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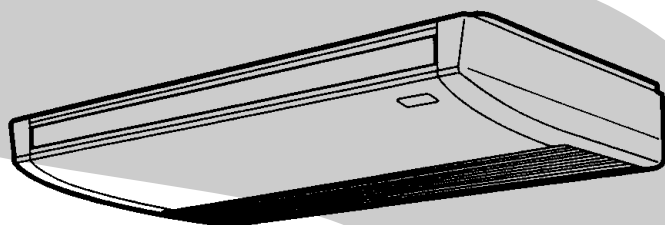
FILE NO. A03-016

SERVICE MANUAL

AIR-CONDITIONER

UNDER CEILING TYPE (INDOOR UNIT)

RAV-SM561CT-E
RAV-SM801CT-E
RAV-SM1101CT-E
RAV-SM1401CT-E



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NOTE :

This Service Manual describes explanation for the Under Ceiling type indoor unit.
For the combined outdoor unit, refer to the following Service Manual.

Outdoor unit Model name	SVM to be referred
RAV-SMXXXAT-E	A03-007
RAV-SPXXXAT-E	A03-014

1. SPECIFICATIONS

1-1. Under Ceiling Type (Indoor Unit)

Model name		RAV-SM561CT-E			RAV-SM801CT-E		
		Cooling	Heating	Average	Cooling	Heating	Average
Standard capacity (Note 1)	(kW)	5.0 (1.5 – 5.6)	5.6 (1.5 – 6.3)		7.0 (2.2 – 8.0)	8.0 (2.2 – 9.0)	
Energy consumption effect ratio (Cooling)		2.75 [D]	3.41 [B]	3.08	2.77 [D]	3.24 [C]	3.01
Electrical characteristics	Power supply	1 phase 230V (220 – 240V) 50Hz					
	Running current (A)	8.71–7.98	7.85–7.19		12.23–11.21	11.94–10.95	
	Power consumption (kW)	1.82	1.64		2.53	2.47	
	Power factor (%)	95	95		94	94	
Appearance	Main unit	Shine white					
Outer dimension	Main unit	Height (mm)	210			210	
		Width (mm)	680			680	
		Depth (mm)	910			1180	
Total weight	Main unit (kg)	20			25		
Heat exchanger		Finned tubu					
Soundproof/Heat-insulating material		Inflammable polyethylene foam					
Fan unit	Fan	Multi-blade fan					
	Standard air flow High (Mid./Low) (m ³ /h)	840			1140		
	Motor (W)	60			60		
Air filter		Attached main unit					
Controller (Sold separately)		RBC-AMT21E					
Connecting pipe	Gas side (mm)	Ø12.7 (1/2")			Ø15.9 (5/8")		
	Liquid side (mm)	Ø6.4 (1/4")			Ø9.5 (3/8")		
	Drain port (Nominal dia.)	25 (Polyvinyl chloride tube)					
Sound level	High (Mid./Low) (Note 2) (dB•A)	36	33	30	38	36	33

Note 1 : The cooling and heating capacities and electrical characteristics are measured under the conditions specified by JIS B 8616 based on the reference piping 7.5m.

Note 2 : The sound level is measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
 Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB

Model name		RAV-SM1101CT-E			RAV-SM1401CT-E		
		Cooling	Heating	Average	Cooling	Heating	Average
Standard capacity (Note 1)	(kW)	10.0 (2.2 – 11.2)	11.2 (2.2 – 12.5)		12.3 (3.0 – 13.2)	14.0 (3.0 – 16.0)	
Energy consumption effect ratio (Cooling)		2.85 [C]	3.50 [B]	3.18	2.72 [D]	3.38 [C]	3.05
Electrical characteristics	Power supply	1 phase 230V (220 – 240V) 50Hz					
	Running current (A)	16.2–14.9	14.84–13.61		21.18–19.40	19.40–17.78	
	Power consumption (kW)	3.51	3.20		4.52	4.14	
	Power factor (%)	98	98		97	97	
Appearance	Main unit	Shine white					
Outer dimension	Main unit	Height (mm)	210				
		Width (mm)	680				
		Depth (mm)	1595				
Total weight	Main unit (kg)	42					
Heat exchanger		Finned tubu					
Soundproof/Heat-insulating material		Inflammable polyethylene foam					
Fan unit	Fan	Multi-blade fan					
	Standard air flow High (Mid./Low) (m ³ /h)	1620			1980		
	Motor (W)	120			120		
Air filter		Attached main unit					
Controller (Sold separately)		RBC-AMT21E					
Connecting pipe	Gas side (mm)	Ø15.9 (5/8")					
	Liquid side (mm)	Ø9.5 (3/8")					
	Drain port (Nominal dia.)	25 (Polyvinyl chloride tube)					
Sound level	High (Mid./Low) (Note 2) (dB•A)	41	38	35	43	40	37

Note 1 : The cooling and heating capacities and electrical characteristics are measured under the conditions specified by JIS B 8616 based on the reference piping 7.5m.

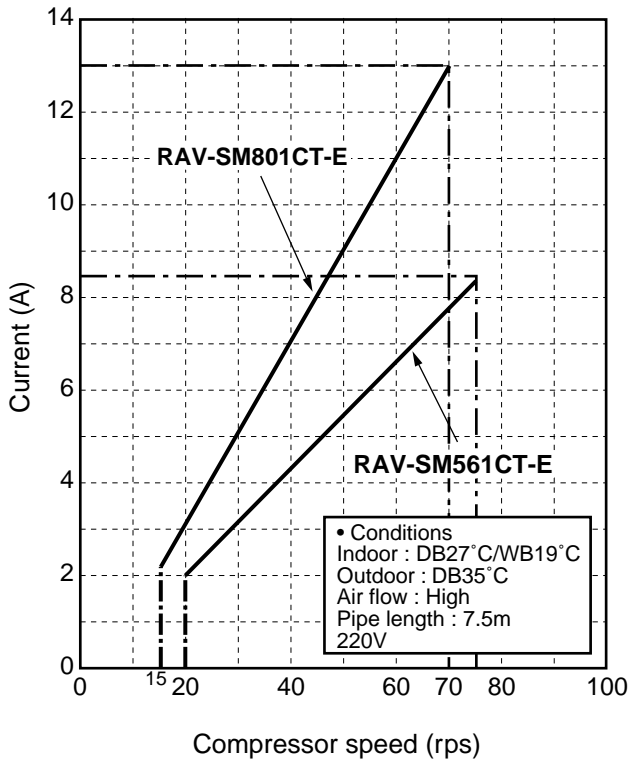
Note 2 : The sound level is measured in an anechoic chamber in accordance with JIS B8616. Normally, the values measured in the actual operating environment become larger than the indicated values due to the effects of external sound.

Note : Rated conditions Cooling : Indoor air temperature 27°C DB/19°C WB, Outdoor air temperature 35°C DB
Heating : Indoor air temperature 20°C DB, Outdoor air temperature 7°C DB/6°C WB

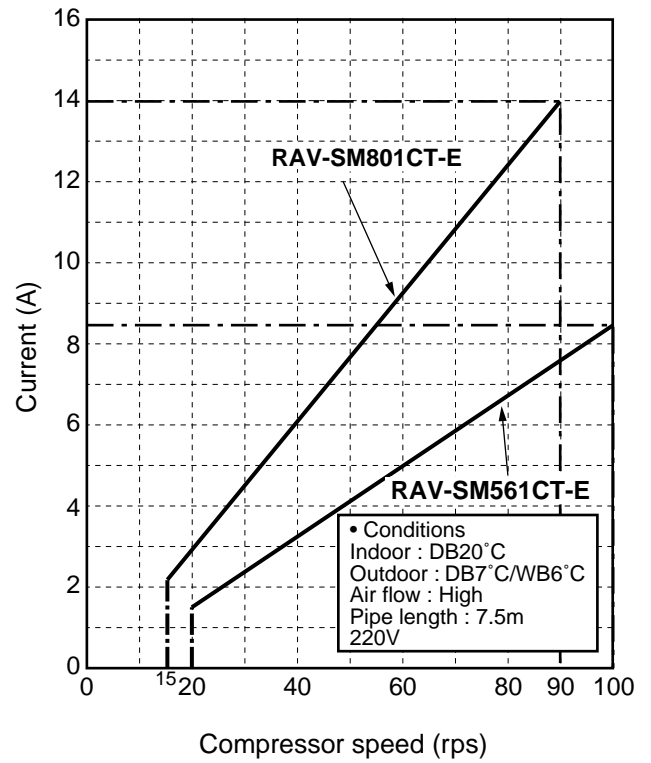
1-2. Operation Characteristic Curve

RAV-SM561CT-E / SM801CT-E

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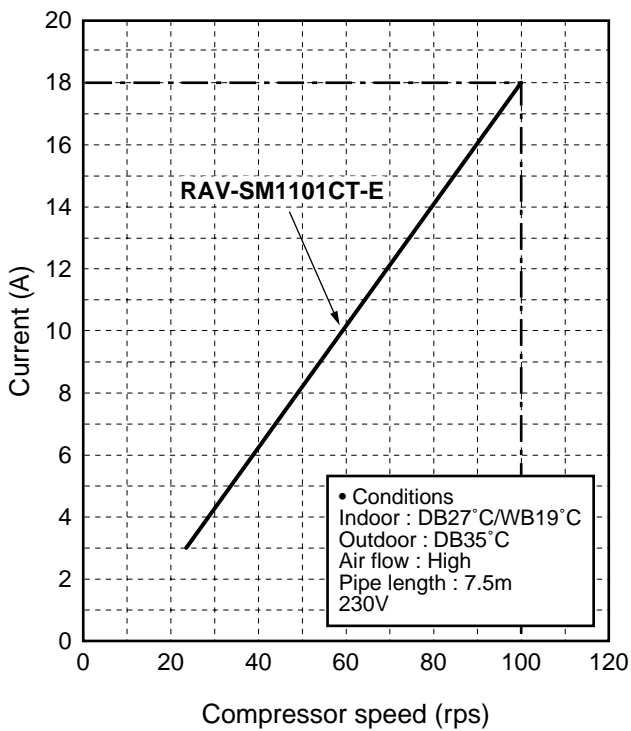


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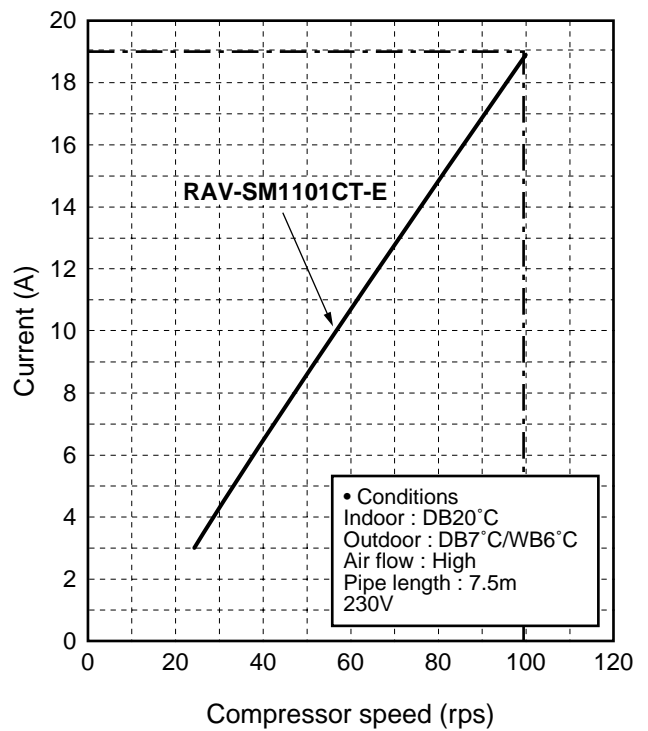


RAV-SM1101CT-E

<Cooling>

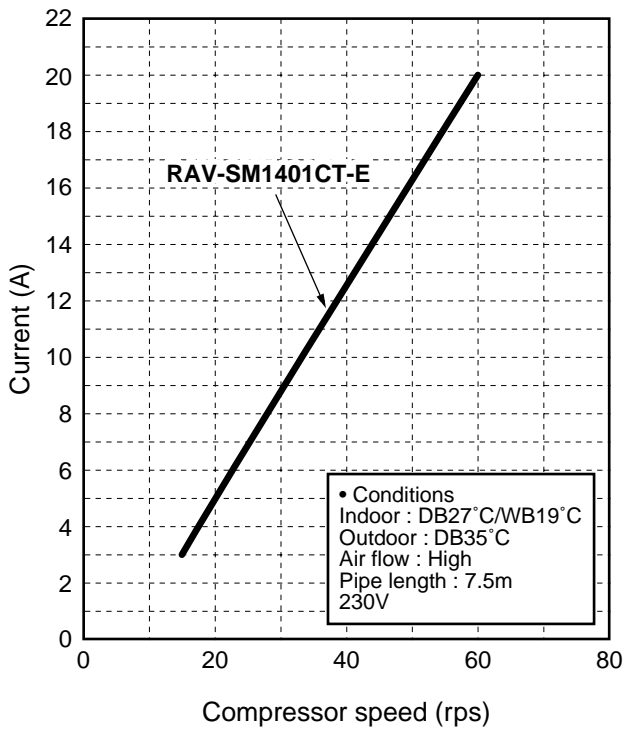


<Heating>

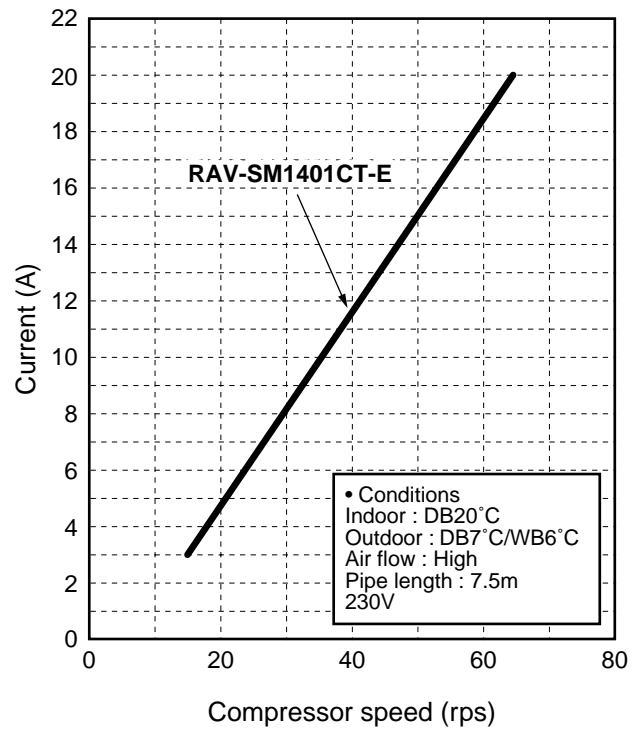


RAV-SM1401CT-E

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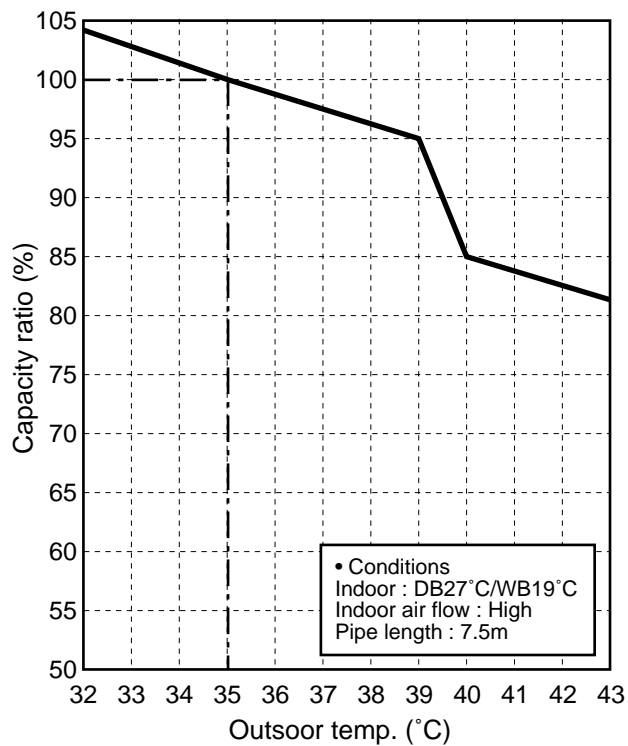


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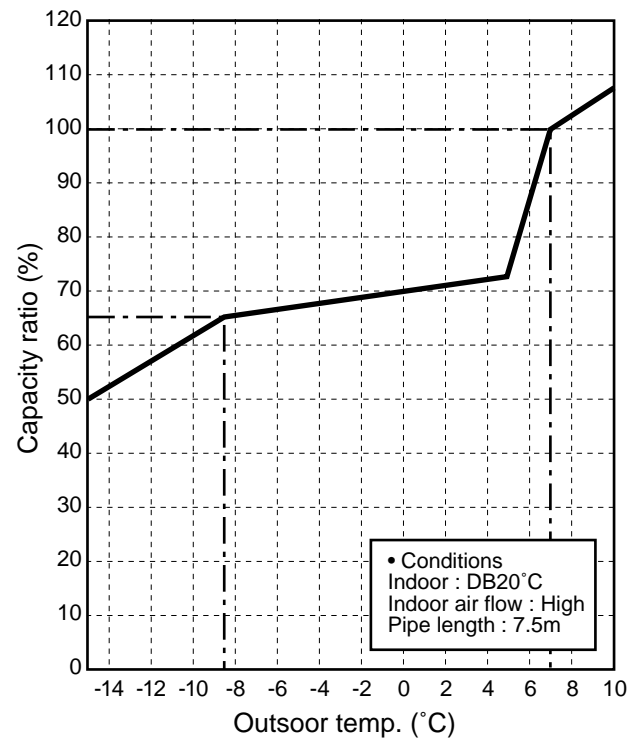


1-3. Capacity Variation Ratio According to Temperature

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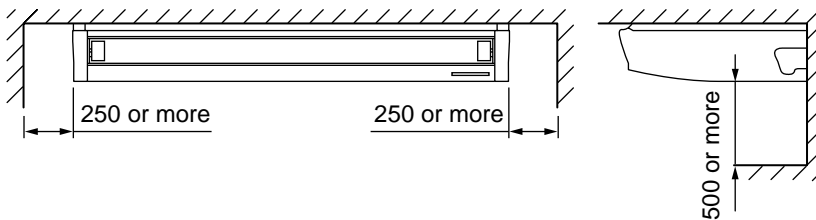
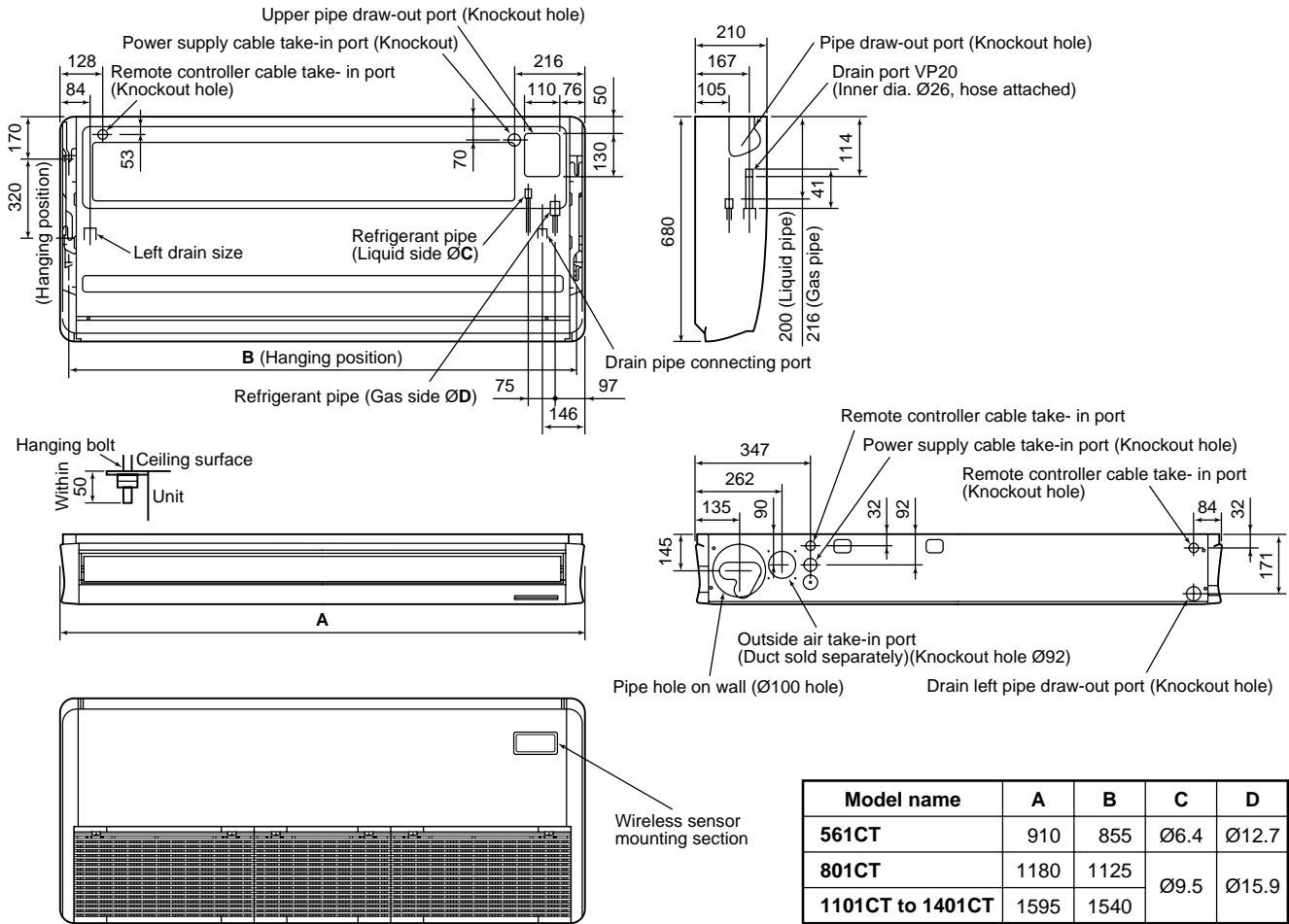
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2. CONSTRUCTION VIEWS (EXTERNAL VIEWS)

2-1. Under Ceiling Type (Indoor Unit)

RAV-SM561CT-E / SM801CT-E / SM1101CT-E / SM1401CT-E

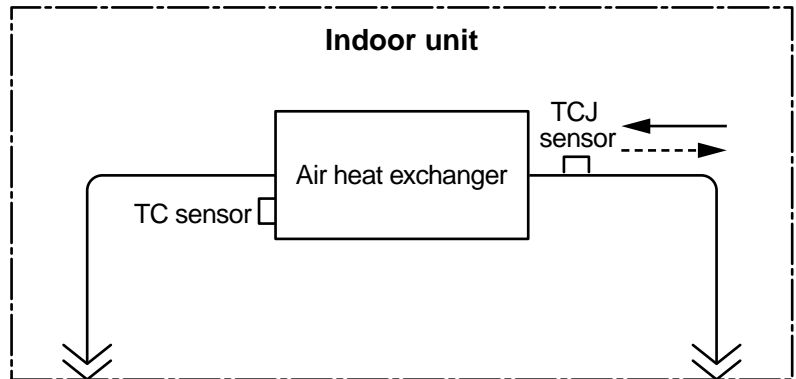


3. SYSTEMATIC REFRIGERATING CYCLE DIAGRAM

3-1. Under Ceiling Type

RAV-SM561CT-E / SM801CT-E / SM1101CT-E / SM1401CT-E

Model	Outer diameter of refrigerant pipe	
	Gas side $\varnothing A$	Liquid side $\varnothing B$
561CT-E	12.7 mm	6.4 mm
801CT-E 1101CT-E 1401CT-E	15.9 mm	9.5 mm



Refrigerant pipe at gas side
Outer dia. $\varnothing A$

Refrigerant pipe at liquid side
Outer dia. $\varnothing B$

Pd Packed valve
Outer dia. $\varnothing A$

Packed valve Ps
Outer dia. $\varnothing B$

Outdoor unit

NOTE :

The refrigerating cycle differs according to the combined outdoor units.
For the cycle diagram, cycle pressure, etc., refer to the following Service Manual.

RAV-SMXXXAT-E : A03-007

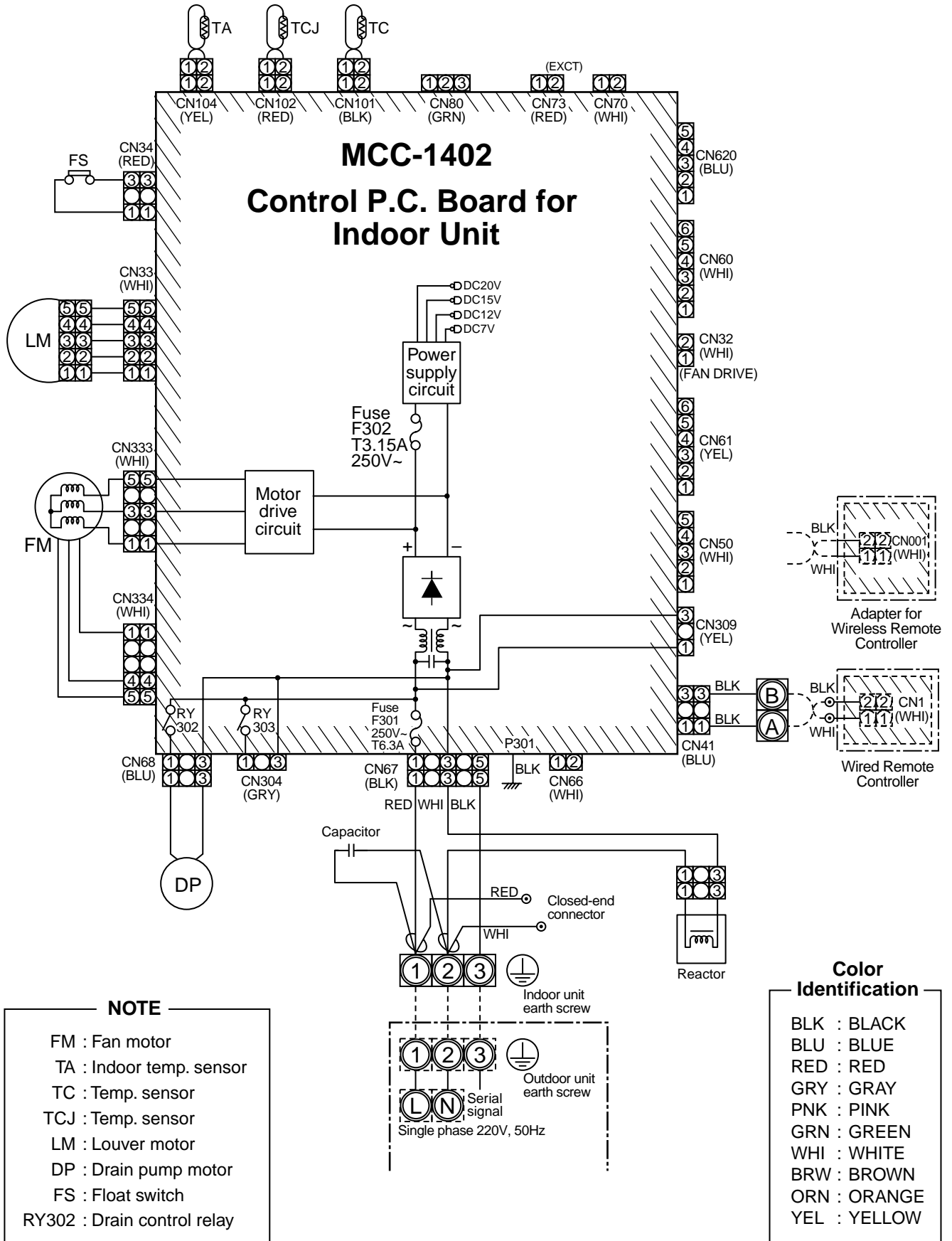
RAV-SPXXXAT-E : A03-014



4. WIRING DIAGRAM

4-1. Under Ceiling Type (Indoor Unit)

RAV-SM561CT-E / SM801CT-E / SM1101CT-E / SM1401CT-E



5. SPECIFICATIONS OF ELECTRICAL PARTS

5-1. Under Ceiling Type (Indoor Unit)

RAV-SM561CT-E / SM801CT-E / SM1101CT-E / SM1401CT-E

No.	Parts name	Type	Specifications
1	Fan motor (SM501CT-E)	SWF-280-60-1	Output (Rated) 60 W, 220–240 V
2	Fan motor (SM801CT-E)	SWF-280-60-2	Output (Rated) 120 W, 220–240 V
3	Fan motor (SM1101CT-E/SM1401CT-E)	SWF-280-120-2	Output (Rated) 120 W, 220–240 V
4	Thermo. sensor (TA-sensor)	258 mm	10 kΩ at 25°C
5	Heat exchanger sensor (TCJ-sensor)	Ø6 mm, 1200 mm	10 kΩ at 25°C
6	Heat exchanger sensor (TC-sensor)	Ø6 mm, 1200 mm	10 kΩ at 25°C
7	Louver motor	MP24GA1	DC 15 V
8	Reactor	CH-43-2Z-K	10 mH, 1 A

5-2. Accessory Separate Soldparts

TCB-DP22CE (Drain up kit)

No.	Parts name	Type	Specifications
1	Float switch	FS-0218-106	
2	Drain pump motor	ADP-1406 or ADP-1415	

6. REFRIGERANT R410A

This air conditioner adopts the new refrigerant HFC (R410A) which does not damage the ozone layer.

The working pressure of the new refrigerant R410A is 1.6 times higher than conventional refrigerant (R22). The refrigerating oil is also changed in accordance with change of refrigerant, so be careful that water, dust, and existing refrigerant or refrigerating oil are not entered in the refrigerant cycle of the air conditioner using the new refrigerant during installation work or servicing time.

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.

6-1. Safety During Installation/Serviceing

As R410A's pressure is about 1.6 times higher than that of R22, improper installation/servicing may cause a serious trouble. By using tools and materials exclusive for R410A, it is necessary to carry out installation/servicing safely while taking the following precautions into consideration.

- (1) Never use refrigerant other than R410A in an air conditioner which is designed to operate with R410A.

If other refrigerant than R410A 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 R410A.

The refrigerant name R410A is indicated on the visible place of the outdoor unit of the air conditioner using R410A as refrigerant. To prevent mischarging, the diameter of the service port differs from that of R22.

- (3) 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 or moisture 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.

- (7) 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.
- (8) 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.

6-2. Refrigerant Piping Installation

6-2-1. 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 R410A incurs pressure higher than when using R22, it is necessary to choose adequate materials.

Thicknesses of copper pipes used with R410A are as shown in Table 6-2-1. Never use copper pipes thinner than 0.8 mm even when it is available on the market.

Table 6-2-1 Thicknesses of annealed copper pipes

		Thickness (mm)	
Nominal diameter	Outer diameter (mm)	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 6-2-3 to 6-2-6 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 6-2-2.

