

FILE NO. A07-003 Revised:Mar., 2008

SERVICE MANUAL

AIR-CONDITIONER SPLIT TYPE

INDOOR UNIT

<DIGITAL INVERTER>
RAV-SM564UT-E
RAV-SM804UT-E
RAV-SM1104UT-E
RAV-SM1404UT-E

OUTDOOR UNIT <SUPER DIGITAL INVERTER>

RAV-SP404AT-E RAV-SP404ATZ-E RAV-SP404ATZG-E

RAV-SP1104AT-E RAV-SP1104ATZ-E RAV-SP1104ATZG-E

RAV-SM404SDT-E RAV-SM454SDT-E RAV-SM564SDT-E

RAV-SP454AT-E RAV-SP454ATZ-E RAV-SP454ATZG-E RAV-SP1404AT-E RAV-SP1404ATZ-E RAV-SP1404ATZG-E



PRINTED IN JAPAN, Mar., 2008 ToMo

Adoption of New Refrigerant

This Air Conditioner is a new type which adopts a new refrigerant HFC (R410A) instead of the conventional refrigerant R22 in order to prevent destruction of the ozone layer.

WARNING

Cleaning of the air filter and other parts of the air filter involves dangerous work in high places, so be sure to have a service person do it. Do not attempt it yourself.

The cleaning diagram for the air filter is there for the service person, and not for the customer.

CONTENTS

SAFETY CAUTION	4
1. SPECIFICATIONS	9
1-1. Indoor Unit	
1-2. Outdoor Unit	25
1-3. Operation Characteristic Curve	27
2. CONSTRUCTION VIEWS (EXTERNAL VIEWS)	29
2-1. Indoor Unit	29
2-2. Outdoor Unit	33
3. SYSTEMATIC REFRIGERATING CYCLE DIAGRAM	36
3-1. Indoor Unit	
3-2. Outdoor Unit	
4. FAN CHARACTERISTICS	39
4-1. Slim Duct (Filter Attached)	39
5. WIRING DIAGRAM	40
5-1. Indoor Unit	40
5-2. Outdoor Unit	42
6. SPECIFICATIONS OF ELECTRICAL PARTS	44
6-1. Indoor Unit	44
6-2. Outdoor Unit (Parts Ratings)	
6-3. Accessory Separate Sold Parts	

7.	REFRIGERANT R410A	46
	7-1. Safety During Installation/Servicing	46
	7-2. Refrigerant Piping Installation	46
	7-3. Tools	50
	7-4. Recharging of Refrigerant	50
	7-5. Brazing of Pipes	
	7-6. Instructions for Re-use Piping of R22 or R407C	53
8.	INDOOR CONTROL CIRCUIT	57
	8-1. Indoor Controller Block Diagram	57
	8-2. Control Specifications	60
	8-3. Optional Connector Specifications of Indoor P.C. Board	73
	8-4. Indoor Print Circuit Board	
9.	CIRCUIT CONFIGURATION AND CONTROL SPECIFICATIONS	75
	9-1. Outdoor Controls	
	9-2. Outline of Main Controls	
10	TROUBLESHOOTING	86
10.	10-1. Summary of Troubleshooting	
	10-2. Troubleshooting	
	10-2. Troubleshooting	00
11.	REPLACEMENT OF SERVICE P.C. BOARD	140
	11-1. Indoort Unit	140
	11-2. Outdoor Unit	145
12.	SETUP AT LOCAL SITE AND OTHERS	146
	12-1. Indoor Unit	146
	12-2. Setup at Local Site / Others	157
	12-3. How to Set up Central Control Address Number	
	12-4. Outdoor Unit	
13.	ADDRESS SETUP	172
	13-1. Address Setup	
	13-2. Address Setup & Group Control	
	13-3. Address Setup	
4 4	DETACHMENTS	170
14.	DETACHMENTS	
	14-1. Indoor Unit	
	14-2. Outdoor Unit	193
15.	EXPLODED VIEWS AND PARTS LIST	208
	15-1. Indoor Unit	208
	15-2. Outdoor Unit	216

SAFETY CAUTION

The important contents concerned to the safety are described on the product itself and on this Service Manual. Please read this Service Manual after understanding the described items thoroughly in the following contents (Indications/Illustrated marks), and keep them.

[Explanation of indications]

Indication	Explanation
Anger	Indicates contents assumed that an imminent danger causing a death or serious injury of the repair engineers and the third parties when an incorrect work has been executed.
WARNING Indicates possibilities assumed that a danger causing a death or serious in engineers, the third parties, and the users due to troubles of the product a an incorrect work has been executed.	
	Indicates contents assumed that an injury or property damage (*) may be caused on the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.

* Property damage : Enlarged damage concerned to property, furniture, and domestic animal/pet

[Explanation of illustrated marks]

Mark	Explanation
\bigcirc	Indicates prohibited items (Forbidden items to do) The sentences near an illustrated mark describe the concrete prohibited contents.
0	Indicates mandatory items (Compulsory items to do) The sentences near an illustrated mark describe the concrete mandatory contents.
\bigtriangleup	Indicates cautions (Including danger/warning) The sentences or illustration near or in an illustrated mark describe the concrete cautious contents.

[Confirmation of warning label on the main unit]

Confirm that labels are indicated on the specified positions (Refer to the Parts disassembly diagram (Outdoor unit).)

If removing the label during parts replace, stick it as the original.

	Turn "OFF" the breaker before removing the front panel and cabinet, otherwise an electric shock is caused by high voltage resulted in a death or injury.
	During operation, a high voltage with 400V or higher of circuit (*) at secondary circuit of the high-voltage transformer is applied.
Turn off breaker.	If touching a high voltage with the naked hands or body, an electric shock is caused even if using an electric insulator.
	* : For details, refer to the electric wiring diagram.
	When removing the front panel or cabinet, execute short-circuit and discharge between high- voltage capacitor terminals.
Execute discharge between terminals.	If discharge is not executed, an electric shock is caused by high voltage resulted in a death or injury. After turning off the breaker, high voltage also keeps to apply to the high-voltage capacitor.
Prohibition	Do not turn on the breaker under condition that the front panel and cabinet are removed. An electric shock is caused by high voltage resulted in a death or injury.

	MARNING
Check earth wires.	Before troubleshooting or repair work, check the earth wire is connected to the earth terminals of the main unit, otherwise an electric shock is caused when a leak occurs. If the earth wire is not correctly connected, contact an electric engineer for rework.
Prohibition of modification.	Do not modify the products. Do not also disassemble or modify the parts. It may cause a fire, electric shock or injury.
Use specified parts.	For spare parts, use those specified (*). If unspecified parts are used, a fire or electric shock may be caused. *: For details, refer to the parts list.
Do not bring a child close to the equipment.	Before troubleshooting or repair work, do not bring a third party (a child, etc.) except the repair engineers close to the equipment. It causes an injury with tools or disassembled parts. Please inform the users so that the third party (a child, etc.) does not approach the equipment.
Insulating measures	Connect the cut-off lead wires with crimp contact, etc, put the closed end side upward and then apply a water-cut method, otherwise a leak or production of fire is caused at the users' side.
No fire	 When repairing the refrigerating cycle, take the following measures. 1) Be attentive to fire around the cycle. When using a gas stove, etc, be sure to put out fire before work; otherwise the oil mixed with refrigerant gas may catch fire. 2) Do not use a welder in the closed room. When using it without ventilation, carbon monoxide poisoning may be caused. 3) Do not bring inflammables close to the refrigerant cycle, otherwise fire of the welder may catch the inflammables.
Refrigerant	 Check the used refrigerant name and use tools and materials of the parts which match with it. For the products which use R410A refrigerant, the refrigerant name is indicated at a position on the outdoor unit where is easy to see. To prevent miss-charging, the route of the service port is changed from one of the former R22. For an air conditioner which uses R410A, never use other refrigerant than R410A. For an air conditioner which uses R410A, never use other refrigerant than R410A. If different types of refrigerant are mixed, abnormal high pressure generates in the refrigerating cycle and an injury due to breakage may be caused. Do not charge refrigerant additionally. If charging refrigerant additionally when refrigerant gas leaks, the refrigerant composition in the refrigerating cycle changes resulted in change of air conditioner characteristics or refrigerant over the specified standard amount is charged and an abnormal high pressure is applied to the inside of the refrigerating cycle resulted in cause of breakage or injury. Therefore if the refrigerant gas leaks, recover the refrigerant in the air conditioner, execute vacuuming, and then newly recharge the specified amount of liquid refrigerant. If air or others is mixed with the refrigerant over the specified amount. When recharging the refrigerant in the refrigerant gas leaks. After installation work, check the refrigerant gas does not leak. If the refrigerant gas leaks in the room, poisonous gas generates when gas touches to fire such as fan heater, stove or cocking stove though the refrigerant gas itself is innocuous. Never recover the refrigerant into the outdoor unit. When the equipment is moved or repaired, be sure to recover the refrigerant with recovering device. The refrigerant cannot be recovered in the outdoor unit; otherwise a serious accident such as breakage or injury is caused.
Assembly/Cabling	After repair work, surely assemble the disassembled parts, and connect and lead the removed wires as before. Perform the work so that the cabinet or panel does not catch the inner wires. If incorrect assembly or incorrect wire connection was done, a disaster such as a leak or fire is caused at user's side.

Insulator check	After the work has finished, be sure to use an insulation tester set (500V Megger) to check the resistance is 2MW or more between the charge section and the non-charge metal section (Earth position). If the resistance value is low, a disaster such as a leak or electric shock is caused at user's side.
Ventilation	When the refrigerant gas leaks during work, execute ventilation. If the refrigerant gas touches to a fire, poisonous gas generates. A case of leakage of the refrigerant and the closed room full with gas is dangerous because a shortage of oxygen occurs. Be sure to execute ventilation.
Be attentive to electric shock	When checking the circuit inevitably under condition of the power-ON, use rubber gloves and others not to touch to the charging section. If touching to the charging section, an electric shock may be caused.
	When the refrigerant gas leaks, find up the leaked position and repair it surely. If the leaked position cannot be found up and the repair work is interrupted, pump-down and tighten the service valve, otherwise the refrigerant gas may leak into the room. The poisonous gas generates when gas touches to fire such as fan heater, stove or cocking stove though the refrigerant gas itself is innocuous.
Compulsion	When installing equipment which includes a large amount of charged refrigerant such as a multi air conditioner in a sub-room, it is necessary that the density does not the limit even if the refrigerant leaks. If the refrigerant leaks and exceeds the limit density, an accident of shortage of oxygen is caused.
	For the installation/moving/reinstallation work, follow to the Installation Manual. If an incorrect installation is done, a trouble of the refrigerating cycle, water leak, electric shock or fire is caused.
ACheck after rerair	After repair work has finished, check there is no trouble. If check is not executed, a fire, electric shock or injury may be caused. For a check, turn off the power breaker.
•	After repair work (installation of front panel and cabinet) has finished, execute a test run to check there is no generation of smoke or abnormal sound. If check is not executed, a fire or an electric shock is caused. Before test run, install the front panel and cabinet.
Check after reinstallation	 Check the following items after reinstallation. 1) The earth wire is correctly connected. 2) The power cord is not caught in the product. 3) There is no inclination or unsteadiness and the installation is stable. If check is not executed, a fire, an electric shock or an injury is caused.

Put on gloves	Be sure to put on gloves (*) during repair work. If not putting on gloves, an injury may be caused with the parts, etc. (*) Heavy gloves such as work gloves
Cooling check	When the power was turned on, start to work after the equipment has been sufficiently cooled.As temperature of the compressor pipes and others became high due to cooling/heating operation, a burn may be caused.

New Refrigerant (R410A)

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

1. Safety Caution Concerned to New Refrigerant

The pressure of R410A is high 1.6 times of that of the former refrigerant (R22).

Accompanied with change of refrigerant, the refrigerating oil has been also changed.

Therefore, be sure that water, dust, the former refrigerant or the former refrigerating oil is not mixed into the refrigerating cycle of the air conditioner with new refrigerant during installation work or service work.

If an incorrect work or incorrect service is performed, there is a possibility to cause a serious accident.

Use the tools and materials exclusive to R410A to purpose a safe work.

2. Cautions on Installation/Service

- Do not mix the other refrigerant or refrigerating oil. For the tools exclusive to R410A, shapes of all the joints including the service port differ from those of the former refrigerant in order to prevent mixture of them.
- 2) As the use pressure of the new refrigerant is high, use material thickness of the pipe and tools which are specified for R410A.
- In the installation time, use clean pipe materials and work with great attention so that water and others do not mix in because pipes are affected by impurities such as water, oxide scales, oil, etc. Use the clean pipes.

Be sure to brazing with flowing nitrogen gas. (Never use gas other than nitrogen gas.)

- 4) For the earth protection, use a vacuum pump for air purge.
- 5) R410A refrigerant is azeotropic mixture type refrigerant.

Therefore use liquid type to charge the refrigerant. (If using gas for charging, composition of the refrigerant changes and then characteristics of the air conditioner change.)

3. Pipe Materials

For the refrigerant pipes, copper pipe and joints are mainly used.

It is necessary to select the most appropriate pipes to conform to the standard.

Use clean material in which impurities adhere inside of pipe or joint to a minimum.

1) Copper pipe

<Piping>

The pipe thickness, flare finishing size, flare nut and others differ according to a refrigerant type. When using a long copper pipe for R410A, it is recommended to select "Copper or copper-base pipe without seam" and one with bonded oil amount 40mg/10m or less.

Also do not use crushed, deformed, discolored (especially inside) pipes. (Impurities cause clogging of expansion valves and capillary tubes.)

<Flare nut>

Use the flare nuts which are attached to the air conditioner unit.

2) Joint

The flare joint and socket joint are used for joints of the copper pipe.

The joints are rarely used for installation of the air conditioner. However clear impurities when using them.

4. Tools

1. Required Tools for R410A

Mixing of different types 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 whose sp	ecifications are chang	ged for R410A a	nd their intercha	ngeability	
	Used tool Usage		R4 air condition	Conventional air conditioner installation		
No.		Existence of new equipment for R410A	Whether conven- tional equipment can be used	Whether conventional equipment can be used		
1	Flare tool	Pipe flaring	Yes	*(Note)	Yes	
2	Copper pipe gauge for adjusting projection margin	Flaring by conventional flare tool	Yes	*(Note)	*(Note)	
3	Torque wrench	Connection of flare nut	Yes	No	No	
4	Gauge manifold	Evacuating, refrigerant	Yes	No	No	
5	Charge hose	charge, run check, etc.	ies	INU	No	
6	Vacuum pump adapter	Vacuum evacuating	Yes	No	Yes	
0	Electronic balance for refrigerant charging	Refrigerant charge	Yes	Yes	Yes	
8	Refrigerant cylinder	Refrigerant charge	Yes	No	No	
9	Leakage detector	Gas leakage check	Yes	No	Yes	
10	Charging cylinder	Refrigerant charge	No	No	No	

margin is necessary. For this adjustment, a copper pipe gauge, etc. are necessary.

General tools (Conventional tools can be used.)

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

- 1) Vacuum pump. Use vacuum pump by attaching vacuum pump adapter.
- 2) Torque wrench
- 3) Pipe cutter
- 4) Reamer
- 5) Pipe bender
- 6) Level vial

- 7) Screwdriver (+, -)
- 8) Spanner or Monkey wrench
- 9) Hole core drill
- 10) Hexagon wrench (Opposite side 4mm)
- 11) Tape measure
- 12) Metal saw

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

- 1) Clamp meter
- 2) Thermometer

- 3) IInsulation resistance tester (Megger)
- 4) Electroscope

1. SPECIFICATIONS

1-1. Indoor Unit

1-1-1. 4-Way Air Discharge Cassette Type

<Single type>

	Indoor unit	RAV-SI	1 564UT-E	804UT-E	1104UT-E	1404UT-E	
Model	Outdoor unit	RAV-S	9 562AT(Z)(ZG)-E	802AT(Z)(ZG)-E	1104AT(Z)(ZG)-E	1404AT(Z)(ZG)-E	
Cooling capacity (kW)) 5.3	7.1	10.0	12.5		
Heating capacit	у	(kW) 5.6	8.0	11.2	14.0	
Power supply				1 phase 230V (2	20 – 240V) 50Hz		
		Running current (A) 7.17 – 6.57	8.95 – 8.21	10.36 - 9.49	14.66 - 13.44	
		Power consumption (kW) 1.53	1.93	2.21	3.16	
	Casting	Power factor (%) 97	98	97	98	
	Cooling	EER	3.46	3.68	4.52	3.96	
		Energy efficiency class *	A	A	A	A	
		Energy rating **	_	—	_		
Electrical characteristics		Running current (A) 5.62 – 5.15	9.42 - 8.63	10.96 - 10.05	14.89 – 13.65	
		Power consumption (kW) 1.20	2.03	2.34	3.21	
	Lleation	Power factor (%) 97	98	97	98	
	Heating	COP	4.67	3.94	4.79	4.36	
		Energy efficiency class *	A	A	A	А	
		Energy rating **	_	_	_		
	Maximum current	A)) 15.33	15.33	20.50	20.50	
	Main unit		Zinc hot dipping steel plate				
Appearance	Ceiling panel	Model	RBC-U31PG (W)-E, RBC-U31PG (WS)-E				
	(Sold separately)	Panel color	W: Moon-white (2.5GY 9.0/0.5), WS: Stripe-white (2.5GY 9.0/0.5, (Gray: 8B 3/0.3))				
	Main unit	Height (mm) 256	256	319	319	
		Width (mm) 840	840	840	840	
Outer		Depth (mm) 840	840	840	840	
dimension		Height (mm) 30	30	30	30	
	Ceiling panel (Sold separately)	Width (mm) 950	950	950	950	
	(Cold Separately)	Depth (mm) 950	950	950	950	
Total weight	Main unit	(kç) 20	20	24	24	
Total weight	Ceiling panel (Solo	d separately) (kg) 4.2	4.2	4.2	4.2	
Heat exchanger				Finne	d tube		
	Fan		Turbo fan	Turbo fan	Turbo fan	Turbo fan	
Fan unit	Standard air flow	H/M/L (m³/min) 17.5/14.5/13.0	20.5/16.0/13.5	33.5/24.0/19.5	35.0/24.0/20.5	
	Motor	(V)) 14	20	68	72	
Air filter				Standard filter attac	ched (Long life filter)	
Controller (Sold	separately)			RBC-AMT32E, AS2	21E2, AX31U (W)-E		
Sound pressure	elevel	H/M/L (dB•A) 32 / 29 / 28	35 / 31 / 28	43 / 38 / 33	44 / 38 / 34	
Sound power le	vel	H/M/L (dB•A) 47 / 44 / 43	50 / 46 / 43	58 / 53 / 48	59 / 53 / 49	
		Gas side (mm) 12.7	15.9	15.9	15.9	
Connecting pipe	e	Liquid side (mm) 6.4	9.5	9.5	9.5	
		Drain port (mm)	VF	P25		

<Single type>

	Indoor unit		RAV-	SM564UT-E	SM804UT-E	SM1104UT-E	SM1404UT-E	
Model	Outdoor unit		RAV-	SM563AT-E	SM803AT-E	SM1103AT-E	SM1403AT-E	
Cooling capacity (kW			(kW)	5.3	6.7	10.0	12.0	
Heating capacit	у		(kW)	5.6	8.0	11.2	14.0	
Power supply					1 phase 230V (2	20 – 240V) 50Hz		
		Running current	(A)	7.89 – 7.24	9.97 – 9.12	14.61 – 13.40	17.62 – 16.14	
		Power consump	tion (kW)	1.65	2.09	3.11	3.74	
	Casting	Power factor	(%)	95	95	97	96	
	Cooling	EER		3.21	3.21	3.22	3.21	
		Energy efficienc	y class *	А	А	А	A	
		Energy rating **		—	_	_		
Electrical characteristics		Running current	(A)	6.89 - 6.32	10.83 – 9.90	13.38 – 12.38	17.88 – 15.87	
		Power consump	tion (kW)	1.44	2.21	2.93	3.80	
	Lingting	Power factor	(%)	95	93	99	98	
	Heating	COP		3.89	3.62	3.82	3.68	
		Energy efficienc	y class *	А	А	А	A	
		Energy rating **	:	—	_	_	_	
	Maximum current		(A)	15.33	15.33	20.50	20.50	
	Main unit			Zinc hot dipping steel plate				
Appearance	Ceiling panel	Model		RBC-U31PG (W)-E, RBC-U31PG (WS)-E				
	(Sold separately)	Panel color		W: Moon-white (2.5	6GY 9.0/0.5), WS: Strip	pe-white (2.5GY 9.0/0	.5, (Gray: 8B 3/0.3))	
		Height	(mm)	256	256	319	319	
	Main unit	Width	(mm)	840	840	840	840	
Outer		Depth	(mm)	840	840	840	840	
dimension		Height	(mm)	30	30	30	30	
	Ceiling panel (Sold separately)	Width	(mm)	950	950	950	950	
	(bold separately)	Depth	(mm)	950	950	950	950	
Total weight	Main unit		(kg)	24	24	24	24	
Total weight	Ceiling panel (Solo	d separately)	(kg)	4.2	4.2	4.2	4.2	
Heat exchanger	•				Finne	d tube		
	Fan			Turbo fan	Turbo fan	Turbo fan	Turbo fan	
Fan unit	Standard air flow	H/M/L	(m³/min.)	17.5/14.5/13.0	20.5/16.0/13.5	33.5/24.0/19.5	35.0/24.0/20.5	
	Motor		(W)	14	20	68	72	
Air filter		5	Standard filter attac	hed (Long life filter)			
Controller (Sold	separately)				RBC-AMT32E, AS2	21E2, AX31U (W)-E		
Sound pressure level H/M/L (dB•A)		(dB•A)	32 / 29 / 28	35 / 31 / 28	43 / 38 / 33	44 / 38 / 34		
Sound power le	vel	H/M/L	(dB•A)	47 / 44 / 43	50 / 46 / 43	58 / 53 / 48	59 / 53 / 49	
		Gas side	(mm)	12.7	15.9	15.9	15.9	
Connecting pipe	e	Liquid side	(mm)	6.4	9.5	9.5	9.5	
		Drain port	(mm)		VP	25		

	Indoor unit 1		RAV-	SM564UT-E	SM804UT-E		
Model	Indoor unit 2		RAV-	SM564UT-E	SM804UT-E		
	Outdoor unit		RAV-	SP1104AT(Z)(ZG)-E	SP1404AT(Z)(ZG)-E		
Cooling capacit	ty		(kW)	10.0	12.5		
Heating capacit	ty		(kW)	11.2	14.0		
			Indoor unit				
Power supply				1 phase 230V (2	220 – 240V) 50Hz		
		Running current	(A)	10.36 – 9.49	14.66 - 13.44		
		Power consumption	(kW)	2.21	3.16		
	Cooling	Power factor	(%)	97	98		
		EER		4.52	3.96		
Electrical		Energy efficiency class	S *	A	A		
characteristics		Running current	(A)	10.96 – 10.05	14.89 – 13.65		
		Power consumption	(kW)	2.34	3.21		
	Heating	Power factor	(%)	97	98		
		COP	. /	4.79	4.36		
		Energy efficiency class	6 *	A	A		
	Fan			Turbo fan	Turbo fan		
Fan unit	Standard air flow	H/M/L	(m³/min.)	17.5 / 14.5 / 13.0	20.5 / 16.0 / 13.5		
	Motor (W)			14	20		
Sound pressure	e level	H/M/L	(dB•A)	32 / 29 / 28	35 / 31 / 28		
Sound power le		H/M/L	(dB•A)	47 / 44 / 43	50 / 46 / 43		
•			Outdoor unit				
Power supply				1 phase 230V (2	se 230V (220 – 240V) 50Hz		
	Standard length		(m)	7.5	7.5		
	Min. length		(m)	3	3		
Outer	Max. total length		(m)	50	50		
dimension	Over 30m		. /	40g/m (31m to 50m)	40g/m (31m to 50m)		
	Height	Outdoor lower	(m)	30	30		
	difference	Outdoor higher	(m)	30	30		
	Fan		. ,	Propeller fan	Propeller fan		
Fan unit	Standard air flow	volume	(m³/min.)	101	103		
	Motor		(W)	100 + 100	100 + 100		
		Main	(mm)	15.9	15.9		
Connecting	Gas side	Sub	(mm)	12.7	15.9		
pipe		Main	(mm)	9.5	9.5		
	Liquid side	Sub	(mm)	6.4	9.5		
Sound pressure	e level	Cooling/Heating	(dB•A)	49 / 50	51 / 52		
Sound power level		Cooling/Heating	(dB•A)	66 / 67	68 / 69		

	Indoor unit 1		RAV-	SM564UT-E	SM804UT-E
Model	Indoor unit 2		RAV-	SM564UT-E	SM804UT-E
	Outdoor unit		RAV-	SM1103AT-E	SM1403AT-E
Cooling capacit	iy		(kW)	10.0	12.5
Heating capacit	ty		(kW)	11.2	14.0
			Indoor unit		1
Power supply				1 phase 230V (2	220 – 240V) 50Hz
		Running current	(A)	14.40 – 13.20	20.57 – 18.97
		Power consumption	(kW)	3.11	4.09
	Cooling	Power factor	(%)	98	95
		EER		3.22	3.06
Electrical		Energy efficiency class	S *	А	В
characteristics		Running current	(A)	14.40 – 13.20	17.74– 16.08
		Power consumption	(kW)	2.93	4.00
	Heating	Power factor	(%)	98	99
		СОР		3.82	3.50
		Energy efficiency class	S *	А	В
	Fan	1		Turbo fan	Turbo fan
Fan unit	Standard air flow	H/M/L	(m³/min.)	17.5 / 14.5 / 13.0	20.5 / 16.0 / 13.5
	Motor	1	(W)	14	20
Sound pressure	e level	H/M/L	(dB•A)	32 / 29 / 28	35 / 31 / 28
Sound power le	evel	H/M/L	(dB•A)	47 / 44 / 43	50 / 46 / 43
			Outdoor unit		
Power supply				1 phase 230V (220 – 240V) 50Hz	
	Standard length		(m)	7.5	7.5
	Min. length		(m)	5	5
Outer	Max. total length		(m)	50	50
dimension	Over 30m			40g/m (31m to 50m)	40g/m (31m to 50m)
	Height	Outdoor lower	(m)	30	30
	difference	Outdoor higher	(m)	30	30
	Fan			Propeller fan	Propeller fan
Fan unit	Standard air flow	volume	(m³/min.)	75	75
	Motor		(W)	63	100
	Cooloide	Main	(mm)	15.9	15.9
Connecting	Gas side	Sub	(mm)	12.7	15.9
pipe		Main	(mm)	9.5	9.5
	Liquid side	Sub	(mm)	6.4	9.5
Sound pressure	e level	Cooling/Heating	(dB•A)	53 / 54	54 / 54
Sound power le	evel	Cooling/Heating	(dB•A)	70 / 71	71 / 71

1-1-2. Concealed Duct Type

<Single type>

Madal	Indoor unit		RAV-SM	562BT-E	802BT-E	1102BT-E	1402BT-E	
Model	Outdoor unit		RAV-SP	562AT(Z)(ZG)-E	802AT(Z)(ZG)-E	1104AT(Z)(ZG)-E	1404AT(Z)(ZG)-E	
Cooling capacit	y		(kW)	5.0	7.1	10.0	12.5	
Heating capacity (kW)				5.6 8.0 11.2 14.0				
Power supply					1 phase 230V (2	20 – 240V) 50Hz		
		Running current	(A)	6.51 – 5.97	9.74 - 8.93	13.78 – 12.63	17.76 – 16.28	
		Power consumpt	ion (kW)	1.39	2.10	2.94	3.83	
	Quality	Power factor	(%)	97	98	97	98	
	Cooling	EER		3.60	3.38	3.40	3.26	
		Energy efficiency	/ class *	А	А	А	А	
		Energy rating **		_	_	_		
Electrical characteristics		Running current	(A)	7.26 – 6.66	9.74 – 8.93	12.98 – 11.90	15.82 – 14.50	
		Power consumpt	ion (kW)	1.55	2.41	2.77	3.41	
	Lippting	Power factor	(%)	97	94	97	98	
	Heating	COP		3.61	3.32	4.04	4.11	
		Energy efficiency	/ class *	А	А	А	А	
		Energy rating **		_	_	_	_	
	Maximum current		(A)	15.86	16.30	21.73	22.13	
	Main unit			Zinc hot dipping steel plate				
Appearance	Ceiling panel Model			_				
	(Sold separately)	Panel color						
	Main unit	Height	(mm)	320	320	320	320	
		Width	(mm)	700	1000	1350	1350	
Outer		Depth	(mm)	800	800	800	800	
dimension	Ceiling panel (Sold separately)	Height	(mm)	_	_	_		
		Width	(mm)	_	_	_	_	
	(,))	Depth	(mm)	_	_	_		
Total weight	Main unit		(kg)	30	39	54	54	
Total weight	Ceiling panel (Solo	d separately)	(kg)	_	_	_	_	
Heat exchanger	•				Finne	d tube		
	Fan			Centrifugal	Centrifugal	Centrifugal	Centrifugal	
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.0/11.9/9.8	19.0/16.2/13.3	27.0/23.0/18.9	33.0/28.0/23.1	
	Motor		(W)	120	120	120	120	
Air filter TCB-			UFM21BE UFM61BE					
Controller (Sold separately)				RBC-AMT31E, AS2	1E2, AX21U(W)-E	2		
Sound pressure level H/M/L (dB•A)		40 / 37 / 33	40 / 37 / 34	42 / 39 / 36	44 / 41 / 38			
Sound power le	vel	H/M/L	(dB•A)	55 / 52 / 48	55 / 52 / 49	57 / 54 / 51	59 / 56 / 53	
		Gas side	(mm)	12.7	15.9	15.9	15.9	
Connecting pipe	e	Liquid side	(mm)	6.4	9.5	9.5	9.5	
		Drain port	(mm)		VF	25		

	Indoor unit 1		RAV-	SM562BT-E	SM802BT-E
Model	Indoor unit 2		RAV-	SM562BT-E	SM802BT-E
	Outdoor unit		RAV-	SP1104AT(Z)(ZG)-E	SP1404AT(Z)(ZG)-E
Cooling capacit	ty		(kW)	10.0	12.5
Heating capaci	ty		(kW)	11.2	14.0
			Indoor unit		l
Power supply				1 phase 230V (2	220 – 240V) 50Hz
		Running current	(A)	13.78 – 12.63	17.76 – 16.28
		Power consumption	(kW)	2.94	3.83
	Cooling	Power factor	(%)	97	98
		EER		3.4	3.26
Electrical		Energy efficiency clas	S *	А	A
characteristics		Running current	(A)	12.98 - 11.90	15.82 – 14.50
		Power consumption	(kW)	2.77	3.41
	Heating	Power factor	(%)	97	98
		COP		4.04	4.11
		Energy efficiency class	S *	A	A
	Fan			Centrifugal	Centrifugal
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.0 / 11.9 / 9.8	19.0 / 16.2 / 13.3
	Motor	1	(W)	120	120
Sound pressure	e level	H/M/L	(dB•A)	40 / 37 / 33	40 / 37 / 34
Sound power le	evel	H/M/L	(dB•A)	55 / 52 / 48	55 / 52 / 49
			Outdoor unit		
Power supply				1 phase 230V (220 – 240V) 50Hz	
	Standard length		(m)	7.5	7.5
	Min. length		(m)	3	3
Outer	Max. total length		(m)	50	50
dimension	Over 30m			40g/m (31m to 50m)	40g/m (31m to 50m)
	Height	Outdoor lower	(m)	30	30
	difference	Outdoor higher	(m)	30	30
	Fan	1		Propeller fan	Propeller fan
Fan unit	Standard air flow	volume	(m³/min.)	101	103
	Motor		(W)	100 + 100	100 + 100
		Main	(mm)	15.9	15.9
Connecting	Gas side	Sub	(mm)	12.7	15.9
pipe		Main	(mm)	9.5	9.5
	Liquid side	Sub	(mm)	6.4	9.5
Sound pressure	e level	Cooling/Heating	(dB•A)	49 / 50	51 / 52
Sound power le	evel	Cooling/Heating	(dB•A)	66 / 67	68 / 69

1-1-3. Under Ceiling Type

<Single type>

Model	Indoor unit	RAV	/-SM	562CT-E	802CT-E	1102CT-E	1402CT-E		
Model	Outdoor unit	RA	V-SP	562AT(Z)(ZG)-E	802AT(Z)(ZG)-E	1104AT(Z)(ZG)-E	1404AT(Z)(ZG)-E		
Cooling capacity	y		(kW)	5.0	7.1	10.0	12.5		
Heating capacit	у	((kW)	5.6 8.0 11.2 14.0					
Power supply					1 phase 230V (2	20 – 240V) 50Hz			
		Running current	(A)	6.61 – 6.06	9.47 – 8.93	12.51 – 11.47	17.30 – 15.86		
		Power consumption ((kW)	1.41	2.1	2.67	3.73		
	Casting	Power factor	(%)	97	98	97	98		
	Cooling	EER		3.55	3.38	3.75	3.35		
		Energy efficiency clas	SS *	А	А	А	А		
		Energy rating **							
Electrical characteristics		Running current	(A)	7.03 – 6.44	10.20 – 9.35	12.28 – 11.25	16.93 – 15.52		
		Power consumption ((kW)	1.50	2.20	2.62	3.65		
	L la atia a	Power factor	(%)	97	98	97	98		
	Heating	COP		3.73	3.64	4.27	3.84		
		Energy efficiency clas	SS *	А	А	А	А		
		Energy rating **		—	—	—	_		
	Maximum current		(A)	15.48	15.90	21.35	21.35		
	Main unit			Shine white					
Appearance	Ceiling panel	Model —							
	(Sold separately)	Panel color			_	_			
	Main unit	Height ((mm)	210	210	210	210		
		Width ((mm)	910	1180	1595	1595		
Outer		Depth ((mm)	680	680	680	680		
dimension		Height ((mm)		_	_	_		
	Ceiling panel (Sold separately)	Width ((mm)	_	—	_	_		
		Depth ((mm)		_	_	_		
Total weight	Main unit		(kg)	21	25	33	33		
iotal weight	Ceiling panel (Solo	d separately)	(kg)	—	—	—	_		
Heat exchanger	•				Finne	d tube			
	Fan			Centrifugal	Centrifugal	Centrifugal	Centrifugal		
Fan unit	Standard air flow	H/M/L (m³/r	min.)	13.0/11.2/10.0	18.5/16.7/14.6	27.5/24.0/21.2	30.0/26.0/23.1		
	Motor		(W)	60	60	120	120		
Air filter				Attached	main unit				
Controller (Sold separately)			RBC-AM	T31E, AS21E2, TC	B-SC642TLE2, AX	21UCE2			
Sound pressure level H/M/L (dB•A)		36 / 33 / 30	38 / 36 / 33	41 / 38 / 36	43 / 40 / 37				
Sound power le	vel	H/M/L (d	IB•A)	51 / 48 / 45	53 / 51 / 48	56 / 53 / 50	58 / 55 / 52		
		Gas side ((mm)	12.7	15.9	15.9	15.9		
Connecting pipe	e	Liquid side (i	(mm)	6.4	9.5	9.5	9.5		
		Drain port ((mm)		VF	25			

	Indoor unit 1		RAV-	SM562CT-E	SM802CT-E		
Model	Indoor unit 2		RAV-	SM562CT-E	SM802CT-E		
	Outdoor unit		RAV-	SP1104AT(Z)(ZG)-E	SP1404A(Z)(ZG)-E		
Cooling capacit	ty		(kW)	10.0	12.5		
Heating capaci	ty		(kW)	11.2	14.0		
			Indoor unit				
Power supply				1 phase 230V (2	220 – 240V) 50Hz		
		Running current	(A)	12.51 – 11.47	17.30 – 15.86		
		Power consumption	(kW)	2.67	3.73		
	Cooling	Power factor	(%)	97	98		
		EER		3.75	3.35		
Electrical		Energy efficiency class	S *	А	A		
characteristics		Running current	(A)	12.28 – 11.25	16.93 – 15.52		
		Power consumption	(kW)	2.62	3.65		
	Heating	Power factor	(%)	97	98		
		COP		4.27	3.84		
		Energy efficiency class	S *	A	A		
	Fan	1		Centrifugal	Centrifugal		
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.0 / 11.2 / 10.0	18.5 / 16.7 / 14.6		
	Motor	<u> </u>	(W)	60	60		
Sound pressure	e level	H/M/L	(dB•A)	36 / 33 / 30	38 / 36 / 33		
Sound power le	evel	H/M/L	(dB•A)	51 / 48 / 45	53 / 51 / 48		
-			Outdoor unit				
Power supply				1 phase 230V (220 – 240V) 50Hz			
	Standard length		(m)	7.5	7.5		
	Min. length		(m)	3	3		
Outer	Max. total length		(m)	50	50		
dimension	Over 30m			40g/m (31m to 50m)	40g/m (31m to 50m)		
	Height	Outdoor lower	(m)	30	30		
	difference	Outdoor higher	(m)	30	30		
	Fan	1		Propeller fan	Propeller fan		
Fan unit	Standard air flow	volume	(m³/min.)	101	103		
	Motor		(W)	100 + 100	100 + 100		
		Main	(mm)	15.9	15.9		
Connecting	Gas side	Sub	(mm)	12.7	15.9		
pipe		Main	(mm)	9.5	9.5		
	Liquid side	Sub	(mm)	6.4	9.5		
Sound pressure	e level	Cooling/Heating	(dB•A)	49 / 50	51 / 52		
Sound power le		Cooling/Heating	(dB•A)	66 / 67	68 / 69		

1-1-4. High Wall Type

<Single type>

Model	Indoor unit		RAV-	SM562KRT-E	SM802KRT-E
wouel	Outdoor unit		RAV-	SP562AT(Z)(ZG)-E	SP802AT(Z)(ZG)-E
Cooling capacity	ý		(kW)	5.0	6.9
Heating capacity (kW)				5.6	8.0
Power supply				1 phase 230V (2	220 – 240V) 50Hz
		Running current	(A)	8.33 - 7.63	13.15 – 12.05
		Power consumption	(kW)	1.39	2.4
		Power factor	(%)	95	94
	Cooling	EER		3.60	2.88
		Energy efficiency class	S *	А	С
		Energy rating **		_	_
Electrical characteristics		Running current	(A)	8.14 - 7.46	12.91 – 11.84
onaraotonotico		Power consumption	(kW)	1.55	2.4
		Power factor	(%)	95	94
	Heating	COP		3.61	3.33
		Energy efficiency class	S *	А	С
		Energy rating **		_	_
	Maximum current		(A)	15.34	15.47
	Main unit			Pure	white
•	Ceiling panel	Model		-	_
	(Sold separately)	Panel color		-	_
		Height	(mm)	298	298
	Main unit	Width	(mm)	998	998
Outer		Depth	(mm)	221	221
dimension	Ceiling panel (Sold separately)	Height	(mm)	_	_
		Width	(mm)	_	_
	(cold copulatoly)	Depth	(mm)	_	_
-	Main unit		(kg)	12	12
Total weight	Ceiling panel (Solo	d separately)	(kg)	_	_
Heat exchanger				Finne	d tube
	Fan			Cross flow fan	Cross flow fan
Fan unit	Standard air flow	H/M/L	(m³/min.)	14.0 / 12.5 / 10.7	18.5 / 14.6 / 12.2
	Motor		(W)	30	30
Air filter				Attached	main unit
Controller (Sold separately)			RBC-AMT31E, AS21E2, TC (FCU comes v	CB-SC642TLE2, AX21UCE2 with WH-H2UE)	
Sound pressure level H/M/L		(dB∙A)	39 / 36 / 33	45 / 41 / 36	
Sound power le	vel	H/M/L	(dB•A)	54 / 51 / 48	60 / 56 / 51
		Gas side	(mm)	12.7	15.9
Connecting pipe	9	Liquid side	(mm)	6.4	9.5
		Drain port	(mm)	VF	P16

	Indoor unit 1		RAV-	SM562KRT-E	SM802KRT-E	
Model	Indoor unit 2		RAV-	SM562KRT-E	SM802KRT-E	
	Outdoor unit		RAV-	SP1104AT(Z)(ZG)-E	SP1404AT(Z)(ZG)-E	
Cooling capacit	ży		(kW)	10.0	12.3	
Heating capacit	ty		(kW)	11.2	14.0	
			Indoor unit		1	
Power supply				1 phase 230V (2	220 – 240V) 50Hz	
		Running current	(A)	12.98 – 11.90	18.00 – 16.50	
		Power consumption	(kW)	2.77	3.88	
	Cooling	Power factor	(%)	97	98	
		EER		3.61	3.17	
Electrical		Energy efficiency class	S *	А	В	
characteristics		Running current	(A)	13.12 – 12.03	17.76 – 16.28	
		Power consumption	(kW)	2.80	3.83	
	Heating	Power factor	(%)	97	98	
		СОР		4.00	3.66	
		Energy efficiency class	s *	A	A	
	Fan			Cross flow fan	Cross flow fan	
Fan unit	Standard air flow	H/M/L	(m³/min.)	14.0 / 12.5 / 10.7	18.5 / 14.6 / 12.2	
	Motor	1	(W)	30	30	
Sound pressure	e level	H/M/L	(dB•A)	39 / 36 / 33	45 / 41 / 36	
Sound power le	evel	H/M/L	(dB•A)	54 / 51 / 48	60 / 56 / 51	
			Outdoor unit			
Power supply				1 phase 230V (2	220 – 240V) 50Hz	
	Standard length		(m)	7.5	7.5	
	Min. length		(m)	3	3	
Outer	Max. total length		(m)	50	50	
dimension	Over 30m			40g/m (31m to 50m)	40g/m (31m to 50m)	
	Height	Outdoor lower	(m)	30	30	
	difference	Outdoor higher	(m)	30	30	
	Fan	1		Propeller fan	Propeller fan	
Fan unit	Standard air flow	volume	(m³/min.)	101	103	
	Motor		(W)	100 + 100	100 + 100	
		Main	(mm)	15.9	15.9	
Connecting	Gas side	Sub	(mm)	12.7	15.9	
pipe		Main	(mm)	9.5	9.5	
	Liquid side	Sub	(mm)	6.4	9.5	
Sound pressure	e level	Cooling/Heating	(dB•A)	49 / 50	51 / 52	
Sound power le	evel	Cooling/Heating	(dB•A)	66 / 67	68 / 69	

1-1-5. Compact 4-Way Cassette (600 × 600) Type

<Single type>

Model	Indoor unit			RAV-SM562MUT-E
Model	Outdoor unit			RAV-SP562AT(Z)(ZG)-E
Cooling capacity		5.0		
Heating capacity		5.6		
Power supply		1 phase 230V		
		Running current	(A)	6.6 - 7.15
		Power consumption	(kW)	1.53
	Casling	Power factor	(%)	97
	Cooling	EER		3.27
		Energy efficiency cl	ass	A
		Energy rating		4.5
Electrical characteristics		Running current	(A)	6.62 – 7.21
		Power consumption	(kW)	1.54
	llesting	Power factor	(%)	97
	Heating	COP		3.64
		Energy efficiency cl	ass	А
		Energy rating		4.5
	Maximum current		(A)	15.53
	Main unit			Zinc hot dipping steel plate
Appearance	Ceiling panel	Model		RBC-UM11PG(W)-E
	(Sold separately)	Panel color		Moon-white (Muncel 2.5GY 9.0 / 0.5)
		Height	(mm)	268
	Main unit	Width	(mm)	575
Outer dimension		Depth	(mm)	575
Outer dimension		Height	(mm)	27
	Ceiling panel (Sold separately)	Width	(mm)	700
	(,	Depth	(mm)	700
Total waight	Main unit		(kg)	17
Total weight	Ceiling panel (Solo	l separately)	(kg)	3
Heat exchanger				Finned tube
	Fan			Turbo fan
Fan unit	Standard air flow	H/M/L (I	m³/min.)	13.3 / 11.2 / 9.1
Motor			(W)	60
Air filter				_
Controller (Sold separatel			As per enclosure	
Sound pressure level		H/M/L	(dB•A)	43 / 39 / 34
Sound power level		H/M/L	(dB•A)	58 / 54 / 49
		Gas side	(mm)	12.7
Connecting pipe		Liquid side	(mm)	6.4
		Drain port	(mm)	VP25

	Indoor unit 1		RAV-	SM562MUT-E
Model	Indoor unit 2		RAV-	SM562MUT-E
	Outdoor unit		RAV-	SP1104AT(Z)(ZG)-E
Cooling capacity			(kW)	10.0
Heating capaci	ty		(kW)	11.2
			Indoor unit	
Power supply				1 phase 230V (220 – 240V) 50Hz
		Running current	(A)	12.51 – 11.47
		Power consumption	(kW)	2.67
	Cooling	Power factor	(%)	97
		EER		3.75
Electrical		Energy efficiency class	S *	А
characteristics		Running current	(A)	12.51 – 11.47
		Power consumption	(kW)	2.67
	Heating	Power factor	(%)	97
		СОР		4.19
		Energy efficiency class	S *	A
	Fan			Turbo fan
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.3 / 11.2 / 9.1
	Motor	I	(W)	60
Sound pressur	e level	H/M/L	(dB•A)	43 / 39 / 34
Sound power le	evel	H/M/L	(dB•A)	58 / 54 / 49
		l	Outdoor uni	t
Power supply				1 phase 230V (220 – 240V) 50Hz
	Standard length		(m)	7.5
	Min. length		(m)	3
Outer	Max. total length		(m)	50
dimension	Over 30m			40g/m (31m to 50m)
	Height	Outdoor lower	(m)	30
	difference	Outdoor higher	(m)	30
	Fan	1		Propeller fan
Fan unit	Standard air flow	volume	(m³/min.)	101
	Motor		(W)	100 + 100
	Cooloida	Main	(mm)	15.9
Connecting	Gas side	Sub	(mm)	12.7
pipe	ا نم بنط منط م	Main	(mm)	9.5
	Liquid side	Sub	(mm)	6.4
Sound pressur	e level	Cooling/Heating	(dB•A)	49 / 50
Sound power le	evel	Cooling/Heating	(dB•A)	66 / 67

1-1-6. Slim Duct Type

<Single type>

Model	Indoor unit		RAV-SM	404SDT-E	454SDT-E	564SDT-E			
woder	Outdoor unit		RAV-SP	404AT(Z)(ZG)-E	454AT(Z)(ZG)-E	562AT(Z)(ZG)-E			
Cooling capacity			(kW)	3.6	4.0	5.0			
Heating capacit	y		(kW)	4.0	4.0 4.5 5.6				
Power supply				1 ph	ase 230V (220 – 240V) 5	0Hz			
		Running current	(A)	5.20 - 4.77	5.87 – 5.38	7.26 - 6.66			
		Power consumption	(kW)	1.03	1.20	1.55			
	Casling	Power factor	(%)	90	93	97			
	Cooling	EER		3.50	3.33	3.23			
		Energy efficiency cla	SS *	А	А	А			
		Energy rating **		5.0	4.5	4.0			
Electrical characteristics		Running current	(A)	4.94 - 4.53	5.62 - 5.15	6.75 – 6.19			
		Power consumption	(kW)	1.00	1.15	1.44			
	l la affa a	Power factor	(%)	92	93	97			
	Heating	COP		4.00	3.91	3.89			
		Energy efficiency cla	SS *	А	А	А			
		Energy rating **		5.5	5.0	5.0			
	Maximum current		(A)	15.00	15.00	15.00			
	Main unit			Z	Zinc hot dipping steel plate				
Appearance	Ceiling panel	Model —							
	(Sold separately)	Panel color			_				
	Main unit	Height	(mm)	210	210	210			
		Width	(mm)	845	845	845			
Outer		Depth	(mm)	645	645	645			
dimension	Ceiling panel (Sold separately)	Height	(mm)			_			
		Width	(mm)	_	_	_			
		Depth	(mm)						
Tatalanalaha	Main unit		(kg)	22	22	22			
Total weight	Ceiling panel (Sol	d separately)	(kg)		_	_			
Heat exchange	r				Finned tube				
	Fan			Centrifugal	Centrifugal	Centrifugal			
Fon unit	Standard air flow	H/M/L	(m³/min.)	11.5 / 10.0 / 8.7	11.5 / 10.0 / 8.7	13.0 / 11.3 / 9.7			
Fan unit	Motor		(W)	60	60	60			
	Extermal static pt	ssure	(Pa)	5 (-15/-30/-45)	5 (-15/-30/-45)	4 (-14/-29/-44)			
Air filter				Standa	rd filter attached (Long lif	e filter)			
Controller (Solo	l separately)				RBC-AMT32E, AS21E2				
Sound	Under air inlet	H/M/L	(dB•A)	39 / 36 / 33	39 / 36 / 33	45 / 40 / 36			
pressure level	Back air inlet	H/M/L	(dB•A)	30 / 28 / 26	30 / 28 / 26	33 / 31 / 28			
Sound	Under air inlet	H/M/L	(dB•A)	54 / 51 / 48	54 / 51 / 48	60 / 55 / 51			
power level	Back air inlet	H/M/L	(dB•A)	45 / 43 / 41	45 / 43 / 41	48 / 46 / 43			
		Gas side	(mm)	12.7	12.7	12.7			
Connecting pip	e	Liquid side	(mm)	6.4	6.4	6.4			
		Drain port	(mm)		VP25				

<Single type>

Model	Indoor unit		RAV-SM	564SDT-E
Model	Outdoor unit		RAV-SM	563AT-E
Cooling capacit	у		(kW)	5.0
Heating capacit	Heating capacity (kW)			5.6
Power supply				1 phase 230V (220 – 240V) 50Hz
		Running current	(A)	7.94 – 7.28
		Power consumption	(kW)	1.66
	Cooling	Power factor	(%)	95
	Cooling	EER		3.01
		Energy efficiency clas	S *	В
		Energy rating **		3.5
Electrical characteristics		Running current	(A)	7.61 – 6.97
		Power consumption	(kW)	1.59
	Llooting	Power factor	(%)	95
	Heating	COP		3.52
		Energy efficiency clas	S *	В
		Energy rating **		4.0
	Maximum current		(A)	15.00
	Main unit			Zinc hot dipping steel plate
Appearance	Ceiling panel	Model		_
	(Sold separately)	Panel color		_
		Height	(mm)	210
	Main unit	Width	(mm)	845
Outer		Depth	(mm)	645
dimension	Ceiling panel (Sold separately)	Height	(mm)	_
		Width	(mm)	_
		Depth	(mm)	_
Tatal waisht	Main unit		(kg)	22
Total weight	Ceiling panel (Sol	d separately)	(kg)	_
Heat exchange	r			Finned tube
	Fan			Centrifugal
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.0 / 11.3 / 9.7
Fan unit	Motor		(W)	60
	Extermal static pt	rssure	(Pa)	4 (-14/-29/-44)
Air filter				Standard filter attached (Long life filter)
Controller (Sold	l separately)			RBC-AMT32E, AS21E2
Sound	Under air inlet	H/M/L	(dB•A)	45 / 40 / 36
pressure level	Back air inlet	H/M/L	(dB•A)	33 / 31 / 28
Sound	Under air inlet	H/M/L	(dB•A)	60 / 55 / 51
power level	Back air inlet	H/M/L	(dB•A)	48 / 46 / 43
		Gas side	(mm)	12.7
Connecting pipe	9	Liquid side	(mm)	6.4
		Drain port	(mm)	VP25

	Indoor unit 1		RAV-SM	564SDT-E	564SDT-E
Model	Indoor unit 2		RAV-SM	564SDT-E	564SDT-E
	Outdoor unit		RAV-SP	1104AT(Z)(ZG)-E	1102AT(Z)(ZG)-E
Cooling capacity	I		(kW)	10.0	10.0
Heating capacity			(kW)	11.2	11.2
		Indoor ur	nit		I
Power supply				1 phase 230V (2	20 – 240V) 50Hz
		Running current	(A)	12.98 -11.90	11.72 – 10.74
		Power consumption	(kW)	2.77	2.50
	Cooling	Power factor	(%)	97	97
		EER		3.61	4.00
Electrical		Energy efficiency class *		А	А
characteristics		Running current	(A)	12.51 – 11.47	11.95 – 10.95
		Power consumption	(kW)	2.67	2.55
	Heating	Power factor	(%)	97	97
		COP		4.19	4.39
		Energy efficiency class *		А	Α
	Fan			Centrifugal	Centrifugal
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.0 / 11.3 / 9.7	13.0 / 11.3 / 9.7
	Motor		(W)	60	60
	Under air inlet	H/M/L	(dB•A)	45 / 40 / 36	45 / 40 / 36
Sound pressure level	Back air inlet	H/M/L	(dB•A)	33 / 31 / 28	33 / 31 / 28
Sound power level	Under air inlet	H/M/L	(dB•A)	60 / 55 / 51	60 / 55 / 51
Sound power lever	Back air inlet	H/M/L	(dB•A)	48 / 46 / 43	48 / 46 / 43
		Outdoor u	nit		
Power supply				1 phase 230V (2	20 – 240V) 50Hz
	Standard length		(m)	7.5	7.5
	Min. length		(m)	3	5
	Max. total length		(m)	50	50
Outer dimension	Over 30m			40g/m (31m to 50m)	40g/m (31m to 50m)
	Height difference	Outdoor lower	(m)	30	30
	Theight difference	Outdoor higher	(m)	30	30
	Fan			Propeller fan	Propeller fan
Fan unit	Standard air flow v	volume	(m³/min.)	101	125
	Motor		(W)	100 + 100	63 + 63
	Gas side	Main	(mm)	15.9	15.9
Connecting pipe		Sub	(mm)	12.7	12.7
	Liquid side	Main	(mm)	9.5	9.5
		Sub	(mm)	6.4	6.4
Sound pressure level	Cooling/Heating		(dB•A)	49 / 50	49 / 51
Sound power level	Cooling/Heating		(dB•A)	66 / 67	66 / 68

	Indoor unit 1		RAV-SM	564SDT-E		
Model	Indoor unit 2		RAV-SM	564SDT-E		
	Outdoor unit		RAV-SM	1103AT-E		
Cooling capacity			(kW)	10.0		
Heating capacity			(kW)	11.2		
		Indoor	unit			
Power supply				1 phase 230V (220 – 240V) 50Hz		
		Running current	(A)	16.47 – 15.09		
		Power consumption	(kW)	3.55		
	Cooling	Power factor	(%)	98		
		EER		2.82		
Electrical		Energy efficiency class -	*	С		
characteristics		Running current	(A)	14.56 – 13.35		
		Power consumption	(kW)	3.14		
	Heating	Power factor	(%)	98		
		COP		3.57		
		Energy efficiency class	*	В		
	Fan			Centrifugal		
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.0 / 11.3 / 9.7		
	Motor		(W)	60		
	Under air inlet	H/M/L	(dB•A)	45 / 40 / 36		
Sound pressure level	Back air inlet	H/M/L	(dB•A)	33 / 31 / 28		
	Under air inlet	H/M/L	(dB•A)	60 / 55 / 51		
Sound power level	Back air inlet	H/M/L	(dB•A)	48 / 46 / 43		
	•	Outdoor	unit			
Power supply				1 phase 230V (220 – 240V) 50Hz		
	Standard length		(m)	7.5		
	Min. length		(m)	5		
	Max. total length		(m)	50		
Outer dimension	Over 30m			40g/m (31m to 50m)		
	Height difference	Outdoor lower	(m)	30		
	Height difference	Outdoor higher	(m)	30		
	Fan			Propeller fan		
Fan unit	Standard air flow volume		(m³/min.)	75		
	Motor		(W)	100		
	Gas side	Main	(mm)	15.9		
Connecting pipe		Sub	(mm)	12.7		
Connecting pipe		Main	(mm)	9.5		
	Liquid side	Sub	(mm)	6.4		
Sound pressure level	Cooling/Heating		(dB•A)	53 / 54		
Sound power level	Cooling/Heating		(dB•A)	70 / 71		

