

# Service Manual

## Inverter Pair Wall Mounted Type F-Series / G-Series



**[Applied Models]**

- Inverter Pair : Cooling Only
- Inverter Pair : Heat Pump

# Inverter Pair F-Series G-Series

●Cooling Only

Indoor Unit

FTKD50FVM

FTKD60FVM

FTKD71FVM

FTKD50FV2Z

FTKD60FV2Z

FTKD71FV2Z

FTKD15GV2S

FTKD18GV2S

FTKD24GV2S

FTKD28GV2S

Outdoor Unit

RKD50BVM

RKD60BVM

RKD71BVM

RKD50BVMA

RKD60BVMA

RKD71BVMA

RKD15GV2S

RKD18GV2S

RKD24GV2S

RKD28GV2S

●Heat Pump

Indoor Unit

FTXD50FVM

FTXD60FVM

FTXD71FVM

FTXD50FV2Z

FTXD60FV2Z

FTXD71FV2Z

Outdoor Unit

RXD50BVMA

RXD60BVMA

RXD71BVMA

1. Introduction .....	V
1.1 Safety Cautions .....	v
1.2 Used Icons .....	ix
<b>Part 1 List of Functions .....</b>	<b>1</b>
1. List of Functions .....	2
1.1 Cooling Only .....	2
1.2 Heat Pump .....	4
<b>Part 2 Specifications .....</b>	<b>5</b>
1. Specifications .....	6
1.1 Cooling Only .....	6
1.2 Heat Pump .....	12
<b>Part 3 Printed Circuit Board Connector Wiring Diagram .....</b>	<b>17</b>
1. Printed Circuit Board Connector Wiring Diagram .....	18
1.1 Indoor Unit .....	18
1.2 Outdoor Unit .....	20
<b>Part 4 Function and Control .....</b>	<b>23</b>
1. Main Functions .....	24
1.1 Frequency Principle .....	24
1.2 Power-Airflow Dual Flaps, Wide Angle Louvers and Auto-Swing .....	26
1.3 Fan Speed Control for Indoor Units .....	27
1.4 Programme Dry Function .....	28
1.5 Automatic Operation .....	29
1.6 Thermostat Control .....	30
1.7 Night Set Mode .....	31
1.8 INTELLIGENT EYE .....	32
1.9 HOME LEAVE Operation .....	34
1.10 Inverter POWERFUL Operation .....	35
1.11 Other Functions .....	36
2. Function of Thermistor .....	38
2.1 Heat Pump Model .....	38
2.2 Cooling Only Model .....	39
3. Control Specification .....	40
3.1 Mode Hierarchy .....	40
3.2 Frequency Control .....	41
3.3 Controls at Mode Changing / Start-up .....	43
3.4 Discharge Pipe Temperature Control .....	44
3.5 Input Current Control .....	44
3.6 Freeze-up Protection Control .....	46
3.7 Heating Peak-cut Control .....	46
3.8 Fan Control .....	47
3.9 Liquid Compression Protection Function 2 .....	47
3.10 Low Hz High Pressure Limit .....	48
3.11 Defrost Control .....	48
3.12 Electronic Expansion Valve Control .....	49
3.13 Malfunctions .....	52

3.14 Forced Operation Mode .....	53
3.15 Additional Function.....	53

## **Part 5 Operation Manual ..... 55**

1. System Configuration.....	56
2. Instruction.....	57
2.1 Safety Precautions .....	57
2.2 Names of parts .....	59
2.3 Preparation Before Operation .....	62
2.4 AUTO · DRY · COOL · HEAT · FAN Operation .....	65
2.5 Adjusting the Air Flow Direction .....	67
2.6 POWERFUL Operation .....	69
2.7 OUTDOOR UNIT QUIET Operation.....	70
2.8 HOME LEAVE Operation .....	71
2.9 INTELLIGENT EYE Operation .....	73
2.10 TIMER Operation .....	75
2.11 Care and Cleaning .....	77
2.12 Troubleshooting.....	80

## **Part 6 Service Diagnosis..... 83**

1. Caution for Diagnosis.....	84
2. Problem Symptoms and Measures .....	85
3. Service Check Function .....	86
4. Troubleshooting .....	89
4.1 Error Codes and Description .....	89
4.2 Indoor Unit PCB Abnormality .....	90
4.3 Freeze-up Protection Control or High Pressure Control.....	91
4.4 Fan Motor (DC Motor) or Related Abnormality.....	93
4.5 Thermistor or Related Abnormality (Indoor Unit).....	95
4.6 Signal Transmission Error (between Indoor and Outdoor Unit) .....	96
4.7 OL Activation (Compressor Overload) .....	98
4.8 Compressor Lock .....	99
4.9 DC Fan Lock .....	100
4.10 Input Over Current Detection .....	101
4.11 Four Way Valve Abnormality .....	103
4.12 Discharge Pipe Temperature Control.....	105
4.13 High Pressure Control in Cooling .....	106
4.14 Position Sensor Abnormality .....	108
4.15 CT or Related Abnormality .....	109
4.16 Thermistor or Related Abnormality (Outdoor Unit).....	111
4.17 Electrical Box Temperature Rise .....	113
4.18 Radiation Fin Temperature Rise .....	115
4.19 Output Over Current Detection.....	117
4.20 Insufficient Gas.....	119
4.21 Low-voltage Detection or Over-voltage Detection.....	123
5. Check.....	124
5.1 How to Check.....	124







<b>Part 7 Removal Procedure .....</b>	<b>133</b>
1. Indoor Unit.....	134
1.1 Removal of Air Filter / Front Panel .....	134
1.2 Removal of Front Grille .....	137
1.3 Removal of Horizontal Blades / Vertical Blades .....	139
1.4 Removal of Electrical Box / PCB / Swing Motor .....	141
1.5 Removal of Heat Exchanger .....	147
1.6 Removal of Fan Rotor / Fan Motor.....	150
2. Outdoor Unit.....	152
2.1 RKD50/60/71BVM, RK(X)D50/60/71BVMA, RKD15/18GV2S .....	152
2.2 RKD24/28GV2S .....	176
<b>Part 8 Others .....</b>	<b>213</b>
1. Others .....	214
1.1 Test Run from the Remote Controller .....	214
1.2 Jumper Settings .....	215
<b>Part 9 Appendix.....</b>	<b>217</b>
1. Piping Diagrams.....	218
1.1 Indoor Units .....	218
1.2 Outdoor Units .....	220
2. Wiring Diagrams.....	224
2.1 Indoor Units .....	224
2.2 Outdoor Units .....	225
<b>Index .....</b>	<b>i</b>
<b>Drawings &amp; Flow Charts .....</b>	<b>v</b>








# 1. Introduction




## 1.1 Safety Cautions









### Cautions and Warnings

- Be sure to read the following safety cautions before conducting repair work.
- The caution items are classified into “ **Warning**” and “ **Caution**”. The “ **Warning**” items are especially important since they can lead to death or serious injury if they are not followed closely. The “ **Caution**” items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.
- About the pictograms
  - △ This symbol indicates the item for which caution must be exercised.  
The pictogram shows the item to which attention must be paid.
  - This symbol indicates the prohibited action.  
The prohibited item or action is shown in the illustration or near the symbol.
  - This symbol indicates the action that must be taken, or the instruction.  
The instruction is shown in the illustration or near the symbol.
- After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer.












### 1.1.1 Cautions Regarding Safety of Workers






 <b>Warning</b>	
<p>Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for repair. Working on the equipment that is connected to the power supply may cause an electrical shock. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.</p>	
<p>If the refrigerant gas is discharged during the repair work, do not touch the discharged refrigerant gas. The refrigerant gas may cause frostbite.</p>	
<p>When disconnecting the suction or discharge pipe of the compressor at the welded section, evacuate the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it may cause injury.</p>	
<p>If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas may generate toxic gases when it contacts flames.</p>	
<p>The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work. A charged capacitor may cause an electrical shock.</p>	
<p>Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment may cause an electrical shock or fire.</p>	







 <b>Warning</b>	
Be sure to wear a safety helmet, gloves, and a safety belt when working at a high place (more than 2m). Insufficient safety measures may cause a fall accident.	
In case of R410A refrigerant models, be sure to use pipes, flare nuts and tools for the exclusive use of the R410A refrigerant. The use of materials for R22 refrigerant models may cause a serious accident such as a damage of refrigerant cycle as well as an equipment failure.	






 <b>Caution</b>	
Do not repair the electrical components with wet hands. Working on the equipment with wet hands may cause an electrical shock.	
Do not clean the air conditioner by splashing water. Washing the unit with water may cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and cause injury.	
Be sure to conduct repair work with appropriate tools. The use of inappropriate tools may cause injury.	
Be sure to check that the refrigerating cycle section has cooled down enough before conducting repair work. Working on the unit when the refrigerating cycle section is hot may cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room may cause oxygen deficiency.	

## 1.1.2 Cautions Regarding Safety of Users

 <b>Warning</b>	
<p>Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools may cause an electrical shock, excessive heat generation or fire.</p>	
<p>If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires may cause an electrical shock, excessive heat generation or fire.</p>	
<p>Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it may cause an electrical shock, excessive heat generation or fire.</p>	
<p>Be sure to use an exclusive power circuit for the equipment, and follow the local technical standards related to the electrical equipment, the internal wiring regulations, and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work may cause an electrical shock or fire.</p>	
<p>Be sure to use the specified cable for wiring between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections may cause excessive heat generation or fire.</p>	
<p>When wiring between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section may cause an electrical shock, excessive heat generation or fire.</p>	
<p>Do not damage or modify the power cable. Damaged or modified power cable may cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable may damage the cable.</p>	
<p>Do not mix air or gas other than the specified refrigerant (R410A / R22) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.</p>	
<p>If the refrigerant gas leaks, be sure to locate the leaking point and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leaking point cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it may generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.</p>	
<p>When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment may fall and cause injury.</p>	





 <b>Warning</b>	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet securely. If the plug has dust or loose connection, it may cause an electrical shock or fire.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation may cause the equipment to fall, resulting in injury.	For unitary type only 
Be sure to install the product securely in the installation frame mounted on the window frame. If the unit is not securely mounted, it may fall and cause injury.	For unitary type only 
When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

 <b>Caution</b>	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	
Do not install the equipment in a place where there is a possibility of combustible gas leaks. If the combustible gas leaks and remains around the unit, it may cause a fire.	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections may cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame may cause the unit to fall, resulting in injury.	
Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding may cause an electrical shock.	

 <b>Caution</b>	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 MΩ or higher. Faulty insulation may cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage may cause the water to enter the room and wet the furniture and floor.	
Do not tilt the unit when removing it. The water inside the unit may spill and wet the furniture and floor.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water may enter the room and wet the furniture and floor.	For unitary type only  

## 1.2 Used Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

Icon	Type of Information	Description
 Note:	Note	A “note” provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
 Caution	Caution	A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, lose data, get an unexpected result or has to restart (part of) a procedure.
 Warning	Warning	A “warning” is used when there is danger of personal injury.
	Reference	A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.



# Part 1

# List of Functions

1. List of Functions .....	2
1.1 Cooling Only .....	2
1.2 Heat Pump .....	4



# 1. List of Functions

## 1.1 Cooling Only

Category	Functions	FTKD50/60/71FVM RKD50/60/71BVM	FTKD50/60/71FVM RKD50/60/71BVM	Category	Functions	FTKD50/60/71FVM RKD50/60/71BVM	FTKD50/60/71FVM RKD50/60/71BVM
Basic Function	Inverter (with Inverter Power Control)	○	○	Health & Clean	Air Purifying Filter	—	—
	Operation Limit for Cooling (°C)	-5 ~46	-5 ~46		Photocatalytic Deodorizing Filter	—	—
	Operation Limit for Heating (°C)	—	—		Air Purifying Filter with Photocatalytic Deodorizing Function	—	—
	PAM Control	○	○		Titanium Apatite Photocatalytic Air-Purifying Filter	○	○
Compressor	Oval Scroll Compressor	—	—	Mold Proof Air Filter	○	○	
	Swing Compressor	○	○	Wipe-clean Flat Panel	○	○	
	Rotary Compressor	—	—	Washable Grille	—	—	
	Reluctance DC Motor	○	○	Mold Proof Operation	—	—	
Comfortable Airflow	Power-Airflow Flap	—	—	Heating Dry Operation	—	—	
	Power-Airflow Dual Flaps	○	○	Good-Sleep Cooling Operation	—	—	
	Power-Airflow Diffuser	—	—	Timer	24-Hour On/Off Timer	○	○
	Wide-Angle Louvers	○	○		Night Set Mode	○	○
	Vertical Auto-Swing (Up and Down)	○	○	Worry Free "Reliability & Durability"	Auto-Restart (after Power Failure)	○	○
	Horizontal Auto-Swing (Right and Left)	○	○		Self-Diagnosis (Digital, LED) Display	○	○
	3-D Airflow	○	○		Wiring Error Check	—	—
	Comfort Airflow Mode	—	—		Anticorrosion Treatment of Outdoor Heat Exchanger	○	○
	3-Step Airflow (H/P Only)	—	—	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	○	○
Comfort Control	Auto Fan Speed	○	○		Flexible Voltage Correspondence	○	○
	Indoor Unit Quiet Operation	○	○		High Ceiling Application	—	—
	Night Quiet Mode (Automatic)	—	—		Chargeless	10m	10m
	Outdoor Unit Quiet Operation (Manual)	○	○		Either Side Drain (Right or Left)	○	○
	Intelligent Eye	○	○		Power Selection	—	—
	Quick Warming Function	—	—		Remote Control	5-Rooms Centralized Controller (Option)	○
	Hot-Start Function	—	—	Remote Control Adaptor (Normal Open-Pulse Contact) (Option)		○	○
Automatic Defrosting	—	—	Remote Control Adaptor (Normal Open Contact) (Option)	○		○	
Operation	Automatic Operation	—	—	Remote Controller	DIII-NET Compatible (Adaptor) (Option)	○	○
	Programme Dry Function	○	○		Wireless	○	○
	Fan Only	○	○		Wired	—	—
Lifestyle Convenience	New Powerful Operation (Non-Inverter)	—	—				
	Inverter Powerful Operation	○	○				
	Priority-Room Setting	—	—				
	Cooling / Heating Mode Lock	—	—				
	Home Leave Operation	○	○				
	ECONO Mode	—	—				
	Indoor Unit On/Off Switch	○	○				
	Signal Reception Indicator	○	○				
	Temperature Display	—	—				
Another Room Operation	—	—					

**Note:** ○ : Holding Functions  
— : No Functions

Category	Functions			Category	Functions			
		FTKD50-71FV2Z RKD50-71BVMA	FTKD15-28GV2S RKD15-28GV2S			FTKD50-71FV2Z RKD50-71BVMA	FTKD15-28GV2S RKD15-28GV2S	
Basic Function	Inverter (with Inverter Power Control)	○	○	Health & Clean	Air Purifying Filter	—	—	
	Operation Limit for Cooling (°CDB)	-5 ~46	10 ~46		Photocatalytic Deodorizing Filter	—	—	
	Operation Limit for Heating (°CWB)	—	—		Air Purifying Filter with Photocatalytic Deodorizing Function	—	—	
	PAM Control	○	○		Titanium Apatite Photocatalytic Air-Purifying Filter	○	○	
Compressor	Oval Scroll Compressor	—	—		Mold Proof Air Filter	○	○	
	Swing Compressor	○	○		Wipe-clean Flat Panel	○	○	
	Rotary Compressor	—	—		Washable Grille	—	—	
	Reluctance DC Motor	○	○		Mold Proof Operation	—	—	
Comfortable Airflow	Power-Airflow Flap	—	—		Timer	Heating Dry Operation	—	—
	Power-Airflow Dual Flaps	○	○			Good-Sleep Cooling Operation	—	—
	Power-Airflow Diffuser	—	—	Worry Free "Reliability & Durability"	24-Hour On/Off Timer	○	○	
	Wide-Angle Louvers	○	○		Night Set Mode	○	○	
	Vertical Auto-Swing (Up and Down)	○	○		Auto-Restart (after Power Failure)	○	○	
	Horizontal Auto-Swing (Right and Left)	○	○		Self-Diagnosis (Digital, LED) Display	○	○	
	3-D Airflow	○	○		Wiring Error Check	—	—	
	Comfort Airflow Mode	—	—		Anticorrosion Treatment of Outdoor Heat Exchanger	○	○	
3-Step Airflow (H/P Only)	—	—	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	○	○		
Comfort Control	Auto Fan Speed	○		○	Flexible Voltage Correspondence	○	—	
	Indoor Unit Quiet Operation	○		○	High Ceiling Application	—	—	
	Night Quiet Mode (Automatic)	—		—	Chargeless	10m	10m	
	Outdoor Unit Quiet Operation (Manual)	○		○	Either Side Drain (Right or Left)	○	○	
	Intelligent Eye	○		○	Power Selection	—	—	
	Quick Warming Function	—		—	Remote Control	5-Rooms Centralized Controller (Option)	○	○
	Hot-Start Function	—		—		Remote Control Adaptor (Normal Open-Pulse Contact) (Option)	○	○
Automatic Defrosting	—	—	Remote Control Adaptor (Normal Open Contact) (Option)	○		○		
Operation	Automatic Operation	—	—	Remote Controller	DIII-NET Compatible (Adaptor) (Option)	○	○	
	Programme Dry Function	○	○		Wireless	○	○	
	Fan Only	○	○		Wired	—	—	
Lifestyle Convenience	New Powerful Operation (Non-Inverter)	—	—					
	Inverter Powerful Operation	○	○					
	Priority-Room Setting	—	—					
	Cooling / Heating Mode Lock	—	—					
	Home Leave Operation	○	○					
	ECONO Mode	—	—					
	Indoor Unit On/Off Switch	○	○					
	Signal Reception Indicator	○	○					
	Temperature Display	—	—					
Another Room Operation	—	—						

**Note:** ○ : Holding Functions

— : No Functions

## 1.2 Heat Pump

Category	Functions	FTXD50/60/71FVM RXD50/60/71BVMA	FTXD50-71FV2Z RXD50-71BVMA	Category	Functions	FTXD50/60/71FVM RXD50/60/71BVMA	FTXD50-71FV2Z RXD50-71BVMA	
Basic Function	Inverter (with Inverter Power Control)	○	○	Health & Clean	Air Purifying Filter with Bacteriostatic, Virustatic Functions	—	—	
	Operation Limit for Cooling (°C)	-5 ~46	-5 ~46		Photocatalytic Deodorizing Filter	—	—	
	Operation Limit for Heating (°C)	-15 ~18	-15 ~18		Air Purifying Filter with Photocatalytic Deodorizing Function	—	—	
	PAM Control	○	○		Titanium Apatite Photocatalytic Air-Purifying Filter	○	○	
Compressor	Oval Scroll Compressor	—	—	Mold Proof Air Filter	○	○		
	Swing Compressor	○	○	Wipe-clean Flat Panel	○	○		
	Rotary Compressor	—	—	Washable Grille	—	—		
	Reluctance DC Motor	○	○	Mold Proof Operation	—	—		
Comfortable Airflow	Power-Airflow Flap	—	—	Heating Dry Operation	—	—		
	Power-Airflow Dual Flaps	○	○	Good-Sleep Cooling Operation	—	—		
	Power-Airflow Diffuser	—	—	Timer	24-Hour On/Off Timer	○	○	
	Wide-Angle Louvers	○	○		Night Set Mode	○	○	
	Vertical Auto-Swing (Up and Down)	○	○	Worry Free "Reliability & Durability"	Auto-Restart (after Power Failure)	○	○	
	Horizontal Auto-Swing (Right and Left)	○	○		Self-Diagnosis (Digital, LED) Display	○	○	
	3-D Airflow	○	○		Wiring Error Check	—	—	
	Comfort Airflow Mode	—	—		Anticorrosion Treatment of Outdoor Heat Exchanger	○	○	
3-Step Airflow (H/P Only)	—	—	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	○	○		
Comfort Control	Auto Fan Speed	○		○	Flexible Voltage Correspondence	○	○	
	Indoor Unit Quiet Operation	○		○	High Ceiling Application	—	—	
	Night Quiet Mode (Automatic)	—		—	Chargeless	10m	10m	
	Outdoor Unit Quiet Operation (Manual)	○		○	Either Side Drain (Right or Left)	○	○	
	Intelligent Eye	○		○	Power Selection	—	—	
	Quick Warming Function	○		○	Remote Control	5-Rooms Centralized Controller (Option)	○	○
	Hot-Start Function	○		○		Remote Control Adaptor (Normal Open-Pulse Contact) (Option)	○	○
Operation	Automatic Operation	○	○	Remote Control Adaptor (Normal Open Contact) (Option)	○	○		
	Programme Dry Function	○	○	DIII-NET Compatible (Adaptor) (Option)	○	○		
	Fan Only	○	○	Remote Controller	Wireless	○	○	
Lifestyle Convenience	New Powerful Operation (Non-Inverter)	—	—		Wired	—	—	
	Inverter Powerful Operation	○	○					
	Priority-Room Setting	—	—					
	Cooling / Heating Mode Lock	—	—					
	Home Leave Operation	○	○					
	ECONO Mode	—	—					
	Indoor Unit On/Off Switch	○	○					
	Signal Reception Indicator	○	○					
	Temperature Display	—	—					
Another Room Operation	—	—						

**Note:** ○ : Holding Functions  
— : No Functions

# Part 2

# Specifications

1. Specifications .....	6
1.1 Cooling Only .....	6
1.2 Heat Pump .....	12

# 1. Specifications

## 1.1 Cooling Only

50Hz 220-230-240V / 60Hz 220-230V

Model	Indoor Units		FTKD50FVM	FTKD60FVM	FTKD71FVM
	Outdoor Units		RKD50BVM	RKD60BVM	RKD71BVM
Capacity Rated (Min.~Max.)	kW		5.2 (1.5~5.9)	6.2 (1.5~6.5)	7.1 (2.1~7.6)
	Btu/h		17,700 (5,100~20,100)	21,200 (5,100~22,200)	24,200 (7,200~25,900)
	kcal/h		4,470 (1,290~5,070)	5,330 (1,290~5,590)	6,110 (1,810~6,540)
Running Current Rated (Max.)	A		7.3-7.0-6.7/7.3-7.0	9.6-9.2-8.8/9.6-9.2	11.7-11.2-10.7/11.7-11.2
Power Consumption Rated (Min.~Max.)	W		1,600 (450~2,300)	2,100 (450~2,700)	2,550 (530~3,210)
Power Factor	%		99.6-99.4-99.5/99.6-99.4	99.4-99.2-99.4/99.4-99.2	99.1-99.0-99.3/99.1-99.0
COP Rated (Min.~Max.)	W/W		3.25 (3.33~2.57)	2.95 (3.33~2.41)	2.78 (3.96~2.37)
Piping Connections	Liquid	mm	φ 6.4	φ 6.4	φ 9.5
	Gas	mm	φ12.7	φ15.9	φ15.9
	Drain	mm	φ18.0	φ18.0	φ18.0
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Max. Interunit Piping Length	m		30	30	30
Max. Interunit Height Difference	m		20	20	20
Chargeless	m		10	10	10
Amount of Additional Charge of Refrigerant	g/m		20	20	50
<b>Indoor Unit</b>			<b>FTKD50FVM</b>	<b>FTKD60FVM</b>	<b>FTKD71FVM</b>
Front Panel Color			White	White	White
Air Flow Rate	m³/min (cfm)	H	16.8 (593)	17.5 (618)	18.3 (646)
		M	14.0 (494)	14.6 (516)	15.3 (540)
		L	11.8 (417)	12.2 (431)	12.7 (448)
		SL	10.4 (367)	10.8 (381)	11.3 (399)
Fan	Type	Cross Flow Fan			Cross Flow Fan
	Motor Output	W			43
	Speed	Steps			5 Steps, Quiet, Auto
Air Direction Control			Right, Left, Horizontal, Downward	Right, Left, Horizontal, Downward	Right, Left, Horizontal, Downward
Air Filter			Removable / Washable / Mildew Proof	Removable / Washable / Mildew Proof	Removable / Washable / Mildew Proof
Running Current (Rated)	A		0.19-0.18-0.17/0.19-0.18	0.21-0.20-0.19/0.21-0.20	0.23-0.22-0.21/0.23-0.22
Power Consumption (Rated)	W		40	45	50
Power Factor	%		95.7-96.6-98.0/95.7-96.6	97.4-97.8-98.7/97.4-97.8	98.8-98.8-99.2/98.8-98.8
Temperature Control			Microcomputer Control	Microcomputer Control	Microcomputer Control
Dimensions (HxWxD)	mm		290x1,050x238	290x1,050x238	290x1,050x238
Packaged Dimensions (HxWxD)	mm		337x1,147x366	337x1,147x366	337x1,147x366
Weight	kg		12	12	12
Gross Weight	kg		17	17	17
Operation Sound	H/M/L/SL	dBA	44/40/35/32	45/41/36/33	46/42/37/34
<b>Outdoor Unit</b>			<b>RKD50BVM</b>	<b>RKD60BVM</b>	<b>RKD71BVM</b>
Casing Color			Ivory White	Ivory White	Ivory White
Compressor	Type	Hermetically Sealed Swing Type			Hermetically Sealed Swing Type
	Model	2YC32UXD			2YC45ZXD
	Motor Output	W			1,500
Refrigerant Oil	Type	SE56P			SE56P
	Charge	L			0.65
Refrigerant	Type	R-22			R-22
	Charge	kg			1.25
Air Flow Rate	m³/min (cfm)	H	42.8 (1,511)	46.3 (1,653)	51.5 (1,819)
		L	40.7 (1,437)	42.9 (1,515)	41.5 (1,465)
Fan	Type	Propeller			Propeller
	Motor Output	W			53
Running Current (Rated)	A		7.11-6.82-6.53/7.11-6.82	9.39-9.00-8.61/9.39-9.00	11.47-10.98-10.49/11.47-10.98
Power Consumption (Rated)	W		1,560	2,055	2,500
Power Factor (Rated)	%		99.7-99.5-99.5/99.7-99.5	99.5-99.3-99.4/99.5-99.3	99.1-99.0-99.3/99.1-99.0
Starting Current	A		7.4	9.6	11.7
Dimensions (HxWxD)	mm		735x825x300	735x825x300	735x825x300
Packaged Dimensions (HxWxD)	mm		784x960x390	784x960x390	784x960x390
Weight	kg		48	52	54
Gross Weight	kg		53	57	59
Operation Sound	dBA		H : 47 SL : 44	H : 49 SL : 46	H : 52 SL : 49
Drawing No.			3D056204	3D056205	3D056206

**Note:** ■ The data are based on the conditions shown in the table below.

Cooling	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	7.5m

Conversion Formulae
kcal/h=kWx860 Btu/h=kWx3414 cfm=m³/minx35.3

## 50Hz 220-230-240V / 60Hz 220-230V

Model	Indoor Units		FTKD50FVM	FTKD60FVM	FTKD71FVM
	Outdoor Units		RKD50BVMA	RKD60BVMA	RKD71BVMA
Capacity Rated (Min.-Max.)	kW		5.2 (1.5-5.9)	6.2 (2.2-7.6)	7.1 (2.9-8.0)
	Btu/h		17,700 (5,100-20,100)	21,200 (7,500-25,900)	24,200 (9,900-27,300)
	kcal/h		4,470 (1,290-5,070)	5,330 (1,890-6,540)	6,110 (2,490-6,880)
Running Current Rated (Max.)	A		7.4-7.0-6.7/7.4-7.0	9.6-9.2-8.8/9.6-9.2	11.9-11.4-10.9/11.9-11.4
Power Consumption Rated (Min.-Max.)	W		1,600 (450-2,300)	2,100 (630-3,210)	2,600 (720-3,350)
Power Factor	%		98.3-99.4-99.5/98.3-99.4	99.4-99.2-99.4/99.4-99.2	99.3-99.2-99.4/99.3-99.2
COP Rated (Min.-Max.)	W/W		3.25 (3.33-2.57)	2.95 (3.49-2.37)	2.73 (4.03-2.39)
Piping Connections	Liquid	mm	φ 6.4	φ 6.4	φ 9.5
	Gas	mm	φ 12.7	φ 15.9	φ 15.9
	Drain	mm	φ 18.0	φ 18.0	φ 18.0
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Max. Interunit Piping Length	m		30	30	30
Max. Interunit Height Difference	m		20	20	20
Chargeless	m		10	10	10
Amount of Additional Charge of Refrigerant	g/m		20	20	50
<b>Indoor Unit</b>			<b>FTKD50FVM</b>	<b>FTKD60FVM</b>	<b>FTKD71FVM</b>
Front Panel Color			White	White	White
Air Flow Rate	m <sup>3</sup> /min (cfm)	H	16.8 (593)	17.5 (618)	18.3 (646)
		M	14.0 (494)	14.6 (516)	15.3 (540)
		L	11.8 (417)	12.2 (431)	12.7 (448)
		SL	10.4 (367)	10.8 (381)	11.3 (399)
Fan	Type	Cross Flow Fan			Cross Flow Fan
	Motor Output	W			43
	Speed	Steps			5 Steps, Quiet, Auto
Air Direction Control			Right, Left, Horizontal, Downward	Right, Left, Horizontal, Downward	Right, Left, Horizontal, Downward
Air Filter			Removable / Washable / Mildew Proof	Removable / Washable / Mildew Proof	Removable / Washable / Mildew Proof
Running Current (Rated)	A		0.19-0.18-0.17/0.19-0.18	0.21-0.20-0.19/0.21-0.20	0.23-0.22-0.21/0.23-0.22
Power Consumption (Rated)	W		40	45	50
Power Factor	%		95.7-96.6-98.0/95.7-96.6	97.4-97.8-98.7/97.4-97.8	98.8-98.8-99.2/98.8-98.8
Temperature Control			Microcomputer Control	Microcomputer Control	Microcomputer Control
Dimensions (HxWxD)	mm		290x1,050x238	290x1,050x238	290x1,050x238
Packaged Dimensions (HxWxD)	mm		337x1,147x366	337x1,147x366	337x1,147x366
Weight	kg		12	12	12
Gross Weight	kg		17	17	17
Operation Sound	H/M/L/SL	dBA	44/40/35/32	45/41/36/33	46/42/37/34
<b>Outdoor Unit</b>			<b>RKD50BVMA</b>	<b>RKD60BVMA</b>	<b>RKD71BVMA</b>
Casing Color			Ivory White	Ivory White	Ivory White
Compressor	Type	Hermetically Sealed Swing Type			Hermetically Sealed Swing Type
	Model	2YC32UXD			2YC45ZXD
	Motor Output	W			1,500
Refrigerant Oil	Type	SE56P			SE56P
	Charge	L			0.65
Refrigerant	Type	R-22			R-22
	Charge	kg			1.25
Air Flow Rate	m <sup>3</sup> /min (cfm)	H	42.8 (1,511)	46.3 (1,635)	51.5 (1,819)
		L	40.7 (1,437)	42.9 (1,515)	41.5 (1,465)
Fan	Type	Propeller			Propeller
	Motor Output	W			53
Running Current (Rated)	A		7.21-6.82-6.53/7.21-6.82	9.39-9.00-8.61/9.39-9.00	11.67-11.18-10.69/11.67-11.18
Power Consumption (Rated)	W		1,560	2,055	2,550
Power Factor (Rated)	%		98.3-99.5-99.5/98.3-99.5	99.5-99.3-99.4/99.5-99.3	99.3-99.2-99.4/99.3-99.2
Starting Current	A		7.4	9.6	11.9
Dimensions (HxWxD)	mm		735x825x300	735x825x300	735x825x300
Packaged Dimensions (HxWxD)	mm		784x960x390	784x960x390	784x960x390
Weight	kg		48	54	56
Gross Weight	kg		53	59	61
Operation Sound	dBA		H : 47 SL : 44	H : 49 SL : 46	H : 52 SL : 49
Drawing No.			3D055905	3D055906	3D055907

**Note:** ■ The data are based on the conditions shown in the table below.

Cooling	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	7.5m

Conversion Formulae
kcal/h=kWx860 Btu/h=kWx3414 cfm=m <sup>3</sup> /minx35.3

50Hz 220V

Models	Indoor Units		FTKD50FV2Z		FTKD60FV2Z	
	Outdoor Units		RKD50BVMA		RKD60BVMA	
Capacity Rated (Min.-Max.)		kW	5.1 (1.5-5.8)		6.1 (2.2-7.5)	
		Btu/h	17,400 (5,100-19,800)		20,800 (7,500-25,600)	
		kcal/h	4,380 (1,290-4,990)		5,240 (1,890-6,450)	
Running Current (Rated)		A	7.4		9.6	
Power Consumption Rated (Min.-Max.)		W	1,600 (450-2,300)		2,090 (630-3,210)	
Power Factor		%	98.3		99.0	
COP Rated (Min.-Max.)		W/W	3.19 (3.33-2.52)		2.92 (3.49-2.34)	
Piping Connections	Liquid	mm	φ 6.4		φ 6.4	
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ18.0		φ18.0	
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Max. Interunit Piping Length		m	30		30	
Max. Interunit Height Difference		m	20		20	
Chargeless		m	10		10	
Amount of Additional Charge of Refrigerant		g/m	20		20	
Indoor Units			FTKD50FV2Z		FTKD60FV2Z	
Front Panel Color			White		White	
Air Flow Rate	m³/min (cfm)	H	15.5 (547)		16.1 (568)	
		M	12.9 (455)		13.5 (477)	
		L	10.8 (381)		11.3 (399)	
		SL	9.6 (339)		10.0 (353)	
Fan	Type		Cross Flow Fan		Cross Flow Fan	
	Motor Output	W	43		43	
	Speed	Steps	5 Steps, Quiet, Auto		5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downward		Right, Left, Horizontal, Downward	
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof	
Running Current (Rated)		A	0.19		0.21	
Power Consumption (Rated)		W	40		45	
Power Factor		%	95.7		97.4	
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (HxWxD)		mm	290x1,050x238		290x1,050x238	
Packaged Dimensions (HxWxD)		mm	337x1,147x366		337x1,147x366	
Weight		kg	12		12	
Gross Weight		kg	17		17	
Operation Sound	H/M/L/SL	dBA	44 / 40 / 35 / 32		45 / 41 / 36 / 33	
Outdoor Units			RKD50BVMA		RKD60BVMA	
Casing Color			Ivory White		Ivory White	
Compressor	Type		Hermetically Sealed Swing Type		Hermetically Sealed Swing Type	
	Model		2YC32UXD		2YC45ZXD	
Refrigerant Oil	Motor Output	W	1,500		1,900	
	Type		SE56P		SE56P	
Refrigerant	Charge	L	0.65		0.75	
	Type		R-22		R-22	
Air Flow Rate	Charge	kg	1.25		1.80	
	m³/min (cfm)	H	42.8 (1,511)		46.3 (1,635)	
Fan	L		40.7 (1,437)		42.9 (1,515)	
	Type		Propeller		Propeller	
Running Current (Rated)		A	7.21		9.39	
Power Consumption (Rated)		W	1,560		2,045	
Power Factor		%	98.3		99.0	
Starting Current		A	7.4		9.6	
Dimensions (HxWxD)		mm	735x825x300		735x825x300	
Packaged Dimensions (HxWxD)		mm	784x960x390		784x960x390	
Weight		kg	48		54	
Gross Weight		kg	53		59	
Operation Sound	H/SL	dBA	47 / 44		49 / 46	
Drawing No.			3D056242		3D056243	

**Note:** ■ The data are based on the conditions shown in the table below.

Cooling	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	7.5m

Conversion Formulae
kcal/h=kWx860 Btu/h=kWx3414 cfm=m³/minx35.3

50Hz 220V

Models	Indoor Units		FTKD71FV2Z
	Outdoor Units		RKD71BVMA
Capacity Rated (Min.-Max.)		kW	7.0 (2.9~7.9)
		Btu/h	2,3900 (9,900~27,000)
		kcal/h	6,020 (2,490~6,790)
Running Current (Rated)		A	11.9
Power Consumption Rated (Min.-Max.)		W	2,590 (720~3,350)
Power Factor		%	98.9
COP Rated (Min.-Max.)		W/W	2.70 (4.03~2.36)
Piping Connections	Liquid	mm	φ 9.5
	Gas	mm	φ15.9
	Drain	mm	φ18.0
Heat Insulation			Both Liquid and Gas Pipes
Max. Interunit Piping Length		m	30
Max. Interunit Height Difference		m	20
Chargeless		m	10
Amount of Additional Charge of Refrigerant		g/m	50
Indoor Units			FTKD71FV2Z
Front Panel Color			White
Air Flow Rate	m³/min (cfm)	H	16.8 (593)
		M	14.0 (494)
		L	11.7 (413)
		SL	10.4 (367)
Fan	Type		Cross Flow Fan
	Motor Output	W	43
	Speed	Steps	5 Steps, Quiet, Auto
Air Direction Control			Right, Left, Horizontal, Downward
Air Filter			Removable / Washable / Mildew Proof
Running Current (Rated)		A	0.23
Power Consumption (Rated)		W	50
Power Factor		%	98.8
Temperature Control			Microcomputer Control
Dimensions (HxWxD)		mm	290x1,050x238
Packaged Dimensions (HxWxD)		mm	337x1,147x366
Weight		kg	12
Gross Weight		kg	17
Operation Sound	H/M/L/SL	dBA	46 / 42 / 37 / 34
Outdoor Units			RKD71BVMA
Casing Color			Ivory White
Compressor	Type		Hermetically Sealed Swing Type
	Model		2YC63ZXD
	Motor Output	W	1,900
Refrigerant Oil	Type		SE56P
	Charge	L	0.65
Refrigerant	Type		R-22
	Charge	kg	1.80
Air Flow Rate	m³/min (cfm)	H	51.5 (1,818)
		L	41.5 (1,465)
Fan	Type		Propeller
	Motor Output	W	53
Running Current (Rated)		A	11.67
Power Consumption (Rated)		W	2,540
Power Factor		%	98.9
Starting Current		A	11.9
Dimensions (HxWxD)		mm	735x825x300
Packaged Dimensions (HxWxD)		mm	784x960x390
Weight		kg	56
Gross Weight		kg	61
Operation Sound	H/SL	dBA	52 / 49
Drawing No.			3D056244

**Note:** ■ The data are based on the conditions shown in the table below.

Cooling	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	7.5m

Conversion Formulae
kcal/h=kWx860 Btu/h=kWx3414 cfm=m³/minx35.3



50Hz 220V

Model	Indoor Units		FTKD15GV2S		FTKD18GV2S	
	Outdoor Units		RKD15GV2S		RKD18GV2S	
Capacity Rated (Min.~Max.)		kW	4.2 (1.5-5.0)		5.2 (1.5-5.8)	
		Btu/h	14,300 (5,100~17,100)		17,700 (5,100~19,800)	
		kcal/h	3,610 (1,290~4,300)		4,470 (1,290~4,990)	
Running Current (Rated)		A	5.52		6.90	
Power Consumption Rated (Min.~Max.)		W	1,200 (450~1,440)		1,500 (450~2,300)	
Power Factor		%	98.8		98.8	
COP Rated (Min.~Max.)		W/W	3.50 (3.33~3.47)		3.47 (3.33~2.52)	
Piping Connections	Liquid	mm	φ6.4		φ6.4	
	Gas	mm	φ15.9		φ15.9	
	Drain	mm	φ18.0		φ18.0	
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
MAX. interunit piping length		m	30		30	
MAX. interunit height difference		m	20		20	
Chargeless		m	10		10	
Amount of additional charge of refrigerant		g/m	20		20	
Indoor Unit			FTKD15GV2S		FTKD18GV2S	
Front Panel Color			White Panel		White Panel	
Air Flow Rate	m <sup>3</sup> /min (cfm)	H	15.3 (540)		17.4 (614)	
		M	13.6 (480)		14.6 (516)	
		L	12.2 (431)		12.2 (431)	
		SL	10.8 (381)		10.8 (381)	
Fan	Type		Cross Flow Fan		Cross Flow Fan	
	Motor Output	W	43		43	
	Speed	Steps	5 Steps, Quiet, Auto		5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downward		Right, Left, Horizontal, Downward	
Air Filter			Removable, Washable, Mildew Proof		Removable, Washable, Mildew Proof	
Running Current (Rated)		A	0.19		0.21	
Power Consumption (Rated)		W	41		45	
Power Factor		%	98.1		97.4	
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (HxWxD)		mm	290x1,050x238		290x1,050x238	
Packaged Dimensions (HxWxD)		mm	337x1,147x366		337x1,147x366	
Weight		kg	12		12	
Gross Weight		kg	17		17	
Operation Sound	H/M/L/SL	dBA	42 / 39 / 36 / 33		45 / 41 / 36 / 33	
Outdoor Unit			RKD15GV2S		RKD18GV2S	
Casing Color			Ivory White		Ivory White	
Compressor	Type		Hermetically Sealed Swing Type		Hermetically Sealed Swing Type	
	Model		2YC32LUXD		2YC32LUXD	
Refrigerant Oil	Motor Output	W	1,500		1,500	
	Type		SE56P		SE56P	
Refrigerant	Charge	L	0.65		0.65	
	Type		R-22		R-22	
Refrigerant	Charge	kg	1.60		1.60	
	Type		R-22		R-22	
Air Flow Rate	m <sup>3</sup> /min		46.3 / 42.9		46.3 / 42.9	
	cfm		1,635 / 1,515		1,635 / 1,515	
Fan	Type		Propeller		Propeller	
	Motor Output	W	53		53	
Running Current (Rated)		A	5.33		6.69	
Power Consumption (Rated)		W	1,159		1,455	
Power Factor		%	98.8		98.9	
Starting Current		A	5.52		6.90	
Dimensions (HxWxD)		mm	735x825x300		735x825x300	
Packaged Dimensions (HxWxD)		mm	792x960x390		792x960x390	
Weight		kg	52		52	
Gross Weight		kg	57		57	
Operation Sound	H/SL	dBA	49 / 46		49 / 46	
Drawing No.			3D056207		3D056208	

**Note:** ■ The data are based on the conditions shown in the table below.

Cooling	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	7.5m

Conversion Formulae
kcal/h=kWx860 Btu/h=kWx3414 cfm=m <sup>3</sup> /minx35.3

50Hz 220V

Model	Indoor Units		FTKD24GV2S		FTKD28GV2S	
	Outdoor Units		RKD24GV2S		RKD28GV2S	
Capacity Rated (Min.~Max.)		kW	6.0 (2.9-7.5)		6.8 (2.9-8.2)	
		Btu/h	20,500 (9,900-25,600)		23,200 (9,900-28,000)	
		kcal/h	5,160 (2,490-6,450)		5,850 (2,490-7,050)	
Running Current (Rated)		A	8.50		11.00	
Power Consumption Rated (Min.~Max.)		W	1,850 (720-2,780)		2,400 (720-3,420)	
Power Factor		%	98.9		99.2	
COP Rated (Min.~Max.)		W/W	3.24 (4.03~2.70)		2.83 (4.03-2.40)	
Piping Connections	Liquid	mm	φ9.5		φ9.5	
	Gas	mm	φ15.9		φ15.9	
	Drain	mm	φ18.0		φ18.0	
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
MAX. interunit piping length		m	30		30	
MAX. interunit height difference		m	20		20	
Chargeless		m	10		10	
Amount of additional charge of refrigerant		g/m	50		50	
Indoor Unit			FTKD24GV2S		FTKD28GV2S	
Front Panel Color			White Panel		White Panel	
Air Flow Rate	m <sup>3</sup> /min (cfm)	H	20.9 (738)		20.9 (738)	
		M	17.3 (611)		17.5 (618)	
		L	13.6 (480)		14.1 (498)	
		SL	11.2 (395)		11.7 (413)	
Fan	Type		Cross Flow Fan		Cross Flow Fan	
	Motor Output	W	43		43	
	Speed	Steps	5 Steps, Quiet, Auto		5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downward		Right, Left, Horizontal, Downward	
Air Filter			Removable, Washable, Mildew Proof		Removable, Washable, Mildew Proof	
Running Current (Rated)		A	0.23		0.24	
Power Consumption (Rated)		W	50		52	
Power Factor		%	98.8		98.5	
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (HxWxD)		mm	290x1,050x238		290x1,050x238	
Packaged Dimensions (HxWxD)		mm	337x1,147x366		337x1,147x366	
Weight		kg	12		12	
Gross Weight		kg	17		17	
Operation Sound	H/M/L/SL	dBA	49 / 44 / 38 / 33		49 / 44 / 39 / 34	
Outdoor Unit			RKD24GV2S		RKD28GV2S	
Casing Color			Ivory White		Ivory White	
Compressor	Type		Hermetically Sealed Swing Type		Hermetically Sealed Swing Type	
	Model		2YC63ZXD		2YC63ZXD	
Refrigerant Oil	Motor Output	W	1,900		1,900	
	Type		SE56P		SE56P	
Refrigerant	Charge	L	0.65		0.65	
	Type		R-22		R-22	
Refrigerant	Charge	kg	2.50		2.50	
	m <sup>3</sup> /min		62.7 / 60.8		62.7 / 60.8	
Air Flow Rate	cfm		2,214 / 2,147		2,214 / 2,147	
	Type		Propeller		Propeller	
Fan	Motor Output	W	70		70	
	Running Current (Rated)	A	8.27		10.76	
Power Consumption (Rated)		W	1,800		2,348	
Power Factor		%	98.9		99.2	
Starting Current		A	8.50		11.00	
Dimensions (HxWxD)		mm	770x900x320		770x900x320	
Packaged Dimensions (HxWxD)		mm	900x925x390		900x925x390	
Weight		kg	68		68	
Gross Weight		kg	76		76	
Operation Sound	H/SL	dBA	54 / 49		54 / 49	
Drawing No.			3D056209A		3D056210A	

**Note:** ■ The data are based on the conditions shown in the table below.

Cooling	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	7.5m

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m <sup>3</sup> /min×35.3

# 1.2 Heat Pump

50Hz 220-230-240V / 60Hz 220-230V

Model	Indoor Units		FTXD50FVM		FTXD60FVM	
	Outdoor Units		RXD50BVMA		RXD60BVMA	
			Cooling	Heating	Cooling	Heating
Capacity Rated (Min.-Max.)	kW		5.2 (1.5-5.9)	6.5 (1.5-8.0)	6.2 (2.2-7.6)	7.2 (2.2-9.0)
	Btu/h		17,700 (5,100-20,100)	22,200 (5,100-27,300)	21,200 (7,500-25,900)	24,600 (7,500-30,700)
	kcal/h		4,470 (1,290-5,070)	5,590 (1,290-6,880)	5,330 (1,890-6,540)	6,190 (1,890-7,740)
Running Current Rated (Max.)	A		7.4-7.0-6.7/7.4-7.0	8.5-8.1-7.7/8.5-8.1	9.6-9.2-8.8/9.6-9.2	9.7-9.3-8.9/9.7-9.3
Power Consumption Rated (Min.-Max.)	W		1,600 (450-2,300)	1,840 (410-2,800)	2,100 (630-3,210)	2,120 (570-3,230)
Power Factor	%		98.3-99.4-99.5/98.3-99.4	98.4-98.8-99.6/98.4-98.8	99.4-99.2-99.4/99.4-99.2	99.3-99.1-99.3/99.3-99.1
COP Rated (Min.-Max.)	W/W		3.25 (3.33-2.57)	3.53 (3.66-2.86)	2.95 (3.49-2.37)	3.40 (3.86-2.79)
Piping Connections	Liquid	mm	φ 6.4		φ 6.4	
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ18.0		φ18.0	
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Max. Interunit Piping Length	m		30		30	
Max. Interunit Height Difference	m		20		20	
Chargeless	m		10		10	
Amount of Additional Charge of Refrigerant	g/m		20		20	
<b>Indoor Unit</b>			<b>FTXD50FVM</b>		<b>FTXD60FVM</b>	
Front Panel Color			White		White	
Air Flow Rate	m <sup>3</sup> /min (cfm)	H	16.8 (593)	17.5 (618)	17.5 (618)	18.7 (660)
		M	14.0 (494)	14.9 (526)	14.6 (516)	16.1 (569)
		L	11.8 (417)	12.5 (441)	12.2 (431)	13.6 (480)
		SL	10.4 (367)	11.0 (388)	10.8 (381)	11.8 (417)
Fan	Type		Cross Flow Fan		Cross Flow Fan	
	Motor Output	W	43		43	
	Speed	Steps	5 Steps, Quiet, Auto		5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downward		Right, Left, Horizontal, Downward	
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof	
Running Current (Rated)	A		0.19-0.18-0.17/0.19-0.18	0.19-0.18-0.17/0.19-0.18	0.21-0.20-0.19/0.21-0.20	0.21-0.20-0.19/0.21-0.20
Power Consumption (Rated)	W		40		45	
Power Factor	%		95.7-96.6-98.0/95.7-96.6	95.7-96.6-98.0/95.7-96.6	97.4-97.8-98.7/97.4-97.8	97.4-97.8-98.7/97.4-97.8
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (HxWxD)	mm		290x1,050x238		290x1,050x238	
Packaged Dimensions (HxWxD)	mm		337x1,147x366		337x1,147x366	
Weight	kg		12		12	
Gross Weight	kg		17		17	
Operation Sound	H/M/L/SL	dBA	44/40/35/32	42/38/33/30	45/41/36/33	44/40/35/32
<b>Outdoor Unit</b>			<b>RXD50BVMA</b>		<b>RXD60BVMA</b>	
Casing Color			Ivory White		Ivory White	
Compressor	Type		Hermetically Sealed Swing Type		Hermetically Sealed Swing Type	
	Model		2YC32UXD		2YC45ZXD	
	Motor Output	W	1,500		1,500	
Refrigerant Oil	Model		SE56P		SE56P	
	Charge	L	0.65		0.75	
Refrigerant	Model		R-22		R-22	
	Charge	kg	1.25		1.80	
Air Flow Rate	m <sup>3</sup> /min (cfm)	H	42.8 (1,511)	40.7 (1,437)	46.3 (1,635)	44.2 (1,561)
		L	40.7 (1,437)	40.7 (1,437)	42.9 (1,515)	44.2 (1,561)
Fan	Type		Propeller		Propeller	
	Motor Output	W	53		53	
Running Current (Rated)	A		7.21-6.82-6.53/7.21-6.82	8.31-7.92-7.53/8.31-7.92	9.39-9.00-8.61/9.39-9.00	9.49-9.10-8.71/9.49-9.10
Power Consumption (Rated)	W		1,560		2,055	
Power Factor (Rated)	%		98.3-99.5-99.5/98.3-99.5	98.5-98.8-99.6/98.5-98.8	99.5-99.3-99.4/99.5-99.3	99.4-99.1-99.3/99.4-99.1
Starting Current	A		8.5		9.7	
Dimensions (HxWxD)	mm		735x825x300		735x825x300	
Packaged Dimensions (HxWxD)	mm		784x960x390		784x960x390	
Weight	kg		49		55	
Gross Weight	kg		54		59	
Operation Sound		dBA	H : 47 SL : 44	H : 48 SL : 45	H : 49 SL : 46	L : 49 SL : 46
Drawing No.			3D055908		3D055909	

**Note:** ■ The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	Indoor ; 20°CDB Outdoor ; 7°CDB/6°CWB	7.5m

Conversion Formulae
kcal/h=kWx860 Btu/h=kWx3414 cfm=m <sup>3</sup> /minx35.3

50Hz 220-230-240V / 60Hz 220-230V

Model	Indoor Units		FTXD71FVM	
	Outdoor Units		RXD71BVMA	
			Cooling	Heating
Capacity Rated (Min.-Max.)	kW		7.1 (2.9~8.0)	8.5 (2.9-9.7)
	Btu/h		24,200 (9,900~27,300)	29,000 (9,900~33,100)
	kcal/h		6,110 (2,490~6,880)	7,310 (2,490~8,340)
Running Current Rated (Max.)	A		11.9-11.4-10.9/11.9-11.4	11.8-11.3-10.9/11.8-11.3
Power Consumption Rated (Min.-Max.)	W		2,600 (720~3,350)	2,580 (660~3,490)
Power Factor (Rated)	%		99.3-99.2-99.4/99.3-99.2	99.4-99.3-98.6/99.4-99.3
COP Rated (Min.-Max.)	W/W		2.73 (4.03~2.39)	3.29 (4.39~2.78)
Piping Connections	Liquid	mm	φ 9.5	
	Gas	mm	φ15.9	
	Drain	mm	φ18.0	
Heat Insulation	Both Liquid and Gas Pipes			
Max. Interunit Piping Length	m		30	
Max. Interunit Height Difference	m		20	
Chargeless	m		10	
Amount of Additional Charge of Refrigerant	g/m		50	
Indoor Unit			FTXD71FVM	
Front Panel Color			White	
Air Flow Rate	m³/min (cfm)	H	18.3 (646)	19.8 (699)
		M	15.3 (540)	17.1 (604)
		L	12.7 (448)	14.4 (508)
		SL	11.3 (399)	12.6 (445)
Fan	Type		Cross Flow Fan	
	Motor Output	W	43	
	Speed	Steps	5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downward	
Air Filter			Removable / Washable / Mildew Proof	
Running Current (Rated)	A		0.23-0.22-0.21/0.23-0.22	0.23-0.22-0.21/0.23-0.22
Power Consumption (Rated)	W		50	50
Power Factor	%		98.8-98.8-99.2/98.8-98.8	98.8-98.8-99.2/98.8-98.8
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)	mm		290x1,050x238	
Packaged Dimensions (HxWxD)	mm		337x1,147x366	
Weight	kg		12	
Gross Weight	kg		17	
Operation Sound	H/M/L/SL	dBA	46/42/37/34	46/42/37/34
Outdoor Unit			RXD71BVMA	
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Swing Type	
	Model		2YC63ZXD	
	Motor Output	W	1,900	
Refrigerant Oil	Model		SE56P	
	Charge	L	0.65	
Refrigerant	Model		R-22	
	Charge	kg	1.80	
Air Flow Rate	m³/min (cfm)	H	51.5 (1,819)	41.9 (1,480)
		L	41.5 (1,465)	37.4 (1,321)
Fan	Type		Propeller	
	Motor Output	W	53	
Running Current (Rated)	A		11.67-11.18-10.69/11.67-11.18	11.57-11.08-10.69/11.57-11.08
Power Consumption (Rated)	W		2,550	2,530
Power Factor	%		99.3-99.2-99.4/99.3-99.2	99.4-99.3-98.6/99.4-99.3
Starting Current	A		11.9	
Dimensions (HxWxD)	mm		735x825x300	
Packaged Dimensions (HxWxD)	mm		784x960x390	
Weight	kg		57	
Gross Weight	kg		61	
Operation Sound		dBA	H : 52 SL : 49	H : 52 SL : 49
Drawing No.			3D055910	

**Note:** ■ The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	Indoor ; 20°CDB Outdoor ; 7°CDB/6°CWB	7.5m

Conversion Formulae
kcal/h=kWx860 Btu/h=kWx3414 cfm=m³/minx35.3

50Hz 220V

Model	Indoor Units		FTXD50FV2Z		FTXD60FV2Z	
	Outdoor Units		RXD50BVMA		RXD60BVMA	
			Cooling	Heating	Cooling	Heating
Capacity Rated (Min.~Max.)	kW		5.1 (1.5~5.8)	6.5 (1.5~8.0)	6.1 (2.2~7.5)	7.2 (2.2~9.0)
	Btu/h		17,400 (5,100~19,800)	2,2200 (5,100~27,300)	20,800 (7,500~25,600)	24,600 (7,500~30,700)
	kcal/h		4,380 (1,290~4,990)	5,590 (1,290~6,880)	5,240 (1,890~6,450)	6,190 (1,890~7,740)
Running Current Rated	A		7.4	8.7	9.6	9.9
Power Consumption Rated (Min.~Max.)	W		1,600 (450~2,300)	1,880 (410~2,860)	2,090 (630~3,210)	2,170 (570~3,310)
Power Factor	%		98.3	98.2	99.0	99.6
COP Rated (Min.~Max.)	W/W		3.19 (3.33~2.52)	3.46 (3.66~2.80)	2.92 (3.49~2.34)	3.32 (3.86~2.72)
Piping Connections	Liquid	mm	φ 6.4		φ 6.4	
	Gas	mm	φ 12.7		φ 15.9	
	Drain	mm	φ 18.0		φ 18.0	
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Max. Interunit Piping Length	m		30		30	
Max. Interunit Height Difference	m		20		20	
Chargeless	m		10		10	
Amount of Additional Charge of Refrigerant	g/m		20		20	
<b>Indoor Unit</b>			<b>FTXD50FV2Z</b>		<b>FTXD60FV2Z</b>	
Front Panel Color			White		White	
Air Flow Rate	m³/min (cfm)	H	15.5 (547)	16.1 (568)	16.1 (568)	17.1 (604)
		M	12.9 (455)	13.7 (484)	13.5 (477)	14.8 (523)
		L	10.8 (381)	11.5 (406)	11.3 (399)	12.5 (441)
		SL	9.6 (339)	10.2 (360)	10.0 (353)	10.9 (385)
Fan	Type	Cross Flow Fan		Cross Flow Fan		
	Motor Output	W	43		43	
	Speed	Steps	5 Steps, Quiet, Auto		5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downward		Right, Left, Horizontal, Downward	
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof	
Running Current (Rated)	A		0.19	0.19	0.21	0.21
Power Consumption (Rated)	W		40	40	45	45
Power Factor	%		95.7	95.7	97.4	97.4
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (HxWxD)	mm		290x1,050x238		290x1,050x238	
Packaged Dimensions (HxWxD)	mm		337x1,147x366		337x1,147x366	
Weight	kg		12		12	
Gross Weight	kg		17		17	
Operation Sound	H/M/L/SL	dBA	44 / 40 / 35 / 32	42 / 38 / 33 / 30	45 / 41 / 36 / 33	44 / 40 / 35 / 32
<b>Outdoor Unit</b>			<b>RXD50BVMA</b>		<b>RXD60BVMA</b>	
Casing Color			Ivory White		Ivory White	
Compressor	Type	Hermetically Sealed Swing Type		Hermetically Sealed Swing Type		
	Model	2YC32UXD		2YC45ZXD		
	Motor Output	W	1,500		1,500	
Refrigerant Oil	Model	SE56P		SE56P		
	Charge	L	0.65		0.75	
Refrigerant	Model	R-22		R-22		
	Charge	kg	1.25		1.80	
Air Flow Rate	m³/min (cfm)	H	42.8 (1,511)	40.7 (1,437)	46.3 (1,635)	44.2 (1,561)
		L	40.7 (1,437)	40.7 (1,437)	42.9 (1,515)	44.2 (1,561)
Fan	Type	Propeller		Propeller		
	Motor Output	W	53		53	
Running Current (Rated)	A		7.21	8.51	9.39	9.69
Power Consumption (Rated)	W		1,560	1,840	2,045	2,125
Power Factor (Rated)	%		98.3	98.3	99.0	99.7
Starting Current	A		8.7		9.9	
Dimensions (HxWxD)	mm		735x825x300		735x825x300	
Packaged Dimensions (HxWxD)	mm		784x960x390		784x960x390	
Weight	kg		49		55	
Gross Weight	kg		54		59	
Operation Sound	H/SL	dBA	47 / 44	48 / 45	49 / 46	49 / 46
Drawing No.			3D056245		3D056246	

**Note:** ■ The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	Indoor ; 20°CDB Outdoor ; 7°CDB/6°CWB	7.5m

Conversion Formulae
kcal/h=kWx860 Btu/h=kWx3414 cfm=m³/minx35.3

50Hz 220V

Model	Indoor Units		FTXD71FV2Z	
	Outdoor Units		RXD71BVMA	
			Cooling	Heating
Capacity Rated (Min.~Max.)	kW		7.0 (2.9~7.9)	8.5 (2.9-9.7)
	Btu/h		23,900 (9,900~27,000)	29,000 (9,900~33,100)
	kcal/h		6,020 (2,490~6,790)	7,310 (2,490~8,340)
Running Current Rated	A		11.9	12.1
Power Consumption Rated (Min.~Max.)	W		2,590 (720~3,350)	2,650 (660~3,580)
Power Factor	%		98.9	99.5
COP Rated (Min.~Max.)	W/W		2.70 (4.03~2.36)	3.21 (4.39~2.71)
Piping Connections	Liquid	mm	φ 9.5	
	Gas	mm	φ15.9	
	Drain	mm	φ18.0	
Heat Insulation			Both Liquid and Gas Pipes	
Max. Interunit Piping Length	m		30	
Max. Interunit Height Difference	m		20	
Chargeless	m		10	
Amount of Additional Charge of Refrigerant	g/m		50	
Indoor Unit		FTXD71FV2Z		
Front Panel Color		White		
Air Flow Rate	m <sup>3</sup> /min (cfm)	H	16.8 (593)	18.2 (643)
		M	14.0 (494)	15.7 (554)
		L	11.7 (413)	13.3 (470)
		SL	10.4 (367)	11.7 (413)
Fan	Type	Cross Flow Fan		
	Motor Output	W		
	Speed	Steps		
Air Direction Control		Right, Left, Horizontal, Downward		
Air Filter		Removable / Washable / Mildew Proof		
Running Current (Rated)	A	0.23	0.23	
Power Consumption (Rated)	W	50	50	
Power Factor	%	98.8	98.8	
Temperature Control		Microcomputer Control		
Dimensions (HxWxD)	mm	290x1,050x238		
Packaged Dimensions (HxWxD)	mm	337x1,147x366		
Weight	kg	12		
Gross Weight	kg	17		
Operation Sound	H/M/L/SL	dBA	46 / 42 / 37 / 34	46 / 42 / 37 / 34
Outdoor Unit		RXD71BVMA		
Casing Color		Ivory White		
Compressor	Type	Hermetically Sealed Swing Type		
	Model	2YC63ZXD		
	Motor Output	W		
Refrigerant Oil	Model	SE56P		
	Charge	L		
Refrigerant	Model	R-22		
	Charge	kg		
Air Flow Rate	m <sup>3</sup> /min (cfm)	H	51.5 (1,818)	41.9 (1,479)
		L	41.5 (1,465)	37.4 (1,321)
Fan	Type	Propeller		
	Motor Output	W		
Running Current (Rated)	A	11.67	11.87	
Power Consumption (Rated)	W	2,540	2,600	
Power Factor (Rated)	%	98.9	99.6	
Starting Current	A	12.1		
Dimensions (HxWxD)	mm	735x825x300		
Packaged Dimensions (HxWxD)	mm	784x960x390		
Weight	kg	57		
Gross Weight	kg	61		
Operation Sound	H/SL	dBA	52 / 49	52 / 49
Drawing No.		3D056247		

**Note:** ■ The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	Indoor ; 20°CDB Outdoor ; 7°CDB/6°CWB	7.5m

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m <sup>3</sup> /min×35.3



# Part 3

# Printed Circuit Board

# Connector Wiring Diagram

1. Printed Circuit Board Connector Wiring Diagram.....	18
1.1 Indoor Unit.....	18
1.2 Outdoor Unit.....	20



# 1. Printed Circuit Board Connector Wiring Diagram

## 1.1 Indoor Unit

### Connectors

#### PCB(1) (Control PCB)

- |        |   |
|--------|---|
| 1) S1  | Connector for DC fan motor                    |
| 2) S6  | Connector for swing motor (horizontal blades) |
| 3) S8  | Connector for swing motor (vertical blades)   |
| 4) S21 | Connector for centralized control (HA)        |
| 5) S26 | Connector for buzzer PCB                      |
| 6) S28 | Connector for signal receiver PCB             |
| 7) S32 | Connector for heat exchanger thermistor       |
| 8) S35 | Connector for Intelligent Eye sensor PCB      |

#### PCB(2) (Signal Receiver PCB)

- |        |                           |
|--------|---------------------------|
| 1) S29 | Connector for control PCB |
|--------|---------------------------|

#### PCB(3) (Buzzer PCB)

- |        |                           |
|--------|---------------------------|
| 1) S27 | Connector for control PCB |
| 2) S38 | Connector for display PCB |

#### PCB(4) (Display PCB)

- |        |                          |
|--------|--------------------------|
| 1) S37 | Connector for buzzer PCB |
|--------|--------------------------|

#### PCB(5) (INTELLIGENT EYE sensor PCB)

- |        |                           |
|--------|---------------------------|
| 1) S36 | Connector for control PCB |
|--------|---------------------------|



#### Note:

Other designations

#### PCB(1) (Control PCB)

- |          |  |
|----------|--|
| 1) V1    | Varistor   |
| 2) JA    | Address setting jumper                                 |
| JB       | Fan speed setting when compressor is OFF on thermostat |
| JC       | Power failure recovery function                        |
|          | * Refer to page 215 for detail.                        |
| 3) LED A | LED A for service monitor (green)                      |
| 4) FU1   | Fuse (3.15A)   |

#### PCB(2) (Signal Receiver PCB)

- |              |                                |
|--------------|--------------------------------|
| 1) SW1 (S1W) | Forced operation ON/OFF switch |
|--------------|--------------------------------|

#### PCB(3) (Buzzer PCB)

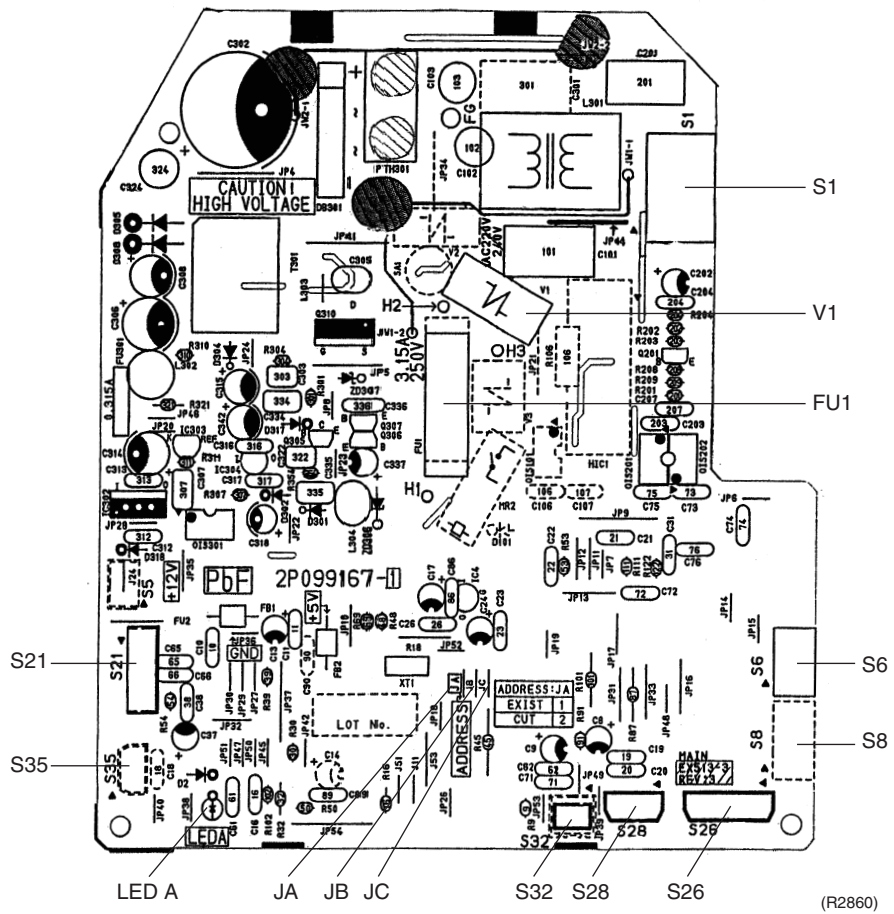
- |               |                             |
|---------------|-----------------------------|
| 1) RTH1 (R1T) | Room temperature thermistor |
|---------------|-----------------------------|

#### PCB(4) (Display PCB)

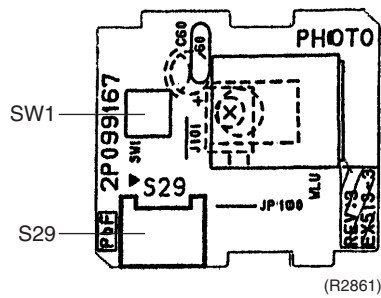
- |         |                                    |
|---------|------------------------------------|
| 4) LED1 | LED for operation (green)          |
| 5) LED2 | LED for timer (yellow)             |
| 6) LED3 | LED for HOME LEAVE operation (red) |

PCB Detail

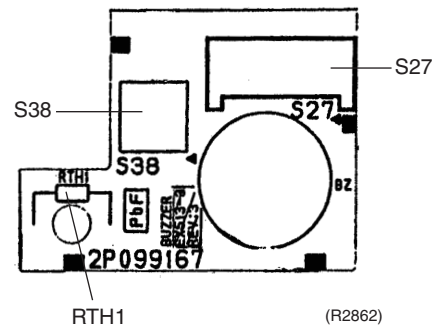
PCB(1): Control PCB (indoor unit)



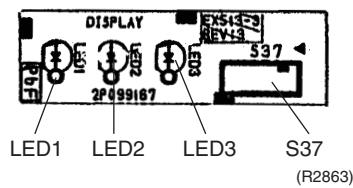
PCB(2): Signal Receiver PCB



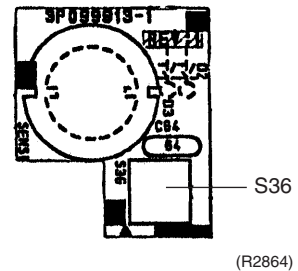
PCB(3): Buzzer PCB



PCB(4): Display PCB



PCB(5): Intelligent Eye sensor PCB



## 1.2 Outdoor Unit

### Connectors

#### PCB (1): Control PCB (outdoor unit)

- |              |   |
|--------------|---|
| 1) S10, AC2  | Connector for terminal strip                  |
| 2) S20       | Connector for electronic expansion valve coil |
| 3) S31, S32  | Connector for SPM                             |
| 4) S33, S71  | Connector for MID                             |
| 5) S40       | Connector for overload protector              |
| 6) S51, S101 | Connector for service monitor PCB             |
| 7) S80       | Connector for four way valve coil             |
| 8) S90       | Connector for thermistors                     |
| 9) S91       | Connector for fin thermistor                  |
| 10) AC1, E   | Connector for power supply PCB                |
| 11) H1, H2   | Connector for diode bridge                    |

#### PCB (2): Power Supply PCB

- |              |                              |
|--------------|------------------------------|
| 1) HL        | Connector for terminal strip |
| 2) HAC1, HE1 | Connector for control PCB    |
| 3) HE2       | Connector for earth          |

#### Display PCB

- |              |                           |
|--------------|---------------------------|
| 1) S52, S102 | Connector for control PCB |
|--------------|---------------------------|

#### MID

- |             |                           |
|-------------|---------------------------|
| 1) S34, S72 | Connector for control PCB |
| 2) S70      | Connector for fan motor   |

#### SPM

- |               |                           |
|---------------|---------------------------|
| 1) CN11, CN14 | Connector for control PCB |
| 2) L1, L2     | Connector for reactor     |



#### Note:

Other Designations

#### PCB (1): Control PCB (outdoor unit)

- |        |              |
|--------|--------------|
| 1) FU2 | Fuse (3.15A) |
|--------|--------------|

#### PCB (2): Power Supply PCB

- |        |            |
|--------|------------|
| 1) FU1 | Fuse (30A) |
| 2) V3  | Varistor   |

