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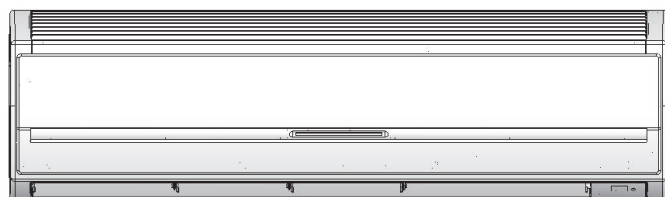
PM | **NO. 0315E**

RAS-80YH5/RAC-80YH5

SERVICE MANUAL
TECHNICAL INFORMATION

REFER TO THE FOUNDATION MANUAL

FOR SERVICE PERSONNEL ONLY

RAS-80YH5

RAC-80YH5

CONTENTS

SPECIFICATIONS

TYPE			(WALL TYPE)	
			INDOOR UNIT	OUTDOOR UNIT
MODEL			RAS-80YH5	RAC-80YH5
POWER SOURCE			1 Ø, 50 Hz, 220 ~ 240V	
COOLING	TOTAL INPUT	(W)	3,070 (200 ~ 3,850)	
	TOTAL AMPERES	(A)	14.10 ~ 12.90	
	CAPACITY	(kW)	8.00 (1.50 ~ 8.50)	
		(B.T.U./h)	27,300 (5,120 ~ 29,000)	
HEATING	TOTAL INPUT	(W)	3,100 (200 ~ 3,850)	
	TOTAL AMPERES	(A)	14.30 ~ 13.00	
	CAPACITY	(kW)	9.30 (1.50 ~ 9.70)	
		(B.T.U./h)	31,730 (5,120 ~ 3,310)	
DIMENSIONS (mm)	W		1150	925
	H		333	875
	D		245	315
NET WEIGHT	(kg)		15	57

※ After installation

## SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

ROOM AIR CONDITIONER
INDOOR UNIT + OUTDOOR UNIT

JANUARY 2006 **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.

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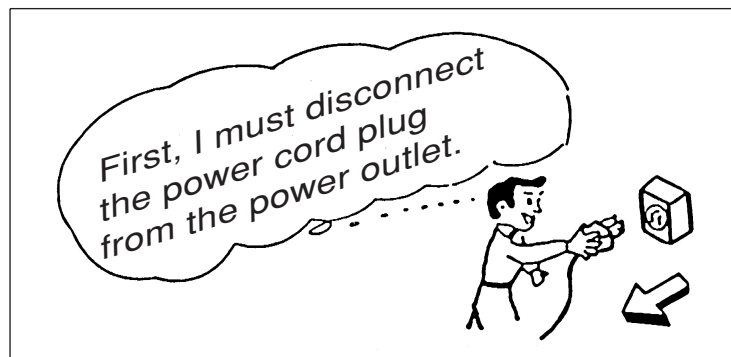
2. If it is necessary to replace any parts, they should be replaced with respective genuine parts for the unit, and the replacement must be effected in correct manner according to the instructions in the Service Manual of the unit.

> 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 $1M\Omega$ or more as measured by a 500V DC megger.

9. The initial location of installation such as window, floor or the other should be checked for being and safe enough to support the repaired unit again.
If it is found not so strong and safe, the unit should be installed at the initial location reinforced or at a new location.

10. Any inflammable thing should never be placed about the location of installation.

11. Check the grounding to see whether it is proper or not, and if it is found improper, connect the grounding terminal to the earth.

DANGER

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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).
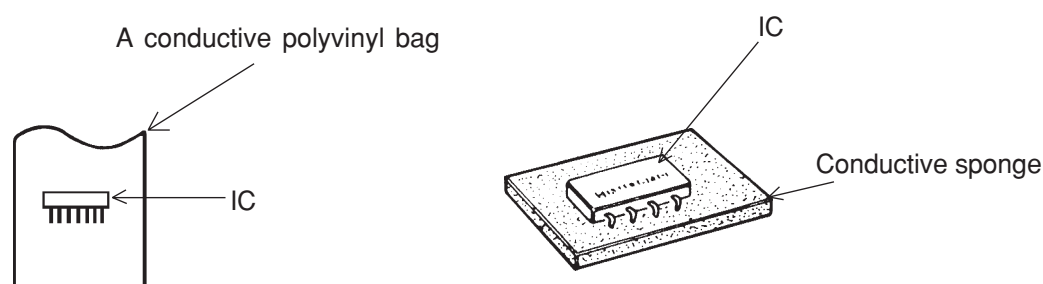
A conductive polyvinyl bag

IC

IC

Conductive sponge

Fig. 1. Conductive Container

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

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

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

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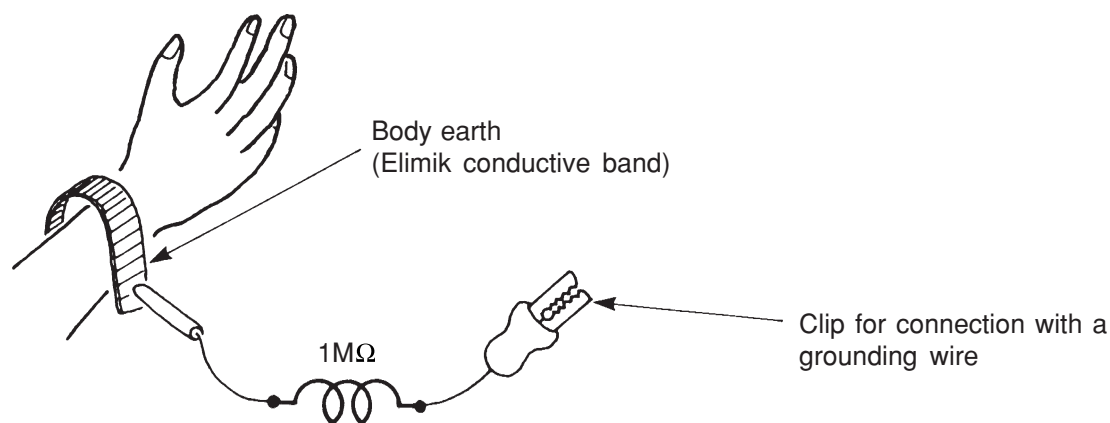
Body earth
(Elimik conductive band)

Clip for connection with a grounding wire

1MΩ

Fig. 2. Body Earth

– 1 –

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

Metal plate (of aluminium, stainless steel, etc.)

Working table

Resistor of 1 MΩ (1/2W)

Staple

Earth wire

Bare copper wire (for body earth)

Fig. 3. Grounding of the working table
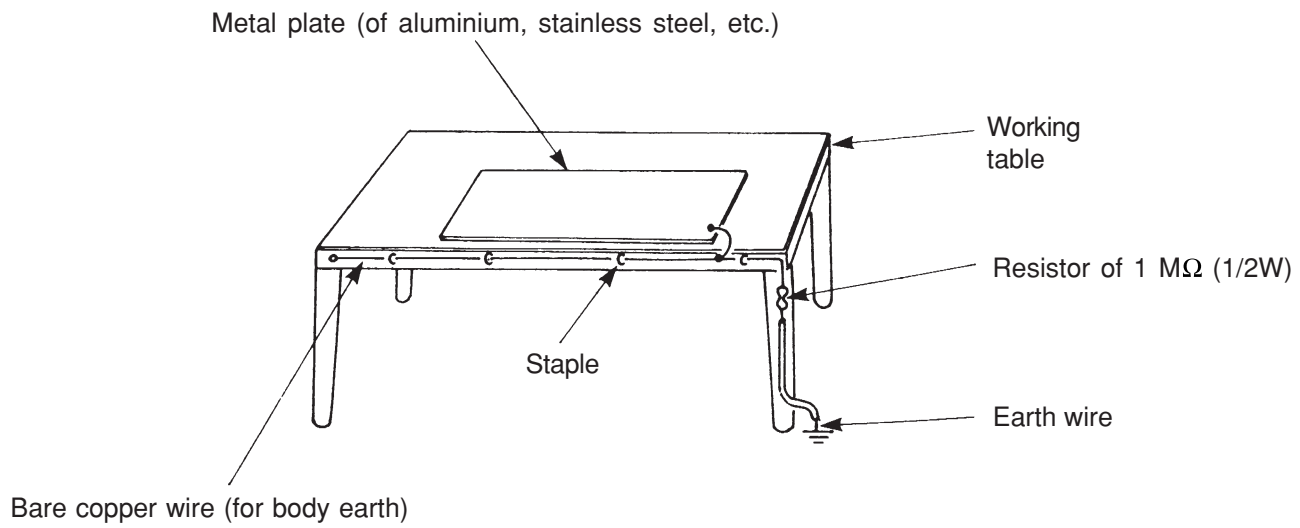
Soldering iron

Grounding wire

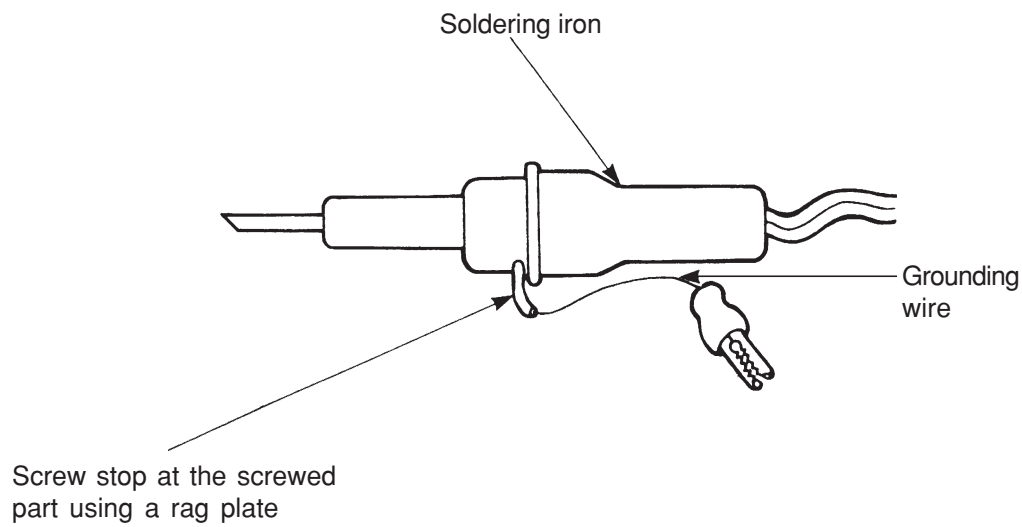Screw stop at the screwed part using a rag plate

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.
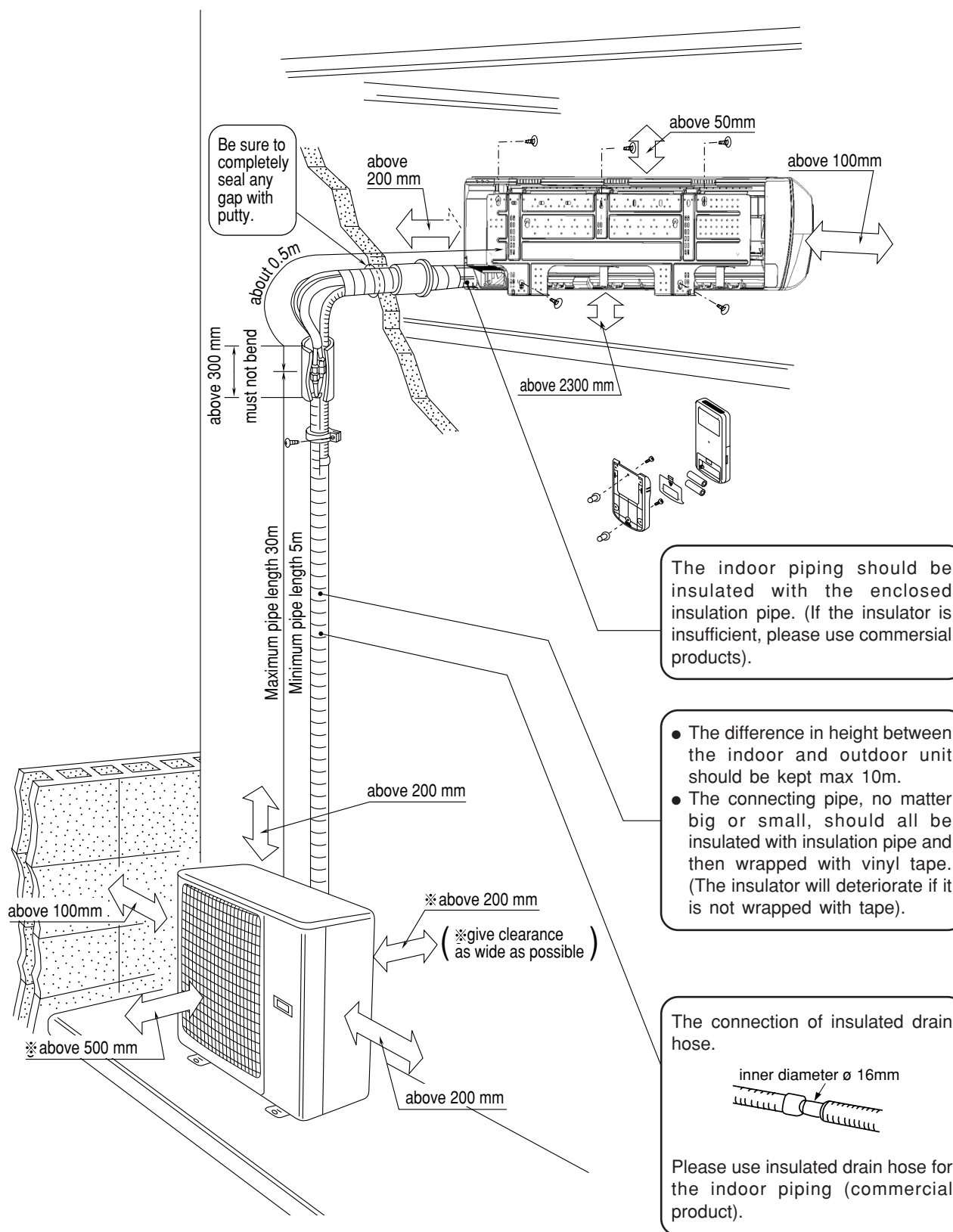
SPECIFICATIONS

MODEL		RAS-80YH5	RAC-80YH5
FAN MOTOR		30 W	100 W
FAN MOTOR CAPACITOR		NO	NO
FAN MOTOR PROTECTOR		NO	NO
COMPRESSOR		–	JU1015D3
COMPRESSOR MOTOR CAPACITOR		NO	NO
OVERLOAD PROTECTOR		NO	NO
OVERHEAT PROTECTOR		NO	YES
FUSE (MICRO COMPUTER CIRCUIT)		3.15A	NO
POWER RELAY		G4A	NO
POWER SWITCH		NO	NO
TEMPORARY SWITCH		YES	NO
SERVICE SWITCH		NO	NO
TRANSFORMER		NO	NO
VARISTOR		416NR	NO
NOISE SUPPRESSOR		NO	NO
THERMOSTAT		YES(IC)	YES(IC)
REMOTE CONTROL SWITCH (LIQUID CRYSTAL)		YES	NO
FUSE CAPACITY		30 A TIME DELAY FUSE	
REFRIGERANT CHARGING VOLUME (Refrigerant R410A)	UNIT	----------	✳ 1800g
	PIPES (MAX. 30m) (MIN. 5m)	ADDITIONAL REFRIGERANT R410A AT 20g PER EVERY METER IF PIPE LENGTH MORE THAN 20m	

Figure showing the installation of Indoor and Outdoor unit

> ⚠ **CAUTION**
> In case the pipe length is more than 20m, add refrigerant R410A at 20 gram per every meter exceeds. However, pipe length shall not exceed 30m.

Be sure to completely seal any gap with putty.

about 0.5m

above 200 mm

above 50mm

above 100mm

above 300 mm

must not bend

above 2300 mm

Maximum pipe length 30m

Minimum pipe length 5m

The indoor piping should be insulated with the enclosed insulation pipe. (If the insulator is insufficient, please use commersial products).

above 200 mm

- The difference in height between the indoor and outdoor unit should be kept max 10m.
- The connecting pipe, no matter big or small, should all be insulated with insulation pipe and then wrapped with vinyl tape. (The insulator will deteriorate if it is not wrapped with tape).

above 100mm

※above 200 mm

(※give clearance as wide as possible)

※above 500 mm

above 200 mm

The connection of insulated drain hose.

inner diameter ø 16mm

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

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.	

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.	

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PRECAUTIONS DURING OPERATION

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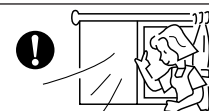
● Do not direct the cool air coming out from the air-conditioner panel to face household heating apparatus as this may affect the working of apparatus such as the electric kettle, oven etc.

● Please ensure that outdoor mounting frame is always stable, firm and without defect. If not, the outdoor unit may collapse and cause danger.
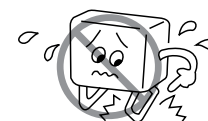
● Do not splash or direct water to the body of the unit when cleaning it as this may cause short circuit.

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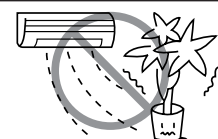
● Turn off the circuit breaker if the unit is not to be operated for a long period.

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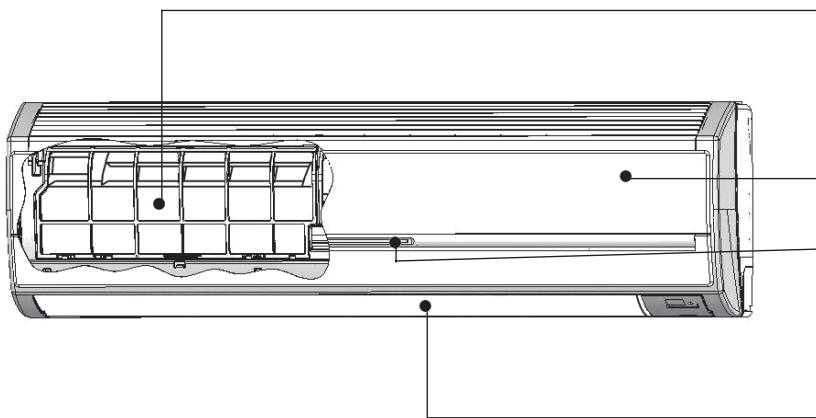
● If the amount of heat in the room is above the cooling or heating capability of the unit (for example: more people entering the room, using heating equipments and etc.), the preset room temperature cannot be achieved.

● 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.

Все каталоги и инструкции здесь: https://splitsystema48.ru/instrukcii-po-ekspluatacii-kondicionerov.html

NAMES AND FUNCTIONS OF EACH PART

INDOOR UNIT

AIR FILTER
To prevent dust from coming into the indoor unit.
(Refer page 25)

FRONT PANEL (AIR INLET).

INDOOR UNIT INDICATORS
Light indicator showing the operating condition.
(Refer page 9)

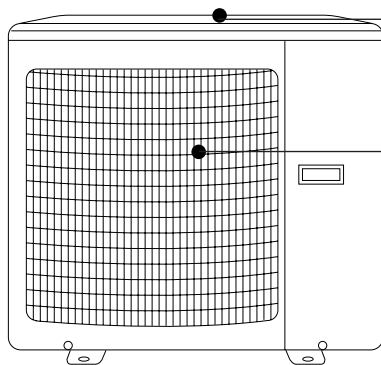**HORIZONTAL DEFLECTOR ●**
VERTICAL DEFLECTOR (AIR OUTLET)
(Refer page 20)

REMOTE CONTROLLER
Send out operation signal to the indoor unit. So as to operate the whole unit.
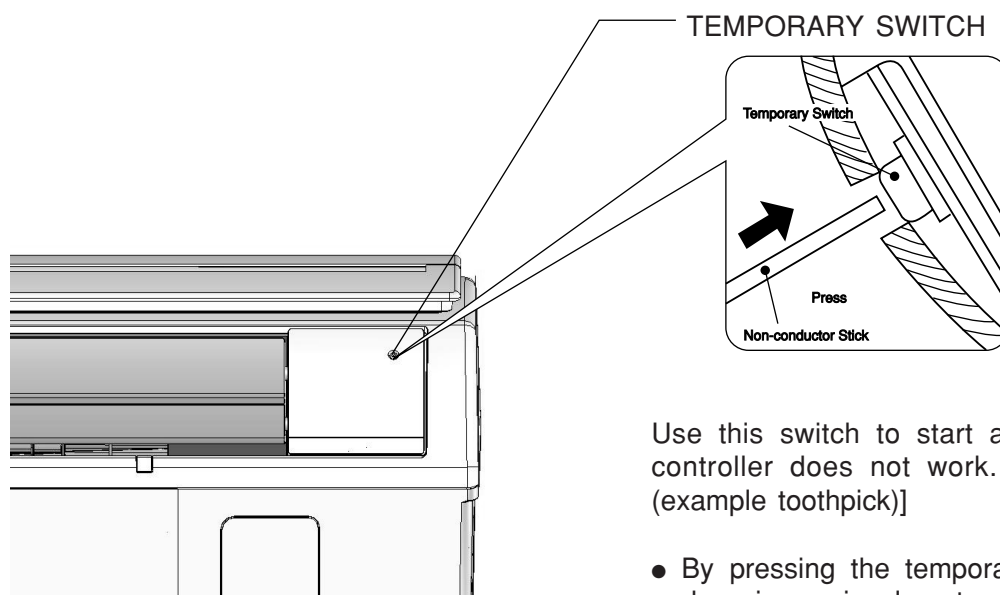(Refer page 10)

OUTDOOR UNIT

AIR INLET (BACK, LEFT SIDE)

AIR OUTLET
Blow out warm air.

MODEL NAME AND DIMENSIONS

MODEL	WIDTH (mm)	HEIGHT (mm)	DEPTH (mm)
RAS-80YH5	1150	333	245
RAC-80YH5	925	875	315

## OPERATION INDICATOR

TEMPORARY SWITCH

Temporary Switch

Press

Non-conductor Stick

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

● By pressing the temporary switch, the operation is done in previously set operation mode.

● When the operation is done using the temporary switch after the power source is turned off and turn on again, the operation is done in automatic mode.

INDOOR UNIT INDICATORS

HITACHI
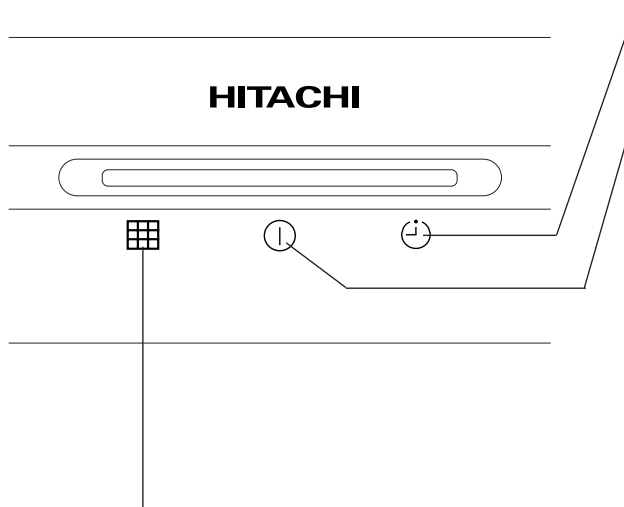
TIMER LAMP
This lamp lights when the timer is working.

OPERATION LAMP
This lamp lights during operation.
The OPERATION LAMP flashes in the following cases during heating.
(1) During preheating
For about 2–3 minutes after starting up.
(2) During defrosting
Defrosting will be performed about once an hour when frost forms on the heat exchanger of the outdoor unit, for 5–10 minutes each time.

FILTER LAMP

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

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NAMES AND FUNCTIONS OF EACH PART

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.
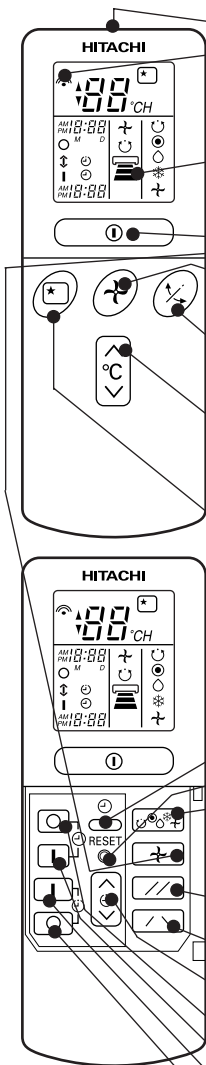
● **Signal emitting window/transmission sign**
Point this window toward the indoor unit when controlling it.
The transmission sign blinks when a signal is sent.

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

● **START/STOP button**
Press this button to start operation. Press it again to stop operation.

● **FAN SPEED selector**
This determines the fan speed. Every time you press this button, the intensity of circulation will change from ↻ (AUTO) to 🗟 (HI) to 🗟 (MED) to 🗟 (LOW) (during the ⤙ (FAN) mode, from 🗟 HI to 🗟 MED to 🗟 LOW).

● **AUTO SWING button**
Controls the angle of the horizontal air deflector.

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

● **SLEEP button**
Use this button to set the sleep timer.

● **TIME button**
Use this button to set and check the time and date.

● **RESET buttons**

● **FUNCTION selector**
Use this button to select the operating mode. Every time you press it, the mode will change from ↻ (AUTO) to ◉ (HEAT) to ○ (DEHUMIDIFY) to ❄ (COOL) and to ⤙ (FAN) cyclically.

● **PARALLEL SWING button**
Controls the angle of the vertical air deflectors to parallel.

● **SYMMETRY SWING button**
Controls the angle of the vertical air deflectors to symmetry.

● **TIMER control**
Use this button to set the timer.

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

↻	AUTO
◉	HEAT
○	DEHUMIDIFY
❄	COOL
⤙	FAN
🗟	FAN SPEED — LOW / MED / HI
⭑	SLEEPING
○	STOP (CANCEL)
I	START (RESERVE)
⏻	START/STOP
⊙	TIME
⏲	TIMER SET
⊙	TIMER SELECTOR — ON TIMER / OFF TIMER
⤡	AUTO SWING (HORIZONTAL DEFLECTOR)
∥	PARALLEL SWING
⁄∖	SYMMETRY SWING

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

VARIOUS FUNCTIONS

■ Auto Restart Control

- If there is a power failure, operation will be automatically restarted when the power is resumed with previous operation mode and airflow direction.
  (As the operation is not stopped by remote controller.)
- If you intend not to continue the operation when the power is resumed, switch off the power supply.
  When you switch on the circuit breaker, the operation will be automatically restarted with previous operation mode and airflow direction.
  Note: 1. If you do not require Auto Restart Control, please consult your sales agent or OFF by remote control.
  　　　 2. Auto Restart Control is not available when Timer or Sleep Timer mode is set.

AUTOMATIC OPERATION

The device will automatically determine the mode of operation, HEAT, COOL or DEHUMIDIFY depending on the current room temperature. The selected mode of operation will change when the room temperature varies.
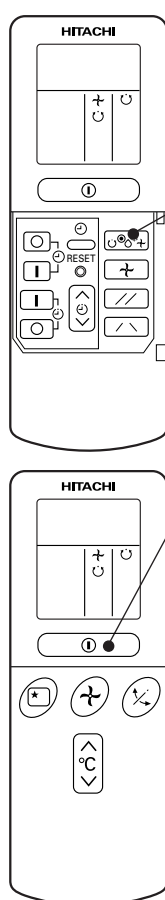
1 — Press the FUNCTION selector so that the display indicates the ⟳ (AUTO) mode of operation.

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

START STOP — Press the ① (START/STOP) button.
Operation starts with a beep.
Press the button again to stop operation.

■ As the settings are stored in memory in the remote controller, you only have to press the ① (START/STOP) button next time.

You can raise or lower the temperature setting as necessary by maximum of 3°C.
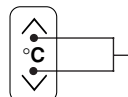
Press the temperature button and the temperature setting will change by 1°C each time.

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

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

■ Condition of Automatic Operation

| Initial room temperature (approx.)	Function	Temperature setting	FAN SPEED
Over 27°C ➡	COOL	27°C	HI at start, MED or LOW after the preset temperature is reached
23~27°C ➡	DEHUMIDIFY	Slightly lower than the room temperature	LOW
Under 23°C ➡	HEAT	23°C	HI at start, MED or LOW after the preset temperature is reached

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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.
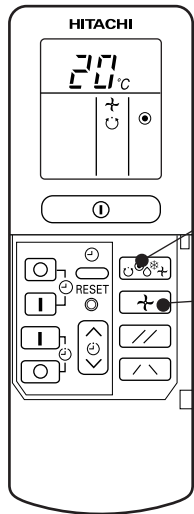
1 Press the FUNCTION selector so that the display indicates ◉ (HEAT).
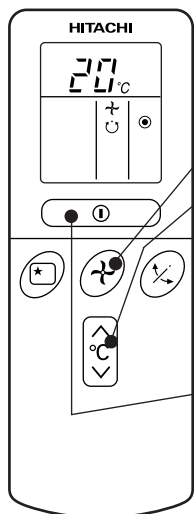
2 Set the desired FAN SPEED with the ✦ (FAN SPEED) button (the display indicates the setting).

  ↻ (AUTO) : The fan speed is HI at first and varies to MED automatically when the preset temperature has been reached.

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

  (MED) : Quiet.

  (LOW) : More quiet.

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

  The range of 18-22°C is recommended as the room temperature for heating.
  If the temperature setting is 20°C, the room temperature will be controlled at around 20°C.

  The temperature setting and the actual room temperature may vary somewhat depending on conditions.
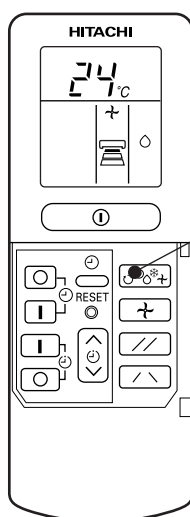
START STOP Press the ① (START/STOP) button. Heating operation starts with a beep. Press the button again to stop operation.