1-2. Outdoor Unit

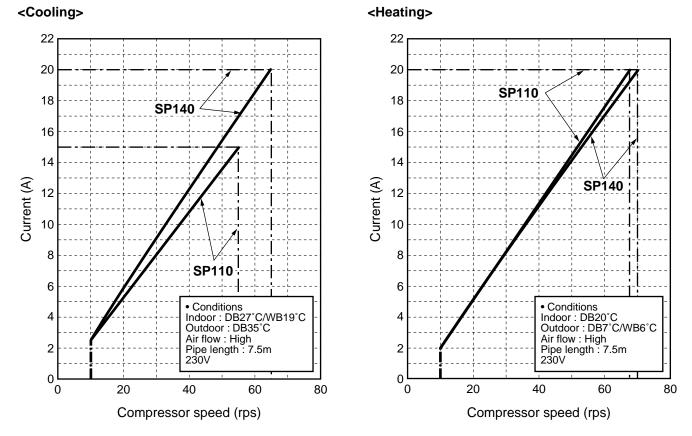
<Super Digital Inverter>

Model name	Outdoor u	nit	RAV-SP	562AT(Z)(ZG)-E	802AT(Z)(ZG)-E	1104AT(Z)(ZG)-E	1404AT(Z)(ZG)-E	
Power supply			1 phase 230V (220 – 240V) 50Hz (Power exclusive to outdoor is required.)					
Туре				Hermetic compressor				
Compressor	Motor		(kW)	2	2	3.75	3.75	
	Pole			4	4	4	4	
Refrigerant charged (kg)			1.5	2.1	3.1	3.1		
Refrigerant contro	I				Pulse mo	otor valve		
Standard length (m)		(m)	7.5	7.5	7.5	7.5		
	Max. total	ength	(m)	50	50	75	75	
Inter connecting pipe	Additional refrigerant charge under long piping connector			20g/m (21m to 50m)	40g/m (31m to 50m)	40g/m (31m to 75m)	40g/m (31m to 75m)	
	Height	Outdoor lower	(m)	30	30	30	30	
	difference	Outdoor higher	(m)	30	30	30	30	
Outer dimension	Height		(mm)	795	795	1340	1340	
	Width		(mm)	900	900	900	900	
Depth		(mm)	320	320 320		320		
Appearance			Silky shade (Muncel 1Y8.5/0.5)					
Total weight (kg)		55	62	93	93			
Heat exchanger	Heat exchanger			Finned tube				
	Fan			Propeller fan				
Fan unit	Standard air flow		(m³/h)	57	57	101	103	
	Motor		(W)	63	63	100 + 100	100 + 100	
Connecting pipe	Gas side		(mm)	12.7	15.9	15.9	15.9	
	Liquid side		(mm)	6.4	9.5	9.5	9.5	
Sound pressure level Cooling/Heating (dB•A		(dB•A)	46 / 47	47 / 49	49 / 50	51 / 52		
Sound power leve	I	Cooling/Heating	(dB•A)	63 / 64	64 / 66	66 / 67	68 / 69	
Outside air tempe	rature, Cooli	ng	(°C)	43 to -15°C				
Outside air tempe	rature, Heati	ng	(°C)	15 to -15°C 15 to		15 to	–20°C	

Model name	Outdoor u	nit	RAV-SP	404AT(Z)(ZG)-E	454AT(Z)(ZG)-E	
Power supply				1 phase 230V (220 – 240V) 50Hz (Power exclusive to outdoor is required.)		
	Туре	Туре		Hermetic c	ompressor	
Compressor	Motor		(kW)	1.1	1.1	
	Pole			4	4	
Refrigerant charge	ed		(kg)	1.0	1.0	
Refrigerant contro	I			Pulse motor valve		
	Standard le	ength	(m)	7.5	7.5	
	Max. total I	ength	(m)	30	30	
Inter connecting pipe	Additional refrigerant charge under long piping connector			20g/m (21m to 30m)	20g/m (21m to 30m)	
	Height	Outdoor lower	(m)	30	30	
	difference	Outdoor higher	(m)	30	30	
	Height		(mm)	550	550	
Outer dimension	Width		(mm)	780	780	
	Depth		(mm)	290	290	
Appearance				Silky shade (Muncel 1Y8.5/0.5)		
Total weight		(kg)	40	40		
Heat exchanger				Finned tube		
	Fan			Propel	ler fan	
Fan unit	Standard air flow		(m³/h)	40	40	
	Motor		(W)	43	43	
Connecting pipe	Gas side		(mm)	12.7	12.7	
	Liquid side		(mm)	6.4	6.4	
Sound pressure level Cooling/Heating		(dB•A)	45 / 47	45 / 47		
Sound power leve	I	Cooling/Heating	(dB•A)	62 / 64	62 / 64	
Outside air temperature, Cooling ((°C)	43 to −15°C			
Outside air tempe	Outside air temperature, Heating		(°C)	15 to –15°C		

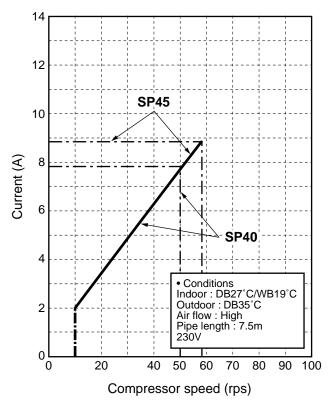
1-3. Operation Characteristic Curve

• Operation characteristic curve <Super Digital Inverter> RAV-SP1104AT-E, RAV-SP1104ATZ-E, RAV-SP1104ATZG-E RAV-SP1404AT-E, RAV-SP1404ATZ-E, RAV-SP1404ATZG-E

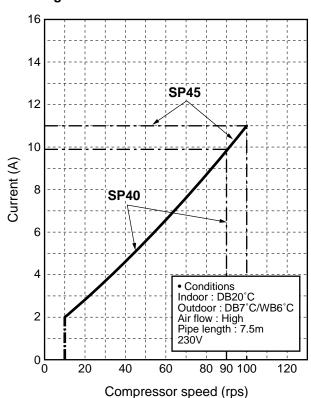


RAV-SP404AT-E, RAV-SP404ATZ-E, RAV-SP404ATZG-E RAV-SP454AT-E, RAV-SP454ATZ-E, RAV-SP454ATZG-E



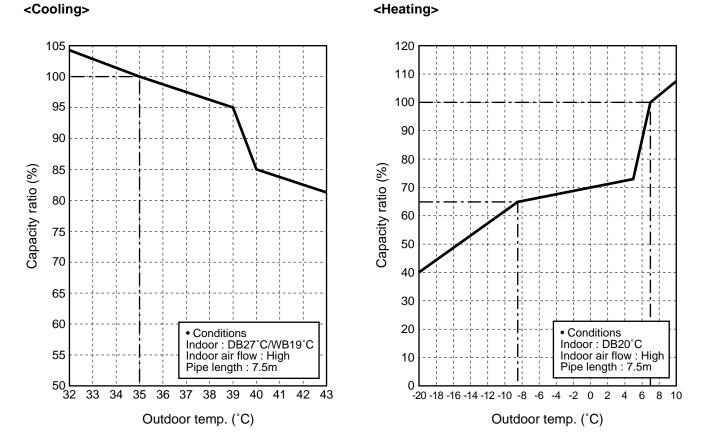


<Heating>



• Capacity variation ratio according to temperature

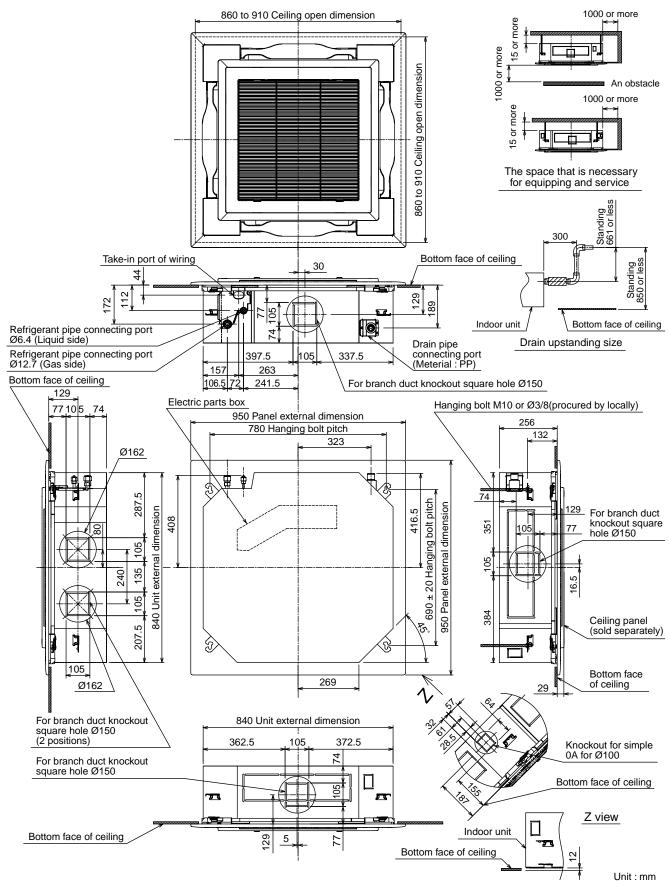
RAV-SP404AT-E, RAV-SP404ATZ-E, RAV-SP404ATZG-E RAV-SP454AT-E, RAV-SP454ATZ-E, RAV-SP454ATZG-E RAV-SP1104AT-E, RAV-SP1104ATZ-E, RAV-SP1104ATZG-E RAV-SP1404AT-E, RAV-SP1404ATZ-E, RAV-SP1404ATZG-E



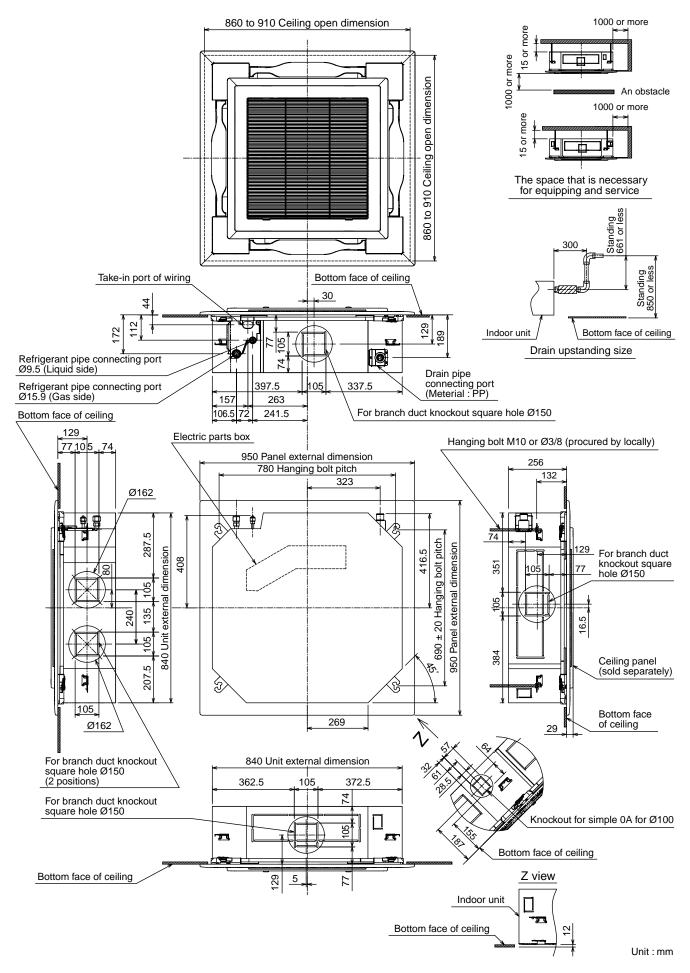
2. CONSTRUCTION VIEWS (EXTERNAL VIEWS)

2-1. Indoor Unit

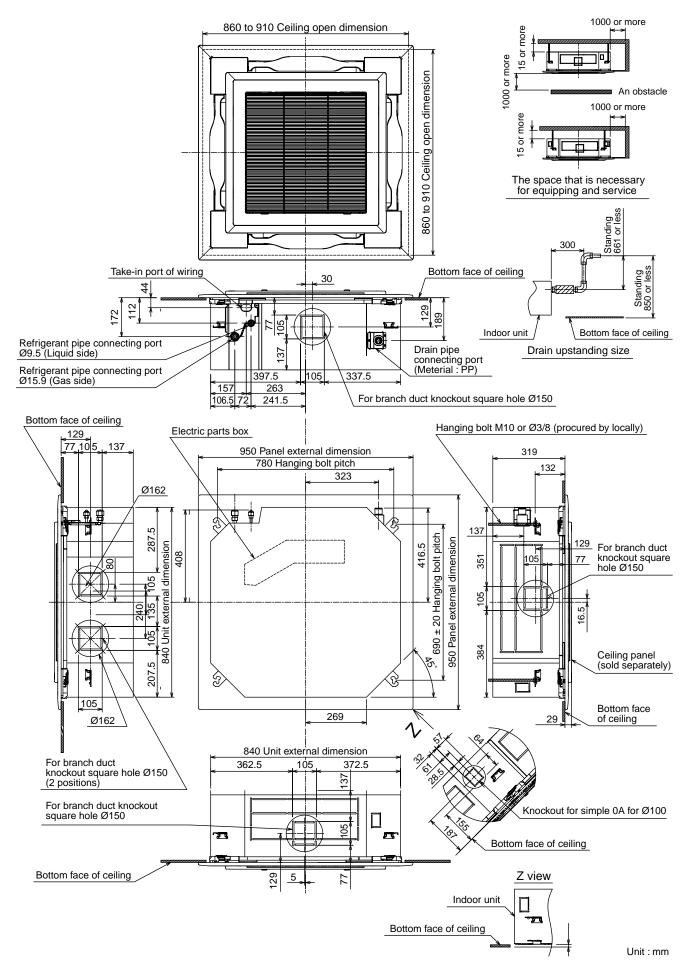
RAV-SM564UT-E



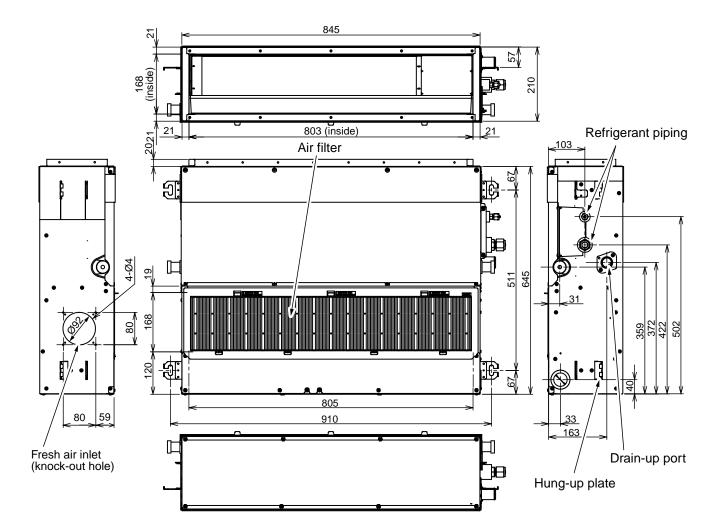
RAV-SM804UT-E

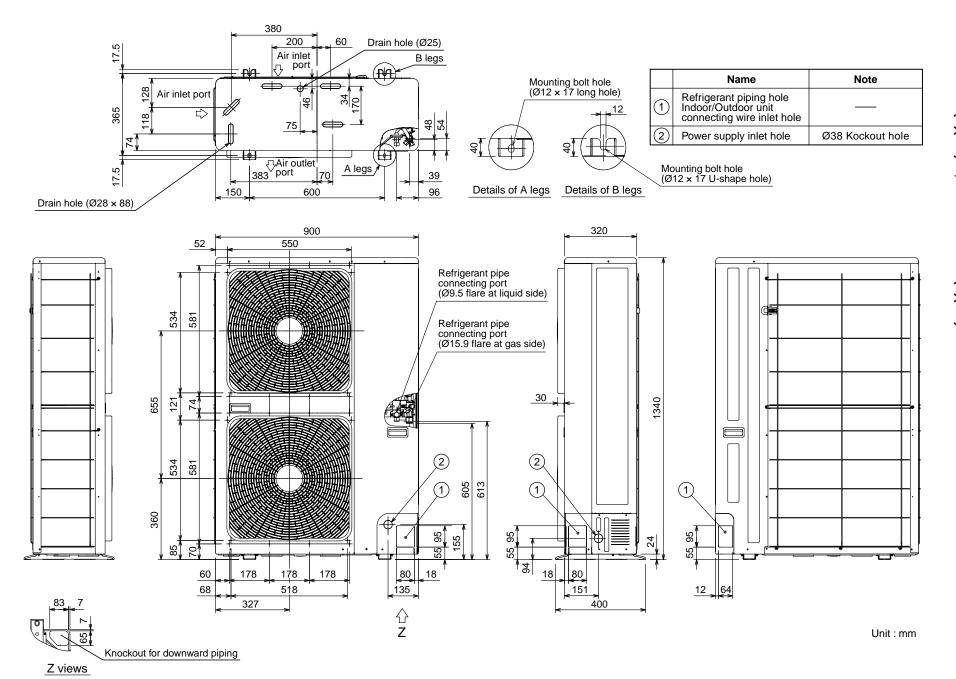


RAV-SM1104UT-E, RAV-SM1404UT-E



RAV-SM404SDT-E, RAV-SM454SDT-E, RAV-SM564SDT-E

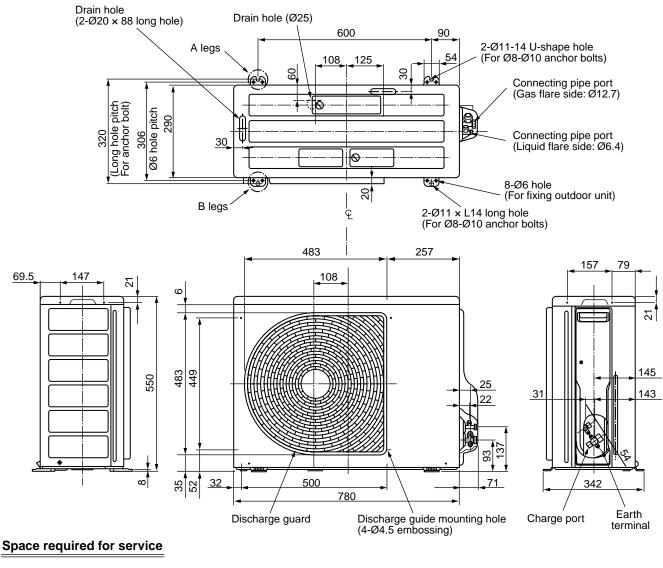


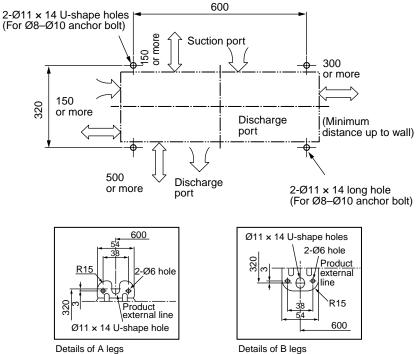




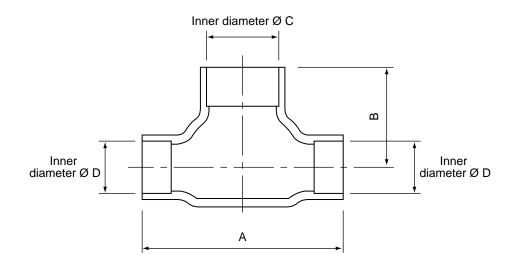
- 33 -

RAVSP404AT(Z)(ZG)-E, RAV-SP454AT(Z)(ZG)-E





RAV-TWP30E2, RAV-TWP50E2 (Simultaneous Twin)

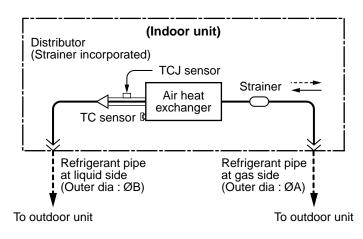


Model (RBC-)		Α	В	С	D
TWP30E2	Liquid side	36	14	Ø9.5	Ø6.4
	Gas side	43	23	Ø15.9	Ø12.7
	Liquid side	34	14	Ø9.5	Ø9.5
TWP50E2	Gas side	44	21	Ø15.9	Ø15.9

3. SYSTEMATIC REFRIGERATING CYCLE DIAGRAM

3-1. Indoor Unit

• Single type (Combination of 1 indoor unit and 1 outdoor unit)



Capillary tube specifications

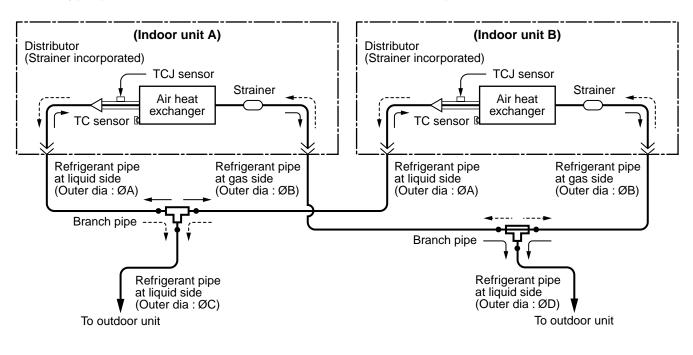
Model RAV-SM***UT	Inner dia. × Length × Q'ty		
SM56 type	Ø2 × 250 × 2, Ø2 × 350 × 1 Ø2 × 700 × 1		
SM80 type	Ø2 × 250 × 3, Ø2 × 500 × 1		
SM110, 140 type	Ø2 × 200 × 1, Ø2 × 300 × 2 Ø2 × 350 × 2, Ø2 × 700 × 1		

Dimension table

Indoor unit	Outer diameter of refrigerant pipe			
indoor unit	Gas side ØA	Liquid side ØB		
SM80, 110, 140 type	15.9	9.5		

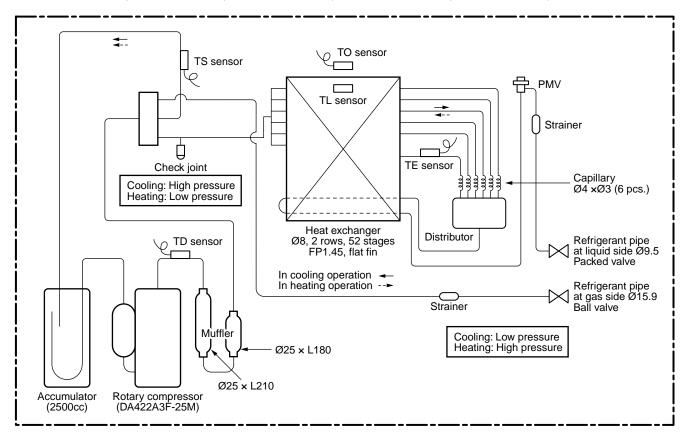
Model RAV-SM***SDT	Inner dia. × Length × Q'ty
SM40, 45, 56 type	Ø2 × 200 × 2, Ø2 × 350 × 1

• Twin type (Combination of 2 indoor units and 1 outdoor unit)



Indoor unit	Branch pipe RBC-	Α	В	С	D
SM56 × 2	TWP30E2	6.4	12.7	9.5	15.9
SM80 × 2	TWP50E2	9.5	15.9	9.5	15.9

3-2. Outdoor Unit



RAV-SP1104AT-E, SP1104ATZ-E, SP1104ATZG-E, RAV-SP1404AT-E, SP1404ATZ-E, SP1404ATZG-E

RAV-SP1104AT-E, RAV-SP1104ATZ-E, RAV-SP1104ATZG-E

			Pres	sure			Pipe surfac	e temperature	e (°C)		Compressor		Indoor/	Outdoor
		(M	Pa)	(kg/c	:m²g)	Discharge	Suction	Indoor heat exchanger		oor heat anger	drive revolution frequency	Indoor fan		onditions 'B) (°C)
		Pd	Ps	Pd	Ps	(TD)	(TS)	(TC)	(TL)	(TE)	(rps)		Indoor	Outdoor
	Standard	2.57	0.99	26.2	10.1	66	14	12	44	38	38	HIGH	27/19	35/-
Cooling	Overload	3.30	1.09	33.7	11.1	78	9	13	49	43	53	HIGH	32/24	43/-
	Low load	1.74	0.75	17.8	7.7	46	7	5	32	25	21	LOW	18/15.5	-5/-
	Standard	2.32	0.73	23.7	7.4	65	3	39	2	3	43	HIGH	20/-	7/6
Heating	Overload	3.22	1.17	32.9	11.9	73	19	54	14	15	26	LOW	30/-	24/18
	Low load	2.17	0.30	22.1	3.1	87	-15	38	-14	-13	71	HIGH	15/—	-15/-

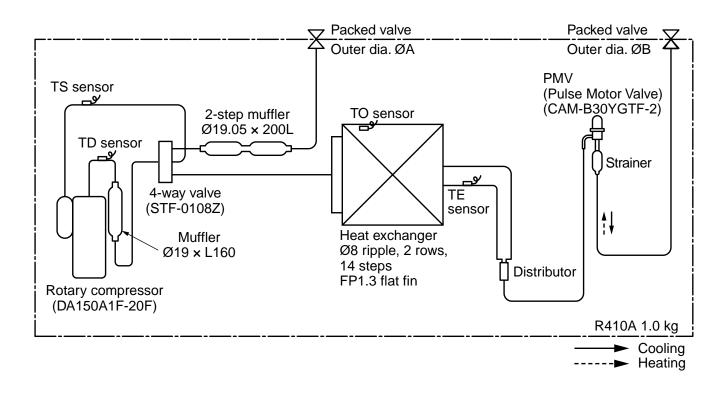
* This compressor has 4-pole motor. The value when compressor frequency (Hz) is measured by a clamp meter becomes 2 times of No. of compressor revolutions (rps).

RAV-SP1404AT-E, RAV-SP1404ATZ-E, RAV-SP1404ATZG-E

			Pres	sure			Pipe surfac	e temperature	∋ (°C)		Compressor		Indoor/0	
		(M	Pa)	(kg/c	:m²g)	Discharge	Suction	Indoor heat exchanger		oor heat anger	drive revolution frequency	Indoor fan	temp. conditions (DB/WB) (°C)	
		Pd	Ps	Pd	Ps	(TD)	(TS)	(TC)	(TL)	(TE)	(rps)		Indoor	Outdoor
	Standard	2.72	0.90	27.8	9.2	73	12	10	46	38	51	HIGH	27/19	35/-
Cooling	Overload	3.34	1.07	34.1	10.9	80	9	13	51	45	55	HIGH	32/24	43/-
	Low load	1.75	0.76	17.9	7.8	47	8	6	33	25	21	LOW	18/15.5	-5/-
	Standard	2.59	0.69	26.4	7.0	75	3	43	2	2	53	HIGH	20/-	7/6
Heating	Overload	3.13	1.05	31.9	10.7	72	16	53	12	13	26	LOW	30/-	24/18
	Low load	2.40	0.21	24.5	2.1	97	-22	42	-19	-18	90	HIGH	15/-	-15/-

* This compressor has 4-pole motor. The value when compressor frequency (Hz) is measured by a clamp meter becomes two times of No. of compressor revolutions (rps).

RAV-SP404AT-E, RAV-SP404ATZ-E, RAV-SP404ATZG-E RAV-SP454AT-E, RAV-SP454ATZ-E, RAV-SP454ATZG-E



RAV-SP404AT-E, RAV-SP404ATZ-E, RAV-SP404ATZG-E

			Pres	sure			Pipe surface	temperature (°C)	Compressor		Indoor/	Outdoor
		(M	Pa)	(kg/c	:m²g)	Discharge	Suction	Indoor heat exchanger	Outdoor heat exchanger	drive revolution frequency	Indoor fan		onditions 'B) (°C)
		Pd	Ps	Pd	Ps	(TD)	(TS)	(TC)	(TE)	(rps)		Indoor	Outdoor
	Standard	2.68	0.94	27.3	9.6	61	12	11	43	47	HIGH	27/19	35/-
Cooling	Overload	3.23	1.16	32.9	11.8	77	14	15	50	50	HIGH	32/24	43/-
	Low load	1.34	0.70	13.7	7.1	36	4	2	8	44	LOW	18/15.5	-5/-
	Standard	2.38	0.70	24.3	7.1	65	7	39	4	49	HIGH	20/-	7/6
Heating	Overload	3.39	1.03	34.6	10.5	83	20	54	16	49	LOW	30/-	24/18
	Low load	1.95	0.26	19.9	2.7	90	-17	32	-19	90	HIGH	15/—	-15/-

* This compressor has 4-pole motor. The value when compressor frequency (Hz) is measured by a clamp meter becomes 2 times of No. of compressor revolutions (rps).

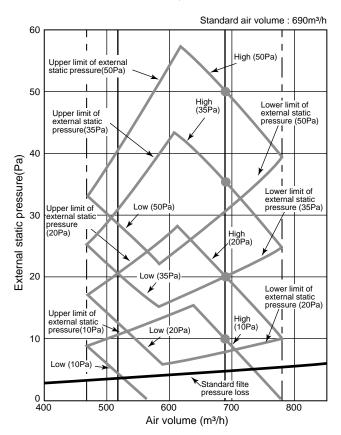
RAV-SP454AT-E, RAV-SP454ATZ-E, RAV-SP454ATZG-E

			Pres	sure			Pipe surface	temperature (°	°C)	Compressor		Indoor/	Outdoor
		(M	Pa)	(kg/c	:m²g)	Discharge	Suction	Indoor heat exchanger	Outdoor heat exchanger	drive revolution frequency	Indoor fan		onditions B) (°C)
		Pd	Ps	Pd	Ps	(TD)	(TS)	(TC)	(TE)	(rps)		Indoor	Outdoor
	Standard	2.81	0.89	28.7	9.1	68	11	10	41	53	HIGH	27/19	35/-
Cooling	Overload	3.24	1.16	33.0	11.8	78	14	15	51	53	HIGH	32/24	43/-
	Low load	1.34	0.70	13.7	7.1	36	4	2	8	44	LOW	18/15.5	-5/-
	Standard	2.53	0.68	25.8	6.9	70	7	41	4	56	HIGH	20/-	7/6
Heating	Overload	3.39	1.03	34.6	10.5	83	20	54	16	49	LOW	30/-	24/18
	Low load	2.00	0.25	20.4	2.6	92	-17	33	-19	98	HIGH	15/-	-15/-

* This compressor has 4-pole motor. The value when compressor frequency (Hz) is measured by a clamp meter becomes two times of No. of compressor revolutions (rps).

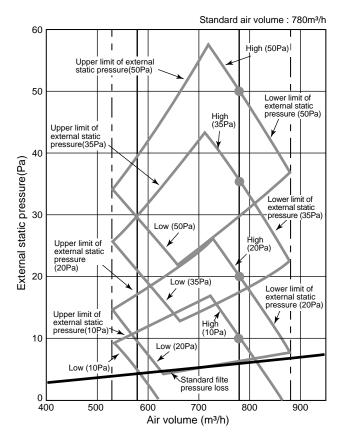
4. FAN CHARACTERISTICS

4-1. Slim Duct (Filter Attached)



RAV-SM404SDT-E, RAV-SM454SDT-E

RAV-SM564SDT-E

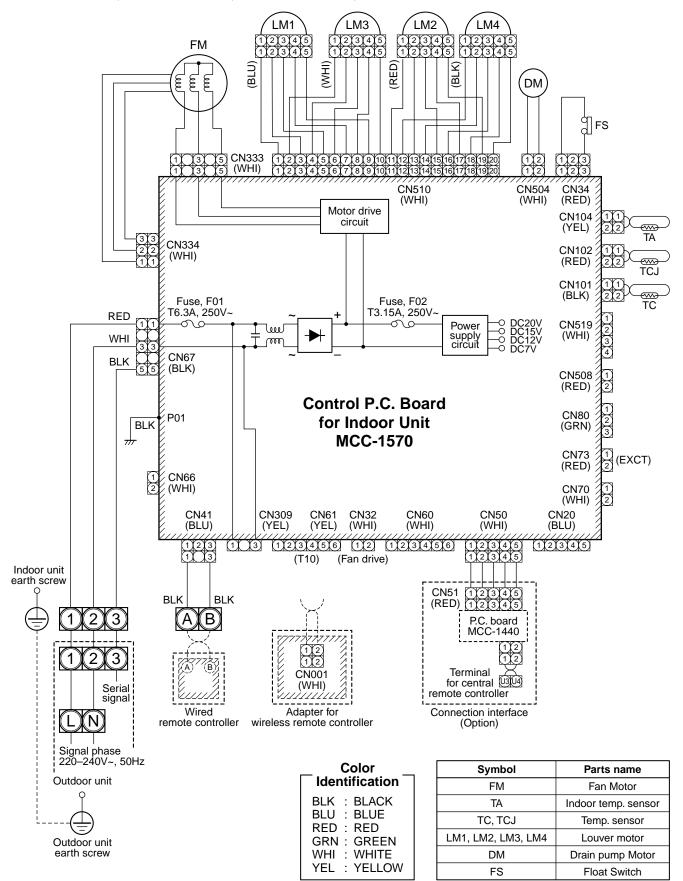


5. WIRING DIAGRAM

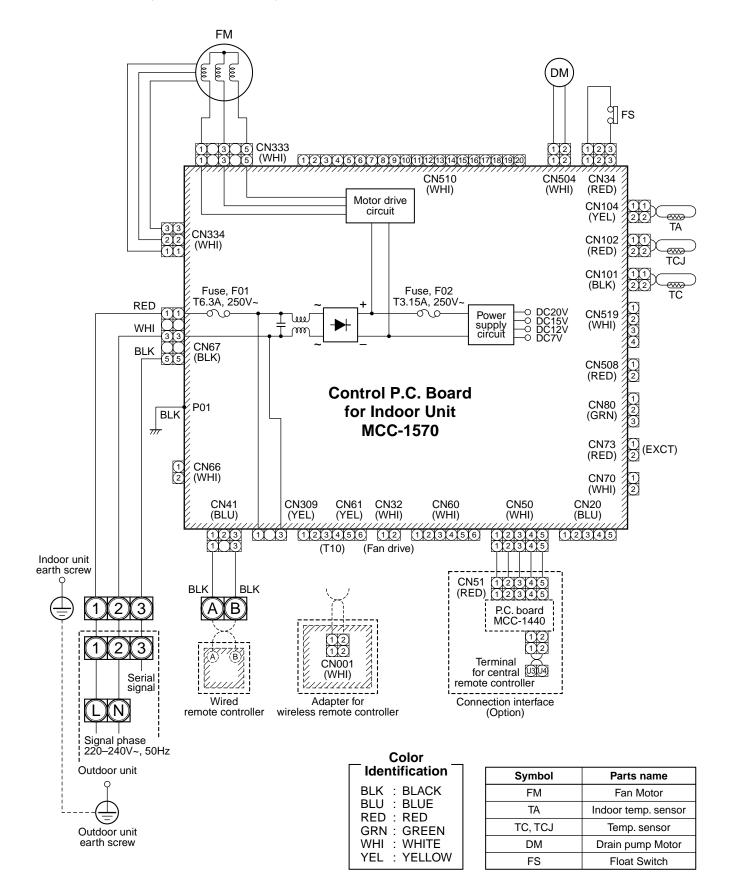
5-1. Indoor Unit

5-1-1. 4-Way Air Discharge Cassette Type

RAV-SM564UT-E, RAV-SM804UT-E, RAV-SM1104UT-E, RAV-SM1404UT-E

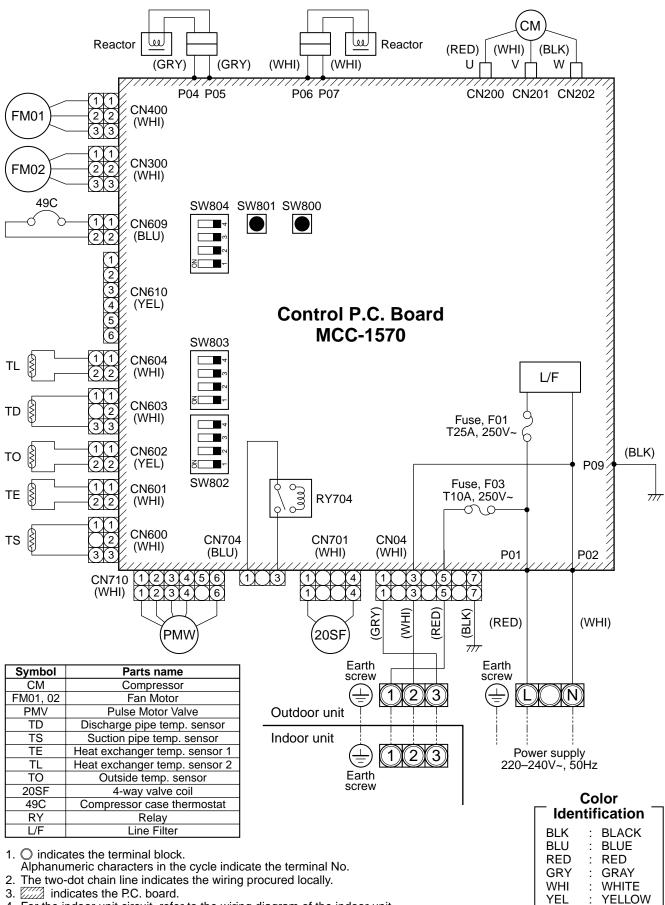


5-1-2. Slim Duct Type RAV-SM404SDT-E, RAV-SM454SDT-E, RAV-SM564SDT-E

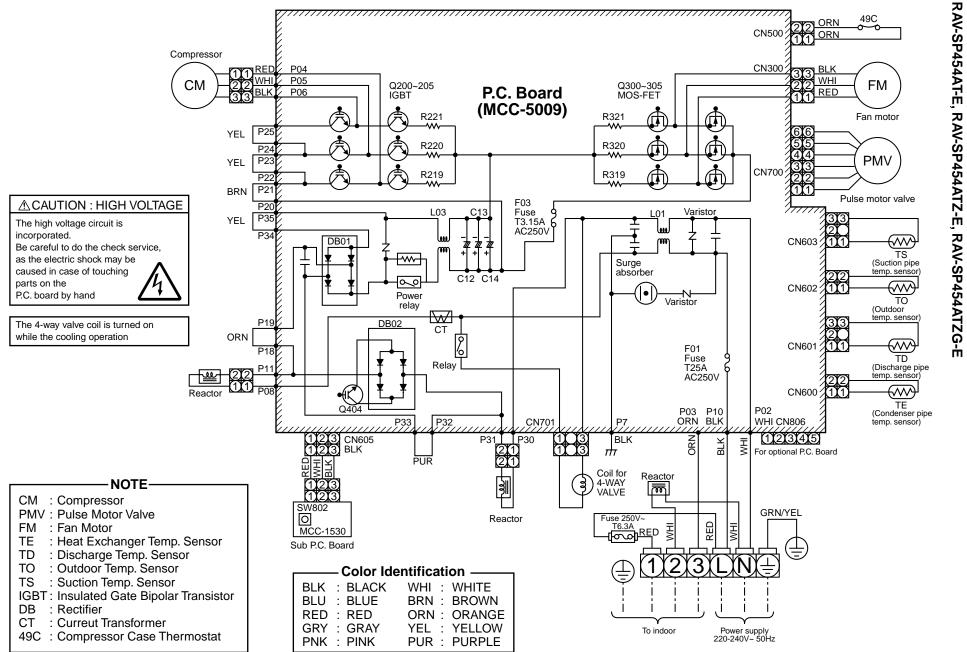


5-2. Outdoor Unit

RAV-SP1104AT-E, SP1104ATZ-E, 1104ATZG-E RAV-SP1404AT-E, SP1404ATZ-E, 1404ATZG-E



4. For the indoor unit circuit, refer to the wiring diagram of the indoor unit.



RAV-SP404AT-E, RAV-SP404ATZ-E, RAV-SP404ATZG-E RAV-SP454AT-E, RAV-SP454ATZ-E, RAV-SP454ATZG-E

6. SPECIFICATIONS OF ELECTRICAL PARTS

6-1. Indoor Unit

RAV-SM564UT-E, RAV-SM804UT-E

No.	Parts name	Туре	Specifications
1	Fan motor (for indoor)	SWF-230-60-2R	Output (Rated) 60 W
2	Thermo. sensor (TA-sensor)	328 mm	10 kΩ at 25°C
3	Heat exchanger sensor (TCJ-sensor)	Ø6 mm, 1000 mm	10 kΩ at 25°C
4	Heat exchanger sensor (TC-sensor)	Ø6 mm, 950 mm	10 kΩ at 25°C
5	Float switch	FS-0218-102	
6	Drain pump motor	MDP-1401	

RAV-SM1104UT-E, RAV-SM1404UT-E

No.	Parts name	Туре	Specifications
1	Fan motor	ICF-280-150-1	Output (Rated) 90 W
2	Thermo. sensor (TA-sensor)	328 mm	10 kΩ at 25°C
3	Heat exchanger sensor (TCJ-sensor)	Ø6 mm, 1000 mm	10 kΩ at 25°C
4	Heat exchanger sensor (TC-sensor)	Ø6 mm, 950 mm	10 kΩ at 25°C
5	Float switch	FS-0218-102	
6	Drain pump motor	MDP-1401	

RAV-SM404SDT-E, RAV-SM454SDT-E, RAV-SM564SDT-E

No.	Parts name	Туре	Specifications
1	Fan motor	SWF-280-60-3	—
2	Drain pump motor	MDP-1401	—
3	Float switch	FS-0218-102	—
4	TA sensor	Lead wire length : 328mm	10 kΩ at 25°C
5	TC sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Black)	10 kΩ at 25°C
6	TCJ sensor	Ø6 size lead wire length : 1200mm Vinyl tube (Red)	10 kΩ at 25°C

6-2. Outdoor Unit (Parts Ratings)

RAV-SP1104AT-E, RAV-SP1104ATZ-E, RAV-SP1104ATZG-E RAV-SP1404AT-E, RAV-SP1404ATZ-E, RAV-SP1404ATZG-E

No.	Parts name	Туре	Specifications
1	Compressor	DA422A3F-25M	
2	Outdoor fan motor	ICF-280-A100-1	Output 100W
3	Reactor	CH-62	5.7mH, 18.5A
4	4-way valve coil	VHV-01AP552B1	AC240V
5	PMV coil	UKV-A038	DC12V
6	P.C. board	MCC-1571	AC220 – 240V
7	Fuse (Mounted on P.C. board)	—	AC250V, 25A
8	Fuse (Mounted on P.C. board)	—	AC250V, 10A
9	Fuse (Mounted on P.C. board)	—	AC250V, 3.15A
10	Outdoor temp. sensor (TO sensor)	_	10 kΩ at 25°C
11	Heat exchanger sensor (Te sensor)	—	10 kΩ at 25°C
12	Discharge temp. sensor (Td sensor)	_	50 kΩ at 25°C
13	Heat exchanger mid. Temp sensor (TL sensor)	—	10 kΩ at 25°C
14	Compressor thermo. (Protection)	US-622	OFF: 125 ± 4°C, ON: 90 ± 5°C

RAV-SP404AT-E, RAV-SP404ATZ-E, RAV-SP404ATZG-E RAV-SP454AT-E, RAV-SP454ATZ-E, RAV-SP454ATZG-E

No.	Parts name	Туре	Specifications
1	Fan motor	ICF-140-43-4R	Output (Rated) 43W
2	Compressor	DA150A1F-20F	3 phase, 4P, 1100W
3	Reactor	CH-57	10mH, 16A
4	Outdoor temp. sensor (To sensor)	—	10 kΩ at 25°C
5	Heat exchanger sensor (Te sensor)	—	10 kΩ at 25°C
6	Suction temp. sensor (Ts sensor)	—	10 kΩ at 25°C
7	Discharge temp. sensor (Td sensor)	—	50 kΩ at 25°C
8	Fuse (Switching power (Protect))	—	T3.15A, AC 250V
9	Fuse (Inverter, input (Current protect))	—	AC240V
10	4-way valve solenoid coil	STF-01AJ502E1	
11	Compressor thermo. (Protection)	US-622	OFF: 125 ± 4°C, ON: 90 ± 5°C
12	Coil (Pulse Motor Valve)	CAM-MD12TF-6	—

6-3. Accessory Separate Sold Parts

RBC-U31PG(WS)-E, RBC-U31PG(W)-E (Ceiling panel) RAV-SM564UT-E, RAV-SM804UT-E, RAV-SM1104UT-E, RAV-SM1404UT-E

No.	Parts name	Туре	Specifications
1	Motor-louver	MP24ZN3N	DC 12 V
2			

7. 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.

7-1. Safety During Installation/Servicing

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.

 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.

 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.

- 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 may result in water leakage, electric shock and fire, etc.

7-2. Refrigerant Piping Installation

7-2-1. 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 7-2-1. Never use copper pipes thinner than 0.8mm even when it is available on the market.

NOTE:

Refer to the "7-6. Instructions for Re-use Piping of R22 or R407C".

		Thickness (mm)			
Nominal diameter	Outer diameter (mm)	R410A	R22		
1/4	6.4	0.80	0.80		
3/8	9.5	0.80	0.80		
1/2	12.7	0.80	0.80		
5/8	15.9	1.00	1.00		

Table 7-2-1 Thicknesses of annealed copper pipes

1. 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 7-2-3 to 7-2-5 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 7-2-2.

Nominal diameter	Reference outer diameter of copper pipe jointed (mm)	Minimum joint thickness (mm)
1/4	6.4	0.50
3/8	9.5	0.60
1/2	12.7	0.70
5/8	15.9	0.80

Table 7-2-2 Minimum thicknesses of socket joints

7-2-2. 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.

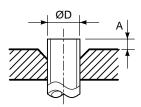


Fig. 7-2-1 Flare processing dimensions

Table 7-2-3	Dimensions related to flare proces	ssing for R410A / R22
-------------	------------------------------------	-----------------------

			A (mm)						
Nominal diameter	Outer diameter (mm)	Thickness (mm)	Flare tool for R410A, R22	Conventional flare tool (R410A)		Conventional flare tool (R22)			
			clutch type	Clutch type	Wing nut type	Clutch type	Wing nut type		
1/4	6.4	0.8	0 to 0.5	1.0 to 1.5	1.5 to 2.0	0.5 to 1.0	1.0 to 1.5		
3/8	9.5	0.8	0 to 0.5	1.0 to 1.5	1.5 to 2.0	0.5 to 1.0	1.0 to 1.5		
1/2	12.7	0.8	0 to 0.5	1.0 to 1.5	2.0 to 2.5	0.5 to 1.0	1.5 to 2.0		
5/8	15.9	1.0	0 to 0.5	1.0 to 1.5	2.0 to 2.5	0.5 to 1.0	1.5 to 2.0		

Table 7-2-4 Flare and flare nut dimensions for R410A

Nominal	Outer diameter	Thickness		Dimension (mm)			Flare nut width
diameter	(mm)	(mm)	Α	В	С	D	(mm)
1/4	6.4	0.8	9.1	9.2	6.5	13	17
3/8	9.5	0.8	13.2	13.5	9.7	20	22
1/2	12.7	0.8	16.6	16.0	12.9	23	26
5/8	15.9	1.0	19.7	19.0	16.0	25	29

Table 7-2-5 Flare and flare nut dimensions for R22

Nominal	Outer diameter	Thickness	Dimension (mm)			Flare nut width	
diameter	(mm)	(mm)	Α	В	С	D	(mm)
1/4	6.4	0.8	9.1	9.2	6.5	13	17
3/8	9.5	0.8	13.0	13.5	9.7	20	22
1/2	12.7	0.8	16.2	16.0	12.9	20	24
5/8	15.9	1.0	19.4	19.0	16.0	23	27
3/4	19.0	1.0	23.3	24.0	19.2	34	36

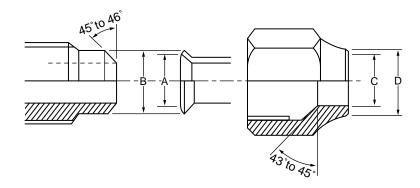


Fig. 7-2-2 Relations between flare nut and flare seal surface

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

Nominal diameter	Outer diameter (mm)	Tightening torque N•m (kgf•m)	Tightening torque of torque wrenches available on the market N•m (kgf•m)
1/4	6.4	14 to 18 (1.4 to 1.8)	16 (1.6), 18 (1.8)
3/8	9.5	33 to 42 (3.3 to 4.2)	42 (4.2)
1/2	12.7	50 to 62 (5.0 to 6.2)	55 (5.5)
5/8	15.9	63 to 77 (6.3 to 7.7)	65 (6.5)

Table 7-2-6	Tightening torque	e of flare for R410A	[Reference values]

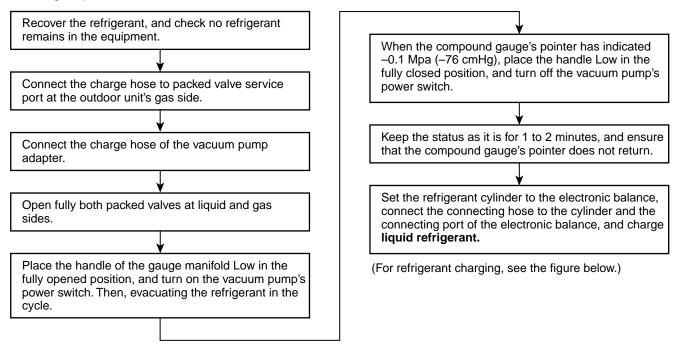
7-3. Tools

7-3-1. Required Tools

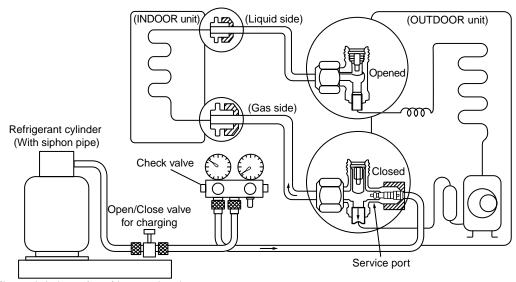
Refer to the "4. Tools" (Page 8)

7-4. 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.



Electronic balance for refrigerant charging

Fig. 7-4-1 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.

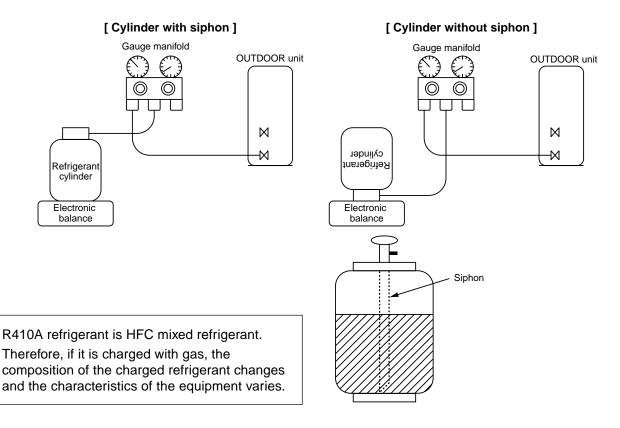


Fig. 7-4-2

7-5. Brazing of Pipes

7-5-1. Materials for Brazing

1. Silver brazing filler

Silver brazing filler is an alloy mainly composed of silver and copper.

It is used to join iron, copper or copper alloy, and is relatively expensive though it excels in solderability.

2. Phosphor bronze brazing filler

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

3. Low temperature brazing filler

Low temperature brazing filler is generally called solder, and is an alloy of tin and lead.

Since it is weak in adhesive strength, do not use it for refrigerant pipes.

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

7-5-2. 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.
- When chlorine contained in the flux remains within the pipe, the lubricating oil deteriorates. Therefore, use a flux which does not contain chlorine.
- 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.

7-5-3. 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 flow.



1. Brazing method to prevent oxidation

- 1) Attach a reducing valve and a flow-meter to the Nitrogen gas cylinder.
- Use a copper pipe to direct the piping material, and attach a flow-meter to the cylinder.
- Apply a seal onto the clearance between the piping material and inserted copper pipe for Nitrogen in order to prevent backflow of the Nitrogen gas.
- 4) When the Nitrogen gas is flowing, be sure to keep the piping end open.
- 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.

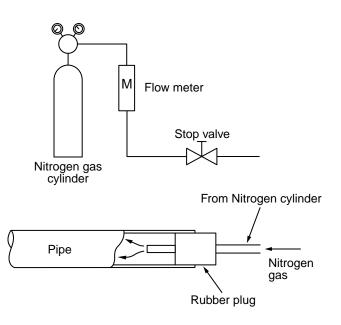


Fig. 7-5-1 Prevention of oxidation during brazing

7-6. Instructions for Re-use Piping of R22 or R407C

Instruction of Works:

The existing R22 and R407C piping can be reused for our digital inverter R410A products installations.

NOTE)

Confirmation of existence of scratch or dent of the former pipes to be applied and also confirmation of reliability of the pipe strength are conventionally referred to the local site.

If the definite conditions can be cleared, it is possible to update the existing R22 and R407C pipes to those for R410A models.

7-6-1. Basic Conditions Needed to Reuse the Existing Pipe

Check and observe three conditions of the refrigerant piping works.

- 1. Dry (There is no moisture inside of the pipes.)
- 2. Clean (There is no dust inside of the pipes.)
- 3. Tight (There is no refrigerant leak.)

7-6-2. Restricted Items to Use the Existing Pipes

In the following cases, the existing pipes cannot be reused as they are. Clean the existing pipes or exchange them with new pipes.

- 1. When a scratch or dent is heavy, be sure to use the new pipes for the works.
- 2. When the thickness of the existing pipe is thinner than the specified "Pipe diameter and thickness" be sure to use the new pipes for the works.
 - The operating pressure of R410A is high (1.6 times of R22 and R407C). If there is a scratch or dent on the pipe or thinner pipe is used, the pressure strength is poor and may cause breakage of the pipe at the worst.
- * Pipe diameter and thickness (mm)

Pipe outer	diameter	Ø6.4	Ø9.5	Ø12.7	Ø15.9	Ø19.0
	R410A					
Thickness	R22 (R407C)	0.8	0.8	0.8	1.0	1.0

- In case that the pipe diameter is Ø12.7 mm or less and the thickness is less than 0.7 mm, be sure to use the new pipes for works.
- 3. The pipes are left as coming out or gas leaks. (Poor refrigerant)
 - There is possibility that rain water or air including moisture enters in the pipe.
- Refrigerant recovery is impossible. (Refrigerant recovery by the pump-down operation on the existing air conditioner)
 - There is possibility that a large quantity of poor oil or moisture remains inside of the pipe.
- 5. A dryer on the market is attached to the existing pipes.
 - There is possibility that copper green rust generated.

- Check the oil when the existing air conditioner was removed after refrigerant had been recovered. In this case, if the oil is judged as clearly different compared with normal oil
 - The refrigerator oil is copper rust green : There is possibility that moisture is mixed with the oil and rust generates inside of the pipe.
 - There is discolored oil, a large quantity of the remains, or bad smell.
 - A large quantity of sparkle remained wear-out powder is observed in the refrigerator oil.
- The air conditioner which compressor was exchanged due to a faulty compressor.
 When the discolored oil, a large quantity of the remains, mixture of foreign matter, or a large quantity of sparkle remained wear-out powder is observed, the cause of trouble will occur.
- 8. Installation and removal of the air conditioner are repeated with temporary installation by lease and etc.
- In case that type of the refrigerator oil of the existing air conditioner is other than the following oil (Mineral oil), Suniso, Freol-S, MS (Synthetic oil), alkyl benzene (HAB, Barrel-freeze), ester series, PVE only of ether series.
 - Winding-insulation of the compressor may become inferior.

NOTE)

The above descriptions are results of confirmation by our company and they are views on our air conditioners, but they do not guarantee the use of the existing pipes of the air conditioner that adopted R410A in other companies.

7-6-3. Branching Pipe for Simultaneous Operation System

 In the concurrent twin system, when TOSHIBAspecified branching pipe is used, it can be reused. Branching pipe model name: RBC-TWP30E-2, RBC-TWP50E-2 On the existing air conditioner for simultaneous operation system (twin system), there is a case of using branch pipe that has insufficient compressive strength.

In this case please change it to the branch pipe for R410A.

