## **TOSHIBA**

## SERVICE MANUAL

# AIR-CONDITIONER

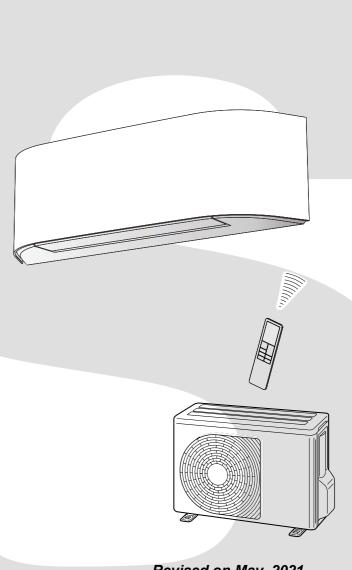
SPLIT TYPE

**Indoor Unit** 

RAS-25N4KVRG-ND RAS-35N4KVRG-ND

**Outdoor Unit** 

RAS-25J2AVSG-ND1 RAS-35J2AVSG-ND1













Revised on May, 2021

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#### 1. SAFETY PRECAUTIONS



Read the precautions in this manual carefully before operating the unit.



This appliance is filled with R32. (Flammable Material)



Information included in the Operation Manual and/or Installation Manual.



Service personnel should be handing this equipment with reference to the Installation Manual.

#### Warning Indications on the Air Conditioner Unit

## Warning indication

## \_\_\_\_\_

## Description



the burst

#### CAUTION

#### . |

#### **BURST HAZARD**

**CAUTION** 

# **BURST HAZARD**Open the service valves before the operation, otherwise there might be

Open the service valves before the operation, otherwise there might be the burst.

#### For general public use

Power supply cord and connecting cable of appliance use shall be at least polychloroprene sheathed flexible cord (design H07RN-F) or cord designation 60245 IEC66. (Shall be installed in accordance with national wiring regulations.)

- Read this "SAFETY PRECAUTIONS" carefully before servicing.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the servicing work, perform a trial operation to check for any problem.
- Turn off the main power supply switch (or breaker) before the unit maintenance.

#### ■ Important information regarding the refrigerant used

This product contains fluorinated greenhouse gases.

Do not vent gases in to the atmosphere. Refrigerant type: R32

GWP<sup>(1)</sup> value: **675**\* (ex. R32 ref. AR4)

(1)GWP = global warming potential

The refrigerant quantity is in dicated on the unit name plate.

\* This value is based on F gas regulation 517/2014

#### **CAUTION**

#### **New Refrigerant Air Conditioner Installation**

• THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R32) WHICH DOES NOT DESTROY OZONE LAYER.

R32 refrigerant is apt to be affected by impurities such as water, oxidizing membrane, and oils because the working pressure of R32 refrigerant is approx. 1.6 times of refrigerant R22. Accompanied with the adoption of the new refrigerant, the refrigeration machine oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigeration machine oil does not enter into the new type refrigerant R32 air conditioner circuit.

To prevent mixing of refrigerant or refrigerating machine oil, the sizes of connecting sections of charging port on main unit and installation tools are different from those used for the conventional refrigerant units.

Accordingly, special tools are required for the new refrigerant (R32) units. For connecting pipes, use new and clean piping materials with high pressure fittings made for R32 only, so that water and/or dust does not enter. Moreover, do not use the existing piping because there are some problems with pressure fittings and possible impurities in existing piping.

#### **CAUTION**

#### TO DISCONNECT THE APPLIANCE FROM THE MAIN POWER SUPPLY

This appliance must be connected to the main power supply by a circuit breaker or a switch with a contact separation of at least 3 mm.

#### **DANGER**

• ASK AN AUTHORIZED DEALER OR QUALIFIED INSTALLATION PROFESSIONAL TO IN-STALL/MAINTAIN THE AIR CONDITIONER.

INAPPROPRIATE SERVICING MAY RESULT IN WATER LEAKAGE, ELECTRIC SHOCK OR FIRE.

• TURN OFF MAIN POWER SUPPLY BEFORE ATTEMPTING ANY ELECTRICAL WORK. MAKE SURE ALL POWER SWITCHES ARE OFF. FAILURE TO DO SO MAY CAUSE ELECTRIC SHOCK.



#### DANGER: HIGH VOLTAGE

The high voltage circuit is incorporated.

Be careful to do the check service, as the electric shock may be caused in case of touching parts on the P.C. board by hand.

- CORRECTLY CONNECT THE CONNECTING CABLE. IF THE CONNECTING CABLE IS INCOR-RECTLY CONNECTED, ELECTRIC PARTS MAY BE DAMAGED.
- CHECK THAT THE EARTH WIRE IS NOT BROKEN OR DISCONNECTED BEFORE SERVICE AND INSTALLATION. FAILURE TO DO SO MAY CAUSE ELECTRIC SHOCK.
- DO NOT INSTALL NEAR CONCENTRATIONS OF COMBUSTIBLE GAS OR GAS VAPORS. FAILURE TO FOLLOW THIS INSTRUCTION CAN RESULT IN FIRE OR EXPLOSION.
- TO PREVENT THE INDOOR UNIT FROM OVERHEATING AND CAUSING A FIRE HAZARD. PLACE THE UNIT WELL AWAY (MORE THAN 2 M) FROM HEAT SOURCES SUCH AS RADIATORS, HEAT REGISTORS, FURNACE, STOVES, ETC.
- WHEN MOVING THE AIR-CONDITIONER FOR INSTALLATION IN ANOTHER PLACE, BE VERY CARE-FUL NOT TO ALLOW THE SPECIFIED REFRIGERANT (R32) TO BECOME MIXED WITH ANY OTHER GASEOUS BODY INTO THE REFRIGERATION CIRCUIT. IF AIR OR ANY OTHER GAS IS MIXED IN THE REFRIGERANT, THE GAS PRESSURE IN THE REFRIGERATION CIRCUIT WILL BECOME ABNORMALLY HIGH AND IT MAY RESULT IN THE PIPE BURSTING AND POSSIBLE PER-SONNEL INJURIES.
- IN THE EVENT THAT THE REFRIGERANT GAS LEAKS OUT OF THE PIPE DURING THE SERVICE WORK AND THE INSTALLATION WORK, IMMEDIATELY LET FRESH AIR INTO THE ROOM. IF THE REFRIGERANT GAS IS HEATED, SUCH AS BY FIRE, GENERATION OF POISONOUS GAS MAY RESULT.

#### **WARNING**

- Never modify this unit by removing any of the safety guards or bypassing any of the safety interlock
- Do not install in a place which cannot bear the weight of the unit. Personal injury and property damage can result if the unit falls.
- Before doing the electrical work, attach an approved plug to the power supply cord. Also, make sure the equipment is properly earthed.
- Appliance shall be installed in accordance with national wiring regulations. If you detect any damage, do not install the unit. Contact your dealer immediately.
- Do not use any refrigerant different from the one specified for complement or replacement. Otherwise, abnormally high pressure may be generated in the refrigeration cycle, which may result in a failure or explosion of the product or an injury to your body.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Be aware that refrigerants may not contain an odour.
- Do not pierce or burn as the appliance is pressurized. Do not expose the appliance to heat, flame, sparks, or other sources or ignition. Else, it may explode and cause injury or death.

- For R32 model, use pipes, flare nut and tools which is specified for R32 refrigerant. Using of existing (R22) piping, flare nut and tools may cause abnormally high pressure in the refrigerant cycle (piping), and possibly result in explosion and injury.
- Thickness of copper pipes used R32 must be more than 0.8mm. Never use copper pipes thinner than 0.8mm.
- After completion of installation or service, confi rm there is no leakage of refrigerant gas. It may generate toxic gas when the refrigerant contacts with fire.
- · Comply with national gas regulations.

#### **CAUTION**

- Exposure of unit to water or other moisture before installation could result in electric shock. Do not store it in a wet basement or expose to rain or water.
- After unpacking the unit, examine it carefully for possible damage.
- Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause of fire.
- Do not install in a place that can increase the vibration of the unit. Do not install in a place that can amplify the noise level of the unit or where noise and discharged air might disturb neighbors.
- To avoid personal injury, be careful when handling parts with sharp edges.
- Please read this installation manual carefully before installing the unit. It contains further important instructions for proper installation.
- The manufacturer shall not assume any liability for the damage caused by not observing the description of this manual.

#### For Reference:

If a heating operation would be continuously performed for a long time under the condition that the outdoor temperature is 0°C or lower, drainage of defrosted water may be difficult due to freezing of the bottom plate, resulting in a trouble of the cabinet or fan.

It is recommended to procure an antifreeze heater locally for a safe installation of the air conditioner. For details, contact the dealer.

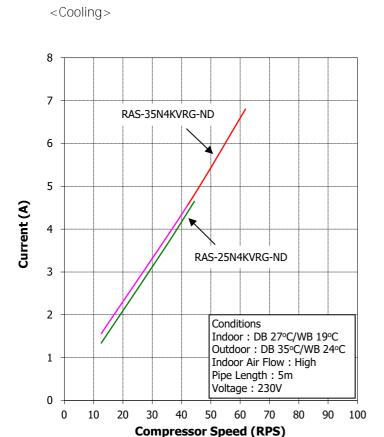
## 2. SPECIFICATIONS

## 2-1. Specification

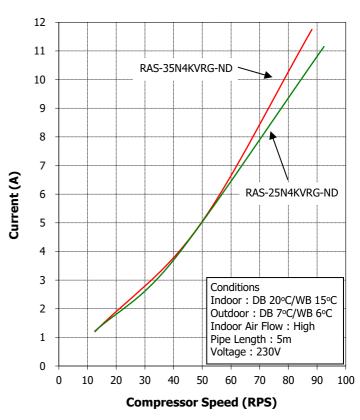
Unit model	Indoor				RAS-25N	4KVRG-ND	RAS-35N	4KVRG-ND	
	Outdoor				RAS-25J2AVSG-ND1		RAS-35J2AVSG-ND1		
Cooling capacity	1			(kW)		80	3.50		
Cooling capacity ra	ange			(kW)		-3.50		1.20-4.50	
Heating capacity	9-			(kW)	3.20 4.2				
Heating capacity r	ange			(kW)	1.00-	-7.20		-7.60	
Power supply				` '		1Ph/50Hz			
Electric	Indoor	Operation	mode		Cooling	Heating	Cooling	Heating	
characteristic		Running c		(A)	0.25-0.23	0.25-0.23	0.28-0.26	0.28-0.26	
onar a otonou o		Power con		(W)	35	35	40	40	
		Power fact	•	(%)	64	64	65	65	
	Outdoor	Operation		(75)	Cooling	Heating	Cooling	Heating	
	o atabo.	Running c		(A)	3.30-3.02	3.40-3.12	4.27-3.91	4.57-4.19	
		Power con		(W)	595	615	830	910	
		Power fact	•	(%)	82	82	88	90	
		Starting cu		(A)	3.55	3.65	4.55	4.85	
COP (Cooling / He	eating)	Otal ting of	iii Ciit	(/-)		/4.92		/4.42	
	Indoor	High	(Cooling / Heating)	(dB-A)		/45		/4.42	
Operating noise	ilidooi	High Medium	(Cooling / Heating) (Cooling / Heating)	(dB-A)		/36		/36	
10136		Low		(dB-A)		/25		/36 /25	
	Outdoor	LOW	(Cooling / Heating) (Cooling / Heating)	(dB-A)		/48		/49	
ndoor unit	Unit model		(Cooling / Healing)	(uD-A)		4KVRG-ND		4KVRG-ND	
maoor unit		Hoight		(mm)					
	Dimension	Height Width		(mm)		00 87		00 87	
				(mm)					
	Depth		(mm)		10		10		
	Net weight			(kg)		1		1	
	Fan motor output			(W)		30	30		
O 11 "		Air flow rate (Cooling / Heating)		(m <sup>3</sup> / hr)	650/		690/		
Outdoor unit	Unit model			(mm)	RAS-25J2AVSG-ND1		RAS-35J2AVSG-ND1		
	Dimension	Height			550		550		
		Width		(mm) (mm)	780		780		
		Depth	Depth		290		290		
	Net weight			(kg)	38			38	
	Compressor	Motor output Type		(W)	1100		11	100	
							nverter variable speed control		
		ļ							
		Model			DX136A1T-40N		l	A1T-30N	
	Fan motor output			(W)			3		
	Air flow rate		(Cooling / Heating)	(m <sup>3</sup> / hr)	1920	/1920	1980	)/1980	
Piping	Туре					Flare co	nnection		
connection	Indoor unit	Liquid side	1	(mm)		Ø	5.35		
		Gas side		(mm)	m) Ø9.52				
	Outdoor unit	Liquid side	Liquid side		Ø6.35				
		Gas side		(mm)	Ø9.52				
	Maximum length			(m)	20				
	Maximum charge-	less length		(m)	15				
	Maximum height o	difference		(m)	12				
Refrigerant	Name of refrigerar	nt				F	32		
	Weight			(kg)		0	.76		
Wiring		Power sup	ply			3 Wires: Include:	s earth (Outdoor)		
connection		Interconne	ction		4 Wires: Includes earth				
Usable temperatui	re range	Indoor	(Cooling / Heating)	(°C)		21-32	2/0-28		
		Outdoor	(Cooling / Heating)	(°C)		-15,46	-25,24		
Accessory	Indoor unit	Installation	n plate				1		
		Wireless r	emote controller				1		
		Batteries					2		
		Remote co	ontroller holder				1		
		Toshiba IA	Q filter			·	1		
		Mounting	screw			6(Ø4	x25L)		
			ontroller holder		<u> </u>	2(Ø3	1x16L)		
			wood screw			·			
		Installation					1		
		Owner's m	anual				1		

<sup>\*</sup> The specification may be subject to change without notice for purpose of improvement.

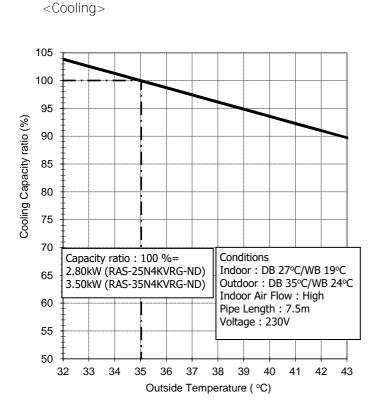
#### 2-2. Operation Characteristic Curve.



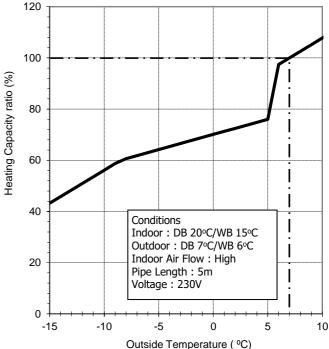




## 2-3. Capacity Variation ratio According to Temperature.







#### 3. REFRIGERANT R32

This air conditioner adopts the new refrigerant HFC (R32) which does not damage the ozone layer.

The next section describes the precautions for air conditioner using the new refrigerant. Conforming to contents of the next section together with the general cautions included in this manual, perform the correct and safe work.

#### 3-1. Safety During Installation/Servicing

The basic installation servicing work procedures are the same as conventional R410A models. As R32's pressure is about 1.6 times higher than that of R22, improper installation/servicing may cause a serious trouble. By using tools and materi-als exclusive for R32, it is necessary to carry out installation/servicing safely while taking the following precautions into consideration.

- Never use refrigerant other than R32 in an air conditioner which is designed to operate with R32. If other refrigerant than R32 is mixed, pressure in the refrigeration cycle becomes abnormally high, and it may cause personal injury, etc. by a rupture.
- 2. Confirm the used refrigerant name, and use tools and materials exclusive for the refrigerant. The refrigerant name R32 is indicated on the visible place of the outdoor unit of the air conditioner using R32 as refrigerant. To prevent mischarging, the diameter of the service port differs from that of R22. R32 and other HFCs are heavier than air, and therefore they are inclined to settle near the floor surface.

If the gas fills up the room or the bottom part of a room, it may also cause oxygen deficiency and may reach its combustion concentration.

# In order to prevent oxygen deficiency and R32 combustion, keep the room well-ventilated for a healthy work environment.

In particular, using HFCs in a basement room or confined area creates a higher risk; be sure to furnish the room with local exhaust ventilation. If a refrigerant leak is confirmed in a room an inadequately ventilated location, do not use a flame until the area has been ventilated appropriately and the work environment has been improved. The same applies in case of brazing, ensure appropriate ventilation to prevent oxygen deficiency and R32 combustion.

Check that there are no dangerous or combustible items nearby, and ensure a fire extinguisher is close at hand.

Keep a sufficient distance away from causes of fire (ignition sources) such as gas-burning equipment and electric heaters in places where installation, repairs, or similar work on air-conditioning equipment is performed.

- If a refrigeration gas leakage occurs during installation/servicing, be sure to ventilate fully.
   If the refrigerant gas comes into contact with fire, a poisonous gas may occur.
- 4. When installing or removing an air conditioner, do not allow air moisture dust or oil to remain in the refrigeration cycle. Otherwise, pressure in the refrigeration cycle may become abnormally high so that a rupture or personal injury may be caused.
- 5. After completion of installation work, check to make sure that there is no refrigeration gas leakage. If the refrigerant gas leaks into the room, coming into contact with fire in the fan-driven heater, space heater, etc., a poisonous gas may occur
- 6. When an air conditioning system charged with a large volume of refrigerant is installed in a small room, it is necessary to exercise care so that, even when refrigerant leaks, its concentration does not exceed the marginal level.
  If the refrigerant gas leakage occurs and its concentration exceeds the marginal level, an oxygen starvation accident may result.
- Be sure to carry out installation or removal according to the installation manual.
   Improper installation may cause refrigeration trouble, water leakage, electric shock, fire, etc.
- Unauthorized modifications to the air conditioner may be dangerous. If a breakdown occurs please call a qualified air conditioner technician or electrician.
   Improper repair's may result in water leakage, electric shock and fire, etc.

## 3-2. Refrigerant Piping Installation3-2-1. Piping Materials and Joints Used

For the refrigerant piping installation, copper pipes and joints are mainly used. Copper pipes and joints suitable for the refrigerant must be chosen and installed. Furthermore, it is necessary to use clean copper pipes and joints whose interior surfaces are less affected by contaminants.

#### 1. Copper Pipes

It is necessary to use seamless copper pipes which are made of either copper or copper alloy and it is desirable that the amount of residual oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface).

Otherwise, the expansion valve or capillary tube may become blocked with contaminants.

As an air conditioner using R32 incurs pres-sure higher than when using R22, it is necessary to choose adequate materials.

Thicknesses of copper pipes used with R32 are as shown in Table 3-2-1. Never use copper pipes thinner than 0.8 mm even when it is available on the market.

Table 3-2-1 Thicknesses of annealed copper pipes

		Thickness (mm)		
Nominal diameter	Outer diameter (mm)	R32(R410A)	R22	
1/4	6.35	0.80	0.80	
3/8	9.52	0.80	0.80	
1/2	12.70	0.80	0.80	
5/8	15.88	1.00	1.00	

#### 2. Joints

For copper pipes, flare joints or socket joints are used. Prior to use, be sure to remove all contaminants.

#### a) Flare Joints

Flare joints used to connect the copper pipes cannot be used for pipings whose outer diameter exceeds 20 mm. In such a case, socket joints can be used.

Sizes of flare pipe ends, flare joint ends and flare nuts are as shown in Tables 3-2-3 to 3-2-6 below.

#### b) Socket Joints

Socket joints are such that they are brazed for connections, and used mainly for thick pipings whose diameter is larger than 20 mm.

Thicknesses of socket joints are as shown in Table 3-2-2.

Table 3-2-2 Minimum thicknesses of socket joints

Nominal diameter	Reference outer diameter of copper pipe jointed (mm)	Minimum joint thickness (mm)
1/4	6.35	0.50
3/8	9.52	0.60
1/2	12.70	0.70
5/8	15.88	0.80

#### 3-2-2. Processing of Piping Materials

When performing the refrigerant piping installation, care should be taken to ensure that water or dust does not enter the pipe interior, that no other oil than lubricating oils used in the installed air-water heat pump is used, and that refrigerant does not leak. When using lubricating oils in the piping processing, use such lubricating oils whose water content has been removed. When stored, be sure to seal the container with an airtight cap or any other cover.

#### 1. Flare processing procedures and precautions

- a) Cutting the Pipe
  - By means of a pipe cutter, slowly cut the pipe so that it is not deformed.
- b) Removing Burrs and Chips
  - If the flared section has chips or burrs, refrigerant leakage may occur.
- Carefully remove all burrs and clean the cut surface before installation.
- c) Insertion of Flare Nut

#### d) Flare Processing

Make certain that a clamp bar and copper pipe have been cleaned.

By means of the clamp bar, perform the flare processing correctly.

Use either a flare tool for R32 or conventional flare tool.

Flare processing dimensions differ according to the type of flare tool. When using a conventional flare tool, be sure to secure "dimension A" by using a gauge for size adjustment.

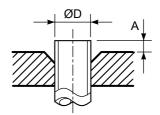


Fig. 3-2-1 Flare processing dimensions

Table 3-2-3 Dimensions related to flare processing for R32(R410A)

	Ocators		A (mm)				
Nominal diameter	Outer diameter	Thickness (mm)	Flare tool for R32	Conventional flare tool			
	(mm)	,	clutch type	Clutch type	Wing nut type		
1/4	6.35	0.8	0 to 0.5	1.0 to 1.5	1.5 to 2.0		
3/8	9.52	0.8	0 to 0.5	1.0 to 1.5	1.5 to 2.0		
1/2	12.70	0.8	0 to 0.5	1.0 to 1.5	2.0 to 2.5		
5/8	15.88	1.0	0 to 0.5	1.0 to 1.5	2.0 to 2.5		

Table 3-2-4 Dimensions related to flare processing for R22

	01			A (mm)		
Nominal diameter	Outer diameter	Thickness (mm)	Flare tool for R22	Conventional flare tool		
	(mm)	,	clutch type	Clutch type	Wing nut type	
1/4	6.35	0.8	0 to 0.5	0.5 to 1.0	1.0 to 1.5	
3/8	9.52	0.8	0 to 0.5	0.5 to 1.0	1.0 to 1.5	
1/2	12.70	0.8	0 to 0.5	0.5 to 1.0	1.5 to 2.0	
5/8	15.88	1.0	0 to 0.5	0.5 to 1.0	1.5 to 2.0	

Table 3-2-5 Flare and flare nut dimensions for R32(R410A)

Nominal	Outer diameter	Thickness	Dimension (mm)				Flare nut width
diameter	(mm)	(mm)	A	В	С	D	(mm)
1/4	6.35	0.8	9.1	9.2	6.5	13	17
3/8	9.52	0.8	13.2	13.5	9.7	20	22
1/2	12.70	0.8	16.6	16.0	12.9	23	26
5/8	15.88	1.0	19.7	19.0	16.0	25	29

Table 3-2-6 Flare and flare nut dimensions for R22

Nominal	Outer diameter (mm)	Thickness	Dimension (mm)				Flare nut width
diameter		(mm)	Α	В	С	D	(mm)
1/4	6.35	0.8	9.0	9.2	6.5	13	17
3/8	9.52	0.8	13.0	13.5	9.7	20	22
1/2	12.70	0.8	16.2	16.0	12.9	20	24
5/8	15.88	1.0	19.7	19.0	16.0	23	27
3/4	19.05	1.0	23.3	24.0	19.2	34	36

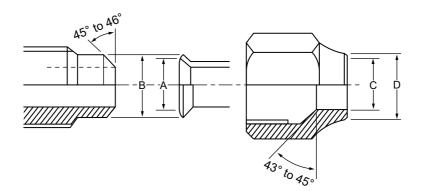


Fig. 3-2-2 Relations between flare nut and flare seal surface

#### 2. Flare Connecting Procedures and Precautions

- a) Make sure that the flare and union portions do not have any scar or dust, etc.
- b) Correctly align the processed flare surface with the union axis.
- c) Tighten the flare with designated torque by means of a torque wrench. The tightening torque for R32 is the same as that for conventional R22. Incidentally, when the torque is weak, the gas leakage may occur. When it is strong, the flare nut may crack and may be made non-removable. When choosing the tightening torque, comply with values designated by manufacturers. Table 3-2-7 shows reference values.

#### NOTE:

When applying oil to the flare surface, be sure to use oil designated by the manufacturer. If any other oil is used, the lubricating oils may deteriorate and cause the compressor to burn out.

Table 3-2-7 Tightening torque of flare for R32(R410A) [Reference values]

Nominal diameter	Outer diameter (mm)	Tightening torque N•m (kgf•cm)	Tightening torque of torque wrenches available on the market N•m (kgf•cm)
1/4	6.35	14 to 18 (140 to 180)	16 (160), 18 (180)
3/8	9.52	33 to 42 (330 to 420)	42 (420)
1/2	12.70	50 to 62 (500 to 620)	55 (550)
5/8	15.88	63 to 77 (630 to 770)	65 (650)

#### 3-3. Tools

#### 3-3-1. Required Tools

The service port diameter of packed valve of the outdoor unit in the air-water heat pump using R32 is changed to prevent mixing of other refrigerant. To reinforce the pressure-resisting strength, flare processing dimensions and opposite side dimension of flare nut (For Ø12.7 copper pipe) of the refrigerant piping are lengthened.

The used refrigerating oil is changed, and mixing of oil may cause a trouble such as generation of sludge, clogging of capillary, etc. Accordingly, the tools to be used are classified into the following three types.

- 1. Tools exclusive for R32 (Those which cannot be used for conventional refrigerant (R22))
- 2. Tools exclusive for R32, but can be also used for conventional refrigerant (R22)
- 3. Tools commonly used for R32 and for conventional refrigerant (R22)

The table below shows the tools exclusive for R32 and their interchangeability.

#### Tools exclusive for R32 (The following tools for R410A are required.)

Tools whose specifications are changed for R32 and their interchangeability

				R410A) pump installation	Conventional air-water heat pump installation
No.	Used tool	Usage	Existence of new equipment for R32	Whether conventional equipment can be used	Whether new equipment can be used with conventional refrigerant
1	Flare tool	Pipe flaring	Yes	*(Note 1)	0
2	Copper pipe gauge for adjusting projection margin	Flaring by conventional flare tool	Yes	*(Note 1)	*(Note 1)
3	Torque wrench (For Ø12.7)	Connection of flare nut	Yes	×	×
4	Gauge manifold	Evacuating, refrigerant	Evacuating, refrigerant Yes X		×
5	Charge hose	charge, run check, etc.	Yes	^	^
6	Vacuum pump adapter	Vacuum evacuating	Yes	×	0
7	Electronic balance for refrigerant charging	Refrigerant charge	Yes	×	0
8	Leakage detector	Gas leakage check	Yes	×	0

(Note 1) When flaring is carried out for R32(R410A) using the conventional flare tools, adjustment of projection margin is necessary. For this adjustment, a copper pipe gauge, etc. are necessary.

#### General tools (Conventional tools can be used.)

In addition to the above exclusive tools, the following equipments which serve also for R22 are necessary as the general tools.

- Vacuum pump
   Use vacuum pump by attaching
   vacuum pump adapter.
- 2. Torque wrench (For Ø6.35, Ø9.52)
- 3. Pipe cutter

- 4. Reamer
- 5. Pipe bender
- 6. Level vial
- 7. Screwdriver (+, -)
- 8. Spanner or Monkey wrench
- 9. Hole core drill (Ø65)
- 10. Hexagon wrench (Opposite side 4mm)
- 11. Tape measure
- 12. Metal saw

Also prepare the following equipments for other installation method and run check.

1. Clamp meter

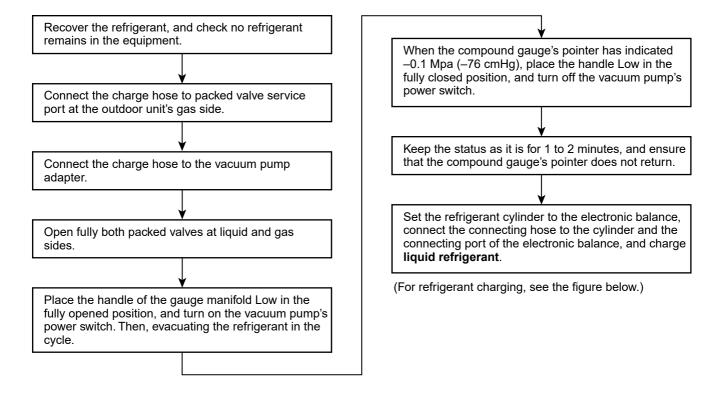
3. Insulation resistance tester

2. Thermometer

4. Electroscope

#### 3-4. Recharging of Refrigerant

When it is necessary to recharge refrigerant, charge the specified amount of new refrigerant according to the following steps.



- 1. Never charge refrigerant exceeding the specified amount.
- 2. If the specified amount of refrigerant cannot be charged, charge refrigerant bit by bit in COOL mode.
- 3. Do not carry out additional charging.
  When additional charging is carried out if refrigerant leaks, the refrigerant composition changes in the refrigeration cycle, that is characteristics of the air conditioner changes, refrigerant exceeding the specified amount is charged, and working pressure in the refrigeration cycle becomes abnormally high pressure, and may cause a rupture or personal injury.

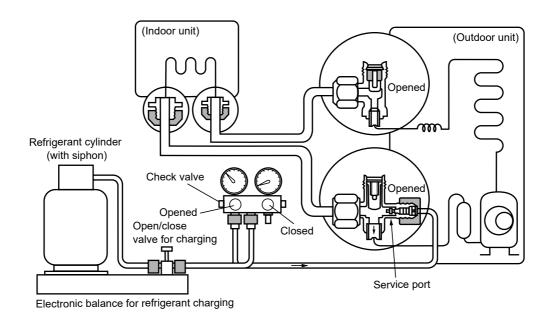


Fig. 3-4-1 Configuration of refrigerant charging

- 1. Be sure to make setting so that liquid can be charged.
- 2. When using a cylinder equipped with a siphon, liquid can be charged without turning it upside down.

Accordingly, when charging refrigerant from the refrigerant cylinder to the equipment, charge it turning the cylinder upside down if cylinder is not equipped with siphon.

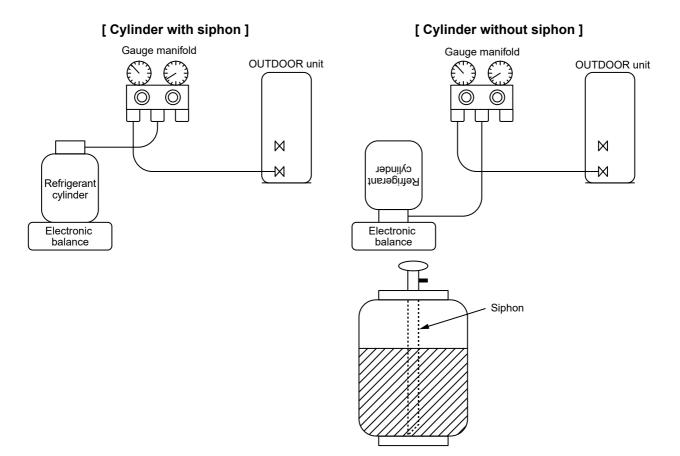


Fig. 3-4-2

#### 3-5. Brazing of Pipes

#### 3-5-1. Materials for Brazing

#### 1. Silver brazing filler

Silver brazing filler is an alloy mainly composed of silver and copper. It is used to join iron, copper or copper alloy, and is relatively expensive though it excels in solderability.

#### 2. Phosphor bronze brazing filler

Phosphor bronze brazing filler is generally used to join copper or copper alloy.

#### 3. Low temperature brazing filler

Low temperature brazing filler is generally called solder, and is an alloy of tin and lead. Since it is weak in adhesive strength, do not use it for refrigerant pipes.

- Phosphor bronze brazing filler tends to react with sulfur and produce a fragile compound water solution, which may cause a gas leakage. Therefore, use any other type of brazing filler at a hot spring resort, etc., and coat the surface with a paint.
- 2. When performing brazing again at time of servicing, use the same type of brazing filler.

#### 3-5-2. Flux

#### 1. Reason why flux is necessary

- By removing the oxide film and any foreign matter on the metal surface, it assists the flow of brazing filler.
- In the brazing process, it prevents the metal surface from being oxidized.
- By reducing the brazing filler's surface tension, the brazing filler adheres better to the treated metal.