■ As the settings are stored in memory in the remote controller, you only have to press the ① (START/STOP) button next time.

DEHUMIDIFYING OPERATION

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

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

2
Set the desired room temperature with the TEMPERATURE button (the display indicates the setting).
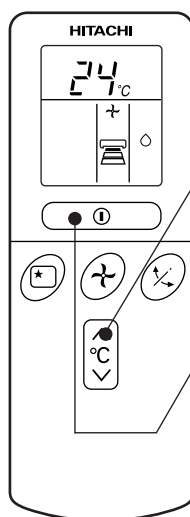
The range of 20-26°C is recommended as the room temperature for dehumidifying.

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

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

■ Dehumidifying Function

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

COOLING OPERATION

Use the device for cooling when the outdoor temperature is –10~43°C.
If humidity is very high (over 80%) indoors, some dew may form on the air outlet grille of the indoor unit.
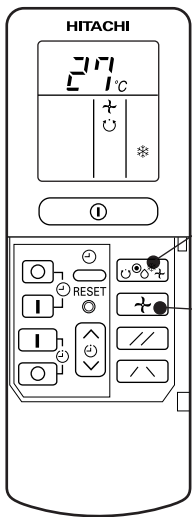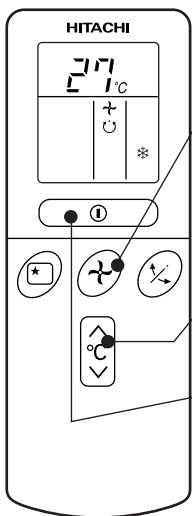
1 Press the FUNCTION selector so that the display indicates ❄ (COOL).

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

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

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

    (MED) : Quiet.

    (LOW) : More quiet.

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

The range of 25-28°C is recommended as the room temperature for cooling.
If the temperature setting is 27°C, the room temperature will be controlled at around 27°C.

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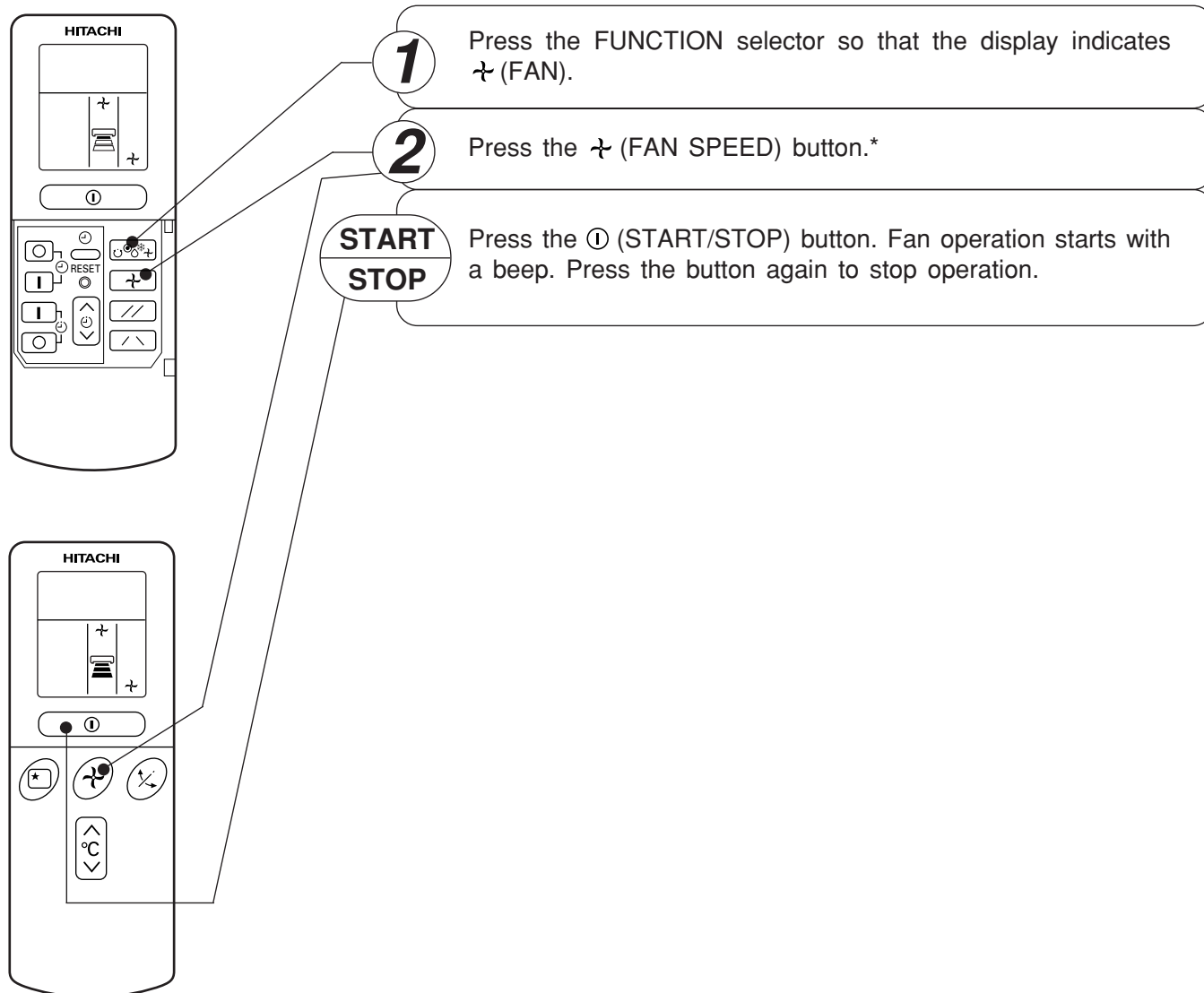
START STOP Press the ⏻ (START/STOP) button. Cooling operation starts with a beep. Press the button again to stop operation. The cooling function does not start if the temperature setting is higher than the current room temperature (even though the ⏻ (OPERATION) lamp lights). The cooling function will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

■ As the settings are stored in memory in the remote controller, you only have to press the ⏻ (START/STOP) button next time.
However, if operation stops with fan speed of "LOW", fan speed is automatically set to "AUTO" next time.

FAN OPERATION

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

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

2 Press the ⊹ (FAN SPEED) button.*

START STOP Press the ① (START/STOP) button. Fan operation starts with a beep. Press the button again to stop operation.

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

For the heating operation	● The fan speed will automatically change according to the temperature of discharged air. ● When the difference of room temperature and setting temperature is large, fan starts to run at HI speed. ● When the room temperature reaches setting temperature, fan speed changes to LOW automatically.
For the cooling operation	● When the difference of room temperature and setting temperature is large, fan starts to run at HI speed. ● After room temperature reaches the preset temperature, the cooling operation, which changes the fan speed and room temperature to obtain optimum conditions for natural healthful cooling will be performed.

HOW TO SET THE TIMER
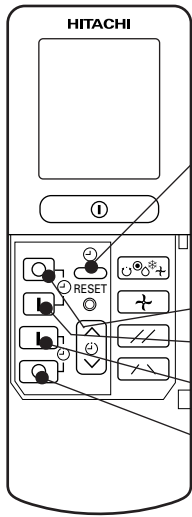
TIME, DAY,
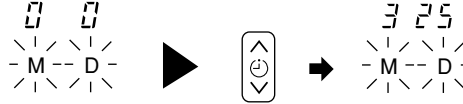MONTH
(current time,
day, month)
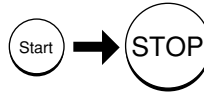
OFF TIMER

ON TIMER

RESERVE

CANCEL

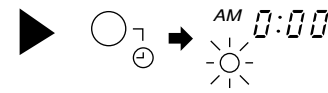**Time, Day, Month**

After you change the batteries;

$$\begin{array}{cc} 0 & 0 \\ -M & -D- \end{array}$$

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

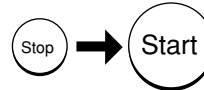$$\begin{array}{cc} 3 & 25 \\ -M & -D- \end{array}$$

OFF-Timer

Start ➡ STOP

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

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

AM 0:00

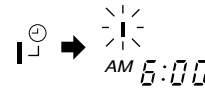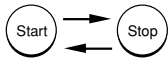**ON-Timer**

Stop ➡ Start

● The device will turn on at the designated times.

1 Press the (ON-TIMER) button the (ON) mark blinks on the display.
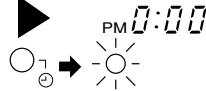
AM 6:00

ON/OFF-Timer

Start ⇄ Stop

● The device will turn on (off) and off (on) at the designated times.
● The switching occurs first at the preset time that comes earlier.
● The arrow mark appearing on the display indicates the sequence of switching operations.
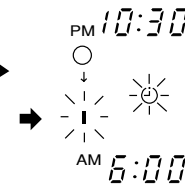
1 Press the (ON-OFF) button so that the (OFF) mark blinks.

PM 0:00

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

PM 10:30
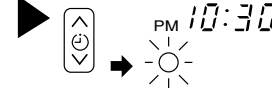
3 Press the (ON-TIMER) button so that the (OFF) mark lights and the (ON) mark blinks.

PM 10:30

AM 6:00

How to Cancel Reservation

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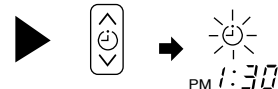The ⏲ (RESERVED) sign goes out with a beep and the ⏲ (TIMER) lamp turns off on the indoor unit.

NOTE

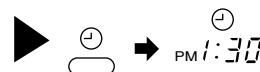You can set only one of the OFF-timer, ON-timer and ON/OFF-timer.

2 Press the ⏰ (TIME) button.

3 Set the current time with the TIMER control button.

4 Press the ⏰ (TIME) button again. The time indication starts lighting instead of flashing.
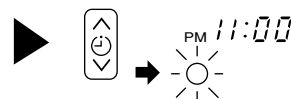
▶ ⏰ → AM PM *18:88*

▶ ⏱ → PM *1:30*

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

▶ ⏰ → PM *1:30*

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

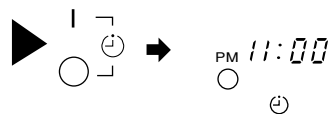The setting of the current time is now complete.

---

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

▶ ⏱ → PM *11:00* ○

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

▶ ○ ⏱ → PM *11:00* ○ ⏱

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

The setting of turn-off time is now complete.

---

2 Set the turn-on time with the TIMER control button.
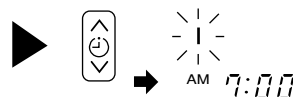
▶ ⏱ → AM *7:00*

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

▶ ○ ⏱ → AM *7:00* ⏱
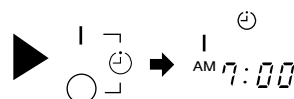
Example:
The device will automatically turn on earlier so that the preset temperature can be reached at 7:00 a.m.
The setting of the turn-on time is now complete.

---

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

▶ ⏱ → PM *10:30* ○ AM *7:00*
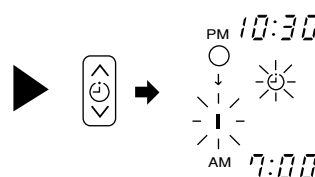
5 Point the signal window of the remote controller toward the indoor unit, and press the ▮ (RESERVE) button.
The ▮ (ON) mark starts lighting instead of flashing and the ⏱ (RESERVED) sign lights. A beep occurs and the ⏱ (TIMER) lamp lights on the indoor unit.

▶ ○ ⏱ → PM *10:30* ○ ⏱ AM *7:00*
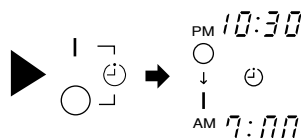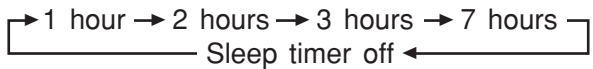
Example:
The device will turn off at 10:30 p.m. and then automatically turn on earlier so that the preset temperature can be reached at 7:00 a.m.
The settings of the turn-on/off times are now complete.

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

● As the time settings are stored in memory in the remote controller, you only have to press the ▮ (RESERVE) button in order to use the same settings next time.
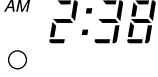
HOW TO SET THE SLEEP TIMER

Set the current time at first if it is not set before (see the pages for setting the current time). Press the ⊡ (SLEEP) button, and the display changes as shown below.
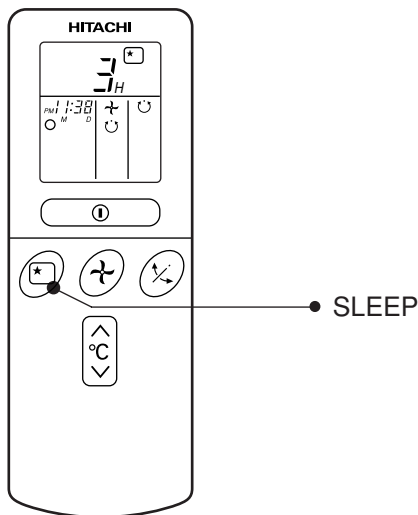
Mode	Indication
Sleep timer	→ 1 hour → 2 hours → 3 hours → 7 hours → Sleep timer off ←

Sleep Timer: The device will continue working for the designated number of hours and then turn off.
Point the signal window of the remote controller toward the indoor unit, and press the SLEEP button.
The timer information will be displayed on the remote controller. The TIMER lamp lights with a beep from the indoor unit. When the sleep timer has been set, the display indicates the turn-off time.
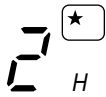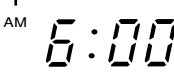
Example: If you set 3 hours sleep time at 11:38 p.m., the turn-off time is 2:38 a.m.
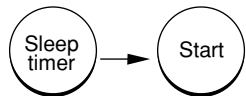
● SLEEP

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

1 Set the ON-timer.

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

Example:

In this case, the device will turn off in 2 hours (at 1:38 a.m.) and turn on early so that the preset temperature will be almost reached at 6:00 next morning.

How to Cancel Reservation

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

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 date or current time is not set, sleep timer can not be set.
● If you set the sleep timer after the off-, on/off- or off/on-timer has been set, the sleep timer becomes effective instead of the off-, on/off- or off/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.

ADJUSTING THE AIR DEFLECTOR

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

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

- If the " ⟨ ⤬ ⟩ (AUTO SWING)" button is pressed once, the horizontal air deflector swings up and down. If the button is pressed again, the deflector stops in its current position. Several seconds (about 6 seconds) may be required before the deflector starts to move.

- Use the horizontal air deflector within the adjusting range shown on the right.

- When the operation is stopped, the horizontal air deflector moves and stops at the position where the air outlet closes.

⚠ CAUTION

- In "Cooling" operation, do not keep the horizontal and vertical air deflector swinging for a long time. Some dew may form on the horizontal and vertical air deflector and dew may drop.

2 Adjustment of the conditioned air in the left and right directions.

- If the " ⟨ ⫽ ⟩ (PARALLEL SWING)" button is pressed once, the vertical air deflectors swing left and right to parallel. If the button is pressed again, the deflectors stop in their current position. Several second (about 6 seconds) may be required before the deflectors start to move.
- If the " ⟨ ∧ ⟩ (SYMMETRY SWING) button is pressed once, the vertical air deflectors swing left and right to symmetry. If the button is pressed again, the deflectors stop in their current position. Several seconds (about 6 seconds) may be required before the deflectors start to move.

- PARALLEL SWING
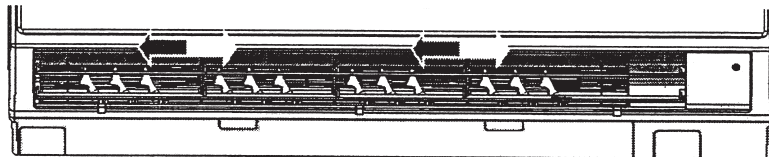
- SYMMETRY SWING

Horizontal air deflector

When cooling, dehumidifying

about 15°

about 60°

When heating

about 45°

about 30°

PARALLEL SWING

SYMMETRY SWING

– 20 –
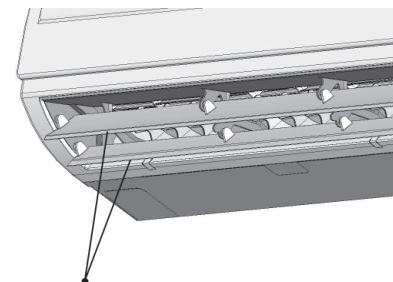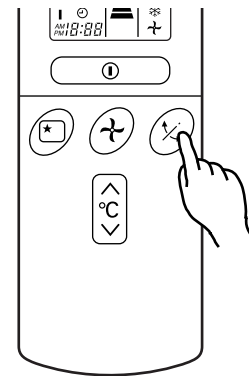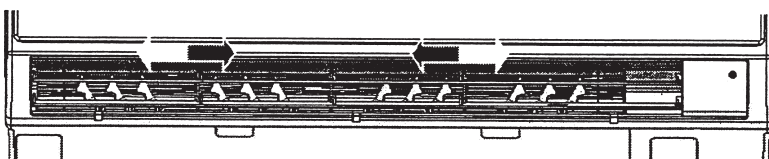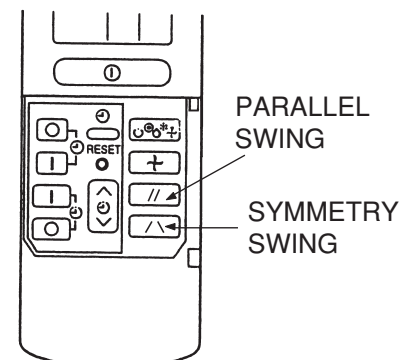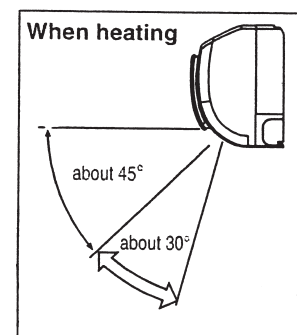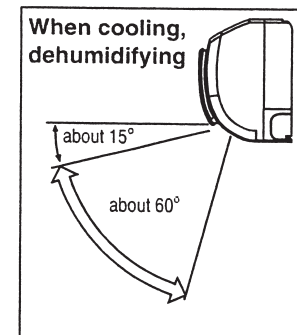
HOW TO EXCHANGE THE BATTERIES IN THE REMOTE CONTROLLER

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

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

⚠ CAUTION

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

Push and pull to the direction of arrow
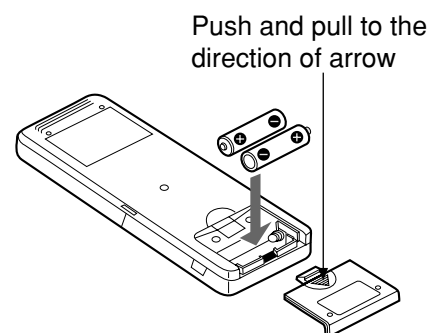
THE IDEAL WAYS OF OPERATION

Suitable Room Temperature
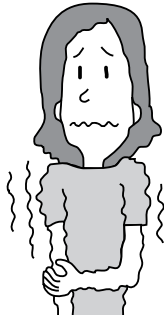
⚠ Warning

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

Install curtain or blinds
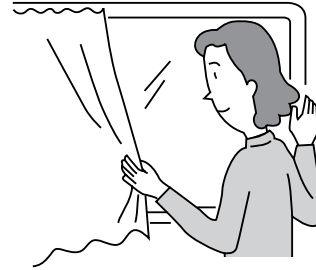
It is possible to reduce heat entering the room through windows.

Ventilation

⚠ Caution

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

Effective Usage Of Timer

At night, please use the "OFF or ON timer operation mode", together with your wake up time in the morning. This will enable you to enjoy a comfortable room temperature. Please use the timer effectively.
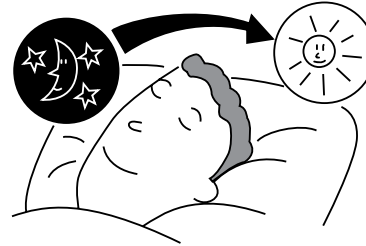
Do Not Forget To Clean The Air Filter

Dusty air filter will reduce the air volume and the cooling efficiency. To prevent from wasting electric energy, please clean the filter every 2 weeks.
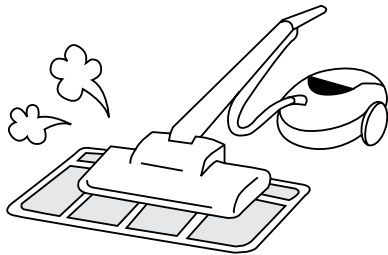
Please Adjust Suitable Temperature For Baby And Children

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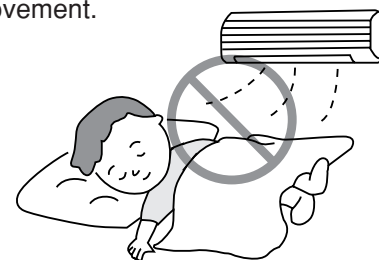
FOR USER'S INFORMATION

The Air Conditioner And The Heat Source In The Room

⚠ Caution

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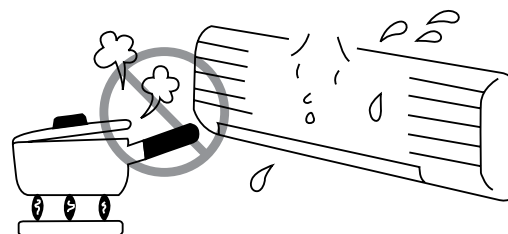
Not Operating For A Long Time

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

OFF
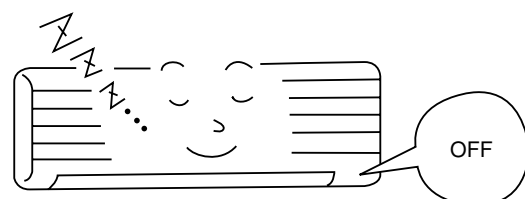
When Lightning Occurs

⚠ Warning

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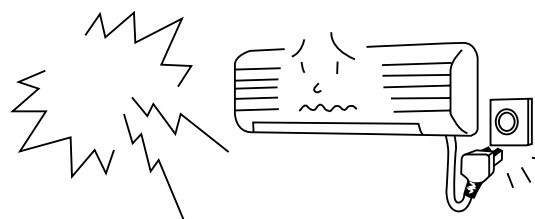
Interference From Electrical Products

⚠ Caution

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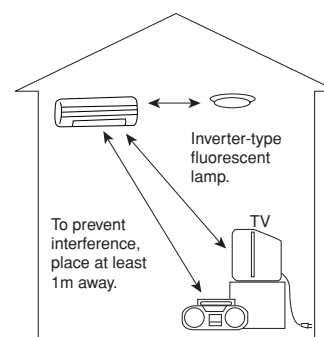
Inverter-type fluorescent lamp.

To prevent interference, place at least 1m away.

TV

ATTACHING THE AIR CLEANSING AND DEODORIZING FILTERS

1 **Open the front panel.**
- Pull up the front panel by holding it at both sides with both hands.
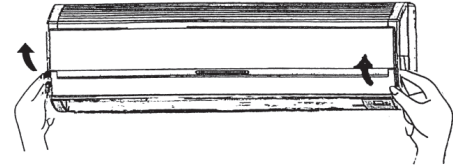
2 **Remove the filter.**
- Push upward to release the claws and pull out the filter.

Claws
(4 places)
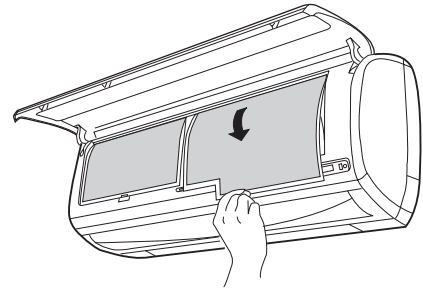
3 **Attaching the air cleansing and deodorizing filters to the filter.**
- Attach the air cleansing and deodorizing filters to the frame by gently compress its both sides and release after insertion into filter frame.
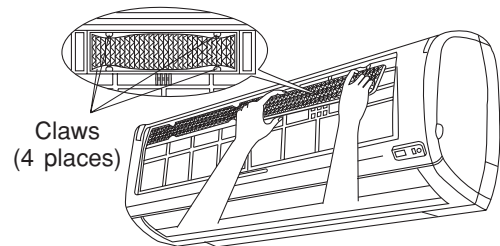
⚠ **CAUTION**

Do not bend the air cleansing and deodorizing filter as it may cause damage to the structure.
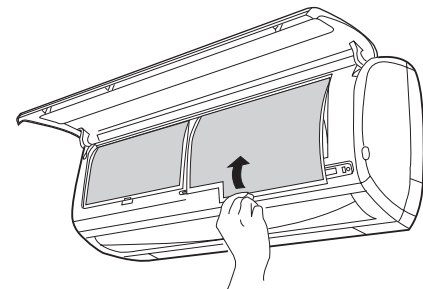
4 **Attach the filters.**
- Attach the filters by ensuring that the surface written "FRONT" is facing front.
- After attaching the filters, push the front panel at three arrow portion as shown in figure and close it.

NOTE

- In case of removing the air cleansing and deodorizing filters, please follow the above procedures.
- The cooling capacity is slightly weakened and the cooling speed becomes slower when the air cleansing and deodorizing filters are used. So, set the fan speed to "HIGH" when using it in this condition.
- Air cleansing and deodorizing filters are washable and reusable up to 20 times by using vacuum cleaner or water rinse under running tap water. Type number for this air cleansing filter is <SPX-CFH12>. Please use this number for ordering when you want to renew it.
- Do not operate the air conditioner without filter. Dust may enter the air conditioner and fault may occur.

MAINTENANCE

1. AIR FILTER ⊞

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

PROCEDURE

1 Open the front panel and remove the filter
   ● Gently lift and remove the air cleansing and deodorizing filter from the air filter frame.
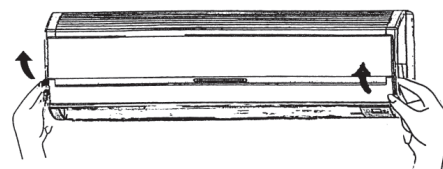
2 Vacuum dust from the air filter and air cleansing and deodorizing filter using vacuum cleaner. If there is too much dust, rinse under running tap water and gently brush it with soft bristle brush. Allow filters to dry in shade.
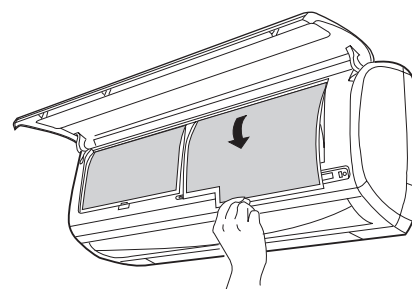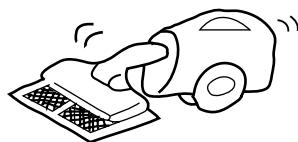
3 ● Re-insert the air cleansing and deodorizing filter to the filter frame. Set the filter with "FRONT" mark facing front, and slot them into the original state.
   ● After attaching the filters, push the front panel at three arrow portions as shown in figure and close it.
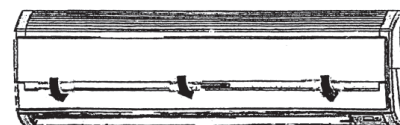
NOTE:
● Air cleansing and deodorizing filter should be cleaned every month or sooner if noticeable loading occurs. When used overtime, it may loose its deodorizing function. For maximum performance, it is recommended to replace it every 3-6 months depending on application requirements.

2. Washable Front Panel

● Remove the front panel and wash with clean water.
Wash it with a soft sponge.
After using neutral detergent, wash thoroughly with clean water.

● When front panel is not removed, wipe it with a soft dry cloth. Wipe the remote controller thoroughly with a soft dry cloth.

● Wipe the water thoroughly.
If water remains at indicators or signal receiver of indoor unit, it causes trouble.
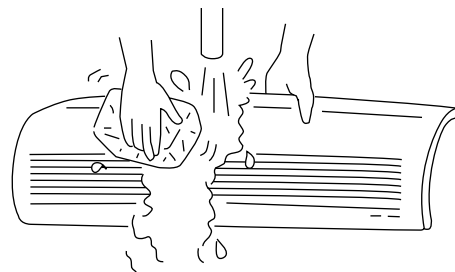
Method of removing the front panel.
Be sure to hold the front panel with both hands to detach and attach it.

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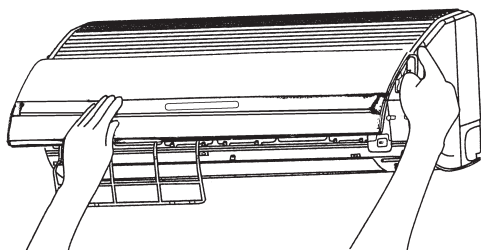
● When the front panel is fully opened with both hands, push the right arm to the inside to release it, and while closing the front panel slightly, put it out forward.

Attaching the Front Panel

Flange
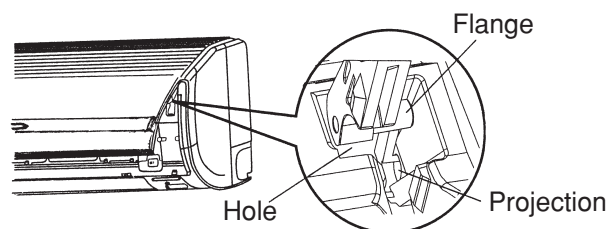
Hole

Projection

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

⚠ CAUTION

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

BENZINE ACID THINNER

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

3.　MAINTENANCE AT BEGINNING OF LONG OFF PERIOD

- Run the unit by setting the operation mode to ❄ (COOL), the temperature to 32°C and the fan speed to HI for about half a day on a fine day, and dry the whole of the unit.

- Switch off the power plug.