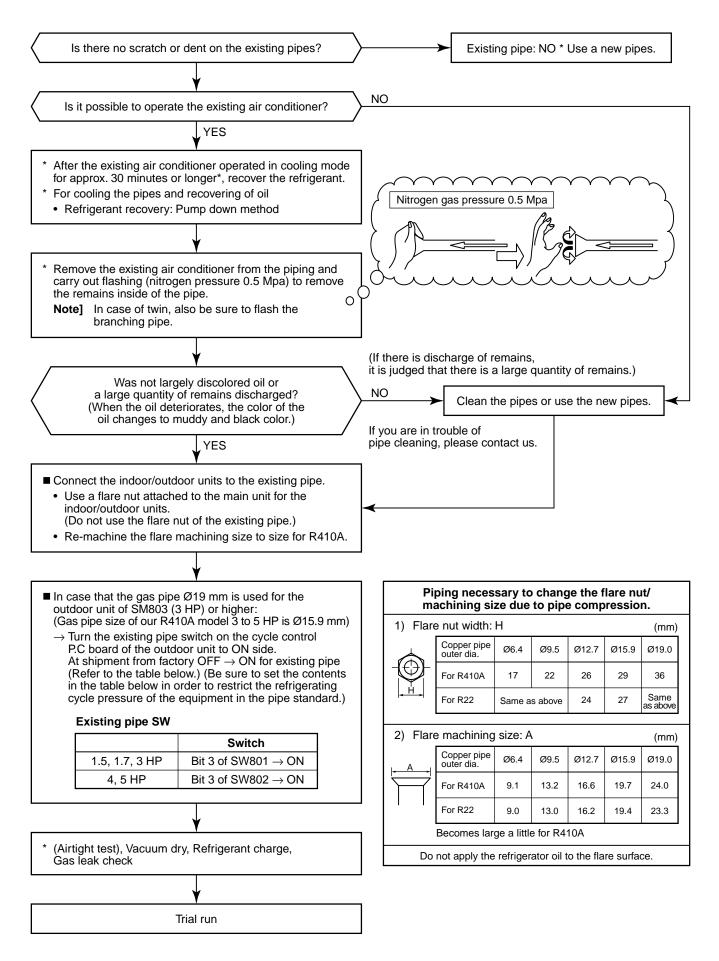
7-6-4. Curing of Pipes

When removing and opening the indoor unit or outdoor unit for a long time, cure the pipes as follows:

- Otherwise rust may generate when moisture or foreign matter due to dewing enters in the pipes.
- The rust cannot be removed by cleaning, and a new piping work is necessary.

Place position	Term	Curing manner		
Outdooro	1 month or more	Pinching		
Outdoors	Less than 1 month	Dinching or toping		
Indoors	Every time	Pinching or taping		

7-6-5. Final Installation Checks



7-6-6. Handling of Existing Pipe

When using the existing pipe, carefully check it for the following:

- Wall thickness (within the specified range)
- Scratches and dents
- Water, oil, dirt, or dust in the pipe
- Flare looseness and leakage from welds
- Deterioration of copper pipe and heat insulator

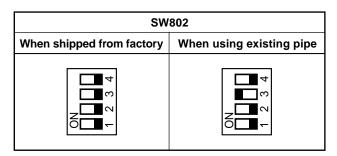
Cautions for using existing pipe

- Do not reuse the flare to prevent gas leak.
 Replace it with the supplied flare nut and then process it to a flare.
- Blow nitrogen gas or use an appropriate means to keep the inside of the pipe clean.
 If discolored oil or much residue is discharged, wash the pipe.
- Check welds, if any, on the pipe for gas leak. When the pipe corresponds to any of the following, do not use it. Install a new pipe instead.
- The pipe has been open (disconnected from indoor unit or outdoor unit) for a long period.
- The pipe has been connected to an outdoor unit that does not use refrigerant R22, R410A or R407C.
- The existing pipe must have a wall thickness equal to or larger than the following thickness.

Reference outside diameter (mm)	Wall thickness (mm)
Ø9.5	0.8
Ø15.9	1.0
Ø19.1	1.0

- Never use any pipe with a wall thickness less than these thicknesses due to insufficient pressure capacity.
- To use an existing Ø19.1 mm pipe, set bit 3 of SW802 (switch for existing pipe) on the P.C. board of the outdoor unit to ON.

In this case, the heating performance may be reduced depending on the outside air temperature and room temperature.



7-6-7. Recovery Method of Refrigerant for RAV-SP1104AT-E, RAV-SP1404AT-E

• Use the refrigerant recovery switch SW801 on the P.C. board of the outdoor unit to recover refrigerant when the indoor unit or outdoor unit is moved.

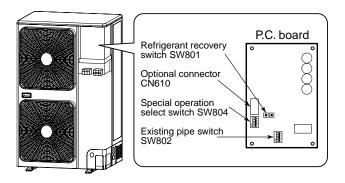
Operation method

- 1. Turn on the power of the air conditioner.
- 2. Select the FAN mode for indoor unit operation with the remote controller.
- 3. Set SW804 on the P.C. board of the outdoor unit to all OFF, and then push SW801 for one second or more.

The air conditioner enters the forced cooling mode for up to 10 minutes.

Operation or handling the valve to recover refrigerant during this time period.

- 4. Upon completion of refrigerant recovery, close the valve and push SW801 for at least one second to stop operation.
- 5. Turn off the power.



A DANGER

Take care for an electric shock because the P.C.board is electrified.

7-6-8. Recovery method of refrigerant for

RAV-SP404AT-E, RAV-SP404ATZ-E, RAV-SP404ATZG-E RAV-SP454AT-E, RAV-SP454ATZ-E, RAV-SP454ATZG-E

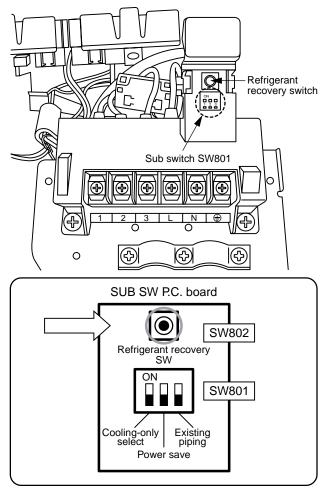
• When recovering refrigerant in case of reinstallation of the indoor or outdoor unit, etc., use the refrigerant recovery switch on the terminal block of the outdoor unit.

[Operation method]

- 1. Set FAN operation to the indoor unit.
- Push the refrigerant recovery switch (SW802) of the outdoor unit (Keep pushing it for approx. 2 seconds.). The cooling operation starts. (This operation continues for 10 minutes.)
- 3. After operation for 3 minutes or more, close the valve at liquid side.
- 4. After finish of the refrigerant recovery, close the valve at gas side.
- 5. When keeping pushed the refrigerant recovery SW again for approx. 2 seconds, the outdoor unit stops.
- 6. Stop the indoor unit and then turn off the power supply.

DANGER

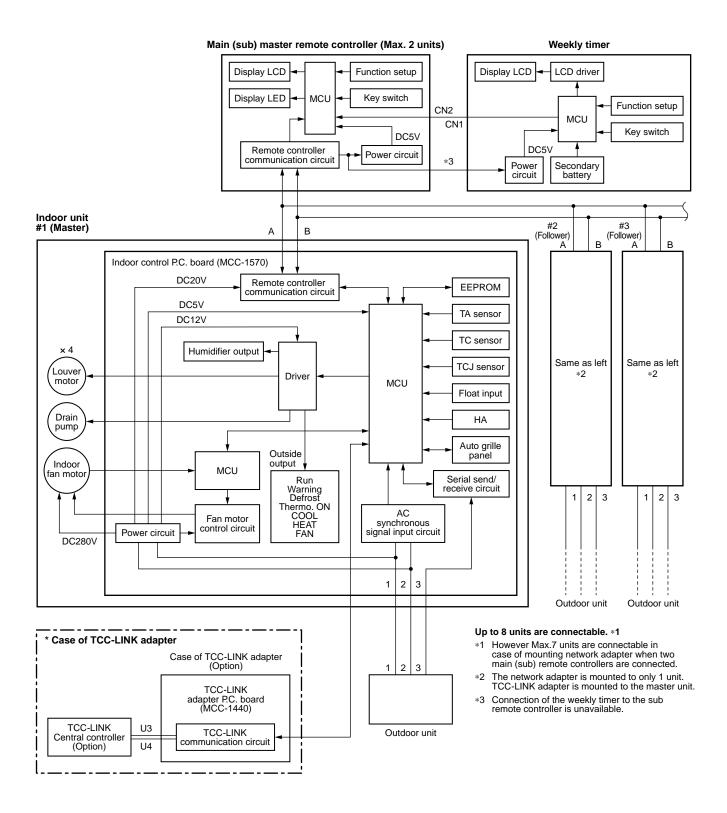
Take care for an electric shock because the control P.C. board is electrified.



8. INDOOR CONTROL CIRCUIT

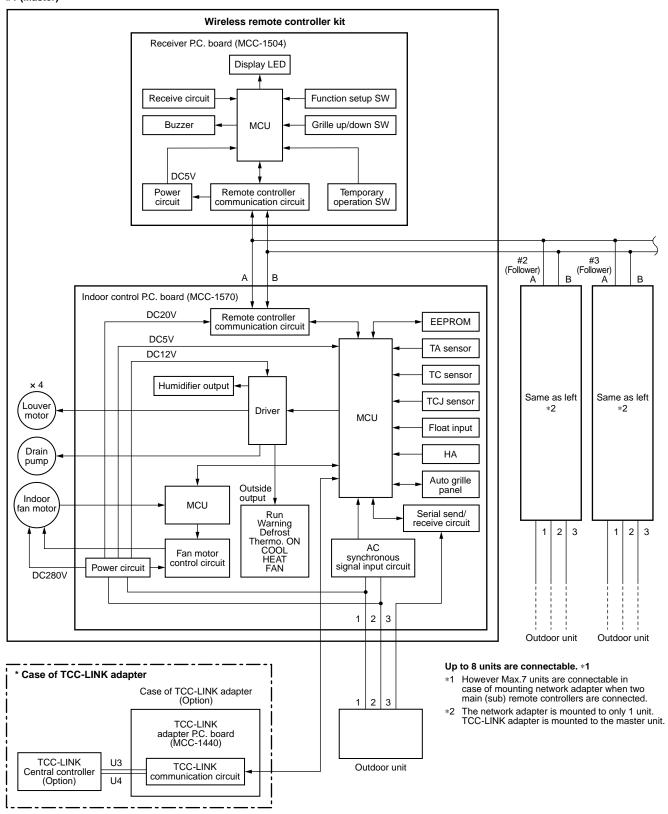
8-1. Indoor Controller Block Diagram

8-1-1. Connection of Main (Sub) Remote Controller



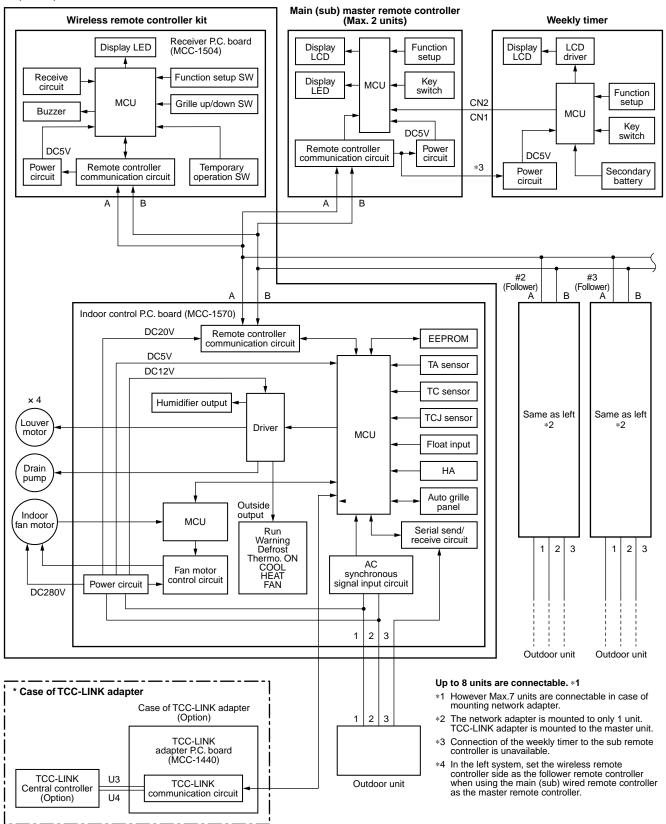
8-1-2. Connection of Wireless Remote Controller Kit





8-1-3. Connection of Both Main (Sub) Remote Controller and Wireless Remote Controller Kit





8-2. Control Specifications

No.	ltem	Outlin	ne of specifications		Remarks		
1	When power supply is reset	 Distinction of outdoor When the power supp guished and the contu distinguished result. Setting of indoor fan s adjustment Based on EEPROM of speed and the exister 	Air speed (rpm)/ Air direction adjustment				
2	Operation mode selection	1) Based on the operation		nand from the			
		Remote controller command	Control outlin	ne			
		STOP	Air conditioner stops.				
		FAN	Fan operation				
		COOL	Cooling operation				
		DRY	Dry operation				
		HEAT	Heating operation		Ta: Room temp.		
		+1.0 Ta (°C) Ts+α	//// Cooling operation ///// Cooling thermo. OFF (F • Setup air volume –	//// Fan)			
		-1.0	//// Heating ////// operation //////	7/			
		 α is corrected acc 	cording to the outside terr	nperature.			
		Outside temp.	Correction value (α)			
		No To	0K		k = deg		
		$To \ge 24^{\circ}C$	-1K				
		24 > To ≥ 18°C	0K				
		To < 18°C	+1K				
		To error	0K				
3	Room temp. control	1) Adjustment range: Rer					
			OOL/DRY HEAT	AUTO			
			18 to 29 18 to 29 18 to 30 16 to 30	18 to 29 17 to 27			

No.	Item	Outline of specifications						Remarks
3	Room temp. control	2) Using the Item code 06, operation can be correct		up tempe	erature i	n heatin	g	Shift of suction temperature in heating
	(Continued)	Setup data	0	2	4	6		operation
		Setup temp. correction	+0°C	+2°C	+4°C	+6°C		
		Setting at shipment						
		Setup data 2						
4	Automatic capacity control (GA control)	 Based on the difference frequency is instructed to Cooling operation 				operatio	on	
		Every 90 seconds, the ro between temperature de varied room temperature the correction value of th the present frequency co	tected l value a ne frequ	oy Ta and are calcu ency col	d Ts and Ilated to mmand	l the obtain	n	
		n : Count Ta (n-1) – Ts (n) : Varied	ts of det d room t	emp. va	lue	nds befo	re	
		ence between temperature varied room temperature the correction value of th	Heating operation Every 1 minute (60 sec.), the room temperature difference between temperature detected by Ta and Ts and the varied room temperature value are calculated to obtain the correction value of the frequency command and then the present frequency command is corrected. Ts (n) – Ta (n) : Room temp. difference n : Counts of detection Ta (n) – Ta (n – 1): Varied room temp. value n - 1 : Counts of detection of 1 minute before					
		Ts (n) – Ta (n) : Roon n : Coun Ta (n) – Ta (n – 1): Varie						
		The frequency correction cooling operation.					Э	
		However the maximum frequencies mately "S6".	requend	cy is limi	ted to ap	oproxi-		
		Note) When LOW is set up limited to approxima			frequer	ncy is		
5	Automatic cooling/heating control	shown below. When +1.5 and after thermoOFF, h exchanges to cooling op	The judgment of selecting COOL/HEAT is carried out as shown below. When +1.5 exceeds against Tsh 10 minutes and after thermoOFF, heating operation (Thermo. OFF) exchanges to cooling operation. Description in the parentheses shows an example of cooling ON/OFF.				Tsc: Setup temp. in cooling operation Tsh: Setup temp. in heating operation	
		or Tsc	+1.5 or Tsc Tsh (Cooling OFF)					+ temp. correction of room temp. control
		When –1.5 lowers again thermo. OFF, cooling ope to heating operation.	st Tsc 1 eration (0 minute Thermo	. OFF) e	exchange	es	
		 For the automatic capac cooling/heating, see Iten 		ol after j	udgmer	nt of		
		 For temperature correcti automatic heating, see It 		om temp	o. contro	l in		

No.	ltem	Outline of specifications	Remarks
6	Air speed selection	1) Operation with (HH), (H), (L) or [AUTO] mode is carried out by the command from the remote controller. 2) When the air speed mode [AUTO] is selected, the air speed varies by the difference between Ta and Ts. COOL> Ta (°C) +3.0 A +2.5 (HH) +2.0 A +1.5 A +1.5 H+ (HH) +1.0 C +1.0 H (HH) +0.5 L (H) -0.5 L (H) -0.5 C C C	HH > H+ > H > L+ > L > UL
		 Controlling operation in case when thermo of remote controller works is same as a case when thermo of the body works. 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. When cooling operation has started, select a downward slope for the air speed, 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 cooling operation. 	
		HEAT> Ta (°C) L (L+) (-0.5) -1.0 L (L+) (0) Tsh L+ (H) (+1.0) +2.0 H+ (+1.5) +3.0 HH (+2.0) +4.0 HH	
		 Value in the parentheses indicates one when thermostat of the remote controller works. Value without parentheses indicates one when thermostat of the body works. If the air speed has been changed once, it is not changed for 1 minute. However when the air speed I exchanged, the air speed changes. When heating operation has started, select an upward slope for the air speed, 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 Tc ≥ 60°C, the air speed increases by 1 step. 	Tc: Indoor heat exchanger sensor temperature

No.	ltem		0	utline	of sp	ecific	ations	6			Remarks	
6	Air speed selection (Continued):	Item code [5d]		idard		e 1		be 3		be 6	Selection of high	
	In case of 4-way	SW501 (1)/(2)		/OFF		OFF		-/ON		/ON	ceiling type	
	Discharge	Tap		COOL		COOL		COOL	HEAT		Item code:	
	Cassette type	F1					НН	нн	HH	НН	[5d] or selection of	
	edeeette type	F2			нн	нн					high ceiling on P.C.	
		F3				H+	H+, H	H+, H	H+, H L+, L	H+, H L+, L	board SW501	
		F4			H+				,_			
		F5		НН		н						
		F6	НН		н		L+	L+				
		F7	H+	H+			L	L				
		F8		н		L+						
		F9	н		L+	L						
		FA		L+	L							
		FB	L+	L								
		FC	L									
		FD		UL		UL		UL		UL		
				01		02		01	ļ			
		Тар	SN	156		180 plution :		110 rpm)	SM	140		
		F1	6	10		30		7 9 11) 00	7	00		
				10								
		F2		50	-	90		70		70		
		F3		00		30		50 40		50		
		F4		50		70		40		50		
		F5		00		50		20		40		
		F6	390		440 410			10	630			
		F7		70				50		50		
		F8		50		30		90		90		
		F9		40		70		80		30		
		FA		30		50		50		50		
		FB		20		30		00		30		
		FC		10		20		00		20		
		FD	2	50	25	50	31	00	30	00		
		 3) In heating operation, the mode changes to [UL] if thermostat is turned off. 4) If Ta ≥ 25°C when heating operation has started and when defrost operation has been cleared, the air conditioner operates with (H) mode or higher mode for 1 minute after Tc entered in E zone of cool air discharge preventive control (Item 7). 5) In automatic cooling/heating operation, the revolution frequency of (HH) is set larger than that in the standard cooling/heating operation. 								However only when the high ceiling selection is set to		
	cooling/heating operation. Ta (°C) 47 47 42 F5 F4 However the revolution frequency is restricted in the automatic heating operation as shown in the following figure.							ation as	[Standard]			
			6) Self-clean (When perfo cooling ope	orming	self-c							[Self-clean @] is displayed.

No.	Item		0	utline	of sp	ecific	ations	5			Remarks
6	Air speed selection (Continued):	Slim Duct Type									
		Item code	Star	ndard	Ту	pe 1	Тур	be 3	Ту	pe 6	Selection of high static
	In case of	[5d]		0		1		3		6	pressure type
	Slim Duct Type	SW501 (1)/(2)	OFF	/OFF	ON	/OFF	OFF	/ON	ON	/ON	Item code:
	Omn Duot Typo	Тар	HEAT	COOL	HEAT	COOL	HEAT	COOL	HEAT	COOL	[5d] or selection of high
		F1							нн	НН	static pressure on P.C.
		F2					НН	нн	H+	H+	board SW501
		F3							н	н	
		F4			нн	НН	H+	H+			
		F5					н	н	L+	L+	
		F6									
		F7	нн	НН	H+	H+					
		F8			н	н	L+	L+			
		F9	H+	H+							
		FA	н	н	L+	L+					
		FB	L+	L+							
		FC	L	L						<u> </u>	
		FD			LL	LL	LL	LL	LL	LL	
		Slim Duct Ty	ne internet	1	I	1		I			
		Тар	-	SM40		SN	145		SM5	6	
				4000	Rev	olution		rpm)	4000		
		F1		1260			:60		1320		
		F2		1180			80		1220		
		F3		1120			20	_	1220		
		F4		1040			40		1220		
		F5		1020 990			90 90	_	1180		
		F6							1180 1180		
		F7		960			60 50				
		F8 F9		950 910			50 10	_	1040 990		
								_			
		FA FB		870 840			70 40		990 880		
		FC		790			+0 90		820		
		FD FD									
				550		5	50		550		
		 3) In heating of thermostat 4) If Ta ≥ 25°C defrost operates w Tc entered control (Iter 	is turr wher tation ith (H) in E z	ned off n heati has b mode	f. ing op een c e or hig	eratior leared gher m	n has s , the a node fo	starteo air con or 1 m	d and ditione inute a	er after	

No.	Item	Outline of specifications	Remarks
7	Cool air discharge preventive control	 In heating operation, the indoor fan is controlled based on the detected temperature of Tc sensor or Tcj sensor. As shown below, the upper limit of the revolution frequency is restricted. However B zone is assumed as C zone for 6 minutes and after when the compressor activated. In defrost operation, the control value of Tc is shifted by 6°C. 	In D and E zones, the priority is given to air volume selection setup of remote controller. In A zone while thermo is ON, [PRE-HEAT (*) (Heating ready)] is displayed.
		Tc (°C) 32 HH 32 H H E zone 28 UL D zone 20 OFF C zone B zone A zone	
8	Freeze preventive control (Low temperature release)	1) The cooling operation (including Dry operation) is performed as follows based on the detected temperature of Tc sensor or Tcj sensor. 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. In [K] zone, time counting is interrupted and the operation is held. When [1] zone is detected, the timer is cleared and the operation returns to the normal operation. 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 [1] zone is detected and the indoor fan operates with [L] mode.	Tcj: Indoor heat exchanger sensor temperature
		 In heating operation, the freeze-preventive control works if 4-way valve is not exchanged and the following conditions are satisfied. (However the temperature for J zone dashing control is changed from 2°C to -5°C.) <conditions></conditions> When ① or ② is established 5 minutes after activation. ① Tcn ≤ Tc (n - 1) - 5 ② Tcn < Tc (n - 1) - 1 and Tcn ≤ Ta < 5°C 	Tcn: Tc temperature when 5 minutes elapsed after activation Tc (n – 1): Tc temperature at start time

No.	ltem	Outline of specifications	Remarks
9	High-temp. release control	 1) The heating operation is performed as follows based on the detected temperature of Tc sensor or Tcj sensor. 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. Setup at shipment Tc (°C) A B 56 (54) 52 (52) 	However this control is ignored in case of the follower unit of the twin.
		NOTE: When the operation has started or when Tc or Tcj < 30°C at start of the operation or after operation start, temperature is controlled between values in parentheses of A and B.	Same status as that when "thermostat-OFF" (status that the air conditioner enters in the room temp. monitor mode when the temperature reached the setup temperature on the remote controller)
10	Drain pump control	 In cooling operation (including Dry operation), the drain pump is usually operated. If the float switch works while drain pump drives, the compressor stops, the drain pump continues the operation, and a check code is output. If the float switch works 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. 	Check code [P10]
11	After-heat elimination	When heating operation stops, in some cases, the indoor fan operates with (L) for approx. 30 seconds.	

No.	ltem	Outline of specifications	Remarks
12	Louver control: In case of 4-way Discharge Cassette type	 Louver position setup When the louver position is changed, the position moves necessarily to downward discharge position once to return to the set position. The louver position can be set up in the following operation range. In cooling/dry operation In heating/fan operation 	The louver position at horizontal discharge position at under SM80 differs from that at over SM110.
		 In group twin/triple operation, the louver positions can be set up collectively or individually. Swing setup (SWING) is displayed and the following display is repeated. In all operations Image: Im	The swinging louver moves usually up to the ceiling side from the louver position of the set time. Setup from the remote controller without button is unavailable. For the setup operation, refer to "How to set up louver individually" of Item "Setup at local site/Others". Using same as the present 4-way Air Discharge Cassette Type is possible

No.	ltem		Outline of s	pecifications	Remarks
12	Louver control	< <selection< td=""><td>n of Swing mode></td><td>></td><td></td></selection<>	n of Swing mode>	>	
12	Louver control (Continued): In case of 4-way Discharge Cassette type	 For the Sw selectable button pusi ① Standa → Data When S horizon operation ② Dual sw When C and [03 louvers dischar the sam ③ Cycle s When C the sam ③ Cycle s When C the sam ③ Cycle s When C the sam ⑤ Cycle s When C the sam ⑤ Cycle s When C the sam ⑤ Cycle s When C the sam ○ Cycle s Uhen C Uhen C the sam ○ Cycle s Uhen C the sam ○ Cycle s Uhen C the sam ○ Cycle s Uhen C the sam 	ing mode, the follow and settable by keep hed for 4 seconds or rd (4 pieces: same : [0001 (At shipmer Swing operation is s tal discharge position on at the same time ving \rightarrow Data: [000 operation is selected of louver No. [02] and ge position and the ne time. wing \rightarrow Data: [000 operation is selected contal discharge position ge position, [02] and art the Swing operation art the Swing mod up data of Item code selecting the Swing a following numerals	ing three types of modes are bing Swing/Direction r more on the remote controller. phase) swing ht)] selected, four louvers align at the on and then start the Swing a. D2] d, the louvers of louver No. [01] ontal discharge position, the und [04] move to the downward n start the Swing operation at D3] d, the louver No. [01] moves to obstion, [03] to the downward d [04] to the middle position and tion at the same time. les can be also selected and set e (DN) [F0]. g mode, "Dual swing" or "Cycle is displayed at the center of or approx. 3 seconds when select [SWING]. wing)	On the remote control- ler before the wired remote controller (RBC-AMT31E), the mode cannot be moved to the select mode even if pushing performs for a long time. Carry out setting operation during stop of the unit; otherwise the unit stops operation. The standard swing performs the same swing operation as the present operation (2 series). For the setting opera- tion, refer to [How to set up type of the swings] in Item "Setup at local site/Others". On the remote controller before the wired remote controller (RBC-AMT31E), flashing showing the Swing mode is not indicated.
		 For the air position ca An arbitrar registered 4 seconds The louver 	an be locked during y air direction of ar and set by keeping or more on the ren lock can be set by	each discharge port, the louver the normal operation. arbitrary louver can be button pushed for note controller. registering the setup data to ccording to the following table.	On the remote control- ler before the wired remote controller (RBC-AMT31E), INTELOUVER button is not provided. Carry out setting operation during stop of
			Objective louver No.	Setup data	the unit; otherwise the
		Item code	objective louver no.		surficient and set
		Item code F1	01	0000: Release (At shipment)	unit stops operation.
			-	0000: Release (At shipment) 0001: Horizontal discharge position	unit stops operation.
		F1	01		unit stops operation.

No.	Item		Outline of spec	Remarks				
12	Louver control (Continued): In case of 4-way Discharge	cont • Whil	ere is the locked louver in the u roller screen. e the following controls are per n if executing the louver lock.		For the setting operation, refer to [How to set louver lock] of Installation Manual.			
	Cassette type		Control which ignores lock	Objective louver No.				
		1	Operation stop	Full-close position				
		2	When heating operation started	Horizontal discharge position				
		3	Heating thermo. OFF	Horizontal discharge position				
		4	During defrost operation	Horizontal discharge position	It is position check operation and it			
		5	Initialize operation	Full-close position	does not link with			
		6	Self-clean operation	Horizontal discharge position	the real louver and air direction setup			
		 The removes swin <sel< li=""> For the less (Correct content of the less sector) </sel<>	(Illustration on the remote controller screen). If selecting the cold draft-less position, effect of the smudg-					
		the fa [000] • To re positi • Whe insta reco	bugh "Smudging-less" position h actory, "Cold draft-less" position 0 (At shipment)] to [0002] on the ealize "360° discharge", it is ne tion. In using the optional part "Heig Illing the unit at position where mmended to set DN Item code d draft-less" position.	can be selected by changing e Item code (DN) [45]. cessary to set "cold draft-less" ht adjustment spacer" or there is no ceiling, it is				
13	HA control	etc rer 2) Th 3) I/C 4) Th ter ON me du	c, and start/stop are available b note position. is control outputs start/stop sta specifications conform to JEM is control outputs [Operation OFI minal while self-cleaning works. I I (Operating) signal] is possible b ent)] of Item code (DN) [CC] to [0 ring self-clean operation during c	control is connected to TV control or remote start/stop I/F, and start/stop are available by HA signal input from the ote position. control outputs start/stop status to HA output terminal. specifications conform to JEMA regulations. control outputs [Operation OFF (STOP) signal] to HA output inal while self-cleaning works. However selection of [Operation (Operating) signal] is possible by changing [0000 (At ship- t)] of Item code (DN) [CC] to [0001]. In this case, if HA is input ng self-clean operation during operation of the air conditioner, self-clean operation is not performed. (Unit stops.)				
14	Frequency fixed operation (Test run)	 Wł dis rur Pu Us Us E A A Aft (Di Fu ([T 	ase of wired remote controlle then pushing [CHK] button for 4 played on the display screen a the mode. sh [ON/OFF] button. ing [MODE] button, set the mo to not use other mode than [CG ouring test run operation, the ten an error is detected as usual. A frequency fixed operation is p er the test run, push [ON/OFF] to splay in the display part is same sh [CHK] button to clear the te EST] display in the display part urns to the normal stop status.	seconds or more, [TEST] is and the mode enters in Test de to [COOL] or [HEAT]. DOL]/[HEAT] mode. nperature cannot be adjusted. erformed. button to stop the operation. e as the procedure in Item 1.) st run mode. t disappears and the status	Command frequency is approximately [S7]			

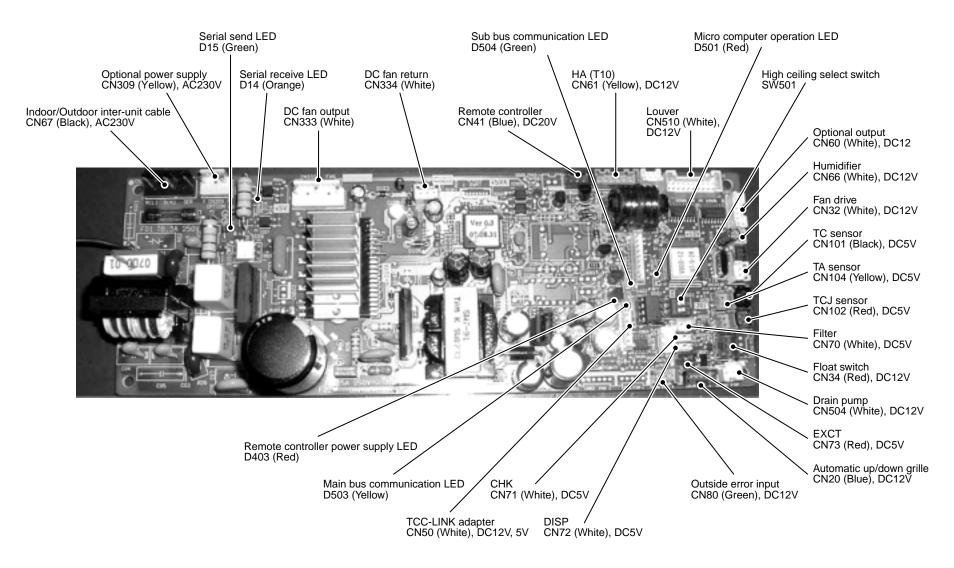
No.	Item	Outline of specifications	Remarks
15	Filter sign display (Except wireless type) * It is provided on the separately sold type TCB-AX21E2.	 The operation time of the indoor fan is calculated, the filter reset signal is sent to the remote controller when the speci- fied time (2500H) has passed, and it is displayed on LCD. When the filter reset signal has been received from the remote controller, time of the calculation timer is cleared. In this case, the measurement time is reset if the speci- fied time has passed, and display on LCD disappears. 	[FILTER 開] goes on.
16	Central control mode selection	 Setting at the centerl controller side enables to select the contents which can be operated on the remote controller at indoor unit side. Setup contents 64 line central controller (TCB-SC642TLE2) [Individual]: Operated on the remote controller (Priority to second pushing) [Central 1]: ON/OFF operation cannot be operated on the remote controller. [Central 2]: ON/OFF, mode selection, temp. setup operations cannot be operated on the remote controller. [Central 3]: Mode selection and temp. setup operations cannot be operated on the remote controller. [Central 4]: Mode selection cannot be operated on the remote controller. * In case of the wireless type, the display lamp does not change but the contents are same. If operating an item which is prohibited by the central control mode from the remote controller, it is notified with the receive sound, Pi, Pi, Pi, Pi, Pi (5 times). 	Display at remote controller side (No display) [Central 🗗] goes on [Central 🗗] goes on [Central 🗗] goes on [Central 🗗] goes on
17	Energy-saving control	 Selecting [AUTO] mode enables an energy-saving to be operated. The setup temperature is shifted (corrected) in the range not to lose the comfort ability according to input values of various sensors. 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. 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 	
18	Max. frequency cut control	rest	ode: It is controlled illowing figure if fricted to approximately rated heating frequency

No.	Item			Remarks			
19	DC motor	 stator and th (Moves slight) 2) The motor of indoor contra- Notes) When the fan entering of ou while the fan 	rotates while the a itside air, etc, the a motor stops. ock is found, the ai	Check code [P12]			
20	Self-clean operation (Dry operation):	1) When coolir	-			DRY) stopped, the following
	In case of 4-way Discharge Cassette	Compressor ON period	Self-clean operation period	FAN	Drain pump		Louver
	type	0 to 10 min. 10 to 60 min. 60 min. to	None 1 hour 2 hours	Fan (UL)	STOP	Hor	izontal discharge position
		 remote controller screen. However the operation lamp (Green LED) goes off. 3) To stop the self-clean operation, push twice the [ON/OFF] button on the remote controller continuously. (Stop the operation as compressor ON time in the table above: 10 minutes or below.) 4) When the follower unit executes self-clean operation in the group connection, the segment of ③ is displayed on the wired remote controller screen via master unit. * If self-clean operation is not used set invalidity. 					(RBC-AMT31E), Self-clean operation display is not output. And it is not also on the wireless remote controller. It is recognized as
21	Save operation	 2) During oper wired remot 3) During save performed w the outdoor 4) The restricting pushed for 4 5) When valida starts with s held even w changes or 6) The restricting data of Item 	operation, the cur vith the restriction	ation, rrent releases ratio set in t by keepin on the ren ration, the d because os, operations set. t by change the range	☐ lights on th se control is EEPROM on ag SAVE butto note controlle next operation contents are on mode ing the setup	on r. n	Operation and display also are unavailable on the wired remote controller RBC- AMT31E and before. Carry out setting operation during stop of the unit; otherwise the unit stops operation. For the setup opera- tion, refer to "How to set up contents of save operation" of Installation Manual.

No.	Item	Outline of specifications	Remarks
22	8°C heating/ Frost protective operation	 This functional is intended for the cold latitudes and performs objective heating operation (8°C heating operation). This function is valid only for combination with the outdoor upita (Super Digital Investor (SDI) 4 period outdoor upita). 	In a group connection,
		units (Super Digital Inverter (SDI) 4-series outdoor units).3) Using the indoor DN code [D1] (1 bit), Valid/Invalid of this function is set up at the customer's side.	if there is even one combination with other unit, "This function is not
		* The setup by DN code is Invalid [0]/Valid [1] and Invalid [0] has been set at the shipment.	provided." is displayed.
		 This operation is the heating operation which sets 8°C as the setup temperature of the target. 	
		 5) This function starts operation by pushing temperature button v during heating operation; besides by pushing button for 4 seconds or more after temperature reached the minimum set temperature. 	The setup temperature jumps from [18] to [8].
		 To stop/release this operation, select and execute one from the following operations. 	
		 Push button: Heating operation (18°C setting) continues. 	
		② Push [START/STOP] button: Air conditioner stops. (Heating 18°C operation at the next start)	
		③ Push	
		7) As the setup temperature is 8°C and the human heating is not targeted, the cold air discharge preventive control (Item 7) is made invalid to suppress the intermittent operation.	
		 The settings of the air direction and air volume are changeable during this operation. 	
		 The indoor fan stops to protect the compressor for 2 minutes after start of heating operation (Thermo-ON) by this function. 	

Function	Connector No.	Pin No.	Specifications	Remarks
Humidifier output (*)	CNCC	1	DC12V	Humidifier output is ON when heating operation is performed, when thermostat is on, when the fan is on.
	CN66	2	Output (Open collector)	* The setting of Humidifier provided + Drain pump ON is performed by short-circuit of CN70 or from the remote controller. (DN [40] = 0001)
ntilation autnut	put $CN32$ 1 $DC12V$ 2 $Output (Open collector)$ 1 $ON/OFF input$ 2 $0V$ 3 $Remote controller prohibited input$ 4 $Operation output (Open collector)$ 5 $DC12V$ 6 $Warning output (Open collector)$ 1 $DC12V$ 6 $Warning output (Open collector)$ 1 $DC12V$ 2 $Defrost output (Open collector)$ 3 $Thermostat ON output (Open collector)$ 4 $Cooling output (Open collector)$ 5 $Heating output (Open collector)$ 6 Fan output (Open collector)		DC12V	Setting at shipment: Interlock of ON by indoor unit operation, with OFF by stop operation
nulation output	CN32	2	Output (Open collector)	* The single operation setting by FAN button on the remote controller is performed on the remote controller (DN [31] = $0000 \rightarrow 0001$)
		1	ON/OFF input	HA ON/OFF input (J01: YES/NO=Pulse (At shipment from factory) /Static input selection)
		2	0V	
	0.10	3	Remote controller prohibited input	Permission/Prohibition of remote controller operation stop is performed by input.
HA	CN61	4	Operation output (Open collector)	Operation ON (Answer back of HA)
		5	DC12V	
		6	Warning output (Open collector)	Warning output ON
		1	DC12V	
		2	Defrost output (Open collector)	ON when outdoor unit is defrosted
		3	Thermostat ON output (Open collector)	ON when real thermostat is on. (Compressor ON)
Option output	CN60	4	Cooling output (Open collector)	ON when operation mode is cooling system (COOL, DRY, Cooling/Heating automatic cooling)
		5		ON when operation mode is heating system (HEAT, Cooling/Heating automatic heating)
		6	Fan output (Open collector)	ON when indoor fan is on. (When air cleaner is used) OFF while clean operation is performed.
		1	DC12V	
Outside error input	CN80	2	NC	Generate the warning code "L30" (continuously for 1 minute) and stop the operation forcibly.
		3	Outside error input	
		1	DC12V	
		2	Panel operation input	
ntilation output HA Option output	CN20	3	Panel up output (Open collector)	The grille is controlled according to up/down operation from the remote controller. * Setting of automatic up/down grille provided is performed on the remote controller.
		4	Panel down output (Open collector)	$(DN [30] = 0000 \rightarrow 0001)$
		5	OV	
		1		Selection of option error input (Protective operation display of device attached to outside) or Humidifier setting input (Vaporizing + Drain pump ON)
	CN70	2	OV	Humidifier is set at shipment from factory. * Setting of option error input is performed on the remote controller. (DN [2A] = $0002 \rightarrow 0001$)
СНК	CN71	1		This check is used to check indoor operation. (Performs operation of indoor fan "H", Louver horizontal
Operation check	CINT	2	0V	and Drain pump ON without communication with outdoor and remote controller)
	CN72	1		Communication is available by indeer unit and remote controller only
Exhibition mode		2	0V	Communication is available by indoor unit and remote controller only.
EXCT	CN72	1	Demand input	Indoor unit forced thermostat OFF operation
Demand	CN73	2	0V	

* This option is not provided to oversea models.



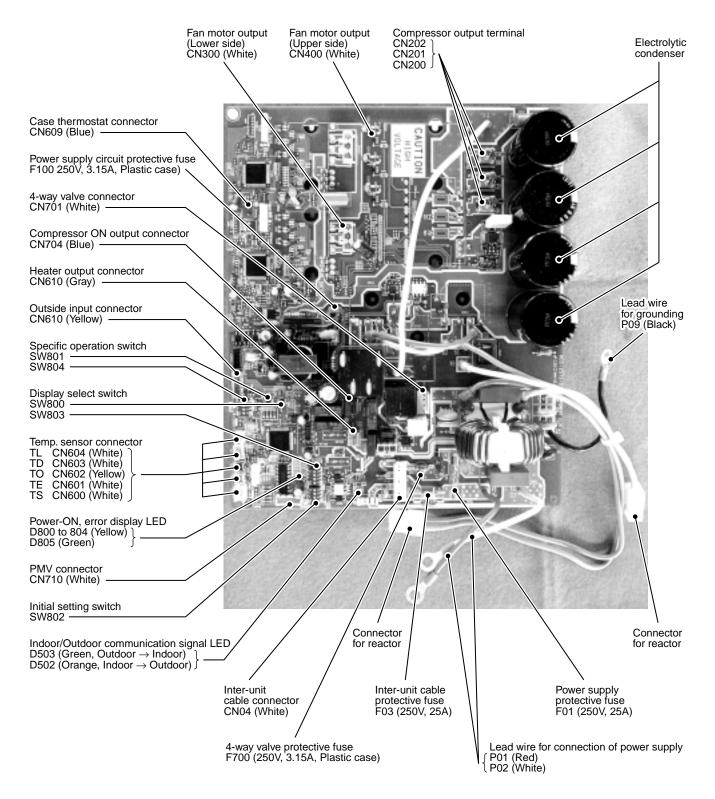
9. CIRCUIT CONFIGURATION AND CONTROL SPECIFICATIONS

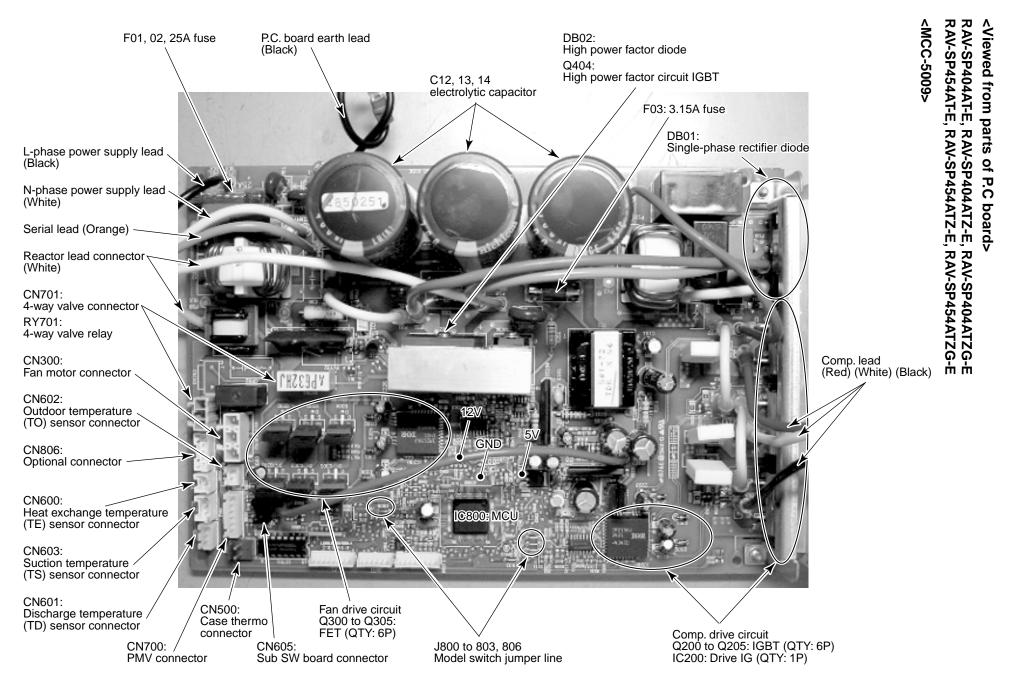
9-1. Outdoor Controls

9-1-1. Print Circuit Board

<Viewed from parts of P.C board> RAV-SP1104AT-E, RAV-SP1404AT-E RAV-SP1104ATZ-E, RAV-SP1404ATZ-E RAV-SP1104ATZG-E, RAV-SP1404ATZG-E

<MCC-1571>





9-2. Outline of Main Controls

<In case of RAV-SP110 and SP140 models>

1. PMV (Pulse Motor Valve) control

- 1) PMV is controlled between 30 and 500 pulsed during operation.
- 2) In cooling operation, PMV is usually controlled with the temperature difference between TS sensor and TC sensor aiming 1 to 4K as the target value.
- 3) In heating operation, PMV is usually controlled with the temperature difference between TS sensor and TE sensor aiming –1 to 4K as the target value.
- 4) When the cycle excessively heated in both cooling and heating operation, PMV is controlled by TD sensor. The target value is usually 91°C in cooling operation and 96°C in heating operation.

REQUIREMENT

A sensor trouble may cause a liquid back-flow or abnormal overheat resulting in excessive shortening of the compressor life. In a case of trouble on the compressor, be sure to check there is no error in the resistance value or the refrigerating cycle of each sensor after repair and then start the operation.

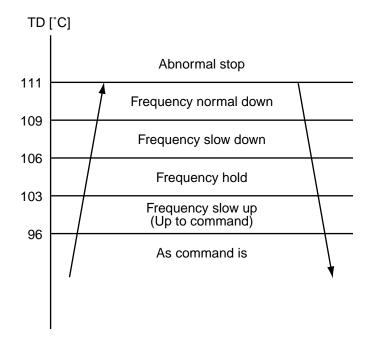
2. Discharge temperature release control

- 1) When the discharge temperature did not fall or the discharge temperature rapidly went up by PMV control, this control lowers the operation frequency. It subdivides the frequency control up to 0.6Hz to stabilize the cycle.
- 2) When the discharge temperature detected an abnormal stop zone, the compressor stops and then restarts after 2 minutes 30 seconds.

The error counting is cleared when the operation continued for 10 minutes. If the error is detected by 4 times without clearing, the error is determined and restarting is not performed.

* The cause is considered as excessively little amount of refrigerant, PMV error or clogging of the cycle.

3) For displayed contents of error, confirm on the check code list.



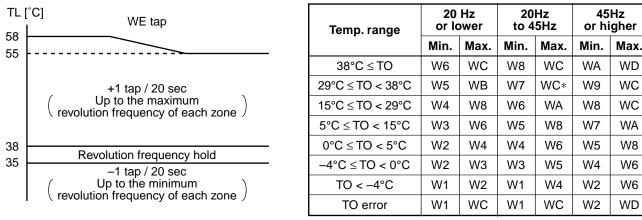
3. Outdoor fan control

		W1	W2	W3	W4	W5	W6	W7	W8	W9	WA	WB	WC	WD	WE
SP110 SP140	Up	200	240	240	260	320	380	480	500	530	610	640	660	720	780
	Down	—	—	200	280	360	400	500	520	550	630	660	700	740	820

Revolution frequency allocation of fan taps [rpm]

3-1) Cooling fan control

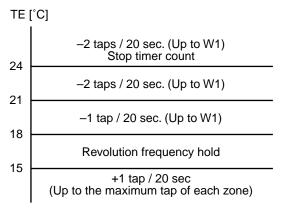
- ① The outdoor fan is controlled by TL sensor, TO sensor and the operation frequency. The outdoor fan is controlled by every 1 tap of DC fan control (14 taps).
- ② Only for 60 seconds after the operation has started, the maximum fan tap corresponding to the zone in the following table is fixed and then the fan is controlled by temperature of TL sensor.



* : WB for SP110

3-2) Heating fan control

- The outdoor fan is controlled by TE sensor, TO sensor and the operation frequency. (Control from minimum W1 to maximum (according to the following table))
- ② For 3 minutes after the operation has started, the maximum fan tap corresponding to the zone in the following table is fixed and then the fan is controlled by temperature of TE sensor.



Object:	SP140
---------	-------

Temp. range	20 Hz or lower	20Hz to 45Hz	45Hz or higher
	Max.	Max.	Max.
10°C ≤ TO	W7	W8	W9
5°C ≤ TO < 10°C	W9	WA	WB
$-3^{\circ}C \le TO < 5^{\circ}C$	WB	WB	WC
–10°C ≤ TO < –3°C	WC	WC	WC
TO < -10°C	WD	WD	WD
TO error	WD	WD	WD

(3) When TE \ge 24°C continues for 5 minutes, the compressor stops.

It is the same status as the normal thermostat-OFF without error display.

The compressor restarts after approx. 2 minutes 30 seconds and this intermittent operation is not abnormal.

④ In case that the status in item ③ generates frequently, stain on filter of the suction part of the indoor unit is considered.

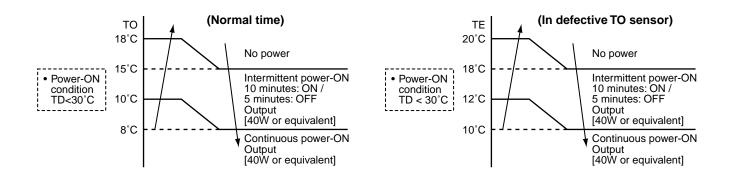
Clean the filter and then restart the operation.

Object:	SP110
----------------	-------

Temp. range	20 Hz or lower	20Hz to 45Hz	45Hz or higher
	Max.	Max.	Max.
10°C ≤ TO	W7	W8	W9
5°C ≤ TO < 10°C	W9	WA	WA
-3°C ≤ TO < 5°C	WA	WA	WB
-10°C ≤ TO < -3°C	WB	WB	WB
TO < -10°C	WD	WD	WD
TO error	WD	WD	WD

4. Coil heating control

- 1) This control function heats the compressor by turning on the stopped compressor instead of a case heater. It purposes to prevent stagnation of the refrigerant inside of the compressor.
- 2) As usual, turn on power of the compressor for the specified time before a test run after installation; otherwise a trouble of the compressor may be caused.
 As same as a test run, it is recommended to turn on power of the compressor beforehand when starting operation after power of the compressor has been interrupted and left as it is for a long time.
- A judgment for electricity is performed by TD and TO sensors.
 If TO sensor is defective, a backup control is automatically performed by TE sensor.
 For a case of defective TO sensor, judge it with outdoor LED display.
- 4) For every model, the power is turned off when TD is 30°C or more.



REQUIREMENT

While heating the coil, the power sound may be heard. However it is not a trouble.

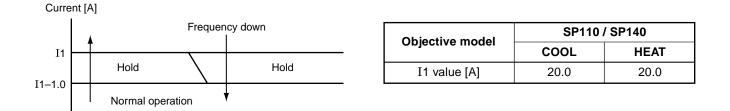
5. Short intermittent operation preventive control

1) For 3 to 10 minutes after operation start, in some cases, the compressor does not stop to protect the compressor even if receiving the thermostat-OFF signal from indoor.

However it is not abnormal status. (The operation continuance differs according to the operation status.) 2) When the operation stops by the remote controller, the operation does not continue.

6. Current release control

No. of revolutions of the compressor is controlled by AC current value detected by T620 on the outdoor P.C. board so that the input current of the inverter does not exceed the specified value.



7. Current release value shift control

- This control purposes to prevent troubles of the electronic parts such as the compressor driving elements and the compressor during cooling operation.
- The current release control value (I1) is selected from the following table according to TO sensor value.

Current release control value (I1)

[A]

Temperature range	SP110, SP140
44°C ≤ To	15.0
39°C ≤ To < 44°C	17.7
To < 39°C	20.0
TO error	15.0

8. Over-current protective control

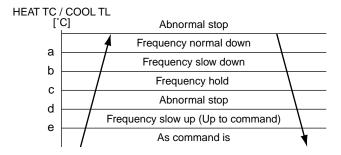
- 1) When the over-current protective circuit detected an abnormal current, stop the compressor.
- 2) The compressor restarts after 2 minutes 30 seconds setting [1] as an error count.
- 3) When the error count [8] was found, determine an error and restart operation is not performed.
- 4) For the error display contents, confirm on the check code list.

9. High-pressure release control

- 1) The operation frequency is controlled to restrain abnormal rising of high pressure by TL sensor in cooling operation and TC sensor in heating operation.
- When TL sensor in cooling operation or TC sensor in heating operation detects abnormal temperature of the stop zone, stop the compressor and the error count becomes +1.
- 3) When the compressor stopped with 2), the operation restarts from the point of the normal operation zone (e point or lower) where it returned after 2 minutes 30 seconds.
- 4) The error count when the compressor stopped with 2) is cleared after the operation continued for 10 minutes.

If the error count becomes [10] without clearing, the error is determined and reactivation is not performed.

5) For the error display contents, confirm on the check code list.



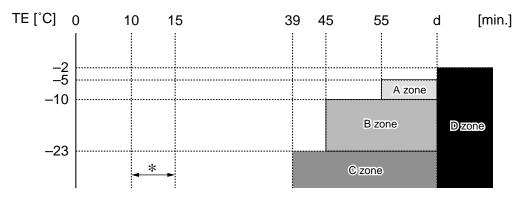
	HEAT	COOL
	тс	TL
а	62°C	63°C
b	57°C	62°C
с	55°C	60°C
d	53°C	58°C
е	49°C	54°C

10. Defrost control

- 1) In heating operation, defrost operation is performed when TE sensor satisfies any condition in A zone to D zone.
- 2) During defrosting operation, it finishes if TE sensor continued 12°C or higher for 3 seconds or continued $7^{\circ}C \le TE < 12^{\circ}C$ for 1 minute.

The defrost operation also finishes when it continued for 10 minutes even if TE sensor temperature was 7°C or lower.

3) After defrost operation was reset, the compressor stopped for approx. 40 seconds and then the heating operation starts.



Start of heating operation

* The minimum TE value and To value between 10 and 15 minutes after heating operation has started are stored in memory as TE0 and To0, respectively.

	In normal To	In abnormal To				
A zone	When status (TE0 – TE) – (To0 – To) ≥ 3°C continued for 20 seconds	When status (TE0 – TE) ≥ 3°C continued for 20 seconds				
B zone	When status (TE0 – TE) – (To0 – To) ≥ 2°C continued for 20 seconds	When status (TE0 – TE) ≥ 2°C continued for 20 seconds				
C zone	When status (TE $\leq -23^{\circ}$ C) continued for 20 seconds					
D zone	When compressor operation status of TE < -2° C is calculated by d portion					

 4) The time of above d can be changed by exchanging jumper [J805] and [J806] of the outdoor control P.C. board.
 (Setting at shipment: 150 minutes)

J805	J806	d
0	0	150 minutes Setting at shipment
0	×	90 minutes
×	0	60 minutes
×	×	30 minutes

O: Short circuit, X: Open

<In case of RAV-SP40 and SP45 models>

1. Pulse Motor Valve (PMV) control

- 1) For PMV with 50 to 500 pulses during operation, respectively.
- 2) In cooling operation, PMV is controlled with the temperature difference between TS sensor and TC sensor.
- 3) In heating operation, PMV is controlled with the temperature difference between TS sensor and TE sensor.
- 4) For the temperature difference in items 2) and 3), 1 to 5K is aimed as the target in both cooling and heating operations.
- 5) When the cycle excessively rose in both cooling and heating operations, PMV is controlled by TD sensor. The aimed value is usually 106°C in both cooling and heating operations.

REQUIREMENT

A sensor trouble may cause a liquid back-flow or abnormal overheat resulting in excessive shortening of the compressor life. In a case of trouble on the compressor, be sure to check there is no error in the resistance value an the refrigerating cycle of each sensor after repair and then start the operation.

2. Discharge temperature release control

 This function controls the operation frequency, that is, lowers the operation frequency when the discharge temperature has not lower or the discharge temperature has rapidly risen during PMV control.

It subdivides the frequency control up to a unit of 0.6 Hz to stabilize the cycle.

 When the discharge temperature is detected in an abnormal stop zone, the unit stops the compressor and restarts after 2 minutes 30 seconds.

The error counter is cleared when it has continued the operation for 6 minutes.

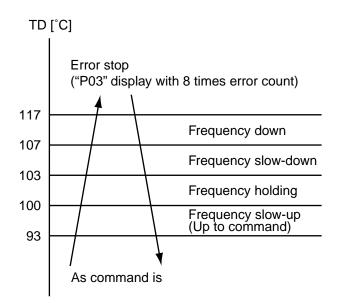
If the abnormal stop zone has been detected by 8 times without clearing of counter, an error "P03" is displayed.

