TOSHIBA

Carrier

SERVICE MANUAL

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AIR-CONDITIONER
SPLIT TYPE

INDOOR UNIT

<SUPER DIGITAL INVERTER>

4-Way Air Discharge Cassette Type

RAV-SP180UT-UL, RAV-SP240UT-UL, RAV-SP300UT-UL, RAV-SP360UT-UL, RAV-SP420UT-UL

Under Ceiling Type

RAV-SP180CT-UL, RAV-SP240CT-UL, RAV-SP300CT-UL, RAV-SP360CT-UL, RAV-SP420CT-UL

High Wall Type

RAV-SP180KRT-UL, RAV-SP240KRT-UL

PRINTED IN JAPAN, Nov., 2009 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

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
⚠ DANGER	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 injury of the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.
⚠ CAUTION	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
	Indicates prohibited items (Forbidden items to do) The sentences near an illustrated mark describe the concrete prohibited contents.
	Indicates mandatory items (Compulsory items to do) The sentences near an illustrated mark describe the concrete mandatory contents.
	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.

⚠ DANGER	
 Turn off breaker.	**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. 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.
 Execute discharge between terminals.	**When removing the front panel or cabinet, execute short-circuit and discharge between high-voltage capacitor 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.

⚠ WARNING	
 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 other refrigerant (R22, etc.), never use 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. In this time, never charge the refrigerant over the specified amount. **When recharging the refrigerant in the refrigerating cycle, do not mix the refrigerant or air other than R410A into the specified refrigerant.** If air or others is mixed with the refrigerant, abnormal high pressure generates in the refrigerating cycle resulted in cause of injury due to breakage. **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.

⚠ WARNING

 Insulator check	**After the work has finished, be sure to use an insulation tester set (500V Megger) to check the resistance is 2MΩ 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.
 Compulsion	**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. **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.
 Check after repair	**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.
 Check after reinstallation	**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 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.

⚠ CAUTION

 Put on gloves	**Be sure to put on the gloves (*) and a long sleeved shirt: otherwise 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

1) 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.
3) 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 0.0001 lbs / 32’ 10” (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 exclusive for R410A (The following tools for R410A are required.)

Tools whose specifications are changed for R410A and their interchangeability

No.	Used tool	Usage	R410A air conditioner installation		Conventional air conditioner installation
			Existence of new equipment for R410A	Whether conventional equipment can be used	Whether 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	Tightening of flare nut	Yes	No	No
④	Gauge manifold	Evacuating, refrigerant charge, run check, etc.	Yes	No	No
⑤	Charge hose				
⑥	Vacuum pump adapter	Vacuum evacuating	Yes	No	Yes
⑦	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

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

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) Insulation resistance tester (Megger)
4) Electroscope

1. SPECIFICATIONS

1-1. 4-Way Air Discharge Cassette Type

RAV-SP180UT-UL, RAV-SP240UT-UL, RAV-SP300UT-UL, RAV-SP360UT-UL, RAV-SP420UT-UL

System	Size			**018**	**024**	**030**	**036**	**042**
	Outdoor Model		**RAV-**	**SP180AT2-UL**	**SP240AT2-UL**	**SP300AT2-UL**	**SP360AT2-UL**	**SP420AT2-UL**
	Indoor Model		**RAV-**	**SP180UT-UL**	**SP240UT-UL**	**SP300UT-UL**	**SP360UT-UL**	**SP420UT-UL**
Performance	Cooling Rated Capacity		(Btu/h)	19000	25000	32000	36400	40500
	SEER			20.50	20.70	21.00	21.00	19.00
	EER			10.7	11.0	14.0	13.0	11.5
	Heating Rated Capacity		(Btu/h)	18800	26000	33400	36000	46000
	HSPF			11.50	9.50	11.00	11.90	10.30
Operating range	Cooling	Outdoor Min - Max DB ∗1	(°F)	23 to 109.4				
		Indoor Min - Max DB	(°F)	69.8 to 89.6				
		Indoor Min - Max WB	(°F)	59 to 75.2				
	Heating	Outdoor WB Min - Max	(°F)	–4 to 59				
		Indoor DB Min -Max	(°F)	59 to 86				
Piping	Standard Piping Length		(ft.)	25				
	Min. Piping Length		(ft.)	16’ 5”	16’ 5”	9’ 8”	9’ 8”	9’ 8”
	Max. Piping Length		(ft.)	164’ 1”	164’ 1”	246’ 1”	246’ 1”	246’ 1”
	Lift	(Outdoor below Indoor)	(ft.)	98’5”				
	Lift	(Outdoor above Indoor)	(ft.)	98’5”				
	Gas Pipe	(Size / connection type)		1/2”	5/8”	5/8”	5/8”	5/8”
	Liquid Pipe	(Size / connection type)		1/4”	3/8”	3/8”	3/8”	3/8”
	Additional refrigerant charge under long piping connection			0.22 oz/ft (65’7”ft to 164’1”ft)	0.43 oz/ft (98’5”ft to 164’1”ft)	0.43 oz/ft (98’ 5” ft to 246’ 1” ft)		
Electrical	Voltage			208 V / 230 V-1-60 Hz				
	Cooling Power Consumption		(W)	1776	2273	2286	2800	3522
	Heating Power Consumption		(W)	1430	2270	2240	2770	3720
	Cooling Running Current		(A)	7.91	10.25	10.30	12.47	15.71
	Heating Running Current		(A)	6.36	10.20	10.10	12.32	16.56
	Maximum Running Current Amps		(A)	17	24	24	24	24
	Breaker		(A)	20	25	25	25	25
	Fuse Rating ∗2			30	40	40	40	40
Indoor	Dimensions	Width	(in.)	33.1	33.1	33.1	33.1	33.1
		Height	(in.)	10.1	10.1	12.6	12.6	12.6
		Length	(in.)	33.1	33.1	33.1	33.1	33.1
	Weight -Gross / Net		(lbs.)	46 / 55	46 / 55	57 / 67	57 / 67	57 / 67
	Sound Pressure at Different Speeds		(dBa) (H/M/L)	37 / 35 / 34	39 / 35 / 34	46 / 40 / 36	47 / 41 / 38	47 / 41 / 38
	Air flow DRY		(CFM) (H/M/L)	600/500/450	700/550/460	1150/820/670	1200/820/700	1200/820/700
Grill	Model name		**RBC-**	**U31PG(W)-UL**	**U31PG(W)-UL**	**U31PG(W)-UL**	**U31PG(W)-UL**	**U31PG(W)-UL**
	Dimensions	Width	(in.)	37.4				
		Height	(in.)	1.2				
		Length	(in.)	37.4				
	Weight -Gross / Net		(lbs.)	10 / 15.5				
	Appearance (Munsell symbol)			Moon white (2.5GY9.0 / 0.5)				

∗1 When installed a duct or wind shield so that it is not affected by the wind.
The minimum outside temperature will be 5°F

∗2 UL value

1-2. Under Ceiling Type

RAV-SP180CT-UL, RAV-SP240CT-UL, RAV-SP300CT-UL, RAV-SP360CT-UL, RAV-SP420CT-UL

System	Size		**018**	**024**	**030**	**036**	**042**
	Outdoor Model	**RAV-**	**SP180AT2-UL**	**SP240AT2-UL**	**SP300AT2-UL**	**SP360AT2-UL**	**SP420AT2-UL**
	Indoor Model	**RAV-**	**SP180CT-UL**	**SP240CT-UL**	**SP300CT-UL**	**SP360CT-UL**	**SP420CT-UL**
Performance	Cooling Rated Capacity	(Btu/h)	17000	23600	30000	36000	41000
	SEER		17.00	19.50	20.60	20.40	18.80
	EER		8.6	9.0	13.0	12.0	9.7
	Heating Rated Capacity	(Btu/h)	19000	28800	29800	38000	44500
	HSPF		10.80	10.30	8.50	11.00	11.00
Operating range	Cooling	Outdoor Min - Max DB ∗1 (°F)	23 to 109.4				
		Indoor Min - Max DB (°F)	69.8 to 89.6				
		Indoor Min - Max WB (°F)	59 to 75.2				
	Heating	Outdoor WB Min - Max (°F)	–4 to 59				
		Indoor DB Min -Max (°F)	59 to 86				
Piping	Standard Piping Length	(ft.)	25				
	Min. Piping Length	(ft.)	16’ 5”	16’ 5”	9’ 8”	9’ 8”	9’ 8”
	Max. Piping Length	(ft.)	164’ 1”	164’ 1”	246’ 1”	246’ 1”	246’ 1”
	Lift (Outdoor below Indoor)	(ft.)	98’ 5”				
	Lift (Outdoor above Indoor)	(ft.)	98’ 5”				
	Gas Pipe (Size / connection type)		1/2”	5/8”	5/8”	5/8”	5/8”
	Liquid Pipe (Size / connection type)		1/4”	3/8”	3/8”	3/8”	3/8”
	Additional refrigerant charge under long piping connection		0.22 oz / ft (65’7”ft to 164’1”ft)	0.43 oz / ft (98’5”ft to 164’1”ft)	0.43 oz / ft (98’ 5” ft to 246’ 1” ft)		
Electrical	Voltage		208 V / 230 V-1-60 Hz				
	Cooling Power Consumption	(W)	1977	2622	2308	3000	4227
	Heating Power Consumption	(W)	1790	2840	2390	3210	3940
	Cooling Running Current	(A)	8.86	11.88	10.50	13.66	18.94
	Heating Running Current	(A)	8.00	12.74	10.71	14.34	17.58
	Maximum Running Current Amps	(A)	17	24	24	24	24
	Breaker	(A)	20	25	25	25	25
	Fuse Rating ∗2		30	40	40	40	40
Indoor	Dimensions	Width (in.)	35.8	46.5	62.8	62.8	62.8
		Height (in.)	8.3	8.3	8.3	8.3	8.3
		Length (in.)	26.8	26.8	26.8	26.8	26.8
	Weight -Gross / Net	(lbs.)	46/60	55/75	73/95	73/95	73/95
	Appearance (Munsell symbol)		Shine white (10Y9.3 / 0.4)				
	Sound Pressure at Different Speeds	(dBa) (H/M/L)	40 / 37 / 34	42 / 40 / 37	45 / 42 / 38	47 / 44 / 40	47 / 44 / 40
	Air flow DRY	(CFM) (H/M/L)	410/360/320	590/530/470	860/750/660	950/820/730	950/820/730

∗1 When installed a duct or wind shield so that it is not affected by the wind.
The minimum outside temperature will be 5°F

∗2 UL value

1-3. High Wall Type

RAV-SP180KRT-UL, RAV-SP240KRT-UL

System	Size			**018**	**024**
	Outdoor Model			**RAV-SP180AT2-UL**	**RAV-SP240AT2-UL**
	Indoor Model			**RAV-SP180KRT-UL**	**RAV-SP240KRT-UL**
Performance	Cooling Rated Capacity		(Btu/h)	18000	25000
	SEER			19.5	16.7
	EER			10.0	9.1
	Heating Rated Capacity		(Btu/h)	19000	26400
	HSPF			11.5	9.8
Operating range	Cooling	Outdoor Min - Max DB ∗1	(°F)	23 to 109.4	
		Indoor Min. - Max. DB	(°F)	69.8 to 89.6	
		Indoor Min. - Max. WB	(°F)	59 to 75.2	
	Heating	Outdoor WB Min. - Max.	(°F)	–4 to 59	
		Indoor DB Min. - Max.	(°F)	59 to 86	
Piping	Standard Piping Length		(ft.)	25	
	Min. Piping Length		(ft.)	16’ 5”	
	Max. Piping Length		(ft.)	164’ 1”	
	Lift	(Outdoor below Indoor)	(ft.)	98’ 5”	
	Lift	(Outdoor above Indoor)	(ft.)	98’ 5”	
	Gas Pipe	(Size / connection type)		1/2”	5/8”
	Liquid Pipe	(Size / connection type)		1/4”	3/8”
	Additional refrigerant charge under long piping connection			0.22 oz / ft (65’ 7” ft to 164’ 1” ft)	0.43 oz / ft (98’ 5” ft to 164’ 1” ft)
Electrical	Voltage			208 V / 230 V-1-60 Hz	
	Cooling Power Consumption		(W)	1800	2747
	Heating Power Consumption		(W)	1710	2780
	Cooling Running Current		(A)	7.96	12.20
	Heating Running Current		(A)	7.53	12.52
	Maximum Running Current Amps		(A)	17	24
	Breaker		(A)	20	25
	Fuse Rating ∗2			30	40
Indoor	Dimensions	Width	(in.)	9	
		Height	(in.)	12.6	
		Length	(in.)	41.3	
	Weight -Gross / Net		(lbs.)	31 / 36	
	Appearance (Munsell symbol)			Moon White (2.5GY9.0 / 0.5)	
	Sound Pressure at Different Speeds		(dBa)	43 / 41 / 38	46 / 41 / 38
	Air flow DRY		(CFM) (H/M/L)	490 / 430 / 400	560 / 460 / 410

∗1 When installed a duct or wind shield so that it is not affected by the wind.
The minimum outside temperature will be 5°F

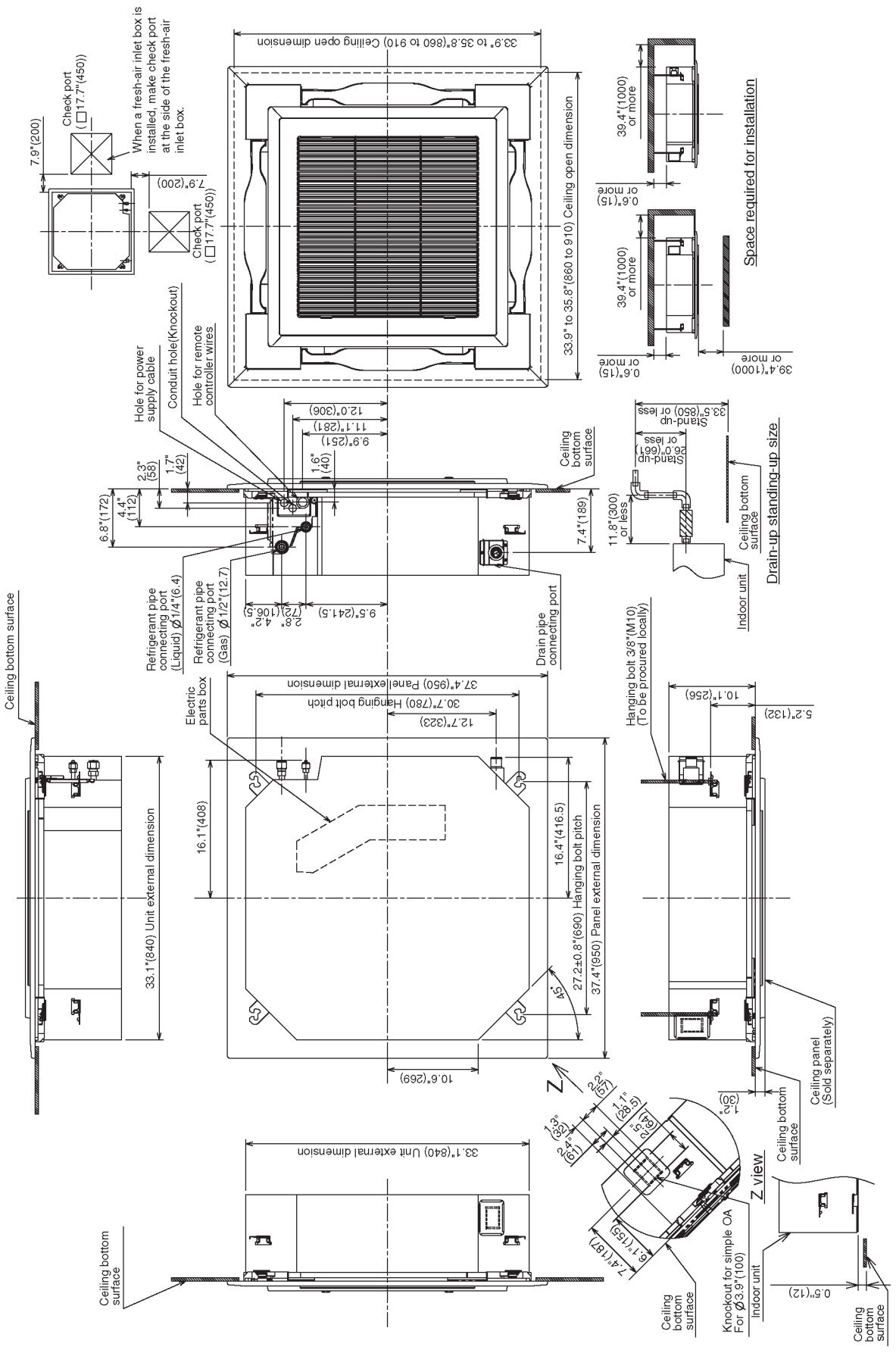
∗2 UL value

2. CONSTRUCTION VIEWS (EXTERNAL VIEWS)

2-1. 4-Way Air Discharge Cassette Type

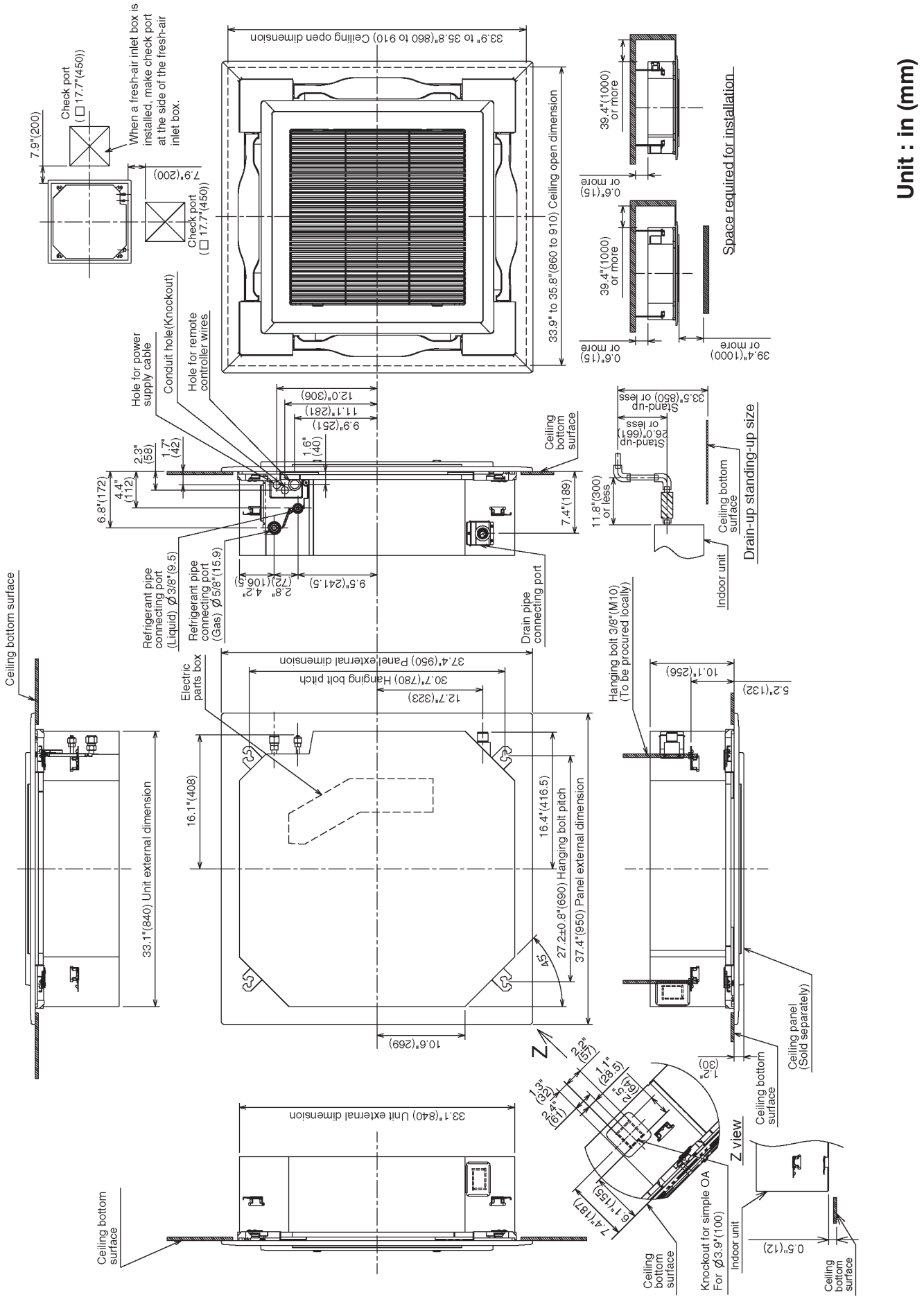
RAV-SP180UT-UL

Unit : in (mm)

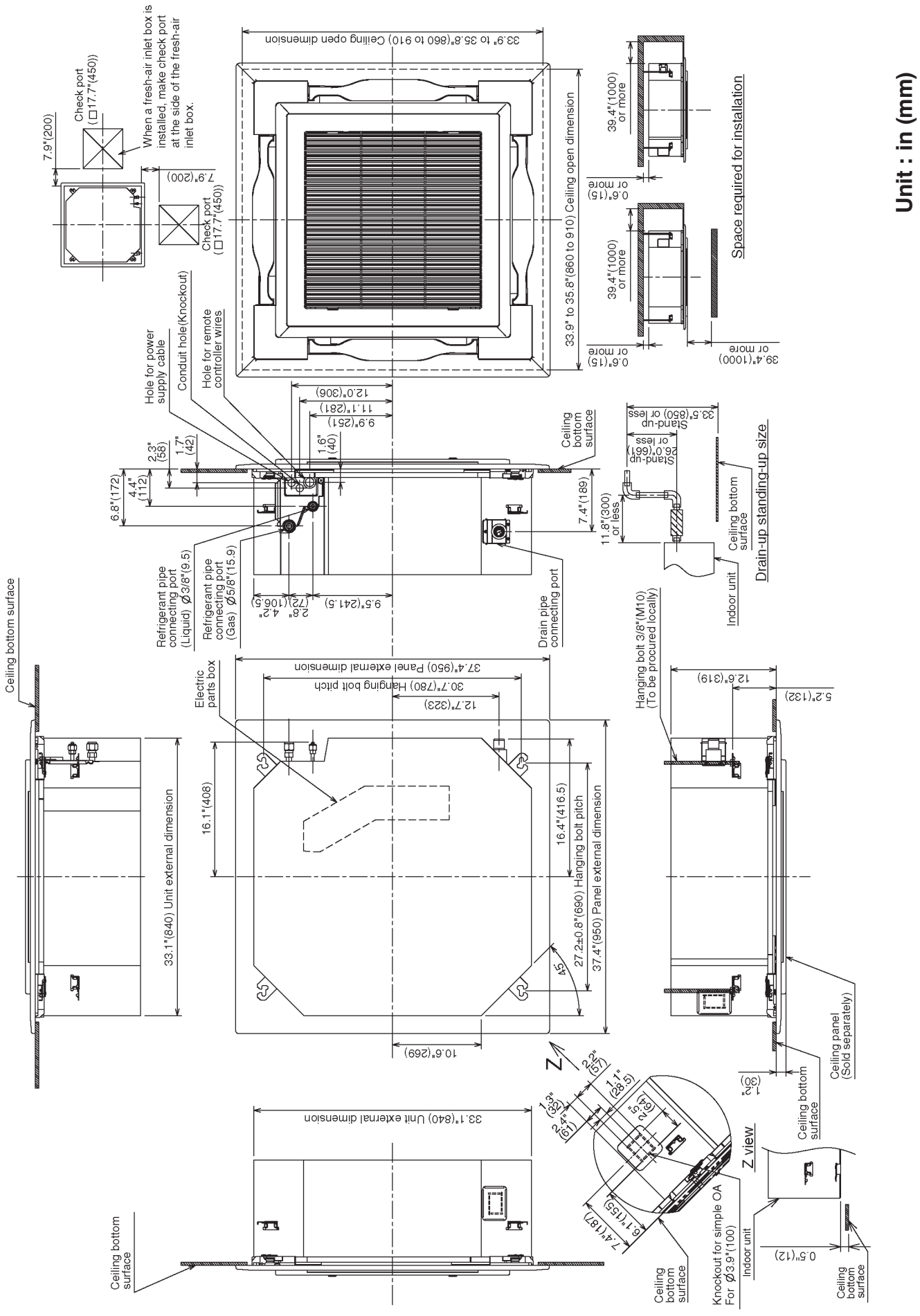


RAV-SP240UT-UL

Unit : in (mm)

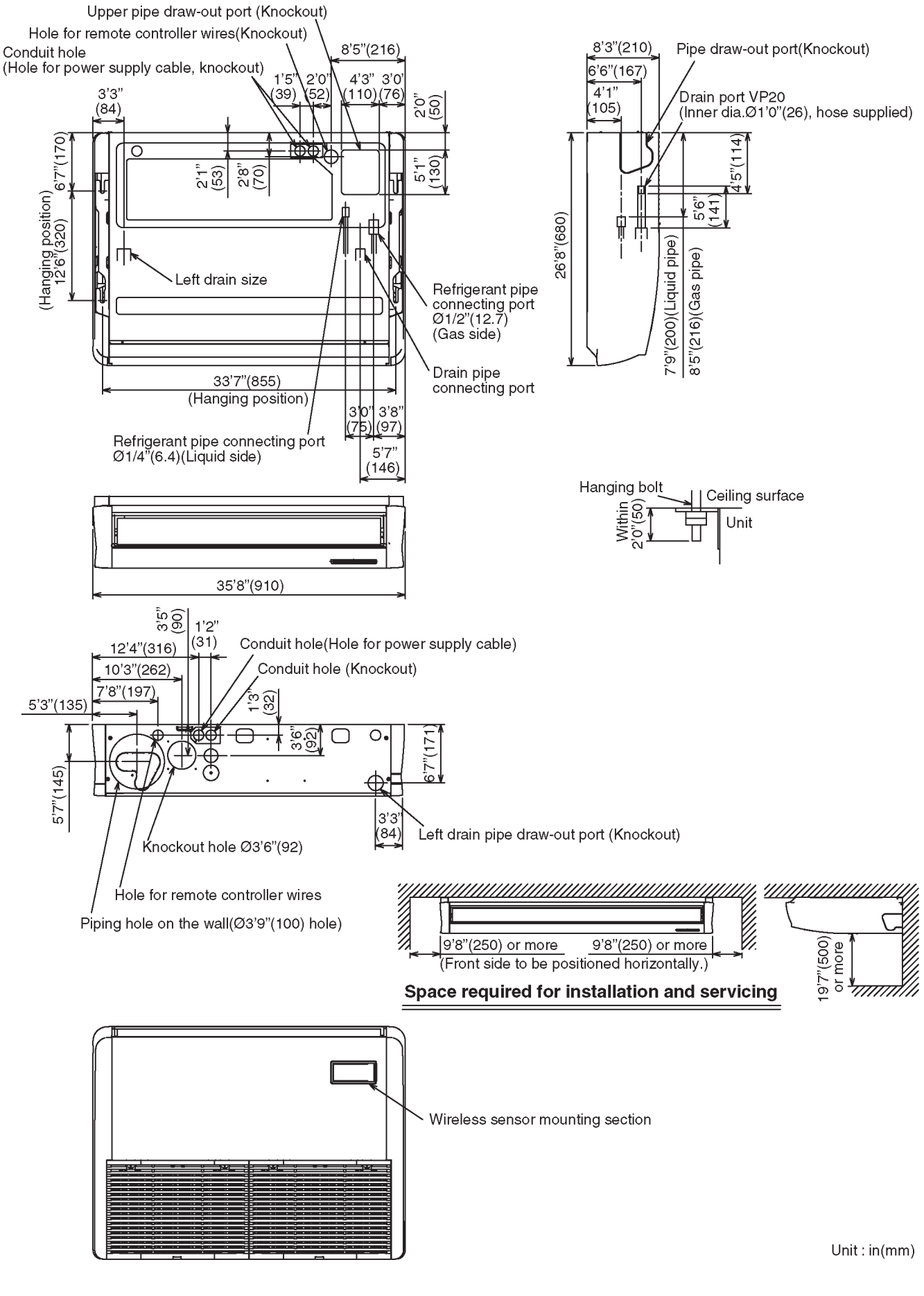


RAV-SP300UT-UL, RAV-SP360UT-UL, RAV-SP420UT-UL



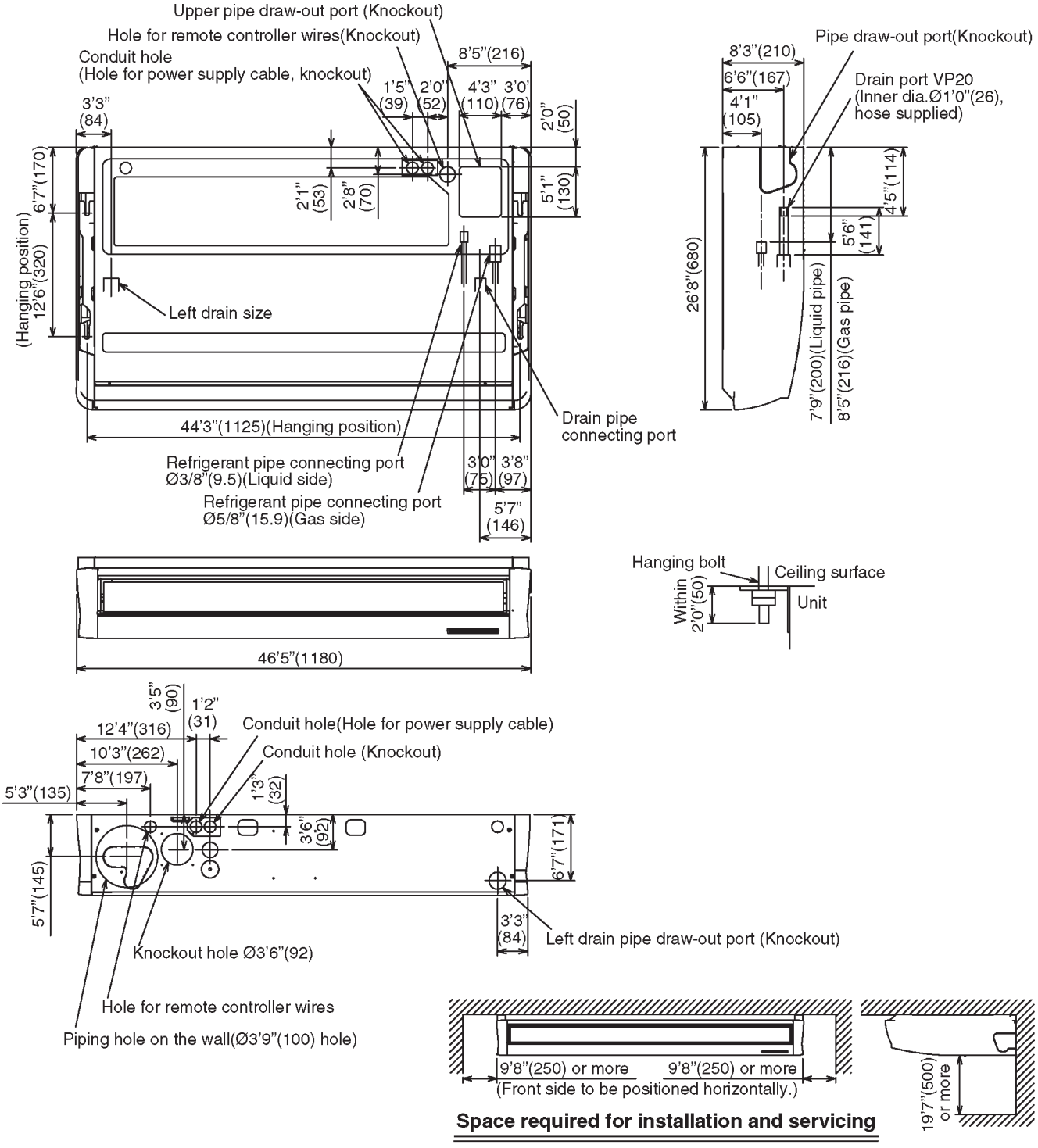
2-2. Under Ceiling Type

RAV-SP180CT-UL

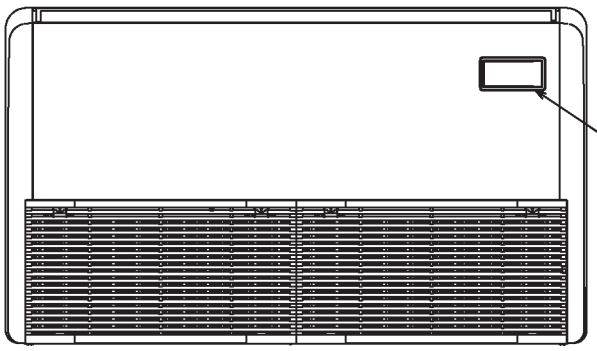


Unit : in(mm)

RAV-SP240CT-UL

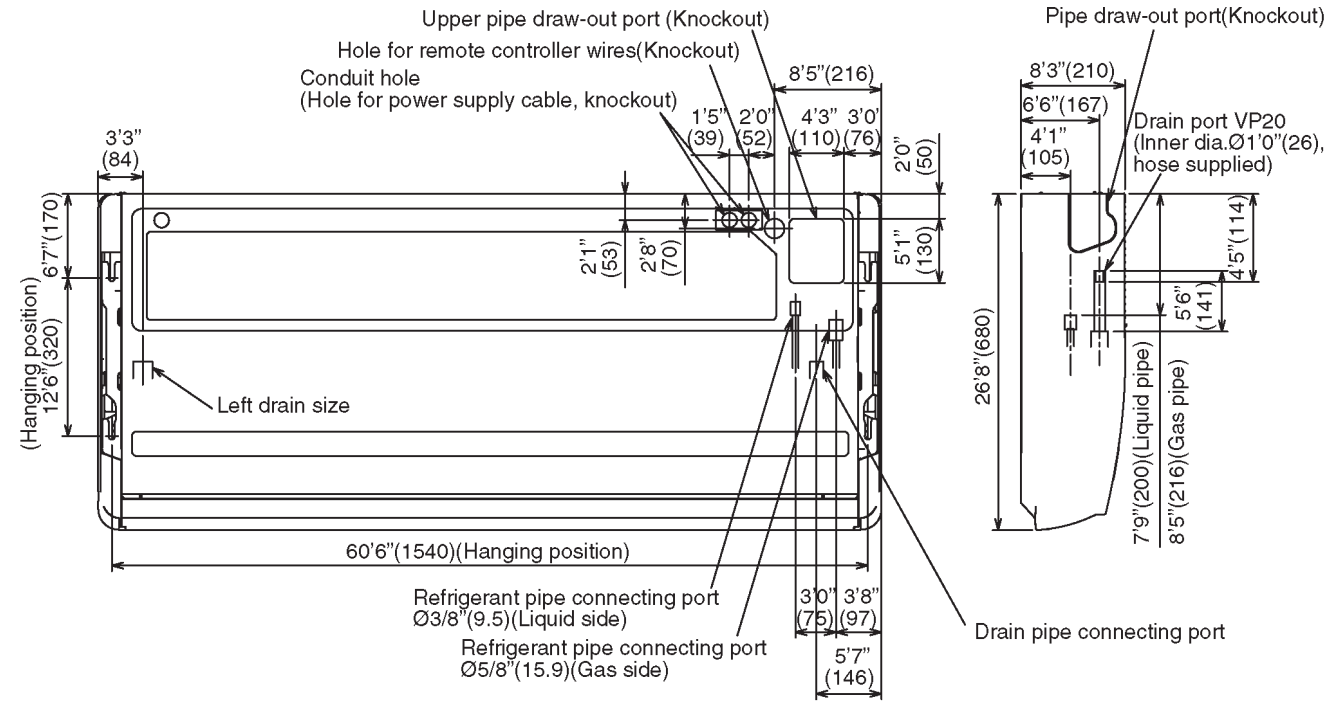


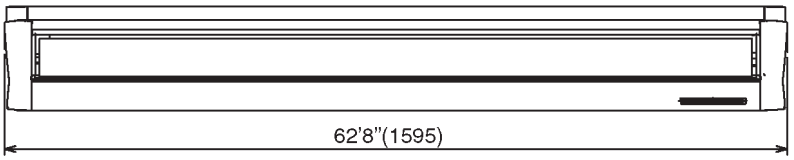
Space required for installation and servicing

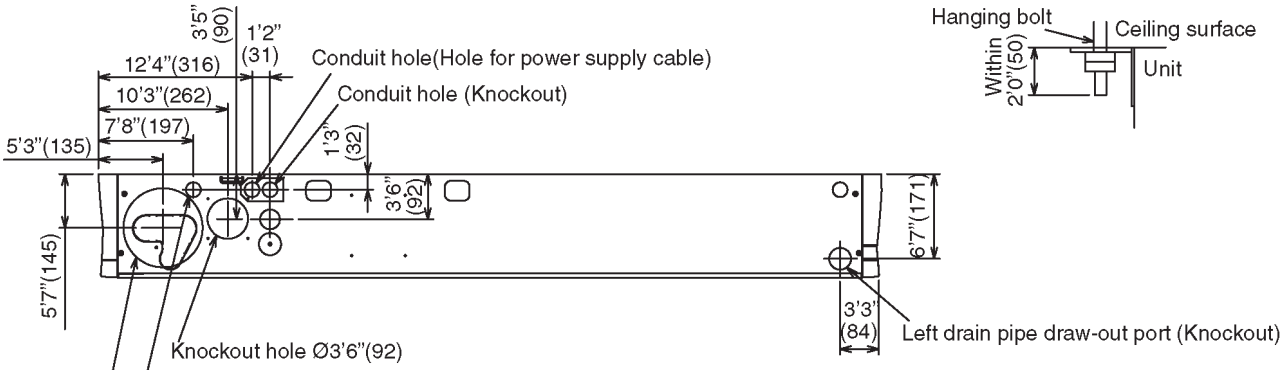


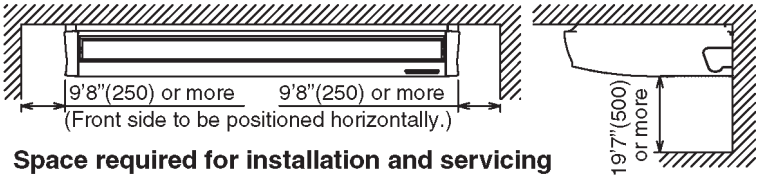
Unit : in(mm)

RAV-SP300CT-UL, RAV-SP360CT-UL, RAV-SP420CT-UL

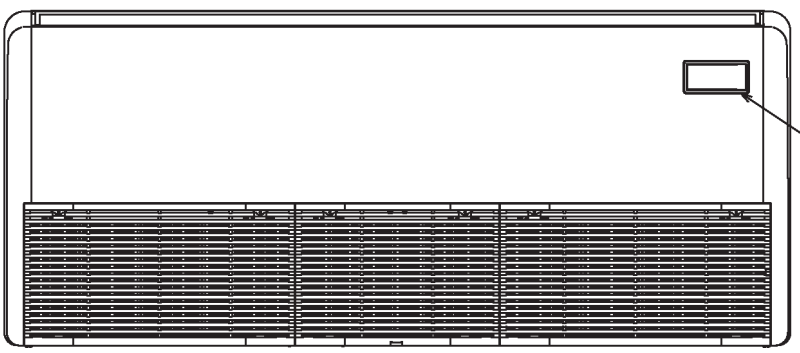








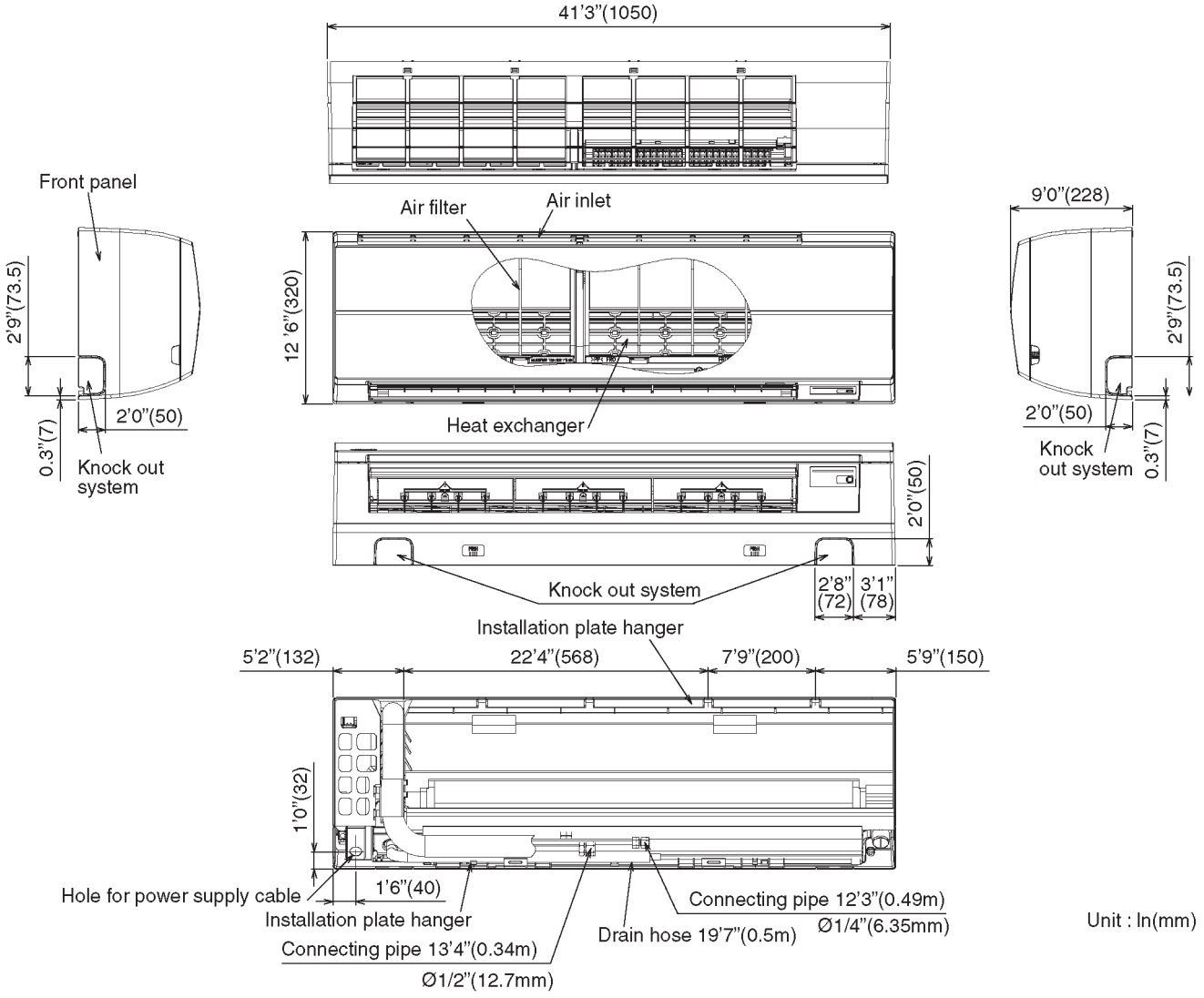
Space required for installation and servicing



Unit : in(mm)

2-3. High Wall Type

RAV-SP180KRT-UL

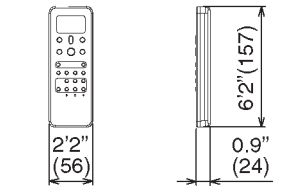


Unit : In(mm)

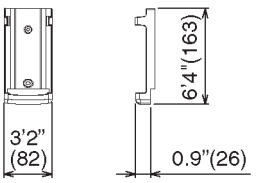
CAUTION

Connecting pipe cannot be connected to the right side of the indoor unit when conduit pipe is used.

When connecting pipe is connected onthe left or bottom of the indoor unit, connect the conduit pipe on other side.

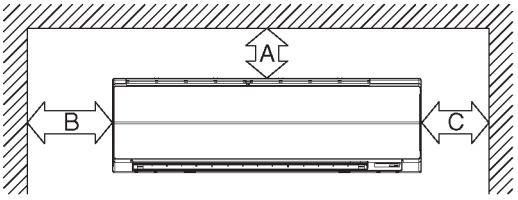


Wireless remote controller

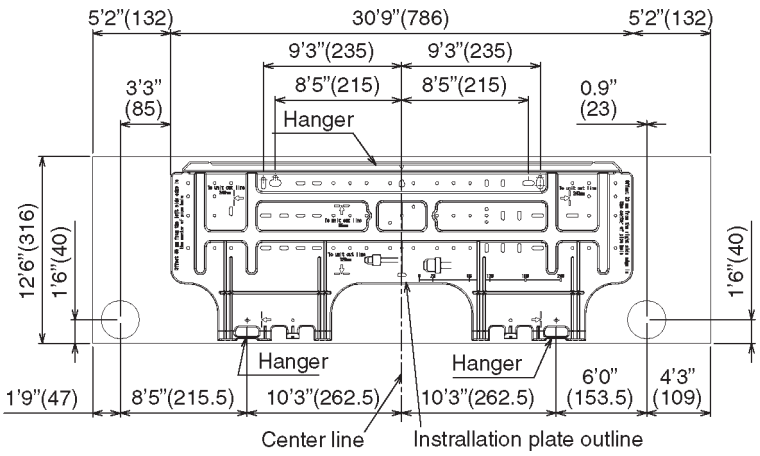


Remote controller holder

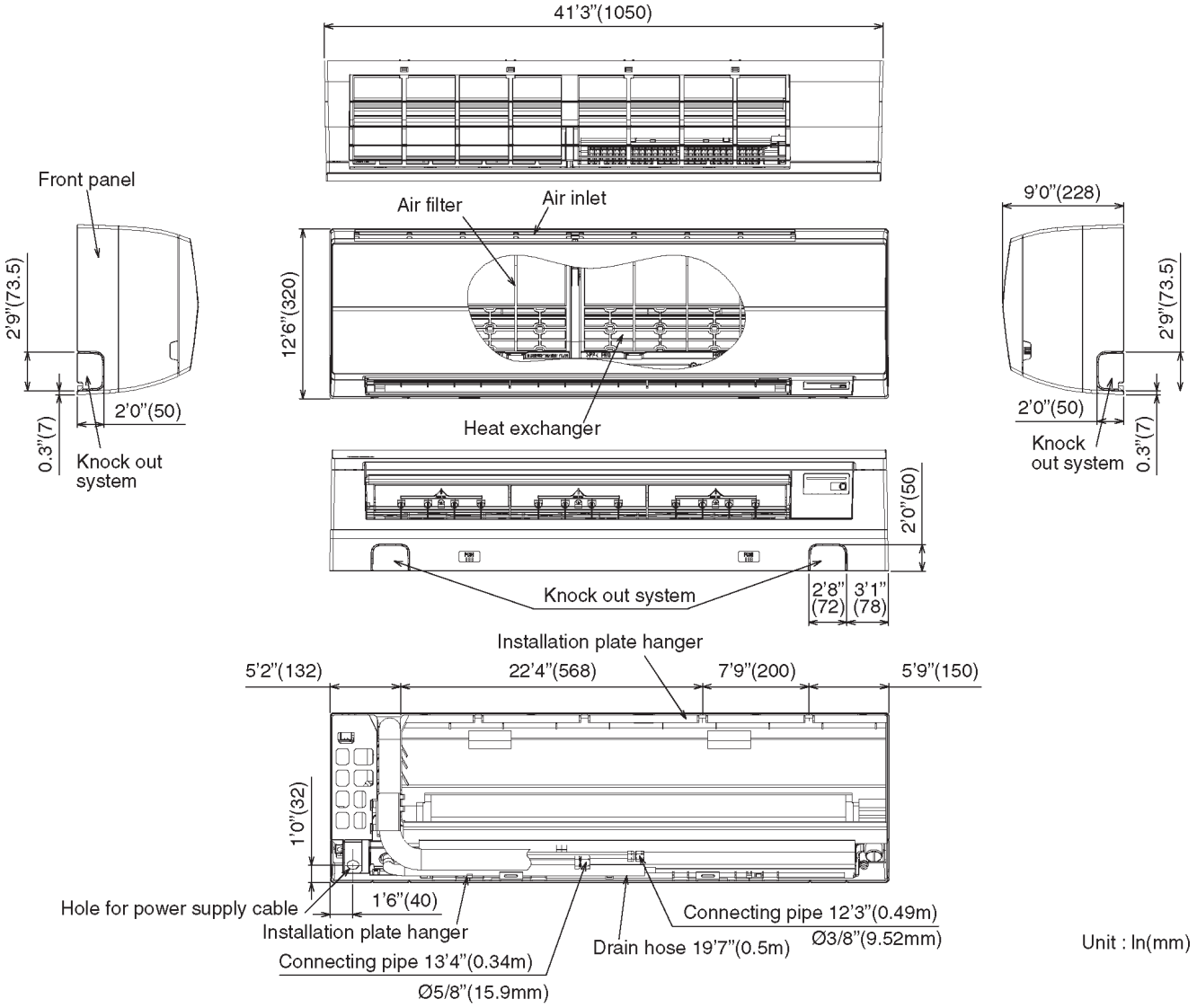
Space required for installation and servicing



	Distance	Comments
A	2'0"(50) or more	
B	33'5"(850) or more	For exchange of cross flow fan
C	6'7"(170) or more	



RAV-SP240KRT-UL

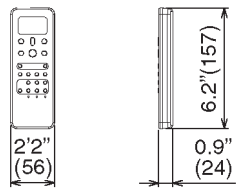


Unit : In(mm)

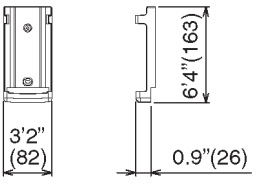
CAUTION

Connecting pipe cannot be connected to the right side of the indoor unit when conduit pipe is used.

When connecting pipe is connected on the left or bottom of the indoor unit, connect the conduit pipe on other side.

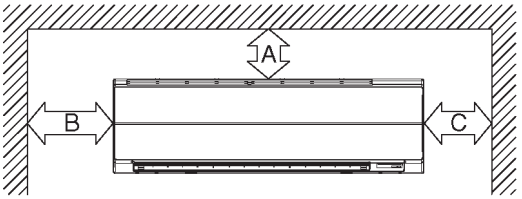


Wireless remote controller

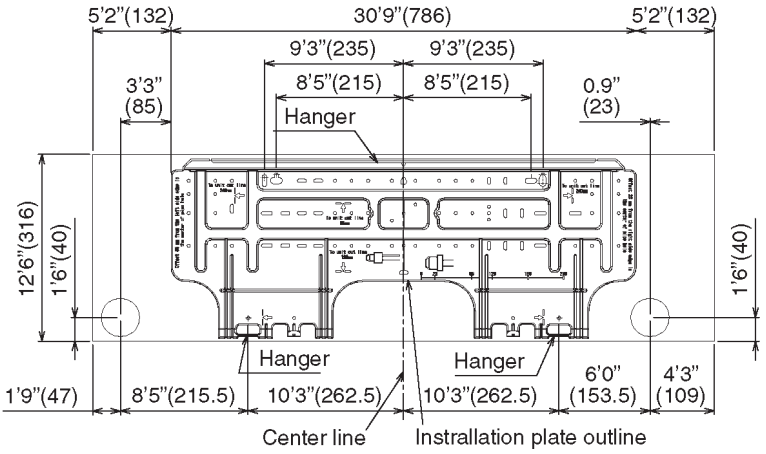


Remote controller holder

Space required for installation and servicing



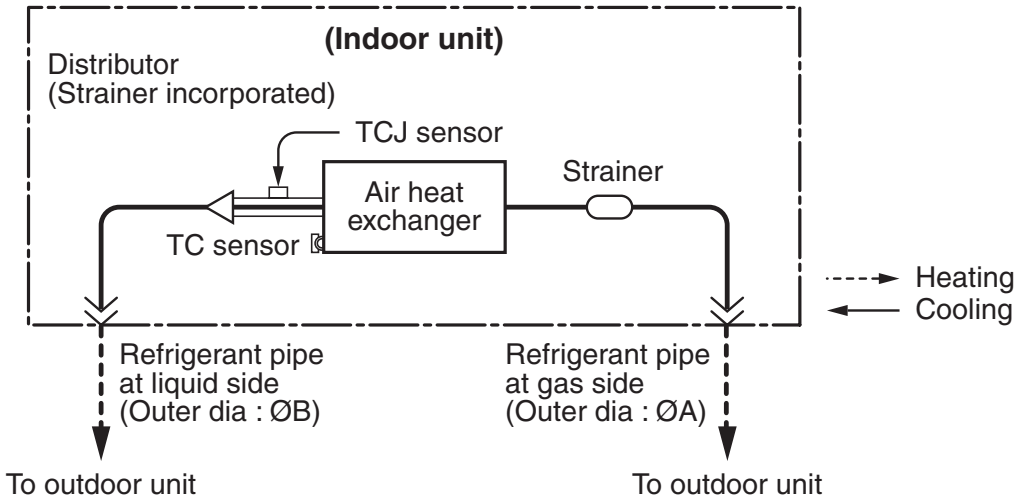
	Distance	Comments
A	2'0"(50) or more	
B	33'5"(850) or more	For exchange of cross flow fan
C	6'7"(170) or more	



3. SYSTEMATIC REFRIGERATING CYCLE DIAGRAM

3-1. 4-Way Air Discharge Cassette Type / Under Ceiling Type

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

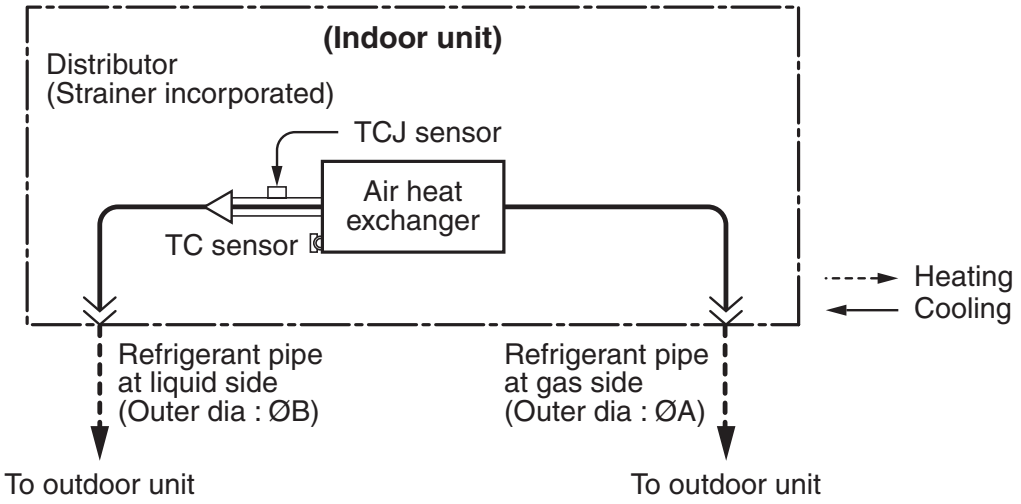


Dimension table

Indoor unit	Outer diameter of refrigerant pipe (In (mm))	
	Gas side ØA	Liquid side ØB
RAV-SP180	1/2” (12.7)	1/4” (6.4)
RAV-SP240, 300, 360, 420 type	5/8” (15.9)	3/8” (9.5)

3-2. High Wall Type

- **Single type (Combination of 1 indoor unit and 1 outdoor unit)**



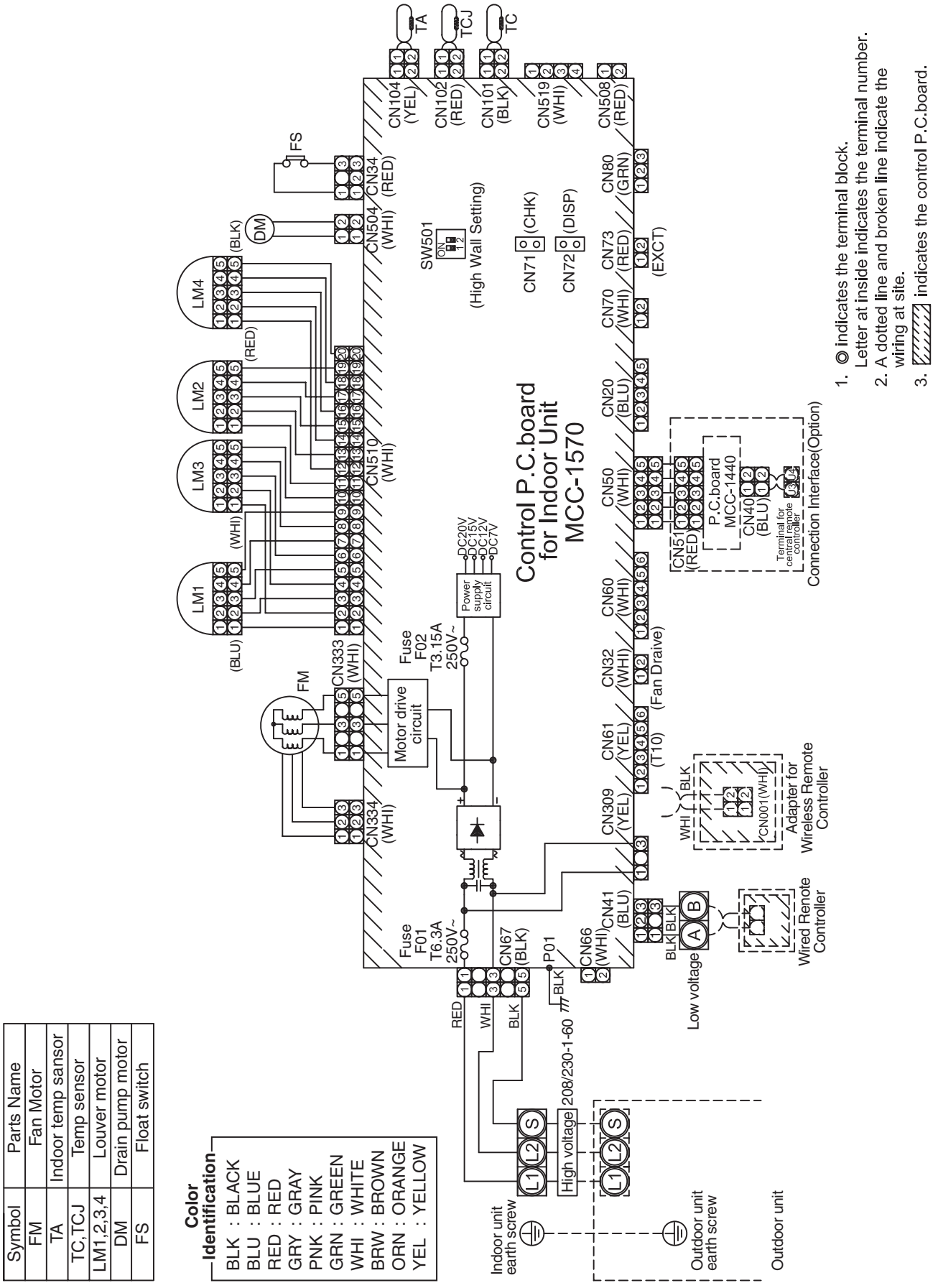
Dimension table

Indoor unit	Outer diameter of refrigerant pipe (In (mm))	
	Gas side ØA	Liquid side ØB
RAV-SP180KRT-UL	1/2” (12.7)	1/4” (6.4)
RAV-SP240KRT-UL	5/8” (15.9)	3/8” (9.5)

4. WIRING DIAGRAM

4-1. 4-Way Air Discharge Cassette Type

RAV-SP180UT-UL, RAV-SP240UT-UL, RAV-SP300UT-UL, RAV-SP360UT-UL, RAV-SP420UT-UL



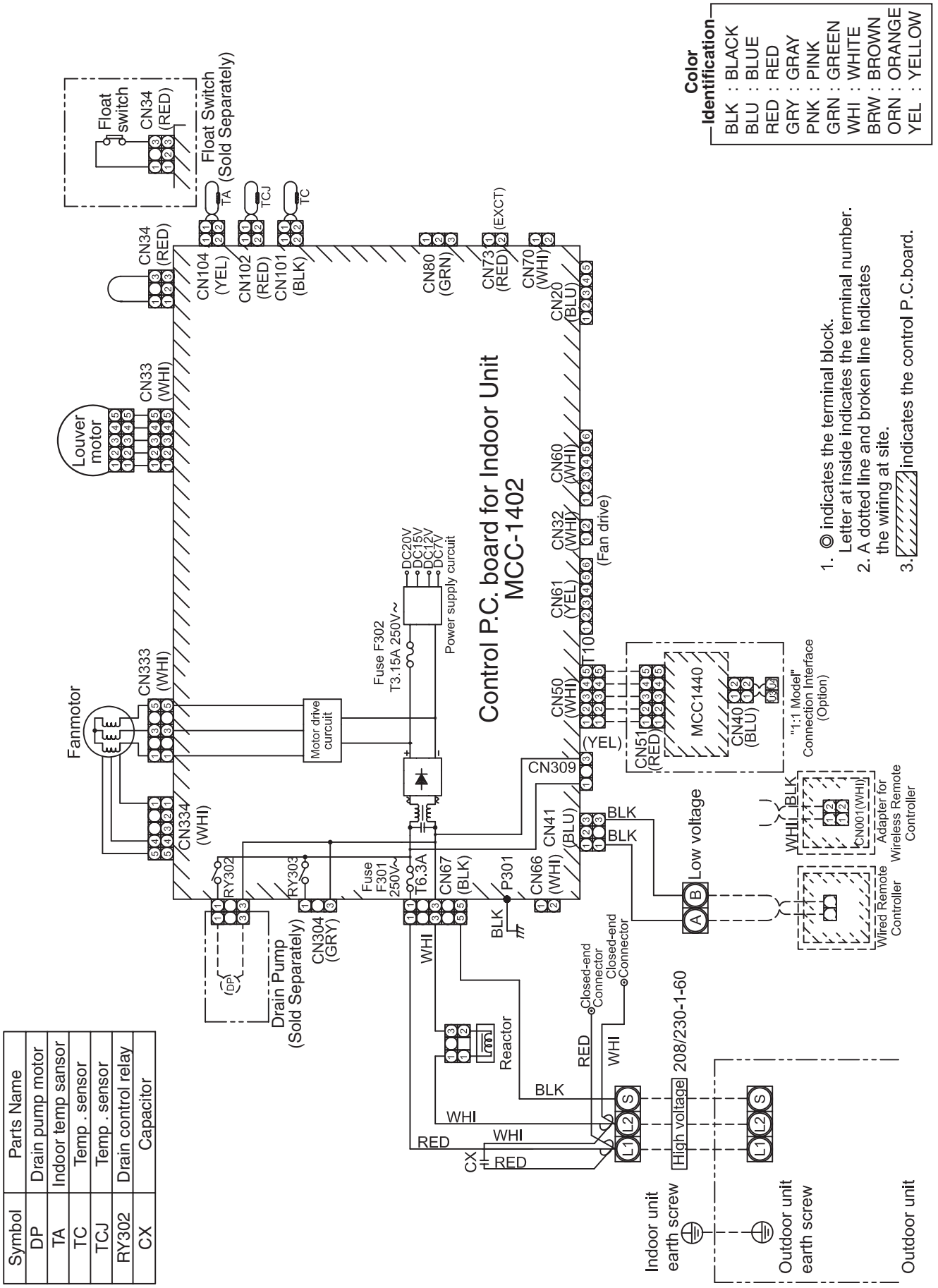
Symbol	Parts Name
FM	Fan Motor
TA	Indoor temp sansor
TC,TCJ	Temp sensor
LM1,2,3,4	Louver motor
DM	Drain pump motor
FS	Float switch

Color Identification

BLK : BLACK
BLU : BLUE
RED : RED
GRY : GRAY
PNK : PINK
GRN : GREEN
WHI : WHITE
BRW : BROWN
ORN : ORANGE
YEL : YELLOW

4-2. Under Ceiling Type

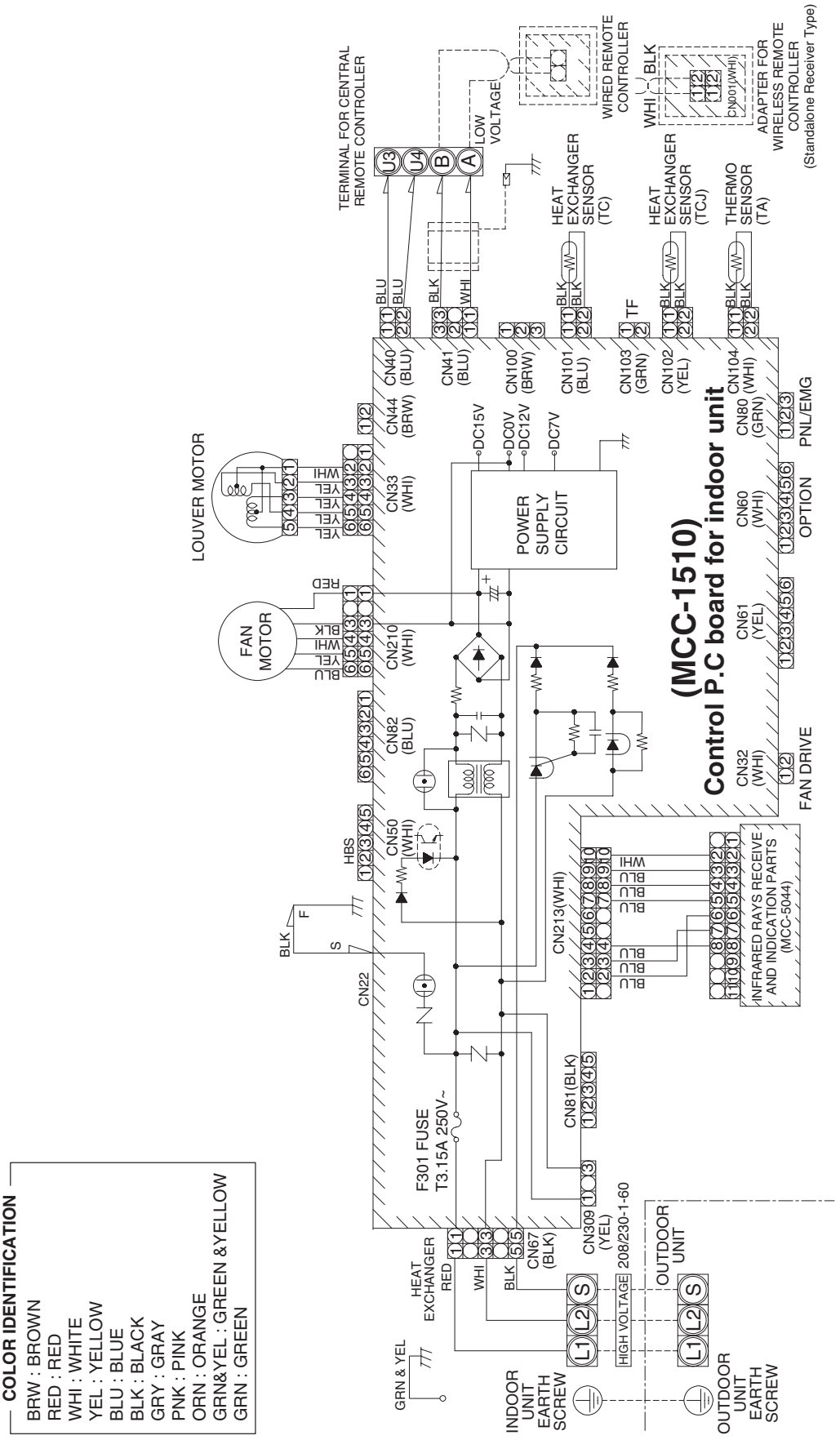
RAV-SP180CT-UL, RAV-SP240CT-UL, RAV-SP300CT-UL, RAV-SP360CT-UL, RAV-SP420CT-UL



Symbol	Parts Name
DP	Drain pump motor
TA	Indoor temp sansor
TC	Temp . sensor
TCJ	Temp . sensor
RY302	Drain control relay
CX	Capacitor

4-3. High Wall Type

RAV-SP180KRT-UL, RAV-SP240KRT-UL



1. ◯ indicates the terminal block.
   Letter at inside indicates the terminal number.
2. A dotted line and broken line indicate the wiring at site.
3. ▨ indicates the control P.C.board.

