DAIKIN

Si04 - 807

Service Manual

Inverter Pair
Wall Mounted Type G-Series

[Applied Models]
- **Inverter Pair : Cooling Only**
- **Inverter Pair : Heat Pump**

Inverter Pair G-Series

●Cooling Only

Indoor Units

FTK20GV1B
FTK25GV1B
FTK35GV1B

Outdoor Units

RK20GV1B
RK25GV1B
RK35GV1B

●Heat Pump

Indoor Units

FTX20GV1B	**ATX20GV1B**
FTX25GV1B	**ATX25GV1B**
FTX35GV1B	**ATX35GV1B**

Outdoor Units

RX20GV1B	**ARX20GV1B**
RX25GV1B	**ARX25GV1B**
RX35GV1B	**ARX35GV1B**

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

⚠ Warning	
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 shook. 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.	
If the refrigerant gas is discharged during the repair work, do not touch the discharged refrigerant gas. The refrigerant gas may cause frostbite.	
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.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas may generate toxic gases when it contacts flames.	
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.	
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.	

Warning	
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.	

Caution	
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

Warning	
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.	
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.	
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.	
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.	
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.	
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.	
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.	
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.	
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.	
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.	

Warning	
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.	

Caution	
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.	

Caution	
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, loose 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

Category	Functions	FTK20/25/35GV1B RK20/25/35GV1B	FTX20/25/35GV1B RX20/25/35GV1B	Category	Functions	FTK20/25/35GV1B RK20/25/35GV1B	FTX20/25/35GV1B RX20/25/35GV1B
Basic Function	Inverter (with Inverter Power Control)	○	○	Health & Clean	Air Purifying Filter	—	—
	Operation Limit for Cooling (°CDB)	10 ~46	10 ~46		Photocatalytic Deodorizing Filter	—	—
	Operation Limit for Heating (°CWB)	—	−15 ~20		Air Purifying Filter with Photocatalytic Deodorizing Function	—	—
	PAM Control	○	○		Titanium Apatite Photocatalytic Air-Purifying Filter	○	○
	Standby Electricity Saving	○	○				
Compressor	Oval Scroll Compressor	—	—		Longlife Filter	—	—
	Swing Compressor	○	○		Ultra-Longlife Filter (Option)	—	—
	Rotary Compressor	—	—		Mold Proof Air Filter	○	○
	Reluctance DC Motor	—	—		Wipe-clean Flat Panel	○	○
Comfortable Airflow	Power-Airflow Flap	○	○		Washable Grille	—	—
	Power-Airflow Dual Flaps	—	—		Filter Cleaning Indicator	—	—
	Power-Airflow Diffuser	—	—		Good-Sleep Cooling Operation	—	—
	Wide-Angle Louvers	○	○	Timer	Weekly Timer	—	—
					24-Hour On/Off Timer	○	○
	Vertical Auto-Swing (Up and Down)	○	○		Night Set Mode	○	○
	Horizontal Auto-Swing (Right and Left)	—	—	Worry Free “Reliability & Durability”	Auto-Restart (after Power Failure)	○	○
	3-D Airflow	—	—		Self-Diagnosis (Digital, LED) Display	○	○
	Comfort Airflow Mode	○	○				
	3-Step Airflow (H/P Only)	—	—		Wiring Error Check	—	—
Comfort Control	Auto Fan Speed	○	○		Anticorrosion Treatment of Outdoor Heat Exchanger	○	○
	Indoor Unit Quiet Operation	○	○	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	○	○
	Night Quiet Mode (Automatic)	—	—		Flexible Voltage Correspondence	—	—
	Outdoor Unit Quiet Operation (Manual)	—	—		High Ceiling Application	—	—
	INTELLIGENT EYE	—	—		Chargeless	10m	10m
	Quick Warming Function	—	○		Either Side Drain (Right or Left)	○	○
	Hot-Start Function	—	○		Power Selection	—	—
	Automatic Defrosting	—	○	Remote Control	5-Rooms Centralized Controller (Option)	—	—
Operation	Automatic Operation	—	○				
	Programme Dry Function	○	○		Remote Control Adaptor (Normal Open-Pulse Contact) (Option)	—	—
	Fan Only	○	○				
Lifestyle Convenience	New POWERFUL Operation (Non-Inverter)	—	—		Remote Control Adaptor (Normal Open Contact) (Option)	—	—
	Inverter POWERFUL Operation	○	○		DIII-NET Compatible (Adaptor) (Option)	—	—
	Priority-Room Setting	—	—	Remote Controller	Wireless	○	○
	Cooling / Heating Mode Lock	—	—		Wired	—	—
	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	ATX20/25/35GV1B ARX20/25/35GV1B	Category	Functions	ATX20/25/35GV1B ARX20/25/35GV1B
Basic Function	Inverter (with Inverter Power Control)	○	Health & Clean	Air Purifying Filter	—
	Operation Limit for Cooling (°CDB)	10 ~46		Photocatalytic Deodorizing Filter	—
	Operation Limit for Heating (°CWB)	−15 ~20		Air Purifying Filter with Photocatalytic Deodorizing Function	—
	PAM Control	○		Titanium Apatite Photocatalytic Air-Purifying Filter	○
	Standby Electricity Saving	○			
Compressor	Oval Scroll Compressor	—		Longlife Filter	—
	Swing Compressor	○		Ultra-Longlife Filter (Option)	—
	Rotary Compressor	—		Mold Proof Air Filter	○
	Reluctance DC Motor	—		Wipe-clean Flat Panel	○
Comfortable Airflow	Power-Airflow Flap	○		Washable Grille	—
	Power-Airflow Dual Flaps	—		Filter Cleaning Indicator	—
	Power-Airflow Diffuser	—		Good-Sleep Cooling Operation	—
	Wide-Angle Louvers	○	Timer	Weekly Timer	—
				24-Hour On/Off Timer	○
	Vertical Auto-Swing (Up and Down)	○		Night Set Mode	○
	Horizontal Auto-Swing (Right and Left)	—	Worry Free “Reliability & Durability”	Auto-Restart (after Power Failure)	○
	3-D Airflow	—		Self-Diagnosis (Digital, LED) Display	○
	Comfort Airflow Mode	○			
	3-Step Airflow (H/P Only)	—		Wiring Error Check	—
Comfort Control	Auto Fan Speed	○		Anticorrosion Treatment of Outdoor Heat Exchanger	○
	Indoor Unit Quiet Operation	○	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	○
	Night Quiet Mode (Automatic)	—		Flexible Voltage Correspondence	—
	Outdoor Unit Quiet Operation (Manual)	—		High Ceiling Application	—
	INTELLIGENT EYE	—		Chargeless	10m
	Quick Warming Function	○		Either Side Drain (Right or Left)	○
	Hot-Start Function	○		Power Selection	—
	Automatic Defrosting	○	Remote Control	5-Rooms Centralized Controller (Option)	—
Operation	Automatic Operation	○			
	Programme Dry Function	○		Remote Control Adaptor (Normal Open-Pulse Contact) (Option)	—
	Fan Only	○			
Lifestyle Convenience	New POWERFUL Operation (Non-Inverter)	—		Remote Control Adaptor (Normal Open Contact) (Option)	—
	Inverter POWERFUL Operation	○		DIII-NET Compatible (Adaptor) (Option)	—
	Priority-Room Setting	—	Remote Controller	Wireless	○
	Cooling / Heating Mode Lock	—		Wired	—
	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

1.1 Cooling Only

50Hz 230V

Model	Indoor Units		FTK20GV1B	FTK25GV1B
	Outdoor Units		RK20GV1B	RK25GV1B
Capacity Rated (Min.~Max.)		kW	2.0 (1.3~2.6)	2.5 (1.3~3.0)
		Btu/h	6,800 (4,400~8,900)	8,500 (4,400~10,200)
		kcal/h	1,720 (1,120~2,240)	2,150 (1,120~2,580)
Running Current (Rated)		A	2.7	3.7
Power Consumption Rated (Min.~Max.)		W	550 (310~720)	740(310~1,050)
Power Factor (Rated)		%	88.6	87.0
COP Rated (Min.~Max.)		W/W	3.62 (4.19~3.61)	3.38 (4.19~2.86)
Piping Connections	Liquid	mm	ϕ 6.4	ϕ 6.4
	Gas	mm	ϕ 9.5	ϕ 9.5
	Drain	mm	ϕ18.0	ϕ18.0
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Max. Interunit Piping Length		m	15	15
Max. Interunit Height Difference		m	12	12
Chargeless		m	10	10
Amount of Additional Charge of Refrigerant		g/m	20	20
Indoor Unit			**FTK20GV1B**	**FTK25GV1B**
Front Panel Color			White	White
Airflow Rate	m³/min (cfm)	H	9.1 (321)	9.2 (325)
		M	7.4 (261)	7.6 (268)
		L	5.9 (208)	6.0 (212)
		SL	4.7 (166)	4.8 (169)
Fan	Type		Cross Flow Fan	Cross Flow Fan
	Motor Output	W	16	16
	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	0.18	0.18
Power Consumption (Rated)		W	40	40
Power Factor		%	96.6	96.6
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (HxWxD)		mm	283x770x198	283x770x198
Packaged Dimensions (HxWxD)		mm	263x840x344	263x840x344
Weight		kg	7	7
Gross Weight		kg	11	11
Operation Sound	H/M/L/SL	dBA	39/33/25/22	40/33/26/22
Sound Power	H	dBA	55	56
Outdoor Unit			**RK20GV1B**	**RK25GV1B**
Casing Color			Ivory White	Ivory White
Compressor	Type		Hermetically Sealed Swing Type	Hermetically Sealed Swing Type
	Model		1YC23AEXDA	1YC23AEXDA
	Motor Output	W	750	750
Refrigerant Oil	Model		FVC50K	FVC50K
	Charge	L	0.375	0.375
Refrigerant	Model		R-410A	R-410A
	Charge	kg	0.74	0.74
Airflow Rate (H)	m³/min		29.2	29.2
	cfm		1,030	1,030
Fan	Type		Propeller	Propeller
	Motor Output	W	33	33
Running Current (Rated)		A	2.52	3.52
Power Consumption (Rated)		W	510	700
Power Factor		%	88.0	86.5
Starting Current		A	2.7	3.7
Dimensions (HxWxD)		mm	550x658x275	550x658x275
Packaged Dimensions (HxWxD)		mm	616x788x359	616x788x359
Weight		kg	28	28
Gross Weight		kg	31	31
Operation Sound	H	dBA	46	46
Sound Power	H	dBA	60	60
Drawing No.			3D059073	3D059074

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	5m

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

50Hz 230V

Model	Indoor Units		FTK35GV1B
	Outdoor Units		RK35GV1B
Capacity Rated (Min.~Max.)		kW	3.2 (1.3~3.8)
		Btu/h	10,900 (4,400~13,000)
		kcal/h	2,750 (1,120~3,270)
Running Current (Rated)		A	5.0
Power Consumption Rated (Min.~Max.)		W	950 (290~1,300)
Power Factor		%	82.6
COP Rated (Min.~Max.)		W/W	3.37 (4.48~2.92)
Piping Connections	Liquid	mm	ϕ 6.4
	Gas	mm	ϕ 9.5
	Drain	mm	ϕ18.0
Heat Insulation			Both Liquid and Gas Pipes
Max. Interunit Piping Length		m	15
Max. Interunit Height Difference		m	12
Chargeless		m	10
Amount of Additional Charge of Refrigerant		g/m	20
Indoor Unit			**FTK35GV1B**
Front Panel Color			White
Airflow Rate	m³/min (cfm)	H	9.3 (328)
		M	7.7 (272)
		L	6.1 (215)
		SL	4.9 (173)
Fan	Type		Cross Flow Fan
	Motor Output	W	16
	Speed	Steps	5 Steps, Quiet, Auto
Air Direction Control			Right, Left, Horizontal, Downward
Air Filter			Removable / Washable / Mildew Proof
Running Current (Rated)		A	0.18
Power Consumption (Rated)		W	40
Power Factor		%	96.6
Temperature Control			Microcomputer Control
Dimensions (H×W×D)		mm	283×770×198
Packaged Dimensions (H×W×D)		mm	263×840×344
Weight		kg	7
Gross Weight		kg	11
Operation Sound	H/M/L/SL	dBA	41/34/27/23
Sound Power	H	dBA	57
Outdoor Unit			**RK35GV1B**
Casing Color			Ivory White
Compressor	Type		Hermetically Sealed Swing Type
	Model		1YC23AEXDA
	Motor Output	W	750
Refrigerant Oil	Model		FVC50K
	Charge	L	0.375
Refrigerant	Model		R-410A
	Charge	kg	1.0
Airflow Rate (H)	m³/min		27.6
	cfm		975
Fan	Type		Propeller
	Motor Output	W	33
Running Current (Rated)		A	4.82
Power Consumption (Rated)		W	910
Power Factor		%	82.1
Starting Current		A	5.0
Dimensions (H×W×D)		mm	550×658×275
Packaged Dimensions (H×W×D)		mm	616×788×359
Weight		kg	30
Gross Weight		kg	33
Operation Sound	H	dBA	48
Sound Power	H	dBA	62
Drawing No.			3D059075

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	5m

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

1.2 Heat Pump

50Hz 230V

Model	Indoor Units		FTX20GV1B		FTX25GV1B	
	Outdoor Units		RX20GV1B		RX25GV1B	
			Cooling	Heating	Cooling	Heating
Capacity Rated (Min.~Max.)		kW	2.0 (1.3~2.6)	2.5 (1.3~3.5)	2.5 (1.3~3.0)	2.8 (1.3~4.0)
		Btu/h	6,800 (4,400~8,900)	8,500 (4,400~1,1600)	8,500 (4,400~10,200)	9,600 (4,400~13,600)
		kcal/h	1,720 (1,120~2,240)	2,150 (1,120~3,010)	2,150 (1,120~2,580)	2,410 (1,120~ 3,440)
Running Current (Rated)		A	2.7	3.0	3.7	3.5
Power Consumption Rated (Min.~Max.)		W	550 (310~720)	640 (250~950)	740(310~1,050)	760 (250~1,110)
Power Factor (Rated)		%	88.6	92.8	87.0	94.4
COP Rated (Min.~Max.)		W/W	3.62 (4.19~3.61)	3.90 (5.2~3.68)	3.38 (4.19~2.86)	3.68 (5.2~3.60)
Piping Connections	Liquid	mm	ϕ 6.4		ϕ 6.4	
	Gas	mm	ϕ 9.5		ϕ 9.5	
	Drain	mm	ϕ18.0		ϕ18.0	
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Max. Interunit Piping Length		m	15		15	
Max. Interunit Height Difference		m	12		12	
Chargeless		m	10		10	
Amount of Additional Charge of Refrigerant		g/m	20		20	
Indoor Unit			**FTX20GV1B**		**FTX25GV1B**	
Front Panel Color			White		White	
Airflow Rate	m³/min (cfm)	H	9.1 (321)	9.4 (331)	9.2 (325)	9.7 (342)
		M	7.4 (261)	7.8 (276)	7.6 (268)	8.0 (283)
		L	5.9 (208)	6.3 (222)	6.0 (212)	6.3 (222)
		SL	4.7 (166)	5.5 (194)	4.8 (169)	5.5 (194)
Fan	Type		Cross Flow Fan		Cross Flow Fan	
	Motor Output	W	16		16	
	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	0.18	0.18	0.18	0.18
Power Consumption (Rated)		W	40	40	40	40
Power Factor		%	96.6	96.6	96.6	96.6
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (HxWxD)		mm	283x770x198		283x770x198	
Packaged Dimensions (HxWxD)		mm	263x840x344		263x840x344	
Weight		kg	7		7	
Gross Weight		kg	11		11	
Operation Sound	H/M/L/SL	dBA	39/33/25/22	39/34/28/25	40/33/26/22	40/34/28/25
Sound Power	H	dBA	55	55	56	56
Outdoor Unit			**RX20GV1B**		**RX25GV1B**	
Casing Color			Ivory White		Ivory White	
Compressor	Type		Hermetically Sealed Swing Type		Hermetically Sealed Swing Type	
	Model		1YC23AEXDA		1YC23AEXDA	
	Motor Output	W	750		750	
Refrigerant Oil	Model		FVC50K		FVC50K	
	Charge	L	0.375		0.375	
Refrigerant	Model		R-410A		R-410A	
	Charge	kg	0.74		0.74	
Airflow Rate (H)	m³/min		29.2	26.2	29.2	26.2
	cfm		1,030	927	1,030	927
Fan	Type		Propeller		Propeller	
	Motor Output	W	33		33	
Running Current (Rated)		A	2.52	2.82	3.52	3.32
Power Consumption (Rated)		W	510	600	700	720
Power Factor		%	88.0	92.5	86.5	94.3
Starting Current		A	2.7		3.7	
Dimensions (HxWxD)		mm	550x658x275		550x658x275	
Packaged Dimensions (HxWxD)		mm	616x788x359		616x788x359	
Weight		kg	28		28	
Gross Weight		kg	31		31	
Operation Sound	H	dBA	46	47	46	47
Sound Power	H	dBA	60	61	60	61
Drawing No.			3D059070		3D059071	

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	5m

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

50Hz 230V

Model	Indoor Units		FTX35GV1B	
	Outdoor Units		RX35GV1B	
			Cooling	Heating
Capacity Rated (Min.~Max.)		kW	3.2 (1.3~3.8)	3.4 (1.3~4.8)
		Btu/h	10,900 (4,400~13,000)	11,600 (4,400~16,400)
		kcal/h	2,750 (1,120~3,270)	2,920 (1,120~4,130)
Running Current (Rated)		A	5.0	4.6
Power Consumption Rated (Min.~Max.)		W	950 (290~1,300)	910 (290~1,290)
Power Factor		%	82.6	86.0
COP Rated (Min.~Max.)		W/W	3.37 (4.48~2.92)	3.74 (4.48~3.72)
Piping Connections	Liquid	mm	ϕ 6.4	
	Gas	mm	ϕ 9.5	
	Drain	mm	ϕ18.0	
Heat Insulation			Both Liquid and Gas Pipes	
Max. Interunit Piping Length		m	15	
Max. Interunit Height Difference		m	12	
Chargeless		m	10	
Amount of Additional Charge of Refrigerant		g/m	20	
Indoor Unit			**FTX35GV1B**	
Front Panel Color			White	
Airflow Rate	m³/min (cfm)	H	9.3 (328)	10.1 (356)
		M	7.7 (272)	8.4 (295)
		L	6.1 (215)	6.7 (235)
		SL	4.9 (173)	5.7 (201)
Fan	Type		Cross Flow Fan	
	Motor Output	W	16	
	Speed	Steps	5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downward	
Air Filter			Removable / Washable / Mildew Proof	
Running Current (Rated)		A	0.18	0.18
Power Consumption (Rated)		W	40	40
Power Factor		%	96.6	96.6
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	283x770x198	
Packaged Dimensions (HxWxD)		mm	263x840x344	
Weight		kg	7	
Gross Weight		kg	11	
Operation Sound	H/M/L/SL	dBA	41/34/27/23	41/35/29/26
Sound Power	H	dBA	57	57
Outdoor Unit			**RX35GV1B**	
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Swing Type	
	Model		1YC23AEXDA	
	Motor Output	W	750	
Refrigerant Oil	Model		FVC50K	
	Charge	L	0.375	
Refrigerant	Model		R-410A	
	Charge	kg	1.0	
Airflow Rate (H)	m³/min		27.6	24.5
	cfm		975	865
Fan	Type		Propeller	
	Motor Output	W	33	
Running Current (Rated)		A	4.82	4.42
Power Consumption (Rated)		W	910	870
Power Factor		%	82.1	85.6
Starting Current		A	5.0	
Dimensions (HxWxD)		mm	550x658x275	
Packaged Dimensions (HxWxD)		mm	616x788x359	
Weight		kg	30	
Gross Weight		kg	34	
Operation Sound	H	dBA	48	48
Sound Power	H	dBA	62	62
Drawing No.			3D059072	