Table 6-2-2 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

6-2-2. 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 other than lubricating oils used in the installed air conditioner 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 R410A 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.

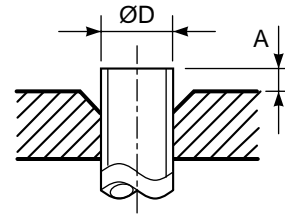


Fig. 6-2-1 Flare processing dimensions

Table 6-2-3 Dimensions related to flare processing for R410A

Nominal diameter	Outer diameter (mm)	Thickness (mm)	A (mm)		
			Flare tool for R410A clutch type	Conventional flare tool	
				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 6-2-4 Dimensions related to flare processing for R22

Nominal diameter	Outer diameter (mm)	Thickness (mm)	A (mm)		
			Flare tool for R22 clutch type	Conventional flare tool	
				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 6-2-5 Flare and flare nut dimensions for R410A

Nominal diameter	Outer diameter (mm)	Thickness (mm)	Dimension (mm)				Flare nut width (mm)
			A	B	C	D	
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 6-2-6 Flare and flare nut dimensions for R22

Nominal diameter	Outer diameter (mm)	Thickness (mm)	Dimension (mm)				Flare nut width (mm)
			A	B	C	D	
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	19.4	19.0	16.0	23	27
3/4	19.05	1.0	23.3	24.0	19.2	34	36

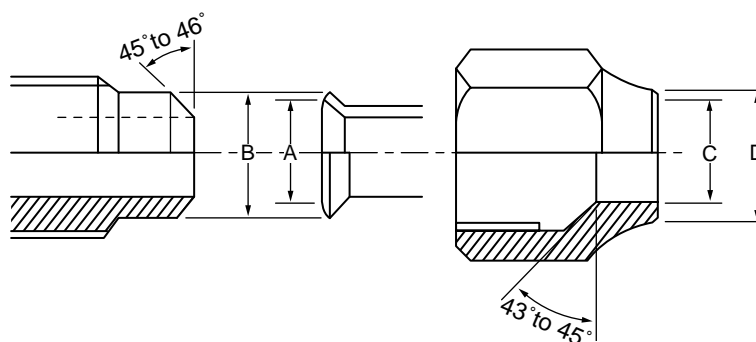


Fig. 6-2-2 Relations between flare nut and flare seal surface

(2) Flare Connecting Procedures and Precautions

- Make sure that the flare and union portions do not have any scar or dust, etc.
- Correctly align the processed flare surface with the union axis.
- Tighten the flare with designated torque by means of a torque wrench. The tightening torque for R410A 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 6-2-7 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 6-2-7 Tightening torque of flare for 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)

6-3. Tools

6-3-1. Required Tools

The service port diameter of packed valve of the outdoor unit in the air conditioner using R410A 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 R410A (Those which cannot be used for conventional refrigerant (R22))
- (2) Tools exclusive for R410A, but can be also used for conventional refrigerant (R22)
- (3) Tools commonly used for R410A and for conventional refrigerant (R22)

The table below shows the tools exclusive for R410A and their interchangeability.

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

Tools whose specifications are changed for R410A and their interchangeability

No.	Used tool	Usage	R410A air conditioner installation		Conventional air conditioner installation
			Existence of new equipment for R410A	Whether conventional equipment can be used	Whether new equipment can be used with conventional refrigerant
①	Flare tool	Pipe flaring	Yes	*(Note 1)	○
②	Copper pipe gauge for adjusting projection margin	Flaring by conventional flare tool	Yes	*(Note 1)	*(Note 1)
③	Torque wrench	Connection of flare nut	Yes	×	×
④	Gauge manifold	Evacuating, refrigerant charge, run check, etc.	Yes	×	×
⑤	Charge hose				
⑥	Vacuum pump adapter	Vacuum evacuating	Yes	×	○
⑦	Electronic balance for refrigerant charging	Refrigerant charge	Yes	×	○
⑧	Refrigerant cylinder	Refrigerant charge	Yes	×	×
⑨	Leakage detector	Gas leakage check	Yes	×	○
⑩	Charging cylinder	Refrigerant charge	(Note 2)	×	×

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

(Note 2) Charging cylinder for R410A is being currently developed.

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.

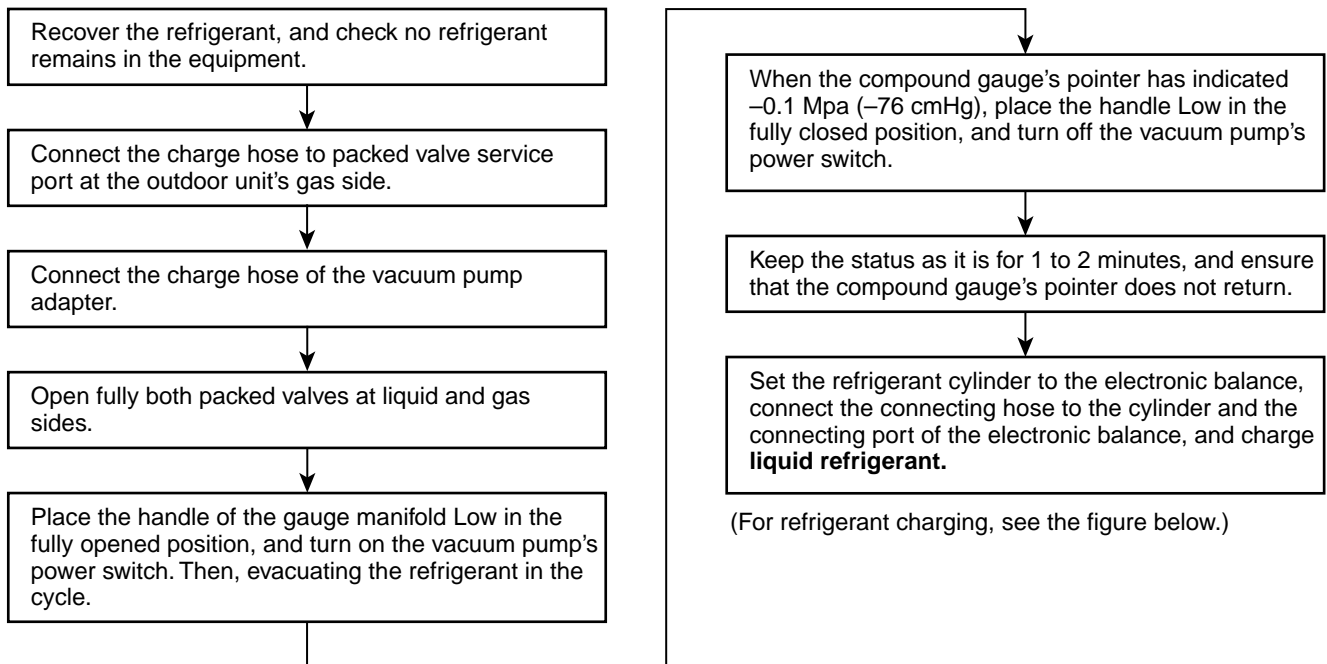
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| (1) Vacuum pump
Use vacuum pump by attaching vacuum pump adapter. | (4) Reamer | (9) Hole core drill (Ø65) |
| (2) Torque wrench | (5) Pipe bender | (10) Hexagon wrench
(Opposite side 4mm) |
| (3) Pipe cutter | (6) Level vial | (11) Tape measure |
| | (7) Screwdriver (+, -) | (12) Metal saw |
| | (8) Spanner or Monkey wrench | |

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

- | | |
|-----------------|----------------------------------|
| (1) Clamp meter | (3) Insulation resistance tester |
| (2) Thermometer | (4) Electro-scope |

6-4. 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.

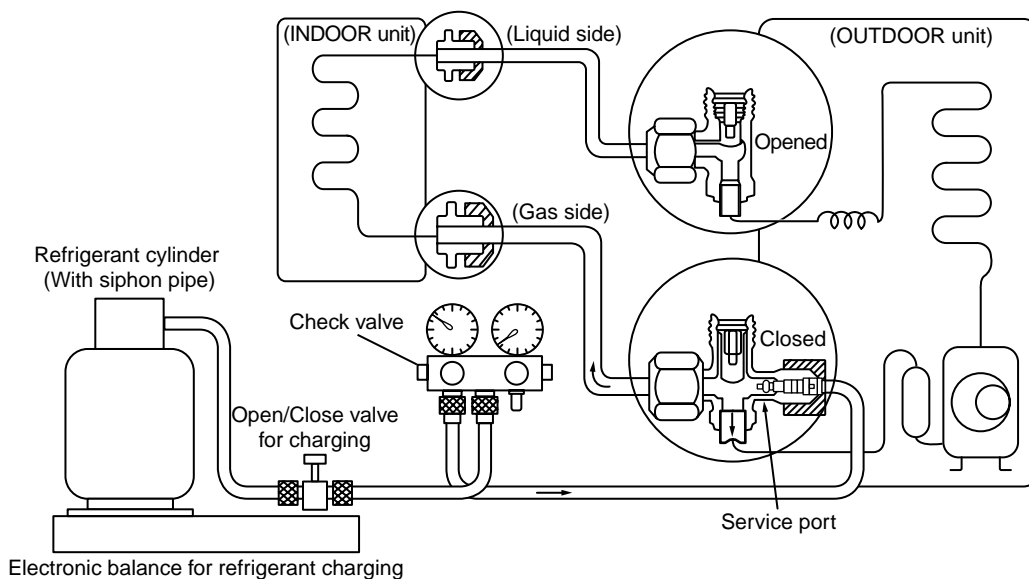
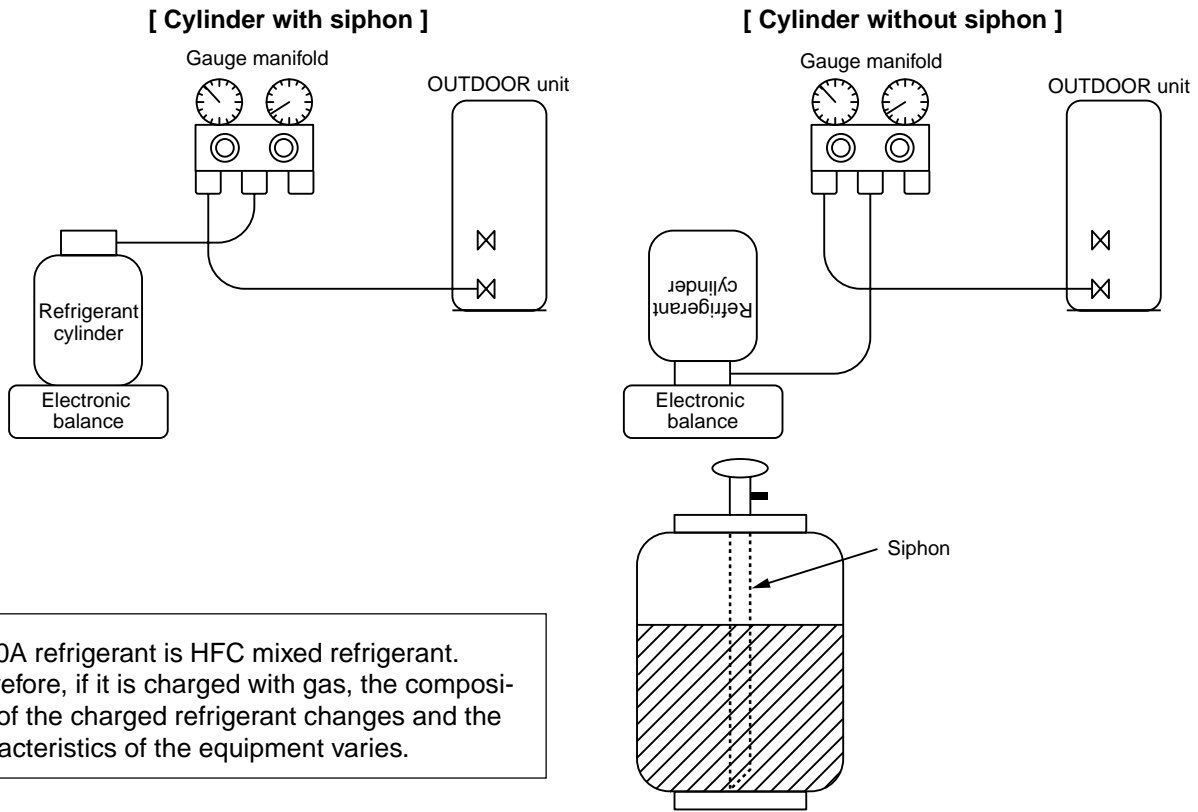


Fig. 6-4-1 Configuration of refrigerant charging

- 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.

It is necessary for charging refrigerant under condition of liquid because R410A is mixed type of refrigerant. 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.



R410A refrigerant is HFC mixed refrigerant. Therefore, if it is charged with gas, the composition of the charged refrigerant changes and the characteristics of the equipment varies.

Fig. 6-4-2

6-5. Brazing of Pipes

6-5-1. 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.

- ① 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.

6-5-2. 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.

6-5-3. 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.
- ③ 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.

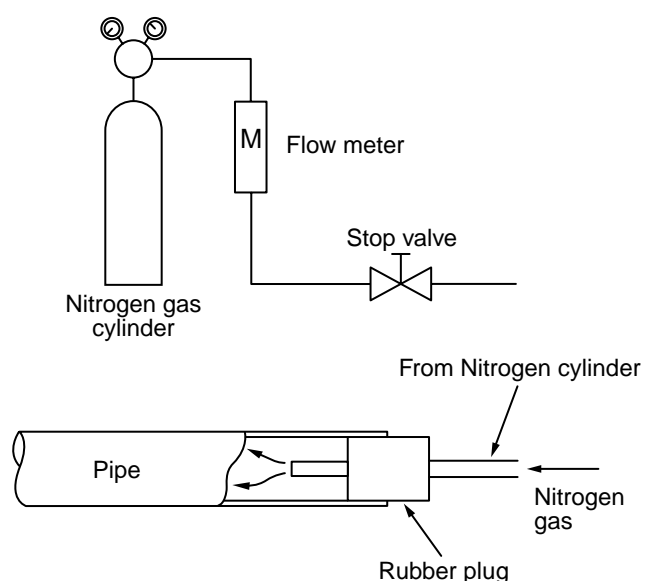


Fig. 6-5-1 Prevention of oxidation during brazing

7. INDOOR UNIT CONTROL

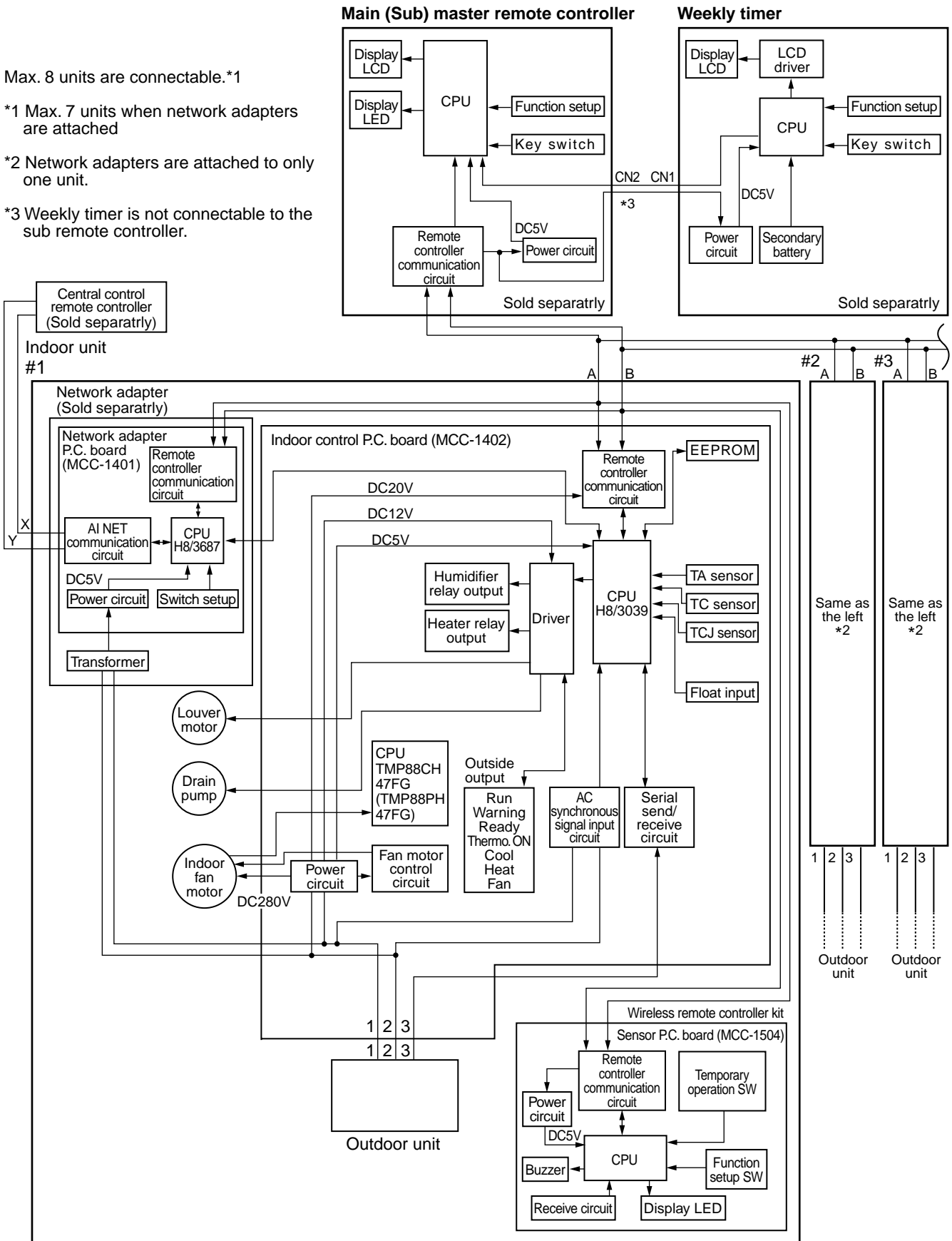
7-1. Indoor Control Circuit

Max. 8 units are connectable.*1

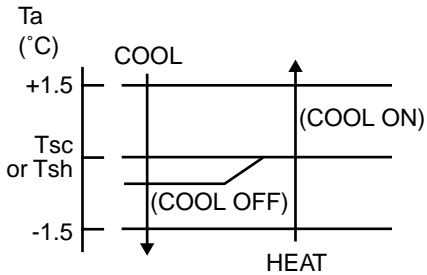
*1 Max. 7 units when network adapters are attached

*2 Network adapters are attached to only one unit.

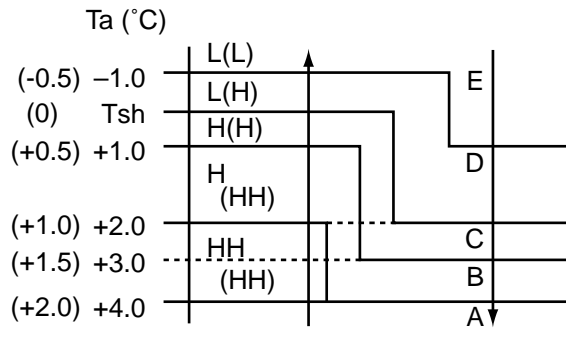
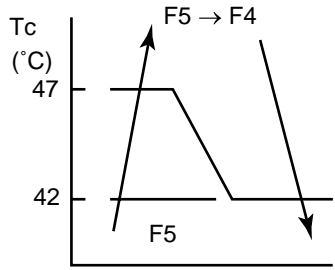
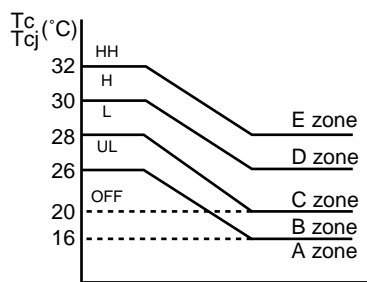
*3 Weekly timer is not connectable to the sub remote controller.

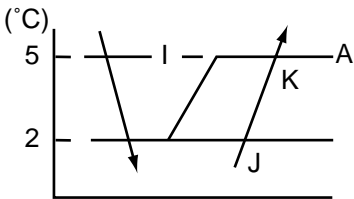
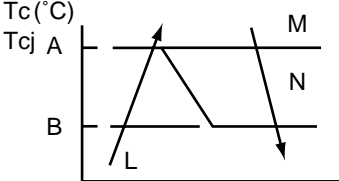


7-2. Control Specifications

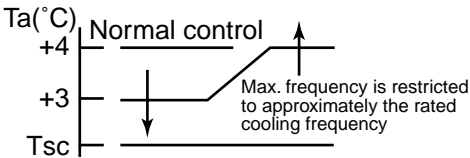
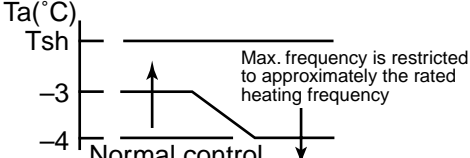
No.	Item	Outline of specifications	Remarks														
1	When power supply is reset	1) Distinction of outdoor units When the power supply is reset, the outdoors are distinguished, and control is exchanged according to the distinguished result. 2) Setting of speed of the indoor fan/setting weather to adjust air direction or unit. 3) Based on EEPROM data, speed of the indoor fan or setting whether to adjust air direction or not is selected.	Air speed/ Air direction adjustment														
2	Operation mode selection	1) Based on the operation mode selecting command from the remote controller, the operation mode is selected. <table border="1" data-bbox="459 752 1078 1115" style="margin: 10px auto;"> <thead> <tr> <th>Remote controller command</th> <th>Outline of control</th> </tr> </thead> <tbody> <tr> <td>STOP</td> <td>Air conditioner stops.</td> </tr> <tr> <td>FAN</td> <td>Fan operation</td> </tr> <tr> <td>COOL</td> <td>Cooling operation</td> </tr> <tr> <td>DRY</td> <td>Dry operation</td> </tr> <tr> <td>HEAT</td> <td>Heating operation</td> </tr> <tr> <td>AUTO</td> <td> <ul style="list-style-type: none"> COOL/HEAT operation mode is automatically selected by Ta and Ts for operation. </td> </tr> </tbody> </table>  <p data-bbox="469 1424 1070 1480">1) Judge the selection of COOL/HEAT mode as shown in the figure above.</p> <p data-bbox="501 1507 1023 1615">When 10 minutes passed after thermostat had been turned off, the heating operation (Thermo OFF) is exchanged to cooling operation if Tsh exceeds +1.5 or more.</p> <p data-bbox="501 1641 1059 1697">(COOL OFF) and (COOL ON) in the figure indicate an example.</p> <p data-bbox="501 1724 1018 1832">When 10 minutes passed after thermostat had been turned off, the cooling operation (Thermo OFF) is exchanged to heating operation if Tsc exceeds -1.5 or less.</p> <p data-bbox="469 1859 1070 1915">2) For the automatic capacity control after judgment of COOL/HEAT, refer to item 4.</p> <p data-bbox="469 1917 1070 1973">3) For the temperature correction of room temperature control in automatic heating operation, refer to item 3.</p>	Remote controller command	Outline of control	STOP	Air conditioner stops.	FAN	Fan operation	COOL	Cooling operation	DRY	Dry operation	HEAT	Heating operation	AUTO	<ul style="list-style-type: none"> COOL/HEAT operation mode is automatically selected by Ta and Ts for operation. 	Ta : Room temperature Ts : Setup temperature Tsc : Setup temperature in cooling operation Tsh : Setup temperature + Room temperature control temperature compensation
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3	Room temperature control	<p>1) Adjustment range Remote controller setup temperature (°C)</p> <table border="1"> <thead> <tr> <th></th> <th>COOL/DRY</th> <th>Heating operation</th> <th>Auto operation</th> </tr> </thead> <tbody> <tr> <td>Wired type</td> <td>18 to 29</td> <td>18 to 29</td> <td>18 to 29</td> </tr> <tr> <td>Wireless type</td> <td>18 to 30</td> <td>16 to 30</td> <td>17 to 27</td> </tr> </tbody> </table> <p>2) Using the item code 06, the setup temperature in heating operation can be compensated.</p> <table border="1"> <thead> <tr> <th>Setup data</th> <th>0</th> <th>2</th> <th>4</th> <th>6</th> </tr> </thead> <tbody> <tr> <td>Setup temp. compensation</td> <td>+0°C</td> <td>+2°C</td> <td>+4°C</td> <td>+6°C</td> </tr> </tbody> </table> <p>Setting at shipment</p> <table border="1"> <tbody> <tr> <td>Setup data</td> <td>2</td> </tr> </tbody> </table>		COOL/DRY	Heating operation	Auto operation	Wired type	18 to 29	18 to 29	18 to 29	Wireless type	18 to 30	16 to 30	17 to 27	Setup data	0	2	4	6	Setup temp. compensation	+0°C	+2°C	+4°C	+6°C	Setup data	2	Shift of suction temperature in heating operation																																																																																																																																																																																																				
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5	Air speed selection	<p>1) Operation with (HH), (H), (L), or [AUTO] mode is performed by the command from the remote controller.</p> <p>2) When the air speed mode [AUTO] is selected, the air speed varies by the difference between Ta and Ts.</p> <p><COOL></p>	<p>HH > H > L > LL</p> <p>• Controlling operation in case when thermo of remote controller works is same as a case when thermo of the body works.</p> <p>• If the air speed has been changed once, it is not changed for 3 minutes. However when the air volume is exchanged, the air speed changes.</p> <p>• When cooling operation has started, the air speed selects a downward slope, that is, the high position.</p> <p>• If the temperature is just on the difference boundary, the air speed does not change.</p> <p>• Mode in the parentheses indicates one in automatic cooling operation.</p>																																																																																																																																																																																																																												
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No.	Item	Outline of specifications	Remarks
5	Air speed selection (Continued)	<p><HEAT></p>  <p>Value in the parentheses indicates one when thermostat of the remote controller works. Value without parentheses indicates one when thermostat of the body works.</p> <ul style="list-style-type: none"> • If the air speed has been changed once, it is not changed for 1 minute. However when the air speed is exchanged, the air speed changes. • When heating operation has started, the air speed selects a upward slope, that is, the high position. • If the temperature is just on the difference boundary, the air speed does not change. • Mode in the parentheses indicates one in automatic heating operation. • In $T_c \geq 60^\circ\text{C}$, the air speed increases by 1 step. <p>3) In heating operation, the mode changes to [UL] if thermostat is turned off.</p> <p>4) If $T_a \geq 25^\circ\text{C}$ when heating operation has started and when defrost operation has been cleared, it operates with HIGH (H) mode or (HH) for 1 minute from when T_c has entered in E zone of cool air discharge preventive control (Item 6).</p> <p>5) In automatic cooling/heating operation, the revolution frequency of [HH] is set larger than that in the standard cooling/heating operation. However the revolution frequency is restricted in the automatic heating operation as shown in the following figure.</p>	<p>[PRE-HEAT] display</p> 
6	Cool air discharge preventive control	<p>1) In heating operation, the indoor fan is controlled based on the detected temperature of T_c sensor or T_{cj} sensor. As shown below, the upper limit of the revolution frequency is determined.</p> 	<p>In D or E zone, the priority is given to setup of air volume exchange. In A and B zones, [PRE-HEAT] is displayed.</p>

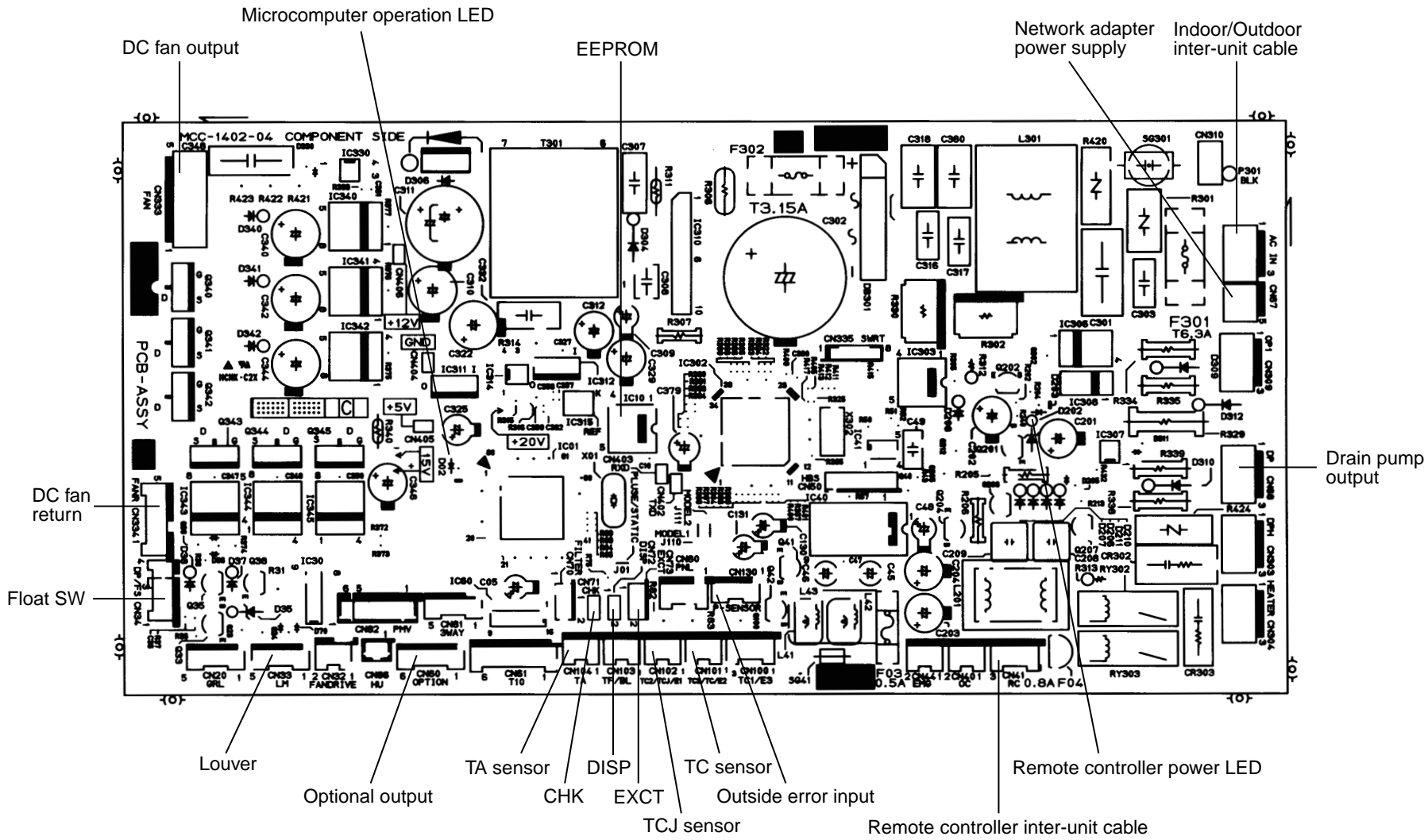
No.	Item	Outline of specifications	Remarks						
7	Freeze preventive control (Low temperature release)	<p>1) The cooling operation (including Dry operation) is performed as follows based on the detected temperature of Tc sensor or Tcj sensor.</p> <p>When [J] zone is detected for 6 minutes (Following figure), the commanded frequency is decreased from the real operation frequency. After then the commanded frequency changes every 30 seconds while operation is performed in [J] zone.</p> <p>In [K] zone, time counting is interrupted and the operation is held.</p> <p>When [I] zone is detected, the timer is cleared and the operation returns to the normal operation.</p> <p>If the commanded frequency becomes S0 because the operation continues in [J] zone, the return temperature A is raised from 5°C to 12°C until [I] zone is detected and the indoor fan operates with [M] mode.</p>  <p>In heating operation, the freeze-preventive control works if 4-way valve is not exchanged and the condition is satisfied. (However the temperature for J zone dashing control is changed from 2°C to -5°C.)</p>	<p>Tcj : Indoor heat exchanger sensor temperature</p> <p>[M] mode : Air speed selection</p>						
8	High-temp release control	<p>1) The heating operation is performed as follows based on the detected temperature of Tc sensor or Tcj sensor.</p> <ul style="list-style-type: none"> • When [M] zone is detected, the commanded frequency is decreased from the real operation frequency. After then the commanded frequency changes every 30 seconds while operation is performed in [M] zone. • In [N] zone, the commanded frequency is held. • When [L] zone is detected, the commanded frequency is returned to the original value by approx. 6Hz every 60 seconds. <p>Setup at shipment</p> <table border="1" data-bbox="533 1487 761 1615"> <thead> <tr> <th colspan="2">Control temp (°C)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>B</td> </tr> <tr> <td>56 (54)</td> <td>52 (52)</td> </tr> </tbody> </table>  <p>NOTE : When the operation has started or when Tc or Tcj became lower than 30°C after start of the operation, temperature is controlled between values in parentheses of A and B.</p>	Control temp (°C)		A	B	56 (54)	52 (52)	<p>Same when thermostat is turned off.</p>
Control temp (°C)									
A	B								
56 (54)	52 (52)								
9	<p>Drain pump control</p> <p>When, the drain up kit (sold separately) is mounted.</p>	<p>1) In cooling operation (including Dry operation), the drain pump is usually operated.</p> <p>2) If the float switch operates while drain pump operates, the compressor stops, the drain pump continues the operation, and a check code is output.</p> <p>3) If the float switch operates while drain pump stops, the compressor stops and the drain pump operates. If the float switch keeps operating for approx. 4 minutes, a check code is output.</p>	<p>Check code [P10]</p>						