Air Blow
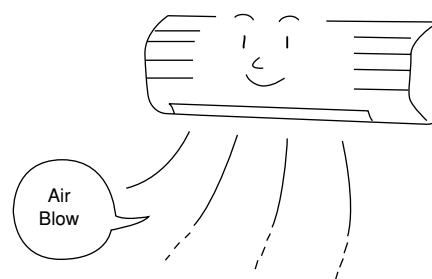
Note :

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
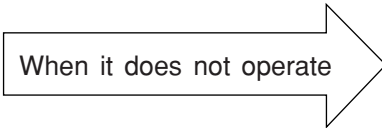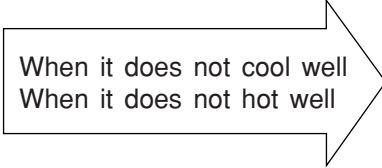
REGULAR INSPECTION

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

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

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

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

● Power supply shall be connected at the rated voltage, otherwise the unit will be broken or could not reach the specified capacity.

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

CONSTRUCTION AND DIMENSIONAL DIAGRAM

Unit : mm

147

56   17.5

Wireless remote controller

1150

333

Mounting plate

Suction grill

Front panel

244

70

8

60

Vertical air deflecter

Discharge grill

Horizontal air deflecter

245   660   245

330

70

About 380

About 500

Viewed from back
(bottom direction pipe lead-out)

Hook for installation

Drain hose

Drain cap connection port

※ When piping is drawn horizontally, exchange the drain hose for the drain cap.

Wide pipe (⌀ 15.88)

Narrow pipe (⌀ 6.35)

Notes:
1. Service space (free space needed for servicing) is 200mm on the right, 100mm on the left and 50mm on top.
2. The wide and narrow pipes must be thermally insulated.

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 30m
4. Height different of the piping between the indoor unit and the outdoor unit should be within 10m.
5. Power supply cord length is about 2m
6. Connecting cable 3.5mm dia. x 3 (AB Line), 1.6mm dia. x 2 (CD Line) is used for the connection.

Indoor Unit

Outdoor Unit

Power supply cord

L

N

A

B

C

D

Connecting Cord

A   B   C   D

– 29 –
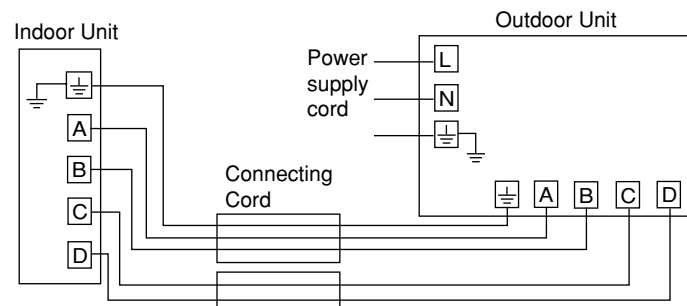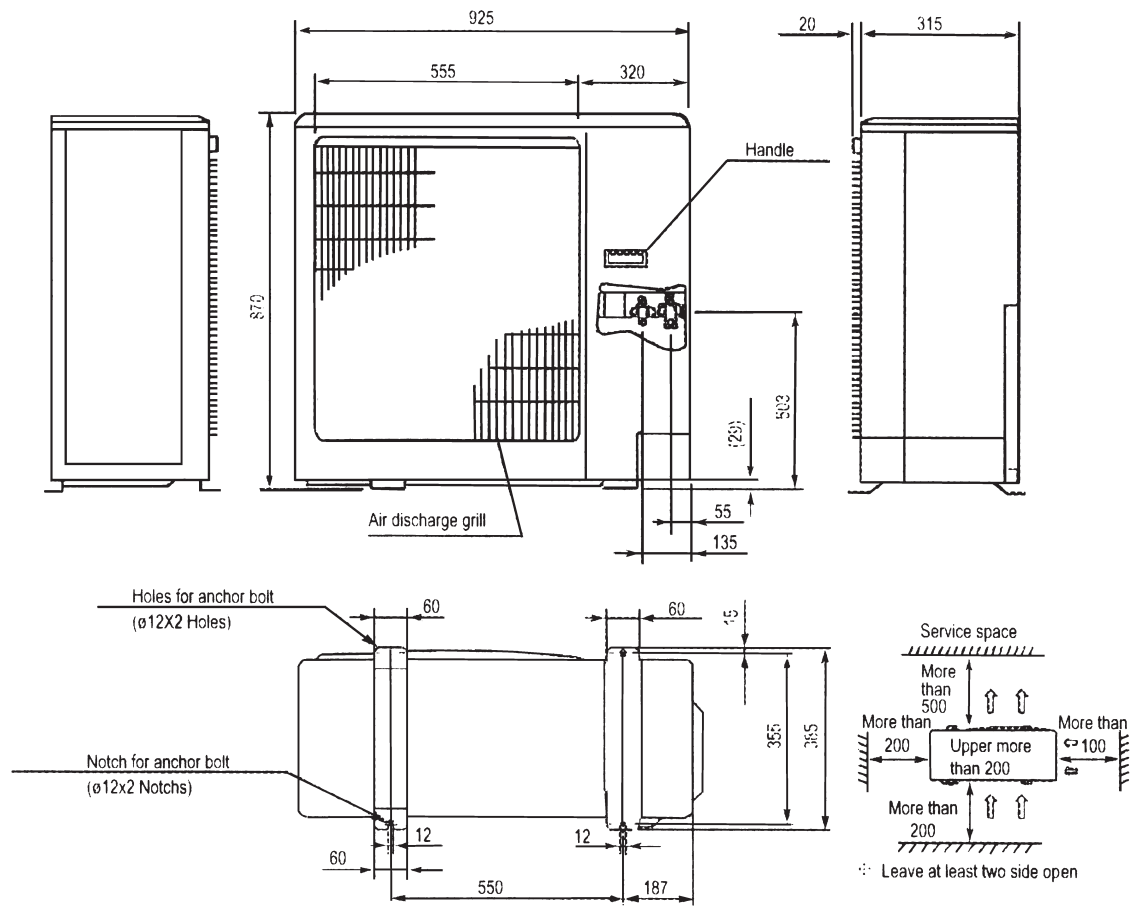
MODEL RAC-80YH5

Note:
1. 200mm or more servicing space is required above the outdoor unit.

MAIN PARTS COMPONENT

THERMOSTAT (Room Temperature Thermistor)

Thermostat Specifications

MODEL			RAS-80YH5	
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	RAS-80YH5	RAC-80YH5
POWER SOURCE	DC: 100 ~ 322V	DC350V
OUTPUT	30W	100W
CONNECTION	100 ~ 322V — RED 0V — BLK 15V — WHT 0 ~ 6.5V — YEL FG — BLU M (Control circuit built in)	360V — RED 0V — BLK 15V — WHT 0~6V — YEL 0~15V — BLU M

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-80YH5
COMPRESSOR MODEL	JU1015D3
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
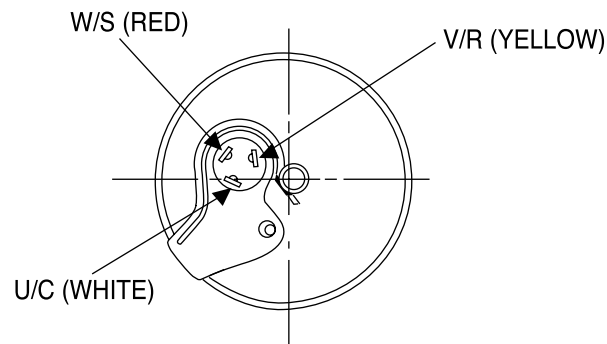
⚠ **CAUTION**

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   RAS-80YH5 / RAC-80YH5

OUTDOOR UNIT

INDOOR UNIT
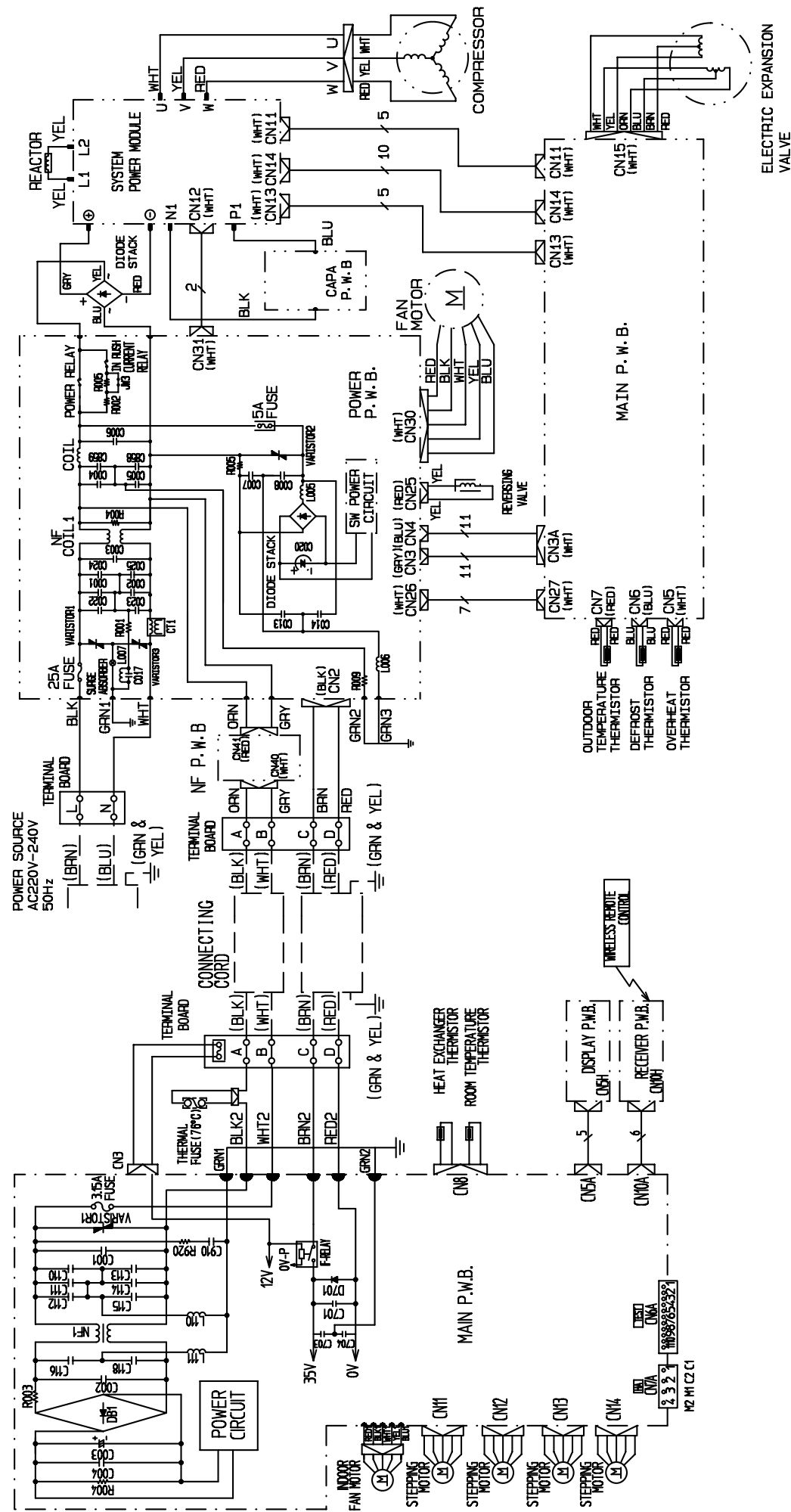
CIRCUIT DIAGRAM

Remote Control
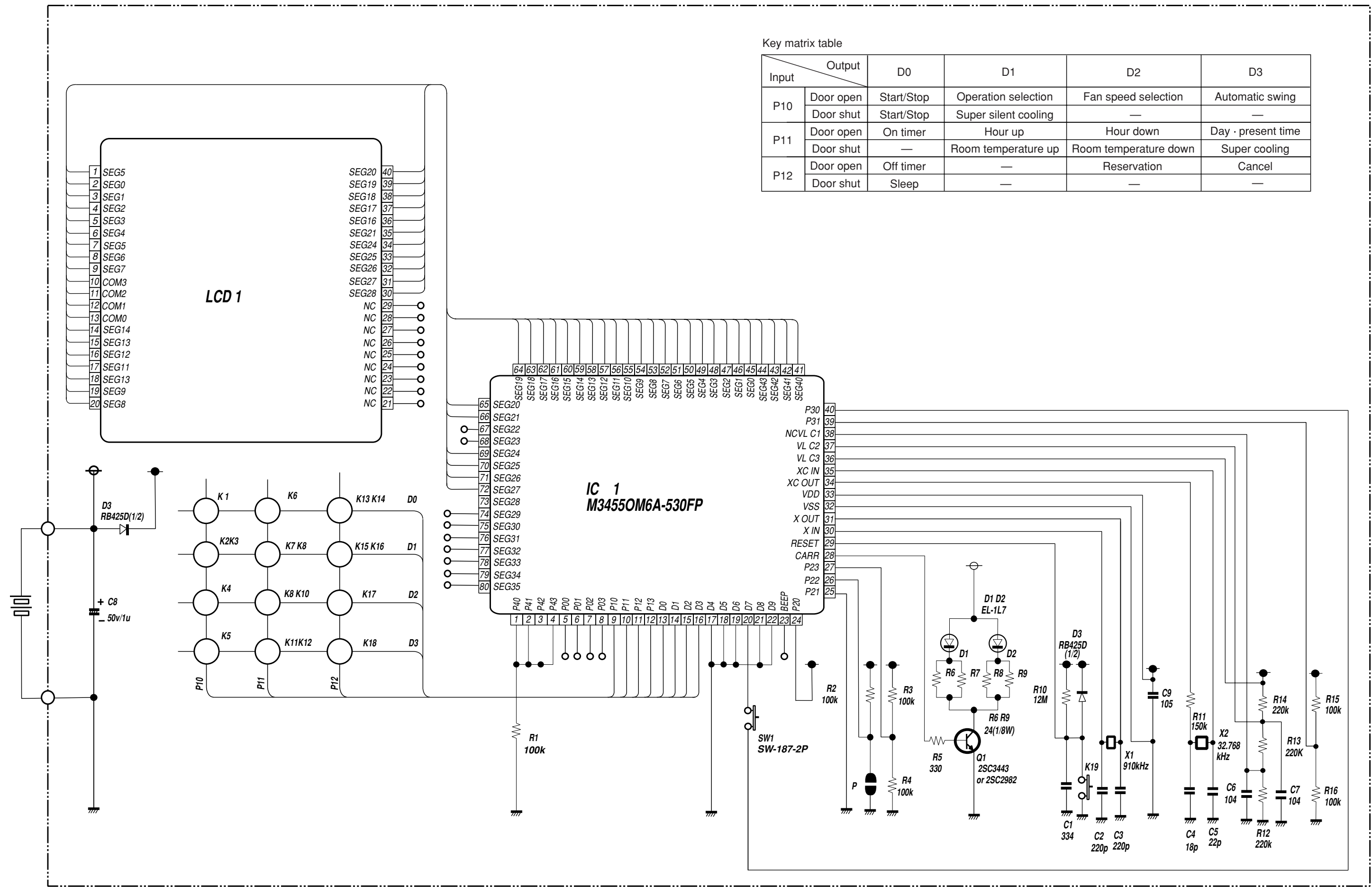
Key matrix table

Input \ Output		D0	D1	D2	D3
P10	Door open	Start/Stop	Operation selection	Fan speed selection	Automatic swing
	Door shut	Start/Stop	Super silent cooling	—	—
P11	Door open	On timer	Hour up	Hour down	Day · present time
	Door shut	—	Room temperature up	Room temperature down	Super cooling
P12	Door open	Off timer	—	Reservation	Cancel
	Door shut	Sleep	—	—	—

LCD 1

1	SEG5	SEG20	40
2	SEG0	SEG19	39
3	SEG1	SEG18	38
4	SEG2	SEG17	37
5	SEG3	SEG16	36
6	SEG4	SEG21	35
7	SEG5	SEG24	34
8	SEG6	SEG25	33
9	SEG7	SEG26	32
10	COM3	SEG27	31
11	COM2	SEG28	30
12	COM1	NC	29
13	COM0	NC	28
14	SEG14	NC	27
15	SEG13	NC	26
16	SEG12	NC	25
17	SEG11	NC	24
18	SEG13	NC	23
19	SEG9	NC	22
20	SEG8	NC	21

IC 1
M3455OM6A-530FP

SEG20 65, SEG21 66, SEG22 67, SEG23 68, SEG24 69, SEG25 70, SEG26 71, SEG27 72, SEG28 73, SEG29 74, SEG30 75, SEG31 76, SEG32 77, SEG33 78, SEG34 79, SEG35 80

P30 40, P31 39, NCVL C1 38, VL C2 37, VL C3 36, XC IN 35, XC OUT 34, VDD 33, VSS 32, X OUT 31, X IN 30, RESET 29, CARR 28, P23 27, P22 26, P21 25

K1, K6, K13 K14 — D0
K2K3, K7 K8, K15 K16 — D1
K4, K8 K10, K17 — D2
K5, K11K12, K18 — D3

P10, P11, P12

D3 RB425D(1/2)

+ C8 50v/1u

R1 100k
R2 100k
R3 100k
R4 100k
R5 330
Q1 2SC3443 or 2SC2982
D1 D2 EL-1L7
R6 R7 R8 R9
R6 R9 24(1/8W)
R10 12M
D3 RB425D (1/2)
C9 105
R11 150k
X2 32.768 kHz
R14 220k
R15 100k
R13 220K
C1 334
C2 220p
C3 220p
K19
X1 910kHz
C4 18p
C5 22p
R12 220k
C6 104
C7 104
R16 100k

SW1 SW-187-2P

BEEP P20

CIRCUIT DIAGRAM
MODEL RAS-80YH5

CIRCUIT DIAGRAM
MODEL   RAC-80YH5

PRINTED WIRING BOARD LOCATION DIAGRAM
MODEL RAS-80YH5

MAIN P.W.B.
Marking on P.W.B

COMPONENT SIDE
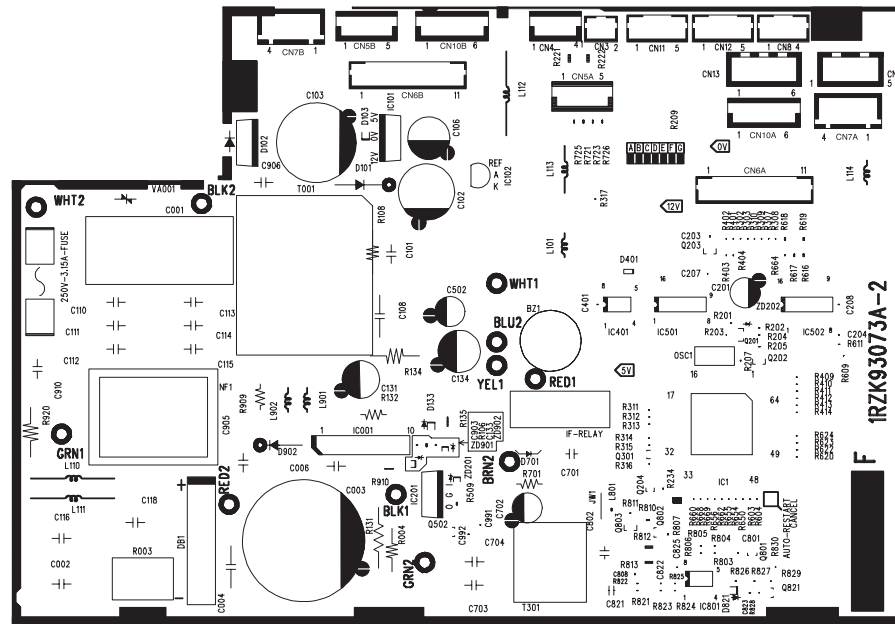
SOLDERING SIDE
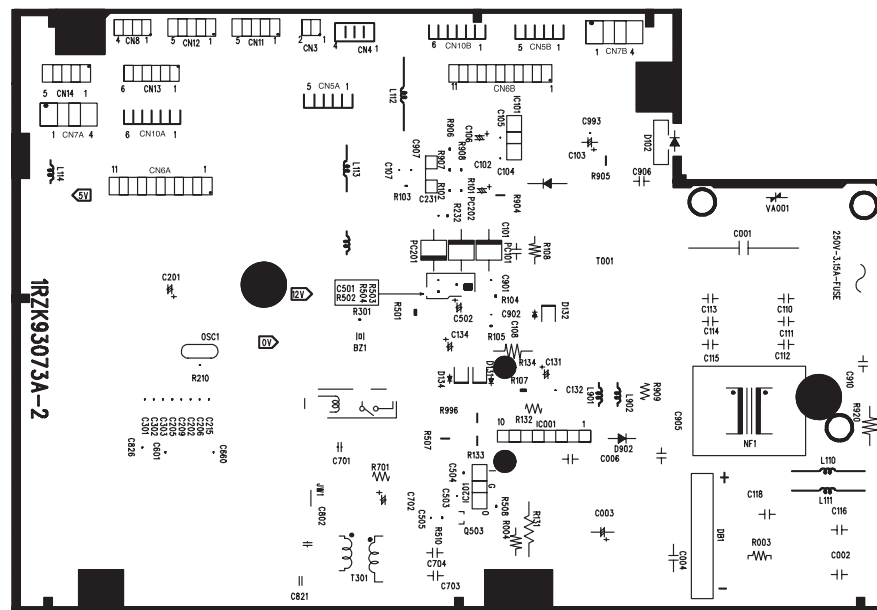
RECEIVING P.W.B.
Marking on P.W.B
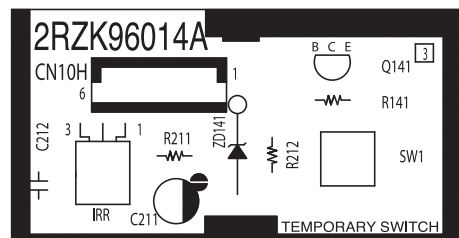
MODEL RAC-80YH5

MAIN P.W.B.
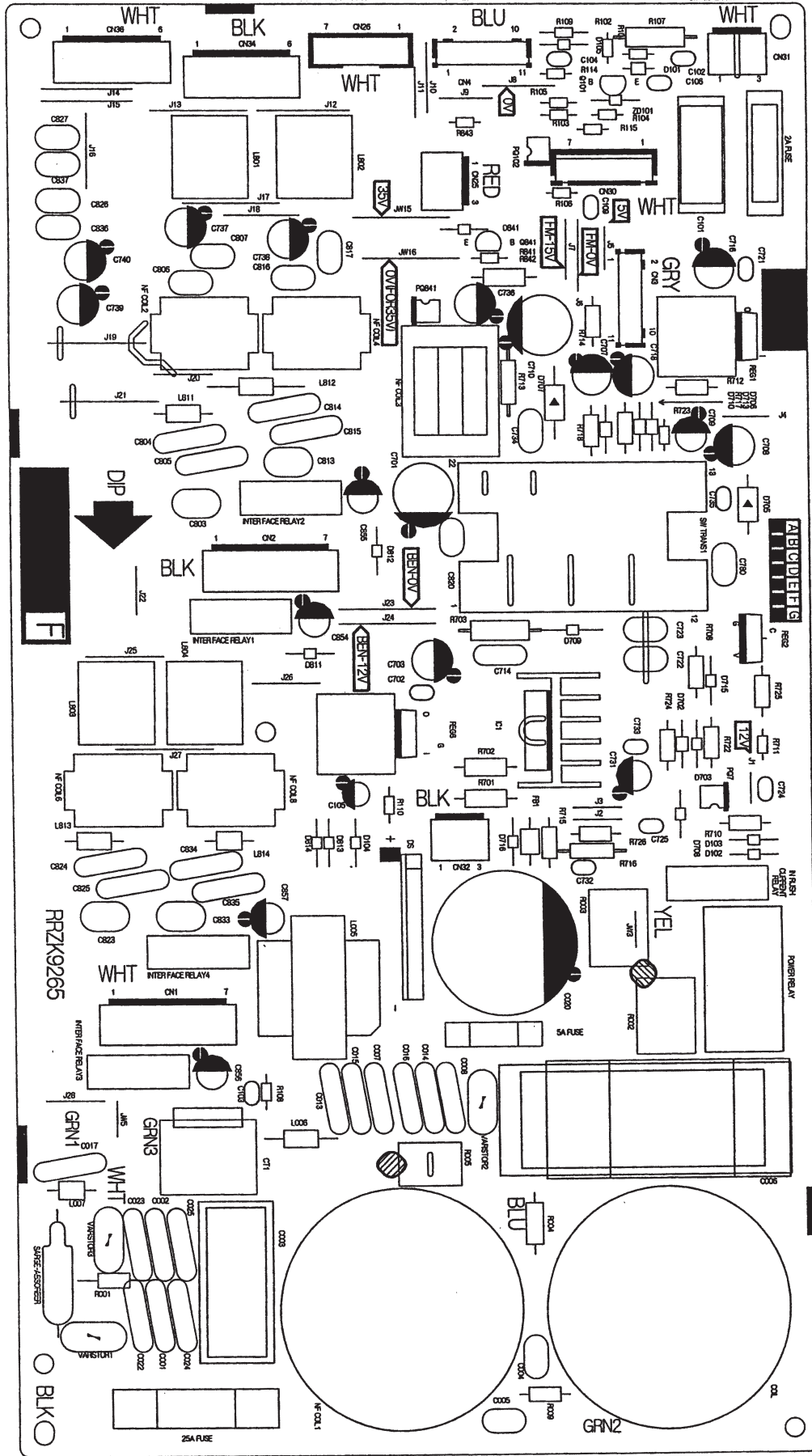
MAIN P.W.B.
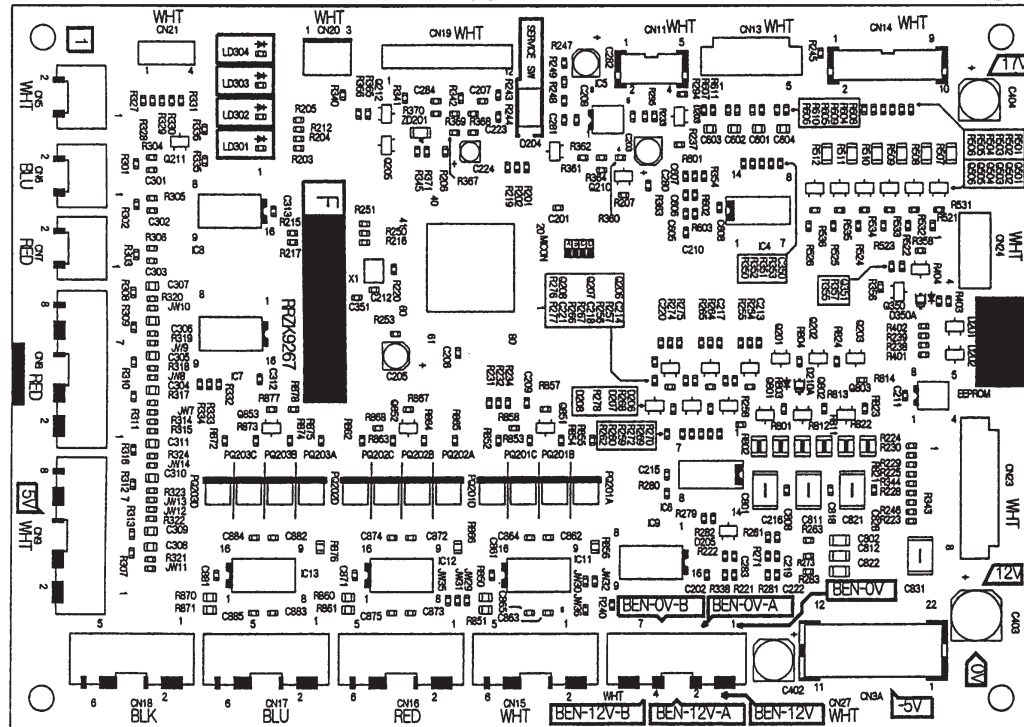
NF P.W.B.
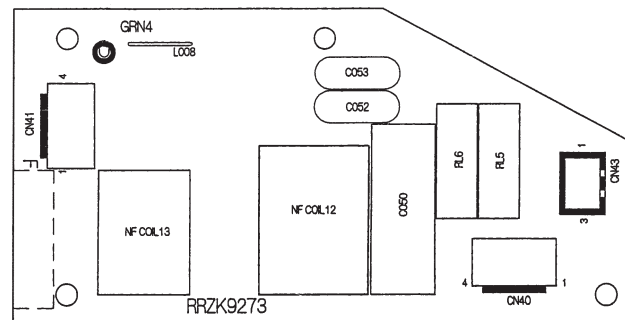
CAPA P.W.B.
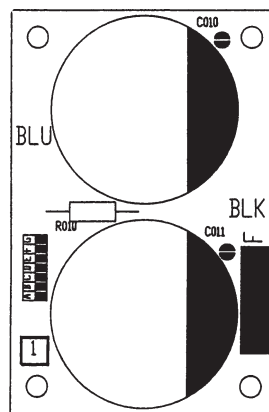
BLOCK DIAGRAM
MODEL RAS-80YH5/RAC-80YH5
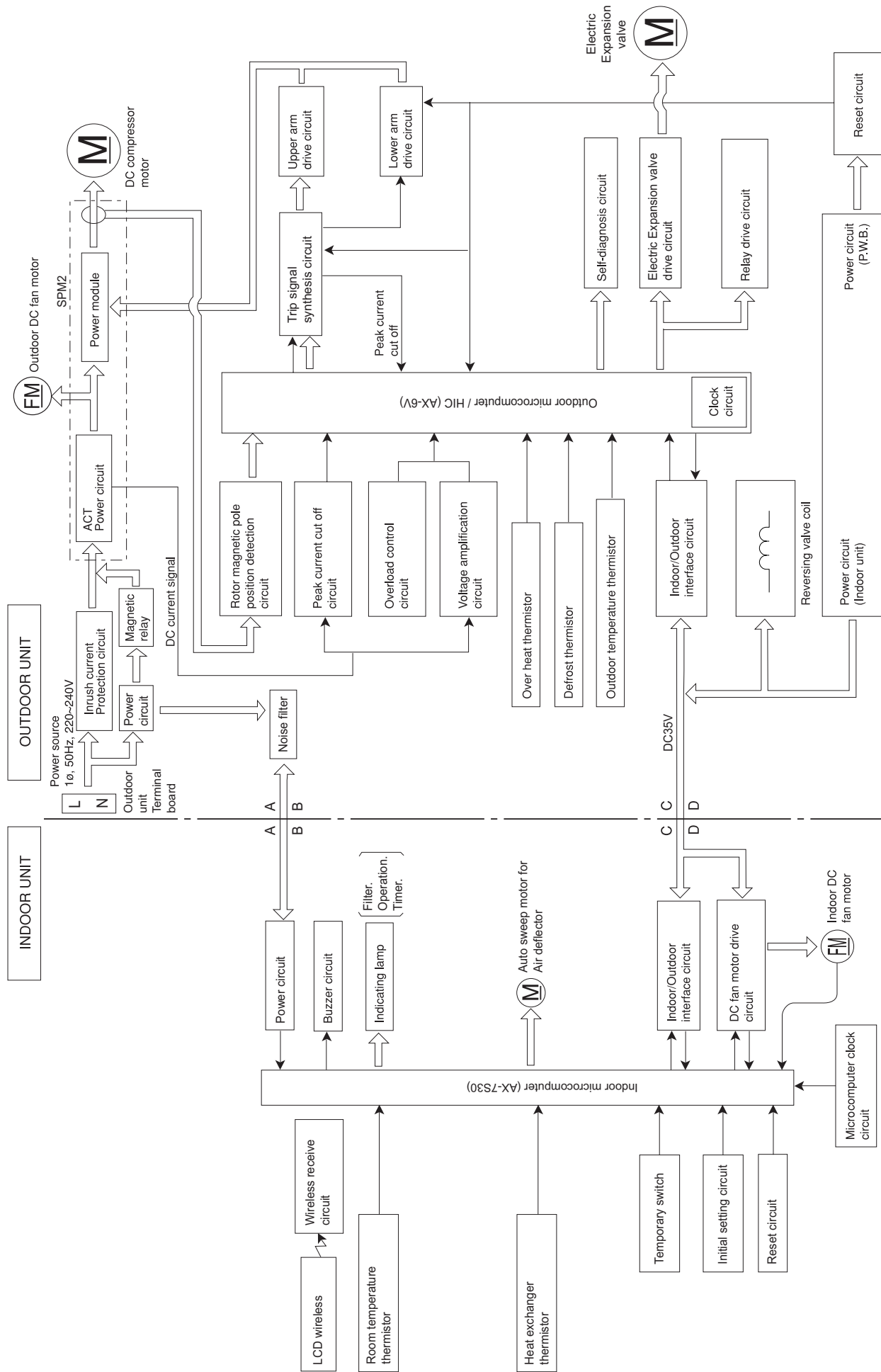
BASIC MODE

Operation mode		Fan	Cooling	Dehumidifying (dehumidifying operation by the function select button only, not including that engaged by the dehumidify button)	Heating	Auto
Basic operation of start/stop switch				Start/stop switch — Start Stop Start Stop / Operation tamp		
Timer functions	Off-timer			Start/stop switch / Operation tamp / Cancel switch / Operation temp / Timer tamp / Timer memory — (Off-timer during stop) (Change in reserved time)		
	On-timer			Srart/stop switch / Reserve switch / Cancel switch / Operation temp / Timer tamp / Timer memory — (Change in reserved time) (On-timer during operation)		
	Off -> On / On -> Off timer			Start/stop switch / Reserve switch / Cancel switch / Operation lamp / Timer tamp / Timer memory — OFF ON ON OFF ON OFF OFF ON / (Off->On timer) (On->Off timer) (On->Off timer) during operation) (Off->On timer) during stop)		
Fan speed mode (indoor fan)	Auto		Changes from "Hi" to "Med" or "Lo" depending on room temperature. Temperature set for cooling / Thermo judgment / Compressor / Hi / Med / Lo / (Compressor stopped forcibly for 3 minutes) 1. Runs at "Hi" until first thermo off after operation is started. 2. Runs at "Lo" when thermo is off.	Changes between "Lo" and "Med" depending on the room temperature. Temperature division / Fan speed: Division 1 — Lo; Division 2 — Lo; Division 3 — Med; Division 4 — Med. 1. The indoor fan also stops when the compressor is in stop status.	Set to "ultra-Lo", "Lo", "Med", "Hi", "ultra-Hi" or "stop" depending on the room temperature, time and heat exchange temperature. Set to "stop" if the room temperature is 18˚C in the "ultra-Lo" mode other than during preheating (cooling is recovered at 18.33˚C). When the compressor is running at maximum speed during hot dash or when recovered from defrosting. In modes other than left. 42, 66 ˚C / 37, 66 / 32, 66 / 29, 66 / Heat exchanger temperature / Hi or ultra-Hl (fan speed set to "auto") / Med / Lo	Operating mode is judged by room temperature and outdoor temperature. (1) Judging by outdoor temperature • Operating mode is judged by outdoor temperature. Only when the mode is not restricted by this judgment, the judgment by room temperature in the next paragraph will be performed. (a) Outdoor temperature ≧ 30°C : Restricted to cooling (b) Outdoor temperature ≦ 9°C : Restricted to heating (2) Judging by room temperature Operating mode at start up is judged (initial judgment) (a) Conditions for judgment (any of the followings) • When auto operation is started after 1 hour has elapsed since the operation was stopped. • When auto operation is started after the previous manual mode operation. • When the operating mode is switched to auto while operating at manual mode. (b) Judging method • Room temperature ≧ 23°C ±3°C : Cooling • Room temperature < 23°C ±3°C : Heating ※ ±3°C is the fine adjustment value from the remote controller. Room-temperature 22 °C / Cooling / Heating / 9°C 30°C Outdoor temperature
	Hi	Operates at "Hi" regardless of the room temperature.	Set to "ultra-Hi" when the compressor runs at maximum speed, and to "Hi" in other modes.	Set to "Hi" in modes other than when compressor stops.	Set to "ultra-Lo", "Lo", "Med", "Hi", "ultra-Hi" or "stop" depending on the room temperature, and time. Set to "stop" if the room temperature is 18˚C in the "ultra-Lo" mode other than during preheating (cooling is recovered at 18.33˚C). Set to "ultra-Hi" when the compressor is running at maximum speed during hot dash or when recovered from defrosting.	Judging operating mode change during operation (Continuous judgment) (a) Conditions for judgment (any of the followings) • The mode is reviewed at every interval time. • When auto operation is started again before 1 hour has elapsed since the operation was stopped. (b) Judging method • Judge by setting the hysteresis on the final preset temperature. The final preset temperature is the actually targeted preset temperature which is the sum of the basic preset temperature and each type of shift value (e.g. ±3°C by remote controller, preset temperature correction value, powerful shift value, etc.). [Currently cooling] • Room temperature ≦ Final preset temperature –3°C Change to heating • Room temperature > Final preset temperature –3°C Continue cooling [Currently heating] • Room temperature ≧ Final preset temperature +2°C Change to cooling • Room temperature < Final preset temperature +2°C Continue heating
	Med	Operates at "Med" regardless of the room temperature.	Same as at left.	Set to "Med" in modes other than when the compressor stops.	Set to "ultra-Lo", "Lo", "Med" or "stop" depending on the room temperature and time. Set to "stop" if the room temperature is 18˚C in the "ultra-Lo" mode other than during preseating (cooling is recovered at 18.33˚C).	
	Lo	Operates at "Lo" regardless of the room temperature.	Same as at left.	Set to "Lo" in modes other than when compressor stops.	Set to "ultra-Lo", "Lo", or "stop" depending on the room temperature and time. Set to "stop" if the room temperature is 18˚C in the "ultra-Lo" mode other than during preseating (cooling is recovered at 18.33˚C). The fan speed is controlled by the heat exchanger temperature; the overload control is executed as in the following diagram: Heat exchanger temperature / KAFON / KAFOF / "Med" with overload / "Lo"	–3°C Cooling / Heating / final preset temperature +2°C
Basic operation of temperature controller		Performs only fan operation at the set speed regardless of the room temperature. Start/stop switch / Operation lamp / Fan Speed Hi Med Lo / Hi Med Lo	See page 49.	See page 53.	See page 55.	
Sleep operation (with sleep button ON)		• Enters sleep operation after set as on the left. • Action during sleep operation Lo (sleep) operation	• Same as at left • See page 51.	• Same as at left • See page 53.	• Same as at left • See page 57.	• Same as at left. • Performs the sleep operation of each operation mode.

Table 1 Mode data file

LABEL NAME	RAS-80YH5
	VALUE
WMAX	6500 min^{-1}
WMAX2	6500 min^{-1}
WSTD	6500 min^{-1}
WBEMAX	4000 min^{-1}
CMAX	6500 min^{-1}
CMAX2	6500 min^{-1}
CSTD	6000 min^{-1}
CKYMAX	4000 min^{-1}
CJKMAX	4000 min^{-1}
CBEMAX	3000 min^{-1}
WMIN	1200 min^{-1}
CMIN	1200 min^{-1}
STARTMC	60 Seconds
DWNRATEW	100%
DWNRATEC	100%
SHIFTW	0.33°C
SHIFTC	0.33°C
CLMXTP	30.00°C
YNEOF	25.00°C
TEION	2.00°C
TEIOF	9.00°C
SFTDSW	0.66°C
DFTIM1	50 Minutes
DFTIM2	50 Minutes

Basic Cooling Operation
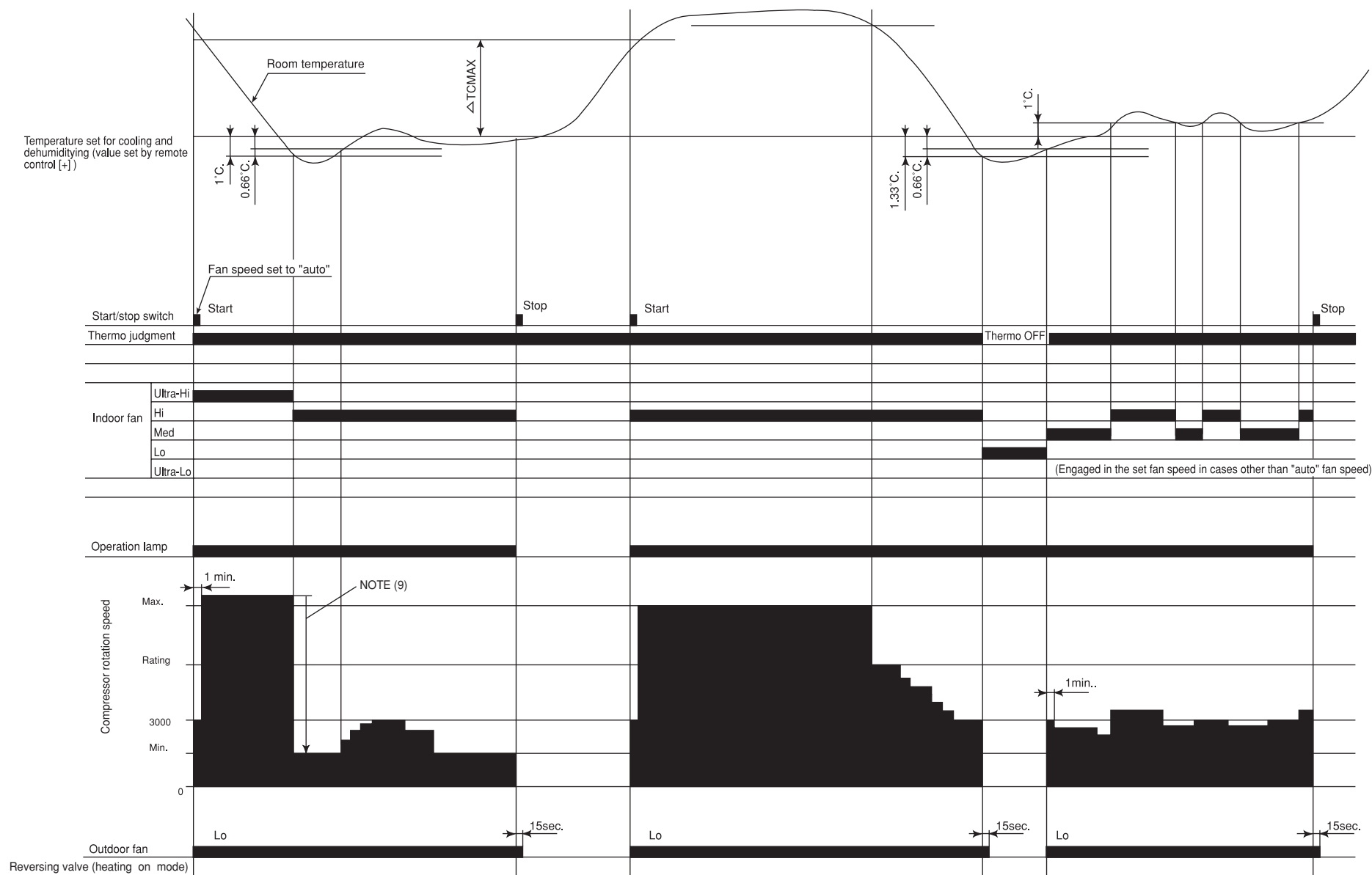
Table 2 ΔTCMAX

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

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 Lo and Med fan mode and v) change operation mode.
(3) During Cool Dashed operation, thermo off temperature is set temperature (with shift value) −3°C. After thermo off, operation continue in Fuzzy control mode.
(4) Compressor minimum "ON" time and "OFF" time is 3 minutes.
(5) During normal cooling mode, compressor maximum rpm CMAX will maintain for 60 minutes if indoor temperature is lower than CLMXTP. No time constrain if indoor temperature is higher than CLMXTP.
(6) When fan is set to "Hi", compressor rpm will be limited to CKYMAX.
(7) When fan is set to "Med", compressor rpm will be limited to CJKMAX.
(8) When fan is set to "Lo", compressor rpm will be limited to CBEMAX.
(9) During Cool Dashed, when room temperature reaches set temperature −1°C compressor rpm is actual rpm x DWNRATEC.

Cooling Defrost

Indoor heat exchange temperature

TEIOF

TEION

Cooling defrost signal

Indoor fan — Hi / Med / Lo

See basic operation.   See basic operation.

Outdoor fan — Lo   15sec.   Lo

Reversing valve (heating "on" mode)   10 mins

Balance period 3min.

1min. 3000

Compressor speed

Cooling Sleep Operation

Final set temperature (Cooling/dehumidifying set temperature (+) sleep shift)

Example 1: Limited to 28°C   Example 2: 25°C or more after 6 shifts   Example 3: 25°C is not reached after 6 shifts.

28°C (shift upper limit)

(Cooling/dehumidifying set temperature = Remote control set temperature (+) SHIFTC)

0.5hr   1.5hr   2.5hr   3.5hr   6hr   7hr

3hr

Sleep key   Set to 7 hours

Operation lamp

Timer lamp

Indoor fan — Hi / Med / Lo (sleep)   See basic operation

Outdoor fan   Lo

Horizontal air deflector — Shut / Horizontal / Facing down

Compressor speed   Maximum speed   P1

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

Dehumidifying
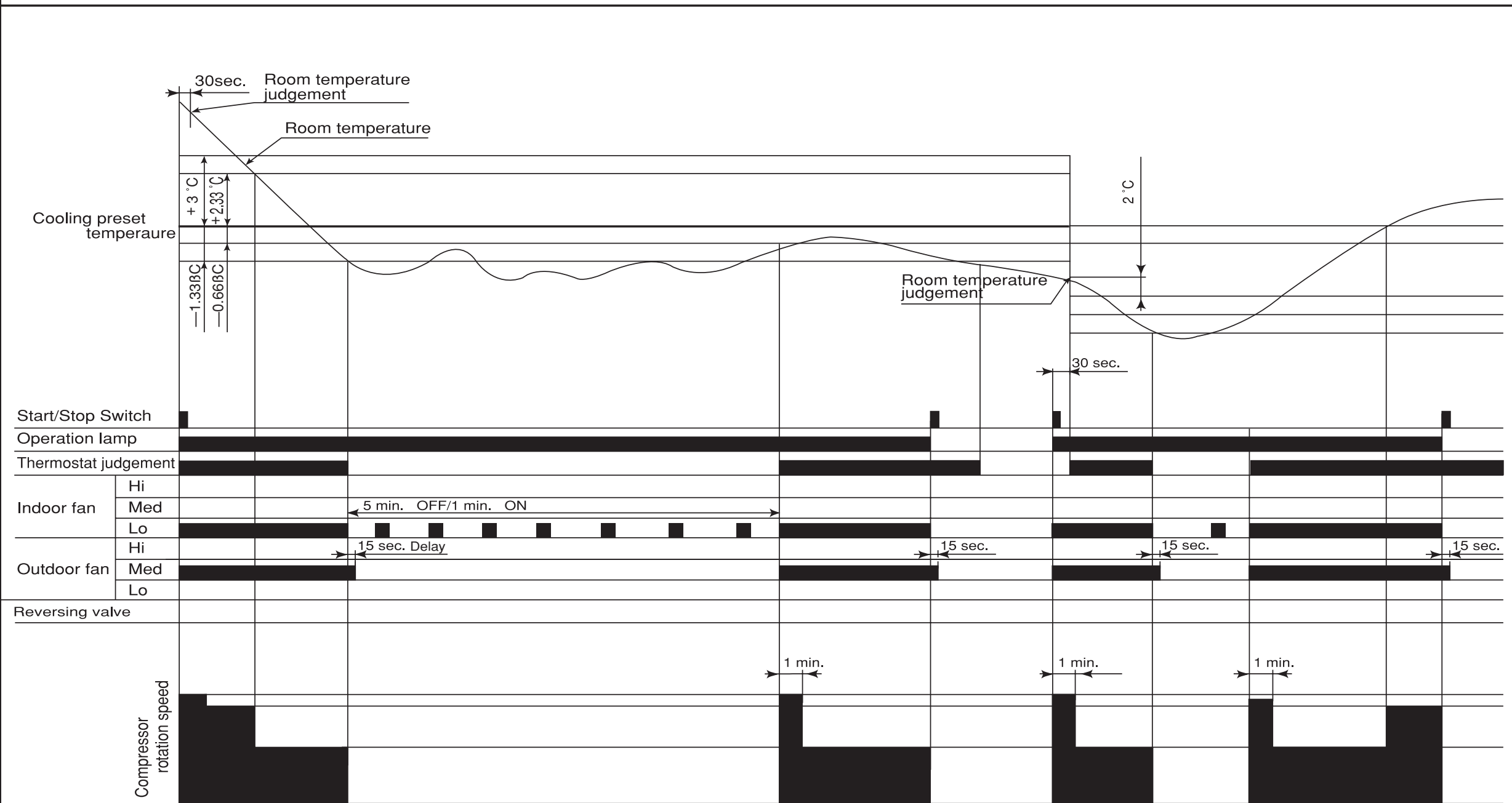
Notes:

(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
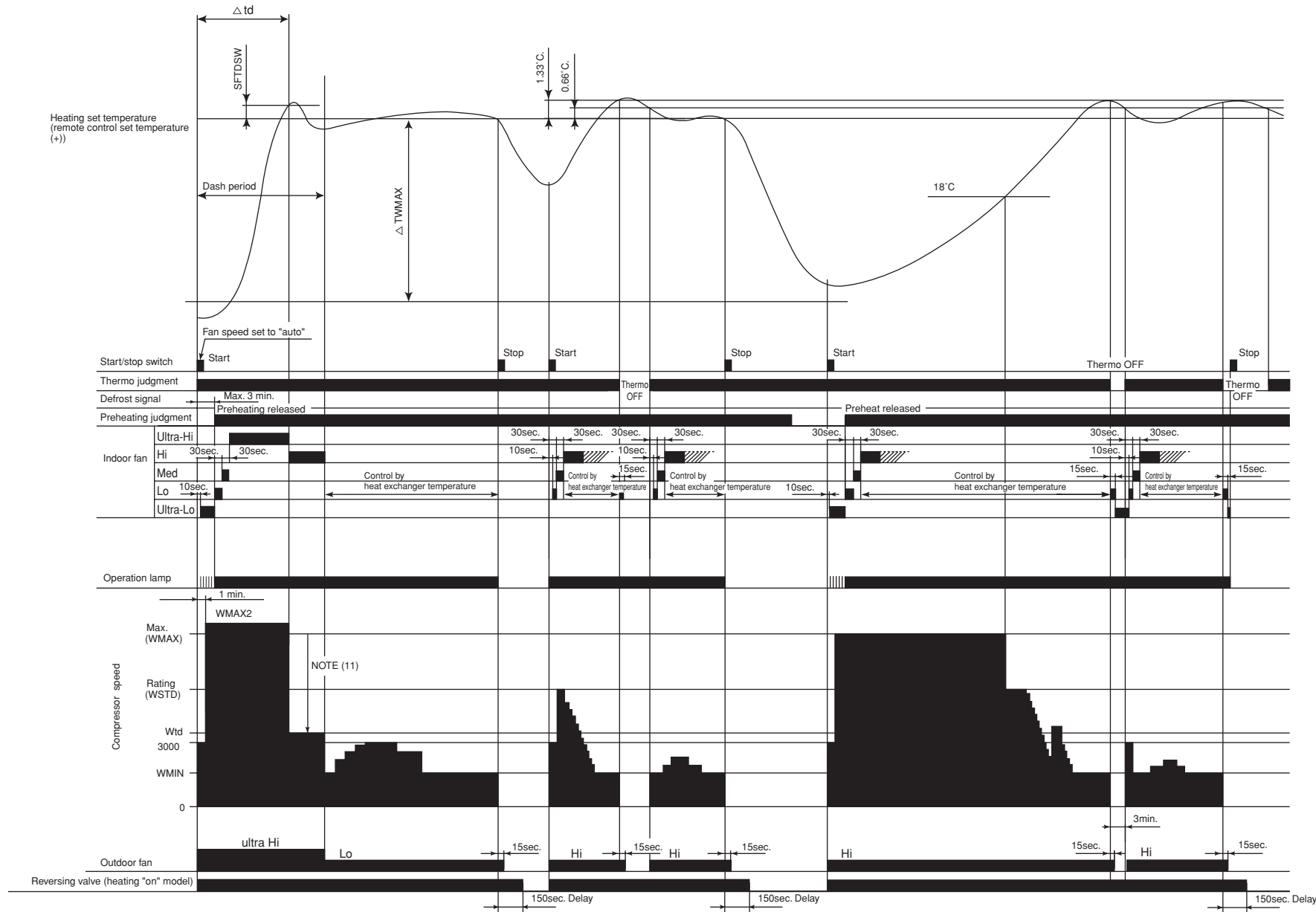
Table 3 ΔTWMAX

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

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

Notes:
(1) Condition for entering into Hot Dashed mode. When fan set to "Hi" or "Auto mode" and i) Indoor temperature is lower than 18°C, and ii) outdoor temperature is lower than 10°C, and iii) Temperature difference between indoor temperature and set temperature has a corresponding compressor rpm (calculated value in Table 3) larger than WMAX.
(2) Hot Dashed will release when i) Room temperature has achieved the set temperature + SFTDSW. ii) Thermo off.
(3) During Hot Dashed operation, thermo off temperature is set temperature (with shift value) +3°C. After thermo off, operation continue in Fuzzy control mode.
(4) Compressor minimum "ON" time and "OFF" time is 3 minutes.
(5) During normal heating mode, compressor maximum rpm WMAX will maintain for 120 minutes if indoor temperature is higher than 18°C. No time limit constrain if indoor temperature is lower than 18°C and outdoor temperature is lower than 2°C.
(6) During Hotkeep or Defrost mode, indoor operation lamp will blink at interval of 3 seconds "ON" and 0.5 second "OFF".
(7) When heating mode starts, it will enter into Hotkeep mode if indoor heat exchanger temperature is lower than YNEOF + 0.33°C.
(8) When fan is set to "Med" or "Lo", compressor rpm will be limited to WBEMAX.
(9) In "Ultra-Lo" fan mode, if indoor temperature is lower than 18°C, indoor fan will stop. If indoor temperature is higher than 18°C + 0.33°C, fan will continue in "Ultra-Lo" mode. During Hotkeep or Defrost mode, fan will continue in "Ultra-Lo" mode.
(10) During Hot Dashed or outdoor temperature is lower than –5°C, compressor rpm is WMAX2.
(11) During Hot Dashed, when room temperature reaches set temperature + SFTDSW compressor rpm is actual rpm x DWNRATEW.

Reversing Valve Defrosting

Over defrosting inhibit period

15' or more   Auto fresh defrosting

Start/Stop Switch — Fan speed set to 'Hi'   30sec.   30sec.   Stop

Defrost signal

Preheating judgment — Preheating released   Preheating

Indoor fan: Hi, Med, Lo, Ultra-Lo   10sec.

Outdoor fan: Hi   Hi   15sec.

Operation lamp

Reversing valve (heating "on" mode)

Deceleration period   Reverse cycle period   Reverse cycle period

12min. Max.   TDP431   3min. Max.   3min.   12min. Max.

TDP 411   TDP 412   TDP 413   TDP421   1 min   1min.

WMAX (WMAX2)   TDP 422

3000   2400   1950   3000   3000

WMIN

0

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

Time

DFTIM2

DFTIM1

−5˚C   0˚C   Outdoor temperature
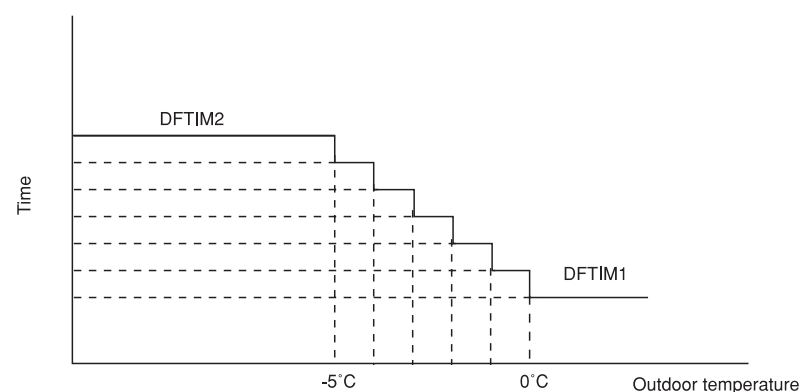
Notes:
(1) The time is set according to the outdoor temperature when it is between 0˚C and -5˚C.
(2) DFTIM is used when the outdoor temperature $\geqq$ 0˚C.
(3) DFTIM2 is used when the outdoor temperature $\leqq$ -5˚C.

Heating Sleep Operation
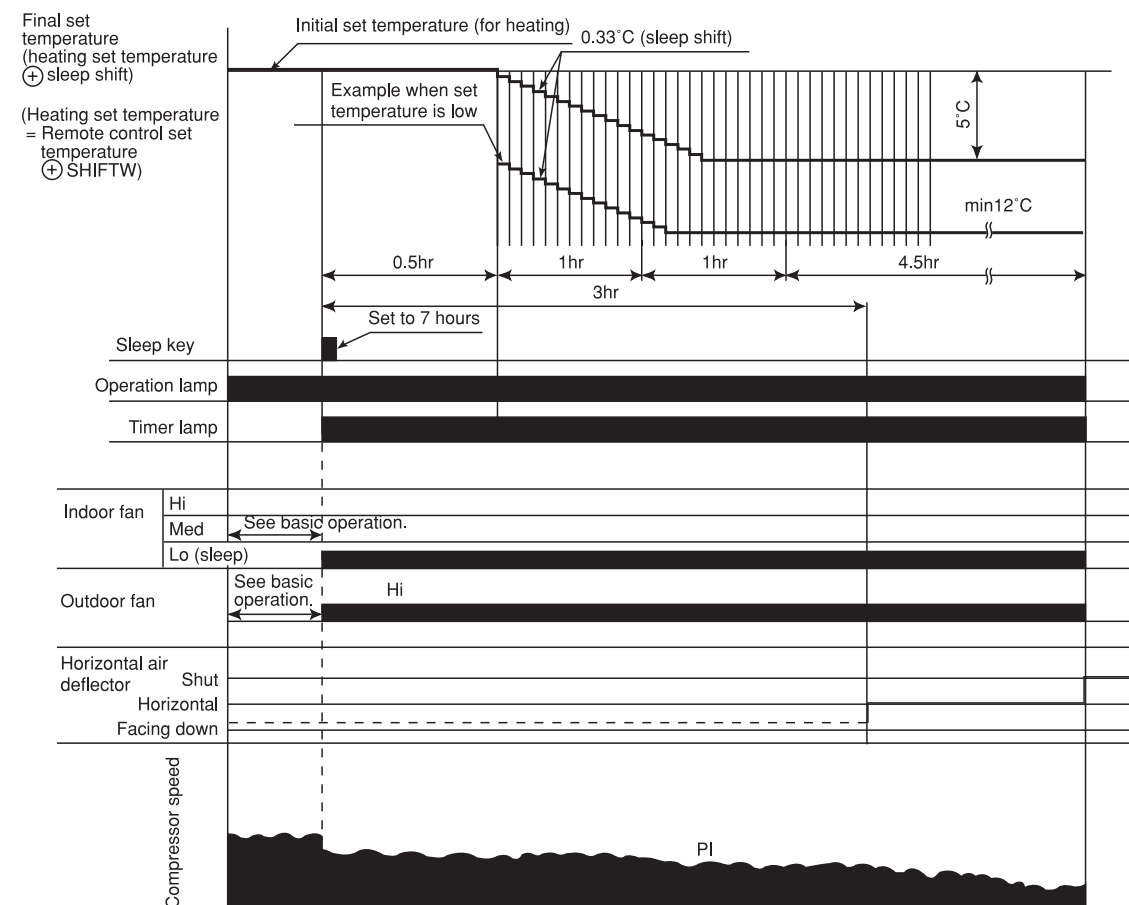
Final set temperature (heating set temperature + sleep shift)

(Heating set temperature = Remote control set temperature + SHIFTW)

Initial set temperature (for heating)   0.33˚C (sleep shift)

Example when set temperature is low

5˚C

min12˚C

0.5hr   1hr   1hr   4.5hr

3hr

Sleep key   Set to 7 hours

Operation lamp

Timer lamp

Indoor fan: Hi, Med, Lo (sleep)   See basic operation.