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	5m

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

50Hz 230V

Model	Indoor Units		ATX20GV1B		ATX25GV1B	
	Outdoor Units		ARX20GV1B		ARX25GV1B	
			Cooling	Heating	Cooling	Heating
Capacity Rated (Min.~Max.)		kW	2.0 (1.3~2.6)	2.5 (1.3~3.5)	2.5 (1.3~3.0)	2.8 (1.3~4.0)
		Btu/h	6,800 (4,400~8,900)	8,500 (4,400~1,1600)	8,500 (4,400~10,200)	9,600 (4,400~13,600)
		kcal/h	1,720 (1,120~2,240)	2,150 (1,120~3,010)	2,150 (1,120~2,580)	2,410 (1,120~ 3,440)
Running Current (Rated)		A	2.7	3.0	3.7	3.5
Power Consumption Rated (Min.~Max.)		W	550 (310~720)	640 (250~950)	740(310~1,050)	760 (250~1,110)
Power Factor (Rated)		%	88.6	92.8	87.0	94.4
COP Rated (Min.~Max.)		W/W	3.62 (4.19~3.61)	3.90 (5.2~3.68)	3.38 (4.19~2.86)	3.68 (5.2~3.60)
Piping Connections	Liquid	mm	ϕ 6.4		ϕ 6.4	
	Gas	mm	ϕ 9.5		ϕ 9.5	
	Drain	mm	ϕ18.0		ϕ18.0	
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Max. Interunit Piping Length		m	15		15	
Max. Interunit Height Difference		m	12		12	
Chargeless		m	10		10	
Amount of Additional Charge of Refrigerant		g/m	20		20	
Indoor Unit			**ATX20GV1B**		**ATX25GV1B**	
Front Panel Color			White		White	
Airflow Rate	m³/min (cfm)	H	9.1 (321)	9.4 (331)	9.2 (325)	9.7 (342)
		M	7.4 (261)	7.8 (276)	7.6 (268)	8.0 (283)
		L	5.9 (208)	6.3 (222)	6.0 (212)	6.3 (222)
		SL	4.7 (166)	5.5 (194)	4.8 (169)	5.5 (194)
Fan	Type		Cross Flow Fan		Cross Flow Fan	
	Motor Output	W	16		16	
	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	0.18	0.18	0.18	0.18
Power Consumption (Rated)		W	40	40	40	40
Power Factor		%	96.6	96.6	96.6	96.6
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (HxWxD)		mm	283x770x198		283x770x198	
Packaged Dimensions (HxWxD)		mm	263x840x344		263x840x344	
Weight		kg	7		7	
Gross Weight		kg	11		11	
Operation Sound	H/M/L/SL	dBA	39/33/25/22	39/34/28/25	40/33/26/22	40/34/28/25
Sound Power	H	dBA	55	55	56	56
Outdoor Unit			**ARX20GV1B**		**ARX25GV1B**	
Casing Color			Ivory White		Ivory White	
Compressor	Type		Hermetically Sealed Swing Type		Hermetically Sealed Swing Type	
	Model		1YC23AEXDA		1YC23AEXDA	
	Motor Output	W	750		750	
Refrigerant Oil	Model		FVC50K		FVC50K	
	Charge	L	0.375		0.375	
Refrigerant	Model		R-410A		R-410A	
	Charge	kg	0.74		0.74	
Airflow Rate (H)	m³/min		29.2	26.2	29.2	26.2
	cfm		1,030	927	1,030	927
Fan	Type		Propeller		Propeller	
	Motor Output	W	33		33	
Running Current (Rated)		A	2.52	2.82	3.52	3.32
Power Consumption (Rated)		W	510	600	700	720
Power Factor		%	88.0	92.5	86.5	94.3
Starting Current		A	2.7		3.7	
Dimensions (HxWxD)		mm	550x658x275		550x658x275	
Packaged Dimensions (HxWxD)		mm	616x788x359		616x788x359	
Weight		kg	28		28	
Gross Weight		kg	31		31	
Operation Sound	H	dBA	46	47	46	47
Sound Power	H	dBA	60	61	60	61
Drawing No.			3D059076		3D059077	

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	5m

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

50Hz 230V

Model	Indoor Units		ATX35GV1B	
	Outdoor Units		ARX35GV1B	
			Cooling	Heating
Capacity Rated (Min.~Max.)		kW	3.2 (1.3~3.8)	3.4 (1.3~4.8)
		Btu/h	10,900 (4,400~13,000)	11,600 (4,400~16,400)
		kcal/h	2,750 (1,120~3,270)	2,920 (1,120~4,130)
Running Current (Rated)		A	5.0	4.6
Power Consumption Rated (Min.~Max.)		W	950 (290~1,300)	910 (290~1,290)
Power Factor		%	82.6	86.0
COP Rated (Min.~Max.)		W/W	3.37 (4.48~2.92)	3.74 (4.48~3.72)
Piping Connections	Liquid	mm	ϕ 6.4	
	Gas	mm	ϕ 9.5	
	Drain	mm	ϕ18.0	
Heat Insulation			Both Liquid and Gas Pipes	
Max. Interunit Piping Length		m	15	
Max. Interunit Height Difference		m	12	
Chargeless		m	10	
Amount of Additional Charge of Refrigerant		g/m	20	
Indoor Unit			**ATX35GV1B**	
Front Panel Color			White	
Airflow Rate	m³/min (cfm)	H	9.3 (328)	10.1 (356)
		M	7.7 (272)	8.4 (295)
		L	6.1 (215)	6.7 (235)
		SL	4.9 (173)	5.7 (201)
Fan	Type		Cross Flow Fan	
	Motor Output	W	16	
	Speed	Steps	5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downward	
Air Filter			Removable / Washable / Mildew Proof	
Running Current (Rated)		A	0.18	0.18
Power Consumption (Rated)		W	40	40
Power Factor		%	96.6	96.6
Temperature Control			Microcomputer Control	
Dimensions (H×W×D)		mm	283×770×198	
Packaged Dimensions (H×W×D)		mm	263×840×344	
Weight		kg	7	
Gross Weight		kg	11	
Operation Sound	H/M/L/SL	dBA	41/34/27/23	41/35/29/26
Sound Power	H	dBA	57	57
Outdoor Unit			**ARX35GV1B**	
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Swing Type	
	Model		1YC23AEXDA	
	Motor Output	W	750	
Refrigerant Oil	Model		FVC50K	
	Charge	L	0.375	
Refrigerant	Model		R-410A	
	Charge	kg	1.0	
Airflow Rate (H)	m³/min		27.6	24.5
	cfm		975	865
Fan	Type		Propeller	
	Motor Output	W	33	
Running Current (Rated)		A	4.82	4.42
Power Consumption (Rated)		W	910	870
Power Factor		%	82.1	85.6
Starting Current		A	5.0	
Dimensions (H×W×D)		mm	550×658×275	
Packaged Dimensions (H×W×D)		mm	616×788×359	
Weight		kg	30	
Gross Weight		kg	34	
Operation Sound	H	dBA	48	48
Sound Power	H	dBA	62	62
Drawing No.			3D059078	

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	5m

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m³/min×35.3

Part 3
Printed Circuit Board Connector Wiring Diagram

1. Printed Circuit Board Connector Wiring Diagram

1.1 Indoor Units

Connectors

PCB(1) (Control PCB)

1)	S6	Connector for swing motor (horizontal blades)
2)	S26	Connector for display PCB
3)	S32	Connector for heat exchanger thermistor
4)	S200	Connector for fan motor
5)	S403	Connector for adaptor for wired remote controller (optional accessory)

PCB(2) (Display PCB)

1)	S27	Connector for control PCB

Note: Other designations

PCB(1) (Control PCB)

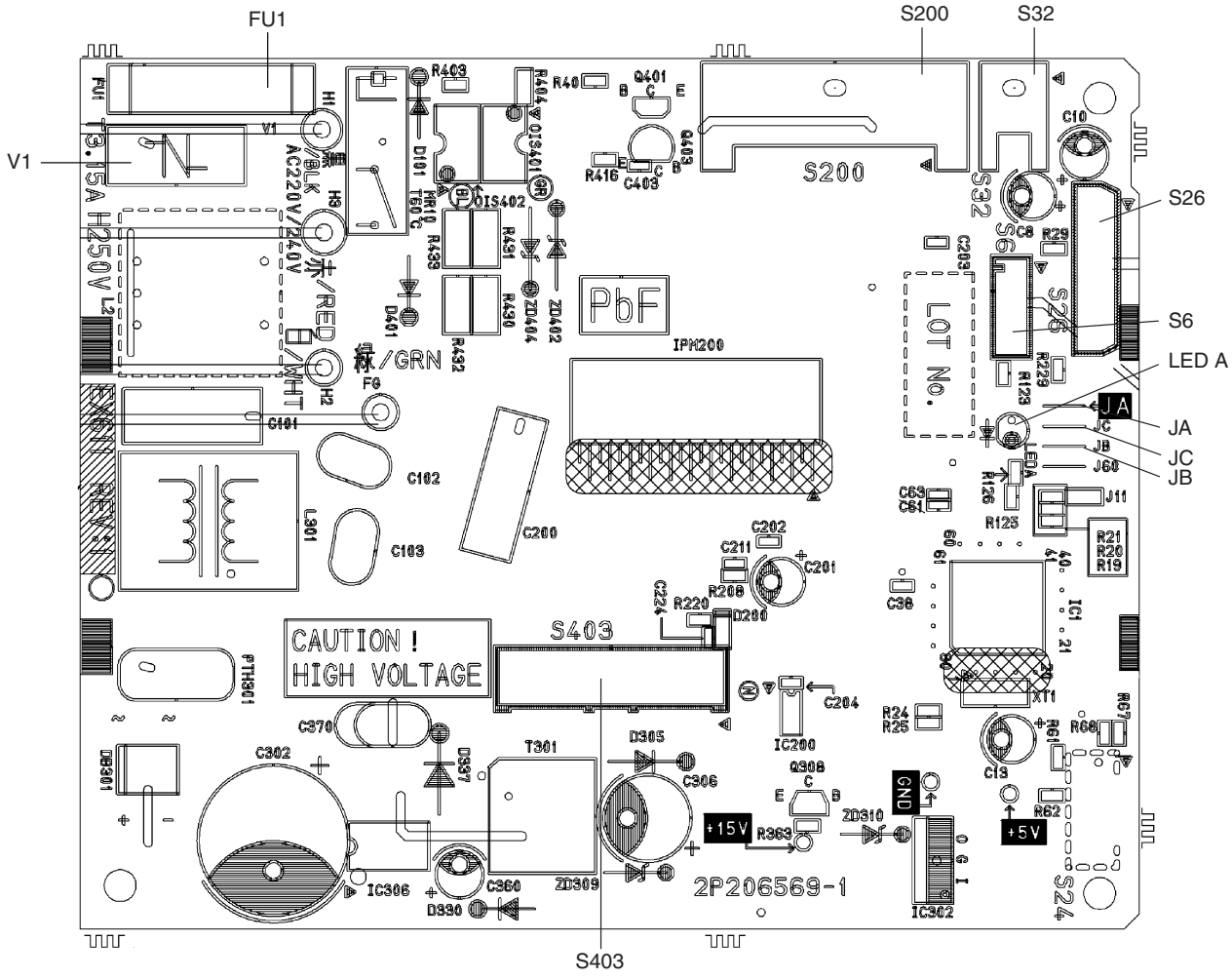
1)	V1	Varistor
2)	JA	Address setting jumper
	JB	Fan speed setting when compressor is OFF on thermostat
	JC	Power failure recovery function (auto-restart)
		∗ Refer to page 159 for detail.
3)	LED A	LED for service monitor (green)
4)	FU1	Fuse (3.15A)

PCB(3) (Display PCB)

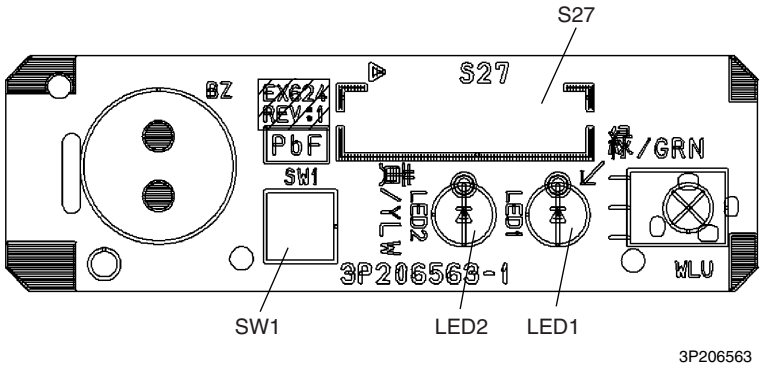
1)	SW1 (S1W)	Forced operation ON / OFF switch
2)	LED1	LED for operation (green)
3)	LED2	LED for timer (yellow)

PCB Detail

PCB(1): Control PCB



PCB(2): Display PCB



1.2 Outdoor Units

Connectors

PCB (1) (Filter PCB)

1)	S11	Connector for control PCB

PCB (2) (Main PCB)

1)	S10	Connector for filter PCB
2)	S20	Connector for electronic expansion valve coil
3)	S40	Connector for overload protector
4)	S70	Connector for fan motor
5)	S80	Connector for four way valve coil
6)	S90	Connector for thermistors (outdoor air, heat exchanger, discharge pipe)
7)	HL3, HN3	Connector for filter PCB

Note: Other designations

PCB (1) (Filter PCB)

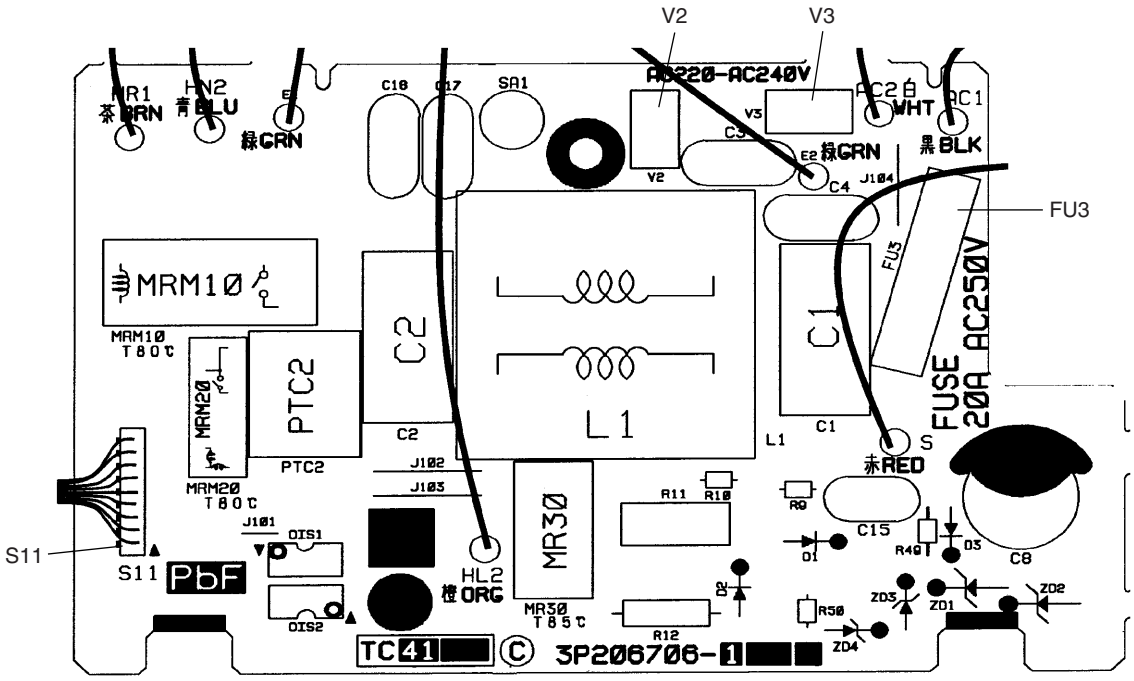
1)	FU3	Fuse (20A)
2)	V2, V3	Varistor

PCB (2) (Main PCB)

1)	FU1, FU2	Fuse (3.15A)
2)	LED A	Service monitor LED (green)
3)	V1	Varistor

PCB Detail

PCB(1): Filter PCB



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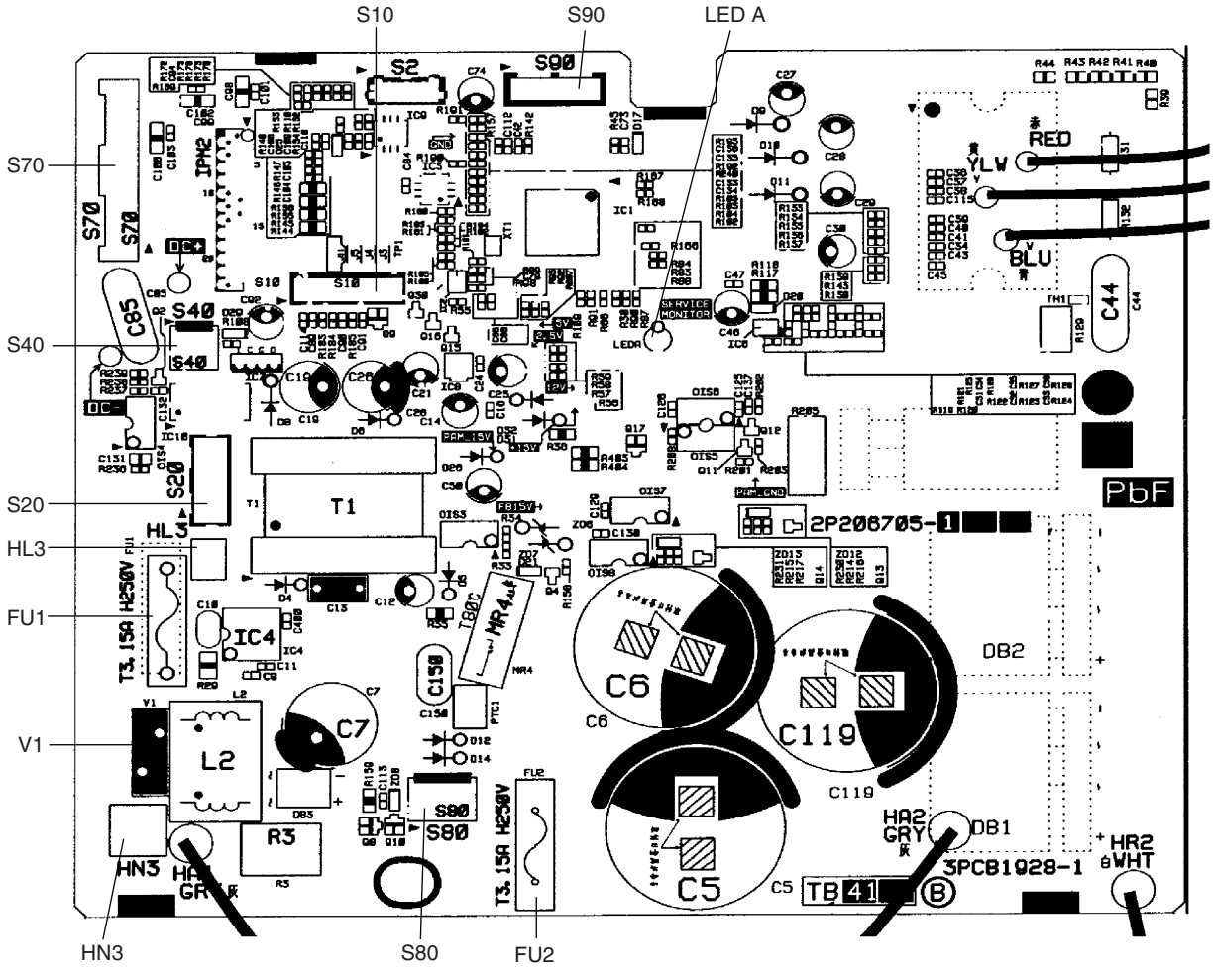
PCB(2): Main PCB



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Part 4
Function and Control

1. Main Functions

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

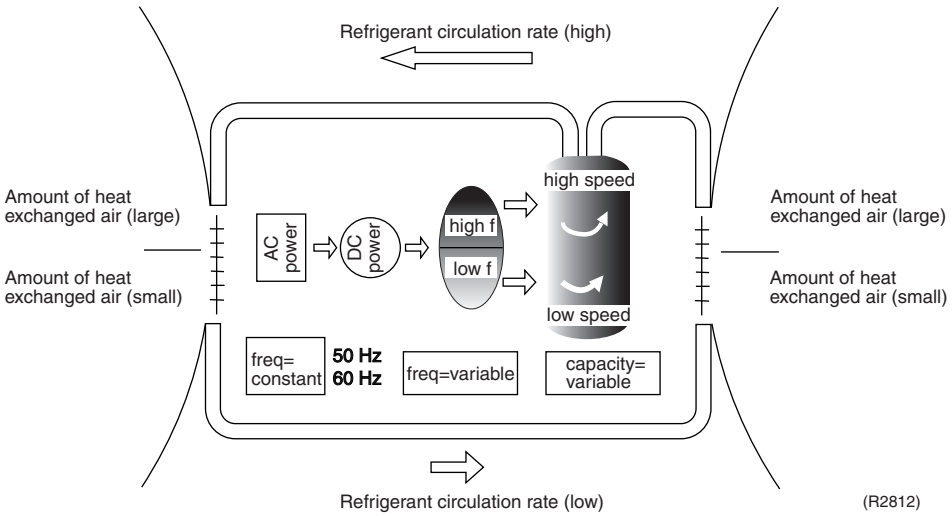
Inverter Principle

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. ■ 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. ■ 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.

Drawing of Inverter

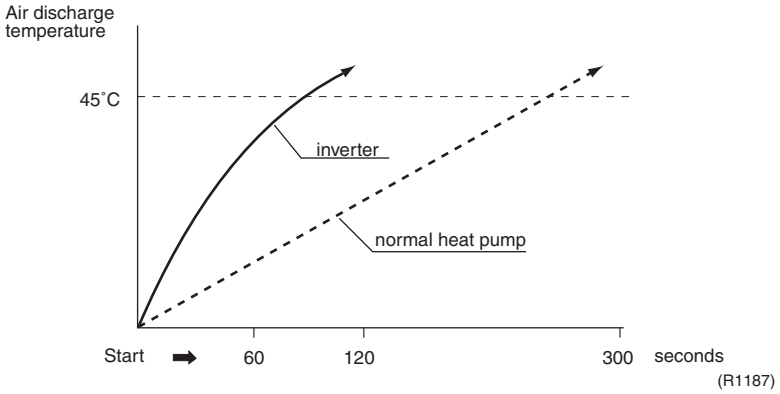
The following drawing shows a schematic view of the inverter principle:



Inverter Features

The inverter provides the following features:

- The regulating capacity can be changed according to the changes in the outdoor air 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 outdoor air 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	■ Four way valve operation compensation. Refer to page 35.
High	■ Input current control. Refer to page 37. ■ Compressor protection function. Refer to page 36. ■ Heating peak-cut control. Refer to page 38. ■ Freeze-up protection control. Refer to page 38. ■ Defrost control. Refer to page 40.