#### 2. Characteristics required for flux

- Activated temperature of flux coincides with the brazing temperature.
- Due to a wide effective temperature range, flux is hard to carbonize.
- It is easy to remove slag after brazing.
- The corrosive action to the treated metal and brazing filler is minimum.
- It excels in coating performance and is harmless to the human body.

As the flux works in a complicated manner as described above, it is necessary to select an adequate type of flux according to the type and shape of treated metal, type of brazing filler and brazing method, etc.

#### 3. Types of flux

#### Noncorrosive flux

Generally, it is a compound of borax and boric acid.

It is effective in case where the brazing temperature is higher than 800°C.

#### Activated flux

Most of fluxes generally used for silver brazing are this type.

It features an increased oxide film removing capability due to the addition of compounds such as potassium fluoride, potassium chloride and sodium fluoride to the borax-boric acid compound.

## 4. Piping materials for brazing and used brazing filler/flux

Piping material	Used brazing filler	Used flux
Copper - Copper	Phosphor copper	Do not use
Copper - Iron	Silver	Paste flux
Iron - Iron	Silver	Vapor flux

- 1. Do not enter flux into the refrigeration cycle.
- 2. When chlorine contained in the flux remains within the pipe, the lubricating oil deteriorates. Therefore, use a flux which does not contain chlorine.
- 3. When adding water to the flux, use water which does not contain chlorine (e.g. distilled water or ion-exchange water).
- 4. Remove the flux after brazing.

#### 3-5-3. Brazing

As brazing work requires sophisticated techniques, experiences based upon a theoretical knowledge, it must be performed by a person qualified.

In order to prevent the oxide film from occurring in the pipe interior during brazing, it is effective to proceed with brazing while letting dry Nitrogen gas (N2) flow.

#### Never use gas other than Nitrogen gas.

#### 1. Brazing method to prevent oxidation

- 1) Attach a reducing valve and a flow-meter to the Nitrogen gas cylinder.
- 2) Use a copper pipe to direct the piping material, and attach a flow-meter to the cylinder.
- Apply a seal onto the clearance between the piping material and inserted copper pipe for Nitrogen in order to prevent backflow of the Nitrogen gas.
- 4) When the Nitrogen gas is flowing, be sure to keep the piping end open.
- 5) Adjust the flow rate of Nitrogen gas so that it is lower than 0.05 m³/Hr or 0.02 MPa (0.2kgf/cm²) by means of the reducing valve.
- 6) After performing the steps above, keep the Nitrogen gas flowing until the pipe cools down to a certain extent (temperature at which pipes are touchable with hands).
- 7) Remove the flux completely after brazing.

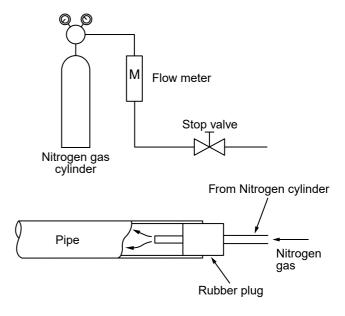
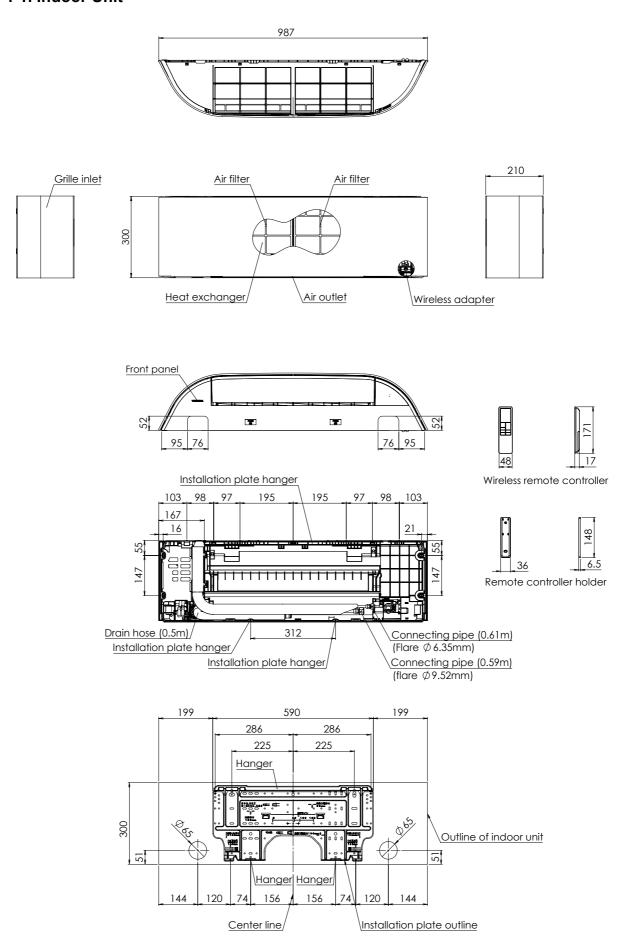


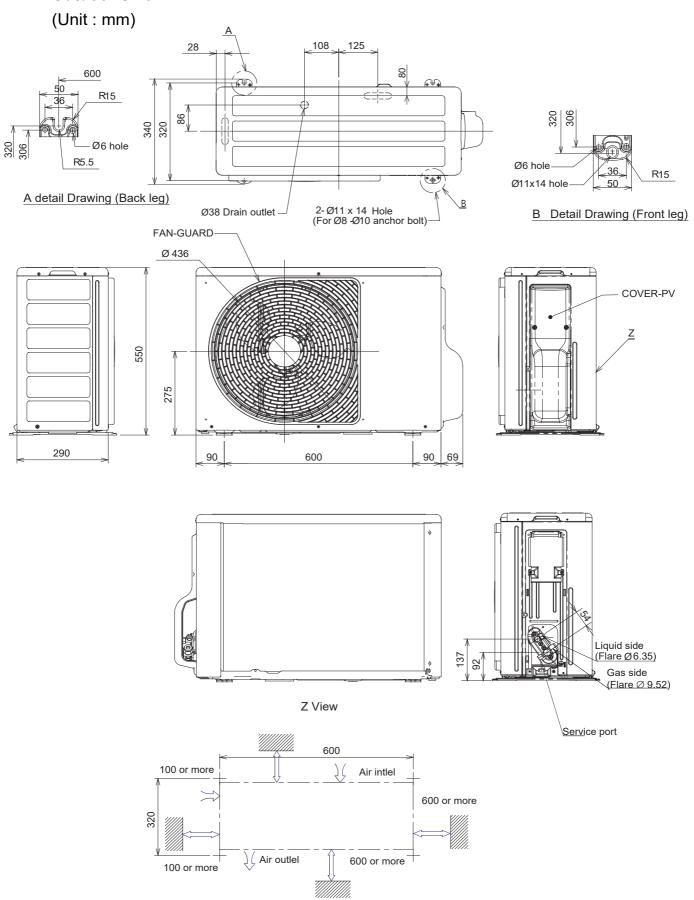
Fig. 3-5-1 Prevention of oxidation during brazing

#### 4. CONSTRUCTION VIEWS

#### 4-1. Indoor Unit

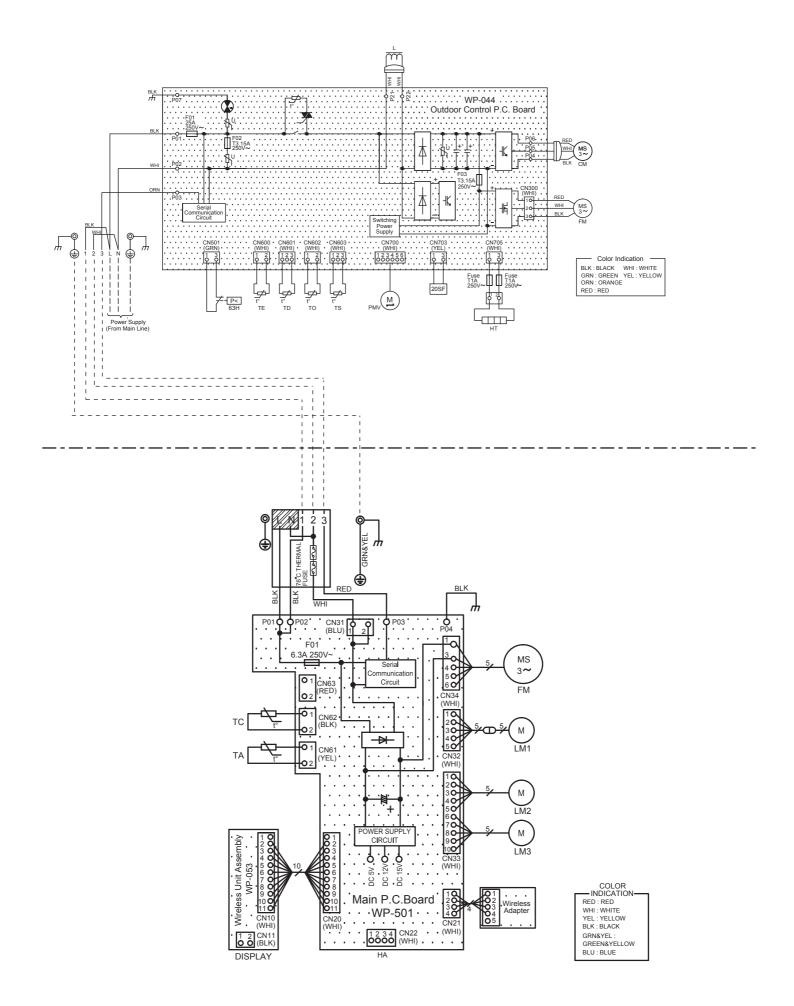


#### 4-2. Outdoor Unit



Installation dimension

#### 5. WIRING DIAGRAM



## 6. SPECIFICATIONS OF ELECTRICAL PARTS

### 6-1. Indoor Unit

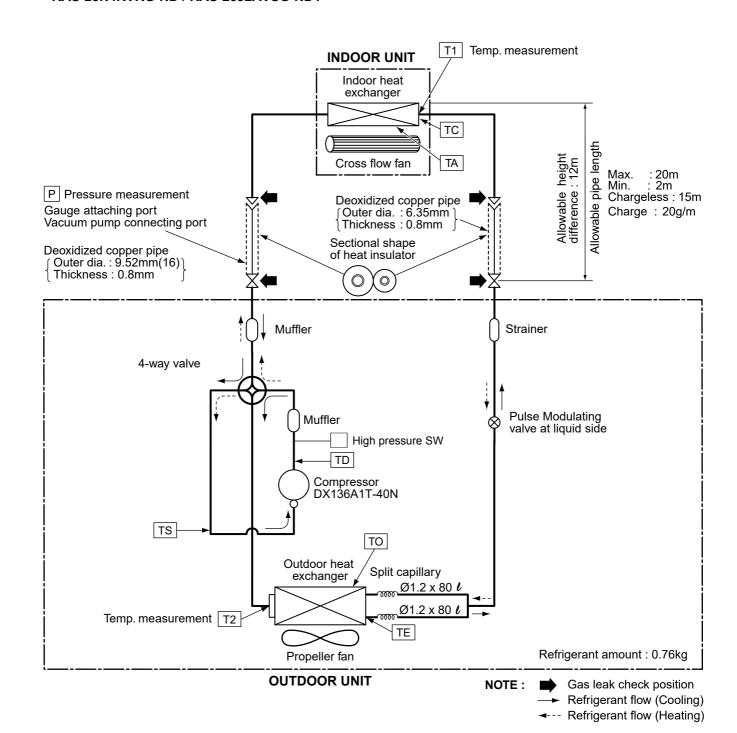
No.	Parts name	Type name	Specifications
1	Fan Motor (for indoor)	ICF-340-30-6	DC280-340V, 42W
2	Room temp. sensor (TA-sensor)	(-)	10kΩ at 25°C
3	Heat exchanger temp. sensor (TC-sensor)	(-)	10kΩ at 25°C
4	Louver motor	24BYJ48-ST, MSBPC20F04	Output (Rated) 4 phase, DC12V

#### 6-2. Outdoor Unit

No.	Parts name		Type name	Specifications
1	Compressor	RAS-25	DX136A1T-40N	3-Phases (4-Poles); 1100W
		RAS-35	DX151A1T-30N	3-Phases (4-Poles) ; 1100W
2	Fan Motor		WDF-340-A43-1	DC 140-340V ; 43W
3	Pulse Modulating Valve (PMV) co	il	CAM-MD12TCTH-5	DC 12V
4	4-Way valve coil		STF-H01AJ1872A1	AC 220-240V
5	Reactor		CH-69-Z-T	L = 19mH, 10A
6	Suction temp. sensor	(TS sensor)	(Inverter attached)	10kΩ at 25°C
7	Discharge temp. sensor	(TD sensor)	(Inverter attached)	62kΩ at 20°C
8	Outside air temp. sensor	(TO sensor)	(Inverter attached)	10kΩ at 25°C
9	Heat Exchanger temp. sensor	(TE sensor)	(Inverter attached)	10kΩ at 25°C
10	Terminal block	(6 poles)	JX0-6B	AC 250V, 30A

#### 7. REFRIGERANT CYCLE DIAGRAM

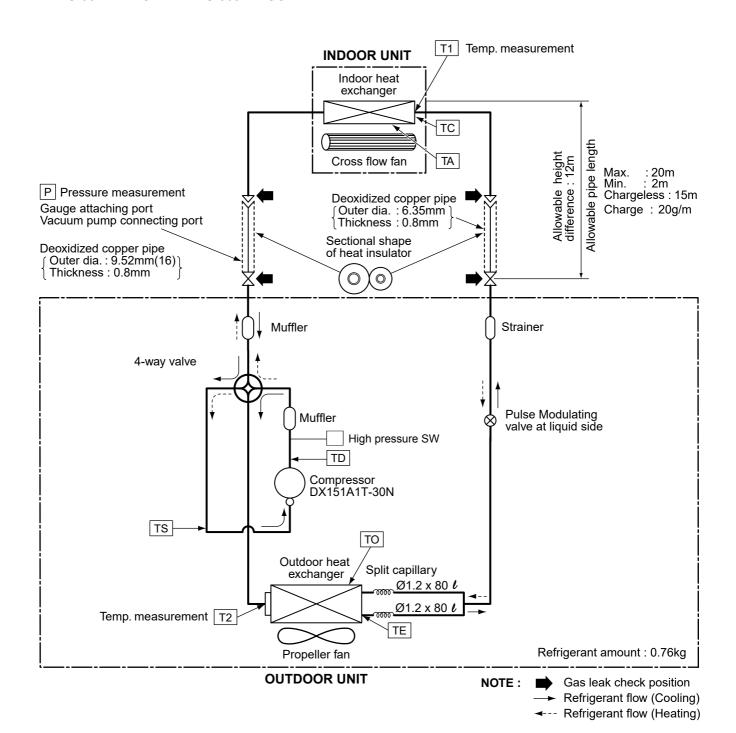
## 7-1. Refrigerant Cycle Diagram RAS-25N4KVRG-ND / RAS-25J2AVSG-ND1



#### NOTE:

• The maximum pipe length of this air conditioner is 15 m. When the pipe length exceeds 15m, the additional charging of refrigerant, 20g per 1m for the part of pipe exceeded 15m is required. (Max. 100g)

#### RAS-35N4KVRG-ND / RAS-35J2AVSG-ND1



#### NOTE:

• The maximum pipe length of this air conditioner is 15 m. When the pipe length exceeds 15m, the additional charging of refrigerant, 20g per 1m for the part of pipe exceeded 15m is required. (Max. 100g)

## 7-2. Operation Data

### <Cooling>

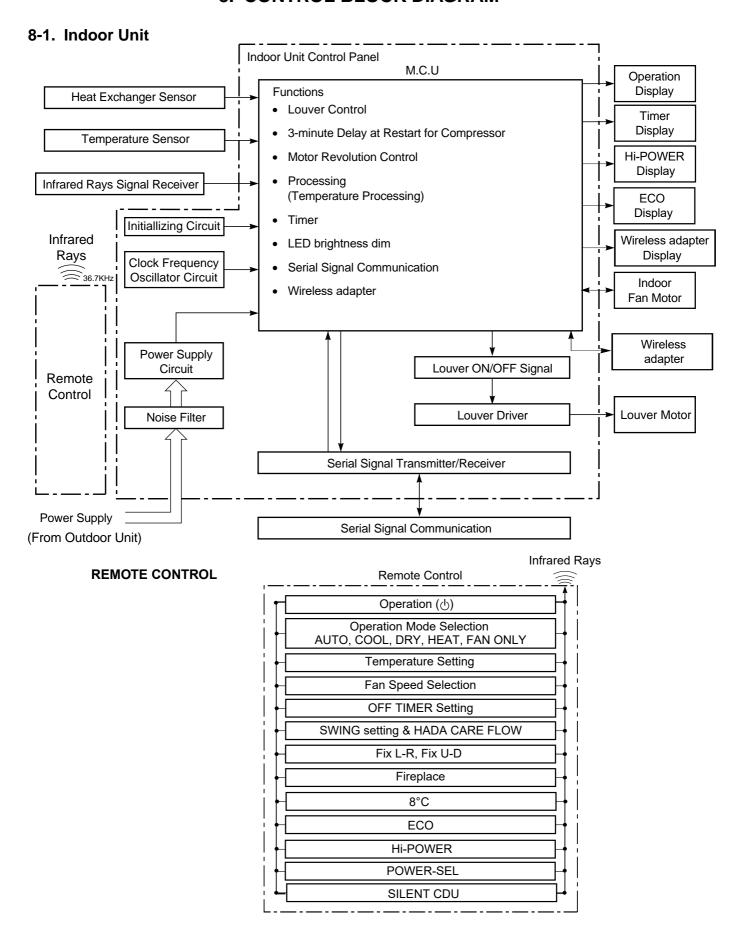
	eature ion(°C)	Model name	Standard pressure		Heat exchanger pipe temp.		•		J		Outdoor fan mode	•	Connecting piping
Indoor	Outdoor		P (MPa)	T1 (°C)	T2 (°C)			(rps)	(m)				
27/19	35/-	RAS-25N4KVRG-ND	1.0 to 1.1	14 to 15	41 to 42	High	High	34	5				
		RAS-35N4KVRG-ND	0.9 to 1.0	12 to 13	43 to 44	High	High	42	3				

### <Heating>

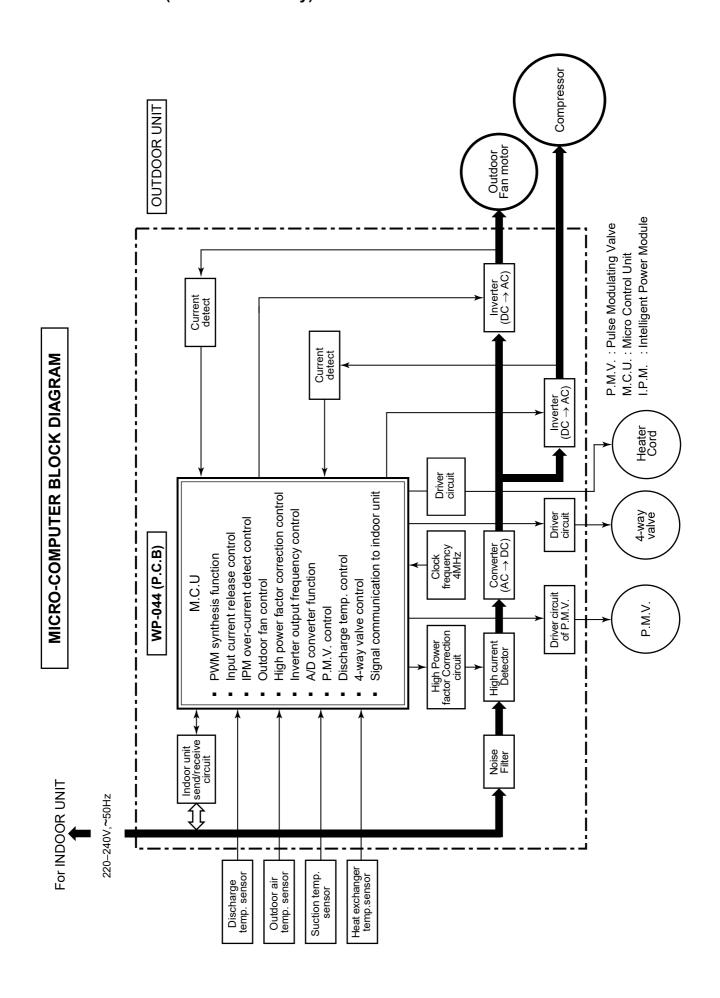
	eature ion(°C)	Model name	Standard pressure	_	Heat exchanger pipe temp.		Outdoor fan mode	Compressor revolution	Connecting piping
Indoor	Outdoor		P (MPa)	T1 (°C)	T2 (°C)			(rps)	(m)
20/-	7/6	RAS-25N4KVRG-ND	2.1 to 2.2	34 to 35	2 to 3	High	High	40	5
		RAS-35N4KVRG-ND	2.3 to 2.4	38 to 39	1 to 2	High	High	49	3

**NOTES :** Measure surface temperature of heat exchanger pipe around center of heat exchanger path U bent. (Thermistor themometer)

#### 8. CONTROL BLOCK DIAGRAM



### 8-2. Outdoor Unit (Inverter Assembly)



#### 9. OPERATION DESCRIPTION

#### 9-1. Outline of Air Conditioner Control

This air conditioner is a capacity-variable type air conditioner. Its system can control the speed of compressor motor according to load. The drive circuit for the indoor motor is mounted in the indoor unit. The drive circuits for outdoor motor and compressor are mounted in the outdoor unit.

The entire air conditioner is mainly controlled by the indoor unit controller. The indoor unit controller drives the indoor fan motor based upon command sent from the remote controller. Moreover, it also determines required speed of compressor motor and then transfers the operation command to the outdoor unit controller.

The outdoor unit controller erceives operation command from the indoor unit and controls revolution speed of the compressor motor.

The outdoor unit controller controls speed of compressor motor be controlling output voltage of the inverter and switching timing of supply power (current transfer timing), so that compressor motor operates according to the operation command. And then, the outdoor unit controller transfers the operating status back to the indoor unit controller.

As the compressor adopts four-poles brushless DC motor, the frequency of the supply power from inverter to compressor is two-times cycles of the actual number of revolution.

#### 1. Role of indoor unit controller

The indoor unit controller judges the operation commands from the remote controller and assumes the following functions.

- Judgment of suction air temperature of the indoor heat exchanger by using the indoor temp. sensor. (TA sensor)
- Judgment of the indoor heat exchanger temperature by using heat exchanger sensor (TC sensor) (Prevent-freezing control, etc.)
- · Louver motor control
- · Indoor fan motor operation control
- · LED (Light Emitting Diode) display control
- Transferring of operation command signal (Serial signal) to the outdoor unit
- Reception of information of operation status (Serial signal including outside temp. data) from the outdoor unit and judgment/display of error

#### 2. Role of outdoor unit controller

Receiving the operation command signal (Serial signal) from the indoor unit controller, the outdoor unit performs compressor operation control as followed to judgment of serial signal from indoor side.

- Detection of inverter input current and current release operation
- Over-current detection and prevention operation to IPM module (Compressor stop function)
- Compressor and outdoor fan stop function when serial signal is off (when the serial signal does not reach the board assembly of outdoor control by trouble of the signal system)
- Transferring of operation information (Serial signal) from outdoor unit controller to indoor unit controller
- Detection of outdoor temperature and operation revolution control
- Defrost control in heating operation (Temp. measurement by outdoor heat exchanger and control for 4-way valve and outdoor fan)

# 3. Contents of operation command signal (Serial signal) from indoor unit controller to outdoor unit controller

The following three types of signals are sent from the indoor unit controller.

- Operation mode set on the remote controller
- Compressor revolution command signal defined by indoor temperature and set temperature (Correction along with variation of room temperature and correction of indoor heat exchanger temperature are added.)
- Temperature of indoor heat exchanger
- For these signals ([Operation mode] and [Compressor revolution] indoor heat exchanger temperature), the outdoor unit controller monitors the input current to the inverter, and performs the followed operation within the range that current does not exceed the allowable value.

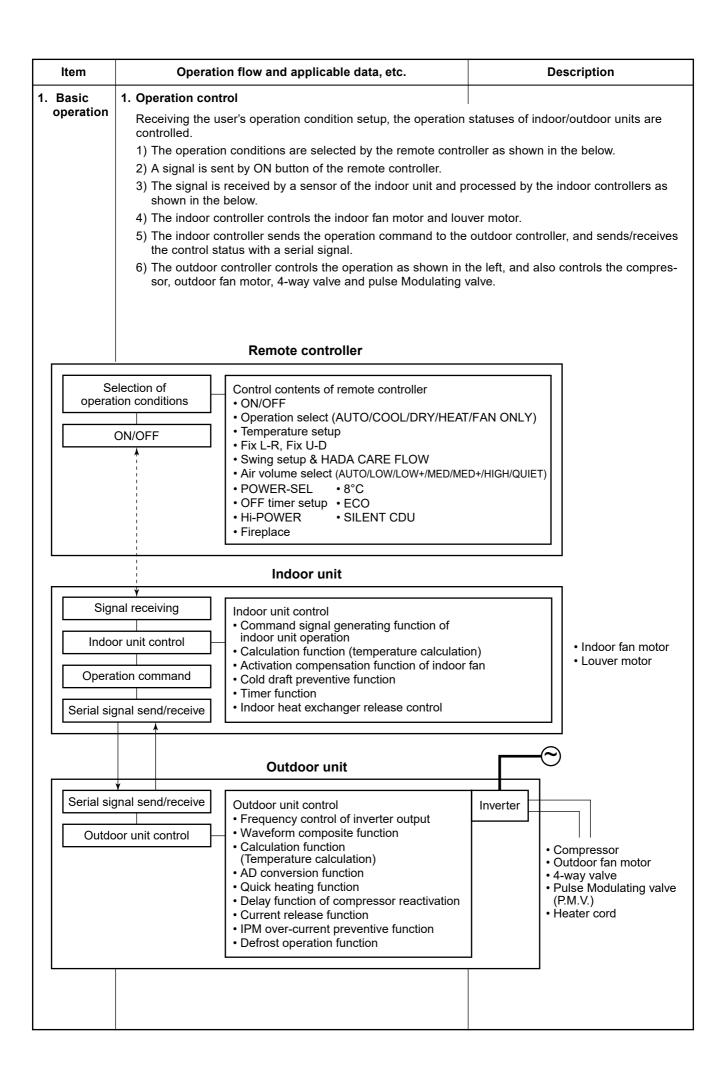
# 4. Contents of operation command signal (Serial signal) from outdoor unit controller to indoor unit controller

The following signals are sent from the outdoor unit controller.

- · The current operation mode
- · The current compressor revolution
- · Outdoor temperature
- Existence of protective circuit operation
   For transferring of these signals, the indoor unit
   controller monitors the contents of signals, and
   judges existence of trouble occurrence. Contents
   of judgment are described below.
  - Whether distinction of the current operation status meets to the operation command signal
  - Whether protective circuit operates
     When no signal is received from the outdoor unit controller, it is assumed as a trouble.

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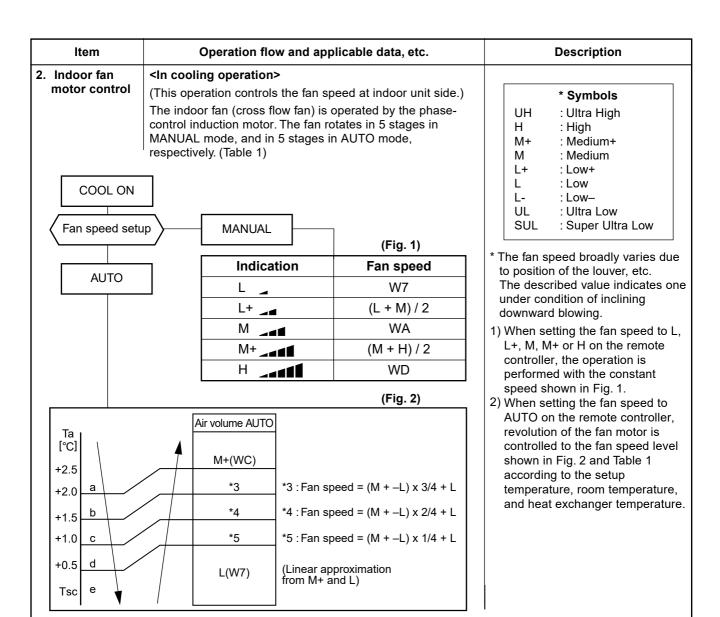


пеш	Operation now and appr	icable data, etc.	Description				
1. Basic	2. Cooling/Heating operation						
operation	The operations are performed in	the following parts by contr	ols according to cooling/heating conditions.				
	1) Receiving the operation ON	Receiving the operation ON signal of the remote controller, the cooling or heating operation s starts being transferred form the indoor controller to the outdoor unit.					
		the indoor unit side, the indoor fan is operated according to the contents of " <b>2. Indoor fa</b> l					
	motor control" and the louve	er according to the content	ts of "8. Louver control", respectively.				
	<ol> <li>The outdoor unit controls the 4-way valve according to the</li> </ol>		ressor, pulse Modulating valve and not the indoor unit.				
	, ,	, ,					
	Operation ON	Setup of remote controlle	er				
	<b>*</b>	Indoorfor motor control	/ Lauren aantral / On anation I In				
	Indoor unit control	Control (Requierment)	/ Louver control / Operation Hz				
	▼ ↑ Sending of operation command	d signal					
	<u> </u>		antical / Outside on few months and feel				
	<b>—</b>	Operation Hz control (Inc					
	Outdoor unit control	4-way valve control In	cooling operation: OFF heating operation: ON				
		Pulse Modulating valve of					
	3. AUTO operation		1) Detects the room temperature (Ta) when				
	Selection of operation mode		the operation started.				
	As shown in the following figure selecting automatically the statu		<ul><li>2) Selects an operation mode from Ta in the left figure.</li><li>3) Fan operation continues until an operation mode is selected.</li></ul>				
	(Ta) when starting AUTO operate						
	*1. When reselecting the oper speed is controlled by the						
	speed is controlled by the	previous operation mode.	When AUTO operation has started within 2 hours after heating operation				
	Та		stopped and if the room temperature is				
		operation	20°C or more, the fan operation is performed with "Super Ultra LOW" mode				
	Ts + 1		for 3 minutes. Then, select an operation mode.				
	Monitori	ng (Fan)	5) If the status of compressor-OFF				
	Ts – 1	operation	continues for 15 minutes the room temperature after selecting an operation				
	Trouting (	oporation.	mode (COOL/HEAT), reselect an				
			operation mode.				
	<b>4. DRY operation</b> DRY operation is performed acc	parding to the difference	Detects the room temperature (Ta) when the DRY operation started.				
	between room temperature and		2) Starts operation under conditions in the				
	as shown below.		left figure according to the temperature difference between the room				
	In DRY operation, fan speed is prevent lowering of the room te		temperature and the setup temperature				
	air flow from blowing directly to		(Tsc). Setup temperature (Tsc) = Set temperature on remote controller				
	[°C]		(Ts) + (0.0 to 1.0)				
	Ta \	<b>↓</b> L− (W5)	3) When the room temperature is lower 1°C or less than the setup temperature,				
			turn off the compressor.				
	+1.0	(W5+W3) / 2					
	+0.5						
	Too	SUL (W3)					
	Tsc   ¶	Fan speed					
		i ali specu					

Operation flow and applicable data, etc.