5. SPECIFICATIONS OF ELECTRICAL PARTS

5-1. 4-Way Air Discharge Cassette Type

RAV-SP180UT-UL, RAV-SP240UT-UL

No.	Parts name	Type	Specifications
1	Fan motor (for indoor)	SWF-340U60-2	Output (Rated) 60 W
2	Thermo. sensor (TA-sensor)	328 mm	10 kΩ at 77°F (25°C)
3	Heat exchanger sensor (TCJ-sensor)	Ø6 mm, 1000 mm	10 kΩ at 77°F (25°C)
4	Heat exchanger sensor (TC-sensor)	Ø6 mm, 1000 mm	10 kΩ at 77°F (25°C)
5	Float switch	FS-0218-102	—
6	Drain pump motor	MDP-1401	—

RAV-SP300UT-UL, RAV-SP360UT-UL, RAV-SP420UT-UL

No.	Parts name	Type	Specifications
1	Fan motor	ICF-340U150-1	Output (Rated) 150 W
2	Thermo. sensor (TA-sensor)	328 mm	10 kΩ at 77°F (25°C)
3	Heat exchanger sensor (TCJ-sensor)	Ø6 mm, 1000 mm	10 kΩ at 77°F (25°C)
4	Heat exchanger sensor (TC-sensor)	Ø6 mm, 1000 mm	10 kΩ at 77°F (25°C)
5	Float switch	FS-0218-102	—
6	Drain pump motor	MDP-1401	—

5-2. Under Ceiling Type

RAV-SP180CT-UL, RAV-SP240CT-UL, RAV-SP300CT-UL, RAV-SP360CT-UL, RAV-SP420CT-UL

No.	Parts name	Type	Specifications
1	Fan motor (SP180CT-UL)	SWF-340U60-1A	Output (Rated) 60 W
2	Fan motor (SP240CT-UL)	SWF-340U60-2A	Output (Rated) 60 W
3	Fan motor (SP300, 360, 420CT-UL)	SWF-340U120-2A	Output (Rated) 120 W
4	Thermo. sensor (TA-sensor)	155 mm	10 kΩ at 77°F (25°C)
5	Heat exchanger sensor (TCJ-sensor)	Ø6 mm, 1200 mm	10 kΩ at 77°F (25°C)
6	Heat exchanger sensor (TC-sensor)	Ø6 mm, 1200 mm	10 kΩ at 77°F (25°C)
7	Louver motor	MP24Z2N	DC 12 V
8	Reactor	CH-43-2Z-T	10 mH, 1 A

5-3. High Wall Type

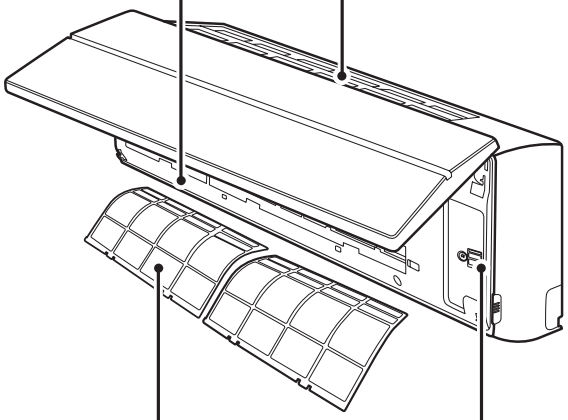
RAV-SP180KRT-UL, RAV-SP240KRT-UL

No.	Parts Name	Type	Specications
1	Fan motor (for indoor)	ICF-340U30-1	Output (Rated) 30W, 340V DC
2	Grille motor	MP24Z3T	Output (Rated) 1W, 16 poles DC
3	Thermo. Sensor (TA sensor)	318mm	10kΩ at 77°F (25°C)
4	Heat exchanger sensor (TC sensor)	Ø6,800mm	10kΩ at 77°F (25°C)
5	Heat exchanger sensor (TCJ sensor)	Ø6,800mm	10kΩ at 77°F (25°C)

■ Name of Each Part

Air outlet / Louver
Change the direction of the air to be discharged according to cool/heat mode.

Air inlet grille
Air in the room is sucked from here.



Air filter
Removes dirt or dust.
(Provided in the air inlet grille)

Earth screw
Earth screws are provided in the electric parts box.

6. REFRIGERANT R410A

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

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

The next section describes the precautions for air conditioner using the new refrigerant.

Conforming to contents of the next section together with the general cautions included in this manual, perform the correct and safe work.

6-1. Safety During Installation/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.

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

   If other refrigerant than R410A is mixed, pressure in the refrigeration cycle becomes abnormally high, and it may cause personal injury, etc. by a rupture.
2. Confirm the used refrigerant name, and use tools and materials exclusive for the refrigerant R410A.

   The refrigerant name R410A is indicated on the visible place of the outdoor unit of the air conditioner using R410A as refrigerant.

   To prevent mischarging, the diameter of the service port differs from that of R22.
3. If a refrigeration gas leakage occurs during installation/servicing, be sure to ventilate fully.

   If the refrigerant gas comes into contact with fire, a poisonous gas may occur.
4. When installing or removing an air conditioner, do not allow air or moisture to remain in the refrigeration cycle.

   Otherwise, pressure in the refrigeration cycle may become abnormally high so that a rupture or personal injury may be caused.
5. After completion of installation work, check to make sure that there is no refrigeration gas leakage.

   If the refrigerant gas leaks into the room, coming into contact with fire in the fan-driven heater, space heater, etc., a poisonous gas may occur.
6. When an air conditioning system charged with a large volume of refrigerant is installed in a small room, it is necessary to exercise care so that, even when refrigerant leaks, its concentration does not exceed the marginal level.

   If the refrigerant gas leakage occurs and its concentration exceeds the marginal level, an oxygen starvation accident may result.
7. Be sure to carry out installation or removal according to the installation manual.

   Improper installation may cause refrigeration trouble, water leakage, electric shock, fire, etc.
8. Unauthorized modifications to the air conditioner may be dangerous. If a breakdown occurs please call a qualified air conditioner technician or electrician.

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

6-2. Refrigerant Piping Installation

6-2-1. Piping Materials and Joints Used

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

Copper pipes and joints suitable for the refrigerant must be chosen and installed.

Furthermore, it is necessary to use clean copper pipes and joints whose interior surfaces are less affected by contaminants.

1. Copper Pipes

   It is necessary to use seamless copper pipes which are made of either copper or copper alloy and it is desirable that the amount of residual oil is less than 0.0001 lbs / 32' 10" (40 mg/10 m).

   Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface).

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

   As an air conditioner using R410A incurs pressure higher than when using R22, it is necessary to choose adequate materials.

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

Table 6-2-1 Thicknesses of annealed copper pipes

	Thickness (In (mm))	
Outer diameter (In (mm))	**R410A**	**R22**
1/4" (6.4)	0.03" (0.80)	0.03" (0.80)
3/8" (9.5)	0.03" (0.80)	0.03" (0.80)
1/2" (12.7)	0.03" (0.80)	0.03" (0.80)
5/8" (15.9)	0.04" (1.00)	0.04" (1.00)

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 6-2-3 to 6-2-5 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 0.79" (20 mm). Thicknesses of socket joints are as shown in Table 6-2-2.

Table 6-2-2 Minimum thicknesses of socket joints

Reference outer diameter of copper pipe jointed (In (mm))	Minimum joint thickness (In (mm))
1/4" (6.4)	0.02" (0.50)
3/8" (9.5)	0.02" (0.60)
1/2" (12.7)	0.03" (0.70)
5/8" (15.9)	0.03" (0.80)

6-2-2. Processing of Piping Materials

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

1. Flare Processing Procedures and Precautions

   a) Cutting the Pipe

      By means of a pipe cutter, slowly cut the pipe so that it is not deformed.

   b) Removing Burrs and Chips

      If the flared section has chips or burrs, refrigerant leakage may occur.

      Carefully remove all burrs and clean the cut surface before installation.

c) Insertion of Flare Nut

d) Flare Processing

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

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

Use either a flare tool for R410A or conventional flare tool.

Flare processing dimensions differ according to the type of flare tool.

When using a conventional flare tool, be sure to secure “dimension A” by using a gauge for size adjustment.

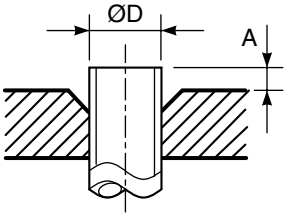


Fig. 6-2-1 Flare processing dimensions

Table 6-2-3 Dimensions related to flare processing for R410A / R22

Outer diameter (In (mm))	Thickness (In (mm))	A (In (mm))		
		Flare tool for R410A, R22clutch type	Conventional flare tool (R410A)	
			Clutch type	Wing nut type
1/4” (6.4)	0.03” (0.8)	0 – 0.02” (0 – 0.5)	0.04” – 0.06” (1.0 – 1.5)	0.06” – 0.08” (1.5 – 2.0)
3/8” (9.5)	0.03” (0.8)	0 – 0.02” (0 – 0.5)	0.04” – 0.06” (1.0 – 1.5)	0.06” – 0.08” (1.5 – 2.0)
1/2” (12.7)	0.03” (0.8)	0 – 0.02” (0 – 0.5)	0.04” – 0.06” (1.0 – 1.5)	0.08” – 0.10” (2.0 – 2.5)
5/8” (15.9)	0.04” (1.0)	0 – 0.02” (0 – 0.5)	0.04” – 0.06” (1.0 – 1.5)	0.08” – 0.10” (2.0 – 2.5)

Table 6-2-4 Flare and flare nut dimensions for R410A

Outer diameter (In (mm))	Thickness (In (mm))	Dimension (In (mm))				Flare nut width (In (mm))
		A	B	C	D	
1/4” (6.4)	0.03” (0.8)	0.36” (9.1)	0.36” (9.2)	0.26” (6.5)	0.51” (13)	0.67” (17)
3/8” (9.5)	0.03” (0.8)	0.52” (13.2)	0.53” (13.5)	0.38” (9.7)	0.79” (20)	0.87” (22)
1/2” (12.7)	0.03” (0.8)	0.65” (16.6)	0.63” (16.0)	0.51” (12.9)	0.91” (23)	1.02” (26)
5/8” (15.9)	0.04” (1.0)	0.78” (19.7)	0.75” (19.0)	0.63” (16.0)	0.98” (25)	1.14” (29)

Table 6-2-5 Flare and flare nut dimensions for R22

Outer diameter (In (mm))	Thickness (In (mm))	Dimension (In (mm))				Flare nut width (In (mm))
		A	B	C	D	
1/4” (6.4)	0.03” (0.8)	0.36” (9.1)	0.36” (9.2)	0.26” (6.5)	0.51” (13)	0.67” (17)
3/8” (9.5)	0.03” (0.8)	0.51” (13.0)	0.53” (13.5)	0.38” (9.7)	0.79” (20)	0.87” (22)
1/2” (12.7)	0.03” (0.8)	0.64” (16.2)	0.63” (16.0)	0.51” (12.9)	0.79” (20)	0.94” (24)
5/8” (15.9)	0.04” (1.0)	0.76” (19.4)	0.75” (19.0)	0.63” (16.0)	0.91” (23)	1.06” (27)
3/4” (19.0)	0.04” (1.0)	0.92” (23.3)	0.94” (24.0)	0.76” (19.2)	1.34” (34)	1.42” (36)

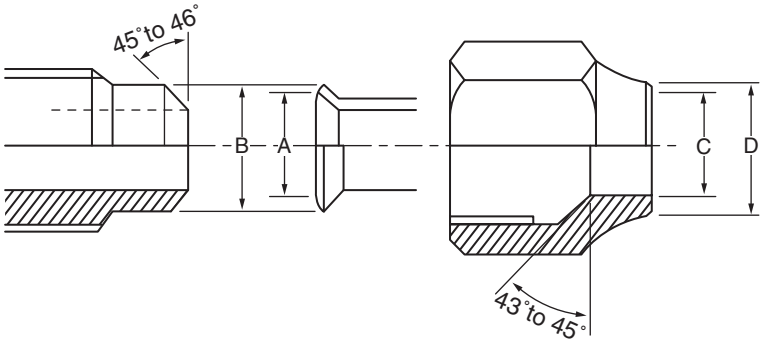


Fig. 6-2-2 Relations between flare nut and flare seal surface

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 6-2-6 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.

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

Outer diameter (In (mm))	Tightening torque (ft • lbs (N • m))
1/4" (6.4)	10 – 13 (14 – 18)
3/8" (9.5)	24 – 31 (33 – 42)
1/2" (12.7)	37 – 46 (50 – 62)
5/8" (15.9)	50 – 60 (68 – 82)

6-3. Tools

6-3-1. Required Tools

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

6-4. Recharging of Refrigerant

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

Recover the refrigerant, and check no refrigerant remains in the equipment.

↓

Connect the charge hose to packed valve service port at the outdoor unit's gas side.

↓

Connect the charge hose of the vacuum pump adapter.

↓

Open fully both packed valves at liquid and gas sides.

↓

Place the handle of the gauge manifold Low in the fully opened position, and turn on the vacuum pump's power switch. Then, evacuating the refrigerant in the cycle.

↓

When the compound gauge's pointer has indicated –101 kpa (–76 cmHg), place the handle Low in the fully closed position, and turn off the vacuum pump's power switch.

↓

Keep the status as it is for 1 to 2 minutes, and ensure that the compound gauge's pointer does not return.

↓

Set the refrigerant cylinder to the electronic balance, connect the connecting hose to the cylinder and the connecting port of the electronic balance, and charge **liquid refrigerant.**

(For refrigerant charging, see the figure below.)

1) Never charge refrigerant exceeding the specified amount.
2) If the specified amount of refrigerant cannot be charged, charge refrigerant bit by bit in COOL mode.
3) Do not carry out additional charging.

   When additional charging is carried out if refrigerant leaks, the refrigerant composition changes in the refrigeration cycle, that is characteristics of the air conditioner changes, refrigerant exceeding the specified amount is charged, and working pressure in the refrigeration cycle becomes abnormally high pressure, and may cause a rupture or personal injury.

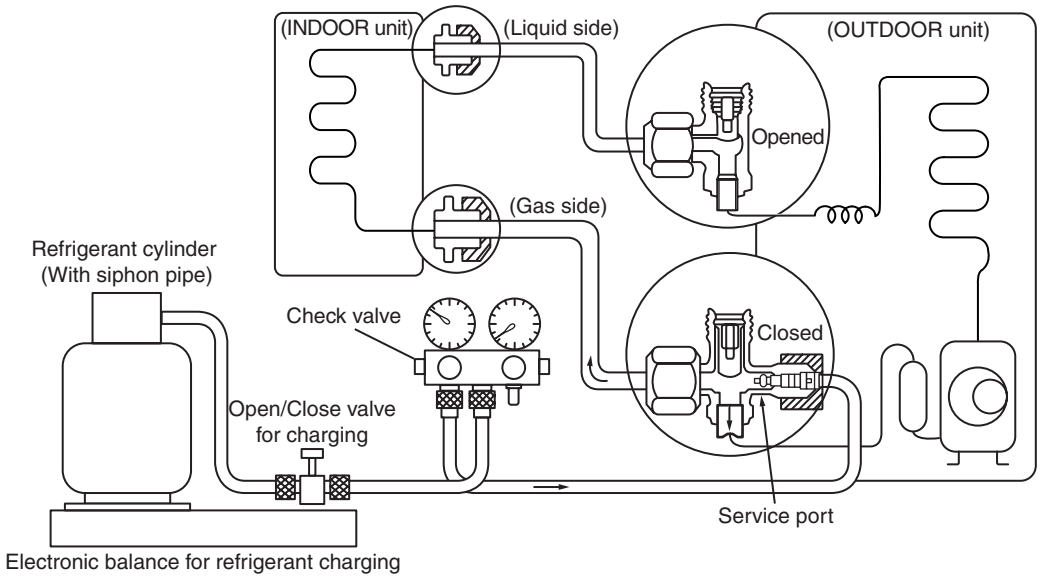
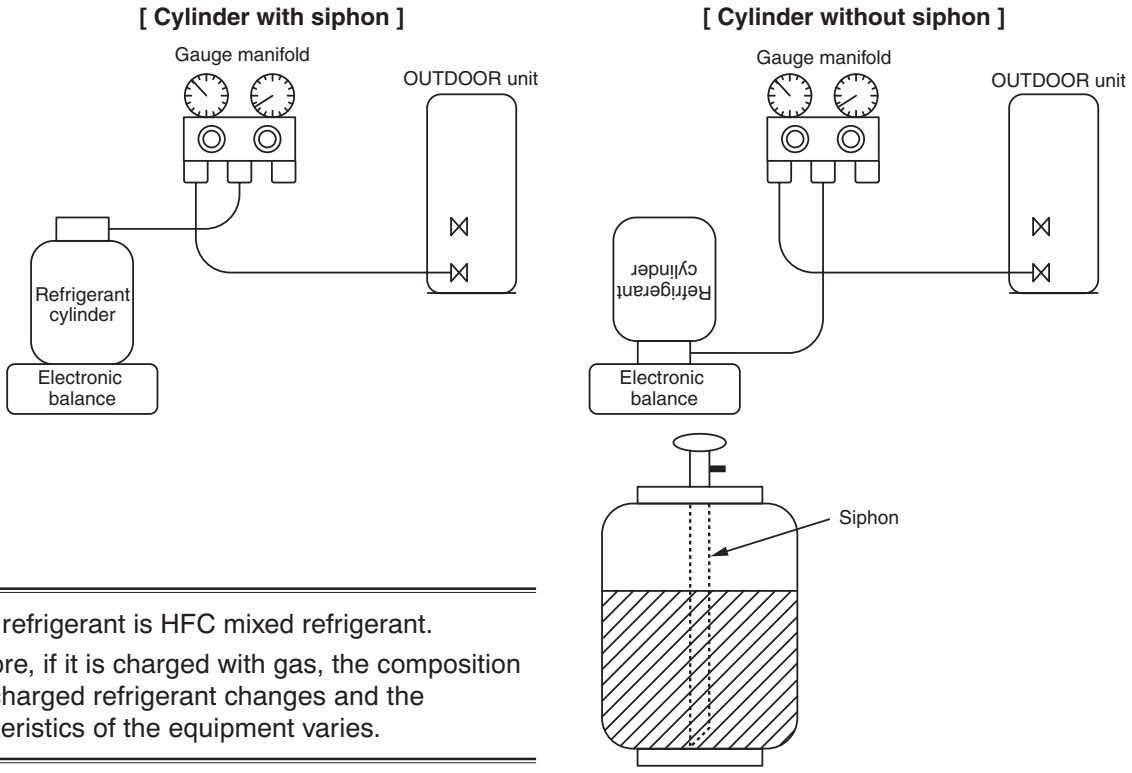


Fig. 6-4-1 Configuration of refrigerant charging

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

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

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



R410A refrigerant is HFC mixed refrigerant.

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

Fig. 6-4-2

6-5. Brazing of Pipes

6-5-1. Materials for Brazing

1. Silver brazing filler

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

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

2. Phosphor bronze brazing filler

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

3. Low temperature brazing filler

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

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

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

6-5-2. Flux

1. Reason why flux is necessary

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

2. Characteristics required for flux

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

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

3. Types of flux

- **Noncorrosive flux**

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

  It is effective in case where the brazing temperature is higher than 1472°F (800°C).

- **Activated flux**

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

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

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

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

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

6-5-3. Brazing

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

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

Never use gas other than Nitrogen gas.

1. Brazing method to prevent oxidation

1) Attach a reducing valve and a flow-meter to the Nitrogen gas cylinder.
2) Use a copper pipe to direct the piping material, and attach a flow-meter to the cylinder.
3) Apply a seal onto the clearance between the piping material and inserted copper pipe for Nitrogen in order to prevent backflow of the Nitrogen gas.
4) When the Nitrogen gas is flowing, be sure to keep the piping end open.
5) Adjust the flow rate of Nitrogen gas so that it is lower than 0.05 m³/Hr or 2.9 psi (0.02 MPa) by means of the reducing valve.
6) After performing the steps above, keep the Nitrogen gas flowing until the pipe cools down to a certain extent (temperature at which pipes are touchable with hands).
7) Remove the flux completely after brazing.

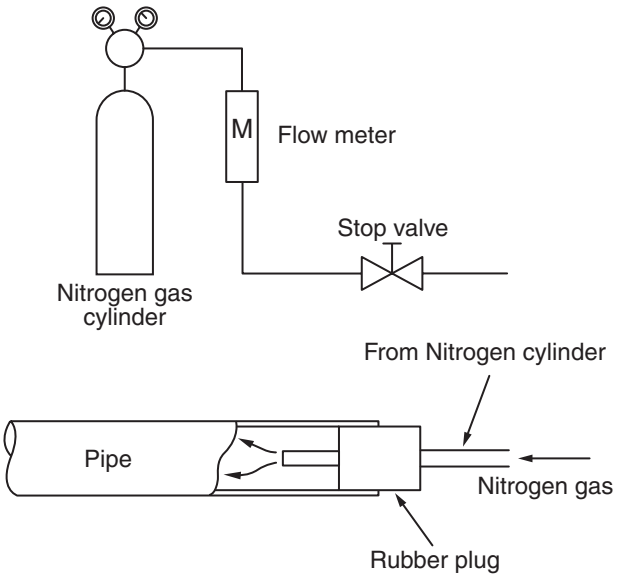
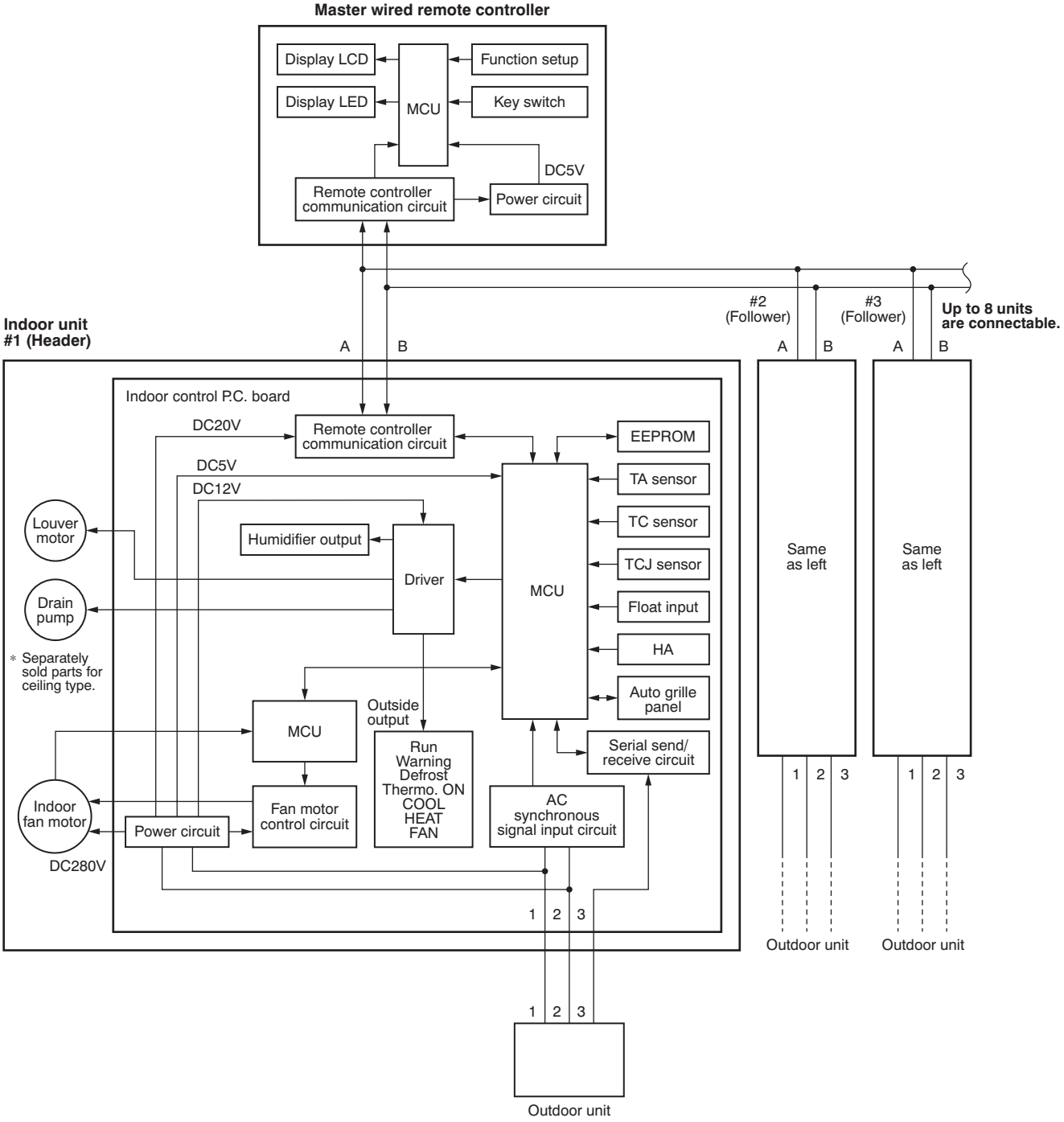


Fig. 6-5-1 Prevention of oxidation during brazing

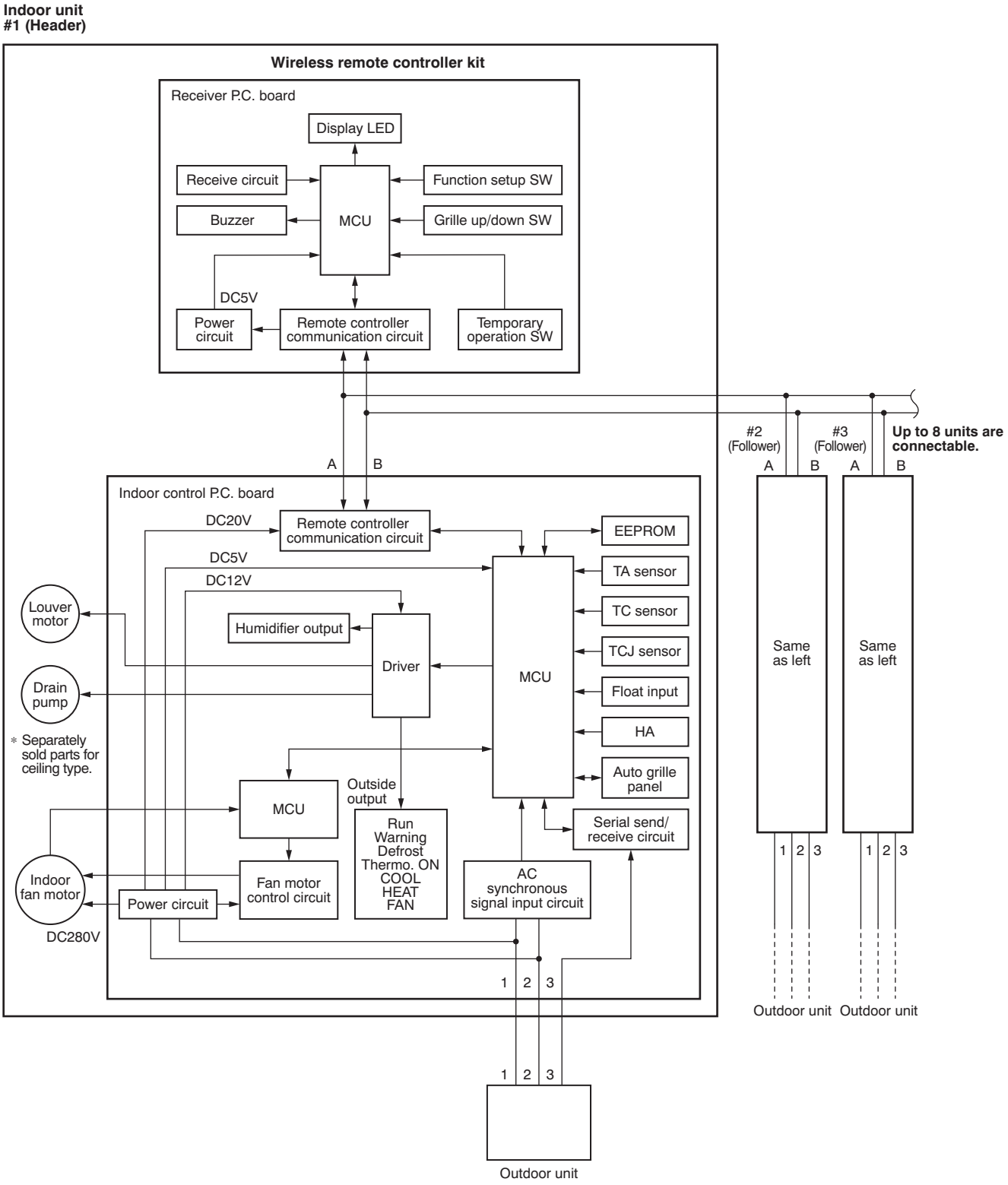
7. INDOOR CONTROL CIRCUIT

7-1. Indoor Controller Block Diagram (4-Way Air Discharge Cassette Type / Under Ceiling Type)

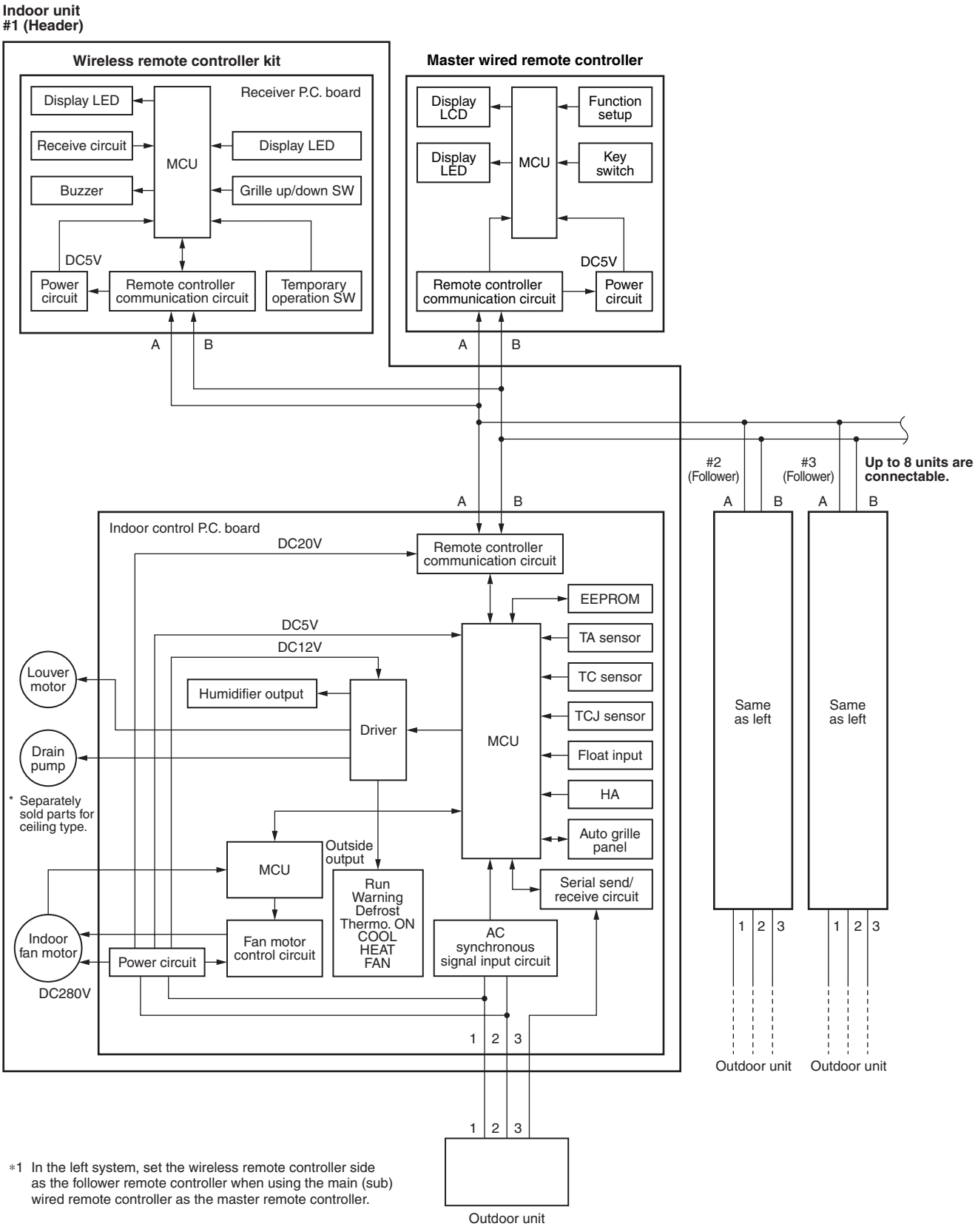
7-1-1. Connection of Wired Remote Controller



7-1-2. Connection of Wireless Remote Controller Kit



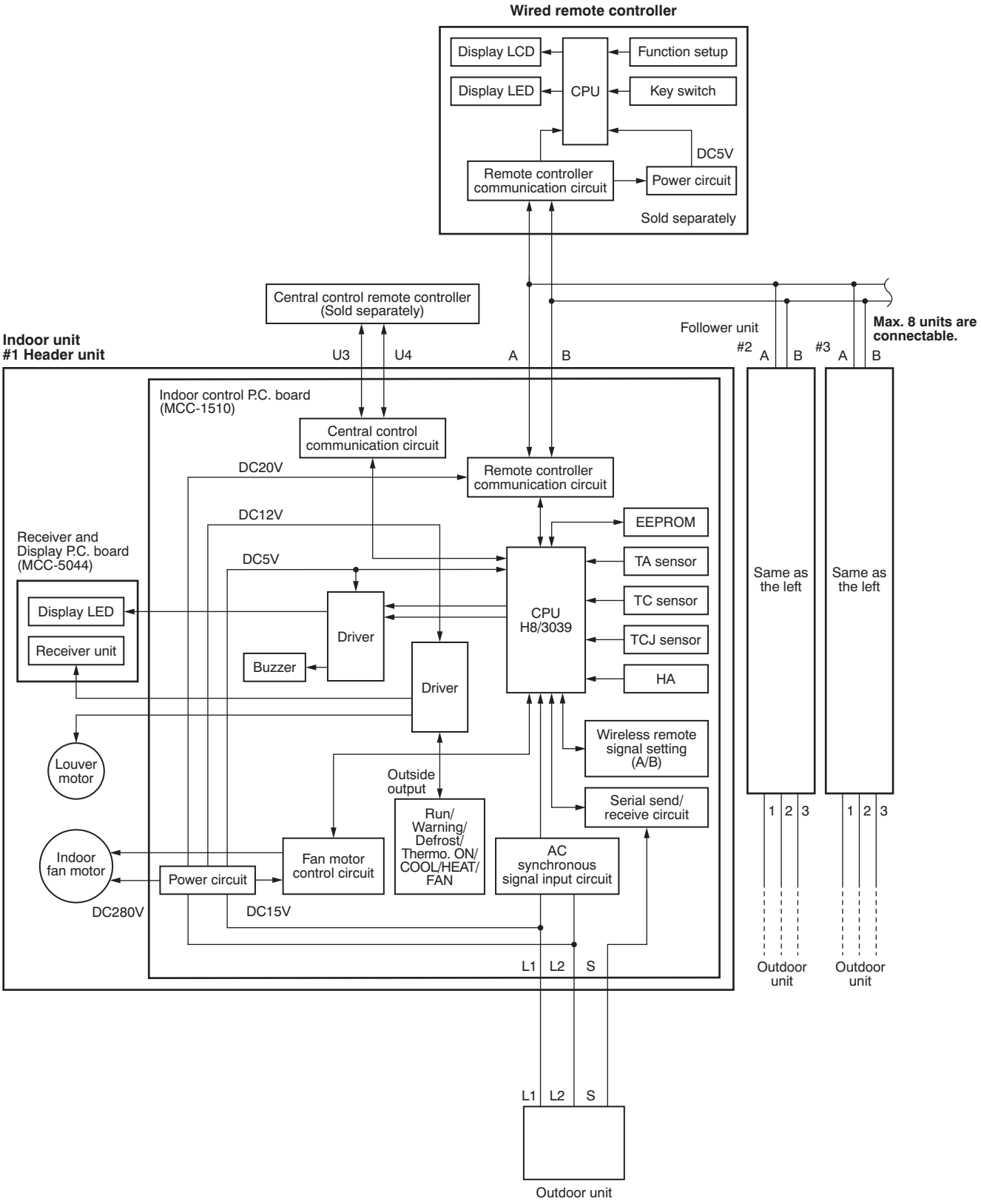
7-1-3. Connection of Both Wired Remote Controller and Wireless Remote Controller Kit



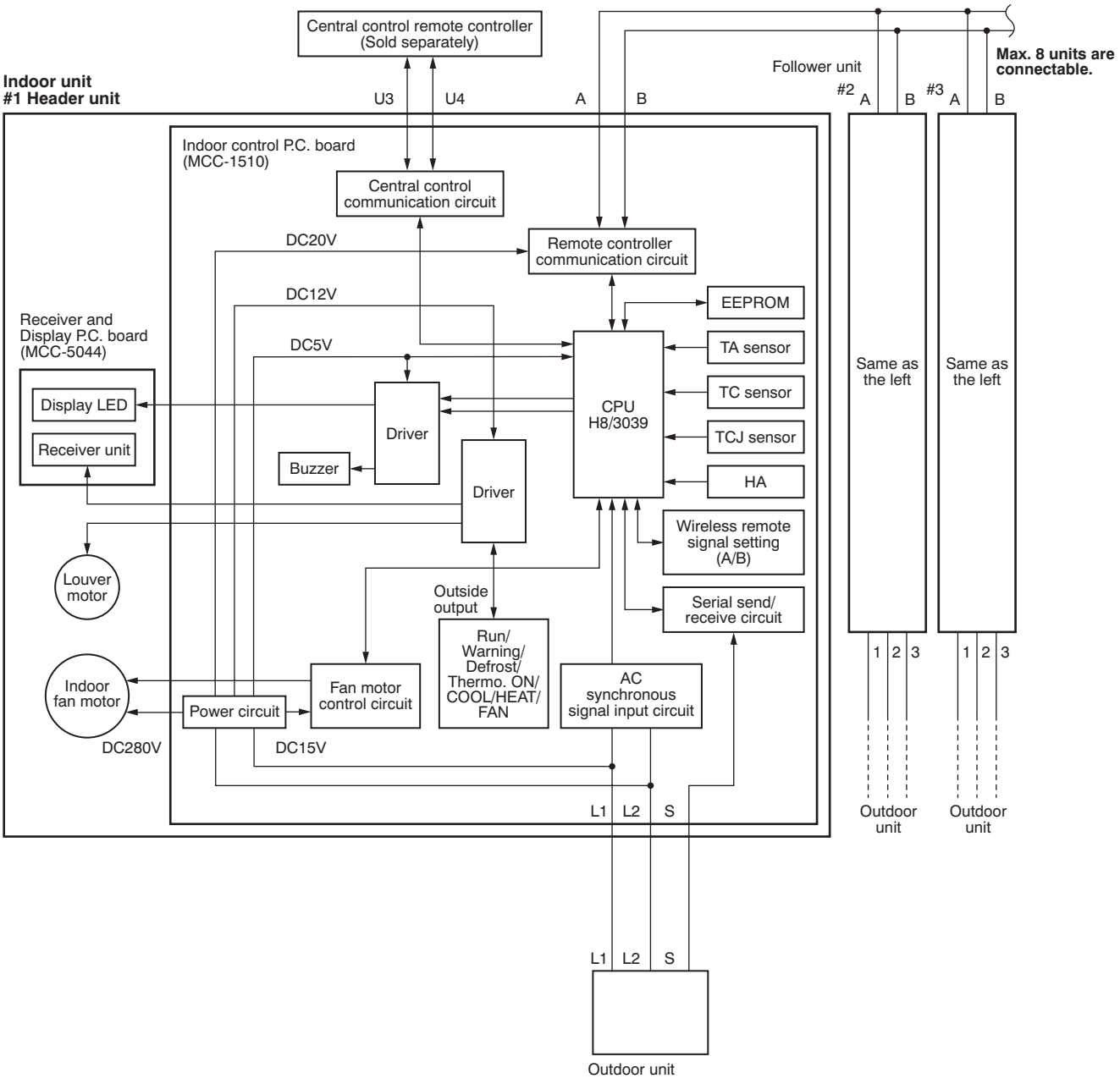
∗1 In the left system, set the wireless remote controller side as the follower remote controller when using the main (sub) wired remote controller as the master remote controller.

7-2. Indoor Controller Block Diagram (High Wall Type)

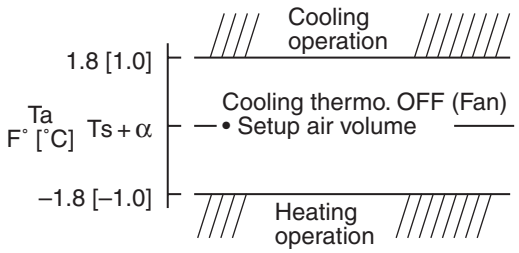
7-2-1. Connection of Wired Remote Controller



7-2-2. Connection of Wireless Remote Controller



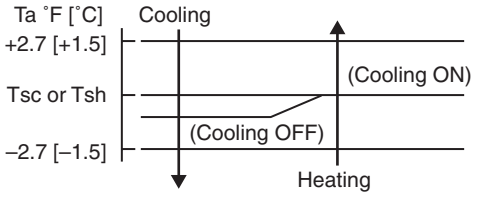
7-3. Control Specifications (4-Way Air Discharge Cassette Type / Under Ceiling Type)

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>1</td><td>When power supply is reset</td><td>1) Setting of indoor fan speed and existence of air direction adjustment
Based on EEPROM data, select setting of the indoor fan speed and the existence of air direction adjustment.</td><td>Fan speed (rpm)/
Air direction adjustment</td></tr>
<tr><td>2</td><td>Operation mode selection</td><td>1) Based on the operation mode selecting command from the remote controller, the operation mode is selected.
<table>
<tr><th>Remote controller command</th><th>Control outline</th></tr>
<tr><td>STOP</td><td>Air conditioner stops.</td></tr>
<tr><td>FAN</td><td>Fan operation</td></tr>
<tr><td>COOL</td><td>Cooling operation</td></tr>
<tr><td>DRY</td><td>Dry operation</td></tr>
<tr><td>HEAT</td><td>Heating operation</td></tr>
<tr><td>AUTO</td><td>• COOL/HEAT operation mode is automatically selected by Ta, Ts and To for operation.
• The operation is performed as shown in the following figure according to Ta value at the first time only. (In the range of Ts + α –1 < Ta < Ts + α + 1: The operation mode is set to the cooling operation (Fan Only operation at thermo OFF) and then the cooling operation is carried out with the fan speed which was set up on the remote controller.))</td></tr>
</table>


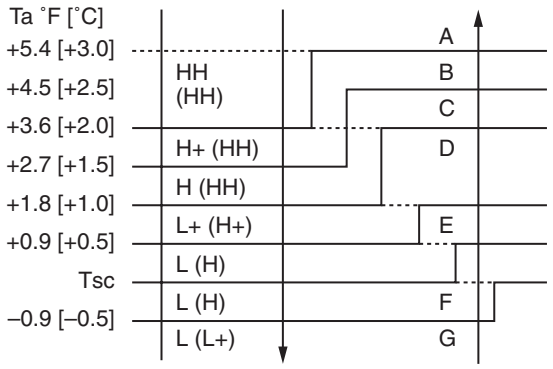
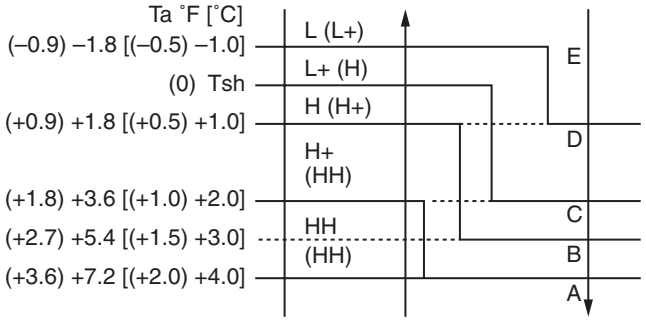
• α is corrected according to the outside temperature.
<table>
<tr><th>Outside temp.</th><th>Correction value (α)</th></tr>
<tr><td>No To</td><td>0K</td></tr>
<tr><td>To ≥ 75.2°F (24°C)</td><td>–1K</td></tr>
<tr><td>75.2°F (24°C) > To ≥ 64.4°F (18°C)</td><td>0K</td></tr>
<tr><td>To < 64.4°F (18°C)</td><td>+1K</td></tr>
<tr><td>To error</td><td>0K</td></tr>
</table></td><td>Ta: Room temp.
Ts: Setup temp.
To: Outside temp.

K = deg</td></tr>
<tr><td>3</td><td>Room temp. control</td><td>1) Adjustment range: Remote controller setup temperature (°F [°C])
<table>
<tr><th></th><th>COOL/DRY</th><th>HEAT</th><th>AUTO</th></tr>
<tr><td>Wired type</td><td>64°F [18°C] to 84°F [29°C]</td><td>64°F [18°C] to 84°F [29°C]</td><td>64°F [18°C] to 84°F [29°C]</td></tr>
<tr><td>Wireless type</td><td>64°F [18°C] to 86°F [30°C]</td><td>61°F [16°C] to 86°F [30°C]</td><td>63°F [17°C] to 80°F [27°C]</td></tr>
</table>
∗When use of remote sensor is set (with DN32), even when sensor value is within the above range in HEAT or AUTO mode, the thermo. sensor turns OFF when Ta sensor value exceeds 95°F (35°C).</td><td></td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>3</td><td>Room temp. control (Continued)</td><td>2) Using the CODE No. 06, the setup temperature in heating operation can be corrected.
<table><tr><th>SET DATA</th><th>0</th><th>2</th><th>4</th><th>6</th></tr><tr><td>Setup temp. correction</td><td>+0°F (+0°C)</td><td>+3.6°F (+2°C)</td><td>+7.2°F (+4°C)</td><td>+10.8°F (+6°C)</td></tr></table>Setting at shipment
<table><tr><th>SET DATA</th><td>2</td></tr></table></td><td>Shift of suction temperature in heating operation</td></tr>
<tr><td>4</td><td>Automatic capacity control

(GA control)</td><td>1) Based on the difference between Ta and Ts, the operation frequency is instructed to the outdoor unit.
2) Cooling operation
Every 90 seconds, 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.
Ta (n) – Ts (n) : Room temp. difference
n : Counts of detection
Ta (n-1) – Ts (n) : Varied room temp. value
n – 1 : Counts of detection of 90 seconds before
3) 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
4) Dry operation
The frequency correction control is same as those of the cooling operation.
However the maximum frequency is limited to approximately “S6”.
Note) When LOW is set up, the maximum frequency is limited to approximately “SB”.</td><td></td></tr>
<tr><td>5</td><td>Automatic cooling/heating control</td><td>1) The judgment of selecting COOL/HEAT is carried out as shown below. When +2.7°F (+1.5°C) exceeds against Tsh 10 minutes and after thermo. OFF, heating operation (Thermo. OFF) exchanges to cooling operation. Description in the parentheses shows an example of cooling ON/OFF.
 

When –2.7°F (–1.5°C) lowers against Tsc 10 minutes and after thermo. OFF, cooling operation (Thermo. OFF) exchanges to heating operation.
2) For the automatic capacity control after judgment of cooling/heating, see Item 4.
3) For temperature correction of room temp. control in automatic heating, see Item 3.</td><td>Tsc: Setup temp. in cooling operation
Tsh: Setup temp. in heating operation + temp. correction of room temp. control</td></tr>
</table>

No.	Item	Outline of specifications	Remarks
6	Fan speed control	1) Operation with (HH), (H), (L) or [AUTO] mode is carried out by the command from the remote controller. **<COOL>**  2) When the fan speed mode [AUTO] is selected, the fan speed varies by the difference between Ta and Ts. • The temperature is usually detected by the temperature sensor of the indoor unit. When the sensor to detect the temperature is changed to the temperature sensor of the wired remote controller, the same control is also carried out. • When the fan speed is exchanged while the operation mode is [AUTO], the fan speed in this time is kept for 3 minutes. However the fan speed is exchanged to other fan speed than [AUTO] by using the remote controller, the fan operates with the exchanged fan speed. • When cooling operation has started, select a downward slope for the fan speed, that is, the high position. • If the temperature is just on the difference boundary, the fan speed does not change. • Mode in the parentheses indicates one in automatic cooling operation. **<HEAT>**  Value in the parentheses indicates one when thermo sensor of the remote controller works. Value without parentheses indicates one when thermo sensor of the body works. • When the fan speed is exchanged while the operation mode is [AUTO], the fan speed in this time is kept for 1 minute. However the fan speed is exchanged to other fan speed than [AUTO] by using the remote controller, the fan operates with the exchanged fan speed. • When heating operation has started, select an upward slope for the fan speed, that is, the high position. • If the temperature is just on the difference boundary, the fan speed does not change. • Mode in the parentheses indicates one in automatic heating operation. • In Tc ≥ 140°F (60°C), the fan speed increases by 1 step.	HH > H+ > H > L+ > L > UL Tc: Indoor heat exchanger sensor temperature

No.	Item	Outline of specifications	Remarks
6	Fan speed control (Continued)		Selection of high ceiling type CODE No.: [5d] or selection of high ceiling on P.C. board SW501

CODE No. [5d]	Standard		Type 1	
	0		1	
SW501 (1)/(2)	OFF/OFF		ON/OFF	
Tap	HEAT	COOL	HEAT	COOL
F1				
F2			HH	HH
F3				H+
F4			H+	
F5		HH		H
F6	HH		H	
F7	H+	H+		
F8		H		L+
F9	H		L+	L
FA		L+	L	
FB	L+	L		
FC	L			
FD		UL		UL

<4-Way Air Discharge Cassette Type>

Tap	SP180	SP240	SP300	SP360, 420
	Revolution speed (rpm)			
F1	610	630	700	700
F2	560	600	680	680
F3	510	540	670	670
F4	460	470	650	660
F5	410	460	630	650
F6	400	450	620	640
F7	380	420	560	570
F8	360	390	500	500
F9	350	380	490	490
FA	340	360	460	470
FB	330	330	400	430
FC	320	320	400	420
FD	250	250	300	300

<Under Ceiling Type>

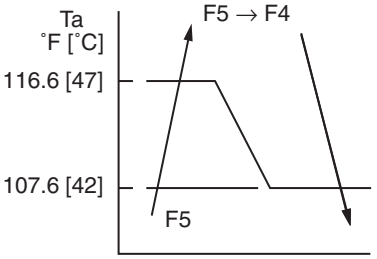
Tap	SP180	SP240	SP300	SP360, 420
	Revolution speed (rpm)			
F1	1120	1140	1240	1300
F2	1100	1100	1200	1240
F3	1020	1060	1140	1200
F4	990	1020	1080	1160
F5	950	970	1040	1120
F6	930	960	1000	1080
F7	880	920	960	1040
F8	840	900	930	990
F9	820	880	900	960
FA	800	850	870	950
FB	780	810	830	890
FC	760	790	800	860
FD	550	560	590	590

3) In heating operation, the mode changes to [UL] if thermostat is turned off.

4) If Ta ≥ 77°F (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 (No. 7).

5) While the operation mode is [AUTO], the revolution frequency of (HH) is set larger than that in the cooling/heating operation.

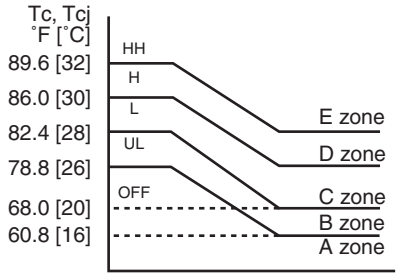
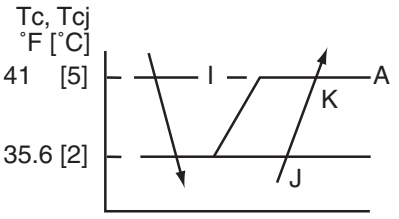
However only when the high ceiling selection is set to [Standard]

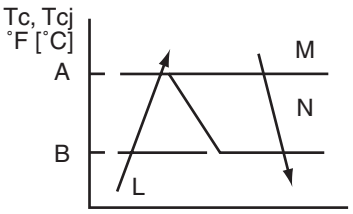


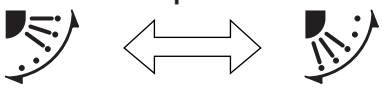
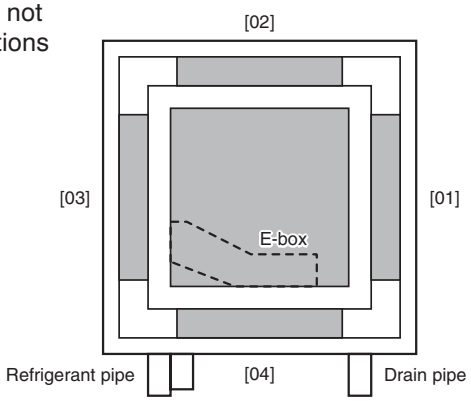
However the revolution frequency is restricted in the automatic heating operation as shown in the following figure.

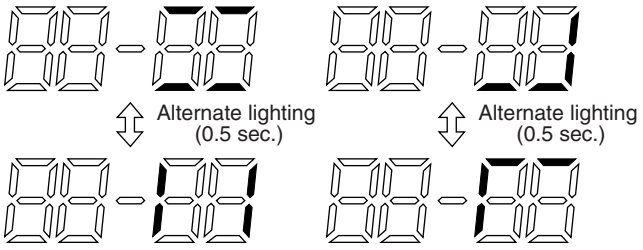
6) Self-clean operation (4-Way Discharge Cassette Type only)
When performing self-clean operation after stopping the cooling operation, the mode becomes 210 rpm.

[Self-clean] is displayed.

No.	Item	Outline of specifications	Remarks
7	Cool air discharge preventive control	1) 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 42.8°F (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.
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 [I] 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 41°F (5°C) to 53.6°F (12°C) until [I] zone is detected and the indoor fan operates with [L] mode.  In the heating operation, if the 4-way valve cannot be reversed due to a trouble, etc. and keeps operation with the cooling cycle, the freeze preventive control works when the following conditions are satisfied. (However the control temperature for J zone is changed from 35.6°F (2°C) to 23°F (–5°C.)) **<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 < 41°F (5°C)	**Tcj:** Indoor heat exchanger sensor temperature **Tcn:** Tc temperature when 5 minutes elapsed after activation **Tc (n – 1):** Tc temperature at start time

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>9</td><td>High-temp. release control</td><td>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
<table><tr><th colspan="2">Control temp. °F (°C)</th></tr><tr><th>A</th><th>B</th></tr><tr><td>132.8 (56) (129.2 (54))</td><td>125.6 (52) (125.6 (52))</td></tr></table> 
NOTE:
When the operation has started or when Tc or Tcj < 86°F (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”</td><td></td></tr>
<tr><td>10</td><td>Drain pump control</td><td>1) In cooling operation (including Dry operation), the drain pump is usually operated.
2) If the float switch works while drain pump drives, the compressor stops, the drain pump continues the operation, and a check code is output.
3) 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.</td><td>Check code [P10]</td></tr>
<tr><td>11</td><td>After-heat elimination</td><td>When heating operation stops, in some cases, the indoor fan operates with (L) for approx. 30 seconds.</td><td>is displayed.</td></tr>
</table>

No.	Item	Outline of specifications	Remarks
12	Louver control: In case of 4-way Discharge Cassette type	1) 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**  • In group twin/triple operation, the louver positions can be set up collectively or individually. 2) Swing setup • [SWING] is displayed and the following display is repeated. **In all operations**  (Repeats) • In group twin operation, the louver positions can be set up collectively or individually. 3) When the unit stopped or the warning was output, the louver is automatically set to full closed position. 4) When PRE-HEAT (Heating ready) is displayed (Heating operation started or defrost operation is performed), heating thermo is off or self-cleaning is performed, the louver is automatically set to horizontal discharge position. * The louver which air direction is individually set or the locked louver closes fully when the unit stops and the louver is automatically set to horizontal discharge position when PRE-HEAT (Heating ready) is displayed, heating thermo is off or self-cleaning is performed. **<<Individual air direction setup>>** • Pushing UNIT LOUVER Louver select button enables every discharge port to set up the air direction. • In case of no input (key operation) for approx. 5 seconds during setting of individual air direction (during displaying of louver No. on the remote controller screen), the remote controller screen returns to the normal display screen. • For the air direction illustration during normal operation, the air direction of the least No. among the louvers which are block-set is displayed. • While individual air direction is being set, the remote controller operation (Illustration of air direction) and operation of the real machine are linked. • When selecting a case, UNIT LOUVER Louver select button is not pushed or louver No. is not displayed, the air directions of all the louvers are collectively set up.  	The louver position at horizontal discharge position at under SP240 differs from that at over SP300. The swinging louver moves usually up to the ceiling side from the louver position of the set time. Setup from the remote controller without UNIT LOUVER button is unavailable. For the setup operation, refer to "How to set louver lock" of Section "**10. SETUP AT LOCAL SITE AND OTHERS**". (Page 116 to 130)

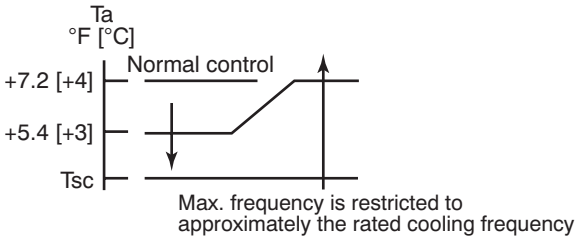
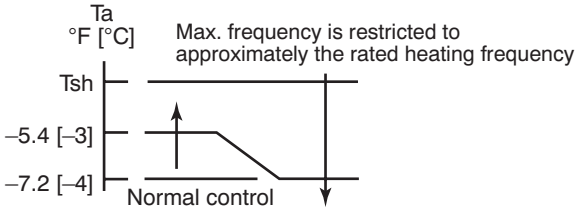
No.	Item	Outline of specifications	Remarks
12	Louver control (Continued): In case of 4-way Discharge Cassette type	**<<Selection of Swing mode>>** • For the Swing mode, the following three types of modes are selectable and settable by keeping Swing/Direction SWING/FIX button pushed for 4 seconds or more on the remote controller. ① Standard (4 pieces: same phase) swing → Data: [0001 (At shipment)] When Swing operation is selected, four louvers align at the horizontal discharge position and then start the Swing operation at the same time. ② Dual swing → Data: [0002] When operation is selected, the louvers of louver No. [01] and [03] move to the horizontal discharge position, the louvers of louver No. [02] and [04] move to the downward discharge position and then start the Swing operation at the same time. ③ Cycle swing → Data: [0003] When operation is selected, the louver No. [01] moves to the horizontal discharge position, [03] to the downward discharge position, [02] and [04] to the middle position and then start the Swing operation at the same time. • Three types of the swing modes can be also selected and set by the SET DATA of CODE No. (DN) [F0]. • In case of selecting the Swing mode, “Dual swing” or “Cycle swing”, the following numerals is displayed at the center of the remote controller screen for approx. 3 seconds when SWING/FIX button was pushed to select [SWING]. (No display for the standard swing)  Alternate lighting (0.5 sec.) Alternate lighting (0.5 sec.) **Dual swing** **Cycle swing** **<<Louver lock (Louver fix)>>** • For the air direction setup for each discharge port, the louver position can be locked during the normal operation. • An arbitrary air direction of an arbitrary louver can be registered and set by keeping UNIT LOUVER button pushed for 4 seconds or more on the remote controller. • The louver lock can be set by registering the SET DATA to CODE No. (DN) [F1] to [F4] according to the following table.	Carry out setting operation during stop of the unit; otherwise the unit stops operation. For the setting operation, refer to [How to set up type of swing] in Section “**10. SETUP AT LOCAL SITE AND OTHERS**”. (Page 116 to 130) Flashing showing the Swing mode is not indicated. Carry out setting operation during stop of the unit; otherwise the unit stops operation.

CODE No.	Objective louver No.	SET DATA
F1	01	0000: Release (At shipment)
F2	02	0001: Horizontal discharge position
F3	03	~
F4	04	0005: Downward discharge position

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>12</td><td>Louver control (Continued):
In case of 4-way Discharge Cassette type</td><td>• If there is the locked louver in the unit, [⊕] goes on the remote controller screen.
• While the following controls are performed, the louvers operate even if executing the louver lock.
<table><tr><th></th><th>Control which ignores lock</th><th>Objective louver No.</th></tr><tr><td>①</td><td>Operation stop</td><td>Full-close position</td></tr><tr><td>②</td><td>When heating operation started</td><td>Horizontal discharge position</td></tr><tr><td>③</td><td>Heating thermo. OFF</td><td>Horizontal discharge position</td></tr><tr><td>④</td><td>During defrost operation</td><td>Horizontal discharge position</td></tr><tr><td>⑤</td><td>Initialize operation</td><td>Full-close position</td></tr><tr><td>⑥</td><td>Self-clean operation</td><td>Horizontal discharge position</td></tr></table>• The real louver corresponding to the louver No. displayed on the remote controller screen during setting of louver lock operates swinging.</td><td>For the setting operation, refer to “10-1-1. How to set louver lock”.