Forced Cooling Operation

For more information, refer to “Forced operation mode” on page 45.

1.2 Airflow Direction Control

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.

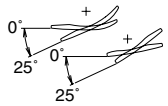
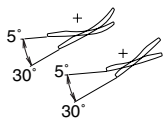
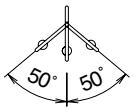
Cooling Mode
During cooling mode, the flap retracts into the indoor unit. Then, cool air can be blown far and pervaded all over the room.

Wide-Angle Louvres

The louvres, 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: manual)
Cooling / Dry / Fan	Heating	Heating, Cooling
 (R2946)	 (R4013)	 (R2817)

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 trouble shooting for fan motor on page 81.

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	Dry Mode
LLL (Heating thermostat OFF)	 (R8431)	 (R8432)	L tap (During powerful operation: L+80rpm)
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:

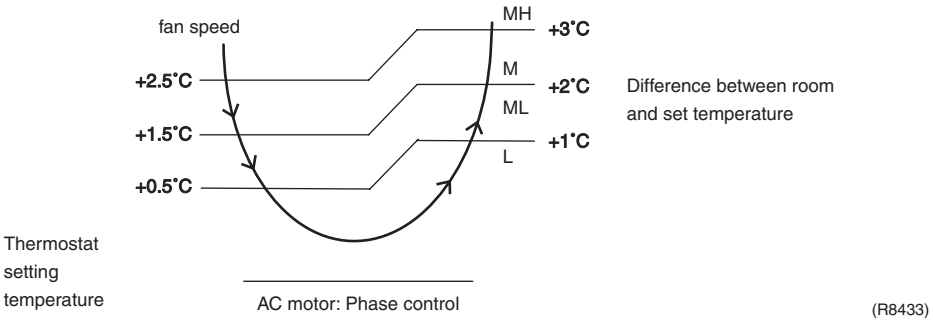
1. During powerful operation, fan operate H tap + 80 rpm.
2. Fan stops during defrost operation.
3. The airconditioner does not operate with MH tap from a start of the auto fan speed operation for about 30 minutes.

Automatic Airflow 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 Airflow Control for Cooling

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



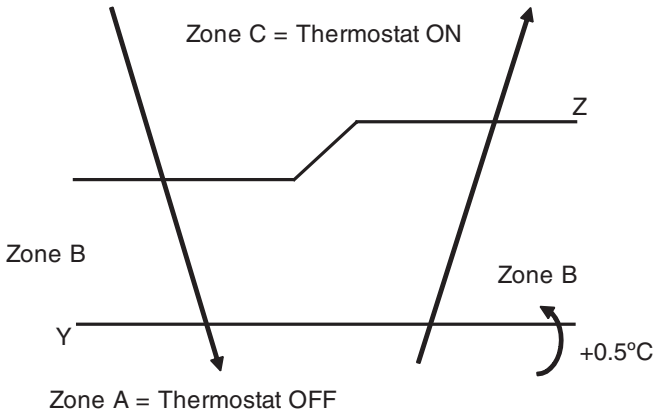
1.4 Programme Dry Function

Programme dry function removes humidity while preventing the room temperature from lowering.
Since the microcomputer controls both the temperature and airflow 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°C	X – 0.5°C (zone C) or Y + 0.5°C (zone B) continues for 10 min.
23.5°C ~ 18°C		X – 2.0°C	X – 0.5°C (zone C) or Y + 0.5°C (zone B) continues for 10 min.
17.5°C ~	18°C	X – 2.0°C	X – 0.5°C = 17.5°C (zone C) or Y + 0.5°C (zone B) continues for 10 min.



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1.5 Automatic Operation

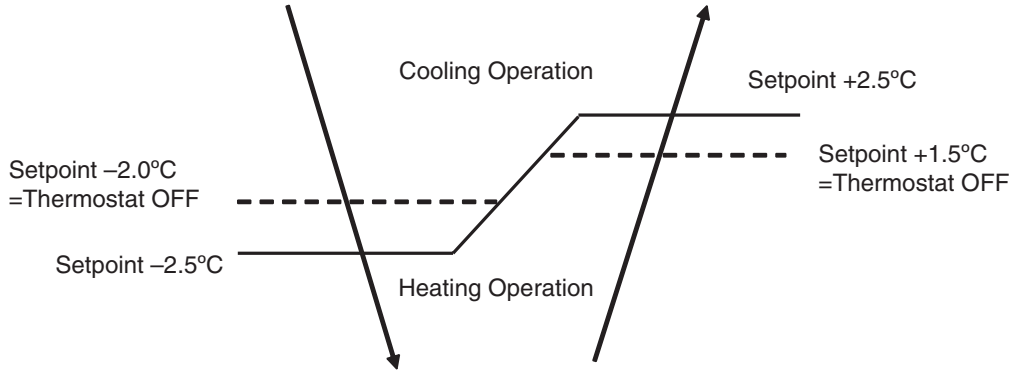
Automatic Cooling / Heating Function (Heat Pump Only)

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 ≥ 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 ≥ 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

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.

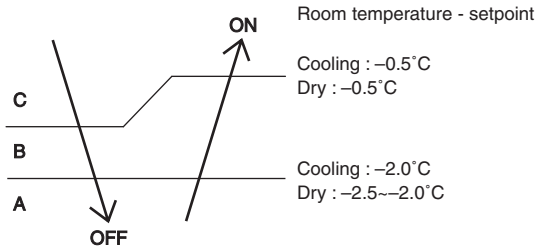
Thermostat OFF Condition

- The temperature difference is in the zone A.

Thermostat ON Condition

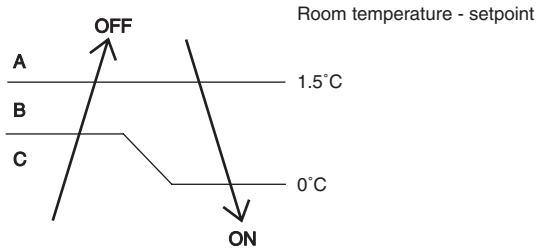
- The temperature difference is above the zone C after being in the zone A.
- The system resumes from defrost control in any zones except A.
- The operation turns on in any zones except A.
- The monitoring time has passed while the temperature difference is in the zone B. (Cooling / Dry : 10 minutes,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

Cooling / Dry



(R4668)

Heating



(R4669)

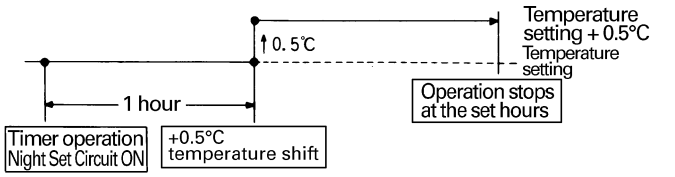
1.7 NIGHT SET Mode

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

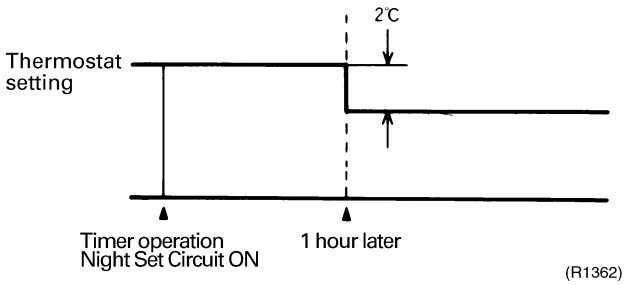
The NIGHT SET circuit continues heating or cooling the room at the set temperature for the first one hour, then automatically raises the temperature setting slightly in the case of cooling, or lowers it slightly in the case of heating, for economical operations. This prevents excessive heating in winter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

Cooling Operation



(R4421)

Heating Operation

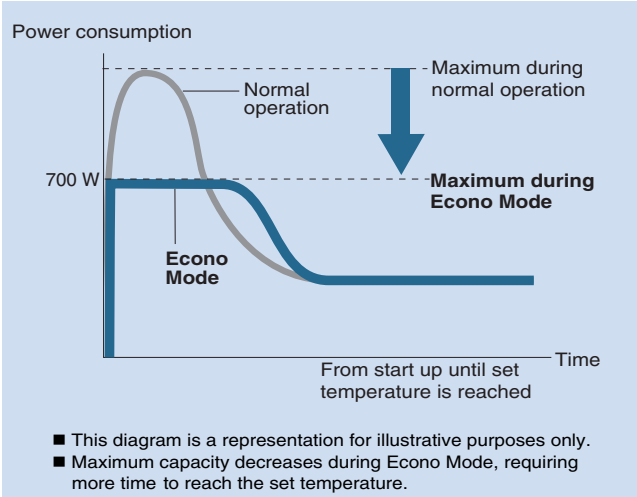


(R1362)

1.8 ECONO Mode

Outline

Econo Mode is a function that sets a limit for power consumption. A maximum power consumption of 700 W is the limit for the RK(X)20-35G and ARX20-35G. This mode is useful for preventing circuit breakers from being overloaded by the use of multiple air conditioners and other electrical devices. The function is easily activated from the remote controller by pushing the ECONO button. Econo Mode is available for all wall-mounted models.



(R8264)

Details

- ECONO mode can be activated while the unit is running. The remote controller can send the ECONO command when the unit is in COOL, HEAT, DRY, or AUTO operation.
- When the ECONO command is valid, the input current is under reducing control. (Refer to "Input current control" on page 37.)
  Also, the upper limit of frequency is restricted.

1.9 Inverter POWERFUL Operation

Outline

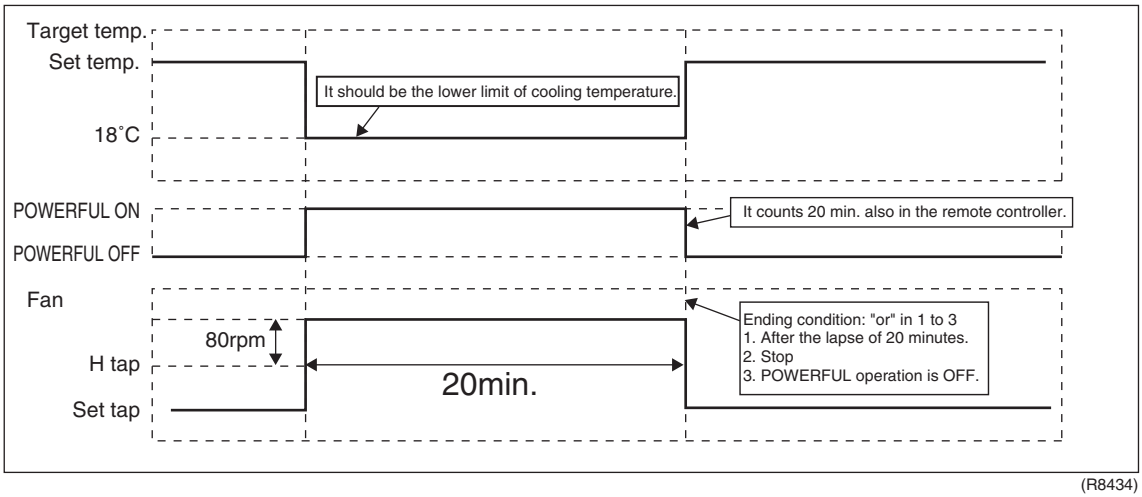
In order to exploit the cooling and heating capacity to full extent, operate the air conditioner by increasing the indoor fan rotating speed and the compressor frequency.

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 20 minutes.

Operation mode	Fan speed	Target set temperature
COOL	H tap + 80 rpm	18°C
DRY	Dry rotating speed + 80 rpm	Normally targeted temperature in dry operation; Approx. –2.5°C
HEAT	H tap + 80 rpm	30°C
FAN	H tap + 80 rpm	—
AUTO	Same as cooling / heating in POWERFUL operation	The target is kept unchanged

Ex.) : POWERFUL operation in cooling mode.



(R8434)

1.10 Other Functions

1.10.1 Hot-Start Function

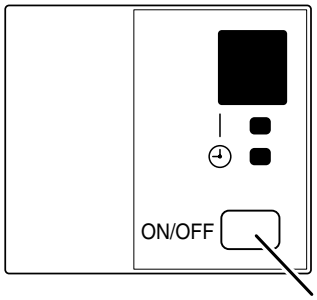
In order to prevent the cold air blast that normally comes when heating is started, the temperature of the heat exchanger of the indoor unit is detected, and either the airflow is stopped or is made very weak thereby carrying out comfortable heating of the room.
*The cold air blast is also prevented using a similar control when the defrosting operation is started or when the thermostat gets turned ON.

1.10.2 Signal Receiving Sign

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

1.10.3 ON/OFF Button on Indoor Unit

An ON/OFF button is provided on the front panel of the unit. Use this button when the remote controller is missing or if its battery has run out.
Every press of the button switches from ON to OFF or from OFF to ON.



(R8435)

- 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	Airflow rate
Heat Pump	AUTO	25°C	AUTO
Cooling	AUTO	22°C	AUTO

<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 45 for the detail of "Forced Operation Mode".

1.10.4 Mold Proof Air Filter (Prefilter)

The air filter net is impregnated with a safe, odourless mould preventative to make the filter virtually immune to mould.

1.10.5 Self-Diagnosis Digital Display

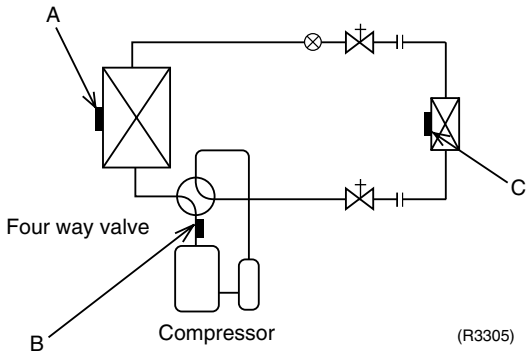
The microcomputer continuously monitors main operating conditions of the indoor unit, outdoor unit and the entire system. When an abnormality occur, the LCD remote controller displays error code. These indications allow prompt maintenance operations.

1.10.6 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. The indoor heat exchanger thermistor is used for anti-icing control.
   During the cooling operation, if the heat exchanger temperature in the room where operation is halted becomes 0°C, it is assumed as icing.
4. 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.

3. Control Specification

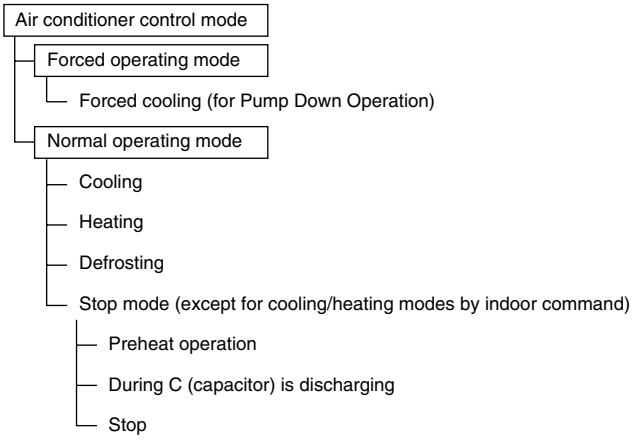
3.1 Mode Hierarchy

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.

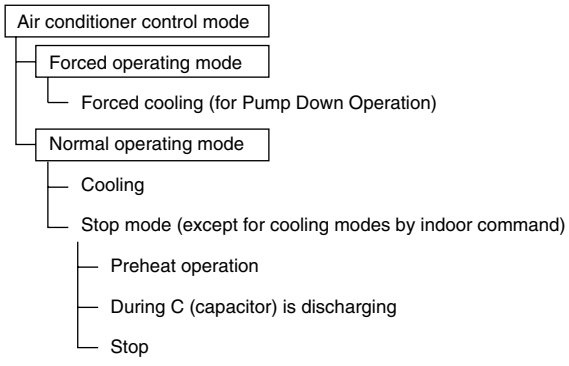
Detail

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)

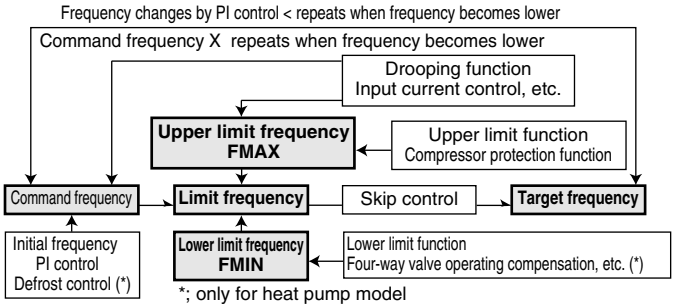
Note: Unless specified otherwise, an indoor dry operation command must be regarded as cooling operation.

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 an 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 (ΔD signal)

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

Temperature difference	ΔD signal	Temperature difference	ΔD signal	Temperature difference	ΔD signal	Temperature difference	ΔD 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 ΔD value of the indoor unit and the Q value of the indoor unit.

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

PI Control (Determine Frequency Up / Down by ΔD Signal)

1. P control

Calculate ΔD 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 ΔD value, obtaining the fixed ΔD value.
When the ΔD value is small...decrease the frequency.
When the ΔD 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 outdoor air temperature, discharge pipe temperature, and fin temperature.

Detail

Outside temperature ≥ 7°C → Control A (preheating for normal state)
Outside temperature < 7°C → Control B (preheating of increased capacity)

Control A

- ON condition
  Discharge pipe temperature < 10°C
  Fin temperature < 85°C
- OFF condition
  Discharge pipe temperature > 12°C
  Fin temperature ≥ 90°C

Control B

- ON condition
  Discharge pipe temperature < 20°C
  Fin temperature < 85°C
- OFF condition
  Discharge pipe temperature > 22°C
  Fin temperature ≥ 90°C

Note: The power consumption of compressor during preheat operation is 35 W.

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 160 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

1. When starting compressor for heating.
2. When the operating mode changes to cooling from heating.
3. When starting compressor for rushing defrosting or resetting.
4. When starting compressor for the first time after the reset with the power is ON.
5. When starting compressor for heating next to the suspension of defrosting.
6. When starting compressor next to the fault of switching over cooling / heating.

Set the lower limit frequency (cooling : 62Hz, heating : 62Hz) for 50 seconds with any conditions 1 through 6 above.

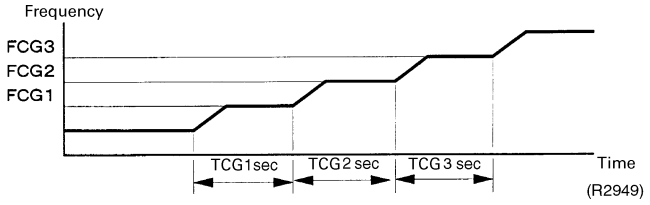
3.3.4 3-minute Standby

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).)

FCG 3	90
FCG 2	72
FCG 1	58
TCG 1	180
TCG 2	180
TCG 3	10



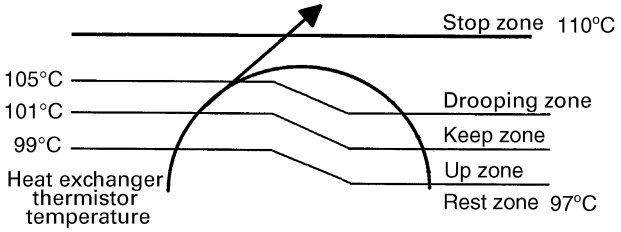
3.4 Discharge Pipe Temperature Control

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

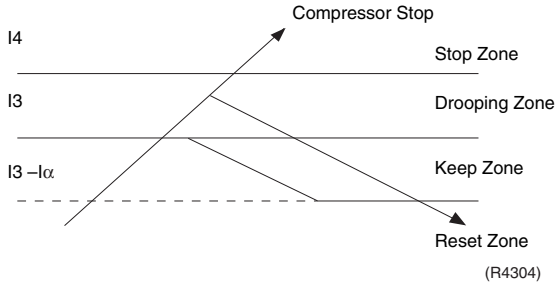
Zone	Control contents
Stop zone	When the temperature reaches the stop zone, stop the compressor and correct abnormality.
Drooping zone	Start the timer, and the frequency will be drooping.
Keep zone	Keep the upper limit of frequency.
Return / Reset zone	Cancel the upper limit of frequency.

3.5 Input Current Control

Outline

The microcomputer calculates the input current 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



Frequency control in each zone

Drooping zone

- The maximum limit of the compressor frequency in this control is defined as operation frequency – 2Hz.
- After this, the output frequency is pulled down by 2Hz every second until it reaches the steady zone.

Keep zone

- The present maximum frequency goes on.

Reset zone

- Limit of the frequency is cancelled.

Stop zone

- After 2.5 s in this zone, the compressor is stopped.

		Cooling			Heating		
		20 class	25 class	35 class	20 class	25 class	35 class
I4 (A)		14			14		
I3 (A)	Normal mode	6.0	6.0	6.5	6.75	6.75	7.75
	ECONO mode	2.75			2.75		
I3-Iα (A)	Normal mode	5.25	5.25	5.75	6.0	6.0	7.0
	ECONO mode	2.0			2.0		

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
- The current droops when outdoor air temperature becomes higher than a certain level (model by model).