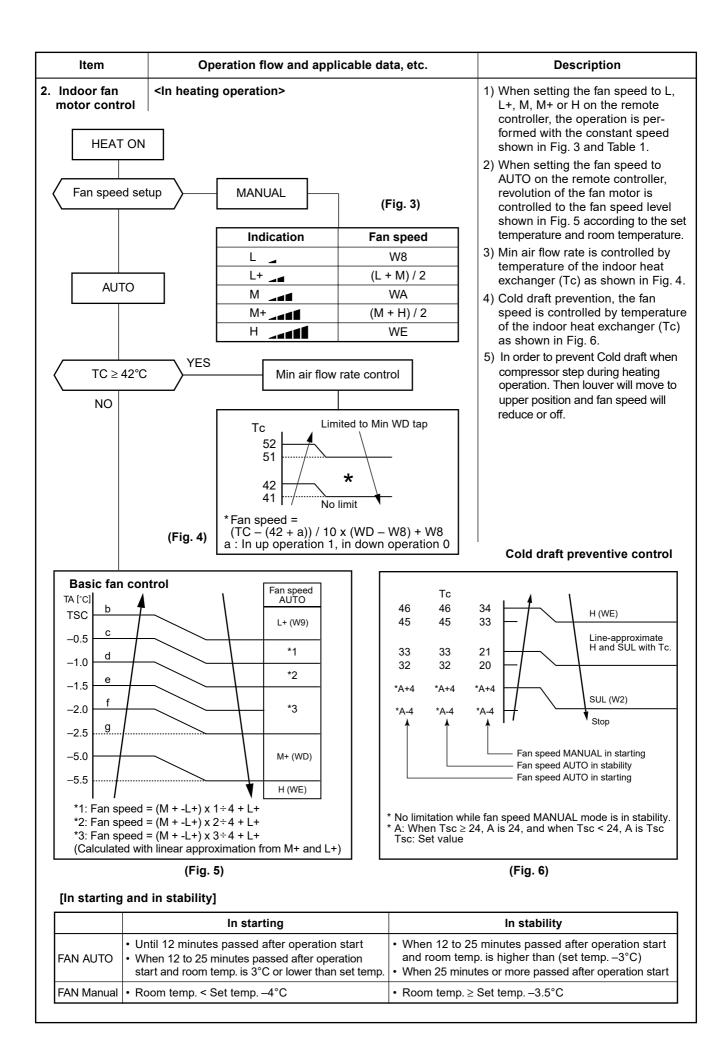
ltem

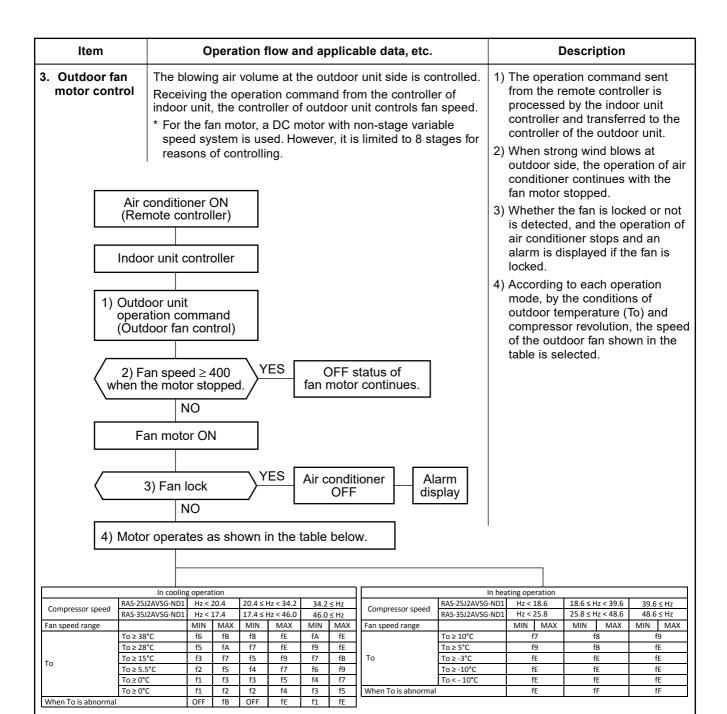
Description



#### (Table 1) Indoor fan air flow rate

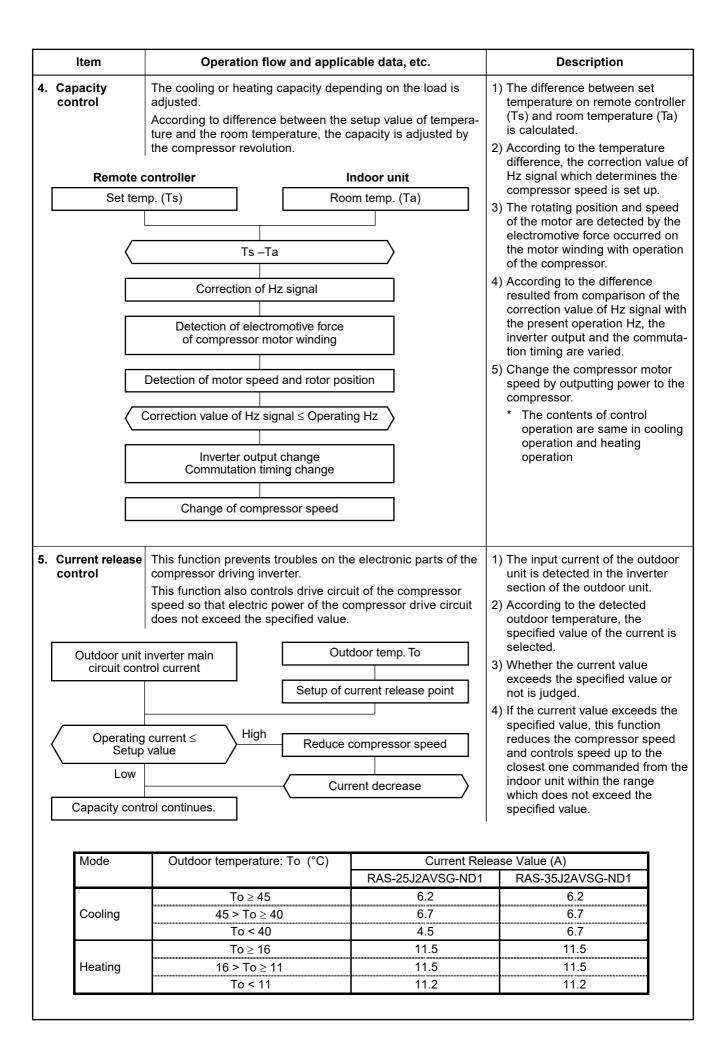
Fan speed	Mode				RAS-25N	4KVRG-ND		RAS-35N4KVRG-ND			
level				Cooling Heating			Cooling Heating				
	Cool	Heat	Dry	Fan speed	Air flow rate	Fan speed	Air flow rate	Fan speed	Air flow rate	Fan speed	Air flow rate
				(rpm)	m³/hr	(rpm)	m³/hr	(rpm)	m³/hr	(rpm)	m³/hr
WF		UH		1100	750	1200	810	1100	750	1200	810
WE	UH	Н		1100	750	1150	770	1100	750	1170	780
WD	Н	M+	UH	1000	650	1000	650	1050	690	1050	690
WC	M+		Н	950	610	900	570	1000	650	900	570
WB		М	M+	900	570	800	490	900	570	800	490
WA	М		М	800	490	700	410	800	490	700	410
W9		L+		650	370	650	370	650	370	650	370
W8	L+	L	L+	630	360	580	320	630	360	580	320
W7	L	L-		580	320	550	300	580	320	550	300
W6	L-		L	530	280	530	280	530	280	530	280
W5	UL	UL	L-	520	270	520	270	520	270	520	270
W4			UL	510	260	510	260	510	260	510	260
W3	SUL		SUL/SL-	510	260	510	260	510	260	510	260
W2		SUL		500	260	510	260	500	260	510	260
W1				500	260	500	260	500	260	500	260

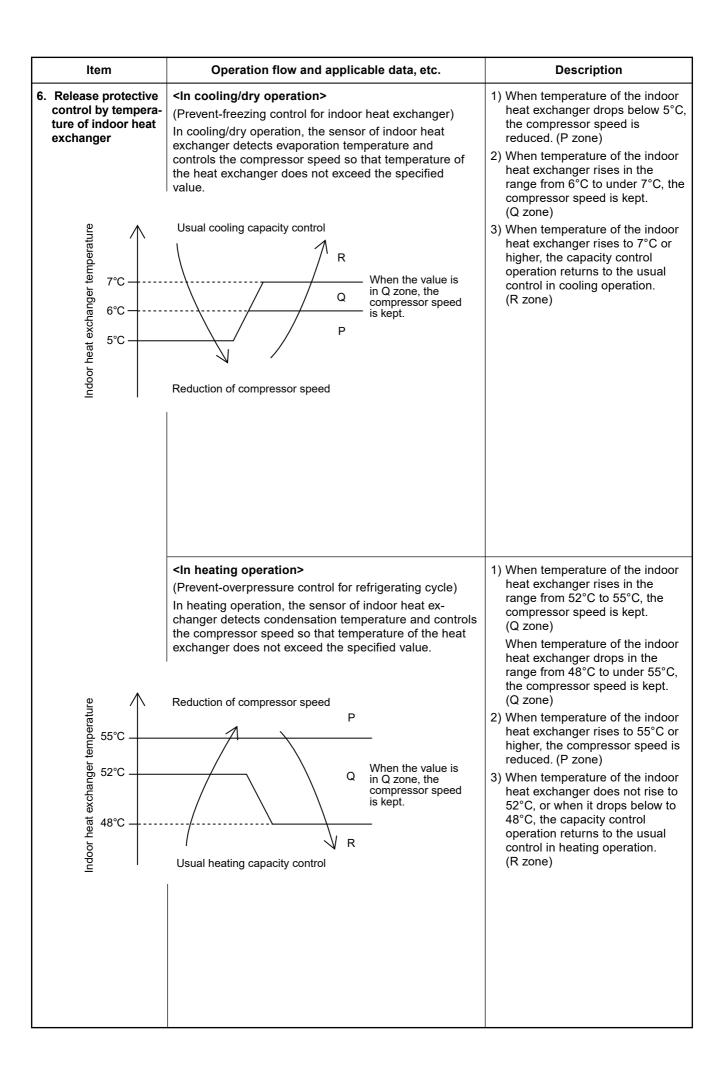




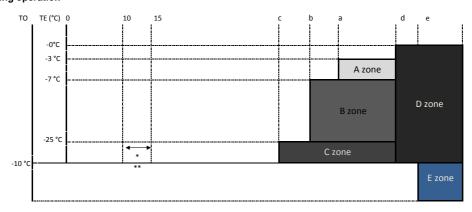
#### Outdoor fan speed (rpm)

Model name		Fan speed range														
	f0	f1	f2	f3	f4	f5	f6	f7	f8	f9	fA	fB	fC	fD	fE	fF
RAS-25J2AVSG-ND1	0	300	300	300	360	450	500	550	600	650	700	700	750	800	860	900
RAS-35J2AVSG-ND1	0	300	300	300	360	450	500	550	600	650	700	700	750	800	860	900





Item	Operation flow and applicable data, etc.	Description
7. Defrost control (Only in heating operation)	The temperature sensor of the outdoor heat ex-changer (TE sensor) judges the frosting status of the outdoor heat exchanger and the defrost operation is performed with 4-way valve reverse defrost system.	The necessity of defrost operation is detected by the outdoor heat exchanger temperature (TE) and outdoor air temperature (TO). The conditions to detect the necessity of defrost operation differ in A, B, C, D or E zone each. And starting of defrost operation of each zone are explain on Table-1.
Start of heating ope	eration	·



- \* The minimum TE value and TO value between 10 and 15 minutes after heating operation has started are stored in memory as TE0 and TO0, respectively.
- \*\* When TO < -10°C, TE are not considered.

#### Table 1

Defrost zone	In normal TO	In abnormal TO ***
A zone	TO≥ -10 °C & (TE0-TE)-(TO0-TO)≥3°C & SH-SH0≤2	TE0-TE≥3°C & SH-SH0≤2
B zone	TO≥ -10 °C & (TE0-TE)-(TO0-TO)≥2°C & SH-SH0≤2	TE0-TE≥2°C & SH-SH0≤2
C zone	To <u>&gt;</u> -10 °C & TE≤ -2	5°C & SH-SH0≤2
D zone	TO > -10 °C & Accumulate heating open	ration time <u>&gt;</u> e minute & TE < 0 °C
E zone	TO< -10°C & accumulate heating operation time > e min	No E zone

<sup>\*\*\*</sup> If TO sensor is **abnormal**, TO value is fixed at -10°C.

#### Table 2

Heating operation	Model				
(time)	RAS-25J2AVSG-ND1 RAS-35J2AVSG-				
а	43				
b	41				
С	3	1			
d	70				
е	9	0			

#### <Defrost operation>

- · Defrost operation in A to C zones
- 1) Stop operation of the compressor for 20 seconds.
- 2) Invert (ON) 4-way valve 10 seconds after stop of the compressor.
- 3) The outdoor fan stops at the same time when the compressor stops.
- 4) When temperature of the indoor heat exchanger becomes 38°C or lower, stop the indoor fan.

#### <Finish of defrost operation>

- Returning conditions from defrost operation to heating operation
- 1) Temperature of outdoor heat exchanger rises to +8°C or higher.
- 2) Temperature of outdoor heat exchanger is kept at +5°C or higher for 80 seconds.
- Defrost operation continues for 15 minutes.

#### <Returning from defrost operation>

- 1) Stop operation of the compressor for approx. 50 seconds.
- Invert (OFF) 4-way valve approx.
   seconds after stop of the compressor.
- 3) The outdoor fan starts rotating at the same time when the compressor starts.

	Operation flow and applicable data, etc.	Description
3. Louver control  1) Louver  position	<ul> <li>This function controls the air direction of the indoor unit.</li> <li>The position is automatically controlled according to the operation mode (COOL/HEAT).</li> <li>The set louver position is stored in memory by the microcomputer, and the louver returns to the stored position when the next operation is performed. (Cooling/Heating memory position)</li> <li>The angle of the louver is indicated as the louver closes fully is 0°.</li> <li>Louver position in cooling operation</li> </ul>	
	Cooling operation/ AUTO (COOL  Initial setting of "Cooling storage position" Louver : Directs downward (39.5°)	
	Heating operation/ AUTO (HEAT)  Initial setting of "Heating storage position" Louver: Directs downward (79.1°)	
2) Air direction ad  Horizontal blowing	Air direction  Inclined blowing downward blowing blowing  Inclined blowing blowing blowing	The louver position car be arbitrarily set up by pressing [FIX] button.

Item	Operation flow and applicable data, etc.	Description
8. Louver control		
3) Swing	<ul> <li>Swing operation is perfor in range 35° with the Fixed position as the center.</li> <li>If the swing range exceeded either upper or lower limit position, swing operation is performed in range 35° from the limit.</li> </ul>	Swing     When pressing [SWING] button during operation, the louver starts swinging.
	Upper Limit Position.  Swing range 35°  Fixed Position before start before start Position.  Swing Fixed Position  Swing Fixed Position  Fixed	
4) HADA CARE Position	<ul> <li>Air flow upward to the ceiling provide indirect air flow to body and homogenize room temperature.</li> <li>HADA care Louver position.</li> </ul>	

### Cooling operation/ AUTO (COOL)



Initial setting of "Cooling storage position" Louver : Directs downward (33.9°)

### Heating operation/ AUTO (HEAT)



Initial setting of "Heating storage position" Louver : Directs downward (79.1°)

# Item 9. ECO operation TΔ +6.5 +6.0 +5.5 +5.0 +4.5 +4.0 +3.5 +3.0 +2.5 +2.0 +1.5 +1.0 +0.5 TSC -0.5 -1.0 -2.0

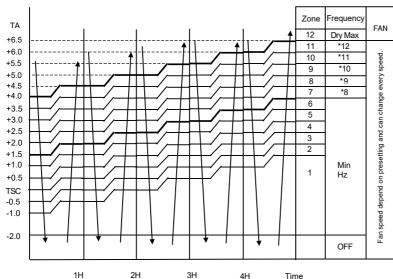
#### Operation flow and applicable data, etc.

## When pressing [ECO] button on the remote controller, a

## Economic operation is performed.

#### <Cooling operation>

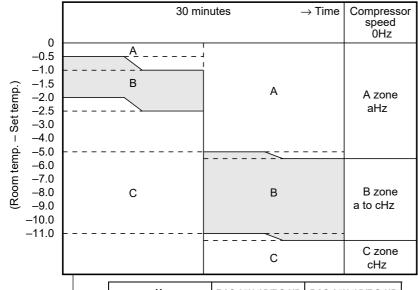
This function operates the air conditioner with the difference between the set and the room temperature as shown in the following figure.



- \* 12 (DRY max COOL min) /6 x 5 + COOL min
- \* 11 (DRY max COOL min) /6 x 4 + COOL min
- \* 10 (DRY max COOL min) /6 x 3 + COOL min
- \* 9 (DRY max COOL min) /6 x 2 + COOL min \* 8 (DRY max - COOL min) /6 x 1 + COOL min

Тар	RAS-25N4KVRG-ND	RAS-35N4KVRG-ND	
Cool min (Hz)	13	13	
DRY max (Hz)	35	35	

#### <Heating operation>



# Hz RAS-25N4KVRG-ND RAS-35N4KVRG-ND a (Heating min Hz) 13 13 c (Heating Quiet) 31 55

#### <Cooling operation>

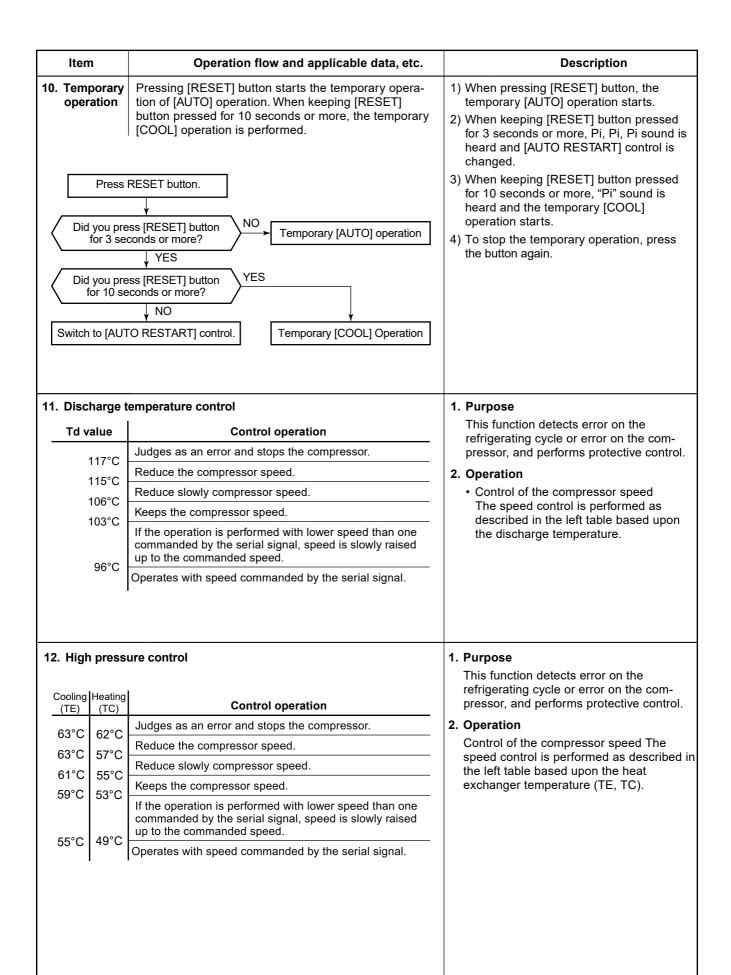
 The control target temperature increase 0.5°C per hour up to 2°C starting from the set temperature when ECONO has been received.

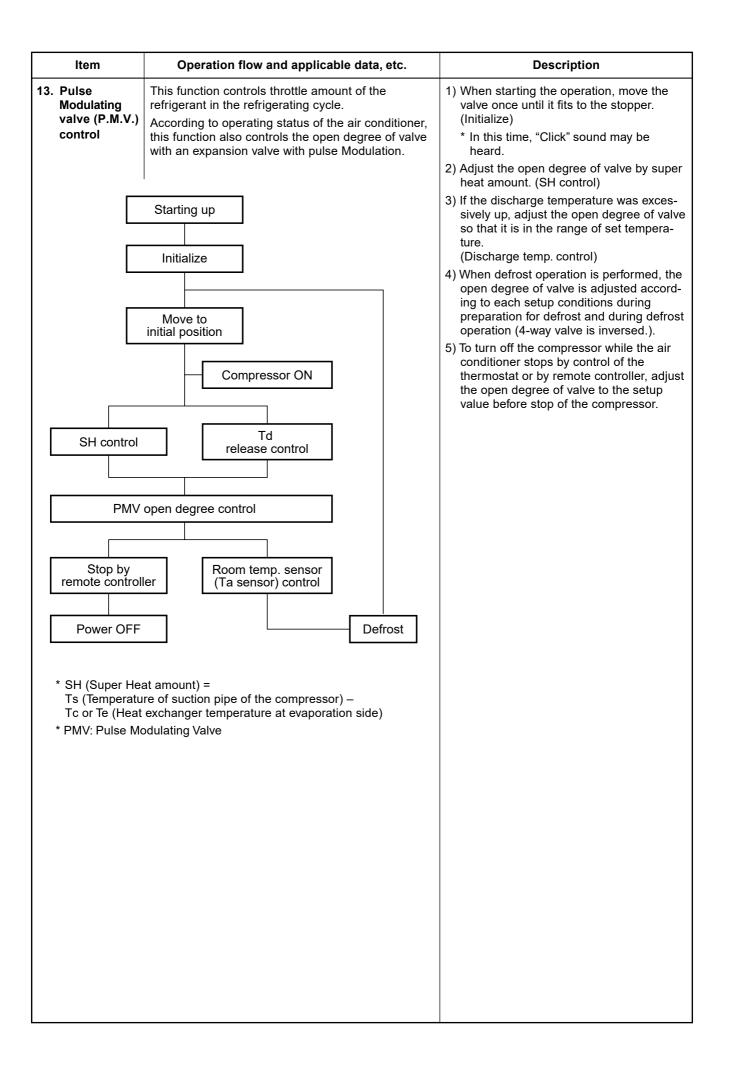
Description

- The indoor fan speed is depend on presetting and can change every speed after setting ECO operation.
- The compressor speed is controlled as shown in the left figure.

#### <Heating operation>

- Setting the compressor speed to Max. aHz, the temperature zone in which the operation can be performed with Max. cHz is gradually widened after 30 minutes passed when starting ECO operation.
- The indoor fan speed is depend on presetting and can change every speed after setting ECO operation.





## Item Operation flow and applicable data, etc. Description 14. Self-Cleaning 1. Purpose function The Self-Cleaning operation is to minimize the growth of mold, bacteria etc. by running the fan and drying so as to keep the inside of the air conditioner clean. Unit now performing cooling or dry operation **Self-Cleaning operation** When the cooling or dry operation shuts down, the unit automatically starts the Self-Press "STOP" button Cleaning operation which is then performed for the specified period based on duration of the operation which was performed prior to the shutdown, after which the Self-Cleaning operation stops. Only timer indicator lights, and Self Cleaning operation starts (The Self-Cleaning operation is not performed after a heating operation.) 2. Operation Time set now elapses 1) When the stop signal from the remote controller or timer-off function is received, only the timer indicator light. 2) The period of the Self-Cleaning operation Operation stops is determined by the duration of the operation performed prior to the reception of the stop code. 3) After the Self-Cleaning operation has been performed for the specified period, the unit stops operating. · During Self-Cleaning operations: The louver opens slightly. The indoor fan operates continuously at a speed of 500 rpm. Self-Cleaning operation times Self-Cleaning operation time Operation time No Self-Cleaning operation Up to 10 minutes performed (0 minutes) Cooling: Auto (cooling) Dry 10 minutes 30 mins. or longer Heating: Auto (heating) Auto (fan only) No Self-Cleaning operation performed Shutdown • To stop an ongoing Self-Cleaning operation at any time Press the start/stop button on the remote controller twice during the Self-Cleaning operation. (After pressing the button for the first time, press it for the second time without delay (within 10 minutes).)

Item	Operation flow and applicable data, etc.	Description
14. Self-Cleaning function		

#### 14-1-1. Self-Cleaning diagram

Operation display	ON	OFF	OFF
FCU fan	ON rpm is depend on presetting.	ON (500RPM)	OFF
FCU louver	OPEN	OPEN (12.7°)	CLOSE
Timer display	ON or OFF depend on presetting of timer function.	ON	ON or OFF depend on presetting of timer function.
Compressor	ON or OFF depend on presetting per room temperature.	OFF	OFF
CDU fan	ON or OFF depend on presetting per room temperature.	OFF	OFF
	Cool mode or dry mode operation more than 10 mins.	Self-Cleaning mode operate 30 mins.	Operation time
ı	Turn off by rom	Automa	tically turn-off.

Turn off by remote controller or timer-off function.

#### 14-1-2. Self-Cleaning function release

#### How to set/cancel Self-Cleaning function

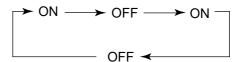
To set/cancel the Self-Cleaning function, proceed as follows:

- Setting diagnosis code "06" on remote controlle (See detail of setting diagnosis code in 11-4-1)
- Turn on the power supply to air conditioner, after that press [RESET] button on air conditioner 1 time to turn on the air conditioner (The LED display will show in operation LED)
- Take the remote controller to direction of LED display on air conditioner, press button "up" (see detail of setting diagnosis code in 11-4-1) 1 time to send the code "07"
  - \*(within 3 sec. after press [RESET] button),\* then air conditioner will shutdown automatically. Also, LED display will show flash follow the able below.

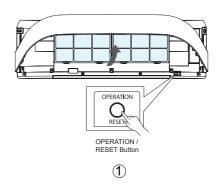
Self-cleaning function	Operation LED	Timer LED
ON	Flash 1 Hz	None
OFF	Flash 1 Hz	Flash 1 Hz

Note) Table above will show current status of Self-Cleaning function

 Set or Cancel Self-Cleaning function by push the RESET button on air conditioner.
 When setting is changed, the sound warning will alarm "Beep". The setting is changed following below.



 Turn on air conditioner again by remote controller to confirm setting.



Item	Operation flow and applicable data, etc.	Description
15. Remote-A or B selection	Setting the remote controller  To separate using of remote control for each indoor unit in case of 2 air conditioner are installed nearly.  Remote Control B Setup.  1. Press RESET button on the indoor unit to turn the air conditioner ON.  2. Point the remote control at the indoor unit.  3. Push and hold button on back side of Remote Control.  "00" will be shown on the display. (Picture 1)  4. Press during pushing ."B" will show on the display and "00" will disappear and the air conditioner will turn OFF. The Remote Control B is memorized. (Picture 2)  Note: 1. Repeat above step to reset Remote Control to be A.  2. Remote Control A has not "A" display.  3. Default setting of Remote Control from factory is A.	1. Purpose This operation is to operate only one indoor unit using one remote controller.  2. Description When operating one indoor unit in a situation where two indoor units have been installed in the same room or nearby rooms, this operation prevents the remote controller signal from being received simultaneously by both units, thus preventing both units from operating.  3. Operation The indoor unit on which the remote controller selection has been set to B receives the signal of the remote controller also set to B.  (At the factory the remote controller selection is set to A on all the indoor units. There is no A setting display.)
16. Hi-POWER Mode	([Hi-POWER] Feature set from MENU button When [Hi-POWER] Feature is select while the indoor unit is in Auto, Cooling or Heating operation, Hi-P mark is indicated on the display of the remote controller and the unit operates as follows.  1. Automatic operation • The indoor unit operates in according to the current operation.  2. Cooling operation • The preset temperature drops 1°C (The value of the preset temperature on the remote controller does not change.) The indoor unit's fan speed level increase 1 tap  3. Heating operation • The preset temperature increases 2°C (The value of the preset temperature on the remote controller does not change.) The indoor unit's fan speed level increase 1 tap  4. The Hi-POWER mode can not be set in Dry operation	

Item	Operation flow and applicable data,etc	Description
17. POWER Selection Mode	To automatically control room temperature to save energy (except in DRY and FAN ONLY mode)  Power Selection 75% is 75% of maximum current.  Power Selection 50% is 50% of rate maximum current.  Press MENU button for enter menu setting and press TEMP. button to select POWER-SEL.  Enter POWER-SEL setting by press MENU button again.  Select POWER-SEL level by press TEMP. button.  Confirm POWER-SEL level by press MENU button.  Leave from menu setting display by select EXIT.  POWER-SELECTION AND SILENT OPERATION  P-SEL P-SEL  100% 75% 50%	The function is used when its circuit breaker is shared with other electrical appliances. It limits the maximum current/ power consumption to 100%, 75% or 50%. The lower the percentage, the higher the saving and also the longer the compressor lifetime.  Description  When the level is selected, Power-SEL level flashes on LCD display for 3 seconds. In case of 75% and 50% level, number "75" or "50" also flashes for 2 seconds.  Note: Due to the reason that POWER SELECT FUNCTION limits the maximum current, inadequate capacity may occur.
18. Silent Operation	Silent 1: Cooling/heating capacity is limited maximum for 70% of rated. Only compressor speed is limited. Silent 2: CDU sound level is limited for lowest CDU sound level. Compressor and CDU fan speed are limited.  1. Press MENU button for enter menu selection. During triangle mark blink can select menu by press TEMP. button.  2. Enter SILENT set by press MENU button. 3. Select SILENT operation by press TEMP. button. 4. Confirm selected feature by press MENU button again. 5. Leave from menu setting display by select	This function is used when the user need to keep silent at outdoor side. It is limit maximum compressor speed and CDU fan speed. Sound level can be implemented by 2 silent level.  Sound level: Rated level > Silent 1 > Silent 2  Note: Due to Silent operation reason, In adequate cooling/heating capacity may occur.

# EXIT. Silent Operation description

		Coc	Cooling		ting
Model	Silent Operation	Compressor frequncy (rps)	CDU Fan Speed (rpm)	Compressor frequncy (rps)	CDU Fan Speed (rpm)
RAS-25J2AVSG-ND1	Silent1	32.4	normal	43.8	normal
NAS-23J2AV3G-ND1	Silent2	20.4	520	28.8	520
RAS-35J2AVSG-ND1	Silent1	48.6	normal	57.0	normal
NAS-SSIZAVSG-NDI	Silent2	28.8	600	37.8	600

## **POWER-SELECTION AND SILENT OPERATION**



Item	Operation flow and applicable data,etc	Description
19. Fireplace Operation	Fireplace 1: Cancel cold draft prevention control and fan speed depend on user require base on basic control.  Fireplace 2: Cold draft prevention control is active with super low fan speed (640 rpm).  1. Press MENU button for enter menu setting and press TEMP. button to select FIREPLACE.  2. Enter FIREPLACE set by press MENU button.  3. Select FIREPLACE operation by press TEMP. button.  4. Confirm selected feature by press MENU button again.  5. Leave from menu setting display by select EXIT.  Fireplace Operation  FIREPLACE 1 FIREPLACE 2 None	Keep air circulation during other heat source applied.  Note: With Fireplace operation on heating mode indoor unit always runs and cold air breezing might be occurred.
20. 8°C heating / Frost protective operation	Press TEMP button down on remote controller in heating mode until set temperature lower than 17°C.  Set temperature is performed for 5°C to 16°C and no cold draft prevention control.	Intended for cold latitudes and performs objective heating operation.
21. QUIET mode	The "Quiet mode" selected from [ FAN ] button;  - The fan of the indoor unit will be restricted the revolving speed at speed UL.  - The compressor speed is controlled as show in the figure.    Model	Quiet mode is the system which, control the revolving speed of indoor fan to work constantly at lower than speed L. In addition, noise level of indoor unit is less than usual.  Remarks:  1. Quiet mode is unable to work in dry mode.  2. Quiet mode is appropriate to work with less cooling load and less heating load condition.  Because of the fan speed L- may cause not enough the cooling capacity or heating capacity.