#### Service Monitor PCB

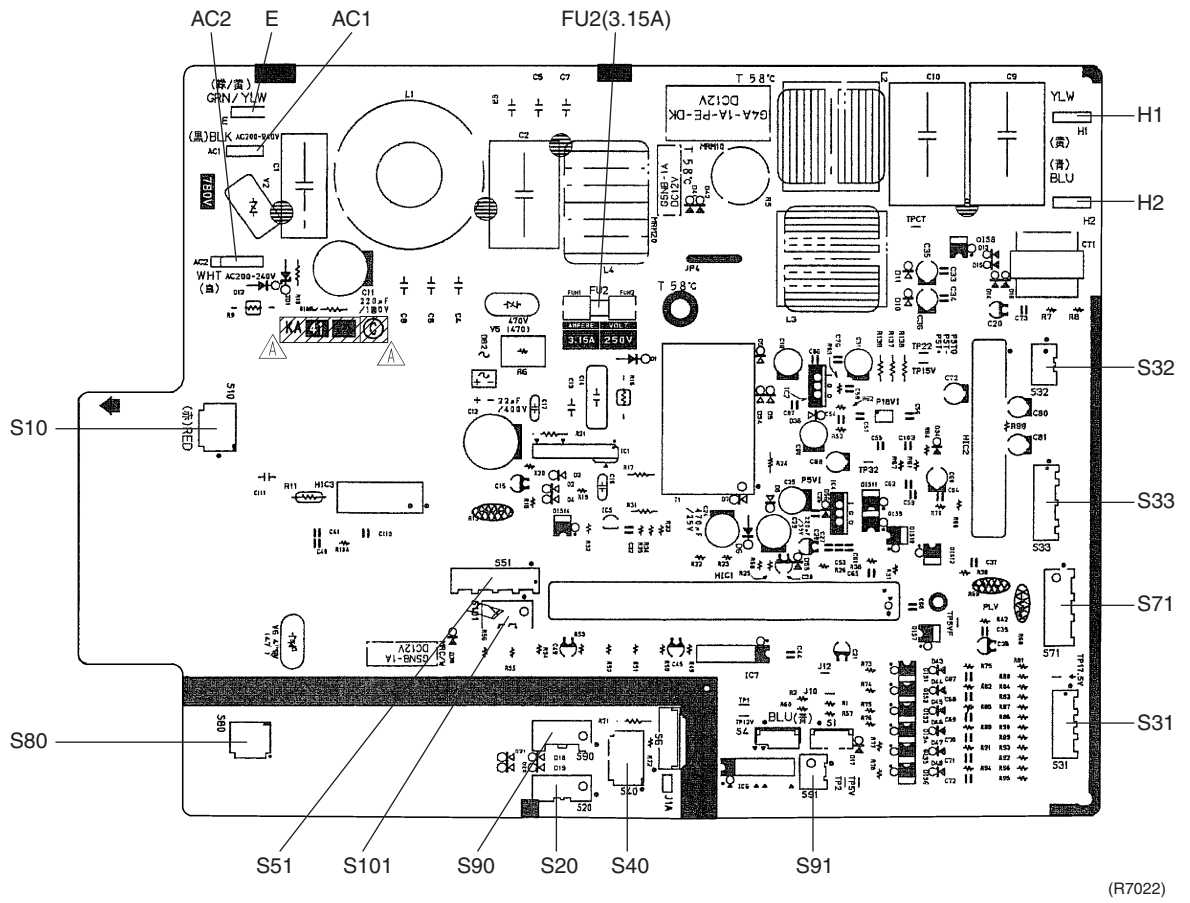
- |          |                                |
|----------|--------------------------------|
| 1) LED A | Service monitor LED            |
| 2) SW1   | Forced operation ON/OFF switch |

#### MID

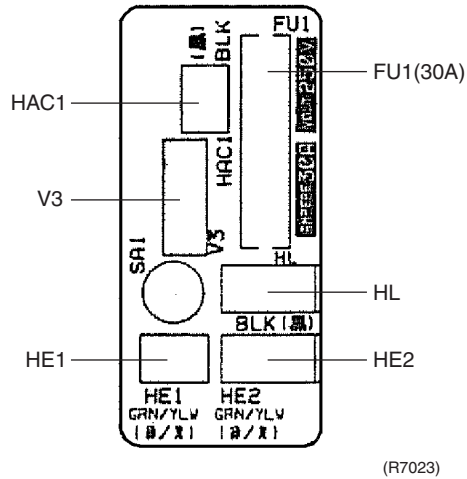
- |          |              |
|----------|--------------|
| 1) FU201 | Fuse (3.15A) |
|----------|--------------|

PCB Detail

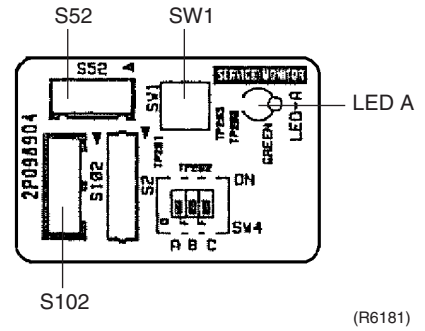
PCB(1): Control PCB (outdoor unit)



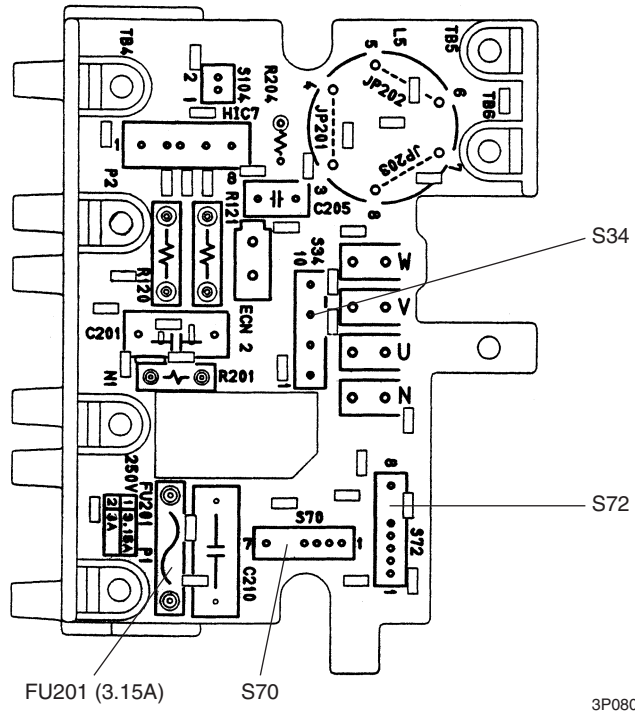
PCB(2): Power Supply PCB



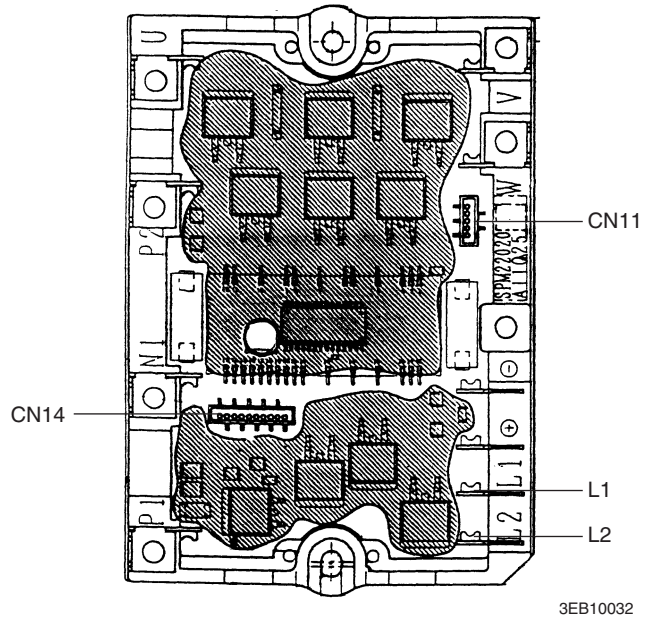
Display PCB



MID



SPM



# Part 4

## Function and Control

1. Main Functions.....	24
1.1 Frequency Principle.....	24
1.2 Power-Airflow Dual Flaps, Wide Angle Louvers and Auto-Swing .....	26
1.3 Fan Speed Control for Indoor Units.....	27
1.4 Programme Dry Function .....	28
1.5 Automatic Operation.....	29
1.6 Thermostat Control.....	30
1.7 Night Set Mode.....	31
1.8 INTELLIGENT EYE .....	32
1.9 HOME LEAVE Operation .....	34
1.10 Inverter POWERFUL Operation .....	35
1.11 Other Functions.....	36
2. Function of Thermistor .....	38
2.1 Heat Pump Model.....	38
2.2 Cooling Only Model .....	39
3. Control Specification .....	40
3.1 Mode Hierarchy .....	40
3.2 Frequency Control.....	41
3.3 Controls at Mode Changing / Start-up.....	43
3.4 Discharge Pipe Temperature Control.....	44
3.5 Input Current Control.....	44
3.6 Freeze-up Protection Control .....	46
3.7 Heating Peak-cut Control .....	46
3.8 Fan Control.....	47
3.9 Liquid Compression Protection Function 2.....	47
3.10 Low Hz High Pressure Limit .....	48
3.11 Defrost Control .....	48
3.12 Electronic Expansion Valve Control .....	49
3.13 Malfunctions .....	52
3.14 Forced Operation Mode .....	53
3.15 Additional Function.....	53

# 1. Main Functions

**i** Note: See the list of functions for the functions applicable to different models.

## 1.1 Frequency Principle

### Main Control Parameters

The compressor is frequency-controlled during normal operation. The target frequency is set by the following 2 parameters coming from the operating indoor unit:

- The load condition of the operating indoor unit
- The difference between the room temperature and the set temperature

### Additional Control Parameters

The target frequency is adapted by additional parameters in the following cases:

- Frequency restrictions
- Initial settings
- Forced cooling operation

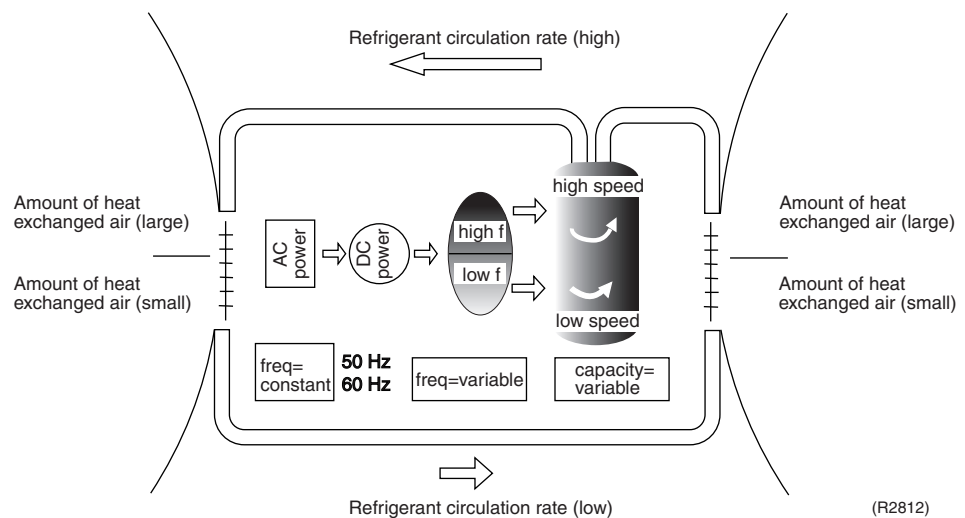
### Inverter Principle

To regulate the capacity, a **frequency control** is needed. The inverter makes it possible to vary the rotation speed of the compressor. The following table explains the conversion principle:

Phase	Description
1	The supplied AC power source is converted into the DC power source for the present.
2	The DC power source is reconverted into the three phase AC power source with variable frequency. <ul style="list-style-type: none"> <li>■ When the frequency increases, the rotation speed of the compressor increases resulting in an increased refrigerant circulation. This leads to a higher amount of the heat exchange per unit.</li> <li>■ When the frequency decreases, the rotation speed of the compressor decreases resulting in a decreased refrigerant circulation. This leads to a lower amount of the heat exchange per unit.</li> </ul>

### Drawing of Inverter

The following drawing shows a schematic view of the inverter principle:



**Inverter Features**

The inverter provides the following features:

- The regulating capacity can be changed according to the changes in the outside temperature and cooling/heating load.
- Quick heating and quick cooling  
The compressor rotational speed is increased when starting the heating (or cooling). This enables a quick set temperature.
- Even during extreme cold weather, the high capacity is achieved. It is maintained even when the outside temperature is 2°C.
- Comfortable air conditioning  
A detailed adjustment is integrated to ensure a fixed room temperature. It is possible to air condition with a small room temperature variation.
- Energy saving heating and cooling  
Once the set temperature is reached, the energy saving operation enables to maintain the room temperature at low power.

**Frequency Limits**

The following table shows the functions that define the minimum and maximum frequency:

Frequency limits	Limited during the activation of following functions
Low	<ul style="list-style-type: none"> <li>■ Four way valve operation compensation. Refer to page 43.</li> </ul>
High	<ul style="list-style-type: none"> <li>■ Input current control. Refer to page 44.</li> <li>■ Compressor protection function. Refer to page 43.</li> <li>■ Heating peak-cut control. Refer to page 46.</li> <li>■ Freeze-up protection control. Refer to page 46.</li> <li>■ Defrost control. Refer to page 48.</li> </ul>

**Forced Cooling Operation**

For more information, refer to “Forced operation mode” on page 53.



## 1.2 Power-Airflow Dual Flaps, Wide Angle Louvers and Auto-Swing

### Power-airflow Dual Flaps

The large flaps send a large volume of air downwards to the floor. The flap provides an optimum control area in cooling, heating and dry mode.

#### Heating Mode

During heating mode, the large flap enables direct warm air straight downwards. The flap presses the warm air above the floor to reach the entire room.

#### Cooling Mode

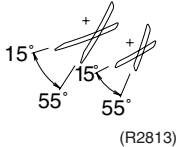
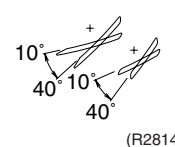
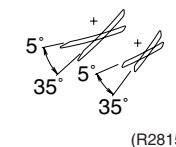
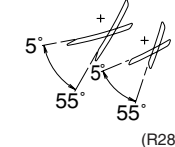
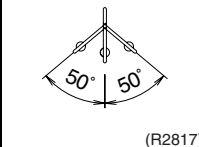
During cooling mode, the flap retracts into the indoor unit. Then, cool air can be blown far and pervaded all over the room.

### Wide-Angle Louvers

The louvers, made of elastic synthetic resin, provide a wide range of airflow that guarantees a comfortable air distribution.

### Auto-Swing

The following table explains the auto-swing process for heating, cooling, dry and fan :

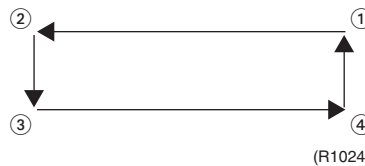
Vertical Swing (up and down)				Horizontal Swing (right and left)
Heating	Cooling	Dry	Fan	Heating, Cooling
 <p>(R2813)</p>	 <p>(R2814)</p>	 <p>(R2815)</p>	 <p>(R2816)</p>	 <p>(R2817)</p>

### Outline of 3-D Airflow

Alternative repetition of vertical and horizontal swing motions enables uniform air-conditioning of the entire room. This function is effective for starting the air conditioner.

### Detail of the Action

When the horizontal swing and vertical swing are both set to auto mode, the airflow become 3-D airflow and the horizontal swing and vertical swing motions are alternated. The order of swing motion is such that it turns counterclockwise, starting from the right upper point as viewed to the front side of the indoor unit.



## 1.3 Fan Speed Control for Indoor Units

### Control Mode

The airflow rate can be automatically controlled depending on the difference between the set temperature and the room temperature. This is done through phase control and Hall IC control.



For more information about Hall IC, refer to the troubleshooting for fan motor on page 93.

### Phase Steps

Phase control and fan speed control contains 9 steps: LLL, LL, SL, L, ML, M, MH, H and HH. In automatic operation, the step "SL" is not available.

Step	Cooling	Heating
LLL		
LL		
L		
ML		
M		
MH		
H		
HH (Powerful)		

= Within this range the airflow rate is automatically controlled when the FAN setting button is set to automatic.



#### Note:

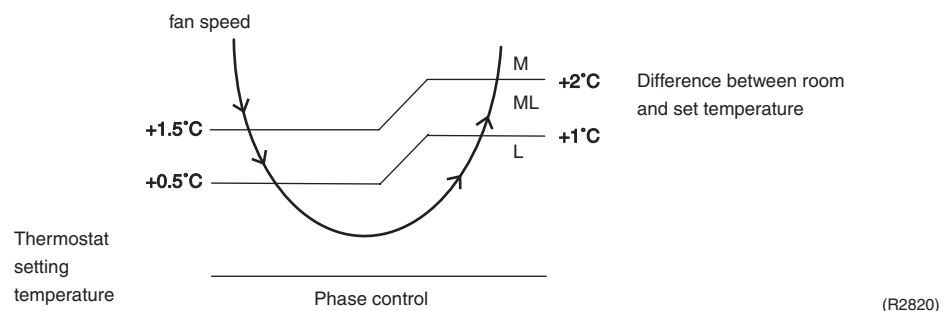
1. During powerful operation, fan operates H tap + 50 - 90 rpm.
2. Fan stops during defrost operation.
3. In time of thermostat OFF, the fan rotates at the following speed.  
Cooling: The fan keeps rotating at the set tap.  
Heating: The fan keeps rotating at LLL tap.

### Automatic Air Flow Control for Heating

On heating mode, the indoor fan speed will be regulated according to the indoor heat exchanger temperature and the difference between the room temperature and the required set point.

### Automatic Air Flow Control for Cooling

The following drawing explains the principle of fan speed control for cooling:



## 1.4 Programme Dry Function

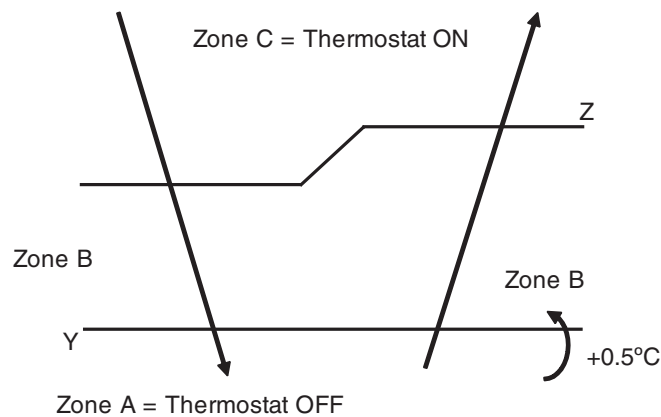
Programme dry function removes humidity while preventing the room temperature from lowering.

Since the microcomputer controls both the temperature and air flow volume, the temperature adjustment and fan adjustment buttons are inoperable in this mode.

### In Case of Inverter Units

The microcomputer automatically sets the temperature and fan settings. The difference between the room temperature at startup and the temperature set by the microcomputer is divided into two zones. Then, the unit operates in the dry mode with an appropriate capacity for each zone to maintain the temperature and humidity at a comfortable level.

Room temperature at startup	Set temperature X	Thermostat OFF point Y	Thermostat ON point Z
24°C or more	Room temperature at startup	$X - 2.5^{\circ}\text{C}$	$X - 0.5^{\circ}\text{C}$ or $Y + 0.5^{\circ}\text{C}$ (zone B) continues for 10 min.
23.5°C ∴ 18°C		$X - 2.0^{\circ}\text{C}$	$X - 0.5^{\circ}\text{C}$ or $Y + 0.5^{\circ}\text{C}$ (zone B) continues for 10 min.
17.5°C ∴	18°C	$X - 2.0^{\circ}\text{C}$	$X - 0.5^{\circ}\text{C} = 17.5^{\circ}\text{C}$ or $Y + 0.5^{\circ}\text{C}$ (zone B) continues for 10 min.



(R6841)

## 1.5 Automatic Operation

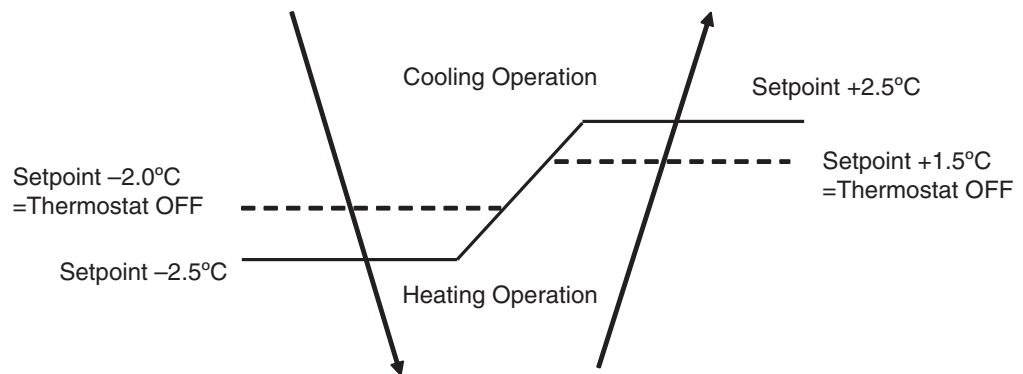
### Automatic Cooling / Heating Function (Heat Pump Only)

When the AUTO mode is selected with the remote controller, the microcomputer automatically determines the operation mode from cooling and heating according to the room temperature and setting temperature at the time of the operation startup, and automatically operates in that mode.

The unit automatically switches the operation mode to cooling or heating to maintain the room temperature at the main unit setting temperature.

#### Detailed Explanation of the Function

1. Remote controller setting temperature is set as automatic cooling / heating setting temperature (18 to 30°C).
2. Main unit setting temperature equals remote controller setting temperature.
3. Operation ON / OFF point and mode switching point are as follows.
  - ① Heating → Cooling switching point:  
Room temperature  $\geq$  Main unit setting temperature +2.5 deg.
  - ② Cooling → Heating switching point:  
Room temperature  $<$  Main unit setting temperature -2.5 deg.
  - ③ Thermostat ON / OFF point is the same as the ON / OFF point of cooling or heating operation.
4. During initial operation
  - Room temperature  $\geq$  Remote controller setting temperature: Cooling operation
  - Room temperature  $<$  Remote controller setting temperature: Heating operation



(R6842)

Ex: When the set point is 25°C

Cooling Operation → 23°C: Thermostat OFF → 22°C: Switch to Heating Operation

5. Heating Operation → 26.5°C: Thermostat OFF → 27.5°C: Switch to Cooling Operation

## 1.6 Thermostat Control

Thermostat control is based on the difference between the room temperature and the setpoint.

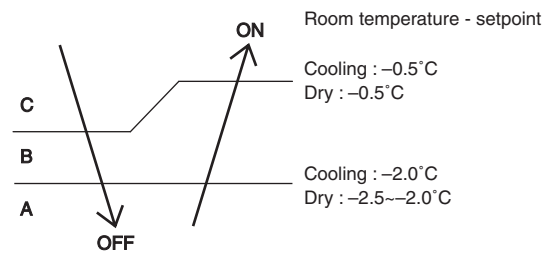
### Thermostat OFF Condition

- ♦ The temperature difference is in the zone A.

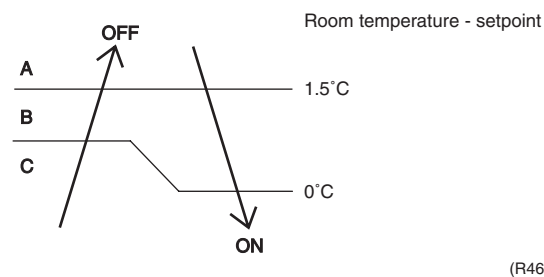
### Thermostat ON Condition

- ♦ The temperature difference is above the zone C after being in the zone A.
- ♦ The system resumes from defrost control in any zones except A.
- ♦ The operation turns on in any zones except A.
- ♦ The monitoring time has passed while the temperature difference is in the zone B.  
(Cooling / Dry : 10 minutes, Heating : 10 seconds)

### Cooling / Dry



### Heating



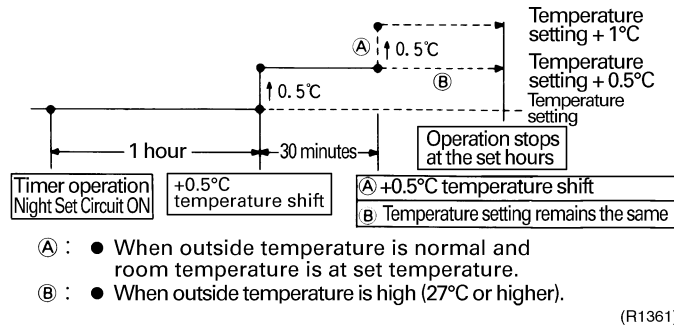
# 1.7 Night Set Mode

When the OFF timer is set, the Night Set circuit automatically activates. The Night Set circuit maintains the airflow setting made by users.

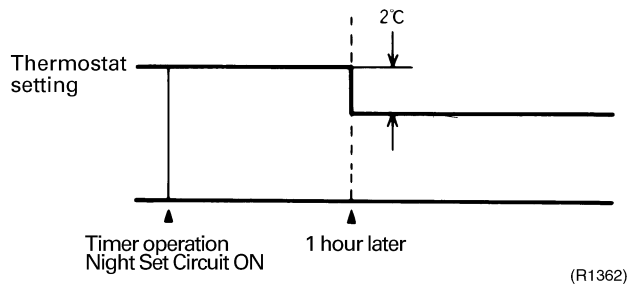
## The Night Set Circuit

The Night Set circuit continues heating or cooling the room at the set temperature for the first one hour, then automatically raises the temperature setting slightly in the case of cooling, or lowers it slightly in the case of heating, for economical operations. This prevents excessive heating in winter and excessive cooling in summer to ensure comfortable sleeping conditions, and also conserves electricity.

## Cooling Operation



## Heating Operation

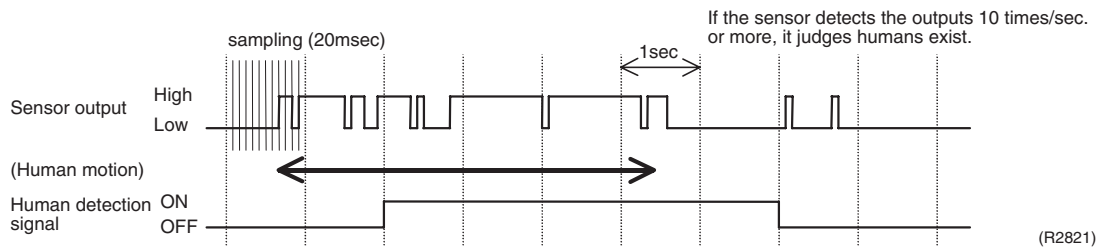


## 1.8 INTELLIGENT EYE

This is the function that detects existence of humans in the room by a human motion sensor (INTELLIGENT EYE) and reduces the capacity when there is no human in the room in order to save electricity.

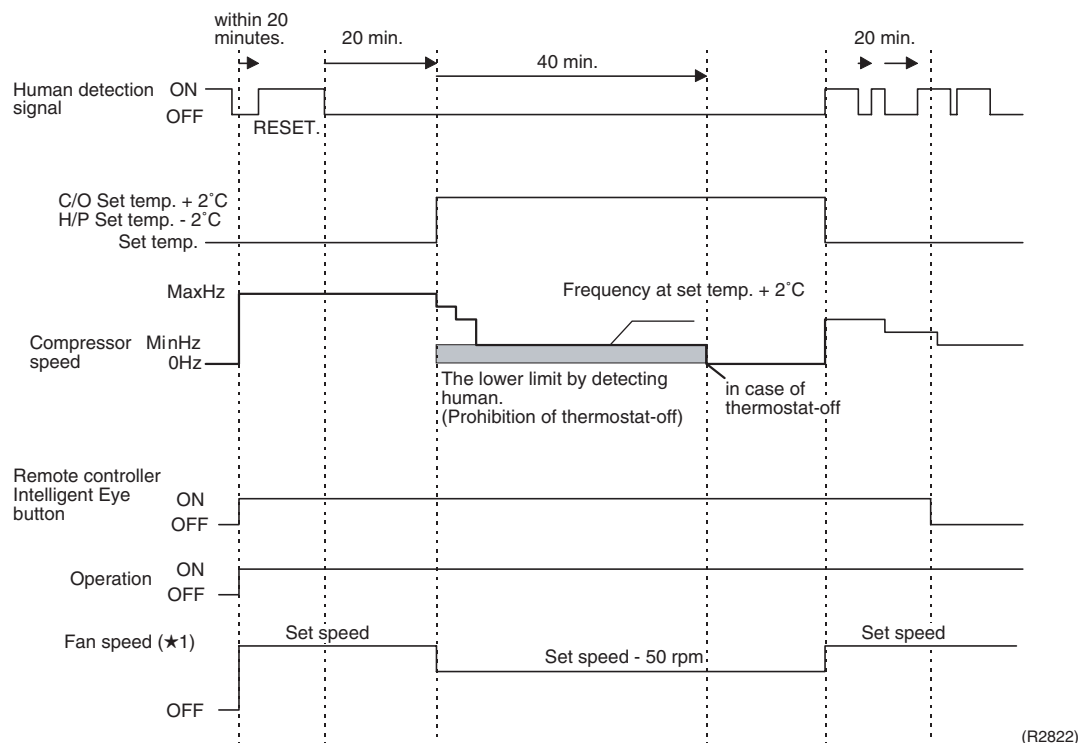
### Processing

#### 1. Detection method by INTELLIGENT EYE



- This sensor detects human motion by receiving infrared rays and displays the pulse wave output.
- A microcomputer in an indoor unit carries out a sampling every 20 msec. and if it detects 10 cycles of the wave in one second in total (corresponding to  $20\text{msec.} \times 10 = 100\text{msec.}$ ), it judges human is in the room as the motion signal is ON.

#### 2. The motions (for example: in cooling)



- When a microcomputer doesn't have a signal from the sensor in 20 minutes, it judges that nobody is in the room and operates the unit in temperature shifted 2°C from the set temperature. (Cooling / Dry : 2°C higher, Heating: 2°C lower and Auto : according to the operation mode at that time.)
- ★1 In case of Fan mode, the fan speed reduces by 50 rpm.

- Since the set temperature is shifted by 2°C higher for 40 minutes, compressor speed becomes low and can realize energy saving operation. But as thermostat is prone to be off by the fact that the set temperature has been shifted, the thermostat-off action is prohibited in 40 minutes so as to prevent this phenomena.  
After this 40 minutes, the prohibition of the thermostat-off is cancelled and it can realize the conditions to conduct thermostat-off depending on the room temperature. In or after this 40 minutes, if the sensor detects human motion detection signal, it let the set temperature and the fan speed return to the original set point, keeping a normal operation.

---

**Others**

- The dry operation can't command the setting temperature with a remote controller, but internally the set temperature is shifted by 1°C.



## 1.9 HOME LEAVE Operation

### Outline

In order to respond to the customer's need for immediate heating and cooling of the room after returning home or for house care, a measure to switch the temperature and air volume from that for normal time over to outing time by one touch is provided. (This function responds also to the need for keeping up with weak cooling or heating.)

This time, we seek for simplicity of operation by providing the special temperature and air volume control for outing to be set by the exclusive button.

### Detail of the Control

#### 1. Start of Function

The function starts when the [HOME LEAVE] button is pressed in cooling mode or heating mode (including stopping and powerful operation). If this button is pressed while the operation is stopped, the function becomes effective when the operation is started. If this button is pressed in **powerful operation**, the powerful operation is reset and this function becomes effective.

- The [HOME LEAVE] button is ineffective in dry mode and fan mode.

#### 2. Details of Function

A mark representing [HOME LEAVE] is indicated on the liquid crystal display of the remote controller. The indoor unit is operated according to the set temperature and air volume for HOME LEAVE which were pre-set in the memory of the remote controller.

The LED (Red) of indoor unit representing [HOME LEAVE] lights up. (It goes out when the operation is stopped.)

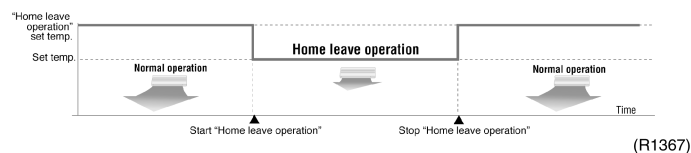
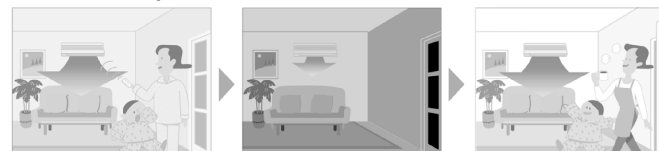
#### 3. End of Function

The function ends when the [HOME LEAVE] button is pressed again during [HOME LEAVE] operation or when the powerful operation button is pressed.

Scene <cooling>



Scene <Heating>



### Others

The set temperature and set air volume are memorized in the remote controller. When the remote controller is reset due to replacement of battery, it is necessary to set the temperature and air volume again for [HOME LEAVE].

## 1.10 Inverter POWERFUL Operation

### Outline

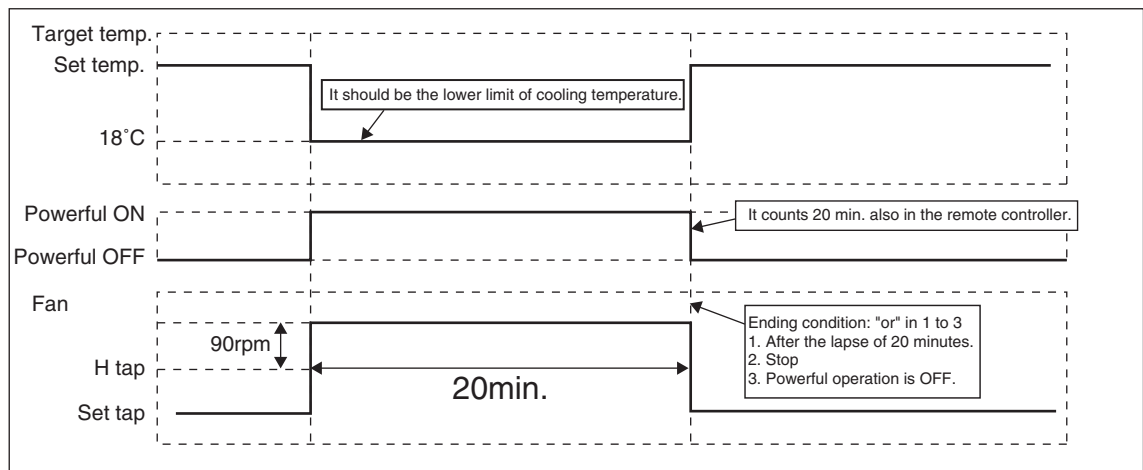
In order to exploit the cooling and heating capacity to full extent, operate the air conditioner by increasing the indoor fan rotating speed and the compressor frequency.

### Details of the Control

When POWERFUL button is pushed in each operation mode, the fan speed/setting temperature will be converted to the following states in a period of twenty minutes.

Operation mode	Fan speed	Target set temperature
Cooling	H tap + 90 rpm	18°C
Dry	Dry rotating speed + 50 rpm	Normally targeted temperature in dry operation; Approx. -2°C
Heating	H tap + 90 rpm	30°C
Fan	H tap + 90 rpm	—
Automatic	Same as cooling / heating in Powerful operation	The target is kept unchanged

Ex.) : Powerful operation in cooling mode.



(R4984)

## 1.11 Other Functions

### 1.11.1 Hot Start Function

#### Heat Pump Only

In order to prevent the cold air blast that normally comes when heating is started, the temperature of the heat exchanger of the indoor unit is detected, and either the air flow is stopped or is made very weak thereby carrying out comfortable heating of the room.

\*The cold air blast is also prevented using a similar control when the defrosting operation is started or when the thermostat gets turned ON.

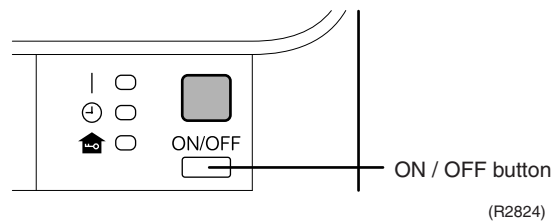
### 1.11.2 Signal Receiving Sign

When the indoor unit receives a signal from the remote controller, the unit emits a signal receiving sound.

### 1.11.3 ON/OFF Button on Indoor Unit

An ON/OFF switch is provided on the front panel of the unit. Use this switch when the remote controller is missing or if its battery has run out.

Every press of the switch changes from Operation to Stop or from Stop to Operation



- Push this button once to start operation. Push once again to stop it.
- This button is useful when the remote controller is missing.
- The operation mode refers to the following table.

	Mode	Temperature setting	Air flow rate
Cooling Only	COOL	22°C	AUTO
Heat Pump	AUTO	25°C	AUTO

- In the case of multi system operation, there are times when the unit does not activate with this button.

#### <Forced operation mode>

Forced operation mode will be set by pressing the ON/OFF button for between 5 to 9 sec. while the unit is not operating.



**Note:** When the ON/OFF button is pressed for 10 sec. or more, the operation will be stopped. See page 53 for the detail of "Forced Operation Mode".

### 1.11.4 Titanium Apatite Photocatalytic Air-Purifying Filter

This filter combines the Air Purifying Filter and Titanium Apatite Photocatalytic Deodorizing Filter in a single highly effective unit. The filter traps microscopic particles, decompose odours and even deactivates bacteria and viruses. It lasts for three years without replacement if washed about once every six months.

### 1.11.5 Mold Proof Air Filter (Prefilter)

The filter net is treated with mold resisting agent TBZ (harmless, colorless, and odorless). Due to this treatment, the amount of mold growth is much smaller than that of normal filters.

### 1.11.6 Self-Diagnosis Digital Display

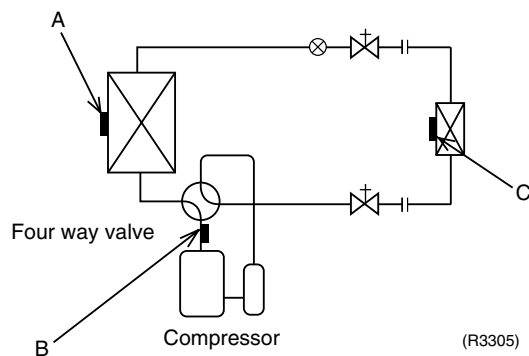
The microcomputer continuously monitors main operating conditions of the indoor unit, outdoor unit and the entire system. When an abnormality occur, the LCD remote controller displays error code. These indications allow prompt maintenance operations.

### 1.11.7 Auto-restart Function

Even if a power failure (including one for just a moment) occurs during the operation, the operation restarts in the condition before power failure automatically when power is restored. (Note) It takes 3 minutes to restart the operation because the 3-minute standby function is activated.

## 2. Function of Thermistor

### 2.1 Heat Pump Model



#### A Outdoor Heat Exchanger Thermistor

1. The outdoor heat exchanger thermistor is used for controlling target discharge temperature. The system sets a target discharge temperature according to the outdoor and indoor heat exchanger temperature, and controls the electronic expansion valve opening so that the target discharge temperature can be obtained.
2. The outdoor heat exchanger thermistor is used for detecting disconnection of the discharge thermistor when cooling.  
When the discharge pipe temperature becomes lower than the outdoor heat exchanger temperature, the discharge pipe thermistor is judged as disconnected.
3. The outdoor heat exchanger thermistor is used for high pressure protection during cooling operation.

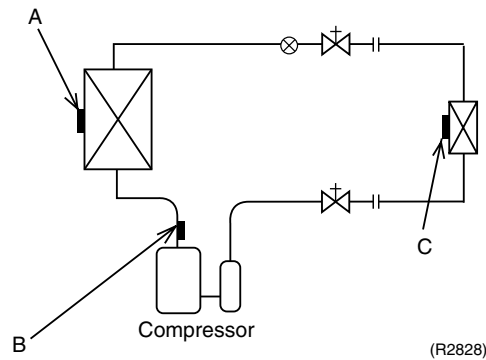
#### B Discharge Pipe Thermistor

1. The discharge pipe thermistor is used for controlling temperature of the discharge pipe. If the temperature of discharge pipe (used in place of the inner temperature of the compressor) rises abnormally, the operating frequency drops or the operation halts.
2. The discharge pipe thermistor is used for detecting disconnection of the discharge thermistor.

#### C Indoor Heat Exchanger Thermistor

1. The indoor heat exchanger thermistor is used for controlling target discharge temperature. The system sets a target discharge temperature according to the outdoor and indoor heat exchanger temperature, and controls the electronic expansion valve opening so that the target discharge temperature can be obtained.
2. The indoor heat exchanger thermistor is used for preventing freezing.  
During the cooling operation, if the temperature drops abnormally, the operating frequency becomes lower, then the operation halts.
3. During heating, the indoor heat exchanger thermistor is used for detecting disconnection of the discharge pipe thermistor.  
When the discharge pipe temperature becomes lower than the indoor heat exchanger temperature, the discharge pipe thermistor is judged as disconnected.  
The indoor heat exchanger thermistor is also used for preventing abnormal high pressure.

## 2.2 Cooling Only Model



### A Outdoor Heat Exchanger Thermistor

1. The outdoor heat exchanger thermistor is used for controlling target discharge temperature. The system sets a target discharge temperature according to the outdoor and indoor heat exchanger temperature, and controls the electronic expansion valve opening so that the target discharge temperature can be obtained.
2. The outdoor heat exchanger thermistor is used for detecting disconnection of the discharge thermistor when cooling.  
When the discharge pipe temperature becomes lower than the outdoor heat exchanger temperature, the discharge pipe thermistor is judged as disconnected.
3. The outdoor heat exchanger thermistor is used for high pressure protection during cooling operation.

### B Discharge Pipe Thermistor

1. The discharge pipe thermistor is used for controlling temperature of the discharge pipe. If the temperature of discharge pipe (used in place of the inner temperature of the compressor) rises abnormally, the operating frequency drops or the operation halts.
2. The discharge pipe thermistor is used for detecting disconnection of the discharge thermistor.

### C Indoor Heat Exchanger Thermistor

1. The indoor heat exchanger thermistor is used for controlling target discharge temperature. The system sets a target discharge temperature according to the outdoor and indoor heat exchanger temperature, and controls the electronic expansion valve opening so that the target discharge temperature can be obtained.
2. The indoor heat exchanger thermistor is used for preventing freezing.  
During the cooling operation, if the temperature drops abnormally, the operating frequency becomes lower, then the operation halts.

## 3. Control Specification

### 3.1 Mode Hierarchy

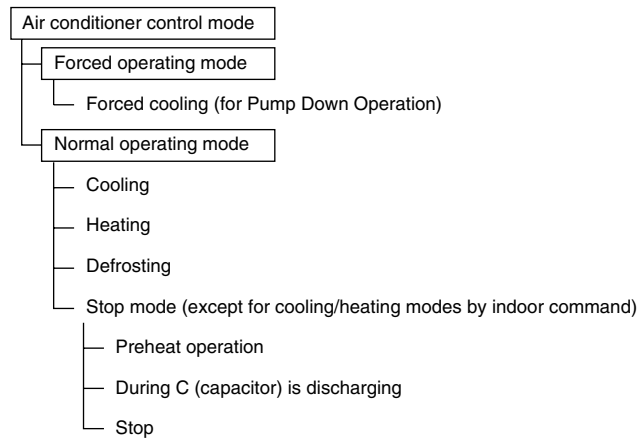
#### Outline

There are two modes; the mode selected in user's place (normal air conditioning mode) and forced operation mode for installation and providing service.

#### Detail

##### 1. For heat pump model

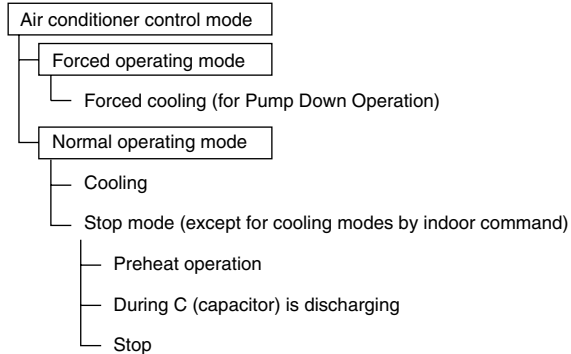
There are following modes; stop, cooling (includes drying), heating (include defrosting)



(R2829)

##### 2. For cooling only model

There are following models; stop and cooling (including drying).



(R2830)



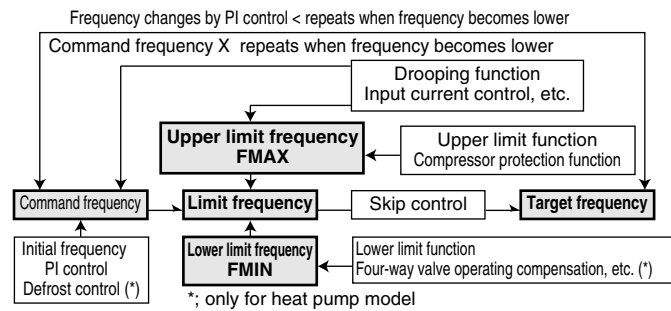
**Note:** Unless specified otherwise, an indoor dry operation command must be regarded as cooling operation.

## 3.2 Frequency Control

### Outline

Frequency will be determined according to the difference between room and set temperature. The function is explained as follows.

1. How to determine frequency.
2. Frequency command from an indoor unit. (The difference between a room temperature and the temperature set by the remote controller.)
3. Frequency command from an indoor unit.
4. Frequency initial setting.
5. PI control.



(R2831)

### Detail

#### How to Determine Frequency

The compressor's frequency will finally be determined by taking the following steps.

#### For Heat Pump Model

##### 1. Determine command frequency

- ◆ Command frequency will be determined in the following order of priority.
  - 1.1 Limiting frequency by drooping function
  - ◆ Input current, discharge pipes, peak cutting, freeze-up protection, dew prevention, fin thermistor temperature.
  - 1.2 Limiting defrost control time
  - 1.3 Forced cooling
  - 1.4 Indoor frequency command

##### 2. Determine upper limit frequency

- ◆ Set a minimum value as an upper limit frequency among the frequency upper limits of the following functions:  
Compressor protection, input current, discharge pipes, peak cutting, freeze-up protection, defrost.

##### 3. Determine lower limit frequency

- ◆ Set a maximum value as a lower limit frequency among the frequency lower limits of the following functions:  
Four way valve operating compensation, draft prevention, pressure difference upkeep.

##### 4. Determine prohibited frequency

- ◆ There is a certain prohibited frequency such as a power supply frequency.

#### For Cooling Only Model

##### 1. Determine command frequency

- ◆ Command frequency will be determined in the following order of priority.
  - 1.1 Limiting frequency by drooping function
  - ◆ Input current, discharge pipes, freeze-up protection, dew prevention, fin thermistor temperature.
  - 1.2 Indoor frequency command



**2. Determine upper limit frequency**

- ◆ Set a minimum value as an upper limit frequency among the frequency upper limits of the following functions:  
Compressor protection, input current, discharge pipes, freeze-up protection, dew prevention, fin thermistor temperature.

**3. Determine lower limit frequency**

- ◆ Set a maximum value as an lower limit frequency among the frequency lower limits of the following functions:  
Pressure difference upkeep.

**4. Determine prohibited frequency**

- ◆ There is a certain prohibited frequency such as a power supply frequency.

**Indoor Frequency Command ( $\Delta D$  signal)**

The difference between a room temperature and the temperature set by the remote controller will be taken as the " $\Delta D$  signal" and is used for frequency command.

Temperature difference	$\Delta D$ signal	Temperature difference	$\Delta D$ signal	Temperature difference	$\Delta D$ signal	Temperature difference	$\Delta D$ signal
0	*Th OFF	2.0	4	4.0	8	6.0	C
0.5	1	2.5	5	4.5	9	6.5	D
1.0	2	3.0	6	5.0	A	7.0	E
1.5	3	3.5	7	5.5	B	7.5	F

\*Th OFF = Thermostat OFF

**Frequency Initial Setting****<Outline>**

When starting the compressor, or when conditions are varied due to the change of the room, the frequency must be initialized according to the  $\Delta D$  value of the indoor unit and the Q value of the indoor unit.

Q value: Indoor unit output determined from indoor unit volume, air flow rate and other factors.

**PI Control (Determine Frequency Up / Down by  $\Delta D$  Signal)****1. P control**

Calculate  $\Delta D$  value in each sampling time (20 seconds), and adjust the frequency according to its difference from the frequency previously calculated.

**2. I control**

If the operating frequency is not change more than a certain fixed time, adjust the frequency up and down according to the  $\Delta D$  value, obtaining the fixed  $\Delta D$  value.

When the  $\Delta D$  value is small...lower the frequency.

When the  $\Delta D$  value is large...increase the frequency.

**3. Frequency management when other controls are functioning**

- ◆ When frequency is drooping;  
Frequency management is carried out only when the frequency droops.
- ◆ For limiting lower limit  
Frequency management is carried out only when the frequency rises.

**4. Upper and lower limit of frequency by PI control**

The frequency upper and lower limits are set depending on indoor unit.

When low noise commands come from the indoor unit or when outdoor unit low noise or quiet commands come from indoor unit, the upper limit frequency must be lowered than the usual setting.

## 3.3 Controls at Mode Changing / Start-up

### 3.3.1 Preheating Operation

**Outline** Operate the inverter in the open phase operation with the conditions including the preheating command from the indoor, the outdoor air temperature and discharge pipe temperature.

**Detail**

**Preheating ON Condition**

- When outdoor air temperature is below 10.5°C and discharge pipe temperature is below 10.5°C, inverter in open phase operation starts. (The power consumption of compressor during preheat operation is 35 W.)

**OFF Condition**

- When outdoor air temperature is higher than 12°C or discharge pipe temperature is higher than 12°C, inverter in open phase operation stops.

### 3.3.2 Four Way Valve Switching

**Outline**

**Heat Pump Only**

During the heating operation current must be conducted and during cooling and defrosting current must not be conducted. In order to eliminate the switching sound (as the four way valve coil switches from ON to OFF) when the heating is stopped, the delay switch of the four way valve must be carried out after the operation stopped.

**Detail**

The OFF delay of four way valve  
Energize the coil for 150 sec after unit operation is stopped.

### 3.3.3 Four Way Valve Operation Compensation

**Outline**

**Heat Pump Only**

At the beginning of the operation as the four way valve is switched, acquire the differential pressure required for activating the four way valve by having output the operating frequency, which is more than a certain fixed frequency, for a certain fixed time.

**Detail**

**Starting Conditions**

- When starting compressor for heating.
- When the operating mode changes from the previous time.
- When starting compressor for starting defrosting or resetting.
- When starting compressor for the first time after the reset with the power is ON.  
Set the lower limit frequency to 55 (model by model) Hz for 70 seconds with any conditions 1 through 4 above.

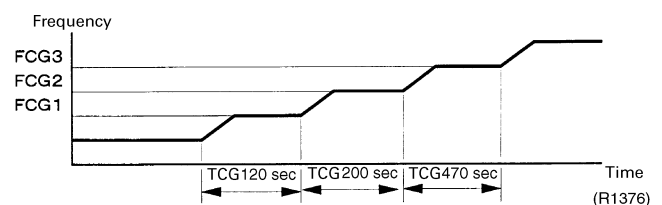
### 3.3.4 3 Minutes Stand-by

Prohibit to turn ON the compressor for 3 minutes after turning it off.  
(Except when defrosting. (Only for Heat Pump Model).)

### 3.3.5 Compressor Protection Function

When turning the compressor from OFF to ON, the upper limit of frequency must be set as follows. (The function must not be used when defrosting (only for heat pump model).)

	2YC63	Others
FCG 3	85	85
FCG 2	70	70
FCG 1	40	55



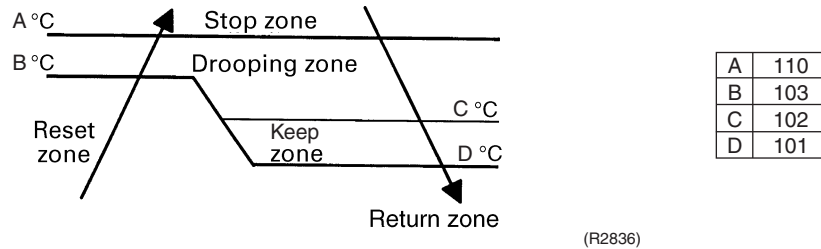
## 3.4 Discharge Pipe Temperature Control

### Outline

The discharge pipe temperature is used as the compressor's internal temperature. If the discharge pipe temperature rises above a certain level, the operating frequency upper limit is set to keep this temperature from going up further.

### Detail

#### Divide the Zone



#### Management within the Zones

Zone	Control contents
Stop zone	When the temperature reaches the stop zone, stop the compressor and correct abnormality.
Drooping zone	Start the timer, and the frequency will be drooping.
Keep zone	Keep the upper limit of frequency.
Return / Reset zone	Cancel the upper limit of frequency.

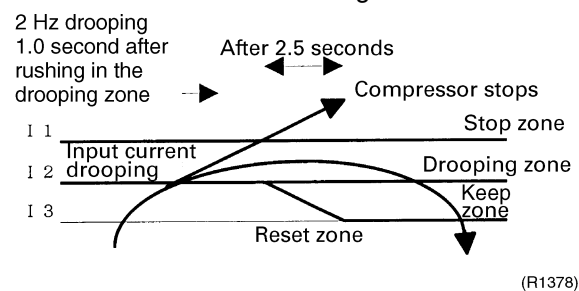
## 3.5 Input Current Control

### Outline

Detect an input current by the CT during the compressor is running, and set the frequency upper limit from such input current. In case of heat pump model, this control is the upper limit control function of the frequency which takes priority of the lower limit of four way valve activating compensation.

### Detail

The frequency control will be made within the following zones.



When a "stop current" continues for 2.5 seconds after rushing on the stop zone, the compressor operation stops.

If a "drooping current" is continues for 1.0 second after rushing on the drooping zone, the frequency will be 2 Hz drooping.

Repeating the above drooping continues until the current rushes on the drooping zone without change.

In the keep zone, the frequency limit will remain.

In the return / reset zone, the frequency limit will be cancelled.

**Limitation of current drooping and stop value according to the outdoor air temperature**

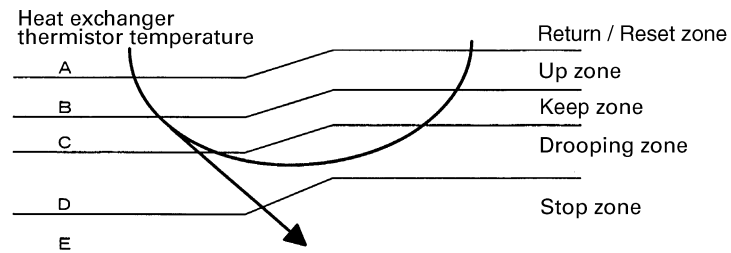
1. In case the operation mode is cooling
  - ◆ The current droops when outdoor air temperature becomes higher than a certain level (model by model).
2. In case the operation mode is heating (only for heat pump model)
  - ◆ The current droops when outdoor air temperature becomes higher than a certain level (model by model).

## 3.6 Freeze-up Protection Control

**Outline** During cooling operation, the signals being sent from the indoor unit allow the operating frequency limitation and then prevent freezing of the indoor heat exchanger. (The signal from the indoor unit must be divided into the zones as the followings.)

**Detail** **Conditions for Start Controlling**  
Judge the controlling start with the indoor heat exchanger temperature after 2 sec from operation start.

### Control in Each Zone



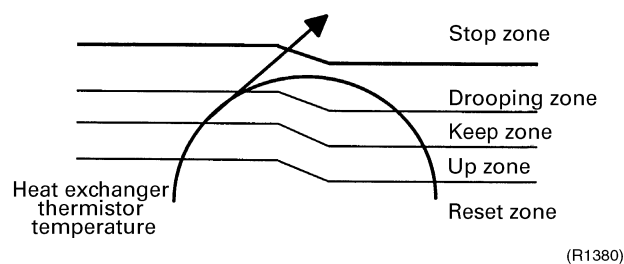
## 3.7 Heating Peak-cut Control

**Outline** **Heat Pump Only**  
During heating operation, the signals being sent from the indoor unit allow the operating frequency limitation and prevent abnormal high pressure. (The signal from the indoor unit must be divided as follows.)

**Detail** **Conditions for Start Controlling**  
Judge the controlling start with the indoor heat exchanger temperature after 2 min from operation start.

### Control in Each Zone

The heat exchange intermediate temperature of indoor unit controls the following.



## 3.8 Fan Control

---

- Outline**
- Fan control is carried out according to the following priority.
1. Fan ON control for electric component cooling fan
  2. Fan control when defrosting
  3. Fan OFF delay when stopped
  4. ON/OFF control in cooling operation
  5. Tap control when drooping function is working
  6. Fan control in forced operation
  7. Fan control in indoor/outdoor unit silent operation
  8. Fan control in powerful mode
  9. Fan control in normal operation
- 

- Detail**
- Fan OFF Control when Stopped**
- ◆ Fan OFF delay for 60 seconds must be made when the compressor is stopped.
- Tap Control in indoor/outdoor unit silent operation**
1. When Cooling Operation  
When the outdoor air temperature is lower than 37°C, the fan tap must be set to L.
  2. When Heating Operation  
When the outdoor air temperature is higher than 4°C, the fan tap must be turned to L (only for heat pump model).

## 3.9 Liquid Compression Protection Function 2

---

- Outline**
- In order to obtain the dependability of the compressor, the compressor must be stopped according to the conditions of the temperature of the outdoor air and outdoor heat exchanger.
- 

- Detail**
- Heat Pump Model**
- ◆ Operation stop depending on the outdoor air temperature.  
Compressor operation turns OFF under the conditions that the system is in cooling operation and outdoor air temperature is below -5°C.
- Cooling Only Model**
- ◆ Operation stops depending on the outdoor air temperature.  
Compressor operation turns OFF under the condition that outdoor air temperature is below -5°C.

### 3.10 Low Hz High Pressure Limit

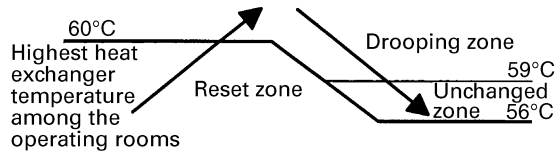
**Outline**

**Heat Pump Only**

Set the upper limit of high pressure in a low Hz zone. Set the upper limit of the indoor heat exchanger temperature by its operating frequency of Hz. Separate into three zones, reset zone, unchanged zone and drooping zone and the frequency control must be carried out in such zones.

**Detail**

**Separate into Zones**



(R1382)



**Note:** Drooping: The system stops 2 minutes after staying in the drooping zone.

### 3.11 Defrost Control

**Outline**

**Heat Pump Only**

Defrosting is carried out by the cooling cycle (reverse cycle). The defrosting time or outdoor heat exchanger temperature must be more than its fixed value when finishing.

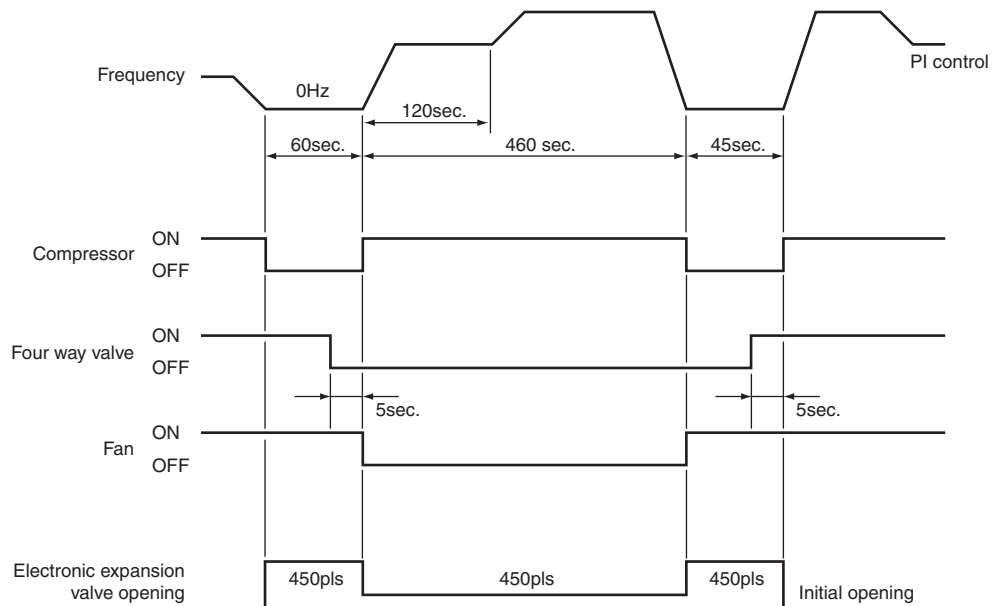
**Detail**

**Conditions for Starting Defrost**

The starting conditions must be made with the outdoor air temperature and heat exchanger temperature. Under the conditions that the system is in heating operation, 6 minutes after the compressor is started and more than 44 minutes of accumulated time pass since the start of the operation or ending the defrosting.

**Conditions for Canceling Defrost**

The judgment must be made with heat exchanger temperature. (4°C~12°C)



(R4082)

### 3.12 Electronic Expansion Valve Control

**Outline**

The following items are included in the electronic expansion valve control.

**Electronic expansion valve is fully closed**

1. Electronic expansion valve is fully closed when turning on the power.
2. Pressure equalizing control

**Open Control**

1. Electronic expansion valve control when starting operation
2. Control when frequency changed
3. Control for defrosting (only for heat pump model)
4. Control when a discharge pipe temperature is abnormally high
5. Control when the discharge pipe thermistor is disconnected

**Feedback Control**

1. Discharge pipe temperature control

**Detail**

The followings are the examples of control which function in each mode by the electronic expansion valve control.

Operation pattern		Control when frequency changed	Control for abnormally high discharge pipe temperature	
When power is turned ON	○ : function × : not function			
↓		Fully closed when power is turned ON	×	×
Cooling operation		Open control when starting	×	○
↓		(Control of target discharge pipe temperature)	○	○
Stop		Pressure equalizing control	×	×
Heating operation (only for heat pump model)		Open control when starting	×	○
↓		(Control of target discharge pipe temperature)	○	○
Stop		(Defrost control FD=1) (only for heat pump model)	×	×
Heating operation (only for heat pump model)		Pressure equalizing control	×	×
↓		Open control when starting	×	○
Control of discharge pipe thermistor disconnection		Continue	×	×
↓		Pressure equalizing control	×	×
Stop				

(R2833)



### 3.12.1 Fully Closing with Power ON

Initialize the electronic expansion valve when turning on the power, set the opening position and develop pressure equalizing.

### 3.12.2 Pressure Equalization Control

When the compressor is stopped, open and close the electronic expansion valve and develop pressure equalization.

### 3.12.3 Opening Limit

#### Outline

Limit a maximum and minimum opening of the electronic expansion valve.

#### Detail

- ◆ A maximum electronic expansion valve opening : 450 pulses
  - ◆ A minimum electronic expansion valve opening : 54 pulses
- The electronic expansion valve is fully closed in the room where cooling is stopped and is opened with fixed opening during defrosting.

### 3.12.4 Starting Operation Control

Control the electronic expansion valve opening when the system is starting, and prevent the system to be super heated or moistened.

### 3.12.5 High Temperature of the Discharge Pipe

When the compressor is operating, if the discharge pipe temperature exceeds a certain value, open the electronic expansion valve and remove the refrigerant to the low pressure side and lower discharge temperature.

### 3.12.6 Disconnection of the Discharge Pipe Thermistor

#### Outline

Detect a disconnected discharge pipe thermistor by comparing the discharge pipe temperature with the condensation temperature. If any is disconnected, open the electronic expansion valve according to the outdoor air temperature and the operating frequency, and operate for a specified time, and then stop.

After 3 minutes of waiting, restart the unit and check if any is disconnected. If any is disconnected stop the system after operating for a specified time. If the disconnection is detected 4 times in succession, then the system will be down.

#### Detail

##### Detect Disconnection

If a 630-second timer for open control becomes over, and a 9-minute timer for the compressor operation continuation is not counting time, the following adjustment must be made.

1. When the operation mode is cooling
  - When the discharge pipe temperature is lower than the outdoor heat exchanger temperature, the discharge pipe thermistor disconnection must be ascertained.
2. When the operation mode is heating (only for heat pump model)
  - When the discharge pipe temperature is lower than the max temperature of operating room heat exchanger, the discharge pipe thermistor disconnection must be ascertained.

##### Adjustment when the thermistor is disconnected

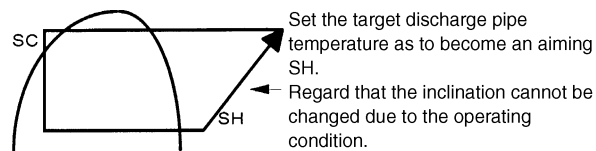
When compressor stop repeats specified time, the system should be down.

### 3.12.7 Control when frequency is changed

When the target discharge pipe temperature control is active, if the target frequency is changed for a specified value in a certain time period, cancel the target discharge pipe temperature control and change the target opening of the electronic expansion valve according to the shift.

### 3.12.8 Target Discharge Pipe Temperature Control

Obtain the target discharge pipe temperature from the indoor and outdoor heat exchanger temperature, and adjust the electronic expansion valve opening so that the actual discharge pipe temperature become close to that temperature. (Indirect SH control using the discharge pipe temperature)



(R1389)

Determine a correction value of the electronic expansion valve compensation and drive it according to the deflection of the target discharge temperature and actual discharge temperature, and the discharge temperature variation by the 20 sec.

## 3.13 Malfunctions

### 3.13.1 Sensor Malfunction Detection

Sensor malfunction may occur either in the thermistor or current transformer (CT) system.

#### Relating to Thermistor Malfunction

1. Outdoor heat exchanger thermistor
2. Discharge pipe thermistor
3. Fin thermistor
4. Outside air thermistor

#### Relating to CT Malfunction

When the output frequency is more than 55 Hz and the input current is less than 1.25A, carry out abnormal adjustment.

### 3.13.2 Detection of Overload and Over Current

#### Outline

In order to protect the inverter, detect an excessive output current, and for protecting compressor, monitor the OL operation.

#### Detail

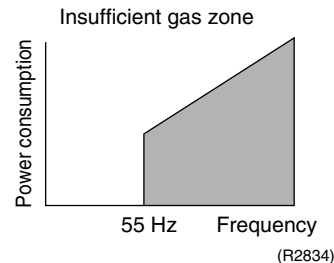
- ◆ If the OL (compressor head) temperature exceeds 120~130°C (depending on the model), the compressor gets interrupted.
- ◆ If the inverter current exceeds 30 A, the compressor gets interrupted too.

### 3.13.3 Insufficient Gas Control

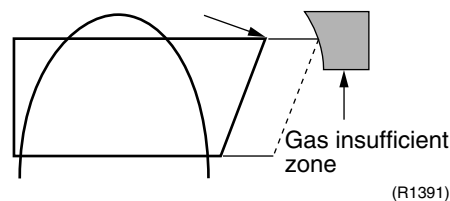
#### Outline

If a power consumption is below the specified value in which the frequency is higher than the specified frequency, it must be regarded as gas insufficient.

In addition to such conventional function, if the discharge temperature is higher than the target discharge pipe temperature, and the electronic expansion valve is fully open (450 pulses) more than the specified time, it is considered as an insufficient gas.



With the conventional function, a power consumption is weak comparing with that in the normal operation when gas is insufficient, and gas insufficiency is detected by checking a power consumption.



When operating with insufficient gas, although the rise of discharge pipe temperature is great and the electronic expansion valve is open, it is presumed as an insufficient gas if the discharge pipe temperature is higher than the target discharge pipe temperature.

#### Detail

#### Judgment by Input Current

When an output frequency is exceeds 55 Hz and the input current is less than specified value, the adjustment is made for insufficient gas.

#### Judgment by Discharge Pipe Temperature

When discharge pipe temperature is 20°C higher than target value and the electronic expansion valve opening is 450 plus (max.), the adjustment is made for insufficient gas.

## 3.14 Forced Operation Mode

**Outline** Forced operating mode includes only forced cooling.

### Detail

#### Forced Cooling

Item	Forced Cooling
Forced operation allowing conditions	1) The outdoor unit is not abnormal and not in the 3-minute stand-by mode.
	2) The operating mode of the outdoor unit is the stop mode.
	3) The forced operation is ON. The forced operation is allowed when the above "and" conditions are met.
Starting/adjustment	If the forced operation switch is pressed as the above conditions are met.
1) Command frequency	◆ 66 Hz
2) Electronic expansion valve opening	◆ Depending on the capacity of the indoor unit.
3) Outdoor unit adjustment	◆ Compressor is in operation
4) Indoor unit adjustment	◆ Transmit the command of forced draft to the indoor unit.
End	1) When the forced operation switch is pressed again.
	2) The operation is to end automatically after 15 min.
Others	The protect functions are prior to all others in the forced operation.

## 3.15 Additional Function

### 3.15.1 POWERFUL Operation Mode

Compressor operating frequency is increased to PI Max. (Max. Hz of operating room) and outdoor unit airflow rate is increased.

### 3.15.2 Voltage Detection Function

Power supply voltage is detected each time equipment operation starts.



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# Part 5

# Operation Manual

1. System Configuration.....	56
2. Instruction.....	57
2.1 Safety Precautions .....	57
2.2 Names of parts .....	59
2.3 Preparation Before Operation .....	62
2.4 AUTO · DRY · COOL · HEAT · FAN Operation .....	65
2.5 Adjusting the Air Flow Direction .....	67
2.6 POWERFUL Operation .....	69
2.7 OUTDOOR UNIT QUIET Operation.....	70
2.8 HOME LEAVE Operation .....	71
2.9 INTELLIGENT EYE Operation .....	73
2.10 TIMER Operation .....	75
2.11 Care and Cleaning .....	77
2.12 Troubleshooting.....	80

# 1. System Configuration

After the installation and test operation of the room air conditioner have been completed, it should be operated and handled as described below. Every user would like to know the correct method of operation of the room air conditioner, to check if it is capable of cooling (or heating) well, and to know a clever method of using it.

In order to meet this expectation of the users, giving sufficient explanations taking enough time can be said to reduce about 80% of the requests for servicing. However good the installation work is and however good the functions are, the customer may blame either the room air conditioner or its installation work because of improper handling. The installation work and handing over of the unit can only be considered to have been completed when its handling has been explained to the user without using technical terms but giving full knowledge of the equipment.

## 2. Instruction

**i** Note: This instruction is appropriate for FTK(X)D 50/60/71 FVM models.

### 2.1 Safety Precautions

## Safety precautions

- Keep this manual where the operator can easily find them.
- Read this manual attentively before starting up the unit.
- For safety reason the operator must read the following cautions carefully.
- This manual classifies precautions into WARNING and CAUTION. Be sure to follow all precautions below: they are all important for ensuring safety.


### WARNING

If you do not follow these instructions exactly, the unit may cause property damage, personal injury or loss of life.

### CAUTION


If you do not follow these instructions exactly, the unit may cause minor or moderate property damage or personal injury.

 Never do.


 Be sure to earth the air conditioner.


 Never touch the air conditioner (including the remote controller) with a wet hand.

 Be sure to follow the instructions.



 Never cause the air conditioner (including the remote controller) to get wet.

### WARNING

- In order to avoid fire, explosion or injury, do not operate the unit when harmful, among which flammable or corrosive gases, are detected near the unit. 
- It is not good for health to expose your body to the air flow for a long time.
- Do not put a finger, a rod or other objects into the air outlet or inlet. As the fan is rotating at a high speed, it will cause injury.
- Do not attempt to repair, relocate, modify or reinstall the air conditioner by yourself. Incorrect work will cause electric shocks, fire etc.  
For repairs and reinstallation, consult your Daikin dealer for advice and information.


- The refrigerant used in the air conditioner is safe. Although leaks should not occur, if for some reason any refrigerant happens to leak into the room, make sure it does not come in contact with any flame as of gas heaters, kerosene heaters or gas range. 
- If the air conditioner is not cooling (heating) properly, the refrigerant may be leaking, so call your dealer. When carrying out repairs accompanying adding refrigerant, check the content of the repairs with our service staff.
- Do not attempt to install the air conditioner by your self. Incorrect work will result in water leakage, electric shocks or fire. For installation, consult the dealer or a qualified technician.
- In order to avoid electric shock, fire or injury, if you detect any abnormally such as smell of fire, stop the operation and turn off the breaker. And call your dealer for instructions.

### CAUTION


- The air conditioner must be earthed. Incomplete earthing may result in electric shocks. Do not connect the earth line to a gas pipe, water pipe, lightning rod, or a telephone earth line. 
- In order to avoid any quality deterioration, do not use the unit for cooling precision instruments, food, plants, animals or works of art. 
- Never expose little children, plants or animals directly to the air flow.
- Do not place appliances which produce open fire in places exposed to the air flow from the unit or under the indoor unit. It may cause incomplete combustion or deformation of the unit due to the heat.
- Do not block air inlets nor outlets. Impaired air flow may result in insufficient performance or trouble.



