will change from ↻ (AUTO) to ≡ (HI) to ≡ (MED) to ≡ (LOW) (This button allows selecting the optimal or preferred fan speed for each operation mode).
- **AUTO SWING button**
  Controls the angle of the horizontal air deflector.
- **TIMER control**
  Use this button to set the timer.
- **OFF-TIMER button** Select the turn OFF time.
- **ON-TIMER button** Select the turn ON time.
- **RESERVE button** Time setting reservation.
- **CANCEL button** Cancel time reservation.

↻	AUTO
◉	HEAT
◇	DEHUMIDIFY
❄	COOL
✣	FAN
≡	FAN SPEED LOW MED HI
★	SLEEPING
○	STOP (CANCEL)
I	START (RESERVE)
⏻	START/STOP
🕘	TIME
🕘	TIMER SET
🕘	TIMER SELECTOR ON TIMER OFF TIMER
⤫	AUTO SWING

Precautions for Use

- Do not put the remote controller in the following places.
  - Under direct sunlight.
  - In the vicinity of a heater.
- Handle the remote controller carefully. Do not drop it on the floor, and protect it from water.
- Once the outdoor unit stops, it will not restart for about 3 minutes (unless you turn the power switch off and on or unplug the power cord and plug it in again).
  This is to protect the device and does not indicate a failure.
- If you press the FUNCTION selector button during operation, the device may stop for about 3 minutes for protection.

VARIOUS FUNCTIONS

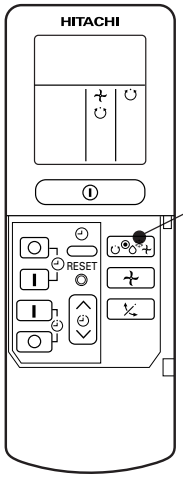
■ Auto Restart Control

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

  Note: 1. If you do not require Auto Restart Control, please consult your sales agent or off by remote control.
  2. Auto Restart Control is not available when Timer or Sleep Timer mode is set.

AUTOMATIC OPERATION

The device will automatically determine the mode of operation, HEAT, COOL or DEHUMIDIFY depending on the initial room temperature. The selected mode of operation will change when the room temperature varies.



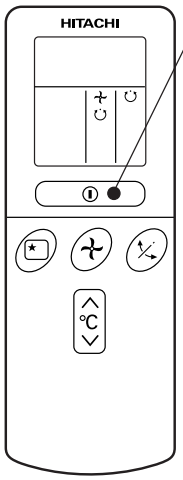
1

Press the FUNCTION selector 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.
- When AUTO is first selected, the device will determine the current room temperature and select the proper operation mode accordingly.
- When the air conditioner has adjusted the room's temperature to the near preset temperature, it will begin to monitor operation. If the room temperature subsequently changes, the air conditioner will once again select the appropriate operation (heating or cooling) to adjust the temperature to the preset temperature. The monitoring operation range is ±3˚C relative to the preset temperature.
- If the mode automatically selected by the unit is not satisfactory, manually change the mode setting (heat, dehumidify, cool or fan).

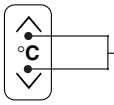
START
STOP

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



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

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



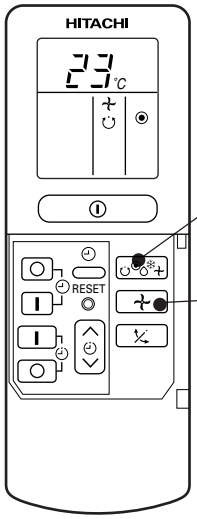
Press the temperature button and the temperature setting will change by 1°C each time.

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

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

HEATING OPERATION

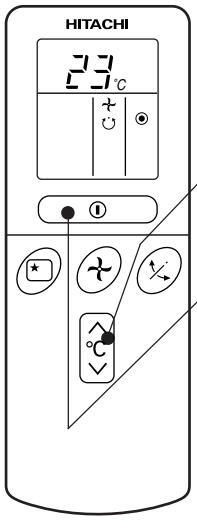
- Use the device for heating when the outdoor temperature is under 21°C.
  When it is too warm (over 21°C), the heating function may not work in order to protect the device.
- In order to keep reliability of the device, please use this device above -15˚C of the outdoor temperature.



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

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

- ⟳ (AUTO): The fan speed changes automatically to the temperature of the air which blows out.
- (HI) : Economical as the room will become warm quickly. But you may feel a chill at the beginning.
- (MED) : Quiet.
- (LOW) : More quiet.



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

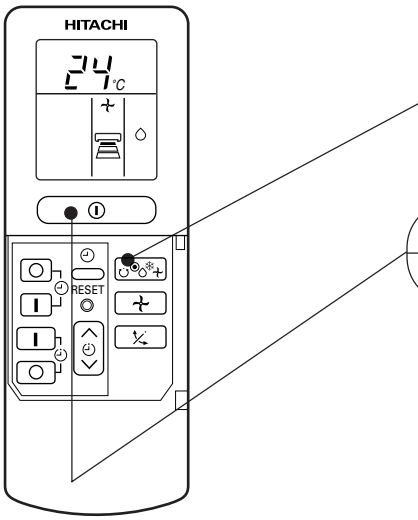
The temperature setting and the actual room temperature may vary somewhat depending on conditions.

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

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

DEHUMIDIFYING OPERATION

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



1 Press the FUNCTION selector so that the display indicates ◇ (DEHUMIDIFY).
The FAN SPEED is set at LOW automatically.
The FAN SPEED button does not work.

START / STOP Press the ⏻ (START/STOP) button.

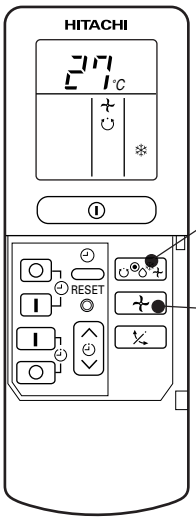
- When you want to change the operation mode, please use the FUNCTION selector.
- Set the desired temperature is available.
- You also can use the FUNCTION selector to select this operation.

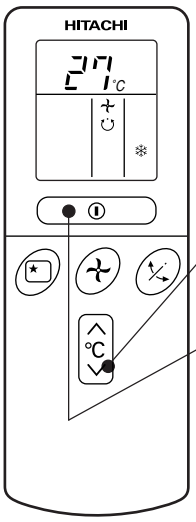
Dehumidifying Function

When the room temperature is higher than the temperature setting: The device will dehumidify the room, reducing the room temperature to the preset level.
When the room temperature is lower than the temperature setting: Dehumidifying will be performed at the temperature setting slightly lower than the current room temperature, regardless of the temperature setting. The function will stop (the indoor unit will stop emitting air) as soon as the room temperature becomes lower than the setting temperature.

COOLING OPERATION

Use the device for cooling when the outdoor temperature is 22-42°C.
If indoors humidity is very high (80%), some dew may form on the air outlet grille of the indoor unit.





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

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

- (AUTO): The FAN SPEED is HI at first and varies to MED automatically when the preset temperature has been reached.
- (HI) : Economical as the room will become cool quickly.
- (MED) : Quiet.
- (LOW) : More quiet.

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

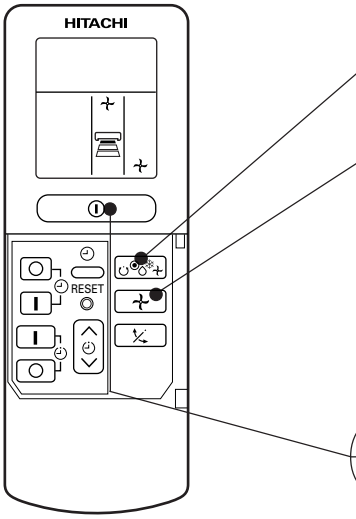
The temperature setting and the actual room temperature may vary somewhat depending on conditions.

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

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

FAN OPERATION

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



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

2 Press the ✣ (FAN SPEED) button.

(HI) : The strongest air blow.

(MED) : Quiet.

(LOW) : More quiet.

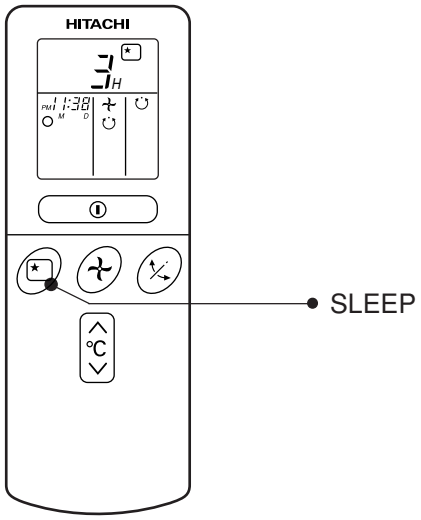
START / STOP Press the ⏻ (START/STOP) button. Fan operation starts with a beep. Press the button again to stop operation.

FAN SPEED (AUTO) ····· When the AUTO fan speed mode is set in the cooling/heating operation:

For the heating operation	● The fan speed will automatically change according to the temperature of discharged air. ● As room temperature reaches the preset temperature, a very light breeze will blow.
For the cooling operation	● Operation starts in the "HI" mode to reach the preset temperature. ● As room temperature approaches the preset temperature, fan speed automatically switches to "LOW".

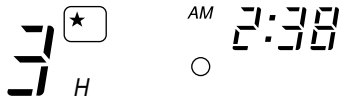
HOW TO SET THE SLEEP TIMER

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

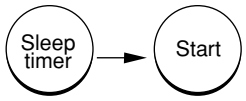


Mode	Indication
Sleep Timer	1 hour → 2 hours → 3 hours → 7 hours → Sleep timer off → 1 hour

Sleep Timer: The device will continue working for the designated number of hours and then turn off.
Point the signal window of the remote controller toward the indoor unit, and press the SLEEP button.
The timer information will be displayed on the remote controller. The TIMER lamp lights with a beep from the indoor unit. When the sleep timer has been set, the display indicates the turn-off time.



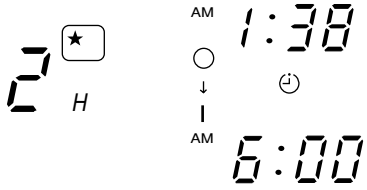
Example: If you set 3 hours sleep time at 11:38 p.m., the turn-off time is 2:38 a.m.



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

1 Set the ON-timer.

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



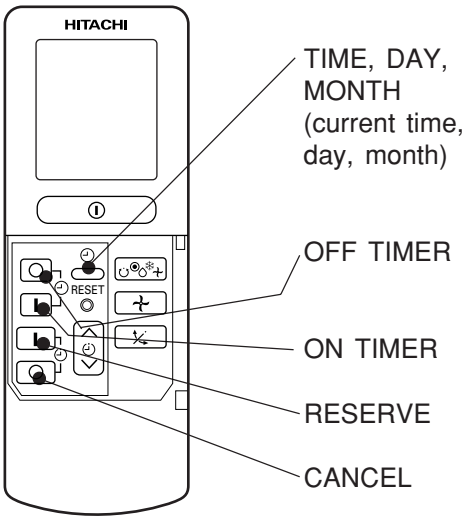
For heating:

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

How to Cancel Reservation

Point the signal window of the remote controller toward the indoor unit, and press the ○ (CANCEL) button.
The (RESERVED) sign goes out with a beep and the (TIMER) lamp turns off on the indoor unit.

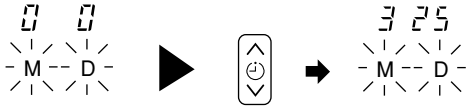
HOW TO SET THE TIMER



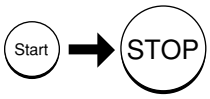
Time, Day, Month

After you change the batteries;

1 Set the current month and day with the TIMER control button.

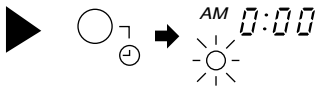


OFF-Timer



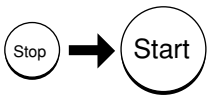
You can set the device to turn off at the present time.

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

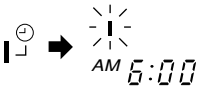


ON-Timer

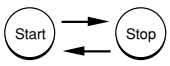
- The device will turn on at the designated times.



1 Press the ❙ (ON-TIMER) button. The ❙ (ON) mark blinks on the display.

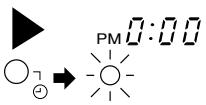


ON/OFF-Timer

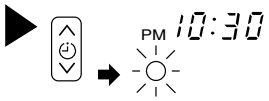


- The device will turn on (off) and off (on) at the designated times.
- The switching occurs first at the preset time that comes earlier.
- The arrow mark appearing on the display indicates the sequence of switching operations.

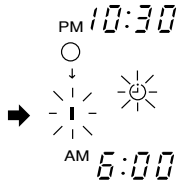
1 Press the ◯ (ON-OFF) button so that the ◯ (OFF) mark blinks.



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



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



How to Cancel Reservation

Point the signal window of the remote controller toward the indoor unit, and press the ◯ (CANCEL) button.
The ◴ (RESERVED) sign goes out with a beep and the ◴ (TIMER) lamp turns off on the indoor unit.

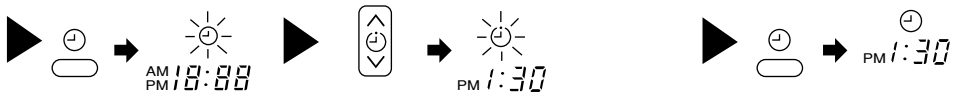
NOTE

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

2 Press the ◴ (TIME) button.

3 Set the current time with the TIMER control button.

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

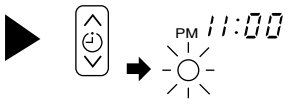


Example: The current time is 1:30 p.m.

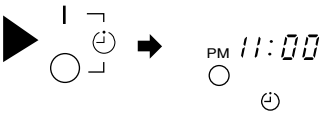
- The time indication will disappear automatically in 10 second.
- To check the current time setting, press the ◴ (TIME) button twice.

The setting of the current time is now complete.

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

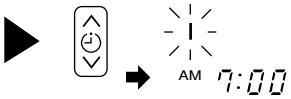


3 Point the signal window of the remote controller toward the indoor unit, and press the ❙ (RESERVE) button.
The ◯ (OFF) mark starts lighting instead of flashing and the sign ◴ (RESERVED) lights. A beep occurs and the ◴ (TIMER) lamp lights on the indoor unit.



Example: The device will turn off at 11:00p.m.
The setting of turn-off time is now complete.

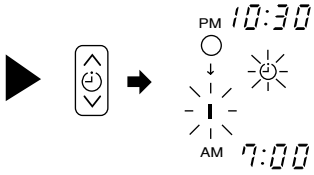
2 Set the turn-on time with the TIMER control button.



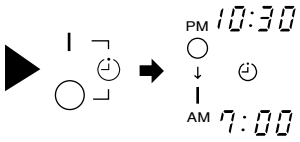
3 Point the signal window of the remote controller toward the indoor unit, and press the ❙ (RESERVE) button.
The ❙ (ON) mark starts lighting instead of flashing and the ◴ (RESERVED) sign lights. A beep occurs and the ◴ (TIMER) lamp lights on the indoor unit.

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

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



5 Point the signal window of the remote controller toward the indoor unit, and press the ❙ (RESERVE) button.
The ❙ (ON) mark starts lighting instead of flashing and the ◴ (RESERVED) sign lights. A beep occurs and the ◴ (TIMER) lamp lights on the indoor unit.



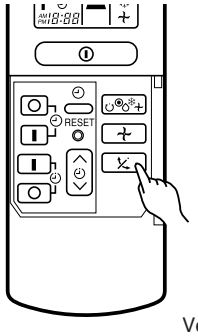
Example:
The device will turn off at 10:30 p.m. and it will be turned on at 7:00 a.m.
The settings of the turn-on/off times are now complete.

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

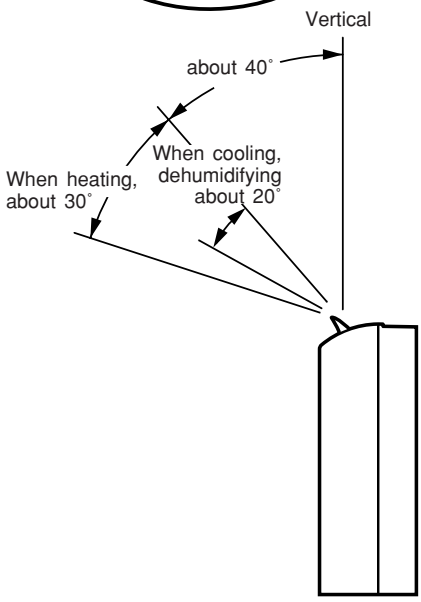
ADJUSTING THE AIR DEFLECTOR

1 Adjustment of the conditioned air in the upward and downward directions.

The horizontal air deflector is automatically set to the proper angle suitable for each operation. The deflector can be swung up and down continuously and also set to the desired angle using the " (AUTO SWING)" button.

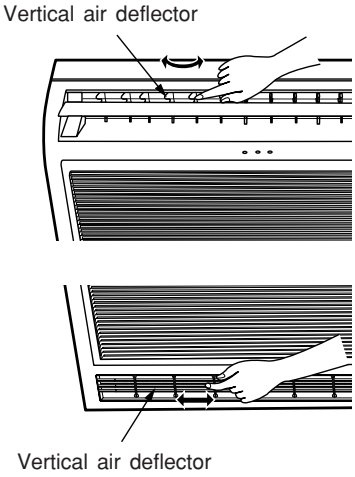


- If the " (AUTO SWING)" button is pressed once, the horizontal air deflector swings up and down. If the button is pressed again, the deflector stops in its current position.
- Use the horizontal air deflector within the adjusting range shown in the right figure.
- When the " (AUTO SWING)" button is pressed while the operation is stopped, the horizontal air deflector moves and stops at the position where the air outlet closes.
- When the auto swing operation is performed, if the horizontal air deflector is moved manually, the swinging range may drift. However, it will return to the original operation range after a short time.



2 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.



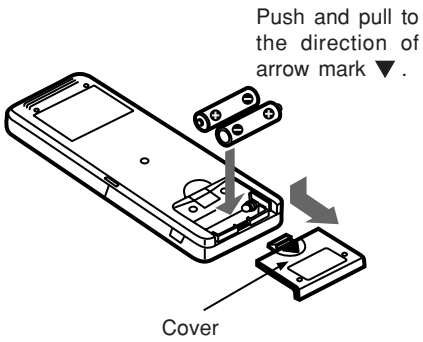
⚠ CAUTION

- 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.

HOW TO CHANGE THE BATTERIES IN THE REMOTE CONTROLLER

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

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



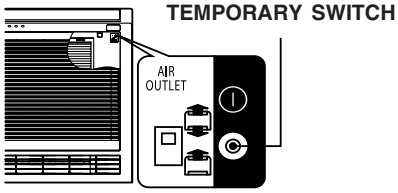
⚠ CAUTION

1. Do not mix new and old batteries, or different type of batteries together.
2. Remove the batteries when you do not use the remote controller for 2 or 3 months.

TEMPORARY SWITCH

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

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



CIRCUIT BREAKER

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

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

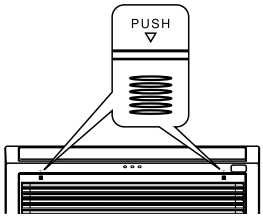
- Do not expose the unit to water as it may cause an electric shock.
- For cleaning inside the air conditioner, consult your sales agent.
- Avoid using detergent when cleaning the heat exchanger of the indoor unit. Unit failure may result.
- When cleaning the heat exchanger with a vacuum cleaner, make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

1. AIR FILTER

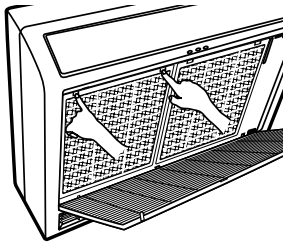
Clean the air filter, as it removes dust inside the room.
Be sure to clean the filter once every two weeks so as not to consume electricity unnecessarily.

PROCEDURE

1 **Open the front panel.**
- To open the front panel, use the remote controller to stop unit operation. Then press the two" ▒ " sections below PUSH 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.



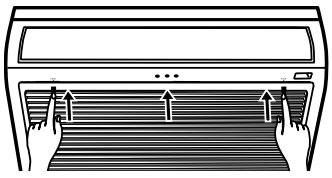
2 **Remove the filters.**



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 filter.**
- Attaching the filters which are placed the surface written "FRONT" up.

5 **Close the front panel.**
- To close the front panel, press the two " ▒ " sections below PUSH at the top left and right corners of the front panel.
- Press the upper center part of the front panel to close properly.



⚠ CAUTION

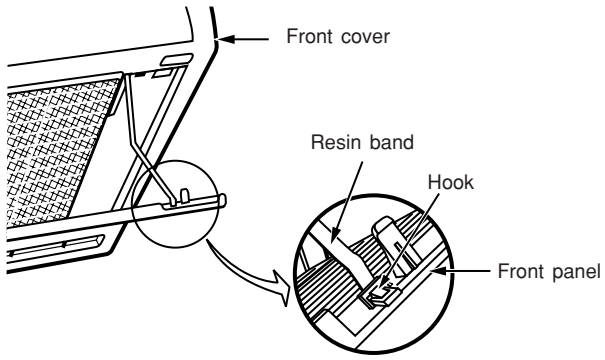
- Do not wash with hot water at more than 40˚C. The filter may shrink.
- When washing it, shake off moisture completely and dry it in the shade; do not expose it directly to the sun. The filter may shrink.
- Don't operate the unit without filter. Fault may occur if you continue.

2. HOW TO INSTALL AND REMOVE THE FRONT PANEL

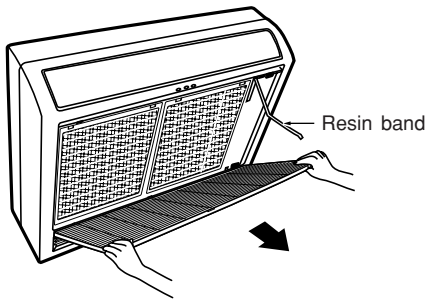
- Be sure to use both hands to grasp the front panel when removing it or attaching it.
- The front panel may be installed up or down to suit user preference.

Removing

- Press the hook found at the tip of the resin band installed inside the front panel's right section to remove the resin band.



- Pull the front panel down toward you and once fully open, pull it to remove.



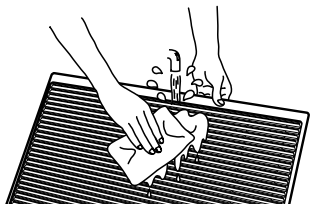
Attaching

- Attach three front panel bearings to the axis of the front cover. (Set the hook to face up.)
- Insert the tip of the resin band into the hole of the protrusion inside the right section of 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.

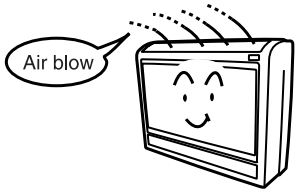


⚠ CAUTION

- 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), benzine, 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.



OPTIONAL PARTS

1. AIR CLEANSING AND DEODORIZING FILTERS (SPX-CFH5)

- The air cleansing and deodorizing filters can absorb even minute dust particles. The filter's antibacteria function prevents growth of microorganisms in the filter. The air cleansing and deodorozing filters also add air purification to the unit's normal operation to offer a clean and comfortable environment.
- When installing the air cleansing and deodorizing 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 and deodorizing filters are used. So, set the fan speed to "HIGH" when using it in this condition.
- The air cleansing and deodorizing filters is washable and reusable up to 20 times by using vacuum cleaner or water rinse under running tap water.

INFORMATION

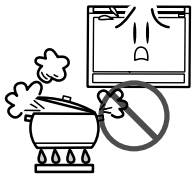
CAPABILITIES

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 amblent 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.

CAUTION

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



PROHIBITION

- 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.

VARIOUS FUNCTIONS

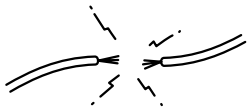
- When fan speed, room temperature are set with the remote controller before starting manual operation and the buttons are released, the indication of settings will go off in 10 seconds and only the operation mode will be displayed.
- Pressing the button while the unit is in operation will let the protective 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 (LOW) 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 (SLEEP) button is pressed while the ON/OFF timer is programmed, the sleep timer takes priority.
- During sleep timer operation, the fan speed sets to (LOW) regardless of the preset speed. The remote controller display indication will remain unchanged even with the (LOW) setting.

REGULAR INSPECTION

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

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

AFTER SALES SERVICE AND WARRANTY

WHEN ASKING FOR SERVICE, CHECK THE FOLLOWING POINTS.

CONDITION	CHECK THE FOLLOWING POINTS
If the remote controller is not transmitting a signal. (Remote controller display is dim or blank.)	● Do the batteries need replacement? ● Is the polarity of the inserted batteries correct?
When it does not operate.	● Is the fuse all right? ● Is the voltage extremely high or low? ● Is the circuit breaker "ON"? ● Is the setting of operation mode different from other indoor units?
When it does not cool well. When it does not heat well.	● Is the air filter blocked with dust? ● Is the set temperature suitable? ● Have the top and bottom air deflectors been adjusted to their correct positions according to the operation mode selected? ● Are the air inlets or air outlets of indoor and outdoor units blocked? ● Is the fan speed "LOW"?

The following phenomena do not indicate unit failure.

During heating, the operation indicator blinks and air blow stops	<Operation start> The unit is preparing to blow warm air. Please wait. <In operation> The outdoor unit is defrosting. Please wait.
Hissing or fizzy sounds	Refrigerant flow noise in the pipe or valve sound generated when flow rate is adjusted.
Squeaking noise	Noise generated when the unit expands or contracts due to temperature changes.
Rustling noise	Noise generated with the indoor unit fan's rpm changing such as operation start times.
Clicking noise	Noise of the motorized valve when the unit is switched on.
Perking noise	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.
Changing operation noise	Operation noise changes due to power variations according to room temperature changes.
Mist emission	Mist is generated as the air within the room is suddenly cooled by conditioned air.

Steam emitted from the outdoor unit	Water generated during defrosting operation evaporates and steam is emitted.
Odors	Caused as the smells and particles of smoke, food, cosmetics, etc. present in room air become attached the unit and blown off into the room again.
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 breaaker 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 operation, the following phenomena may occassionally occur, but they are not abnormal for the operation.
  (1) Slight flowing noise of refrigerant in the refrigerating cycle.
  (2) Slight rubbing noise from the fan casing which is cooled and then gradually warmed as operation stops.
- The odor will possibly be emitted from the room air conditioner because the various odor, emitted by smoke, foodstuffs, cosmetics and so on, sticks to it. So the air filter and the evaporator regularly must be cleaned to reduce the odor.

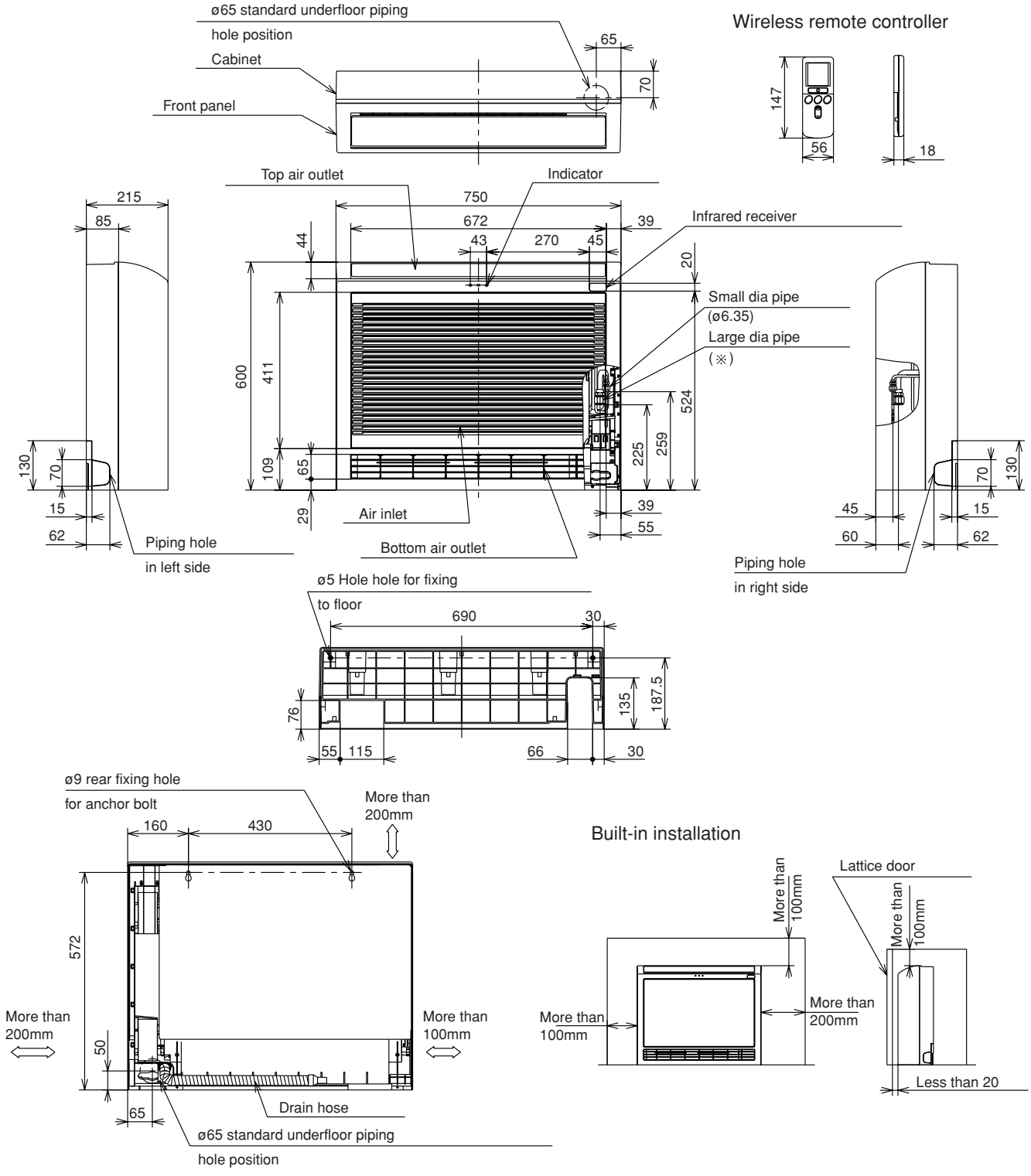
- Please contact your sales agent immediately if the air conditioner still fails to operate normally after the above inspections. Inform your agent of the model of your unit, production number, date of installation. Please also inform him regarding the fault.

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-25NH4, RAF-50NH4

Unit: mm



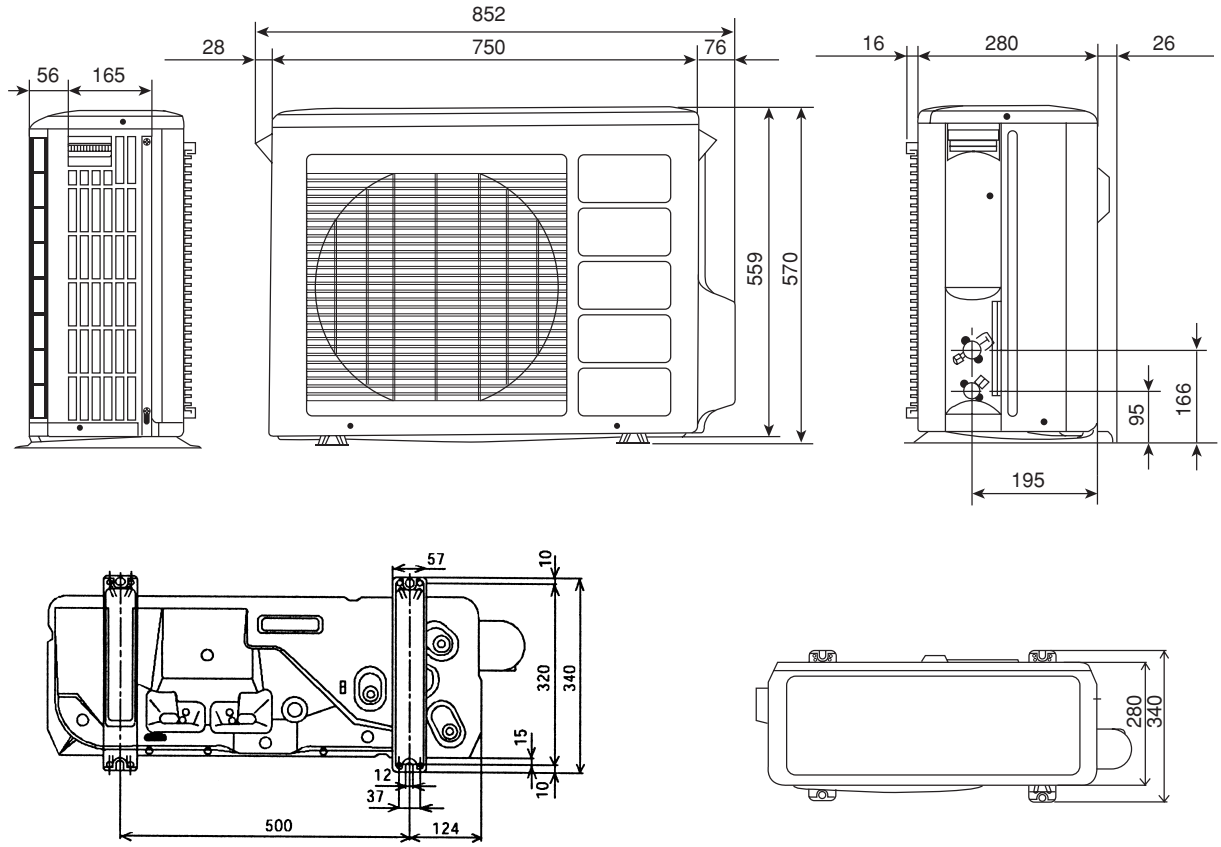
Cautions:

1. Use insulated pipes for both large and small diameters.
2. Make sure the difference in heights between the indoor and outdoor units is 10m.
3. For built-in installation, make sure that the infrared receiver and indicator are not blocked.
4. Pipes can be laid out from the right, bottom or rear, when the unit is viewed from front.
5. Keep the clearance shown by ⟺ for installation.
6. For built-in installation, keep the vertical deflector at the 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.
7. An connection cable 1.6mm or 2.0mm dia.x2 (control side) is used for the connection cable.

