HITACHI

PM | NO. 0545E

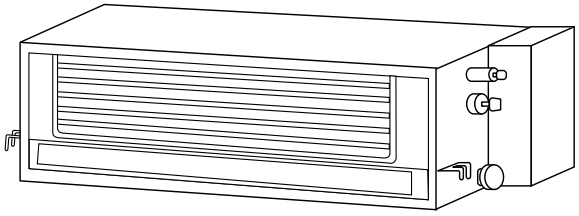
RAD-50PPA/RAC-50DPA
RAD-60PPA/RAC-60DPA
RAD-70PPA/RAC-70DPA

SERVICE MANUAL

TECHNICAL INFORMATION

REFER TO THE FOUNDATION MANUAL

FOR SERVICE PERSONNEL ONLY

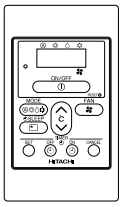


RAD-50PPA
RAD-60PPA
RAD-70PPA

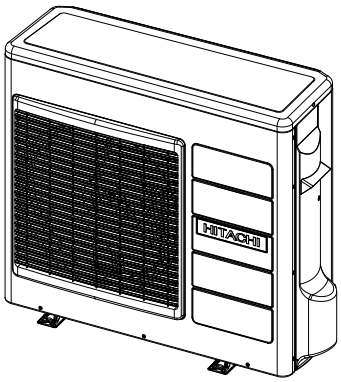
OPTIONAL



WIRELESS REMOTE CONTROLLER (SPX-RCKA)



WIRED REMOTE CONTROLLER (SPX-RCDA)



RAC-50DPA
RAC-60DPA
RAC-70DPA

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SPECIFICATIONS

TYPE			(DUCTING TYPE)					
			INDOOR UNIT	OUTDOOR UNIT	INDOOR UNIT	OUTDOOR UNIT	INDOOR UNIT	OUTDOOR UNIT
MODEL			RAD-50PPA	RAC-50DPA	RAD-60PPA	RAC-60DPA	RAD-70PPA	RAC-70DPA
POWER SOURCE			1 Ø, 50 Hz, 220-240V		1 Ø, 50 Hz, 220-240V		1 Ø, 50 Hz, 220-240V	
COOLING	TOTAL INPUT	(W)	1,400 (200 ~ 2,100)		1,870 (200 ~ 2,500)		2,530 (200 ~ 2,920)	
	TOTAL AMPERES	(A)	6.40 ~ 5.90		8.55 ~ 7.90		11.60 ~ 10.70	
	CAPACITY	(kW)	5.00 (0.90 ~ 6.00)		6.00 (0.90 ~ 7.00)		7.10 (0.90 ~ 8.00)	
		(B.T.U./h)	17,070 (3,073 ~ 20,490)		20,490 (3,073 ~ 23,901)		24,240 (3,073 ~ 27,310)	
HEATING	TOTAL INPUT	(W)	1,590 (200 ~ 2,200)		2,130 (200 ~ 2,600)		2,340 (200 ~ 3,100)	
	TOTAL AMPERES	(A)	7.30 ~ 6.70		9.75 ~ 9.00		10.70 ~ 9.80	
	CAPACITY	(kW)	6.00 (0.90 ~ 7.00)		7.30 (0.90 ~ 8.00)		8.00 (0.90 ~ 9.00)	
		(B.T.U./h)	20,490 (3,073 ~ 23,901)		24,920 (3,073 ~ 27,315)		27,310 (3,070 ~ 30,730)	
DIMENSIONS (mm)		W	900	850	900	850	900	850
		H	270	800	270	800	270	800
		D	720	298	720	298	720	298
NET WEIGHT		(kg)	35	55	35	55	35	55

※ After installation

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

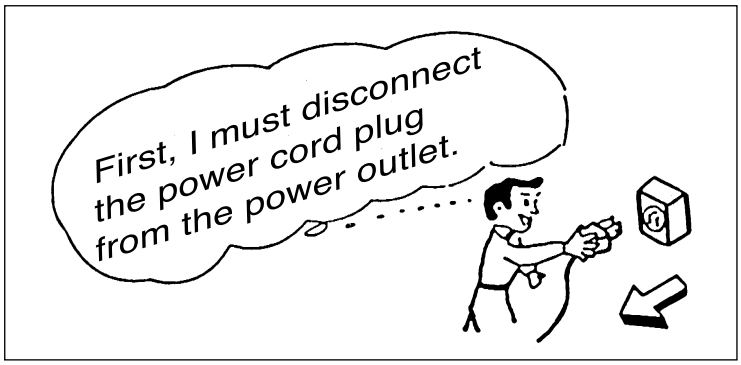
ROOM AIR CONDITIONER

INDOOR UNIT + OUTDOOR UNIT

FEBRUARY 2013 **Refrigeration & Air-Conditioning Division**

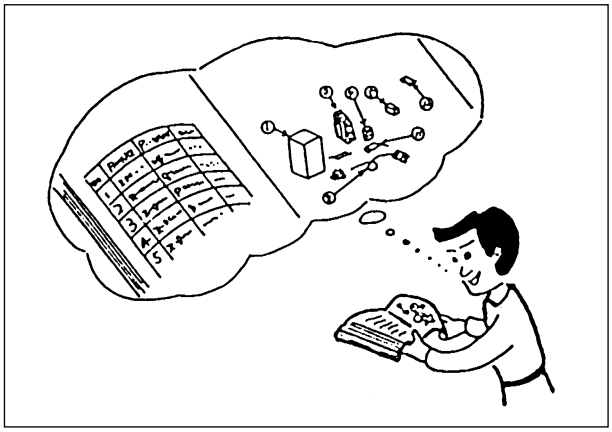
SAFETY DURING REPAIR WORK

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).

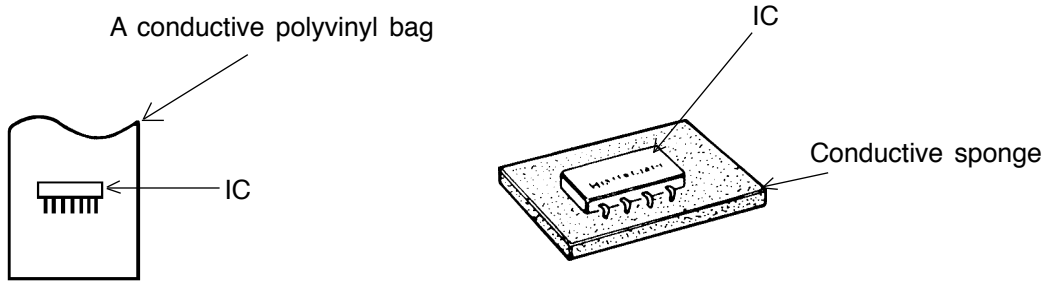


Fig. 1. Conductive Container

   (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 1MΩ 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.

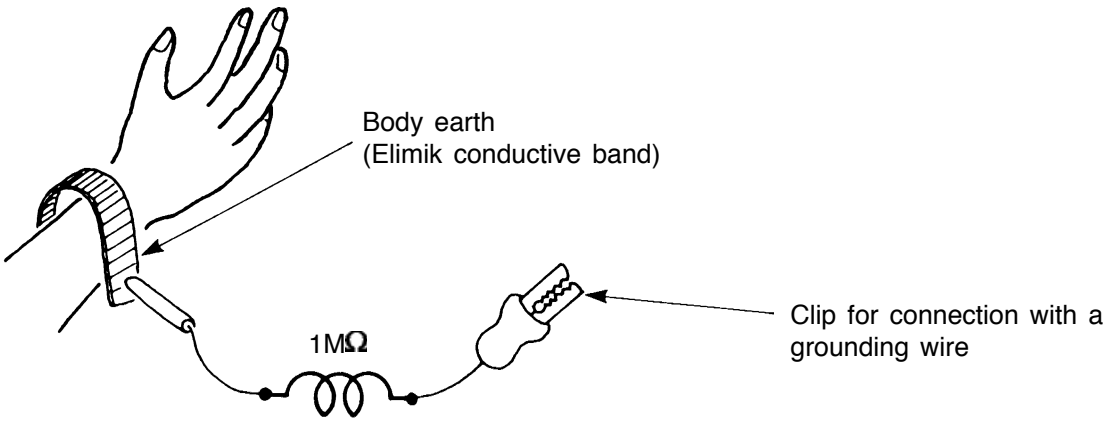


Fig. 2. Body Earth

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

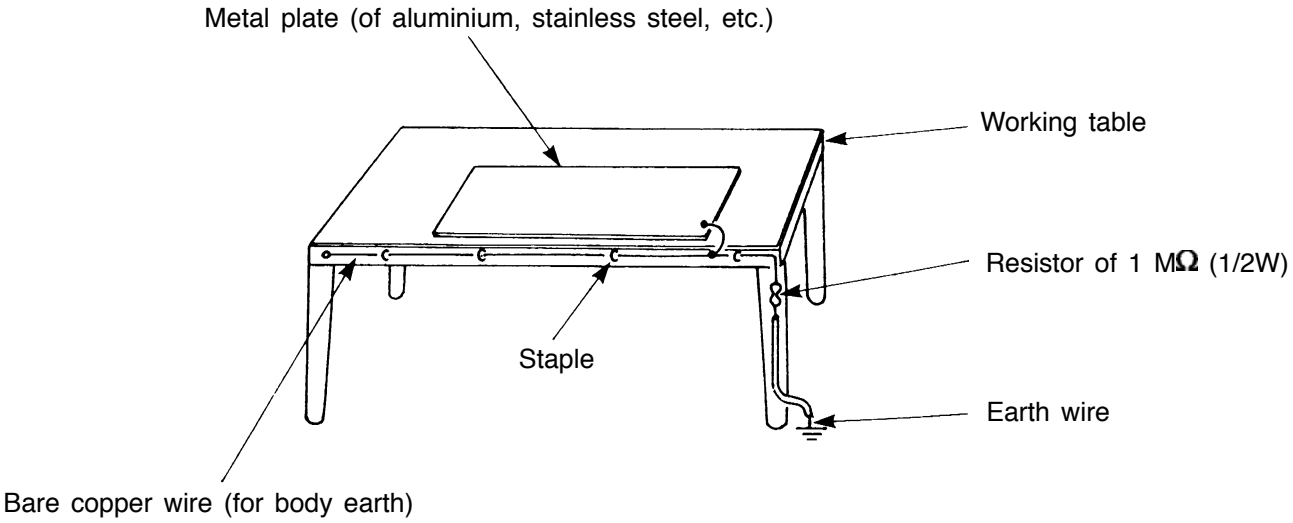


Fig. 3. Grounding of the working table

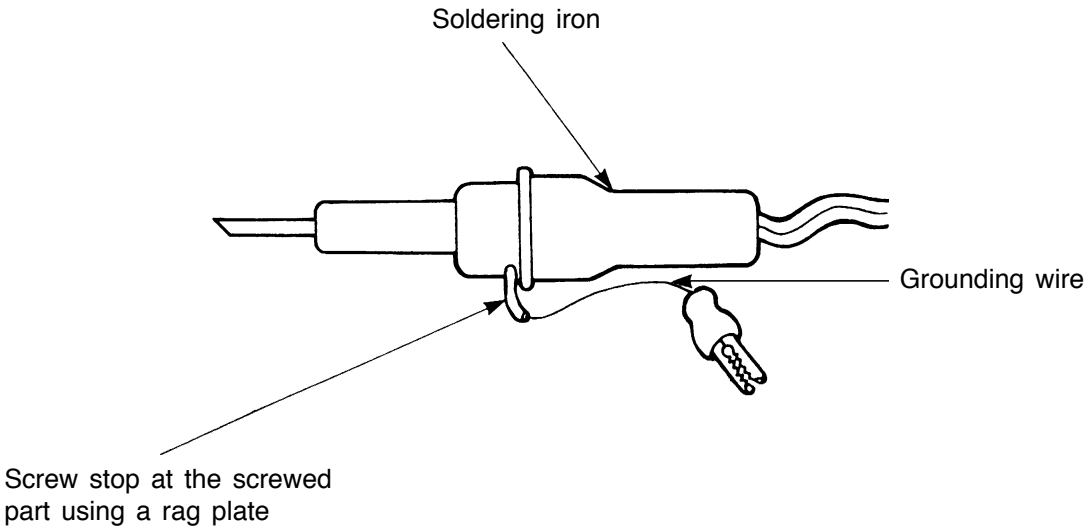


Fig. 4. Grounding a soldering iron

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 recommended to stop the operation and to disconnect the power cord plug from the power outlet for safety.

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

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

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

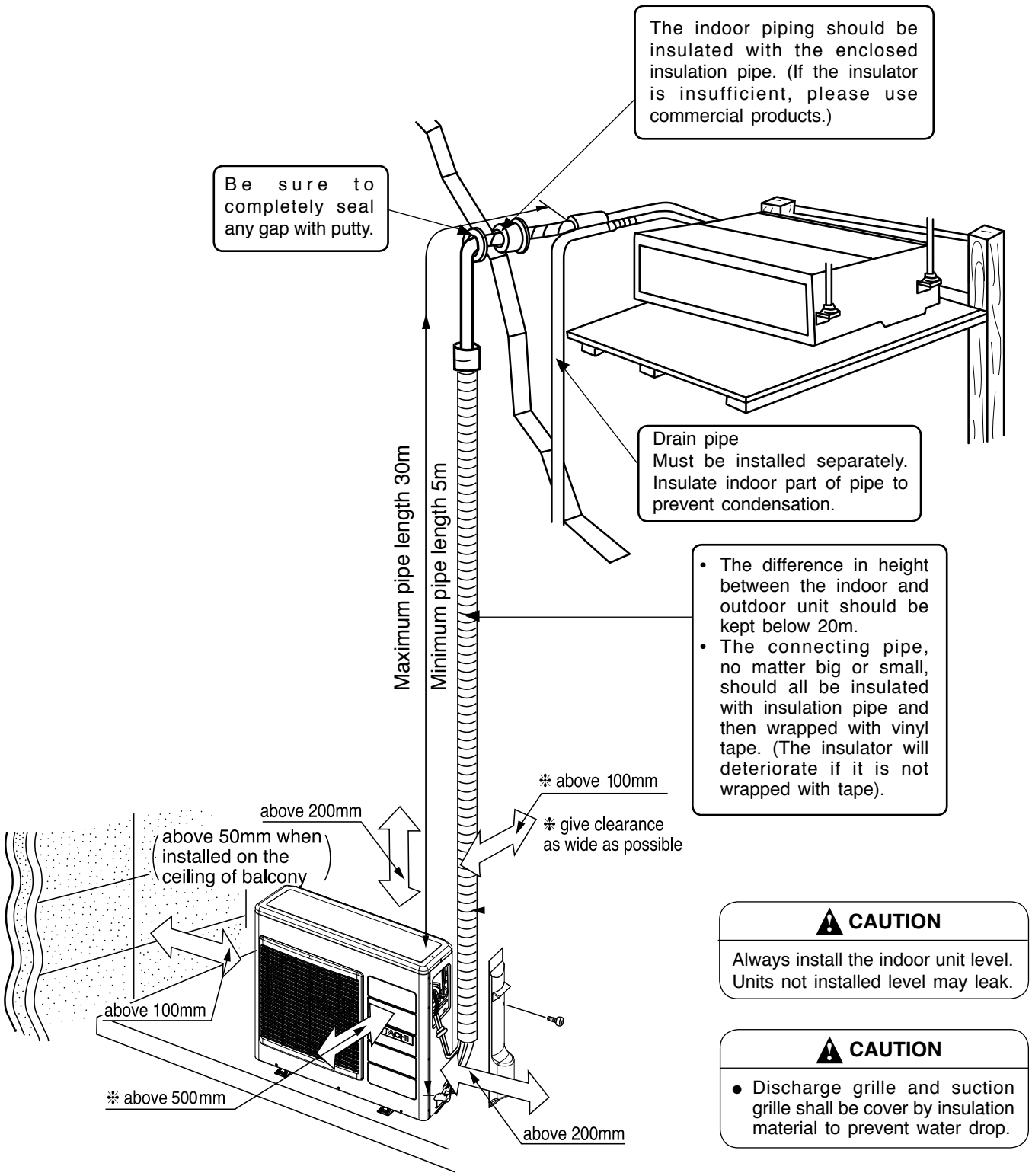
SPECIFICATIONS

MODEL		RAD-50PPA RAD-60PPA RAD-70PPA	RAC-50DPA	RAC-60DPA/ RAC-70DPA
FAN MOTOR		56 W	80 W	80 W
FAN MOTOR CAPACITOR		NO	NO	NO
FAN MOTOR PROTECTOR		NO	NO	NO
COMPRESSOR		–	JU1015D4	JU151XC2
COMPRESSOR MOTOR CAPACITOR		NO	NO	NO
OVERLOAD PROTECTOR		NO	NO	NO
OVERHEAT PROTECTOR		NO	YES	YES
FUSE (MICRO COMPUTER CIRCUIT)		3.15A	NO	NO
POWER RELAY		NO	G4A	G4A
POWER SWITCH		NO	NO	NO
TEMPORARY SWITCH		YES	NO	NO
SERVICE SWITCH		NO	YES	YES
TRANSFORMER		NO	NO	NO
VARISTOR		416NR	450NR	450NR
NOISE SUPPRESSOR		NO	NO	NO
THERMOSTAT		YES(IC)	YES(IC)	YES(IC)
REMOTE CONTROL SWITCH (LIQUID CRYSTAL)		YES	NO	NO
FUSE CAPACITY		30 A TIME DELAY FUSE		
REFRIGERANT CHARGING VOLUME (Refrigerant R410A)	UNIT	----------	❊ 1800g	❊ 1800g
	PIPES (MAX. 30m) (MIN. 5m)			

Figure showing the installation of Indoor and Outdoor unit

⚠ CAUTION

- Install the indoor unit with a proper clearance around it for operation and maintenance working space.
- In case that the ceiling board can not be detected for servicing, prepare a service access door below the indoor unit for removing the indoor unit.



⚠ CAUTION

Always install the indoor unit level.
Units not installed level may leak.

⚠ CAUTION

- Discharge grille and suction grille shall be cover by insulation material to prevent water drop.



SAFETY PRECAUTION

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

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

- Please keep this manual after reading.

PRECAUTIONS DURING INSTALLATION

⚠ WARNING

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



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



⚠ 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 near location where there is flammable gas. The outdoor unit may catch fire if flammable gas leaks around it.



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

PRECAUTIONS DURING SHIFTING OR MAINTENANCE

⚠ WARNING

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



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

PRECAUTIONS DURING OPERATION

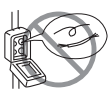
⚠ WARNING

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





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





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

PRECAUTIONS DURING OPERATION

CAUTION

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





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

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





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

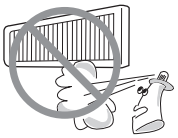
- Please ensure that outdoor mounting frame is always stable, firm and without defect. If not, the outdoor unit may collapse and cause danger.





- Do not splash or direct water to the body of the unit when cleaning it as this may cause short circuit.

- Do not use any aerosol or hair sprays near the indoor unit. This chemical can adhere on heat exchanger fin and blocked the evaporation water flow to drain pan. The water will drop on tangential fan and cause water splashing out from indoor unit.





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

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

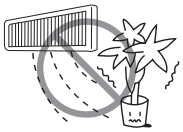




- Do not climb on the outdoor unit or put objects on it.

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





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

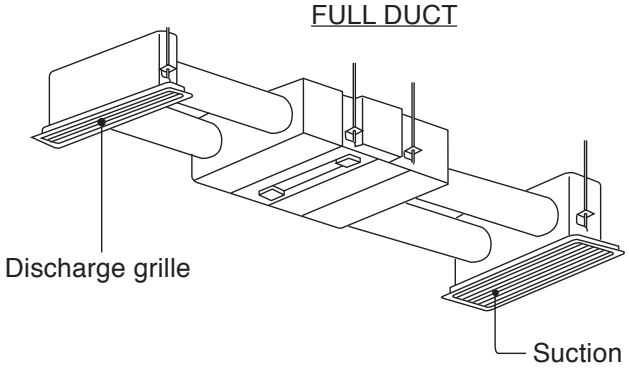
- When operating the unit with the door and windows opened, (the room humidity is always above 80%) and with the air deflector facing down or moving automatically for a long period of time, water will condense on the air deflector and drips down occasionally. This will wet your furniture. Therefore, do not operate under such condition for a long time.
- If the amount of heat in the room is above the cooling or heating capability of the unit (for example: more people entering the room, using heating equipments and etc.), the preset room temperature cannot be achieved.

- This appliance is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure that they can use the appliance safely.
- Young children should be supervised to ensure that they do not play with the appliance.

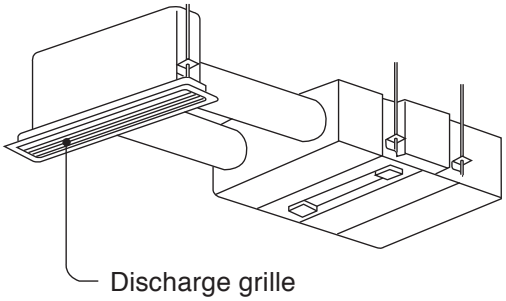
NAMES AND FUNCTIONS OF EACH PART

INDOOR UNIT

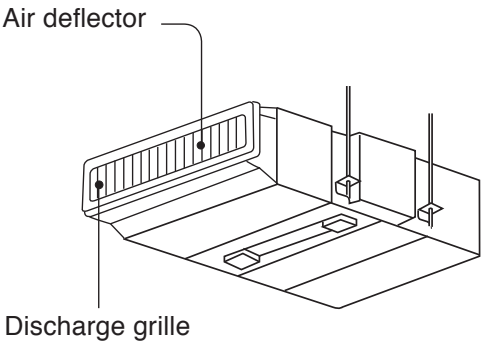
FULL DUCT



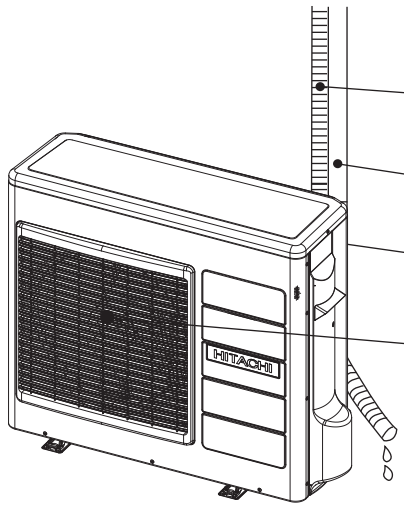
SEMI DUCT



NON DUCT



OUTDOOR UNIT



DRAIN PIPE
Condensed water drain to outside.

CONNECTING CORD

AIR INLET (BACK, LEFT SIDE)

AIR OUTLET

MODEL NAME AND DIMENSIONS

MODEL	WIDTH (mm)	HEIGHT (mm)	DEPTH (mm)
RAD-50PPA / RAD-60PPA / RAD-70PPA	900	270	720
RAC-50DPA / RAC-60DPA / RAC-70DPA	850	800	298

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.**



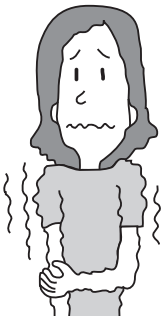
4. **The following must never be used for cleaning the indoor and outdoor units.**
   - Benzine, thinner and scrub can damage plastic surfaces or coating.
   - Hot water above 40°C can shrink the filter and deform plastic parts.



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.

THE IDEAL WAYS OF OPERATION

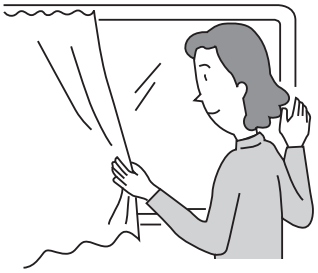
Suitable Room Temperature



⚠ Warning

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

Install curtain or blinds



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

Ventilation

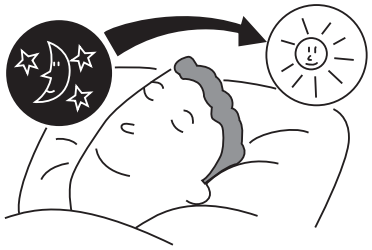
⚠ Caution

Do not close the room for a long period of time. Occasionally open the door and windows to allow the entrance of fresh air.



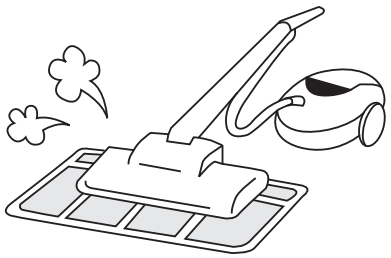
Effective Usage Of Timer

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



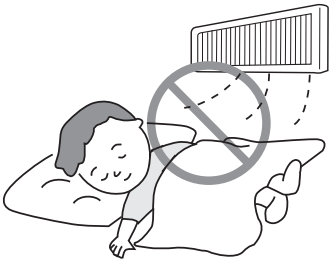
Do Not Forget To Clean The Air Filter

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



Please Adjust Suitable Temperature For Baby And Children

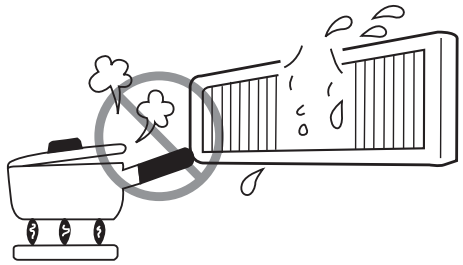
Please pay attention to the room temperature and air flow direction when operating the unit for baby, children and old folks who have difficulty in movement.



The Air Conditioner And The Heat Source In The Room

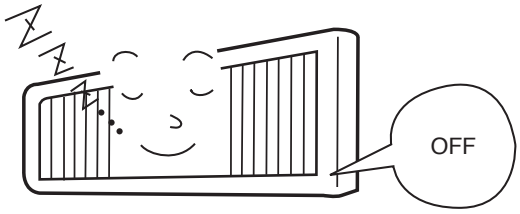
⚠ Caution

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



Not Operating For A Long Time

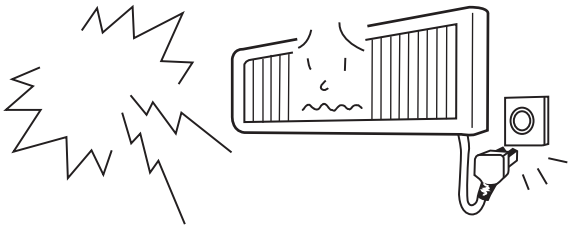
When the indoor unit is not to be used for a long period of time, please switch off the power from the mains. If the power from mains remains "ON", the indoor unit still consumes about 12W in the operation control circuit even if it is in "OFF" mode.



When Lightning Occurs

⚠ Warning

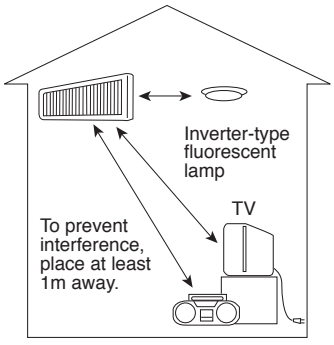
To protect the whole unit during lightning, please stop operating the unit and remove the plug from the socket.



Interference From Electrical Products

⚠ Caution

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



MAINTENANCE

⚠ WARNING

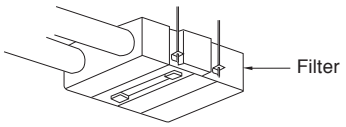
- Before cleaning, stop unit operation with the remote controller and turn off the circuit breaker.

⚠ 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.

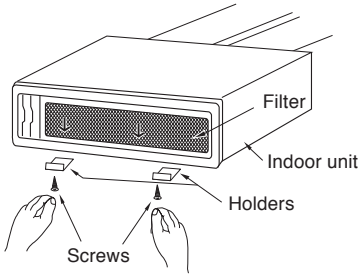
1. AIR FILTER

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. Loose the screw and release the filter holders. Pull the filter toward center to take it out from indoor unit (refer to diagram).



2. Remove dust from the filter using a vacuum cleaner. If there is too much dust, use neutral detergent. After using neutral detergent, wash with clean water and dry in the shade.

3. Install the filters.
Slightly lift the suction grille and close as original state.

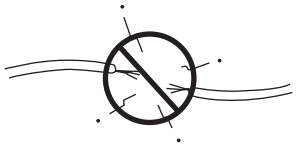
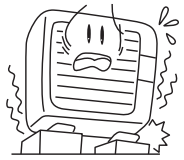
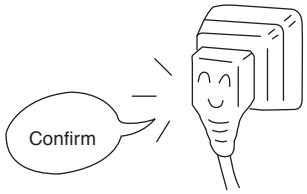


⚠ CAUTION

- Do not wash with hot water at more than 40°C. The filter may shrink.
- When washing it, shake off moisture completely and dry it in the shade; do not expose it directly to the sun. The filter may shrink.
- Do not operate the air conditioner with the filter removed. Dust may enter the air conditioner and cause trouble.

REGULAR INSPECTION

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

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

AFTER SALE SERVICE AND WARRANTY

WHEN ASKING FOR SERVICE, CHECK THE FOLLOWING POINTS.

CONDITION	CHECK THE FOLLOWING POINTS
When it does not operate	● Is the fuse all right? ● Is the voltage extremely high or low? ● Is the circuit breaker “ON”?
When it does not cool well When it does not hot well	● Was the air filter cleaned? ● Does sunlight fall directly on the outdoor unit? ● Is the air flow of the outdoor unit obstructed? ● Are the doors or windows opened, or is there any source of heat in the room? ● Is the set temperature suitable?



Notes

- In quiet or stop operation, the following phenomena may occassionally occur, but they are not abnormal for the operation.
  (1) Slight flowing noise of refrigerant in the refrigerating cycle.
  (2) Slight rubbing noise from the fan casing which is cooled and then gradually warmed as operation stops.
- The odor will possibly be emitted from the room air conditioner because the various odor, emitted by smoke, foodstuffs, cosmetics and so on, sticks to it. So the air filter and the evaporator regularly must be cleaned to reduce the odor.

- Please contact your sales agent immediately if the air conditioner still fails to operate normally after the above inspections. Inform your agent of the model of your unit, production number, date of installation. Please also inform him regarding the fault.
- Power supply shall be connected at the rated voltage, otherwise the unit will be broken or could not reach the specified capacity.

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.

Note

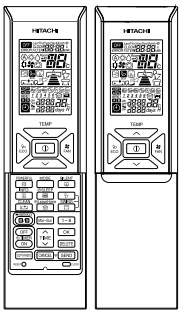
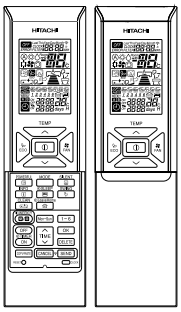
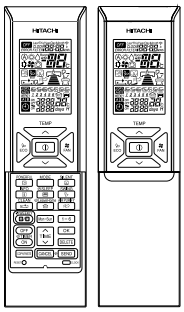
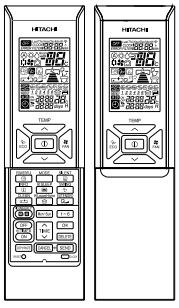
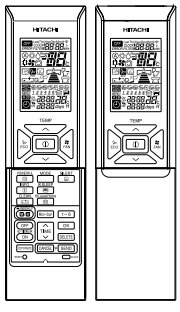
- Avoid to use the room air conditioner for cooling operation when the outside temperature is below 21°C (70°F). The recommended maximum and minimum operating temperatures of the hot and cold sides should be as below:

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

MEMO

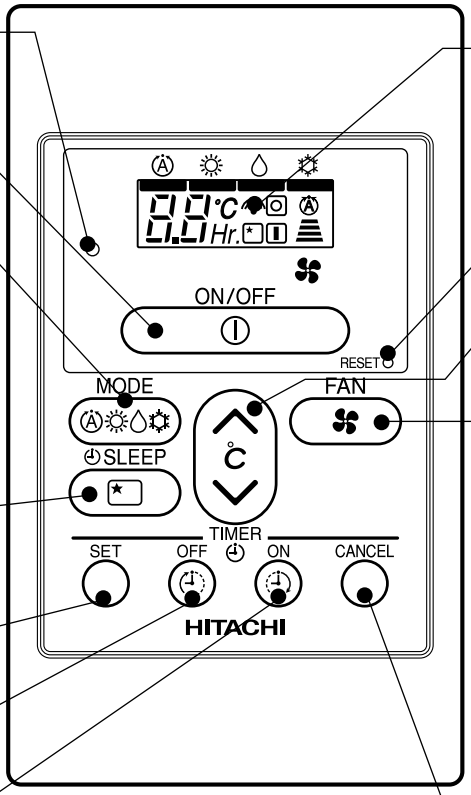
PRECAUTIONS FOR USE

- In case of power failure happen, Wired Remote Controller may not show current operating mode when power comes back. However unit will continue to operate at previous setting mode.
- Some features of Wireless Remote Controller are not available when use Wired Remote Controller as mentioned below:

Standard Wireless Remote Controller	Features not available on Wired Remote Controller	
RAR-5E1 	• Powerful POWERFUL • Information INFO • One touch clean CLEAN • Leave home LeaveHome	• Silent SILENT • Weekly timer WEEKLY A/B • Auto swing (vertical) • Auto swing (horizontal)
RAR-5E2 	• Powerful POWERFUL • Information INFO • One touch clean CLEAN • Leave home LeaveHome	• Silent SILENT • Weekly timer WEEKLY A/B • Auto swing (vertical)
RAR-5E3 	• Powerful POWERFUL • Information INFO • One touch clean CLEAN • Leave home LeaveHome	• Silent SILENT • Weekly timer WEEKLY A/B • Auto swing (vertical) • Air purify AIR PURIFY
RAR-5E4 	• Powerful POWERFUL • Information INFO • One touch clean CLEAN • Leave home LeaveHome	• Silent SILENT • Weekly timer WEEKLY A/B • Auto swing (vertical) • Extended EXTENDED
RAR-5E5 	• Powerful POWERFUL • Information INFO • One touch clean CLEAN • Leave home LeaveHome	• Silent SILENT • Weekly timer WEEKLY A/B

NAMES AND FUNCTIONS OF REMOTE CONTROLLER

■ This controls the operation function and timer setting of the room air conditioner.



OPERATION LAMP

START/STOP Button

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

MODE SELECTOR Button

Use this button to select the operating mode. Every time you press it, the mode will change from Ⓐ (AUTO) to ☼ (HEAT) to ○ (DEHUMIDIFY) and to ❄ (COOL) cyclically.

SLEEP Button

Use this button to set the sleep timer. (☞Page 24)

SET Button

Timer setting reservation.

OFF TIMER Button

Select the turn OFF timer.

ON TIMER Button

Select the turn ON timer.

Transmission Sign

The transmission sign blinks when a signal has been send.

RESET SWITCH

ROOM TEMPERATURE Setting Button

Room temperature setting. Value will change quicker when keep pressing.

FAN SPEED Button

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

CANCEL Button

Cancel timer reservation.

Precautions for Use

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

  This is to protect the device and does not indicate a failure.
- If you press the MODE SELECTOR button during operation, the device may stop for about 3 minutes for protection.

VARIOUS FUNCTIONS

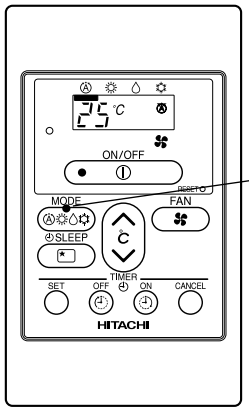
■ Auto Restart Control

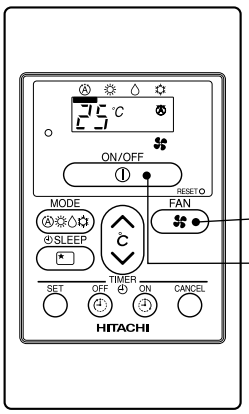
- If there is a power failure, operation will be automatically restarted when the power is resumed with previous operation mode.
  (As the operation is not stopped by remote controller.)
- If you intend not to continue the operation when the power is resumed, switch off the power supply. When you switch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

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

AUTOMATIC OPERATION

The device will automatically determine the mode of operation, HEAT or COOL depending on the current room temperature. The selected mode of operation will change when the room temperature varies. However the mode of operation will not change for RAD-50PPA, RAD-60PPA, RAD-70PPA and when indoor unit is connected to multi type outdoor unit.





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

- When AUTO has been selected, the device will automatically determine the mode of operation, HEAT or COOL depending on the current room temperature.
- If the mode automatically selected by the unit is not satisfactory, manually change the mode setting (HEAT, DEHUMIDIFY or COOL).

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

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

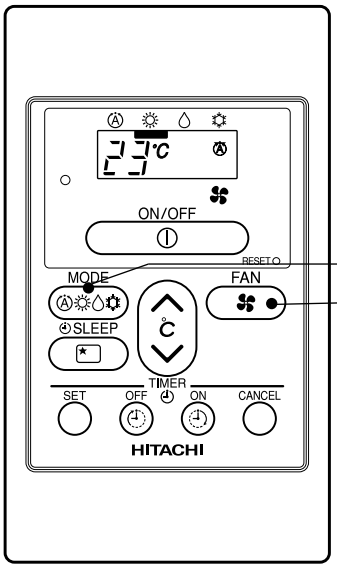
→ Ⓐ (AUTO) → (HIGH) → (MED) → (SILENT) ← (LOW) ←

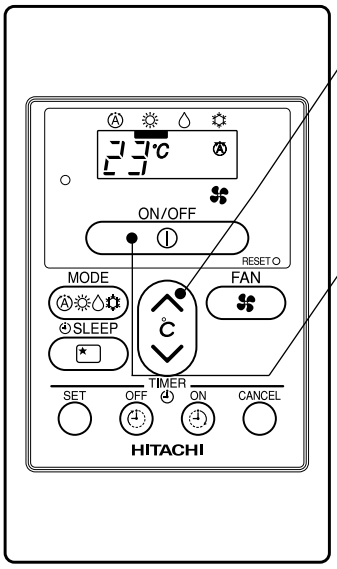
START / STOP Press the ⏻ (START/STOP) button.
Operation starts.
Press the button again to stop operation.

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

HEATING OPERATION

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





1 Press the MODE SELECTOR button so that the display indicates ☼ (HEAT).

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

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

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

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

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

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

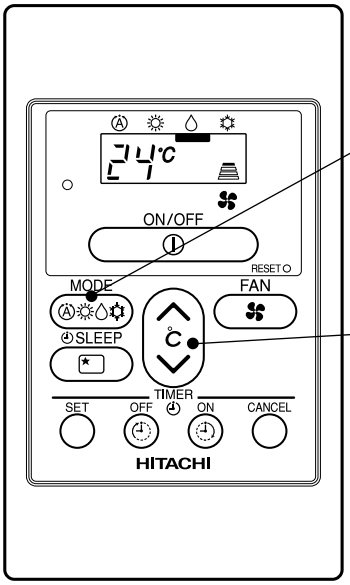
■ During AUTO fan, the fan speed automatically changes as below:
- When the difference between room temperature and setting temperature is large, fan starts to run at HI speed.
- After room temperature reaches the preset temperature, fan speed will be changed to lower speed to obtain optimum room temperature condition for natural healthy heating.

Defrosting

Defrosting will be performed about once an hour when frost forms on the heat exchange of the outdoor unit, for 5~10 minutes each time.
During defrosting operation, the operation lamp blinks in a cycle of 3 seconds on and 0.5 second off.
The maximum time for defrosting is 20 minutes.
However, if the indoor unit is connected to multi type outdoor unit, the maximum time for defrosting is 15 minutes.
(If the piping length used is longer than usual, frost is likely to form.)

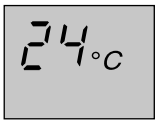
DEHUMIDIFYING OPERATION

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



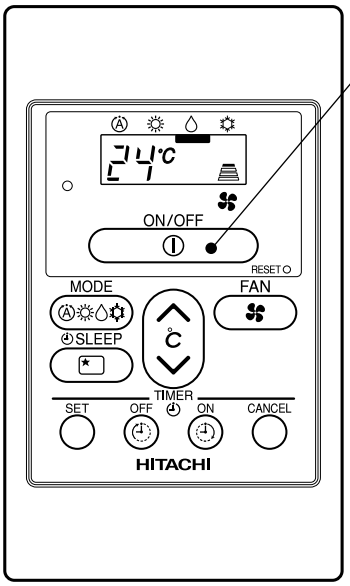
1 Press the MODE SELECTOR button so that the display indicates ♢ (DEHUMIDIFY).
Press (FAN SPEED) button to select SILENT or LOW fan speed.

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



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

START / STOP Press the ⏻ (START/STOP) button. Dehumidifying operation starts. Press the button again to stop operation.



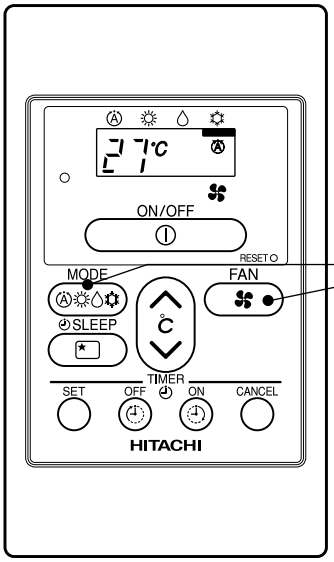
■ As the settings are stored in the memory in the remote controller, you only have to press the ⏻ (START/STOP) button next time.

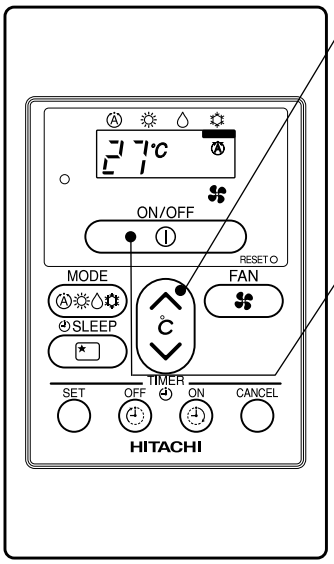
■ Dehumidifying Function

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

COOLING OPERATION

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





1 Press the MODE SELECTOR button so that the display indicates ☼ (COOL).

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

→ Ⓐ (AUTO) → ▤ (HIGH) → ▤ (MED) → ▤ (LOW) → ▤ (SILENT) →

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

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

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

LEAVE HOME(LH) AND CLEAN (ONE TOUCH CLEAN) OPERATIONS

- Leave Home (LH) and CLEAN(One Touch Clean) operations activation buttons are not available on this device. The operations shall be activated by wireless remote controller.
- Please refer to wireless 'Remote Controller Manual' to activate the operations.

NOTE

- If  or  is displayed on the wired remote controller display, the unit will operate Leave Home (LH) operation mode or CLEAN (One Touch Clean) which shall be activated by wireless remote controller.
- Push start/stop ⏻ button to stop Leave Home (LH) or CLEAN (One Touch Clean) operation.

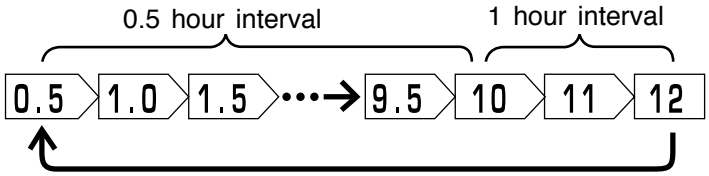
TIMER RESERVATION

■ ON Timer and OFF Timer are available.

OFF Timer Reservation

1 OFF TIMER setting

- Select the OFF TIMER by pressing the (OFF) Button.
- Setting timer will change according to the below sequence when you press the button.

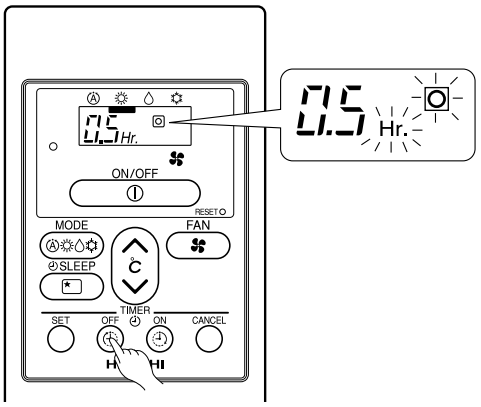


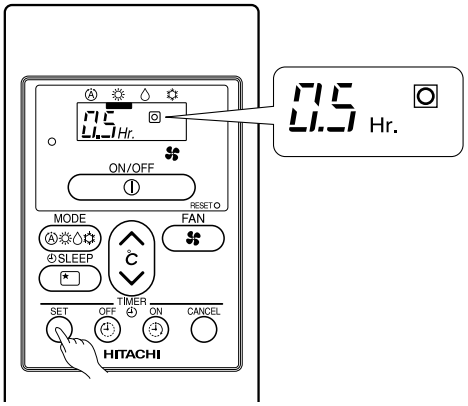
- The value change quicker if you keep pressing the button.

2 Press the ◯ (SET) button

- OFF TIMER is reserved.
- The ⊙ (OFF) Mark starts lighting instead of blinking.

■ Operation stop at setting timer

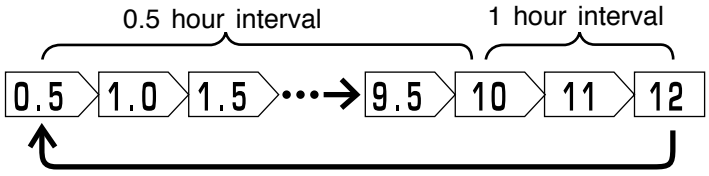




ON Timer Reservation

1 ON TIMER setting

- Select the ON TIMER by pressing the (ON) Button.
- At the beginning of setting, timer is set to 6 hours.
- Setting timer will change according to the below sequence.

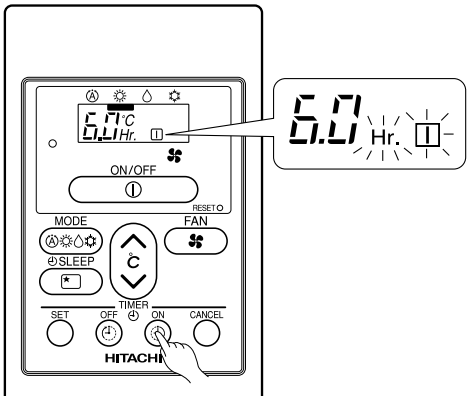


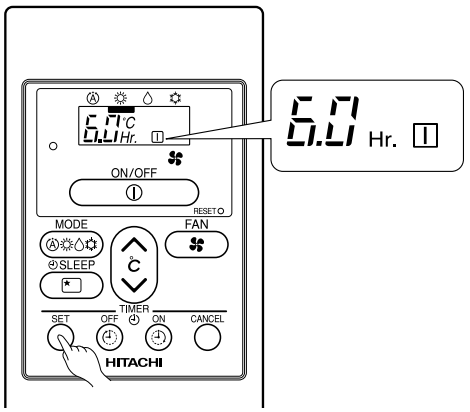
- The value change quicker if you keep pressing the button.

2 Press the ◯ (SET) button

- ON TIMER is reserved.
- The [I] (ON) Mark starts lighting instead of blinking.

■ Operation will start for setting temperature at setting timer (The starting time may different depend on the room temperature and set temperature).



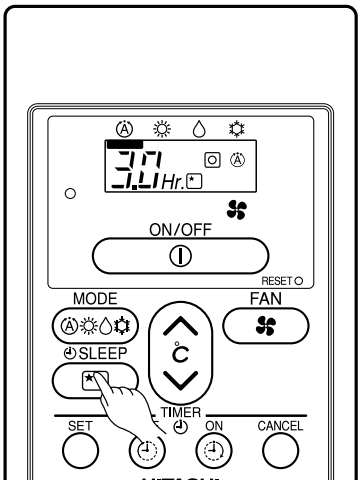


CANCELLATION of Timer Reservation

1 Press the ◯ (CANCEL) button

- As the timer settings are stored in remote controller memory, you only have to press the ◯ (SET) button in order to use the same setting next time.

HOW TO SET THE SLEEP TIMER



Example: Setting 3 hours sleep timer.

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

Sleep Timer: The device will continue working for the designated number of hours and then turn off.
Press the SLEEP button.
The timer information will be displayed on the remote controller.

How to Cancel Reservation

Press the ○ (CANCEL) button. The ⊙ and ★ (RESERVED) sign goes out.

Explanation of the sleep timer

The device will control the FAN SPEED and room temperature automatically so as to be quiet and good for people's health.

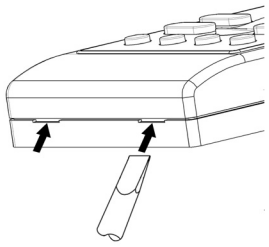
NOTE

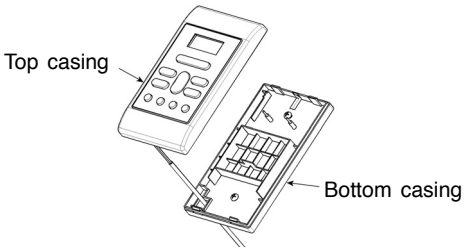
- If you set the sleep timer after the off or on-timer has been set, the sleep timer becomes effective instead of the off or on-timer set earlier.
- You can not set other timer during sleep timer operation.
- After sleep timer time is up and when press sleep button again, the sleep timer will be set as last setting.
- Sleep timer effective only once.

INSTALLATION OF WIRED REMOTE CONTROLLER

(a) Connection to the electrical box;
- Remove the cover of electric box
- Connect the connector of wired remote controller to CN1102 of electrical board
- Assemble back the cover of electrical box

(b) Wiring installation for wired remote controller (2 methods);
- Wired remote controller casing can be opened by pressing the slots with minus screw driver (see below diagram)





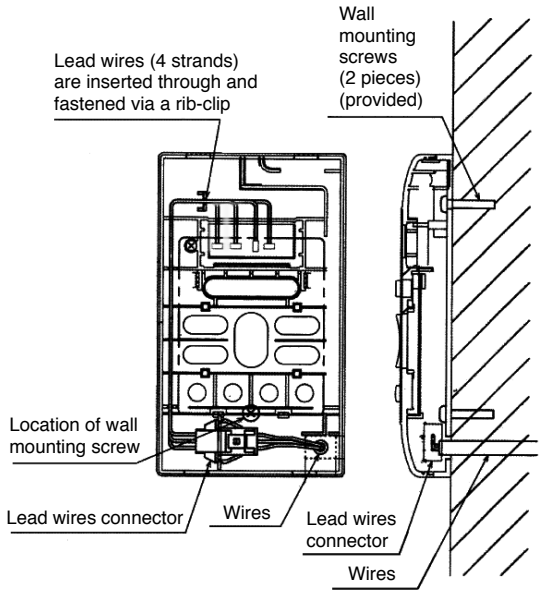
- Decide the fixing location of remote controller so that the length of wire shall be within 5 meters.

⚠ CAUTION	• Do not cut the provided wire. Excess wire should be properly wound and fitted at safe place. • Do not join the wire with additional wire.

Wiring installation illustrations

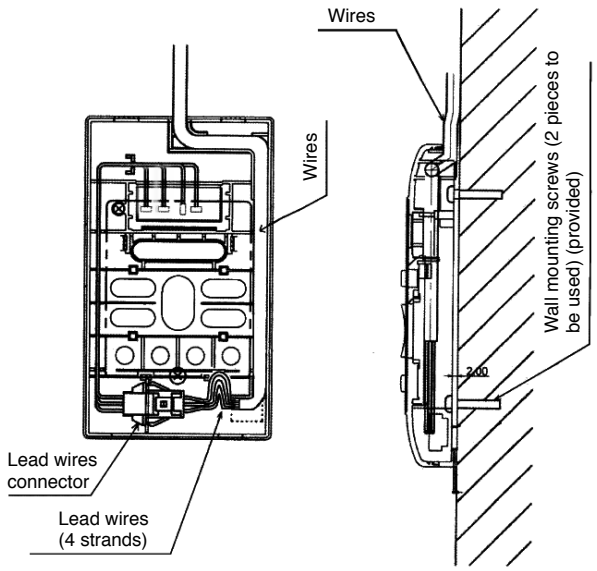
Wall recessed wiring installation (Supplied)

1. When connecting the wires via the wall's recessed slot;
   - Fix the bottom casing to the wall by provided screw.
   - Assemble the top casing to the fixed bottom casing.
     (Refer to the illustration below for detail installation)



Inside top wiring installation (Alternative)

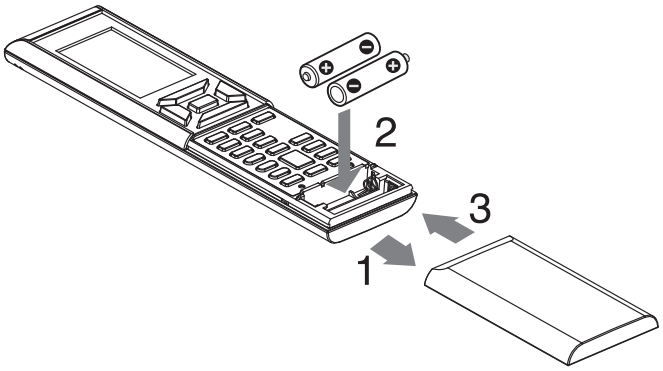
2. When the wires to be connected from the inside top portion of top casing;
   - Break off a perforated aperture located at the top portion of the bottom casing by nipper. Smoothen the aperture by cutter.
     Fix the bottom casing to the wall by provided screw.
   - Connect the wires to the lead wires connector.
   - Mount the wires through the provided slot on top casing.
   - Assemble the top casing to the fixed bottom casing
     (Refer to the illustration below for detail installation)



PREPARATION BEFORE OPERATION

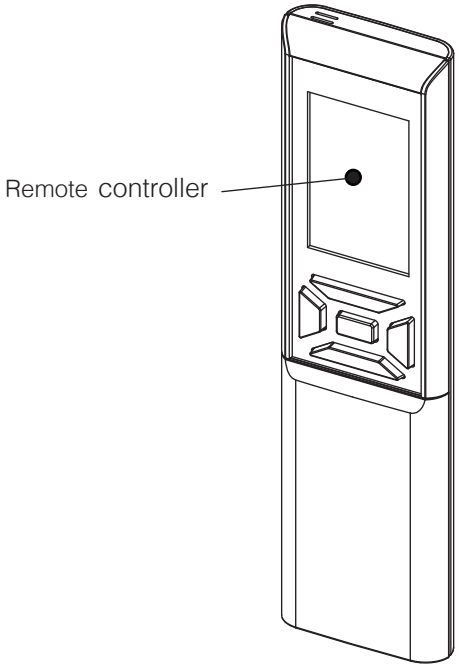
■ To install the batteries

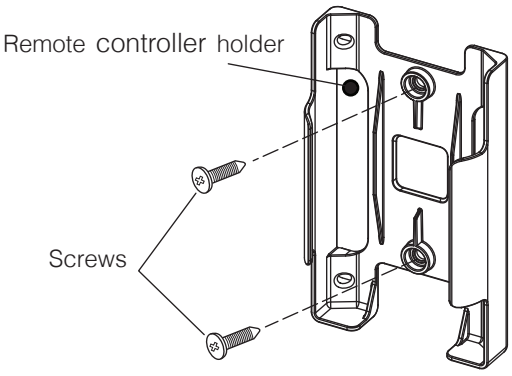
1. Slide the cover to take it off.
2. Install two dry batteries AAA.LR03 (alkaline).
   The direction of the batteries should match the marks in the case.
3. Replace the cover at its original position.



■ To fix the remote controller holder to the wall

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





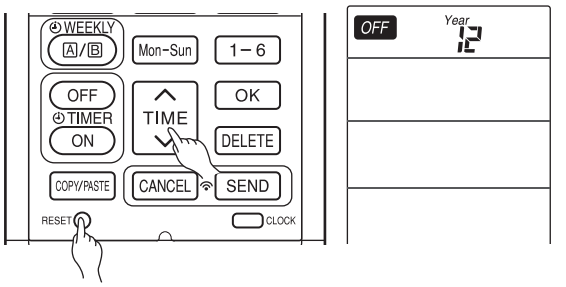
NOTE

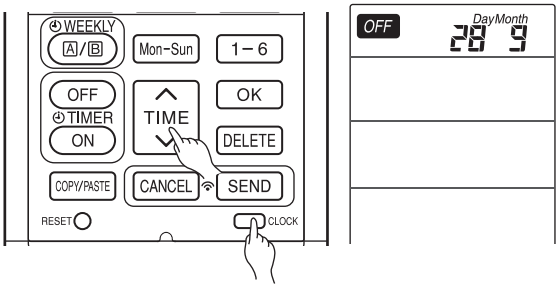
Notes on batteries

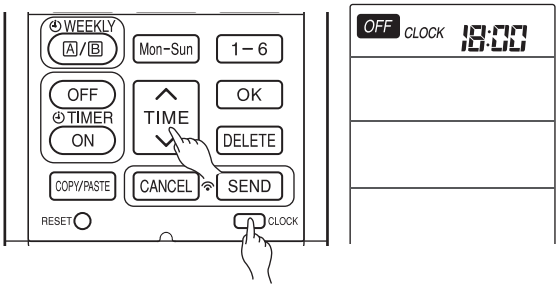
- When replacing the batteries, use batteries of the same type, and replace both old batteries together.
- When the system is not used for a long time, take the batteries out.
- The batteries will last for approximately 1 year. However, if the remote controller display begins to fade and degradation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

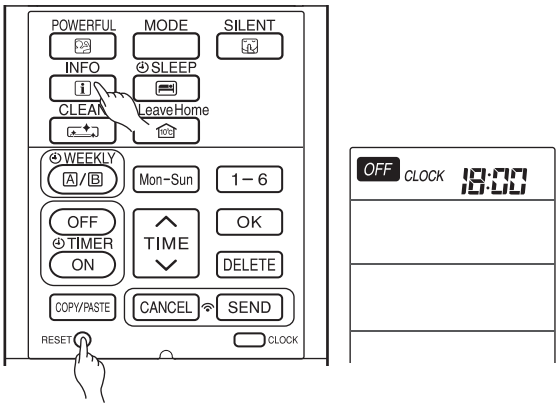
Notes on the remote controller

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









■ To set calendar and clock

1. Press RESET (RESET) button when first time setting. "Year" blinks.
2. Press TIME (TIME) button to set the current year.
3. Press CLOCK (CLOCK) button. "Day" and "Month" blink.
4. Press TIME (TIME) button to set the current day and month.
5. Press CLOCK (CLOCK) button. "CLOCK" blinks.
6. Press TIME (TIME) button to set the clock to the current time.
7. Press CLOCK (CLOCK) button.