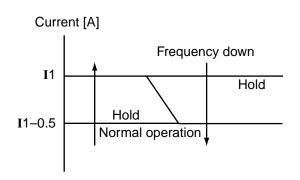
* The cause is considered as excessively little amount of refrigerant, defective PMV, or clogging of cycle.

3. Current release control

The output frequency and the output voltage are controlled by AC current value detected by T02 on the outdoor P.C. board so that input current of the inverter does not exceed the specified value.

Objective medal	SP40, SP45					
Objective model	COOL HEAT					
I1 value [A]	10.13	10.50				





4. Outdoor fan control

	W1	W2	W3	W4	W5	W6	W7	W8	W9	WA	WB	wc	WD	WE	WF
SP40, SP45	200	300	350	410	480	500	560	640	670	700	750	800	800	840	840

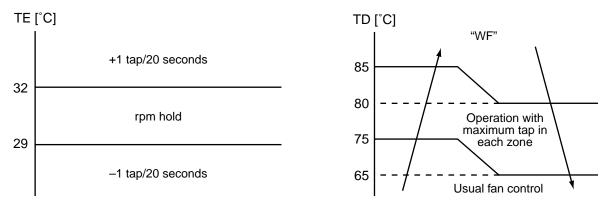
Allocations of fan tap revolutions [rpm]

1) Cooling fan control

- ① The outdoor fan is controlled by TE, TD, and TO sensors and also revolution frequency of the operation. The outdoor is controlled by every 1 tap of DC fan control (15 taps).
- 0 Only during 60 seconds after the operation has started, the fan is fixed with the maximum fan tap which corresponds to the zone in the following table.

After then the fan is controlled by TE sensor temperature.

③ Considering a case that TE sensor has come out of the holder, the fan is controlled so that revolution frequency of the fan increases regardless of TE if temperature of TD sensor has risen.



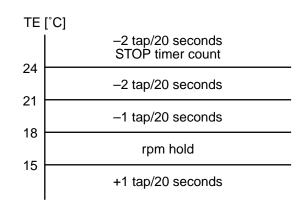
Operation with WE

Temp. range	f < 34	4.1Hz	34.1Hz ≤ 1	f < 58.6Hz	58.6Hz ≤ f		
Temp. range	Min.	Max.	Min.	Max.	Min.	Max.	
38°C ≤ TO	W6	WB	W8	WD	WA	WF	
32 ≤ TO < 38°C	W5	WA	W7	WC	W9	WF	
15 ≤ TO < 32°C	W3	W7	W5	W9	W7	WB	
5 ≤ TO < 15°C	W2	W5	W4	W7	W6	W9	
1 ≤ TO < 5°C	W1	W3	W3	W5	W4	W7	
_5 ≤ TO < 1°C	W1	W2	W2	W4	W3	W5	
TO <-5°C	O	FF	OFF	W3	W1	W4	
TOerror	W1	WF	W1	WF	W1	WF	

- 2) Heating fan control
 - The outdoor fan is controlled by TE sensor, TO sensor and the operation frequency. (From Min. W1 to Max. are controlled according to the following table.)
 - ② During 3 minutes after start-up, the fan is fixed with the maximum fan tap corresponding to zone in the following table.

After then the fan is controlled by temperature of TE sensor.

- ③ If status, TE ≥ 24°C continues for 5 minutes, the operation stops. This status is same to the usual Thermo-OFF which has no alarm display, and the fan restarts after 2 minutes and 30 seconds. This intermittent operation is not abnormal.
- ④ When the above status ② occurs frequently, it is considered that the filter of suction part of the indoor unit is stain.



Clean the filter and then restart the operation.

	Temp. range	f < 38.9Hz	38.9Hz ≤ f < 67.6Hz	67.6Hz ≤ f
	10°C ≤ TO	W7	W8	W9
	5 ≤ TO <10°C	WA	WB	WD
Maximum	–5 ≤ TO < 5°C	WE	WF	WF
	TO <−5°C	WE	WF	WF
	TO error	WE	WF	WF

5. Coil heating control

- 1) This control function heats the compressor by turning on the stopped compressor instead of a case heater. It purposes to prevent slackness of the refrigerant inside of the compressor.
- As usual, turn on power of the compressor for the specified time before a test run after installation, otherwise a trouble of the compressor may be caused.

As same as a test run, it is recommended to turn on power of the compressor beforehand when starting operation after power of the compressor has been interrupted for a long time.

- 3) Coil heating is controlled by TD and TE sensor.
- 4) The power is turned off when TD is 30°C or more.



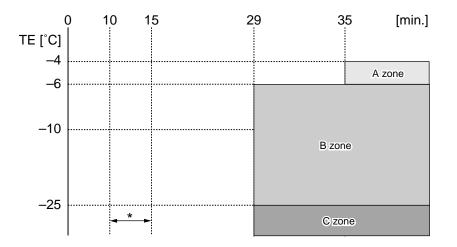
6. Defrost control

- ① In heating operation, defrost operation is performed when TE sensor temperature satisfies any condition in A zone to C zone.
- ② The defrost operation is immediately finished if TE sensor temperature has become 12°C or more, or it also is finished when condition of 5°C < TE < 12°C has continued for 80 seconds.</p>

The defrost operation is also finished when defrost operation has continued for 15 minutes even if TE sensor temperature has become 5°C or lower.

③ After defrost operation has finished, the compressor and the outdoor fan start heating operation after stopped for approx. 40 seconds.

Start of heating operation



* The minimum TE value between 10 and 15 minutes after heating operation has started is stored in memory as TE0.

A zone	Defrost operation is performed in this zone when TE0-TE > 2.5 continued for 20 seconds.
B zone	Defrost operation is performed in this zone when TE0-TE > 3 continued for 20 seconds.
C zone	Defrost operation is performed when this zone continued for 20 seconds.

10. TROUBLESHOOTING

10-1. 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
 - a) The following operations are normal.
 - 1. Compressor does not operate.
 - Is not 3-minutes delay (3 minutes after compressor OFF)?
 - Is not the outdoor unit in standby status though the remote controller reached the setup temperature?
 - Does not timer operate during fan operation?
 - Is not an overflow error detected on the indoor unit?
 - Is not outside high-temperature operation controlled in heating operation?
 - 2. 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 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.)
 - Is not being carried out a test run by operation of the outdoor controller?
 - b) Did you return the cabling to the initial positions?
 - c) 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
 - \oplus and \bigcirc screwdrivers, spanners, radio cutting pliers, nippers, etc.
 - Tester, thermometer, pressure gauge, etc.
- 2) Confirmation points before check
 - a) The following operations are normal.
 - 1. Compressor does not operate.
 - Is not 3-minutes delay (3 minutes after compressor OFF)?
 - Is not the outdoor unit in standby status though the remote controller reached the setup temperature?
 - Does not timer operate during fan operation?
 - Is not an overflow error detected on the indoor unit?
 - Is not outside high-temperature operation controlled in heating operation?
 - 2. 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?
 - Is not being carried out a test run by operation of the outdoor controller?
 - a) Did you return the cabling to the initial positions?
 - b) 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.



Confirmation of lamp display (When 4-way air discharge cassette type wireless remote controller is connected)

Check defective position and parts.

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.

10-2. Troubleshooting

10-2-1. Outline of judgment

The primary judgment to check whether a trouble occurred in the indoor unit or outdoor unit is carried out with the following method.

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

The indoor unit monitors the 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.

● : Go off, ◯ : Go on, -兴- : Flash (0.5 sec.)

Lamp indication	Check code	Cause of trouble occurrence				
Operation Timer Read	у	Power supply OFF or miswiring between receiving unit and indoor unit				
	E01					
	E02	Sending error Receiving unit Miswiring or wire connection error between receiving unit and indoor unit				
	E03	Communication stop				
Operation Timer Read	y E08	Duplicated indoor unit No.				
-☆- ● ●	E09	Duplicated master units of remote controller Setup error				
Flash	E10	Communication error between CPUs on indoor unit P.C. board				
	E18	Wire connection error between indoor units, Indoor power OFF (Communication stop between indoor master and follower or between main and sub indoor twin)				
Operation Timer Read ● • -☆- Flas	E04	Miswiring between indoor unit and outdoor unit or connection erorr (Communication stop between indoor and outdoor units)				
Operation Timer Read	y P10	Overflow was detected. Protective device of indoor unit worked.				
Alternate flash	P12	Indoor DC fan error				
	P03	Outdoor unit discharge temp. error Protective device of *1				
	P04	Outdoor high pressure system error outdoor unit worked.				
	P05	Negative phase detection error				
	P07	Heat sink overheat error Outdoor unit error				
Operation Timer Read	y P15	Gas leak detection error				
	P19	4-way valve system error (Indoor or outdoor unit judged.)				
Alternate flash	P20	Outdoor unit high pressure protection				
	P22	Outdoor unit: Outdoor unit error				
	P26	Outdoor unit: Inverter Idc operation { Outdoor unit worked. Protective device of *1				
	P29	Outdoor unit: Position detection error				
	P31	Stopped because of error of other indoor unit in a group (Check codes of E03/L03/L07/L08)				

*1: These are representative examples and the check code differs according to the outdoor unit to be combined.

<In case of SP110, SP140>

Lamp indication	on	Check code	Cause of trou	ble occurrence	
Operation Timer	Ready	F01	Heat exchanger sensor (TCJ) error]	
-\	•	F02	Heat exchanger sensor (TC) error	Indoor unit sensor error	
Alternate flash		P10	Heat exchanger sensor (TA) error		
		F04			
		F06	Discharge temp. sensor (TD) error		
Operation Timer	Ready	F07	Temp. sensor (TE) error Temp. sensor (TL) error		
-\0'\0'-	0	F08	Temp. sensor (TO) error	Sensor error of outdoor unit *1	
Alternate flash		F12	Temp. sensor (TS) error		
		F13	Temp. sensor (TH) error		
		F15			
Operation Timer -ໍ\(\c)- Simultaneous flash	Ready ●	F29	Indoor EEPROM error		
Operation Timer -ໍ\ໍ\\ LJ Simultaneous flash	Ready	F31	Outdoor EEPROM error		
		H01			
Operation Timer	Ready	H02	Compressor break down Compressor lock		
• - <u>`</u> ,-		H03		tdoor compressor system error *1	
Flash		H04	Case thermostat worked. Outdoor unit low pressure system erro	λr.	
		H06		1	
		L03	Duplicated master indoor units		
	Ready	L07	There is indoor unit of group connection in individual indoor unit.	$f \rightarrow AOTO address$ * If group construction and	
-☆- Simultaneous fla	-Ò́- ash	L08	Unsetting of group address address are not n Missed setting when power supp	^J address are not normal when power supply turned on, automatically goes to address	
		L09		setup mode.	
		L10]	
Operation Timer	Ready	L20	Unset model type (Service board) Duplicated indoor central addresses		
-`Ŏ҉- O	-Ŏ-	L29	Outdoor unit and other error	Others	
Simultaneous fla	ash	L30	Outside interlock error		
		L31	Negative phase error]	

*1: These are representative examples and the check code differs according to the outdoor unit to be combined.

10-2-2. Others (Other than Check Code)

Lam	Lamp indication			Cause of trouble occurrence
Operation -∵ִִֽ่- Simul	Timer - ːoː́- taneous	Ready - ૻૣ- flash	_	During test run
Operation	-``	Ready -Ò- te flash	_	Disagreement of cool/heat (Automatic cool/heat setting to automatic cool/heat prohibited model, or setting of heating to cooling-only model)

10-2-3. Check Code List (Indoor)

○: Go on, : Flash, •: Go off ALT (Alternate): Alternate flashing when there are two flashing LED SIM (Simultaneous): Simultaneous flashing when there are two flashing LED

(Indoor unit detected)

Check code indication	Ser	nsor lamp	indicat	ion				Air condition	ner operation
TCC-LINK central & Block indication		Representative defective position		Explanation of error contents	Automatic	Operation			
Wired remote controller	Operation	n Timer	Ready	Flash				reset	continuation
E03	0	•	•		Regular communication error between indoor and remote controller		No communication from remote controller and network adapter (Also no communication from central control system)	0	×
E04		•	0		Indoor/Outdoor serial error		There is error on serial communication between indoor and outdoor units	0	×
E08	0	•	•		Duplicated indoor addresses	\diamond	Same address as yours was detected.	0	×
E10	0	•	•		Communication error between indoor MCU		MCU communication error between main motor and micro computer	0	×
E18	0	•	•		Regular communication error between indoor master and follower units		Regular communication between indoor master and follower units is impossible, Communication between twin master (main) and follower (sub) units is impossible.	0	×
F01	0	0		ALT	Indoor unit, Heat exchanger (TCJ) error		Open/short was detected on heat exchanger (TCJ).	0	×
F02	0	0	•	ALT	Indoor unit, Heat exchanger (TC) error		Open/short was detected on heat exchanger (TC).	0	×
F10	0	0	•	ALT	Indoor unit, Room temp. sensor (TA) error		Open/short was detected on room temp. sensor (TA).	0	×
F29	0	0	•	SIM	Indoor unit, other indoor P.C. board error		EEPROM error (Other error may be detected. If no error, automatic address is repeated.	×	×
L03	0	•	0	SIM	Duplicated setting of indoor group master unit	\diamond	There are multiple master units in a group.	×	×
L07	0	•	0	SIM	There is group cable in individual indoor unit.	\diamond	When even one group connection indoor unit exists in individual indoor unit.	×	×
L08	0	•	0	SIM	Unset indoor group address	\diamond	Indoor group address is unset.	×	×
L09	0	•	0	SIM	Unset indoor capacity		Capacity of indoor unit is unset.	×	×
L20	0	0	0	SIM	Duplicated central control system address		Duplicated setting of central control system address	0	×
L30	0	0	0	SIM	Outside error input to indoor unit (Interlock)		Abnormal stop by outside error (CN80) input	×	×
P01		0	0	ALT	Indoor unit, AC fan error		An error of indoor AC fan was detected. (Fan motor thermal relay worked.)	×	×
P10		0	0	ALT	Indoor unit, overflow detection		Float switch worked.	×	×
P12		0	0	ALT	Indoor unit, DC fan error		Indoor DC fan error (Over-current/Lock, etc.) was detected.	×	×
P19	0	•	0	ALT	4-way valve system error		In heating operation, an error was detected by temp. down of indoor heat exchanger sensor.	0	×
P31	0	•	0	ALT	Other indoor unit error		Follower unit in group cannot operate by warning from [E03/L03/L07/L08] of master unit.	0	×

When this warning was detected before group construction/address check finish at power supply was turned on, the mode shifts automatically to AUTO address setup mode.

(Remote controller detected)

Check code indication	Check code indication Sensor lamp indication				Air condition	ner operation		
Wired remote controller	Block indication		۱	Representative defective position	Explanation of error contents	Automatic	Operation	
wired remote controller	Operation	n Timer	Ready	Flash			reset	continuation
E01				No master remote controller, Remote controller communication (Receive) error	Signal cannot be received from indoor unit. Master remote controller was not set. (including 2 remote controllers)	_	—	
E02	0	•	•		Remote controller communication (Send) error	Signal cannot be sent to indoor unit.	—	—
E09	0	•	•		Duplicated master remote controller	In 2-remote controller control, both were set as master. (Indoor master unit stops warning and follower unit continues operation.)	×	Δ

(Central control devices detected)

Check code indication	Sensor lamp indication			Air conditio	ner operation
TCC-LINK central	Block indication Operation Timer Ready Flash	Representative defective position	Explanation of error contents	Automatic reset	Operation continuation
C05	Is not displayed. (Common use of	Central control system communication (send) error	Signal sending operation of central control system is impossible. There are multiple same central devices. (AI-NET)	_	_
C06	remote controller, etc.)	Central control system communication (receive) error	Signal receiving operation of central control system is impossible.	-	_
C12	-	General-purpose device control interface batched warning	An error on device connected to general-purpose device control interface of exclusive to TCC-LINK/AI-NET	_	_
P30	By warning unit (Above-mentioned)	Group follower unit is defective.	Group follower unit is defective. (For remote controller, above-mentioned [***] details are displayed with unit No.	_	_

NOTE: Even for the same contents of error such as communication error, the display of check code may differ according to detection device. When remote controller or central controller detects an error, it is not necessarily related to operation of the air conditioner. In this list, the check codes that outdoor unit detects are not described.

Check Code List (Outdoor)

○ : Go on, ◎ : Flash, ● : Go off

ALT (Alternate): Alternate flashing when there are two flashing LED SIM (Simultaneous): Simultaneous flashing when there are two flashing LED

Remote	5	Sensor la	amp part	t				A	0
controller		Block in			Representative defective position	Detection	Explanation of error contents	Automatic reset	Operation continuation
		n Timer	Ready	Flash		0.11			
F04	0	0	0	ALT	Outdoor unit Discharge temp. sensor (TD) error	Outdoor	Open/Short of discharge temp. sensor was detected.	×	×
F06	0	0	0	ALT	Outdoor unit Temp. sensor (TE, TS, TL) error	Outdoor	Open/Short of heat exchanger temp. sensor was detected. Miswiring between TE sensor and TS sensor	×	×
F08	0	0	0	ALT	Outdoor unit Outside temp. sensor (TO) error	Outdoor	Open/Short of outside temp. sensor was detected.	0	0
F07	0	0	0	ALT	Outdoor unit Temp. sensor (TL) error	Outdoor	Open/Short of heat exchanger temp. sensor was detected.	×	×
F12	0	0	0	ALT	Outdoor unit Temp. sensor (TS) error	Outdoor	Open/Short of suction temp. sensor was detected.	×	×
F13	0	0	0	ALT	Outdoor unit Temp. sensor (TH) error	Outdoor	Open/Short of heat sink temp. sensor (Board installed) was detected.	×	×
F15	0	0	0	ALT	Outdoor unit Misconnection of temp. sensor (TE, TS)	Outdoor	Misconnection of outdoor heat exchanger temp. sensor and suction temp. sensor was detected.	×	×
F31	0	0	0	SIM	Outdoor unit EEPROM error	Outdoor	Outdoor P.C. board part (EEPROM) error was detected.	×	×
H01	•	0	٠		Outdoor unit Compressor break down	Outdoor	When reached min-Hz by current release control, short-circuited current (ldc) after DC excitation was detected.	×	×
H02		0			Outdoor unit Compressor lock	Outdoor	Compressor lock was detected.	×	×
H03		0			Outdoor unit Current detection circuit error	Outdoor	Current detection circuit error	×	×
H04		0			Outdoor unit Case thermostat operation	Outdoor	Case thermostat operation was detected.	×	×
L10	0	0	0	SIM	Outdoor unit Setting error of service P.C. board type	Outdoor	When outdoor service P.C. board was used, model type select jumper setting was inappropriate.	×	×
L29	۲	0	0	SIM	Outdoor unit Other outdoor unit error	Outdoor	 Defective parts on outdoor P.C. board (MCU communication, EEPROM, TH sensor error) When outdoor service P.C. board was used, model type selection was inappropriate. Other error (Heat sink abnormal overheat, gas leak, 4-way valve inverse error) was detected. 	×	×
P03	0	•	0	ALT	Outdoor unit Discharge temp. error	Outdoor	Error was detected by discharge temp. release control.	×	×
P04	0	•	0	ALT	Outdoor unit High pressure system error, Power supply voltage error	Outdoor	When case thermostat worked, error was detected by high release control from indoor/ outdoor heat exchanger temp. sensor. Power supply voltage error	×	×
P05	0	•	0	ALT	Power supply error	Outdoor	Power supply voltage error		×
P07	0	•	0	ALT	Outdoor unit Heat sink overheat	Outdoor	Abnormal overheat was detected by outdoor heat sink temp. sensor.		×
P15	0	•	0	ALT	Gas leak detection	Outdoor	Abnormal overheat of discharge temp. or suction temp. was detected.		×
P20	0	•	0	ALT	Outdoor unit High pressure system error	Outdoor	Error was detected by high release control from indoor/outdoor heat exchanger temp. sensor.	×	×
P22	0	•	0	ALT	Outdoor unit Outdoor fan error	Outdoor	Error (Over-current, lock, etc.) was detected on outdoor fan drive circuit.	×	×
P26	0	•	0	ALT	Outdoor unit Inverter Idc operation	Outdoor	Short-circuited protective operation of compressor drive circuit element (G-Tr /IGBT) worked.	×	×
P29	0	•	0	ALT	Outdoor unit Position detection error	Outdoor	Position detection error of compressor motor was detected.	×	×
E01	0	•	•		No remote controller master unit Remote controller communication error	Remote controller	Signal was not received from indoor unit. Main remote controller was not set. (including 2 remote controllers)	_	-
E02	0	•	•		Remote controller send error	Remote controller	Signal cannot be sent to indoor unit.	—	_
E03	0	•	٠		Regular communication error between indoor and remote controller	Indoor	No communication from remote controller and network adapter	0	×
E04			0		Indoor/Outdoor serial error	Indoor	Serial communication error between indoor and outdoor	0	×
E08	0				Duplicated indoor addresses	Indoor	Same address as yours was detected.	0	
E09	0	•	٠		Duplicated main remote controllers	Remote controller	In 2-remote controller control, both were set as master. (Indoor master unit stops warning and follower unit continues operation.)	×	×
E10	0				Communication error between CPU	Indoor	MCU communication error between main motor and micro computer	0	Δ
E18	0	•	•		Regular communication error between master and follower indoor units	Indoor	Regular communication was impossible between master and follower indoor units. Communication between twin master (Main unit) and follower (sub unit) was impossible.	0	×
L03	0		0	SIM	Duplicated indoor master units	Indoor	There are multiple master units in a group.	×	×
L07	0	•	0	SIM	There is group cable in individual indoor unit.	Indoor	When even one group connection indoor unit exists in individual indoor unit	×	×
L08	0	•	0	SIM	Unset indoor group address	Indoor	Indoor address group was unset.	×	×
L09	0	•	0	SIM	Unset indoor capacity	Indoor	Capacity of indoor unit was unset.	×	×
L30	0	Õ	0	SIM	Outside error input to indoor unit (Interlock)	Indoor	Abnormal stop by CN80 outside error input	×	×
P19	0	•	0	ALT	4-way valve inverse error	Indoor Outdoor	In heating operation, error was detected by temp. down of indoor heat exchanger or temp. up ofTE, TS.	0	×

+ When this warning was detected before group construction/address check finish at power supply was turned on, the mode shifts automatically to AUTO address setup mode.

O : Go on, @ : Flash, ● : Go off ALT (Alternate): Alternate flashing when there are two flashing LED SIM (Simultaneous): Simultaneous flashing when there are two flashing LED

Remote controller			amp part dication		Representative defective position	Detection	Explanation of error contents	Automatic	Operation
indication			Ready	Flash	· · · · · · · · · · · · · · · · · · ·			reset	continuation
F01	0	0	•	ALT	Indoor unit Heat exchanger sensor (TCJ) error	Indoor	Open/Short of heat exchanger (TCJ) was detected.	0	×
F02	0	0	•	ALT	Indoor unit Heat exchanger sensor (TC) error	Indoor	Open/Short of heat exchanger (TC) was detected.	0	×
F10	0	0		ALT	Indoor unit Room temp. sensor (TA) error	Indoor	Open/Short of room temp. (TA) was detected.	0	×
F29	0	0	•	SIM	Indoor unit Other indoor P.C. board error	Indoor	EEPROM error (Other error may be detected. If no error, automatic address is repeated.	×	×
P01		0	0	ALT	Indoor unit Indoor fan error	Indoor	Indoor AC fan error was detected. (Fan thermal relay worked.)	×	×
P10		0	0	ALT	Indoor unit Overflow detection	Indoor	Float switch worked.	×	×
P12		0	0	ALT	Indoor unit Indoor fan error	Indoor	Indoor fan error (Over-current / Lock, etc.) was detected.	×	×
P31	0	•	0	ALT	Other indoor unit error	Indoor	Other indoor under condition of warning in group. E03/L07/L03/L08 warning	0	×
-	By uni	t with war	ning No.	ALT	Error in indoor group	Network adapter	Sub remote controller error in a group (Details of remote controller are displayed with unit No. Only central control side is displayed.)	-	—
-	— LAN sys			LAN system communication error	Network adapter/ Center	Communication error of central control system signal * Is not displayed on the remote controller	0	0	
L20	0	0	0	SIM	LAN system communication error	Network adapter/ Center	Duplicated indoor address of central control system communication	0	×
-	—			There are multiple communication adapters.	Network adapter	There are multiple communication adapters on remote controller communication line.	0	Ó	

Error mode detected by indoor unit

	Operation of diagnosti	c function		
Check code	Cause of operation	Status of air conditioner	Condition	Judgment and measures
E03	No communication from remote controller (including wireless) and communication adapter	Stop (Automatic reset)	Displayed when error is detected	 Check cables of remote controller and communication adapters. 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. Miswiring of inter-unit wire Defective serial sending circuit on outdoor P.C. board Defective serial receiving circuit on indoor P.C. board 	Stop (Automatic reset)	Displayed when error is detected	 Outdoor unit does not completely operate. Inter-unit wire check, correction of miswiring Check outdoor P.C. board. Correct wiring of P.C. board. When outdoor unit normally operates Check P.C. board (Indoor receiving / Outdoor sending).
E08	Duplicated indoor unit address			 Check whether remote controller connection (Group/Individual) was changed or not after power supply turned on
L03	Duplicated indoor master unit		Displayed when	(Finish of group construction/Address check).
L07	There is group wire in individual indoor unit.	Stop	error is detected	* If group construction and address are not normal when the power has been turned on, the mode automatically shifts to address setup mode. (Resetting of address)
L08	Unset indoor group address			
L09	Unset indoor capacity	Stop	Displayed when error is detected	1. Set indoor capacity (DN=11)
L30	Abnormal input of outside interlock	Stop	Displayed when error is detected	 Check outside devices. Check indoor P.C. board.
P10	Float switch operation • Float circuit, Disconnection, Coming-off, Float switch contact error	Stop	Displayed when error is detected	 Trouble of drain pump Clogging of drain pump Check float switch. Check indoor P.C. board.
P12	Indoor DC fan error	Stop	Displayed when error is detected	 Position detection error Over-current protective circuit of indoor fan driving unit operated. Indoor fan locked. Check indoor P.C. board.
P19	 4-way valve system error After heating operation has started, indoor heat exchangers temp. is down. 	Stop (Automatic reset)	Displayed when error is detected	 Check 4-way valve. Check 2-way valve and check valve. Check indoor heat exchanger (TC/TCJ). Check indoor P.C. board.
P31	Own unit stops while warning is output to other indoor units.	Stop (Follower unit) (Automatic reset)	Displayed when error is detected	 Judge follower unit while master unit is [E03], [L03], [L07] or [L08]. Check indoor P.C. board.
F01	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TCJ)	Stop (Automatic reset)	Displayed when error is detected	 Check indoor heat exchanger temp. sensor (TCJ). Check indoor P.C. board.
F02	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TC)	Stop (Automatic reset)	Displayed when error is detected	 Check indoor heat exchanger temp. sensor (TC). Check indoor P.C. board.
F10	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TA)	Stop (Automatic reset)	Displayed when error is detected	 Check indoor heat exchanger temp. sensor (TA). Check indoor P.C. board.
F29	Indoor EEPROM error • EEPROM access error	Stop (Automatic reset)	Displayed when error is detected	 Check indoor EEPROM. (including socket insertion) 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 indoor P.C. board.
E18	Regular communication error between indoor aster and follower units and between main and sub units	Stop (Automatic reset)	Displayed when error is detected	 Check remote controller wiring. Check indoor power supply wiring. Check indoor P.C. board.

Error mode detected by remote controller or central controller (TCC-LINK)

	Operation of diagnostic fur				
Check code	heck code Cause of operation		Condition	Judgment and measures	
Not displayed at all (Operation on remote controller is impossible.)	No communication with master indoor unit • Remote controller wiring is not correct. • Power of indoor unit is not turned on. • Automatic address cannot be completed.	Stop —		 Power supply error of remote controller, Indoor EEPROM error 1. Check remote controller inter-unit wiring. 2. Check remote controller. 3. Check indoor power wiring. 4. Check indoor P.C. board. 5. Check indoor EEPROM. (including socket insertion) → Automatic address repeating phenomenon generates. 	
E01 *2	No communication with master indoor unit • Disconnection of inter-unit wire between remote controller and master indoor unit (Detected by remote controller side)	Stop (Automatic reset) * If center exists, operation continues.	Displayed when error is detected	 Receiving error from remote controller Check remote controller inter-unit wiring. Check remote controller. Check indoor power wiring. Check indoor P.C. board. 	
E02	Signal send error to indoor unit (Detected by remote controller side)	Stop (Automatic reset) * If center exists, operation continues.	Displayed when error is detected	 Sending error of remote controller Check sending circuit inside of remote controller. → Replace remote controller. 	
E09	There are multiple main remote controllers. (Detected by remote controller side)	Stop (Sub unit continues operation.)	Displayed when error is detected	 In 2-remote controllers (including wireless), there are multiple main units. Check that there are 1 main remote controller and other sub remote controllers. 	
L20 Central controller L20	Duplicated indoor central addresses on communication of central control system (Detected by indoor/central controller side)	Stop (Automatic reset)	Displayed when error is detected	 Check setting of central control system network address. (Network adapter SW01) Check network adapter P.C. board. 	
	Communication circuit error of central control system (Detected by central controller side)	Continues (By remote controller)	Displayed when error is detected	 Check communication wire / miswiring Check communication (U3, U4 terminals) Check network adapter P.C. board. Check central controller (such as central control remote controller, etc.) Check terminal resistance. (TCC-LINK) 	
– – – – – – – Central controller P30	Indoor Gr sub unit error (Detected by central controller side)	Continuation/Stop (According to each case)	Displayed when error is detected	Check the check code of the corresponding unit from remote controller.	

*2 The check code cannot be displayed by the wired remote controller. (Usual operation of air conditioner becomes unavailable.) For the wireless models, an error is notified with indication lamp.

*3 This trouble is related to communication of remote controller (A, B), central system (TCC-LINK U3, U4), and [E01], [E02], [E03], [E09] or [E18] is displayed or no check display on the remote controller according to the contents.

Error mode detected by outdoor unit

The check code has been ramified from 4 series and after.

The ramified check code is displayed only when both the indoor unit and the outdoor unit are 4 series and after. (Ex. Combination of RAV-SM1404UT-E with RAV-SP1404AT-E)

When the indoor unit is 3 series and before, the conventional check code is displayed.

(Ex. Combination of RAV-SM1402BT-E and RAV-SP1404AT-E: Outdoor unit only is 4 series.)

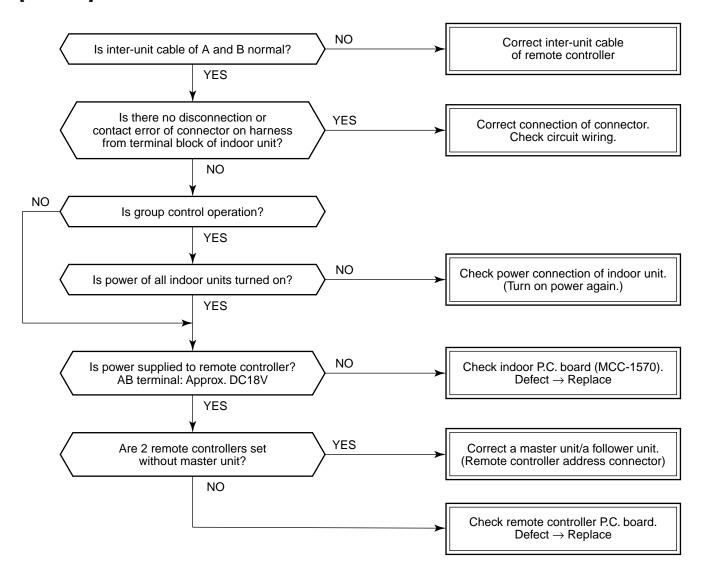
Operation of diagnostic function						
Check code						
Indoor unit		Cause of operation	Status of air conditioner	Condition	Judgment and measures	
before 3 series	after 4 series		air conditioner			
F04	F04	Disconnection, short of discharge temp. sensor (TD)	Stop	Displayed when error is detected	 Check discharge temp. sensor (TD). Check outdoor P.C. board. 	
F06	F06	Disconnection, short of outdoor temp. sensor (TE)	Stop	Displayed when error is detected	 Check temp. sensor (TE). Check outdoor P.C. board. 	
	F07	Disconnection, short of outdoor temp. sensor (TL)	Stop	Displayed when error is detected	 Check temp. sensor (TL). Check outdoor P.C. board. 	
	F12	Disconnection, short of suction temp. sensor (TS)	Stop	Displayed when error is detected	 Check suction temp. sensor (TS). Check outdoor P.C. board. 	
	F15	Miss-mounting of outdoor temp. sensor (TE, TS)	Stop	Displayed when error is detected	 Check temp. sensor (TE, TS). Check outdoor P.C. board. 	
F08	F08	Disconnection, short of outside temp. sensor (TO)	Continue	Displayed when error is detected	 Check outside temp. sensor (TO). Check outdoor P.C. board. 	
L29	F13	Disconnection, short of heat sink temp. sensor (TH)	Stop	Displayed when error is detected	1. Check outdoor P.C. board.	
	F31	Outdoor P.C. EEPROM error	Stop	Displayed when error is detected	1. Check outdoor P.C. board.	
	L10	Unset jumper of service P.C. board	Stop	Displayed when error is detected	1. Outdoor service P.C. board Check model type setting jumper wire.	
	L29	Communication error between outdoor P.C. board MCU	Stop	Displayed when error is detected	1. Check outdoor P.C. board.	
	P07	Heat sink overheat error * Heat sink temp. sensor detected over specified temperature.	Stop	Displayed when error is detected	 Check screw tightening between PC. Board and heat sink and check radiator grease. Check heat sink blast path. 	
	P15	Detection of gas leak * Discharge temp. sensor (TD), Suction temp. sensor (TS) detected temperature over specified temp.	Stop	Displayed when error is detected	 Check gas leak, recharge Check full open of service valve. Check PMV (Pulse Motor Valve). Check broken pipe. Check discharge temp. sensor (TD), suction temp. sensor (TS). 	
	P19	 4-way valve inverse error After heating operation has started, indoor heat exchanger temp. lowers under the specified temp. After heating operation has started, outdoor heat exchanger / suction temp. rises over the specified temp. 	Stop	Displayed when error is detected	 Check operation of 4-way valve. Check outdoor heat exchanger (TE), suction temp. sensor (TS). Check indoor heat exchanger sensor (TC). Check 4-way valve coil. Check PMV (Pulse Motor Valve). 	
H01	H01	Compressor break down * Although operation has started, operation frequency decreases and operation stops.	Stop	Displayed when error is detected	 Check power supply voltage. (AC198 to 264V) Overload operation of refrigerating cycle 	
H02	H02	Compressor lock * Over-current detection after compressor start-up	Stop	Displayed when error is detected	 Trouble of compressor (Lock, etc.): Replace compressor. Wiring error of compressor (Open phase) 	
H03	H03	Current detection circuit error	Stop	Displayed when error is detected	1. Check outdoor P.C. board. (AC current detection circuit)	

<In case of SP110, SP140>

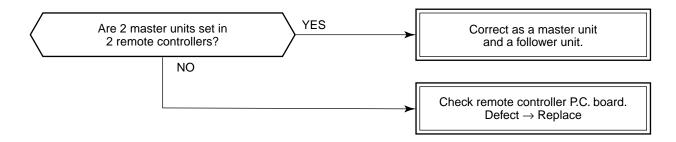
Operation of diagnostic function					
Check code Indoor unit before after 3 series 4 series		Cause of operation	Status of air conditioner	Condition	Judgment and measures
P03	P03	Discharge temp. error * Discharge temp. (TD) over specified value was detected.	Stop	Displayed when error is detected	 Check refrigerating cycle (Gas leak) Trouble of electronic expansion valve Check discharge temp. sensor (TD).
P04	H04	Case thermostat operation * Abnormal overheat of compressor	Stop	Displayed when error is detected	 Check case thermostat and connector. Check gas leak, recharge Check full open of service valve. Check PMV (Pulse Motor Valve). Check broken pipe.
	P05	Power supply voltage error	Stop	Displayed when error is detected	1. Check power supply voltage. AC198 to 264V
	P20	 High pressure protective operation During cooling operation, outdoor temp. sensor (TL) detected temperature over specified temp. During heating operation, indoor temp. sensor (TC, TCJ) detected temperature over specified temp. 	Stop	Displayed when error is detected	 Check outdoor heat exchanger sensor (TL). Check indoor heat exchanger sensor (TC, TCJ). Check full open of service valve. Check indoor/outdoor fan. Check PMV (Pulse Motor Valve). Check clogging and short circuit of indoor/outdoor heat exchanger. Overcharge of refrigerant. Recharge
P22	P22	Outdoor fan system error	Stop	Displayed when error is detected	 Check lock of fan motor. Check power supply voltage. AC198 to 264V Check outdoor P.C. board.
P26	P26	Short-circuit error of compressor driving element	Stop	Displayed when error is detected	 When performing operation while taking-off compressor wire, P26 error occurs. Check control PC. board. When performing operation while taking-off compressor wire, an error does not occur. (Compressor rare short)
P29	P29	Position detection circuit error	Stop	Displayed when error is detected	1. Check control P.C. board.

10-2-4. Diagnostic Procedure for Each Check Code (Indoor Unit)

Check code [E01 error]

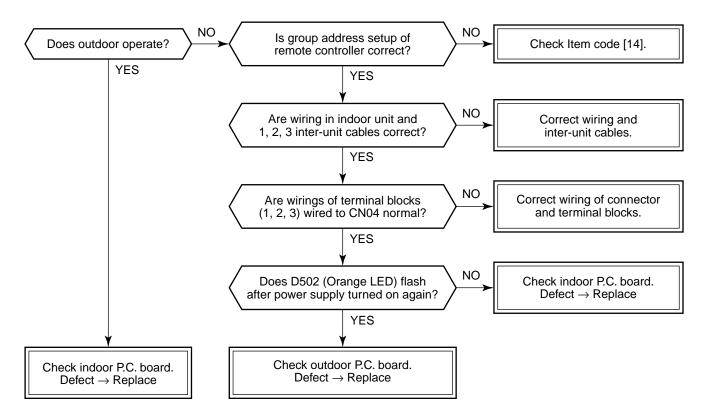


[E09 error]

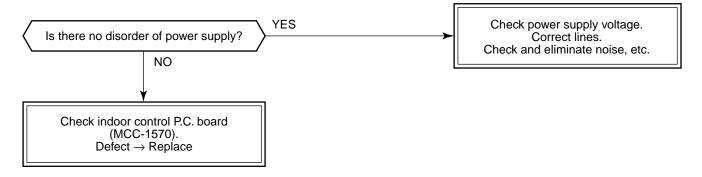


<In case of SP110, SP140>

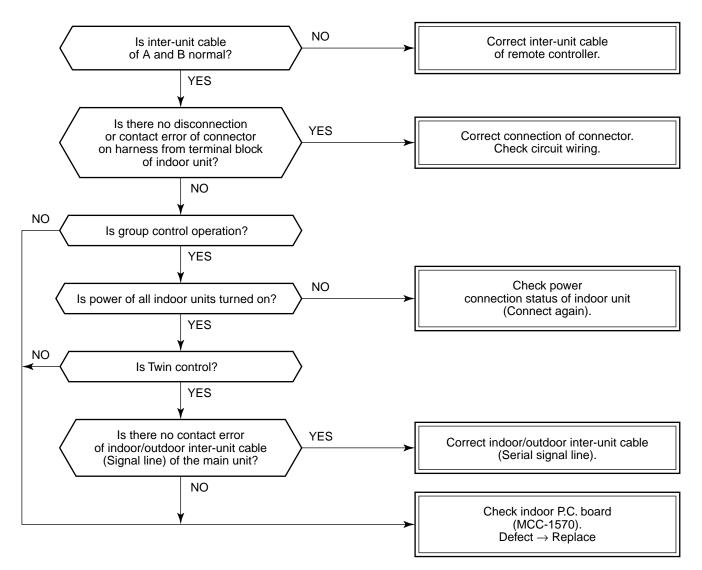
[E04 error]



[E10 error]



[E18 error]



[E08, L03, L07, L08 error]

E08: Duplicated indoor unit No.

L03: There are 2 or more master units in a group control.

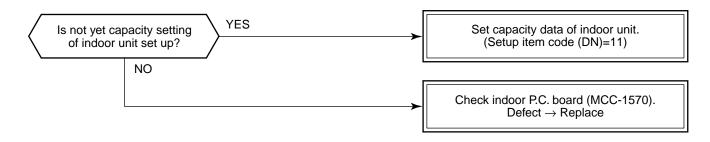
L07: There is 1 or more group address [Individual] in a group control.

L08: The indoor group address is unset. (13. ADDRESS SETUP)

If the above error is detected when power supply turned on, the mode enters automatically in the automatic address set mode. (Check code is not output.)

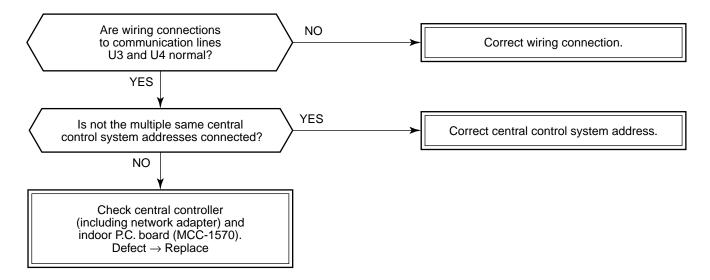
However, if the above error is detected during the automatic address set mode, a check code may be output.

[L09 error]

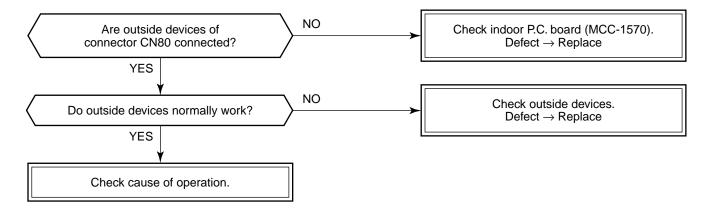


<In case of SP110, SP140>

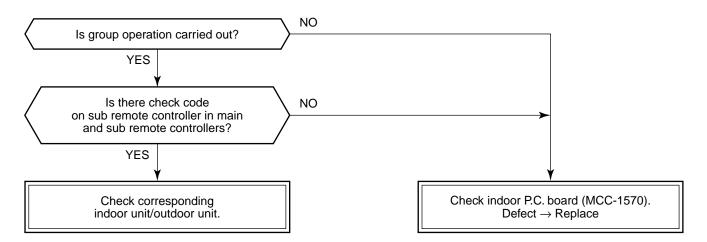
[L20 error]



[L30 error]

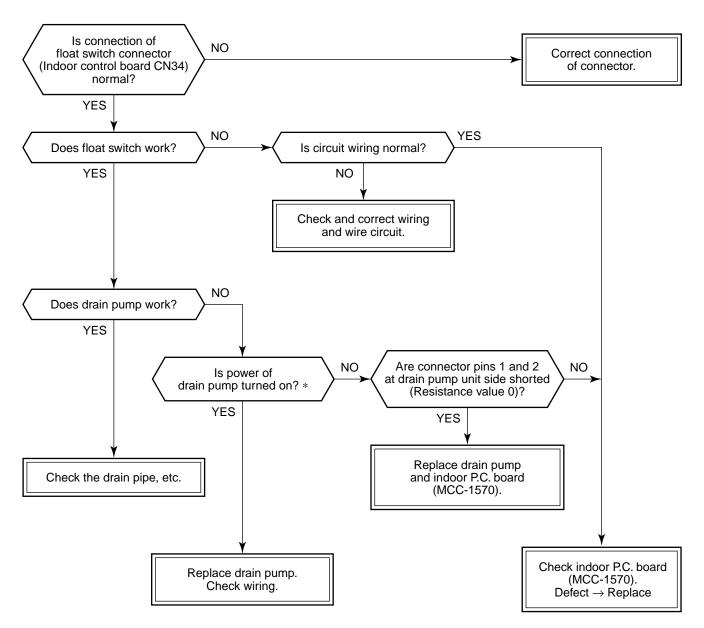


[P30 error] (Central controller)



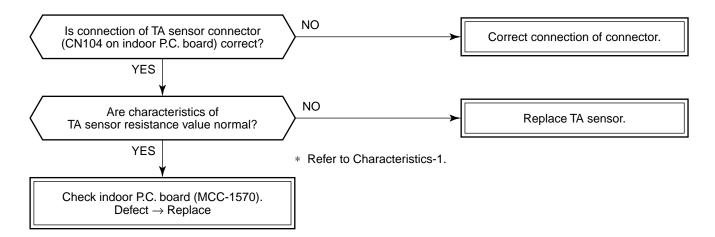
<In case of SP110, SP140>

[P10 error]

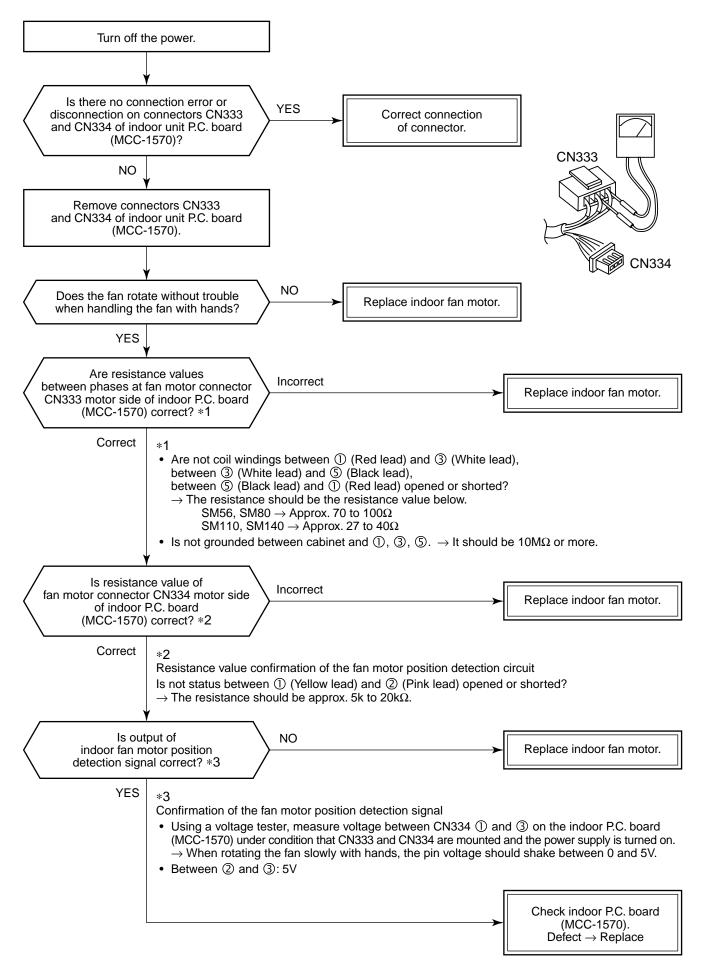


* Check that voltage of 1-2 pin of CN504 on the indoor P.C. board is +12V. (1 pin is plus (+).)

[F10 error]

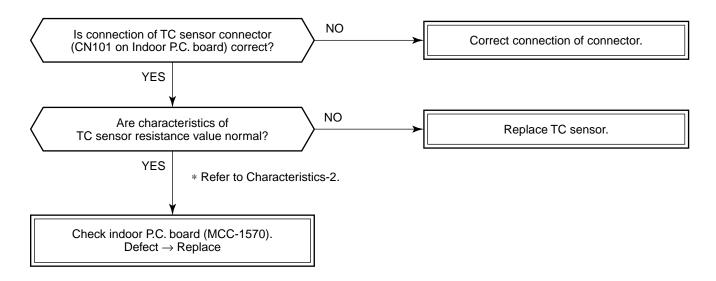


[P12 error]

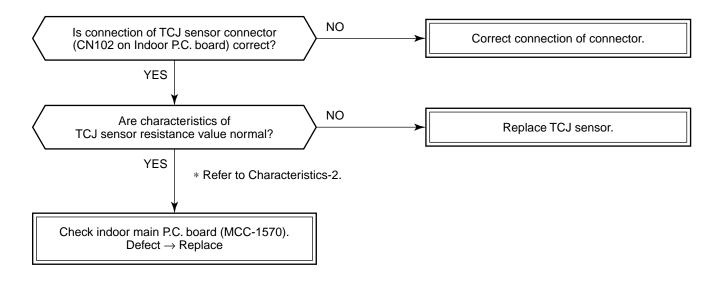


<In case of SP110, SP140>

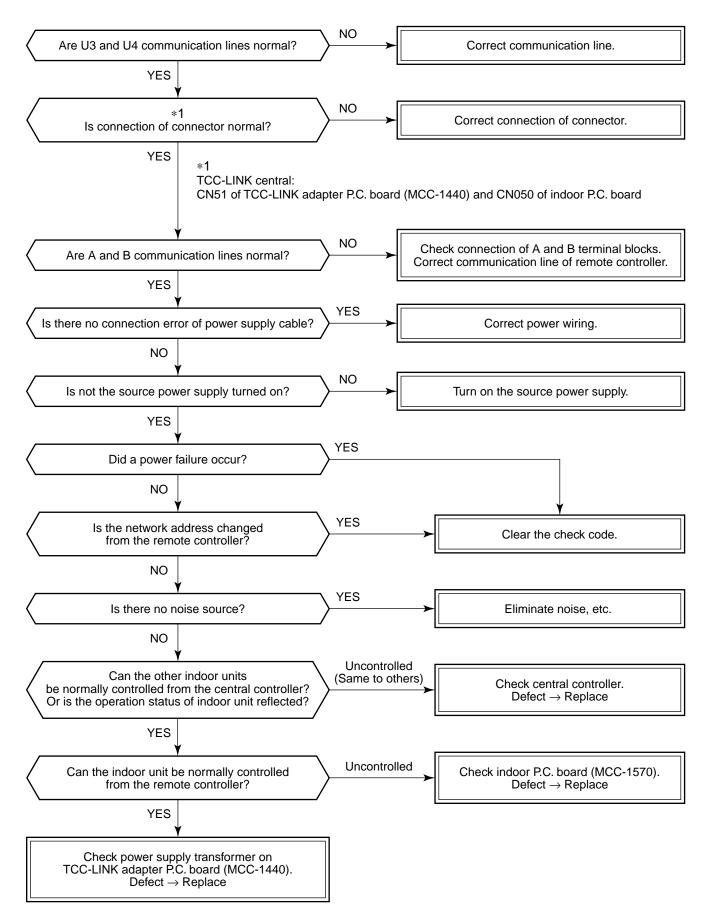
[F02 error]



[F01 error]



[C06 error] (TCC-LINK central controller)



[E03 error] (Master indoor unit)

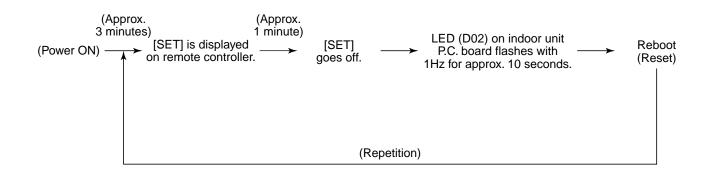
[E03 error] is detected when the indoor unit cannot receive a signal from the remote controller (also central controller).

Check A and B remote controllers and communication lines of the central control system U3 and U4. As communication is impossible, this check code [E03] is not displayed on the remote controller and the central controller. [E01] is displayed on the remote controller and [C06 error] is displayed on the central controller. If these check codes generate during operation, the air conditioner stops.

[F29 error]

This check code indicates a detection error of IC10 non-volatile memory (EEPROM) on the indoor unit P.C. board, which generated during operation of the air conditioner. Replace the service P.C. board.

* When EEPROM was not inserted when power supply turned on or when the EEPROM data read/write operation is impossible at all, the automatic address mode is repeated. In this time, [97 error] is displayed on the central controller.



[P31 error] (Follower indoor unit)

When the master unit of a group operation detected [E03], [L03], [L07] or [L08] error, the follower unit of the group operation detects [P31 error] and then the unit stops.

There is no display of the check code or alarm history of the remote controller. (In this model, the mode enters in automatic address set mode when the master unit detected [L03], [L07] or [L08] error.)

10-2-5. Diagnostic Procedure for Each Check Code (Outdoor Unit)

- 1) This section describes the diagnostic method for each check code displayed on the remote controller.
- 2) In some cases, a check code indicates multiple symptoms.In this case, confirm LED display on the outdoor P.C. board to narrow the contents to be confirmed.
- 3) The check code on the remote controller is displayed only when the same error occurred continuously by multiple times while LED of the outdoor P.C. board displays even an error which occurred once. Therefore the display on the remote controller may differ from that of LED.

LED display on outdoor P.C. board

Dip switch setup

- When turning on 1) only of SW803, the latest error is displayed. As the memory is stored, it can be confirmed even if the power supply is turned off once. (excluding outside temp. sensor (TO) error)
- When the work finished or the outdoor temp. sensor (TO) error was found, turn off all of SW803. (The error which occurs at present is displayed.)

<Latest error display>

Only 1) of SW803 is ON.

	4
	က
	2
S	-

<Error display, which occurs at present>

All SW803 are OFF. (Initial status)

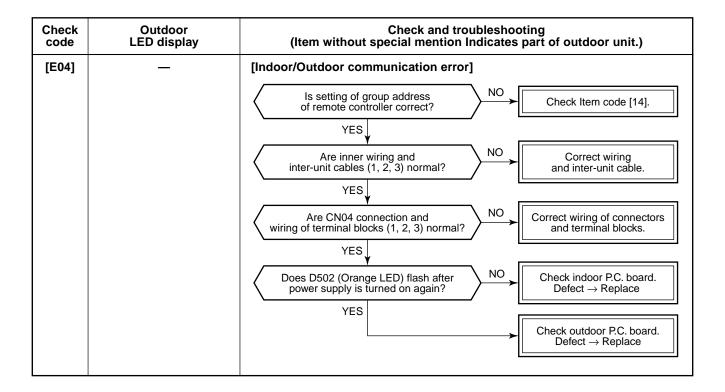
C	4
[Ċ
[<u>_</u>
SC	~

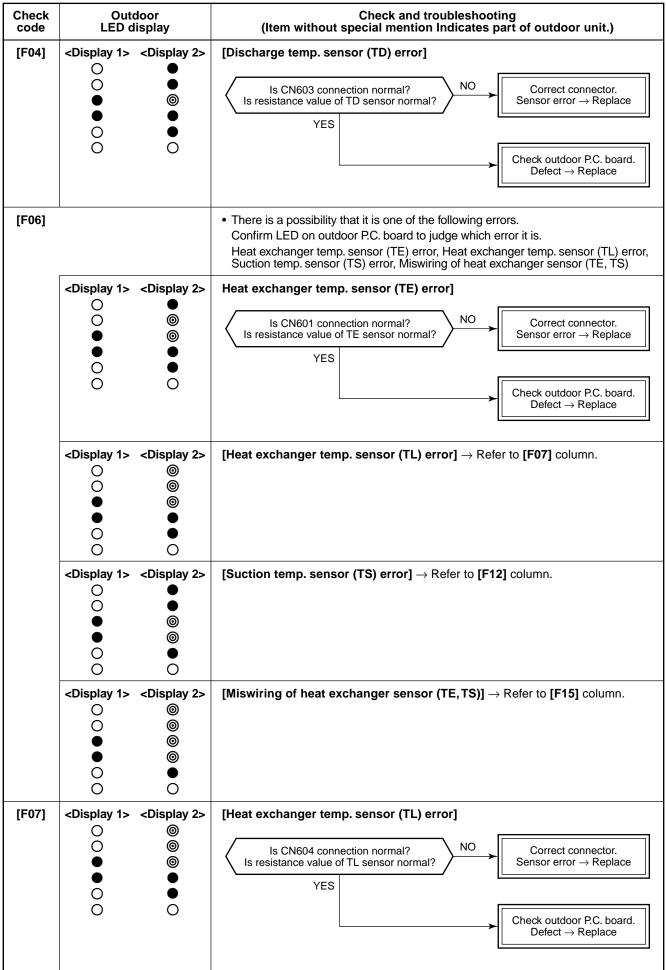
Display selection

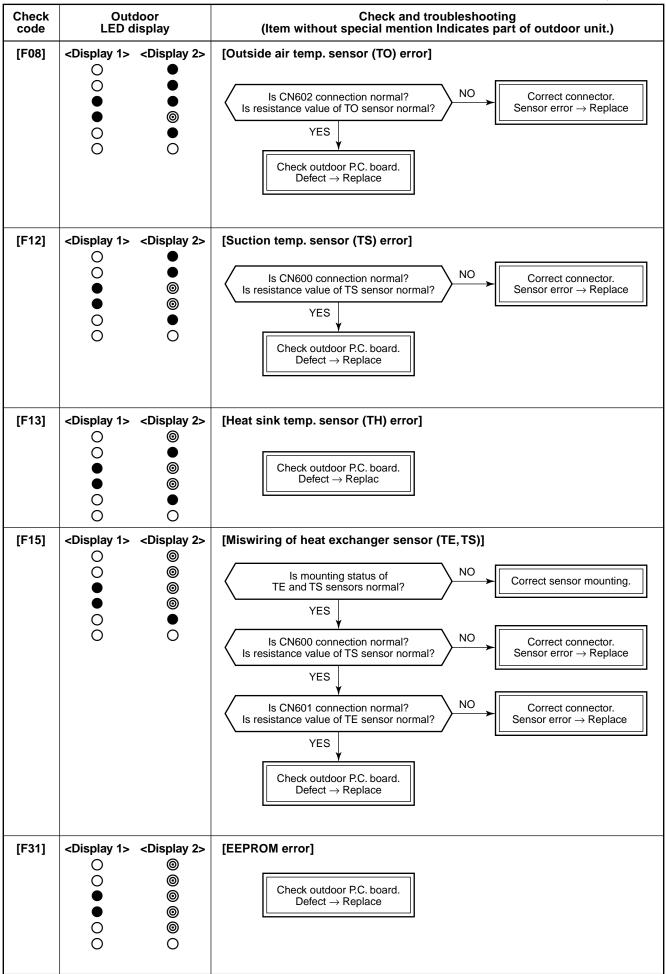
- When even a LED of D800 to D804 (Yellow) goes on, error occurrence is indicated.
- If pushing the button switch SW800 for 1 second under the above condition, the yellow LED is displayed with flashing.
- When pushing SW800 for 1 second again, the status returns to **<Display 1>**.
- The error contents can be confirmed by combining <Display 1> and <Display 2>.