Ite	m	Operation f	flow and applicable data, etc.		Description	
22. Display		To decrease the display lamp brightness or turn it off.				
adjustn		1. Press and l d∂ or d∃) i	nold ran for 3 seconds until br s shown on remote control LCD the	ightness lev	/el ( <b>dŪ, d l</b> , e button.	
		2. Press 🗷				
		Remote control LCD	Operation display		Brightness	
		d3	上amp illuminates full brightness.		100%	
		95	条章 Lamp illuminates 50% brightness.		50%	
		d !	Lamp illuminates 50% brightness an operation lamp is turned off.	d the	50%	
		d0	© O All lamps are turned off.		All turned off	
22 Oneset	ion	Operating system	n setting	1 Durna	220	
23. Operation mode Selectable Operating system setting			appro 2. Opera	sing the operating priate in real con	dition	
				"Heat able to only s	"Heat pump" system. Throug able to cooling only system h only system or return to facto default.	
	<ul> <li>Do cut J804 for cooling only system</li> <li>Do cut J805 for heating only system</li> <li>Do cut both of J804 and J805 for return to factory default.</li> </ul>					

## Item Operation flow and applicable data, etc. Description 24. Short Timer In the normal condition, after switching one circuit **Purpose** breaker, 3-minute delay time for compressor and To start the unit immediately for the purpose of 1 hour for plasma air purifier are set for the testing, trial...etc, short timer can be used. maintenance of the unit. maintenance of the unit. **Short Timer Setting** Press [(<sup>l</sup>)] button to turn the unit OFF. Set the operation mode or plasma air purifier on the remote control without sending the signal to the unit. Press button and hold, "00" will show on display, them press [ FIX + ] button to make "00" disappear. 4 Φ **TEMP** Press [(|)] button to turn the unit ON. MODE 3 (5) When short timer is activated, all FAN MENU setting on the remote operates FIX♣ FIX◀▶ immediately, besides, all indicatiors on front panel turns ON continuously for 3 seconds. 25. Cord Base plate cord heater control 1. Purpose Heater Base plate freeze prevention of the TO temp. **Heater output** Control outdoor unit. 2. Operation OFF As shown in the figure below, the base plate freeze preventive heater is controlled by temperature ON of the outside temperature sensor (Equivalent to 100W) (TO). When TO sensor is defective or the air conditioner is cooling operation, heater output is turned off.

#### 9-3. Auto Restart Function

This indoor unit is equipped with an automatic restarting function which allows the unit to restart operating with the set operating conditions in the event of a power supply being accidentally shut down.

The operation will resume without warning three minutes after power is restored.

This function is set to work from the factory.

The Auto Restart Function will not restart operation of the air conditioner in following case.

- The Auto Restart Function is setup to OFF.
- The power supply is shut down during the air conditioner is OFF.
- The power supply is shut down when timer operatio is set.

#### 9-3-1. How to Cancel the Auto Restart Function

To cancel Auto Restart Function, proceed as follows.

- 1. The power supply to the unit must be ON; The function will not set or reset if the power supply is OFF.
- 2. Press the [RESET] button located on the front panel of the indoor unit for more than 3 seconds.
- 3. After 3 seconds, the unit beeps three times.

## · When the system is on stand-by (not operating)

Operation	Motion	s
Press [RESET] button for more than three seconds. (Less than 10 seconds)	The unit is on standby. ↓	
		e white indicator is on.
	↓ After approx. three sec	e white indicator flashes
OPERATION		5 seconds.
RESERVE	If the unit is not required to operate at button once more or use the remote of	
OPERATION / RESET Button		

## • When the unit is in operation

Operation	N	Motions
Press [RESET] button for more than three seconds. (Less than 10 seconds)	The unit is in operation. ↓	The white indicator is on.
	The unit stops operating.  ↓ After approx. thi	The white indicator is turned off.
	The unit beeps three times.	The white indicator flashes
OPERATION	The drift beeps times times.	for 5 seconds.
RESERVE	If the unit is required to operate once more or use the remote of	e at this time, press [RESET] button controller to turn it on.
OPERATION / RESET Button		

#### 9-3-2. How to Set the Auto Restart Function

To set Auto Restart Function, proceed as follows:

- 1. The power supply to the unit must be ON; The function will not set or reset if the power supply is OFF.
- 2. Press the [RESET] button located on the front panel of the indoor unit for more than 3 seconds.
- 3. After 3 seconds, the unit beeps three times and the indicator blinks for 5 seconds.

## • When the unit is standby (Not operating)

Operation	Motions
Press [RESET] button for more than three seconds. (Less than 10 seconds)	The unit is on standby. ↓
OPERATION / RESET Button	The unit starts to operate. The white indicator is on.  ↓ After approx. three seconds,  The unit beeps three times and continues to operate.  If the unit is not required to operate at this time, press [RESET] button once more or use the remote controller to turn it off.

### . When the system is operating

Operation	Motions		
Press [RESET] button for more than three seconds. (Less than 10 seconds)	The unit is in operation.	The white indicator is on.	
OPERATION / RESET Button	The unit stops operating.  ↓ After approx. the The unit beeps three times.  If the unit is required to operationice more or use the remote	te at this time, press [RESET] button	

### 9-3-3. Power Failure During Timer Operation

When the unit is turned off because of power failure during timer operation, the timer operation is canceled. In that case, set the timer operation again.

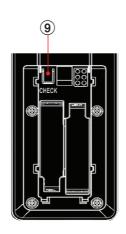
#### NOTE:

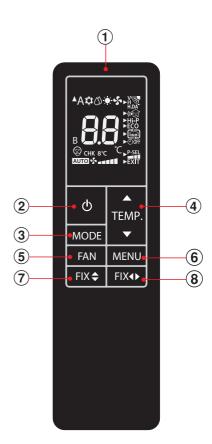
The Daily Timer is reset while a command signal can be received from the remote controller even if it stopped due to a power failure.

#### 9-4. Remote control

#### 9-4-1. Remote control and its functions

- 1) Infrared signal emitter
- (2) Start/Stop button
- (3) Mode select button
- (4) Temperature button
- 5 Fan speed button
- (6) Menu select button
- (7) Set louver Up-Down button
- (8) Set louver Left-Right button
- 9 Check button\*\*Check button under battery cover





#### 9-4-2. Operation of remote control

#### 1. AUTOMATIC OPERATION

To automatically select cooling, heating, or fan only operation

1. Press MODE : Select Auto A.

2. Press TEMP. : Set the desire

: Set the desired temperature. Min. 17°C, Max. 30°C.

3. Press FAN : Select AUTO, LOW \_, LOW+ \_\_, MED \_\_\_, MED \_\_\_\_, MED+ \_\_\_\_, MIGH \_\_\_\_\_\_ or Quiet ©

## 2. COOLING / FAN ONLY / OPERATION

1. Press MODE: Select Cool \*\*, or Fan only \*.

2. Press TEMP: Set the desired temperature. Min. 17°C, Max. 30°C.

Fan Only: No temperature indication

3. Press S FAN : Select AUTO, LOW \_, LOW+ \_\_, MED \_\_\_, MED \_\_\_, MED+\_\_\_, HIGH \_\_\_\_, FOR ONLY OF CONTROL OF CON

#### 3. HEATING and 8°C OPERATION

1. Press MODE : Select Heat

2. Press TEMP: : Set the desired temperature. Min = 5°C, Max = 30°C.

\* Temperature range 5-16°C is Heat mode with 8°C operation with less of energy usage

3. Press FAN :: Select AUTO, LOW \_, LOW+ \_\_, MED \_\_\_\_, MED \_\_\_\_, MED+ \_\_\_\_\_, MED \_\_\_\_\_, MED \_\_\_\_\_,

Note: During 8°C mode active (temperature range 5-16°C), some operation such as QUIET, HI-POWER, TIMER OFF cannot use.

#### 4. DRY OPERATION

For dehumidification, a moderate cooling performance is controlled automatically.

1. Press MODE : Select Dry

2. Press TEMP. : Set the desired temperature. Min. 17°C, Max. 30°C.

Note: DRY mode fan speed is set to Auto only.

#### 5. MENU SETUP

For select more setting of Air conditioner such as Louver select Hi Power, OFF Timer and other use MENU button.



#### LOUVER SWING and HADA CARE FLOW OPERATION



Comfortable air flow can select from feature.

### Louver swing operation:



• To distribute air flow in both vertical and horizontal by swing the louver automatically.

### HADA care flow operation:



 Air flow upward to the ceiling, provide Indirect air flow to body and homogenize room temperature.

#### Note:

• During HADA CARE FLOW mode, FIX button cannot active.

#### Louver Swing and HADA Care Flow Operation Setting

1. Press MENU button for enter menu selection



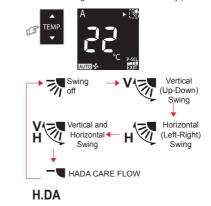
During triangle mark blink can select menu by press TEMP. button.



Enter Louver set by press MENU button again.
 triangle mark will stop blink and setting feature will be blink instead.



3. Select Louver swing or HADA CARE FLOW by press TEMP. button.



4. Confirm selected feature by press MENU button again.



When feature had selected will return to menu selection display triangle mark will blink  $\hriangle$  .

5. Leave from menu setting display by select exit and press menu button



Leave from menu setting to normal display (no triangle and feature blink).

#### **SILENT OPERATION (Outdoor Unit)**



Keep outdoor unit operating silently to ensure either yourself or neighborhood will have a tight sleep in nighttime. By this feature, the heating capacity will be optimized to deliver such silent experience. The silent operation can be selected from one of two purposes (Silent 1 and Silent 2).

There are three setting parameters: Standard level > Silent 1 > Silent 2



- Though operating silently, the Heating (or Cooling) capacity is still prioritized to ensure having sufficient comfort inside the room.
- This setting is a perfect balance between the Heating (or Cooling) capacity and the Sound level of outdoor unit.

#### Silent 2:



- Compromising the Heating (or Cooling) capacity to the Sound level in any circumstance where the outdoor unit's sound level is highly prioritized.
- This setting has a purpose to reduce the maximum sound level of outdoor unit by 4 dB(A).

#### Note:

• While activating of Silent operation, inadequate heating (or cooling) capacity may occur.

#### Silent Operation Setting

1. Press MENU button for enter menu selection



During triangle mark blink can select menu by press TEMP. button.



2. Enter SILENT set by press MENU button. triangle mark will stop blink and setting feature will be blink instead.



3. Select SILENT operation by press TEMP. button





4. Confirm selected feature by press MENU button again.



When feature had selected will return to menu selection display triangle mark

5. Leave from menu setting display by select EXIT.



#### Hi POWER OPERATION



To automatically control room temperature and airflow for faster cooling or heating operation (except in DRY and FAN ONLY mode)

1. Press MENU button for enter menu setting and press TEMP. button to





Blink both triangle and feature mark Feature not yet set

2. Confirm selected feature by press MENU button again.





Blink only triangle Feature already set

3. Leave from menu setting display by select EXIT.



#### **ECO OPERATION**



To automatically control room temperature to save energy (except in DRY and FAN ONLY mode)

1. Press MENU button for enter menu setting and press TEMP. button to





Blink both triangle and feature mark Feature not yet set

2. Confirm selected feature by press MENU button again.





Blink only triangle Feature already set

3. Leave from menu setting display by select EXIT.





#### Note:

 Cooling operation: the set temperture will increase automatically 1 degree/hour for 2 hours (maximum 2 degrees increase). For heating operation the set temperature will decrease.

#### **FIREPLACE OPERATION**



Keep indoor unit's fan blowing continuously during thermo off, to circulate heat from other sources over the room. There are three setting parameters Default setting > Fireplace 1 > Fireplace 2

#### Fireplace 1:



During thermo off period, the indoor unit's fan will continue to run by the same speed, previously selected by end-user.

## Fireplace 2:



During thermo off period, the indoor unit's fan will continue to run at super-low speed, programmed from factory.

#### **Fireplace Operation Setting**

1. Press MENU button for enter menu setting and press TEMP. button to select FIREPLACE





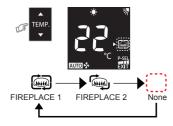
Blink both triangle and feature mark Feature not

Enter FIREPLACE set by press MENU button.
 triangle mark will stop blink and setting feature will be blink instead.





3. Select FIREPLACE operation by press TEMP. button.



4. Confirm selected feature by press MENU button again.





When feature had selected will return to menu selection display triangle mark will blink

5. Leave from menu setting display by select EXIT.





#### Note:

- While Fireplace operation on heating mode, indoor unit fan always runs and cold air breezing might be occurred.
- · Fireplace will operate in Heating mode only.

#### **TIMER OFF OPERATION**



To set the timer OFF when the air conditioner is operating.

1. Press MENU button for enter menu setting and press TEMP. button to





Blink both triangle and feature mark Feature not

2. Enter TIMER set by press MENU button. triangle mark will stop blink and setting feature will be blink instead.





3. Select TIMER OFF by press TEMP. button. Can select TIMER OFF from 0.5 - 12hrs.





4. Confirm TIMER OFF by press MENU button.





Blink only triangle Feature already set

5. Leave from menu setting display by select EXIT.





#### Note:

- Keep the remote control in accessible transmission to the indoor unit; otherwise, the time lag of up to 15 minutes will occur
- The setting will be saved for the next same operation.

#### Cancel TIMER OFF

6. During TIMER OFF already set (no.5) press MENU button and press TEMP. button to select TIMER OFF.





Blink only triangle Feature already set

7. Press MENU button again will cancel TIMER OFF.





Blink both triangle and feature mark Feature not yet set

8. Leave from menu setting display by select EXIT.





#### **POWER-SELECTION OPERATION**



This function is used when the circuit breaker is shared with other electrical appliances. It limits the maximum current and power consumption to 100%, 75%, or 50% and can be implemented by POWER-SELECTION. The lower percentage, the higher saving and also longer compressor lifetime. Note:

- Due to the reason that POWER-SELECTION function limits the maximum current, inadequate cooling or heating capacity may occur.
- 1. Press MENU button for enter menu setting and press TEMP. button to select ECO





2. Enter POWER-SEL setting by press MENU button again.

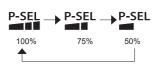




3. Select POWER-SEL level by press TEMP. button.







4. Confirm POWER-SEL level by press MENU button.



5. Leave from menu setting display by select EXIT.



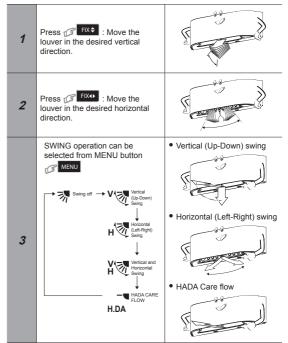


#### 6. MANUAL DEFORST OPERATION

To defrosting the heat exchanger of the outdoor unit during Heating operation Press and hold MENU: for 5 seconds , then remote control display will show dF as picture  $\overline{\bigcirc 1}$  for 2 seconds.



### 7. AIR FLOW DIRECTION



- Do not move the louver manually by hands or others.
  The louver may automation positioning by some operation mode.

#### 8. WIRELESS LAN CONNECTION

### Toshiba Home AC Control

Please visit the application store on your device to download and install Toshiba Home AC Control application.



**Application** 

Keyword: Toshiba Home AC Control

#### Toshiba Home AC Control application support



iOS: 9.0 or later.



Android: Version 5.0 or later.

#### About Toshiba Home AC Control

- 1. Toshiba Home AC Control can control AC operation by Smartphone or tablet (mobile device) via internet connection.
- 2. Everywhere control, control software run on Cloud system and mobile device can set and monitor AC operation via internet connection.
- 3. Everyone can control, 1 Wireless adapter maximum 5 User (use 1 email register).
- 4. Multi AC system control, 1 user can control 10 AC.
- 5. Group control.
  - 5.1 Can create and control 3 groups of AC.
  - 5.2 Can control max 10 AC per group.

#### Note:

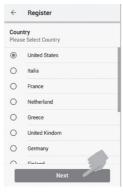
- 1. Adapter can register only 1 email address, if register with new email, current email will be invalid.
- 2.1 email address can use for register 5 devices for control same AC.

#### Register process

Open an application and follow register for User registration.

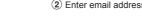




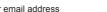




1 Tab Register







3 Select country





5 Enter password by 6-10 characters, combination of alphabet and number



6 Check for term and condition



7 Confirm information



8 Information will be submitted to email, click link to confirm

#### Login to Toshiba Home AC Control application.

① Connect Wireless adapter to A/C and turn on power supply.



Build-in type, Wireless adapter already install with unit.





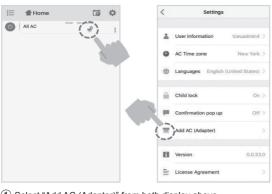


3 Enter user name and password.



4 Login successful.

#### Add Wireless adapter for control by Toshiba Home AC Control application.







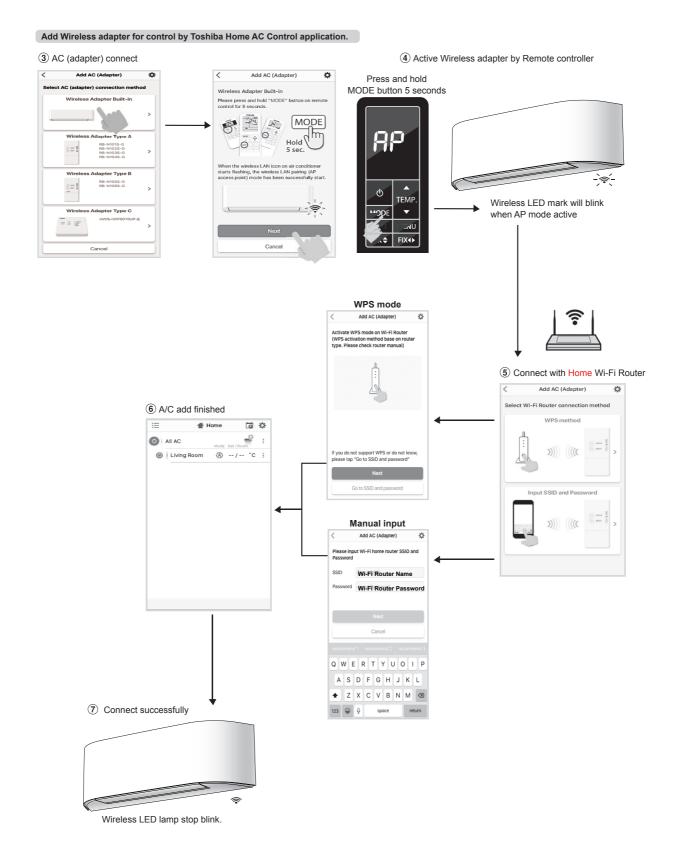
Active Wireless adapter by remote controller and Auto login.

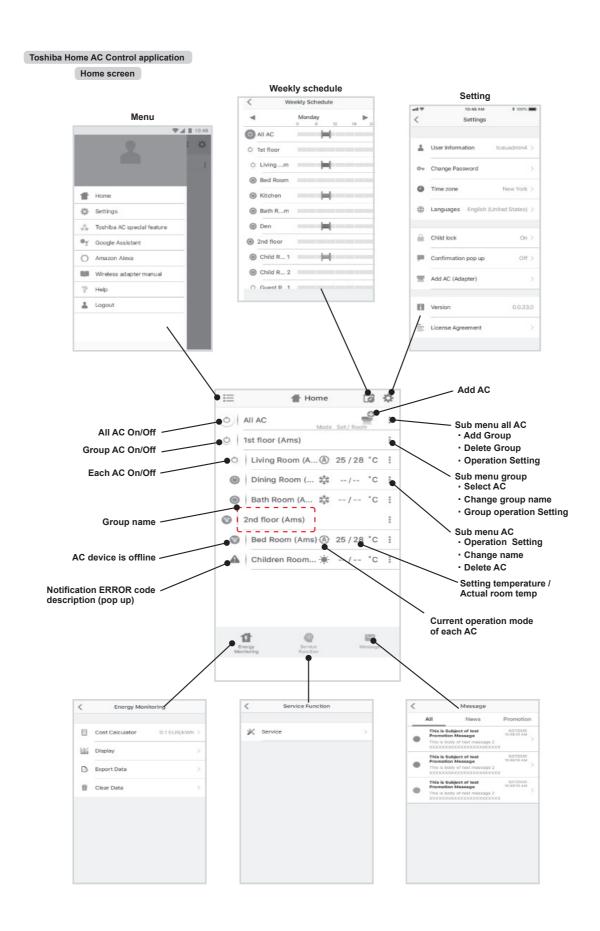
Wireless adapter Build-in

2 Select AC (adapter) connection method.

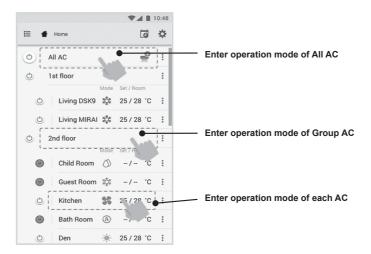
#### \*Note

- 1.In case of Wi-Fi router change or Email for register change need to re-process for add Wireless adapter again (Build in type : Press MODE button at Remote controller 5 seconds for active AP mode).
- 2.In case of change Wireless adapter to use with other A/C need to factory reset and re-process for add Wireless adapter again (Build in type: Press MODE button at Remote controller 5 seconds and select "rb").





#### Mode and Condition setting.



#### Mode select for Toshiba Home AC Control application.

Provide for 5 operation modes





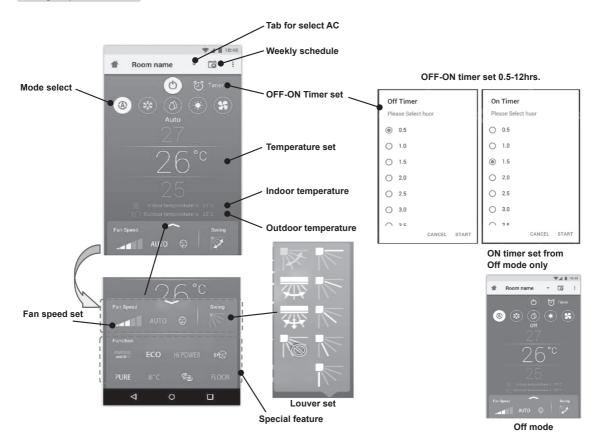








#### Setting in operation mode.

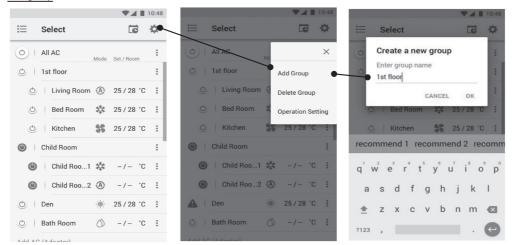


#### Group operation.

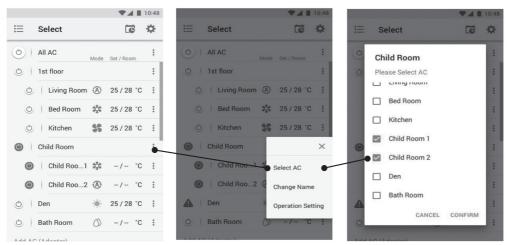
Maximum 3 groups

1 Group maximum = 10 units.

#### Add group



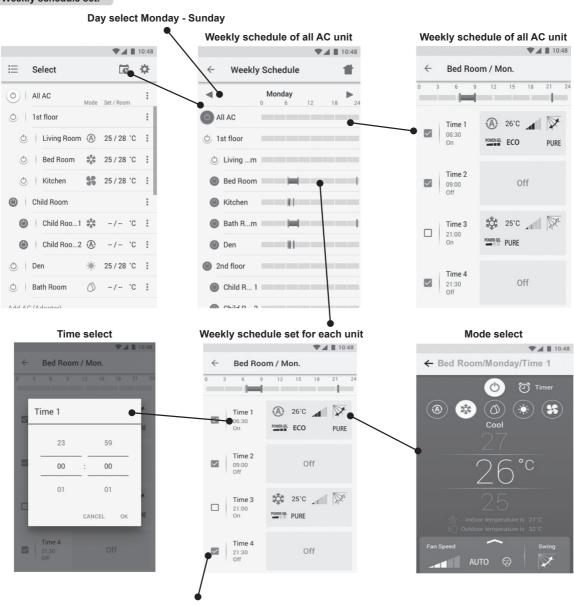
#### Add AC in group



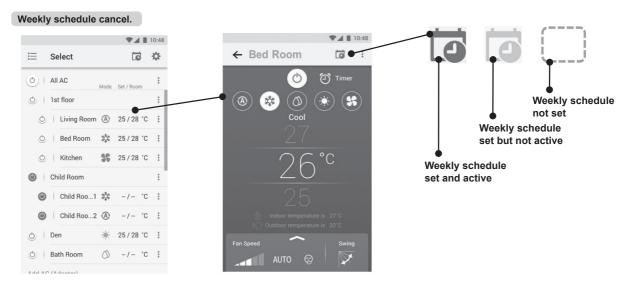
#### Delete AC in group



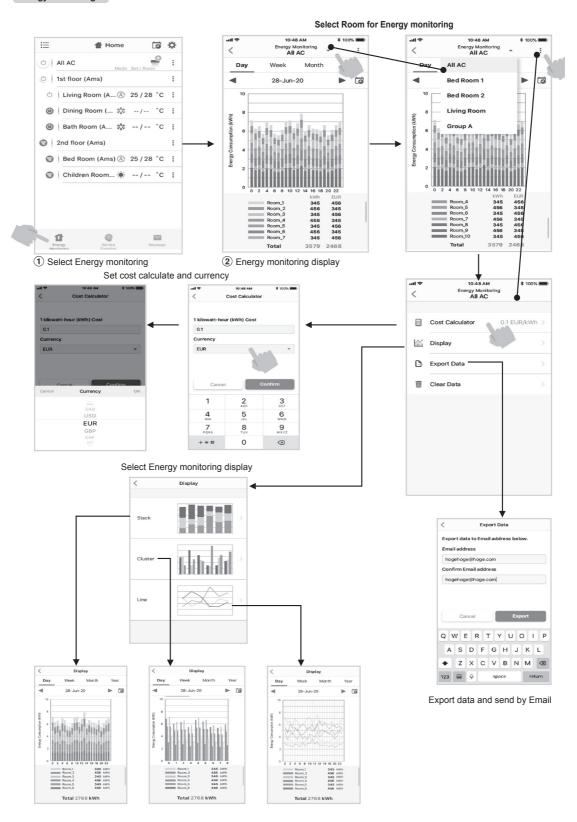
#### Weekly schedule set.



Select program for active by tick at select box

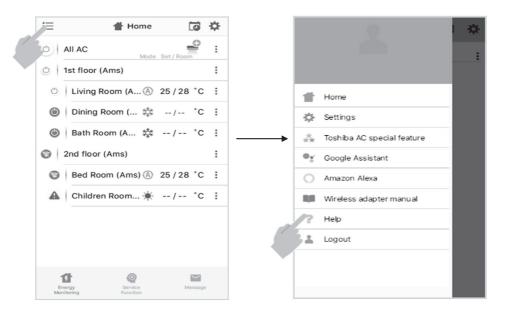


#### Energy monitoring



The power consumption displayed is just an estimate as it is calculated simply.
 It may sometimes differ from the result measured by the power meter.

#### In case of have some problem can check from Help menu.



### Note:

"The Wireless Adapter must be installed, maintained, repaired and removed by a qualified installer or qualified service person."

"Contact dealer and/or service center when equipment is malfunction."

## 9-4-3. Name and Functions of Indications on Remote Controller

## [Display]

All indications, except for the clock time indicator, are displayed by pressing the  ${\color{dkgray} o}$  button.

**1** Transmission mark

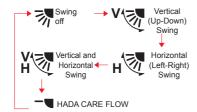
This transmission mark **\( \Lambda \)** indicates when the remote controller transmits signals to the indoor unit

**2** Mode indicator

**3** Temperature indicator

Indicates the temperature setting.

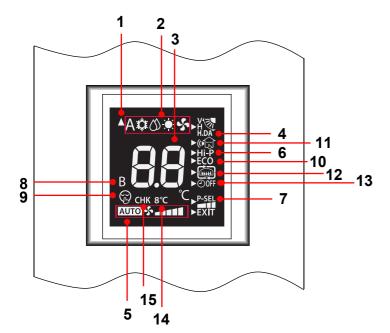
4 SWING and HADA CARE FLOW indicator Indicates status of SWING and HADA CARE FLOW



**5** FAN speed indicator

Indicates the selected fan speed.

AUTO or five fan speed levels (LOW – , LOW<sup>+</sup> – – , MED – – , MED<sup>+</sup> – – , MED – , MED<sup>+</sup> – – – , HIGH – – – – ) can be shown.



6 Hi-POWER indicator

Indicates when the Hi-POWER operation starts.

7 POWER-SEL

Indicates the selected POWER-SEL level. (\_\_\_ 100%, \_\_ 75%, \_ 50%)

**8** A, B change indicator remote controller

When the remote controller switching function is set, "B" appears in the remote controller display. (When the remote controller setting is "A", there is no indication at this position.)

**9** Quiet

Indicates when quiet is activated. Press Fan button to start and press it again to select other fan speed for operation.

10 ECO indicator

Indicates when the ECO is in activated.

11 Silent operation

Indicates the selected Silent 1 and Silent 2.

12 Fireplace operation

Indicates the selected Fireplace 1 and Fireplace 2.

**13** Timer off operation.

Indicates when the OFF timer operation active.

**14** 8°C OPERATION

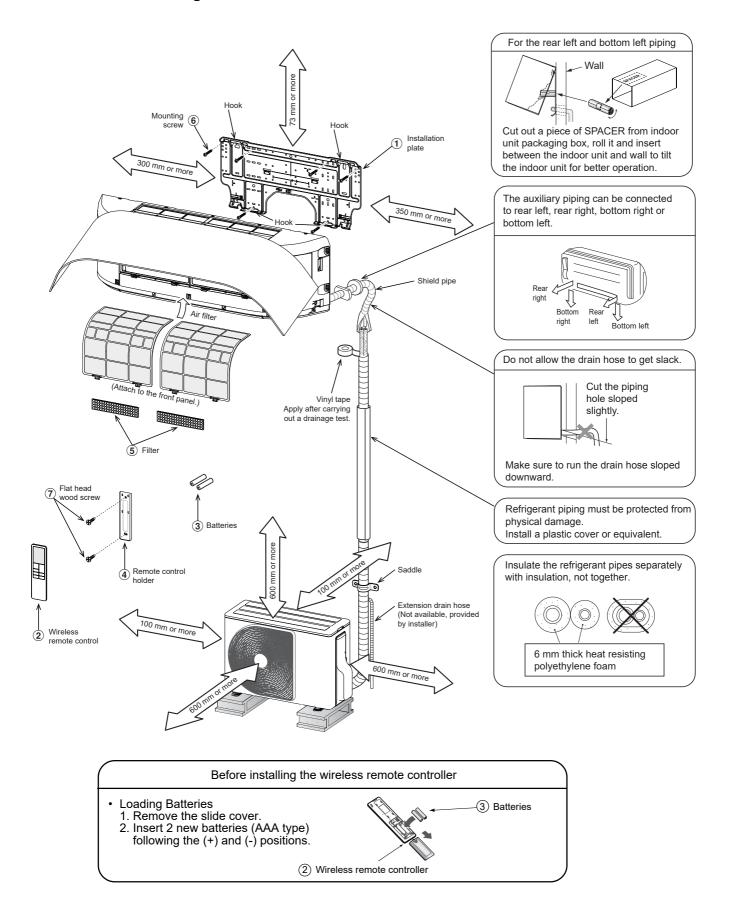
Indicates when 8°C operation star.

**15** Service Mode indicator

Shows during enter service Mode.

## 10. INSTALLATION PROCEDURE

## 10-1. Installation Diagram of Indoor and Outdoor Units



## 10-2. Installation

## 10-2-1. Optional installation parts

Part code	Parts name	Q'ty		
<b>A</b>	Refrigerant piping Liquid side : Ø6.35 mm Gas side : Ø9.52 mm	One each		
B	Pipe insulating material (polyethylene foam, 6 mm thick)	1		
©	© Putty, PVC tapes			

## <Fixing bolt arrangement of outdoor unit>

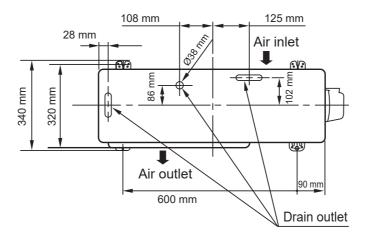


Fig. 10-2-1

- Secure the outdoor unit with fixing bolts and nuts if the unit is likely to be exposed to a strong wind.
- Use Ø 8 mm or Ø 10 mm anchor bolts and nuts.
- If it is necessary to drain the defrost water, attach drain nipple ② and cap waterproof ③ to the bottom plate of the outdoor unit before installing it.