   Calendar and clock are set.

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

Calendar and clock need to be set again after changing batteries.

After changing the batteries,
1. Press RESET (RESET) button.
2. Direct remote controller towards indoor unit and press INFO (INFO) button.
3. The calendar and clock from indoor unit will be transmitted.

■ Calendar and clock will not be transmitted from indoor unit when the following occurs:
- When there is a power failure.
- When breaker is OFF by user (unit is not in STANDBY MODE).

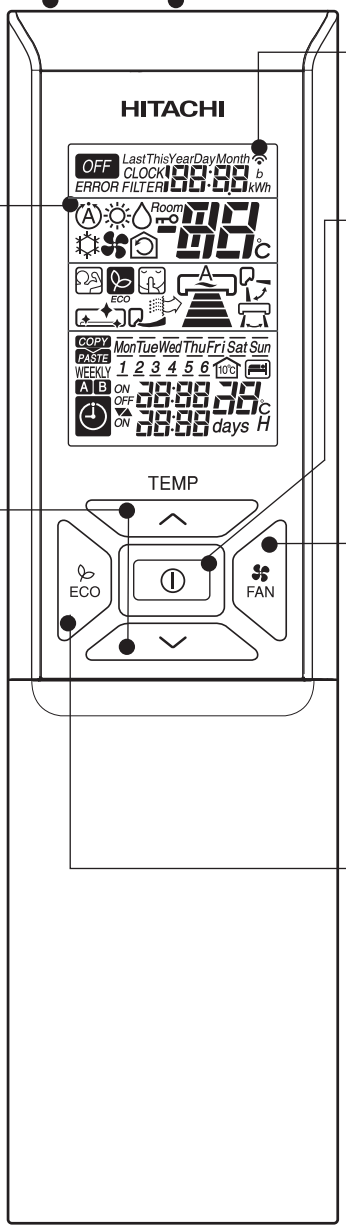
NOTE

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

NAMES AND FUNCTIONS OF REMOTE CONTROLLER

REMOTE CONTROLLER

- This controls the operation of the indoor unit. The range of control is about 7 meters. If indoor lighting is controlled electronically, the range of 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.
- When remote controller is not in use for about 3 minutes during OFF condition, indicated by OFF on the display, the LCD will turn off.
- During clock setting, the LCD will turn off about 10 minutes later if the remote controller is not in use.
- When pressing any button, the LCD will turn on.
- The LCD will not turn off during TIMER setting.



Signal Transmitting/Receiving Window

Point this window towards the indoor unit when controlling it.

Sensor

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

Display

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

ROOM TEMPERATURE setting Buttons

Press these buttons to set the room temperature.

Press the [∧] button to raise the room temperature.

Press the [∨] button to lower the room temperature.

Keep pressing and the value will change more quickly.

Transmission sign

The transmission sign lights up when a signal is sent.

START/STOP button

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

FAN SPEED selector Button

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

ECO Button

Use this button to set the ECO mode. (▶ p. 37)

NAMES AND FUNCTIONS OF REMOTE CONTROLLER

POWERFUL Button
Use this button to set the POWERFUL mode. (▶ p. 35)

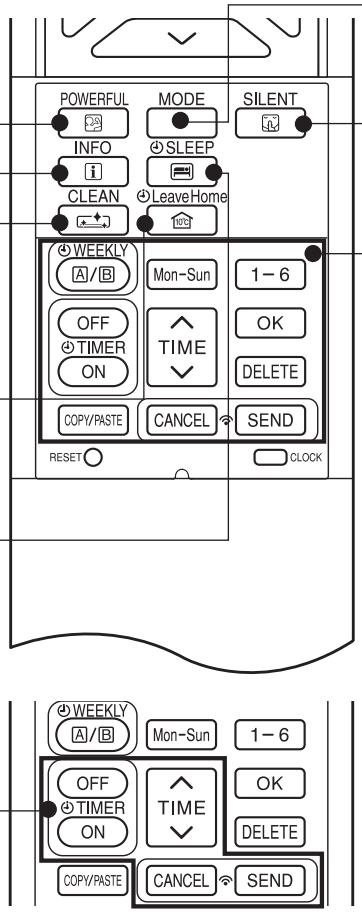
INFORMATION Button
(▶ p. 49)

ONE TOUCH CLEAN Button
(▶ p. 39)

LEAVE HOME Button
(▶ p. 38)

ECO SLEEP TIMER Button
Use this button to set the ECO sleep timer. (▶ p. 41)

ON / OFF TIMER setting Buttons
(▶ p. 40)



MODE selector Button
Use this button to select the operating mode. Every time you press this button, the mode will change from Ⓐ (AUTO) → ☼ (HEAT) → ◯ (DEHUMIDIFY) → ☼ (COOL) and → ✿ (FAN) cyclically.

SILENT Button
Use this button to set the SILENT mode. (▶ p. 36)

WEEKLY TIMER setting Buttons
(▶ p. 43)

MODE	MODE SELECTOR
Ⓐ	AUTO
☼	HEAT
◯	DEHUMIDIFY
☼	COOL
✿	FAN
A	FAN SPEED AUTO SILENT LOW MED HIGH
⏻	START / STOP

ECO	ECO
FAN	FAN
	POWERFUL
	SILENT
	INFO
	SLEEP TIMER
10°C	LEAVE HOME
	CLEAN
Mon-Sun	DAY
1–6	PROGRAM NO.

OFF TIMER ON	ON / OFF TIMER
TIME	TIME
OK	OK
DELETE	DELETE
COPY/PASTE	COPY / PASTE
CANCEL	CANCEL
SEND	SEND
CLOCK	CLOCK

Precautions for Use

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

VARIOUS FUNCTIONS

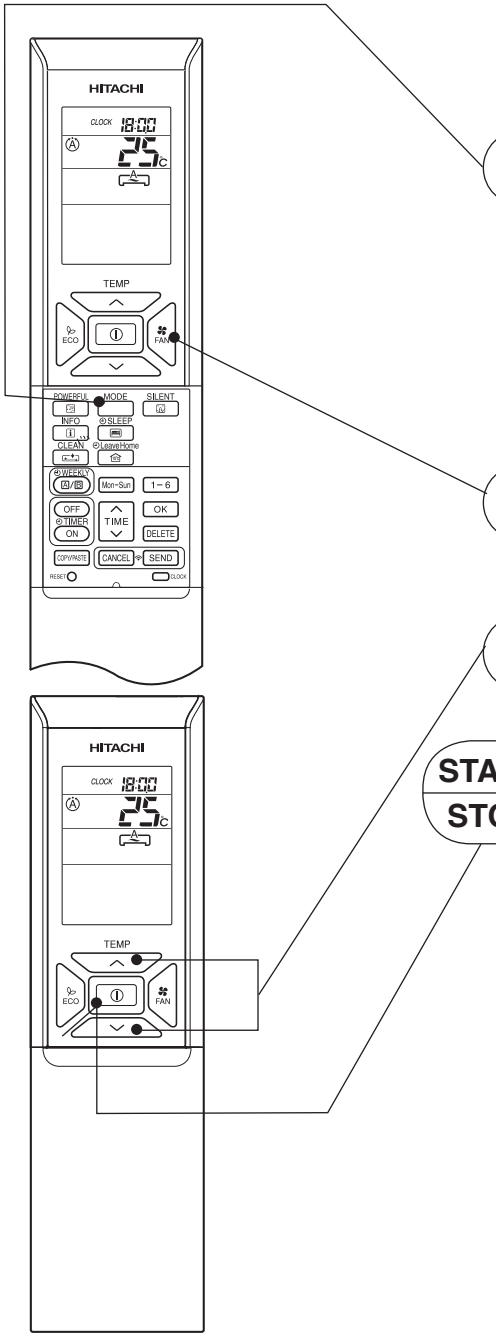
■ Auto Restart Control

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

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

AUTOMATIC OPERATION

The device will automatically determine the mode of operation, HEAT or COOL depending on the current room temperature. The selected mode of operation will change when the room temperature varies. However, the mode of operation will not change for RAD-50PPA, RAD-60PPA, RAD-70PPA and when indoor unit is connected to multi type outdoor unit.



1

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

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

2

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

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

3

Set the desired room temperature with the TEMPERATURE buttons (the display indicates the setting).
The temperature setting and the actual room temperature may vary depending on conditions.

START / STOP

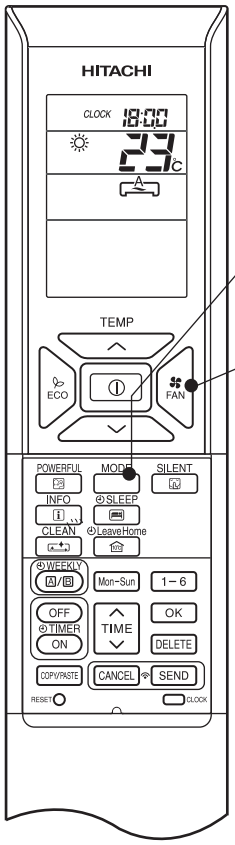
Press the ⏻ (START/STOP) button.
Operation starts with a beep.
Press the button again to stop operation.

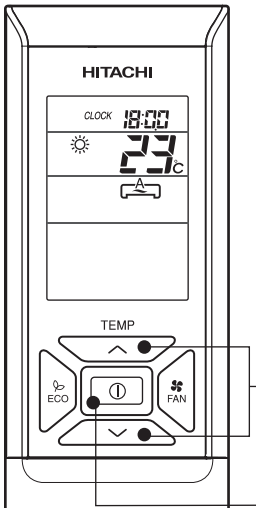
■ As the settings are stored in the memory of the remote controller, you only have to press the ⏻ (START/STOP) button next time.

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

HEATING OPERATION

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





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

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

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

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

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

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

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

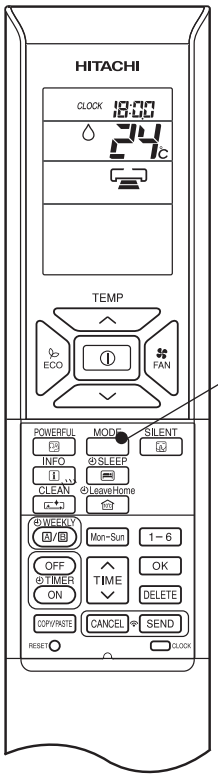
■ During AUTO fan, the fan speed automatically changes as below:
- When the difference between room temperature and setting temperature is large, fan starts to run at HI speed.
- After room temperature reaches the preset temperature, fan speed will be changed to lower speed to obtain optimum room temperature condition for natural healthy heating.

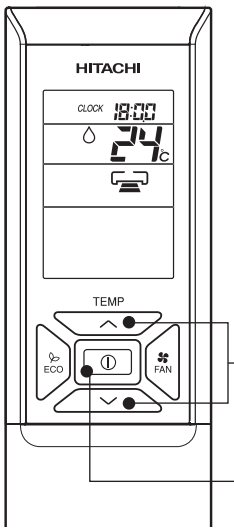
Defrosting

Defrosting will be performed about once an hour when frost forms on the heat exchange of the outdoor unit, for 5~10 minutes each time.
During defrosting operation, the operation lamp blinks in a cycle of 3 seconds on and 0.5 second off.
The maximum time for defrosting is 20 minutes.
However, if the indoor unit is connected to multi type outdoor unit, the maximum time for defrosting is 15 minutes.
(If the piping length used is longer than usual, frost is likely to form.)

DEHUMIDIFYING OPERATION

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





1 Press the MODE selector button so that the display indicates ◇ (DEHUMIDIFY).
The fan speed is set at LOW.
Press FAN (FAN SPEED) button to select SILENT or LOW fan speed.

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



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

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

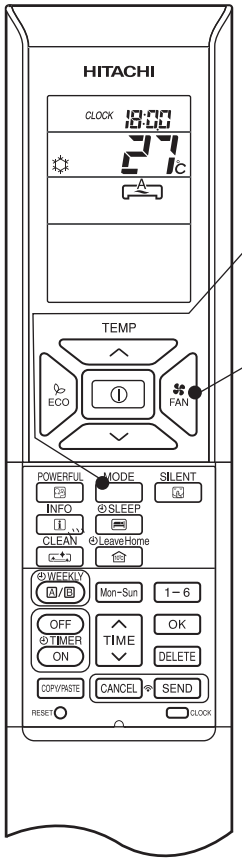
■ As the settings are stored in the memory of the remote controller, you only have to press the ⏻ (START/STOP) button next time.

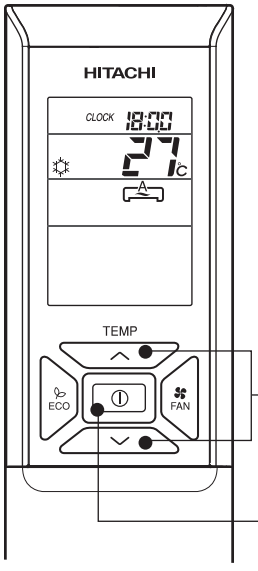
■ Dehumidifying Function

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

COOLING OPERATION

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





1 Press the MODE selector button so that the display indicates ☼ (COOL).

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

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

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

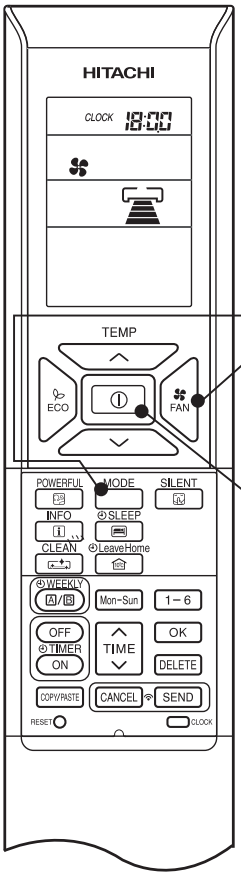
The temperature setting and the actual room temperature may vary depending on conditions.

START / STOP 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 user set the temperature below the current room temperature.

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

FAN OPERATION

User can use the device simply as an air circulator.



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

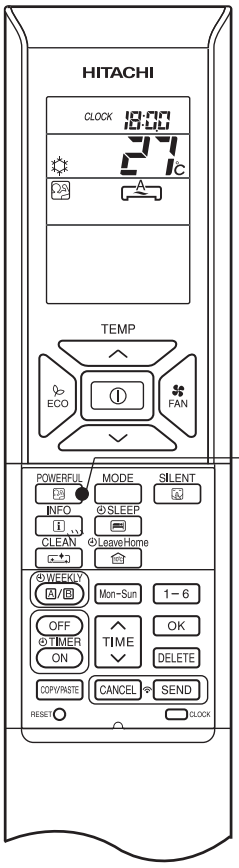
2 Set the desired FAN SPEED with the FAN (FAN SPEED) button (the display indicates the setting).

→ (HIGH) → (MED) → (LOW) → (SILENT) →

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

POWERFUL OPERATION

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



■ To start POWERFUL operation

1

- Press POWERFUL (POWERFUL) button during operation.

  " " is displayed on the LCD.

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

■ To cancel POWERFUL operation

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

  POWERFUL operation stops.

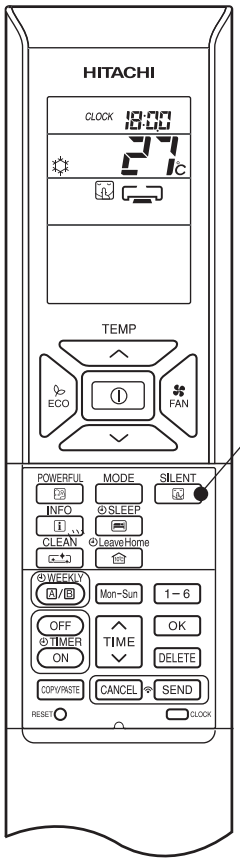
  " " disappears from the LCD.

NOTE

- When SLEEP mode, ECO mode, SILENT mode or LEAVE HOME mode is selected, POWERFUL operation is cancelled.
- During POWERFUL operation, capacity of the air conditioner will not increase
  – if the air conditioner is already running at maximum capacity.
  – just before defrost operation (when the air conditioner is running in HEATING operation).
- After auto restart, POWERFUL operation is cancelled and previous operation shall start.
- For multi model connections, RAD-50PPA, RAD-60PPA and RAD-70PPA, POWERFUL operation may not function depending on operation conditions.

SILENT OPERATION

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



■ To start SILENT operation

1

- Press SILENT (SILENT) button during operation.

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

■ To cancel SILENT operation

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

  Fan speed will return to previous fan speed before SILENT operation starts.

  SILENT operation stops.

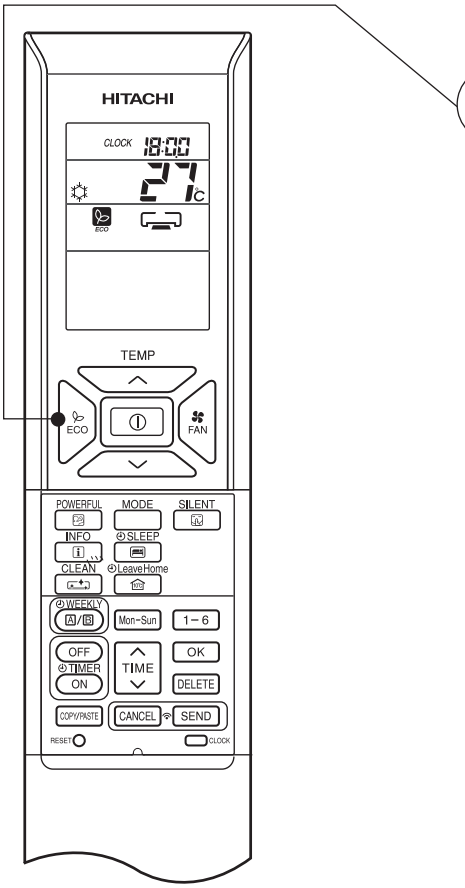
  " " disappears from the LCD.

NOTE

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

ECO OPERATION

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



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

■ To start ECO operation

● Press ECO (ECO) button during operation.

" ECO " is displayed on the LCD.

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

■ To cancel ECO operation

● Press ⏻ (START/STOP) button. Or

● Press ECO (ECO) button again.

" ECO " disappears from the LCD.

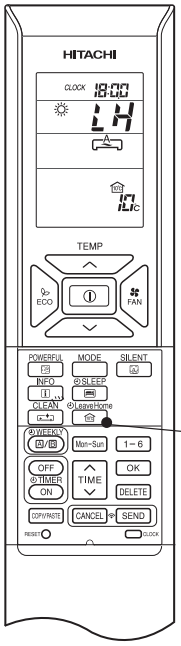
NOTE

- ECO function will not be effective when power consumption is low.
- By pressing (POWERFUL) button, ECO operation is cancelled.
- After auto restart, ECO operation is cancelled and previous operation mode shall start.
- For multi model connections, RAD-50PPA, RAD-60PPA and RAD-70PPA, energy saving operation shall start only by changing set temperature higher or lower automatically. However, effectiveness of ECO depends on operation conditions.

LEAVE HOME(LH) OPERATION

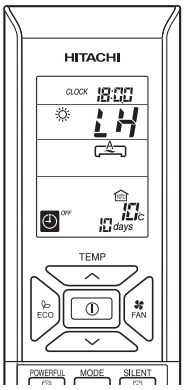
Prevent the room temperature from falling too much by setting temperature 10°C automatically when no one is at home.
This operation is able to operate by "Continuous operation" or "Day timer operation". Please use "Day timer operation" to set the number of days up to 99 days.

Continuous operation



1

Day timer operation



■ To start LEAVE HOME operation

Option 1. Continuous operation.

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

Option 2. Day timer operation.

- Press LeaveHome (LEAVE HOME) button during stop or operation.
  Room temperature is set at 10°C and heating operation starts.
  " ☼ ", " LH ", " ▭ ", " 10°C " is displayed on the LCD.
- Set number of operation days (1 to 99 days), if needed.
  Press TIME (TIME) button to select number of days.
  Number of days blink.
  * Press " ∧ (UP)" to set number of days from 1 day, 2 days, 3 days ..... 98 days, 99 days, 1 day and so on.
  * Press " ∨ (DOWN)" to set number of days from 99 days, 98 days, 97 days .... 3 days, 2 days, 1 day, 99 days and so on.
  * Number of day is counted when clock indicates 0:00.
- Press SEND (SEND) button to confirm number of operation days. Display for number of operation days will stop blinking.
- Press CANCEL (CANCEL) button to reset number of operation days or to have continuous operation.

■ To cancel LEAVE HOME operation

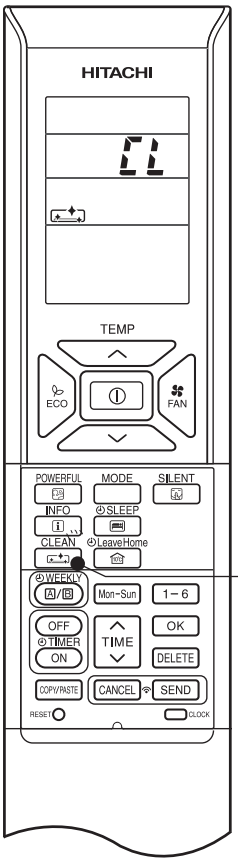
- Press ⏻ (START/STOP) button. Or
- Press LeaveHome (LEAVE HOME) button again.
  Return to previous operation mode. Or
- Change to other operation mode by pressing MODE (MODE) button.

NOTE

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

CLEAN (ONE TOUCH CLEAN) OPERATION

Drying indoor heat exchanger after cooling operation to prevent mildew.



■ To start CLEAN operation

1

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

  "CL", " " is displayed on the LCD.

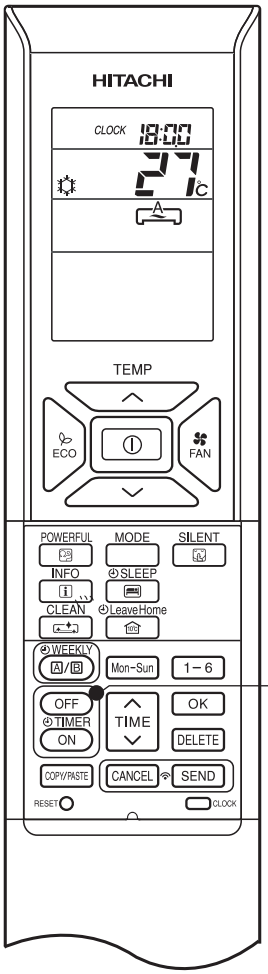
■ To cancel CLEAN operation

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

NOTE

- When CLEAN operation finish, unit will switch OFF automatically.
- If Weekly Timer or Once Timer is set, there is a need to cancel those timer before operating CLEAN function.
- For multi connections, RAD-50PPA, RAD-60PPA and RAD-70PPA, when pressing CLEAN (CLEAN) button, operation is limited to FAN operation.
- For multi connections, when one room operates CLEAN operation first, other rooms can operate COOLING, DEHUMIDIFYING or FAN operation. However, when other rooms need to operate HEATING operation, air conditioner will be in STANDBY mode. After CLEAN operation finish, HEATING operation will start.

ONCE TIMER (ON/OFF TIMER) OPERATION



1

OFF TIMER

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

1. Press OFF TIMER (OFF-TIMER) button. OFF and 0:00 blink on the display.
2. Set the "turn-off time" with TIME (TIME) button.
3. After setting, direct the remote controller towards the indoor and press SEND (SEND) button.

   OFF and "set time" lights up instead of blinking.

   A beep sound emitted from indoor unit and the (TIMER) lamp on the indoor unit lights up.

ON TIMER

The device will turn on at a designated time.

1. Press TIMER ON (ON-TIMER) button. ON and 0:00 blink on the display.
2. Set the "turn-on time" with TIME (TIME) button.
3. After setting, direct the remote controller towards the indoor and press SEND (SEND) button.

   ON and "set time" light up instead of blinking.

   A beep sound emitted from indoor unit and the (TIMER) lamp on the indoor unit lights up.

ON/OFF TIMER

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

1. Press OFF TIMER (OFF-TIMER) button so that OFF and 0:00 blink on the display.
2. Set the "turn-off" time with TIME (TIME) button. After setting, direct the remote controller towards the indoor and press SEND (SEND) button.
3. Press TIMER ON (ON-TIMER) button so that OFF and set "turn-off" time light up.

   The ON and 0:00 blink.
4. Set the "turn-on" time with TIME (TIME) button.
5. After setting, direct the remote controller towards the indoor and press SEND (SEND) button

   ON and set "turn-on" time light up instead of blinking.

   A beep sound emitted from indoor unit and the (TIMER) lamp on the indoor unit lights up.

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

■ To cancel Reservation

- Point the signal window of the remote controller towards the indoor unit and press CANCEL (CANCEL) button.

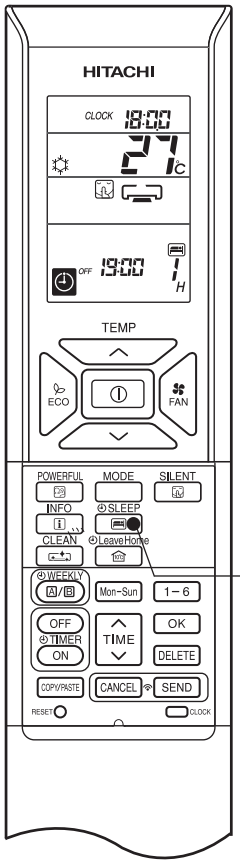
  and "ON or OFF set time" goes out with a beep and the (TIMER) lamp on the indoor unit turns off.

NOTE

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

SLEEP ECO SLEEP TIMER OPERATION

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



1

■ To start ECO SLEEP TIMER operation

Press SLEEP (SLEEP) button during operation.

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

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



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



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

■ To cancel ECO SLEEP TIMER operation

Press (START/STOP) button.

- Room air conditioner will switch off.

Press SLEEP (SLEEP) button again until " ", " ", " ", off time, " " and number of hour disappear from the remote controller display.

Press CANCEL (CANCEL) button.

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

SLEEP ECO SLEEP TIMER OPERATION

■ To set ECO SLEEP TIMER and ON TIMER

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

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



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

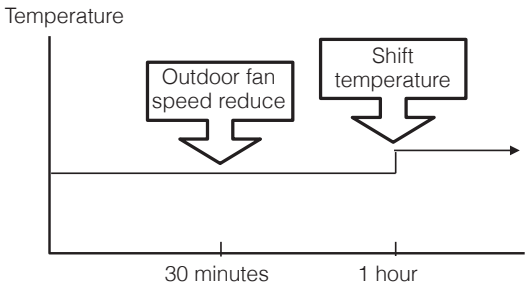
■ To cancel ECO SLEEP TIMER and ON TIMER operation

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

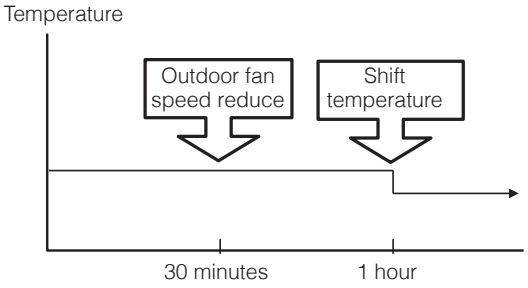
- " ", " ", " ", "OFF", off time, " ", number of hour, "ON" and ON TIMER set time disappear from the remote controller display.
- A beep sound emitted from indoor unit and the (TIMER) lamp on the indoor unit turns off.
- ECO SLEEP TIMER and ON TIMER reservations are cancelled.

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

Cooling operation [diagram representation for illustrative purpose only]



Heating operation [diagram representation for illustrative purpose only]



NOTE

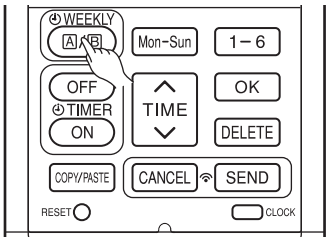
- If ECO SLEEP TIMER is set when OFF TIMER or ON/OFF TIMER has been set earlier, the ECO SLEEP TIMER becomes effective instead of the OFF TIMER or ON/OFF TIMER.

WEEKLY TIMER OPERATION

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

Step 1 : Set the reservation schedule to the remote controller. Send the registered reservation to indoor unit and then operate.
Step 2 : Select Mode A or Mode B and activate or deactivate WEEKLY TIMER .
Step 3 : Copy and cancel the reservation schedule.

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



① ②

■ How to set a WEEKLY TIMER.

1. Select Mode A or Mode B

Press (WEEKLY) button. WEEKLY lights up. A and 🕘 blink on the display. (Mode A is selected).

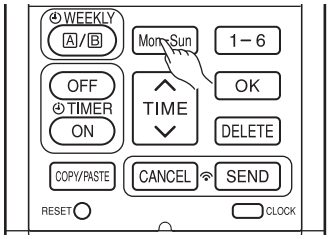
Press (WEEKLY) button again, B and 🕘 blink on the display. (Mode B is selected).

- If no reservation has been made, ON/OFF, --:-- , --.-°C appear.
- If reservation has been made, ON/OFF, --:-- , --.-°C will not appear.

2. Set a program

Press (WEEKLY) button for about 3 seconds. The selection mode can be changed.

🕘, day: Mon, program no. : 1, ON/OFF, setting time and setting temperature blink on the display.



③

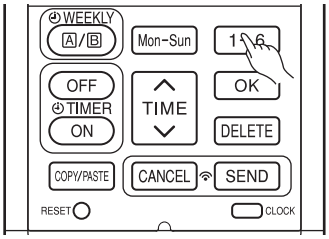
3. Select the desired day of the week

Press [Mon-Sun] (DAY) button.

The day changes from Mon ⟶ Tue ⟶ Wed ⟶ Thu ⟶ Fri ⟶ Sat ⟶ Sun ⟶ Mon, Tue, Wed, Thu, Fri, Sat, Sun [Full days] ⟶ Mon, Tue, Wed, Thu, Fri [weekday] ⟶ Sat, Sun [weekend] ⟶ Mon ⟶ Tue .....

Select [Full days] for daily reservation.
Select [weekday] for Monday to Friday reservation.
Select [weekend] for Saturday and Sunday reservation.

- After reservation has been set, it is easy to check and edit at the same time.



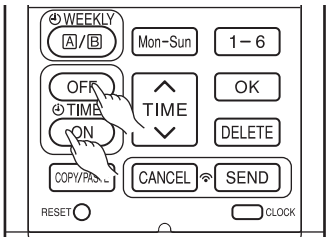
④

4. Press [1–6] button to select a program number.

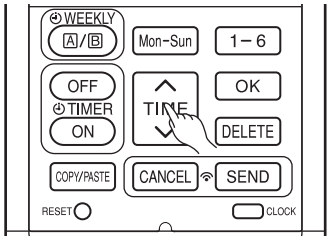
The number changes from 1 ⟶ 2 ⟶ 3 ⟶ 4 ⟶ 5 ⟶ 6 ⟶ 1 ⟶ 2 .....

- If program number has been set, follow above in order to make changes.

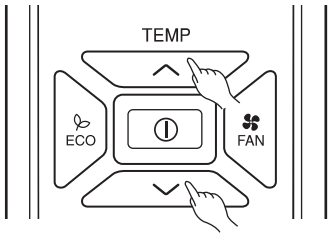
WEEKLY TIMER OPERATION



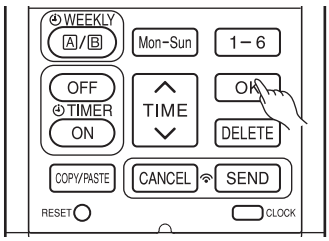
5



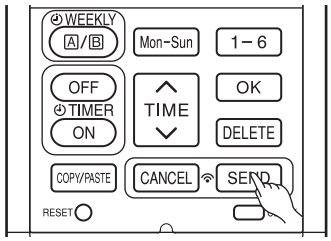
6



7



8



9

5. Press (OFF TIMER ON) (ON-OFF TIMER) button to select ON TIMER or OFF TIMER reservation.
6. Press (TIME) (TIME) button to set time reservation.
7. Press (TEMP ∧ or ∨) button to set temperature reservation.
8. Press [OK] (OK) button. The reservations are set. Day, program number, ON reservation, setting temperature will light up. 🕘 will be continuously blinks. If reservation is not complete, settings will not be stored in memory.

To continue with the reservation, press [Mon-Sun] [1–6] (TIME) (OFF TIMER ON) buttons. Follow step 3 to 8 for reservation.

9. After all the reservations have been set, press [SEND] (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds. Timer lamp on the indoor unit will blink rapidly.
   After beep sound emitted from indoor unit, TIMER lamp will light up.
   Please ensure that the TIMER lamp lights up.
   This indicates that the reservation has been stored in the indoor unit and Timer function has been completed.
   The reservation contents will appear on the remote controller display.

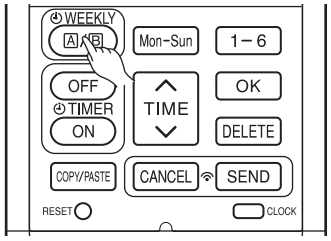
- If TIMER lamp on the indoor unit does not light up, press [SEND] (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds.
- **CAUTION !** Do not press [CANCEL] (CANCEL) button during reservation setting because this will result in all reservation contents to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

NOTE

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

WEEKLY TIMER OPERATION

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

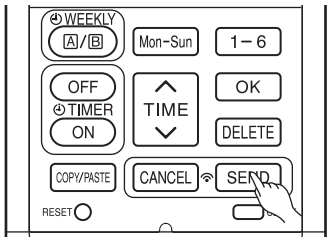


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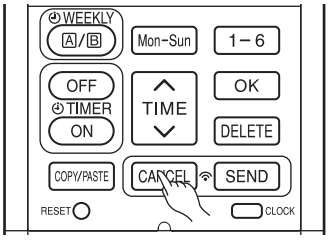
■ How to select Mode A or Mode B of WEEKLY TIMER setting.

1. Press WEEKLY (A/B) (WEEKLY) button. **A** and ◴ blink on the display. (Normally Mode A will blink first).
2. Press WEEKLY (A/B) (WEEKLY) button again. **B** and ◴ blink on the display.
3. Select Mode A or Mode B. Press SEND (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds. Timer lamp on the indoor unit will blink rapidly.



3

After beep sound emitted from indoor unit, TIMER lamp will light up.
Please ensure that the TIMER lamp lights up.
This indicates that Mode A or Mode B selection and active WEEKLY TIMER have been confirmed.



1

■ Setting non-active WEEKLY TIMER .

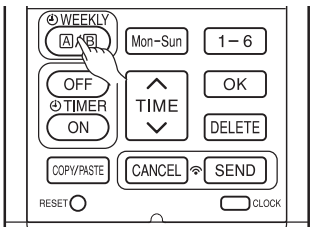
1. Direct the remote controller towards the indoor unit and press CANCEL (CANCEL) button.
   Beep sound will be emitted from indoor unit and TIMER lamp will be OFF. Reservation indication on remote display will also disappear.
   This indicates that non-active WEEKLY TIMER has been confirmed.

   - To activate back the setting of WEEKLY TIMER , repeat the steps for "How to select Mode A or Mode B of WEEKLY TIMER setting".

NOTE

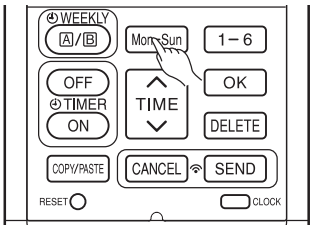
- When setting ONCE TIMER, operation of WEEKLY TIMER is interrupted. After ONCE TIMER operation is complete, WEEKLY TIMER operation will be activated.
- When ONCE TIMER is cancelled, operation of WEEKLY TIMER is also cancelled. Need to set WEEKLY TIMER operation for activation.
- After auto restart,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

Step 3: Copy and cancel the reservation schedule.

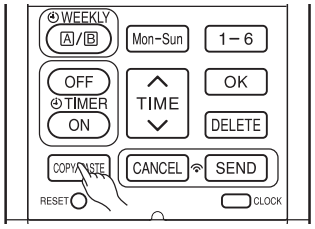


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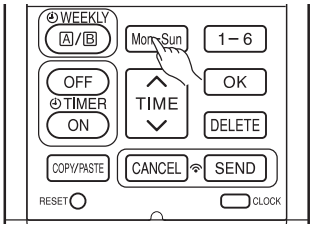
2



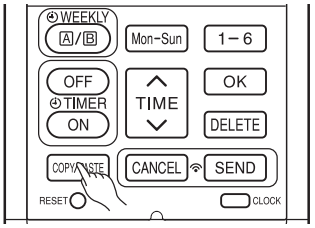
3



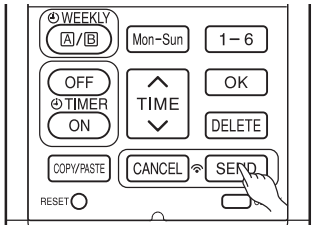
4



5



6



8

■ How to copy and paste.

Editing the reservation schedule is easy by copying data from one day to another day.

1. Press WEEKLY A/B (WEEKLY) button to select Mode A or Mode B.
2. Press WEEKLY A/B (WEEKLY) button for about 3 seconds to start editing the reservation schedule.
3. Press Mon-Sun (DAY) button to select a day of the week to copy.
4. Press COPY/PASTE (COPY/PASTE) button. Then "PASTE" blinks on the display.
   * Press CANCEL (CANCEL) button to cancel the COPY mode. Normal setting mode is activated.
5. Press Mon-Sun (DAY) button to select a day of the week to paste.
6. Press COPY/PASTE (COPY/PASTE) button one more time to paste. ⏲ only blinks on the display.
7. To continue copying to other days, press Mon-Sun or 1–6 or TIME or OFF TIMER ON .

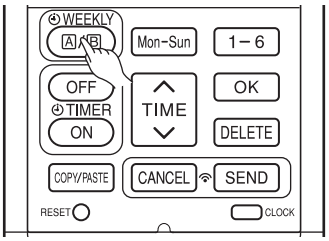
   Then start from step 3.
8. After copy and paste completed, press SEND (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds. Timer lamp on the indoor unit will blink rapidly.
   After beep sound emitted from indoor unit, TIMER lamp will light up.
   Please ensure that the TIMER lamp lights up.
   If TIMER lamp does not light up, Press SEND (SEND) button again.

- Reservation data will not change if SEND (SEND) button is not pressed.

NOTE

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

Step 3: Copy and cancel the reservation schedule.

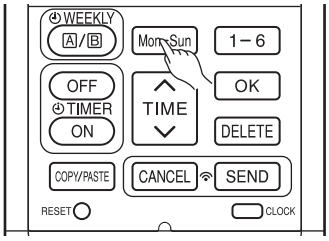


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2

■ How to delete WEEKLY TIMER data.

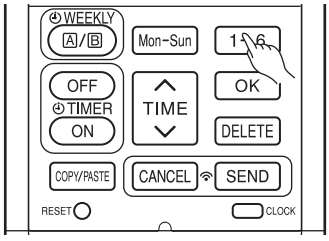
[Delete one program number reservation]

1. Press WEEKLY A/B (WEEKLY) button to select Mode A or Mode B.
2. Press WEEKLY A/B (WEEKLY) button for 3 seconds to start editing the reservation schedule.



3

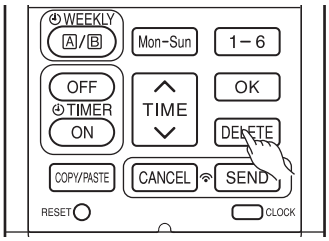
3. Press Mon-Sun (DAY) button to select a day of the week to edit.
4. Press 1–6 to select program number. Selected program number will blink.
5. Press DELETE (DELETE) button. Reservation of selected program number is deleted.



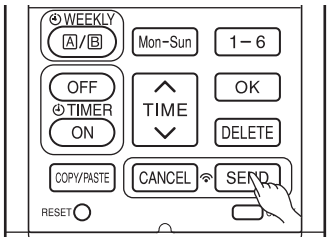
4

6. After deleting, press SEND (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds. Timer lamp on the indoor unit will blink rapidly.
   After beep sound emitted from indoor unit, TIMER lamp will light up.
   Please ensure that the TIMER lamp lights up.

● Reservation will not change if SEND (SEND) button is not pressed.

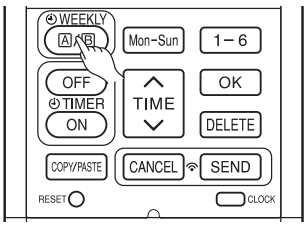


5

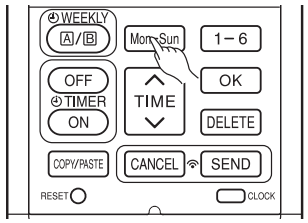


6

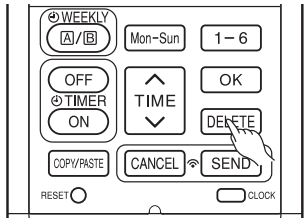
Step 3: Copy and cancel the reservation schedule.



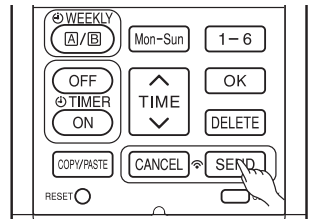
1



2



3



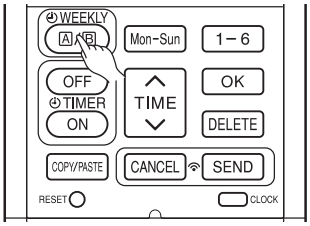
4

5

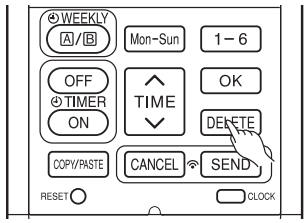
[Delete one day reservation]

1. Press WEEKLY A/B (WEEKLY) button to select Mode A or Mode B.
2. Press WEEKLY A/B (WEEKLY) button for 3 seconds to start editing the reservation schedule.
3. Press Mon-Sun (DAY) button to select a day of the week to edit.
4. Press DELETE (DELETE) button for about 10 seconds. Reservations for all program numbers will be deleted.
   - If press for a short time, reservation for one program number will be deleted.
5. After deleting, press SEND (SEND) button while directing the remote controller towards the indoor unit for about 3 seconds. Timer lamp on the indoor unit will blink rapidly.
   After beep sound emitted from indoor unit, TIMER lamp will light up.
   Please ensure that the TIMER lamp lights up.

- Reservation will not change if SEND (SEND) button is not pressed.



1



2

[Delete Mode A or Mode B]

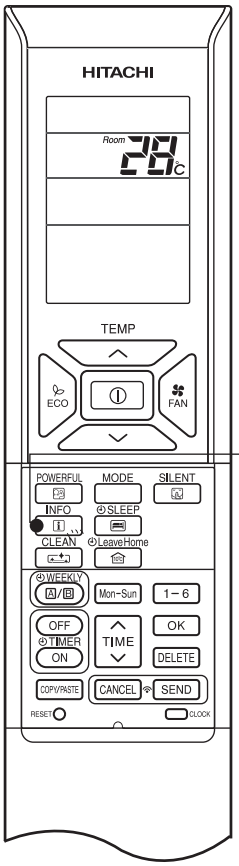
1. Press WEEKLY A/B (WEEKLY) button to select Mode A or Mode B.
2. Direct the remote controller towards the indoor unit and press DELETE (DELETE) button for about 10 seconds while Mode A or Mode B display blinks.
   After beep sound emitted from indoor unit, reservations for Mode A or Mode B will disappear.

NOTE

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

INFO FUNCTION

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



■ To check temperature around remote controller

1 Press INFO (INFO) button.

Temperature will be displayed for 10 seconds.

■ To check monthly power consumption

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

While temperature around remote controller is displayed, press INFO (INFO) button repeatedly. The display will show as below:

this month power consumption amount for heating → last month power consumption amount for heating → this month power consumption amount for cooling → last month power consumption amount for cooling → temperature around remote controller → this month power consumption amount for heating ..... cyclically.

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

■ Current calendar and clock can be retrieved from indoor unit

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

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

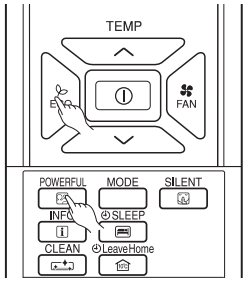
- If there is no power supply to indoor unit or calendar and clock have not been set, INFO function cannot be used for sending or receiving information.

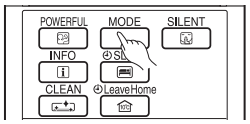
NOTE

- In case failure occurs to the air conditioner, by pressing INFO (INFO) button, an error code will be displayed. Direct the remote controller towards the receiver of indoor unit (within 2 meters in front of indoor unit) and press INFO (INFO) button. Wait for 2 seconds for signal transmission.
  An error code will be displayed.
  Call service center and inform the error code.
- Information of “Monthly power consumption” are not available for model RAM-130NP6A.
- Info Function to check monthly power consumption.
  During installation, in case of power failure or breaker ON / OFF, ensure to set the clock and calendar for each indoor unit (unit in standby mode or auto restart), for single or multi connection, by pressing ⏻ (START / STOP) button.
  Failure to do the above, monthly power consumption amount will not be displayed on the remote controller.

OPERATION MODE LOCK

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





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

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

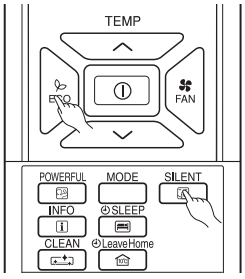
" ☼ ", " ✿ " and " 🔑 " will be displayed for about 10 seconds. Later, " ☼ " and " 🔑 " will remain.

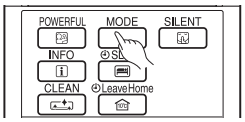
This indicates that HEATING mode operation is locked.

When pressing MODE (MODE) button, " ☼ " or " ✿ " will be displayed.

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

Press ECO (ECO) and POWERFUL (POWERFUL) buttons simultaneously for about 5 seconds when the remote controller is OFF.
All operation mode symbols will appear on the display for about 10 seconds. After that, operation mode symbol before cancellation will be displayed.
This indicates that HEATING mode operation is unlocked.





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

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

" ☼ ", " ◯ ", " ✿ " and " 🔑 " will be displayed for about 10 seconds. Later, " ☼ " and " 🔑 " will remain.

This indicates that COOLING and DEHUMIDIFYING mode operation is locked.

When pressing MODE (MODE) button, " ☼ ", " ✿ " or " ◯ " will be displayed.

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

Press ECO (ECO) and SILENT (SILENT) buttons simultaneously for about 5 seconds when the remote controller is OFF.
All operation mode symbols will appear on the display for about 10 seconds. After that, operation mode symbol before cancellation will be displayed.
This indicates that COOLING and DEHUMIDIFYING modes operation is unlocked.

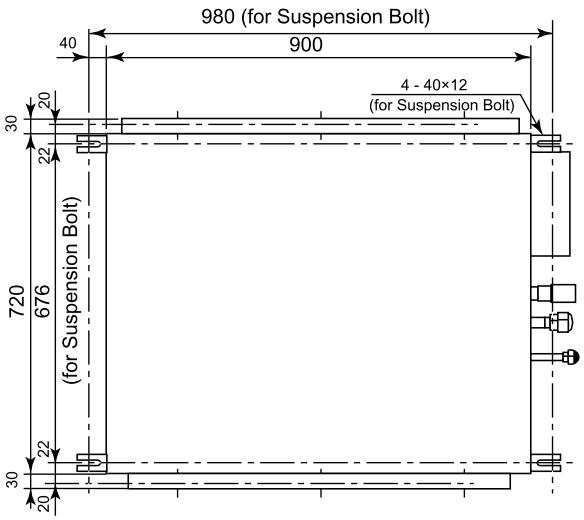
NOTE

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

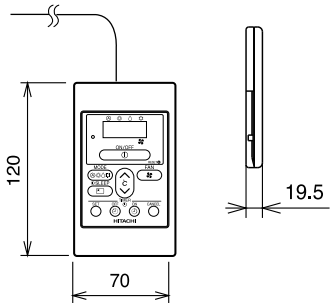
CONSTRUCTION AND DIMENSIONAL DIAGRAM

MODEL RAD-50PPA
RAD-60PPA
RAD-70PPA

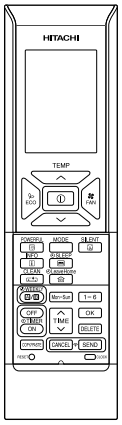
Unit: mm

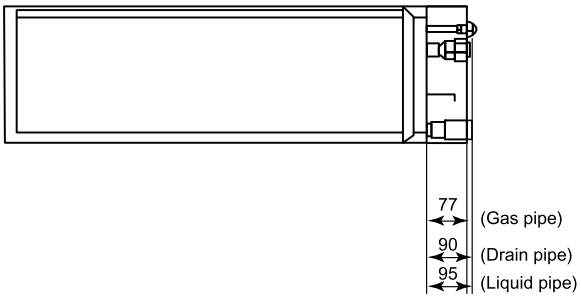


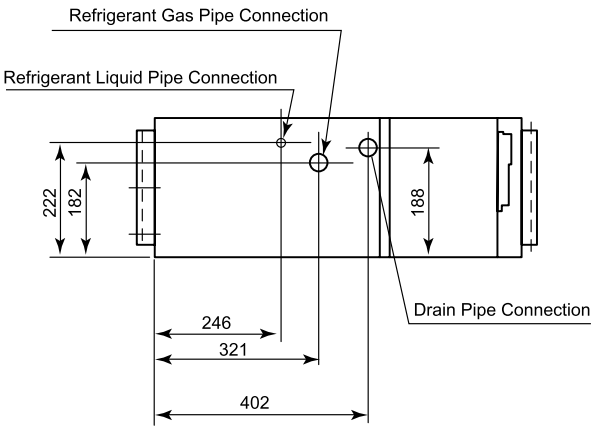
OPTIONAL
Wired Remote Controller
(SPX-RCDA)



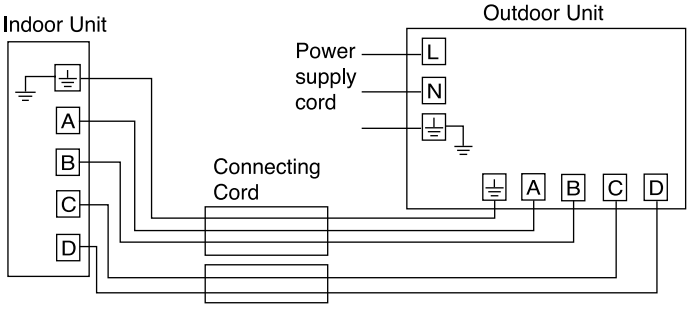
OPTIONAL
Wireless Remote Controller
(SPX-RCKA)







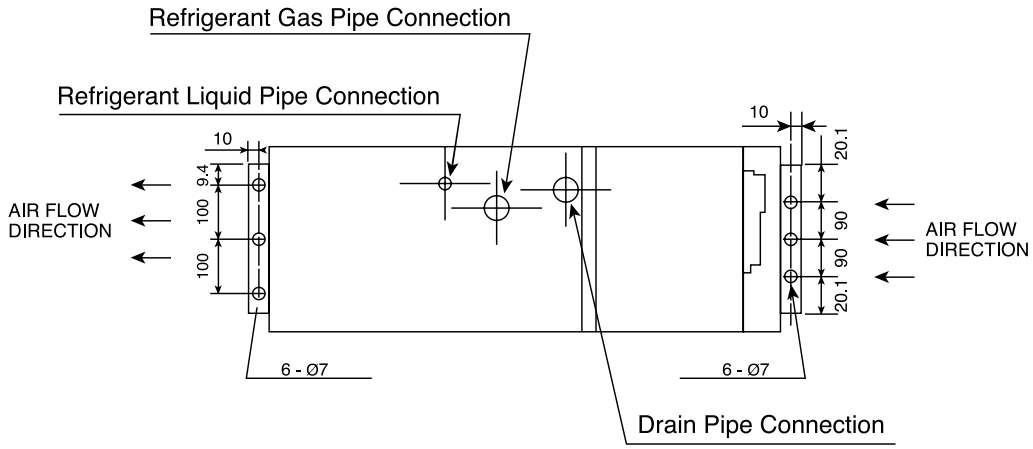
Note:
1. Servicing space of 100mm or more is required on the left and right sides of the indoor unit and also 50mm or more space is required above the unit
2. Insulated pipes should be used for both the narrow and wide dia. pipes.
3. Piping length is within 20m
4. Height different of the piping between the indoor unit and the outdoor unit should be within 10m.
5. Connecting cable 2.5mm dia. x 3 (AB Line), 1.6mm dia. x 2 (CD Line) is used for the connection.