No.	Item	Outline of specifications	Remarks
10	DAfter-heat elimination	When heating operation stops, the indoor fan operates with LOW mode for approx. 30 seconds.	
11	Frequency fixed operation (Test run)	<p><In case of wired remote controller></p> <ol style="list-style-type: none"> 1. When pushing [CHECK] button for 4 seconds or more, [TEST] is displayed on the display screen and the mode enters in Test run mode. 2. Push [ON/OFF] button. 3. Using [MODE] button, change the mode from [COOL] to [HEAT]. <ul style="list-style-type: none"> • Do not use other mode than [COOL]/[HEAT] mode. • During test run operation, the temperature cannot be adjusted. • An error is detected as usual. • A frequency fixed operation is performed. 4. After the test run, push [ON/OFF] button to stop the operation. (Display in the display part is same as the procedure in item 1).) 5. Push [CHECK] button to clear the test run mode. ([TEST] display in the display part disappears and the status returns to the normal stop status.) <p><In case of wireless remote controller></p> <ol style="list-style-type: none"> 1. Turn off the power of the set. Remove the adjuster with sensors from the ceiling panel. 2. Turn Bit [1: TEST] of sensor P.C. board switch [S003] from OFF to ON. Turn on the power of the set. 3. Push [ON/OFF] button of the wireless remote controller and set the operation mode to [COOL] or [HEAT] using [MODE] button. (During test run operation, all the display lamps of wireless remote controller sensors flash.) <ul style="list-style-type: none"> • Do not use other mode than [COOL]/[HEAT] mode. • An error is detected as usual. • A frequency fixed operation is performed. 4. After the test run, push [ON/OFF] button to stop the operation. 5. Turn off the power of the set. Turn Bit [1: TEST] of sensor P.C. board switch [S003] from ON to OFF. Mount the adjuster with sensors to the ceiling panel. 	
12	Central control mode selection	<ol style="list-style-type: none"> 1) Setting at the central controller side enables to select the contents which can be operated on the remote controller at indoor unit side. 2) RBC-AMT21 [Last push priority] : The operation contents can be selected from both remote controller and central controller of the indoor unit side, and the operation is performed with the contents selected at the last. [Center] : Start/Stop operation only can be handled on the remote controller at indoor unit side. [Operation Prohibited] : It cannot be operated on the remote controller at indoor unit side. (Stop status is held.) 	<p>(No display)</p> <p>[CENTER] goes on.</p> <p>[CENTER] goes on. In a case of wireless type, the display lamp does not change. However, contents which can be operated are same. The status set in [CENTER]/[Operation Prohibited] mode is notified with the receiving sound "Pi, Pi, Pi, Pi" (5 times).</p>

No.	Item	Outline of specifications	Remarks
13	Energy-save control (By connected outdoor unit)	<ol style="list-style-type: none"> 1) Selecting [AUTO] mode enables an energy-saving to be operated. 2) The setup temperature is shifted (corrected) in the range not to lose the comfort ability according to input values of various sensors. 3) Data (Input value room temp. Ta, Outside temp. To, Air volume, Indoor heat exchanger sensor temp. Tc) for 20 minutes are taken the average to calculate correction value of the setup temperature. 4) The setup temperature is shifted every 20 minutes, and the shifted range is as follows. In cooling time : +1.5 to -1.0k In heating time : -1.5 to +1.0k 	
14	Max. frequency cut control	<ol style="list-style-type: none"> 1) This control is operated by selecting [AUTO] operation mode. 2) COOL operation mode: the frequency is controlled according to the following figure if $T_o < 28^{\circ}\text{C}$.  3) HEAT operation mode: the frequency is controlled according to the right figure if $T_o > 15^{\circ}\text{C}$.  	
15	DC motor	<ol style="list-style-type: none"> 1) When the fan operation has started, positioning of the stator and the rotor are performed. (Moves slightly with tap sound) 2) The motor operates according to the command from the indoor controller. <p>NOTES :</p> <ul style="list-style-type: none"> • When the fan rotates while the air conditioner stops due to entering of outside air, etc, the air conditioner may operated while the fan motor stops. • When a fan locking is found, the air conditioner stops, and an error is displayed. 	Check code [P12]

7-3. Indoor Print Circuit Board

RAV-SM561CT-E / SM801CT-E / SM1101CT-E / SM1401CT-E
 <MCC-1402>



7-4. Indoor P.C. Board Optional Connector Specifications

Function	Connector No.	Pin No.	Specifications	Remarks
Option output	CN60	1	DC12V (COM)	
		2	Defrost output	ON during defrost operation of outdoor unit
		3	Thermo. ON output	ON during Real thermo-ON (Comp ON)
		4	Cooling output	ON when operation mode is in cooling system (COOL, DRY, COOL in AUTO cooling/heating)
		5	Heating output	ON when operation mode is in heating system (HEAT, HEAT in AUTO cooling/heating)
		6	Fan output	ON during indoor fan ON (Air purifier is used/Interlock cable)
Outside error input	CN80	1	DC12V (COM)	(When continued for 1 minute) Check code "L30" is output and forced operation stops.
		2	DC12V (COM)	
		3	Outside error input	
Filter option error	CN70	1	Filter/Option/Humidifier setup input	Option error input is controlled. (Protective operation for device attached to outside is displayed.)
		2	0V	* Setting of option error input is performed from remote controller. (DN=2A)
CHK Operation check	CN71	1	Check mode input	Used for operation check of indoor unit. (Communication with outdoor unit or remote controller is not performed, but the specified operation such as indoor fan "H" or drain pump ON is output.)
		2	0V	
DISP display mode	CN72	1	Display mode input	Display mode enables indoor unit and remote controller to communicate. (When power is turned on)
		2	0V	
EXCT demand	CN73	1	Demand input	Forced thermo-OFF operation in indoor unit
		2	0V	

8. TROUBLESHOOTING

9-1. Summary of Troubleshooting

<Wired remote controller type>

1. Before troubleshooting

1) Required tools/instruments

- ⊕ and ⊖ screwdrivers, spanners, radio cutting pliers, nippers, push pins for reset switch
- Tester, thermometer, pressure gauge, etc.

2) Confirmation points before check

① The following operations are normal.

a) Compressor does not operate.

- Is not 3-minutes delay (3 minutes after compressor OFF)?
- Does not thermostat turn off?
- Does not timer operate during fan operation?
- Is not outside high-temperature operation controlled in heating operation?

b) Indoor fan does not rotate.

- Does not cool air discharge preventive control work in heating operation?

c) Outdoor fan does not rotate or air volume changes.

- Does not high-temperature release operation control work in heating operation?
- Does not outside low-temperature operation control work in cooling operation?
- Is not defrost operation performed?

d) ON/OFF operation cannot be performed from remote controller.

- Is not the control operation performed from outside/remote side?
- Is not automatic address being set up?

(When the power is turned on at the first time or when indoor unit address setting is changed, the operation cannot be performed for maximum approx. 5 minutes after power-ON.)

② Did you return the cabling to the initial positions?

③ Are connecting cables of indoor unit and remote controller correct?

2. Troubleshooting procedure

When a trouble occurred, check the parts along with the following procedure.



NOTE :

For cause of a trouble, power conditions or malfunction/erroneous diagnosis of microcomputer due to outer noise is considered except the items to be checked. If there is any noise source, change the cables of the remote controller to shield cables.

<Wireless remote controller type>

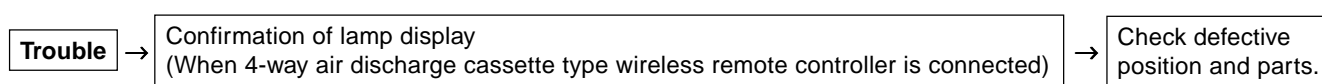
1. Before troubleshooting

- 1) Required tools/instruments
 - ⊕ and ⊖ screwdrivers, spanners, radio cutting pliers, nippers, etc.
 - Tester, thermometer, pressure gauge, etc.
- 2) Confirmation points before check
 - ① The following operations are normal.
 - a) Compressor does not operate.
 - Is not 3-minutes delay (3 minutes after compressor OFF)?
 - Does not thermostat turn off?
 - Does not timer operate during fan operation?
 - Is not outside high-temperature operation controlled in heating operation?
 - b) Indoor fan does not rotate.
 - Does not cool air discharge preventive control work in heating operation?
- 3) Outdoor fan does not rotate or air volume changes.
 - Does not high-temperature release operation control work in heating operation?
 - Does not outside low-temperature operation control work in cooling operation?
 - Is not defrost operation performed?
- 4) ON/OFF operation cannot be performed from remote controller.
 - Is not forced operation performed?
 - Is not the control operation performed from outside/remote side?
 - Is not automatic address being set up?
 - ① Did you return the cabling to the initial positions?
 - ② Are connecting cables between indoor unit and receiving unit correct?

2. Troubleshooting procedure

(When the power is turned on at the first time or when indoor unit address setting is changed, the operation cannot be performed for maximum approx. 5 minutes after power-ON.)

When a trouble occurred, check the parts along with the following procedure.



1) Outline of judgment

The primary judgment to check where a trouble occurred in indoor unit or outdoor unit is performed with the following method.

Method to judge the erroneous position by flashing indication on the display part of indoor unit (sensors of the receiving unit)

The indoor unit monitors operating status of the air conditioner, and the blocked contents of self-diagnosis are displayed restricted to the following cases if a protective circuit works.

8-2. Check Code List

Error mode detected by indoor unit

: Flash, ○ : Go on, : Go off

Wireless sensor lamp display			Wired remote controller	Diagnostic function			Judgment and measures
Operation	Timer	Ready	Check code	Cause of operation	Status of air conditioner	Condition	
			E03	No communication from remote controller (including wireless) and communication adapters	Stop (Automatic reset)	Displayed when error is detected	1. Check cables of remote controller and communication adapters. • Handy remote controller LCD display OFF (Disconnection) • Central remote controller [97] check code
			E04	The serial signal is not output from outdoor unit to indoor unit. • Miscabling of inter-unit cables • Defective serial sensing circuit on outdoor P.C. board • Defective serial receiving circuit on indoor P.C. board	S top (Automatic reset)	Displayed when error is detected	1. Outdoor unit does not completely operate. • Inter-unit cable check, correction of miscabling, case thermo operation • Outdoor P.C. board check, P.C. board cables check 2. In normal operation P.C. board (Indoor receiving/Outdoor sending) check
			E08	Duplicated indoor unit addresses	Stop	Displayed when error is detected	1. Check whether there is modification of remote controller connection (Group/Individual) or not after power has been turned on (finish of group configuration/address check). * If group configuration and address are not normal when the power has been turned on, the mode automatically shifts to address setup mode. (Resetting of address)
			L03	Duplicated indoor master units			
			L07	There is group line in individual indoor units.			
			L08	Unsetting of indoor group address			
			L09	Unset indoor capacity	Stop	Displayed when error is detected	1. Set the indoor capacity. (DN=I1)
			L30	Abnormal outside interlock input	Stop	Displayed when error is detected	1. Check outside devices. 2. Check indoor P.C. board.
			P01	Fan motor thermal protection	Stop	Displayed when error is detected	1. Check thermal relay of fan motor. 2. Check indoor P.C. board.
			P10	Float switch operation • Disconnection, coming-off, defective float switch contactor of float circuit	Stop	Displayed when error is detected	1. Defect of drain pump 2. Clogging of drain pump 3. Check float switch. 4. Check indoor P.C. board.
			P12	Indoor DC fan error	Stop	Displayed when error is detected	1. Defective detection of position 2. Over-current protective circuit of indoor fan driving unit operates. 3. Lock of indoor fan 4. Check indoor P.C. board.
			P19	Error in 4-way valve system • Indoor heat exchanger temperature lowered after start of heating operation.	Stop (Automatic reset)	Displayed when error is detected	1. Check 4-way valve. 2. Check indoor heat exchanger (TC/TCJ) sensor. 3. Check indoor P.C. board.
			P31	Own unit stops while warning is output to other indoor units.	Stop (Sub unit) (Automatic reset)	Displayed when error is detected	1. Judge sub unit while master unit is in [E03], [L03], [L07], [L08]. 2. Check indoor P.C. board.
			F01	Coming-off, disconnection or short of indoor heat exchanger sensor (TCJ)	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor heat exchanger temperature sensor (TCJ). 2. Check indoor P.C. board.
			F02	Coming-off, disconnection or short of indoor heat exchanger sensor (TC)	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor heat exchanger temperature sensor (TC). 2. Check indoor P.C. board.
			F10	Coming-off, disconnection or short of indoor heat exchanger sensor (TA)	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor heat exchanger temperature sensor (TA). 2. Check indoor P.C. board.
			F29	Indoor EEPROM error • EEPROM access error	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor EEPROM. (including socket insertion) 2. Check indoor P.C. board.
			E10	Communication error between indoor MCU • Communication error between fan driving MCU and main MCU	Stop (Automatic reset)	Displayed when error is detected	1. Check cables of remote controller. 2. Check power cables of indoor unit. 3. Check indoor P.C. board.
			E18	Regular communication error between master and sub indoor units or between main and sub indoor units	Stop (Automatic reset)	Displayed when error is detected	1. Check cables of remote controller. 2. Check indoor power cable. 3. Check indoor P.C. board.

Error mode detected by outdoor unit

: Flash, ○ : Go on, : Go off

Wireless sensor lamp display			Wired remote controller	Diagnostic function			Judgment and measures
Operation	Timer	Ready	Check code	Cause of operation	Status of air conditioner	Condition	
			H01	Breakdown of compressor • Displayed when error is detected	Stop	Displayed when error is detected	1. Check power voltage. AC200V±20V 2. Overload operation of refrigerating cycle 3. Check current detection circuit at AC side.
			H02	Compressor does not rotate. • Over-current protective circuit operates after specified time passed when compressor had been activated.	Stop	Displayed when error is detected	1. Trouble of compressor (Compressor lock, etc.) : Replace compressor. 2. Defective cabling of compressor (Phase missing) 3. Phase-missing operation of power supply (3-phase model)
			H03	Current detection circuit error • Current value at AC side is high even during compressor-OFF. • Phase of power supply is missed.	Stop	Displayed when error is detected	1. Compressor immediately stops even if restarted. : Check IPDU. 2. Phase-missing operation of power supply Check 3-phase power voltage and cables.
			L29	Outdoor unit and other errors • Communication error between CDB and IPDU (Coming-off of connector) • Heat sink temperature error (Detection of temperature over specified value)	Stop	Displayed when error is detected	1. Check cables of CDB and IPDU. 2. Abnormal overload operation of refrigerating cycle
			L31	Phase detection protective circuit operates. (Normal models)	Operation continues. (Compressor stops.)	Displayed when error is detected	1. Check power phase order (Reversed phase)/phase missing. 2. Check outdoor P.C. board.
			P03	Discharge temperature error • Discharge temperature over specified value was detected.	Stop	Displayed when error is detected	1. Check refrigerating cycle. (Gas leak) 2. Trouble of PMV 3. Check Td sensor.
			P04	High-pressure protection error by TE sensor (Temperature over specified value was detected.)	Stop	Displayed when error is detected	1. Overload operation of refrigerating cycle 2. Check outdoor temperature sensor (TE). 3. Check outdoor CDB P.C. board.
			P22	Outdoor DC fan error	Stop	Displayed when error is detected	1. Defective detection of position 2. Over-current protective circuit of outdoor fan driving unit operates. 3. Lock of outdoor fan 4. Check outdoor CDB P.C. board.
			P26	Inverter over-current protective circuit operates. (For a short time) Short voltage of main circuit operates.	Stop	Displayed when error is detected	1. Inverter immediately stops even if restarted. : Compressor motor rare short 2. Check IPDU. : Cabling error
			P29	IPDU position detection circuit error	Stop	Displayed when error is detected	1. Position detection circuit operates even if operating compressor by removing 3P connector. : Replace IPDU.
			F04	Coming-off, disconnection or short of outdoor temperature sensor (TD)	Stop	Displayed when error is detected	1. Check outdoor temperature sensor (TD). 2. Check outdoor CDB P.C. board.
			F06	Coming-off, disconnection or short of outdoor temperature sensor (TE/TS)	Stop	Displayed when error is detected	1. Check outdoor temperature sensor (TE/TS). 2. Check outdoor CDB P.C. board.
			F08	Coming-off, disconnection or short of outdoor temperature sensor (TO)	Operation continues.	Displayed when error is detected	1. Check outdoor temperature sensor (TO). 2. Check outdoor CDB P.C. board.

For an error mode detected in outdoor unit, the fan operates because sub unit of a group operation does not communicate with the outdoor unit.

For the combined outdoor unit, refer to the following Service Manual.

Outdoor unit Model name
RAV-SMXXXAT-E / RAV-SPXXXAT-E

SVM to be referred
A03-007 / A03-014

Error mode detected by remote controller or network adapter

: Flash, ○ : Go on, : Go off

Wireless sensor lamp display			Wired remote controller	Diagnostic function			Judgment and measures
Operation	Timer	Ready	Check code	Cause of operation	Status of air conditioner	Condition	
—	—	—	No check code is displayed. (Remote controller does not operate.)	No communication with master indoor unit <ul style="list-style-type: none"> • Remote controller cable is not correctly connected. • Power of indoor unit is not turned on. • Automatic address cannot be completed. 	Stop	—	Remote controller power error, Defective indoor EEPROM <ol style="list-style-type: none"> 1. Check remote controller inter-unit cables. 2. Check remote controller. 3. Check indoor power cables. 4. Check indoor P.C. board. 5. Check indoor EEPROM. (including socket insertion) : Phenomenon of automatic address repetition occurred.
			E01*2	No communication with indoor master unit <ul style="list-style-type: none"> • Disconnection of inter-unit cable between remote controller and master indoor unit (Detected at remote controller side) 	Stop (Automatic restart) * When there is center, operation continues.	Displayed when error is detected	Signal receiving of remote controller is defective. <ol style="list-style-type: none"> 1. Check remote controller inter-unit cables. 2. Check remote controller. 3. Check indoor power cables. 4. Check indoor P.C. board.
			E02	Signal sending error to indoor unit (Detected at remote controller side)	Stop (Automatic restart) * When there is center, operation continues.	Displayed when error is detected	Signal sending of remote controller is defective. <ol style="list-style-type: none"> 1. Check sending circuit inside of remote controller. : Replace remote controller.
			E09	Multiple master remote controllers are recognized. (Detected at remote controller side)	Stop (Sub unit continues operation.)	Displayed when error is detected	1. Check there are multiple master units for 2 remote controllers (including wireless). : Master unit is one and others are sub units.
			L20 Central remote controller 98	Duplicated indoor central addresses on communication of central control system (AI-NET) (Detected by central controller side)	Stop (Automatic restart)	Displayed when error is detected	<ol style="list-style-type: none"> 1. Check address setup of central control system network. (Network adapter SW01) 2. Check network adapter P.C. board.
—	—	—	— *3 Central remote controller 99	Multiple network adapters on remote controller communication line (Detected by central controller side)	Operation continues.	Displayed when error is detected	<ol style="list-style-type: none"> 1. Check multiple network adapters. 2. Check inter-unit cable/miscabling of remote controller. : Only one network adapter on remote controller communication line
—	—	—	— *3 Central remote controller 97	Interruption of central control system (AI-NET) communication circuit (Detected by central controller side)	Operation continues. (According to handy remote controller)	Displayed when error is detected	<ol style="list-style-type: none"> 1. Check communication line/miscabling. Check power of indoor unit. 2. Check communication. (XY terminals) 3. Check network adapter P.C. board. 4. Check central controller (such as central control remote controller, etc.).
—	—	—	— Central remote controller b7	Indoor Gr sub unit error (Detected by central controller side)	Continuation/stop (Based on a case)	Displayed when error is detected	Check the check code of corresponding unit by handy remote controller.

*2 Check code is not displayed by wired remote controller. (Usual operation of air conditioner is disabled.)

For wireless type models, E01 is notified by the display lamp.

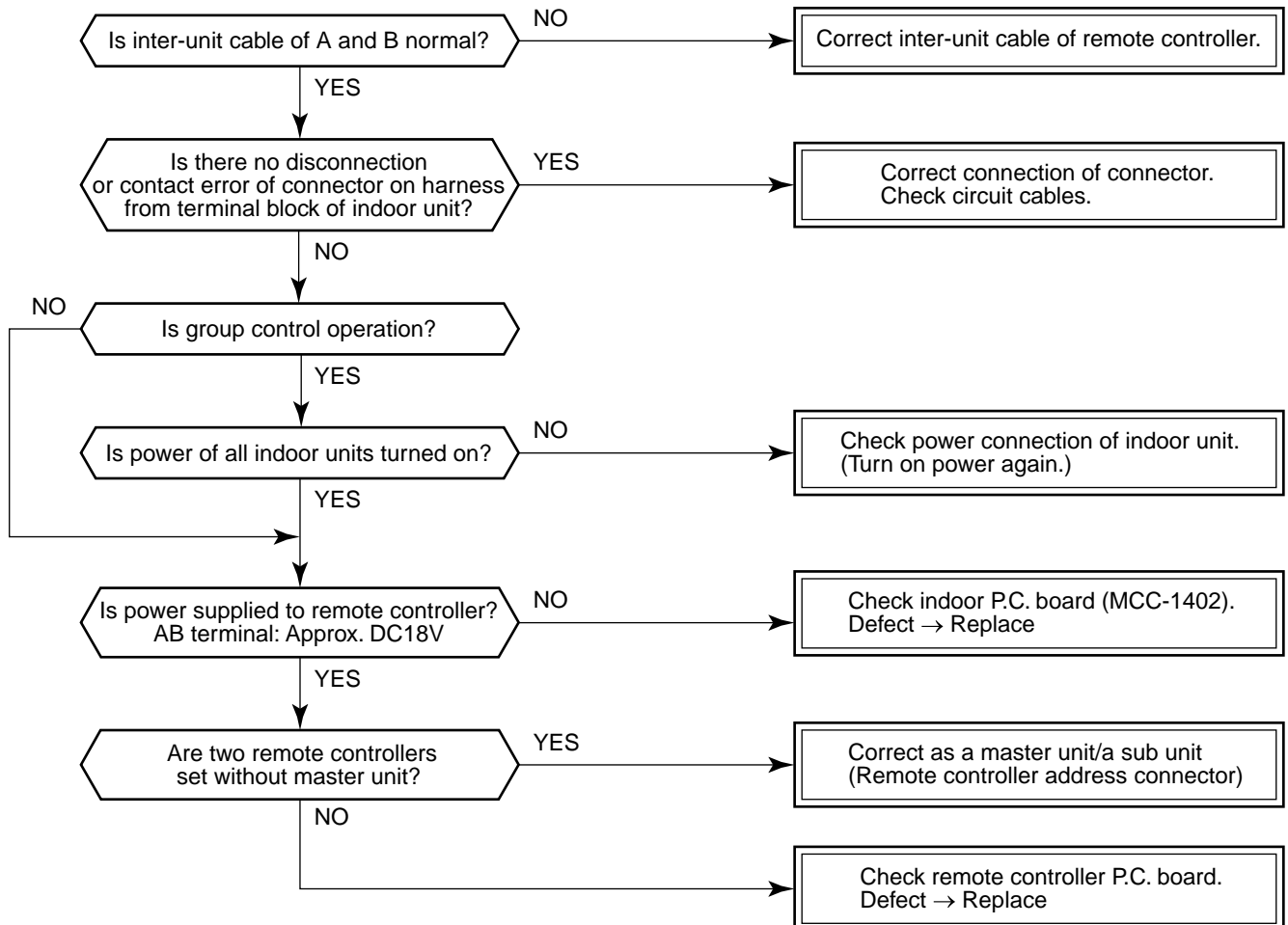
*3 These errors are related to communication of remote controllers (A, B) and central system (AI-NET, X, Y), and [E01], [E02], [E03], [E09], or [E18] is displayed or no check code is displayed on the remote controller according to the error contents.

8-4. Troubleshooting Procedure for Each Check Code

8-4-1. New Check Code/Present Check Code (Central Control Side)

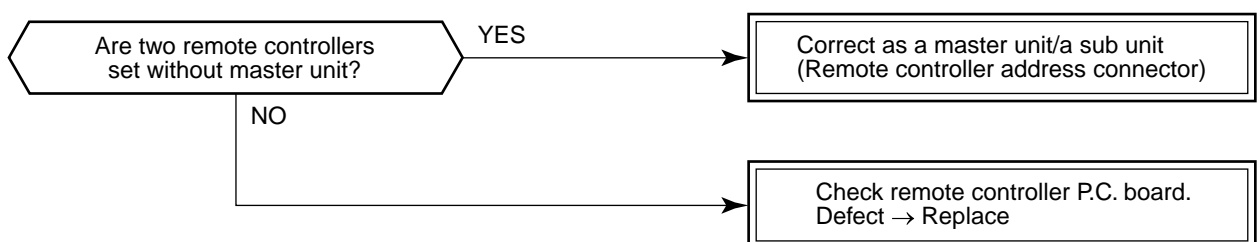
[E01 error]/*[99 error]

* : When central controller [99] is displayed, there are other causes of error.

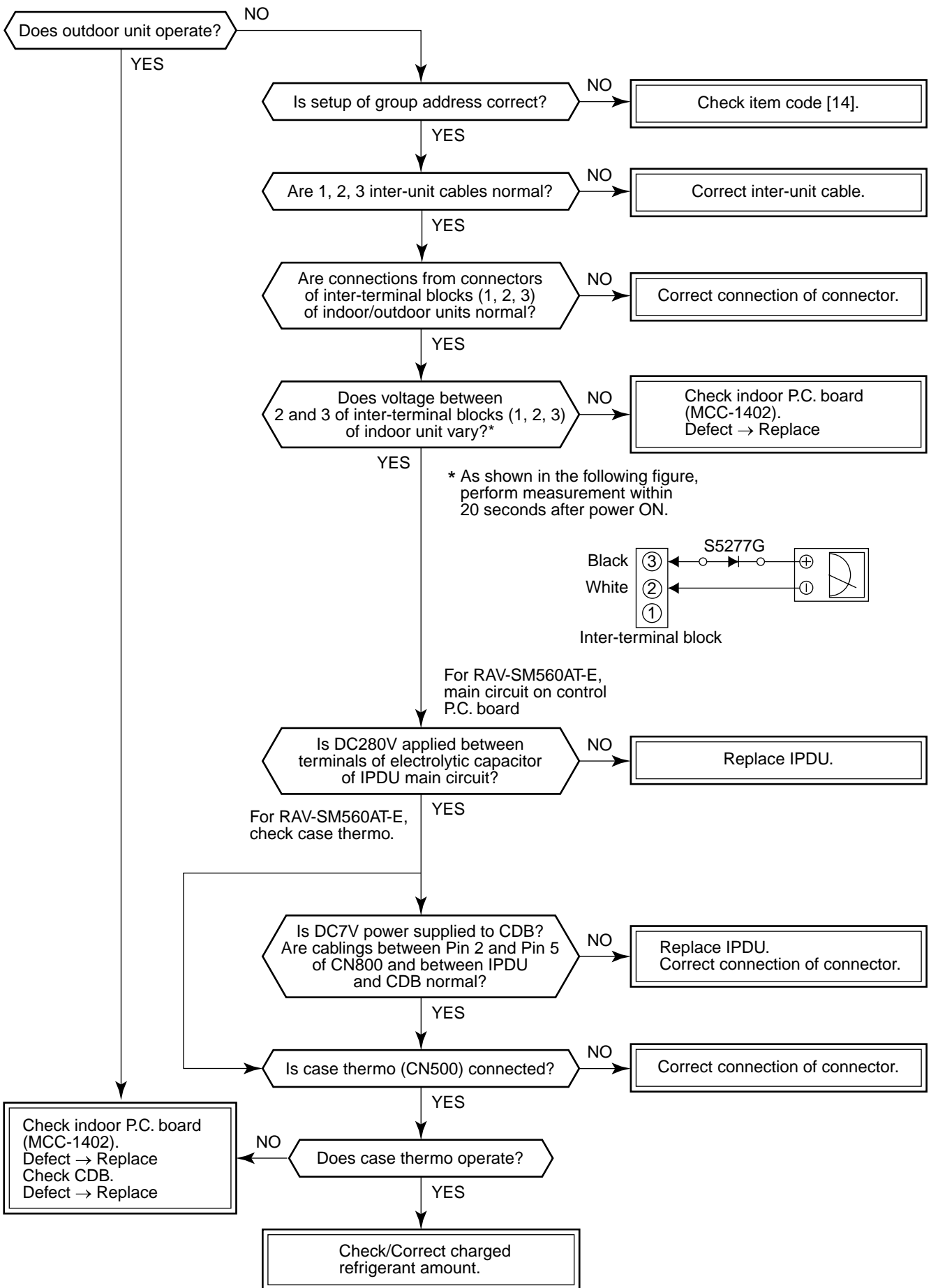


[E09 error]/*[99 error]

* : When central controller [99] is displayed, there are other causes of error.