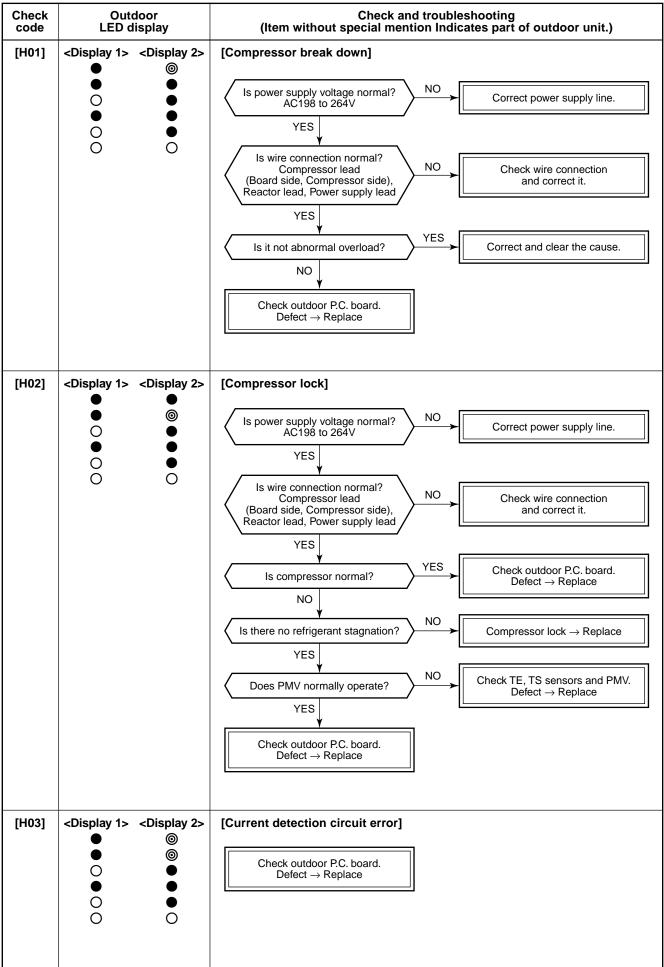
<Display 1> ⇔ <Display 2>

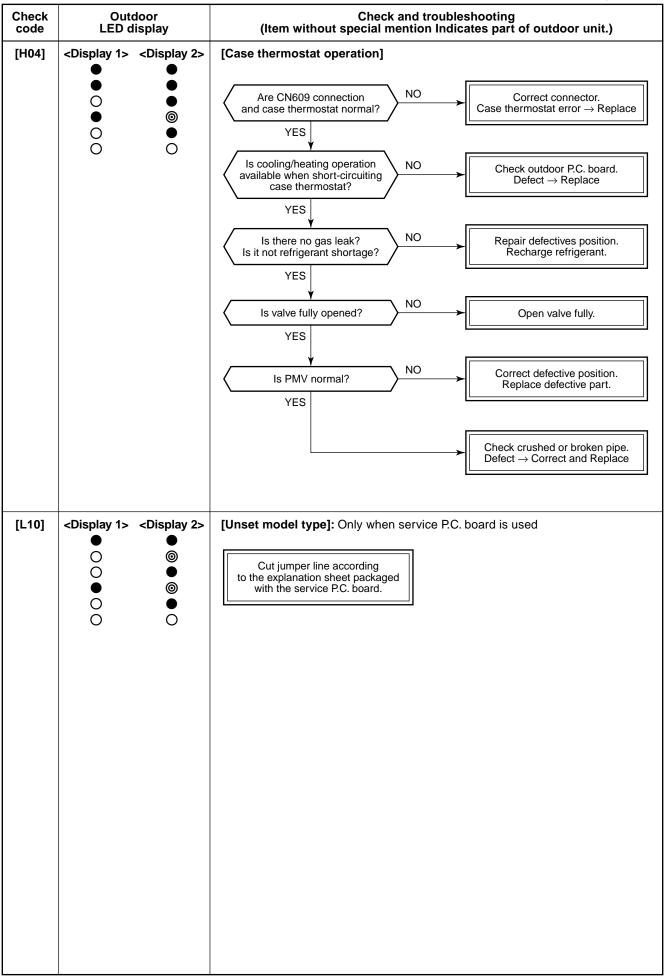
(Error occurred) (Push SW800) (No error) D800 (Yellow) 0 Ο D801 (Yellow) D802 (Yellow) D803 (Yellow) D804 (Yellow) 0 0 0 \cap D805 (Green) (Example of discharge temp. sensor error) ● : Go off, O : Go on, @ : Flash



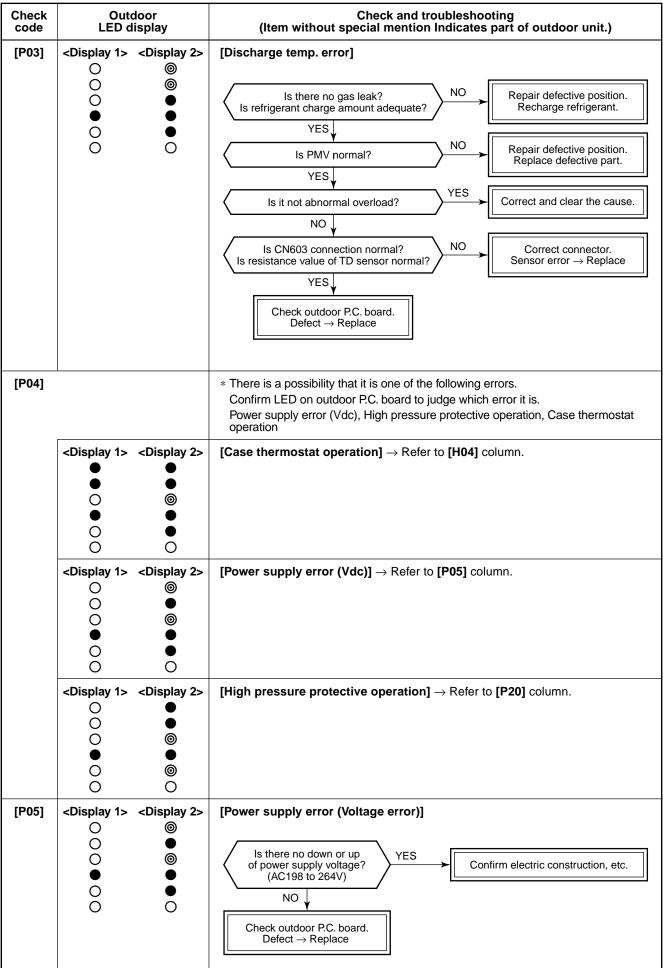




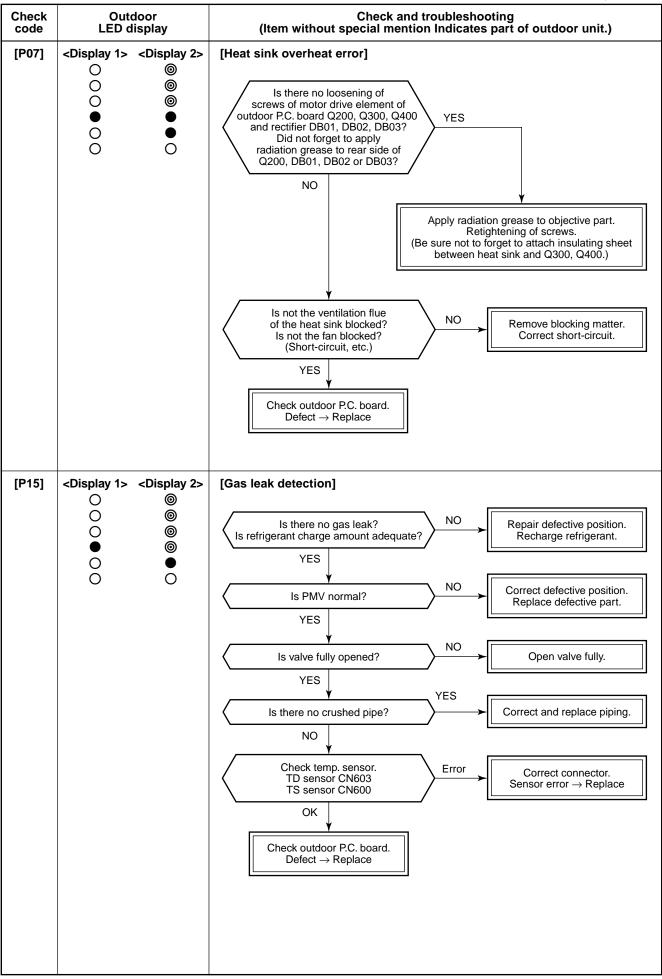


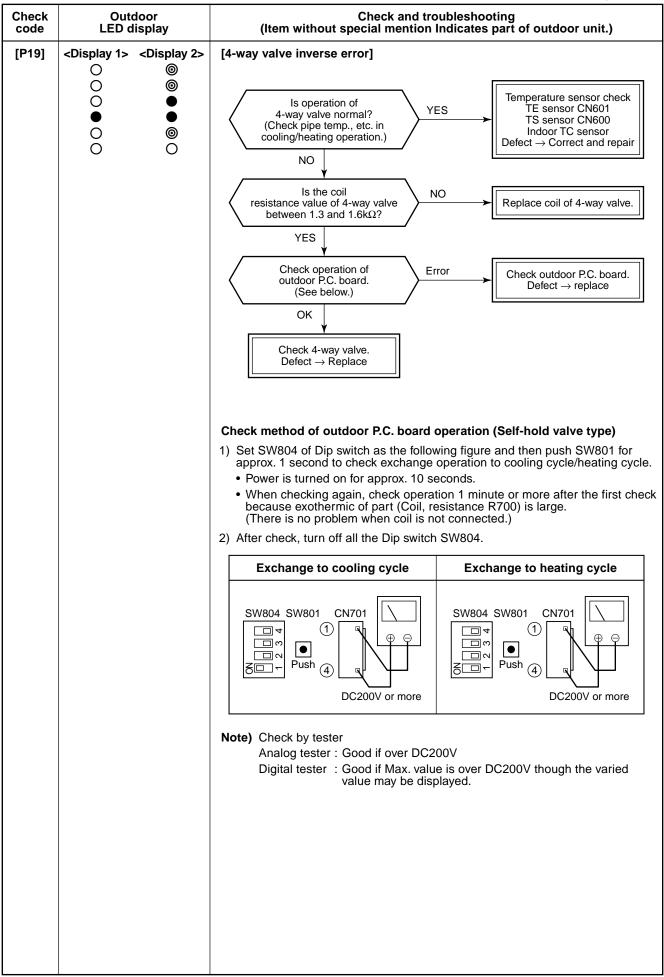


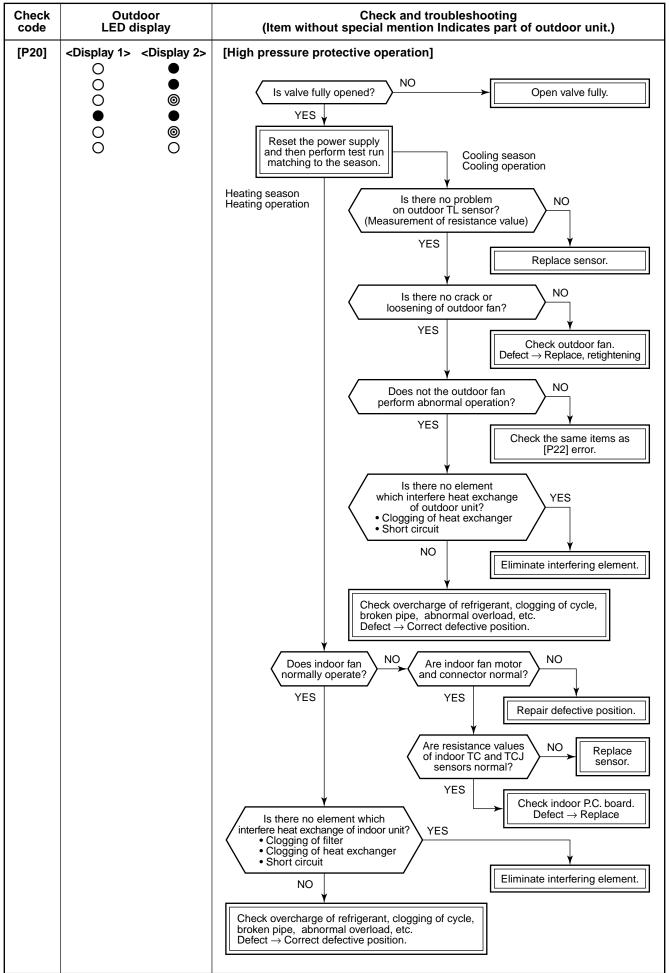
Charle		door	<in case="" of="" sp110,="" sp140=""></in>					
Check code	LED d	door lisplay	Check and troubleshooting (Item without special mention Indicates part of outdoor unit.)					
[L29]			 There is a possibility that it is one of the following errors. Confirm LED on outdoor P.C. board to judge which error it is. Communication error between MCU, Heat sing temp. sensor (TH) error, EEPROM error, Unset model type, Heat sink overheat error, Gas leak detection, 4-way valve inverse error 					
	<display 1=""> O O O O O </display>	<display 2=""> () () () () () () () () () ()</display>	[Communication error between MCU] Check outdoor P.C. board. Defect \rightarrow Replace					
	<display 1=""> O O O O O O O</display>	<display 2=""> (©) (©) (©) () () () () () () () () () (</display>	[Heat sink temp. sensor (TH) error] \rightarrow Refer to [F13] column.					
	<display 1=""> O O O O O O O O</display>	<display 2=""> (0) (0) (0) (0) (0) (0) (1) (1) (1) (1) (1) (1) (1) (1</display>	[EEPROM error] \rightarrow Refer to [F31] column.					
	<display 1=""></display>	<display 2=""> Ø Ø Ø O </display>	[Unset model type] → Refer to [L10] column.					
	<display 1=""> ○ ○ ○ ○ ○</display>	<display 2=""> (9) (9) (9) (9) (9) (9) (9) (9)</display>	[Heat sink overheat error] \rightarrow Refer to [P07] column.					
	<display 1=""> ○ ○ ○ ○ ○</display>	<display 2=""> ◎ ◎ ◎ ● ○</display>	[Gas leak detection] → Refer to [P15] column.					
	<display 1=""> ○ ○ ○ ○ ○</display>	<display 2=""> (©) (©) (©) () () () () () () () () () (</display>	[4-way valve inverse error] → Refer to [P19] column.					

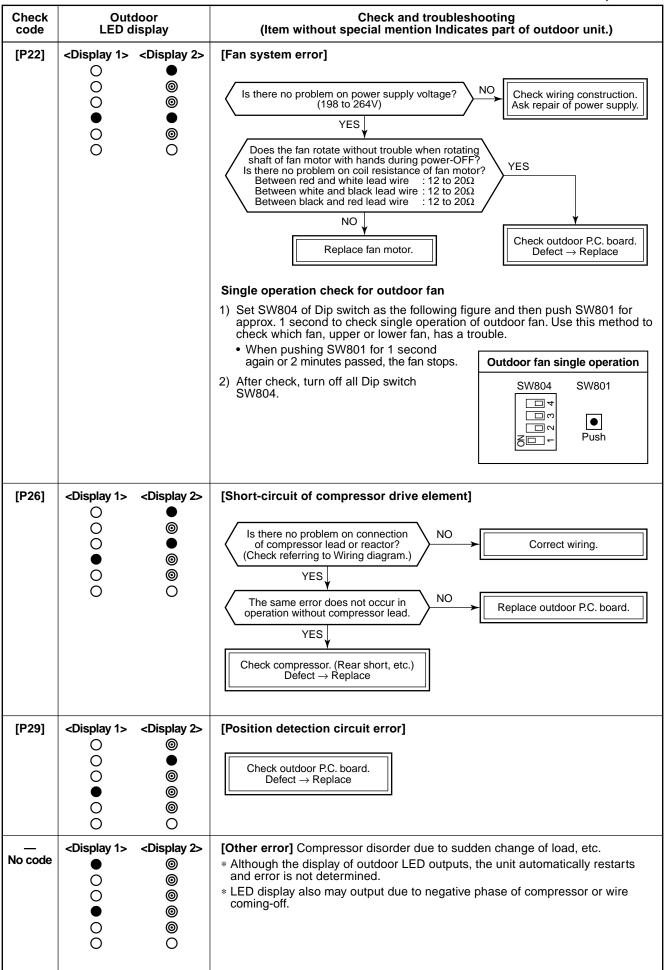


<In case of SP110, SP140>









Temperature sensor

<u>Temperature – Resistance value characteristic table</u>

TA, TC, TCJ, TE, TS, TO sensors

Representative value

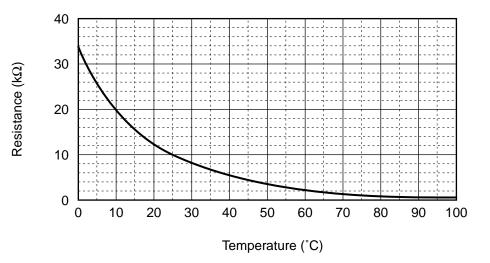
Temperature	Re	esistance value (k	Ω)	
(°C)	(Minimum value)	(Standard value)	(Maximum value)	
0	32.33	33.80	35.30	
10	19.63	20.35	21.09	
20	12.23	12.59	12.95	
25	9.75	10.00	10.25	
30	7.764	7.990	8.218	
40	5.013	5.192	5.375	
50	3.312	3.451	3.594	
60	2.236	2.343	2.454	
70	1.540	1.623	1.709	
80	1.082	1.146	1.213	
90	0.7740	0.8237	0.8761	
100	0.5634	0.6023	0.6434	

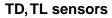
TD, TL sensors

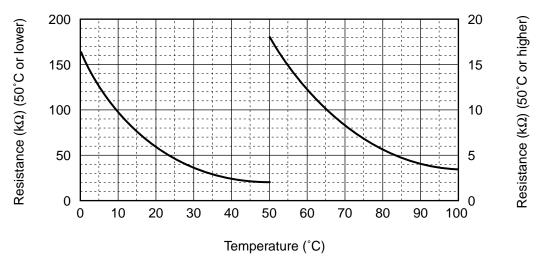
Representative value

Temperature	Resistance value (kΩ)						
(°C)	(Minimum value)	(Standard value)	(Maximum value)				
0	150.5	161.3	172.7				
10	92.76	99.05	105.6				
20	58.61	62.36	66.26				
25	47.01	49.93	52.97				
30	37.93	40.22	42.59				
40	25.12	26.55	28.03				
50	17.00	17.92	18.86				
60	11.74	12.34	12.95				
70	8.269	8.668	9.074				
80	5.925	6.195	6.470				
90	4.321	4.507	4.696				
100	3.205	3.336	3.468				

TA, TC, TCJ, TE, TS, TO sensors







* As TH sensor (Outdoor unit heat sink temp. sensor) is incorporated in the outdoor control P.C. board, the resistance value cannot be measured.

<In case of SP110, SP140>

10-2-6. Outline of judgment

The primary judgment to check whether a trouble occurred in the indoor unit or outdoor unit is carried out with the following method.

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

The indoor unit monitors the 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.

Lam	o indica	tion	Check code	Cause of trouble occurrence			
Operation ●	Timer	Ready	_	Power supply OFF or miswiring between receiving unit and indoor unit			
No inc	dication a	at all					
			E01	Receiving error Receiving unit Miswiring or wire connection error			
			E02	between receiving unit and indoor unit			
Operation	Timer	Ready	E03	Communication stop			
-)			E08	Duplicated indoor unit No.			
Flash	•	•	E09	Duplicated master units of remote controller			
			E10	Communication error between CPUs on indoor unit P.C. board			
			E18	Wire connection error between indoor units, Indoor power OFF (Communication stop between indoor master and follower or between main and sub indoor twin)			
Operation •	Timer	Ready - ֲִֽֽׁׁׁ- Flash	E04	Miswiring between indoor unit and outdoor unit or connection erorr (Communication stop between indoor and outdoor units)			
Operation	Timer -Ò́-	Ready -ᢕ	P10	Overflow was detected. Protective device of indoor unit worked.			
	Alterna	te flash	P12	Indoor DC fan error			
			P03	Outdoor unit discharge temp. error } *1 Protective device of outdoor unit worked.			
			P05	Negative phase detection error } Outdoor unit error			
Operation	Timer	Ready	P19	4-way valve system error (Indoor or outdoor unit judged.)			
-)Ŏ(-	•	-)Ó-	P22	Outdoor unit: Outdoor fan error			
Alte	rnate fla	sh	P26	Outdoor unit: Inverter Idc operation Protective device of *1			
			P29	Outdoor unit: Position detection error			
			P31	Stopped because of error of other indoor unit in a group (Check codes of E03/L03/L07/L08)			

*1: These are representative examples and the check code differs according to the outdoor unit to be combined.

<In case of SP110, SP140>

Lamp	o indicati	on	Check code	Cause of trouble occurrence
Operation		Ready	F01	Heat exchanger sensor (TCJ) error
-Ò-	-Ò́-	•	F02	Heat exchanger sensor (TC) error Indoor unit sensor error
Alternate	flash		P10	Heat exchanger sensor (TA) error
	- .	D 1	F04	
Operation	imer -\otivi-	Ready	F06	Discharge temp. sensor (TD) error Temp. sensor (TE) error
		Ŭ	F08	Temp. sensor (TO) error
Alternate	flash		F12	Temp. sensor (TS) error
Operation - Č- Simultaneo	-)	Ready ●	F29	Indoor EEPROM error
Operation	Timer	Ready	H01	Compressor break down
•	-`\	ullet	H02	Compressor lock Outdoor compressor system error *1
	Flash		H03	Current detection circuit error
			L03	Duplicated master indoor units
Operation	Timer	Ready -Ò	L07	There is indoor unit of group connection in individual indoor unit. → AUTO address * If group construction and
i	•		L08	Unsetting of group addressaddress are not normalMissed settingwhen power supply turned on,
Simult	aneous fl	ash	L09	(Unset indoor capacity) automatically goes to address setup mode.
Operation	Timer	Ready	L20	Duplicated indoor central addresses
-)0-	\bigcirc	-)(-	L30	Outside interlock error Others
Simultaneous flash		L31	Negative phase error	

*1: These are representative examples and the check code differs according to the outdoor unit to be combined.

10-2-7. Others (Other than Check Code)

Lam	Lamp indication			Cause of trouble occurrence
Operation ໍ\ Simul	Timer -兴- taneous	Ready -ʾᢕֽ̆- flash	_	During test run
Operation	-`Ċ-	Ready -Ò- te flash	_	Disagreement of cool/heat (Automatic cool/heat setting to automatic cool/heat prohibited model, or setting of heating to cooling-only model)

10-2-8. Check Code List (Indoor)

O : Go on, @ : Flash, ● : Go off ALT (Alternate): Alternate flashing when there are two flashing LED SIM (Simultaneous): Simultaneous flashing when there are two flashing LED

(Indoor unit detected)

Check code indication			ion				Air condition	ner operation	
TCC-LINK central &	Block indication				Representative defective position		Explanation of error contents	Automatic	Operation
Wired remote controller	Operation	n Timer	Ready	Flash				reset	continuation
E03	0	•	•		Regular communication error between indoor and remote controller		No communication from remote controller and network adapter (Also no communication from central control system)	0	×
E04		•	0		Indoor/Outdoor serial error		There is error on serial communication between indoor and outdoor units	0	×
E08	0	•	•		Duplicated indoor addresses	\diamond	Same address as yours was detected.	0	×
E10	0	•	•		Communication error between indoor MCU		MCU communication error between main motor and micro computer	0	×
E18	0	•	•		Regular communication error between indoor master and follower units		Regular communication between indoor master and follower units is impossible, Communication between twin master (main) and follower (sub) units is impossible.	0	×
F01	0	0		ALT	Indoor unit, Heat exchanger (TCJ) error		Open/short was detected on heat exchanger (TCJ).	0	×
F02	0	0	•	ALT	Indoor unit, Heat exchanger (TC) error		Open/short was detected on heat exchanger (TC).	0	×
F10	0	0	•	ALT	Indoor unit, Room temp. sensor (TA) error		Open/short was detected on room temp. sensor (TA).	0	×
F29	0	0	•	SIM	Indoor unit, other indoor P.C. board error		EEPROM error (Other error may be detected. If no error, automatic address is repeated.	×	×
L03	0	•	0	SIM	Duplicated setting of indoor group master unit	\diamond	There are multiple master units in a group.	×	×
L07	0	•	0	SIM	There is group cable in individual indoor unit.	\diamond	When even one group connection indoor unit exists in individual indoor unit.	×	×
L08	0	•	0	SIM	Unset indoor group address	\diamond	Indoor group address is unset.	×	×
L09	0	•	0	SIM	Unset indoor capacity		Capacity of indoor unit is unset.	×	×
L20	0	0	0	SIM	Duplicated central control system address		Duplicated setting of central control system address	0	×
L30	0	0	0	SIM	Outside error input to indoor unit (Interlock)		Abnormal stop by outside error (CN80) input	×	×
P01		0	0	ALT	Indoor unit, AC fan error		An error of indoor AC fan was detected. (Fan motor thermal relay worked.)	×	×
P10		0	0	ALT	Indoor unit, overflow detection		Float switch worked.	×	×
P12		0	0	ALT	Indoor unit, DC fan error		Indoor DC fan error (Over-current/Lock, etc.) was detected.	×	×
P19	0	•	0	ALT	4-way valve system error		In heating operation, an error was detected by temp. down of indoor heat exchanger sensor.	0	×
P31	0	•	0	ALT	Other indoor unit error		Follower unit in group cannot operate by warning from [E03/L03/L07/L08] of master unit.	0	×

Т

+ When this warning was detected before group construction/address check finish at power supply was turned on, the mode shifts automatically to AUTO address setup mode.

(Remote controller detected)

Check code indication	Check code indication Sensor la		p indica	tion			Air condition	ner operation
Wired remote controller	Block indication				Representative defective position	Explanation of error contents	Automatic	Operation
wired remote controller	Operation Timer Ready Flash			Flash			reset	continuation
E01	0	•	•		No master remote controller, Remote controller communication (Receive) error	Signal cannot be received from indoor unit. Master remote controller was not set. (including 2 remote controllers)	—	_
E02	0	•	•		Remote controller communication (Send) error	Signal cannot be sent to indoor unit.	_	—
E09	0	•	٠		Duplicated master remote controller	In 2-remote controller control, both were set as master. (Indoor master unit stops warning and follower unit continues operation.)	×	Δ

(Central control devices detected)

Check code indication	Sensor lamp indication			Air condition	ner operation
TCC-LINK central	Block indication Operation Timer Ready Flash	Representative defective position	Explanation of error contents	Automatic reset	Operation continuation
C05	Is not displayed. (Common use of	Central control system communication (send) error Signal sending operation of central control system is impossible. There are multiple same central devices. (AI-NET)		_	_
C06	remote controller, etc.)	Central control system communication (receive) error	Signal receiving operation of central control system is impossible.	_	_
C12	General-purpose device control interface batched warning		An error on device connected to general-purpose device control interface of exclusive to TCC-LINK/AI-NET	_	_
P30	By warning unit (Above-mentioned)	Group follower unit is defective.	Group follower unit is defective. (For remote controller, above-mentioned [***] details are displayed with unit No.	_	_

NOTE: Even for the same contents of error such as communication error, the display of check code may differ according to detection device. When remote controller or central controller detects an error, it is not necessarily related to operation of the air conditioner. In this list, the check codes that outdoor unit detects are not described.

Check Code List (Outdoor)

○: Go on, : Flash, : Go off ALT (Alternate): Alternate flashing when there are two flashing LED SIM (Simultaneous): Simultaneous flashing when there are two flashing LED

Remote	Remote Sensor		amp part	1					Operation
controller	ontroller E		dication		Representative defective position	Detection	Explanation of error contents	Automatic reset	continuation
Indication	Operatio	n Timer	Ready	Flash				10000	oonanaaaon
F04	0	0	0	ALT	Outdoor unit Discharge temp. sensor (TD) error	Outdoor	Open/Short of discharge temp. sensor was detected.	×	×
F06	0	0	0	ALT	Outdoor unit Temp. sensor (TE, TS, TL) error Outdoor Open/Short of heat exchanger temp. sensor was detected. Miswiring between TE sensor and TS sensor		×	×	
F08	0	0	0	ALT	Outdoor unit Outside temp. sensor (TO) error	Outdoor	Open/Short of outside temp. sensor was detected.	0	0
F12	0	0	0	ALT	Outdoor unit Temp. sensor (TS) error	Outdoor	Open/Short of suction temp. sensor was detected.	×	×
H01	•	0			Outdoor unit Compressor break down	Outdoor	When reached min-Hz by current release control, short-circuited current (ldc) after DC excitation was detected.	×	×
H02		0			Outdoor unit Compressor lock	Outdoor	Compressor lock was detected.	×	×
H03		0			Outdoor unit Current detection circuit error	Outdoor	Current detection circuit error	×	×
P03	0		0	ALT	Outdoor unit Discharge temp. error	Outdoor	Error was detected by discharge temp. release control.	×	×
P05	0		0	ALT	Power supply error	Outdoor	Power supply voltage error	×	×
P22	0		0	ALT	Outdoor unit Outdoor fan error	Outdoor	Error (Over-current, lock, etc.) was detected on outdoor fan drive circuit.	×	×
P26	0		0	ALT	Outdoor unit Inverter Idc operation	Outdoor	Short-circuited protective operation of compressor drive circuit element (G-Tr /IGBT) worked.	×	×
P29	0	•	0	ALT	Outdoor unit Position detection error	Outdoor	Position detection error of compressor motor was detected.	×	×
E01	0	•	•		No remote controller master unit Remote controller communication error	Remote controller	Signal was not received from indoor unit. Main remote controller was not set. (including 2 remote controllers)	_	_
E02	0	٠	•		Remote controller send error	Remote controller	Signal cannot be sent to indoor unit.	_	_
E03	0	٠	•		Regular communication error between indoor and Indoor No communication from remote controller and network adapter		0	×	
E04			0		Indoor/Outdoor serial error	Indoor	Serial communication error between indoor and outdoor	0	×
E08	0				Duplicated indoor addresses	Indoor	Same address as yours was detected.	0	
E09	0	٠	٠		Duplicated main remote controllers	Remote controller	In 2-remote controller control, both were set as master. (Indoor master unit stops warning and follower unit continues operation.)	×	×
E10	0				Communication error between CPU	Indoor	MCU communication error between main motor and micro computer	0	$ \Delta $
E18	0	٠	•		Regular communication error between master and follower indoor units	Indoor	Regular communication was impossible between master and follower indoor units. Communication between twin master (Main unit) and follower (sub unit) was impossible.	0	×
L03	0		0	SIM	Duplicated indoor master units	Indoor	There are multiple master units in a group.	×	×
L07	0		0	SIM	There is group cable in individual indoor unit. \diamond	Indoor	When even one group connection indoor unit exists in individual indoor unit	×	×
L08	0		0	SIM	Unset indoor group address	Indoor	Indoor address group was unset.	×	×
L09	0	•	0	SIM	Unset indoor capacity	Indoor	Capacity of indoor unit was unset.	×	×
L30	0	0	0	SIM	Outside error input to indoor unit (Interlock)	Indoor	Abnormal stop by CN80 outside error input	×	×
P19	0	•	0	ALT	4-way valve inverse error	Indoor Outdoor	In heating operation, error was detected by temp. down of indoor heat exchanger or temp. up ofTE, TS.	0	×
F01	0	0		ALT	Indoor unit Heat exchanger sensor (TCJ) error	Indoor	Open/Short of heat exchanger (TCJ) was detected.	0	×
F02	0	0		ALT	Indoor unit Heat exchanger sensor (TC) error	Indoor	Open/Short of heat exchanger (TC) was detected.	0	×
F10	0	0		ALT	Indoor unit Room temp. sensor (TA) error	Indoor	Open/Short of room temp. (TA) was detected.	0	×
F29	0	0		SIM	Indoor unit Other indoor P.C. board error	Indoor	EEPROM error (Other error may be detected. If no error, automatic address is repeated.	×	×
P01		0	0	ALT	Indoor unit Indoor fan error	Indoor	Indoor AC fan error was detected. (Fan thermal relay worked.)	×	×
P10	•	0	0	ALT	Indoor unit Overflow detection	Indoor	Float switch worked.	×	×
P12		0	0	ALT	Indoor unit Indoor fan error	Indoor	Indoor fan error (Over-current / Lock, etc.) was detected.	×	×
P31	0	•	0	ALT	Other indoor unit error	Indoor	Other indoor under condition of warning in group. E03/L07/L03/L08 warning	0	×
—	By uni	t with war	ning No.	ALT	Error in indoor group	Network adapter	Sub remote controller error in a group (Details of remote controller are displayed with unit No. Only central control side is displayed.)	_	_
_					LAN system communication error	Network adapter/ Center	Communication error of central control system signal * Is not displayed on the remote controller	0	0
L20	0	0	0	SIM	LAN system communication error	Network adapter/ Center	Duplicated indoor address of central control system communication	0	×
—		—			There are multiple communication adapters.	Network adapter	There are multiple communication adapters on remote controller communication line.	0	0

+ When this warning was detected before group construction/address check finish at power supply was turned on, the mode shifts automatically to AUTO address setup mode.

Error mode detected by indoor unit

	Operation of diagnosti	c function			
Check code	Cause of operation	Status of air conditioner	Condition	Judgment and measures	
E03	No communication from remote controller (including wireless) and communication adapter	Stop (Automatic reset)	Displayed when error is detected	 Check cables of remote controller and communication adapters. 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. Miswiring of inter-unit wire Defective serial sending circuit on outdoor P.C. board Defective serial receiving circuit on indoor P.C. board 	Stop (Automatic reset)	Displayed when error is detected	 Outdoor unit does not completely operate. Inter-unit wire check, correction of miswiring Check outdoor P.C. board. Correct wiring of P.C. board. When outdoor unit normally operates Check P.C. board (Indoor receiving / Outdoor sending). 	
E08	Duplicated indoor unit address			 Check whether remote controller connection (Group/Individual) was changed or not after power supply turned on 	
L03	Duplicated indoor master unit		Displayed when	(Finish of group construction/Address check).	
L07	There is group wire in individual indoor unit.	Stop	error is detected	* If group construction and address are not normal when the power has been turned on, the mode automatically shifts to address setup mode. (Resetting of address)	
L08	Unset indoor group address				
L09	Unset indoor capacity	Stop	Displayed when error is detected	1. Set indoor capacity (DN=11)	
L30	Abnormal input of outside interlock	Stop	Displayed when error is detected	 Check outside devices. Check indoor P.C. board. 	
P10	Float switch operation • Float circuit, Disconnection, Coming-off, Float switch contact error	Stop	Displayed when error is detected	 Trouble of drain pump Clogging of drain pump Check float switch. Check indoor P.C. board. 	
P12	Indoor DC fan error	Stop	Displayed when error is detected	 Position detection error Over-current protective circuit of indoor fan driving unit operated. Indoor fan locked. Check indoor P.C. board. 	
P19	 4-way valve system error After heating operation has started, indoor heat exchangers temp. is down. 	Stop (Automatic reset)	Displayed when error is detected	 Check 4-way valve. Check 2-way valve and check valve. Check indoor heat exchanger (TC/TCJ). Check indoor P.C. board. 	
P31	Own unit stops while warning is output to other indoor units.	Stop (Follower unit) (Automatic reset)	Displayed when error is detected	 Judge follower unit while master unit is [E03], [L03], [L07] or [L08]. Check indoor P.C. board. 	
F01	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TCJ)	Stop (Automatic reset)	Displayed when error is detected	 Check indoor heat exchanger temp. sensor (TCJ). Check indoor P.C. board. 	
F02	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TC)	Stop (Automatic reset)	Displayed when error is detected	 Check indoor heat exchanger temp. sensor (TC). Check indoor P.C. board. 	
F10	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TA)	Stop (Automatic reset)	Displayed when error is detected	 Check indoor heat exchanger temp. sensor (TA). Check indoor P.C. board. 	
F29	Indoor EEPROM error • EEPROM access error	Stop (Automatic reset)	Displayed when error is detected	 Check indoor EEPROM. (including socket insertion) 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 indoor P.C. board.	
E18	Regular communication error between indoor aster and follower units and between main and sub units	Stop (Automatic reset)	Displayed when error is detected	 Check remote controller wiring. Check indoor power supply wiring. Check indoor P.C. board. 	

Error mode detected by remote controller or central controller (TCC-LINK)

	Operation of diagnostic fur			
Check code	Cause of operation	Status of air conditioner	Condition	Judgment and measures
Not displayed at all (Operation on remote controller is impossible.)	No communication with master indoor unit • Remote controller wiring is not correct. • Power of indoor unit is not turned on. • Automatic address cannot be completed.	Stop	_	 Power supply error of remote controller, Indoor EEPROM error 1. Check remote controller inter-unit wiring. 2. Check remote controller. 3. Check indoor power wiring. 4. Check indoor P.C. board. 5. Check indoor EEPROM. (including socket insertion) → Automatic address repeating phenomenon generates.
E01 *2	No communication with master indoor unit • Disconnection of inter-unit wire between remote controller and master indoor unit (Detected by remote controller side)	Stop (Automatic reset) * If center exists, operation continues.	Displayed when error is detected	 Receiving error from remote controller Check remote controller inter-unit wiring. Check remote controller. Check indoor power wiring. Check indoor P.C. board.
E02	Signal send error to indoor unit (Detected by remote controller side)	Stop (Automatic reset) * If center exists, operation continues.	Displayed when error is detected	 Sending error of remote controller Check sending circuit inside of remote controller. → Replace remote controller.
E09	There are multiple main remote controllers. (Detected by remote controller side)	Stop (Sub unit continues operation.)	Displayed when error is detected	 In 2-remote controllers (including wireless), there are multiple main units. Check that there are 1 main remote controller and other sub remote controllers.
L20 Central controller L20	Duplicated indoor central addresses on communication of central control system (Detected by indoor/central controller side)	Stop (Automatic reset)	Displayed when error is detected	 Check setting of central control system network address. (Network adapter SW01) Check network adapter P.C. board.
	Communication circuit error of central control system (Detected by central controller side)	Continues (By remote controller)	Displayed when error is detected	 Check communication wire / miswiring Check communication (U3, U4 terminals) Check network adapter P.C. board. Check central controller (such as central control remote controller, etc.) Check terminal resistance. (TCC-LINK)
 Central controller P30	Indoor Gr sub unit error (Detected by central controller side)	Continuation/Stop (According to each case)	Displayed when error is detected	Check the check code of the corresponding unit from remote controller.

*2 The check code cannot be displayed by the wired remote controller. (Usual operation of air conditioner becomes unavailable.)

For the wireless models, an error is notified with indication lamp.

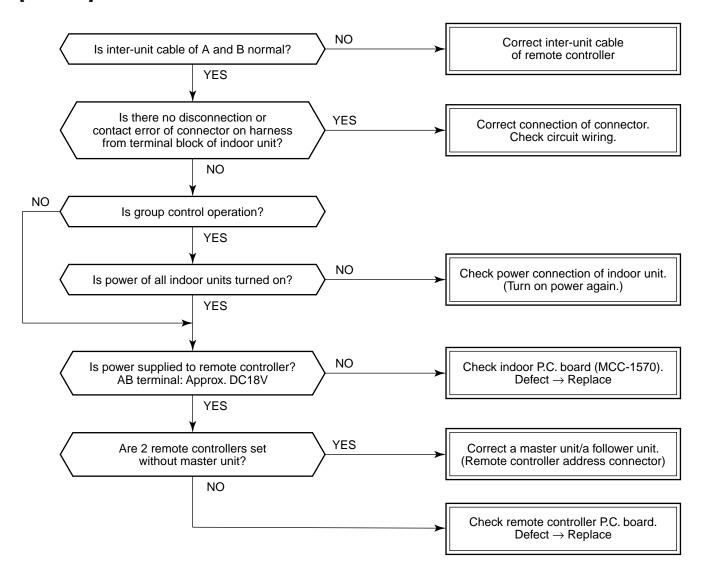
*3 This trouble is related to communication of remote controller (A, B), central system (TCC-LINK U3, U4), and [E01], [E02], [E03], [E09] or [E18] is displayed or no check display on the remote controller according to the contents.

Error mode detected by outdoor unit

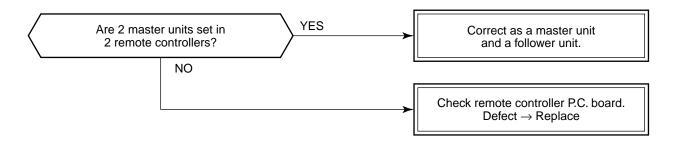
Operation of diagnostic function					
Check code	Cause of operation	Status of air conditioner	Condition	Judgment and measures	
F04	Disconnection, short of discharge temp. sensor (TD)	Stop	Displayed when error is detected	 Check discharge temp. sensor (TD). Check outdoor P.C. board. 	
F06	Disconnection, short of outdoor temp. sensor (TE)	Stop	Displayed when error is detected	 Check temp. sensor (TE). Check outdoor P.C. board. 	
F12	Disconnection, short of suction temp. sensor (TS)	Stop	Displayed when error is detected	 Check suction temp. sensor (TS). Check outdoor P.C. board. 	
F08	Disconnection, short of outside temp. sensor (TO)	Continue	Displayed when error is detected	 Check outside temp. sensor (TO). Check outdoor P.C. board. 	
P19	 4-way valve inverse error After heating operation has started, indoor heat exchanger temp. lowers under the specified temp. After heating operation has started, outdoor heat exchanger / suction temp. rises over the specified temp. 	Stop	Displayed when error is detected	 Check operation of 4-way valve. Check outdoor heat exchanger (TE), suction temp. sensor (TS). Check indoor heat exchanger sensor (TC). Check 4-way valve coil. Check PMV (Pulse Motor Valve). 	
H01	Compressor break down * Although operation has started, operation frequency decreases and operation stops.	Stop	Displayed when error is detected	 Check power supply voltage. (AC198 to 264V) Overload operation of refrigerating cycle 	
H02	Compressor lock * Over-current detection after compressor start-up	Stop	Displayed when error is detected	 Trouble of compressor (Lock, etc.): Replace compressor. Wiring error of compressor (Open phase) 	
H03	Current detection circuit error	Stop	Displayed when error is detected	1. Check outdoor P.C. board. (AC current detection circuit)	
P03	Discharge temp. error * Discharge temp. (TD) over specified value was detected.	Stop	Displayed when error is detected	 Check refrigerating cycle (Gas leak) Trouble of electronic expansion valve Check discharge temp. sensor (TD). 	
P05	Power supply voltage error	Stop	Displayed when error is detected	1. Check power supply voltage. AC198 to 264V	
P22	Outdoor fan system error	Stop	Displayed when error is detected	 Check lock of fan motor. Check power supply voltage. AC198 to 264V Check outdoor P.C. board. 	
P26	Short-circuit error of compressor driving element	Stop	Displayed when error is detected	 When performing operation while taking-off compressor wire, P26 error occurs. Check control P.C. board. When performing operation while taking-off compressor wire, an error does not occur. (Compressor rare short) 	
P29	Position detection circuit error	Stop	Displayed when error is detected	1. Check control P.C. board.	

10-2-9. Diagnostic Procedure for Each Check Code (Indoor Unit)

Check code [E01 error]

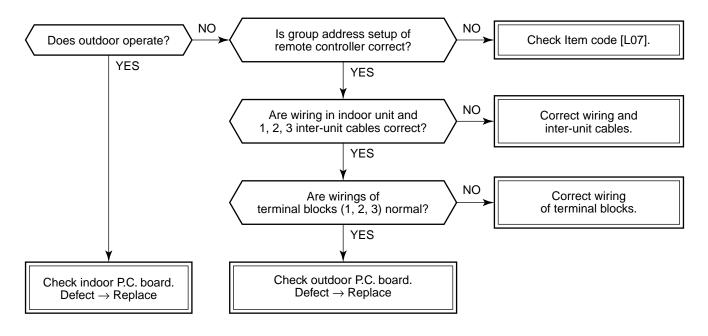


[E09 error]

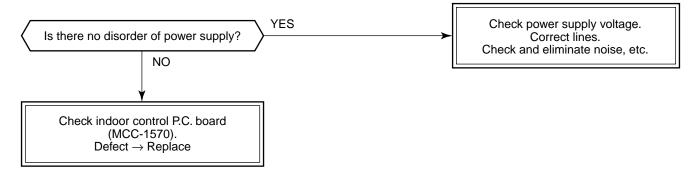


<In case of SP40, SP45>

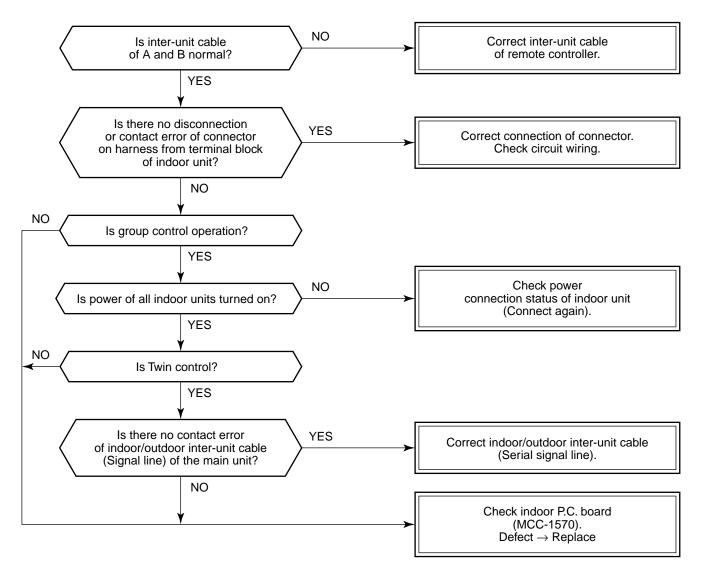
[E04 error]



[E10 error]



[E18 error]



[E08, L03, L07, L08 error]

E08: Duplicated indoor unit No.

L03: There are 2 or more master units in a group control.

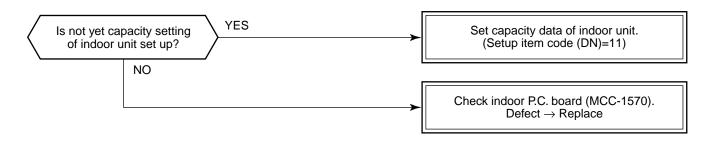
L07: There is 1 or more group address [Individual] in a group control.

L08: The indoor group address is unset. (13. ADDRESS SETUP)

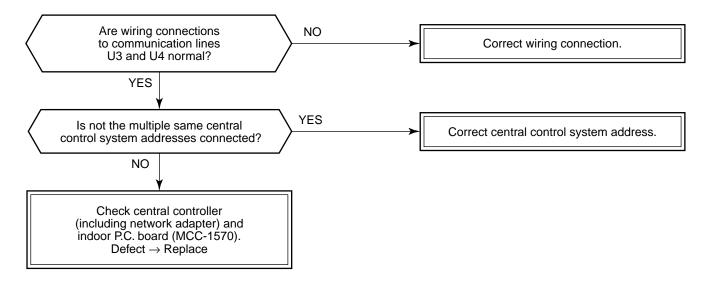
If the above error is detected when power supply turned on, the mode enters automatically in the automatic address set mode. (Check code is not output.)

However, if the above error is detected during the automatic address set mode, a check code may be output.

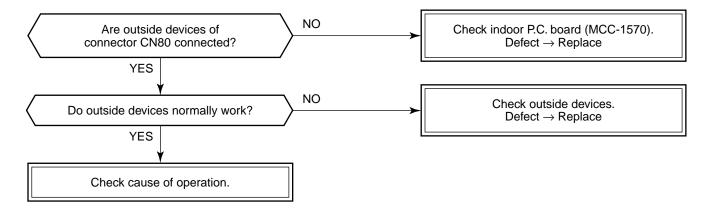
[L09 error]



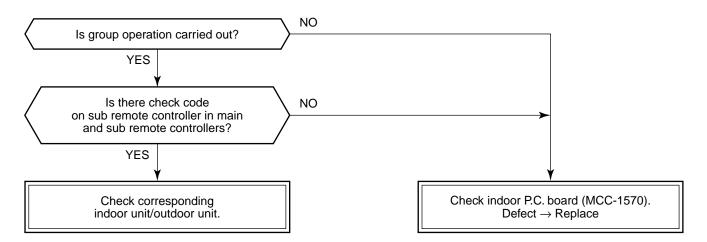
[L20 error]



[L30 error]

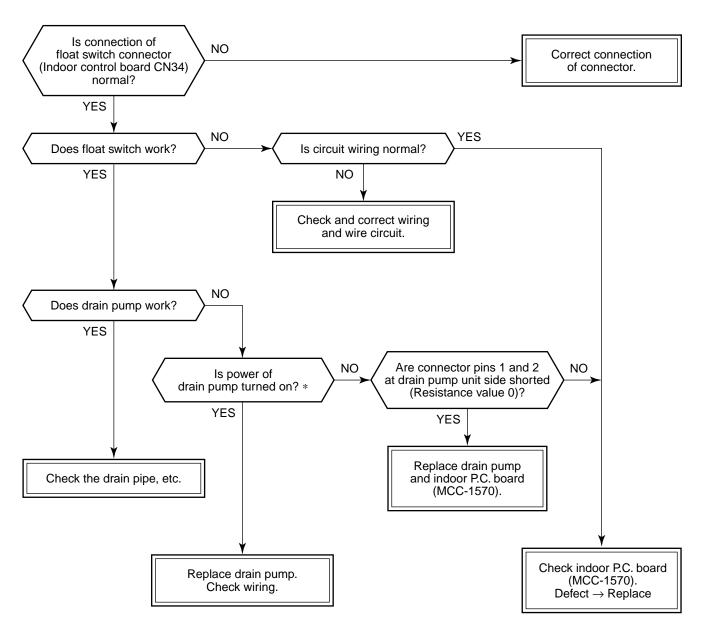


[P30 error] (Central controller)



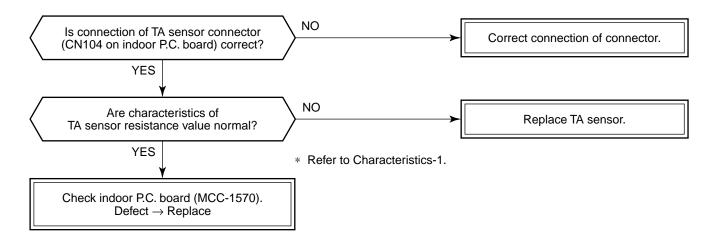
<In case of SP40, SP45>

[P10 error]

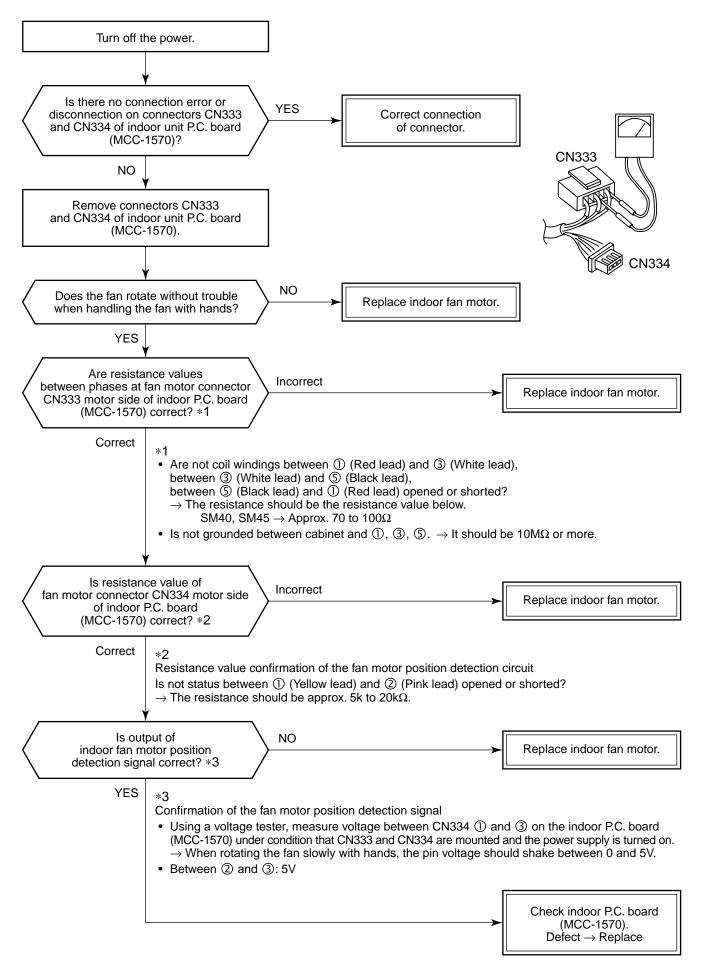


* Check that voltage of 1-2 pin of CN504 on the indoor P.C. board is +12V. (1 pin is plus (+).)