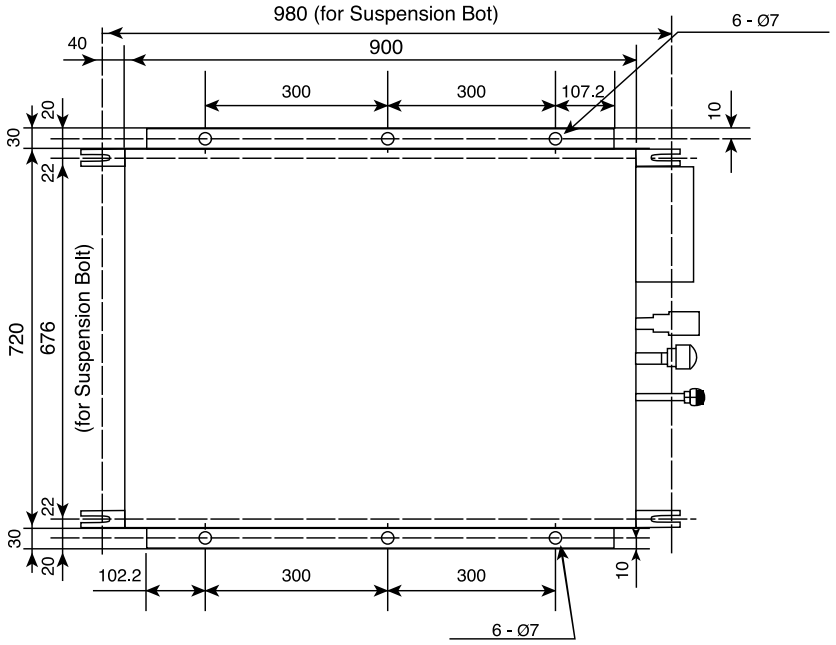
MOUNTING HOLE DIMENSION

MODEL RAD-50PPA
RAD-60PPA
RAD-70PPA

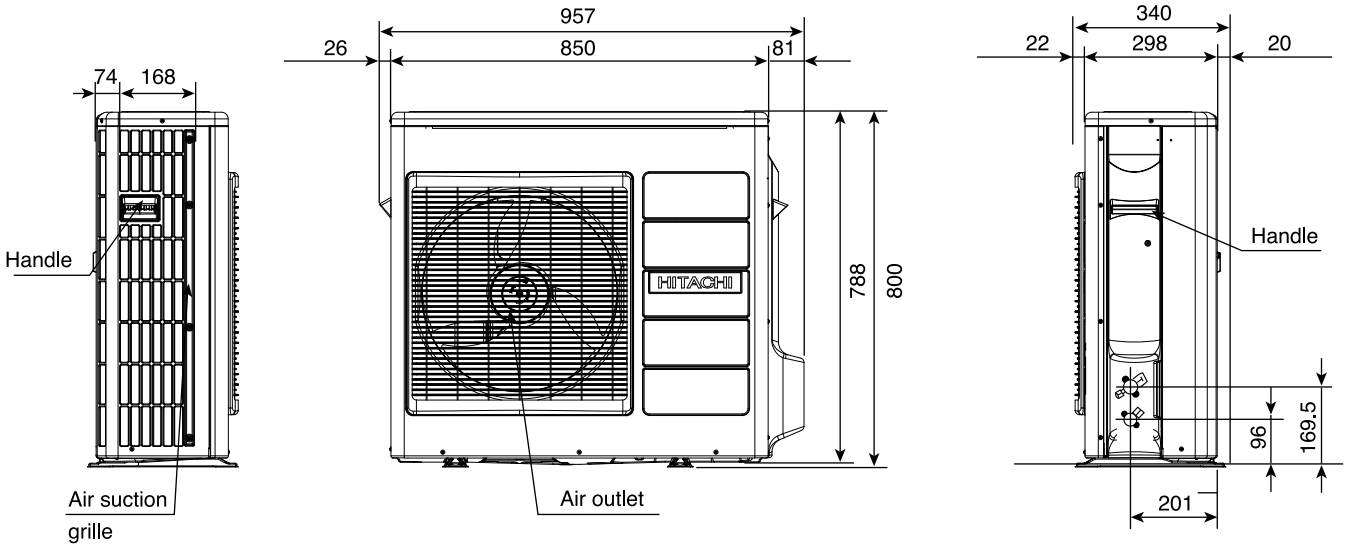
SIDE VIEW

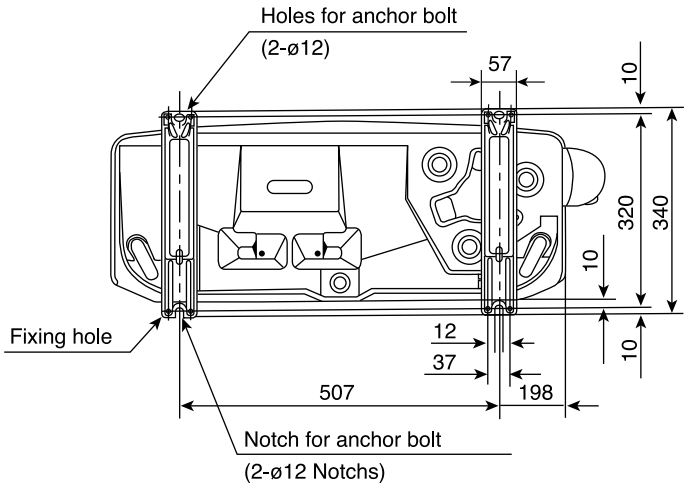


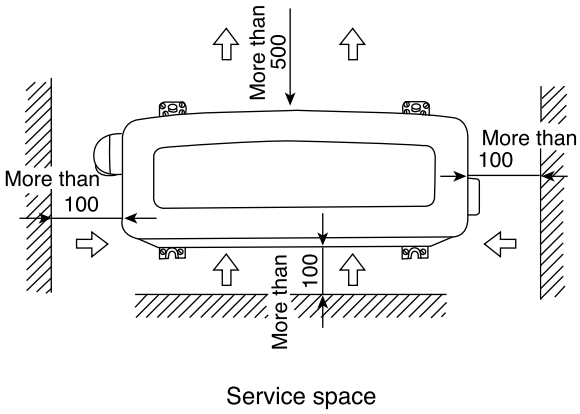
TOP VIEW



MODEL RAC-50PPA
RAC-60PPA
RAC-70PPA







Service space

MAIN PARTS COMPONENT

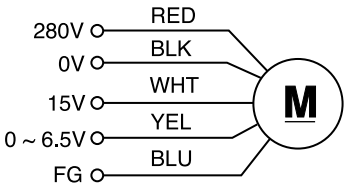
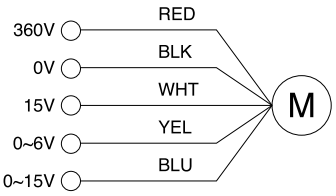
THERMOSTAT (Room Temperature Thermistor)

Thermostat Specifications

MODEL			RAD-50PPA/RAD-60PPA/RAD-70PPA	
THERMOSTAT MODEL			IC	
OPERATION MODE			COOL	HEAT
TEMPERATURE °C (°F)	INDICATION 16	ON	15.6 (60.1)	20.0 (68.0)
		OFF	15.3 (59.5)	20.7 (69.3)
	INDICATION 24	ON	23.6 (74.5)	28.0 (82.4)
		OFF	23.3 (73.9)	28.7 (83.7)
	INDICATION 32	ON	31.6 (88.9)	36.0 (96.8)
		OFF	31.3 (88.3)	36.7 (98.1)

FAN MOTOR

Fan Motor Specifications

MODEL	RAD-50PPA/RAD-60PPA/RAD-70PPA	RAC-50DPA/RAC-60DPA/RAC-70DPA
POWER SOURCE	DC: 280V	DC350V
OUTPUT	56W	80W
CONNECTION	 (Control circuit built in)	

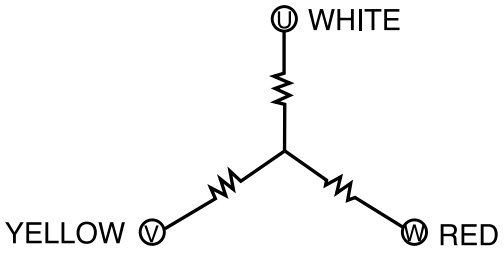
BLU : BLUE YEL : YELLOW BRN : BROWN WHT : WHITE

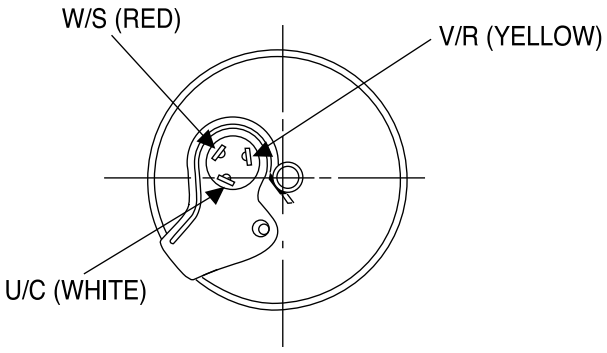
GRY : GRAY ORN : ORANGE GRN : GREEN RED : RED

BLK : BLACK PNK : PINK VIO : VIOLET

COMPRESSOR MOTOR

Compressor Motor Specifications

MODEL		RAC-50DPA	RAC-60DPA/RAC-70DPA
COMPRESSOR MODEL		JU1015D4	JU151XC2
PHASE		SINGLE	
RATED VOLTAGE		AC 220 ~ 240 V	
RATED FREQUENCY		50 Hz	
POLE NUMBER		4	
CONNECTION			
RESISTANCE VALUE (Ω)	20°C (68°F)	2M = 1.05	
	75°C (167°F)	2M = 1.268	



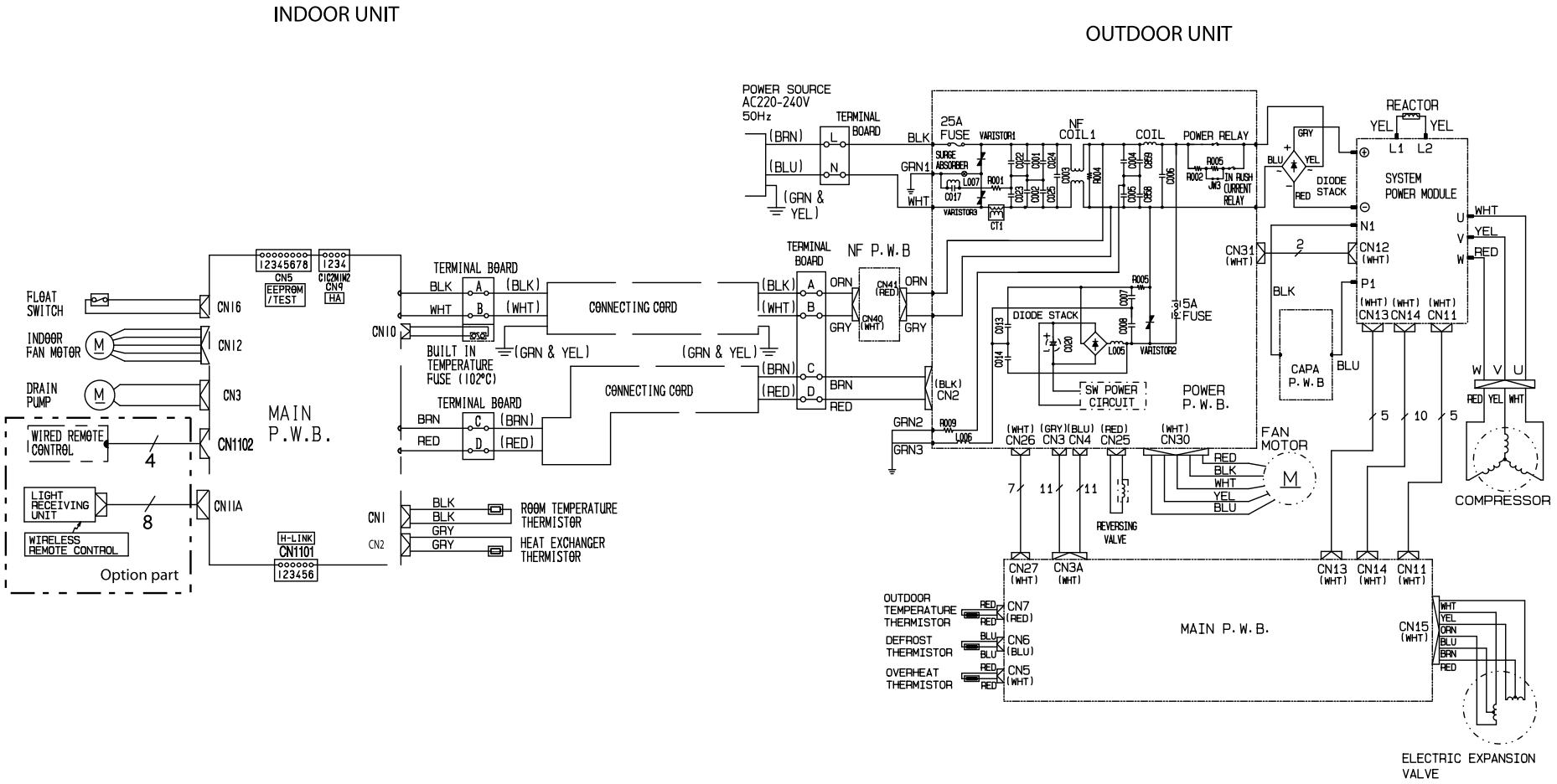
⚠ CAUTION

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

WIRING DIAGRAM

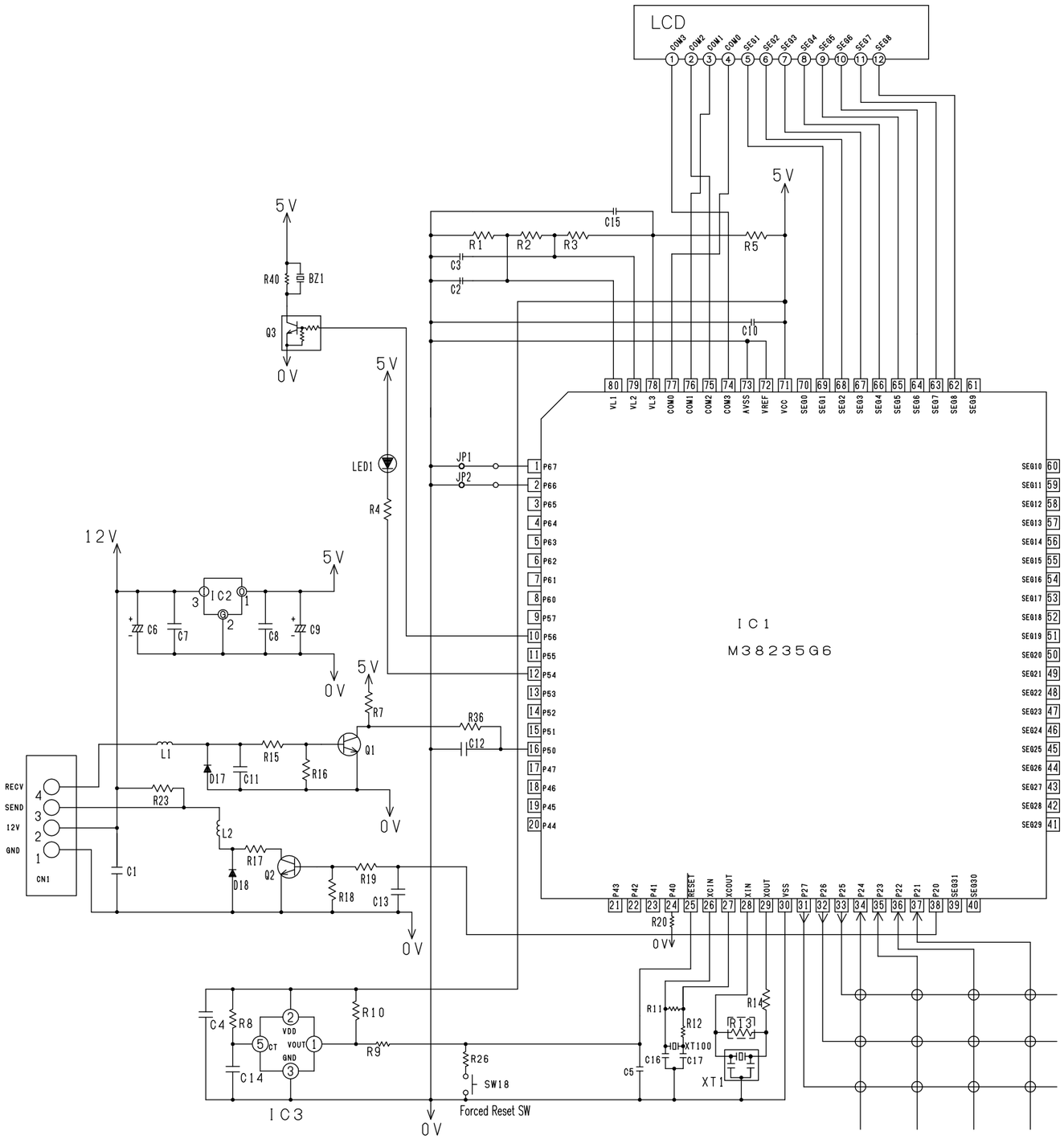
MODEL RAD-50PPA/RAD-60PPA/RAD-70PPA
RAC-50DPA/RAC-60DPA/RAC-70DPA

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



CIRCUIT DIAGRAM

Wired Remote Control



Resistor

symbol	resistance (Ω)	tolerance	power rating (W)	mounting form	surface	remark
R1	220k	5%	1/10	C	A	1608
R2	220k	5%	1/10	C	A	1608
R3	220k	5%	1/10	C	A	1608
R4	1k	5%	1/10	C	A	1608
R5	430k	5%	1/10	C	A	1608
R7	10k	5%	1/10	C	A	1608
R8	No Mount		1/10	C	A	1608
R9	1k	5%	1/10	C	A	1608
R10	300k	5%	1/10	C	A	1608
R11	10M	5%	1/10	C	A	1608
R12	220k	5%	1/10	C	A	1608
R13	No Mount		1/10	C	A	1608
R14	0	5%	1/10	C	A	1608
R15	10k	5%	1/10	C	A	1608
R16	10k	5%	1/10	C	A	1608
R17	0	5%	1/10	C	A	1608
R18	10k	5%	1/10	C	A	1608
R19	10k	5%	1/10	C	A	1608
R20	4.7k	5%	1/10	C	A	1608
R23	10k	5%	1/10	C	A	1608
R26	1k	5%	1/10	C	A	1608
R36	1k	5%	1/10	C	A	1608
R40	No Mount		1/10	C	A	1608
JP1	No Mount		1/10	C	A	1608
JP2	No Mount		1/10	C	A	1608

Capacitor

symbol	capacitance (μF)	rated voltage (V)	type	mounting form	surface	remark	temperature compensating
C1	0.1	25	C	C	A	1608	B
C2	0.1	25	C	C	A	1608	B
C3	0.1	25	C	C	A	1608	B
C4	0.1	25	C	C	A	1608	B
C5	0.1	25	C	C	A	1608	B
C6	10	25	D	C	A		
C7	0.1	25	C	C	A	1608	B
C8	0.1	25	C	C	A	1608	B
C9	10	25	D	C	A		
C10	1	16	C	C	A	1608	B
C11	470p	50	C	C	A	1608	B
C12	470p	50	C	C	A	1608	B
C13	470p	50	C	C	A	1608	B
C14	0.01	50	C	C	A	1608	B
C15	0.1	25	C	C	A	1608	B
C16	18p	50	C	C	A	1608	CH
C17	22p	50	C	C	A	1608	CH

Diode

symbol	product name	mounting form	surface
D17	1SS355	C	A
D18	1SS355	C	A

LED

symbol	product name	mounting form	surface
LED1	SML-811WT(A)	C	A

IC

symbol	product name	mounting form	surface
IC1	M38235G6-105HP	C	A
IC2	NJM78L05UA	C	A
IC3	S-80942CNMC-G9CT2G	C	A

Coil

symbol	product name	mounting form	surface
L1	BLM18AG102SN1D	C	A
L2	BLM18AG102SN1D	C	A

Transistor

symbol	product name	mounting form	surface
Q1	2SC2412K	C	A
Q2	2SC2412K	C	A
Q3	No Mount	C	A

Resonators

symbol	product name	mounting form	surface
XT100	CFS2063276	H	A
XT1	CSTCR4M00G55-R0	C	A

Connector

symbol	product name	mounting form	surface
CN1	S4B-ZR-SM4A-TF	C	A

Buzzer

symbol	product name	mounting form	surface
BZ1	NO MOUNT	C	B

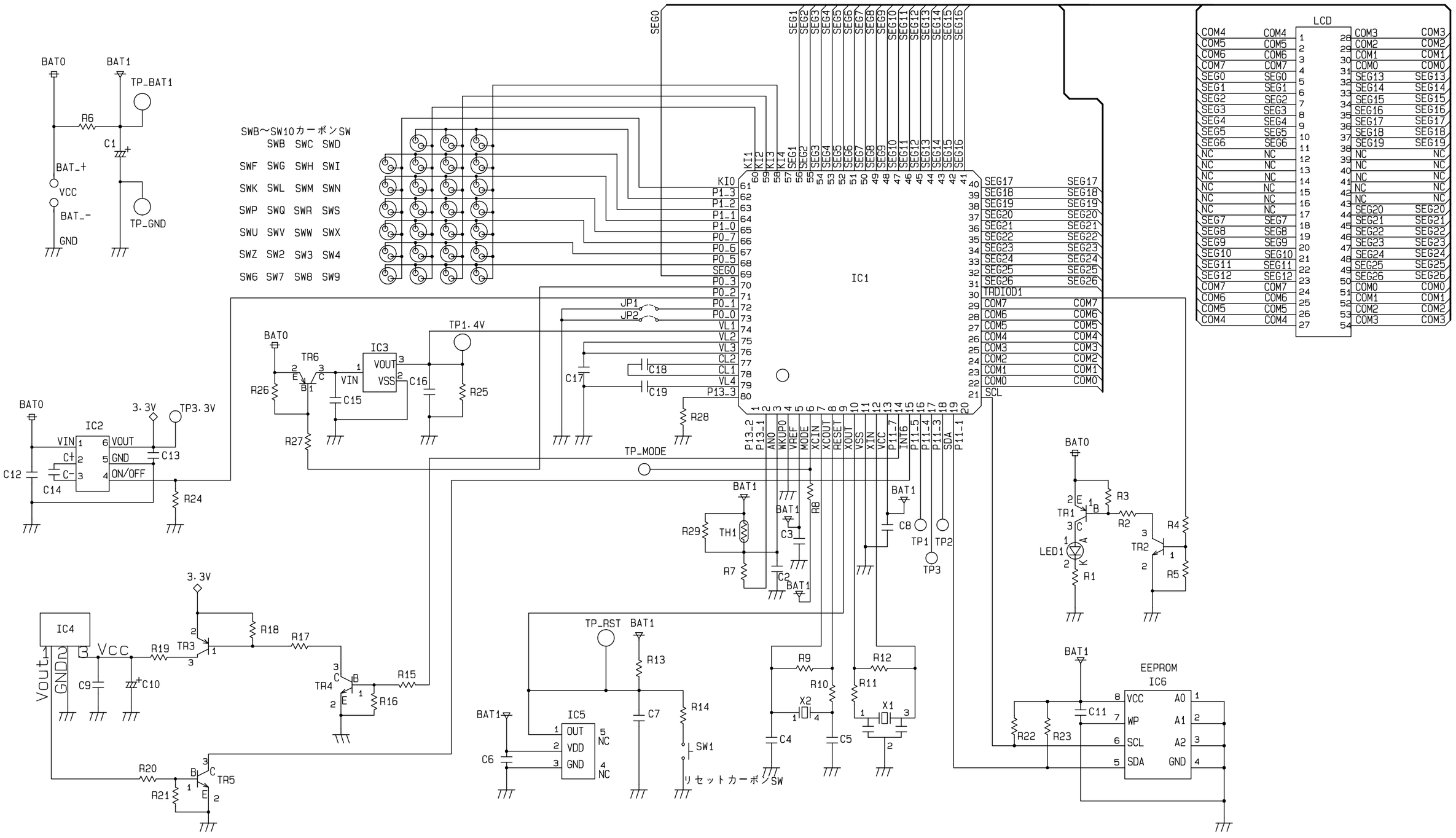
表1 キーマトリックス表

Table1. Key-matrix table

Output \ Input	P21	P22	P23	P24
P25	(自動風向) (Auto louver)	取消 Cancel	風速切換 Wind speed select	予約 Book
P26	切タイマー Off	入タイマー On	温度 ∧ Temperature up	温度 ∨ Temperature down
P27	運転/停止 Start/Stop	—	おやすみ Sleep	運転切換 Drive mode select

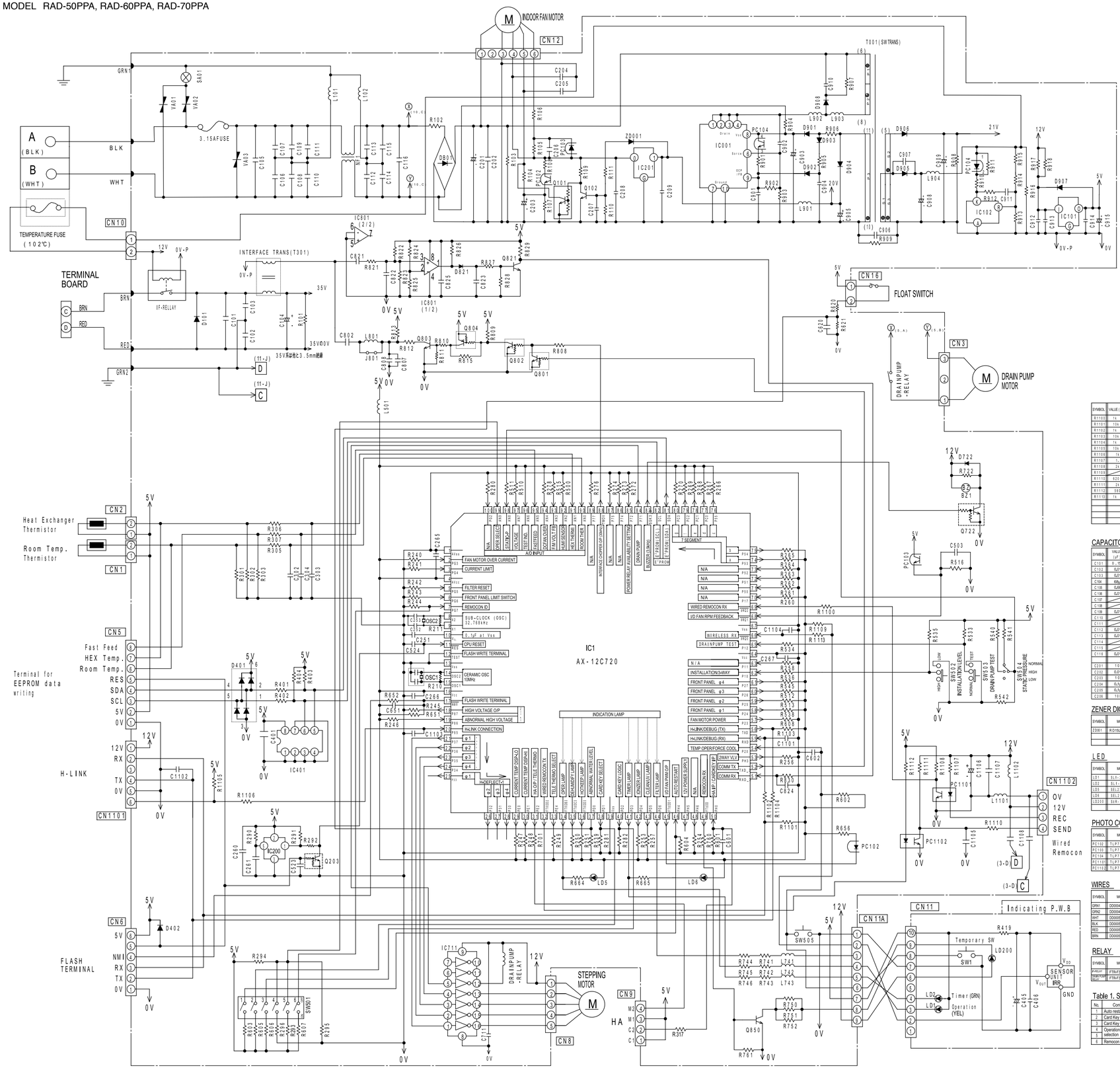
CIRCUIT DIAGRAM

Wireless Remote Controller



CIRCUIT DIAGRAM

MODEL RAD-50PPA, RAD-60PPA, RAD-70PPA



RESISTOR

SYMBOL	VALUE (Ω)	TOL	POWER (W)	FORM	MOUNT PCB	ASSY PARTS	REMARK
R101	22k	5%	1/6	A	M		
R102	2.2	5%	1	A	M		
R103	1M	5%	1/4	C	M		3216
R104	7.5k	5%	1/2	C	M		4532
R105	4.3k	5%	1/4	C	M		3216
R106	4.3k	5%	1/4	C	M		3216
R107	33k	5%	1/8	C	M		2125
R108	47k	5%	1/8	C	M		2125
R109	15k	5%	1/8	C	M		2125
R110	15k	5%	1/8	C	M		2125
R111	10k	5%	1/8	C	M		2125
R210	4R	5%	1/16	C	M		1608
R211	4R	5%	1/16	C	M		1608
R240	10k	5%	1/16	C	M		1608
R241	10k	5%	1/16	C	M		1608
R242	10k	5%	1/16	C	M		1608
R243	10k	5%	1/16	C	M		1608
R244	10k	5%	1/16	C	M		1608
R245	10k	5%	1/16	C	M		1608
R246	10k	5%	1/16	C	M		1608
R247	10k	5%	1/16	C	M		1608
R248	10k	5%	1/16	C	M		1608
R249	10k	5%	1/16	C	M		1608
R250	10k	5%	1/16	C	M		1608
R251	10k	5%	1/16	C	M		1608
R253	10k	5%	1/16	C	M		1608
R254	10k	5%	1/16	C	M		1608
R255	10k	5%	1/16	C	M		1608
R256	10k	5%	1/16	C	M		1608
R257	10k	5%	1/16	C	M		1608
R258	10k	5%	1/16	C	M		1608
R259	10k	5%	1/16	C	M		1608
R260	10k	5%	1/16	C	M		1608
R261	10k	5%	1/16	C	M		1608
R262	10k	5%	1/16	C	M		1608
R263	10k	5%	1/16	C	M		1608
R264	10k	5%	1/16	C	M		1608
R265	10k	5%	1/16	C	M		1608
R266	10k	5%	1/16	C	M		1608
R267	10k	5%	1/16	C	M		1608
R268	10k	5%	1/16	C	M		1608
R269	10k	5%	1/16	C	M		1608
R270	10k	5%	1/16	C	M		1608
R271	10k	5%	1/16	C	M		1608
R272	10k	5%	1/16	C	M		1608
R273	10k	5%	1/16	C	M		1608

SYMBOL	VALUE (Ω)	TOL	POWER (W)	FORM	MOUNT PCB	ASSY PARTS	REMARK
R274	10k	5%	1/16	C	M		1608
R275	10k	5%	1/16	C	M		1608
R276	10k	5%	1/16	C	M		1608
R280	10k	5%	1/16	C	M		1608
R281	10k	5%	1/16	C	M		1608
R282	10k	5%	1/16	C	M		1608
R290		5%	1/10	C	M		1608
R291	30k	5%	1/10	C	M		1608
R292	10k	5%	1/10	C	M		1608
R293	1k	5%	1/10	C	M		1608
R294	10k	5%	1/16	C	M		1608
R295	10k	5%	1/16	C	M		1608
R296	1k	5%	1/10	C	M		1608
R297	12.7k	5%	1/10	C	M		1608
R298	10k	5%	1/10	C	M		1608
R299	1k	5%	1/10	C	M		1608
R301	1k	5%	1/16	C	M		1608
R302	1k	5%	1/16	C	M		1608
R303	5.7k	5%	1/10	C	M		1608
R304	5.1k	5%	1/10	C	M		1608
R305	1k	5%	1/16	C	M		1608
R306	1k	5%	1/16	C	M		1608
R307	1k	5%	1/16	C	M		1608
R401	39Ω	5%	1/10	C	M		1608
R402	39Ω	5%	1/10	C	M		1608
R419	47	5%	1/8	C	M		2012
R500	10k	5%	1/16	C	M		1608
R510	10k	5%	1/16	C	M		1608
R511	**1k**	**5%**	**1/10**	**C**	**M**		**1608**
R512	**10k**	**5%**	**1/16**	**C**	**M**		**1608**
R513	**10k**	**5%**	**1/16**	**C**	**M**		**1608**
R515	10k	5%	1/16	C	M		1608
R516	10k	5%	1/8	C	M		2012
R533	10k	5%	1/10	C	M		1608
R534	1k	5%	1/10	C	M		1608
R535	10k	5%	1/10	C	M		1608

SYMBOL	VALUE (Ω)	TOL	POWER (W)	FORM	MOUNT PCB	ASSY PARTS	REMARK
R536	1k	5%	1/10	C	M		1608
R538	10k	5%	1/16	C	M		1608
R539	10k	5%	1/10	C	M		1608
R540	10k	5%	1/10	C	M		1608
R541	10k	5%	1/10	C	M		1608
R542	10k	5%	1/10	C	M		1608
R545	10k	5%	1/16	C	M		1608
R601	10k	5%	1/10	C	M		1608
R602	10k	5%	1/10	C	M		1608
R604	10k	5%	1/16	C	M		1608
R605	1k	5%	1/16	C	M		1608
R606	10k	5%	1/16	C	M		1608
R607	1k	5%	1/16	C	M		1608
R620	1k	5%	1/10	C	M		1608
R621	10k	5%	1/10	C	M		1608
R651	1k	5%	1/10	C	M		1608
R652	10k	5%	1/10	C	M		1608
R656	39Ω	5%	1/8	C	M		2125
R664	1k	5%	1/10	C	M		1608
R665	1k	5%	1/10	C	M		1608
R751	1k	5%	1/10	C	M		1608
R752	3.3k	5%	1/10	C	M		1608
R761	4.7k	5%	1/10	C	M		1608
R762	75	5%	1/2	C	M		4532
R763	75	5%	1/2	C	M		4532
R764	75	5%	1/2	C	M		4532

SYMBOL	VALUE (Ω)	TOL	POWER (W)	FORM	MOUNT PCB	ASSY PARTS	REMARK
R703	330	5%	1/10	C	M		1608
R761	10k	5%	1/10	C	M		1608
R809	5.6k	5%	1/16	C	M		1608
R810	10	5%	1/10	C	M		1608
R811	2k	5%	1/10	C	M		1608
R812	39	5%	1/8	C	M		3216
R813	39	5%	1/8	C	M		3216
R815	10k	5%	1/10	C	M		1608
R821	1k	5%	1/16	C	M		1608
R822	10k	5%	1/16	C	M		1608
R823	10k	1%	1/16	C	M		1608
R824	6.25k	1%	1/16	C	M		1608
R825	10k	1%	1/16	C	M		1608
R826	1k	5%	1/16	C	M		1608
R827	1k	5%	1/16	C	M		1608
R828	10k	5%	1/16	C	M		1608
R829	10k	5%	1/16	C	M		1608
R830	5.1k	5%	1/16	C	M		1608
R831	10k	5%	1/16	C	M		1608
R832	10k	5%	1/16	C	M		1608
R833	10k	5%	1/16	C	M		1608
R834	10k	5%	1/16	C	M		1608
R835	1k	5%	1/16	C	M		1608
R836	1k	5%	1/16	C	M		1608
R837	1k	5%	1/16	C	M		1608
R838	10k	5%	1/16	C	M		1608
R839	10k	5%	1/16	C	M		1608
R840	10k	5%	1/16	C	M		1608
R841	10k	5%	1/16	C	M		1608
R842	10k	5%	1/16	C	M		1608
R843	10k	5%	1/16	C	M		1608
R844	10k	5%	1/16	C	M		1608
R845	10k	5%	1/16	C	M		1608
R846	10k	5%	1/16	C	M		1608
R847	10k	5%	1/16	C	M		1608
R848	10k	5%	1/16	C	M		1608
R849	10k	5%	1/16	C	M		1608
R850	10k	5%	1/16	C	M		1608
R851	10k	5%	1/16	C	M		1608
R852	10k	5%	1/16	C	M		1608
R853	10k	5%	1/16	C	M		1608
R854	10k	5%	1/16	C	M		1608
R855	10k	5%	1/16	C	M		1608
R856	10k	5%	1/16	C	M		1608
R857	10k	5%	1/16	C	M		1608
R858	10k	5%	1/16	C	M		1608

SYMBOL	VALUE (Ω)	TOL	POWER (W)	FORM	MOUNT PCB	ASSY PARTS	REMARK
R901	33k	5%	1/4	C	M		3216
R902	680	5%	1/4	C	M		3216
R903	2.2	5%	1/2	A	M		
R904	470k	5%	1/2	A	M		
R905	2.2k	5%	1/4	C	M		3216
R906	10	5%	1/2	A	M		
R907	220k	5%	2	A	M		
R908	2k	5%	1/2	A	M		
R909				A	M		
R910	12k	5%	1/4	C	M		3216
R911	1	5%	1/10	C	M		1608
R912	33K	5%	1/8	C	M		2125
R913	33k	1%	1/8	C	M		2125
R914	10k	5%	1/10	C	M		1608
R915	680	5%	1/10	C	M		1608
R916				C	M		1608
R917	51	5%	1	A	M		
R918	51	5%	1	A	M		

TRANSISTOR

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
Q101	KRC402E	C	M		
Q102	2SC2412KR	C	M		
Q203	KRC402E	C	M		
Q722	KRC402E	C	M		
Q801	KRC402E	C	M		
Q802	KRC402E	C	M		
Q803	2SC1441E	C	M		
Q804	DTA114EETL	C	M		
Q821	KTC4075EGR	C	M		
Q850	2SD596	C	M		

DIODE

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
D101	DSM2MA2	C	M		
D401	WN1D31FU	C	M		
D402	RD5614U	C	M		
D722	1SS355	C	M		
D821	RD5414EU	C	M		
D901	ALG1Z-V1	C	M		
D902	ALG1Z-V1	C	M		
D903	ALG1Z-V1	C	M		
D904	ALG1Z-V1	C	M		
D905	RLZZ-V1	C	M		
D906	ALG1Z-V1	C	M		
D907	RD5414EU	C	M		
D908	ESG01V1	C	M		
DB01	D3SBA60	C	M		

CAPACITOR

SYMBOL	VALUE (μF)	VOLT (V)	TYPE	FORM	MOUNT PCB	ASSY PARTS	REMARK
C101	0.15μ	50	F	R	M		QYX
C102	0.01μ	AC250	D	R	M		
C103	0.01μ	AC250	D	R	M		
C104	68μ	50	D	R	M		LXZ
C105	0.68μ	AC250	F	R	M		
C106	0.01μ	AC250	D	R	M		
C107				R	M		
C108				R	M		
C109	0.01μ	AC250	D	R	M		
C110				R	M		
C111				R	M		
C112	0.01μ	AC250	D	R	M		
C113	0.01μ	AC250	D	R	M		
C114				R	M		
C115				R	M		
C116	0.01μ	AC250	D	R	M		
C201	100μ	450	D	R	M		GU
C202	0.01μ	1000	C	C	M		
C203	10μ	16	D	R	M		
C204	0.1μ	50	C	C	M		
C205	0.1μ	50	C	C	M		
C206	1000p	50	C	C	M		1608

SYMBOL	VALUE (μF)	VOLT (V)	TYPE	FORM	MOUNT PCB	ASSY PARTS	REMARK
C207	1200p	50	C	C	M		1608
C208	0.1μ	25	C	C	M		1608
C209	0.1μ	50	C	C	M		1608
C251	0.1μ	25	C	C	M		1608
C252	12p	50	C	C	M		1608
C253	15p	50	C	C	M		1608
C260	0.1μ	25	C	C	M		1608
C261	0.01μ	50	C	C	M		1608
C265	0.1μ	25	C	C	M		1608
C266	0.1μ	25	C	C	M		1608
C267	**0.1μ**	**25**	**C**	**C**	**M**		**1608**
C502	0.1μ	25	C	C	M		1608
C503	0.1μ	25	C	C	M		1608
C504	0.1μ	25	C	C	M		1608
C401	0.1μ	25	C	C	M		1608
C455	4.7μ	16	D	R	M		UWF
C406	0.1μ	25	C	C	M		
C503	1000p	50	C	C	M		1608
C523	0.1μ	25	C	C	M		1608
C524	0.1μ	25	C	C	M		1608
C601	0.1μ	25	C	C	M		1608
C602	0.1μ	25	C	C	M		1608
C620	0.1μ	25	C	C	M		1608
C651	0.1μ	25	C	C	M		1608
C711	0.1μ	25	C	C	M		1608
C602	0.22μ	50	D	R	M	QYX	
C697			C	C	M		1608
C698	0.1μ	25	C	C	M		1608

SYMBOL	VALUE (μF)	VOLT (V)	TYPE	FORM	MOUNT PCB	ASSY PARTS	REMARK
C821	0.01μ	50	D	R	M		QYX
C822	0.022μ	50	C	C	M		1608 B
C823	3.3-4.7μ	25	C	C	M		1608
C824	0.01μ	50	C	C	M		1608
C825	0.1μ	25	C	C	M		1608
C901	470μ	50	C	C	M		1608
C902	220μ	50	D	A	M		
C903	1.0μ	50	D	A	M		
C904	1500μ	50	C	C	M		1608
C905	68μ	50	D	R	M		LXZ
C906	2200μ	AC250	D	R	M		
C907	2200μ	1000	D	R	M		
C908	330μ	25	D	R	M		YXG
C909	330μ	50	D	R	M		LXZ
C910	2200μ	1000	D	R	M		
C911	0.1μ	16	C	C	M		1608
C912	1.0μ	25	D	R	M		UMR
C913	0.1μ	25	C	C	M		1608
C914	0.1μ	25	C	C	M		1608
C915	220μ	16	D	R	M		YXA
C1101	1000μ	35	C	C	M		1608
C1102	1000μ	35	C	R	M		
C1103	0.1μ	25	C	C	M		1608
C1104	1000μ	35	C	C	M		1608
C1105	1000μ	35	C	C	M		1608
C1106	4.7μ	25	D	R	M		UYR
C1107	0.1μ	25	C	C	M		1608
C1108	0.01μ	AC250	C	R	M		
C1109	0.01μ	AC250	C	R	M		

OSCILATOR

SYMBOL	MODEL NAME	FORM	ASSY PARTS	REMARK
OSC1	CSTLS10M0X2	R	M	
OSC2	CFS206J27E	C	M	

ZENER DIODE

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
ZD901	RD15GJ-T1	C	M		

LED

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
LD1	SLI-343T8F (YEL)	H	H		
LD2	SLI-343B8G (GRN)	H	H		
LD5	SEL2715K (YEL)	H	M		
LD6	SEL2715E (GRN)	H	M		
LD223	5XR-3457JF	H	H		

PHOTO COUPLER

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
PC102	TLP781-TPE	S	M		
PC103	TLP781-TPE	S	M		
PC104	TLP781-TPE	S	M		
PC1101	TLP781-TPE	S	M		
PC1102	TLP781-TPE	S	M		

WIRES

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
GRN1	D000049300	stranded	M		AWG20
GRN2	D000049300	stranded	M		AWG20
WHT	D000054770	stranded	M		AWG20
BLK	D000054770	stranded	M		AWG20
RED	D000054770	stranded	M		AWG20
BRN	D000054770	stranded	M		AWG20

RELAY

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
K-RELAY	FTR-F3J6V	H	M		
DEBOTTOM RELAY	FTR-F3J6Y	H	M		

IC

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
IC001	STRL472	S	M		
IC1	HD64F3010HVU	S	M		
IC101	KIA7805API	S	M		
IC110	KIA431A	S	M		
IC201	RN5VD42C	S	M		
IC301	KIA7815API	S	M		
IC431	S-24C01BAJI	S	M		
IC801	KDS5020AF	S	M		
IC851	KIA393A	S	M		

COIL

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
L101	FB-HF70BTL	H	M		
L151	FB-HF70BTL	H	M		
L301	EXCELSA35	H	M		
L551	EXCELSA35	H	M		
L741	CHIP JUMPER	C	M		1608
L742	CHIP JUMPER	C	M		1608
L743	CHIP JUMPER	C	M		1608
L851	LB251H-T01	C	M		SMT
L901	LEAD JUMPER	A	M		
L902	LEAD JUMPER	A	M		
L903	LEAD JUMPER	A	M		
L904	LEAD JUMPER	A	M		
L1101	EXCELSA35	H	M		
L1102	EXCELSA35	H	M		

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
NF1	SC-03-07J	H	M		
NF301	AZ-4187H-121K	H	M		
T001	RHNF8U08 (200V)	H	M		

Table 1. SW501 (explaination of detail function)

No.	Content	Switch condition/function			
1	Auto restart	OFF	Yes	ON	No
2	Card Key function	OFF	No	ON	Yes
3	Card Key input	OFF	Hi input	ON	Lo input
4	Operation mode selection	OFF	Normal	OFF	Heating only / Cooling only
5		OFF		ON	
6	Remocon ID	OFF	Factory	ON	Select

BUZZER

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
BZ1	PKM13EPY-T	H	M		

SWITCH

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
SW501	CSW-0603B	H	M		
SW502		H	M		
SW503	3SS01200	H	M		
SW504	3SS01800	H	M		
TEMP.SW	EVG1AA89K	H	M		
SW1	JW0200	H	H		

FUSE

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
FUSE	3.15A-FUSE	H	M		

IR RECEIVER

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
IRR	GP1UW218K	H	H		

SURGE PROTECTOR

SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
SA01	RA-102M-C6-Y	H	M		
VA01	410NR01D-302TB5	H	M		
VA02	410NR01D-302TB5	H	M		
VA03	410NR01D-302TB5	H	M		

CONNECTOR

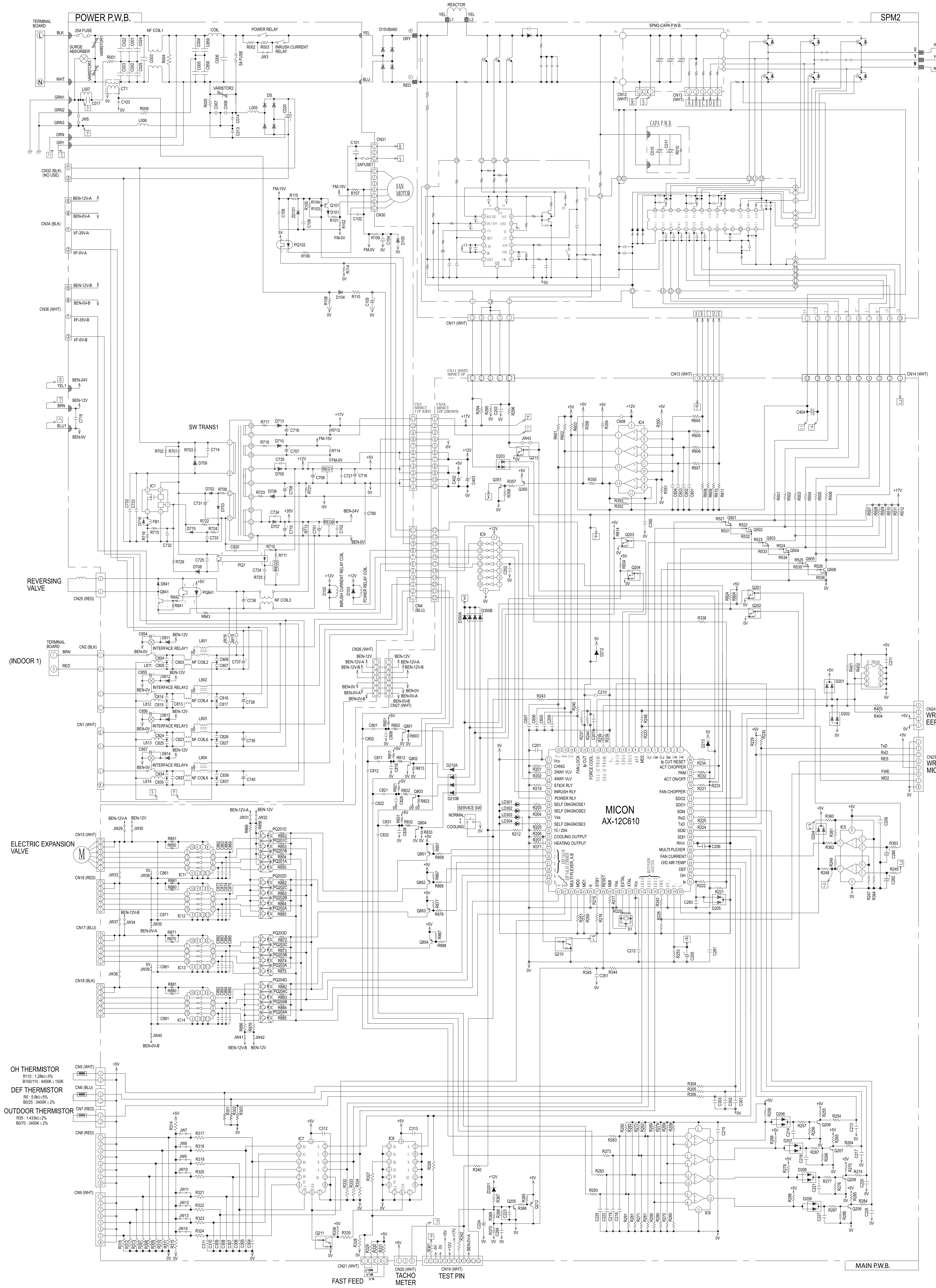
SYMBOL	MODEL NAME	FORM	MOUNT PCB	ASSY PARTS	REMARK
CN1	B02B-PH-K-K	H	M		
CN2	B02B-PH-K-E	H	M		
CN3	B3PS/HNBL	H	M		
CN5	B6B-ZR-SM3-TF	H	M		
CN6	B6B-ZR-SM3-TF	H	M		
CN8	B05B-PH-K-S	H	M		
CN9	B4B-XH-A-BK	H	M		
CN10	B2B-PHK-S	H	M		
CN11A	PH-POST-9P	H	M		
CN12	B9PE-VH-L	H	M		
CN16	B2B-XADK-1N	H	M		
CN1101	B6B-PASK-1	H	M		
CN1102	B4B-PASK-1	H	M		

NOTES:

1. TYPE OF CAPACITOR
   - F- FILM CAPACITOR
   - C- CERAMIC CAPACITOR
   - D- ELETROLYTIC CAPACITOR
2. MOUNTING TYPE
   - A- AXIAL
   - R- RADIAL
   - P- RADIAL(7.5mm PITCH)
   - H- HAND INSERT
   - C- SURFACE MOUNT(SMT)
3. MOUNTING PCB
   - M- MAIN BOARD
   - H- INDICATION BOARD

CIRCUIT DIAGRAM

MODEL RAC-50DPA, RAC-60DPA, RAC-70DPA

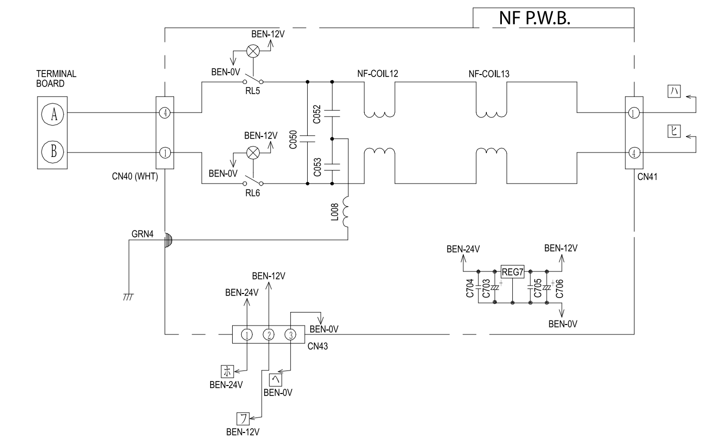


COMPRESSOR MOTOR

PCB SET
M : MAIN P.W.B.
P : POWER P.W.B.
C : CAPA P.W.B.
N : NF P.W.B.

Surface
A : Component Side
B : Solder side

Mounting Form
A : Axial insertion
R : Radial insertion
P : Radial insertion (7.5mm pitch)
H : Hand insertion
C : Chip surface mounting
S : In addition surface mounting



DIODE STACK

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
DS	D15XB60	H			P

TRANSISTOR

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
Q101	2SA673	R			P
Q201	RN1402	C	A		M
Q202	RN1402	C	A		M
Q203	RN1402	C	A		M
Q204	RN1402	C	B		M
Q205	2SC2462LC	C	A		M
Q206	2SC2462LC	C	A		M
Q207					M
Q208					M
Q209					M
Q210					M
Q211	RN1402	C	A		M
Q212	2SA1121SC	C	A		M
Q213					M
Q350	2SA1121SC	C	A		M
Q351	2SC2462LC	C	A		M
Q501	2SC2462LC	C	A		M
Q502	2SC2462LC	C	A		M
Q503	2SC2462LC	C	A		M
Q504	2SC2462LC	C	A		M
Q505	2SC2462LC	C	A		M
Q506	2SC2462LC	C	A		M
Q801	2SC2618RC	C	A		M
Q802					M
Q803					M
Q804					M
Q841	2SC1214CT	R			P
Q851	2SC1121SC	C	A		M
Q852					M
Q853					M
Q854					M

PHOTO COUPLER

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
PQ7	PS2501-1(K,L-rank)	H			P
PQ102	PS2501-1(K,L-rank)	H			P
PQ201A-D	PS2701-1(P-rank)	S	A		M
PQ202A-D					M
PQ203A-D					M
PQ204A-D					M
PQ841	PC817X(C,D-rank)	H			P

FUSE

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
2A FUSE	RRPN2038	H			P
5A FUSE	RRPN2586	H			P
25A FUSE	RRPN1220	H			P

OSCILLATOR

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
X1	CSTCV16.0MXJ03	C	A		M

MAIN P.W.B. JUMPER WIRE

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
JW7					M
JW8					M
JW9					M
JW10					M
JW11					M
JW12					M
JW13					M
JW14					M
JW29					M
JW30	JUMPER				M
JW31					M
JW32	JUMPER				M
JW33					M
JW34					M
JW35					M
JW36	JUMPER				M
JW37					M
JW38					M
JW39					M
JW40					M
JW41					M
JW42					M
JW43					M

POWER P.W.B. JUMPER WIRE

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
J1-J23	JUMPER	A			P
J25-J28	JUMPER	A			P
JW3	JUMPER	A			P
JW5					P
JW15	JUMPER				P
JW16					P

SWITCH

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
SERVICE SW	SKQMALE010	C	A		M

TRANS

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
SW-TRANS1	RRMF3529	H			P
L801	RRMF3636	H			P
L802					P
L803					P
L804					P

NF-COIL

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
NF COIL 1	RRMH3681	H			P
NF COIL 2	RRMH3573	H			P
NF COIL 3	RRMH3573	H			P
NF COIL 4					P
NF COIL 6					P
NF COIL 8					P
NF COIL 12	RRMH3901	H			N
NF COIL 13	HF2223VU-622Y1R0-01H	H			N
COIL	RRMH3442	H			P

INDUCTOR

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
L005	RRMH3728	H			P
L006	EXCELSA35V	A			P
L007	FBA04MA450	A			P
L008	JUMPER	A			N
L811	HF70BTL3.5X6R	A			P
L812					P
L813					P
L814					P
FB1	BL01RN1	A			P
CT1	S19-J299CT	H			P

ZENNER DIODE

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
ZD101					P
ZD201	RLZ6.8A	C	A		M

LED

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
LD301	LT1D67A	C	A	RED	M
LD302	LT1D67A	C	A	RED	M
LD303	LT1D67A	C	A	RED	M
LD304	LT1D67A	C	A	GREEN	M

CONNECTOR

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
CN1					P
CN2	B4P7-VH-BK	H		BLACK	P
CN3A	MINICT-22P	C	A	2ROWS	M
CN3	MINICT-11P	H		GRAY	P
CN4	MINICT-11P	H		BLUE	P
CN5	BM02B-XASS-TF	C	A	WHITE	M
CN6	BM02B-XAES-TF	C	A	BLUE	M
CN7	BM02B-XARS-TF	C	A	RED	M
CN8					M
CN9					M
CN11	MINICT-5P	C	A	WHITE	M
CN13	CT-5P	C	A	WHITE	M
CN14	MINICT-10P	C	A	WHITE	M
CN15	BM06B-XASS-TF	C	A	WHITE	M
CN16					M
CN17					M
CN18					M
CN19	B12B-ZR-SM3-TF	C	A	WHITE	M
CN20					M
CN21	B4B-ZR-SM3-TF	C	A	WHITE	M
CN23	CT-8P	C	A	WHITE	M
CN24	B4B-PH-SM3-TF	C	A	WHITE	M
CN25	B2P3-VH-R	H		RED	P
CN26	B07B-XASK-1	H		WHITE	P
CN27	BM07B-XASS-TF	C	A	WHITE	M
CN30	B5(7-23)B-XH-A	H		WHITE	P
CN31	B2P3-VH	H		WHITE	P
CN32					P
CN34					P
CN36					P
CN40	B2P4-VH	H	A	WHITE	N
CN41	B2P4-VH	H	A	RED	N
CN43	BM03B-XASS-TF	H	A	WHITE	N

RELAY's

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb set
IF RELAY 1	G5NB-1A	H			P
IF RELAY 2	G5NB-1A	H			P
IF RELAY 3	G5NB-1A	H			P
IF RELAY 4	G5NB-1A	H			P
RELAY 5	FTR-F3AA012E	H			N
RELAY 6	FTR-F3AA012E	H			N
CURRENT RELAY	FTR-F3AA012E	H			P
POWER RELAY	G4A-1A-PE	H			P

SURGE ARRESTER

Symbol	Part Name	Mounting Form	Surface	Remark	Pcb set
VARISTOR1	450NR-12D	P			P
VARISTOR2	450NR-12D	P			P
VARISTOR3	450NR-12D	P			P
SURGE ABSOR	DSA-102MA-05F25	H			P