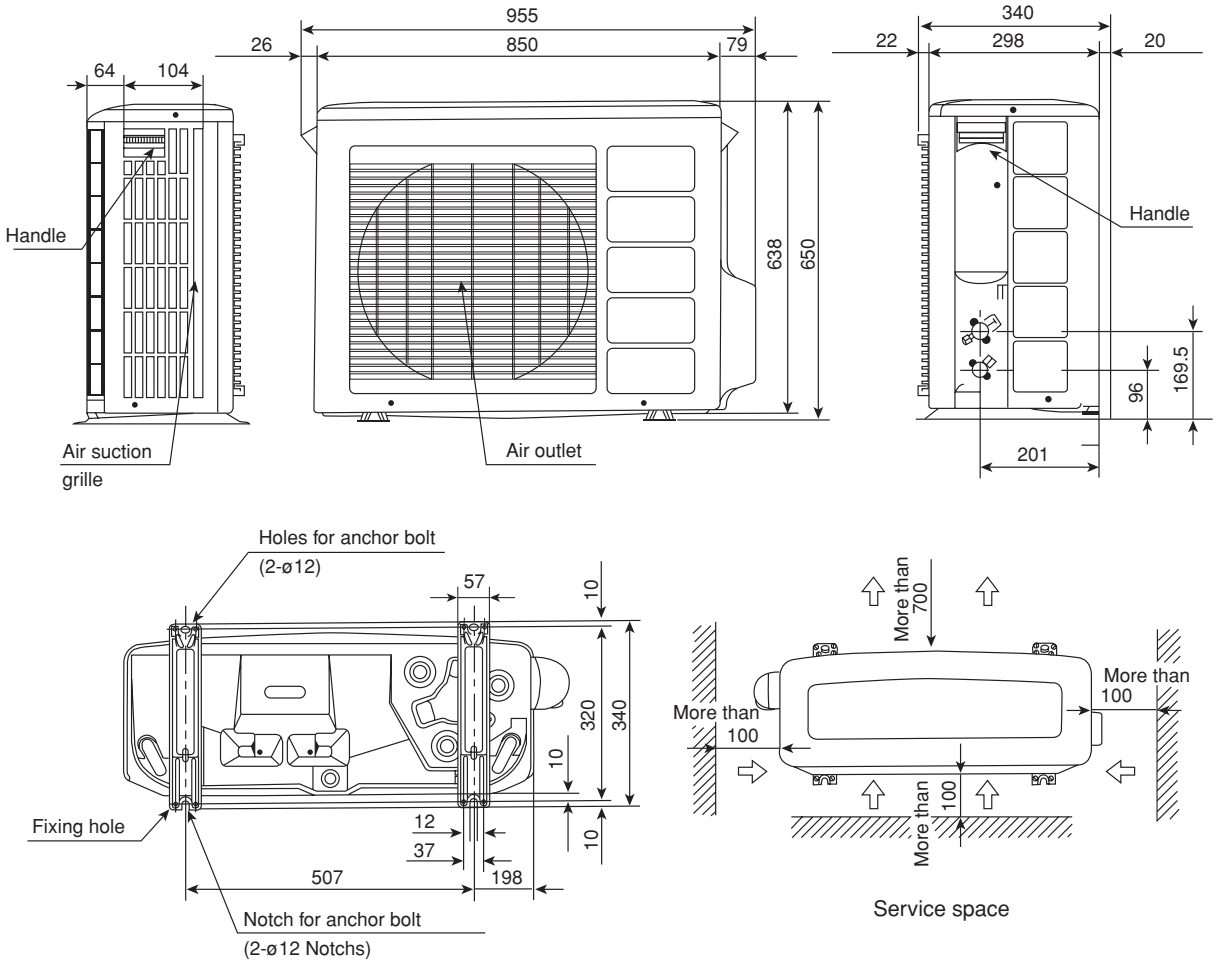
※ RAF-25NH4 → ø9.52, RAF-50NH4 → ø12.7

CONSTRUCTION AND DIMENSIONAL DIAGRAM FOR OUTDOOR

MODEL RAC-25NH4



MODEL RAC-50NH4



MAIN PARTS COMPONENT

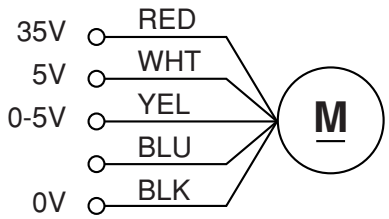
THERMOSTAT

Thermostat Specifications

MODEL			RAF-25NH4, RAF-50NH4	
THERMOSTAT MODEL			IC	
OPERATION MODE			COOL	HEAT
TEMPERATURE ˚C (˚F)	INDICATION 16	ON	15.7 (60.3)	19.0 (66.2)
		OFF	15.0 (59.0)	19.7 (67.5)
	INDICATION 24	ON	23.7 (74.7)	27.0 (80.6)
		OFF	23.0 (73.4)	27.7 (81.9)
	INDICATION 32	ON	31.7 (89.1)	35.0 (95.0)
		OFF	31.0 (87.8)	35.7 (96.3)

FAN MOTOR

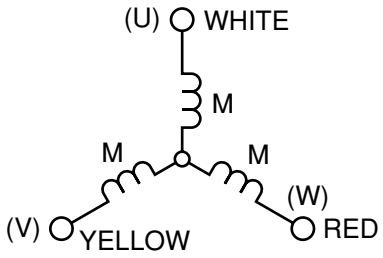
Fan Motor Specifications

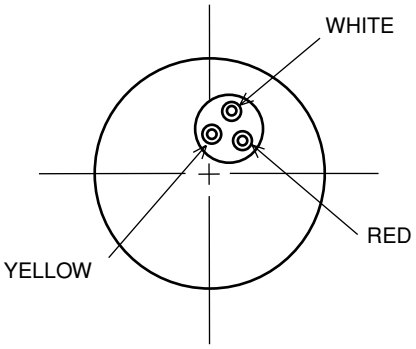
MODEL	RAF-25NH4, RAF-50NH4
POWER SOURCE	DC : 5V, DC : 0-35V
OUTPUT	20W (MAX40)
CONNECTION	 (Control circuit built in)

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

COMPRESSOR MOTOR

Compressor Motor Specifications

MODEL		RAC-25NH4	RAC-50NH4
COMPRESSOR MODEL		JU1012D	JU1013D
PHASE		SINGLE	
RATED VOLTAGE		AC 220 ~ 230 V	
RATED FREQUENCY		50 Hz	
POLE NUMBER		4	
CONNECTION			
RESISTANCE VALUE (Ω)	20°C (68°F)	2M = 1.05	
	75°C (167°F)	2M = 1.28	



⚠CAUTION

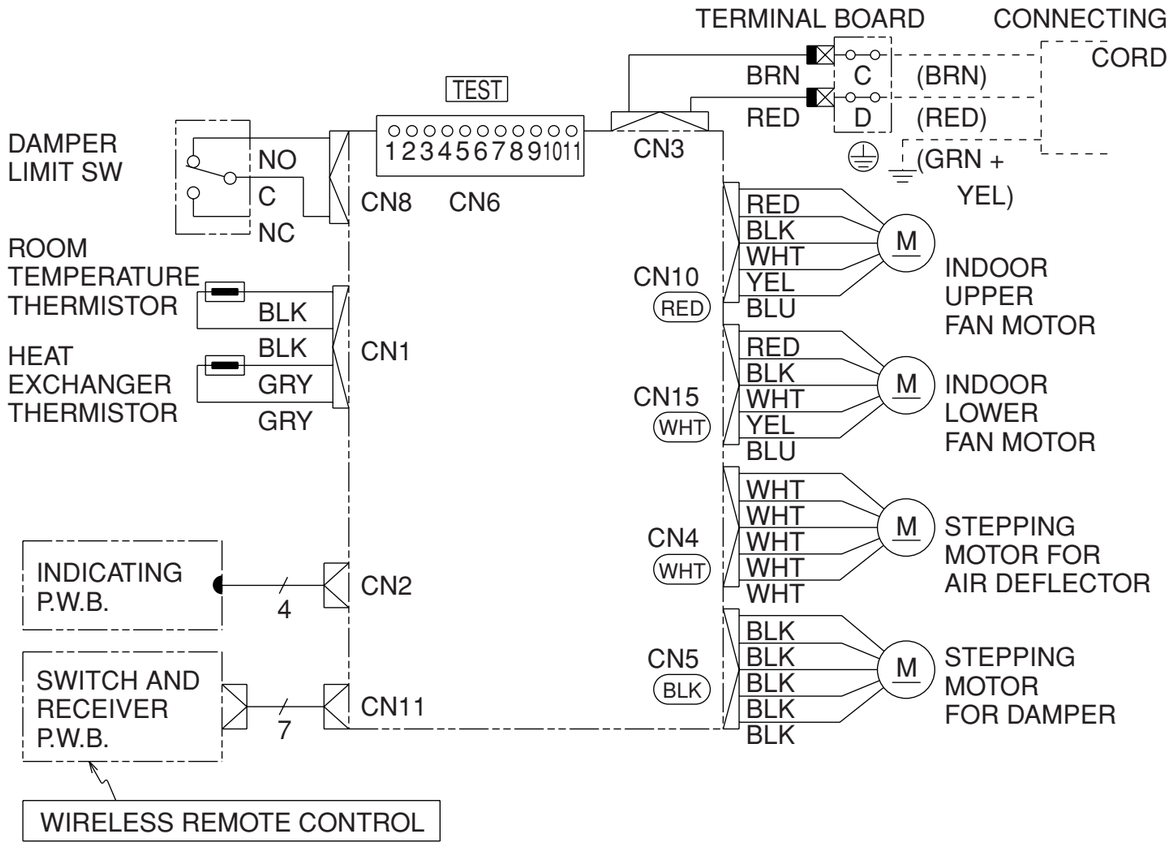
When the refrigerating cycle has been operated for a long time with the capillary tubes clogged or crushed or with too little refrigerant, check the color of the refrigerating machine oil inside the compressor. If the color has been changed conspicuously, replace the compressor.

WIRING DIAGRAM

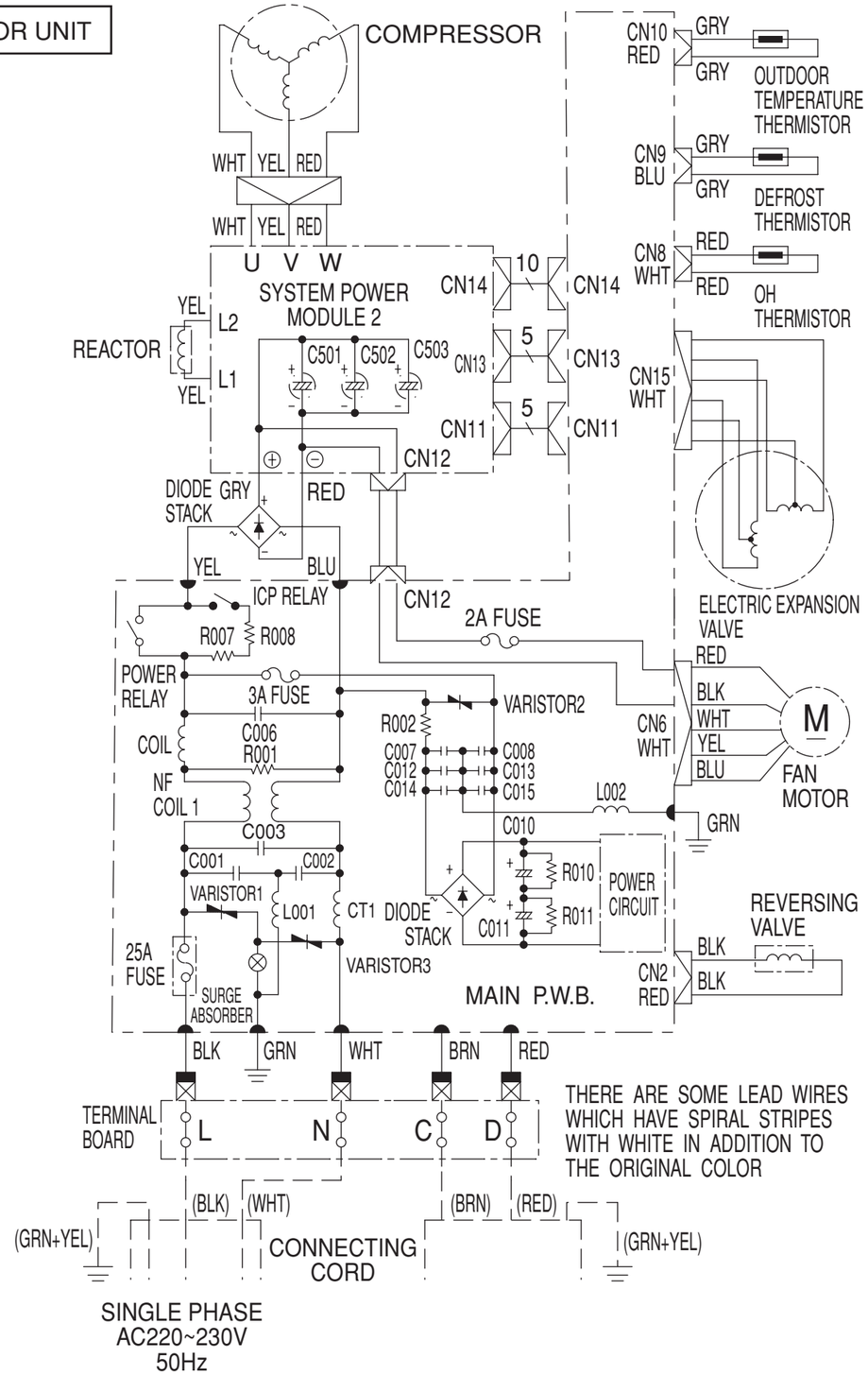
MODEL RAF-25NH4 / RAC-25NH4
RAF-50NH4 / RAC-50NH4

INDOOR UNIT

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



OUTDOOR UNIT



MODEL		RAF-25NH4	RAF-50NH4
NO.	LABEL NAME	REQUIRED OF UNIT SIDE	REQUIRED OF UNIT SIDE
000	WMAX	4400 min-1	5100 min-1
001	WMAX 2	4500 min-1	5100 min-1
002	WSTD	3400 min-1	5100 min-1
003	WJKMAX	3000 min-1	4000 min-1
004	WBEMAX	2800 min-1	3500 min-1
005	CMAX	2700 min-1	4800 min-1
006	CMAX 2	2800 min-1	4800 min-1
007	CSTD	2450 min-1	4550 min-1
008	CKYMAX	2200 min-1	4000 min-1
009	CJKMAX	1800 min-1	3000 min-1
00A	CBEMAX	1600 min-1	2000 min-1
01F	SDMAX	1600 min-1	2000 min-1
020	SDRPM	1500 min-1	1900 min-1
026	WMIN	1500 min-1	1800 min-1
027	CMINHI	1500 min-1	1800 min-1
028	CMIN	1500 min-1	1800 min-1
029	DMIN	1500 min-1	1800 min-1
02A	STAROTP	5 ˚C	5 ˚C
02B	STARCPL	2000 min-1	2000 min-1
02C	STARCPH	3000 min-1	3000 min-1
02E	STARTMW	60 sec	60 sec
02F	STARTMC	60 sec	60 sec
031	PKOU	500 min-1	500 min-1
032	FZZY_GN	1.0	1.0
033	FZZYTM	3 min	3 min
039	SHIFTW	2.33 ˚C	2.33 ˚C
03A	SFTSZW	0.66 ˚C	0.66 ˚C
03B	SHIFTC	-0.66 ˚C	-0.66 ˚C
03C	SHIFTD	-0.66 ˚C	-0.66 ˚C
03D	CLMXTP	30.00 ˚C	30.00 ˚C
03E	YNEOF	20.00 ˚C	20.00 ˚C
043	TEION	5.00 ˚C	5.00 ˚C
044	TEIOF	12.00 ˚C	12.00 ˚C
04F	TDTMPH	27.00 ˚C	27.00 ˚C
050	TDTMPM	25.00 ˚C	25.00 ˚C
051	TDTMPL	20.00 ˚C	20.00 ˚C
053	TDSFNP	12.66 ˚C	12.66 ˚C
054	TDSFLH	4.66 ˚C	4.66 ˚C
057	DFTIM1	45 min	45 min
058	DFTIM2	60 min	90 min
059	DFTIM3	90 min	60 min
05A	TDF411	60 sec	60 sec
05B	TDF412	30 sec	30 sec
05C	TDF413	60 sec	60 sec
05D	DFRPM3	1500 min-1	1500 min-1
05E	DFMXTM	20 min	20 min
05F	DFMAX	5600 min-1	5600 min-1
060	TDF421	150 sec	150 sec
061	TDF422	2000 min-1	2000 min-1
062	TDF431	90 sec	90 sec
068	DEFCOL	5 min	5 min
0C0	FWSS	400 min-1	400 min-1
0C1	FWSOY	710 min-1	820 min-1
0C2	FWS	710 min-1	820 min-1
0C3	FWKAF	790 min-1	950 min-1
0C4	FWL	790 min-1	950 min-1
0C5	FWAH	830 min-1	1040 min-1
0C6	FWH	870 min-1	1080 min-1
0C7	FWHM	960 min-1	1100 min-1
0C8	FWHH	960 min-1	1100 min-1
0C9	FCSOY	670 min-1	670 min-1
0CA	FCS	670 min-1	730 min-1
0CB	FCL	750 min-1	920 min-1
0CC	FCAH	790 min-1	1000 min-1
0CD	FCH	830 min-1	1050 min-1
0CE	FCHM	880 min-1	1090 min-1
0CF	FCHH	880 min-1	1090 min-1
0D5	FDOY	670 min-1	700 min-1
0D6	FDS1	670 min-1	790 min-1
0D7	FDS2	670 min-1	790 min-1
0D8	FCLN	600 min-1	600 min-1
0DE	FWOPN	960 min-1	1250 min-1
0DF	FCOPN	880 min-1	1090 min-1
0E0	FWCLD	960 min-1	1250 min-1
0E1	FCCLD	880 min-1	1090 min-1

MODEL		RAF-25NH4	RAF-50NH4
NO.	LABEL NAME	REQUIRED OF UNIT SIDE	REQUIRED OF UNIT SIDE
0E2	FWUDSS	400 min-1	400 min-1
0E3	FWUDSOY	640 min-1	740 min-1
0E4	FWUDS	640 min-1	740 min-1
0E5	FWUDKAF	710 min-1	860 min-1
0E6	FWUDL	710 min-1	860 min-1
0E7	FWUDAH	750 min-1	950 min-1
0E8	FWUDH	780 min-1	970 min-1
0E9	FWUDHH	870 min-1	990 min-1
0EA	FCUDSOY	600 min-1	660 min-1
0EB	FCUDS	600 min-1	660 min-1
0EC	FCUDL	680 min-1	820 min-1
0ED	FCUDAH	710 min-1	900 min-1
0EE	FCUDH	750 min-1	940 min-1
0EF	FCUDHH	790 min-1	980 min-1
0F5	FWUDOPN	870 min-1	1100 min-1
0F6	FCUDOPN	790 min-1	980 min-1

Table 1 Fan speed by mode

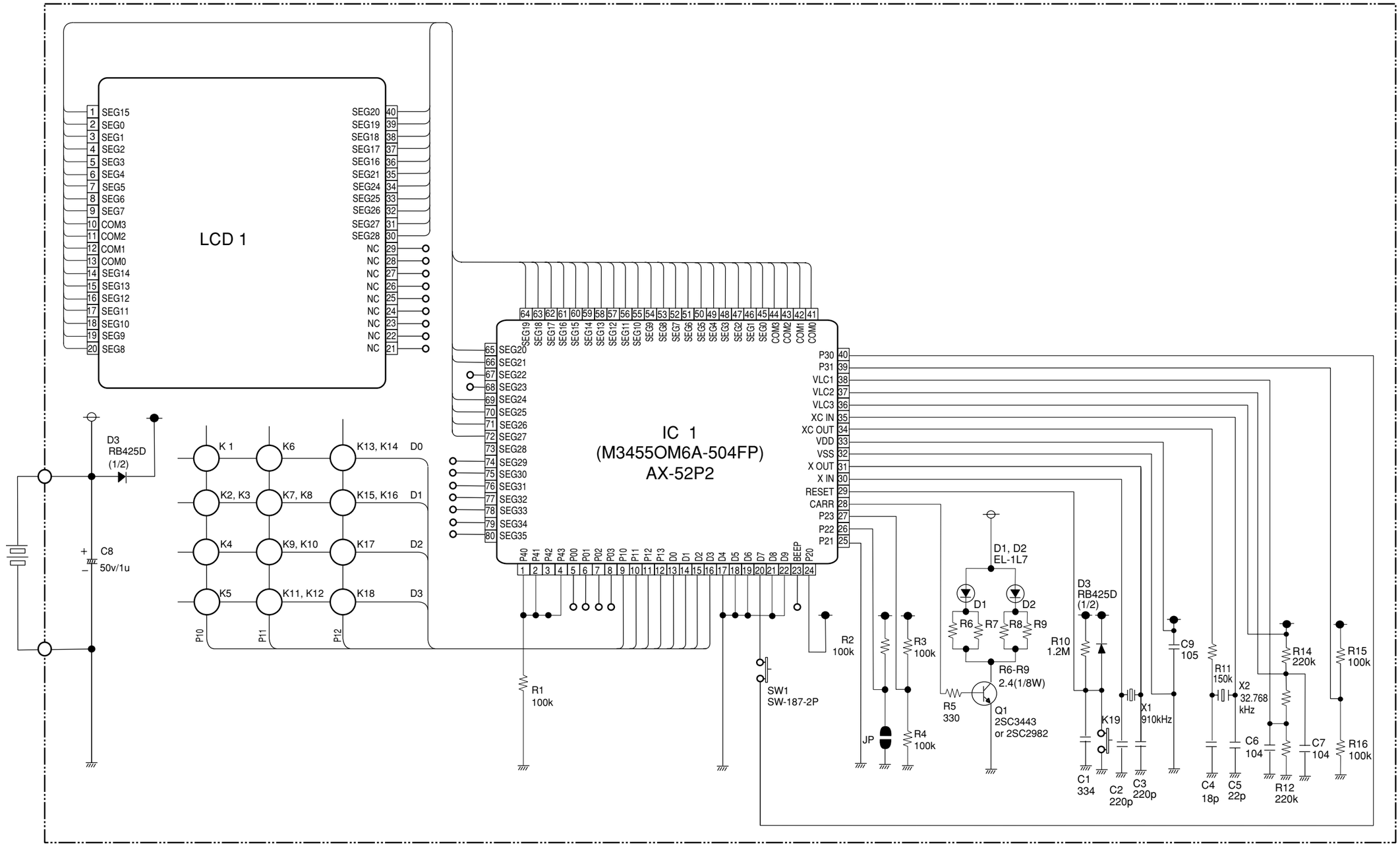
Operation mode				Label name
Heating operation	Upper Fan	Ultra Lo		FWSS
		Sleep		FWSOY
		Lo		FWS
		Overload		FWKAF
		Med		FWL
		Hi	Set fan speed "Hi"	FWH
		Ultra Hi	(When AIR OUTLET SWITCH "ON")	FWHM
		Ultra Hi	(When AIR OUTLET SWITCH "OFF")	FWHH
		Hi	Set fan speed "AUTO"	FWAH
	Lower Fan	Ultra Lo		FWUDSS
		Sleep		FWUDSOY
		Lo		FWUDS
		Overload		FWUDKAF
		Med		FWUDL
		Hi	Set fan speed "Hi"	FWUDH
		Ultra Hi		FWUDHH
		Hi	Set fan speed "AUTO"	FWUDAH
Cooling operation	Upper Fan	Sleep		FCSOY
		Lo		FCS
		Med		FCL
		Hi	Set fan speed "Hi"	FCH
		Ultra Hi	(When AIR OUTLET SWITCH "ON")	FCHM
		Ultra Hi	(When AIR OUTLET SWITCH "OFF")	FCHH
		Hi	Set fan speed "AUTO"	FCAH
	Lower Fan	Sleep		FCUDSOY
		Lo		FCUDS
		Med		FCUDL
		Hi	Set fan speed "Hi"	FCUDH
		Ultra Hi		FCUDHH
		Hi	Set fan speed "AUTO"	FCUDAH
Dehumidifying operation		Sleep		FDOY
		Lo 1		FDS1
		Lo 2		FDS2

Table 2 Room temperature shift value

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

CIRCUIT DIAGRAM

Remote Controller (RAR-2P2)

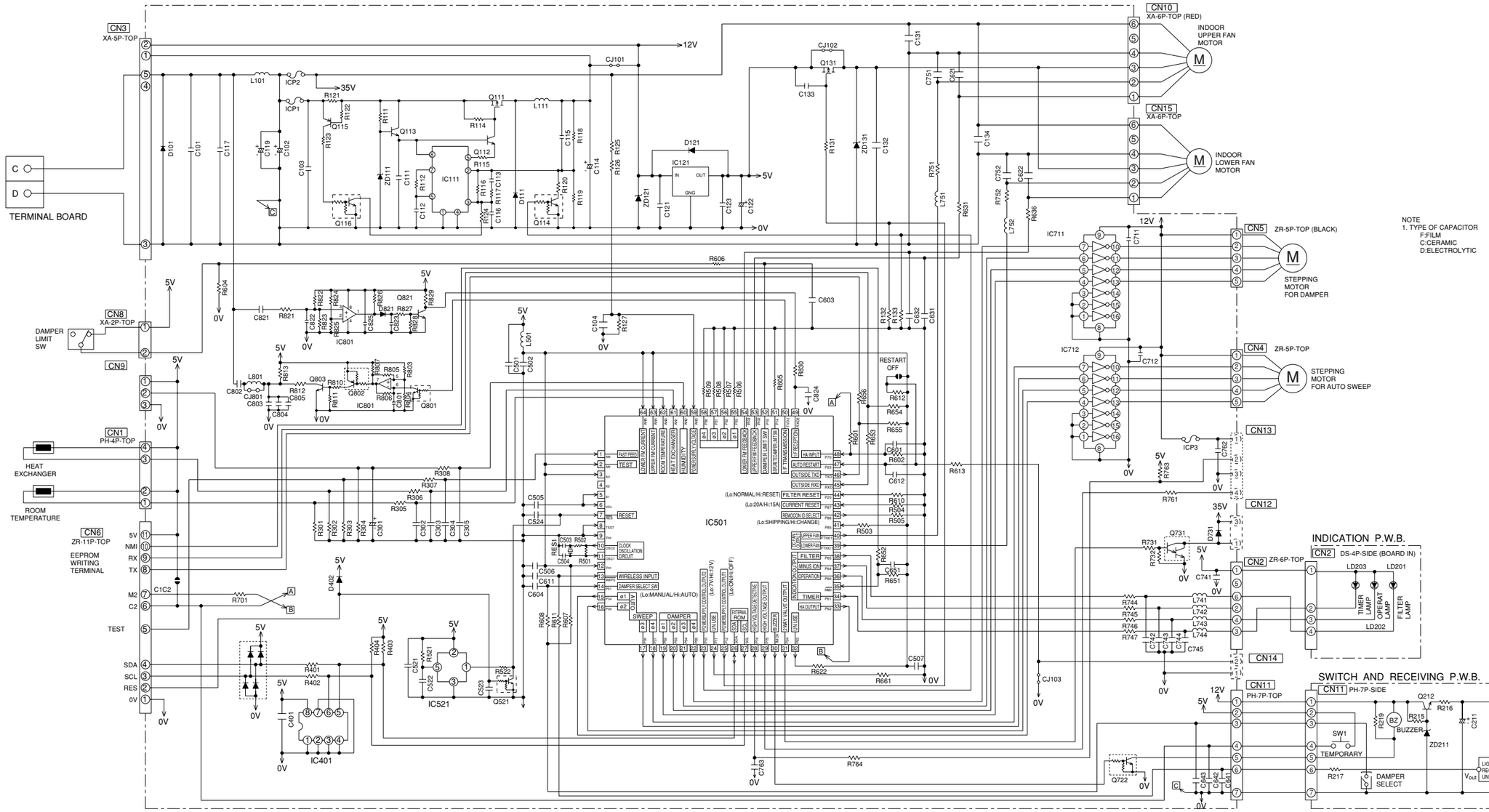


Key matrix table

input \ output		D0	D1	D2	D3
P10	Door open	Start/Stop	Operation selection	Fan speed selection	—
	Door shut	Start/Stop	Dry	—	—
P11	Door open	On timer	Hour up	Hour down	Dry • present time
	Door shut	—	Room temperature up	Room temperature down	—
P12	Door open	Off timer	—	Reservation	Cancel
	Door shut	Sleep	—	—	—
P13	Door open	—	—	—	—
	Door shut	—	—	—	—

CIRCUIT DIAGRAM

MODEL RAF-25NH4, RAF-50NH4



RESISTOR

SYMBOL	RETER Ω	LIMIT	VALUE W
R111	27K	±5%	1/10W
R112	30K	±5%	1/16W
R114	750	±5%	1/8W
R115	560	±5%	1/8W
R116			1/16W
R117	68K	±5%	1/16W
R118	75K	±2%	1/16W
R119	6.8K	±2%	1/16W
R120			1/16W
R121	0.56	±5%	1/4W
R122	100	±5%	1/16W
R123	33K	±5%	1/16W
R124	100	±5%	1/16W
R125	30K	±5%	1/16W
R126	30K	±5%	1/16W
R127	5.1K	±5%	1/16W
R131	5.1K	±5%	1/16W
R132	10K	±5%	1/16W
R133	10K	±5%	1/16W
R215	2.7K	±5%	1/10W
R216	47	±5%	1/10W
R217	1K	±5%	1/8W
R219	3.3K	±5%	1/10W
R301	12.7K	±1%	1/16W
R302	12.7K	±1%	1/16W
R303	10K	±5%	1/16W
R304	100K	±1%	1/16W

SYMBOL	RETER Ω	LIMIT	VALUE W
R305	1K	±5%	1/16W
R306	1K	±5%	1/16W
R307	1K	±5%	1/16W
R308	1K	±5%	1/16W
R401	390	±5%	1/16W
R402	390	±5%	1/16W
R403	5.1K	±5%	1/16W
R404	5.1K	±5%	1/16W
R501	1M	±5%	1/16W
R502	0	±5%	1/16W
R503	10K	±5%	1/16W
R504	10K	±5%	1/16W
R505	10K	±5%	1/16W
R506	10K	±5%	1/16W
R507	10K	±5%	1/16W
R508	10K	±5%	1/16W
R509	10K	±5%	1/16W
R521	1M	±5%	1/16W
R522	1K	±5%	1/16W
R601	1K	±5%	1/16W
R602	10K	±5%	1/16W
R604	10K	±5%	1/16W
R605	1K	±5%	1/16W
R606	1K	±5%	1/16W

SYMBOL	RETER Ω	LIMIT	VALUE W
R607	10K	±5%	1/16W
R608	1K	±5%	1/16W
R610	10K	±5%	1/16W
R611	1K	±5%	1/16W
R612	10K	±5%	1/16W
R613	1K	±5%	1/16W
R631	1K	±5%	1/16W
R636	1K	±5%	1/16W
R651	1K	±5%	1/16W
R652	100	±5%	1/16W
R653	1K	±5%	1/16W
R654	10K	±5%	1/16W
R655	10K	±5%	1/16W
R656	1K	±5%	1/16W
R661	10K	±5%	1/16W
R662	10K	±5%	1/16W
R701	1K	±5%	1/16W
R731	2.7K	±5%	1/16W
R732	10K	±5%	1/16W
R744	300	±5%	1/10W
R745	300	±5%	1/10W

SYMBOL	RETER Ω	LIMIT	VALUE W
R746	300	±5%	1/10W
R747	300	±5%	1/10W
R751	2.7K	±5%	1/16W
R752	2.7K	±5%	1/16W
R761	100	±5%	1/16W
R763	10K	±5%	1/16W
R764	1K	±5%	1/16W
R803	120K	±5%	1/16W
R804	120K	±5%	1/16W
R805	120K	±5%	1/16W
R806	120K	±5%	1/16W
R807	4.3K	±5%	1/16W
R810	680	±5%	1/10W
R811	2K	±5%	1/16W
R812	39	±5%	1/8W
R813	39	±5%	1/8W
R821	1K	±5%	1/16W
R822	10K	±1%	1/16W
R823	10K	±1%	1/16W
R824	8.25K	±1%	1/16W
R825	10K	±1%	1/16W
R826	1K	±5%	1/16W
R827	3K	±5%	1/16W
R828	10K	±5%	1/16W

SYMBOL	RETER Ω	LIMIT	VALUE W
R829	5.1K	±5%	1/16W
R830	1K	±5%	1/16W

IC

SYMBOL	MODEL
IC111	NJM2340M
IC121	LF50CDT
IC401	BR24C04FJ-W
IC501	HD64F36877H
IC521	RN5VD42C
IC711	ULN2003ANS
IC712	ULN2003ANS
IC801	NJM2903M

CHIP JUMPER

SYMBOL	MOUNT	NOTE
CJ101	USE	1608
CJ102	USE	1608
CJ103	USE	1608
CJ801	-	1608

OVER CURRENT PROTECTOR

SYMBOL	MODEL	RATING CURRENT
ICP1	CCP2E-20	0.8A
ICP2	CCP2E-50	2.0A
ICP3	ICP-S0.5	0.5A

CAPACITOR

SYMBOL	RETER VALUE F	V	TYPE
C101	0.22µ	55V	F
C102	330µ	50V	D
C103	470p	630V	C
C104	0.1µ	25V	C
C111	2.2µ	10V	C
C112	1000p	50V	C
C113	0.047µ	25V	C
C114	220µ	25V	D
C115		50V	C
C116		55V	F
C117		50V	D
C119			
C121	0.1µ	25V	C
C122	100µ	10V	D
C123	0.1µ	25V	C
C131	0.22µ	50V	C
C132	0.1µ	25V	C
C133	0.1µ	25V	C
C134	0.22µ	50V	C
C211	47µ	16V	D
C212	0.1µ	25V	C
C301	22µ	4V	D
C302	0.1µ	25V	C
C303	0.1µ	25V	C

SYMBOL	RETER VALUE F	V	TYPE
C304	0.1µ	25V	C
C305	0.1µ	25V	C
C401	0.1µ	25V	C
C501	0.1µ	25V	C
C502	0.1µ	25V	C
C503	12p	50V	C
C504	12p	50V	C
C505	0.1µ	25V	C
C506	0.1µ	25V	C
C507	0.1µ	25V	C
C521	0.1µ	25V	C
C522	0.22µ	10V	C
C523	0.1µ	25V	C
C524	0.1µ	25V	C
C601	0.1µ	25V	C
C603	0.1µ	25V	C
C604	0.1µ	25V	C
C611	1000p	50V	C
C612	0.1µ	25V	C
C621			
C622			

SYMBOL	RETER VALUE F	V	TYPE
C631	1000p	50V	C
C632	1000p	50V	C
C641			
C642			
C643			
C651	0.1µ	25V	C
C711	0.1µ	25V	C
C712	0.1µ	25V	C
C741	0.1µ	25V	C
C742			
C743			
C744			
C745			
C751	1µ	16V	C
C752	1µ	16V	C
C762	0.1µ	25V	C
C763	0.1µ	25V	C
C801	150p	50V	C
C802	0.22µ	55V	F
C803	0.1µ	25V	C
C804		25V	C
C805		25V	C

SYMBOL	RETER VALUE F	V	TYPE
C821	0.01µ	55V	F
C822	1000p	50V	C
C823	0.047µ	25V	C
C824	0.01µ	50V	C
C825	0.1µ	25V	C

TRANSISTOR

SYMBOL	MODEL
Q111	2SJ518
Q112	2SC5209H
Q113	2SC5209H
Q114	RN1102
Q115	2SA1162Y
Q116	RN1102
Q131	2SJ511
Q212	2SC2462LC
Q521	RN1102
Q722	RN1102
Q731	2SD1834
Q801	RN1102
Q802	RN2102
Q803	2SC3441E
Q821	2SC4738GRY

DIODE

SYMBOL	MODEL
D101	DSM3MA2
D111	D1FS6
D121	1SS355
D401	HN1D03FU
D402	1SS355
D731	1SS355
D821	1SS355

ZENER DIODE

SYMBOL	MODEL
ZD111	RD6.2UJN2
ZD121	PTZ20A
ZD131	RLZ6.8A
ZD211	RD5.6UJN2

BUZZER

SYMBOL	MODEL
BZ	PKM13EPY

LIGHT RECEIVING UNIT

SYMBOL	MODEL
IRR	GP1U281R

OSCILLATOR

SYMBOL	MODEL	FREQUENCY
RES1	MA-406-10M	10MHz

COIL

SYMBOL	RATING(H)	RATING CURRENT
L101	82µ	1.3A
L111	560µ	0.4A
L501	SLM11A601SPT	0.2A
L741	CHIP JUMPER	-
L742	CHIP JUMPER	-
L743	CHIP JUMPER	-
L744	CHIP JUMPER	-
L751	SLM11A601SPT	0.2A
L752	SLM11A601SPT	0.2A
L801	100µ	55mA

LED

SYMBOL	MODEL	COLOR
LD201	SEL6814A	YELLOW
LD202	SEL6914A	ORANGE
LD203	SEL6414E	GREEN

SWITCH

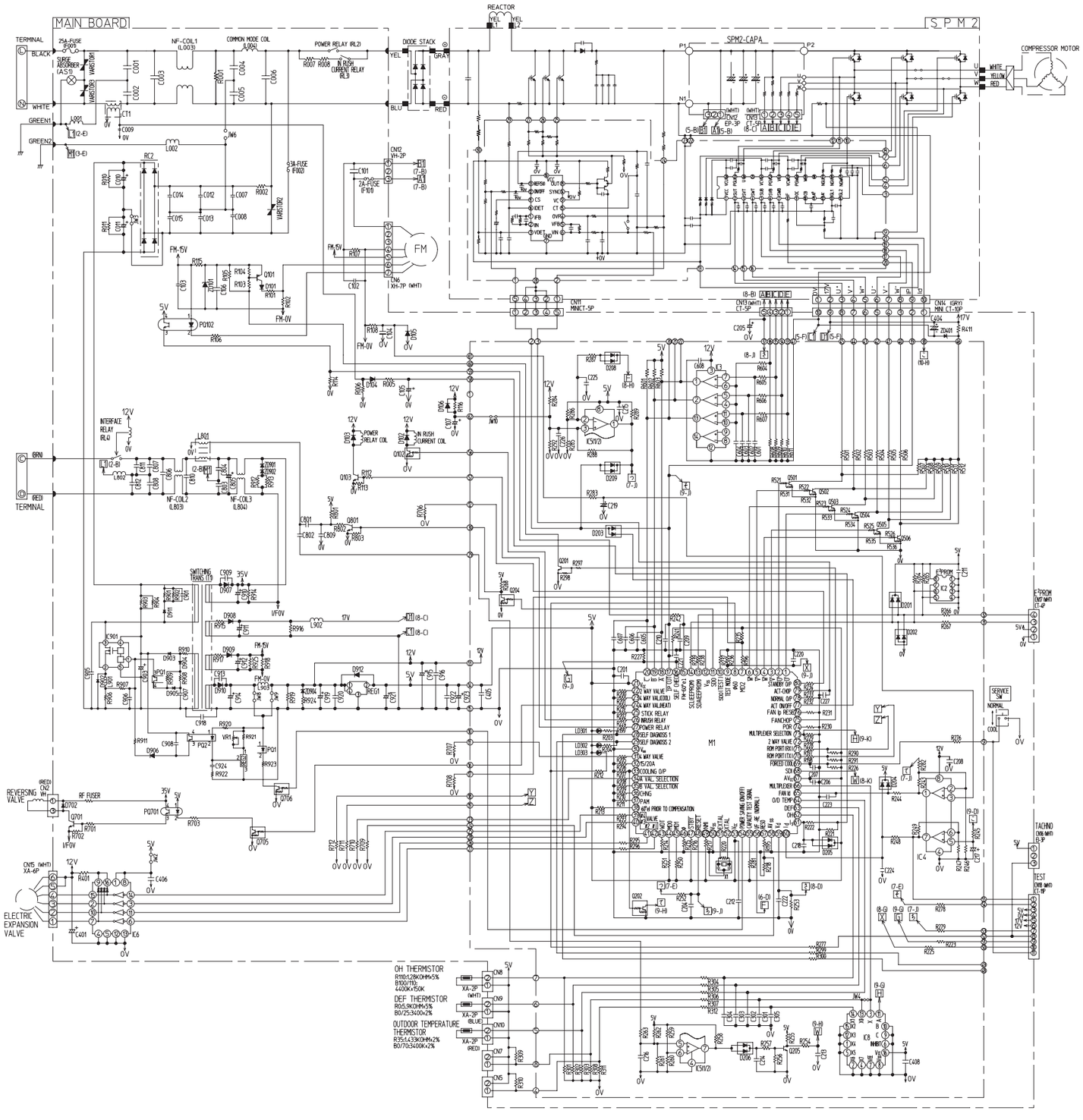
SYMBOL	MODEL
SW1 (TEMPORARY S.W.)	EVQ21509K
SW2 (DAMPER SELECT S.W.)	ESD170206

CONNECTOR

SYMBOL	MODEL
CN1	PH-4P-TOP
CN2	ZR-6P-TOP
CN2	DS-4P-SIDE-(BOARD IN)
CN3	XA-5P-TOP
CN4	ZR-5P-TOP
CN5	ZR-5P-TOP(BLACK)
CN6	ZR-11P-TOP
CN8	XA-2P-TOP
CN9	PH-3P-TOP
CN10	XA-6P-TOP (RED)
CN11	PH-7P-TOP
CN11	PH-7P-SIDE
CN12	SMT-2P-TOP
CN13	ZR-4P-TOP
CN14	
CN15	XA-6P-TOP