3.6 Freeze-up Protection Control

Outline

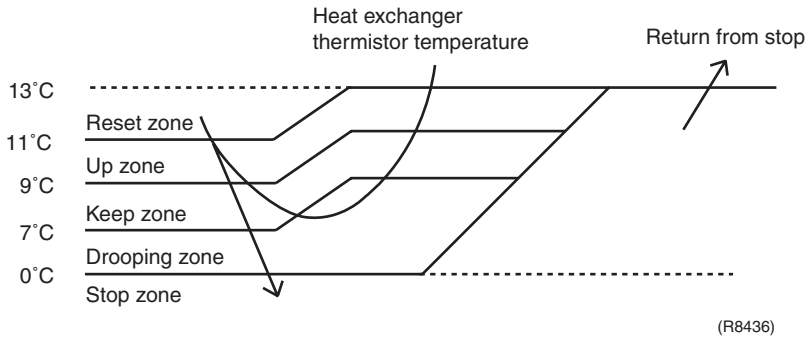
During cooling operation, the signals being sent from the indoor unit allow the operating frequency limitation and then prevent freezing of the indoor heat exchanger. (The signal from the indoor unit must be divided into the zones as the followings.

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.)

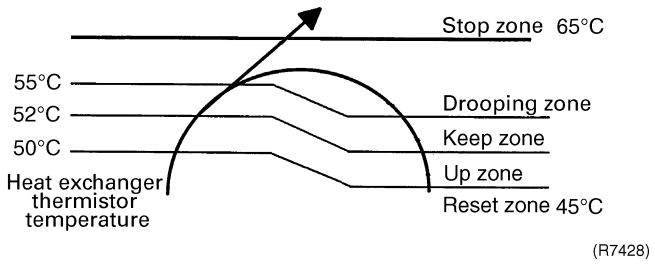
Detail

Conditions for Start Controlling

Judge the controlling start with the indoor heat exchanger temperature after 2 sec. 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 condition.

1. Fan ON control for electric component cooling fan
2. Fan control when defrosting
3. Fan OFF delay when stopped
4. Fan control for maintaining pressure difference
5. Fan control when the compressor starts for heating
6. Fan control in forced operation
7. Fan control in powerful mode
8. Fan control in low noise operation
9. Fan control in quiet mode

Detail

Fan OFF Control when Stopped

◆ Fan OFF delay for 70 seconds must be made when the compressor is stopped.

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

◆ Operation stops 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 0°C.

3.10 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.

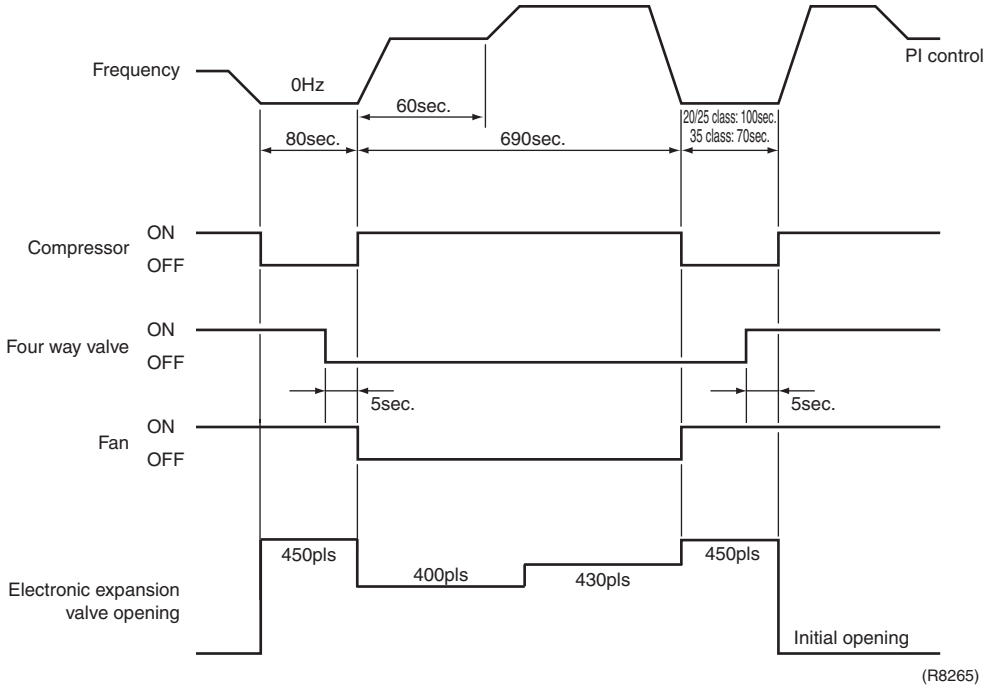
Detail

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 28 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-22°C)



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

(R2833)

3.11.1 Fully Closing with Power ON

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

3.11.2 Pressure Equalization Control

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

3.11.3 Opening Limit

Outline

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

Detail

- A maximum electronic expansion valve opening : 470 pulses
- A minimum electronic expansion valve opening : 52 pulses

The electronic expansion valve is fully closed in the room where cooling is stopped and is opened with fixed opening during defrosting.

3.11.4 Starting Operation Control

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

3.11.5 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.

3.11.6 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 5 times in succession, then the system will be down.

Detail

Detect Disconnection

If the timer for open control (12min.) becomes over, and the 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 +6°C is lower than the outdoor heat exchanger temperature, the discharge pipe thermistor disconnection must be ascertained.
2. When the operation mode is heating
   When the discharge pipe temperature +6°C is lower than the max temperature of indoor unit heat exchanger, the discharge pipe thermistor disconnection must be ascertained.

Adjustment when the thermistor is disconnected

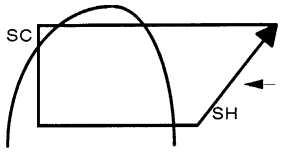
When compressor stop repeats specified time, the system should be down.

3.11.7 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.

3.11.8 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)



Set the target discharge pipe temperature as to become an aiming SH.
Regard that the inclination cannot be changed due to the operating condition.

(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.

3.12 Malfunctions

3.12.1 Sensor Malfunction Detection

Sensor malfunction may occur in the thermistor.

Relating to Thermistor Malfunction

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

3.12.2 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°C (depending on the model), the compressor gets interrupted.**
- **If the inverter current exceeds 14 A, the compressor gets interrupted too.**

3.12.3 Insufficient Gas Control

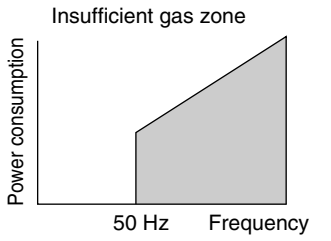
Outline

There are 3 ways of control to detect insufficient gas.

I Detecting by power consumption

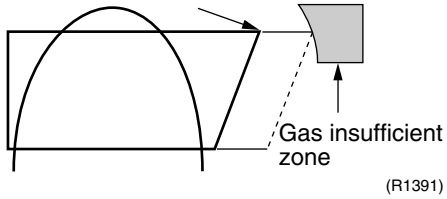
If the power consumption is below the specified value and the frequency is higher than the specified frequency, it is regarded as insufficient gas.

The 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.



II Detecting by discharge pipe temperature

If the discharge temperature is higher than the target discharge pipe temperature, and the electronic expansion valve is fully open (470 pulses) more than the specified time, it is regarded as insufficient gas.



III Detecting by the difference of temperature

If the difference between inhale and exhale temperature is smaller than the specified value, it is regarded as insufficient gas.

Refer to “Insufficient Gas” on page 107 for detail.

Detail

I Judgment by power consumption
When an output frequency is exceeds 50 Hz and the input current is less than specified value, the adjustment is made for insufficient gas.

II Judgment by discharge pipe temperature
When discharge pipe temperature is certain degree higher than target value and the electronic expansion value opening is 470 pulses (max.), the adjustment is made for insufficient gas.

III Judgment by the difference of temperature
When the difference of the temperature is smaller than △, it is regarded as insufficient gas.

		△
Cooling	room temperature – indoor heat exchanger temperature	0
	outdoor heat exchanger temperature – outdoor temperature	0
Heating	indoor heat exchanger temperature – room temperature	0
	outdoor temperature – outdoor heat exchanger temperature	0

3.13 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	58 Hz
2) Electronic expansion valve opening	It depends on the capacity of the indoor unit.
3) Outdoor unit adjustment	Compressor is in operation.
4) Indoor unit adjustment	The command of forced operation is transmitted 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.

3.14 Additional Function

3.14.1 POWERFUL Operation Mode

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

3.14.2 Voltage Detection Function

Power supply voltage is detected each time equipment operation starts.

Part 5
Operation Manual

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

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

Be sure to earth the air conditioner.

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

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

⚠ 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.
- Depending on the environment, an earth leakage breaker must be installed. Lack of an earth leakage breaker may result in electric shocks or fire.

- 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.

⚠ CAUTION

- 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.

2

- 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 remove the fan guard.
- 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 aluminum 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.
- 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.

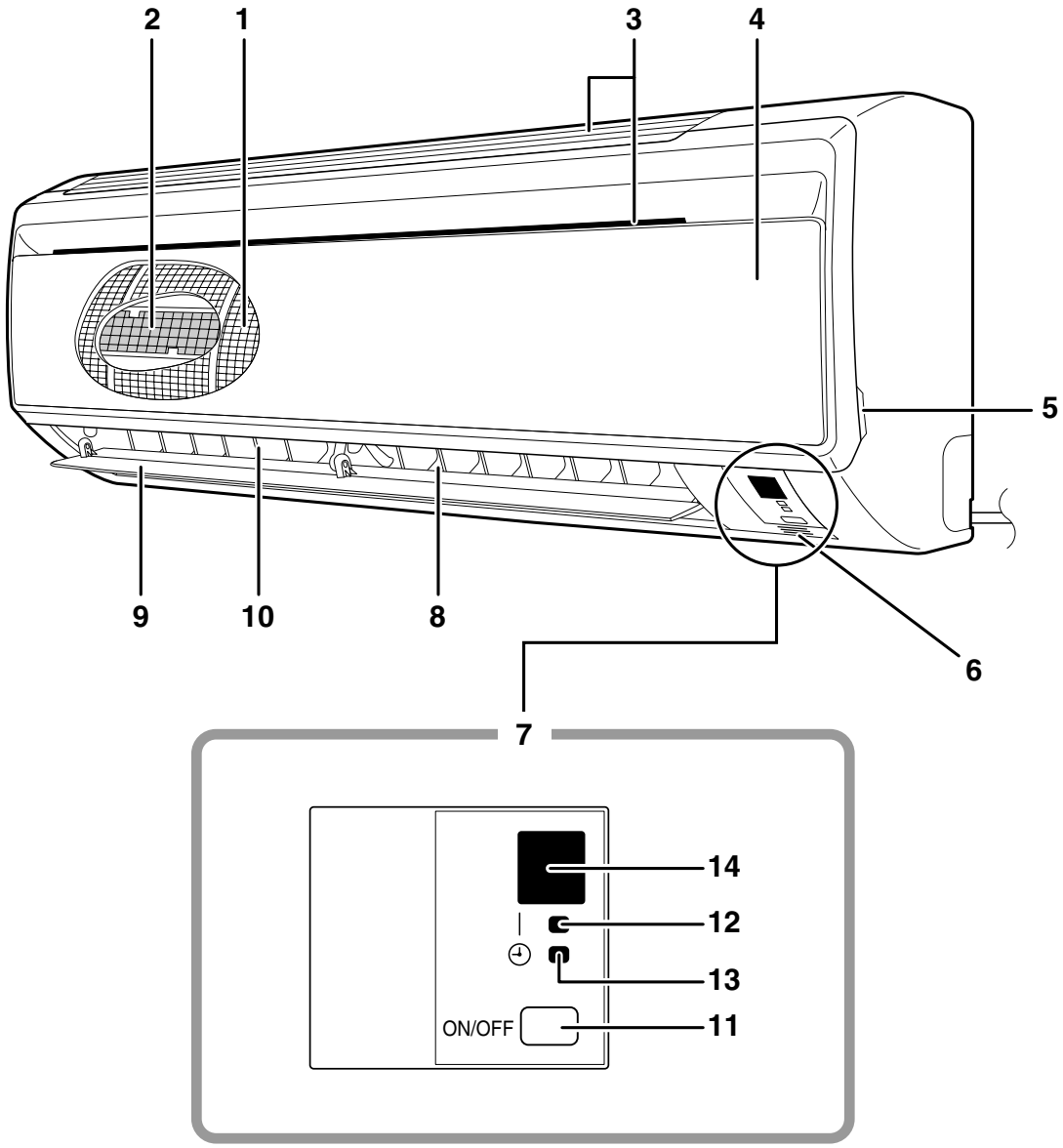
- Relocating the air conditioner requires specialized knowledge and skills. Please consult the dealer if relocation is necessary for moving or remodeling.

2.2 Name of Parts

Note: The instruction is for FTK(X)20/25/35GV1B as representative.

Names of parts

■ Indoor Unit



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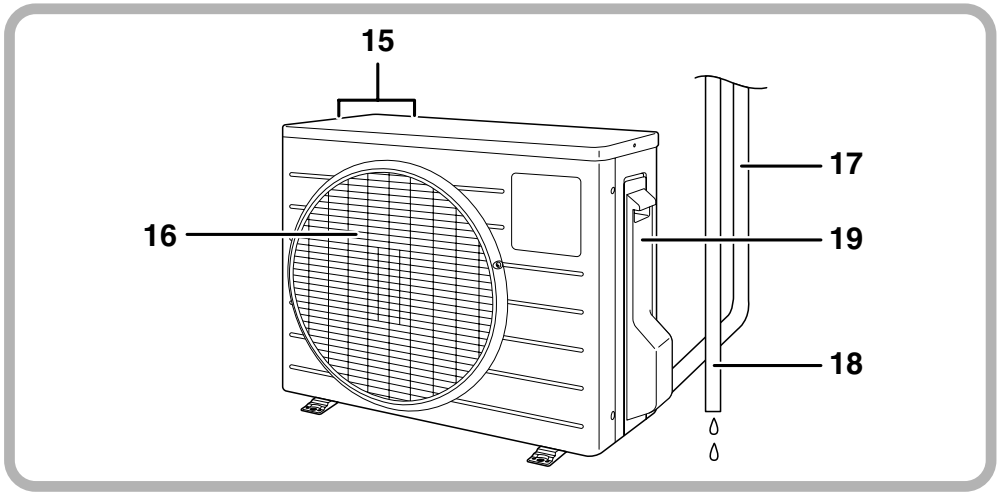
■ Outdoor Unit



■ Indoor Unit

1. **Air filter**
2. **Titanium Apatite Photocatalytic Air-Purifying Filter:**
   - These filters are attached to the inside of the air filters.
3. **Air inlet**
4. **Front panel**
5. **Panel tab**
6. **Room temperature sensor:**
   - It senses the air temperature around the unit.
7. **Display**
8. **Air outlet**
9. **Horizontal blades (Flaps):** (page 12.)
10. **Vertical blades (Louvers):**
    - The louvers are inside of the air outlet. (page 12.)
11. **Indoor Unit ON/OFF switch:** (page 10.)
    - Push this switch once to start operation. Push once again to stop it.
    - The operation mode refers to the following table.

	Mode	Temperature setting	Airflow rate
FTK	COOL	22°C	AUTO
FTX	AUTO	25°C	AUTO

    - This switch is useful when the remote controller is missing.
12. **Operation lamp (green)**
13. **TIMER lamp (yellow):** (page 16.)
14. **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 .....beeeeep

■ Outdoor Unit

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

Appearance of the outdoor unit may differ from some models.

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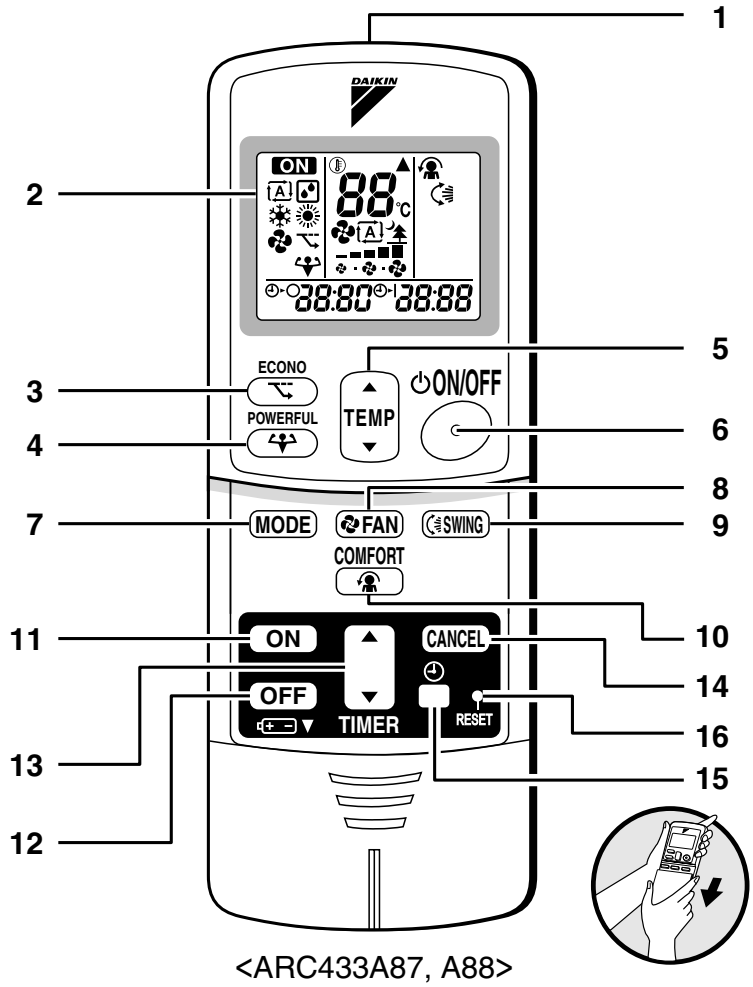
■ Remote Controller



<ARC433A87, A88>

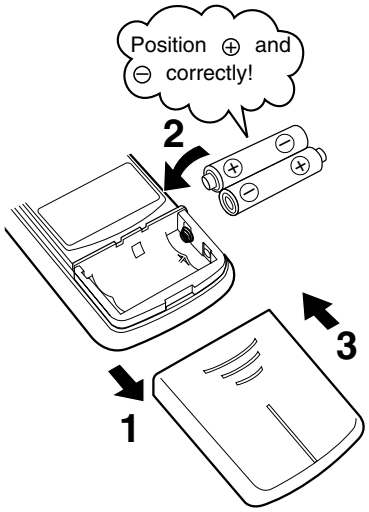
1. **Signal transmitter:**
   - It sends signals to the indoor unit.
2. **Display:**
   - It displays the current settings.
     (In this illustration, each section is shown with all its displays ON for the purpose of explanation.)
3. **ECONO button:**
   ECONO operation (page 15.)
4. **POWERFUL button:**
   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. **FAN setting button:**
   - It selects the airflow rate setting.
9. **SWING button:**
   - Ajusting the Airflow Direction. (page 12.)
10. **COMFORT AIRFLOW button:** COMFORT AIRFLOW operation (page 13.)
11. **ON TIMER button:** (page 17.)
12. **OFF TIMER button:** (page 16.)
13. **TIMER Setting button:**
    - It changes the time setting.
14. **TIMER CANCEL button:**
    - It cancels the timer setting.
15. **CLOCK button:** (page 9.)
16. **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 (LR03·AAA).**
3. **Set the front cover as before.**



ATTENTION

■ **About batteries**

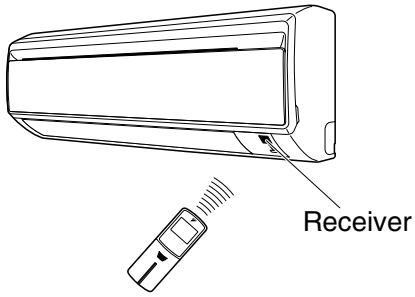
- When replacing the batteries, use batteries of the same type, and replace the two old batteries together.
- When the system is not used for a long time, take the batteries out.
- The batteries will last for approximately one year. If the remote controller display begins to fade and the degradation of reception performance occurs within a year, however, replace both two batteries with new size AAA alkaline batteries.
- 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.

7

Preparation Before Operation

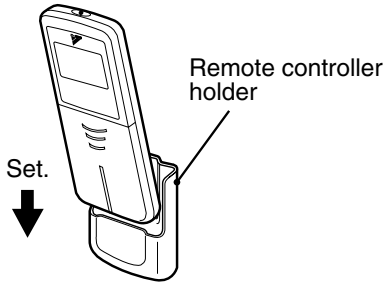
■ To operate the remote controller

- 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.

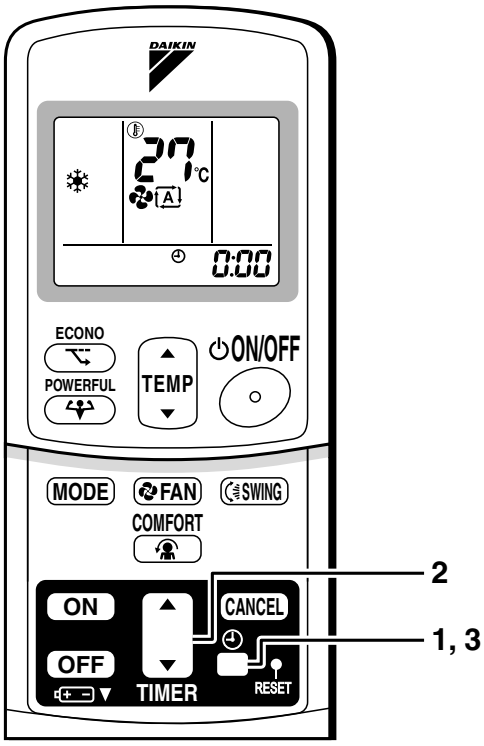
   ⏲ blinks.