RESISTOR

Symbol	Resistance (Ω)	Tolerance	Power (W)	Mounting Form	Surface	Remark	Pcb set
R001	JUMPER			A			P
R002	100	5%	10	H			P
R003							P
R004	470k	5%	1/2	A		RCR	P
R005	2.2	5%	5	H			P
R009	JUMPER						P
R010	470k	5%	1/2	A		RCR	C
R101	3.6k	1%	1/6	A			P
R102	3k	1%	1/6	A			P
R103	30k	5%	1/6	A			P
R104	3.9k	5%	1/6	A			P
R105	7.5k	5%	1/6	A			P
R106	2.4k	5%	1/6	A			P
R107	0.24	1%	2	P			P
R108	1k	1%	1/6	A			P
R109	510	5%	1/6	A			P
R110	1.69k	1%	1/6	A			P
R114	1k	5%	1/6	A			P
R115	JUMPER			A			P
R201	10k	5%	1/16	C	A	1608	M
R202	10k	5%	1/16	C	A	1608	M
R203	2k	5%	1/16	C	A	1608	M
R204	2k	5%	1/16	C	A	1608	M
R205	2k	5%	1/16	C	A	1608	M
R206	10k	5%	1/16	C	A	1608	M
R207	10k	5%	1/16	C	A	1608	M
R212	2k	5%	1/16	C	A	1608	M
R215	10k	5%	1/16	C	A	1608	M
R216	10k	5%	1/16	C	A	1608	M
R217	10k	5%	1/16	C	A	1608	M
R219	10k	5%	1/16	C	A	1608	M
R220	1M	5%	1/16	C	A	1608	M
R221	10k	1%	1/16	C	A	1608	M
R222	510	5%	1/16	C	A	1608	M
R223	100	5%	1/16	C	A	1608	M
R224	100	5%	1/16	C	A	1608	M
R225	100	5%	1/16	C	A	1608	M
R228	100	5%	1/16	C	A	1608	M
R229	10k	5%	1/16	C	A	1608	M
R230	10k	5%	1/16	C	A	1608	M
R231	10k	5%	1/16	C	A	1608	M
R232	10k	5%	1/16	C	A	1608	M
R233	10k	5%	1/16	C	A	1608	M
R234	10k	5%	1/16	C	A	1608	M
R237	5.1k	5%	1/16	C	A	1608	M
R238	100	5%	1/16	C	A	1608	M
R239	100	5%	1/16	C	A	1608	M
R240	1k	5%	1/16	C	A	1608	M
R243	100	5%	1/16	C	A	1608	M
R244	2k	5%	1/16	C	A	1608	M
R245	5.1k	5%	1/16	C	A	1608	M
R246	10k	5%	1/16	C	A	1608	M
R247	1.43k	1%	1/16	C	A	1608	M
R248	1k	5%	1/16	C	A	1608	M
R249	20k	1%	1/16	C	A	1608	M
R250	10k	5%	1/16	C	A	1608	M
R251	10k	5%	1/16	C	A	1608	M
R253	3.32k	1%	1/16	C	A	1608	M
R254	100	5%	1/16	C	A	1608	M
R255	2k	5%	1/16	C	A	1608	M
R256	10k	5%	1/16	C	A	1608	M
R257	3k	5%	1/16	C	A	1608	M
R258	1k	5%	1/16	C	A	1608	M
R259	8.25k	1%	1/16	C	A	1608	M
R260	10k	1%	1/16	C	A	1608	M
R261	10k	1%	1/16	C	A	1608	M
R262	10k	1%	1/16	C	A	1608	M
R263	470	5%	1/16	C	A	1608	M
R264	100	5%	1/16	C	A	1608	M
R265	2k	5%	1/16	C	A	1608	M
R266							M
R267							M
R268							M
R269							M
R270							M
R271							M
R272							M
R273							M
R274	100	5%	1/16	C	A	1608	M
R275	2k	5%	1/16	C	A	1608	M
R276							M
R277							M
R278							M
R279							M
R280							M
R281							M
R282							M
R283							M
R284	100	5%	1/16	C	B	1608	M
R285	2k	5%	1/16	C	B	1608	M
R286							M
R287							M
R288							M
R289							M
R290							M
R291							M
R292							M
R293							M
R294	18k	5%	1/16	C	A	1608	M
R295	910	1%	1/16	C	A	1608	M
R296							M
R301	3.74k	1%	1/16	C	A	1608	M
R302	3.01k	1%	1/16	C	A	1608	M
R303	3.01k	1%	1/16	C	A	1608	M
R304	100	5%	1/16	C	A	1608	M
R305	100	5%	1/16	C	A	1608	M
R306	100	5%	1/16	C	A	1608	M
R307							M
R308							M
R309							M
R310							M
R311							M
R312							M
R313							M
R314							M
R315							M
R316							M
R317							M
R318							M
R319							M
R320							M
R321							M
R322							M
R323							M
R324							M
R326	1k	5%	1/16	C	A	1608	M
R327							M
R328	2.7k	5%	1/16	C	A	1608	M
R329	470	5%	1/16	C	A	1608	M
R330	1.6k	5%	1/16	C	A	1608	M
R331	4.3k	5%	1/16	C	A	1608	M
R332	10k	5%	1/16	C	A	1608	M
R333	10k	5%	1/16	C	A	1608	M
R334	10k	5%	1/16	C	A	1608	M
R335							M
R336							M
R338	0	5%	1/16	C	A	1608	M
R340	100	5%	1/16	C	A	1608	M
R341	100	5%	1/16	C	A	1608	M
R342	100	5%	1/16	C	A	1608	M
R343	10k	5%	1/16	C	A	1608	M
R344	100	5%	1/16	C	A	1608	M
R345	5.1k	5%	1/16	C	A	1608	M
R350	120k	1%	1/16	C	A	1608	M
R351	120k	1%	1/16	C	A	1608	M
R352	120k	1%	1/16	C	A	1608	M
R353	120k	1%	1/16	C	A	1608	M
R354	4.3k	1%	1/16	C	A	1608	M
R355	4.3k	5%	1/16	C	A	1608	M
R356	10k	5%	1/16	C	A	1608	M
R357	2k	5%	1/16	C	A	1608	M
R358	3k	5%	1/16	C	A	1608	M
R360							M
R361	6.98k	1%	1/16	C	A	1608	M
R362	2k	5%	1/16	C	A	1608	M
R363	1k	5%	1/16	C	A	1608	M

RESISTOR

Symbol	Resistance (Ω)	Tolerance	Power (W)	Mounting Form	Surface	Remark	Pcb set
R364	1k	1%	1/16	C	A	1608	M
R365	10k	5%	1/16	C	A	1608	M
R366	4.7k	5%	1/16	C	A	1608	M
R367	10k	5%	1/16	C	A	1608	M
R368	1.6k	5%	1/16	C	A	1608	M
R369	27k	5%	1/16	C	A	1608	M
R370	5.1k	5%	1/16	C	A	1608	M
R371	10k	5%	1/16	C	A	1608	M
R401	5.1k	5%	1/16	C	A	1608	M
R402	5.1k	5%	1/16	C	A	1608	M
R403	390	5%	1/16	C	A	1608	M
R404	390	5%	1/16	C	A	1608	M
R501	1k	5%	1/16	C	A	1608	M
R502	1k	5%	1/16	C	A	1608	M
R503	1k	5%	1/16	C	A	1608	M
R504	1k	5%	1/16	C	A	1608	M
R505	1k	5%	1/16	C	A	1608	M
R506	1k	5%	1/16	C	A	1608	M
R507	5.1k	5%	1/8	C	A	3216	M
R508	5.1k	5%	1/8	C	A	3216	M
R509	5.1k	5%	1/8	C	A	3216	M
R510	5.1k	5%	1/8	C	A	3216	M
R511	5.1k	5%	1/8	C	A	3216	M
R512	5.1k	5%	1/8	C	A	3216	M
R521	10k	5%	1/16	C	A	1608	M
R522	10k	5%	1/16	C	A	1608	M
R523	10k	5%	1/16	C	A	1608	M
R524	10k	5%	1/16	C	A	1608	M
R525	10k	5%	1/16	C	A	1608	M
R526	10k	5%	1/16	C	A	1608	M
R531	5.1k	5%	1/16	C	A	1608	M
R532	5.1k	5%	1/16	C	A	1608	M
R533	5.1k	5%	1/16	C	A	1608	M
R534	5.1k	5%	1/16	C	A	1608	M
R535	5.1k	5%	1/16	C	A	1608	M
R536	5.1k	5%	1/16	C	A	1608	M
R601	2k	5%	1/16	C	A	1608	M
R602	2k	5%	1/16	C	A	1608	M
R603	2k	5%	1/16	C	A	1608	M
R604	100	5%	1/16	C	A	1608	M
R605	100	5%	1/16	C	A	1608	M
R606	100	5%	1/16	C	A	1608	M
R607	100	5%	1/16	C	A	1608	M
R608	4.02k	1%	1/16	C	A	1608	M
R609	4.02k	1%	1/16	C	A	1608	M
R610	4.02k	1%	1/16	C	A	1608	M
R611	4.02k	1%	1/16	C	A	1608	M
R701	1M	5%	1/2	A		RCR	P
R702	1M	5%	1/2	A		RCR	P
R703	100k	5%	2	P		MOS	P
R708	10	5%	1/4	A			P
R710	1.8k	5%	1/4	A			P
R711	75	5%	1/6	A			P
R712	3.3k	5%	1/4	A			P
R713	8.2k	5%	1	P		MOS	P
R714	3.3k	5%	1/4	A			P
R715	680	5%	1/4	A			P
R716	0.56	5%	1	P		MOSX	P
R717	JUMPER			A			P
R718	8.2	5%	1/4	A			P
R719	8.2k	5%	1	P		MOS	S
R720	8.2k	5%	1	P		MOS	S
R721	10k	5%	1/6	A			P
R722	2.7k	5%	1/4	A			P
R723	33	5%	1/6	A			P
R724	2.7k	5%	1/4	A			P
R725	JUMPER			A			P
R726	3.3k	5%	1/4	A			P
R801	39	5%	1/4	C	A	3225	M
R802	39	5%	1/4	C	A	3225	M
R803	3k	5%	1/16	C	A	1608	M
R804	3k	5%	1/16	C	A	1608	M
R811							M
R812							M
R813							M
R814							M
R821							M
R822							M
R823							M
R824							M
R831							M
R832							M
R833							M
R834							M
R841	10k	5%	1/6	A			P
R842	7.5k	5%	1/2	A			P
R843	620	5%	1/6	A			P
R850	200	5%	1/10	C	A	2125	M
R851	200	5%	1/10	C	A	2125	M
R852	510	5%	1/16	C	A	1608	M
R853	510	5%	1/16	C	A	1608	M
R854	510	5%	1/16	C	A	1608	M
R855	510	5%	1/16	C	A	1608	M
R856	1k	5%	1/10	C	A	2125	M
R857	10k	5%	1/16	C	A	1608	M
R858	3k	5%	1/16	C	A	1608	M
R860							M
R861							M
R862							M
R863							M
R864							M
R865							M
R866							M
R867	10k	5%	1/16	C	A	1608	M
R868	3k	5%	1/16	C	A	1608	M
R870							M
R871							M
R872							M
R873							M
R874							M
R875							M
R876							M
R877	10k	5%	1/16	C	A	1608	M
R878	3k	5%	1/16	C	A	1608	M
R880							M
R881							M
R882							M
R883							M
R884							M
R885							M
R886							M
R887	10k	5%	1/16	C	B	1608	M
R888	3k	5%	1/16	C	B	1608	M

CAPACITOR

Symbol	Capacitance (μF)	Voltage (V)	Type	Mounting Form	Surface	Remark	Temp. Char.	Pcb set
C001	0.01	AC250	C	P		STANDARD PART	F	P
C002	0.01	AC250	C	P		STANDARD PART	F	P
C003	0.68	630	F	H		ECQU		P
C004	0.001	AC250	C	P		STANDARD PART	F	P
C005	0.01	AC250	C	P		STANDARD PART	F	P
C006	3.3	AC300	F	H		VEA		P
C007	0.01	AC250	C	P		STANDARD PART	F	P
C008	0.01	AC250	C	P		STANDARD PART	F	P
C010	400	450	D	H				C
C011	400	450	D	H				C
C013	0.01	AC250	C	P		STANDARD PART	F	P
C014	0.01	AC250	C	P		STANDARD PART	F	P
C017	0.0022	AC250	C	P		STANDARD PART	F	P
C020	270	450	D	H		SMH		P
C022	0.01	AC250	C	P		STANDARD PART	F	P
C023	0.01	AC250	C	P		STANDARD PART	F	P
C024	0.01	AC250	C	P		STANDARD PART	F	P
C025	0.01	AC250	C	P		STANDARD PART	F	P
C050	0.47	AC275	F	H		STANDARD PART		N
C052	0.01	AC250	C	P		STANDARD PART	F	N
C053	0.01	AC250	C	P		STANDARD PART	F	N
C101	0.082	630	F	H		QXJ		P
C102								P
C103	0.1	50	C	R			F	P
C104	1000p	50	C	R				P
C105	100	10	D	R				P
C106								P
C109	0.1	50	C	R			F	P
C201	0.1	25	C	C	A	1608	F	M
C202	2200p	25	C	C	A	1608	B	M
C203	2200p	25	C	C	A	1608	B	M
C205	0.1	50	D	C	A	WX		M
C206	0.1	25	C	C	A	1608	F	M
C207	0.047	50	C	C	A	1608	F	M
C208	0.1	25	C	C	A	1608	F	M
C209	0.1	25	C	C	A	1608	F	M
C210	0.047	50	C	C	A	1608	F	M
C211	0.1	25	C	C	A	1608	F	M
C212	0.1	25	C	C	A	1608	F	M
C213	0.047	50	C	C	A	1608	F	M
C214	0.068	16	C	C	A	1608	B	M
C215	0.1	25	C	C	A	1608	F	M
C216	4700p	50	C	C	A	1608	B	M
C217								M
C218								M
C219								M
C220								M
C221								M
C222								M
C223	0.1	25	C	C	A	1608	F	M
C224	10	16	D	C	A	WX		M
C225								M
C226								M
C227								M
C280	2.2	50	D	C	A	WX		M
C281	0.01	50	C	C	A	1608	R	M
C282	22	6.3	D	C	A	WX		M
C283	0.1	25	C	C	A	1608	F	M
C284	0.1	25	C	C	A	1608	F	M
C301	0.1	25	C	C	A	1608	F	M
C302	0.1	25	C	C	A	1608	F	M
C303	0.1	25	C	C	A	1608	F	M
C304								M
C305								M
C306								M
C307								M
C308								M
C309								M
C310								M
C311								M
C312								M
C313								M
C350	150p	50	C	C	A	1608	CH	M
C351	0.047	50	C	C	A	1608	F	M
C402	100	10	D	C	A	UR		M
C403	100	25	D	C	A			M
C404	33	25	D	C	A	WX		M
C601	680p	50	C	C	A	2125	CH	M
C602	680p	50	C	C	A	2125	CH	M
C603	680p	50	C	C	A	2125	CH	M
C604	680p	50	C	C	A	2125	CH	M
C605	1000p	50	C	C	A	1608	B	M
C606	1000p	50	C	C	A	1608	B	M
C607	1000p	50	C	C	A	1608	B	M
C608	0.1	25	C	C	A	1608	F	M
C701	330	50	D	H		LXV		P
C702	0.1	50	C	R			F	P
C703	330	50	D	H		LXV		N
C704	0.1	50	C	R			F	N
C705	0.1	50	C	R			F	N
C706	330	25	D	H		PF		N
C707	330	25	D	H		PF		P
C708	330	25	D	H		PF		P
C709	180	10	D	R		PF		P
C710	330	50	D	H		LXV		P
C714	0.01	1K	C	P			E	P
C716	330	10	D	R		PF		P
C718	220	25	D	R		PF		P
C719	0.1	50	C	R			F	P
C721	0.1	50	C	R			F	P
C722								P
C723	470p	2K	C	P			R	P
C724	0.1	50	C	R			F	P
C725								P
C731	330	25	D	H		PF		P
C732	470p	50	C	R				P
C733	1000p	50	C	R				P
C734	1000p	AC250	C	P			E	P
C735	1000p	50	C	R				P
C736	68	50	D	R		PF		P
C737	68	50	D	R		PF		P
C738								P
C739								P
C740								P
C780	470p	AC250	C	P			B	P
C801	0.15	50	F	C	A	6041		M
C802	0.022	16	F	C	A	3216		M
C803	0.15	50	F	R				P
C804	0.01	AC250	C	P		STANDARD PART	F	P

CAPACITOR

Symbol	Capacitance (μF)	Voltage (V)	Type	Mounting Form	Surface	Remark	Temp. Char.	Pcb set
C805	0.01	AC250	C	P		STANDARD PART	F	P
C806	0.01	AC250	C	P			F	P
C807	0.01	AC250	C	P			F	P
C808	0.1	25	C	C	A	1608	F	M
C811								M
C812								M
C813								P
C814								P
C815								P
C816								P
C817								P
C818								M
C820	470p	AC250	C	P			B	P
C821								M
C822								M
C823								P
C824								P
C825								P
C826								P
C827								P
C828								M
C831								M
C832								M
C833	0.15	50	F	R				P
C834	0.01	AC250	C	P		STANDARD PART	F	P
C835	0.01	AC250	C	P		STANDARD PART	F	P
C836	0.01	AC250	C	P			F	P
C837	0.01	AC250	C	P			F	P
C838								M
C854	100	25	D	R				P
C855								P
C856								P
C857								P
C858	0.001	AC250	C	P		STANDARD PART	F	P
C859	0.01	AC250	C	P		STANDARD PART	F	P
C861	0.1	25	C	C	A	1608	F	M
C862	0.01	50	C	C	A	1608	B	M
C863	0.01	50	C	C	A	1608	B	M
C864	0.01	50	C	C	A	1608	B	M
C865	0.01	50	C	C	A	1608	B	M
C871								M
C872								M
C873								M
C874								M
C875								M
C881								M
C882								M
C883								M
C884								M
C885								M
C891								M
C892								M
C893								M
C894								M
C895								M

DIODE

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb Set
D101	1GH46	A			P
D102	1S2076A	A			P
D103	1S2076A	A			P
D104	1SS120	A			P
D105	1SS120	A			P
D201	DAN202K	C	A		M
D202	DAN202K	C	A		M
D203	DAN202K	C	A		M
D204	DAN202K	C	A		M
D205	DAN202K	C	A		M
D206	DAN202K	C	A		M
D207					M
D208					M
D209					M
D210A	1SS355	C	A		M
D210B					M
D212	1SS355	C	A		M
D213	1SS355	C	A		M
D350A	1SS355	C	A		M
D350B					M
D702	1GH46	A			P
D703	1SS120	A			P
D705	RN2Z	H			P
D706	AK04	A			P
D707	RN3Z	H			P
D708	JUMPER	A			P
D709	RU1P	A			P
D710	1GH46	A			P
D713	1GH46	A			P
D715	1SS120	A			P
D716	1S2473	A			P
D811	1SS120	A			P
D812	1SS120	A			P
D813	1SS120	A			P
D814	1SS120	A			P
D841	1SS120	A			P

IC's

Symbol	Product Name	Mounting Form	Surface	Remark	Pcb Set
MICON	HD6433039	Q	A		M
EEPROM	S24C32CI-J	S	A		M
IC1	STR-F6523	H			P
IC4	NJM2901M-TE1	S	A		M
IC5	NJM2904M-TE3	S	A		M
IC6	NJM2901M-TE1	S	A		M
IC7					M
IC8					M
IC9	ULN2003ANS	S	A		M
IC11	M54532FP	S	A		M
IC12					M
IC13					M
IC14					M
REG1	MC7805CT	H			P
REG2	SE012N	H			P
REG6	TA7824S	H			P
REG7	MC7812CT	H			N

BLOCK DIAGRAM

MODEL RAD-50PPA/RAC-50DPA
RAD-60PPA/RAC-60DPA
RAD-70PPA/RAC-70DPA

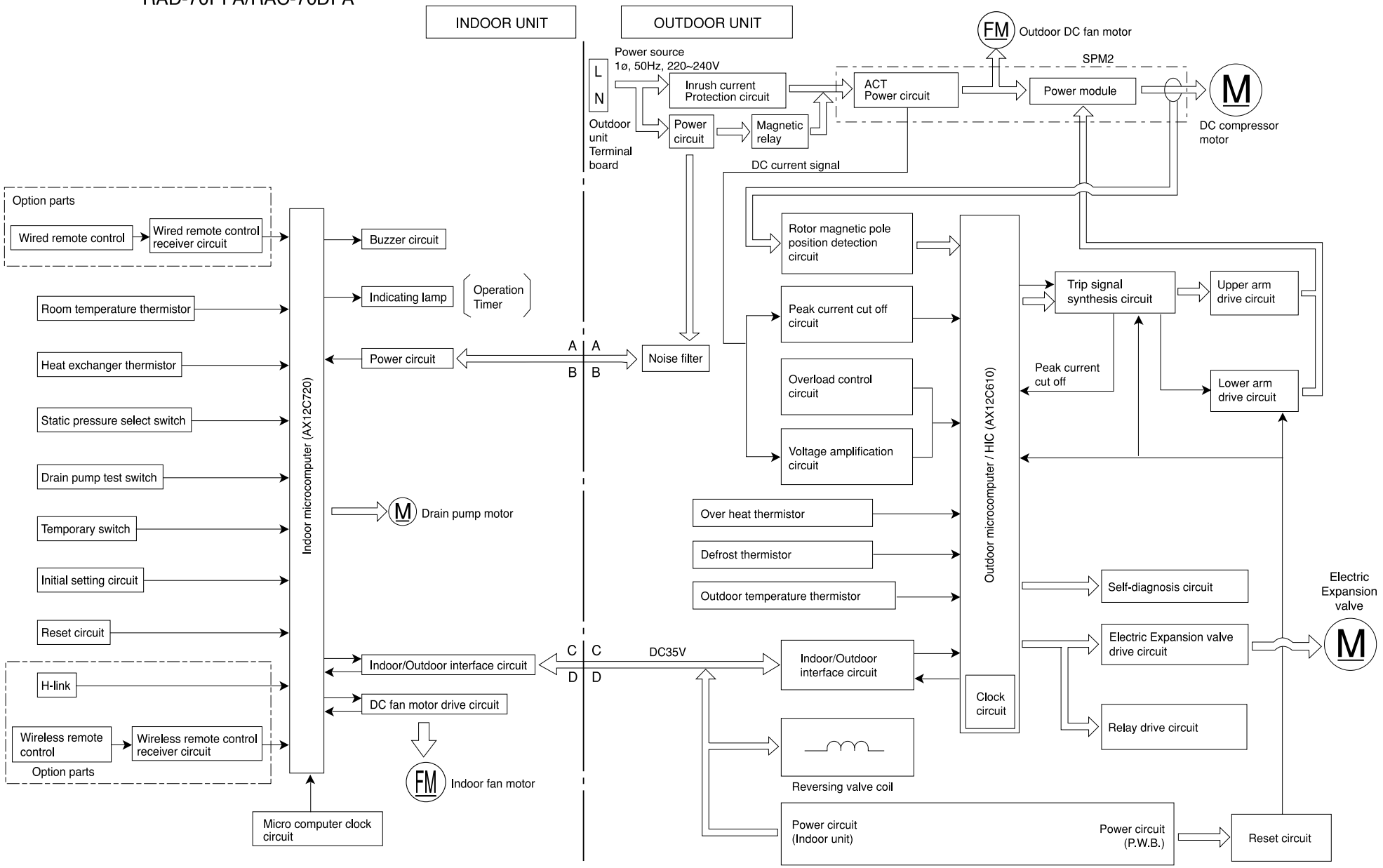
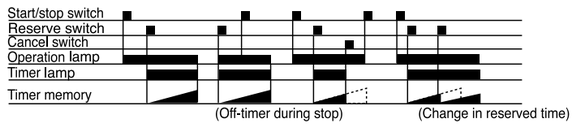
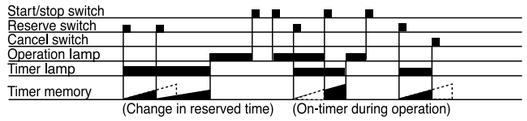
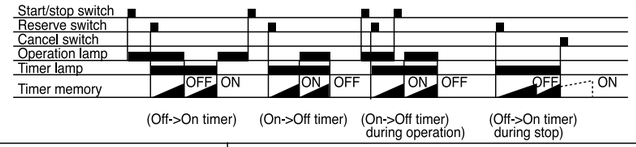
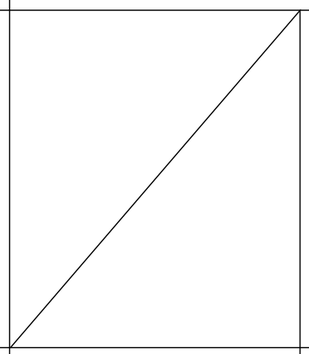
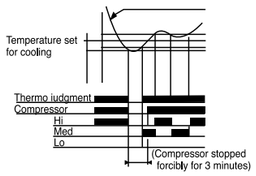
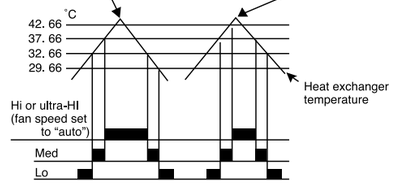
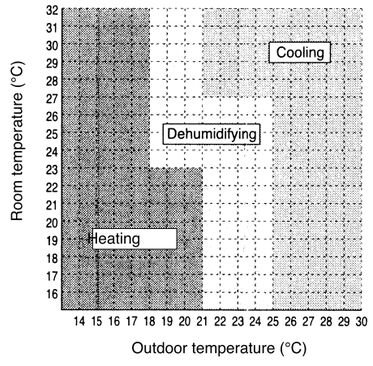


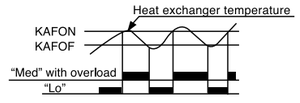
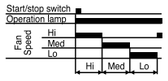
Table 1 Mode data file

	RAD-50PPA	RAD-60PPA	RAD-70PPA
LABEL NAME	**VALUE**		
WMAX	5000 min^{-1}	5500 min^{-1}	5800 min^{-1}
WMAX2	5000 min^{-1}	5500 min^{-1}	5800 min^{-1}
WSTD	3950 min^{-1}	5100 min^{-1}	5350 min^{-1}
CMAX	4500 min^{-1}	5000 min^{-1}	5600 min^{-1}
CSTD	3550 min^{-1}	5100 min^{-1}	5550 min^{-1}
WMIN	1500 min^{-1}	1500 min^{-1}	1500 min^{-1}
CMIN	1600 min^{-1}	1600 min^{-1}	1600 min^{-1}
STARTMC	60 Seconds	60 Seconds	60 Seconds
DWNRATEW	80%	80%	80%
DWNRATEC	80%	80%	80%
SHIFTW	2.0°C	2.0°C	2.0°C
SHIFTC	1.0°C	1.0°C	1.0°C
CLMXTP	30.0°C	30.0°C	30.0°C
YNEOF	25.0°C	25.0°C	25.0°C
TEION	0.0°C	0.0°C	0.0°C
TEIOF	9.0°C	9.0°C	9.0°C
SFTDSW	2.0°C	2.0°C	2.0°C
DFTIM_OTP0	60 Minutes	60 Minutes	60 Minutes
DFTIM2_OTP10	60 Minutes	60 Minutes	60 Minutes

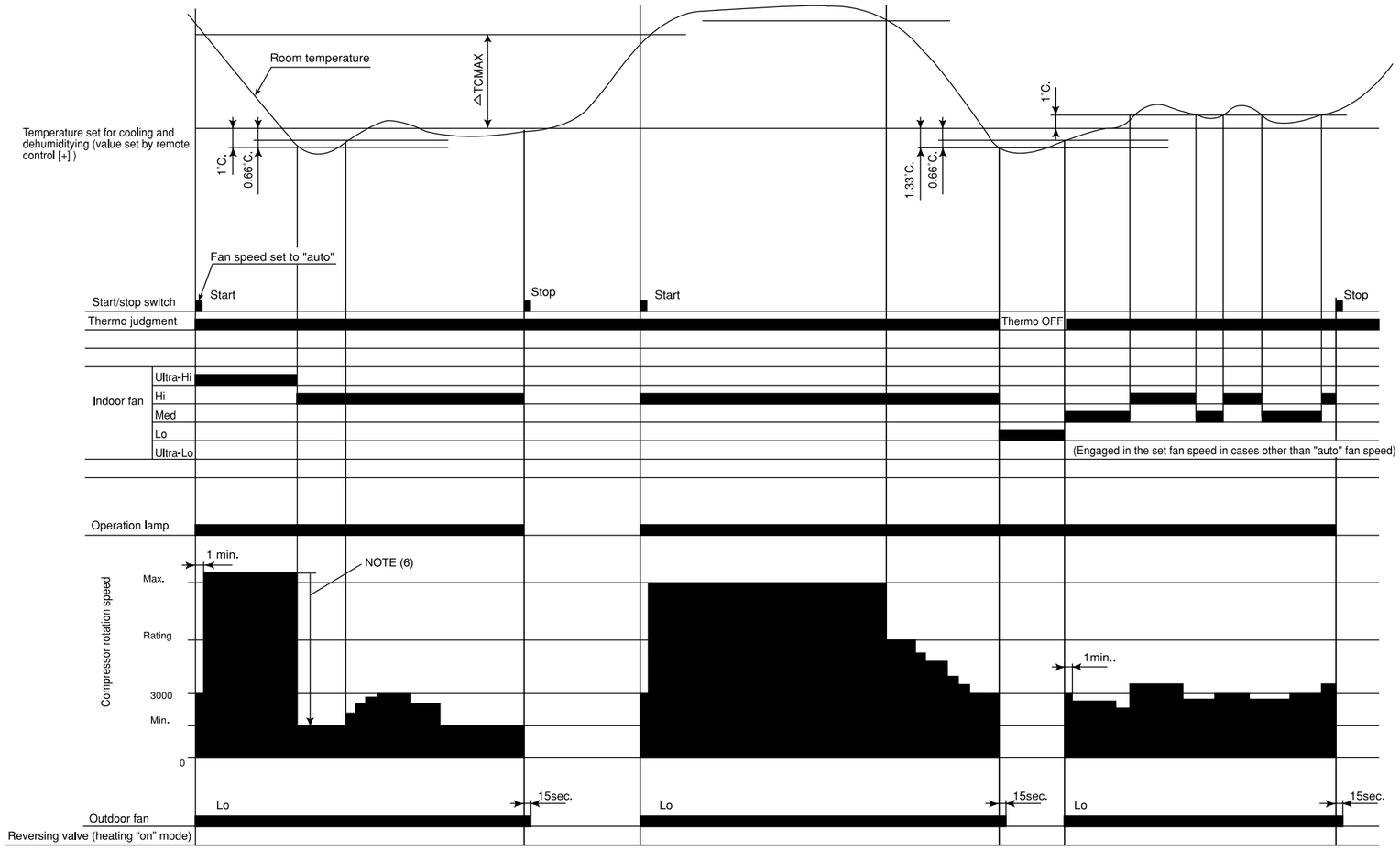
BASIC MODE

<table>
<tr><th colspan="2">Operation mode</th><th>Fan</th><th>Cooling</th><th>Dehumidifying (dehumidifying operation by the function select button only, not including that engaged by the dehumidify button)</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="3">Timer functions</td><td>Off-timer</td><td colspan="5"> 
</td></tr>
<tr><td>On-timer</td><td colspan="5"> 
</td></tr>
<tr><td>Off -> On
On -> Off 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” or “Lo” 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>Changes between “Lo” and “Med” depending on the room temperature.
<table>
<tr><th>Temperature division</th><th>Fan speed</th></tr>
<tr><td>Division 1</td><td>Lo</td></tr>
<tr><td>Division 2</td><td>Lo</td></tr>
<tr><td>Division 3</td><td>Med</td></tr>
<tr><td>Division 4</td><td>Med</td></tr>
</table>
1. The indoor fan also stops when the compressor is in stop status.</td><td>Set to “ultra-Lo”, “Silent”, “Lo”, “Med”, “Hi”, “ultra-Hi” or “stop” depending on the room temperature, time and heat exchanger temperature. Set to “stop” if the heat exchanger temperature is 18°C in the “ultra-Lo” mode other than during preheating (cooling is recovered at 20°C).
When the compressor is running at maximum speed during hot dash or when recovered from defrosting.
In modes other than left
 
</td><td>Judging by room temperature and outdoor temperature.
• Outdoor temperature ≧ 25°C or 21°C ≦ outdoor temperature < 25°C, at room temperature > 27°C, restricted to cooling.
• Outdoor temperature < 18°C or 18°C ≦ outdoor temperature < 21°C, at room temperature ≦ 23°C, restricted to heating.
• 21°C ≦ outdoor temperature < 25°C, at room temperature ≦ 27°C or 18°C ≦ outdoor temperature < 21°C, at room temperature > 23°C, restricted to dehumidifying.
 

Below setting temperature can be corrected by remote controller ± 3°C.
27°C : Cooling
23°C : Heating
Current room temperature: Dehumidifying
(25°C < room temperature < 27°C)</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>Set to “Hi” in modes other than when the compressor stops.</td><td>Set to “ultra-Lo”, “Silent”,“Lo”, “Med”, “Hi”, “ultra-Hi” or “stop” depending on the room temperature, and time. Set to “stop” if the heat exchanger temperature is 18°C in the “ultra-Lo” mode except during preheating (cooling is recovered at 20°C).
Set to “ultra-Hi” when the compressor is running at maximum speed during hot dash or when recovered from defrosting.</td></tr>
<tr><td>Med</td><td>Operates at “Med” regardless of the room temperature.</td><td>Same as at left.</td><td>Set to “Med” in modes other than when the compressor stops.</td><td>Set to “ultra-Lo”, “Silent”,“Lo”, “Med”, “Hi”, “ultra-Hi” or “stop” depending on the room temperature, and time. Set to “stop” if the heat exchanger temperature is 18°C in the “ultra-Lo” mode except during preheating (cooling is recovered at 20°C).</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 rowspan="2">Set to “ultra-Lo”, “Silent”,“Lo”, or “stop” depending on the room temperature and time. Set to “stop” if the heat exchanger temperature is 18°C in the “ultra-Lo” mode except during preheating (cooling is recovered at 20°C). The fan speed is controlled by the heat exchanger temperature; the overload control is executed as in the following diagram:
 
</td></tr>
<tr><td>Silent</td><td>Operates at “Silent” regardless of the room temperature.</td><td>Same as at left.</td><td>Set to “Silent” in modes other than when the compressor stops.</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 71.</td><td>See page 75.</td><td>See page 77.</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 73.</td><td>• Same as at left
• See page 81.</td><td>• Same as at left
• See page 79.</td><td>• Same as at left.
• Performs the sleep operation of each operation mode.</td></tr>
</table>

Basic Cooling Operation



Notes:

(1) Condition for entering into Cool Dashed mode. When fan set to “Hi” or “Auto mode” and temperature difference between indoor temperature and set temperature has a corresponding compressor rpm (calculated value in Table 2) larger than WMAX.

(2) Cool Dashed will release when i) a maximum 25 minutes is lapsed and ii) room temperature is lower than set temperature –3°C (thermo off) and iii) when room temperature has achieved setting temperature –1°C then maximum Cool Dashed time will be revised to 20 minutes. And iv) indoor fan is set to Silent, Lo and Med fan mode and v) change operation mode.

(3) During Cool Dashed operation, thermo off temperature is set temperature (with shift value) –3°C. After thermo off, operation continue in Fuzzy control mode.

(4) Compressor minimum “ON” time and “OFF” time is 3 minutes.

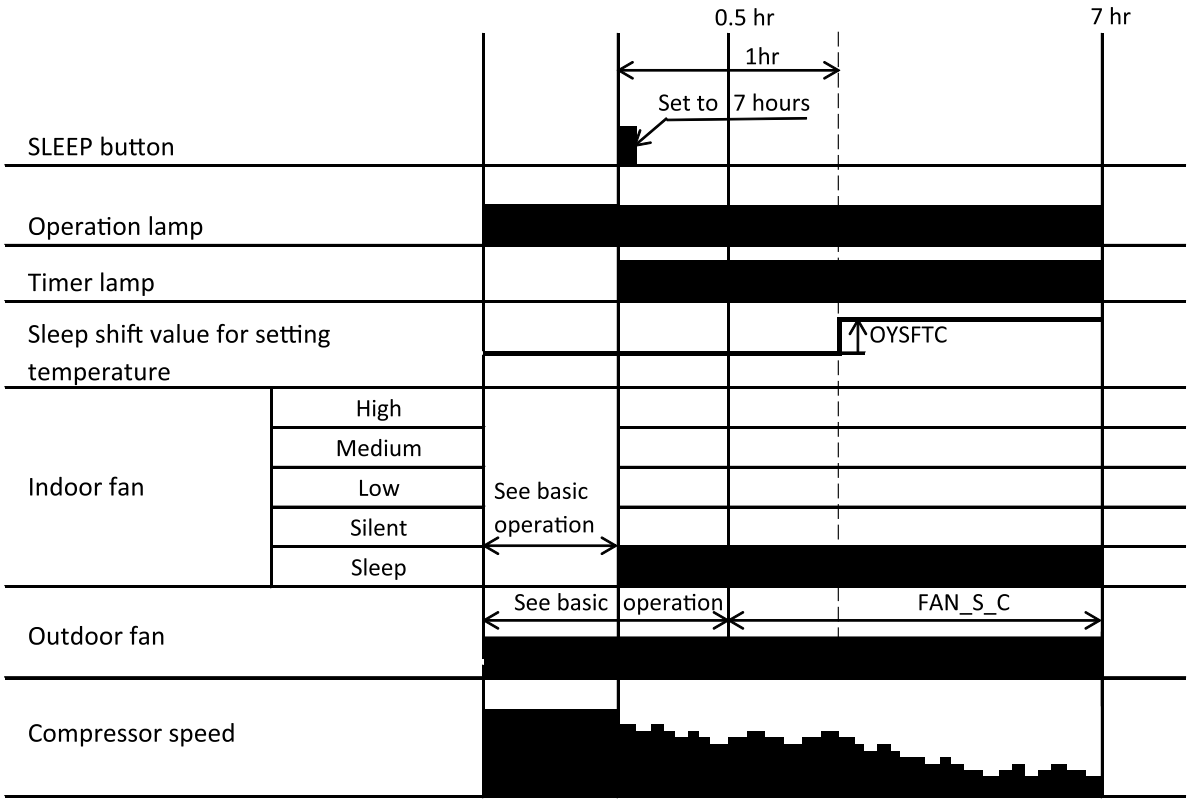
(5) During normal cooling mode, compressor maximum rpm CMAX will maintain for 60 minutes if indoor temperature is lower than CLMXTP. No time constrain if indoor temperature is higher than CLMXTP.

(6) During Cool Dashed, when room temperature reaches set temperature –1°C compressor rpm is actual rpm x DWNRATEC.

Table 2 ΔTCMAX

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

Cooling Sleep Operation



Notes :

(1) The sleep operation starts when the "SLEEP" button is pressed.

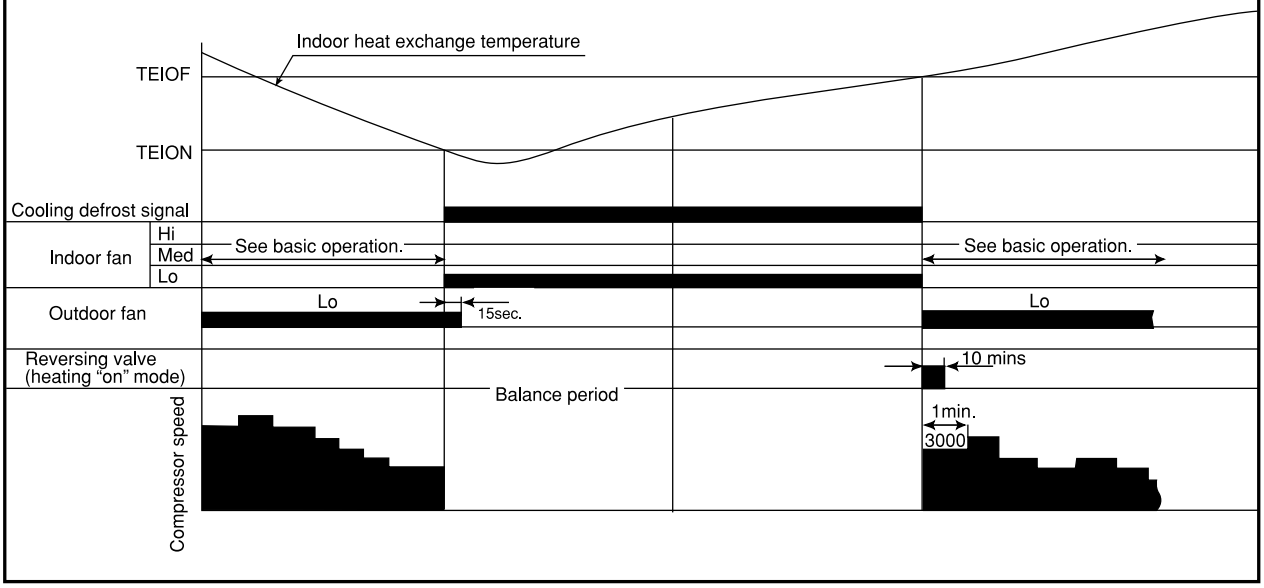
(2) When the sleep operation is set, the maximm compressor speed is limited to CSZMAX, and the indoor fan set is "sleep"(FCSOY_P).

(3) The indoor fan speed does not change even when the fan speed mode is changed.

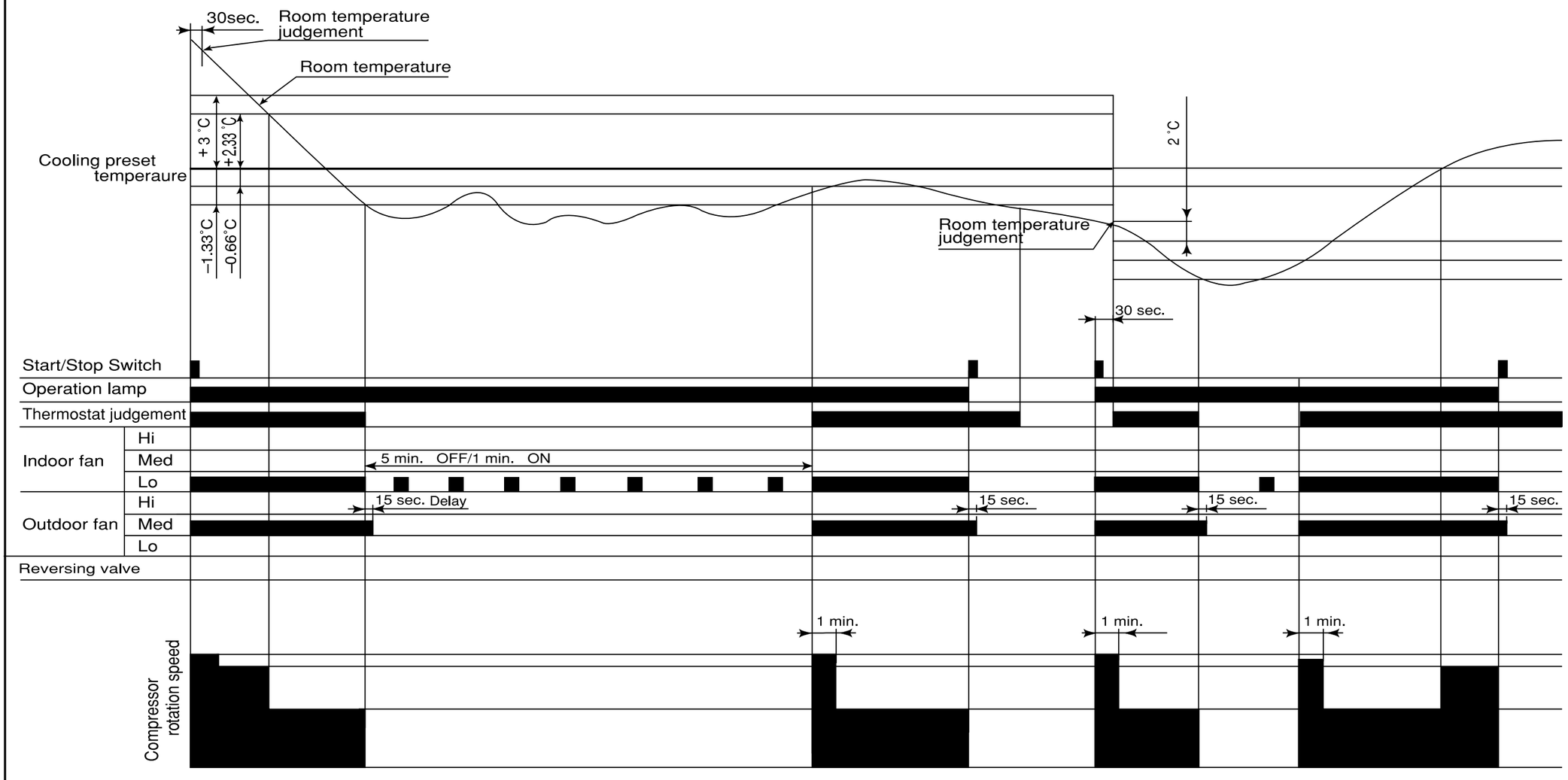
(4) If sleep operation is canceled by the cancel button or sleep button, all data is cleared.

(5) 1 hour after the sleep operation is set, the sleep shift value(OYSFTC) is added.

Cooling Defrost



Dehumidifying



Notes:

(1) If the room temperature is (cooling preset temperature) - (1.33°C) or less after 30 seconds from starting the operation, the operation is done assuming as the preset temperature = (room temperature at the time) - (2°C).

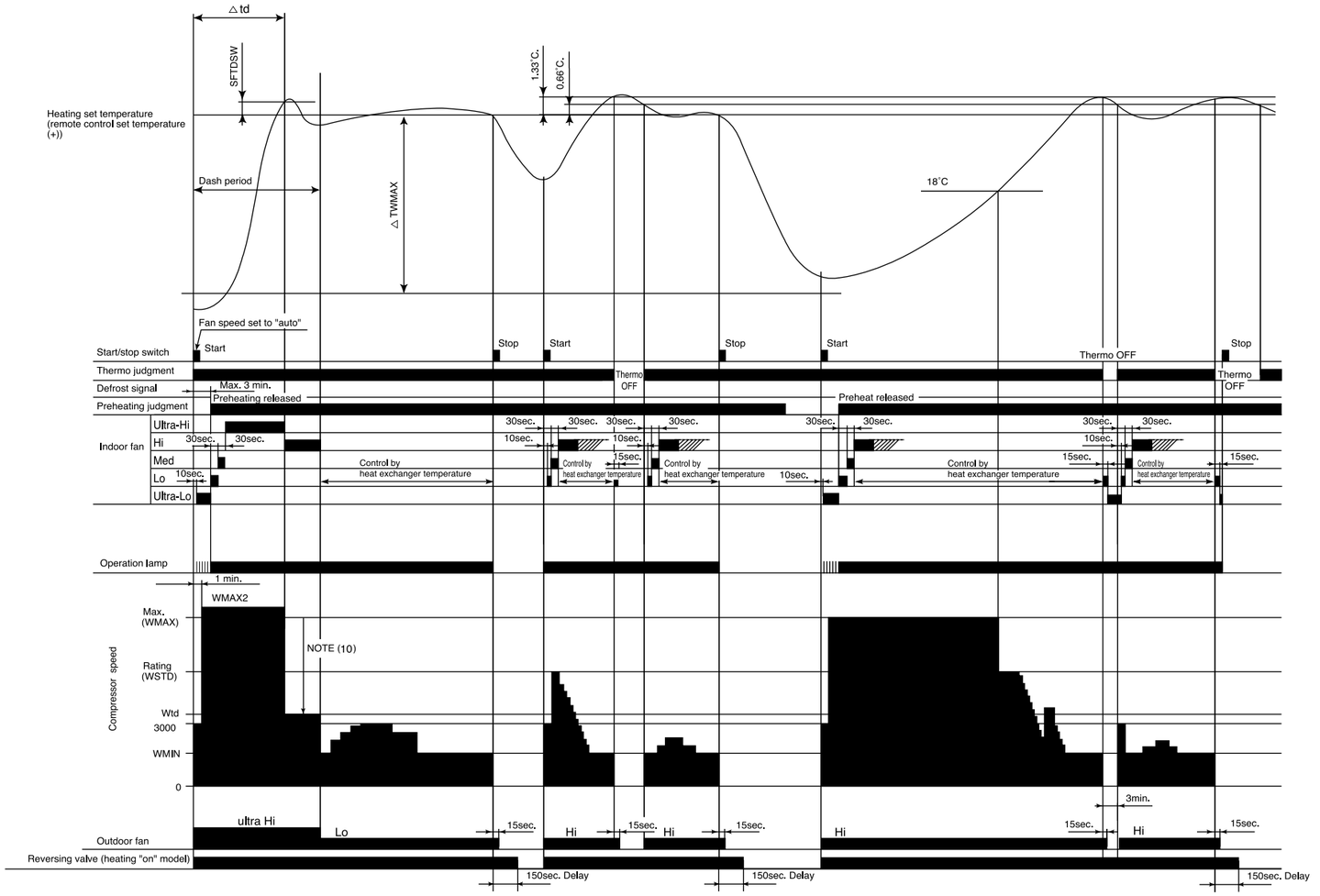
(2) The indoor fan is operated in the “Lo” mode. During thermo OFF indoor fan will be OFF for 5 minutes and ON for 1 minute.

(3) When the operation is started by the themostat turning ON, the start of the indoor fan is delayed 32 seconds after the start of compressor operation.

(4) The compressor is operated forcedly for 3 minutes after operation is started.

(5) The minimum ON time and OFF time of the compressor are 3 minutes.

Basic Heating Operation



Notes:

(1) Condition for entering into Hot Dashed mode. When fan set to “Hi” or “Auto mode” and i) Indoor temperature is lower than 18°C, and ii) outdoor temperature is lower than 10°C, and iii) Temperature difference between indoor temperature and set temperature has a corresponding compressor rpm (calculated value in Table 3) larger than WMAX.

(2) Hot Dashed will release when i) Room temperature has achieved the set temperature + SFTDSW. ii) Thermo off.

(3) During Hot Dashed operation, thermo off temperature is set temperature (with shift value) +2°C. After thermo off, operation continue in Fuzzy control mode.

(4) Compressor minimum “ON” time and “OFF” time is 3 minutes.

(5) During normal heating mode, compressor maximum rpm WMAX will maintain for 120 minutes if indoor temperature is higher than 18°C. No time limit constrain if indoor temperature is lower than 18°C or outdoor temperature is lower than 2°C.

(6) During Hotkeep or Defrost mode, indoor operation lamp will blink at interval of 3 seconds “ON” and 0.5 second “OFF”.

(7) When heating mode starts, it will enter into Hotkeep mode if indoor heat exchanger temperature is lower than YNEOF + 0.33°C.

(8) In “Ultra-Lo” fan mode, if indoor temperature is lower than 18°C, indoor fan will stop. If indoor temperature is higher than 18°C + 0.33°C, fan will continue in “Ultra-Lo” mode. During Hotkeep or Defrost mode, fan will continue in “Ultra-Lo” mode.

(9) During Hot Dashed or outdoor temperature is lower than –5°C, compressor rpm is WMAX2.

(10) During Hot Dashed, when room temperature reaches set temperature + SFTDSW compressor rpm is actual rpm x DWNRATEW.

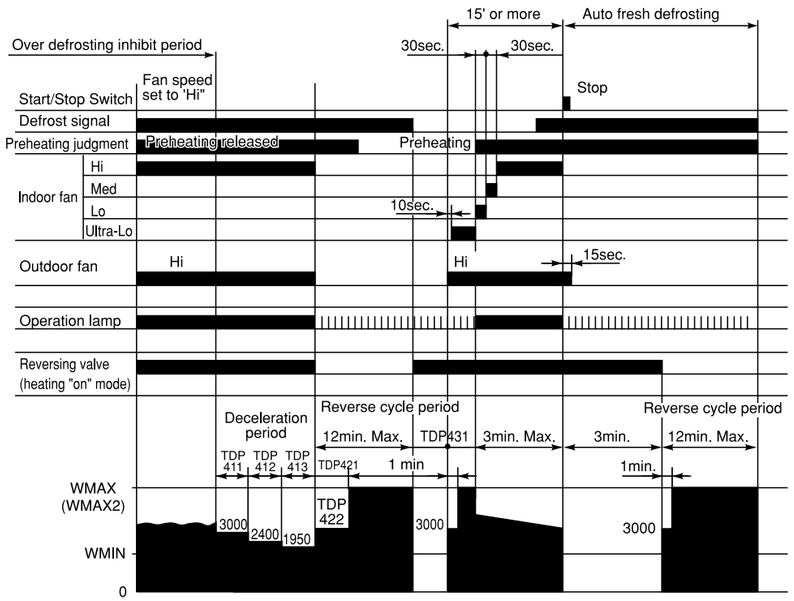
Table 3 ΔTWMAX

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

Notes:

1. See the data in Table 1 on page 67 for each constant in capital letters in the diagrams.

Reversing Valve Defrosting



Notes:

(1) The defrosting inhibit period is set as shown in the diagram below. When defrosting has finished once, the inhibit period is newly set, based on the outdoor temperature when the compressor was started. During this period, the defrost signal is not accepted.

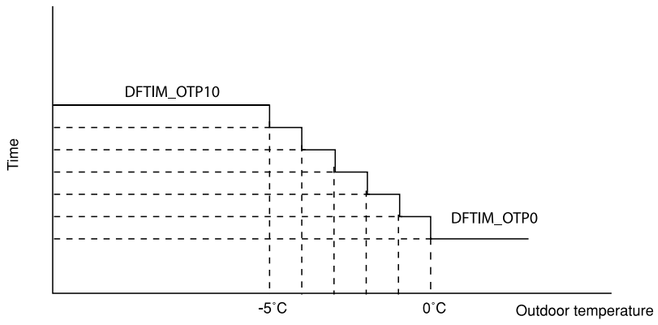
(2) If the difference between the room and outdoor temperature is large when defrosting is finished, the maximum compressor speed (WMAX) or (WMAX2) can be continued for 120 minutes maximum.

(3) The defrosting period is 12 minutes maximum.

(4) When operation is stopped during defrosting, it is switched to auto refresh defrosting.

(5) Auto refresh defrosting cannot be engaged within 15 minutes after operation is started or defrosting is finished.

Setting Defrosting Inhibit Period



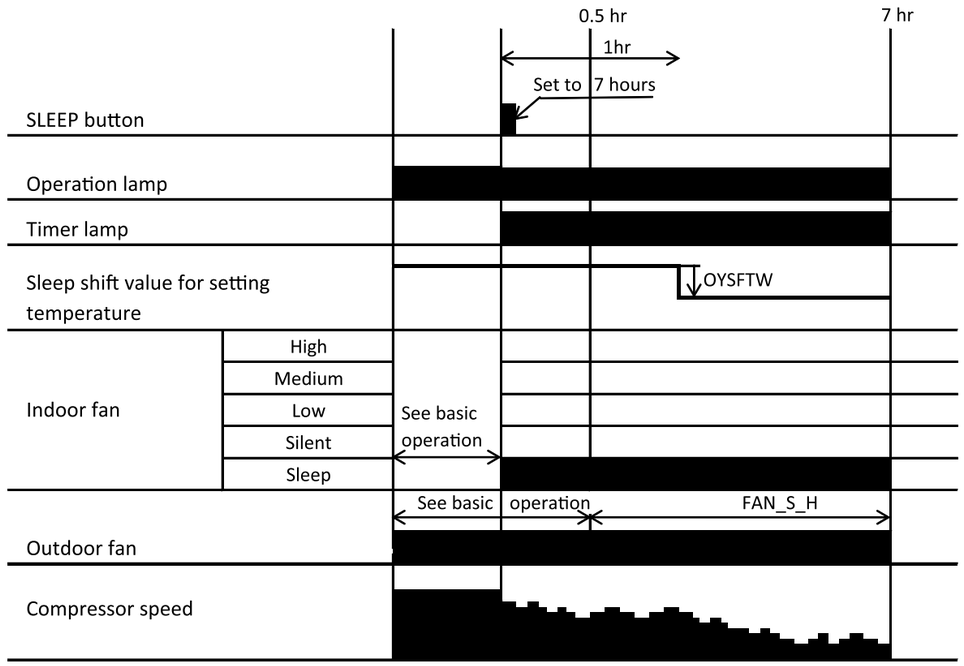
Notes:

(1) The time is set according to the outdoor temperature when it is between 0˚C and -5˚C.

(2) DFTIM_OTP0 is used when the outdoor temperature ≧ 0˚C.

(3) DFTIM_OTP10 is used when the outdoor temperature ≦ -5˚C.

Heating Sleep Operation



Notes :

(1) The sleep operation starts when the "SLEEP" button is pressed.

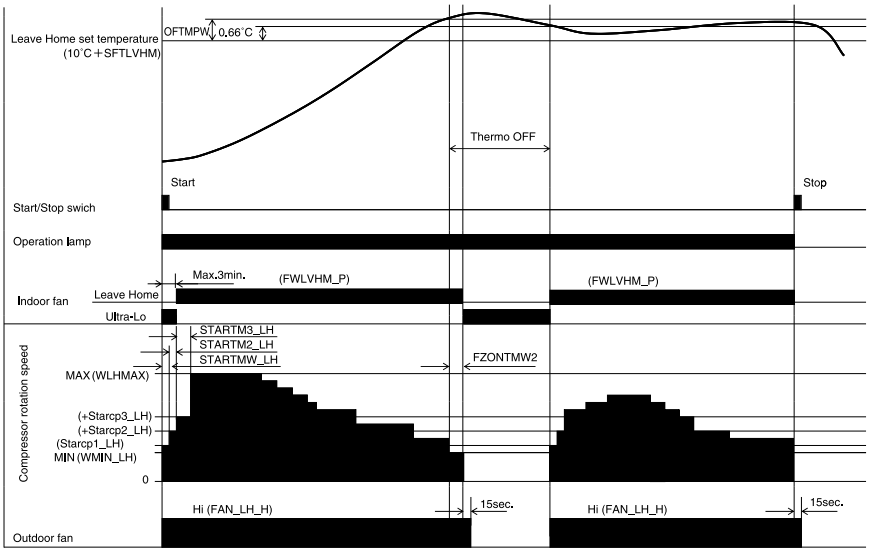
(2) When the sleep operation is set, the maximm compressor speed is limited to WSZMAX, and the indoor fan set is "sleep"(FWSOY_P).

(3) The indoor fan speed does not change even when the fan speed mode is changed.

(4) If sleep operation is canceled by the cancel button or sleep button, all data is cleared.

(5) 1 hour after the sleep operation is set, the sleep shift value(OYSFTW) is reduced.