[E04 error]/[04 error]

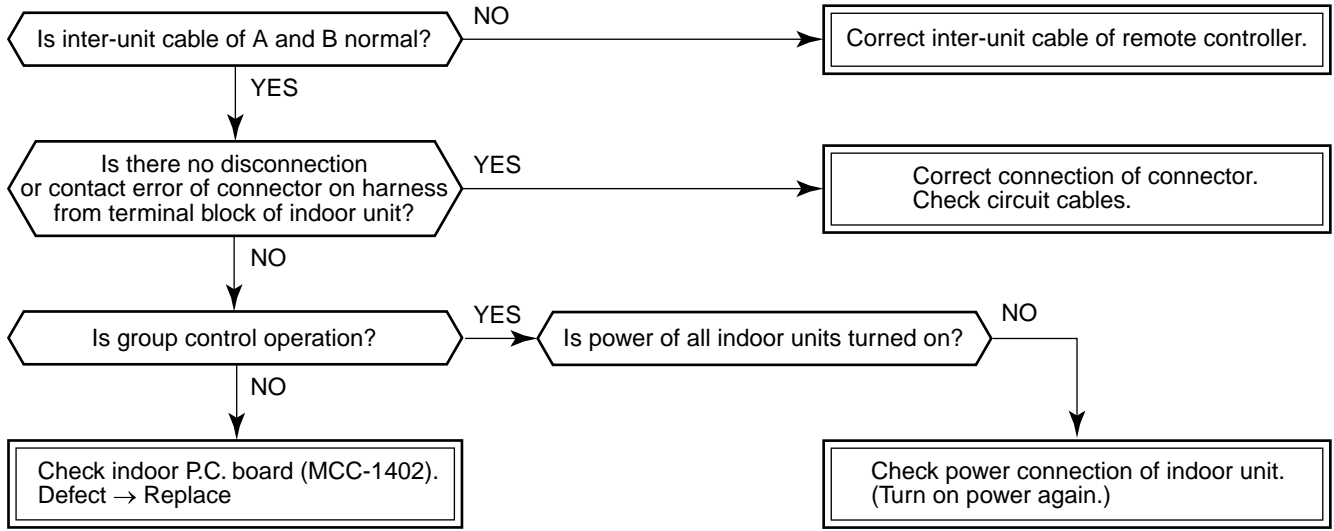


[E10 error]/[CF error]

Check indoor control P.C. board (MCC-1402).
Defect → Replace

[E18 error]/[97 error] *[99 error]

* : When central controller [99] is displayed, there are other causes of trouble.



[E08, L03, L07, L08 error]/ *[96 error] [99 error]

* : When central controller [99] is displayed, there are other causes of trouble.

E08 : Duplicated indoor unit numbers

L03 : Two or more master units in a group control

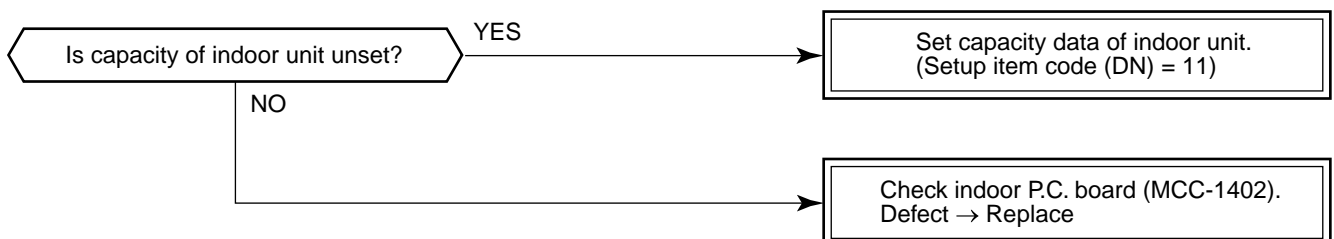
L07 : One or more group addresses of [Individual] in a group control

L08 : Unset indoor group address (99)

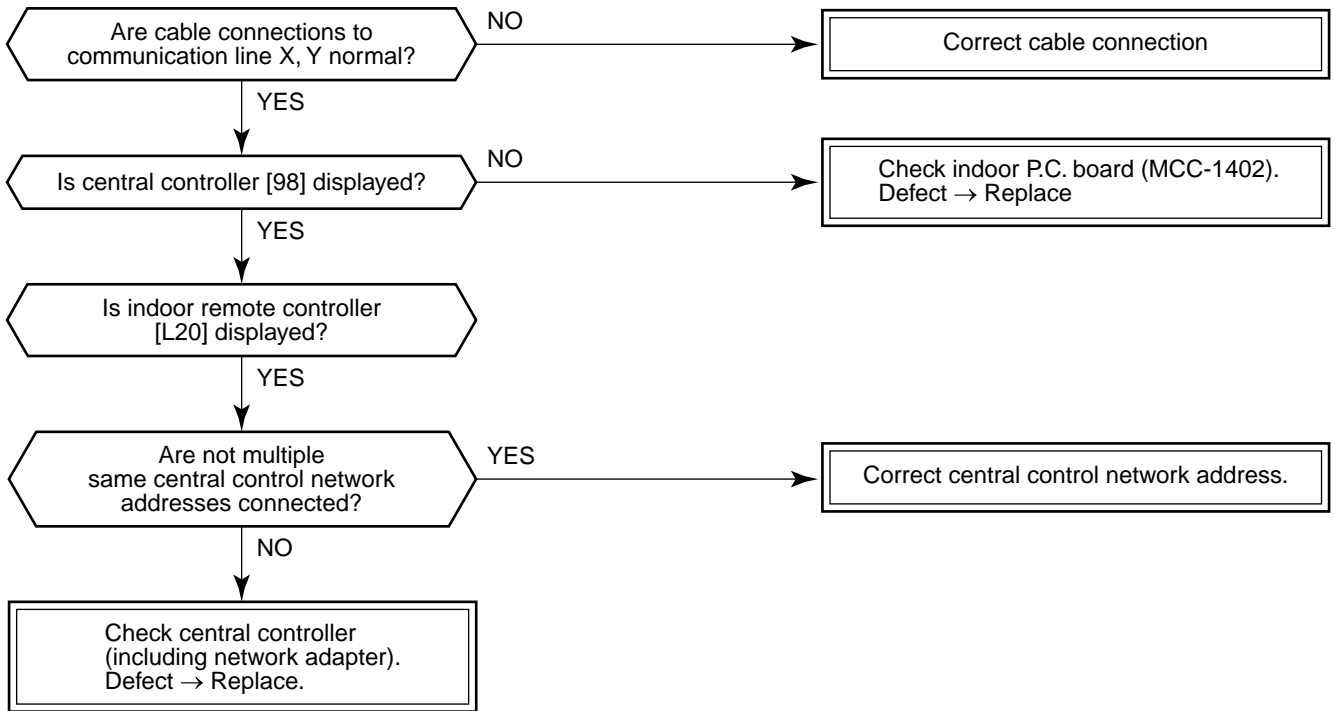
If the above is detected when power has been turned on, the mode automatically enters in automatic address setup mode. (Check code is not displayed.)

However, if the above is detected during automatic address setup mode, the check code may be displayed.

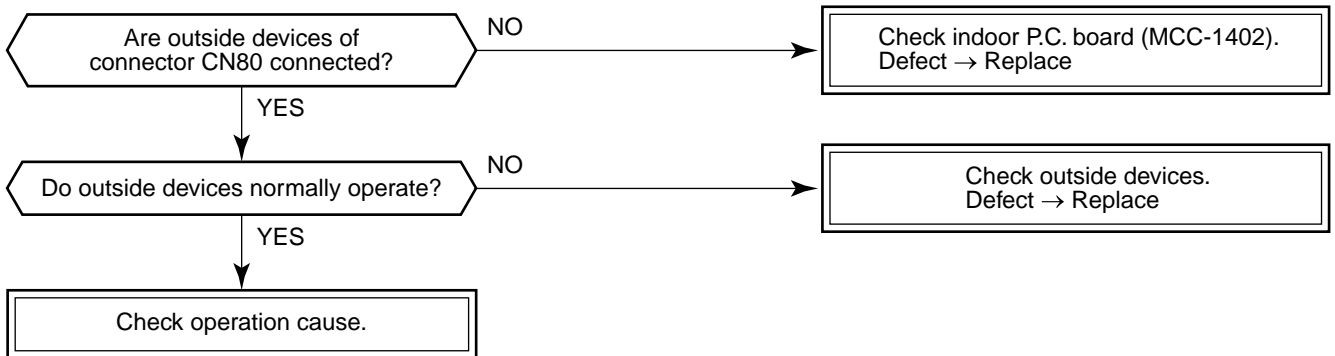
[L09 error]/[46 error]



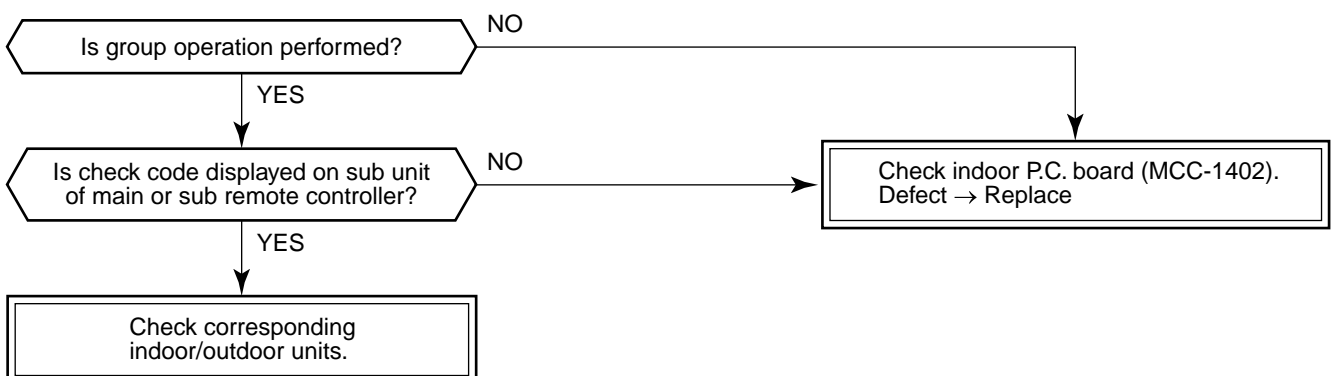
[L20 error]/[98 error]



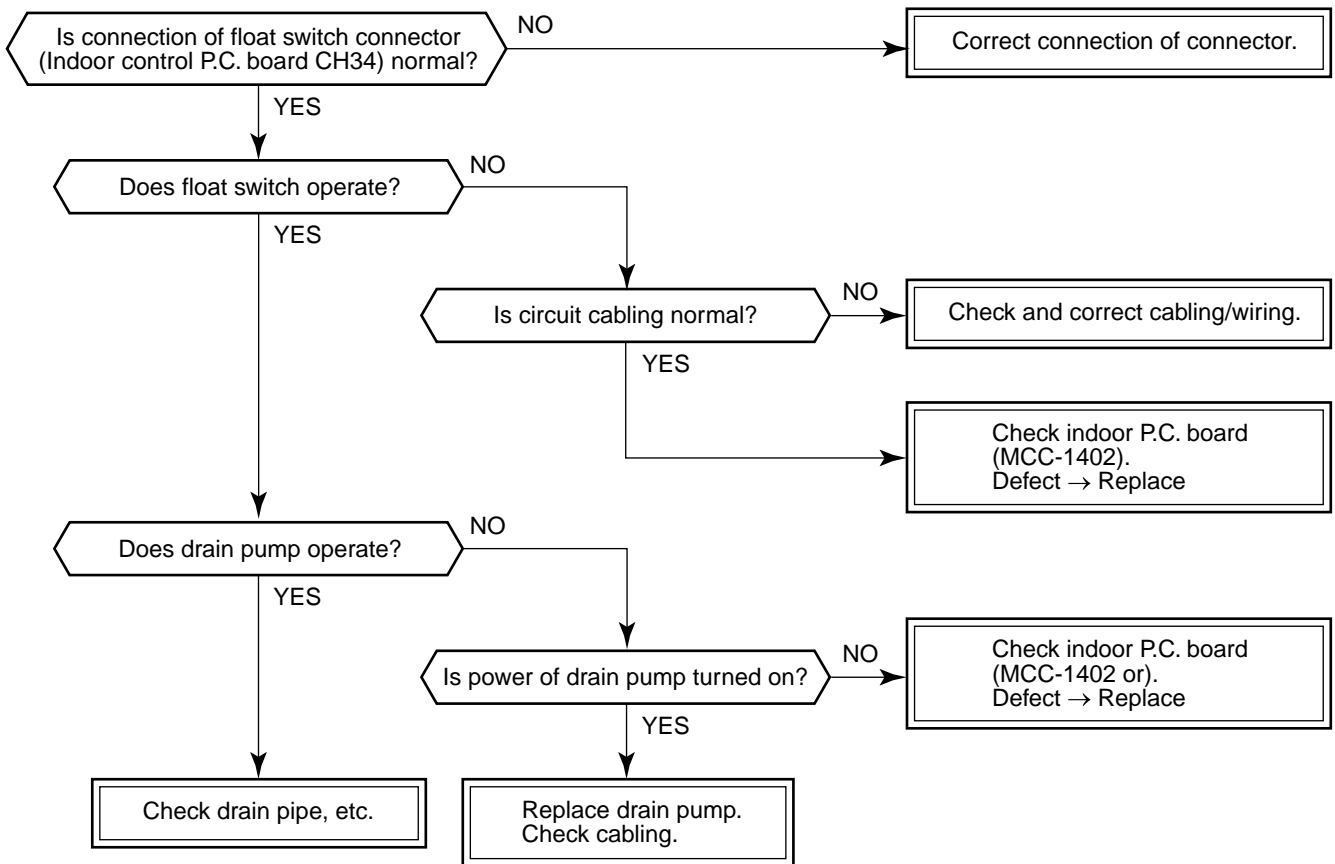
[L30 error]/[B6 error]



[b7 error] (Central controller)



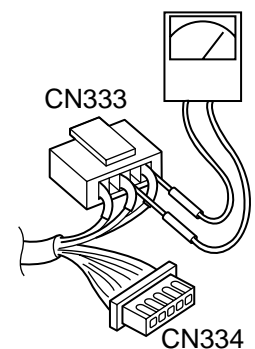
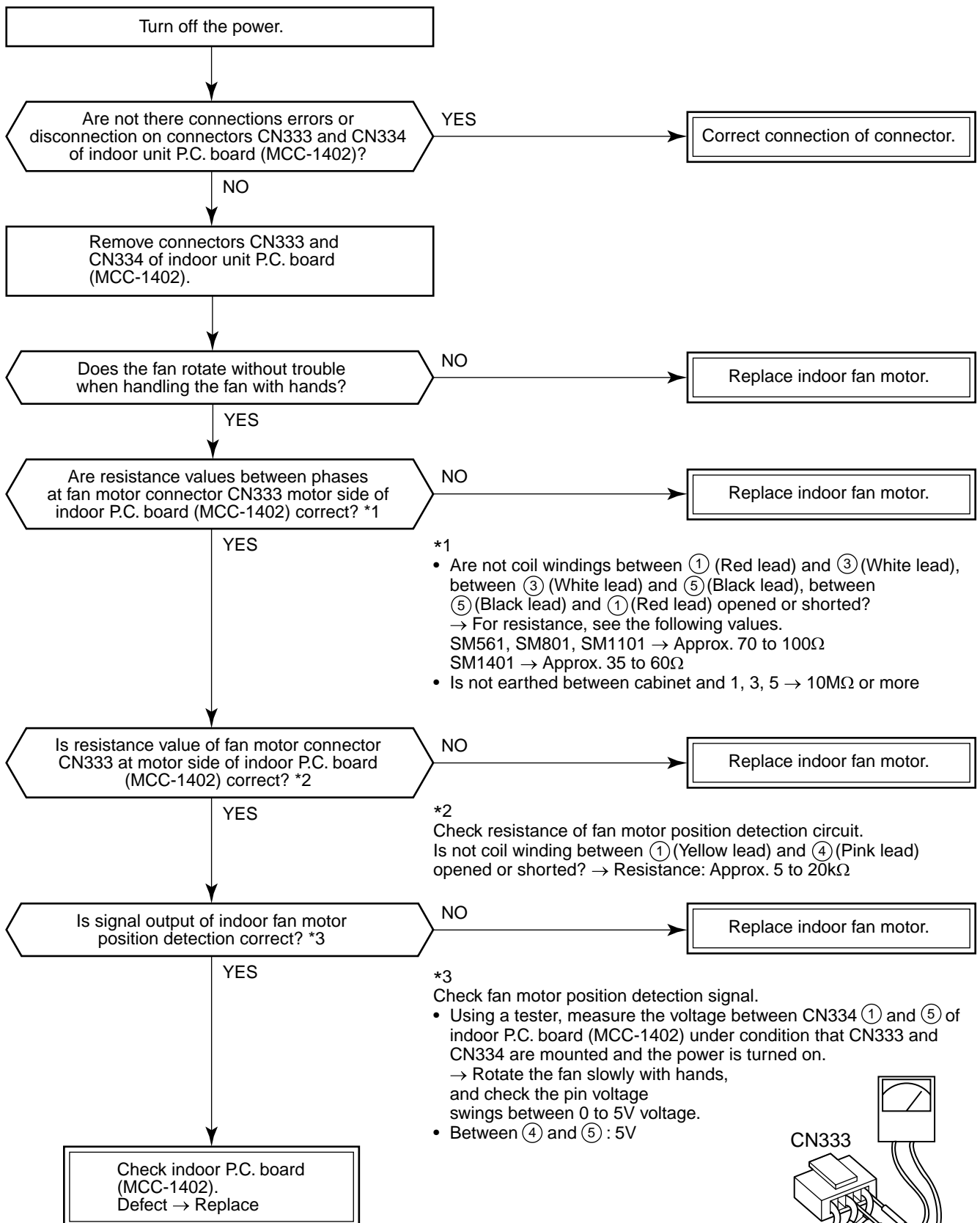
[P10 error]/[Ob error]



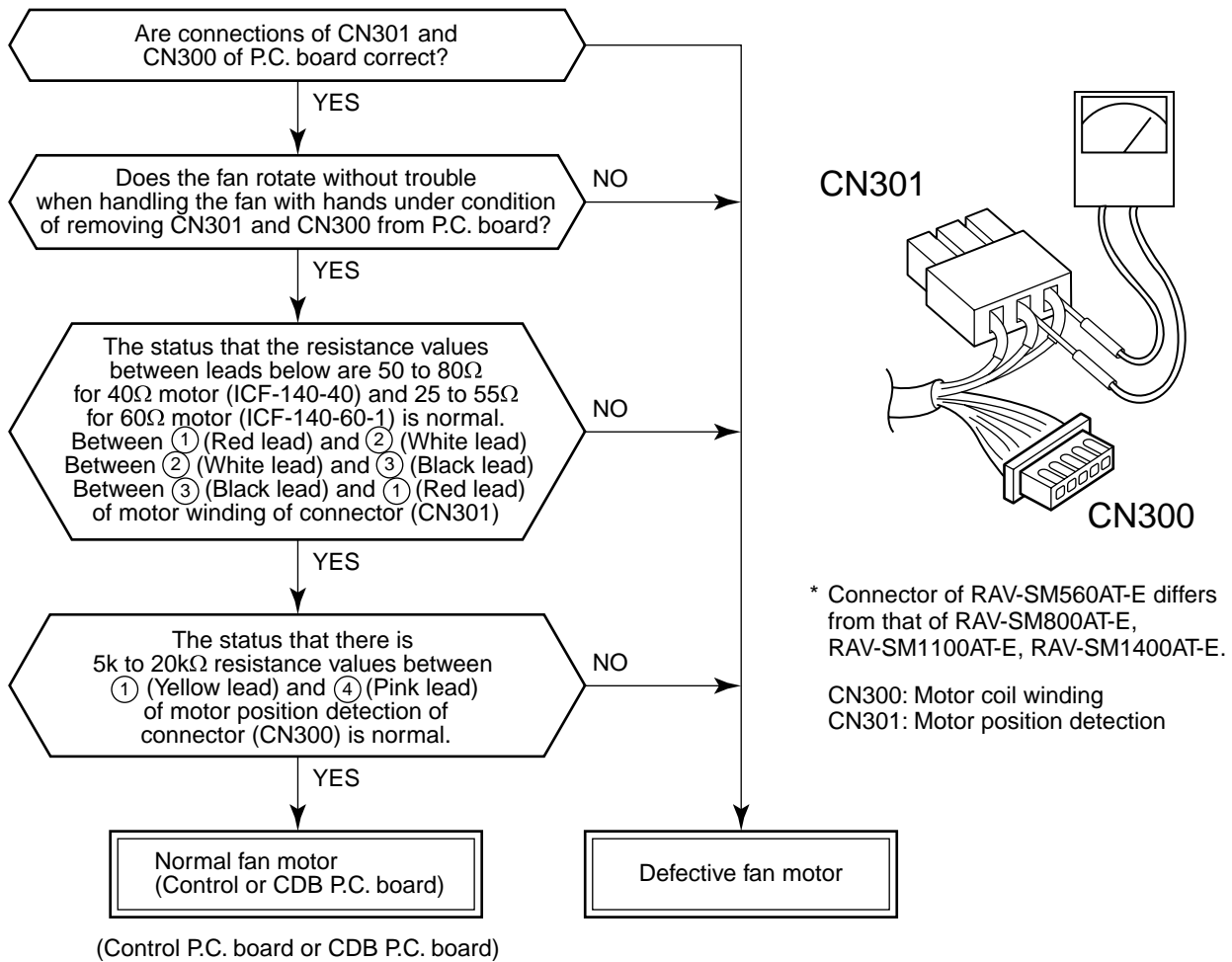
[F10 error] [0C error]



[P12 error]/[11 error]



[P22 error]/[1A error]

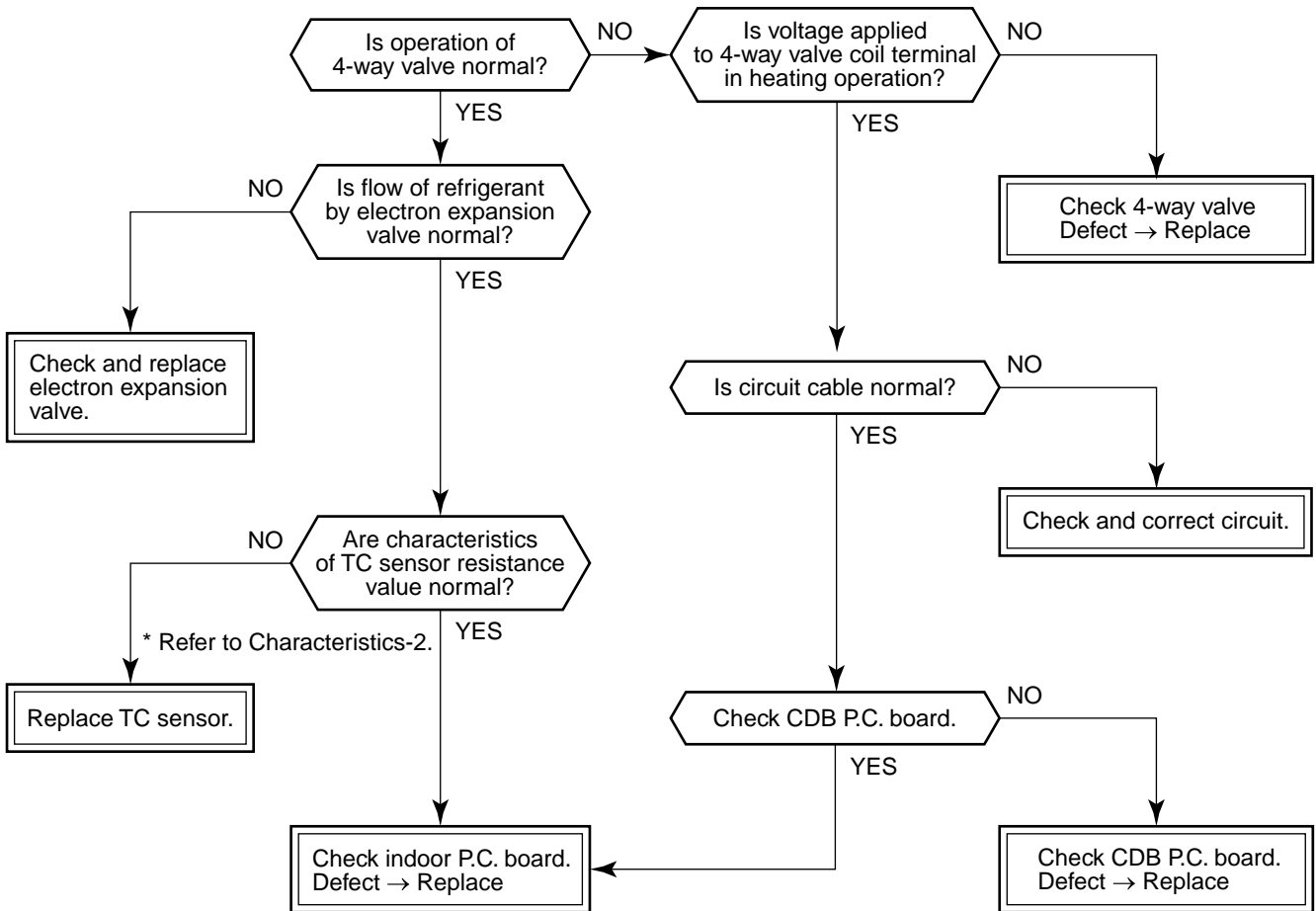


NOTE :

However, GND circuit error inside of the motor is rarely detected even if the above check is carried out. When the circuit does not become normal even if P.C. board has been replaced, replace outdoor fan motor.

	Single phase	Single phase	Single phase
	RAV-SM560AT-E	RAV-SM800AT-E RAV-SP560AT-E, SP800AT-E	RAV-SM1100AT-E, SM1400AT-E RAV-SP1100AT-E, SP1400AT-E
Objective P.C. board	Control P.C. board	CDB P.C. board	CDB P.C. board
Fan motor winding	CN300	CN301	CN301
Motor position detection	CN301	CN300	CN300
Fan motor winding	—	—	CN303
Motor position detection	—	—	CN302

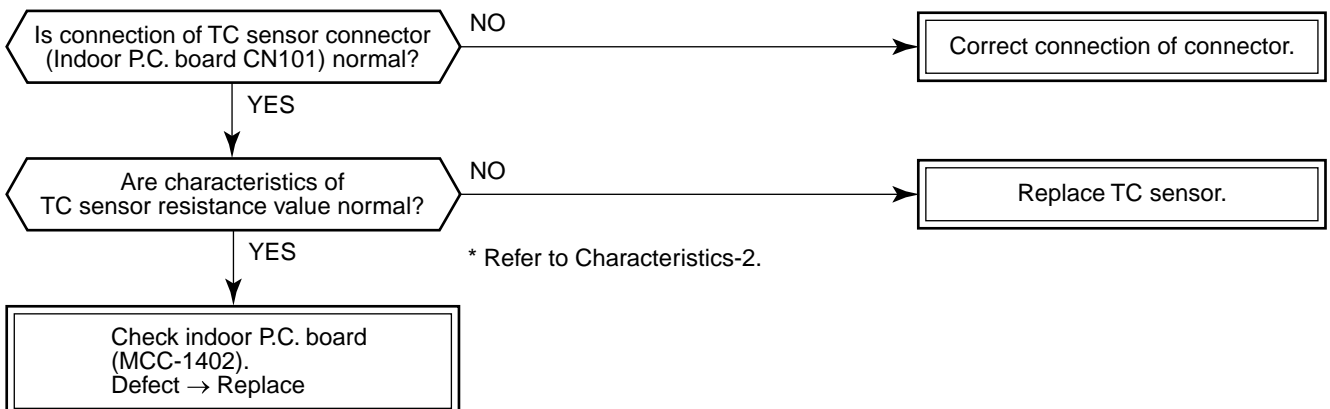
[P19 error]/[08 error]



* For RAV-SM560AT-E, check control P.C. board.

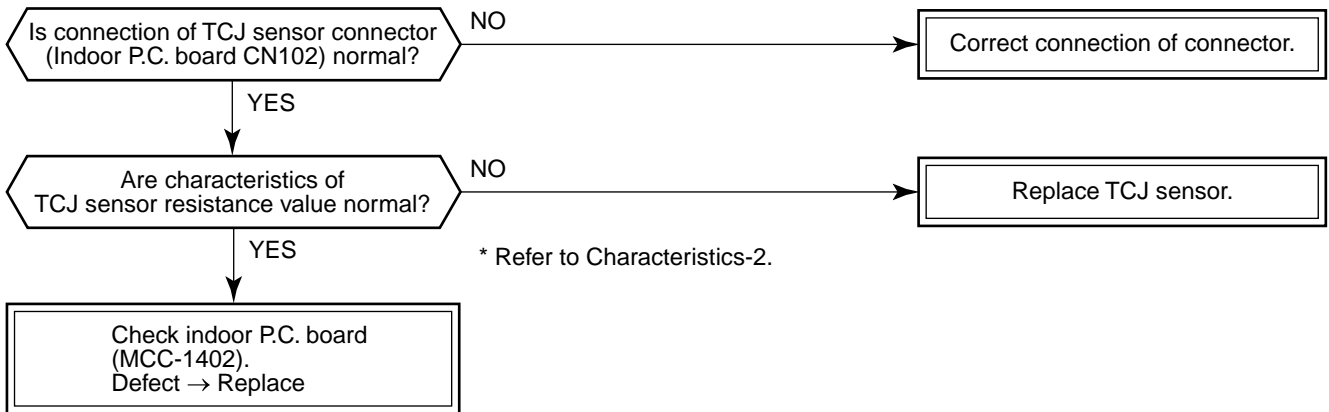
- In cooling operation, if high pressure is abnormally raised, [P19 error]/[08 error] may be displayed. In this case, remove cause of pressure up and then check again referring to the item [P04 error]/[21 error].