CIRCUIT DIAGRAM

MODEL RAC-25NH4, RAC-50NH4



MOUNTING

A: AXIAL
R: RADIAL (R1,R2)
P: RADIAL (7.5MM PITCH)
H: MANUAL INSERT

BOARD

HIC: HYBRID IC
M: MAIN BOARD

COMPONENT TYPE

C: CERAMIC
F: FILM
D: ELECTROLYTIC

RESISTORS

MARK	RATING (R)	(%)	W	MOUNTING	BOARD	REMARK
R001	470K	5%	1/2	A	M	
R002	2.2	5%	5	H	M	CEMENT
R005	1.69K	1%	1/4	A	M	
R006	9K	1%	1/4	A	M	
R007	100	5%	10	H	M	CEMENT
R008	100	5%	10	H	M	CEMENT
R010	470K	5%	1/2	A	M	
R011	470K	5%	1/2	A	M	
R101	3.6K	1%	1/4	A	M	
R102	3K	1%	1/4	A	M	
R103	30K	5%	1/4	A	M	
R104	3.9K	5%	1/4	A	M	
R105	7.5K	5%	1/4	A	M	
R106	2.4K	5%	1/4	A	M	
R107	1	1%	2	P	M	
R108	510	5%	1/4	A	M	
R112	10K	5%	1/4	A	M	
R113	7.5K	5%	1/4	A	M	
R114	1K	5%	1/4	A	M	
R115	JUMPER			A	M	
R116				A	M	
R195	9K	5%	1/16	C	HIC	1608
R196	9K	5%	1/16	C	HIC	1608
R197	9K	5%	1/16	C	HIC	1608
R198	9K	5%	1/16	C	HIC	1608
R199	9K	5%	1/16	C	HIC	1608
R200	10K	5%	1/16	C	HIC	1608
R201	10K	5%	1/16	C	HIC	1608
R202	10K	5%	1/16	C	HIC	1608
R203	390	5%	1/16	C	HIC	1608
R204	390	5%	1/16	C	HIC	1608
R205	9K	5%	1/16	C	HIC	1608
R206	10K	5%	1/16	C	HIC	1608
R207	10K	5%	1/16	C	HIC	1608
R208	9K	5%	1/16	C	HIC	1608
R209	10K	5%	1/16	C	HIC	1608
R210	10K	5%	1/16	C	HIC	1608
R211	10K	5%	1/16	C	HIC	1608
R212	390	5%	1/16	C	HIC	1608
R213	10K	5%	1/16	C	HIC	1608
R214	10K	5%	1/16	C	HIC	1608
R215	10K	5%	1/16	C	HIC	1608
R216	10K	5%	1/16	C	HIC	1608
R217	10K	5%	1/16	C	HIC	1608
R218	10K	5%	1/16	C	HIC	1608
R219	9K	5%	1/16	C	HIC	1608
R220	1M	5%	1/16	C	HIC	1608
R221	10K	1%	1/16	C	HIC	1608
R222	510	5%	1/16	C	HIC	1608
R223	9K	5%	1/16	C	HIC	1608
R224	9K	5%	1/16	C	HIC	1608
R225	9K	5%	1/16	C	HIC	1608
R226	10K	5%	1/16	C	HIC	1608
R227	10K	5%	1/16	C	HIC	1608
R228	10K	5%	1/16	C	HIC	1608
R229	10K	5%	1/16	C	HIC	1608
R230	10K	5%	1/16	C	HIC	1608
R231	10K	5%	1/16	C	HIC	1608
R232	10K	5%	1/16	C	HIC	1608
R233	100	5%	1/16	C	HIC	1608
R234	9K	5%	1/16	C	HIC	1608
R235	10K	5%	1/16	C	HIC	1608
R236	10K	5%	1/16	C	HIC	1608
R237	10K	5%	1/16	C	HIC	1608
R238	100	5%	1/16	C	HIC	1608
R239	100	5%	1/16	C	HIC	1608
R241	5.6K	5%	1/16	C	HIC	1608
R242	9K	5%	1/16	C	HIC	1608
R243	2K	1%	1/16	C	HIC	1608
R244	2K	5%	1/16	C	HIC	1608
R245	10K	5%	1/16	C	HIC	1608
R246	9K	1%	1/16	C	HIC	1608
R247	3.16K	1%	1/16	C	HIC	1608
R248	2K	5%	1/16	C	HIC	1608
R249	20K	1%	1/16	C	HIC	1608
R250	10K	5%	1/16	C	HIC	1608
R251	10K	5%	1/16	C	HIC	1608
R252	5.9K	5%	1/16	C	HIC	1608
R253	3.32K	1%	1/16	C	HIC	1608
R254	100	5%	1/16	C	HIC	1608
R255	2K	5%	1/16	C	HIC	1608
R256	10K	5%	1/16	C	HIC	1608
R257	3K	5%	1/16	C	HIC	1608
R258	1K	5%	1/16	C	HIC	1608
R259	8.25K	1%	1/16	C	HIC	1608
R260	10K	1%	1/16	C	HIC	1608
R261	10K	1%	1/16	C	HIC	1608
R262	10K	1%	1/16	C	HIC	1608
R263	9K	5%	1/16	C	HIC	1608
R264	5.1K	5%	1/16	C	HIC	1608
R265	5.1K	5%	1/16	C	HIC	1608
R266	390	5%	1/16	C	HIC	1608
R267	390	5%	1/16	C	HIC	1608
R268	2K	5%	1/16	C	HIC	2125
R276	100	5%	1/16	C	HIC	1608
R277	100	5%	1/16	C	HIC	1608
R278	100	5%	1/16	C	HIC	1608
R279	100	5%	1/16	C	HIC	1608
R281	10K	5%	1/16	C	HIC	1608
R282		5%	1/16	C	HIC	1608
R283	9K	5%	1/16	C	HIC	1608
R284	10K	2%	1/16	C	HIC	1608
R285	4.7K	2%	1/16	C	HIC	1608
R286	5.1K	2%	1/16	C	HIC	1608
R287			1/16	C	HIC	1608
R288	51K	5%	1/16	C	HIC	1608
R289	5.1K	5%	1/16	C	HIC	1608
R290	10K	5%	1/16	C	HIC	1608
R291	10K	5%	1/16	C	HIC	1608
R292	3K	2%	1/16	C	HIC	1608
R293	100	5%	1/16	C	HIC	1608
R294	100	5%	1/16	C	HIC	1608
R295	100	5%	1/16	C	HIC	1608
R296	100	5%	1/16	C	HIC	1608
R297	10K	5%	1/16	C	HIC	1608
R298	5.1K	5%	1/16	C	HIC	1608
R299	100	5%	1/16	C	HIC	1608
R300	100	5%	1/16	C	HIC	1608
R301	3.74K	1%	1/16	C	HIC	1608
R302	3.01K	1%	1/16	C	HIC	1608
R303	3.01K	1%	1/16	C	HIC	1608
R304	100	5%	1/16	C	HIC	1608
R305	100	5%	1/16	C	HIC	1608
R306	100	5%	1/16	C	HIC	1608
R307	100	5%	1/16	C	HIC	1608

RESISTORS

MARK	RATING (R)	(%)	W	MOUNTING	BOARD	REMARK
R308	3.01K	1%	1/16	C	HIC	1608
R309	5.1K	5%	1/4	A	M	
R310	5.1K	5%	1/4	A	M	
R311	10K	1%	1/16	C	HIC	1608
R312	100	5%	1/16	C	HIC	1608
R401	100	5%	1/4	A	M	
R411	JUMPER					
R501	1K	5%	1/16	C	HIC	1608
R502	1K	5%	1/16	C	HIC	1608
R503	1K	5%	1/16	C	HIC	1608
R504	1K	5%	1/16	C	HIC	1608
R505	1K	5%	1/16	C	HIC	1608
R506	1K	5%	1/16	C	HIC	1608
R507	5.1K	5%	1/8	C	HIC	3216
R508	5.1K	5%	1/8	C	HIC	3216
R509	5.1K	5%	1/8	C	HIC	3216
R510	5.1K	5%	1/8	C	HIC	3216
R511	5.1K	5%	1/8	C	HIC	3216
R512	5.1K	5%	1/8	C	HIC	3216
R521	10K	5%	1/16	C	HIC	1608
R522	10K	5%	1/16	C	HIC	1608
R523	10K	5%	1/16	C	HIC	1608
R524	10K	5%	1/16	C	HIC	1608
R525	10K	5%	1/16	C	HIC	1608
R526	10K	5%	1/16	C	HIC	1608
R531	5.1K	5%	1/16	C	HIC	1608
R532	5.1K	5%	1/16	C	HIC	1608
R533	5.1K	5%	1/16	C	HIC	1608
R534	5.1K	5%	1/16	C	HIC	1608
R535	5.1K	5%	1/16	C	HIC	1608
R536	5.1K	5%	1/16	C	HIC	1608
R601	2K	5%	1/16	C	HIC	1608
R602	2K	5%	1/16	C	HIC	1608
R603	2K	5%	1/16	C	HIC	1608
R604	100	5%	1/16	C	HIC	1608
R605	100	5%	1/16	C	HIC	1608
R606	100	5%	1/16	C	HIC	1608
R607	100	5%	1/16	C	HIC	1608
R608	4.02K	1%	1/16	C	HIC	1608
R609	4.02K	1%	1/16	C	HIC	1608
R610	4.02K	1%	1/16	C	HIC	1608
R611	4.02K	1%	1/16	C	HIC	1608
R701	7.5K	5%	1/2	A	M	
R702	10K	5%	1/4	A	M	
R703	470	5%	1/4	A	M	
R706	10K	5%	1/4	A	M	
R707	10K	5%	1/4	A	M	
R708						
R709						
R710	10K	5%	1/4	A	M	
R711						
R712						
R801	39	5%	1/4	A	M	
R802	39	5%	1/4	A	M	
R803	3K	5%	1/4	A	M	
R901	200K	5%	1/2	A	M	
R902	200K	5%	1/2	A	M	
R903	820K	5%	1/2	A	M	
R904	820K	5%	1/2	A	M	
R906	0.39	5%	2	P	M	
R907	680	5%	1/4	A	M	
R908	2.7K	5%	1/4	A	M	
R909	2.7K	5%	1/4	A	M	
R910	6.2	5%	1/2	A	M	
R911	4.3K	5%	1/4	A	M	
R912	270	5%	2	H	M	
R913		0.01				
R914	47K	5%	1/4	A	M	
R915	JUMPER			A	M	
R916	15K	5%	1	A	M	
R917	3.3	5%	1	P	M	
R918	1K	5%	1	P	M	
R919	3K	5%	1/4	A	M	
R920	680	5%	1/4	A	M	
R921				A	M	
R922	JUMPER			A	M	
R923	1K	5%	1/4	A	M	
R924						
R925						

CAPACITORS

MARK	RATING (uF)	(V)	CURRENT TYPE	MOUNTING	BOARD	REMARK
C001	0.01	250	C	P	M	
C002	0.01	250	C	P	M	
C003	0.68	250/275V	F	H	M	
C004						
C005						
C006	2	400	F	H	M	MITACHI
C007	0.01	250	C	P	M	(RAC-50NH4 ONLY)
C008	0.01	250	C	P	M	(RAC-50NH4 ONLY)
C009	0.1	50	C	R	M	
C010	100	250	D	R	M	
C011	100	250	D	R	M	
C012	0.01	250	C	R	M	
C013	0.01	250	C	R	M	
C014	0.01	250	C	R	M	
C015	0.01	250	C	R	M	
C101	0.082	630	F	H	M	
C102						
C103	0.1	50	C	R	M	
C104	1000P	50	C	R	M	
C105	100	10	D	R	M	VR
C106						
C107	2.2	50	D	R	M	VR
C201	0.047	25	C	C	HIC	1608
C204	0.047	25	C	C	HIC	1608
C205	1	50	D	R	M	VR
C206	0.047	25	C	C	HIC	1608
C207	0.1	25	C	C	HIC	1608
C208	0.047	25	C	C	HIC	1608
C209	0.047	25	C	C	HIC	1608
C210	0.0047	50	C	C	HIC	1608
C211	0.047	25	C	C	HIC	1608
C212	0.047	25	C	C	HIC	1608
C213	0.047	25	C	C	HIC	1608
C214	0.068	16	C	C	HIC	1608
C215	0.047	25	C	C	HIC	1608
C216	0.0047	50	C	C	HIC	WX
C217	22	6.3	C	C	HIC	1608
C218	0.1	16	C	C	HIC	1608
C219	2.2	50	D	C	HIC	WX
C220	0.047	25	C	C	HIC	1608
C221	0.1	25	C	C	HIC	1608
C222	0.1	16	C	C	HIC	1608
C223	0.01	50	C	C	HIC	1608
C224	0.01	50	C	C	HIC	1608
C225	0.01	50	C	C	HIC	1608
C226	0.1	16	C	C	HIC	1608
C227	2200p	50	C	C	HIC	
C301	0.1	16	C	C	HIC	1608
C302	0.1	16	C	C	HIC	1608
C303	0.1	16	C	C	HIC	1608
C304	0.1	16	C	C	HIC	1608
C305	0.1	16	C	C	HIC	1608
C401	100	25	D	R	M	VR
C404	100	25	D	R	M	PF
C405	0.1	16	C	C	HIC	1608
C406	0.1	50	C	R	M	
C408	0.1	16	C	C	HIC	1608
C601	0.00068	50	C	C	HIC	2125
C602	0.00068	50	C	C	HIC	2125
C603	0.00068	50	C	C	HIC	2125
C604	0.00068	50	C	C	HIC	2125
C605	0.001	50	C	C	HIC	1608
C606	0.001	50	C	C	HIC	1608
C607	0.001	50	C	C	HIC	1608
C608	0.047	25	C	C	HIC	1608
C801	0.15	50	F	R	M	
C802	0.022	50	F	R	M	
C803	0.01	250	C	P	M	
C804	0.01	250	C	P	M	
C805	68	50	D	R	M	PF
C806	0.15	50	F	R	M	
C807	0.01	250	C	P	M	
C808	0.01	250	C	P	M	
C809	0.15	50	C	R	M	
C810						
C811	0.01	250	C	P	M	(RAC-50NH4 ONLY)
C812	0.01	250	C	P	M	(RAC-50NH4 ONLY)
C901	0.01	1K	C	H	M	
C903	120	25	D	R	M	
C905	1000P	2K	C	P	M	LXV
C906	470p	50	C	R	M	
C907	1800p	50	C	R	M	
C908	0.1	50	C	R	M	
C909						
C910	330	50	D	R	M	LXV
C911	220	25	D	R	M	LXV
C912	330	25	D	R	M	PF
C913						
C914	470	16	D	R	M	PF
C915	120	16	D	R	M	LXV
C916	0.1	50	C	R	M	
C918	0.001	250	C	P	M	
C919						
C920	0.1	50	C	R	M	
C921	180	10	D	R	M	PF
C922	0.1	50	C	R	M	
C923	180	10	D	R	M	PF
C924	0.1	50	C	R	M	

ICS

MARK	MODEL	MOUNTING	BOARD	REMARK
IC901	STR-F6523	H	M	
REG1	PQ05RD08	H	M	
REG2	SE012N	H	M	
IC2	S24C02BFJ-TB	S	HIC	
IC3	NJM2901M-TE1	S	HIC	
IC4	NJM2904M-TE3	S	HIC	
IC5	NJM2903V-TE1	S	HIC	
IC6	M54567P	H	M	
IC8				
M1	AX-8N00	Q	HIC	

SURGE PROTECTORS

MARK	MODEL	MOUNTING	BOARD	REMARK
VARISTOR1	450NR12D	P	M	
VARISTOR2	450NR12D	P	M	
VARISTOR3	450NR12D	P	M	
AS1	RA-102M-C6-Y	H	M	

SWITCH

MARK	MODEL	MOUNTING	BOARD	REMARK
SW1	KSM0612BTS	R	M	

RELAYS

MARK	MODEL	MOUNTING	BOARD	REMARK
POWER RELAY (RL2)	G4A-1A-PE	H	M	
INTERFACE R (RL4)	FTR-F3AA012E	H	M	
IN RUSH C.R (RL3)	FTR-F3AA012E	H	M	

LEDS

MARK	MODEL	MOUNTING	BOARD	REMARK
LD301	LT1D67A	C	HIC	RED
LD302	LT1D67A	C	HIC	RED
LD303	LT1D67A	C	HIC	RED

ZENER DIODES

MARK	MODEL	MOUNTING	BOARD	REMARK
ZD101				
ZD401				
ZD901	HZ12CPTK	H	M	
ZD902	HZ12CPTK	H	M	
ZD904				

TRANSISTORS

MARK	MODEL	R	MOUNTING	BOARD	REMARK
Q101	2SA673	R	M		
Q102	DTC114YSATP	R	M		
Q103	2SC3246	R	M		
Q201	2SC2462LC	C	HIC		
Q202		C	HIC		
Q204	RN1402	C	HIC		
Q205	2SC2462LC	C	HIC		
Q501	2SC2462LC	C	HIC		
Q502	2SC2462LC	C	HIC		
Q503	2SC2462LC	C	HIC		
Q504	2SC2462LC	C	HIC		
Q505	2SC2462LC	C	HIC		
Q506	2SC2462LC	C	HIC		
Q701	2SC1214CTZ	R	M		
Q705	DTC114YSATP	R	M		
Q706	DTC114YSATP	R	M		
Q801	2SC1214CTZ	R	M		

CONNECTORS

MARK	MODEL	MOUNTING	BOARD	REMARK
CN2	B2P3-VH-R	H	M	
CN6	B5P-2.3B-XH-A	H	M	
CN8	B02B-XASK-1N	H	M	
CN9	B02B-XAEK-1	H	M	
CN10	B02B-XARK-1	H	M	
CN11	0-353297-5	H	M	
CN12	B2P3-VH	H	M	
CN13	0-175487-5	H	M	
CN14	1-353297-0	H	M	
CN15	B08-XASK-1N	H	M	
CN16				
CN17	0-175487-4	H	M	
CN18	1-175487-1	H	M	

PHOTOCOUPLERS

MARK	MODEL	MOUNTING	BOARD	REMARK
PQ1	TLP521-1	H	M	
PQ2	TLP521-1	H	M	
PQ102	TLP521-1	H	M	
PQ701	TLP521-1	H	M	

VARIABLE RESISTOR

MARK	RATING	MOUNTING	BOARD	REMARK
VR1	200Ω,300mV	A	M	

FUSE

MARK	MODEL	MOUNTING	BOARD	REMARK
RF FUSER	JUMPER	A	M	
F001	250VTLNC25A	H	M	250V,25A
F002	N20SL-250-3A	H	M	250V, 3A
F101	N20SL-250-2A	H	M	250V, 2A

OSCILLATOR

MARK	MODEL	MOUNTING	BOARD	REMARK
X1	CSTCV6MXJ0C3	C	HIC	6MHZ

JUMPERS

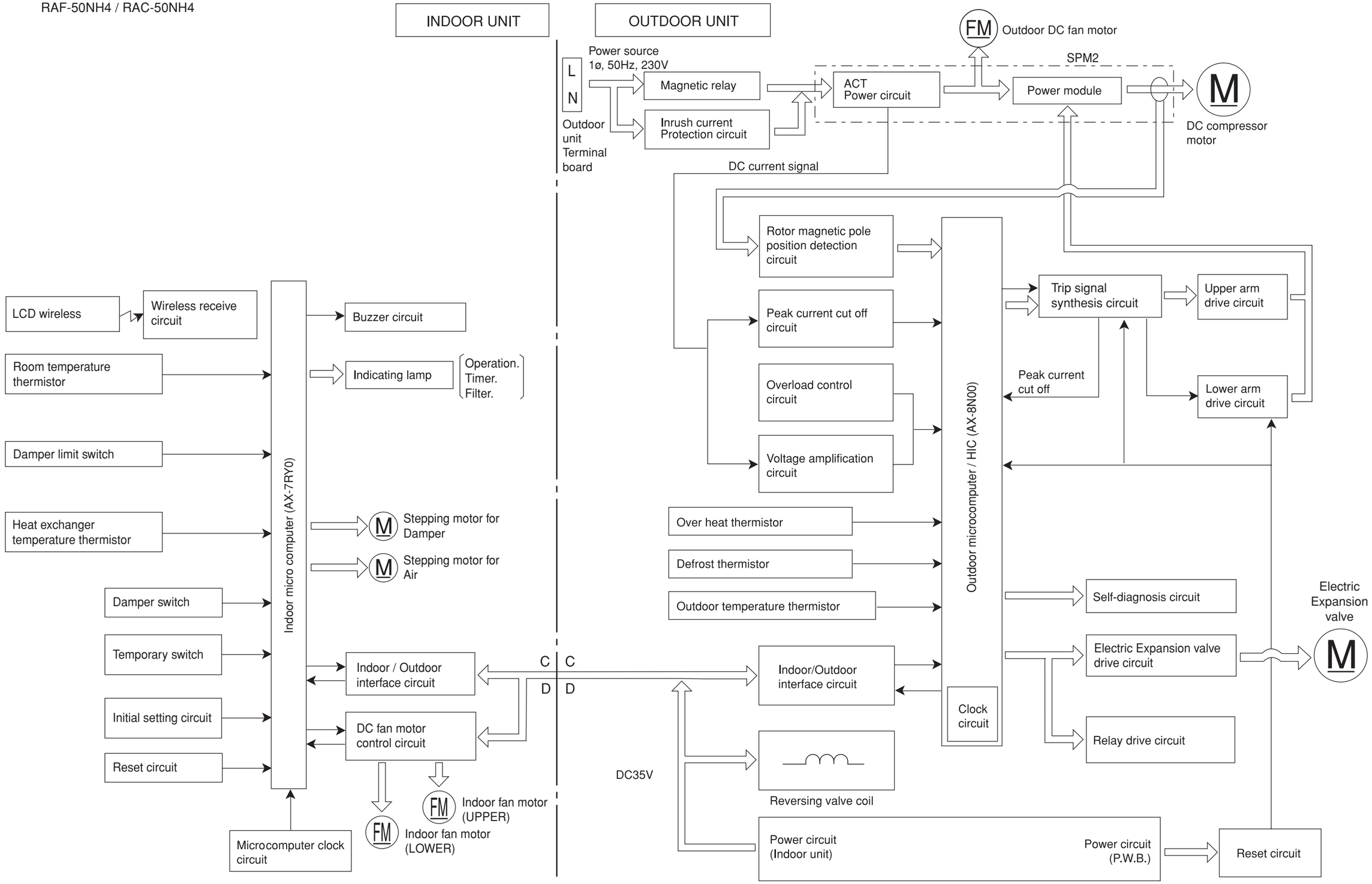
MARK	MODEL	MOUNTING	BOARD	REMARK
JW2	EXIST	A	M	
JW3	NONE	A	M	
JW4	CHIP JUMPER	C	HIC	
JW6	NONE	A	M	
JW8	EXIST	A	M	
JW9	NONE	A	M	
JW10	CHIP JUMPER	C	HIC	

DIODES

MARK	MODEL	MOUNTING	BOARD	REMARK
D101	1N4936	A	M	
D102	1N4148	A	M	
D103	1N4148	A	M	
D104	1N4148	A	M	
D105	1N4148	A	M	
D106				
D201	HSM2838CTR	C	HIC	
D202	HSM2836CTL	C	HIC	
D203	HSM2836CTL	C	HIC	
D204	HSM2838CTR	C	HIC	
D205	HSM2838CTR	C	HIC	
D206	HSM2838CTR	C	HIC	
D208	HSM2838CTR	C	HIC	
D209	HSM2838CTR	C	HIC	
D702	1N4148	A	M	
D902	1N4148	A	M	
D903	RMPG06G	A	M	
D904	RMPG06G	A	M	
D905	1N4148	A	M	
D906	1N4148	A	M	
D907	RN37-N	H	M	
D908	1N4936	A	M	
D909	1N4936	A	M	
D910	RK36	A	M	
D911	RU1P	A	M	
D912	1N4148	A	M	
RC2	D3SBA60	H	M	

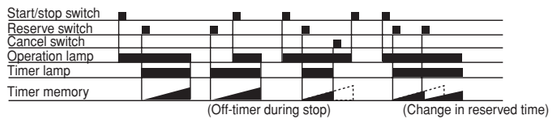
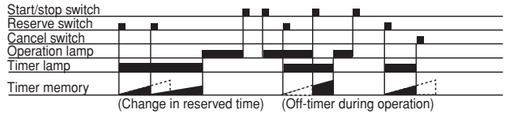
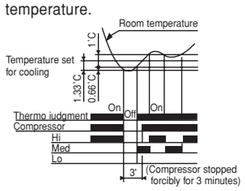
BLOCK DIAGRAM

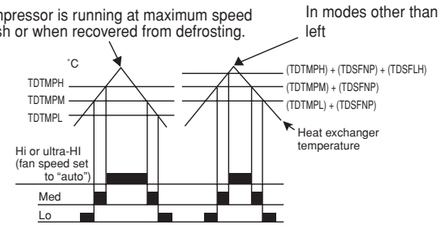
MODEL RAF-25NH4 / RAC-25NH4
RAF-50NH4 / RAC-50NH4



BASIC MODE

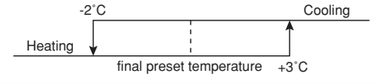
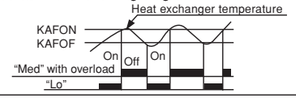
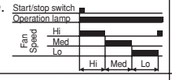
MODEL RAF-25NH4, RAF-50NH4

<table>
<tr><th colspan="2">Operation mode</th><th>Fan</th><th>Cooling</th><th>Dehumidifying</th><th>Heating</th><th>Auto</th></tr>
<tr><td colspan="2">Basic operation of start/stop switch</td><td colspan="5"> 
</td></tr>
<tr><td rowspan="2">Timer functions</td><td>Off-timer</td><td colspan="5"> 
</td></tr>
<tr><td>On-timer</td><td colspan="5"> 
</td></tr>
<tr><td rowspan="5">Fan speed mode (indoor fan)</td><td>Auto</td><td></td><td>Changes from “Hi” to “Med” depending on room temperature.
 

1. Runs at “Hi” until first thermo off after operation is started.
2. Runs at “Lo” when thermo is off.</td><td></td><td>Set to “ultra-Lo”, “Lo”, “Med”, “Hi”, “ultra-Hi” or “stop” depending on the room temperature, time and heat exchange temperature. Set to “stop” if the room temperature is 18˚C in the “ultra-Lo” mode other than during preheating (cooling is recovered at 18.33˚C).
 
</td><td>Operating mode is judged by room temperature and outdoor temperature.

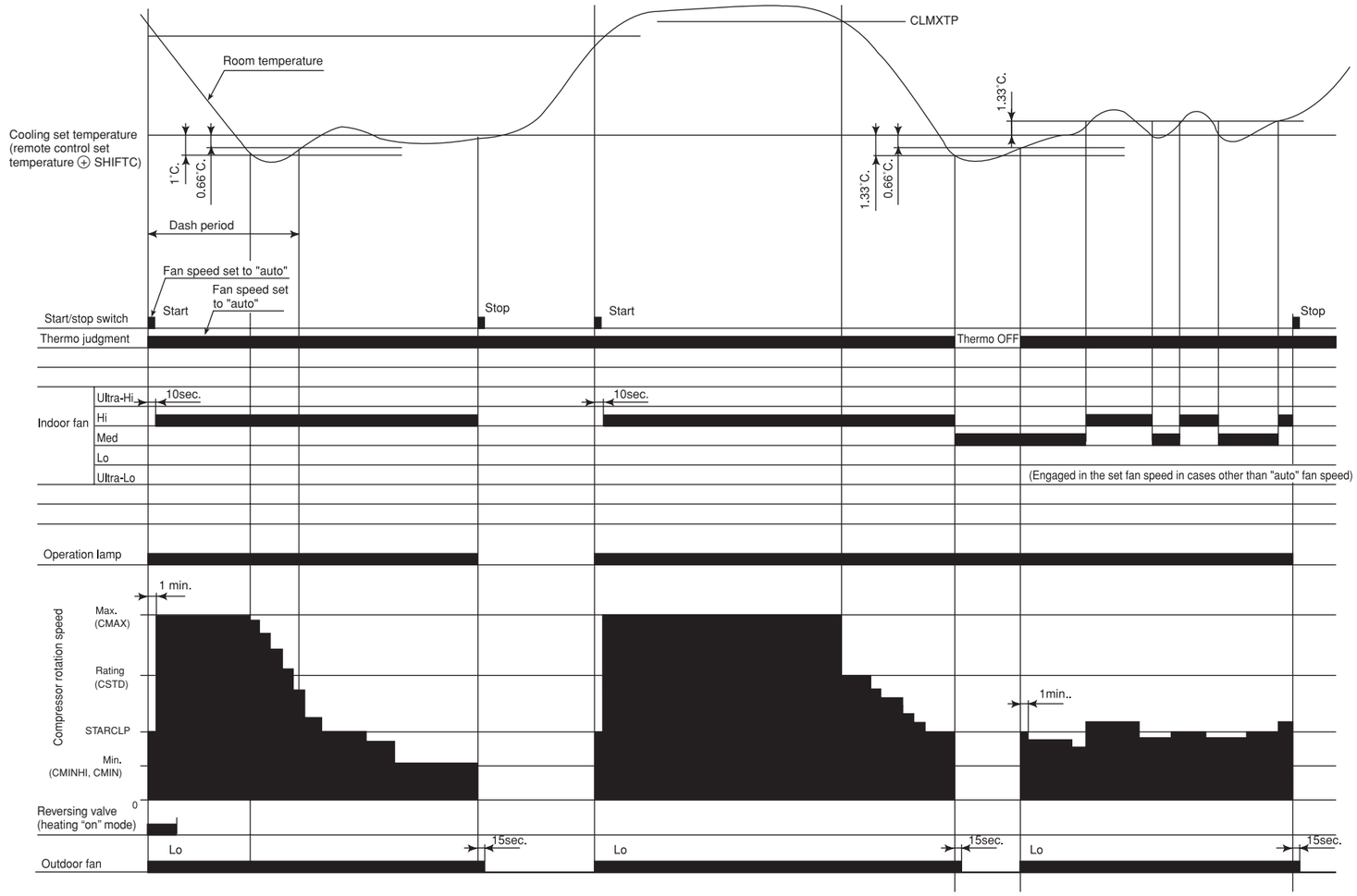
(1) Judging by outdoor temperature
• Operating mode is judged by outdoor temperature.
Only when the mode is not restricted by this judgment, the judgment by room temperature in the next paragraph will be performed.
(a) Outdoor temperature ≥ 27˚C : Restricted to cooling
(b) Outdoor temperature ≤ 16˚C : Restricted to heating

(2) Judging by room temperature
• Operating mode at start up is judge (Initial judgement)
(a) Conditions for judgment (any of the followings)
• When auto operation is started after 1 hour has elapsed since the operation was stopped.
• When auto operation is started after the previous manual mode operation.
• When the operating: mode is switched to auto while operating at manual mode.
(b) Judging method
• Room temperature ≥ 22˚C ±3˚C : Cooling
• Room temperature < 22˚C ±3˚C : Heating
※±3˚C is the fine adjustment value from the remote controller.
 

Judging operating mode change during operation (Continuous judgment)
(a) Conditions for judgment (any of the followings)
• The mode is reviewed at every interval time.
• When auto operation is started again before 1 hour has elapsed since the operation was stopped.
(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 the sum of the basic preset temperature and each type of shift value (e.g. ±3˚C by remote controller, preset temperature correction value, powerful shift value, etc.).
[Currently cooling]
• Room temperature ≤ Final preset temperature -2˚C Change to heating
• Room temperature > Final preset temperature -2˚C Continue cooling
[Currently heating]
• Room temperature ≥ Final preset temperature +3˚C Change to cooling
• Room temperature < Final preset temperature +3˚C Continue heating
 
</td></tr>
<tr><td>Hi</td><td>Operates at “Hi” regardless of the room temperature.</td><td>Set to “ultra-Hi” when the compressor runs at maximum speed, and to “Hi” in other modes.</td><td></td><td>Set to “ultra-Lo”, “Lo”, “Med”, “Hi”, “ultra-Hi” or “stop” depending on the room temperature, and time.
Set to “stop” if the room temperature is 18˚C in the “ultra-Lo” mode other than during preheating (cooling is recovered at 18.33˚C).
Set to “ultra-Hi” when the compressor is running at maximum speed during hot dash or when recovered from defrosting.</td><td></td></tr>
<tr><td>Med</td><td>Operates at “Med” regardless of the room temperature.</td><td>Same as at left.</td><td></td><td>Set to “ultra-Lo”, “Lo”, “Med” or “stop” depending on the room temperature and time. Set to “stop” if the room temperature is 18˚C in the “ultra-Lo” mode other than during preheating (cooling is recovered at 18.33˚C).</td><td></td></tr>
<tr><td>Lo</td><td>Operates at “Lo” regardless of the room temperature.</td><td>Same as at left.</td><td>Set to “Lo” in modes other than when the compressor stops.</td><td>Set to “ultra-Lo”, “Lo”, or “stop” depending on the room temperature and time. Set to “stop” if the room temperature is 18˚C in the “ultra-Lo” mode other than during preheating (cooling is recovered at 18.33˚C). The fan speed is controlled by the heat exchanger temperature; the overload control is executed as in the following diagram:
 
</td><td></td></tr>
<tr><td colspan="2">Basic operation of temperature controller</td><td>Performs only fan operation at the set speed regardless of the room temperature.
 
</td><td>See page 33.</td><td>See page 36.</td><td>See page 38.</td><td></td></tr>
<tr><td colspan="2">Sleep operation (with sleep button ON)</td><td>• Enters sleep operation after set as on the left.
• Action during sleep operation
Lo (sleep) operation</td><td>• Same as at left.
• See page 34.</td><td>• Same as at left
• See page 37.</td><td>• Same as at left
• See page 41.</td><td>• Same as at left.
• Performs the sleep operation of each operation mode.</td></tr>
</table>

Notes:
1. The speed set of rotation for the fan motor in each operation mode are as shown in Table 1.
2. The set room temperatures in the diagram include the shift values in Table 2.
3. See "Damper control theory" for damper control and upper / lower fan operations.

Basic Cooling Operation



Notes:

(1) Cool dash is started when the operation is started at fan speed "AUTO" or "HI" or when the fan speed is changed to "AUTO" or "HI" during cooling operation, and when the compressor speed (P item) reaches CMAX or higher (See Table 1).

(2) The maximum compressor speed period during cool dash is finished ① when 25 minutes have elapsed after cool dash was started ② when the room temperature reaches the cooling set temperarure -1˚C (including cooling shift) and then becomes lower than the preset temperature by 0.66˚C after the steady speed period, ③ when thermo is OFF.
(if cool dash finished in the above ①, the compressor does not go through the steady speed period but it starts fuzzy control.)

(3) The thermo OFF temperature during cool dash is cooling set temperature (including cooling shift) -3˚C. After thermo OFF, cool dash is finished and fuzzy control starts.

(4) The compressor minimum ON time and minimum OFF time is 3 minutes.

(5) The time limit for which the maximum compressor speed (CMAX) during normal cooling can be maintained is less than 60 minutes when the room temperature is less than CLMXTP: it is not provided when the room temperature is CLMXTP or more.

(6) If the fan speed is set to "Med" by remote control, the maximum compressor speed is CJKMAX.

(7) If the fan speed is set to "Lo" by remote control, the maximum compressor speed is CBEMAX.

(8) If the fan speed is set to "Hi" by remote control and both the room temperature and outside temperature (data from the outdoor unit) satisfy the condensation condition in Table 2, the maximum compressor speed is CKYMAX.

(9) While the cooling thermo is OFF, the indoor fan speed is maintained at the preset fan speed.

(10) See "Damper control theory" for damper control and upper / lower fan operations.

Table 1 The temperature differences and compressor speed

① Model : RAF-25NH4

Compressor speed (P item)	Room temperature-setting temperature (including shift)
1900min^{-1}	1.00˚C
2100min^{-1}	1.33˚C
2600min^{-1}	1.66˚C
3100min^{-1}	2.00˚C
3600min^{-1}	2.33˚C

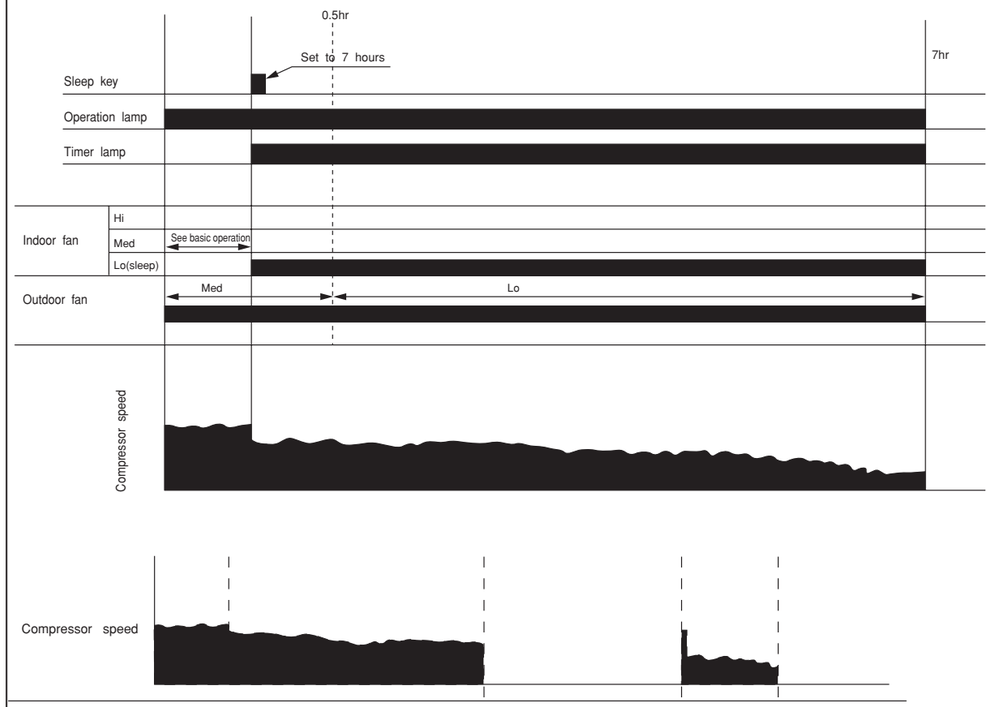
② Model : RAF-50NH4

Compressor speed (P item)	Room temperature-setting temperature (including shift)
2400min^{-1}	1.33˚C
2900min^{-1}	1.66˚C
3400min^{-1}	2.00˚C
3900min^{-1}	2.33˚C
4400min^{-1}	2.66˚C
4900min^{-1}	3.00˚C
5400min^{-1}	3.33˚C
5900min^{-1}	3.66˚C

Table 2 Condensation Condition Criterion Value

Item		Temperature
Room temperature	Condensation condition (engaged)	30˚C
	Condensation condition (released)	32˚C
Outdoor temperature	Condensation condition (engaged)	32˚C
	Condensation condition (released)	34˚C

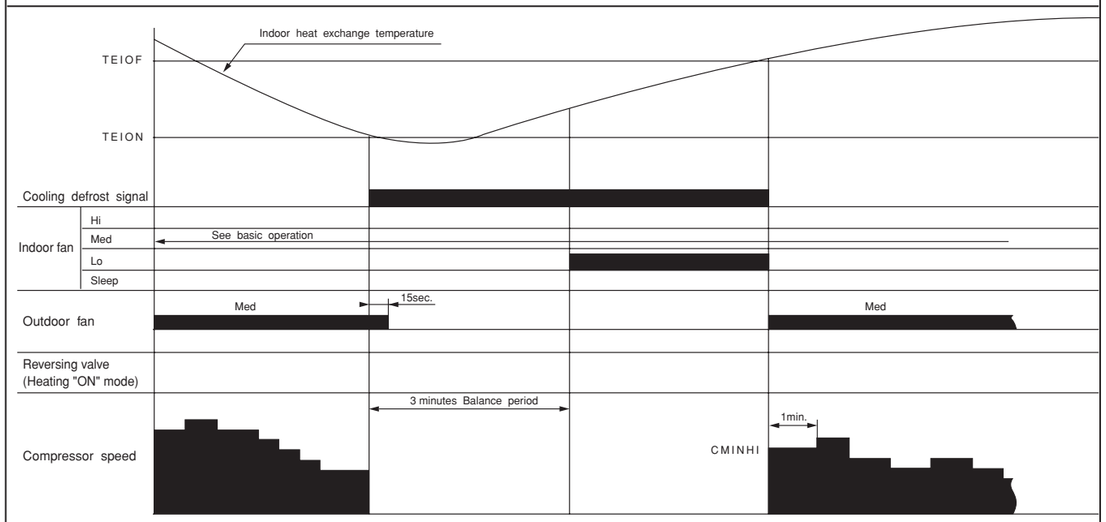
Cooling Sleep Operation



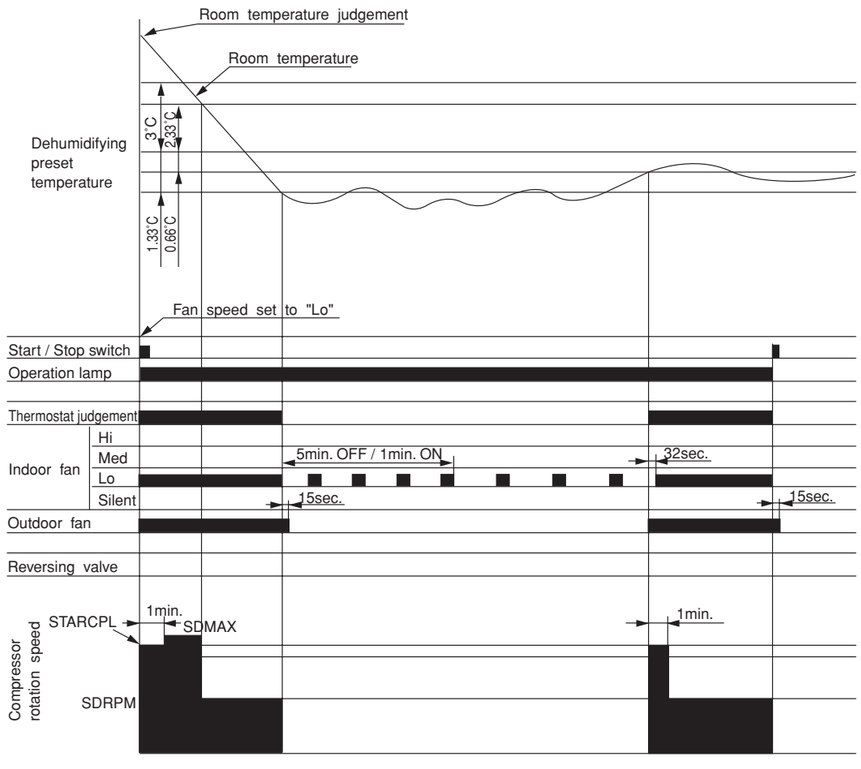
Notes:

(1) The sleep operation starts when the sleep key is pressed.
(2) When the sleep key is set, the maximum compressor speed is limited to CBEMAX, and the indoor fan is set to “sleep, silent” (FCSOY).
(3) If the operation mode is changed during sleep operation, the set temperature is cleared, and shift starts from the point when switching is made.
(4) The indoor fan speed does not change even when the fan speed mode is changed.
(5) When operation is stopped during sleep operation, the set temperature when stopped, as well as the time, continue to be counted.
(6) If the set time is changed during sleep operation, all data including set temperarure, time, etc. is cleared and restarted.
(7) If sleep operation is canceled by the cancel key or sleep key, all data is cleared.
(8) The indoor fan is stopped while the thermo is OFF during sleep operation.
(9) There is no preset temperature shift due to time elapse.