Leave Home

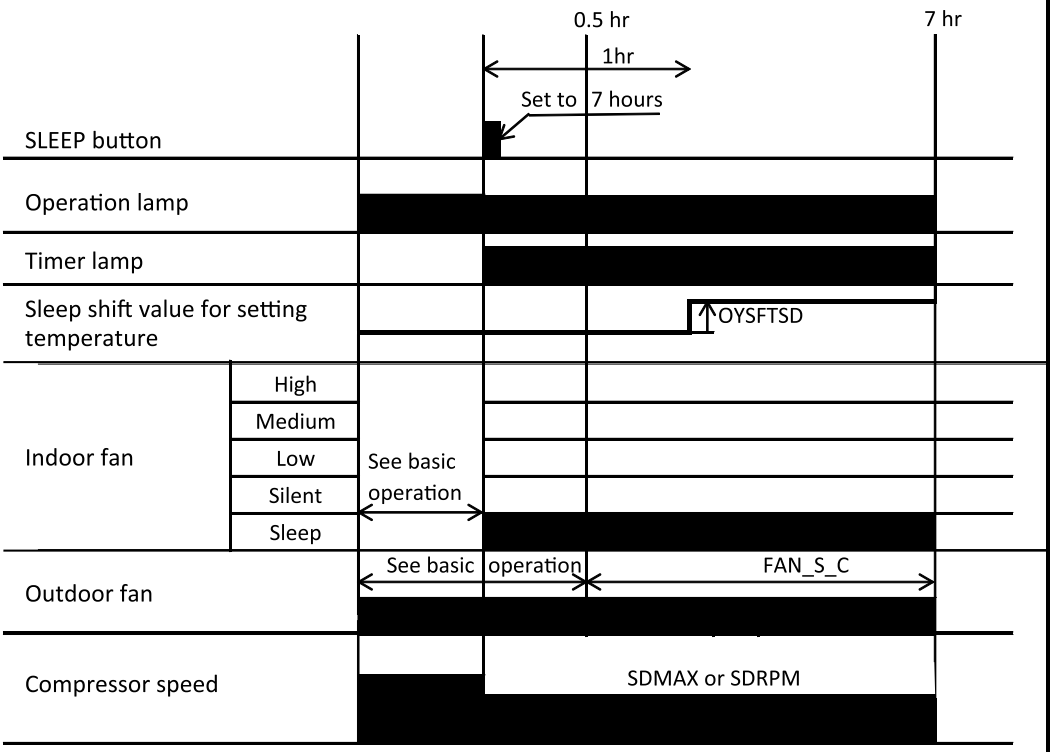


Notes:

Perform Leave Home operation according to the following control contents.

① Operation mode：Heating
② Temperature set：10˚C
③ Temperature setting correction shift：＋『SFTLVHM』
④ Indoor fan：『FWLVHM_P』
⑤ Outdoor fan：『FAN_LH_H』
⑥ Compressor start control：Set the start control using the special value for the Leave Home mode.
⑦ Compressor rotation speed：Upper limit speed by fuzzy control『WLHMAX』
Lower limit speed by fuzzy control『WMIN_LH』
⑧ Operation lamp：The timer lamp lights up when the timer for the desired number of days is set.

Dehumidifying Sleep Operation



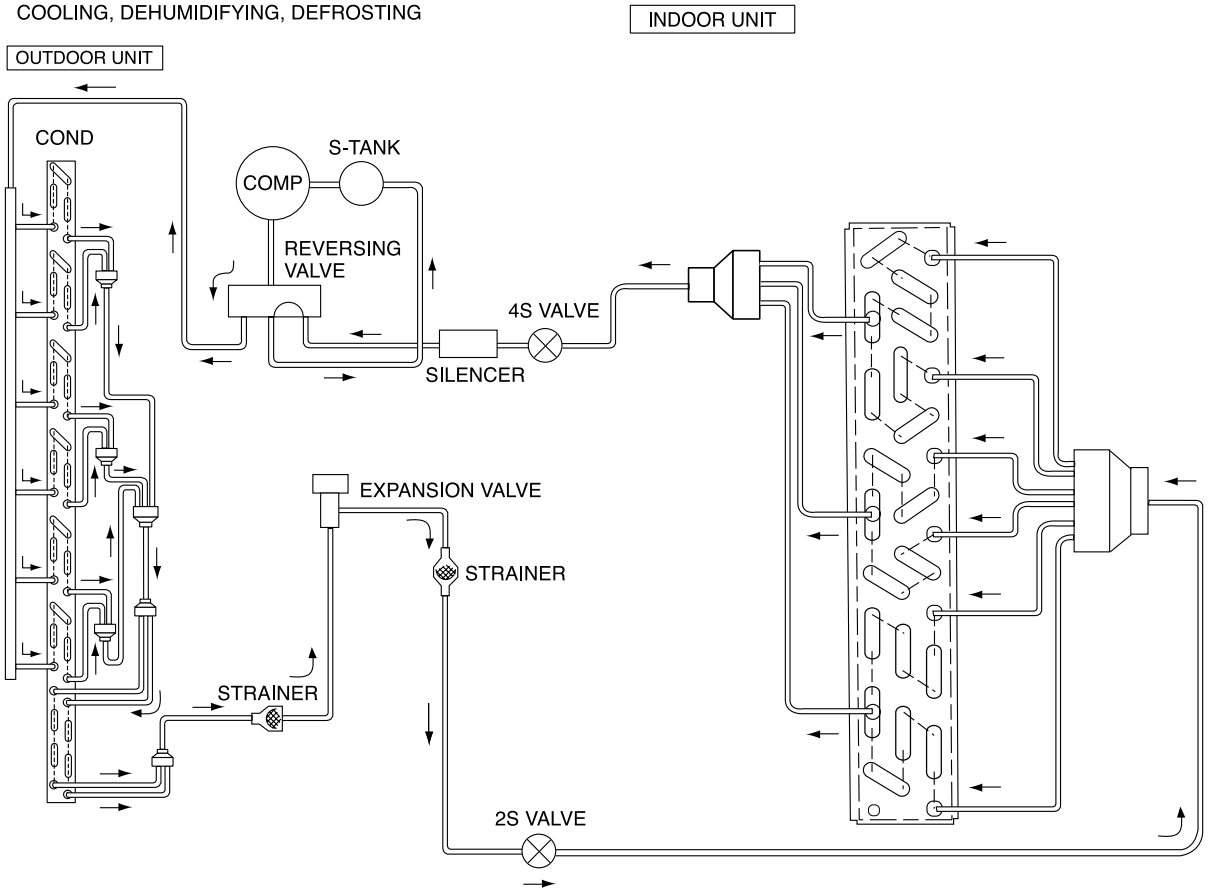
Notes :

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

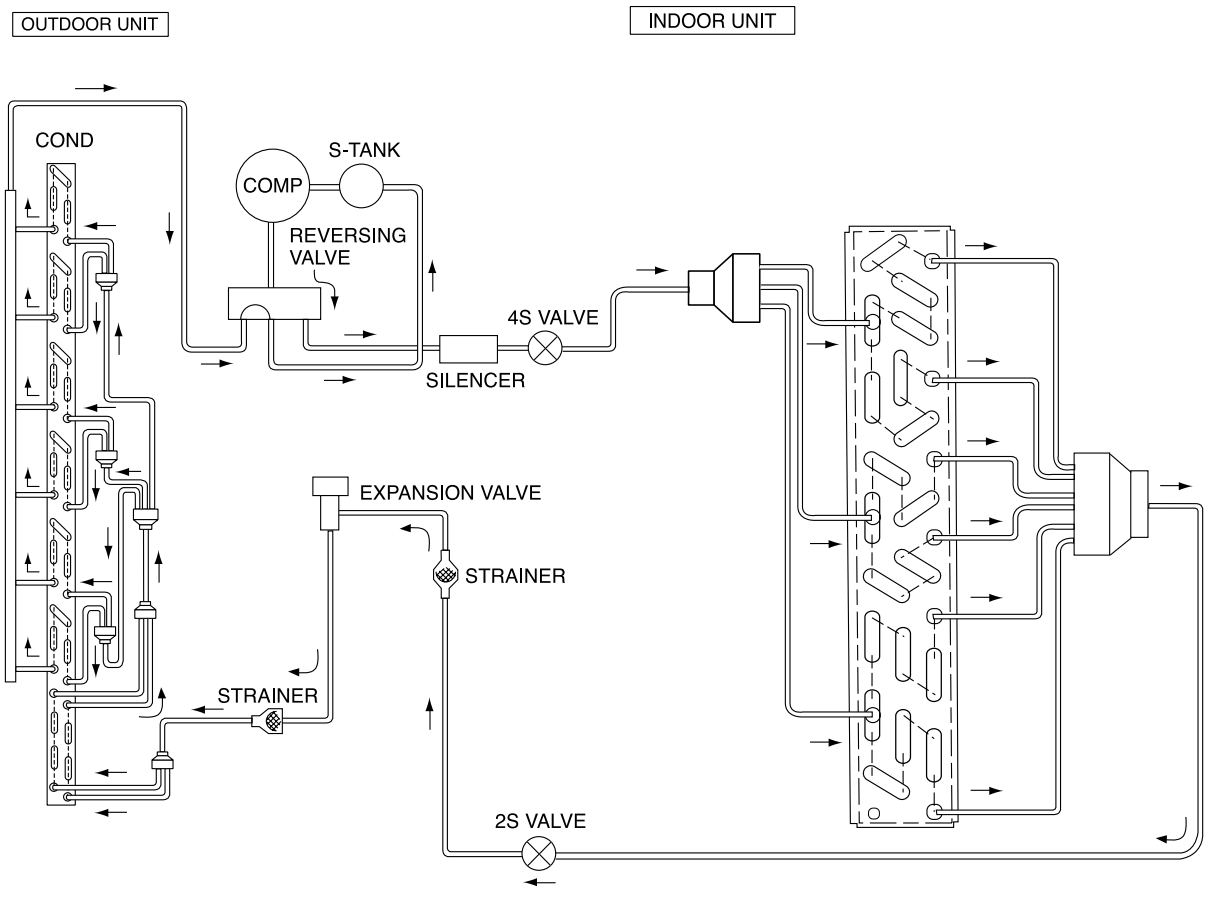
REFRIGERATING CYCLE DIAGRAM

MODEL RAD-50PPA/RAC-50DPA
RAD-60PPA/RAC-60DPA

COOLING, DEHUMIDIFYING, DEFROSTING

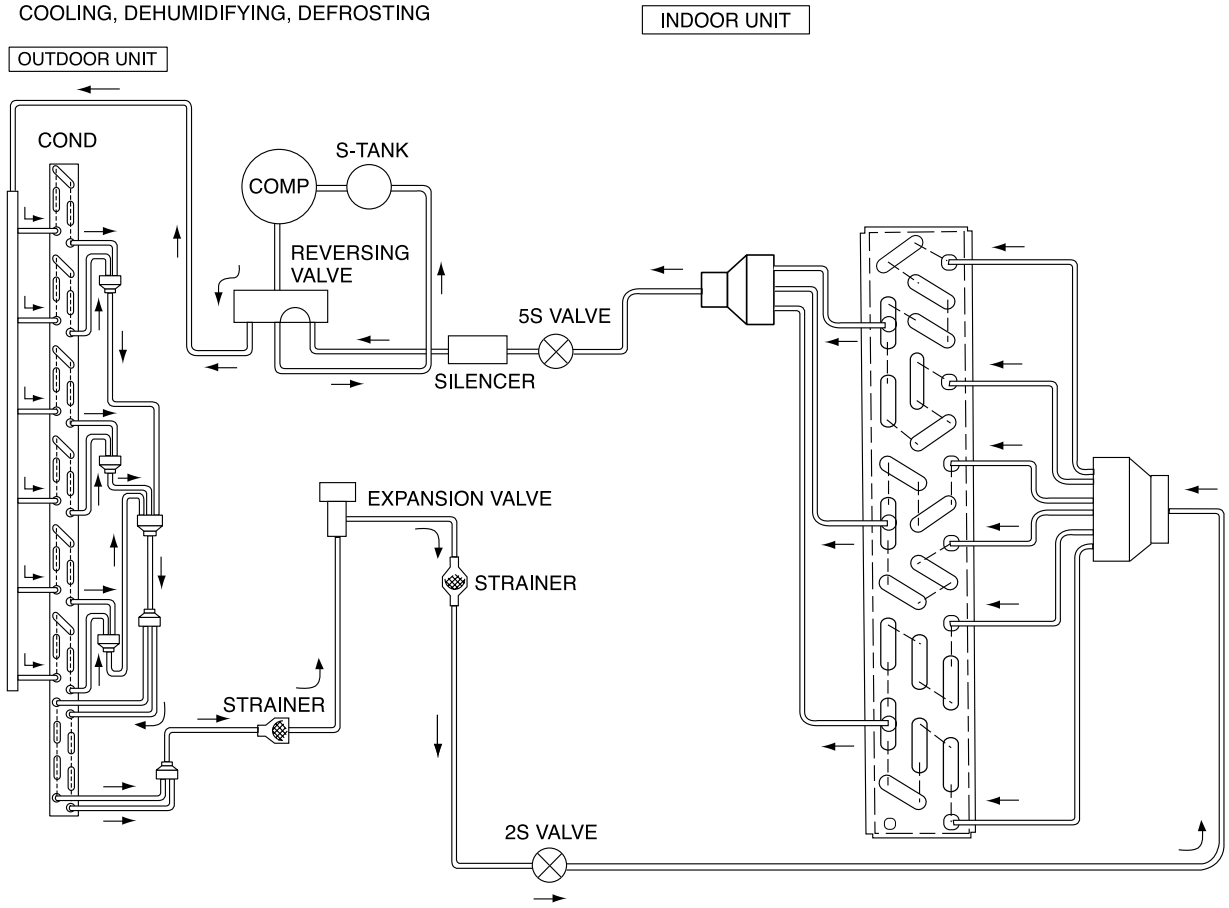


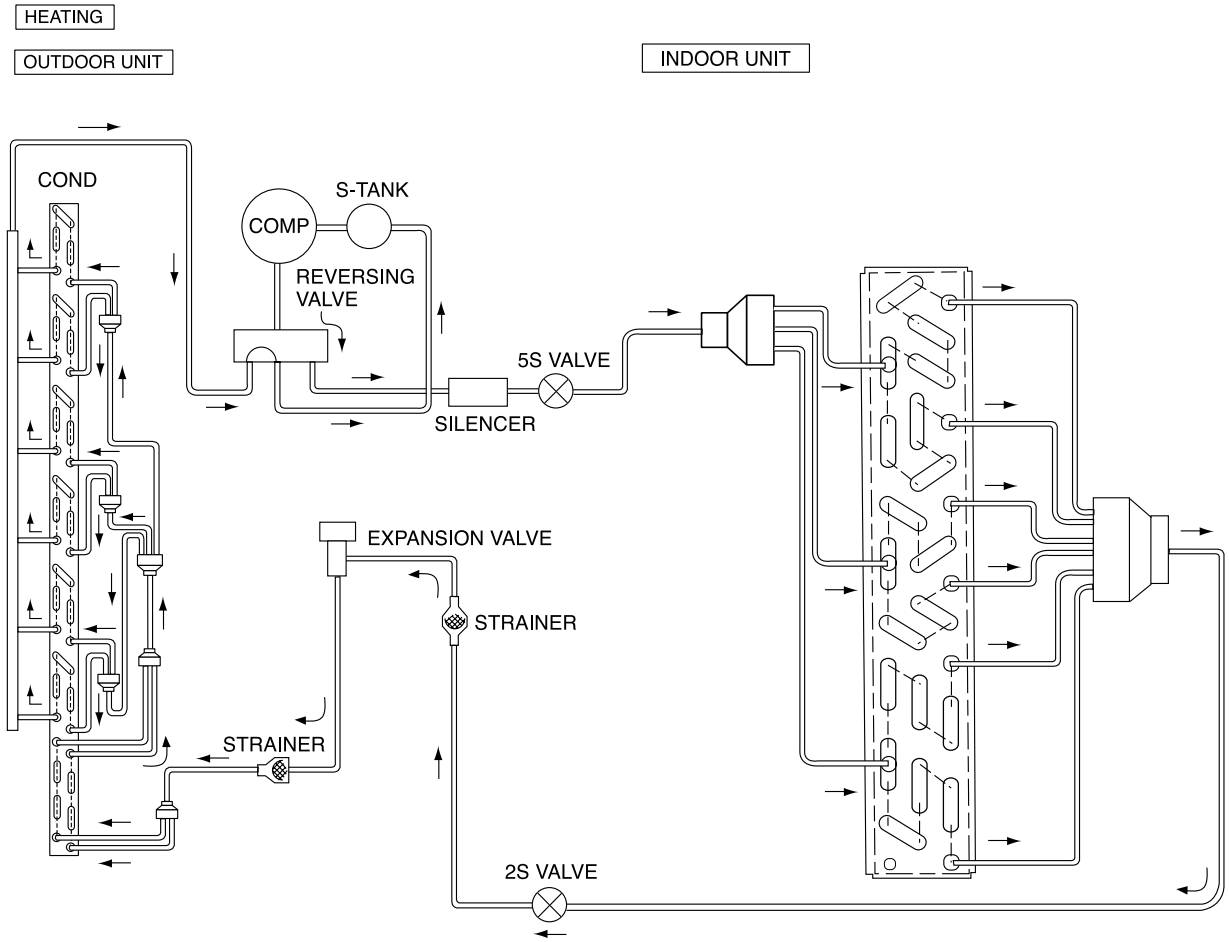
HEATING



REFRIGERATING CYCLE DIAGRAM

MODEL RAD-70PPA/RAC-70DPA





DESCRIPTION OF MAIN CIRCUIT OPERATION

MODEL RAD-50PPA, RAD-60PPA, RAD-70PPA

1. Reset Circuit

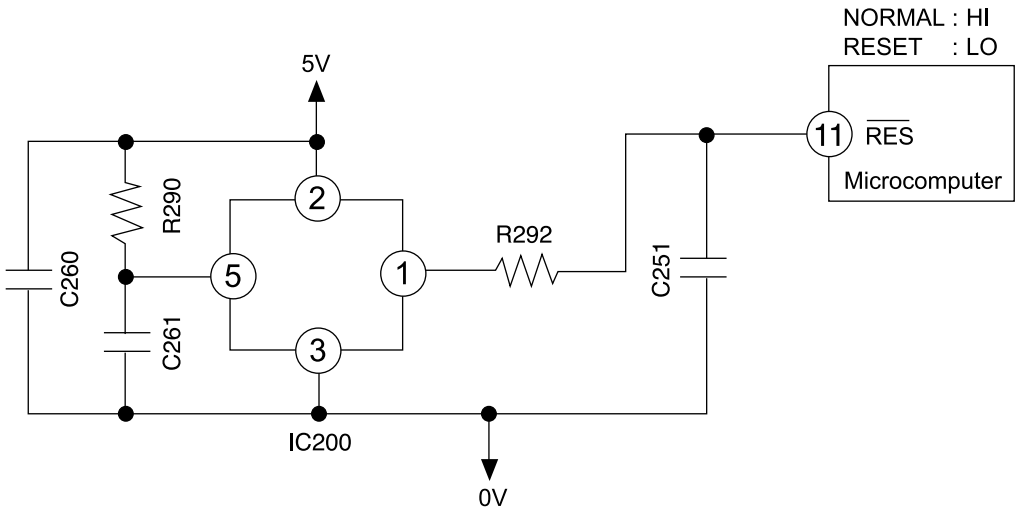


Fig. 1-1

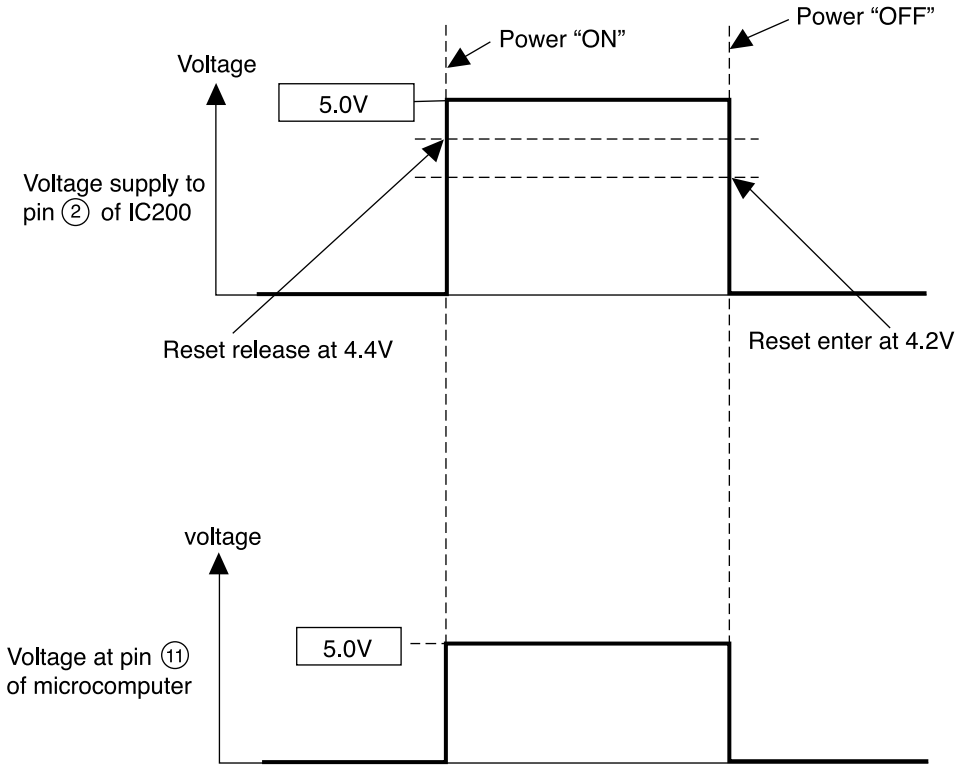


Fig. 1-2

- The reset circuit initializes the microcomputer program when power is ON or OFF.
- Low voltage at pin ⑪ resets the microcomputer and Hi activates the microcomputer.
- When power "ON" 5V voltage rises and reaches 4.4V, pin ① of IC200 is set to "Hi". At this time the microcomputer starts operation.
- When power "OFF" voltage drops and reaches 4.2V, pin ① of IC200 is set to "Low". This will RESET the microcomputer.

2. Buzzer Circuit

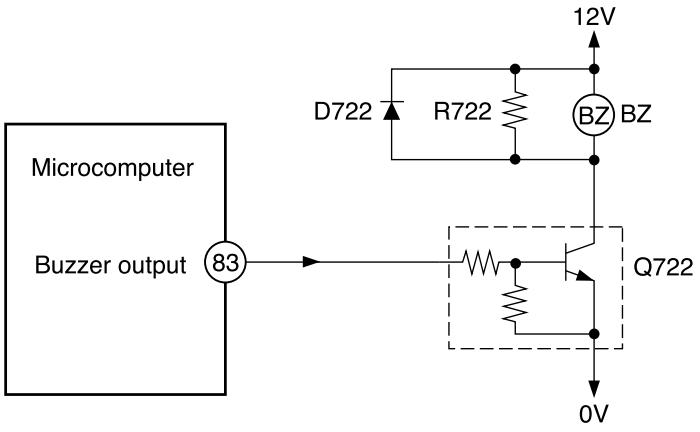


Fig. 2-1 Buzzer Circuit

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

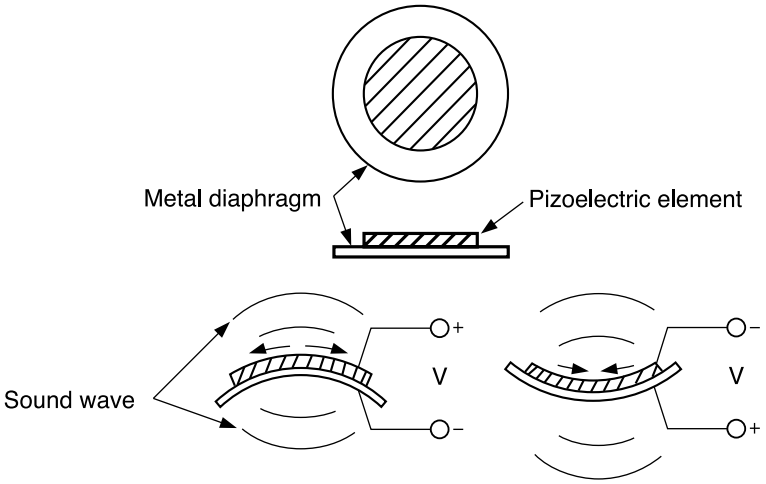


Fig. 2-2 Buzzer Operation

3. Initial Setting Circuit (IC401)

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

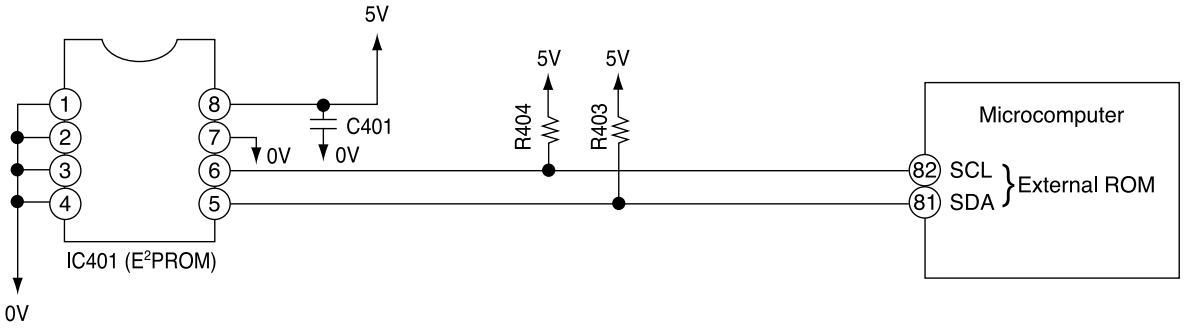


Fig. 3-1

4. Room Temperature Thermistor Circuit

- Fig. 4-1 shows the room temperature thermistor circuit.
- The voltage at Ⓐ depends on the room temperature as shown in Fig. 5-2.

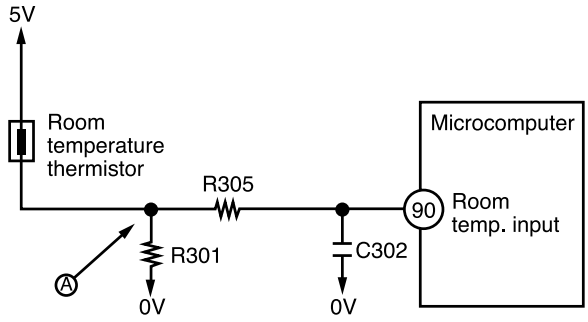


Fig. 4-1

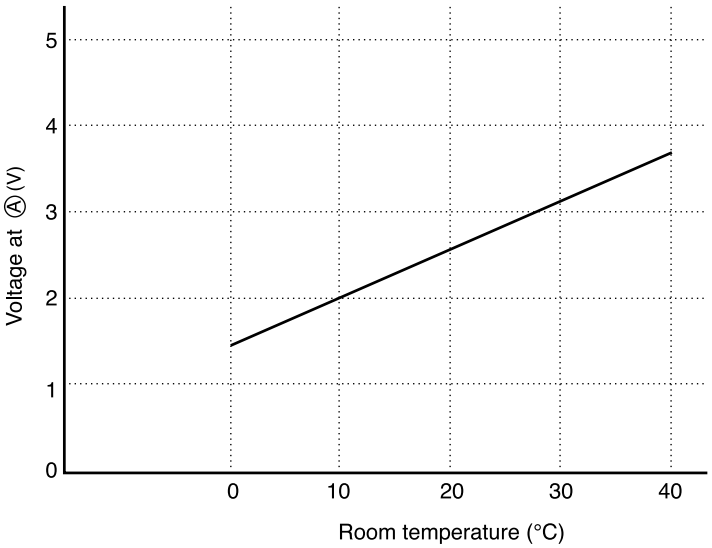


Fig. 4-2

5. Heat exchanger temperature thermistor circuit

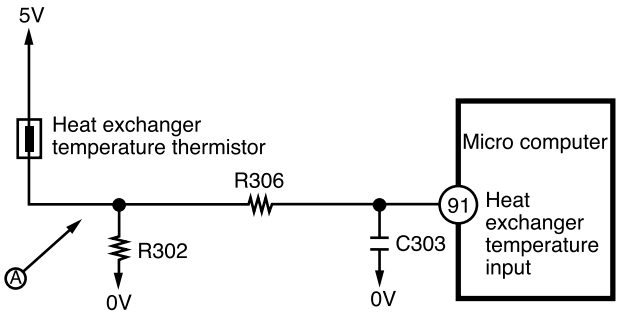


Fig. 5-1

- The circuit detects the indoor heat exchanger temperature and controls the following.

  (1) Low-temperature defrosting during cooling and dehumidifying operation.

  The voltage at Ⓐ depends on the heat exchanger temperature as shown in Fig. 5-2.

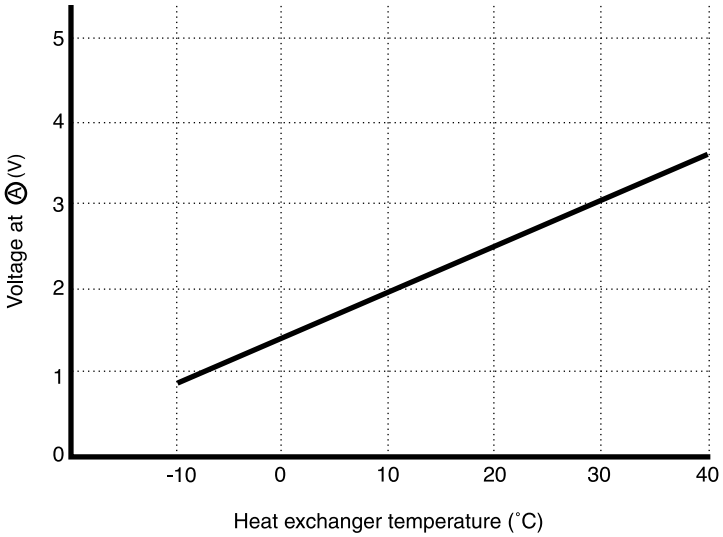


Fig. 5-2

6. Temporary Switch

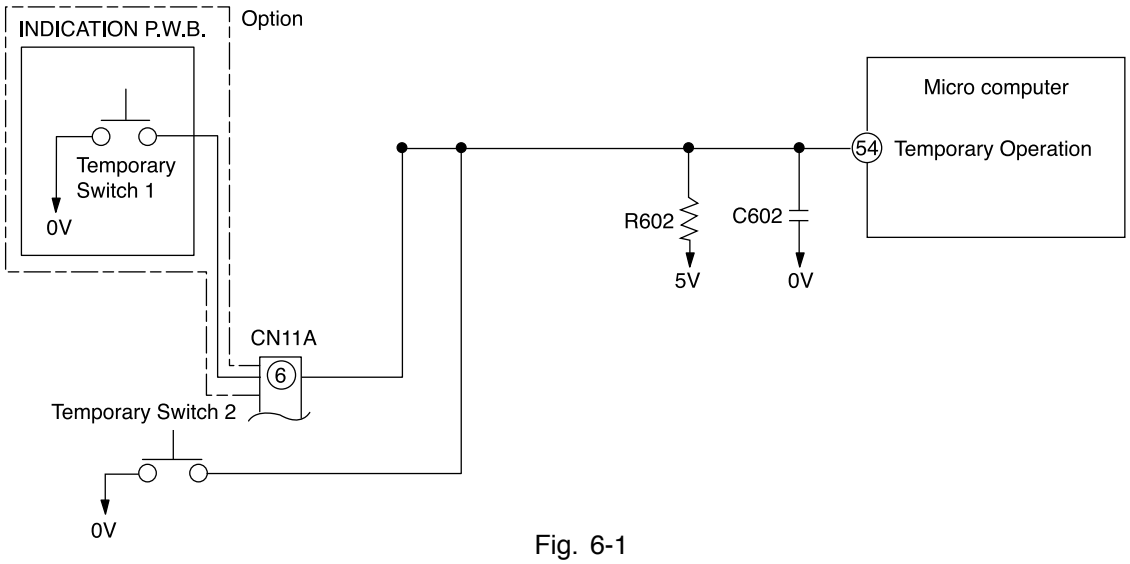
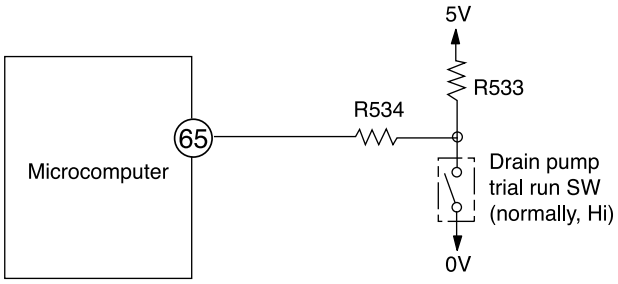


Fig. 6-1

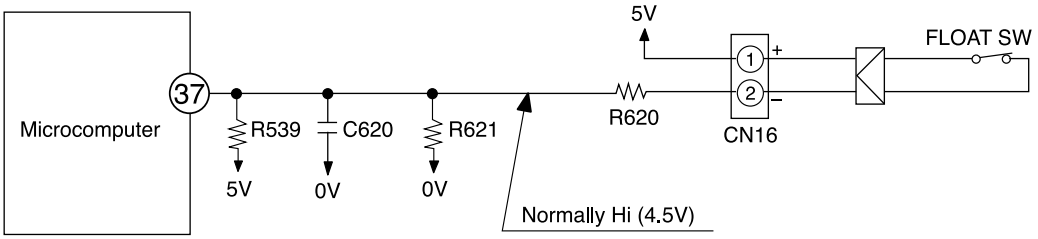
- The temporary switch is used to operate the air conditioner temporarily when the wireless remote control is lost or faulty.
- The air conditioner operates in the previous mode at the previously set temperature. However, when the power switch is set to OFF, it starts automatic operation.

7. Drain pump trial run switch



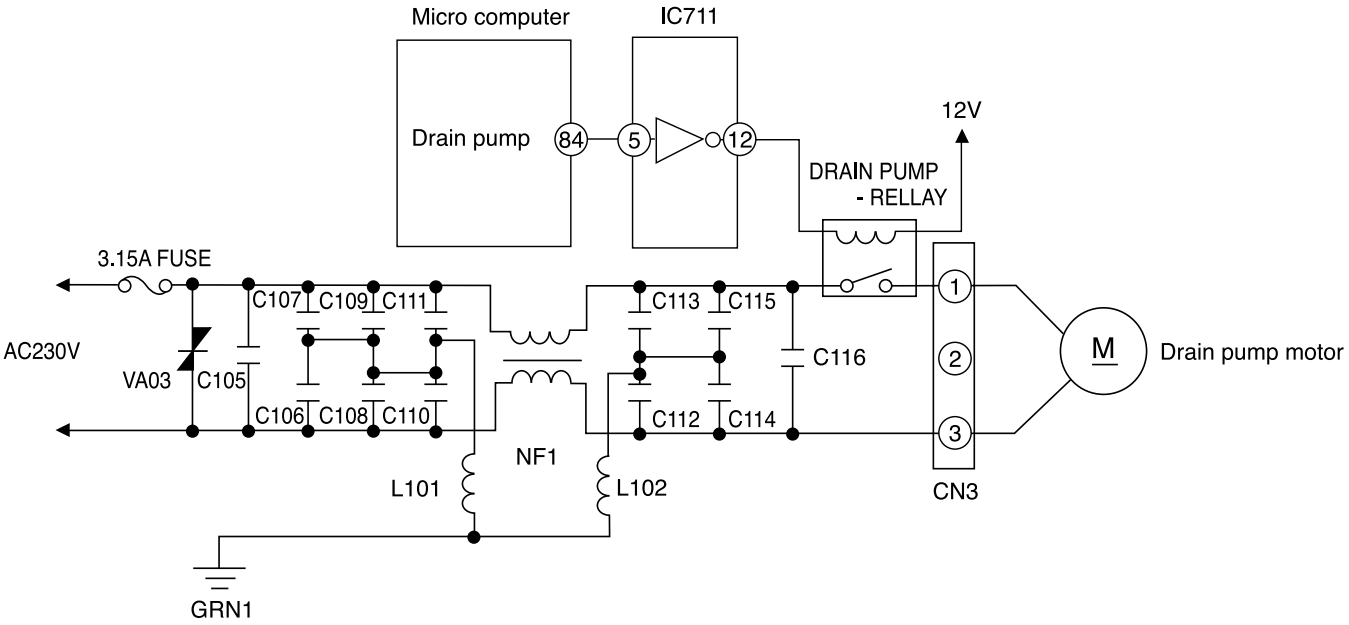
- This switch forcibly turns the drain pump on. When the drain pump trial run switch is turned on, the timer indicator will blink seven times, and no remote signal will be accepted.

8. Float switch



- This is a float type switch that monitors the drain level of drain pan. The switch will be activated and will stop operation if the drain pump is faulty or drain hose is stopped up, disabling drainage, causing the drain level to rise abnormally.
- When the float switch is activated, the timer indicator will flash six times. Note that the float switch will also be activated, disabling operation if the connector of float switch has defective contact or is connected incompletely.

9. Drain pump drive circuit



Drain pump drive circuit is using drain pump relay that control by micro computer pin no 84 to drive the drain pump.

10. Indoor Fan Motor Feedback Circuit

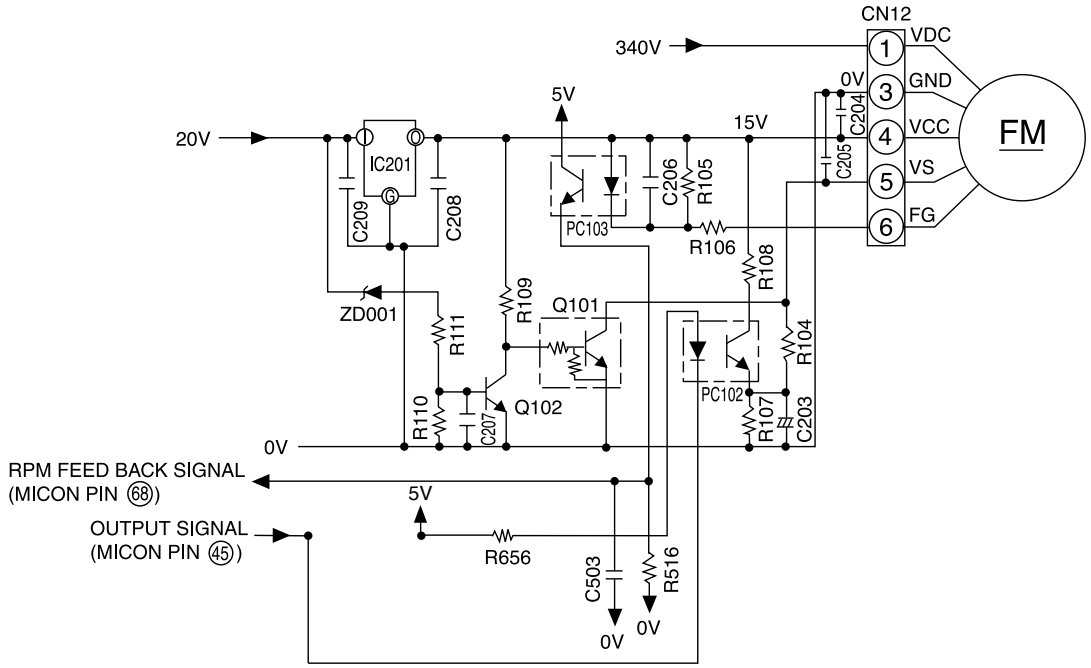


Fig. 10-1

- <Exp. of circuit wave>

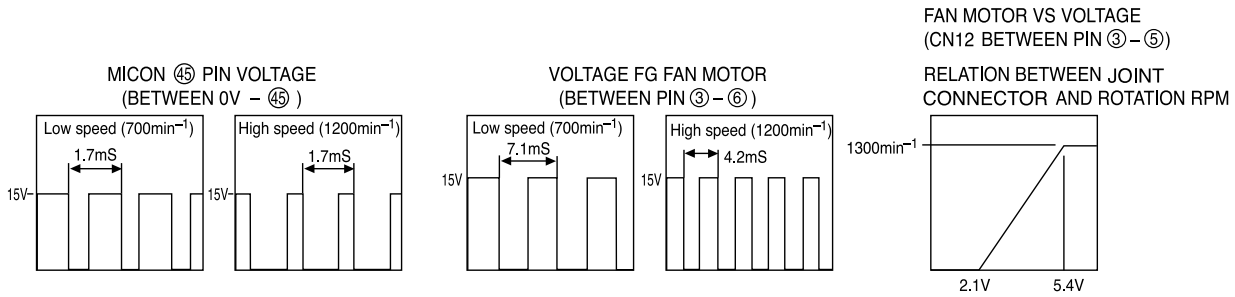


Fig. 10-2

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

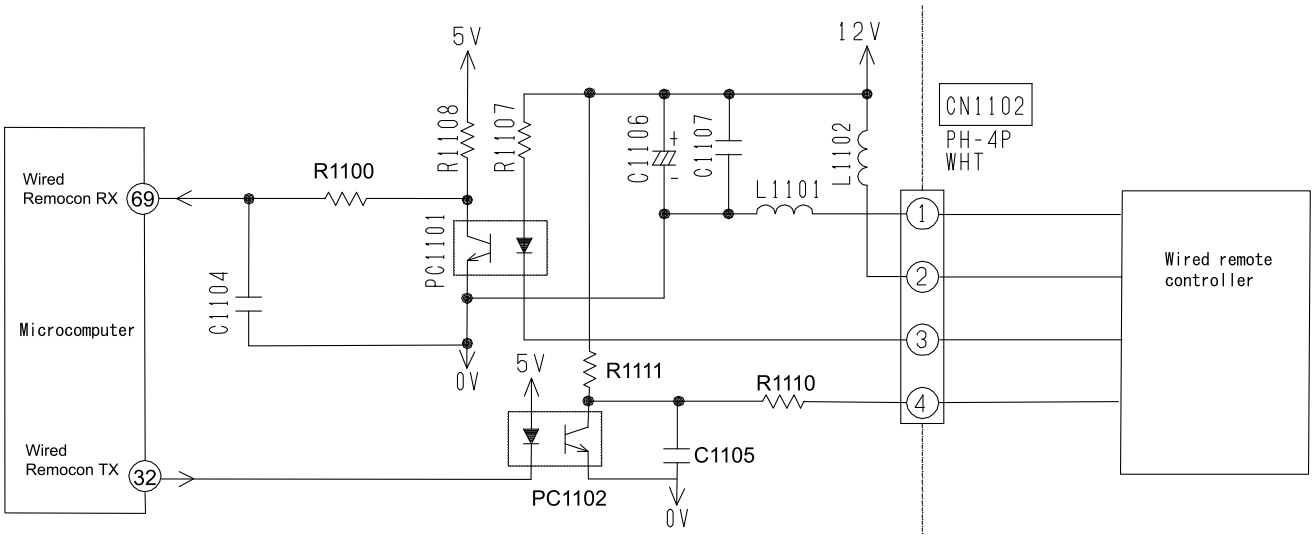
⚠ CAUTION 1

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

⚠ CAUTION 2

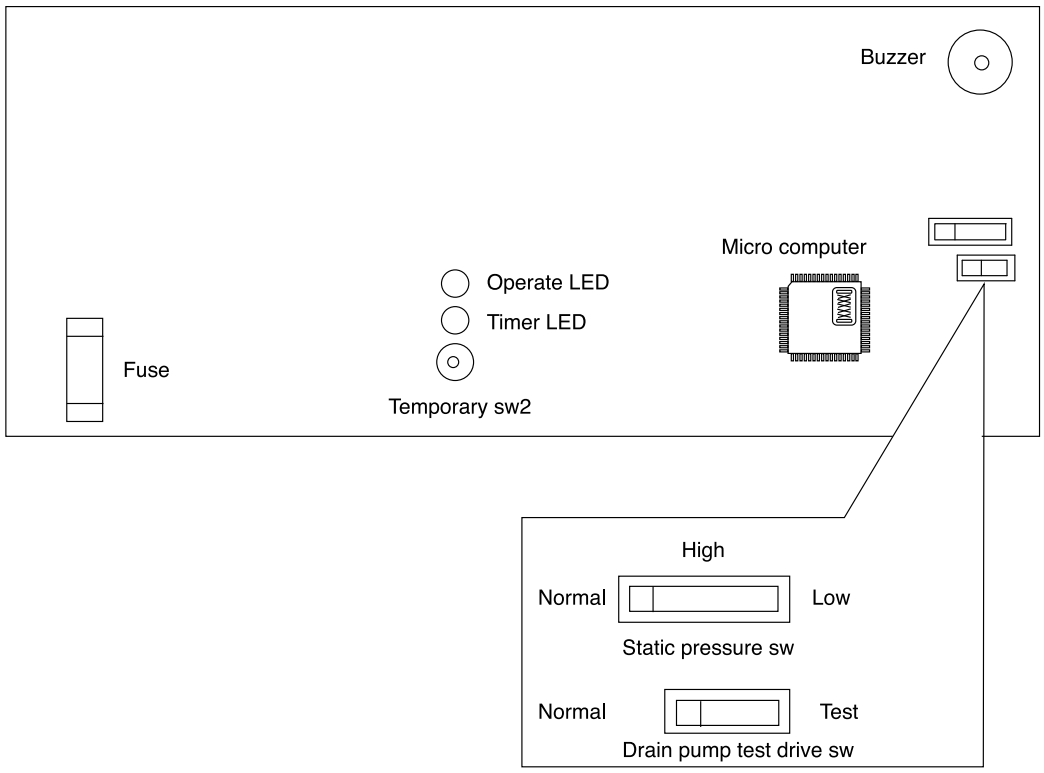
Please do not disconnect the fan motor connector during running due to the high voltage supply, it will cause the damage at fan motor and PWB.

11. Wired remote control receive and transmit circuit



In wired remote control circuit, the signal will transmit to micro computer pin 69 by using photocoupler PC1101 and receive from micro computer pin 32 by using photocoupler PC1102.

12. Static-pressure switch



Static pressure switch
When set to High, the revolution per minute will increase 100 min^{-1} and when set to Low, the revolution per minute will decrease 200 min^{-1}.

13. Dip-switch

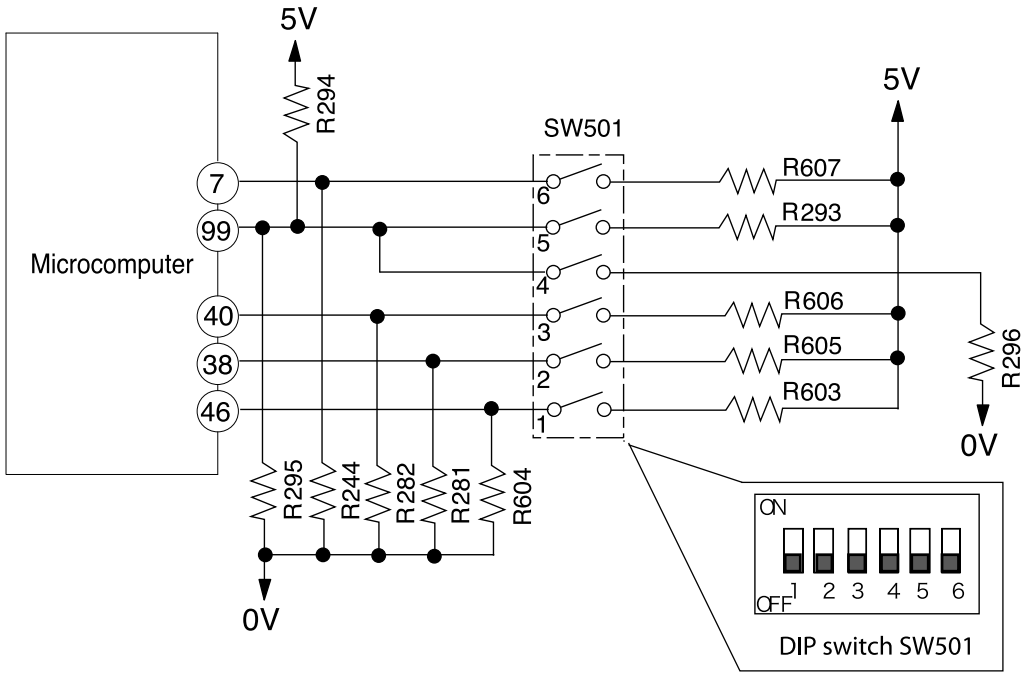


Fig. 13-1 Dip switch Circuit

- Fig. 13-1 shows the dip switch circuit; the table shown in Fig. 13-2 are function and setting position from ①–⑥ of the switch no.

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

Fig. 13-2 Functions of Dip switch

NOTE:

❋ Marking is position of shipping [FACTORY default setting]

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

- If the dip switch is set to “Heating mode only” or “Cooling mode only”, the wireless remote controller must be set to operation mode lock setting as indicated on page 133.

1. Power Circuit

RAC-50DPA, RAC-60DPA, RAC-70DPA

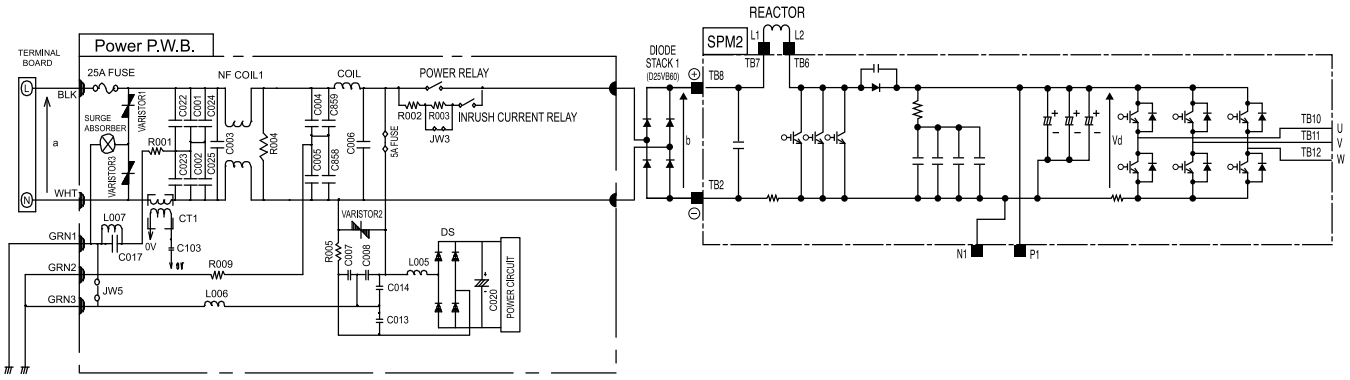


Fig. 1-1

- This circuit full-wave rectifies 220-240V AC applied between terminals L and N, and boosts it to a required voltage with the active module, to create a DC voltage.

The voltage becomes 260-360V when the compressor is operated

(1) Active module

The active filter, consisting of a reactor and switching element, eliminates higher harmonic components contained in the current generated when the compressor is operated, and improves the power-factor.

(2) Diode stacks

These rectify the 220-240V AC from terminals L and N to a DC power supply.

< Reference >

- In case of active module malfunction or defective connection: Immediately after the compressor starts, it may stop due to “abnormally low speed” active error, etc.

  The compressor may continue to operate normally, but the power-factor will decrease, the operation current will increase, and the overcurrent breaker of the household power board will probably activate.

< Reference >

- If diode stack 1 is faulty, the compressor may stop due to “lp”, “abnormally low speed”, etc. immediately after it starts, or it may not operate at all because no DC voltage is generated between the positive ⊕ and negative ⊖ terminals.

  If diode stack 1 is faulty, be aware that the 25A fuse might also have blown.

- If diode stack 2 is faulty, DC voltage may not be generated and the compressor may not operate at all. Also, be aware that the 5A fuse might have blown.

(3) Smoothing capacitor (C501, C502, C503)

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

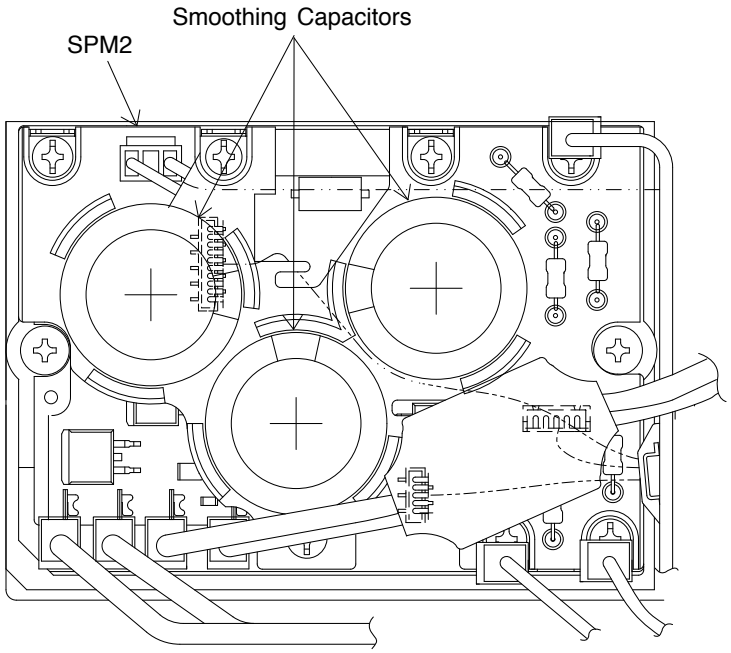


Fig. 1-2

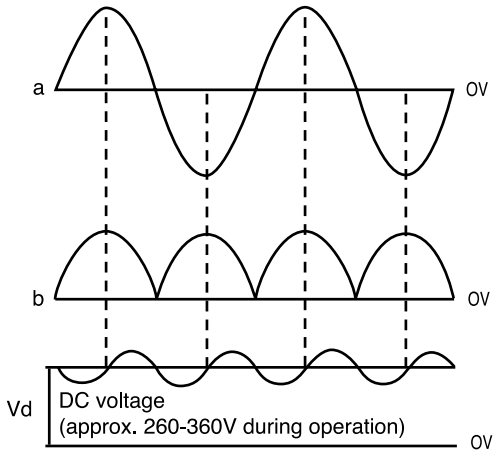


Fig. 1-3

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

(4) Smoothing capacitor (C020)
This smoothes (averages) the voltage rectified by the diode stack2. A DC voltage is generated in the same way as in Fig. 1-3.
Voltage between + side of C020 is about 330V.

(5) C001 to C003, C012 to C015, C007, C008, NF COIL1, COIL, C22～C25 absorb electrical noise generated during operation of compressor, and also absorb external noise entering from power line to protect electronic parts.

(6) Surge absorber, Varistor 1, 2, 3, absorbs external power surge.

(7) Inrush protective resistor (R002, R003)
This works to protect from overcurrent when power is turned on.

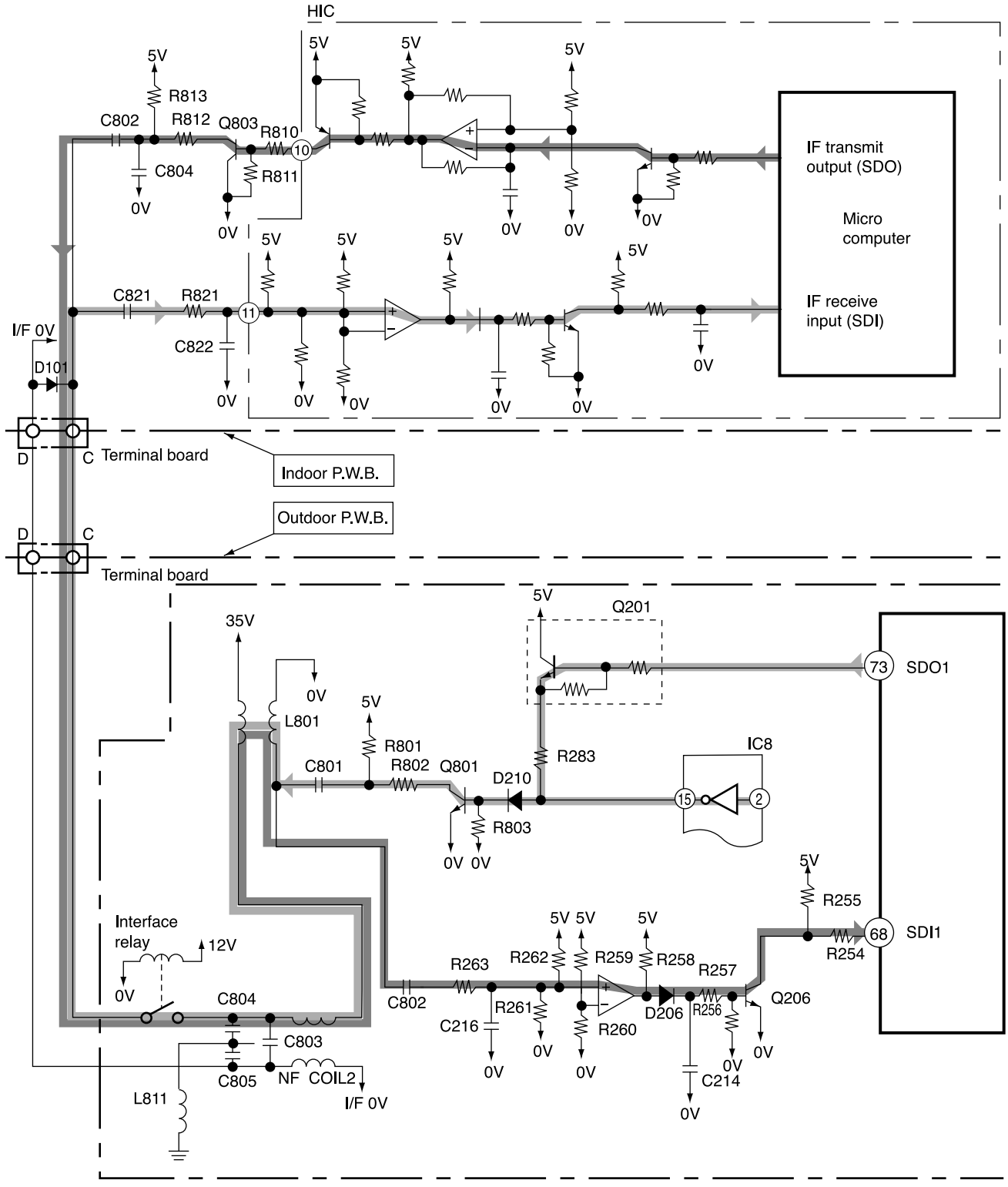
< Reference >

- When inrush protective resistor is defective, diode stack may malfunction. As a result, DC voltage is not generated and no operation can be done.