It is position check operation and it does not link with the real louver and air direction setup (Illustration on the remote controller screen).</td></tr>
<tr><td></td><td>(For under ceiling type only)</td><td>1) 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
  
• In group operation, the louver positions can be set up collectively or individually.
2) Swing setup
• The swinging position can be moved in the following operation range.
All modes
 
• In group operation, the swinging positions can be set up collectively or individually.
3) When the unit stops or when a warning is output, the louver automatically moves downward.
4) While the heating operation is ready, the louver automatically moves upward.</td><td>Warning :
A check code is displayed on the remote controller, and the indoor unit stops. (Excluding [F08] and [L31])</td></tr>
</table>

No.	Item	Outline of specifications	Remarks
13	Frequency fixed operation (Test run)	**<In case of wired remote controller>** 1) When pushing [CHK] button for 4 seconds or more, [TEST] is displayed on the display screen and the mode enters in Test run mode. 2) Push [ON/OFF] button. 3) Using [MODE] button, set the mode to [COOL] or [HEAT]. • Do not use other mode than [COOL]/[HEAT] mode. • During test run operation, the temperature cannot be adjusted. • An error is detected as usual. • A frequency fixed operation is performed. 4) After the test run, push [ON/OFF] button to stop the operation. (Display in the display part is same as the procedure in Item 1.) 5) Push [CHK] button to clear the test run mode. ([TEST] display in the display part disappears and the status returns to the normal stop status.)	Command frequency is approximately [S7] For the Test run with the wireless remote control, refer to p. 118.
14	Filter sign display (Except wireless type) ∗ It is provided on the separately sold type TCB-AX21UL.	1) The operation time of the indoor fan is calculated, the filter reset signal is sent to the remote controller when the specified time (2500H) has passed, and it is displayed on LCD. 2) 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 specified time has passed, and display on LCD disappears.	[FILTER ▦] goes on.
15	Energy-saving control	1) Selecting [AUTO] mode enables an energy-saving to be operated. 2) The setup temperature is shifted (corrected) in the range not to lose the comfort ability according to input values of various sensors. 3) Data (Input value room temp. Ta, Outside temp. To, Air volume, Indoor heat exchanger sensor temp. Tc) for 20 minutes are taken the average to calculate correction value of the setup temperature. 4) The setup temperature is shifted every 20 minutes, and the shifted range is as follows. In cooling time: +1.5 to – 1.0K In heating time: –1.5 to +1.0K	

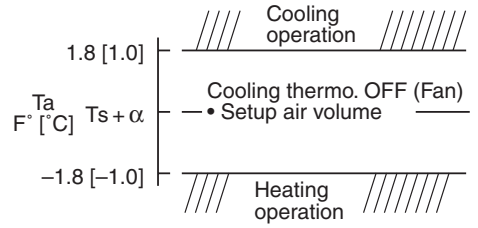
No.	Item	Outline of specifications	Remarks
16	Max. frequency cut control	1) This control is operated by selecting [AUTO] operation mode. 2) COOL operation mode: It is controlled according to the following figure if To < 82.4°F (28°C).  3) HEAT operation mode: It is controlled according to the following figure if To > 59°F (15°C).  	
17	DC motor	1) When the fan operation has started, positioning of the stator and the rotor are performed. (Moves slightly with tap sound) 2) The motor operates according to the command from the indoor controller. **Notes)** • When the fan rotates while the air conditioner stops due to entering of outside air, etc, the air conditioner may operate while the fan motor stops. • When a fan lock is found, the air conditioner stops, and an error is displayed.	Check code [P12]

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>18</td><td>Self-clean operation (Dry operation):
In case of 4-way Discharge Cassette type</td><td>1) When cooling operation mode (AUTO COOL, COOL, DRY) stopped, the following three self-clean operations are performed.
<table>
<tr><th>Compressor ON period</th><th>Self-clean operation period</th><th>FAN</th><th>Drain pump</th><th>Louver</th></tr>
<tr><td>0 to 10 min.</td><td>None</td><td rowspan="3">Fan (UL)</td><td rowspan="3">STOP</td><td rowspan="3">Horizontal discharge position</td></tr>
<tr><td>10 to 60 min.</td><td>1 hour</td></tr>
<tr><td>60 min. to</td><td>2 hours</td></tr>
</table>
2) During operation of self-clean, lights on the wired 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 is displayed on the wired remote controller screen via master unit.
∗ If self-clean operation is not used, set invalidity (does not use) of the self-clean operation by changing [0001 (At shipment) of CODE No. (DN) [D3] to [0000].
∗ To erase the display during operation of self-clean, change CODE No. [D4] from [0000: Display (At shipment)] to [0001: Non-display].</td><td>And it is not also on the wireless remote controller.
It is recognized as [STOP] from the remote monitor side.</td></tr>
<tr><td>19</td><td>Save operation</td><td>1) Turn on SAVE button on the remote controller.
2) During operation of save operation, SAVE lights on the wired remote controller.
3) During save operation, the current release control is performed with the restriction ratio set in EEPROM on the outdoor unit.
4) The restriction ratio can be set by keeping SAVE button pushed for 4 seconds or more on the remote controller.
5) When validating the save operation, the next operation starts with save operation valid because contents are held even when operation stops, operation mode changes or power supply is reset.
6) The restriction ratio can be set by changing the setup data of CODE No. (DN) [C2] in the range of 50 to 100% (every 1%, Setting at shipment: 75%).</td><td>Carry out setting operation during stop of the unit; otherwise the unit stops operation.
For the setup operation, refer to “How to set contents of save operation” in Sction “10. SETUP AT LOCAL SITE AND OTHERS”. (Page 116 to 130)</td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>20</td><td>46°F (8°C) heating/ Frost protective operation
(4-Way Air Discharge Cassette Type only)</td><td>1) This functional is intended for the cold latitudes and performs objective heating operation (46°F (8°C) heating operation).
2) This function is valid only for combination with the outdoor units.
3) Using the indoor CODE No. [D1] (1 bit), Valid/Invalid of this function is set up at the customer's side.
∗ The setup by CODE No. is Invalid [0]/Valid [1] and Invalid [0] has been set at the shipment.
4) This operation is the heating operation which sets 46°F (8°C) as the setup temperature of the target.
5) This function starts operation by pushing temperature button (▼) during heating operation; besides by pushing (▲) button for 4 seconds or more after temperature reached the minimum set temperature.
6) To stop/release this operation, select and execute one from the following operations.
① Push (▲) button: Heating operation (64°F (18°C) setting) continues.
② Push [START/STOP] button: Air conditioner stops. (Heating 64°F (18°C) operation at the next start)
③ Push (MODE) : Other operation mode is selected and the operation continues.
7) As the setup temperature is 46°F (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.
8) The settings of the air direction and air volume are changeable during this operation.
9) The indoor fan stops to protect the compressor for 2 minutes after start of heating operation (Thermo-ON) by this function.</td><td>In a group connection, if there is even one combination with other unit, "This function is not provided." is displayed.

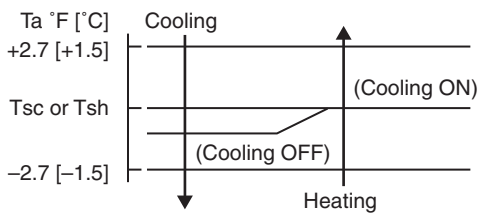
The setup temperature jumps from [18] to [8].</td></tr>
<tr><td>21</td><td>AUTO restart</td><td>1) Object
It restarts the operation automatically after resetting the unexpected stop of power supply such as power failure.
2) Contents
After returning from a power failure, the AUTO restart function reads the operation status from EEPROM and then restarts the operation automatically according to the operation contents.
3) Setup of function exchange by wired remote controller
CODE No. (DN): 28
<table><tr><th>SET DATA</th><th>0000</th><th>0001</th></tr><tr><td>AUTO restart</td><td>None</td><td>Provided</td></tr></table></td><td></td></tr>
</table>

7-4. Control Specifications (High Wall Type)

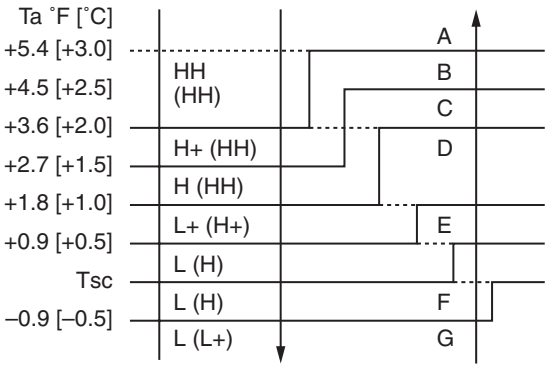
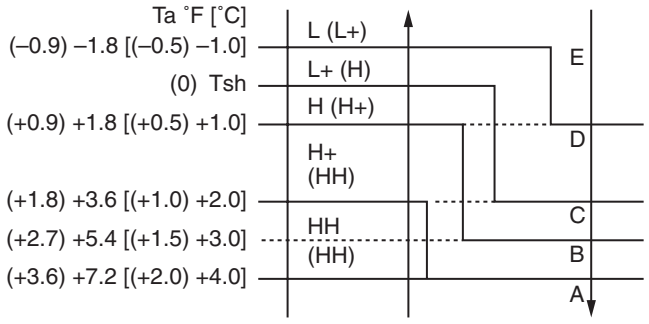
<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>1</td><td>When power supply is reset</td><td>1) Distinction of outdoor unit
When the power supply is reset, the outdoors are distinguished and the control is selected according to the distinguished result.
2) Setting of indoor fan speed and existence of air direction adjustment
Based on EEPROM data, select setting of the indoor fan speed and the existence of air direction adjustment.</td><td>Fan speed (rpm)/
Air direction adjustment</td></tr>
<tr><td>2</td><td>Operation mode selection</td><td>1) Based on the operation mode selecting command from the remote controller, the operation mode is selected.
<table>
<tr><th>Remote controller command</th><th>Control outline</th></tr>
<tr><td>STOP</td><td>Air conditioner stops.</td></tr>
<tr><td>FAN</td><td>Fan operation</td></tr>
<tr><td>COOL</td><td>Cooling operation</td></tr>
<tr><td>DRY</td><td>Dry operation</td></tr>
<tr><td>HEAT</td><td>Heating operation</td></tr>
<tr><td>AUTO</td><td>• COOL/HEAT operation mode is automatically selected by Ta, Ts and To for operation.
• The operation is performed as shown in the following figure according to Ta value at the first time only. (In the range of Ts + α –1 < Ta < Ts + α + 1: The operation mode is set to the cooling operation (Fan Only operation at thermo OFF) and then the cooling operation is carried out with the fan speed which was set up on the remote controller.))</td></tr>
</table>


• α is corrected according to the outside temperature.
<table>
<tr><th>Outside temp.</th><th>Correction value (α)</th></tr>
<tr><td>No To</td><td>0K</td></tr>
<tr><td>To ≥ 75.2°F (24°C)</td><td>–1K</td></tr>
<tr><td>75.2°F (24°C) > To ≥ 64.4°F (18°C)</td><td>0K</td></tr>
<tr><td>To < 64.4°F (18°C)</td><td>+1K</td></tr>
<tr><td>To error</td><td>0K</td></tr>
</table></td><td>Ta: Room temp.
Ts: Setup temp.
To: Outside temp.

K = deg</td></tr>
<tr><td>3</td><td>Room temp. control</td><td>1) Adjustment range: Remote controller setup temperature (°F [°C])
<table>
<tr><th></th><th>COOL/DRY</th><th>HEAT</th><th>AUTO</th></tr>
<tr><td>Wired type ∗</td><td colspan="3">64°F [18°C] to 84°F [29°C]</td></tr>
<tr><td>Wireless type</td><td colspan="3">62°F [17°C] to 86°F [30°C]</td></tr>
</table>
∗ When use of remote sensor is set (with DN32), even when sensor value is within the above range in HEAT or AUTO mode, the thermo. sensor turns OFF when Ta sensor value exceeds 95°F (35°C).</td><td></td></tr>
</table>

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>3</td><td>Room temp. control (Continued)</td><td>2) Using the CODE No. 06, the setup temperature in heating operation can be corrected.
<table><tr><th>SET DATA</th><th>0</th><th>2</th><th>4</th><th>6</th></tr><tr><td>Setup temp. correction</td><td>+0°F (+0°C)</td><td>+3.6°F (+2°C)</td><td>+7.2°F (+4°C)</td><td>+10.8°F (+6°C)</td></tr></table>Setting at shipment
<table><tr><th>SET DATA</th><td>2</td></tr></table>• When use of remote controller sensor is set (with DN32), no correction is performed.</td><td>Shift of suction temperature in heating operation</td></tr>
<tr><td>4</td><td>Automatic capacity control (GA control)</td><td colspan="2">1) Based on the difference between Ta and Ts, the operation frequency is instructed to the outdoor unit.
2) Cooling operation
Every 90 seconds, 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.
Ta (n) – Ts (n) : Room temp. difference
n : Counts of detection
Ta (n-1) – Ts (n) : Varied room temp. value
n – 1 : Counts of detection of 90 seconds before
3) 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
4) Dry operation
The frequency correction control is same as those of the cooling operation.
However the maximum frequency is limited to approximately “S6”.
Note) When LOW is set up, the maximum frequency is limited to approximately “SB”.</td></tr>
<tr><td>5</td><td>Automatic cooling/heating control</td><td>1) The judgment of selecting COOL/HEAT is carried out as shown below. When +2.7°F (+1.5°C) exceeds against Tsh 10 minutes and after thermo.-OFF, heating operation (Thermo. OFF) exchanges to cooling operation.
Description in the parentheses shows an example of cooling ON/OFF.
 

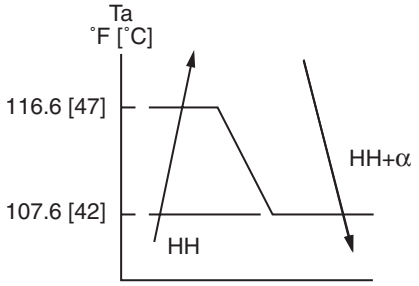
When –2.7°F (–1.5°C) lowers against Tsc 10 minutes and after thermo. OFF, cooling operation (Thermo. OFF) exchanges to heating operation.
2) For the automatic capacity control after judgment of cooling/heating, see Item 4.
3) For temperature correction of room temp. control in automatic heating, see Item 3.</td><td>Tsc: Setup temp. in cooling operation
Tsh: Setup temp. in heating operation + temp. correction of room temp. control</td></tr>
</table>

No.	Item	Outline of specifications	Remarks
6	Fan speed control	1) Operation with (HH), (H), (L) or [AUTO] mode is carried out by the command from the remote controller. **<COOL>**  2) When the fan speed mode [AUTO] is selected, the fan speed varies by the difference between Ta and Ts. • The temperature is usually detected by the temperature sensor of the indoor unit. When the sensor to detect the temperature is changed to the temperature sensor of the wired remote controller, the same control is also carried out. • When the fan speed is exchanged while the operation mode is [AUTO], the fan speed in this time is kept for 3 minutes. However the fan speed is exchanged to other fan speed than [AUTO] by using the remote controller, the fan operates with the exchanged fan speed. • When cooling operation has started, select a downward slope for the fan speed, that is, the high position. • If the temperature is just on the difference boundary, the fan speed does not change. • Mode in the parentheses indicates one in automatic cooling operation. **<HEAT>**  Value in the parentheses indicates one when thermo sensor of the remote controller works. Value without parentheses indicates one when thermo sensor of the body works. • When the fan speed is exchanged while the operation mode is [AUTO], the fan speed in this time is kept for 1 minute. However the fan speed is exchanged to other fan speed than [AUTO] by using the remote controller, the fan operates with the exchanged fan speed. • When heating operation has started, select an upward slope for the fan speed, that is, the high position. • If the temperature is just on the difference boundary, the fan speed does not change. • Mode in the parentheses indicates one in automatic heating operation. • In Tc ≥ 140°F (60°C), the fan speed increases by 1 step.	HH > H+ > H > L+ > L > UL Wireless type allows HH, H+, H, L+, L and AUTO.  Tc: Indoor heat exchanger sensor temperature

No.	Item	Outline of specifications	Remarks
6	Fan speed control (Continued)		

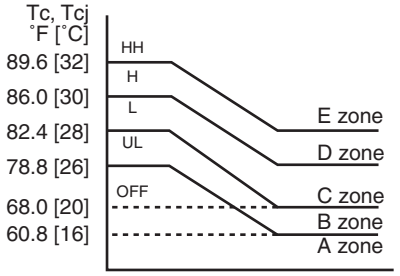
COOL	HEAT	SP180	SP240
	HH	1080	1200
HH		1080	1180
H+	H+	1020	1080
	H	1000	1020
H		980	980
	L+	980	980
L+	L	940	940
L		900	900
UL	UL	500	500

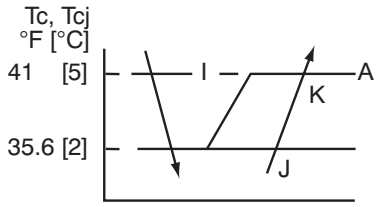
3) When thermo sensor turns OFF during heating, the fan speed mode becomes UL (weak).
4) When Ta is 77°F (25°C) or above at the beginning of HEAT operation or when canceling defrost mode, H or HH mode continues for 1 minute from the time when Tc enters zone E. (Following figure.)
5) The HH fan speed for auto cooling/heating is set to a speed higher than that for normal cooling/heating.
   However, it varies depending on the temperature difference of Tc during auto heating.



"PRE-HEAT ❋" indication

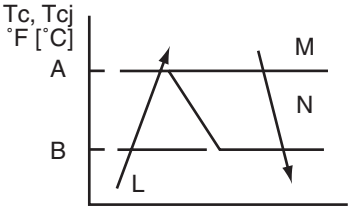
7	Cool air discharge preventive control	1) In heating operation, the indoor fan is controlled based on the detected temperature of Tc sensor or Tcj sensor. As shown below, the upper limit of the revolution frequency is restricted. However B zone is assumed as C zone for 6 minutes and after when the compressor activated. In defrost operation, the control value of Tc or Tcj is shifted by 42.8°F (6°C).	In D and E zones, the priority is given to air volume selection setup of remote controller.



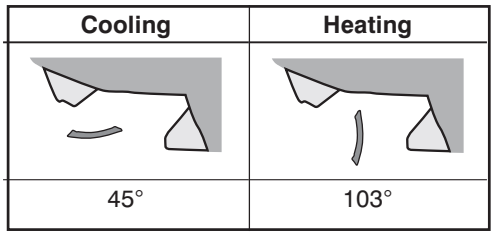
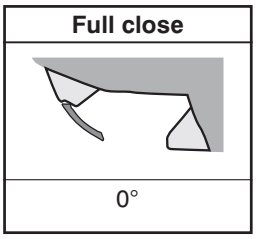
<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>8</td><td>Freeze preventive control
(Low temperature release)</td><td>1) The cooling operation (including Dry operation) is performed as follows based on the detected temperature of Tc sensor or Tcj sensor.
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 [I] 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 41°F (5°C) to 53.6°F (12°C) until [I] zone is detected and the indoor fan operates with [L] mode.
 

In he heating operation, if the 4-way valve cannot be reversed due to a trouble, etc. and keeps operation with the cooling cycle, the freeze preventive control works when the following conditions are satisfied. (However the control temperature for J zone is changed from 35.6°F (2°C) to 23°F (–5°C.))
<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 < 41°F (5°C)</td><td>Tcj:
Indoor heat exchanger sensor temperature

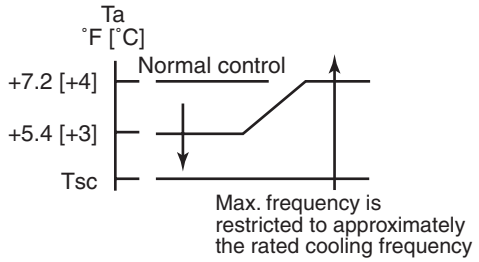
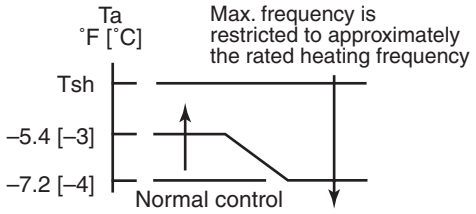
Tcn:
Tc temperature when 5 minutes elapsed after activation

Tc (n – 1):
Tc temperature at start time</td></tr>
<tr><td>9</td><td>High-temp. release control</td><td>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
<table><tr><th colspan="2">Control temp. °F (°C)</th></tr><tr><th>A</th><th>B</th></tr><tr><td>132.8 (56)
(129.2 (54))</td><td>125.6 (52)
(125.6 (52))</td></tr></table> 

NOTE:
When the operation has started or when Tc or Tcj < 86°F (30°C) at start of the operation or after operation start, temperature is controlled between values in parentheses of A and B.</td><td></td></tr>
</table>

No.	Item	Outline of specifications	Remarks
10	After-heat elimination	When heating operation stops, in some cases, the indoor fan operates with (L) for approx. 30 seconds.	
11	Louver control	1) During the first operation after power on, louver position is controlled automatically according to operation mode (COOL/HEAT).  2) When louver position is controlled by remote controller, the unit's microcomputer memorizes the position for use in the next operation. * The memorized louver position is cleared when power is turned off, and returns to the state of 1) above. 3) Louver position setting • Louver position can be set within the range below. **COOL/DRY** **HEAT/FAN**  4) Swing setting • Louver moves within the range beloW. **All operation modes**  5) When air conditioner opration stops, louver closes automatically. It keeps its position in the event of an alarm. 6) Louver tilts upward automatically during preparation for heating.	Louver angle: 0° (full close)  **Alarm:** A code number (except F08 and L31) appears on the remote controller and the indoor unit stops.

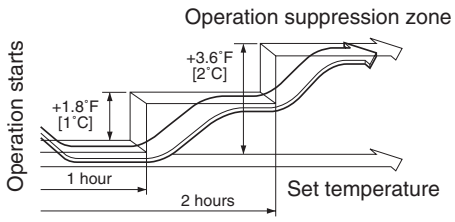
No.	Item	Outline of specifications	Remarks
12	Frequency fixed operation (Test run)	**<In case of wireless remote controller>** 1) Push [ON/OFF] ⏻ button. 2) Using [SELECT] MODE button, set [COOL] or [HEAT] to the operation mode to drive the air conditioner. 3) Set [HIGH ■■■■■] to the fan speed. 4) To change the temperature setting, repeat it 6 times to COOL and HEAT operations each. COOL: [62°F] (17°C) ↔ [64°F] (18°C) 62°F (17°C) → 64°F (18°C) → 62°F (17°C) → 64°F (18°C) → 62°F (17°C) → 64°F (18°C) → 62°F (17°C) → (test run) → ON/OFF HEAT: [86°F] (30°C) ↔ [84°F] (29°C) 86°F (30°C) → 84°F (29°C) → 86°F (30°C) → 84°F (29°C) → 86°F (30°C) → 84°F (29°C) → 86°F (30°C) → (test run) → ON/OFF • Change an operation setting within 3 seconds. • The error detection is performed as usual. • The frequency-fixed operation is performed. 5) To finish a test run, push [ON/OFF] ⏻ button.	
13	Filter sign display (Except wireless type) ∗ It is provided on the separately sold type TCB-AX21UL.	1) The operation time of the indoor fan is calculated, the filter reset signal is sent to the remote controller when the specified time (150H) has passed, and it is displayed on LCD. 2) 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 specified time has passed, and display on LCD disappears.	FILTER [▦] goes on.

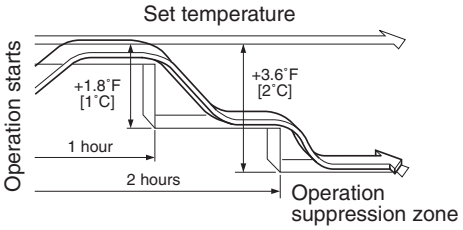
No.	Item	Outline of specifications	Remarks
14	Power-saving control	1) Power-saving opration is available in the AUTO mode. 2) The set temperature is corrected using various sensor data within the range where comfort is maintained. 3) By using various sensor data including room temp. Ta, outside air temp. To, fan speed, and indoor unit heat exchange sensor temp. Tc, 20 minutes data is averaged to calculate a set temperature correction value. 4) The set temperature is corrected every 20 minutes with the following shift range. Cooling: +1.5 to –1.0K Heating: –1.5 to +1.0K	
15	Max. frequency cut control	1) This control is operated by selecting [AUTO] operation mode. 2) COOL operation mode: It is controlled according to the following figure if To < 82.4°F (28°C).  3) HEAT operation mode: It is controlled according to the following figure if To > 59°F (15°C).  	
16	DC motor	1) When the fan operation has started, positioning of the stator and the rotor are performed. (Moves slightly with tap sound) 2) The motor operates according to the command from the indoor controller. **Notes)** • When the fan rotates while the air conditioner stops due to entering of outside air, etc, the air conditioner may operate while the fan motor stops. • When a fan lock is found, the air conditioner stops, and an error is displayed.	Check code [P12]

<table>
<tr><th>No.</th><th>Item</th><th>Outline of specifications</th><th>Remarks</th></tr>
<tr><td>17</td><td>Save operation (Wired remote controller specific operation)</td><td>1) Turn on SAVE button on the wired remote controller.
2) During operation of save operation, lights on the wired remote controller.
3) During save operation, the current release control is performed with the restriction ratio set in EEPROM on the outdoor unit.
4) The restriction ratio can be set by keeping SAVE button pushed for 4 seconds or more on the remote controller.
5) When validating the save operation, the next operation starts with save operation valid because contents are held even when operation stops, operation mode changes or power supply is reset.
6) The restriction ratio can be set by changing the setup data of CODE No. (DN) [C2] in the range of 50 to 100%
(every 1%, Setting at shipment: 75%).</td><td>Carry out setting operation during stop of the unit; otherwise the unit stops operation.
For the setup operation, refer to “How to set up contents of save operation” of “10. SETUP AT LOCAL SITE AND OTHERS”. (Page 131 to 138)</td></tr>
<tr><td>18</td><td>Auto restart</td><td>1) Object
It restarts the operation automatically after resetting the unexpected stop of power supply such as power failure.
2) Contents
After returning from a power failure, the auto restart function reads the operation status from EEPROM and then restarts the operation automatically according to the operation contents.
3) Setup of function exchange by wired remote controller
CODE No. (DN): 28
<table>
<tr><th>SET DATA</th><th>0000</th><th>0001</th></tr>
<tr><td>Auto restart</td><td>None</td><td>At shipment</td></tr>
</table></td><td></td></tr>
<tr><td>19</td><td>46°F (8°C) heating/
Frost protective operation
(Wired remote controller specific operations)</td><td>1) This function is intended for the cold latitudes and performs objective heating operation (46°F (8°C) heating operation).
2) This function is valid only for combination with the outdoor units.
3) Using the indoor CODE No. [D1] (1 bit), Valid/Invalid of this function is set up at the customer’s side.
∗ The setup by CODE No. is Invalid [0]/Valid [1] and Invalid [0] has been set at the shipment.
4) This operation is the heating operation which sets 46°F (8°C) as the setup temperature of the target.
5) This function starts operation by pushing temperature button (▼) during heating operation; besides by pushing (▲) button for 4 seconds or more after temperature reached the minimum set temperature.
6) To stop/release this operation, select and execute one from the following operations.
① Push (▲) button:
Heating operation (64°F (18°C) setting) continues.
② Push [START/STOP] button:
Air conditioner stops.
(Heating 64°F (18°C) operation at the next start)
③ Push MODE :
Other operation mode is selected and the operation continues.
7) As the setup temperature is 46°F (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.
8) The settings of the air direction and air volume are changeable during this operation.
9) The indoor fan stops to protect the compressor for 2 minutes after start of heating operation (Thermo-ON) by this function.</td><td>In a group connection, if there is even one combination with other unit, “This function is not provided.” is displayed.

The setup temperature jumps from [18] to [8].</td></tr>
</table>

No.	Item	Outline of specifications	Remarks
20	Hi POWER operation (Wireless remote controller specific operations)	When you push the Hi POWER button during cooling, heating or AUTO, the air conditioner will start the following operation. • **Cooling operation** Performs the cooling operation at +1.8°F (1°C) lower than the setting temperature. Only when the fan speed before the Hi POWER operation is not high, the fan speed will be increased. • **Heating operation** Performs the heating operation at +3.6°F (2°C) higher than the setting temperature. Only when the fan speed before the Hi POWER operation is not high, the fan speed will be increased.	• [Hi POWER] Display
21	COMFORT SLEEP operation (Wireless remote controller specific operations)	When you push the COMFORT SLEEP button during cooling, heating or AUTO, the air conditioner will start the following operation. The fan speed display will indicate AUTO and low speed will be used. • **Cooling operation** In the operation suppression zone, where capacity is kept to the minimum, overcooling is prevented by raising the temperature setting by +1.8°F (1°C) after 1 hour and by +3.6°F (2°C) after 2 hours of operation. The room temperature is thus regulated between the operation suppression zone and the set temperature. When the OFF timer is simultaneously set, 1, 3, 5 and 9 hours appear by turns every pushing COMFORT SLEEP button and one of them can be selected for OFF timer. • **Heating operation** In the operation suppression zone, where capacity is kept to the minimum, overheating is prevented by lowering the temperature setting by +1.8°F (1°C) after 1 hour and by +3.6°F (2°C) after 2 hours of operation. The room temperature is thus regulated between the set temperature and the operation suppression zone. When the OFF timer is simultaneously set, 1, 3, 5 and 9 hours appear by turns every pushing COMFORT SLEEP button and one of them can be selected for OFF timer.	• [ ] display

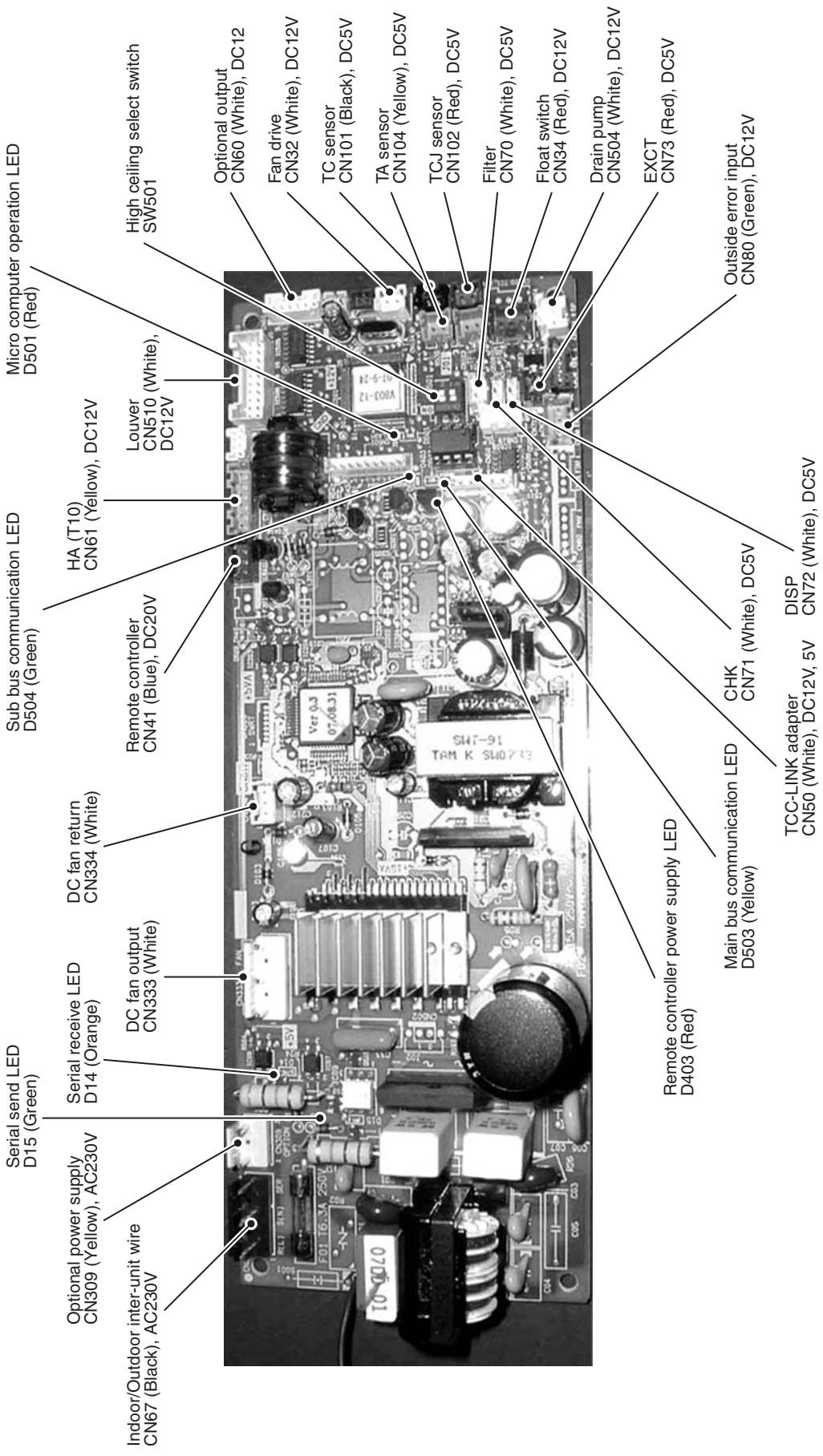




No.	Item	Outline of specifications	Remarks
22	PRESET operation (Wireless remote controller specific operations)	Start the air conditioner in the operation mode which you want the remote controller to memorize. 1) Push and hold the PRESET button for more than 3 seconds while the display flashes. The mark is indicated and the setting is memorized. • If you do not push the PRESET button within 3 seconds or if you push another button, the memory setting is cancelled. • Operation modes which can be memorized with the PRESET button are MODE, Temperatures, FAN, TIMER and Hi POWER. To operate the air conditioner with the setting memorized by the PRESET button. 1) Push the PRESET button briefly. The setting memorized will be indicated and the air conditioner operates with regards to the setting. • The lamp (green) on the display panel of the indoor unit goes on, and operation starts after approximately 3 minutes. • Initial setting: MODE : AUTO Temperature : 71°F (22°C)	• [Ⓟ] display
23	QUIET operation (Wireless remote controller specific operation)	When you push the QUIET button during cooling, heating, fan only or AUTO, the air conditioner will start the following operation. • The fan speed display will indicate AUTO and low speed will be used.	• [ ] display
24	SLEEP operation (Wireless remote controller specific operation)	When the OFF timer is set, 1, 3, 5 and 9 hours appear by turns every pushing SLEEP button and one of them can be selected for OFF timer.	

7-5. Indoor Print Circuit Board (4-Way Air Discharge Cassette Type)

<MCC-1570>

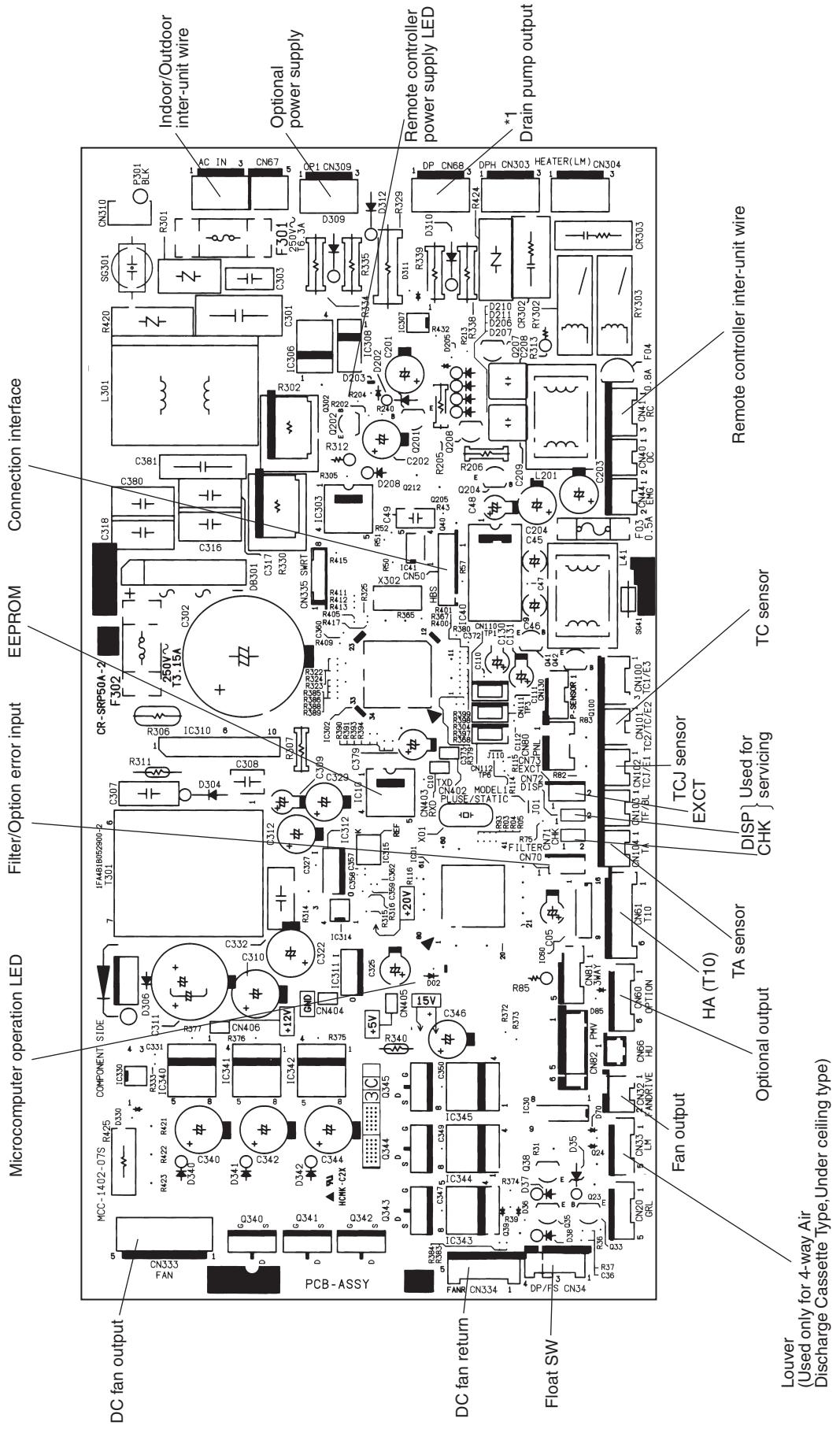


Function	Connector No.	Pin No.	Specifications	Remarks
Fan drive	CN32	1	DC12V	Setting at shipment: Interlock of ON by indoor unit operation, with OFF by stop operation * The single operation setting by FAN button on the remote controller is performed on the remote controller (DN [31] = 0000 → 0001)
		2	Output (Open collector)	
HA	CN61	1	ON/OFF input	HA ON/OFF input (J01:YES/NO=Pulse (At shipment from factory) /Static input selection)
		2	0V	
		3	Remote controller prohibited input	Permission/Prohibition of remote controller operation stop is performed by input.
		4	Operation output (Open collector)	Operation ON (Answer back of HA)
		5	DC12V	
		6	Warning output (Open collector)	Warning output ON
Option output	CN60	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)
		4	Cooling output (Open collector)	ON when operation mode is cooling system (COOL, DRY, Cooling/Heating automatic cooling)
		5	Heating output (Open collector)	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.
Outside error input	CN80	1	DC12V	Generate the warning code “L30” (continuously for 1 minute) and stop the operation forcibly.
		2	NC	
		3	Outside error input	
FILTER Option error / Humidifier setting (*)	CN70	1		Selection of option error input (Protective operation display of device attached to outside) or Humidifier setting input (Vaporizing + Drain pump ON) Humidifier is set at shipment from factory. * Setting of option error input is performed on the remote controller. (DN [2A] = 0002 → 0001)
		2	0V	
CHK Operation check	CN71	1		This check is used to check indoor operation. (Performs operation of indoor fan “H”, Louver horizontal and Drain pump ON without communication with outdoor and remote controller)
		2	0V	
DISP Exhibition mode	CN72	1		Communication is available by indoor unit and remote controller only.
		2	0V	
EXCT Demand	CN73	1	Demand input	Indoor unit forced thermostat OFF operation
		2	0V	

* This option is not provided to oversea models.

7-6. Indoor Print Circuit Board (Under Ceiling Type)

<MCC-1402>

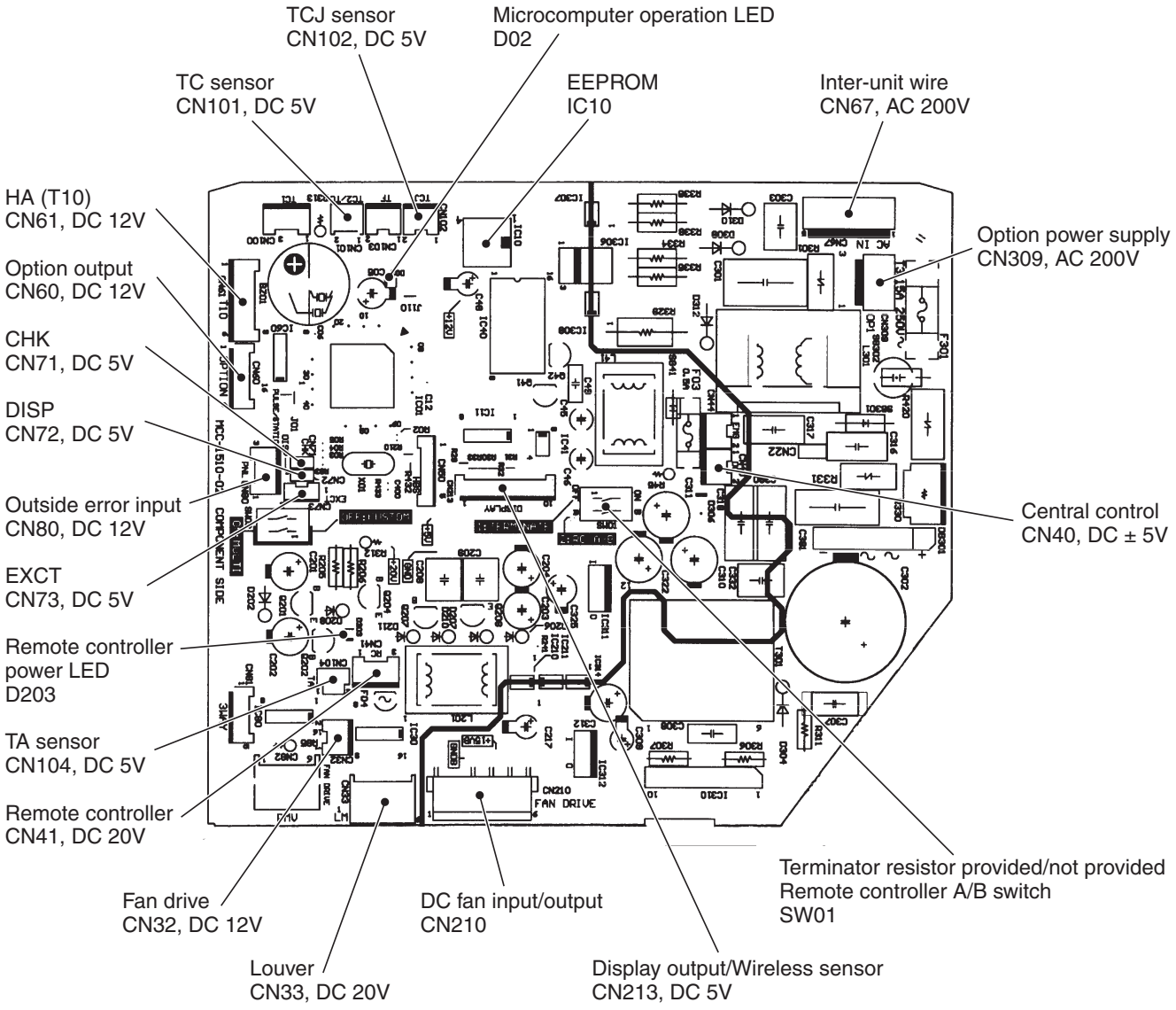


Indoor P.C. board optional connector specifications <MCC-1402>

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

7-7. Indoor Print Circuit Board (High Wall Type)

<MCC-1510>



High Wall Type P.C. board optional switch/Connector specifications

Function	Connector No.	Pin No.	Specifications	Remarks
Terminator resistor provided/Not provided	SW01	Bit 1	OFF: No terminator resistor, ON: Terminator resistor provided	Setup at shipment OFF: No terminator resistor. Only 1 unit is ON during central control by custom only.
Remote controller A/B		Bit 2	OFF: Remote controller A ON: Remote controller B	Setup at shipment OFF: Remote controller A
Fan output	CN32	1	DC12V	Setup at shipment: Linked operation of ON with operation of indoor unit and OFF with stop * The setup of single operation by FAN button on remote controller is executed from remote controller. (DN = 31)
		2	Output	
HA	CN61	1	Start/Stop input	HA Start/Stop input (J01: Provided/Not provided = Pulse (At shipment from factory)/Static input switch)
		2	0V (COM)	
		3	Handy prohibition input	Operation stop of handy remote controller is permitted / prohibited by input.
		4	Operation output	ON during operation (Answer back of HA)
		5	DC12V (COM)	
		6	Alarm output	ON during output of alarm
Optional output	CN60	1	DC12V (COM)	
		2	Defrost output	ON during defrosting of outdoor unit
		3	Thermo-ON output	ON when Real thermo. ON (Comp. ON)
		4	Cooling output	ON when operation mode is cooling line (Cool, Dry, Cooing/Heating AUTO cooling)
		5	Heating output	ON when operation mode is heating line (Heat, Cooling/Heating AUTO heating)
		6	Fan output	ON when indoor fan is ON
Outside error input	CN80	1	DC12V (COM)	At shipment from factory, the error code “L30” generates and optional error input to stop operation forcedly (DN:2A = 1) is controlled (Display of protection for devices attached to outside) by setup of outside error input (DN:2A = 2) for 1 minute. * Optional error input control is set up on the remote controller.
		2	DC12V (COM)	
		3	Filter/Option/Outside error input	
CHK Operation check	CN71	1	Check mode input	This check is used for operation check of indoor unit. (The specified operation such as indoor fan “H”, drain pump ON, etc. is executed without communication with outdoor unit or remote controller.)
		2	0V	
DISP Display mode	CN72	1	Display mode input	Display mode, communication is enabled by indoor unit and remote controller only. (When power supply is turned on.) Timer short (Usual)
		2	0V	
EXCT Demand	CN73	1	Demand input	Indoor unit forced thermo-OFF operation
		2	0V	

8. TROUBLESHOOTING

8-1. 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 wiring to the initial positions?
   c) Are connecting wires of indoor unit and remote controller correct?

2. Troubleshooting procedure

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

Trouble → **Confirmation of check code display** → **Check defective position and parts.**

NOTE :

For cause of a trouble, power conditions or malfunction/erroneous diagnosis of microcomputer due to outer noise is considered except the items to be checked.

If there is any noise source, change the cables of the remote controller to shield cables.

<Wireless remote controller type>

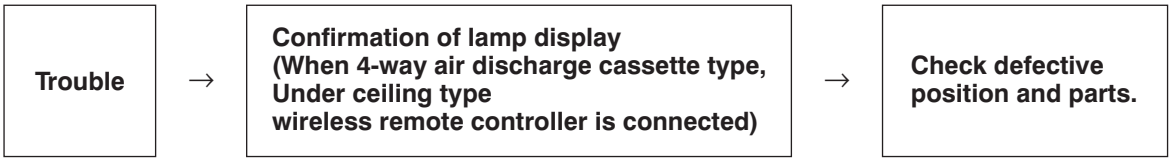
1. Before troubleshooting

1) Required tools/instruments
   - ⊕ and ⊖ screwdrivers, spanners, radio cutting pliers, nippers, etc.
   - Tester, thermometer, pressure gauge, etc.
2) Confirmation points before check
   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?
   b) Did you return the wiring to the initial positions?
   c) Are connecting wires between indoor unit and receiving unit correct?

2. Troubleshooting procedure

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

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



1) Outline of judgment

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

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

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

8-2. Troubleshooting (4-Way Air Discharge Cassette Type / Under Ceiling Type)

8-2-1. 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.

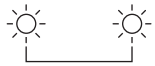
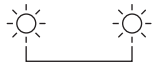
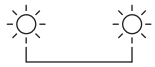
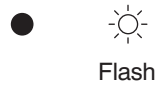
Method to judge the erroneous position by flashing indication on the display part of the indoor unit (sensors of the receiving part)

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, ☼ : Flash (0.5 sec.)

Lamp indication	Check code	Cause of trouble occurrence
Operation ● Timer ● Ready ● No indication at all	—	Power supply OFF or miswiring between receiving unit and indoor unit
Operation ☼ Flash Timer ● Ready ●	E01	Receiving error / Sending error } Receiving unit } Miswiring or wire connection error between receiving unit and indoor unit
	E02	
	E03	Communication stop } Miswiring or wire connection error between receiving unit and indoor unit
	E08	Duplicated indoor unit No. / Duplicated master units of remote controller } Setup error
	E09	
	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 header and follower)
Operation ● Timer ● Ready ☼ Flash	E04	Miswiring between indoor unit and outdoor unit or connection erorr (Communication stop between indoor and outdoor units)
Operation ● Timer ☼ Ready ☼ Alternate flash	P10	Overflow was detected. / Indoor DC fan error } Protective device of indoor unit worked.
	P12	
Operation ☼ Alternate flash Timer ● Ready ☼ Alternate flash	P03	Outdoor unit discharge temp. error / Outdoor high pressure system error } Protective device of outdoor unit worked. ∗1
	P04	
	P05	Negative phase detection error / Heat sink overheat error / Gas leak detection error } Outdoor unit error
	P07	
	P15	
	P19	4-way valve system error (Indoor or outdoor unit judged.)
	P20	Outdoor unit high pressure protection
	P22	Outdoor unit: Outdoor unit error / Outdoor unit: Inverter Idc operation / Outdoor unit: Position detection error } Protective device of outdoor unit worked. ∗1
	P26	
	P29	
	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.

Lamp indication	Check code	Cause of trouble occurrence
Operation Timer Ready  Alternate flash	F01 F02 F10	Heat exchanger sensor (TCJ) error Heat exchanger sensor (TC) error Heat exchanger sensor (TA) error } Indoor unit sensor error
Operation Timer Ready  Alternate flash	F04 F06 F07 F08 F12 F13 F15	Discharge temp. sensor (TD) error Temp. sensor (TE) error Temp. sensor (TL) error Temp. sensor (TO) error Temp. sensor (TS) error Temp. sensor (TH) error Temp. Sensor miswiring (TE, TS) } Sensor error of outdoor unit ∗1
Operation Timer Ready  Simultaneous flash	F29	Indoor EEPROM error
Operation Timer Ready  Simultaneous flash	F31	Outdoor EEPROM error
Operation Timer Ready  Flash	H01 H02 H03 H04 H06	Compressor break down Compressor lock Current detection circuit error Case thermostat worked. } Outdoor compressor system error ∗1 Outdoor unit low pressure system error
Operation Timer Ready  Simultaneous flash	L03 L07 L08 L09	Duplicated master indoor units There is indoor unit of group connection in individual indoor unit. } → AUTO address Unsetting of group address Missed setting (Unset indoor capacity) * If group construction and address are not normal when power supply turned on, automatically goes to address setup mode.
Operation Timer Ready  Simultaneous flash	L10 L20 L29 L30 L31	Unset model type (Service board) Duplicated indoor central addresses Outdoor unit and other error Outside interlock error Negative phase error } Others

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

8-2-2. Others (Other than Check Code)

Lamp indication	Check code	Cause of trouble occurrence
Operation Timer Ready  Simultaneous flash	—	During test run
Operation Timer Ready ○  Alternate flash	—	Disagreement of cool/heat (Automatic cool/heat setting to automatic cool/heat prohibited model)

8-2-3. 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	Sensor lamp indication				Representative defective position	Explanation of error contents	Air conditioner operation	
TCC-LINK central & Wired remote controller	Block indication						Automatic reset	Operation continuation
	Operation	Timer	Ready	Flash				
E03	◎	●	●		Regular communication error between indoor and remote controller	No communication from remote controller and network adapter (Also no communication from central control system)	○	×
E04	●	●	◎		Indoor/Outdoor serial error	There is error on serial communication between indoor and outdoor units	○	×
E08	◎	●	●		Duplicated indoor addresses ✧	Same address as yours was detected.	○	×
E10	◎	●	●		Communication error between indoor MCU	MCU communication error between main motor and micro computer	○	×
E18	◎	●	●		Regular communication error between indoor master and follower units	Regular communication between indoor header and follower units is impossible, Communication between twin master (main) and follower (sub) units is impossible.	○	×
F01	◎	◎	●	ALT	Indoor unit, Heat exchanger (TCJ) error	Open/short was detected on heat exchanger (TCJ).	○	×
F02	◎	◎	●	ALT	Indoor unit, Heat exchanger (TC) error	Open/short was detected on heat exchanger (TC).	○	×
F10	◎	◎	●	ALT	Indoor unit, Room temp. sensor (TA) error	Open/short was detected on room temp. sensor (TA).	○	×
F29	◎	◎	●	SIM	Indoor unit, other indoor P.C. board error	EEPROM error (Other error may be detected. If no error, automatic address is repeated.	×	×
L03	◎	●	◎	SIM	Duplicated setting of indoor group header unit ✧	There are multiple header units in a group.	×	×
L07	◎	●	◎	SIM	There is group cable in individual indoor unit. ✧	When even one group connection indoor unit exists in individual indoor unit.	×	×
L08	◎	●	◎	SIM	Unset indoor group address ✧	Indoor group address is unset.	×	×
L09	◎	●	◎	SIM	Unset indoor capacity	Capacity of indoor unit is unset.	×	×
L20	◎	○	◎	SIM	Duplicated central control system address	Duplicated setting of central control system address	○	×
L30	◎	○	◎	SIM	Outside error input to indoor unit (Interlock)	Abnormal stop by outside error (CN80) input	×	×
P01	●	◎	◎	ALT	Indoor unit, AC fan error	An error of indoor AC fan was detected. (Fan motor thermal relay worked.)	×	×
P10	●	◎	◎	ALT	Indoor unit, overflow detection	Float switch worked.	×	×
P12	●	◎	◎	ALT	Indoor unit, DC fan error	Indoor DC fan error (Over-current/Lock, etc.) was detected.	×	×
P19	◎	●	◎	ALT	4-way valve system error	In heating operation, an error was detected by temp. down of indoor heat exchanger sensor.	○	×
P31	◎	●	◎	ALT	Other indoor unit error	Follower unit in group cannot operate by warning from [E03/L03/L07/L08] of master unit.	○	×

✧ 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	Sensor lamp indication				Representative defective position	Explanation of error contents	Air conditioner operation	
Wired remote controller	Block indication						Automatic reset	Operation continuation
	Operation	Timer	Ready	Flash				
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	◎	●	●		Remote controller communication (Send) error	Signal cannot be sent to indoor unit.	—	—
E09	◎	●	●		Duplicated master remote controller	In 2-remote controller control, both were set as header. (Indoor master unit stops warning and follower unit continues operation.)	×	△

(Central control devices detected)

Check code indication	Sensor lamp indication				Representative defective position	Explanation of error contents	Air conditioner operation	
TCC-LINK central	Block indication						Automatic reset	Operation continuation
	Operation	Timer	Ready	Flash				
C05	Is not displayed. (Common use of remote controller, etc.)				Central control system communication (send) error	Signal sending operation of central control system is impossible. There are multiple same central devices. (AI-NET)	—	—
C06					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.

Error mode detected by indoor unit

Operation of diagnostic function				Judgment and measures
Check code	**Cause of operation**	**Status of air conditioner**	**Condition**	
E03	No communication from remote controller (including wireless) and communication adapter	Stop (Automatic reset)	Displayed when error is detected	1. 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	1. Outdoor unit does not completely operate. • Inter-unit wire check, correction of miswiring • Check outdoor P.C. board. Correct wiring of P.C. board. 2. When outdoor unit normally operates Check P.C. board (Indoor receiving / Outdoor sending).
E08	Duplicated indoor unit address	Stop	Displayed when error is detected	1. Check whether remote controller connection (Group/Individual) was changed or not after power supply turned on (Finish of group construction/Address check). * 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)
L03	Duplicated indoor master unit			
L07	There is group wire in individual indoor unit.			
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	1. Check outside devices. 2. Check indoor P.C. board.
P10	Float switch operation • Float circuit, Disconnection, Coming-off, Float switch contact error	Stop	Displayed when error is detected	1. Trouble of drain pump 2. Clogging of drain pump 3. Check float switch. 4. Check indoor P.C. board.
P12	Indoor DC fan error	Stop	Displayed when error is detected	1. Position detection error 2. Over-current protective circuit of indoor fan driving unit operated. 3. Indoor fan locked. 4. 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	1. Check 4-way valve. 2. Check 2-way valve and check valve. 3. Check indoor heat exchanger (TC/TCJ). 4. 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	1. Judge follower unit while master unit is [E03], [L03], [L07] or [L08]. 2. 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	1. Check indoor heat exchanger temp. sensor (TCJ). 2. 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	1. Check indoor heat exchanger temp. sensor (TC). 2. 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	1. Check indoor heat exchanger temp. sensor (TA). 2. Check indoor P.C. board.
F29	Indoor EEPROM error • EEPROM access error	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor EEPROM. (including socket insertion) 2. Check indoor P.C. board.
E10	Communication error between indoor MCU • Communication error between fan driving MCU and main MCU	Stop (Automatic reset)	Displayed when error is detected	1. Check 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	1. Check remote controller wiring. 2. Check indoor power supply wiring. 3. Check indoor P.C. board.

Error mode detected by remote controller or central controller

Operation of diagnostic function				Judgment and measures
Check code	Cause of operation	Status of air conditioner	Condition	
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 1. Check remote controller inter-unit wiring. 2. Check remote controller. 3. Check indoor power wiring. 4. 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 1. 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	1. 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	1. Check setting of central control system network address. (Network adapter SW01) 2. Check network adapter P.C. board.
— ∗3 Central controller (Send) C05 (Receive) C06	Communication circuit error of central control system (Detected by central controller side)	Continues (By remote controller)	Displayed when error is detected	1. Check communication wire / miswiring 2. Check communication (U3, U4 terminals) 3. Check network adapter P.C. board. 4. Check central controller (such as central control remote controller, etc.) 5. 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 (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

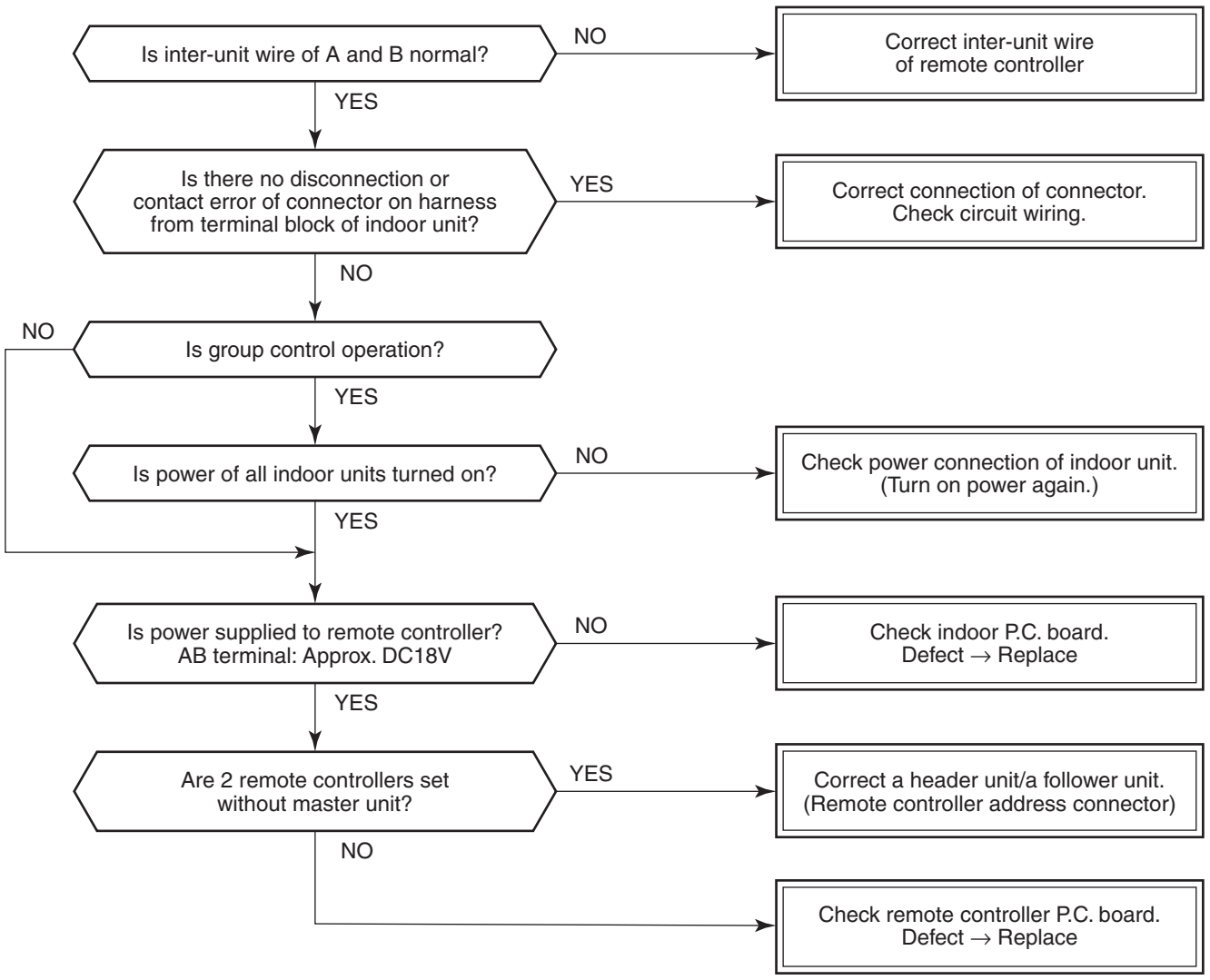
Operation of diagnostic function				Judgment and measures
Check code	**Cause of operation**	**Status of air conditioner**	**Condition**	
F04	Disconnection, short of discharge temp. sensor (TD)	Stop	Displayed when error is detected	1. Check discharge temp. sensor (TD). 2. Check outdoor P.C. board.
F06	Disconnection, short of outdoor temp. sensor (TE)	Stop	Displayed when error is detected	1. Check temp. sensor (TE). 2. Check outdoor P.C. board.
F07	Disconnection, short of outdoor temp. sensor (TL)	Stop	Displayed when error is detected	1. Check temp. sensor (TL). 2. Check outdoor P.C. board.
F12	Disconnection, short of suction temp. sensor (TS)	Stop	Displayed when error is detected	1. Check suction temp. sensor (TS). 2. Check outdoor P.C. board.
F15	Miss-mounting of outdoor temp. sensor (TE, TS)	Stop	Displayed when error is detected	1. Check temp. sensor (TE, TS). 2. Check outdoor P.C. board.
F08	Disconnection, short of outside temp. sensor (TO)	Continue	Displayed when error is detected	1. Check outside temp. sensor (TO). 2. Check outdoor P.C. board.
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	1. Check screw tightening between PC. Board and heat sink and check radiator grease. 2. 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	1. Check gas leak, recharge 2. Check full open of service valve. 3. Check PMV (Pulse Motor Valve). 4. Check broken pipe. 5. 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	1. Check operation of 4-way valve. 2. Check outdoor heat exchanger (TE), suction temp. sensor (TS). 3. Check indoor heat exchanger sensor (TC). 4. Check 4-way valve coil. 5. 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	1. Check power supply voltage. (AC208V / 230V ± 10%) 2. Overload operation of refrigerating cycle
H02	Compressor lock * Over-current detection after compressor start-up	Stop	Displayed when error is detected	1. Trouble of compressor (Lock, etc.): Replace compressor. 2. 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)

Operation of diagnostic function				Judgment and measures
Check code	**Cause of operation**	**Status of air conditioner**	**Condition**	
P03	Discharge temp. error * Discharge temp. (TD) over specified value was detected.	Stop	Displayed when error is detected	1. Check refrigerating cycle (Gas leak) 2. Trouble of electronic expansion valve 3. Check discharge temp. sensor (TD).
H04	Case thermostat operation * Abnormal overheat of compressor	Stop	Displayed when error is detected	1. Check case thermostat and connector. 2. Check gas leak, recharge 3. Check full open of service valve. 4. Check PMV (Pulse Motor Valve). 5. Check broken pipe.
P04	High-pressure SW error	Stop	Displayed when error is detected	• Check full-open of service valve. • Check outdoor fan error. • Check outdoor fan motor error. • Check clogging of outdoor PMV. • Check loading of indoor/outdoor heat exchangers. • Short-circuit of outdoor discharge/suction air • Check outdoor P.C. board (I/F) error. • Check error of fan system (air volume drop) at indoor side. • Check miswiring of communication line between indoor and outdoor. • Check overcharge of refrigerant.
P05	Power supply voltage error	Stop	Displayed when error is detected	1. Check power supply voltage. (AC208V / 230V ± 10%)
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	1. Check outdoor heat exchanger sensor (TL). 2. Check indoor heat exchanger sensor (TC, TCJ). 3. Check full open of service valve. 4. Check indoor/outdoor fan. 5. Check PMV (Pulse Motor Valve). 6. Check clogging and short circuit of indoor/outdoor heat exchanger. 7. Overcharge of refrigerant. Recharge
P22	Outdoor fan system error	Stop	Displayed when error is detected	1. Check lock of fan motor. 2. Check power supply voltage. (AC208V / 230V ± 10%) 3. Check outdoor P.C. board.
P26	Short-circuit error of compressor driving element	Stop	Displayed when error is detected	1. When performing operation while taking-off compressor wire, P26 error occurs. Check control P.C. board. 2. 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.