[F02 error]/[0d error]

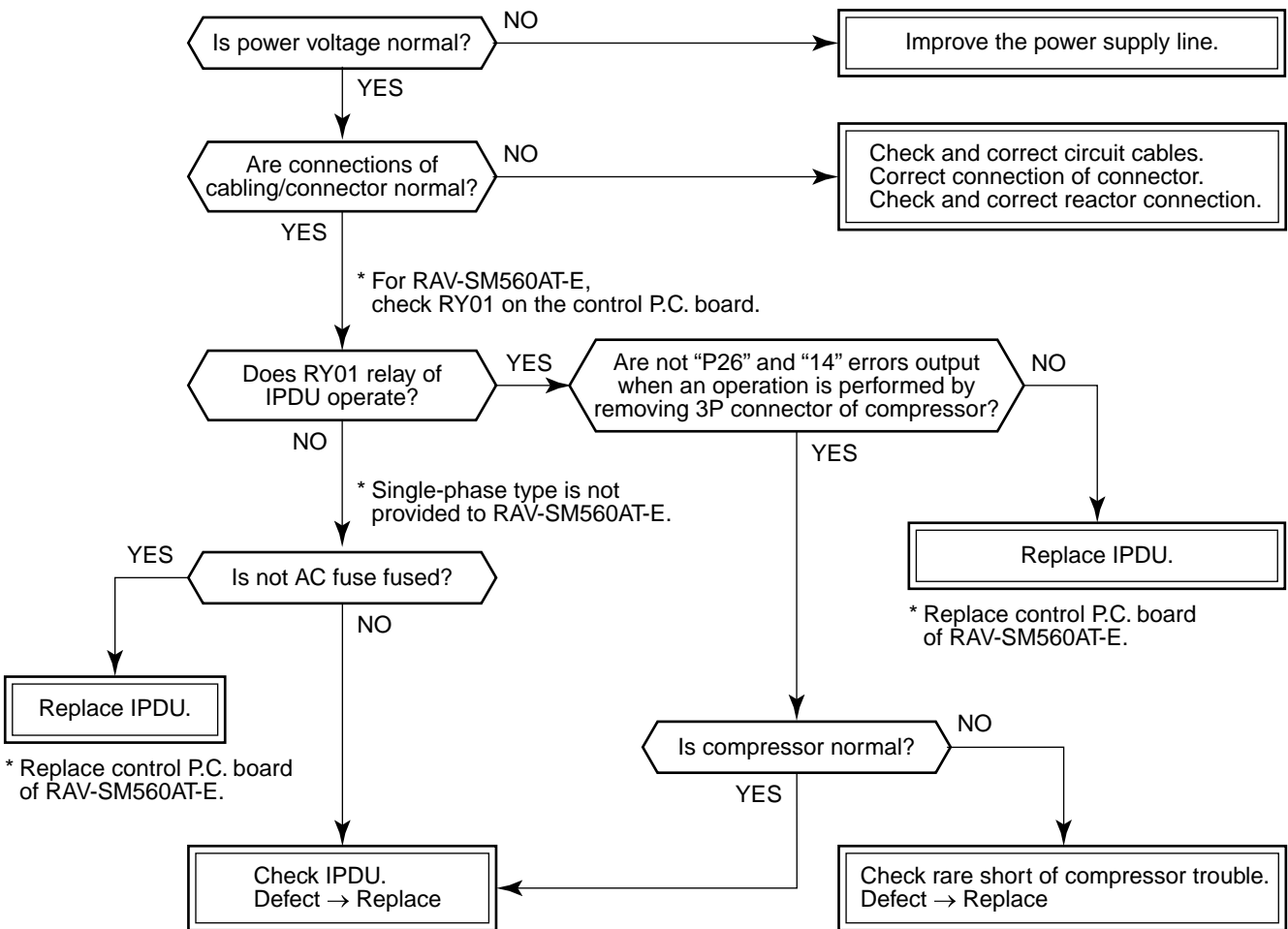


* Refer to Characteristics-2.

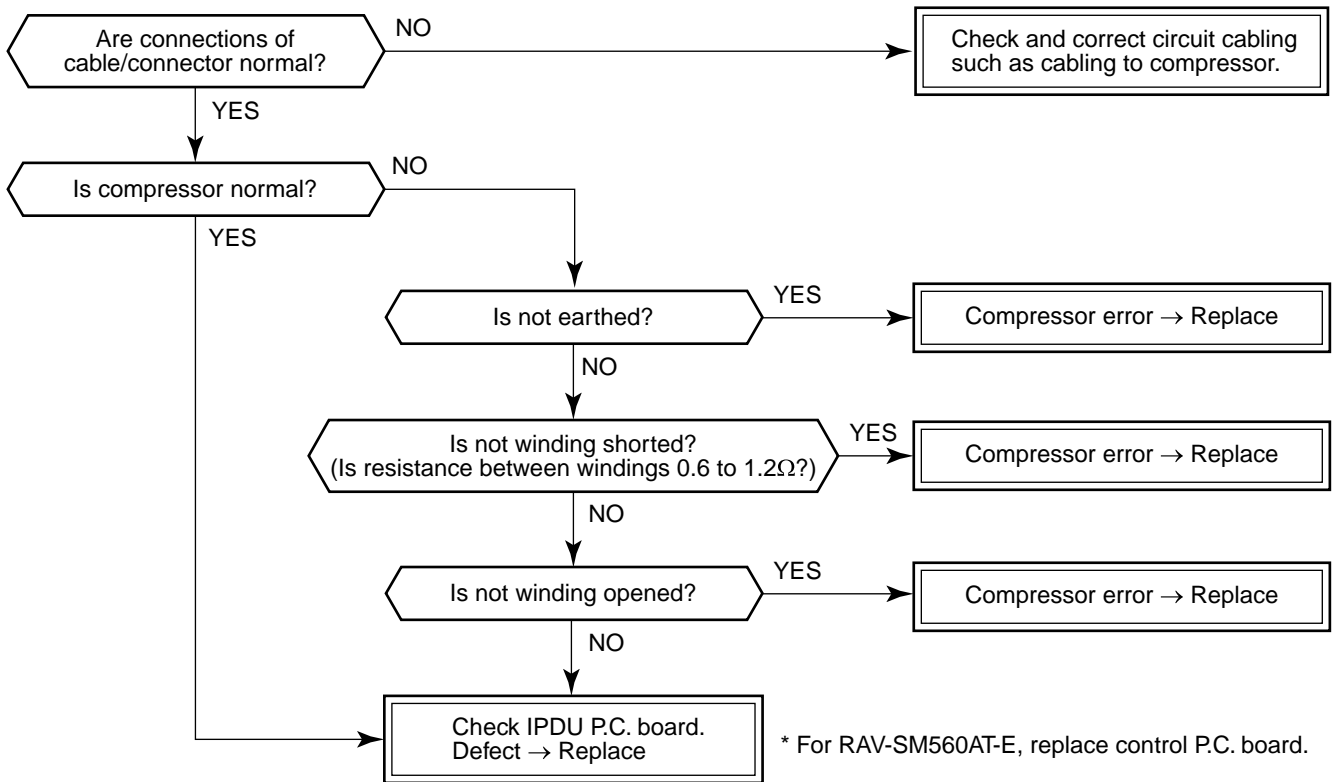
[F01 error]/[0F error]



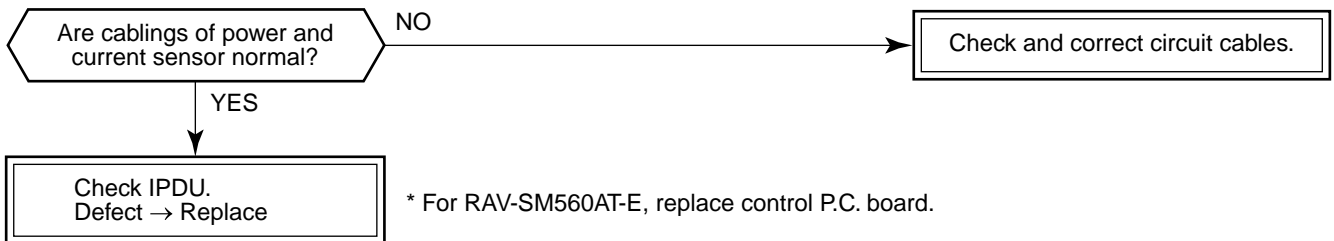
[P26 error]/[14 error]



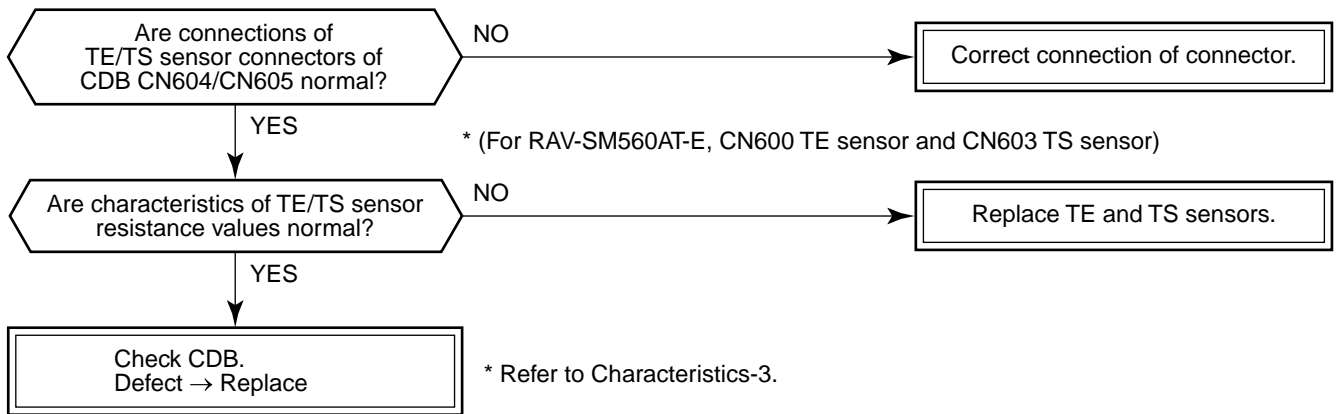
[P29 error]/[16 error]



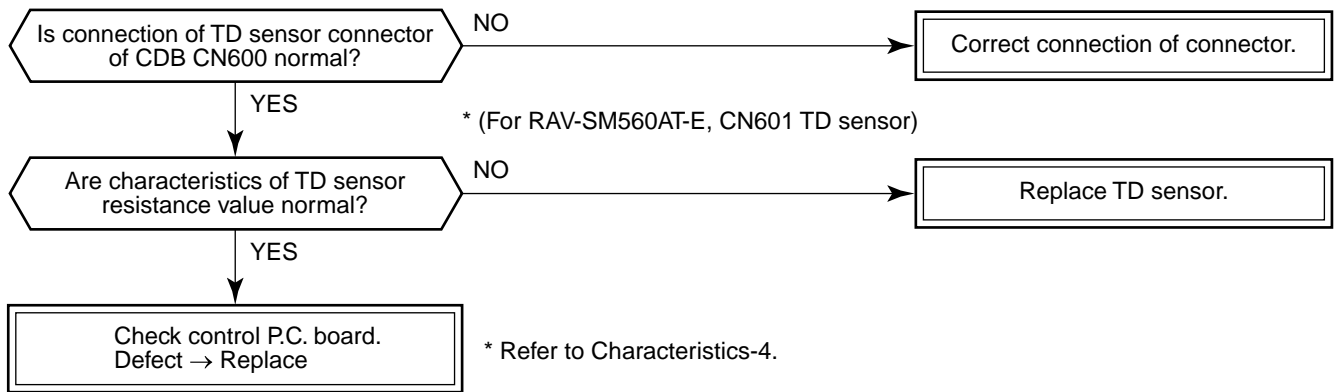
[H03 error]/[17 error]



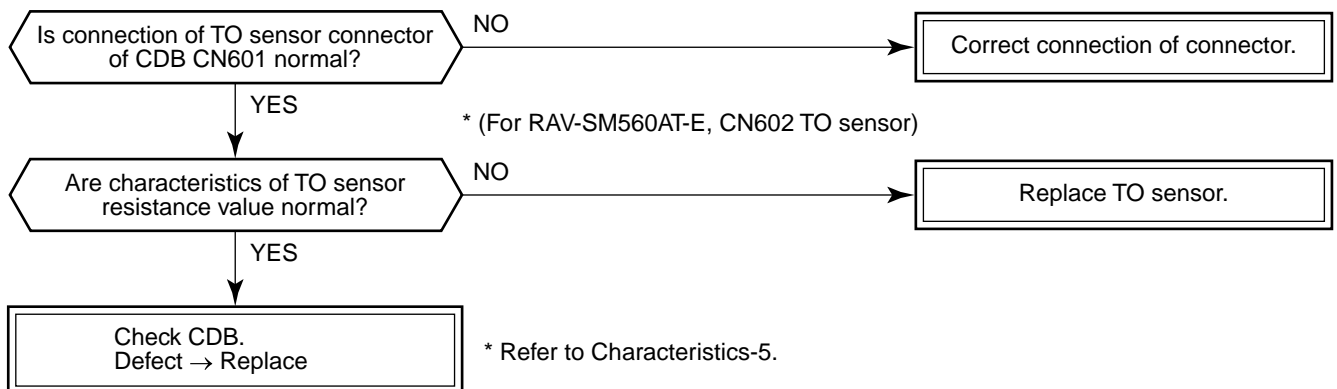
[F06 error]/[18 error]



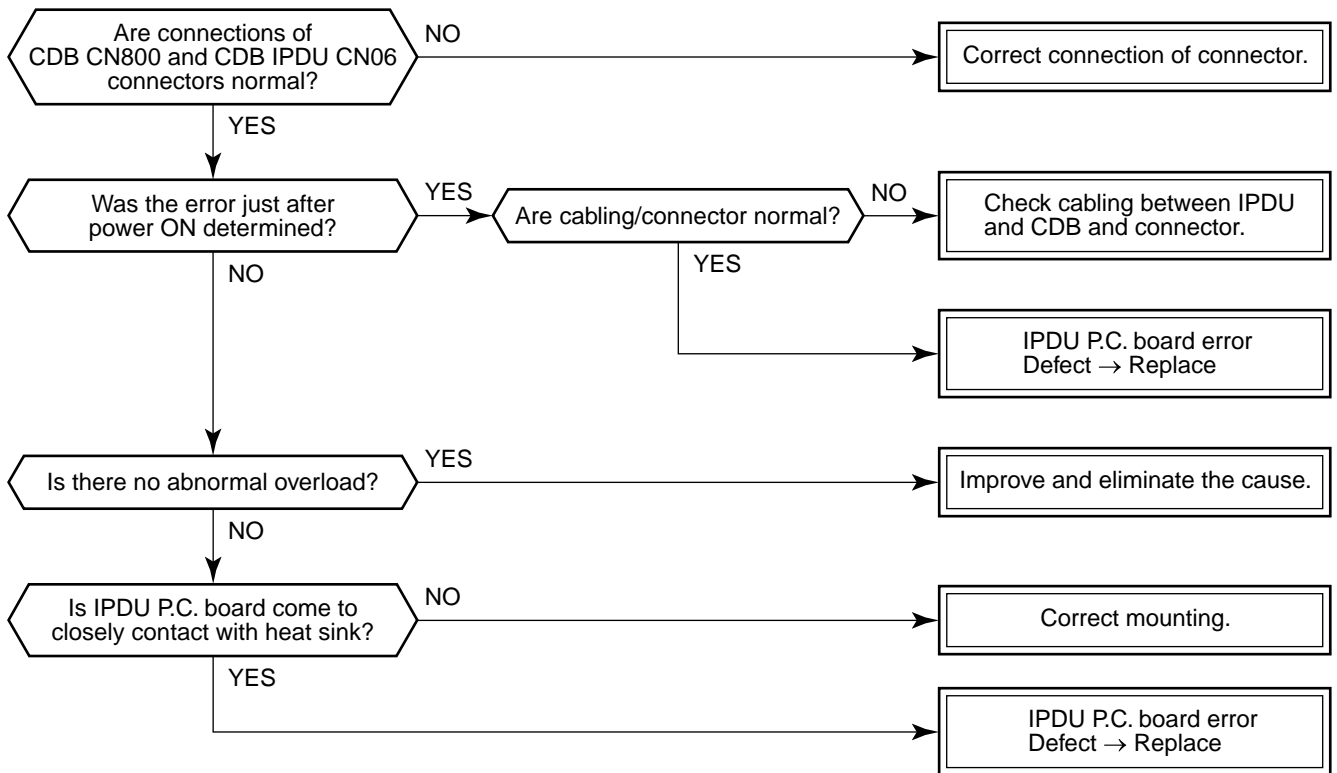
[F04 error]/[19 error]



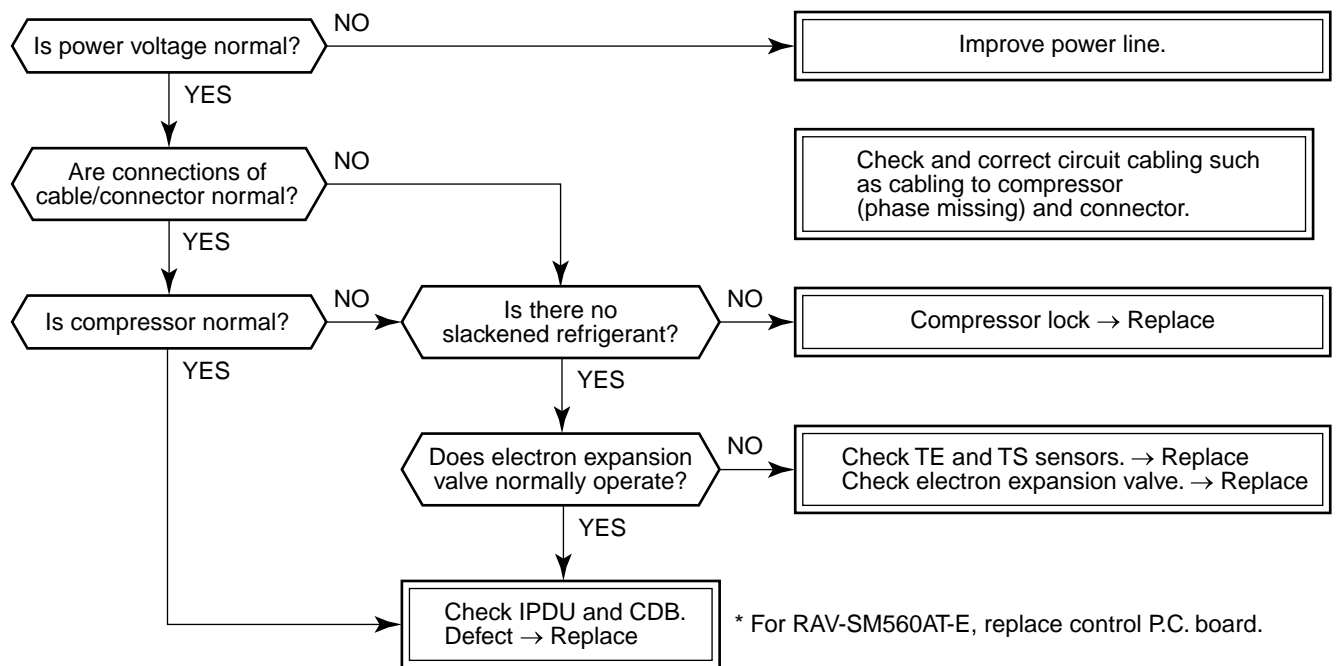
[F08 error]/[1b error]



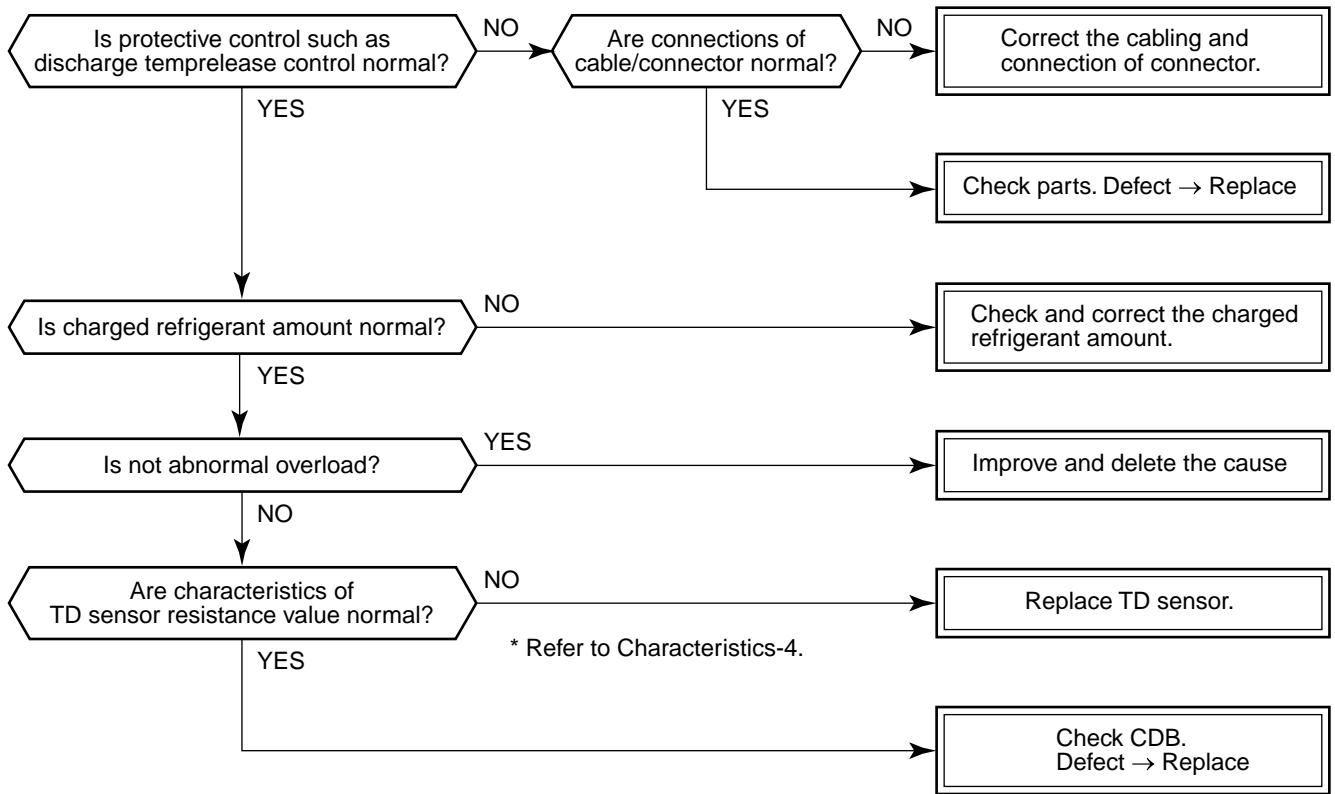
[L29 error]/[1C error]



[H02 error]/[1d error]

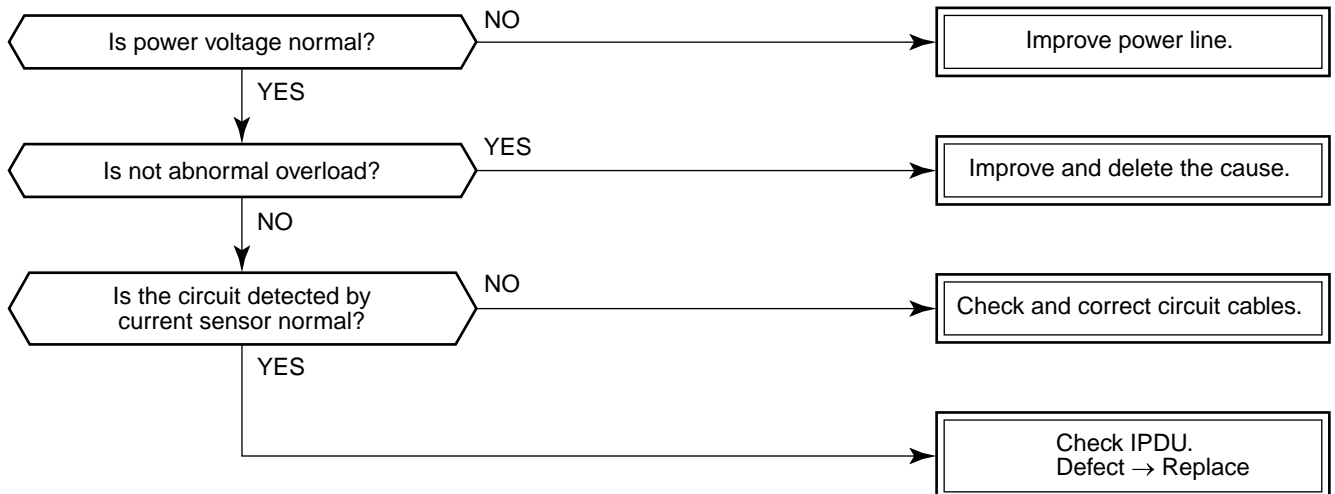


[P03 error]/[1E error]



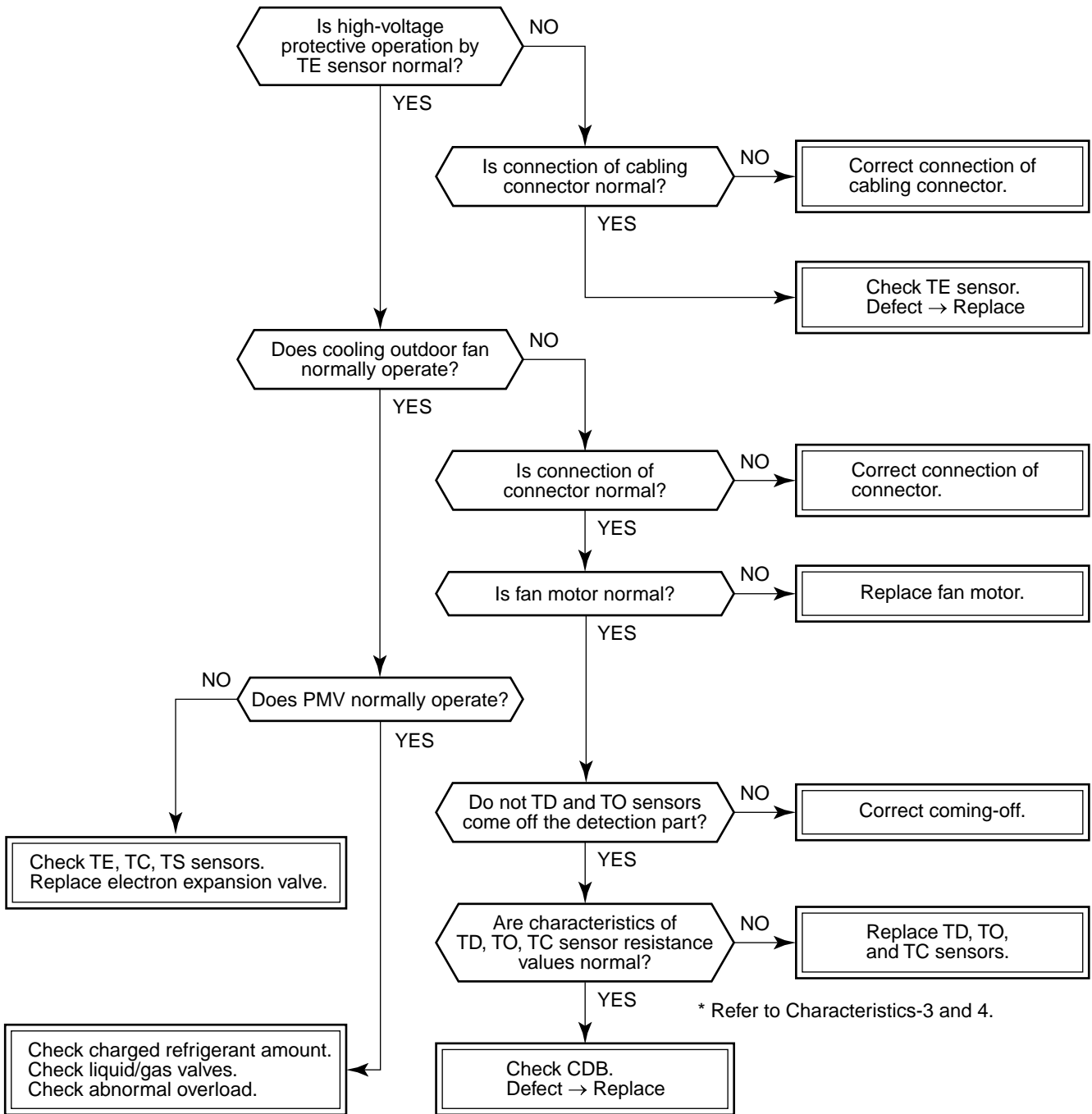
* For RAV-SM560AT-E, replace control P.C. board.

[H01 error]/[1F error]



* For RAV-SM560AT-E, replace control P.C. board.

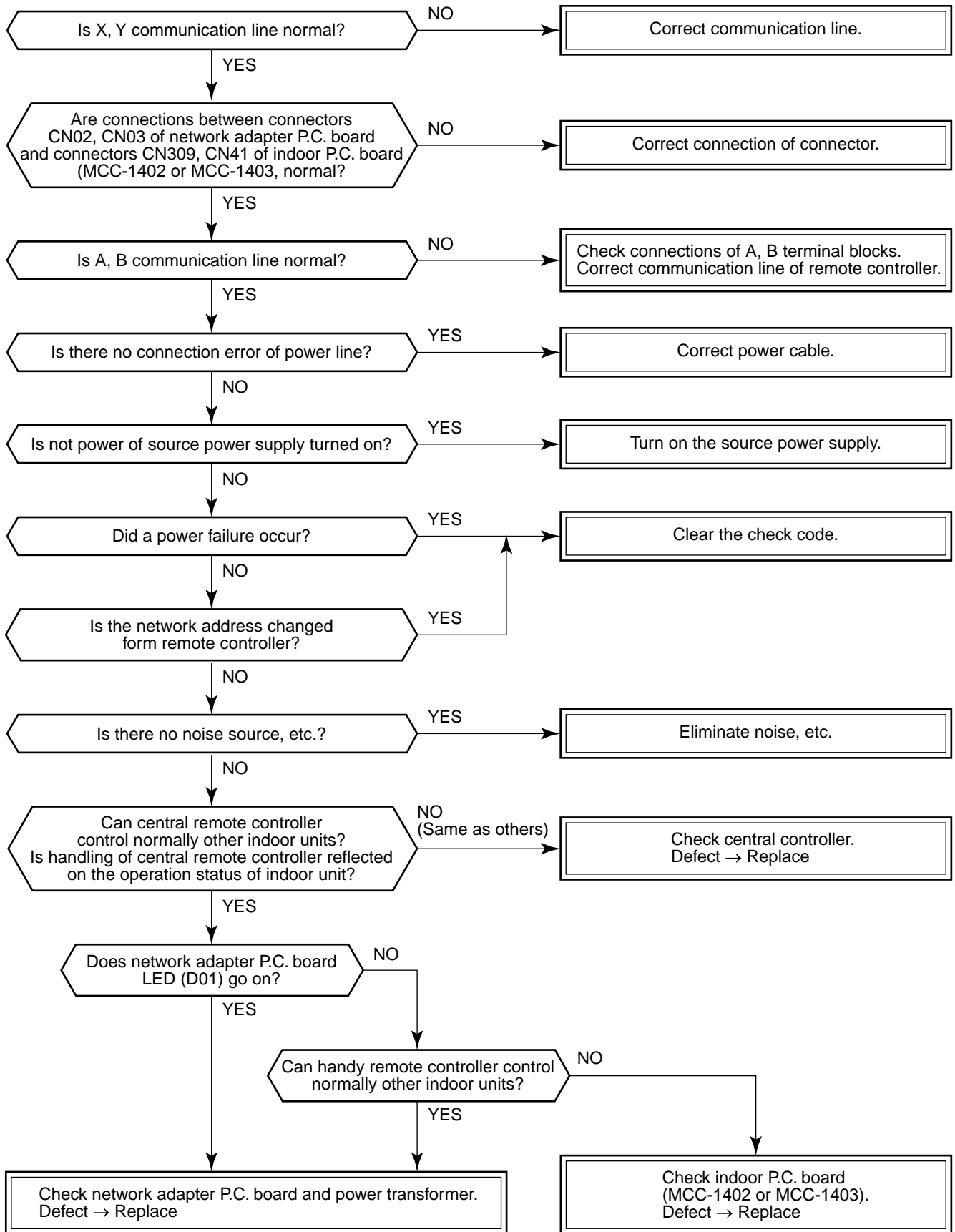
[P04 error]/[21 error]



* Refer to Characteristics-3 and 4.