Cooling Defrost



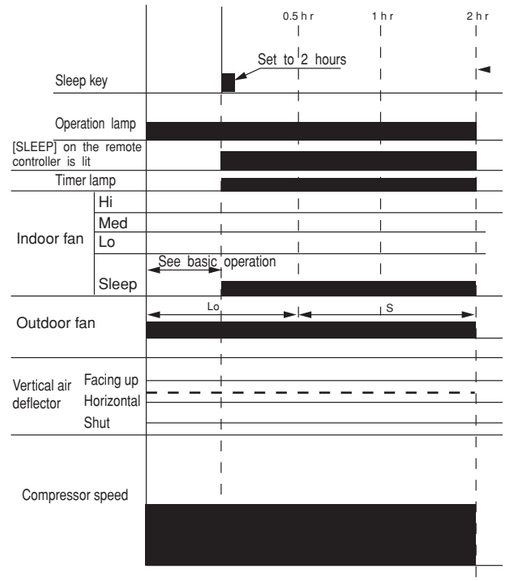
Dehumidifying



Notes:

(1) The indoor fan is operated in the "Lo" or "Silent" mode, OFF for 5 minutes and ON for 1 minute, repeatedly according to the humidity judgement when the thermostat is turned OFF.
(2) 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.
(3) The compressor is operated forcedly for 3 minutes after operation is started.
(4) The minimum ON time and OFF time of the compressor are 3 minutes.

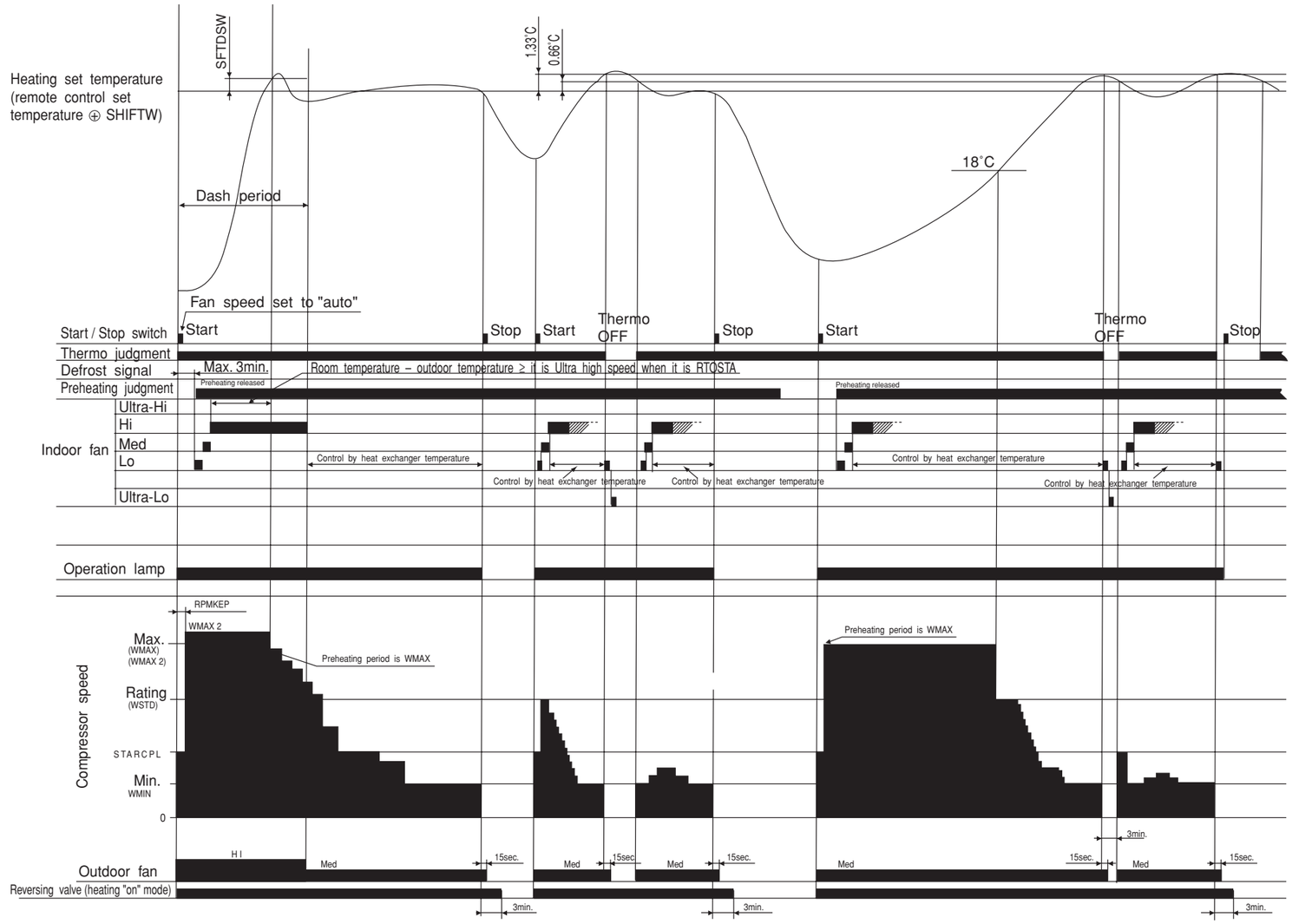
Dehumidifying Sleep Operation



Notes:

(1) The sleep operation starts when the sleep key is pressed.
(2) When the sleep key is set, the indoor fan is set to "Sleep Silent" (FDOY)
(3) If the operation mode is changed during sleep operation, the set temperature is cleared, and shift starts from the point when switching is made.
(4) The indoor fan speed does not change even when the fan speed mode is changed.
(5) When operation is stopped during sleep operation, the set temperature when stopped, as well as the time, continue to be counted.
(6) If the set time is changed during sleep operation, all data including set temperature, time, etc. is cleared and restarted.
(7) If sleep operation is canceled by the cancel key or sleep key, all data is cleared.
(8) The indoor fan is stopped while the thermo is OFF during sleep operation.
(9) There is no preset temperature shift due to time elapse.

Heating Basic Operation



Notes:

(1) Hot dash is engaged if the difference between the room temperature and set temperature is equal to that between the room temperature, at which the compressor reaches maximum speed, and set temperature (See Table 1), and the room and outdoor temperatures are less than 10˚C; when the fan speed is "auto", operation is started at "Hi", or the fan speed is changed to "Hi" during heating.

(2) The maximum compressor speed period during hot dash is finished (1) when the room temperature reaches the heating set temperature (including heating shift) plus SFTDSW or (2) when the thermo is off.

(3) The thermo OFF temperature during hot dash is heating set temperature (including heating shift) plus 3˚C. After thermo OFF, hot dash finishes, and FUZZY control start.

(4) The compressor minimum ON time and minimum OFF time is 3 minutes.

(5) The time limit for which the maximum compressor speed (WMAX) or (WMAX2) during normal heating (except for hot dash) can be maintained is less than 120 minutes when the room temperature is 18˚C or more; it is not provided when the room temperature is less than 18˚C and outdoor temperature is less than 2˚C.

(6) The operation indicator blinks every second during initial cycle operation, preheating, defrosting (including balance time after defrosting is finished), or auto fresh defrosting.

(7) For preheating judgment, preheating starts if the heat exchange temperature is lower than YNEOF˚C and is cancelled if the heat exchange temperature is YNEOF plus 0.33˚C or higher at the start of operation using the START / STOP button.

(8) During the operation at the fan speed of "Lo", the compressor speed is set to WBEMAX or below. It is restricted to WJKMAX or below when the fan speed is "Med".

(9) If the outdoor temperature (data from outdoor unit) is 6˚C or more, the maximum compressor speed is WSTD.

(10) If the room temperature falls to less than 18˚C in the "Ultra-Lo" mode, the indoor fan stops. When the room temperature is 18˚C+0.33˚C or more, the ultra-Lo operation restarts. However, the ultra-Lo operation during preheating or preheating after defrosting does not stop if the room temperature is less than 18˚C.

(11) WMAX2 is used as the maximum compressor speed during hot dash, when the outdoor temperature is less than -5˚C.

(12) With thermo OFF or in approximately 1 minute after operation is stopped using the remote controller, the fan operates in the "Ultra-Lo" mode. This operation is for discharging heat from the indoor unit.

Table 1 The temperature differences and compressor speed

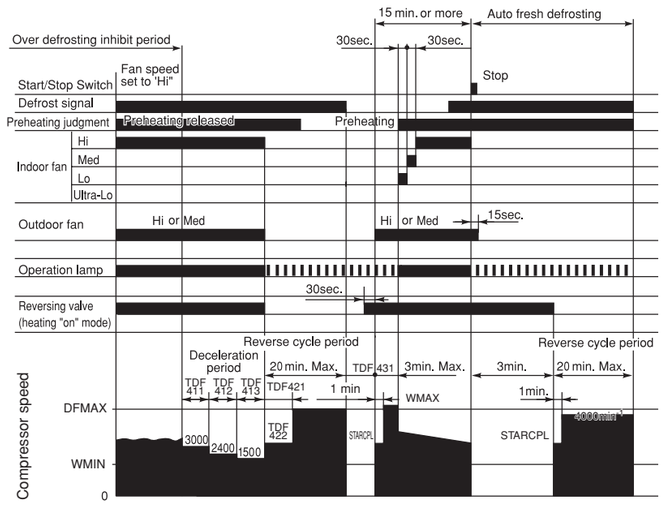
① Model: RAF-25NH4

Compressor speed (P item)	Setting temperature (including shift) - Room temperature
1900min^{-1}	1.00˚C
2100min^{-1}	1.33˚C
2600min^{-1}	1.66˚C
3100min^{-1}	2.00˚C
3600min^{-1}	2.33˚C

② Model: RAF-50NH4

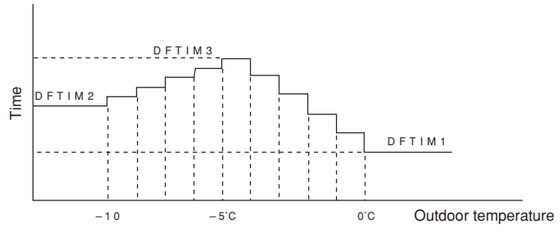
Compressor speed (P item)	Setting temperature (including shift) - Room temperature
2400min^{-1}	1.33˚C
2900min^{-1}	1.66˚C
3400min^{-1}	2.00˚C
3900min^{-1}	2.33˚C
4400min^{-1}	2.66˚C
4900min^{-1}	3.00˚C
5400min^{-1}	3.33˚C
5900min^{-1}	3.66˚C

Reversing Valve Defrosting



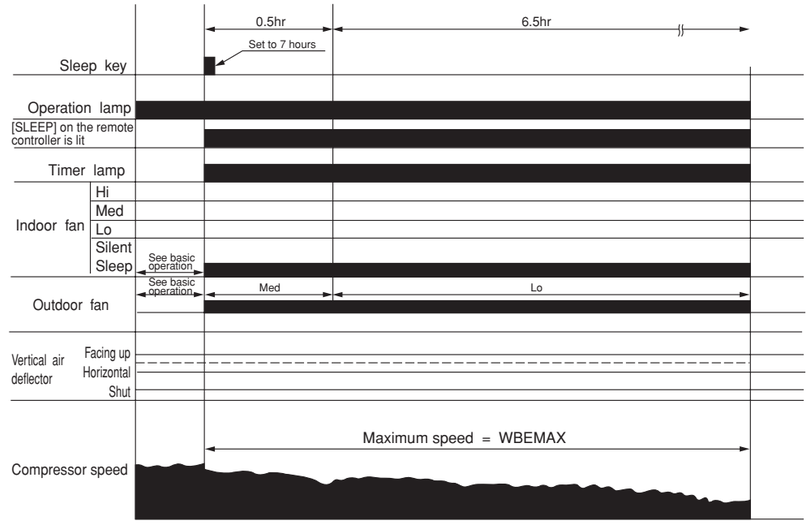
Notes:
(1) The defrosting inhibit period is set as shown in the diagram below. When defrosting has finished once, the inhibit period is newly set, based on the outdoor temperature when the compressor was started. During this period, the defrost signal is not accepted.
(2) If the difference between the room and outdoor temperatures is large when defrosting is finished, the maximum compressor speed (WMAX) or (WMAX2) can be continued for 120 minutes maximum.
(3) The defrosting period is 20 minutes maximum.
(4) When operation is stopped during defrosting, it is switched to auto refresh defrosting.
(5) Auto refresh defrosting cannot be engaged within 15 minutes after operation is started or defrosting is finished.

Setting Defrosting Inhibit Period



Notes:
(1) The first inhibit time after operation start is set to DFTIM1.
(2) From the second time onwards, the inhibit time is set according to the time required for defrosting.
Reverse cycle operation time ≥ [DEFCOL] : DEFTIM1 is set.
Reverse cycle operation time < [DEFCOL] : The time corresponding to outdoor temperature is set.

Heating Sleep Operation

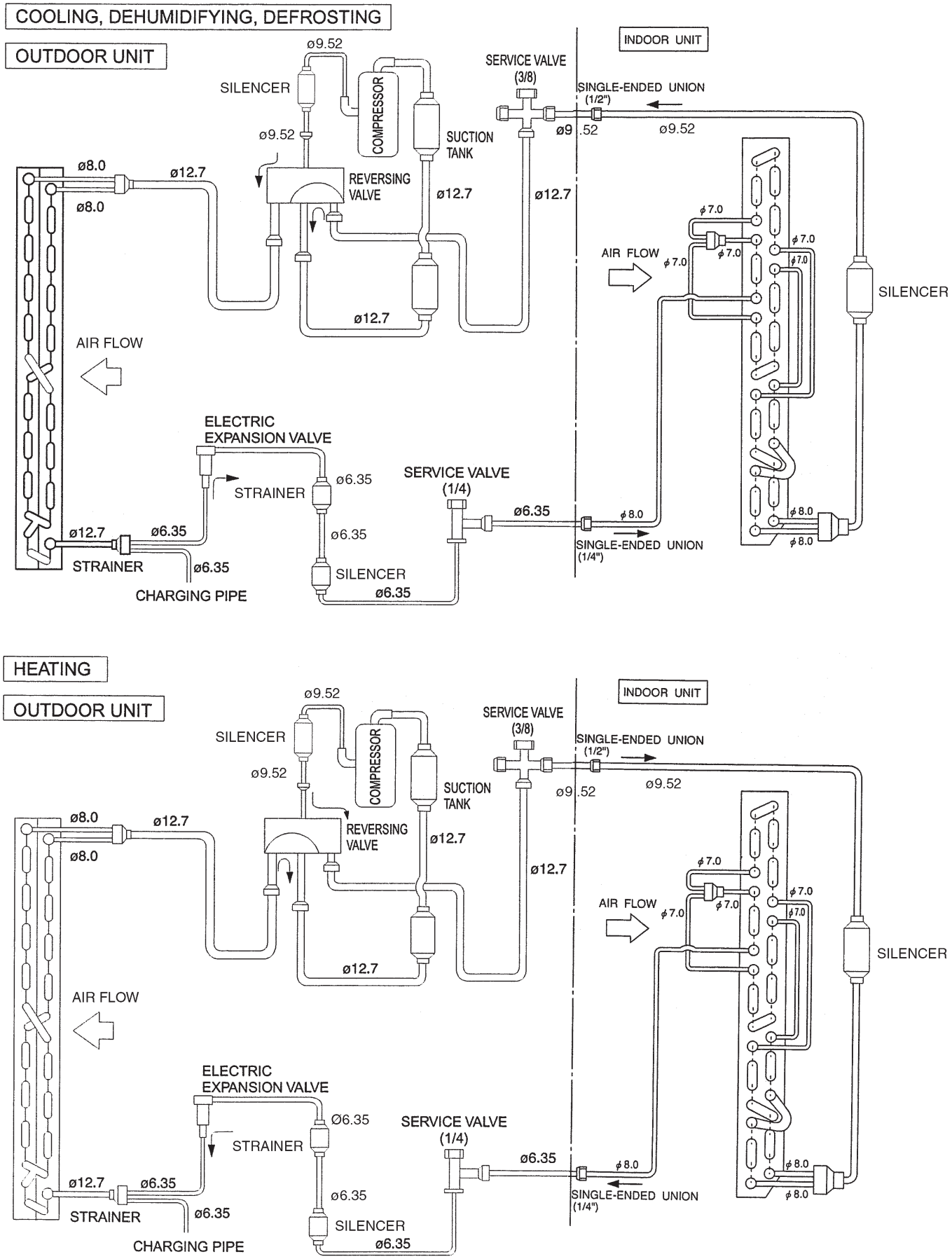


Notes:
(1) The sleep operation starts when the sleep key is pressed.
(2) When the sleep key is set, the maximum compressor speed is limited to WBEMAX, and the indoor fan is set to “Sleep Silent” (FWSOY).
(3) If the operation mode is changed during sleep operation, the changed operation mode is set and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

NOTE
1. Refer to the PWRITE-ZU data for the constants expressed by capital alphabet letters in the drawing.

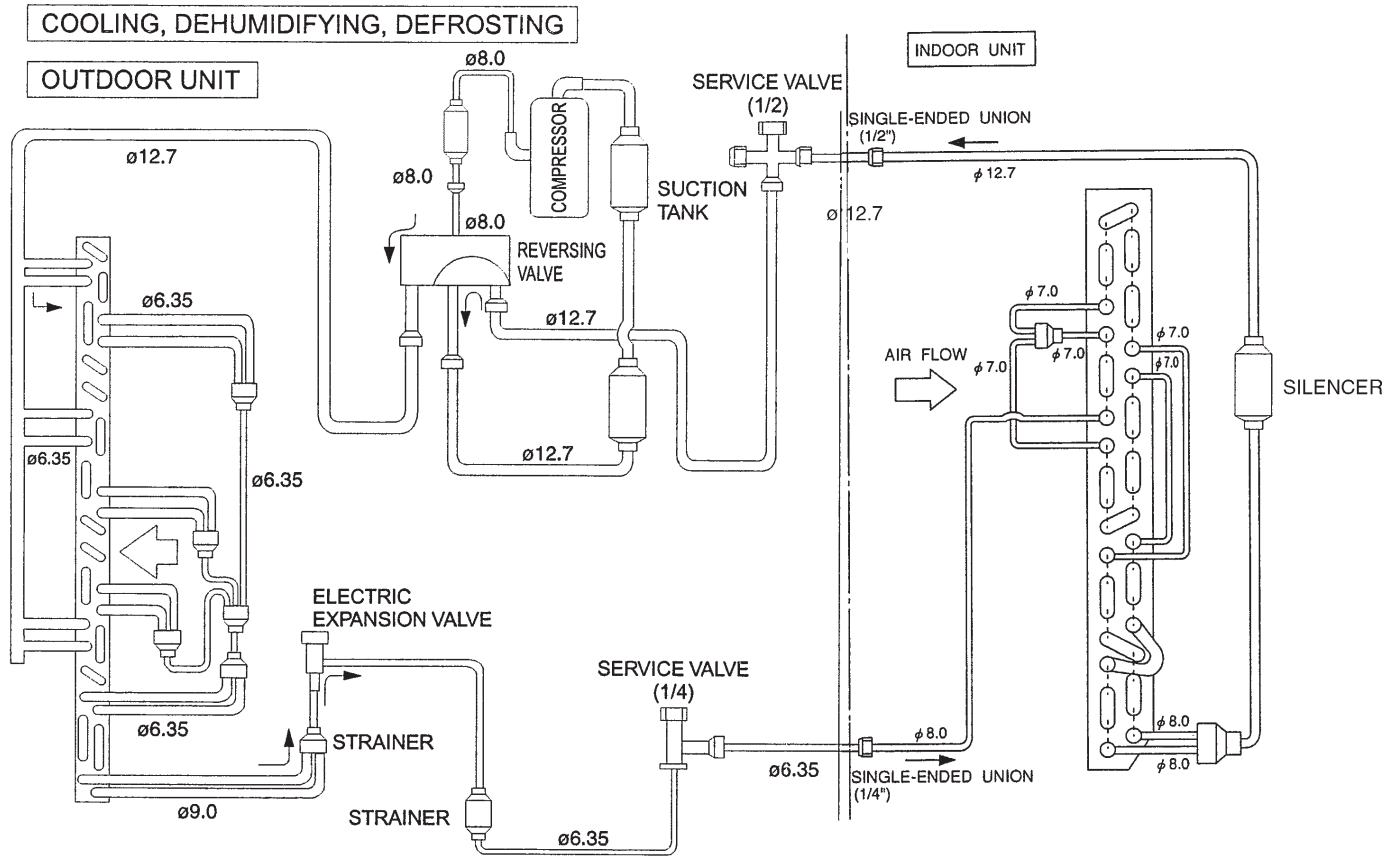
REFRIGERATING CYCLE DIAGRAM

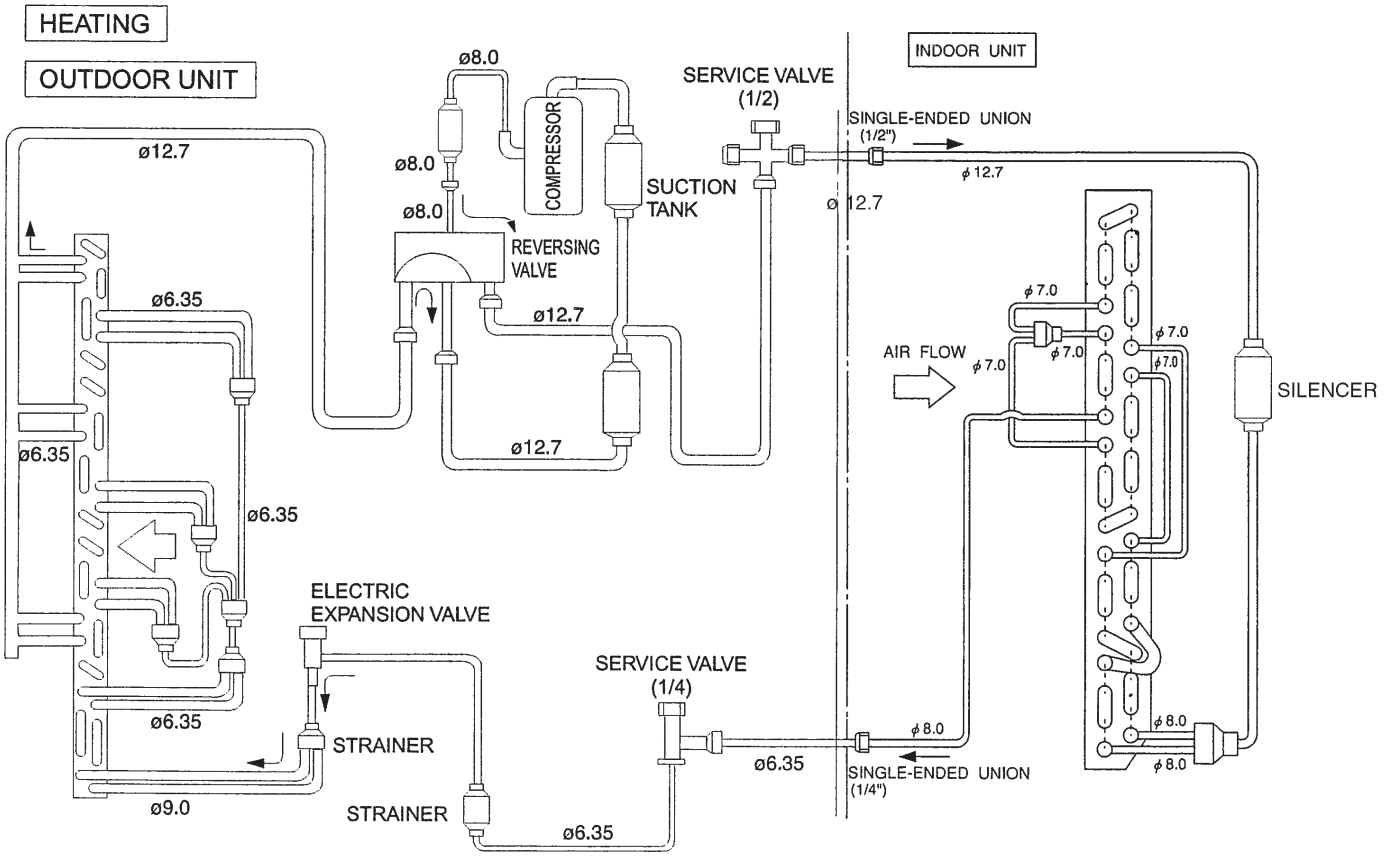
MODEL RAF-25NH4 / RAC-25NH4



REFRIGERATING CYCLE DIAGRAM

MODEL RAF-50NH4 / RAC-50NH4





Damper control

1. Precondition

The damper has 2-directional output and realizes OPEN/CLOSE using a stepping motor.
Damper control functions only when the Air outlet SW is set to " ".

2. OPEN/CLOSE Operation

(1) OPEN operation
Start up the damper towards OPEN direction by overall angle width [DNPALD1]. When the start up completes, turn off the output.
(2) CLOSE operation
Start up the damper towards CLOSE direction by overall angle width [DNPALD1]+tightening angle [CNPPLS1]. When start up completes, turn off the output.

3. Initial Operation

Initial operation is performed only once when the mail power is switched ON. The damper should be operated as follows due to its structure.
① Damper OPEN (Damper limit SW = OFF signal)
② Damper CLOSE (Damper limit SW = ON signal)
Its travel speed is pulse output speed [DNPPPS].

4. Monitor Function of Damper Limit SW

Monitoring of damper limit SW is inhibited during start up and for 2 seconds after starting up the damper. after which the damper limit SW will be monitored.
(1) Damper limit SW signal at the completion of initial operation is monitored. If the signal is OFF, it is judged as malfunction and the malfunction mode is entered immediately.
(2) Monitoring of damper limit SW signal is inhibited while the unit is stopped.
(3) Damper limit SW is always monitored while the unit is in operation. Right after the unit operation is started, however, malfunction judgment is not made and the damper performs the following operation.
When "ON" signal is detected (Normal signal): Start up towards CLOSE direction by tightening angle.
When "OFF" signal is detected (Abnormal signal): Start up towards CLOSE direction by overall angle width plus tightening angle.
(4) After performing the above operation, malfunction judgment will always be carried out. If abnormality is detected for 4 times consecutively within 30 minutes, the malfunction mode is entered at the moment the 4th abnormality is detected.
In the case where 3 or less abnormality are detected, retry operation is performed.
Abnormal OPEN location
If the signal is "ON", the damper is judged to be at CLOSE location (abnormal). The retry operation, which is the same as OPEN operation by overall angle width, will be performed.
Abnormal CLOSE location
If the signal is "OFF", the damper is judged to be at OPEN location (abnormal). The retry operation, which is the same as CLOSE operation by overall angle width + tightening angle, will be performed.
(5) Self diagnosis mode of the damper is indicated by "Timer lamp blinks for 8 times".

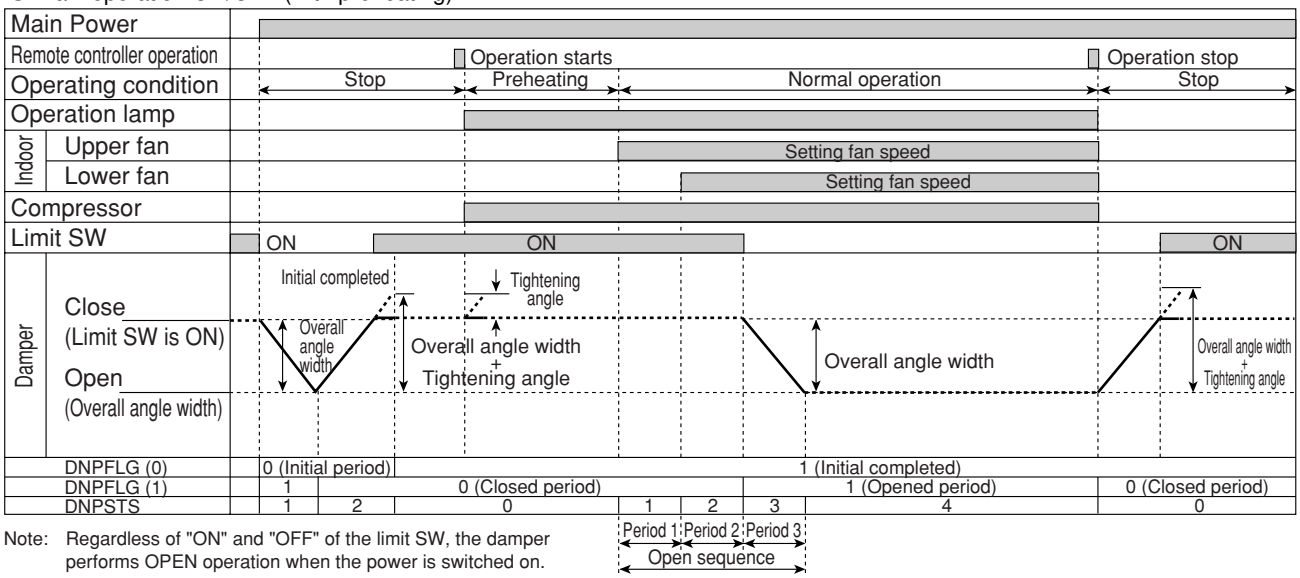
5. Damper operation by operating modes

The damper functions only during heating and cooling operation. It stays closed during other operating modes.

Heating mode

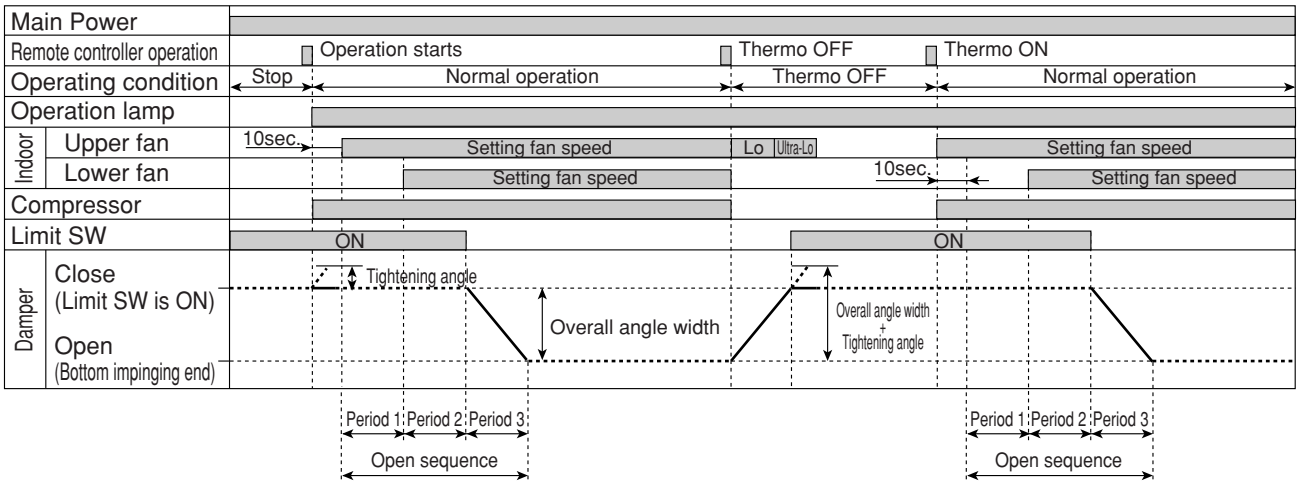
The damper is open during normal heating operation (except for 10 seconds after thermo resumes, during sleep operation and during nice temperature). It is closed during other types of operation.
The damper closes immediately if the damper changeover SW is set to "manual". When the damper is starting up, however, it closes only after open operation completed.

● Main operation ON/OFF (with preheating)

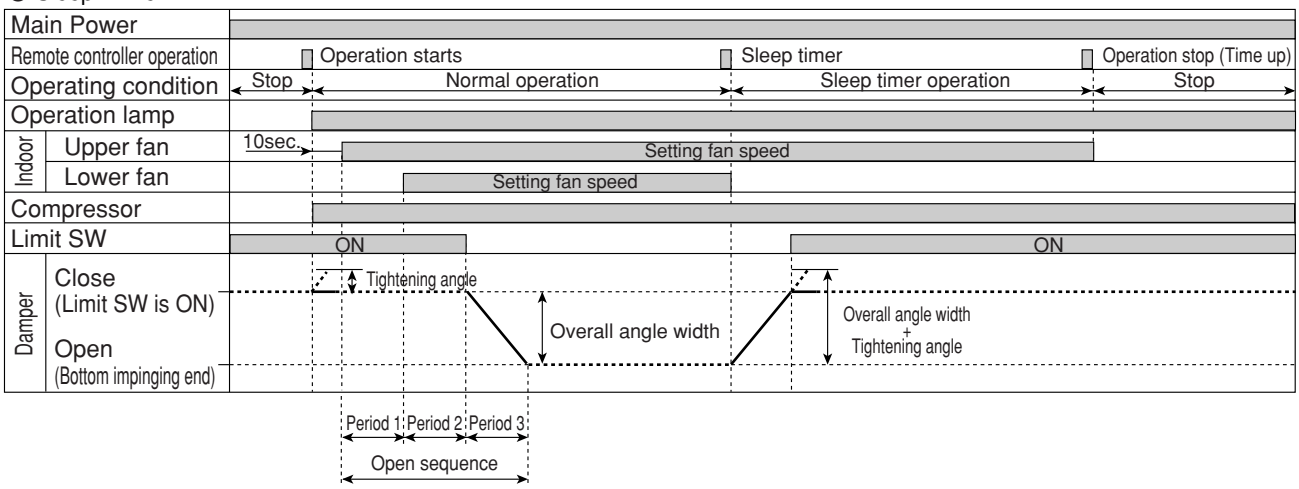


Note: Regardless of "ON" and "OFF" of the limit SW, the damper performs OPEN operation when the power is switched on.

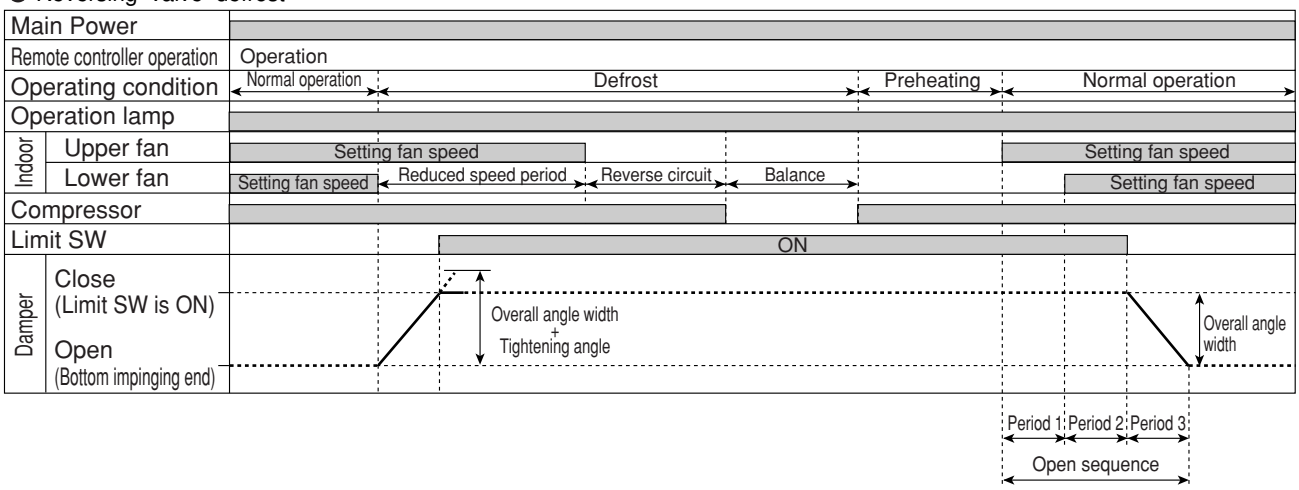
● Thermo intermittence



● Sleep Timer



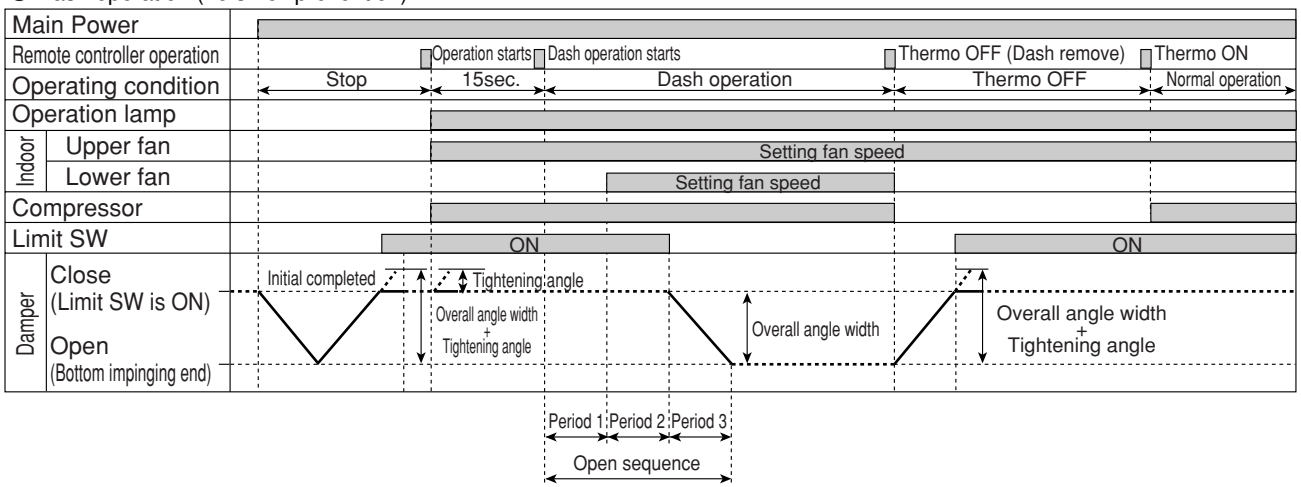
● Reversing valve defrost



Cooling mode

The damper opens at cool dash (excluding smell prevention) and closes at the completion of cool dash.
The damper also closes at the moment the Air outlet SW is set to " ".