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.

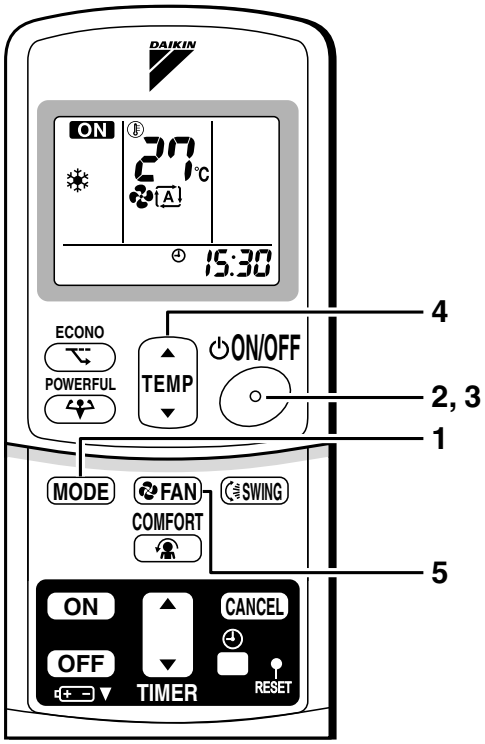
Mode	Operating conditions	If operation is continued out of this range
COOL	Outdoor temperature: 10 to 46˚C Indoor temperature: 18 to 32˚C Indoor humidity: 80% max.	• A safety device may work to stop the operation. • Condensation may occur on the indoor unit and drip.
HEAT	Outdoor temperature: –15 to 20˚C Indoor temperature: 10 to 30˚C	• A safety device may work to stop the operation.
DRY	Outdoor temperature: 10 to 46˚C Indoor temperature: 18 to 32˚C Indoor humidity: 80% max.	• A safety device may work to stop the operation. • Condensation may occur on the indoor unit and drip.

- 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

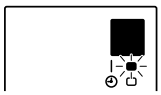
: FAN

<FTK>

<FTX>

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 airflow rate setting

5. Press “FAN setting button”.

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

- Indoor unit quiet operation

  When the airflow 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 airflow 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, the performance of the air conditioner 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 airflow rate, so manual adjustment of these functions is unavailable.

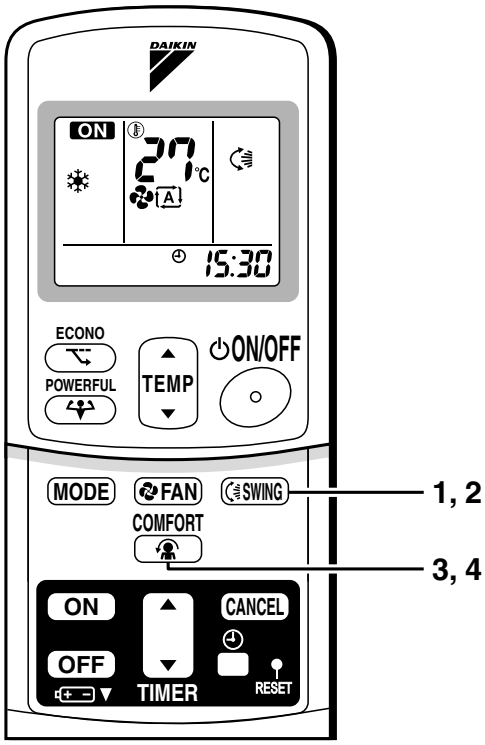
■ **Note on AUTO operation**
- In AUTO operation, the system selects an appropriate operation mode (COOL or HEAT) based on the room temperature at the start of the operation.
- The system automatically reselects setting at a regular interval to bring the room temperature to user-setting level.
- If you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

■ **Note on airflow rate setting**
- At smaller airflow rates, the cooling (heating) effect is also smaller.

2.5 Adjusting the Airflow Direction

Adjusting the Airflow Direction

You can adjust the airflow direction to increase your comfort.



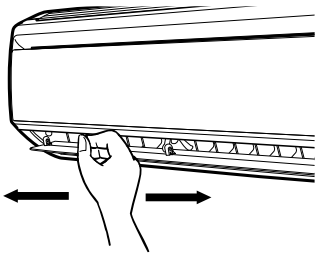
■ To adjust the horizontal blades (flaps)

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

■ To adjust the vertical blades (louvers)

Hold the knob and move the louvers.
(You will find a knob on the left-side and the right-side blades.)

- When the unit is installed in the corner of a room, the direction of the louvers should be facing away from the wall.
  If they face the wall, the wall will block off the wind, causing the cooling (or heating) efficiency to drop.



12

■ To start COMFORT AIRFLOW operation

3. Press “COMFORT AIRFLOW button”.

- The flap position will change, preventing air from blowing directly on the occupants of the room.
- “ ” is displayed on the LCD.
- Airflow rate is set to “AUTO”.

<COOL/DRY> The flap will go up.

<HEAT> The flap will go down.

■ To cancel COMFORT AIRFLOW operation

4. Press “COMFORT AIRFLOW button” again.

- The flaps will return to the memory position from before COMFORT AIRFLOW mode.
- “ ” disappears from the LCD.

Notes on COMFORT AIRFLOW operation

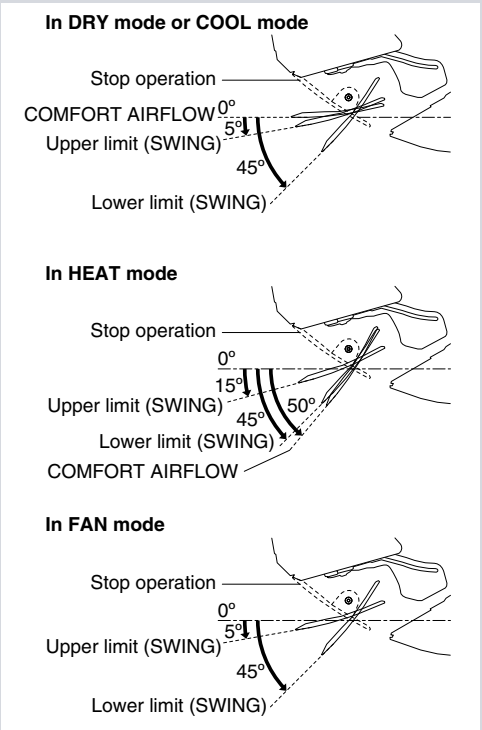
- POWERFUL operation and COMFORT AIRFLOW operation cannot be used at the same time. Priority is given to POWERFUL operation.

Notes on flaps and louvers angles

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

■ **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, a fan is rotating at a high speed.
- If the air conditioner is operated in cooling or dry mode with the flap kept stopped in the downward direction, the flap will automatically start operating in approximately an hour in order to prevent dew condensation.



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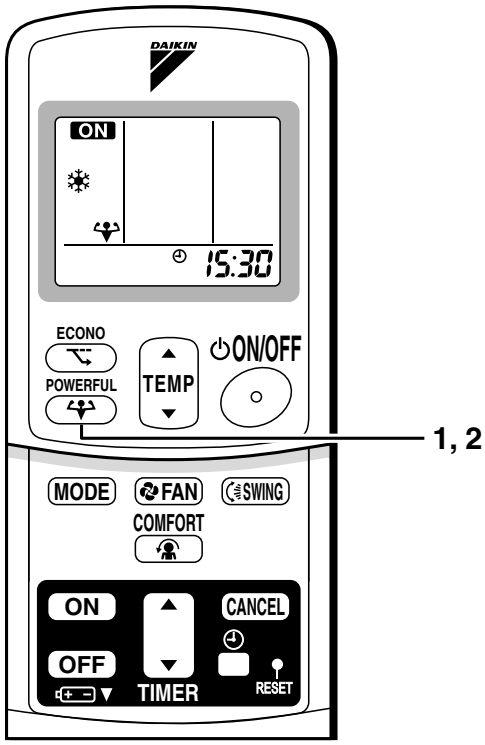
2.6 POWERFUL Operation

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

■ 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 ECONO or COMFORT AIRFLOW 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 airflow rate be fixed to the maximum setting.
  The temperature and airflow settings are not variable.
- **In DRY mode**
  The temperature setting is lowered by 2.5˚C and the airflow rate is slightly increased.
- **In FAN mode**
  The airflow rate is fixed to the maximum setting.

2.7 ECONO Operation

ECONO Operation

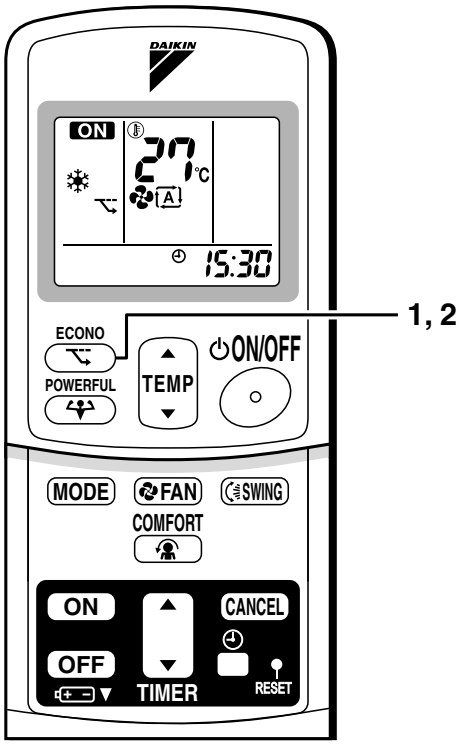
ECONO operation is a function which enables efficient operation by lowering the maximum power consumption value.

■ To start ECONO operation

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

■ To cancel ECONO operation

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



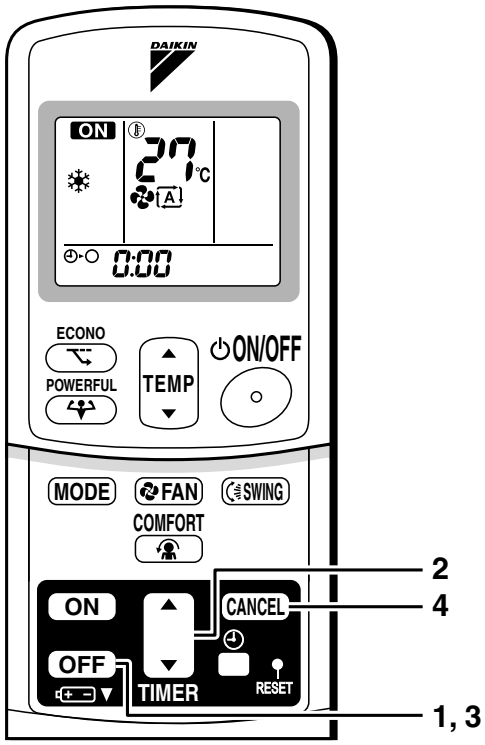
NOTE

- ECONO 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.
- ECONO operation is a function which enables efficient operation by limiting the power consumption of the outdoor unit (operating frequency).
- ECONO operation functions in AUTO, COOL, DRY, and HEAT modes.
- POWERFUL operation and ECONO operation cannot be used at the same time. Priority is given to the function of whichever button is pressed last.
- Power consumption may not drop even if ECONO operation is used, when the level of power consumption is already low.

2.8 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.

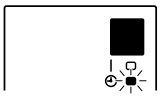
⏲ blinks.

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.

■ 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.

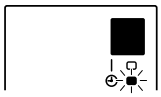
blinks.

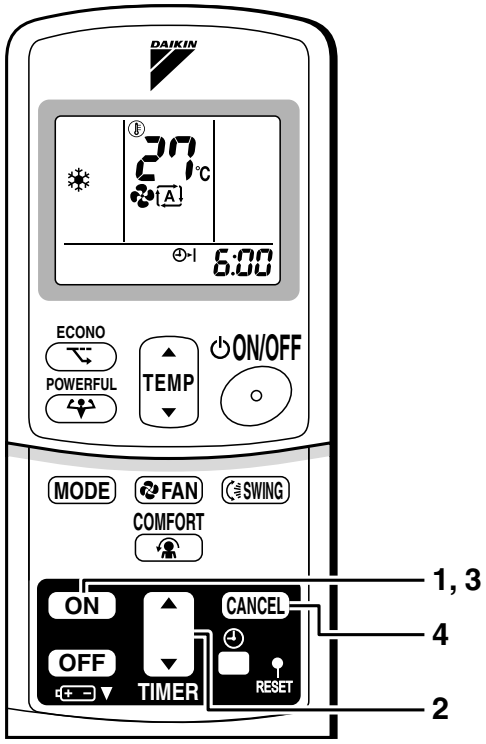
2. Press “TIMER Setting button” until the time setting reaches the point you like.

- 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

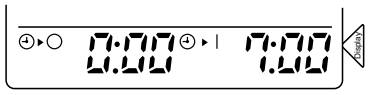
4. Press “CANCEL button”.

- The TIMER lamp goes off.

■ To combine ON TIMER and OFF TIMER

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

(Example)
Present time: 11:00 p.m.
(The unit operating)
OFF TIMER at 0:00 a.m.
ON TIMER at 7:00 a.m. } Combined



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.

2.9 Care and Cleaning

Care and Cleaning

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

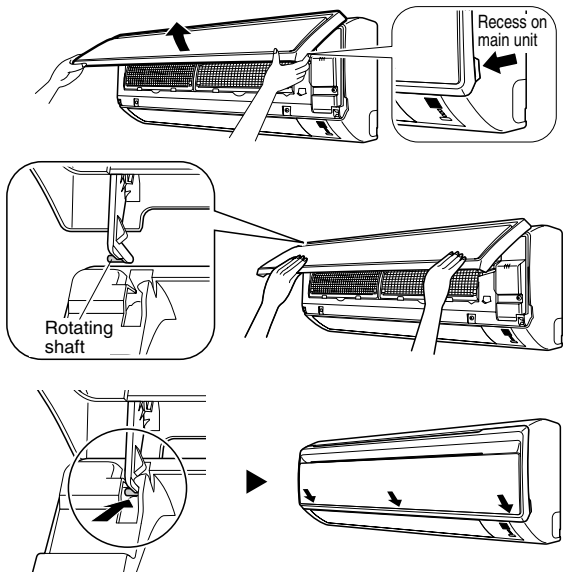
Units

■ Indoor unit, Outdoor unit and Remote controller

1. **Wipe them with dry soft cloth.**

■ Front panel

1. **Open the front panel.**
   - Hold the panel at the recesses on the main unit (2 recesses on right and left sides) and lift it until it stops.
2. **Remove the front panel.**
   - While lifting the front panel further, slide it to the right and pull it to the front side. The left rotating shaft is detached. Slide the right rotating shaft to the left and pull it to the front side to remove it.
3. **Attach the front panel.**
   - Align the right and left rotating shafts of the front panel with the grooves and push them all the way in.
   - Gently close the front panel. (Push both ends and the center on the front panel.)

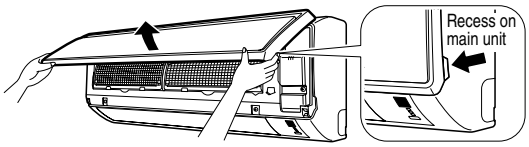


⚠ CAUTION

- 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.

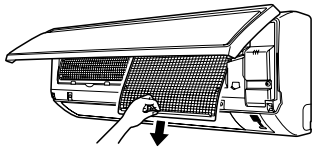
Filters

1. **Open the front panel. (page 18.)**
   - Hold the panel at the recesses on the main unit (2 recesses on right and left sides) and lift it until it stops.



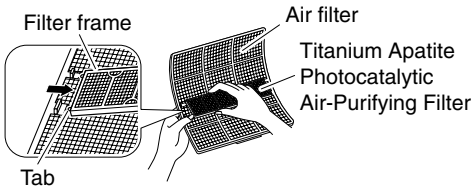
2. **Pull out the air filters.**
   - Push a little upwards the tab at the center of each air filter, then pull it down.

3. **Take off the Titanium Apatite Photocatalytic Air-Purifying Filter.**
   - Hold the recessed parts of the frame and unhook the four claws.

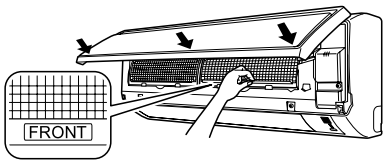


4. **Clean or replace each filter.**

   See figure.
   - When shaking off remaining water, do not wring the filter.

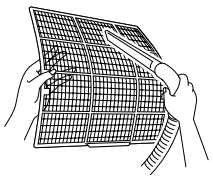


5. **Set the air filter and Titanium Apatite Photocatalytic Air-Purifying Filter as they were and close the front panel.**
   - Insert claws of the filters into slots of the front panel. Close the front panel slowly and push the panel at the 3 points. (1 on each side and 1 in the middle.)
   - The air filter and the Titanium Apatite Photocatalytic Air-Purifying Filter have a symmetrical form in the horizontal direction.

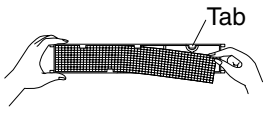


■ Air Filter

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. **Do not remove filter from frame when washing with water.**
4. **After washing, shake off remaining water and dry in the shade.**
5. **When shaking off remaining water, do not wring the filter.**

[Replacement]

1. **Remove the tabs on the filter frame and replace with a new filter.**
   • Dispose of old filters 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	KAF970A46

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. • 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.

■ Before a long idle period

1. **Operate the “FAN only” for several hours on a fine day to dry out the inside.**
   • Press “MODE selector 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.**

2.10 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
Operation does not start soon. • When ON/OFF button was pressed soon after operation was stopped. • When the mode was reselected.	• This is to protect the air conditioner. You should wait for about 3 minutes.
Hot air does not flow out soon after the start of heating operation.	• 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.)
The heating operation stops suddenly and a flowing sound is heard.	• The system is taking away the frost on the outdoor unit. You should wait for about 3 to 8 minutes.
The outdoor unit emits water or steam.	■ In HEAT mode • The frost on the outdoor unit melts into water or steam when the air conditioner is in defrost operation. ■ In COOL or DRY mode • Moisture in the air condenses into water on the cool surface of outdoor unit piping and drips.
Mist comes out of the indoor unit.	■ This happens when the air in the room is cooled into mist by the cold airflow during cooling operation.
The indoor unit gives out odour.	■ This happens when smells of the room, furniture, or cigarettes are absorbed into the unit and discharged with the airflow. (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.)
The outdoor fan rotates while the air conditioner is not in operation.	■ After operation is stopped: • The outdoor fan continues rotating for another 60 seconds for system protection. ■ While the air conditioner is not in operation: • When the outdoor temperature is very high, the out door fan starts rotating for system protection.
The operation stopped suddenly. (OPERATION lamp is on.)	■ For system protection, the air conditioner may stop operating on a sudden large voltage fluctuation. It automatically resumes operation in about 3 minutes.
No remote controller signals are displayed. **The remote controller sensitivity is low.** **The display is low in contrast or blacked out.** **The display runs out of control.**	• The batteries are dying and the remote controller is malfunctioning. Replace all the batteries with new size AAA alkaline batteries. For details, refer to “To set the batteries” of this manual. (page 7.) * If the reset button is provided, press the reset button after the batteries are replaced.

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Check again.

Please check again before calling a repair person.

Case	Check
The air conditioner does not operate. (OPERATION lamp is off.)	• Hasn't a breaker turned OFF or a fuse blown? • Isn't it a power failure? • Are batteries set in the remote controller? • Is the timer setting correct?
Cooling (Heating) effect is poor.	• Are the air filters clean? • Is there anything to block the air inlet or the outlet of the indoor and the outdoor units? • Is the temperature setting appropriate? • Are the windows and doors closed? • Are the airflow rate and the air direction set appropriately?
Operation stops suddenly. (OPERATION lamp flashes.)	• Are the air filters clean? • Is there anything to block the air inlet or the outlet of the indoor and the outdoor units? 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 flashes, call the service shop where you bought the air conditioner.
An abnormal functioning happens during operation.	• 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.

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.

■ **The power cord is abnormally hot or damaged.** ■ **An abnormal sound is heard during operation.** ■ **The safety breaker, a fuse, or the earth leakage breaker cuts off the operation frequently.** ■ **A switch or a button often fails to work properly.** ■ **There is a burning smell.** ■ **Water leaks from the indoor unit.**	▶ Turn the breaker OFF and call the service shop.

■ After a power failure The air conditioner automatically resumes operation in about 3 minutes. You should just wait for a while.	■ Lightning If lightning may strike the neighbouring area, stop operation and turn the breaker OFF for system protection.

Disposal requirements

Your air conditioning product is marked with this symbol. This means that electrical and electronic products shall not be mixed with unsorted household waste.

Do not try to dismantle the system yourself: the dismantling of the air conditioning system, treatment of the refrigerant, of oil and of other parts must be done by a qualified installer in accordance with relevant local and national legislation.

Air conditioners must be treated at a specialized treatment facility for re-use, recycling and recovery. By ensuring this product is disposed of correctly, you will help to prevent potential negative consequences for the environment and human health. Please contact the installer or local authority for more information.

Batteries must be removed from the remote controller and disposed of separately in accordance with relevant local and national legislation.

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.

Important information regarding the refrigerant used.

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol.

Refrigerant type:**R410A**

GWP(1) value:**1975**

(1) GWP = global warming potential

Periodical inspections for refrigerant leaks may be required depending on European or local legislation. Please contact your local dealer for more information.