* For RAV-SM560AT-E, replace control P.C. board.

[97 error] (Central controller)



[E03 error] (Master indoor unit)

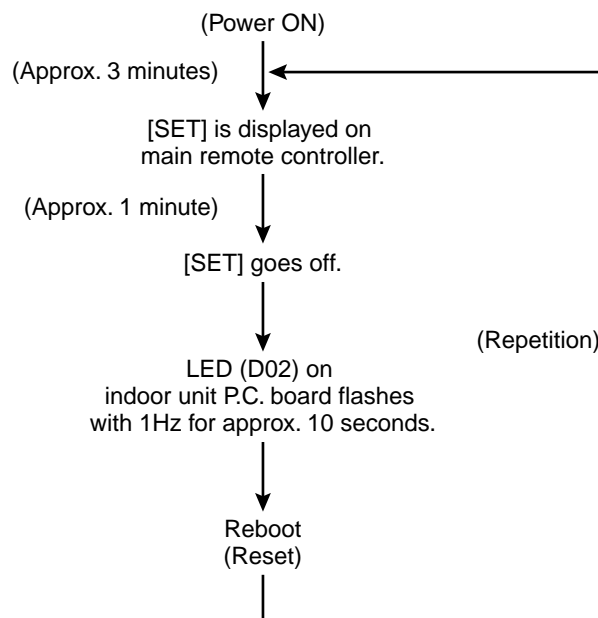
[E03 error] is detected when the indoor unit cannot receive a signal sent from the main remote controller (and central controller).

In this case, check the communication cables of the remote controllers A and B, the central control system X and Y. As communication is disabled, [E03] is not displayed on the main remote controller and the central controller. [E01] is displayed on the main remote controller and [97 error] on the central controller, respectively. If [E03] occurs during an operation, the air conditioner stops.

[F29 error] / [12 error]

[F29 error] or [12 error] indicates detection of trouble which occurred on IC10 non-volatile memory (EEPROM) on the indoor unit P.C. board during operation of the air conditioner. Replace the service P.C. board.

* If EEPROM has not been inserted when the power was turned on or if EEPROM data never be read/written, the automatic address mode is repeated. In this time, the central controller displays [97 error].

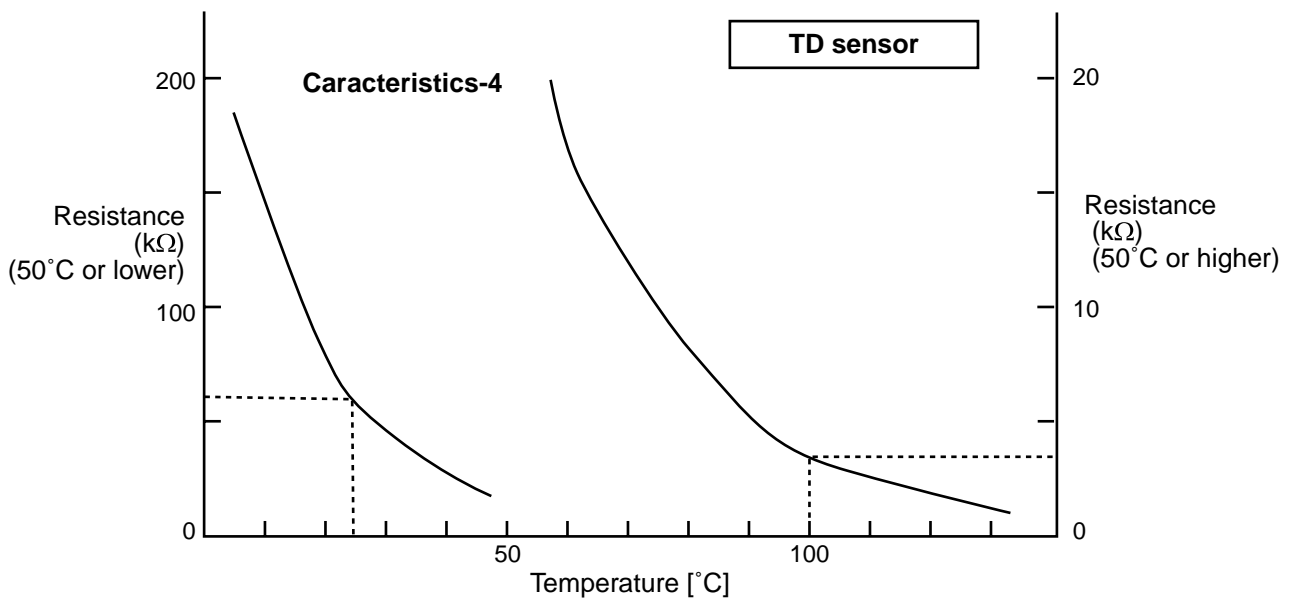
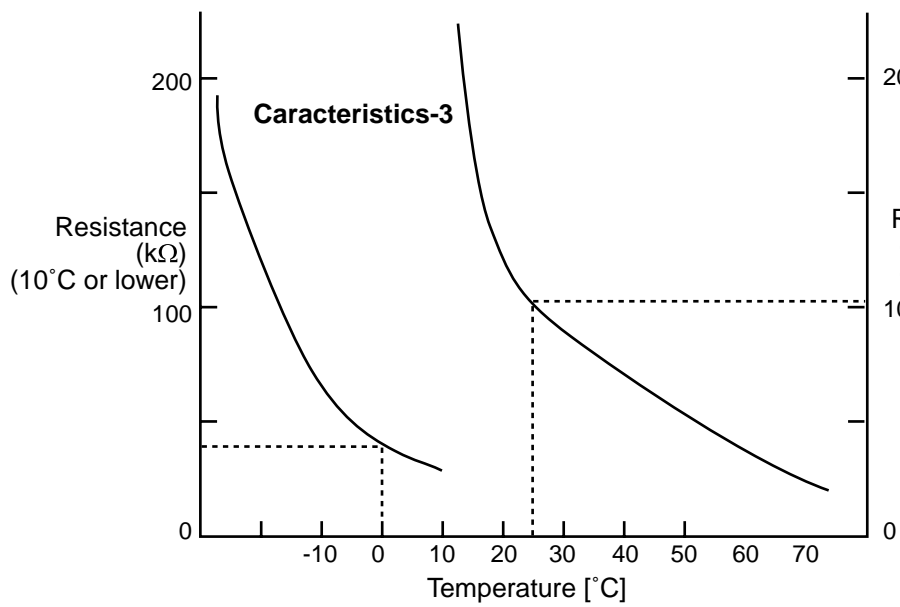
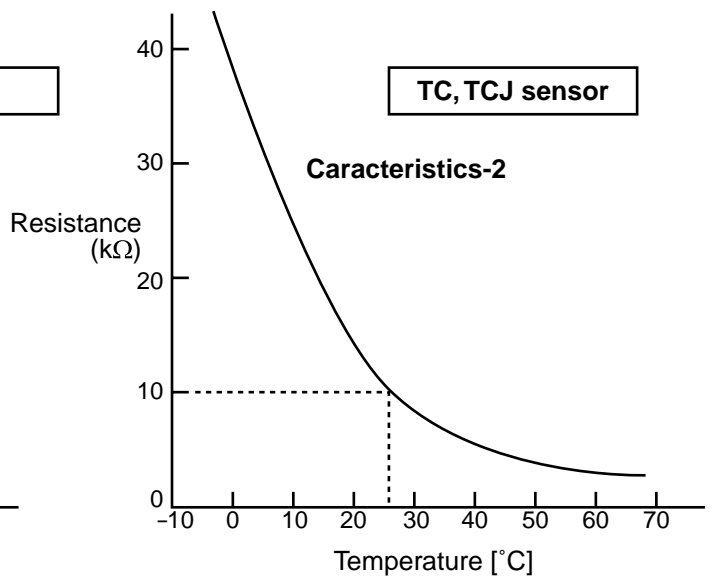
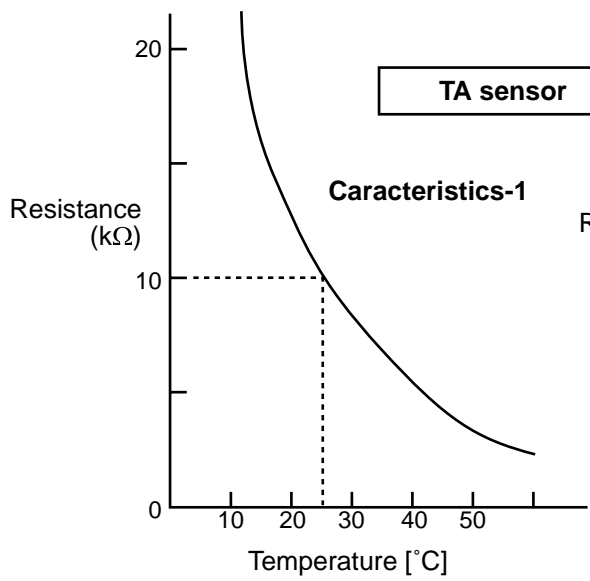


[P31 error] (Sub indoor unit)

When the master unit of a group operation has detected [E03], [L03], [L07], or [L08] error, the sub unit of the group operation detects [P31 error] and then it stops. There is no display of the check code or alarm history of the main remote controller.

(In this model, the mode enters in automatic address set mode when the master unit has detected [E03], [L03], [L07], or [L08] error.)

8-4-2. Relational Graph of Temperature Sensor Resistance Value and Temperature



9. REPLACEMENT OF SERVICE INDOOR P.C. BOARD

[Requirement when replacing the service indoor P.C. board assembly]

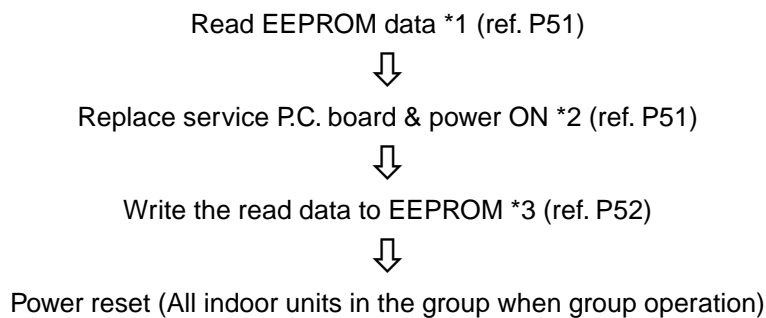
In the non-volatile memory (Hereinafter said EEPROM, IC10) installed on the indoor P.C. board before replacement, the type and capacity code exclusive to the corresponding model have been stored at shipment from the factory and the important setup data such as system/indoor/group address set in (AUTO/MANUAL) mode or setting of high ceiling selection have been stored at installation time. Replace the service indoor P.C. board assembly according to the following procedure.

After replacement, check the indoor unit address and also the cycle by a test run.

<REPLACEMENT PROCEDURE>

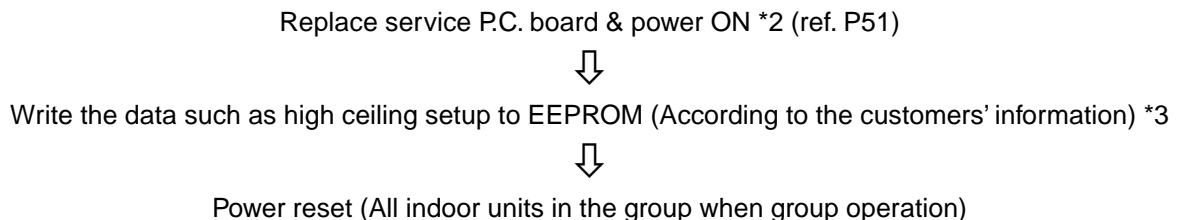
CASE 1

Before replacement, power of the indoor unit can be turned on and the setup data can be readout from the wired remote controller.



CASE 2

Before replacement the setup data can not be readout from the wired remote controller.



□1 Readout of the setup data from EEPROM

(Data in EEPROM contents, which have been changed at the local site, are read out together with data in EEPROM set at shipment from the factory.)

1. Push **SET**, **CL**, and **ON** buttons of the remote controller at the same time for 4 seconds or more. **1**
(Corresponded with No. in Remote controller)
When group operation, the master indoor unit address is displayed at the first time. In this time, the item code (DN) **10** is displayed. The fan of the selected indoor unit operates and the flap starts swinging if any.
2. Every pushing **UNIT** button, the indoor unit address in the group are displayed successively. **2** Specify the indoor unit No. to be replaced.
3. Using the set temperature **▲** / **▼** buttons, the item code (DN) can be moved up and down one by one. **3**
4. First change the item code (DN) from **10** to **01**. (Setting of filter sign lighting time) Make a note of the set data displayed in this time.
5. Next change the item code (DN) using the set temperature **▲** / **▼** buttons. Also make a note of the set data.
6. Repeat item 5. and make a note of the important set data as shown in the later table (Ex.).
• **01** to **9F** are provided in the item code (DN). On the way of operation, DN No. may come out.
7. After finishing making a note, push **ON** button to return the status to usual stop status. **6**
(Approx. 1 minute is required to start handling of the remote controller.)

Minimum requirements for item code

DN	Contents
10	Type
11	Indoor unit capacity
12	Line address
13	Indoor address
14	Group address

- (1) Type and capacity of the indoor unit is necessary to set the revolutions frequency of the fan.
- (2) If Line/Indoor/Group addresses differ from those before replacement, the mode enters in automatic address setup mode and a manual resetting may be required.

□2 Replacement of service P.C. board

1. Replace the P.C. board with a service P.C. board.
In this time, setting of jumper line (cut) or setting of (short-circuit) connecting connectors on the former P.C. board should be reflected on the service P.C. board.
2. According to the system configuration, turn on power of the indoor unit with any method in the following items.
 - a) In case of single (individual) operation
Turn on the power supply.
 - 1) Wait for completion of automatic address setup mode (Required time: Approx. 5 minutes) and then proceed to **□3**.
(Line address = 1, Indoor address = 1, Group address = 0 (Individual) are automatically set.)
 - 2) Push **SET**, **CL**, and **ON** buttons of the remote controller at the same time for 4 seconds or more (**1** operation), interrupt the automatic address setup mode, and then proceed to **□3**.
(Unit No. **ALL** is displayed.)
 - b) In case of group operation
Turn on power of the indoor unit of which P.C. board has been replaced with the service P.C. board with any method in the following items.
 - 1) Turn on power of the replaced indoor unit only.
(However, the remote controller is also connected. Otherwise **□3** operation cannot be performed.)
Same as 1) and 2) in item a).
 - 2) Turn on power of the multiple indoor units including replaced indoor unit.
 - Only 1 system for twin, triple, double twin
 - For all units in the group

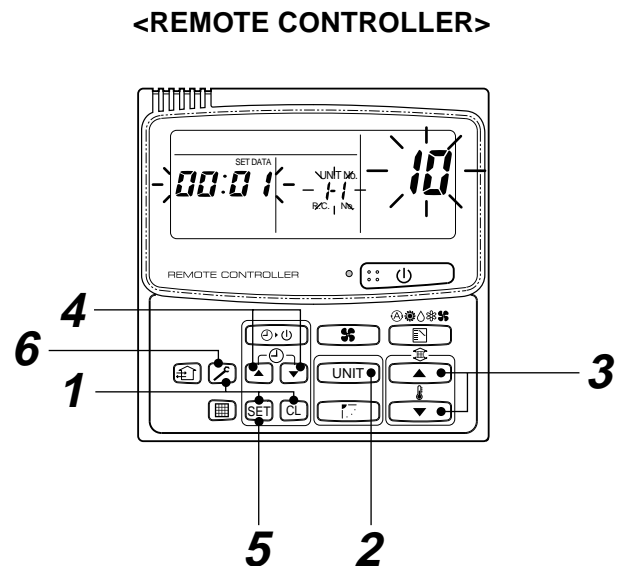
* The master unit of a group may change by setup of automatic address. The line address/indoor address of the replaced indoor unit are automatically set to the vacant addresses except addresses belonging to other indoor units which have not been replaced. It is recommended to make a note that the refrigerant line which includes the corresponding indoor unit and that the corresponding indoor unit is master or sub in the group control.

□3 Writing of the setup contents to EEPROM

(The contents of EEPROM installed on the service P.C. board have been set up at shipment from the factory.)

1. Push **SET**, **CL**, and **UNIT** buttons of the remote controller at the same time for 4 seconds or more. **1**
(Corresponded with No. in Remote controller)
In group operation control, the master indoor unit No. is displayed at the first time. (If the automatic address setup mode is interrupted in item 2. - a) - 2) in the previous page, the unit No. *ALL* is displayed.) In this time, the item code (DN) */0* is displayed. The fan of the selected indoor unit operates and the flap starts swinging if any.
2. Every pushing **UNIT** button, the indoor unit numbers in the group control are displayed successively. **2**
Specify the indoor unit No. of which P.C. board has been replaced with a service P.C. board.
(When the unit No. *ALL* is displayed, this operation cannot be performed.)
3. Using the set temperature **▲** / **▼** buttons, the item code (DN) can be moved up and down one by one. **3**
4. First set a type and capacity of the indoor unit.
(Setting the type and capacity writes the data at shipment from the factory in EEPROM.)
 - 1) Set the item code (DN) to */0*. (As it is)
 - 2) Using the timer time **▲** / **▼** buttons, set up a type. **4**
(For example, 4-way air discharge cassette type is 0001) Refer to the attached table.
 - 3) Push **SET** button. (OK when the display goes on.) **5**
 - 4) Using the set temperature **▲** / **▼** buttons, set *//* to the item code (DN).
 - 5) Using the timer time **▲** / **▼** buttons, set the capacity.
(For example, 0012 for class 80) Refer to the attached table.
 - 6) Push **SET** button. (OK when the display goes on.)
 - 7) Push **UNIT** button to return the status to usual stop status. **6**
(Approx. 1 minute is required to start handling of the remote controller.)
5. Next write the contents which have been set up at the local site such as the address setup in EEPROM.
Repeat the above procedure 1. and 2.
6. Using the set temperature **▲** / **▼** buttons, set *0/* to the item code (DN).
(Setup of lighting time of filter sign)
7. The contents of the displayed setup data in this time should be agreed with the contents in the previous memorandum in □1.
 - 1) If data disagree, change the displayed setup data to that in the previous memorandum by the timer time **▲** / **▼** buttons, and then push **SET** button. (OK when the display goes on.)
 - 2) There is nothing to do when data agrees.
8. Using the set temperature **▲** / **▼** buttons, change the item code (DN).
As same as the above, check the contents of the setup data and then change them to data contents in the previous memorandum.
9. Then repeat the procedure 7. and 8.
10. After completion of setup, push **UNIT** button to return the status to the usual stop status. **6**
(Approx. 1 minute is required to start handling of the remote controller.)

* *0/* to *9F* are provided in the item code (DN).
On the way of operation, DN No. may come out.
When data has been changed by mistake and **SET** button has been pushed, the data can be returned to the data before change by pushing **CL** button if the item code (DN) was not yet changed.



Memorandum for setup contents (Item code table (Example))

DN	Item	Memo	At shipment
01	Filter sign lighting time		According to type
02	Dirty state of filter		0000: Standard
03	Central control address		0099: Unfixed
06	Heating suction temp shift		0002: +2°C (Floor type: 0)
0F	Cooling only		0000: Shared for cooling/heating
10	Type		According to model type
11	Indoor unit capacity		According to capacity type
12	Line address		0099: Unfixed
13	Indoor unit address		0099: Unfixed
14	Group address		0099: Unfixed
19	Flap type (Adjustment of air direction)		According to type
1E	Temp difference of automatic cooling/ heating selecting control points		0003: 3 deg (Ts ± 1.5)
28	Automatic restart of power failure		0000: None
2A	Option		0002:
2b	Thermo output selection		0000: Thermo ON
2E	Option		0000:
32	Sensor selection		0000: Body sensor
5d	High ceiling selection		0000: Standard
60	Timer set (Wired remote controller)		0000: Available
8b	Correction of high heat feeling		0000: None

Type

Item code [10]

Setup data	Type	Abbreviated name
0007	Under ceiling	RAV-SM561/801/1101/1401CT-E

* Initial setup value of EEPROM installed on the service P.C. board

Indoor unit capacity

Item code [11]

Setup data	RAV-SM561CT-E RAV-SM801CT-E
0000*	Invalid
0009	560
0012	800

Setup data	RAV-SM1101CT-E RAV-SM1401CT-E
0000*	Invalid
0015	1100
0017	1400



* Initial setup value of EEPROM installed on the service P.C. board


10. SETUP AT LOCAL SITE AND OTHERS

10-1. Indoor Unit

10-1-1. Test Run Setup on Remote Controller











<Wired remote controller>

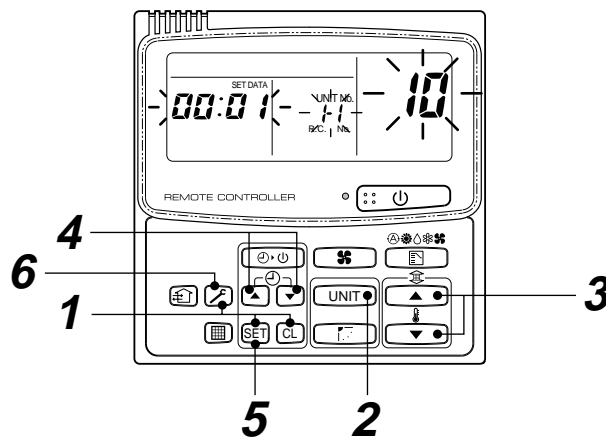
1. When pushing  button on the remote controller for 4 seconds or more, "TEST" is displayed on LC display. Then push  button.
 - "TEST" is displayed on LC display during operation of Test Run.
 - During Test Run, temperature cannot be adjusted but air volume can be selected.
 - In heating and cooling operation, a command to fix the Test Run frequency is output.
 - Detection of error is performed as usual. However, do not use this function except case of Test Run because it applies load on the unit.
2. Use either heating or cooling operation mode for [TEST].

NOTE : The outdoor unit does not operate after power has been turned on or for approx. 3 minutes after operation has stopped.
3. After a Test Run has finished, push  button again and check that [TEST] on LC display has gone off. (To prevent a continuous test run operation, 60-minutes timer release function is provided to this remote controller.)

10-1-2. Setup to Select Function

<Procedure> Use this function while the indoor unit stops.

- 1** Push , , and  buttons concurrently for 4 seconds or more.
The unit No. displayed at the first time indicates the indoor unit address of the master unit in the group control. In this time, fan and flap of the selected indoor unit operate.
- 2** Every pushing  button, the indoor unit numbers in the group control are displayed successively. In this time, fan and flap of the selected indoor unit only operate.
- 3** Using the set temperature  /  buttons, set the item code (DN).
- 4** Using the timer time  /  buttons, select the setup data.
- 5** Push  button. (OK if display goes on.)
 - To change the selected indoor unit, proceed to **2**.
 - To change the item to be set, proceed to **3**.
- 6** Pushing  button returns the status to usual stop status.



<Operation procedure>

1 → 2 → 3 → 4 → 5 → 6 END

Item No. (DN) table (Selection of function)

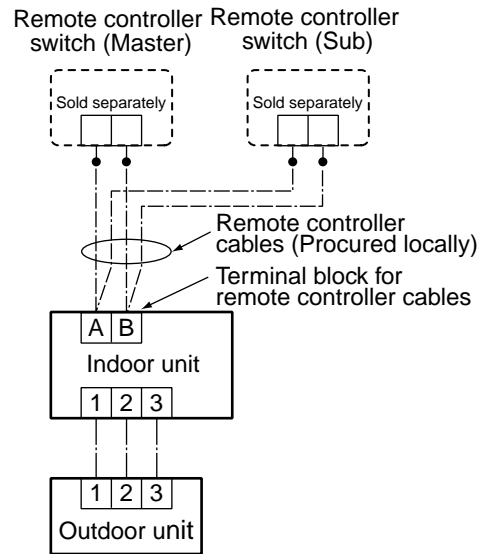
DN	Item	Description	At shipment
01	Filter sign lighting time	0000 : None 0002 : 2500H 0004 : 10000H 0001 : 150H 0003 : 5000H 0005 : Clogged sensor used	According to type
02	Dirty state of filter	0000 : Standard 0001 : High degree of dirt (Half of standard time)	0000 : Standard
03	Central control address	0001 : No.1 unit to 0064 : No.64 unit 0099 : Unfixed	0099 : Unfixed
06	Heating suction temp shift	0000 : No shift to 0001 : +1°C 0002 : +2°C to 0010 : -10°C (Up to recommendation + 6)	0002 : +2°C (Floor type 0000: 0°C)
0F	Cooling only	0000 : Heat pump to 0001 : Cooling only (No display of [AUTO] [HEAT])	0000 : Shared for cooling/ heating
10	Type	0000 : (Air discharge cassette 1) to 0001 : (Air discharge cassette 4) to 0037	According to model type
11	Indoor unit capacity	0000 : Unfixed to 0001 to 0034	According to capacity type
12	Line address	0001 : No.1 unit to 0030 : No.30 unit	0099 : Unfixed
13	Indoor unit address	0001 : No.1 unit to 0064 : No.64 unit	0099 : Unfixed
14	Group address	0000 : Individual to 0001 : Master of group 0002 : Sub of group	0099 : Unfixed
19	Flap type (Adjustment of air direction)	0000 : No flap to 0001 : Swing only 0004 : 4-way	According to type
1E	Temp difference of automatic cooling/heating mode selection COOL → HEAT, HEAT →COOL	0000 : 0 deg to 0010 : 10 deg (For setup temperature, reversal of COOL/HEAT by ± (Data value)/2)	0003 : 3 deg (Ts±1.5)
28	Automatic restart of power failure	0000 : None to 0001 : Restart	0000 : None
2A	Option		0002 : Default
2b	Thermo output selection (T10 ③)	0000 : Indoor thermo ON to 0001 : Output of outdoor comp-ON receiving	0000: Thermo. ON
2E	Option		0000 : Default
30	Option		0000 : Default
31	Option		0000 : Default
32	Sensor selection	0000 : Body TA sensor to 0001 : Remote controller sensor	0000 : Body sensor
40	Option		0003 : Default
5d	High ceiling selection (Air volume selection)	0000 : Standard filter 0001 : Oil guard, Super-long life, Optical regenerative deodorization 0003 : High performance (65%), High performance (90%), High antibacterial performance (65%)	0000 : Standard
60	Timer set (Wired remote controller)	0000 : Available (Operable) to 0001 : Unavailable (Operation prohibited)	0000 : Available
8b	Correction of high heat feeling	0000 : None to 0001 : Correction	0000 : None

10-1-3. Cabling and Setting of Remote Controller Control

2-remote controller control (Controlled by two remote controllers)

One or multiple indoor units are controlled by two remote controllers.
(Max. 2 remote controllers are connectable.)

- 1 indoor unit is controlled by 2 remote controllers



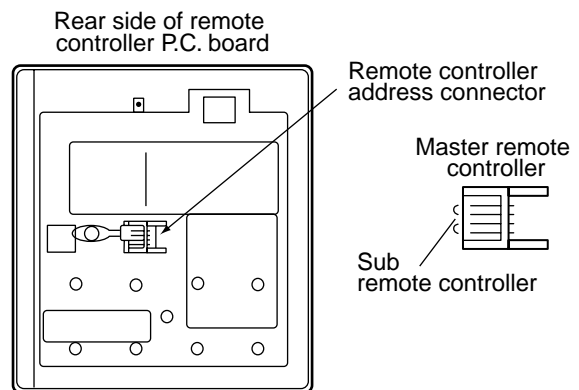
(Setup method)

One or multiple indoor units are controlled by two remote controllers.
(Max. 2 remote controllers are connectable.)

<Wired remote controller>

How to set wired remote controller to sub remote controller

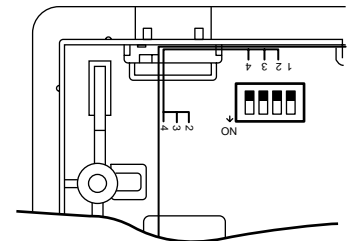
Insert the remote controller address connector provided on the rear side of the remote controller switch P.C. board into Sub in exchange for Master.



<Wireless remote controller>

How to set wireless remote controller to sub remote controller

Change OFF of Bit [3: Remote controller Sub/Master] of switch S003 to ON.



[Operation]

1. The operation contents can be changed by Last-push-priority.
2. Use a timer on either Master remote controller or Sub remote controller.

10-1-4. Monitor Function of Remote Controller Switch

■ Call of sensor temperature display

<Contents>

Each sensor temperature of the remote controller, indoor unit, and outdoor unit can become known by calling the service monitor mode from the remote controller.

<Procedure>

- 1 Push **[ON]** + **[OFF]** buttons simultaneously for 4 seconds or more to call the service monitor mode.

The service monitor goes on, the master indoor unit No. is displayed, and then temperature of the item code **00** is displayed.

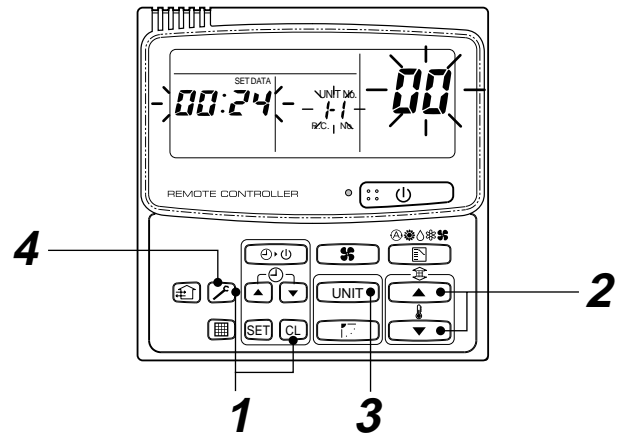
- 2 Push the temperature setup **[▲]** / **[▼]** buttons to select the sensor No. (Item code) of the sensor to be monitored.