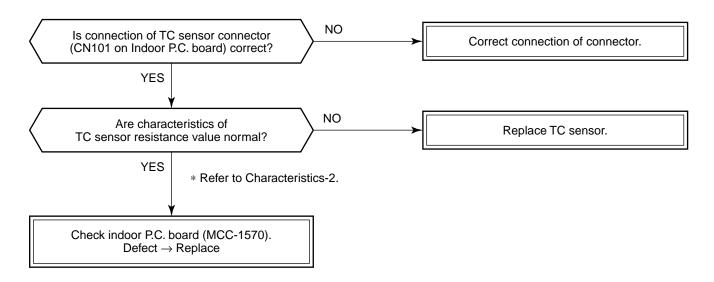
[F10 error]



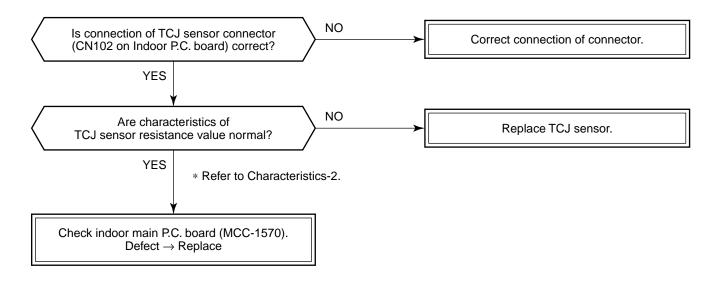
[P12 error]



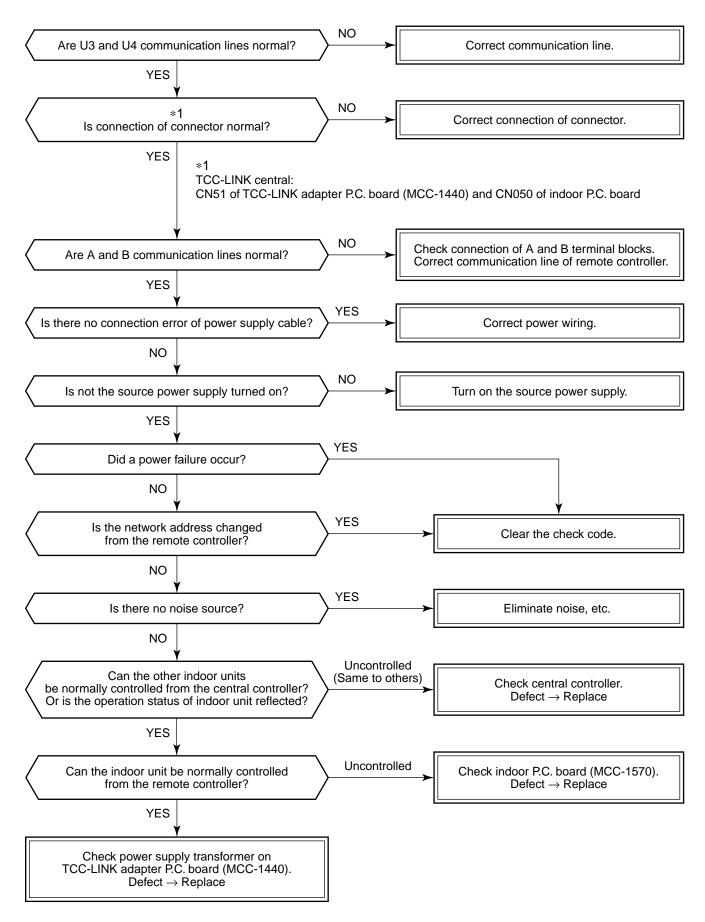
[F02 error]



[F01 error]



[C06 error] (TCC-LINK central controller)



[E03 error] (Master indoor unit)

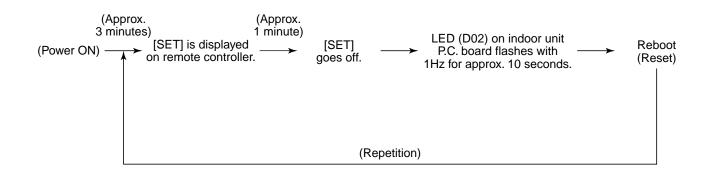
[E03 error] is detected when the indoor unit cannot receive a signal from the remote controller (also central controller).

Check A and B remote controllers and communication lines of the central control system U3 and U4. As communication is impossible, this check code [E03] is not displayed on the remote controller and the central controller. [E01] is displayed on the remote controller and [C06 error] is displayed on the central controller. If these check codes generate during operation, the air conditioner stops.

[F29 error]

This check code indicates a detection error of IC10 non-volatile memory (EEPROM) on the indoor unit P.C. board, which generated during operation of the air conditioner. Replace the service P.C. board.

* When EEPROM was not inserted when power supply turned on or when the EEPROM data read/write operation is impossible at all, the automatic address mode is repeated. In this time, [97 error] is displayed on the central controller.



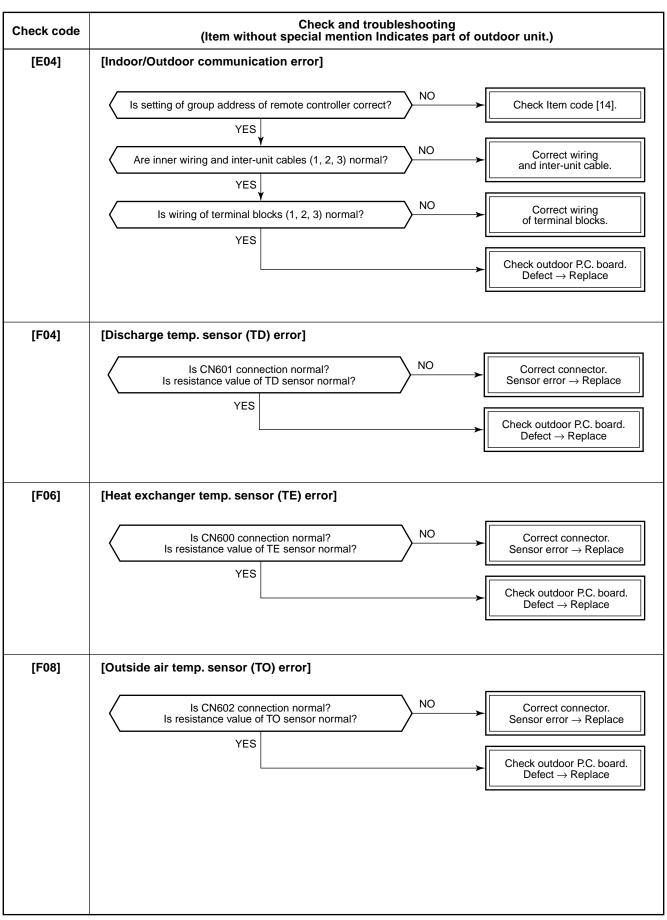
[P31 error] (Follower indoor unit)

When the master unit of a group operation detected [E03], [L03], [L07] or [L08] error, the follower unit of the group operation detects [P31 error] and then the unit stops.

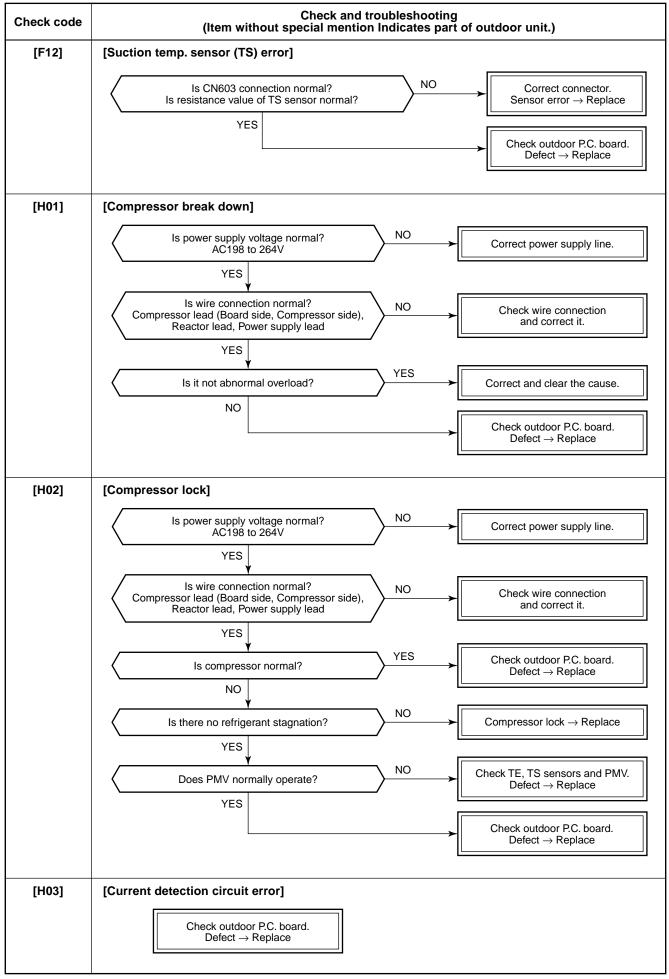
There is no display of the check code or alarm history of the remote controller. (In this model, the mode enters in automatic address set mode when the master unit detected [L03], [L07] or [L08] error.)

10-2-10. Diagnostic Procedure for Each Check Code (Outdoor Unit)

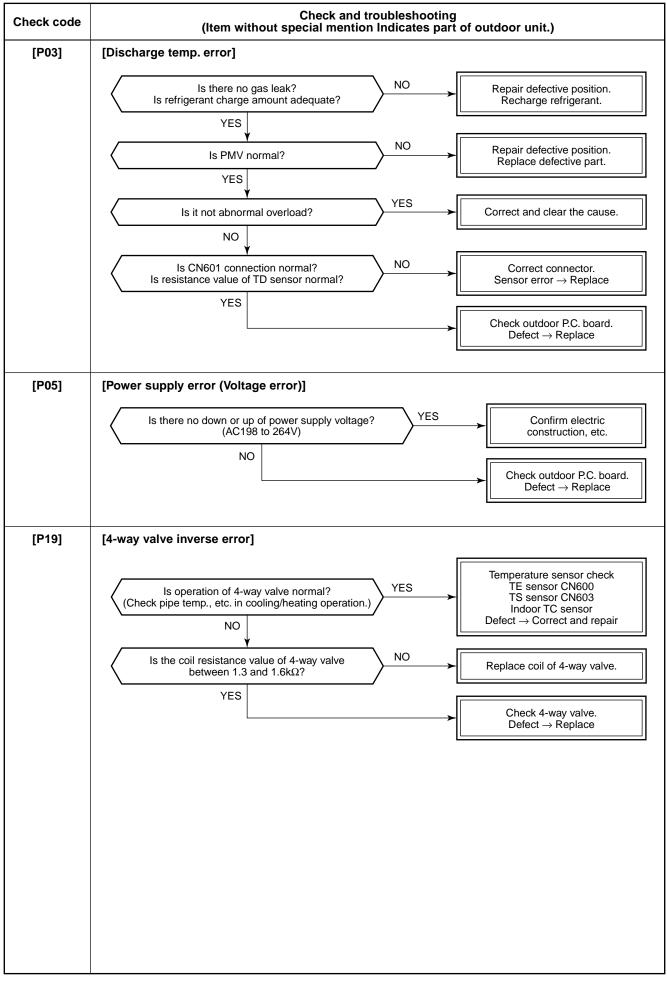
• This section describes the diagnostic method for each check code displayed on the remote controller. In some cases, a check code indicates multiple symptoms.

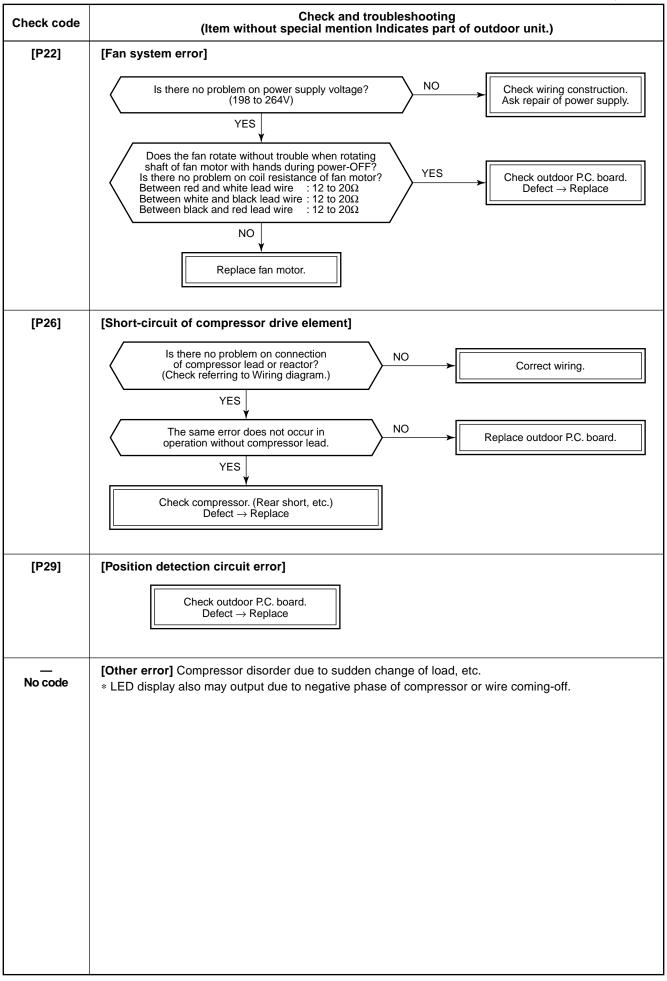


<In case of SP40, SP45>



<In case of SP40, SP45>





Temperature sensor

Temperature – Resistance value characteristic table

T A,T C,T CJ,T E,T S,T O sensors

Representative value

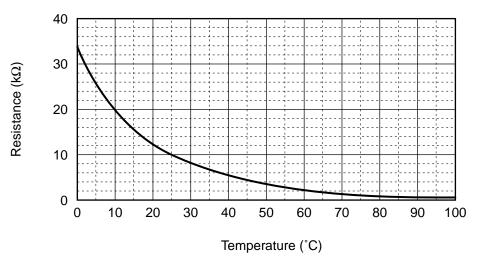
T emperature	Resistance value (kΩ)			
(°C)	(Minimum value) (Standard value)		(Maximum value)	
0	32.33	33.80	35.30	
10	19.63	20.35	21.09	
20	12.23	12.59	12.95	
25	9.75	10.00	10.25	
30	7.764	7.990	8.218	
40	5.013	5.192	5.375	
50	3.312	3.451	3.594	
60	2.236	2.343	2.454	
70	1.540	1.623	1.709	
80	1.082	1.146	1.213	
90	0.7740	0.8237	0.8761	
100	0.5634	0.6023	0.6434	

T D,T L sensors

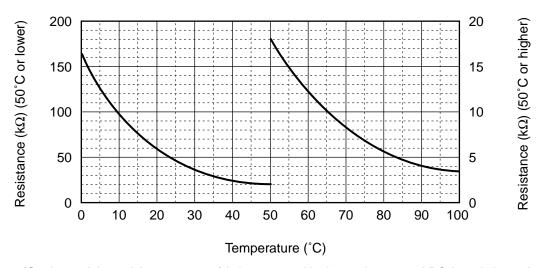
Representative value

T emperature	Resistance value (kΩ)			
(°C)	(Minimum value) (Standard value)		(Maximum value)	
0	150.5	161.3	172.7	
10	92.76	99.05	105.6	
20	58.61	62.36	66.26	
25	47.01	49.93	52.97	
30	37.93	40.22	42.59	
40	25.12	26.55	28.03	
50	17.00	17.92	18.86	
60	11.74	12.34	12.95	
70	8.269	8.668	9.074	
80	5.925	6.195	6.470	
90	4.321	4.507	4.696	
100	3.205	3.336	3.468	

T A,T C,T CJ,T E,T S,T O sensors







* As TH sensor (Outdoor unit heat sink temp. sensor) is incorporated in the outdoor control P.C. board, the resistance value cannot be measured.

<In case of SP40, SP45>

11. REPLACEMENT OF SERVICE P.C. BOARD

11-1. Indoort Unit

<Note: when replacing the P.C. board for indoor unit servicing>

The nonvolatile memory (hereafter called EEPROM, IC503) on the indoor unit P.C. board before replacement includes the model specific type information and capacity codes as the factory-set value and the important setting data which have been automatically or manually set when the indoor unit is installed, such as system/ indoor/group addresses, high ceiling select setting, etc.

When replacing the P.C. board for indoor unit servicing, follow the procedures below.

After replacement completes, confirm whether the settings are correct by checking the indoor unit No., Group header unit/follower unit settings and perform the cooling cycle confirmation through the trial operation.

<Replacement procedures>

CASE 1

Before replacement, the indoor unit can be turned on and the setting data can be read out by wired remote control operation.

EEPROM data read out [1] Replacement of P.C. board for Indoor unit servicing and power on [2] Writing the read out EEPROM data [3]

Û

Power reset

(for all indoor units connected to the remote control when the group operation control is performed.)

CASE 2

The EEPROM before replacement is defective and the setting data cannot be read out.

EEPROM data read out [2]

Û

Writing the setting data to EEPROM, such as high ceiling installation setting and optional connection setting, etc., based on the customer information. [3]

Û

Power reset

(for all indoor units connected to the remote control when the group operation control is performed.)

[1] Setting data read out from EEPROM

The setting data modified on the site, other than factory-set value, stored in the EEPROM shall be read out.

Step 1 Push $\stackrel{\text{SET}}{\longrightarrow}$, $\stackrel{\text{CL}}{\longrightarrow}$ and $\stackrel{\text{TEST}}{\swarrow}$ button on the remote controller simultaneously for more than 4 seconds.

* When the group operation control is performed, the unit No. displayed for the first time is the header unit No. At this time, the CODE No. (DN) shows " $/\mathcal{G}$ ". Also, the fan of the indoor unit selected starts its operation and the swing operation also starts if it has the louvers.

- Step 2 Every time when the button is pushed, the indoor unit No. under the group control is displayed in order. Specify the indoor unit No. to be replaced.
 - Change the CODE No. (DN) to / □ → □ / by pushing ▼ / ▲ buttons for the temperature setting. (this is the setting for the filter sign lighting time.)
 - At this time, be sure to write down the setting data displayed.

 - 3. Repeat the step 2-2 to set the other settings in the same way and write down the setting data as shown in the table 1 (example).
 - * The CODE No. (DN) are ranged from " \mathcal{G} /" to " \mathcal{FF} ". The CODE No. (DN) may skip.
- **Step 3** After writing down all setting data, push $\overset{\text{TEST}}{\textcircled{O}}$ button to return to the normal stop status. (It takes approx. 1 min until the remote controller operation is available again.)

CODE No. required at least

DN	Contents	
10	Туре	
11	Indoor unit capacity	
12	System address	
13	Indoor unit address	
14	Group address	

- 1. The CODE No. for the Indoor unit type and Indoor unit capacity are required to set the rotation number setting of the fan.
- If the system/indoor/group addresses are different from those before replacement, the auto-address setting mode starts and the manual resetting may be required again. (when the multiple units group operation including twin system.)

[2] P.C. Board for indoor unit servicing replacement procedures

- Step 1 Replace the P.C. board to the P.C. board for indoor unit servicing.At this time, perform the same setting of the jumper wire (J01) setting (cut), switch SW501, (short-circuit) connector CN34 as the setting of the P.C. board before replacement.
- **Step 2** According to the system configuration, turn on the indoor unit following to the either methods shown below.
 - a) Single operation (Indoor unit is used as standalone.)
 - Turn on the indoor unit.
 - 1. After completion of the auto-address setting mode (required time: approx. 5 min.), proceed to [3]. (System address = 1, Indoor unit address = 1, Group address = 0 (standalone) are automatically set.)
 - Push ^{SET} , ^{CL} and ^{TEST} buttons simultaneously for more than 4 seconds to interrupt the auto-address setting mode, and proceed to [3]. (The unit No. " *ALL* " is displayed.)
 - b) Group operation (including twin system)

Turn on the indoor unit(s) with its P.C. board replaced to the P.C. board for indoor unit servicing, according to either methods 1 or 2 shown below.

- 1. Turn on only the indoor unit with its P.C. board replaced. (Be sure to confirm the remote controller is surely connected. If not, the operation [3] cannot be performed.)
- Perform either methods 1 or 2 described in item a) above.
- 2. Turn on the multiple indoor units including the indoor unit with its P.C. board replaced.
 - Twin 1 system only
 - All group connections

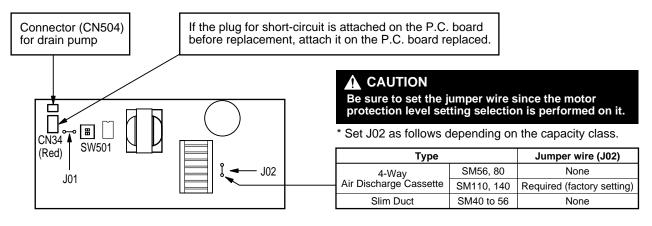
After completion of the auto-address setting mode (required time: approx. 5 min.), proceed to [3].

* The header unit of the group may be changed by performing the auto-address setting. Also, the system address/Indoor unit address of the indoor unit with its P.C. board replaced may be assigned to the addresses (not used) other than those of the indoor units without its P.C. board replaced. It is recommended to keep the information in advance, which cooling system the indoor unit belongs to or whether the indoor unit works as the header unit or the follower unit in the group control operation.

Setting 4-way air discharge cassette Indoor Unit model only

- 1. Using the set temperature \bigcirc / \bigcirc buttons, set " $\mathcal{L}\mathcal{L}$ " to the CODE No. (DN).
- 2. Using the timer time \bigcirc / \bigcirc buttons, set the data. (0001)
- Push ^{SET} button. (The setting completes if the setting data are displayed.)

<In case of 4-way Discharge Cassette type>



<In case of Slim Duct type>

- As P.C. board of the Slim Duct type differs from that of the 4-way Discharge Cassette type, selection by HP is unnecessary.
- Push the EST button to return to the normal stop status.
 (It takes approx. 1 min until the remote controller operation is available again.)

[3] Writing the setting data to EEPROM

The settings stored in the EEPROM of the P.C. board for indoor unit servicing are the factory-set values.

Step 1 Push $\stackrel{\text{SET}}{\longrightarrow}$, $\stackrel{\text{CL}}{\longrightarrow}$ and $\stackrel{\text{TEST}}{\swarrow}$ buttons on the remote controller simultaneously for more than 4 seconds.

* In the group control operation, the unit No. displayed for the first time is the header unit No. At this time, the CODE No. (DN) shows " / J". Also, the fan of the indoor unit selected starts its operation and the swing operation starts if it has the louvers.

(The unit No. " *ALL* " is displayed if the auto-address setting mode is interrupted in [2] step 2 a))

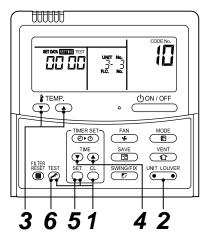
Step 2 Every time when button is pushed, the indoor unit No. in the group control operation are displayed in order.

(The settings stored in the EEPROM of the P.C. board for indoor unit servicing are the factory-set values.) Specify the indoor unit No. with its P.C. board replaced to the P.C. board for indoor unit servicing. (You cannot perform this operation if " *ALL* " is displayed.)

- **Step 3** Select the CODE No. (DN) can be selected by pushing the ▼ / ▲ button for the temperature setting.
 - Set the indoor unit type and capacity. The factory-set values shall be written to the EEPROM by changing the type and capacity.
 - 1. Set the CODE No. (DN) to " $/\mathcal{G}$ ". (without change)

 - Push ^{SET} button. (The operation completes if the setting data is displayed.)
 - Change the CODE No. (DN) to "ℓℓ" by pushing ▼ / ▲ buttons for the temperature setting.
 - Select the capacity by pushing (▼) / (▲) buttons for the timer setting. (For example, 80 Type is set to "0012". Refer to table 3)
 - Push ^{SET} button. (The setting completes if the setting data are displayed.)

<Fig. 1 RBC-AMT32E>

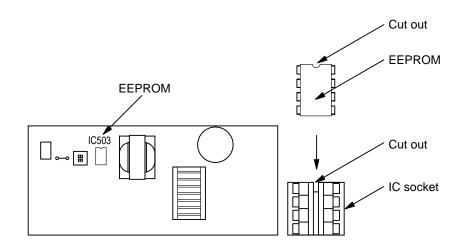


- **Step 4** Write the on-site setting data to the EEPROM, such as address setting, etc. Perform the steps 1 and 2 above again.
- **Step 5** Change the CODE No. (DN) to " \mathcal{U} " by pushing \bigtriangledown / \blacktriangle buttons for the temperature setting. (this is the setting for the filter sign lighting time.)
- Step 6 Check the setting data displayed at this time with the setting data put down in [1].
 - 1. If the setting data is different, modify the setting data by pushing 🐨 / 🗅 buttons for the timer setting to the data put down in [1].
 - The operation completes if the setting data is displayed.
 - 2. If the data is the same, proceed to next step.
- **Step 7** Change the CODE No. (DN) by pushing ▼ / ▲ buttons for the temperature setting. As described above, check the setting data and modify to the data put down in [1].
- **Step 8** Repeat the steps 6 and 7.
- **Step 9** After the setting completes, push $\stackrel{\text{TEST}}{\textcircled{B}}$ button to return to the normal stop status. (It takes approx. 1 min until the remote control operation is available again.)
 - * The CODE No. (DN) are ranged from "*G*?" to "*FF*". The CODE No. (DN) is not limited to be serial No. Even after modifying the data wrongly and pushing ^{SET} button, it is possible to return to the data before modification by pushing ^{CL} button if the CODE No. (DN) is not changed.

<Fig. 2 EEPROM layout diagram>

The EEPROM (IC503) is attached to the IC socket. When detaching the EEPROM, use a tweezers, etc. Be sure to attach the EEPROM by fitting its direction as shown in the figure.

* Do not bend the IC lead when replacing.



DN	Item	Setting data	Factory-set value
01	Filter sign lighting time	J	Depending on Type
02	Filter pollution leve		0000: standard
03	Central control address		0099: Not determined
06	Heating suction temperature shift		0002: +2°C (flooring installation type: 0)
OF	Cooling only		0000: Heat pump
10	Туре		Depending on model type
11	Indoor unit capacity		Depending on capacity type
12	System address		0099: Not determined
13	Indoor unit address		0099: Not determined
14	Group address		0099: Not determined
19	Louver type (wind direction adjustment)		Depending on Type.
1E	Temperature range of cooling/heating automatic SW control point		0003: 3 deg (Ts ± 1.5)
28	Power failure automatic recovery		0000: None
2A	Option/Abnormal input (CN70) SW		0002: Humidifier
2b	Thermo output SW (T10 ③)		0000: Thermo ON
31	Ventilation fan (standalone)		0000: Not available
32	Sensor SW (Selection of static pressure)		0000: Body sensor
40	Humidifier control (+ drain pump control)		0003: Humidifier ON + Pump OFF
5d	High ceiling SW		0000: Standard
60	Timer setting (wired remote controller)		0000: Available
C2	Demand setting (outdoor unit current demand)		0075: 75 %
d0	Remote controller operation save function		0001: Enable
d3	Rotation number of the self-clean operation		0001: 210ypm(at self-clean operation)
d1	Frost protection function		0000: None
F0	Swing mode		0001: Standard
F1	Louver fixing position (Flap No. 1)		0000: Not fixed
F2	Louver fixing position (Flap No. 2)		0000: Not fixed
F3	Louver fixing position (Flap No. 3)		0000: Not fixed
F4	Louver fixing position (Flap No. 4)		0000: Not fixed

Table 2. Type: CODE No. 10

Setting data	Туре	Type name abb.
0001*1*2	4-way Air Discharge Cassette Type	RAV-SM***UT-E
0005	Slim Duct Type	RAV-SM***SDT-E

*1 EEPROM initial value on the P.C. board for indoor unit servicing *2

<Model Name: RAV-SM***UT-E>

For the above models, set the CODE No. to " \mathcal{LE} " and the setting data 0000 (initial) to "0001".

Table 3. Indoor unit capacity: CODE No. 11

Setting data	Туре
0000*	Disable
0006	40
0007	45
0009	56
0012	80
0015	110
0017	140

* EEPROM initial value on the P.C. board for indoor unit servicing.

11-2. Outdoor Unit

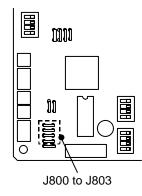
Part	name	Function	Setting
	J800 to J803	Model switching	Cut these jumper wires according to the following table.
Jumper wire	J804 to J810	Settings	Set these jumper wires to the settings of the P.C. board before replacement.
	SW802	Settings	Set SW802 to the setting of the P.C. board before replacement.
DIP switch	SW803	LED indication switching	Set SW803 to all OFF.
	SW804	Special operations for service	Set SW804 to all OFF.

1. Setting the jumper wires and DIP switches

Model switching (J800 to J803)

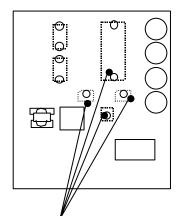
Since this service P.C. board is available for several models, cut the jumper wires according to the following table. If they are not cut correctly, an error code "L10" or "L29" appears on the remote controller and the operation of the air conditioner is disabled.

Model name		J 801	J 802	J 803
Factory setting (default)		0	0	0
RAV-SP1104AT*-E		0	0	0
RAV-SP1404AT*-E		X	0	0
 * : Characters that indicate the following: No character Standard models Z For salt-affected areas ZG For heavily salt-affected areas 		: Connec	ited, 🗙 :	Cut

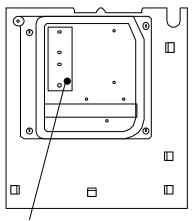


2. Installing the P.C. board

- 1) Apply thermal grease to the back (heat sink contacting side) of devices Q200, Q650, DB01, and DB02. (Q300 and Q400 are not necessary to be applied thermal grease.)
- 2) Reuse the insulating sheet. When a small amount of thermal grease is applied to the back of the insulating sheet, it adheres temporarily to the heat sink, which makes it easy to attach the insulating sheet.
- 3) Insert the P.C. board, align the holes of the insulating sheets, semiconductor devices, and heat sinks, and then secure them with screws.
- 4) Connect the lead wires according to the wiring diagram sticked on the backside of the pannel .



Apply thermal grease to the back (heat sink contacting side) of Q200, Q650, DB01, and DB02.



Reuse the insulating sheet. Applying thermal grease to the back of the insulating sheet makes it easy to attach the insulating sheet.

12. SETUP AT LOCAL SITE AND OTHERS

12-1. Indoor Unit

12-1-1. 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 ^{(UON/OFF})</sup> 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.

 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.)

<Wireless remote controller>

(4-way Air Discharge Cassette Type only)

1 Turn off power of the unit.

Remove the adjuster attached with sensors from the ceiling panel. For removing, refer to the Installation manual attached to the ceiling panel. (Be careful to handle the adjuster because cables are connected to the sensor.) Remove the sensor cover from the adjuster. (1 screw)

2 Change ON of Bit [1: TEST] of the sensor P.C. board switch [S003] to OFF.

Mount the sensor cover and mount the adjuster with sensor to the ceiling panel. Turn on power of the unit.

3 Push $\stackrel{\text{(JON/OFF})}{=}$ button on the wireless remote controller and select [COOL] or [HEAT] operation mode using $\stackrel{\text{MODE}}{=}$ button.

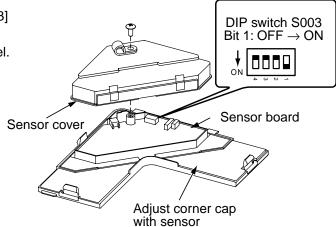
(All the display lamps of sensors on the wireless remote controller flash during Test Run.)

- Do not perform Test Run operation in other modes than [HEAT] / [COOL] mode.
- Detection of error is performed as usual.

4 After Test Run operation, push $\bigcirc 000/0FF$ button to stop the operation.

5 Turn off power of the unit.

Return Bit [1] of the sensor P.C. board switch [S003] to the original position. (ON \rightarrow OFF) Mount the adjuster with sensors to the ceiling panel.



(Except 4-way Air Discharge Cassette Type and Under Ceiling Type)

1 Remove a screw which fixes the serial olate of the receiver part on the wireless remote controller.

Remove the nameplate of the reciver section by inserting a minus screwdriver, etc. into the notch at the bottom of the plate, and set the Dip switch to [TEST RUN ON].

${f 2}$ Execute a test operation with ${f \cup}$ button on the wireless remote controller.

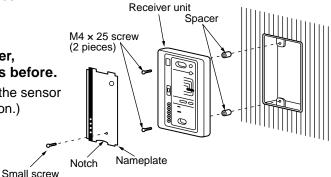
- (), (2) and (3) LED flash during test operation.
- Under status of [TEST RUN ON], the temperature adjustment from the wireless remote controller is invalid.

Do not use this method in the operation other than test operation because the equipment is damaged.

3 Use either [COOL] or [HEAT] operation mode for test operation.

- The outdoor unit does not operate approx. 3 minutes after power-ON and operation stop.
- **4** After the test operation finished, stop the air conditioner from the wireless remote controller, and return Dip switch of the sensor section as before.

(A 60 minutes timer clearing function is attached to the sensor section in order to prevent a continuous test operation.)



(Under Ceiling Type only)

1 Turn off power of the air conditioner.

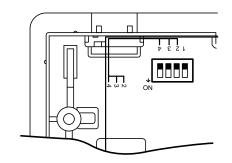
Remove the adjust corner cap attached with sensor section from the ceiling panel. For removing method, follow to the installation manual attached to the ceiling panel. (Be careful to handle the sensor section because cables are connected to the sensor section.) Remove the sensor cover from the adjust corner cap. (1 screw)

- **2** Change Bit [1:TEST] of the switch [S003] on the sensor P.C. board from OFF to ON. Mount the sensor cover and attach the adjust corner cap with with sensors to the ceiling panel. Turn on power of the air conditioner.
- 3 Push ⁽¹⁾ button of the wireless remote controller and select an operation mode [COOL] or [HEAT] with ^{™™} button. (All the display lamps of the wireless remote controller sensor section flash during the tst operation.)
 - Do not use operation mode other than [COOL] or [HEAT].
 - Error is detected as usual.

4 When the test operation has finished, push button to stop the operation.

5 Turn off power of the air conditioner.

Change Bit [1] of the switch [S003] on the sensor P.C. board from ON to OFF. Attach the adjust corner cap with sensors to the ceiling panel.



<In case of wireless remote controller>

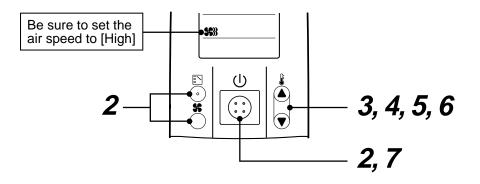
Procedure	Description			
	Turn on power of the air conditioner.			
1	The operation is not accepted for 5 minutes when power has been turned on at first time after installation, and 1 minute when power has been turned on at the next time and after. After the specified time has passed, perform a test operation.			
2	Push [Start/Stop] button and change the operation mode to [COOL] or [HEAT] with [Mode] button. Then change the fan speed to [High] using [Fan] button.			
_	Test cooling operation Test heating operation			
3	Set temperature to [18°C] using [Temperature set] button.	Set temperature to [30°C] using [Temperature set] button.		
4	After checking the receiving sound "Pi", immediately push [Temperature set] button to set to [19°C]After checking the receiving sound "Pi", immediately push [Temperature set] button to set to [29°C]			
5	After checking the receiving sound "Pi", immediately push [Temperature set] button to set to [18°C]. After checking the receiving sound "Pi", immediately push [Temperature set] button to set to [30°C].			
6	Then repeat the procedure $4 \rightarrow 5 \rightarrow 4 \rightarrow 5$. After approx. 10 seconds, all the display lamps on the sensor part of wireless remote controller, [Operation] (Green), [Timer] (Green), and [Ready] (Yellow) flash and the air conditioner starts operation. If the lamps do not flash, repeat the procedure 2 and after.			
7	After the test operation, push [Start/Stop] button to stop the operation.			

<Outline of test operation from the wireless remote controller>

Test cooling operation:

Start \rightarrow 18°C \rightarrow 19°C \rightarrow 18°C \rightarrow 19°C \rightarrow 18°C \rightarrow 19°C \rightarrow 18°C \rightarrow (Test operation) \rightarrow Stop Test heating operation:

 $Start \rightarrow 30^{\circ}C \rightarrow 29^{\circ}C \rightarrow 30^{\circ}C \rightarrow 29^{\circ}C \rightarrow 30^{\circ}C \rightarrow 29^{\circ}C \rightarrow 30^{\circ}C \rightarrow (Test \text{ operation}) \rightarrow Stop$



12-1-2. Forced Defrost Setup of Remote Controller (For wired remote controller only)

(Preparation in advance)

Push [™] + [™] + [™] + [™] + [™] buttons simultaneously for 4 seconds or more on the remote controller. (Push buttons while the air conditioner stops.)

The first displayed unit No. is the master indoor unit address in the group control.

2 Every pushing <u>use</u> button, the indoor unit No. in the group control is displayed one after the other.

Select a main indoor unit (outdoor unit is connected) which is to be defrosted. In this time, fan and louver of the selected indoor unit operate.

- **3** Using the set temperature $\textcircled{\begin{tabular}{c} \begin{tabular}{c} $\begin{tabular}{c} $\begin{tabula$
- **4** Using the timer time $\textcircled{T}^{\text{TME}}$ buttons, set time to data 0001. (0000 at shipment)
- **5** Push $\stackrel{\text{\tiny BT}}{\bigcirc}$ button. (OK if indication lights)
- **6** Pushing $\stackrel{\text{\tiny TEST}}{\triangleright}$ button returns the status to the normal stop status.

(Practical operation)

- Push ON/OFF Key.
- Select the HEAT mode.
- After while, the forced defrost signal is sent to the outdoor unit and then the outdoor unit starts defrost operation. (The forced defrost operation is performed for Max. 12 minutes.)
- After defrost operation finished, the operation returns to the heating operation.

To execute the defrost operation again, start procedure from above item 1.

(If the forced defrost operation was executed once, setting of the above forced defrost operation is cleared.)

12-1-3. LED Display on P.C. Board

1. D501 (Red)

- It goes on (Goes on by operation of the main microcomputer) at the same time when the power supply is turned on.
- It flashes with 1-second interval (every 0.5 second): When there is no EEPROM or writing-in operation fails.
- It flashes with 10-seconds interval (every 5 second): During DISP mode
- It flashes with 2-seconds interval (every 1 second): While setting of function select (EEPROM)

2. D403 (Red)

• It goes on when power supply of the remote controller is turned on. (Lights on hardware)

3. D503 (Yellow): Main bus communication

• It goes on for 5 seconds in the first half of communication with the central controller.

4. D504 (Green): Sub bus communication

- It flashes for 5 seconds in the first half of communication with the remote controller. (Group master unit)
- It flashes with 0.2-second interval (for 0.1 second) for 5 second in the latter half of communication between master and follower in the Gr indoor unit.

5. D14 (Orange)

• It flashes while receiving the serial signal from the outdoor unit. (Hardware)

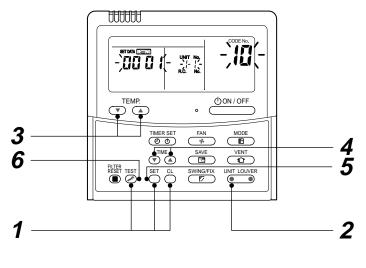
6. D15 (Green)

• It flashes while sending the serial signal to the outdoor unit. (Hardware)

12-1-4. Function Selection Setup

<Procedure> Perform setting while the air conditioner stops.

- **1** Push $\stackrel{\text{TEST}}{\textcircled{B}}$ + $\stackrel{\text{SET}}{\bigcirc}$ + $\stackrel{\text{CL}}{\bigcirc}$ buttons simultaneously for 4 seconds or more. The first displayed unit No. is the master indoor unit address in the group control. In this time, fan and louver of the selected indoor unit operate. Ί 2 Every pushing button (button at left side), the indoor unit No. in the group control is displayed one after the other. In this time, fan and louver of the selected indoor unit only operate. Û 3 Using the set temperature $\underbrace{\textcircled{}_{\mathsf{TEMP}}}_{\bullet}$ buttons, specify the item code (DN). Û 4 Using the timer time $\overline{\mathbf{v}}^{\text{IME}}$ buttons, select the set data. Ŷ **5** Push $\stackrel{\text{\tiny{SET}}}{\bigcirc}$ button. (OK if indication lights) To change the selected indoor unit, proceed to Procedure 2. • To change item to be set up, proceed to Procedure ${f 3}$. Û
- **6** Pushing $\stackrel{\text{TEST}}{\textcircled{O}}$ button returns the status to the normal stop status.



<Operation procedure>

 $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6$ END

Function selection item No. (DN) list

DN	ltem	Con	tents	At shipment from factory
01	Filter sign lighting time	0000: None 0002: 2500H 0004: 10000H	0001: 150H 0003: 5000H 0005: Clogging sensor used	According to type
02	Filter stain level	0000: Standard 0001: Heavy stain (Half of standa	rd time)	0000: Standard
03	Central control address	0001: No.1 unit to 0099: Undecided	0064: No.64 unit	0099: Undecided
06	Heating suction temp. shift	0000: No shift 0002: +2°C to	0001: +1°C 0010: +10°C (Up to +6 is recommended.)	0002: +2°C (Floor type 0000: 0°C)
0F	Cooling-only	0000: Heat pump 0001: Cooling only (No display for	[AUTO] [HEAT])	0000: Heat pump
10	Туре	0000: (1-way air discharge cassel 0001: (4-way air discharge cassel		According to model type
11	Indoor unit capacity	0000: Undecided	0001 to 0034	According to capacity type
12	Line address	0001: No.1 unit to	0030: No.30 unit	0099: Undecided
13	Indoor unit address	0001: No.1 unit to	0064: No.64 unit	0099: Undecided
14	Group address	0000: Individual 0002: Follower unit in group	0001: Master unit in group	0099: Undecided
19	Louver type (Adjustment of air direction)	0000: No louver model (0002:1-way) 0004: 4-way	0001: Swing only (0003:2-way)	According to model type
1E	In automatic cooling/heating, temp. width of cool \rightarrow heat, heat \rightarrow cool mode selection control point	0000: 0 deg to (Cool/heat are reversed wit 2 against the set temperatu		0003: 3 deg (Ts±1.5)
28	Automatic reset of power failure	0000: None	0001: Provided	0000: None
2A	Selection of option / error input (CN70)	0000: Filter input 0002: Humidifier input	0001: Alarm input (Air cleaner, etc.)	0002: Humidifier
2b	Selection of thermostat output (T10 $\textcircled{3}$)	0000: Indoor thermostat ON 0001: ON receiving output of outc	loor compressor	0000: Thermostat ON
2E	Selection of HA (T10) terminal	0000: Normal (JEMA) 0002: Fire alarm input	0001: Card input (Forgotten to be off)	0000: Normal (HA terminal)
30	AUTO grille (This function is not provided.)	0000: Impossible	0001: Possible	0000: Impossible
31	Fan (Single operation)	0000: Impossible	0001: Possible	0000: Impossible
32	Sensor selection	0000: Body TA sensor	0001: Remote controller sensor	0000: Body sensor
40	Humidifier control (+Drain pump control) (This function is not provided.)	0000: No control 0001: Humidifier + Vaporizing type 0002: Humidifier + Supersonic typ (Pump ON when specified 0003: Humidifier + Natural drain type	be time elapsed)	0003: Humidifier ON Pump OFF
5d -	<4-way Discharge Cassette type> High ceiling selection (Air volume selection)	0000: Standard filter 0001: Super long life 0003: High performance (65%), H (0006:Deodorant, Ammonia deod		0000: Standard
	<slim duct="" type=""> External static pressure</slim>	0000: Standard (At shipment) 0001: High static pressure 1 0003: High static pressure 2 0006: High static pressure 3	(10 Pa) (20 Pa) (35 Pa) (50 Pa)	0000: Standard
60	Timer setting (Wired remote controller)	0000: Operable	0001: Operation prohibited	0000: Operable

DN	Item	Contents	At shipment from factory
42	Self-clean operation time	0000: None 0000: 0.5 h to 0.012: 0 h Set when compressor-ON time is 10 to 60 minutes. When ON-time is 60 minutes or more, the double of this operation time setting is set.	0002: 1 hour
45	Selection of louver horizontal discharge position	0000: Smudging-less setting 0002: Cold draft preventive setting	0000: Smudging- less setting
C2	Current demand X% to outdoor unit	0050: 50% to 0100: 100%	0075: 75%
сс	Setting of self-clean operation forced stop	 0000: No Clean operation is performed in case of stop by HA input. HA operation output OFF during clean operation in case of stop by remote controller 0001: Yes Clean operation is not performed in case of stop by HA input. HA operation output ON during clean operation in case of stop by remote controller 	0000: None
CD	Clean operation stop function when [ON/OFF] operation is prohibited.	The air conditioner stops (including fire alarm such as remote monitor system) while setup of [ON/OFF] operation prohibited (Central 1, 2) is performed from the central controller side. 0000: Valid (Clean operation) 0001: Invalid (No clean operation)	0000: Valid
D0	Existence of remote controller save function	0000: Invalid (Impossible) 0001: Valid (Possible)	0001: Valid (Possible)
D1	Existence of 8°C heating operation function	0000: Invalid (Impossible) 0001: Valid (Possible)	0001: Invalid (Impossible)
D3	Revolution frequency of self clean operation	0000: Invalid (Self clean operation is not carried out.) 0001: Valid (Self clean operation is practiced with 210 rpm.)	0001: Valid (210 rpm / operation)
D4	Display / No display of [Dry operation] during self clean operation	0000: Display 0001: No display	0000: Display
F0	Louver swing mode	0000: No synchronization0001: 4-way synchronization0002: Dual0003: Cycle	0001: 4-way synchronization
F1	Louver No.1 fixed position	0000: Release (Free) 0001 to 0005: Horizontal discharge position to Downward discharge position	0000: Release
F2	Louver No.2 fixed position	0000: Release (Free) 0001 to 0005: Horizontal discharge position to Downward discharge position	0000: Release
F3	Louver No.3 fixed position	0000: Release (Free) 0001 to 0005: Horizontal discharge position to Downward discharge position	0000: Release
F4	Louver No.4 fixed position	0000: Release (Free) 0001 to 0005: Horizontal discharge position to Downward discharge position	0000: Release

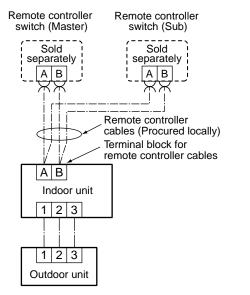
* The swing mode selection (DN code No. [F0]), louver fix (DN code No. [F1] to [F4]) and restriction ratio setting for save operation (DN code No. [C2]) can be set/changed from the normal DN setup (Detail DN setup).

12-1-5. Wiring and Setting of Remote Controller Control

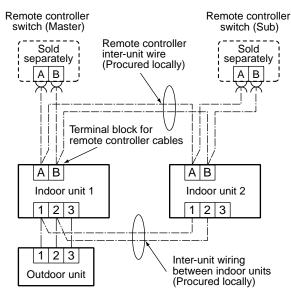
2-remote controller control (Controlled by 2 remote controllers)

This control is to operate 1 or multiple indoor units are operated by 2 remote controllers. (Max. 2 remote controllers are connectable.)

When connected 2 remote controllers operate an indoor unit



When connected 2 remote controllers operate the twin



(Setup method)

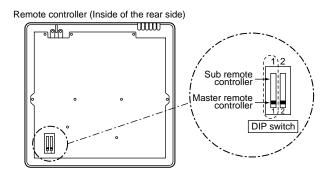
One or multiple indoor units are controlled by 2 remote controllers.

(Max. 2 remote controllers are connectable.)

<Wired remote controller>

How to set wired remote controller as sub remote controller

Change DIP switch inside of the rear side of the remote controller switch from remote controller master to sub. (In case of RBC-AMT32E)

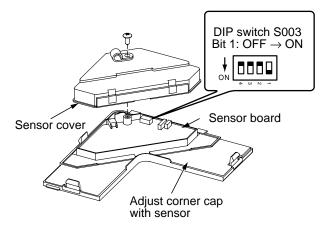


<Wireless remote controller>

How to set wireless remote controller to sub remote controller

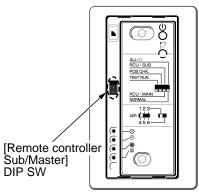
Change OFF of Bit [3: Remote controller Sub/Master] of switch S003 to ON.

<In case of 4-way Discharge Cassette type>



Replace OFF with ON of the Bit SW [Remote controller Sub/Master].

<In case of Slim Duct type>



[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.

12-1-6. Monitor Function of Remote Controller Switch

Calling of sensor temperature display

<Contents>

Each data of the remote controller, indoor unit and outdoor unit can be understood by calling the service monitor mode from the remote controller.

<Procedure>

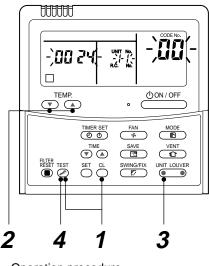
1 Push ^{Est} → ^{CL} buttons simultaneously for 4 seconds to call the service monitor mode.

The service monitor goes on, the master indoor unit No. is displayed at first and then the temperature of item code \mathcal{DD} is displayed.

Û

2 Push temperature set ^{♣ TEMP}/ ▲ buttons and then change the item code of data to be monitored.

The item code list is shown below.



<Operation procedure>

$$1 \rightarrow 2 \rightarrow 3 \rightarrow 4$$

Returned to usual display

	Item code	Data name	Unit
	01	Room temperature (Remote controller)	°C
a	02	Indoor suction temperature (TA)	°C
unit data	03	Indoor heat exchanger (Coil) temperature (TCJ)	°C
Indoor un	04	Indoor heat exchanger (Coil) temperature (TC)	°C
ğ	* 07	Indoor fan revolution frequency	rpm
-	* F2	Indoor fan calculated operation time	×100h
	F3	Filter sign time	×1h
	* F8	Indoor discharge temperature*1	°C

	Item code	Data name	Unit
	60	Outdoor heat exchanger (Coil) temperature (TE)	°C
	61	Outside temperature (TO)	°C
data	62	Compressor discharge temperature (TD)	°C
it d	63	Compressor suction temperature (TS)	°C
unit	65	Heat sink temperature (THS)	°C
Outdoor	6A	Operation current (x 1/10)	А
ltde	* 6D	Outdoor heat exchanger (Coil) temperature (TL)	°C
õ	* 70	Compressor operation frequency	rps
	* 72	Outdoor fan revolution frequency (Lower)	rpm
	* 73	Outdoor fan revolution frequency (Upper)	rpm
	F1	Compressor calculated operation time	×100h

Items with * marks are not provided to the Slim Duct type.

3 Push UNIT LOUVER button to select the indoor unit to be monitored. Each data of the indoor unit and its outdoor units can be monitored.

Û

Û

4 Pushing $\stackrel{\text{\tiny IEST}}{>}$ button returns the status to the usual display.

*1 The indoor discharge temperature of item code [F8] is the estimated value from TC or TCJ sensor. Use this value to check discharge temperature at test run.

(A discharge temperature sensor is not provided to this model.)

- The data value of each item is not the real time, but value delayed by a few seconds to ten-odd seconds.
- If the combined outdoor unit is one before 2 or 3 series, the outdoor unit data [6D], [70], [72] and [73] are not displayed.

Calling of error history

<Contents>

The error contents in the past can be called.

<Procedure>

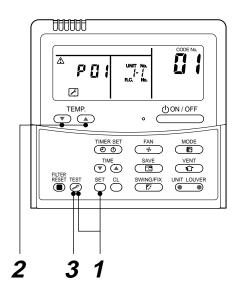
1 Push $\stackrel{\text{SET}}{\bigcirc}$ + $\stackrel{\text{TEST}}{\textcircled{B}}$ buttons simultaneously for 4 seconds or more to call the service check mode.

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 \hat{U} / (Latest) → Item code \hat{U} (Old) NOTE : 4 error histories are stored in memory.
- **3** Pushing 🖉 button returns the display to usual display.

REQUIREMENT

Do not push $\stackrel{\circlearrowright}{\bigcirc}$ button, otherwise all the error histories of the indoor unit are deleted.



<Operation procedure>

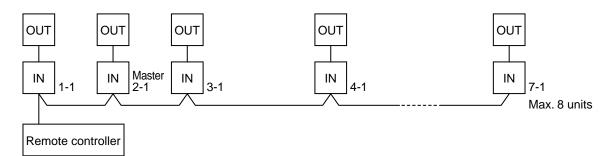
1→2→3

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.

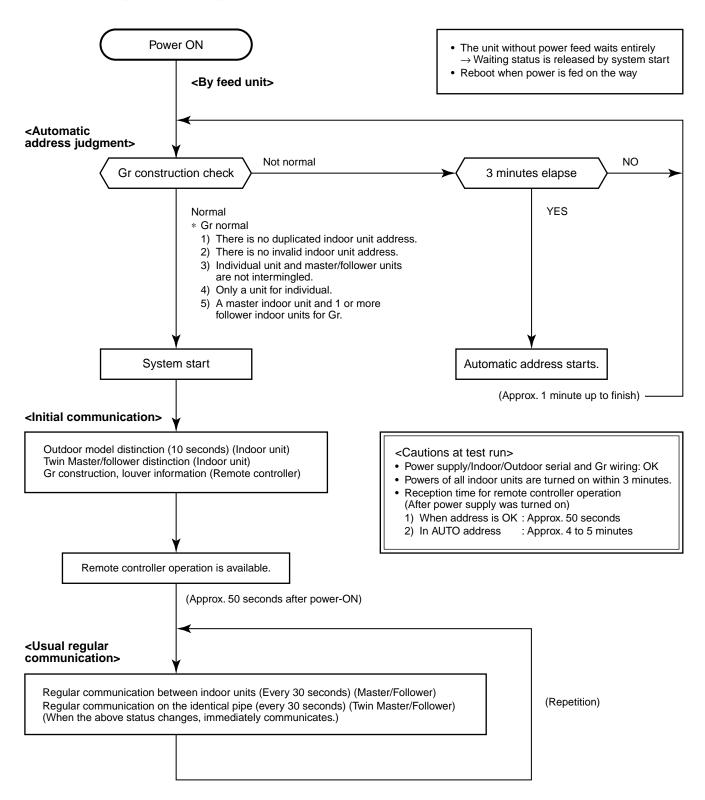
2. Address setup

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.

■ Indoor unit power-ON sequence



- In a group operation, if the indoor unit which was fed power after judgment of automatic address cannot receive regular communication from the master unit and regular communication on identical pipe within 120 seconds after power was turned on, it reboots (system reset).
 - → The operation starts from judgment of automatic address (Gr construction check) again. (If the address of the master unit was determined in the previous time, the power fed to the master unit and reboot works, the master unit may change though the indoor unit line address is not changed.)

12-2. Setup at Local Site / Others

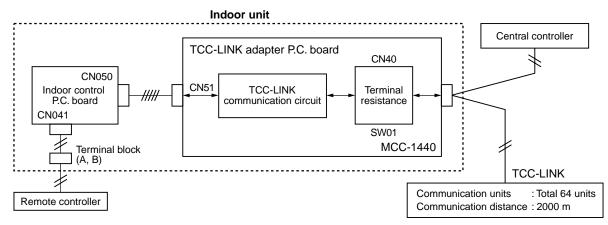
Model name: TCB-PCNT30TLE2

12-2-1. TCC-LINK Adapter (For TCC-LINK Central Control)

1. Function

This model is an optional P.C. board to connect the indoor unit to TCC-LINK (Central controller).

2. Microprocessor block diagram

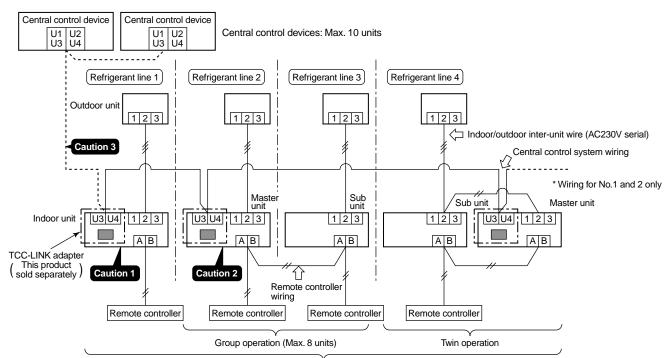


3. TCC-LINK wiring connection

CAUTION

- 1) When controlling customized setup collectively, TCC-LINK adapter (This option) is required.
- 2) In case of group operation or twin operation, the adapter is necessary to be connected to the main unit.
- 3) Connect the central control devices to the central control system wiring.
- 4) When controlling collectively customized setup only, turn on only Bit 1 of SW01 of the least line of the system address No. (OFF when shipped from the factory)

In case of customized setup, the address is necessary to be set up again from the wired remote controller after automatic addressing.



Indoor units in all refrigerant lines: Max. 64 units

[If mixed with multi model (Link wiring), multi indoor units are included.] * However group sub units and twin sub units of customized setup are not included in number of the units.

4. Wiring specifications

- Use 2-core with no polar wire.
- Match the length of wire to wire length of the central control system.
 If mixed in the system, the wire length is lengthened

with all indoor/outdoor inter-unit wire length at side.