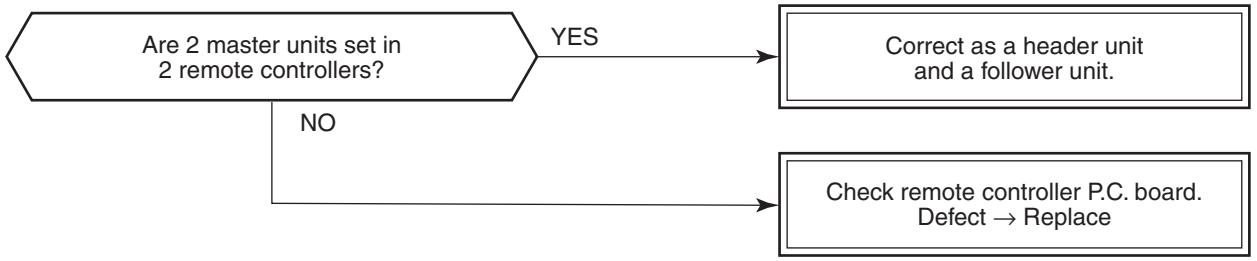
8-2-4. Diagnostic Procedure for Each Check Code (Indoor Unit)

Check code

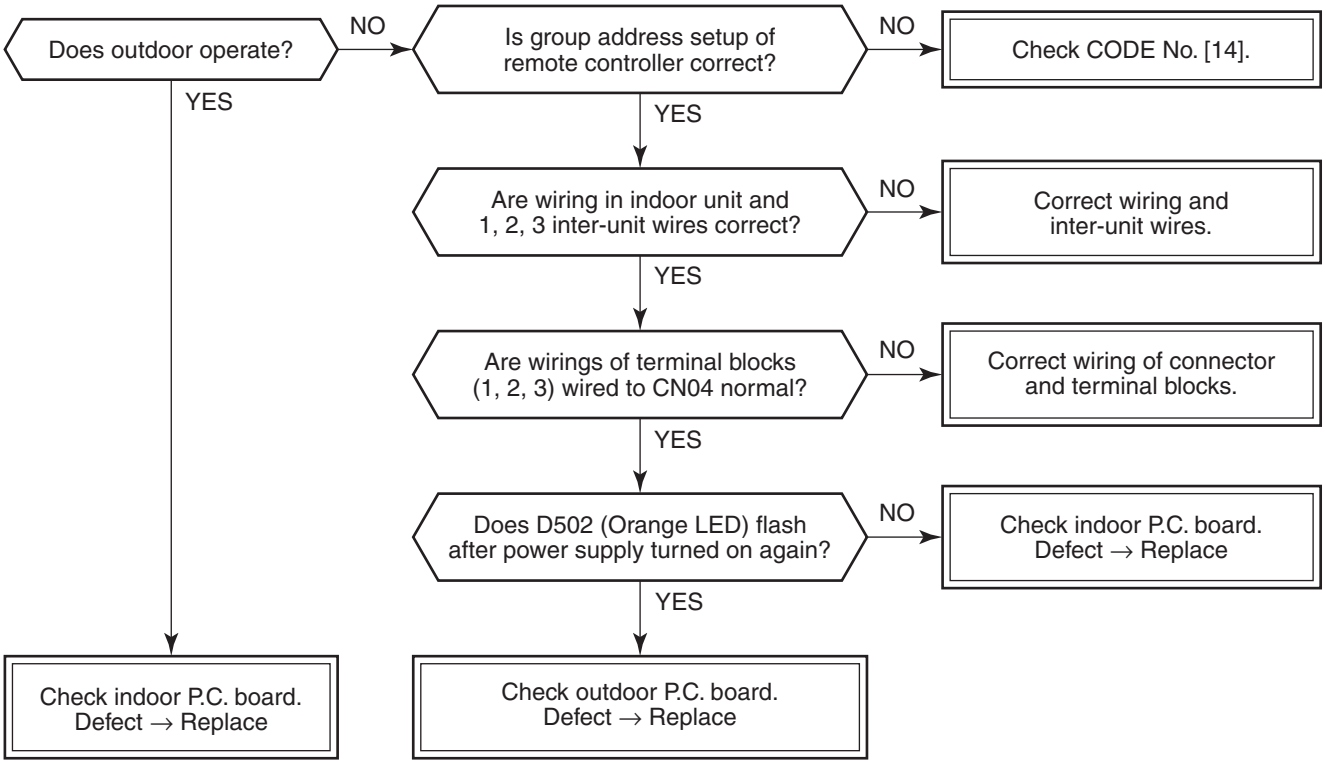
[E01 error]



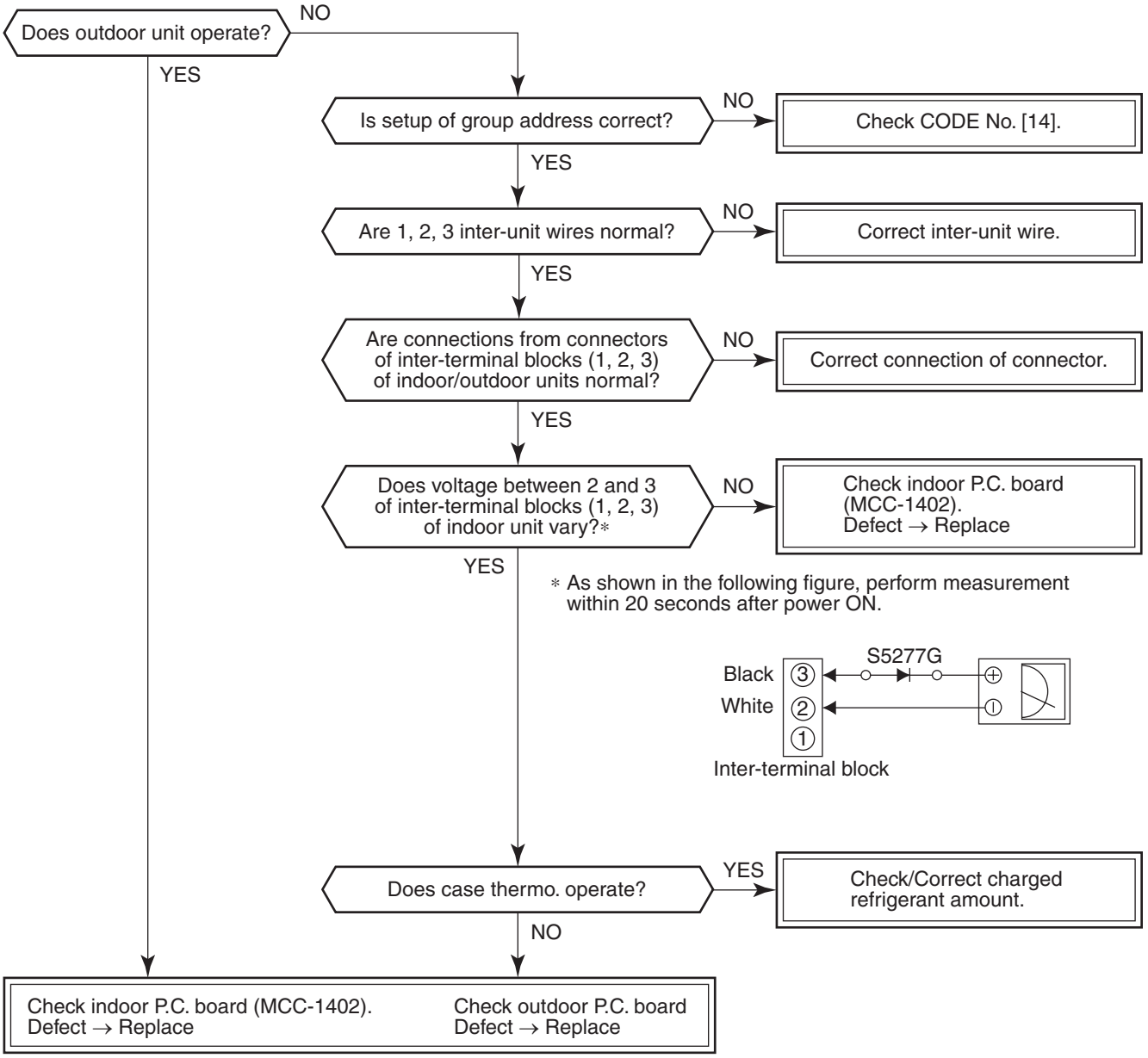
[E09 error]



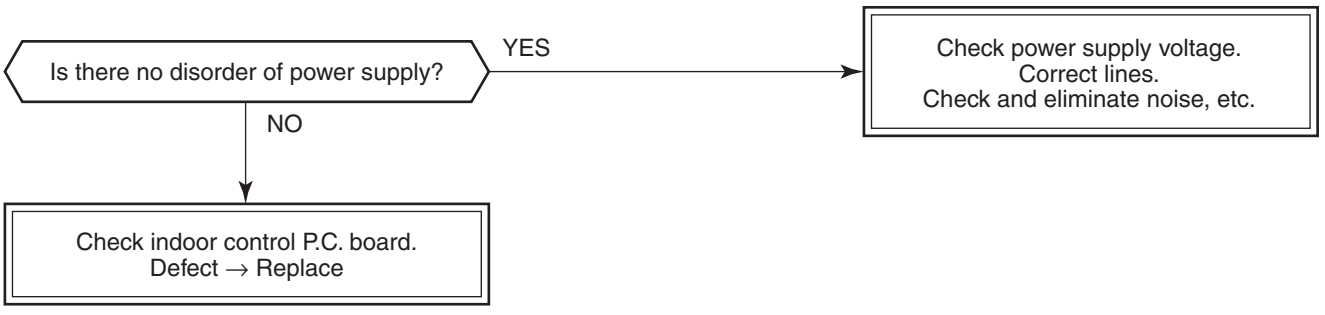
[E04 error] <In case of 4-Way Air Discharge Cassette Type>



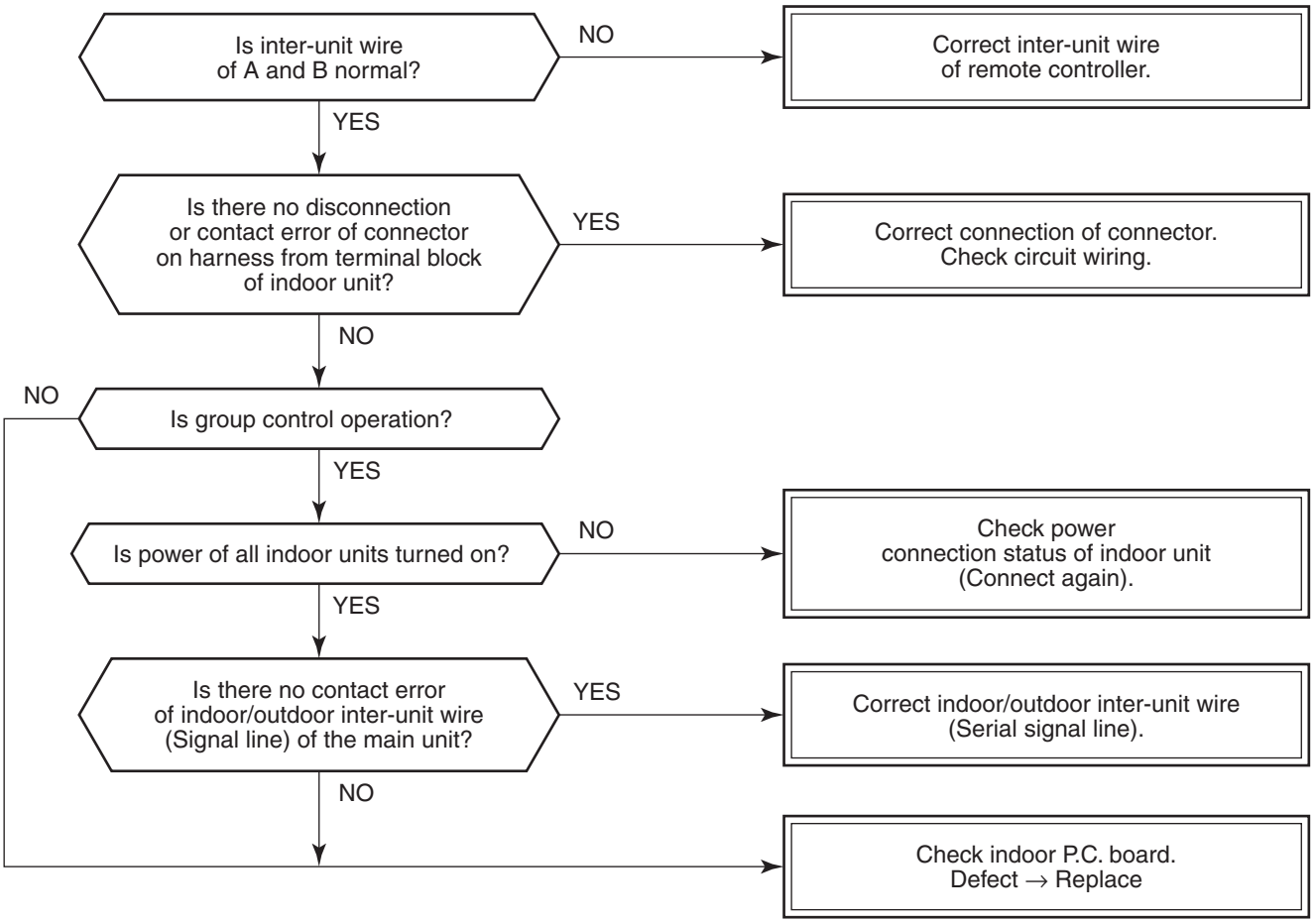
[E04 error] <In case of Under Ceiling Type>



[E10 error]



[E18 error]



[E08, L03, L07, L08 error]

E08: Duplicated indoor unit No.

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

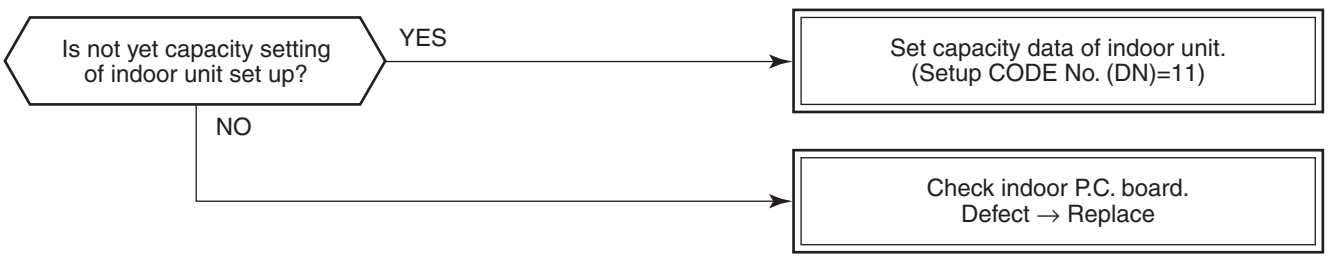
L07: There is 1 or more group address [Individual] in a group control.

L08: The indoor group address is unset. (**11. ADDRESS SETUP**)

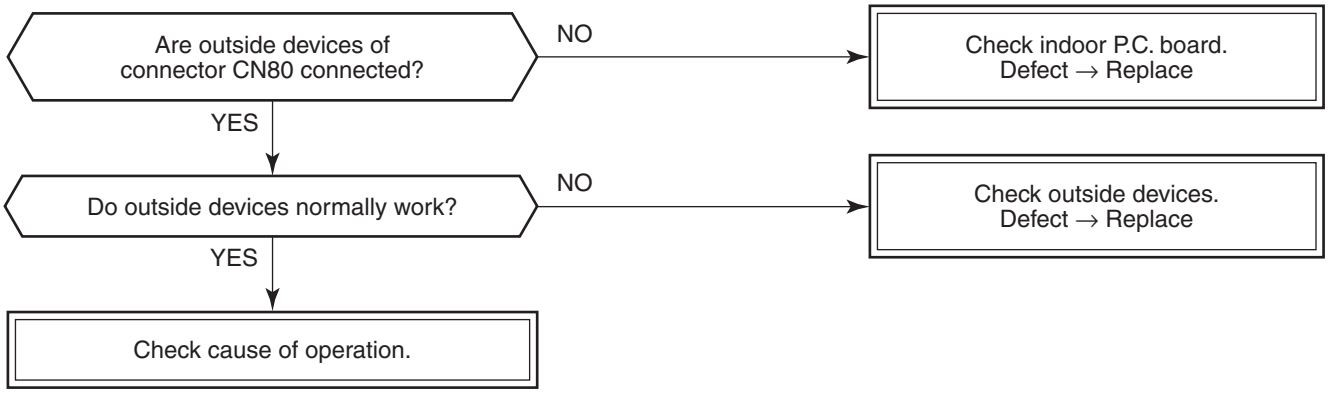
If the above error is detected when power supply turned on, the mode enters automatically in the automatic address set mode. (Check code is not output.)

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

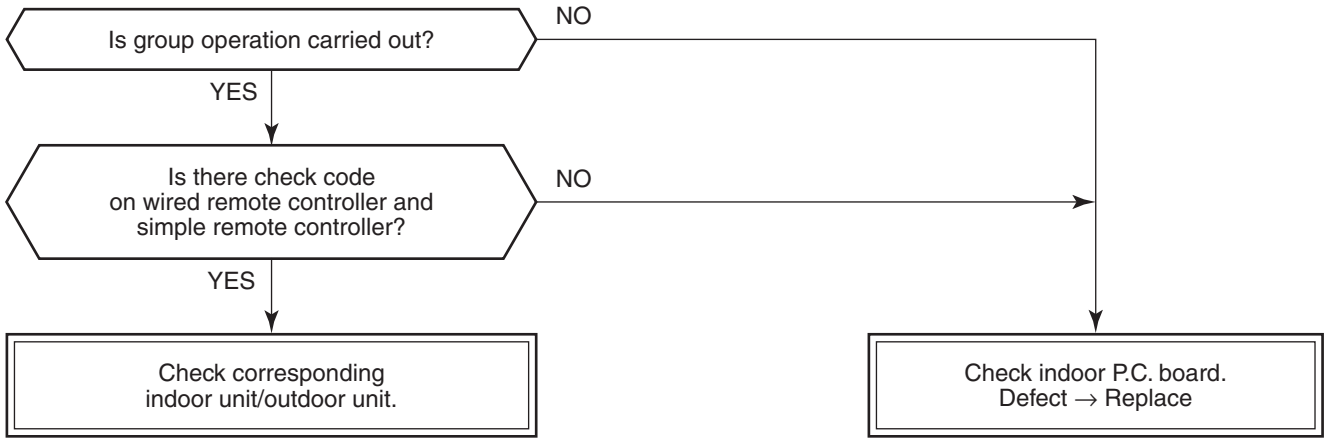
[L09 error]



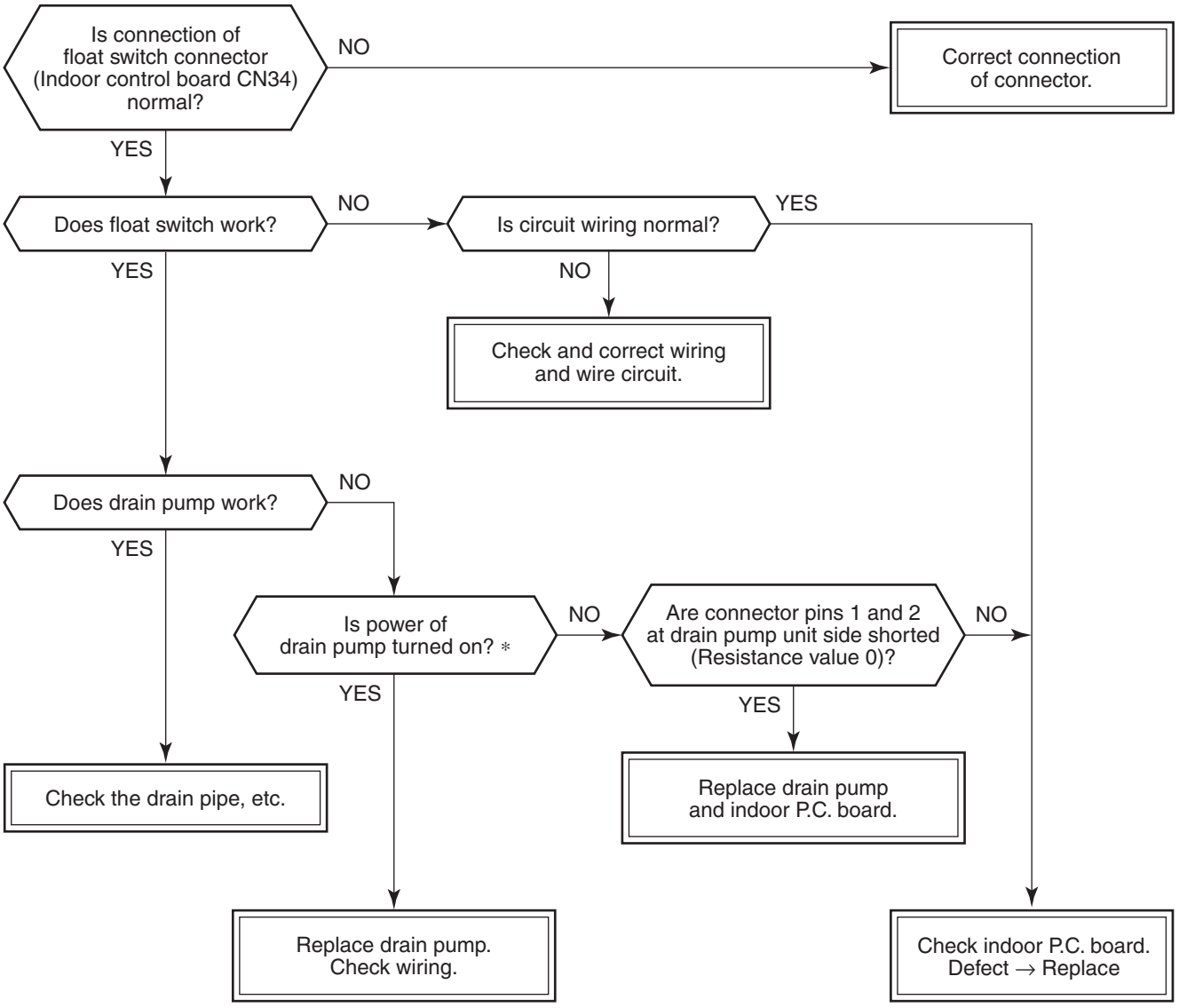
[L30 error]



[P30 error] (Central controller)

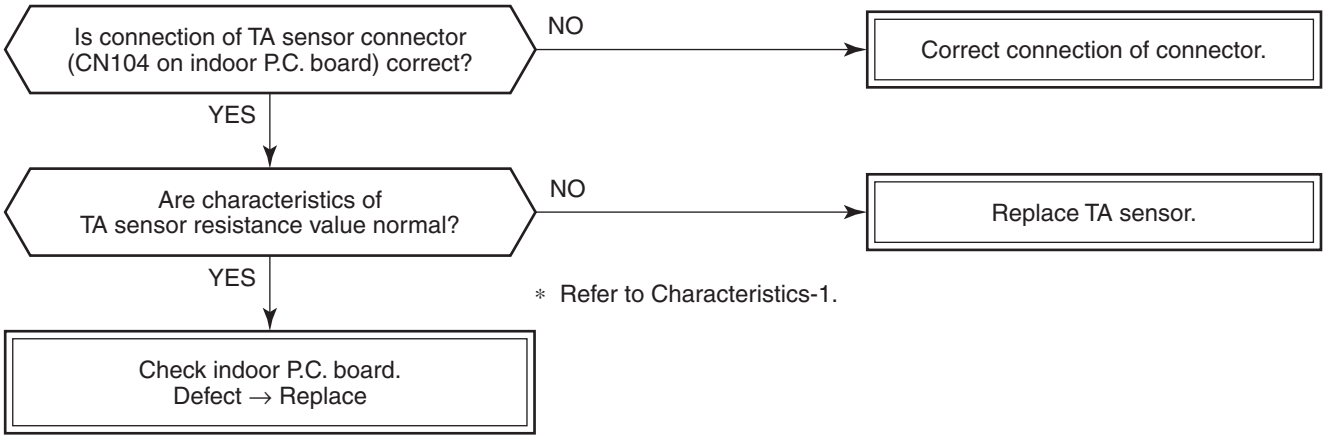


[P10 error]



∗ Check that voltage of 1-2 pin of 4-way: CN504, Under Ceiling: CN68 on the indoor P.C. board is +12V. (1 pin is plus (+).)

[F10 error]



∗ Refer to Characteristics-1.

[P12 error]

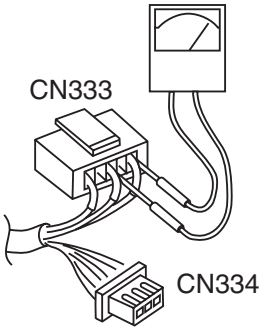
Turn off the power.

Is there no connection error or disconnection on connectors CN333 and CN334 of indoor unit P.C. board?

YES → Correct connection of connector.

NO

Remove connectors CN333 and CN334 of indoor unit P.C. board.



Does the fan rotate without trouble when handling the fan with hands?

NO → Replace indoor fan motor.

YES

Are resistance values between phases at fan motor connector CN333 motor side of indoor P.C. board correct? ∗1

Incorrect → Replace indoor fan motor.

Correct

∗1

- Are not coil windings between ① (Red lead) and ③ (White lead), between ③ (White lead) and ⑤ (Black lead), between ⑤ (Black lead) and ① (Red lead) opened or shorted?
  → The resistance should be the resistance value below.
  SP180, SP240 → Approx. 70 to 100Ω
  SP300, SP360, SP420 → 4-Way: Approx. 27 to 40Ω,
  Under Ceiling: Approx. 35 to 50Ω
- Is not grounded between cabinet and ①, ③, ⑤. → It should be 10MΩ or more.

Is resistance value of fan motor connector CN334 motor side of indoor P.C. board correct? ∗2

Incorrect → Replace indoor fan motor.

Correct

∗2

Resistance value confirmation of the fan motor position detection circuit

Is not status between ① (Yellow lead) and ② (Pink lead) opened or shorted?
→ The resistance should be approx. 5k to 20kΩ.

Is output of indoor fan motor position detection signal correct? ∗3

NO → Replace indoor fan motor.

YES

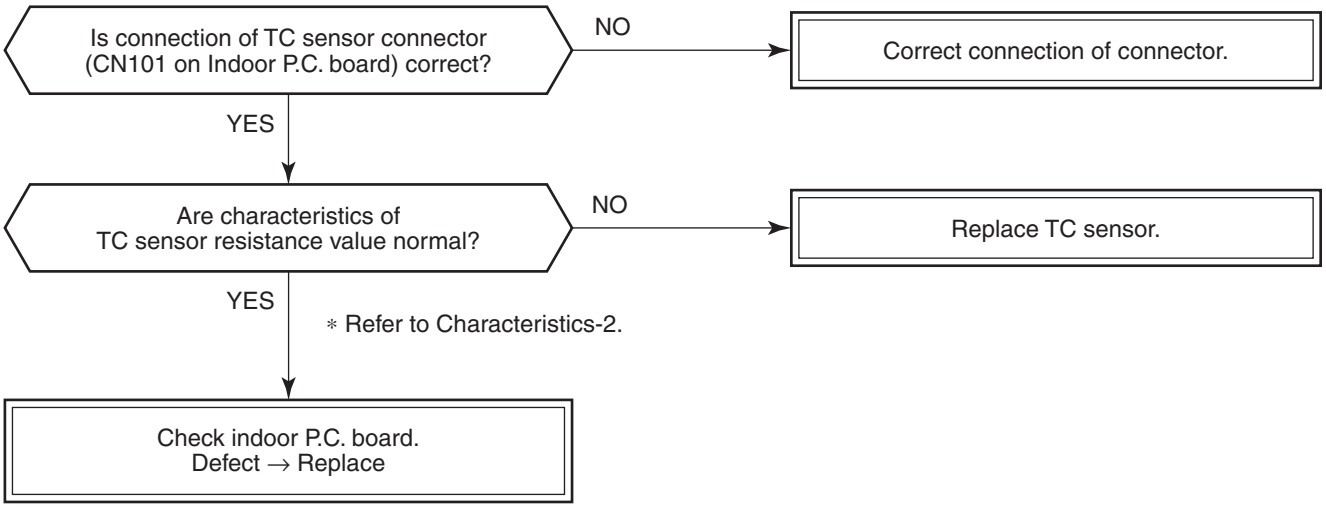
∗3

Confirmation of the fan motor position detection signal

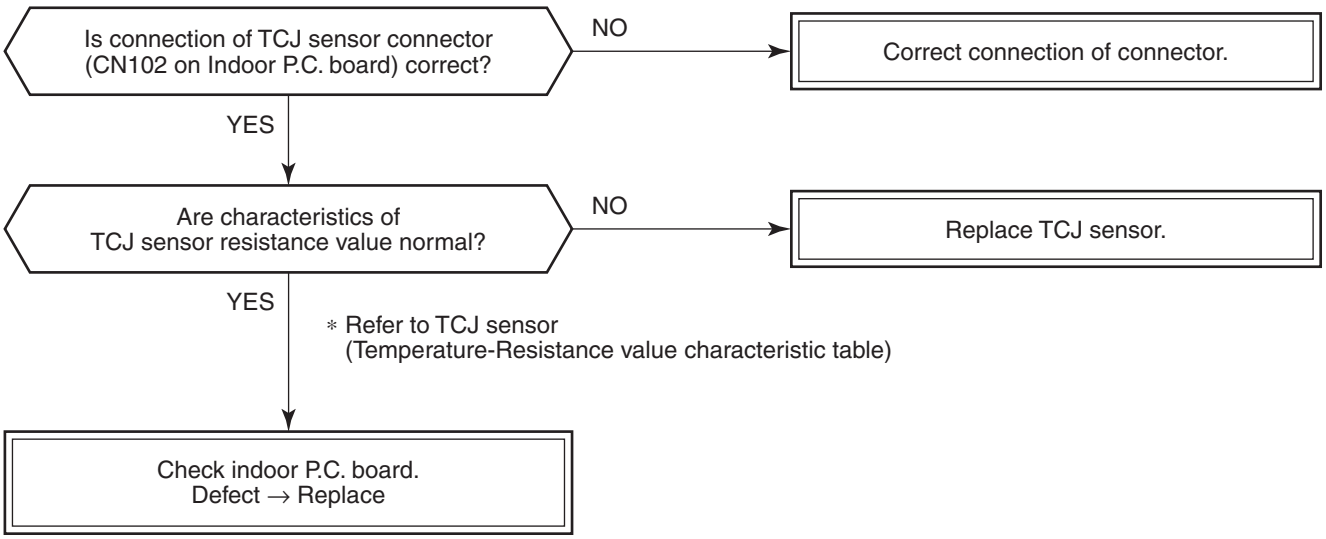
- Using a voltage tester, measure voltage between CN334 ① and ③ on the indoor P.C. board under condition that CN333 and CN334 are mounted and the power supply is turned on.
  → When rotating the fan slowly with hands, the pin voltage should shake between 0 and 5V.
- Between ② and ③: 5V

Check indoor P.C. board.
Defect → Replace

[F02 error]



[F01 error]



[E03 error] (Header indoor unit)

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

Check A and B remote controllers.

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.

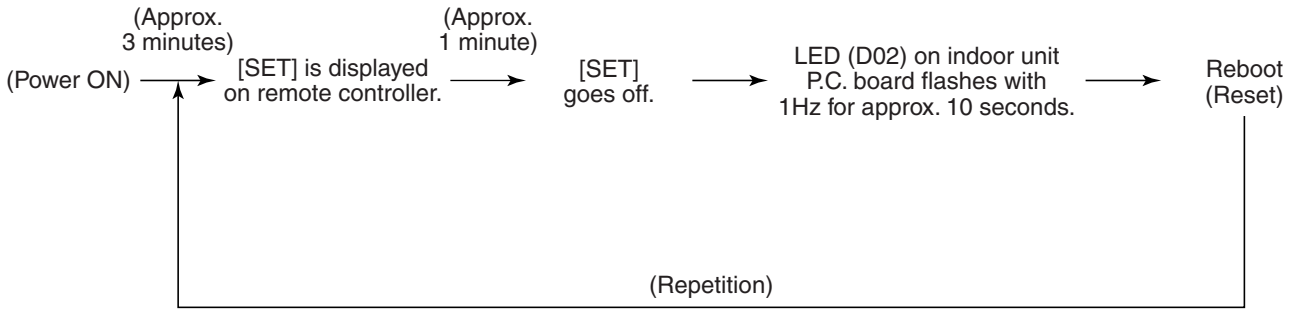
If these check codes generate during operation, the air conditioner stops.

[F29 error]

This check code indicates a detection error of 4-Way: IC503, Under Ceiling: 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 header 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 header unit detected [L03], [L07] or [L08] error.)

Temperature sensor Temperature – Resistance value characteristic table

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

Representative value

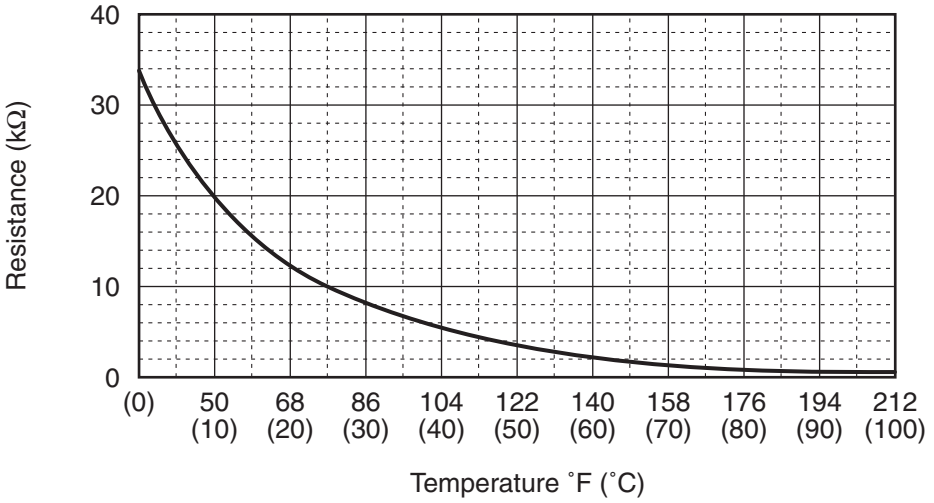
Temperature °F (°C)	Resistance value (kΩ)		
	(Minimum value)	(Standard value)	(Maximum value)
32 (0)	32.33	33.80	35.30
50 (10)	19.63	20.35	21.09
68 (20)	12.23	12.59	12.95
77 (25)	9.75	10.00	10.25
86 (30)	7.764	7.990	8.218
104 (40)	5.013	5.192	5.375
122 (50)	3.312	3.451	3.594
140 (60)	2.236	2.343	2.454
158 (70)	1.540	1.623	1.709
176 (80)	1.082	1.146	1.213
194 (90)	0.7740	0.8237	0.8761
212 (100)	0.5634	0.6023	0.6434

TD, TL sensors

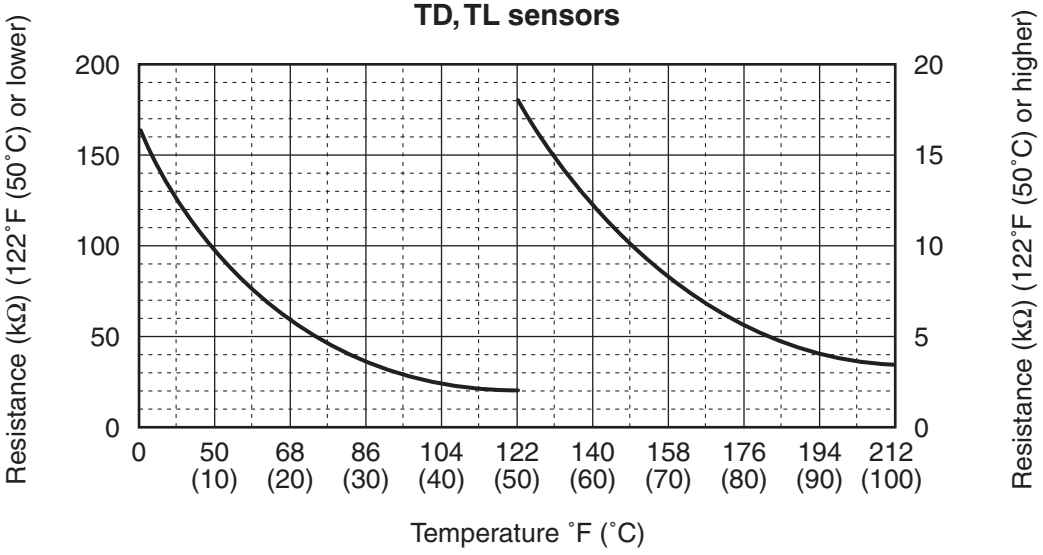
Representative value

Temperature °F (°C)	Resistance value (kΩ)		
	(Minimum value)	(Standard value)	(Maximum value)
32 (0)	150.5	161.3	172.7
50 (10)	92.76	99.05	105.6
68 (20)	58.61	62.36	66.26
77 (25)	47.01	49.93	52.97
86 (30)	37.93	40.22	42.59
104 (40)	25.12	26.55	28.03
122 (50)	17.00	17.92	18.86
140 (60)	11.74	12.34	12.95
158 (70)	8.269	8.668	9.074
176 (80)	5.925	6.195	6.470
194 (90)	4.321	4.507	4.696
212 (100)	3.205	3.336	3.468

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



TD, TL 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.

8-3. Troubleshooting (High Wall Type)

8-3-1. 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.

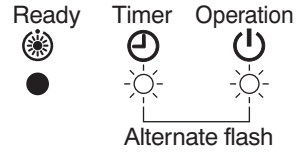
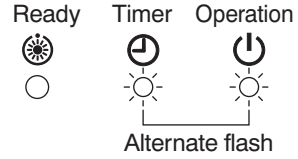
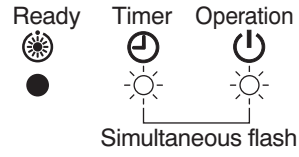
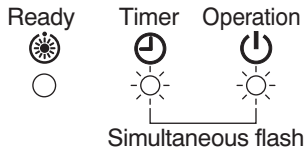
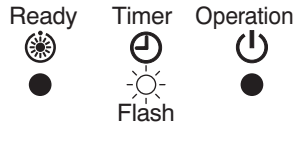
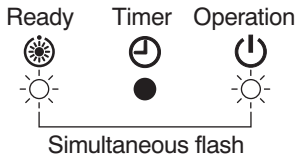
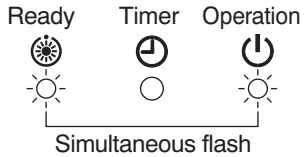
Method to judge the erroneous position by flashing indication on the display part of the indoor unit

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, ☼ : Flash (0.5 sec.)

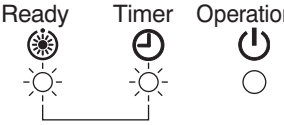
Lamp indication	Check code	Cause of trouble occurrence
Ready ● Timer ● Operation ● No indication at all	—	Power supply OFF or miswiring between receiving unit and indoor unit
Ready ● Timer ● Operation ☼ Flash	E01	Receiving error } Receiving unit } Miswiring or wire connection error between receiving unit and indoor unit
	E02	Sending error
	E03	Communication stop
	E08	Duplicated indoor unit No. } Setup error
	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)
Ready ☼ Timer ● Operation ● Flash	E04	Miswiring between indoor unit and outdoor unit or connection erorr (Communication stop between indoor and outdoor units)
Ready ☼ Timer ☼ Operation ● Alternate flash	P01	Indoor AC fan error } Protective device of indoor unit worked.
	P10	Overflow was detected.
	P12	Indoor DC fan error
Ready ☼ Timer ● Operation ☼ Alternate flash	P03	Outdoor unit discharge temp. error Outdoor high pressure system error Case thermostat worked Power supply error } Protective device of outdoor unit worked. ∗1
	P04	
	P05	Power supply error } Outdoor unit error
	P07	Heat sink overheat error
	P15	Gas leak detection error
	P19	4-way valve system error (Indoor or outdoor unit judged.)
	P20	Outdoor unit high pressure protection
	P22	Outdoor unit: Outdoor unit error } Protective device of outdoor unit worked. ∗1
	P26	Outdoor unit: Inverter Idc operation
	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.

Lamp indication	Check code	Cause of trouble occurrence
	F01	Heat exchanger sensor (TCJ) error } Indoor unit sensor error
	F02	Heat exchanger sensor (TC) error
	F10	Heat exchanger sensor (TA) error
	F04	Discharge temp. sensor (TD) error } Sensor error of outdoor unit ∗1
	F06	Temp. sensor (TL, TS, TE) error
	F07	Temp. sensor (TD) error
	F08	Temp. sensor (TO) error
	F12	Temp. sensor (TS) error
	F13	Heat sink sensor (TH) error
	F15	Temp. sensor miswiring (TE, TS)
	F29	Indoor EEPROM error
	F31	Outdoor EEPROM error
	H01	Compressor break down } Outdoor compressor system error ∗1
	H02	Compressor lock
	H03	Current detection circuit error } Power supply, outdoor P.C. board error
	H04	Case thermostat worked. } Compressor overheat, outdoor wiring error
	L03	Duplicated master indoor units There is indoor unit of group connection in individual indoor unit. → AUTO address ∗ If group construction and address are not normal when power supply turned on, automatically goes to address setup mode.
	L07	
	L08	Unsetting of group address
	L09	Missed setting (Unset indoor capacity)
	L10	Unset model type (Service board)
	L20	Duplicated indoor central addresses
	L29	Temp. sensor (TH) error EEPROM error Communication between outdoor MCU Heat sink overheat error Gas leak detection error 4-way valve error
	L30	Outside interlock error

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

8-3-2. Others (Other than Check Code)

Lamp indication	Check code	Cause of trouble occurrence
Ready Timer Operation  Simultaneous flash	—	During test run
Ready Timer Operation  Alternate flash	—	Disagreement of cool/heat (Automatic cool/heat setting to automatic cool/heat prohibited model, or setting of heating to cooling-only model)

8-3-3. 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	Sensor lamp indication				Representative defective position	Explanation of error contents	Air conditioner operation	
Wired remote controller	Block indication						Automatic reset	Operation continuation
	Ready	Timer	Operation	Flash				
E03	●	●	◎		Regular communication error between indoor and remote controller	No communication from remote controller and network adapter (Also no communication from central control system)	○	×
E04	◎	●	●		Indoor/Outdoor serial error	There is error on serial communication between indoor and outdoor units	○	×
E08	●	●	◎		Duplicated indoor addresses ✧	Same address as yours was detected.	○	×
E18	●	●	◎		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.	○	×
F01	●	◎	◎	ALT	Indoor unit, Heat exchanger (TCJ) error	Open/short was detected on heat exchanger (TCJ).	○	×
F02	●	◎	◎	ALT	Indoor unit, Heat exchanger (TC) error	Open/short was detected on heat exchanger (TC).	○	×
F10	●	◎	◎	ALT	Indoor unit, Room temp. sensor (TA) error	Open/short was detected on room temp. sensor (TA).	○	×
F29	●	◎	◎	SIM	Indoor unit, other indoor P.C. board error	EEPROM error (Other error may be detected. If no error, automatic address is repeated.	×	×
L03	◎	●	◎	SIM	Duplicated setting of indoor group master unit ✧	There are multiple master units in a group.	×	×
L07	◎	●	◎	SIM	There is group cable in individual indoor unit. ✧	When even one group connection indoor unit exists in individual indoor unit.	×	×
L08	◎	●	◎	SIM	Unset indoor group address ✧	Indoor group address is unset.	×	×
L09	◎	●	◎	SIM	Unset indoor capacity	Capacity of indoor unit is unset.	×	×
L20	◎	○	◎	SIM	Duplicated central control system address	Duplicated setting of central control system address	○	×
L30	◎	○	◎	SIM	Outside error input to indoor unit (Interlock)	Abnormal stop by outside error (CN80) input	×	×
P12	◎	◎	●	ALT	Indoor unit, DC fan error	Indoor DC fan error (Over-current/Lock, etc.) was detected.	×	×
P19	◎	●	◎	ALT	4-way valve system error	In heating operation, an error was detected by temp. down of indoor heat exchanger sensor.	○	×
P31	◎	●	◎	ALT	Other indoor unit error	Follower unit in group cannot operate by warning from [E03/L03/L07/L08] of master unit.	○	×

✧ 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	Sensor lamp indication				Representative defective position	Explanation of error contents	Air conditioner operation	
Wired remote controller	Block indication						Automatic reset	Operation continuation
	Ready	Timer	Operation	Flash				
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	●	●	◎		Remote controller communication (Send) error	Signal cannot be sent to indoor unit.	—	—
E09	●	●	◎		Duplicated master remote controller	In 2-remote controller control, both were set as master. (Indoor master unit stops warning and follower unit continues operation.)	×	△

(Central control devices detected)

Check code indication	Sensor lamp indication				Representative defective position	Explanation of error contents	Air conditioner operation	
TCC-LINK central	Block indication						Automatic reset	Operation continuation
	Ready	Timer	Operation	Flash				
C05	Is not displayed. (Common use of remote controller, etc.)				Central control system communication (send) error	Signal sending operation of central control system is impossible. There are multiple same central devices. (AI-NET)	—	—
C06					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.

Error mode detected by indoor unit

Operation of diagnostic function				Judgment and measures
Check code	**Cause of operation**	**Status of air conditioner**	**Condition**	
E03	No communication from remote controller (including wireless) and communication adapter	Stop (Automatic reset)	Displayed when error is detected	1. 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	1. Outdoor unit does not completely operate. • Inter-unit wire check, correction of miswiring • Check outdoor P.C. board. Correct wiring of P.C. board. 2. When outdoor unit normally operates Check P.C. board (Indoor receiving / Outdoor sending).
E08	Duplicated indoor unit address	Stop	Displayed when error is detected	1. Check whether remote controller connection (Group/Individual) was changed or not after power supply turned on (Finish of group construction/Address check). ∗ 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)
E18	Regular communication error between indoor aster and follower units and between main and sub units	Stop (Automatic reset)	Displayed when error is detected	1. Check remote controller wiring. 2. Check indoor power supply wiring. 3. 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	1. Check indoor heat exchanger temp. sensor (TCJ). 2. 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	1. Check indoor heat exchanger temp. sensor (TC). 2. 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	1. Check indoor heat exchanger temp. sensor (TA). 2. Check indoor P.C. board.
F29	Indoor EEPROM error • EEPROM access error	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor EEPROM. (including socket insertion) 2. Check indoor P.C. board.
L03	Duplicated indoor master unit	Stop	Displayed when error is detected	1. Check whether remote controller connection (Group/Individual) was changed or not after power supply turned on (Finish of group construction/Address check). ∗ 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)
L07	There is group wire in individual indoor unit.			
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	1. Check outside devices. 2. Check indoor P.C. board.
P12	Indoor DC fan error	Stop	Displayed when error is detected	1. Position detection error 2. Over-current protective circuit of indoor fan driving unit operated. 3. Indoor fan locked. 4. 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	1. Check 4-way valve. 2. Check 2-way valve and check valve. 3. Check indoor heat exchanger (TC/TCJ). 4. 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	1. Judge follower unit while master unit is [E03], [L03], [L07] or [L08]. 2. Check indoor P.C. board.

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

Operation of diagnostic function				Judgment and measures
Check code	**Cause of operation**	**Status of air conditioner**	**Condition**	
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 1. Check remote controller inter-unit wiring. 2. Check remote controller. 3. Check indoor power wiring. 4. 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 1. 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	1. 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	1. Check setting of central control system network address. (Network adapter SW01) 2. Check network adapter P.C. board.
— ∗3 Central controller (Send) C05 (Receive) C06	Communication circuit error of central control system (Detected by central controller side)	Continues (By remote controller)	Displayed when error is detected	1. Check communication wire / miswiring 2. Check communication (U3, U4 terminals) 3. Check network adapter P.C. board. 4. Check central controller (such as central control remote controller, etc.) 5. 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

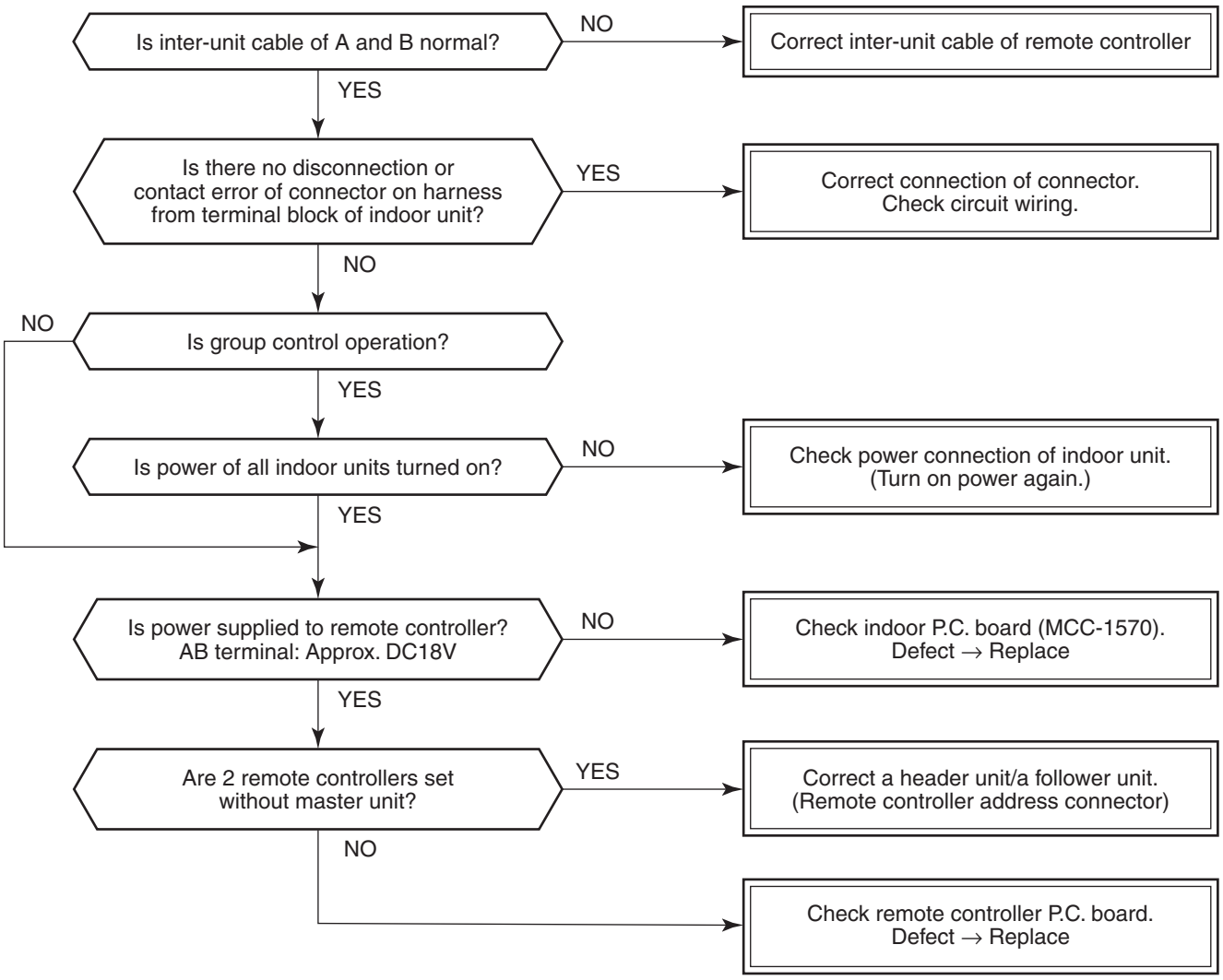
Operation of diagnostic function				Judgment and measures
Check code / Indoor unit / High Wall	Cause of operation	Status of air conditioner	Condition	
F04	Disconnection, short of discharge temp. sensor (TD)	Stop	Displayed when error is detected	1. Check discharge temp. sensor (TD). 2. Check outdoor P.C. board.
F06	Disconnection, short of outdoor temp. sensor (TE)	Stop	Displayed when error is detected	1. Check temp. sensor (TE). 2. Check outdoor P.C. board.
F07	Disconnection, short of outdoor temp. sensor (TL)	Stop	Displayed when error is detected	1. Check temp. sensor (TL). 2. Check outdoor P.C. board.
F08	Disconnection, short of outside temp. sensor (TO)	Continue	Displayed when error is detected	1. Check outside temp. sensor (TO). 2. Check outdoor P.C. board.
F12	Disconnection, short of suction temp. sensor (TS)	Stop	Displayed when error is detected	1. Check suction temp. sensor (TS). 2. Check outdoor P.C. board.
F13	Disconnection, short of heat sink temp. sensor (TH)	Stop	Displayed when error is detected	1. Check outdoor P.C. board.
F15	Miss-mounting of outdoor temp. sensor (TE, TS)	Stop	Displayed when error is detected	1. Check temp. sensor (TE, TS). 2. Check outdoor P.C. board.
F31	Outdoor P.C. EEPROM error	Stop	Displayed when error is detected	1. Check outdoor P.C. board.
H01	Compressor break down * Although operation has started, operation frequency decreases and operation stops.	Stop	Displayed when error is detected	1. Check power supply voltage. (AC208V/230V ±10V) 2. Overload operation of refrigerating cycle
H02	Compressor lock * Over-current detection after compressor start-up	Stop	Displayed when error is detected	1. Trouble of compressor (Lock, etc.): Replace compressor. 2. 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)
H04	Case thermostat operation * Abnormal overheat of compressor	Stop	Displayed when error is detected	1. Check case thermostat and connector. 2. Check gas leak, recharge 3. Check full open of service valve. 4. Check PMV (Pulse Motor Valve). 5. Check broken pipe.
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.

Operation of diagnostic function				Judgment and measures
Check code / Indoor unit / High Wall	Cause of operation	Status of air conditioner	Condition	
P03	Discharge temp. error * Discharge temp. (TD) over specified value was detected.	Stop	Displayed when error is detected	1. Check refrigerating cycle (Gas leak). 2. Trouble of electronic expansion valve. 3. Check discharge temp. sensor (TD).
P04	High pressure system error	Stop	Displayed when error is detected	1. Freezing cycle overload operation. 2. Check outdoor heat exchange sensor (TE). 3. Check outdoor P.C. board. 4. Check high-pressure switch and circuit.
P05	Power supply voltage error	Stop	Displayed when error is detected	1. Check power supply voltage. (AC208V/230V ±10V)
P07	Heat sink overheat error * Heat sink temp. sensor detected over specified temperature.	Stop	Displayed when error is detected	1. Check screw tightening between PC. Board and heat sink and check radiator grease. 2. 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	1. Check gas leak, recharge. 2. Check full open of service valve. 3. Check PMV (Pulse Motor Valve). 4. Check broken pipe. 5. 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	1. Check operation of 4-way valve. 2. Check outdoor heat exchanger (TE), suction temp. sensor (TS). 3. Check indoor heat exchanger sensor (TC). 4. Check 4-way valve coil. 5. Check PMV (Pulse Motor Valve).
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	1. Check outdoor heat exchanger sensor (TL). 2. Check indoor heat exchanger sensor (TC, TCJ). 3. Check full open of service valve. 4. Check indoor/outdoor fan. 5. Check PMV (Pulse Motor Valve). 6. Check clogging and short circuit of indoor/outdoor heat exchanger. 7. Overcharge of refrigerant. Recharge
P22	Outdoor fan system error	Stop	Displayed when error is detected	1. Check lock of fan motor. 2. Check power supply voltage. (AC208V/230V ±10V) 3. Check outdoor P.C. board.
P26	Short-circuit error of compressor driving element	Stop	Displayed when error is detected	1. When performing operation while taking-off compressor wire, P26 error occurs. Check control P.C. board. 2. 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.

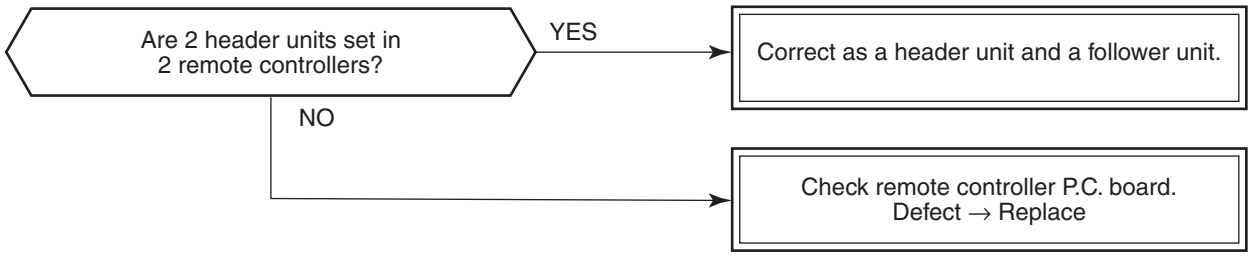
8-3-4. Diagnostic Procedure for Each Check Code (Indoor Unit)

Check code

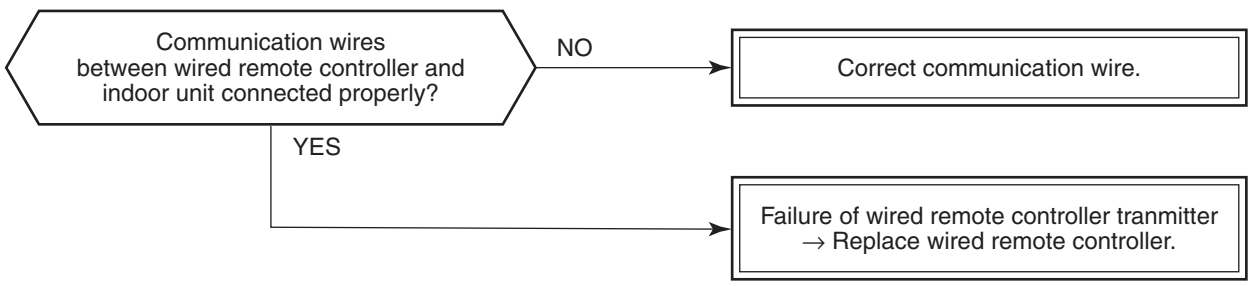
[E01 error]



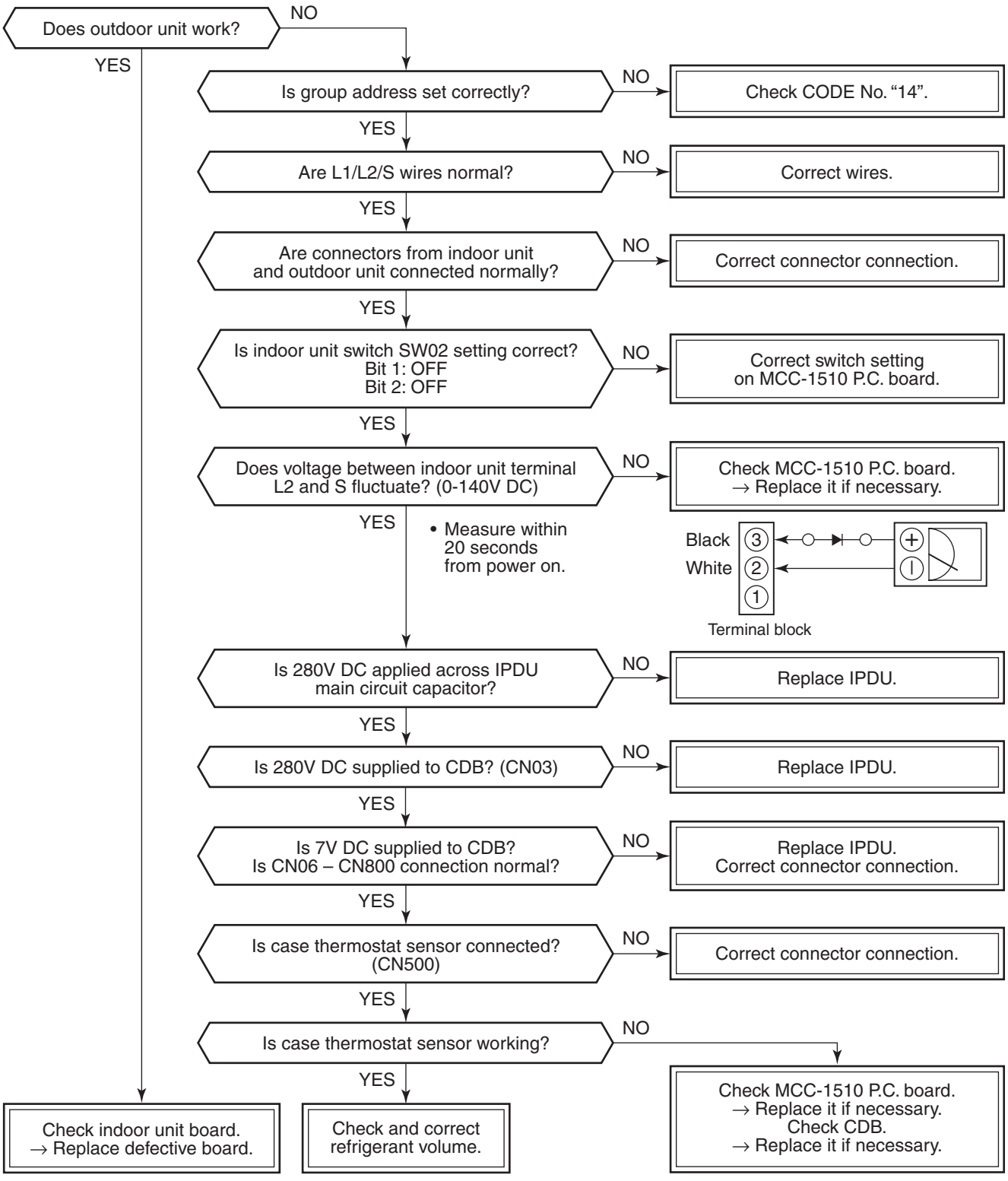
[E09 error]



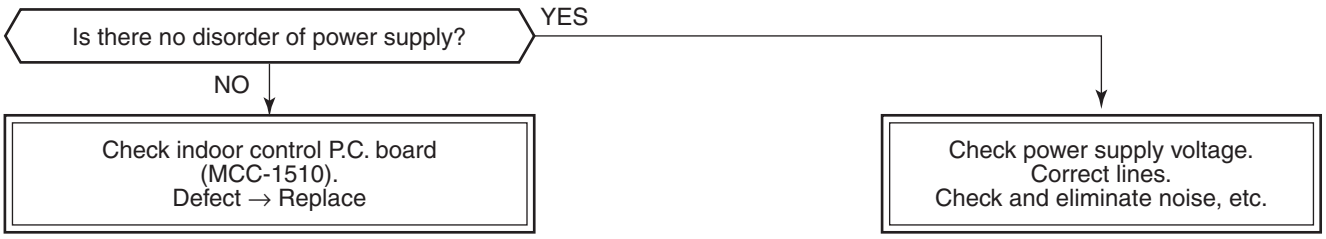
[E02 error]



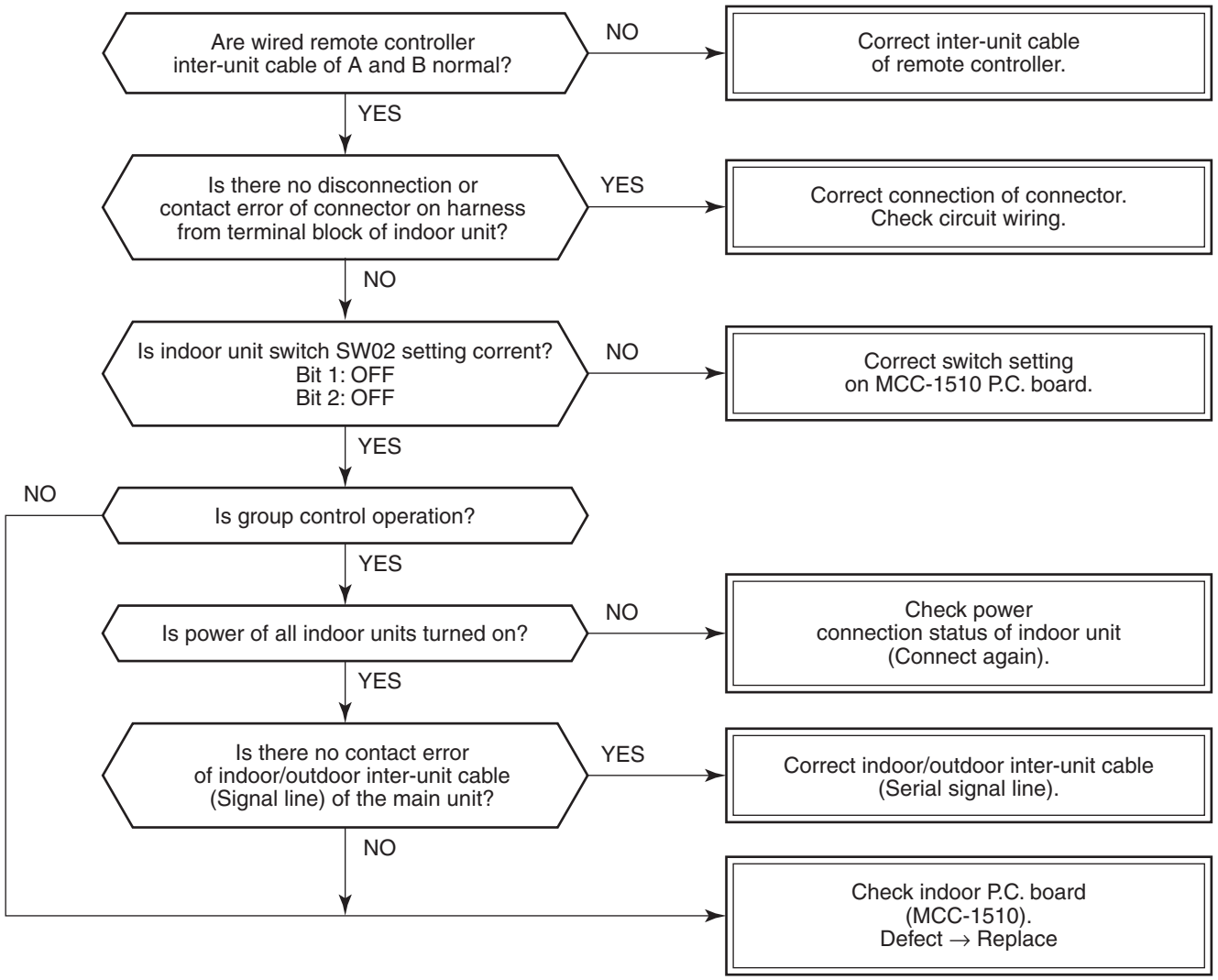
[E04 error]



[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.