The sensor numbers are described below:

	Item code	Data name		Item code	Data name
Indoor unit data	00	Room temp (under control) *1	Outdoor unit data	60	Heat exchanger temp TE
	01	Room temp (remote controller)		61	Outside temp TO
	02	Indoor suction temp		62	Discharge temp TD
	03	Indoor coil temp (TCJ)		63	Suction temp TS
	04	Indoor coil temp (TC)		64	—
			65	Heat sink temp THS	

*1 Only master unit in group control

- 3 The temperature of indoor units and outdoor unit in a group control can be monitored by pushing **[UNIT]** button to select the indoor unit to be monitored.
- 4 Pushing **[ON]** button returns the display to usual display.



<Operation procedure>

1 → 2 → 3 → 4

Returned to usual display

■ Calling of error history

<Contents>

The error contents in the past can be called.

<Procedure>

- 1 Push + buttons simultaneously for 4 seconds or more to call the service check mode.

Service Check goes on, the **item code 01** is displayed, and then the content of the latest alarm is displayed. The number and error contents of the indoor unit in which an error occurred are displayed.

- 2 In order to monitor another error history, push the set temperature / buttons to change the error history No. (Item code).

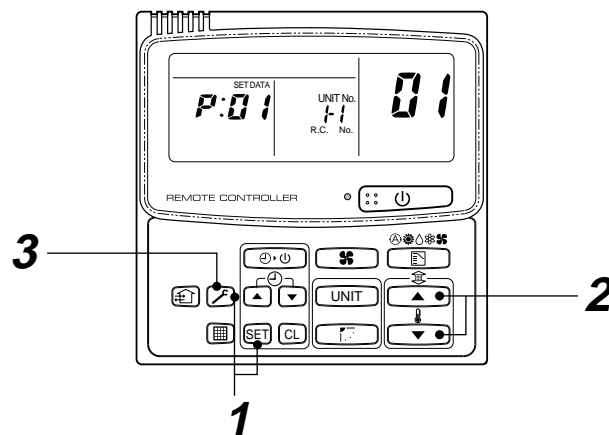
Item code 01 (Latest) → Item code 04 (Old)

NOTE : Four error histories are stored in memory.

- 3 Pushing button returns the display to usual display.

<Requirement>

Do not push button, otherwise all the error histories of the indoor unit are deleted.



<Operation procedure>

1 → 2 → 3

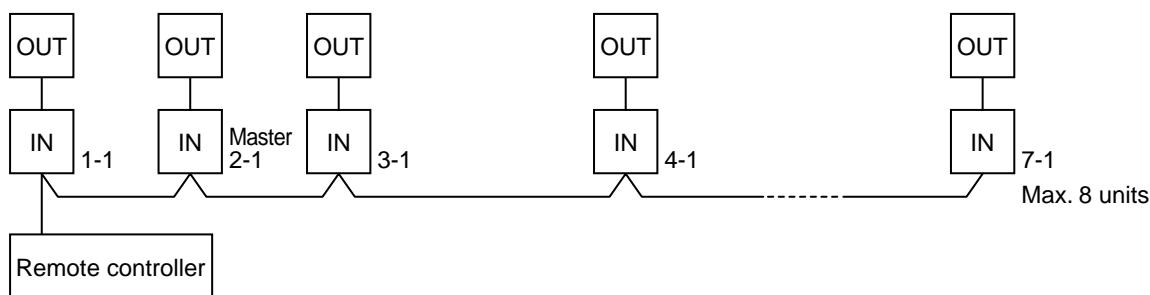
Returned to usual display

(Group control operation)

In a group control, operation of maximum 8 indoor units can be controlled by a remote controller.

The indoor unit connected with outdoor unit (Individual/Master of twin) controls room temperature according to setting on the remote controller.

<System example>



- (1) Display range on remote controller

The setup range (Operation mode/Air volume select/Setup temp) of the indoor unit which was set to the master unit is reflected on the remote controller.

- (2) Address setup

Turn on power of the indoor unit to be controlled in a group within 3 minutes after setting of automatic address.

If power of the indoor unit is not turned on within 3 minutes (completion of automatic address setting), the system is rebooted and the automatic address setting will be judged again.

- 1) Connect 3 In/Out cables surely.
- 2) Check line address/indoor address/group address of the unit one by one.
- 3) The unit No. (line/indoor gout address) which have been set once keep the present status as a rule if the unit No. is not duplicated with one of another unit.

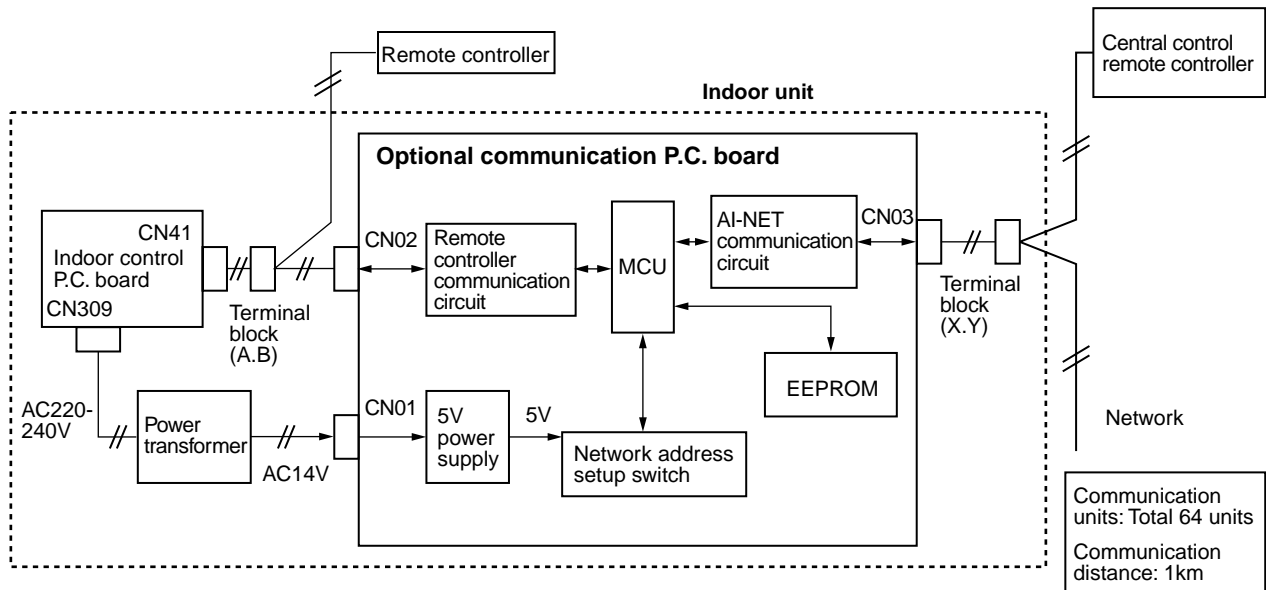
10-2. Network Adapter

Model name: TCB-PCNT20E

10-2-1. Function

A network adapter is an optional P.C. board to connect the indoor unit to AI net (Central control remote controller).

10-2-2. Microcomputer Block Diagram



10-2-3. Network Address Setup Switch (SW01)

No.	Item	Setup contents
1	Central control address	1 2 3 4 5 6
2		x x x x x x : No.1 unit x : Switch OFF
3		○ x x x x x : No.2 unit ○ : Switch OFF
4		:
5		○○○○○ x : No.63 unit
6		○○○○○○ : No.64 unit
7	Setup availability from remote controller	Switch OFF : Setup available from remote controller
8		Switch ON : Setup unavailable from remote controller

10-2-4. LED Display Specification

LED No.	Function	Go on	Go off
D01 (Red)	Communication status: Remote controller	During communication	No communication (including communication error)
D02 (Red)	Communication status: Center	During communication	No communication (including communication error)
D03 (Red)	Operation status of air conditioner	Running	Stop
D04 (Red)	Air conditioner error	Error	Normal

* For positions of LED, refer to P.C. board external view.

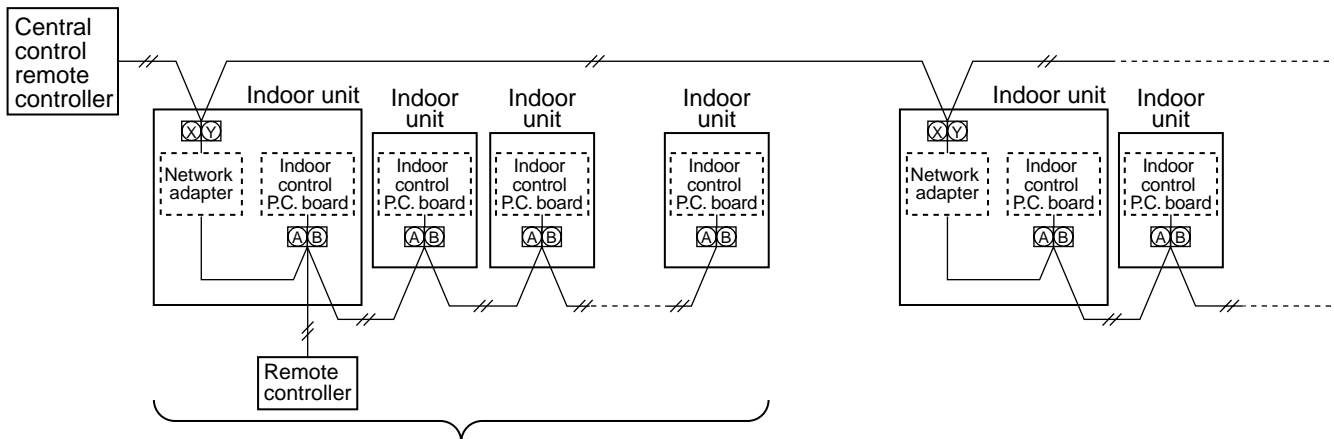
10-2-5. Communication Cable Specifications

No.	Communication circuit	Communication cable specifications	
1	Remote controller communication side	Cable	Neutral 2-cable type
		Cable type	CVV (JIS C3401) Controlling vinyl insulation vinyl seal cable VCTF (JIS C3306) Vinyl cab tire round type cord VCT (JIS C3401) 600V vinyl cab tire cable VVR (JIS C3401) Vinyl insulation seal cable round type MVVS Cable with net shielding for instrumentation CPEVS Shielded polyethylene insulation vinyl seal cable
		Cable dia.	0.5 to 2.0 mm ²
		Cable length	Total cable length Max. 500m (Up to 400m when there is wireless remote controller in group)
2	AI NET side	Cable	Neutral 2-cable type
		Cable type	MVVS Cable with net shielding for instrumentation
		Cable dia.	1.25 mm ² ≤ 500 m, 2.0 mm ² ≤ 1 km
		Cable length	Total cable length : Up to 500m when using 1.25mm ² cable, Up to 1000m when using 2.0mm ² cable

10-2-6. Cable Connection

<Network cable connection>

- Install a network adapter per 1 group of the group control (including single unit control). Also install a network adapter to one of the indoor units in the group control.



Connectable indoor units per group: Up to 8 units
(1-remote controller system*)

* In case of 2-remote controllers system,
the connectable indoor units are up to 7 units.

10-3. How to Set an Address Number

When connecting indoor units to the central control remote controller by using a network adapter, it is required to set up a network address No.

- The network address No. should be agreed with the line No. of the central control remote controller.
- When the unit was shipped from the factory, the network address has been set to 1.

The following two methods to set the network address are provided.

1. How to set from the remote controller at indoor unit side

* This method is effective only when ⑦ of set switch SW01 on the network adapter P.C. board is turned off.

<Procedure> Set the network address while the unit stops.

1 Push + buttons for 4 seconds or more.

In the group control, the unit No. *RLL* is displayed, and then all the indoor units in the group control are selected. In this time, fans of all the selected indoor units are turned on. (Fig. 1)

(Keep status of *RLL* display without pushing button.)

For the individual remote controller which is not included in a group control, the line address and the indoor unit address are displayed.

2 Specify the item code *03* using the temperature setup / buttons.

3 Using the timer time / buttons, select the setup data.

The setup data are shown in the right table (Table 1).

4 Push button. (OK if display goes on)

- To change the item to be set, return to **2**.

5 Push button.

The status returns to the usual stop status.

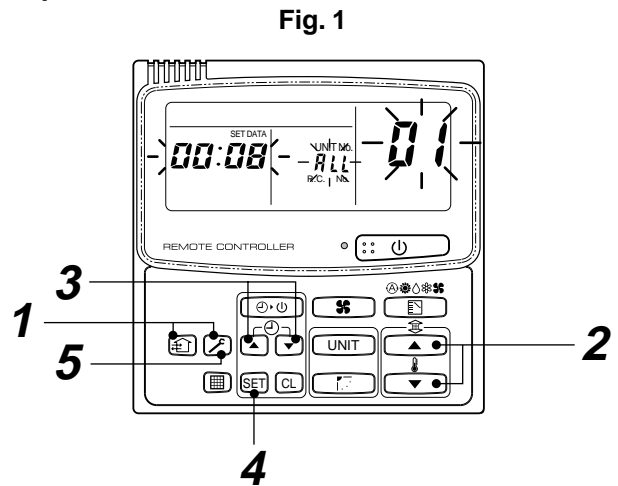


Table 1

Setup data	Network address No.
0001	1
0002	2
0003	3
⋮	⋮
0064	64
0099	Unset (Setup at shipment from factory)

2. How to set by the switch on the network adapter P.C. board

When the remote controller cannot be found or when you don't want to change setting of the network address No. from the remote controller, use the setup switch SW01 on the network adapter P.C. board (Network address No. setup switch) to set the address No.

<Procedure>

- (1) Turn off the power.
- (2) Turn ⑦ of the address No. setup switch SW01 to ON side. Accordingly the address No. set on the remote controller is invalidated. (See Fig. 2.)
- (3) Set the network address No. with combination of ON and OFF of ⑥ to ① of the address No. setup switch SW01. The relation between combination of ON/OFF and address No. is described in Table 2. The right figure (Fig. 3) shows an example of case that the address No. is set to 16.

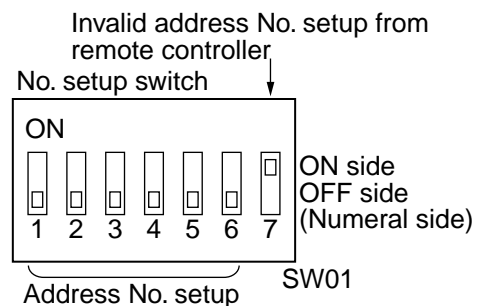


Fig. 2

Setup example of address No. 16

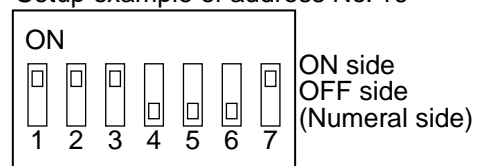


Fig. 3

When the network address No. has been changed, be sure to turn of power of the central control remote controller again or to reset the remote controller using the reset hole on the operation panel of the central control remote controller.

Table 2 Network address No. setup table (SW01)

○ : ON side
 x : OFF side

Address No.						
01	x	x	x	x	x	x
02	○	x	x	x	x	x
03	x	○	x	x	x	x
04	○	○	x	x	x	x
05	x	x	○	x	x	x
06	○	x	○	x	x	x
07	x	○	○	x	x	x
08	○	○	○	x	x	x
09	x	x	x	○	x	x
10	○	x	x	○	x	x
11	x	○	x	○	x	x
12	○	○	x	○	x	x
13	x	x	○	○	x	x
14	○	x	○	○	x	x
15	x	○	○	○	x	x
16	○	○	○	○	x	x
17	x	x	x	x	○	x
18	○	x	x	x	○	x
19	x	○	x	x	○	x
20	○	○	x	x	○	x
21	x	x	○	x	○	x
22	○	x	○	x	○	x
23	x	○	○	x	○	x
24	○	○	○	x	○	x
25	x	x	x	○	○	x
26	○	x	x	○	○	x
27	x	○	x	○	○	x
28	○	○	x	○	○	x
29	x	x	○	○	○	x
30	○	x	○	○	○	x
31	x	○	○	○	○	x
32	○	○	○	○	○	x

Address No.						
33	x	x	x	x	x	○
34	○	x	x	x	x	○
35	x	○	x	x	x	○
36	○	○	x	x	x	○
37	x	x	○	x	x	○
38	○	x	○	x	x	○
39	x	○	○	x	x	○
40	○	○	○	x	x	○
41	x	x	x	○	x	○
42	○	x	x	○	x	○
43	x	○	x	○	x	○
44	○	○	x	○	x	○
45	x	x	○	○	x	○
46	○	x	○	○	x	○
47	x	○	○	○	x	○
48	○	○	○	○	x	○
49	x	x	x	x	○	○
50	○	x	x	x	○	○
51	x	○	x	x	○	○
52	○	○	x	x	○	○
53	x	x	○	x	○	○
54	○	x	○	x	○	○
55	x	○	○	x	○	○
56	○	○	○	x	○	○
57	x	x	x	○	○	○
58	○	x	x	○	○	○
59	x	○	x	○	○	○
60	○	○	x	○	○	○
61	x	x	○	○	○	○
62	○	x	○	○	○	○
63	x	○	○	○	○	○
64	○	○	○	○	○	○

Requirement in Service

When using this product as service part to replace the network adapter P.C. board, be sure to match the setup of the setup switch SW01 (Network address No. setup switch) on the network adapter P.C. board with the P.C. board setup before replacement.

10-4. Display and Operation of Main Remote Controller and Central Control Remote Controller

- Turn on all the power supplies of the air conditioner, and then turn on power of the central control remote controller (Line 16 RBC-SXC1P, Line 64 TCB-SC641). If both power supplies are simultaneously turned on or if they are turned on reversely, the check code [97] may be temporarily displayed on the central remote controller. When settings of connecting cables and central control address are correct, the connected air conditioner is displayed on the central control remote controller.
- As shown in the following table, there is difference of LCD between main remote controller (RBC-AMT21) and the central control remote controller and also there are restriction and others of operation.

	Item	Contents		Cautions
		Main remote controller	Central control remote controller	
1	Air volume selection	[SPEED] [AUTO] [HH] [H] [L]	[VOL] [AUTO] [H] [M] [L]	Display of air speed selection differs.
		[SPEED] [HH]	[VOL] [FIX]	In duct type Air speed becomes [H] and [FIX].
2	Air speed selection in FAN mode	[SPEED] [HH] [H] [L]	[VOL] [AUTO] [H] [M] [L]	When handling main remote controller, [AUTO] is not displayed. If [AUTO] is selected at center side, [AUTO] is displayed on the main remote controller. In this time, the air speed becomes [HH].
3	Air speed selection in DRY mode	[SPEED] [AUTO] [HH] [H] [L]	[VOL] [AUTO]	On the central remote controller, only [AUTO] is displayed. The display on the main remote controller changes to [AUTO] by changing the setup temperature/louver, and the air speed is automatically selected.
4	Air direction adjustment	[SWING] and air direction adjustment	[LOUVER]	On the central remote controller, only [LOUVER] is displayed. It is displayed while flap is swinging, and the setup operation of [LOUVER] becomes selection of swing ON/OFF. To set up the air direction, use the main remote controller.
		(No display)	Manual operation for [LOUVER]	In a model type without air direction adjustment
5	Check button	Test run (4 seconds)	Check code display and check reset (3 seconds)	The function of long-pushing operation for the check button differs. If the check reset operation on the central remote controller is performed during operation of air conditioner, the operation stops once, and then the operation restarts. (Error of air conditioner is cleared.)
6	Check code	3-digits display (alphabet + 2-digits numeral)	2-digits display (alphabet or numeral)	Display of check code differs. Ex. : Float switch operation Main side: [P10] Center side: [0b]

- When using the remote controller together with the former one (RBC-AM1, AT1), the display on the main remote controller differs if [Last-push priority/Center/Operation Prohibited] is selected from the central control remote controller.

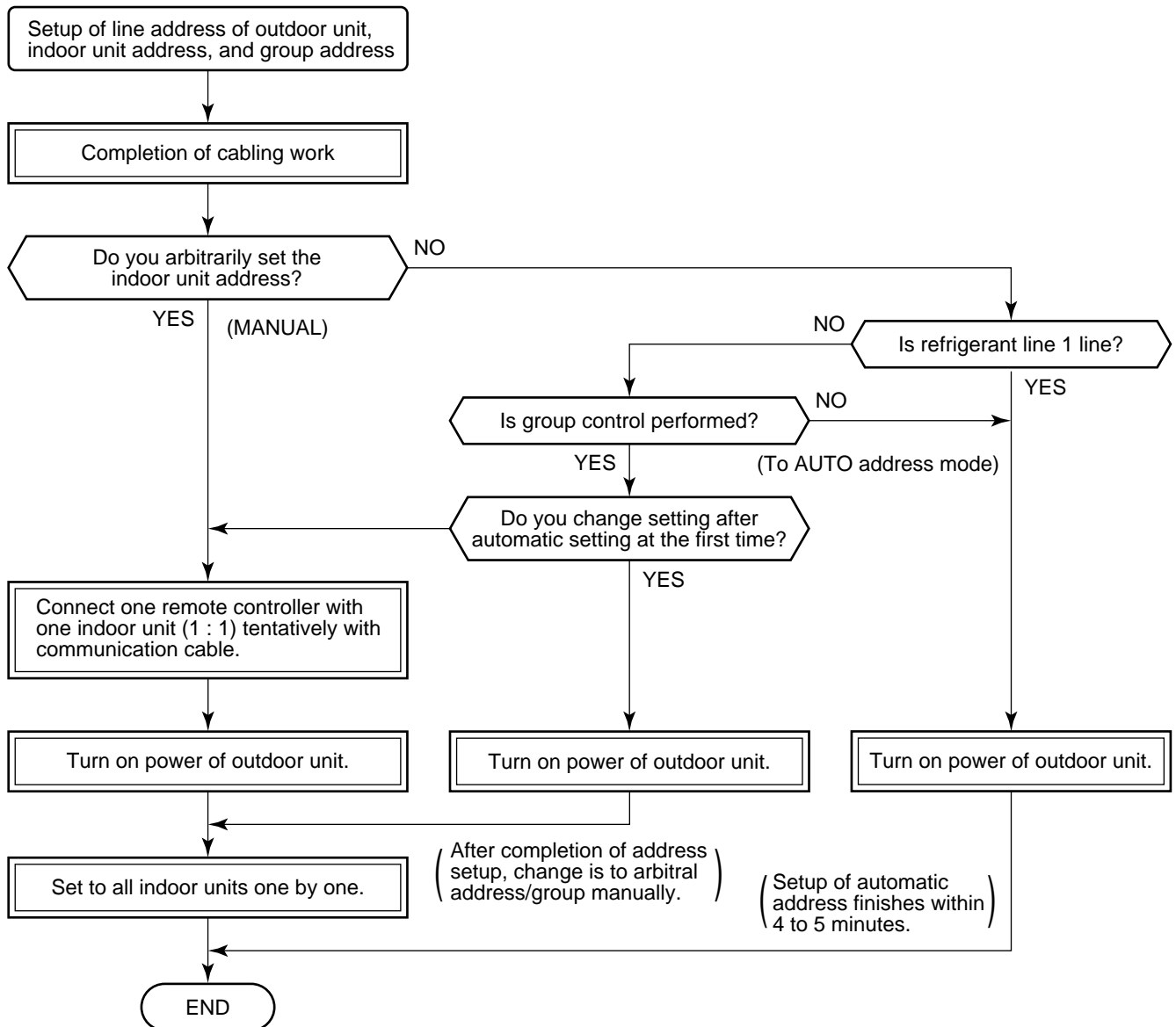
	Item	Contents		Remarks
		New remote controller (RBC-AMT21)	Former remote controller (RBC-AM1, AT1)	
1	Last-push priority	(No display)	(No display)	All the settings and ON/OFF operations are available.
2	Center	[CENTER] goes on	[CENTER] goes on	The setup contents on the central control remote controller are fixed, and only ON/OFF operation and timer setup operation are available on the main remote controller.
3	Operation prohibited		[CENTER] flashes	The setup contents on the central control remote controller are fixed, and the air conditioner stops. Operation from the main remote controller is unavailable.

11. ADDRESS SETUP

11-1. Address Setup

<Address setup procedure>

When an outdoor unit and an indoor unit are connected, or when an outdoor unit is connected to each indoor unit respectively in the group operation even if multiple refrigerant lines are provided, the automatic address setup completes with power-ON of the outdoor unit. The operation of the remote controller is not accepted while automatic address works. (Approx. 4 to 5 minutes)



- When the following addresses are not stored in the neutral memory (IC10) on the indoor P.C. board, a test run operation cannot be performed. (Unfixed data at shipment from factory)

	Item code	Data at shipment	Setup data range
Line address	12	0099	0001 (No. 1 unit) to 0030 (No. 30 unit)
Indoor unit address	13	0099	0001 (No. 1 unit) to 0030 (No. 30 unit) Max. value of indoor units in the identical refrigerant line (Double twin = 4)
Group address	14	0099	0000 : Individual (Indoor units which are not controlled in a group) 0001 : Master unit (1 indoor unit in group control) 0002 : Sub unit (Indoor units other than master unit in group control)

11-2. Address Setup & Group Control

<Terminology>

Indoor unit No. : $N - n =$ Outdoor unit line address N (Max. 30) - Indoor unit address n (Max. 64)

Group address : 0 = Individual (Not group control)

1 = Master unit in group control

2 = Sub unit in group control

Master unit (= 1) : The representative of multiple indoor units in group operation sends/receives signals to/from the remote controllers and sub indoor units. (* It has no relation with an indoor unit which communicates serially with the outdoor units.)

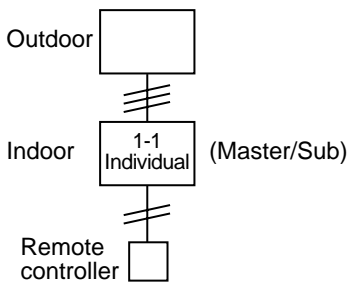
The operation mode and setup temperature range are displayed on the remote controller LCD. (Except sir direction adjustment of flap)

Sub unit (= 2) : Indoor units other than master unit in group operation

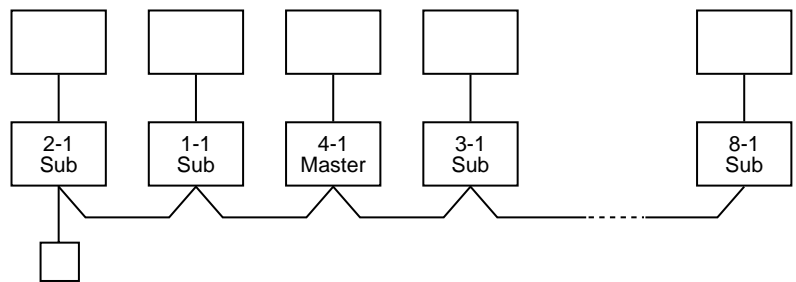
Basically, sub units do not send/receive signals to/from the remote controllers. (Except errors and response to demand of service data)

11-2-1. System configuration

1. Single



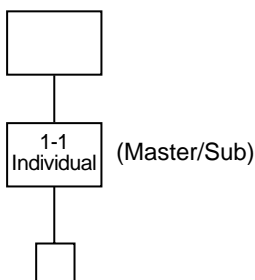
2. Single group operation



11-2-2. Automatic address example from unset address (No miscabling)

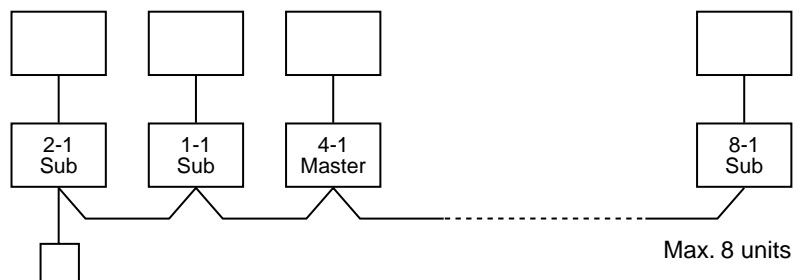
1. Standard (One outdoor unit)

1) Single



2) Gr operation

(Multiple outdoor units = Multiple indoor units only with serial communication)



Only turning on source power supply (Automatic completion)

11-3. Address Setup

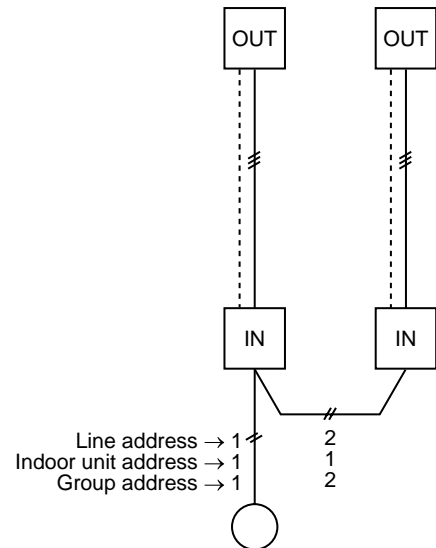
In case that addresses of the indoor units will be determined prior to piping work after cabling work
(Manual setting from remote controller)

<Address setup procedure>

- Set an indoor unit per a remote controller.
- Turn on power supply.

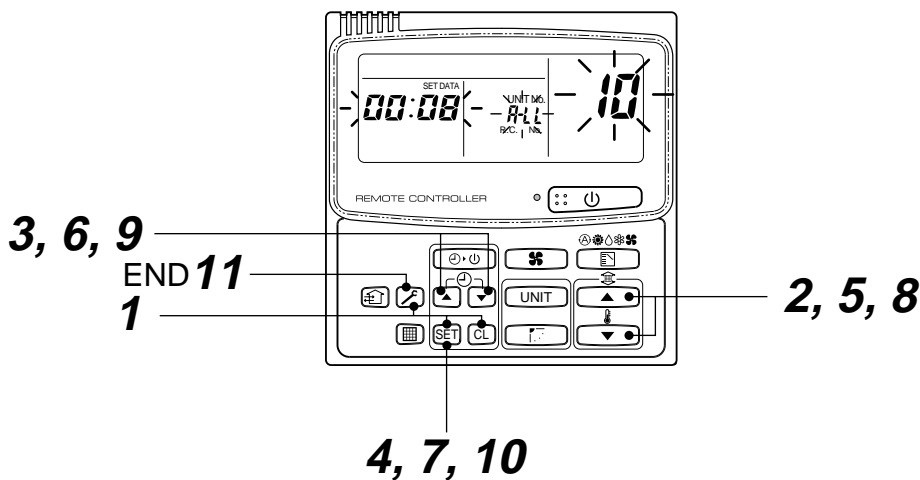
- 1** Push **SET** + **END** + **1** buttons simultaneously for 4 seconds or more.
- 2** (← Line address) Using the temperature setup **▲** / **▼** buttons, set **1** to the item code.
- 3** Using timer time **▲** / **▼** buttons, set the line address.
- 4** Push **SET** button. (OK when display goes on.)
- 5** (← Indoor unit address) Using the temperature setup **▲** / **▼** buttons, set **1** to the item code.
- 6** Using timer time **▲** / **▼** buttons, set **1** to the line address.
- 7** Push **SET** button. (OK when display goes on.)
- 8** (← Group address) Using the temperature setup **▲** / **▼** buttons, set **1** to the item code.
- 9** Using timer time **▲** / **▼** buttons, set **0000** to Individual, **0001** to Master unit, and **0002** to sub unit.
- 10** Push **SET** button. (OK when display goes on.)
- 11** Push **END** button.
Setup completes.
(The status returns to the usual stop status.)