#### 10-2-2. Accessory and installation parts

Indoor Unit				
No.	Part name	No.	Part name	
1	Installation plate × 1	2	Wireless remote control × 1	
3	Battery × 2	4	Remote control holder × 1	
(5)	Toshiba Ultra pure filter × 2	6	⊘⊒⊒⊒⊒⊒> Mounting screw × 10	
7	⊗> Flat head wood screw × 2	8	Communication Screw × 2	
9	Owner's Manual × 1	10	Installation Manual × 1	
11)	Decorative fabric (dark gray) × 1 Decorative fabric (light gray) × 1			

Outdoor Unit				
No.	Part name	No.	Part name	
12	Drain nipple × 1	13	Cap water proof × 2	



Clean every 2 weeks.

- 1. Open the air inlet grille.
- Remove the air filters.
   Vacuum or wash and
- Vacuum or wash and then dry them.
   Reinstall the air filters and close the air inlet grille.



Maintenance & Shelf-life

Clean every 3-6 months when dust stuck or covers the filter.

- 1. Recommend to use vacuum to clean by sucking the dusts which stick or dip inside the filter or use the blower to blow the dust go out through the filter.
- If necessary to use water to clean, simply use the plain water to wash the filter, dry with the sunlight for 3-4 hours or until it completely dry.

  Nevertheless, use hair drier to dry it. However, washing with water, it may reduce the performance of the filter.
- 3. Replace every 2 years or sooner. (contact your dealer to purchase new filter) (P/N: RB-A622DA)

Note: Filter life depends on the level of impurities in your operating environment. Higher levels of impurities may require more frequent cleaning and replacement. In all cases, we recommend an additional set of filters to improve the purifying and deodorizing performance of your air conditioner.



Maintenance & Shelf-life

Clean when dust stuck or covers the decorative fabric.

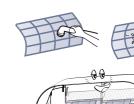
Take extra care when cleaning the decorative fabric.

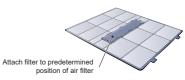
Vacuum the decorative fabric with soft brush nozzle that use for cleaning on furniture or curtain.

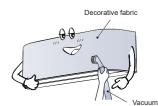
In case of getting heavy dirty on decorative fabric, please use dry cleaning service or wash by hand with warm water separated from other clothes (to avoid color staining), then line dry in the shade.

- Switch 'OFF' and unplug the air conditioner before removing the grille and decorative fabric.
  Ensure decorative fabric are completely dry before refitting to the grille.
- Do not put the decorative fabric in a dishwasher, washing machine, tumble dryer, oven, microwave or near an open flame.









## 10-2-3. Installation/Servicing Tools

#### Changes in the product and components

In the case of an air conditioner using R32, in order to prevent any other refrigerant from being charged accidentally, the service port diameter of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch)

• In order to increase the pressure resisting strength of the refrigerant piping flare processing diameter and size of opposite side of flare nuts has been changed. (for copper pipes with nominal dimensions 1/2 and 5/8)

## New tools for R32(R410a)

New tools for R32(R410a) Applicable to R22 model		able to R22 model	Changes	
Gauge manifold	×		As pressure is high, it is impossible to measure by means of conventional gauge. In order to prevent any other refrigerant from being charged, each port diameter has been changed.	
Charge hose	×	000	In order to increase pressure resisting strength, hose materials and port size have been changed (to 1/2 UNF 20 threads per inch). When purchasing a charge hose, be sure to confirm the port size.	
Electronic balance for refrigerant charging	0		As pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur.	
Torque wrench (nominal diam. 1/2, 5/8)	×	3	The size of opposite sides of flare nuts have been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8.	
Flare tool (clutch type)	0	1	By increasing the clamp bar's receiving hole, strength of spring in the tool has been improved.	
Gauge for projection adjustment	_	_	Used when flare is made by using conventional flare tool.	
Vacuum pump adapter	0		Connected to conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back to the charge hose. The charge hose connecting part has two ports-one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R32(R410a). If the vacuum pump oil (mineral) mixes with R32(R410a) a sludge may occur and damage the equipment.	
Gas leakage detector	×	-	Exclusive for HFC refrigerant.	

- Incidentally, the "refrigerant cylinder" comes with the refrigerant designation R32(R410a) and protector coating in the U.S's ARI specified rose color (ARI color code: PMS 507).
- Also, the "charge port and packing for refrigerant cylinder" require 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.

#### 10-3. Indoor Unit

#### 10-3-1. Installation place

- A place which provides the spaces around the indoor unit as shown in the diagram
- A place where there are no obstacles near the air inlet and outlet
- A place which allows easy installation of the piping to the outdoor unit
- · A place which allows the front panel to be opened
- The indoor unit shall be installed at least 2.5 m height. Also, it must avoided to put anything on the top of the indoor unit.

## **CAUTION**

- Direct sunlight to the indoor unit's wireless receiver should be avoided.
- The microprocessor in the indoor unit should not be too close to RF noise sources.
   (For details, see the owner's manual.)

#### <Remote control>

- A place where there are no obstacles such as a curtain that may block the signal from the indoor unit.
- Do not install the remote control in a place exposed to direct sunlight or close to a heating source, such as a stove.
- Keep the remote control at least 1 m apart from the nearest TV set or stereo equipment. (This is necessary to prevent image disturbances or noise interference.)
- The location of the remote control should be determined as shown below.

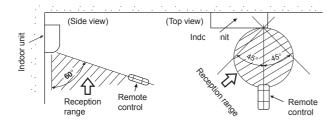


Fig. 10-3-1

#### 10-3-2. Cutting a hole and mounting installation

#### <Cutting a hole>

When installing the refrigerant pipes from the rear.

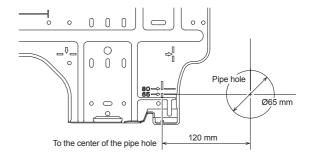


Fig. 10-3-2

 After determining the pipe hole position on the mounting plate (→), drill the pipe hole (Ø65 mm) at a slight downward slant to the outdoor side.

#### **NOTE**

 When drilling a wall that contains a metal lath, wire lath or metal plate, be sure to use a pipe hole brim ring sold separately.

#### <Mounting the installation plate>

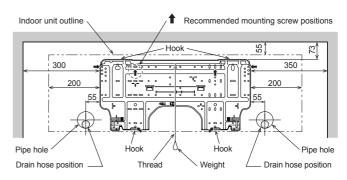


Fig. 10-3-3

 Space allows for moving range of the air inlet grille and horizontal louver in operation above curtain rails, window cornice or other objects.

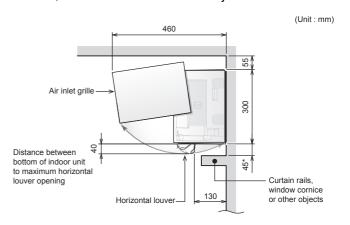


Fig. 10-3-4

## **CAUTION**

- If have curtain rails, window cornice or other objects, allow space from the indoor unit should be 45 mm or more.
- If allow space is less than 45 mm, this can affect the opening and closing of the air inlet grille and the horizontal louver.
- However, there should be no objects in the air outlet position.
   It will block the air fl ow direction and drop performance.

#### <When the installation plate is directly mounted on the wall>

- Securely fit the installation plate onto the wall by screwing it in the upper and lower parts to hook up the indoor unit.
- 2. To mount the installation plate on a concrete wall with anchor bolts, utilize the anchor bolt holes as illustrated in the above figure.
- 3. Install the installation plate horizontally in the wall.

## CAUTION

When installing the installation plate with a mounting screw, do not use the anchor bolt hole. Otherwise the unit may fall down and result in personal injury and property damage.

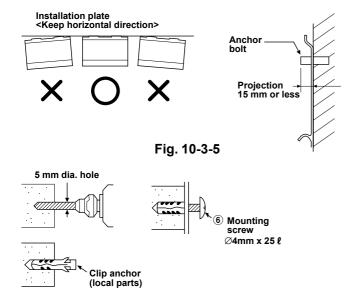


Fig. 10-3-6

## CAUTION

Failure to firmly install the unit may result in personal injury and property damage if the unit falls.

- In case of block, brick, concrete or similar type walls, make 5 mm dia. holes in the wall.
- Insert clip anchors for appropriate mounting
   6 screws.

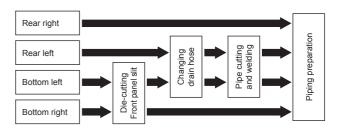
#### NOTE:

 Secure four corners and lower parts of the installation plate with 4 to 6 mounting screws to install it.

## 10-3-3. Piping and drain hose installation

#### <Piping and Drain Hose Forming>

- Since dewing results in a machine trouble, make sure to insulate both the connecting pipes. (Use polyethylene foam as insulating material.)
- The connection of pipes can be installed in the following directions.



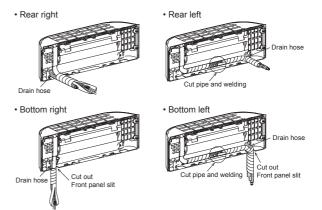


Fig. 10-3-7

## 1. Die-cutting Front panel slit

 Cut out the slit on the bottom left or bottom right side of the Front panel for the bottom left or bottom right connection with a coping saw or an equivalent tool.

#### 2. Changing drain hose

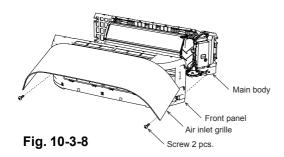
- The factory default of the drain hose is installed on the right side.
- For bottom-leftward connection and rear leftward connection's piping, it is necessary to change the drain hose and drain cap.

#### 3. Cutting and welding pipes

 For bottom-leftward connection and rear leftward connection's piping, refrigerant connection must be made by brazing or welding.

#### <How to cutting the Front panel>

- To connect piping to the bottom side, the Front panel must be cut off.
- The front panel can be removed by removing 2 screws securing then secure remove the front panel from the main body.
- \* Be careful of air inlet grill fall down that may cause of injure of part damage.



 The marking for cutting are indicated on the inside of the Front panel in the following positions.

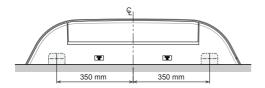


Fig. 10-3-9

- Cut off the pipe exist from inside of Front panel using a coping saw or an equivalent tool.
- The plastic burrs from the cutting process should be removed with a half round file or an equivalent tool.

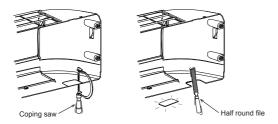


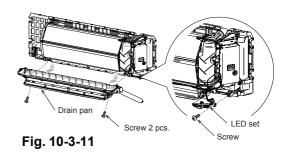
Fig. 10-3-10

## CAUTION

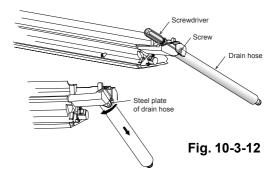
When cutting the Front panel, be careful of cutting tools and any sharp edges of plastic. It can cause injuries.

#### <How to remove the drain hose>

- Removed fixing screw of LED set then pull out it from the main body.
- Removed 2 screws to fix drain pan then secure remove the drain pan from the main body.

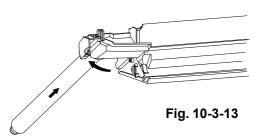


 The drain hose can be removed by removing the screw securing the drain hose then secure rotate steel plate of drain hose to out of the Drain pan and pulling out the drain hose.



#### <How to fix the drain hose>

 To install the drain hose, insert the drain hose firmly until the connection part contacts with heat insulator, secure push steel plate of drain hose to predetermined position of Drain pan then fix it by original screw.

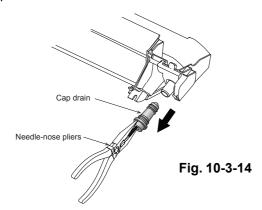


## CAUTION

When removing or install the drain hose, be careful of any sharp edges of steel plate. The edges can cause injuries.

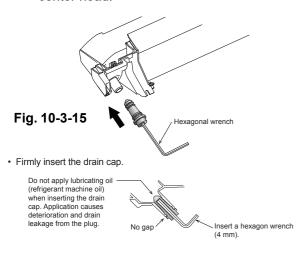
#### <How to remove the drain cap>

 Clip the drain cap by needle-nose pliers and pull out.



### <How to fix the drain cap>

Insert hexagonal wrench (dia. 4 mm) in a center head.



## **CAUTION**

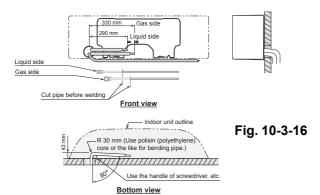
Firmly insert the drain hose and drain cap; otherwise, water may leak.

#### <Left-hand connection with piping>

Bend the connecting pipe so that it is laid within 43 mm above the wall surface. If the connecting pipe is laid exceeding 43 mm above the wall surface, the indoor unit may unstably be set on the wall. When bending the connecting pipe, make sure to use a spring bender so as not to crush the pipe.

#### Bend the connecting pipe within a radius of 30 mm.

To connect the pipe after installation of the unit (figure)



#### **NOTE**

If the pipe is bent incorrectly, the indoor unit may unstably be set on the wall.

After passing the connecting pipe through the pipe hole, connect the connecting pipe to the auxiliary pipes and wrap the facing tape around them.

#### How to cutting pipe

- To connect piping to the left side, the indoor unit pipes must be cut and connected by brazing or welded to the auxiliary pipes.
- · Cut the pipe with a pipe cutter.

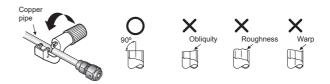
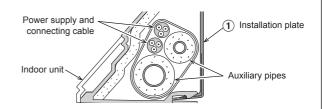


Fig. 10-3-17

## CAUTION

 Bind the auxiliary pipes (two) power supply and connecting cable with facing tape tightly.



- Carefully arrange pipes so that any pipe does not stick out of the rear plate of the indoor unit.
- Carefully connect the auxiliary pipes and connecting pipes to each other and cut off the insulating tape wound on the connecting pipe to avoid double-taping at the joint, moreover, seal the joint with the vinyl tape, etc.
- Since dewing results in a machine trouble, make sure to insulate both the connecting pipes.
   (Use polyethylene foam as insulating material.)
- When bending a pipe, carefully do it, not to crush it.

#### 10-3-4. Indoor unit fixing

- Pass the pipe through the hole in the wall, and hook the indoor unit on the installation plate at the upper hooks
- 2. Swing the indoor unit to right and left to confirm that it is firmly hooked up on the installation plate.
- 3. While pressing the indoor unit onto the wall, hook it at the lower part on the installation plate. Pull the indoor unit toward you to confirm that it is firmly hooked up on the installation plate.

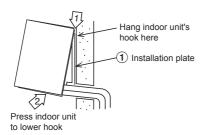
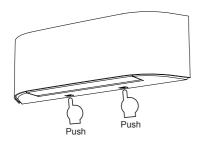


Fig. 10-3-18

 For detaching the indoor unit from the installation plate, pull the indoor unit toward you while pushing its bottom up at the specified parts.



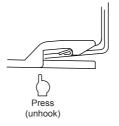
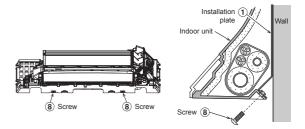


Fig. 10-3-19

#### CAUTION

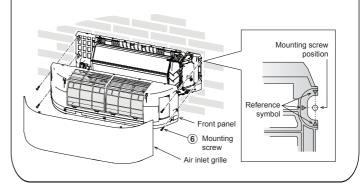
#### MOUNTING INDOOR UNIT TO THE INSTALLATION PLATE

- The lower part of indoor unit may float, due to the condition of piping and installer cannot fix it to the installation plate. In that case, use the screws provided to fix the indoor unit with the installation plate.
- Especially when the pipes are pulled out to the left side, the indoor unit must be screwed to the installation plate.



#### MOUNTING INDOOR UNIT TO THE INSTALLATION PLATE

- In case left side or right of indoor unit may float, the provided screws should be used to fix the indoor unit directly to the wall at the predetermined position.
- In the case of block, brick, concrete or similar type wall, determining the mount screw position on the wall can be used symbol (►) on the main body of indoor unit for drill hole to insert clip anchors for appropriate mounting screw.



#### 10-3-5. Drainage

1. Run the drain hose sloped downwards.

#### **NOTE**

 Hole should be made at a slight downward slant on the outdoor side.

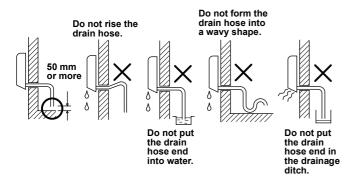


Fig. 10-3-20

- 2. Put water in the drain pan and make sure that the water is drained out of doors.
- When connecting extension drain hose, insulate the connecting part of extension drain hose with shield pipe.

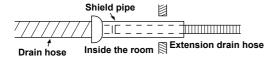


Fig. 10-3-21

# CAUTION

Arrange the drain pipe for proper drainage from the unit. Improper drainage can result in dew-dropping.

This air conditioner has the structure designed to drain water collected from dew, which forms on the back of the indoor unit, to the drain pan.

Therefore, do not store the power cord and other parts at a height above the drain guide.

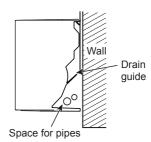


Fig. 10-3-22

#### 10-4. Outdoor Unit

#### 10-4-1. Installation place

- A place which provides the spaces around the outdoor unit as shown in the diagram
- A place which can bear the weight of the outdoor unit and does not allow an increase in noise level and vibration
- A place where the operation noise and discharged air do not disturb your neighbors
- · A place which is not exposed to a strong wind
- A place free of a leakage of combustible gases
- · A place which does not block a passage
- When the outdoor unit is to be installed in an elevated position, be sure to secure its feet.
- The allowable length of the connecting pipe.

Model	RAS-25J2AVSG-ND1	RAS-35J2AVSG-ND1
Chargeless	up to 15 m	up to 15 m
Maximum length	20 m	20 m
Additional refrigerant charging	16 - 20 m (20 g / 1 m)	16 - 20 m (20 g / 1 m)
Maximum refrigerant charging	0.86 kg	0.86 kg

· The allowable height of outdoor unit installation site.

Model	RAS-25J2AVSG-ND1	RAS-35J2AVSG-ND1
Maximum height	12 m	12 m

A place where the drain water does not raise any problems

#### Precautions for adding refrigerant

 Use a scale having a precision with at least 10 g per index line when adding the refrigerant.
 Do not use a bathroom scale or similar instrument.

## CAUTION

When the outdoor unit is installed in a place where the drain water might cause any problems, Seal the water leakage point tightly using a silicone adhesive or caulking compound.

# 10-4-2. Precautions about installation in Regions with Snowfall and Cold Temperatures

- Do not use the supplied drain nipple for draining water. Drain the water from all the drain holes directly.
- To protect the outdoor unit from snow accumulation, install a holding frame, and attach a snow protection hood and plate.
- \* Do not use a double-stacked design.

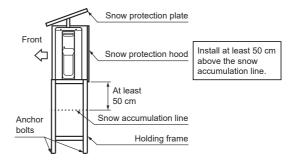


Fig. 10-4-1

# CAUTION

- 1. Install the outdoor unit without anything blocking the air discharging.
- When the outdoor unit is installed in a place exposed always exposed to strong wind like a coast or on a high storey of a building, secure the normal fan operation using a duct or a wind shield.
- 3. In particularly windy areas, install the unit such as to avoid admission of wind.
- 4. Installation in the following places may result in trouble.

Do not install the unit in such places.

- A place full of machine oil.
- A saline-place such as the coast.
- A place full of sulfide gas.
- A place where high-frequency waves are likely to be generated as from audio equipment, welders, and medical equipment.

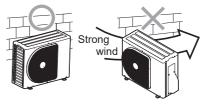
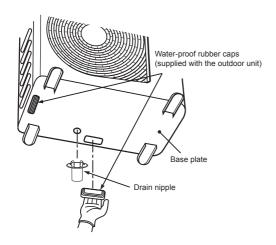


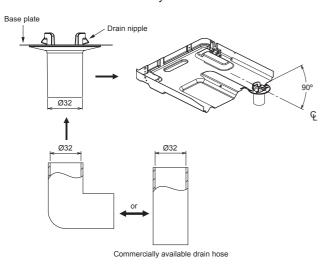
Fig. 10-4-2

#### **Draining the Water**

- Holes are provided on the base plate of the outdoor unit to ensure that the defrost water produced during heating operations is drained off efficiently. If a centralized drain is required when installing the unit on a balcony or wall, follow the steps below to drain off the water.
- Proceed with water-proofing by installing the water-proof rubber caps in the 2 elongated holes on the base plate of the outdoor unit. [How to install the water-proof rubber caps]
  - (1) Place four fingers into each cap, and insert the caps into the water drain holes by pushing them into place from the underside of the base plate.
  - (2) Press down on the outer circumferences of the caps to ensure that they have been inserted tightly. (Water leaks may result if the caps have not been inserted properly, if their outer circumferences lift up or the caps catch on or wedge against something.)



- 2. Install the drain nipple and a commercially available drain hose (32 mm inside diameter), and drain off the water. (For the position where the drain nipple is installed, refer to the installation diagram of the indoor and outdoor units.)
  - Check that the outdoor unit is horizontal, and route the drain hose at a downward sloped angle while ensuring that it is connected tautly.



Do not use ordinary garden hose, but one can flatten and prevent water from draining.

#### 10-4-3. Refrigerant piping connection

#### <Flaring>

1. Cut the pipe with a pipe cutter.



Fig. 10-4-3

- 2. Insert a flare nut into the pipe, and flare the pipe.
  - Projection margin in flaring : A (Unit : mm)

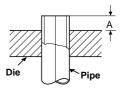


Fig. 10-4-4

#### RIDGID (clutch type)

Outer dia. of copper pipe	Tool used	Conventional tool used
Ø6.35	0 to 0.5	1.0 to 1.5
Ø9.52	0 to 0.5	1.0 to 1.5
Ø12.70	0 to 0.5	1.0 to 1.5
Pipes thickness	0.8 mm or more	

#### IMPERIAL (wing nut type)

Outer dia. of copper pipe	Tool used
Ø6.35	1.5 to 2.0
Ø9.52	1.5 to 2.0
Ø12.70	2.0 to 2.5
Pipes thickness	0.8 mm or more

#### CAUTION

- Do not scratch the inner surface of the fared part when removing burrs.
- Flare processing under the condition of scratches on the inner surface of f are processing part will cause refrigerant gas leak.

#### <Tightening connection>

Align the centers of the connecting pipes and tighten the flare nut as far as possible with your fingers. Then tighten the nut with a spanner and torque wrench as shown in the figure.

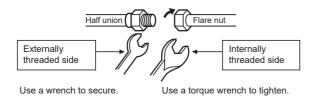


Fig. 10-4-5

## CAUTION

Do not apply excess torque.

Otherwise, the nut may crack depending on the conditions.

(Unit: N•m)

Outer dia. of copper pipe	Tightening torque
Ø6.35 mm	16 to 18 (1.6 to 1.8 kgf•m)
Ø9.52 mm	30 to 42 (3.0 to 4.2 kgf•m)
Ø12.70 mm	50 to 62 (5.0 to 6.2 kgf•m)

#### Tightening torque of flare pipe connections

The operating pressure of R32 is higher than that of R22 (Approx. 1.6 times).

It is therefore necessary to firmly tighten the flare pipe connecting sections (which connect the indoor and outdoor units) up to the specified tightening torque. Incorrect connections may cause not only a gas leakage, but also damage to the refrigerant cycle.

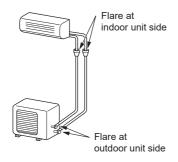


Fig. 10-4-6

#### **Evacuating**

After the piping has been connected to the indoor unit, you can perform the air purge together at once.

#### **AIR PURGE**

Evacuate the air in the connecting pipes and in the indoor unit using a vacuum pump. Do not use the refrigerant in the outdoor unit. For details, see the manual of the vacuum pump.

#### <Using a vacuum pump>

Be sure to use a vacuum pump with counter-flow prevention function so that inside oil of the pump does not flow backward into pipes of the air conditioner when the pump stops. (If oil inside of the vacuum pump enters into the air conditioner, which use R32, refrigeration cycle trouble may result.)

- 1. Connect the charge hose from the manifold valve to the service port of the gas side packed valve.
- 2. Connect the charge hose to the port of the vacuum pump.
- 3. Open fully the low pressure side handle of the gauge manifold valve.
- 4. Operate the vacuum pump to start evacuating. Perform evacuating for about 15 minutes if the piping length is 20 meters. (15 minutes for 20 meters) (assuming a pump capacity of 27 liters per minute. Then confirm that the compound pressure gauge reading is -101 kPa (76 cmHg).
- Close the low pressure side valve handle of gauge manifold.
- Open fully the valve stem of the packed valves (both side of Gas and Liquid).
- 7. Remove the charging hose from the service port.
- 8. Securely tighten the caps on the packed valves.

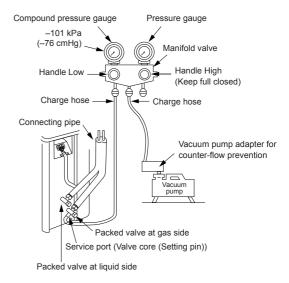


Fig. 10-4-7

# CAUTION

- · KEEP IMPORTANT 6 POINTS FOR PIPING WORK.
- (1) Take away dust and moisture (inside of the connecting pipes).

  (2) Tighten the connections (between pipes and unit).
- (3) Evacuate the air in the connecting pipes using a VACUUM PUMP.
- (4) Check gas leak (connected points).
- (5) Be sure to fully open the packed valves before operation.
- (6) Reusable mechanical connectors and f ared joints are not allowed indoors. When mechanical connectors are reused indoors, sealing parts shall be renewed. When f ared joints are reused indoors, the f are part shall be refabricated.

Open the valve stem all the way out, but do not try to open it beyond the stopper.

Pipe size of Packed Valve	Size of Hexagon wrench
12.70 mm and smallers	A = 4 mm
15.88 mm	A = 5 mm

Securely tighten the valve cap with torque in the following table

Cap	Cap Size (H)	Torque
Сар	Cap Size (11)	Torque
Valve Rod Cap	H17 - H19	14∼18 N.m (1.4 to 1.8 kgf·m)
	H22 - H30	33~42 N.m (3.3 to 4.2 kgf·m)
Service	H14	8~12 N.m (0.8 to 1.2 kgf·m)
Port Cap	H17	14~18 N.m (1.4 to 1.8 kgf·m)

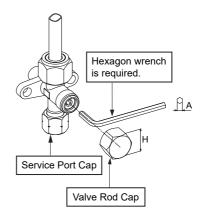


Fig. 10-4-8

#### 10-5. Electrical works

Model	RAS-25N4KVRG-ND	RAS-35N4KVRG-ND
Power source	50Hz, 220 – 240V Single phase	
Maximum running current	11.80A	11.85A
Circuit breaker rating	20A	20A
Power supply cable	H07RN-F or 60245 IEC66 (2.0 mm² or more)	
Connecting cable		

#### 10-5-1. Indoor unit

Wiring of the connecting cable can be carried out without removing the front panel.

- Remove the air inlet grille.
   Open the air inlet grille upward and pull it toward you.
- 2. Remove the terminal cover and cord clamp.
- 3. Insert the connecting cable (according to the local cords) into the pipe hole on the wall.
- Take out the connecting cable through the cable slot on the rear panel so that it protrudes about 20 cm from the front.
- 5. Insert the connecting cable fully into the terminal block and secure it tightly with screws.
- 6. Tightening torque: 1.2 N·m (0.12 kgf·m)
- 7. Secure the connecting cable with the cord clamp.
- 8. Fix the terminal cover and air inlet grille on the indoor unit.

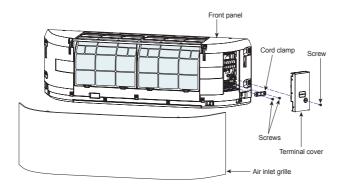


Fig. 10-5-1

#### <How to install the air inlet grille on the indoor unit>

• When attaching the air inlet grille, the contrary of the removed operation is performed.

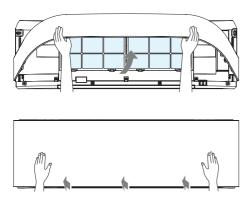


Fig. 10-5-2

#### <Outdoor unit>

- 1. Remove the valve cover, the electric parts cover and the cord clamp from the outdoor unit.
- Connect the connecting cable to the terminal as identified by the matching numbers on the terminal block of indoor and outdoor unit.
- Insert the power cord and the connecting cable carefully into the terminal block and secure it tightly with screws.
- 4. Use vinyl tape, etc. to insulate the cords which are not going to be used. Locate them so that they do not touch any electrical or metal parts.
- 5. Secure the power cord and the connecting cable with the cord clamp.
- 6. Attach the electric parts cover and the valve cover on the outdoor unit.

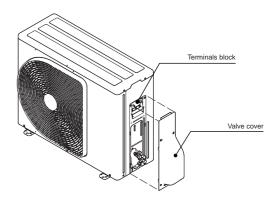
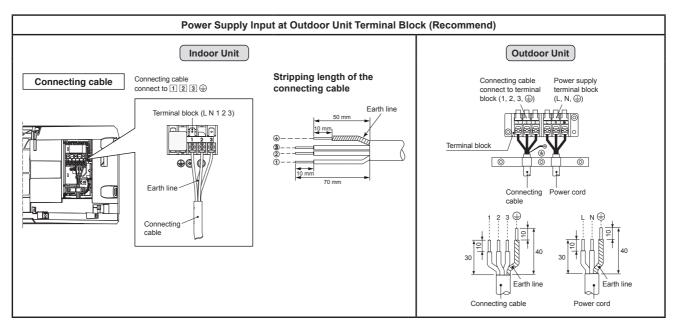
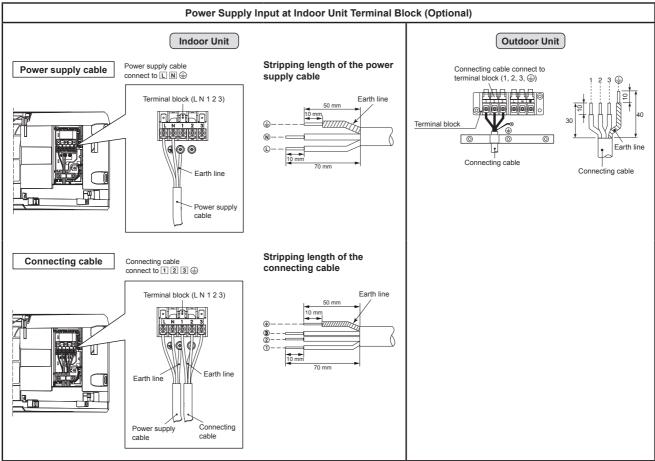


Fig. 10-5-3

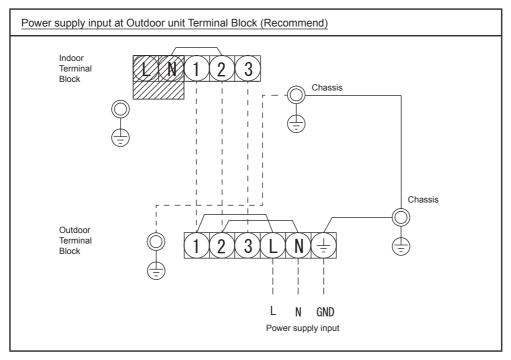
#### 10-5-2. Power Supply and Connecting Cable Connection

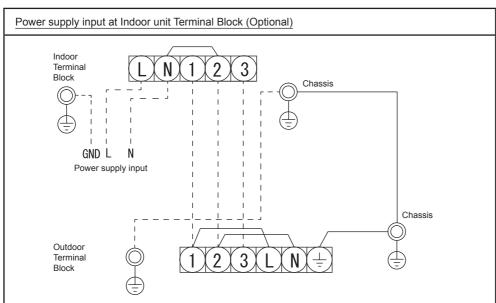
The power supply can be selected to connect to indoor unit or outdoor unit. Choose proper way and connect the power supply and connecting cable by follow the instruction as following.





#### 10-5-3. Power supply Input Wiring Diagram





# **CAUTION**

- 1. The power supply must be same as the rated of air conditioner.
- 2. Prepare the power source for exclusive use with air conditioner.
- 3. Circuit breaker must be used for the power supply line of this air conditioner.
- 4. Be sure to comply power supply and connecting cable for size and wiring method.
- 5. Every wire must be connected firmly.
- 6. Perform wiring works so as to allow a general wiring capacity.
- 7. Wrong wiring connection may cause some electrical part burn out.
- 8. Incorrect or incomplete wiring is carried out, it will cause an ignition or smoke.
- This product can be connected to main power supply.Connection to fixed wiring: A switch which disconnects all poles and has a contact separation at least 3mm must be incorporated in the fixed wiring.

# **10-6. Others 10-6-1. Gas leak test**

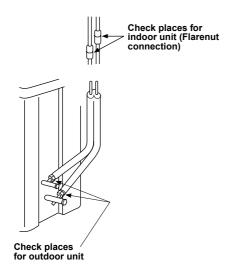


Fig. 10-6-1

 Check the flare nut connections for the gas leak with a gas leak detector or soap water.

#### 10-6-2. Remote Control A-B Selection

- When two indoor units are installed in the same room or adjacent two rooms, if operating a unit, two units may receive the remote control signal simultaneously and operate. In this case, the operation can be preserved by setting either one remote control to B setting. (Both are set to A setting in factory shipment.)
- The remote control signal is not received when the settings of indoor unit and remote control are different.
- There is no relation between A setting/B setting and A room/B room when connecting the piping and cables.

To separate using of remote control for each indoor unit in case of 2 air conditioner are installed near.

#### Remote Control B Setup.

- 1. Press [RESET] button on the indoor unit to turn the air conditioner ON.
- 2. Point the remote control at the indoor unit.
- 3. Push and hold [CHECK] button on back side of Remote Control. "00" will be shown on the display (Picture 1).

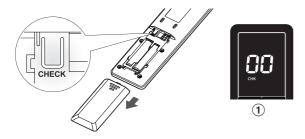


Fig. 10-6-2

4. Press [MODE] during pushing [CHECK]. "B" will show on the display and "00" will disappear and the air conditioner will turn OFF.

The Remote Control B is memorized (Picture 2).



Note: 1. Repeat previous step to reset Remote Control to be A.

- 2. Remote Control A have not "A" display.
- 3. Default setting of Remote Control from factory is A.

#### 10-6-3. Test operation

To switch the TEST RUN (COOL) mode, press [RESET] button for 10 sec. (The beeper will make a short beep.)

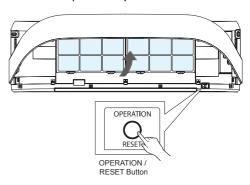


Fig. 10-6-3

#### 10-6-4. Auto restart function setting

This product is designed so that, after a power failure, it can restart automatically in the same operating mode as before the power failure.

#### Information

The product is shipped with Auto Restart function in the ON position. Turn it OFF if this function is not required.

#### <How to turn OFF the Auto Restart Function>

 Press and hold the [OPERATION] button on the indoor unit for 3 seconds (3 Beep sounds but OPERATION lamp does not blink).

#### <How to turn ON the Auto Restart Function>

 Press and hold the [OPERATION] button on the indoor unit for 3 seconds (3 Beep sounds and OPERATION lamp blink 5 time/sec for 5 seconds).

#### NOTE

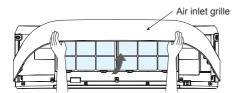
- In case of ON timer or OFF timer are set, AUTO RESTART OPERATION does not activate.
- Default setting of AUTO RESTART OPERATION is ON.

#### 10-6-5. Decorative Fabric Installation

 The decorative fabric for cover on the air inlet grille of indoor unit was put in the accessories. User can use it as required.

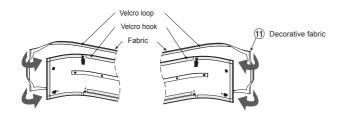
The method of installation is as follows.

 Remove the air inlet grille.
 Open the air inlet grille upward and pull it toward you. As shown on figure as below.

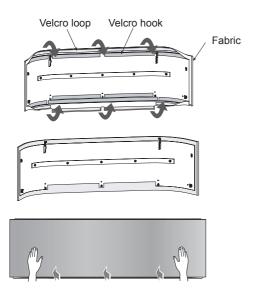


- 2. Prepare the fabric that you choose for install.
- Insert the fabric into the left and right side of the air inlet grille and adjust corner position of decorative fabric is smooth.

Attach the hook and loop of Velcro tape fully together. As shown on figure as below.



4. Insert the fabric into the top and bottom side of the air inlet grille. Attach the hook and loop of Velcro tape fully together. As shown on figure as below.



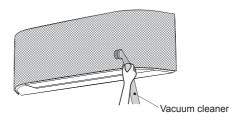
5. Reassembly the air inlet grille by reverse process of 1.

#### NOTE

 The tightness of the fabric depends on attaching the hook and loop of Velcro around the air inlet grille, take appropriate action.

#### Maintenance & Shelf-life

- Clean when dust stuck or covers the decorative fabric.
- Take extra care when cleaning the decorative fabric.
- Vacuum the decorative fabric with soft brush nozzle that use for cleaning on furniture or curtain.



 In case of getting heavy dirty on decorative fabric, please use dry cleaning service or wash by hand with warm water separated from other clothes (to avoid color staining), then line dry in the shade.

#### NOTE

- Switch "OFF" and unplug the air conditioner before removing the air inlet grille and decorative fabric.
- Ensure decorative fabric are completely dry before refitting to the air inlet grille.
- Do not put the decorative fabric in a dishwasher, washing machine, tumble dryer, oven, microwave or near an open flame.

#### **CAUTION**

- If clean decorative fabric by washing, it may affect to appearance and fitting of the decorative fabric
- Recommend to use vacuum cleaner to removing the dusts from decorative fabric.

#### 11. HOW TO DIAGNOSE THE TROUBLE

The pulse motor circuits are mounted to both indoor and outdoor units. Therefore, diagnose troubles according to the trouble diagnosis procedure as described below. (Refer to the check points in servicing written on the wiring diagrams attached to the indoor/outdoor units.)

**Table 11-1** 

No.	Troubleshooting Procedure	
1	First Confirmation	
2	Primary Judgment	
3	Judgment by Flashing LED of Indoor Unit	
4	Self-Diagnosis by Remote Controller	
5	Judgment of Trouble by Every Symptom	

No.	Troubleshooting Procedure	
6	How to Check Simply the Main Parts	
7	Troubleshooting	
8	How to Diagnose Trouble in Outdoor Unit	
9	How to Check Simply the Main Parts	
10	How to Simply Judge Whether Outdoor Fan Motor is Good or Bad	

#### Precautions when handling the new inverter

#### ▲ CAUTION: HIGH VOLTAGEN

The high voltage circuit is incorporated.

Be careful to do the check service, as the electric shock may be caused in case of touching parts on the P.C. board by hand.

The new inverter will be incorporated starting with this unit.

#### ◆ The control circuitry has an uninsulated construction.

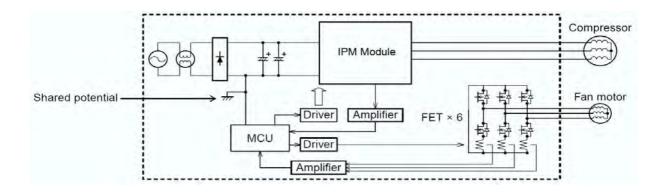


Fig. 11-1

## **A** CAUTION

A high voltage (equivalent to the supply voltage) is also energized to ground through the sensors, PMV and other low-voltage circuits. The sensor leads and other wires are covered with insulated tubes for protection. Nevertheless, care must be taken to ensure that these wires are not pinched.

Take sufficient care to avoid directly touching any of the circuit parts without first turning off the power.

At times such as when the circuit board is to be replaced, place the circuit board assembly in a vertical position.

Laying the board flat on an electrically conductive object (such as the top panel of the air conditioner's outdoor unit) while a charge is still retained by the electrolytic capacitors of the inverter's main circuit may cause short-circuiting between the electrolytic capacitors and secondary circuit components and result in damage to the components.



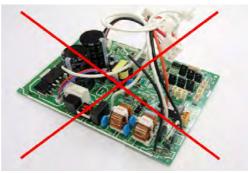


Fig. 11-2

Sensor leads

Do NOT lay the circuit board assembly flat.

#### Precautions when inspecting the control section of the outdoor unit

#### NOTE:

A large-capacity electrolytic capacitor is used in the outdoor unit controller (inverter). Therefore, if the power supply is turned off, charge (charging voltage DC280 to 380V) remains and discharging takes a lot of time. After turning off the power source, if touching the charging section before discharging, an electrical shock may be caused. Discharge the electrolytic capacitor completely by using soldering iron, etc.

#### < Discharging method >

- 1. Remove the inverter cover (plating) by opening four mounting claws.
- As shown below, connect the discharge resistance (approx. 100Ω4 0W) or plug of the soldering iron to voltage between + – terminals of the C09, C10 ("WARNING ELECTRIC SHOCK" is indicated.) electrolytic capacitor (760µF/400V) on P.C. board, and then perform discharging.

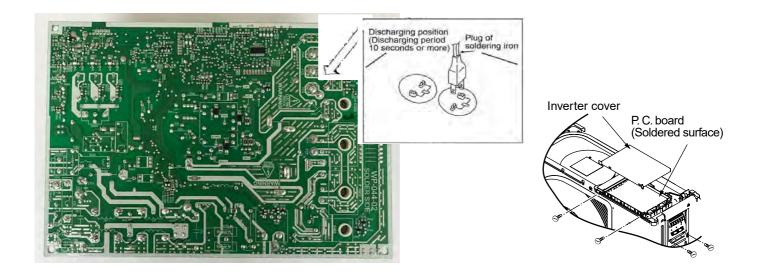


Fig. 11-3

#### 11-1. First Confirmation

#### 11-1-1. Confirmation of Power Supply

Confirm that the power breaker operates (ON) normally.

### 11-1-2. Confirmation of Power Voltage

Confirm that power voltage is AC 220–230–240  $\pm$  10%.

If power voltage is not in this range, the unit may not operate normally.

#### 11-1-3. Operation Which is not a Trouble (Program Operation)

For controlling the air conditioner, the program operations are built in the microcomputer as described in the following table.

If a claim is made for running operation, check whether or not it meets to the contents in the following table. When it does, we inform you that it is not trouble of equipment, but it is indispensable for controlling and maintaining of air conditioner.

Table 11-1-1

No.	Operation of air conditioner	Description
1	When power breaker is turned "ON", the operation indicator (White) of the indoor unit flashes.	The OPERATION lamp of the indoor unit flashes when power source is turned on. If [ 🕁 ] button is operated once, flashing stops. (Flashes also in power failure)
2	Compressor may not operate even if the room temperature is within range of compressor-ON.	The compressor does not operate while compressor restart delay timer (3-minutes timer) operates.  The same phenomenon is found after power source has been turned on because 3-minutes timer operates.
3	In Dry and ECO mode, FAN (air flow) display does not change even though FAN (air flow select) button is operated.	The air flow indication is fixed to [AUTO].
4	Increasing of compressor motor speed stops approx. 30 seconds after operation started, and then compressor motor speed increases again approx. 30 seconds after.	For smooth operation of the compressor, the compressor motor speed is restricted to Max. 41 rps for 2 minutes, and Max.91 rps for 2 minutes to 3 minutes, respectively after the operation has started.
5	In AUTO mode, the operation mode is changed.	After selecting Cool or Heat mode, select an operation mode again if the compressor keeps stop status for 15 minutes.
6	In HEAT mode, the compressor motor speed does not increase up to the maximum speed or decreases before the temperature arrives at the set temperature.	The compressor motor speed may decrease by high- temp. release control (Release protective operation by tempup of the indoor heat exchanger) or current release control.

#### 11-2. Primary Judgment

To diagnose the troubles, use the following methods.

- 1) Judgment by flashing LED of indoor unit
- 2) Self-diagnosis by service check remote controller
- 3) Judgment of trouble by every symptom

Firstly use the method 1) for diagnosis. Then, use the method 2) or 3) to diagnose the details of troubles.

#### 11-3. Judgment by Flashing LED of Indoor Unit

While the indoor unit monitors the operation status of the air conditioner, if the protective circuit operates, the contents of self-diagnosis are displayed with block on the indoor unit indication section.

**Table 11-3-1** 

	Item	Check code	Block display	Description for self-diagnosis
Indoor indication lamp flashes.	A		OPERATION Flashing display (1 Hz)	Power failure (when power is ON)
Which lamp does flash?	В		OPERATION Flashing display (5 Hz)	Protective circuit operation for indoor P.C. board
	С		OPERATION TIMER (White) Flashing display (5 Hz)	Protective circuit operation for connecting cable and serial signal system
	D		OPERATION Flashing display (5 Hz)	Protective circuit operation for outdoor P.C. board
	E	E C	OPERATION TIMER Flashing display (5 Hz)	Protective circuit operation for others (including compressor)
	F	EE	OPERATION TIMER  Normal Normal  Flash 1 Hz None  Flash 2 Hz None 2 times every 1 sec	Release status display Nothing Current release TD release
			None Plash 1 Hz	TC release

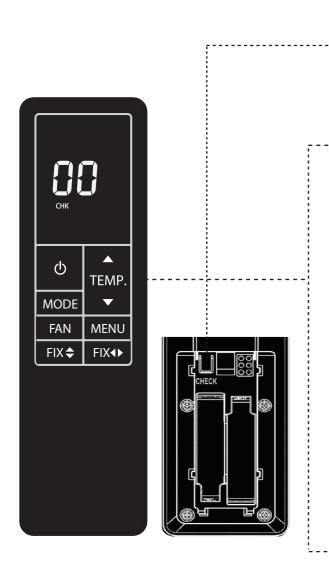
#### **NOTES:**

- 1. The contents of items B and C and a part of item E are displayed when air conditioner operates.
- 2. When item B and C, and item B and a part of item E occur concurrently, priority is given to the block of item B.
- 3. The check codes can be confirmed on the remote controller for servicing.

#### 11-4. Self-Diagnosis by Remote Controller (Check Code)

- 1. If the lamps are indicated as shown B to E in Table 11-4-1, execute the self-diagnosis by the remote controller.
- 2. When the remote controller is set to the service mode, the indoor controller diagnoses the operation condition and indicates the in formation of the self-diagnosis on the display of the remote controller with the check codes. If a fault is detected, all lamps on the indoor unit will flash at 5Hz and it will beep for 10 seconds (Beep, Beep, Beep...). The timer lamp usually flashes (5Hz) during self-diagnosis.

#### 11-4-1. How to Use Remote Controller in Service Mode



Press [CHECK] button at back side of remote controller to the service mode.

• " ☐☐ " is indicated on the display of the remote controller.

Press [TEMP ▲] button If there is no fault with a code, the indoor unit will beep once (Beep) and the display of the remote controller will change as follows:

$$ightarrow$$
 00  $ightarrow$  01  $ightarrow$  02  $\cdots$  16  $ightarrow$  15  $ightarrow$  33  $ightarrow$  7. F  $ightarrow$ 

- TheTIMER indicator of the indoor unit fashes continuously. (5 times per 1 sec.)
- Check the unit with all 52 check codes ( [[[]] to ]] ) as shown in Table-11-4-1.
- Press [TEMP ▼] button to change the check code backward.

If there is a fault, the indoor unit will beep for 10 seconds (Beep, Beep, Beep...).

Note the check code on the display of the remote controller.

- 2-digits alphanumeric will be indicated on the display.
- All indicators on the indoor unit will flash.
   (5 times per 1 sec.)

Press [TEMP ♦] until 7F for clear service code after service finish.



Press [  $\circlearrowleft$  ] button to release the service mode.

• The display of the remote controller returns to as it was before service mode was engaged.

Alphanumeric characters are used for the check codes.

Fig. 11-4-1

#### 11-4-2 Caution at Servicing

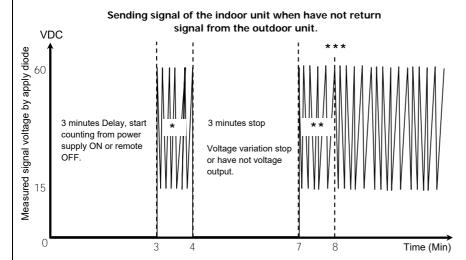
- 1. After using the service mode of remote controller finished, press the [  $\oplus$ ] button to reset the remote controller to normal function.
- 2. After finished the diagnosis by the remote controller, turn OFF power supply and turn its ON again to reset the air conditioner to normal operation. However, the check codes are not deleted from memory of the microcomputer.
- 3. After servicing finished, enter service mode again and select "7F" for send code to the indoor unit. The check code stored in memory is cleared.

Table 11-4-1

Bloc	k distinction		Operation of diagnos	is function		
Check code	Block	Check code	Cause of operation	Air conditioner status	Display flashing error	Action and Judgment
	Indoor P.C.		TA sensor ; The room	Operation	Flashes when	Check the sensor TA and connection.
	board.		temperature sensor is short-Circuit or disconnection.	continues.	error is detected.	In case of the sensor and its     connection is normal, check the     P.C. board.
		<u> </u>	TC sensor ; The heat	Operation	Flashes when	Check the sensor TC and connection.
			exchanger temperature	continues.	error is detected.	2. In case of the sensor and its
			sensor of the indoor unit			connection is normal, check the
			is out of place, disconnection,			P.C. board.
			short-circuit or migration.			
			Outdoor Unit "OFF" Indoor Unit continue fan only operation for 250 minute or "OFF".	Flashes when error is detected.	Check Gas sensor shortage / open.     Check Gas sensor disconnect.	
		1 1	Fan motor of the indoor unit	All OFF	Flashes when	Check the fan motor and connection.
		1 1	is failure, lock-rotor, short-		error is detected.	2. In case of the motor and its
			circuit, disconnection, etc.			connection is normal, check the
			Or its circuit on P.C. board has problem.			P.C. board.
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		Other trouble on the indoor	Depend on	Depend on	Reset power supply.
			P.C. board.	cause of	cause of	2. Replace P.C. board.
				failure.	failure.	
			Gas detector sensor life time	Operation continues.	Flashes when error is detected.	Replace new sensor.

Blo	ck distinction		Operation of diagnosis function				
Check code	Block	Check code	Cause of operation	Air conditioner status	Display flashing error		
	Serial signal	1711_1	1) Defective wiring of the	Indoor unit	Flashes when		
j_i i	and connecting		connecting cable or	operates	error is detected.		
_	cable.		miss-wiring.	continue.	Flashing stop		
			2) Operation signal has not	Outdoor unit	and outdoor unit		
			send from the indoor unit	stop.	start to operate		
			when operation start.		when the return		
			3) Outdoor unit has not		signal from the		
			send return signal to the		outdoor unit is		
			indoor unit when operation		normal.		
			started.				
			4) Return signal from the				
			outdoor unit is stop during				
			operation.				
			Some protector				
			(hardware, if exist) of the				
			outdoor unit open				
			circuit of signal.				
			Signal circuit of indoor				
			P.C. board or outdoor				
			P.C. board is failure				
			in some period.				

#### Note: Operation signal of the indoor unit shall be measured in the sending period as picture below.



- \* Signal send only 1 minute and stop. Because of return signal from outdoor unit has not received.
- \*\* Signal resend again after 3 minutes stop. And the signal will send continuously.
- \*\* \* 1 minute after resending, the indoor unit display flashes error.

# 1) to 3) The outdoor unit never

operate. Check connecting cable and correct

**Action and Judgment** 

- if defective wiring.
- Check 25A fuse of inverter P.C. board.
- Check 3.15A fuse of inverter P.C. board.
- Check operation signal of the indoor unit by using diode. Measure voltage at terminal block of the indoor unit between No.2 and No.3 (or L2 and S) If signal is varied 15-60V continuously, replace inverter P.C. board. If signal is not varied, replace indoor P.C. board.
- 4) The outdoor unit abnormal stop at some time.
- If the other check codes are found concurrently, check them together.
- Check protector (hardware) such as Hi-Pressure switch, Thermal-Relay, etc.
- Check refrigerant amount or any possibility case which may caused high temperature or high pressure.
- Check operation signal of the indoor unit by using diode. Measure voltage at terminal block of the indoor unit between No.2 and No.3 (or L2 and S) If signal is varied 15-60V continuously, replace inverter P.C. board. If signal is not varied, replace indoor P.C. board.

Block distinction			Operation of diagnos	sis function		
Check code	Block	Check code	Cause of operation	Air conditioner status	Display flashing error	Action and Judgment
	board	11	Current on inverter circuit is over limit in short time.  Inverter P.C. board is failure, IGBT shortage, etc.  Compressor current is higher than limitation, lock rotor, etc.	All OFF	Flashes after error is detected 8 times*.	<ol> <li>Remove connecting lead wire of the compressor, and operate again.</li> <li>If outdoor fan does not operate or operate but stop after some period, replace the inverter P.C. board.</li> <li>If outdoor fan operates normally, measure 3-Phase output of inverter P.C. board (150-270VAC) at the connecting lead wire of compressor.</li> <li>If 3-Phase output is abnormal, replace inverter P.C.Board.</li> <li>If 3-Phase output is normal, replace compressor. (lock rotor, etc.)</li> </ol>
		Li Li	Compressor position-detect circuit error or short-circuit between winding of compressor.	All OFF	Flashes after error is detected 8 times*.	1. Remove connecting lead wire of the compressor, and operate again.  2. If outdoor fan does not operate or operation but stop after some period, replace the inverter P.C. board.  3. If outdoor fan operates normally, measure resistance of compressor winding. If circuit is shortage, replace the compressor.
		17	Current-detect circuit of inverter P.C. board error.	All OFF	Flashes after error is detected 4 times*.	Even if trying to operate again, all operations stop, replace inverter P.C. board.
		<u>13</u>	TE or TS sensor; abnormal. Out of place, disconnection, shortage, or misconnection (TE sensor is connected to TS connector, TS sensor is connected to TE sensor connector) TE sensor; Outdoor heat exchanger temperature sensor TS sensor; Suction pipe temperature sensor	All OFF	Flashes after error is detected 4 times*.	1. Check sensors, TE, TS connection. In case of sensors and it's connection is normal, check the inverter P.C. board  2. Check 4way valve operation/position. In case TE, TS detected temperature relationship are different from normal operation, "18" might be detected.
			TD sensor; Discharge pipe temperature sensor is disconnection or shortage.	All OFF	Flashes after error is detected 4 times*.	Check sensors TD and connection.     In case of the sensor and its     connection is normal, check the     inverter P.C. board.
		117	Outdoor fan failure or its drive-circuit on the inverter P.C. board failure.	All OFF	Flashes after error is detected 8 times*.	Check the motor, measure winding resistance, shortage or lock rotor.      Check the inverter P.C. board.
		占	TO sensor; The outdoor temperature sensor is disconnection or shortage.	Operation continues.	Record error after detected 4 times*. But does not flash display.	Check sensors TO and connection.     In case of the sensor and its connection is normal, check the inverter P.C. board.

Block distinction			Operation of diagnos	is function		
Check code	Block	Check code	Cause of operation	Air conditioner status	Display flashing error	Action and Judgment
	After re- When e	starting oper	Compressor drive output error.  (Relation of voltage, current and frequency is abnormal)  Overloading operation of compressor caused by over-charge refrigerant, P.M.V. failure, etc.  Compressor failure (High current).	or is detected, eneck code. But	error count is add (c after re-starting op	ount become 2 times)
<u> </u>	The others (including compressor)		Return signal of the outdoor unit has been sent when operation start. But after that, signal is stop some time.  Instantaneous power failure.  Some protector (hardware) of the outdoor unit open circuit of signal.  Signal circuit of indoor P.C. board or outdoor P.C. board is failure in some period.	Indoor unit operates continue. Outdoor unit stop.	Flashes when error is detected. Flashing stop and outdoor unit start to operate when the return signal from the outdoor unit is normal.	<ol> <li>Check power supply (Rate ± 10%)</li> <li>If the air conditioner repeat operates and stop with interval of approx. 10 to 40 minutes.</li> <li>Check protector (hardware) such as Hi-Pressure switch,         Thermal-Relay, etc.     </li> <li>Check refrigerant amount, packed valve opening and any possibility cause which may affect high temperature or high pressure.</li> <li>Check operation signal of the indoor unit by using diode. Measure voltage at terminal block of the indoor unit between No.2 and No.3 (or L2 and S) If signal is varied 15-60V continuously, replace inverter P.C. board.         If signal is not varied, replace indoor P.C. board.     </li> </ol>

Block	distinction	T	Operation of diagno	sis function		
Check code	Block	Check code	Cause of operation	Air conditioner status	Display flashing error	Action and Judgment
		Ī	Compressor does not rotate.  Because of missed wiring, missed phase or shortage.	All OFF	Flashes after error is detected 8 times*.	<ol> <li>Remove connecting lead wire of the compressor, and operate again.</li> <li>If outdoor fan does not operate or operation but stop after some period, replace the inverter P.C. board.</li> <li>If outdoor fan operates normally, measure 3-Phase output of inverter P.C. board (150-270VAC) at the connecting lead wire of compressor.</li> <li>If 3-Phase output is abnormal, replace inverter P.C.Board.</li> <li>If 3-Phase output is normal, measure resistance of compressor winding.</li> <li>If winding is shortage, replace the compressor.</li> </ol>
		IE	Discharge temperature exceeded 117°C.	All OFF	Flashes after error is detected 4 times*.	1. Check sensors TD. 2. Check refrigerant amount. 3. Check P.M.V. by measure the resistance of the coil and confirm its operation (sound of initial operation, etc.) 4. Observe any possibility cause which may affect high temperature of compressor.
		F	Compressor is high current though operation Hz is decreased to minimum limit.  Installation problem. Instantaneous power failure. Refrigeration cycle problem. Compressor break down. Compressor failure (High current).operation, etc.)	All OFF	Flashes after error is detected 8 times*.	<ol> <li>Check installation conditions such as packed valve opening, refrigerant amount and power supply (rate ±10%, both of operation and non operation condition).</li> <li>Check P.M.V. by measure the resistance of the coil and confirm its operation (sound of initial operation, etc.)</li> <li>Observe any possibility cause which may affect high current of compressor.</li> <li>If 1, 2 and 3 are normal, replace compressor.</li> </ol>

Bloc	k distinction		Operation of diagnos	Operation of diagnosis function					
Check code	Block	Check code	Cause of operation	Air conditioner status	Display flashing error	Action and Judgment			
		2	Return signal of the outdoor unit has been sent when operation start. But after that, signal is stop some time.  Instantaneous power failure.  Some protector (hardware) of the outdoor unit open circuit of signal.  Signal circuit of indoor P.C. board or outdoor P.C. board is failure in some period.  TE, TC high tmperature TE for cooling operation TC for heating operation.	Indoor unit operates continue. Outdoor unit stop.	Flashes when error is detected 11 times*. Flashing stop and outdoor unit start to operate when the return signal from the outdoor unit is normal.	<ol> <li>Check power supply (Rate ±10%)</li> <li>If the air conditioner repeat operat and stop with interval of approx. 10 to 40 minutes.</li> <li>Check protector (hardware) such as Hi-Pressure switch,         Thermal-Relay, etc.</li> <li>Check refrigerant amount, packed valve opening and any possibility cause which may affect high temperature or high pressure.</li> <li>Check operation signal of the indo unit by using diode. Measure voltage at terminal block of the indoor unit between No.2 and No.3 (or L2 and S) If signal is varied 15-60V continuously, replace inverter P.C. board.         If signal is not varied, replace indoor P.C. board.</li> <li>Check and clean heat exchanger area Indoor and Outdoor unit.</li> </ol>			
	After r When	re-starting of error count	st error is detected, error is count a peration within 6 minutes, if same comes 4, 8 or 11 times, record error or conditioner can operate more that	error is detecte or to check coc	d, error count is add le. But after re-star	d (count become 2 times) ting operation, if no error			

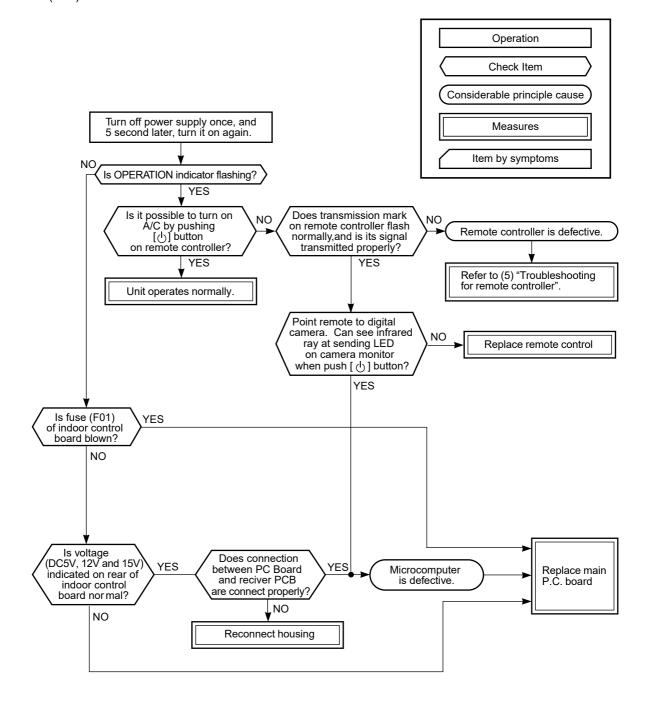
#### 11-5. Judgment of Trouble by Every Symptom

#### 11-5-1. Indoor Unit (Including Remote Controller)

#### (1) Power is not turned on (Does not operate entirely)

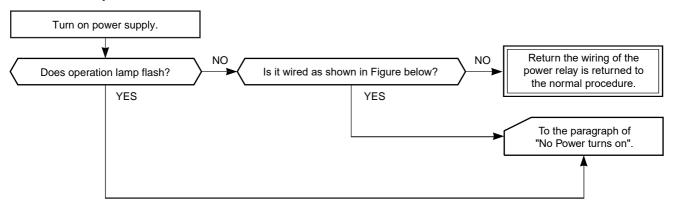
#### <Primary check>

- 1. Is the supply voltage normal?
- 2. Is the normal voltage provided to the outdoor unit?
- 3. Is the crossover cable connected properly?
- 4. Is the fuse (F01) blown?



• Be sure to disconnect the motor connector CN34 after shut off the power supply, or it will be a cause of damage of the motor.

# (2) Power is not turned on though Indoor P.C. board is replaced <Confirmation procedure>

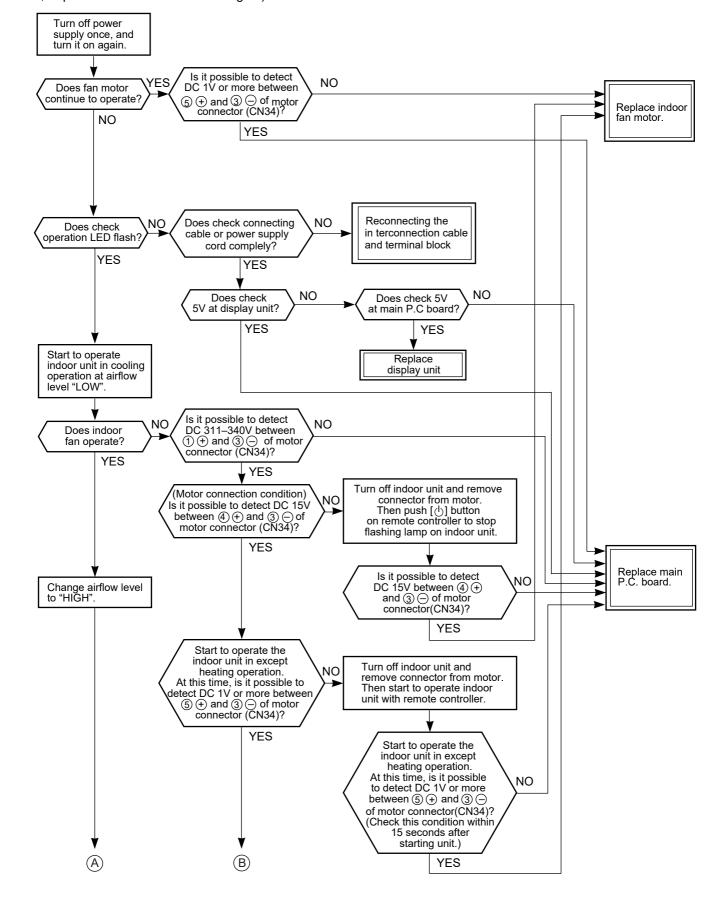


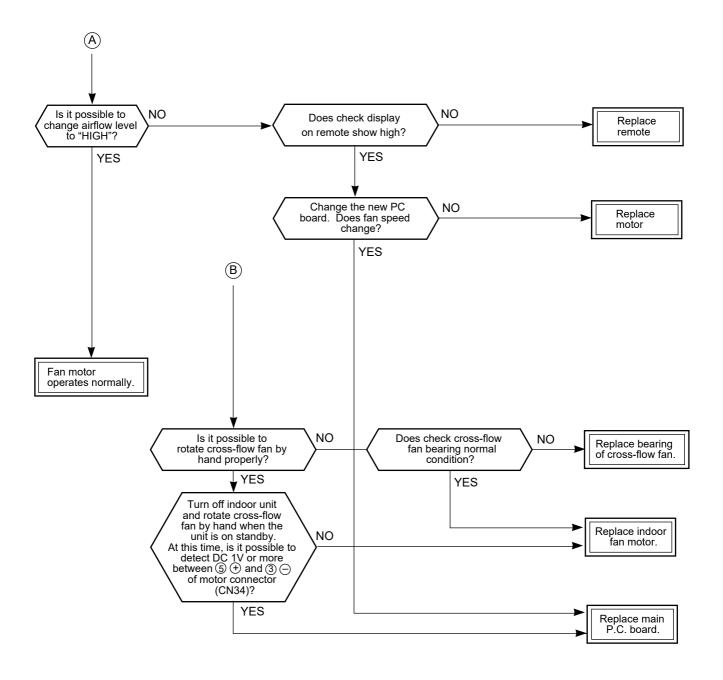
#### (3) Only the indoor motor fan does not operate

#### <Primary check>

- 1. Is it possible to detect the power supply voltage (AC220–240V) between ① and ② on the terminal block?
- 2. Does the indoor fan motor operate in cooling operation?

  (In heating operation, the indoor fan motor does not operate for approximately 10 minutes after it is turned on, to prevent a cold air from blowing in.)





#### (4) Indoor fan motor automatically starts to rotate by turning on power supply

#### [For DC fan motor]

#### <Cause>

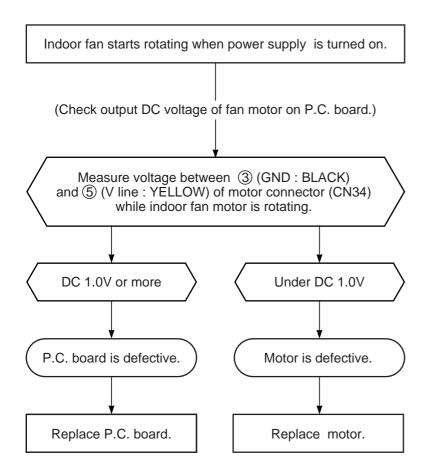
The IC is built in the indoor fan motor. Therefore the P.C. board is also mounted to inside of the motor. If the P.C. board is soldered imperfectly or the IC is defective, the fan motor may automatically rotate by turning on power supply.

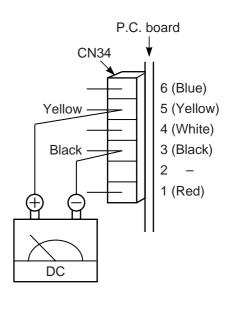
#### <Inspection procedure>

- 1. Remove the front panel. (Remove 2 screws.)
- 2. Remove the cover of the fan motor lead wires.
- 3. Check DC voltage with CN34 connector while the fan motor is rotating.

#### NOTE:

- Do not disconnect the connector while the fan motor is rotating.
- · Use a thin test rod.

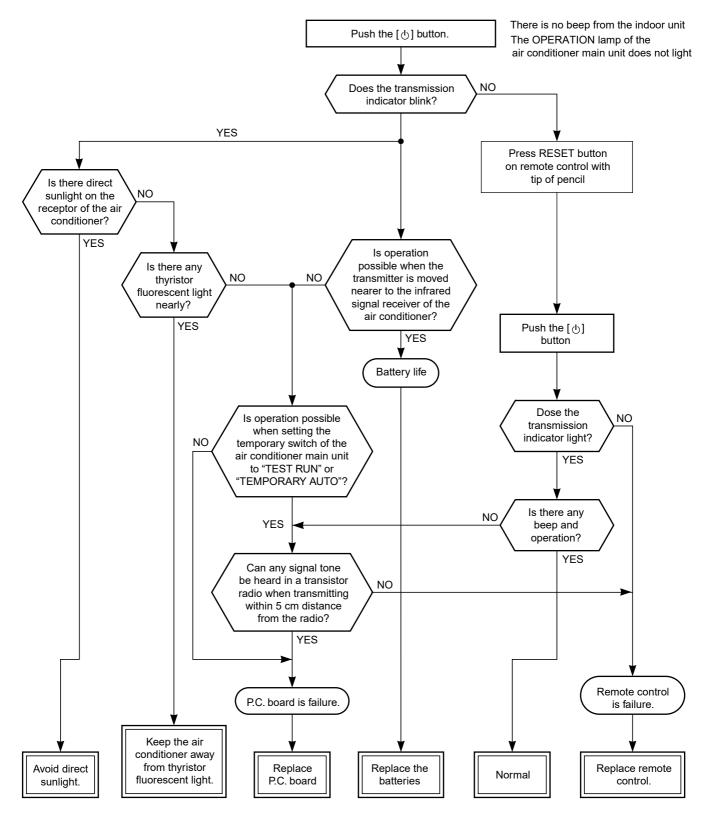




#### (5) Troubleshooting for remote controller

#### <Primary check>

Check that A or B selected on the main unit is matched with A or B selected on the remote controller.



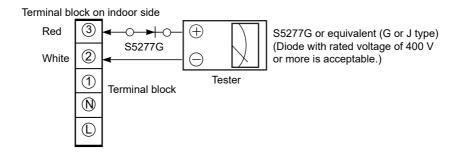
#### 11-5-2. Wiring Failure (Interconnecting and Serial Signal Wire)

#### (1) Outdoor unit does not operate

Is the voltage between ② and ③ of the indoor terminal block varied?
 Confirm that transmission from indoor unit to outdoor unit is correctly performed based upon the following diagram.

#### NOTE:

- Measurement should be performed 2 minutes and 30 seconds after starting of the operation.
- Be sure to prepare a diode for judgment.



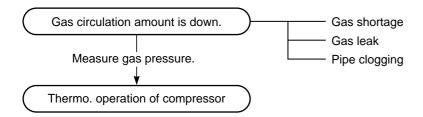
Normal time : Voltage swings between DC15 and 60V. .....Inverter Assembly check (11-7-1.)

Abnormal time : Voltage does not vary.

#### (2) Outdoor unit stops in a little while after operation started

#### <Check procedure> Select phenomena described below.

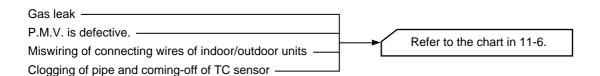
1) The outdoor unit stops 10 to 20 minutes after operation started, and 10 minutes or more are required to restart the unit.



2) If the unit stops once, it does not operate until the power will be turned on again.

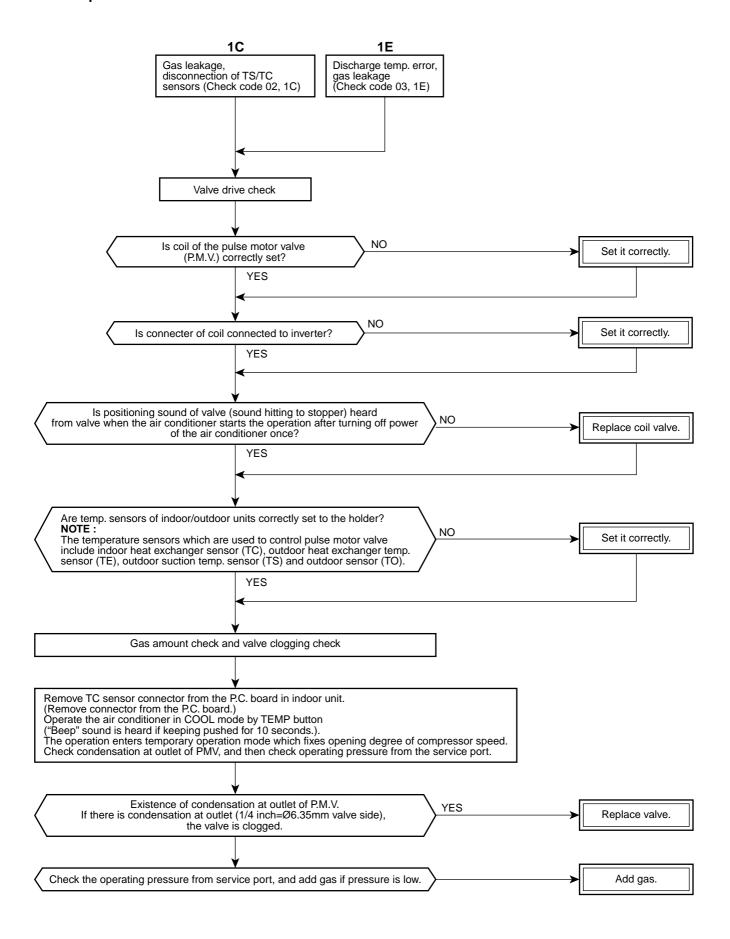
To item of Outdoor unit does not operate.

3) The outdoor unit stops 10 minutes to 1 hour after operation started, and an alarm is displayed. (Discharge temp. error check code 03, 1E Sensor temp. error check code 02, 1C)



#### 11-6. How to Check Simple the Main Parts

#### <Check procedure>



# 11-7. How to Diagnose Trouble in Outdoor Unit

# 11-7-1. Summarized Inner Diagnosis of Inverter Assembly

Diagnosis/Process flowchart	Item	Contents	Summary
Remove connector of compressor.	Preparation	Turn "OFF" the power supply breaker, and remove 3P connector which connects inverter and compressor.	
Check 25A fuse (Part No.F01).  OK  Replace fuse.  Check electrolytic capacitor, diode block (DB01), etc.	Check	Check whether 25A fuse on the control board assembly is blown or not. (F01)	If fuse was blown, be sure to check the electrolytic capacitor and diode block. (DB01)  • Connect discharge resistance (approx. 100Ω, 40W) or soldering iron (plug) between +, – terminals of the electrolytic capacitor (760μF) of C09,C10 (with printed WARNING ELECTRIC SHOCK) on P.C. board.
Check terminal voltage of electrolytic capacitor.  OK  Check electrolytic capacitor, diode (DB01), etc.			Discharging position (Discharging period 10 seconds or more)  Plug of soldering iron
Does outdoor fan rotate?  YES	Operation	Turn on the power breaker, and operate the air condi- tioner in COOL mode by time shortening.	OK if 760 $\mu$ F $\rightarrow$ DC280 to 380V
	Measure- ment	Measure terminal voltage of the electrolytic capacity.  760μF:400V x 2	Remove CN300 while pushing the part indicated by an by an arrow because CN300 is a connector with lock.
Remove connector CN300 of outdoor fan motor, and using a tester, check resistance value between every phases at motor side.  OK	Check Stop	After operation, turn off the power breaker after 2 minutes 20 seconds passed, and discharge the electrolytic capacitor by soldering iron. Check voltage between motor phases.	
Replace outdoor fan motor.  A  B	Check Measure- ment	<ul> <li>Is not winding between ①-②, ②-③, or ①-③ opened or short-circuited?</li> <li>Is not frame grounded with ①, ②, or ③?</li> </ul>	→ Resistance between phases should be approx. 33.7Ω $ → Should be 100MΩ or more.$

Diagnosis/Process flowchart	Item	Contents	Summary
Replace control board assembly.  Check compressor winding resistance.  OK  Replace control board.  Replace compressor.	Check	Check winding resistance between phases of compressor, and resistance between outdoor frames by using a tester.  • Is not grounded.  • Is not short-circuited between windings.  • Winding is not opened.  Remove connector CN31 of the outdoor fan motor, turn on the power supply breaker, and perform the operation. (Stops though activation is prompted.)  Check operation within 2 minutes 20 seconds after activation stopped.	→ OK if 20MΩ or more  → OK if about 1.31Ω for RAS-25J2AVSG-ND1 1.10Ω for RAS-35J2AVSG-ND1  → (Check by a digital tester.)

#### 11-8. How to Check Simply the Main Parts

#### 11-8-1. How to Check the P.C. Board (Indoor Unit)

#### (1) Operating precautions

- 1) When removing the front panel or the P.C. board, be sure to shut off the power supply breaker.
- 2) When removing the P.C. board, hold the edge of the P.C. board and do not apply force to the parts.
- 3) When connecting or disconnecting the connectors on the P.C. board, hold the whole housing. Do not pull at the lead wire.

#### (2) Inspection procedures

- 1) When a P.C. board is judged to be defective, check for disconnection, burning, or discoloration of the copper foil pattern or this P.C. board.
- 2) The P.C. board consists of the following 2 parts

#### a. Main P.C. board part:

DC power supply circuit, Indoor fan motor control circuit, CPU and peripheral circuits, buzzer, and Driving circuit of louver.

#### b. Indication unit of infrared ray receiving infrared ray receiving circuit, LED:

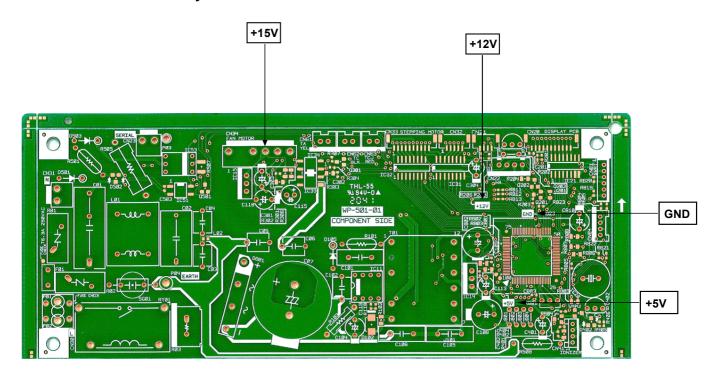
To check defect of the P.C. board, follow the procedure described below.

# (3) Check procedures

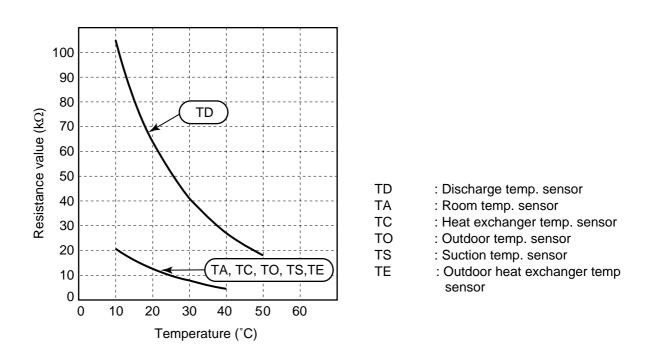
Table 11-8-1

No.	Procedure	Check points	Causes
1	Turn off the power supply breaker and remove the P.C. board assembly from electronic parts base. Remove the connecting cables from the terminal block.	Check whether or not the fuse (F01) is blown.	Impulse voltage was applied or the indoor fan motor short-circuited.
2	Remove the connector of the motor and turn on the power supply breaker. If OPERATION indicator flashes (once per second), it is not necessary to check steps (1 to 4) in the right next column.	Check power supply voltage:  1. Between Pin 4 of CN30 and CN31 (AC 220–240V)  2. Between ⊕ and ⊝of C01 (DC 310–340V)  3. Between 12V and GND  4. Between 5V and GND	<ol> <li>The terminal block or the crossover cable is connected wrongly.</li> <li>The fuse (F01), line filter (L01), resistor (R03), or the diode (DB01) is defective.</li> <li>T01 is defective.</li> <li>IC14 and T01 are defective.</li> </ol>
3	Push [🖰] button once to start the unit. (Do not set the mode to On-Timer operation.)	Check power supply voltage :  1. Between CN23 and CN31 (DC 15–60V)	IC52 and IC53 are defective.
4	Shorten the restart delay timer and start unit.	Check whether or not all indicators (OPERATION,TIMER, HI-POWER, ECO, Wireless adepter) are lit for 3 seconds and they return to normal 3 seconds later.	The indicators are defective or the housing assembly (CN20) is defective.
5	Push [♣] button once to start the unit.  • Shorten the restart delay timer.  • Set the operation mode to COOL.  • Set the fan speed level to AUTO.  • Set the preset temperature much lower than the room temperature. (The unit (compressor) operates continuously in the above condition.)	Check whether or not the compressor operates.     Check whether or not the OPERATION indicator flashes.	<ol> <li>The temperature of the indoor heat exchanger is extremely low.</li> <li>The connection of the heat exchanger sensor is loose.         (The connector is disconnected.)         (CN62, CN63)</li> <li>The heat exchanger sensor and the P.C. board are defective.         (Refer to Table 11-4-1.)</li> <li>The main P.C. board is defective.</li> </ol>
6	If the above condition (No. 5) still continues, start the unit in the following condition.  Set the operation mode to HEAT.  Set the preset temperature much higher than room temperature.	Check whether or not the compressor operates.     Check whether or not the OPERATION indicator flashes.	<ol> <li>The temperature of the indoor heat exchanger is extremely high.</li> <li>The connection of the heat exchanger sensor short-circuited. (CN62, CN63)</li> <li>The heat exchanger sensor and the P.C. board are defective. (Refer to Table 11-4-1.)</li> <li>The main P.C. board is defective</li> </ol>
7	Connect the motor connector to the motor and turn on the power supply. Start the unit the following condition. • Set the fan speed level to HIGH. (The unit (compressor) operates continuously in the above condition in No. 5.)	1. Check it is impossible to detect the voltage (AC120V or higher voltage) between red and black lead of the motor.  2. The motor does not operate or the fan motor does not rotate with high speed.  (But it is possible to receive the signal from the remote controller.)  3. The motor rotates but vibrates strongly.	The indoor fan motor is defective. (Protected operation of P.C. board.)     The P.C. board is defective.     The connection of the motor connector is loose.

11-8-2. P .C . Board Layout



#### [1] Sensor characteristic table



# 11-8-3. Indoor Unit (Other Parts)

No.	Part name	Checking procedure								
1	Room temp. (TA) sensor Heat exchanger (TC)	Disconnect the connector and measure the resistance value with tester. (Normal temp.)								
	sensor	Sensor Temperature 10°C 20°C 25°C 30°C 40°C								
		TA, TC (kΩ) 20.7 12.6 10.0 7.9 4.5								
2	Remote controller	Refer to 11-5-1. (5).								
3	Louver motor MSBPC20F04	Measure the resistance value of each winding coil by using the tester. (Under normal temp. 25°C)								
	Webi 620161	Position Resistance value								
		White 100								
		Yellow ③③ Yellow ④④ Yellow ⑤⑤ Yellow ⑤⑤								
		at 25°C								
4	Indoor fan motor	Refer to 11-5-1. (3) and (4).								

#### 11-8-4. Outdoor Unit

11-0	3-4. OutdoorUnit									
1	Compressor	Measure the resistance	value of	each wi	nding by ເ	using the	e tester.			
	RAS-25J2AVSG-ND1	Black	Black							
	Model : DX136A1T-40N			-	Position		Resistance value			
		7 000				DX136	DX136A1T-40N		T-30N	
	RAS-35J2AVSG-ND1 Model : DX151A1T-30N	( coo lee		Wh	ed - White lite - Black ack - Red	1	.31Ω	1.100	Ω	
		White Red				•			at 20°C	
2	2 Fan motor Measure the resistance value of winding by using the tester.									
		Red				Po	sition	Resistance		
								WDF-340-	A43-1	
							- White e - Black	33.7 ±	1 70	
							k - Red	00.7 1	1.7.22	
		White Black				'			at 20°C	
3	4-Way valve coil	Measure the resistant	ce value	of wind	ing by us	ing the	tester.			
					Mod		: Resistance value : 1725 ± 172.5Ω			
					311	F-HUTAJ1072A1 1723 ± 172.312				
								6	at 20°C	
4	Pulse Modulating Valve (PMV) coil	Measure the resistance	value of w	vinding by	/ using the	tester.				
	Model : CAM-MD12TCTH-5	1 W —			Position	R	esistand	e value		
		$COM \rightarrow 5 R \stackrel{\bigcirc}{+} M$	) )	R	led - Whit	е	42 to	50Ω		
		3 0 — 9	m/	Re	ed - Orang	ge	42 to	50Ω		
			1	G	Gray- Yello	w	42 to	50Ω		
		Y G			Gray- Blue	е	42 to	50Ω		
		COM 2 6	i 4					at 20°C		
5	Outside air temp. sensor (TO) Discharge temp. sensor (TD) Suction temp. sensor (TS)	Disconnect the connector, (Normal temperature)	and mea	sure resis	tance value	e with the	e tester.			
	Exchanger temp. sensor (TE)	Temperature Sensor	10°C	20°C	30°C	40°C	50°C			
		TD (kΩ )	105	64	41	27	18			
		TO, TS, TE (kΩ)	20.7	12.6	7.9	4.5	3.4			
							1	<b>-</b>		

## 11-8-5. Checking Method for Each Part

No.	Part name	Checking procedure
1	Electrolytic capacitor	<ol> <li>Turn OFF the power supply breaker.</li> <li>Discharge all three capacitors completely.</li> <li>Check that safety valve at the bottom of capacitor is not broken.</li> <li>Check that vessel is not swollen or exploded.</li> <li>Check that electrolytic liquid does not blow off.</li> <li>Check that the normal charging characteristics are show in continuity test by the tester.</li> </ol>
		Case that product is good Pointer swings once, and returns slowly. When performing test once again under another polarity, the pointer should return. $C09, C10 \rightarrow 760 \mu F/400 V$
2	Converter module	Turn OFF the power supply breaker.     Discharge all three capacitors completely.     Check that the normal rectification characteristics are shown in continuity test by the tester.
		$ \begin{array}{c c}  & & & & & & & \\  & & & & & & \\  & & & &$
		Diode check  Tester rod Resistance value in good product  (+) (-)
		$\begin{array}{c c} \hline \bigcirc_2 \\ \hline \bigcirc_3 \\ \hline \bigcirc_4 \\ \hline \bigcirc_{1} \\ \hline \bigcirc_{2} \\ \hline \bigcirc_{3} \\ \hline \end{array} \begin{array}{c c} 50k\Omega \text{ or more} \\ (0\Omega \text{ in trouble}) \\ \hline \end{array}$

## 11-9. How to Simply Judge Whether Outdoor Fan Motor is Good or Bad

## 1. Symptom

- · Outdoor fan motor does not rotate.
- Outdoor fan motor stops within several tens seconds though it started rotating.
- Outdoor fan motor rotates or does not rotate according to the position where the fan stopped, etc.

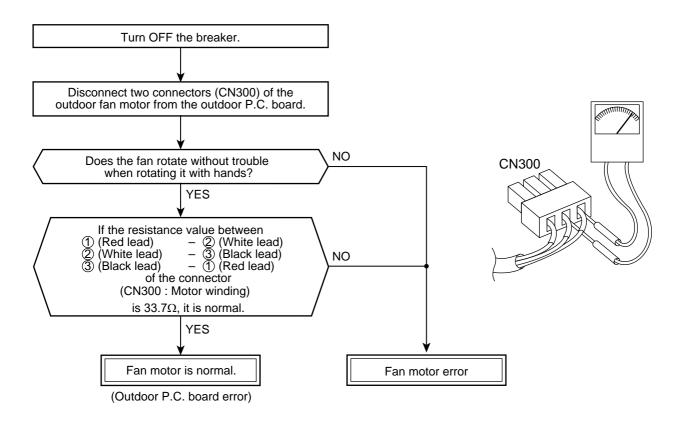
Remote controller check code "02: Outdoor block, 1A: Outdoor fan drive system error"

### 2. Cause

The following causes are considered when the outdoor fan motor does not normally rotate.

- 1) Mechanical lock of the outdoor fan motor
- 2) Winding failure of the outdoor fan motor
- 3) Position-detect circuit failure inside of the outdoor fan motor
- 4) Motor drive circuit failure of the outdoor P.C. board

## 3. How to simply judge whether outdoor fan motor is good or bad



#### NOTE:

However, GND circuit error inside of the motor may be accepted in some cases when the above check is performed.

When the fan motor does not become normal even if P.C. board is replaced, replace the outdoor fan motor.

## 12. HOW TO REPLACE THE MAIN PARTS

## **WARNING**

- Since high voltages pass through the electrical parts, turn off the power without fail before proceeding with the repairs. Electric shocks may occur if the power plug is not disconnected.
- After the repairs have been completed (after the front panel and cabinet have been installed), perform a test run, and check for smoking, unusual sounds and other abnormalities.

If this check is omitted, a fire and/or electric shocks may occur.

Before proceeding with the test run, install the front panel and cabinet.

- Ensure that the following steps are taken when doing repairs on the refrigerating cycle.
  - 1. Do not allow any naked flames in the surrounding area.
    - If a gas stove or other appliance is being used, extinguish the flames before proceeding.
    - If the flames are not extinguished, they may ignite any oil mixed with the refrigerant gas.
  - 2. Do not use welding equipment in an airtight room.
    - Carbon monoxide poisoning may result if the room is not properly ventilated.
  - 3. Do not bring welding equipment near flammable objects.
    - Flames from the equipment may cause the flammable objects to catch fire.
- If keeping the power on is absolutely unavoidable while doing a job such as inspecting the cir-cuitry, wear rubber gloves to avoid contact with the live parts.

Electric shocks may be received if the live parts are touched.

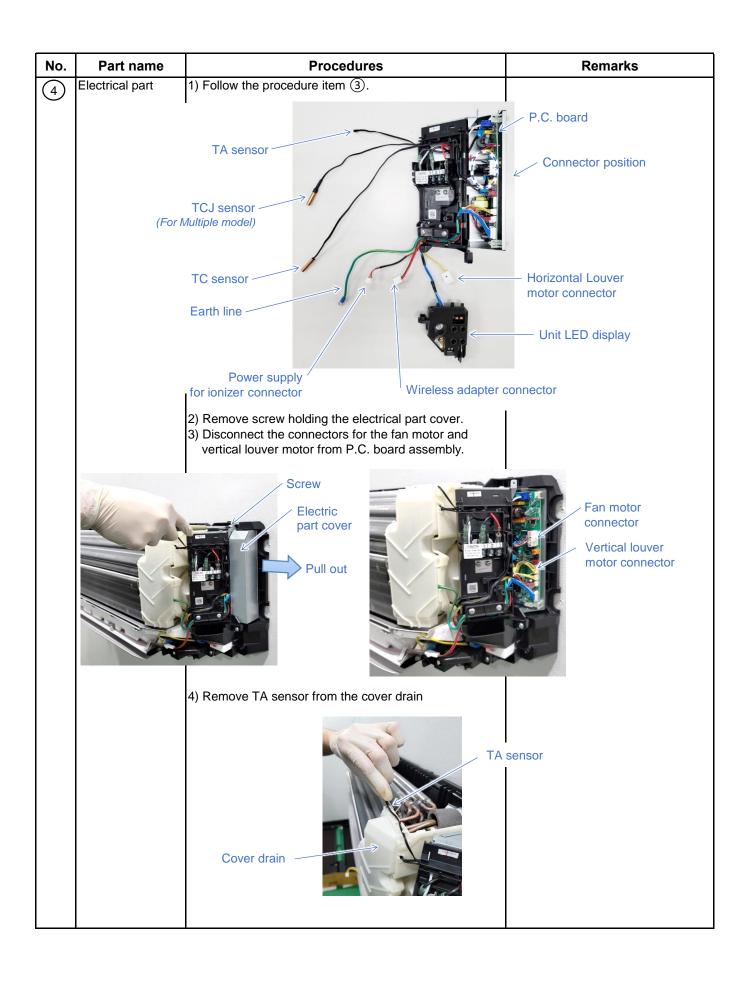
High-voltage circuits are contained inside this unit.

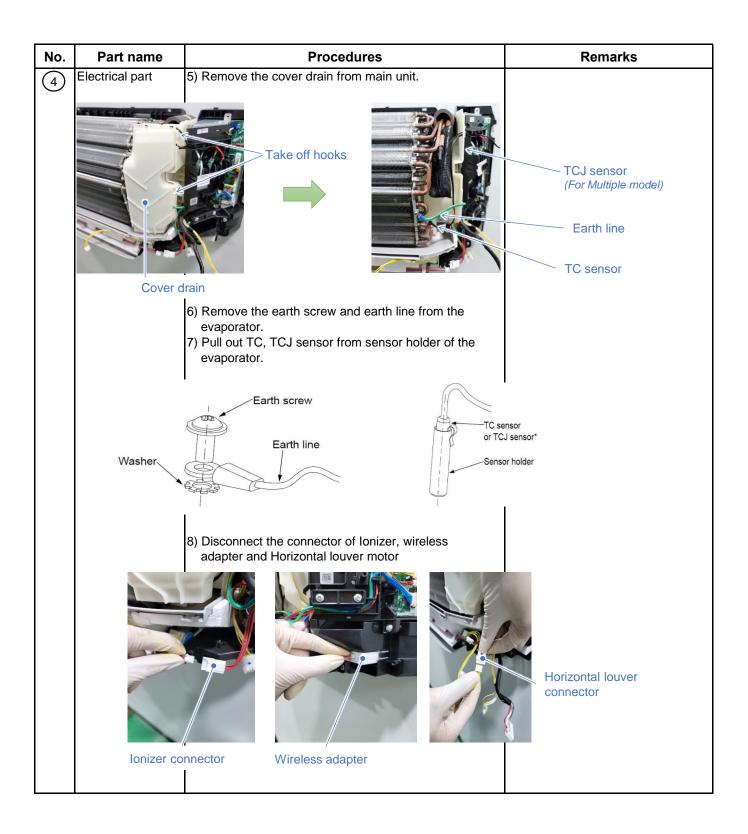
Proceed very carefully when conducting checks since directly touching the parts on the control circuit board may result in electric shocks.

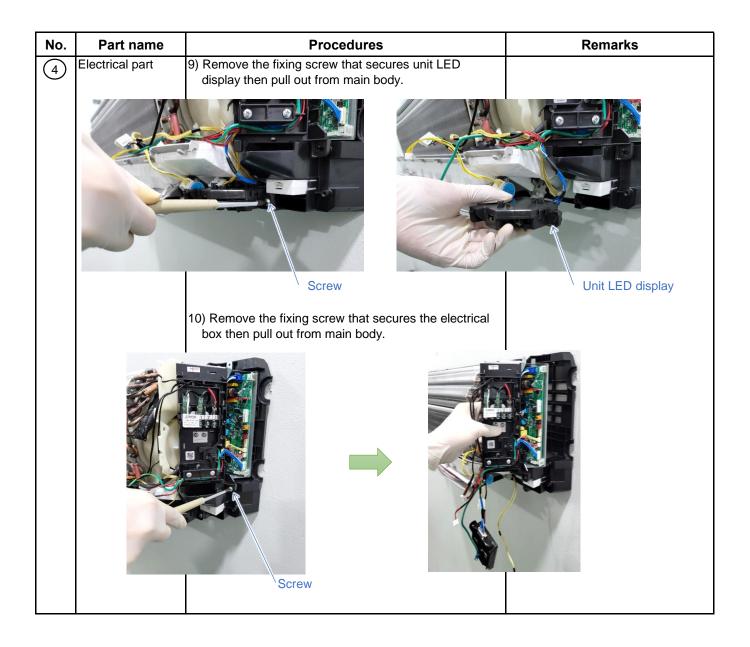
## 12-1. Indoor unit

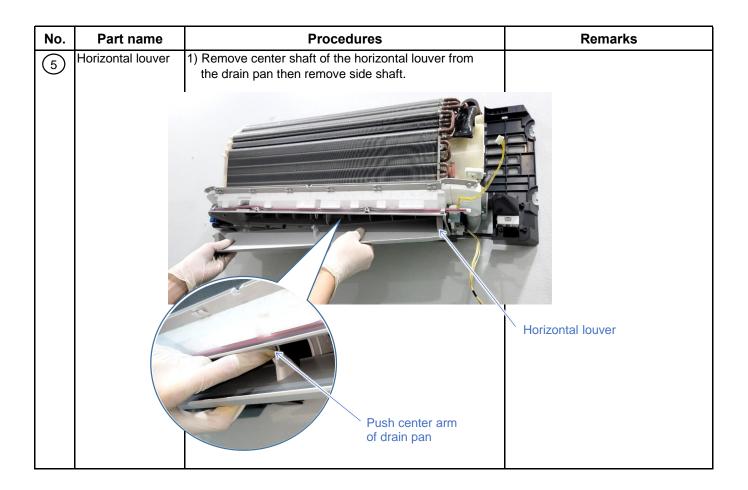
No.	Part name	Procedures	Remarks
1	Air inlet grille	1) Stop operation of the air conditioner and turn off its main power supply.  2) Open the air inlet grille and push the arm toward the outside, and remove the grille.	
2	Air filters	<ul> <li>1) Follow to the procedure in the item ①.</li> <li>2) Push up the rib air filter and remove the air filters left and right from the front panel.</li> </ul>	

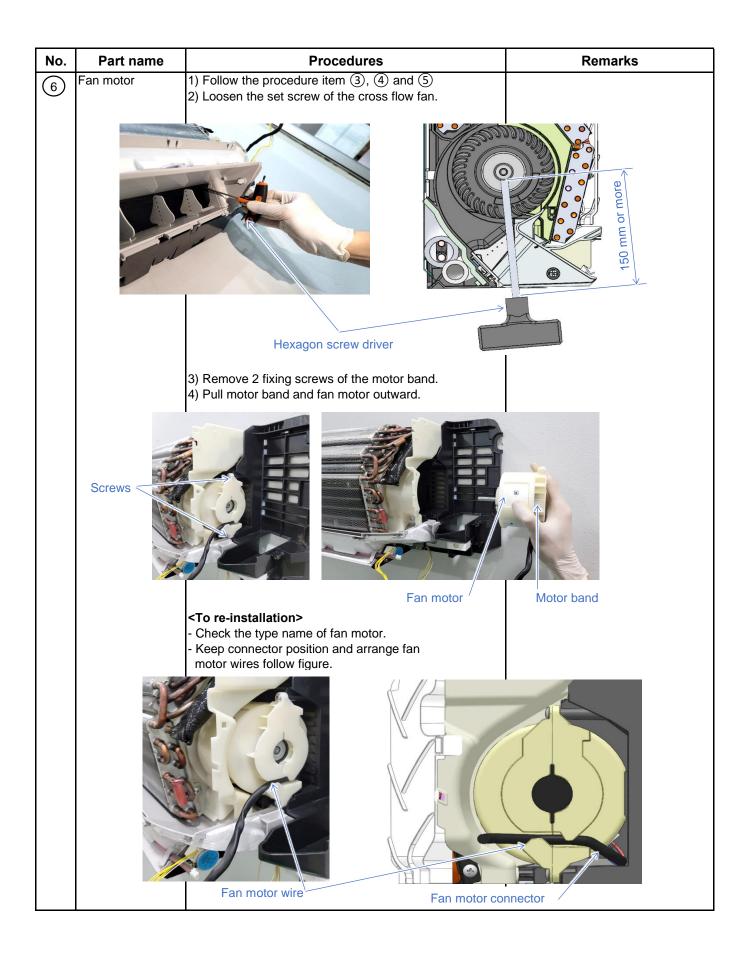




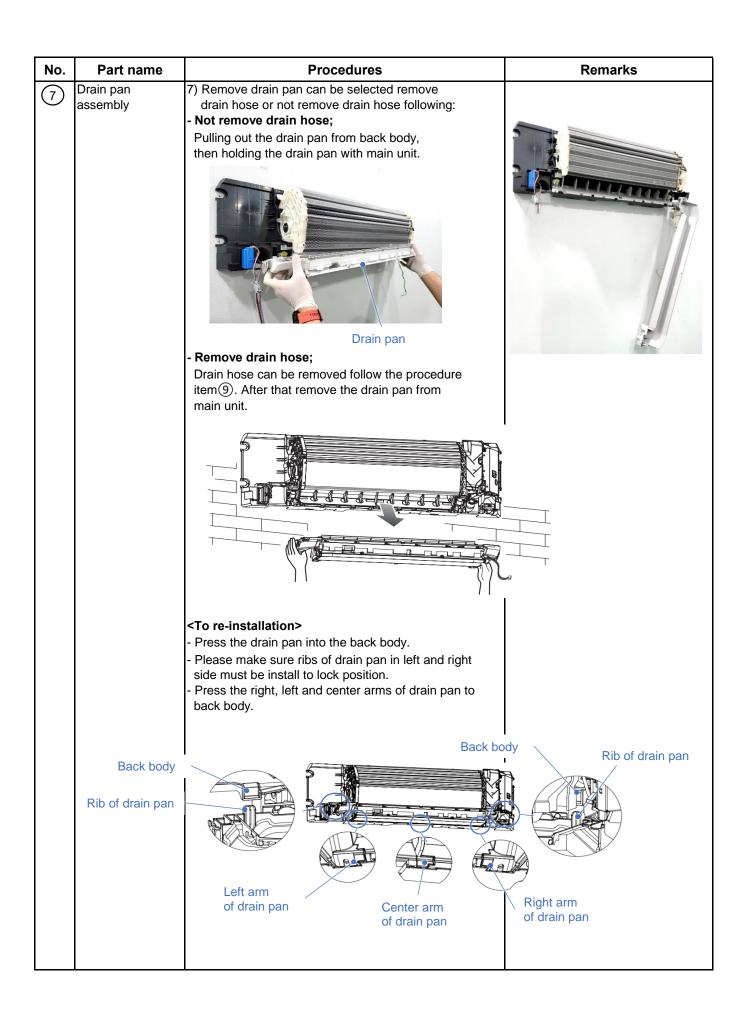


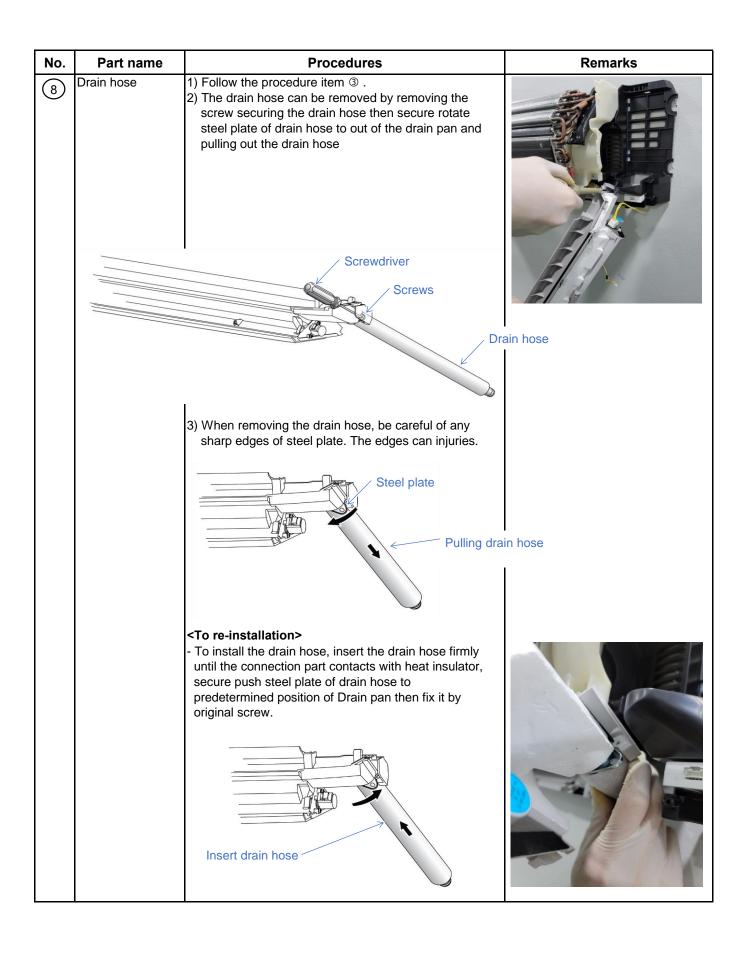


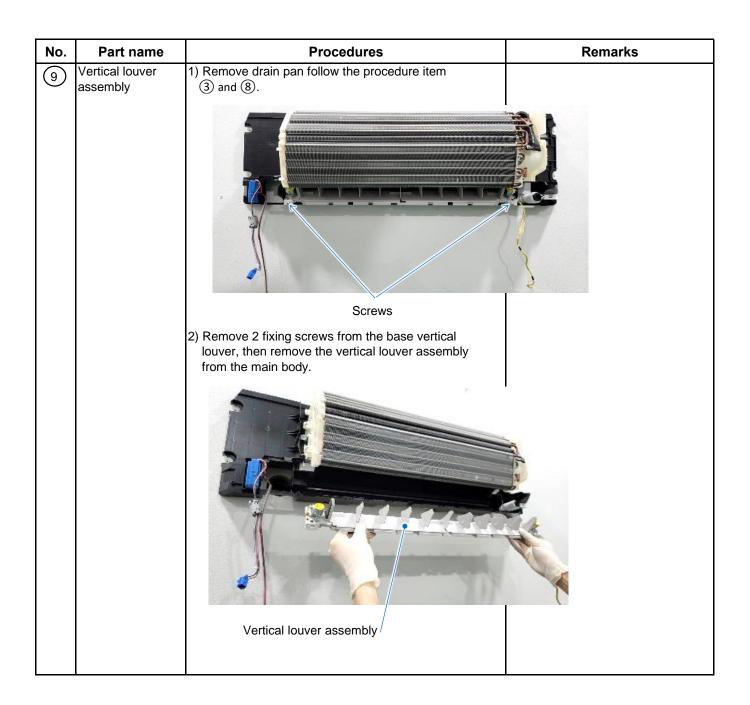




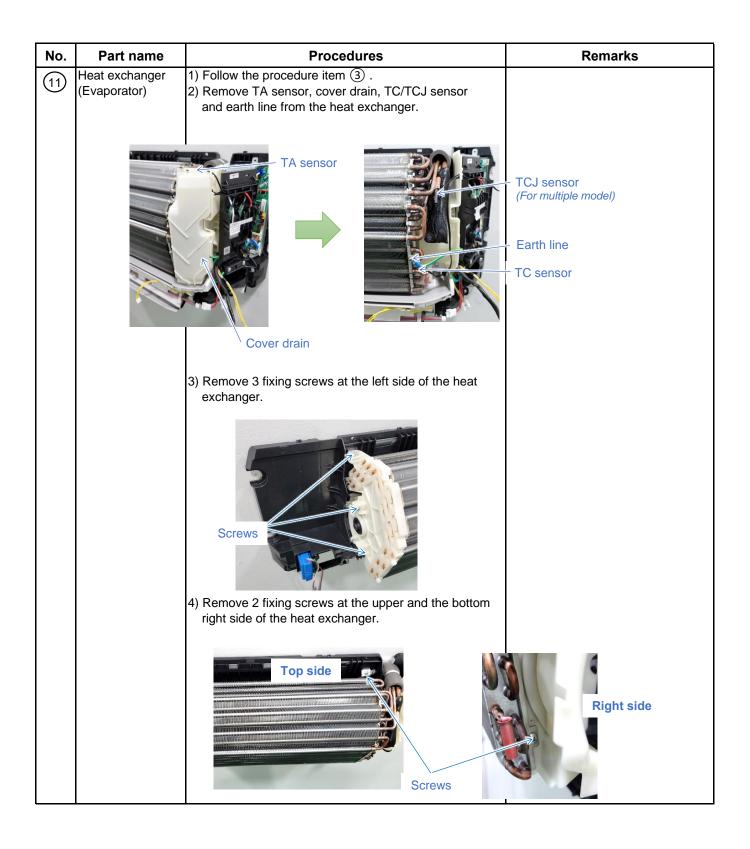








# Part name No. **Procedures** Remarks Cross flow fan 1) Follow the procudure item (8) and (10). (10) 2) Loosen the set screw of the cross flow fan. Hexagon screw driver 3) Remove 2 fixing screws from the bearing base and 3 fixing screws of evaporator, then remove it Bearing base from the main unit. Screws of evaporator Screws 4) Lift up the heat exchanger follow the figure. Pull out the left hand side until the cross flow fan released from the shalf of the fan motor and thenpull out the lower side of heat exchanger follow the figure. <To re-installation> Cross flow fan Body back 1) To incorporate the fan motor and the motor into the position in the following figure. Install the cross flow fan so that the right end if the 1st joint from the right of the cross flow fan is keep 5mm from closed wall of the main unit.



No.	Part name	Procedures	Remarks
No. (11)	Part name Heat exchanger (Evaporator)	Procedures  5) Remove the pipe holder from the rear side of the main unit.  Un-hook 2 posit	
		6) Pull out the heat exchanger to upper side  To re-installation> - Keep the back body horizontally and put the heat exchanger to the back body - Make sure the heat exchanger can be assembled with the back body and secure it tightly with screws.	

# Microcomputer

No.	Part name	Procedure	Remarks
1	Common procedure	<ol> <li>Turn the power supply off to stop the operation of air-conditioner.</li> <li>Remove the front panel.</li> <li>Remove the 2 fixing screws.</li> <li>Remove the electrical part base.</li> </ol>	Replace terminal block, microcomputer ass'y and the P.C. board ass'y.

## 12-2. Outdoor unit

12-2. Outdoor unit		
No. Part name	Procedures	Remarks
① Common procedure	Wear gloves for this job. Otherwise, you may injure your hands on the parts, etc.  1) Stop operation of the air conditioner, and turn off the main switch of the breaker for air conditioner.  2) Remove the valve cover. (ST2TØ4 × 10L 2 pcs.)  • After removing screw, remove the valve cover pulling it downward.  3) Remove cord clamp (ST2TØ4 × 14L 3 pcs.), and then remove connecting cable.  4) Remove the upper cabinet. (ST1TØ4 × 10L 5 pcs.)  • After removing screws, remove the upper cabinet pulling it upward.	Upper cabinet  Valve cover  Screw ST1T  Screw ST2T
② Front cabinet	1. Detachment 1) Perform step 1 in ①. 2) Remove the fixing screws (ST2TØ4 × 10L 2 pcs.) used to secure the front cabinet and inverter cover, the screws (ST2TØ4 × 10L 4 pcs.) used to secure the front cabinet at the bottom, and the fixing screws (ST2TØ4 × 10L 2 pcs.) used to secure the motor base.  • The front cabinet is fitted into the side cabinet (left) at the front left side so pull up the top of the front cabinet to remove it.  2. Attachment 1) Insert the claw on the front left side into the side cabinet (left). 2) Hook the bottom part of the front right side onto the concave section of the bottom plate. Insert the claw of the side cabinet (right) into the square hole in the front cabinet. 3) Return the screws that were removed above to their original positions and attach them.	Front cabinet  Claw Square hole  Concave section

No.	Part name	Procedures	Remarks
3	Inverter assembly	<ol> <li>Perform work of item 1 in ①.</li> <li>Remove screw (ST2TØ4 × 10L 2 pcs.) of the upper part of the front cabinet.</li> <li>If removing the inverter cover in this condition, P.C. board can be checked.</li> <li>If there is no space above the unit, perform work of 1 in ②.</li> <li>Be careful to check the inverter because high-voltage circuit is incorporated in it.</li> <li>Perform discharging by connecting ⊕, ⊝ polarity by discharging resistance (approx. 100Ω40W) or plug of soldering iron ⊕ to ⊝, terminals a of the C09 ,C10 (printed "CAUTION HIGH VOLTAGE" is attached.) electrolytic capacitor (760µF) on P.C. board.</li> <li>Be careful to discharge the capacitor</li> </ol>	Discharging position (Discharging period 10 seconds or more)  P.C. board (Soldered surface)  Plug of soldering iron
		because the electrolytic capacitor cannot naturally discharge and voltage remains according to trouble type in some cases.  NOTE  This capacitor is one with mass capacity. Therefore, it is dangerous that a large spark generates if short-circuiting between ⊕, ⊖  4) Remove screw (ST2TØ4 x 10L 4pcs.) fixing the terminal part of inverter box to the main body.  5) Remove the front cabinet by performing step 1 in ②, and remove the fixing screws (ST2TØ4 x 10L) for securing the main body and inverter box.  6) Remove various lead wires from the holder at upper part of the inverter box.  7) Pull the inverter box upward.  8) Disconnect connectors of various lead wires.  Requirement  As each connector has a lock mechanism, avoid to remove the connector by holding the lead wire, but by holding the connector.	A screw (ST2T Ø 4x10L)  The connector is one with lock, so remove it while pushing the part indicated by an arrow.  Be sure to remove the connector by holding the connector, not by pulling the lead wire.

No.	Part name	Procedures	Remarks
<b>⑤</b>	Side cabinet	1. Side cabinet (right)  1) Perform step 1 in ② and all the steps in ③.  2) Remove the fixing screw (ST2TØ4 × 10L 4 pcs.) used for securing the side cabinet to the bottom plate and valve fixing panel  2. Side cabinet (left)  1) Perform step 1 in ②.  2) Remove the fixing screw (ST2TØ4 × 10L 1 pc.) used to secure the side cabinet (left) onto the heat exchanger.  3) Remove the fixing screw (ST2TØ4 × 10L 2 pcs.) used for securing the side cabinet to the bottom plate and heat exchanger.	Hook the claw noto the bottom plate  The back body section hooked onto the bottom plate here.
		Detail A Detail B	Detail C
<b>6</b>	Fan motor	<ol> <li>Perform work of item 1 of ① and ②.</li> <li>Remove the flange nut fixing the fan motor a the propeller.         <ul> <li>Flange nut is loosened by turning clockwise. (To tighten the flange nut, tur counterclockwise.)</li> </ul> </li> <li>Remove the propeller fan.</li> <li>Disconnect the connector for fan motor from the inverter.</li> <li>Remove the fixing screws 3 pcs.) holding by hands so that the fan motor does not fall.         <ul> <li>Precautions when assembling the fan motor Tighten the flange nut using a tightenin torque of 4.9 N•m.</li> </ul> </li> </ol>	Propeller fan Fan motor Flange nut

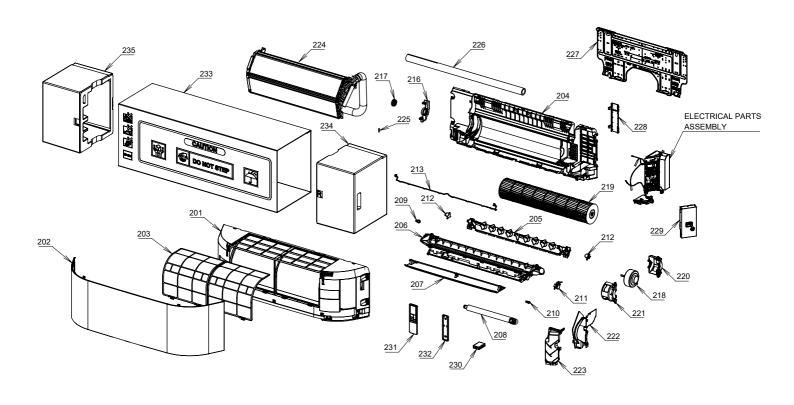
No.	Part name	Procedures	Remarks
7	Compressor	<ol> <li>Perform work of item 1 of ① and ②, ③, ④, ⑤.</li> <li>Extract refrigerant gas.</li> <li>Remove the partition board. (ST2TØ4 × 10L 3 pcs.)</li> <li>Remove the sound-insulation material.</li> <li>Remove terminal cover of the compressor, and disconnect lead wire of the compressor from the terminal.</li> <li>Remove pipe connected to the compressor with a burner.</li> <li>Remove the fixing screw of the bottom plate and heat exchanger. (ST2TØ4 × 10L 1 pc.)</li> <li>Remove the fixing screw of the bottom plate and valve fixing plate. (ST2TØ4 × 10L 1 pc.)</li> <li>Pull upward the refrigeration cycle.</li> <li>Remove NUT (3 pcs. fixing the compressor to the bottom plate.</li> </ol>	Compressor
8	Reactor	1) Perform work of item 1 of ② and ③.  2) Remove screws fixing the reactors (ST2TØ4 × 10L 2 pcs.)	Reactor

No.	Part name	Procedures	Remarks
9	Electronic expansion valve coil	1. Detachment 1) Perform step 1 in ②, all the steps in ③ and 1 in ⑤. 2) Remove the coil by pull it upward.  2. Attachment 1) Insert a valve coil to value body by push it downward. And confirm to fix it surely.	
(0)	Fan Guard	1. Detachment 1) Perform work of item 1 of ② . 2) Remove the front cabinet, and put it down so that fan guard side directs downward.  Perform work on a corrugated cardboard, cloth, etc. to prevent f aw to the product.  3) Remove the hooking claws by pushing minus screwdriver according to the arrow mark in the right figure, and remove the fa guard.  2. Attachment 1) Insert claws of the fan guard in the holes of the front cabinet. Push the hooking claws (9 positions) by hands and fix the claws  Check that all the hooking claws are fixed to the specified positions.	Minus screwdriver Hooking claw

lo.	Part name	Procedures	Remarks
1)	TE sensor (outdoor heat	exchanging temperature sensor)	
	Attachment		
	Install the sensor onto	the straight pipe part of the condenser output pipe.	
12	TS sensor (Suction pipe	temperature sensor)	
	Attachment	'	
	Install the senser onto	the straight pipe part of the suction pipe.	
	Be careful for the lead	direction of the sensor.	
3)	TD sensor (Discharge pip	pe temperature sensor)	
	Attachment		
	With its leads pointed u	ipward, install the sensor onto the vertical straight	
	pipe part of the dischar	ge pipe.	
 D	TO sensor (Outside air te	emperature sensor)	
	Attachment	,	
	Insert the outdoor air te	emperature sensor into the holder, and install the	
	holder onto the heat ex	changer.	
	of the metal plates o	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be	
		n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be	
	of the metal plates o shocks and/or a fire.	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be	damaged since damage may cause electric
	of the metal plates o shocks and/or a fire.  After replacing the p	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be	damaged since damage may cause electric
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be coverings to be covering to b	damaged since damage may cause electric ere installed are the proper positions as
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be coverings to be covering to b	damaged since damage may cause electric ere installed are the proper positions as
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be coverings to be covering to b	damaged since damage may cause electric ere installed are the proper positions as
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be coverings to be covering to b	damaged since damage may cause electric ere installed are the proper positions as
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be coverings to be covering to b	damaged since damage may cause electric ere installed are the proper positions as
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be coverings to be covering to b	damaged since damage may cause electric ere installed are the proper positions as
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be coverings to be covering to b	damaged since damage may cause electric ere installed are the proper positions as
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be coverings to be covering to b	damaged since damage may cause electric ere installed are the proper positions as
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	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be covering to be	damaged since damage may cause electric ere installed are the proper positions as
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be covering to be	damaged since damage may cause electric ere installed are the proper positions as
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be covering to be	damaged since damage may cause electric ere installed are the proper positions as
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be covering to be	damaged since damage may cause electric ere installed are the proper positions as
	of the metal plates o shocks and/or a fire.  After replacing the p instructed. The prod	n work (and on its completion), take care not to damager other parts. It is dangerous for these coverings to be covering to be	damaged since damage may cause electric ere installed are the proper positions as

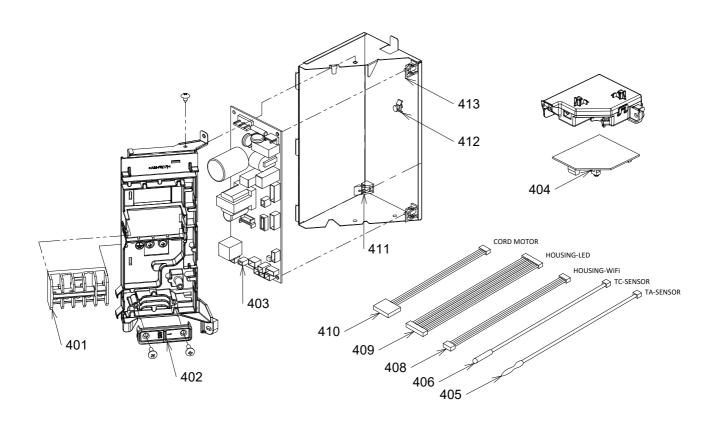
# 13. EXPLODED VIEWS AND PARTS LIST

## 13-1. Indoor Unit



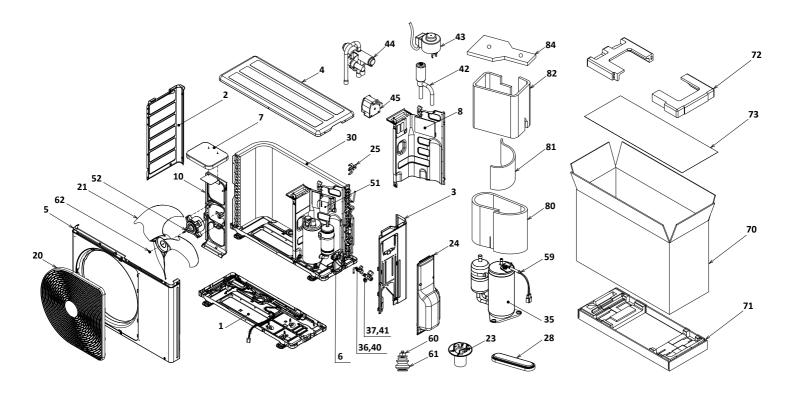
Location	Part	Description	Location	Part	Description
No.	No.	Bescription	No.	No.	Bescription
201	43T00837	FRONT PANEL ASSY	220	43T39423	MOTOR BAND BACK
202	43T09592	GRILLE OF AIR INLET ASSY	221	43T39424	MOTOR BAND FRONT
203	43T80363	AIR FILTER	222	43T39425	MOTOR COVER
204	43T03421	BACK BODY ASSY	223	43T79326	DRAIN COVER
205	43T22375	VERTICAL LOUVER ASSY	224	43T44726	REFRIGERATION CYCLE ASSY
206	43T72370	DRAIN PAN ASSY	225	43T19333	HOLDER, SENSOR
207	43T22376	HORIZONTAL LOUVER	226	43T11331	PIPE-SHIELD
208	43T70324	DRAIN HOSE	227	43T82346	INSTALLATION PLATE ASSY
209	43T79322	DRAIN CAP	228	43T49388	PIPE HOLDER
210	43125202	COVER-AXIS	229	43T62396	TERMINAL COVER ASSY
211	43T21478	MOTOR; STEPPING	230	43T66421	WIRELESS ADAPTER
212	43T21434	STEPPING-MOTOR	231	43T66427	WIRELESS REMOCO
213	43T60536	VERTICAL MOTOR CORD	232	43T66423	HOLDER, REMOTE CONTROL
216	43T22377	BASE BEARING	233	43T91410	PACKING SLEEVE
217	43T22312	BEARING ASSY, MOLD	234	43T91411	PACKING CUSHION RIGHT
218	43T21471	MOTOR FAN	235	43T91412	PACKING CUSHION LEFT
219	43T20361	CROSS FLOW FAN ASSY			

# 13-2. Indoor Unit (Part-E)



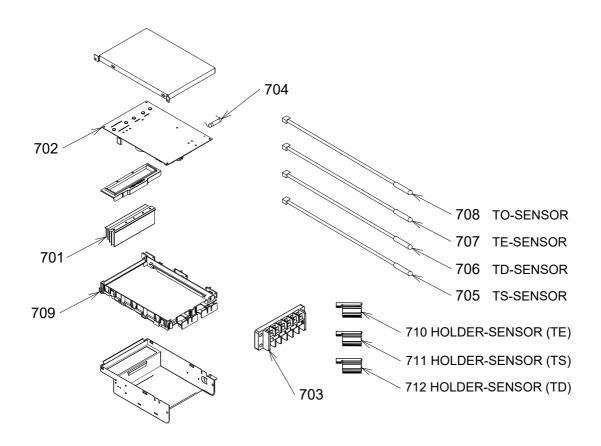
Location	Part	Description	Location	Part	Description
No.	No.		No.	No.	Description
401	43T60532	TERMINAL(5P-TF)	406	43T50393	TEMPERATURE SENSOR
402	43T62340	CORD-CLAMP	408	43T60533	HOUSING-WiFi
403	43TN9333	PC BOARD (WP-501)	409	43T60537	HOUSING-LED
		(FOR RAS-25N4KVRG-ND)	410	43T60538	CORD-MOTOR
403	43TN9334	PC BOARD (WP-501)	411	43T95302	SPACER(EDGE)
		(FOR RAS-35N4KVRG-ND)	412	43T95303	SUPPORTER, ASSY
404	43T6W727	PC BOARD ASSY : WRS-LED	413	43T95304	SPACER-KGES
405	43T50399	TEMPERATURE SENSOR			

# 13-3. Outdoor Unit



Location No.	Part No.	Description	Location No.	Part No.	Description
1	43T42380	ASM-BASE(WITH HEATER)	37	43T47404	BONNET, 9.52 DIA
2	43T00459	LEFT CABINET	40	43T46504	VALVE;PACKED 6.35 DIA
3	43T00690	RIGHT CABINET ASSEMBLY	41	43T46503	VALVE ; PACKED 9.52 DIA
4	43T00735	UPPER CABINET ASSEMBLY	42	43T46347	BODY PMV
5	43T00688	FRONT CABINET ASSEMBLY	43	43T63329	COIL PMV
6	43T00448	FIXING PLATE VALVE	44	43T46375	4 WAY VALVE
7	43T39333	MOTOR BASE CONNECTION PLATE	45	43T63337	4 WAY VALVE COIL ASSEMBLY
8	43T04342	PARTITION ASSEMBLY	51	43T58309	REACTOR
10	43T39393	MOTOR BASE	52	43T21460	FAN MOTOR
20	43T19364	FAN GUARD	59	43T60497	LEAD ASSY, COMPRESSOR
21	43T20319	PROPELLER FAN	60	43T97001	NUT
23	43T79324	DRAIN NIPPLE	61	43T49335	RUBBER CUSHION
24	43T00762	PACKED-VALVE COVER ASSEMBLY	62	43T47001	NUT FLANGE
25	43T63376	HOLDER, SENSOR	70	43T91312	CARTON BOX
28	43089160	CAP, WATERPROOF	71	43T91309	ASM-FBBRD-UD
30	43T43634	CONDENSER ASSEMBLY	72	43T91314	CUSHION-PKG-UPR
35	43T41523	COMPRESSOR	73	43T91301	PE SHEET
		(FOR RAS-35J2AVSG-ND1)	80	43T04357	SOUND INSULATION(IS)
35	43T41534	COMPRESSOR	81	43T04446	INSULATION SOUND INSIDE
		(FOR RAS-25J2AVSG-ND1)	82	43T04445	INSULATION SOUND OUTSIDE
36	43T47403	BONNET, 6.35 DIA	84	43T04416	SOUND INSULATION(UP)

# 13-4. Outdoor Unit (Part-E)



Location	Part	Description	Location	Part	Description
No.	No.		No.	No.	Description
701	43T62351	HEATSINK	706	43T50334	TEMPERATURE SENSOR
702	43TN9331	PC BOARD	707	43T50352	TEMPERATURE SENSOR
		(FOR RAS-25J2AVSG-ND1)	708	43T50360	TC-SENSOR(TO)
702	43TN9332	PC BOARD	709	43T62313	PC PLATE BASE
		(FOR RAS-35J2AVSG-ND1)	710	43T63318	HOLDER SENSOR
703	43T60384	TERMINAL-6P	711	43T63316	HOLDER,SENSOR
704	43T60326	FUSE	712	43T63317	HOLDER,SENSOR
705	43T50353	TEMPERATURE SENSOR			

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