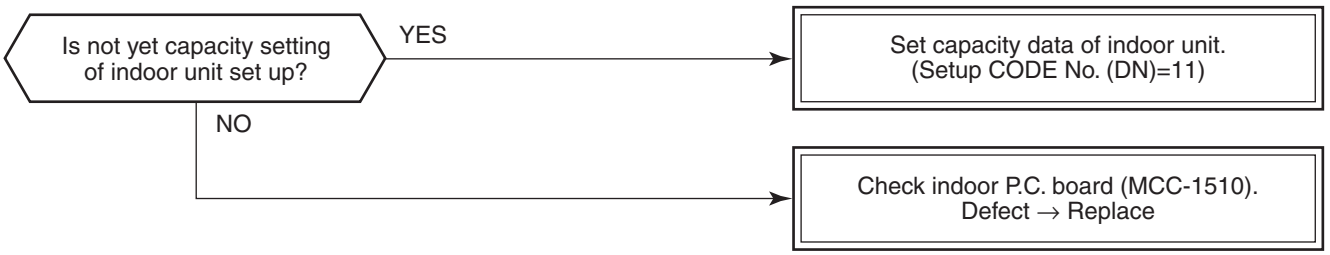
L07: There is 1 or more group address [Individual] in a group control.

L08: The indoor group address is unset. (**11. ADDRESS SETUP**)

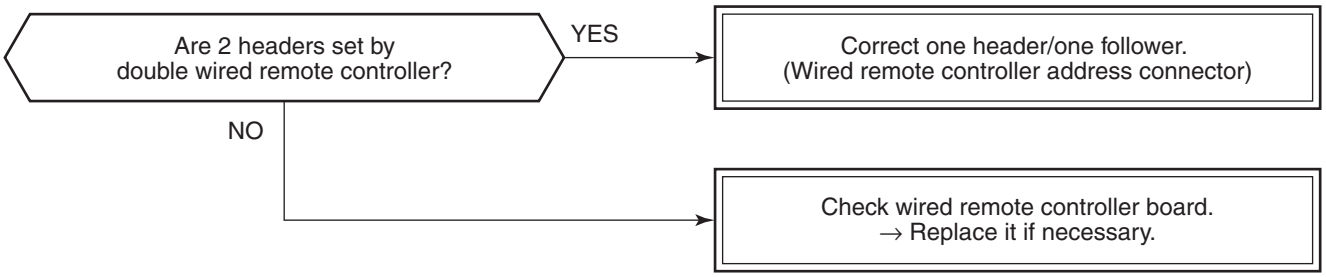
If the above error is detected when power supply turned on, the mode enters automatically in the automatic address set mode. (Check code is not output.)

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

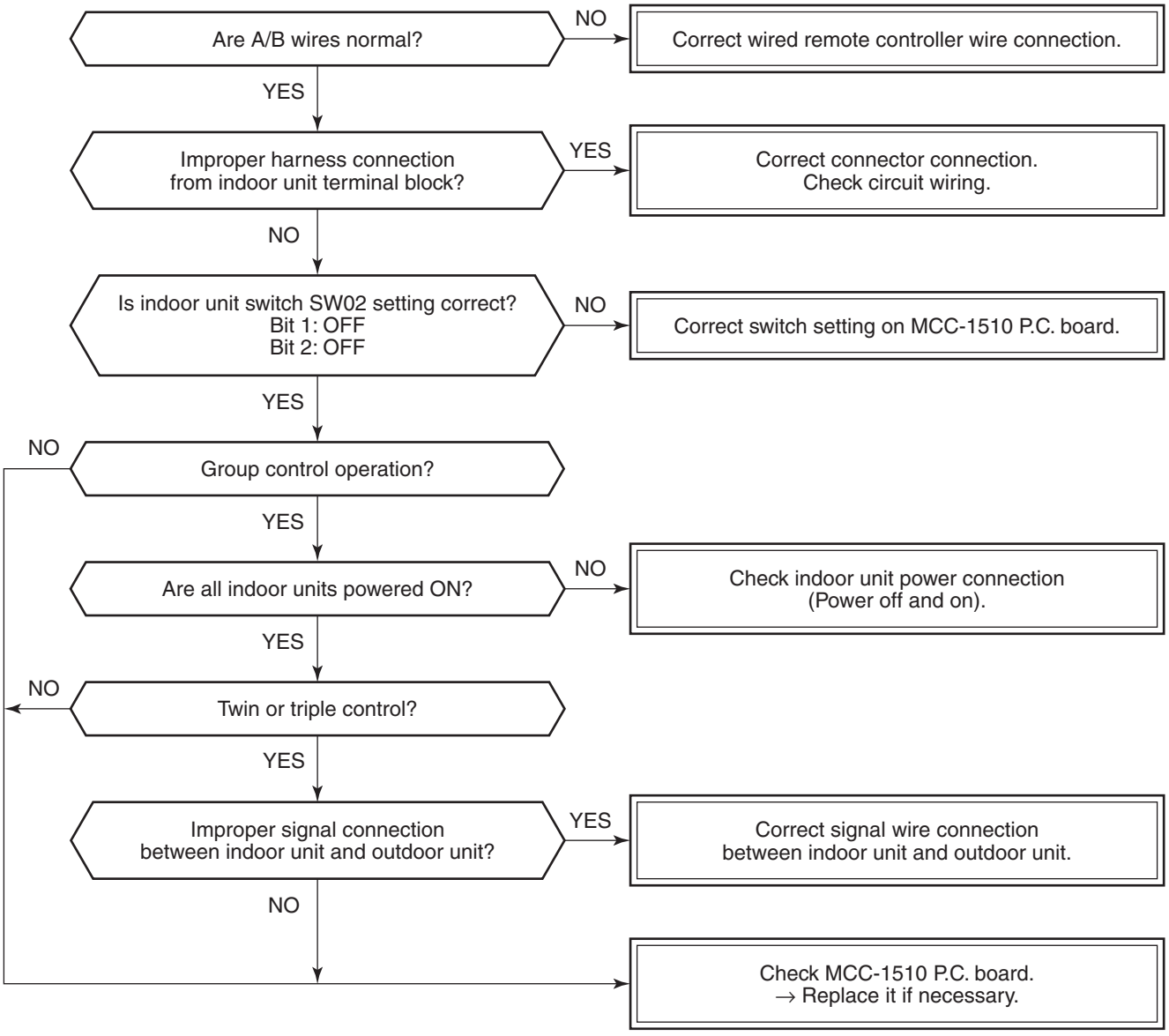
[L09 error]



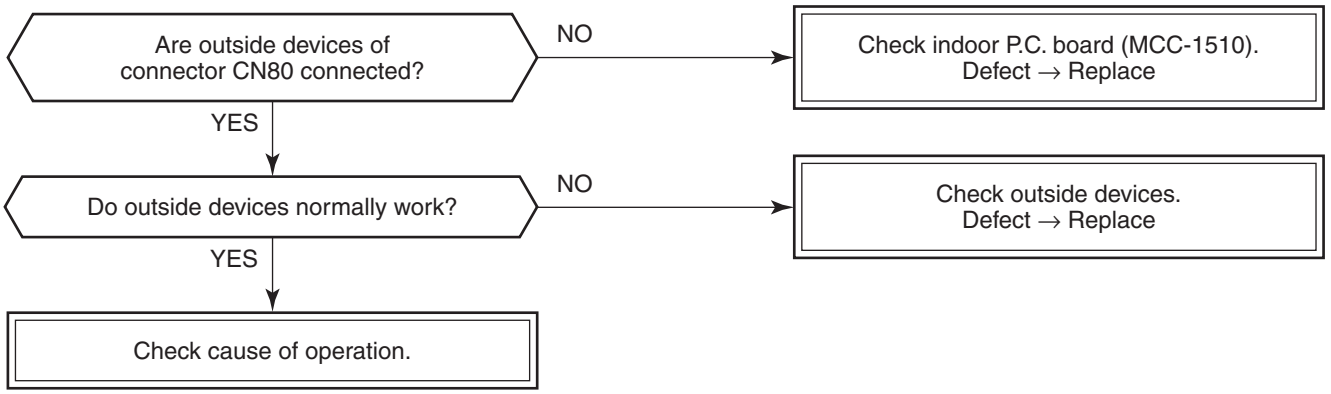
[E09 error]



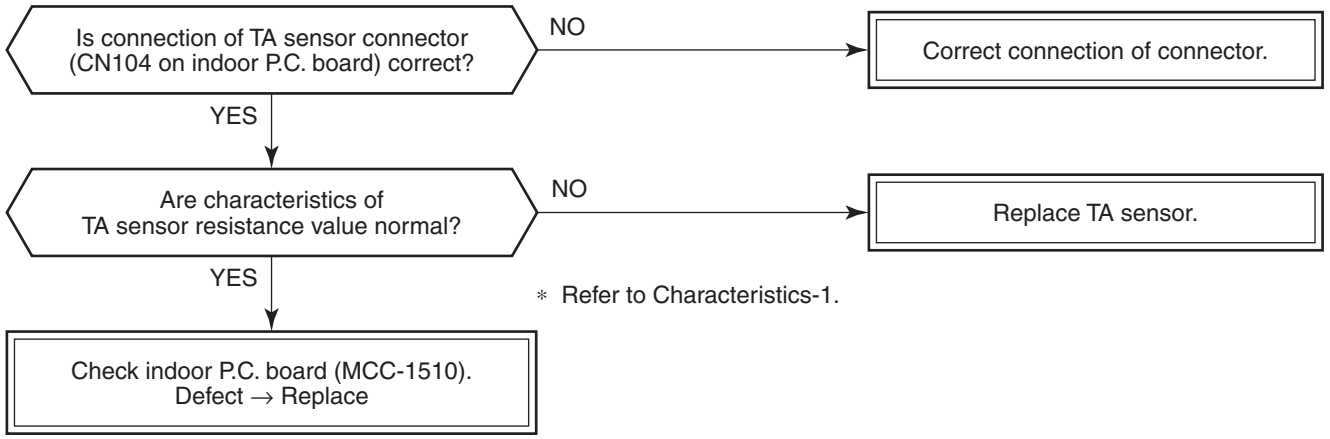
[E18 error]



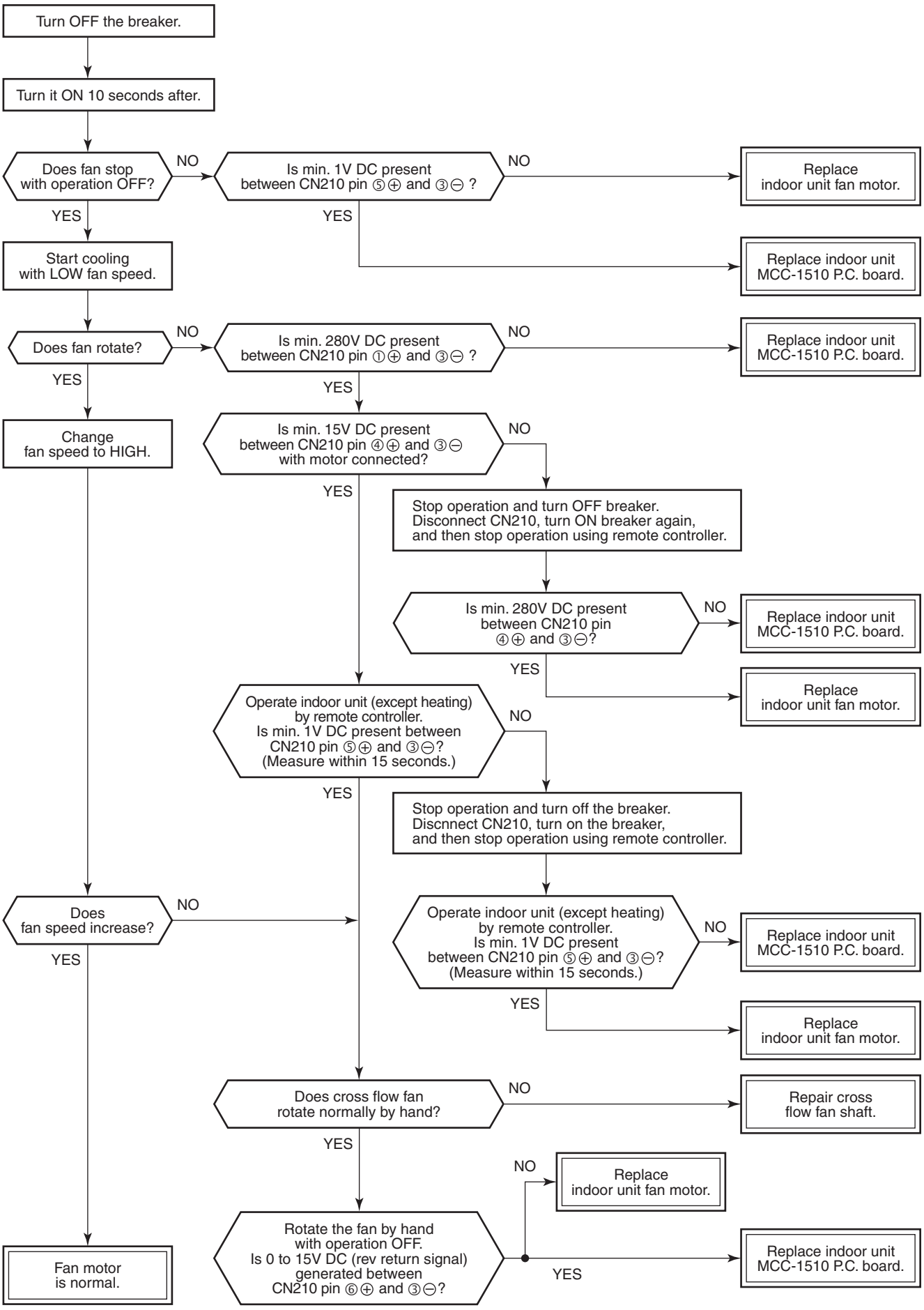
[L30 error]



[F10 error]

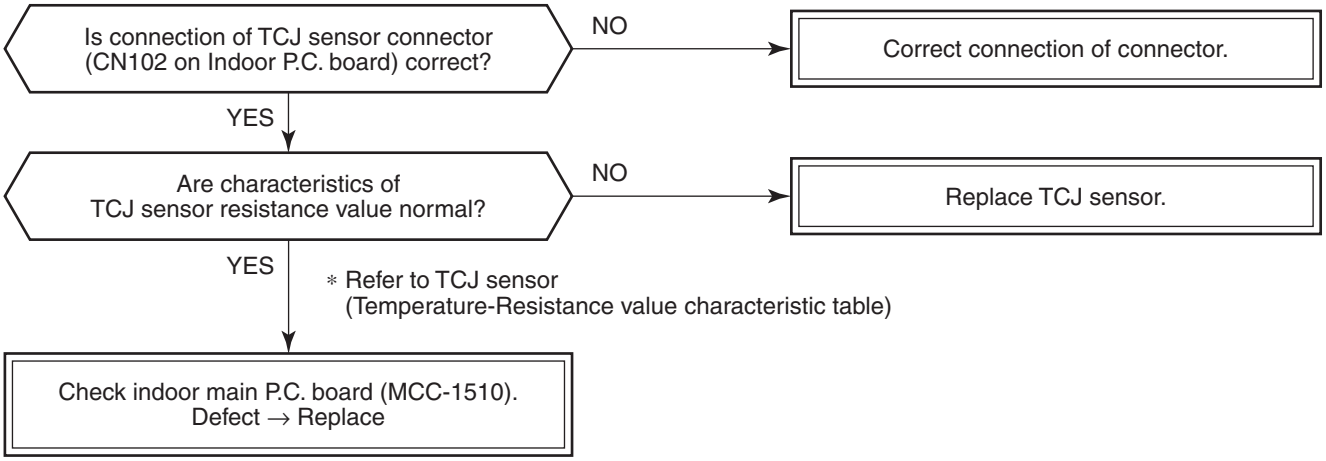


[P12 error]


Turn OFF the breaker.
Turn it ON 10 seconds after.
Does fan stop with operation OFF?
NO
Is min. 1V DC present between CN210 pin ⑤⊕ and ③⊖ ?
NO
Replace indoor unit fan motor.
YES
YES
Start cooling with LOW fan speed.
Replace indoor unit MCC-1510 P.C. board.
Does fan rotate?
NO
Is min. 280V DC present between CN210 pin ①⊕ and ③⊖ ?
NO
Replace indoor unit MCC-1510 P.C. board.
YES
YES
Change fan speed to HIGH.
Is min. 15V DC present between CN210 pin ④⊕ and ③⊖ with motor connected?
NO
YES
Stop operation and turn OFF breaker. Disconnect CN210, turn ON breaker again, and then stop operation using remote controller.
Is min. 280V DC present between CN210 pin ④⊕ and ③⊖?
NO
Replace indoor unit MCC-1510 P.C. board.
YES
Replace indoor unit fan motor.
Operate indoor unit (except heating) by remote controller. Is min. 1V DC present between CN210 pin ⑤⊕ and ③⊖? (Measure within 15 seconds.)
NO
YES
Stop operation and turn off the breaker. Discnnect CN210, turn on the breaker, and then stop operation using remote controller.
Does fan speed increase?
NO
Operate indoor unit (except heating) by remote controller. Is min. 1V DC present between CN210 pin ⑤⊕ and ③⊖? (Measure within 15 seconds.)
NO
Replace indoor unit MCC-1510 P.C. board.
YES
YES
Replace indoor unit fan motor.
Does cross flow fan rotate normally by hand?
NO
Repair cross flow fan shaft.
YES
NO
Replace indoor unit fan motor.
Rotate the fan by hand with operation OFF. Is 0 to 15V DC (rev return signal) generated between CN210 pin ⑥⊕ and ③⊖?
YES
Replace indoor unit MCC-1510 P.C. board.
Fan motor is normal.

[F02 error]

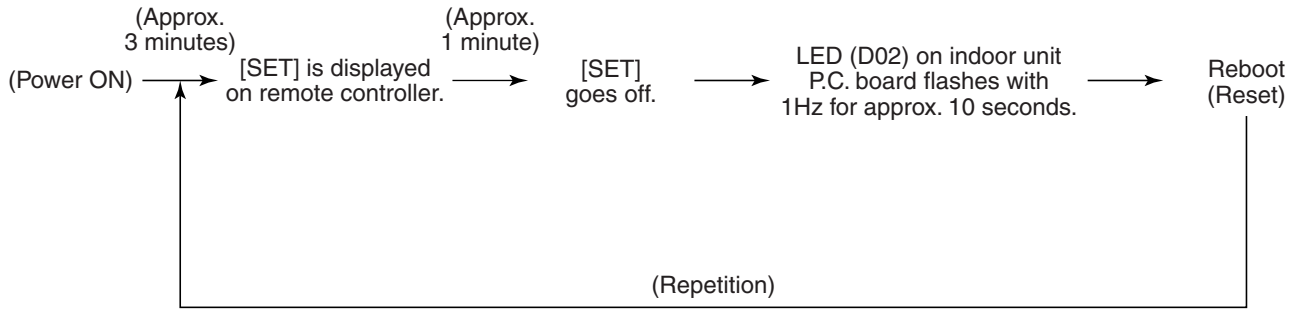
[F01 error]



[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.



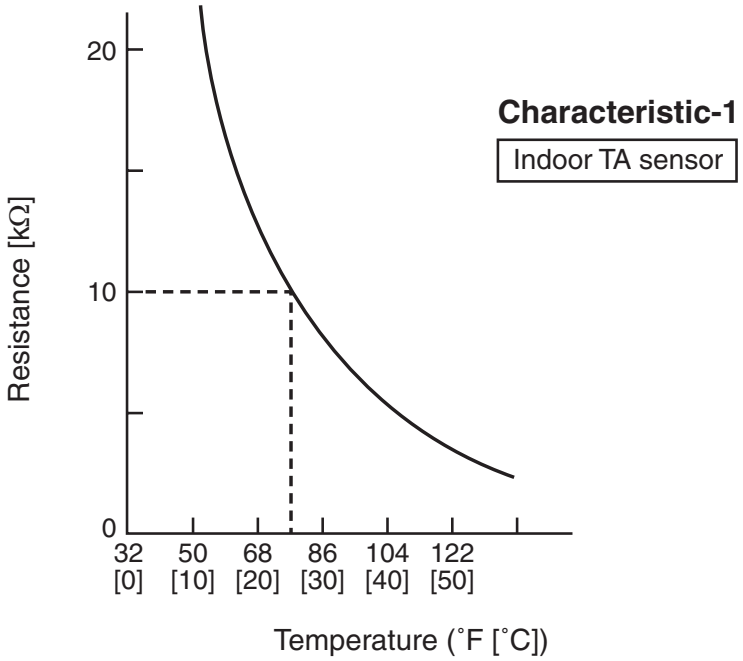
[P31 error] (Follower indoor unit)

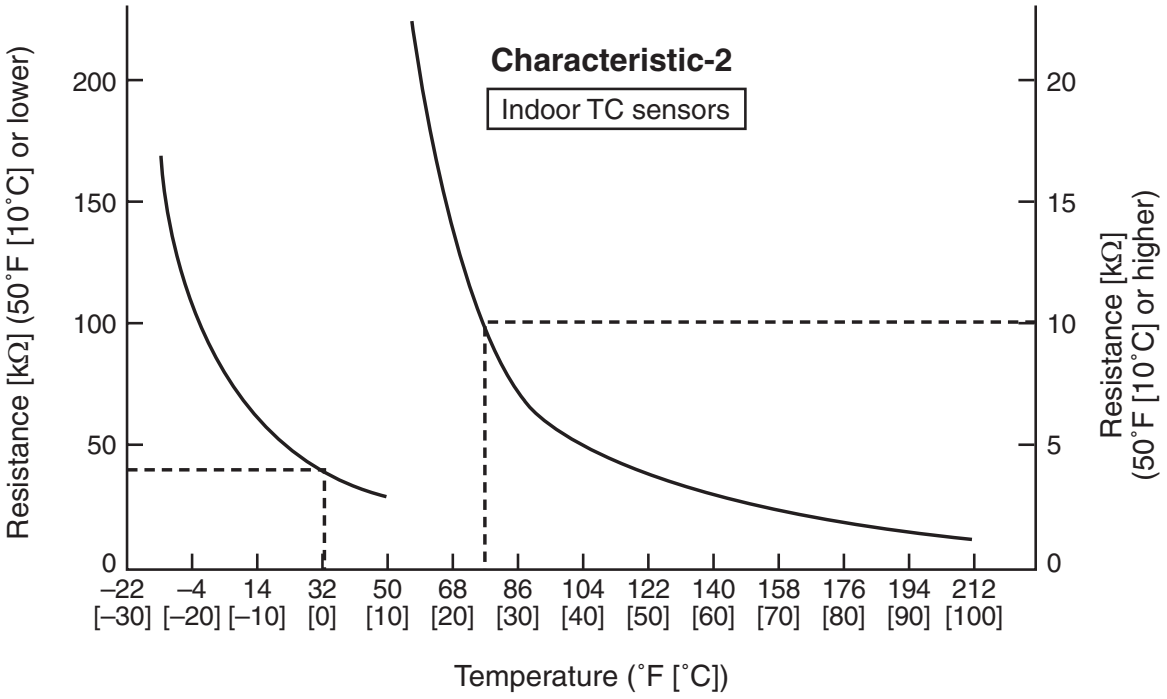
When the header unit of a group operation detected [E03], [L03], [L07] or [L08] error, the follower unit of the group operation detects [P31 error] and then the unit stops.

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

8-3-5. Indoor Unit

■ **Temperature semsor characteristics**





9. REPLACEMENT OF SERVICE P.C. BOARD

9-1. 4-Way Air Discharge Cassette Type / Under Ceiling Type

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

The nonvolatile memory (hereafter called EEPROM) 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 SET 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 SET 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]**

⇩

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 SET DATA cannot be read out.

EEPROM data read out **[2]**

⇩

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

⇩

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

[1] SET DATA read out from EEPROM

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

Step 1 Push SET, CL and TEST 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 "10". 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 UNIT LOUVER button is pushed, the indoor unit No. under the group control is displayed in order. Specify the indoor unit No. to be replaced.

1. **Change the CODE No. (DN) to 10 → 01 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 SET DATA displayed.
2. Change the CODE No. (DN) by pushing ▼ / ▲ buttons for the temperature setting.
   Similarly, be sure to write down the SET DATA displayed.
3. Repeat the step 2-2 to set the other settings in the same way and write down the SET DATA as shown in the table 1 (example).
   ∗ The CODE No. (DN) are ranged from "01" to "FF". The CODE No. (DN) may skip.

Step 3 After writing down all SET DATA, push TEST 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

CODE No. (DN)	Contents
10	Type
11	Indoor unit capacity
12	System address
13	Indoor unit address
14	Group address

1. The CODE No. (DN) for the Indoor unit type and Indoor unit capacity are required to set the rotation number setting of the fan.
2. 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.)

[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 (4-Way Air Discharge Cassette Type), (short-circuit) connector CN34 (Under Ceiling Type) 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.

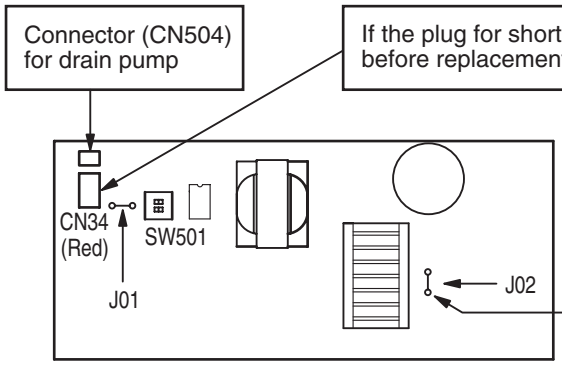
a) Single operation (Indoor unit is used as standalone.)
Turn on the indoor unit.
1. After completion of the auto-address setting mode (required time: approx. 5 min.), proceed to [3]. (System address = 1, Indoor unit address = 1, Group address = 0 (standalone) are automatically set.)
2. Push SET, CL 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
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.
   • 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.

<In case of 4-way Discharge Cassette type>

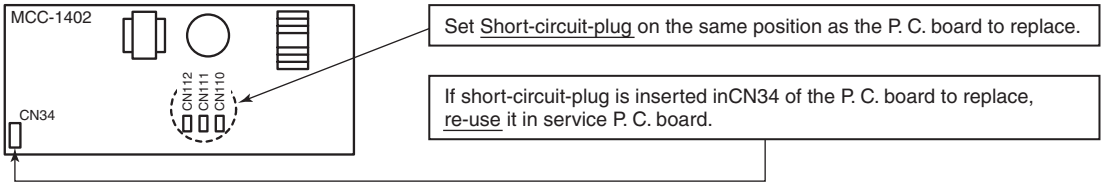


⚠ CAUTION
Be sure to set the jumper wire since the motor protection level setting selection is performed on it.

* Set J02 as follows depending on the capacity class.

Type		Jumper wire (J02)
4-Way Air Discharge Cassette	SP180, 240	None
	SP300, 360, 420	Required (factory setting)

<In case of Under Ceiling Type>



[3] Writing the SET 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 SET, CL and TEST 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 "10". 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))

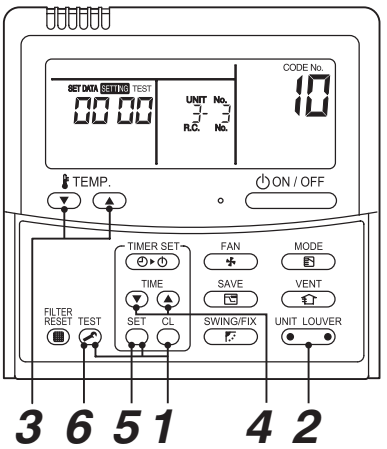
Step 2 Every time when UNIT LOUVER button is pushed, the indoor unit No. in the group control operation are displayed in order.
(The settings stored in the EEPROM of the P.C. board for indoor unit servicing are the factory-set values.)
Specify the indoor unit No. with its P.C. board replaced to the P.C. 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 "10". (without change)
2. Select the type by pushing ▼ / ▲ buttons for the timer setting.
   (For example, 4-way Air Discharge Cassette Type is set to "0001". Refer to table 2)
3. Push SET button.
   (The operation completes if the SET DATA is displayed.)
4. Change the CODE No. (DN) to "11" by pushing ▼ / ▲ buttons for the temperature setting.
5. Select the capacity by pushing ▼ / ▲ buttons for the timer setting.
   (For example, 240 Type is set to "0012". Refer to table 3)
6. Push SET button.
   (The setting completes if the SET DATA are displayed.)

<Fig. 1>



Step 4 Write the on-site SET 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 "01" by pushing ▼ / ▲ buttons for the temperature setting.
(this is the setting for the filter sign lighting time.)

Step 6 Check the SET DATA displayed at this time with the SET DATA put down in [1].

1. If the SET DATA is different, modify the SET DATA by pushing ▼ / ▲ buttons for the timer setting to the data put down in [1].
   The operation completes if the SET 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 SET 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 TEST button to return to the normal stop status.
(It takes approx. 1 min until the remote controller operation is available again.)

∗ The CODE No. (DN) are ranged from "01" 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.

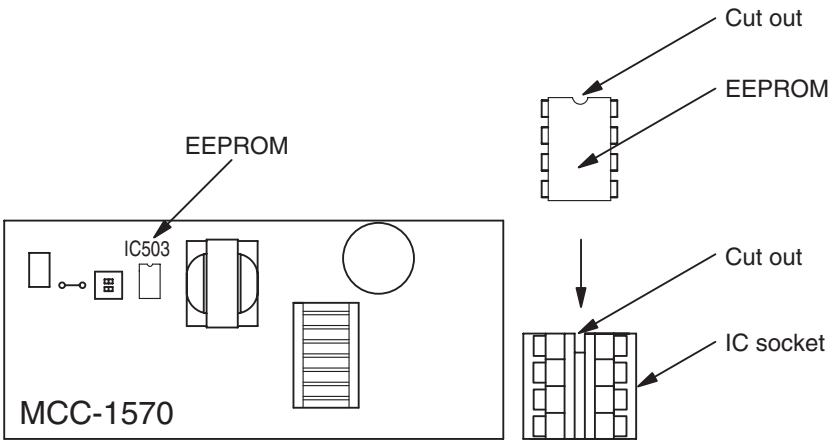
<Fig. 2 EEPROM layout diagram>

The EEPROM (4-Way: IC503, Under Ceiling: IC10) 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.

<In case of 4-Way Air Discharge Cassette Type>



<In case of Under Ceiling Type>

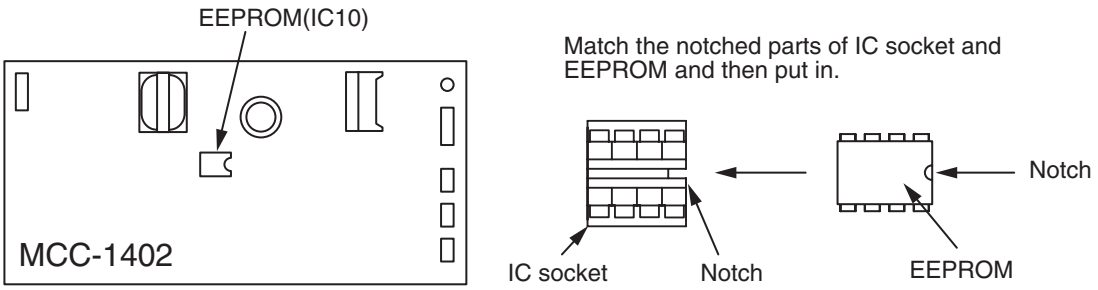


Table 1. SET DATA (CODE No. table (example))

CODE No.(DN)	Item	SET DATA	Factory-set value
01	Filter sign lighting time		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)
0F	Cooling only		0000: Heat pump
10	Type		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	AUTO restart		0001: Provided
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
33	Temperature display SW		0001: °F
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

SET DATA	Type	Type name abb.
0001*1	4-way Air Discharge Cassette Type	RAV-SP∗∗∗UT-UL
0007	Under Ceiling Type	RAV-SP∗∗∗CT-UL

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

Table 3.
Indoor unit capacity: CODE No. 11

SET DATA	Type
0000∗	Disable
0009	180
0012	240
0015	300
0017	360, 420

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

9-2. High Wall Type

Model type	P.C. board model	Label display on P.C. board
RAV-SP ✻✻✻ KRT-UL series	MCC-1510	04DD 03

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

In the non-volatile memory (Hereinafter said EEPROM, IC10) installed on the indoor P.C. board before replacement, the type and capacity code exclusive to the corresponding model have been stored at shipment from the factory and the important setup data such as refrigerant line /indoor unit /group address in (AUTO/MANUAL) mode have been stored at installation.

Replace the service indoor P.C. board assembly according to the following procedure.

After replacement, make sure that the indoor unit address is set correctly and also the refrigerant cycle is working correctly by test operation.

<Replacement procedure>

CASE 1

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

Read EEPROM data (see ❒**1** in Page 111)

⇩

Replace service P.C. board & power ON (see ❒**2** in Page 112)

⇩

Write the read data to EEPROM (see ❒**3** in Page 114)

⇩

Power reset
(If in group operation, reset the power for all indoor units which are connected to the remote controller.)

CASE 2

Before replacement, the setup data can not be read out by the wired remote controller.

Replace service P.C. board & power ON (see ❒**2** in Page 112)

⇩

Write the data such as “option input selection” setup to EEPROM (see ❒**3** in Page 114)
(According to the customers’ information)

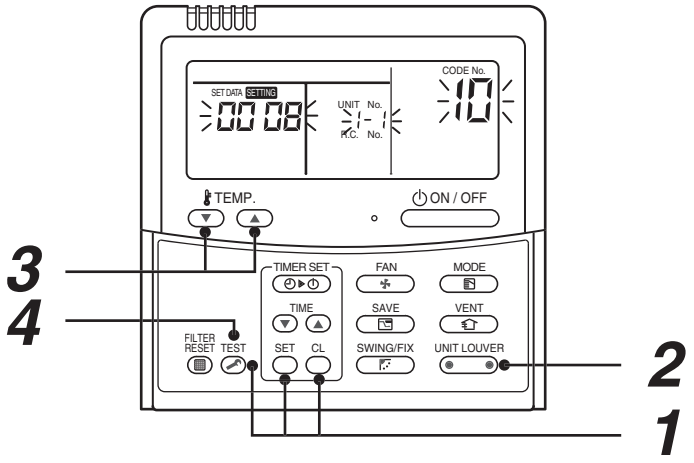
⇩

Power reset

❒1 Readout of the setup data from EEPRO

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

1. Push SET , CL and TEST buttons of the remote controller at the same time for 4 seconds or more. ***1***
   (Corresponded with No. in Remote controller as shown below picture)
   ∗ When group operation, the header indoor unit address is displayed at the first time. In this time, the CODE No. (DN) 10 is displayed.
   The fan of the second indoor unit operates and the louver starts swinging if any.
2. Every pushing [Unit, Louver UNIT LOUVER] button, the indoor unit address in the group are displayed successively. ***2***
   Specify the indoor unit No. to be replaced.
3. Using the set temperature ▼ / ▲ buttons, the CODE No. (DN) can be moved up and down one by one. ***3***
4. First change the CODE No. (DN) from 10 to 01. (Setting of filter sign lighting time)
   Make a note of the SET DATA displayed in this time.
5. Next change the CODE No. (DN) using the set temperature ▼ / ▲ buttons.
   Also make a note of the SET DATA.
6. Repeat item 5. and made a note of the important SET DATA as shown in the below table.
   ∗ 01 to AA are provided in the CODE No. (DN). On the way of operation, CODE No. (DN) may skip.
7. After finishing making a note, push TEST button to return to the usual stop status. ***4***
   (Approx. 1 minute is required to be able to use the remote controller.)



Minimum requirements for CODE No.

CODE No. (DN)	Contents
11	Indoor unit capacity
12	Refrigerant line address
13	Indoor unit address
14	Group address

Capacity of the indoor unit is necessary to set the revolutions of the fan.

❒2 Replacement of service P.C. board

1. Replace the P.C. board with a service P.C. board.

   In this time, setting of jumper line (cut) or setting of DIP switch on the former P.C. board should be reflected on the service P.C. board.

   Refer to the following table about DIP switch setting and drawing of P.C. board parts layout.

2. According to the system configuration, turn on power of the indoor unit with any method in the following items.

   1) In case of single (individual) operation. Turn on power supply.

      A) Wait for completion of automatic address setup mode (Required time: Approx. 5 minutes) and then proceed to **❒3**. (Refrigerant line address = 1, Indoor unit address = 1, Group address = 0 (Individual) are automatically set.)

      B) Push SET , CL and TEST buttons of the remote controller at the same time for 4 seconds or more (***1*** operation), Interrupt the automatic address setup mode, and then proceed to **❒3**.

   2) In case of group operation. Turn on power of the indoor unit of which P.C. board has been replaced with the service P.C. board with any method in the following items.

      A) Turn on power of the replaced indoor unit only.
      (However, the remote controller is also connected. Otherwise **❒3** operation cannot be performed.)
      Same as A) and B) in item 1).

      B) Turn on power of the multiple indoor units including replaced indoor unit.

      - Only a set of twin combination system
      - For all units in the group

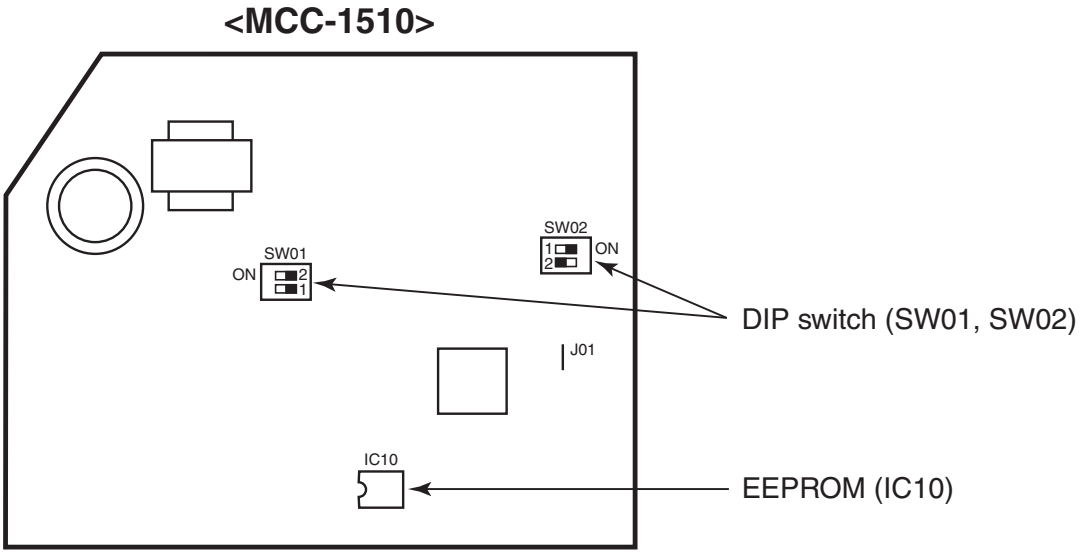
      Wait for completion of automatic address setup mode (Required time: Approx. 5 minutes) and then proceed to **❒3**.

   * The header indoor unit of a group may change by setup of automatic address.

     The refrigerant line address/indoor unit address of the replaced indoor unit are automatically set to the vacant addresses except addresses belonging to other indoor units which have not been replaced.

     It is recommended to make a note that the refrigerant line which includes the corresponding indoor unit and that the corresponding indoor unit is master or sub in the group control.

P.C. board parts layout drawing



Method of DIP switch setting

		Selected content	RAV-SP ✻✻✻ KRT-UL series	At shipment
SW01	Bit 1	Terminator resistor (for central control)	✻ 1	OFF (Without terminator)
	Bit 2	Remote controller A/B selection	✻ 1	OFF (A selection)
SW02	Bit 1	Custom / Multi model selection	OFF	OFF (Custom model)
	Bit 2	No use	OFF	OFF

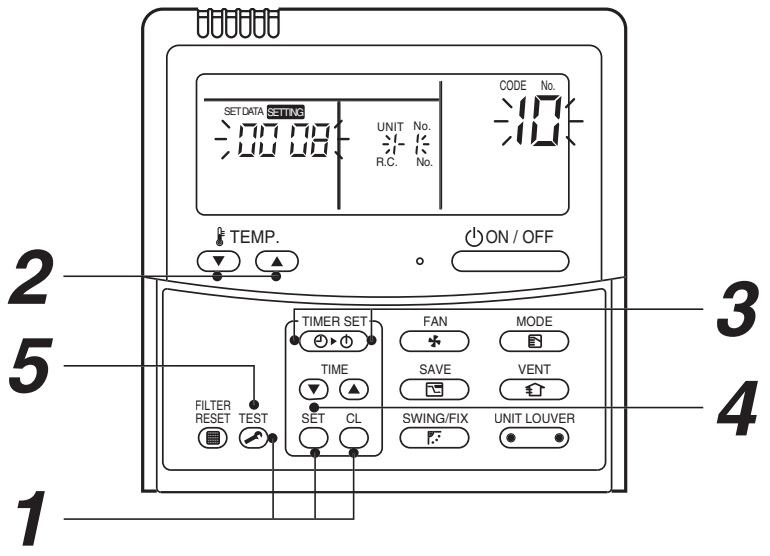
∗1 : Match to set up contents of P.C. board before replacement.

❒3 Writing of the setup contents to EEPROM

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

1. Push SET , CL and TEST buttons of the remote controller at the same time for 4 seconds or more. **1**
   (Corresponded with No. in Remote controller as shown below picture) (The UNIT No. ALL is displayed.)
   In this time, the CODE No. (DN) 10 is displayed.
   The fan of the indoor unit operates and the louver starts swinging if any.
2. Using the set temperature ▼ / ▲ buttons, the CODE No. (DN) can be moved up and down one by one. **2**
3. First set the capacity of the indoor unit.
   (Setting the capacity writes the data at shipment from the factory in EEPROM.)
   1) Using the set temperature ▼ / ▲ buttons, set 11 to the CODE No. (DN). **2**
   2) Using the timer time ▼ / ▲ buttons, set the capacity. **3**
   3) Push SET button. (OK when the display goes on.) **4**
   4) Push TEST button to return to usual stop status. **5**
      (Approx. 1 minute is required to start handling of the remote controller.)
4. Next write the contents that have been written at the installation such as the address data into EEPROM.
   Repeat the above procedure 1.
5. Using the set temperature ▼ / ▲ buttons, set 01 to the CODE No. (DN). **2**
   (Setup of lighting time of filter sign)
6. The contents of the displayed SET DATA in this time should be agreed with the contents in the previous memorandum in **❒1**.
   1) If data disagree, change the displayed SET DATA to that in the previous memorandum by the timer time ▼ / ▲ buttons, and then push SET button. (OK when the display goes on.)
   2) There is nothing to do when data agrees.
7. Using the set temperature ▼ / ▲ buttons, change the CODE No. (DN).
   As same as the above 6., check the contents of the SET DATA and then change them to data contents in the previous memorandum in **❒1**.
8. Then repeat the procedure 6. and 7.
9. After completion of setup, push TEST button to return the status to the usual stop status. **5**
   In a group operation, turn off the power supply once, return the group wires between indoor units and CN41 connectors as before, and then turn on power of all the indoor units.
   (Approx. 1 minute is required to be able to use of the remote controller.)
   ∗ 01 to AA are provided in the CODE No. (DN). On the way of operation, CODE No. (DN) may skip.

When data has been changed by mistake and SET button has been pushed, the data can be returned to the data before change by pushing CL button if the CODE No. (DN) was not yet changed.



CODE No. (DN) table (Please record the objective unit data at field)

DN	Item	Memo	At shipment	
01	Filter sign lighting time		0001: 150 hour	
02	Dirty state of filter		0000: Standard	
03	Central control address		0099: Unfixed	
06	Heating suction temp shift		0002: +3.6°F (+2°C)	
0C	PRE-DEF indication selection		0000: Standard	
0d	Cooling auto mode existence		0001: No auto mode cooling/heating	Automatic selection by connected outdoor unit
0F	Cooling only		0000: Heat pump	
10	Type	Be sure to set as 0008	0008: High wall type	
11	Indoor unit capacity (See below table)		According to capacity type	
12	Refrigerant line address		0099: Unfixed	
13	Indoor unit address		0099: Unfixed	
14	Group address		0099: Unfixed	
1E	Temp difference of automatic cooling/ heating selecting control points		0003: 3deg (Ts ± 1.5)	
28	Auto restart		0001: Provided	
2A	Option input selection (CN80)		0002: External emergency input	
2b	Thermo output selection (T10 ③)		0000: Thermo ON	
2E	Input selection (T10 ①)		0000: Operation input	
32	Sensor selection		0000: Available	
60	Timer set (Wired remote controller)		0000: Available	
69	Louver selection of cooling		0000: Standard	

Indoor unit capacity (CODE No. [11])

SET DATA	Model
0001*	Invalid
0009	RAV-SP180KRT-UL
0012	RAV-SP240KRT-UL

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

10. SETUP AT LOCAL SITE AND OTHERS

10-1. 4-Way Air Discharge Cassette Type / Under Ceiling Type

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

<Wired remote controller>

1. When pushing TEST button on the remote controller for 4 seconds or more, "TEST" is displayed on LC display. Then push ON / OFF button.
   - "TEST" is displayed on LC display during operation of Test Run.
   - During Test Run, temperature cannot be adjusted but air volume can be selected.
   - In heating and cooling operation, a command to fix the Test Run frequency is output.
   - Detection of error is performed as usual. However, do not use this function except case of Test Run because it applies load on the unit.
2. Use either heating or cooling operation mode for [TEST].
   NOTE : The outdoor unit does not operate after power has been turned on or for approx. 3 minutes after operation has stopped.
3. After a Test Run has finished, push TEST 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 ON / OFF button on the wireless remote controller and select [COOL] or [HEAT] operation mode using MODE button.**
(All the display lamps of sensors on the wireless remote controller flash during Test Run.)

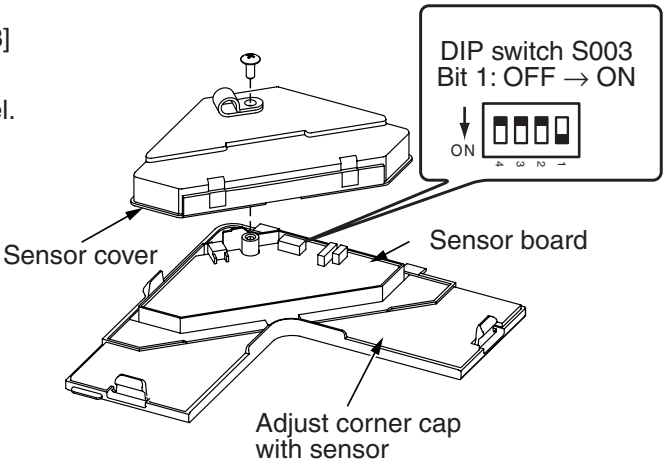
- Do not perform Test Run operation in other modes than [HEAT] / [COOL] mode.
- Detection of error is performed as usual.

4 **After Test Run operation, push ON / OFF 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 → OFF)

Mount the adjuster with sensors to the ceiling panel.



(Wireless remote controller kit)

1 Remove a screw which fixes the name plate 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].

2 Execute a test operation with ⏻ button on the wireless remote controller.

- ⏻, 🕘 and ❁ LED flash during test operation.
- Under status of [TEST RUN ON], the temperature adjustment from the wireless remote controller is invalid.

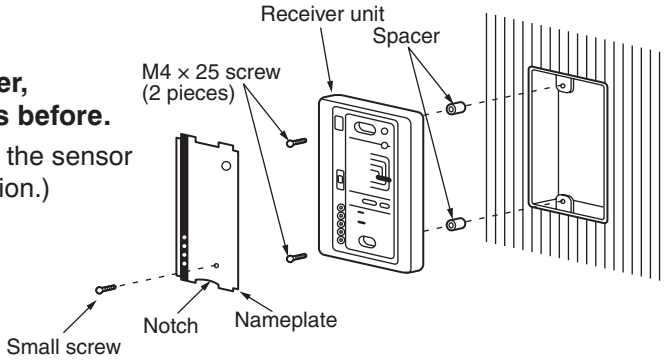
Do not use this method in the operation other than test operation because the equipment is damaged.

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 ⏻ button of the wireless remote controller and select an operation mode [COOL] or [HEAT] with MODE button. (All the display lamps of the wireless remote controller sensor section flash during the tst operation.)

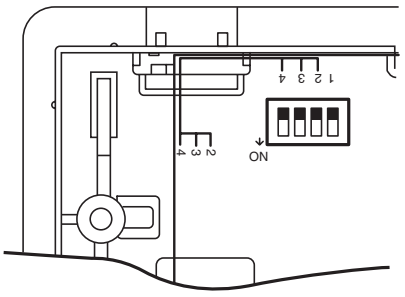
- Do not use operation mode other than [COOL] or [HEAT].
- Error is detected as usual.

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	
1	Turn on power of the air conditioner.	
	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 [64°F (18°C)] using [**Temperature set**] button.	Set temperature to [86°F (30°C)] using [**Temperature set**] button.
4	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [66°F (19°C)]	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [84°F (29°C)].
5	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [64°F (18°C)].	After checking the receiving sound “Pi”, immediately push [**Temperature set**] button to set to [86°F (30°C)].
6	Then repeat the procedure ***4*** → ***5*** → ***4*** → ***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.	

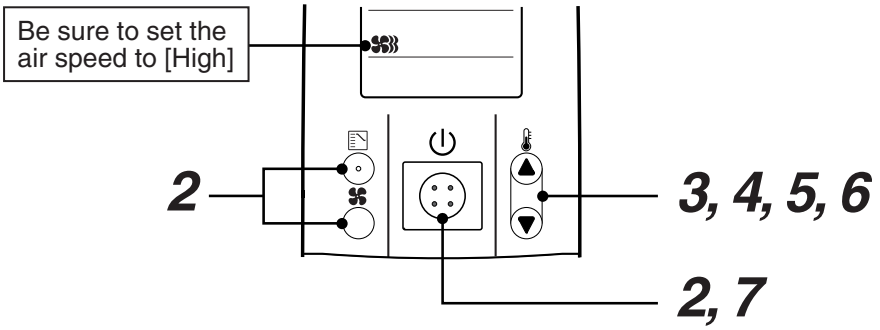
<Outline of test operation from the wireless remote controller>

Test cooling operation:

Start → 64°F (18°C) → 66°F (19°C) → 64°F (18°C) → 66°F (19°C)
→ 64°F (18°C) → 66°F (19°C) → 64°F (18°C) → (Test operation) → Stop

Test heating operation:

Start → 86°F (30°C) → 84°F (29°C) → 86°F (30°C) → 84°F (29°C)
→ 86°F (30°C) → 84°F (29°C) → 86°F (30°C) → (Test operation) → Stop



10-1-2. Forced Defrost Setup of Remote Controller (For wired remote controller only)

(Preparation in advance)

1 **Push TEST + SET + CL 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 UNIT 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 TEMP. buttons, specify the CODE No. (DN) 8C.**

4 **Using the timer time TIME buttons, set time to data 0001. (0000 at shipment)**

5 **Push SET button. (OK if indication lights)**

6 **Pushing TEST button returns the status to the normal stop status.**

(Practical operation)

- Push ON/OFF ON / OFF button.
- 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.)

10-1-3. LED Display on P.C. Board

1. D501 (Red): 4-Way Air Discharge Cassette, D02 (Red): Under Ceiling

- 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): 4-Way Air Discharge Cassette, D203 (Red): Under Ceiling

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

3. D503 (Yellow): Main bus communication: 4-Way Air Discharge Cassette Type only

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

4. D504 (Green): Sub bus communication: 4-Way Air Discharge Cassette Type only

- 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 header and follower in the Gr indoor unit.

5. D14 (Orange): 4-Way Air Discharge Cassette Type only

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

6. D15 (Green): 4-Way Air Discharge Cassette Type only

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

10-1-4. Function Selection Setup

<Procedure> Perform setting while the air conditioner stops.

1 **Push TEST + SET + CL buttons simultaneously for 4 seconds or more.**

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

In this time, fan and louver of the selected indoor unit operate.

⇩

2 **Every pushing UNIT LOUVER 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.

⇩

3 **Using the set temperature TEMP. buttons, specify the CODE No. (DN).**

⇩

4 **Using the timer time TIME buttons, select the SET DATA.**

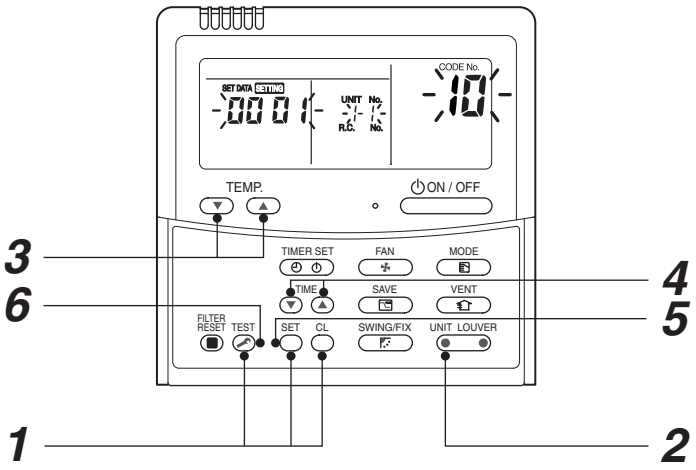
⇩

5 **Push SET 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 ***3*** .

⇩

6 **Pushing TEST button returns the status to the normal stop status.**



<Operation procedure>

1 → ***2*** → ***3*** → ***4*** → ***5*** → ***6*** END

Function selection CODE No. (DN) list

CODE No. (DN)	Item	Contents	At shipment from factory
01	Filter sign lighting time	0000: None 0001: 150H 0002: 2500H 0003: 5000H 0004: 10000H 0005: Clogging sensor used	According to type
02	Filter stain level	0000: Standard 0001: Heavy stain (Half of standard time)	0000: Standard
03	Central control address	0001: No.1 unit to 0064: No.64 unit 0099: Undecided	0099: Undecided
06	Heating suction temp. shift	0000: No shift 0001: 1.8°F [+1°C] 0002: 3.6°F [+2°C] to 0010: 18°F [+10°C] (Up to +6 is recommended.)	0002: 3.6°F [+2°C]
0F	Cooling-only	0000: Heat pump 0001: Cooling only (No display for [AUTO] [HEAT])	0000: Heat pump
10	Type	0001: (4-way air discharge cassette) 0007: (Under ceiling)	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 0001: Header unit in group 0002: Follower unit in group	0099: Undecided
19	Louver type (Adjustment of air direction)	0000: No louver model 0001: Swing only (0002: 1-way) (0003: 2-way) 0004: 4-way	According to model type
1E	In automatic cooling/heating, temp. width of cool → heat, heat → cool mode selection control point	0000: 0 deg to 0010: 10 deg (Cool/heat are reversed with ± (Data value) / 2 against the set temperature)	0003: 3 deg (Ts±1.5)
28	Auto restart	0000: None 0001: Provided	0001: Provided
2A	Selection of option / error input (CN70)	0000: Filter input 0001: Alarm input 0002: Humidifier input (Air cleaner, etc.)	0002: Humidifier
2b	Selection of thermostat output (T10 ③)	0000: Indoor thermostat ON 0001: ON receiving output of outdoor compressor	0000: Thermostat ON
2E	Selection of HA (T10) terminal	0000: Normal (JEMA) 0001: Card input 0002: Fire alarm input (Forgotten to be off)	0000: Normal (HA terminal)
31	Fan (Single operation)	0000: Impossible 0001: Possible	0000: Impossible
32	Sensor selection	0000: Body TA sensor 0001: Remote controller sensor	0000: Body sensor
33	Temperature display SW	0000: °C 0001: °F	0001: °F
5d	High ceiling selection (Air volume selection)	0000: Standard filter 0001: Super long life 0003: High performance (65%), High performance (90%), (0006: Deodorant, Ammonia deodorization)	0000: Standard
60	Timer setting (Wired remote controller)	0000: Operable 0001: Operation prohibited	0000: Operable

CODE No. (DN)	Item	Contents	At shipment from factory
42	Self-clean operation time (4-Way Air Discharge Cassette Type only)	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 (4-Way Air Discharge Cassette Type only)	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%
CC	Setting of self-clean operation forced stop (4-Way Air Discharge Cassette Type only)	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. (4-Way Air Discharge Cassette Type only)	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 46°F (8°C) heating operation function	0000: Invalid (Impossible) 0001: Valid (Possible)	0001: Invalid (Impossible)
D3	Revolution frequency of self clean operation (4-Way Air Discharge Cassette Type only)	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 (4-Way Air Discharge Cassette Type only)	0000: Display 0001: No display	0000: Display
F0	Louver swing mode	0000: No synchronization 0001: 4-way synchronization 0002: Dual 0003: 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

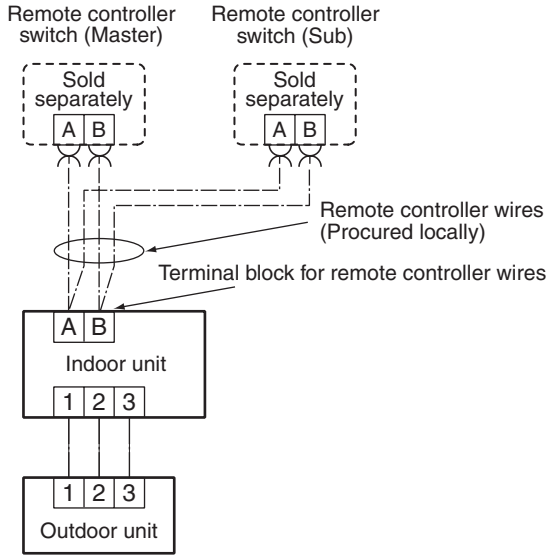
* The swing mode selection (DN code No. [F0]), louver fix (DN code No. [F1] to [F4]) and restriction ratio setting for save operation (DN code No. [C2]) can be set/changed from the normal DN setup (Detail DN setup).

10-1-5. 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**



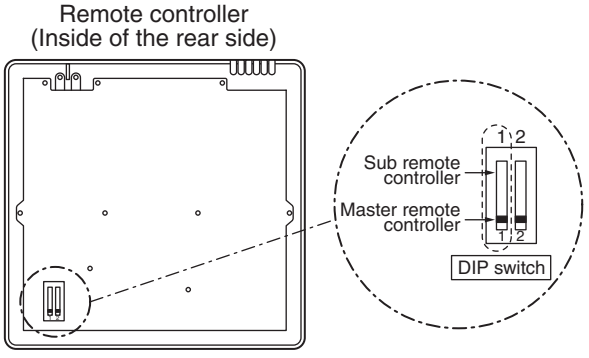
(Setup method)

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.

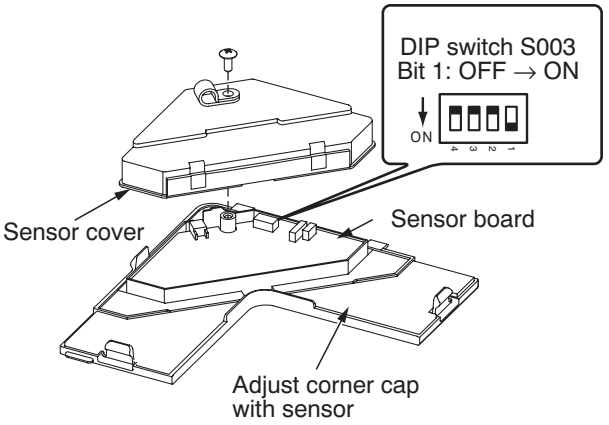


<Wireless remote controller>

How to set wireless remote controller to sub remote controller

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

<In case of 4-way Discharge Cassette Type>

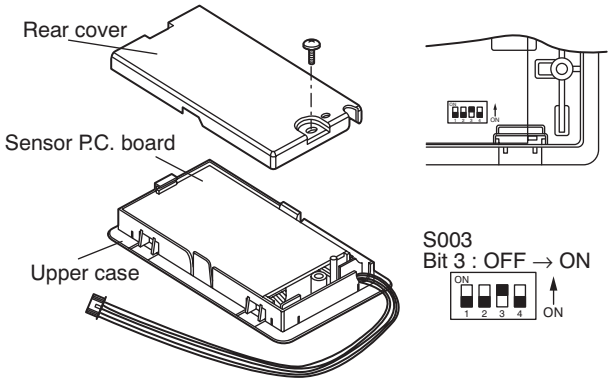


Replace OFF with ON of the Bit SW [Remote controller Master/Sub].

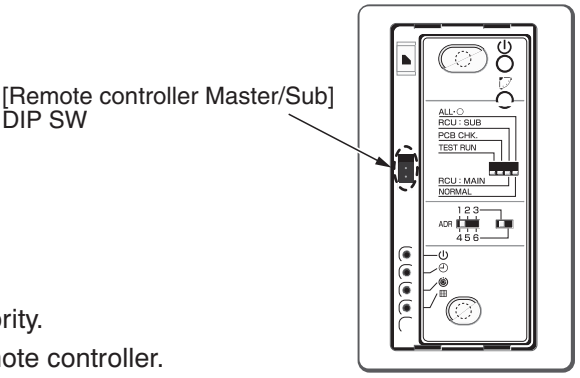
<In case of Under Ceiling Type>

How to set wireless remote controller as sub remote controller

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



<In case of Wireless remote controller kit>



[Operation]

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

10-1-6. 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>

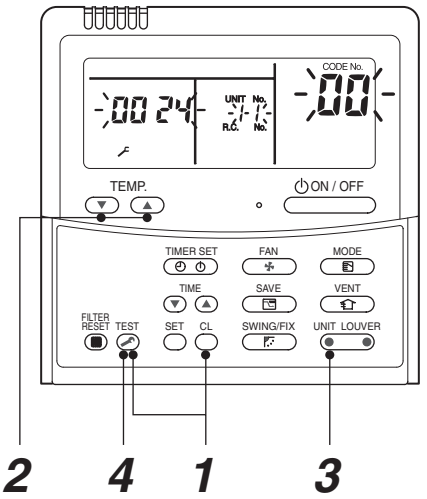
1 Push TEST + CL buttons simultaneously for 4 seconds to call the service monitor mode.

The service monitor goes on, the header indoor unit No. is displayed at first and then the temperature of CODE No. 00 is displayed.

⇩

2 Push temperature set TEMP. buttons and then change the CODE No. of data to be monitored.

The CODE No. list is shown below.