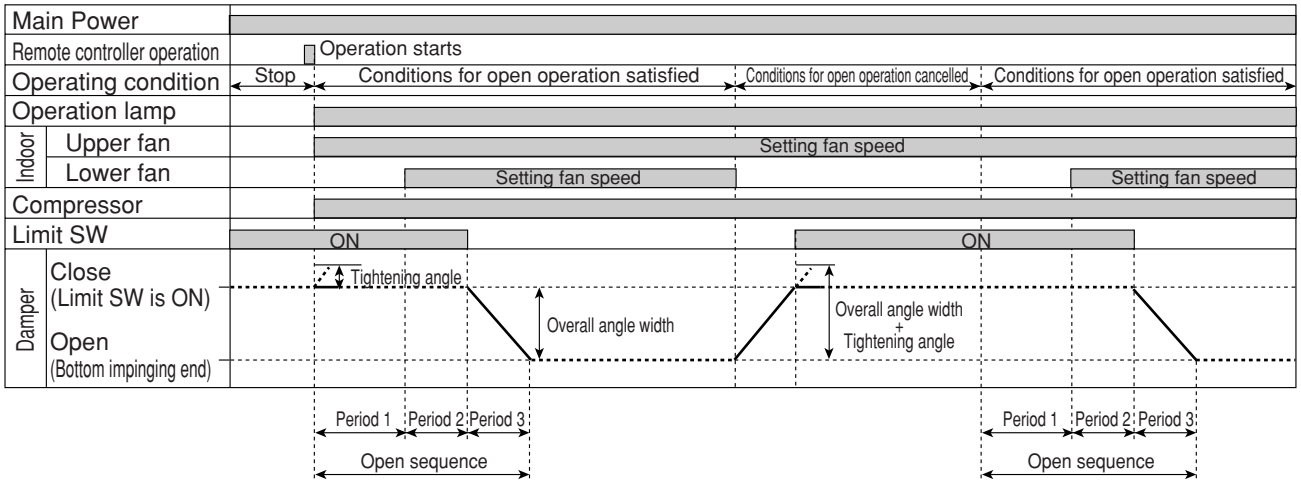
● Dash operation (no smell prevention)



● Damper open operation (except dash)

This function is allowed when the damper open control select flag on EEPROM at cooling operation and fan speed of HI is set to [FLGET8 (3) = 1] and all the following conditions are satisfied. If any of the following conditions is unsatisfied, the damper will be closed.

(a) Operating mode: "Manual cooling"
(b) Preset fan speed: "Hi"
(c) Preset temperature: "16˚C"
(d) [Room temperature (RMTM) - Final preset temperature (THERW2)] ≥ [ONDOSA] However, the condition. (d) will be cancelled when [Room temperature (RMTM) - Final preset temperature (THERW2)]≤ [ONDOSA].
(e) Thermo ON condition (ASTUS=3)



DESCRIPTION OF MAIN CIRCUIT OPERATION

Model RAF-25NH4, RAF-50NH4

1. Power Circuit

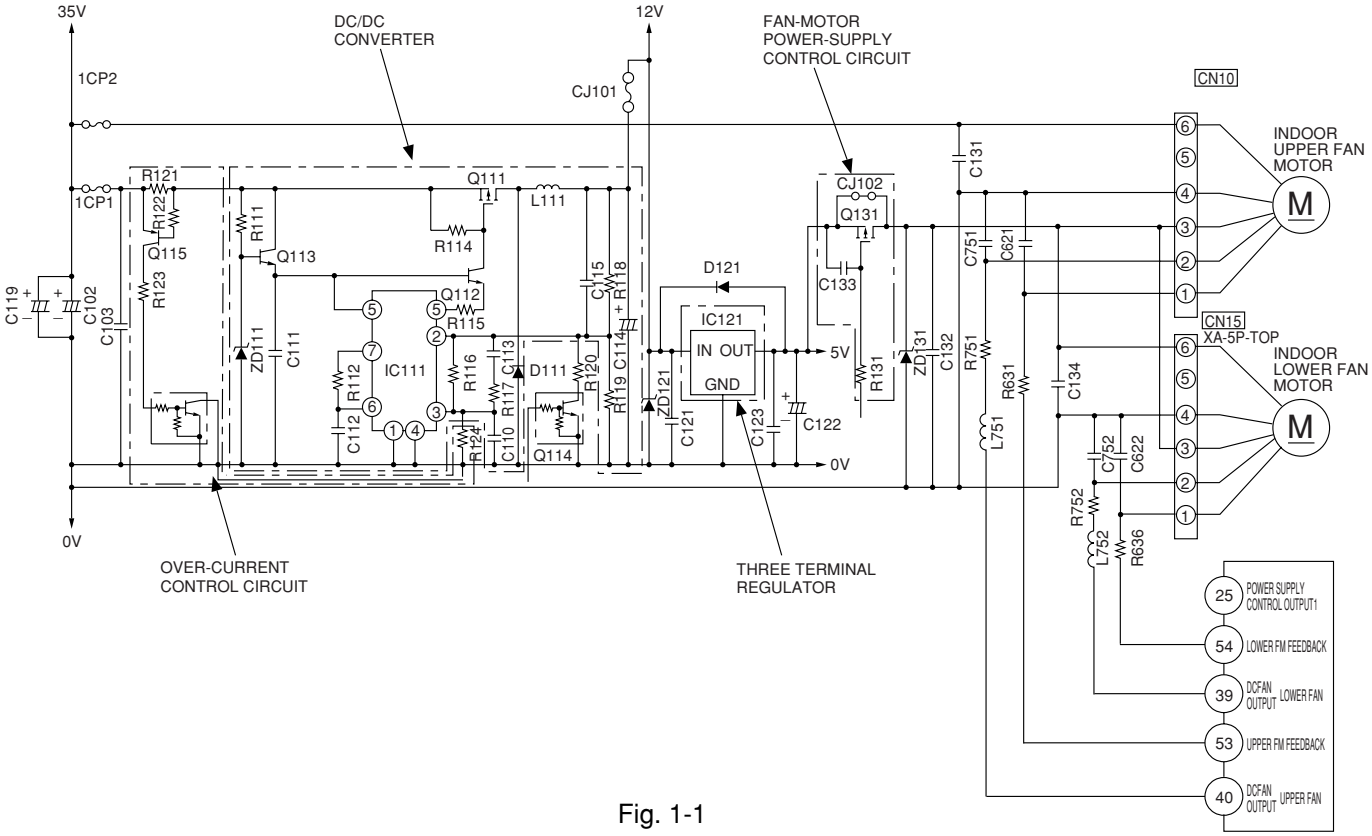


Fig. 1-1

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 stepping 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

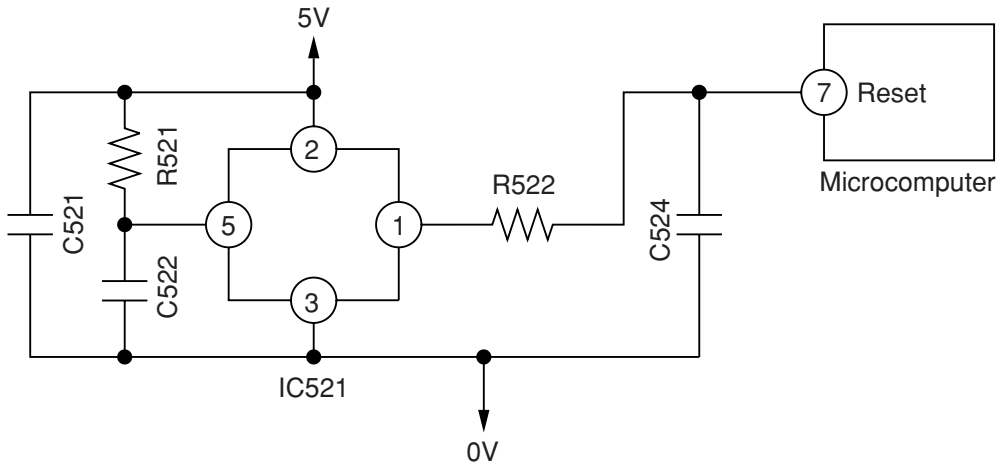


Fig. 2-1

Timing chart

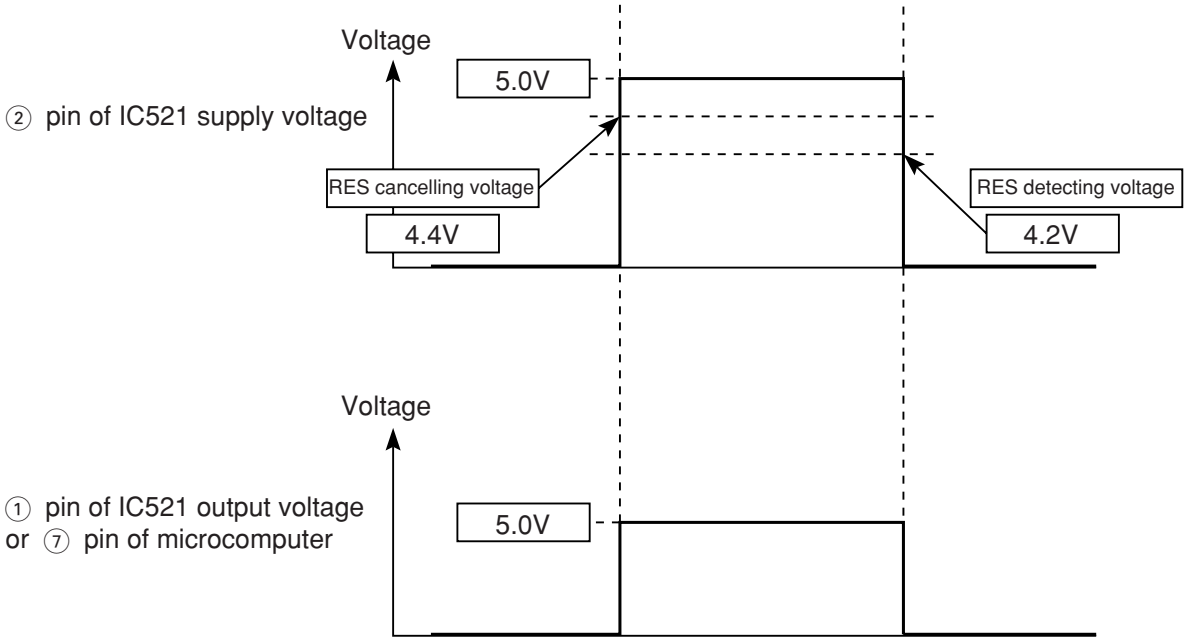


Fig. 2-2

- Reset circuit is to initialize the indoor unit microcomputer when switching ON the power or after recovering from power failure.
- Microcomputer operates when ⑦ pin of the indoor unit microcomputer (reset input) is “Lo” for resetting and “Hi” for hitting.
- 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, ① pin of IC521 and ⑦ 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, ① pin of IC521 and ⑦ 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. Room Temperature Thermistor Circuit

A room temperature thermistor circuit is shown in Fig. 3-1.
According to room temperature, the voltage of point Ⓐ becomes as it is shown in Fig. 3-2.

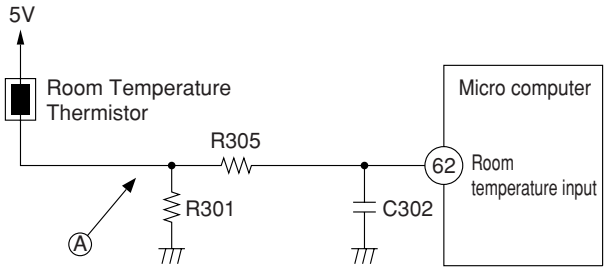


Fig. 3-1

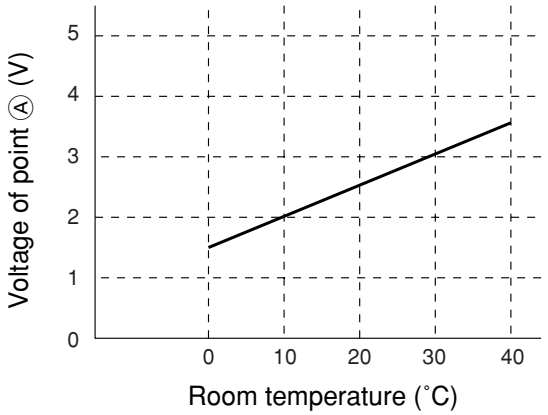


Fig. 3-2

4. Heat Exchanger Thermistor Circuit

Heat exchanger temperature is noticed inside the room
(1) Preheating
(2) Low-temperature defrosts at cooling-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 Ⓐ becomes as it is shown in Fig. 4-2.

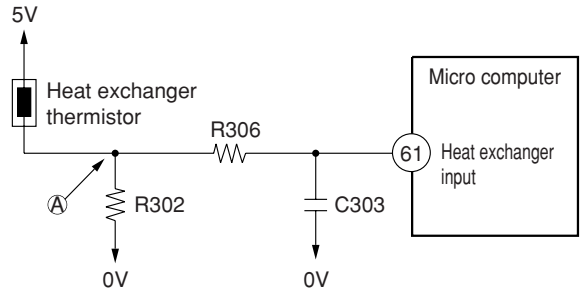


Fig. 4-1

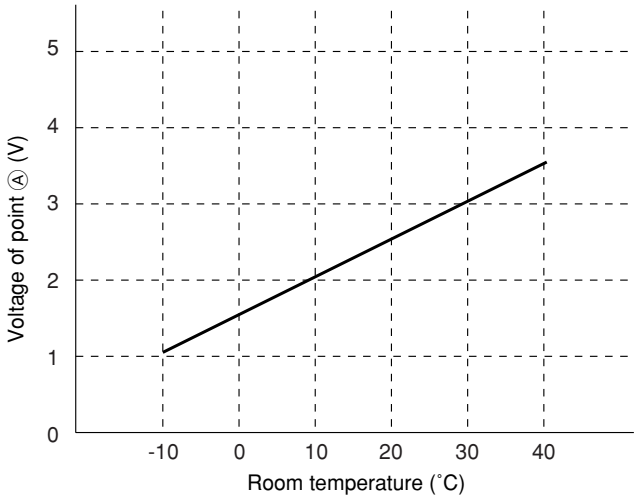


Fig. 4-2

6. Fan Motor Drive Circuit

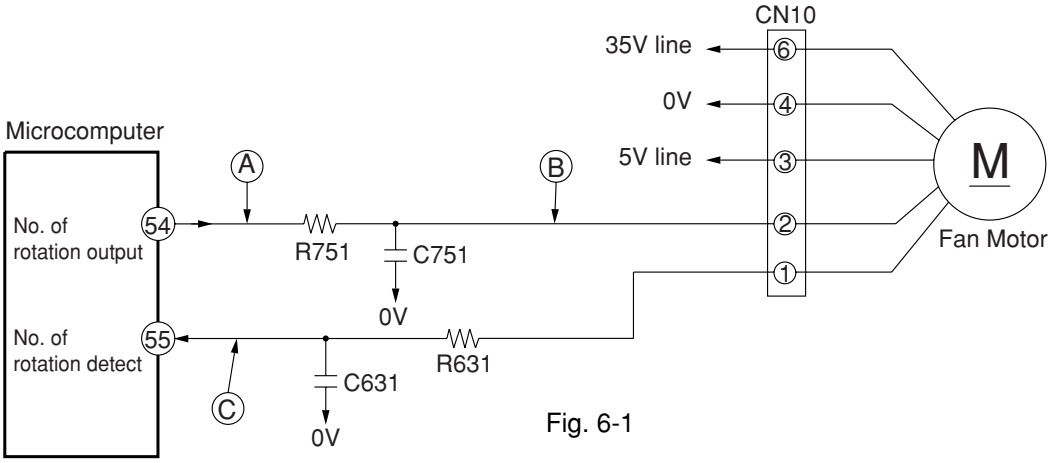


Fig. 6-1

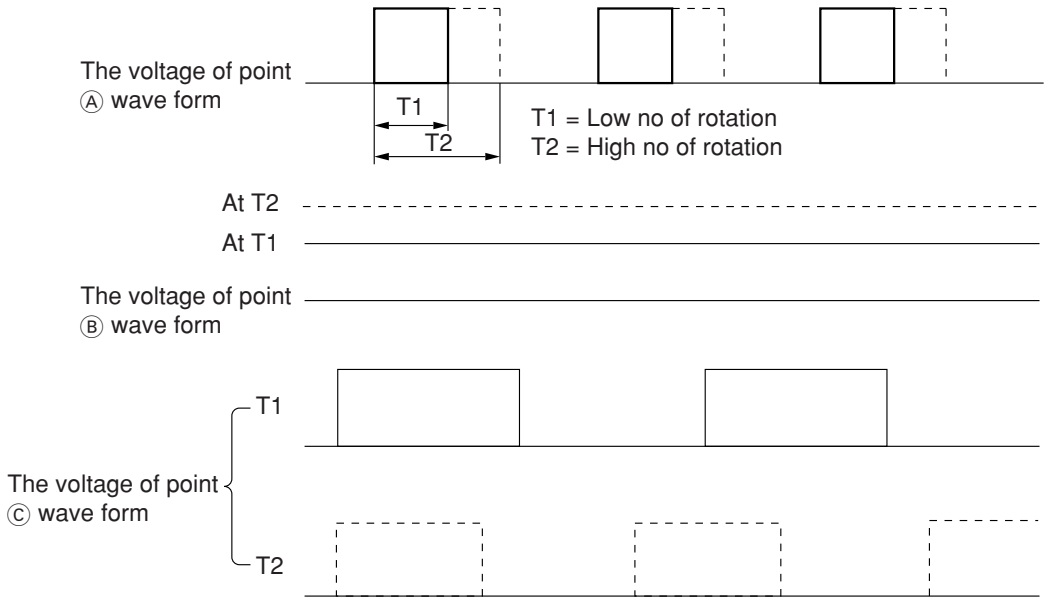


Fig. 6-2

- The 15.7 kHz PWM pulse shown in Fig. 6-2 from the microcomputer pin ⑭ is output to point Ⓐ. 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 Ⓑ and number of rotations becomes as shown in Fig. 6-3. (The gap may arise depending on the condition of unit.)
- The feedback pulse of number of rotation is output from the fan motor and input to microcomputer pin ⑮. The frequency of this pulse is 12/60 of the number of rotations. (Ex: 1000min^{-1}X 12/60=200Hz) The micro computer observes this frequency and to make it as the instruction number of rotation all the time, adjusts the output pulse width of pin ⑭.
- If the feedback pulse becomes lower than 100min^{-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.

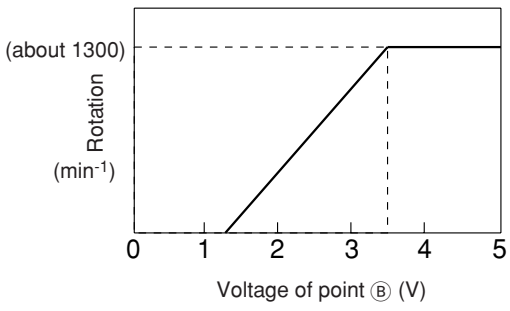


Fig. 6-3

2. Indoor/Outdoor Interface Circuit

- The interface circuit superimposes an interface signal on the DC 35V line supplied from the outdoor unit to perform communications between indoor and outdoor units. This circuit consists of a transmiting circuit which superimposes an interface signal transmit from the microcomputer on the DC 35V line and a transmiting circuit which detects the interface signal on the DC 35V line and outputs it to the microcomputer.
- Communications are performed by mutually transmiting and receiving the 4-frame outdoor request signal one frame of which consists of a leader of approx. 100 ms., start bit, 8-bit data and stop bit and the command signal with the same format transmit from the indoor unit.
- Communication signal from outdoor microcomputer to indoor microcomputer. At first outdoor microcomputer will send a request signal (SDO) to indoor microcomputer. A high-frequency IF signal approx. 38 KHz is generated and modulated by the request signal (SDO) inside the outdoor microcomputer then output to pin ⑪ of microcomputer. This modulated IF signal is output to pin ㉚ of HIC and amplified by amp. 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 C821, where DC components are eliminated, and is then shaped by the comparator. The shaped signal is detected by diode, amplified by amp, and output to pin ㊾ of the indoor microcomputer.
  Fig. 2-2 shows the voltages at each component when data is transferred from the outdoor microcomputer to the indoor microcomputer.
- Communication signal from indoor microcomputer to outdoor microcomputer. The request signal (SDO) generates by indoor microcomputer is output to pin ㊿, and amplifies by C801. IF signal approx. 38 kHz is generated by comparator, then modulate by the request signal from pin ㊿ of indoor microprocessor. This modulated IF signal is then amplified and superimposed to DC 35V line via L801 and C802 of indoor interface circuit.
  Fig. 2-3 shows the voltages at each component when data is transferred from outdoor microcomputer to indoor microcomputer.
  The circuit operation of the outdoor receiving circuit is same as indoor receiving circuit.

- Fig. 2-1 shows the interface circuit used for the indoor and outdoor microcomputers to communicate with each other.

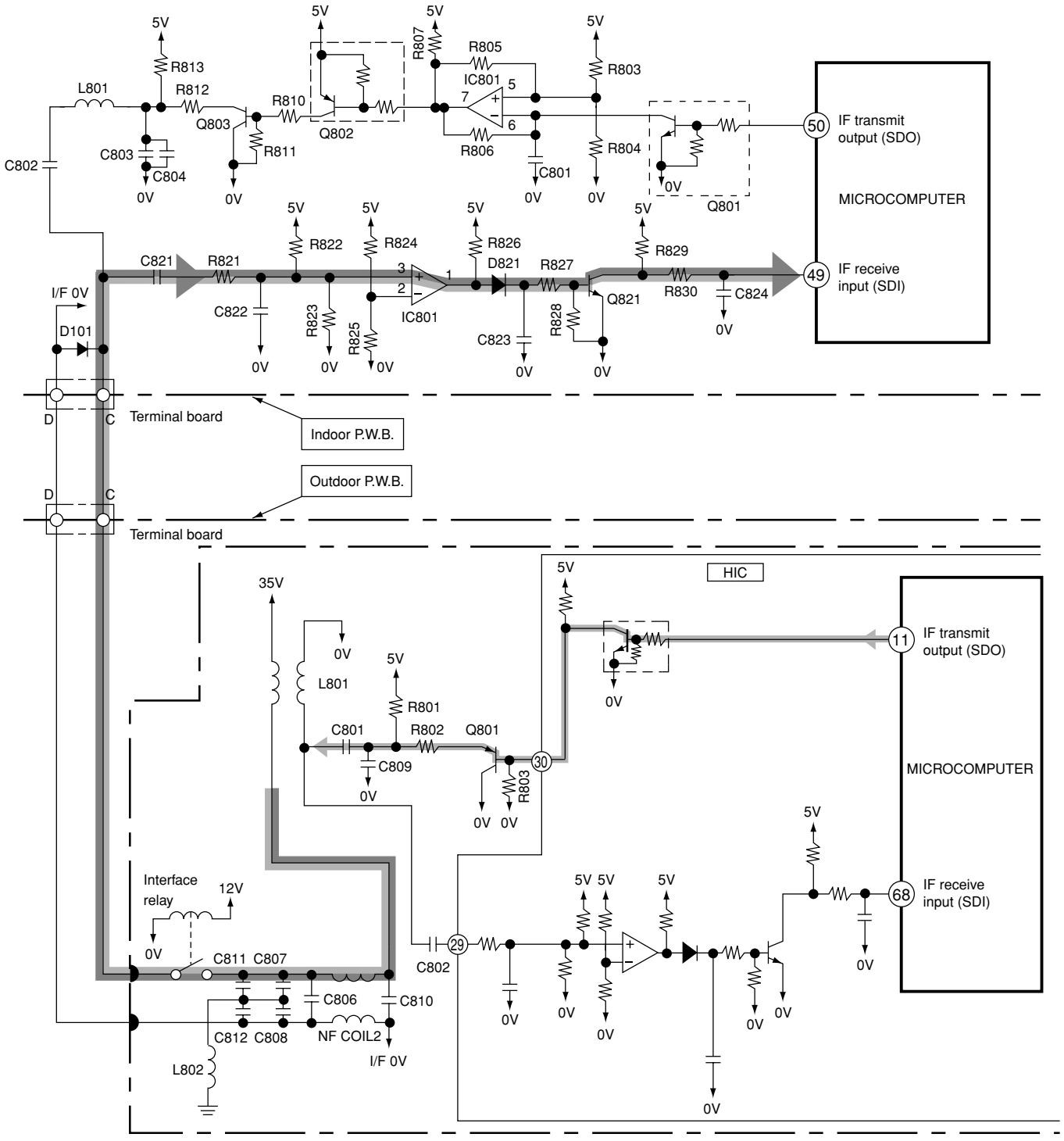


Fig. 2-1 Indoor/outdoor interface Circuit

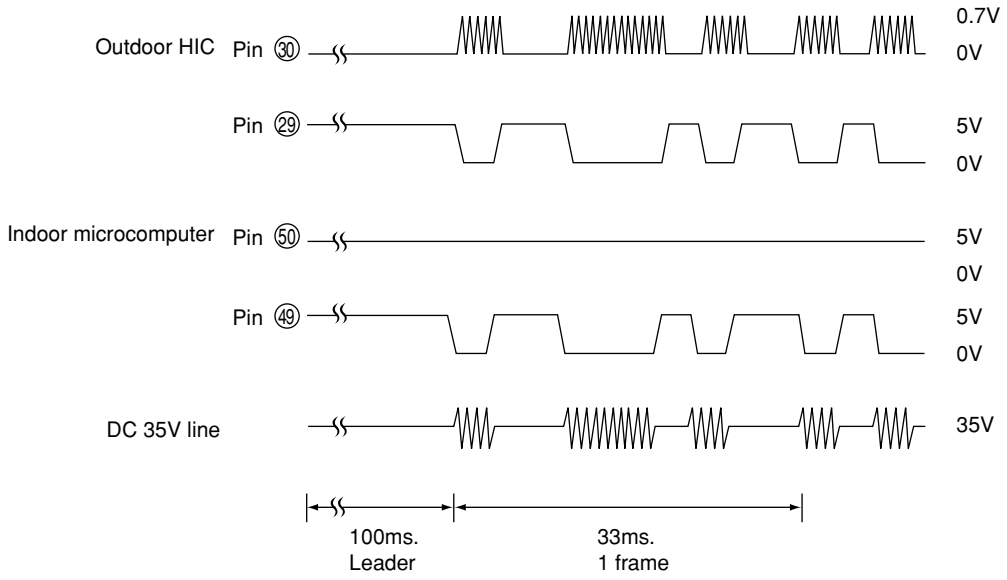


Fig. 2-2 Voltages Waveforms of indoor / Outdoor Microcomputers (Outdoor to Indoor Communications)

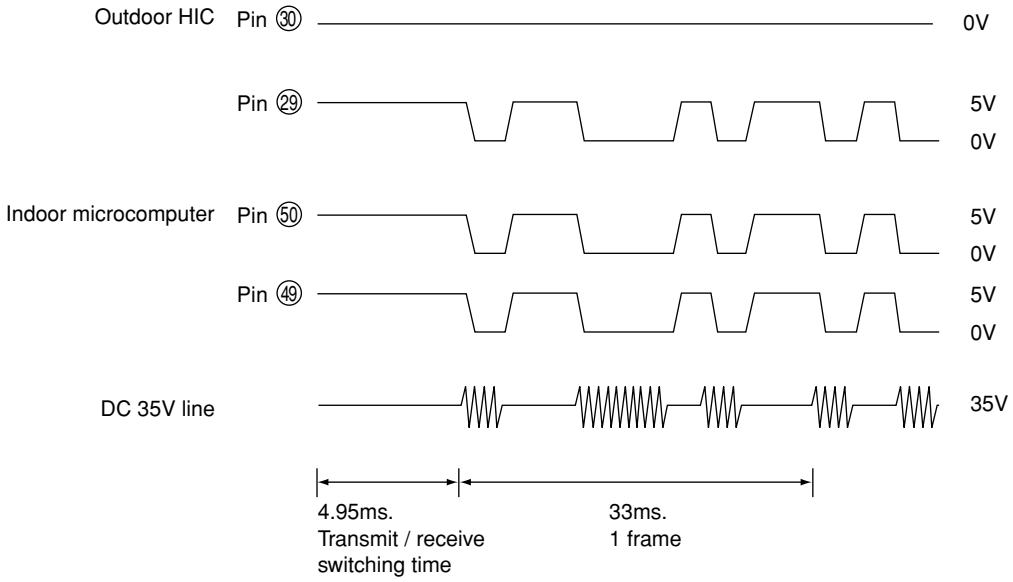


Fig. 2-3 Voltages Waveforms of indoor / Outdoor Microcomputers (Indoor to Outdoor Communications)

[Serial Communications Data]

(1) Outdoor message

Character No.	Bit No.	Contents	Data
0	0	Multi-bit	1/0
	1		0
	2	During forced operation	1/0
	3	Defrost request signal	1/0
	4	Self-diagnosis (0 LSB)	1/0
	5	Self-diagnosis (1)	1/0
	6	Self-diagnosis (2)	1/0
	7	Self-diagnosis (3 MSB)	1/0
1	0	Outside temperature (0 LSB)	1/0
	1	Outside temperature (1	1/0
	2	Outside temperature (2)	1/0
	3	Outside temperature (3)	1/0
	4	Outside temperature (4)	1/0
	5	Outside temperature (5)	1/0
	6	Outside temperature (6)	1/0
	7	Outside temperature (7 MSB)	1/0
2	0	Compressor during operation	1/0
	1	Compressor during operation	1/0
	2	Actual compressor rotation speed (0 LSB)	1/0
	3	Actual compressor rotation speed (1)	1/0
	4	Actual compressor rotation speed (2)	1/0
	5	Actual compressor rotation speed (3)	1/0
	6	Actual compressor rotation speed (4)	1/0
	7	Actual compressor rotation speed (5 MSB)	1/0
3	0		0
	1	Fan-7-step request	1
	2		0
	3		0
	4		0
	5		0
	6		0
	7		0

(2) Indoor message

Character No.	Bit No.	Contents	Data
0	0	Operation mode (0 LSB)	1/0
	1	Operation mode (1)	1/0
	2	Operation mode (2 MSB)	1/0
	3	Indoor in-operation bit	1/0
	4	Capacity code (0 LSB)	0
	5	Capacity code (1)	0
	6	Capacity code (2)	0
	7	Capacity code (3 MSB)	0
1	0	Fan (0 LSB)	1/0
	1	Fan (1)	1/0
	2	Fan (2 MSB)	1/0
	3	2-way valve	0
	4	Reversing valve	1/0
	5		0
	6		0
	7	Compressor ON	1/0
2	0	Compressor command speed (0 LSB)	1/0
	1	Compressor command speed (1)	1/0
	2	Compressor command speed (2)	1/0
	3	Compressor command speed (3)	1/0
	4	Compressor command speed (4)	1/0
	5	Compressor command speed (5)	1/0
	6	Compressor command speed (6)	1/0
	7	Compressor command speed (7 MSB)	1/0
3	0	15/20(A)	1/0
	1	OVL up	1/0
	2		1/0
	3	Compressor minimum rotation speed (0 LSB)	1/0
	4	Compressor minimum rotation speed (1)	1/0
	5	Compressor minimum rotation speed (2)	1/0
	6	Compressor minimum rotation speed (3)	1/0
	7	Compressor minimum rotation speed (4 MSB)	1/0

SERVICE CALL Q & A

Model RAF-25NH4 / RAC-25NH4
RAF-50NH4 / RAC-50NH4

COOLING MODE

Q1 The compressor has stopped suddenly during cooling operation.

A1 Check if the indoor heat exchanger is frosted.
Wait for 3-4 minutes until it is defrosted.

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

DEHUMIDIFYING MODE

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

A1 Normal sound when refrigerant flows in pipe.

Q2 Compressor occasionally does not operate during dehumidifying.

A2 Compressor may not operate when room temperature is 10°C or less. It also stops when the humidity is preset humidity or less.

Q3 Cold air comes out during a dehumidifying operation.

A3 To improve the dehumidification effciency performs quiet fan operation. Therefore the air is cold and it is not a malfunction.

Q4 The operation does not stop even by setting the temperature higher than room temperature on the remote controller.

A4 It sets to perform dehumidifying operation by setting the temperature slightly lower than remote controller setting.

HEATING MODE

Q1 The circulation stops occasionally during Heating mode.

A1 It occurs during defrosting.
Wait for 5-10 minutes until the condenser is defrosted.

Q2 When the fan speed is set at HIGH or MED, the flow is actually Weak.

A2 At the beginning of heating, the fan speed remains LOW for 30 seconds. If HIGH is selected, it switches to LOW and again to MED after additional 30 seconds.

Q3 Heating operation stops while the temperature is preset at "30".

A3 If temperature is high in the outdoor, heating operation may stop to protect internal devices.

AUTO FRESH DEFROSTING

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

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

AUTO OPERATION

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

A1 At this point fan speed is automatic.

Q2 How is the automatic operation mode determined?

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

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

A3 It is automatically set as follows.
At cooling: and heating: Set at 22˚C
The room temperature setting can be raised 3˚C by "∧" or lowered 3˚C by "∨".

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.

AT STARTING OPERATION

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

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

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

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

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

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

OTHERS

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

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

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

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

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

Q3 Noise from the outdoor unit occasionally changes.

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

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

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

Q5 Air does not flow immediately after operation is started.

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

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

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

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

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

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

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

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

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

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

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

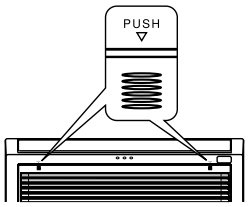
DISASSEMBLY AND REASSEMBLY

MODEL RAF-25NH4, RAF-50NH4

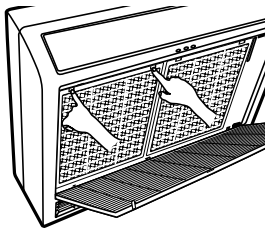
1. AIR FILTER

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



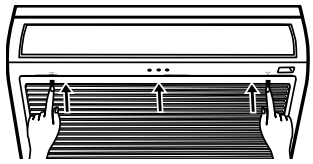
1 **Open the front panel.**
- To open the front panel, use the remote controller to stop unit operation. Then press the two" ≣ " sections below PUSH at the top left and right corners of the front panel.
- Grasp the left and right sides of the front panel and open it toward you.



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 filter.**
- Attaching the filters which are placed the surface written "FRONT" up.



5 **Close the front panel.**
- To close the front panel, press the two " ≣ " sections below PUSH at the top left and right corners of the front panel.
- Press the upper center part of the front panel to close properly.

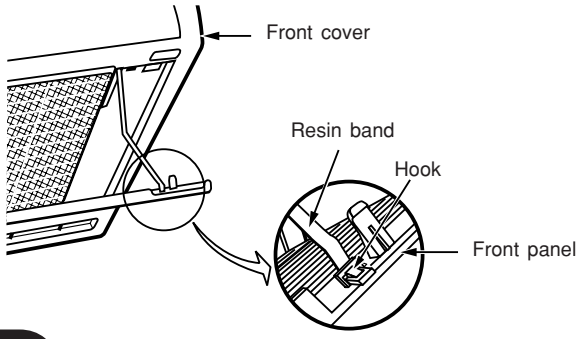
2. FRONT PANEL

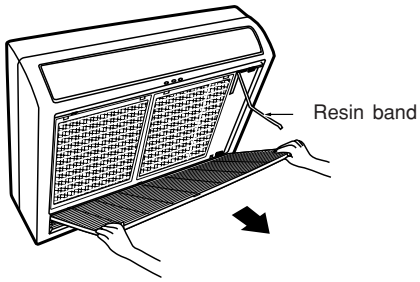
- Be sure to use both hands to grasp the front panel when removing it or attaching it.
- The front panel may be installed up or down to suit user preference.

Removing

① Press the hook found at the tip of the resin band installed inside the front panel's right section to remove the resin band.

② Pull the front panel down toward you and once fully open, pull it to remove.





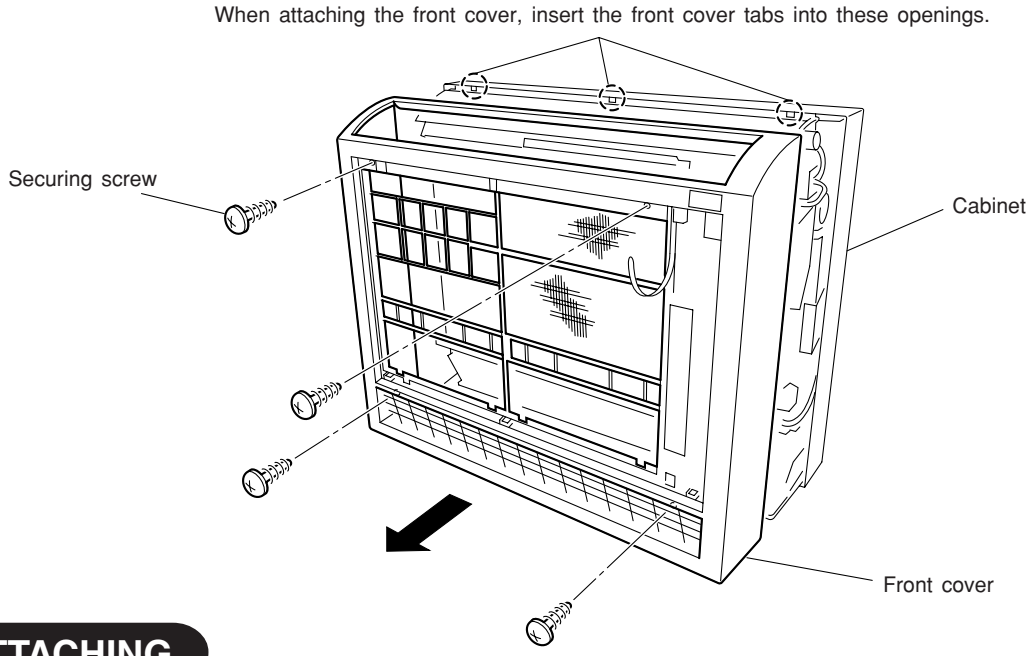
Attaching

① Attach three front panel bearings to the axis of the front cover.