(Example of 2-lines cabling)
(Real line: Cabling, Broken line: Refrigerant pipe)



For the above example, perform setting by connecting singly the wired remote controller without remote controller inter-unit cable.

Group address
Individual : 0000
Master unit : 0001
Sub unit : 0002 } In case of group control



<Operation procedure>



1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 → 9 → 10 → 11 END

■ Confirmation of indoor unit No. position

1. To know the indoor unit addresses though position of the indoor unit body is recognized

- In case of individual operation (Wired remote controller : indoor unit = 1 : 1)
(Follow to the procedure during operation)


<Procedure>

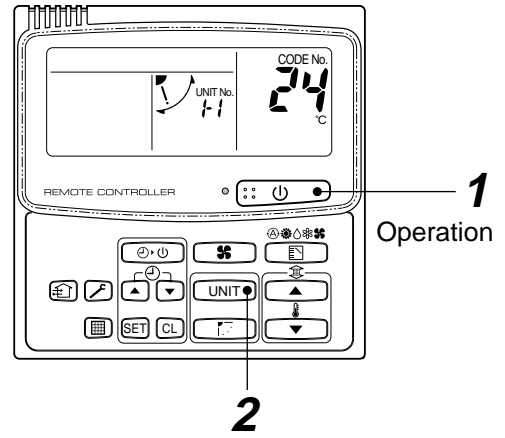
- 1 Push  button if the unit stops.
- 2 Push  button.

Unit No. /-/- is displayed on LCD.

(It disappears after several seconds.)

The displayed unit No. indicate line address and indoor unit address.

(When other indoor units are connected to the identical remote controller (Group control unit), other unit numbers are also displayed every pushing  button.



<Operation procedure>





1 → 2 END

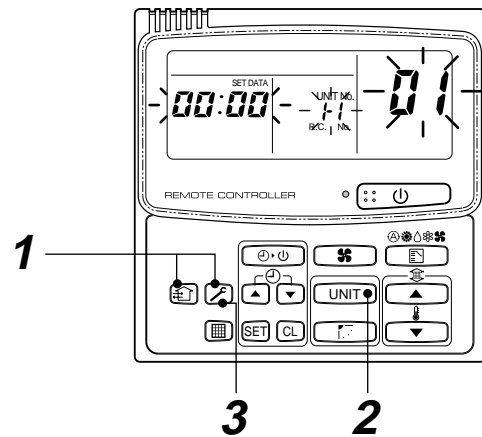
2. To know the position of indoor unit body by address

- To confirm the unit No. in the group control
(Follow to the procedure during operation) (in this procedure, the indoor units in group control stop.)

<Procedure>

The indoor unit numbers in the group control are successively displayed, and fan, flap, and drain pump of the corresponding indoor unit are turned on. (Follow to the procedure during operation)

- 1 Push  and  buttons simultaneously for 4 seconds or more.
 - Unit No. ALL is displayed.
 - Fans and flaps of all the indoor units in the group control operate.
- 2 Every pushing  button, the unit numbers in the group control are successively displayed.
 - The unit No. displayed at the first time indicates the master unit address.
 - Fan and flap of the selected indoor unit only operate.
- 3 Push  button to finish the procedure. All the indoor units in the group control stop.



<Operation procedure>

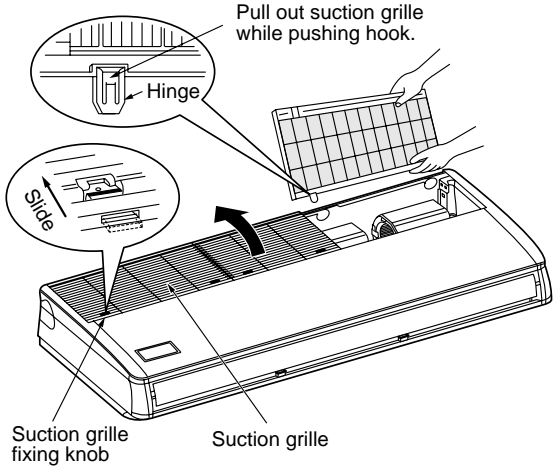
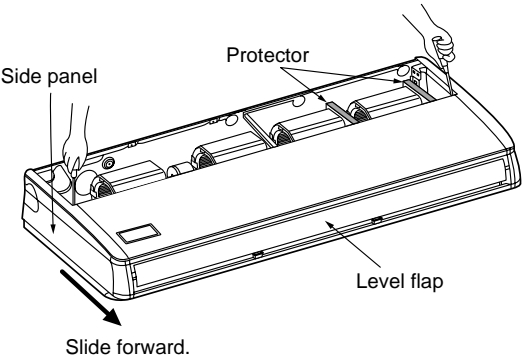
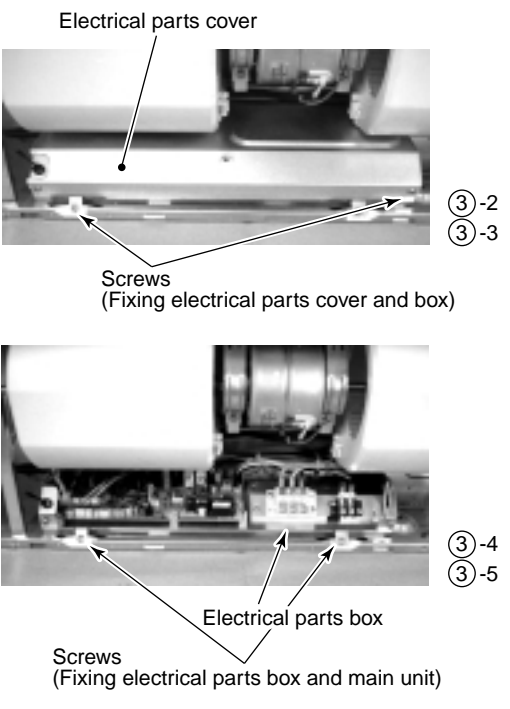
1 → 2 → 3 END

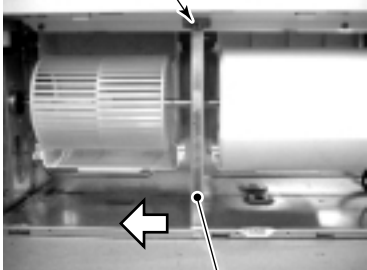
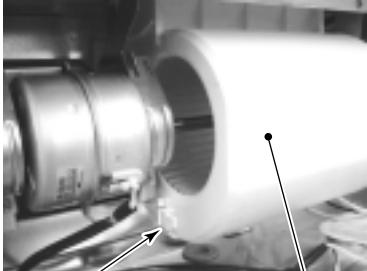
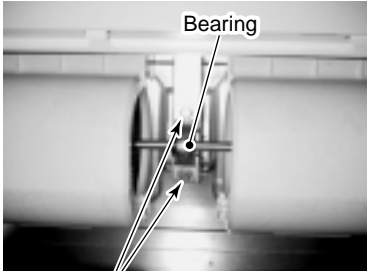
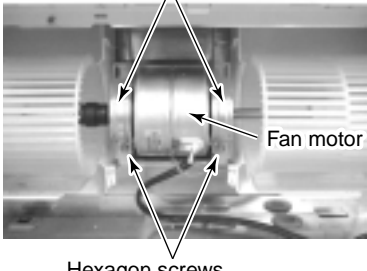
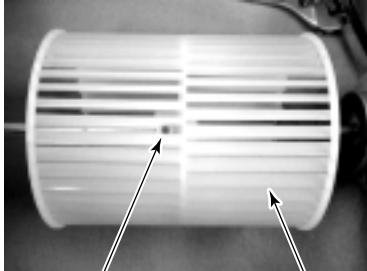
12. DETACHMENTS

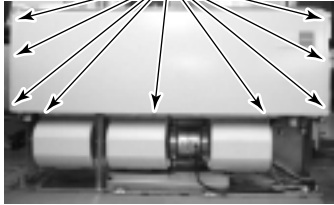
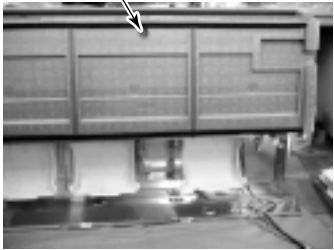
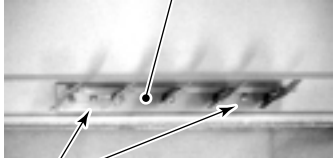
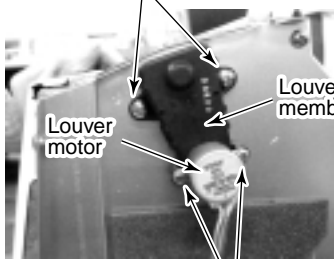
12-1. Replacement of Main Parts (Indoor Unit)

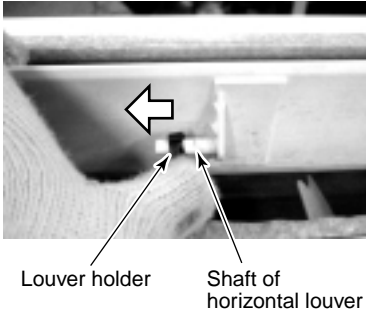
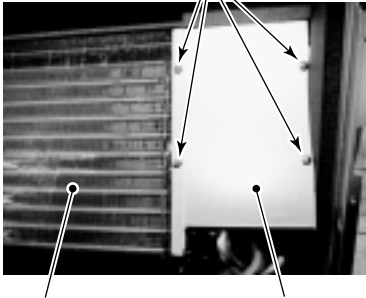
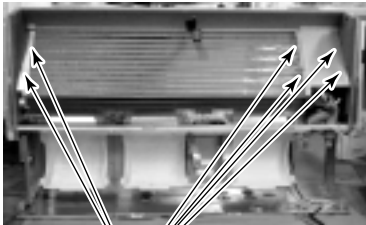
RAV-SM561CT-E / SM801CT-E / SM1101CT-E / SM1401CT-E

Be sure to turn off the power supply or circuit breaker before disassembling work

No.	Part name	Procedure	Remarks
①	Suction grille	<ol style="list-style-type: none"> 1. Slide the suction grille fixing knobs (2 positions) toward the arrow direction of left figure, and open the suction grille. 2. Under the condition of the suction grille opened, push the hook section of hinges (2 positions) at the rear side, and then pull out the suction grille. 	
②	Side panel	<ol style="list-style-type: none"> 1. Open the suction grille. 2. After removing the side panel screws (2 positions), slide the side panel forward and then remove it. 	
③	Electrical parts box	<ol style="list-style-type: none"> 1. Remove the suction grille. 2. Loosen the set screws (2 positions) of the electrical parts cover. 3. Remove the electrical parts cover. 4. Remove the set screws (2 positions) of the electrical parts box. 5. Remove the electrical parts box. <p>In this time, remove connectors of TA sensor, TC sensor and TCJ sensor if necessary.</p>	

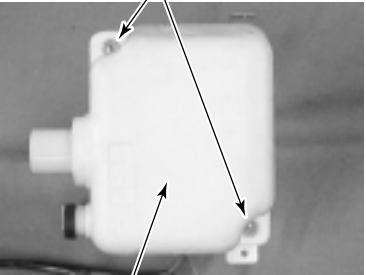
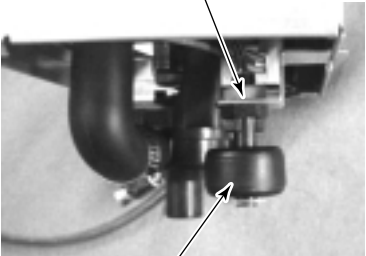
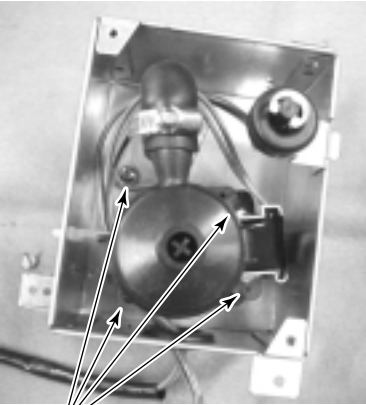
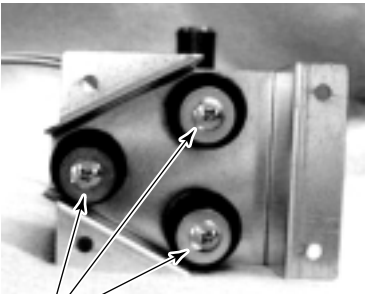
No.	Part name	Procedure	Remarks
④	Multi blade fan motor	<ol style="list-style-type: none"> 1. Remove the suction grille. 2. Remove the connector of the fan motor from P.C. board. 3. (SM801, SM1101, SM1401CTE only) Remove the set screw (1 position) to fixing and reinforcing bar. (Slide the reinforcing bar toward arrow side on the left figure.) 4. Push the fan cover fixing hooks (2 positions) forward fan cover side and remove the fan cover. 5. (SM1101, SM1401CTE only) Remove the hexagon head screws (2 positions) to fix bearing and the bearing. 6. Remove the hexagon head screw of fixing fan motor and fan motor holder then the assembly removed from the main unit. 7. Loosen the sets crew of the multi blade fan using hexagon wrench. 8. Pull the multi blade fan towered fan case side. Then fans come off. 	<p>Screws (Fixing reinforcing bar and main unit)</p>  <p>④-3</p> <p>Reinforcing bar</p>  <p>④-4</p> <p>Fan cover fixing hook Fan cover (Lower side)</p>  <p>④-5</p> <p>Bearing</p> <p>Hexagon head screws (Fixing bearing and main unit)</p>  <p>④-6</p> <p>Fan motor holder</p> <p>Fan motor</p> <p>Hexagon screws (Fixing fan motor and main unit)</p>  <p>④-7</p> <p>Set screw of multi blade fan Multi blade fan</p>

No.	Part name	Procedure	Remarks
⑤	Drain pan	<ol style="list-style-type: none"> 1. Take down the main unit and then treat the drain pan on the floor. 2. Remove the both side panels and suction grilles. 3. (SM801, SM1101, SM1401CT-E only) Remove the set screw (1 position) to fixing and reinforcing bar. (Slide the reinforcing bar toward arrow side on the right figure.) 4. Remove the set screws (9 positions) of fixing lower plate. 5. Remove the heat insulation on the drain pan. (SM561, SM801 : 1 position, SM1101, SM1401 : 2 positions) 6. Remove the set screws (SM561, SM801 : 1 position, SM1101, SM1401 : 2 positions) of fixing drain pan and main unit. 7. Remove the drain pan. Pull it lower side. 	<p>Screws (Fixing lower plate and main unit)</p>  <p>⑤-4</p> <p>Heat insulation The screw that fixed drain pan and main unit is under this insulation.</p>  <p>⑤-5 ⑤-6</p>
⑥	Vertical grille	<ol style="list-style-type: none"> 1. Remove the drain pan. 2. Remove the set screws (2 positions) of fixing vertical grille. 3. Remove the vertical grille. 	<p>Vertical grille</p>  <p>Screws (Fixing drain pan and vertical grille) ⑥-2</p>
⑦	Louver motor, Louver drive member	<ol style="list-style-type: none"> 1. Remove the side cover (right side only). 2. Remove the set screws (2 positions) and louver motor. 3. Remove the set screws (2 positions) and louver drive member. 	<p>Screws (Fixing louver drive member and main unit)</p>  <p>Louver motor</p> <p>Louver drive member</p> <p>⑦-3</p> <p>Screws (Fixing louver motor and louver drive member)</p>

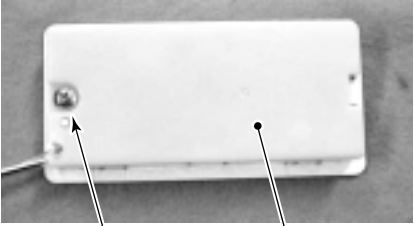

No.	Part name	Procedure	Remarks
⑧	Horizontal louver	<ol style="list-style-type: none"> 1. Push the louver holder toward arrow direction of right figure, and pull out the center shaft (SM561, SM801 : 1 position, SM1101, SM1401 : 2 positions) from louver holder. 2. Pull off the left and right chaft of horizontal louver. 	 <p data-bbox="1002 521 1353 568">Louver holder Shaft of horizontal louver</p> <p data-bbox="1369 465 1422 495">⑧-1</p>
⑨	TC, TCJ sensor	<ol style="list-style-type: none"> 1. Remove the drain pan. 2. Remove the set screws (4 positions) and heat exchanger support. 3. Pull out the sensor is inserted into pipe of the heat exchanger. 	 <p data-bbox="1050 674 1353 719">Screws (Fixing heat exchanger support)</p> <p data-bbox="938 1055 1406 1077">Heat exchanger Heat exchanger support</p> <p data-bbox="1369 999 1422 1028">⑨-3</p>
⑩	Heat exchanger	<ol style="list-style-type: none"> 1. Take down the main unit and then treat the heat exchanger on the floor. 2. Remove the drain pan. 3. Remove the set screws (6 positions) of fixing heat exchanger and main unit. 	 <p data-bbox="991 1442 1353 1487">Screws (Fixing heat exchanger and main unit)</p> <p data-bbox="1369 1379 1422 1408">⑩-3</p>

12-2. Replacement of Main Parts (Sold separately)

TCB-DP22CE (Drain up kit)

No.	Part name	Procedure	Remarks
①	Drain pan	<ol style="list-style-type: none"> 1. Remove the Drain up kit from the main unit. 2. Remove the set screws (2 positions) and drain pan. 	<p>Screws (Fixing drain pan and main unit)</p>  <p>Drain pan</p> <p>①-2</p>
②	Float switch	<ol style="list-style-type: none"> 1. Remove the drain pan. 2. Remove the plastics nut of fixing float switch. 3. Remove the float switch. 	<p>Plastics nut</p>  <p>Float switch</p> <p>②-2</p>
③	Drain pump	<ol style="list-style-type: none"> 1. Remove the drain pan. 2. Remove the set screws (4 positions) of fixing drain pump plate and main unit. 3. Remove the screws (3 positions) of fixing drain pump plate and drain pump. 	 <p>③-2</p> <p>Screws (Fixing drain pump and main unit)</p>  <p>③-3</p> <p>Screws (Fixing drain pump and drain plate)</p>

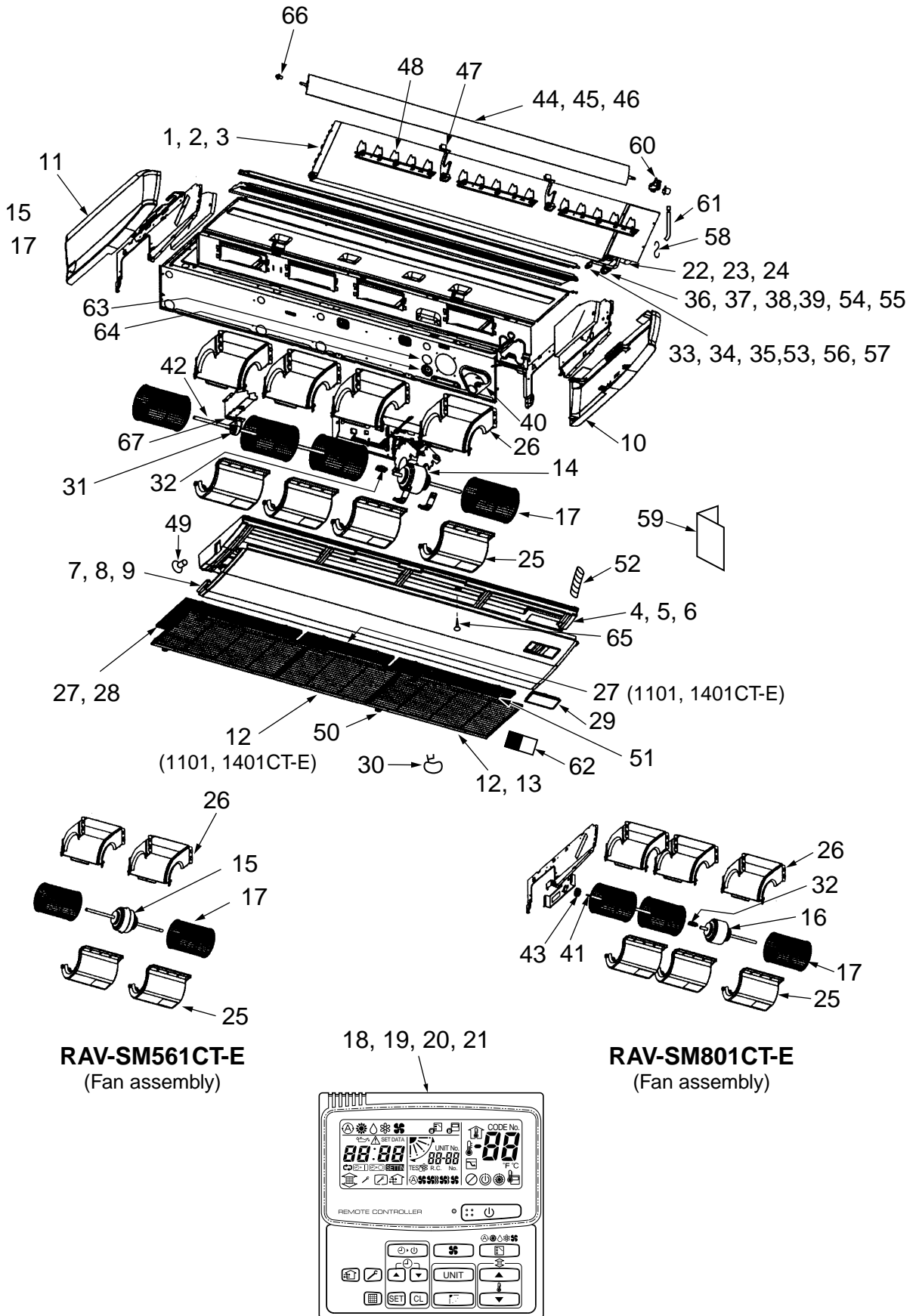
RBC-AX22CE (Wireless remote control kit)

No.	Part name	Procedure	Remarks
①	P.C. board	<ol style="list-style-type: none"> 1. Remove the signal receiving unit from main unit. 2. Remove the set screw (1 position) and P.C. board cover. 3. Remove the p.c. board. 	 <p style="text-align: center;"> Screw P.C. board cover </p> 

13. EXPLODED VIEWS AND PARTS LIST

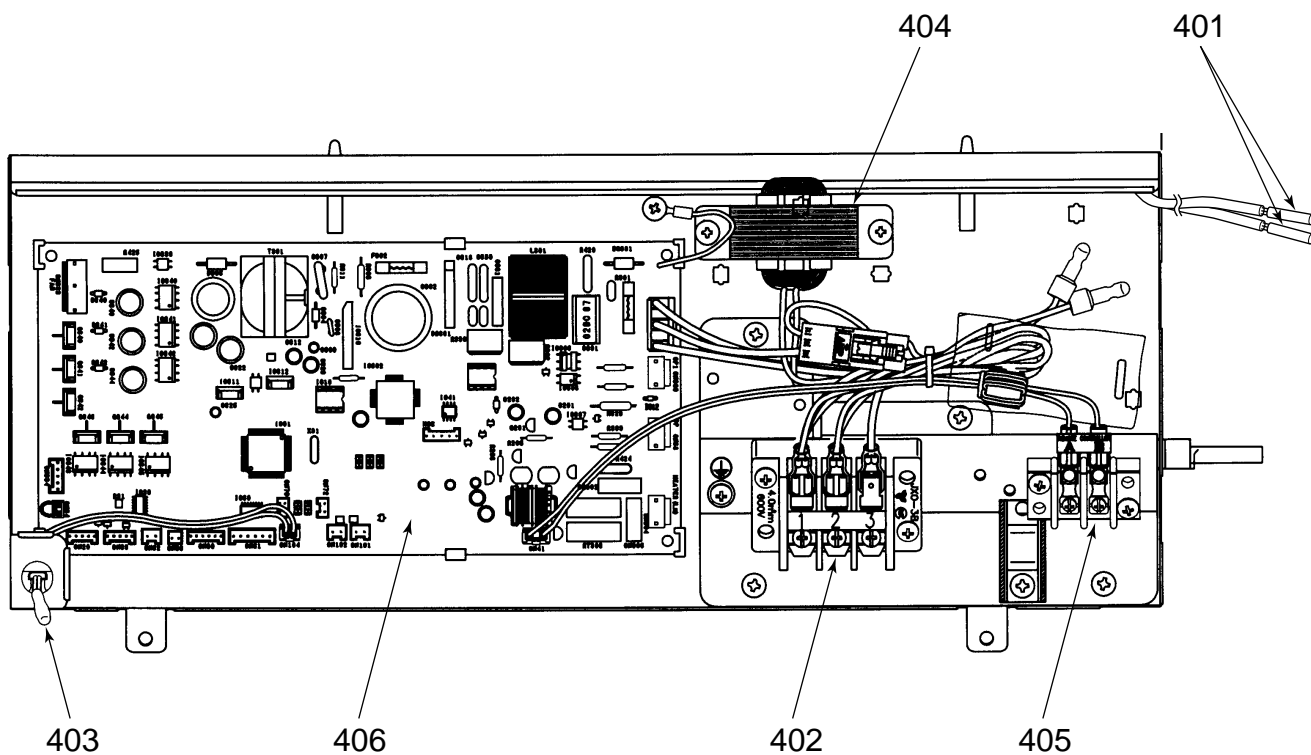
13-1. Under Ceiling Type (Indoor Unit)

RAV-SM561CT-E / SM801CT-E / SM1101CT-E / SM1401CT-E



Location No.	Part	Description
1	4314J198	Refrigeration cycle Ass'y (SM561CT)
2	4314J187	Refrigeration cycle Ass'y (SM801CT)
3	4314J188	Refrigeration cycle Ass'y (SM1101CT, SM1401CT)
4	43172173	Pan Drain Ass'y (SM561CT)
5	43172174	Pan Drain Ass'y (SM801CT)
6	43172175	Pan Drain Ass'y (SM1101CT, SM1401CT)
7	43191663	Panel, Under (SM561CT)
8	43191664	Panel, Under (SM801CT)
9	43191665	Panel, Under (SM1101CT, SM1401CT)
10	43102647	Cover Ass'y, Right Side
11	43102648	Cover Ass'y, Left Side
12	43109407	Grille, Inlet (SM561CT, SM1101CT, SM1401CT)
13	43109408	Grille, Inlet (SM801CT, SM1101CT, SM1401CT)
14	43121714	Motor, Fan, SWF-280-120-2, 120W (SM1101CT, SM1401CT)
15	43121715	Motor, Fan, SWF-280-60-1, 60W (SM561CT)
16	43121716	Motor, Fan, SWF-280-60-2, 60W (SM801CT)
17	43120222	Fan, Multi Blade
18	4316V194	Remote Controller, SX-A3JE
19	4316V195	Remote Controller, SX-A11JE
20	4316V196	Remote Controller, EX-W2JE
21	4316V197	Remote Controller, WH-H1JE
22	43147700	Distributor Ass'y (SM561CT)
23	43147701	Distributor Ass'y (SM801CT)
24	43147702	Distributor Ass'y (SM1101CT, SM1401CT)
25	43122084	Case, Fan, Lower
26	43122085	Case, Fan, Upper
27	43180314	Air Filter (SM561CT, SM1101CT, SM1401CT)
28	43180315	Air Filter (SM801CT, SM1101CT, SM1401CT)
29	43108014	Base, Receiver
30	43179130	Band, Hose
31	43125131	Bearing, Shaft (SM1101CT, SM1401CT)
32	43125155	Coupling (SM801CT, SM1101CT, SM1401CT)

Location No.	Part	Description
33	43047545	Nut, Flare, 1/4 IN (SM561CT)
34	43194026	Socket (SM801CT, SM1101CT, SM1401CT)
35	43194051	Socket (SM561CT)
36	43194081	Nut, Flare, 1/2 IN (SM561CT)
37	43194078	Nut, Flare, 5/8 IN (SM801CT, SM1101CT, SM1401CT)
38	43194080	Socket, 1/2 IN (SM561CT)
39	43194079	Socket, 5/8 IN (SM801CT, SM1101CT, SM1401CT)
40	43149326	Cover, Back Base
41	43125157	Shaft, SS400B-D2 12 (SM801CT)
42	43125158	Shaft, SS400B-12 DIA (SM1101CT, SM1401CT)
43	43125159	Bearing (SM801CT)
44	43109409	Grille Ass'y, Horizontal (SM561CT)
45	43109410	Grille Ass'y, Horizontal (SM801CT)
46	43109411	Grille Ass'y, Horizontal (SM1101CT, SM1401CT)
47	43107253	Support, Grille Horizontal
48	43122086	Grille Ass'y, Vertical
49	43179129	Cap Drain
50	43107254	Hinge, Grille Inlet
51	43107255	Hook, Grille Inlet
52	43170234	Hose, Drain
53	43047609	Bonnet (SM801CT, SM1101CT, SM1401CT)
54	43047303	Bonnet (SM561CT)
55	43194029	Bonnet (SM801CT, SM1101CT, SM1401CT)
56	43194055	Nut, Flare, 3/8 IN (SM801CT, SM1101CT, SM1401CT)
57	43049697	Bonnet (SM561CT)
58	43019904	Holder, Sensor
59	4318T491	Owner's Manual
60	43121719	Driver Ass'y, Horizontal L Louver
61	43160556	Lead, Louver Horizontal
62	43108016	Mark TOSHIBA
63	43162049	Bushing, 50DIA
64	43162050	Bushing, 56DIA
65	43197163	Screw, Fix Drain Pan
66	43107252	Shaft, Horizontal Louver
67	43139151	Spacer, Bearing (SM1101CT, SM1401CT)



Location No.	Part	Description
401	43050382	Sensor, TC (F6)
402	43060750	Terminal Block, 3P
403	43150297	Sensor, TA

Location No.	Part	Description
404	43158184	Reactor
405	43160445	Terminal Block, 2P
406	4316V230	P.C. Board Ass'y, MMC-1402

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