<Operation procedure>

1→ 2→ 3→ 4

Returned to usual display

	CODE No.	Data name	Unit
Indoor unit data	01	Room temperature (Remote controller)	°C
	02	Indoor suction temperature (TA)	°C
	03	Indoor heat exchanger (Coil) temperature (TCJ)	°C
	04	Indoor heat exchanger (Coil) temperature (TC)	°C
	∗ 07	Indoor fan revolution frequency	rpm
	∗ F2	Indoor fan calculated operation time	×100h
	F3	Filter sign time	×1h
	∗ F8	Indoor discharge temperature*1	°C

	CODE No.	Data name	Unit
Outdoor unit data	60	Outdoor heat exchanger (Coil) temperature (TE)	°C
	61	Outside temperature (TO)	°C
	62	Compressor discharge temperature (TD)	°C
	63	Compressor suction temperature (TS)	°C
	65	Heat sink temperature (THS)	°C
	6A	Operation current (× 1/10)	A
	∗ 6d	Outdoor heat exchanger (Coil) temperature (TL)	°C
	∗ 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

Item with ∗ mark is not provided to the Under Ceiling 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.

⇩

4 Pushing TEST button returns the status to the usual display.

∗1 The indoor discharge temperature of CODE No. [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.

10-1-7. Calling of error history

<Contents>

The error history in the past can be called.

<Procedure>

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

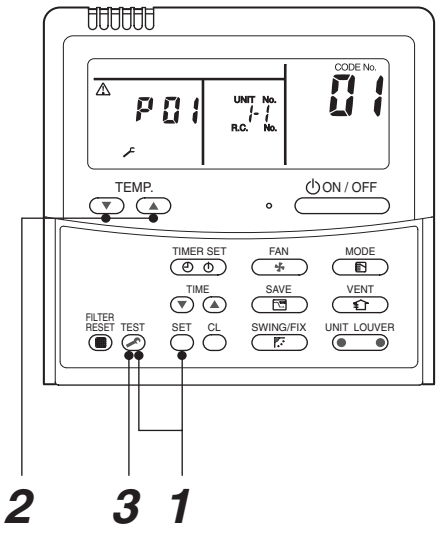
Service Check goes on, the **CODE No. *01*** is displayed, and then the content of the latest alarm is displayed. The number and error contents of the indoor unit in which an error occurred are displayed.

2 **In order to monitor another error history, push the set temperature ▼ / ▲ buttons to change the error history No. (CODE No.).**

CODE No. *01* (Latest) → **CODE No. *04*** (Old)

NOTE : 4 error histories are stored in memory.

3 **Pushing TEST button returns the display to usual display.**



<Operation procedure>

1 → 2 → 3

Returned to usual display

REQUIREMENT

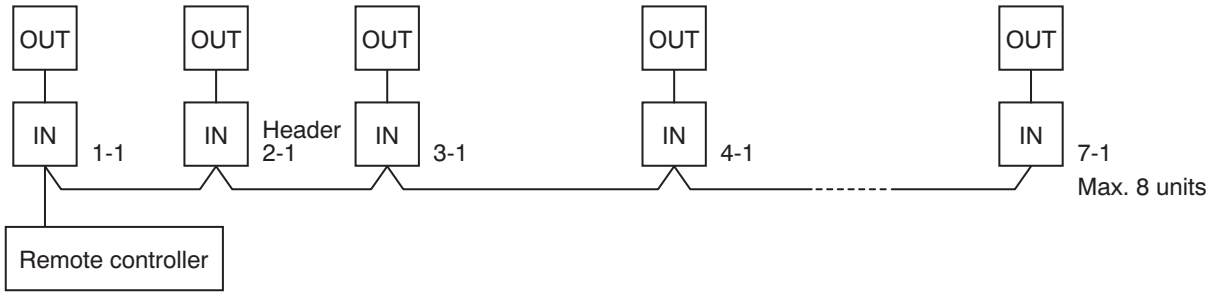
Do not push CL button, otherwise all the error histories of the indoor unit are deleted.

10-1-8. 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 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 header unit is reflected on the remote controller.

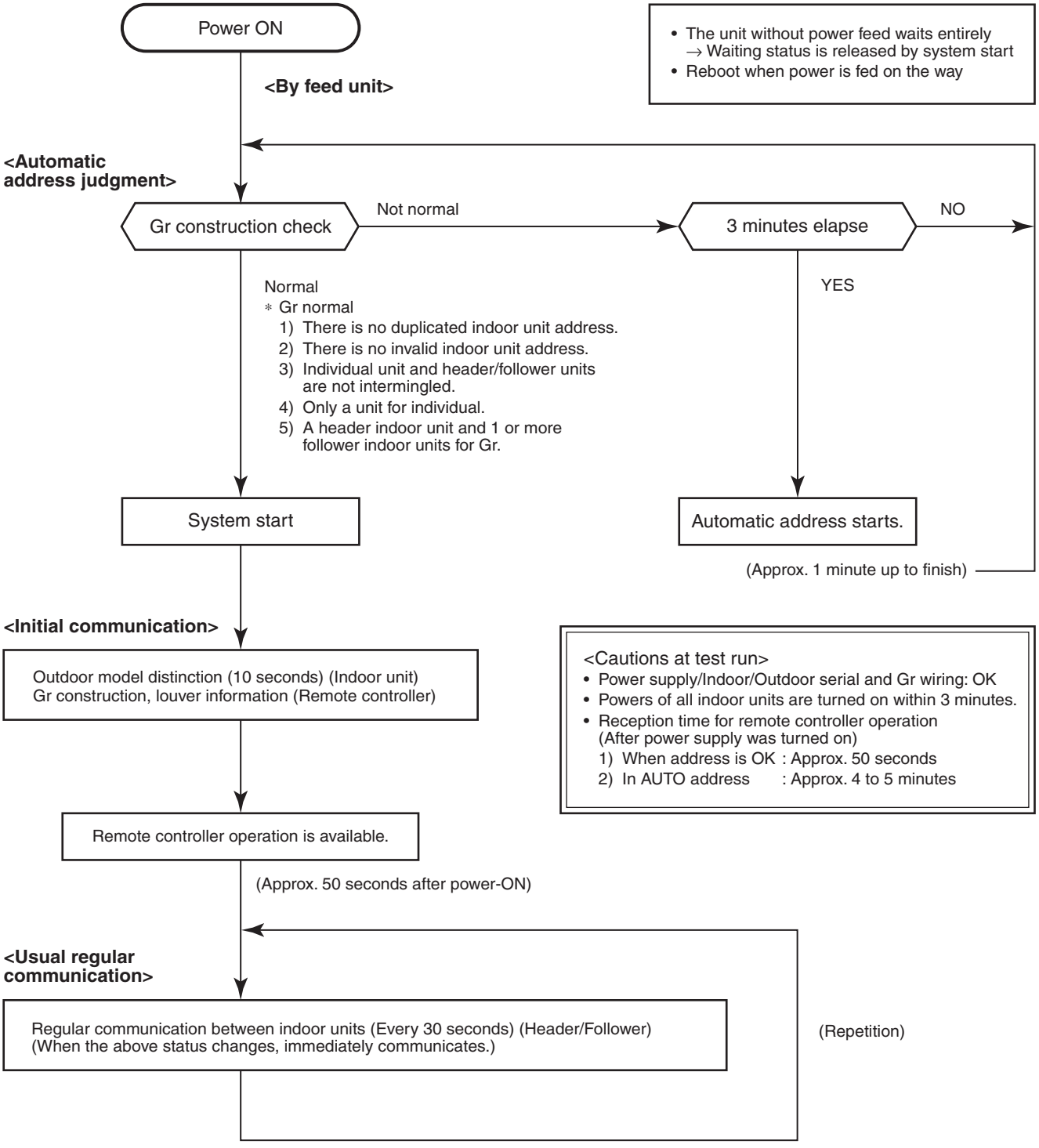
2. Address setup

   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 Indoor/Outdoor connecting wires.
   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 header 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 header unit was determined in the previous time, the power fed to the header unit and reboot works, the header unit may change though the indoor unit line address is not changed.)

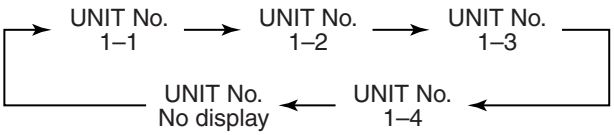
10-1-9. How to set up type of swing <4-Way Discharge Cassette Type only>

1 Push SWING/FIX for 4 seconds or more during stop of the operation.

- SETTING flashes.

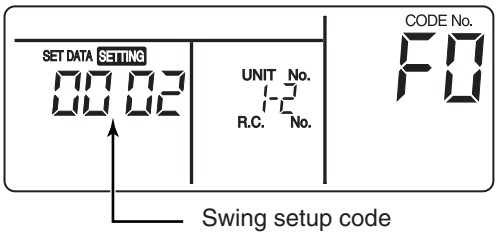
2 Push UNIT LOUVER (At the left side of the button) and select the unit to be selected.

- 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	Louver operation
0001	Standard swing (At shipment)
0002	Dual swing
0003	Cycle swing

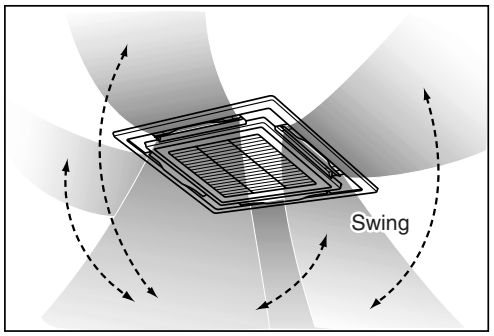
REQUIREMENT

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

4 Push SET .

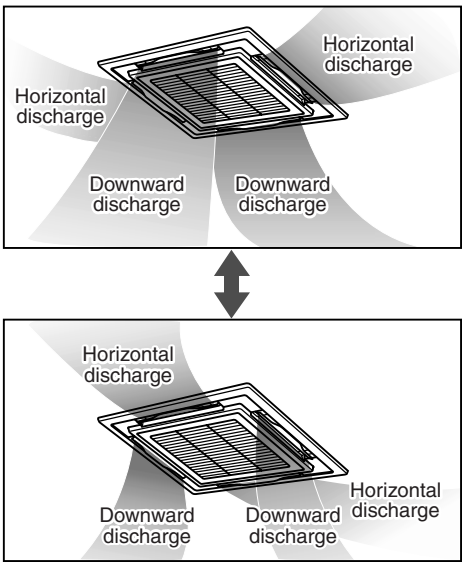
5 Push TEST to finish the setup.

∗ Standard swing
Four louvers swing simultaneously with the same angel.



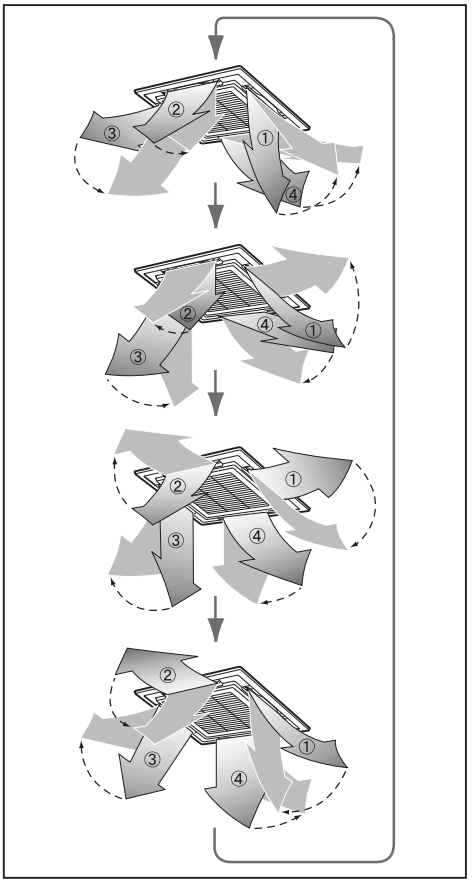
∗ Dual swing
(Recommended for heating operation)

- 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.



10-1-10. How to set louver lock (Louver fix) <4-Way Discharge Cassette Type only>

1 **Push UNIT LOUVER (At the right side of the button) for 4 seconds or more during stop of the operation.**

- SETTING flashes.

2 **Push UNIT LOUVER (At the left side of the button) and select the unit to be set.**

- Every pushing the button, the unit No. changes.

UNIT No. 1–1 → UNIT No. 1–2 → UNIT No. 1–3 → UNIT No. 1–4 → UNIT No. 1–1

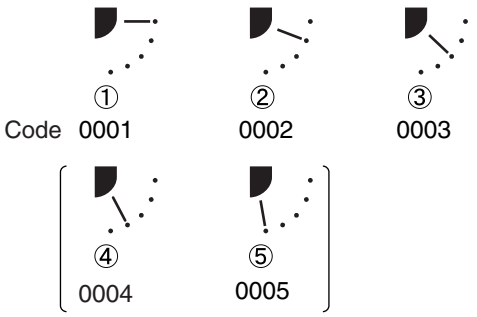
The fan of the selected unit rotates and the louver swings.

3 **Push temp. set (▼) / (▲) to display the louver No. of which air direction is to be fixed.**

- The selected louver swings.

[F1] ⟷ [F2] ⟷ [F3] ⟷ [F4]

4 **Push TIMER SET (▼) / (▲) and select air direction of the louver of which swinging you do not want.**



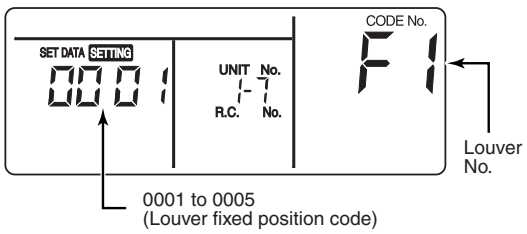
∗ If selecting above „ and …, there may be fear of dewing in cooling time.

5 **Push SET to determine the setup contents.**

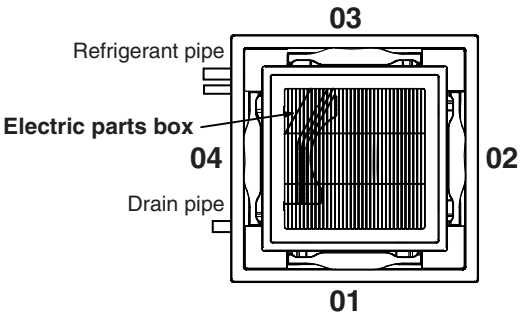
- When the setup was determined, ✥ mark goes on.

(To set continuously the louver lock of the other unit, repeat operations from 2 but from 3 to set the other louver lock in the same unit, respectively.)

6 **Push TEST to finish the setup.**



∗ F1 displayed at the CODE No. on the remote controller means that the 01 louver was selected as shown in the figure.



NOTIFICATION

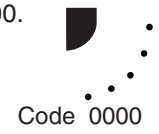
- Even if louver lock works, the louver temporarily moves in the following cases.
  1) During stop
  2) At start of heating operation
  3) During defrost operation
  4) During thermostat OFF

10-1-11. How to clear louver lock <4-Way Discharge Cassette Type only>

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

- ✥ mark goes off.

The operations from 1 to 3, 5 and 6 are same as those of the louver lock.



10-1-12. How to set contents of save operation

1 **Push SAVE for 4 seconds or more during stop of the operation.**

- SETTING flashes.

2 **Push UNIT LOUVER (At the left side of the button) and select the unit to be set.**

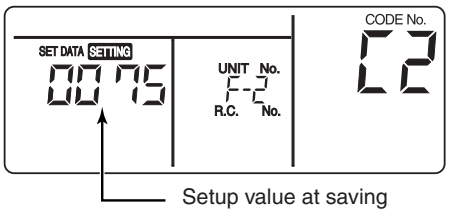
- Every pushing the button, the unit No. changes.

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

UNIT No. 1–1 → UNIT No. 1–2 → UNIT No. 1–3 → UNIT No. 1–4 → UNIT No. 1–1

3 **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 SET and then push TEST to finish the setup.**

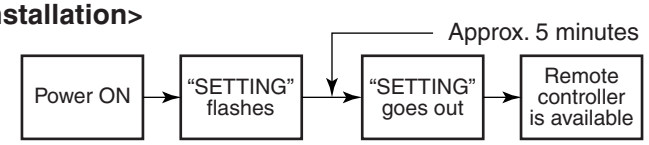
10-1-13. When installing separately sold filters

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.

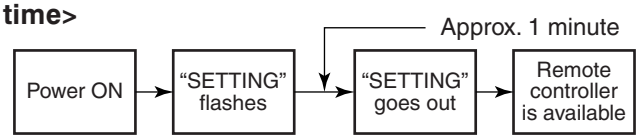
<When power is turned on for the first time after installation>

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



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

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

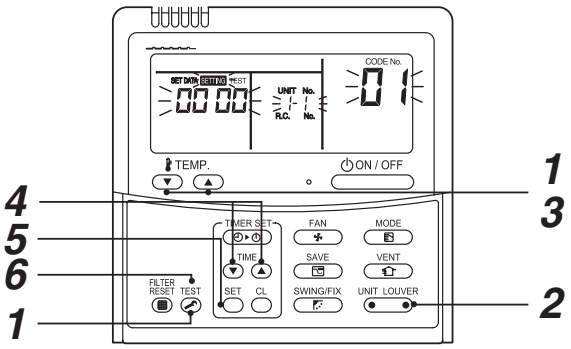


- Normal settings were made when the indoor unit was shipped from factory. Change the indoor unit settings as required.
- Use the wired remote controller to change the settings.
  ∗ The settings cannot be changed using the wireless remote controller, simple remote controller. Therefore, install the wired 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.)

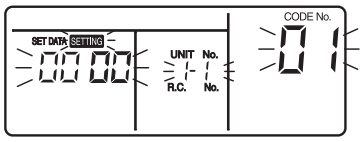


Procedure *1*

Push TEST button and temp. setup (▼) 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 TEST 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 TEST button is pushed.)

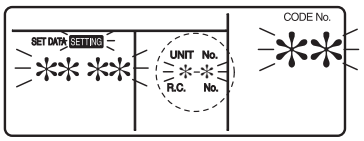


(∗ Display content varies with the indoor unit model.)

Procedure *2*

Each time you push UNIT 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 (▼) / (▲) buttons, specify CODE No. [∗∗].

Procedure *4*

Using timer time (▼) / (▲) buttons, select SET DATA [∗∗∗∗].

Procedure *5*

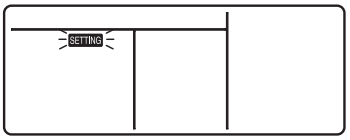
Push SET button. When the display changes from flashing to lit, the setup is completed.

- 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.
  To make settings after SET button was pushed, repeat from **Procedure *2***.

Procedure *6*

When settings have been completed, push TEST button to determine the settings.

When TEST 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 (***1*** → ***2*** → ***3*** → ***4*** → ***5*** → ***6***).

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

SET DATA	High-ceiling setting
0000	Normal filter (Installed at factory shipping)

SET 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 SET DATA for **Procedure *4*** from the "Height list of ceiling possible to be installed" table.

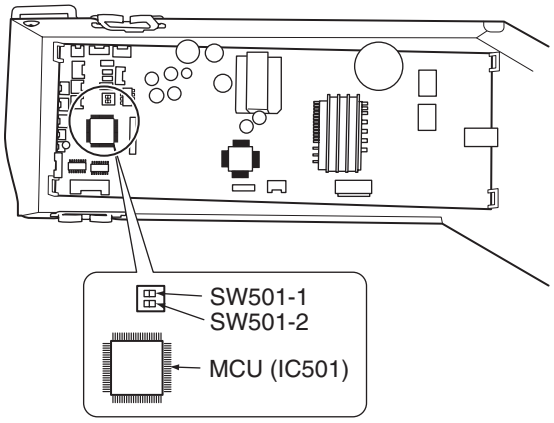
When wireless remote controller is used

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 SET DATA change to 0000 using the wired remote controller (separately sold) with the normal switch setting (factory setting).



SET 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 DATA of CODE No. [5d] to "0000" in "When installing separately sold filters" in the previous page.

10-2. High Wall Type

10-2-1. Test Run Setup on Remote Controller

<Wired remote controller>

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

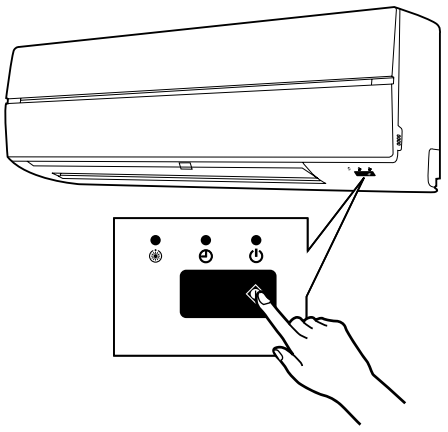
NOTE

The outdoor unit does not operate after power has been turned on or for approx. 3 minutes after operation has stopped.

3. After a Test Run has finished, push TEST 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.)

- **Checking wiring and piping of indoor/outdoor units**
  1. Open the front panel of the indoor unit.
  2. Push [TEMPORARY] button for 10 seconds.
     The unit enters forcible cooling mode with a sound "pi". COOL operation starts forcibly about 3 minutes later.
     Check whether cool air is discharged. If COOL opration does not start, recheck the wiring.
  3. Push [TEMPORARY] for about 1 second to stop trial opration.
     The vertical airflow louver closes and the operation stops.

- **Checking signal transmission from remote controller**
  1. Push [ON/OFF] on the remote controller to check for nomal operation using remote controller.
     - To enter AUTO mode, push [TEMPORARY] once for about 1 second.
       For forcible cooiing, push [TEMPORARY] for 10 seconds or more.
     - COOL operation specified by remote controller may not start depending on temperature conditions.
       Use forcible cooling operation to check wiring and piping of iindoor/outdoor unit.



10-2-2. Forced Defrost Setup of Remote Controller (For wired remote controller only)

(Preparation in advance)

1 **Push TEST + SET + CL 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 UNIT LOUVER 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 TEMP. buttons, specify the CODE No. (DN) 8C.**

4 **Using the timer time TIME buttons, set time to data 0001. (0000 at shipment)**

5 **Push SET button. (OK if indication lights)**

6 **Pushing TEST button returns the status to the normal stop status.**

(Practical operation)

- Push ON/OFF 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.)

10-2-3. LED Display on P.C. Board

1. D02 (Red)

- Lights up by the control of main microcomputer when the indoor unit is powered ON.
- Flashes at intervals of 1 second (0.5-scond ON and OFF) when EEPROM is not mounted or write error occurs.
- Flashes at intervals of 10 seconds (5-scond ON and OFF) in the DISP mode. (CN72 shout-circuited at power ON)
- Flashes at intervals of 2 seconds (1-scond ON and OFF): Applicable unit in the EEPRPM setting (address, function selection, ect.) mode.

2. D203 (Red)

- Lights up by hardware control when power is supplied to remote controller.

10-2-4. Function Selection Setup (Wired Remote Controller Only)

<Procedure> Perform setting while the air conditioner stops.

1 **Push TEST + SET + CL buttons simultaneously for 4 seconds or more.**
The first displayed unit No. is the header indoor unit address in the group control.
In this time, fan and louver of the selected indoor unit operate.

⇩

2 **Every pushing UNIT LOUVER 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.**

⇩

3 **Using the set temperature TEMP. buttons, specify the CODE No. (DN).**

⇩

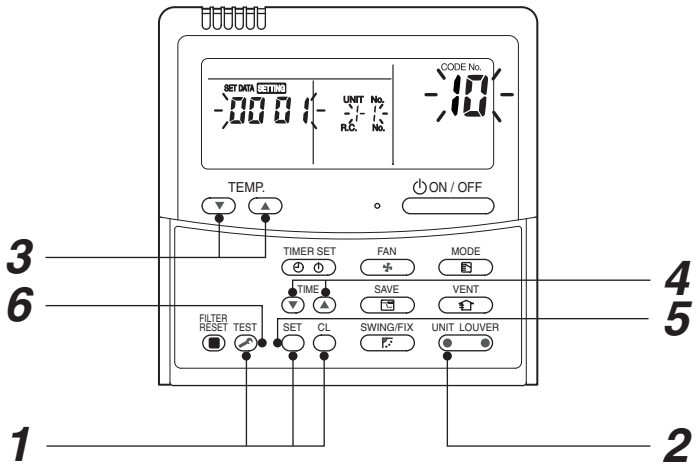
4 **Using the timer time TIME buttons, select the SET DATA.**

⇩

5 **Push SET button. (OK if indication lights)**
- To change the selected indoor unit, proceed to Procedure ***2*** .
- To change CODE No. to be set up, proceed to Procedure ***3*** .

⇩

6 **Pushing TEST button returns the status to the normal stop status.**



<Operation procedure>

1 → ***2*** → ***3*** → ***4*** → ***5*** → ***6*** END

Function selection CODE No. (DN) list

CODE No. (DN)	Item	Contents	At shipment from factory
01	Filter sign lighting time	0000: None 0001: 150H 0002: 2500H 0003: 5000H 0004: 10000H 0005: Clogging sensor used	0001: 150H
02	Filter stain level	0000: Standard 0001: Heavy stain (Half of standard time)	0000: Standard
03	Central control address	0001: No.1 unit to 0064: No.64 unit 0099: Undecided	0099: Undecided
06	Heating suction temp. shift	0000: No shift 0001: 1.8°F [+1°C] 0002: 3.6°F [+2°C] to 0010: 18°F [+10°C] (Up to +6 is recommended.)	0002: 3.6°F [+2°C]
0C	Preparing indication selection	0000: Preparing indicated 0001: No indication	0000: Preparing indicated
0F	Cooling-only	0000: Heat pump 0001: Cooling only (No display for [AUTO] [HEAT])	0000: Heat pump
10	Type	0001: 4-way air discharge cassette 0004: Concealed duct 0007: Under ceiling 0008: High wall	0008: High wall
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 0001: Master unit in group 0002: Follower unit in group	0099: Undecided
1E	In automatic cooling/heating, temp. width of cool → heat, heat → cool mode selection control point	0000: 0 deg to 0010: 10 deg (Cool/heat are reversed with ± (Data value) / 2 against the set temperature)	0003: 3 deg (Ts±1.5)
28	Auto restart	0000: None 0001: Provided	0001: Provided
2A	Selection of option / error input (CN80)	0000: Filter input 0001: Alarm input 0002: External alarm input (Air cleaner, etc.)	0002: External alarm input
2b	Selection of thermostat output (T10 ③)	0000: Indoor thermostat ON 0001: ON receiving output of outdoor compressor	0000: Thermostat ON
2E	Selection of HA (T10 ①) terminal	0000: Normal (JEMA) 0001: Card input 0002: Fire alarm input (Forgotten to be off)	0000: Normal (HA terminal)
31	Fan (Single operation)	0000: Impossible 0001: Possible	0000: Impossible
32	Sensor selection	0000: Body TA sensor 0001: Remote controller sensor	0000: Body sensor
60	Timer setting (Wired remote controller)	0000: Operable 0001: Operation prohibited	0000: Operable
69	Louver setting for cooling	0000: Normal 0001: Down allowed	0000: Normal
86	Correction of feeling of strong heating	0000: Not priovided 0001: Priovided	0000: Not priovided

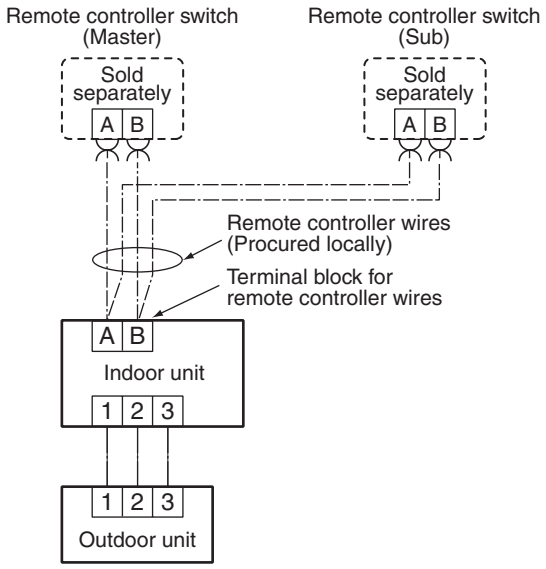
* The swing mode selection (CODE No. (DN) [F0]), louver fix (CODE No. (DN) [F1] to [F4]) and restriction ratio setting for save operation (CODE No. (DN) [C2]) can be set/changed from the normal CODE No. (DN) setup (Detail CODE No. (DN) setup).

10-2-5. 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**



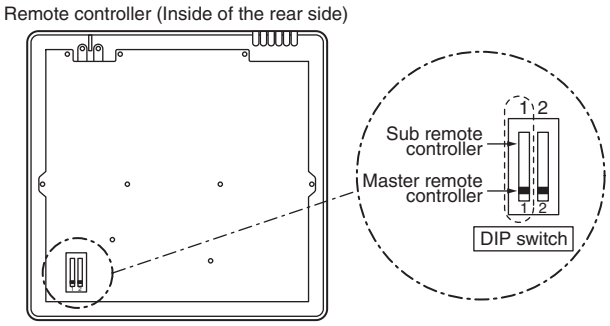
(Setup method)

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.



[Operation]

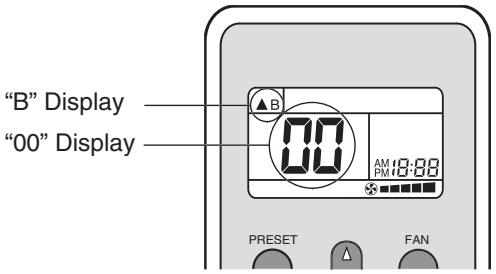
1. The operation contents can be changed by Last-push-priority.
2. Use a timer on either Master remote controller or Sub remote controller.

<Wireless remote controller A-B selection>

Using 2 wireless remote controllers for the respective air conditioners, when the 2 air conditioners are closely installed.

Wireless remote controller B setup

1. Push ⏻ button on the indoor unit to turn the air conditioner ON.
2. Point the wireless remote controller at the indoor unit.
3. Push and hold CHK ● button on the wireless remote controller by the tip of the pencil.
   "00" will be shown on the display.
4. Push MODE ● during pushing CHK ● .
   "B" will be shown on the display and "00" will be disappear and the air conditioner will turn OFF.
   The wireless remote controller B is memorized.



NOTE

- Repeat above step to reset wireless remote controller to be A.
- The wireless remote controllers do not display "A".
- The factory default of the wireless remote controllers is "A".

10-2-6. 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>

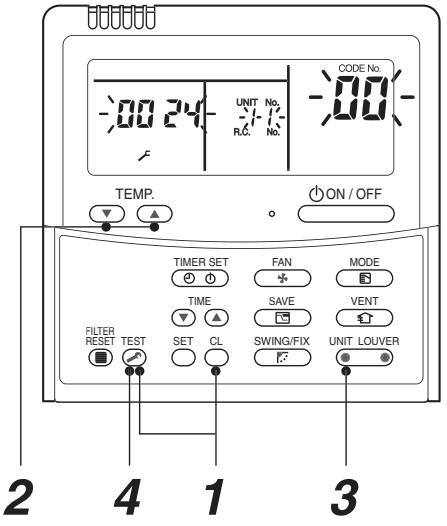
1 **Push TEST + CL buttons simultaneously for 4 seconds to call the service monitor mode.**

The service monitor goes on, the master indoor unit No. is displayed at first and then the temperature of CODE No. 00 is displayed.

⇩

2 **Push temperature set TEMP. buttons and then change the CODE No. of data to be monitored.**

The CODE No. list is shown below.



<Operation procedure>

1→ 2→ 3→ 4

Returned to usual display

	CODE No.	Data name
Indoor unit data	00	Room temperature under control ∗1
	01	Room temperature (Remote controller)
	02	Indoor suction temperature (TA)
	03	Indoor heat exchanger (Coil) temperature (TCJ)
	04	Indoor heat exchanger (Coil) temperature (TC)
	05	Indoor heat exchanger temperature (TC1)

	CODE No.	Data name
Outdoor unit data	60	Outdoor heat exchanger (Coil) temperature (TE)
	61	Outside temperature (TO)
	62	Compressor discharge temperature (TD)
	63	Compressor suction temperature (TS)
	65	Heat sink temperature (THS)

∗1 Header indoor unit only under group control.

⇩

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.

⇩

4 **Pushing TEST button returns the status to the usual display.**

10-2-7. Calling of error history

<Contents>

The error contents in the past can be called.

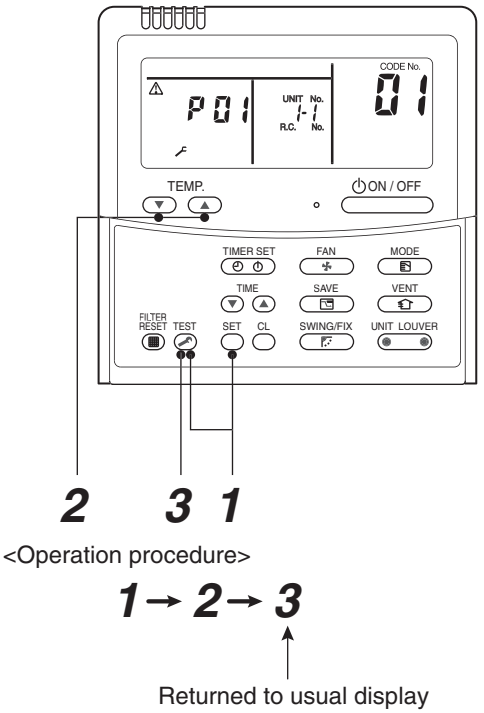
<Procedure>

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

Service Check goes on, the **CODE No. *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. (CODE No.).**

CODE No. *01* (Latest) → **CODE No.** *04* (Old)



<Operation procedure>

1→ 2→ 3

Returned to usual display

NOTE

4 error histories are stored in memory.

3 **Pushing TEST button returns the display to usual display.**

REQUIREMENT

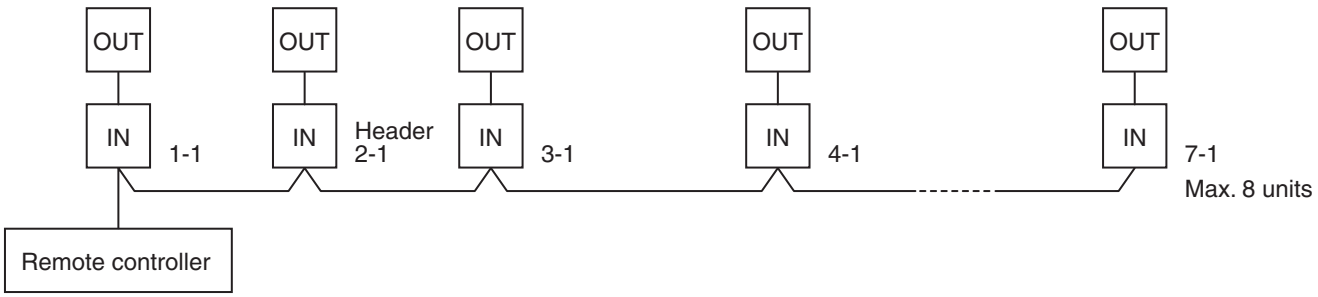
Do not push CL button, otherwise all the error histories of the indoor unit are deleted.

10-2-8. 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 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 header unit is reflected on the remote controller.

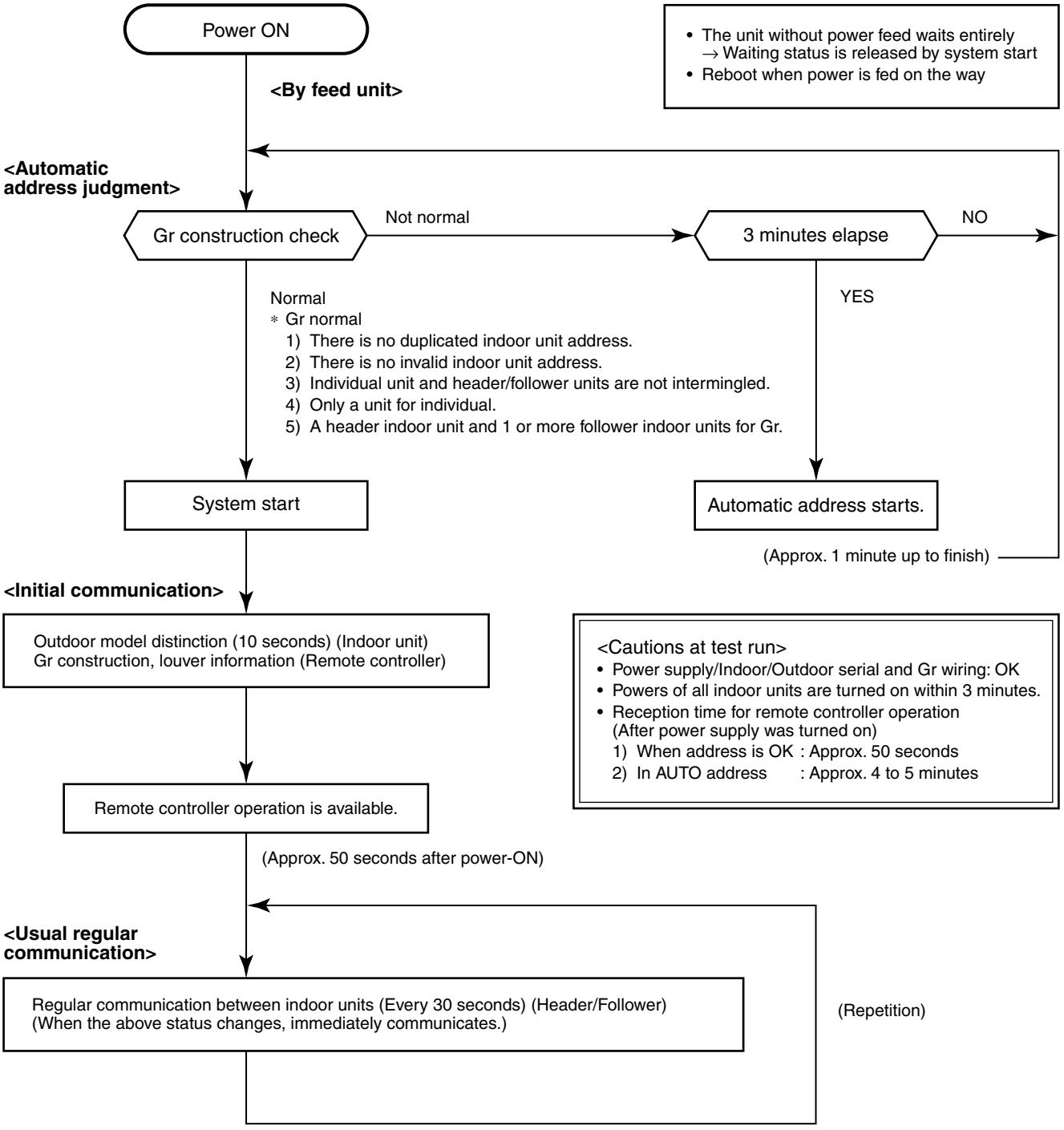
2. Address setup

   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 Indoor/Outdoor connecting wires.
   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



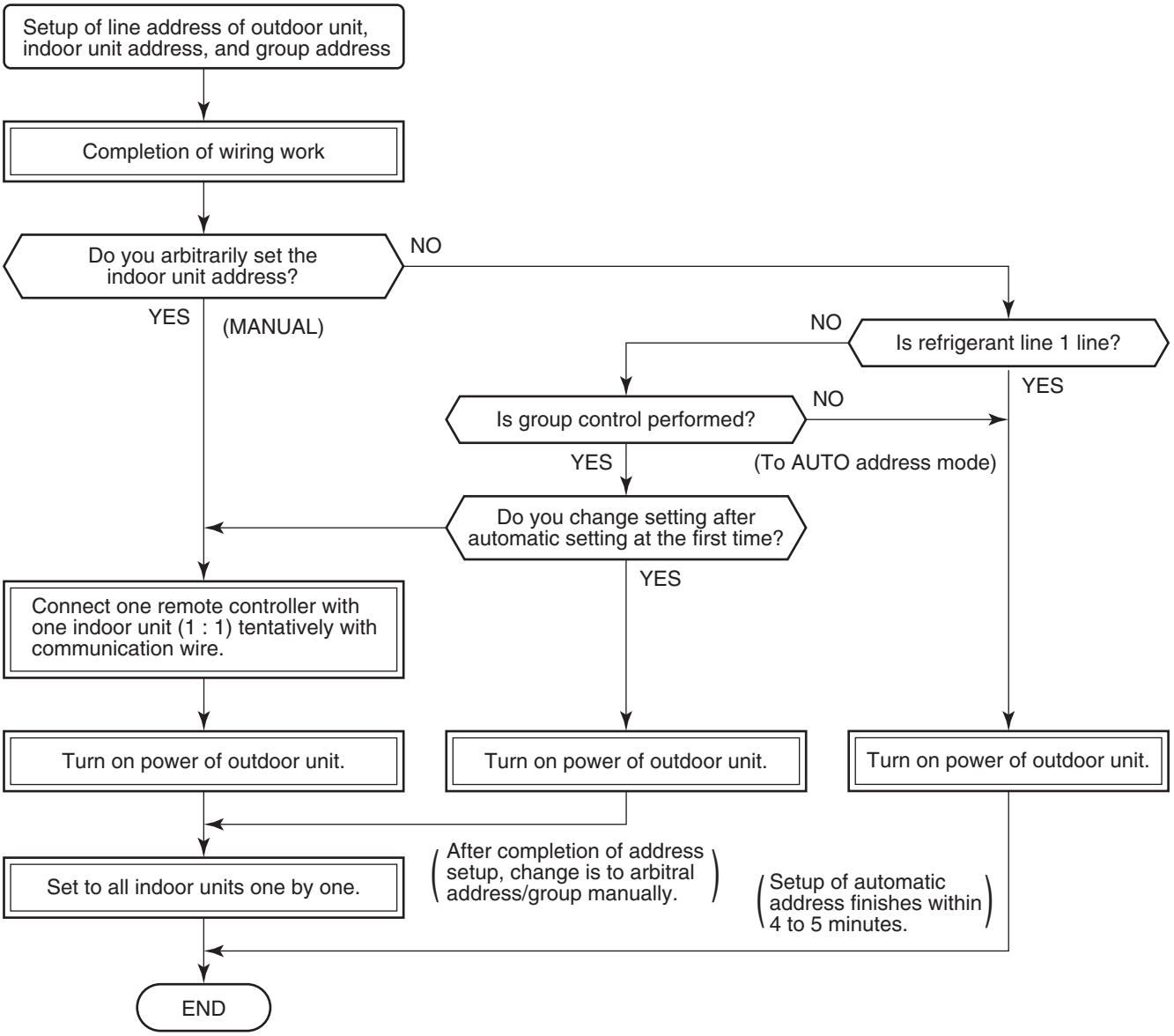
- In a group operation, if the indoor unit which was fed power after judgment of automatic address cannot receive regular communication from the header unit and regular communication on identical pipe within 120 seconds after power was turned on, it reboots (system reset).
  → The operation starts from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

11. ADDRESS SETUP

11-1. 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 (4-Way: IC503, Under Ceiling: IC10) on the indoor P.C. board, a test run operation cannot be performed. (Unfixed data at shipment from factory)

	CODE No.	Data at shipment	SET DATA range
Line address	12	0099	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 : Follower unit (Indoor units other than header unit in group control)

11-2. Address Setup & Group Control

<Terminology>

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

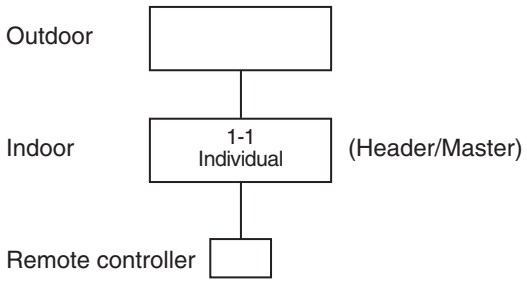
Group address : 0 = Single (Not group control)
1 = Header unit in group control
2 = Follower unit in group control

Heade unit (= 1) : The representative of multiple indoor units in group operation sends/receives signals to/from the remote controllers and follower 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)

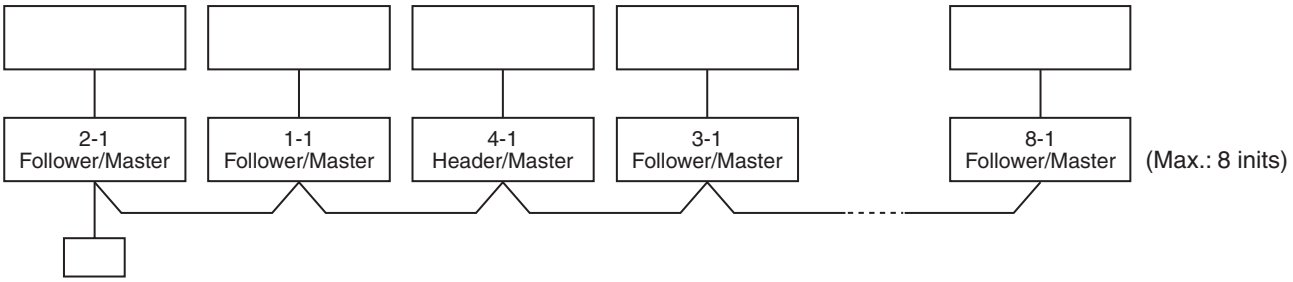
Follower unit (= 2) : Indoor units other than header unit in group operation
Basically, follower units do not send/receive signals to/from the remote controllers.
(Except errors and response to demand of service data)

11-2-1. System Configuration

1. Single

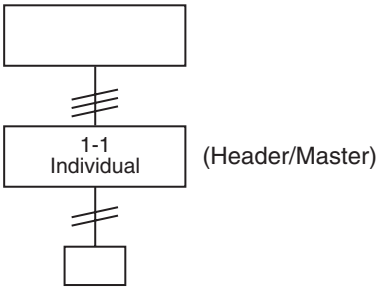


2. Single group operation

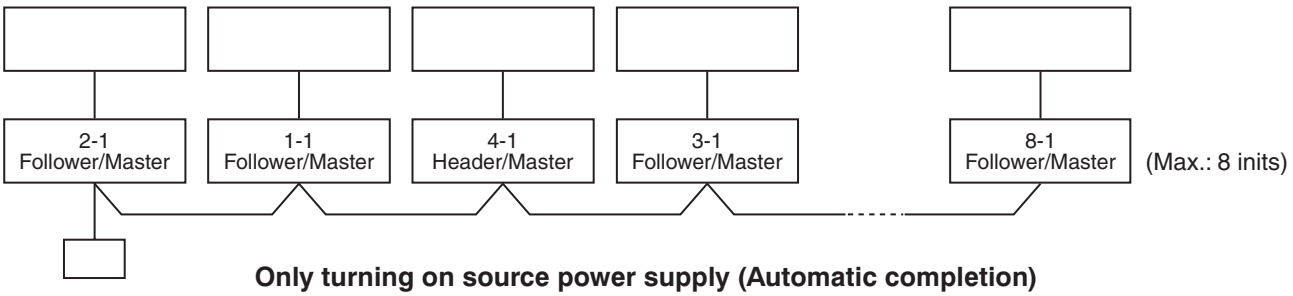


11-2-2. Automatic Address Example from Unset Address (No miswiring)

1. Standard (One outdoor unit)
   1) Single



   2) Group operation



Only turning on source power supply (Automatic completion)

■ Changing of settings for Fahrenheit display (4-Way Air Discharge Cassette Type / Under Ceiling Type)

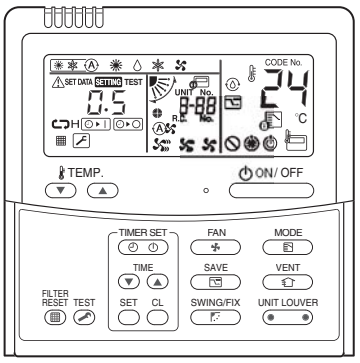
- When you use this air conditioner for the first time, it takes approx. 5 minutes until the remote controller becomes available after power-on.

Procedure *1*

Push simultaneously TEST + SET + CL buttons for 4 seconds or more.

After a while, the display part flashes as shown right. Check the displayed CODE No. is [10].

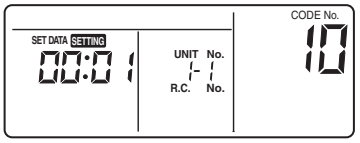
- When the CODE No. is other than [10], push TEST button to erase the display and repeat procedure from the first step.
  (After pushing TEST button, operation of the remote controller is not accepted for approx. 1 minute.) (For a group control, No. of the firstly displayed indoor unit becomes the header unit.)



Procedure *2*

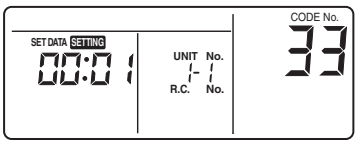
Every pushing UNIT LOUVER UNIT button, the indoor unit No. in the group control is displayed in order. Select the indoor unit of which setup is changed.

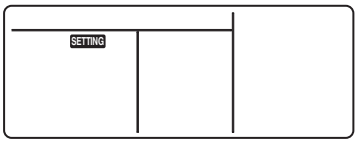
In this time, the position of the indoor unit of which setup is changed can be confirmed because fan and louver of the selected indoor unit operate.



Procedure *3*

1. Using temp. setup TEMP. buttons, specify CODE No. [33].
   (CODE No. [33]: Fahrenheit display)
2. Using timer TIME buttons, change the line address from [0] to [1].
3. Push SET button. In this time, the setup finishes when the display changes from flashing to lighting.





Procedure *4*

After check of the changed contents, push TEST button. (Setup is determined.)

When pushing TEST button, the display disappears and the status becomes the usual stop status.
(When pushing TEST button the operation from the remote controller is not accepted for approx. 1 minute.)

- If the operation from the remote controller is not accepted even 1 minute or more passed after pushing TEST button, it is considered that the address setup is incorrect.

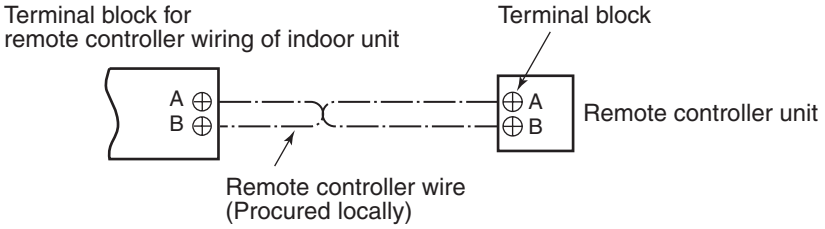
  In this case, the automatic address must be again set up.

  Therefore repeat procedure of the setup change from the **Procedure *1***.

11-3. Remote Controller Wiring

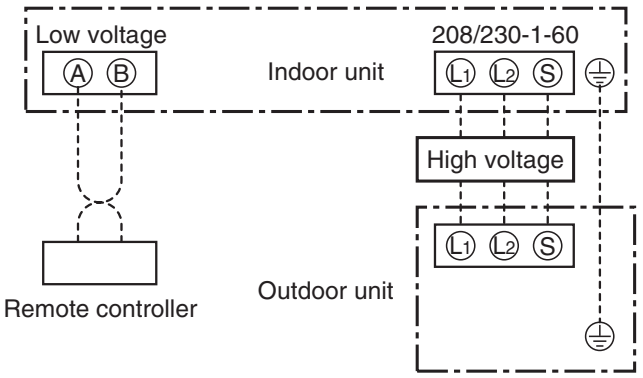
- Strip off approx. 9 mm the wire to be connected.
- For single system, use non polarity, 2 core wire is used for wiring of the remote controller. (0.5 mm² to 2.0 mm² wires)
- For the synchronous twin, triple system, use 2-conre shield wire (Vinyl cord for microphone 0.5 to 2.0 mm²) to conform to the EMC standard.

Wiring diagram



* For details of wiring/installation of the remote controller, refer to the Installation Manual enclosed with the remote controller.

<Single system>

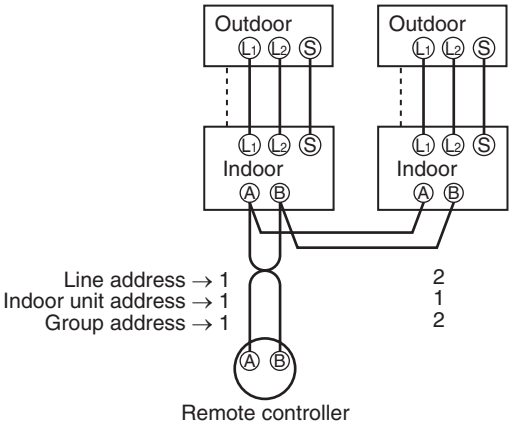


11-4. Address Setup (Manual setting from remote controller)

In case that addresses of the indoor units will be determined prior to piping work after wiring work

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

(Example of 2-lines wiring)
(Real line: Wiring,
Broken line: Refrigerant pipe)



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

Group address
Individual : 0000
Header unit : 0001
Follower unit : 0002
} In case of group control

1 **Push SET + CL + TEST buttons simultaneously for 4 seconds or more.**

2 **(← Line address)**
Using the temperature setup ▼ / ▲ buttons, set *12* to the CODE No.

3 **Using timer time ▼ / ▲ buttons, set the line address.**

4 **Push SET button.** (OK when display goes on.)

5 **(← Indoor unit address)**
Using the temperature setup ▼ / ▲ buttons, set *13* to the CODE No.

6 **Using timer time ▼ / ▲ buttons, set 1 to the line address.**

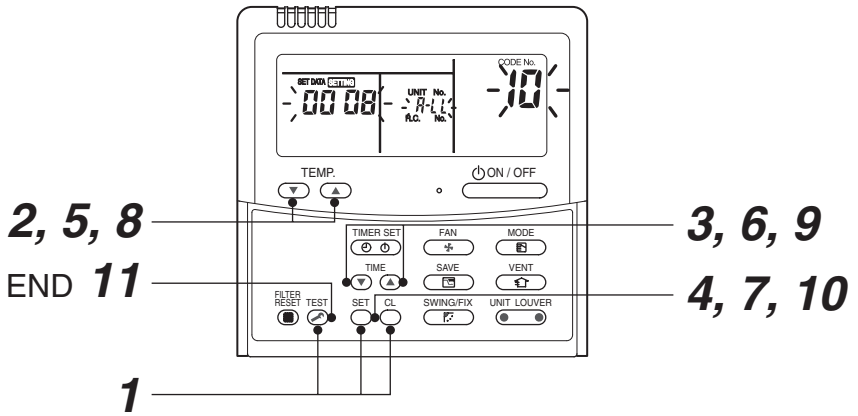
7 **Push SET button.** (OK when display goes on.)

8 **(← Group address)**
Using the temperature setup ▼ / ▲ buttons, set *14* to the CODE No.

9 **Using timer time ▼ / ▲ buttons, set *0000* to Individual, *0001* to Header unit, and *0002* to Follower unit.**

10 **Push SET button.** (OK when display goes on.)

11 **Push TEST button.**
Setup completes. (The status returns to the usual stop status.)



<Operation procedure>

1→ 2→ 3→ 4→ 5→ 6→ 7→ 8→ 9→ 10→ 11 END

11-5. 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 ON / OFF button if the unit stops.**

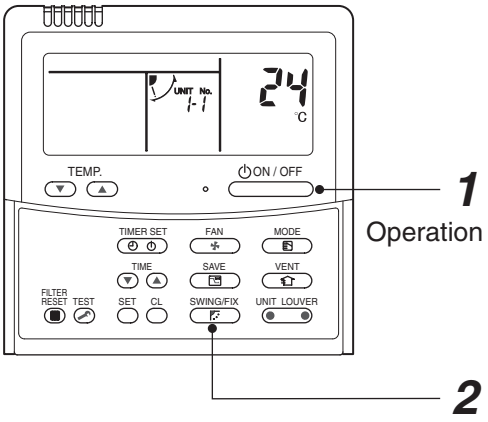
2 **Push UNIT LOUVER button.**

Unit No. 1-1 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 UNIT LOUVER button.



<Operation procedure>

1 → ***2*** END

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

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

<Procedure>

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

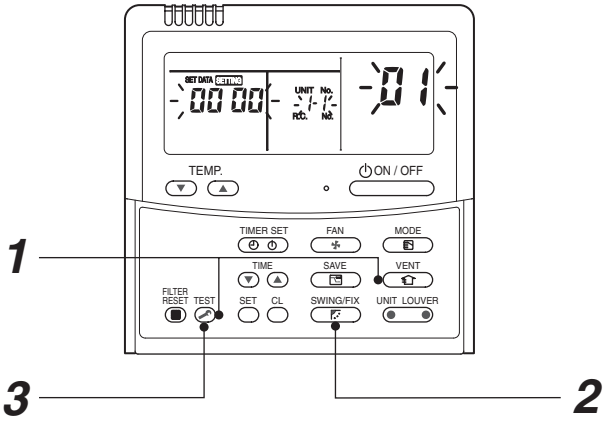
1 **Push VENT and TEST buttons simultaneously for 4 seconds or more.**

- 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 header unit address.
- Fan and louver of the selected indoor unit only operate.

3 **Push TEST button to finish the procedure.**
All the indoor units in the group control stop.



<Operation procedure>

1 → ***2*** → ***3*** END

<Maintenance>

Periodic Maintenance - periodic maintenance is recommended to ensure proper operation of the unit.
Recommended maintenance intervals may vary depending on the installation environment, e.g. dusty zones, etc.
Refer to table below.

Periodic Maintenance

INDOOR UNIT	EVERY MONTH	EVERY 4 MONTHS	EVERY YEAR
Clean Air Filter ∗1	1 (2)		
Clean Drain Pan		1	
Clean indoor heat exchanger ∗2			1
Clean fan ∗2			1
Change Remote Control Batteries			1
OUTDOOR UNIT	**EVERY MONTH**	**EVERY 4 MONTHS**	**EVERY YEAR**
Clean Outdoor heat exchanger from Outside		1	
Clean Outdoor heat exchanger from Inside ∗2			1
Blow Air Over Electric Parts ∗2			1
Check Electric Connection Tightening ∗2			1
Clean Fan Wheel ∗2			1
Check Fan Tightening ∗2			1
Clean Drain Pans ∗2			1

( ): High Wall Type

∗1: Increase frequency in dusty zones.

∗2: Maintenance to be carried out by qualified service personal.

REQUIREMENT

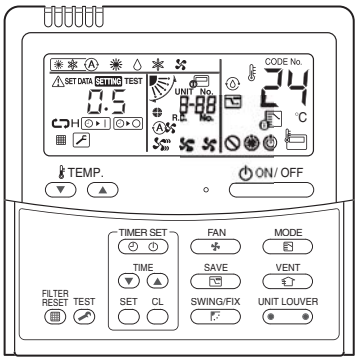
Be sure to clean the heat exchanger with pressurized water.

If a commercially available detergent (strong alkaline or acid) cleaning agent is used, the surface treatment of the heat exchanger will be marred, which may degrade the self cleaning performance.

For further details, contact the dealer.

■ Changing of settings for Fahrenheit display

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

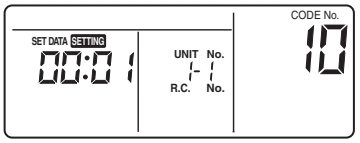


Procedure *1*

Push simultaneously TEST + SET + CL buttons for 4 seconds or more.

After a while, the display part flashes as shown right. Check the displayed CODE No. is [10].

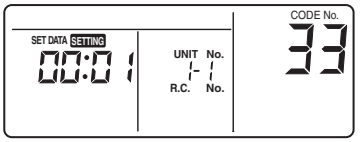
- When the CODE No. is other than [10], push TEST button to erase the display and repeat procedure from the first step. (After pushing TEST button, operation of the remote controller is not accepted for approx. 1 minute.) (For a group control, No. of the firstly displayed indoor unit becomes the header unit.)



Procedure *2*

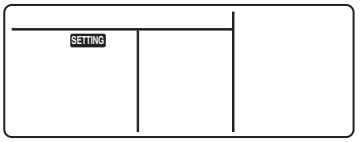
Every pushing UNIT LOUVER UNIT button, the indoor unit No. in the group control is displayed in order. Select the indoor unit of which setup is changed.

In this time, the position of the indoor unit of which setup is changed can be confirmed because fan and louver of the selected indoor unit operate.



Procedure *3*

1. Using temp. setup TEMP. buttons, specify CODE No. [33]. (CODE No. [33]: Fahrenheit display)
2. Using timer TIME buttons, change the line address from [0] to [1].
3. Push SET button. In this time, the setup finishes when the display changes from flashing to lighting.



Procedure *4*

After check of the changed contents, push TEST button. (Setup is determined.)

When pushing TEST button, the display disappears and the status becomes the usual stop status.
(When pushing TEST button the operation from the remote controller is not accepted for approx. 1 minute.)

- If the operation from the remote controller is not accepted even 1 minute or more passed after pushing TEST button, it is considered that the address setup is incorrect.

  In this case, the automatic address must be again set up.

  Therefore repeat procedure of the setup change from the **Procedure *1***.

12. DETACHMENTS

12-1. 4-Way Air Discharge Cassette Type

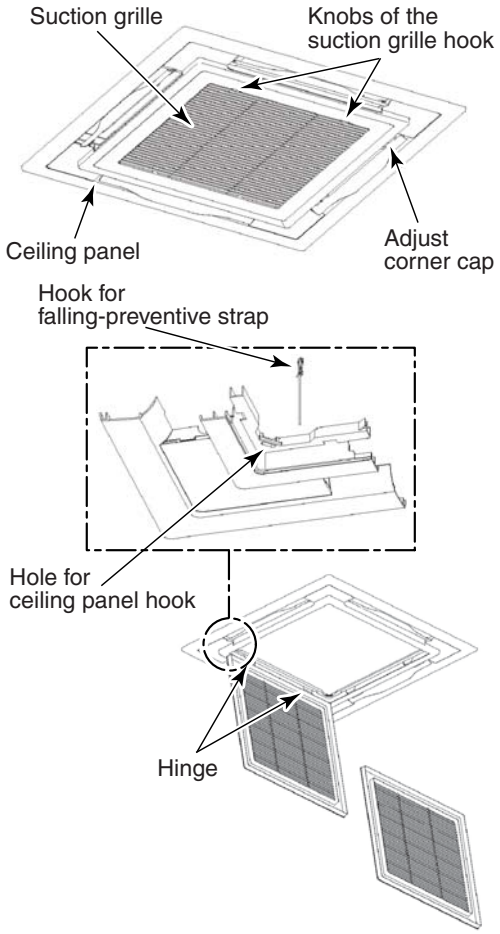
RAV-SP180UT-UL, RAV-SP240UT-UL, RAV-SP300UT-UL, RAV-SP360UT-UL, RAV-SP420UT-UL

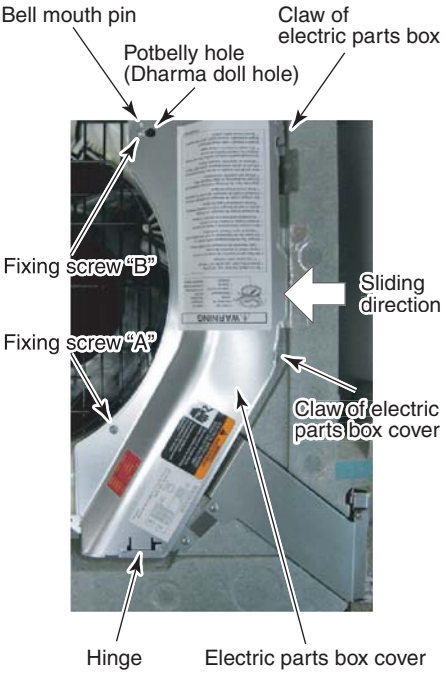
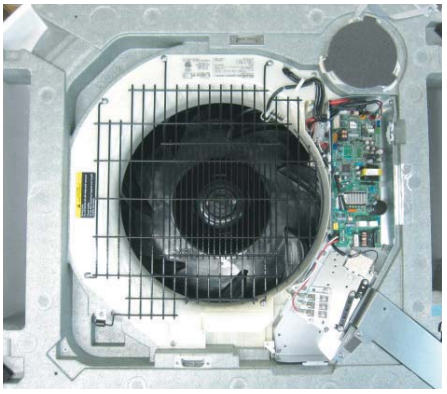
WARNING

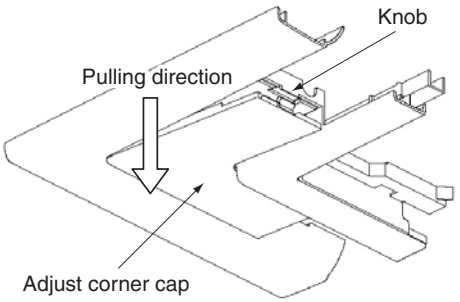
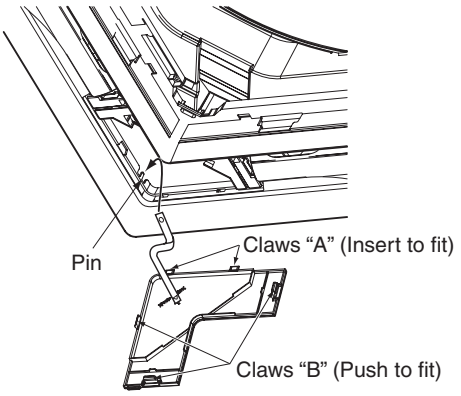
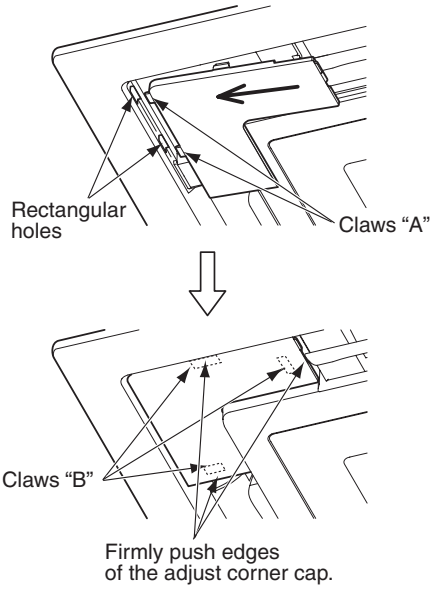
Be sure to turn off the power supply and the breaker and then start a work.