- Do not stand or sit on the outdoor unit. Do not place any object on the unit to avoid injury.
- Do not place anything under the indoor or outdoor unit that must be kept away from moisture. In certain conditions, moisture in the air may condense and drip.
- After a long use, check the unit stand and fittings for damage.
- Do not touch the air inlet and aluminium fins of outdoor unit. It may cause injury.
- The appliance is not intended for use by young children or infirm persons without supervision.
- Young children should be supervised to ensure that they do not play with the appliance.

- 
- To avoid oxygen deficiency, ventilate the room sufficiently if equipment with burner is used together with the air conditioner. 
  - Before cleaning, be sure to stop the operation, turn the breaker off or pull out the supply cord.
  - Do not connect the air conditioner to a power supply different from the one as specified. It may cause trouble or fire.
  - Depending on the environment, an earth leakage breaker must be installed. Lack of an earth leakage breaker may result in electric shocks.
  - Arrange the drain hose to ensure smooth drainage. Incomplete draining may cause wetting of the building, furniture etc.
  - Do not place objects in direct proximity of the outdoor unit and do not let leaves and other debris accumulate around the unit.  
Leaves are a hotbed for small animals which can enter the unit. Once in the unit, such animals can cause malfunctions, smoke or fire when making contact with electrical parts.

- 
- Do not operate the air conditioner with wet hands. 

- 
- Do not wash the indoor unit with excessive water, only use a slightly wet cloth. 
  - Do not place things such as vessels containing water or anything else on top of the unit. Water may penetrate into the unit and degrade electrical insulations, resulting in an electric shock.

### Installation site.

- To install the air conditioner in the following types of environments, consult the dealer.
  - Places with an oily ambient or where steam or soot occurs.
  - Salty environment such as coastal areas.
  - Places where sulfide gas occurs such as hot springs.
  - Places where snow may block the outdoor unit.

The drain from the outdoor unit must be discharged to a place of good drainage.

### Consider nuisance to your neighbours from noises.

- For installation, choose a place as described below.
  - A place solid enough to bear the weight of the unit which does not amplify the operation noise or vibration.
  - A place from where the air discharged from the outdoor unit or the operation noise will not annoy your neighbours.

### Electrical work.

- For power supply, be sure to use a separate power circuit dedicated to the air conditioner.

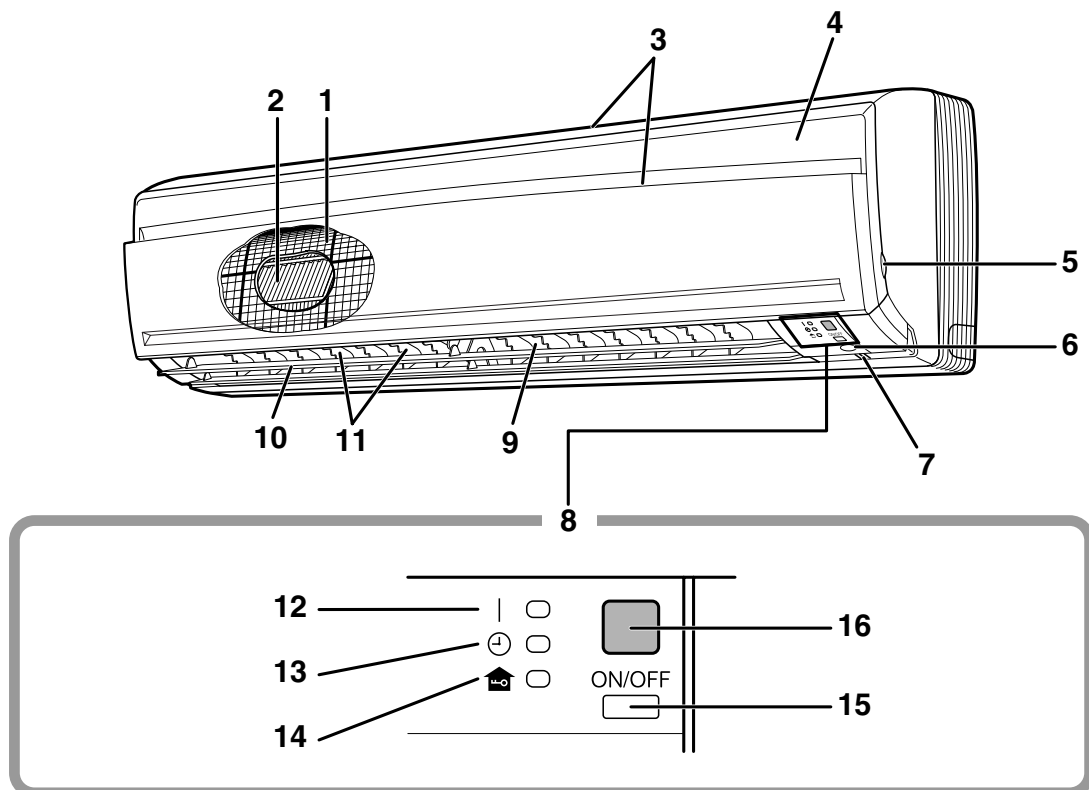
### System relocation.

- Relocating the air conditioner requires specialized knowledge and skills. Please consult the dealer if relocation is necessary for moving or remodeling.

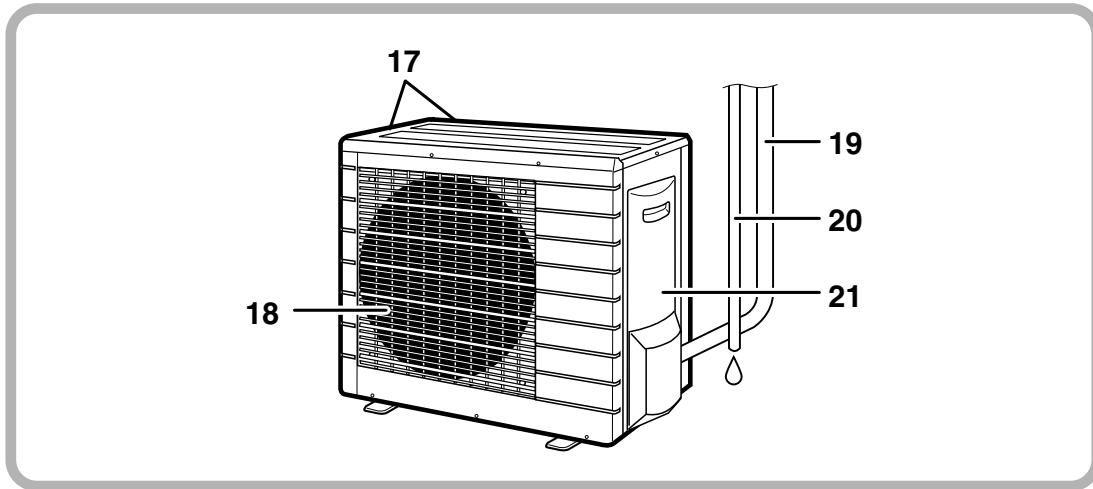
## 2.2 Names of parts

# Names of parts

### ■ Indoor Unit



## ■ Outdoor Unit



## ■ Indoor Unit

1. Air filter
2. Titanium Apatite Photocatalytic Air-Purifying Filter
3. Air inlet
4. Front panel
5. Panel tab
6. INTELLIGENT EYE sensor:
  - It detects the movements of people and automatically switches between normal operation and energy saving operation. (page 18.)
7. Room temperature sensor:
  - It senses the air temperature around the unit.
8. Display
9. Air outlet
10. Flap (horizontal blade): (page 12.)
11. Louvers (vertical blades):
  - The Louvers are inside of the air outlet. (page 12.)
12. Operation lamp (green)
13. TIMER lamp (yellow): (page 20.)
14. HOME LEAVE lamp (red):
  - Lights up when you use HOME LEAVE Operation. (page 16.)
15. Indoor Unit ON/OFF switch:
  - Push this switch once to start operation. Push once again to stop it.
  - The operation mode refer to the following table.

	Mode	Temperature setting	Air flow rate
FTKD	COOL	22°C	AUTO
FTXD	AUTO	25°C	AUTO

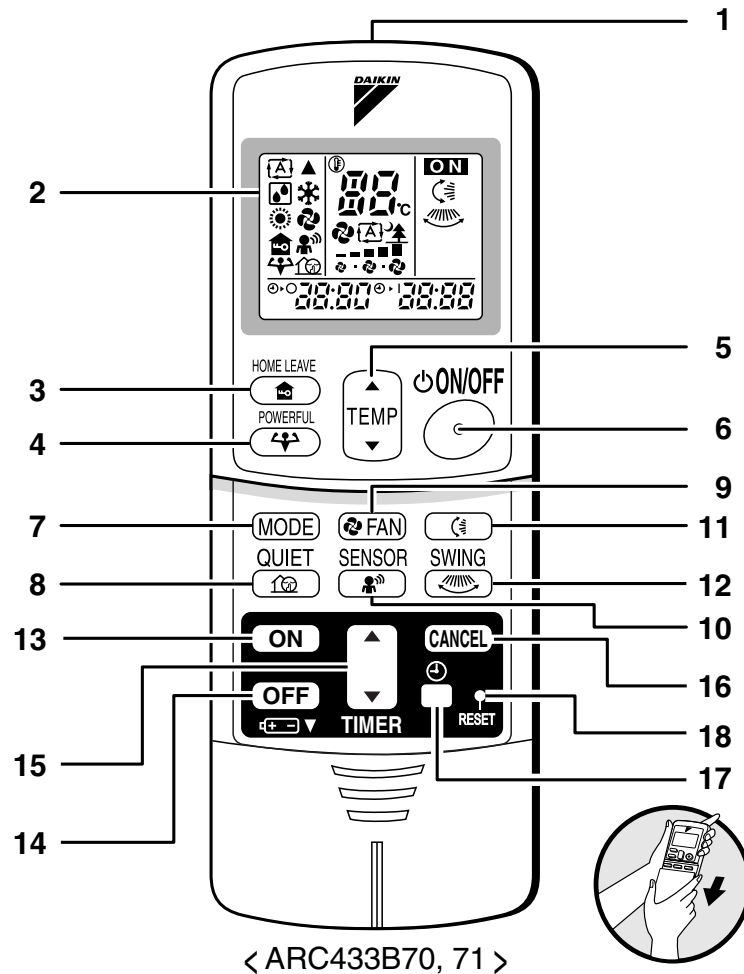
  - This switch is useful when the remote controller is missing.
16. Signal receiver:
  - It receives signals from the remote controller.
  - When the unit receives a signal, you will hear a short beep.
    - Operation start .....beep-beep
    - Settings changed.....beep
    - Operation stop .....beeeep

## ■ Outdoor Unit

17. Air inlet: (Back and side)
18. Air outlet
19. Refrigerant piping and inter-unit cable
20. Drain hose
21. Earth terminal:
  - It is inside of this cover.

Appearance of the outdoor unit may differ from some models.

## ■ Remote Controller



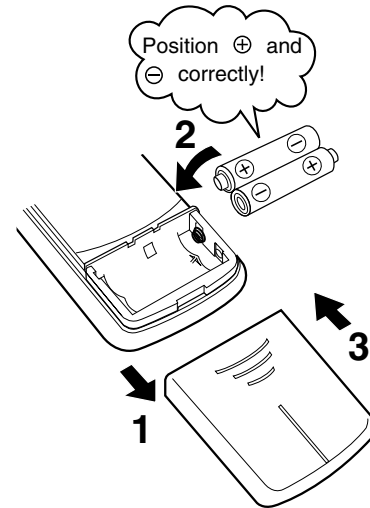
- 1. Signal transmitter:**
  - It sends signals to the indoor unit.
- 2. Display:**
  - It displays the current settings.  
(In this illustration, each section is shown with all its displays ON for the purpose of explanation.)
- 3. HOME LEAVE button:**  
HOME LEAVE operation (page 16.)
- 4. POWERFUL button:**  
POWERFUL operation (page 14.)
- 5. TEMPERATURE adjustment buttons:**
  - It changes the temperature setting.
- 6. ON/OFF button:**
  - Press this button once to start operation.  
Press once again to stop it.
- 7. MODE selector button:**
  - It selects the operation mode.  
(AUTO/DRY/COOL/HEAT/FAN) (page 10.)
- 8. QUIET button:** OUTDOOR UNIT QUIET operation (page 15.)
- 9. FAN setting button:**
  - It selects the air flow rate setting.
- 10. SENSOR button:** INTELLIGENT EYE operation (page 18.)
- 11. SWING button:** (page 12.)
  - Flap (Horizontal blade)
- 12. SWING button:** (page 12.)
  - Louver (Vertical blades)
- 13. ON TIMER button:** (page 21.)
- 14. OFF TIMER button:** (page 20.)
- 15. TIMER Setting button:**
  - It changes the time setting.
- 16. TIMER CANCEL button:**
  - It cancels the timer setting.
- 17. CLOCK button:** (page 9.)
- 18. RESET button:**
  - Restart the unit if it freezes.
  - Use a thin object to push.

## 2.3 Preparation Before Operation

# Preparation Before Operation

### ■ To set the batteries

1. Slide the front cover to take it off.
2. Set two dry batteries (AAA).
3. Set the front cover as before.



### ATTENTION

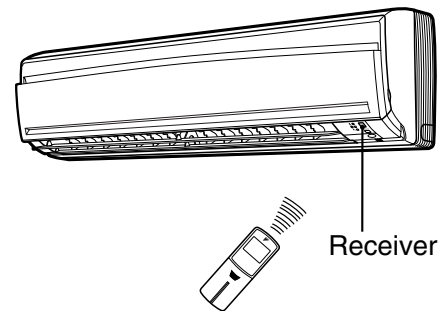
#### ■ About batteries

- When replacing the batteries, use batteries of the same type, and replace the two old batteries together.
- When the system is not used for a long time, take the batteries out.
- We recommend replacing once a year, although if the remote controller display begins to fade or if reception deteriorates, please replace with new alkali batteries. Using manganese batteries reduces the lifespan.
- The attached batteries are provided for the initial use of the system.  
The usable period of the batteries may be short depending on the manufactured date of the air conditioner.

# Preparation Before Operation

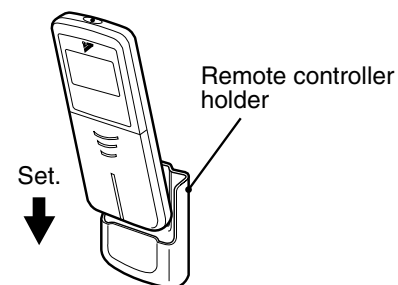
## ■ To operate the remote controller

- To use the remote controller, aim the transmitter at the indoor unit. If there is anything to block signals between the unit and the remote controller, such as a curtain, the unit will not operate.
- Do not drop the remote controller. Do not get it wet.
- The maximum distance for communication is about 7m.



## ■ To fix the remote controller holder on the wall

1. Choose a place from where the signals reach the unit.
2. Fix the holder to a wall, a pillar, or similar location with the screws procured locally.
3. Place the remote controller in the remote controller holder.



- To remove, pull it upwards.

## ATTENTION

### ■ About remote controller

- Never expose the remote controller to direct sunlight.
- Dust on the signal transmitter or receiver will reduce the sensitivity. Wipe off dust with soft cloth.
- Signal communication may be disabled if an electronic-starter-type fluorescent lamp (such as inverter-type lamps) is in the room. Consult the shop if that is the case.
- If the remote controller signals happen to operate another appliance, move that appliance to somewhere else, or consult the shop.

## ■ To set the clock

### 1. Press “CLOCK button”.

0:00 is displayed.

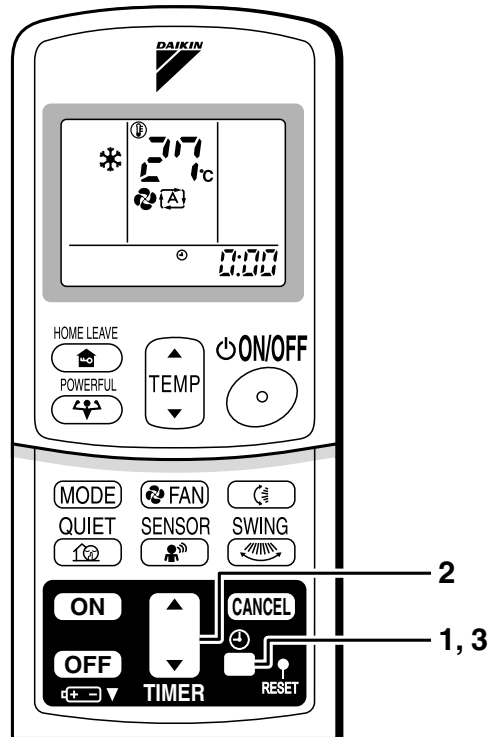
🕒 blinks.

### 2. Press “TIMER setting button” to set the clock to the present time.

Holding down “▲” or “▼” button rapidly increases or decreases the time display.

### 3. Press “CLOCK button”.

🕒 blinks.



## ■ Turn the breaker ON

- Turning ON the breaker opens the flap, then closes it again. (This is a normal procedure.)

## NOTE

### ■ Tips for saving energy

- Be careful not to cool (heat) the room too much. Keeping the temperature setting at a moderate level helps save energy.
- Cover windows with a blind or a curtain. Blocking sunlight and air from outdoors increases the cooling (heating) effect.
- Clogged air filters cause inefficient operation and waste energy. Clean them once in about every two weeks.

Recommended temperature setting
For cooling: 26°C – 28°C
For heating: 20°C – 24°C

### ■ Please note

- The air conditioner always consumes 15-35 watts of electricity even while it is not operating.
- If you are not going to use the air conditioner for a long period, for example in spring or autumn, turn the breaker OFF.
- Use the air conditioner in the following conditions.

Mode	Operating conditions	If operation is continued out of this range
COOL	Outdoor temperature: <2/3/4MKD> 10 to 46°C <3/4MXD> -10 to 46°C <RK(X)D> -5 to 46°C Indoor temperature: 18 to 32°C Indoor humidity: 80% max.	<ul style="list-style-type: none"> <li>• A safety device may work to stop the operation. (In multi system, it may work to stop the operation of the outdoor unit only.)</li> <li>• Condensation may occur on the indoor unit and drip.</li> </ul>
HEAT	Outdoor temperature: <3/4MXD> -15 to 15.5°C <RXD> -15 to 18°C Indoor temperature: 10 to 30°C	<ul style="list-style-type: none"> <li>• A safety device may work to stop the operation.</li> </ul>
DRY	Outdoor temperature: <2/3/4MKD> 10 to 46°C <3/4MXD> -10 to 46°C <RK(X)D> -5 to 46°C Indoor temperature: 18 to 32°C Indoor humidity: 80% max.	<ul style="list-style-type: none"> <li>• A safety device may work to stop the operation.</li> <li>• Condensation may occur on the indoor unit and drip.</li> </ul>

- Operation outside this humidity or temperature range may cause a safety device to disable the system .

## 2.4 AUTO · DRY · COOL · HEAT · FAN Operation

# AUTO · DRY · COOL · HEAT · FAN Operation

The air conditioner operates with the operation mode of your choice.

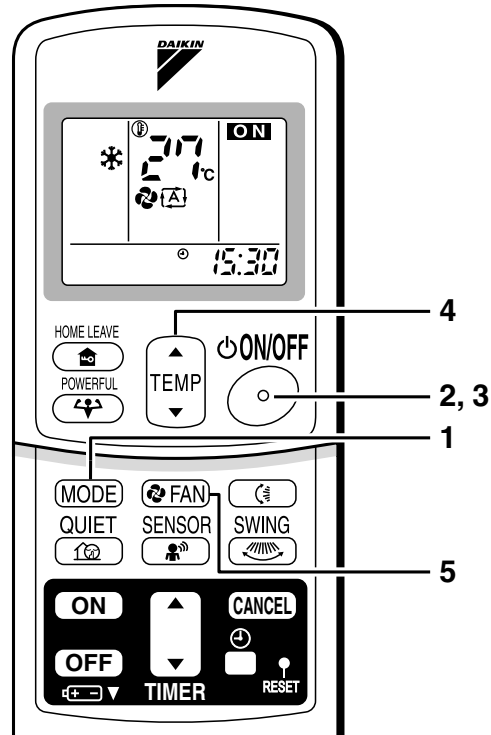
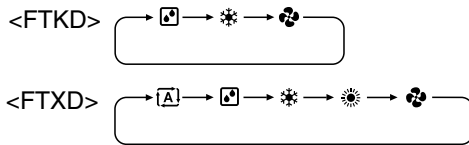
From the next time on, the air conditioner will operate with the same operation mode.

### ■ To start operation

#### 1. Press “MODE selector button” and select a operation mode.

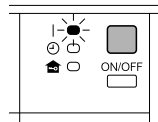
- Each pressing of the button advances the mode setting in sequence.

- : AUTO
- : DRY
- : COOL
- : HEAT
- : FAN



#### 2. Press “ON/OFF button”.

- The OPERATION lamp lights up.



### ■ To stop operation

#### 3. Press “ON/OFF button” again.

- Then OPERATION lamp goes off.

### ■ To change the temperature setting






#### 4. Press “TEMPERATURE adjustment button”.

DRY or FAN mode	AUTO or COOL or HEAT mode
The temperature setting is not variable.	Press “▲” to raise the temperature and press “▼” to lower the temperature.
	Set to the temperature you like. 




## ■ To change the air flow rate setting

### 5. Press “FAN setting button”.

DRY mode	AUTO or HEAT or COOL or FAN mode
The air flow rate setting is not variable.	Five levels of air flow rate setting from “  ” to “  ” plus “  ” “  ” are available. 

- Indoor unit quiet operation

When the air flow is set to “”, the noise from the indoor unit will become quieter. Use this when making the noise quieter.

The unit might lose capacity when the air flow rate is set to a weak level.

## NOTE

### ■ Note on HEAT operation

- Since this air conditioner heats the room by taking heat from outdoor air to indoors, the heating capacity becomes smaller in lower outdoor temperatures. If the heating effect is insufficient, it is recommended to use another heating appliance in combination with the air conditioner.
- The heat pump system heats the room by circulating hot air around all parts of the room. After the start of heating operation, it takes some time before the room gets warmer.
- In heating operation, frost may occur on the outdoor unit and lower the heating capacity. In that case, the system switches into defrosting operation to take away the frost.
- During defrosting operation, hot air does not flow out of indoor unit.

### ■ Note on COOL operation

- This air conditioner cools the room by blowing the hot air in the room outside, so if the outside temperature is high, performance drops.

### ■ Note on DRY operation

- The computer chip works to rid the room of humidity while maintaining the temperature as much as possible. It automatically controls temperature and fan strength, so manual adjustment of these functions is unavailable.

### ■ Note on AUTO operation

- In AUTO operation, the system selects a temperature setting and an appropriate operation mode (COOL or HEAT) based on the room temperature at the start of the operation.
- The system automatically reselects setting at a regular interval to bring the room temperature to user-setting level.
- If you do not like AUTO operation, you can manually select the operation mode and setting you like.

### ■ Note on air flow rate setting





- At smaller air flow rates, the cooling (heating) effect is also smaller.

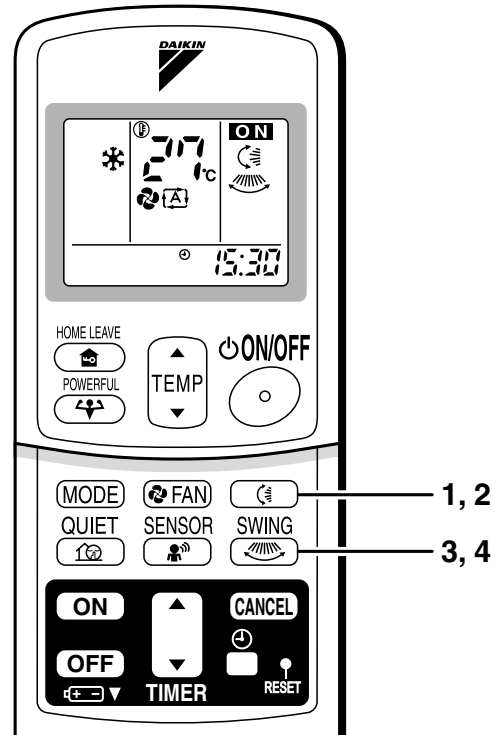
## 2.5 Adjusting the Air Flow Direction

# Adjusting the Air Flow Direction





You can adjust the air flow direction to increase your comfort.

### ■ To adjust the horizontal blade (flap)


1. Press “SWING button ”.
  - “” is displayed on the LCD and the flaps will begin to swing.
2. When the flap has reached the desired position, press “SWING button ” once more.
  - The flap will stop moving.
  - “” disappears from the LCD.



### ■ To adjust the vertical blades (louvers)

3. Press “SWING button ”.
  - “” is displayed on the LCD.
4. When the louvers have reached the desired position, press the “SWING button ” once more.
  - The louvers will stop moving.
  - “” disappears from the LCD.

■ **To 3-D Airflow**

1. 3. Press the “SWING button 

■ **To cancel 3-D Airflow**

2. 4. Press either the “SWING button 

**Notes on louvers angles**

■ **ATTENTION**

- Always use a remote controller to adjust the louvers angles. Inside the air outlet, a fan is rotating at a high speed.

**Notes on flap angle**

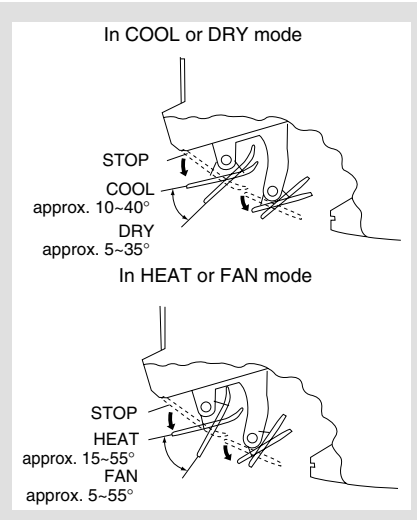
- When “SWING button” is selected, the flaps swinging range depends on the operation mode. (See the figure.)

**Three-Dimensional (3-D) Airflow**

- Using three-dimensional airflow circulates cold air, which tends to collect at the bottom of the room, and hot air, which tends to collect near the ceiling, throughout the room, preventing areas of cold and hot developing.

■ **ATTENTION**

- Always use a remote controller to adjust the flaps angle. If you attempt to move it forcibly with hand when it is swinging, the mechanism may be broken.
- Be careful when adjusting the louvers. Inside the air outlet, fan is rotating at a high speed.




## 2.6 POWERFUL Operation

# POWERFUL Operation

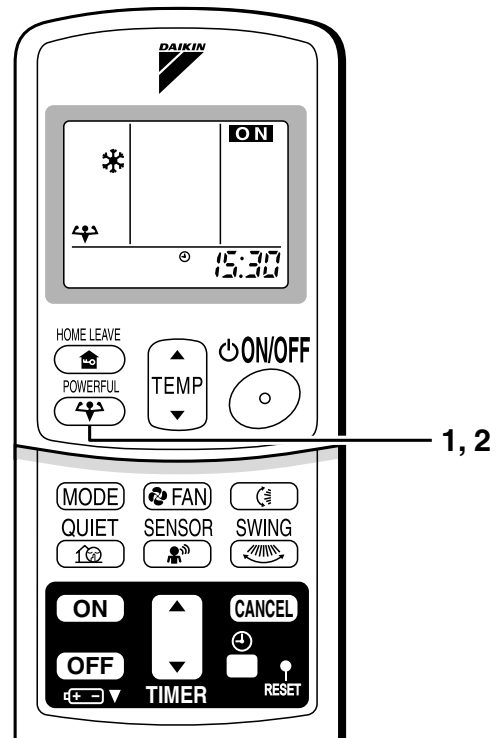
POWERFUL operation quickly maximizes the cooling (heating) effect in any operation mode. You can get the maximum capacity.

### ■ To start POWERFUL operation

1. Press “POWERFUL button”.
  - POWERFUL operation ends in 20 minutes. Then the system automatically operates again with the settings which were used before POWERFUL operation.
  - When using Powerful operation, there are some functions which are not available.
  - “” is displayed on the LCD.


### ■ To cancel POWERFUL operation

2. Press “POWERFUL button” again.
  - “” disappears from the LCD.



## NOTE

### ■ Notes on POWERFUL operation

- POWERFUL Operation cannot be used together with QUIET Operation. Priority is given to the function of whichever button is pressed last.
- POWERFUL Operation can only be set when the unit is running. Pressing the operation stop button causes the settings to be canceled, and the “” disappears from the LCD.
- **In COOL and HEAT mode**  
To maximize the cooling (heating) effect, the capacity of outdoor unit must be increased and the air flow rate be fixed to the maximum setting.  
The temperature and air flow settings are not variable.
- **In DRY mode**  
The temperature setting is lowered by 2.5°C and the air flow rate is slightly increased.
- **In FAN mode**  
The air flow rate is fixed to the maximum setting.

## 2.7 OUTDOOR UNIT QUIET Operation

# OUTDOOR UNIT QUIET Operation

OUTDOOR UNIT QUIET operation lowers the noise level of the outdoor unit by changing the frequency and fan speed on the outdoor unit. This function is convenient during night.

### ■ To start OUTDOOR UNIT QUIET operation

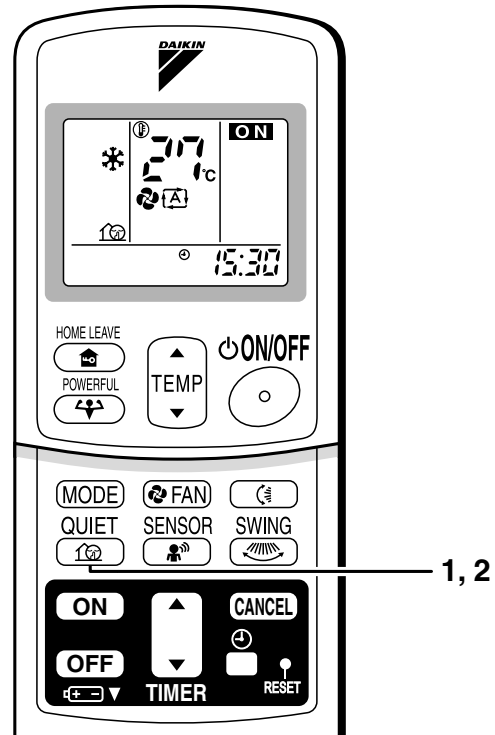
#### 1. Press “QUIET button”.

- “” is displayed on the LCD.

### ■ To cancel OUTDOOR UNIT QUIET operation


#### 2. Press “QUIET button” again.

- “” disappears from the LCD.



## NOTE

### ■ Note on OUTDOOR UNIT QUIET operation

- This function is available in COOL, HEAT, and AUTO modes. (This is not available in FAN and DRY mode.)
- POWERFUL operation and OUTDOOR UNIT QUIET operation cannot be used at the same time. Priority is given to the function of whichever button is pressed last.
- If operation is stopped using the remote controller or the main unit ON/OFF switch when using OUTDOOR UNIT QUIET operation, “” will remain on the remote controller display.


## 2.8 HOME LEAVE Operation

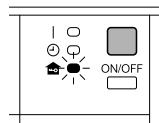
# HOME LEAVE Operation

HOME LEAVE operation is a function which allows you to record your preferred temperature and air flow rate settings.

### ■ To start HOME LEAVE operation


#### 1. Press “HOME LEAVE button”.

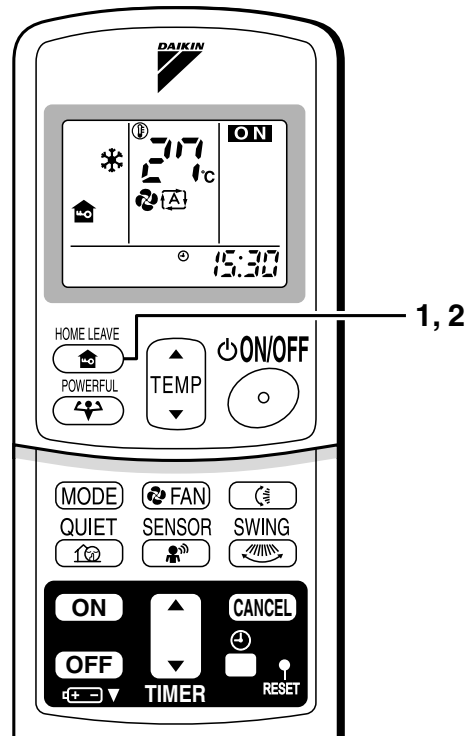
- “” is displayed on the LCD.
- The HOME LEAVE lamp lights up.



### ■ To cancel HOME LEAVE operation

#### 2. Press “HOME LEAVE button” again.







- “” disappears from the LCD.
- The HOME LEAVE lamp goes off.





### Before using HOME LEAVE operation.

#### ■ To set the temperature and air flow rate for HOME LEAVE operation

When using HOME LEAVE operation for the first time, please set the temperature and air flow rate for HOME LEAVE operation. Record your preferred temperature and air flow rate.

	Initial setting		Selectable range	
	temperature	Air flow rate	temperature	Air flow rate
Cooling	25°C	“  ”	18-32°C	5 step, “  ” and “  ”
Heating	25°C	“  ”	10-30°C	5 step, “  ” and “  ”

1. Press “HOME LEAVE button”. Make sure “” is displayed in the remote controller display.

2. Adjust the set temperature with “” or “” as you like.

3. Adjust the air flow rate with “FAN” setting button as you like.

Home leave operation will run with these settings the next time you use the unit. To change the recorded information, repeat steps 1 – 3.

## ■ What's the HOME LEAVE operation?

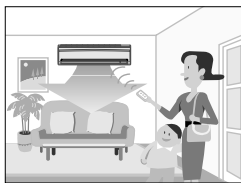
Is there a set temperature and air flow rate which is most comfortable, a set temperature and air flow rate which you use the most? HOME LEAVE operation is a function that allows you to record your favorite set temperature and air flow rate. You can start your favorite operation mode simply by pressing the HOME LEAVE button on the remote controller. This function is convenient in the following situations.

## ■ Useful in these cases

### 1. Use as an energy-saving mode.

Set the temperature 2-3°C higher (cooling) or lower (heating) than normal. Setting the fan strength to the lowest setting allows the unit to be used in energy-saving mode. Also convenient for use while you are out or sleeping.

#### • Every day before you leave the house...



When you go out, push the "HOME LEAVE Operation" button, and the air conditioner will adjust capacity to reach the preset temperature for HOME LEAVE Operation.

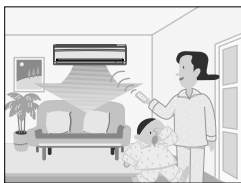


When you return, you will be welcomed by a comfortably air conditioned room.

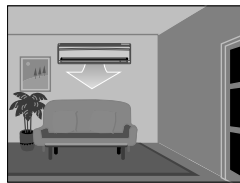


Push the "HOME LEAVE Operation" button again, and the air conditioner will adjust capacity to the set temperature for normal operation.

#### • Before bed...



Set the unit to HOME LEAVE Operation before leaving the living room when going to bed.



The unit will maintain the temperature in the room at a comfortable level while you sleep.



When you enter the living room in the morning, the temperature will be just right. Disengaging HOME LEAVE Operation will return the temperature to that set for normal operation. Even the coldest winters will pose no problem!

### 2. Use as a favorite mode.

Once you record the temperature and air flow rate settings you most often use, you can retrieve them by pressing HOME LEAVE button. You do not have to go through troublesome remote control operations.

## NOTE


- Once the temperature and air flow rate for HOME LEAVE operation are set, those settings will be used whenever HOME LEAVE operation is used in the future. To change these settings, please refer to the "Before using HOME LEAVE operation" section above.
- HOME LEAVE operation is only available in COOL and HEAT mode. Cannot be used in AUTO, DRY, and FAN mode.
- HOME LEAVE operation runs in accordance with the previous operation mode (COOL or HEAT) before using HOME LEAVE operation.
- HOME LEAVE operation and POWERFUL operation cannot be used at the same time. Last button that was pressed has priority.
- The operation mode cannot be changed while HOME LEAVE operation is being used.
- When operation is shut off during HOME LEAVE operation, using the remote controller or the indoor unit ON/OFF switch, " " will remain on the remote controller display.

## 2.9 INTELLIGENT EYE Operation


# INTELLIGENT EYE Operation

“INTELLIGENT EYE” is the infrared sensor which detects the human movement.

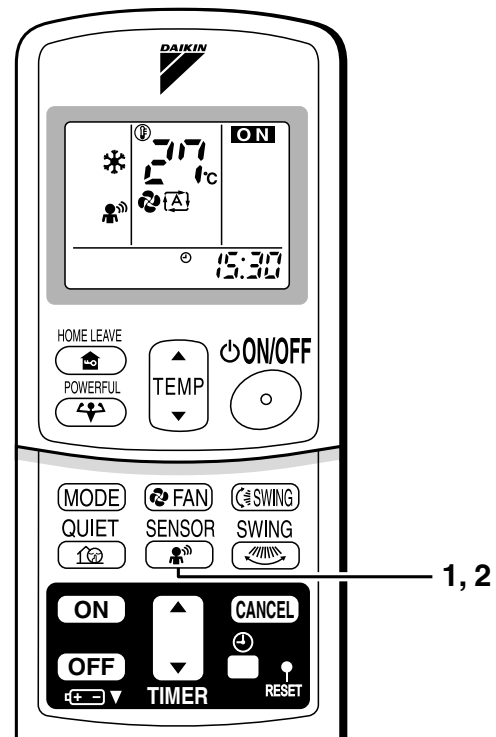
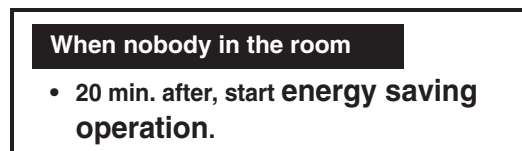
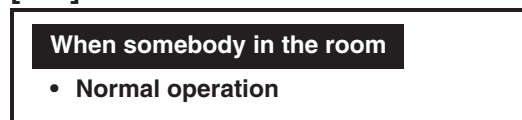
### ■ To start INTELLIGENT EYE operation

1. Press “SENSOR button”.
  - “” is displayed on the LCD.

### ■ To cancel the INTELLIGENT EYE operation

2. Press “SENSOR button” again.
  - “” disappears from the LCD.

[EX.]





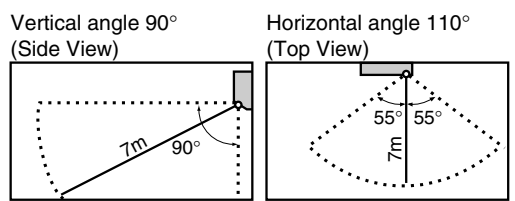
## “INTELLIGENT EYE” is useful for Energy Saving.

### ■ Energy saving operation

- Change the temperature  $-2^{\circ}\text{C}$  in heating /  $+2^{\circ}\text{C}$  in cooling /  $+1^{\circ}\text{C}$  in dry mode from set temperature.
- Decrease the air flow rate slightly in fan operation. (In FAN mode only)

## Notes on “INTELLIGENT EYE”

- Application range is as follows.



- Sensor may not detect moving objects further than 7m away. (Check the application range)
- Sensor detection sensitivity changes according to indoor unit location, the speed of passersby, temperature range, etc.
- The sensor also mistakenly detects pets, sunlight, fluttering curtains and light reflected off of mirrors as passersby.
- INTELLIGENT EYE operation will not go on during powerful operation.
- Night set mode (page 20.) will not go on during you use INTELLIGENT EYE operation.

## CAUTION

- Do not place large objects near the sensor.  
Also keep heating units or humidifiers outside the sensor's detection area. This sensor can detect objects it shouldn't as well as not detect objects it should.
- Do not hit or violently push the INTELLIGENT EYE sensor. This can lead to damage and malfunction.

## 2.10 TIMER Operation

# TIMER Operation

Timer functions are useful for automatically switching the air conditioner on or off at night or in the morning. You can also use OFF TIMER and ON TIMER in combination.

### ■ To use OFF TIMER operation

- Check that the clock is correct. If not, set the clock to the present time. (page 9.)

#### 1. Press “OFF TIMER button”.

0:00 is displayed.

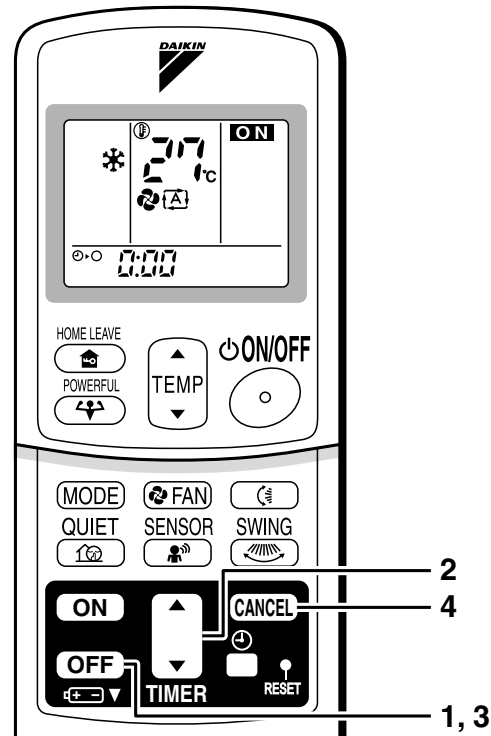
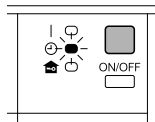
⊖-○ blinks.

#### 2. Press “TIMER Setting button” until the time setting reaches the point you like.

- Every pressing of either button increases or decreases the time setting by 10 minutes. Holding down either button changes the setting rapidly.

#### 3. Press “OFF TIMER button” again.

- The TIMER lamp lights up.



### ■ To cancel the OFF TIMER Operation

#### 4. Press “CANCEL button”.

- The TIMER lamp goes off.

## NOTE

- When TIMER is set, the present time is not displayed.
- Once you set ON, OFF TIMER, the time setting is kept in the memory. (The memory is canceled when remote controller batteries are replaced.)
- When operating the unit via the ON/OFF Timer, the actual length of operation may vary from the time entered by the user. (Maximum approx. 10 minutes)

#### ■ NIGHT SET MODE

When the OFF TIMER is set, the air conditioner automatically adjusts the temperature setting (0.5°C up in COOL, 2.0°C down in HEAT) to prevent excessive cooling (heating) for your pleasant sleep.

## ■ To use ON TIMER operation

- Check that the clock is correct. If not, set the clock to the present time. (page 9.)

### 1. Press “ON TIMER button”.

6:00 is displayed.

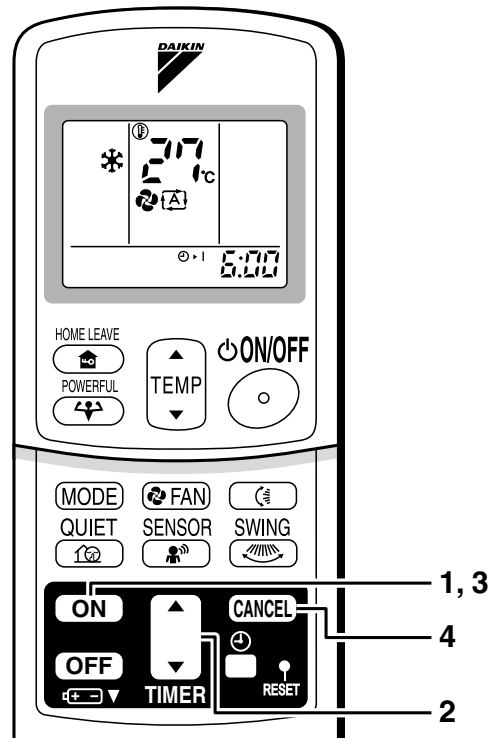
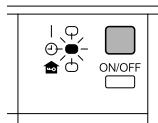
⊕-| blinks.

### 2. Press “TIMER Setting button” until the time setting reaches the point you like.

- Every pressing of either button increases or decreases the time setting by 10 minutes. Holding down either button changes the setting rapidly.

### 3. Press “ON TIMER button” again.

- The TIMER lamp lights up.



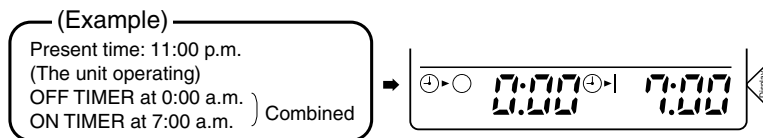
## ■ To cancel ON TIMER operation

### 4. Press “CANCEL button”.

- The TIMER lamp goes off.

## ■ To combine ON TIMER and OFF TIMER

- A sample setting for combining the two timers is shown below.



## ATTENTION

- In the following cases, set the timer again.
  - After a breaker has turned OFF.
  - After a power failure.
  - After replacing batteries in the remote controller.

## 2.11 Care and Cleaning

# Care and Cleaning

**⚠ CAUTION** Before cleaning, be sure to stop the operation and turn the breaker OFF.

### Units

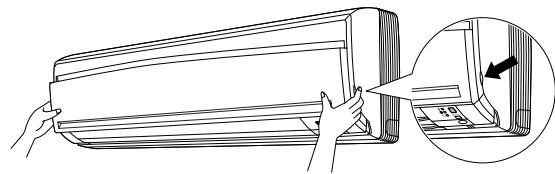
#### ■ Indoor unit, Outdoor unit and Remote controller

1. Wipe them with dry soft cloth.

#### ■ Front panel

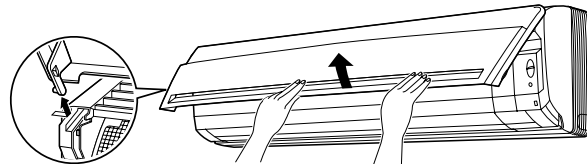
##### 1. Open the front panel.

- Hold the panel by the tabs on the two sides and lift it until it stops with a click.



##### 2. Remove the front panel.

- Open the front panel further while sliding it to either the left or right and pulling it toward you. This will disconnect the rotation dowel on one side. Then disconnect the rotation dowel on the other side in the same manner.

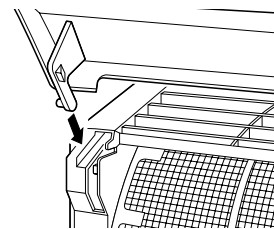


##### 3. Clean the front panel.

- Wipe it with a soft cloth soaked in water.
- Only neutral detergent may be used.
- In case of washing the panel with water, dry it with cloth, dry it up in the shade after washing.

##### 4. Attach the front panel.

- Align the rotation dowels on the left and right of the front panel with the slots, then push them all the way in.
- Close the front panel slowly. (Press the panel at both sides and the center.)

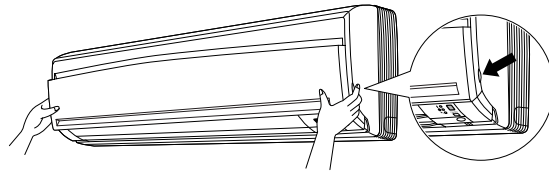


### ⚠ CAUTION

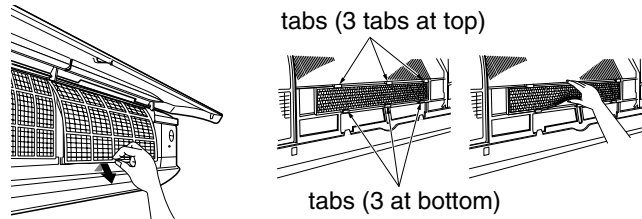
- Don't touch the metal parts of the indoor unit. If you touch those parts, this may cause an injury.
- When removing or attaching the front panel, use a robust and stable stool and watch your steps carefully.
- When removing or attaching the front panel, support the panel securely with hand to prevent it from falling.
- For cleaning, do not use hot water above 40°C, benzine, gasoline, thinner, nor other volatile oils, polishing compound, scrubbing brushes, nor other hand stuff.
- After cleaning, make sure that the front panel is securely fixed.

**Filters**

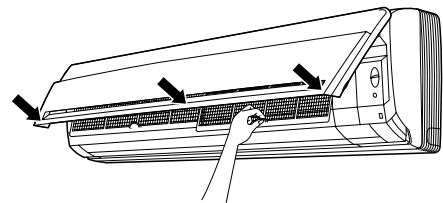
1. **Open the front panel.**  
(page 24.)
2. **Pull out the air filters.**
  - Push a little upwards the tab at the center of each air filter, then pull it down.



3. **Take off the Titanium Apatite Photocatalytic Air-Purifying Filter.**
  - Press the top of the air-cleaning filter onto the tabs (3 tabs at top). Then press the bottom of the filter up slightly, and press it onto the tabs (3 at bottom).

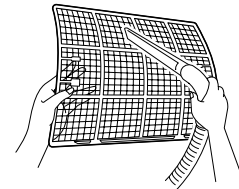


4. **Clean or replace each filter.**  
See figure.
5. **Set the air filter and the Titanium Apatite Photocatalytic Air-Purifying Filter as they were and close the front panel.**
  - Press the front panel at both sides and the center.



■ **Air Filter**

1. **Wash the air filters with water or clean them with vacuum cleaner.**
  - If the dust does not come off easily, wash them with neutral detergent thinned with lukewarm water, then dry them up in the shade.
  - It is recommended to clean the air filters every two weeks.



■ **Titanium Apatite Photocatalytic Air-purifying Filter**

The Titanium Apatite Photocatalytic Air-Purifying Filter can be renewed by washing it with water once every 6 months. We recommend replacing it once every 3 years.

**[ Maintenance ]**

1. **Remove dust with a vacuum cleaner and wash lightly with water.**
2. **If it is very dirty, soak it for 10 to 15 minutes in water mixed with a neutral cleaning agent.**
3. **After washing, shake off remaining water and dry in the shade.**
4. **Since the material is made out of polyester, do not wring out the filter when removing water from it.**

**[ Replacement ]**

1. **Remove the tabs on the filter frame and replace with a new filter.**
  - Dispose of the old filter as non-flammable waste.

## NOTE

- Operation with dirty filters:  
 (1) cannot deodorize the air.                      (2) cannot clean the air.  
 (3) results in poor heating or cooling.            (4) may cause odour.
- To order Titanium Apatite Photocatalytic Air-Purifying Filter contact to the service shop there you bought the air conditioner.
- Dispose of old filters as non-flammable waste.

Item	Part No.
Titanium Apatite Photocatalytic Air-Purifying Filter (without frame) 1 set	KAF952B42

## Check

Check that the base, stand and other fittings of the outdoor unit are not decayed or corroded.
Check that nothing blocks the air inlets and the outlets of the indoor unit and the outdoor unit
Check that the drain comes smoothly out of the drain hose during COOL or DRY operation. <ul style="list-style-type: none"> <li>• If no drain water is seen, water may be leaking from the indoor unit. Stop operation and consult the service shop if this is the case.</li> </ul>

## ■ Before a long idle period

1. Operate the “FAN only” for several hours on a fine day to dry out the inside.
  - Press “MODE” button and select “FAN” operation.
  - Press “ON/OFF” button and start operation.
2. After operation stops, turn off the breaker for the room air conditioner.
3. Clean the air filters and set them again.
4. Take out batteries from the remote controller.

## 2.12 Troubleshooting

# Trouble Shooting

### These cases are not troubles.

The following cases are not air conditioner troubles but have some reasons. You may just continue using it.

Case	Explanation
<b>Operation does not start soon.</b> <ul style="list-style-type: none"> <li>When ON/OFF button was pressed soon after operation was stopped.</li> <li>When the mode was reselected.</li> </ul>	<ul style="list-style-type: none"> <li>This is to protect the air conditioner. You should wait for about 3 minutes.</li> </ul>
<b>Hot air does not flow out soon after the start of heating operation.</b>	<ul style="list-style-type: none"> <li>The air conditioner is warming up. You should wait for 1 to 4 minutes. (The system is designed to start discharging air only after it has reached a certain temperature.)</li> </ul>
<b>The heating operation stops suddenly and a flowing sound is heard.</b>	<ul style="list-style-type: none"> <li>The system is taking away the frost on the outdoor unit. You should wait for about 4 to 12 minutes.</li> </ul>
<b>The outdoor unit emits water or steam.</b>	<ul style="list-style-type: none"> <li>In HEAT mode           <ul style="list-style-type: none"> <li>The frost on the outdoor unit melts into water or steam when the air conditioner is in defrost operation.</li> </ul> </li> <li>In COOL or DRY mode           <ul style="list-style-type: none"> <li>Moisture in the air condenses into water on the cool surface of outdoor unit piping and drips.</li> </ul> </li> </ul>
<b>Mist comes out of the indoor unit.</b>	<ul style="list-style-type: none"> <li>This happens when the air in the room is cooled into mist by the cold air flow during cooling operation.</li> <li>This is because the air in the room is cooled by the heat exchanger and becomes mist during defrost operation.</li> </ul>
<b>The indoor unit gives out odour.</b>	<ul style="list-style-type: none"> <li>This happens when smells of the room, furniture, or cigarettes are absorbed into the unit and discharged with the air flow. (If this happens, we recommend you to have the indoor unit washed by a technician. Consult the service shop where you bought the air conditioner.)</li> </ul>
<b>The outdoor fan rotates while the air conditioner is not in operation.</b>	<ul style="list-style-type: none"> <li>After operation is stopped:           <ul style="list-style-type: none"> <li>The outdoor fan continues rotating for another 60 seconds for system protection.</li> </ul> </li> <li>While the air conditioner is not in operation:           <ul style="list-style-type: none"> <li>When the outdoor temperature is very high, the outdoor fan starts rotating for system protection.</li> </ul> </li> </ul>
<b>The operation stopped suddenly. (OPERATION lamp is on.)</b>	<ul style="list-style-type: none"> <li>For system protection, the air conditioner may stop operating on a sudden large voltage fluctuation. It automatically resumes operation in about 3 minutes.</li> </ul>

**Check again.**

Please check again before calling a repair person.

<b>Case</b>	<b>Check</b>
<b>The air conditioner does not operate. (OPERATION lamp is off.)</b>	<ul style="list-style-type: none"> <li>• Hasn't a breaker turned OFF or a fuse blown?</li> <li>• Isn't it a power failure?</li> <li>• Are batteries set in the remote controller?</li> <li>• Is the timer setting correct?</li> </ul>
<b>Cooling (Heating) effect is poor.</b>	<ul style="list-style-type: none"> <li>• Are the air filters clean?</li> <li>• Is there anything to block the air inlet or the outlet of the indoor and the outdoor units?</li> <li>• Is the temperature setting appropriate?</li> <li>• Are the windows and doors closed?</li> <li>• Are the air flow rate and the air direction set appropriately?</li> </ul>
<b>Operation stops suddenly. (OPERATION lamp flashes.)</b>	<ul style="list-style-type: none"> <li>• Are the air filters clean?</li> <li>• Is there anything to block the air inlet or the outlet of the indoor and the outdoor units?</li> </ul> <p>Clean the air filters or take all obstacles away and turn the breaker OFF. Then turn it ON again and try operating the air conditioner with the remote controller. If the lamp still blinks, call the service shop where you bought the air conditioner.</p>
<b>An abnormal functioning happens during operation.</b>	<ul style="list-style-type: none"> <li>• The air conditioner may malfunction with lightning or radio waves. Turn the breaker OFF, turn it ON again and try operating the air conditioner with the remote controller.</li> </ul>




**Call the service shop immediately.**

 **WARNING**

- When an abnormality (such as a burning smell) occurs, stop operation and turn the breaker OFF. Continued operation in an abnormal condition may result in troubles, electric shocks or fire. Consult the service shop where you bought the air conditioner.
- Do not attempt to repair or modify the air conditioner by yourself. Incorrect work may result in electric shocks or fire. Consult the service shop where you bought the air conditioner.

If one of the following symptoms takes place, call the service shop immediately.

<ul style="list-style-type: none"> <li>■ <b>The power cord is abnormally hot or damaged.</b></li> <li>■ <b>An abnormal sound is heard during operation.</b></li> <li>■ <b>The safety breaker, a fuse, or the earth leakage breaker cuts off the operation frequently.</b></li> <li>■ <b>A switch or a button often fails to work properly.</b></li> <li>■ <b>There is a burning smell.</b></li> <li>■ <b>Water leaks from the indoor unit.</b></li> </ul>		<p>Turn the breaker OFF and call the service shop.</p>
---	---	--

<ul style="list-style-type: none"> <li>■ <b>After a power failure</b> The air conditioner automatically resumes operation in about 3 minutes. You should just wait for a while.</li> </ul>	<ul style="list-style-type: none"> <li>■ <b>Lightning</b> If lightning may strike the neighboring area, stop operation and turn the breaker OFF for system protection.</li> </ul>
--	---

**We recommend periodical maintenance.**

In certain operating conditions, the inside of the air conditioner may get foul after several seasons of use, resulting in poor performance. It is recommended to have periodical maintenance by a specialist aside from regular cleaning by the user. For specialist maintenance, contact the service shop where you bought the air conditioner.  
The maintenance cost must be born by the user.

# Part 6

## Service Diagnosis

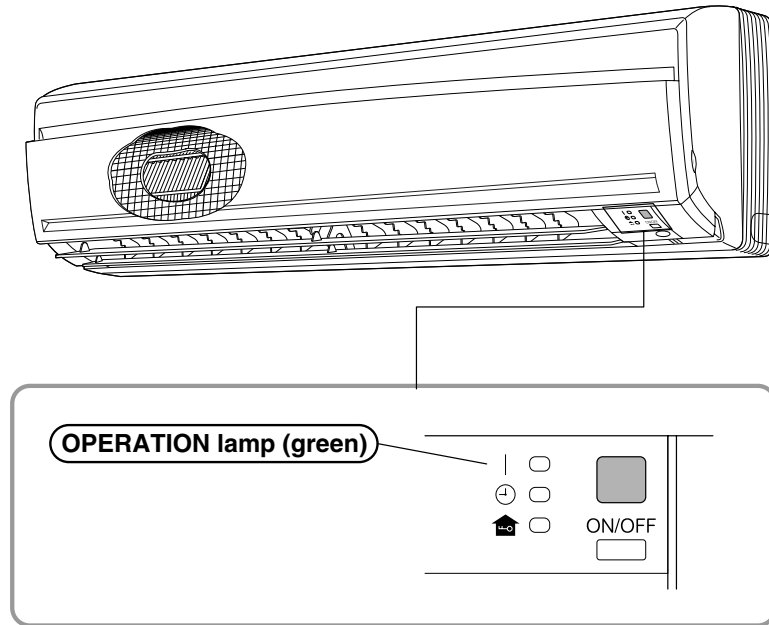
1. Caution for Diagnosis.....	84
2. Problem Symptoms and Measures .....	85
3. Service Check Function .....	86
4. Troubleshooting .....	89
4.1 Error Codes and Description .....	89
4.2 Indoor Unit PCB Abnormality .....	90
4.3 Freeze-up Protection Control or High Pressure Control.....	91
4.4 Fan Motor (DC Motor) or Related Abnormality.....	93
4.5 Thermistor or Related Abnormality (Indoor Unit).....	95
4.6 Signal Transmission Error (between Indoor and Outdoor Unit) .....	96
4.7 OL Activation (Compressor Overload) .....	98
4.8 Compressor Lock .....	99
4.9 DC Fan Lock .....	100
4.10 Input Over Current Detection .....	101
4.11 Four Way Valve Abnormality .....	103
4.12 Discharge Pipe Temperature Control.....	105
4.13 High Pressure Control in Cooling .....	106
4.14 Position Sensor Abnormality .....	108
4.15 CT or Related Abnormality .....	109
4.16 Thermistor or Related Abnormality (Outdoor Unit).....	111
4.17 Electrical Box Temperature Rise.....	113
4.18 Radiation Fin Temperature Rise .....	115
4.19 Output Over Current Detection.....	117
4.20 Insufficient Gas.....	119
4.21 Low-voltage Detection or Over-voltage Detection.....	123
5. Check .....	124
5.1 How to Check.....	124

# 1. Caution for Diagnosis

The Operation lamp flashes when any of the following errors is detected.

1. When a protection device of the indoor or outdoor unit is activated or when the thermistor malfunctions, disabling equipment operation.
  2. When a signal transmission error occurs between the indoor and outdoor units.
- In either case, conduct the diagnostic procedure described in the following pages.

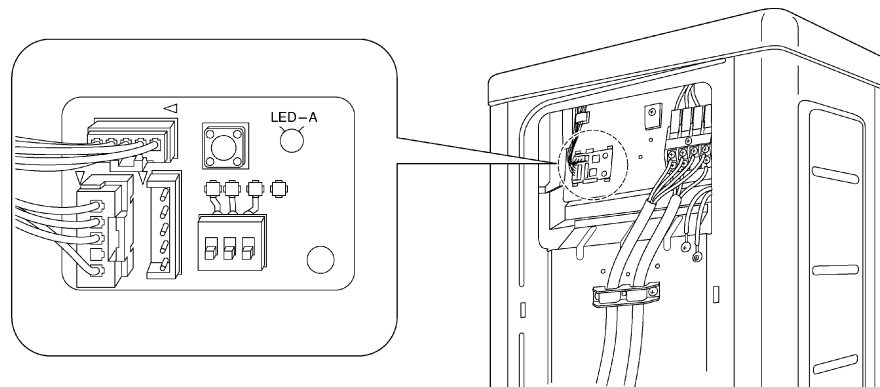
## Location of Operation Lamp



(R6947)

## Troubleshooting with the LED Indication

### Outdoor Unit



(R2838)

The outdoor unit has one green LED (LED A) on the PCB. The flashing green LED indicates normal condition of microcomputer operation.

## 2. Problem Symptoms and Measures

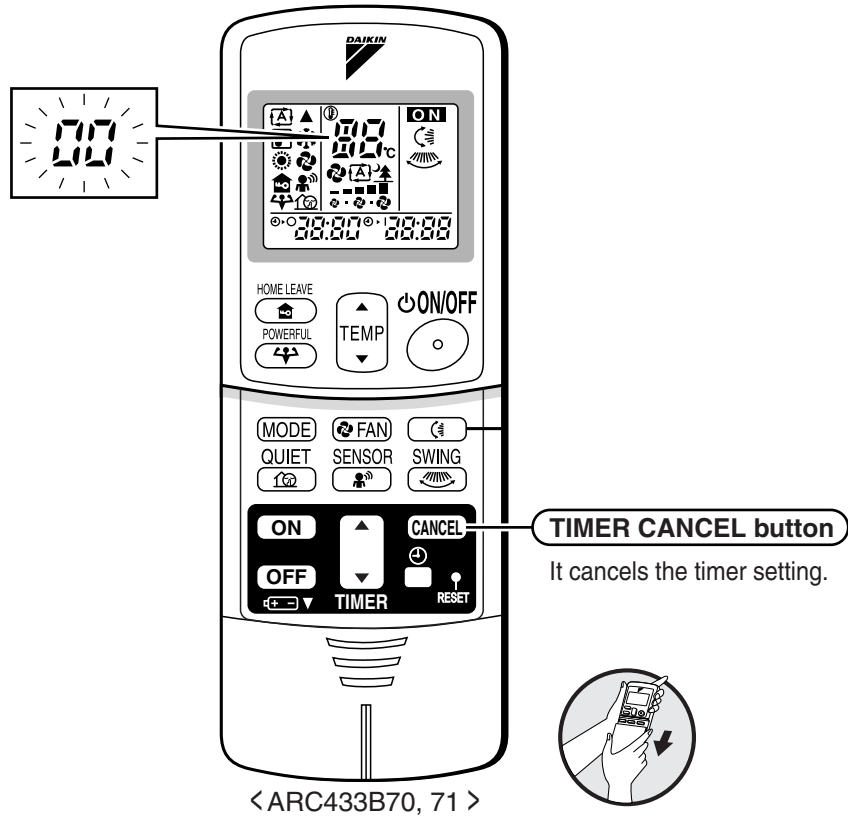
Symptom	Check Item	Details of Measure	Reference Page
None of the units operates.	Check the power supply.	Check to make sure that the rated voltage is supplied.	—
	Check the type of the indoor units.	Check to make sure that the indoor unit type is compatible with the outdoor unit.	—
	Check the outdoor air temperature.	Heating operation cannot be used when the outdoor air temperature is 18°C or higher (only for heat pump model), and cooling operation cannot be used when the outside temperature is below -5°C.	—
	Diagnosis with remote controller indication	—	89
	Check the remote controller addresses.	Check to make sure that address settings for the remote controller and indoor unit are correct.	—
Operation sometimes stops.	Check the power supply.	A power failure of 2 to 10 cycles can stop air conditioner operation. (Operation lamp OFF)	—
	Check the outdoor air temperature.	Heating operation cannot be used when the outdoor air temperature is 18°C or higher (only for heat pump model), and cooling operation cannot be used when the outside temperature is below -5°C.	—
	Diagnosis with remote controller indication	—	89
Equipment operates but does not cool, or does not heat (only for heat pump model).	Check for wiring and piping errors in the indoor and outdoor units connection wires and pipes.	Conduct the wiring/piping error check described on the product diagnosis nameplate.	—
	Check for thermistor detection errors.	Check to make sure that the main unit's thermistor has not dismantled from the pipe holder.	—
	Check for faulty operation of the electronic expansion valve.	Set the units to cooling operation, and compare the temperatures of the liquid side connection pipes of the connection section among rooms to check the opening and closing operation of the electronic expansion valves of the individual units.	—
	Diagnosis with remote controller indication	—	89
	Diagnosis by service port pressure and operating current	Check for insufficient gas.	129
Large operating noise and vibrations	Check the output voltage of the power transistor.	—	130
	Check the power transistor.	—	—
	Check the installation condition.	Check to make sure that the required spaces for installation (specified in the Engineering data book, etc.) are provided.	—

### 3. Service Check Function

In the **ARC433B** series remote controller, the temperature display sections on the main unit indicate corresponding codes.

**Check Method 1**

1. When the timer cancel button is held down for 5 seconds, a “00” indication flashes on the temperature display section.



(R2839)

2. Press the timer cancel button repeatedly until a continuous beep is produced.
  - The code indication changes in the sequence shown below, and notifies with a long beep.

No.	Code	No.	Code	No.	Code
1	00	12	F6	23	R1
2	U4	13	C7	24	E1
3	L5	14	R3	25	UR
4	E6	15	H8	26	UH
5	H6	16	H9	27	P4
6	HD	17	C9	28	L3
7	R6	18	C4	29	L4
8	E7	19	C5	30	H7
9	UD	20	J3	31	U2
10	F3	21	J6	32	ER
11	R5	22	E5	33	RH

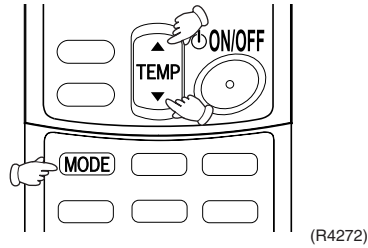


**Note:**

1. A short beep and two consecutive beeps indicate non-corresponding codes.
2. To cancel the code display, hold the timer cancel button down for 5 seconds. The code display also cancels itself if the button is not pressed for 1 minute.

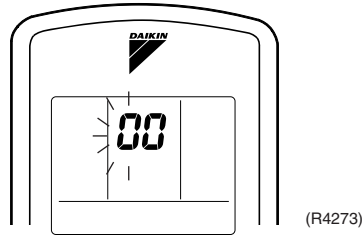
## Check Method 2

1. Enter the diagnosis mode.  
Press the 3 buttons (TEMP▲,TEMP▼, MODE) simultaneously.

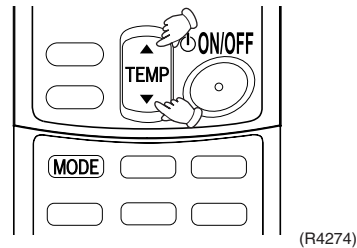


The digit of the number of tens blinks.

★Try again from the start when the digit does not blink.

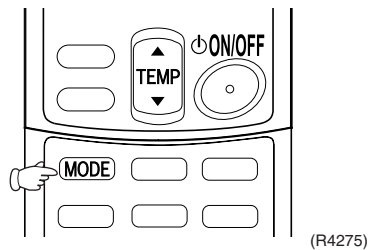


2. Press the TEMP button.  
Press TEMP▲ or TEMP▼ and change the digit until you hear the sound of “beep” or “pi pi”.

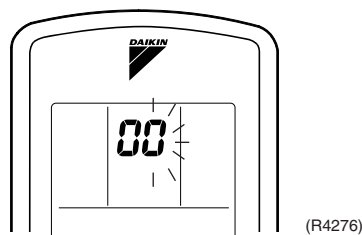


3. Diagnose by the sound.
  - ★“pi” : The number of tens does not accord with the error code.
  - ★“pi pi” : The number of tens accords with the error code.
  - ★“beep” : The both numbers of tens and units accord with the error code. (→See 7.)

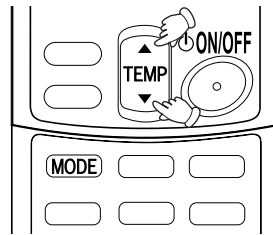
4. Enter the diagnosis mode again.  
Press the MODE button.



The digit of the number of units blinks.

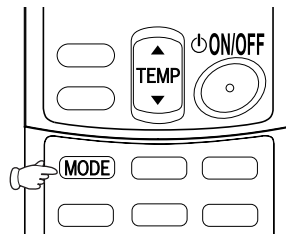


5. Press the TEMP button.  
Press TEMP▲ or TEMP▼ and change the digit until you hear the sound of “beep”.



(R4277)

6. Diagnose by the sound.  
★“pi” : The both numbers of tens and units do not accord with the error code.  
★“pi pi” : The number of tens accords with the error code.  
★“beep” : The both numbers of tens and units accord with the error code.
7. Determine the error code.  
The digits indicated when you hear the “beep” sound are error code.  
(Error codes and description → Refer to page 89.)
8. Exit from the diagnosis mode.  
Press the MODE button.



(R4278)

## 4. Troubleshooting

### 4.1 Error Codes and Description

	Code Indication	Description	Reference Page
System	00	Normal	—
	U0★	Insufficient gas	119
	U2	Low-voltage detection or over-voltage detection	123
	U4	Signal transmission error (between indoor and outdoor units)	96
Indoor Unit	P1	Indoor unit PCB abnormality	90
	P5	Freeze-up protection control or high pressure control	91
	P6	Fan motor or related abnormality	93
	C4	Heat exchanger thermistor abnormality	95
	C9	Room temperature thermistor abnormality	95
Outdoor Unit	E5★	OL activation (compressor overload)	98
	E6★	Compressor lock	99
	E7	DC fan lock	100
	E8	Input over current detection	101
	E8	Four Way Valve Abnormality	103
	F3	Discharge pipe temperature control	105
	F6	High Pressure Control in Cooling	106
	H5	Position sensor abnormality	108
	H8	CT or related abnormality	109
	H9	Outdoor air thermistor or related abnormality	111
	J3	Discharge pipe thermistor or related abnormality	111
	J5	Heat exchanger thermistor or related abnormality	111
	L3	Electrical box temperature rise	113
	L4	Radiation fin temperature rise	115
	L5	Output over current detection	117
	P4	Radiation fin thermistor or related abnormality	111


★: Displayed only when system-down occurs.

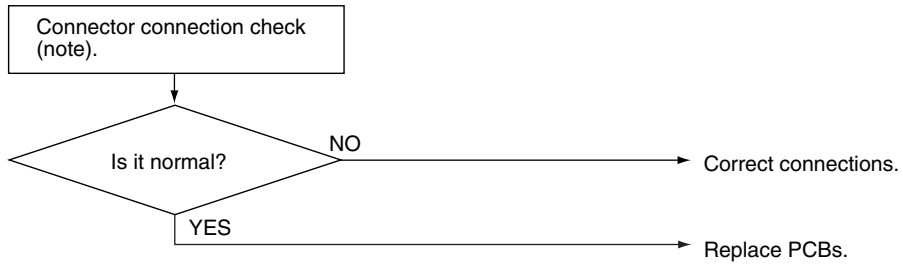


## 4.2 Indoor Unit PCB Abnormality


<b>Remote Controller Display</b>	81
<b>Method of Malfunction Detection</b>	Evaluation of zero-cross detection of power supply by indoor unit.
<b>Malfunction Decision Conditions</b>	When there is no zero-cross detection in approximately 10 continuous seconds.
<b>Supposed Causes</b>	<ul style="list-style-type: none"> <li>■ Faulty indoor unit PCB</li> <li>■ Faulty connector connection</li> </ul>

**Troubleshooting**

 **Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(R1400)

 **Note:** Connector Nos. vary depending on models.

Model Type	Connector No.
Wall Mounted Type	Terminal strip~Control PCB (indoor unit)

## 4.3 Freeze-up Protection Control or High Pressure Control

Remote  
Controller  
Display

85

Method of  
Malfunction  
Detection

- High pressure control (heat pump model only)  
During heating operations, the temperature detected by the indoor heat exchanger thermistor is used for the high pressure control (stop, outdoor fan stop, etc.)
- The freeze-up protection control (operation halt) is activated during cooling operation according to the temperature detected by the indoor unit heat exchanger thermistor.