Outdoor fan: See basic operation.   Hi

Horizontal air deflector: Shut, Horizontal, Facing down

Compressor speed   PI

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

REFRIGERATING CYCLE DIAGRAM

MODEL RAS-80YH5/RAC-80YH5

COOLING, DEHUMIDIFYING, DEFROSTING

OUTDOOR UNIT

SUCTION TANK

SERVICE VALVE

INDOOR UNIT

COMP

SINGLE-ENDED UNION (5/8)

ø15.88

REVERSING VALVE

EXPENSION VALVE

SILENCER

SERVICE VALVE   ø6.35 (1/4)

SINGLE-ENDED UNION

HEATING

OUTDOOR UNIT

SUCTION TANK

SERVICE VALVE

INDOOR UNIT

COMP

SINGLE-ENDED UNION (5/8)

ø15.88

REVERSING VALVE

EXPENSION VALVE

SILENCER

SERVICE VALVE   ø6.35 (1/4)

SINGLE-ENDED UNION

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AUTO SWING FUNCTION

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

DESCRIPTION OF MAIN CIRCUIT OPERATION

1. Reset Circuit
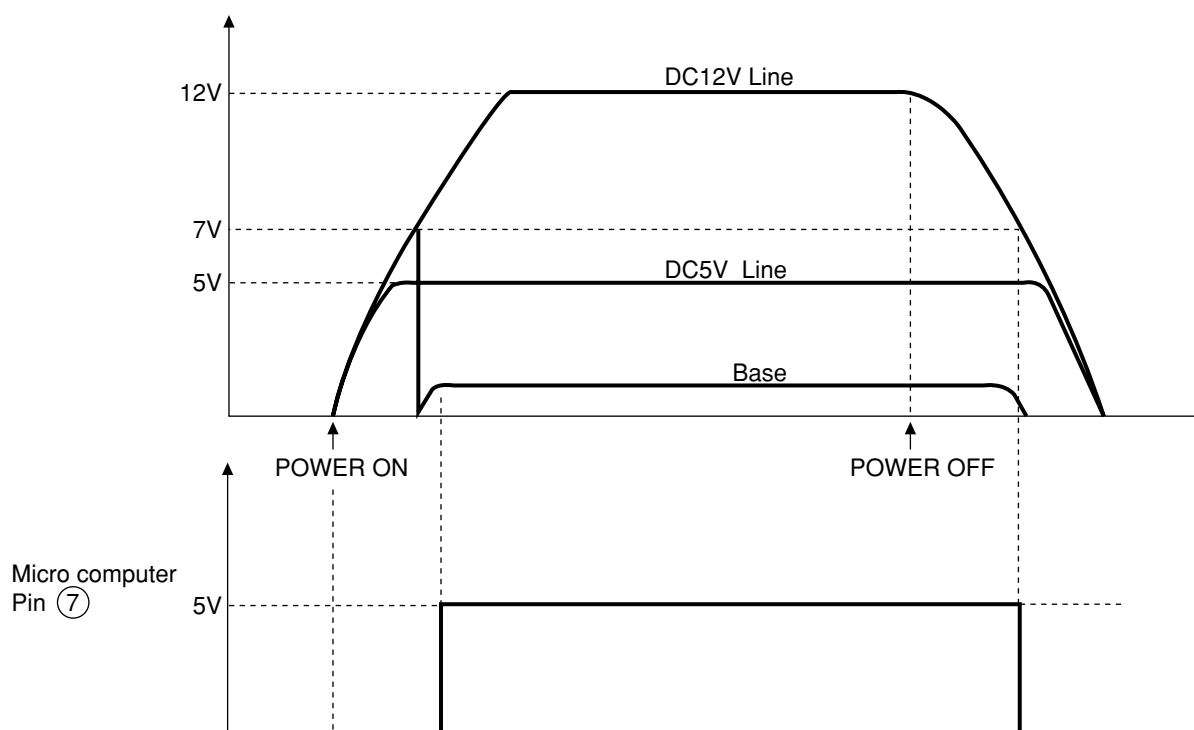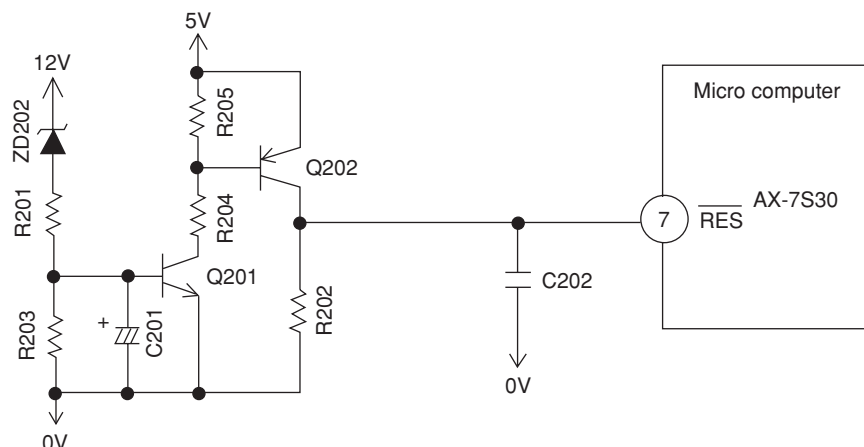
- The reset circuit is used to reset the program to its initial settings when the power is turned on or when the power is recovered after a power failure.

- The micro computer is reset when the reset input is "Hi", and operation is possible when the reset input is "Lo".

- The waveforms at each point when the power is turned on and off are shown in the diagrams.

- When the power is turned on, the voltages of the DC 12V line and DC 5V lines are increased. When the voltage of DC 12V lines reaches about 7V, ZD202 is turned ON, the potential of Q201's base rises and Q202 is turned ON. Since Q202's collector is set to "LO" at this time, Q202 is turned OFF and the reset input of the micro computer is set to "Lo". The DC 5V line voltage has already become 5V at this time and the micro computer starts operation.

- When the power is turned OFF, the voltage of the DC 12V line decreases. When it becomes about 7V, ZD202 is turned OFF, then Q201 is turned OFF, Q202 is turned ON the reset input of the micro computer is set to "Hi' and the micro computer is set to the reset mode.

2. Buzzer Circuit
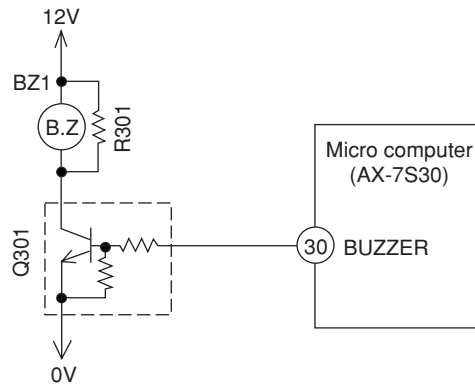
When the buzzer is to be activated, buzzer output pin ㉚ of the micro computer alternates between ON and OFF repeatedly at 4kHz and Q302 is turned ON/OFF accordingly. A 4kHz voltage is applied to the buzzer and the diaphragm of the buzzer vibrates to output 4kHz sound.

3. Initial setting (IC301)

The pre-heating operation start value, ratings of the compressor, maximum rotation speed, etc. are preset in the micro computer.
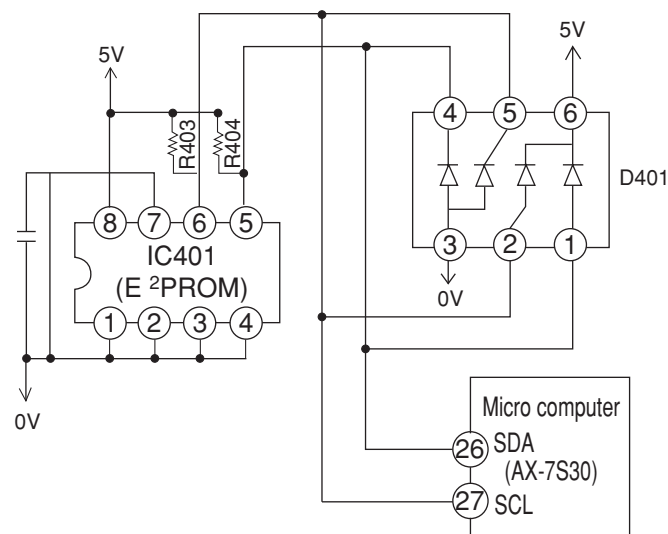
4. Receive circuit
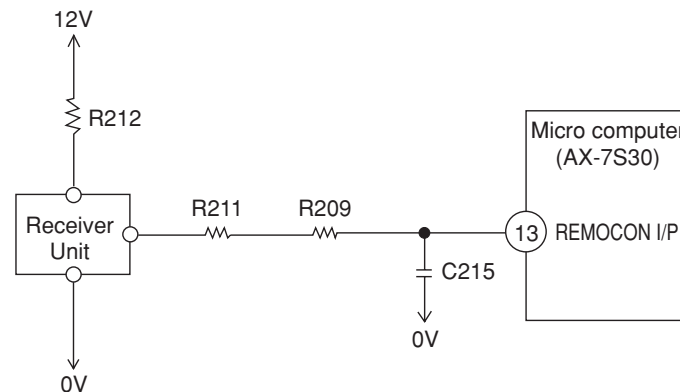
Infrared signals from the wireless remote controller are received by the light receiving unit and output after being amplified and shaped.

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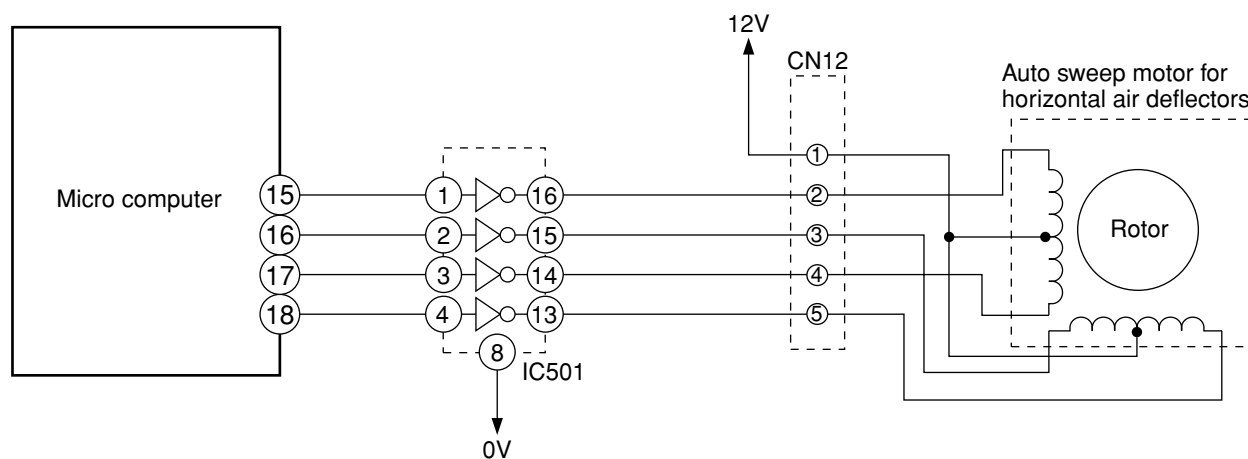
Fig. 5-1 Auto Sweep Motor Circuit (Horizontal air deflectors)

● Fig. 5-1 shows the Auto sweep motor drive circuit; the signals shown in Fig. 5-2 are output from pins ⑮ – ⑱ of the micro computer.
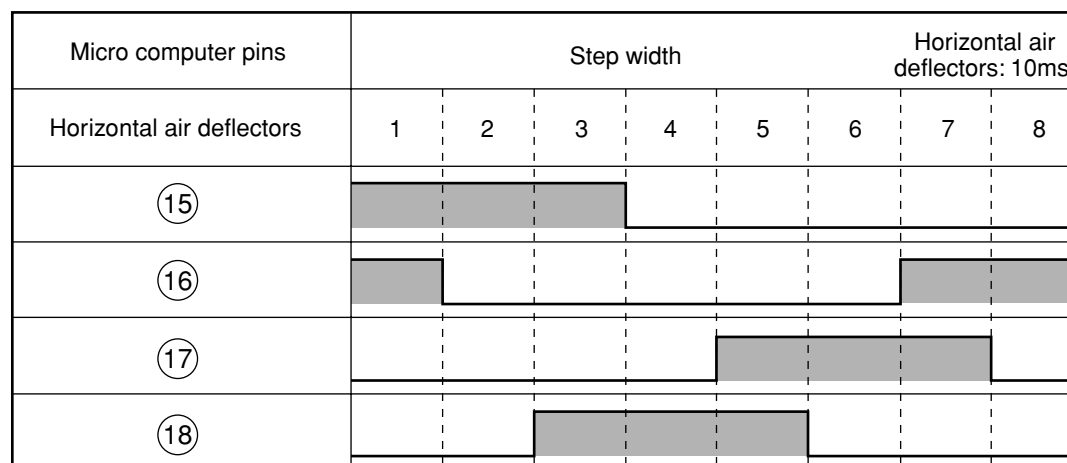
Fig. 5-2 Micro computer Output Signals

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

Table 5-1 Auto sweep Motor Rotation

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

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Все каталоги и инструкции здесь: https://splitsystema48.ru/instrukcii-po-ekspluatacii-kondicionerov.html

6. Room Temperature Thermistor Circuit

● Fig. 6-1 shows the room temperature thermistor circuit.
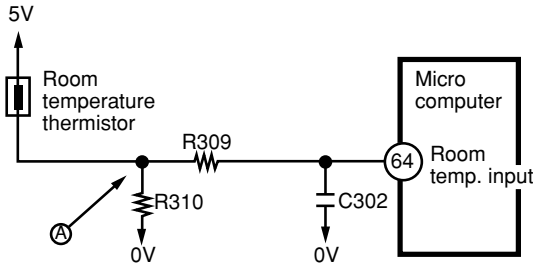
● The voltage at Ⓐ depends on the room temperature as shown in Fig. 6-2.

Fig. 6-1
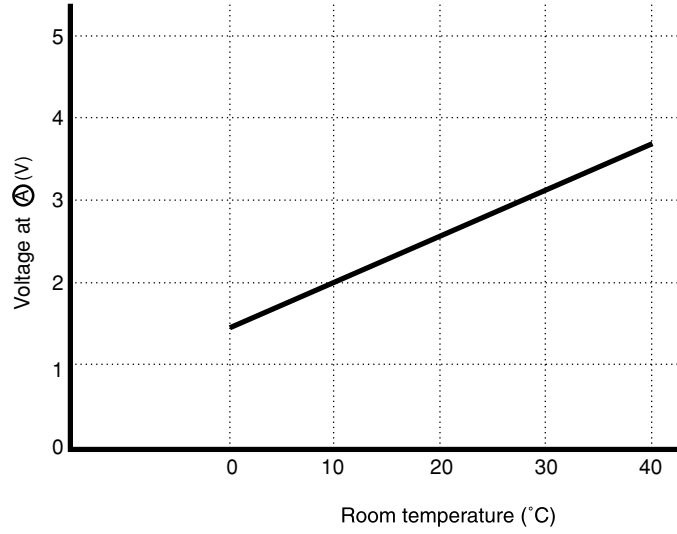
Fig. 6-2

7. Heat exchanger temperature thermistor circuit
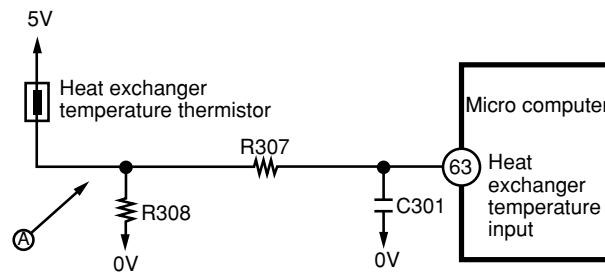
Fig. 7-1

● 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. 7-2.

Fig. 7-2

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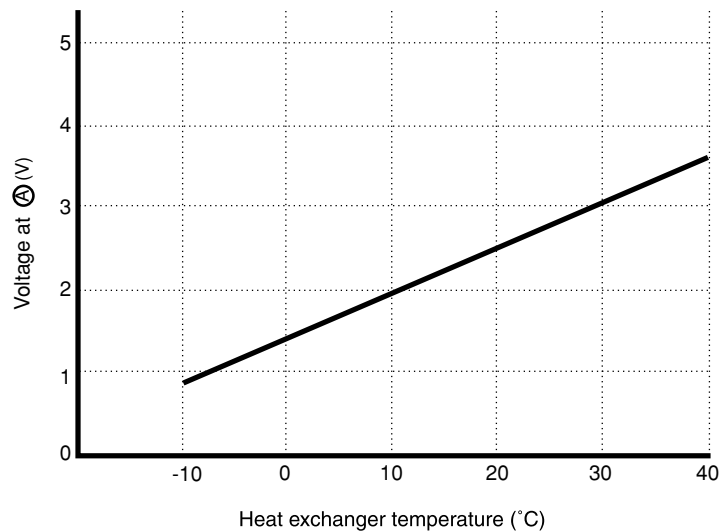
8. Temporary Switch
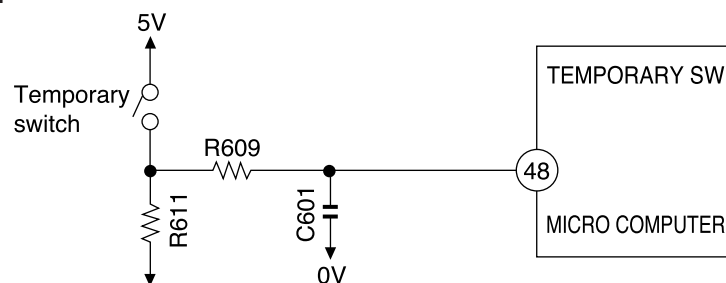
Fig. 8-1

- The temporary switch is used to operate the air conditioner temporarily when the wireless remote control is lost or faulty.

- The air conditioner operates in the previous mode at the previously set temperature. However, when the power switch is set to OFF, it starts automatic operation.

9. Indoor Fan Motor Feedback Circuit
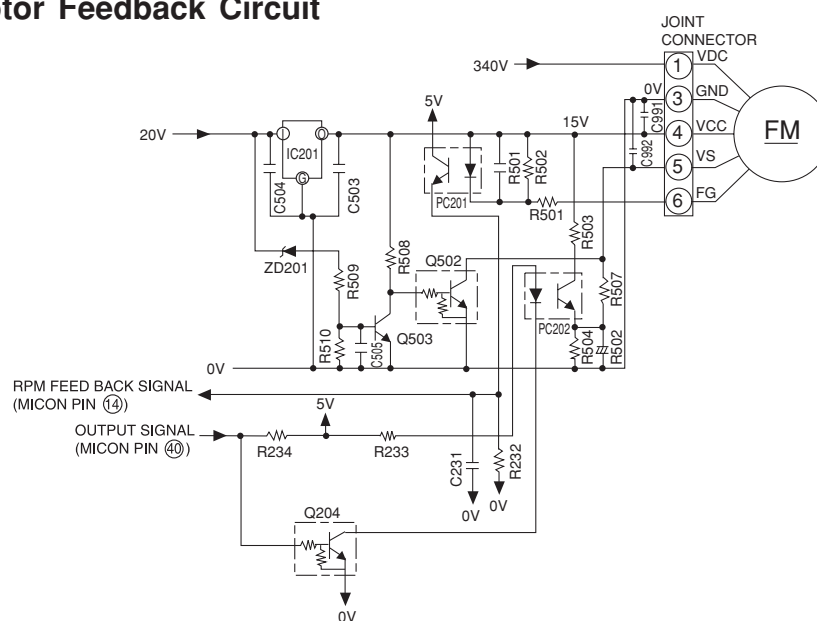
Fig. 9-1

- <Exp. of circuit wave>
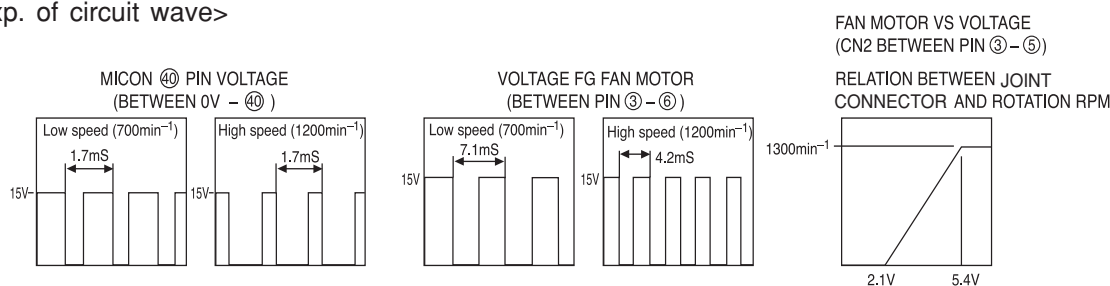
Fig. 9-2

- Fan motor will receive signal thru Joint Connector with VDC (Motor Drive Voltage), VCC (Motor Controller Power Supply), VSC (RPM Instruction) motor WCC return the FG 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.

– 65 –

1. Power Circuit
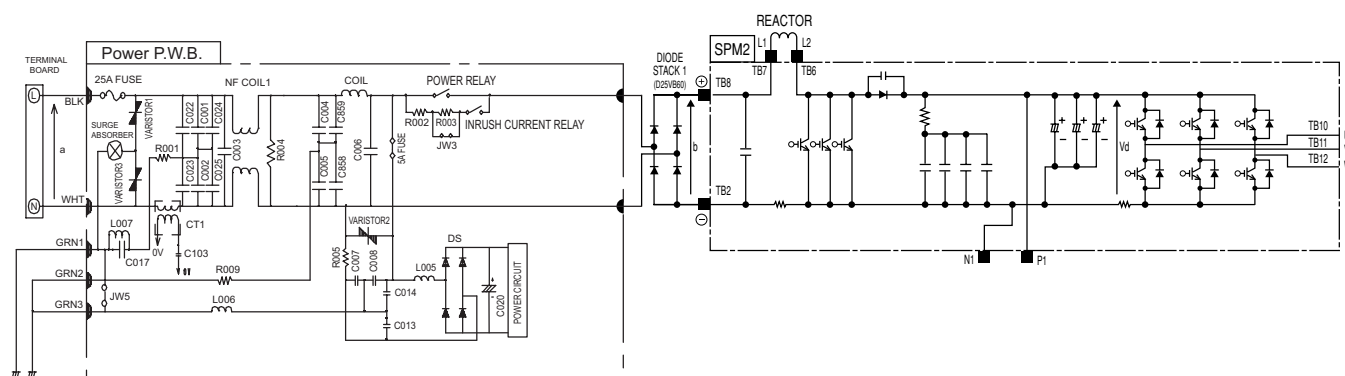
Fig. 1-1

● 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 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.

● In case of active module faulty or defective connection:

Although the compressor continues to operate normally, 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 "Ip", "anbormally 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.

– 66 –

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

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

Smoothing Capacitors

SPM2

Fig. 1-2

a   0V

b   0V

V_d | DC voltage (approx. 260-360V during operation)   0V
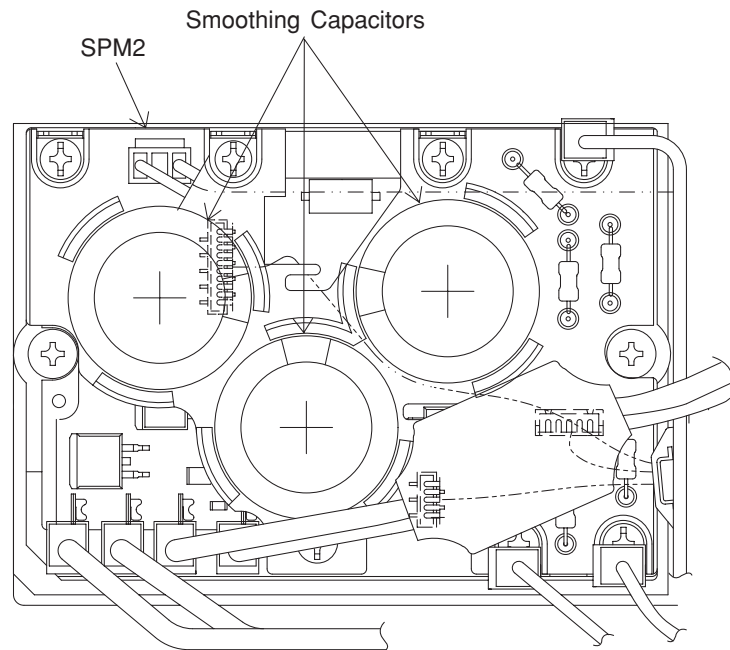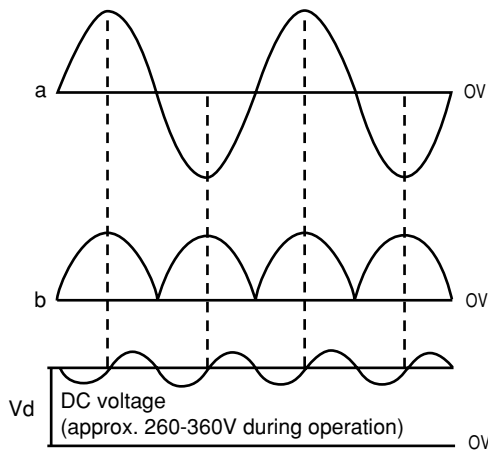
Fig. 1-3

- 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.

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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 transmitting 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.