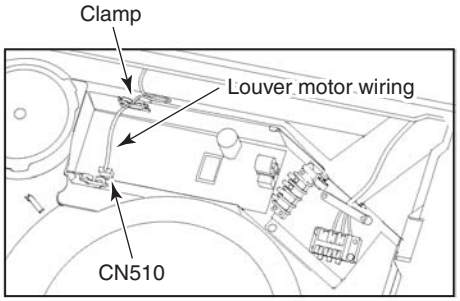
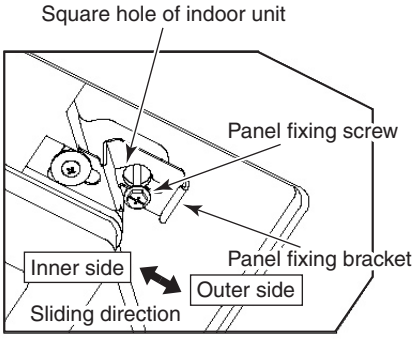
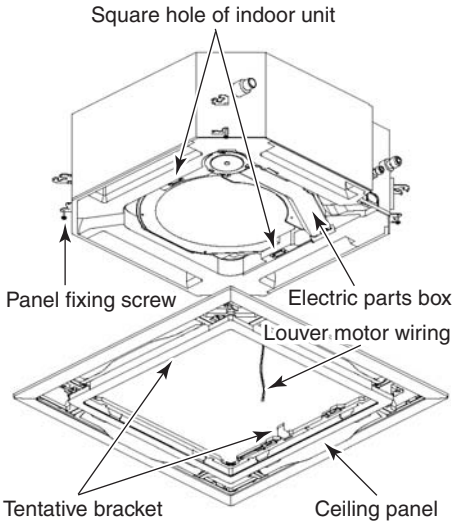
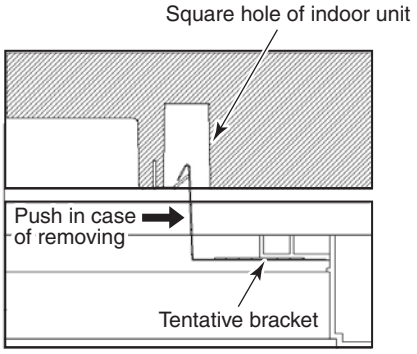
CAUTION

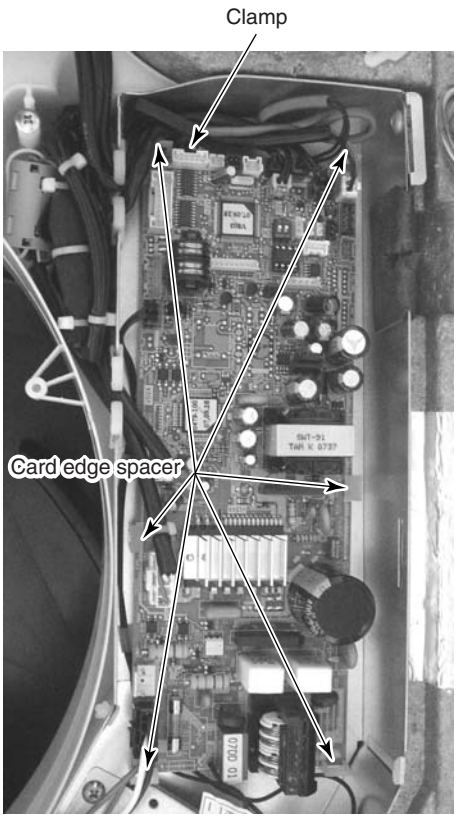
Be sure to put on the gloves at disassembling work; otherwise an injury will be caused by a part, etc.

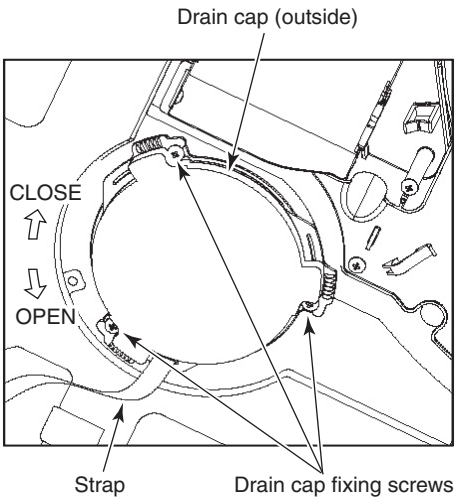
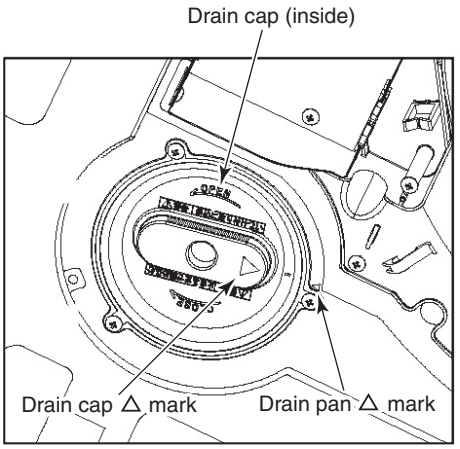
No.	Part name	Procedure	Remarks
①	Suction grille	**1. Detachment** 1) Slide the 2 knobs of the suction grille inward and then hang down the suction grille. 2) Remove hook of the strap connecting the panel and the suction grille and then remove the suction grille. **2. Attachment** 1) Hook the suction grille to the panel. 2) Attach hook of the suction grille strap to the panel as before. 3) Close the suction grille, slide the knobs outward and then fix the panel.	

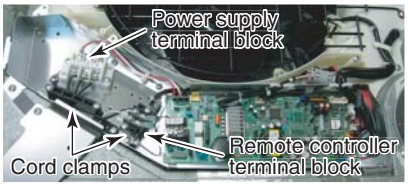
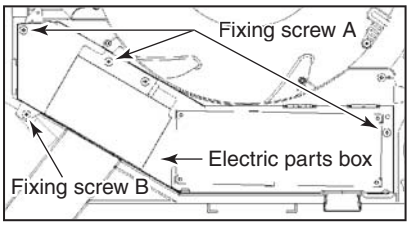
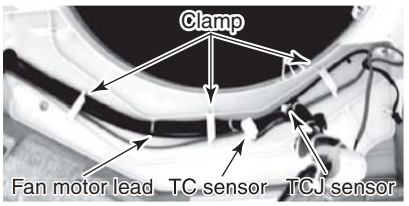
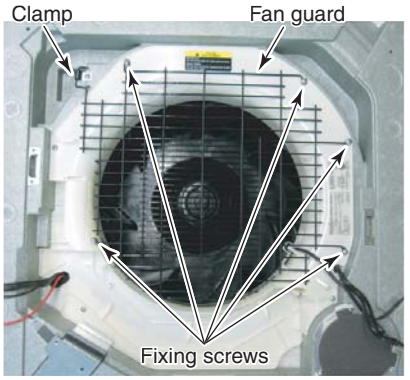
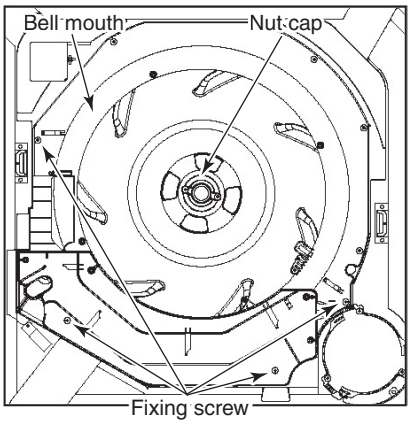
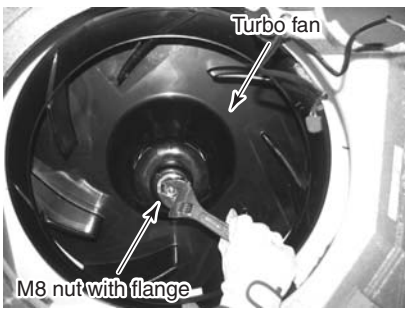
No.	Part name	Procedure	Remarks
②	Electric parts cover	**1. Detachment** 1) Carry out work of Detachment of ① . 2) Remove the fixing screw “A” which fixes the electric parts cover and loosen the fixing screw “B”. 3) Pull down the electric parts cover, remove pin of the bell mouth and then slide it to the arrow direction in order to open the claws and the electric parts box cover. 4) Remove the hinge unit and then remove the electric parts box cover. **2. Attachment** 1) Attach the hinge unit of the electric parts box cover. 2) 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. 3) Tighten the fixing screws “A and B” and then fix the electric parts box cover. 4) Following to work of Attachment of ① , mount the suction grille as before.	 

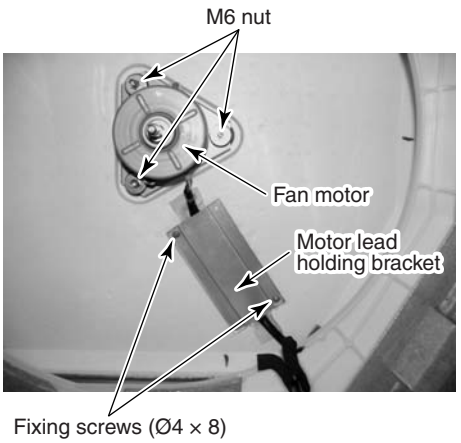
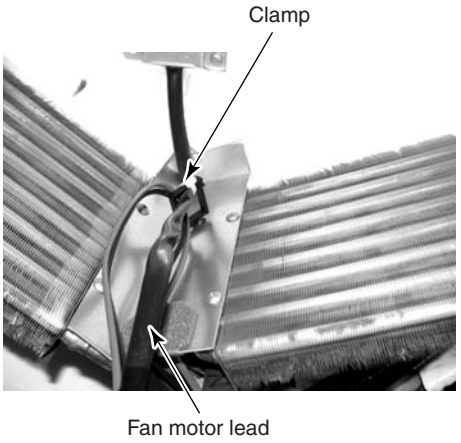
No.	Part name	Procedure	Remarks
③	Adjust corner cap	**1. Detachment** 1) Pull knob of the adjust corner cap to the arrow direction, remove strap of the adjust corner cap from pin of the panel and then remove all the 4 corners of the cap. **NOTE :** The knob is provided to only one side. Be sure to remove the cap of the knob side at first. **2. Attachment** 1) Hook the strap of the adjust corner cap securely to the pin of the ceiling panel. 2) Insert the 2 claws “A” of the adjust corner cap into rectangular holes of the ceiling panel in the direction of the arrow. 3) Press the adjust corner cap so that the 3 claws “B” on the back of the cap are fitted.	  

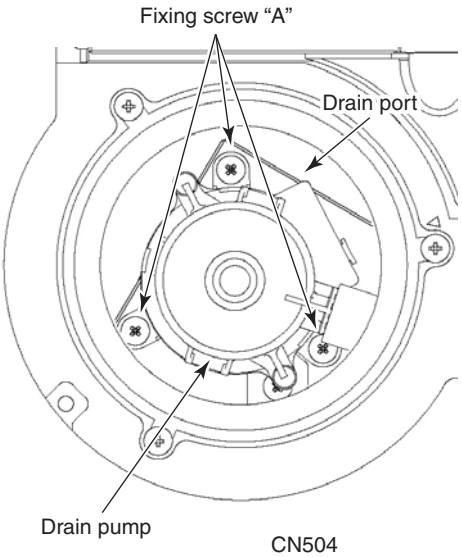
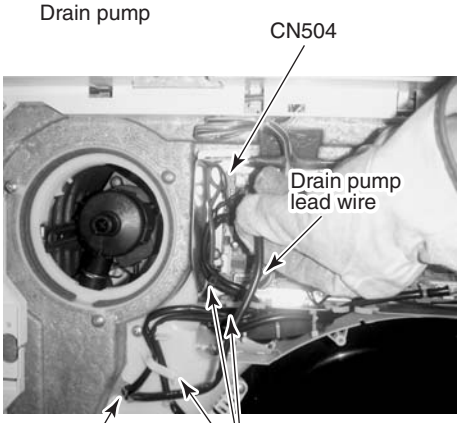
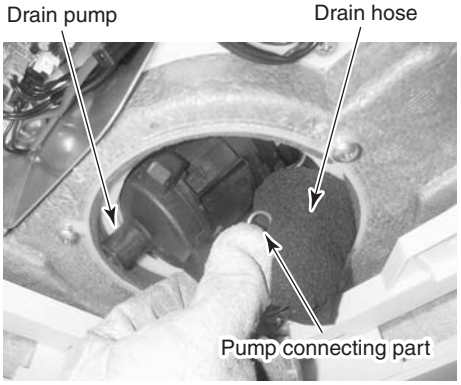
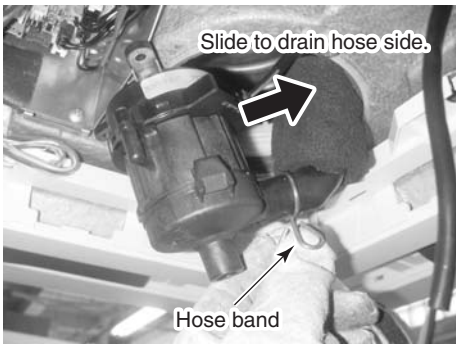
No.	Part name	Procedure	Remarks
④	Ceiling panel	**1. Detachment** 1) Carry out works of Detachment of ② and ③ . 2) Remove the louver connector (CN510, White, 20P) connected to the control P.C. board and then remove the lead wire from the clamp. **NOTE :** Unlock the lock of the housing part and then remove the connector. 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. **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 Attachment 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 Attachment of ② , mount the electric parts box cover and the suction grille as before.	   

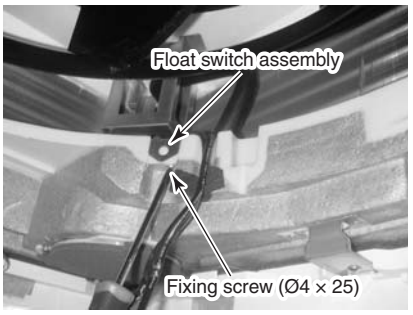
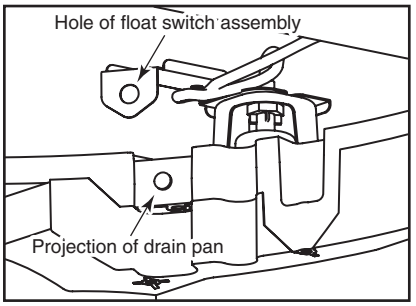
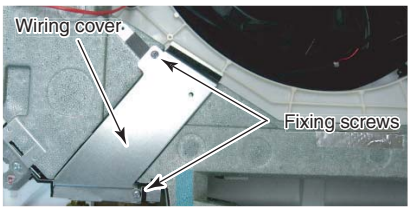
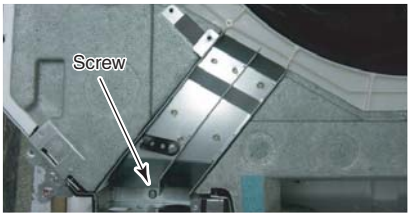
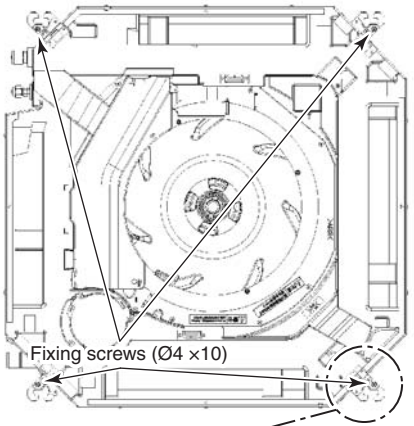
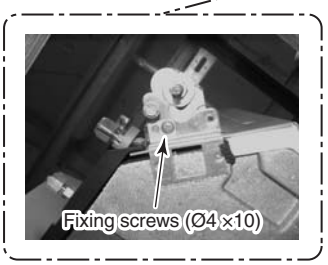
No.	Part name	Procedure	Remarks
⑤	Control P.C. board	**1. Detachment** 1) Carry out work of Detachment of ② . 2) Remove connectors which are connected from the control P.C. board to the other parts and then remove wiring from the clamp. CN510 : Louver motor (20P, White) CN34 : Float switch (3P, Red) 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 (5P, White) CN334 : Fan motor position detection (3P, White) **NOTE :** Unlock the lock of the housing part and then remove the connector. 3) Unlock the locks of the card edge spacer (6 positions) and then remove the control P.C. board. **2. Attachment** 1) Fix the control P.C. board to the card edge spacer (6 positions) 2) Connect the connector removed in the above Detachment as before and then fix the wiring with the clamp. 3) Following to work of Attachment of ② , mount the electric parts box cover and the suction grille as before.	

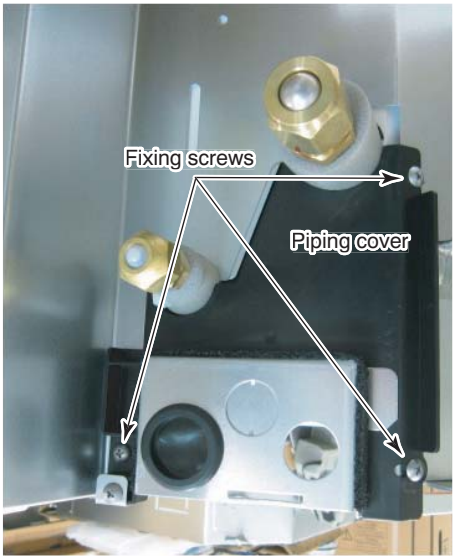
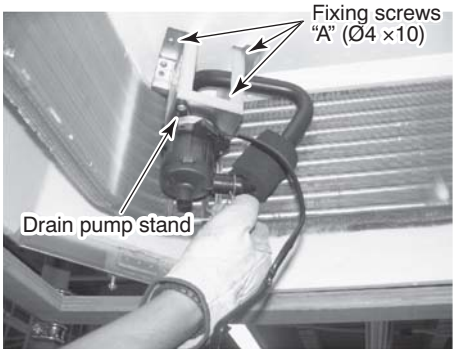
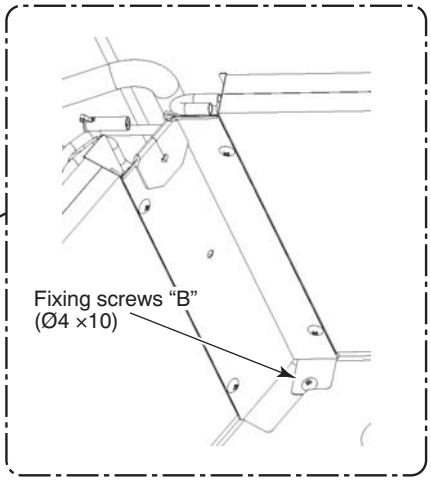
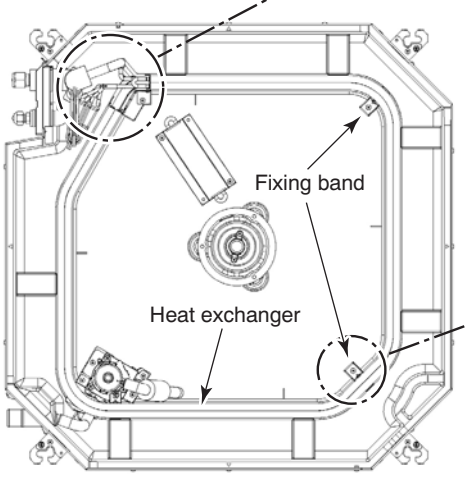
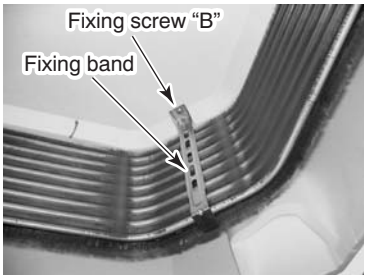
No.	Part name	Procedure	Remarks
⑥	Drain cap	**1. Detachment** 1) Carry out work of Detachment of ① . 2) Loosen screws (3 positions) fixing the drain cap (outside) and then turn the drain cap to the arrow mark → (OPEN) direction to remove it. **NOTE :** The drain cap is hung down because a strap is attached to it (outside). 3) 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. **NOTE :** Be sure to catch drain water using a bucket, 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. 4) Turn the drain cap once again to OPEN → direction to remove it. **2. Attachment** 1) Insert the drain cap (inside), turn it to the arrow mark → (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. **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 the arrow mark → (CLOSE) direction and then attach it using the fixing screw as before. 3) Following to work of Attachment of ① , mount the suction grille as before.	 

No.	Part name	Procedure	Remarks
⑦	Fan motor	**1. Detachment** 1) Carry out work of Detachment of ② . 2) Remove the power supply wire and the remote controller wire from the power supply terminal block and the remote controller terminal block each. After then remove the cord clamps (2 positions) and a screw. 3) 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 (5P, White) CN334 : Fan motor position detection (3P, White) **NOTE :** Unlock the lock of the housing part and then remove the connector. 4) Remove the fixing screws “A and B”, and then remove the electric parts box. (Fixing screw “A”: M4, 10 mm, 3 pcs, Fixing screw “B”: M4, 8 mm, 1 pc.) 5) Remove the fan motor lead, TC sensor and TCJ sensor from clamp of the bell mouth. 6) Remove the fixing screws for the fan guard and then hang down it from the clamps. (M4, 10 mm, 5 pcs.) 7) Remove the fixing screws and then remove the bell mouth. (M4, 10 mm, 8 pcs.) 8) Remove the fixing screws and then remove the nut cap. (M4, 10 mm, 2 pcs.) 9) Remove the fixing nut and then remove the turbo fan. (M8 nut with flange, 1 pc.) 10) Remove the fixing screws and then remove the motor lead holding bracket. (M4, 8 mm, 2 pcs.) 11) Cut the bundling band and then remove it from the clamp. 12) Remove the fixing nut and then remove the fan motor. (M6 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, fan guard. **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.	     

No.	Part name	Procedure	Remarks
⑦	Fan motor (Continued)	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”. (M4, 10 mm, 3 pcs. M4, 8 mm, 1 pc.) 4) Connect the connector, the power supply wire and the remote controller wire as before, which were removed in Detachment work 2) and 3) in previous page, and then fix wiring with clamp. 5) Following to work of Attachment of ② , mount the electric parts box cover and the suction grille as before.	 

No.	Part name	Procedure	Remarks
⑧	Drain pump	**1. Detachment** 1) Carry out works of Detachment of ② and ⑥ . 2) Remove the drain pump connector (CN504, White, 2P) connected to the control P.C. board and then remove the lead wire from the clamp. 3) Remove the fixing screws “A” and then remove the drain pump. (M4, 10 mm, 3 pcs.) 4) As shown in the right figure, first pull out the connecting part of the drain pump and the drain hose from the drain port and then take out the drain pump. 5) Set direction of the knob of the hose band downward, slide it from the pump connecting part to the hose side and then remove the drain hose from the drain pump. 6) Pass the connector of the drain pump lead wire through the wiring taking-out port and then take out the drain pump. **2. Attachment** 1) Enter your hand into the drain port and pass the connector of the drain pump lead wire through the wiring taking-out port. 2) Connect the drain hose to the drain pump as before. **NOTE :** Insert the drain hose up to the end of the drain pump connecting part, apply band to the white mark position of the hose and then set the band knob upward. 3) Return the drain pump to the indoor unit and then mount it as before using the fixing screws “A”. (M4, 10 mm, 3 pcs.) 4) Connect the drain pump connector (CN504, White, 2P) to the control P.C. board and then fix it as before with the clamp. 5) Following to words of Attachment of ⑥ and ② , mount the drain cap, the electric parts box cover and the suction grille as before.	   

No.	Part name	Procedure	Remarks
⑨	Float switch assembly	**1. Detachment** 1) Carry out works of Detachment of ⑦ and works from 1) to 7). 2) Remove the fixing screw and then remove the float switch assembly. (M4, 25 mm, 1 pc.) **2. Attachment** 1) 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 and fan guard as before. (M4, 10 mm, 8 pcs.) 3) Following to works of Attachment of ⑦ and works from 2) to 5), attach the parts as before.	 
⑩	Drain pan	**1. Detachment** 1) Carry out works of Detachment of ④ , ⑥ , ⑦ and works from 2) to 7). 2) Remove the wiring cover by removing the fixing screws. (M4, 8 mm, 2 pcs.) 3) Remove the wiring box by removing the fixing screw. (M4, 10 mm, 1pc.) 4) Remove the fixing screws to remove the drain pan. (M4, 10 mm, 4 pcs.) **2. Attachment** 1) Fix parts as before in order of drain cap → drain pan → bell mouth → wiring box. 2) Following to works of Attachment of ⑦ and works from 2) to 4), attach parts as before. 3) Attach the wiring cover and then attach the electric parts box cover as before. 4) Following to works of Attachment of ④ , attach the parts as before.	   

No.	Part name	Procedure	Remarks
⑪	Heat exchanger	**1. Detachment** 1) Recover the refrigerant gas. 2) Carry out work of Detachment of ⑩. 3) Remove refrigerant pipe at indoor unit side. 4) Remove the fixing screws and then remove the piping cover. (M4, 10 mm, 3 pcs.) 5) Remove the drain hose from the drain pump and remove the fixing screws “A” to remove the drain pump stand. (M4, 8 mm, 3 pcs.) 6) While pushing the heat exchanger, remove the fixing band, fixing screws “B” and the heat exchanger. (M4, 8 mm, 3 pcs.) **2. Attachment** 1) Mount the heat exchanger with the fixing band and the fixing screws “B”. (M4, 8 mm, 3 pcs.) 2) Fix the parts as before in order of drain pump stand → piping cover. 3) Connect the refrigerant pipe as before and then apply vacuuming. 4) Following to work of Attachment of ⑩ , attach the parts as before.	    

12-2. Under Ceiling Type

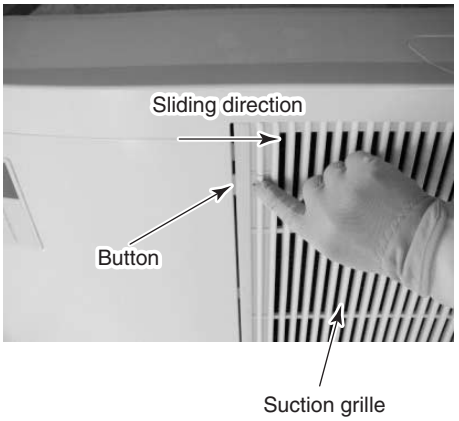
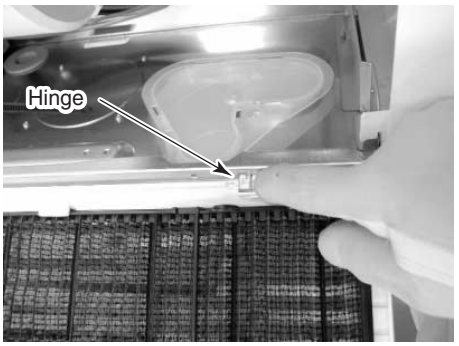
RAV-SP180CT-UL, RAV-SP240CT-UL, RAV-SP300CT-UL, RAV-SP360CT-UL, RAV-SP420CT-UL

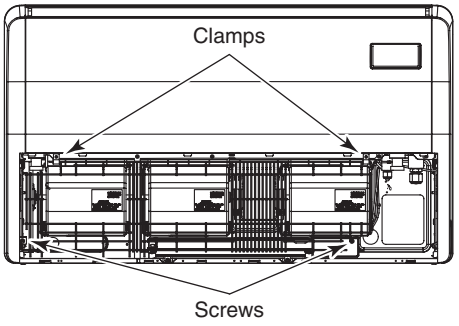
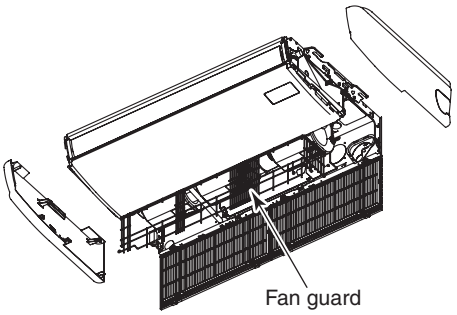
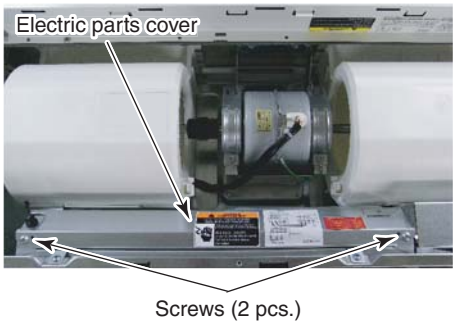
WARNING

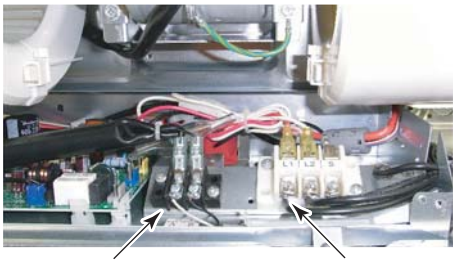
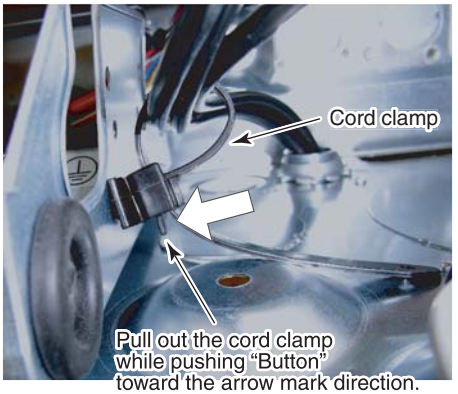
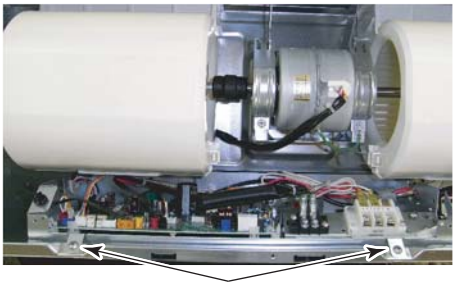
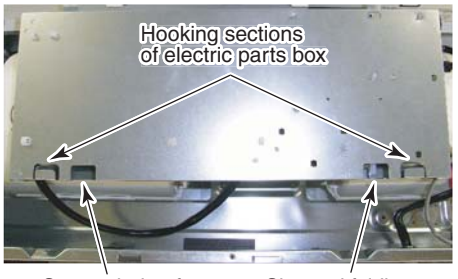
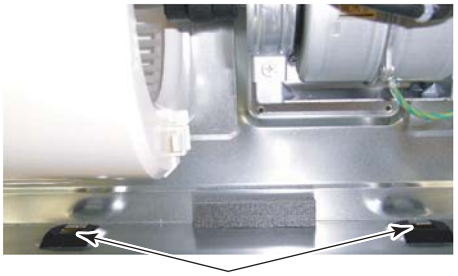
Stop the operation of the air conditioner and then turn off switch of the breaker.

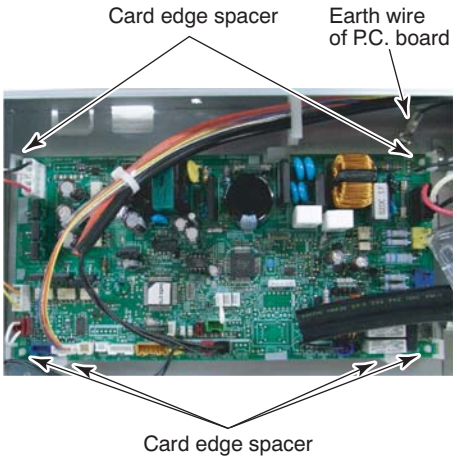
CAUTION

Be sure to put on the gloves at disassembling/assembling work; otherwise an injury will be caused by a part, etc.

No.	Part name	Procedure	Remarks
①	Suction grille	**1. Detachment** 1) Slide button of the suction grille toward the suction grille side and then hang down the suction grille. 2) Remove hinge of the suction grille from the main unit to remove the suction grille. Remove the hinge while pushing the claw at the center part with a minus driver, etc. **2. Attachment** 1) Attach hinge of the suction grille to the square hole of the main unit. Check that the claw is surely hooked on. 2) Close the suction grille and then slide the button to the panel side to fix the suction grille.	 

No.	Part name	Procedure	Remarks
②	Electric parts cover	**1. Detachment** 1) Carry out work of Detachment of ① . 2) Remove the screws (2 pcs.) which are fixing the fan guard. **CAUTION** Remove the 2 screws fixing the fan guard and hang the fan guard with the clamps during a service. 3) Remove the electric parts cover by removing screws (2 positions) which fix the cover. (M4, 10 mm, 2 pcs.) **2. Attachment** 1) Insert the electric parts cover into back side of the electric parts box and then fix it with screws (2 positions). (M4, 10 mm, 2 pcs.) **NOTE:** Be careful that wires are not caught in the electric parts cover. 2) Attach the fan guard as before and then fix it with screws (2 positions). 3) Carry out work of Attachment of ① .	  

No.	Part name	Procedure	Remarks
③	Electric parts box	**1. Detachment** 1) Carry out works of Detachment of ① and ② . 2) Remove the power supply wire and the remote controller wire from the power supply terminal block and the remote controller terminal block each. 3) Remove the power supply wire from cord clamp at side of the electric parts box. 4) Remove screws (M4, 10 mm, 2 pcs.) of the electric parts box and pull out downward. 5) Hook the hooking section temporarily at the rear side of the electric parts box to the sheet fittings part of the main unit. **2. Attachment** 1) Insert the square hole of the electric parts box into the claw of the main unit. 2) Attach screws (M4, 10 mm, 2 pcs.) to the electric parts box. 3) Connect the power supply wire and the remote controller wire as before. 4) Carry out works of Attachment of ① and ② .	 Remote controller terminal block Electric terminal block  Cord clamp Pull out the cord clamp while pushing "Button" toward the arrow mark direction.  Screw  Hooking sections of electric parts box Square hole of electric parts box Sheeted folding up section of main unit  Claws of main unit

No.	Part name	Procedure	Remarks
④	Control P.C. board	**1. Detachment** 1) Carry out works of Detachment of ① , ② and ③ . 2) Remove connectors and earth wire which are connected from the control P.C. board to other parts. **NOTE :** Remove the connectors after releasing lock of the housing part. CN33 : Louver motor (5P: White) CN41 : Remote controller terminal (3P: Blue) (Remote controller terminal block: 2P) CN67 : Power supply terminal (3P: Black) (Power supply terminal block: 3P) CN101 : TC sensor (2P: Black) CN102 : TCJ sensor (2P: Red) CN104 : Room temperature sensor (2P: Orange) CN333 : Fan motor power supply (5P: White) CN334 : Fan motor position detection (5P: White) 3) Release locks of the card edge spacers (6 positions) and then remove the control P.C. board. **2. Attachment** 1) Fix the control P.C. board with the card edge spacers (6 positions). 2) Connect the connectors and earth wires as before, which were removed in Detachment work. **NOTE :** For the connectors, confirm there is no missing or connection failure. 3) Carry out works of Attachment of ① , ② and ③ .	

No.	Part name	Procedure	Remarks
⑤	Fan, Shaft, Bearing, Coupling, Fan case	Fan quantity and mounting construction	

Model name	Quantity	Mounting construction
SP180CT-UL	2 fans	Direct mounting to both sides of fan motor
SP240CT-UL	3 fans	Shaft is used and one side of shaft is supported by bearing.
SP300 to 420CT-UL	4 fans	Shaft is used and the middle part of shaft is supported by bearing.

1. Detachment

NOTE :

The following description is detachment method of SP300 to 420 CT-UL class as representative.

1) Carry out works of Detachment of ② and 1), 2).
2) Remove the hooking claws at both sides of the fan case (bottom).
3) Pull out and remove the fan case (bottom) from the partition panel.
4) Remove the bearing from the main unit by removing the bolts (2 positions) which fix the bearing. (M8, 12 mm, 2 pcs.) (SP300 to 420 models only)

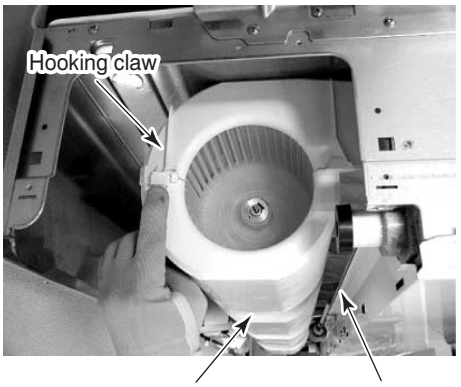
NOTE :

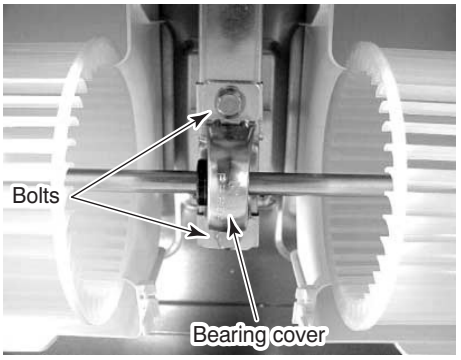
There is a bearing spacer (2 pcs.) between the cover which fixes the bearing and the base.

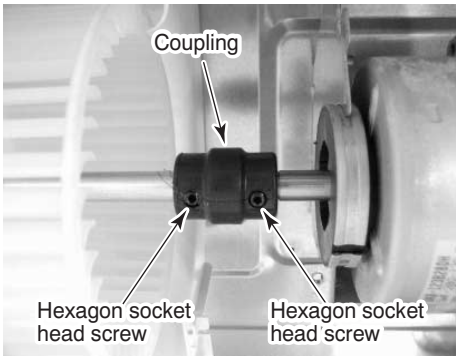
Be careful not to miss the bearing spacer.

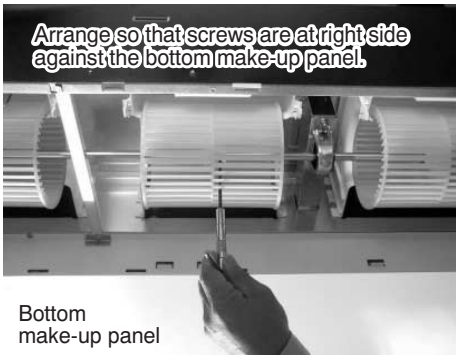
5) Loosen the hexagon socket head screw and then remove the shaft together with the fan.
6) Loosen the hexagon socket head screw and then remove the fan from the shaft.

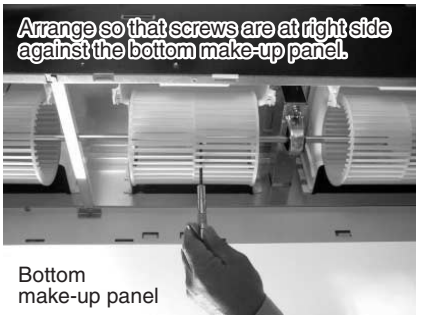
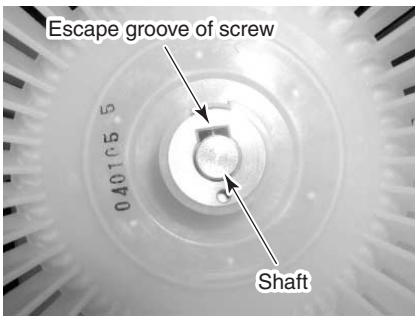
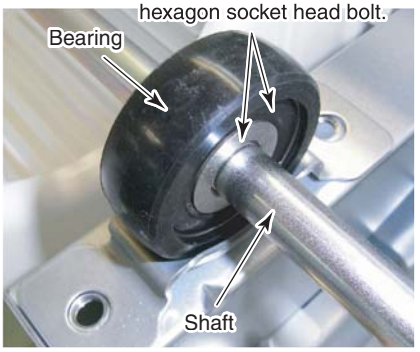
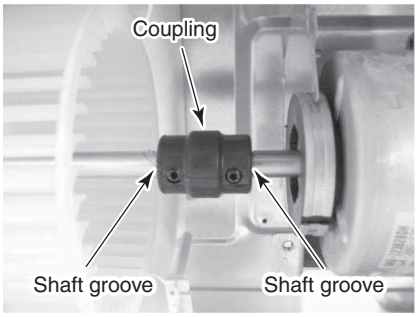
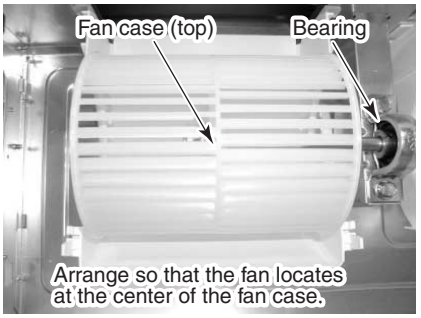
   Loosen the hexagon socket head screws (2 positions) of bearing and then remove them from the shaft if necessary.

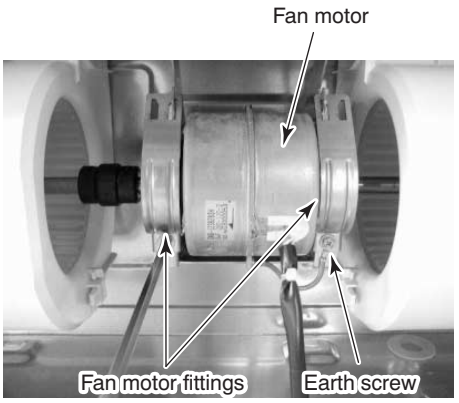
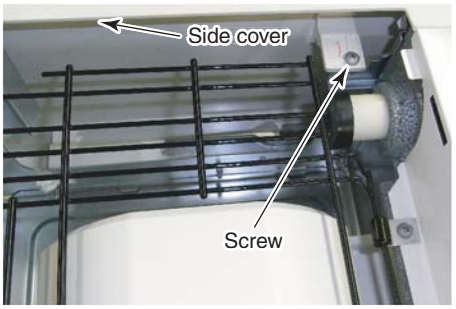


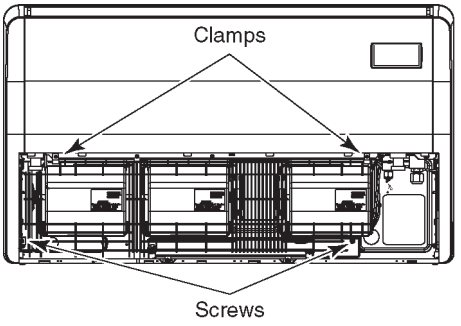
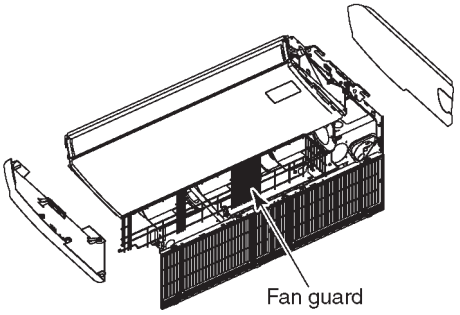
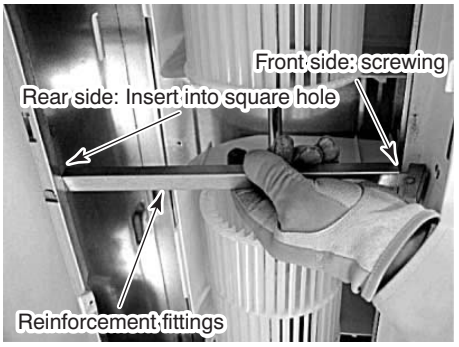
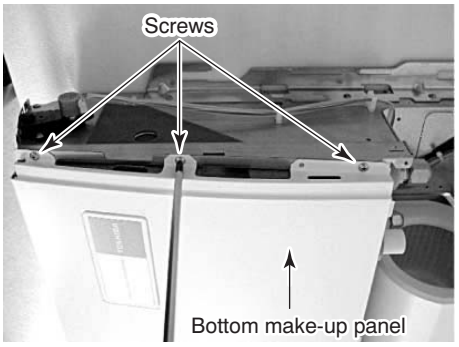
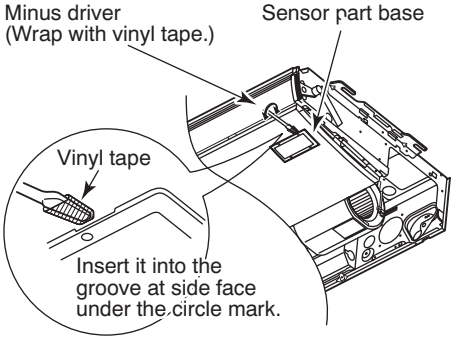


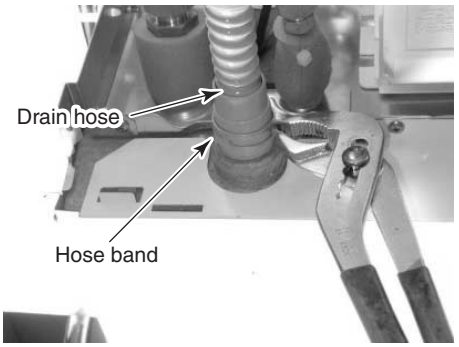
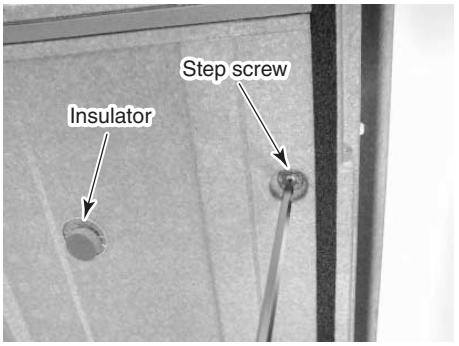
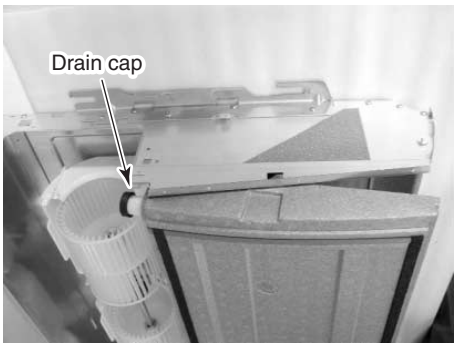


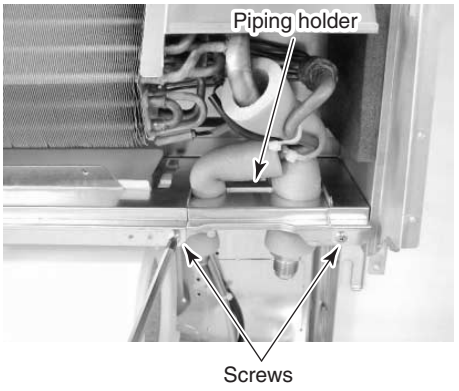
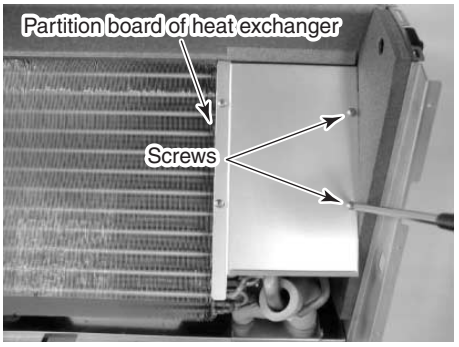
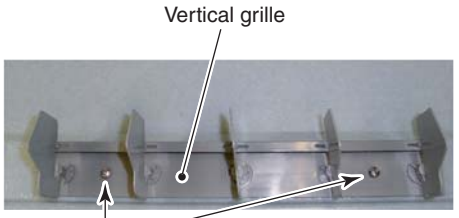


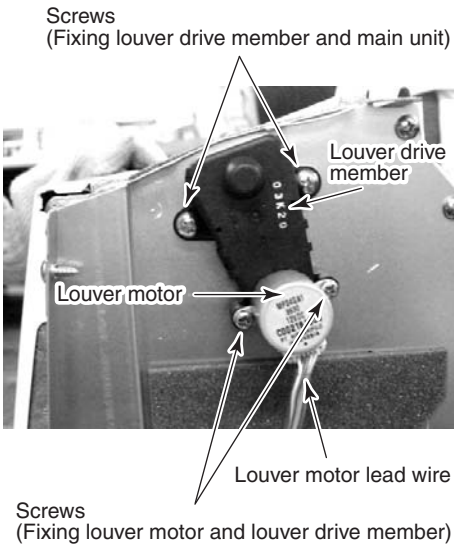
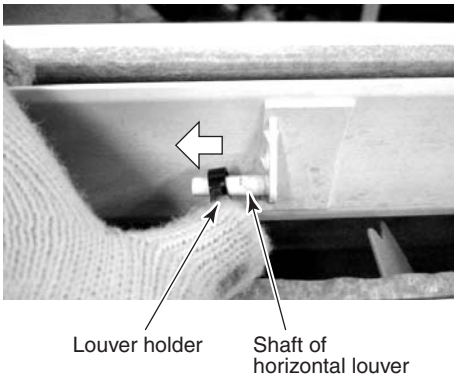
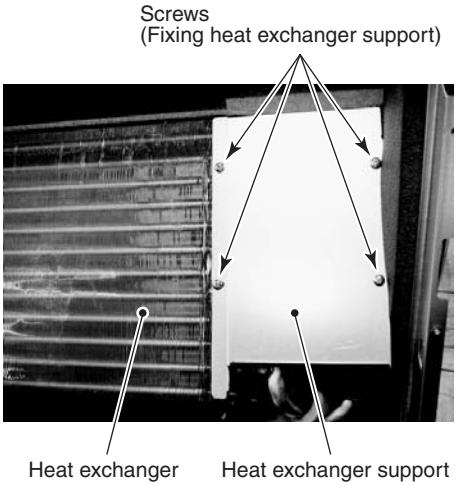
No.	Part name	Procedure	Remarks
⑤	Fan, Shaft, Bearing, Coupling, Fan case (Continued)	**2. Attachment** 1) Mount a fan to the shaft. Refereeing to the right photo, arrange the tightening screw at the right side of the fan against the make-up panel. On boss of the fan, there is attached a groove to escape a scratch received when mounting the hexagon socket head screw to the shaft. Mount it while aligning scratch of the shaft and groove of the fan. Tightening is carried out in the following work. 2) If mounting of bearing to the shaft is required, mount it in the work of 1). (For only SP300 to 420 only) A groove is provided on the shaft in order to match the mounting position with the bearing. Mount the bearing by aligning the single face of bearing to the groove and then fix it with hexagon socket head screws (2 positions). **NOTE :** Use a torque wrench for fixing with 2.5 to 3.4Nm. 3) Put the shaft which was inserted with the fan into the coupling. Tightening is carried out in the following work. 4) Mount the bearing in the main unit as before. **NOTE :** Put into the bearing spacer between base and cover and then fix the bearing spacer with bolts (M8, 12 mm, 2 pcs.) 5) Fix the coupling with the hexagon socket head screws. A groove is provided on the shaft in order to match the mounting position with the coupling. Mount the coupling by aligning the single face of coupling to the groove and then fix it. **NOTE :** Use a torque wrench for fixing with 4.9Nm or more. 6) Position the fan so that the fan locates at the center against the fan case (top) and then fix it with the hexagon socket head screws. **NOTE :** Use a torque wrench for fixing with 4.9Nm or more. 7) Mount the fan case (top) as before. Finally, check the fan turns surely and smoothly. 8) Carry out works 2) and 3) of Attachment of ② .	    

No.	Part name	Procedure	Remarks
⑥	Fan motor	**1. Detachment** 1) Carry out works 1), 2), 3) and 5) of Detachment of ① . 2) Remove wires and connectors which are connected from the control P.C. board to the fan motor. **NOTE :** Release the lock of the housing part and then remove the connectors. CN333 : Fan motor power supply (5P: White) CN334 : Fan motor position detection (5P: White) 3) Remove the screws of the fan motor fixing fittings. Earth screws are tightened together. (M5, 10 mm, 2 pcs.) 4) Remove the fan motor while supporting it with hands so that the fan motor does not fall. **2. Attachment** 1) Mount the fan motor and the motor fixing fittings, tighten it together with earth wire and then fix them with the screws. 2) Connect the connectors as before, which were removed in works of Detachment. 3) Carry out work of Attachment of ⑤ .	
⑦	Side cover	**1. Detachment** 1) Carry out work of Detachment of ① . 2) Remove screws of the side cover. (One-side: M4, 12 mm, with washer, 1 pc.) 3) Slide the side cover toward discharge direction to remove the side cover. **2. Attachment** 1) Slide the side cover toward sucking direction and mount it while inserting hooking claw of the side cover into the square hole at side of the main unit. 2) Attach screws to the side cover. (One-side: M4, 12 mm, with washer, 1 pc.) 3) Carry out work of Attachment of ① .	 Detaching direction Attaching direction 

No.	Part name	Procedure	Remarks
⑧	Fan guard	**1. Detachment** 1) Carry out work of Detachment of ① . 2) Remove the screws (2 pcs.) which are fixing the fan guard. 3) Remove the fan guard by removing screws which fix the clamp. **2. Attachment** 1) Using screws, mount the clamp with the fan guard. 2) Fix the fan guard with screws which were removed in the work of Detachment of ② . 3) Carry out work of Attachment of ① .	 
⑨	Bottom make-up panel	**1. Detachment** 1) Carry out works of Detachment of ⑦ and ⑧ . 2) For models of SP240 to 420 class, remove reinforcement fittings. (M4, 10 mm, 1 pc.) Remove screws at the front side and remove them from the square hole at the rear side. The reinforcement bracket is not provided to models of SP180 class. 3) Remove screws at both sides. (One-side: M4, 10 mm, 3 pcs.) 4) Remove screws at the fan side. (M4, 10 mm, 1 pc.) 5) Float the bottom make-up panel downward while moving it toward the discharge port direction and then remove the panel. **NOTE :** Slide the panel horizontally from the drain pan at discharge side. If you remove the panel forcibly, it may be broken. 6) When removing base of the sensor part, as shown in the following figure, wrap the tip of minus driver with vinyl tape, insert it into the groove at the side face under the circle mark of the cover and then remove the base by winkling out. **2. Attachment** 1) Mount the panel by sliding from discharge side along the drain pan. 2) Attach the screws (Reinforcement fittings (SP240 to 420 class only)) which were removed in the work of Detachment. 3) Carry out works of Attachment of ⑦ and ⑧ .	  

No.	Part name	Procedure	Remarks
⑩	Drain pan	**1. Detachment** 1) Carry out work of Detachment of ⑨ . 2) Take off the drain cap and then extract drain water accumulated in the drain pan. **NOTE :** When taking off the drain cap, be sure to receive drain water by a bucket, etc. 3) Remove the drain hose while picking the hose band and move it out of connecting section of the drain pan. 4) Peel off insulator adhered to discharge side of the drain pan and then remove the sep screw inside. SP180 to 240: Step screw, 1 pc. SP300 to 420: Step screw, 2 pcs. The peeled-off insulator is used at attachment work. 5) Remove the drain pan while sliding it to discharge side. **2. Attachment** 1) Insert the drain cap surely up to the end of the drain pan. 2) Slide the drain cap from discharge side and then hang it surely to the sheeted hooking section at the fan side. 3) Attach step screw removed in the Detachment work and adhere the insulator over it. 4) Using the hose band, mount the drain hose removed in the Detachment work. 5) Carry out work of Attachment of ⑨ .	  

No.	Part name	Procedure	Remarks
⑪	Heat exchanger	**1. Detachment** 1) Recover the refrigerant gas. 2) Remove the refrigerant piping at the indoor unit side. 3) Carry out work of Detachment of ⑩ . 4) Remove screws which fix the piping holder and take off the piping holder. (M4, 8 mm, 2 pcs.) 5) Remove screws of the partition board of the heat exchanger to remove the partition board of the heat exchanger while pressing the heat exchanger. (M4, 8 mm, 4 pcs.) 6) Remove screws of the partition board of heat exchanger and screws of the heat exchanger at the opposite side to remove the heat exchanger while pressing the heat exchanger. (M4, 8 mm, 2 pcs.) **2. Attachment** 1) Fix the parts with sensors as before in order of heat exchanger and then piping holder. 2) Carry out work of Attachment of ⑩ . 3) Connect the refrigerant pipes as before and then perform vacuuming.	 
⑫	Vertical grille	**1. Detachment** 1) Carry out work of Detachment of ⑩ . 2) Remove the set screws (2 positions) of fixing vertical grille. 3) Remove the vertical grille. **2. Attachment** 1) Using screws, mount the vertical grille as before. 2) Carry out work of Attachment of ⑩ .	

No.	Part name	Procedure	Remarks
⑬	Louver motor, Louver drive member	**1. Detachment** 1) Carry out work of Detachment of ⑦ . 2) Remove connectors of the louver motor lead wire. 3) Remove the set screws (2 positions) and louver motor. 4) Remove the set screws (2 positions) and louver drive member. **2. Attachment** 1) Using screws, mount the louver drive member and the louver motor. Mount also the connectors of the louver motor lead wire. 2) Carry out work of Attachment of ⑦ .	
⑭	Horizontal louver	**1. Detachment** 1) Push the louver holder toward arrow direction of right figure, and pull out the center shaft (SP180, SP240: 2 positions) from louver holder. 2) Pull out the left and right shaft of horizontal louver. **2. Attachment** 1) Match the shaft shape at the louver motor side with shape of the shaft hole and then insert the louver. 2) Insert the shaft at opposite side of the above 1) into the shaft hole. 3) Insert the central shaft into the louver holder.	
⑮	TC, TCJ sensor	**1. Detachment** 1) Carry out work of Detachment of ⑩ . 2) Remove the set screws (4 positions) and heat exchanger support. (M4, 10 mm, 4 pcs.) 3) Pull out the sensor is inserted into pipe of the heat exchanger. • TC sensor: Black (Tube color) • TCJ sensor: Red (Tube color) 4) Remove the sensor connectors from P.C. board. (Refer to ④ .) **2. Attachment** 1) Insert the sensor into the sensor holder as before. 2) Mount sensor connectors to P.C. board. 3) Carry out work of Attachment of ⑩ .	

12-3. High Wall Type

RAV-SP180KRT-UL, RAV-SP240KRT-UL

⚠ WARNING

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

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

  Before proceeding with the test run, install the front panel and cabinet.
- Ensure that the following steps are taken when doing repairs on the refrigerating cycle.
  1. Do not allow any naked flames in the surrounding area.

     If a gas stove or other appliance is being used, extinguish the flames before proceeding.

     If the flames are not extinguished, they may ignite any oil mixed with the refrigerant gas.
  2. Do not use welding equipment in an airtight room.

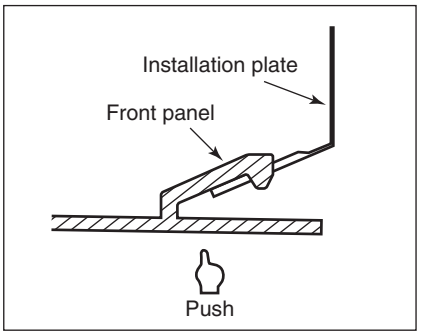
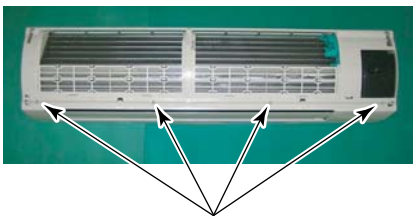
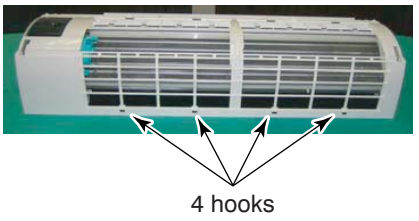
     Carbon monoxide poisoning may result if the room is not properly ventilated.
  3. Do not bring welding equipment near flammable objects.

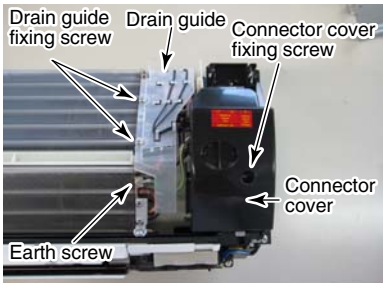
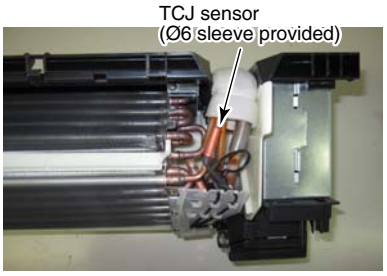
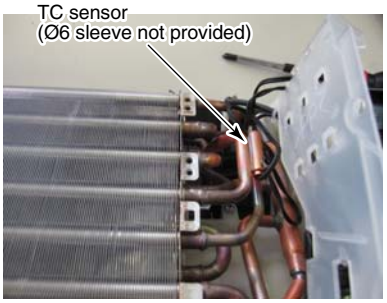
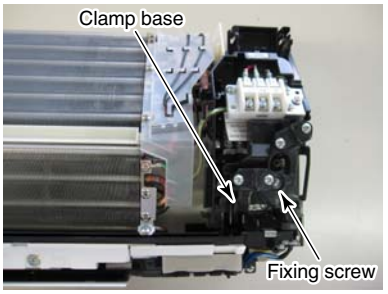
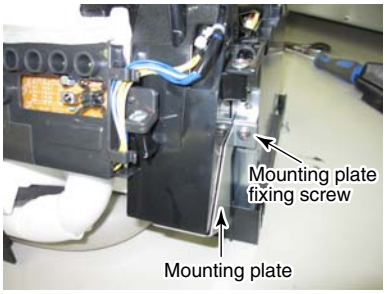
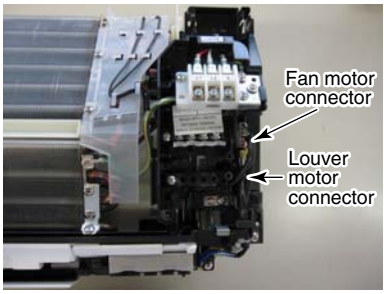
     Flames from the equipment may cause the flammable objects to catch fire.
- **If keeping the power on is absolutely unavoidable while doing a job such as inspecting the circuitry, wear rubber gloves to avoid contact with the live parts.**

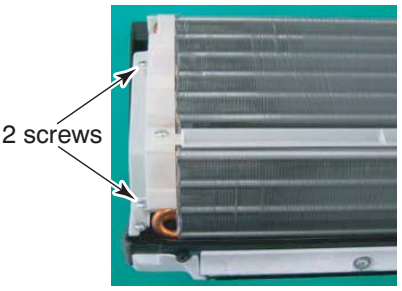
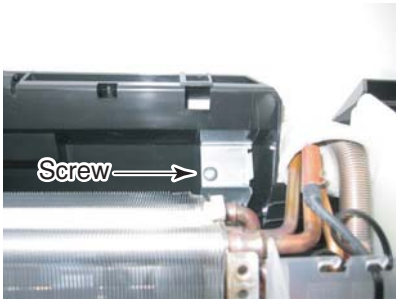
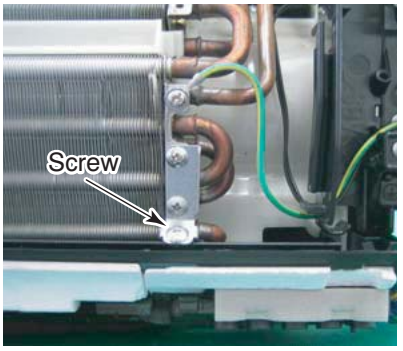
  Electric shocks may be received if the live parts are touched.