Malfunction  
Decision  
Conditions

- High pressure control  
During heating operations, the temperature detected by the indoor heat exchanger thermistor is above 65°C
- Freeze-up protection  
When the indoor unit heat exchanger temperature is below 0°C during cooling operation.

Supposed  
Causes

- Operation halt due to clogged air filter of the indoor unit.
- Operation halt due to dust accumulation on the indoor unit heat exchanger.
- Operation halt due to short-circuit.
- Detection error due to faulty indoor unit heat exchanger thermistor.
- Detection error due to faulty indoor unit PCB.

Troubleshooting

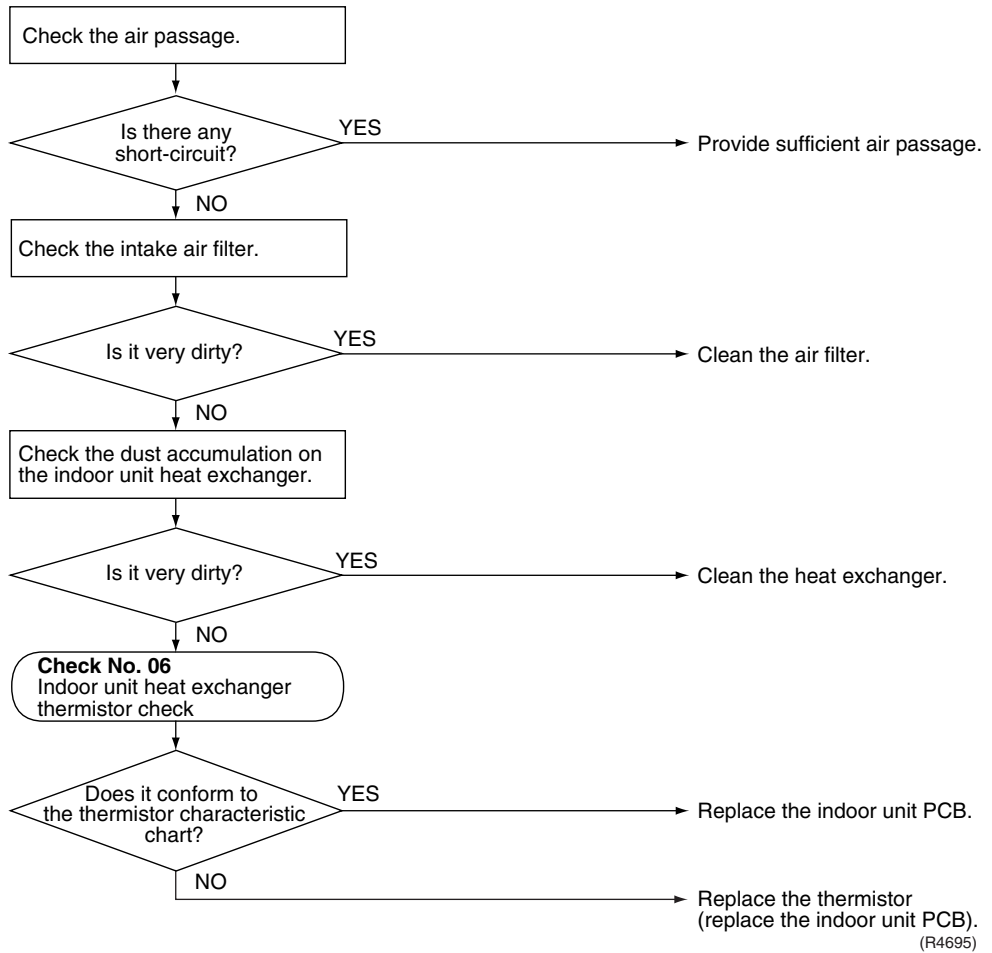


**Check No.06**  
Refer to P.126



**Caution**

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



## 4.4 Fan Motor (DC Motor) or Related Abnormality

---

### Remote Controller Display



### Method of Malfunction Detection

The rotation speed detected by the [Hall IC](#) during fan motor operation is used to determine abnormal fan motor operation.

---

### Malfunction Decision Conditions

When the detected rotation speed does not reach the demanded rotation speed of the target tap, and is less than 50% of the maximum fan motor rotation speed.

---

### Supposed Causes

- Operation halt due to short circuit inside the fan motor winding.
- Operation halt due to breaking of wire inside the fan motor.
- Operation halt due to breaking of the fan motor lead wires.
- Operation halt due to faulty capacitor of the fan motor.
- Detection error due to faulty indoor unit PCB.

Troubleshooting

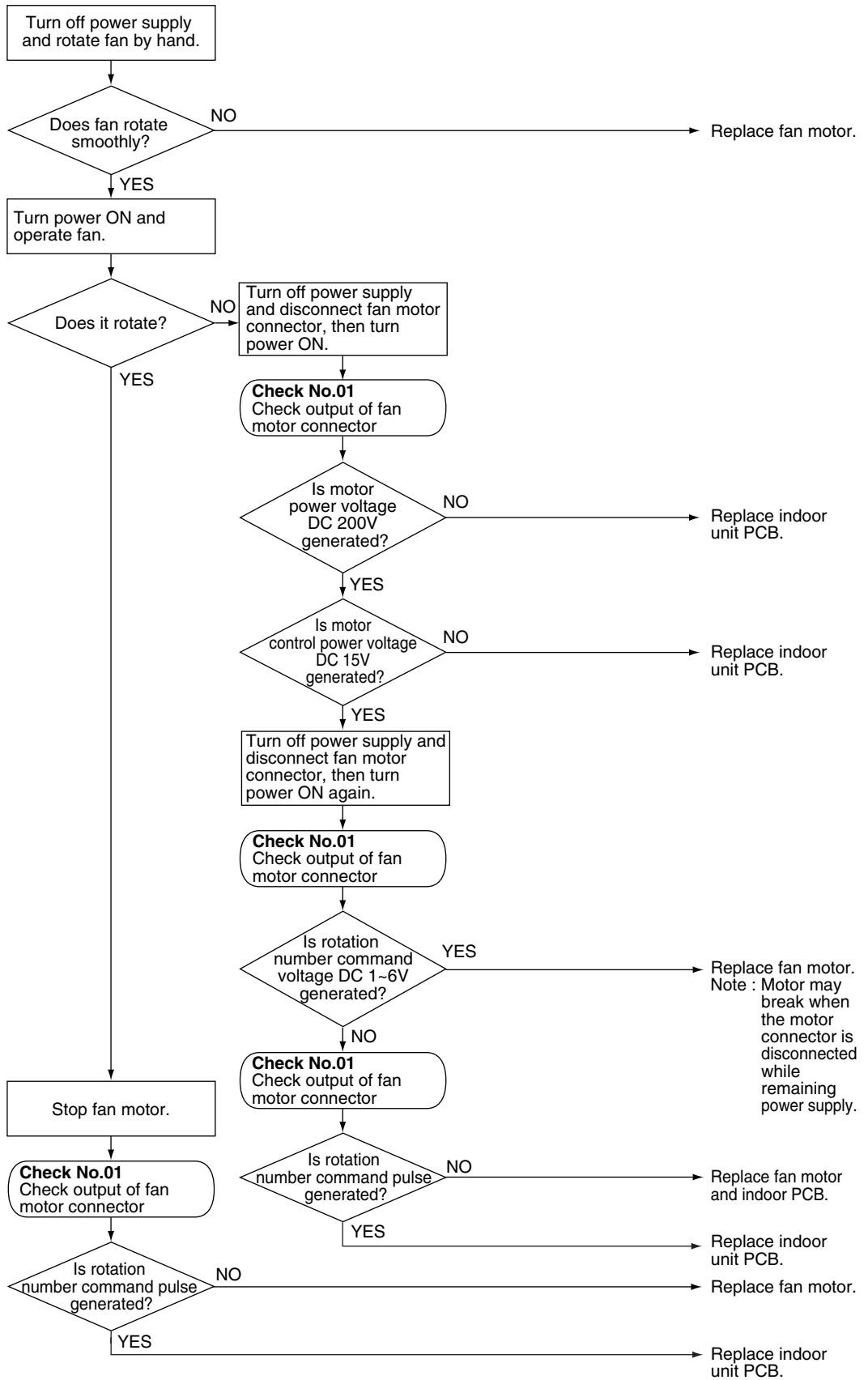


**Check No.01**  
Refer to P.124



**Caution**

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(R3098)

## 4.5 Thermistor or Related Abnormality (Indoor Unit)

Remote  
Controller  
Display

Ⓔ4,Ⓔ9

Method of  
Malfunction  
Detection

The temperatures detected by the thermistors are used to determine thermistor errors.

Malfunction  
Decision  
Conditions

When the thermistor input is more than 4.96 V or less than 0.04 V during compressor operation\*.

\* (reference)

When above about 212°C (less than 120 ohms) or below about -50°C (more than 1,860 kohms).



**Note:** The values vary slightly in some models.

Supposed  
Causes

- Faulty connector connection
- Faulty thermistor
- Faulty PCB

Troubleshooting

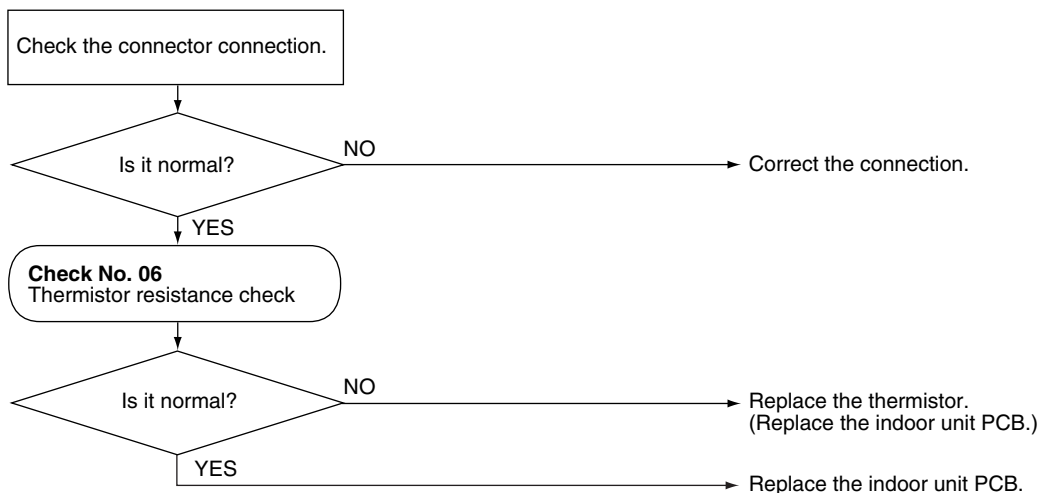


Check No.06  
Refer to P.126



**Caution**

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(R4696)

Ⓔ4 : Indoor heat exchanger thermistor

Ⓔ9 : Room temperature thermistor

## 4.6 Signal Transmission Error (between Indoor and Outdoor Unit)

Remote  
Controller  
Display

U4

Method of  
Malfunction  
Detection

The data received from the outdoor unit in indoor unit-outdoor unit signal transmission is checked whether it is normal.

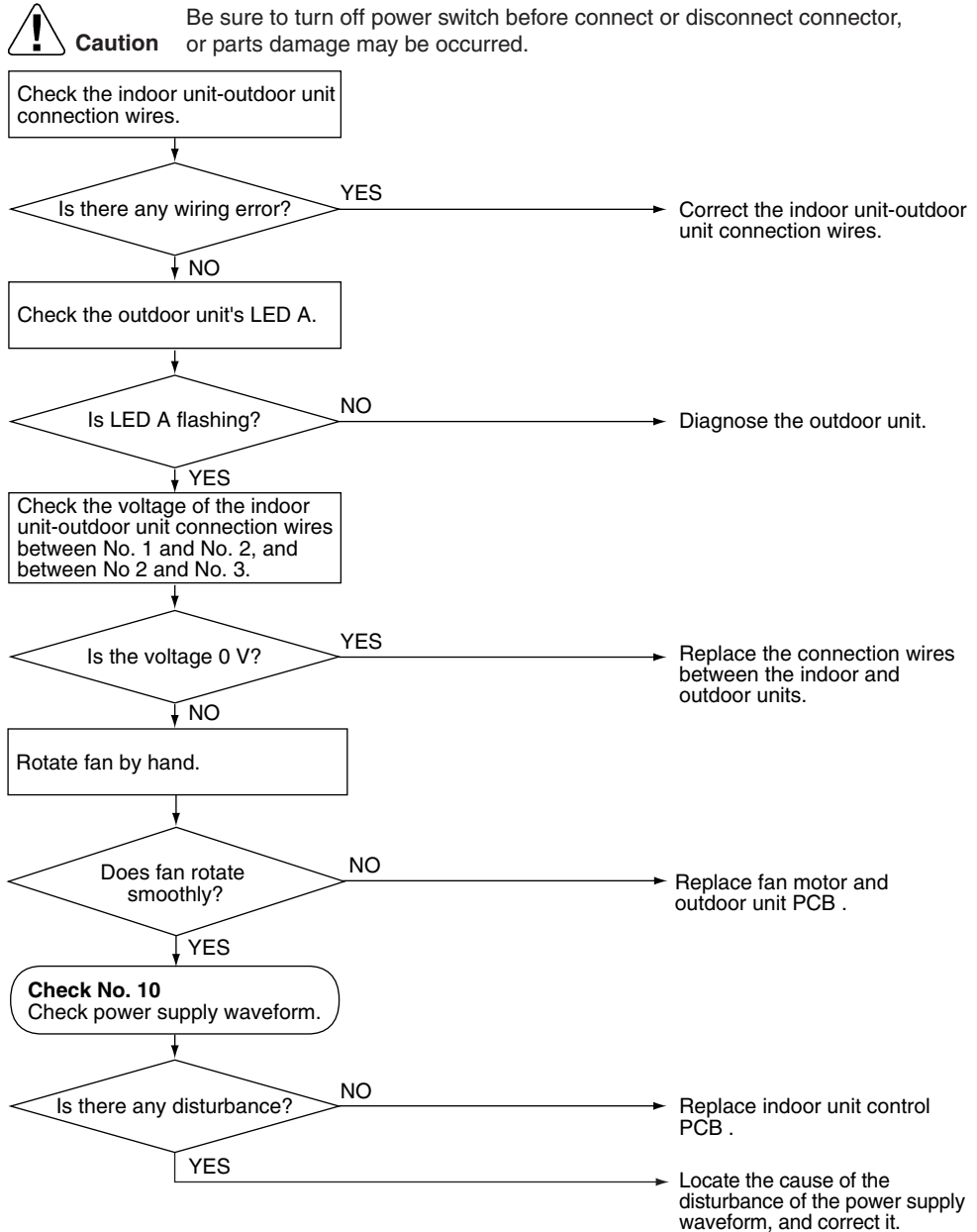
Malfunction  
Decision  
Conditions

When the data sent from the outdoor unit cannot be received normally, or when the content of the data is abnormal.

Supposed  
Causes

- Faulty outdoor unit PCB.
- Faulty indoor unit PCB.
- Indoor unit-outdoor unit signal transmission error due to wiring error.
- Indoor unit-outdoor unit signal transmission error due to disturbed power supply waveform.
- Indoor unit-outdoor unit signal transmission error due to breaking of wire in the connection wires between the indoor and outdoor units (wire No. 2).
- Short circuit inside the fan motor winding.

## Troubleshooting


**Check No.10**  
**Refer to P.129**



(R6471)





## 4.7 OL Activation (Compressor Overload)


<p>Remote Controller Display</p>	<p>ES</p>
<p>Method of Malfunction Detection</p>	<p>A compressor overload is detected through compressor OL.</p>
<p>Malfunction Decision Conditions</p>	<ul style="list-style-type: none"> <li>■ If the compressor OL is activated twice, the system will be shut down.</li> <li>■ The error counter will reset itself if this or any other error does not occur during the following 60-minute compressor running time (total time).</li> </ul> <p>* The operating temperature condition is not specified.</p>
<p>Supposed Causes</p>	<ul style="list-style-type: none"> <li>■ Refrigerant shortage</li> <li>■ Four way valve malfunctioning</li> <li>■ Outdoor unit PCB defective</li> <li>■ Water mixed in the local piping</li> <li>■ Electronic expansion valve defective</li> <li>■ Stop valve defective</li> </ul>

Troubleshooting

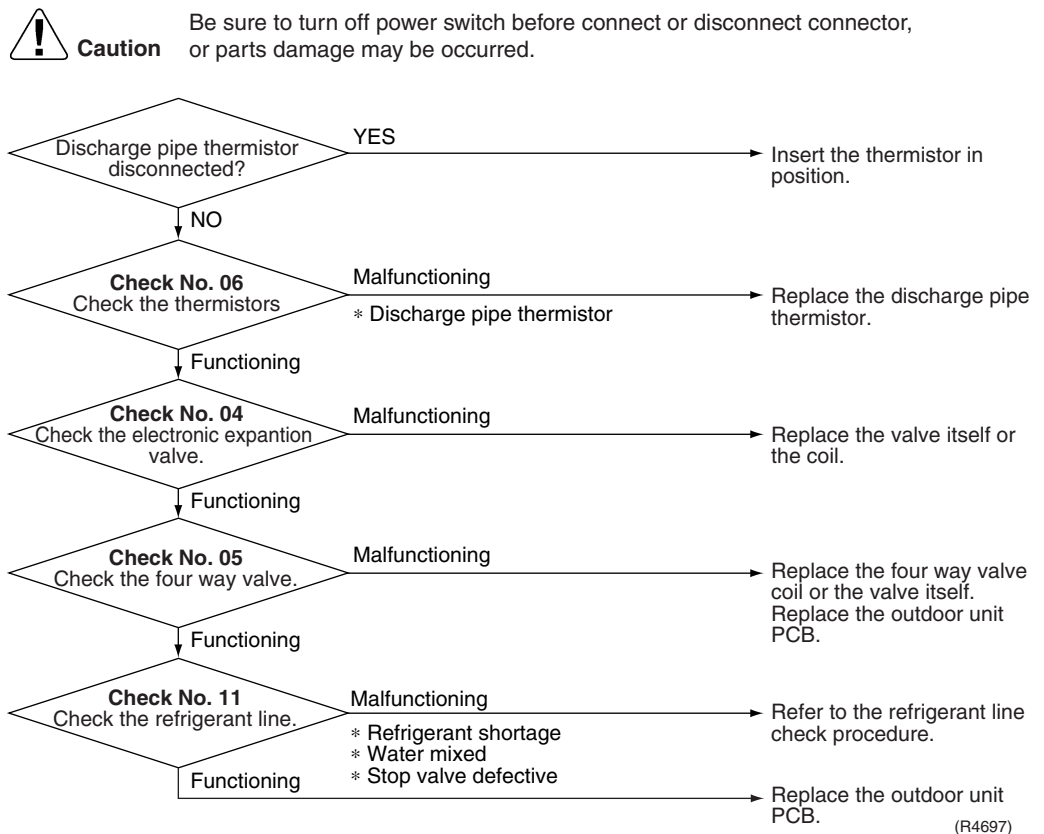
- 

**Check No.04**  
Refer to P.124
- 

**Check No.05**  
Refer to P.125
- 

**Check No.06**  
Refer to P.126
- 

**Check No.11**  
Refer to P.129



## 4.8 Compressor Lock

### Remote Controller Display



### Method of Malfunction Detection

A compressor lock is detected by checking the compressor running condition through the position detection circuit.

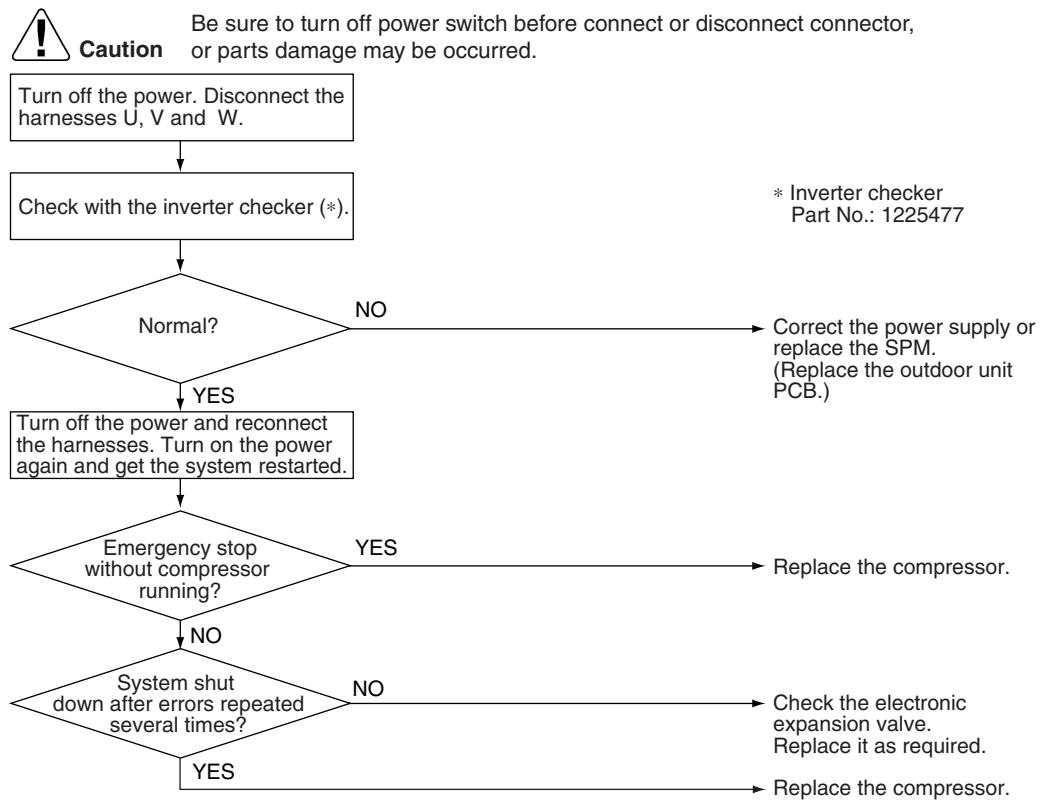
### Malfunction Decision Conditions

- The position detection circuit detects a compressor frequency of below 10 Hz for 20 seconds or a frequency of above 160 Hz.
- 40 seconds after the compressor has started, the position detection circuit detects a compressor frequency of above 180 Hz.
- The system will be shut down if the error occurs 16 times.
- Clearing condition: Continuous run for about 5 minutes (normal)

### Supposed Causes

- Compressor locked

### Troubleshooting



(R2842)

## 4.9 DC Fan Lock

Remote  
Controller  
Display

E7

Method of  
Malfunction  
Detection

A fan motor or related error is detected by checking the high-voltage fan motor rpm being detected by the Hall IC.

Malfunction  
Decision  
Conditions

- The fan does not start in 30 seconds even when the fan motor is running.
- The system will be shut down if the error occurs 16 times.
- Clearing condition: Continuous run for about 5 minutes (normal)

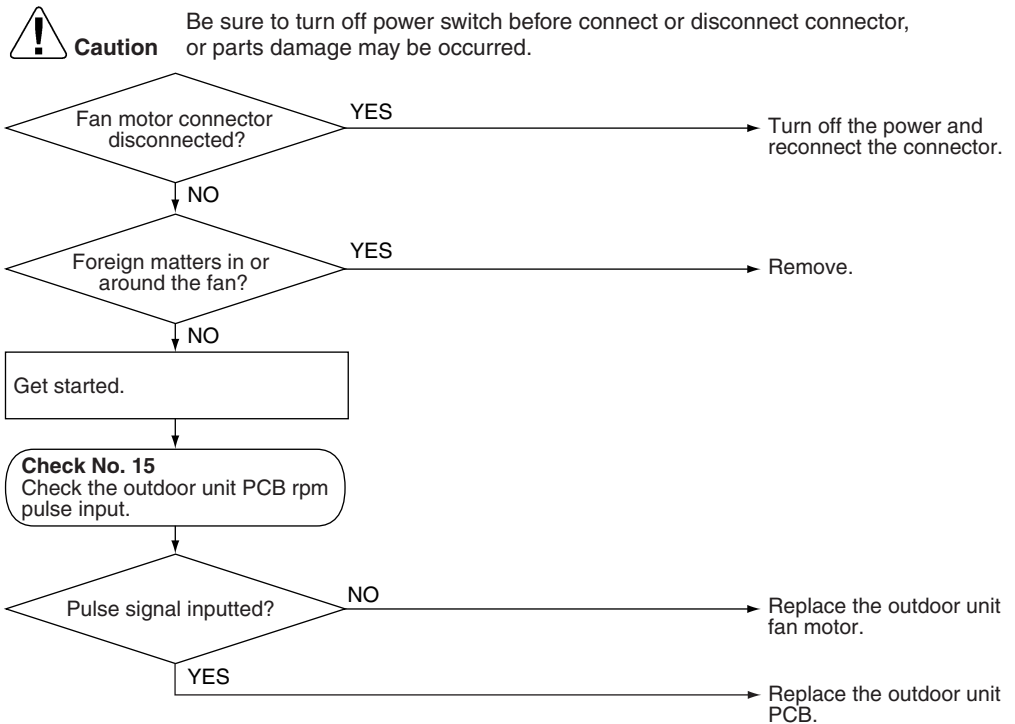
Supposed  
Causes

- Fan motor breakdown
- Harness or connector disconnected between fan motor and PCB or in poor contact
- Foreign matters stuck in the fan

### Troubleshooting



Check No.15  
Refer to P.131



(R2843)

## 4.10 Input Over Current Detection

### Remote Controller Display



### Method of Malfunction Detection

An input over-current is detected by checking the input current value being detected by CT with the compressor running.

### Malfunction Decision Conditions

- The following CT input with the compressor running continues for 2.5 seconds.  
CT input : Above 20 A
- The system will be shut down if the error occurs 16 times.
- Clearing condition : Continuous run for about 5 minutes (normal)

### Supposed Causes

- Over-current due to compressor failure
- Over-current due to defective power transistor
- Over-current due to defective inverter main circuit electrolytic capacitor
- Over-current due to defective outdoor unit PCB
- Error detection due to outdoor unit PCB
- Over-current due to short-circuit

Troubleshooting



**Check No.07**  
Refer to P.127



**Check No.08**  
Refer to P.128



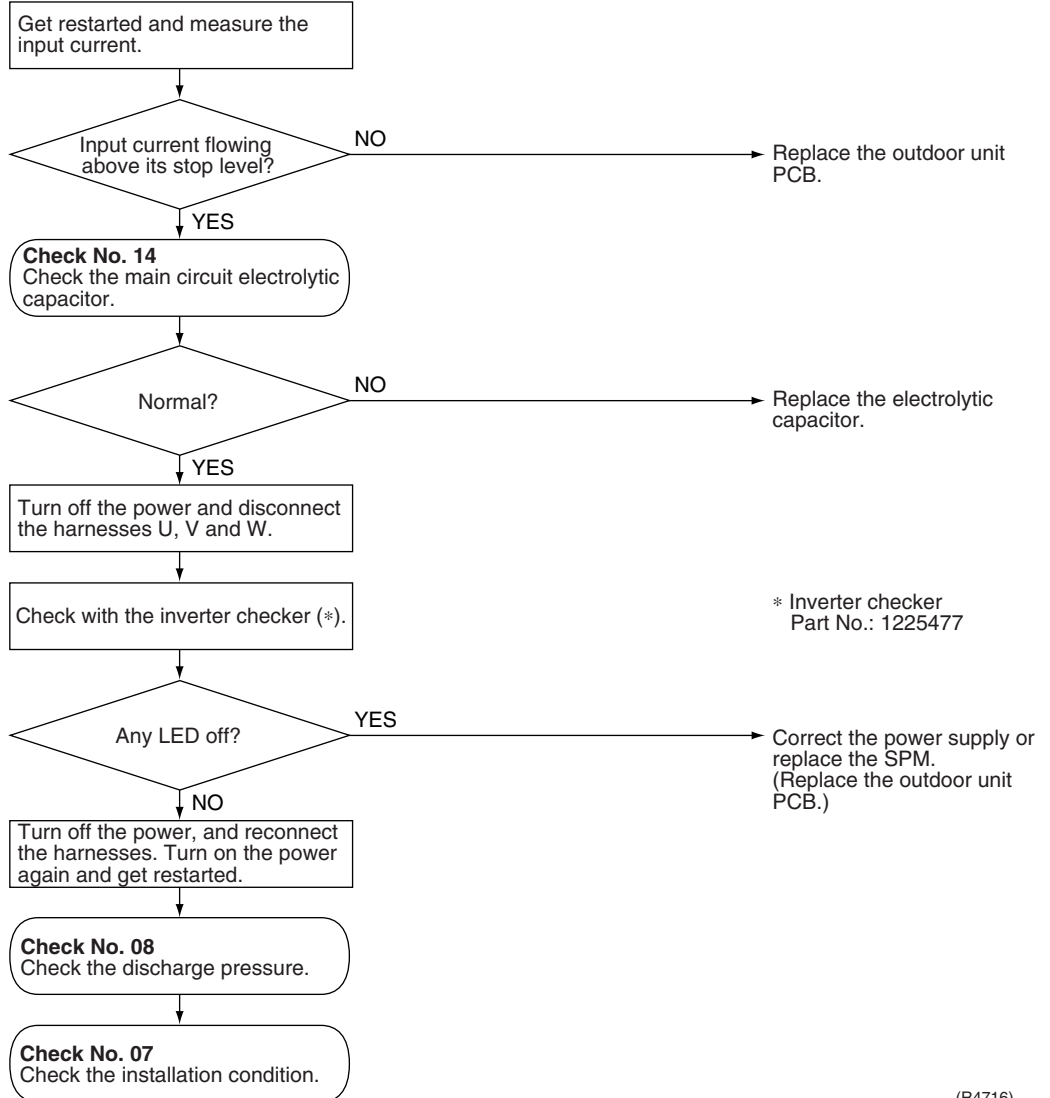
**Check No.14**  
Refer to P.131



**Caution**

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

\* An input over-current may result from wrong internal wiring. If the wires have been disconnected and reconnected for part replacement, for example, and the system is interrupted by an input over-current, take the following procedure.



(R4716)

## 4.11 Four Way Valve Abnormality

Remote  
Controller  
Display

EA

Method of  
Malfunction  
Detection

The room temperature thermistor, the indoor unit heat exchanger thermistor, the outdoor temperature thermistor and the outdoor unit heat exchanger thermistor are checked to see if they function within their normal ranges in the operating mode.

Malfunction  
Decision  
Conditions

A following condition continues over 1 minute after operating 10 minutes.

- Cooling / dry operation  
(room temp. – indoor heat exchanger temp.) < –10°C
- Heating  
(indoor unit heat exchanger temp. – room temp.) < –10°C
- The system will be shut down if the cooling / heating changeover abnormality occurs 5 times.

Supposed  
Causes

- Connector in poor contact
- Thermistor defective
- Outdoor unit PCB defective
- Four way valve coil or harness defective
- Four way valve defective
- Foreign substance mixed in refrigerant
- Insufficient gas

Troubleshooting



**Check No.05**  
Refer to P.125



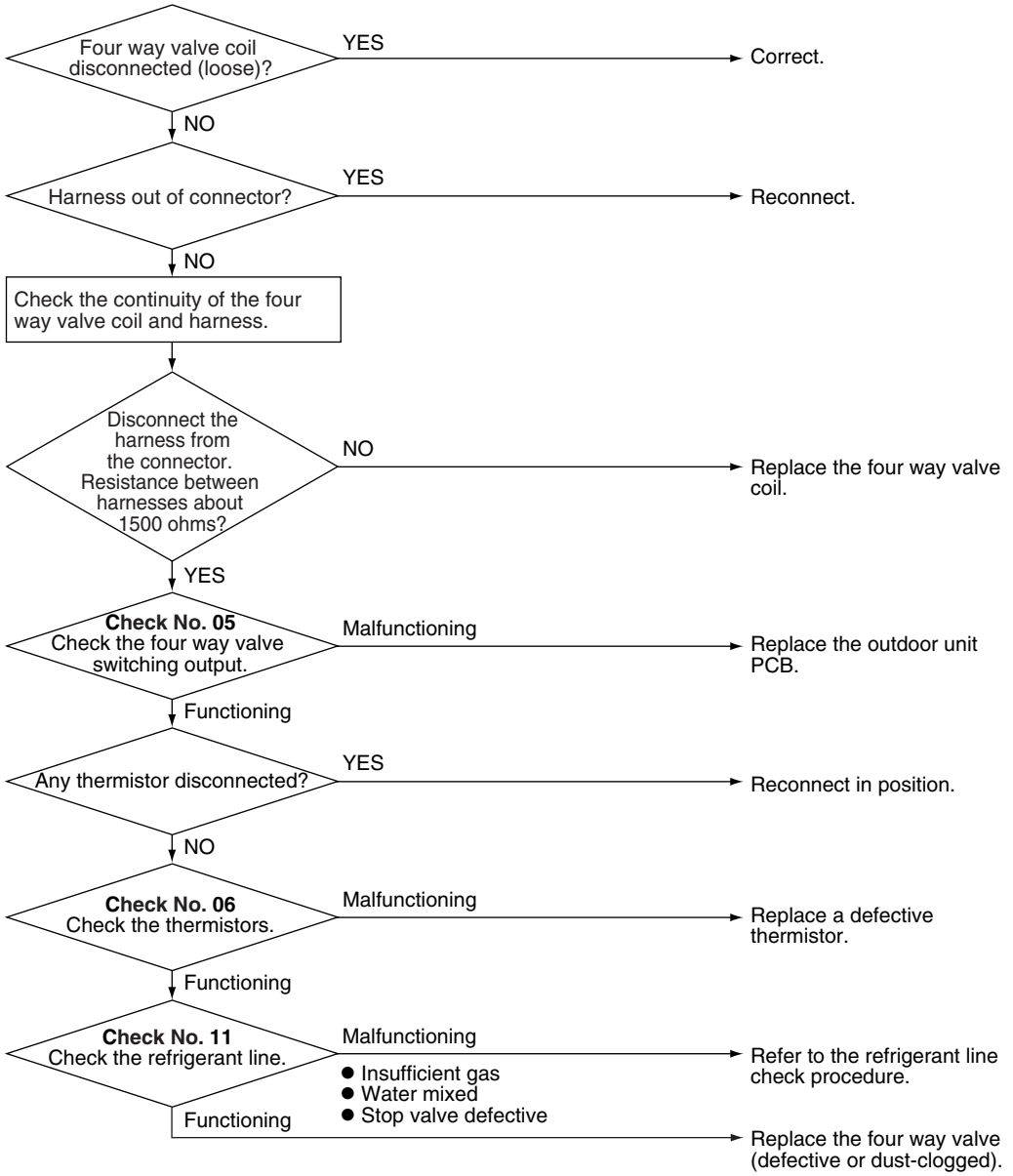
**Check No.06**  
Refer to P.126



**Check No.11**  
Refer to P.129




**Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.






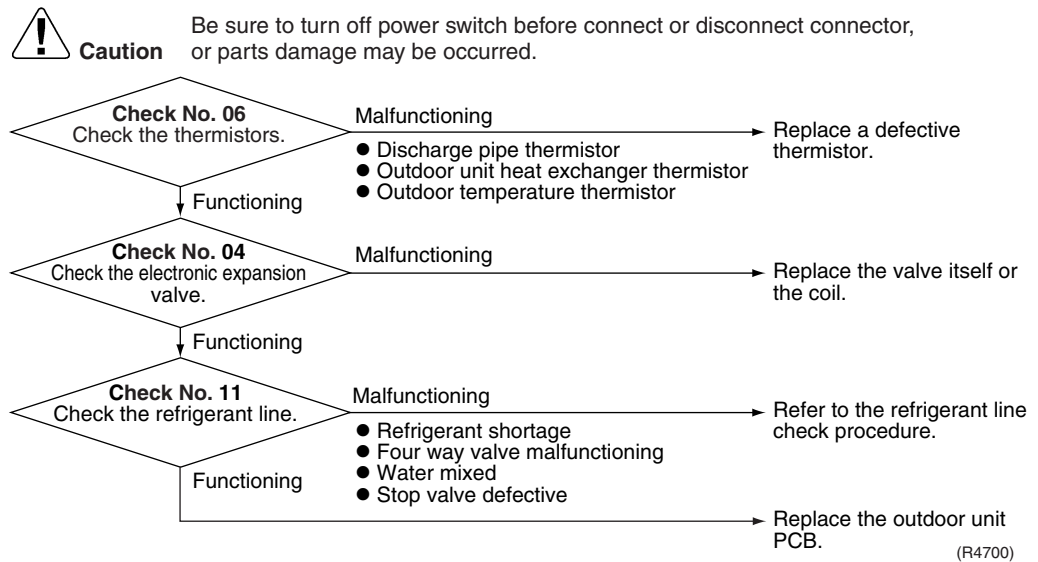
(R4710)

## 4.12 Discharge Pipe Temperature Control

<b>Remote Controller Display</b>	
<b>Method of Malfunction Detection</b>	The discharge pipe temperature control (stop, frequency drooping, etc.) is checked with the temperature being detected by the discharge pipe thermistor.
<b>Malfunction Decision Conditions</b>	<ul style="list-style-type: none"> <li>■ If a stop takes place 6 times successively due to abnormal discharge pipe temperature, the system will be shut down.</li> <li>■ If the temperature being detected by the discharge pipe thermistor rises above 120°C, the compressor will stop. (The error is cleared when the temperature has dropped below 107°C.)</li> <li>■ The error counter will reset itself if this or any other error does not occur during the following 60-minute compressor running time (total time).</li> </ul>
<b>Supposed Causes</b>	<ul style="list-style-type: none"> <li>■ Refrigerant shortage</li> <li>■ Four way valve malfunctioning</li> <li>■ Discharge pipe thermistor defective (heat exchanger or outdoor temperature thermistor defective)</li> <li>■ Outdoor unit PCB defective</li> <li>■ Water mixed in the local piping</li> <li>■ Electronic expansion valve defective</li> <li>■ Stop valve defective</li> </ul>

### Troubleshooting

-  **Check No.04**  
Refer to P.124
-  **Check No.06**  
Refer to P.126
-  **Check No.11**  
Refer to P.129





## 4.13 High Pressure Control in Cooling

---

Remote  
Controller  
Display

FE

---

Method of  
Malfunction  
Detection

High-pressure control (stop, frequency drop, etc.) is activated in the cooling mode if the temperature being sensed by the heat exchanger thermistor exceeds the limit.

---

Malfunction  
Decision  
Conditions

Activated when the temperature being sensed by the heat exchanger thermistor rises above 60°C. (Deactivated when the said temperature drops below 50°C.)

---

Supposed  
Causes

- The installation space is not large enough.
- Faulty outdoor unit fan
- Faulty electronic expansion valve
- Faulty defrost thermistor
- Faulty outdoor unit PCB
- Faulty stop valve
- Dirty heat exchanger

Troubleshooting



**Check No.04**  
Refer to P.124



**Check No.06**  
Refer to P.126



**Check No.07**  
Refer to P.127

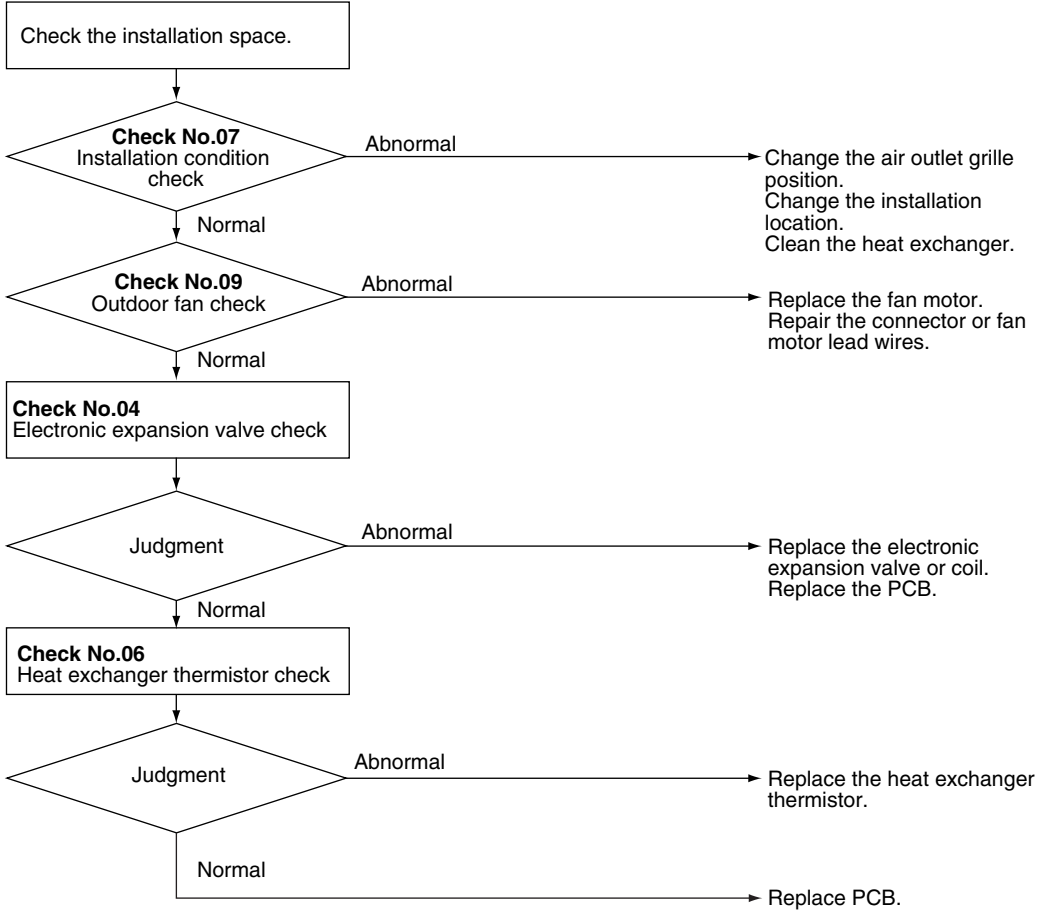


**Check No.09**  
Refer to P.128



**Caution**

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(R4701)

## 4.14 Position Sensor Abnormality

Remote  
Controller  
Display



Method of  
Malfunction  
Detection

A compressor startup failure is detected by checking the compressor running condition through the position detection circuit.

Malfunction  
Decision  
Conditions

- The compressor fails to start in about 15 seconds after the compressor run command signal is sent.
- Clearing condition: Continuous run for about 5 minutes (normal)
- The system will be shut down if the error occurs 16 times.

Supposed  
Causes

- Compressor relay cable disconnected
- Compressor itself defective
- Outdoor unit PCB defective
- Stop valve closed
- Input voltage out of specification

### Troubleshooting



Check No.13  
Refer to P.130



(R5211)

## 4.15 CT or Related Abnormality

### Remote Controller Display



### Method of Malfunction Detection

A CT or related error is detected by checking the compressor running frequency and CT-detected input current.

### Malfunction Decision Conditions

The compressor running frequency is below 55 Hz and the CT input is below 0.1 V.  
(The input current is also below 1.25 A.)

- If this error repeats 4 times, the system will be shut down.
- The error counter will reset itself if this or any other error does not occur during the following 60-minute compressor running time (total time).

### Supposed Causes

- Power transistor defective
- Internal wiring broken or in poor contact
- Reactor defective
- Outdoor unit PCB defective

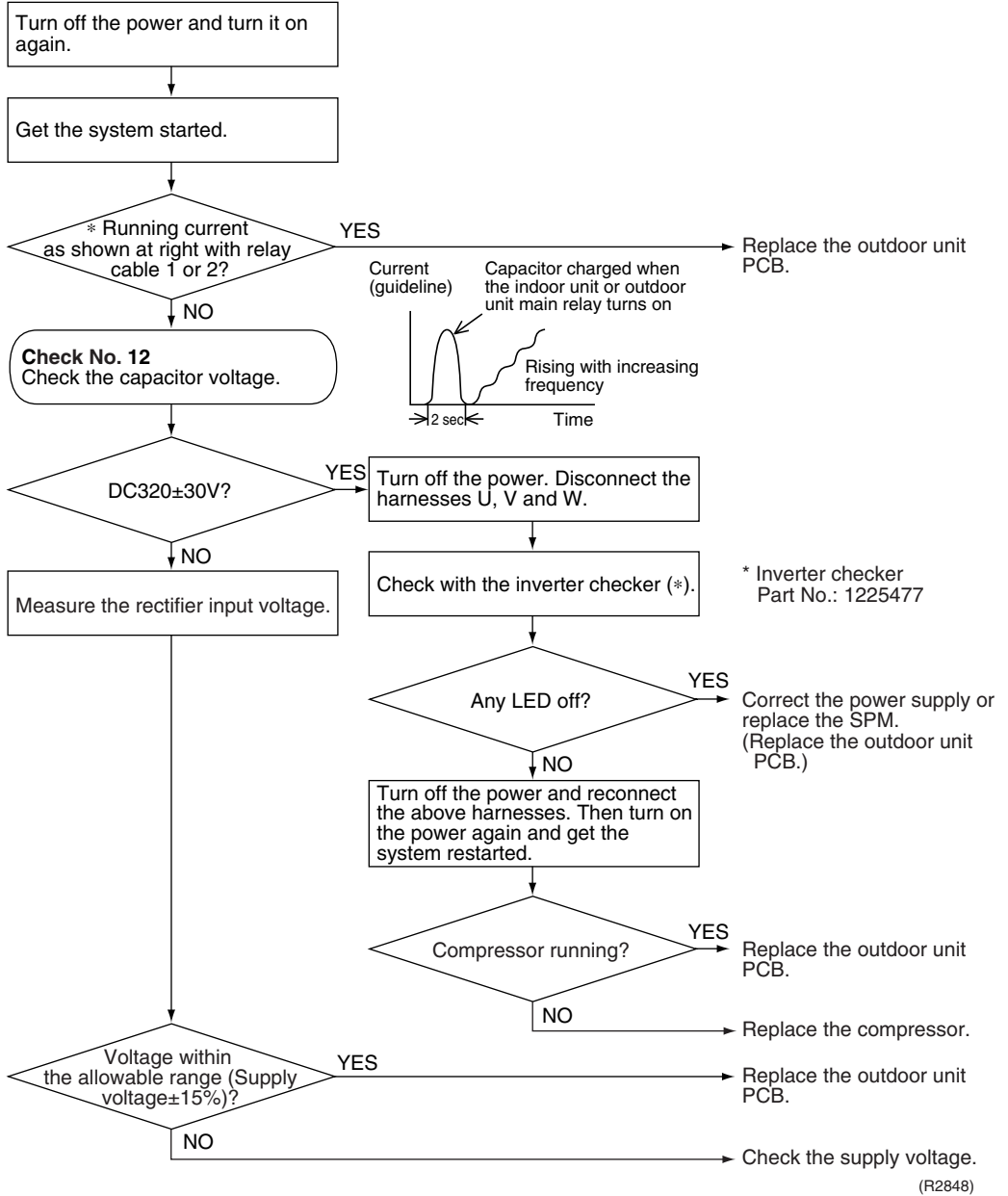
Troubleshooting



**Check No.12**  
Refer to P.130



**Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



## 4.16 Thermistor or Related Abnormality (Outdoor Unit)

<b>Remote Controller Display</b>	P4, J3, J6, K9
<b>Method of Malfunction Detection</b>	This type of error is detected by checking the thermistor input voltage to the microcomputer. [A thermistor error is detected by checking the temperature.]
<b>Malfunction Decision Conditions</b>	The thermistor input is above 4.96 V or below 0.04 V with the power on. Error J3 is judged if the discharge pipe thermistor temperature is smaller than the condenser thermistor temperature.
<b>Supposed Causes</b>	<ul style="list-style-type: none"> <li>■ Connector in poor contact</li> <li>■ Thermistor defective</li> <li>■ Outdoor unit PCB defective</li> <li>■ Indoor unit PCB defective</li> <li>■ Condenser thermistor defective in the case of J3 error (outdoor unit heat exchanger thermistor in the cooling mode, or indoor unit heat exchanger thermistor in the heating mode)</li> </ul>

Troubleshooting

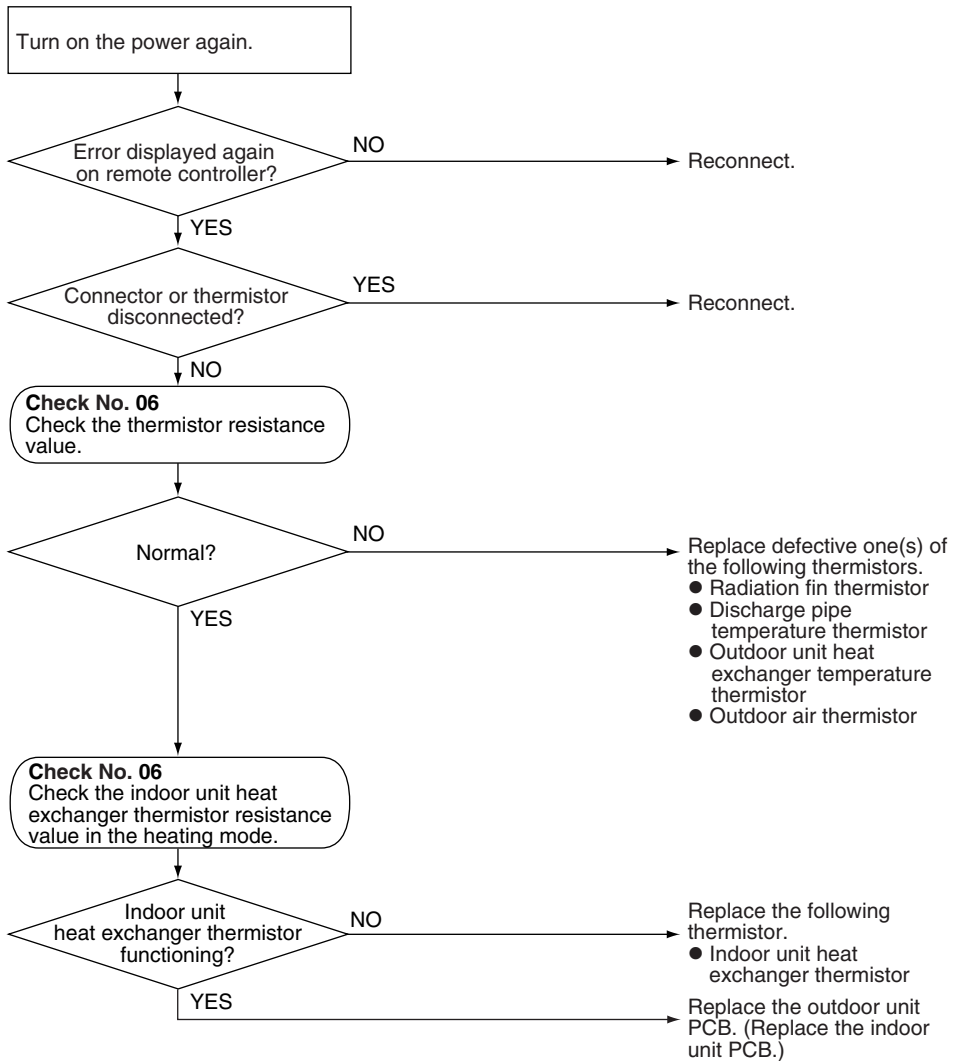


**Check No.06**  
Refer to P.126



**Caution**

Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(R4711)

- P4 : Radiation fin thermistor
- J3 : Discharge pipe thermistor
- J5 : Outdoor heat exchanger thermistor
- H3 : Outdoor air thermistor

## 4.17 Electrical Box Temperature Rise

---

**Remote  
Controller  
Display**



**Method of  
Malfunction  
Detection**

An electrical box temperature rise is detected by checking the radiation fin thermistor with the compressor off.

---

**Malfunction  
Decision  
Conditions**

With the compressor off, the radiation fin temperature is above 80°C (71 class : 75°C). (Reset is made when the temperature drops below 70°C.)

---

**Supposed  
Causes**

- Fin temperature rise due to defective outdoor unit fan
- Fin temperature rise due to short-circuit
- Fin thermistor defective
- Connector in poor contact
- Outdoor unit PCB defective

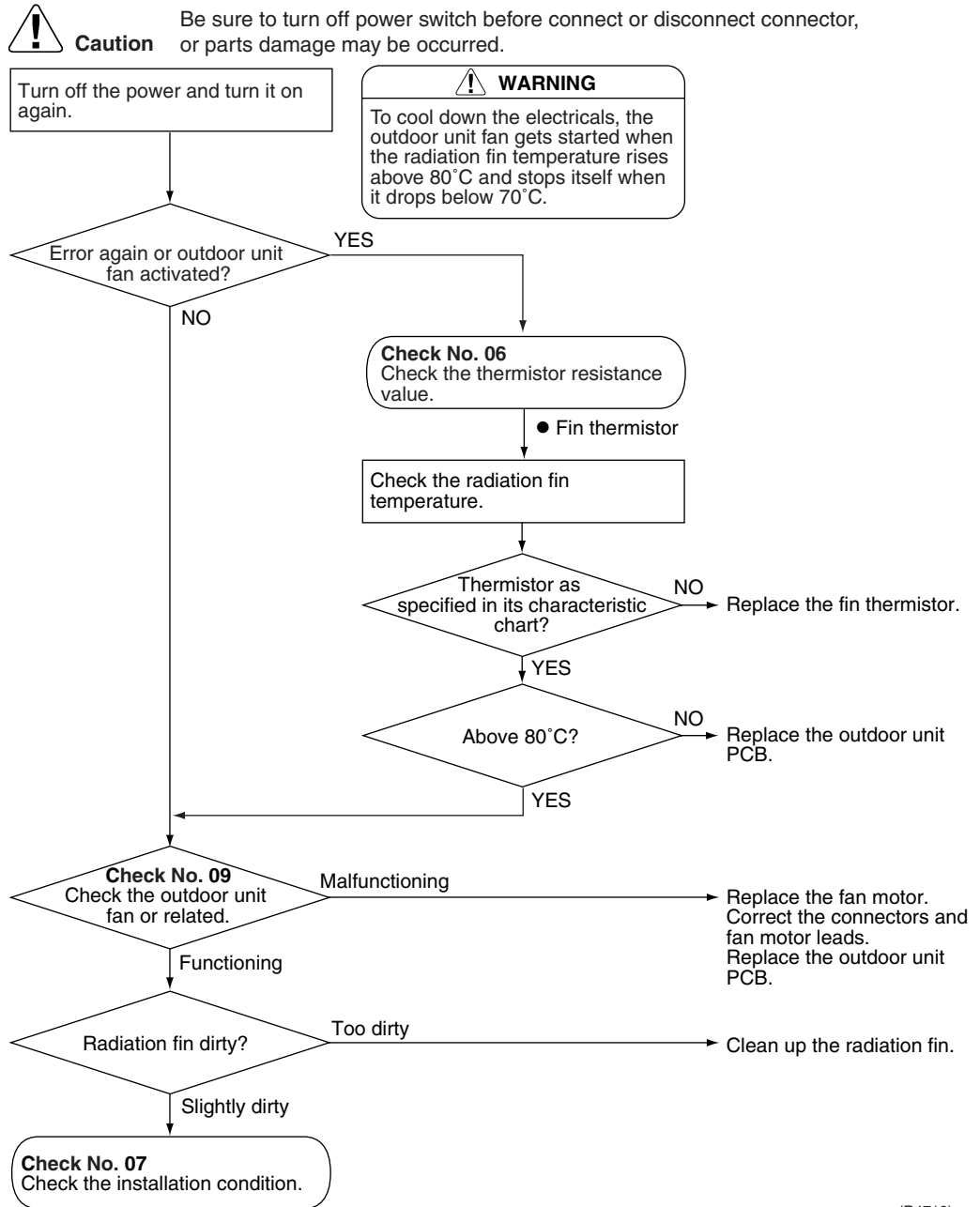


Troubleshooting

  
**Check No.06**  
 Refer to P.126

  
**Check No.07**  
 Refer to P.127

  
**Check No.09**  
 Refer to P.128



(R4712)

## 4.18 Radiation Fin Temperature Rise

Remote  
Controller  
Display

L4

Method of  
Malfunction  
Detection

A radiation fin temperature rise is detected by checking the radiation fin thermistor with the compressor on.

Malfunction  
Decision  
Conditions

- If the radiation fin temperature with the compressor on is above 90°C,
- If a radiation fin temperature rise takes place 4 times successively, the system will be shut down.
- The error counter will reset itself if this or any other error does not occur during the following 60-minute compressor running time (total time).

Supposed  
Causes

- Fin temperature rise due to defective outdoor unit fan
- Fin temperature rise due to short-circuit
- Fin thermistor defective
- Connector in poor contact
- Outdoor unit PCB defective

Troubleshooting

 **Check No.06**  
Refer to P.126

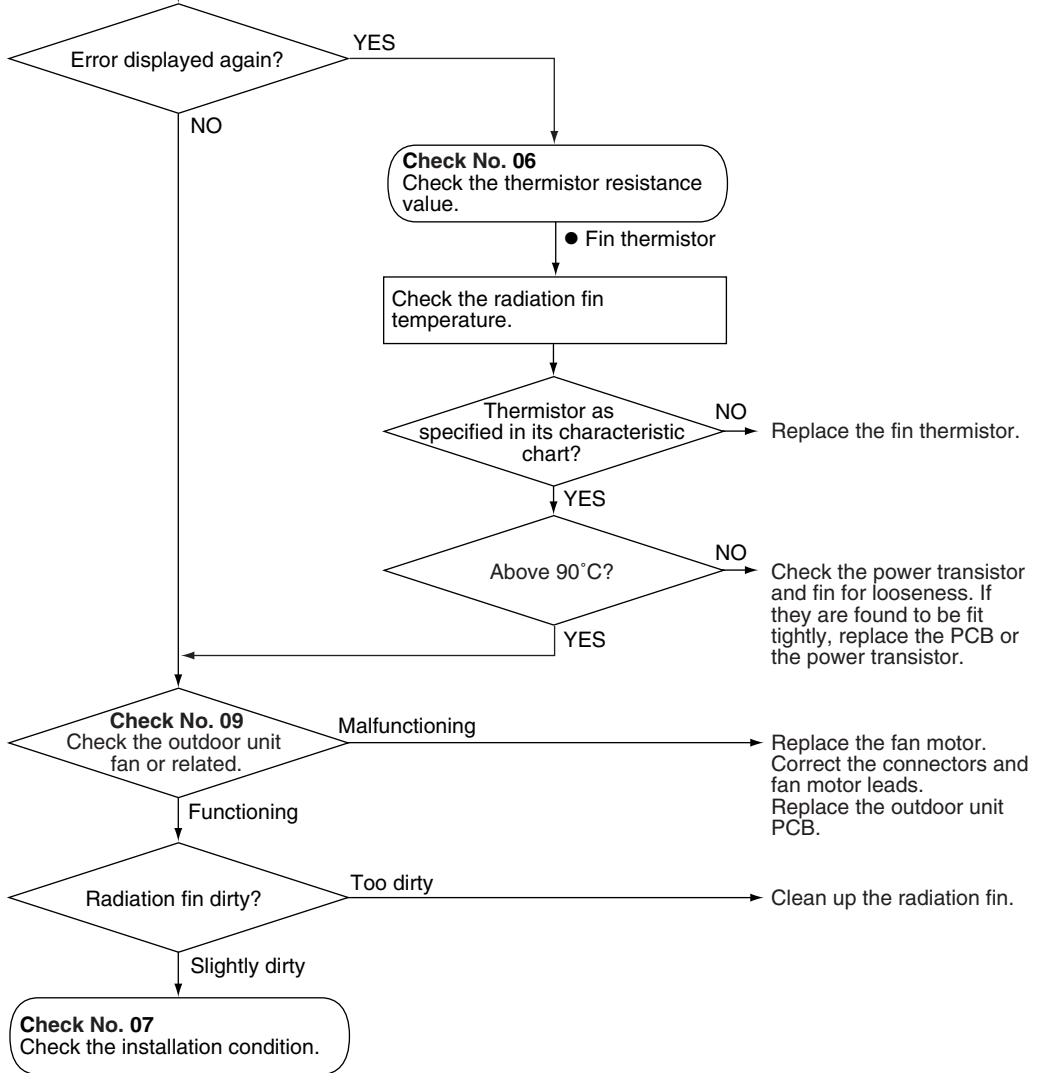
 **Check No.07**  
Refer to P.127

 **Check No.09**  
Refer to P.128



**Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Turn off the power and turn it on again to get the system started.



(R4704)

## 4.19 Output Over Current Detection

Remote  
Controller  
Display

LS

Method of  
Malfunction  
Detection

An output over-current is detected by checking the current that flows in the inverter DC section.

Malfunction  
Decision  
Conditions

- A position signal error occurs while the compressor is running.
- A speed error occurs while the compressor is running.
- An output over-current input is fed from the output over-current detection circuit to the microcomputer.
- The system will be shut down if the error occurs 16 times.
- Clearing condition: Continuous run for about 5 minutes (normal)

Supposed  
Causes

- Over-current due to defective power transistor
- Over-current due to wrong internal wiring
- Over-current due to abnormal supply voltage
- Over-current due to defective PCB
- Error detection due to defective PCB
- Over-current due to closed stop valve
- Over-current due to compressor failure
- Over-current due to poor installation condition

Troubleshooting



**Check No.07**  
Refer to P.127



**Check No.08**  
Refer to P.128

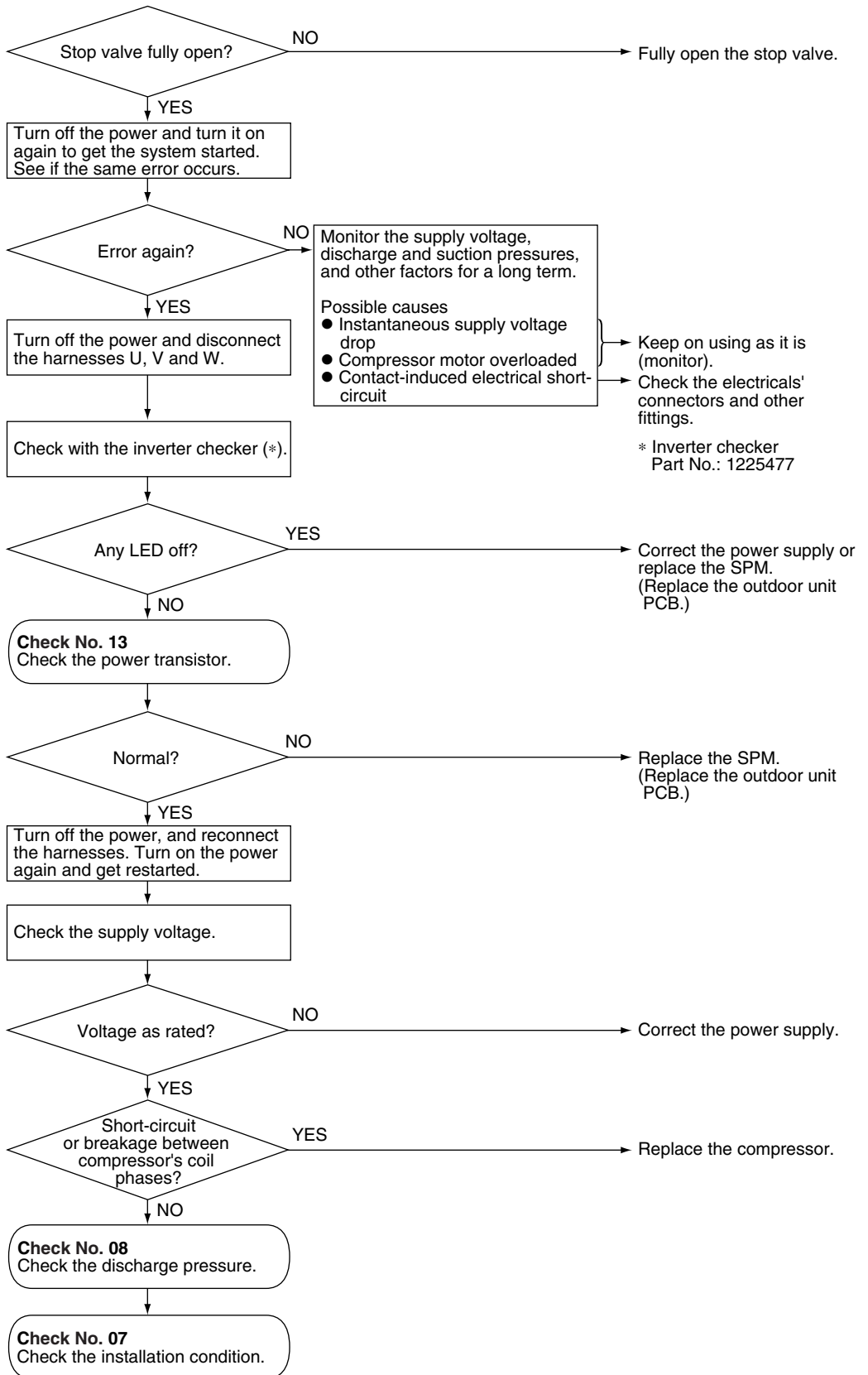


**Check No.13**  
Refer to P.130



**Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

\* An output over-current may result from wrong internal wiring. If the wires have been disconnected and reconnected for part replacement, for example, and the system is interrupted by an output over-current, take the following procedure.



(R4705)

## 4.20 Insufficient Gas

### 4.20.1 RK(X)D50-71B, RKD15/18G

Remote  
Controller  
Display



Method of  
Malfunction  
Detection

**Gas shortage detection I :**

A gas shortage is detected by checking the CT-detected input current value and the compressor running frequency.

**Gas shortage detection II :**

A gas shortage is detected by checking the difference between indoor unit heat exchanger temperature and room temperature as well as the difference between outdoor unit heat exchanger temperature and room temperature.

Malfunction  
Decision  
Conditions

**Gas shortage detection I :**

$DC \text{ current} \leq A \text{ (A/Hz)} \times \text{Output frequency} + B$

However, when the status of running frequency > 55 (Hz) is kept on for a certain time.

Note : The values are different from model to model.

	A	B
2YC63	2420 / 256	55
Others	2600 / 256	-300

**Gas shortage detection II :**

If a gas shortage error takes place 4 times successively, the system will be shut down. The error counter will reset itself if this or any other error does not occur during the following 60-minute compressor running time (total time).

Supposed  
Causes

- Refrigerant shortage (refrigerant leakage)
- Poor compression performance of compressor
- Discharge pipe thermistor disconnected, or indoor unit or outdoor unit heat exchanger thermistor disconnected, room or outside air temperature thermistor disconnected
- Stop valve closed
- Electronic expansion valve defective

Troubleshooting



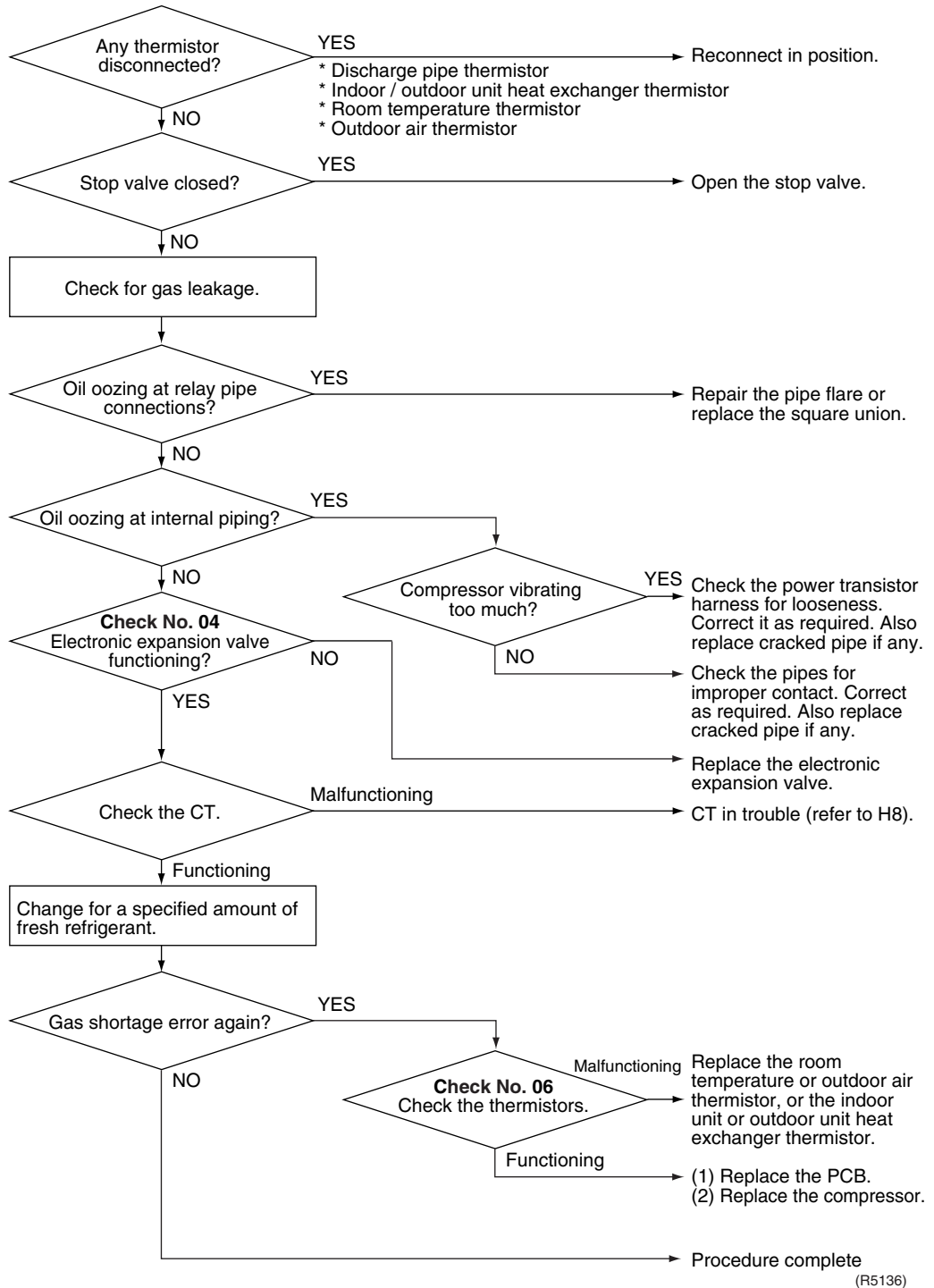
Check No.04  
Refer to P.124



Check No.06  
Refer to P.126



**Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(R5136)

## 4.20.2 RKD24/28G

### Remote Controller Display



### Method of Malfunction Detection

#### Gas shortage detection I:

Gas shortage is detected by checking the input current value and the compressor running frequency. If the gas is short, the input current is smaller than the normal value.

#### Gas shortage detection II:

Gas shortage is detected by checking the discharge temperature and the opening of the electronic expansion valve. If the gas is short, the discharge temperature tends to rise.

### Malfunction Decision Conditions

#### Gas shortage detection I:

The following conditions continue for 7 minutes.

- ◆ Input current × input voltage ≤ 4000 / 256 × output frequency +100 (W)
- ◆ Output frequency > 54 (Hz)

#### Gas shortage detection II:

The following conditions continue for 80 seconds.

- ◆ Target opening of the electronic expansion valve ≥ 450 (pulse)
- ◆ Cooling: discharge temperature > 255 / 256 × target discharge temperature +20 (°C)  
Heating: discharge temperature > 255 / 256 × target discharge temperature +45 (°C)

If a gas shortage error takes place 4 times straight, the system will be shut down. The error counter will reset itself if this or any other error does not occur during the following 60-minute compressor running time (total time).