- To prevent noise trouble, use 2-core shield wire.
- Connect the shield wire by closed-end connection and apply open process (insulating process) to the last terminal. Ground the earth wire to 1 point at indoor unit side. (In case of central controlling of digital inverter unit setup) CAUTION

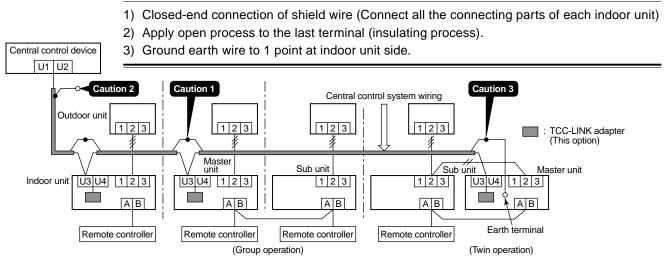
No. of wires

2

Size

Up to 1000m: twisted wire 1.25mm²

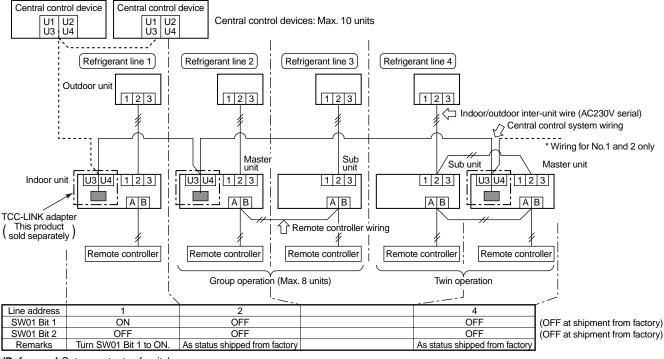
Up to 2000m: twisted wire 2.0mm²



5. P.C. board switch (SW01) setup

When performing collective control by customized setup only, the setup of terminator is necessary.

- Using SW01, set up the terminator.
- Set up the terminator to only the adapter connected to the indoor unit of least line address No.

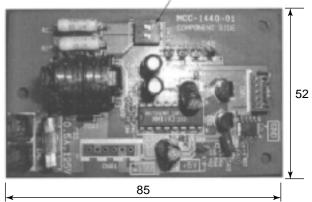


(Reference) Setup contents of switch

SW01		Terminator	Remarks
Bit 1	Bit 1	Terminator	Rellidiks
OFF	OFF	None	Mixed with multi (Link wiring) at shipment from factory
ON	OFF	100Ω	Central control by digital inverter only
OFF	ON	75Ω	Spare
ON	ON	43Ω	Spare

6. External view of P.C. board assembly

Terminator (SW01)



7. Address setup

In addition to set up the central control address, it is necessary to change the indoor unit number. (Line/Indoor/Group address). For details, refer to TCC-LINK Adapter Installation Manual.

12-3. How to Set up Central Control Address Number

When connecting the indoor unit to the central control remote controller using TCC-LINK adapter, it is necessary to set up the central control address number.

• The central control address number is displayed as the line No. of the central control remote controller.

1. Setup from remote controller at indoor unit side

* If you use the network adapter P.C. board, it is effective only when No. 7 of setup switch SW01 on P.C. board is turned off.

<Procedure> Perform setup while the unit stops.

1 Push $\stackrel{\text{TEST}}{\mathrel{\textcircled{}}}$ + $\stackrel{\text{VENT}}{\mathrel{\textcircled{}}}$ buttons for 4 seconds or more.

When group control is executed, first the unit No. *ALL* is displayed and 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 *ALL* displayed status without pushing UNIT LOUVER button.)

In case of individual remote controller which is not group-controlled, Line address and Indoor unit address are displayed.

- **2** Using temperature setup $\underbrace{\mathbb{C}}_{\mathbb{C}}^{\text{ITEMP}}$ buttons, specify item code $\mathcal{O}\mathcal{A}$.
- 3 Using timer time [™] buttons, select the setup data. The setup data is shown in the table below (Table 1).
- **4** Push ^{SET} button. (OK if display goes on.)
 - To change the item to be set up, return to Procedure 2.

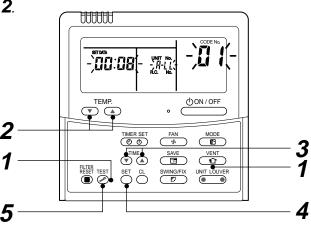
5 Push $\overset{\text{TEST}}{\swarrow}$ button.

The status returns to usual stop status.

(Table 1)

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

(Fig.1)



2. How to confirm the central control address (New function for AMT32 remote controller)

<Procedure> It can be confirmed even during operation or stopping.

1 Push UNIT LOUVER button for 4 seconds or more.

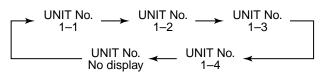
Û

2 In the frame at left side of the remote controller screen, the lighting set contents are displayed.

During unset time, *CC99* (At shipment from factory) is displayed.

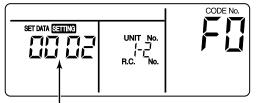
After lighting display for 3 seconds, the display automatically disappears.
If any button is pushed during display, immediately the display disappears and then the pushed button is displayed.

- 3. How to set up type of swing <For only 4-way Discharge Cassette type>
- **1** Push *for* 4 seconds or more during stop of the operation.
 - SETTING flashes.
- **2** Push (At the left side of the button) and select the unit to be selected.
 - Every pushing the button, the unit No. changes.



The fan of the selected unit rotates and the louver swings.

3 Using TIMER SET **()** / **()** buttons, select type of the swing.



Swing setup code

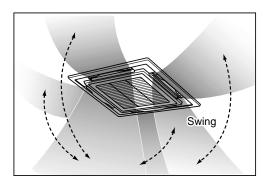
Swing setup code	Louver operation
0001	Standard swing (At shipment)
0002	Dual swing
0003	Cycle swing

REQUIREMENT

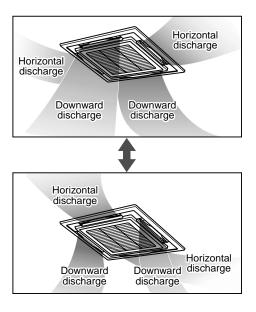
• Do not set 0000. (Louver may cause a trouble.)

4 Push $\stackrel{\text{\tiny SET}}{\bigcirc}$.

- **5** Push \mathcal{E} to finish the setup.
 - * Standard swing Four louvers swing simultaneously with the same angel.

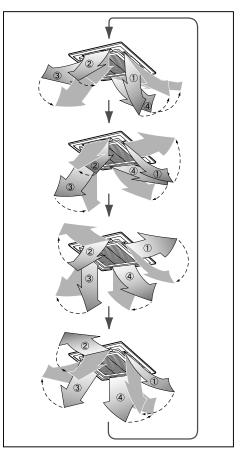


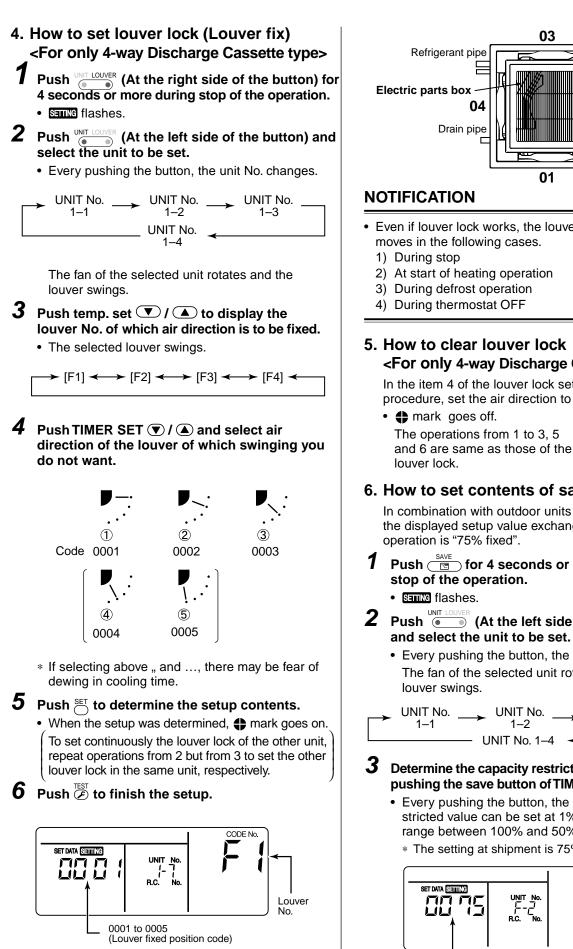
- * Dual swing
 - (Recommended for heating operation)
 - The adjoined louvers repeat horizontal discharge/Downward discharge alternately to clear irregularity of the temperature in heating operation.
 - The vertical discharge spreads hot air to the floor, and the horizontal discharge stirs. Both suppress the temperature irregularity.



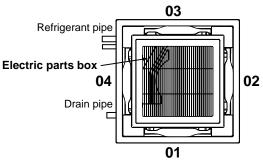
* Cycle swing

- (Recommended for cooling operation)
- 4 louvers swing with time lag as if they heave.





* F1 displayed at the item code on the remote controller means that the 01 louver was selected as shown in the figure.



NOTIFICATION

- · Even if louver lock works, the louver temporarily moves in the following cases.
 - 2) At start of heating operation
 - 3) During defrost operation
 - 4) During thermostat OFF

5. How to clear louver lock <For only 4-way Discharge Cassette type>

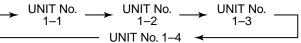
In the item 4 of the louver lock setup procedure, set the air direction to 0000.



6. How to set contents of save operation

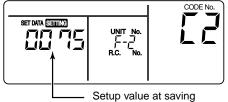
In combination with outdoor units before 4 series, the displayed setup value exchanges, but the real operation is "75% fixed".

- Push (B) for 4 seconds or more during stop of the operation.
 - SETTING flashes.
- Push (At the left side of the button) and select the unit to be set.
 - Every pushing the button, the unit No. changes. The fan of the selected unit rotates and the louver swings.



- Determine the capacity restricted value when pushing the save button of TIMER SET ()/ ().
 - · Every pushing the button, the capacity restricted value can be set at 1% interval in the range between 100% and 50%.

* The setting at shipment is 75%.



4 Push $\stackrel{\text{SET}}{\bigcirc}$ and then push $\stackrel{\text{TEST}}{\textcircled{O}}$ to finish the setup.

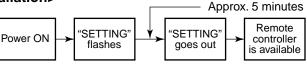
7. When installing separately sold filters

REQUIREMENT

• When you use this air conditioner for the first time, it takes approx. 5 minutes until the remote controller becomes available after power-on. This is normal.

<When power is turned on for the first time after installation>

It takes approx. 5 minutes until the remote controller becomes available.



SETTING

flashes

SETTING

goes out

Approx. 1 minute

Remote

controller

is available

<When power is turned on for the second (or later) time>

It takes approx. 1 minute until the remote controller becomes available.

- Normal settings were made when the indoor unit was shipped from factory. Change the indoor unit settings as required.
- Use the wired remote controller to change the settings.
- The settings cannot be changed using the wireless remote controller, sub remote controller, or remote controllerless system (for central remote controller only).
 Therefore, install the wired remote controller to change the settings.
- Changing of settings of for applicable controls Basic procedure for changing settings

Change the settings while the air conditioner is not working. (Be sure to stop the air conditioner before making settings.)

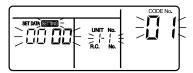
Procedure 1

Push $\overset{\text{TEST}}{{\mathscr{S}}}$ button and temp. setup \bigtriangledown button simultaneously for at least 4 seconds.

After a while, the display flashes as shown in the figure. Confirm that the CODE No. is [01].

 If the CODE No. is not [01], push button to erase the display content, and repeat the procedure from the beginning.

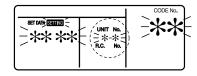
(No operation of the remote controller is accepted for a while after $\stackrel{\text{TEST}}{\textcircled{O}}$ button is pushed.)



(* Display content varies with the indoor unit model.)

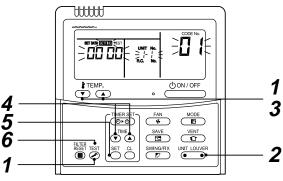
Procedure 2

Each time you push built LOUVER button, indoor unit numbers in the control group change cyclically. Select the indoor unit you want to change settings for. The fan of the selected unit runs. You can confirm the indoor unit for which you want to change settings.



Procedure 3

Using temp. setup \bigcirc / \bigcirc buttons, specify CODE No. [**].



Procedure 4

Power ON

Using timer time \bigcirc / \bigcirc buttons, select SET DATA [****].

Procedure 5

Push $\stackrel{\text{SET}}{\bigcirc}$ button. When the display changes from flashing to lit, the setup is completed.

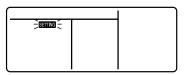
- To change settings of another indoor unit, repeat from **Procedure 2**.
- To change other settings of the selected indoor unit, repeat from Procedure 3. Use ^{SET} button to clear the settings.

Use $\stackrel{\text{SET}}{\bigcirc}$ button to clear the settings. To make settings after $\stackrel{\text{SET}}{\bigcirc}$ button was pushed, repeat from **Procedure 2**.

Procedure 6

When settings have been completed, push $\overset{\text{TEST}}{>}$ button to determine the settings.

When $\overleftarrow{\mathcal{S}}$ button is pushed, "SETTING" flashes and then the display content disappears and the air conditioner enters the normal stop mode. (While "SETTING" is flashing, no operation of the remote controller is accepted.)



Be sure to make ceiling setting when installing separately sold filters.

* Separately sold filters cannot be installed in an indoor unit on a high ceiling.

Follow to the basic operation procedure

 $(\textbf{1} \rightarrow \textbf{2} \rightarrow \textbf{3} \rightarrow \textbf{4} \rightarrow \textbf{5} \rightarrow \textbf{6}).$

- For the CODE No. in **Procedure 3**, specify [5d].
- For the set data in **Procedure 4**, select the setup data of filters to be installed from the following table.

Setup data	High-ceiling setting
0000	Normal filter (Installed at factory shipping)

Setup data	High-ceiling setting
0003	High Efficiency Filter (65%) High Efficiency Filter (90%)

Installing indoor unit on high ceiling

When an indoor unit is installed on a ceiling higher than the standard height, make the high-ceiling setting for air volume adjustment.

- Take the same procedure as that in "When installing separately sold filters".
- Select the setting data for **Procedure 4** from the "Height list of ceiling possible to be installed" table.

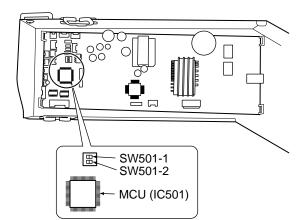
When wireless remote controller is used

Change the high-ceiling and filter settings with the DIP switch on the receiver section P.C. board.

For details, refer to the manual of the wireless remote controller kit.

The settings can also be changed with the switch on the indoor microcomputer P.C. board.

* However, once the setting is changed, setting to 0001 or 0003 is possible but setting to 0000 requires a setting data change to 0000 using the wired remote controller (separately sold) with the normal switch setting (factory setting).



Setup data	SW501-1	SW501-2
0000 (Factory shipping)	OFF	OFF
0001	ON	OFF
0003	OFF	ON

To restore the factory settings

To return the DIP switch settings to the factory settings, set SW501-1 and SW501-2 to OFF, connect a separately sold wired remote controller, and then set the data of CODE No. [5d] to "0000" in "When installing separately sold filters" in the previous page.

12-4. Outdoor Unit

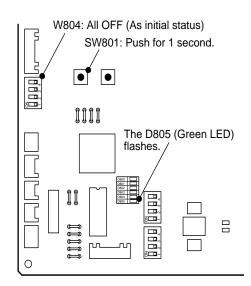
12-4-1. Refrigerant Recovery Control

The "ozone destruction coefficient" of HFC refrigerant is 0 and the discharge regulation is set as anathermal effect gas.

To this model, a switch which can perform the refrigerant recovery (pump down) by the outdoor unit is mounted so that it is easy to react against the environment at reinstalling or rejection time.

[Operation method]

- 1) Set the mode of the indoor unit to fan mode.
- Set all DIP switch SW804 to OFF (Initial status) and then push the button switch SW801 for approx. 1 second. The cooling operation starts. (During this time, D805 (Green LED) flashes.) This operation finishes by 10 minutes.
- 3) After operation for 3 minutes or more, close valve at liquid side.
- 4) After recovery of refrigerant, close valve at gas side.
- 5) Push the button switch SW801 again for approx. 1 second. The outdoor unit stops.
- 6) Stop the indoor unit and then turn off the power supply.



12-4-2. Various setting on outdoor unit (Existing piping, Power save, Cooling-only, etc.)

The following settings are available by DIP switch setup and jumper line setup.

Function	Set position	Control contents			
High static pressure setup	SW802	Turn the switch to ON when mounting a duct to the discharge port of the outdoor unit. Add 3 taps to the upper limit value of the outdoor fan tap. The operation is performed with (Max: Upper fan: 890 rpm / Lower fan: 910 rpm (WF)). In this case, the outdoor noise level may increase.			
Existing piping setup	High static pressure setup Existing piping setup Power save setup	Turn the switch to ON when Ø19.1 is used for the existing pipe. In this case, the heating capacity may lower according to outside temp. and indoor temp. in heating operation.			
Power save setup	Compose Power save setup Compose Snow-proof fan control	Turn the switch to ON when using the power save function. The control to lower the compressor frequency (Approx. –10%) is performed by indoor heat exchanger temp. in heating operation.			
Snow-proof fan control	* all are OFF at shipment.	When snow enters from clearance of the fan guard or heat exchanger into blast path and it is accumulated, the control to prevent generation of motor lock is validated. When outside temp. is below 0°C though the compressor stops, the outdoor fan operates with W5.			
Defrost time change	J805, J806	The defrost interval is cut to shorten it than the standard status. For contents of control and cutting method, refer to Section 9-2-10. Defrost control.			
		When it is needed to lower the maximum value of the compressor frequency, cut the jumper line. Max. frequency at cooling/heating is lowered. In this case the Max. capacity decreases. Max. frequency of compressor			
Max. frequency	J807	RAV-SP1104 RAV-SP1404			
change		Model COOL HEAT COOL HEAT			
		Standard status 53.4 71.4 64.2 90.6			
		When J807 is cut 53.4 64.2 64.2 72.0			
Cooling-only setup	J808	When using the air conditioner as a cooling-only conditioner, cut the jumper line. (An air conditioner can be changed to cooling- only conditioner by "0F" of DN code on the remote controller.)			

12-4-3. Service Support Function (LED Display, Switch Operation)

1. Outline

A various setup and operation check can be performed by DIP switches at 3 positions (SW802, SW803, SW804) and the pushdown button switches (SW800, SW801) at 2 positions.

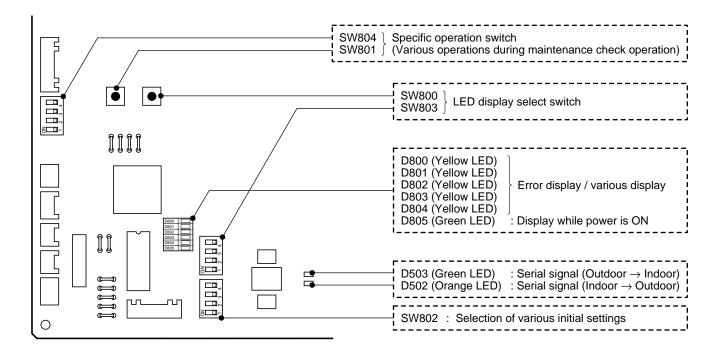
Operation part

Part No.	Specifications	Operation contents	
SW800	Pushdown button switch	Exchanges the displayed contents of LED (D800 to D804) on the outdoor	
SW803	DIP switch	control P.C. board.	
SW801	Pushdown button switch	Derferme the energities are refined to shortly register and	
SW804	DIP switch	Performs the specific operation to check maintenance.	
SW802	DIP switch	Performs various initial settings. (Refer to 12-4-2.)	

Display part

Part No.	Specifications	Operation contents
D502	Orange LED	Indoor/Outdoor communication (Serial communication) signal display (Receive signal from indoor signal)
D503	Green LED	Indoor/Outdoor communication (Serial communication) signal display (Send signal from outdoor signal)
D800 to D804	Yellow LED	Error display When all SW803 are OFF, or when any of D800 to D804 goes on, LED displays that the outdoor controller detects an error. When status of SW803 is other than OFF, various indications are displayed.
D805	Green LED	Power-ON display When the power of the outdoor unit is turned on, LED goes on. When SW801 and SW804 operate the specific operation, LED flashes.

* All LED are colorless when it goes off.



12-4-4. Others

1. Selection of LED display (SW800, SW803 operation)

1) Display selection list

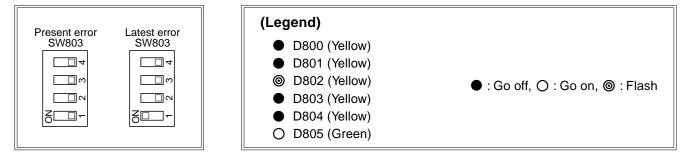
The displayed contents of LED D800 to D804 on the outdoor control P.C. board can be exchanged by operation of SW803.

Switch	Function / Contents	Refer
SW803	Error display (Error generating at present) Error generating at present is displayed. This switch goes off when an error does not generate.	Refer to Page 168.
SW803	 Error display (The latest error: Latest error including present) After error status was cleared, the error which generated before can be confirmed by this setting. (Reconfirmation is available even if power supply was turned off once.) If an error generates at present, the same contents as those of error which is generating at present are displayed. Only error of TO sensor is not displayed by this setting. (Confirm it by setting of error which is generating at present.) 	Refer to Page 168.
TD TE TS SW803 SW803 SW803 TO TL TH SW803 SW803 SW803 TO TL TH SW803 SW803 SW803 TA TC TC TA TC TC SW803 SW803 SW803 TA TC TC TC TC TC TC	Temperature sensor display The detected value of temperature sensor is displayed.	Refer to Page 169.
SW803	Current display The current value which flows in the outdoor unit is displayed.	Refer to Page 169.
SW803	Compressor operation frequency display The operation frequency of the compressor is displayed.	Refer to Page 169.
SW803	PMV opening display The opening of PMV (Pulse Motor Valve) is displayed.	Refer to Page 169.

2) Error display

The error which is generating at present and the latest error (Latest error information including present) can be confirmed by lighting LED D800 toD804 on the outdoor control P.C. board.

- a) When all DIP switch SW803 are OFF, the status of error which is generating at present is displayed.
- b) <1> only of DIP switch SW803 is turned on, the error which generated before (Latest error information including present) is displayed.a)
- c) If there is an error, any of LED D800 to D804 goes on. (Display 1)
- d) When pushing the pushdown button switch SW800 for approx. 1 second, the display is exchanged. (Display 2)
- e) When pushing SW800 again or after 2 minutes, the status returns to that of Display .



Display 1) (Initial display)	Display 2) (SW800 operation)	Error contents	Wired remote controller Error code
$\bullet \bullet \bullet \bullet \bullet \circ \circ$		Normal	—
	$\bullet \bullet @ \bullet \bullet \bigcirc$	Discharge temp. sensor (TD) error	F04
		Heat exchanger temp. sensor (TE) error	F06
	◎◎◎●●○	Heat exchanger temp. sensor (TL) error	F06, F07
000000		Outside temp. sensor (TO) error	F08
	$\bullet \bullet $	Suction temp. sensor (TS) error	F06, F12
	00000	Heat sink temp. sensor (TH) error	F13, L29
	0000000	Heat exchanger sensor (TE, TS) miswiring	F06, F15
	000000	EEPROM error	F31, L29
		Compressor break down	H01
●●○●○○		Compressor lock	H02
	⊚⊚●●●○	Current detection circuit error	H03
	$\bullet \bullet \odot \bullet \bullet \bigcirc$	Case thermostat operation	H04, P04
		Model unset	L10, L29
●00●00	00000	Communication error between MCU	L29
	000000	Other error (Compressor disorder, etc.)	Error is not determined.
	⊚⊚●●●○	Discharge temp. error	P03
		Power supply error	P04, P05
	◎◎◎●●○	Heat sink overheat error	P07, L29
	000000	Gas leak detection	P15, L29
000000	00000	4-way valve reverse error	P19, L29
		High pressure protective operation	P04, P20
		Fan system error	P22
		Driving element short-circuit	P26
	00000	Position detection circuit erro	P29

* As the error code displayed on the wired remote controller may differ according to type of indoor model, multiple codes are described.

3) Sensor, current, compressor operation frequency, PMV opening display

Г

The values detected by the controller, such as temperature sensor or current value are simply confirmed.

(Legend)				
D800 (Yello	■ D800 (Yellow) ■ D803 (Yellow)			
D801 (Yello	, , ,		 Go off, 	O : Go on
D802 (Yelle				
	Temperature sensor (°C)		Compressor	
	• • • • •	Current	operation	PMV opening
ltem setup	TD TE TS TO TL SW803 SW803 SW803 SW803 CTTL CTTL CTTL	(A)	frequency (rpm)	(Þulse)
			(19)	
		SW803	SW803	SW803
		4	1	4
	TH TA TC TCJ SW803 SW803 SW803 SW803		∞	
			S S S S S S S S S S S S S S S S S S S	≥ ⊐ S
LED				<u> </u>
display				
	Below –25	0 to 0.9	0 to 4	0 to 19
$\bigcirc \bullet \bullet \bullet \bullet \bigcirc$	-25 to -21	1 to 1.9	5 to 9	20 to 39
$\bigcirc \bigcirc $	-20 to -16	2 to 2.9	10 to 14	40 to 59
00000	-15 to -11	3 to 3.9	15 to 19	60 to 79
$\bullet \bullet \circ \bullet \bullet \circ$	–10 to – 5	4 to 4.9	20 to 24	80 to 99
000000	−5 to −1	5 to 5.9	25 to 29	100 to 119
●00●●0	0 to 4	6 to 6.9	30 to 34	120 to 139
000000	5 to 9	7 to 7.9	35 to 39	140 to 159
$\bullet \bullet \bullet \circ \bullet \circ$	10 to 14	8 to 8.9	40 to 44	160 to 179
$0 \bullet \bullet 0 \bullet 0$	15 to 19	9 to 9.9	45 to 49	180 to 199
$\bullet \circ \bullet \circ \bullet \circ$	20 to 24	10 to 10.9	50 to 54	200 to 219
00000	25 to 29	11 to 11.9	55 to 59	220 to 239
●●00●0	30 to 34	12 to 12.9	60 to 64	240 to 259
00000	35 to 39	13 to 13.9	65 to 69	260 to 279
●000●0	40 to 44	14 to 14.9	70 to 74	280 to 299
000000	45 to 49	15 to 15.9	75 to 79	300 to 319
	50 to 54	16 to 16.9	80 to 84	320 to 339
00000	55 to 59	17 to 17.9	85 to 89	340 to 359
	60 to 64	18 to 18.9	80 to 84	360 to 379
	65 to 69 70 to 74	19 to 19.9	95 to 99 100 to 104	380 to 399
	70 to 74 75 to 79	20 to 20.9 21 to 21.9	100 to 104 105 to 109	400 to 419 420 to 439
●00●00	80 to 84	21 to 21.9 22 to 22.9	105 to 109 110 to 114	420 to 439 440 to 459
000000	85 to 89	22 to 22.9 23 to 23.9	110 to 114	460 to 479
●●●000	90 to 94	23 to 23.9 24 to 24.9	120 to 124	480 to 499
00000	95 to 99	25 to 25.9	125 to 129	500
00000	100 to 104	26 to 26.9	130 to 134	
000000	105 to 109	27 to 27.9	135 to 139	
●0 000	110 to 114	28 to 28.9	140 to 144	
00000	115 to 119	29 to 29.9	145 to 149	_
00000	Over 120	30 to 30.9	150 to 154	_
000000	Sensor error, unconnected	Over 31	Over 155	

* As TD, TL and TH are sensors for high temperature, there is error at normal temperature or below position.

* For current value, the current for the outdoor unit only is displayed.

4) Specific operation for maintenance check (SW801, SW804)

The following specific operations for the maintenance check are performed by operation of SW801 or SW804.

- a) Select DIP switch SW804. (See table below)
- b) Push the pushdown button switch SW801 for approx. 1 second.
- c) The following functions start. While each function starts, LED D805 (Green) flashes.
- d) When pushing the pushdown button switch SW801 again for approx. 1 second, when selecting DIP switch SW804 or when the specified time of each function elapsed, each function stops and LED D805 (Green) returns to the continuous lighting.

<Specific operation>

SW804	Operation when pushdown button switch SW801 is pushed				
	Refrigerant recovery operation The outdoor unit performs cooling operation. The indoor unit doe alone. Therefore operate the fan beforehand. (Refer \rightarrow 12-4-1. R	nt recovery operation tdoor unit does not work by this operation tdoor unit performs cooling operation. The indoor unit does not work by this operation Therefore operate the fan beforehand. (Refer \rightarrow 12-4-1. Refrigerant Recovery Control)			
	Indoor cooling test run demand The cooling test run is performed. (→ Note 1)				
	Indoor heating test run demand The heating test run is performed. (→ Note 1)				
	Fan motor forced operation Drive the fan motor forcedly. When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control.				
	(No operation especially)	[NOTE] Although these operations can be performed even during operation, basically perform			
	PMV full open operation Open PMV (Pulse Motor Valve) fully. When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control.	operation while the unit stops. If performing this operation during driving the unit, it is dangerous because the pressure may change suddenly.			
SW804	PMV full close operation Close PMV (Pulse Motor Valve) fully. When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control.				
SW804	Set PMV (Pulse Motor Valve) to middle opening (250 pulses). When pushing SW801 again or when 2 minutes elapsed, the				

Note 1) Indoor cooling test run demand / Indoor heating test run demand

Only when combining with the following indoor unit, cooling/heating operation can be performed from the outdoor unit.

Test run is available: Indoor unit of 4 series and after (RAV-SM***4UT-E etc.)

Test run is unavailable: Indoor units other than the above-mentioned indoor units, or indoor units other than above-mentioned indoor units are included in the twin connection.

Note 2) The forced test run by this setting cannot be cleared on the indoor remote controller. Be sure to clear the test run by operation of the outdoor unit. (Push SW801 again for 1 second.)

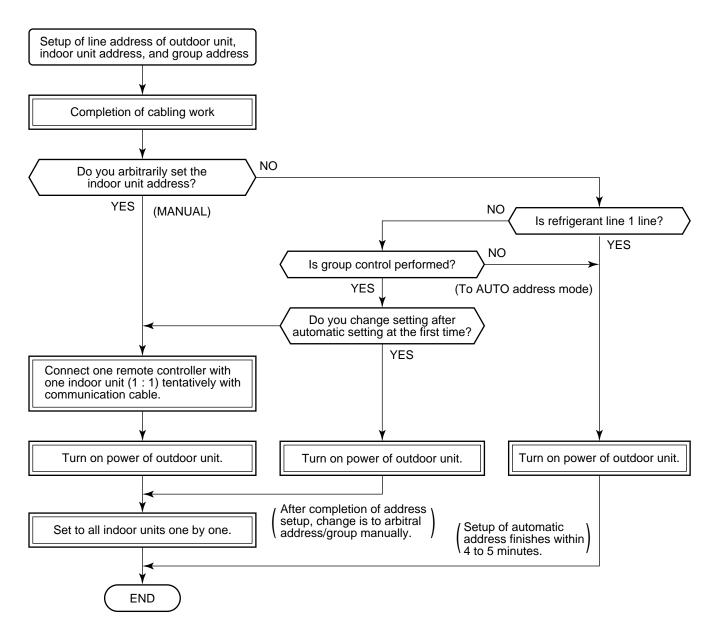
SW804	Operation when pushdown button switch S	<pre><in case="" of="" sp110,="" sp140=""> W801 is pushed</in></pre>
	 4-way valve relay operation (For RY700, CN70 check) Turn on 4-way valve power relay (RY700). When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control. [NOTE] In case of model adopting the self hold valve (RAV-SP1104AFE, RAV-SP1404T-E), the coil develops fever. Therefore do not perform this operation as coil is connected. 	
SW804	Self-hold valve suction operation (Exchange to heating cycle) (For RY700 RY701, RY705, CN701 check) Turn on relay RY700, RY701, RY705. (CN701 between ① and ④ : Voltage=Approx. +198 to 380V) This function works for 10 seconds and then is OFF.	
SW804	Self-hold valve separation operation (Exchange to cooling cycle) Turn on relay RY700. (CN701 between 1) and 4): Voltage=Approx. –198 to 380V) This function works for 10 seconds and then is OFF.	
SW804	 SV valve relay operation (For RY702, CN702 check) Turn on SV valve relay (RY702). When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control. * For RAV-SP1104 to RAV-SP1404, the part is not mounted, so do not operate. 	[CAUTION] Although these operations can be performed even during operation, basically perform operation while the unit stops. If performing this operation during driving the unit, it is dangerous
SW804	Heater output relay operation (For check RY703, CN703 check) Turn on relay for option heater (RY703). When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control.	because the pressure may change suddenly.
SW804	Outside output relay operation (RY704, CN704) Turn on relay for outside output (RY704). When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control.	
SW804	(No operation especially)	
	Relay operation change for outside output [CAUTION] Do not use this setting.	

13. ADDRESS SETUP

13-1. 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 (IC503) 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 0064 (No. 64 unit)		0001 (No. 1 unit) to 0064 (No. 64 unit)	
Indoor unit address	13	0099	0001 (No. 1 unit) to 0064 (No. 64 unit) Max. value of indoor units in the identical refrigerant line
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)

13-2. 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 = Single (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 air direction adjustment of louver)
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)
Master unit (Rep	resentative unit) (Master Twin)
	: This unit communicates with the indoor unit (follower) which serial-communicates with the outdoor units and sends/receives signal (Command from compressor) to/from the outdoor units as the representative of the cycle control in the indoor units of the identical line address

Follower unit (Subordinate unit) (Follower Twin)

: Indoor units excluding the master unit in Twin

This unit communicates with (Master) indoor unit in the identical line address and performs control synchronized with (Master) indoor unit.

This unit does not perform the signal send/receive operation with the outdoor units. : No judgment for serial signal error.

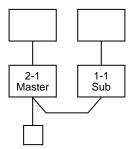
within the minimum unit which configures one of the refrigerating cycles of Twin.

13-2-1. System configuration

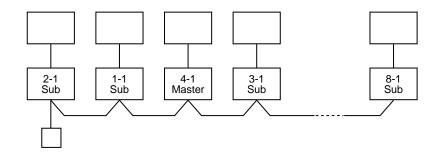
1. Single

Outdoor

2. Twin



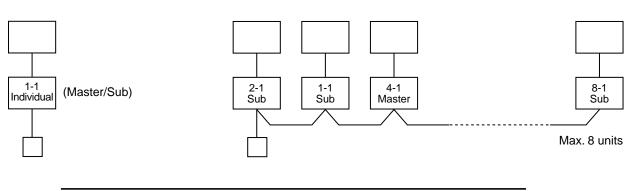
3. Single group operation



13-2-2. Automatic address example from unset address (No miscabling)

- 1. Standard (One outdoor unit)
 - 1) Single

 Gr operation (Multiple outdoor units = Miltiple indoor units only with serial communication)



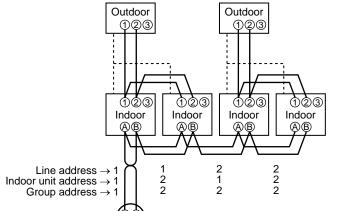
Only turning on source power supply (Automatic completion)

13-3. 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>

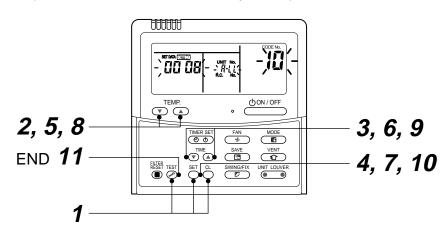
- Set an indoor unit per a remote controller.
- Turn on power supply.



- **1** Push $\stackrel{\text{set}}{\bigcirc}$ + $\stackrel{\text{c}}{\bigcirc}$ + $\stackrel{\text{rest}}{\textcircled{B}}$ buttons simultaneously for 4 seconds or more.
- 2 (← Line address) Using the temperature setup ▼ / ▲ buttons, set /2 to the item code.
- **3** Using timer time I **A** buttons, set the line address.
- **4** Push ^⁵ button. (OK when display goes on.)
- 5 (← Indoor unit address)
 Using the temperature setup ▼ / ▲ buttons, set /∃ to the item code.
- **6** Using timer time I **a** buttons, set 1 to the line address.
- **7** Push [™] button. (OK when display goes on.)
- 8 (← Group address) Using the temperature setup ▼ / ▲ buttons, set / 4 to the item code.
- **9** Using timer time **I** (**buttons**, set 0000 to Individual, 0007 to Master unit, and 0002 to sub unit.
- **1 O**Push [≦] button. (OK when display goes on.)

1 1 Push \mathbb{E} button.

Setup completes. (The status returns to the usual stop status.)



<Operation procedure>

 $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 10 \rightarrow 11$ end

Remote controller

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

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

Group address Individual : 0000 Master unit : 0001 Sub unit : 0002

■ 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 \bigcirc button if the unit stops.

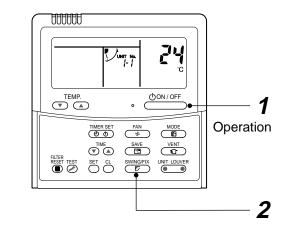
2 Push UNIT LOUVER button.

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



<Operation procedure>

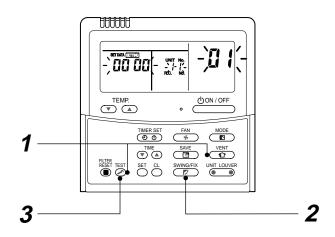
2. To know the position of indoor unit body by address

• 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, louver, and drain pump of the corresponding indoor unit are turned on. (Follow to the procedure during operation)

- Push ^{VENT} and ^{TEST} buttons simultaneously for 4 seconds or more.
 - Unit No. *ALL* is displayed.
 - Fans and louvers of all the indoor units in the group control operate.
- 2 Every pushing UNIT LOUVER 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 louver 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>

$$1 \rightarrow 2 \rightarrow 3$$
 END

<Maintenance/Check list>

Aiming in environmental preservation, it is strictly recommended to clean and maintain the indoor/outdoor units of the operating air conditioning system regularly to secure effective operation of the air conditioner.

It is also recommended to maintain the units once a year regularly when operating the air conditioner for a long time.

Check periodically signs of rust or scratches, etc. on coating of the outdoor units.

Repair the defective position or apply the rust resisting paint if necessary.

If an indoor unit operates for approx. 8 hours or more per day, usually it is necessary to clean the indoor/outdoor units once three months at least.

These cleaning and maintenance should be carried out by a qualified dealer.

Although the customer has to pay the charge for the maintenance, the life of the unit can be prolonged.

Failure to clean the indoor/outdoor units regularly will cause shortage of capacity, freezing, water leakage or trouble on the compressor.

Part name	Object		Contents of check	Contents of maintenance	
Fait hame	Indoor	Outdoor	Contents of check	Contents of maintenance	
Heat exchanger	0	0	Blocking with dust, damage check	Clean it when blocking is found.	
Fan motor	0	0	Audibility for sound	When abnormal sound is heard	
Filter	0		Visual check for dirt and breakage	Clean with water if dirtyReplace if any breakage	
Fan	0	0	 Visual check for swing and balance Check adhesion of dust and external appearance. 	 Replace fan when swinging or balance is remarkably poor. If a large dust adheres, clean it with brush or water. 	
Suction/ Discharge grille	0	_	Visual check for dirt and scratch	 Repair or replace it if deformation or damage is found. 	
Drain pan	0	_	 Check blocking by dust and dirt of drain water. 	Clean drain pan, Inclination check	
Face panel, Louver	0	—	Check dirt and scratch.	Cleaning/Coating with repair painting	
External appearance		0	Check rust and pealing of insulatorCheck pealing and floating of coating film	Coating with repair painting	

14. DETACHMENTS

14-1. Indoor Unit

14-1-1. 4-Way Air Discharge Cassette Type

RAV-SM564UT-E, RAV-SM804UT-E, RAV-SM1104UT-E, RAV-SM1404UT-E

No.	Part name	Procedure	Remarks
1	Suction grille	 <u>CAUTION</u> Be sure to put on the gloves at disassembling work; otherwise an injury will be caused by a part, etc. 1. Detachment Stop operation of the air conditioner and then turn off switch of the breaker. Slide the 2 knobs of the suction grille inward and then hang down the suction grille. Remove a strap connecting the panel and the suction grille and then remove the suction grille. 2. Attachment Hook the suction grille to the panel. Attach strap of the suction grille to the panel as before. 	Suction grille Suction grille Ceiling panel Hook for falling-preventive strap Hole for ceiling panel hook Hole for ceiling panel hook
2	Electric parts cover	 Detachment Carry out work of item 1. of ①. Remove the fixing screw A which fixes the electric parts cover and loosen the fixing screw B. Pull down the electric parts cover, remove pin of the bell mouth and then slide it to the arrow direction in order to open the claws and the electric parts box cover. Attachment Close the electric parts cover and slide it, hook claw of the electric parts box, claw of the electric parts box cover and the Dharma doll hole, and then insert pin of the bell mouth into hole of the electric parts box cover. Tighten the fixing screws A and B and then fix the electric parts box cover. Following to work of item 2 of ①, mount the suction grille as before. 	Bell mouth pin Claw of electric parts box Fixing screw B Potbelly hole (Dharma doll hole) Claw of electric parts box cover Fixing screw A Electric parts box cover

No.	Part name	Procedure	Remarks
2	Electric parts cover (Continued)		
3	Adjust corner cap	 1. Detachment Pull knob of the adjust corner cap to the arrow direction, remove strap of the adjust corner cap from pin of the panel and then remove all the 4 corners of the cap. NOTE : The knob is provided to only one side. Be sure to remove the cap of the knob side at first. 2. Attachment Hook strap of the adjust corner cap securely to pin of the ceiling panel. Insert claw of the adjust corner cap into the square hole of the panel. (2 positions) 3) Push claws of the adjust corner cap into the positions indicated with arrow marks so that they fit in 3 positions. 	Adjust corner cap (Nob) Pulling direction Pulling direction Pin Pin Strap of adjust corner cap Claws (3 positions) Claws (3 positions) Push into positions with arrow marks

No.	Part name	Procedure	Remarks
4	Ceiling panel	 Detachment Carry out works of item 1 of ② and item 1 	Clamp
		of ③. 2) Remove the flap connector (CN510, White, 20P) connected to the control P.C. board and then remove the lead wire from the clamp.	Louver motor wiring
		NOTE : Unlock the lock of the housing part and then remove the connector.	CN510 Square hole of indoor unit
		 3) Loosen the panel fixing 4 screws. 4) Slide the panel fixing brackets (4 positions) outward. 5) Push the tentative bracket outward and then remove the ceiling panel. 	
		 2. Attachment 1) Insert the tentative brackets (2 positions) of the ceiling panel into square holes of the indoor unit and then hook the panel tentatively. 	Panel fixing screw Electric parts box Louver motor wiring
		 NOTE : The ceiling panel has the directional properties against the indoor unit. Direct the louver motor wire to the electric parts box side of the indoor unit. 2) Pass the head of the panel fixing screw through hole of the panel fixing bracket and then slide the panel fixing bracket inward. 3) Tighten in the panel fixing screw to fix the ceiling panel. 4) Following to work of item 2 of ③, attach the adjust corner cap as before. 5) Connect the louver connector (CN510, White, 20P) as before and then fix the lead wire with clamp. 6) Following to work of item 2 of ②, mount the electric parts box cover and the suction grille as before. 	

No.	Part name	Procedure	Remarks
5	Control P.C. board	 Detachment Carry out work of item 1 of ②. Remove connectors which are connected from the control P.C. board to the other parts and then remove wiring from the clamp. 	Camp Carber Carb

No.	Part name	Procedure	Remarks
6	Drain cap	 Detachment Carry out work of item 1 of ①. Loosen screws (3 positions) fixing the drain cap (outside) and then turn the drain cap to the arrow mark direction to remove it. 	Drain cap (outside)
		NOTE : The drain cap is hung down because a strap is attached to it (outside).	CLOSE D OPEN
		 Loosen the cap by turn the drain cap (inside) for approx. 1 turn to OPEN → direction and then drain the drain water accumulated in the drain pan. 	Strap Drain cap fixing screws
		NOTE : Be sure to catch drain water using a bucket,	Drain cap (inside)
		etc. when loosening the drain cap. The insulating materials are adhered to the drain cap (outside) and opening part of the drain pan; be careful that they are not come off.	
		If they are come off, stick them as before using double-faces tape, etc.	CLOSE Î
		4) Turn the drain cap once again to OPEN \rightarrow direction to remove it.	OPEN
		 2. Attachment 1) Insert the drain cap (inside), turn it to CLOSE → direction until the position where "Clashed sound" is heard and it cannot be turned more over (Position where △ mark of the drain pan matches with △ mark of the drain cap (inside)) and then fix it. 	Drain cap A mark Drain pan A mark
		NOTE : When attaching the drain cap (inside), remove dirt attached to the packing. And tighten in it noting so that the cap is not slantingly set. If attaching the drain cap as dust or dirt is attached or the cap is set slantingly, water leakage is caused.	
		 2) Turn the drain cap (outside) to → direction and then attach it using the fixing screw as original. 3) Following to work of item 2 of ①, mount the suction grille as before. 	

No.	Part name	Procedure	Remarks
	Fan motor	 Detachment Carry out work of item 1 of ②. Remove connectors which are connected from the control P.C. board to the other parts and then remove each wiring from the clamp. CN510 : Louver motor (20P, White) CN34 : Float switch (3P, Red) CN504 : Drain pump (2P, White) CN101 : TC sensor (2P, Black) CN102 : TCJ sensor (2P, Red) CN104 : Room temp. Sensor (2P, Orange) CN333 : Fan motor power supply 	Fixing screw A Fixing screw B Electric parts box
		(5P, White) CN334 : Fan motor position detection (3P, White) NOTE : Unlock the lock of the housing part and then remove the connector.	Fan motor lead TC sensor TCJ sensor
		 Remove the fixing screws A and B, and then remove the electric parts box. (Fixing screw A: Ø4 × 10, 3 pcs, Fixing screw B: Ø4 × 8, 1 pc.) Remove the fan motor lead, TC sensor and TCJ sensor from clamp of the bell mouth. Remove the fixing screws and then remove the bell mouth. (Ø4 × 10, 8 pcs.) Remove the fixing screws and then remove the nut cap. (Ø4 × 10, 2 pcs.) Remove the fixing nut and then remove the turbo fan. (M8 nut with flange, 1 pc.) Remove the fixing screws and then remove the motor lead holding bracket. (Ø4 × 8, 2 pcs.) Cut the bundling band and then remove it from the clamp. 	Bell mouth Nut cap Image: Constrained state Image: Constrained state Image: Constrained state Image: Constrained state </td
		from the clamp. 10) Remove the fixing nut and then remove the fan motor. (Ø6 nut, 3 pcs.) 2. Attachment 1) Fix the parts as before in order of fan motor → motor lead holding bracket → turbo fan → nut cap → bell mouth. NOTE : Fix the motor lead to the clamp without slack as before using bundling band. When fixing the turbo fan, be sure to match the D-cut of the fan boss with D-cut of the motor shaft. Using a torque wrench, fix the turbo fan and tighten it to 5.4 ^{+0.5} _{-0.2} Nm.	Turbo fan Turbo fan M8 nut with flange

No.	Part name	Procedure	Remarks
No.	Part name Fan motor (Continued)	 Procedure 2. Attachment 2) Fix the fan motor lead, TC sensor and TCJ sensor with the clamp of the bell mouth. 3) Mount the electric parts box with the fixing screws A and B. (Ø4 × 10, 3 pcs. Ø4 × 8, 1 pc.) 4) Connect the connector removed in item 1 as before and then fix wiring with the clamp. 5) Following to work of item 2 of ②, mount the electric parts box cover and the suction grille as before. 	RemarksM6 nutFan motorFan motorNotor leadholding bracketFixing screws (Ø4 × 8)Clamp
			Fan motor lead

No.	Part name	Procedure	Remarks
9	Float switch assembly	 1. Detachment Carry out works of item 1 of ⑦ and works from 1) to 5). Remove the fixing screw and then remove the float switch assembly. (Ø4 × 25, 1 pc.) 2. Attachment Mount the float switch assembly as before with the fixing screw. NOTE : When mounting, match hole of the float switch assembly with projection of the drain pan. 2) Mount the bell mouth as before. (Ø4 × 10, 8 pcs.) 3) Following to works of item 2 of ⑦ and works from 2) to 5), attach the parts as before. 	Floatswitch assembly Fixing screw (Ø4 × 25) Hole of float switch assembly
			Projection of drain pan
	Drain pan	 1. Detachment Carry out works of item 1 of ④, item 1 of ⑥, item 1 of ⑦ and works from 2) to 5). Remove the fixing screws to remove the drain pan. (Ø4 ×10, 4 pcs.) 2. Attachment Fix parts as before in order of drain cap → drain pan → bell mouth. Following to works of item 2 of ⑦ and works from 2) to 5), attach parts as before. 	Fxing screws (Ø4 x10)

No.	Part name	Procedure	Remarks
	Heat exchanger	 Detachment Recover the refrigerant gas. Carry out work of item 1 of ⁽¹⁾. Remove refrigerant pipe at indoor unit side. Remove the fixing screws and then remove the piping cover. (Ø4 ×10, 3 pcs.) Remove the drain hose from the drain pump and remove the fixing screws to remove the drain pump stand. (Ø4 ×8, 3 pcs.) While pushing the heat exchanger, remove the fixing band, fixing screws and the heat exchanger. (Ø4 ×8, 3 pcs.) Mount the heat exchanger with the fixing band and the fixing screws. (Ø4 ×8, 3 pcs.) Fix the parts as before in order of drain pump stand → piping cover. Connect the refrigerant pipe as before and then apply vacuuming. Following to work of item 2 of ⁽¹⁾, attach the parts as before. 	<image/>
		Fixing band Heat exchanger	Fixing screws (Ø4 ×10)

14-1-2. Slim Duct Type

RAV-SM404SDT-E, RAV-SM454SDT-E, RAV-SM564SDT-E

No.	Part name	Procedure	Remarks
		REQUIREMENT Be sure to put on gloves at working; otherwise an injury may be caused by parts, etc. • Before replacement of the parts, be sure to stop operation of the air conditioner and turn off switch of the breaker.	
1	Air Filter	 1. Detachment Push knobs (3 positions) of the air filter hooks toward the arrow direction to remove the air filter. 2. Attachment Insert the air filter surely into the hooking grooves (4 positions) at the opposite side of the hooks, and then fix it to the original position. NOTE) In case of sucking system from bottom side, installation direction is determined. Install the air filter so that hooks are aligned at discharge side.	
2	Plate inlet-A Plate inlet-B	 Detachment Take off fixing screws while holding the plate inlet-A with hands to remove it. (Sucking system from rear side: Ø4 × 10, 8 pcs) (Sucking system from bottom side: Ø4 × 10, 11 pcs) Take off fixing screws while holding the plate inlet-B with hands to remove it. (Ø4 × 10, 6 pcs) NOTE) Be careful that sheeting metal does not fall when removing the plate inlet. Attachment Using the screws taken off in procedure 1. 2) of ②, attach the plate inlets in order of B → A while holding them not to fall down. A while holding them not to fall down. 	In case of sucking system from rear side]Plate inlet-B: 6 screwsPlate inlet-A: 8 screws

No.	Part name	Procedure	Remarks
3	E-cover	 Detachment Perform work 1. of ②. Take off screws fixing E-cover, and then remove hooks of the hooking part by lifting up. (Ø4 × 10, 2 pcs) Attachment Hang on E-cover to hooks of the hooking part so that it does not fall down. NOTE) Be sure not to catch TA sensor in the E-cover; otherwise the equipment cannot operate correctly. Using the screws taken off in procedure 1. 2) of ③, attach E-cover while holding it with hands without clearance. NOTE) If there is clearance, dust may enter in the electric parts box. 	
4	E-box	 Detachment Perform works 1. of ② and 1. of ③. Remove clamps and tie wrap at upper part of the photo. (Drain pump incorporated model: 3 positions) (Natural drain model: 2 positions) Take off screws fixing E-box. (Ø4 × 10, 2 pcs) E-box does not fall down under condition that screws are taken off. Remove the E-box over sheeting metal which was fixed with screws. Attachment Insert hooks of E-box into the hooking part of the main body. Store E-box as before, and then attach it by using screws taken off in procedure 1. 3) of ④. MOTE) Be sure to fix surely as before the lead wires of which clamps and tie wrap were taken off. NOTEE Check that lead wires of the drain pump do not reach the fan so that they are not caught in the fan, and then fix them. (In case of drain pump incorporated model) 	<image/>

No.	Part name	Procedure	Remarks
5	P.C. board assembly	 1. Detachment Perform works 1. of ②, 1. of ③, and 1. of ④. Disconnect connectors which are connected from P.C. board assembly to other parts. NOTE) Unlock the lock of the housing to disconnect the connectors. CN41 : Remote controller terminal (2P: Blue) Remote controller terminal block: 2P CN67 : Power supply terminal (3P: Black) CN101 : TC sensor (2P: Black) CN102 : TCJ sensor (2P: Red) CN333 : Fan motor power supply (5P: White) CN334 : Detection of fan motor position (3P: White) CN34 : Float SW (3P: Red) CN504 : Drain pump lead (2P: White) 3) Unlock the lock of the card edge spacer, and the sense of the card edge spacer, and the sense of the card edge spacer. Attachment Attach P.C. board assembly to the card edge spacer. Using wires connect connectors as before, white procedure 1. 2) of ⑤. NOTE) Check there is no missing or poor contact of the card edge spacer.	nen remove P.C. board assembly. bacer. ch were disconnected in
6	Multi blade fan case, fan lower case, fan upper case	 Detachment Perform work 1. of ②. Take off hanging hooks at both sides of the lower fan case to remove fan lower case. Remove the upper fan case while taking off hooks of fan upper case which are hooked to the partition board. Loosen hexagonal hole screw of the multi blade fan to remove multi blade fan from the shaft. If necessary, remove multi blade fan and then remove fan upper case. Attachment Determine the position so that multi blade fan positions at the center of the fan upper case, and then fix it with hexagonal hole screw. MOTEJ Arrange the multi blade fan so that screws position at the right side against the drain pan assembly. MOTEJ Hook the lower fan case as before and attach it with hooks. MOTEJ Finally check whether the multi blade fan turns surely and smoothly or not. 	<image/>

No.	Part name	Procedure	Remarks
	Fan motor	 Detachment Perform works 1. of ②, 1. of ③, and 1. of ⑥. Remove lead wires which are connected to the following connectors of P.C. board assembly. NOTE) Unlock locks of the housing, and then remove the connectors. CN333 : Fan motor power supply (5P: White) CN334 : Detection of fan motor (3P: White) Remove tie wrap which fixes lead wires. Remove the noise filter from lead wire to detect fan motor position. Take off screws of fan motor fixing bracket. Earth wires of the motor are tightened together. (Ø5 × 10, 2 pcs) Remove tie wrap which fixes the lead wires. Remove fixing bracket of the fan motor by holding it with hands so that the fan motor does not fall down. Attachment Mount the fan motor as before in order, Fan motor → Fixing bracket of fan motor → Noise filter → Lead v NOTE) Check there is no missing or poor contact of the connect fan turns surely and smoothly, and check together-tighter 	ors. Check also that the multi blade
8	Under panel Drain pan assembly	 Detachment Take off the drain cap and drain the drain water accumulated in the drain pan assembly. In case of natural drain model, drain the drain water by taking off hose band and drain hose. NOTE) When taking off drain cap and drain hose, be sure receive drain water in a bucket, etc. Take off screws fixing the under panel while holding it to remove. (Ø4 × 10, 8 pcs) NOTE) Be careful that sheeting metal does not fall when removing the under panel. Pull out the drain pan assy. by holding handle at lower part. NOTE) When pulling out the drain pan assy, never pull out the drain socket by drawing it with hands. If doing so, water leak may be caused. Pull out it to some extent, lay hand on the bump at suction side, and then remove the drain pan assy. to the flange at discharge side, and then push in. Using screws taken off in procedure 1. 2) of (3), attach under panel by holding with hands. Attach drain cap, hose band, and drain hose as before, which were taken off in procedure 1. 1) of (3). 	<image/>

No.	Part name	Procedure	Remarks
9	Drain pump, Float switch, Drain hose	 Detachment Perform works in procedures 1. of ②, 1. of ③, 1. of ⑧. Disconnect lead wires which are connected to the following connectors of P.C. board assembly. NOTE) Unlock locks of the housing to remove the connectors. CN34 : float SW (3P: Red) CN504 : Drain pump lead (2P: White) Loosen hose band, remove cap of the drain hose, and take off screws while holding drain pump. Remove them with care that pipes are not damaged. (Ø4 × 10, 3 pcs) Take off screws while holding metal on float switch. Remove them with care so that pipes are not damaged. (Ø4 × 10, 1 pc) NOTE) If the pipes are damaged, refrigerant leak may be Attach MSSY sheeting metal which was remove pipes are not damaged, and then fix it with scr Insert the drain hose into the inlet of drain pum handle of the hose band at contrary side of he from drain pan assembly. Carry out wiring as before, and then perform v NOTE) Finally check whether they correctly operate or not 	ved in procedure 1. 3) of (9) with care that rews. np, and then fix it with hose band. Arrange eat exchanger side and at direction remote vork of procedure 2. of (8).
	Evaporator assembly	 Detachment Recover refrigerant, and then remove refrigerant pipes at indoor unit side. Perform works of procedures 1. of ②, 1. of ③, 1. of ③, 1. of ⑧. Remove sensors. Take off screws of the pipe holder, and remove the pipe holder. (Ø4 × 10, 2 pcs) Take off screws of the heat exchanger support board (Pipe side), and remove the heat exchanger support board (Pipe side). (Ø4 × 10, 4 pcs) Take off screws of the heat exchanger support board (Opposite side) which fixes terminal block of the evaporator assembly. (Ø4 × 10, 2 pcs) Remove the evaporator assembly. Attachment Fasten the parts as before in order, Evaporator assembly → Pipe holder → Set sensors → Drain pan assembly → Under panel. Connect the refrigerant pipe as before, and then perform vacuuming. 	<image/> <text></text>

14-2. Outdoor Unit

RAV-SP1104AT-E, RAV-SP1104ATZ-E, RAV-SP1104ATZG-E RAV-SP1404AT-E, RAV-SP1404ATZ-E, RAV-SP1404ATZG-E

No.	Part name	Procedure	Remarks
No.	Part name Common procedure	Procedure CAUTION Never forget to put on the gloves at working time; otherwise an injury will be caused by the parts, etc. 1. Detachment 1) Stop operation of the air conditioner and then turn off switch of the breaker. 2) Remove the front panel. (Hexagonal screw Ø4 × 10, 2 pcs.) • Remove the screws and then remove the front panel by pulling it downward. 3) Remove the power supply cable and the indoor/outdoor connecting wire from the cord clamp and the terminal. 4) Remove the top plate. (Hexagonal screw Ø4 × 10, 5 pcs.) 2. Attachment 1) Attach the top plate. (Hexagonal screw Ø4 × 10, 5 pcs.) 2) Connect the power supply cable and the indoor/outdoor connecting wire to the terminal and then fix them with the cord clamp. REQUIREMENT For the power supply cable and the indoor/ outdoor connecting wire, be sure fix them using the bundling band on the market along	<text><text><image/><text></text></text></text>
		For the power supply cable and the indoor/ outdoor connecting wire, be sure fix them	

No.	Part name	Procedure	Remarks
2	Discharge port cabinet	 Detachment Carry out work of 1 of ①. Remove screws for the discharge port cabinet and the partition board. (ST1T Ø4 x 8, 4 pcs.) Remove screws for the discharge port cabinet and the bottom plate. (Hexagonal screw Ø4 x 10, 2 pcs.) Remove screws for the discharge cabinet and the motor base. (ST1T Ø4 x 8, 2 pcs.) Remove screw for the discharge cabinet and the heat exchanger. (ST1T Ø4 x 8, 1 pc.) Remove screws for the discharge port cabinet and the fin guard. (Hexagonal screw Ø4 x 10, 2 pcs.) 	Motor base Discharge port cabinet Heat exchanger Partition board
3	Side cabinet	 Carry out work of 1 of ①. Remove the screws which fix the inverter assembly and the side cabinet. (ST1T Ø4 × 8, 2 pcs.) Remove the screws for the side cabinet and the valve fixing plate. (ST1T Ø4 × 8, 2 pcs.) Remove screws for the side cabinet and the piping panel (Rear). (Hexagonal screw Ø4 × 10, 2 pcs.) Remove screws for the side cabinet and the bottom plate. (Hexagonal screw Ø4 × 10, 1 pc.) Remove screws for the side cabinet and the fin guard (Heat exchanger). (Hexagonal screw Ø4 × 10, 5 pcs.) 	<text></text>

No.	Part name	Procedure	Remarks
4	Replacement of electric parts	 Control P.C. board 1) Carry out work of 1 of ①. 	Control P.C. board Upper fan motor
			case thermo.
		Never disassemble the inverter for 1 minute after power supply has been turned off because an electric shock may be caused.	
		 2) Remove the connectors connected to the control P.C. board. (Indoor power supply, Temperature sensor, PMV coil, 4-way valve coil, Compressor case thermo, Fan motor) Unlock the lock of the housing part 	Lower fan motor Temperature sensor
		and then remove the connectors.3) Remove the lead wires connected to the control P.C. board.	PMV coil Indoor power supply
		Compressor lead U: CN200 Red V: CN201 White W: CN202 Black	P.C. board Element fixing screws (9 positions)
		Reactor cord CN05 White CN06 White	
		 4) Remove the earth wire from the control P.C. board. (Trust B tight screw Ø4 × 6, 1 pc.) 	
		 5) Remove the fixing screws of the control P.C. board. (Screw with collar for fixing element Ø3 × 16, 9 pcs. Pan S tight screw for fixing board Ø3 × 20, 1 pc.) 	
		6) Remove the control P.C. board. (Supporter: 5 positions)	1 And
		NOTE : Be careful to take out because there is sealing material for the heat sink.	Insulating sheet
		 Replace the control P.C. board with a new one. 	Control P.C. board Sealing material
		 NOTE : Be sure not to confuse for Compressor lead V (CN201 White), Reactor lead CN05 and CN06. Be sure not to come-off of the insulating sheet. 	