② Insert the tip of the resin band into the hole of the protrusion inside the right section of the front panel.

3. FRONT COVER

Remove the four securing screws of the front cover, and then pull the front cover towards you.

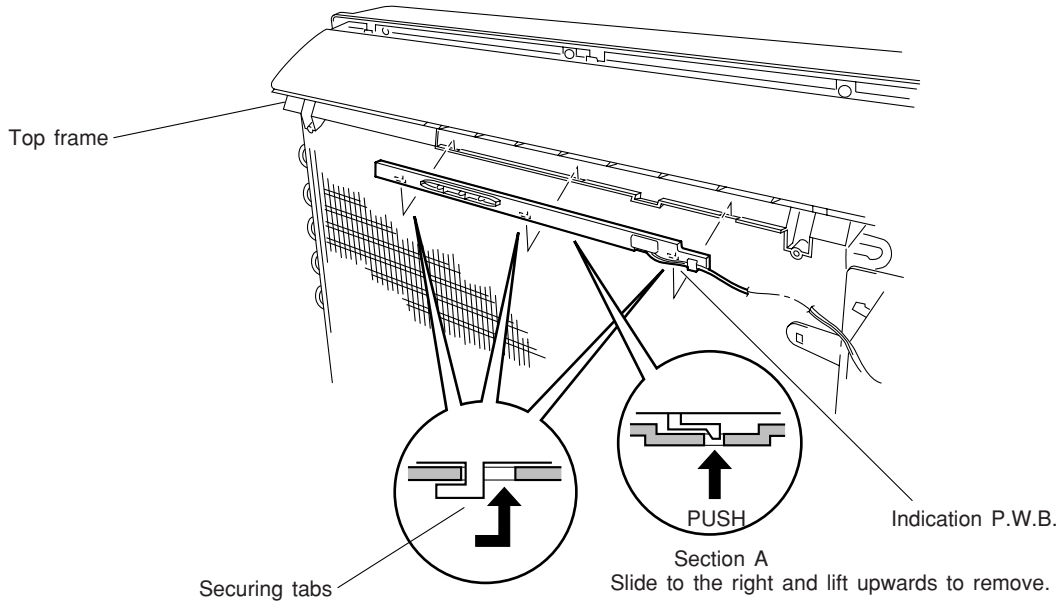


ATTACHING

When attaching the front cover, fit the three tabs on the top of the front cover so that they enter the openings on the top frame (insert from a slightly raised position). Be sure that the tabs are inserted correctly.

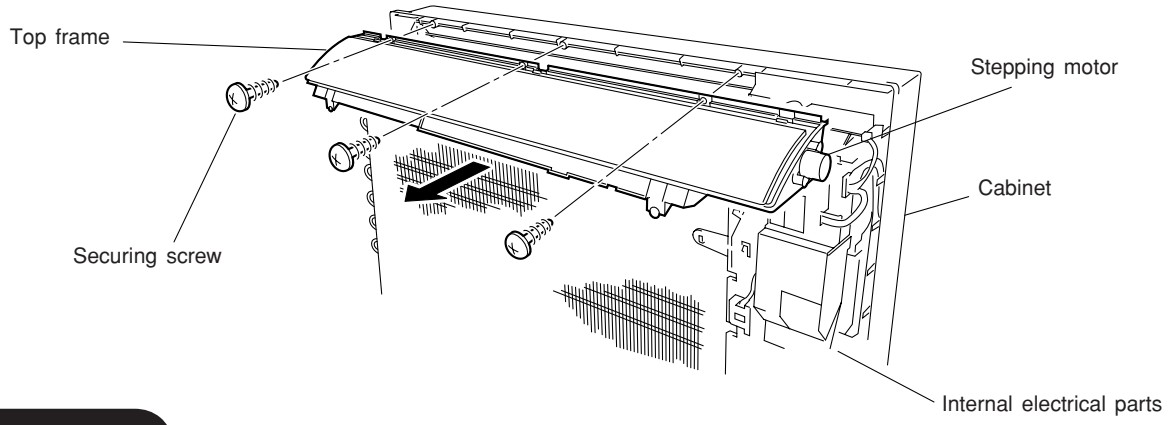
4. INDICATION P.W.B.

(1) Use a screwdriver or other such tool to push up the tabs of the section A from below, and remove.
(2) As shown in the following diagram, slide the L-shaped tab on the indication P.W.B. to the right so that it enters the hole in the top frame. You can then remove the indication P.W.B. by pulling upwards.



5. TOP FRAME

(1) Remove the front panel, and then remove the front cover.
(2) Remove the indication P.W.B..
(3) Remove the cord from the stepping motor of the air deflector.
(4) Remove the three securing screws of the top frame, and pull the frame towards you.

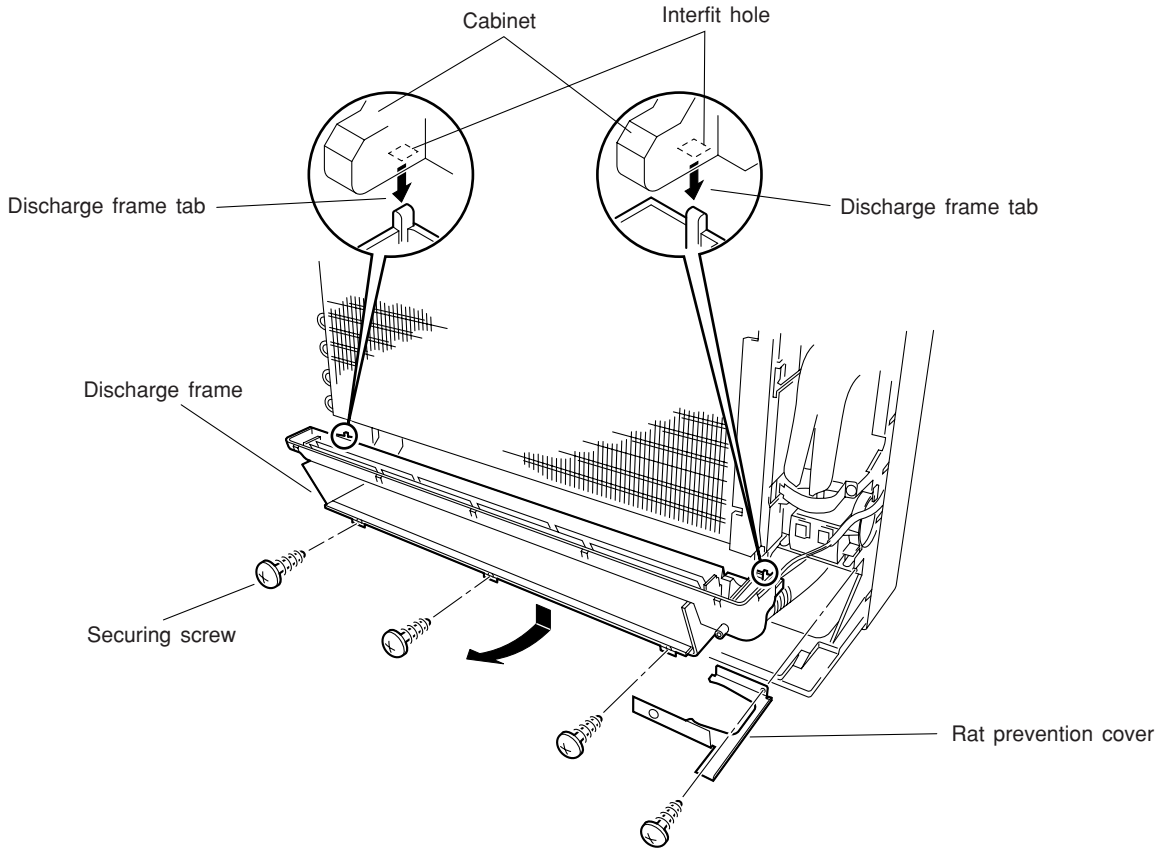


ATTACHING

(1) When attaching the top frame, align the left and right of the top frame with the inside of the guides on the cabinet, and then push the top frame straight to the back.
Note: Check to see that there is no space between the top frame and the cabinet.
(2) Fasten the three securing screws, and then check to see that the top frame does not slip to the side.

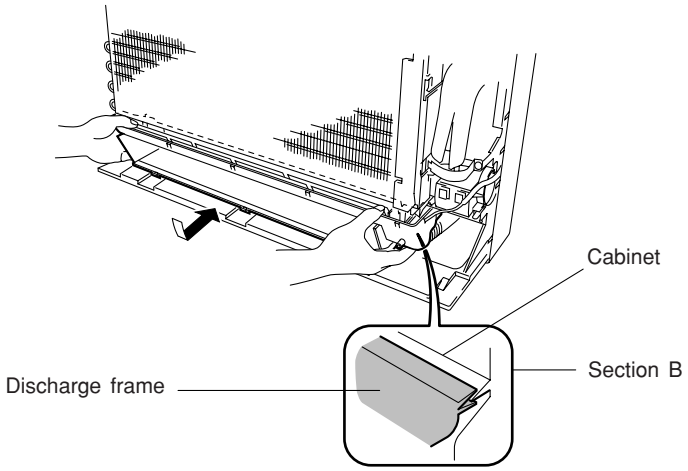
6. DISCHARGE FRAME

(1) Remove the three securing screws of the discharge frame.
(2) Remove the screw on the rat prevention cover.
(3) Lower the rear side of the discharge fram, remove the tab on the interfit section, and then pull out the discharge frame towards you.



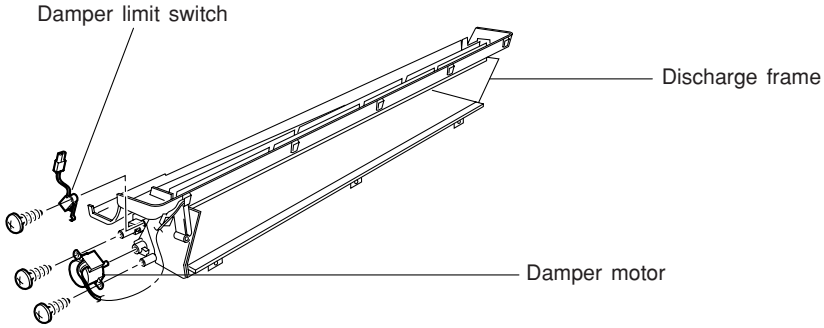
ATTACHING

(1) Align the tabs to the left and the right of the discharge frame with the holes in the cabinet, lift up the discharge frame while pushing it to the rear, and keep pushing until it clicks into place.
Note: After installing, check to see that the cabinet and the discharge frame are correctly fitted together, as shown in section B.



7. DAMPER MOTOR-DAMPER LIMIT SWITCH

(1) Remove the securing screws of the damper limit switch.
(2) Remove the two securing screws of the damper motor (stepping motor).
(3) Pull out the damper motor and the damper limit switch, and then remove them.

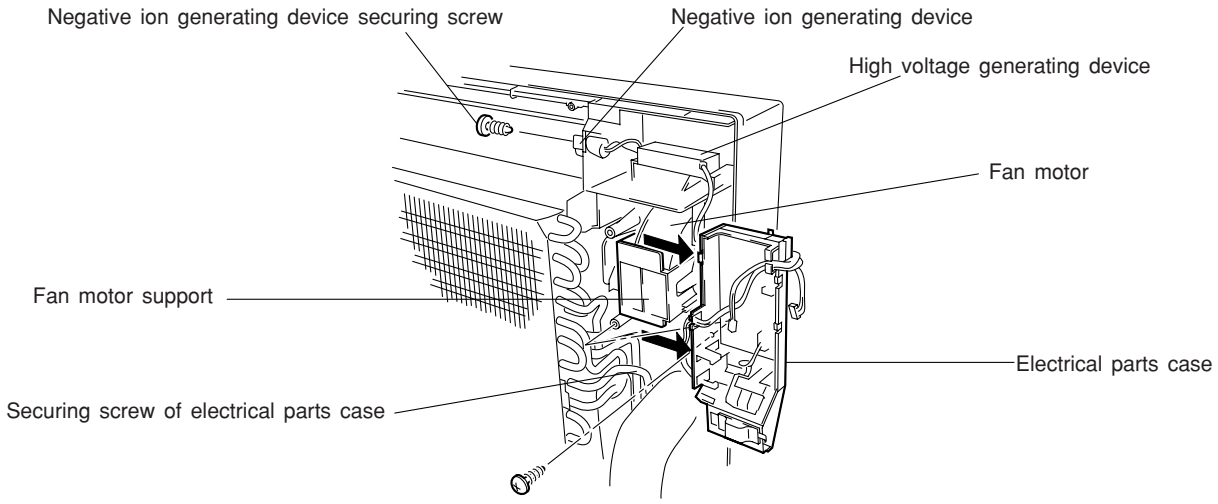


ATTACHING

Note: After removing the damper limit switch, check to see that the switch operates when the damper goes upwards.

8. NEGATIVE ION GENERATING DEVICE

(1) Remove the front panel, and then remove the front cover.
(2) Remove the display P.W.B..
(3) Remove the cord from the stepping motor of the air deflector.
(4) Remove the top frame.
(5) Use a flat-blade screwdriver to slightly lift the high voltage generating device, and then pull it towards you.
(6) Remove the securing screw, and remove the negative ion generating device.

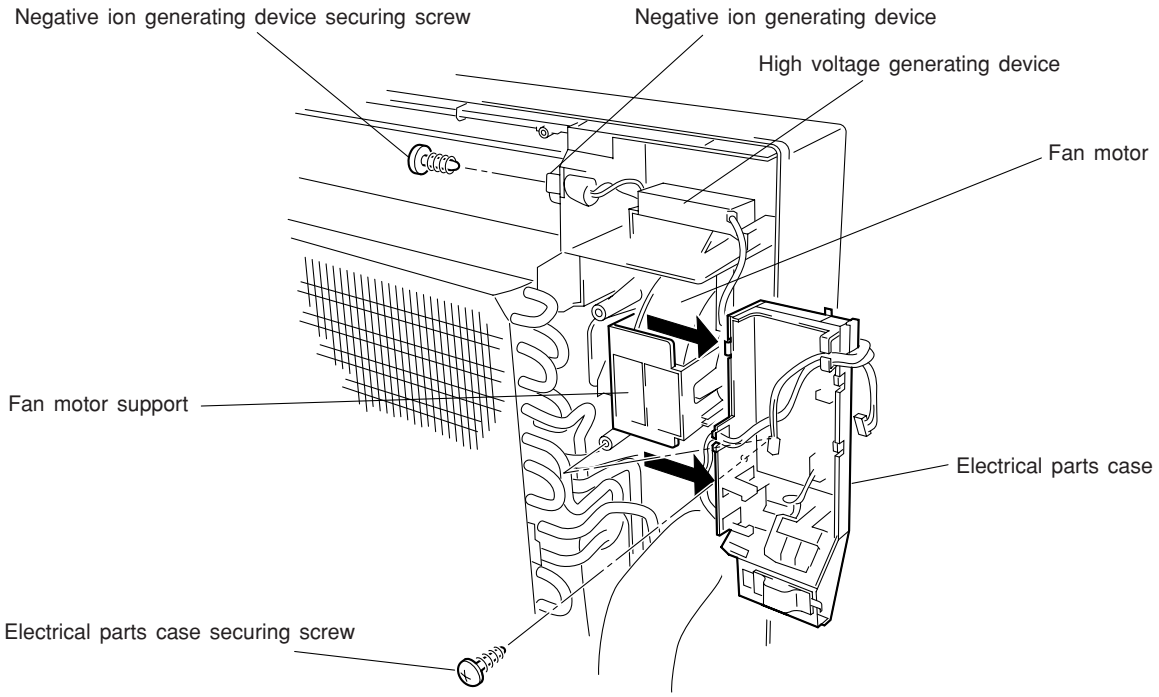


ATTACHING

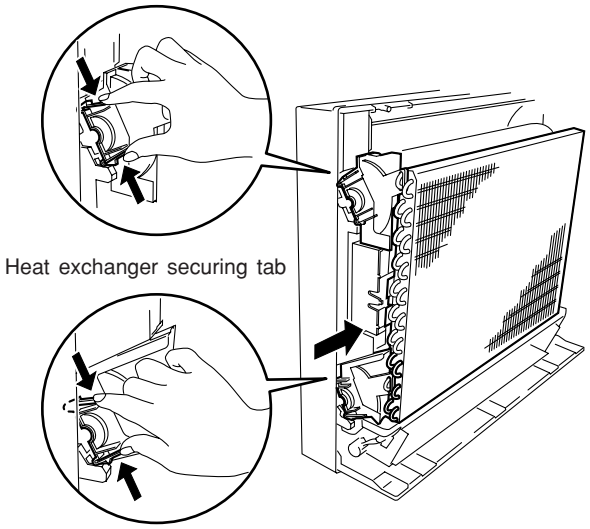
Note - Don't touch the ion generating tip when replacing the electrode.
- The ion generating tip must be replaced if it is bent.
- Clean the electrode with a toothbrush if dust gathers on the electrode. Even if this happens, be sure not to touch the ion generating tip.

9. FAN MOTOR - TANGENTIAL AIR FLOW FAN

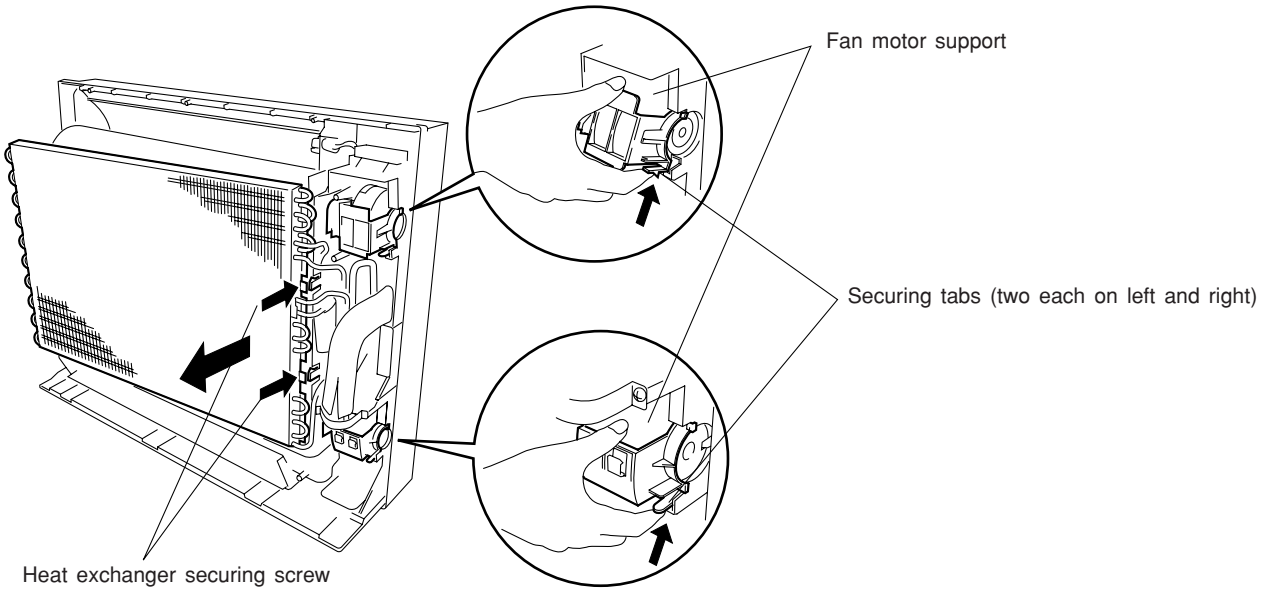
(1) Remove the front panel, and then remove the front cover.
(2) Remove the display P.W.B..
(3) Remove the cord from the stepping motor of the air deflector.
(4) Remove the top frame.
(5) Remove the electrical parts cover, the fan motor cord, the negative ion generating device cord, and the heat exchanger thermostat cord.
(6) Remove the pipe cover from the heat exchanger.
(7) Remove the securing screw of the electrical parts case, then slide the electrical parts case to the right while removing it from the fan motor support.



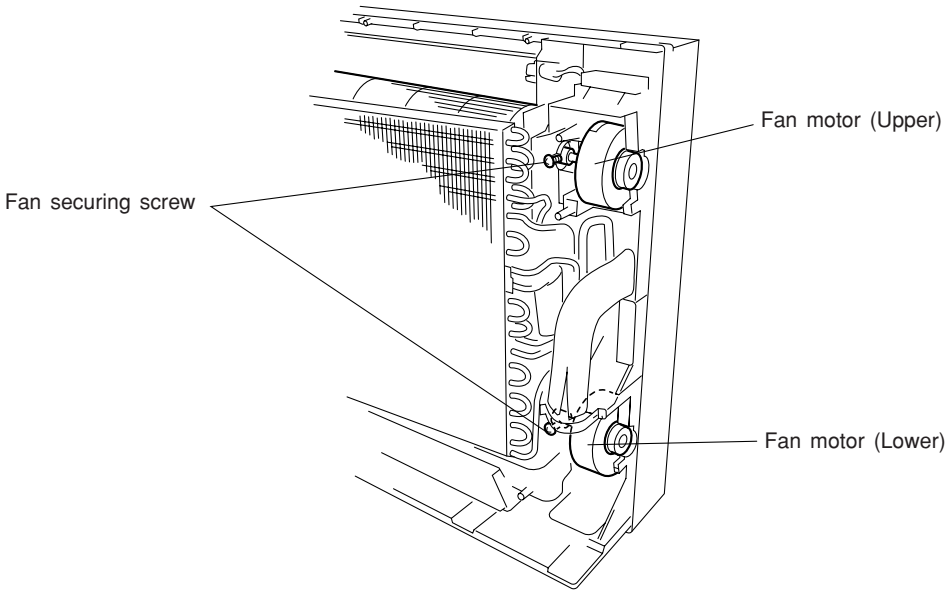
(8) Use a flat-blade screwdriver or other such tool to lift up the central securing tab and the left side of the heat exchanger.
(9) Remove the upper and lower fan covers.
- As shown in the diagram below, bend the lever (tab) securing the fan cover inwards while pulling out the heat exchanger towards you.
- Bend the lever (tab) of the lower fan cover inwards while pulling out the lower fan cover slightly upwards and towards you.



(10) Use a minus screwdriver or other such tool to raise the two tabs (see arrows in diagram below) securing the right side of the heat exchanger, then pull out the heat exchanger towards you.
(11) Pull the lower section of the fan motor support towards you while raising the two levers (tabs) on the left and right of the upper and lower sides of the fan motor support securing the fan motor, and then remove the fan motor support.



(12) Loosen the screws securing the tangential air flow fan and the motor, and then remove the tangential air flow fan and the fan motor.



ATTACHING

(1) When attaching the tangential air flow fan and the fan motor, insert the axis of the fan motor into the boss of the tangential air flow fan. Insert the fan support into the boss on the right side of the tangential air flow fan, and then insert into the fan support securing groove on the cabinet.
(2) Fasten the securing screws of the fan.
Note: Rotate the fan by hand, and check to see that it does not strike the inside section.

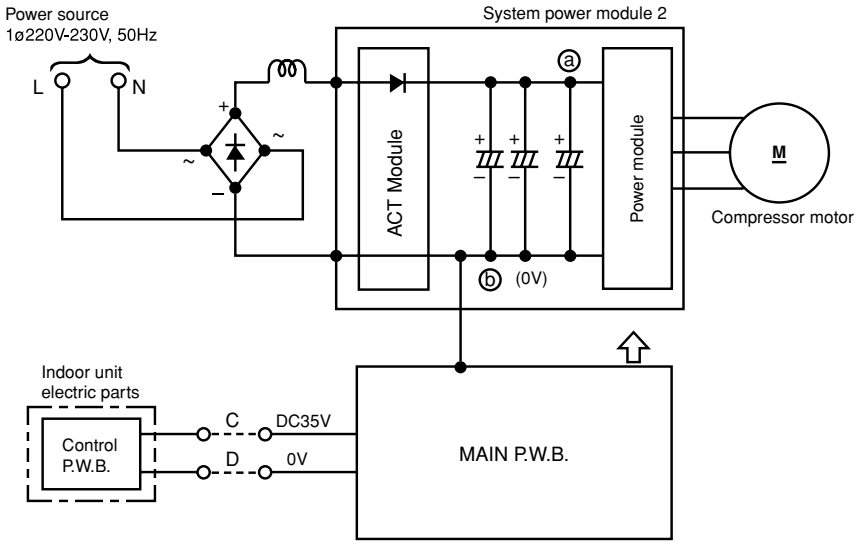
TROUBLE SHOOTING

Model RAF-25NH4 / RAC-25NH4
RAF-50NH4 / RAC-50NH4

PRECAUTIONS FOR CHECKING

DANGER

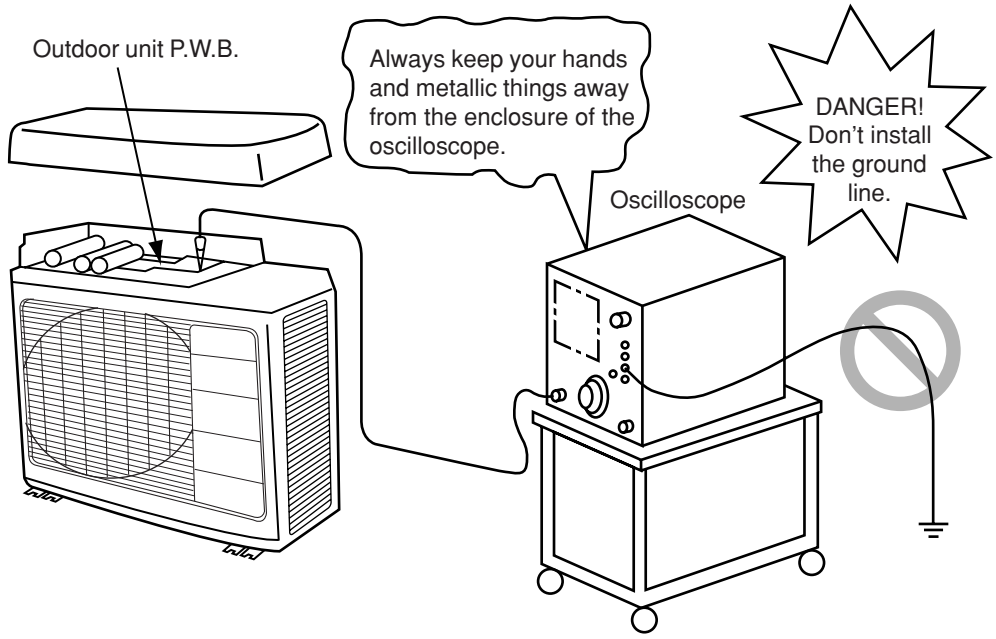
1. Remember that the 0V line is biased to 155-170V in reference to the ground level.
2. Also note that it takes about 10 minutes until the voltage fall after the power switch is turned off.



Across ⓐ – ⓑ (0V line)..... approx 260-360V
Across ⓐ – ground..... approx 155-170V
Across ⓑ (0V line)– ground..... approx 155-170V

DANGER

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

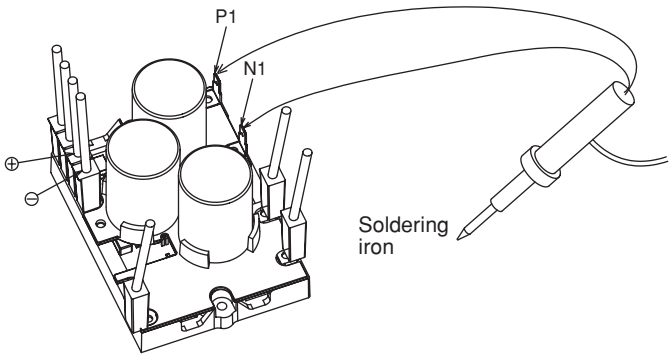


DISCHARGE PROCEDURE AND POWER SHUT OFF METHOD FOR POWER CIRCUIT

WARNING

Caution
- Voltage of about 300-330V is charged between both ends of smoothing capacitors
- During continuity check for each part of circuit in indoor unit electrical parts, disconnect red/gray lead wire connected from diode stack to system power module (SPM2) to prevent secondary trouble. (Be sure to discharge smoothing capacitor)

1. Turn OFF the Power supply to the outdoor unit.
2. After power is turned off, wait for 10 minutes or more. Then, remove electrical parts cover and apply soldering iron of 30 to 75W for 15 seconds or more to P2 and N1 terminals on system power module, in order to discharge voltage in smoothing capacitor.
3. Remove receptable of red/gray lead wire connected to system power module from diode stack before performing operation chech of each circuit.

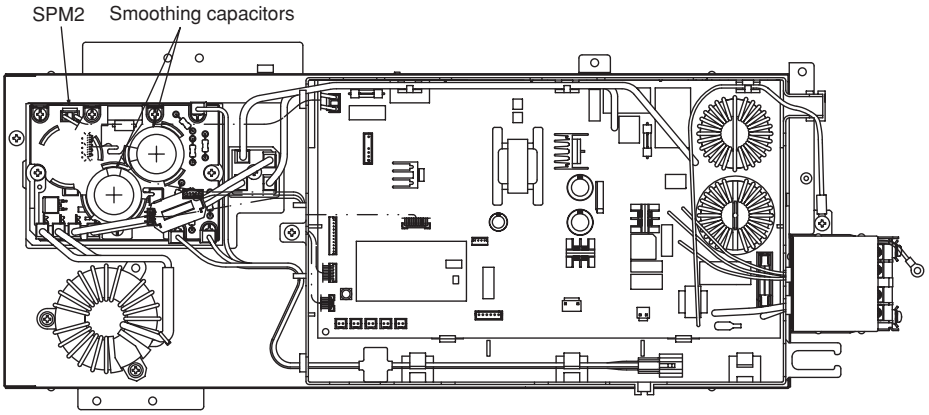


System power module

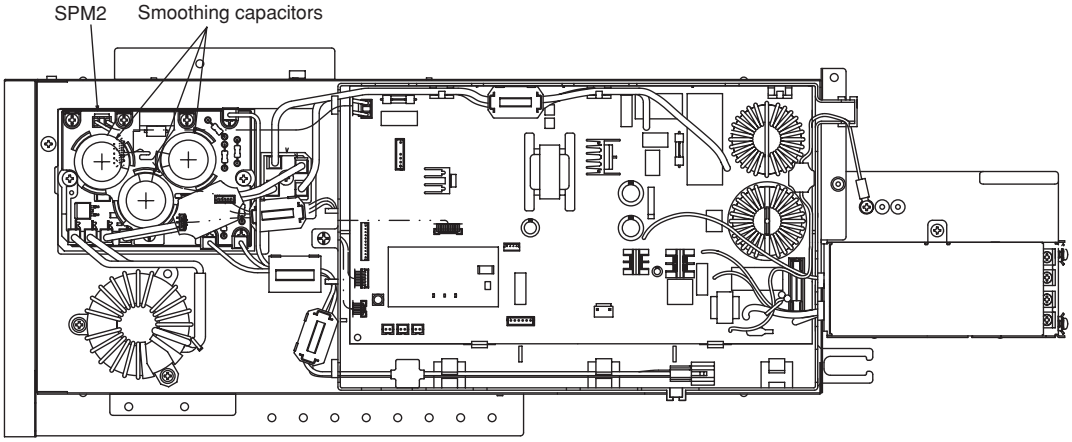
Do not use a soldering iron with transformer: If one is used, thermal fuse inside transformer will be blown

As shown above, apply soldering iron to metal parts (receptable) inside the sleeve corresponding to P1 and N1 terminals of system power module: Do this with smoothing capacitors kept connected. By removing red/gray lead wire from diode stack, power supply can be shut off. (corresponding to ⊕ and ⊖ terminals of system power module)

RAC-25NH4



RAC-50NH4



CHECKING THE INDOOR/OUTDOOR UNIT ELECTRICAL PARTS AND REFRIGERATING CYCLE

Model RAF-25NH4 / RAC-25NH4
RAF-50NH4 / RAC-50NH4

Timer lamp

Does the timer or filter lamp on the indoor unit blink?

See "Troubleshooting when the timer lamp blinks".

Check the outdoor electrical parts.

Filter lamp

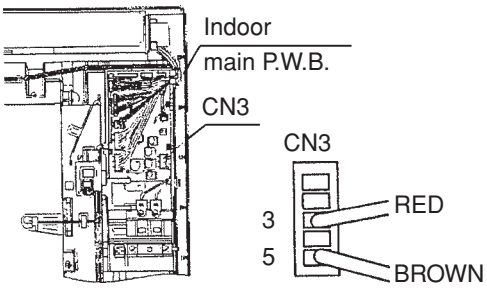
No

Set to room temperature 16°C in the cooling mode or to 32°C in the heating mode, and press the start/stop button

Does the operation lamp on the indoor unit start to light or blink?

No

Remove the decorative cover and electrical parts cover and check the pin voltages of CN3 (brown and red wires).
Pin ⑤: +35 V, pin ③: 0 V



Is approx. 32V to 39V being generated? Is the polarity correct?

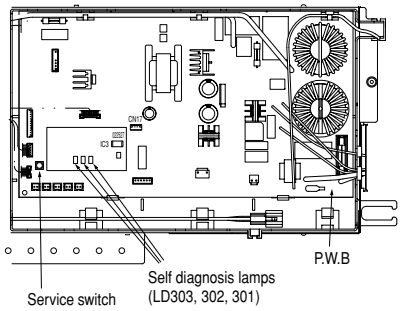
Yes

Is the compressor in the outdoor unit operating?

Yes

No

Remove the outdoor unit cover and electrical parts cover, and check self-diagnosis lamp LD301



Does LD301 blink one time ?
* Repeats 0.25-second on and 2-second off.

No

Check to see whether the F-cable is connected incorrectly or disconnected

Normal

Blinking other than one time

One-time blinking

Press the service switch for 1 sec. Does the compressor operate? (After checking, be sure to press the service switch to stop the operation).

Yes

No

See "Out door unit self-diagnosis lamp lighting mode".

Check the refrigerating cycle.

Check the outdoor electrical parts.

Check the indoor electrical parts.

TROUBLE SHOOTING WHEN THE TIMER and FILTER LAMP BLINKS
Model RAF-25NH4, RAF-50NH4

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

	Lamp blinking mode	Main defective
	2 sec ---------- Once	Reversing valve defective
	2 sec ---------- 2 Times	Forced operation of outdoor unit
	2 sec ---------- 3 Times	Indoor/Outdoor interface defective
	2 sec ---------- 5 Times	Abnormal rotating numbers of DC fan motor (Lower)
	2 sec ---------- 8 Times	Damper defective
	2 sec ---------- 9 Times	Indoor sensor defective
	2 sec -------- 10 Times	Abnormal rotating numbers of DC fan motor (Upper)
※2	2 sec -------- 13 Times	IC401 defective

(▮ – – Lights for 0.35 sec at interval of 0.35 sec.)

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

	Lamp blinking mode	Main defective
	2 sec ---------- 2 Times	Peak current cut
	2 sec ---------- 3 Times	Abnormal low speed rotation
	2 sec ---------- 4 Times	Switching failure
	2 sec ---------- 5 Times	Overload lower limit cut
	2 sec ---------- 6 Times	OH thermistor temp. rise
	2 sec ---------- 7 Times	Outdoor thermistor abnormal
	2 sec ---------- 8 Times	Acceleration defective
	2 sec ---------- 9 Times	Communications error
	2 sec -------- 12 Times	Fan lock error
※1	2 sec -------- 13 Times	Defective EEPROM of outdoor unit
	2 sec -------- 14 Times	Defective active converter
※1	2 sec -------- 15 Times	Discharge error

<Cautions>

(1) If the interface circuit is faulty when power is supplied, self-diagnosis display will not be displayed.

(2) When the indoor unit is in the above self-diagnosis modes, the self-diagnosis indicator on the outdoor unit will blink nine time (except for mode marked ※1 or when connected to the branch unit).

(3) If the indoor unit does not operate at all, check to see if the connectting cord is reversely connected or disconnected.

(4) To check operation again when the timer or filter lamp is blinking, you can use the remote control for operation (except for mode mark ※2).

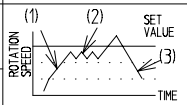
SELF-DIAGNOSIS LIGHTING MODE

MODEL: RAC-25NH4, RAC-50NH4

DANGER (DC360V)

- SWITCH OFF MAIN POWER SUPPLY TO THE OUTDOOR UNIT AT LEAST 10 MINUTES BEFORE START THE SERVICING WORK.
- MAKE SURE THE DC VOLTAGE LEVEL AT MEASURING POSITION (P1) AND (N1) IS LESS THAN 10V.
- DO NOT TOUCH THE SCREWS OF THE SYSTEM POWER MODULE WHEN THE UNIT IS TURNED ON. HIGH VOLTAGE STILL REMAIN EVEN AFTER THE UNIT IS TURNED OFF.
- DO NOT TOUCH ANY OTHER PARTS EXCEPT THE SERVICE SWITCH WHEN SERVICE OPERATION IS CONDUCTED.

SELF-DIAGNOSIS LIGHTING MODE ■ LIT ▨ BLINKING □ OFF

LD301	LD302	SELF-DIAGNOSIS NAME	DETAILS	MAIN CHECK POINT
		[1] DURING OPERATION		LD303 LIGHTS. ■
□	□	NORMAL OPERATION	COMPRESSOR OPERATION	NOT MALFUNCTION
■	□	OVERLOAD (1)	 UNDER OVERLOAD CONDITION, THE ROTATION SPEED IS CONTROLLED AUTOMATICALLY IN ORDER TO PROTECT THE COMPRESSOR.	THIS SHOWS AN OVERLOAD, NOT MALFUNCTION.
□	■	OVERLOAD (2)		
■	■	OVERLOAD (3)		

LD301	LD302	[2] DURING STOP	LD303 GOES OFF. □	
□	□	NORMAL STOP	INDOOR THERMOSTAT OFF. MAIN OPERATION OFF.	NOT MALFUNCTION.
▨ 1 TIME	□	RESET STOP	WHEN STOPPED WITH POWER RESET. (NORMAL WHEN POWER HAS BEEN TURNED ON).	① P.W.B.s (POWER CIRCUIT,HIC, ETC.)
▨ 2 TIMES	□	PEAK CURRENT CUT	OVER CURRENT IS DETECTED.	① SYSTEM POWER MODULE ② COMPRESSOR ③ P.W.B.s
▨ 3 TIMES	□	ABNORMAL LOW SPEED ROTATION	POSITION DETECTION SIGNAL IS NOT INPUT DURING OPERATION.	① SYSTEM POWER MODULE ② COMPRESSOR ③ P.W.B.s
▨ 4 TIMES	□	SWITCHING FAILURE	FAIL TO SWITCH FROM INITIAL LOW FREQUENCY SYNC. TO POSITION DETECTION SYNC. .	① SYSTEM POWER MODULE ② COMPRESSOR ③ P.W.B.s
▨ 5 TIMES	□	OVERLOAD LOWER LIMIT CUT	OVERLOAD CONDITION STILL PERSISTING EVEN WHEN ROTATION SPEED IS BELOW THE LOWER RPM LIMIT.	① OUTDOOR UNIT IS EXPOSED TO DIRECT SUNLIGHT OR ITS AIRFLOW BLOCKED. ② FAN MOTOR ③ FAN MOTOR CIRCUIT ④ THE VOLTAGE IS EXTREMELY LOW.
▨ 6 TIMES	□	OH THERMISTOR TEMP. RISE	OH THERMISTOR IS OPERATING.	① LEAK OF REFRIGERANT ② COMPRESSOR ③ OH THERMISTOR CIRCUIT ④ FAN MOTOR ⑤ FAN MOTOR CIRCUIT
▨ 7 TIMES	□	ABNORMAL THERMISTOR	THERMISTOR IS OPENED OR SHORTED.	① THERMISTOR ② CONNECTION OF THERMISTOR IS FAULTY ③ THERMISTOR CIRCUIT
▨ 8 TIMES	□	ACCELERATION DEFECTIVE	NO ACCELERATION ABOVE THE LOWER LIMIT OF THE ROTATION SPEED.	① LEAK OF REFRIGERANT ② COMPRESSOR
▨ 9 TIMES	□	COMMUNICATION ERROR	COMMUNICATION BETWEEN INDOOR UNIT AND OUTDOOR UNIT ARE INTERRUPTED.	① C. D CABLE IS REVERSED ② CABLE IS DISCONNECTED ③ INTERFACE CIRCUIT OF INDOOR AND OR OUTDOOR UNIT
▨ 10 TIMES	□	POWER SUPPLY VOLTAGE ERROR	POWER SUPPLY VOLTAGE IS INCORRECT.	① POWER SUPPLY VOLTAGE ② RECEPTACLE OF WIRE AT SYSTEM POWER MODULE IS NOT PROPERLY INSERTED
▨ 12 TIMES	□	FAN LOCK ERROR	OUTDOOR FAN RPM IS NOT ROTATE AS INTENDED RPM.	① FAN MOTOR ② FAN MOTOR CIRCUIT
▨ 13 TIMES	□	EEPROM READING ERROR	MICROCOMPUTER CANNOT READ THE DATA IN EEPROM.	① HIC
▨ 14 TIMES	□	ACTIVE CONVERTER DEFECTIVE	OVER VOLTAGE IS DETECTED BY SYSTEM POWER MODULE.	① SYSTEM POWER MODULE

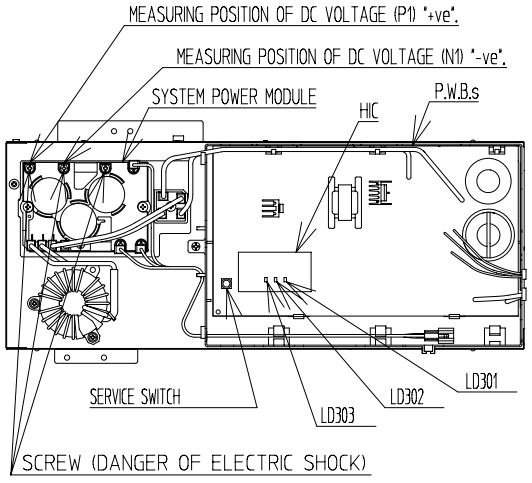
※ EXAMPLE OF BLINKING (5 TIMES) ▨▨▨▨▨ 2SEC ▨ (▨ •• LIGHTS FOR 0.25 SEC. AT INTERVAL OF 0.25 SEC.)

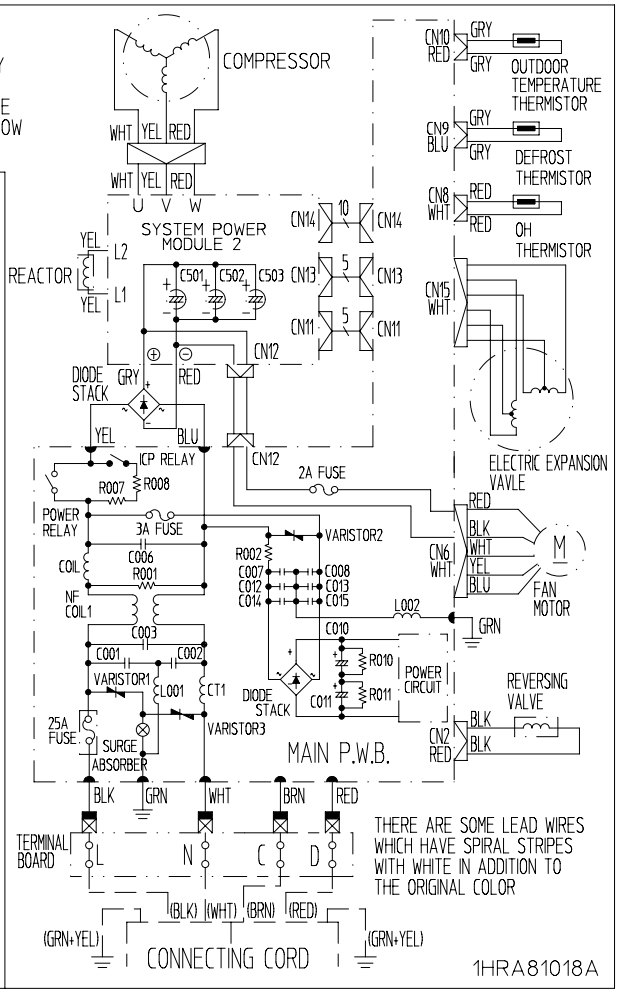
WIRING DIAGRAM

BLK : BLACK GRY : GRAY
BLU : BLUE RED : RED
BRN : BROWN WHT : WHITE
GRN : GREEN YEL : YELLOW

SERVICE OPERATION COLLECT REFRIGERANT FROM INDOOR UNIT AND STORE AT OUTDOOR UNIT.

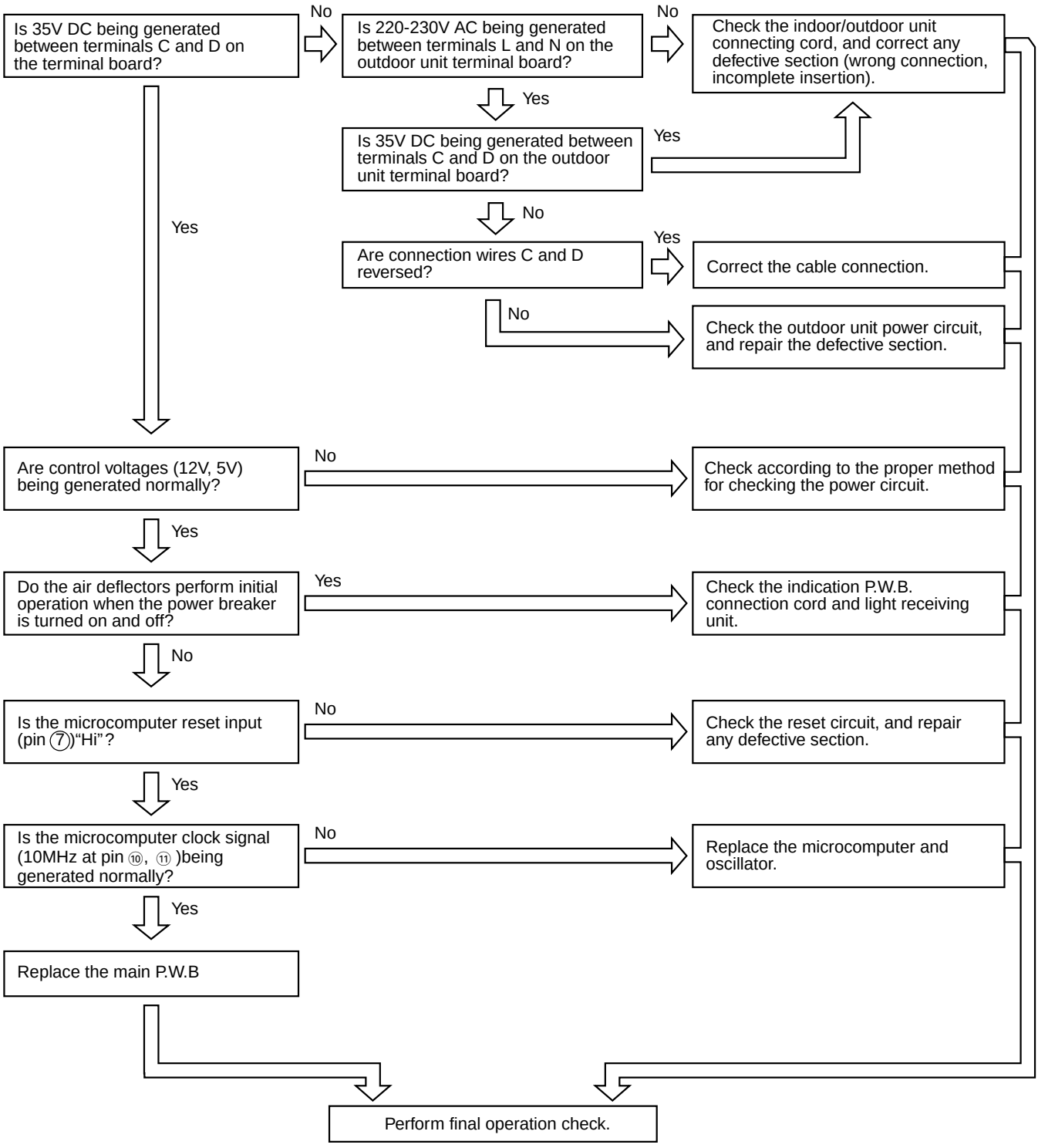
1. SWITCH OFF THE MAIN POWER SUPPLY AND THEN SWITCH IT ON AGAIN. WAIT FOR 1 MINUTE.
2. PRESS AND HOLD THE SERVICE SWITCH FOR 1 SECOND TO START OUTDOOR UNIT IN COOLING OPERATION. IN ORDER TO PREVENT PARTS FROM DAMAGE, DO NOT OPERATE THE OUTDOOR UNIT FOR MORE THAN 5 MINUTES.
3. PRESS AND HOLD THE SERVICE SWITCH FOR 1 SECOND TO STOP THE SERVICE OPERATION.
4. REPEAT STEP 1 TO 3 IF SERVICE OPERATION NEED TO BE REPEATED.





CHECKING INDOOR UNIT ELECTRICAL PARTS

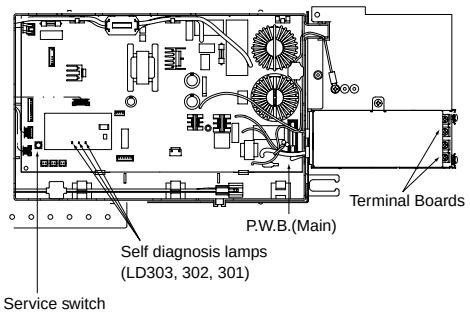
1. Power does not come on (no operation)



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

Set to room temperature 16°C in the cooling mode or to 32°C in the heating mode, and press the start/stop button.

Remove the outdoor unit cover and electrical parts cover, and check self-diagnosis lamp LD301.



Does LD301 blink one time?
*Repeats 0.25-second on and 2-second off.

Yes

Check the room temperature thermistor; if it is defective, replace it.
<Normal values>
10°C → approx. 20kΩ
25°C → approx. 10kΩ
30°C → approx. 8kΩ

Check the heat exchanger thermistor; if it is defective, replace it.
<Normal values>
10°C → approx. 20kΩ
25°C → approx. 10kΩ
30°C → approx. 8kΩ

No

Does outdoor electrical part LD301 blink nine times?

Yes

"Comunication circuit self-diagnosis" is does by the operation of the remote controller.

As for the diagnosis result?

Negative ion lamp blinks nine times

Check outdoor electrical parts, and repair any defective parts (around the outdoor interface transmitting circuit).

Timer Lamp blinks three times

Check outdoor electrical parts, and repair any defective parts (around the outdoor interface transmitting circuit).

No

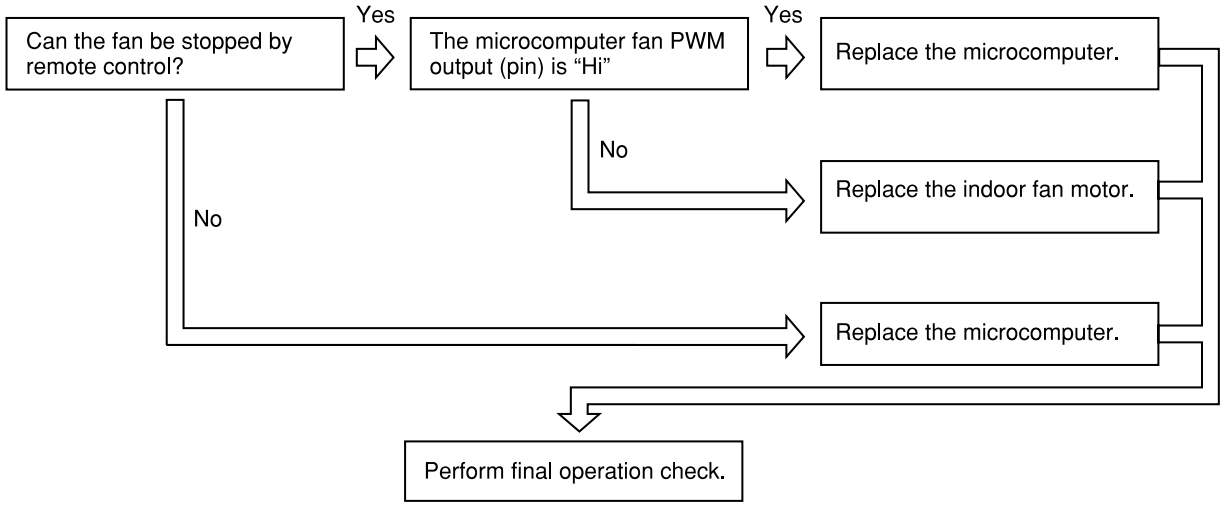
Does LD303 switch off several second after it lights?

Yes

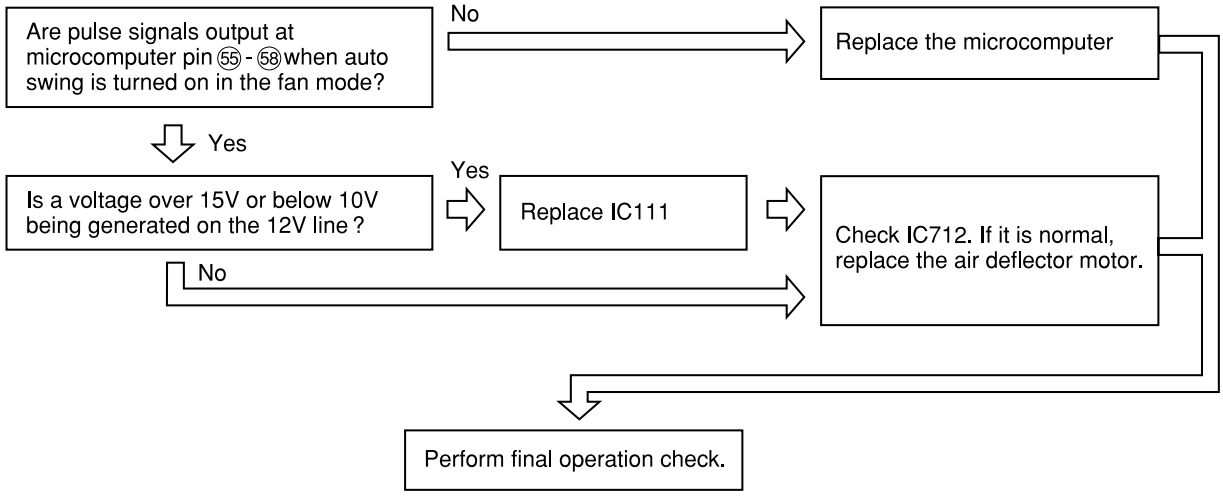
Check outdoor electrical parts, and repair any defective parts.

Perform final operation check.

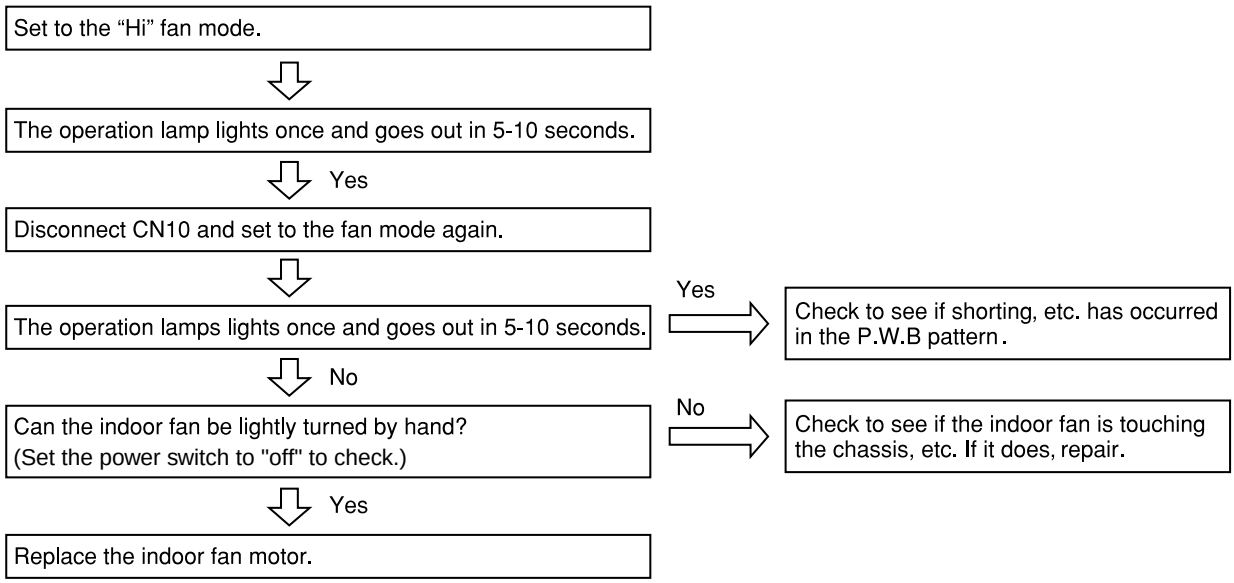
3. Indoor fan speed does not change (others are normal)



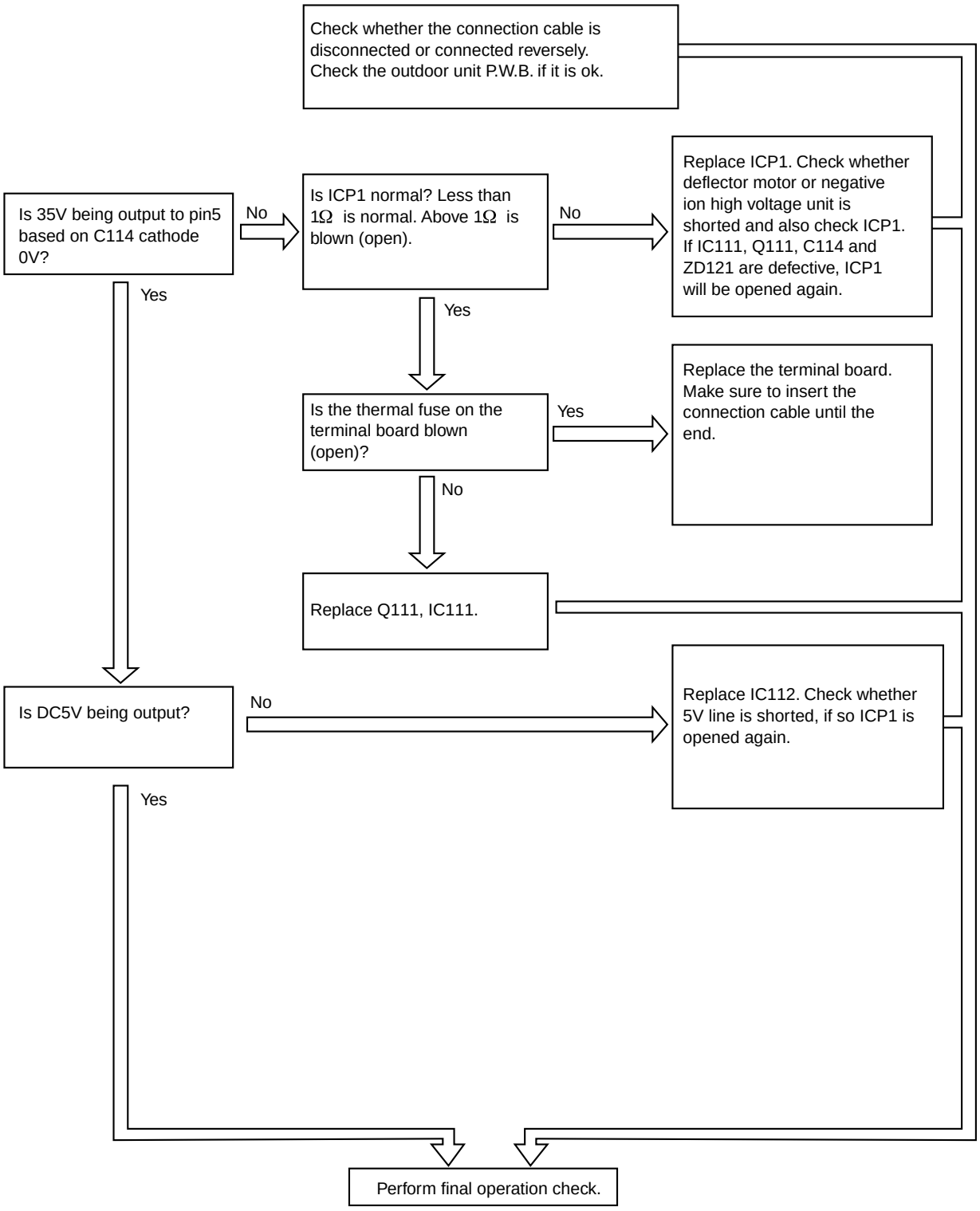
4. Air deflector does not move (others are normal)



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



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



※1 During the operation is being stopped, 12V line may change to 7V.

CHECKING THE REMOTE CONTROLLER

Is battery polarity correct?

No

Install the battery in the correct polarity.

Yes

Is the battery check sign + − flashing?

Yes

Replace the battery.

No

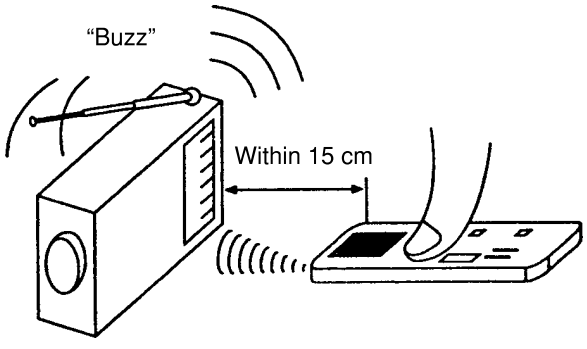
Turn on an AM radio, bring the remote control switch within 15 cm of the radio, and press the ON/OFF button.

Does the radio buzz noisily?

No

Check the LED (D1) with a multimeter.

Yes



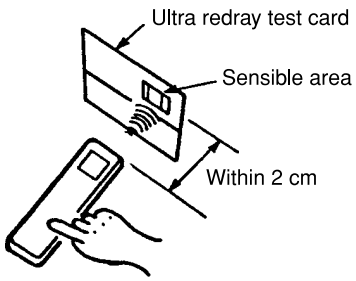
[AM radio]

Check the indoor unit signal receiving P. W. B..
If it is good, check the main P. W. B..

Check functions again.
If it does not work, replace the remote controller.

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

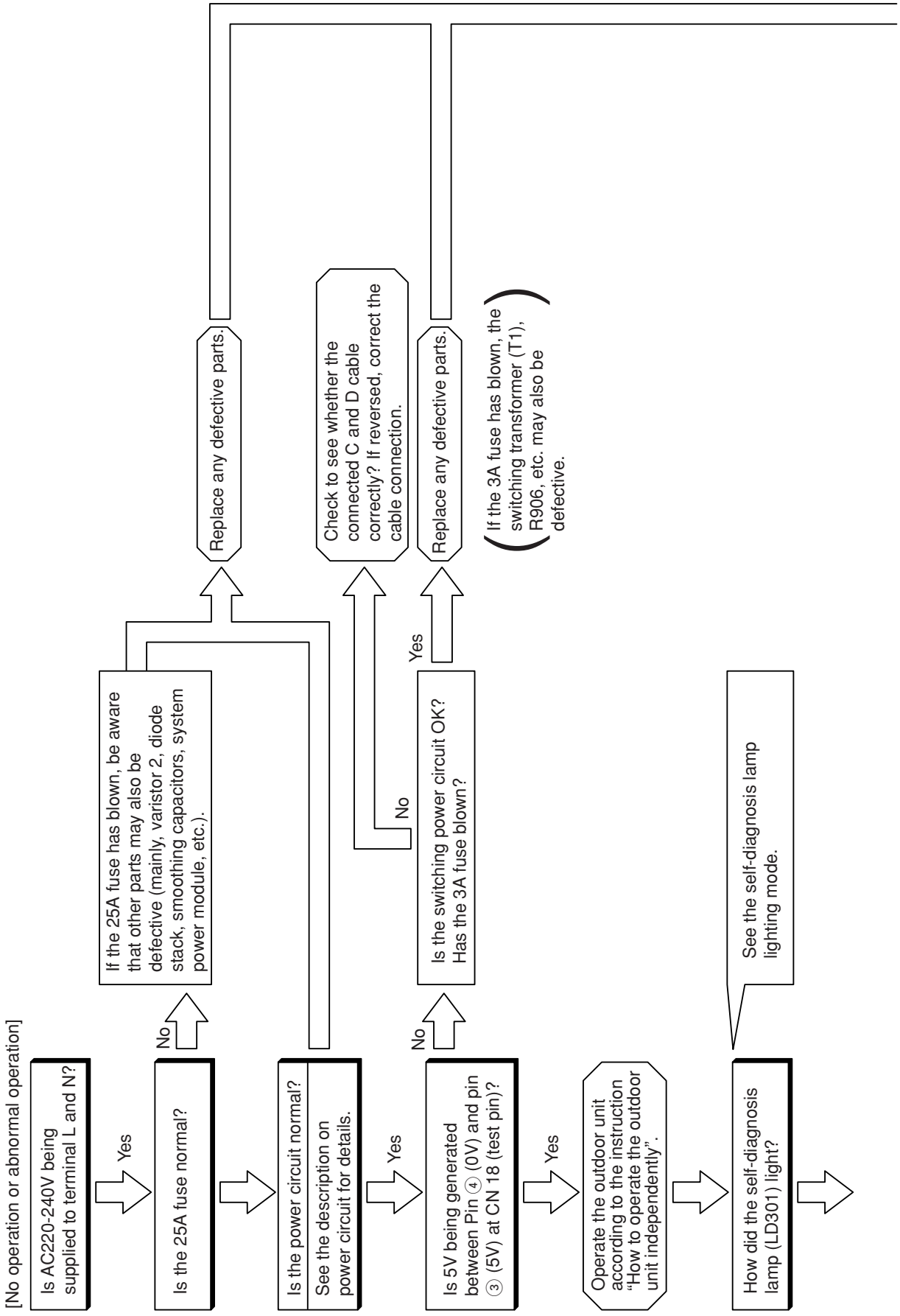
Using the test card



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

CHECKING THE OUTDOOR UNIT ELECTRICAL PARTS

MODEL RAC-25NH4, RAC-50NH4



LD301 blinks 9 time.
Communication error.

Is DC 35V being output at terminals C and D? (Normally, DC 33-38.5V is output.)

Yes

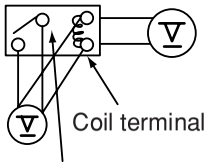
No

Is DC 35V being output across R914?

D907 and C910 may be defective.

Yes

Interface relay



No

Is DC 12V being supplied across the control side (coil terminal) of interface relay?

There is a defective section between the 12V output of switching power supply on the main P.W.B. and interface relay (also, check for contact with solder, etc.).

Yes

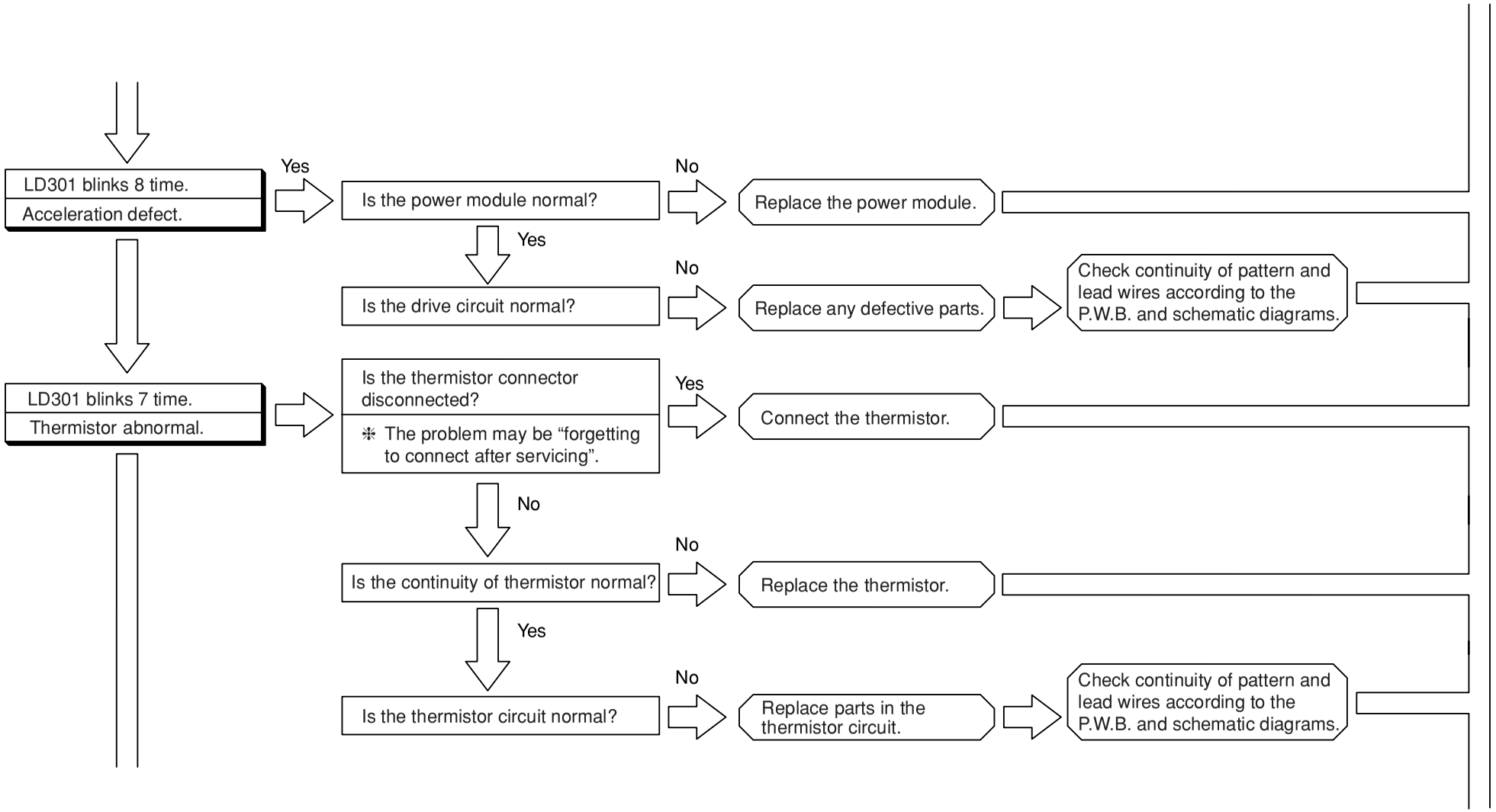
Yes

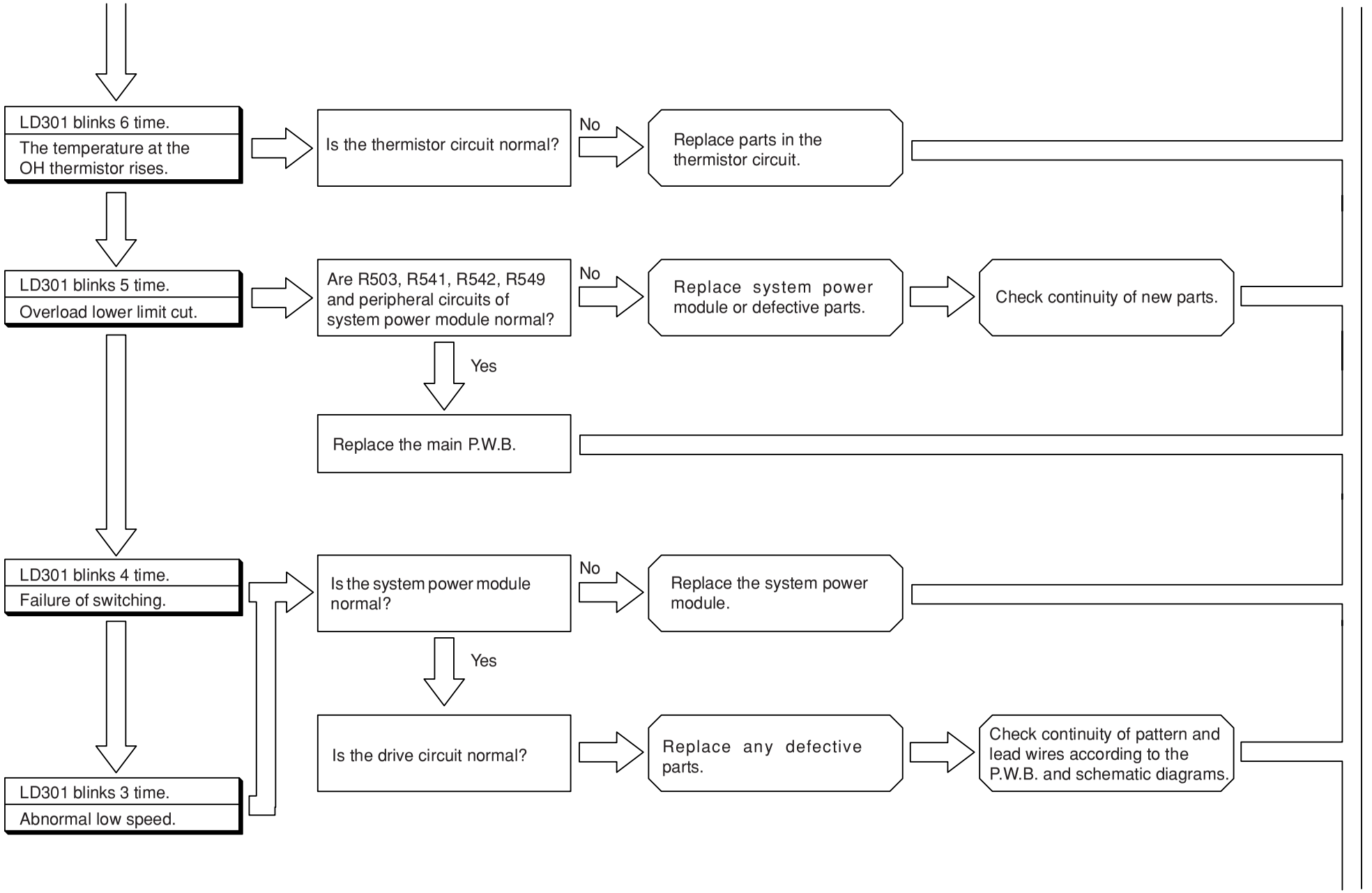
Is a voltage (at least 10V) being generated between the contact terminals of interface relay?

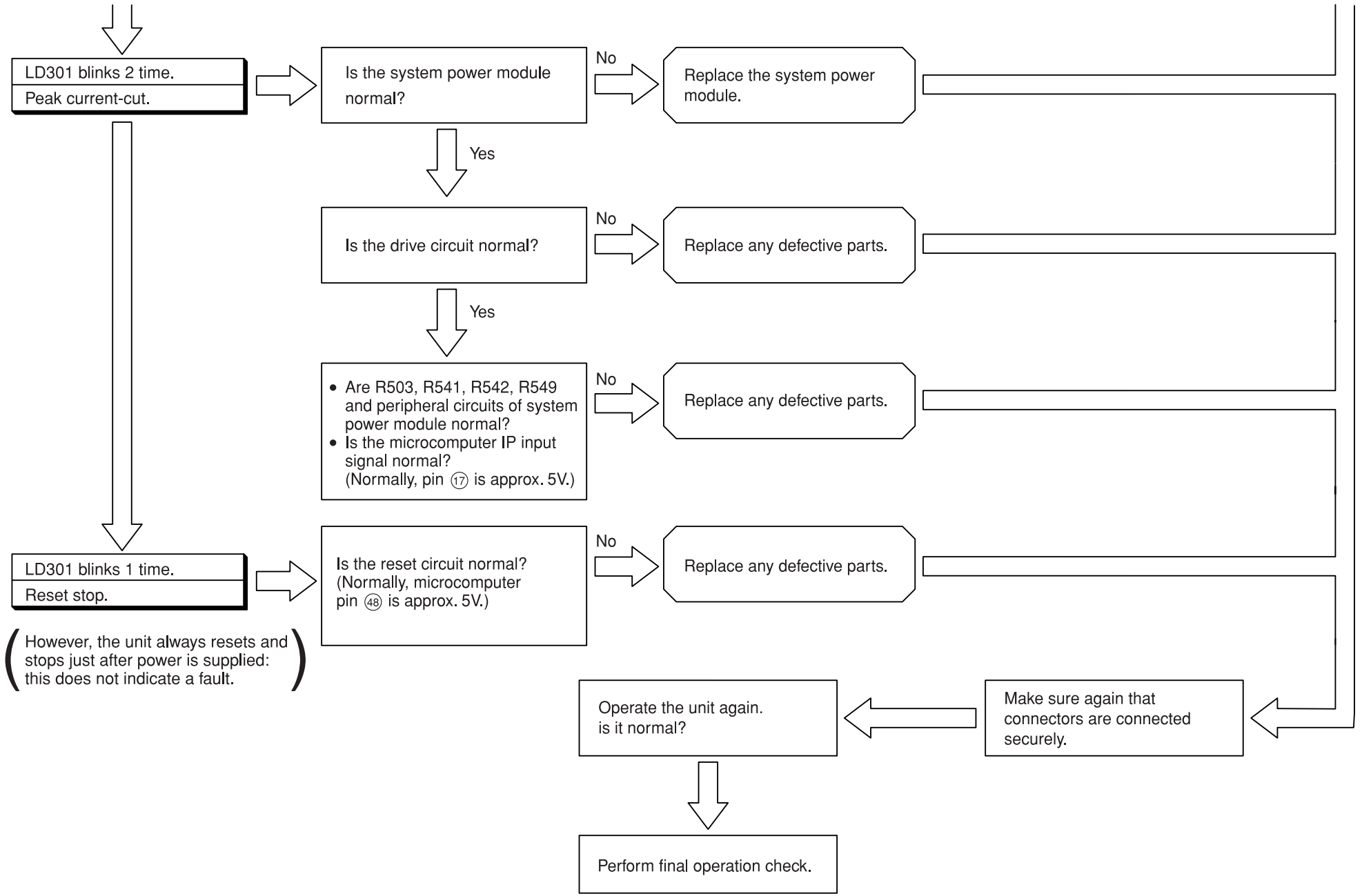
Repalce the interface relay.