### Supposed Causes

- Refrigerant shortage (refrigerant leakage)
- Poor compression performance of compressor
- Discharge pipe thermistor disconnected, or indoor unit or outdoor unit heat exchanger thermistor disconnected, room or outside air temperature thermistor disconnected
- Stop valve closed
- Electronic expansion valve defective



Troubleshooting



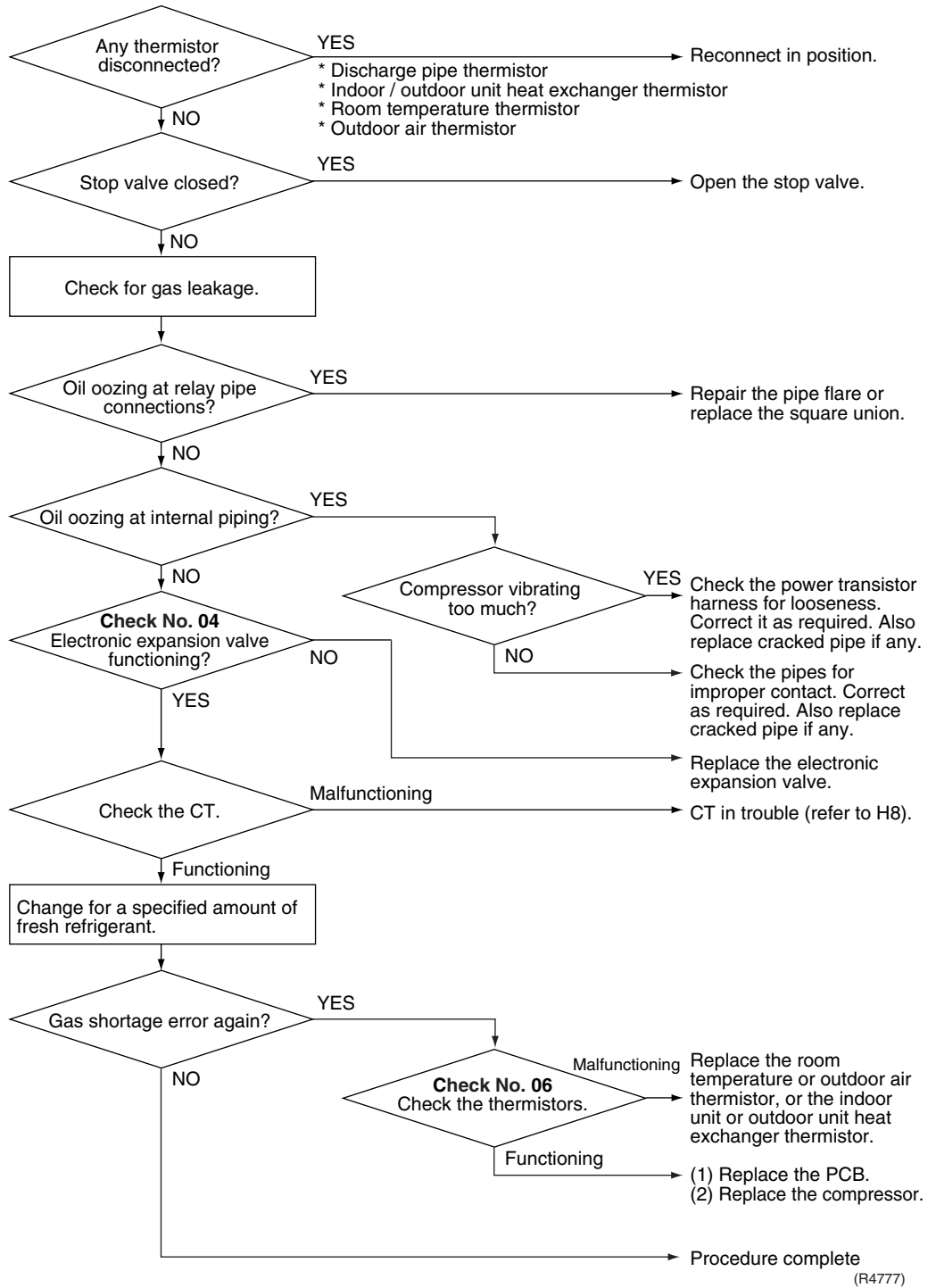
Check No.04  
Refer to P.124



Check No.06  
Refer to P.126



**Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



## 4.21 Low-voltage Detection or Over-voltage Detection

Remote  
Controller  
Display

U2

Method of  
Malfunction  
Detection

An abnormal voltage rise or drop is detected by checking the detection circuit or DC voltage detection circuit.

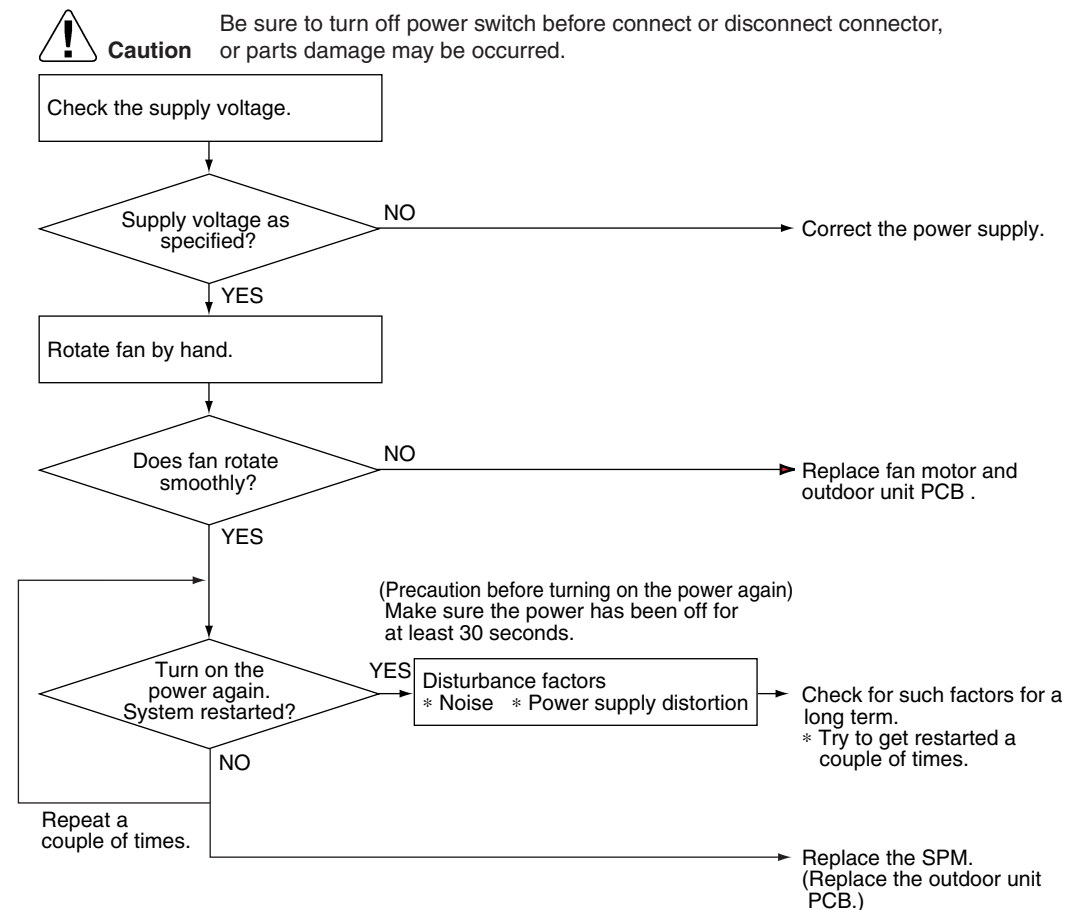
Malfunction  
Decision  
Conditions

- An over-voltage signal is fed from the over-voltage detection circuit to the microcomputer, or the voltage being detected by the DC voltage detection circuit is judged to be below 150 V for 0.1 second.
- The system will be shut down if the error occurs 16 times.
- Clearing condition: Continuous run for about 60 minutes (normal)

Supposed  
Causes

- Supply voltage not as specified
- Over-voltage detector or DC voltage detection circuit defective
- PAM control part(s) defective
- Short circuit inside the fan motor winding.

Troubleshooting



(R7024)

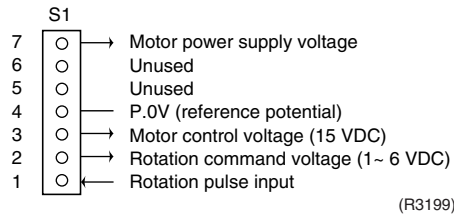
# 5. Check

## 5.1 How to Check

### 5.1.1 Fan Motor Connector Output Check

**Check No.01**

1. Check connector connection.
2. Check motor power supply voltage output (pins 4-7).
3. Check motor control voltage (pins 4-3).
4. Check rotation command voltage output (pins 4-2).
5. Check rotation pulse input (pins 4-1).

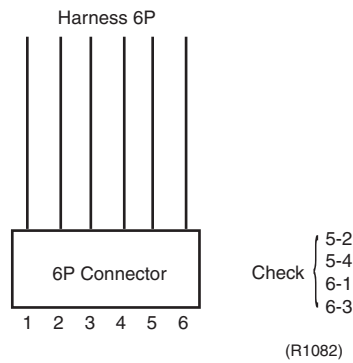


### 5.1.2 Electronic Expansion Valve Check

**Check No.04**

Conduct the followings to check the electronic expansion valve (EV).

1. Check to see if the EV connector is correctly inserted in the PCB. Compare the EV unit and the connector number.
2. Turn the power off and back on again, and check to see if all the EVs generate latching sound.
3. If any of the EVs does not generate latching noise in the above step 2, disconnect that connector and check the conductivity using a tester.  
Check the conductivity between pins 1, 3 and 6, and between pins 2, 4 and 5. If there is no conductivity between the pins, the EV coil is faulty.



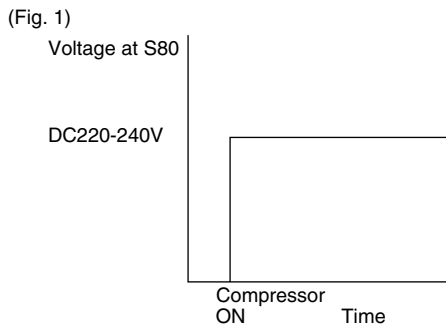
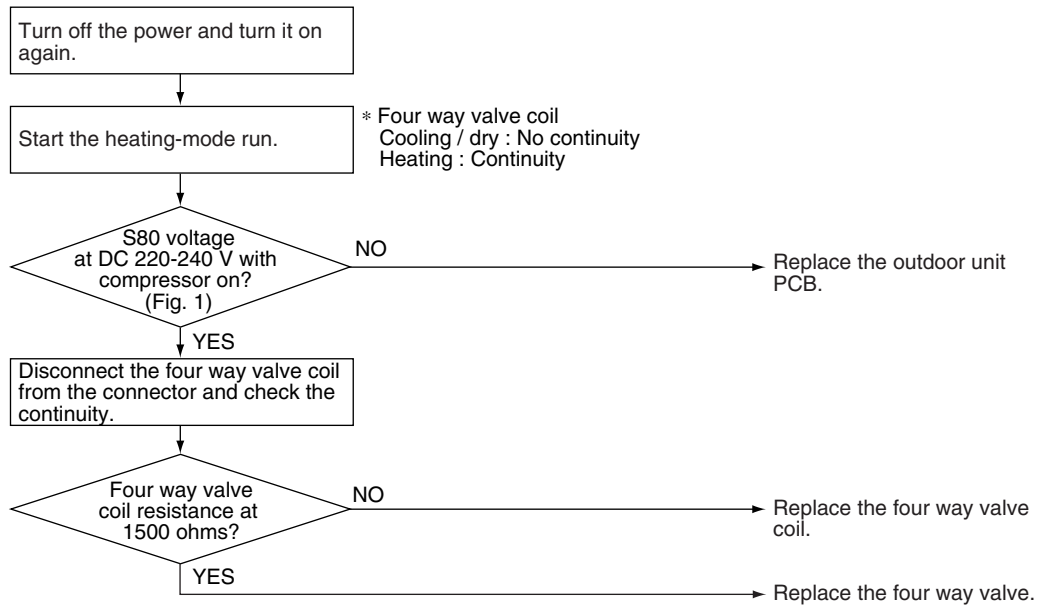
4. If no EV generates latching sound in the above step 2, the outdoor unit PCB is faulty.
5. If the conductivity is confirmed in the above step 2, mount a good coil (which generated latching sound) in the EV unit that did not generate latching sound, and check to see if that EV generates latching sound.  
\*If latching sound is generated, the outdoor unit PCB is faulty.  
\*If latching sound is not generated, the EV unit is faulty.



**Note:** Please note that the latching sound varies depending on the valve type.

### 5.1.3 Four Way Valve Performance Check

Check No.05



(R5220)

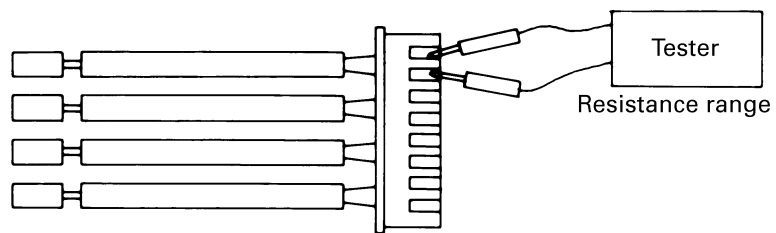
### 5.1.4 Thermistor Resistance Check

**Check No.06**

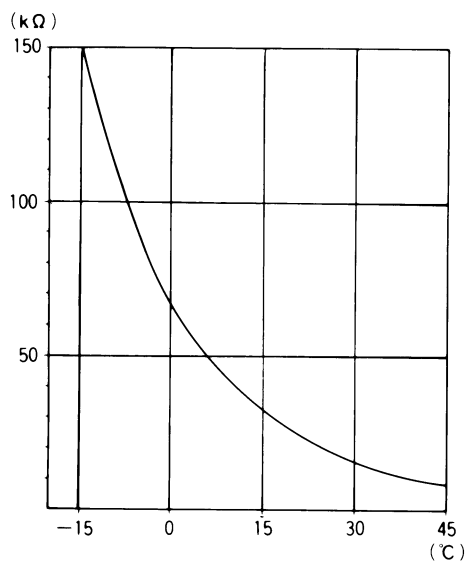
Remove the connectors of the thermistors on the PCB, and measure the resistance of each thermistor using tester.

The relationship between normal temperature and resistance is shown in the graph and the table below.

Temperature (°C)	Thermistor R25°C=20kΩ B=3950
-20	211.0 (kΩ)
-15	150
-10	116.5
-5	88
0	67.2
5	51.9
10	40
15	31.8
20	25
25	20
30	16
35	13
40	10.6
45	8.7
50	7.2



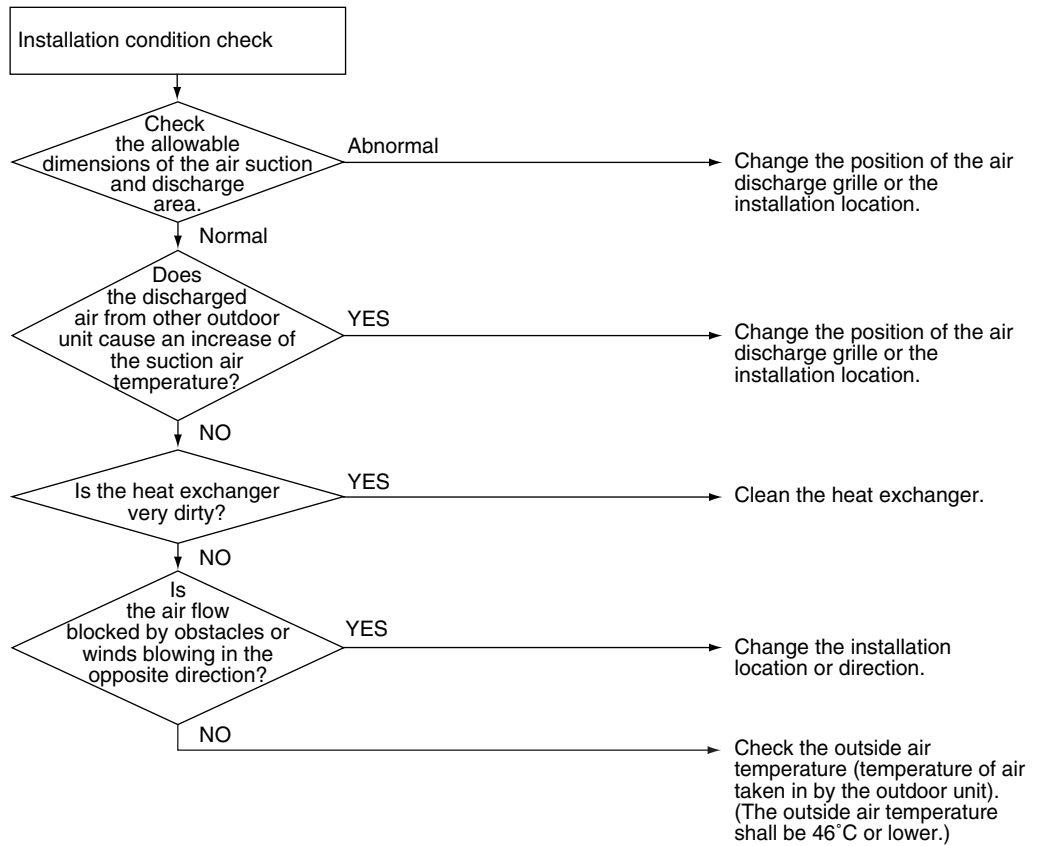
( R25 = 20k Ω 、 B = 3950 )



(R1437)

## 5.1.5 Installation Condition Check

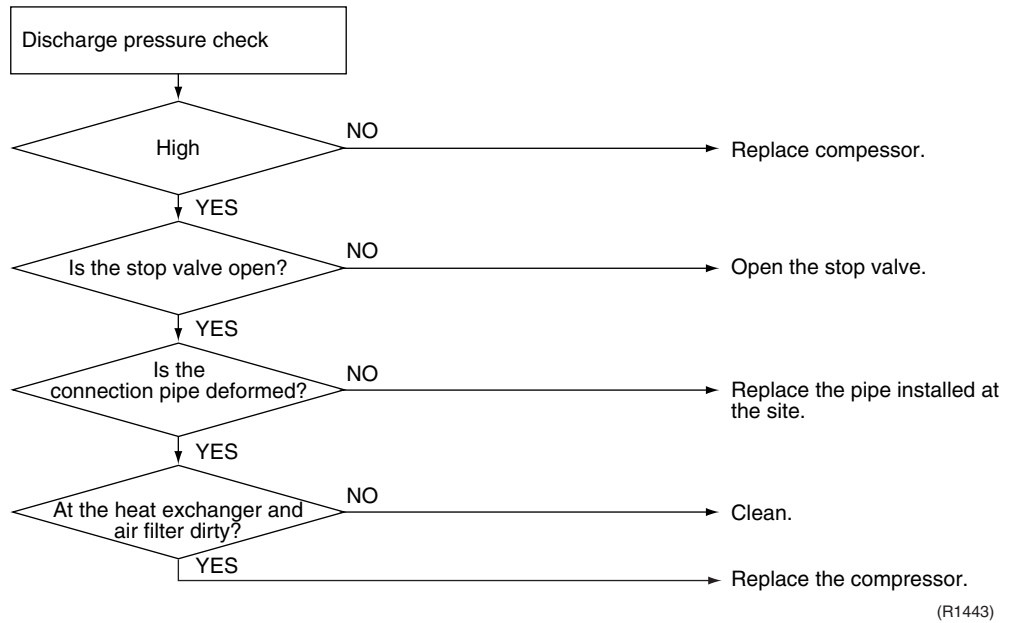
### Check No.07



(R5221)

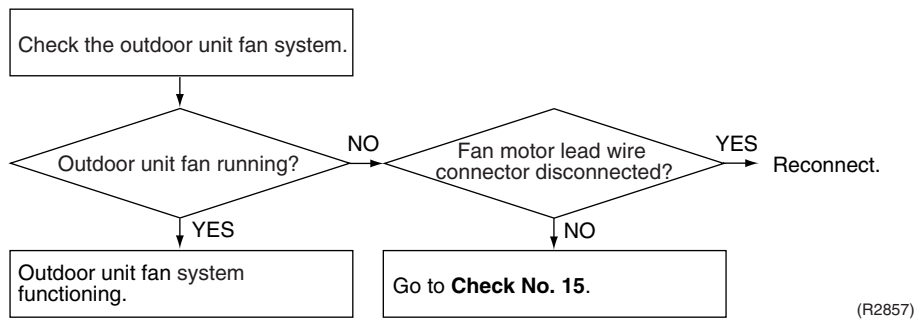
### 5.1.6 Discharge Pressure Check

Check No.08



### 5.1.7 Outdoor Unit Fan System Check (With DC Motor)

Check No.09



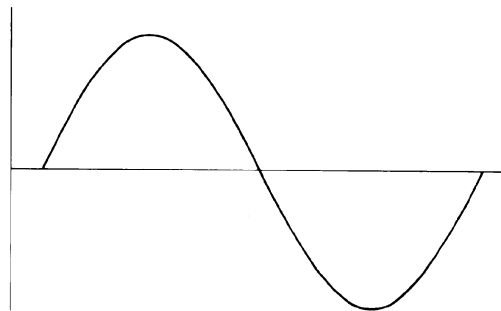
## 5.1.8 Power Supply Waveforms Check

### Check No.10

Measure the power supply waveform between pins 1 and 3 on the terminal board, and check the waveform disturbance.

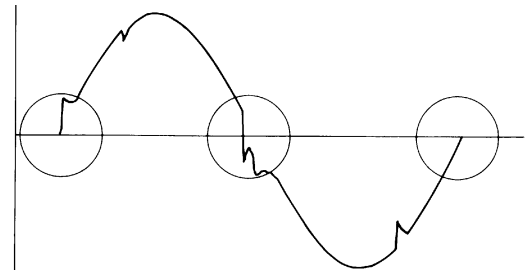
- Check to see if the power supply waveform is a sine wave (Fig.1).
- Check to see if there is waveform disturbance near the zero cross (sections circled in Fig.2)

[Fig.1]



(R1736)

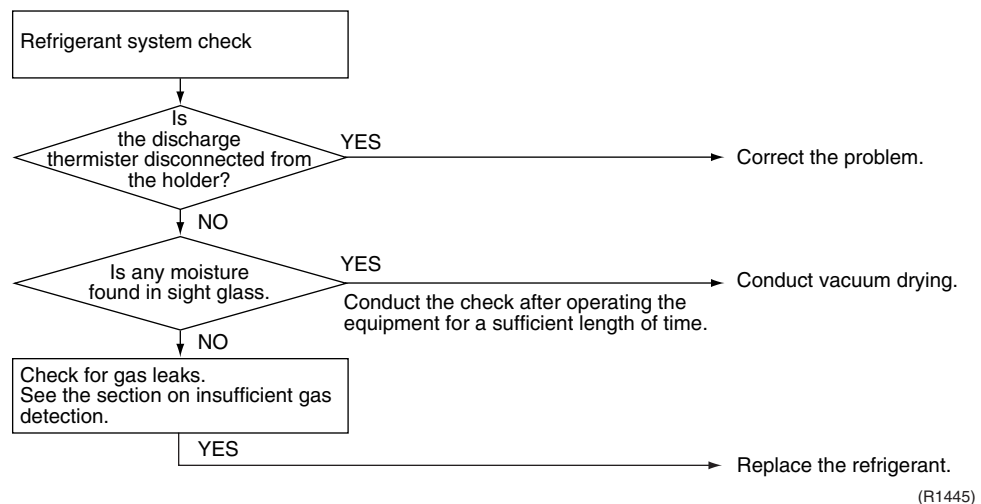
[Fig.2]



(R1444)

## 5.1.9 Inverter Units Refrigerant System Check

### Check No.11



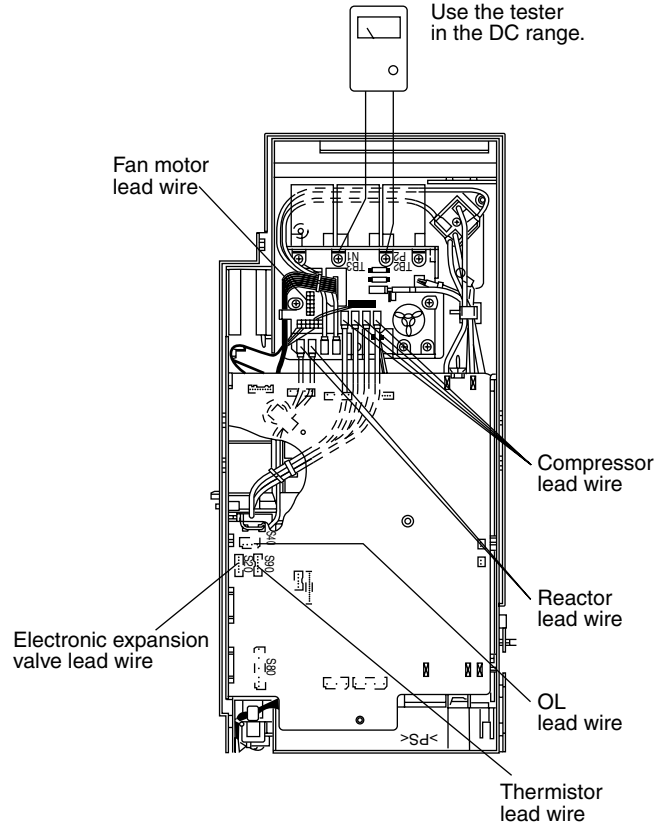


### 5.1.10 Capacitor Voltage Check

**Check No.12**

Before this checking, be sure to check the main circuit for short-circuit.

- Checking the capacitor voltage
- With the circuit breaker still on, measure the voltage according to the drawing of the model in question. Be careful never to touch any live parts.



(R6264)

### 5.1.11 Power Transistor Check

**Check No.13**

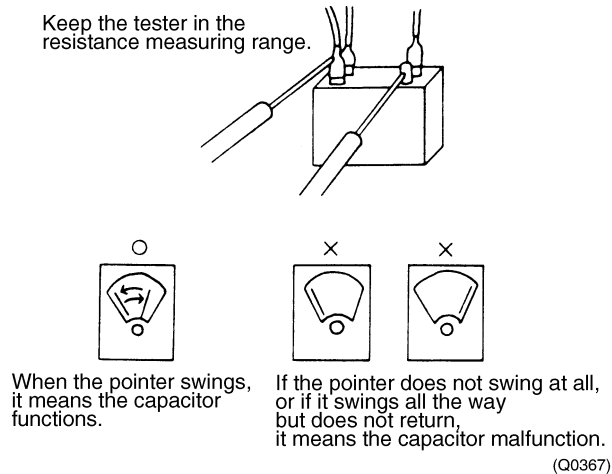
- Checking the power transistor
- Never touch any live parts for at least 10 minutes after turning off the circuit breaker.
- If unavoidably necessary to touch a live part, make sure the power transistor's supply voltage is below 50 V using the tester.
- For the UVW, make measurements at the Faston terminal on the board or the relay connector.

Tester's negative terminal	Power transistor (+)	UVW	Power transistor (-)	UVW
Tester's positive terminal	UVW	Power transistor (+)	UVW	Power transistor (-)
Normal resistance	Several kohms to several Mohms			
Abnormal resistance	0 or ∞			

## 5.1.12 Main Circuit Electrolytic Capacitor Check

### Check No.14

- Checking the main circuit electrolytic capacitor
- Never touch any live parts for at least 10 minutes after turning off the circuit breaker.
- If unavoidably necessary to touch a live part, make sure there is no DC voltage using the tester.
- Check the continuity with the tester. Reverse the pins and make sure there is continuity.



## 5.1.13 Turning Speed Pulse Input on the Outdoor Unit PCB Check

### Check No.15

<Propeller fan motor>

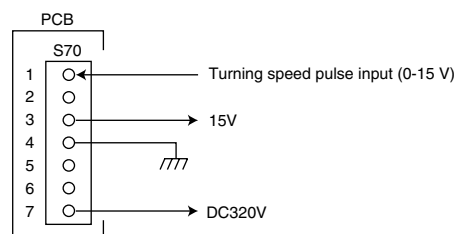
Make sure the voltage of  $320\pm 30V$  is being applied.

- (1) Stop the operation first and then the power off, and disconnect the connector S70.
- (2) Make sure there is about DC 320 V between pins 4 and 7.
- (3) With the system and the power still off, reconnect the connector S70.
- (4) Make a turn of the fan motor with a hand, and make sure the pulse (0-15 V) appears twice at pins 1 and 4.

If the fuse for fan motor protection is blown out, the outdoor-unit fan may also be in trouble. Check the fan too.

If the voltage in Step (2) is not applied, it means the PCB is defective. Replace the PCB.

If the pulse in Step (4) is not available, it means the Hall IC is defective. Replace the DC fan motor. If there are both the voltage (2) and the pulse (4), replace the PCB.



(R5223)

\* Propeller fan motor : S70



# Part 7

## Removal Procedure

1. Indoor Unit.....	134
1.1 Removal of Air Filter / Front Panel .....	134
1.2 Removal of Front Grille .....	137
1.3 Removal of Horizontal Blades / Vertical Blades .....	139
1.4 Removal of Electrical Box / PCB / Swing Motor .....	141
1.5 Removal of Heat Exchanger .....	147
1.6 Removal of Fan Rotor / Fan Motor.....	150
2. Outdoor Unit.....	152
2.1 RKD50/60/71BVM, RK(X)D50/60/71BVMA, RKD15/18GV2S .....	152
2.2 RKD24/28GV2S .....	176

# 1. Indoor Unit

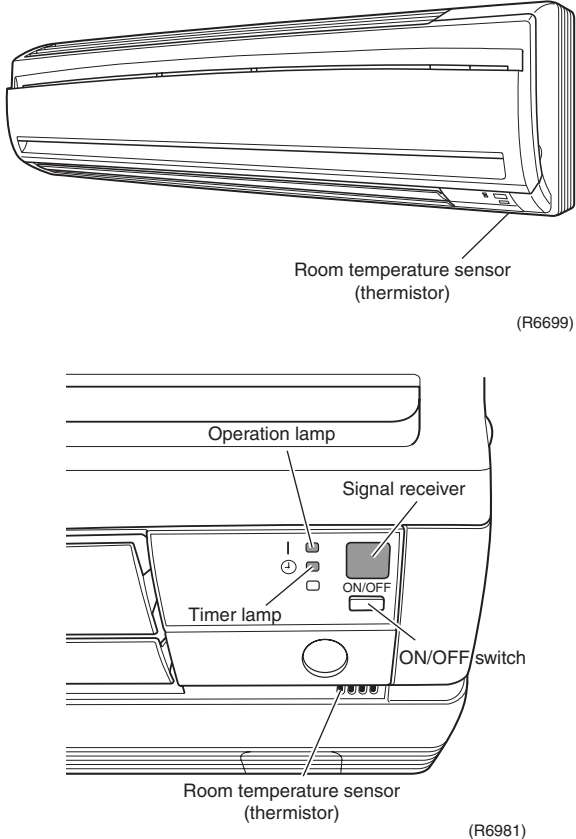
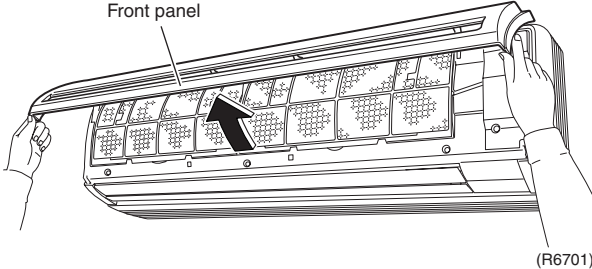
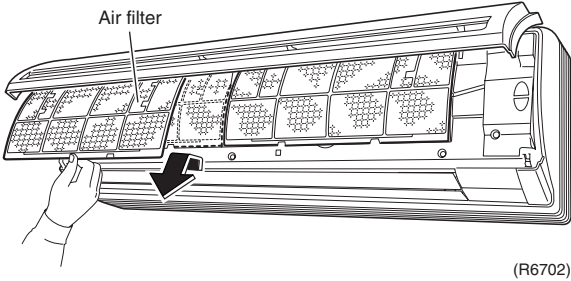
## 1.1 Removal of Air Filter / Front Panel

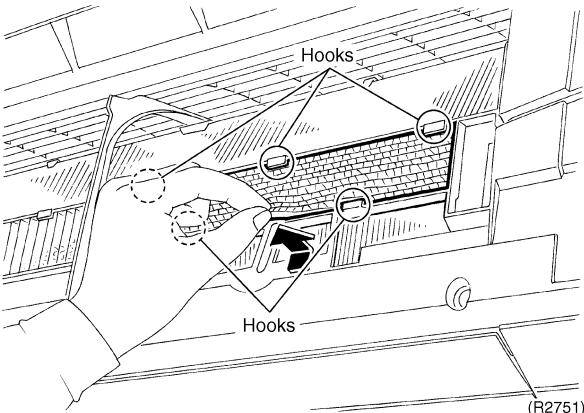
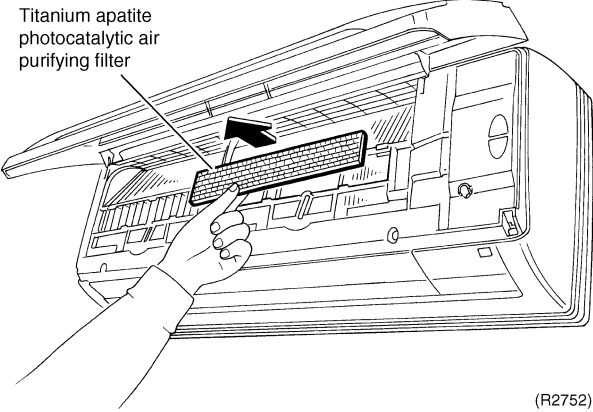
**Procedure**

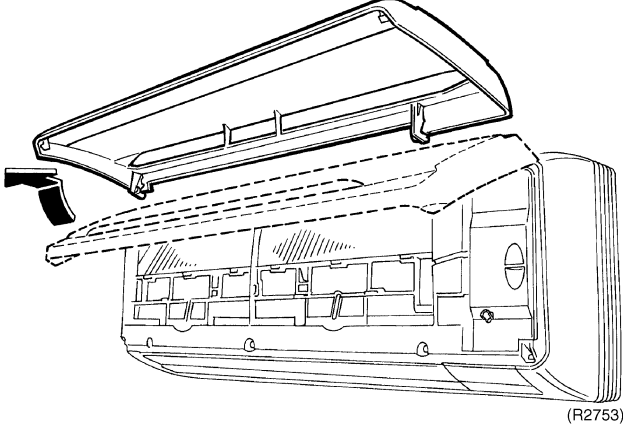
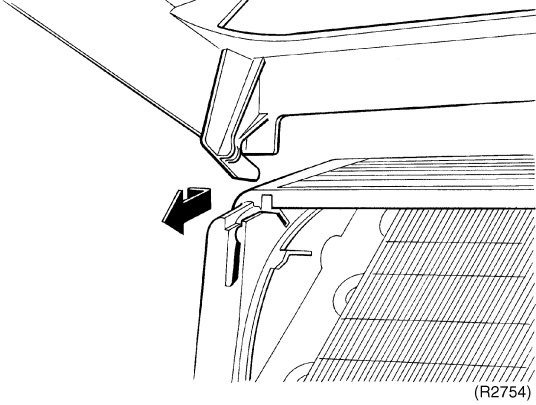
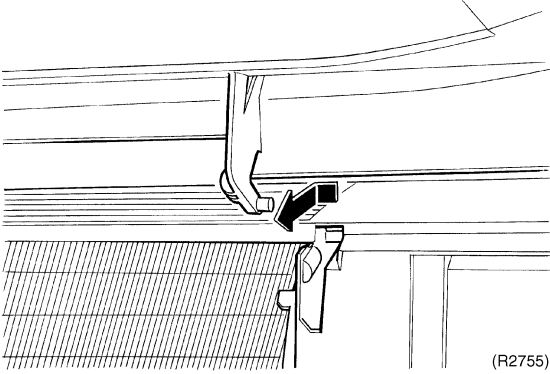


**Warning**

Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
<p>1. Features</p>		<ul style="list-style-type: none"> <li>When the <b>signal receiver</b> catches a signal from the remote controller, it produces beep sound and the operation lamp blinks.</li> </ul>
<p>2. Remove the air filters.</p>	<p>1 Hold the <b>front panel</b> by the tabs on the both sides and lift it until it stops with a click.</p>  <p>2 Lift an <b>air filter</b> upwards slightly by the center knob, and then pull it out downwards.</p> 	<ul style="list-style-type: none"> <li>The right and left filters are interchangeable.</li> <li>Insert the air filters along grooves when installing.</li> <li>Set the air filters with displaying "FRONT" on the front side.</li> <li>Insert 2 hooks of the air filter completely.</li> </ul>

Step	Procedure	Points
<p>3. Remove an "titanium apatite photocatalytic air purifying filter".</p>	<p>1 Push up the bottom of an air purifying filter to undo the hooks (2 on lower, 3 on upper) and take the filter out.</p>  	<ul style="list-style-type: none"> <li>■ The right and left filters are interchangeable.</li> </ul>

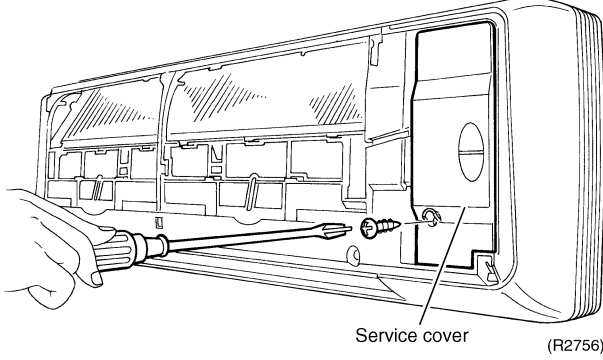
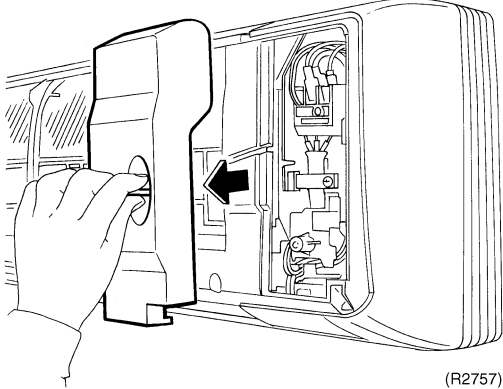
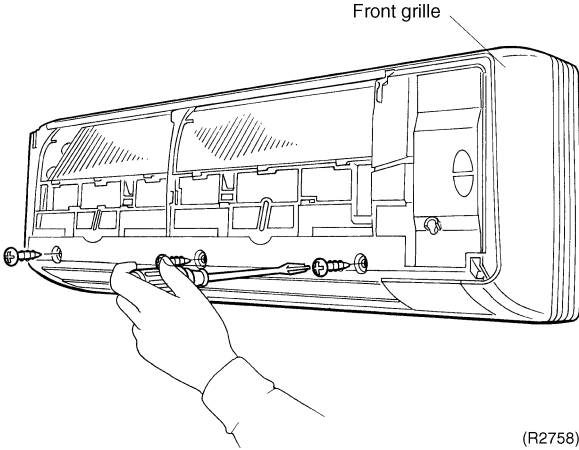
Step	Procedure	Points
<p>4. Remove the front panel.</p> <p>1</p>	<p>While opening the front panel further than it stops, release both axes and remove the front panel.</p>  <p>(R2753)</p>  <p>(R2754)</p>  <p>(R2755)</p>	<ul style="list-style-type: none"> <li>■ Slide the front panel side to side to release each axis.</li> <li>■ Align the right and left axes with grooves in turn and insert them to the end when installing.</li> </ul>

## 1.2 Removal of Front Grille

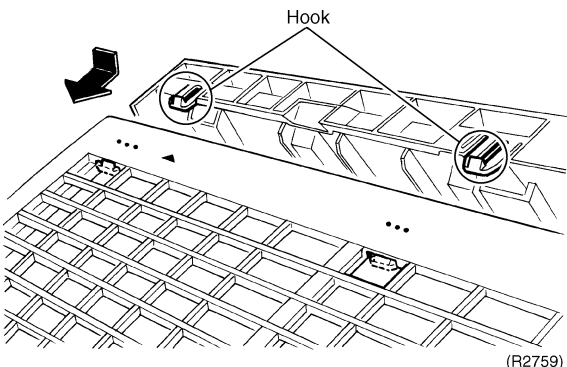
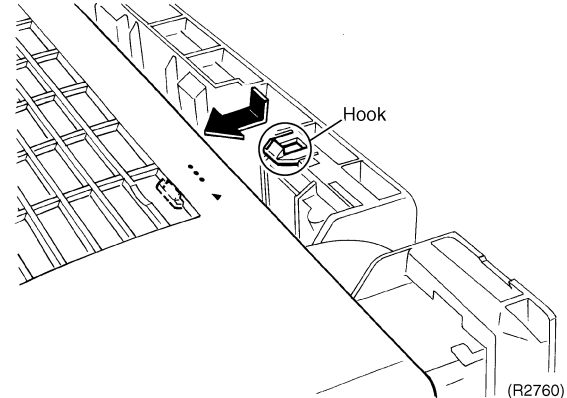
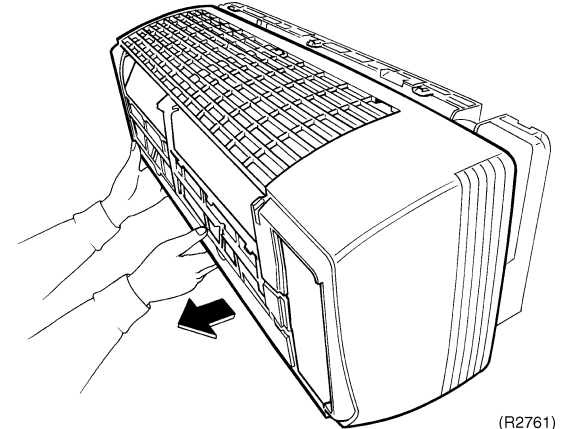
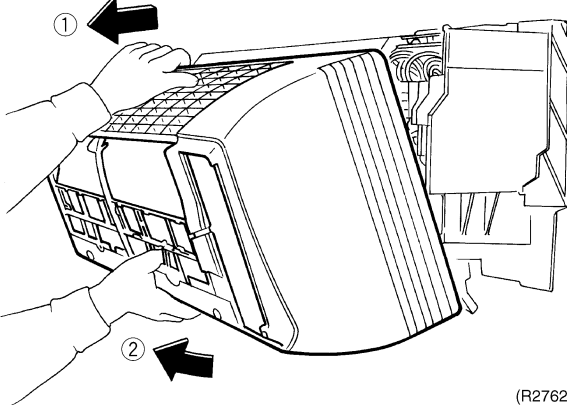
### Procedure



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

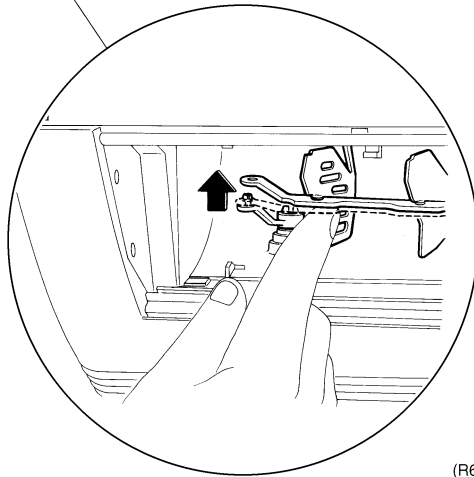
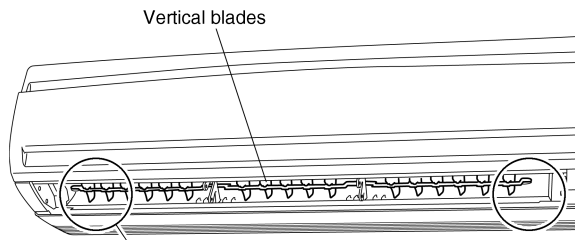
Step	Procedure	Points
<p>1. Remove the <b>service cover</b>.</p> <p>1 Loosen the screw and remove the service cover by the knob.</p>	 <p>Service cover (R2756)</p>  <p>(R2757)</p>	<ul style="list-style-type: none"> <li>■ No field setting switch is inside it.</li> <li>■ You can remove the front grille without detaching the service cover.</li> </ul>
<p>2. Remove the <b>front grille</b>.</p> <p>1 Loosen the 3 fixing screws of the front grille.</p>	 <p>Front grille (R2758)</p>	<ul style="list-style-type: none"> <li>■ It has no fixing screws inside blades, though previous models had.</li> </ul>



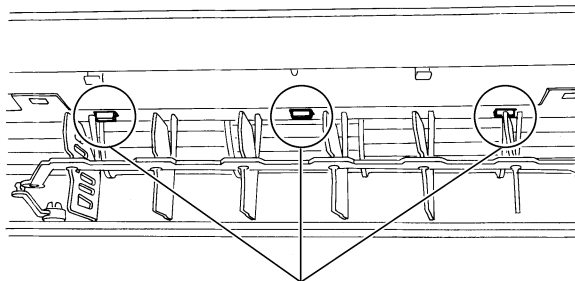
Step	Procedure	Procedure	Points
<p>2</p> <p>Undo the 3 hooks on the top of the front grille.</p>		 <p>(R2759)</p>  <p>(R2760)</p>  <p>(R2761)</p>	<ul style="list-style-type: none"> <li>■ The front grille has 3 hooks on the center and the both sides of the upper part.</li> <li>■ Refer to the removal procedure in a reverse way when reassembling.</li> </ul>
<p>3</p> <p>Pull the upper part of the front grille out and lift the lower part up, and then remove the front grille.</p>		 <p>(R2762)</p>	<ul style="list-style-type: none"> <li>■ Make sure that all the hooks are placed securely when reassembling.</li> </ul>



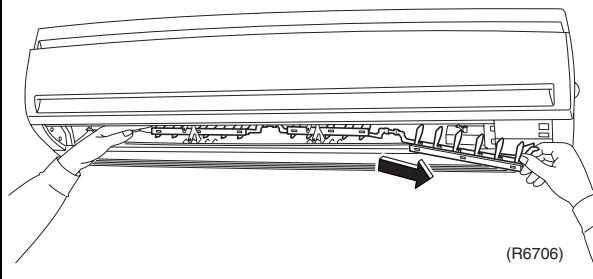
Step	Procedure	Points
2.	Remove the vertical blades.	
1	Undo the right and left pivots.	
2	Undo the 3 hooks.	
3	Pull the vertical blades rightwards and remove it.	



(R6705)



(R2768)



(R6706)

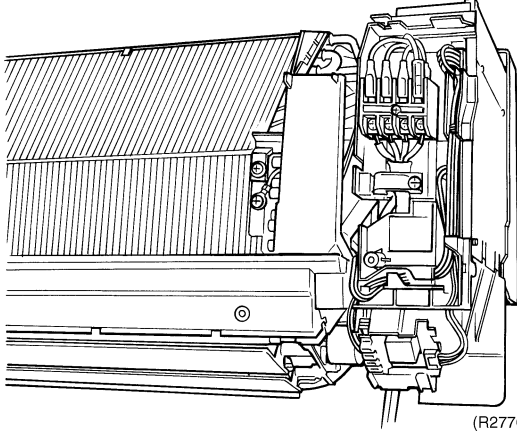
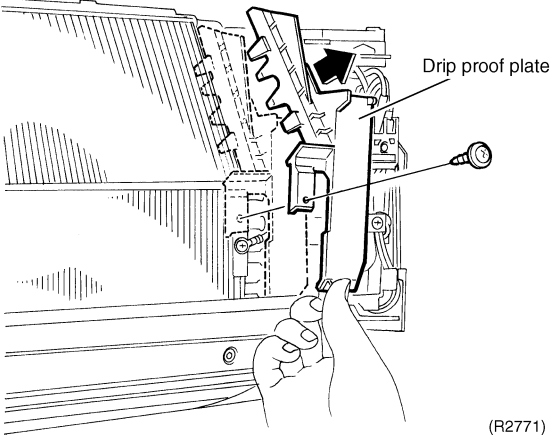
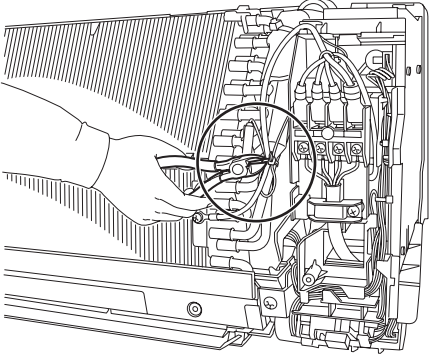
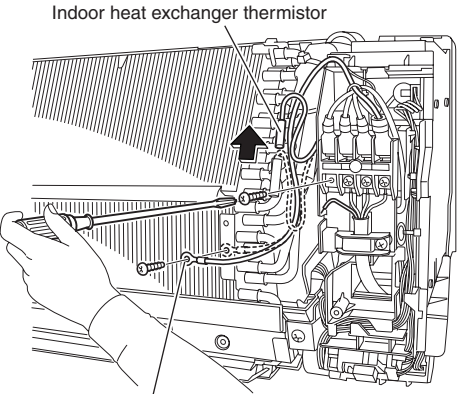
## 1.4 Removal of Electrical Box / PCB / Swing Motor

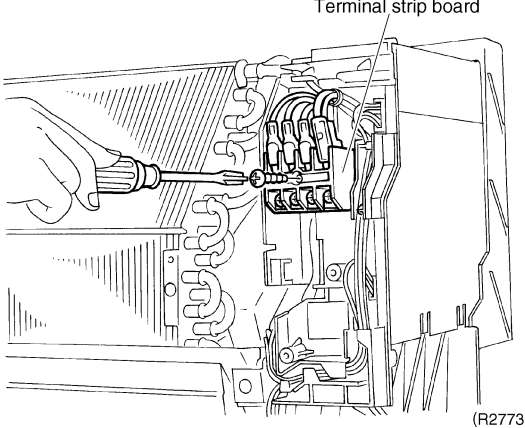
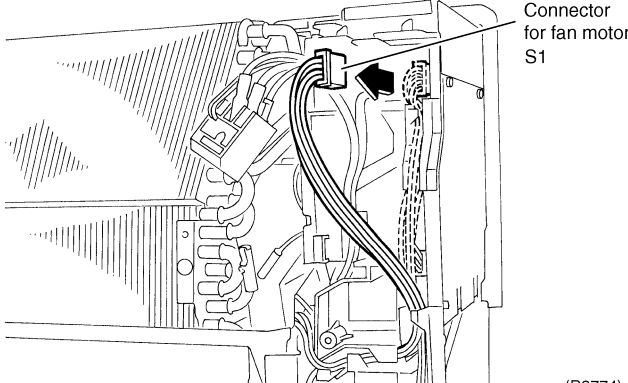
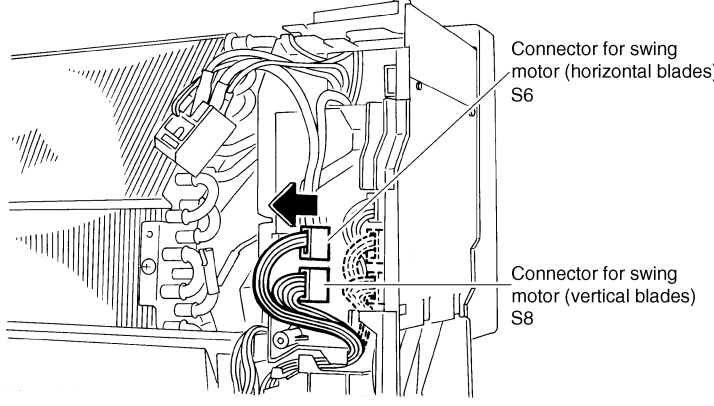
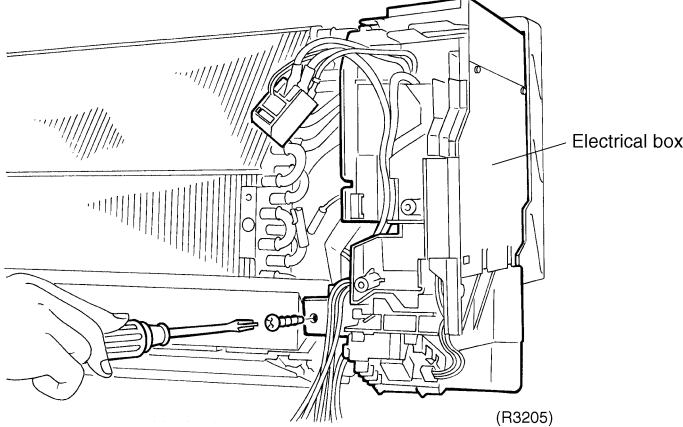
### Procedure



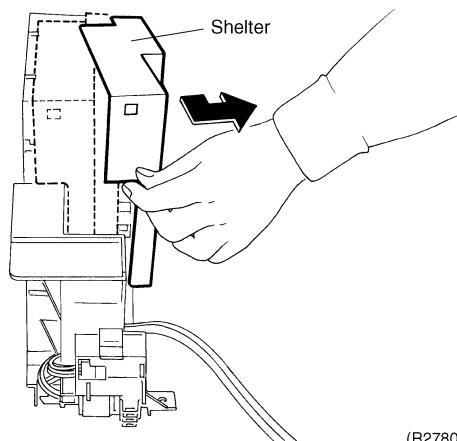
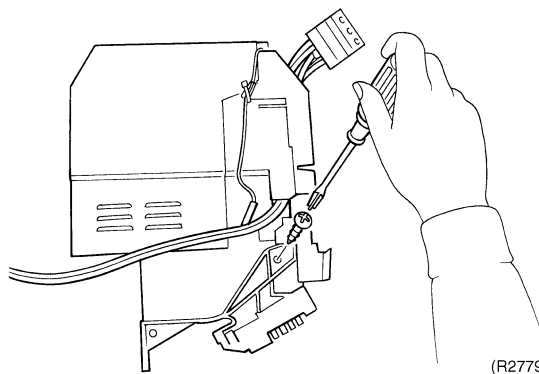
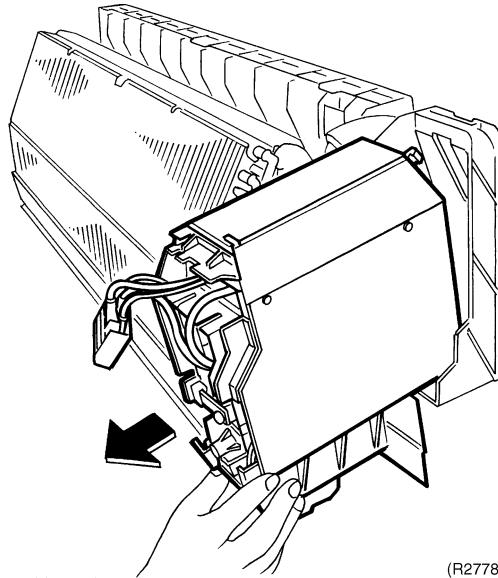
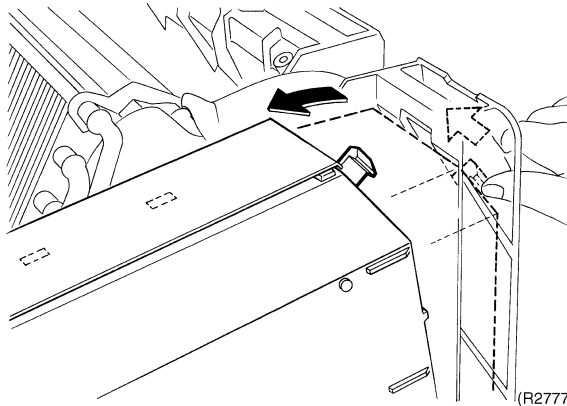
### Warning

Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

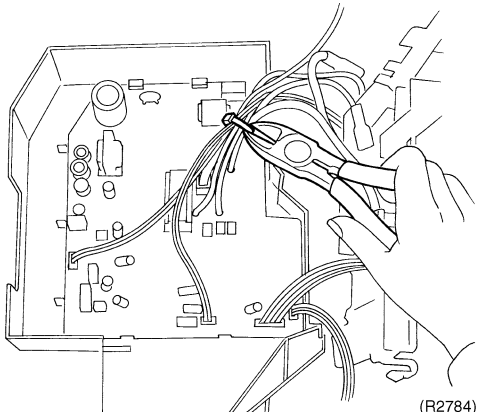
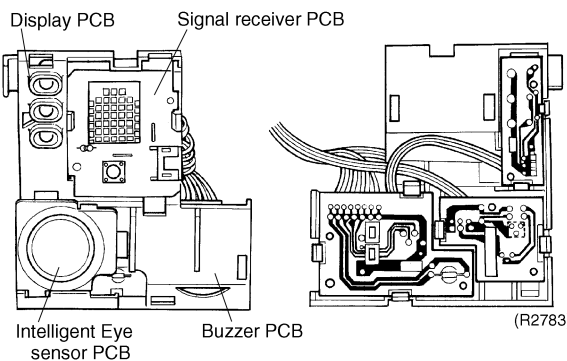
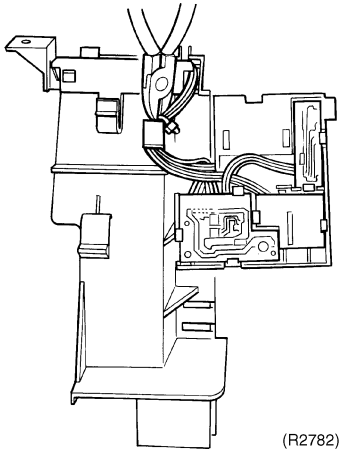
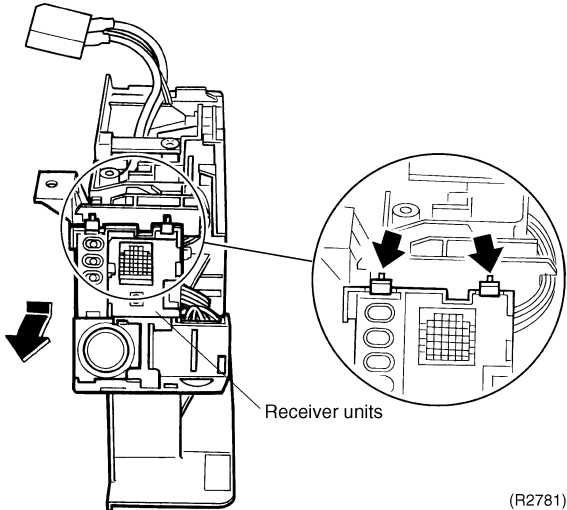
Step	Procedure	Points
1. Remove the front grille.	 <p style="text-align: right;">(R2770)</p>	<ul style="list-style-type: none"> <li>■ Parts layout</li> </ul>
2. Remove the drip proof plate.	<p>1 Loosen the screw.</p>  <p style="text-align: right;">(R2771)</p> <p>2 Cut the clamp.</p>  <p style="text-align: right;">(R6707)</p>	
3. Disconnect the indoor heat exchanger thermistor and the earth.	 <p style="text-align: right;">(R6708)</p>	<ul style="list-style-type: none"> <li>■ Mind that not to lose the clip for the thermistor.</li> </ul>

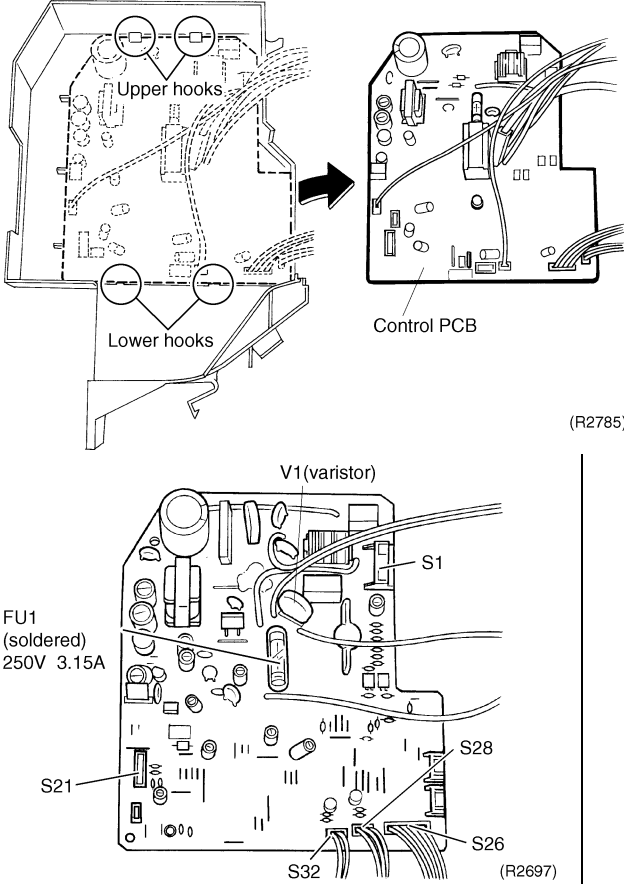
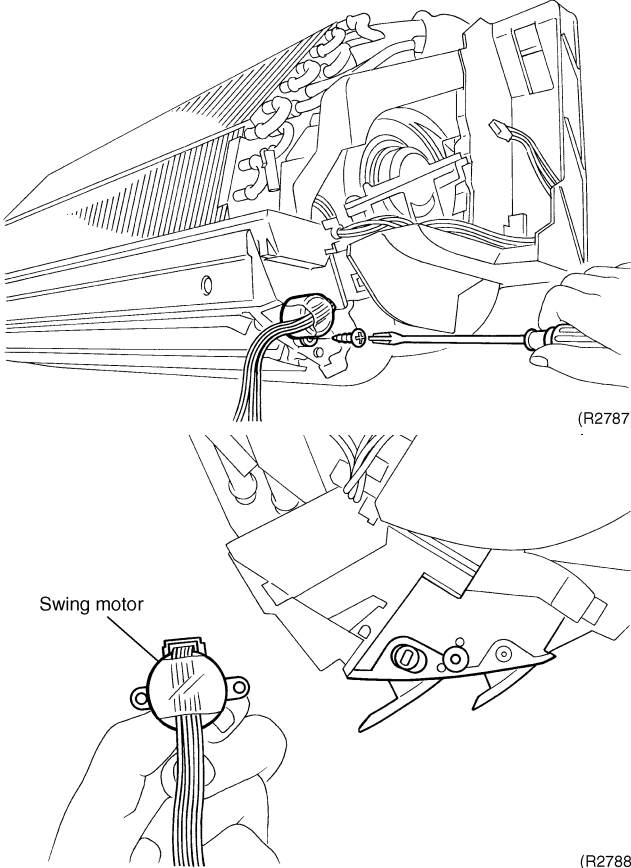
Step	Procedure	Points
4.	Remove the electrical box.	
1	Disconnect the 4 connection wirings. Loosen the screw and remove the terminal strip board.	<ul style="list-style-type: none"> <li>■ You can remove the electrical box without detaching the terminal strip board.</li> <li>■ Screw: M4×25</li> </ul>
2	Disconnect the connectors for fan motor (S1).	
3	Disconnect the connectors for swing motor (S6, S8).	
4	Loosen the fixing screw of the electrical box.	
		

Step	Procedure	Points
5	Dislocate the electrical box to the left and undo the back hook.	<ul style="list-style-type: none"> <li>■ The electrical box has a hook on its back.</li> </ul>
6	Pull the electrical box out towards you.	<ul style="list-style-type: none"> <li>■ Catch the back hook of the electrical box when reassembling.</li> </ul>
7	Loosen the screw on the electrical box.	<ul style="list-style-type: none"> <li>■ Screw: M4×16</li> </ul>
8	Push the <b>shelter</b> up and undo the hook.	