Part 6
Service Diagnosis

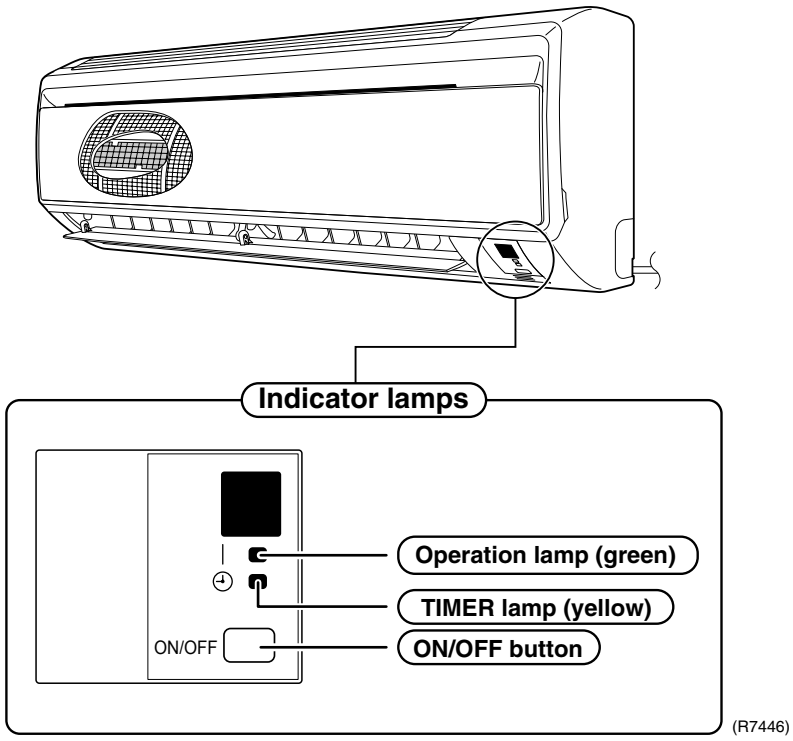
1. Caution for Diagnosis

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



Troubleshooting with LED Indication

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

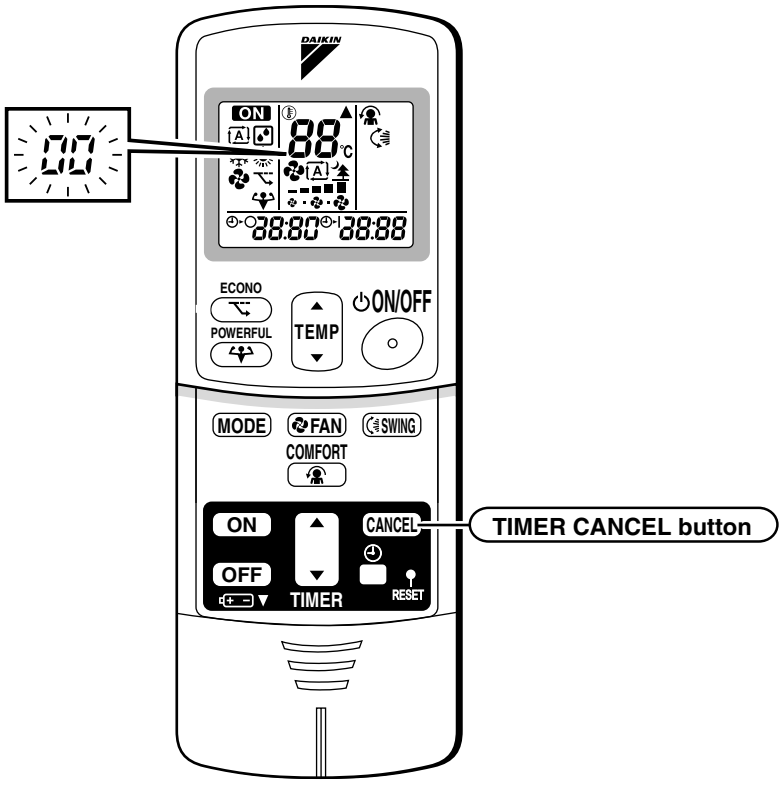
Symptom	Check Item	Details of Measure	Reference Page
None of the Units Operates.	Check the power supply.	Check to make sure that the rated voltage is supplied.	—
	Check the type of the indoor units.	Check to make sure that the indoor unit type is compatible with the outdoor unit.	—
	Check the outdoor air temperature.	Heating operation cannot be used when the outdoor air temperature is 24°C or higher (only for heat pump model), and cooling operation cannot be used when the outdoor air temperature is below 10°C.	—
	Diagnosis with remote controller indication	—	77
	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 24°C or higher (only for heat pump model), and cooling operation cannot be used when the outdoor air temperature is below 10°C.	—
	Diagnosis with remote controller indication	—	77
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 dismounted 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	—	77
	Diagnosis by service port pressure and operating current	Check for insufficient gas.	115
Large Operating Noise and Vibrations	Check the output voltage of the power transistor.	—	115
	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 ARC433 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.



<ARC433A87, A88> (R8275)

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.

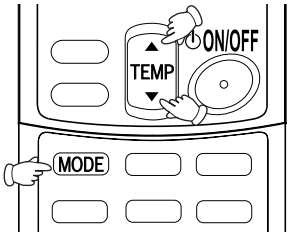
No.	Code	No.	Code	No.	Code
1	00	12	F6	23	A1
2	U4	13	C7	24	E1
3	L5	14	A3	25	UA
4	E6	15	H8	26	UH
5	H6	16	H9	27	P4
6	H0	17	C9	28	L3
7	A6	18	C4	29	L4
8	E7	19	C5	30	H7
9	U0	20	J3	31	U2
10	F3	21	J6	32	EA
11	A5	22	E5	33	AH

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.

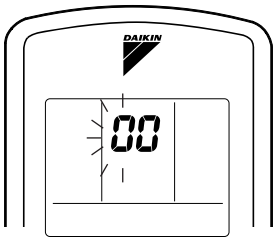
Check Method 2

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



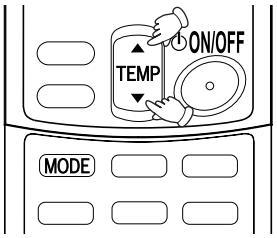
(R4272)

   The digit of the number of tens blinks.
   ★Try again from the start when the digit does not blink.



(R4273)

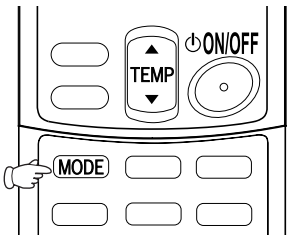
2. Press the TEMP button.
   Press TEMP▲ or TEMP▼ and change the digit until you hear the sound of “beep” or “pi pi”.



(R4274)

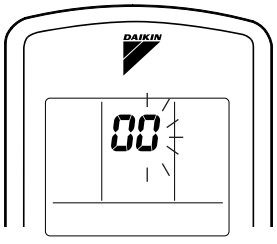
3. Diagnose by the sound.
   ★“pi” : The number of tens does not accord with the error code.
   ★“pi pi” : The number of tens accords with the error code.
   ★“beep” : The both numbers of tens and units accord with the error code. (→See 7.)

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



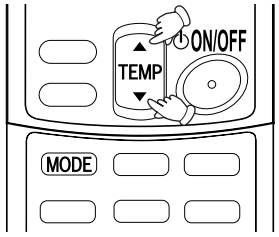
(R4275)

   The digit of the number of units blinks.



(R4276)

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

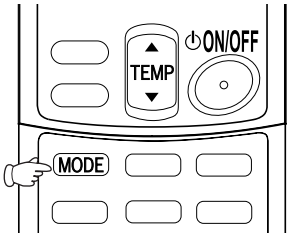


(R4277)

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 77.)

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	107
	U2	Over-voltage detection	109
	U4	Signal transmission error (between indoor and outdoor unit)	84
	UA	Unspecified voltage (between indoor and outdoor unit)	85
Indoor Unit	A1	Indoor unit PCB abnormality	78
	A5	Freeze-up protection control or high pressure control	79
	A6	Fan motor or related abnormality	81
	C4	Heat exchanger temperature thermistor abnormality	83
	C9	Room temperature thermistor abnormality	83
Outdoor Unit	E1	Outdoor unit PCB abnormality	86
	E5★	OL activation (compressor overload)	87
	E6★	Compressor lock	88
	E7	DC fan lock	89
	E8	Input over current detection	90
	EA	Four way valve abnormality	91
	F3	Discharge pipe temperature control	93
	F6	High pressure control in cooling	94
	H0	Compressor system sensor abnormality	96
	H6	Position sensor abnormality	97
	H8	DC voltage/current sensor abnormality	98
	H9	Outdoor air thermistor or related abnormality	99
	J3	Discharge pipe temperature thermistor or related abnormality	99
	J6	Heat exchanger temperature thermistor or related abnormality	99
	L3	Electrical box temperature rise	101
	L4	Radiation fin temperature rise	103
	L5	Output over current detection	105
	P4	Heat radiation fin thermistor or related abnormality	99

★: Displayed only when system-down occurs.

4.2 Indoor Unit PCB Abnormality

Remote Controller Display

A1

Method of Malfunction Detection

Evaluation of zero-cross detection of power supply by indoor unit.

Malfunction Decision Conditions

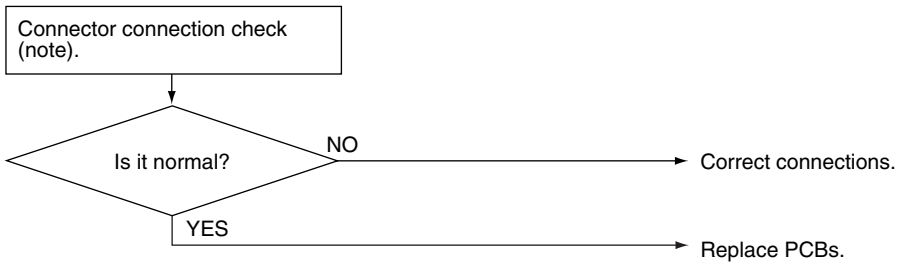
When there is no zero-cross detection in approximately 10 continuous seconds.

Supposed Causes

- Faulty indoor unit PCB
- Faulty connector connection

Troubleshooting

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



(R7130)

Note: Connector Nos. vary depending on models.

Model Type	Connector No.
Wall Mounted Type 20 / 25 / 35 class	Terminal strip~Control PCB

4.3 Freeze-up Protection Control or High Pressure Control

Remote Controller Display

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.)
- 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 61°C
- Freeze-up protection
  When the indoor unit heat exchanger temperature is below 0°C during cooling operation.

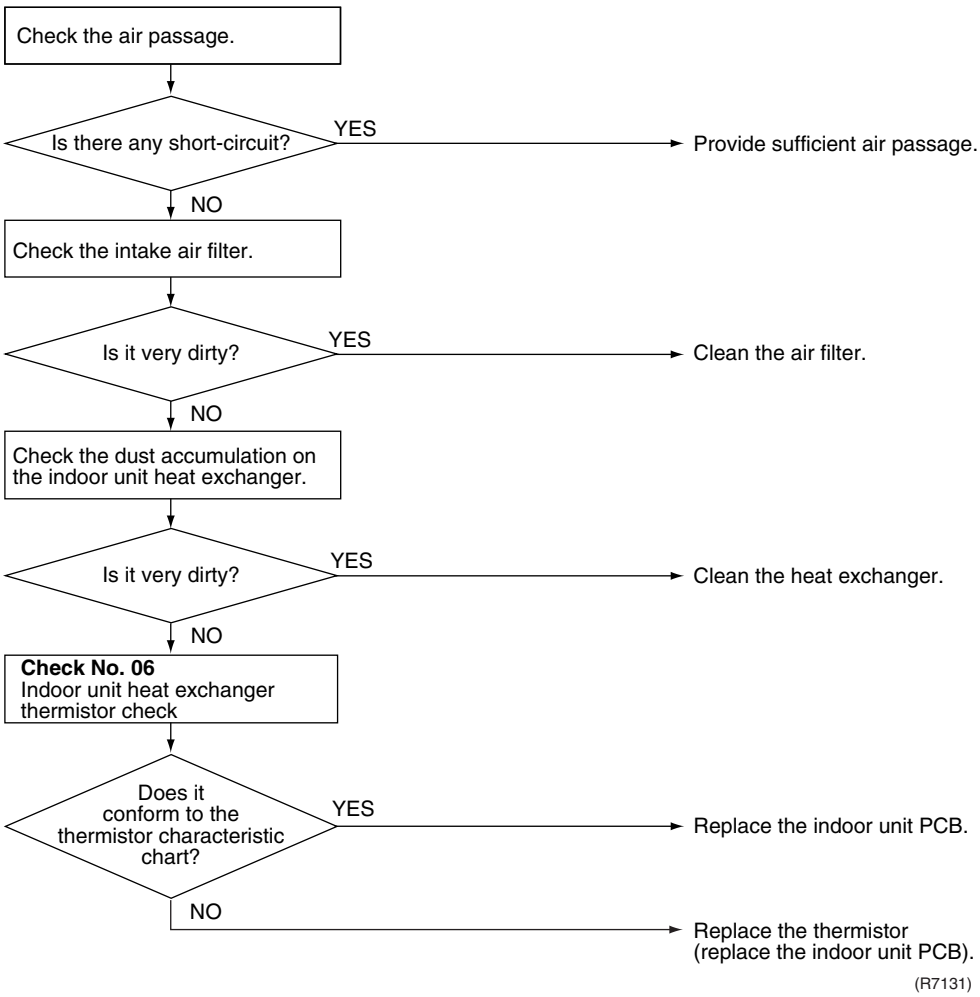
Supposed Causes

- 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.112

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



(R7131)

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 is less than 50% of the H tap under maximum fan motor rotation demand.
When the fan motor starts rotation and then stops within 5 seconds.

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.
- Detection error due to faulty indoor unit PCB.

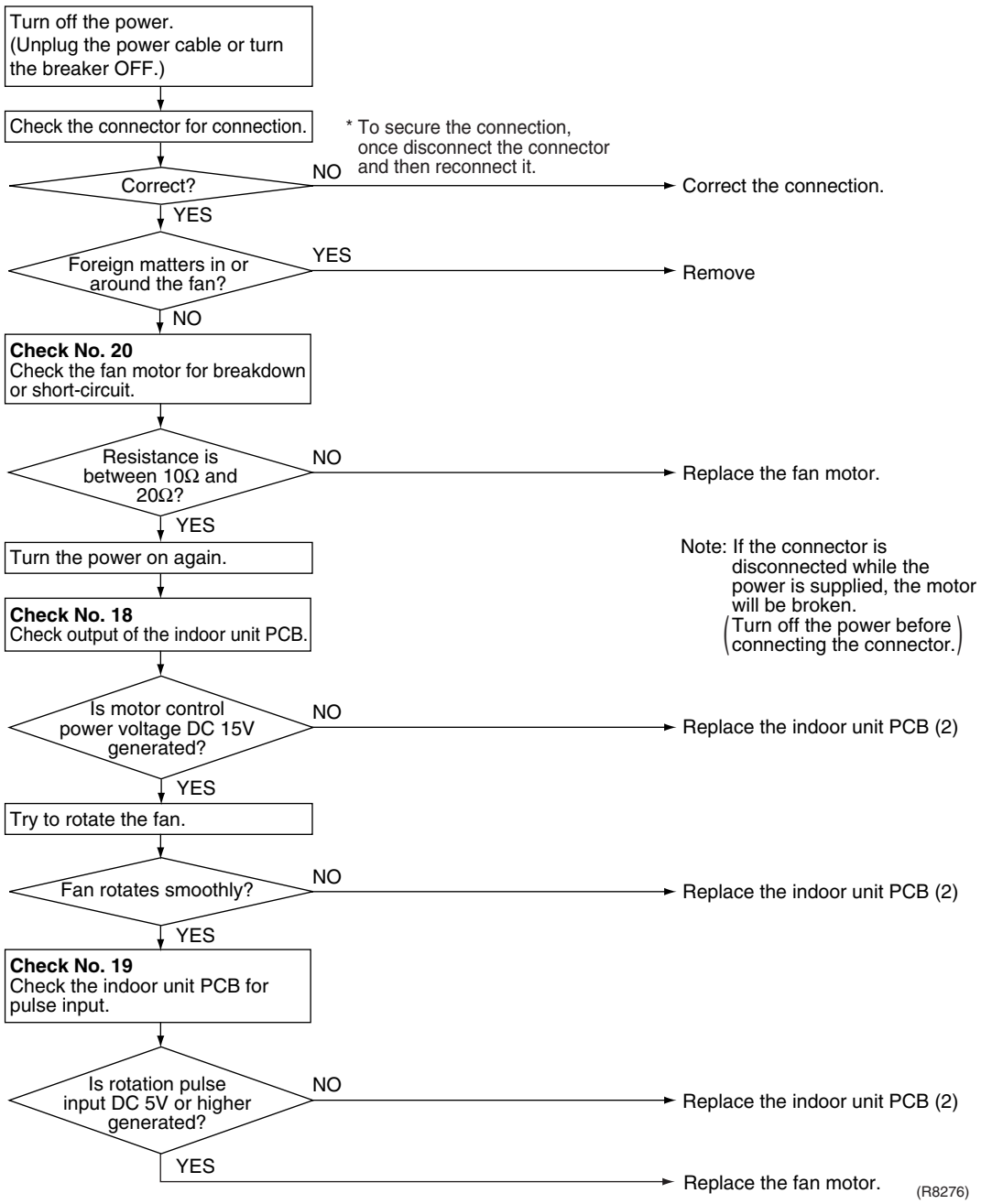
Troubleshooting

Check No.18
Refer to P.116

Check No.19
Refer to P.112

Check No.20
Refer to P.112

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



4.5 Thermistor or Related Abnormality (Indoor Unit)

Remote Controller Display

C4, C9

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 105°C (less than C4: 1,070/C9: 829 ohms) or below about –30°C (more than C4: 331ohms/C9: 88 kohms).

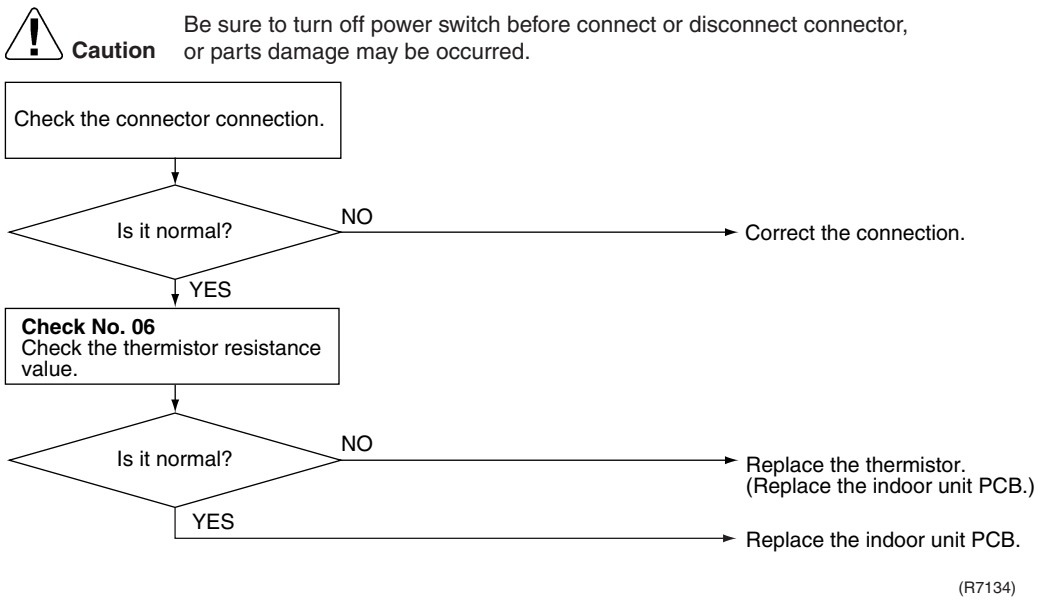
Note: The values vary slightly in some models.

Supposed Causes

- Faulty connector connection
- Faulty thermistor
- Faulty PCB

Troubleshooting

Check No.06
Refer to P.112



C4 : Heat exchanger thermistor
C9 : 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.