No

Check the interface curcuit.

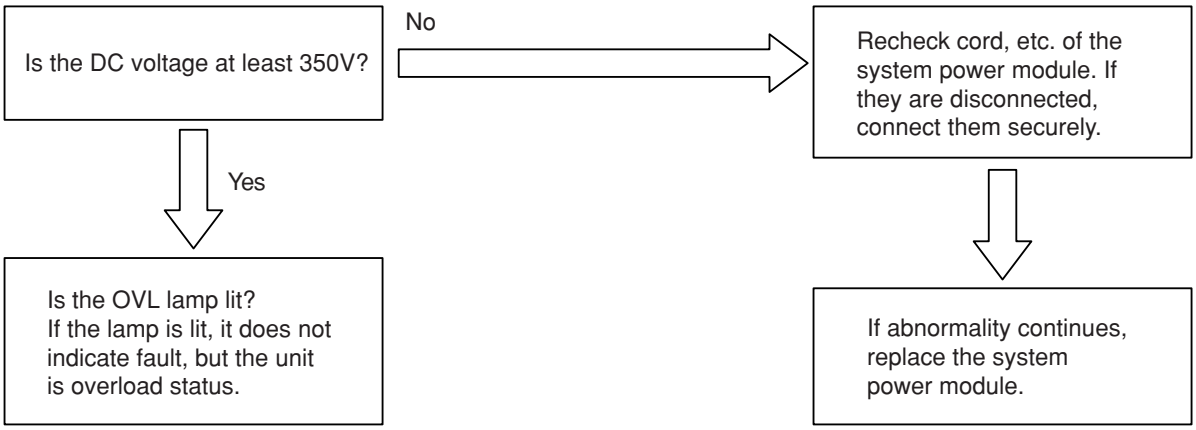

LD301 blinks 8 time.
Acceleration defect.
Yes
Is the power module normal?
No
Replace the power module.
Yes
Is the drive circuit normal?
No
Replace any defective parts.
Check continuity of pattern and lead wires according to the P.W.B. and schematic diagrams.
LD301 blinks 7 time.
Thermistor abnormal.
Is the thermistor connector disconnected?
❊ The problem may be “forgetting to connect after servicing”.
Yes
Connect the thermistor.
No
Is the continuity of thermistor normal?
No
Replace the thermistor.
Yes
Is the thermistor circuit normal?
No
Replace parts in the thermistor circuit.
Check continuity of pattern and lead wires according to the P.W.B. and schematic diagrams.


LD301 blinks 6 time.
The temperature at the OH thermistor rises.
Is the thermistor circuit normal?
No
Replace parts in the thermistor circuit.
LD301 blinks 5 time.
Overload lower limit cut.
Are R503, R541, R542, R549 and peripheral circuits of system power module normal?
No
Replace system power module or defective parts.
Check continuity of new parts.
Yes
Replace the main P.W.B.
LD301 blinks 4 time.
Failure of switching.
Is the system power module normal?
No
Replace the system power module.
Yes
LD301 blinks 3 time.
Abnormal low speed.
Is the drive circuit normal?
Replace any defective parts.
Check continuity of pattern and lead wires according to the P.W.B. and schematic diagrams.


LD301 blinks 2 time.
Peak current-cut.
Is the system power module normal?
No
Replace the system power module.
Yes
Is the drive circuit normal?
No
Replace any defective parts.
Yes
• Are R503, R541, R542, R549 and peripheral circuits of system power module normal?
• Is the microcomputer IP input signal normal? (Normally, pin ⑰ is approx. 5V.)
No
Replace any defective parts.
LD301 blinks 1 time.
Reset stop.
Is the reset circuit normal? (Normally, microcomputer pin ㊽ is approx. 5V.)
No
Replace any defective parts.
(However, the unit always resets and stops just after power is supplied: this does not indicate a fault.)
Operate the unit again. is it normal?
Make sure again that connectors are connected securely.
Perform final operation check.

POWER CIRCUIT

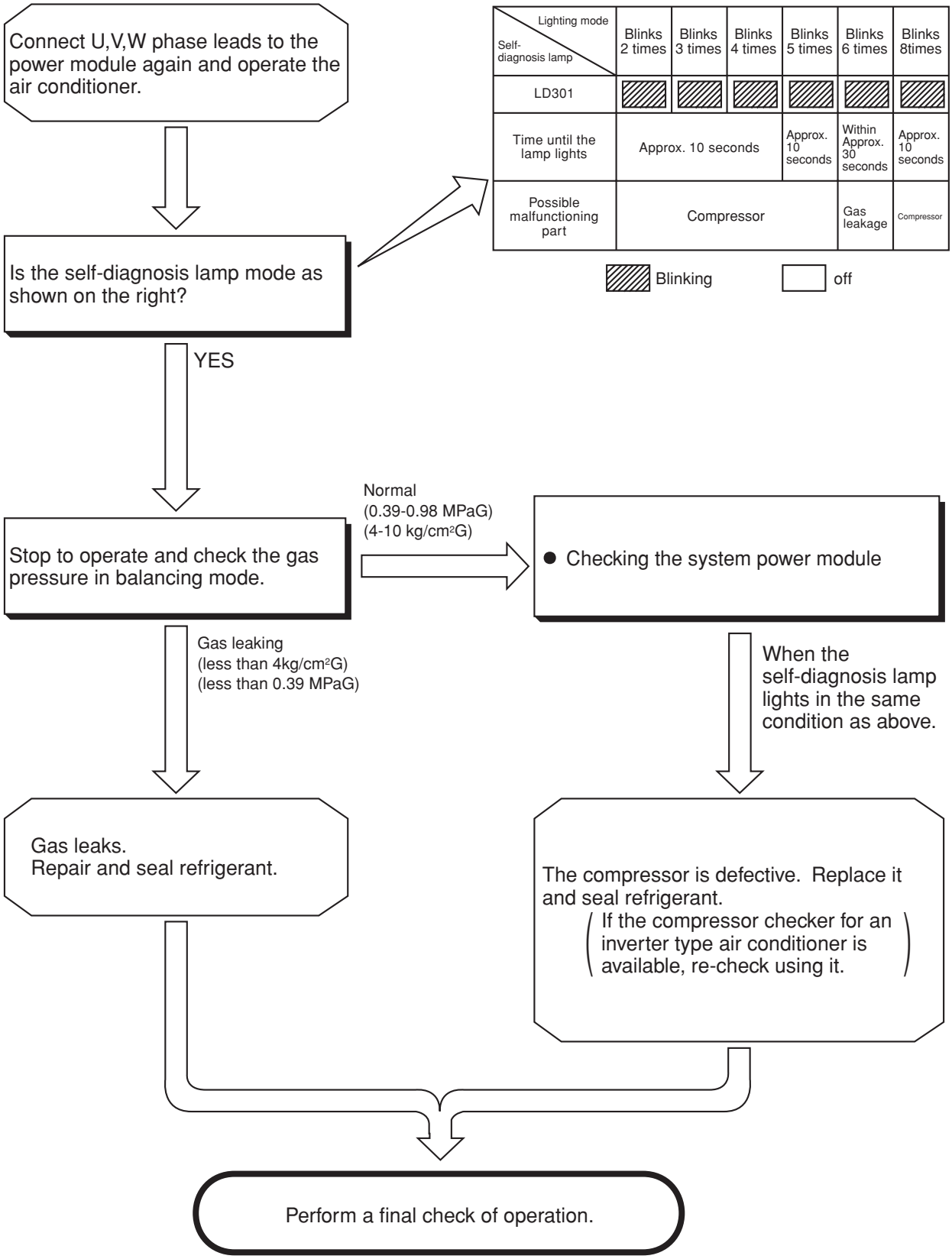
Phenomenon 1 <Rotation speed does not increase>



Overvoltage defect: system power module faulty (15-times blinking)

CHECKING THE REFRIGERATING CYCLE (JUDGING BETWEEN GAS LEAKAGE AND COMPRESSOR DEFECTIVE)

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



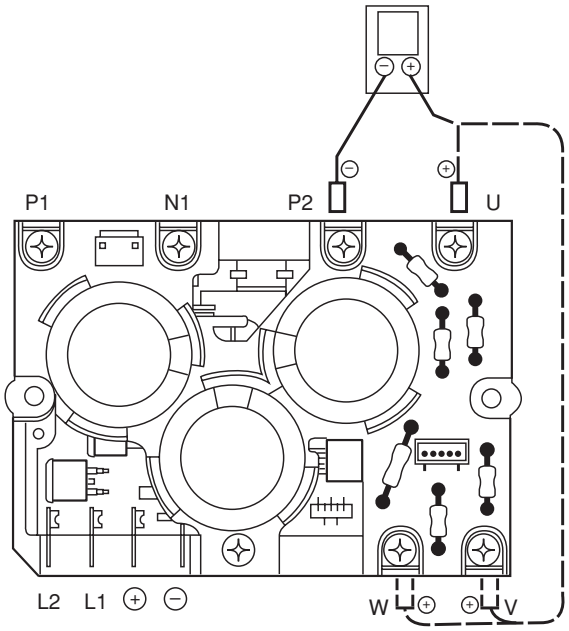
Lighting mode / Self-diagnosis lamp	Blinks 2 times	Blinks 3 times	Blinks 4 times	Blinks 5 times	Blinks 6 times	Blinks 8times
LD301	▨	▨	▨	▨	▨	▨
Time until the lamp lights	Approx. 10 seconds			Approx. 10 seconds	Within Approx. 30 seconds	Approx. 10 seconds
Possible malfunctioning part	Compressor				Gas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

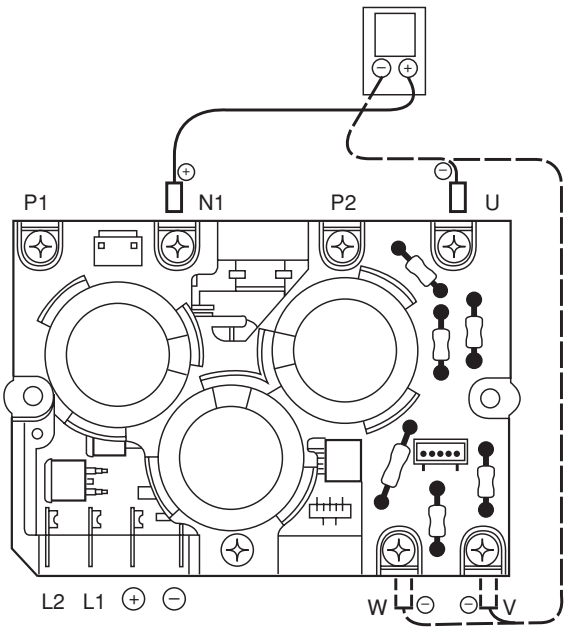
HOW TO CHECK SYSTEM POWER MODULE

Checking system power module using tester
Set tester to resistance range (X 100)
If indicator does not swing in the following conductivity check, the system power module is normal.
(In case of digital tester, since built-in battery is set in reverse direction, ⊕ and ⊖ terminals are reversed.)

⚠ CAUTION

If inner circuit of system power module is disconnected (open), the indicator of tester will not swing and this may assumed as normal. In this case, if indicator swings when ⊕ and ⊖ terminals are connected in reverse of diagram below, it is normal. Furthermore, compare how indicator swings at U, V and W phases. If indicator swings the same way at each point, it is normal.





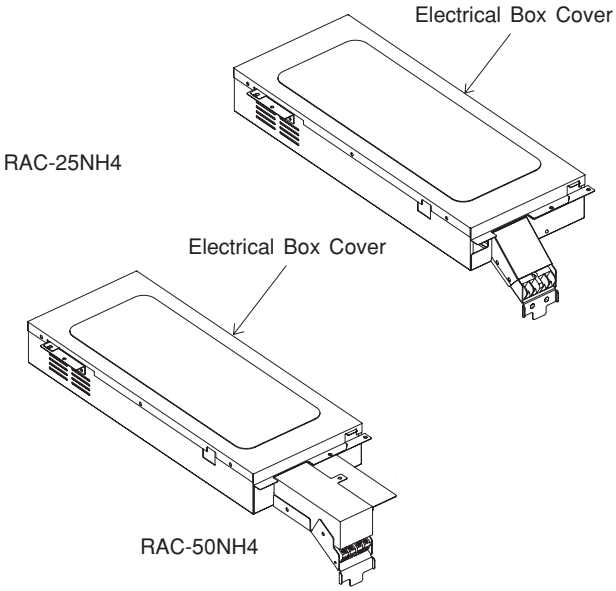
HOW TO OPERATE USING THE SERVICE SWITCH THE OUTDOOR UNIT

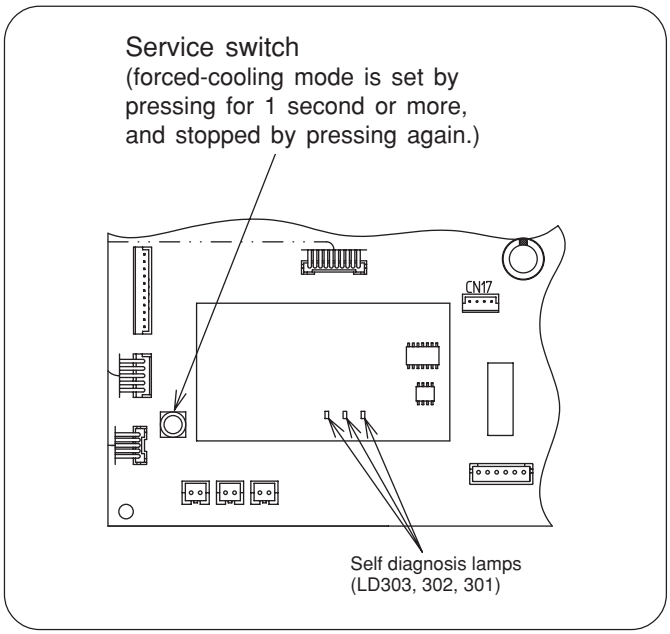
MODEL RAC-25NH4, RAC-50NH4

1. Turn off the power supply to outdoor unit and then turn on again.
2. Remove the electrical box cover.

LD303 (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 continue normal operation when the electrical parts are normal, or it will repeat operating for approx. one minute and stop due to overload power limit cut, or it will operate in the overload status.

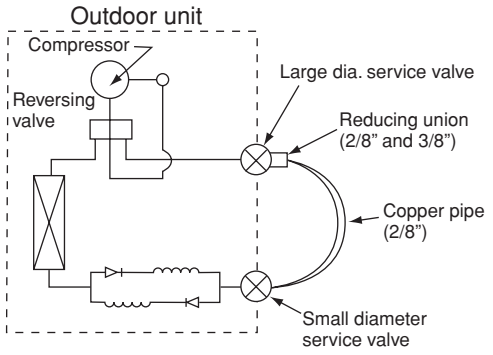
Be sure to push the service switch again to stop the forced cool operation.

HOW TO OPERATE THE OUTDOOR UNIT INDEPENDENTLY

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

Connect the small diameter service value 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)



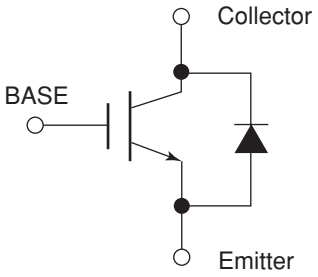
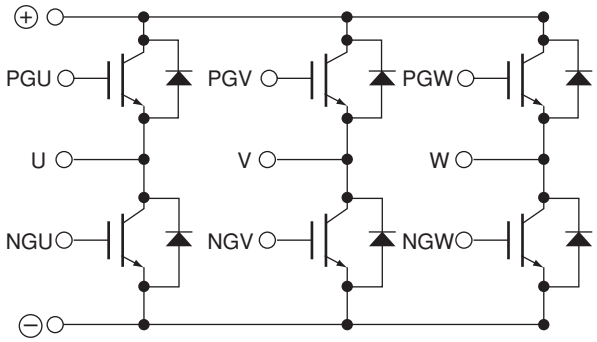
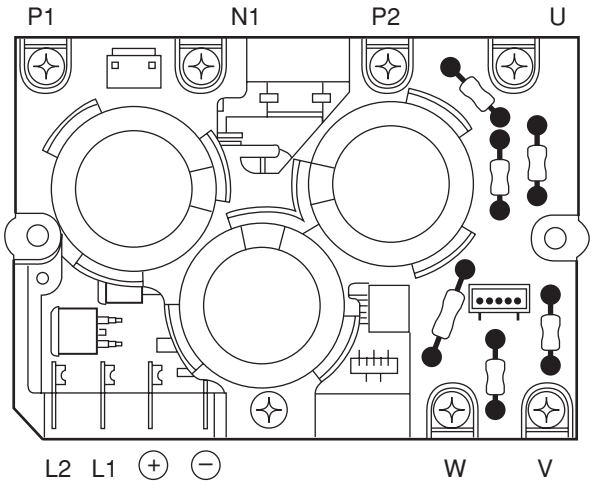
Parts to be prepared

(1) Reducing union
2/8" (6.35mm)
1/2" (12.7mm)
(2) Copper pipe (2/8" and 1/2")
(3) Shorting leads
2 leads approx. 10 cm long with alligator clip or IC clip

Do not operate for more than 5 minutes

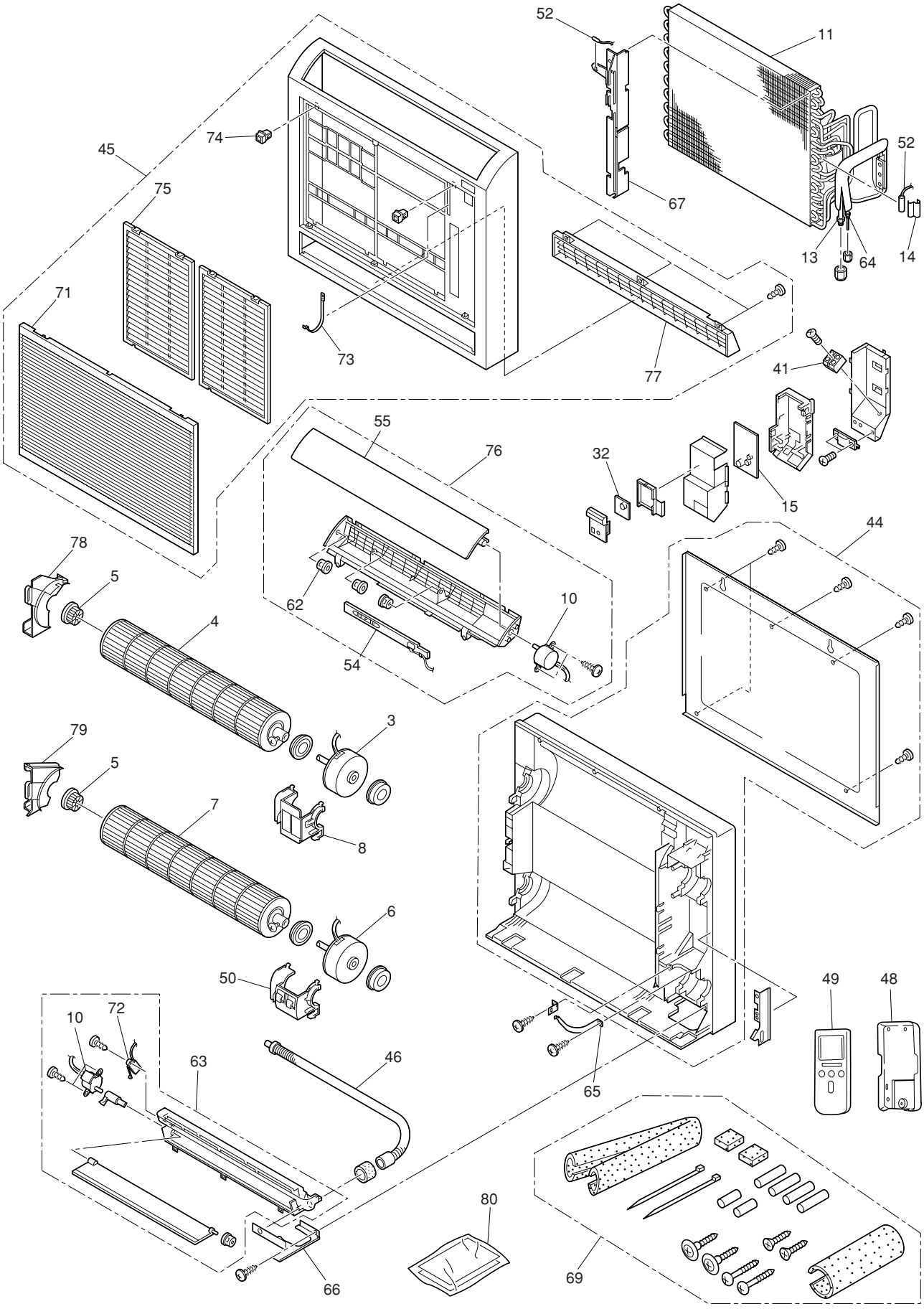
The operation method is the same as "How to operate using the connector to servicing the outdoor unit".
※ 1 The charging amount of 300g is equivalent to the load in normal operation.

SYSTEM POWER MODULE DIAGNOSIS

Circuit diagram of the device (excepting the reflux diode)	
Circuit diagram of the module	
Terminals symbol mark of the module ※ See next page for measuring value using tester	

PARTS LIST AND DIAGRAM

INDOOR UNIT
MODEL : RAF-25NH4, RAF-50NH4



MODEL RAF-25NH4

NO.	PART N0. RAF-25NH4		Q'TY / UNIT	PARTS NAME
3	ATI-0972B	902	1	FAN MOTOR (UPPER)
4	ATI-0972B	903	1	TANGENTIAL FAN (UPPER)
5	RAS4010LX2	010	2	FAN SUPPORT ASSEMBLY
6	ATI-0972B	905	1	FAN MOTOR (LOWER)
7	ATI-0972B	906	1	TANGENTIAL FAN (LOWER)
8	ATI-0972B	904	1	FAN MOTOR SUPPORT (UPPER)
10	RAS-2810NX	045	2	AUTO SWEEP MOTOR
11	RAF-25NH4	902	1	HEAT EXCHANGER ASSEMBLY
13	RAS-287AX	802	1	UNION (3)
14	ATI-0972B	935	1	BULB SUPPORT
15	RAF-25NH4	903	1	P.W.B. (MAIN)
32	ATI-0972B	914	1	P.W.B. (SWITCH)
41	ATI-0972B	936	1	TERMINAL BORD (2P)
44	RAF-25NH4	901	1	CABINET
45	RAF-25NH4	906	1	FRONT COVER ASSEMBLY
46	KFR47GBPM	907	1	DRAIN HOSE
48	RAS-258JX	004	1	REMOTE CONTROL SUPPORT
49	RAD-25QH4	905	1	REMOTE CONTROL ASSEMBLY
50	ATI-0972B	912	1	FAN MOTOR SUPPORT (LOWER)
52	ATI-0972B	915	1	THERMISTOR
54	RAF-25NH4	905	1	P.W.B. (INDICATION)
55	RAF-25NH4	909	1	WIDE DEFLECTOR
62	RAS-3610LX	003	3	DEFLECTOR SUPPORT
63	ATI-0972B	917	1	DISCHARGE FRAME
64	RAS-2810KX	009	1	UNION (2)
65	ATI-0972B	925	1	PIPE BAND
66	ATI-0972B	926	1	RAT PREVENTION COVER
67	ATI-0972B	927	1	PIPE COVER

MODEL RAF-25NH4

NO.	PART N0. RAF-25NH4		Q'TY / UNIT	PARTS NAME
69	ATI-0972B	929	1	ACCESSORIES ASSEMBLY
71	RAF-25NH4	907	1	FRONT PANEL
72	ATI-0972B	932	1	DAMPER LIMIT SWITCH
73	ATI-0972B	933	1	BAND (FOR FRONT PANEL)
74	RAP-5CPJ	004	2	LATCH 1 (FRONT COVER)
75	ATI-0972B	934	2	AIR FILTER
76	RAF-25NH4	904	1	TOP FRAME
77	RAF-25NH4	908	1	DISCHARGE GRILL
78	ATI-0972B	922	1	FAN COVER (UPPER)
79	ATI-0972B	923	1	FAN COVER (LOWER)

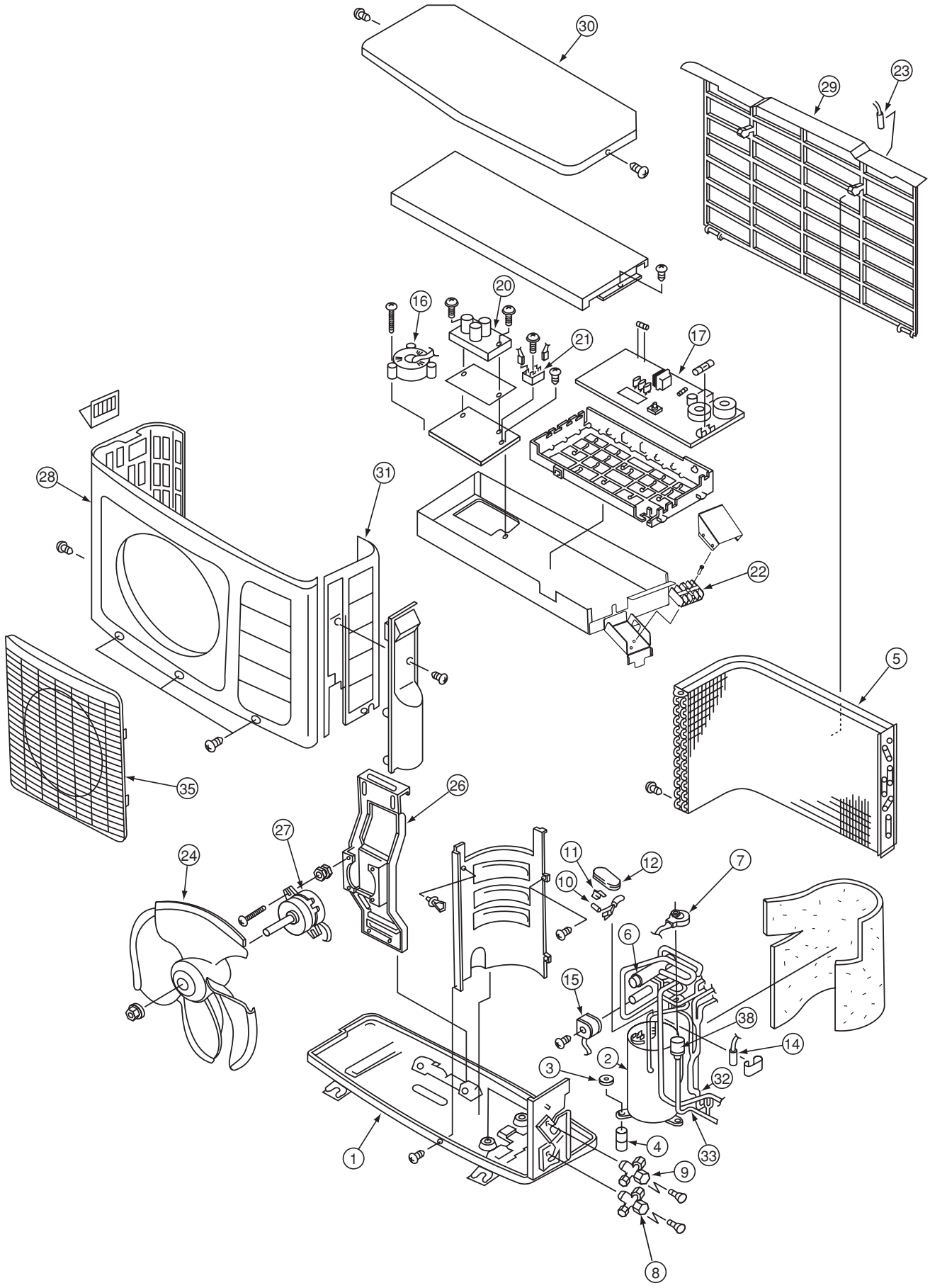
MODEL RAF-50NH4

NO.	PART N0. RAF-50NH4		Q'TY / UNIT	PARTS NAME
3	ATI-0972B	902	1	FAN MOTOR (UPPER)
4	ATI-0972B	903	1	TANGENTIAL FAN (UPPER)
5	RAS4010LX2	010	2	FAN SUPPORT ASSEMBLY
6	ATI-0972B	905	1	FAN MOTOR (LOWER)
7	ATI-0972B	906	1	TANGENTIAL FAN (LOWER)
8	ATI-0972B	904	1	FAN MOTOR SUPPORT (UPPER)
10	RAS-2810NX	045	2	AUTO SWEEP MOTOR
11	ATI-0972B	907	1	HEAT EXCHANGER ASSEMBLY
13	RAS4010KX2	008	1	UNION (4)
14	ATI-0972B	935	1	BULB SUPPORT
15	RAF-50NH4	901	1	P.W.B. (MAIN)
32	ATI-0972B	914	1	P.W.B. (SWITCH)
41	ATI-0972B	936	1	TERMINAL BORD (2P)
44	RAF-25NH4	901	1	CABINET
45	RAF-25NH4	906	1	FRONT COVER ASSEMBLY
46	KFR47GBPM	907	1	DRAIN HOSE
48	RAS-258JX	004	1	REMOTE CONTROL SUPPORT
49	RAD-25QH4	905	1	REMOTE CONTROL ASSEMBLY
50	ATI-0972B	912	1	FAN MOTOR SUPPORT (LOWER)
52	ATI-0972B	915	1	THERMISTOR
54	RAF-25NH4	905	1	P.W.B. (INDICATION)
55	RAF-25NH4	909	1	WIDE DEFLECTOR
62	RAS-3610LX	003	3	DEFLECTOR SUPPORT
63	ATI-0972B	917	1	DISCHARGE FRAME
64	RAS-2810KX	009	1	UNION (2)
65	ATI-0972B	925	1	PIPE BAND
66	ATI-0972B	926	1	RAT PREVENTION COVER
67	ATI-0972B	927	1	PIPE COVER

MODEL RAF-50NH4

NO.	PART N0. RAF-50NH4	Q'TY / UNIT	PARTS NAME
69	ATI-0972B 929	1	ACCESSORIES ASSEMBLY
71	RAF-25NH4 907	1	FRONT PANEL
72	ATI-0972B 932	1	DAMPER LIMIT SWITCH
73	ATI-0972B 933	1	BAND (FOR FRONT PANEL)
74	RAP-5CPJ 004	2	LATCH 1 (FRONT COVER)
75	ATI-0972B 934	2	AIR FILTER
76	RAF-25NH4 904	1	TOP FRAME
77	RAF-25NH4 908	1	DISCHARGE GRILL
78	ATI-0972B 922	1	FAN COVER (UPPER)
79	ATI-0972B 923	1	FAN COVER (LOWER)

OUTDOOR UNIT
MODEL : RAC-25NH4

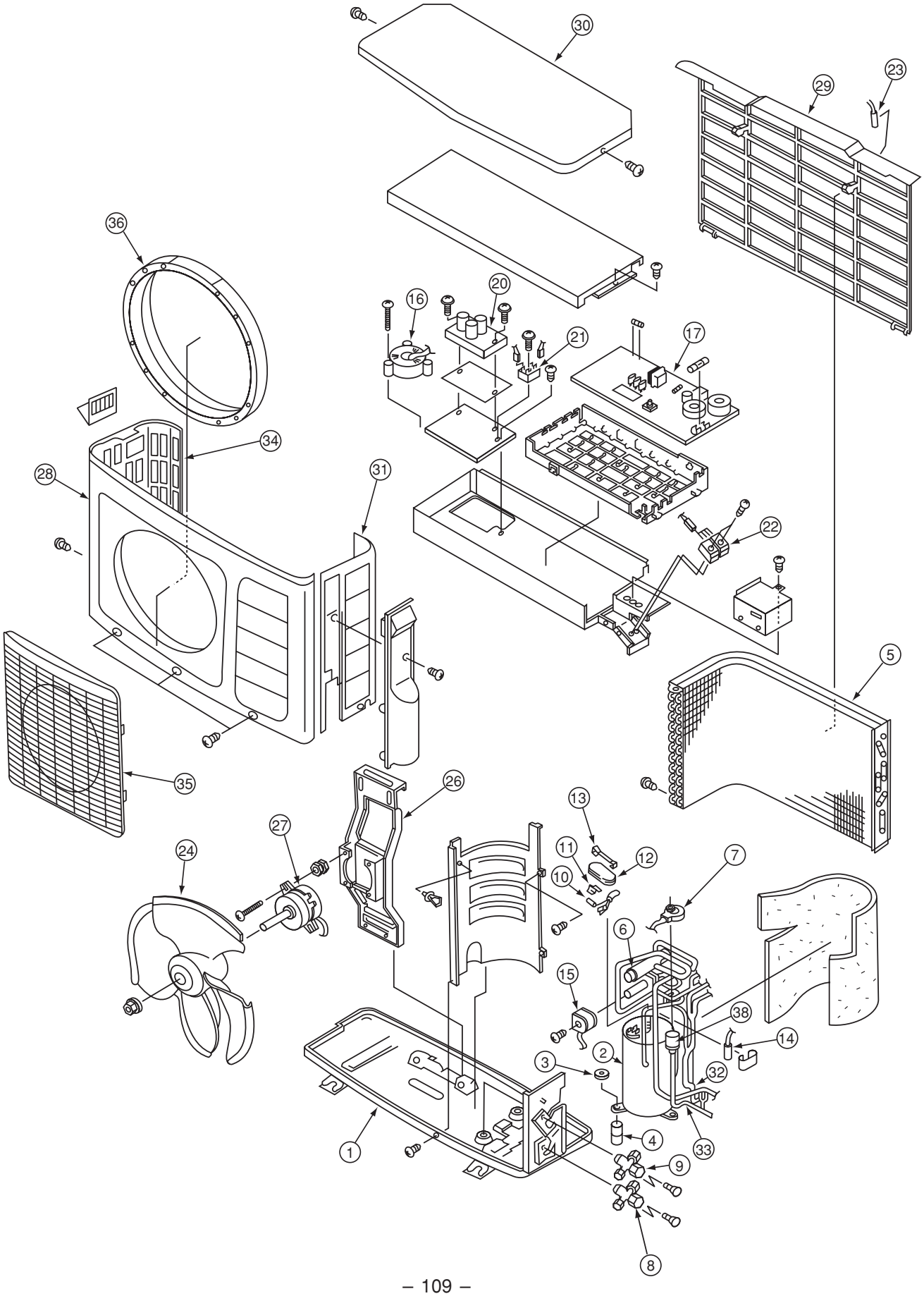


MODEL RAC-25NH4

NO.	PART N0. RAC-25NH4	Q'TY / UNIT	PARTS NAME
1	PMRAC-25NH4 918	1	BASE
2	PMRAC-25NH4 908	1	COMPRESSOR
3	KPNT1 001	6	PUSH NUT
4	RAC-2226HV 805	3	COMPRESSOR RUBBER
5	PMRAC-25NH4 901	1	CONDENSER
6	PMRAC-25NH4 902	1	REVERSING VALVE
7	PMRAC-25NH4 903	1	ELECTRICAL EXPANSION COIL
8	PMRAC-25NH4 904	1	VALVE (2S)
9	PMRAC-25NH4 905	1	VALVE (4S)
10	PMRAC-40CNH2 914	1	THERMISTOR (OH)
11	PMRAC-25NH4 909	1	OVERHEAT THERMISTOR SUPPORT
12	PMRAC-25NH4 910	1	OVERLOAD RELAY COVER
14	PMRAC-40CNH2 915	1	THERMISTOR (DEFROST)
15	PMRAC-07CHV1 921	1	COIL (REVERSING VALVE)
16	PMRAC-40CNH2 908	1	REACTOR
17	PMRAC-25NH4 906	1	P.W.B (MAIN)
20	PMRAC-25NH4 912	1	SYSTEM POWER MODULE
21	PMRAC-40CNH2 902	1	DIODE STACK (D25VB60)
22	PMRAC-25NH4 913	1	TERMINAL BOARD (4P)
23	PMRAC-40CNH2 916	1	THERMISTOR (OUTSIDE TEMPERATURE)
24	PMRAC-25CNH2 902	1	PROPELLER FAN
26	PMRAC-25NH4 914	1	SUPPORT (FAN MOTOR)
27	PMRAC-40CNH2 919	1	FAN MOTOR (40W)
28	PMRAC-51CA1 901	1	CABINET
29	PMRAC-51CA1 908	1	NET
30	PMRAC-51CA1 909	1	TOP COVER
31	PMRAC-25NH4 917	1	SIDE PLATE-R
32	PMRAC-25NH4 915	1	STRAINER
33	PMRAC-25NH4 907	1	STRAINER
35	PMRAC-09CHA1 903	1	GRILL
38	PMRAC-25NH4 916	1	EXPANSION VALVE

PARTS LIST AND DIAGRAM

OUTDOOR UNIT
MODEL : RAC-50NH4



MODEL RAC-50NH4

NO.	PART N0. RAC-50NH4	Q'TY / UNIT	PARTS NAME
1	PMRAC-50NH4 901	1	BASE
2	PMRAC-50NH4 907	1	COMPRESSOR
3	KPNT1 001	4	PUSH NUT
4	RAC-2226HV 805	3	COMPRESSOR RUBBER
5	PMRAC-50NH4 902	1	CONDENSER
6	PMRAC-25NH4 902	1	REVERSING VALVE
7	PMRAC-25NH4 903	1	ELECTRICAL EXPANSION COIL
8	PMRAC-50NH4 903	1	VALVE (2S)
9	PMRAC-50NH4 904	1	VALVE (4S)
10	PMRAC-40CNH2 914	1	THERMISTOR (OH)
11	PMRAC-25NH4 909	1	OVERHEAT THERMISTOR SUPPORT
12	PMRAC-25NH4 910	1	OVERLOAD RELAY COVER
14	PMRAC-40CNH2 915	1	THERMISTOR (DEFROST)
15	PMRAC-07CHV1 921	1	COIL (REVERSING VALVE)
16	PMRAC-40CNH2 908	1	REACTOR
17	PMRAC-50NH4 905	1	P.W.B (MAIN)
20	PMRAC-40CNH2 901	1	SYSTEM POWER MODULE
21	PMRAC-40CNH2 902	1	DIODE STACK (D25VB60)
22	PMRAS-10C6M 002	2	TERMINAL BOARD (2P)
23	PMRAC-40CNH2 916	1	THERMISTOR (OUTSIDE TEMPERATURE)
24	PMRAC-40CNH2 917	1	PROPELLER FAN
26	PMRAC-40CNH2 918	1	SUPPORT (FAN MOTOR)
27	PMRAC-40CNH2 919	1	FAN MOTOR (40W)
28	PMRAC-40CNH2 904	1	CABINET
29	PMRAC-40CNH2 921	1	NET
30	PMRAC-40CNH2 922	1	TOP COVER
31	PMRAC-50NH4 910	1	SIDE PLATE-R
32	PMRAC-50NH4 906	1	STRAINER
33	PMRAC-50NH4 909	1	STRAINER
34	PMRAC-40CNH2 926	1	SIDE PLATE-L
35	PMRAC-40CNH2 928	1	GRILL
36	PMRAC-40CNH2 920	1	MOUTH RING
38	PMRAC-25NH4 916	1	EXPANSION VALVE

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