No.	Part name	Procedure	Remarks
4	Replacement of electric parts (Continued)	 2. Reactor Carry out work of 1 of ①. Remove the reactor lead connected to the control P.C. board. CN05 White, CN06 White Cut the bundling band which bundled the compressor lead and fan motor lead. Remove the reactor. (Trust B tight screw, Ø4 × 6, 2 pcs.) Seplace the reactor with a new one. NOTE : Be sure to bundle the removed bundling band with the bundling band on the market. Be careful so that the fan motor lead does not come to contact with the reactor body.	<text></text>
			<text></text>

No.	Part name	Procedure	Remarks
5	Fan motor	 Carry out works of item 1 of ① and work of ②. Remove the flange nut fixing the fan motor and the propeller fan. The flange nut is loosened by turning it clockwise. (When tightening it, turn it counterclockwise.) Remove the propeller fan. Remove the connector for the fan motor from the inverter. (Remove the ferrite core of the lower fan motor because it is used.) Remove the fan motor lead from the fan motor lead fixed rubber of the penetrated part of the partition board. Remove the fixing screws (4 pieces each) while supporting the fan motor so that it does not fall down. Cautions for assembling of fan motor Tighten the flange nut with 4.95N•m (50kgf•cm). Adjust length of the fan motor lead wire at the fan motor lead fixed rubber so that the fan motor lead is not slackened; otherwise the fan motor lead fixed rubber so that the fan motor lead so that the projection is set at the refrigerating cycle side. Be sure so that the rector body does not contact with the fan motor lead. Be sure to bundle the removed bundling band with the bundling band on the market. Necessarily attach the ferrite core of the lower fan motor again. (Fix it with bundling band on the market.) 	<image/> <image/>
		REQUIREMENT Be sure to fix the fan motor lead to the motor base using the metal band of the motor base so that the fan motor lead does not come to contact with the propeller fan.	<image/>

Compressor Compressor lead	 Removal of defective compressor Recover the refrigerant gas. Carry out work of item 1 of ① and work of ③. Remove the piping panel (Front).	Piping panel (Front)
	 Remove screw of the piping panel (Front) and the piping panel (Rear). (Hexagonal screw Ø4 × 10, 1 pc.) 4) Remove the piping panel (Rear). Remove the piping panel (Rear) and screws of the bottom plate. (Hexagonal screw Ø4 × 10, 2 pcs.) 5) Remove the sound-insulation plate. (Upper, rolling in, rolling out) 6) Remove the terminal cover of the compressor and then remove the compressor lead and the compressor case thermo. 7) Remove TD sensor which is fixed to the discharge pipe. 8) Remove the compressor lead. (Leave the ferrite core as it is attached to the electric parts box.) Control P.C. board U : CN200 Red V : CN201 White W: CN202 Black 9) Using a burner, remove the discharge pipe and the suction pipe which are connected to the compressor. 	<image/>
	In case of removing the piping by broiling the welded part with a burner, if there is oil in the pipe, it may burst into flames at the moment that wax melted, so take sufficient care.	Ferrite core
	CAUTION : Note so that the flame does not catch the 4-way valve and PMV. (A malfunction may be caused.)	(Discharge pipe) Remove (Suction pipe)
	 Pull off the discharge pipe and the suction pipe of the refrigerating cycle upward. Remove the compressor nuts which fix the compressor to the bottom plate. (3 pcs.) Pull out the compressor toward you. 	
	CAUTION : As weight of the compressor is 20kg or more, handle it by 2 workers.	Gompressor nuts (3 pcs)
		screws of the bottom plate. (Hexagonal screw Ø4 × 10, 2 pcs.) 5) Remove the sound-insulation plate. (Upper, rolling in, rolling out) 6) Remove the terminal cover of the com- pressor and then remove the compressor lead and the compressor case thermo. 7) Remove TD sensor which is fixed to the discharge pipe. 8) Remove the compressor lead. (Leave the ferrite core as it is attached to the electric parts box.) Control P.C. board U : CN200 Red V : CN201 White W: CN202 Black 9) Using a burner, remove the discharge pipe and the suction pipe which are connected to the compressor. <u>MARNING</u> In case of removing the piping by broiling the welded part with a burner, if there is oil in the pipe, it may burst into flames at the moment that wax melted, so take sufficient care. CAUTION : Note so that the flame does not catch the 4-way valve and PMV. (A malfunction may be caused.) 10) Pull off the discharge pipe and the suction pipe of the refrigerating cycle upward. 11) Remove the compressor ruts which fix the compressor to the bottom plate. (3 pcs.) 12) Pull out the compressor toward you. CAUTION : As weight of the compressor is 20kg or

No.	Part name	Procedure	Remarks
6	Compressor Compressor lead (Continued)	 2. Mounting of compressor 1) Mount the compressor in the reverse procedure for removal. 	Wrap the ferrite core with the compressor lead wire for 4 times.
		 NOTE : After replacement of the compressor, be sure to replace the compressor lead. (Repair part code of compressor lead: 43160591) In this time, wrap the ferrite core with the compressor lead wire by 4 times. As shown in the right figure, mount the sound-insulation plate (rolling in, rolling out) by passing through it between the compressor and the piping, and between the piping and the partition board. Fix TD sensor by the bundling band for heat-proof on the market via the pipe cover so that TD sensor does not directly come to contact with the discharge pipe. Xecuuming Connect the vacuum pump to the charge port and the check joint of the gas pipe valve and then drive the vacuum pump. Carry out vacuuming until the vacuum low pressure gauge indicates 1 (mmHg). NOTE : Before vacuuming, open PMV fully. If PMV is closed, vacuum may be impossible between liquid pipe valve and PMV of the outdoor unit. Forced full-opening method of PMV Turn on the leakage breaker. Turn on 1 and 3 of Dip switch SW804 on the	<image/> <image/> <text><text><text><text><text><text></text></text></text></text></text></text>
		 Keep pushing SW801 on the control P.C. board of the outdoor unit. Keep pushing SW801 on the control P.C. board of the outdoor unit for 1 second or more. After pushing SW801 for 1 second or more, turn off the leakage breaker within 2 minutes. 	Insert one side under cultural rivet. Sound-insulation plate (rolling out)
		 4. Refrigerant charge 1) Add the refrigerant amount determined by the pipe length from the charge port of the valve. 	SW804 SW801

No.	Part name	Procedure	Remarks
Ø	PMV coil	 Detachment Carry out work of item 1 of ①. Turn the coil while pulling upward and then remove the coil from the PMV main unit. Attachment Surely match the positioning projection of the coil with the concave part of PMV main unit and then fix it. 	Concave partPMV main unitImage: Strain of the strain of t
8	Fan guard	 1. Detachment Carry out works of item 1 of ① and work of ②. REQUIREMENT To prevent scratch on the product, carry out the work on cardboard, cloth, etc. Remove the discharge port cabinet and then put on it so that the fan guard side directs downward. Remove the hooking claws (8 positions) of the fan guard. 2. Attachment Push the hooking claws (8 positions) with hands from the front side to fix the claws. REQUIREMENT Check that all the hooking claws are fixed at the specified positions.	Fan guard Bell mouth Discharge port cabinet Image: Construction of the second seco

RAV-SP404AT-E, RAV-SP404ATZ-E, RAV-SP404ATZG-E RAV-SP454AT-E, RAV-SP454ATZ-E, RAV-SP454ATZG-E

No.	Part name	Procedure	Remarks
1	Common procedure	CAUTION Never forget to put on the gloves at working time, otherwise an injury will be caused by the parts, etc.	Valve cover
		 Detachment Stop operation of the air conditioner, and turn off the main switch of the breaker for air conditioner. Remove the valve cover. (ST1T Ø4 × 10L, 1 pc.) 	
		2. Attachment 1) Attach the waterproof cover. CAUTION Be sure to attach a waterproof cover. If it is not attached, there is a possibility that water enters inside of the outdoor unit.	Upper cabinet Water-proof cover Cord clamp
		 2) Attach the upper cabinet. (ST1T Ø4 × 10L, 2 pcs.) Hook the rear side of the upper cabinet to claw of the rear cabinet, and then put it on the front cabinet. 3) Perform cabling of connecting cables, and fix with cord clamp. (ST1T Ø4 × 10L 3 pcs.) 4) Attach the wiring cover. (ST1T Ø4 × 10L, 2 pcs.) 5) Attach the valve cover. (ST1T Ø4 × 10L, 1 pc.) Insert the upper part of the upper cabinet, set hooking claw of the valve cover to the slit (at three positions) of the main body, and then attach it pushing upward. 	Rear cabinet

No.	Part name	Procedure	Remarks
2	Front cabinet	 Detachment Perform work of item 1 of ①. Remove screws (ST1T Ø4 × 10L, 2 pcs.) of the front cabinet and the inverter cover. Take off screws of the front cabinet and the bottom plate. (ST1T Ø4 × 10L 3 pcs.) Take off screws of the front cabinet and the motor support. (ST1T Ø4 × 10L, 2 pcs.) The left side of the front side if made to insert to the rear cabinet, so remove it pulling upward. 	Motor support Weight of the support Front cabinet For single-phase type models, also take off this screw
		 3. Attachment Insert hook at the left side of the front side into the rear cabinet. Hook the lower part at the right side of the front to concavity of the bottom plate. Insert the hook of the rear cabinet into the slit of the front cabinet. Attach the removed screws to the original positions. 	<image/>

No.	Part name	Procedure	Remarks
3	Inverter assembly	 Detachment Perform work of item 1 of ①. Take off screws of the upper part of the front cabinet. If removing the inverter cover under this condition, P.C. board can be checked. If there is no space in the upper part of the upper cabinet, perform work of ②. 	Screws Front cabinet
			Inverter cover
		CAUTION Be careful to check the inverter because high-voltage circuit is incorporated in it.	
		 Perform discharging by connecting +, polarities by discharging resistance (approx. 100Ω, 40W) or plug of soldering iron to +, Caution HIGH VOLTAGE") electrolytic capacitor (500µF) of P.C. board. 	Cord clamp
		WARNING	
		The electrolytic capacitor may not normally discharge according to error contents and the voltage may remain. Therefore, be sure to discharge the capacitor.	Screws
		WARNING	Plug of soldering iron Discharging
		For discharging, never use a screwdriver and others for short-circuiting between ⊕ and — electrodes. As the electrolytic capacitor is one with a large capacity, it is very danger- ous because a large electric spark will occur.	Discharging position (Discharging period 10 seconds or more)
		 4) Take off screws (ST1T Ø4 × 10L, 2 pcs.) fixing the main body and the inverter box. 5) Remove various lead wires from the holder at upper part of the inverter box and wiring holder at right side of the terminal block. 6) Remove the lead wire from the bundled part at left side of the terminal block. 	Inverter assembly
		 Pull the inverter box upward. Disconnect connectors of various lead wires. 	
		REQUIREMENT As each connector has a lock mechanism, avoid to remove the connector by holding the lead wire, but by holding the connector.	Remove the connectors with locking function by pushing the part indicated by the arrow mark.

 Control P.C. board assembly Disconnect lead wires and connectors connected from the control P.C. board assembly to other parts. Lead wires Connection with the power terminal
 Connectors wires (Black, White, Orange) Earth wire: 1 wire (Black, White, Orange) Earth wire: 1 wire (Black, White, Orange) Earth wire: 1 wire (Black, White, Orange) Connection with compressor: Remove 3P connector. Connection with reactor: Remove 3P connectors from POT, 08 (2P, White) and P12, 13 (2P, Yellow) CN300 : Outdoor fan (3P, White) CN500 : Obsensor (3P, White) CN602 : TD sensor (3P, White) CN603 : TS sensor (3P, White) CN603 : TS sensor (3P, White) CN603 : TS sensor (3P, White) CN603 : TD sensor (3P, White) CN603 : TD sensor (3P, White) CN603 : TD sensor (3P, White) CN602 : TO sensor (3P, White) CN603 : TO sensor (3P, White) CN603 : TD sensor (3P, White) CN603 : TD sensor (3P, White) CN602 : TO sensor (3P, White) CN603 : TD sensor (3P, White) CN603 : TD sensor (3P, White) CN604 is the ant back assembly from PC. board base. (Remove the inverter box (Metal plate). Remove the control board assembly as they are screwed.) NOTES: CNS01 and CN701, etc. at the control board assembly as they are screwed.) NOTES: CNS03 1 and CN701, etc. at the control board assembly side are connectors with locking function. Therefore, remove the connector while pushing the part indicated by an arrow mark. Remove 4 hooking claws of PC, board base, and remove upward the heat sink with hands. Take off 3 screws fixing the heat sink and main control board assembly side, and replace the board with a new one.

No.	Part name	Procedure	Remarks
6	Rear cabinet	 Perform works of items 1 of ① and ② , ③ . Take off fixed screws for the bottom plate. (ST1T Ø4 × 10L, 3 pcs.) Take off fixed screws for the heat exchanger. (ST1T Ø4 × 10L, 2 pcs.) Take off fixed screw for the valve mounting plate. (ST1T Ø4 × 10L, 1 pc.) 	Rear cabinet
6	Fan motor	 Perform works of items 1 of ① and ②. Take off the flange nut fixing the fan motor and the propeller. Turning it clockwise, the flange nut can be loosened. (To tighten the flange nut, turn counterclockwise.) Remove the propeller fan. Disconnect the connector for fan motor from the inverter. Take off the fixing screws (3 pcs.) holding by hands so that the fan motor does not fall. NOTE: Tighten the flange nut with torque 4.9Nm (50kgf/cm). 	<image/> <image/>

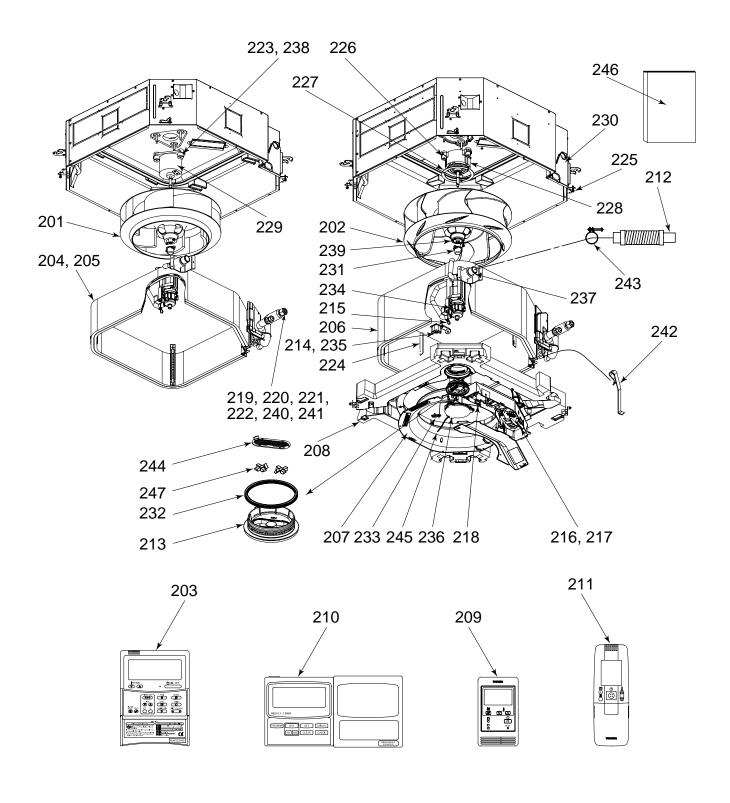
No.	Part name	Procedure	Remarks
	Compressor	 Perform works of items 1 of ① and ② , ③ , ④ , ⑤ . Discharge refrigerant gas. Remove the partition plate. (ST1T Ø4 × 10L, 2 pcs.) Remove the noise-insulator. Remove the terminal covers of the compressor, and disconnect lead wires of the compressor and the compressor thermo assembly from the terminal. Remove pipes connected to the com- pressor with a burner. Pay attention to that flame does not involve 4-way valve or PMV. (If doing so, a malfunction may be caused.) Take off the fixing screws of the bottom plate and heat exchanger. (ST1T Ø4 × 10L, 2 pcs.) Take off the fixing screws of the valve clamping plate to the bottom plate. Pull upward he refrigerating cycle. Take off nut fixing the compressor to the bottom place. When reconnecting the lead wires to the compressor terminals after replacement of the compressor, be sure to caulk the Faston terminal without loosening. 	Partition plate Formula in the initial initia
8	Reactor	 Perform works of item 1 of ① and ③ . First take off two screws (ST1T Ø4 × 10L) of the reactor fixed to the reactor support. Remove the reactor support from the partition plate. (ST1T Ø4 × 10L, 4 pcs.) Take off two screws (ST1T Ø4 × 10L) directly attached to the partition plate. 	Reactor Partition Reactor Support board

No.	Part name	Procedure	Remarks
9	Pulse Motor Valve (PMV) coil	 Detachment Perform works of items ① and ② . Release the coil from the concavity by turning it, and remove coil from the PMV. Attachment Put the coil deep into the bottom position. Fix the coil firmly by turning it to the concavity. 	PMV body Positioning extrusion
	Fan guard	 1. Detachment Perform works of items 1 of ① and ②. Remove the front cabinet, and put it down so that fan guard side directs downward. CAUTION Perform works on a corrugated cardboard, cloth, etc. to prevent flaw on the product. 3) Remove the hooking claws by pushing with minus screwdriver along with the arrow mark in the right figure, and remove the fan guard. 2. Attachment Insert claws of the fan guard in the hole of the front cabinet. Push the hooking claws (10 positions) with hands and then fix the claws. All the attaching works have completed. Check that all the hooking claws are fixed to the specified positions.	<image/> <image/>

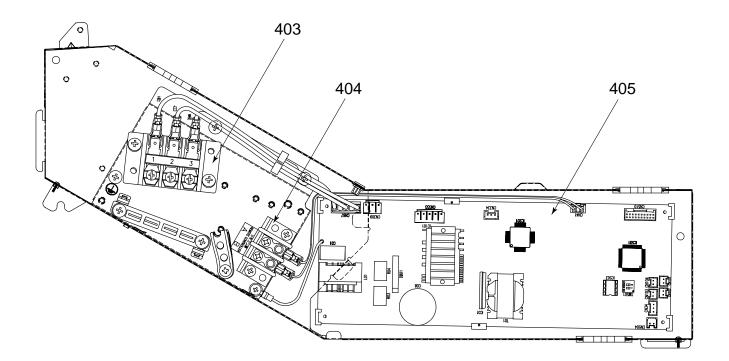
15. EXPLODED VIEWS AND PARTS LIST

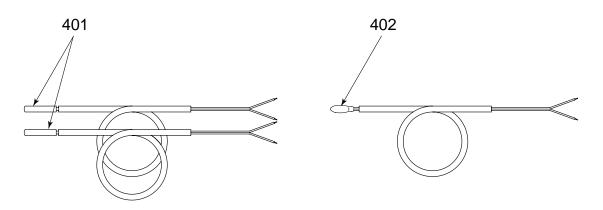
15-1. Indoor Unit

15-1-1. 4-Way Air Discharge Cassette Type RAV-SM564UT-E, RAV-SM804UT-E, RAV-SM1104UT-E, RAV-SM1404UT-E



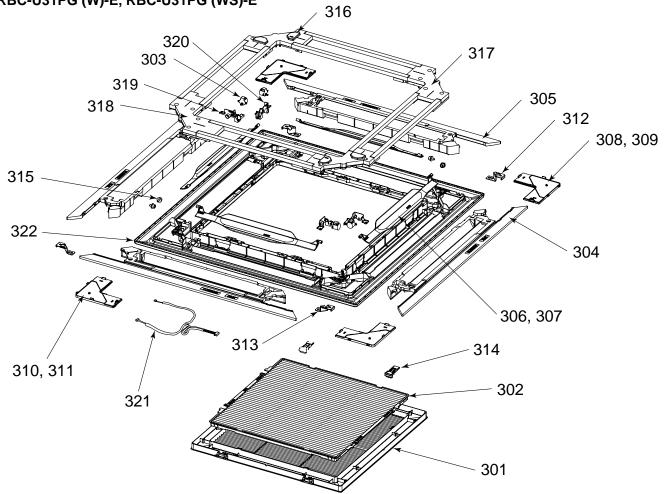
Location	Part No.	Description	Model Name RAV-SM				
No.	Part No.	Description	564UT-E	804UT-E	1104UT-E	1404UT-E	
201	43120247	Fan Ass'y, Turbo, ABS	1	1			
202	43120248	Fan Ass'y, Turbo, ABS			1	1	
203	43166011	Remote Controller, SX-A4EE	1	1	1	1	
204	4314J399	Refrigeration Cycle Ass'y	1				
205	4314J400	Refrigeration Cycle Ass'y		1			
206	4314J401	Refrigeration Cycle Ass'y			1	1	
207	43122110	Bell Mouth, ABS	1	1	1	1	
208	43172202	Pan Ass'y, Drain	1	1	1	1	
209	43166004	Remote Controller, SX-A11JE2	1	1	1	1	
210	43166005	Remote Controller, EX-W2JE2	1	1	1	1	
211	43166006	Remote Controller, WH-H1JE2	1	1	1	1	
212	43170244	Hose, Drain, 25A	1	1	1	1	
213	43179144	LID, Inside	1	1	1	1	
214	43151290	Switch, Float, FS-0218-102	1	1	1	1	
215	43079249	Band, Hose	1	1	1	1	
216	43163057	Clamp, Down, ABS	1	1	1	1	
217	43163058	Clamp, Up, ABS	1	1	1	1	
218	43089147	Clamp, Wire, NYLON6	3	3	3	3	
219	43047688	Nut, Flare, 1/2 IN, RoHs	1				
220	43149352	Nut, Flare, 5/8 IN		1			
221	43149353	Socket, 1/2"	1				
222	43149354	Socket, 5/8"		1			
223	43139137	Rubber, Cushion	3	3			
224	43122099	Plate, Wind		0	4	4	
225	43197197	Screw, Fix Panel	4	4	4	4	
226	43139165	Rubber, Cushion			3	3	
227	43197199	Washer			1	1	
228	4312C038	Motor, Fan			1	1	
229	4312C039	Motor, Fan	1	1	•	•	
230	43119497	Cover Ass'y	1	1	1	1	
231	43139166	Cap, Nut	1	1	1	1	
232	43179147	Gasket, VMQ	1	1	1	1	
232	43119498	Cover, Sensor, ABS	1	1	1	1	
233	43177010	Pump Ass'y, MDP-1401	1	1	1	1	
235	43151299	Switch Ass'y, Float, FS-0218-102	1	1	1	1	
235	43179145	LID Ass'y, Outside	1	1	1	1	
230	43179143	Socket Ass'y, Drain	1	1	1	1	
	43170254	•	3	3	1	1	
238 239		Washer, 25X6, 5X2T	1	3	1	1	
	430497212	Nut Roppet 1/2 IN	-				
240	43147195	Bonnet, 1/2, IN	1	4			
241	43194029	Bonnet		1			
242	43019904	Holder, Sensor, SUS	2	2	4	4	
243	43179135	Band, Hose, 37-40	1	1	1	1	
244	43179146	Cover, Glass	1	1	1	1	
245	43182010	String	1	1	1	1	
246	431S8083	Owner's Manual	1	1	1	1	
247	43179148	Glass	1	1	1	1	



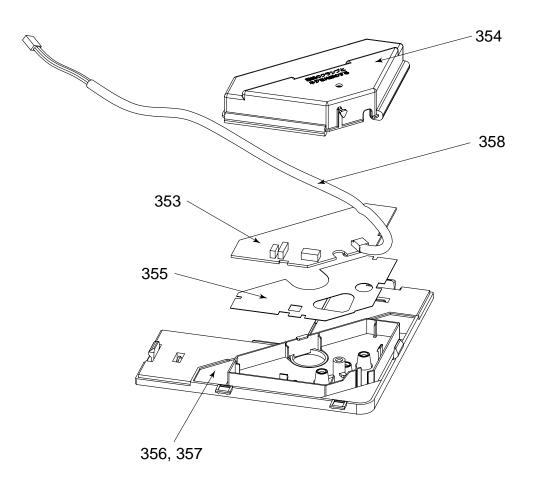


Location	Part No.	Description		Model Name	e RAV-SM	
No.	Fart NO.	Description	564UT-E	804UT-E	1104UT-E	1404UT-E
401	43050425	Sensor Ass'y, TC (F6), Service	2	2	2	2
402	43050426	Sensor, TA, Service	1	1	1	1
403	43160565	Terminal, Block, 3P, AC250V, 20A	1	1	1	1
404	43160568	Terminal, 2P, AC30V/DC42V, 1A	1	1	1	1
405	4316V355	P.C. Board Ass'y, 220–240V, MCC-1570	1	1	1	1

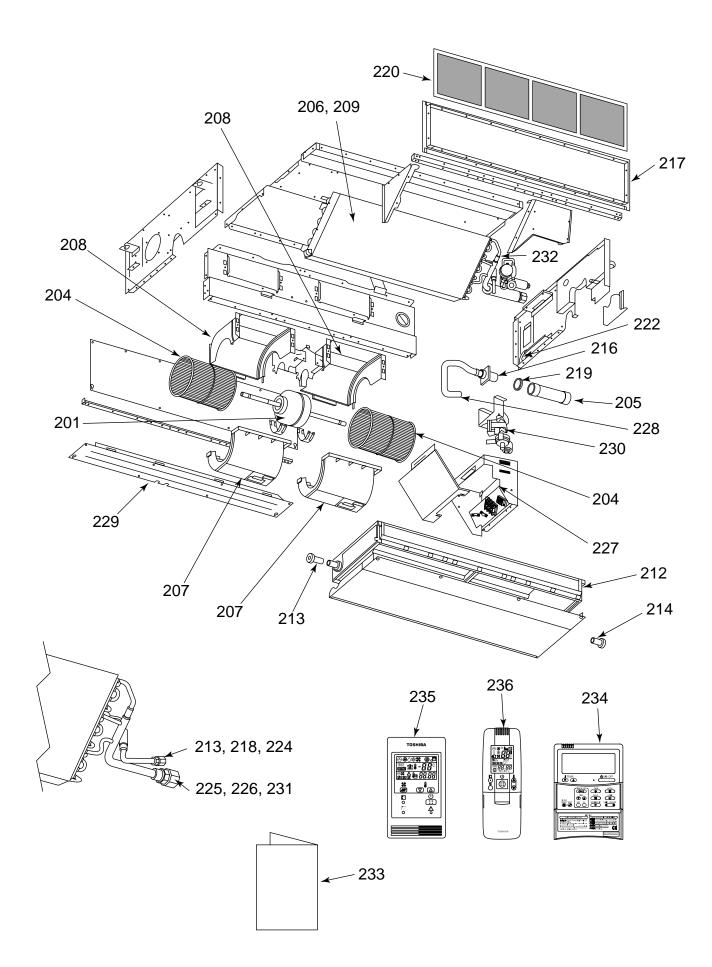
RBC-U31PG (W)-E, RBC-U31PG (WS)-E



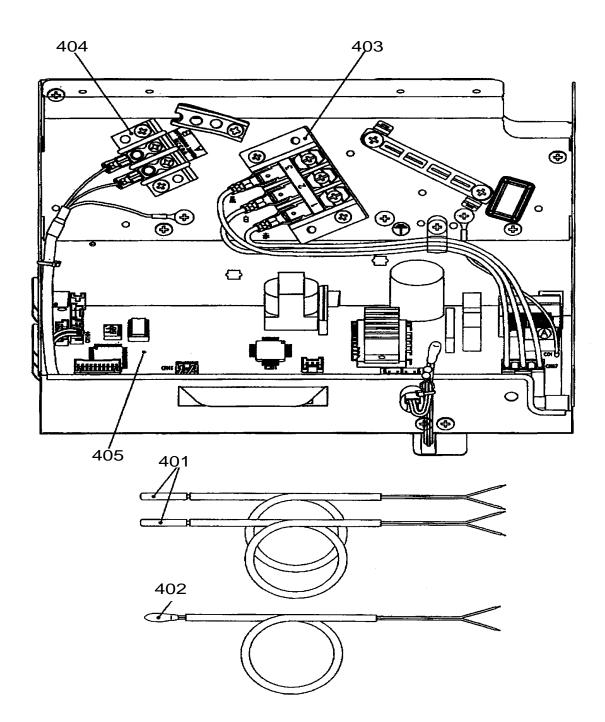
Location	Part No.	Description	Model Nan	ne RBC-
No.	Fart NO.	Description	U31PG (W)-E	U31PG (WS)-E
301	43409207	Grille, Air Inlet	1	1
302	43480017	Air Filter, ABS + PPNET	1	1
303	4302D003	Motor, Louver, MP24Z3N	4	4
304	43407145	Outlet, Air Form, PS-F	2	2
305	43407146	Outlet, Air Form, PS-F	2	2
306	43409212	Louver, ABS	4	
307	43409216	Louver, ABS		4
308	43401037	Cover, Panel Ass'y	3	
309	43401041	Cover, Panel Ass'y		3
310	43401043	Cover, Panel Ass'y	1	
311	43401047	Cover, Panel Ass'y		1
312	43407148	Plate, Fix, Panel	2	2
313	43407149	Plate, Fix, Panel	2	2
314	43407150	Hook, ABS	2	2
315	43407154	Cap, AXIS, POM	4	4
316	43403010	Cover Ass'y, Motor	2	2
317	43403011	Cover Ass'y	1	1
318	43403012	Cover Ass'y	1	1
319	43407155	Fix, Motor, ABS	2	2
320	43407156	Fix, Motor, ABS	2	2
321	43460125	Lead, Motor	1	1
322	43400077	Panel, Front, PS (W)	1	1



Location	Dort No	art No. Description		e RBC-
No.	Part No.	Description	AX31U (W)-E	AX31U (WS)-E
353	43459011	P.C. Board Ass'y, Remote Receiver	1	1
354	43462010	Cover, WRS, ABS	1	1
355	43461006	Sheet, PC	1	1
356	43108018	Cover, Panel, WRS	1	
357	43108019	Cover, Panel, WRS		1
358	43460126	Lead	1	1



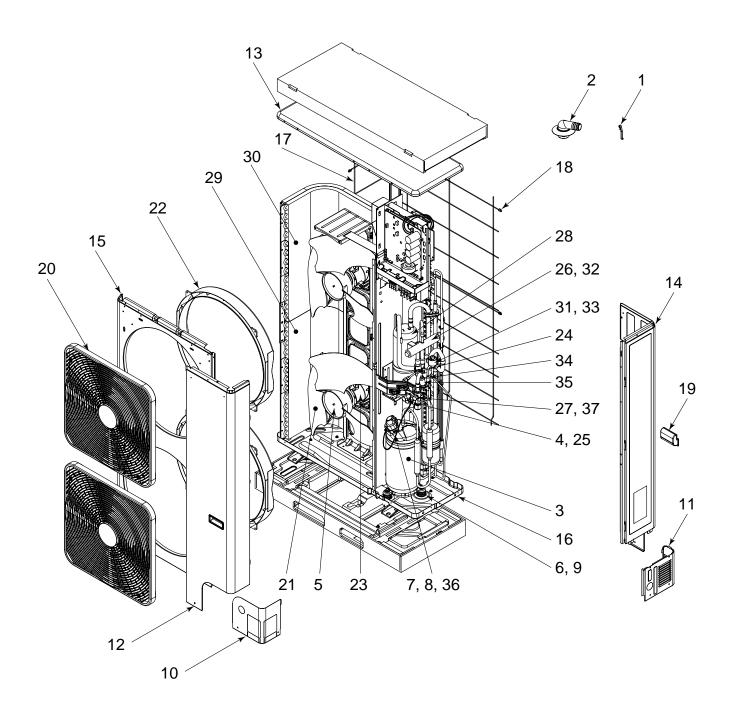
Location	Dout No.	Description	Mod	Model Name RAV-SM				
No.	Part No.	Description	404SDT-E	454SDT-E	564SDT-E			
201	4312C040	Motor, Fan	1	1	1			
203	43120227	Fan, Multi blade	2	2	2			
205	43170244	Hose, Drain	1	1	1			
206	4314J402	Refrigeration Cycle Ass'y	1	1	1			
207	43122084	Case, Fan, Lower	2	2	2			
208	43122085	Case, Fan, Upper	2	2	2			
211	43100319	Plate, Inlet-B	1	1	1			
212	43172183	Pan Ass'y, Drain	1	1	1			
213	43149351	Socket	1	1	1			
214	43179129	Cap, Drain	2	2	2			
216	43170240	Hose, Drain	1	1	1			
217	43100321	Flange	1	1	1			
218	43049697	Bonnet	1	1	1			
219	43179135	Band, Hose	1	1	1			
220	43180327	Air Filter, ABS PP	1	1	1			
221	43079249	Band, Hose	1	1	1			
222	43196109	Bushing	2	2	2			
224	43047685	Nut, Flare, 1/4 IN	1	1	1			
225	43047688	Nut, Flare, 1/2 IN	1	1	1			
226	43149353	Socket, 1/2 IN	1	1	1			
227	43060029	Filter, Noise	1	1	1			
228	43151287	Switch, Float	1	1	1			
229	43100320	Plate, Inlet-A	1	1	1			
230	43177012	Pump, Drain, MDP-1401	1	1	1			
231	43147195	Bonnet, 1/2 IN	1	1	1			
232	43019904	Holder, Sensor SUS	2	2	2			
233	431S8088	Owner's Manual	1	1	1			
234	43166011	Remote controller, SX-A4EE	1	1	1			
235	43166004	Remote controller, SX-A11JE2	1	1	1			
236	43166006	Remote controller, WH-H1JE2	1	1	1			



Location	Part No.	Description	Mod	el Name RAV-	SM
No.	Fart NO.	Description	404SDT-E	454SDT-E	564SDT-E
401	43050425	Sensor Ass'y, Service TC (F6)	2	2	2
402	43050426	Sensor, Service	1	1	1
403	43160565	Terminal, Block, 3P, AC250V, 20A	1	1	1
404	43160568	Terminal, 2P, AC30V/DC42V, 1A	1	1	1
405	4316V368	P.C. Board Ass'y, 220–240V, MCC-1570	1	1	1

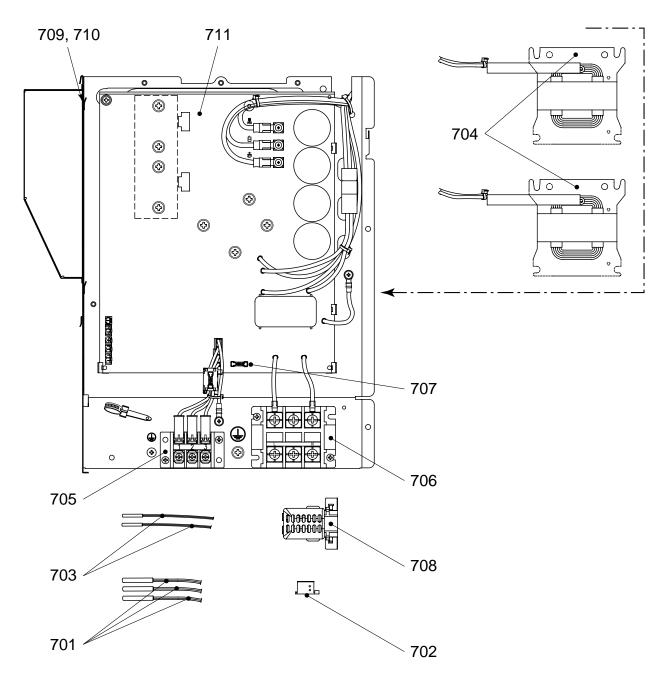
15-2. Outdoor Unit

RAV-SP1104AT-E, RAV-SP1104ATZ-E, RAV-SP1104ATZG-E RAV-SP1404AT-E, RAV-SP1404ATZ-E, RAV-SP1404ATZG-E

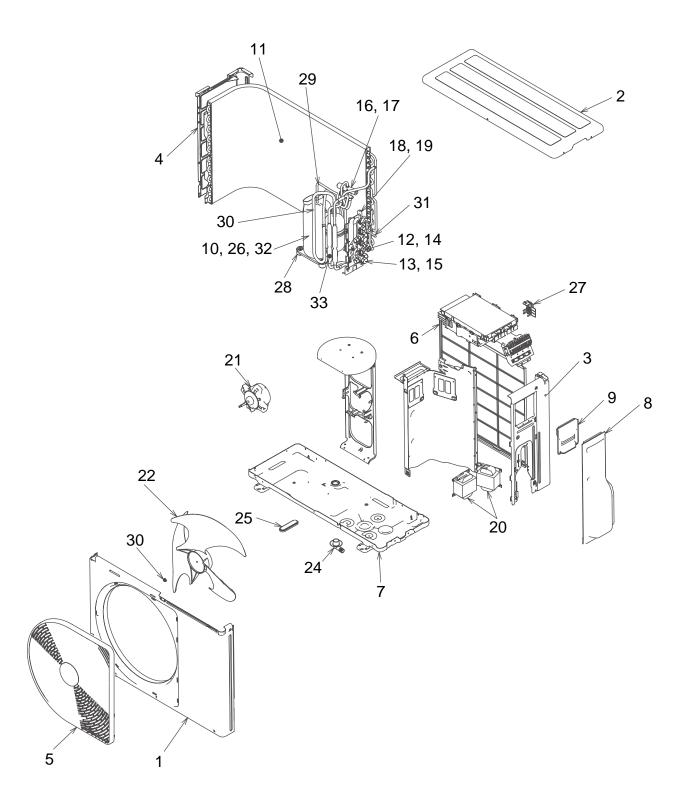


Location	Denthi	Description	Model Name RAV-SP						
No.	Part No.		1104AT-E	1404AT-E	1104ATZ-E	1404ATZ-E	1104ATZG-E	1404ATZG-E	
1	43019904	Holder, Sensor, SUS	3	3	3	3	3	3	
2	43032441	Nipple, Drain	1	1	1	1	1	1	
3	43041794	Compressor, DA422A3F-25M	1	1	1	1	1	1	
4	43047246	Bonnet, 3/8 IN	1	1	1	1	1	1	
5	43047669	Nut, Flange	2	2					
5	43197164	Nut, Flange, SUS304-WSB			2	2	2	2	
6	43049739	Cushion, Rubber	3	3	3	3	3	3	
7	43050407	Thermostat, Bimetal	1	1	1	1	1	1	
8	43063317	Holder, Thermostat	1	1	1	1	1	1	
9	43097212	Nut	3	3					
9	43197174	Nut, Comp., SWCH10R			3	3	3	3	
10	43100437	Panel, Front, Piping	1	1	1	1	1	1	
11	43100438	Panel, Back, Piping	1	1	1	1	1	1	
12	43100439	Panel, Front	1	1	1	1	1	1	
13	43100440	Plate, Roof	1	1	1	1	1	1	
14	43100441	Panel, Side	1	1	1	1	1	1	
15	43100442	Panel, Air Outlet	1	1	1	1	1	1	
16	43100443	Base Ass'y	1	1	1	1	1	1	
17	43107274	Guard, Fin, Side	1	1	1	1	1	1	
18	43107275	Guard, Fin, Back	1	1	1	1	1	1	
19	43107276	Hanger, PP	3	3	3	3	3	3	
20	43109422	Guard, Fan, PP	2	2	2	2	2	2	
21	43120244	Fan, Propeller, PB521, SAN-GF20	2	2	2	2	2	2	
22	43122113	Bell, Mouth, PP	2	2	2	2	2	2	
23	4312C037	Motor, Fan, ICF-280-A100-1	2	2	2	2	2	2	
24	43146676	Joint, Check	1	1	1	1	1	1	
25	43146686	Valve, Packed, 9.52	1	1	1	1	1	1	
26	43146687	Valve, 4-Way, STF-0401G	1	1	1	1	1	1	
27	43146724	Valve, Ball, SBV-JA5GTC-1, Rohs	1	1	1	1	1	1	
28	43148170	Accumulator Ass'y, 2.5L	1	1	1	1			
28	43148188	Accumulator, 2.5L					1	1	
29	4314G266	Condenser Ass'y, Down	1	1					
29	4314G267	Condenser Ass'y, Down			1	1			
29	4314G268	Condenser Ass'y, Down					1	1	
30	4314G269	Condenser Ass'y, Up	1	1					
30	4314G270	Condenser Ass'y, Up			1	1			
30	4314G271	Condenser Ass'y, Up					1	1	
31	4314N023	Valve, Pulse, Modulaing, UKV-25D100	1	1	1	1	1	1	
32	4314N024	Coil, Valve, 4-Way, VHV-01AP552B1	1	1	1	1	1	1	
33	4314N025	Coil, PMV, UKV-A038	1	1	1	1	1	1	
34	4314Q031	Strainer, DIA 9.52, C1220T-H	1	1	1	1	1	1	
35	4314Q032	Strainer	1	1	1	1	1	1	
36	43160591	Lead Ass'y, Compressor	1	1	1	1	1	1	
37	43194029	Bonnet	1	1	1	1	1	1	

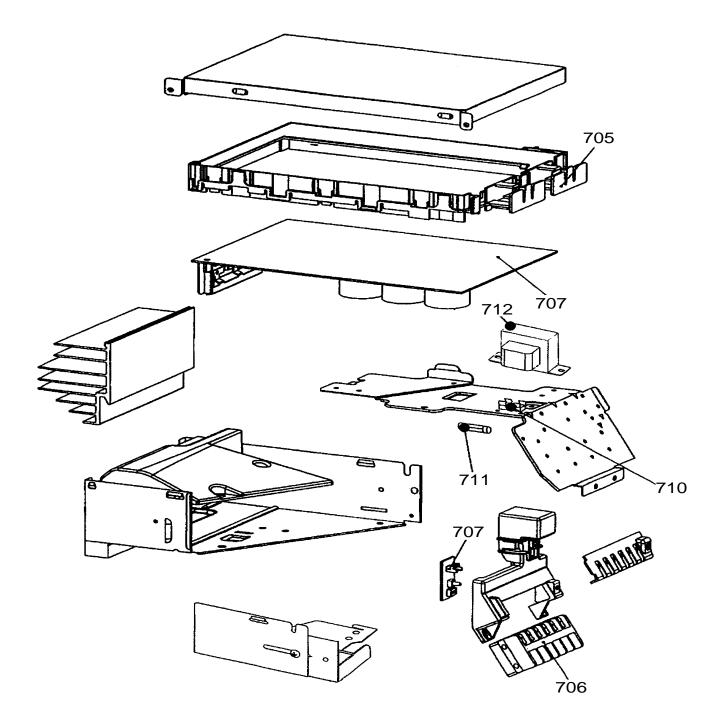
RAV-SP1104AT-E, RAV-SP1104ATZ-E, RAV-SP1104ATZG-E RAV-SP1404AT-E, RAV-SP1404ATZ-E, RAV-SP1404ATZG-E



Location	Desthic	Description			Model I	Name RAV	-SP	
No.	Part No.	Description	1104AT-E	1404AT-E	1104ATZ-E	1404ATZ-E	1104ATZG-E	1404ATZG-E
701	43050425	Sensor Ass'y, TC (F6), Service	3	3	3	3	3	3
702	43063325	Holder, Sensor, 6 - 6.35, 8	1	1	1	1	1	1
703	43150319	Sensor Ass'y, TD (F4), Service	2	2	2	2	2	2
704	43158190	Reactor, CH-62-ZT	2	2	2	2	2	2
705	43160565	Terminal Block, 3P, AC250V, 20A	1	1	1	1	1	1
706	43160581	Terminal, 3P, 60A	1	1	1	1	1	1
707	43160589	Fuse, AC250V, 10A	1	1	1	1	1	1
708	43163055	Holder, Sensor	1	1	1	1	1	1
709	43163059	Spacer (Bush), P.C. Board	1	1	1	1	1	1
710	43163060	Spacer (Collar), P.C. Board	1	1	1	1	1	1
711	4316V357	P.C. Board Ass'y, MCC-1571	1	1	1	1	1	1



Location					Model Nam	e RAV-SF	כ	
No.	Part No.	Description	404AT-E	404ATZ-E	404ATZG-E	454AT-E	454ATZ-E	454ATZG-E
1	43105042	Cabinet, Front, RoHs	1	1	1	1	1	1
2	43105041	Cabinet, Upper	1	1	1	1	1	1
3	43005698	Cabinet, Side, Right, RoHs	1	1	1	1	1	1
4	43005672	Cabinet, Side, Left	1	1	1	1	1	1
5	4301V035	Guard, Fan	1	1	1	1	1	1
6	4301V053	Guard, Fin	1	1	1	1	1	1
7	43100346	Base Ass'y, RoHs	1	1	1	1	1	1
8	43119471	Caver, Valve, Packed	1	1	1	1	1	1
9	43162055	Caver, Wiring Ass'y, RoHs	1	1	1	1	1	1
10	43041786	Compressor, DA150A1F-20, RoHs	1	1	1	1	1	1
11	4314G246	Condenser Ass'y, RoHs	1			1		
11	4314G247	Condenser Ass'y, RoHs			1			1
11	4314G248	Condenser Ass'y, RoHs		1			1	
12	37546845	Valve, Packed, 6.35	1	1	1	1	1	1
13	43146680	Valve, Packed, 12.7	1	1	1	1	1	1
14	43147196	Bonnet, 1/4 IN	1	1	1	1	1	1
15	43147195	Bonnet, 1/2 IN	1	1	1	1	1	1
16	43046444	Valve, 4-WAY, STF-0108Z	1	1	1	1	1	1
17	43146722	Coil, Solenoid, STF-01A J502E1	1	1	1	1	1	1
18	43146695	Valve, Pulse, Modulating	1	1	1	1	1	1
19	37546849	Coil, PMV, CAM-MD12TF-6	1	1	1	1	1	1
20	43055521	Reactor	2	2	2	2	2	2
21	4302C068	Motor, Fan, ICF-140-43-4R	1	1	1	1	1	1
22	43020329	Fan, Propeller, PJ421	1	1	1	1	1	1
23	43047669	Nut, Flange	1			1		
23	43197164	Nut, Flange, SUS304-WSB		1	1		1	1
24	43032441	Nipple, Drain	1	1	1	1	1	1
25	43089160	Cap, Waterproof	2	2	2	2	2	2
26	43050407	Thermostat, Bimetal	1	1	1	1	1	1
27	43063339	Holder, Sensor (TO)	1	1	1	1		
28	43049749	Rubber, Cushion	3	3	3	3	3	3
29	43063321	Holder, Sensor, 4-8, 9.52	1	1	1	1	1	1
30	43063322	Holder, Sensor, 6-11.4, 12.7	1	1	1	1	1	1
31	43063325	Holder, Sensor, 6-6.35, 8	1	1	1	1	1	1
32	43063317	Holder, Thermostat	1	1	1	1	1	1
33	4314Q064	Muffler, 1/2	1	1	1	1	1	1



Location	DestNa	Description	Model Name RAV-SP					
No.	Part No.		404AT-E	404ARZ-E	404ATZG-E	454AT-E	454ATZ-E	454ATZG-E
701	43050422	Sensor, TE	1	1	1	1	1	1
702	43050423	Sensor, TS	1	1	1	1	1	1
703	43050427	Sensor, TO	1	1	1	1	1	1
704	43050430	Sensor, TD	1	1	1	1	1	1
705	43062228	Base, P.C.board	1	1	1	1	1	1
706	43160566	Terminal, Block 6P, 20A	1	1	1	1	1	1
707	4316V293	P.C. Board Ass'y, SW, MCC-1530	1	1	1	1	1	1
708	4316V367	P.C.board Ass'y, MCC-5009	1	1	1	1	1	1
710	43160571	Fuse, Holder, 250V, 15A	1	1	1	1	1	1
711	43160590	Fuse, AC250V, 6.3A	1	1	1	1	1	1
712	43158192	Reactor	1	1	1	1	1	1

WARNINGS ON REFRIGERANT LEAKAGE

Check of Concentration Limit

The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its concentration will not exceed a set limit.

The refrigerant R410A which is used in the air conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise excessively. Suffocation from leakage of R410A is almost non-existent. With the recent increase in the number of high concentration buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power etc.

Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared with conventional individual air conditioners. If a single unit of the multi conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its concentration does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).

In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.

The concentration is as given below.

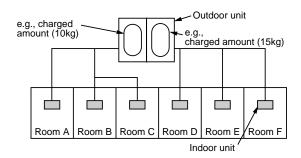
Total amount of refrigerant (kg)

 $\label{eq:minimum} \begin{array}{l} \mbox{Min. volume of the indoor unit installed room (m^3)} \\ \le \mbox{Concentration limit (kg/m^3)} \end{array}$

The concentration limit of R410A which is used in multi air conditioners is 0.3kg/m³.

NOTE 1 :

If there are 2 or more refrigerating systems in a single refrigerating device, the amounts of refrigerant should be as charged in each independent device.



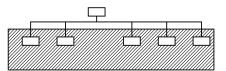
For the amount of charge in this example:

The possible amount of leaked refrigerant gas in rooms A, B and C is 10kg. The possible amount of leaked refrigerant gas in rooms D, E and F is 15kg.

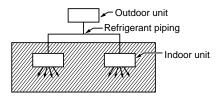
Important

NOTE 2 :

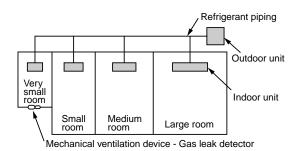
The standards for minimum room volume are as follows. (1) No partition (shaded portion)



(2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).

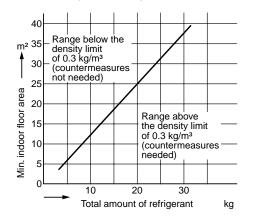


(3) If an indoor unit is installed in each partitioned room and the refrigerant piping is interconnected, the smallest room of course becomes the object. But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



NOTE 3 :

The minimum indoor floor area compared with the amount of refrigerant is roughly as follows: (When the ceiling is 2.7m high)



TOSHIBA CARRIER CORPORATION

23-17, TAKANAWA 3 CHOME, MINATOKU, TOKYO, 108-0074, JAPAN Copyright © 1999 to 2007 TOSHIBA CARRIER CORPORATION, ALL Rights Reserved.