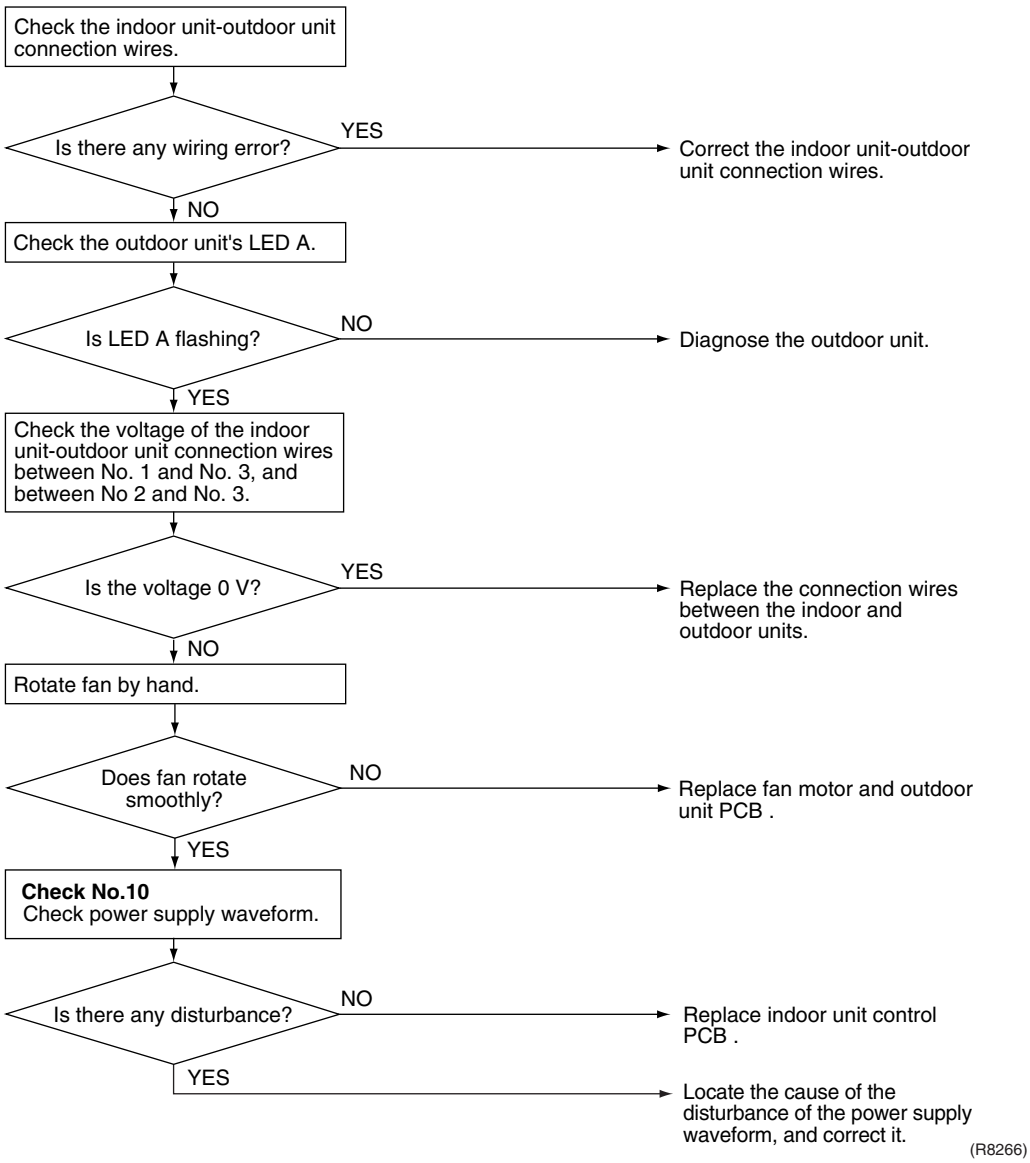
Supposed Causes

- Faulty outdoor unit PCB / Faulty indoor unit PCB
- Indoor unit-outdoor unit signal transmission error due to wiring error / due to disturbed power supply waveform / due to breaking of wire in the connection wires between the indoor and outdoor units (wire No. 3)
- Short circuit inside the fan motor winding

Troubleshooting

Check No.10
Refer to P.114

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



(R8266)

4.7 Unspecified Voltage (between Indoor and Outdoor Units)

Remote Controller Display

UP

Method of Malfunction Detection

The supply power is detected for its requirements (different from pair type and multi type) by the indoor / outdoor transmission signal.

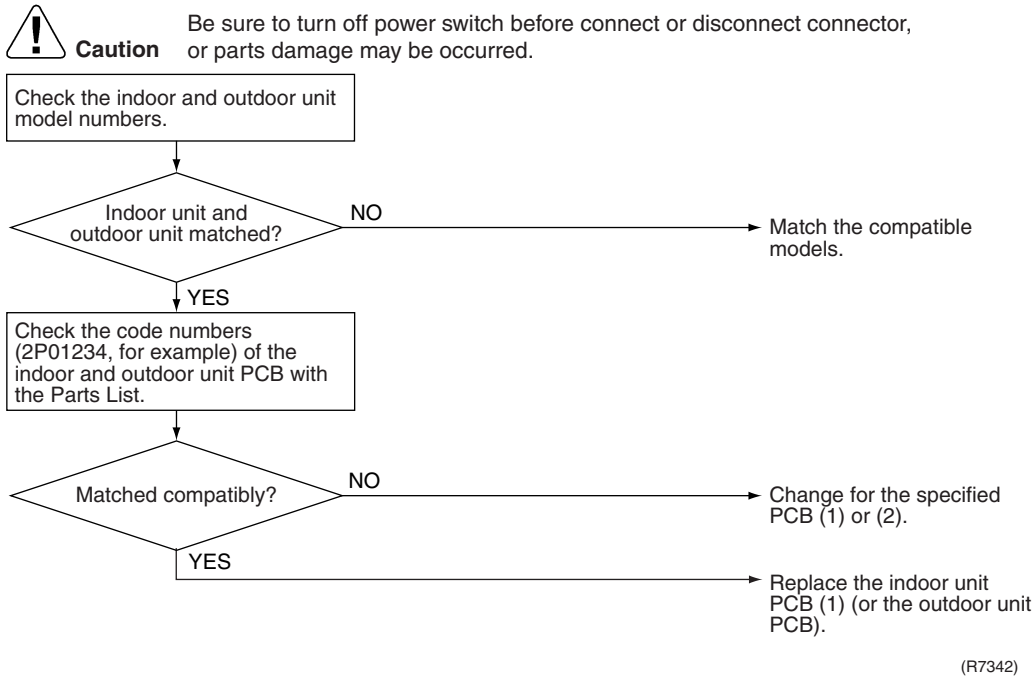
Malfunction Decision Conditions

The pair type and multi type are interconnected.

Supposed Causes

- Wrong models interconnected
- Wrong indoor unit PCB mounted
- Indoor unit PCB defective
- Wrong outdoor unit PCB mounted or defective

Troubleshooting



4.8 Outdoor Unit PCB Abnormality

Remote Controller Display

E1

Method of Malfunction Detection

- The system follows the microprocessor program to make sure it runs specified.
- The system checks to see if the zero-cross signal comes in properly.

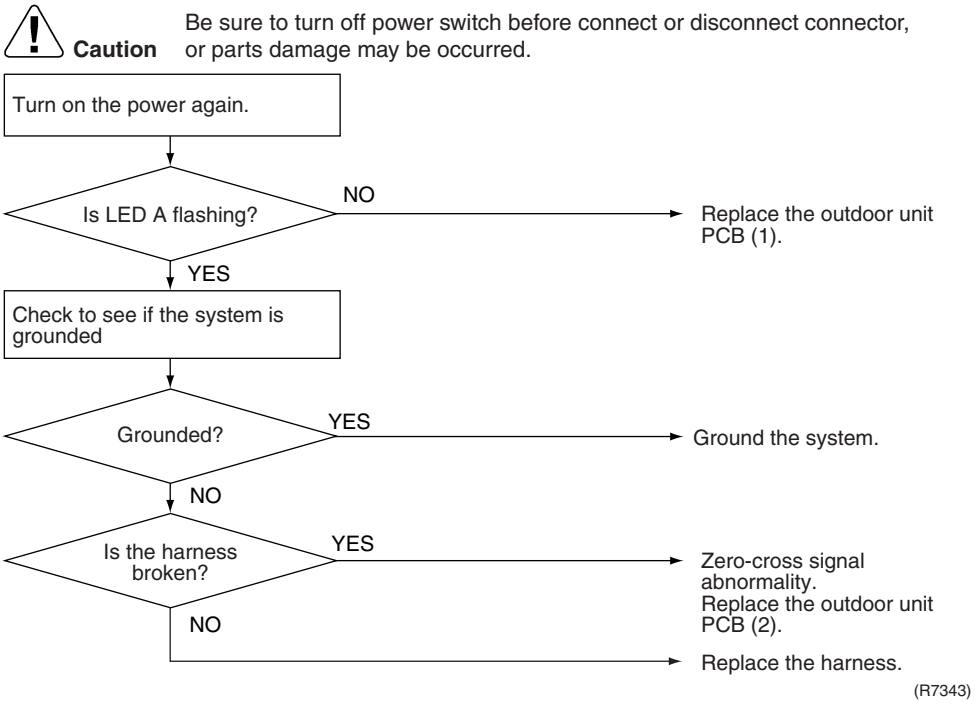
Malfunction Decision Conditions

- The microprocessor program runs out of control.
- The zero-cross signal is not detected.

Supposed Causes

- The microcomputer is out of control due to external factors.
  - Noise
  - Momentary voltage drop
  - Momentary power failure, etc.
- Outdoor unit PCB defective
- Broken harness between PCBs

Troubleshooting



4.9 OL Activation (Compressor Overload)

Remote Controller Display

E5

Method of Malfunction Detection

A compressor overload is detected through compressor OL.

Malfunction Decision Conditions

- If the compressor OL is activated twice, 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).

* The operating temperature condition is not specified.

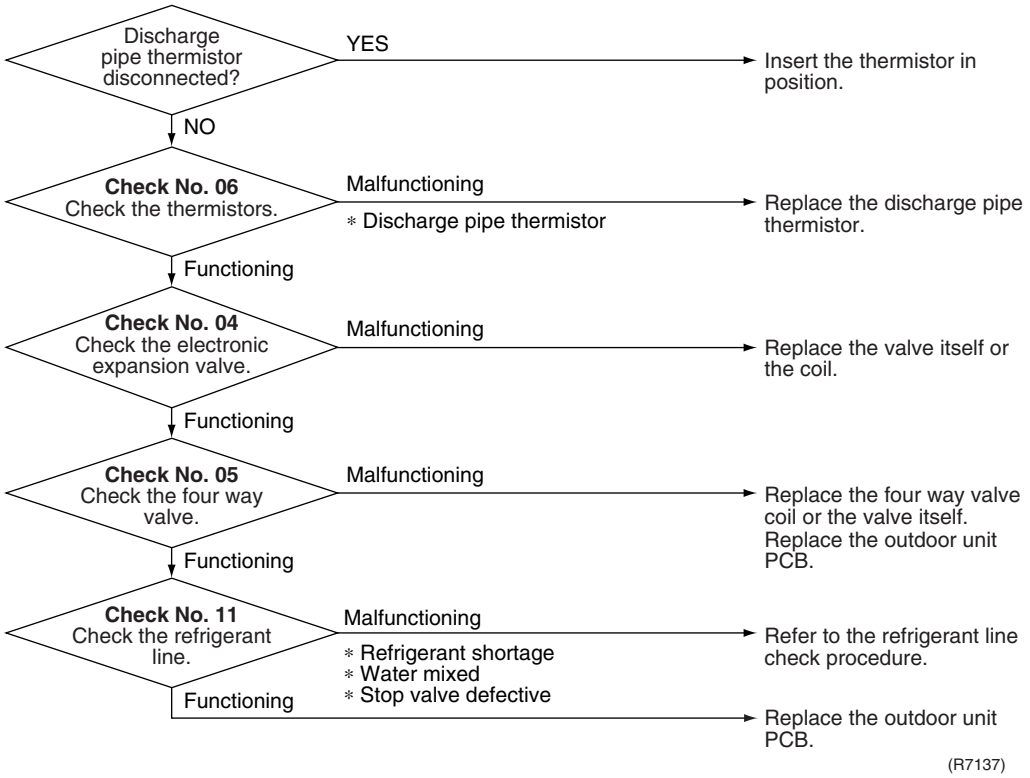
Supposed Causes

- Refrigerant shortage
- Four way valve malfunctioning
- Outdoor unit PCB defective
- Water mixed in the local piping
- Electronic expansion valve defective
- Stop valve defective

Troubleshooting

Check No.04 Refer to P.110
Check No.05 Refer to P.111
Check No.06 Refer to P.112
Check No.11 Refer to P.115

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



(R7137)

4.10 Compressor Lock

Remote Controller Display

E6

Method of Malfunction Detection

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

Malfunction Decision Conditions

- The system judges the compressor lock, and stops due to over current.
- The system judges the compressor lock, and cannot operation with position detection within 15 seconds after start up.
- The system will be shut down if the error occurs 16 times.
- Clearing condition: Continuous run for about 10 minutes (normal)

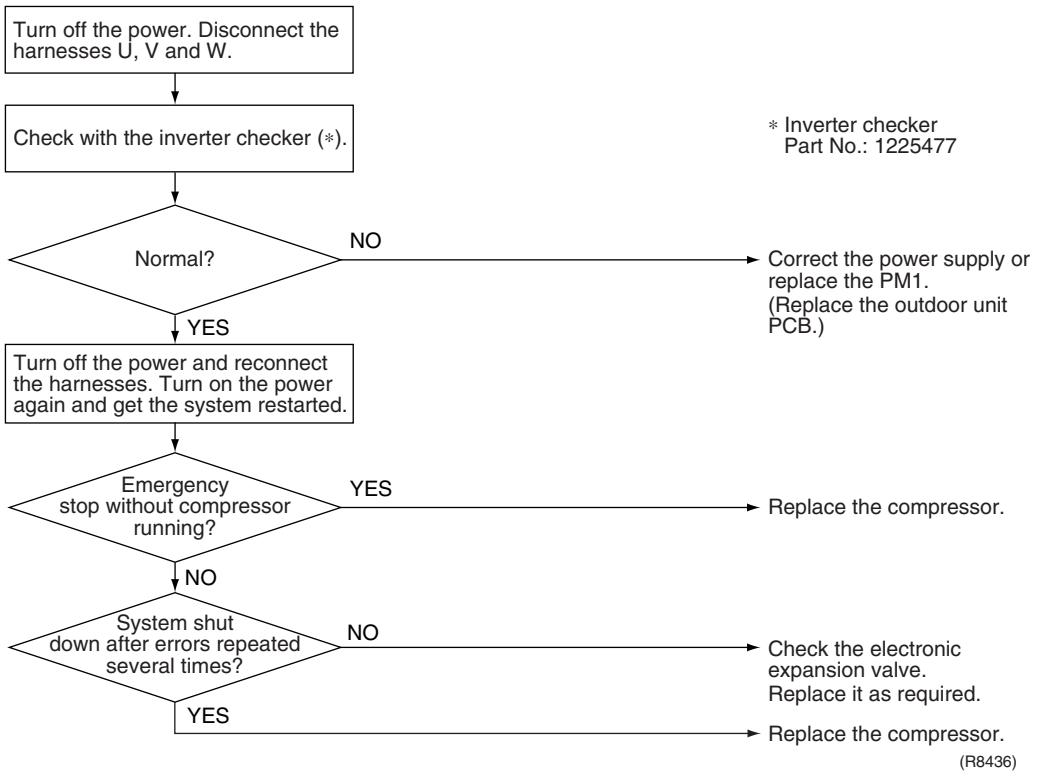
Supposed Causes

- Compressor locked
- Compressor harness disconnected

Troubleshooting

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

(Precaution before turning on the power again)
Make sure the power has been off for at least 30 seconds.



(R8436)

4.11 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

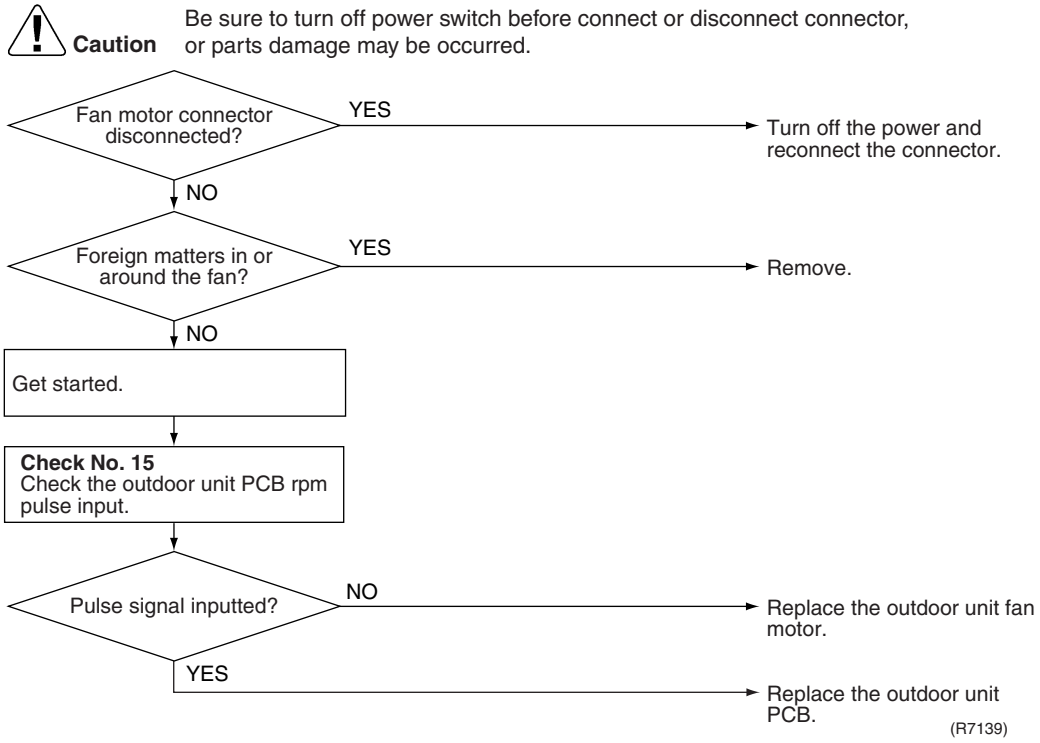
- The fan does not start in 30 seconds even when the fan motor is running.
- The system will be shut down if the error occurs 16 times.
- Clearing condition: Continuous run for about 10 minutes (normal)

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.116



4.12 Input Over Current Detection

Remote Controller Display

E8

Method of Malfunction Detection

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

Malfunction Decision Conditions

- The following current with the compressor running continues for 2.5 seconds.
  Cooling/Heating: Above 14A

Supposed Causes

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

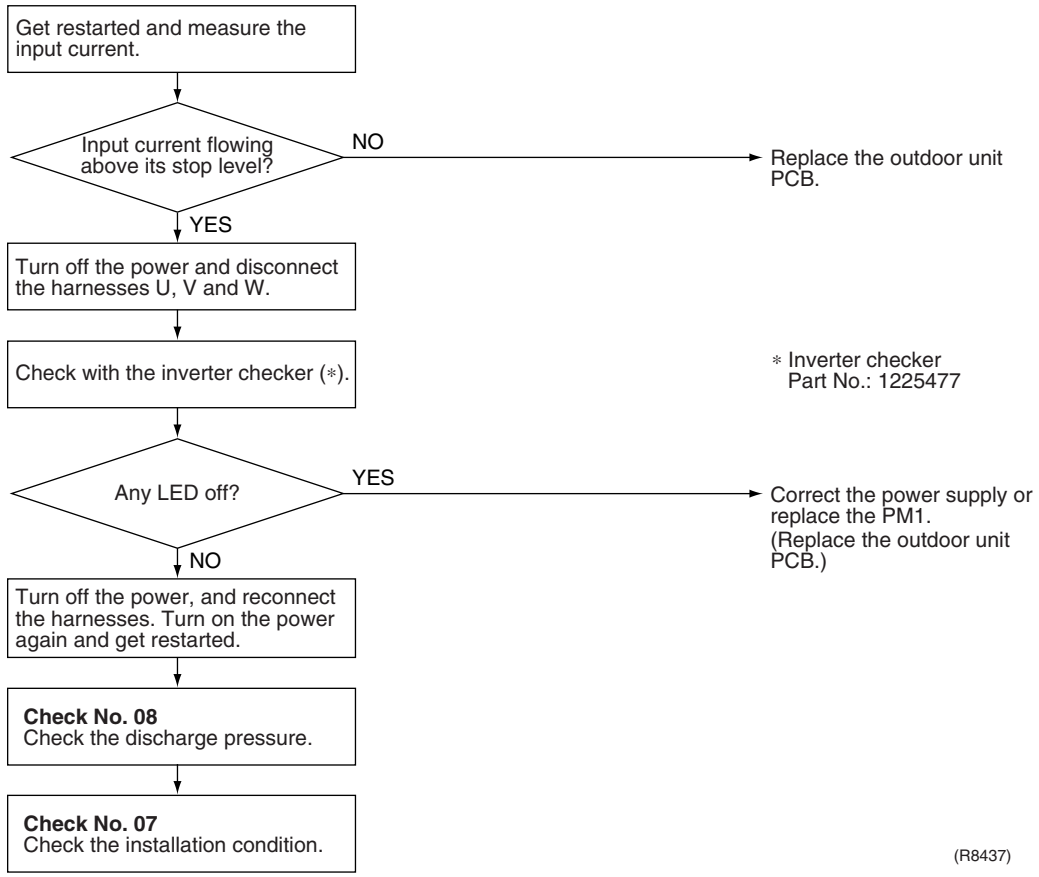
Troubleshooting

Check No.07
Refer to P.113

Check No.08
Refer to P.113

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.



4.13 Four Way Valve Abnormality

Remote Controller Display

E8

Method of Malfunction Detection

The indoor air 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 10 minute after operating 5 minutes.

- Cooling / dry operation
  (room temp. – indoor heat exchanger temp.) < –5°C
- Heating
  (indoor unit heat exchanger temp. – room temp.) < –5°C

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.111

Check No.06
Refer to P.112

Check No.11
Refer to P.115

4.14 Discharge Pipe Temperature Control

Remote Controller Display

F3

Method of Malfunction Detection

The discharge pipe temperature control (stop, frequency drooping, etc.) is checked with the temperature being detected by the discharge pipe thermistor.