HIC

5V
R813
C802 R812 Q803 R810
10
C804 R811
0V 0V

5V 5V 5V
IF transmit output (SDO)
Micro computer
0V 0V 0V 0V

I/F 0V
D101

C821 R821
11
C822

5V 5V 5V 5V
IF receive input (SDI)
0V 0V 0V 0V 0V 0V

D C Terminal board
Indoor P.W.B.
Outdoor P.W.B.
D C Terminal board

35V
5V Q201
73 SDO1
0V
L801 5V
R283
C801 R801 R802 Q801 D210 IC8
15 2
R803
0V 0V

5V
R255
Interface relay
12V R263 R262 R259 R258 R257 R254 68 SDI1
0V C804 5V 5V 5V
C803 C802 R261 D206 R256 Q206
C805 NF COIL2 C216 R260
L811 I/F 0V 0V 0V 0V 0V C214
0V

(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

– 69 –

Base of outdoor P.W.B Q801, Q802 , Q803 ⑨ Pin — 0.7V / 0V

Outdoor micro computer ㉝ Pin ㉞ Pin — 5V / 0V

Indoor micro computer SDO Pin — 5V / 0V

SDI Pin — 5V / 0V

35V DC line — 35V

100ms. Leader

33ms. 1 frame
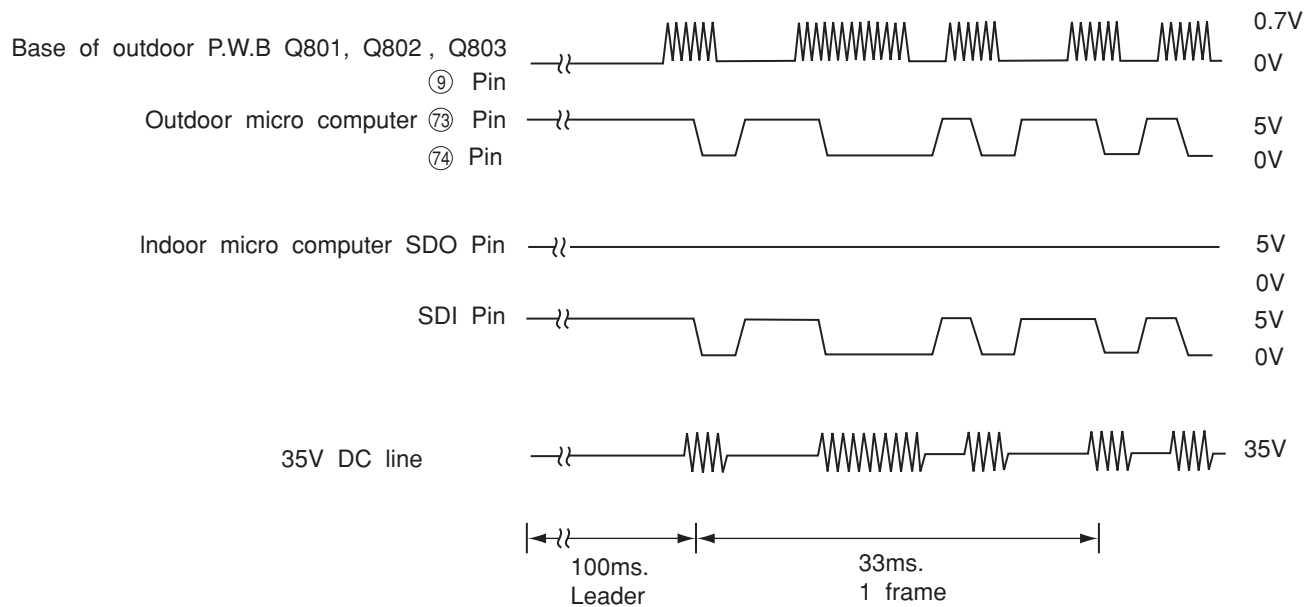
Fig. 2-2 Voltages Waveforms of indoor / Outdoor Micro computers (Outdoor to Indoor Communications)

Base of outdoor P.W.B Q801, Q802 ㊽ Pin — 0V

Outdoor micro computer ㊾ Pin ⑪ Pin — 5V / 0V

Indoor micro computer SDO Pin — 5V / 0V

SDI Pin — 5V / 0V

35V DC line — 35V

5-7.5ms. Transmit/receive switching time

33ms. 1 frame
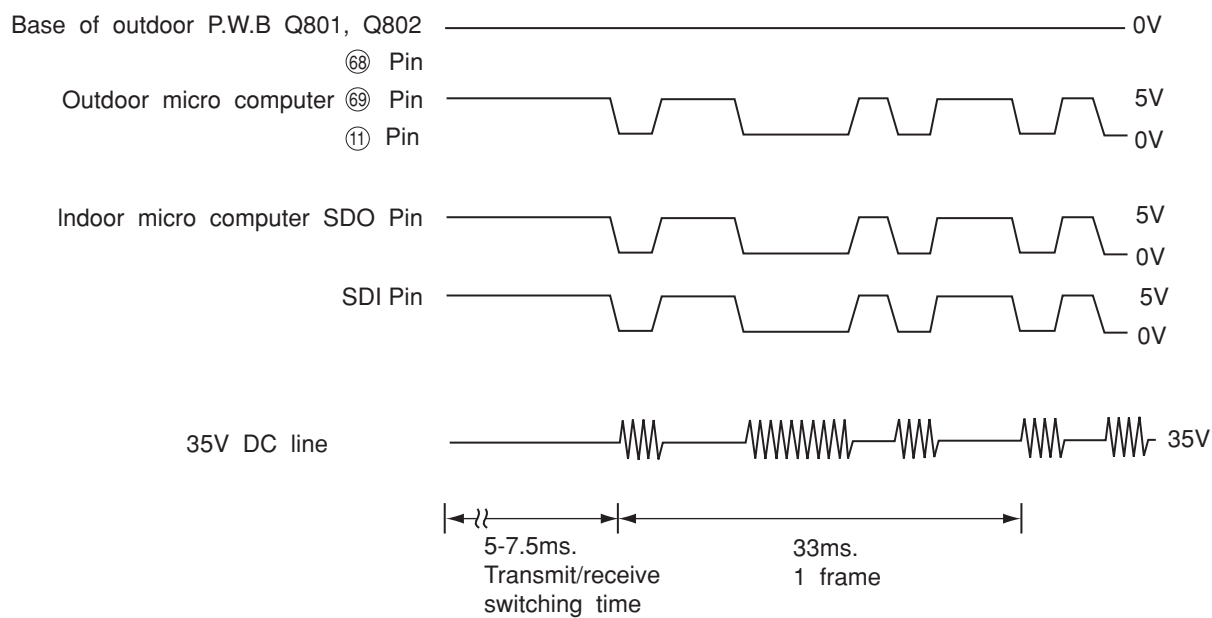
Fig. 2-3 Voltages Waveforms of indoor / Outdoor Micro computers (Indoor to Outdoor Communications)

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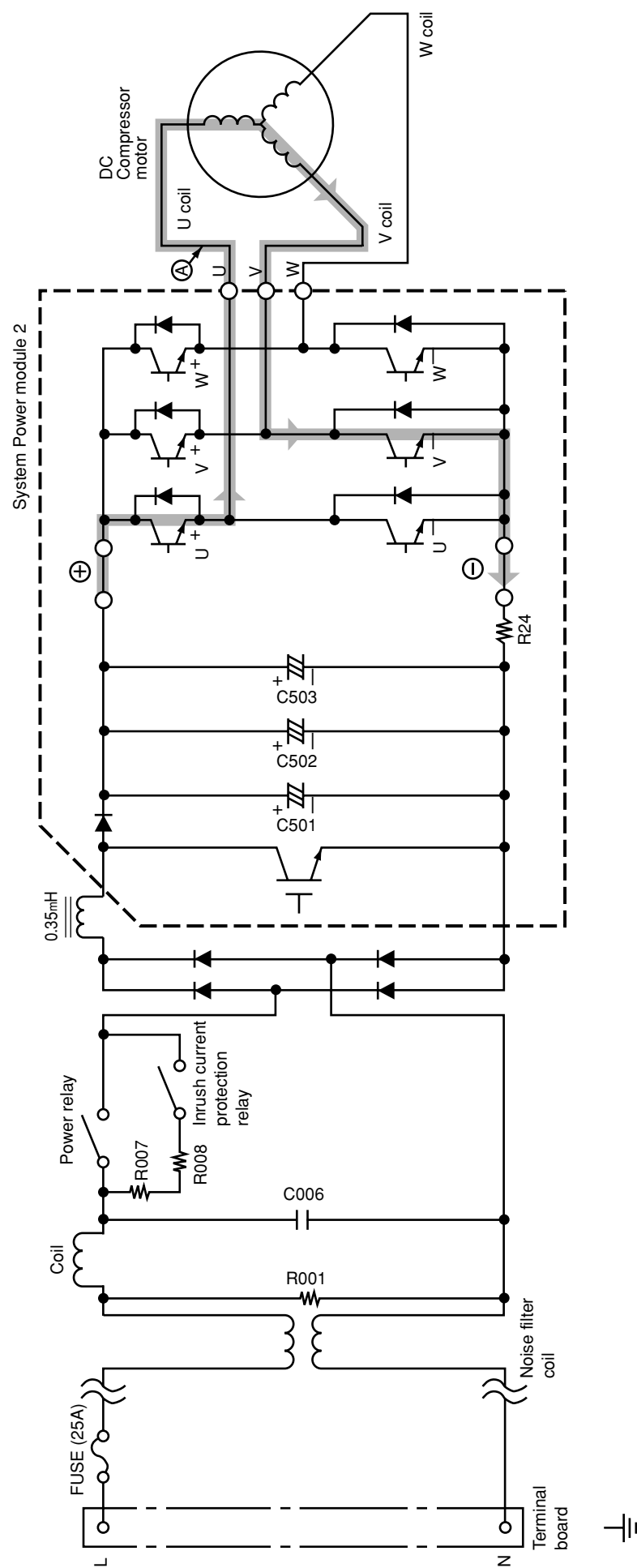
Fig. 3-1 Power module circuit (U⁺ is ON, V⁻ is ON)

● 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.

$$\left[\begin{array}{l} \text{※ At point E: } U^+ \text{ is ON, } V^- \text{ is ON (circuit in Fig. 3-1)} \\ \text{※ At point F: } U^+ \text{ is chopped (OFF), } V^- \text{ is ON (circuit in Fig. 3-4)} \end{array}\right]$$
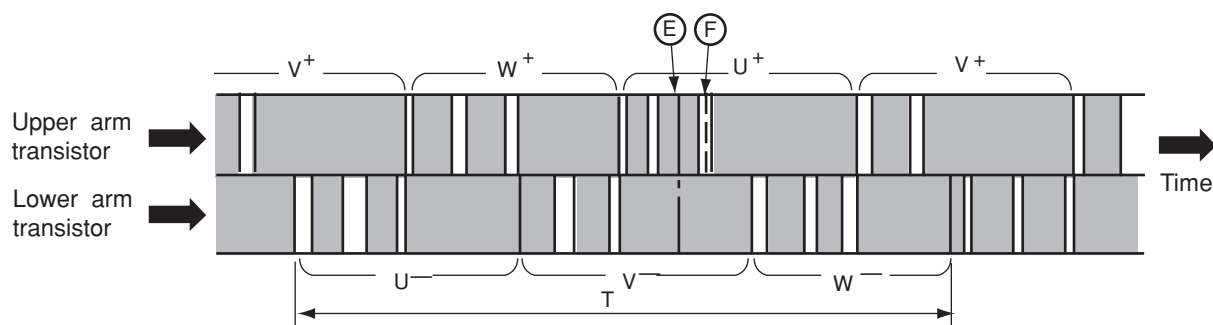
Fig. 3-2 Switching order of power module

● 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.
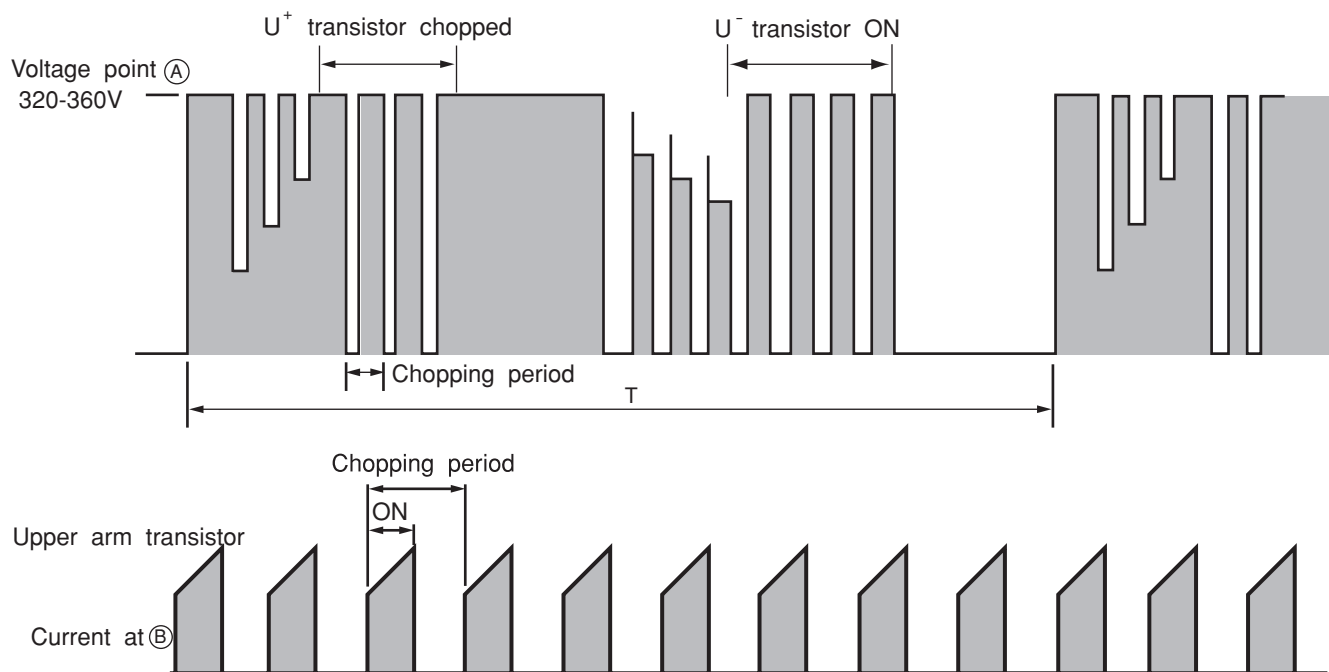
Fig. 3-3 Voltage waveform at each point

● 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)

– 72 –
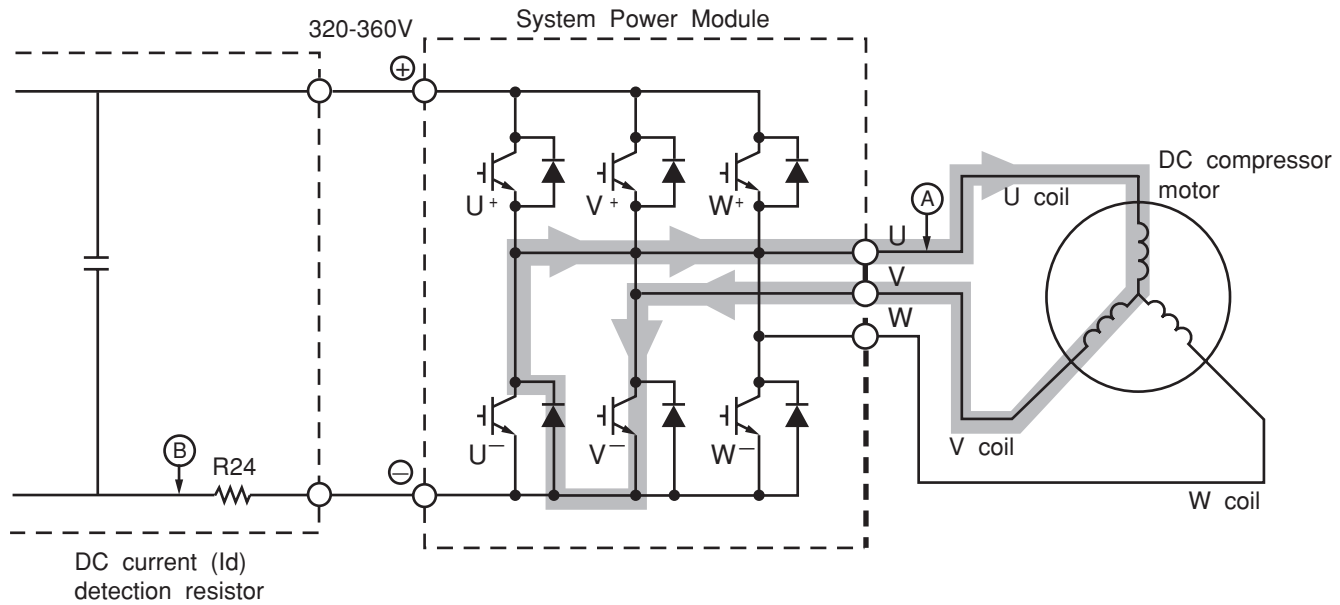
Fig. 3-4 System Power module circuit (U$^+$ is OFF, V$^-$ is ON)

- 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:
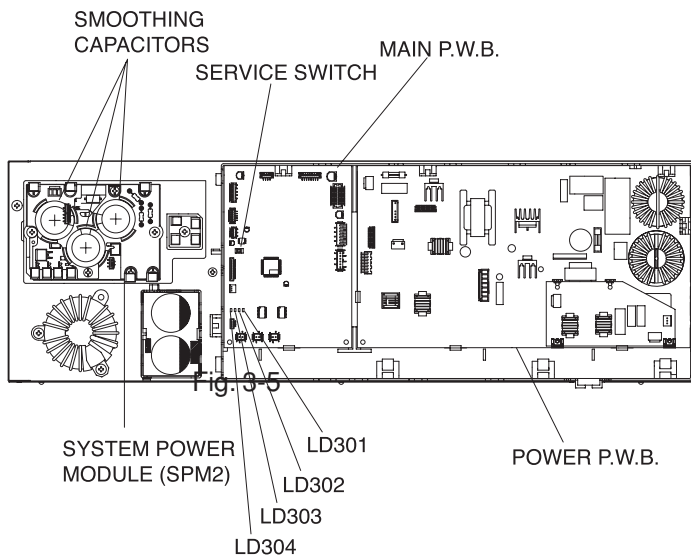
Table 3-1

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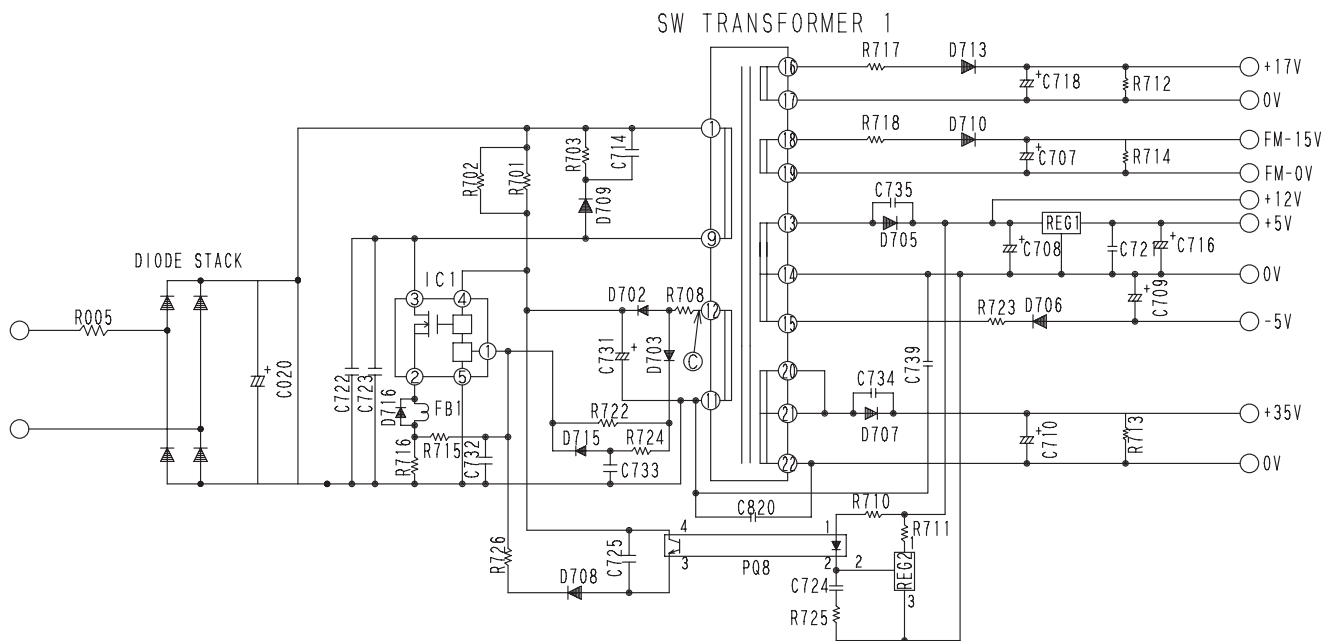
Fig. 4-1 Power circuit for P.W.B.

● 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.

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(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.]

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6. Rotor magnetic pole position detection circuit
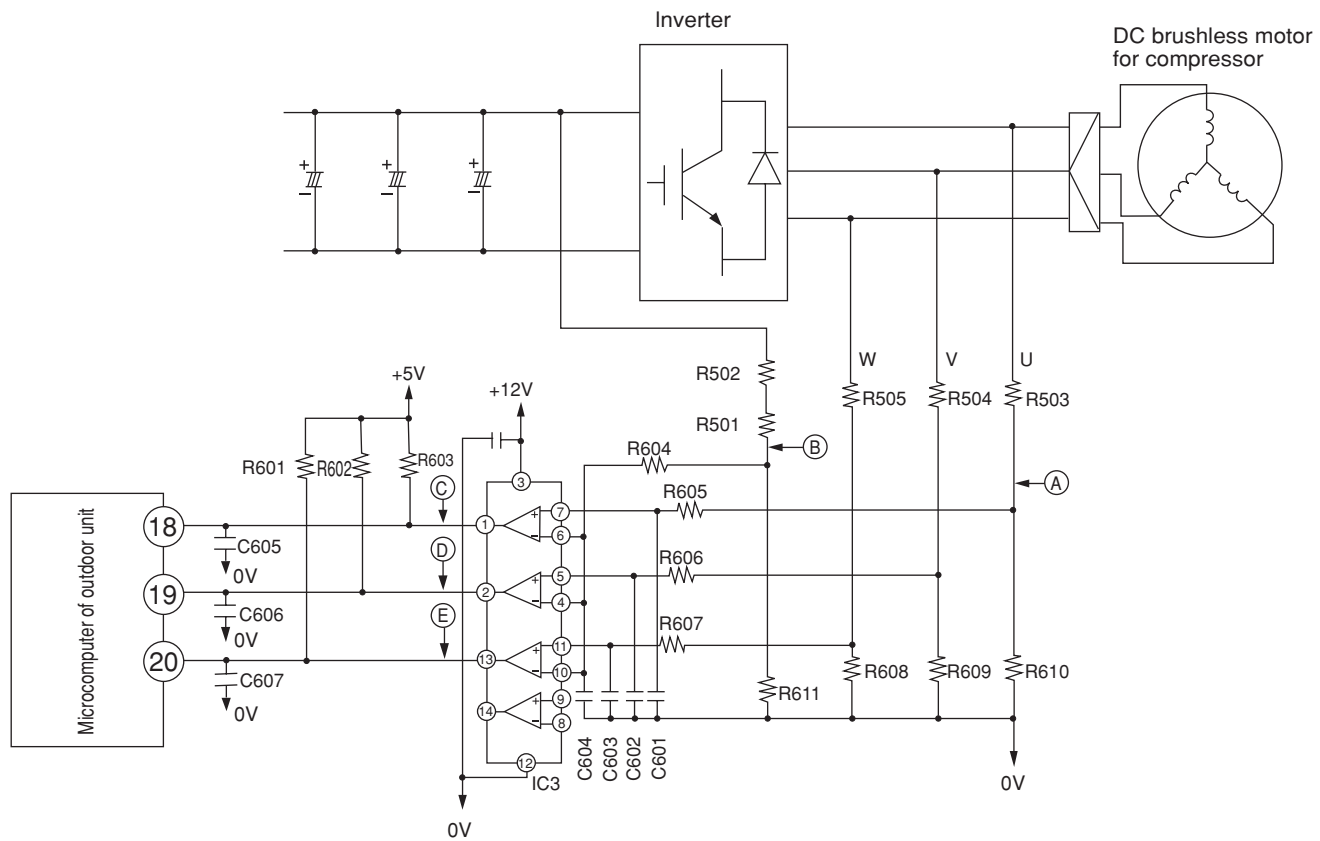
Fig. 6-1 Rotor magnetic pole position detection circuit

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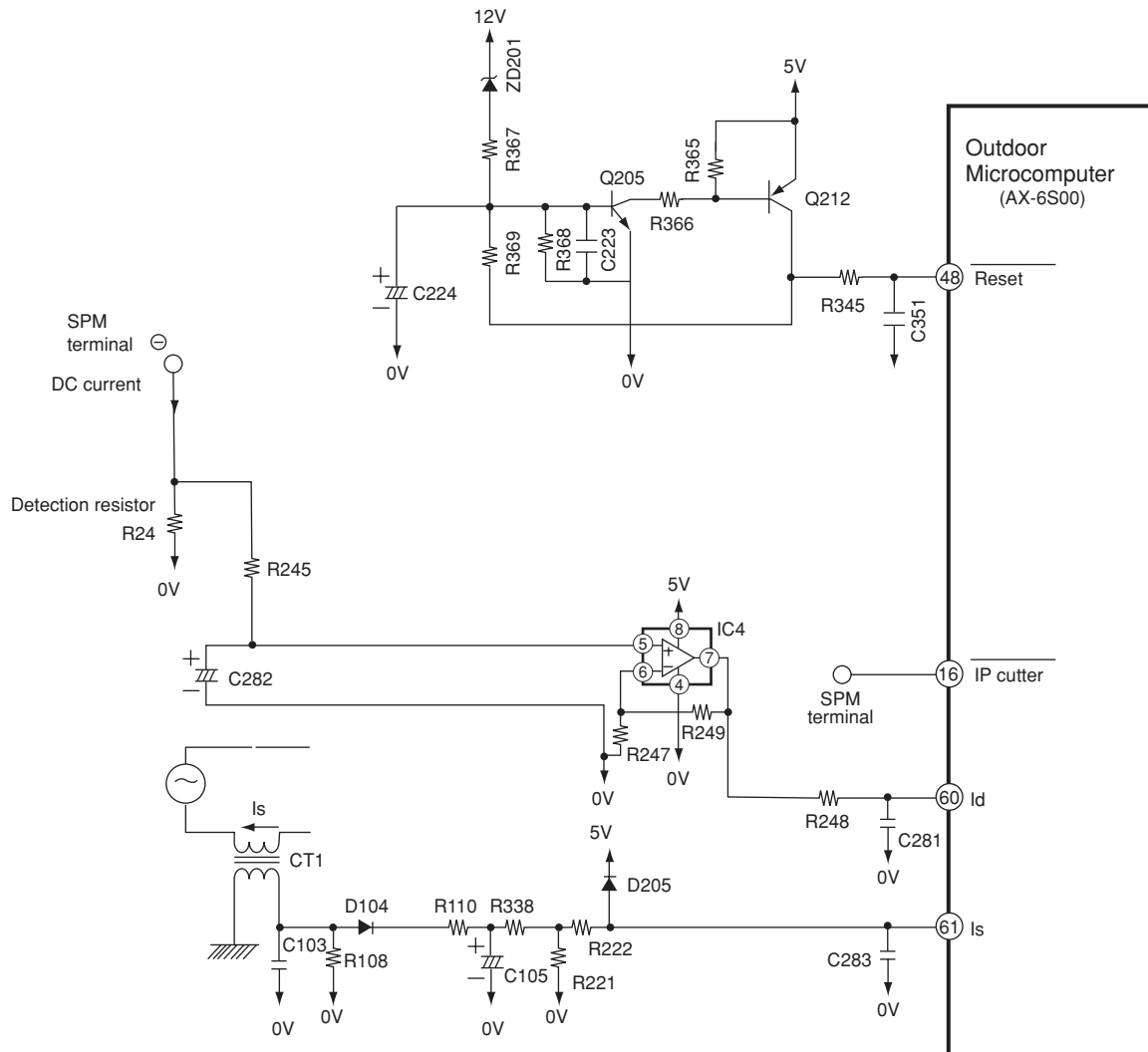
Fig. 7-1 Peripheral circuit of microcomputer (AX-6S)

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.
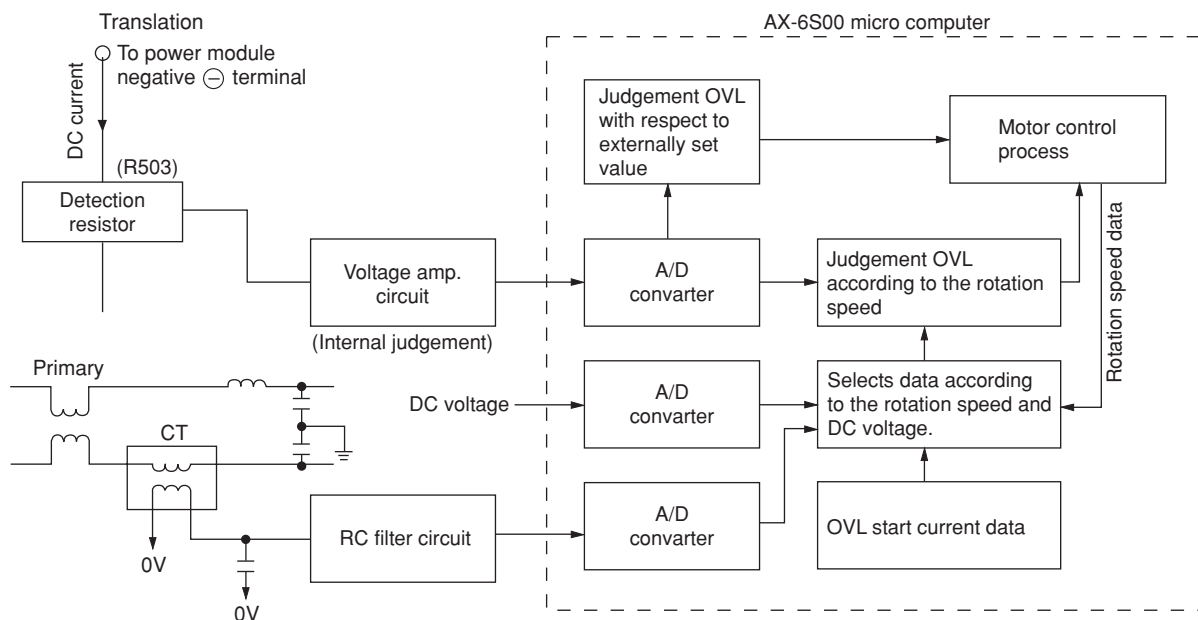
Fig. 8-1 Overload Control System Configuration
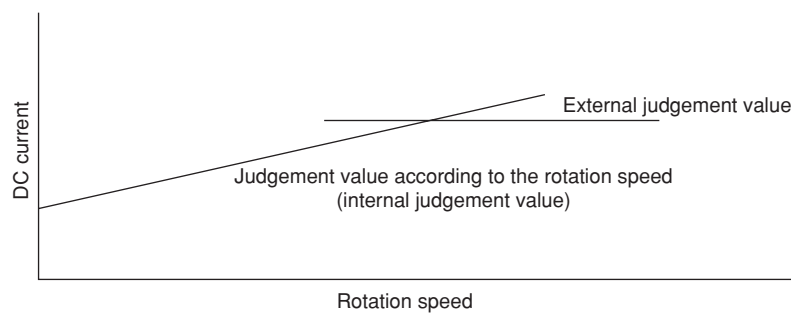
Fig. 8-2

9. Reset Circuit
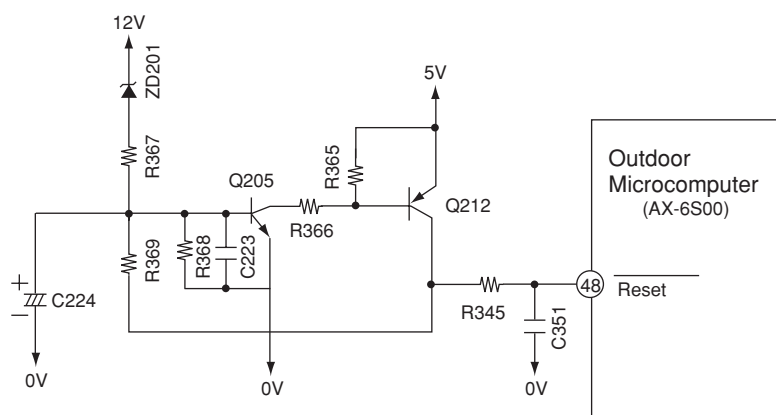
Fig. 9-1

- 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

– 79 –
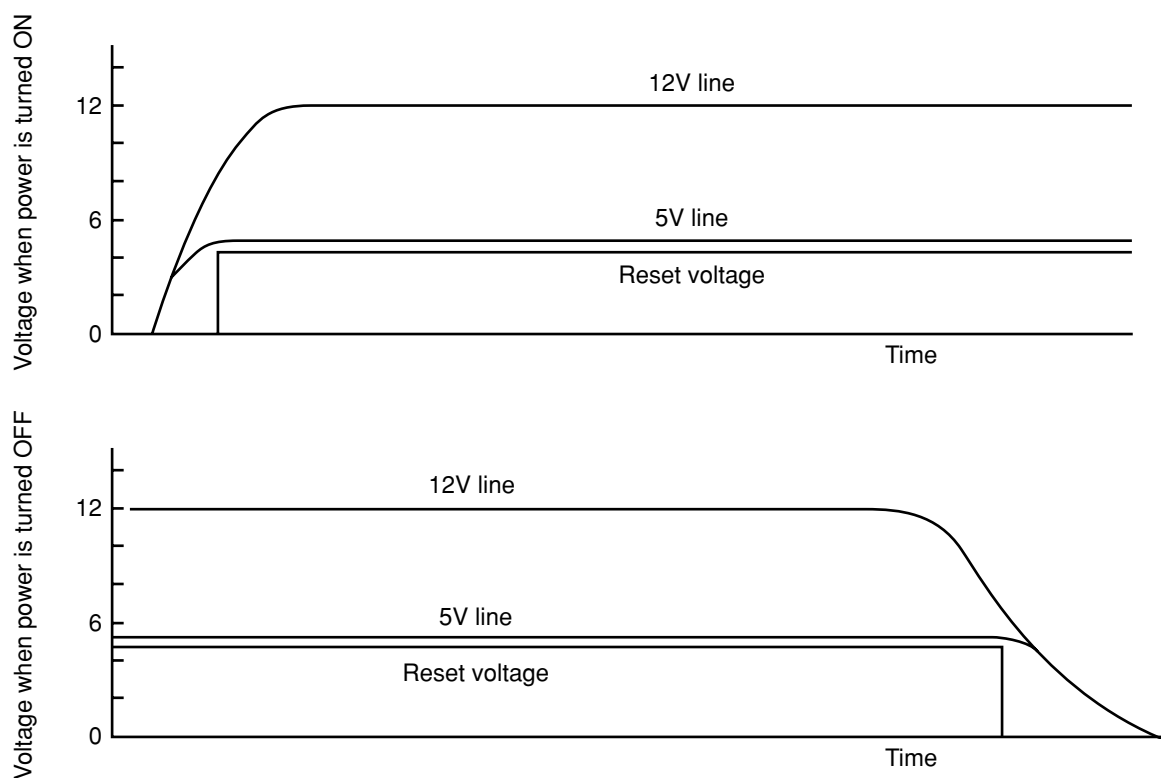
10. Temperature Detection Circuit

- The outdoor units (this model) provides with the outdoor temperature thermistor, DEF (defrost) thermistor, OH (overheat) thermistor and electric expansion valve 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 for model RAS-80YHA, and their roles and temperature measuring points are shown as Table 10-1.
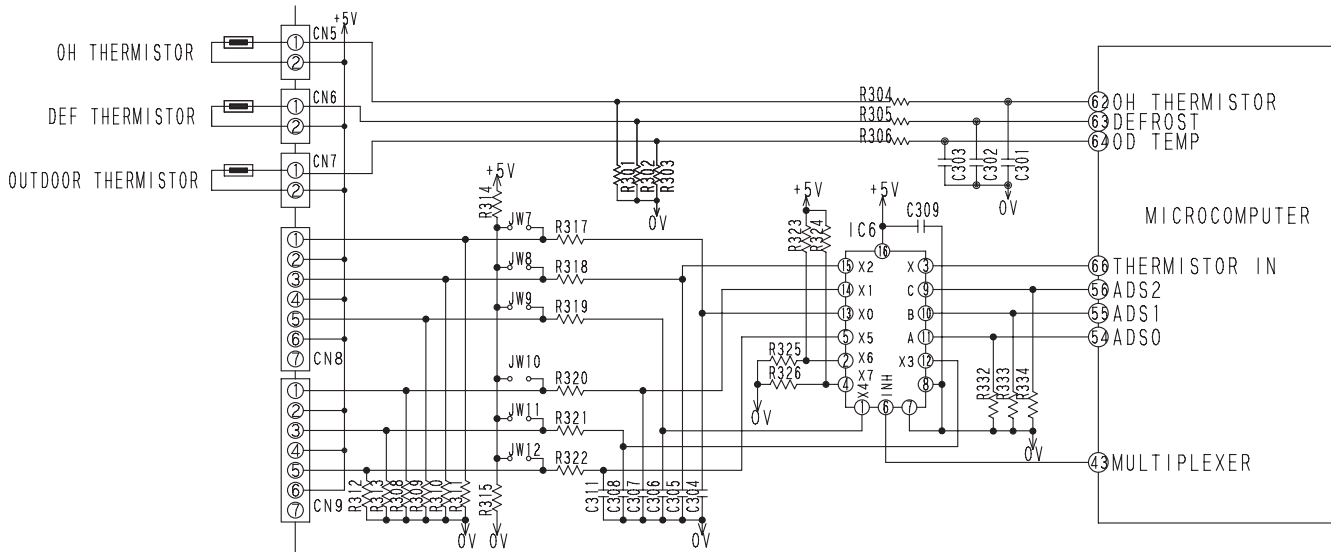
Fig. 10-1 Temperature Detection Circuit

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.
Electric expansion valve thermistor (NARROW PIPE)	CN8	Indoor unit (NARROW PIPE)	The thermistors detect the temperatures of the piping to the indoor units. The temperatures are used to decide how much the expansion valve is opened.
Electric expansion valve thermistor (WIDE PIPE)	CN9	Indoor unit (WIDE PIPE)	

- 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)

Electric expansion valve thermistor 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 togrther 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.

- Be ware 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.

11. Electric expansion valve
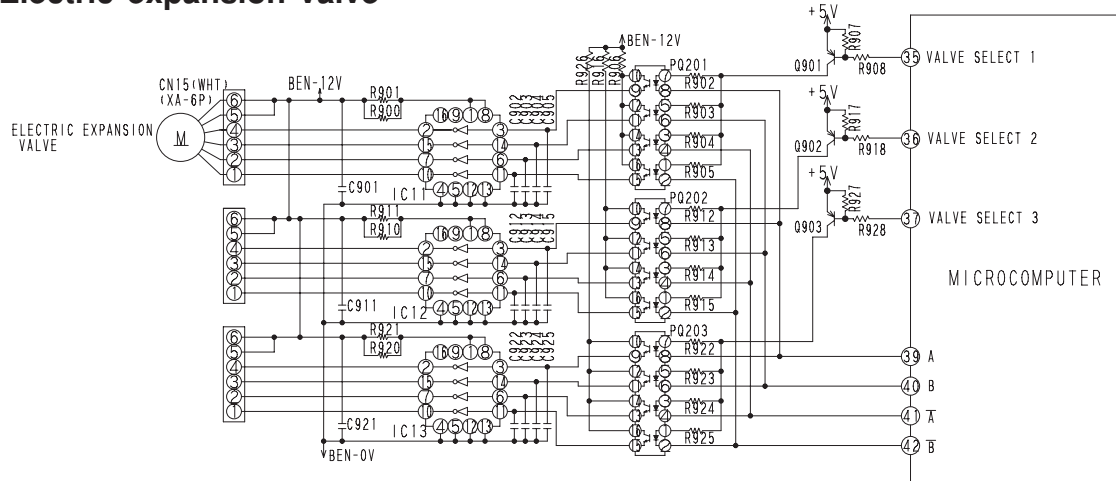
Table 11-1

- 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
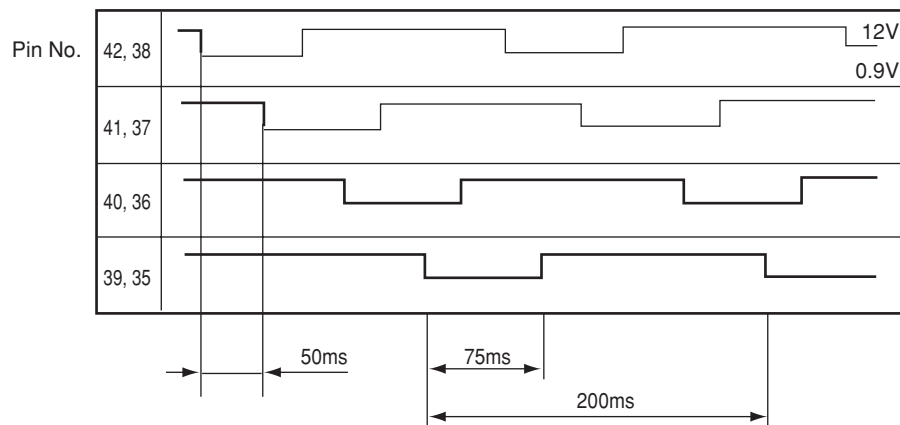
Fig. 11-2

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.

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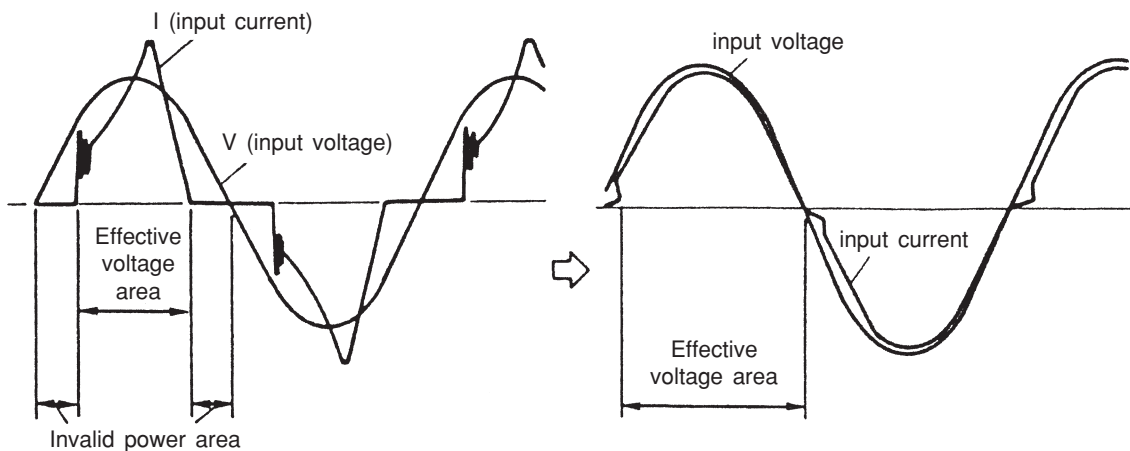
*Assuming the same current capacity (20A), power can be used about 10% effective, comparing with curent use (power factor of 90%), and maximum capacity is thereby improved.

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 lighting.

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

DANGER

1. Remember that the 0V line is biased to 155-170V in reference to the ground level.

2. Also note that it takes about 10 minutes until the voltage fall after the power switch is turned off.

Power source
1ø220V-230V, 50Hz

System power module 2

ACT Module

Power module

Compressor motor

(0V)

Indoor unit electric parts

Control P.W.B.

C   DC35V

D   0V

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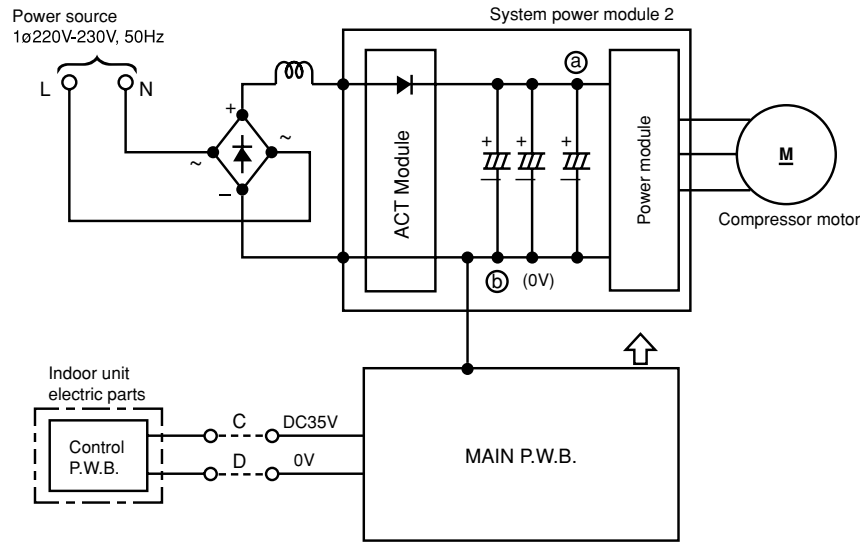
Across ⓐ – ⓑ (0V line).................... approx 260-360V
Across ⓐ – ground.......................... approx 155-170V
Across ⓑ (0V line)– ground............ approx 155-170V

DANGER

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

Outdoor unit P.W.B.

Always keep your hands and metallic things away from the enclosure of the oscilloscope.

DANGER! Don't install the ground line.

Oscilloscope
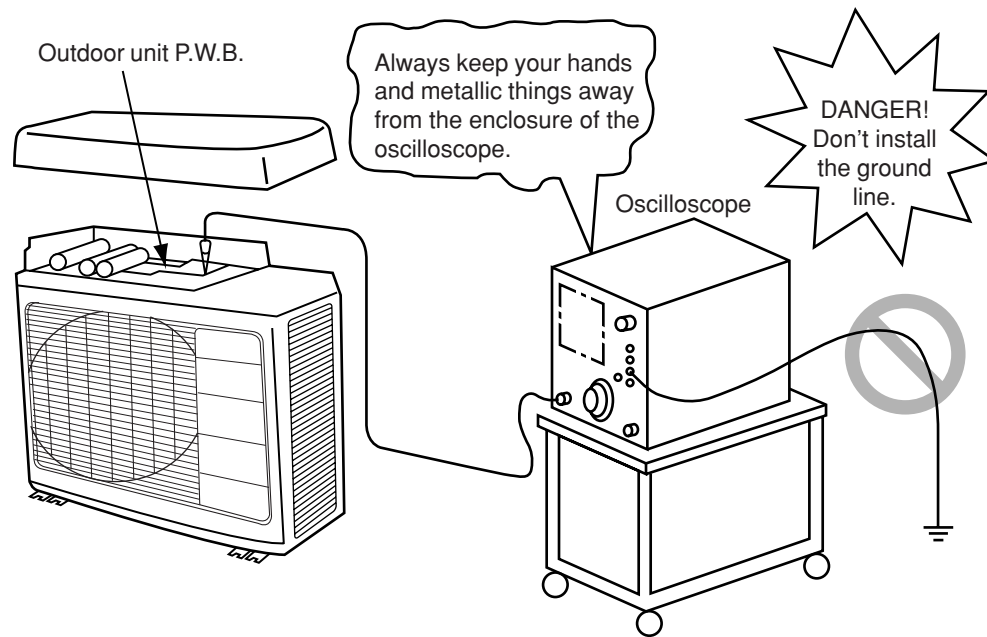
DISCHARGE PROCEDURE AND POWER SHUT OFF METHOD FOR POWER CIRCUIT

⚠ 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.

P1
N1

Soldering iron

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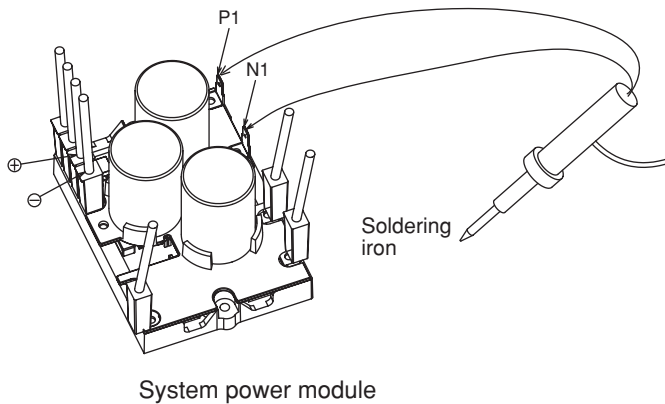
Do not use a soldering iron with transformer: If one is used, thermal fuse inside transformer will be blown

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)

SMOOTHING CAPACITORS

SYSTEM POWER MODULE (SPM2)

– 89 –
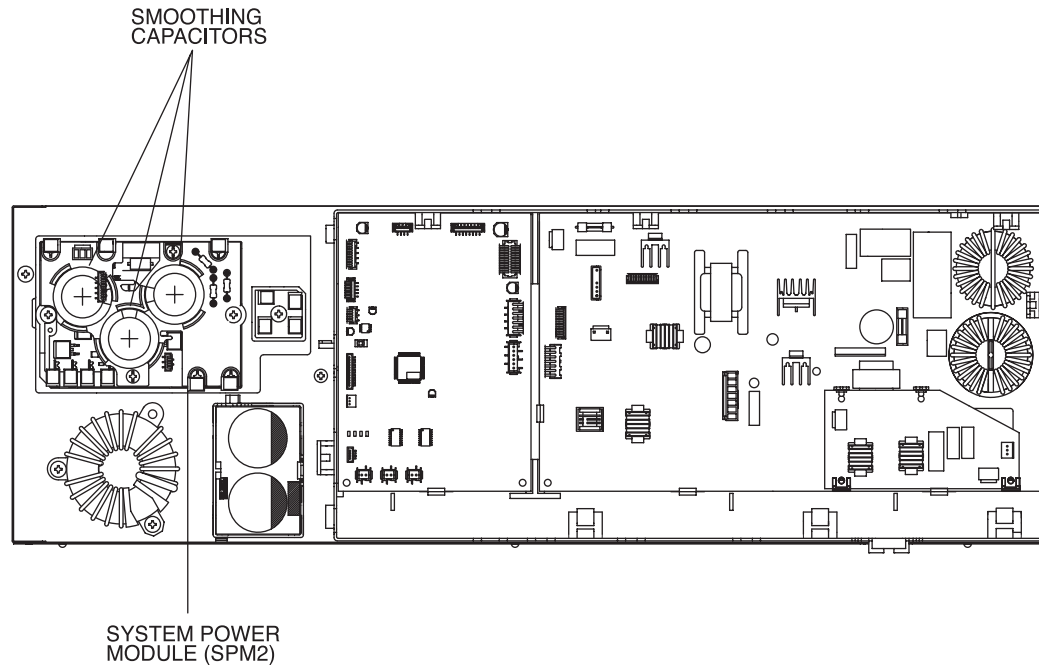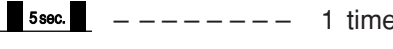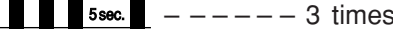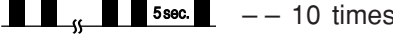
CHECKING THE INDOOR/OUTDOOR UNIT ELECTRICAL PARTS AND REFRIGERATING CYCLE

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

↓ Yes

Is the compressor in the outdoor unit operating?

Yes / No

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

Terminal C (+35V)
Terminal D (0V)
Terminal A
Terminal B

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

SMOOTHING CAPACITORS
MAIN P.W.B.
SERVICE SWITCH

SYSTEM POWER MODULE (SPM2)
LD301
LD302
LD303
LD304
POWER P.W.B.

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.

TROUBLESHOOTING WHEN TIMER LAMP BLINKS.

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

SELF-DIAGNOSIS LIGHTING MODE

No.	Blinking of Timer lamp	Reason for indication	Possible cause
1	▌5sec.▌ – – – – – – – 1 time	Reversing valve defective When the indoor heat exchanger temperature is too low in the heating mode or it is too high in the cooling mode.	(1) Reversing valve defective (2) Heat exchanger thermistor disconnected (only in the heating mode) (Note) The malfunction mode is entered the 3rd time this abnormal indication appears (read every 3 minutes).
2	▌▌5sec.▌ – – – – – – 2 times	Outdoor unit forced operation When the outdoor unit is in forced operation or balancing operation after forced operation	Electrical parts in the outdoor unit
3	▌▌▌5sec.▌ – – – – – 3 times	Indoor/outdoor interface defective When the interface signal from the outdoor unit is interrupted.	(1) Indoor interface circuit (2) Outdoor interface circuit
4	▌▌ ~ ▌▌5sec.▌ – – 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	▌▌ ~ ▌▌5sec.▌ – – 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
6	▌▌ ~ ▌▌5sec.▌ – – 10 times	Over-current detection at the DC fan motor when over-current is detected at the DC fan motor of the indoor unit.	(1) Indoor fan locked (2) Indoor fan motor (3) Indoor control P.W.B.
※1 7	▌▌ ~ ▌▌5sec.▌ – – 13 times	IC401 or IC402 data reading error When data read from IC401 or IC402 is incorrect.	IC401 or IC402 abnormal

(▌ – – Lights for 0.5 sec. at interval of 0.5 sec..)

<Cautions>

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

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

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

SELF-DIAGNOSIS LIGHTING MODE

⚠ ⚡ 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)	(1) (2) SET VALUE (3) ROTATION SPEED / TIME	
▨	▨	▨	☐	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

[2] DURING STOP

LD301	LD302	LD303	LD304	SELF-DIAGNOSIS NAME	DETAILS	MAIN CHECK POINT
☐	☐	☐	☐	NORMAL STOP	INDOOR THERMOSTAT OFF. MAIN OPERATION OFF.	NOT MALFUNCTION.
▧	☐	☐	☐ 1 TIME	RESET STOP	WHEN STOPPED WITH POWER RESET. (NORMAL WHEN POWER HAS BEEN TURNED ON).	① P.W.B.s (POWER CIRCUIT, HIC, ETC.)
▧	☐	☐	☐	PEAK CURRENT CUT	OVER CURRENT IS DETECTED.	① COMPRESSOR ② P.W.B.s
▧	▧	☐	☐ 2 TIMES			① SYSTEM POWER MODULE ② P.W.B.s
▧	☐	☐	☐ 3 TIMES	ABNORMAL LOW SPEED ROTATION	POSITION DETECTION SIGNAL IS NOT INPUT DURING OPERATION.	① SYSTEM POWER MODULE ② COMPRESSOR ③ P.W.B.s
▧	☐	☐	☐ 4 TIMES	SWITCHING FAILURE	FAIL TO SWITCH FROM INITIAL LOW FREQUENCY SYNC. TO POSITION DETECTION SYNC. .	① SYSTEM POWER MODULE ② COMPRESSOR ③ P.W.B.s
▧	☐	☐	☐ 5 TIMES	OVERLOAD LOWER LIMIT CUT	OVERLOAD CONDITION STILL PERSISTING EVEN WHEN ROTATION SPEED IS BELOW THE LOWER RPM LIMIT.	① OUTDOOR UNIT IS EXPOSED TO DIRECT SUNLIGHT OR ITS AIRFLOW BLOCKED. ② FAN MOTOR ③ FAN MOTOR CIRCUIT ④ THE VOLTAGE IS EXTREMELY LOW.
▧	☐	☐	☐ 6 TIMES	OH THERMISTOR TEMP. RISE	OH THERMISTOR IS OPERATING.	① LEAK OF REFRIGERANT ② COMPRESSOR ③ OH THERMISTOR CIRCUIT ④ FAN MOTOR ⑤ FAN MOTOR CIRCUIT
▧	☐	☐	☐ 8 TIMES	ACCELERATION DEFECTIVE	NO ACCELERATION ABOVE THE LOWER LIMIT OF THE ROTATION SPEED.	① LEAK OF REFRIGERANT ② COMPRESSOR
▧	☐	☐	☐ 10 TIMES	POWER SUPPLY VOLTAGE ERROR	POWER SUPPLY VOLTAGE IS INCORRECT.	① POWER SUPPLY VOLTAGE ② RECEPTACLE OF WIRE AT SYSTEM POWER MODULE IS NOT PROPERLY INSERTED
▧	☐	☐	☐ 12 TIMES	FAN LOCK ERROR	OUTDOOR FAN RPM IS NOT ROTATE AS INTENDED RPM.	① FAN MOTOR ② FAN MOTOR CIRCUIT
▧	☐	☐	☐ 13 TIMES	EEPROM READING ERROR	MICROCOMPUTER CANNOT READ THE DATA IN EEPROM.	① MAIN P.W.B.
▧	☐	☐	☐ 14 TIMES	ACTIVE CONVERTER DEFECTIVE	OVER VOLTAGE IS DETECTED BY SYSTEM POWER MODULE.	① SYSTEM POWER MODULE
■	▧	☐	☐ LIT 1~3 TIMES	ABNORMAL THERMISTOR	THERMISTOR IS OPENED OR SHORTED. REFER TO TABLE "CORRESPONDENCE TABLE FOR ABNORMAL THERMISTOR"	① THERMISTOR ② CONNECTION OF THERMISTOR IS FAULTY ③ THERMISTOR CIRCUIT
☐	☐	☐	▧ 1 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.

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.

MEASURING POSITION OF DC VOLTAGE (P1) '+ve'.
MEASURING POSITION OF DC VOLTAGE (N1) '-ve'.
SERVICE SWITCH
POWER P.W.B.

SYSTEM POWER MODULE (SPM2)
CAPA P.W.B.
LD301
LD302
LD303
LD304
POWER P.W.B.
NF P.W.B.

POWER SOURCE AC240V 50Hz
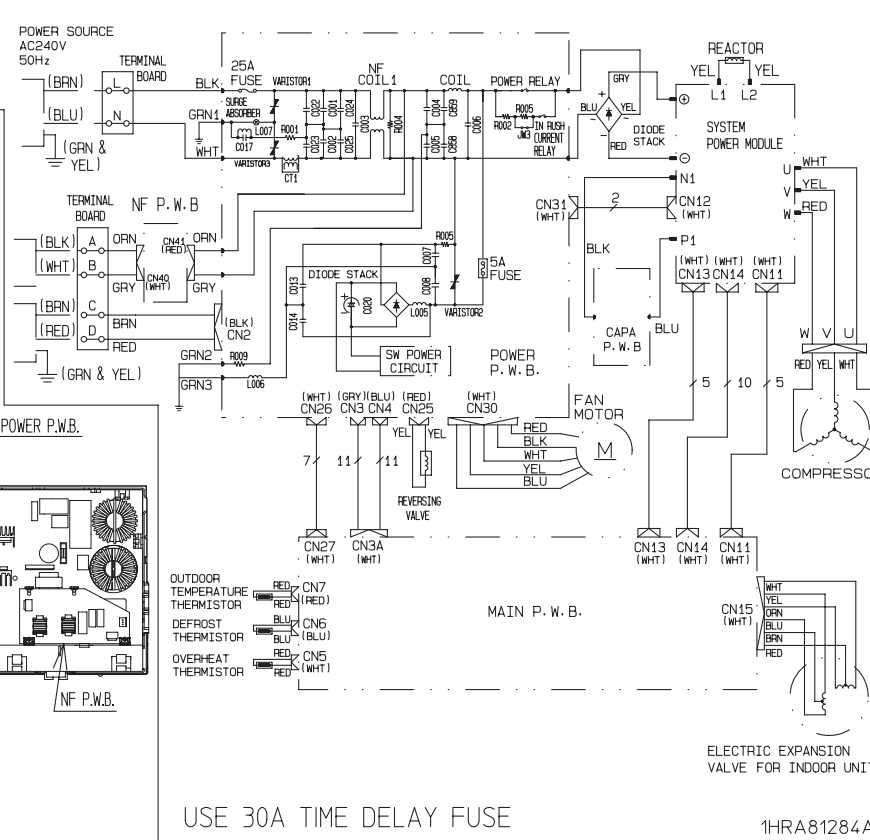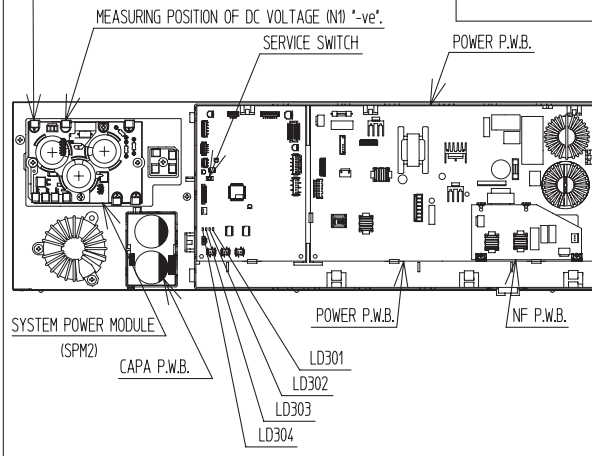
USE 30A TIME DELAY FUSE

1HRA81284A

CHECKING INDOOR UNIT ELECTRICAL PARTS

1. Power does not come on (no operation)

Is DC 35V being generated between terminals C and D on the terminal board?

→ **No** → Is AC 220-240V AC being generated between terminals L and N on the outdoor unit terminal board?

→ **No** → Check AC outlet and breaker, and repair any defective part.

↓ **Yes**

Is DC 35V being generated between terminals C and D on the outdoor unit terminal board?

→ **Yes** → Check the indoor/outdoor unit connection cable, and correct any defective section (wrong connection, incomplete insertion reversed).

→ **No** → Check the outdoor unit power circuit, and repair the defective section.

Are control voltages (12V, 5V) being generated normally?

→ **No** → Check according to the proper method for checking the power circuit.

↓ **Yes**

Do the air deflectors perform initial operation when the power supply is turned on and off?

→ **Yes** → Check the indication P.W.B. connection cord and light receiving unit.

↓ **No**

Is the microcomputer reset input (pin ⑦) Hi ?

→ **No** → Check the reset circuit, and repair any defective section.

↓ **Yes**

Is the microcomputer clock signal 10MHz at pin ⑩ ⑪ being generated normally?

→ **No** → Replace the microcomputer and oscillator.

↓ **Yes**

Replace the control P.W.B

↓

Perform final operation check.

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.

CN17

Self diagnosis lamps (LD303, 302, 301)

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?

38kHz Approx. 2Vp-p
Approx. 35V
0V

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?