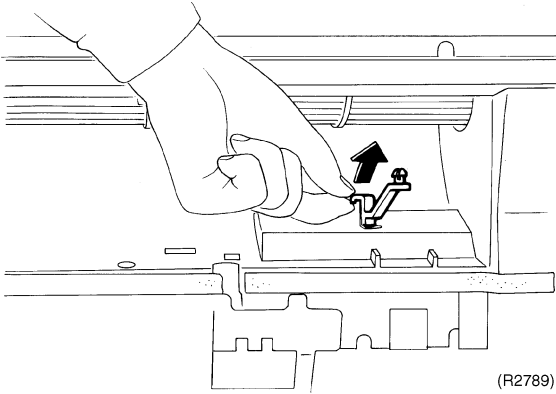
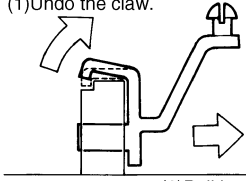
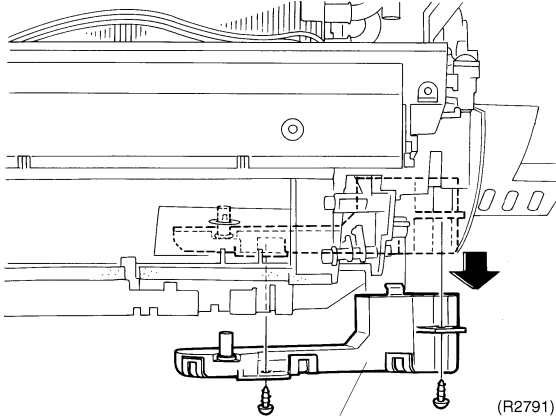
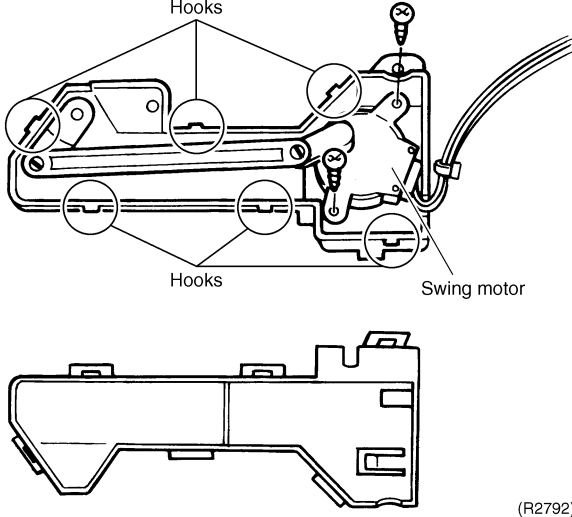


Step	Procedure	Points
9	<p>Press the <b>receiver units</b> down and undo the hooks on the upper side, and then undo the hooks on the lower side.</p>	<ul style="list-style-type: none"> <li>Release the hooks on the upper side.</li> </ul>
10	<p>Cut the clamp.</p>	(R2781)
11	<p>The receiver units contain 4 PCBs. Remove each PCB with releasing hooks. Disconnect every connector from each PCB.</p>	<ul style="list-style-type: none"> <li>Remove the receiver units while pushing the hooks of connectors.</li> </ul>
12	<p>Cut the clamp.</p>	<ul style="list-style-type: none"> <li>Clamps should be always available. Fix it as it was before.</li> </ul>



Step	Procedure	Points
<p>5. Remove the control PCB.</p> <p>1 Undo the 2 hooks on the lower side, and then the 2 hooks on the upper side. Remove the control PCB.</p> <p>2 <b>Control PCB (indoor unit)</b>  <b>S1:</b> connector for the fan motor  <b>S21:</b> HA  <b>S26:</b> connector for buzzer PCB thermistor  <b>S28:</b> connector for signal receiver PCB  <b>S32:</b> connector for the heat exchanger thermistor</p>		
<p>6. Remove the swing motor for horizontal blades.</p> <p>1 Remove the screw of the swing motor.</p>		



Step	Procedure	Points
7. Remove the swing motor for vertical blades.		
1 Release the swing axis on the right side.	 <p>(R2789)</p>	<p>■ Releasing the swing axis</p> <p>(1) Undo the claw.</p>  <p>(2) Pull it out.</p> <p>(R2790)</p>
2 Loosen the 2 screws and detach the swing motor assembly.	 <p>Swing motor assembly</p> <p>(R2791)</p>	
3 Loosen the 2 screws and remove the swing motor.	 <p>Hooks</p> <p>Swing motor</p> <p>Hooks</p> <p>(R2792)</p>	<p>■ 6 hooks hold the assembly.</p>

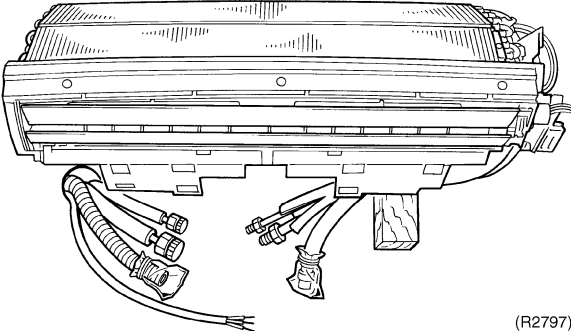
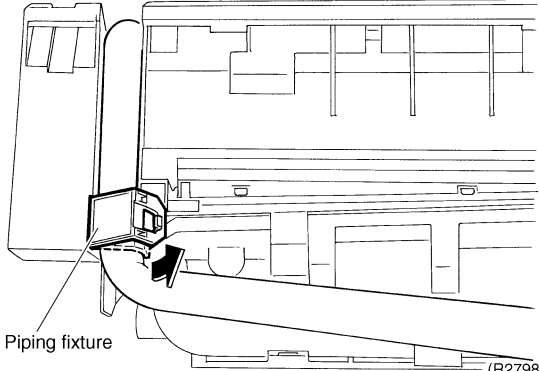
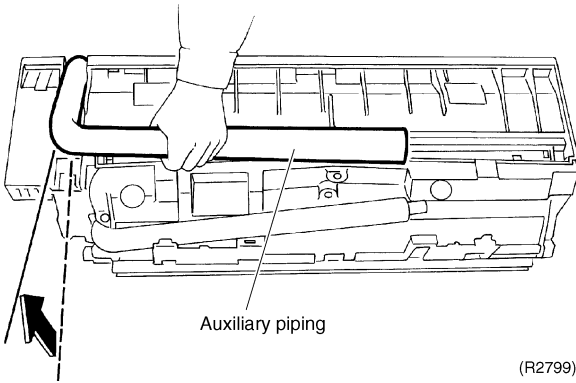
# 1.5 Removal of Heat Exchanger

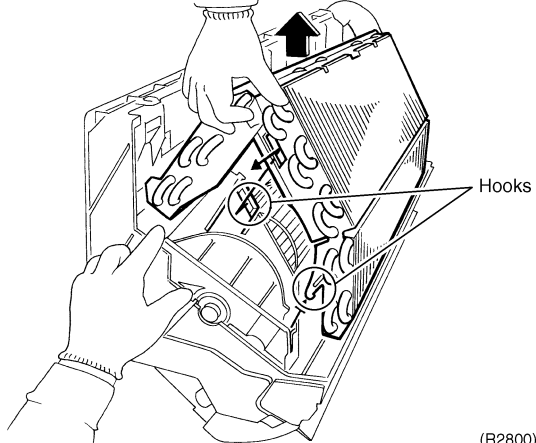
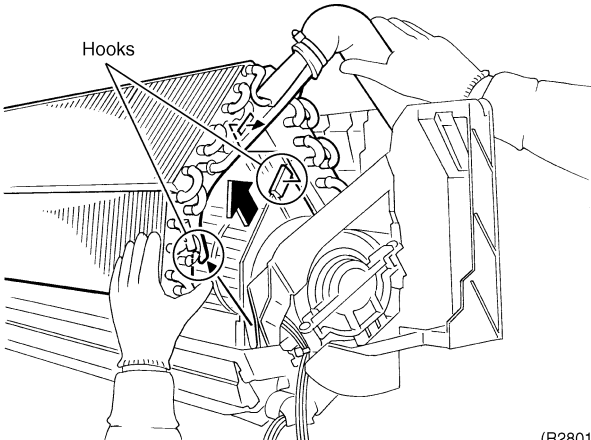
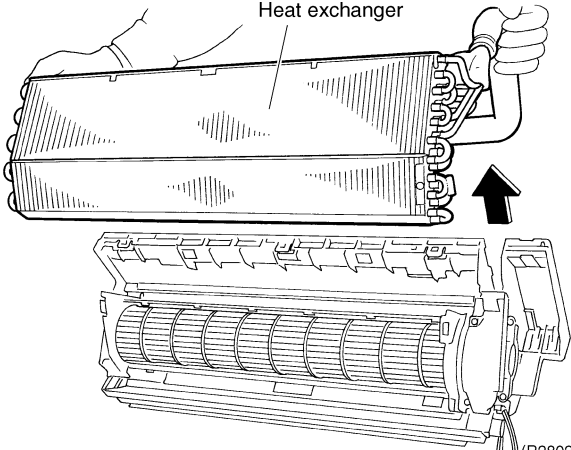
**Procedure**



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
<p>■ Remove the electrical box.</p> <p>1. Disconnect the refrigerant piping.</p>	<p>(R2793)</p>	<p><b>! Caution</b> If gas leaks, repair the spot of leaking, then collect all refrigerant from the unit. After conducting vacuum drying, recharge proper amount of refrigerant.</p>
<p>1 Hold the indoor unit up by a piece of wood etc.</p>	<p>Drain</p> <p>(R2794)</p>	<p><b>! Caution</b> Do not contaminate any gas (including air) other than the specified refrigerant (R-22 or R-410A, depending on the model) into refrigerant cycle. (Contaminating of air or other gas causes abnormal high pressure in refrigerating cycle, and this results in pipe breakage or personal injuries.)</p> <ul style="list-style-type: none"> <li>■ Pay attention so that the residual water in the drain will not make the floor wet.</li> <li>■ In case that a <b>drain hose</b> is buried inside a wall, remove it after the drain hose in the wall is pulled out.</li> </ul>
<p>2 Unscrew the flare nut for <b>gas piping</b> by 2 wrenches.</p>	<p>(R2795)</p>	<ul style="list-style-type: none"> <li>■ Use 2 wrenches to disconnected pipes.</li> <li>■ When disconnecting pipes, cover every nozzle with caps so as not to let dust and moisture in.</li> </ul>
<p>3 Unscrew the flare nut for <b>liquid piping</b> by 2 wrenches.</p>	<p>Liquid piping</p> <p>Gas piping</p> <p>(R2796)</p>	

Step	Procedure	Points
<p>2. Remove the indoor unit.</p> <p>1 Detach the indoor unit from the installation plate.</p>	 <p>(R2797)</p>	
<p>3. Remove the piping fixture.</p> <p>1 Release the hook on the upper side of the piping fixture on the back of the unit.</p>	 <p>Piping fixture</p> <p>(R2798)</p>	
<p>4. Remove the heat exchanger.</p> <p>1 Widen the auxiliary piping to the extent of 10°~20°.</p>	 <p>Auxiliary piping</p> <p>(R2799)</p>	<p>■ At an angle of 10°~20°</p>

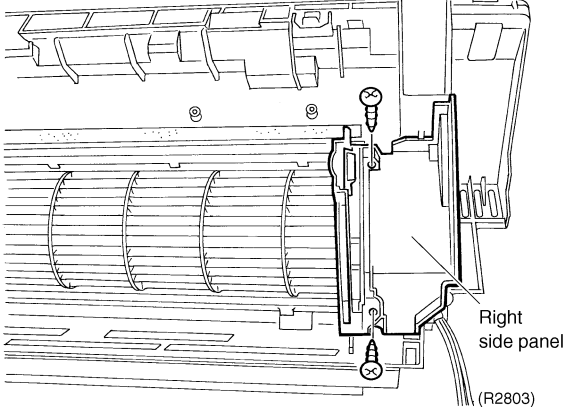
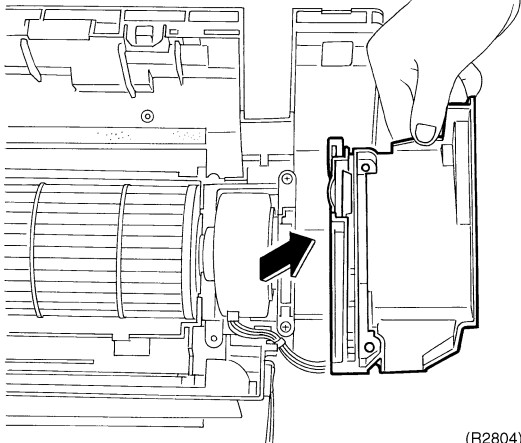
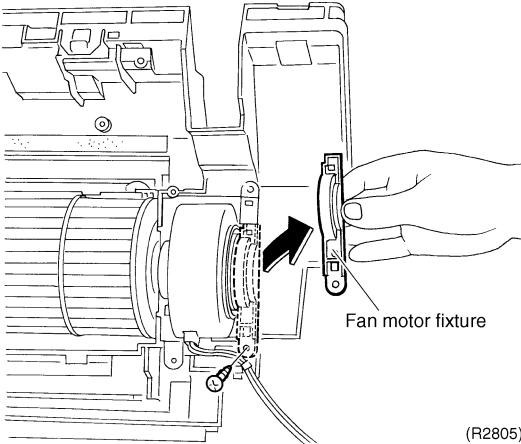
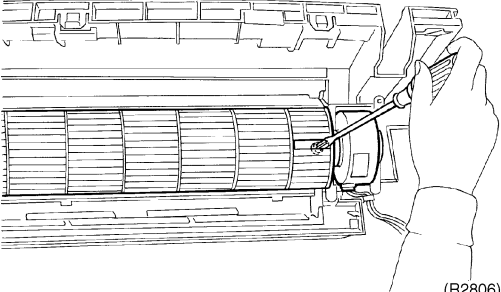
Step	Procedure	Procedure	Points
2	Release the hooks on the left side.	 <p style="text-align: right;">(R2800)</p>	
3	Push the fixing hooks on the right side and release.	 <p style="text-align: right;">(R2801)</p>	
4	Pull the <b>heat exchanger</b> to the front side and undo the hooks completely, and then lift it.	 <p style="text-align: right;">(R2802)</p>	<p><b>⚠ Caution</b>  <b>When removing or reinstalling heat exchanger, be sure to wear protective gloves or wrap the heat exchanger with cloths. (Fins can cut fingers.)</b></p>

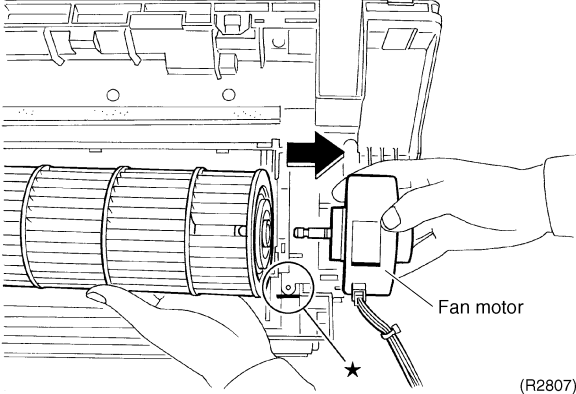
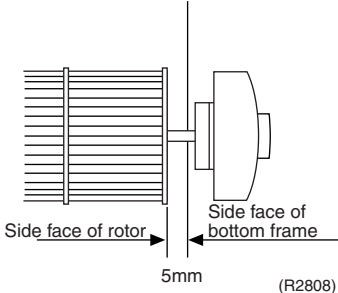
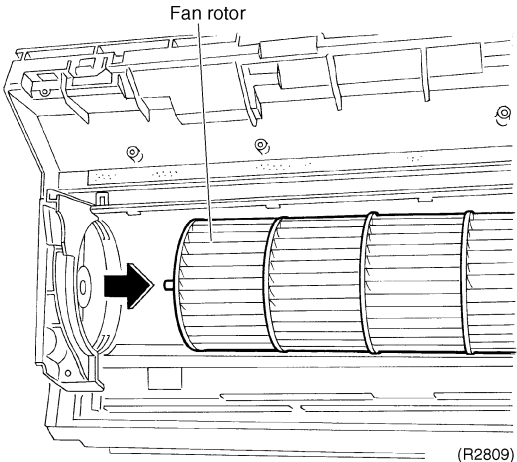
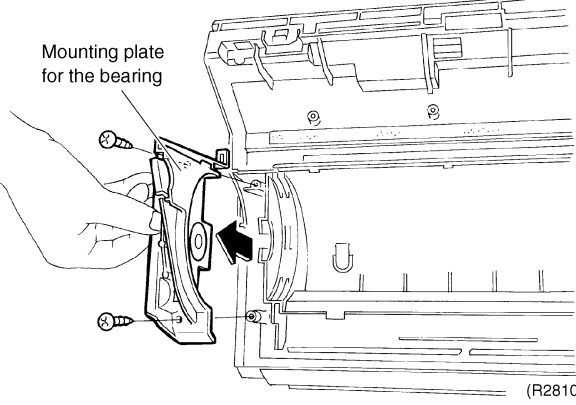
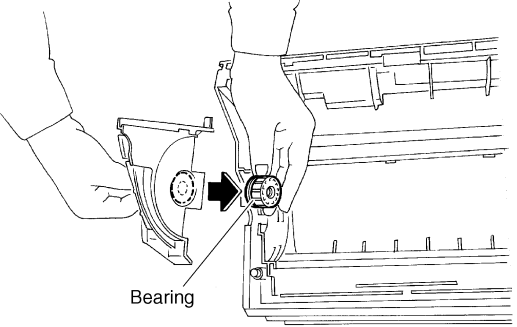
# 1.6 Removal of Fan Rotor / Fan Motor

**Procedure**



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
<p>1. Remove the right side panel.</p> <p>1 Loosen the 2 screws.</p> <p>2 Lift the right side panel and remove it.</p>	 <p>Right side panel (R2803)</p>  <p>(R2804)</p>	<p>■ You can remove the fan rotor without detaching the right side panel.</p>
<p>2. Remove the fan rotor.</p> <p>1 Loosen the screw and remove the fan motor fixture.</p> <p>2 Loosen the fixing screw of the fan rotor.</p>	 <p>Fan motor fixture (R2805)</p>  <p>(R2806)</p>	

Step	Procedure	Points
<p>3. Remove the fan motor.</p> <p>1 Remove the fan rotor.</p>	 <p style="text-align: right;">(R2807)</p>	<p>■ Reassembling the fan motor</p> <p>(1) When reassembling the fan rotor, provide as much as 5mm of play between the side face of the rotor and the bottom frame.</p>  <p style="text-align: right;">(R2808)</p>
<p>4. Remove the bearing.</p> <p>1 Remove the fan rotor. The bearing is on the left side.</p> <p>2 Loosen the 2 screws and remove the mounting plate for the bearing.</p> <p>3 The bearing is made of rubber. Push it inwards firmly and remove it.</p>	 <p style="text-align: right;">(R2809)</p>  <p style="text-align: right;">(R2810)</p>  <p style="text-align: right;">(R2811)</p>	<p>(2) When reassembling the fan motor, align the end of the connector with the height of ★ for play.</p>

## 2. Outdoor Unit

### 2.1 RKD50/60/71BVM, RK(X)D50/60/71BVMA, RKD15/18GV2S

#### 2.1.1 Removal of the Panels and Plates

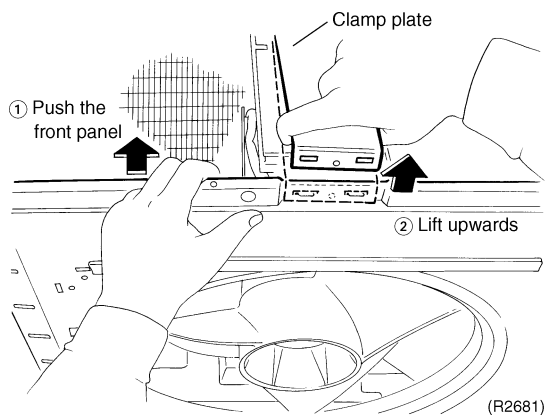
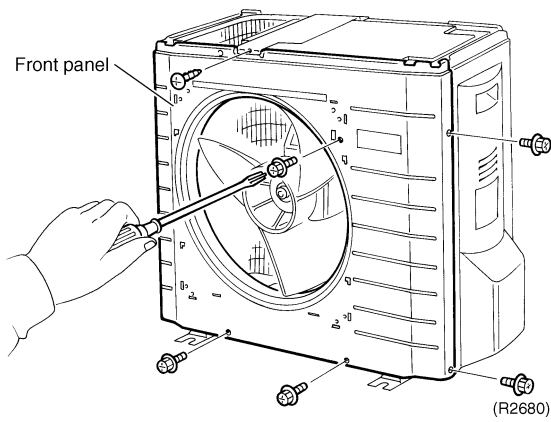
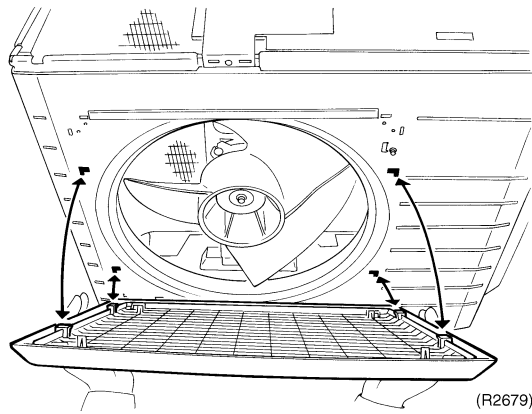
Procedure



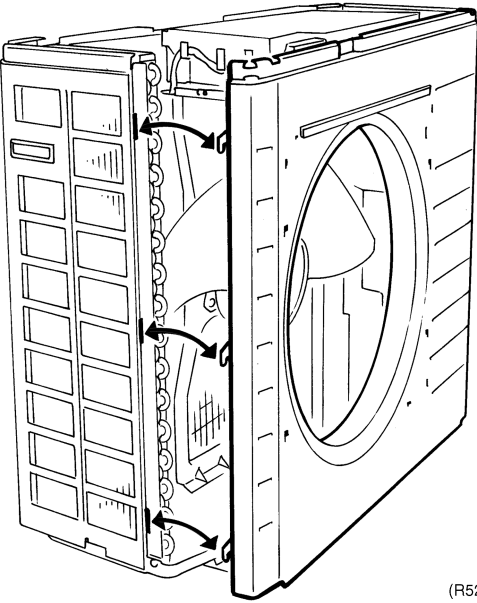
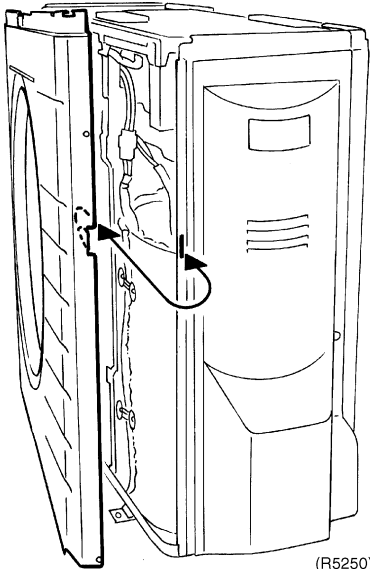
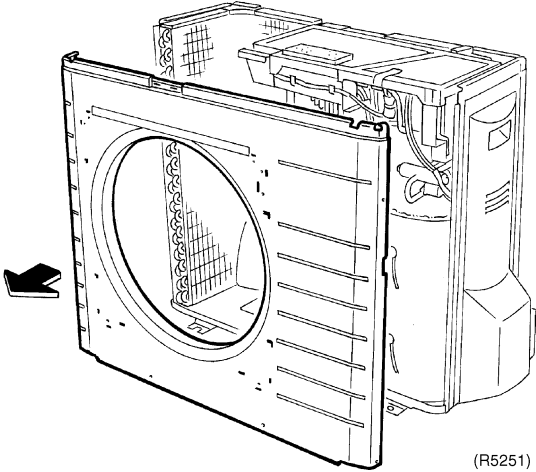
**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

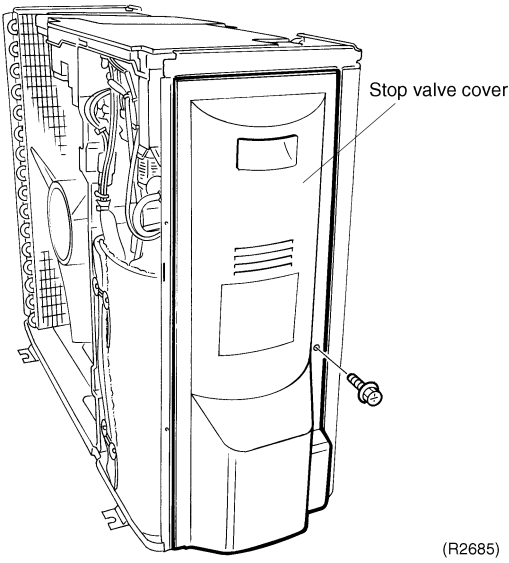
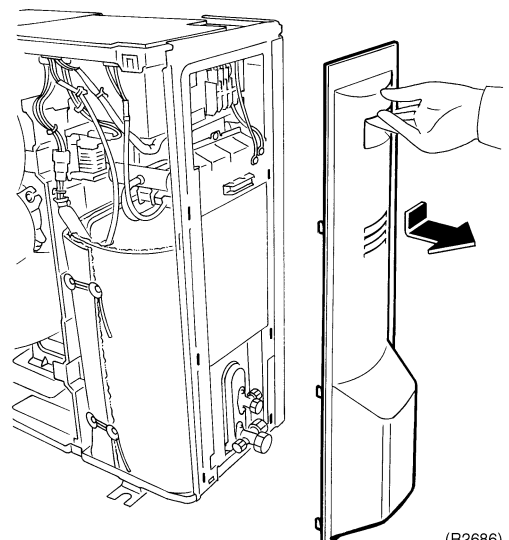
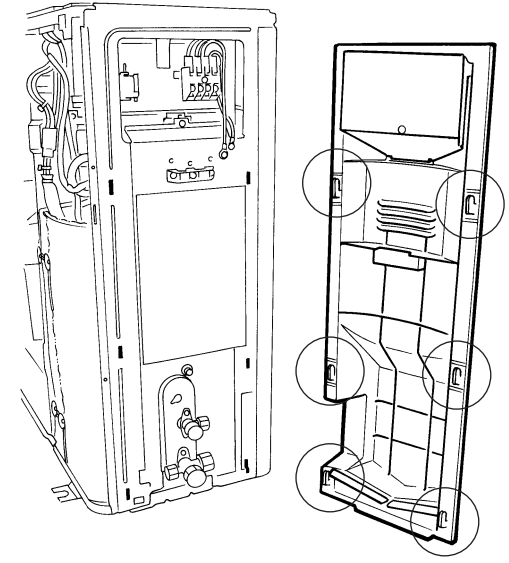
Step	Procedure	Points
1. Remove the panels and plates.	<p>Top panel</p> <p>(R2676)</p>	
1 Loosen the 4 screws and lift the top panel.	<p>Outdoor air thermistor</p> <p>Heat exchanger</p> <p>(R2677)</p>	<ul style="list-style-type: none"> <li>Take care not to cut your finger by the fins of the heat exchanger.</li> </ul>
2 Loosen the 4 screws and remove the discharge grille.	<p>Discharge grille</p> <p>(R2678)</p>	

Step	Procedure	Points
3	<p>Loosen the 6 screws of the front panel.</p>	<p>■ The front grille has 4 hooks. Slide the discharge grille upwards and remove it.</p>
	<p>4</p> <p>Push the front panel and undo the hooks. Lift the clamp plate and remove it.</p>	





Step	Procedure	Points
<p>5</p>	<p>Undo the left side hooks, and then the right side hook. Remove the front panel.</p>  <p>(R5249)</p>  <p>(R5250)</p>  <p>(R5251)</p>	<ul style="list-style-type: none"> <li>■ Lift the front panel and remove it while pushing the left side panel inwards.</li>   <li>■ Lift the front panel and undo the right side hook.</li> <li>■ Fit the right side of the front panel first when installing.</li> </ul>

Step	Procedure	Points
2.	Remove the <b>stop valve cover</b> .	
1	Loosen the screw of the stop valve cover.	
2	Pull down the stop valve cover to undo the hooks and remove it.	
	  	<p>■ The stop valve cover has 6 hooks.</p>

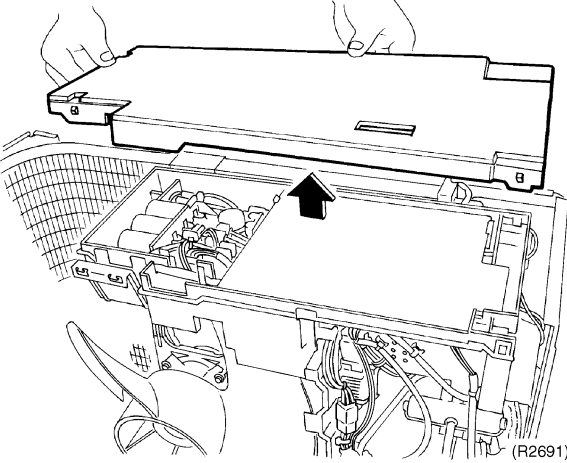
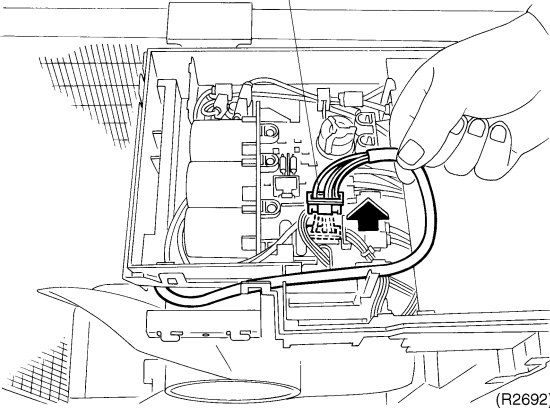
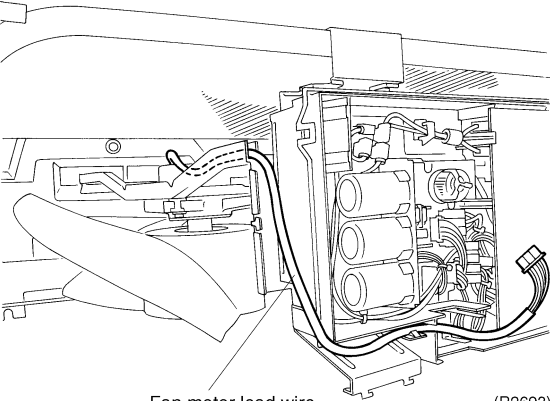
## 2.1.2 Removal of the Fan Motor / Propeller Fan

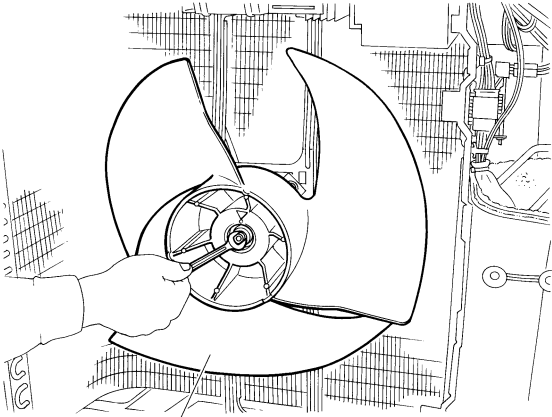
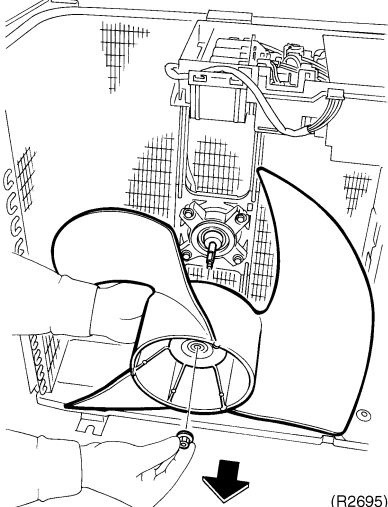
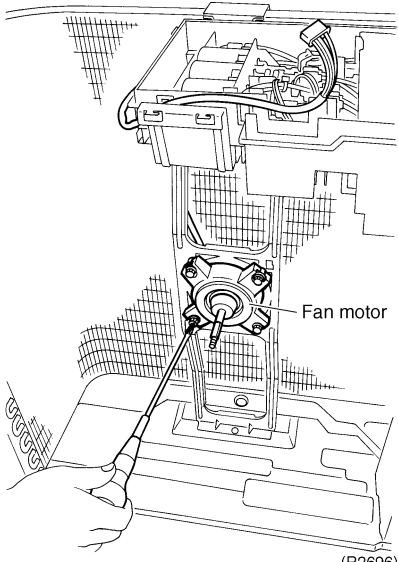
**Procedure**

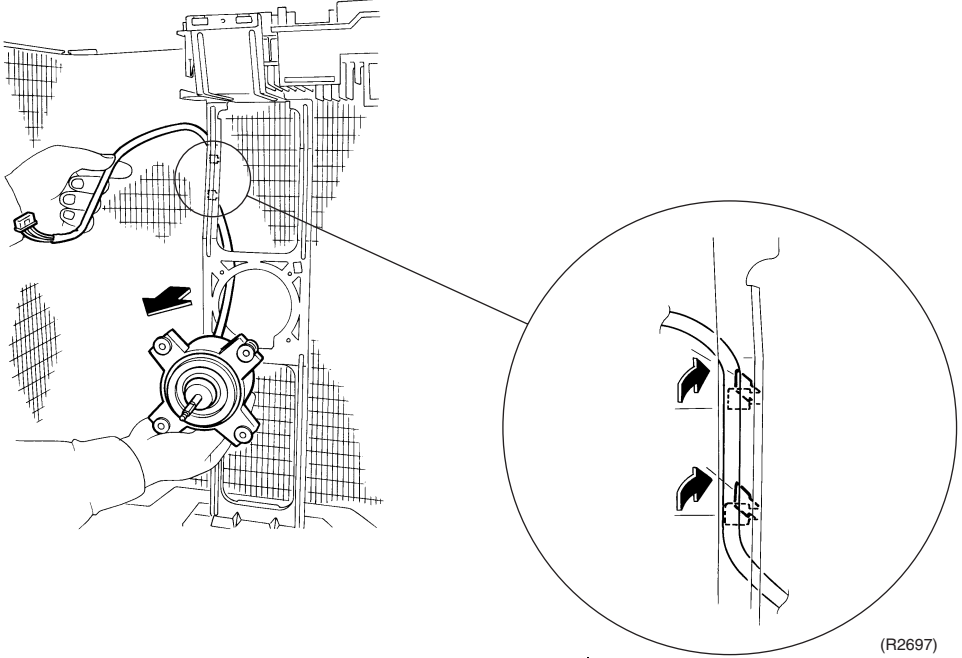


**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
<p>■ Remove the top panel and the front panel.</p>		
<p>1. Remove the electrical box cover.</p>		<p>■ This procedure is not necessary to remove the propeller fan only.</p>
<p>1 Loosen the screw on the back of the <b>shelter</b>.</p>		
<p>2 Undo the 2 hooks and remove it.</p>		<p>■ The hooks have been released since the front panel was removed.</p>
<p>3 Release the 4 hooks of the <b>electrical box cover</b> and remove it.</p>		

Step	Procedure	Points
	 <p>(R2691)</p>	
<p>2. Remove the fan motor.</p> <p>1</p> <p>2</p>	<p>Disconnect the connector for fan motor (S70).</p> <p>The illustration shows arrangement of the fan motor lead wire.</p>  <p>(R2692)</p>  <p>Fan motor lead wire (R2693)</p>	

Step	Procedure	Points
3	<p>Unscrew the washer-fitted nut (M10) of the propeller fan with a spanner.</p>  <p>Propeller fan (R2694)</p>  <p>(R2695)</p>	<ul style="list-style-type: none"> <li>Align mark of the propeller fan with D-cut section of the motor shaft when reassembling.</li> </ul>
4	<p>Remove the 4 screws from the fan motor.</p>  <p>Fan motor (R2696)</p>	

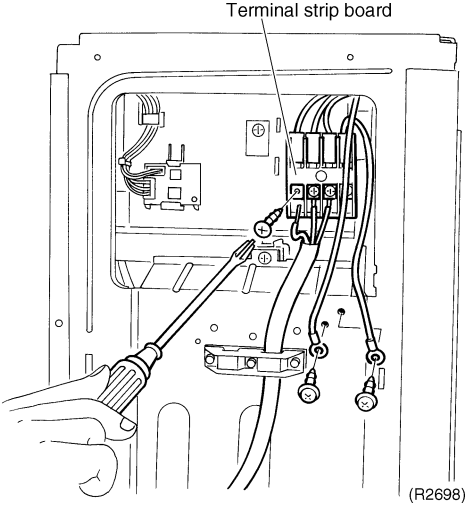
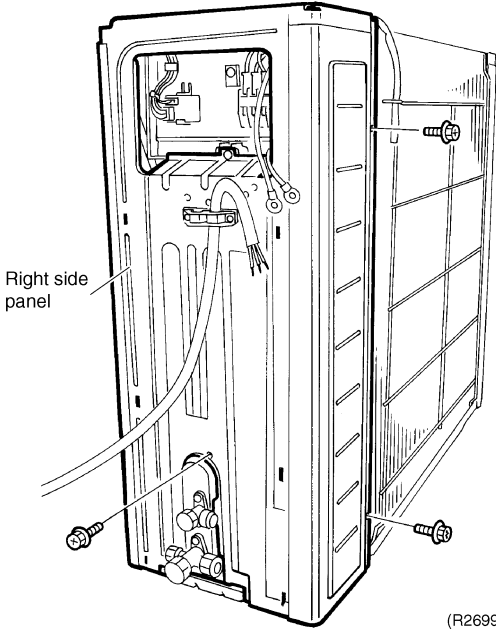
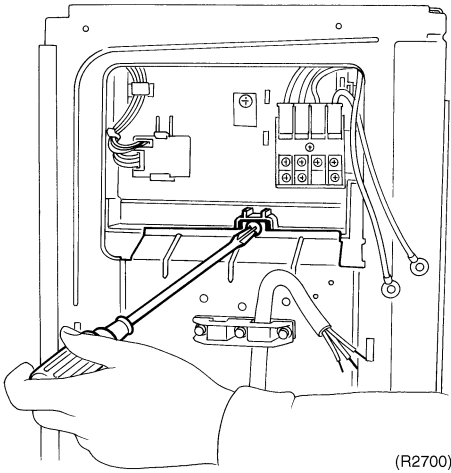
Step	Procedure	Points
5	Pull the fan motor out. 	<ul style="list-style-type: none"><li>■ Put the lead wire through the back of the motor when reassembling. (so as not to be entangled with the propeller fan)</li></ul> <p>(R2697)</p>

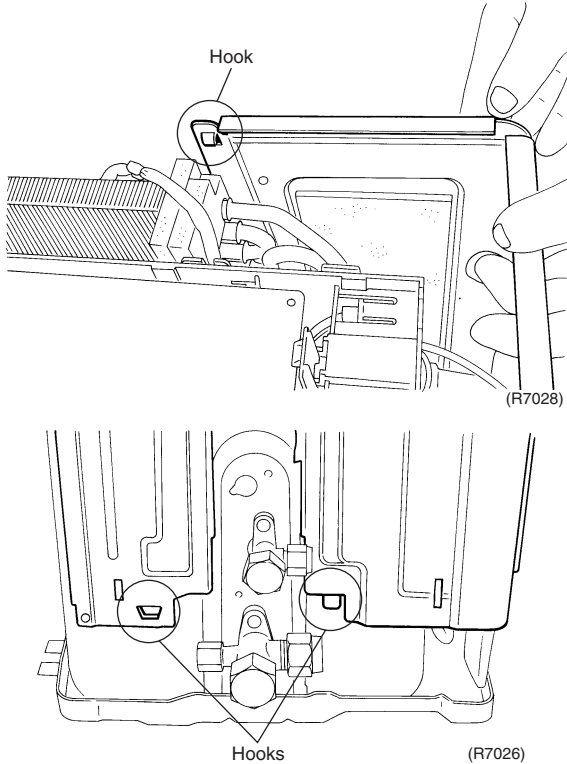
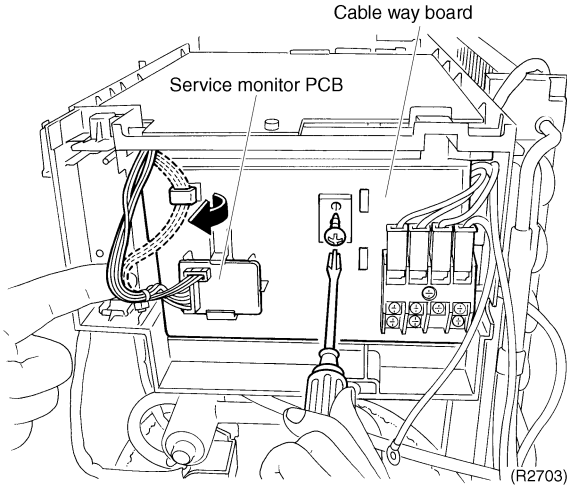
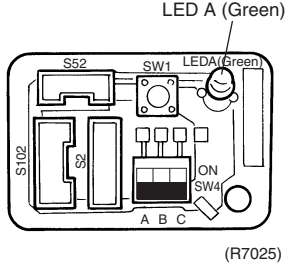
### 2.1.3 Removal of the PCB / Electrical Box

**Procedure**

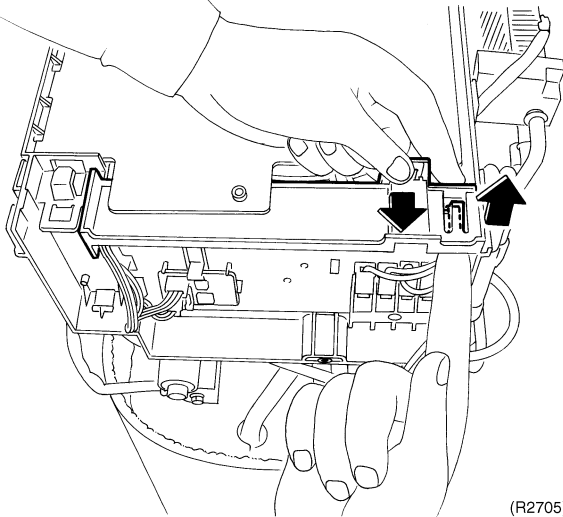
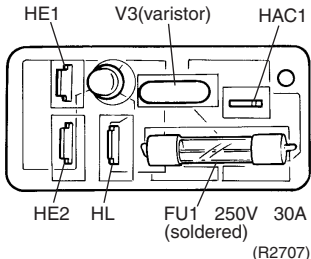
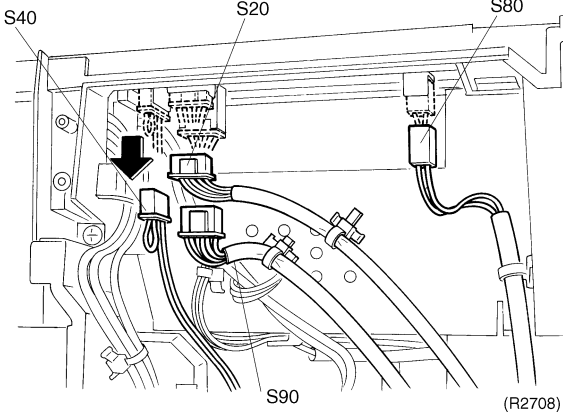


**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

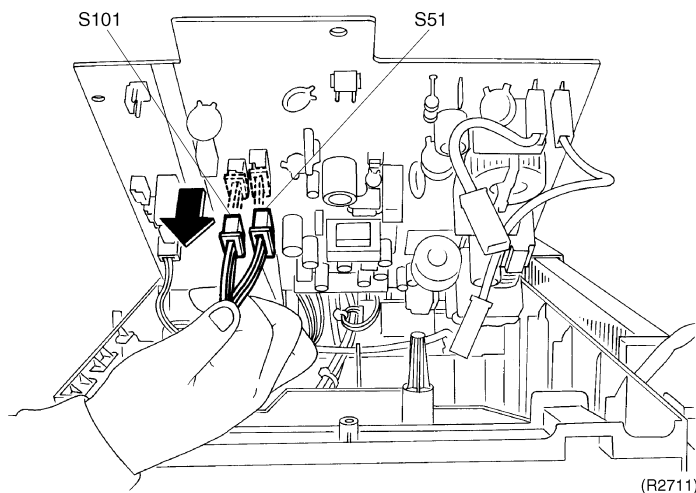
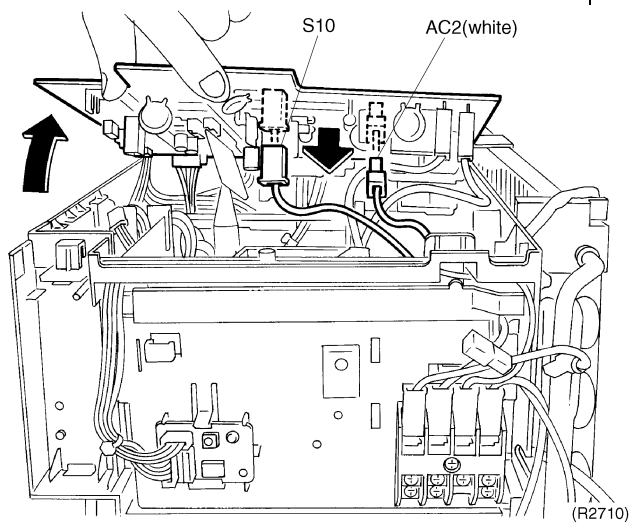
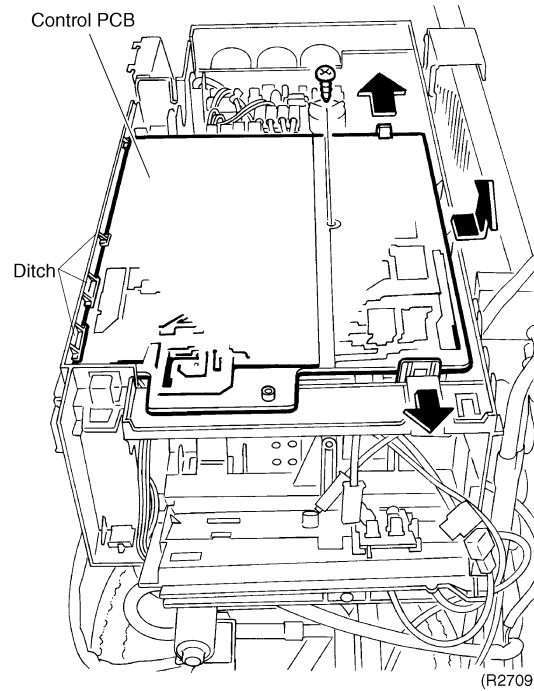
Step	Procedure	Points
<p>■ Remove the top panel and the front panel.</p>		
<p>1. Remove the right side panel.</p>		
<p>1 Disconnect the 3 connection wirings and the 2 earth wires.</p>	 <p style="text-align: right;">(R2698)</p>	<p><b>Terminal strip</b> number                      black (1) ----- power supply                      white (2) ----- power supply                      red (3) ----- transmission                      yellow / green (⊥) ----- earth</p>
<p>2 Loosen the 3 screws of the right side panel.</p>	 <p style="text-align: right;">(R2699)</p>	
<p>3 Loosen the fixing screw of the electrical box.</p>	 <p style="text-align: right;">(R2700)</p>	

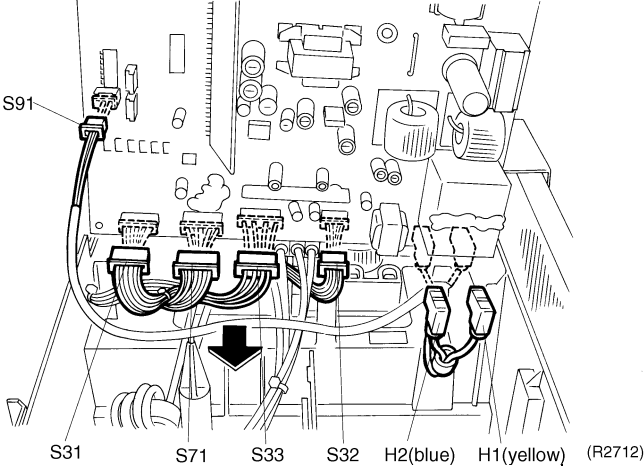
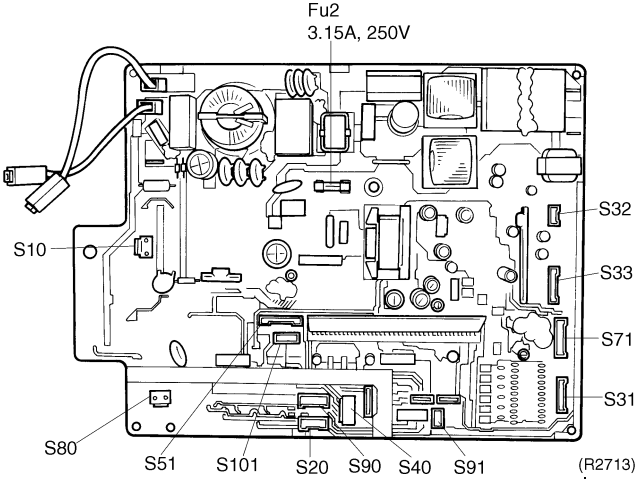
Step		Procedure	Points
			<ul style="list-style-type: none"> <li>■ Insert the 2 hooks of the lower part and the 1 hook of the upper back when reassembling.</li> </ul>
<p>2. Disconnect harnesses.</p> <p>1 Loosen the fixing screw of the <b>cable way board</b>.</p>			<ul style="list-style-type: none"> <li>■ <b>Service monitor PCB</b></li> </ul> 



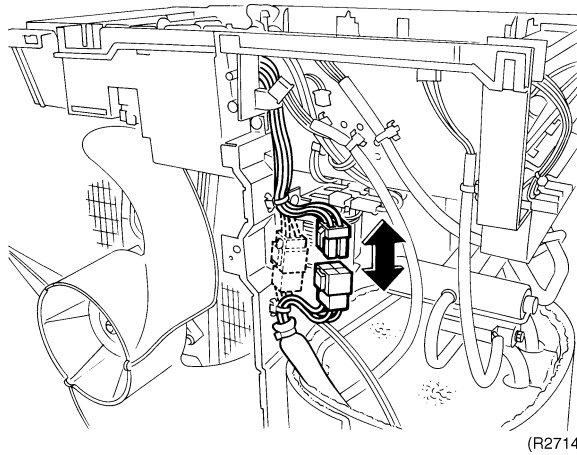
Step	Procedure	Points
2	<p>Push the hook up to release the cable way board. Open the cable way board.</p>	 <p>(R2705)</p>
3	<p>Disconnect the harnesses from the power supply PCB.  <b>HL</b> (black) .... to the terminal strip  <b>HE2</b> (yellow / green) .... to the terminal strip (earth)  <b>HAC1</b> (black) .... from the control PCB (<b>AC1</b>)  <b>HE1</b> (yellow / green) .... from the control PCB (<b>E</b>)</p>	<p>■ <b>Power supply PCB</b></p>  <p>(R2707)</p>
4	<p>Disconnect the connectors of the front side.  <b>S20</b>: electronic expansion valve  <b>S40</b>: overload protector  <b>S80</b>: four way valve  <b>S90</b>: thermistors (discharge pipe, outdoor air, heat exchanger)</p>	 <p>(R2708)</p>

Step	Procedure	Points
5	Loosen the screw of the control PCB.	
6	Undo the 2 hooks and release the control PCB from the ditch of the front side.	
7	Disconnect the harnesses while opening the control PCB. S10: to the terminal strip AC2: to the terminal strip	
8	Disconnect the connectors. S51: to the service monitor PCB S101: to the service monitor PCB	

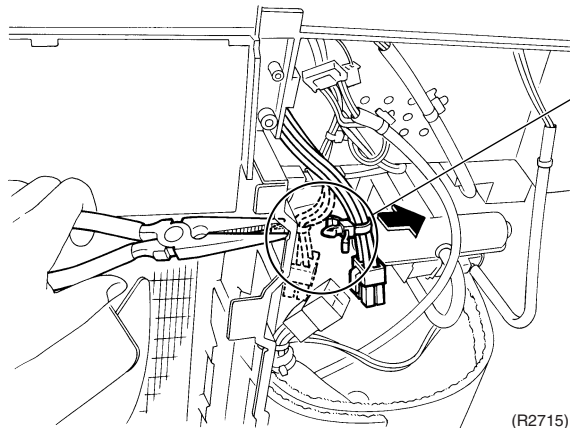


Step	Procedure	Points
9	<p>Disconnect the connectors.</p> <p>S31: to the SPM                      S32: to the SPM                      S33: to the MID                      S71: to the MID                      S91: fin thermistor</p> 	
10	<p><b>Control PCB (outdoor unit)</b></p> <p>S10: to the terminal strip                      S20: electronic expansion valve                      S31: to CN14 of the SPM                      S32: to CN11 of the SPM                      S33: to S34 of the MID                      S40: overload protector                      S51: to S52 of the service monitor PCB                      S71: to S72 of the MID                      S80: four way valve                      S90: thermistors (discharge pipe, outdoor air, heat exchanger)                      S91: fin thermistor                      S101: to S102 of the service monitor PCB</p> 	

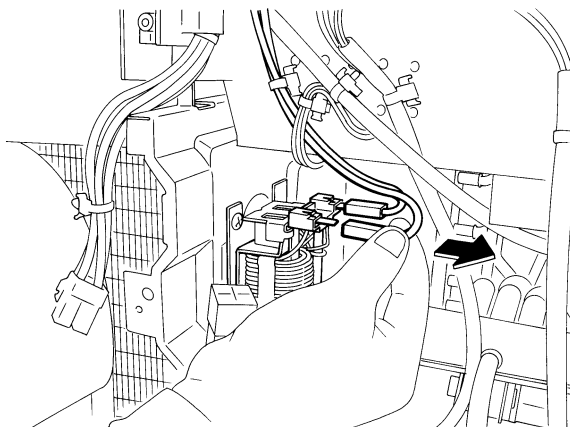
Step	Procedure	Points
11	Disconnect the relaying wire connector for the compressor.	
12	Release the clamp by pliers.	
13	Disconnect the reactor harness.	



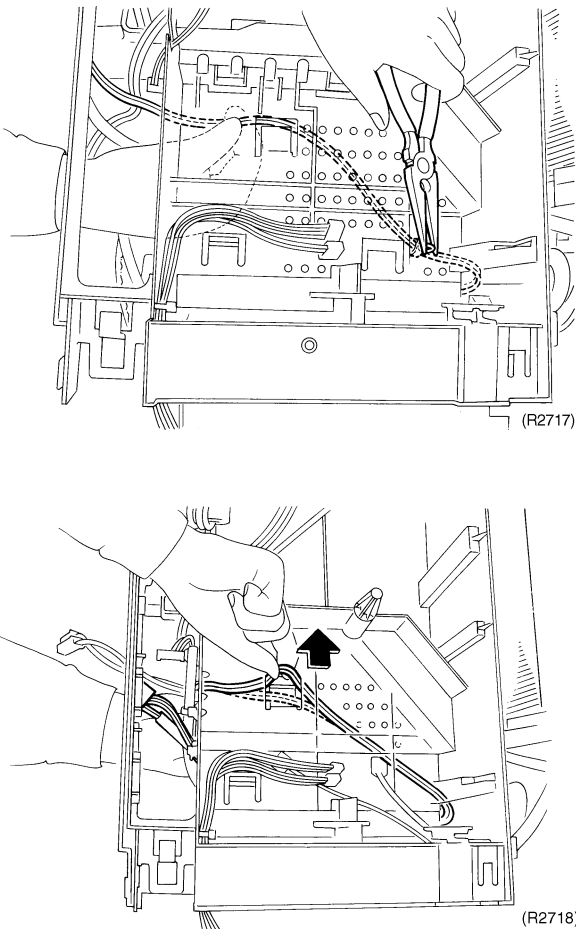
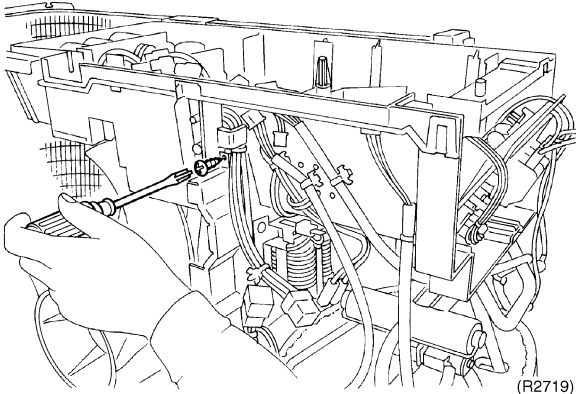
(R2714)

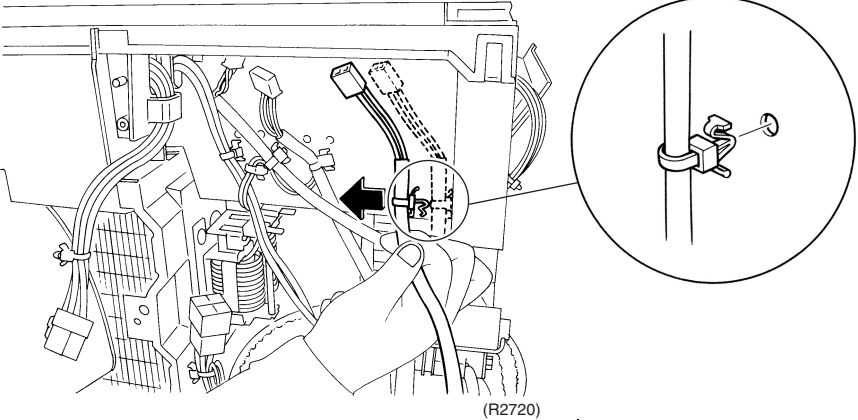
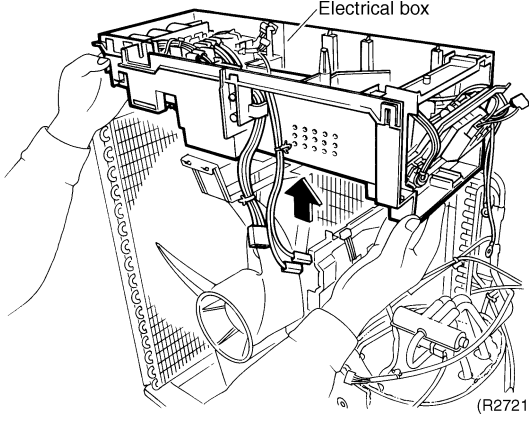


(R2715)



(R2716)

Step	Procedure	Points
14	<p>Pull the clamp and draw the thermistor harness out from the back of the electrical box.</p>	
	 <p>(R2717)</p> <p>(R2718)</p>	
15	<p>Loosen the screw of the electrical box.</p>	
	 <p>(R2719)</p>	

Step	Procedure	Procedure	Points
16	Release the clamp of the four way valve harness.	 <p style="text-align: right;">(R2720)</p>	
17	Lift the <b>electrical box</b> and remove it.	 <p style="text-align: right;">(R2721)</p>	

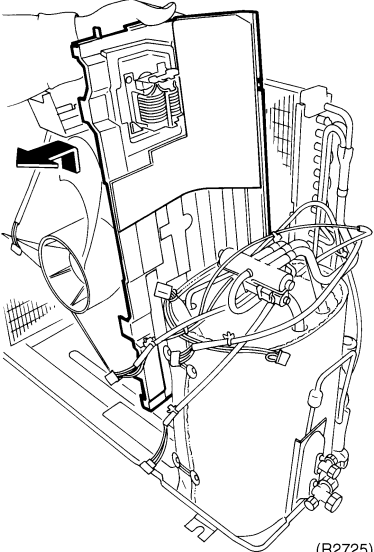
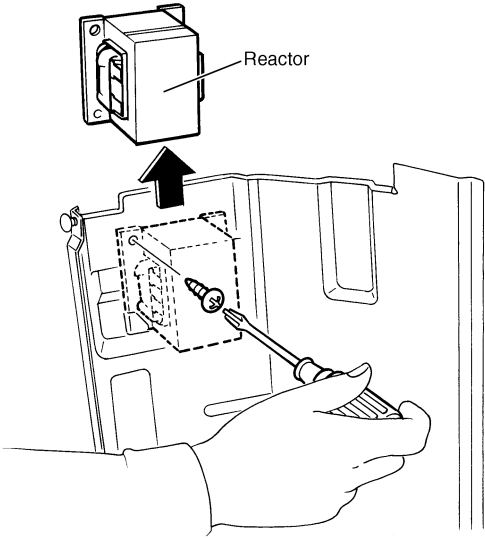
## 2.1.4 Removal of the Reactor

**Procedure**



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
<p>■ Remove the electrical box.</p>		
<p>1. Remove the <b>partition plate</b>.</p>		
<p>1</p>	<p>Release the clamp by pliers.</p>	
	<p style="text-align: right;">(R2722)</p>	
<p>2</p>	<p>Loosen the 2 screws of the partition plate.</p>	
	<p style="text-align: right;">(R2723)</p>	
	<p style="text-align: right;">(R7027)</p>	
		<p>■ The partition plate is fixed to the bottom frame with a hook.</p>

Step	Procedure	Points
3	<p data-bbox="199 217 438 275">Lift the partition plate and remove it.</p>  <p data-bbox="911 813 970 835">(R2725)</p>	
4	<p data-bbox="199 855 438 987">Loosen the screw. Slide the reactor and remove it from the partition plate.</p>  <p data-bbox="770 965 842 987">Reactor</p> <p data-bbox="978 1485 1037 1507">(R2726)</p>	



## 2.1.5 Removal of the Sound Blanket

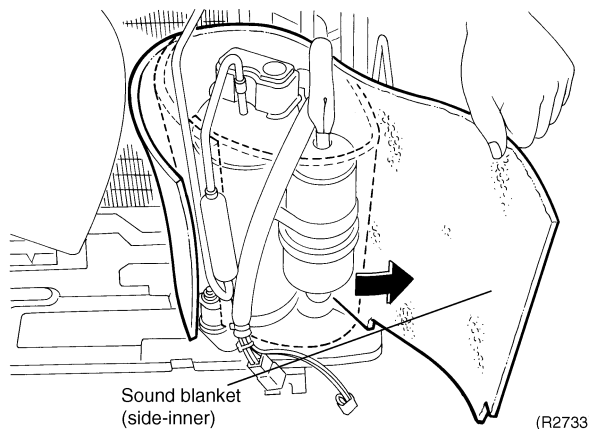
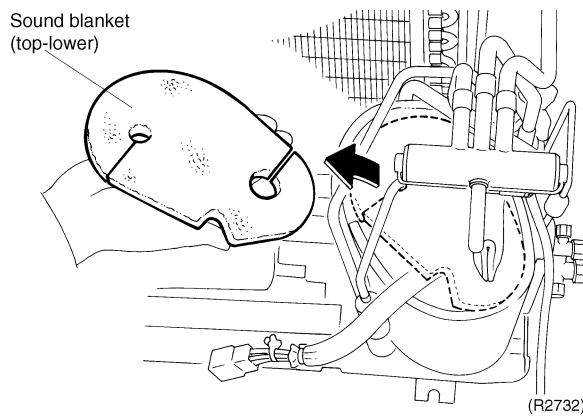
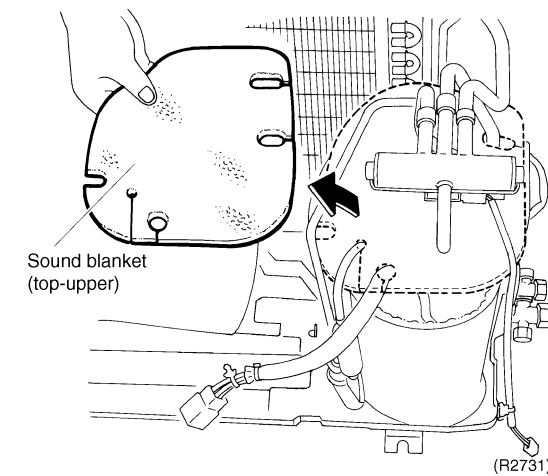
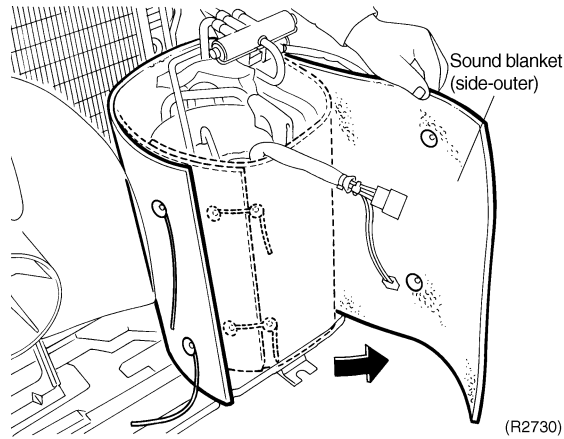
**Procedure**



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Procedure	Points
1	Disconnect the harness of each thermistor.	<p style="text-align: right;">(R2727)</p>	
2	Release the discharge pipe thermistor.	<p style="text-align: right;">(R2728)</p>	<ul style="list-style-type: none"> <li>■ Pay attention to the direction of the clip so as not to touch the lead wire of the thermistor when reassembling.</li> </ul>
3	Cut the clamp by nippers. Disconnect the outdoor heat exchanger thermistor.	<p style="text-align: right;">(R2729)</p>	<ul style="list-style-type: none"> <li>■ Clamps should be always available. Fix it as it was before.</li> </ul>

Step	Procedure	Points
4	Remove the <b>sound blanket (side-outer)</b> .	<ul style="list-style-type: none"> <li>Since the piping ports on the sound blanket (side-outer) are torn easily, remove the blanket carefully.</li> </ul>
5	Remove the sound blanket (top-upper).	
6	Remove the sound blanket (top-lower).	
7	Remove the sound blanket (side-inner).	<ul style="list-style-type: none"> <li>Since the piping ports on the sound blanket (side-inner) are torn easily, remove the blanket carefully.</li> </ul>



## 2.1.6 Removal of the Four Way Valve

**Procedure**



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

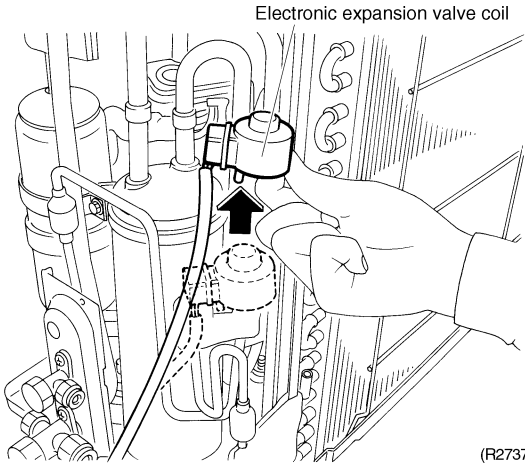
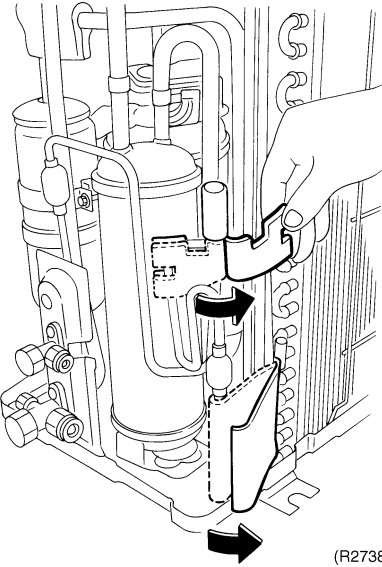
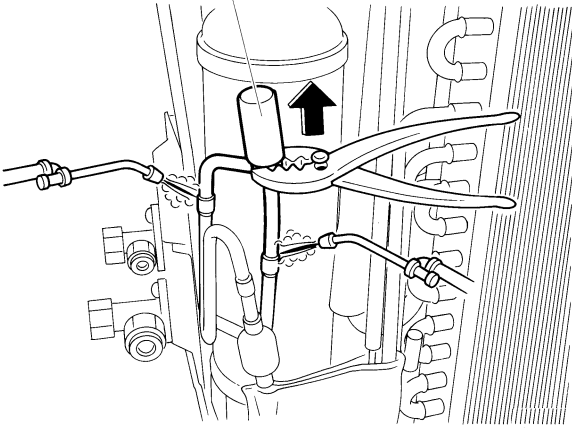


Step	Procedure	Procedure	Points
1	Loosen the screw of the <b>four way valve coil</b> .	<p>Four way valve</p> <p>Four way valve coil</p> <p>(R2734)</p>	<ul style="list-style-type: none"> <li>■ Provide a protective sheet or a steel plate so that the brazing flame cannot influence peripheries.</li> <li>■ Be careful so as not to break the pipes by pressing it excessively by pliers when withdrawing it.</li> </ul> <p><b>Caution</b> Be careful about the four way valve, pipes and so on, which were heated up by a gas brazing machine, so as not to get burnt your hands.</p>
2	Heat up the brazed part of the <b>four way valve</b> and disconnect.  <ul style="list-style-type: none"> <li>■ Be sure to apply nitrogen replacement when heating up the brazed part.</li> </ul>	<p>(R2735)</p>	<p><b>Cautions for restoration</b></p> <ol style="list-style-type: none"> <li>1. Restore the piping by non-oxidation brazing. Braze it quickly when no nitrogen gas can be used.</li> <li>2. It is required to prevent the carbonization of the oil inside the four way valve and the deterioration of the gaskets affected by heat. For the sake of this, wrap the four way valve with wet cloth and provide water so that the cloth will not be dried and avoid excessive heating. (Keep below 120°C)</li> </ol> <p><b>In case of the difficulty with gas brazing machine</b></p> <ol style="list-style-type: none"> <li>1. Disconnect the brazed part where is easy to disconnect and restore.</li> <li>2. Cut pipes on the main unit by a miniature copper tube cutter in order to make it easy to disconnect.</li> </ol> <p><b>Note:</b> Do not use a metal saw for cutting pipes by all means because the sawdust come into the circuit.</p>
3	Heat up every brazed part in turn and disconnect.	<p>(R2736)</p>	

## 2.1.7 Removal of the Electronic Expansion Valve

### Procedure



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

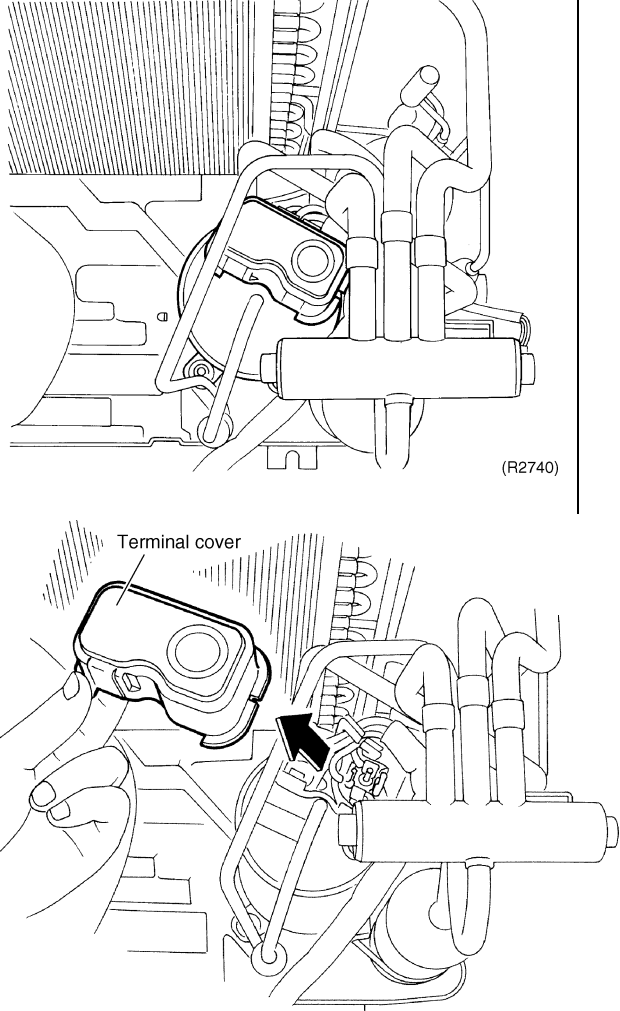
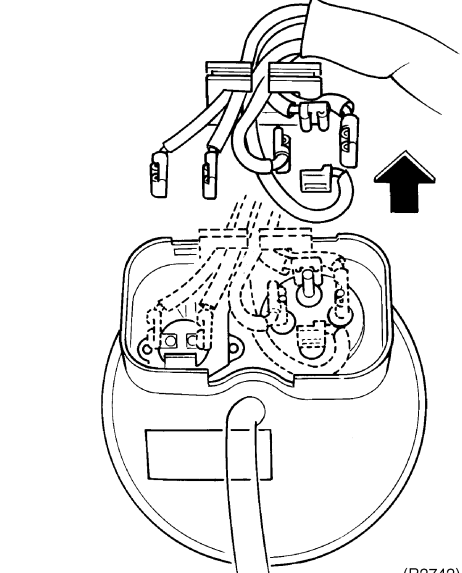
Step	Procedure	Procedure	Points
1	Remove the <b>electronic expansion valve coil</b> .	 <p style="text-align: right;">(R2737)</p>	
2	Remove the sheets of putty.  <ul style="list-style-type: none"> <li>■ Before working, make sure that the refrigerant is empty in the circuit.</li> </ul>	 <p style="text-align: right;">(R2738)</p>	
3	Heat up the two brazed parts of the <b>electronic expansion valve</b> and disconnect.  <ul style="list-style-type: none"> <li>■ Be sure to apply nitrogen replacement when heating up the brazed part.</li> </ul>	 <p style="text-align: right;">(R2739)</p>	<p> <b>Caution</b> Be careful about the electronic expansion valve, pipes and so on, which were heated up by a gas brazing machine, so as not to get burnt your hands.</p> <p> <b>Warning</b> Ventilate when refrigerant leaks during the work. (If refrigerant contacts fire, it will cause to arise toxic gas.)</p>

## 2.1.8 Removal of the Compressor

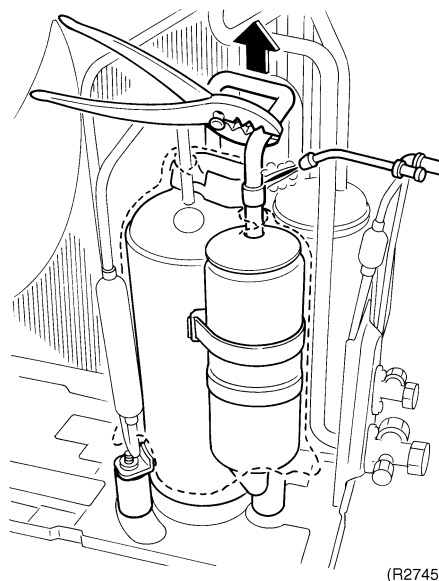
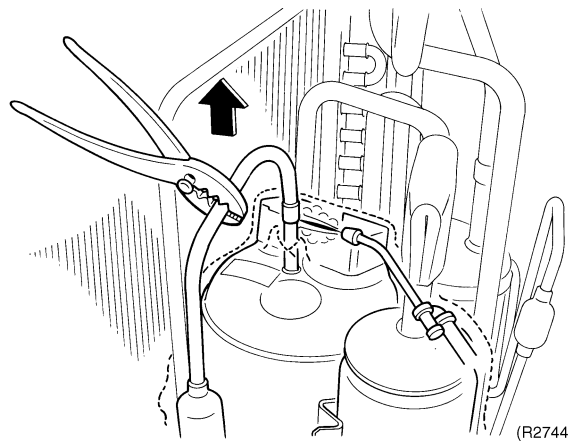
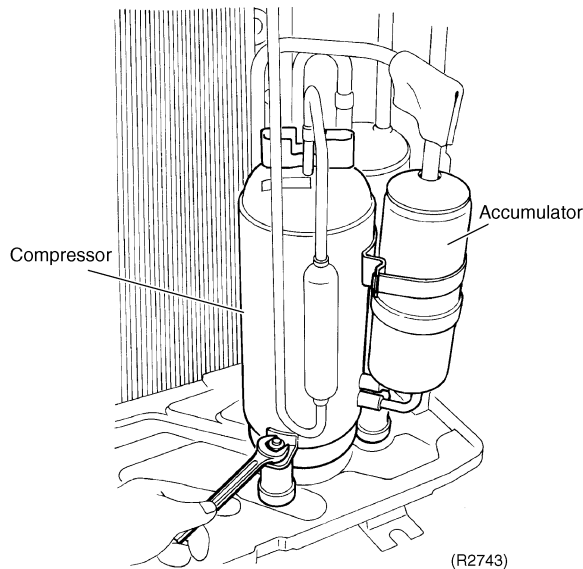
**Procedure**



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Procedure	Points
1	Remove the terminal cover.	 <p>(R2740)</p>	
2	Disconnect the lead wires of the compressor.	 <p>(R2741)</p> <p>(R2742)</p>	<p>■ Be careful so as not to burn the compressor terminals or the name plate.</p> <p>Make a note.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">U V    N W</p> </div> <p>U : red V : yellow W : blue N : brown</p>

Step	Procedure	Points
3	Unscrew the nut of the compressor.	
4	Remove the putty of the accumulator.	
5	Heat up the brazed part of the discharge side and disconnect.	
6	Heat up the brazed part of the suction side and disconnect.	
7	Lift the compressor up and remove it.	



- Before working, make sure that the refrigerant is empty in the circuit.
- Be sure to apply nitrogen replacement when heating up the brazed part.



#### Warning

**Ventilate when refrigerant leaks during the work. (If refrigerant contacts fire, it will cause to arise toxic gas.)**

- Provide a protective sheet or a steel plate so that the brazing flame cannot influence peripheries.
- Be careful so as not to burn the compressor terminals or the name plate.

- Be careful so as not to burn the heat exchanger fin.