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.
- From outdoor microcomputer to indoor microcomputer.
  The request signal output from microcomputer pin ⑦③ , ⑦④ , ⑨ is input to the transmitting circuit. The transmitting circuit modulates this signal by approx. 38kHz high-frequency. This high-frequency signal is amplified by a transistor, superimposed on the DC 35V line via C801 (or C811, C821) and L801 (or L802, L803), and supplied to the indoor unit.
  To prevent erroneous reception, the outdoor microcomputer is designed so that it cannot receive a signal while is 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 supplied to receiving input 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.
- Indoor microcomputer to outdoor microcomputer.
  The communications from the indoor microcomputer to the outdoor micro computer are the same. Fig. 2-3 shows the voltages and waveforms at each circuit.

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



(Communications from indoor micro computer to outdoor micro computer)

(Communications from outdoor micro computer to indoor micro computer)

Fig. 2-1 Indoor / Outdoor interface Circuit

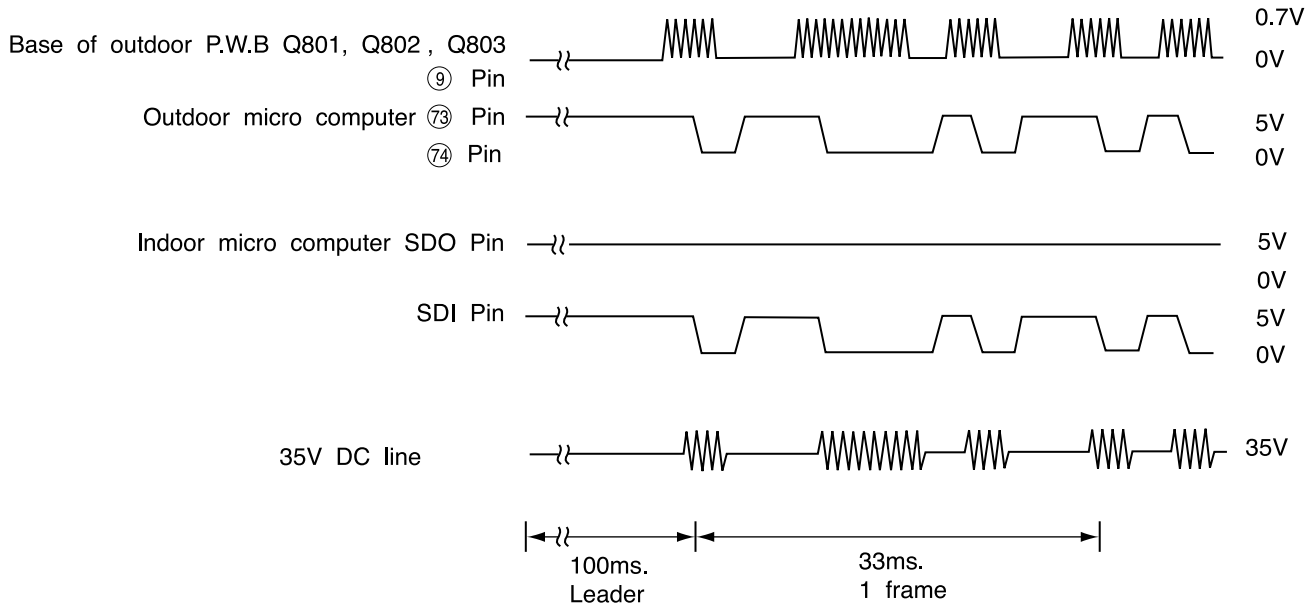


Fig. 2-2 Voltages Waveforms of indoor / Outdoor Micro computers (Outdoor to Indoor Communications)

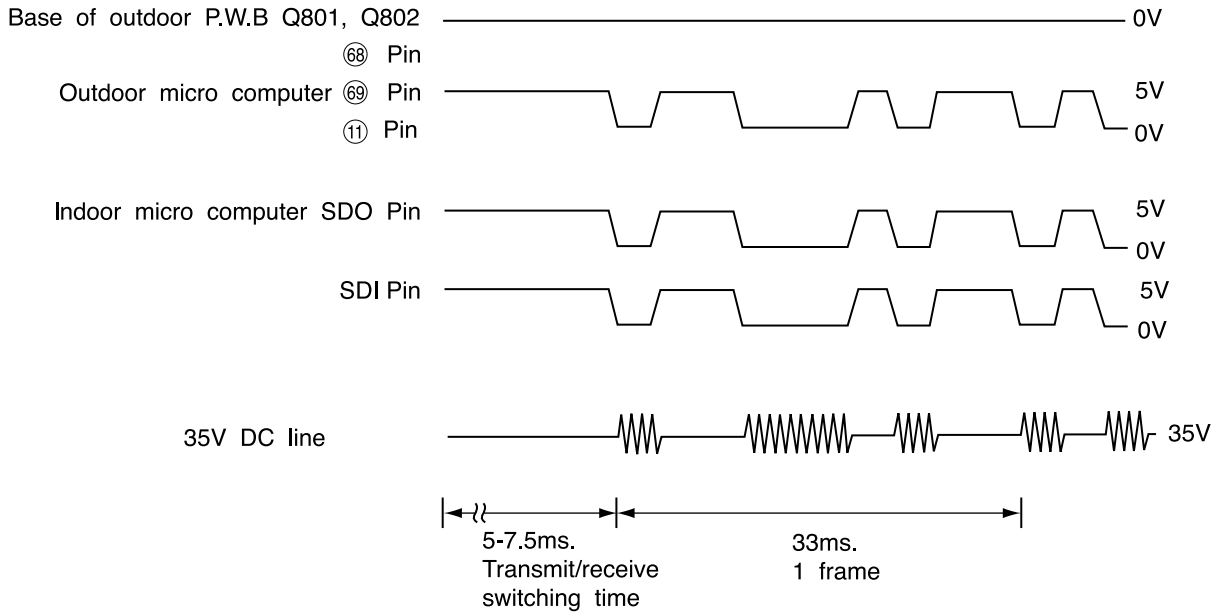


Fig. 2-3 Voltages Waveforms of indoor / Outdoor Micro computers (Indoor to Outdoor Communications)

3. Power Module Circuit

- Fig. 3-1 shows the system power module and its peripheral circuit. (Current ACT module and power module are combined into one unit.)
  The three transistors on the positive ⊕ side are called the upper arm, and the three transistors on the negative ⊖ side, the lower arm.

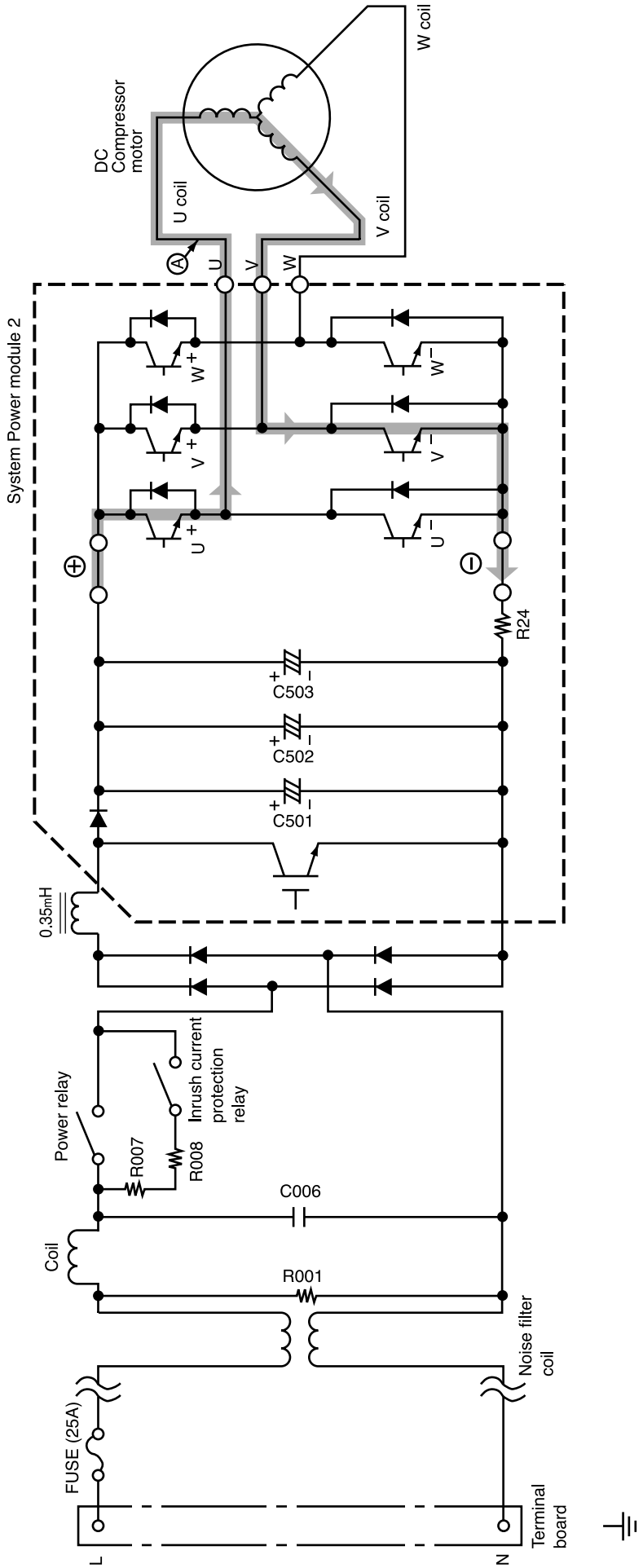


Fig. 3-1 Power module circuit (U^+ is ON, V^- is ON)

- DC 320-360V is input to power module and power module switches power supply current according to rotation position of magnet rotor. The switching order is as shown in Fig. 3-2.

[※ At point E: U^+ is ON, V^- is ON (circuit in Fig. 3-1)
※ At point F: U^+ is chopped (OFF), V^- is ON (circuit in Fig. 3-4)]

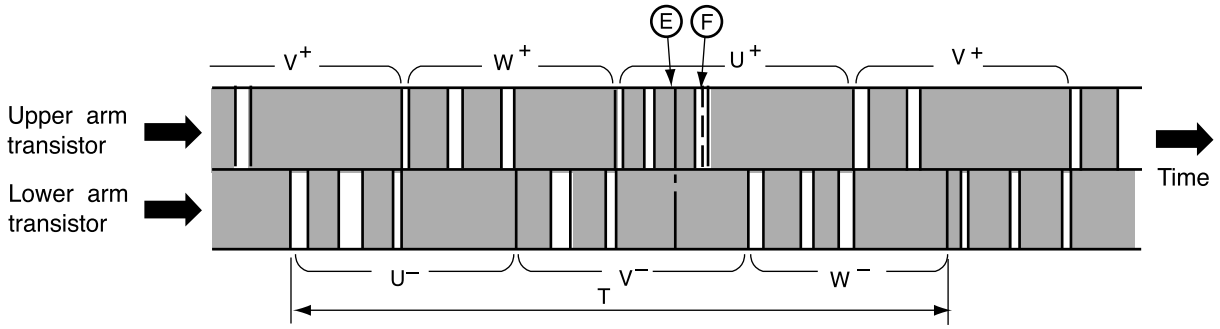


Fig. 3-2 Switching order of power module

- Upper arm transistor is controlled to ON/OFF by 3.2kHz chopper signal. Rotation speed of the compress is proportional to duty ratio (ON time/ ON time + OFF time) of this chopper signal.
- Time T in Fig. 3-2 shows the switching period, and relation with rotation speed (N) of the compressor is shown by formula below;

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

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

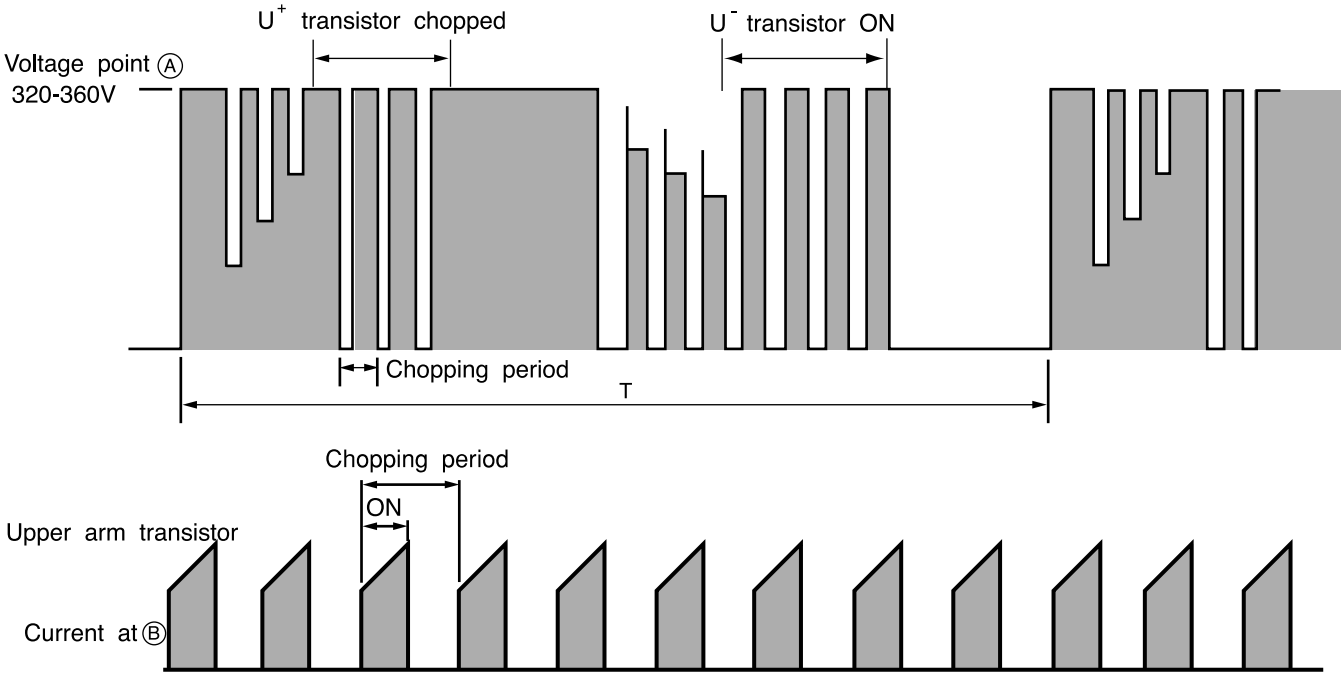


Fig. 3-3 Voltage waveform at each point

- When power is supplied $U^+ \rightarrow U^-$, because of that U^+ is chopped, current flows as shown below; Ⓑ
  (1) When U^+ transistor is ON: U^+ transistor → U coil → V coil → V^- transistor → DC current detection resistor → Point Ⓑ (Fig. 3-1)
  (2) When U^+ transistor is OFF: (by inductance of motor coil) U coil → V coil → V^- transistor → Return diode → Point Ⓐ (Fig. 3-4)

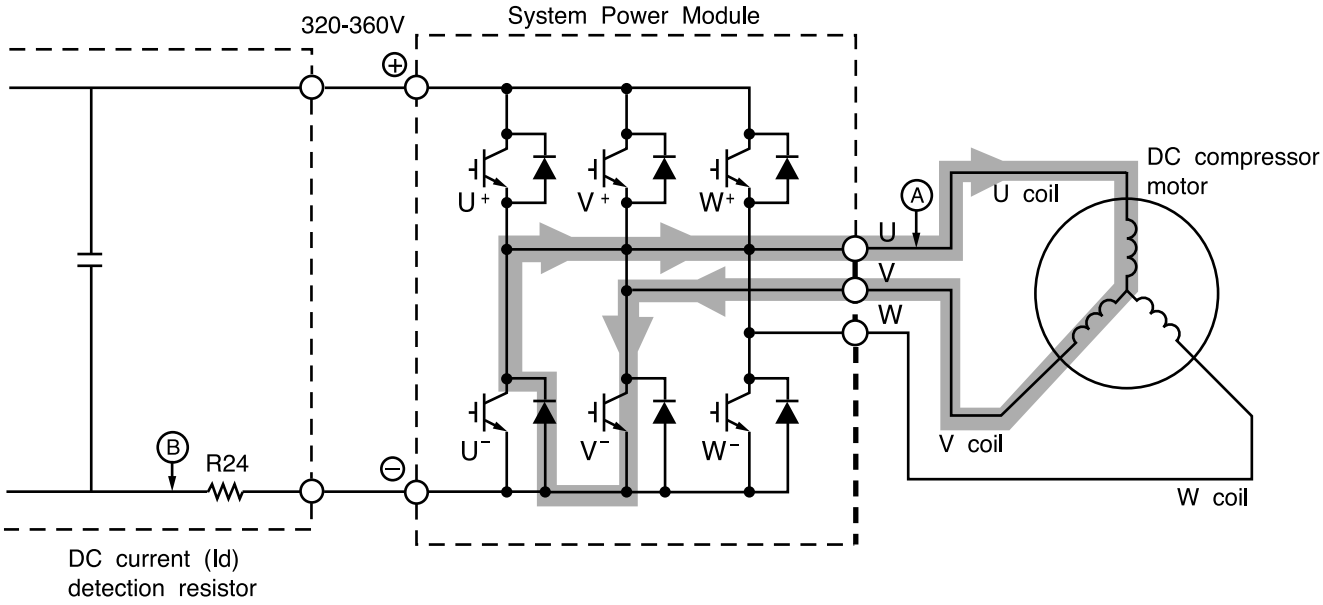


Fig. 3-4 System Power module circuit (U^+ is OFF, V^- is ON)

- Since current flows at point Ⓑ only when U+ transistor and V^- transistor is ON, the current waveform at point Ⓑ becomes intermittent waveform as shown in Fig. 3-3. Since current at point Ⓑ is approximately proportional to the input current of the air conditioner, input current is controlled by using DC current (Id) detection resistor.

<Reference>

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

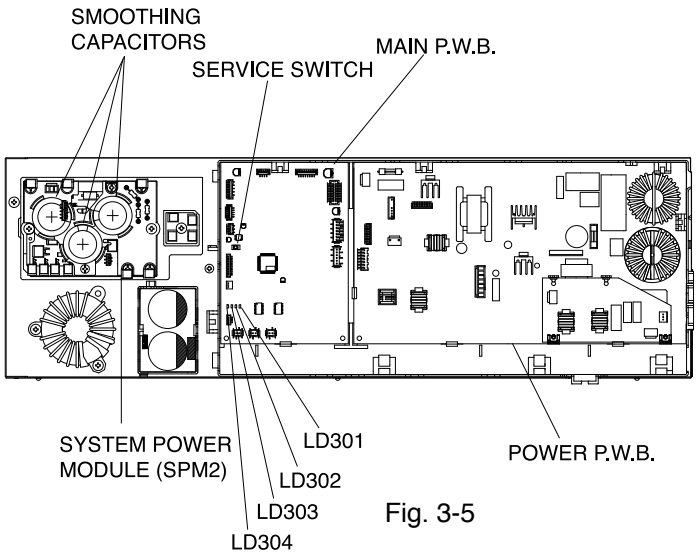


Fig. 3-5

Table 3-1

Self-diagnosis	Self-diagnosis lamp and mode	
Ip (peak current cut)	LD301	Blinks 2 times
Abnormal low speed rotation	LD301	Blinks 3 times
Switching incomplete	LD301	Blinks 4 times

※ From results of power module simple inspection (inspection mode when operated with compressor lead disconnected), LD310 blinks four times about 2 seconds later: Unit has not entered the normal operation.

4. Power Supply Circuit

- Fig. 4-1 shows the power circuit.

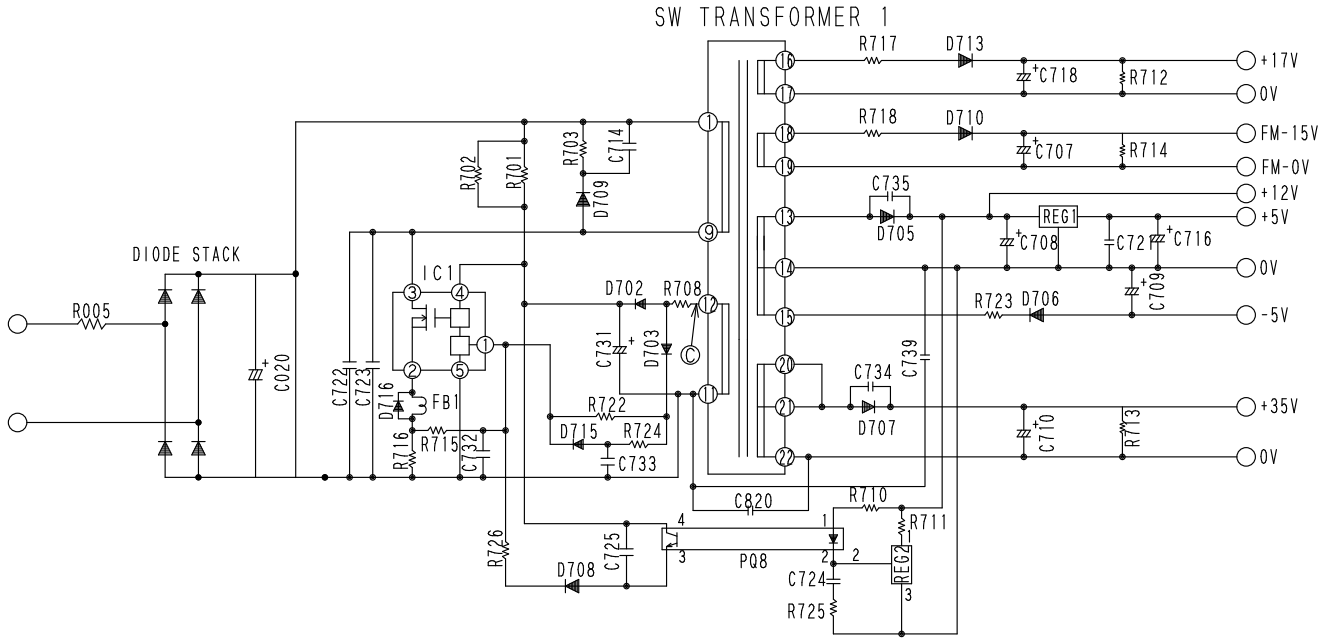


Fig. 4-1 Power circuit for P.W.B.

- There are two switching power supply in Power PWB.
- Switching power supply 1 is generating the secondary power for control circuits and DC35V indoor unit.
- Switching power supply performs voltage conversion effectively by switching transistor IC1 to convert DC330V to high frequency of approximately 20kHz to 200kHz.
- Transistor IC1 operates as follows:

(1) Shifting from OFF to ON

- DC about 330V is applied from smoothing capacitors C020 ⊕ and ⊖ in the control power circuit. With this power, current flows to pin ④ of IC1 via R701 and IC1 starts to turn ON. Since voltage in the direction of arrow generates at point ⓒ at the same time, current passing through R708 and D702 is positive-fed back to IC1.

(2) During ON

- The drain current at IC1 increases linearly. During this period, the gate voltage and current become constant because of the saturation characteristics of the transformer.

(3) Shifting from ON to OFF

- This circuit applies a negative feedback signal from the 12V output. When the voltage across C708 reaches the specified value, REG2 turns on and current flows to PQ8 ①-②. This turns the secondary circuits on, sets IC1 pin ① to “Hi”, and turns IC1 off.

(4) During OFF

- While IC1 is on, the following energy charges the primary windings of the transformer:

  Energy=$LI^2/2$. Here, L : Primary inductance

  I : Current when IC1 is off

  This energy discharges to the secondary windings during power off. That is, C707-C710, C718 is charged according to the turn ratio of each winding.
- At the start, an overcurrent flows to IC1 because of the charged current at C707-C710, C718.
- The drain current at IC1 generates a voltage across R716. If it exceeds the IC1 base voltage, it sets the IC gate voltage to “HI”.
- R716 limits the gate voltage to prevent excessive collector current from flowing to IC1.
- This SW power circuit uses a frequency as low as 20kHz, especially at a low load (when both the indoor and outdoor units stop): This reduces power loss in standby status.

<Reference>

If the power circuit for P.W.B. seems to be faulty:

(1) Make sure that 5V, 12V, 15V, 17V and -5V on the control P.W.B. power voltage are the specified values.

(2) When only the 5V output is low:
REG 1 (regulator) faulty, 5V-0V shorted, output is too high, or REG 1 is abnormal.

(3) When 12V and 5V are abnormal:
The following defects can be considered:
① Fan, operation, power, rush prevention relay (shorting in relay, etc.)
② REG 1 (regulator is abnormal), etc.
Shorting on primary circuits.
When shorting occurs in the secondary circuits, there is no abnormality in the primary circuits because of overcurrent protection.
The voltage rises when an opening occurs in the primary circuits, or the feedback system is abnormal.

(4) When 15V and 17V power supply are abnormal:
D710, D713 or Drive circuit is abnormal.

(5) When all voltage are abnormal:
IC1, R716, may possibly be defective. Also D cable may possibly be reverse connected.
If IC1 is abnormal, be aware that other components, such as the power module, REG (regulator), etc. are possibly defective.

[When the switching power supply seems to be abnormal, the voltage between IC1 pin ④ (to be measured at the leads of R701 and R702) and IC1 pin ⑤ (to be measured at R216 lead) may be between 11 and 16V. This is because the protection circuit of IC is operating.]

6. Rotor magnetic pole position detection circuit

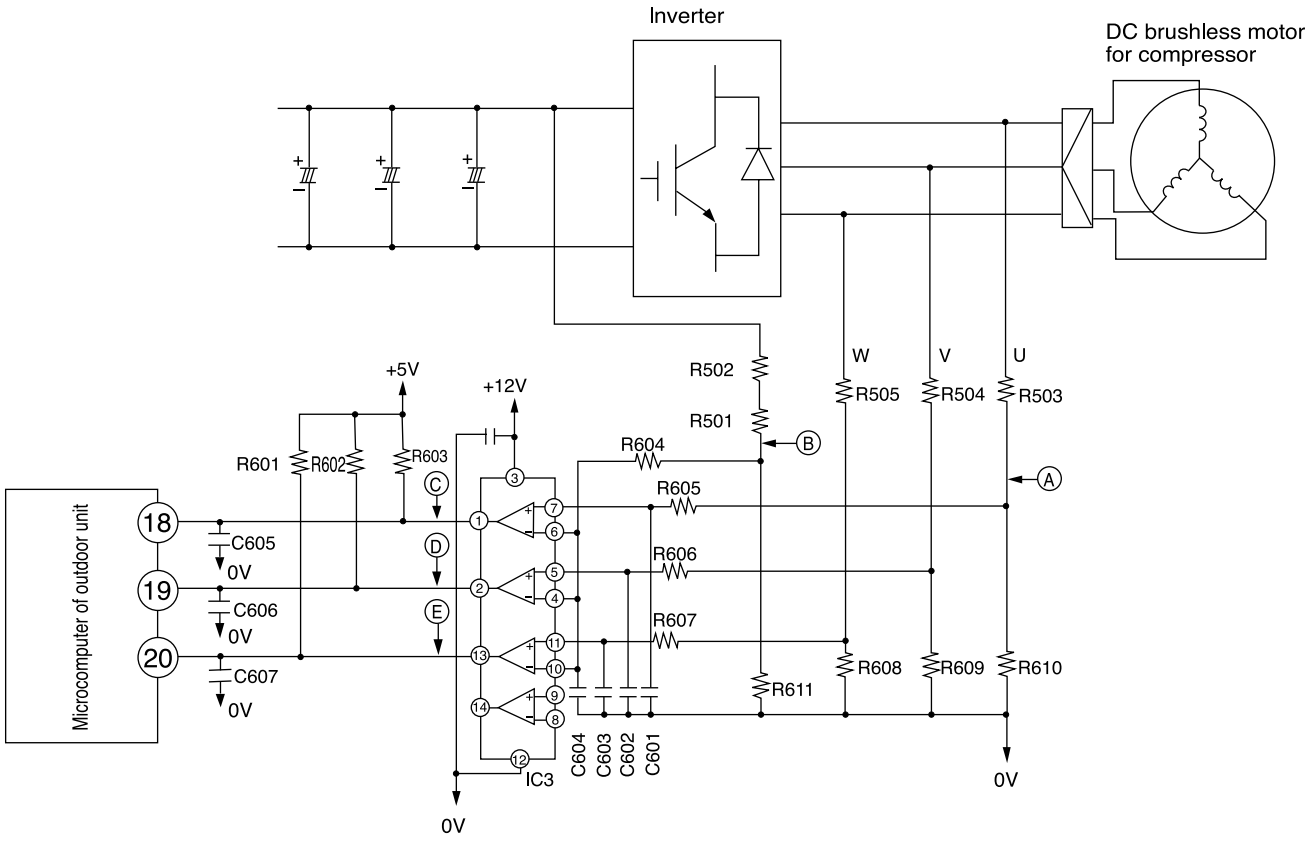


Fig. 6-1 Rotor magnetic pole position detection circuit

When the DC brushless motor is rotated, it also operates as power generator, generating reverse electromotive force according to number of rotations. This reverse electromotive force is voltage-divided by R503 – R505 and R608 – R610, and appears as point Ⓐ voltage. IC3 compares and digitalizes point Ⓐ voltage with point Ⓑ voltage (in which DC voltage (Vd) is voltage-divided by R501, R502 and R611), and inputs this to microcomputer as position detection signals for points Ⓒ, Ⓓ and Ⓔ. Microcomputer switches inverter using optimum timing based on position detection signals, in order to control the rotation of the brushless motor.

7. Peripheral circuit of microcomputer

- Fig. 7-1 shows the microcomputer and its peripheral circuits.
  Table 7-1, the basic operations of each circuit block, and Fig. 7-2, the system configuration.

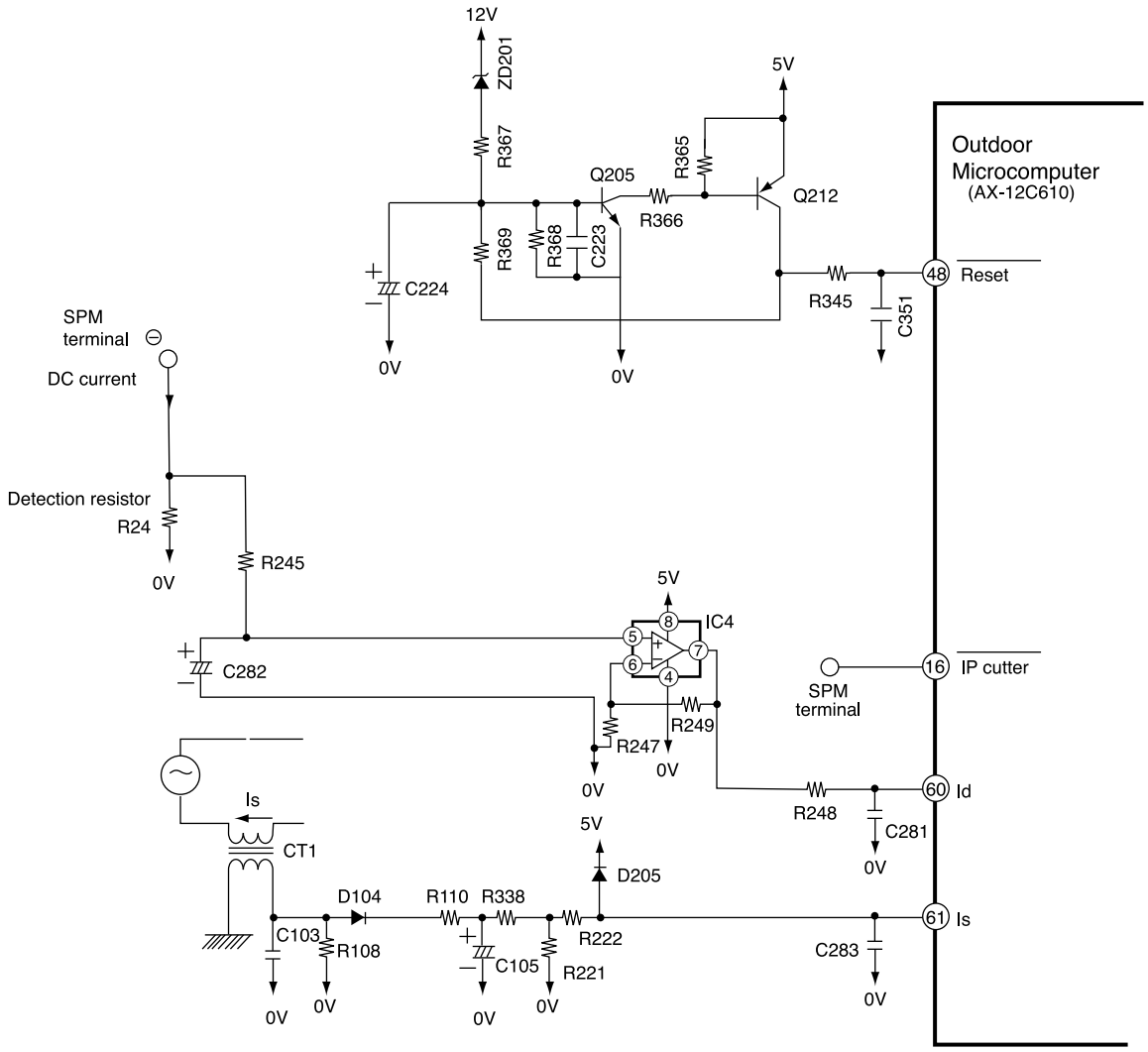


Fig. 7-1 Peripheral circuit of microcomputer (AX-6V)

Table 7-1

Circuit block	Basic operation
Peak current cutoff circuit	This circuit detects DC current flowing power module: When over-current (instantaneous value) flows, it stops upper and lower arm drive circuit and also produces Ip signal to stop microcomputer.
Overload external judgment circuit	This circuit detects DC current flowing to power module and produces signal to notify microcomputer of overload status.
Voltage amplifier circuit	This circuit voltage-amplifies DC current level detected by detection resistor and sends it to microcomputer. In addition, setting of internal/external overload judgment is performed.
Reset circuit	This circuit produces reset voltage.

8. Overload control circuit (OVL control circuit)

- Overload control is to decrease the speed of the compressor and reduce the load when the load on the air conditioner increases to an overload state, in order to protect the compressor, electronic components and power breaker.
- Overloads are judged by comparing the DC current level and set value.
- Fig. 8-1 shows the overload control system configuration and Fig. 8-2 is a characteristic diagram of overload judgement values. There are two judgement methods-external judgement which compares the externally set value with the DC current value regardless of the rotation speed and internal judgement which compares the set value that varies according to the rotation speed programmed in the microcomputer software with the DC current value.

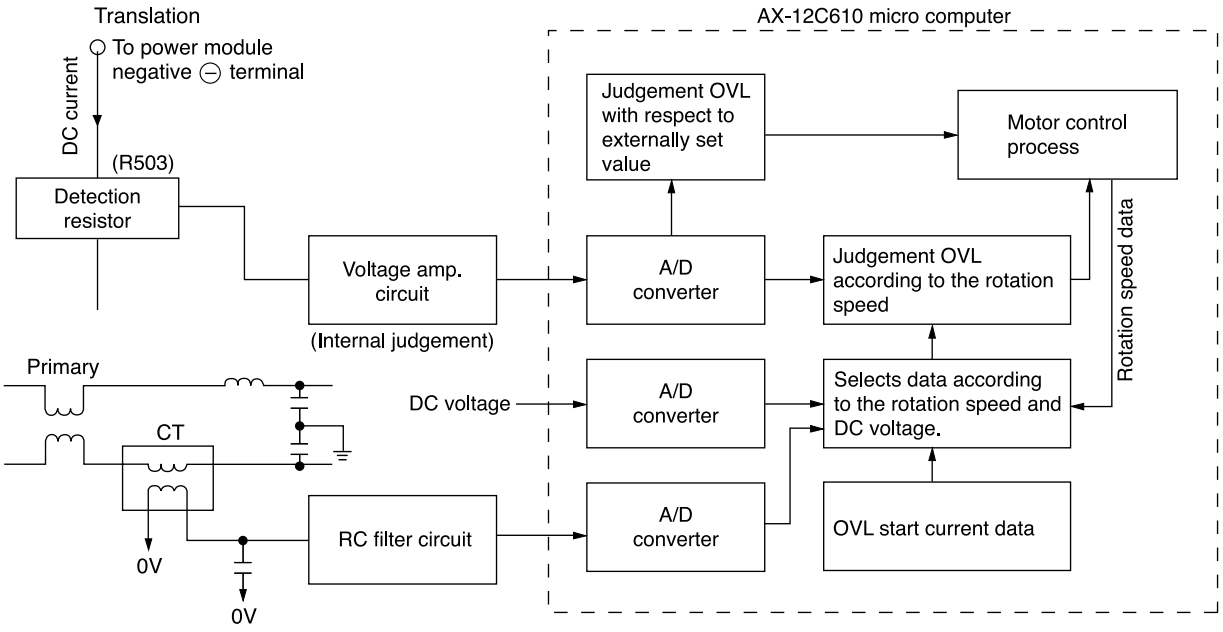


Fig. 8-1 Overload Control System Configuration

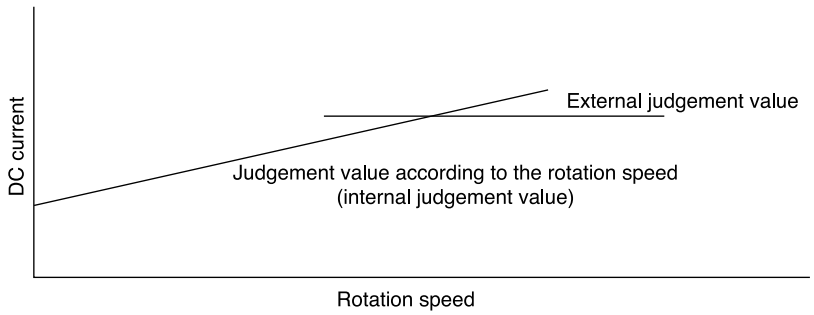


Fig. 8-2

9. Reset Circuit

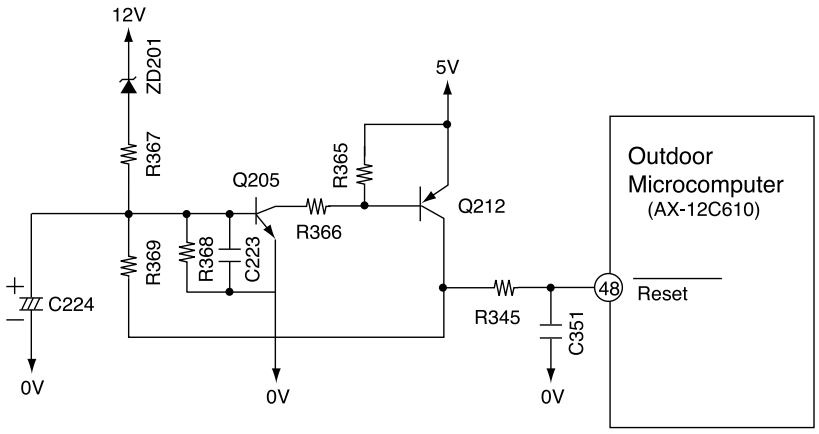


Fig. 9-1

- Reset circuit performs initial setting of the microcomputer program when power is turned on.
- Microcomputer resets program with reset voltage set to Lo, to enable operation at Hi level.
- Fig. 9-1 shows the reset circuit, and Fig. 9-2 shows waveform at each point when power is turned on/off.
- After power is turned on, 12V line and 5V line voltages rise: When 12V line voltage reaches 7.2V (Zener voltage of ZD201), ZD201 turns ON and Q211 and Q205 turn on, and reset voltage becomes Hi. Reset voltage is not set to Hi until VDD of microcomputer rises to 5V, enabling operation, due to ZD201.
- After power turns off, when 12V line voltage drops, ZD201 also turns OFF.

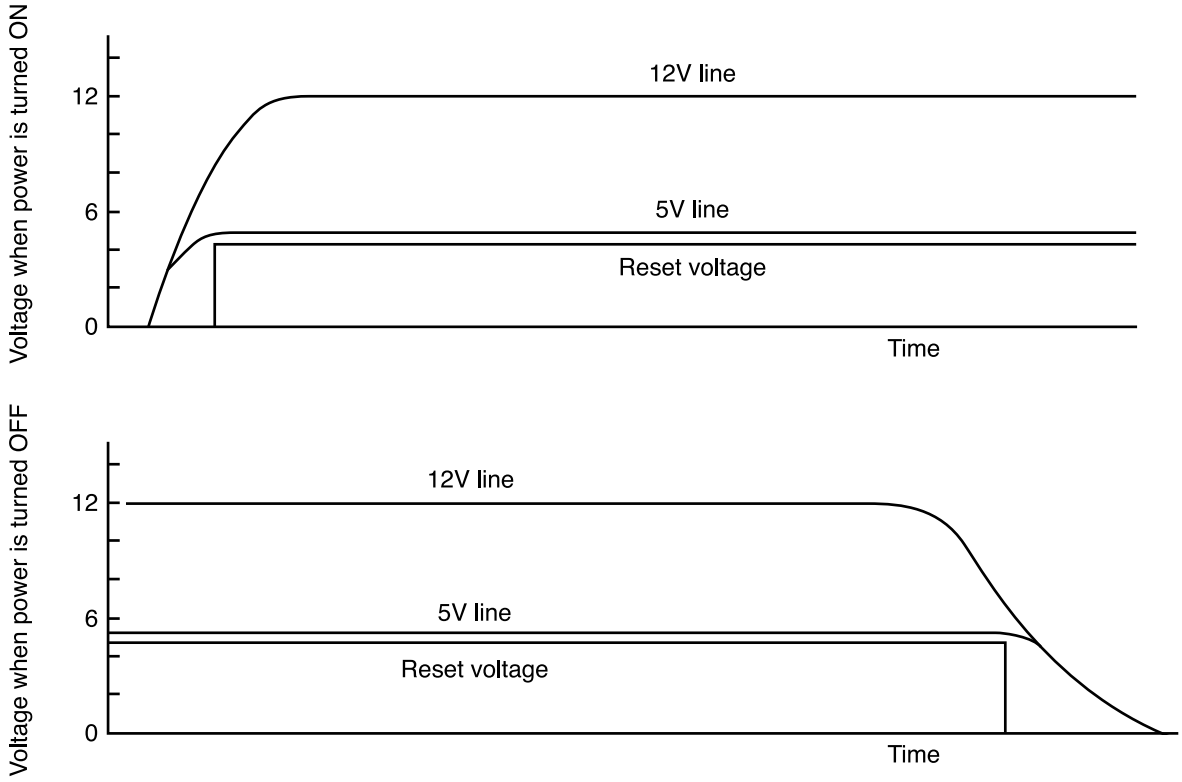


Fig. 9-2

10. Temperature Detection Circuit

- The outdoor units (this model) provides with the outdoor temperature thermistor, DEF (defrost) thermistor and OH (overheat) thermistor so that they detect the temperatures of the unit and control the system.
- The circuit of the thermistors is shown as Fig. 10-1, and their roles and temperature measuring points are shown as Table 10-1.

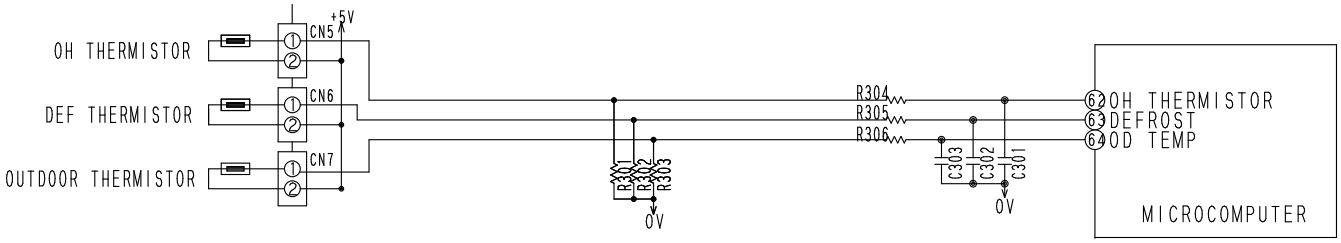


Fig. 10-1 Temperature Detection Circuit

Table 10-1 Name and Role of each thermistor

Name	Connector No	Measuring Point	Role
OH thermistor	CN5	Compressor head	If the temperature of the compressor rises abnormally (118˚C), the compressor will be stopped. The temperature is used to decide the operation of the valve.
DEF thermistor	CN6	Heat exchanger	The thermistors decide the defrost operation during heating combined the data of the outside temperature and its data.
Outdoor temperature thermistor	CN7	Outside temperature	Outdoor temperature is used to decide the various operations of the air conditioner.

- Table 10-2 shows the correspondence between the thermistor's resistance and the temperature. They should be used as reference values. The value, which you measure, may be slightly difference from that in the table. It depends on the instrument.
- When you measure the resistance, pull out the connector after turning off the power supply. Pulling out the connector while the power supply is turned on will cause troubles.

Table 10-2 Correspondence between each thermistor's resistance and temperature (reference value)

DEF thermistor	Temperature	Resistance	Microcomputer pin potential
	-15˚C	12.6kΩ	1.0V
	0˚C	6.1kΩ	1.7V
	25˚C	2.2kΩ	3.0V
	50˚C	860Ω	3.9V
	75˚C	400Ω	4.4V
Outdoor temperature thermistor	Temperature	Resistance	Potential
	-15˚C	12.6kΩ	1.0V
	0˚C	6.1kΩ	1.7V
	15˚C	3.2kΩ	2.4V
	30˚C	2kΩ	3.1V
OH thermistor	Temperature	Resistance	Potential
	25˚C	33.9kΩ	0.5V
	50˚C	10.8kΩ	1.3V
	75˚C	4.1kΩ	2.4V
	100˚C	1.7kΩ	3.4V
	105˚C	1.5kΩ	3.6V
	118˚C	1kΩ	3.9V

- When the connectors of the thermistors are disconnected or the thermistors is open or short, LD301 (red) lights and LD302 (red) blinks so that they indicate troubled parts. Combinations of LD301 and LD302 are set up for indicating troubled thermistors. The correspondences between the number of blink time and troubled parts are shown as Table 10-3. Look in the table (LD301 and LD302 blink) for troubled parts, and if the disconnections of them are checked out, they are replaced.
- If you can see two or more troubled thermistors, a small number of blink takes precedence of others.
- The electric expansions valve thermistor is put together with 3 pieces, when replacing the thermistor, replace one set of 3 pieces as taking care of positioning. If you don't do so, the unit may not operate normally and its cooling performance may drop.
- Beware that only an open-circuit for OH thermistor has to be checked in 5 minutes after the compressor starts.
- If the unit operates abnormally after replacing the thermistor, replace the control P.W.B. because it malfunctions.

Table 10-3 LED lighting mode at the thermistors troubled

LED lighting mode		Troubled thermistor	Judgement	
LD301	LD302		Open	Short
Lights	1 blink	OH thermistor	0.04V or less	4.96V or more
Lights	2 blinks	DEF thermistor	0.04V or less	4.94V or more
Lights	3 blinks	Outdoor temperature thermistor		
Lights	4 blinks	Electric expansion value thermistor (thin pipe 1)		
Lights	5 blinks	Electric expansion value thermistor (thick pipe 1)		
Lights	6 blinks	Electric expansion value thermistor (thin pipe 2)		
Lights	7 blinks	Electric expansion value thermistor (thick pipe 2)		
Lights	8 blinks	Electric expansion value thermistor (thin pipe 3)	0.04V or less	4.94V or more
Lights	9 blinks	Electric expansion value thermistor (thick pipe 3)		

- The OH thermistors are detecting the compressor head temperatures. If the temperature rises over 118˚C, the compressor in the cycle will be stopped to protect itself and LD301 will blink 6 times (OH STOP). When the compressor temperature fells under 105˚C, the compressor will restart. During OH STOP, the fan continues to spin. The other cycles without a trouble operates normally.
- If OH STOP often occurs, the refrigerant may be leaking.

11. Electric expansion valve

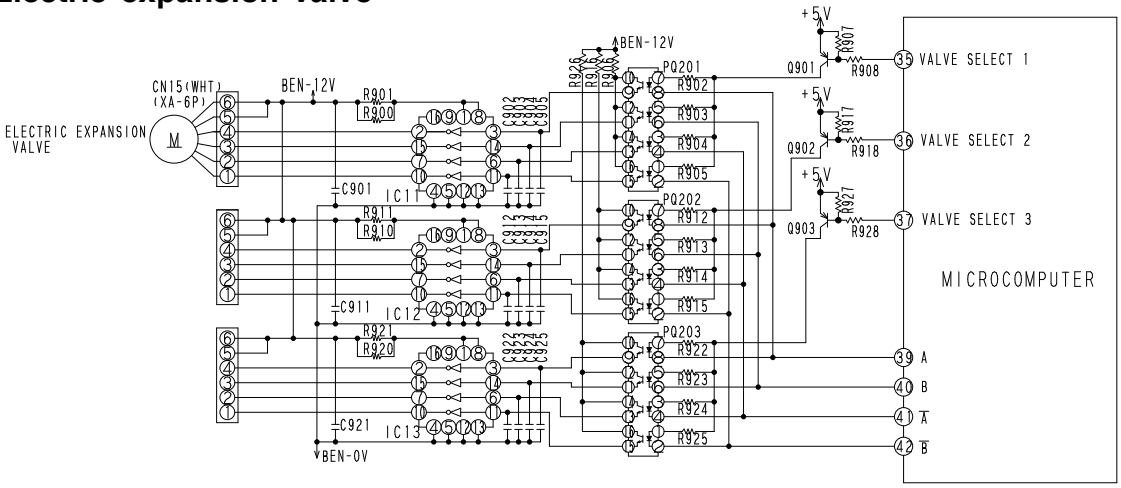


Table 11-1

- The electric expansion valve is driven by DC 12V. Power is supplied to 1 or 2 phases of 4-phase winding to switch magnetic pole of winding in order to control opening degree.
- Relationship between power switching direction of phase and open/close direction is shown below.

  When power is supplied, voltages at pins 4 to 1 of CN15 are about 0.9V; they are about 12V when no power is supplied. When power is reset, initialization is performed for 10 or 20 seconds.

  During initialization, measure all voltages at pins 4 to 1 of CN15 using mutimeter. If there is any pin with voltage that has not changed from around 0.9V or 12V, expansion valve or microcomputer is defective.
- Fig. 11-2 shows logic waveform when expansion valve is operating.

Table 11-2

Pin phase No.	Lear wire	Drive status							
		1	2	3	4	5	6	7	8
④	White	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
③	Yellow	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
②	Orange	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
①	Blue	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

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

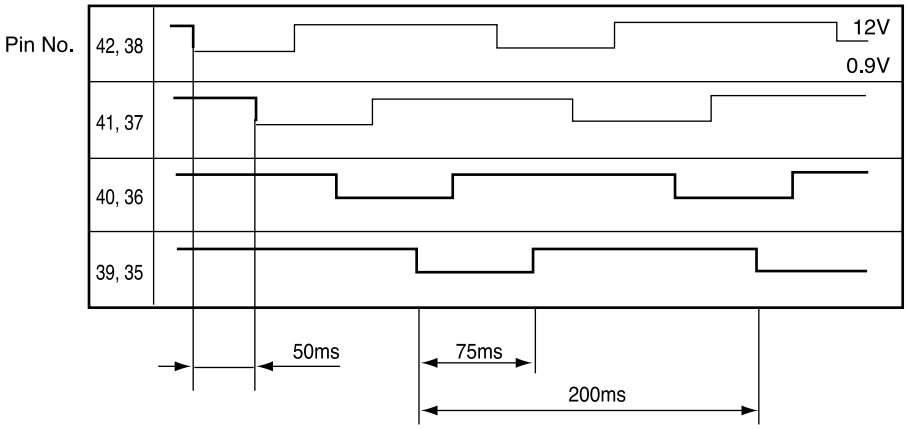


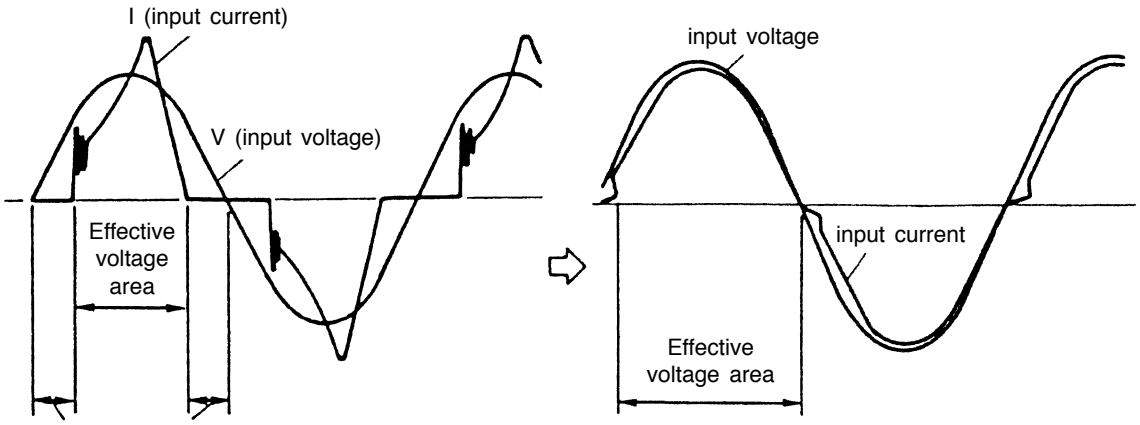
Fig. 11-2

With expansion valve control, opening degree is adjusted to stabilize target temperature, by detecting temperature of compressor head.

The period of control is about once per 20 seconds, and output a few pulses.

12. Power Factor Control Circuit

Power factor is controlled by almost 100%. (Effective use of power)
With IC in ACT module, control is performed so that input current waveform will be similar to waveform of input voltage.



*Assuming the same current capacity (20A), power can be used about 10% effective, comparing with curent use (power factor of 90%), and maximum capacity is thereby improved.

SERVICE CALL Q & A

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

Q2 Sound of running water is heard from indoor unit during dehumidifying.

A2 Normal sound when refrigerant flows in pipe.

Q3 Compressor occasionally does not operate during dehumidifying.

A3 Compressor may not operate when room temperature is 10°C or less. It also stops when the humidity is preset humidity or less.

HEATING MODE

Q4 The circulation stops occasionally during Heating mode.

A4 It occurs during defrosting. Wait for 5-10 minutes until the condenser is defrosted.

Q5 When the fan speed is set at HIGH or MED, the flow is actually Weak.

A5 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.

Q6 Heating operation stops while the temperature is preset at “30”.

A6 If temperature is high in the outdoor, heating operation may stop to protect internal devices.

AUTO FRESH DEFROSTING

Q7 After the ON/OFF button is pressed to stop heating, the outdoor unit is still working with the OPERATION lamp blinking.

A7 Auto Fresh Defrosting is carried out : the system checks the outdoor heat exchanger and defrosts it as necessary before stopping operation.

AUTO OPERATION

Q8 Fan speed does not change when fan speed selector is changed during auto operation.

A8 At this point fan speed is automatic.

NICE TEMPERATURE RESERVATION

Q9 When on-timer has been programmed, operation starts before the preset time has been reached.

A9 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.

Q10 Does “Nice temperature reservation” function operate during dehumidifying?

A10 It does not work. It works only during cooling and heating.

Q11 Even if the same time is preset, the operation start time varies.

A11 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.

INFRARED REMOTE CONTROL

Q12 Timer cannot be set.

A12 Has the clock been set? Timer cannot be set unless the clock has been set.

Q13 The current time display disappears soon.

A13 The current time disappears in approx. 10 seconds. The time set display has priority.

When the current time is set the display flashes for approx 3 minutes.

Q14 The timer has been programmed, but the preset time disappears.

A14 Is the current time past the preset time? When the preset time reaches the current time, it disappears.

OTHERS

Q15 The indoor fan varies among high air flow, low air flow and breeze in the auto fan speed mode. (Heating operation)

A15 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 speed mode. When the temperature is low, the fan speed varies among high air flow, low air flow and breeze.

Q16 Loud noise from the outdoor unit is heard when operation is started.

A16 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.

Q17 Noise from the outdoor unit occasionally changes.

A17 The compressor rotation speed changes according to the difference between the thermostat set temperature and room temperature. This does not indicate a fault.

Q18 There is a difference between the set temperature and room temperature.

A18 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.

Q19 Air does not flow immediately after operation is started.