38kHz Approx. 2Vp-p
Transmission waveform
Approx. 35V
0V

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)

| Can the fan be stopped by remote control? | →(Yes) | The microcomputer fan PWM output (pin) is "Hi" | →(Yes) | Replace the microcomputer. |

No →

No → Replace the indoor fan motor.

Replace the microcomputer.

Perform final operation check.

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

| Are pulse signals output at microcomputer pin ⑮ - ⑱ when auto swing is turned on in the fan mode? | →(No) | Replace the microcomputer |

↓ Yes

| Is a voltage over 15V or below 10V being generated on the 12V line | →(Yes) | Check the T001 and interface relay. | →(Yes) | Check IC501. If it is normal, replace the air deflector motor. |

Perform final operation check.

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

Set to the "Hi" fan mode.

↓

The operation lamp lights once and goes out in 5-10 seconds.

↓ Yes

Disconnect joint connector at indoor fan motor and set to the fan mode again.

↓

The operation lamps lights once and goes out in 5-10 seconds. →(Yes)→ Check to see if shorting etc. has occurred in the P.W.B pattern

↓ No

Can the indoor fan be lightly turned by hand? (Switch of main power before check) →(No)→ Check to see if the indoor fan is touching the chassis, etc. If it does repair

↓ Yes

Replace the indoor fan motor.

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

Is DC 35V being output at terminals C and D?

⇩ Yes

Is DC 12V being output?

│ Yes
↓

Is DC 5V being output?

━━━━━━━━▶ Replace IC101.

Is DC 35V being output between cathode and mode of D701

━No━▶ D701 and C701 may be defective

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

━No━▶ There is a defective between the 12V output of switching power supply and interface relay.

⇩ Yes

Replace the interface relay

Perform final operation check.

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..

"Buzz"

Within 15 cm

[AM radio]

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

Using the test card

Ultra redray test card

Sensible area

Within 2 cm

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

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

CHECKING THE OUTDOOR UNIT ELECTRICAL PARTS

[No operation or abnormal operation]

Is AC220-240V being supplied to terminal L and N? "Be sure terminal L, N and A, B are properly connected".

→ Yes

Is the 25A fuse normal?

→ No → If the 25A fuse has blown, be aware that other parts may also be defective (mainly, varistor 2, diode stack, smoothing capacitors, system power module, etc.). → Replace any defective parts.

Is the power circuit normal?

See the description on power circuit for details.

→ Yes

Is the switching power circuit OK? Has the 5A fuse blown?

→ No → Check to see whether the connected C and D cable correctly? If reversed, correct the cable connection.

→ Yes → Replace any defective parts.

(If the 5A fuse has blown, the switching transformer (T1), varistor 2, R716, etc. may also be defective.)

Is 5V being generated between Pin ④ (0V) and pin ③ (5V) at CN 19 (test pin)?

→ Yes

Operate the outdoor unit according to the instruction "How to operate the outdoor unit independently".

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

See the self-diagnosis lamp lighting mode.

```
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 → Is DC 35V being output across R713?

No → D707 and C710 may be defective.

Yes → 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.

Interface relay
Coil terminal
Contact terminal

```
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 → Is the drive circuit normal?
  - No → Replace any defective parts. → Check continuity of pattern and lead wires according to the P.W.B. and schematic diagrams.

LD301 blinks 3 time. — Abnormal low speed.

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.)

→ Make sure again that connectors are connected securely.

→ Operate the unit again. is it normal?

→ Perform final operation check.

POWER CIRCUIT

Phenomenon 1 <Rotation speed does not increase>

```
┌─────────────────────────┐          No        ┌──────────────────────────┐
│ Is the DC voltage at     │ ═══════════════▶  │ Recheck cord, etc. of the │
│ least 350V?              │                    │ system power module. If   │
└─────────────────────────┘                    │ they are disconnected,    │
             ║                                  │ connect them securely.    │
             ║ Yes                              └──────────────────────────┘
             ▼                                              ║
┌─────────────────────────┐                                ▼
│ Is the OVL lamp lit?     │                    ┌──────────────────────────┐
│ If the lamp is lit, it does not                │ If abnormality continues, │
│ indicate fault, but the unit                   │ replace the system        │
│ is overload status.      │                    │ power module.             │
└─────────────────────────┘                    └──────────────────────────┘
```
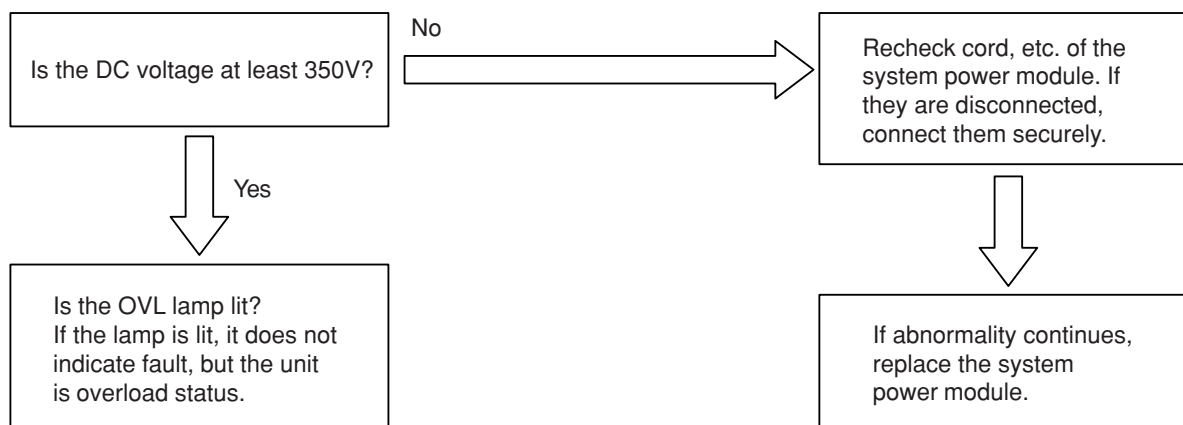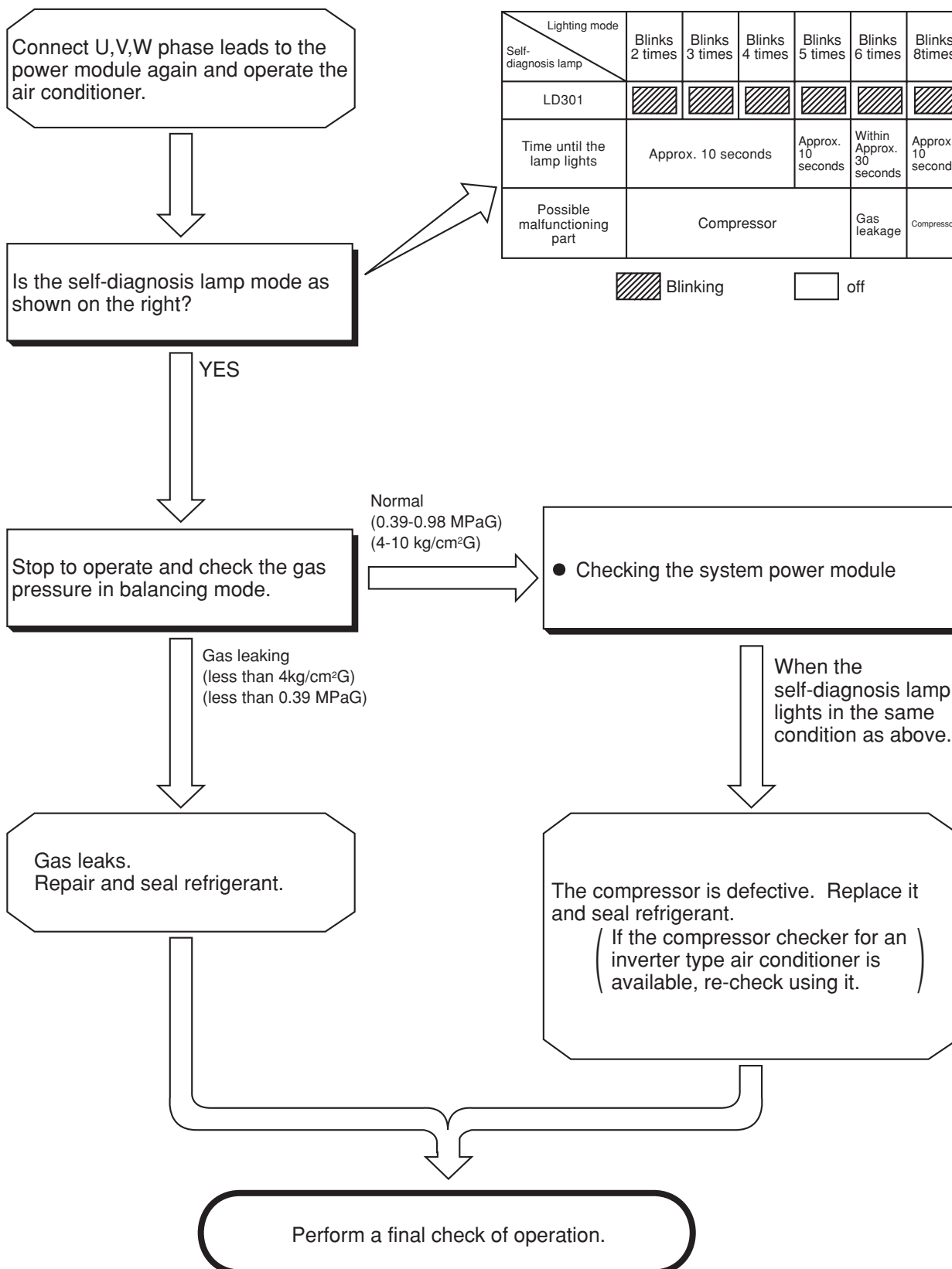
Overvoltage defect: system power
module faulty (15-times blinking)

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

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

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

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

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

Blinking   off

YES

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

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

● Checking the system power module

Gas leaking
(less than 4kg/cm²G)
(less than 0.39 MPaG)

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

Gas leaks.
Repair and seal refrigerant.

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

Perform a final check of operation.

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.
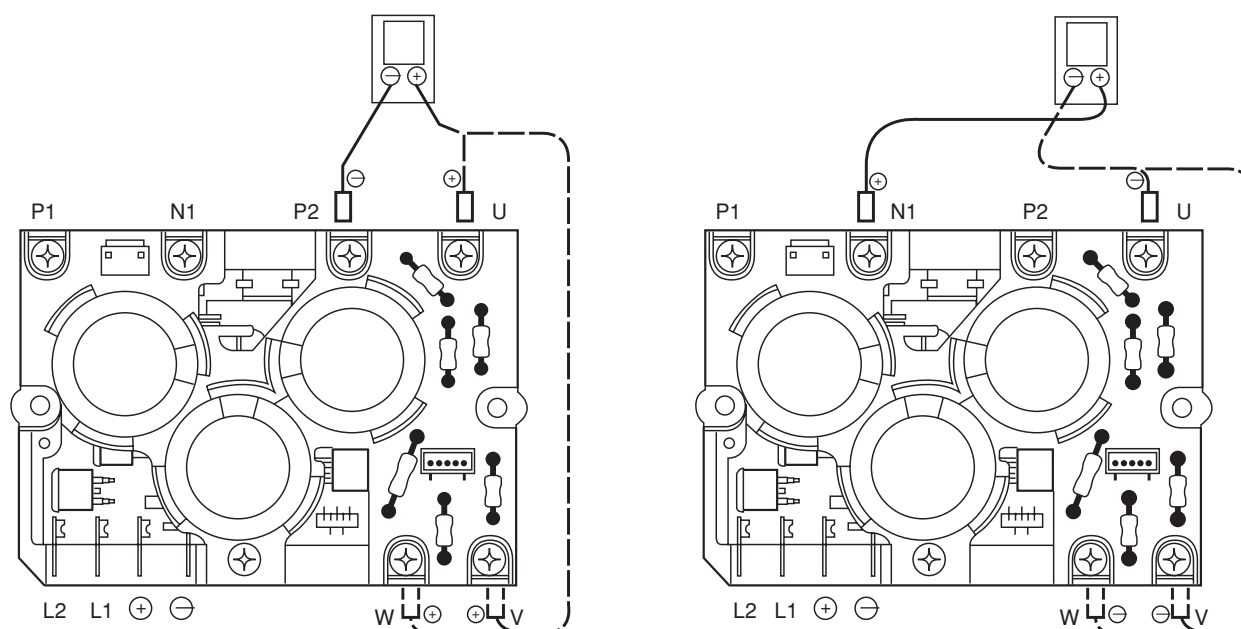
HOW TO OPERATE USING THE SERVICE SWITCH THE OUTDOOR UNIT

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.

Electrical Box Cover

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

CN17

Self diagnosis lamps
(LD303, 302, 301)
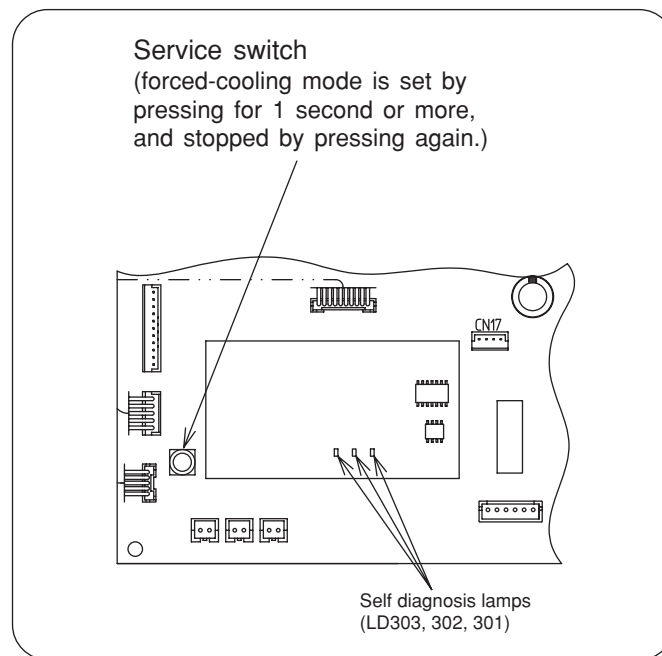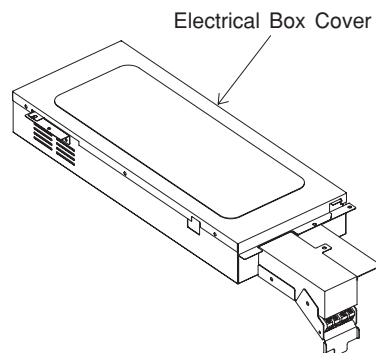
(Cautions)
(1) If interface signal (DC 35V) terminals C and D are not connected when the outdoor unit is in forced cool mode, the outdoor unit defect indicator (LD301) will blink 9 times during operation to indicate communication error.
(2) If checking is done with the compressor connector disconnected, 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)

Outdoor unit

Compressor

Reversing valve

Large dia. service valve

Reducing union
(2/8 and 3/8)

Copper pipe
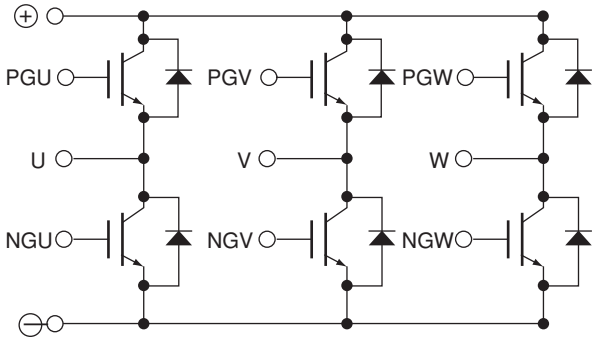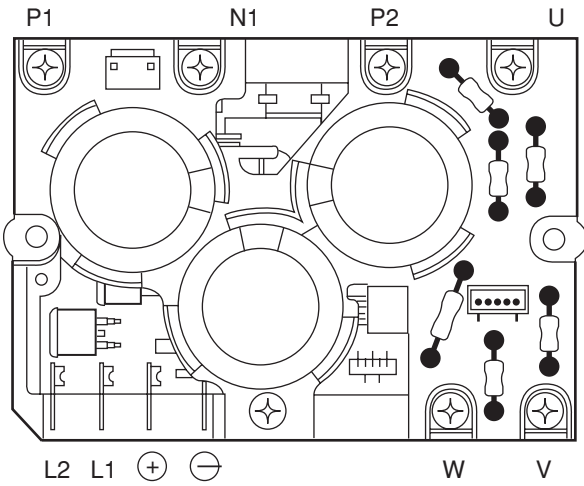(2/8)

Small diameter service valve
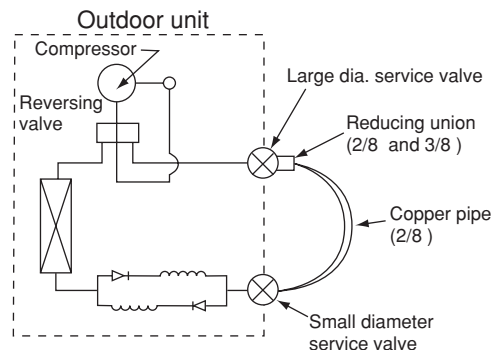
Parts to be prepared
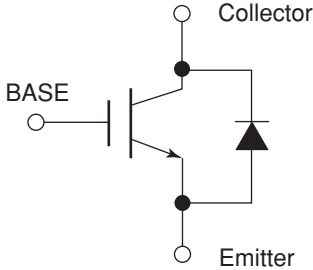
(1) Reducing union
2/8" (6.35mm)
1/2" (12.7mm)
(2) Copper pipe (2/8" and 1/2")

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.

SYSTEM POWER MODULE DIAGNOSIS

Circuit diagram of the device (excepting the reflux diode)	Collector BASE Emitter
Circuit diagram of the module	PGU PGV PGW U V W NGU NGV NGW
Terminals symbol mark of the module ※ See next page for measuring value using tester	P1 N1 P2 U L2 L1 ⊕ ⊖ W V

PARTS LIST AND DIAGRAM

INDOOR UNIT
MODEL : RAS-80YH5
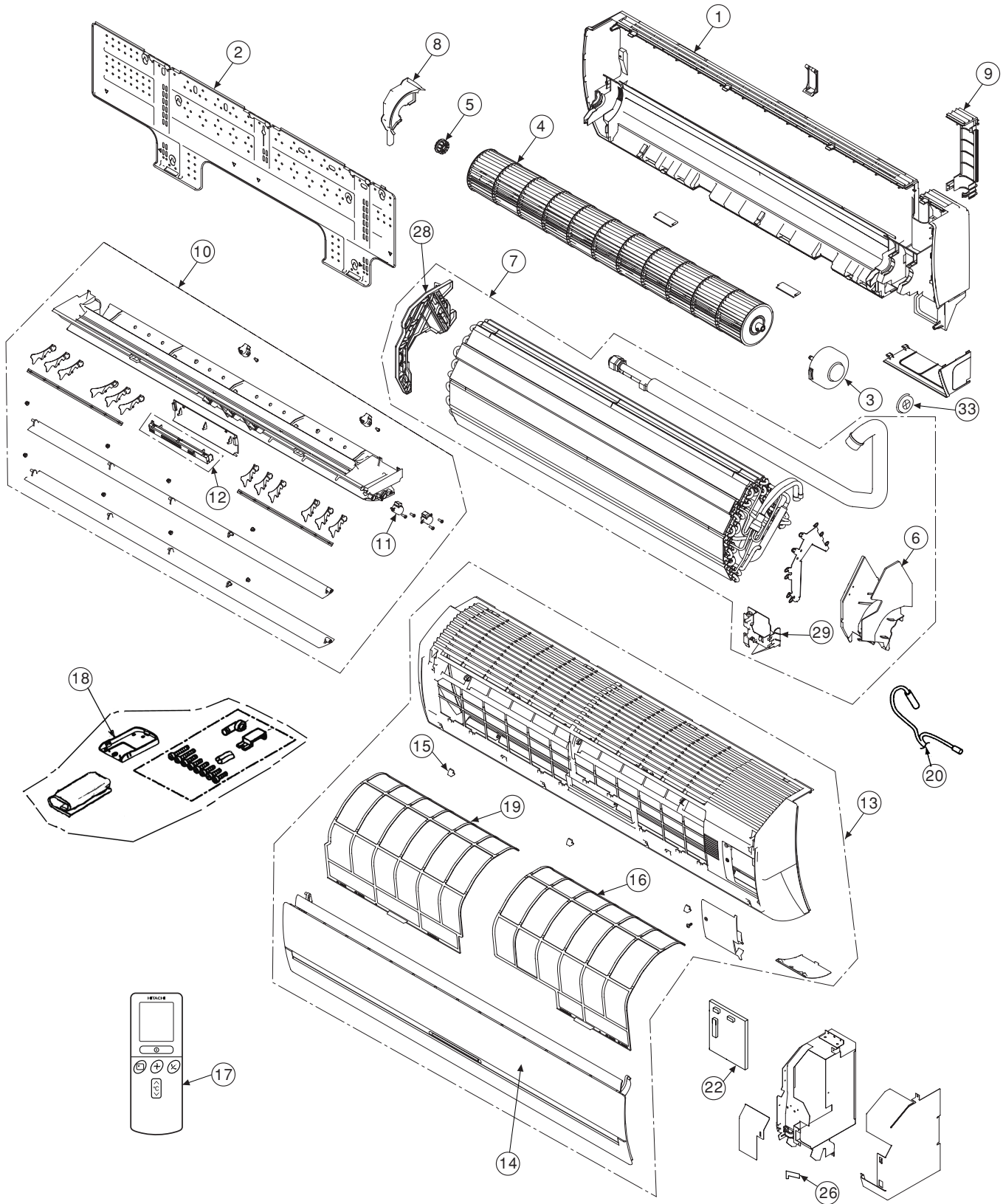
MODEL   RAS-80YH5

NO.	PART N0. RAS-80YH5	Q'TY / UNIT	PARTS NAME
1	PMRAS-72CHA3 002	1	CABINET ASSY
2	PMRAS-72CHA3 013	1	MOUNTING PLATE
3	PMRAS-80YHA 001	1	FAN MOTOR
4	PMRAS-80YHA 004	1	TANGENTIAL FAN
5	PMRAS-72CHA3 017	1	P-BEARING ASSY
6	PMRAS-72CHA3 007	1	FAN MOTOR SUPPORT
7	PMRAS-80YHA 006	1	CYCLE ASSY
8	PMRAS-72CHA3 005	1	BEARING COVER
9	PMRAS-72CHA3 029	1	PIPE SUPPORT (U-COVER)
10	PMRAS-80YHA 005	1	DRAIN PAN ASSY
11	PMRAS-72CHA3 001	4	AUTO SWEEP MOTOR
12	PMRAS-72CHA3 014	1	P.W.B (LED)
13	PMRAS-80YH5 001	1	FRONT COVER ASSY
14	PMRAS-80YH5 002	1	FRONT PANEL
15	PMRAS-10C7M 008	3	CAP
16	PMRAS-72CHA3 009	1	FILTER (R)
17	PMRAS-72CHA3 019	1	REMOTE CONTROL ASSY
18	PMRAS-10C3M 003	1	REMOTE CONTROL SUPPORT
19	PMRAS-72CHA3 008	1	FILTER (L)
20	PMRAS-72CHA3 022	1	THERMISTOR
22	PMRAS-80YHA 003	1	P.W.B (MAIN)
26	PMRAS-72CHA3 015	1	P.W.B (RECEIVER)
28	PMRAS-72CHA3 024	1	FAN COVER
29	PMRAS-72CHA3 018	1	PIPE COVER
33	PMRAS-72CHA3 028	1	FAN MOTOR RUBBER

PARTS LIST AND DIAGRAM

OUTDOOR UNIT
MODEL : RAC-80YH5
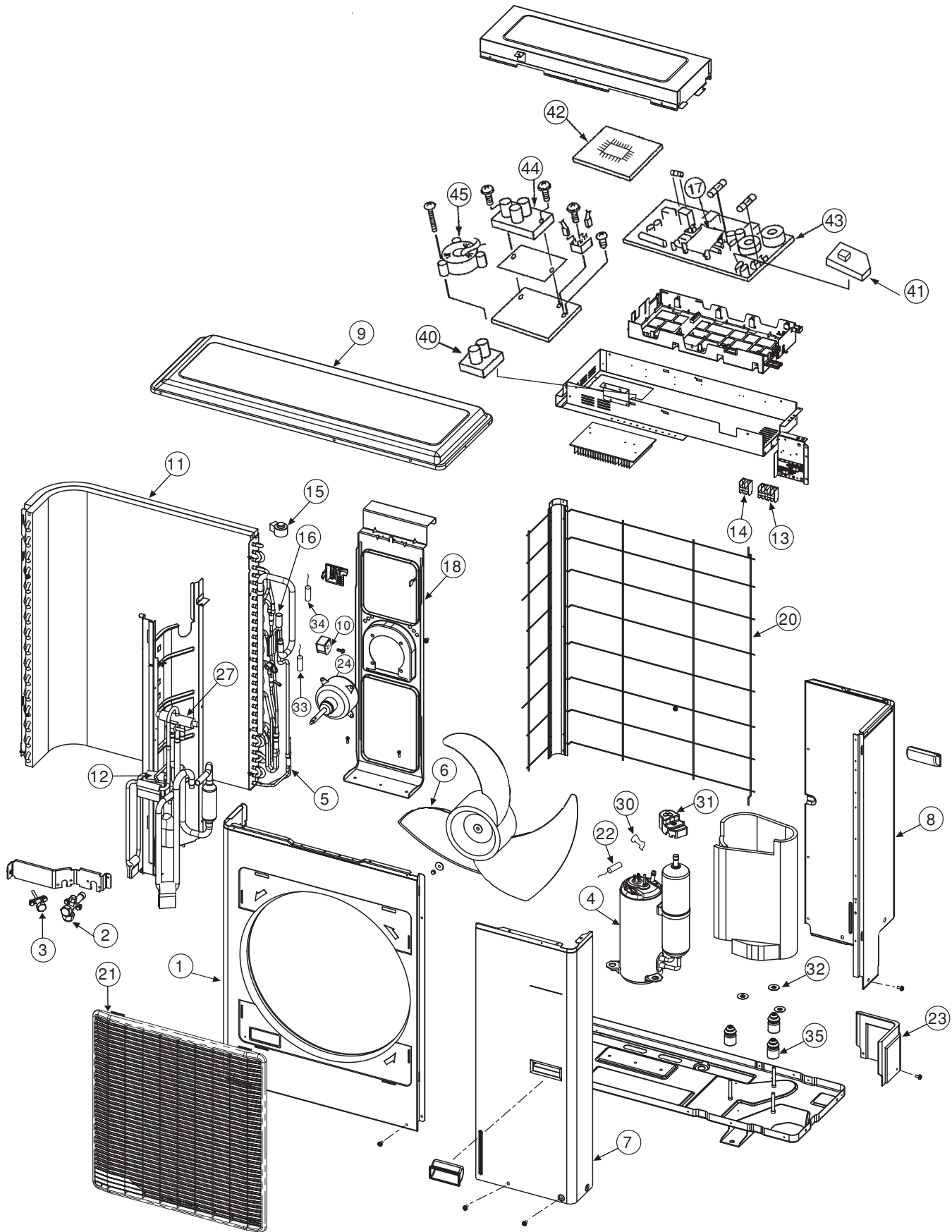
MODEL　RAC-80YH5

NO.	PART N0. RAC-80YH5		Q'TY / UNIT	PARTS NAME
1	PMRAC-30CVP1	901	1	CABINET
2	PMRAC-80YHA	905	1	VALVE (5S)
3	PMRAC-50NH4	903	1	VALVE (2S)
4	PMRAC-80YHA	902	1	COMPRESSOR
5	PMRAC-80YHA	908	1	STRAINER (COND)
6	PMRAC-30CVP1	903	1	PROPELLER FAN
7	PMRAC-81CHA3	909	1	SIDE PLATE
8	PMRAC-80YHA	917	1	BACK PLATE
9	PMRAC-30CVP1	906	1	TOP COVER
10	PMRAC-80YHA	907	1	COIL (REVERSING VALVE)
11	PMRAC-80YHA	903	1	CONDENSER
12	PMRAC-80YHA	909	1	STRAINER (PIPE)
13	PMRAC-25NH4	913	1	TERMINAL BOARD (4P)
14	PMRAC-63CA1	902	1	TERMINAL BOARD (2P)
15	PMRAC-25NH4	903	1	ELECTRICAL EXPANSION COIL
16	PMRAC-80YHA	906	1	EXPANSION VALVE
18	PMRAC-80YHA	915	1	FAN MOTOR SUPPORT
20	PMRAC-80YHA	916	1	NET
21	PMRAC-81CHA3	904	1	GRILL
22	PMRAC-80YHA	914	1	OH TERMISTOR
23	PMRAC-30CVP1	911	1	PIPE COVER (BACK)
24	PMRAC-80YHA	904	1	FAN MOTOR
27	PMRAM-22NHZ4	901	1	REVERSING VALVE
30	PMRAC-25NH4	909	1	OVERHEAD THERMISTOR SUPPORT
31	PMRAC-25NH4	910	1	OVERLOAD RELAY COVER
32	KPNTI	001	3	PUSH NUT
33	PMRAC-70YHA	913	1	THERMISTOR (DEFROST)
34	PMRAM-65QH4	910	1	THERMISTOR (OUTSIDE TEMPERATURE)
35	RAC-2226HV	805	3	COMPRESSOR RUBBER
40	PMRAC-80YHA	912	1	CAPACITOR BOARD
41	PMRAC-80YHA	913	1	NOISE FILTER BOARD
42	PMRAC-80YHA	901	1	PWB MAIN
43	PMRAC-80YHA	911	1	POWER BOARD
44	PMRAC-80YHA	910	1	SYSTEM POWER MODULE
45	PMRAC-18SH4	901	1	REACTOR

HITACHI

RAS-80YH5 / RAC-80YH5

PM NO. 0315E