#### Warning

**Since it may happen that refrigeration oil in the compressor will catch fire, prepare wet cloth so as to extinguish fire immediately.**



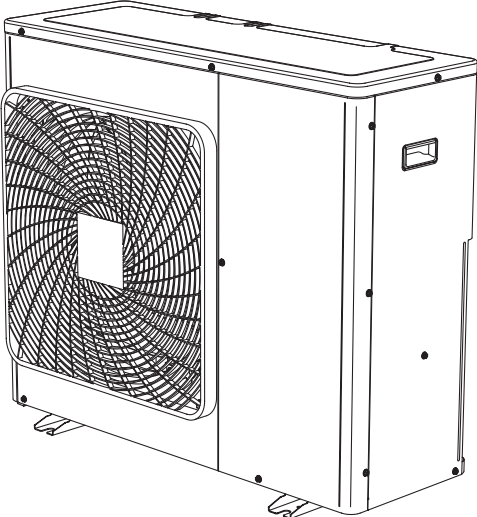
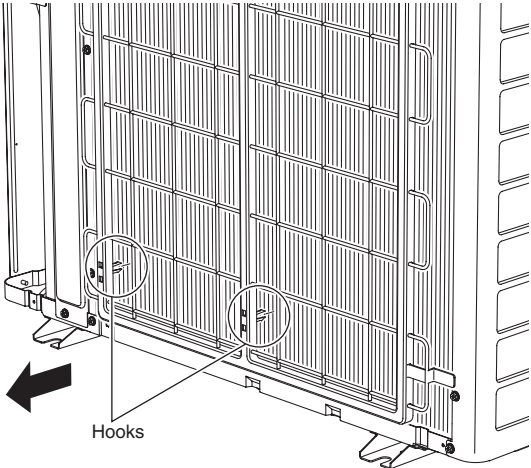
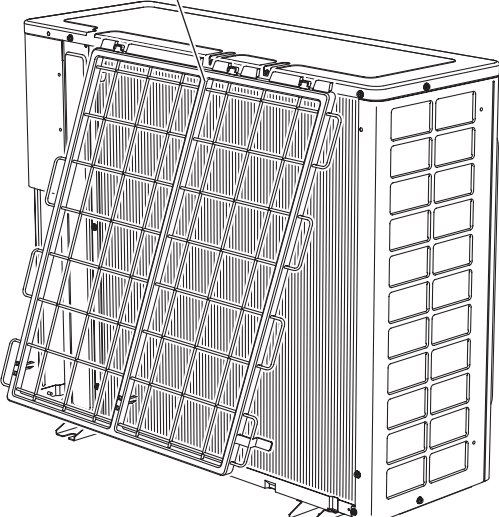
## 2.2 RKD24/28GV2S

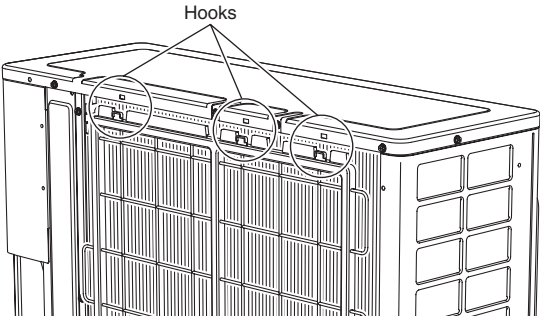
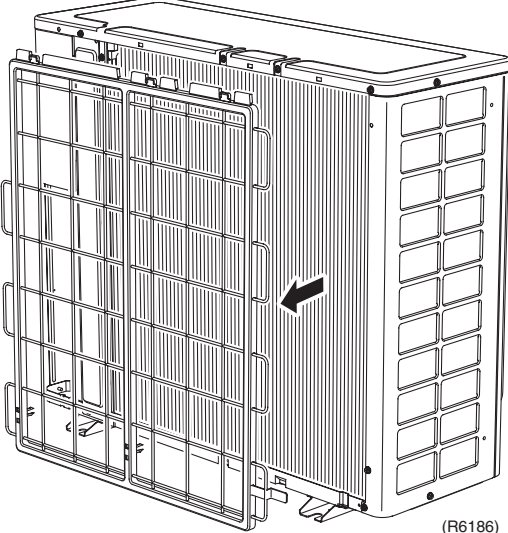
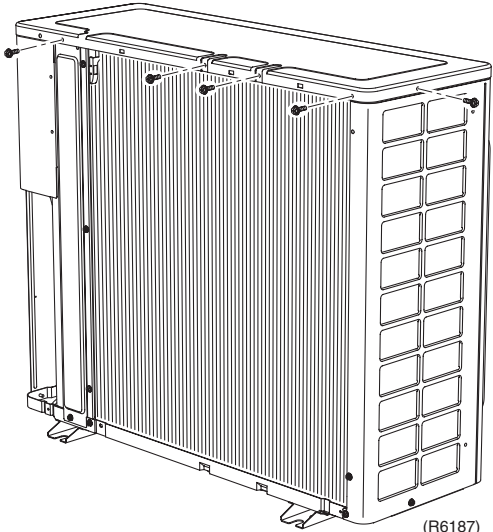
### 2.2.1 Removal of Outer Panels

**Procedure**

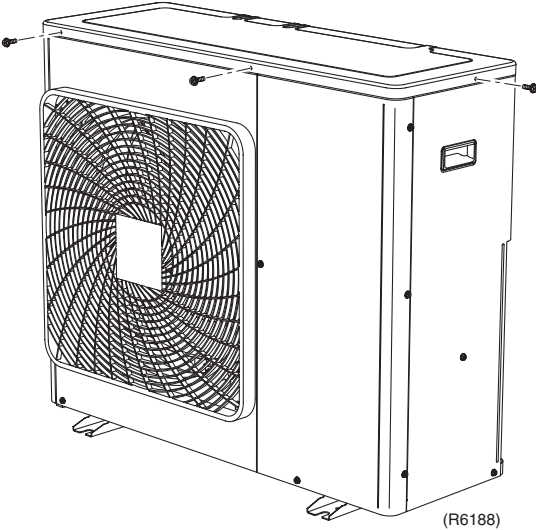
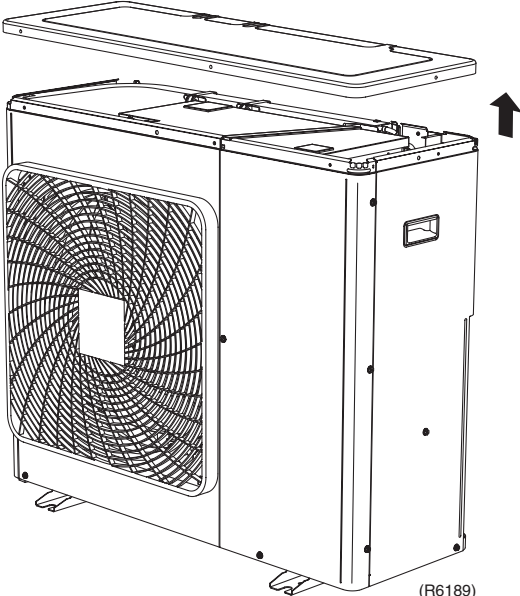
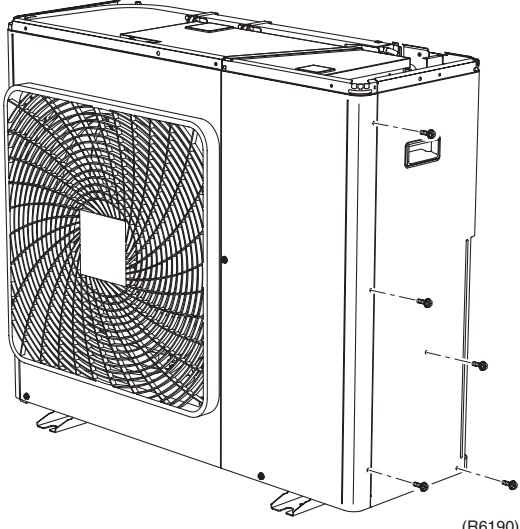


**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

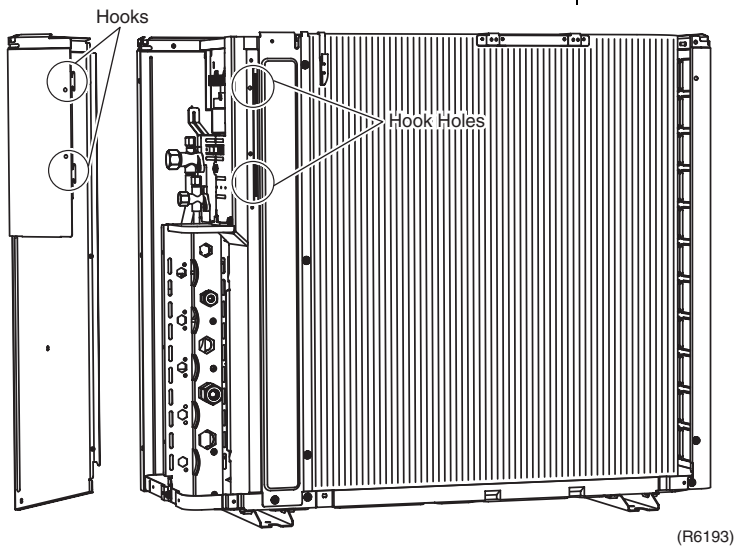
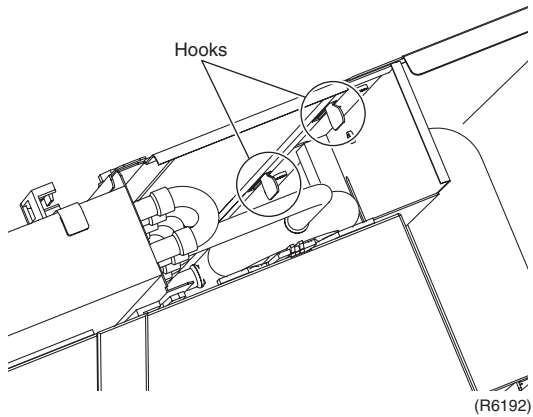
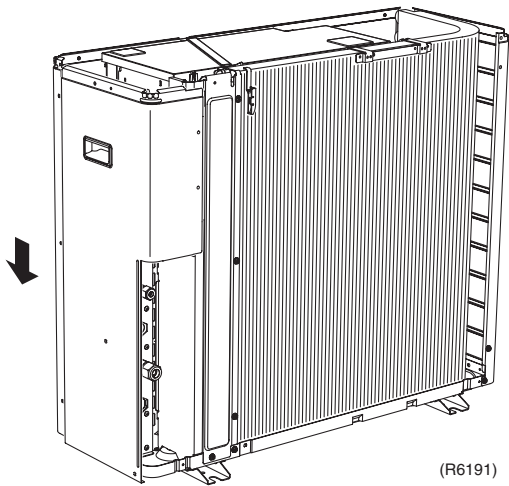
Step	Procedure	Points
<p>External appearance from front side.</p>	 <p style="text-align: right;">(R6182)</p>	
<p>1. Removing the suction grille.</p>	<p style="text-align: center;">Rear side</p>  <p style="text-align: center;">Hooks</p> <p style="text-align: right;">(R6183)</p>	<p>■ The hooks are secured in the clearances of the heat exchanger fins.</p>
<p>1 Undo the 2 hooks at the bottom first.</p>	<p style="text-align: center;">Suction grille</p>  <p style="text-align: right;">(R6184)</p>	

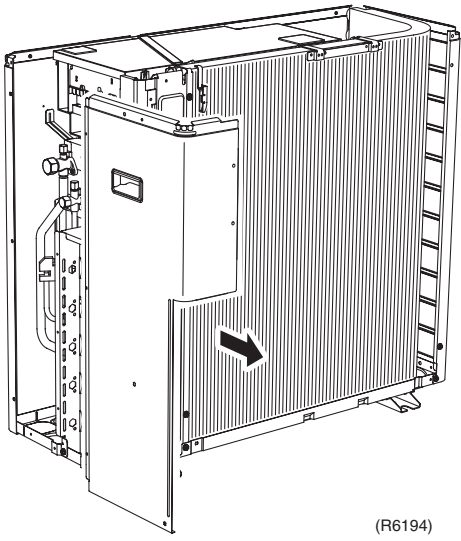
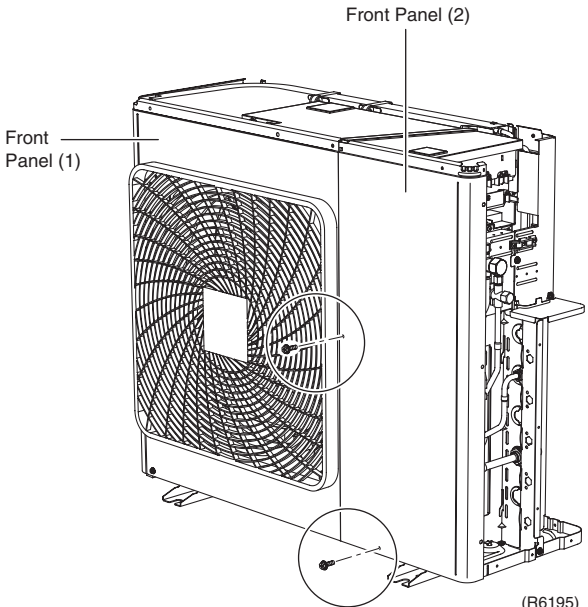
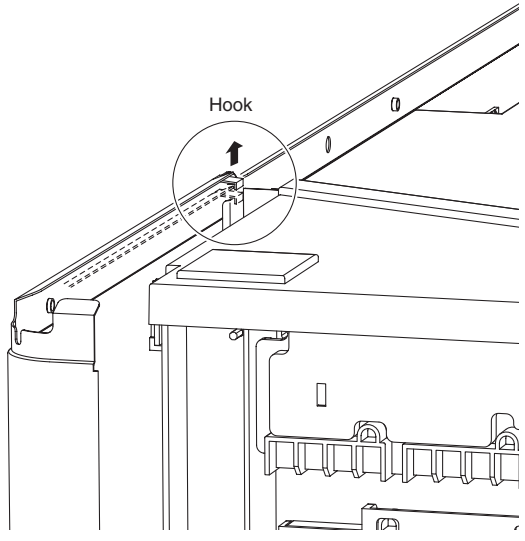
Step	Procedure	Points
2	<p data-bbox="199 215 467 309">Next, slide the grille downward to undo the 3 top hooks.</p>  <p data-bbox="991 584 1050 607">(R6185)</p>	
3	<p data-bbox="199 1234 427 1328">Remove the suction grille.</p>  <p data-bbox="967 1189 1026 1211">(R6186)</p>	
2. Removing the top panel.		
1	<p data-bbox="199 1267 443 1361">Remove 4 screws on the back and 1 screw on the left side panel.</p>  <p data-bbox="959 1794 1018 1816">(R6187)</p>	

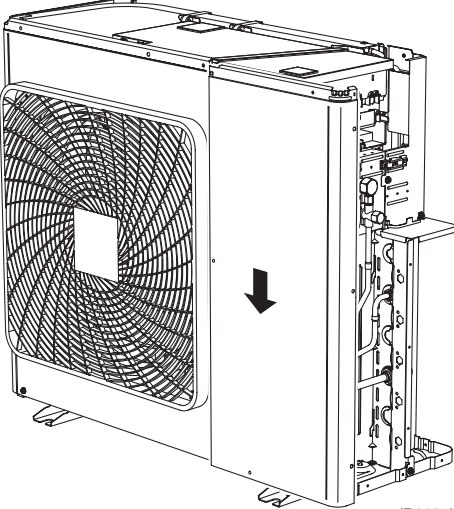
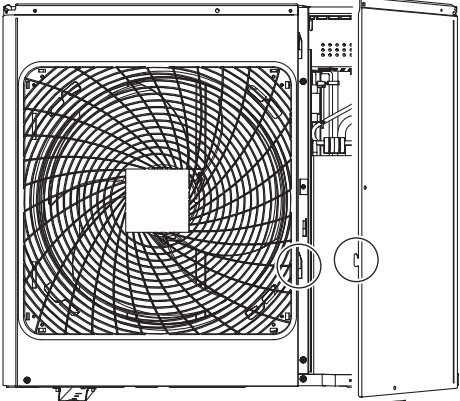
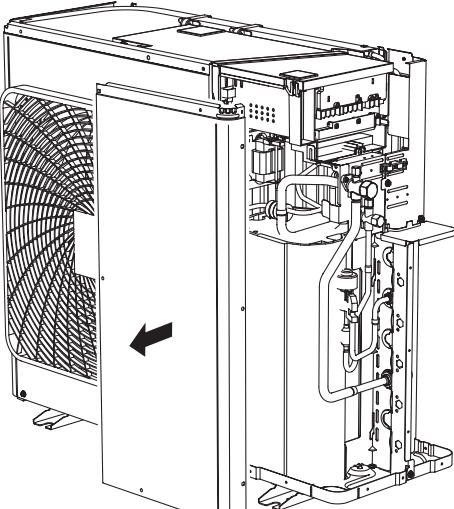


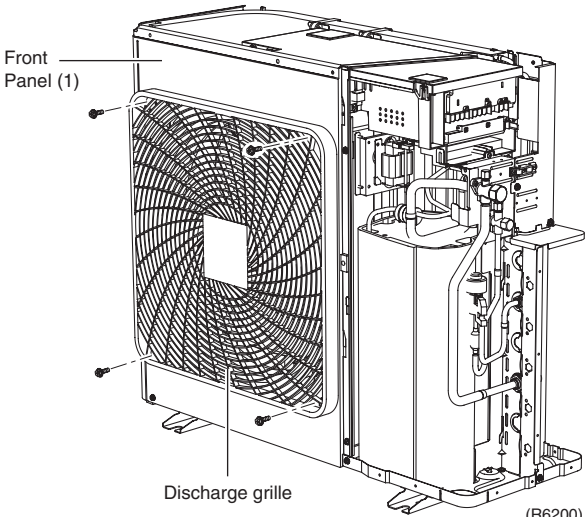
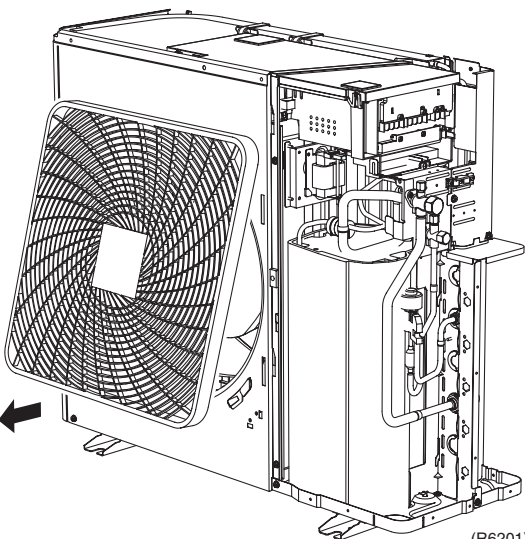
Step	Procedure	Points
2	<p>Remove 2 screws on the front and 1 screw on the right side panel.</p>  <p>(R6188)</p>	
3	<p>Lift the top panel and remove it.</p>  <p>(R6189)</p>	
3. Removing the right side panel.	<p>1 Remove 5 screws.</p>  <p>(R6190)</p>	

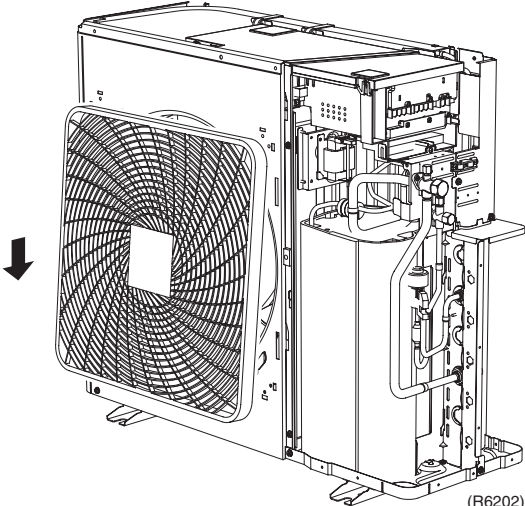
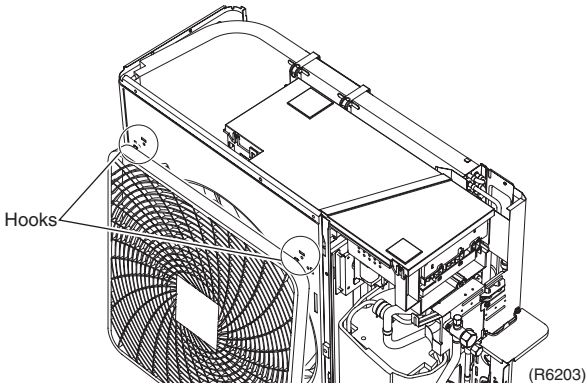
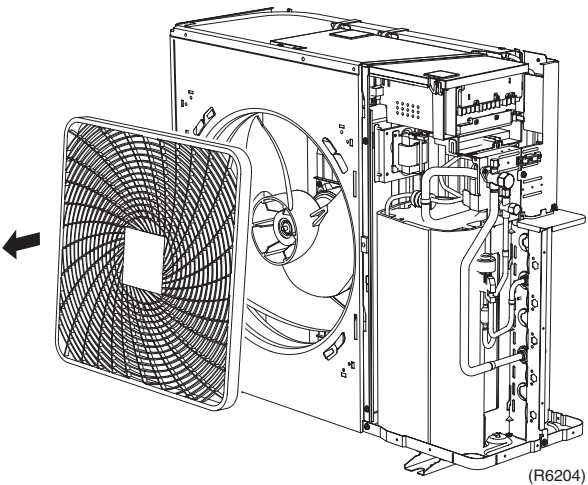
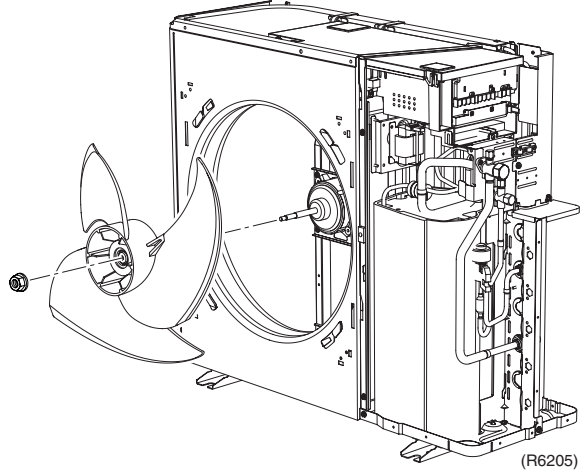
Step	Procedure	Points
2	Slide the panel downward to undo 2 hooks on the back side.	



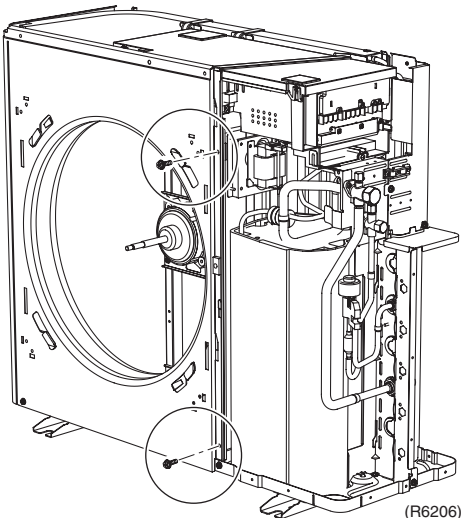
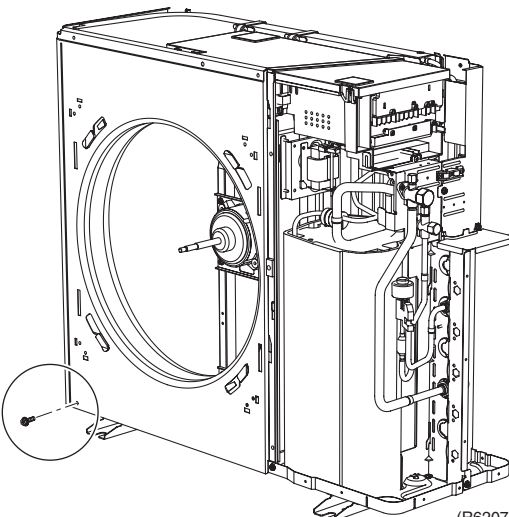
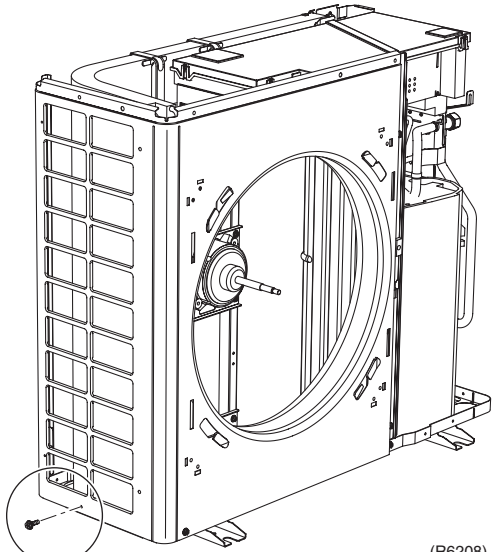
Step	Procedure	Points
3	<p>Remove the right side panel.</p>  <p>(R6194)</p>	
4. Removing the front panel (2)	<p>1 Remove the 2 screws.</p>  <p>(R6195)</p> <p>2 There is a hook at the top of the front panel (2). Slightly lift the front panel off position.</p>  <p>(R6196)</p>	<ul style="list-style-type: none"> <li>■ The hook is provided to keep the front panel (2) secured in place. It covers the top projections of the front panel (1) from above.</li> </ul>

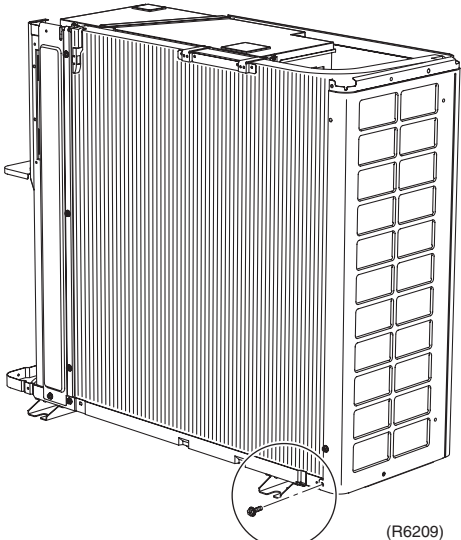
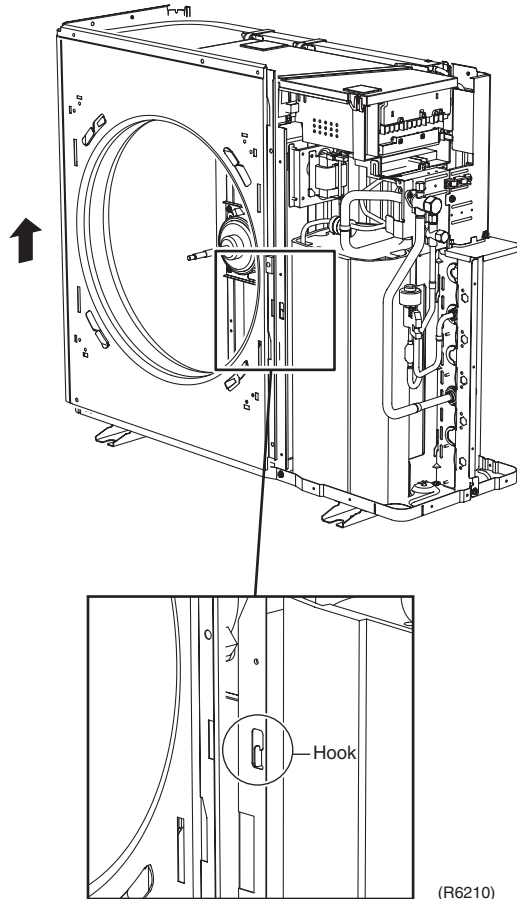
Step		Procedure	Points
3	Slide the panel downward to undo the hook.	 <p>(R6197)</p>  <p>(R6198)</p>	
4	Remove the front panel (2).	 <p>(R6199)</p>	

Step	Procedure	Points
5. Removing the front panel (1)		Remove the discharge grille and propeller fan first to remove the front panel (1).
1	<p>Remove the 4 screws on the discharge grille.</p>  <p style="text-align: right;">(R6200)</p>	
2	<p>Pull the bottom of the discharge grille toward yourself.</p>  <p style="text-align: right;">(R6201)</p>	

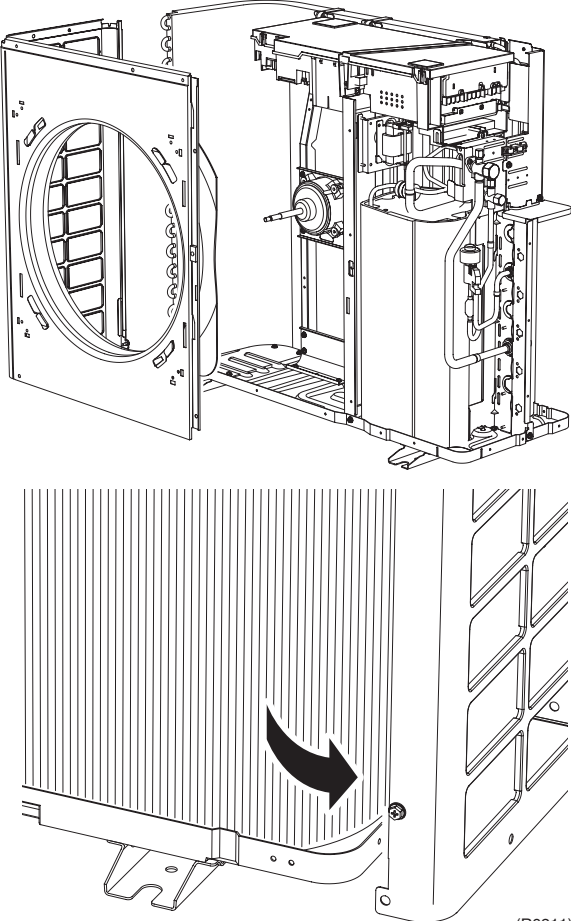
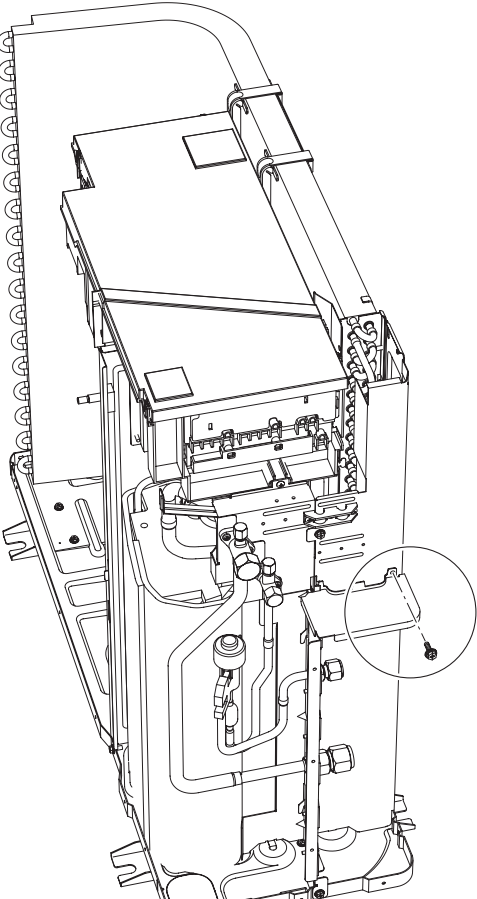
Step	Procedure	Procedure	Points
3	Next, slide the grille downward to undo the 2 hooks at the top.	 <p>(R6202)</p>  <p>(R6203)</p>	
4	Remove the discharge grille.	 <p>(R6204)</p>	
5	Remove the propeller fan fixing nut.	 <p>(R6205)</p>	Fan fixing nut : M8

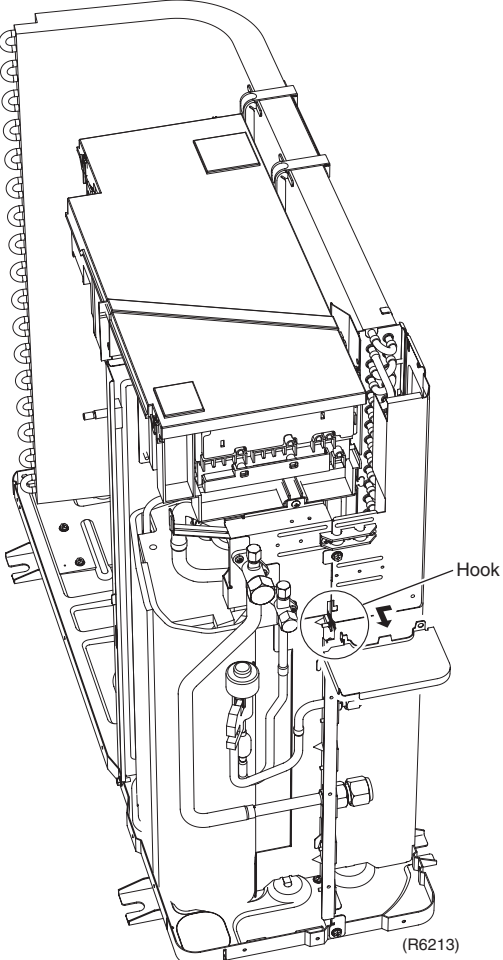
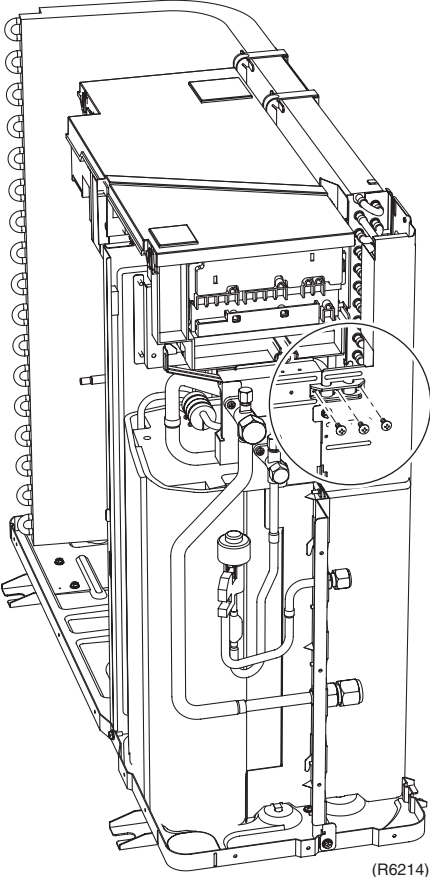


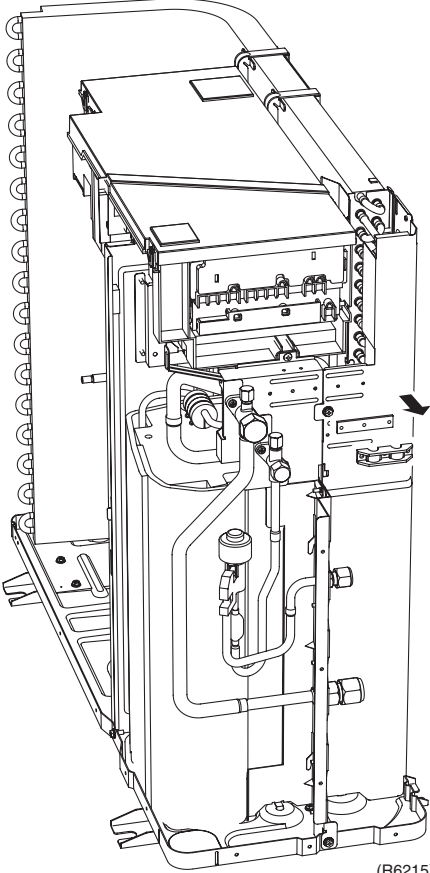
Step	Procedure	Procedure	Points
6	Remove the 2 fixing screws on the partition plate.	 <p>(R6206)</p>	
7	Remove the screw at bottom left of the front.	 <p>(R6207)</p>	
8	Remove the screw at bottom of the left side.	 <p>(R6208)</p>	

Step		Procedure	Points
9	Remove the screw at bottom of the back side.	 <p>(R6209)</p>	
10	The front panel (1) is provided with a hook on its front. Lift the front panel off position to remove it.	 <p>(R6210)</p>	

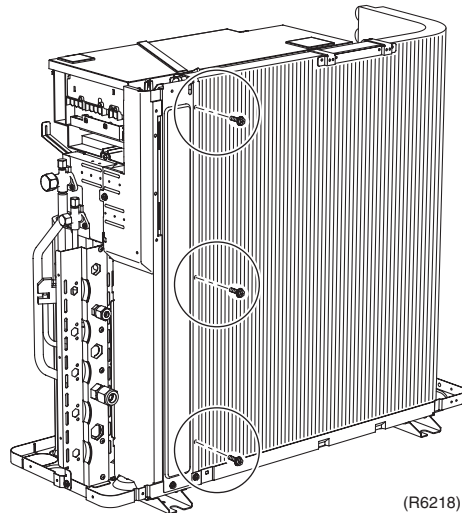
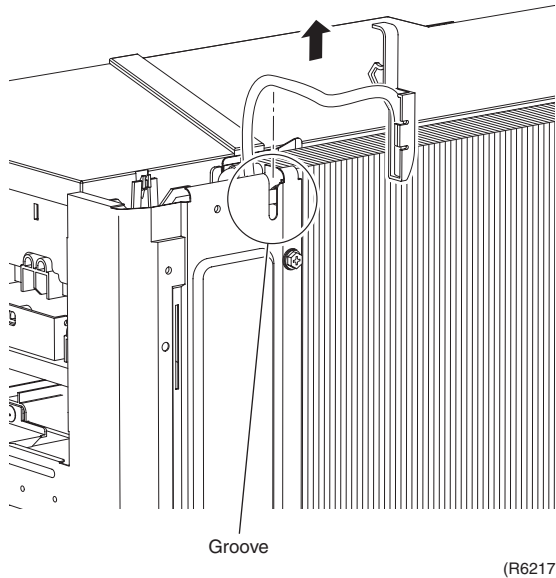
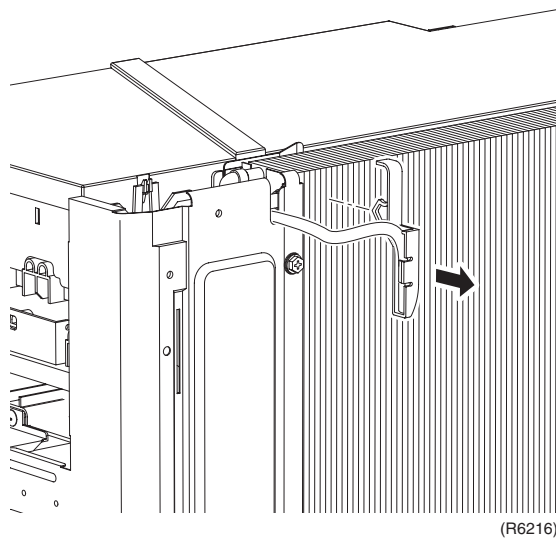


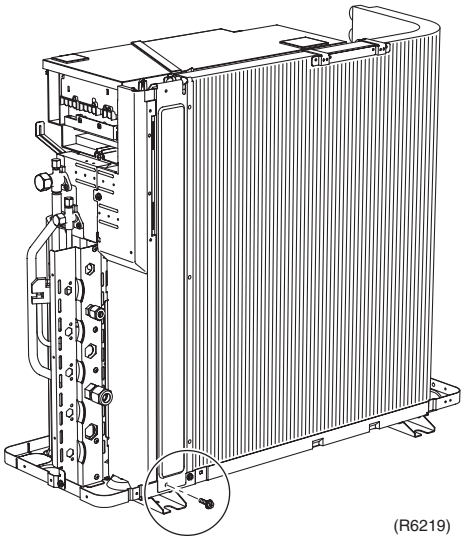
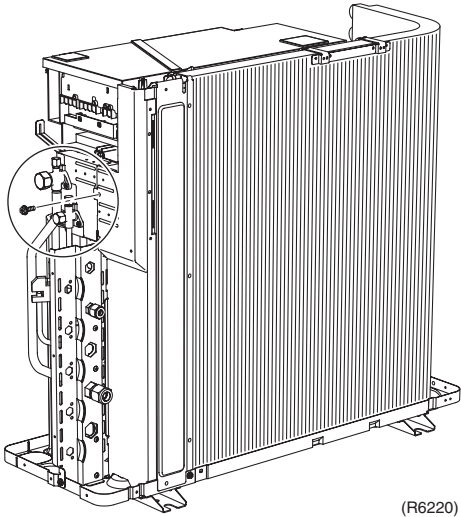
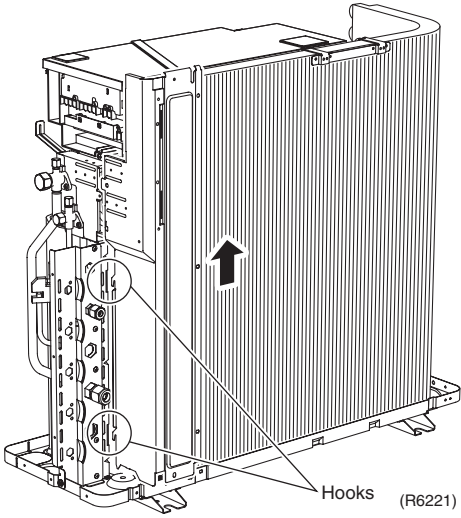
Step	Procedure	Points
<p>11</p>	<p>Remove the front panel (1).</p>  <p>(R6211)</p>	<ul style="list-style-type: none"> <li>■ The back is a little complicated in shape. Be sure to detach carefully.</li> </ul>
<p>6. Removing the rear panel</p> <p>1</p>	<p>Remove the fixing screw on the partition plate.</p>  <p>(R6212)</p>	

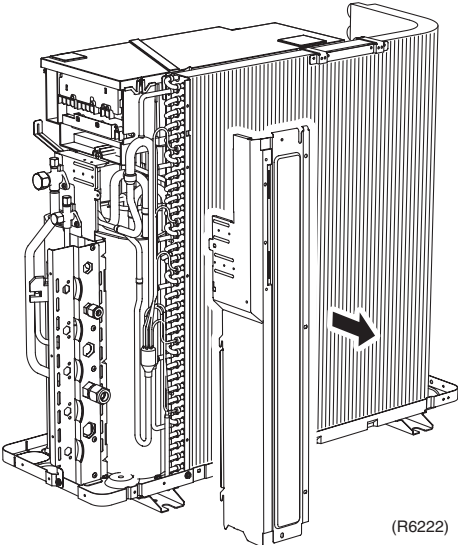
Step	Procedure	Points
2	<p>Slide the panel leftward to undo the hooks, and remove the partition plate.</p>  <p style="text-align: right;">(R6213)</p>	
3	<p>Remove the 3 screws.</p>  <p style="text-align: right;">(R6214)</p>	

Step	Procedure	Points
<p>4</p>	<p>Remove the wire fixing plate.</p>  <p>(R6215)</p>	

Step	Procedure	Points
5	Undo the holder of the thermistor.	<ul style="list-style-type: none"> <li>■ The holder is secured in the clearances of the heat exchanger fins.</li> </ul>
6	Remove the 3 fixing screws on the partition plate.	



Step	Procedure	Procedure	Points
7	Remove the fixing screw from the bottom frame.	 <p>(R6219)</p>	
8	Remove the fixing screw from the shut-off valve mounting plate.	 <p>(R6220)</p>	
9	Lift the panel upward to undo the 2 hooks and remove it.	 <p>Hooks (R6221)</p>	

Step	Procedure	Points
10	<p data-bbox="201 215 469 248">Remove the rear panel.</p>  <p data-bbox="943 775 1002 797">(R6222)</p>	

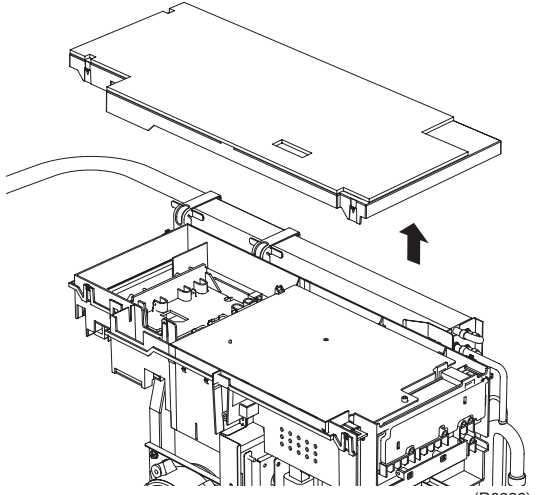
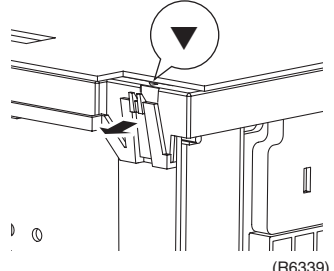
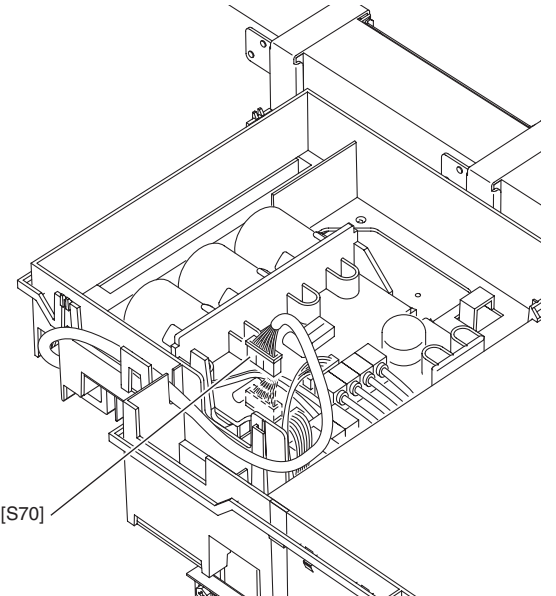
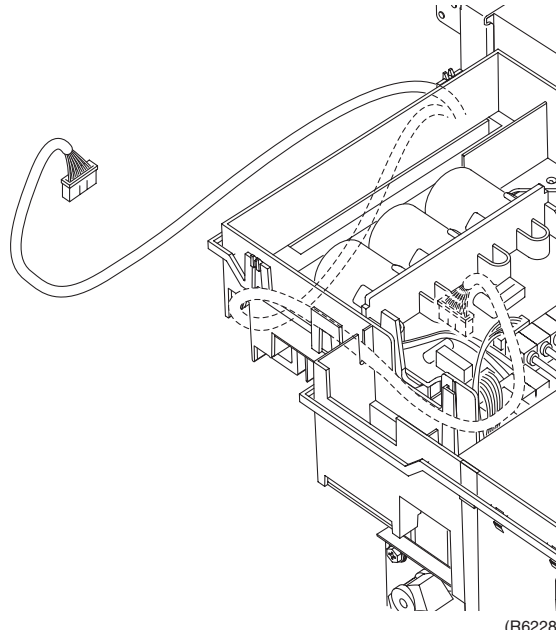
## 2.2.2 Removal of the Electrical Box

**Procedure**

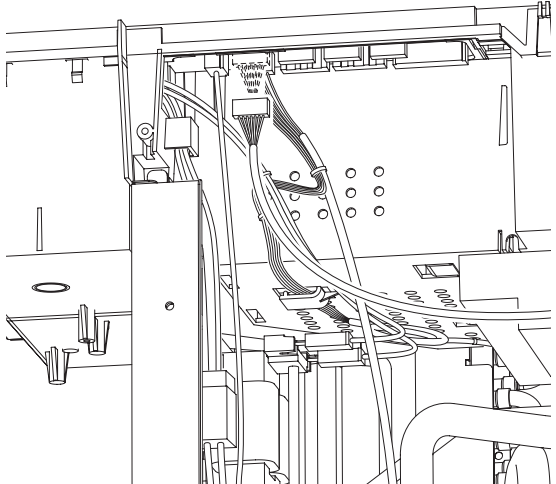
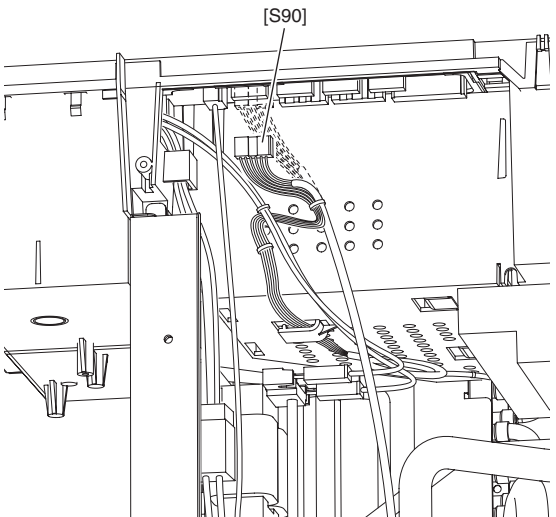
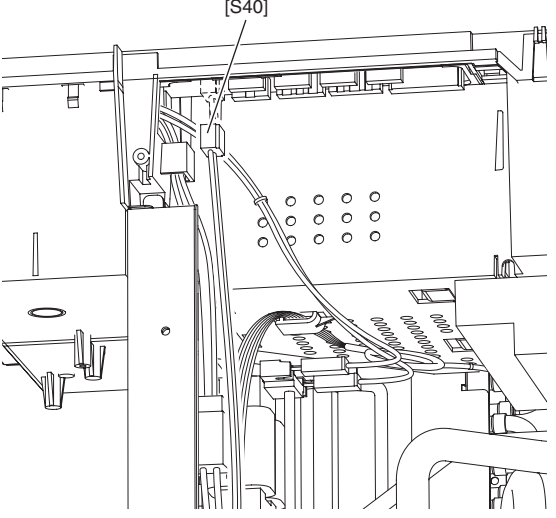


**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

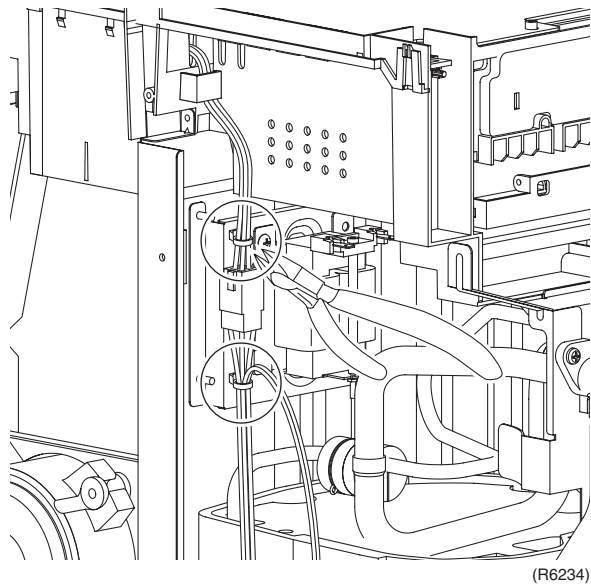
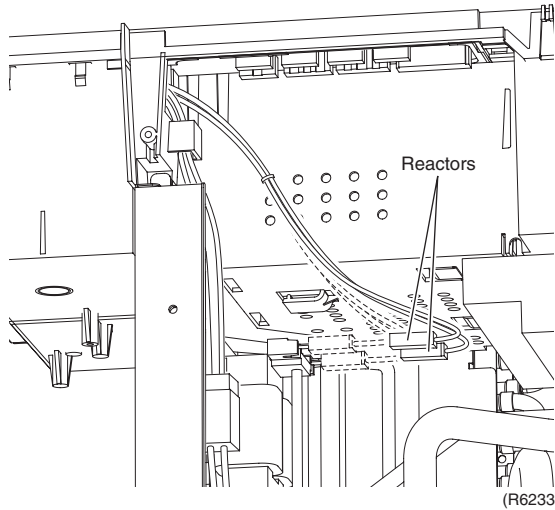
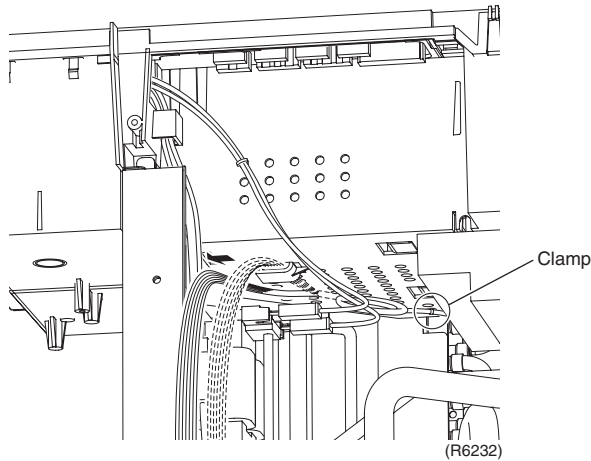
Step	Procedure	Procedure	Points
1	Remove the fixing screw from the shut-off valve mounting plate.	<p>(R6223)</p>	
2	Remove the fixing screw on the partition plate.	<p>(R6224)</p>	
3	Remove the 2 screws to detach the earth wires.	<p>(R6225)</p>	

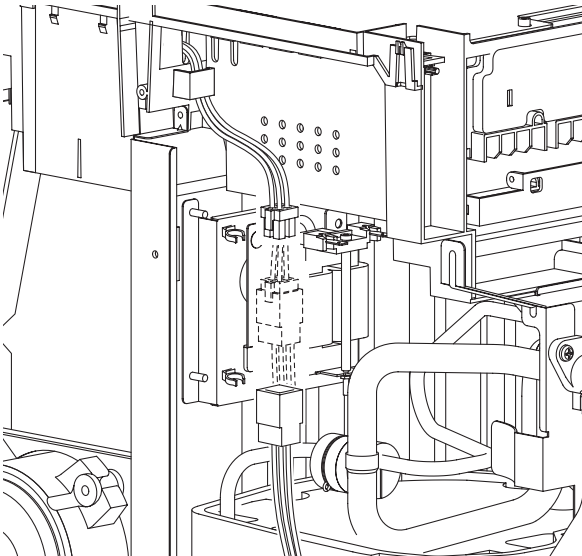
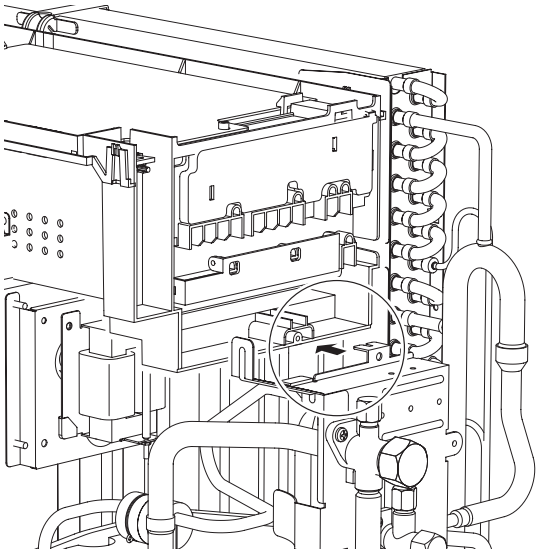
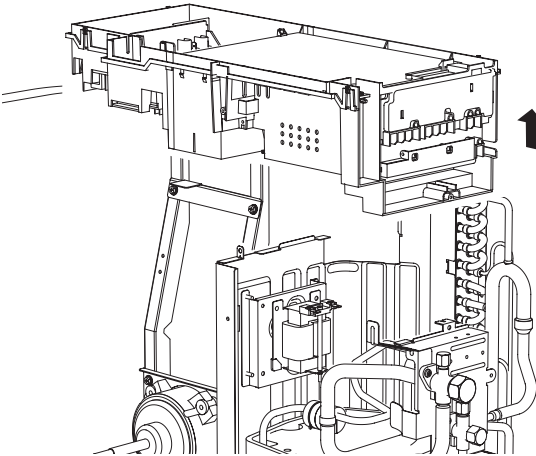
Step	Procedure	Procedure	Points
4	Open the cover of the electrical box.	 <p>(R6226)</p>	<p>■ Undo the four hooks. The hooks are marked with ▼.</p>  <p>(R6339)</p>
5	Disconnect the fan motor connector S70.	 <p>[S70]</p> <p>(R6227)</p>	
6	Release the fan motor wire harness.	 <p>(R6228)</p>	



Step	Procedure	Points
7	<p>Disconnect the electronic expansion valve coil connector S20.</p>	 <p>(R6229)</p>
8	<p>Disconnect the discharge pipe thermistor connector S90.</p>	 <p>(R6230)</p>
9	<p>Disconnect the OL connector S40.</p>	 <p>(R6231)</p>

Step	Procedure	Points
10	The wire harness is hooked on the bottom of the electrical box. Unhook it and pull out the clamp.	
11	Disconnect the 2 reactor wire harnesses.	
12	Cut the clamps with nippers to detach the OL wire harness and the compressor wire harness together from the partition.	



Step	Procedure	Points
13	<p>Disconnect the relay connector of the compressor.</p>  <p>(R6235)</p>	
14	<p>First, slide the box leftward to undo the hook on the right side of the box.</p>  <p>(R6236)</p>	
15	<p>Lift up the electrical box to remove it.</p>  <p>(R6237)</p>	

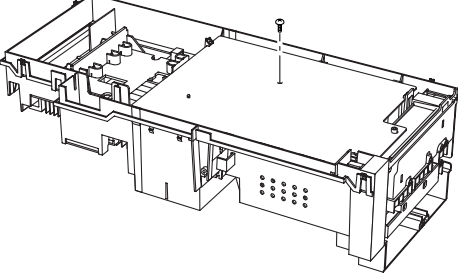
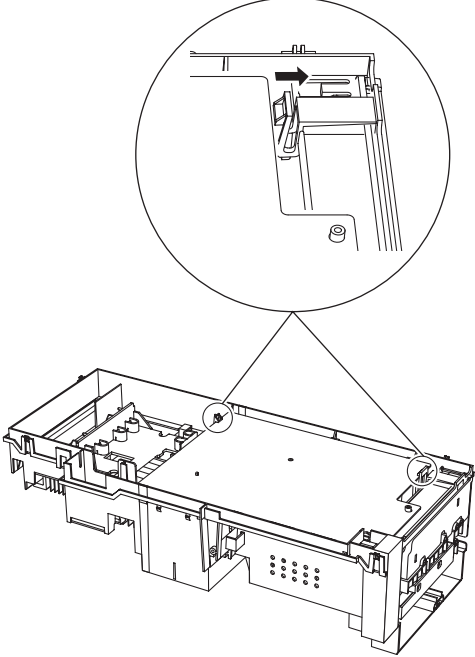
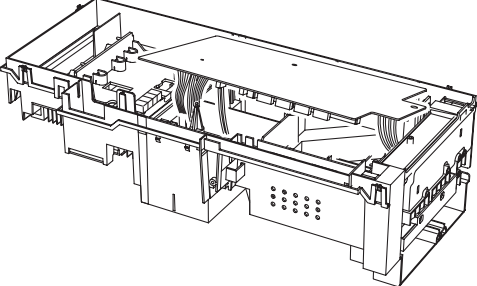
## 2.2.3 Removal of PCB

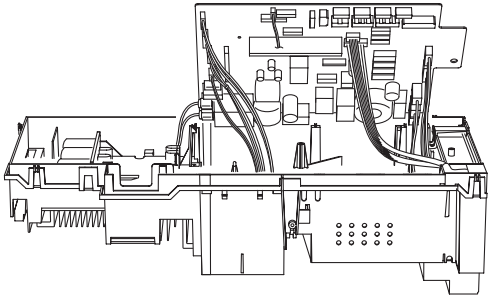
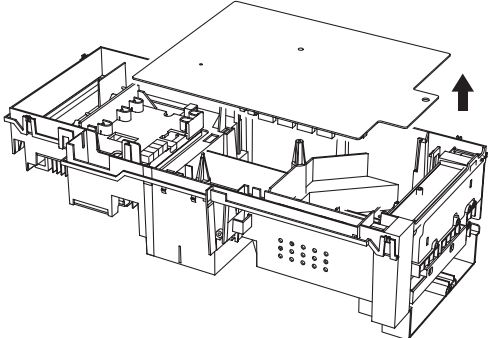
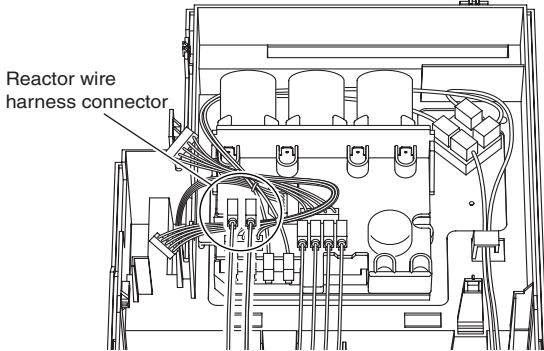
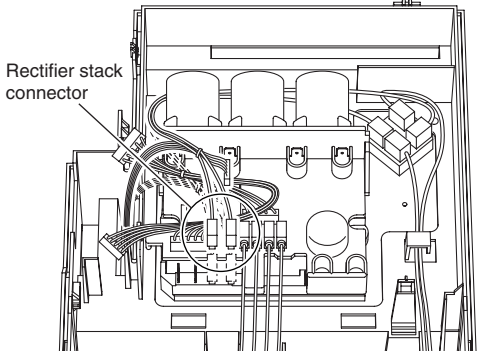
### Procedure

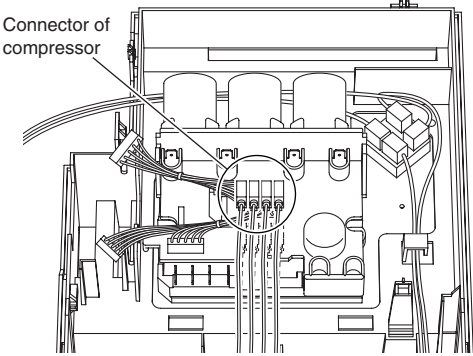
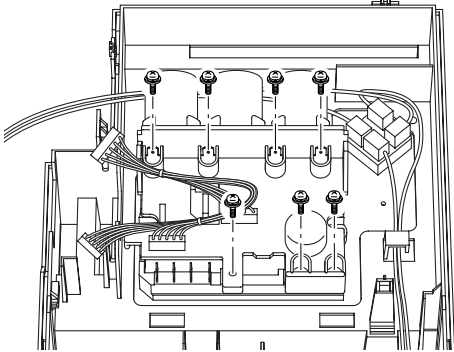
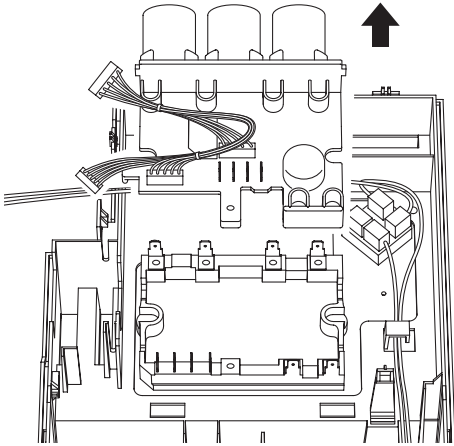


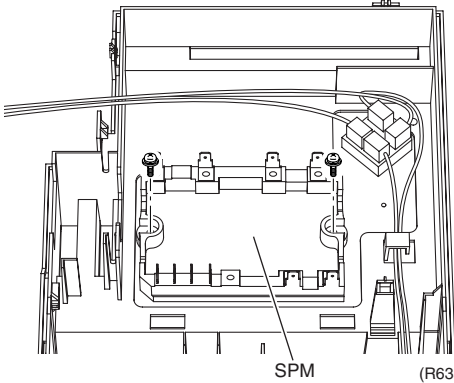
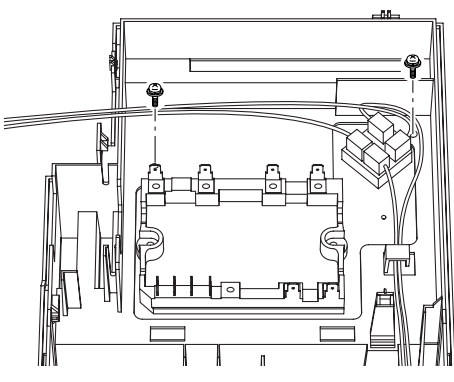
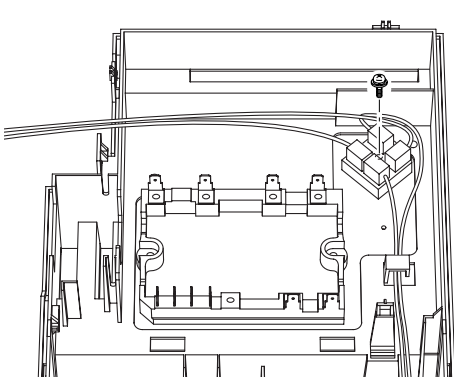
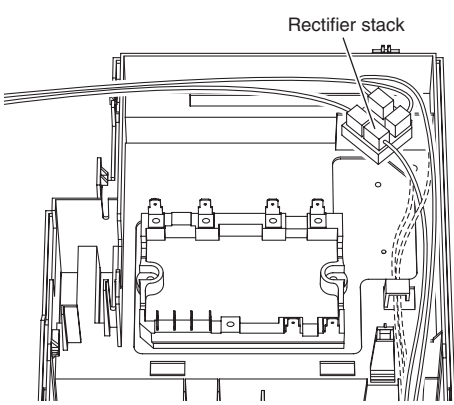
### Warning

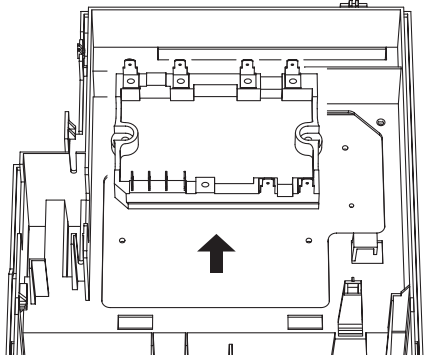
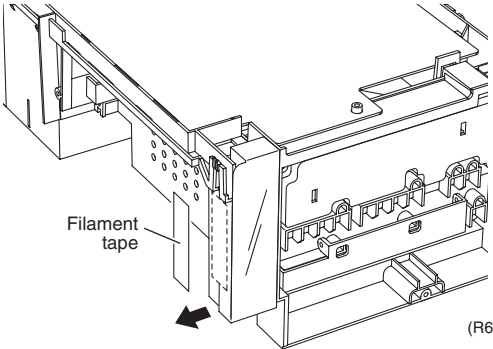
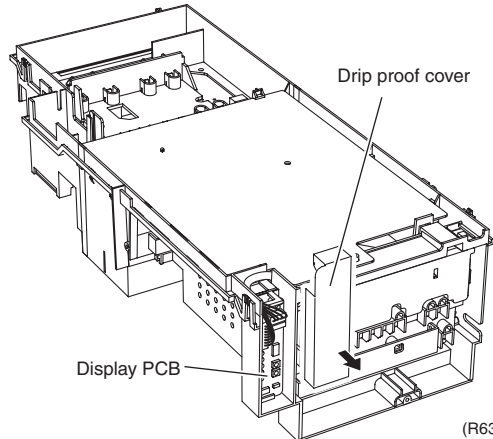
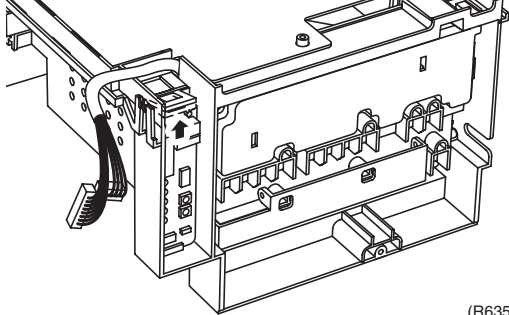
Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
1.	Removing the Control PCB	
1	Remove the screw.	 <p>(R6340)</p>
2	Undo the 2 hooks.	 <p>(R6341)</p>
3	Lift up your side of the control PCB.	 <p>(R6342)</p>

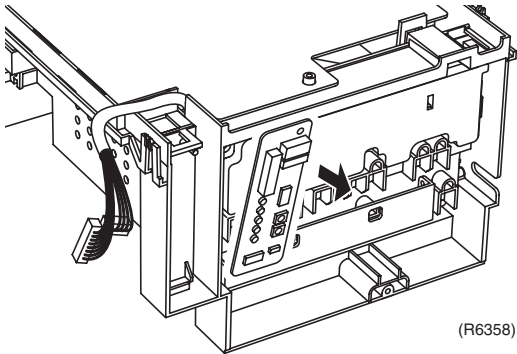
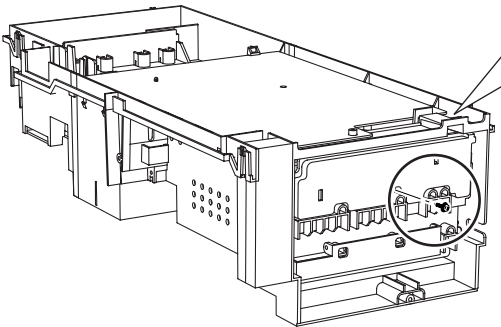
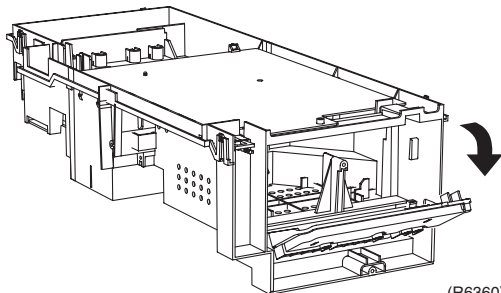
Step	Procedure	Procedure	Points
<p>4</p> <p>5</p>	<p>Disconnect the connectors one by one starting from your side.</p> <p>Remove the control PCB.</p>	 <p>(R6343)</p>  <p>(R6344)</p>	<ul style="list-style-type: none"> <li>● Connectors S33 &amp; S71: For inverter PCB (MID)</li> <li>● Connectors S31 &amp; S32: For SPM PCB</li> <li>● Connectors S51 &amp; S101: For display PCB</li> <li>● Connector S10: For terminal strip</li> <li>● Connectors H1/H2: For DB (diode bridge), power wire harnesses AC1 (black) and AC2 (white)</li> </ul>
<p>2. Removing the inverter PCB</p>	<p>1</p> <p>2</p>	 <p>Reactor wire harness connector</p> <p>(R6345)</p>  <p>Rectifier stack connector</p> <p>(R6346)</p>	<ul style="list-style-type: none"> <li>■ Connector L1/L2</li> <li>■ Black and red</li> </ul>

Step	Procedure	Points
3	Disconnect the connector of the compressor.  <p style="text-align: right;">(R6347)</p>	■ Blue, yellow, red, and brown
4	Remove the 7 screws.  <p style="text-align: right;">(R6348)</p>	
5	Lift the inverter PCB (MID) upward to remove it.  <p style="text-align: right;">(R6349)</p>	

Step	Procedure	Points
3. Removing the SPM.		
1 Remove the 2 screws.	 <p style="text-align: center;">SPM (R6350)</p>	
2 Remove the 2 screws.	 <p style="text-align: center;">(R6531)</p>	
3 Remove the screw (rectifier stack).	 <p style="text-align: center;">(R6352)</p>	
4 Remove the rectifier stack.	 <p style="text-align: center;">Rectifier stack (R6353)</p>	

Step		Procedure	Points
5	Remove the SPM.	 <p>(R6354)</p>	
4. Removing the display PCB.			
1	Remove the filament tape.	 <p>Filament tape</p> <p>(R6355)</p>	
2	Remove the drip proof cover.	 <p>Drip proof cover</p> <p>Display PCB</p> <p>(R6356)</p>	
3	Slightly lift the top hooks to detach.	 <p>(R6357)</p>	



Step	Procedure	Procedure	Points
4	Undo the bottom hook to remove the display PCB.	 <p>(R6358)</p>	
5.	<p>Removing the servicing cover off the terminal block assembly.</p> <p>1 Remove the screw.</p> <p>2 Lift the hook to detach.</p> <p>3 Open the cover toward yourself.</p>	 <p>(R6359)</p>  <p>(R6360)</p>	

## 2.2.4 Removal of Fan Motor

Procedure



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

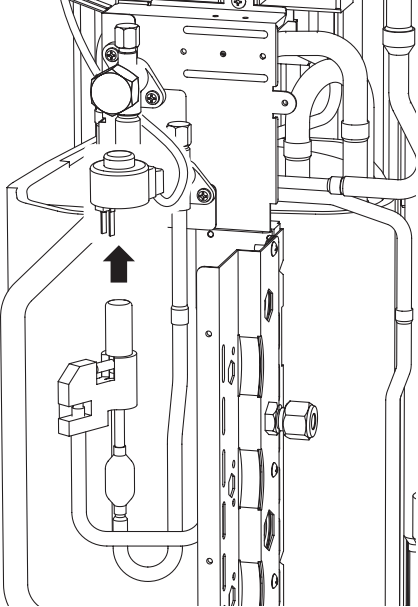
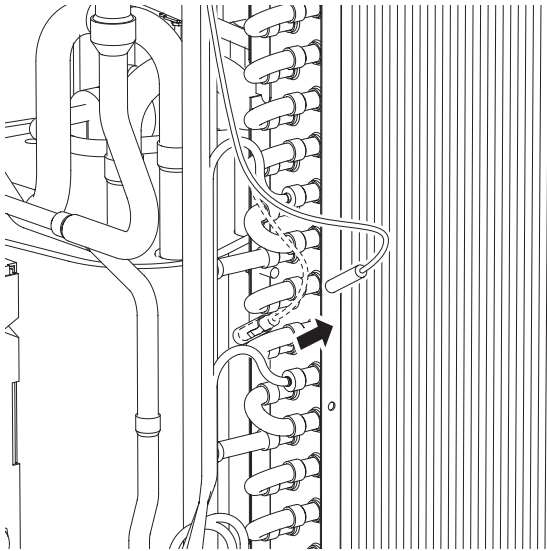
Step	Procedure	Points
<p>1 Remove the 2 screws at the lower first.</p> <p>2 Next, remove the 2 upper screws.</p>	<p style="text-align: right;">(R6238)</p> <p style="text-align: right;">(R6239)</p>	<p>Be sure to remove the lower screws first. If the upper screws are removed first, the fan motor, the center of gravity of which is toward the front, may tilt down or fall, getting you injured.</p>
<p>3 Remove the fan motor.</p>	<p style="text-align: right;">(R6240)</p> <p style="text-align: right;">(R6241)</p>	<p>When reassembling, be sure to place the wire harness lower.</p>