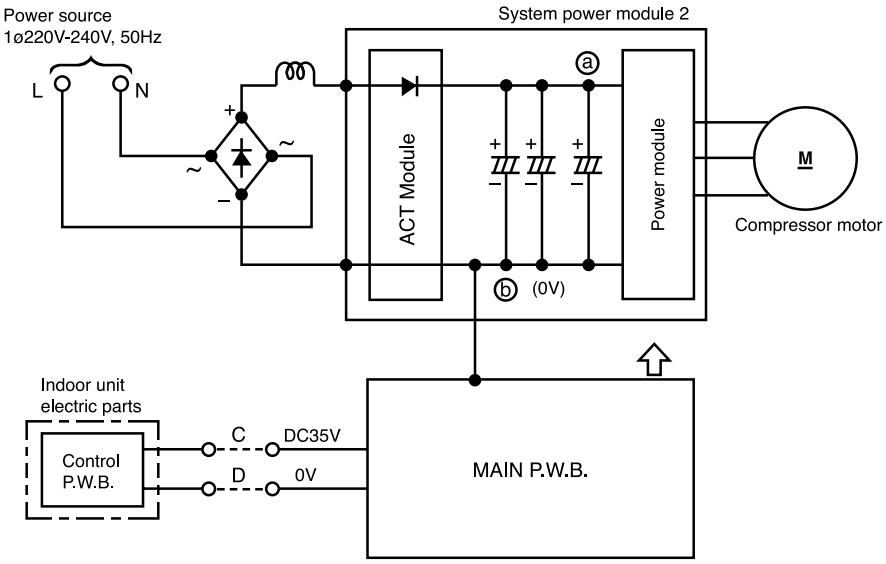
A19 Preliminary operation is performed for one minute when the power switch on and heating or dehumidifying is set. The operation lamp blinks during this time for heating. This does not indicate a fault.

TROUBLE SHOOTING

PRECAUTIONS FOR CHECKING

□ANGER

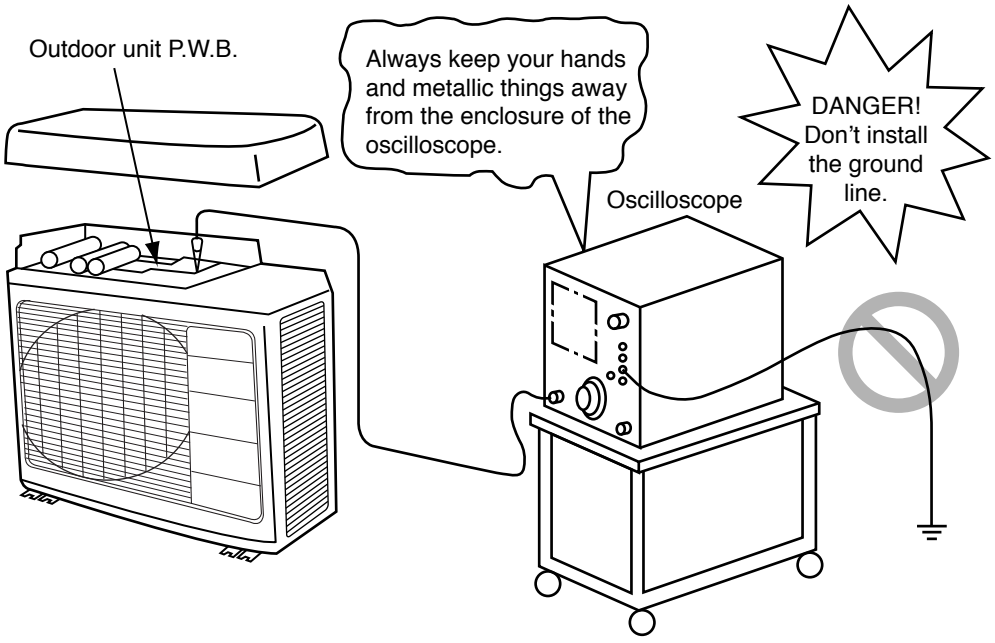
1. Remember that the 0V line is biased to 155-170V in reference to the ground level.
2. Also note that it takes about 10 minutes until the voltage fall after the power switch is turned off.



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.

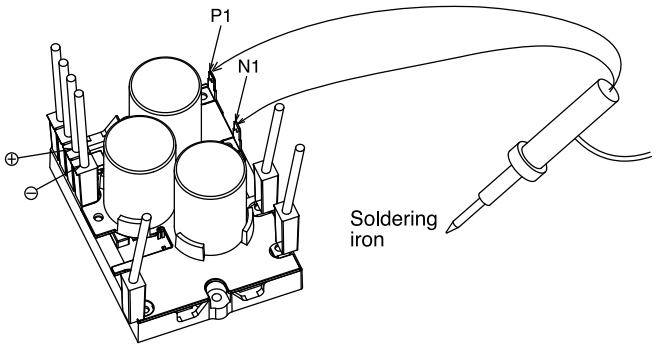


DISCHARGE PROCEDURE AND POWER SHUT OFF METHOD FOR POWER CIRCUIT

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)

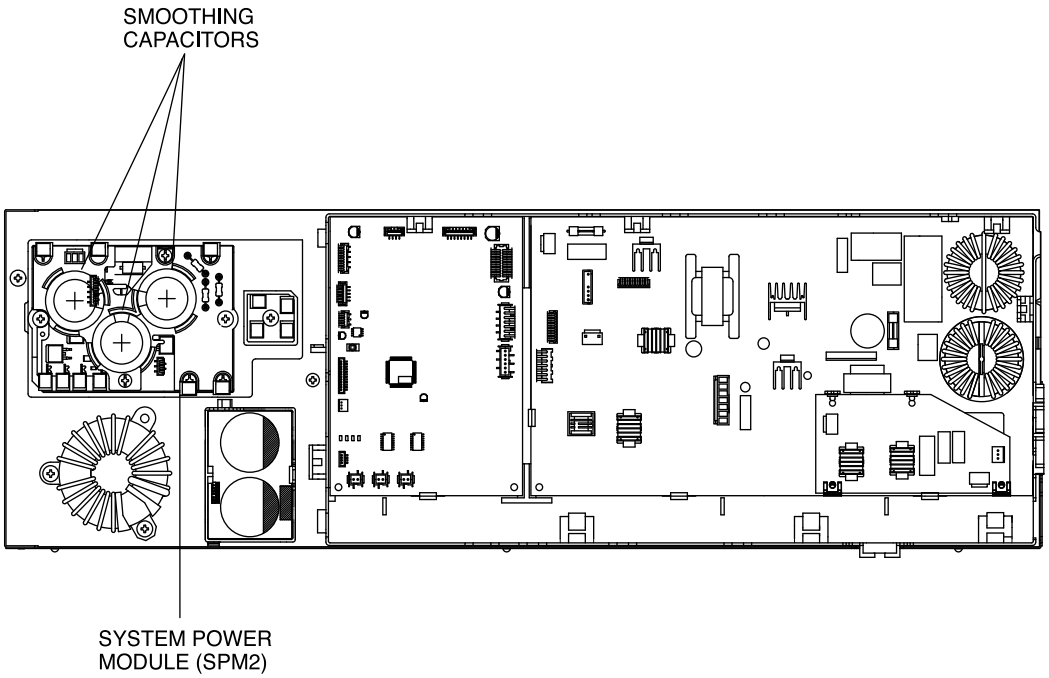
1. Turn OFF the Power supply to the outdoor unit.
2. After power is turned off, wait for 10 minutes or more. Then, remove electrical parts cover and apply soldering iron of 30 to 75W for 15 seconds or more to P2 and N1 terminals on system power module, in order to discharge voltage in smoothing capacitor.
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)



TROUBLESHOOTING WHEN TIMER LAMP BLINKS

Model RAD-50PPA, RAD-60PPA, RAD-70PPA

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

SELF-DIAGNOSIS LIGHTING MODE

Model: RAD-50PPA, RAD-60PPA, RAD-70PPA

<Remark>

If using wired remote controller, electrical cover have to be opened so that timer lamp at indoor p.w.b can be seen as Fig. 1.

If using wireless remote controller (optional part), no need to open electrical cover. Refer the timer lamp at panel-as (Fig. 2).

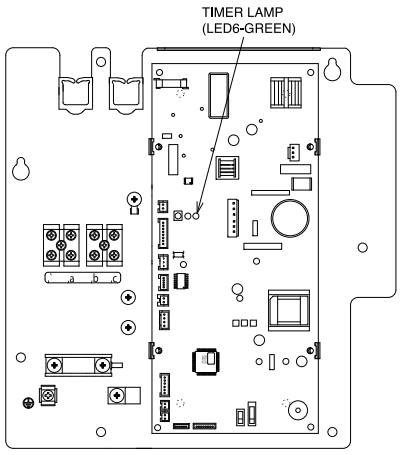


Fig. 1

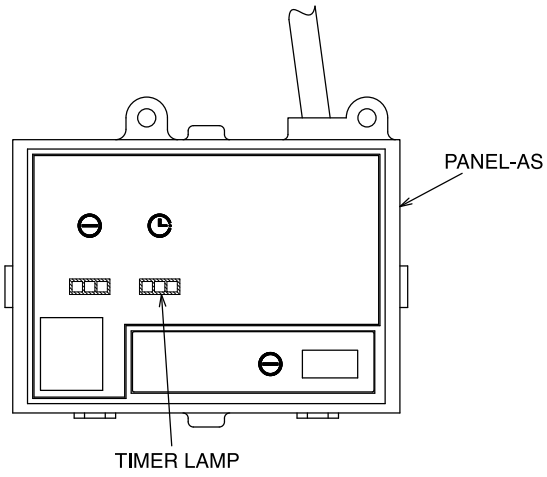


Fig. 2

No.	Timer indicator flashing mode	Reason for display	Section of estimated fault
1	2 sec. – – – – – – – – Once	**Four-way valve faulty** The room heat exchange temperature is low during heating, or it is high during cooling.	(1) Four-way valve faulty. (2) Disconnection in heat exchange thermistor (only during heating)
2	2 sec. – – – – – – – Twice	**Outdoor unit forced operation** The outdoor unit is in forced operation or undergoing balancing after forced operation.	Service SW in outdoor electrical parts turned ON.
3	2 sec. – – – – – – 3 times	**Indoor/outdoor interface faulty** The interface signal from the outdoor unit has been interrupted.	(1) Indoor interface circuit (2) Outdoor interface circuit
4	2 sec. – – 4 times	**Outdoor electrical assembly defective.**	Please check at the outdoor electrical led lamp blinking (LD301) and refer to self diagnosis lighting mode for outdoor unit.
5	2 sec. – – 6 times	**Abnormal water level detection** All stop when the float switch has been activated.	(1) Drain stopped up (2) Drain pump (3) Float switch
6	2 sec. – – 7 times	**Drain pump forced operation.** When the knob of drain pump test switch at Indoor P.W.B main slide to 'test' position.	(1) Indoor P.W.B. Main.
7	2 sec. – – 9 times	**Room thermistor or heat exchanger thermistor is faulty** When room thermistor or heat exchanger thermistor is opened circuit or short circuit.	(1) Room thermistor (2) Heat exchanger thermistor
8	2 sec. – – 10 times	**DC fan motor overcurrent detection** Overcurrent in indoor DC fan motor has been detected.	(1) Indoor fan locked (2) Indoor fan motor (3) Indoor P.W.B. Main
※1 9	2 sec. – – 13 times	**IC401 data reading fault** There was error in the data read from IC401	IC401 faulty

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

<Cautions>

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

(2) If the indoor unit does not operate at all, check to see if the connecting cable is connected or disconnected.

(3) To check operation again when the timer lamp is blinking, you can use the remote control for operation (except for mode mark ※1).

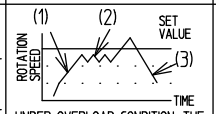
SELF-DIAGNOSIS LIGHTING MODE

MODEL RAC-50DPA, RAC-60DPA, RAC-70DPA

⚠ 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 RED	LD302 RED	LD303 RED	LD304 GRN	SELF-DIAGNOSIS NAME	DETAILS	MAIN CHECK POINT
				[1] DURING OPERATION		
□	□	■	□	NORMAL OPERATION	COMPRESSOR OPERATION	NOT MALFUNCTION
■	□	■	□	OVERLOAD (1)		THIS SHOWS AN OVERLOAD, NOT MALFUNCTION.
□	■	■	□	OVERLOAD (2)		
■	■	■	□	OVERLOAD (3)	UNDER OVERLOAD CONDITION, THE ROTATION SPEED IS CONTROLLED AUTOMATICALLY IN ORDER TO PROTECT THE COMPRESSOR.	

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

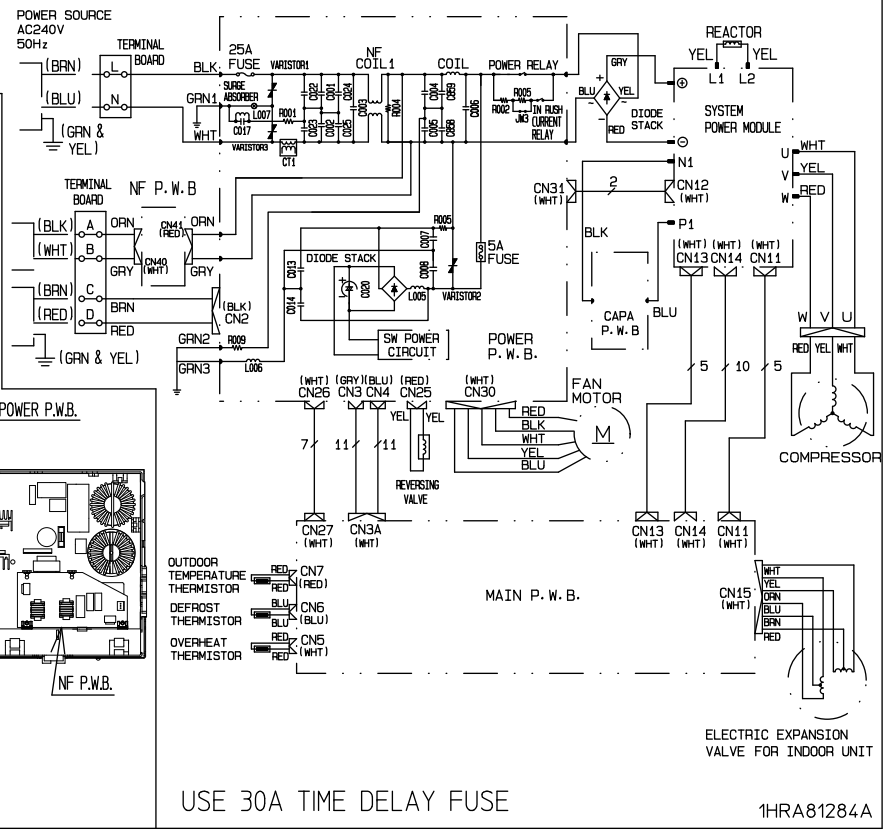
CORRESPONDENCE TABLE FOR ABNORMAL THERMISTOR

BLINKING TIME	ABNORMAL THERMISTOR
1 TIME	OVERHEAT THERMISTOR
2 TIMES	DEFROST THERMISTOR
3 TIMES	OUTDOOR TEMPERATURE THERMISTOR

LD301	LD302	LD303	LD304	[2] DURING STOP		
□	□	□	□	NORMAL STOP	INDOOR THERMOSTAT OFF. MAIN OPERATION OFF.	NOT MALFUNCTION.
▨	□	□	□	RESET STOP	WHEN STOPPED WITH POWER RESET. (NORMAL WHEN POWER HAS BEEN TURNED ON).	① P.W.B.s (POWER CIRCUIT,HIC, ETC.)
▨	□	□	□	PEAK CURRENT CUT	OVER CURRENT IS DETECTED.	① COMPRESSOR ② P.W.B.s
▨	▨	□	□			① SYSTEM POWER MODULE ② P.W.B.s
▨	□	□	□	ABNORMAL LOW SPEED ROTATION	POSITION DETECTION SIGNAL IS NOT INPUT DURING OPERATION.	① SYSTEM POWER MODULE ② COMPRESSOR ③ P.W.B.s
▨	□	□	□	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
▨	□	□	□	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.
▨	□	□	□	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
▨	□	□	□	ACCELERATION DEFECTIVE	NO ACCELERATION ABOVE THE LOWER LIMIT OF THE ROTATION SPEED.	① LEAK OF REFRIGERANT ② COMPRESSOR
▨	□	□	□	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
▨	□	□	□	FAN LOCK ERROR	OUTDOOR FAN RPM IS NOT ROTATE AS INTENDED RPM.	① FAN MOTOR ② FAN MOTOR CIRCUIT
▨	□	□	□	EEPROM READING ERROR	MICROCOMPUTER CANNOT READ THE DATA IN EEPROM.	① MAIN P.W.B.
▨	□	□	□	ACTIVE CONVERTER DEFECTIVE	OVER VOLTAGE IS DETECTED BY SYSTEM POWER MODULE.	① SYSTEM POWER MODULE
■	▨	□	□	ABNORMAL THERMISTOR	THERMISTOR IS OPENED OR SHORTED. REFER TO TABLE "CORRESPONDENCE TABLE FOR ABNORMAL THEMISTOR"	① THERMISTOR ② CONNECTION OF THERMISTOR IS FAULTY ③ THERMISTOR CIRCUIT
LIT	1~3 TIMES					
□	□	□	▨	COMMUNICATION ERROR BETWEEN INDOOR AND OUTDOOR UNIT	WHEN INDOOR UNIT IS NOT CONNECTED, IT BLINKS SIMILARLY. NOT MULFUNTION.	① CABLE IS WRONG CONNECTED ② CABLE IS OPEN ③ INTERFACE CIRCUIT BETWEEN INDOOR AND OUTDOOR UNIT.
1 TIMES						

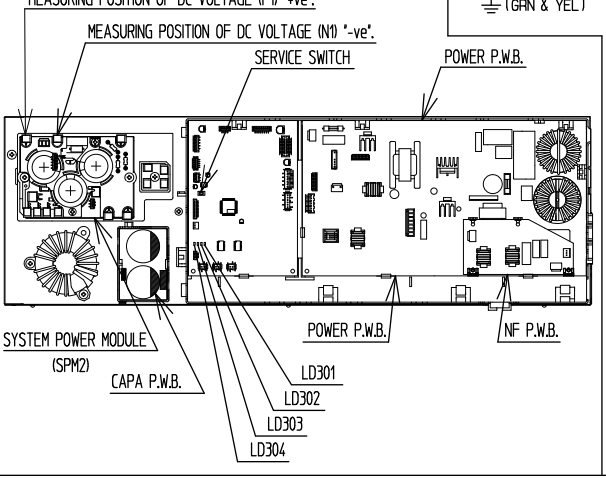
WIRING DIAGRAM

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



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.



USE 30A TIME DELAY FUSE

1HRA81284A

SELF-DIAGNOSIS MEMORY FUNCTION

Failure modes are stored in the nonvolatile memory of indoor unit and shall be redisplayed by remote controller.

This function is useful in checking the failure modes either during switching OFF the power or restarting the device without checking the number of indication lamp blinking . Remote controller can redisplay up to last 5 failure modes from the memory. However, failure modes which are rarely to occur are also stored in the memory which caused the numbers of failure more than 5. Thus, for some failure modes which are unable to retrive because of remote controller limit to redisplay only 5 failure modes, it can be found by clearing up the memory first then recheck the memory content again during the visit at the customer place.

< How to redisplay failure diagnosis >

1. Turn the circuit breaker OFF.
2. Set the remote controller to OFF condition, indicated by OFF on the display.
3. By pressing MODE (MODE) button on the remote controller, set to Cooling operation indicated by (COOL).
4. Turn the circuit breaker ON.
5. Set the room temperature setting on the remote controller to 32°C by pressing the (TEMP ﹀ or ﹀) button.
6. Set the fan speed with the FAN (FAN SPEED) button according to the desired failure information. (Refer to the corresponding table below)

Fan speed settings for failure data

Fan Speed	Data
AUTO	Newest
HI	Second newest
MED	Third newest
LOW	Fourth newest
SILENT	Oldest

7. While directing the remote controller towards the receiver of the indoor unit, press (TEMP ﹀) button and ⏻ (START/STOP) button simultaneously. (The remote controller perform signal transmission with the device.)
8. The device beeps [Pi-] to indicate that it has just received the signal to redisplays the failure mode.
9. Direct the remote controller towards the receiver of indoor unit (within 2 meters in front of indoor unit) and press the INFO (INFO) button. Wait for 2 seconds for signal transmission. An error code will be displayed on the remote controller display.

< How to clear the troubleshooting data >

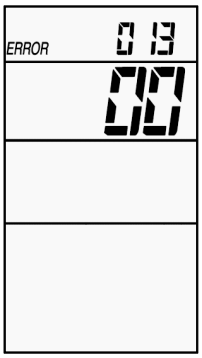
1. Redisplay the troubleshooting status. (See the above procedure.)
2. Turn the circuit breaker OFF.
3. By pressing MODE (MODE) button on the remote controller, set to Heating operation indicated by (HEAT).
4. Turn the circuit breaker ON.
5. Set the room temperature setting on the remote controller to 16°C by pressing the (TEMP ﹀ or ﹀) button.
6. While directing the remote controller towards the receiver of the indoor unit, press (TEMP ﹀) button and ⏻ (START/STOP) button simultaneously. (The remote controller perform signal transmission with the device.)
7. The product beeps for a second [Pi–] to indicated that it has just received the signal. The data has now been cleared.

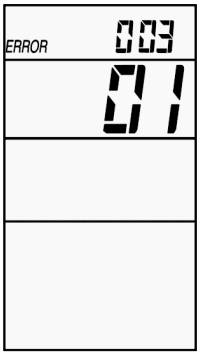
< How to display error code in case of failure just occurs>

If timer lamp ⏲ of the indoor unit blinking and operation stops, please perform below procedures.

1. Direct the remote controller towards the receiver of indoor unit (within 2m in front of the indoor unit) and press INFO (INFO) button.
2. Wait for 2 seconds for signal transmission.
3. Indication of error code will be shown on the remote controller display for 10 seconds.

For example :





For details information regarding error code, please refer to page 118.

CHECKING THE INDOOR/OUTDOOR UNIT ELECTRICAL PARTS AND REFRIGERATING CYCLE

Unit does not operate

Yes

Open electrical cover of indoor unit.

Does the timer lamp on the indoor unit blink?

Timer lamp

See “Troubleshooting when the timer lamp blinks”.

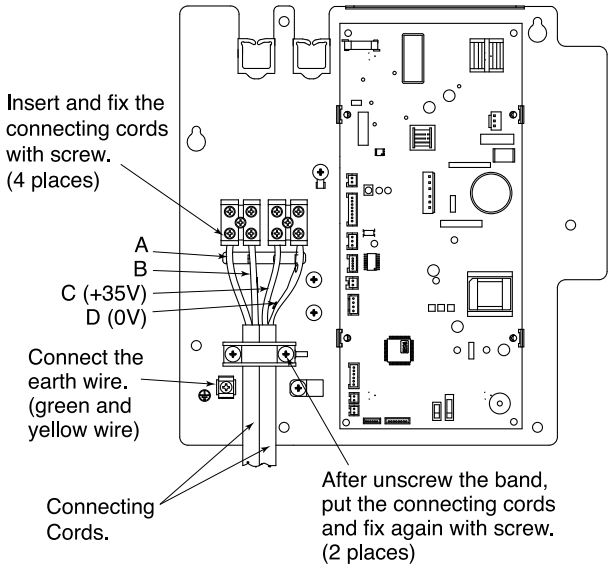
No

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 terminal cover and check the voltage between terminal (C) and terminal (D)



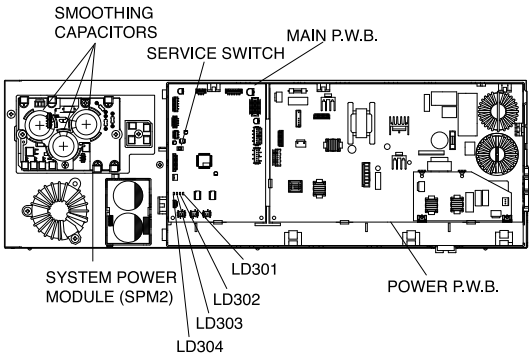
Yes

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.

Is approx. DC 33 to 37V being generated? Is the polarity correct?

No

Yes

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

See “Out door unit self-diagnosis lamp lighting mode”.

No

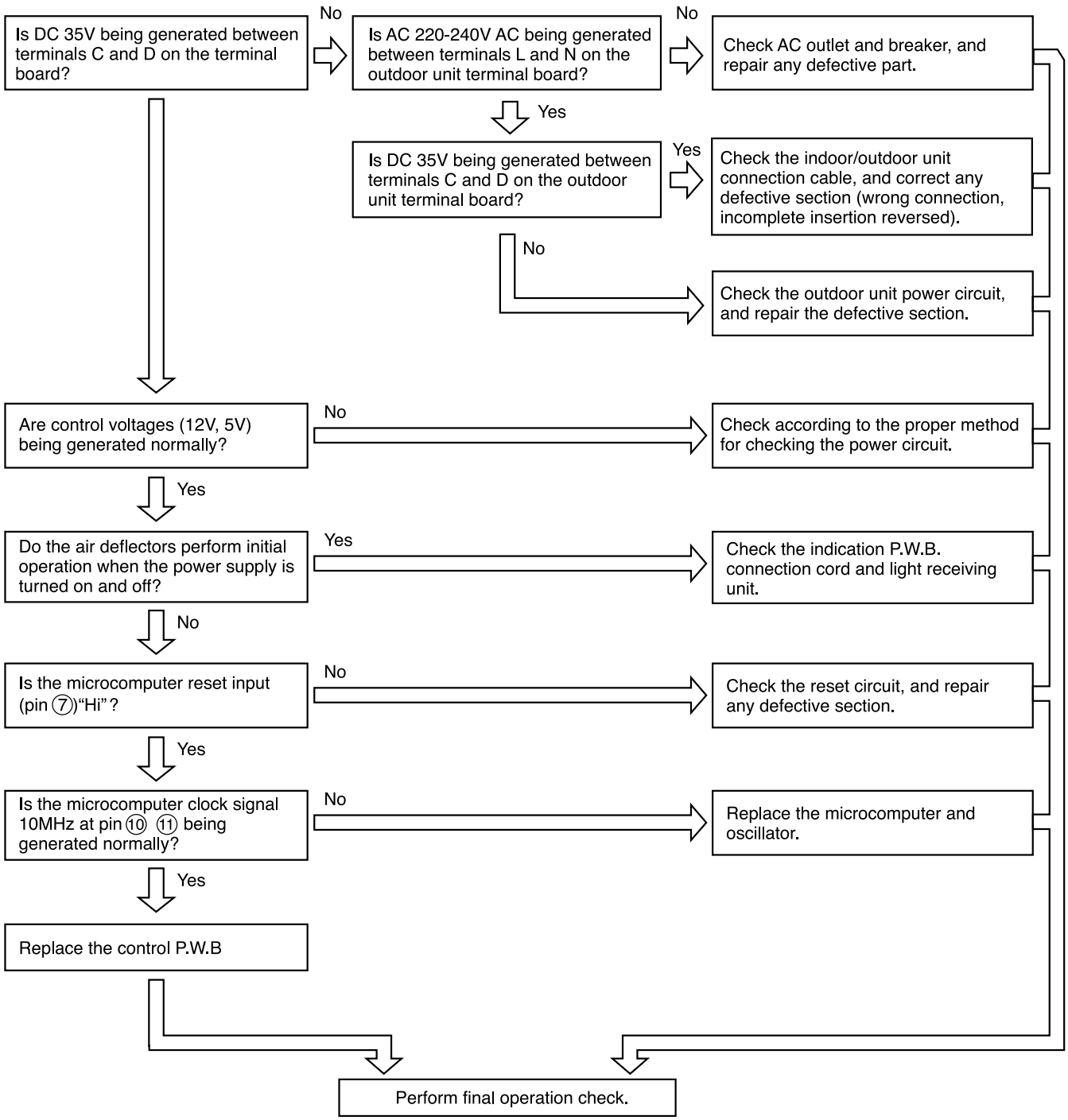
Check the refrigerating cycle.

Check the outdoor electrical parts.

Check the indoor electrical parts.

CHECKING INDOOR UNIT ELECTRICAL PARTS

1. Power does not come on (no operation)



	TIMER LAMP BLINKING	LD301 BLINKING	WIRELESS REMOCON CODE	WIRED REMOCON CODE	MEANING	DETAILS	MAIN CHECK POINT
INDOOR	-	-	000 00	-	Normal		
	1 time	-	001 00		Refrigerant cycle fault	When the indoor heat exchanger temperature is too low in the heating mode or it is too high in the cooling mode.	1. Reversing valve defective 2. Heat exchanger thermistor disconnected. (only in heating mode)
	2 times	-	-	-	Outdoor unit is under forced operation.	It is not failure. Outdoor unit is in forced operation or balancing operation after forced operation.	1. Electrical parts in the outdoor unit.
	3 times	-	003 00		Communication error between indoor and outdoor units.	Interface signal from the outdoor unit is interrupted.	1. Indoor interface circuit 2. Outdoor interface circuit
	6 times	-	006 00		Abnormal water level: ceiling / small duct	All stop when the float switch has been activated	1. Drain stopped up 2. Drain pump 3. Float switch
	9 times	-	009 00		Indoor thermistor	Room thermistor or heat exchanger thermistor is opened circuit or short circuit.	1. Room thermistor 2. Heat exchanger thermistor
	10 times	-	010 00		Abnormal rotating numbers of DC fan motor	Overcurrent is detected at the DC fan motor of the indoor unit.	1. Indoor interface circuit 2. Outdoor interface circuit 3. Indoor control P.W.B
	13 times	-	013 00		IC401 data reading error	When data read from IC401 is incorrect.	1. IC401 abnormal
OUTDOOR	4 times	2 times	002 01		Peak current cut	Over current is detected.	1.Compressor 2. P.W.B.s
	4 times	3 times	003 01		Compressor abnormal low speed rotation	Position detection signal is not input during operation.	1. P.W.B.s 2.Compressor
	4 times	4 times	004 01		Compressor switching failure	Fail to switch from initial low frequency sync to position detection sync.	1. P.W.B.s 2.Compressor
	4 times	5 times	005 01		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 air flow blocked. 2. Fan motor 3. Fan motor circuit 4. The voltage is extremely low.
	-	6 times	006 01	-	OH thermistor temperature rise	OH thermistor is operating.	1. Leak of refrigerant 2. Compressor 3. OH thermistor circuit 4. Fan motor 5. Fan motor circuit
	4 times	7 times	007 01		Abnormal outdoor thermistor	Thermistor is opened or shorted.	1. Thermistor 2. Connection of thermistor is faulty 3. Thermistor circuit
	4 times	8 times	008 01		Acceleration defective		
	-	9 times	009 01	-	Communication error	When indoor unit is not connected, it blinks similarly, not malfunction.	1. Cable is wrong connected 2. Cable is open 3. Interface circuit between indoor and outdoor unit
	-	10 times	010 01	-	Abnormal power source	Power supply voltage is incorrect.	1. Power supply voltage 2. Receptacle of wire for P.W.B IPM is not properly inserted
	4 times	12 times	012 01		Fan motor fault	Outdoor fan rpm is not rotate as intended rpm.	1. Fan motor 2. Fan motor circuit
	4 times	13 times	013 01		EEPROM reading error	Microcomputer cannot read the data in EEPROM.	1. P.W.B main
	4 times	14 times	014 01		Active converter defective	Over voltage is detected, compressor abnormal load.	1. P.W.B.s 2. Compressor

< Cautions >

This function is effective only once immediately after the power is turned on. It will not work if you have performed another remote control operation before hand Note also that it may not function in response to a procedure other than the above. (If it does not work, turn off the power, turn it back on and repeat the procedure.)

If the memory stores nothing, performing a redisplay operation will not blink the lamp.

For a normal operation, turn off the power and turn it back on. After the above operation, the product will not receive a remote control signal normally.

After clearing the troubleshooting data, turn off the power. (If you do not turn off the power, the product will become unresponsive to remote control signals.)

Remarks:
When this unit were mean to be connected to multi outdoor unit system, below diagnosis table shall be use.
If LD301 lit and at the same time LD302 blinks in a number of times, this indicates thermistor faulty.

	TIMER LAMP BLINKING	LD302 BLINKING	WIRELESS REMOCON CODE	WIRED REMOCON CODE	MEANING	DETAILS	MAIN CHECK POINT
OUTDOOR	4 times	1 time	071 01		OVERHEAT THERMISTOR	THERMISTOR IS OPENED OR SHORTED	1. THERMISTOR 2. CONNECTION OF THERMISTOR IS FAULTY 3. THERMISTOR CIRCUIT
	4 times	2 times	072 01		DEFROST THERMISTOR		
	4 times	3 times	073 01		OUTDOOR TEMPERATURE THERMISTOR		
	4 times	4 times	074 01		NARROW PIPE THERMISTOR (INDOOR NO.1)		
	4 times	5 times	075 01		WIDE PIPE THERMISTOR (INDOOR NO.1)		
	4 times	6 times	076 01		NARROW PIPE THERMISTOR (INDOOR NO.2)		
	4 times	7 times	077 01		WIDE PIPE THERMISTOR (INDOOR NO.2)		
	4 times	8 times	078 01		NARROW PIPE THERMISTOR (INDOOR NO.3)		
	4 times	9 times	079 01		WIDE PIPE THERMISTOR (INDOOR NO.3)		
	4 times	10 times	080 01		NARROW PIPE THERMISTOR (INDOOR NO.4)		
	4 times	11 times	081 01		WIDE PIPE THERMISTOR (INDOOR NO.4)		
	4 times	12 times	082 01		NARROW PIPE THERMISTOR (INDOOR NO.5)		
	4 times	13 times	083 01		WIDE PIPE THERMISTOR (INDOOR NO.5)		

If LD304 blinks, the number of blinks indicates a communication error with the corresponding indoor unit connection.
Detail as per below table.

	TIMER LAMP BLINKING	LD304 BLINKING	WIRELESS REMOCON CODE	WIRED REMOCON CODE	MEANING	DETAILS	MAIN CHECK POINT
OUTDOOR	-	1 time	009 01		COMMUNICATION ERROR BETWEEN OUTDOOR AND INDOOR UNIT NO.1	EVEN WHEN INDOOR UNIT IS NOT CONNECTED, IT BLINKS SIMILARLY. (NOT MALFUNCTION)	1. INDOOR TO OUTDOOR C-D LINE CABLE NOT CONNECTED PROPERLY. 2. COMMUNICATION CIRCUIT DAMAGED. 3. DC35V POWER SUPPLY DAMAGED. 4. EFFECT OF EXTERNAL NOISE TO C-D LINE CABLE.
	-	2 times			COMMUNICATION ERROR BETWEEN OUTDOOR AND INDOOR UNIT NO.2		
	-	3 times			COMMUNICATION ERROR BETWEEN OUTDOOR AND INDOOR UNIT NO.3		
	-	4 times			COMMUNICATION ERROR BETWEEN OUTDOOR AND INDOOR UNIT NO.4		

Note : This communication error diagnosis table only applicable for 2 rooms until 4 rooms multi system model.
Other shall refer to diagnosis table on the electrical cover or inside outdoor service manual.

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

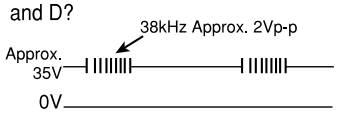
Check the heat exchanger thermistor; if it is defective, replace it.
<Normal values>
10°C → approx. 20kΩ
25°C → approx. 10kΩ
30°C → approx. 8kΩ

No

Does outdoor electrical part LD301 blink nine times?

Yes

Is the indoor/outdoor unit communication signal superimposed on 35V DC of connection wires C and D?

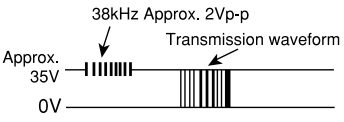


No

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

Yes

Is the indoor transmitting signal being generated at Q801's collector?



No

Check the indoor interface transmitting circuit. Replace IC801.

Yes

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

No

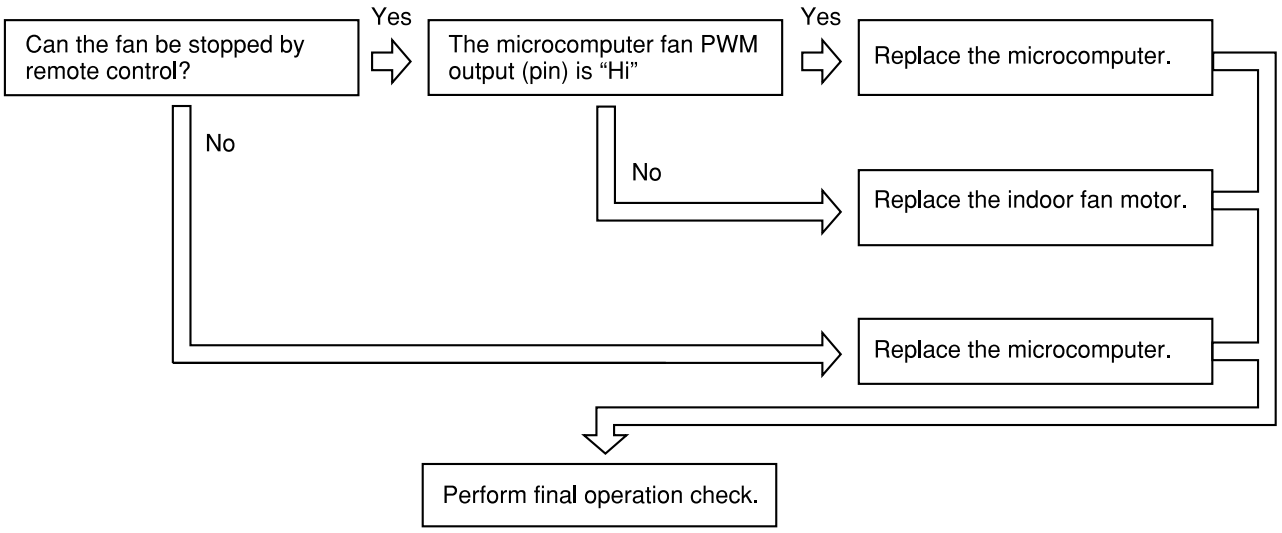
Does LD303 switch off several second after it lights?

Yes

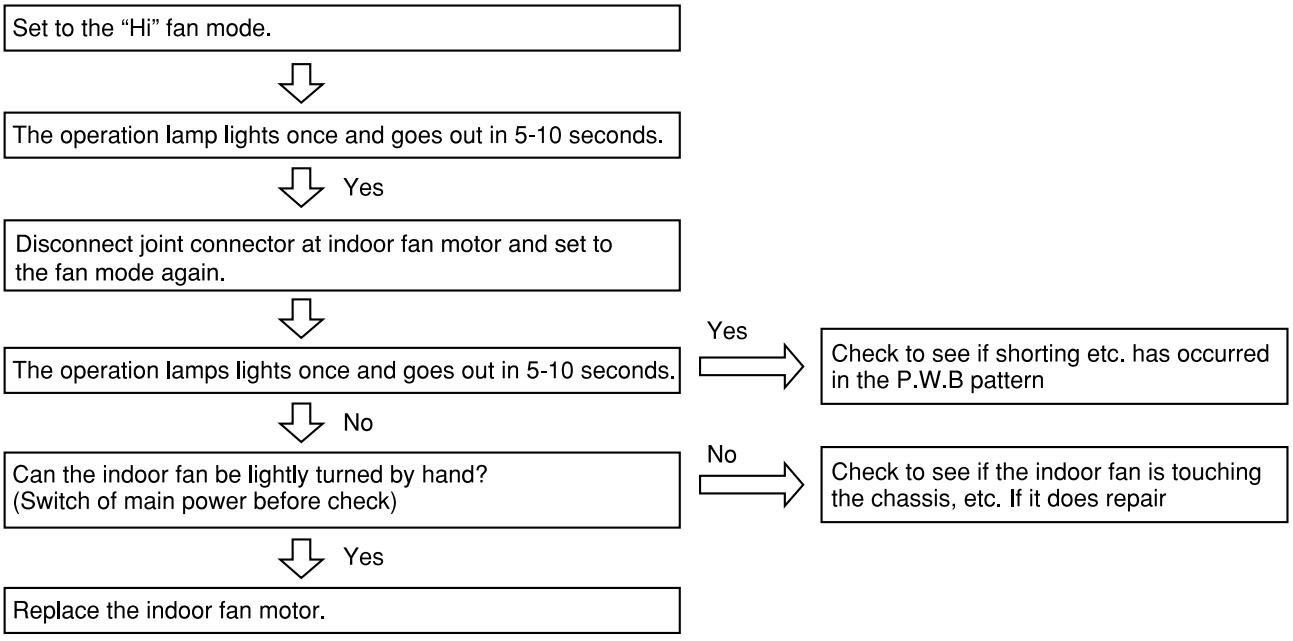
Check outdoor electrical parts, and repair any defective parts.

Perform final operation check.

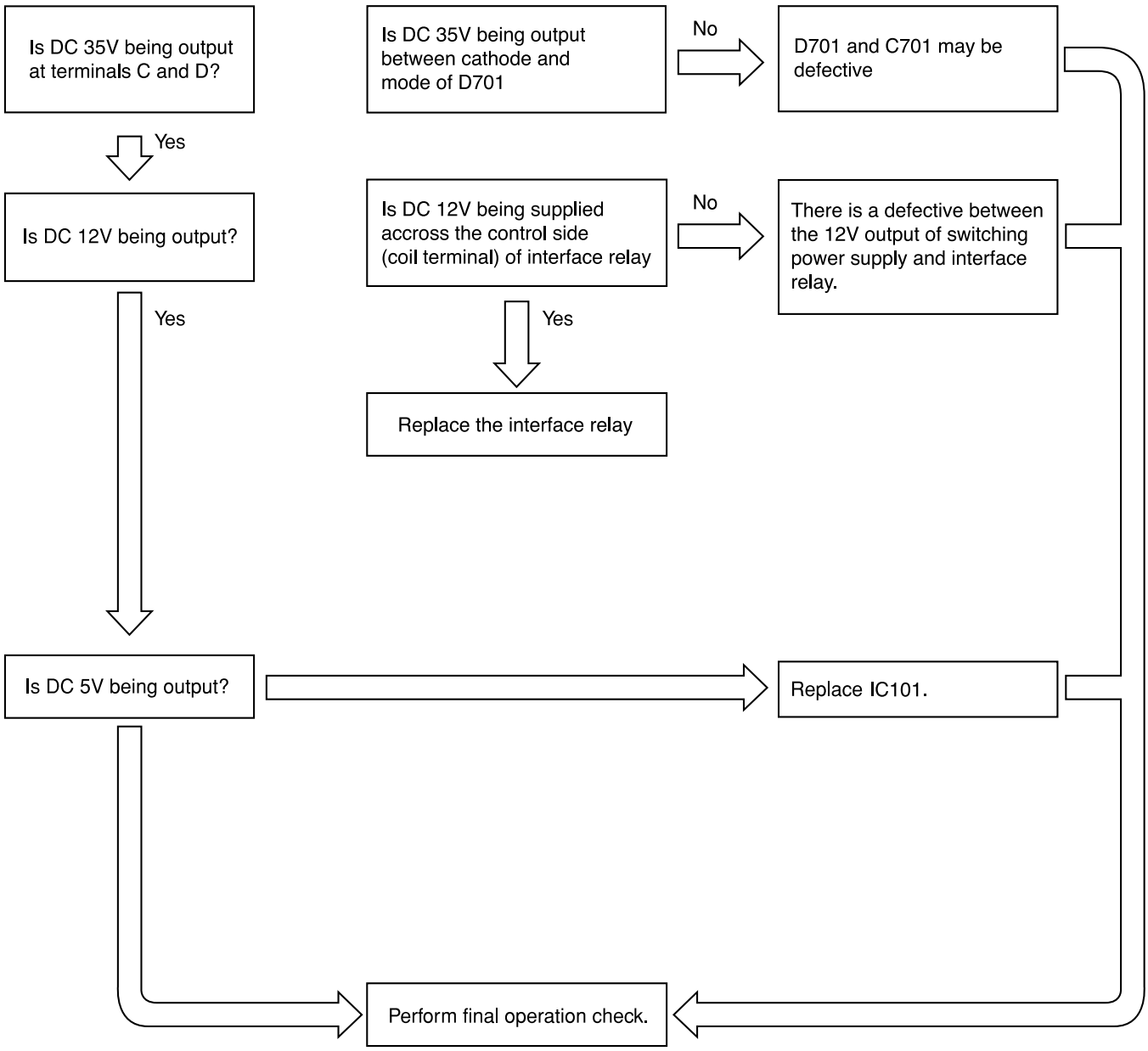
3. Only indoor fan does not operate (other is normal)



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



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



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

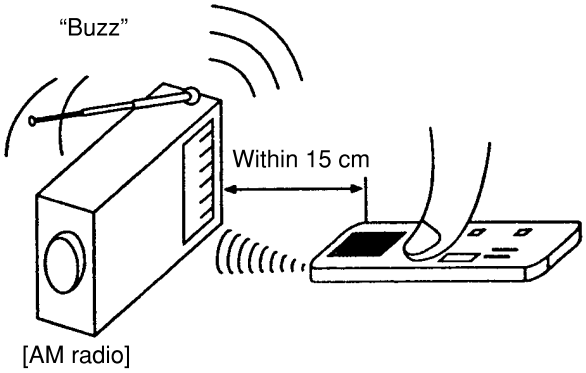
Turn on an AM radio, bring the remote control switch within 15 cm of the radio, and press the ON/OFF button.

Does the radio buzz noisily?

No

Check the LED (D1) with a multimeter.

Yes

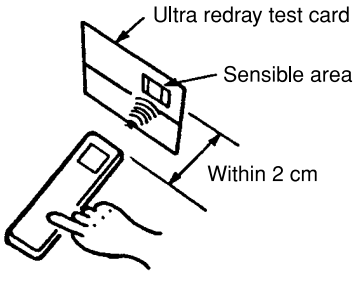


Check the indoor unit signal receiving P. W. B..
If it is good, check the main P. W. B..

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

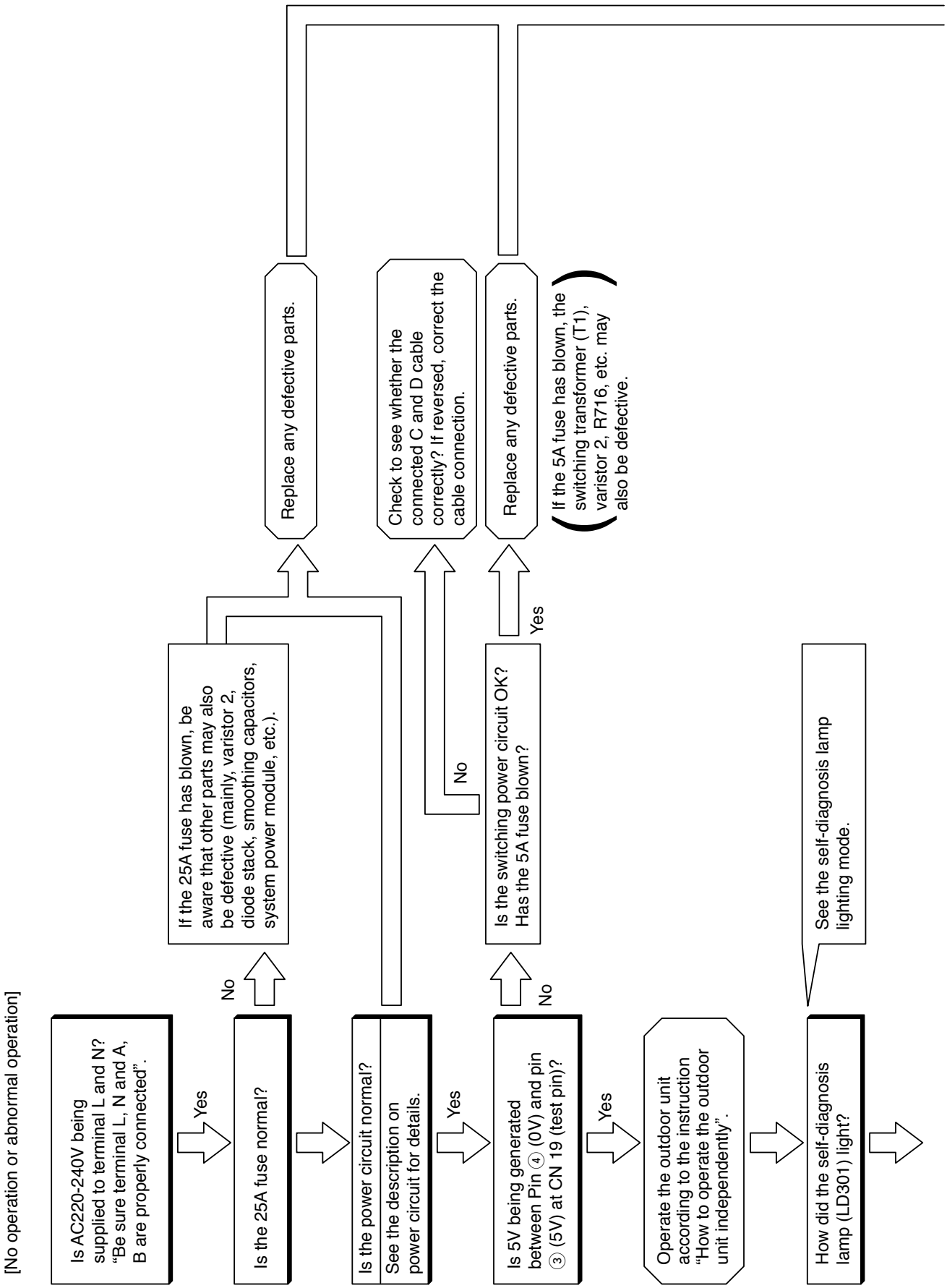
You can check the remote control switch by other methods as explained below.

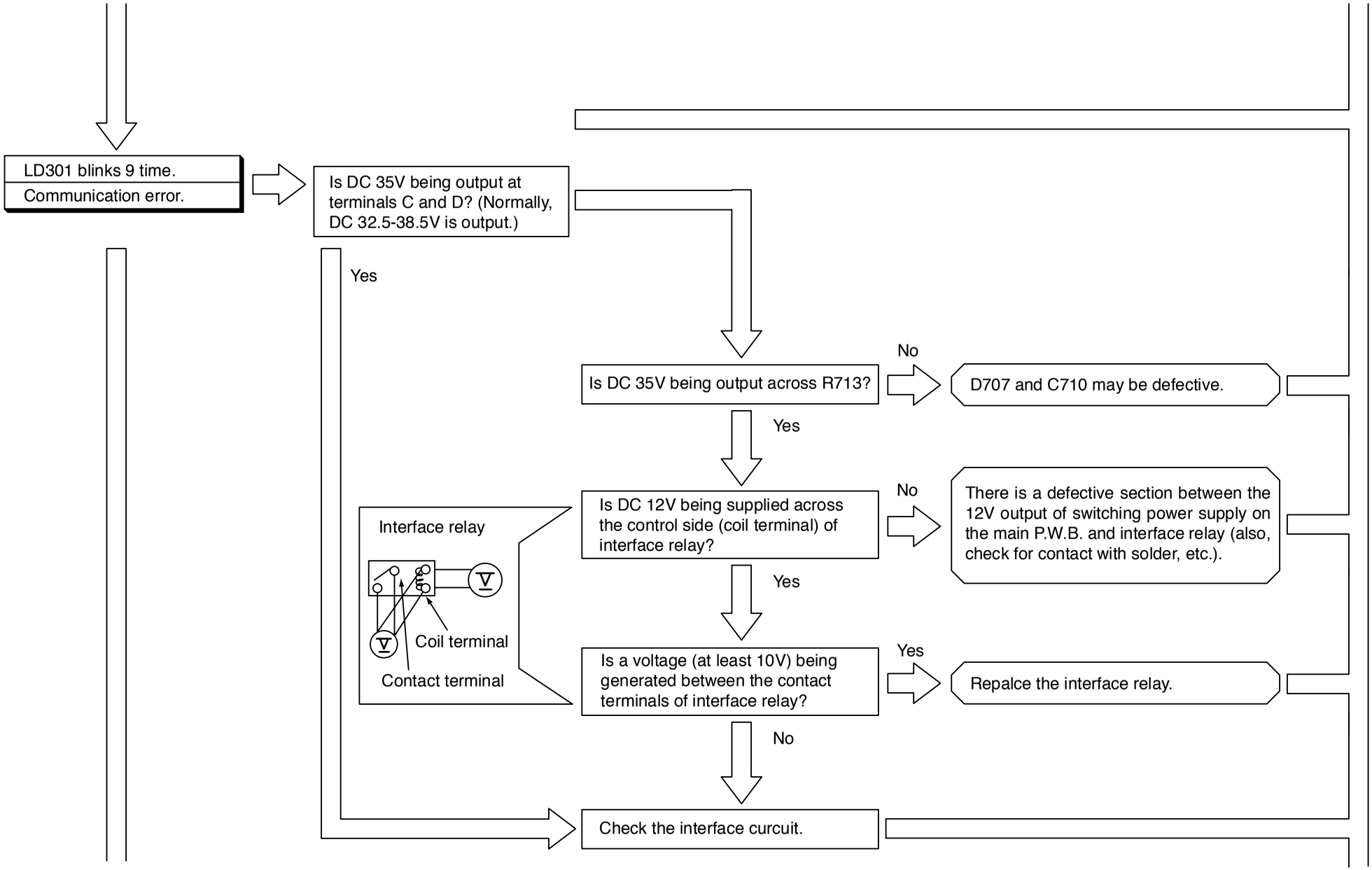
Using the test card

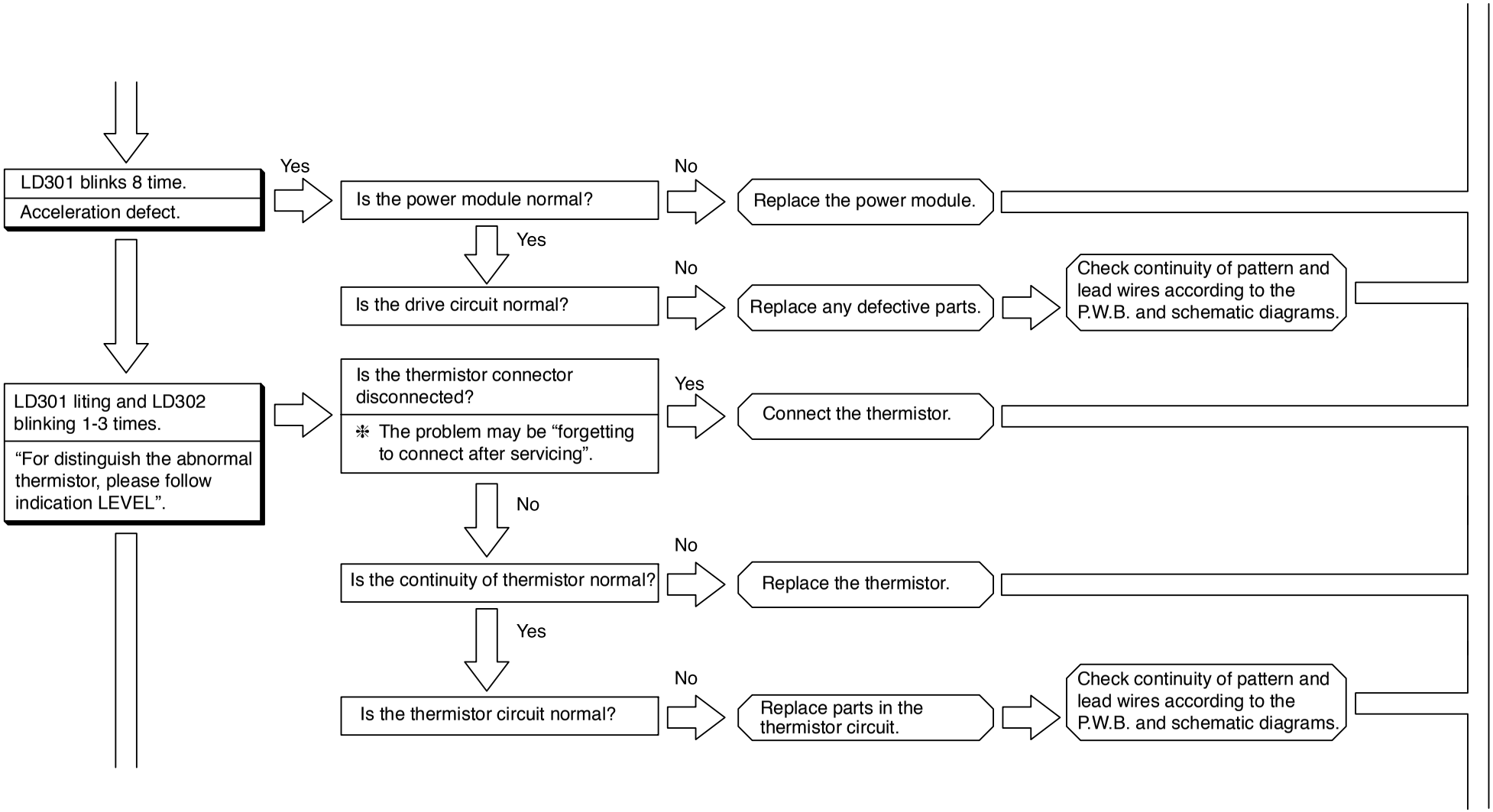


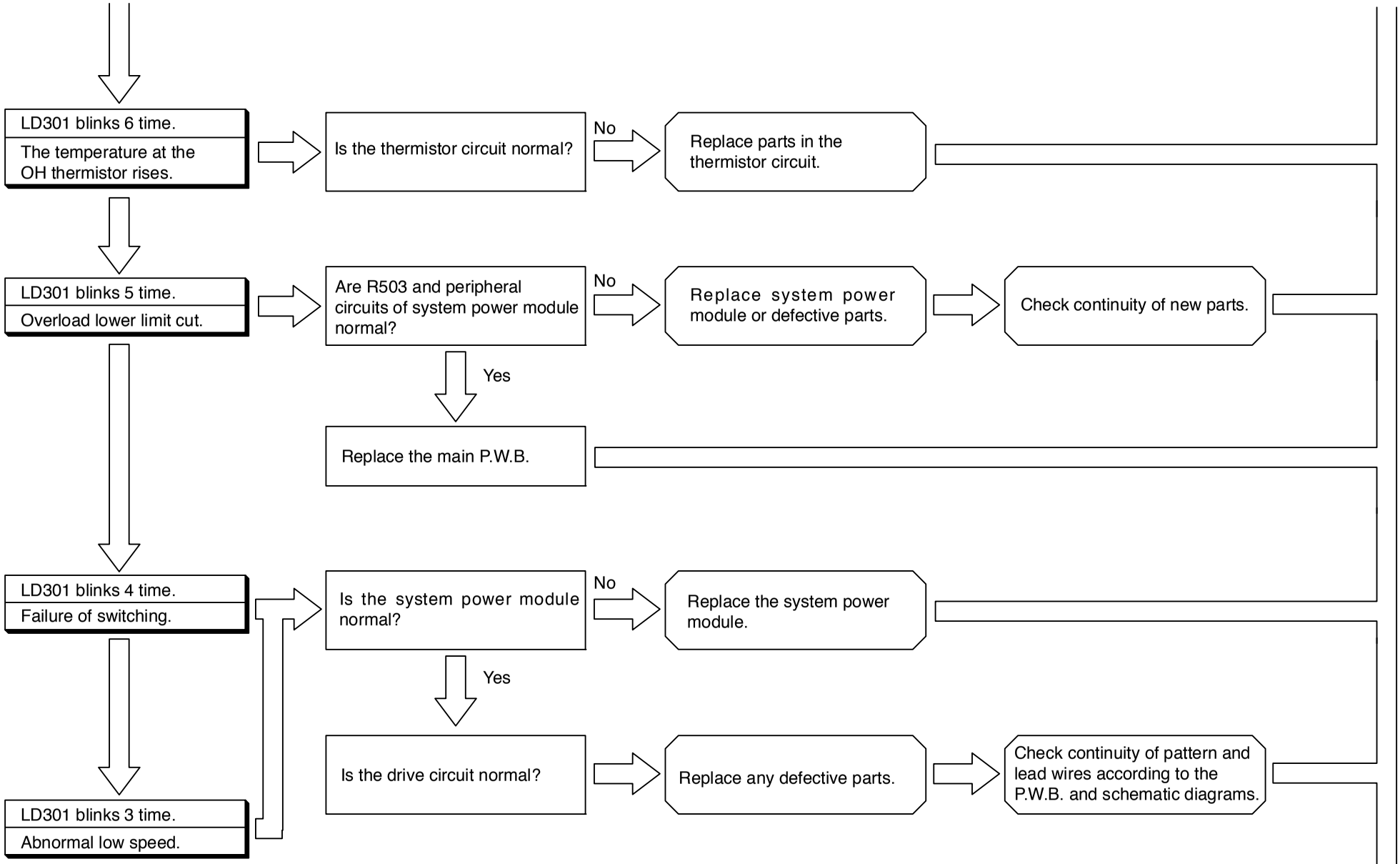
The sensible area should flash in orange when you operate the remote control unit if it is good.