Malfunction Decision Conditions

- If a stop takes place 4 times successively due to abnormal discharge pipe temperature, the system will be shut down.
- If the temperature being detected by the discharge pipe thermistor rises above Ⓐ °C, the compressor will stop. (The error is cleared when the temperature has dropped below Ⓑ °C.)

Stop temperatures	Ⓐ	Ⓑ
(1) above 45Hz (rising), above 40Hz (dropping)	110	97
(2) 30~45Hz (rising), 25~40Hz (dropping)	105	92
(3) below 30Hz (rising), below 25Hz (dropping)	99	86

- 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

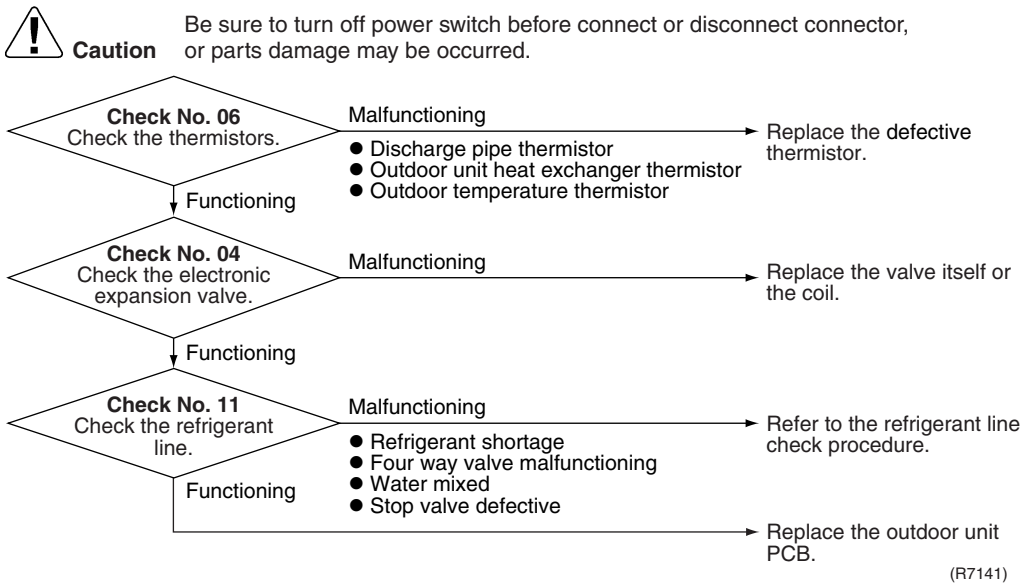
- Refrigerant shortage
- Four way valve malfunctioning
- Discharge pipe thermistor defective
  (heat exchanger or outdoor air temperature thermistor defective)
- Outdoor unit PCB defective
- Water mixed in the local piping
- Electronic expansion valve defective
- Stop valve defective

Troubleshooting

Check No.04
Refer to P.110

Check No.06
Refer to P.112

Check No.11
Refer to P.115



4.15 High Pressure Control in Cooling

Remote Controller Display

F6

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 61°C. (The error is cleared when the temperature drops below 52°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

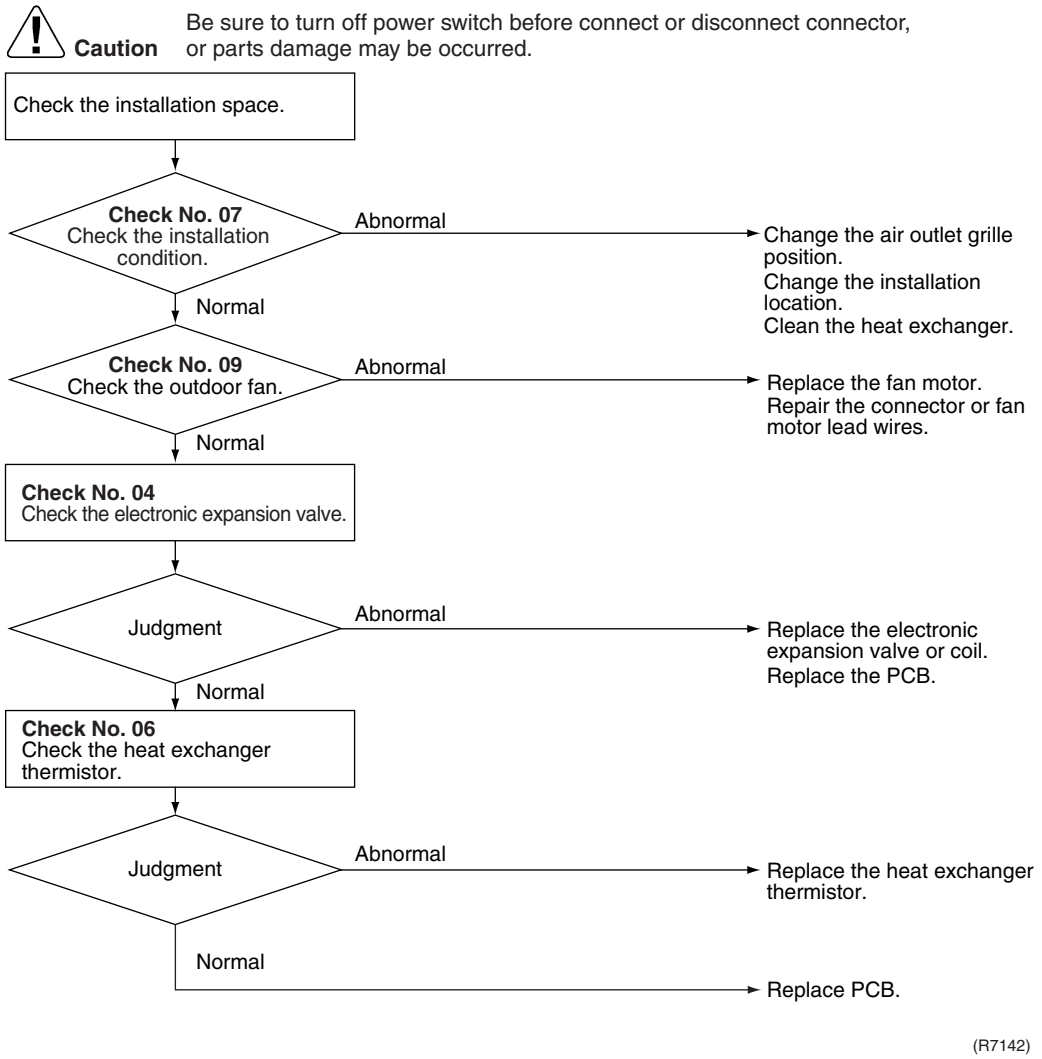
Troubleshooting

Check No.04
Refer to P.110

Check No.06
Refer to P.112

Check No.07
Refer to P.113

Check No.09
Refer to P.114



(R7142)

4.16 Compressor System Sensor Abnormality

Remote Controller Display

H07

Method of Malfunction Detection

- The system checks the DC current before the compressor starts.

Malfunction Decision Conditions

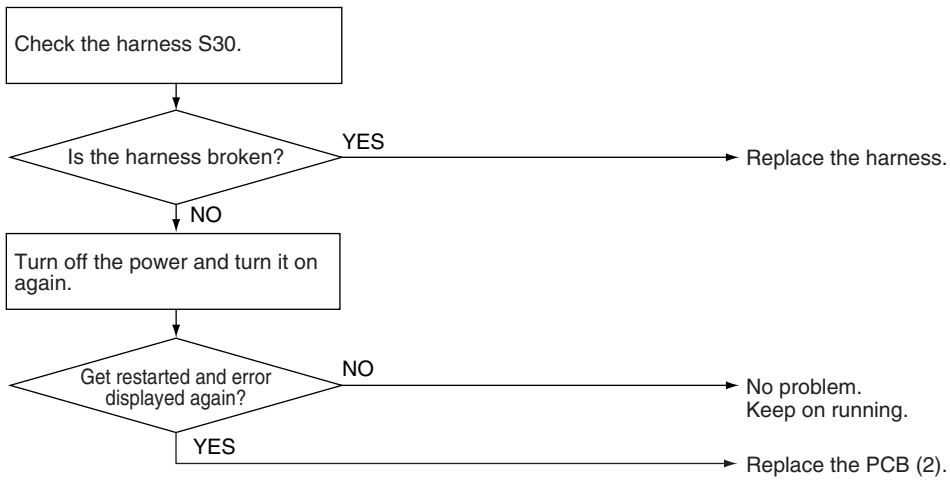
- If the DC current before compressor start-up is out of the range 0.5-4.5 V (sensor output converted to voltage value) or if the DC voltage before compressor start-up is below 50 V.

Supposed Causes

- PCB defective
- Broken or poorly connected harness

Troubleshooting

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



(R7348)

4.17 Position Sensor Abnormality

Remote Controller Display

H6

Method of Malfunction Detection

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

Malfunction Decision Conditions

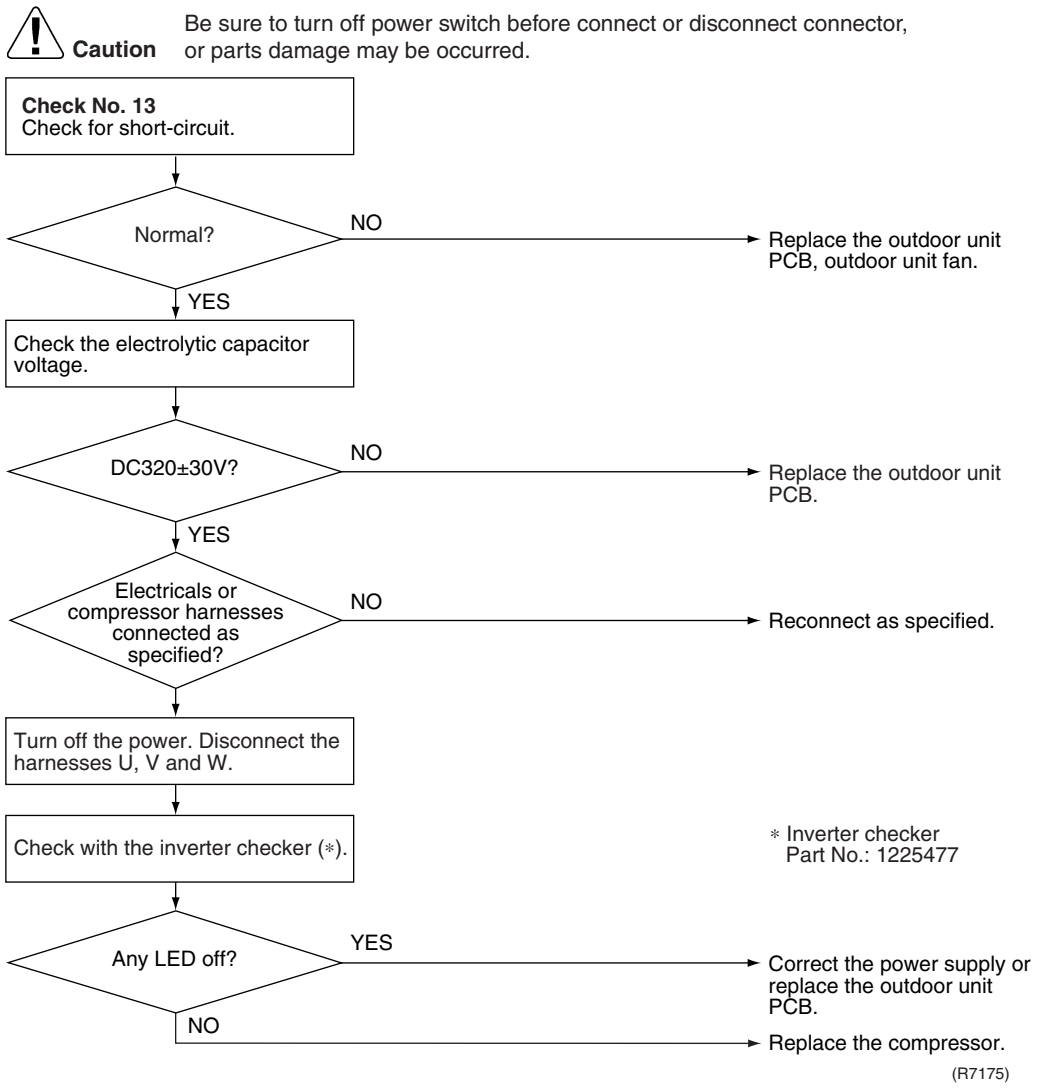
- The compressor fails to start in about 15 seconds after the compressor run command signal is sent.
- Clearing condition: Continuous run for about 10 minutes (normal)
- The system will be shut down if the error occurs 16 times.

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.115



4.18 DC Voltage / Current Sensor Abnormality

Remote Controller Display

H8

Method of Malfunction Detection

Detecting abnormality of the DC sensor by the running frequency of compressor and by the input current multiplied DC voltage and current.

Malfunction Decision Conditions

The compressor running frequency is below 52 Hz.
(The input current is also below 0.1 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

- Outdoor unit PCB defective

Troubleshooting

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

Replace the outdoor unit PCB.

4.19 Thermistor or Related Abnormality (Outdoor Unit)

Remote Controller Display

P4, J3, J6, H9

Method of Malfunction Detection

This type of error is detected by checking the thermistor input voltage to the microcomputer.
[A thermistor error is detected by checking the temperature.]

Malfunction Decision Conditions

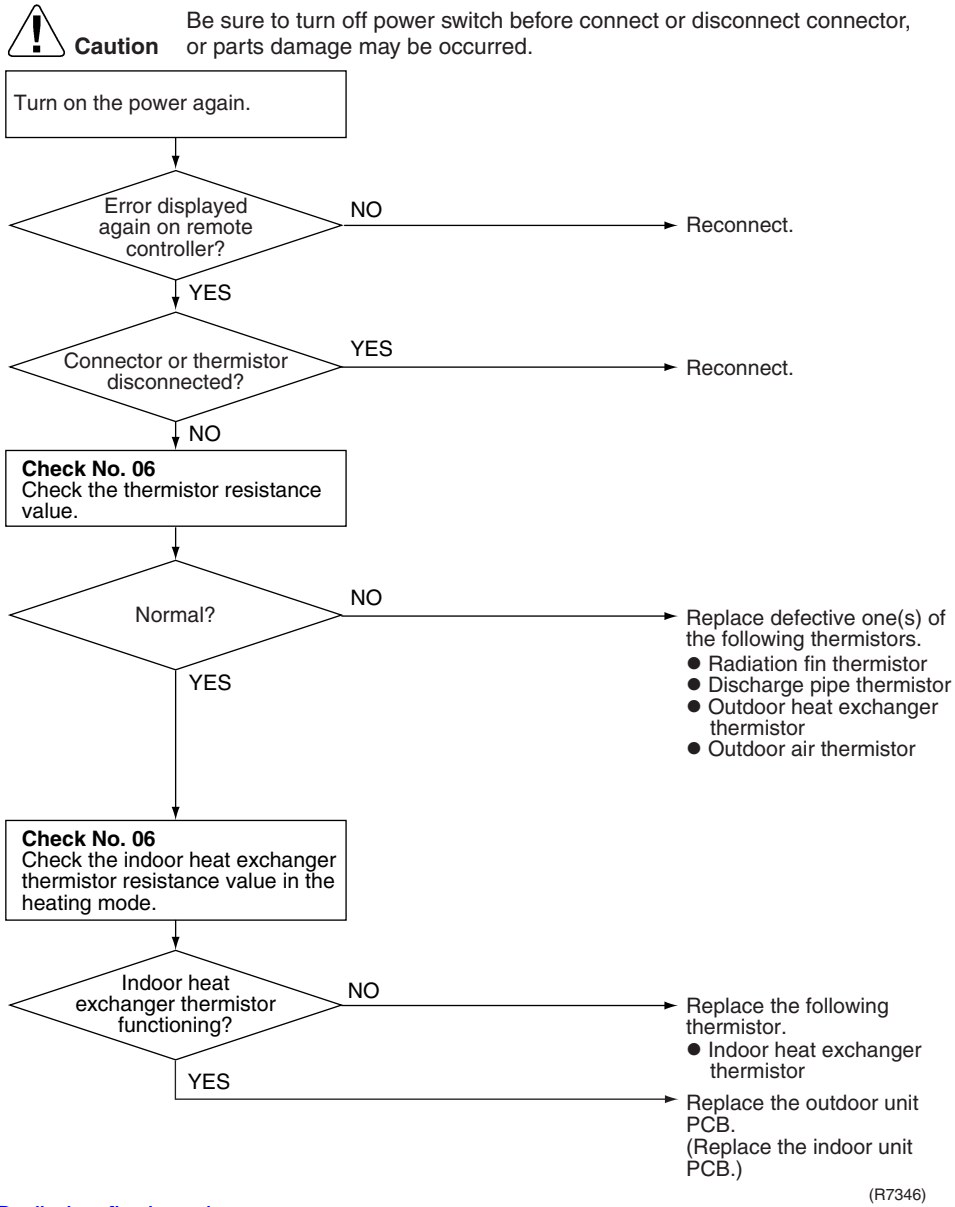
The thermistor input is above 4.96 V or below 0.04 V with the power on.
Error J3 is judged if the discharge pipe thermistor temperature is smaller than the condenser thermistor temperature.

Supposed Causes

- Connector in poor contact
- Thermistor defective
- Outdoor unit PCB defective
- Indoor unit PCB defective
- 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)

Troubleshooting

Check No.06
Refer to P.112



P4 : Radiation fin thermistor
J3 : Discharge pipe thermistor
J6 : Outdoor heat exchanger thermistor
H9 : Outdoor air temperature thermistor

4.20 Electrical Box Temperature Rise

Remote Controller Display

L3

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 93°C. Reset is made when the temperature drops below 70°C.

Supposed Causes

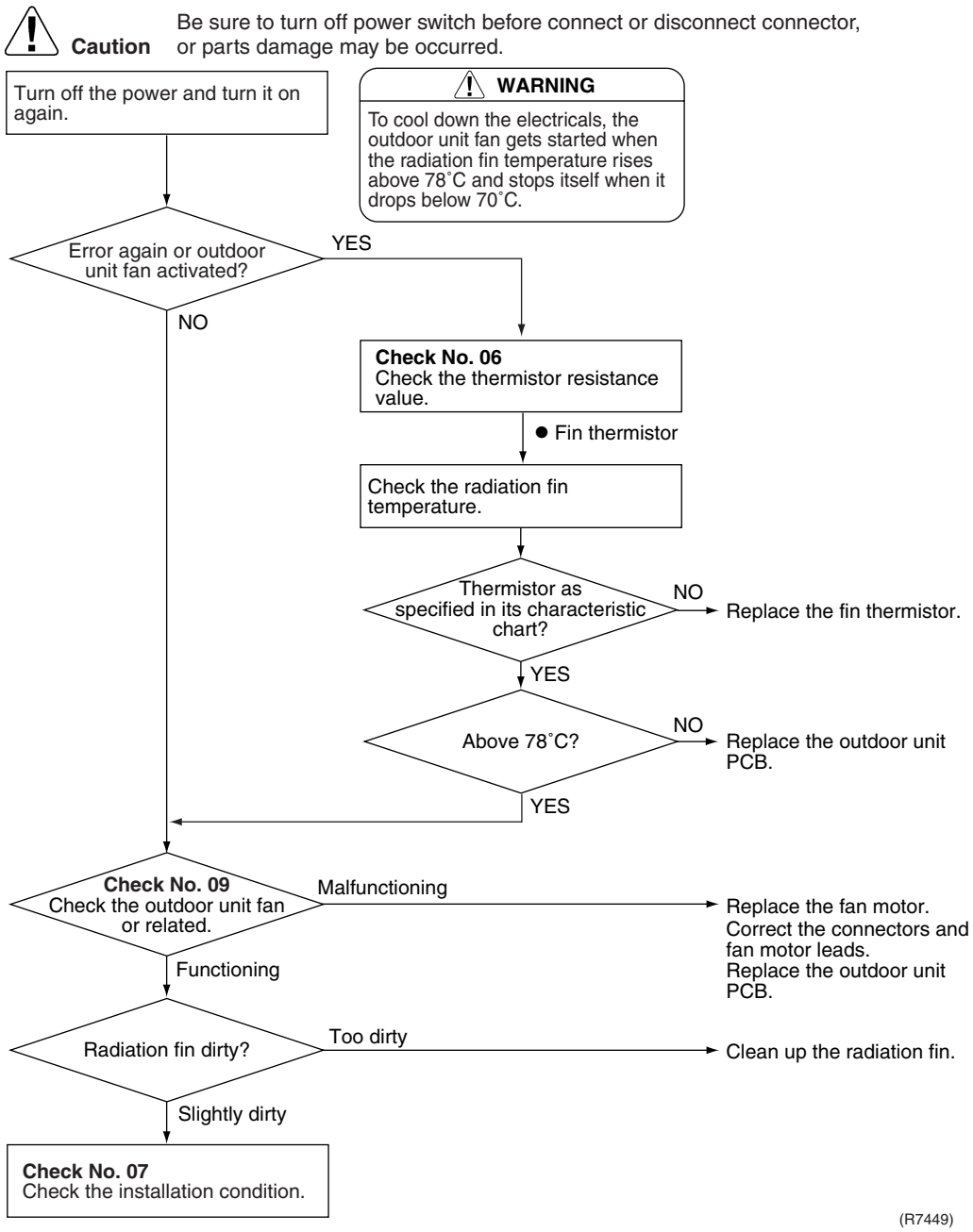
- Fin temperature rise due to defective outdoor unit fan
- Fin temperature rise due to short-circuit
- