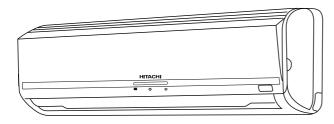
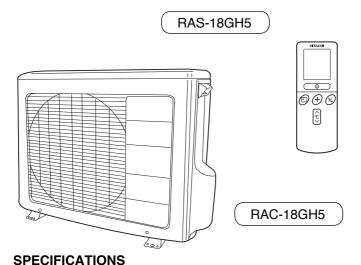
# HITACHI Inspire the Next

### SERVICE MANUAL TECHNICAL INFORMATION

### FOR SERVICE PERSONNEL ONLY





# PM NO. 0479E

### RAS-18GH5/RAC-18GH5

### **REFER TO THE FOUNDATION MANUAL**

### CONTENTS

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#### (WALL TYPE) TYPE INDOOR UNIT OUTDOOR UNIT MODEL RAS-18GH5 RAC-18GH5 POWER SOURCE 1 Ø, 50 Hz, 220 ~ 230 TOTAL INPUT (W) 1550 ~ 1580 TOTAL AMPERES (A) 7.42 ~ 7.23 COOLING (kW) 5.10 CAPACITY (B.T.U./h) 17,410 (W) 1640 ~ 1680 TOTAL INPUT TOTAL AMPERES (A) 7.77 ~ 7.61 HEATING (kW) 5.75 CAPACITY (B.T.U./h) 19,630 W 1030 850 DIMENSIONS н 295 650 (mm) D 298 207 NET WEIGHT 12 47 (kg)

\* After installation

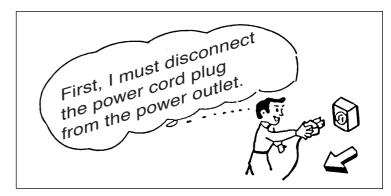
### SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

# ROOM AIR CONDITIONER

## JANUARY 2011 Refrigeration & Air-Conditioning Division

### SAFETY DURING REPAIR WORK

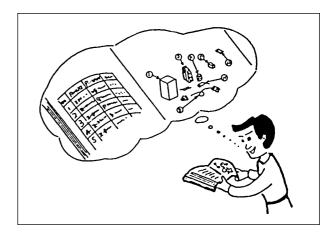
1. In order to disassemble and repair the unit in question, be sure to disconnect the power cord plug from the power outlet before starting the work.



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

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

- 3. After completion of repairs, the initial state should be restored.
- 4. Lead wires should be connected and laid as in the initial state.
- 5. Modification of the unit by user himself should absolutely be prohibited.



- 6. Tools and measuring instruments for use in repairs or inspection should be accurately calibrated in advance.
- 7. In installing the unit having been repaired, be careful to prevent the occurence of any accident such as electrical shock, leak of current, or bodily injury due to the drop of any part.
- 8. To check the insulation of the unit, measure the insulation resistance between the power cord plug and grounding terminal of the unit. The insulation resistance should be  $1M\Omega$  or more as measured by a 500V DC megger.
- The initial location of installation such as window, floor or the other should be checked for being and safe enough to support the repaired unit again.
   If it is found not so strong and safe, the unit should be installed at the initial location reinforced or at a new location.
- 10. Any inflammable thing should never be placed about the location of installation.
- 11. Check the grounding to see whether it is proper or not, and if it is found improper, connect the grounding terminal to the earth.



### WORKING STANDARDS FOR PREVENTING BREAKAGE OF SEMICONDUCTORS

### 1. Scope

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

- 2. Object parts
  - (1) Micro computer
  - (2) Integrated circuits (IC)
  - (3) Field-effect transistors (FET)
  - (4) P.C. boards or the like on which the parts mentioned in (1) and (2) of this paragraph are equipped.
- 3. Items to be observed in handling
  - (1) Use a conductive container for carrying and storing of parts. (Even rejected goods should be handled in the same way).

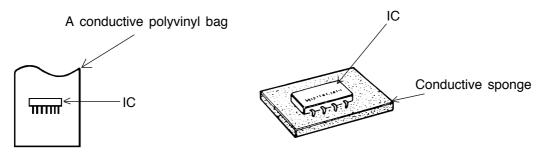


Fig. 1. Conductive Container

- (2) When any part is handled uncovered (in counting, packing and the like), the handling person must always use himself as a body earth. (Make yourself a body earth by passing one M ohm earth resistance through a ring or bracelet).
- (3) Be careful not to touch the parts with your clothing when you hold a part even if a body earth is being taken.
- (4) Be sure to place a part on a metal plate with grounding.
- (5) Be careful not to fail to turn off power when you repair the printed circuit board. At the same time, try to repair the printed circuit board on a grounded metal plate.

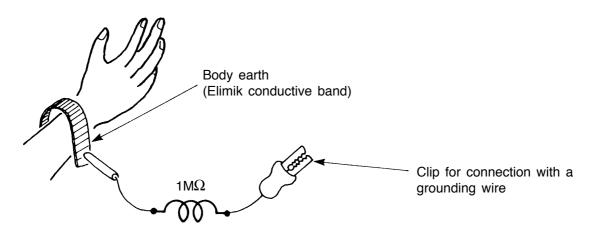


Fig. 2. Body Earth

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

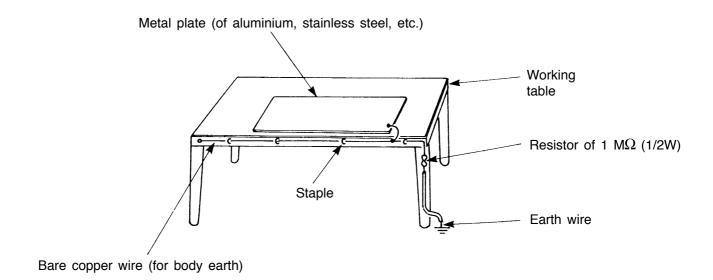


Fig. 3. Grounding of the working table

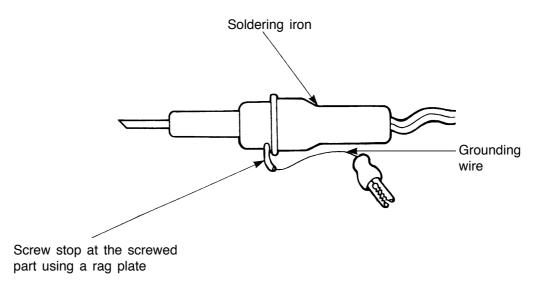


Fig. 4. Grounding a soldering iron

Use a high insulation mode (100V, 10M $\Omega$  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.

### 

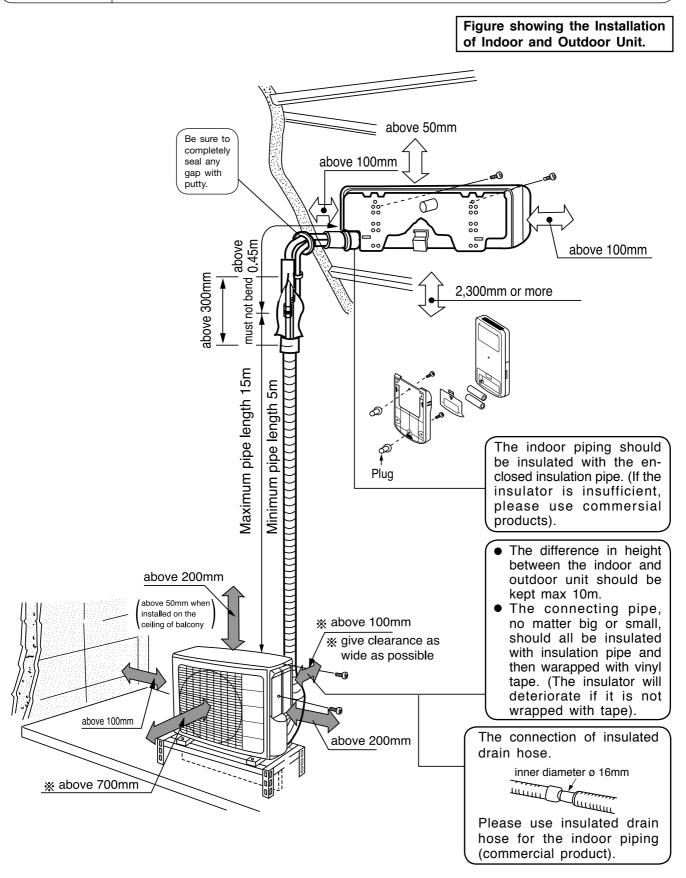
- 1. In quiet or stop operation, slight flowing noise of refrigerant in the refrigerating cycle is heard occasionally, but this noise is not abnormal for the operation.
- 2. When it thunders near by, it is recommended to stop the operation and to disconnect the power cord plug from the power outlet for safety.
- 3. In the event of power failure, the air conditioner will restart automatically in the previously selected mode once the power is restored. In the event of power failure during TIMER operation, the timer will be reset and the unit will begin or stop operating under a new timer setting.
- 4. If the room air conditioner is stopped by adjusting thermostat, or missoperation, and re-start in a moment, there is occasion that the cooling and heating operation does not start for 3 minutes, it is not abnormal and this is the result of the operation of IC delay circuit. This IC delay circuit ensures that there is no danger of blowing fuse or damaging parts even if operation is restarted accidentally.
- 5. This room air conditioner should not be used at the cooling operation when the outside temperature is below 10°C (50°F).
- This room air conditioner (the reverse cycle) should not be used when the outside temperature is below -10°C (14°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-18GH5	RAC-18GH5
FAN MOTOR	30 W	40 W	
FAN MOTOR CAPACITOR		NO	2.5 μF,450V
FAN MOTOR PROTECTOR		NO	YES (INTERNAL)
COMPRESSOR		_	5KS205DAA
COMPRESSOR MOTOR CAPACI	TOR	NO	50 μF, 450VAC
OVERLOAD PROTECTOR		NO	YES (INTERNAL)
OVERHEAT PROTECTOR		NO	YES (INTERNAL)
FUSE (MICRO COMPUTER CIRC	UIT)	3.15A	NO
POWER RELAY		G4A	NO
POWER SWITCH		YES	NO
TEMPORARY SWITCH		NO	NO
SERVICE SWITCH		YES	NO
TRANSFORMER		NO	NO
VARISTOR		450NR	NO
NOISE SUPPRESSOR		NO	NO
THERMOSTAT		YES(IC)	YES(IC)
REMOTE CONTROL SWITCH (LIQUID CRYSTAL)		YES	NO
FUSE CAPACITY		20 A TIME	DELAY FUSE
	UNIT		<b>※</b> 1450g
REFRIGERANT CHARGING VOLUME (Refrigerant R410A)	PIPES (MAX. 15m) (MIN. 5m)	ADDITIONAL RE AT 15g PER EVE PIPE LENGTH M	



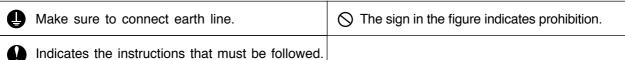
The installation height of indoor unit must be 2.3m or more in a non public area





# 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 " A Warning" and " A 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.



• Please keep this manual after reading.

### PRECAUTIONS DURING INSTALLATION • Do not reconstruct the unit. Water leakage, fault, short circuit or fire may occur if you reconstruct the unit by vourself. • 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. WARNING 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. • Be sure to use the specified piping set for R410A. Otherwise, this may result in broken copper pipes or faults. • 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 CAUTION catch fire if flammable gas leaks around it. • Please ensure smooth flow of water when installing the drain hose.

### PRECAUTIONS DURING SHIFTING OR MAINTENANCE

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



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

### PRECAUTIONS DURING OPERATION

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

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



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

### PRECAUTIONS DURING OPERATION

• 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.





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O N • 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.

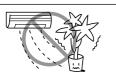




• Do not climb on the outdoor unit or put objects on it.

• 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.

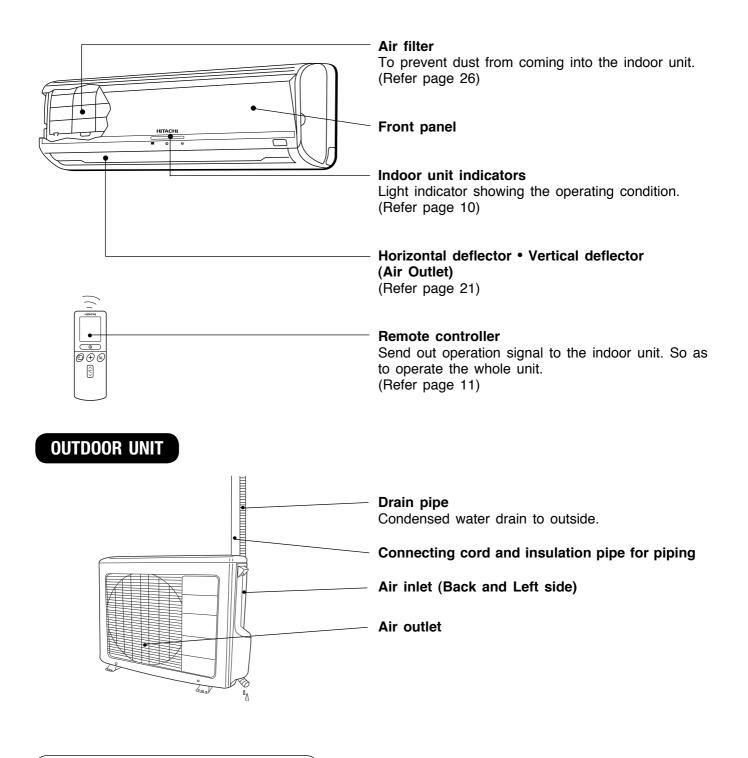




• Do not place plants directly under the air flow as it is bad for the plants.

- 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.

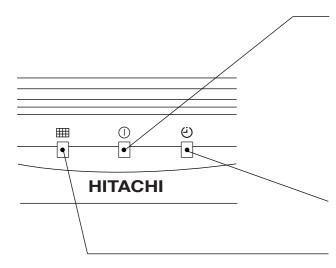
### **INDOOR UNIT**



### MODEL NAME AND DIMENSIONS

MODEL	WIDTH (mm)	HEIGHT (mm)	DEPTH (mm)
RAS-18GH5	1030	295	207
RAC-18GH5	850	650	298

### **INDOOR UNIT INDICATORS**



### **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.

### TIMER LAMP

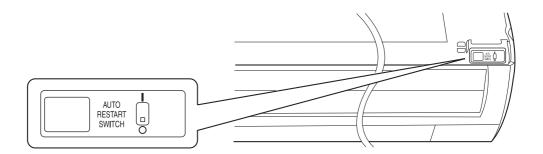
This lamp lights when the timer is working.

### 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 POWER SWITCH set to OFF and ON again.

### **OPERATION INDICATOR**

• This figure shows the opening condition of front panel. Refer to page 25 in relation to how to open or close the front panel.



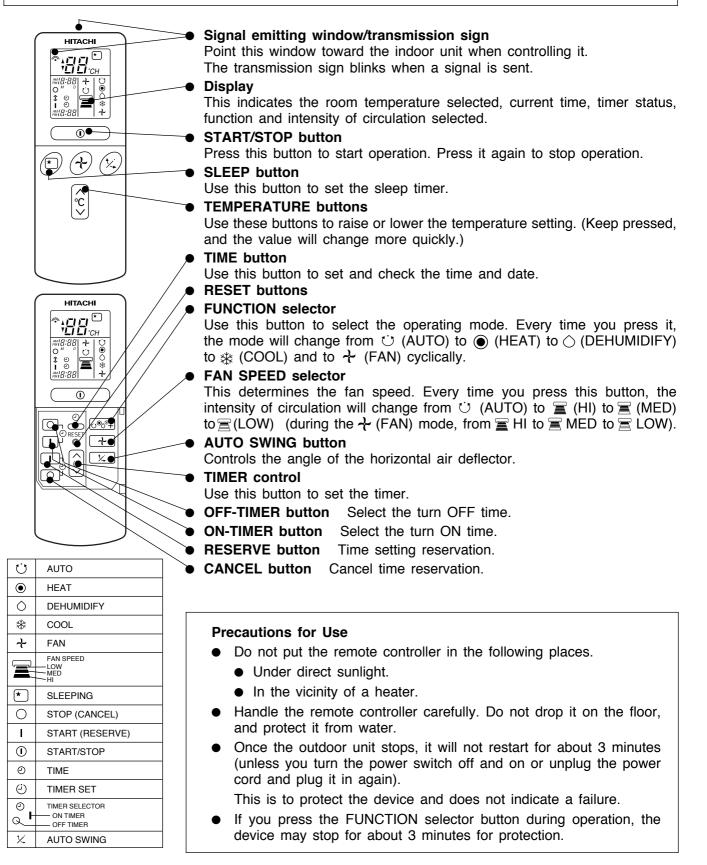
### **AUTO RESTART SWITCH**

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

### REMOTE CONTROLLER

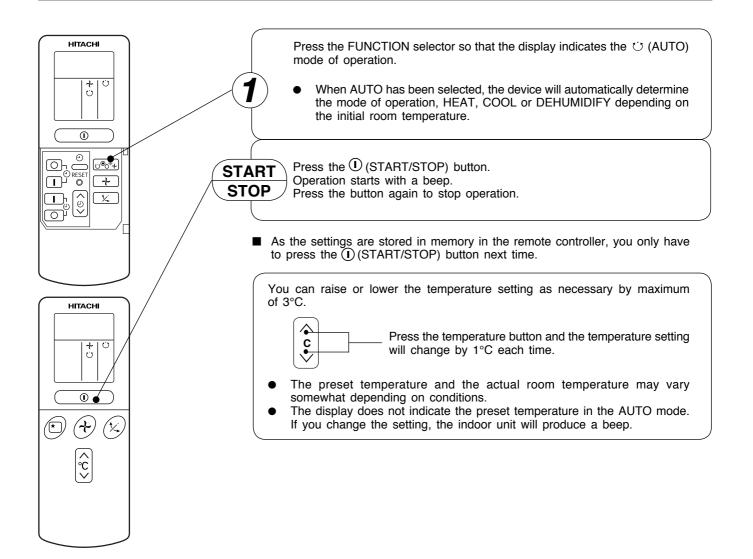
This controls the operation of the indoor unit. The range of control is about 7 meters. If indoor lighting is controlled electronically, the range of control may be shorter.

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.



### AUTOMATIC OPERATION

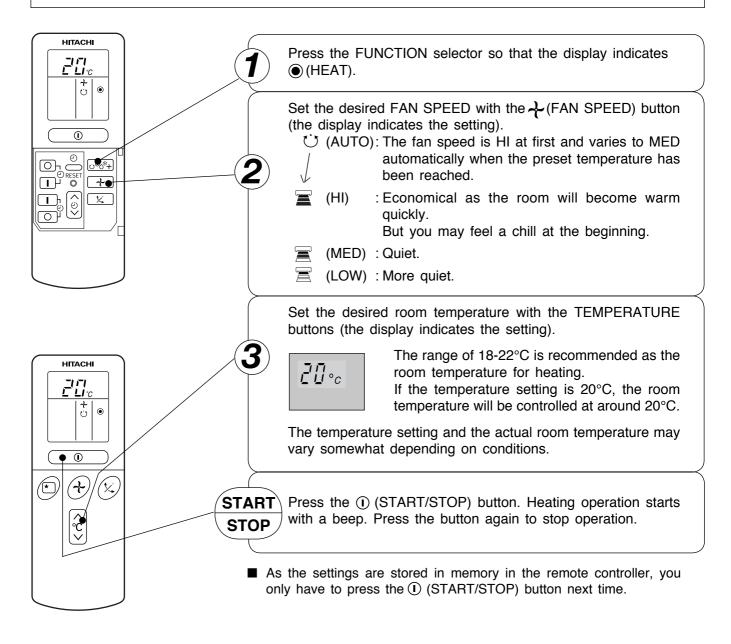
The device will automatically determine the mode of operation, HEAT, COOL or DEHUMIDIFY depending on the initial room temperature. The selected mode of operation will not change when the room temperature varies.



### Condition of Automatic Operation

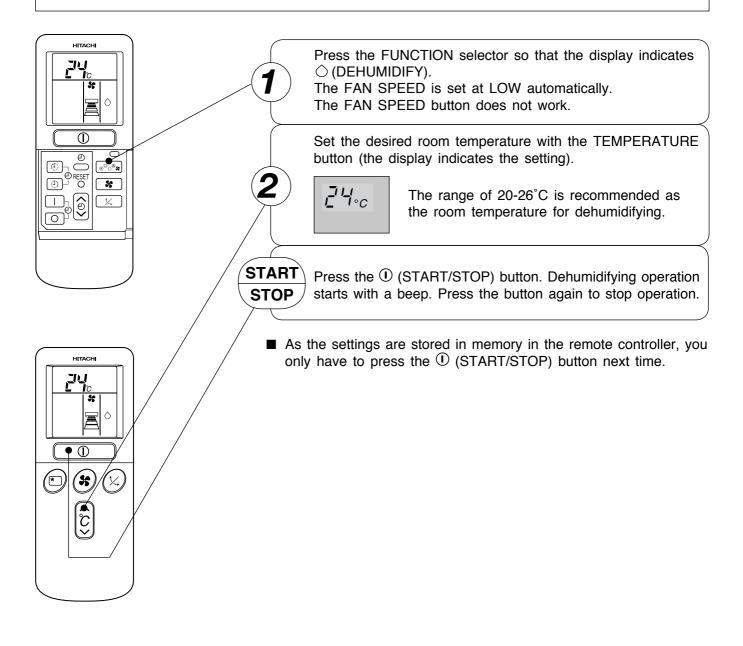
Initial room temperature (approx.)	Function	Temperature setting	FAN SPEED
Over 27°C ■	COOL	27°C	HI at start, MED or LOW after the preset temperature is reached
23~27°C ■		Slightly lower than the room temperature	LOW
Under 23°C ■	► HEAT	23°C	HI at start, MED or LOW after the preset temperature is reached

- Use the device for heating when the outdoor temperature is under 21°C.
- When it is too warm (over 21°C), the heating function may not work in order to protect the device.
- In order to keep reliability of the device, please use this device above -10°C of the outdoor temperature.



### **DEHUMIDIFYING OPERATION**

Use the device for dehumidifying when the room temperature is over  $16^{\circ}$ C. When it is under  $15^{\circ}$ C, the dehumidifying function will not work.



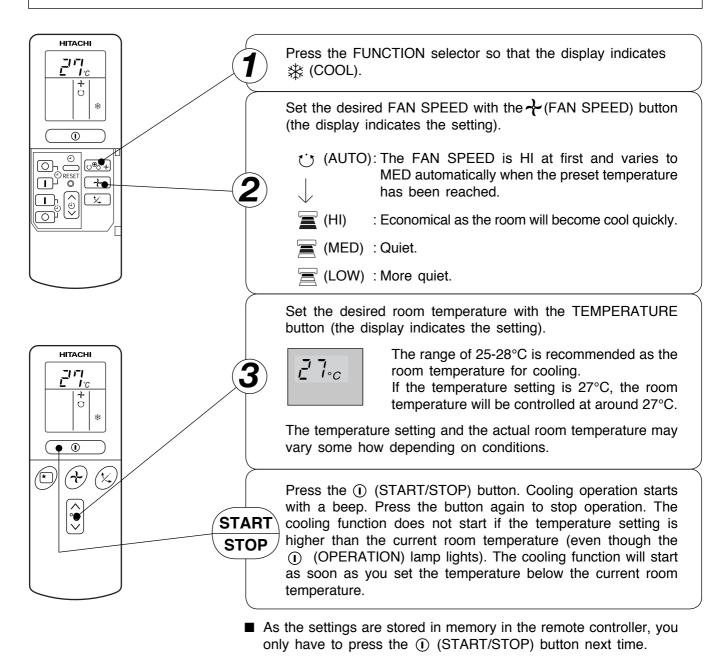
### Dehumidifying Function

When the room temperature is higher than the temperature setting: The device will dehumidify the room, reducing the room temperature to the preset level.

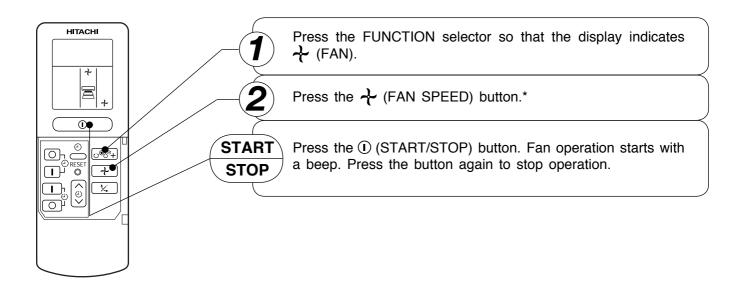
When the room temperature is lower than the temperature setting: Dehumidifying will be performed at the temperature setting slightly lower than the current room temperature, regardless of the temperature setting. The function will stop (the indoor unit will stop emitting air) as soon as the room temperature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

Use the device for cooling when the outdoor temperature is 22-42°C.

If indoor humidity is very high (over 80%), some dew may form on the air outlet grille of the indoor unit.

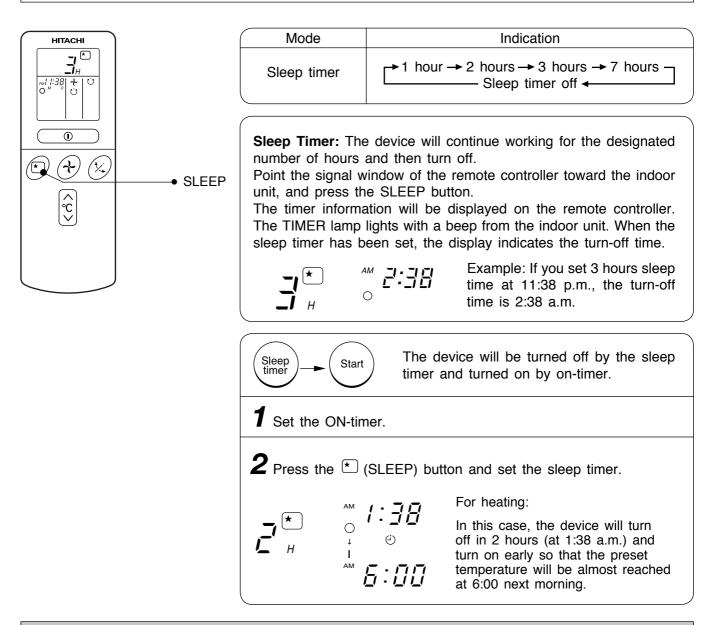


You can use the device simply as an air circulator. Use this function to dry the interior of the indoor unit at the end of summer.



FAN SPEED (AUTO) When the AUTO fan speed mode is set in the cooling/heating operation:					
For the heating operation	<ul> <li>The fan speed will automatically change according to the temperature of discharged air.</li> <li>When the difference of room temperature and setting temperature is large, fan starts to run at HI speed.</li> <li>When the room temperature reaches setting temperature, fan speed changes to LOW automatically.</li> </ul>				
For the cooling operation	<ul> <li>When the difference of room temperature and setting temperature is large, fan starts to run at HI speed.</li> <li>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.</li> </ul>				

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

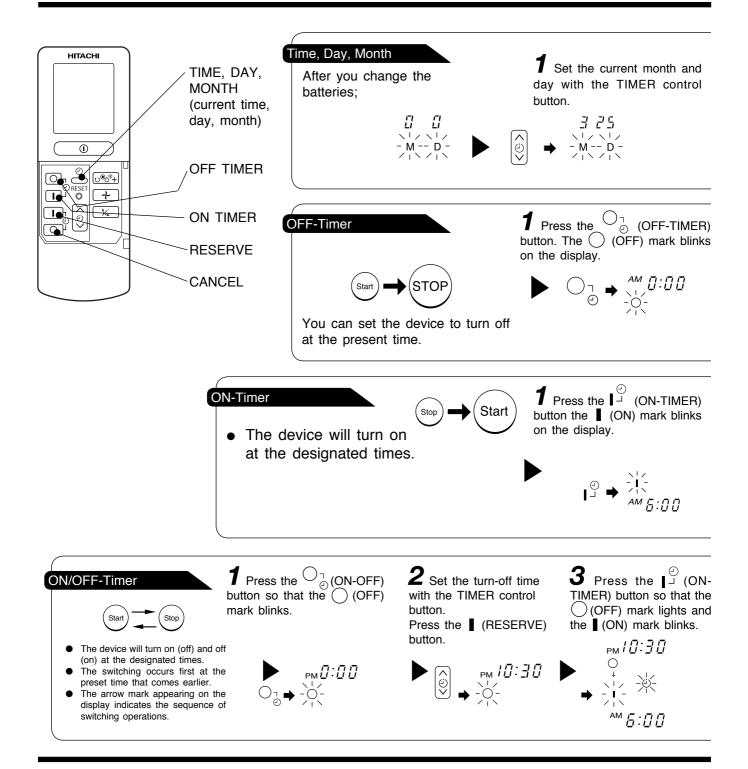


### How to Cancel Reservation

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

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

### HOW TO SET THE TIMER



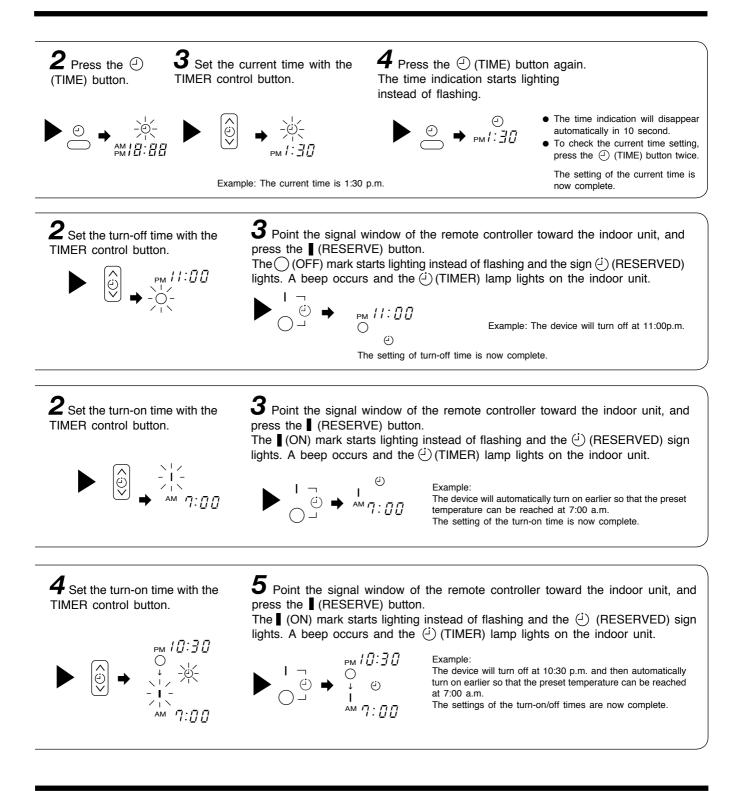
### How to Cancel Reservation

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

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

### NOTE

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



- 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.

### 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.

You can set the sleep timer to turn off after 1, 2, 3 or 7 hours. The FAN SPEED and room temperature will be controlled as shown below.

### Operation with the sleep timer

Function	Operation			
Heating "	The room temperature will be controlled 5°C below the temperature and the FAN SPEED will be set to LOW setting 30 minutes after the setting of the sleep timer.	Sleep timer set 30 minutes later 1 hour later 3 hours later		
Cooling " 禁 " and dehumidifying " ()"	The room temperature will be controlled 2°C above the temperature and the FAN SPEED will be set to LOW setting 30 minutes after the setting of the sleep timer.	2C Sleep timer set 30 minutes later 30 minutes later 31 hours later 32 hours 33 hours later		
Fan " <del>~ "</del>	The settings of room temperatu	re and circulation are varied.		

### 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.



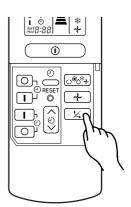
Adjustment of the conditioned air in the upward and downward directions.

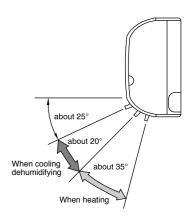
The horizontal air deflector is automatically set to the proper angle suitable for each operation. The deflector can be swung up and down continuously and also set to the desired angle using the " $\searrow$  (AUTO SWING)" button.

- If the " (X) (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.

### 

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

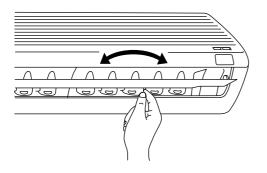






Adjustment of the conditioned air to the left and right.

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



### 

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

### HOW TO EXCHANGE THE BATTERIES IN THE REMOTE CONTROLLER

2

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

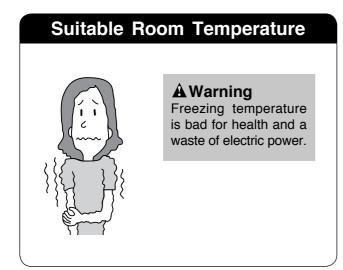
Install the new batteries. The direction of the batteries should match the marks in the case.

# direction of arrow

Push and pull to the

### 

- 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.



# Install curtain or blinds

# Ventilation A 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.

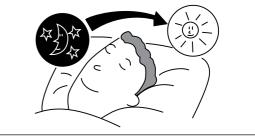
### Do Not Forget To Clean The Air Filter

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.



### **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.



### Please Adjust Suitable Temperature For Baby And Children

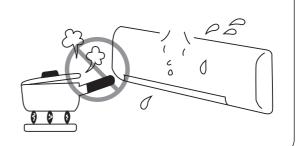
Please pay attention to the room temperature and air flow direction when operating the unit for baby, children and old folks who have difficulty in movement.



### The Air Conditioner And The Heat Source In The Room

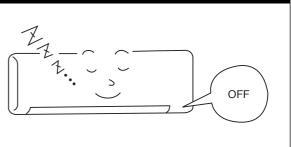
### **A**Caution

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



### Not Operating For A Long Time

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



### When Lightning Occurs

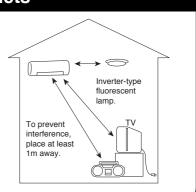
### A Warning

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



### **A**Caution

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



### 

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



### Open the front panel.

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



### Remove the filter.

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



### 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.

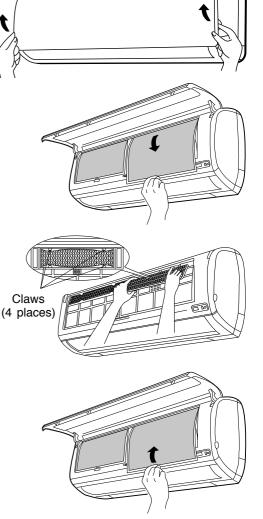
**A** CAUTION Do not bend the air cleansing and deodorizing filter as it may cause damage to the structure.

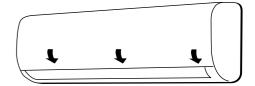




### Attach the filters.

- 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-CFH5>. 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.

### 

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

### 1. PRE-FILTER 🏢

Clean the pre-filter, as it removes dust inside the room. In case the pre-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.

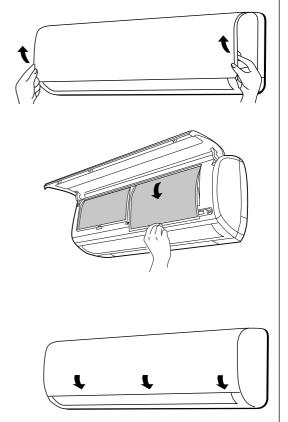
### PROCEDURE

Open the front panel and remove the pre-filter
Gently lift and remove the air cleansing and purifying filter from the pre-filter frame.

Vacuum dust from the pre-filter and air purifying 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.



- Re-insert the air purifying 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 purifying 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.

### 

- Do not wash with hot water at more than 40°C. The filter may shrink.
- When washing it, shake off moisture completely and dry it in the shade; do not expose it directly to the sun. The filter may shrink.
- Do not use detergent on the air purifying filter as some detergent may deteriorate the filter electrostatic performance.

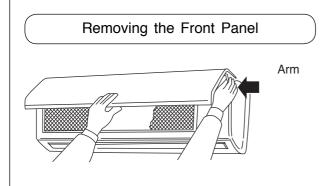
### 2. Washable Front Panel

• Remove the front panel and wash with clean water.

Wash it with a soft sponge. After using neutral detergent, wash thoroughly with clean water.

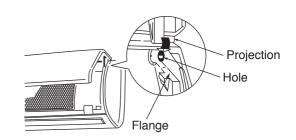
- When front panel is not removed, wipe it with a soft dry cloth. Wipe the remote controller thoroughly with a soft dry cloth.
- Wipe the water thoroughly.
   If water remains at indicators or signal receiver of indoor unit, it causes trouble.

Method of removing the front panel. Be sure to hold the front panel with both hands to detach and attach it.



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

Attaching the Front Panel



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

### 

- 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.

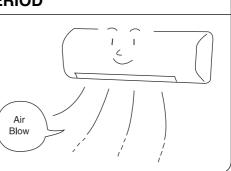


### 

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

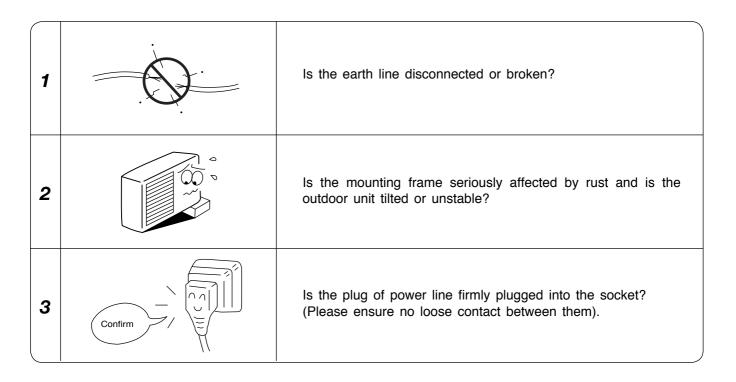
### 3. MAINTENANCE AT BEGINNING OF LONG OFF PERIOD

- 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.



### **REGULAR INSPECTION**

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



### AFTER SALE SERVICE AND WARRANTY

### WHEN ASKING FOR SERVICE, CHECK THE FOLLOWING POINTS.

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



### 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

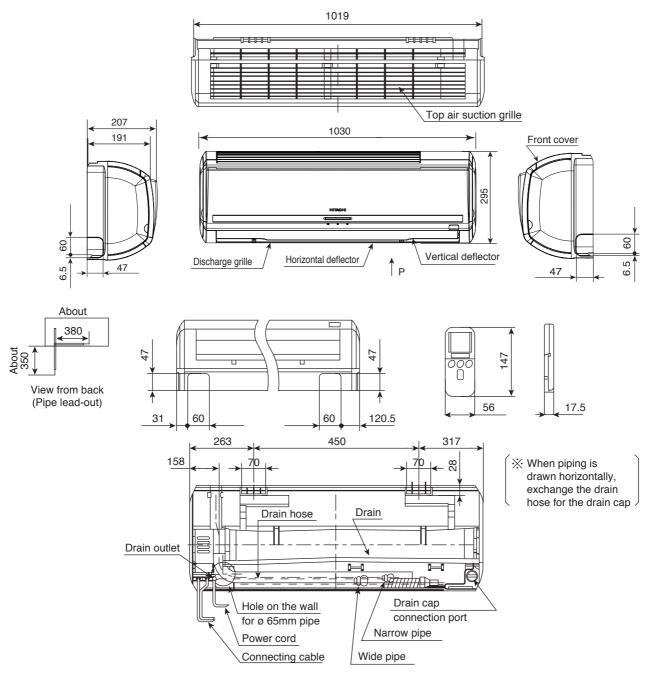
 Avoid to use the room air conditioner for cooling operation when the outside temperature is below 21°C (70°F).

The recommended maximum and minimum operating temperatures of the hot and cold sides should be as below:

			Cooling		ating
		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

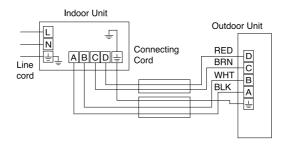
### CONSTRUCTION AND DIMENSIONAL DIAGRAM

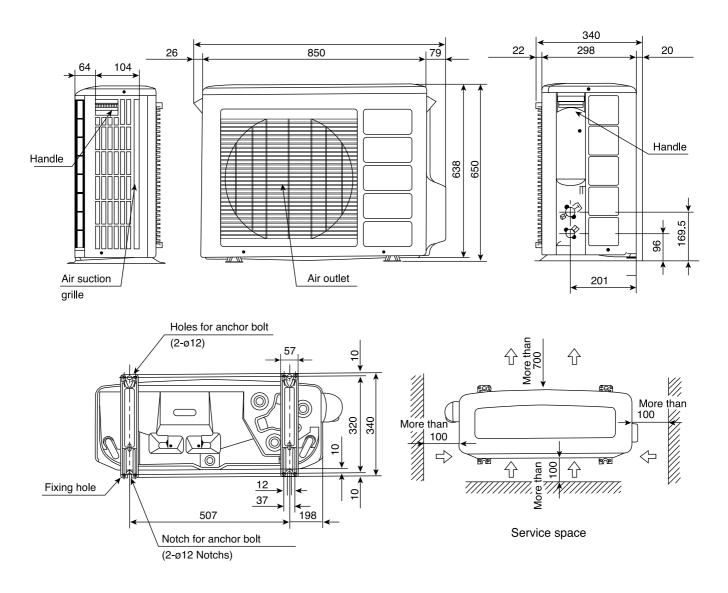
MODEL RAS-18GH5



### 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 15m
- 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 2.5mm dia. x 3 (AB Line), 1.6mm dia. x 2 (CD Line) is used for the connection.





### Note:

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

### MAIN PARTS COMPONENT

### THERMOSTAT (Room Temperature Thermistor)

Thermostat Specifications

MODEL			RAS-18GH5	
THERMOSTAT MODEL			IC	C C
OPERATION			COOL	HEAT
	INDICATION		17.6 (63.7)	19.6 (67.3)
	16	OFF	17.3 (63.1)	19.3 (66.7)
TEMPERATURE °C	INDICATION	ON	25.6 (78.1)	27.6 (81.7)
	24	OFF	25.3 (77.5)	27.3 (81.1)
	INDICATION	ON	33.6 (92.5)	35.6 (96.1)
	32 OFF		33.3 (91.9)	35.3 (95.5)

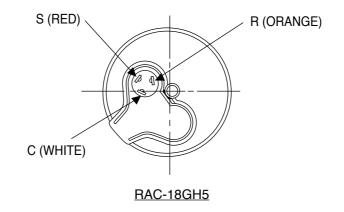
### FAN MOTOR

Fan Motor Specifications

MODEL		RAS-18GH5	RAC-18GH5	
PHASE			SINGLE	
RATED VOLTAGE		DC35V	220-230V	
RATED FREQUENCY			50 Hz	
OUTPUT		30 W	40 W	
POLE NUMBER			6	
CONNECTION		35V SV SV BLUE	INTERNAL THERMAL FUSE BLACK CAPACITOR CAPACITOR GRAY	
RESISTANCE VALUE	20°C		RM = 122.4 RA = 114.8	
(Ω)	75°C		RM = 161.6 RA = 139.6	

**Compressor Motor Specifications** 

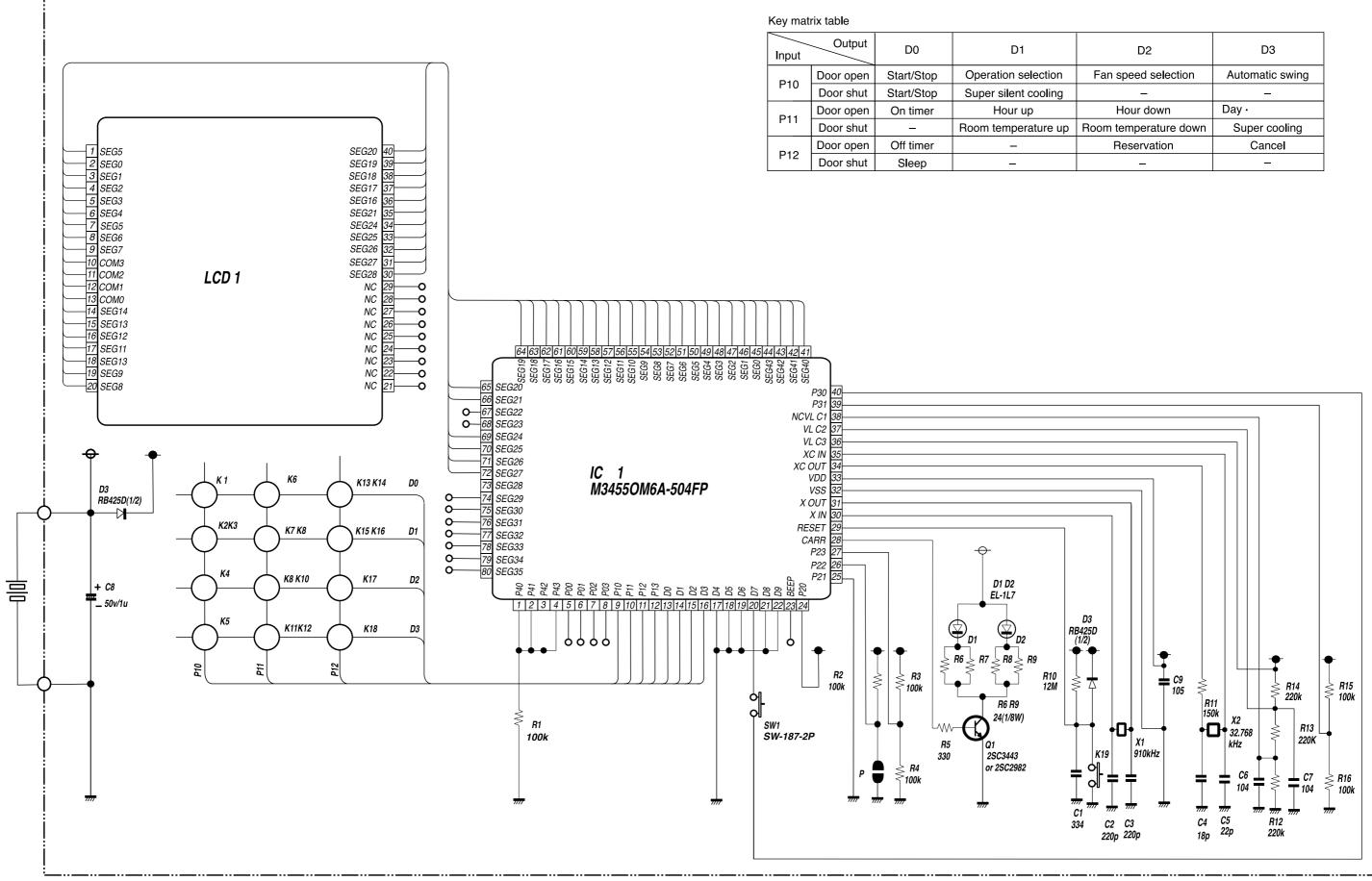
MODEL		RAC-18GH5	
COMPRESSOR MODEL		5KS205DAA	
PHASE		SINGLE	
RATED VOLTAGE		220 ~ 230 V	
RATED FREQUENCY		50 Hz	
LOCKED ROTOR CURRE	ENT	26.0 ~ 28.0	
POLE NUMBER		2	
CONNECTION		ORANGE CAPACITOR CAPACITOR RED	
RESISTANCE VALUE	20°C (68°F)	RM = 1.780 RA = 2.175	
(Ω)	75°C (167°F)	RM = 2.16 RA = 2.64	
EXTERNAL OVERLOAD RELAY		NO	
INTERNAL PROTECTOR		YES	



### **A**CAUTION

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

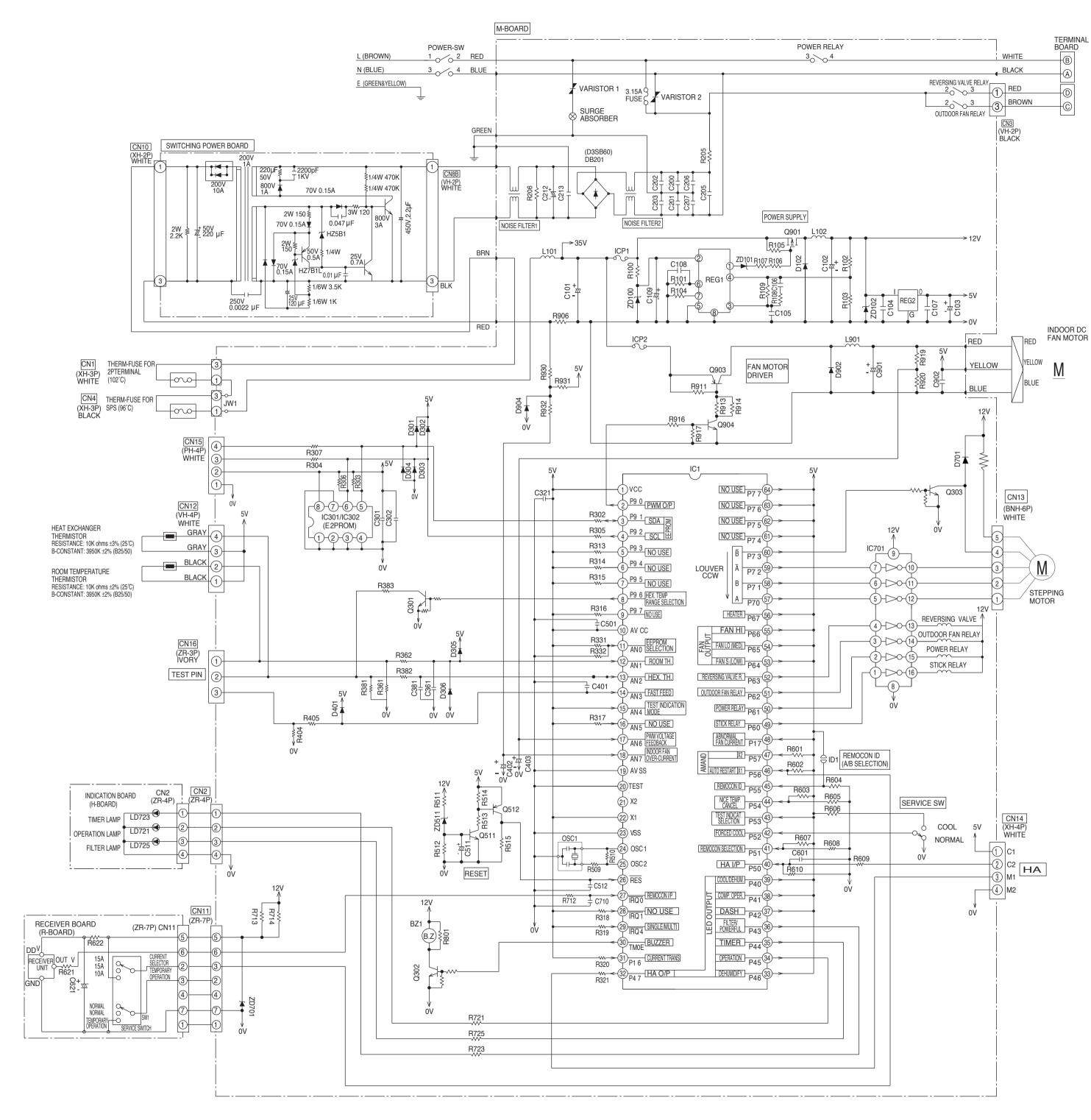
	<ul> <li>(S) : ROOM THERMISTOR</li> <li>(T) : HEX THERMISTOR</li> <li>(U) : INTERNAL PROTECTOR</li> <li>(V) : VARISTOR</li> <li>(V) : VARISTOR</li> <li>(V) : VARISTOR</li> <li>(V) : REVERNAL PROTECTOR</li> <li>(V) : REVERSING VALVE RELAY</li> <li>(Z) : AUTO SWEEP MOTOR</li> </ul>	: WHITE : RED : IVORY OUTDOOR UNIT	ERMORE THE DATA OF THE OF THE DATA OF THE
	<ul> <li>TERMINAL BOARD</li> <li>LINE CORD</li> <li>EXTERNAL FAN RELAY</li> <li>NOISE FILTER</li> <li>POWER RELAY</li> <li>SURGE ABSORBER</li> </ul>	BRN : BROWN GRN : GREEN VIO : VIOLET IVO : IVO :	CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTENDE CONTEN
WIRING DIAGRAM MODEL RAS-18GH5/RAC-18GH5	COMPRESSOR FAN MOTOR POWER SWITCH THERMAL FUSE FOR 2P TER THERMAL FUSE FOR P.C.B. ( REVERSING VALVE 50 µF CAPACITOR 2.5 µF CAPACITOR	: BLUE YEL : YELLOW B : GRAY ORN : ORANGE G : BLACK PNK : PINK V INDOOR UNIT	(S)       (
WIRING MODEL F		BLU GRY BLK	



### **CIRCUIT DIAGRAM**

**Remote Control** 

	D2	D3
	Fan speed selection	Automatic swing
	-	—
	Hour down	Day∙
р	Room temperature down	Super cooling
	Reservation	Cancel
	_	_



SYMBOL	RESISTANCE	TOLERANCE	POWER	FORM
R100	5.6K	± 5%	1/4W	A
R101	120K	± 5%	1/6W	Α
R102	33K	± 2%	1/6W	Α
R103	ЗK	± 2%	1/6W	Α
R104	130K	± 5%	1/6W	Α
R105	470	± 5%	1/4W	Α
R106	330	± 5%	1/4W	Α
R107	330	± 5%	1/4W	Α
R108	2.2K	± 5%	1/6W	A
R109	220K	± 5%	1/6W	A
R205	7.5	± 5%	7W	Н
R206	560K	± 5%	1/2W	Α
R302	390	± 5%	1/6W	A
R303	5.1K	± 5%	1/6W	A
R304	390	± 5%	1/6W	A
R305	390	± 5%	1/6W	A
R306	5.1k	± 5%	1/6W	A
R307	390	± 5%	1/6W	A
R313	10k	± 5%	1/6W	A
R314	10k	± 5%	1/6W	A
R315	10k	± 5%	1/6W	A
R316	10k	± 5%	1/6W	A
R317	10k	± 5%	1/6W	A

SYMBOL	RESISTANCE	TOLERANCE	POWER	FORM	
R318	10k	± 5%	1/6W	A	
R319	10k	± 5%	1/6W	A	
R320	10k	± 5%	1/6W	A	
R321	1k	± 5%	1/6W	A	
R331	1k	± 5%	1/6W	A	
R332	10k	± 5%	1/6W	A	
R361	12.7k	± 1%	1/6W	A	
R362	1k	± 5%	1/6W	A	
R381	18k	± 1%	1/6W	A	
R382	1k	± 5%	1/6W	A	
R383	2.4k	± 2%	1/6W	A	
R404	10k	± 5%	1/6W	A	
R405	1k	± 5%	1/6W	A	
R509	0	± 5%	1/6W	A	
R510	1M	± 5%	1/6W	A	
R511	3k	± 5%	1/6W	A	
R512	10k	± 5%	1/6W	A	
R513	5.1k	± 5%	1/6W	A	
R514	2.7k	± 5%	1/6W	A	
R515	5.1k	± 5%	1/6W	A	

	SYMBOL	RESISTANCE	TOLERANCE	POWER	FORM
	R601	10K	± 5%	1/6W	A
	R602	10K	± 5%	1/6W	Α
	R603	10K	± 5%	1/6W	A
	R604	10K	± 5%	1/6W	A
	R605	1K	± 5%	1/6W	A
	R606	5.1K	± 5%	1/6W	A
	R607	10K	± 5%	1/6W	A
	R608	1K	± 5%	1/6W	A
	R609	1K	± 5%	1/6W	А
	R610	10K	± 5%	1/6W	A
R	R621	1K	± 5%	1/6W	А
R	R622	47	± 5%	1/6W	A
	R712	1K	± 5%	1/6W	A
	R713	2K	± 5%	1/6W	A
	R714	2K	± 5%	1/6W	A
	R801	3.3K	± 5%	1/6W	A
	R721	240	± 5%	1/6W	A
	R723	300	± 5%	1/6W	A
	R725	240	± 5%	1/6W	A

SYMBOL	RESISTANCE	TOLERANCE	POWER	FORM
R906	0.2	± 5%	1W	A
R911	300	± 5%	1/6W	A
R913	2.0K	± 5%	2	Н
R914	2.0K	± 5%	2	Н
R916	3.3K	± 5%	1/6W	A
R917	3.3K	± 5%	1/6W	Α
R919	20K	± 1%	1/6W	Α
R920	2.21K	± 1%	1/6W	A
R930	1K	± 1%	1/6W	A
R931	8.25K	± 1%	1/6W	Α
R932	5.1K	± 5%	1/6W	A

MODEL NO.

MODEL NO.

ICP-0.6AT

ICP-2.0AT

AX-3T2/AX-3T3

S24C01BDP

IC701 ULN2003AN

REG1 TL5001CP

REG2 MC7805CT

IC PROTECTOR

SYMBOL

ICP1

ICP2

LED

MOUNTING FORM

Н

Н

Н

Н

Н

MOUNTING

R

R

SYMBOL CAPACITANCE VOLTAGE TYPE MOUNTING

	(F)	(V)		FORM
C101	220 µ	50	D(PF)	Н
C102	68 µ	50	D(PF)	R
C103	220 µ	10	D(VR)	R
C104	0.1µ	25	С	R
C105	1000P	50	С	R
C106	0.1 µ	50	F	R
C107	0.047 µ	25	С	R
C108	1000P	50	С	R
C109	1μ	50	D(PF)	R
C205	0.082 µ	AC300	F	Н
C206	1000P ± 20%	AC250	С	Н
C207	1000P ± 20%	AC250	С	Н
C208	0.047 µ	AC300	F	Н
C209	0.01 µ	AC400	С	Н
C210	0.01 µ	AC250	С	Н
C211	0.01 µ	AC250	С	Н
C212	100 µ	DC450	D	Н
C301	0.1µ	50	С	R
C302	0.1µ	50	С	R
C321	0.1µ	50	С	R
C361	0.047 µ	25	С	R

	SYMBOL	CAPACITANCE (F)	VOLTAGE (V)	TYPE	Mounting Form
	C381	0.047 µ	25	С	R
	C401	0.1 µ	50	С	R
	C402	10 µ	16	D(VX)	R
	C403	10 µ	16	D(VX)	R
	C501	0.1µ	50	С	R
	C511	33 µ	6.3	D(VX)	R
	C512	0.1 µ	25	С	R
	C601	0.1 µ	25	С	R
R	C621	47 µ	16	D(MF)	Н
	C710	1000P	50	С	R
	C901	150 µ	50	D(PF)	Н
	C902	0.1 µ	25	С	R

	OTHERS		
	SYMBOL	MODEL NO.	MOUNTING FORM
	VARISTOR1	450NR-12D	Н
	VARISTOR2	450NR-12D	Н
	OSC1	EF0EC8004A	Н
	SURGE ABSORBER	DSA-362MA-05	Н
	BUZZER	PKM13EPY	Н
	FUSE RESISTOR	RF25S	A
	SERVICE SWITCH	SSSS9AE	Н
2	TEMPOPARY SWITCH (SW1)	ESD172306	Н
2	INFRARED RECEIVER	SBX8035-F	Н
	NOISE FILTER	SU16V-10035	Н
	3.15A FUSE	GLASS CAPSULE	Н

CONNECTORS

CN1 XH-3P (TOP ENTRY)

CN2 ZR-4P (TOP ENTRY)

CN11 ZR-7P (TOP ENTRY)

CN12 VH-4P (TOP ENTRY)

CN14 XH-4P (TOP ENTRY)

MODEL NO.

SYMBOL

WIRES						
SYMBOL	M	ODEL N	0.	MO FO	UNTING RM	
BLACK WIRE	SI	V-21T-1.	8S		Н	
WHITE WIRE	SI	V-21T-1.	8S		Н	
RED WIRE	SI	V-21T-1.	8S		Н	
BROWN WIRE	SI	V-21T-1.	8S		Н	
EARTH (GREEN)	SI	V-41T-2.	4S		Н	
BLUE WIRE	SI	V-21T-1.	8S		Н	
YELLOW WIRE	SI	V-21T-1.	8S		Н	
RED WIRE	SI	V-21T-1.	8S		Н	
						1

RELAYS		
SYMBOL	MODEL NO.	MOUNTING FORM
POWER RELAY	G4A-RY-200	Н
STICK RELAY	G4A-RY-200	Н
REVERSING VALVE RELAY	G5N-RELAY	Н
OUTDOOR FAN RELAY	G5N-RELAY	Н

	TOWLITTILLAT	04A-111-200	
	STICK RELAY	G4A-RY-200	
	REVERSING VALVE RELAY	G5N-RELAY	
	OUTDOOR FAN RELAY	G5N-RELAY	
3	REMARKS		

			OTMODE	MODEL NO.
			POWER RELAY	G4A-RY-200
			STICK RELAY	G4A-RY-200
			REVERSING VALVE RELAY	G5N-RELAY
			OUTDOOR FAN RELAY	G5N-RELAY
_				
	COLOR	MOUNTING	REMARKS	

WHITE H THERM-FUSE (2PTERMINAL)

IVORY H INDICATING BOARD

IVORY H RECEIVER BOARD

WHITE H HA TERMINAL

WHITE H ROOM HEX. THERMISTOR

CN3 VH-2P (3P, TOP ENTRY) BLACK H REVERSING VALVE & OUTDOOR FAN RELAY

CN4 XH-3P (TOP ENTRY) BLACK H THERM-FUSE (P.C.B)

 CN8B
 B2P3-VH (TOP ENTRY)
 WHITE
 H
 SWITCHING POWER SUPPLY

 CN10
 B2B-XH-A (TOP ENTRY)
 WHITE
 H
 SWITCHING POWER SUPPLY

CN13 BNH-6P (SIDE ENTRY) WHITE H STEPPING MOTOR

 CN15
 PH-4P (SIDE ENTRY)
 WHITE
 H
 EEPROM

 CN16
 ZR-3P (SIDE ENTRY)
 IVORY
 H
 TEST PIN

AYS		
SYMBOL	MODEL NO.	MOUNTIN FORM
VER RELAY	G4A-RY-200	Н
CK RELAY	G4A-RY-200	Н

D102	D1NL40	A
D301	1SS-120	A
D302	1SS-120	A
D303	1SS-120	A
D304	1SS-120	A
D401	1SS-120	A
D701	1SS-120	A
		A
D902	D2S6M	A
D904	ISS131	A

MODEL NO.

D3SB60

DIODE

SYMBOL

DB201

Q901

Q903

Q904

INDUCTO	DR	
SYMBOL	RATED VALUE.	MOUNTING FORM
L101	82 μH, 1.3A	Н
L102	560 μH, 0.6A	Н
L901	450 μH, 1.5A	Н

#### TRANSISTOR SYMBOL MODEL NO. MOUNTING Q301 AA1A4M Q302 AA1A4M Q303 AA1A4M 2SC458CT Q511 Q512 2SA673CT

2SJ326

2SA1757F

'ING		SYMBOL	RATED VALUE.	MOUNTING FORM
ł	Н	LD721	SEL6914A	YELLOW
ł	Н	LD723	SEL6214S	RED
	Н	LD725	SEL6414E	GREEN
ł				
		ZENER DI	ODE	
014				MOUNTING

ICs

MOUNTING

н

SYMBOL

IC301

SYMBOL	MODEL NO.	Mounting Form
ZD100	HZ24-3	А
ZD101	HZ24-3	А
ZD102	HZ30-2	А
ZD511	HZ7B2	А
ZD701	HZ5.1B-J	А

NOTES:
1. THE COMPON

2SC1214CTZ R

. THE COMPONENT WITH A "H" MARK ON THE LEFT OF THE TABLE ARE BELONG TO INDICATING BOARD.

2. THE DEFINATION OF MOUNTING FORM

R

R

R

R

R

Н

a) C --- SURFACE MOUNT (SMT) b) H --- HAND INSERTION

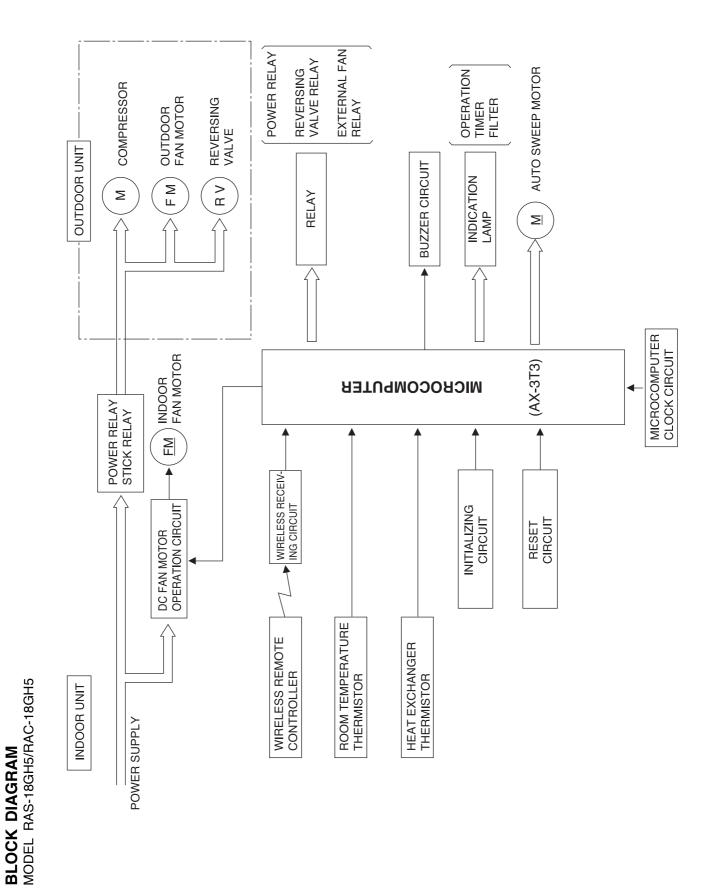
c) R --- RADIAL

- d) A --- AXIAL
- 3. THE DEFINATION OF TYPE OF CAPACITOR

a) F --- FILM

- b) C --- CERAMIC
- c) D --- ELECTROLYTIC

ORM		



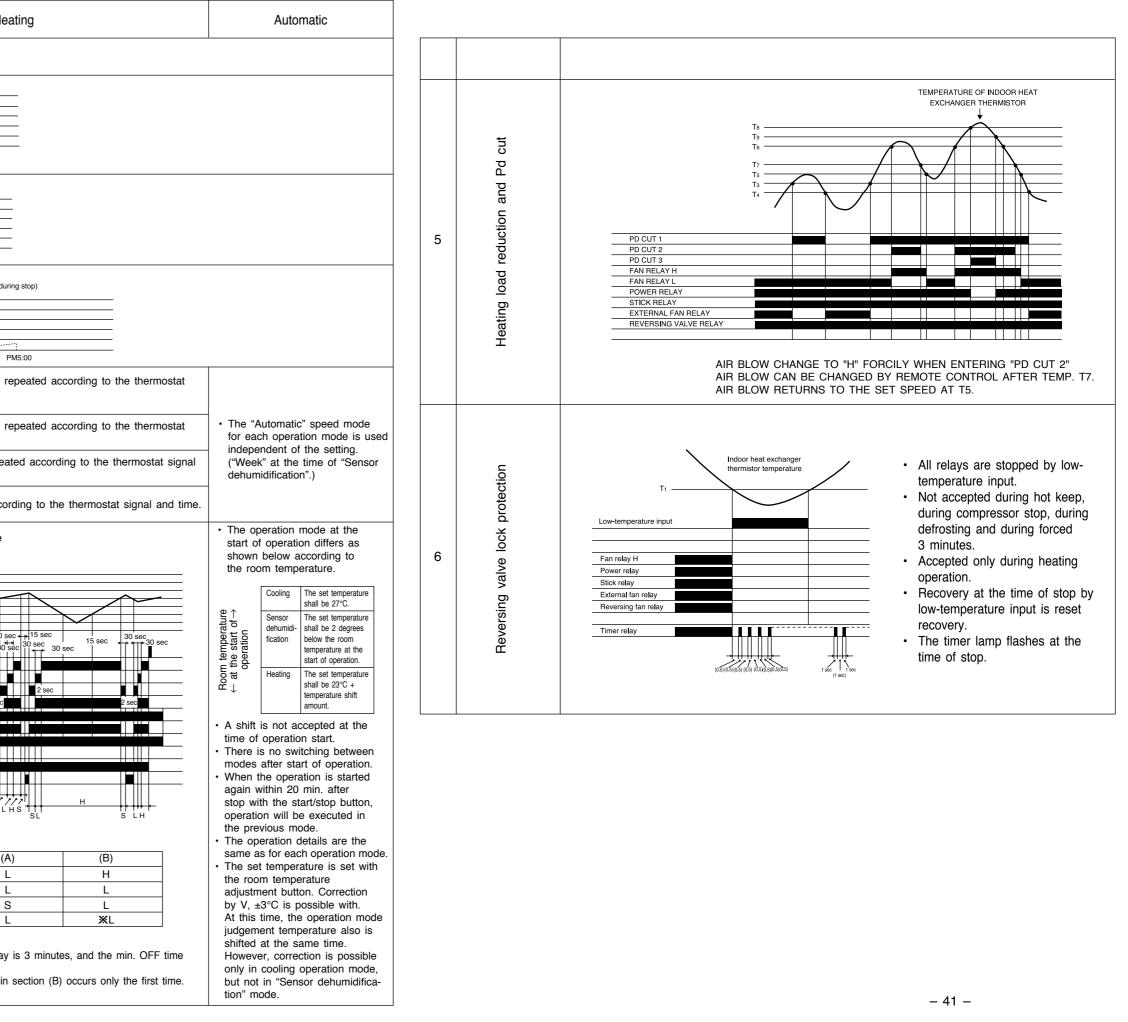
## \_

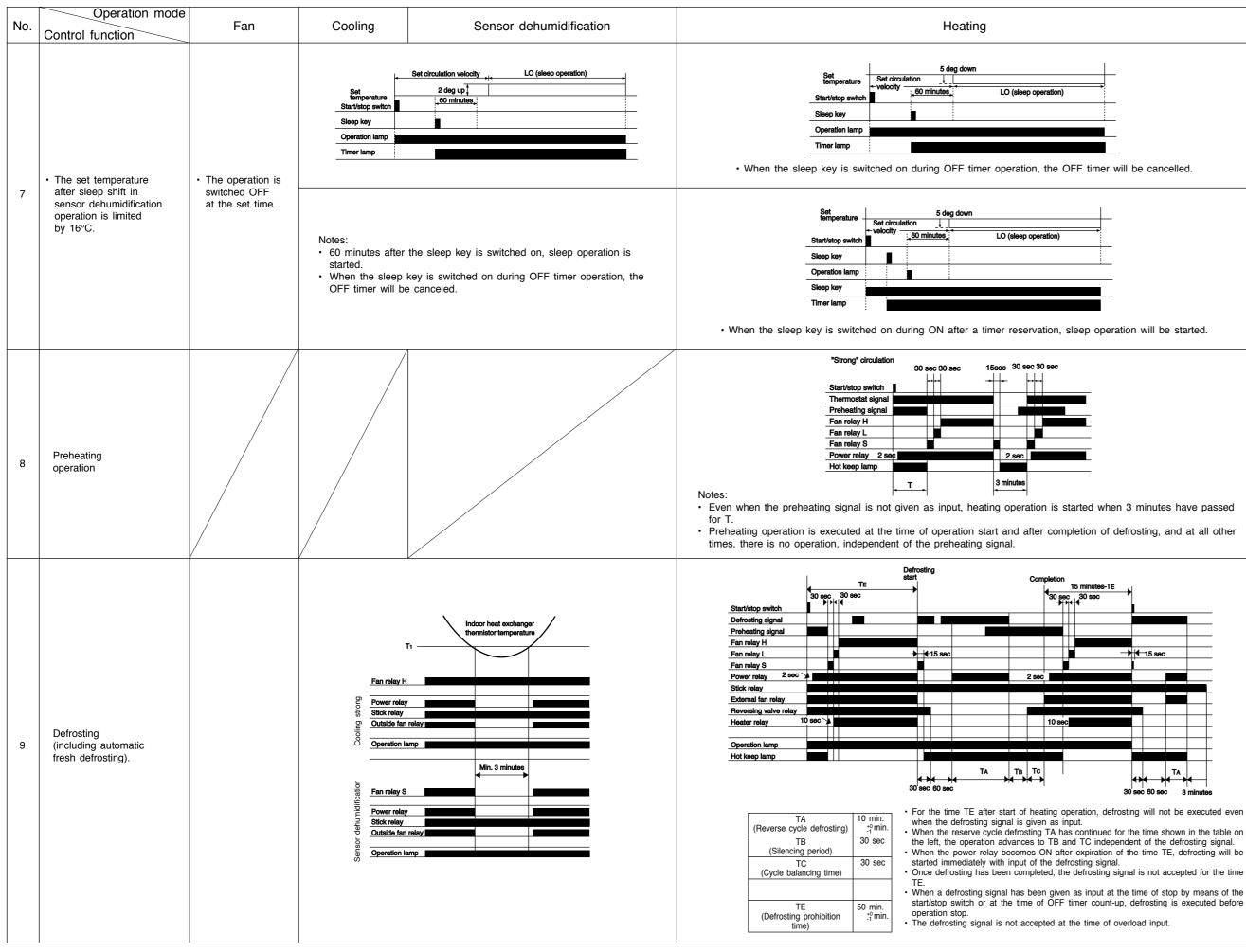
- 39 -

## BASIC MODE

MODEL RAS-18GH5/RAC-18GH5

No.	Control fur	peration mode	Fan	Cooling	Sensor dehumidification	Heat
1	Start/stop but basic mode	~ ~	Start/stop button			1
		OFF timer			Start/stop button       Reservation       Cancel       Operation lamp       Timer lamp       Timer memory       (OFF timer during stop)     (Cancel)	ange of the reservation time)
2	Timer operation	ON timer			Start/stop button       Reservation       Cancel       Operation lamp       Timer lamp       Timer memory       (ON timer during operation)       (Cancel)	nge of the reservation time)
		$OFF \stackrel{\leftarrow}{\rightarrow} ON$ timer			Start/stop button     Reservation       Reservation     Cancel       Operation lamp     Cancel       Timer lamp     Cancel       Timer memory     Cancel	<ul> <li>OFF timer during operation) (OFF → ON timer during</li> <li>OFF timer during</li> <li>OFF timer during</li> <li>OFF → ON timer dur</li></ul>
		Automatic	Operation in the previous circulation mode	• "HI", "MED", or "LO" operation is executed according to the thermostat signal. (Refer to "Thermostat operation".)		"HI", "MED", "LO", and "Stop" are reprint signal and time.
3	3 Circulation mode	н	Operation in "HI" mode	Same as on the left.	• "LO" and "Stop" are repeated according to the thermostat	<ul> <li>"HI", "MED", "LO", and "Stop" are rep signal and time.</li> </ul>
		MED	Operation in "MED" mode	Same as on the left.	signal, independent of the setting.	<ul> <li>"MED", "LO", and "Stop" are repeate and time.</li> </ul>
		LO	•Operation in "LO" mode	Same as on the left.		"LO" and "Stop" are repeated accord
4	Thermostat of $H \rightarrow HI$ $L \rightarrow MED$ $S \rightarrow LO$ • The power delayed by from the si thermostat	relay is 2 seconds tart of	(1) Strong       Start/stop button       Fan relay H       Stick relay         Stick relay	) In case of "Automatic" mode Set temperature 1.3 tart/stop button an relay H an relay L an relay 2 sec tick relay termal fan relay peration lamp H S L S L H H S S L S L H S L S L S L S L H S S S S S S S S S S S S S S S	<ul> <li>(1) When the set temperature is lower than the room temperature.</li> <li>(Set temperature) + (Temperature shift amount) + (Temperature) + (Temperature)</li></ul>	Example for "HI" circulation mode
				Same as above (but operation is made with the velocity set at the time of operation start).	<ul> <li>0.66 deg</li> <li>-2</li> <li>-4</li> <li>-30 sec</li> <li>-4</li> <li>-30 sec</li> <li>-4</li> <li>-30 sec</li> <li>-4</li> <li>-5</li> <li>-6</li> <li>-7</li> <li>-7</li></ul>	Image: Notes:     Image: Notes       • The min. ON time of the power relay is also is 3 minutes.       • In automatic circulation mode, "HI" in s





	Automatic
	<ul> <li>Sleep operation is executed for each operation mode.</li> </ul>
DFF timer will be cancelled.	
	<ul> <li>Sleep operation is executed for each operation mode.</li> </ul>
sleep operation will be started.	
	<ul> <li>At the time of heating operation mode, the same operation as for heating is executed.</li> </ul>
tarted when 3 minutes have passed	
pletion of defrosting, and at all other	
15 minutes-TE c 30 sec ↓ ↓ ↓ ↓ 15 sec ↓ ↓ ↓ ↓ 15 sec	Defrosting of each operation mode is executed.

- T 30 sec 60 sec 3 minute
- When the power relay becomes ON after expiration of the time TE, defrosting will be
- Once defrosting has been completed, the defrosting signal is not accepted for the time

#### Table 1 Specifications

Item		
Operation switching	Automatic	Yes
	Heating	Yes
	Fan	Yes
	Sensor	Yes
	dehumidification	
	Cooling	Yes
Temporary switch		Yes (automatic)
Service switch	Heating	NO
	Cooling	Yes
Nice temperature res	ervation	Yes
Automatic fresh defro	osting	Yes
Defrosting		Yes
Pd cut 1	Yes	
Pd cut 2	Yes	
Pd cut 3	Yes	
Heating load reduction	Yes	
External fan relay		Yes
Reversing valve relay	y	Yes
Reversing valve lock	protection	Yes
Sleep circuit	Yes	
Heater operation at t dehumidification	No	
Automatic blowing di	Yes	
Filter sign		Yes
Wireless mode		Cooling/Heating

#### Table 2 Sensor operation values

Item					
			Cooling, Sensor	16	17.6
	ON tem	perature	dehumidification	24	25.6
Thermostat	(Thermo	stat relay)		32	33.6
operation	power re	elay	Heating	16	19.6
	(°C)			24	27.6
				32	35.6
	Different	ial (°C)			0.33
					_
					_
Low-tempera	ature	(T1)	ON (°C)		1.0
defrosting			Res	set (°C)	12.0
Preheating			Res	set (°C)	17.0
			C	DN (°C)	15.0
				_	
					_
Pd cut 1		(T3)	C	DN (°C)	56.0
		(T4)	Res	set (°C)	52.0
Pd cut 2		(T6) ON (°C)		66.0	
		(T7) Reset (°C)		57.0	
		(T5) Fan Relay H → Original (°C)		58.0	
Pd cut 3		(T8)	C	DN (°C)	62.0
		(T9)	Res	set (°C)	57.0

#### Other detailed specifications

- 1. When the room temperature rises within 3 minutes after thermostat OFF during cooling operation with automatic velocity, the blowing velocity changes in the order of  $S \rightarrow L \rightarrow H$  in the same way as at the time of thermostat ON.
- 2. In case of Tele. control input during stopped ON timer, operation will be started at that time and the timer will be cleared.
- 3. In case of Tele. control input during operation of the OFF timer, the operation will be stopped at that time and the timer will be cleared.
- 4. Even when operation stop is executed at the time of outside fan OFF by overload, automatic fresh defrosting will not be executed.
- 5. In case of switching to "Heating" during "Automatic" heating operation, the operation will be continued as it is when the thermostat is ON. 3 min delay will not be entered. However, the set room temperature and the blowing velocity will be according to the remote control signal. The same applies for switching from "Heating" to "Automatic" heating.
- 6. In case of switching from "Sensor dehumidification" operation to "Cooling", as it is when the thermostat is ON. 3 min delay will not be entered. However, the set room temperature and the blowing velocity will be according to the remote control signal. The same applies for switching from "Cooling" to "Sensor dehumidification". The same also applies for "Automatic" sensor dehumidification, cooling "Sensor dehumidification", "Cooling".
- 7. The filter sign lights after operation of the indoor fan for 100 hours. The time is cleared when power switch set to OFF and ON again.
- 8. After entry into trouble mode (when the indication lamp is flashing), the rapid feed mode can not be changed.

- 9. When operation by nice temperature reservation is executed during sleep operation, normal operation will be continued, and the advance time becomes the temperature difference between the set temperature without sleep shift and the room temperature.
- 10. The 50 minutes of defrosting prohibition are counted from Thermostat ON after start/stop switch ON. When the thermostat is OFF at the time of start/stop switch ON, the 60 minutes will be counted from the time of thermostat ON. The initial OFF time is not counted. Counting starts when the thermostat becomes ON, and the count then continues even if the thermostat becomes OFF.
- 11. In case of switching from "Heating" the reversing valve is held for 3 minutes
- 12. The defrosting signal is not accepted with overload input, and the operation becomes as shown below when the overload input disappears.
- (1) When previously the defrosting signal existed without overload input, defrosting will start immediately.
- (2) In cases other th defrosting will with a defrosti the condition wit input.

nan	the abo	ve,
be	execut	ed
ing	signal	in
thou	ut overlo	ad

- Operation starts in advance so that the room temperature reaches the preset value at the set time.
- The operation time is obtained as follows depending on the room temperature when operation starts.
- (1) Calculation method of the moved-up time.
   Moved-up time (MT) = Moved-up time depending on the temperature difference (OT) + compensation time (HT).
   MT is at least 1 minute if OT is not zero.

	Heating	Cooling
(MT)	00 ~ 60 min.	00 ~ 60 min.
(OT)	00 ~ 60 min.	00 ~ 60 min.
(HT)	-60 ~ 60 min.	-60 ~ 60 min.

Obtain OT (moved-up time depending on the temperature difference) from the table below.

8

	ŀ	leating			C	Cooling	
Setting temp.	_	Room temp.	Time (min.)	Setting temp.	-	Room temp.	Time (min.)
00	_	01.00	00	00.00	-	02.00	00
01.25	—	03.00	10	02.25	_	05.00	15
03.25	_	07.00	20	05.25	_	08.00	30
07.25	—	10.00	30	08.25	—	11.00	45
10.25	_	13.00	40	11.25	_		60
13.25	_	16.00	50				
16.25	_	19.00	60				
19.25	_	22.00	60				

10 TEMPERA-TURE"

"NICE

reservation

\* The preset temperature value shown above does not include any shift value.

#### (2) Compensation

\_

22<u>.25</u>

1 The "Attained" state is monitored and a "Not attained" check is done to revise the compensation time (HT).

#### "Attained" monitor

Continuously monitored during "NICE TEMPERATURE" operation.

#### — (Heating) -

When the room temperature < Set value + compensation shift, it is regarded to be "attained" and 5 minutes are reduced from the compensation time.

#### — (Cooling)

When the room temperature < Set value + compensation shift, it's operated same as above.

#### "Not attained" check

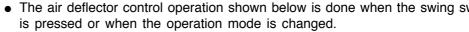
Performed once when the "NICE TEMPERATURE" timer is completed.

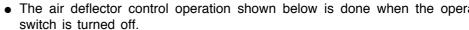
— (Heating)

When the room temperature < Set value + compensation shift  $1^{\circ}$ C, it is regarded to be "Not attained" and 5 minutes are added to the compensation time.

#### — (Cooling) –

When the room temperature > Set value + compensation shift  $+1^{\circ}C$ , it's operated same as above.





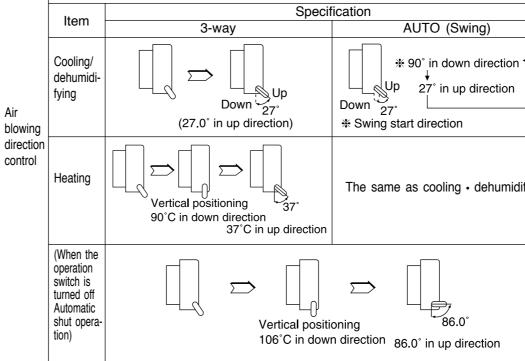


Table 1	Specifications
---------	----------------

Item		RAS-18GH5
	Automatic	Yes
	Heating	Yes
Operation switching	Sensor dehumidification	Yes
	Cooling	Yes
	Fan	Yes
Temporary switch		Yes (automatic)
Service switch	Cooling	Yes
Nice temperature reservation	on	Yes
Defrosting	Yes	
Sleep circuit	Yes	
Heater operation at the tim	No	
Automatic blowing direction	Yes	
Filter sign	Yes	
Wireless mode	Heat and Cool wireless	

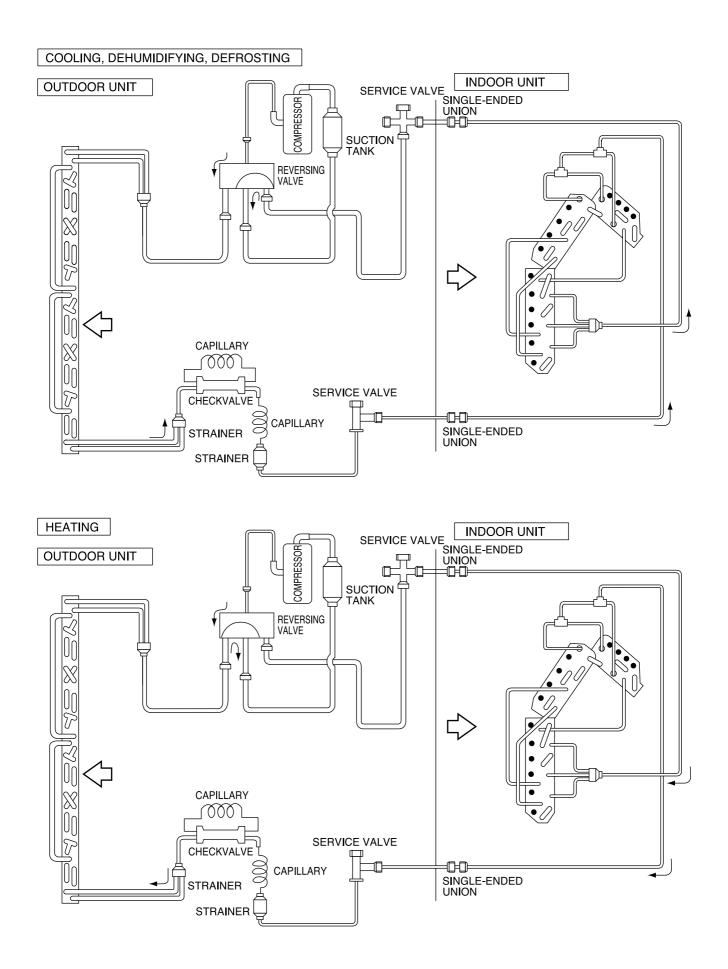
#### Table 2 Sensor operation values

	Item					RAS-18GH5
		ON temperatu	N temperature		16	17.6
	Thermostat operation	(Thermostat relay) power relay (°C)		Cooling, sensor dehumidification	24	25.6
						33.6
	Differential (		C)			0.33
	Low-temperature defrosting				ON (°C)	4.0
					Reset (°C)	12.0

switch	Other detailed specifications
ration	1. When the room temperature starts to increase within 3 minutes after thermo OFF in "cooling" and fan speed "AUTO", the fan speed changes $L \rightarrow M \rightarrow H$ as when thermo ON.
lifying	<ol> <li>If "cooling" is selected during "sensor dehumidification" operation the operation continues as it is with the thermo ON. The 3 minutes delay is not started. The set temperature and fan speed depend on the remote control signal. It is same for "cooling" "sensor dehumidification". It is same for "AUTO"</li> </ol>
	sensor dehumidification cooling "sensor dehumidification" "cooling".
	3. The filter sign lights after 200 hours operation of the room fan. The lamp goes out when the POWER SWITCH set to OFF and ON again.
	4. After the failure mode is started (indicator lamp flickering), rapid mode changing cannot be done.
	5. If the operation is made by the nice temperature reservation during the sleep operation, the normal operation continuously occurs, and for the advance time, the temperature difference between the set temperature without sleep shift and "room temperature" is used.
ŝS	
15	
1	1

# **REFRIGERATING CYCLE DIAGRAM**

MODEL RAS-18GH5/RAC-18GH5



# **DESCRIPTION OF MAIN CIRCUIT OPERATION**

## 1. ON / OFF

The "ON / OFF" and "Timer reserve button" and "Sleeping" function independently. Their operations are shown in Fig. 1-1.

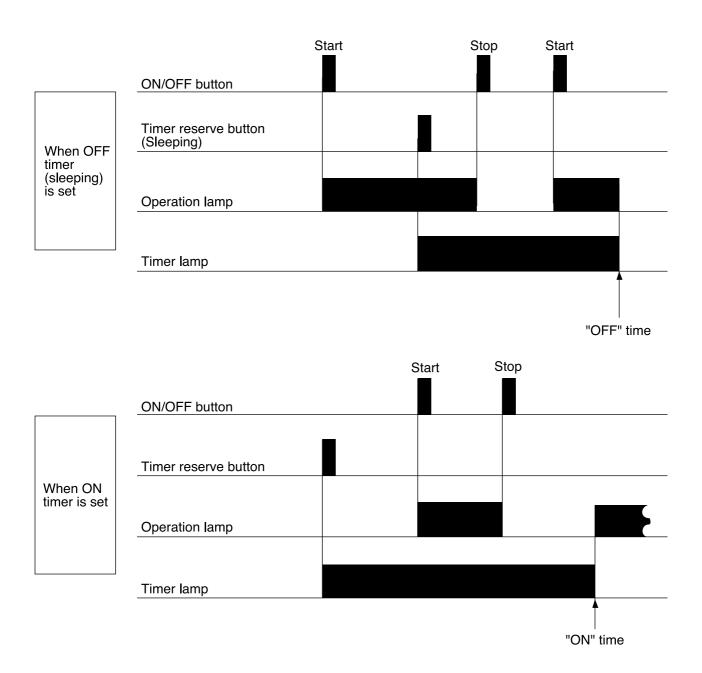
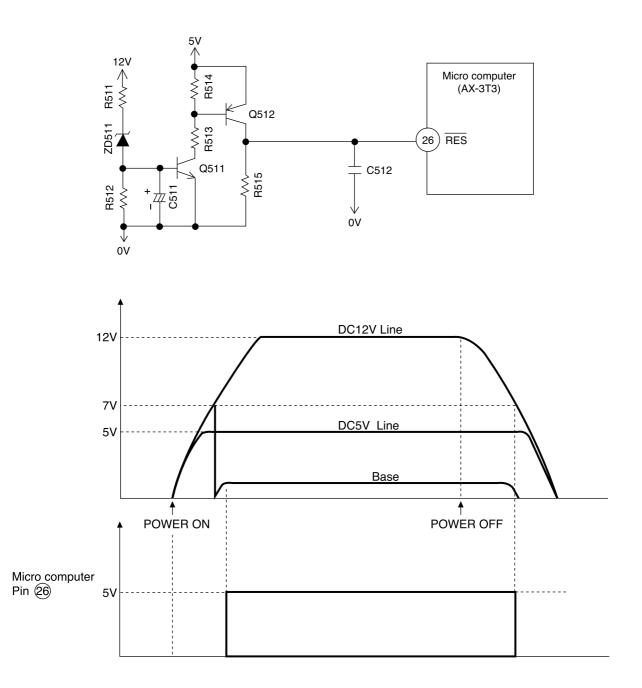
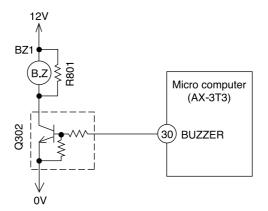


Fig. 1-1 Timer operation



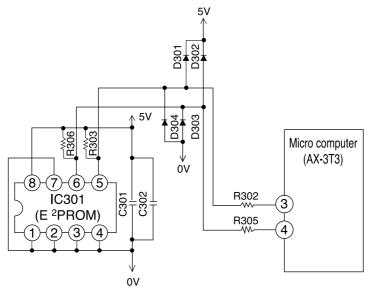
- The reset circuit is used to reset the program to its initial settings when the power is turned on or when the power is recovered after a power failure.
- The micro computer is reset when the reset input is "Hi", and operation is possible when the reset input is "Lo".
- The waveforms at each point 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, ZD511 is turned ON, the potential of Q511's base rises and Q511 is turned ON. Since Q511's collector is set to "LO" at this time, Q512 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, ZD511 is turned OFF, then Q511 is turned OFF, Q512 is turned ON the reset input of the micro computer is set to "Hi' and the micro computer is set to the reset mode.



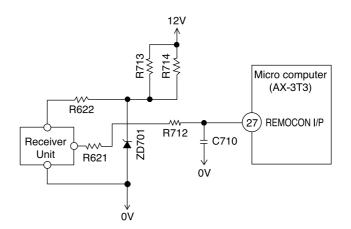
When the buzzer is to be activated, buzzer output pin (30) of the micro computer alternates between ON and OFF repeatedly at 4kHz and Q302 is turned ON/OFF accordingly. A 4kHz voltage is applied to the buzzer and the diaphragm of the buzzer vibrates to output 4kHz sound.

#### 4. Initial setting (IC301)

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

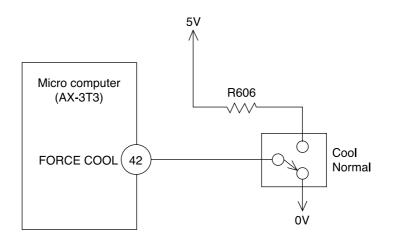


#### 5. Receive circuit



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

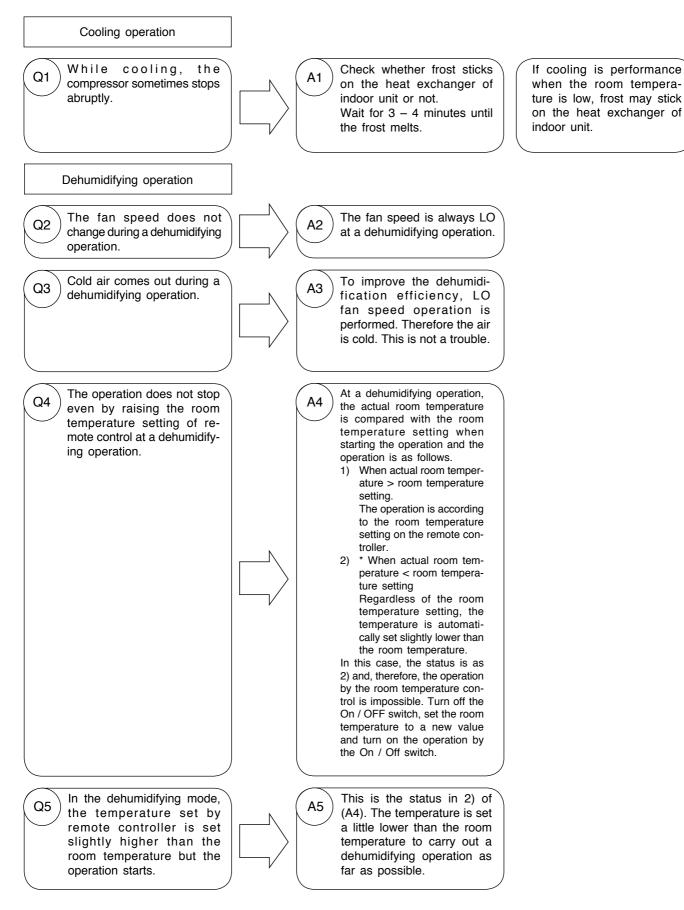
#### 6. Service Operation Circuit

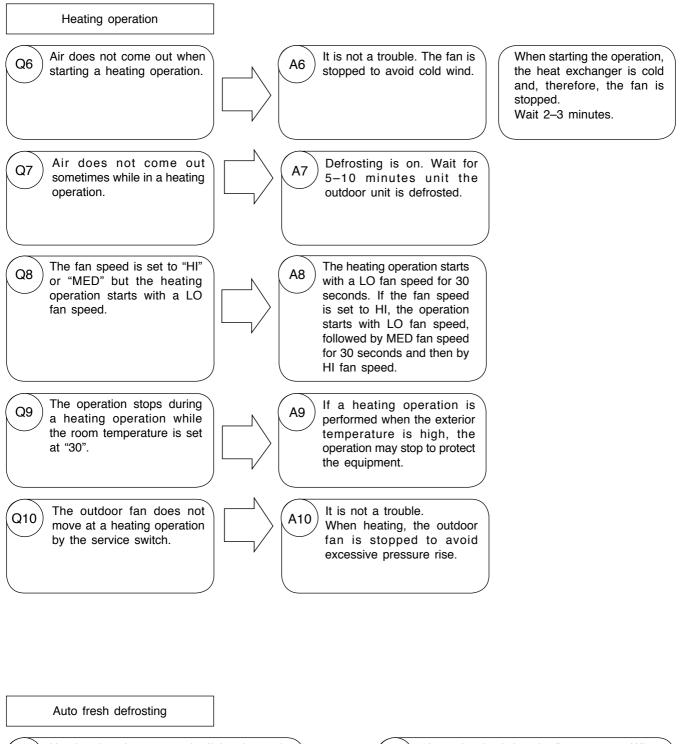


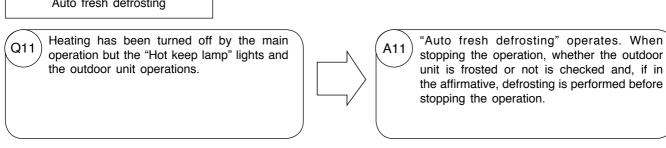
- Use the service switch to select "Cooling" temporarily when the interior electric equipment has troubled.
- Setting the switch to "Cooling" causes continuous cooling room temperature control. To control the room temperature, turn on and off the disconnect switch. To protect the compressor, wait at least 3 minutes before turning on again.
- The fan speed is "MED".
- Does not operate is 12V is not generated in the control circuit.
- When the service switch is used for operation, each change switch is overridden.
- Setting the service switch to "Cooling" turns on the "Power relay".

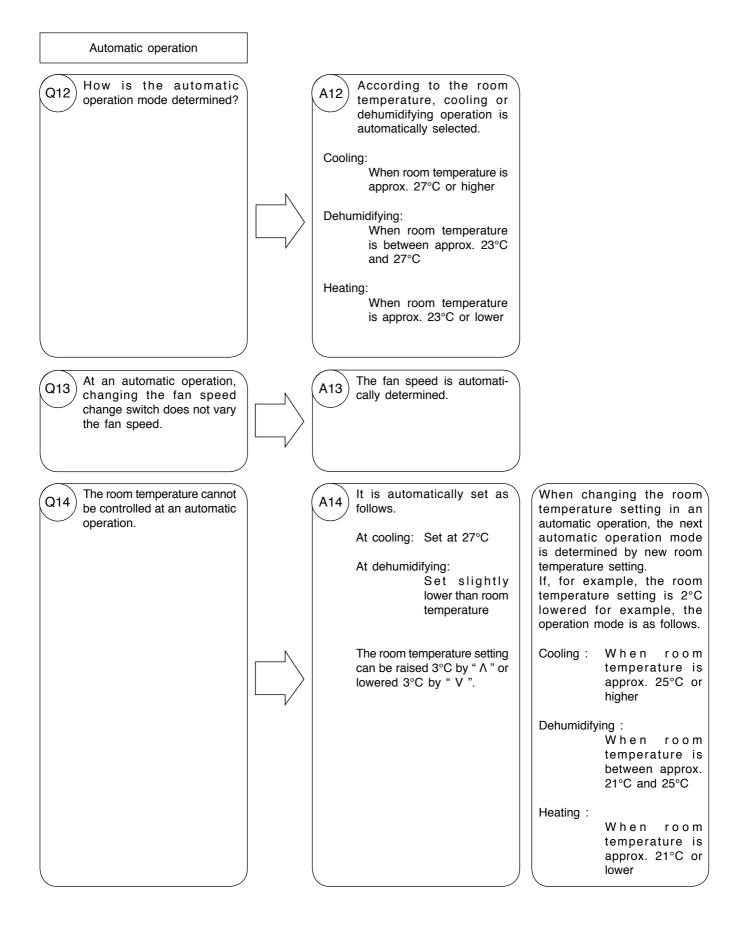
		PRESENT CONDITION	lion		
INPUT SIGNAL	OPERATION	OPERATION MODE	AIR DEFLECTOR	OPERATING SPECIFICATION	KEFEKENCE
KEY INPUT	STOP	EACH MODE	STOP	ONE SWING (CLOSING AIR DEFLECTOR) (1) DOWNWARD (2) UPWARD	INITIALIZE AT NEXT OPERATION.
			DURING ONE SWING	STOP AT THE MOMENT.	
		AUTO COOL COOL FAN AUTO DRY DRY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

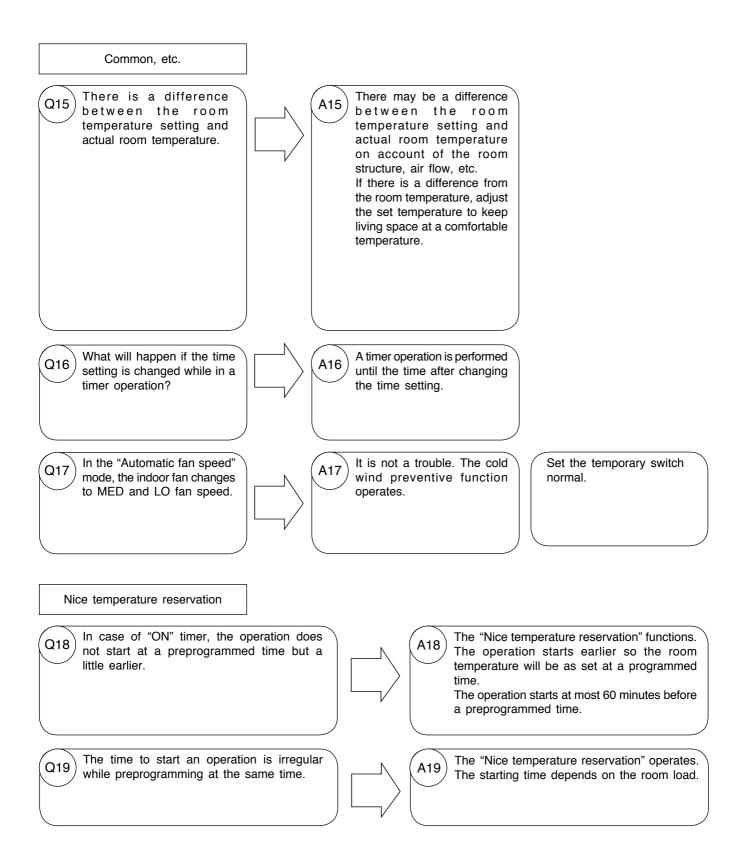
# SERVICE CALL Q & A



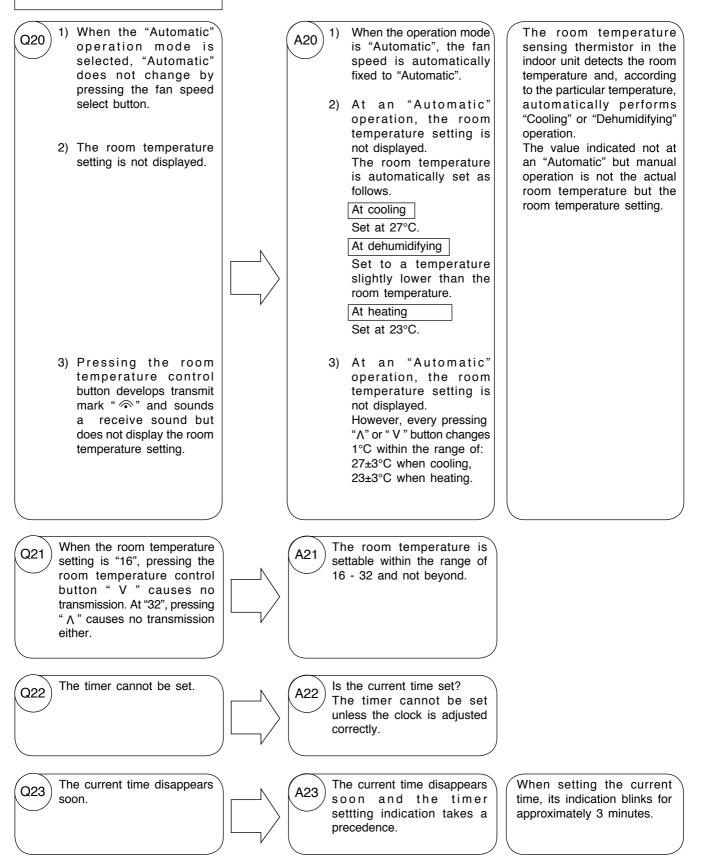


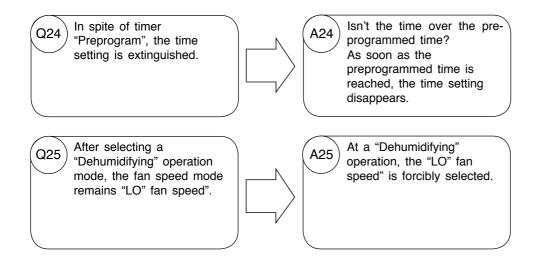




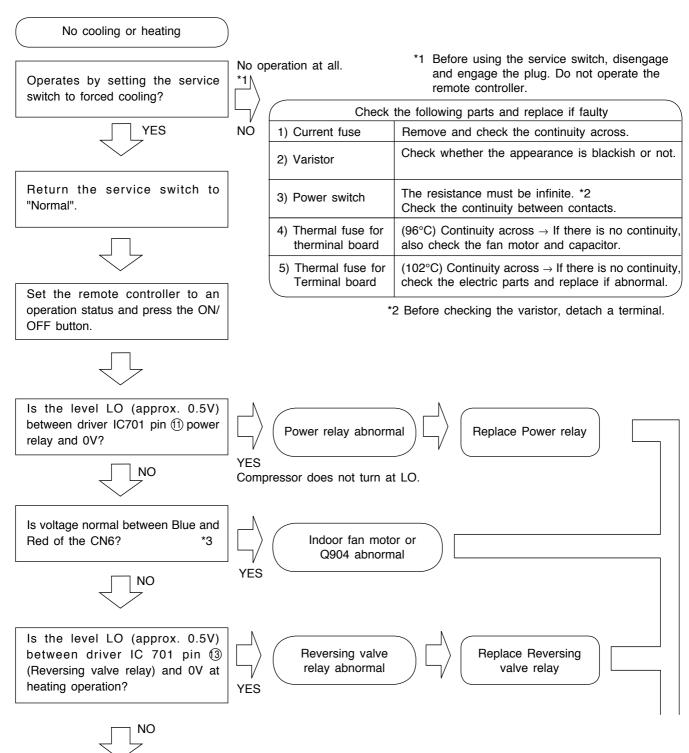


Wireless remote controller

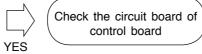




### **TROUBLE-SHOOTING**



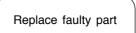
Is voltage normal (approx. 280  $\sim$  300V) at out put side of the DB201?



NO

Check the circuit board inside parts. When checking, carry out a self diagnosis by indoor indicator lamp.

4	Wait for 3 minutes before forced re-
	operation by the service switch.



\*3

0								
	CN6 BLUE-RED (V)							
Fan Speed	RAS-18GH5							
	Cooling	Heating						
н	30.0	30.0						
MED	26.0	24.0						
LO	22.0	21.5						

## Timer-Lamp, break-down checking in blinking sign.

Indication Factor Estimated Break-Down Part No. Mode of Timer-Lamp blinking 4-way valve not working (1) 4-way valve is not working. Inside temperature is low in <sup>5</sup> sec. \_\_\_\_\_1 time (2) Heat-exchanger thermistor is 1 heating operation time or inside in disconnection. temperature is high in cooling (Only heating time) operation time. Force cooling operation Check force cooling switch at indoor electrical. Unit is under forcible operation <sup>5</sup> sec. – – – – – 2 times 2 or under balancing after forcible operation. DC Fan motor - over flow of (1) Indoor - Fan is locked. electricity 1  $\frac{5}{\text{sec.}}$  --- 10 times (2) Indoor - Fan motor damage. 3 Indoor - DC Fan motor has over flow of electricity. (3) Indoor - control circuit board. IC 401 Data read wrongly IC401 data is not in order. In case that data read from IC401 4 is wrong. Heat exchanger thermistor (1) Thermistor error 3(2) Indoor - control circuit board. 5 Heat exchanger thermistor open or short-circuit detected. **Room thermistor error** (1) Thermistor Room thermistor error open or (2) Indoor - control circuit board. short-circuit detected. 6

Check the break-down factor from the frequency of timer-lamp blinking.

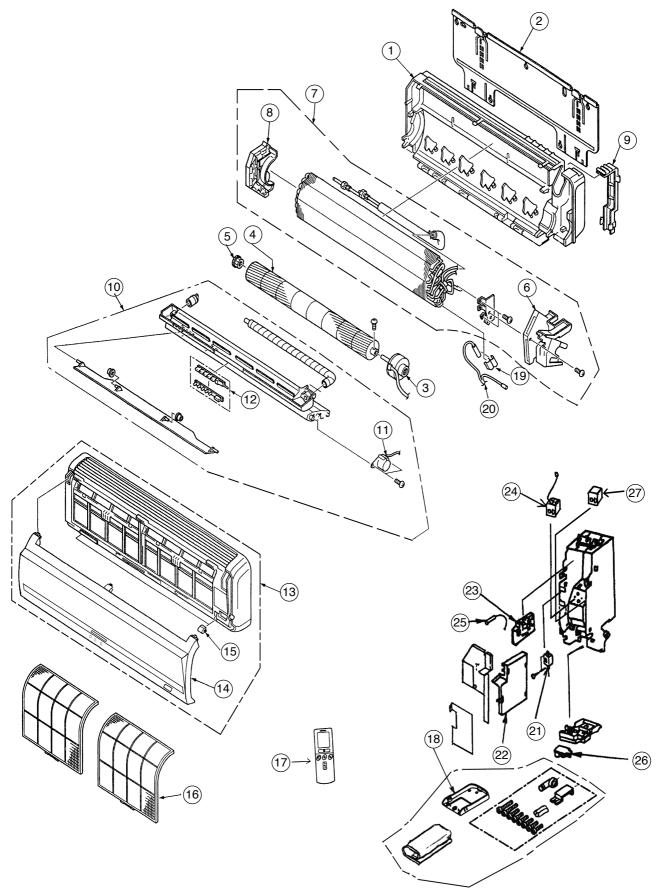
(  $\_$  -- 0.5 second on, 0.5 second off.)

## 

Remote control is disabled while the Timer lamp is flashing. To check operation, turn off the power switch and turn it on again.

# PARTS LIST AND DIAGRAM

## INDOOR UNIT MODEL : RAS-18GH5

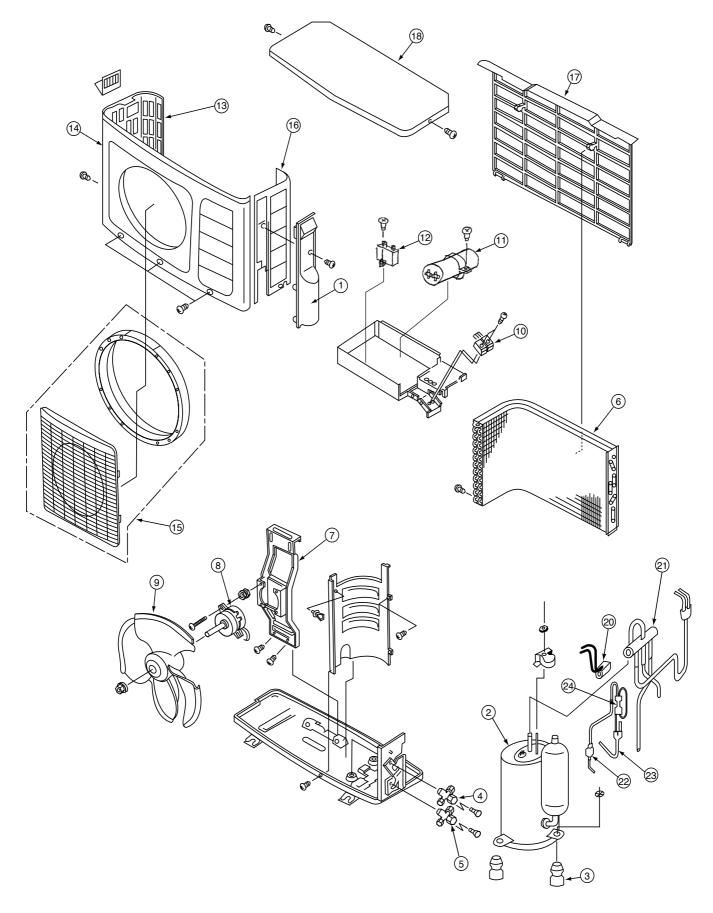


## MODEL RAS-18GH5

NO.	PART N0. RAS-18GH5		Q'TY / UNIT	PARTS NAME
1	PMRAS-18GH4	002	1	CABINET
2	PMRAS-40CNH2	023	1	MOUNTING PLATE
3	PMRAS-51CHA1	002	1	FAN MOTOR
4	PMRAS-51CHA1	003	1	TANGENTIAL FAN
5	PMRAS-25CNH2	005	1	P-BEARING ASSY
6	PMRAS-51CHA1	004	1	FAN MOTOR BASE
7	PMRAS-18GH4	003	1	CYCLE ASSY
8	PMRAS-51CHA1	020	1	FAN COVER
9	PMRAS-18CP5	003	1	PIPE SUPPORT
10	PMRAS-63CA2	003	1	DRAIN PAN ASSY
11	PMRAS-18C9	002	1	AUTO SWEEP MOTOR
12	PMRAS-63CA2	005	1	P.W.B (LED)
13	PMRAS-60YH5	001	1	FRONT COVER ASSY
14	PMRAS-60YH5	002	1	FRONT PANEL
15	PMRAS-10C7M	008	3	САР
16	PMRAS-51CHA1	010	2	FILTER
17	PMRAS-51CHA1	011	1	REMOTE CONTROL ASSY
18	PMRAS-10C3M	003	1	REMOTE CONTROL SUPPORT
19	PMRAS-51CHA1	015	1	THERMISTOR SUPPORT
20	PMRAS-18C9G	007	1	THERMISTOR
21	PMRAS-18CP2R	002	1	POWER SWITCH
22	PMRAS-18GH4	001	1	P.W.B (MAIN)
23	PMRAS-51CHA1	013	1	P.W.B (POWER SW SUPPLY)
24	PMRAS-51CHA1	017	1	TERMINAL BOARD (FUSE)
25	PMRAS-51CHA1	018	1	THERM-FUSE FOR P.C.B
26	PMRAS-51CHA1	019	1	P.W.B (RECEIVER)
27	PMRAC-07CV1	006	1	TERMINAL BOARD (2P)

# PARTS LIST AND DIAGRAM

# OUTDOOR UNIT MODEL : RAC-18GH5



## MODEL RAC-18GH5

NO.	PART N0. RAC-18GH5		Q'TY / UNIT	PARTS NAME
1	PMRAC-50NH4	912	1	SV. COVER
2	PMRAC-18GH4	901	1	COMPRESSOR
3	PMRAC-18GH4	902	3	COMPRESSOR RUBBER
4	PMRAC-50NHA	903	1	VALVE (2S)
5	PMRAC-18GH4	905	1	VALVE (4S)
6	PMRAC-51CHA1	902	1	CONDENSER
7	PMRAC-40CNH2	918	1	FAN MOTOR SUPPORT
8	PMRAC-18CH1	901	1	FAN MOTOR
9	PMRAC-40CNH2	917	1	PROPELLER FAN
10	PMRAC-51CHA1	903	1	TERMINAL BOARD (4P)
11	PMRAC-63CHA2	907	1	COMPRESSOR CAPACITOR
12	PMRAC-63CHA2	908	1	FAN MOTOR CAPACITOR 2.5µF
13	PMRAC-40CNH2	926	1	SIDE PLATE (L)
14	PMRAC-18CH1	903	1	CABINET
15	PMRAC-51CHA1	907	1	GRILL ASSY
16	PMRAC-40CNH2	923	1	SIDE PLATE (R)
17	PMRAC-24CP5	904	1	NET
18	PMRAC-40CNH2	922	1	TOP COVER
20	PMRAC-18GH4	906	1	REVERSING VALVE COIL
21	PMRAC-18GH5	901	1	REVERSING VALVE
22	PMRAC-51CHA1	905	1	STRAINER (CAPI)
23	PMRAC-18GH4	908	1	STRAINER (COND)
24	PMRAC-09GH4	904	1	CHECK VALVE

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RAS-18GH5 / RAC-18GH5