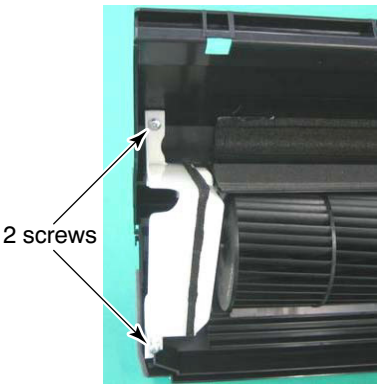
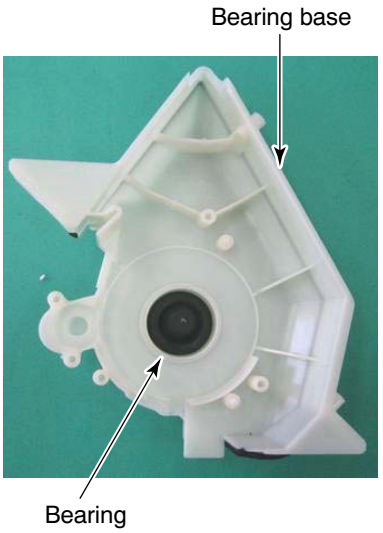
  High-voltage circuits are contained inside this unit.

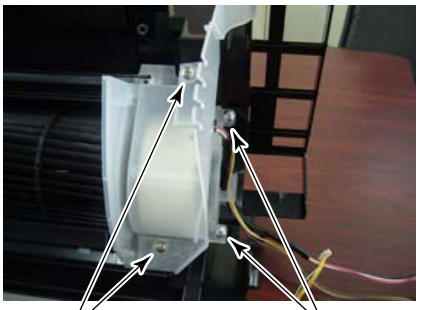
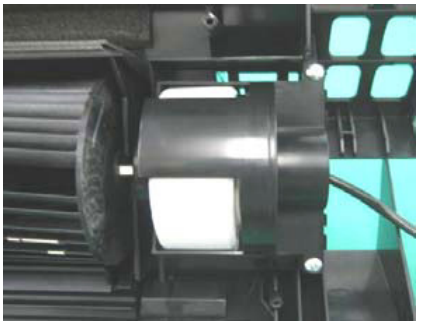
  Proceed very carefully when conducting checks since directly touching the parts on the control circuit board may result in electric shocks.

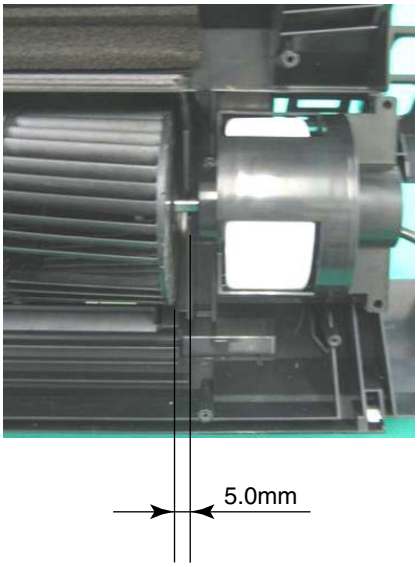
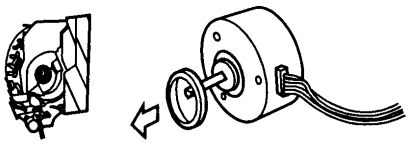
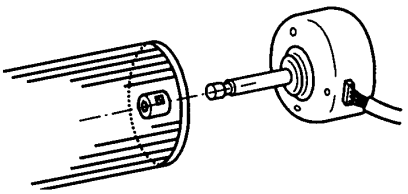
No.	Part name	Procedures	Remarks
①	Front panel	1) Stop operation of the air conditioner and turn off its main power supply. 2) Open the air inlet grille, push the arm toward the outside, and remove the grille.	
		3) Push “PUSH” part under the front panel and remove hooks of the front panel from the installation plate.	
		4) Remove the front panel fixing screws. (4 pcs.) 5) Take off 4 hooks of panel from rear side.	 
		<How to assemble the front panel> 1) Push 3 center positions and 2 lower center positions of the air outlet, and then hang the hanging hooks (4 pcs.) at the top side of the front panel to the rear plate. 2) Tighten four screws. • Incomplete hanging or incomplete pushing may cause a dewdrops or generation of a fluttering sound.	

No.	Part name	Procedures	Remarks
②	Electric parts assembly	1) Perform work of item ① . 2) Take off drain guide fixing screws (2pcs) 3) Pull out TC and TCJ sensors from the senser holder of the heat exchanger. (When reassembling the elect parts ,be careful to the attaching positions of every seneor. TC and TCJ sensors resemble in the shapes , so distinct them by making ,etc. when mounting them.) 4) Take off the connentor cover mounting screw (1pc.) and then remove the connector cover. 5) Take off the clamp base mounting screw (1pc.) and then remove the clamp base. 6) Take off the mounting plate mounting screw (1pc.) and then remove the mounting plate. 7) Remove the fan motor connector (5P) and the connector for louver motor (5P) from the P.C. board. 8) Disengage the display unit by simply pushing at the top of the display unit. 9) Remove the fixing screw that secures the electrical parts box assembly, LED assembly and remove the assembly.	     
③	Horizontal louver	1) Remove shaft of the horizontal louver from the back body. (First remove the left shaft, and then remove other shafts while sliding the horizontal louver leftward.)	

No.	Part name	Procedures	Remarks
④	Evaporator (Heat exchanger)	1) Follow to the procedure in the item ③ . 2) Remove the pipe holder from the rear side of the main unit. 3) Remove 2 fixing screws at the left side of the end plate of the heat exchanger.	 
		4) Remove 2 fixing screws on the heat exchager fixing holder to separate the heat exchanger from the back body.	 

No.	Part name	Procedures	Remarks
⑤	Bearing	1) Follow to the procedure in the item ④ . 2) Remove the 2 screws used to secure the bearing base. 3) Remove the bearing base. **<Caution at assembling>** • If the bearing is out from the housing, push it into the specified position and then incorporate it in the main body.	 

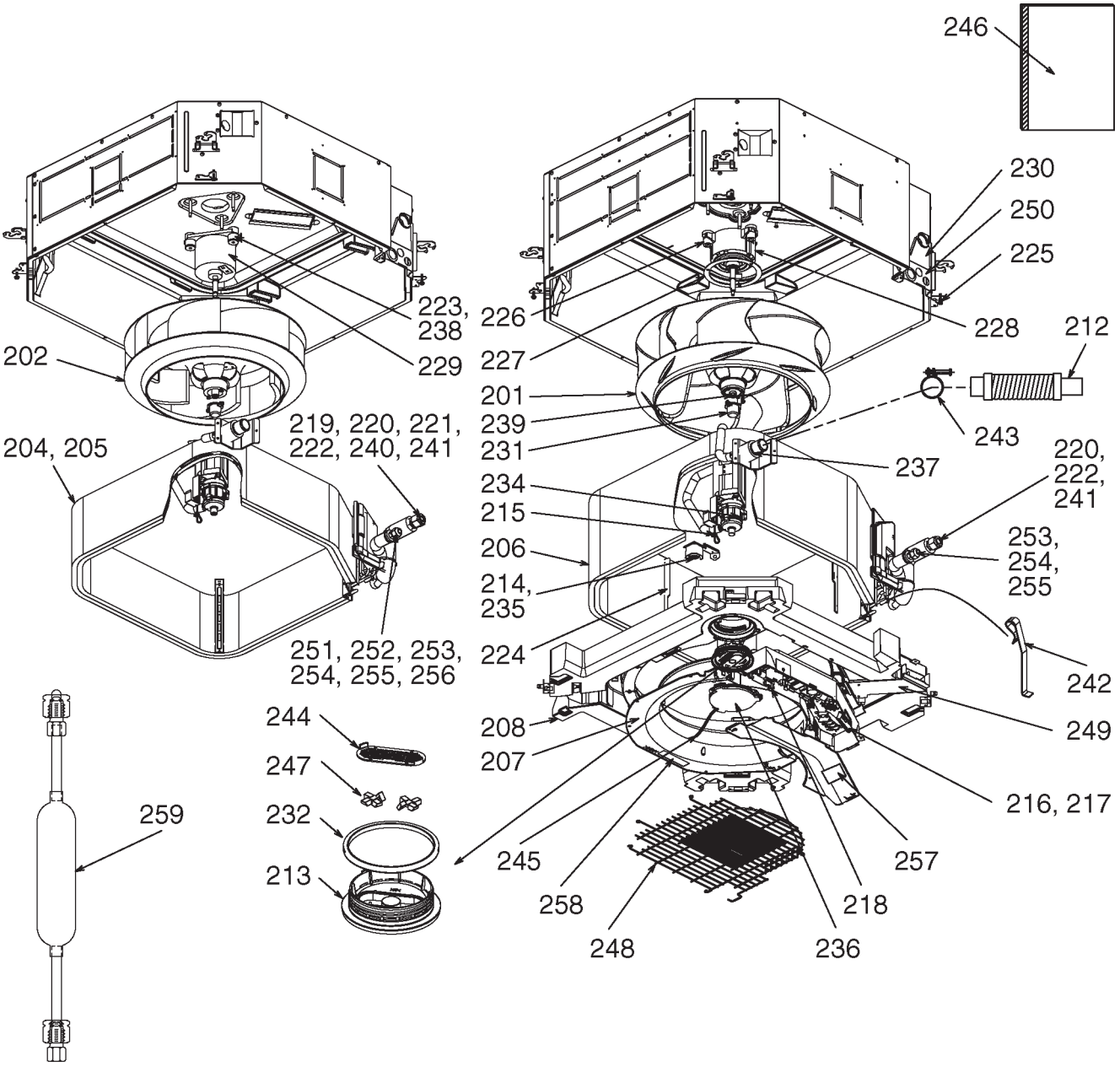
No.	Part name	Procedures	Remarks
⑥	Fan motor	1) Follow to the procedure till item ④ . 2) Loosen the set screw of the cross flow fan. 3) Remove 2 fixing screws of the motor cover and them remove the motor cover. 4) Remove 2 more fixing screws of the motor band and remove the motor band.	 Set screw
			 2 screws on motor cover 2 screws on motor band
		5) Pull the fan motor outward.	

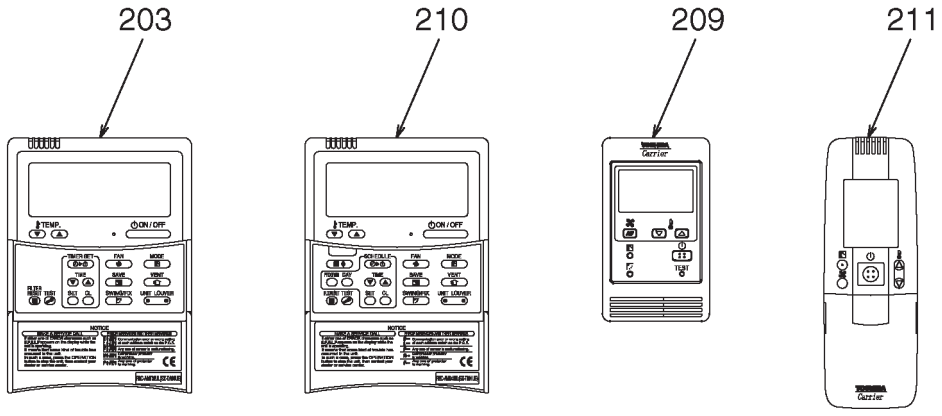
No.	Part name	Procedures	Remarks
⑦	Cross flow fan	**<Caution at reassembling>** 1) To incorporate the fan motor, remove the fan motor rubber (at shaft core side), incorporate the motor into the position in the following figure, and then install the fan motor.	
		• Install the cross flow fan so that the right end of the 1st joint from the right of the cross flow fan is set keeping 5 mm from wall of rear plate of the main unit. • Holding the set screw, install the cross flow fan so that U-groove of the fan motor comes to the mounting hole of the set screw.	
		• Perform positioning of the fan motor as follows: • When assembling the fan motor, the fan motor must be installed in such a way that the fan motor leads will be taken out is positioned at the bottom front. • After assembling the 2 fixing screws of the motor band (right) into the main body, position the fan motor, insert it, and then secure the motor band (right) using the 2 fixing screws.	

13. EXPLODED VIEWS AND PARTS LIST

13-1. 4-Way Air Discharge Cassette Type

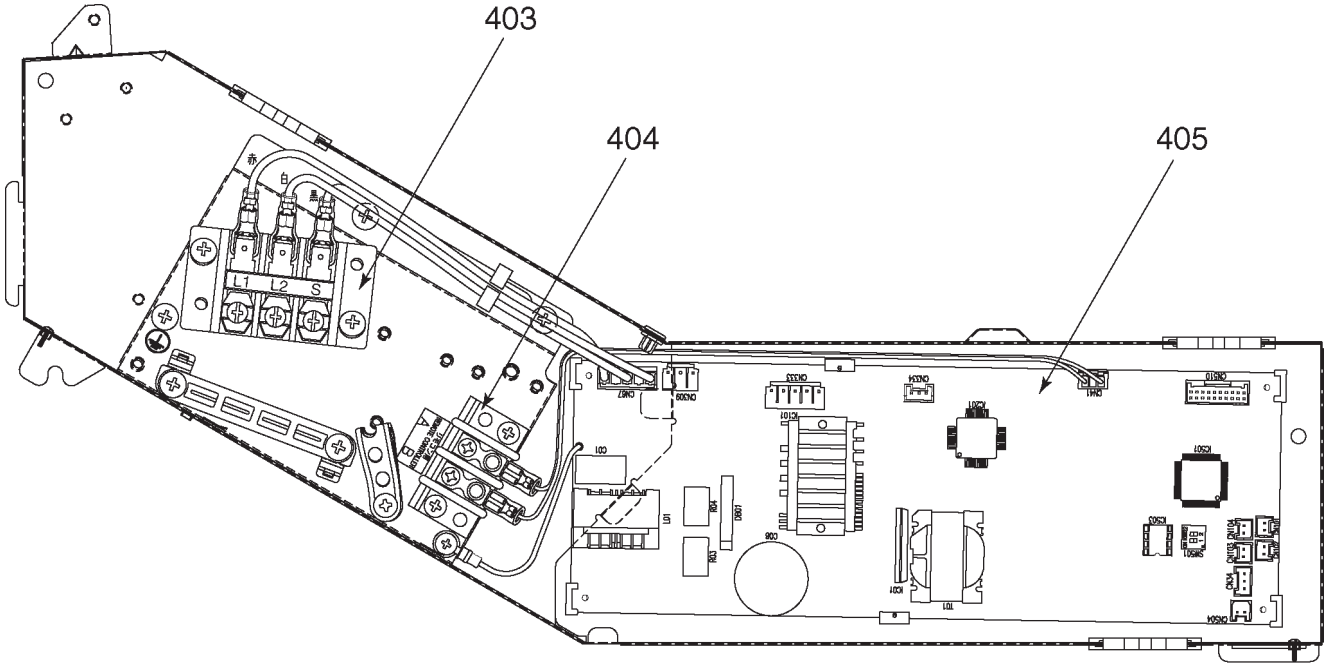
RAV-SP180UT-UL, RAV-SP240UT-UL, RAV-SP300UT-UL, RAV-SP360UT-UL, RAV-SP420UT-UL

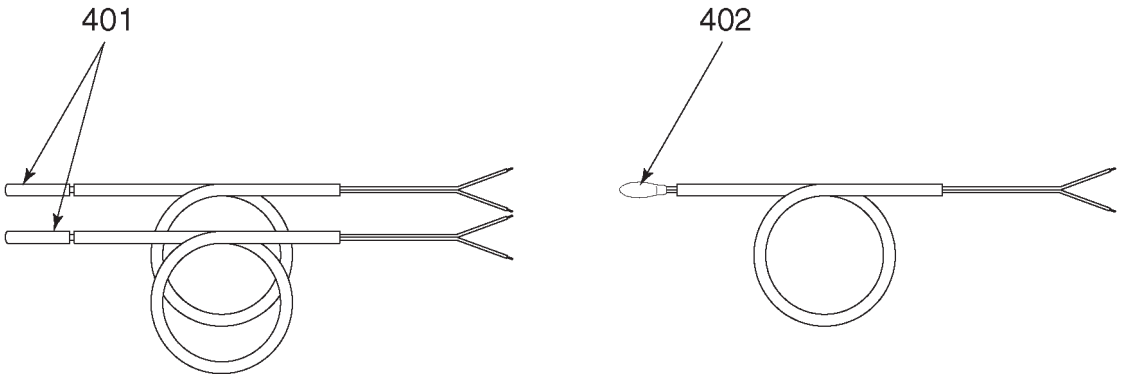




Location No.	Part No.	Description	Model Name RAV-SP				
			180UT-UL	240UT-UL	300UT-UL	360UT-UL	420UT-UL
201	43120247	Fan, Ass'y, Turbo			1	1	1
202	43120248	Fan, Ass'y, Turbo	1	1			
203	43166013	Remote Controller, SX-TA01UE	1	1	1	1	1
204	4314J399	Refrigeration Cycle Ass'y	1				
205	4314J400	Refrigeration Cycle Ass'y		1			
206	4314J401	Refrigeration Cycle Ass'y			1	1	1
207	43122110	Bell Mouth	1	1	1	1	1
208	43172209	Pan Ass'y, Drain	1	1	1	1	1
209	43166015	Remote Controller, SX-UA01UE	1	1	1	1	1
210	43166014	Remote Controller, SX-TB01UE	1	1	1	1	1
211	43166016	Remote Controller, WH-TA01UES	1	1	1	1	1
212	43170244	Hose, Drain, 25A	1	1	1	1	1
213	43179144	LID, Inside	1	1	1	1	1
214	43151290	Switch, Float, FS-0218-102	1	1	1	1	1
215	43079249	Band, Hose	1	1	1	1	1
216	43163057	Clamp, Down	1	1	1	1	1
217	43163058	Clamp, Up	1	1	1	1	1
218	43089147	Clamp, Wire	4	4	4	4	4
219	43047688	Nut, Flare, 1/2 IN	1				
220	43149352	Nut, Flare, 5/8 IN		1	1	1	1
221	43149353	Socket, 1/2 IN	1				
222	43149354	Socket, 5/8 IN		1	1	1	1
223	43139137	Rubber, Cushion	3	3			
224	43122117	Plate, Wind			4	4	4
225	43197197	Screw, Fix Panel	4	4	4	4	4
226	43139165	Rubber, Cushion			3	3	3
227	43197199	Washer			1	1	1
228	4312C058	Motor, Fan, ICF-340U150-1			1	1	1
229	4312C059	Motor, Fan, SWF-340U60-2	1	1			
230	43119500	Cover Ass'y	1	1	1	1	1
231	43139166	Cap, Nut	1	1	1	1	1
232	43179147	Gasket	1	1	1	1	1
234	43177010	Pump Ass'y, MDP-1401	1	1	1	1	1
235	43151299	Switch Ass'y, Float, FS-0218-102	1	1	1	1	1
236	43179145	LID Ass'y, Outside	1	1	1	1	1
237	43170254	Socket Ass'y, Drain	1	1	1	1	1
238	43197155	Washer, 25X6, 5X2T	3	3			
239	43097212	Nut	1	1	1	1	1
240	43147195	Bonnet, 1/2 IN	1				
241	43194029	Bonnet, 5/8 IN		1	1	1	1
242	43019904	Holder, Sensor	2	2	2	2	2
243	43179135	Band, Hose, 37-40	1	1	1	1	1
244	43179146	Cover, Glass	1	1	1	1	1
245	43182010	String	1	1	1	1	1
246	431S8134	Owner's Manual	1	1	1	1	1
247	43179152	Glass	1	1	1	1	1
248	43107280	Guard, Fan	1	1	1	1	1
249	43104200	Cover Wire	1	1	1	1	1
250	43119502	Plate Ass'y	1	1	1	1	1
251	43047685	Nut, Flare, 1/4 IN	1				
252	43149351	Socket, 1/4 IN	1				
253	43049776	Socket, 3/8 IN		1	1	1	1
254	43047609	Bonnet, 3/8 IN		1	1	1	1
255	43149355	Nut, Flare, 3/8 IN		1	1	1	1
256	43049697	Bonnet, 1/4 IN	1				
257	431S8138	Label, WARNING		1	1	1	1
258	431S8137	Label, CAUTION		1	1	1	1
259	43148234	Muffler, 1/4 IN	1				

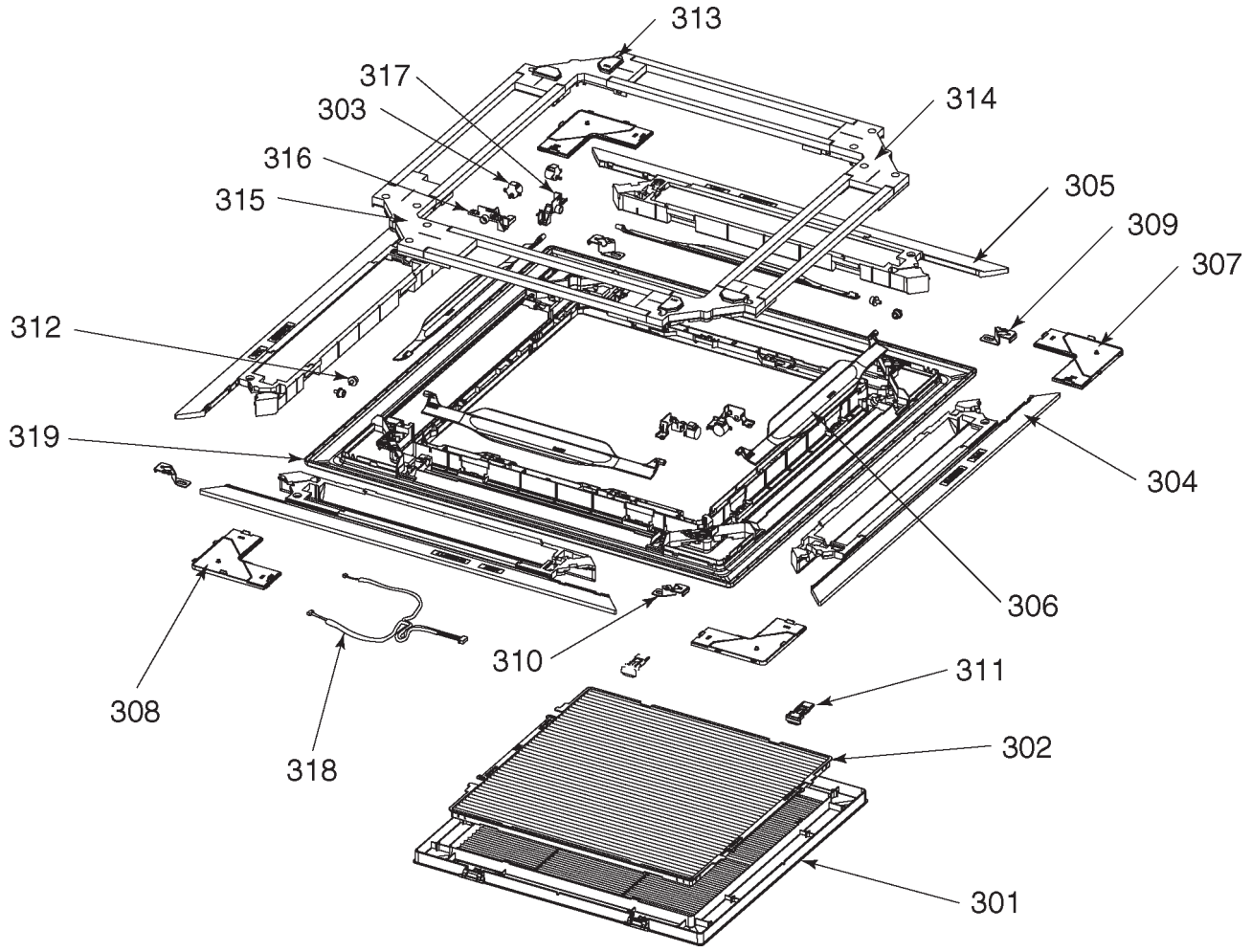
<4-Way Air Discharge Cassette Type Electric Parts>



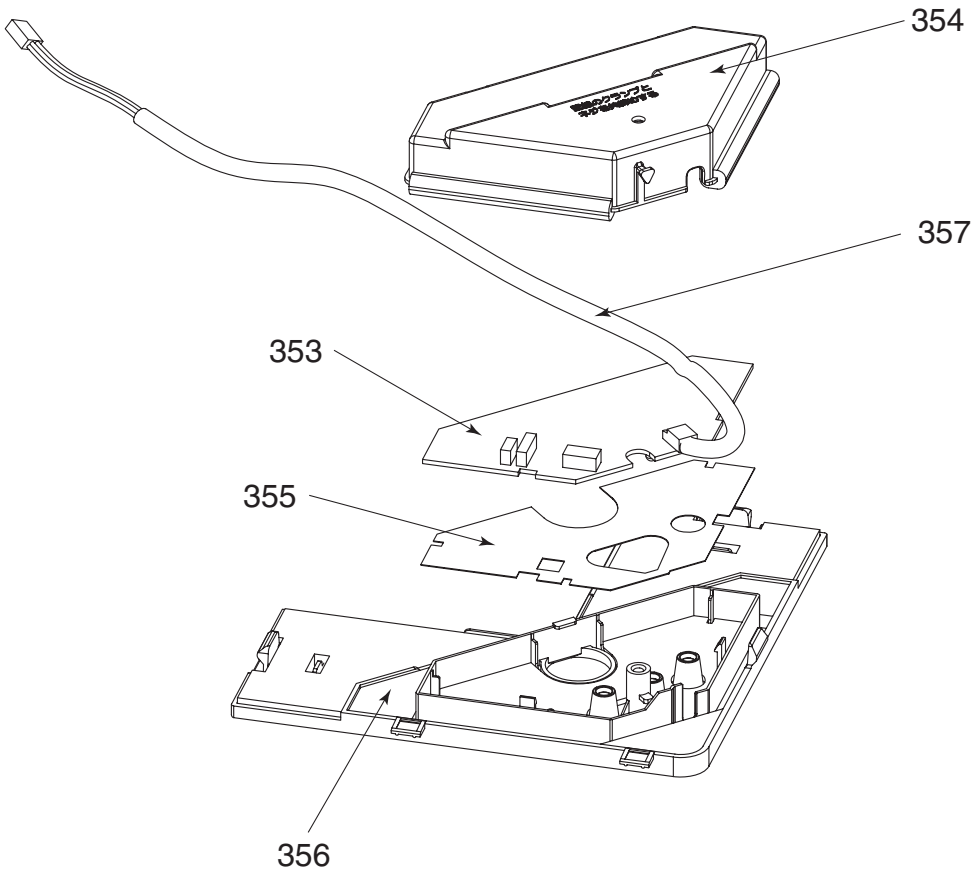


Location No.	Part No.	Description	Model Name
			RAV-SP180UT-UL, 240UT-UL, 300UT-UL, 360UT-UL, 420UT-UL
401	43050425	Sensor Ass'y, TC (F6) : TC, TCJ	2
402	43050426	Sensor, TA	1
403	43160607	Terminal, Block, 3P, AC250V, 20A	1
404	43160568	Terminal, 2P, AC30V/DC42V, 1A	1
405	4316V407	P.C. Board Ass'y, MCC-1570 (208–230V)	1

RBC-U31PG (W)-UL



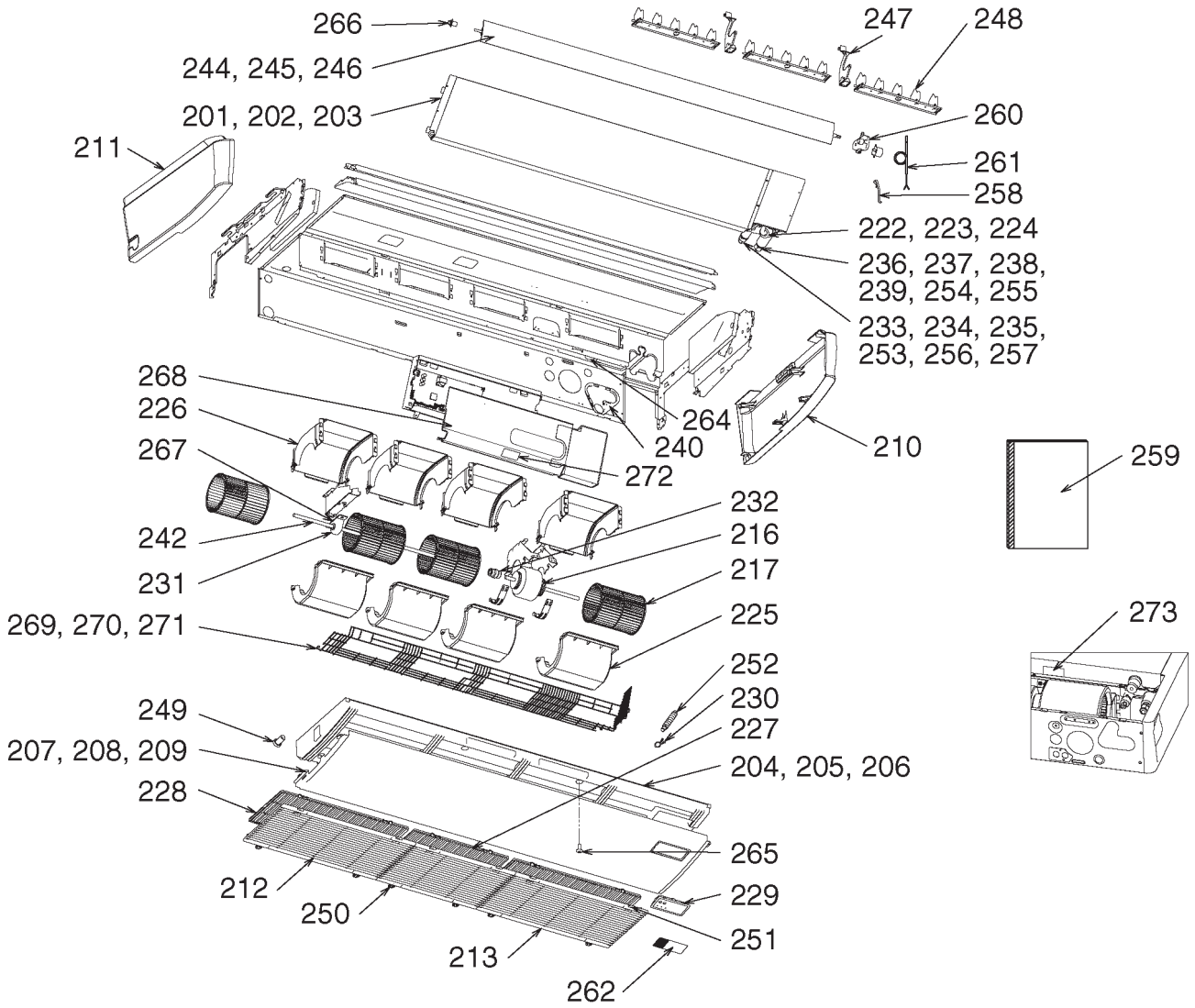
Location No.	Part No.	Description	Model Name
			RBC-U31PG (W)-UL
301	43409207	Grille, Air Inlet	1
302	43480017	Air Filter	1
303	4302D003	Motor, Louver	4
304	43407145	Outlet, Air Form	2
305	43407146	Outlet, Air Form	2
306	43409212	Louver	4
307	43401037	Cover, Panel Ass'y	3
308	43101358	Cover, Panel Ass'y	1
309	43407148	Plate, Fix, Panel	2
310	43407149	Plate, Fix, Panel	2
311	43407150	Hook	2
312	43407154	Cap, AXIS	4
313	43403010	Cover Ass'y, Motor	2
314	43403011	Cover Ass'y	1
315	43403012	Cover Ass'y	1
316	43407155	Fix, Motor	2
317	43407156	Fix, Motor	2
318	43460125	Lead, Motor	1
319	43400077	Panel, Front	1



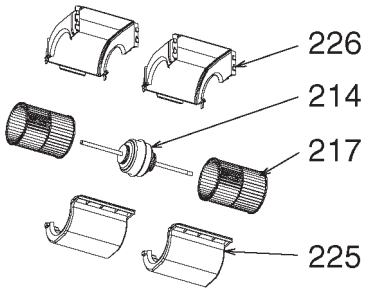
Location No.	Part No.	Description	Model Name
			RBC-AX31U (W)-UL
353	43459011	P.C. Board Ass'y, Remote Receiver	1
354	43462010	Cover, WRS	1
355	43461006	Sheet	1
356	43108018	Cover, Panel, WRS	1
357	43160599	Lead	1

13-2. Under Ceiling Type

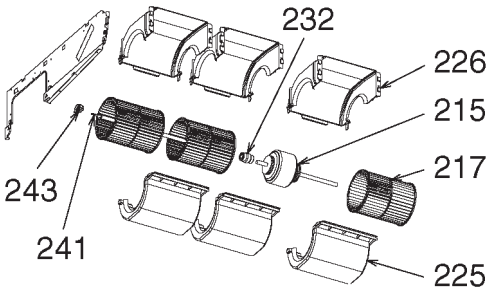
RAV-SP180CT-UL, RAV-SP240CT-UL, RAV-SP300CT-UL, RAV-SP360CT-UL, RAV-SP420CT-UL

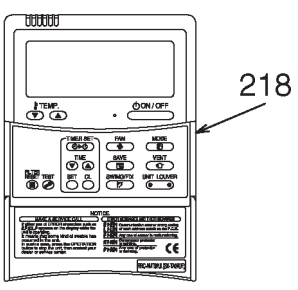


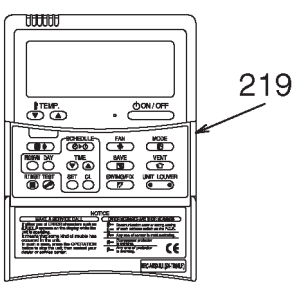
RAV-SP180CT-UL
(Fan assembly)

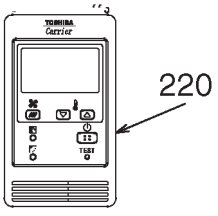


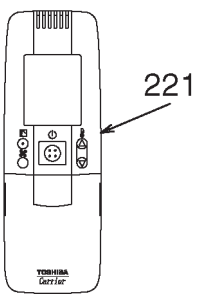
RAV-SP240CT-UL
(Fan assembly)





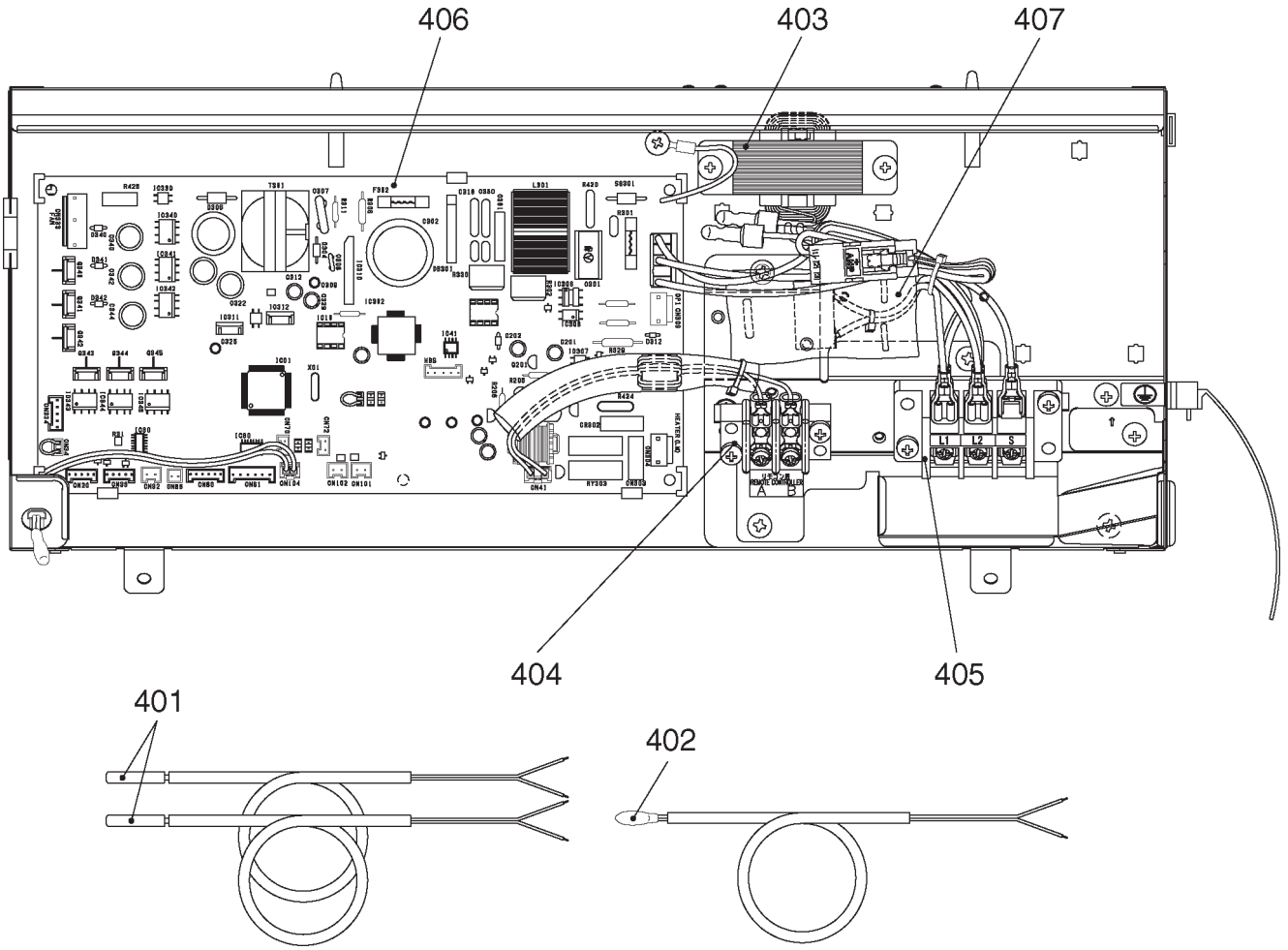




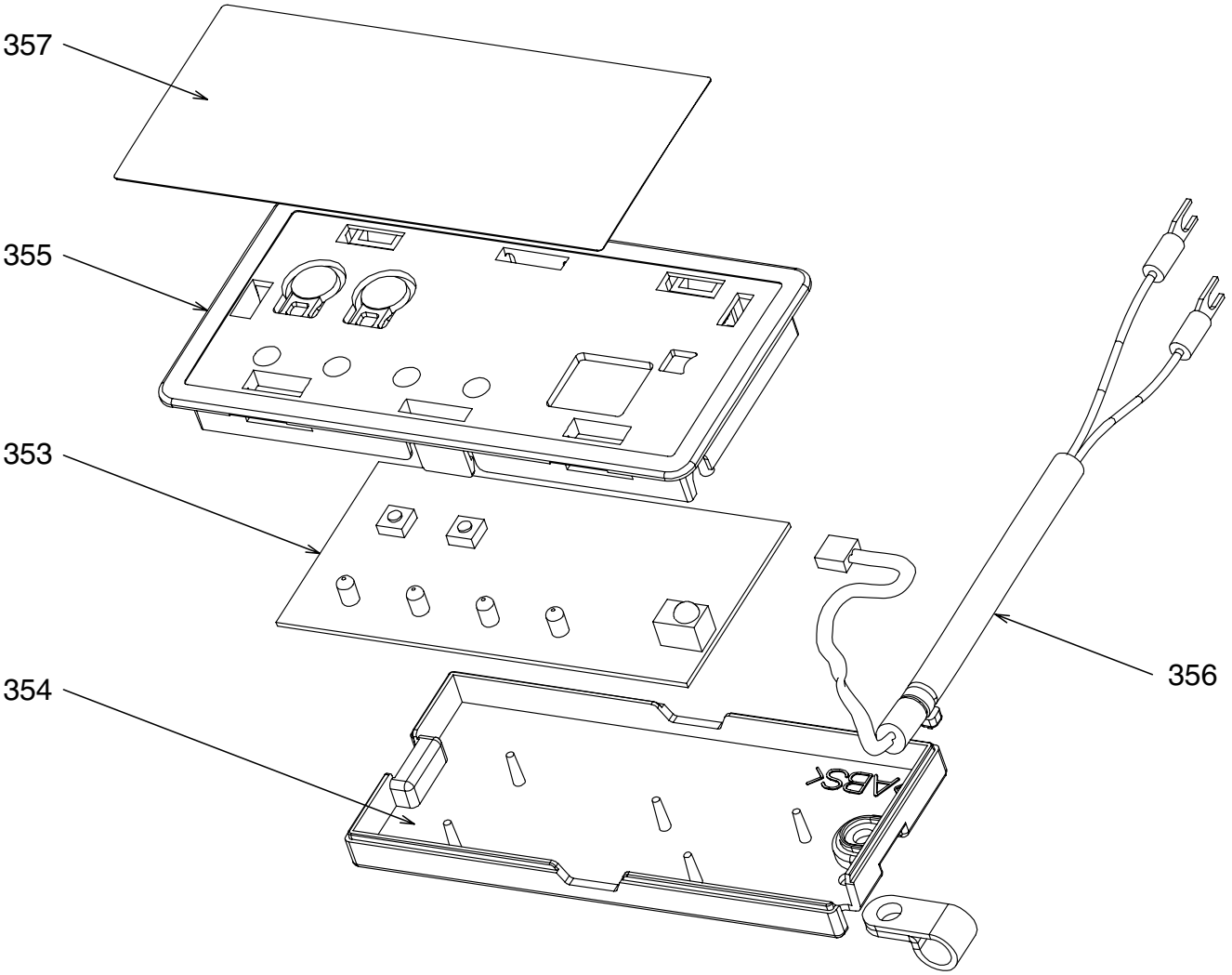


Location No.	Part No.	Description	Model Name RAV-SP				
			180CT-UL	240CT-UL	300CT-UL	360CT-UL	420CT-UL
201	4314J271	Refrigeration Cycle Ass'y	1				
202	4314J272	Refrigeration Cycle Ass'y		1			
203	4314J367	Refrigeration Cycle Ass'y			1	1	1
204	43172188	Pan Drain, Ass'y	1				
205	43172189	Pan Drain, Ass'y		1			
206	43172190	Pan Drain, Ass'y			1	1	1
207	43100356	Panel, Under	1				
208	43100357	Panel, Under		1			
209	43100358	Panel, Under			1	1	1
210	43102647	Cover, Side (Right)	1	1	1	1	1
211	43102648	Cover, Side (Left)	1	1	1	1	1
212	43109407	Grille, Inlet	2		1	1	1
213	43109408	Grille, Inlet		2	2	2	2
214	4312C055	Motor, Fan, SWF-340U60-1A	1				
215	4312C056	Motor, Fan, SWF-340U60-2A		1			
216	4312C057	Motor, Fan, SWF-340U120-2A			1	1	1
217	43120227	Fan, Multi Blade	2	3	4	4	4
218	43166013	Remote Controller, SX-TA01UE	1	1	1	1	1
219	43166014	Remote Controller, SX-TB01UE	1	1	1	1	1
220	43166015	Remote Controller, SX-UA01UE	1	1	1	1	1
221	43166016	Remote Controller, WX-TA01UES	1	1	1	1	1
222	4314Q090	Distributor Ass'y	1				
223	43147701	Distributor Ass'y		1			
224	43147702	Distributor Ass'y			1	1	1
225	43122084	Case, Fan Lower	2	3	4	4	4
226	43122085	Case, Fan Upper	2	3	4	4	4
227	43180314	Air Filter	2		1	1	1
228	43180315	Air Filter		2	2	2	2
229	43108014	Base, Receiver	1	1	1	1	1
230	43179136	Band, Hose	2	2	2	2	2
231	43125131	Bearing, Shaft			1	1	1
232	43125162	Coupling		1	1	1	1
233	43047685	Nut, Flare, 1/4 IN	1				
234	43049776	Socket, 3/8 IN		1	1	1	1
235	43149351	Socket, 1/4 IN	1				
236	43047688	Nut, Flare, 1/2 IN	1				
237	43149352	Nut, Flare, 5/8 IN		1	1	1	1
238	43149353	Socket, 1/2 IN	1				
239	43149354	Socket, 5/8 IN		1	1	1	1
240	43149326	Cover, Back Base	1	1	1	1	1
241	43125164	Shaft		1			
242	43125165	Shaft			1	1	1
243	43125171	Bearing Ass'y, Mold		1			
244	43109409	Grille Ass'y, Horizontal	1				
245	43109410	Grille Ass'y, Horizontal		1			
246	43109411	Grille Ass'y, Horizontal			1	1	1
247	43107260	Support, Grille Horizontal	1	1	2	2	2
248	43122086	Grille Ass'y, Vertical	2	2	3	3	3
249	43179129	Cap, Drain	1	1	1	1	1
250	43107254	Hinge, Grille Inlet	4	4	6	6	6
251	43107255	Hook, Grille Inlet	4	4	6	6	6
252	43170234	Hose, Drain	1	1	1	1	1
253	43047609	Bonnet		1	1	1	1
254	43047692	Bonnet	1				
255	43194029	Bonnet		1	1	1	1
256	43149355	Nut, Flare, 3/8 IN		1	1	1	1
257	43049697	Bonnet	1				
258	43019904	Holder, Sensor	2	2	2	2	2
259	431S8135	Owner's Manual	1	1	1	1	1
260	43121746	Driver Ass'y Horizontal Louver	1	1	1	1	1
261	43160556	Lead, Louver Horizontal	1	1	1	1	1
262	43108020	Mark, TOSHIBA	1	1	1	1	1
263	43196012	Bushing	1	1	1	1	1
264	43162050	Bushing, 56 DIA	1	1	1	1	1
265	43197189	Screw, Fix Drain Pan	1	1	2	2	2
266	43107252	Shaft, Horizontal Louver	1	1	1	1	1
267	43139153	Spacer, Bearing			2	2	2
268	43162059	Cover, E-parts	1	1	1	1	1
269	43107281	Guard, Fan			1	1	1
270	43107282	Guard, Fan		1			
271	43107283	Guard, Fan	1				
272	431S8138	Label, WARNING	1	1	1	1	1
273	431S8137	Label, CAUTION	1	1	1	1	1
274	43196010	Bushing	1	1	1	1	1

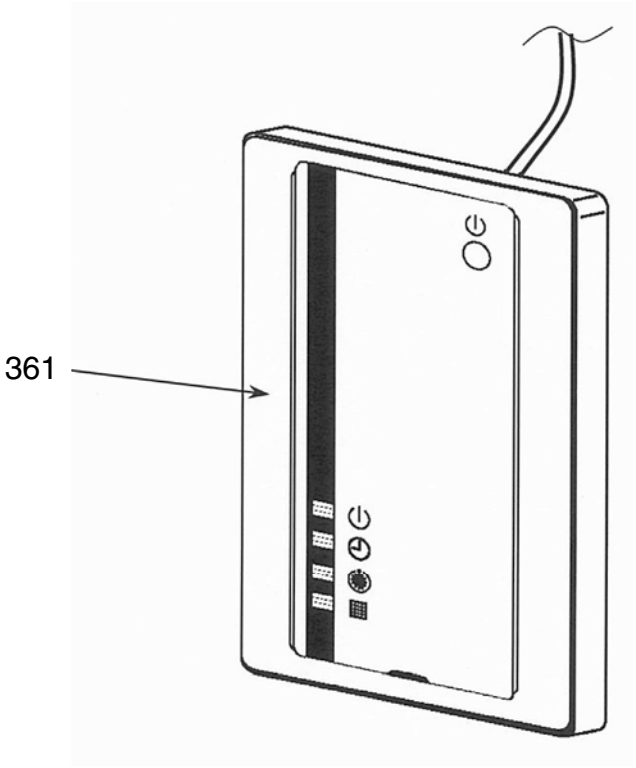
<Under Ceiling Type Electric Parts>



Location No.	Part No.	Description	Model Name RAV-SP				
			180CT-UL	240CT-UL	300CT-UL	360CT-UL	420CT-UL
401	43050425	Sensor, TC (F6) : TC, TCJ	2	2	2	2	2
402	43050426	Sensor, TA	1	1	1	1	1
403	43158193	Reactor, CH-43-2Z-T	1	1	1	1	1
404	43160568	Terminal, 2P, AC30V/DC42V, 1A	1	1	1	1	1
405	43160607	Terminal Block, 3P, AC250V, 20A	1	1	1	1	1
406	4316V406	P.C. Board Ass'y, MCC-1402 (208-230V)	1	1	1	1	1
407	43155203	Capacitor Kit, ECQU3A474 (M) G. 0.47UF	1	1	1	1	1



Location No.	Part No.	Description	Model Name
			RBC-AX22CUL
353	43459012	P.C. Board (MCC-1504)	1
354	43408030	Cover, Receiver	1
355	43108014	Base, Receiver	1
356	43160601	Lead	1
357	43108021	Mark, TOSHIBA	1

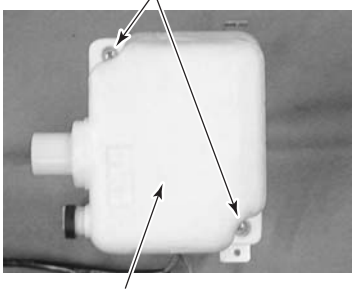
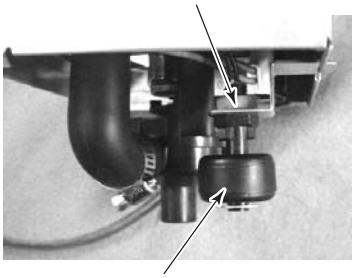
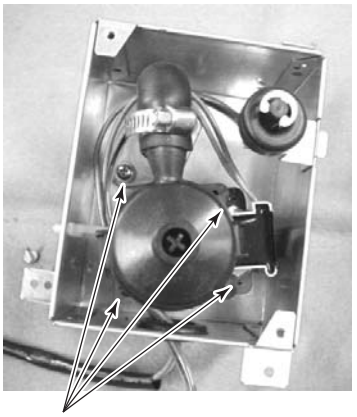
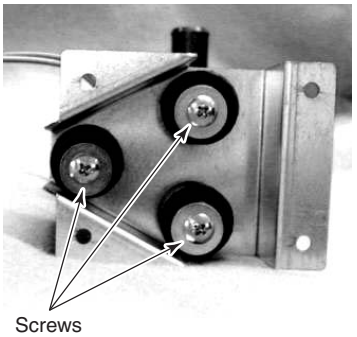


Location No.	Part No.	Description	Model Name
			TCB-AX21UL
361	4316V409	Receiver, Unit, CR-BH1AG-R	1

13-3. Replacement of Main Parts (Sold Separately)

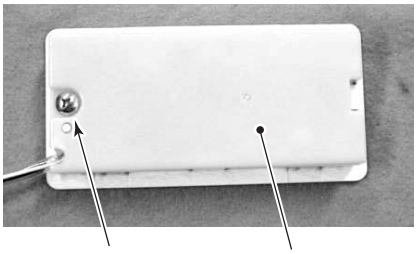
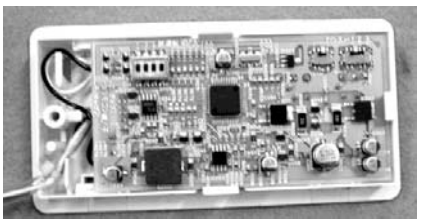
13-3-1. Drain up Kit

TCB-DP22CUL

No.	Part name	Procedure	Remarks
①	Drain pan	1. Remove the Drain up kit from the main unit. 2. Remove the set screws (2 positions) and drain pan.	Screws (Fixing drain pan and main unit)  ①-2 Drain pan
②	Float switch	1. Remove the drain pan. 2. Remove the plastics nut of fixing float switch. 3. Remove the float switch.	Plastics nut  ②-2 Float switch
③	Drain pump	1. Remove the drain pan. 2. Remove the set screws (4 positions) of fixing drain pump plate and main unit. 3. Remove the screws (3 positions) of fixing drain pump plate and drain pump.	 ③-2 Screws (Fixing drain pump and main unit)  ③-3 Screws (Fixing drain pump and drain plate)

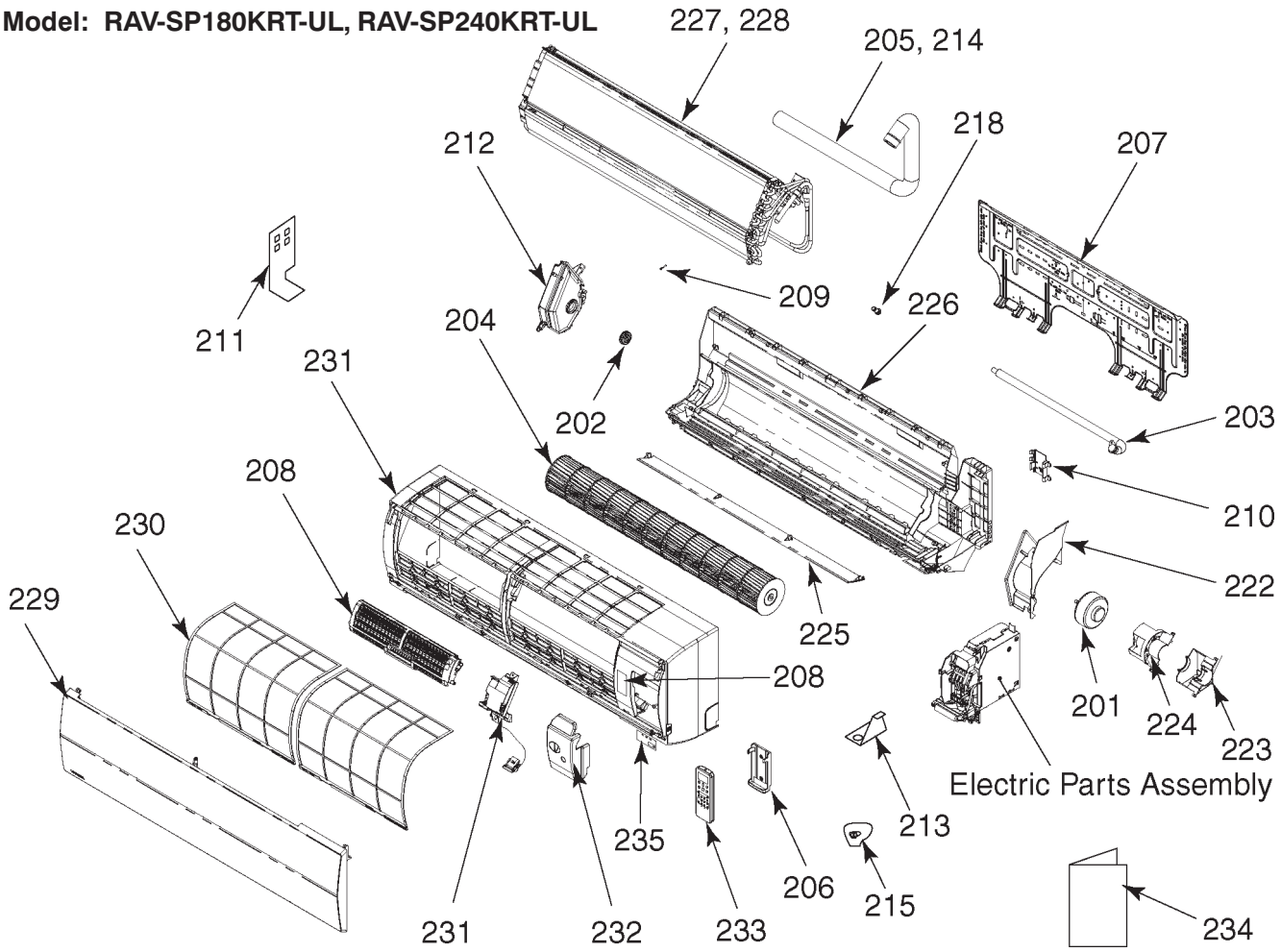
13-3-2. Wireless Remote Controller Kit

RBC-AX22CUL

No.	Part name	Procedure	Remarks
①	P.C. board	1. Remove the signal receiving unit from main unit. 2. Remove the set screw (1 position) and P.C. board cover. 3. Remove the P.C. board.	 Screw P.C. board cover ①-2  ①-3

13-4. High Wall Type

Model: RAV-SP180KRT-UL, RAV-SP240KRT-UL



⚠ CAUTION

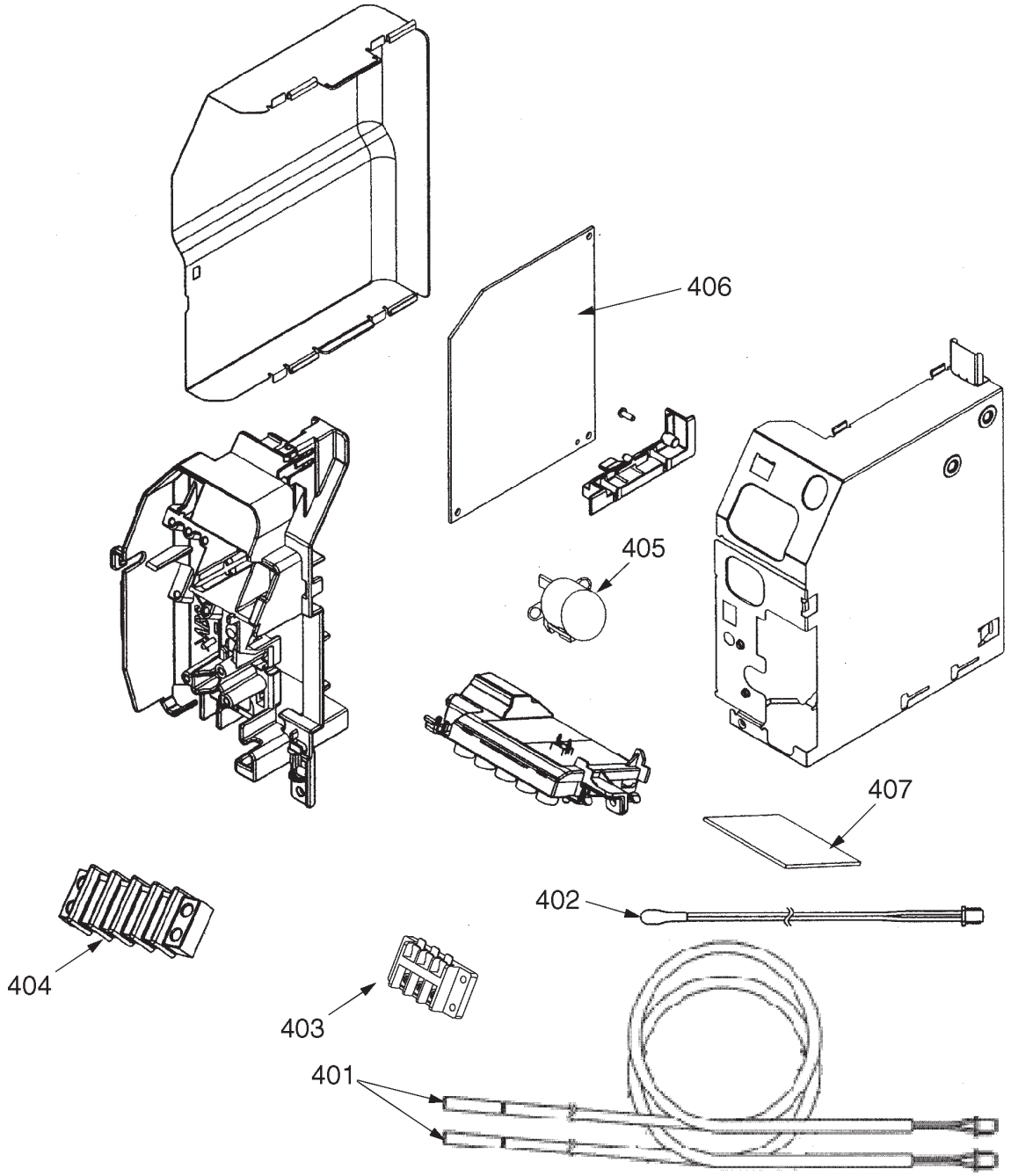
For orders of the service parts for High Wall type air conditioners, please check the service parts on Web site of [TOSHIBA CARRIER THAILAND CO., Ltd.], and then place an order for parts to (TOSHIBA CARRIER THAILAND CO., Ltd.).

Location No.	Part No.	Description
201	43T21371	Motor, Fan
202	43T22312	Bearing Ass'y, Mold
203	43T70313	Hose, Drain
204	43T20016	Fan Ass'y, Cross Flow
205	43T49010	Pipe, Shield (SP180KRT)
206	43T83003	Holder, Remote Controller
207	43T82011	Plate, Installation
208	43T62031	Label, Warning
209	43T19333	Holder, Sensor
210	43T49043	Holder, Pipe
211	43T39024	Guide, Drain
212	43T22011	Base, Bearing
213	43T19021	Plate
214	43T49045	Pipe, Shield (SP240KRT)
215	43T62032	Clamp, Base Ass'y
218	43T79313	Cap, Drain

Location No.	Part No.	Description
222	43T39026	Band, Motor, Left
223	43T39023	Band, Motor, Right down
224	43T39022	Band, Motor, Right up
225	43T09040	Louver, Horizontal
226	43T03020	Body Ass'y, Back
227	43T44038	Evaporator Ass'y (SP240KRT)
228	43T44039	Evaporator Ass'y (SP180KRT)
229	43T00058	Grille Ass'y, Sub TOSHIBA
230	43T80019	Air filter
231	43T00057	Panel Ass'y, Service
232	43T62031	Cover, Terminal
233	43T69085	Remote controller, Wireless
234	43T85073	Owner's Manual
235	43T15002	Display

13-5. Electric Parts

Model: RAV-SP180KRT-UL, RAV-SP240KRT-UL



⚠ CAUTION

For orders of the service parts for High Wall type air conditioners, please check the service parts on Web site of [TOSHIBA CARRIER THAILAND CO., Ltd.], and then place an order for parts to (TOSHIBA CARRIER THAILAND CO., Ltd.).

Location No.	Part No.	Description
401	43T50304	ASM-Sensor-Serv : TC, TCJ
402	43T69320	Sensor, TA
403	43T60080	Terminal Block, 3P
404	43T60079	Terminal Block, 4P, 1A

Location No.	Part No.	Description
405	43T21397	Louver, Motor, MP24Z3T
406	43T69083	P.C.Board Ass'y
407	43T69084	P.C.Board Ass'y, WRS-LED

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.

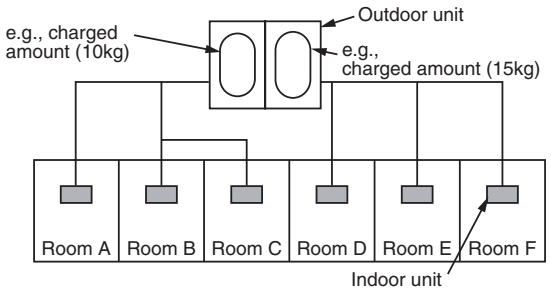
The refrigerant R410A which is used in the air conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise 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.

$$\frac{\text{Total amount of refrigerant (kg)}}{\text{Min. volume of the indoor unit installed room (m}^3\text{)}} \leq \text{Concentration limit (kg/m}^3\text{)}$$

Refrigerant Concentration Limit shall be in accordance with local regulations.

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:

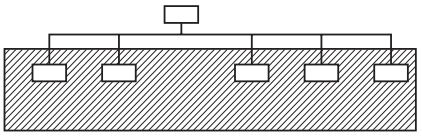
The possible amount of leaked refrigerant gas in rooms A, B and C is 10kg.
The possible amount of leaked refrigerant gas in rooms D, E and F is 15kg.

Important

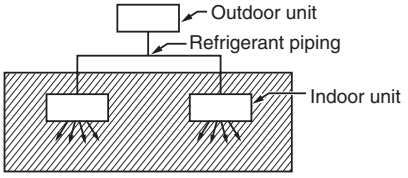
NOTE 2 :

The standards for minimum room volume are as follows.

1) No partition (shaded portion)

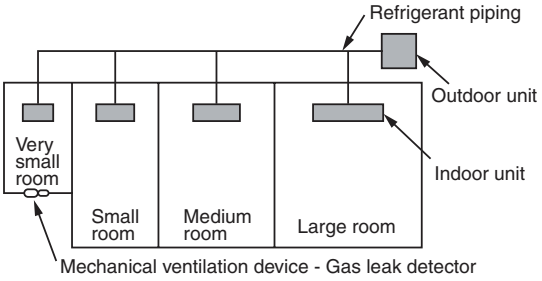


2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).



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.



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Revision record

First issue	—	—	Nov., 2009
Revision 2	File volume down	—	Jan., 2012
Revision 3	4-Way Cassette weight changed	Page 9	Sep., 2014
	4-Way Cassette CONSTRUCTION VIEWS changed	Page 12, 13, 14	
Revision 4	The contents change of Description of service parts	Page 178, 183, 189	Jun., 2017
Revision 5	Deleted the word.	Page 145, 152	Nov., 2021