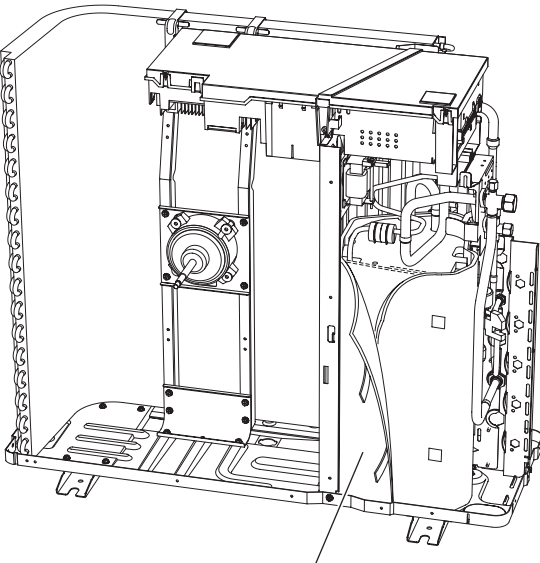
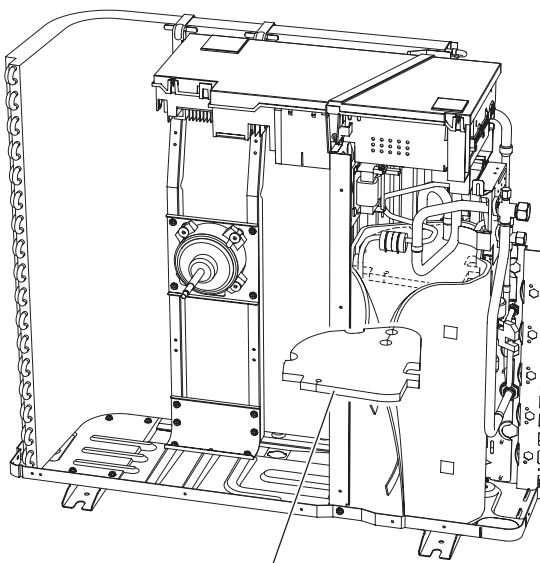
## 2.2.5 Removal of Coils / Thermistors

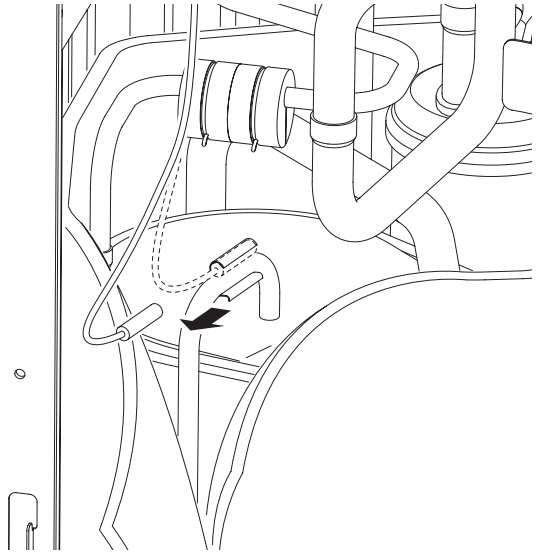
**Procedure**



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
1. Removing the electronic expansion valve coil	 <p style="text-align: right;">(R6242)</p>	
2. Removal of thermistors	 <p style="text-align: right;">(R6243)</p>	<ul style="list-style-type: none"> <li>■ Be careful no to lose the spring.</li> </ul>

Step	Procedure	Procedure	Points
2	Slightly open the sound blanket (outer sleeve).	 <p data-bbox="694 824 1061 862">Sound blanket (outer sleeve) (R6245)</p>	
3	Remove the sound blanket (top upper).	 <p data-bbox="646 1496 1061 1534">Sound blanket (top upper) (R6246)</p>	

Step	Procedure	Points
<p>4</p>	<p>Remove the discharge pipe thermistor.</p>  <p>(R6247)</p>	<ul style="list-style-type: none"> <li>■ Be careful not to lose the fixture.</li> </ul>

## 2.2.6 Removal of Reactor

**Procedure**



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Procedure	Points
1	Remove the screw.	<p>(R6249)</p>	
2	Lift the reactor upward to undo the hooks, and remove the reactor.	<p>Reactor</p> <p>Hooks</p> <p>(R6250)</p>	

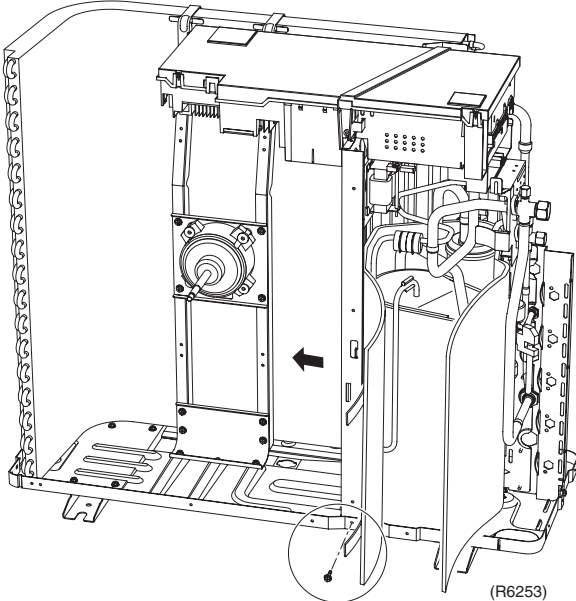
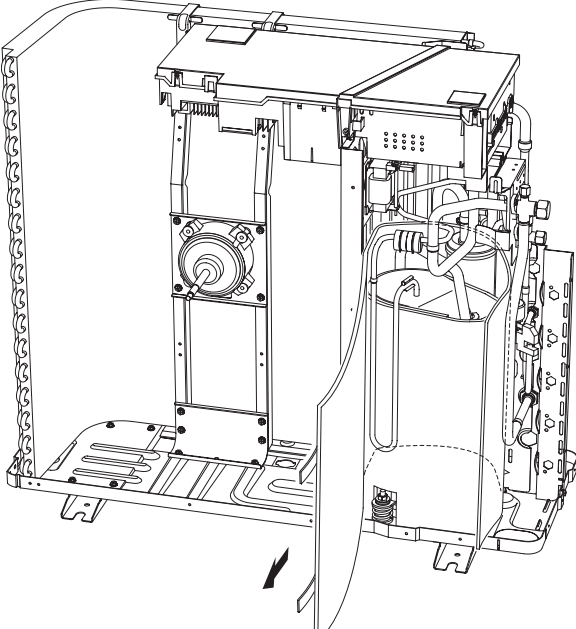
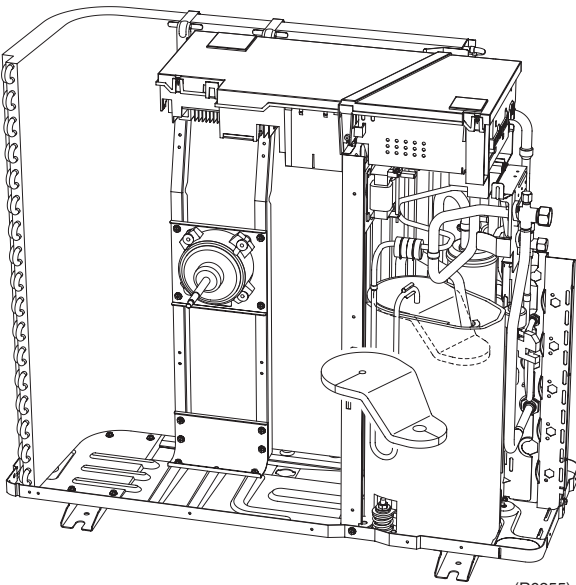
## 2.2.7 Removal of Sound Blanket

**Procedure**

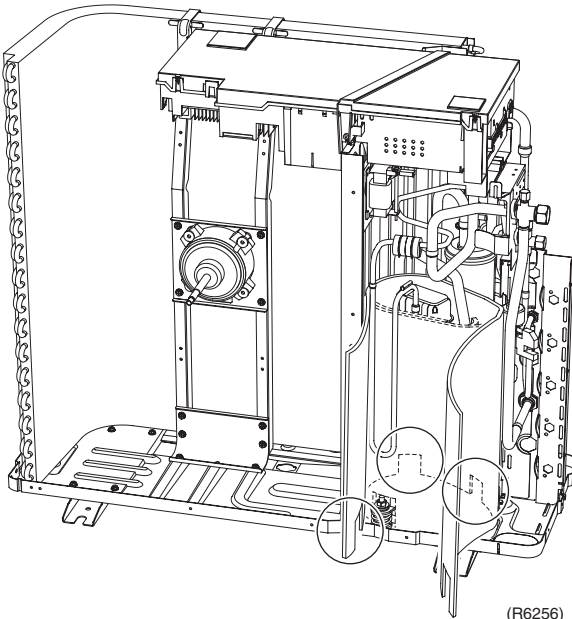
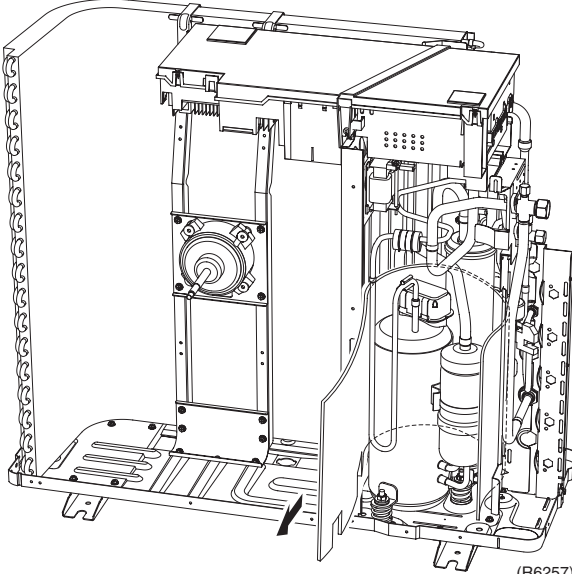


**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
1	Undo the 2 Velcro tapes off the sound blanket, and open the sound blanket (outer sleeve).	
	<p style="text-align: center;">Velcro tape (R6251)</p>	
2	Remove the sound blanket (top upper).	<ul style="list-style-type: none"> <li>■ The sound blanket is fragile. Carefully pass the discharge pipe through it.</li> </ul>
	<p style="text-align: center;">(R6252)</p>	

Step	Procedure	Points
3	<p>Remove the screw from the partition plate and open the plate slightly to the left for easy work.</p>  <p>(R6253)</p>	
4	<p>Remove the sound blanket (outer sleeve).</p>  <p>(R6254)</p>	<ul style="list-style-type: none"> <li>■ The sound blanket is fragile. Be careful of the notches of the compressor mount (3 locations).</li> </ul>
5	<p>Remove the sound blanket (top lower).</p>  <p>(R6255)</p>	<ul style="list-style-type: none"> <li>■ The sound blanket is fragile. Carefully pass the discharge pipe through it.</li> </ul>



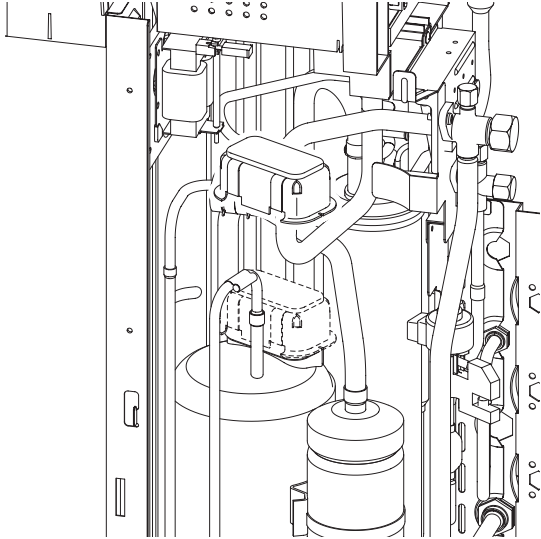
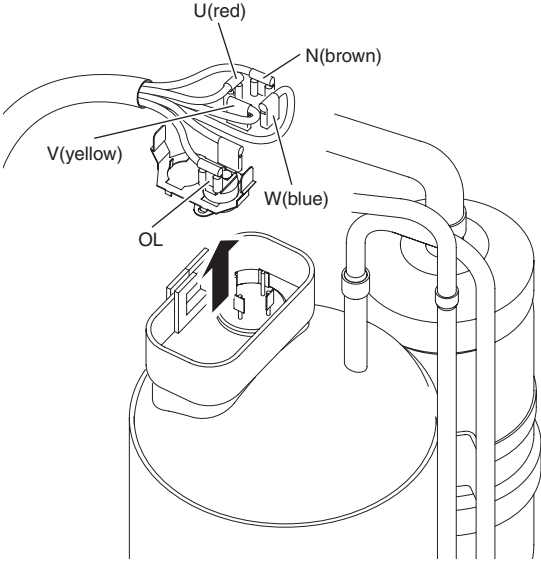
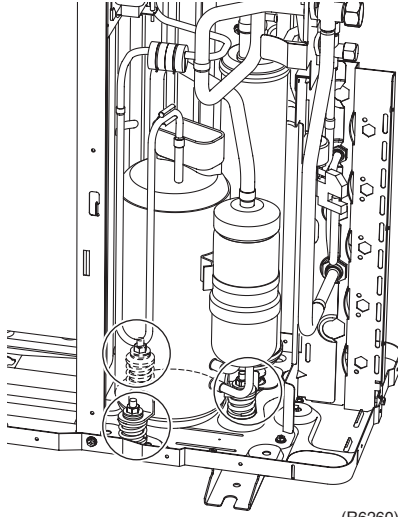
Step	Procedure	Points
6	<p data-bbox="199 215 470 280">Open the sound blanket (inner sleeve).</p>  <p data-bbox="997 862 1061 884">(R6256)</p>	<ul style="list-style-type: none"> <li data-bbox="1093 705 1455 840">■ The sound blanket is fragile. Be careful of the notches of the compressor mount (3 locations).</li> </ul>
7	<p data-bbox="199 896 470 963">Remove the sound blanket (inner sleeve).</p>  <p data-bbox="997 1512 1061 1534">(R6257)</p>	

## 2.2.8 Removal of Compressor

**Procedure**



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
1	Remove the terminal cover.  <p style="text-align: right;">(R6258)</p>	
2 3	Pull out the 4 leads using long-nose pliers. Remove the OL.  <p style="text-align: right;">(R6259)</p>	■ U:red, V:yellow, W:blue, N:brown
4	Remove the 3 screws.  <p style="text-align: right;">(R6260)</p>	



# Part 8 Others

1. Others .....	214
1.1 Test Run from the Remote Controller .....	214
1.2 Jumper Settings .....	215

# 1. Others

## 1.1 Test Run from the Remote Controller

### For Heat pump

In cooling mode, select the lowest programmable temperature; in heating mode, select the highest programmable temperature.

- Trial operation may be disabled in either mode depending on the room temperature.
- After trial operation is complete, set the temperature to a normal level.  
(26°C to 28°C in cooling mode, 20°C to 24°C in heating mode)
- For protection, the system disables restart operation for 3 minutes after it is turned off.

### For Cooling Only

Select the lowest programmable temperature.

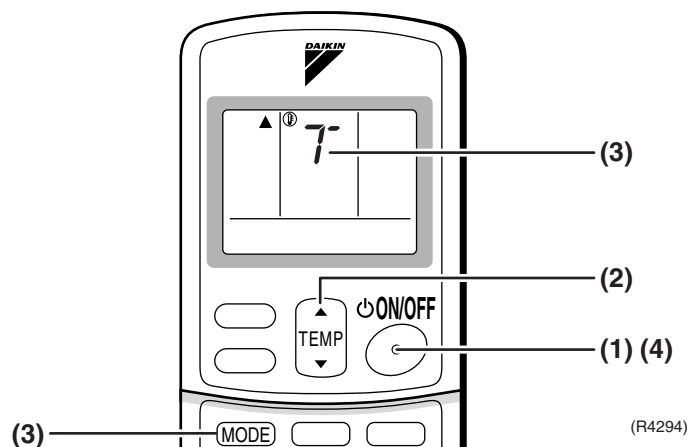
- Trial operation in cooling mode may be disabled depending on the room temperature.  
Use the remote control for trial operation as described below.
- After trial operation is complete, set the temperature to a normal level (26°C to 28°C).
- For protection, the machine disables restart operation for 3 minutes after it is turned off.

### Trial Operation and Testing

1. Measure the supply voltage and make sure that it falls in the specified range.
  2. Trial operation should be carried out in either cooling or heating mode.
  3. Carry out the test operation in accordance with the Operation Manual to ensure that all functions and parts, such as louver movement, are working properly.
- The air conditioner requires a small amount of power in its standby mode. If the system is not to be used for some time after installation, shut off the circuit breaker to eliminate unnecessary power consumption.
  - If the circuit breaker trips to shut off the power to the air conditioner, the system will restore the original operation mode when the circuit breaker is opened again.

### Trial operation from Remote Controller

- (1) Press ON/OFF button to turn on the system.
- (2) Simultaneously press center of TEMP button and MODE buttons.
- (3) Press MODE button twice.  
(“T” will appear on the display to indicate that Trial Operation mode is selected.)
- (4) Trial run mode terminates in approx. 30 minutes and switches into normal mode. To quit a trial operation, press ON/OFF button.



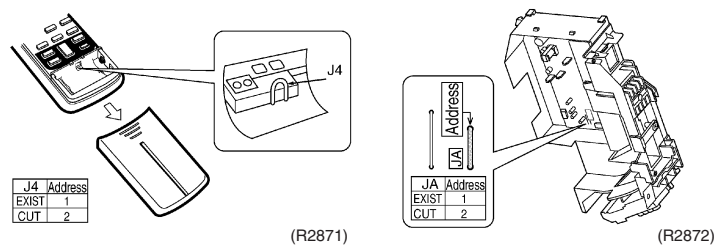
## 1.2 Jumper Settings

### 1.2.1 When Two Units are Installed in One Room

When two indoor units are installed in one room, the two wireless remote controllers can be set for different addresses.

#### How to set the different addresses

- Control PCB of the indoor unit
  - (1) Remove the front grille. (3 screws)
  - (2) Remove the electrical box (1-screw).
  - (3) Remove the drip proof plate. (4 tabs)
  - (4) Cut the address jumper **JA** on the control PCB.
  
- Wireless remote controller
  - (1) Slide the front cover and take it off.
  - (2) Cut the address jumper **J4**.



### 1.2.2 Jumper Setting

Jumper (On indoor control PCB)	Function	When connected (factory set)	When cut
<b>JC</b>	Power failure recovery function	Auto start	Unit does not resume operation after recovering from a power failure. Timer ON-OFF settings are cleared.
<b>JB</b>	Fan speed setting when compressor is OFF on thermostat. (effective only at cooling operation)	Fan speed setting ; Remote controller setting	Fan rpm is set to "0" <Fan stop>



# Part 9 Appendix

1. Piping Diagrams.....	218
1.1 Indoor Units.....	218
1.2 Outdoor Units.....	220
2. Wiring Diagrams.....	224
2.1 Indoor Units.....	224
2.2 Outdoor Units.....	225



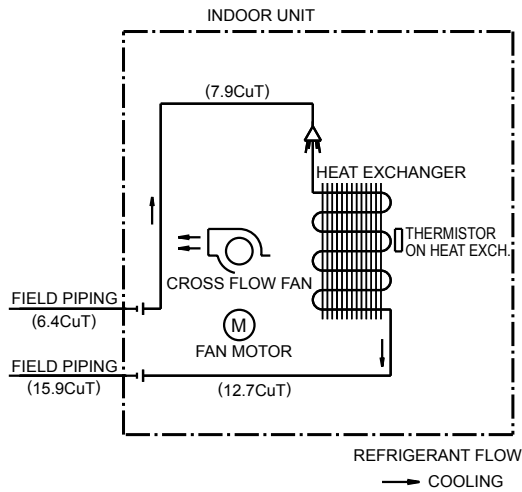
# 1. Piping Diagrams

## 1.1 Indoor Units

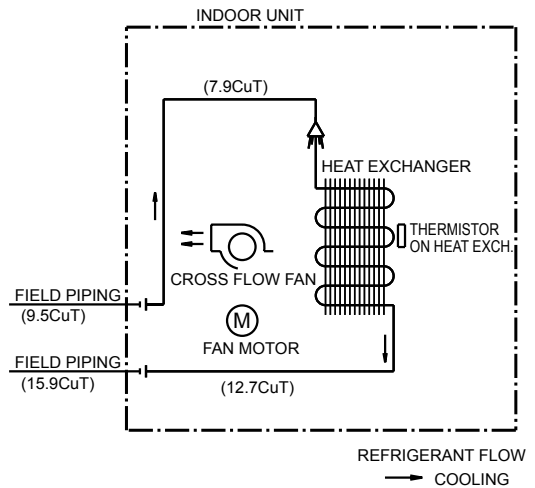
### 1.1.1 Cooling Only

FTKD60FVM, FTKD60FV2Z  
FTKD15GV2S, FTKD18GV2S

FTKD71FVM, FTKD71FV2Z  
FTKD24GV2S, FTKD28GV2S

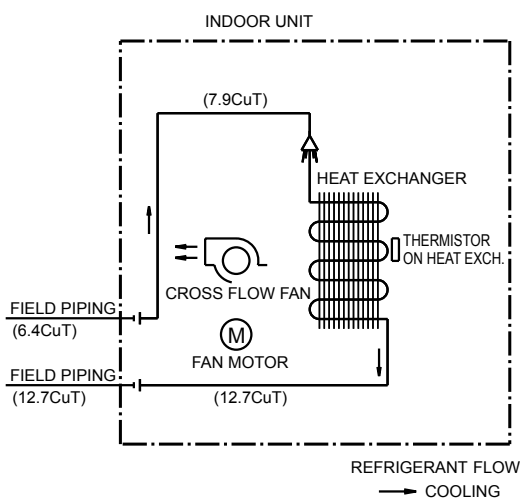


4D050919E



4D053131A

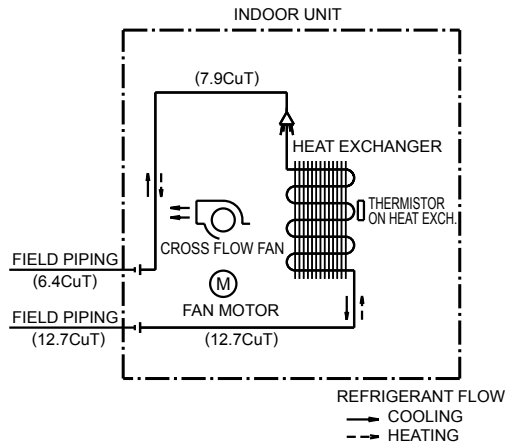
FTKD50FVM, FTKD50FV2Z



4D054932A

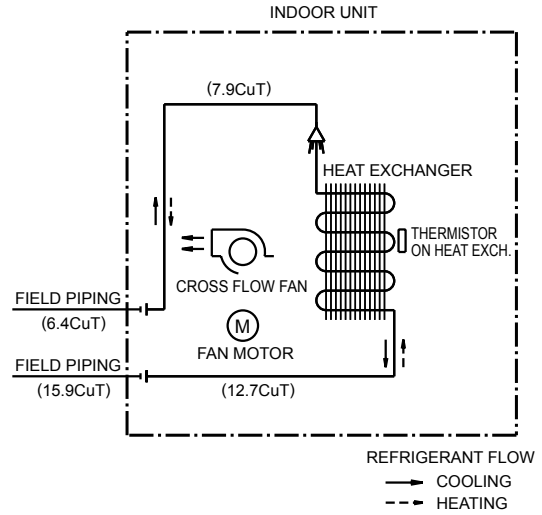
### 1.1.2 Heat Pump

FTXD50FVM, FTXD50FV2Z



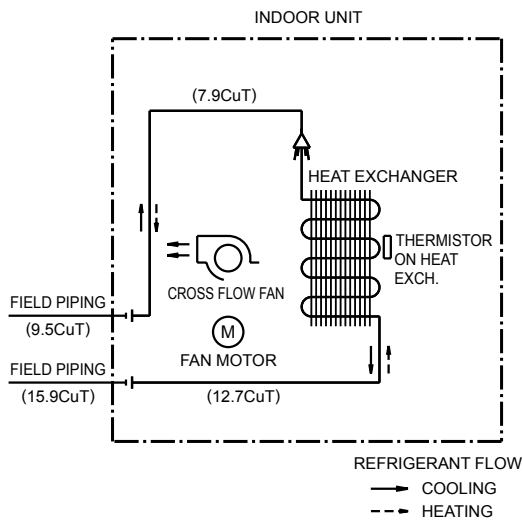
4D040081Q

FTXD60FVM, FTXD60FV2Z



4D040082P

FTXD71FVM, FTXD71FV2Z

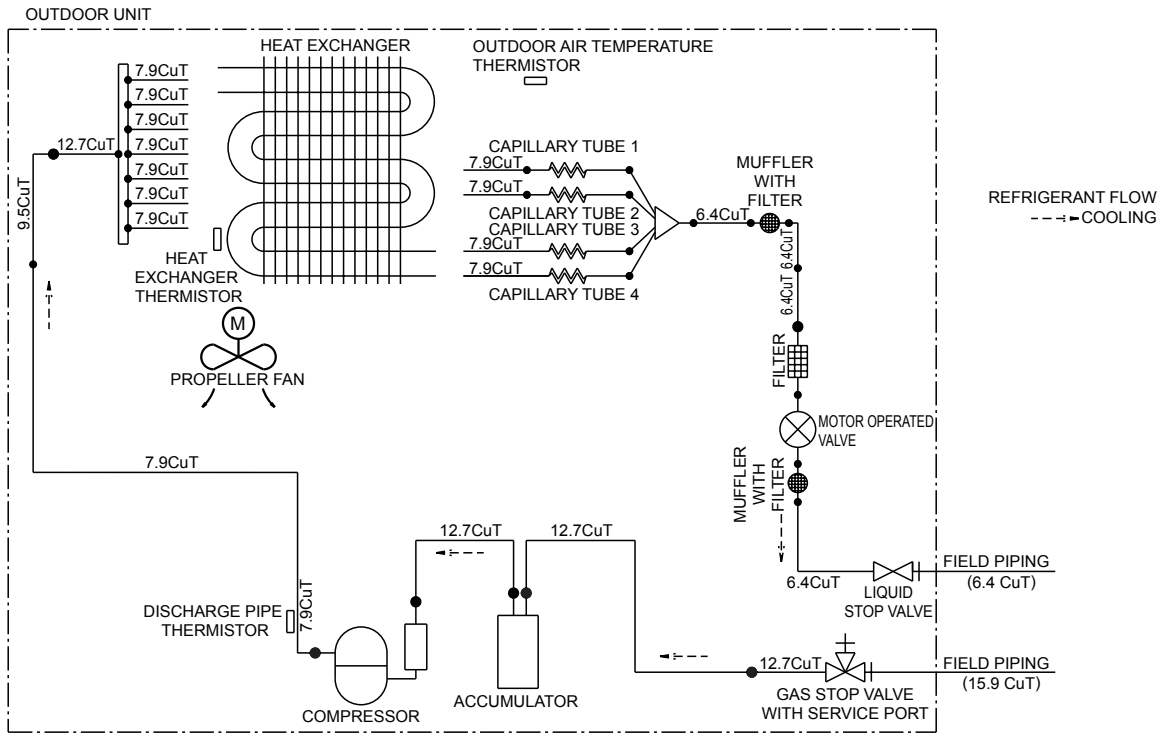


4D040083G

# 1.2 Outdoor Units

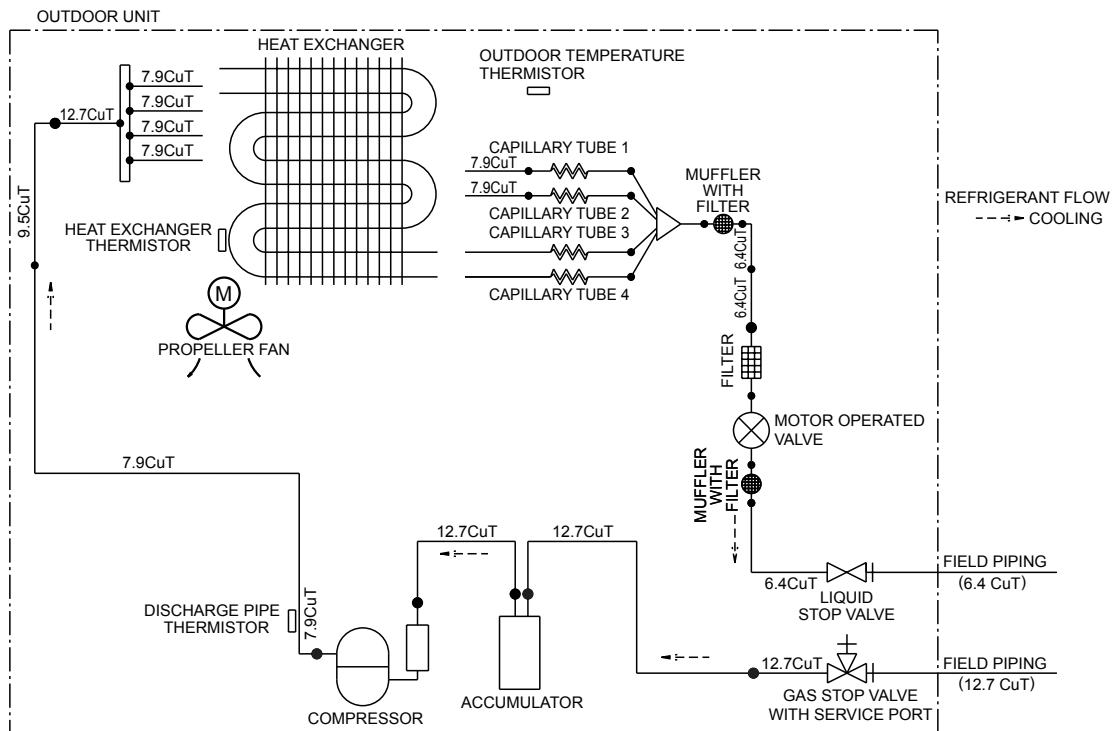
## 1.2.1 Cooling Only

### RKD60BVM, RKD60BVMA, RKD15GV2S, RKD18GV2S



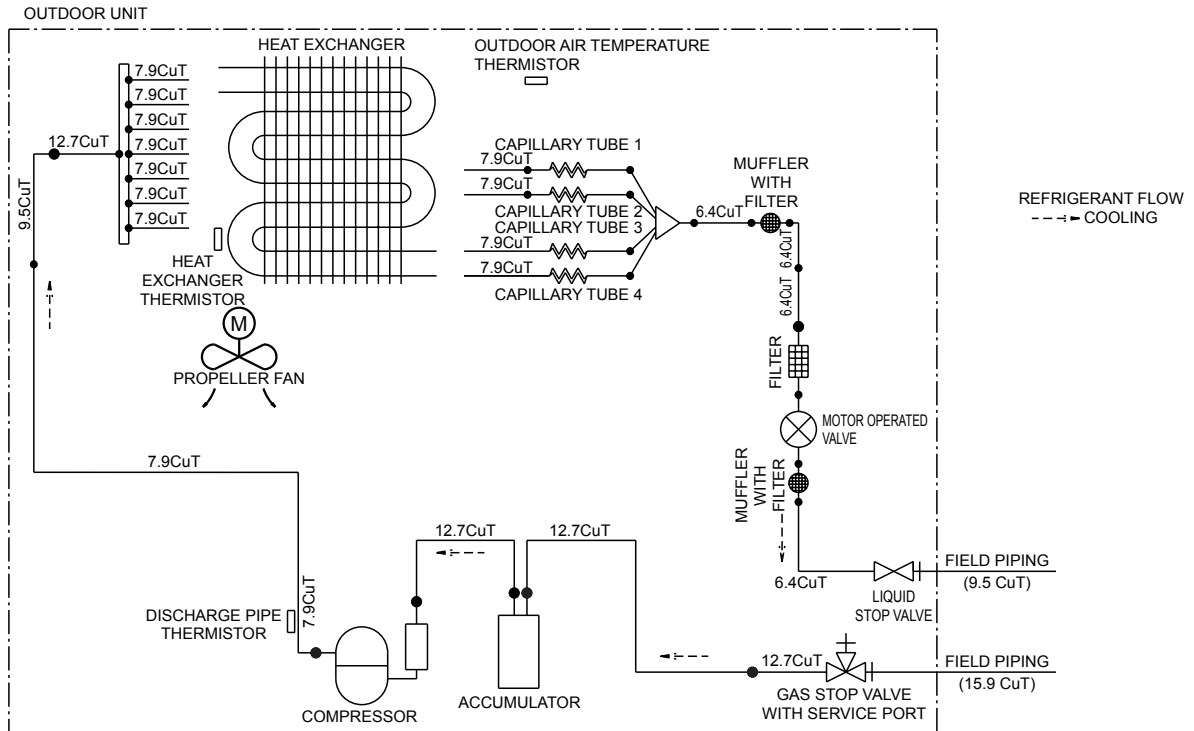
3D037852H

### RKD50BVM, RKD50BVMA



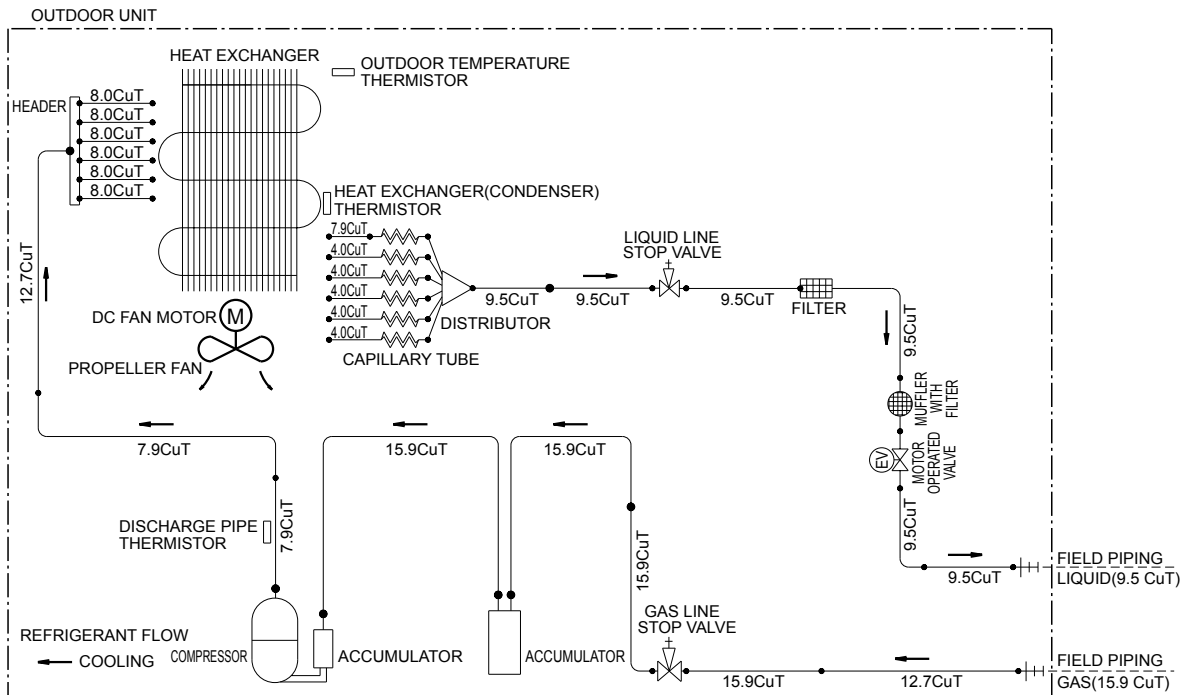
3D037851B

**RKD71BVM, RKD71BVMA**



3D050337

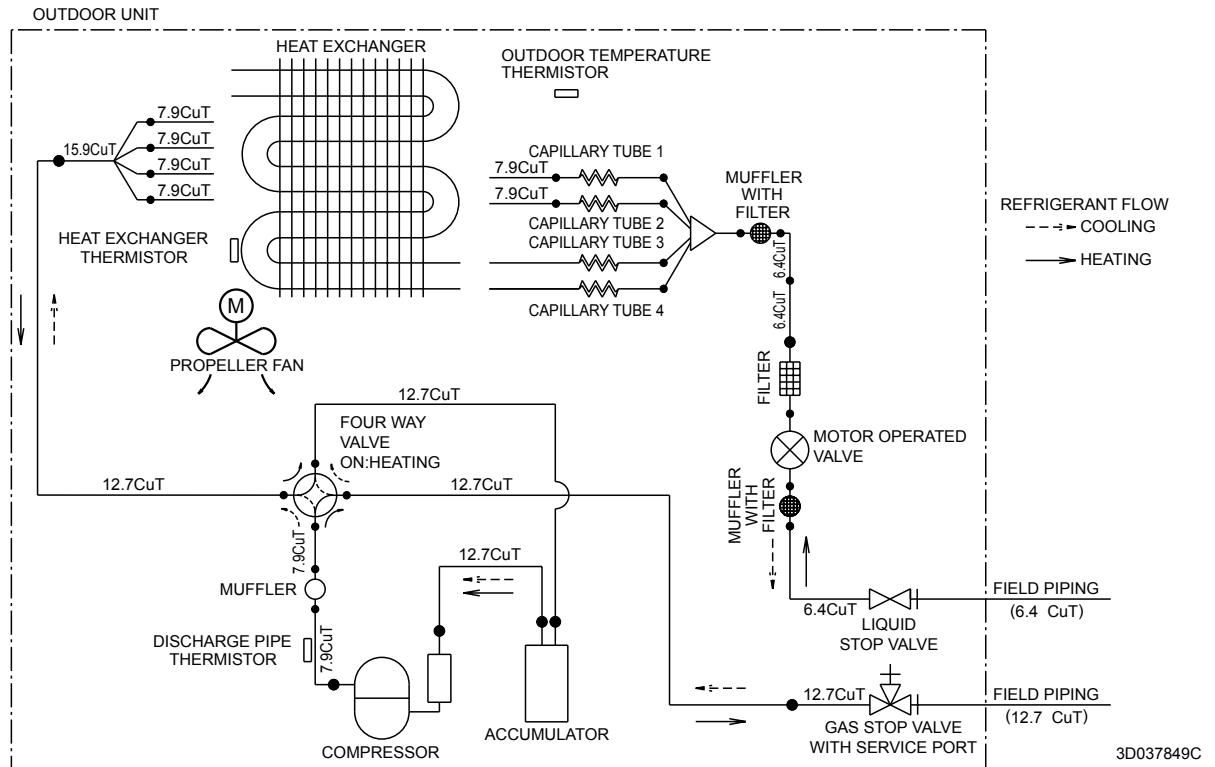
**RKD24GV2S, RKD28GV2S**



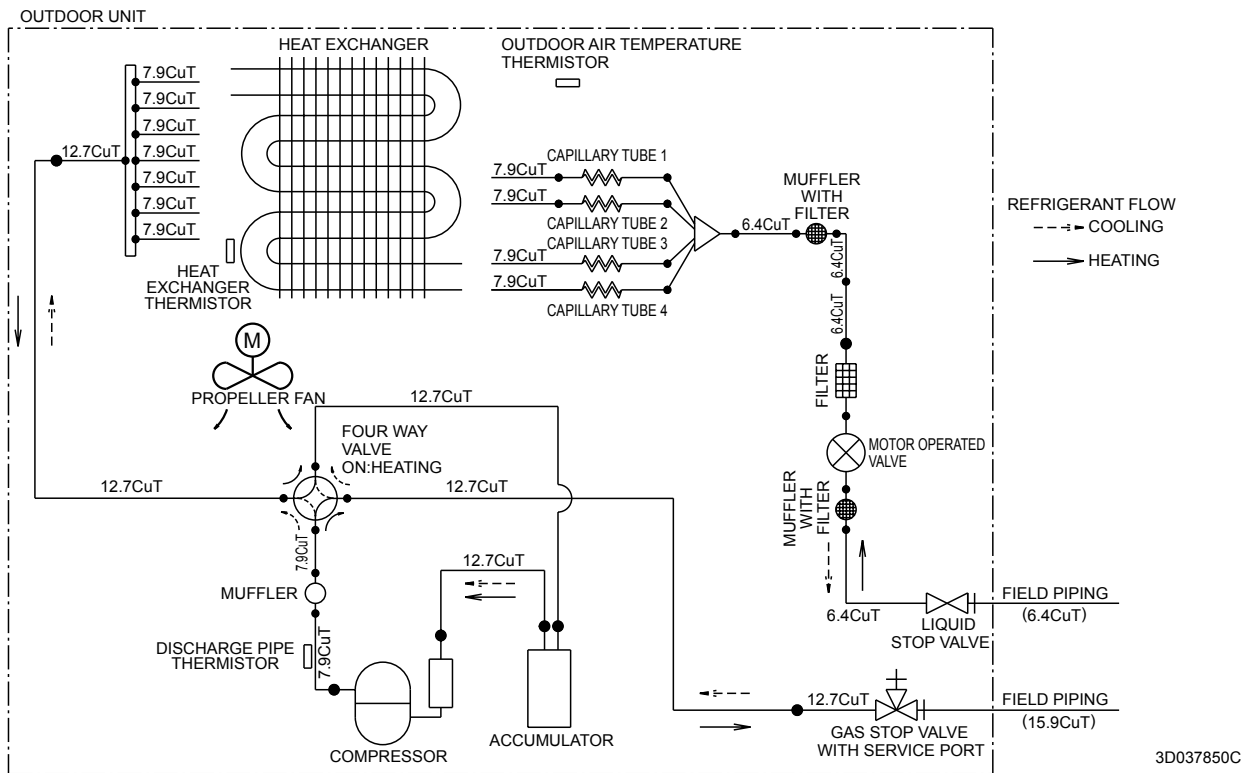
3D053628A

## 1.2.2 Heat Pump

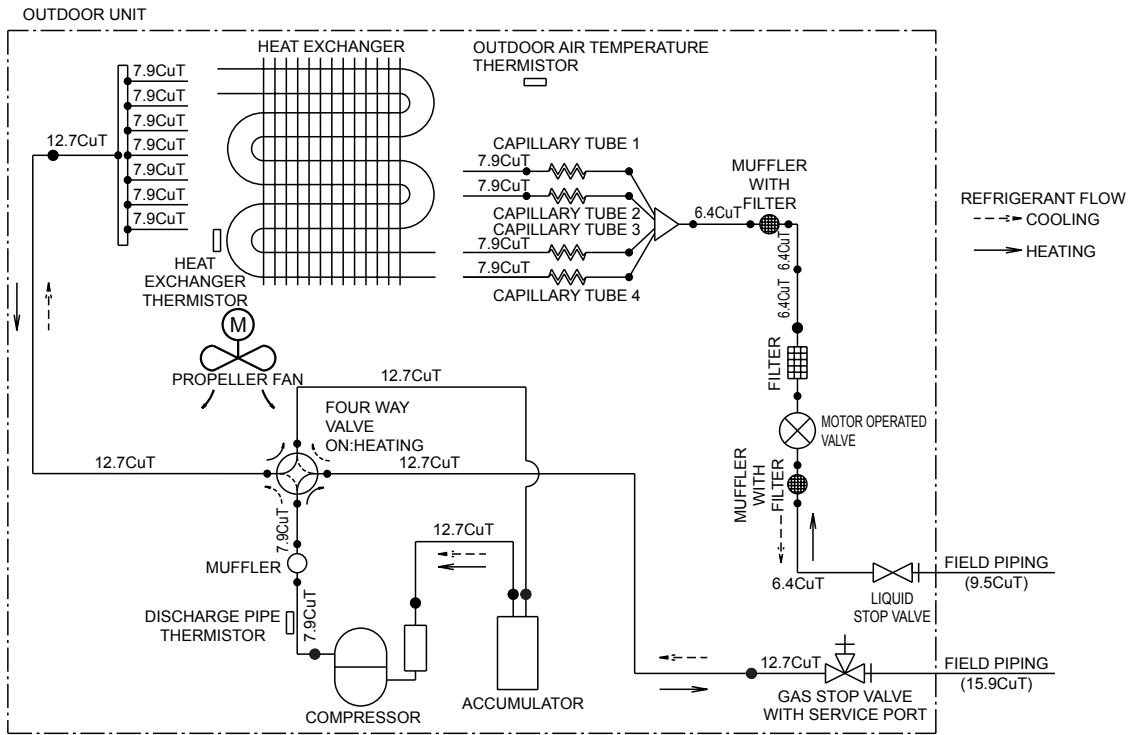
### RXD50BVMA



### RXD60BVMA



RXD71BVMA

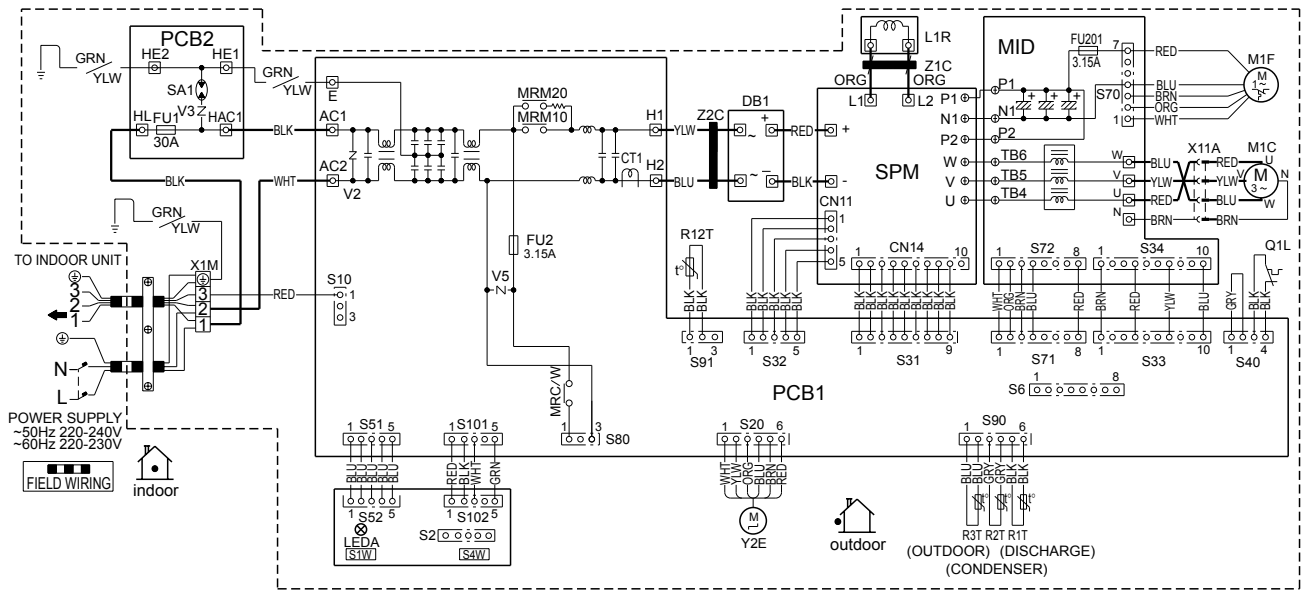


3D050338

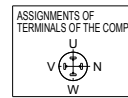


## 2.2 Outdoor Units

RKD50BVM, RKD60BVM, RKD71BVM  
 RKD50BVMA, RKD60BVMA, RKD71BVMA

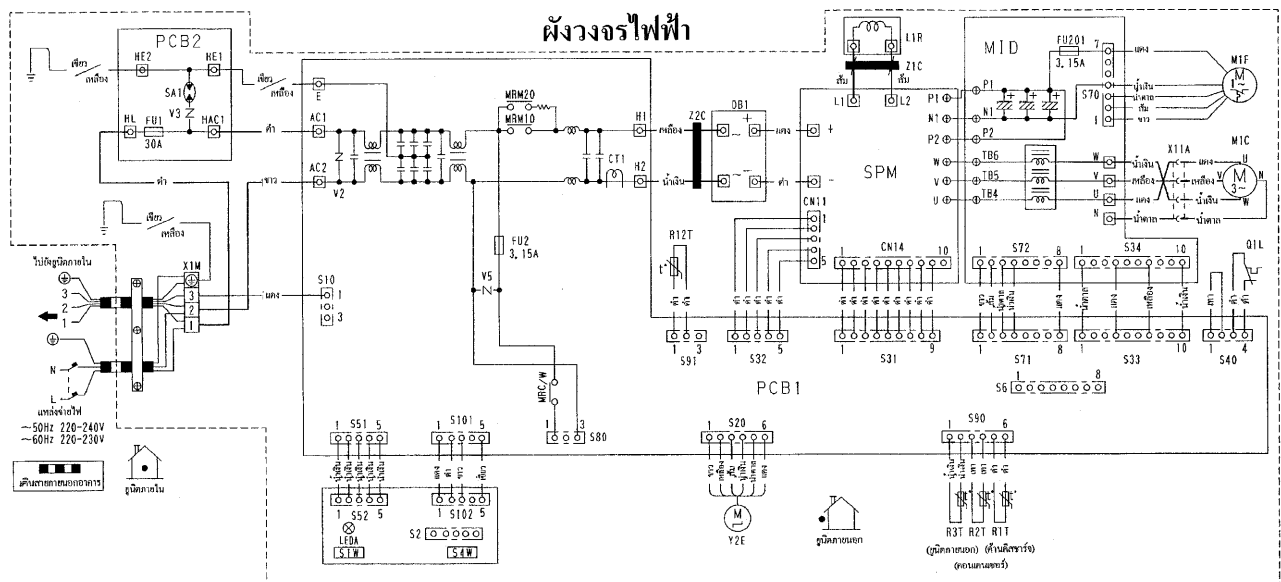


- |                                  |  |                                   |
|----------------------------------|--|-----------------------------------|
| Z1C, Z2C : FERRITE CORE          | S2-S102 : CONNECTOR                    | Q1L : OVERLOAD PROTECTOR          |
| X1M : TERMINAL STRIP             | LEDA : PILOT LAMP                      | CT1 : CURRENT TRANSFORMER         |
| Y2E : ELECTRONIC EXPANSION VALVE | PCB1, PCB2 : PRINTED CIRCUIT BOARD     | MID : MOLDED INTER CONNECT DEVICE |
| V2-V5 : VARIATOR                 | L : LIVE                               | SPM : SYSTEM POWER MODULE         |
| FU1, FU2, FU201 : FUSE           | N : NEUTRAL                            |                                   |
| HE1, HE2, HAC1 : E, AC1, AC2     | S1W : FORCED OPERATION ON/OFF SW (SW1) |                                   |
| H1, H2, HL : SURGE ARRESTER      | S4W : LOCAL SETTING SW (SW4)           |                                   |
| L1, L2, X11A : CONNECTOR         | SA1 : SURGE ARRESTER                   |                                   |
| MRM10, MRM20 : MAGNETIC RELAY    | DB1 : DIODE BRIDGE                     |                                   |
| R1T-R3T : THERMISTOR             | M1C : COMPRESSOR MOTOR                 |                                   |
|                                  | M1F : FAN MOTOR                        |                                   |
|                                  | L1R : REACTOR                          |                                   |



3D037866H

## RKD15GV2S, RKD18GV2S, RKD24GV2S, RKD28GV2S



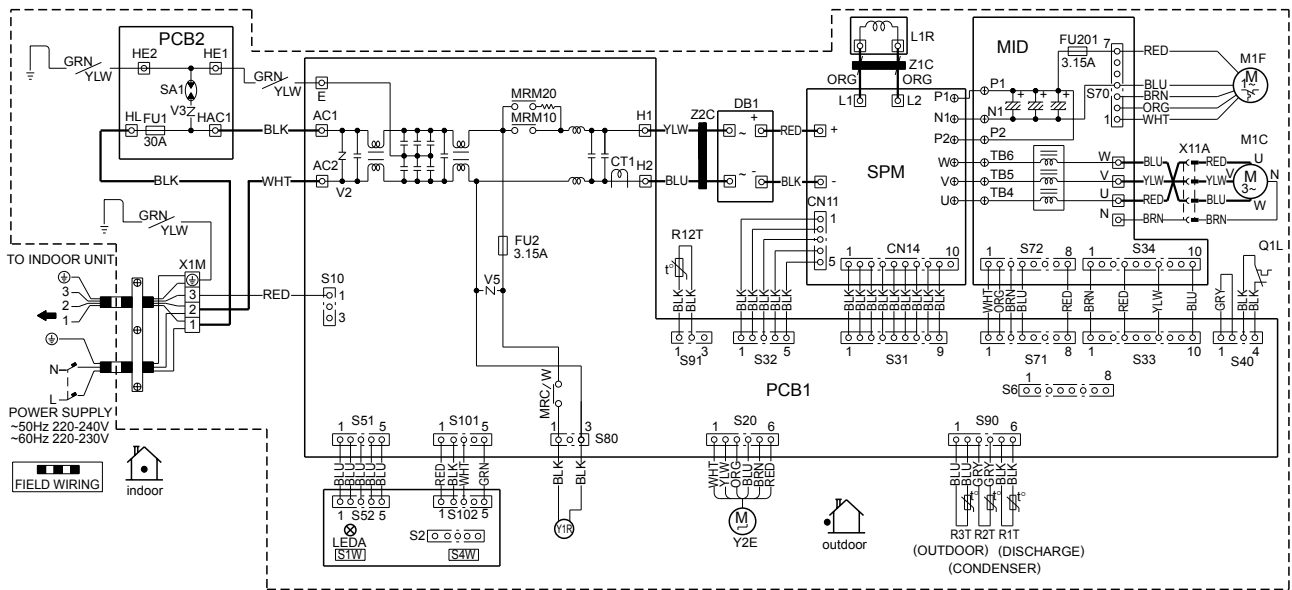
- |                                  |                                     |  |
|----------------------------------|-------------------------------------|--|
| Z1C, Z2C : ขดลวดเฟอร์ไรต์        | S2-S102 : จุดต่อสายไฟ               | Q1L : ตัวป้องกันโหลดเกิน                 |
| X1M : รางต่อสายไฟ                | LEDA : หลอดไฟ                       | CT1 : หม้อแปลงกระแส                      |
| Y2E : วาล์วขยายตัวอิเล็กทรอนิกส์ | PCB1, PCB2 : แผงวงจรพิมพ์           | MID : อุปกรณ์ต่อเชื่อมสายไฟแบบฉีดพลาสติก |
| V2-V5 : ตัวปรับ                  | L : สายไฟ                           | SPM : โมดูลระบบกำลังไฟ                   |
| FU1, FU2, FU201 : ฟิวส์          | N : สายดิน                          |  |
| HE1, HE2, HAC1 : B, AC1, AC2     | S1W : สวิตช์บังคับการเปิด/ปิด (SW1) |  |
| H1, H2, HL : ฮีตเตอร์            | S4W : สวิตช์ตั้งค่า (SW4)           |  |
| L1, L2, X11A : จุดต่อสายไฟ       | SA : อุปกรณ์ป้องกันไฟกระชาก         |  |
| MRM10, MRM20 : รีเลย์แม่เหล็ก    | DB1 : สะพานไดโอด                    |  |
| M1C : มอเตอร์คอมเพรสเซอร์        | M1F : มอเตอร์พัดลม                  |  |
| M1R : มอเตอร์รีแอคเตอร์          | L1R : ตัวเหนี่ยวนำ                  |  |



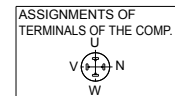
3D040606F



RXD50BVMA, RXD60BVMA, RXD71BVMA



- |                                  |  |                                   |
|----------------------------------|--|-----------------------------------|
| Z1C, Z2C : FERRITE CORE          | S2-S102 : CONNECTOR                    | L1R : REACTOR                     |
| X1M : TERMINAL STRIP             | LEDA : PILOT LAMP                      | Q1L : OVERLOAD PROTECTOR          |
| Y2E : ELECTRONIC EXPANSION VALVE | PCB1, PCB2 : PRINTED CIRCUIT BOARD     | CT1 : CURRENT TRANSFORMER         |
| V2-V5 : VARISTOR                 | L : LIVE                               | MID : MOLDED INTER CONNECT DEVICE |
| FU1, FU2, FU201 : FUSE           | N : NEUTRAL                            | SPM : SYSTEM POWER MODULE         |
| HE1, HE2, HAC1 : HEATER          | S1W : FORCED OPERATION ON/OFF SW (SW1) |                                   |
| E, AC1, C2 : CONNECTOR           | S4W : LOCAL SETTING SW (SW4)           |                                   |
| H1, H2, HL : CONNECTOR           | SA1 : SURGE ARRESTER                   |                                   |
| L1, L2, X11A : CONNECTOR         | Y1R : REVERSING SOLENOID VALVE COIL    |                                   |
| MRM10, MRM20 : MAGNETIC RELAY    | DB1 : DIODE BRIDGE                     |                                   |
| MRC/W : THERMISTOR               | M1C : COMPRESSOR MOTOR                 |                                   |
| R1T-R3T : THERMISTOR             | M1F : FAN MOTOR                        |                                   |



3D037854J

# Index

## Numerics

00 .....	89
3 minutes stand-by .....	43
3-D airflow .....	26

## A

A1 .....	90
A5 .....	91
A6 .....	93
AC1 .....	20, 162
AC2 .....	20, 163
accumulator .....	175
address setting jumper .....	18
air filter .....	134
ARC433B series .....	86
automatic air flow control .....	27
automatic operation .....	29
auto-restart function .....	37
auto-swing .....	26

## B

buzzer PCB .....	19
------------------	----

## C

C4 .....	95
C9 .....	95
cable way board .....	161
capacitor voltage check .....	130
centralized control .....	18
check	
capacitor voltage check .....	130
discharge pressure check .....	128
electronic expansion valve check .....	124
fan motor connector output check .....	124
four way valve performance check .....	125
installation condition check .....	127
inverter units refrigerant system check .....	129
main circuit electrolytic capacitor check .....	131
outdoor unit fan system check .....	128
power supply waveforms check .....	129
power transistor check .....	130
thermistor resistance check .....	126
turning speed pulse input on the outdoor unit PCB check .....	131
check No.01 .....	124
check No.04 .....	124
check No.05 .....	125
check No.06 .....	126
check No.07 .....	127
check No.08 .....	128
check No.09 .....	128
check No.10 .....	129
check No.11 .....	129
check No.12 .....	130
check No.13 .....	130
check No.14 .....	131

check No.15 .....	131
clamp plate .....	153
CN11 .....	20, 164
CN14 .....	20, 164
coils	
removal of .....	204
compressor .....	175, 211
compressor lock .....	99
compressor overload .....	98
compressor protection function .....	43
connectors .....	18, 20
control PCB (indoor unit) .....	19, 90, 145
control PCB (outdoor unit) .....	21, 164
CT or related abnormality .....	109

## D

DC fan lock .....	100
defrost control .....	48
diagnosis mode .....	87
diode bridge .....	20
discharge grille .....	152
discharge pipe .....	50
discharge pipe temperature control .....	44, 51, 105
discharge pipe thermistor .....	38, 39, 50, 112, 170
discharge pressure check .....	128
display PCB .....	19, 21
drain hose .....	147
drip proof plate .....	141

## E

E .....	20, 162
E5 .....	98
E6 .....	99
E7 .....	100
E8 .....	101
EA .....	103
earth .....	141, 160
electrical box .....	142, 167, 192
electrical box cover .....	156
electrical box temperature rise .....	113
electronic expansion valve .....	173
electronic expansion valve check .....	124
electronic expansion valve coil .....	173
electronic expansion valve control .....	49
error codes	
00 .....	89
A1 .....	90
A5 .....	91
A6 .....	93
C4 .....	95
C9 .....	95
E5 .....	98
E6 .....	99
E7 .....	100
E8 .....	101
EA .....	103

F3	105
F6	106
H6	108
H8	109
H9	111
J3	111
J6	111
L3	113
L4	115
L5	117
P4	111
U0	119, 121
U2	123
U4	96
error codes and description	89
<b>F</b>	
F3	105
F6	106
fan control	47
fan motor	142, 150, 158, 203
fan motor (DC motor) or related abnormality	93
fan motor connector output check	124
fan rotor	150
fan speed control	27
fan speed setting	18, 215
filter	
mold proof air filter (prefilter)	36
titanium apatite photocatalytic air-purifying filter	36
forced cooling operation	25
forced operation mode	53
forced operation ON/OFF switch	18, 20
four way valve	172
four way valve abnormality	103
four way valve coil	172
four way valve operation compensation	43
four way valve performance check	125
four way valve switching	43
freeze-up protection control	46, 91
frequency control	24, 41
frequency principle	24
front grille	137
front panel	136, 153
FU1	18, 20
FU2	20
FU201	20
functions, list of	2
fuse	18, 20
<b>G</b>	
gas piping	147
<b>H</b>	
H1	20
H2	20
H6	108
H8	109
H9	111
HA	18, 145
HAC1	20, 162
Hall IC	27, 93
HE1	20, 162
HE2	20, 162
heat exchanger	147, 152
heating peak-cut control	46
high pressure control	91
high pressure control in cooling	106
HL	20, 162
HOME LEAVE operation	34
horizontal blade	139
hot start function	36
<b>I</b>	
indoor heat exchanger thermistor	38, 39, 95, 141
indoor unit PCB abnormality	90
input current control	44
input over current detection	101
installation condition check	127
insufficient gas	119
insufficient gas control	52
INTELLIGENT EYE	32
INTELLIGENT EYE sensor PCB	19
inverter POWERFUL operation	35
inverter principle	24
inverter units refrigerant system check	129
<b>J</b>	
J3	111
J4	215
J6	111
JA	18, 215
JB	18, 215
JC	18, 215
jumper settings	215
<b>L</b>	
L1	20
L2	20
L3	113
L4	115
L5	117
LED A	18, 20
LED1	18
LED2	18
LED3	18
liquid compression protection function 2	47
liquid piping	147
list of functions	2
low Hz high pressure limit	48
low-voltage detection	123
<b>M</b>	
main circuit electrolytic capacitor check	131
MID	22
mode hierarchy	40
mold proof air filter (prefilter)	36
<b>N</b>	
night set mode	31

<b>O</b>	
OL activation .....	98
ON/OFF button on indoor unit .....	36
operation lamp .....	84
outdoor air thermistor .....	112
outdoor heat exchanger thermistor .....	38, 39, 112, 170
outdoor unit fan system check .....	128
outer panels .....	176
output over current detection .....	117
over current .....	52, 101
overload .....	52, 98
over-voltage detection .....	123
<b>P</b>	
P4 .....	111
partition plate .....	168
PCB	
removal of .....	197
PI control .....	42
piping diagrams .....	218
position sensor abnormality .....	108
power failure recovery function .....	18, 215
power supply PCB .....	21, 162
power supply waveforms check .....	129
power transistor check .....	130
power-airflow dual flaps .....	26
POWERFUL operation .....	35, 53
preheating operation .....	43
printed circuit board (PCB)	
buzzer PCB .....	19
control PCB (indoor unit) .....	19, 90, 145
control PCB (outdoor unit) .....	21, 164
display PCB .....	19, 21
INTELLIGENT EYE sensor PCB .....	19
MID .....	22
power supply PCB .....	21, 162
service monitor PCB .....	161
signal receiver PCB .....	19
SPM .....	22
problem symptoms and measures .....	85
programme dry function .....	28
propeller fan .....	158
<b>R</b>	
radiation fin temperature rise .....	115
radiation fin thermistor .....	112
reactor .....	169, 207
receiver units .....	144
remote controller .....	86
right side panel .....	160
room temperature thermistor .....	95
RTH1 .....	18
<b>S</b>	
S1 .....	18, 142, 145
S10 .....	20, 163, 164
S101 .....	20, 163, 164
S102 .....	20, 164
S20 .....	20, 162, 164
S21 .....	18, 145
S26 .....	18, 145
S27 .....	18
S28 .....	18, 145
S29 .....	18
S31 .....	20, 164
S32 .....	18, 20, 145, 164
S33 .....	20, 164
S34 .....	20, 164
S35 .....	18
S36 .....	18
S37 .....	18
S38 .....	18
S40 .....	20, 162, 164
S51 .....	20, 163, 164
S52 .....	20, 164
S6 .....	18, 142
S70 .....	20, 157
S71 .....	20, 164
S72 .....	20, 164
S8 .....	18, 142
S80 .....	20, 162, 164
S90 .....	20, 162, 164
S91 .....	20, 164
self-diagnosis digital display .....	36
sensor malfunction detection .....	52
service check function .....	86
service cover .....	137
service monitor PCB .....	161
shelter .....	143, 156
signal receiver .....	134
signal receiver PCB .....	19
signal receiving sign .....	36
signal transmission error .....	96
sound blanket .....	171, 208
specifications .....	6
SPM .....	22
stop valve cover .....	155
SW1 .....	18, 20
swing motor .....	142, 145, 146
swing motor assembly .....	146
<b>T</b>	
terminal cover .....	174
terminal strip .....	90, 142, 160
test run .....	214
thermistor	
discharge pipe thermistor ...	38, 39, 50, 112, 170
indoor heat exchanger thermistor .....	38, 39, 95, 141
outdoor air thermistor .....	112
outdoor heat exchanger thermistor .....	38, 39, 112, 170
radiation fin thermistor .....	112
removal of .....	204
room temperature thermistor .....	95
thermistor or related abnormality (indoor unit) .....	95
thermistor or related abnormality (outdoor unit) ..	111
thermistor resistance check .....	126
thermostat control .....	30
titanium apatite photocatalytic air-purifying filter ...	36
top panel .....	152

---

troubleshooting .....	89
troubleshooting with the LED indication .....	84
turning speed pulse input on the outdoor unit PCB check .....	131

**U**

U0 .....	119, 121
U2 .....	123
U4 .....	96

**V**

V1 .....	18
V3 .....	20
varistor .....	18, 20
vertical blade .....	140
voltage detection function .....	53

**W**

wide-angle louvres .....	26
wiring diagrams .....	224

# Drawings & Flow Charts

<b>A</b>		
ARC433B series .....	86	
automatic air flow control .....	27	
automatic operation .....	29	
auto-swing .....	26	
<b>B</b>		
buzzer PCB .....	19	
<b>C</b>		
capacitor voltage check .....	130	
check No.01 .....	124	
check No.04 .....	124	
check No.05 .....	125	
check No.06 .....	126	
check No.07 .....	127	
check No.08 .....	128	
check No.09 .....	128	
check No.10 .....	129	
check No.11 .....	129	
check No.12 .....	130	
check No.13 .....	130	
check No.14 .....	131	
check No.15 .....	131	
compressor lock .....	99	
compressor protection function .....	43	
control PCB (indoor unit) .....	19	
control PCB (outdoor unit) .....	21	
CT or related abnormality .....	109	
<b>D</b>		
DC fan lock .....	100	
defrost control .....	48	
diagnosis mode .....	87	
discharge pipe temperature control .....	44, 105	
discharge pressure check .....	128	
display PCB .....	19, 21	
<b>E</b>		
electrical box temperature rise .....	113	
electronic expansion valve check .....	124	
electronic expansion valve control .....	49	
<b>F</b>		
fan motor (DC motor) or related abnormality .....	93	
fan motor connector output check .....	124	
four way valve abnormality .....	103	
four way valve performance check .....	125	
freeze-up protection control .....	46	
freeze-up protection control or high pressure control .....	91	
frequency control .....	41	
frequency principle .....	24	
<b>H</b>		
heating peak-cut control .....	46	
high pressure control in cooling .....	106	
HOME LEAVE operation .....	34	
<b>I</b>		
indoor unit PCB abnormality .....	90	
input current control .....	44	
input over current detection .....	101	
installation condition check .....	127	
insufficient gas .....	119	
insufficient gas control .....	52	
INTELLIGENT EYE .....	32	
INTELLIGENT EYE sensor PCB .....	19	
inverter POWERFUL operation .....	35	
inverter units refrigerant system check .....	129	
<b>J</b>		
jumper settings .....	215	
<b>L</b>		
low Hz high pressure limit .....	48	
low-voltage detection .....	123	
<b>M</b>		
main circuit electrolytic capacitor check .....	131	
MID .....	22	
mode hierarchy .....	40	
<b>N</b>		
night set mode .....	31	
<b>O</b>		
OL activation (compressor overload) .....	98	
ON/OFF button on indoor unit .....	36	
operation lamp, location .....	84	
outdoor unit fan system check (with DC motor) ..	128	
output over current detection .....	117	
over-voltage detection .....	123	
<b>P</b>		
piping diagram		
FTKD15GV2S .....	218	
FTKD18GV2S .....	218	
FTKD24GV2S .....	218	
FTKD28GV2S .....	218	
FTKD50FV2Z .....	218	
FTKD50FVM .....	218	
FTKD60FV2Z .....	218	
FTKD60FVM .....	218	
FTKD71FV2Z .....	218	
FTKD71FVM .....	218	
FTXD50FV2Z .....	219	
FTXD50FVM .....	219	
FTXD60FV2Z .....	219	

FTXD60FVM .....	219	FTXD71FV2Z .....	224
FTXD71FV2Z .....	219	FTXD71FVM .....	224
FTXD71FVM .....	219	RKD15GV2S .....	225
RKD15GV2S .....	220	RKD18GV2S .....	225
RKD18GV2S .....	220	RKD24GV2S .....	225
RKD24GV2S .....	221	RKD28GV2S .....	225
RKD28GV2S .....	221	RKD50BVM .....	225
RKD50BVM .....	220	RKD50BVMA .....	225
RKD50BVMA .....	220	RKD60BVM .....	225
RKD60BVM .....	220	RKD60BVMA .....	225
RKD60BVMA .....	220	RKD71BVM .....	225
RKD71BVM .....	221	RKD71BVMA .....	225
RKD71BVMA .....	221	RXD50BVMA .....	226
RXD50BVMA .....	222	RXD60BVMA .....	226
RXD60BVMA .....	222	RXD71BVMA .....	226
RXD71BVMA .....	223		
position sensor abnormality .....	108		
power supply PCB .....	21		
power supply waveforms check .....	129		
power transistor check .....	130		
programme dry function .....	28		
<b>R</b>			
radiation fin temperature rise .....	115		
remote controller .....	86		
<b>S</b>			
signal receiver PCB .....	19		
signal transmission error .....	96		
SPM .....	22		
<b>T</b>			
target discharge pipe temperature control .....	51		
thermistor			
cooling only model .....	39		
heat pump model .....	38		
thermistor or related abnormality (indoor unit) .....	95		
thermistor or related abnormality (outdoor unit) ...	111		
thermistor resistance check .....	126		
thermostat control .....	30		
trial operation from remote controller .....	214		
troubleshooting with the LED indication .....	84		
turning speed pulse input on the outdoor unit			
PCB check .....	131		
<b>W</b>			
wiring diagrams			
FTKD15GV2S .....	224		
FTKD18GV2S .....	224		
FTKD24GV2S .....	224		
FTKD28GV2S .....	224		
FTKD50FV2Z .....	224		
FTKD50FVM .....	224		
FTKD60FV2Z .....	224		
FTKD60FVM .....	224		
FTKD71FV2Z .....	224		
FTKD71FVM .....	224		
FTXD50FV2Z .....	224		
FTXD50FVM .....	224		
FTXD60FV2Z .....	224		
FTXD60FVM .....	224		

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- Read the User's Manual carefully before using this product. The User's Manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

If you have any enquiries, please contact your local importer, distributor and/or retailer.

### Cautions on product corrosion

1. Air conditioners should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided. If you need to install the outdoor unit close to the sea shore, contact your local distributor.



JMI-0107



JQA-1452

#### About ISO 9001

ISO 9001 is a plant certification system defined by the International Organization for Standardization (ISO) relating to quality assurance. ISO 9001 certification covers quality assurance aspects related to the "design, development, manufacture, installation, and supplementary service" of products manufactured at the plant.



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#### About ISO 14001

ISO 14001 is the standard defined by the International Organization for Standardization (ISO) relating to environmental management systems. Our group has been acknowledged by an internationally accredited compliance organisation as having an appropriate programme of environmental protection procedures and activities to meet the requirements of ISO 14001.

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