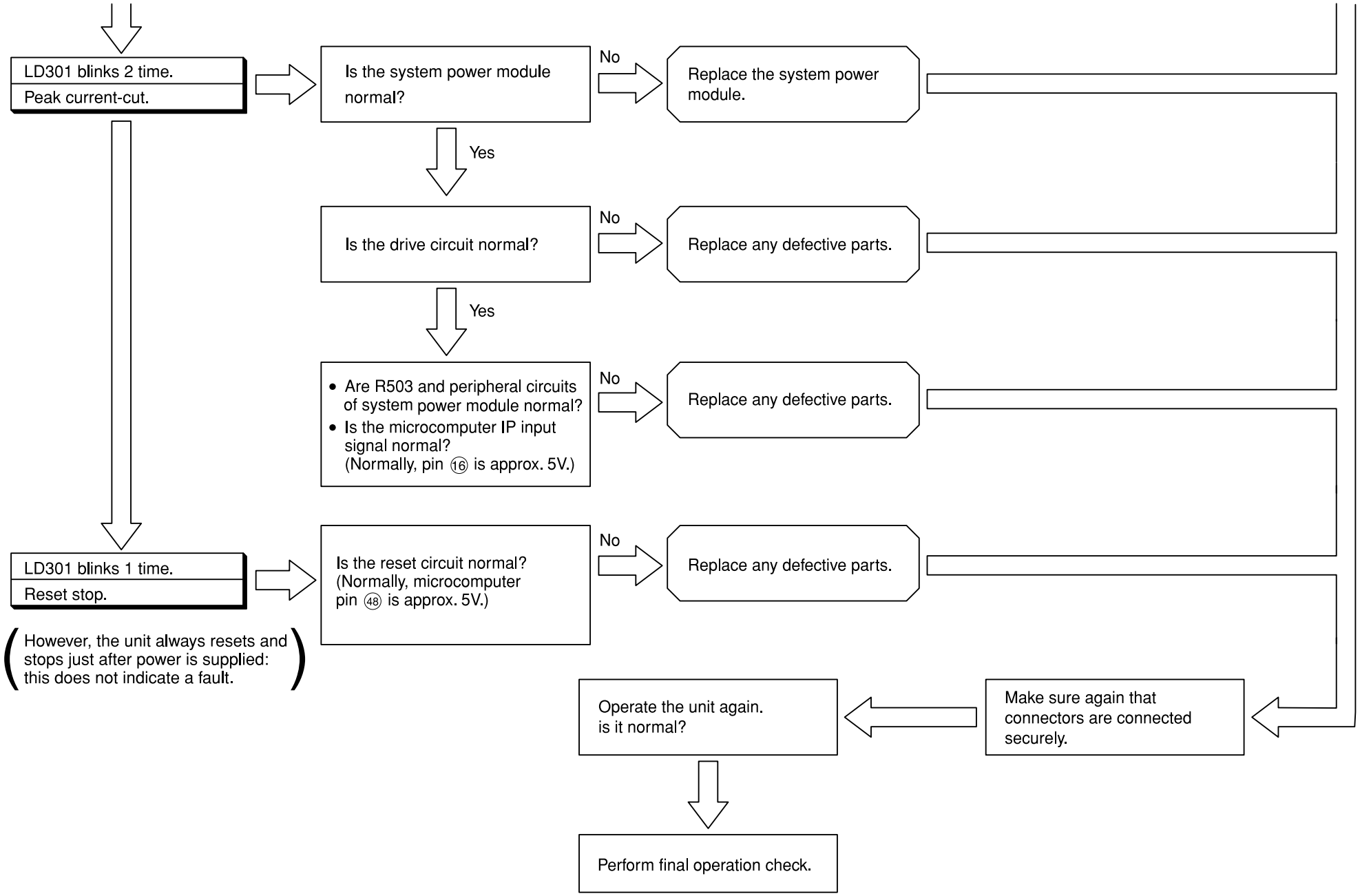
CHECKING THE OUTDOOR UNIT ELECTRICAL PARTS




LD301 blinks 9 time.
Communication error.
Is DC 35V being output at terminals C and D? (Normally, DC 32.5-38.5V is output.)
Yes
No
Is DC 35V being output across R713?
D707 and C710 may be defective.
Yes
Interface relay
Coil terminal
Contact terminal
Is DC 12V being supplied across the control side (coil terminal) of interface relay?
No
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
Is a voltage (at least 10V) being generated between the contact terminals of interface relay?
Yes
Repalce the interface relay.
No
Check the interface curcuit.

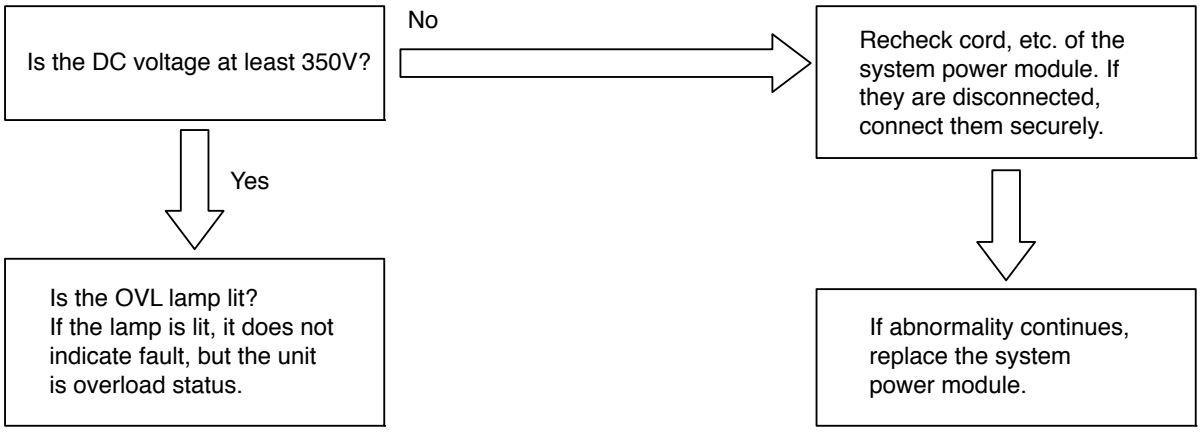

LD301 blinks 8 time.
Acceleration defect.
Yes
Is the power module normal?
No
Replace the power module.
Yes
Is the drive circuit normal?
No
Replace any defective parts.
Check continuity of pattern and lead wires according to the P.W.B. and schematic diagrams.
LD301 liting and LD302 blinking 1-3 times.
"For distinguish the abnormal thermistor, please follow indication LEVEL".
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 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 and peripheral circuits of system power module normal?
• Is the microcomputer IP input signal normal? (Normally, pin ⑯ 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)

HOW TO CHANGE THE SHIFT VALUE SETTING TEMPERATURE USING WIRELESS REMOTE CONTROLLER

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

(For initial shift value temperature setting for Cooling mode (SHIFTC) and Heating operation mode (SHIFTW) : Please refer to page 67)

PROCEDURES

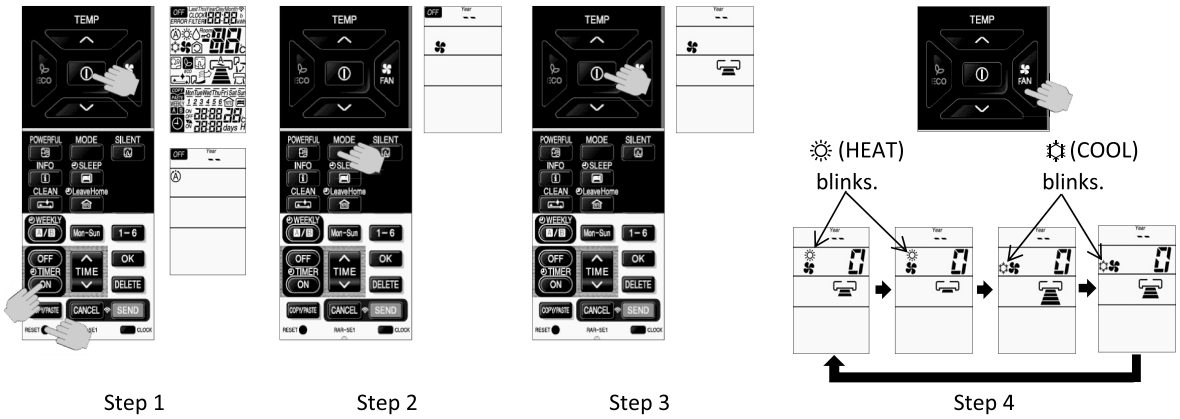
1. While pressing and holding ⏻ (START/STOP) button and ⊕TIMER ON (ON) button, press RESET ◯ [RESET] button on the same. Release RESET ◯ [RESET] button only and make sure that all marks on the remote controller display are indicated, then release the ⏻ (START/STOP) button and ⊕TIMER ON [ON] button.
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

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

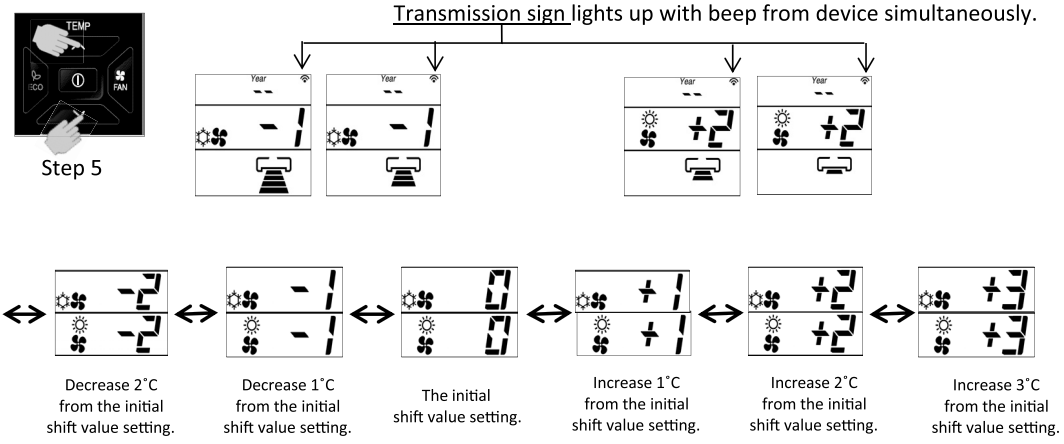
3. Press the ⏻ (START/STOP) button and FAN operation will be started.

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

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



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



NOTE :

(1) The displayed shift value, (HEAT) and (COOL) symbol on the remote controller display will be disappear after 10 seconds.

(2) The changed shift value will remain unchanged after turned off the power.

(3) If "0" is displayed on the remote controller display, it indicates the shift value is now at the initial setting.

HOW TO CHANGE THE SHIFT VALUE for SETTING TEMPERATURE USING WIRED REMOTE CONTROLLER

Shift value for COOLING and HEATING mode operation can be changed using wired remote controller.
(This procedure shall be strictly carried out by service personnel).
(For initial shift value temperature setting for Cooling mode (SHIFTC) and Heating operation mode (SHIFTW):
Please refer to page 67)

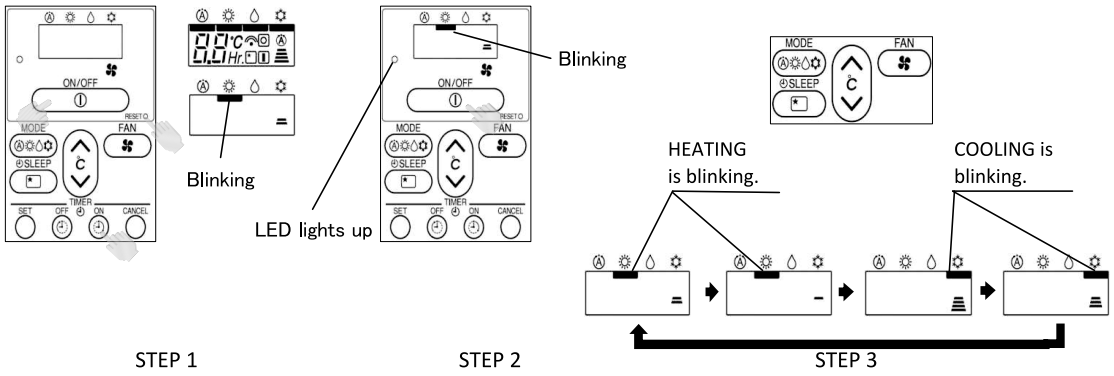
PROCEDURE

1. While pressing the ⏻ ON/OFF and ON TIMER button, press and release the RESET RESET button once.
All icon will be displayed on the LCD screen and shortly disappear.
Initial cursor will be at AUTO mode. After about 5 sec, cursor will shift and blink continously at HEATING mode. Release hold of ⏻ ON/OFF and ON TIMER button.
The remote is now in **SHIFT VALUE CHANGE MODE**.

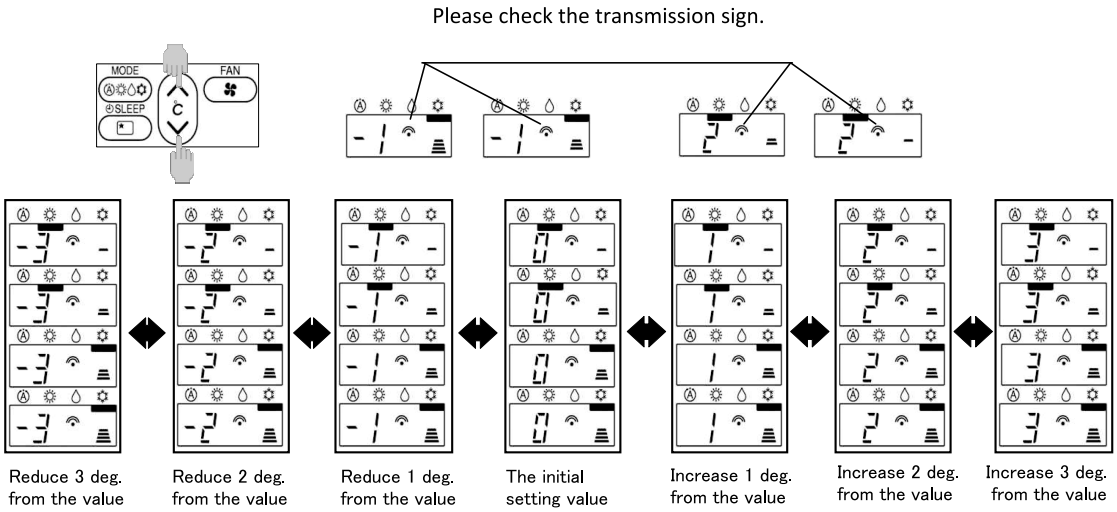
2. Press ⏻ ON/OFF button. Operation LED will ON. Cursor will stop blinking. Unit will operate in FAN mode.

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

- To change the shift value of COOLING mode operation, select either ≡ (HIGH) or ≡ (MED) FAN SPEED.
- To change the shift value of HEATING mode operation, select either ≡ (LOW) or ▬ (SILENT) FAN SPEED.



4. Press the (TEMP V or Λ) button to change the shift value.



5. Press the ⏻ [ON/OFF] button to end "Shift value change mode".

NOTE :
1. Shift value is everytime temperature button is pressed. Maximum 7 shift values only. (-3°C to + 3°C)
2. Changed shift value remain even after power supply is switched off.
3. By default the Shift value is set at "0°C" on the remote display. This indicates the unit is set to initial setting.

SETTING THE PREVENTION OF MUTUAL INTERFERENCE FOR REMOTE CONTROLLER

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

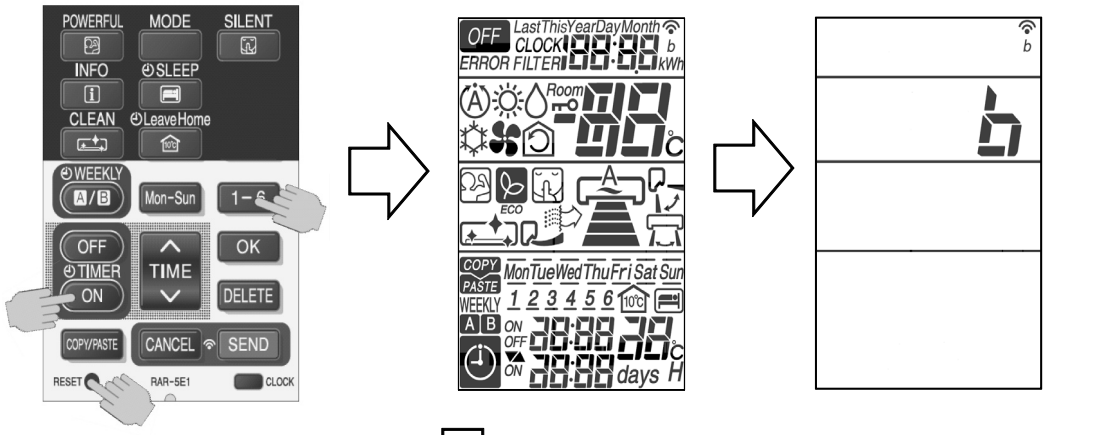
Case : 2 sets of indoor units installed near to each other.
If both indoor units can receive the same remote controller signal, please set the remote controller as below. (This setting will change the signal address of each remote controller.)

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

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

2. Slide the remote controller cover to take it off.
3. While directing the remote controller towards the receiver of the indoor unit, press 1~6 button, TIMER ON (ON TIMER) button and RESET (RESET) button simultaneously. (The remote controller perform signal transmission with the device.)

Signal transmission : From A to B

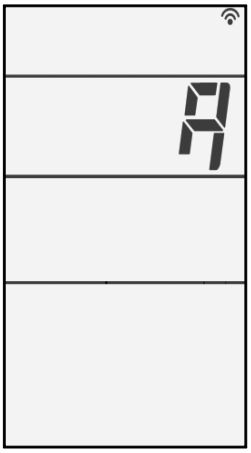


4. The indoor unit beeps [Pip] to indicate that it has just received the signal from remote controller.

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

Signal transmission : From B to A

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



OPERATION MODE LOCK SETTING

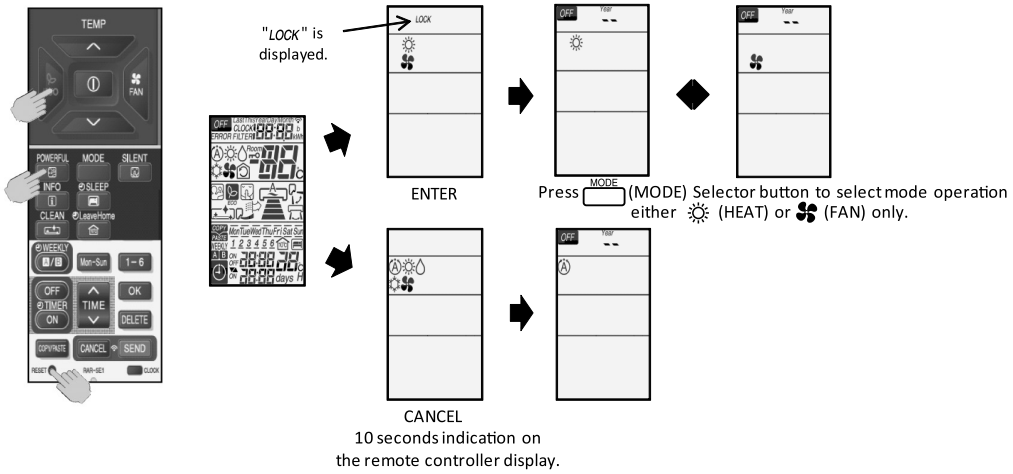
If Dip switch position is set at "Heating mode only" or "Cooling mode only" as mentioned on page 91, it is required to set the remote controller into operation mode lock setting. Without setting the remote controller, it will caused unmatch signal transmission between indoor unit and remote controller.

PROCEDURE

1. Heating operation mode lock setting

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

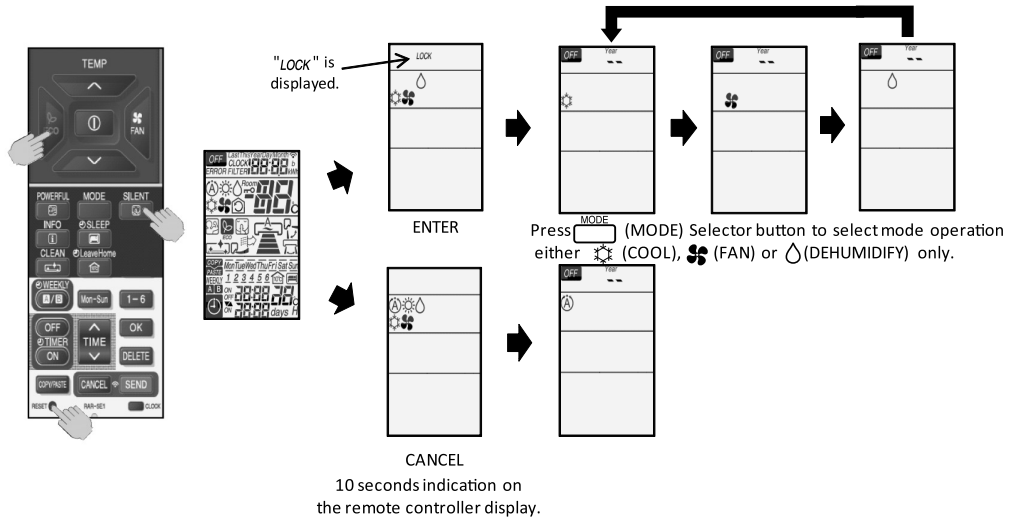
(b) To cancel the "Heating operation mode lock", repeat the above procedure (1(a)).



2. Cooling opearation mode lock setting

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

(b) To cancel the "Cooling operation mode lock", repeat the above procedure (2(a)).



NOTE :

(1) The indication of " LOCK " and (" "(HEAT), " " (COOL)," " (FAN) or " " "(DEHUMIDIFY)) mode operation symbol on the remote controler display will disappear after 10 seconds and it will enters to OFF condition indicated by OFF on the display.

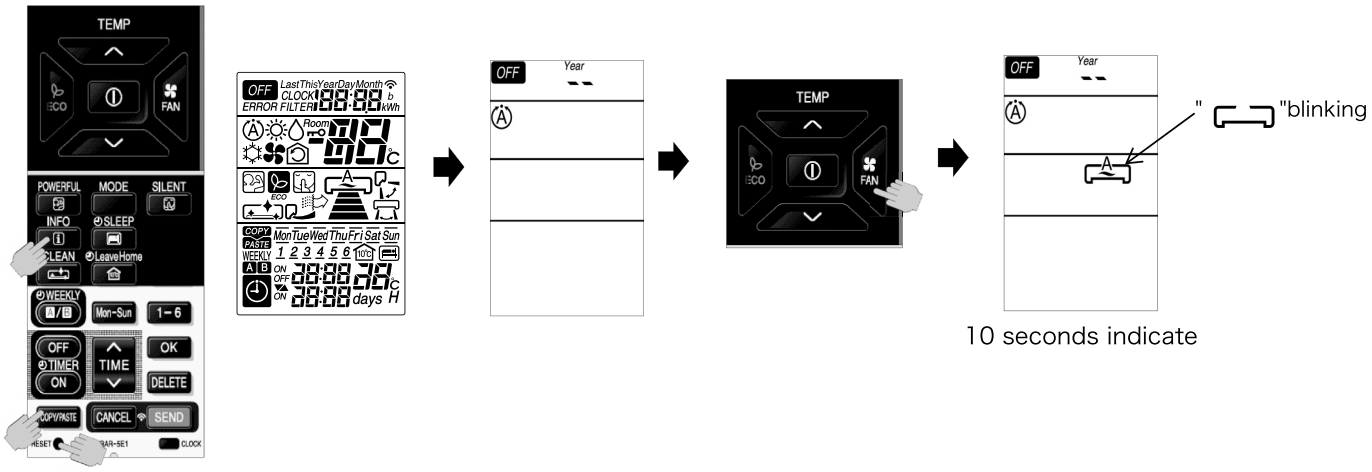
(2) The OPERATION MODE LOCK setting will remain in the remote controller memory eventhough the remote controller is ran out of battery.

DISPLAY OPERATION MODE SETTING

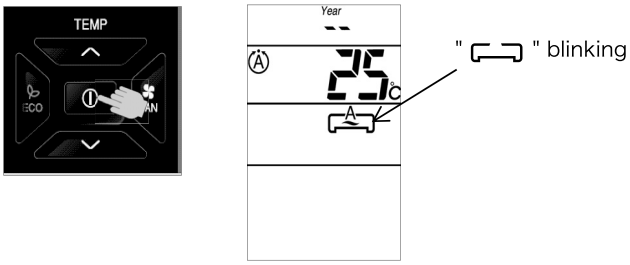
For operating indoor unit independently (without outdoor unit connection), remote controller has to be set according to below procedures before send the signal to the indoor unit. New communication format between indoor and outdoor is required to communicate with outdoor unit.

PROCEDURE

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



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



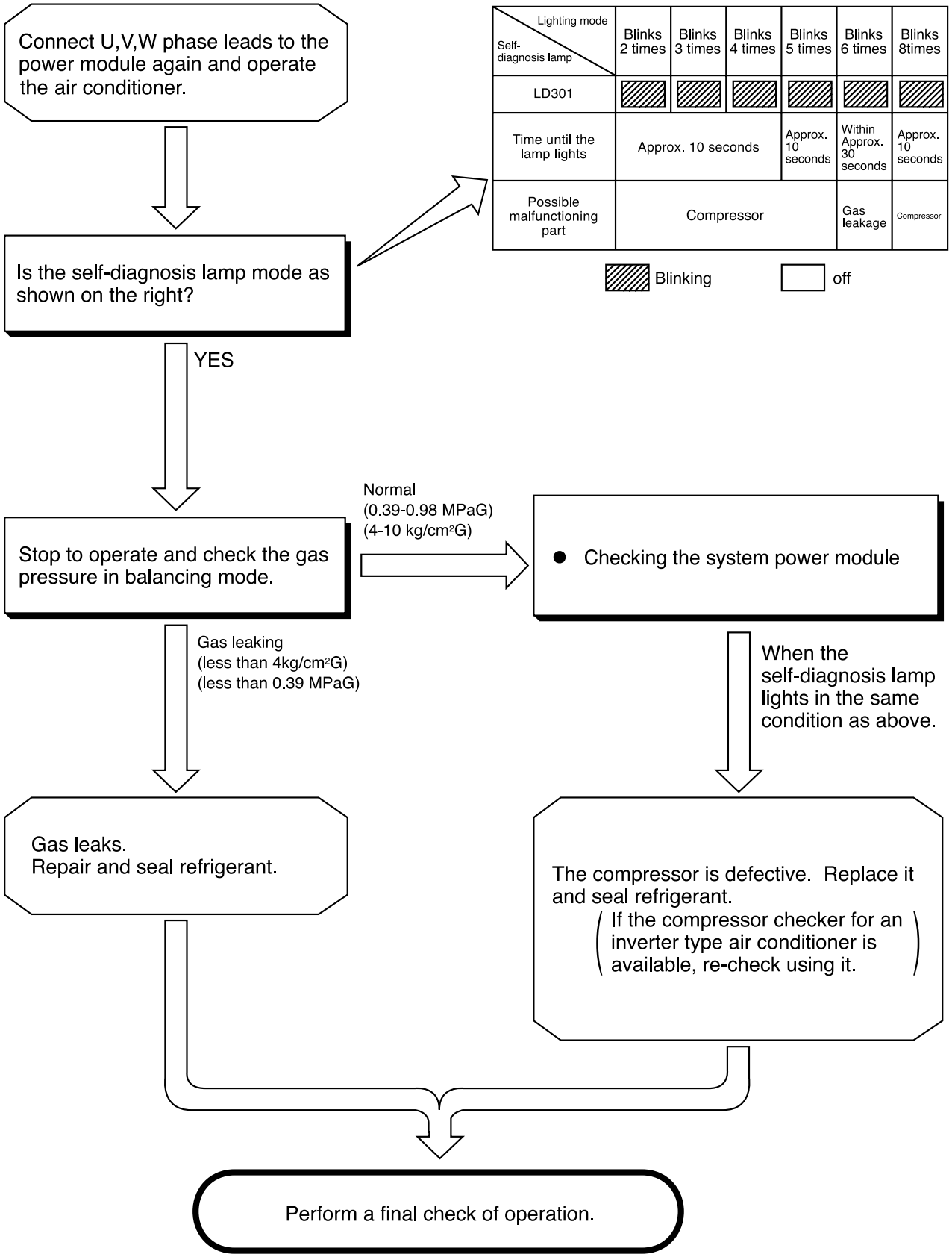
NOTE :

(1) During "DISPLAY OPERATION MODE", "⌐¬" blinks on LCD of remote controller.

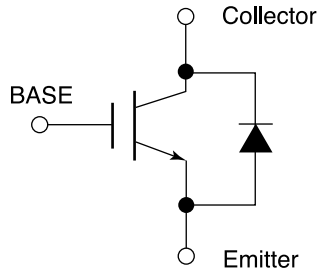
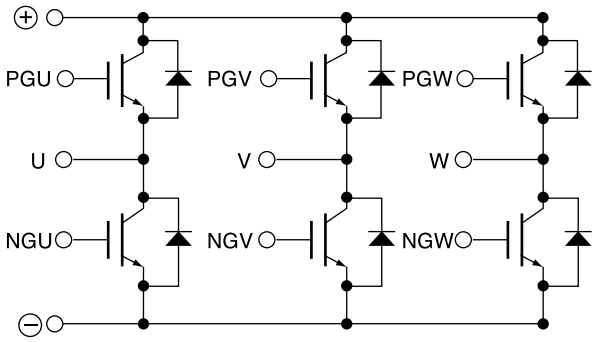
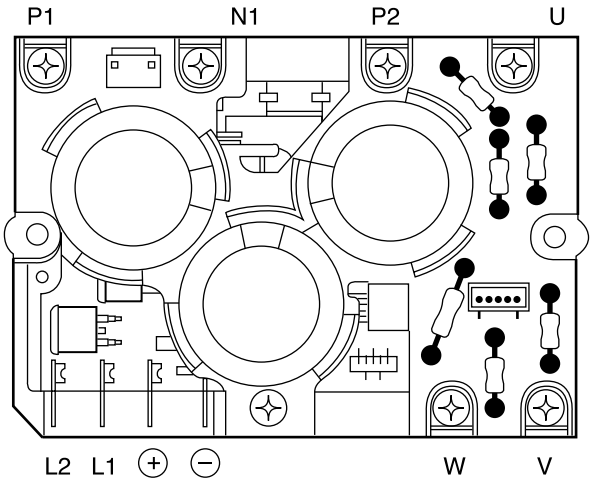
(2) When operation stops, "DISPLAY OPERATION MODE" is canceled.

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

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



SYSTEM POWER MODULE DIAGNOSIS

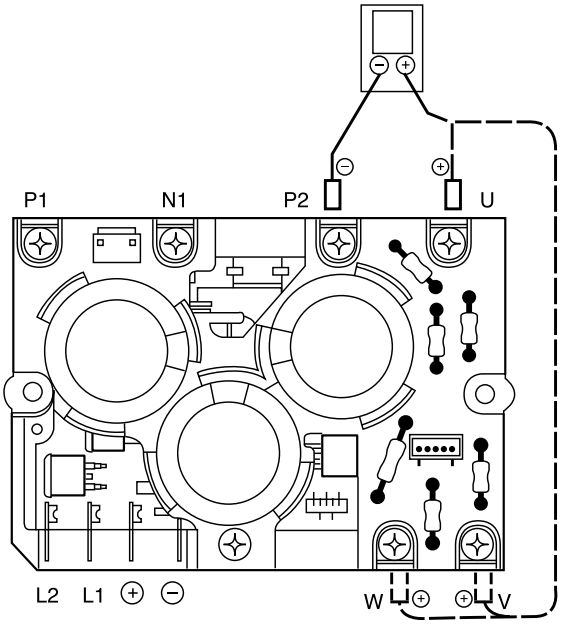
Circuit diagram of the device (excepting the reflux diode)	
Circuit diagram of the module	
Terminals symbol mark of the module ※ See next page for measuring value using tester	

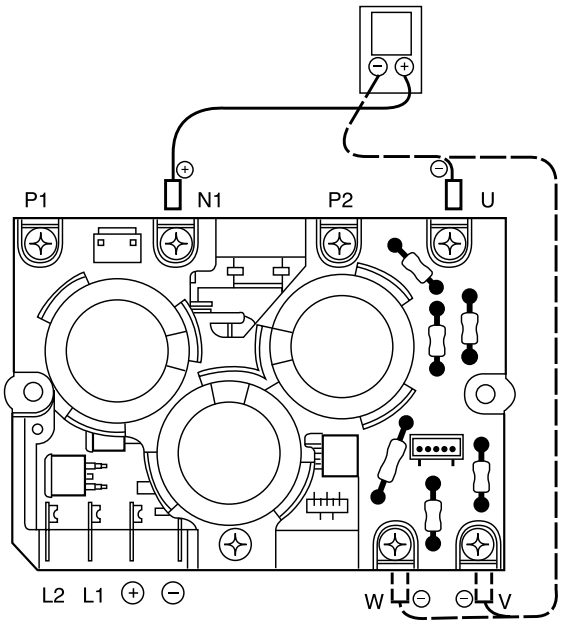
HOW TO CHECK SYSTEM POWER MODULE

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.



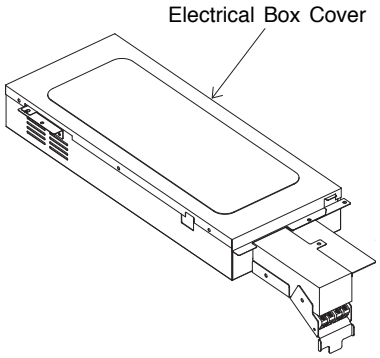


HOW TO OPERATE USING THE SERVICE SWITCH THE OUTDOOR UNIT

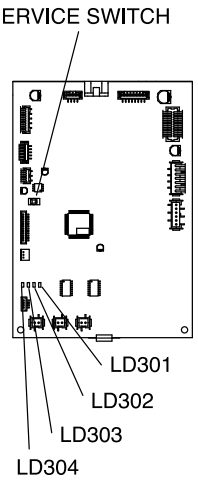
1. Turn off the power supply to outdoor unit and then turn on again.
2. Remove the electrical box cover.

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.



Service switch (forced-cooling mode is set by pressing for 1 second or more, and stopped by pressing again.)



(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.

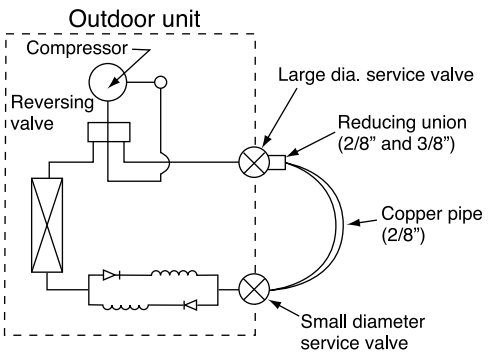
Be sure to push the service switch again to stop the forced cool operation.

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

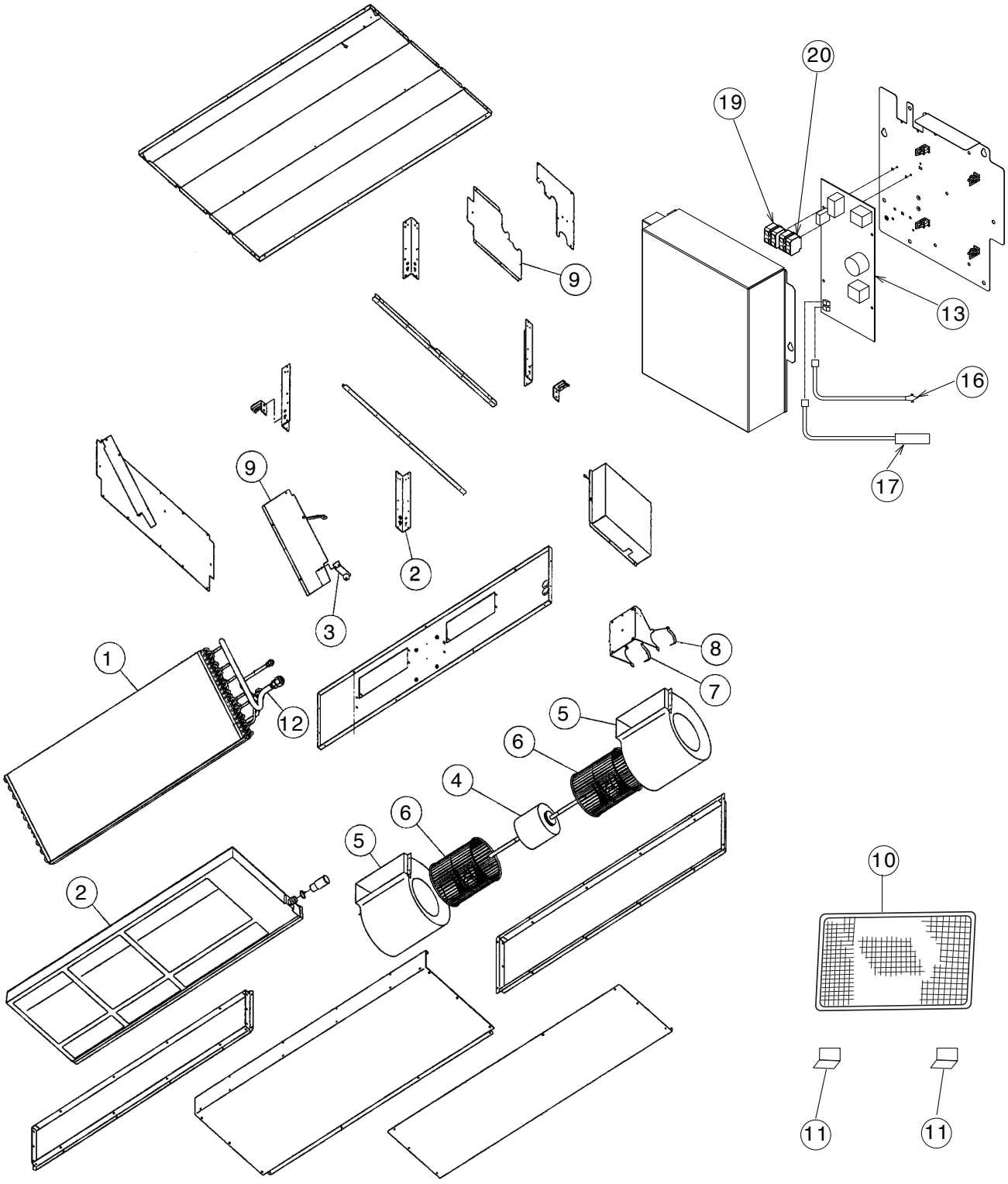
(1) Reducing union
2/8" (6.35mm)
1/2" (12.7mm)
(2) Copper pipe (2/8" and 1/2")

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.

PARTS LIST AND DIAGRAM

INDOOR UNIT
MODEL : RAD-50PPA/RAD-60PPA/RAD-70PPA



MODEL RAD-50PPA

NO.	PART N0.	Q'TY / UNIT	PARTS NAME
1	PMRAD-50PPA R02	1	CYCLE ASSY
2	PMRAD-50DH7 003	1	DRAIN PAN ASSY
3	PMRAD-50DH7 004	1	FLOAT SWITCH
4	PMRAD-50DH7 005	1	FAN MOTOR
5	PMRAD-50DH7 006	2	FAN CASING
6	PMRAD-50DH7 007	2	FAN
7	PMRAD-50DH7 008	1	BAND (L)
8	PMRAD-50DH7 009	1	BAND (R)
9	PMRAD-50DH7 010	1	DRAIN PUMP
10	PMRAD-50DH7 011	1	FILTER
11	PMRAD-50DH7 012	2	FILTER PLATE
12	PMRAD-50DH7 013	1	THERMISTOR SUPPORT
13	PMRAD-50PPA R01	1	P.W.B MAIN
16	PMRAD-50DH7 014	1	ROOM THERMISTOR
17	PMRAD-50DH7 015	1	THERMISTOR
19	PMRAS-70YHA 011	1	2P TERMINAL WITH FUSE
20	PMRAC-07CV1 R06	1	2P TERMINAL

MODEL RAD-60PPA

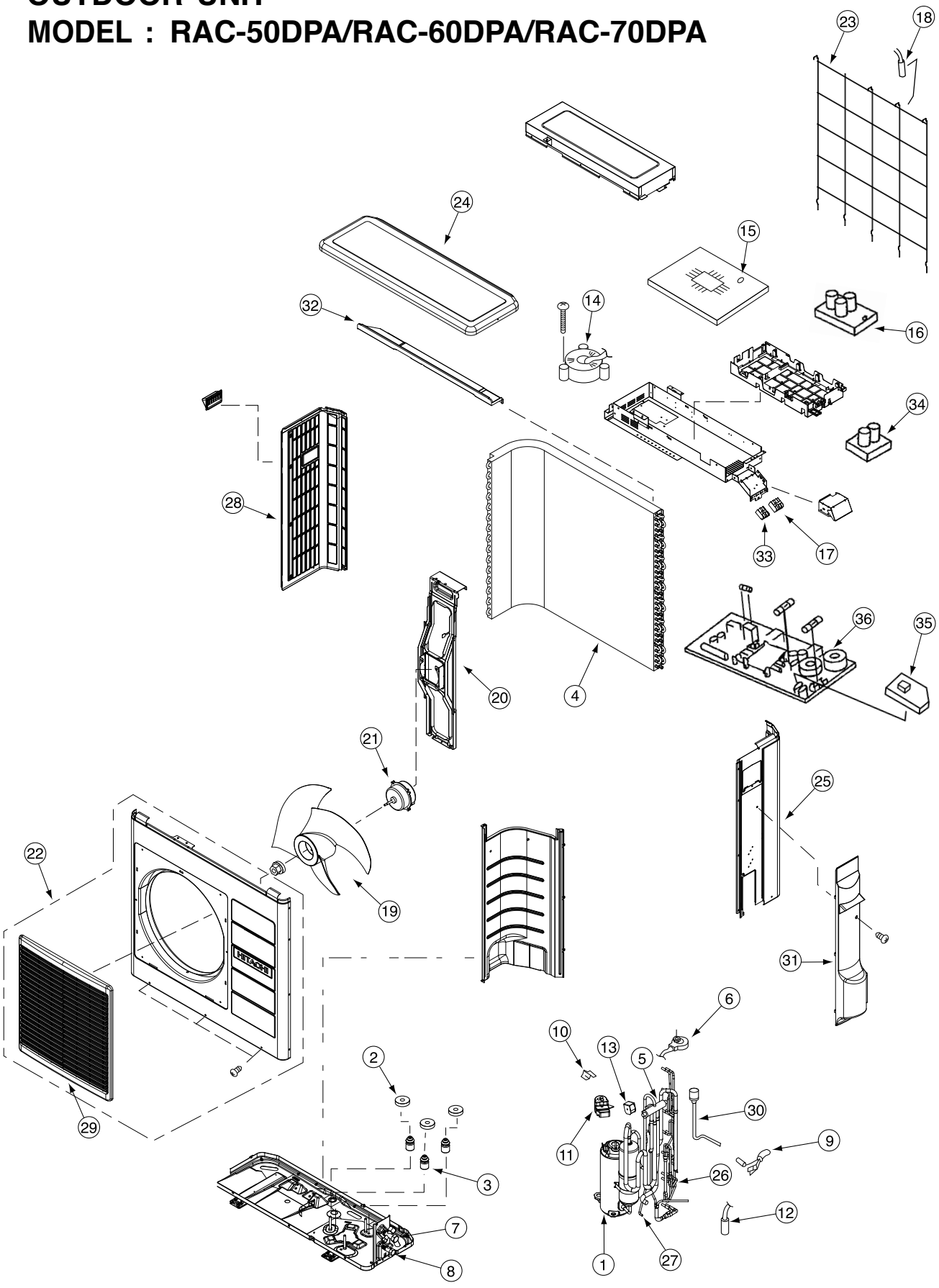
NO.	PART N0.	Q'TY / UNIT	PARTS NAME
1	PMRAD-50PPA R02	1	CYCLE ASSY
2	PMRAD-50DH7 003	1	DRAIN PAN ASSY
3	PMRAD-50DH7 004	1	FLOAT SWITCH
4	PMRAD-50DH7 005	1	FAN MOTOR
5	PMRAD-50DH7 006	2	FAN CASING
6	PMRAD-50DH7 007	2	FAN
7	PMRAD-50DH7 008	1	BAND (L)
8	PMRAD-50DH7 009	1	BAND (R)
9	PMRAD-50DH7 010	1	DRAIN PUMP
10	PMRAD-50DH7 011	1	FILTER
11	PMRAD-50DH7 012	2	FILTER PLATE
12	PMRAD-50DH7 013	1	THERMISTOR SUPPORT
14	PMRAD-60PPA R01	1	P.W.B MAIN
16	PMRAD-50DH7 014	1	ROOM THERMISTOR
17	PMRAD-50DH7 015	1	THERMISTOR
19	PMRAS-70YHA 011	1	2P TERMINAL WITH FUSE
20	PMRAC-07CV1 R06	1	2P TERMINAL

MODEL RAD-70PPA

NO.	PART N0.	Q'TY / UNIT	PARTS NAME
1	PMRAD-70PPA R02	1	CYCLE ASSY
2	PMRAD-50DH7 003	1	DRAIN PAN ASSY
3	PMRAD-50DH7 004	1	FLOAT SWITCH
4	PMRAD-50DH7 005	1	FAN MOTOR
5	PMRAD-50DH7 006	2	FAN CASING
6	PMRAD-50DH7 007	2	FAN
7	PMRAD-50DH7 008	1	BAND (L)
8	PMRAD-50DH7 009	1	BAND (R)
9	PMRAD-50DH7 010	1	DRAIN PUMP
10	PMRAD-50DH7 011	1	FILTER
11	PMRAD-50DH7 012	2	FILTER PLATE
12	PMRAD-50DH7 013	1	THERMISTOR SUPPORT
15	PMRAD-70PPA R01	1	P.W.B MAIN
16	PMRAD-50DH7 014	1	ROOM THERMISTOR
17	PMRAD-50DH7 015	1	THERMISTOR
19	PMRAS-07YHA 011	1	2P TERMINAL WITH FUSE
20	PMRAC-07CV1 R06	1	2P TERMINAL

PARTS LIST AND DIAGRAM

OUTDOOR UNIT
MODEL : RAC-50DPA/RAC-60DPA/RAC-70DPA



MODEL RAC-50DPA

NO.	PART N0.	Q'TY / UNIT	PARTS NAME
1	PMRAC-50YHA1 902	1	COMPRESSOR
2	KPNT1 001	6	PUSH NUT
3	RAC-2226HV 805	3	COMPRESSOR RUBBER
4	PMRAC-50DPA S02	1	CONDENSER
5	PMRAC-X24CAT S02	1	REVERSING VALVE
6	PMRAC-70WPA S02	1	ELECTRICAL EXPANSION COIL
7	PMRAC-50NH4 S04	1	VALVE (4S)
8	PMRAC-50NH4 S03	1	VALVE (2S)
9	PMRAM-72Q8 S03	1	THERMISTOR (OH)
10	PMRAC-25NH4 S09	1	OVERHEAT THERMISTOR SUPPORT
11	PMRAC-25NH4 910	1	OVERLOAD RELAY COVER
12	PMRAC-70YHA S13	1	THERMISTOR (DEFROST)
13	PMRAC-60YHA1 902	1	COIL (REVERSING VALVE)
14	PMRAC-18SH4 S01	1	REACTOR
15	PMRAC-50DPA S01	1	P.W.B (MAIN)
16	PMRAC-80YHA S10	1	SYSTEM POWER MODULE
17	PMRAC-25NH4 S13	1	TERMINAL BOARD (4P)
18	PMRAM-65QH4 S10	1	THERMISTOR (OUTSIDE TEMPERATURE)
19	PMRAC-70YHA 907	1	PROPELLER FAN
20	PMRAC-70YHA S12	1	SUPPORT (FAN MOTOR)
21	PMRAC-80YHA2 902	1	FAN MOTOR
22	PMRAC-70YHA S01	1	CABINET
23	PMRAC-70YHA S06	1	NET
24	PMRAC-24CP5 905	1	TOP COVER
25	PMRAC-70YHA S09	1	SIDE PLATE-R
26	PMRAC-70YHA2 904	1	STRAINER (COND)
27	PMRAC-70YHA 910	1	STRAINER (PIPE)
28	PMRAC-70YHA 908	1	SIDE PLATE-L
29	PMRAC-70YHA S05	1	GRILL
30	PMRAC-70WPA S03	1	EXPANSION VALVE
31	PMRAC-70YHA 915	1	SV-COVER
32	PMRAC-70YHA 916	1	NET COVER
33	PMRAC-63CA1 S02	1	TERMINAL BOARD (2P)
34	PMRAC-80YHA S12	1	CAPACITOR BOARD
35	PMRAC-70YHA S18	1	NOISE FILTER BOARD
36	PMRAD-50DH7 902	1	POWER BOARD

MODEL RAC-60DPA

NO.	PART N0.	Q'TY / UNIT	PARTS NAME
1	PMRAC-60DPA S02	1	COMPRESSOR
2	KPNT1 001	6	PUSH NUT
3	RAC-2226HV 805	3	COMPRESSOR RUBBER
4	PMRAC-50DPA S02	1	CONDENSER
5	PMRAC-X24CAT S02	1	REVERSING VALVE
6	PMRAC-70WPA S02	1	ELECTRICAL EXPANSION COIL
7	PMRAC-50NH4 S04	1	VALVE (4S)
8	PMRAC-50NH4 S03	1	VALVE (2S)
9	PMRAC-80YHA S14	1	THERMISTOR (OH)
10	PMRAC-25NH4 S09	1	OVERHEAT THERMISTOR SUPPORT
11	PMRAC-25NH4 910	1	OVERLOAD RELAY COVER
12	PMRAC-70YHA S13	1	THERMISTOR (DEFROST)
13	PMRAC-60YHA1 902	1	COIL (REVERSING VALVE)
14	PMRAC-18SH4 S01	1	REACTOR
15	PMRAC-60DPA S01	1	P.W.B (MAIN)
16	PMRAC-80YHA S10	1	SYSTEM POWER MODULE
17	PMRAC-25NH4 S13	1	TERMINAL BOARD (4P)
18	PMRAM-65QH4 S10	1	THERMISTOR (OUTSIDE TEMPERATURE)
19	PMRAC-70YHA 907	1	PROPELLER FAN
20	PMRAC-70YHA S12	1	SUPPORT (FAN MOTOR)
21	PMRAC-80YHA2 902	1	FAN MOTOR
22	PMRAC-70YHA S01	1	CABINET
23	PMRAC-70YHA S06	1	NET
24	PMRAC-24CP5 905	1	TOP COVER
25	PMRAC-70YHA S09	1	SIDE PLATE-R
26	PMRAC-70YHA2 904	1	STRAINER (COND)
27	PMRAC-70YHA 910	1	STRAINER (PIPE)
28	PMRAC-70YHA 908	1	SIDE PLATE-L
29	PMRAC-70YHA S05	1	GRILL
30	PMRAC-70WPA S03	1	EXPANSION VALVE
31	PMRAC-70YHA 915	1	SV-COVER
32	PMRAC-70YHA 916	1	NET COVER
33	PMRAC-63CA1 S02	1	TERMINAL BOARD (2P)
34	PMRAC-80YHA S12	1	CAPACITOR BOARD
35	PMRAC-70YHA S18	1	NOISE FILTER BOARD
36	PMRAC-50DH7 902	1	POWER BOARD

MODEL RAC-70DPA

NO.	PART N0.	Q'TY / UNIT	PARTS NAME
1	PMRAC-60DPA S02	1	COMPRESSOR
2	KPNT1 001	6	PUSH NUT
3	RAC-2226HV 805	3	COMPRESSOR RUBBER
4	PMRAC-50DPA S02	1	CONDENSER
5	PMRAC-X24CAT S02	1	REVERSING VALVE
6	PMRAC-70WPA S02	1	ELECTRICAL EXPANSION COIL
7	PMRAC-70YHA3 S04	1	VALVE (5S)
8	PMRAC-50NH4 S03	1	VALVE (2S)
9	PMRAM-72Q8 S03	1	THERMISTOR (OH)
10	PMRAC-25NH4 S09	1	OVERHEAT THERMISTOR SUPPORT
11	PMRAC-25NH4 910	1	OVERLOAD RELAY COVER
12	PMRAC-70YHA S13	1	THERMISTOR (DEFROST)
13	PMRAC-60YHA1 902	1	COIL (REVERSING VALVE)
14	PMRAC-18SH4 S01	1	REACTOR
15	PMRAC-70DPA S01	1	P.W.B (MAIN)
16	PMRAC-80YHA S10	1	SYSTEM POWER MODULE
17	PMRAC-25NH4 S13	1	TERMINAL BOARD (4P)
18	PMRAM-65QH4 S10	1	THERMISTOR (OUTSIDE TEMPERATURE)
19	PMRAC-70YHA 907	1	PROPELLER FAN
20	PMRAC-70YHA S12	1	SUPPORT (FAN MOTOR)
21	PMRAC-80YHA2 902	1	FAN MOTOR
22	PMRAC-70YHA S01	1	CABINET
23	PMRAC-70YHA S06	1	NET
24	PMRAC-24CP5 905	1	TOP COVER
25	PMRAC-70YHA S09	1	SIDE PLATE-R
26	PMRAC-70YHA2 904	1	STRAINER (COND)
27	PMRAC-70YHA 910	1	STRAINER (PIPE)
28	PMRAC-70YHA 908	1	SIDE PLATE-L
29	PMRAC-70YHA S05	1	GRILL
30	PMRAC-70WPA S03	1	EXPANSION VALVE
31	PMRAC-70YHA 915	1	SV-COVER
32	PMRAC-70YHA 916	1	NET COVER
33	PMRAC-63CA1 S02	1	TERMINAL BOARD (2P)
34	PMRAC-80YHA S12	1	CAPACITOR BOARD
35	PMRAC-70YHA S18	1	NOISE FILTER BOARD
36	PMRAC-50DH7 902	1	POWER BOARD

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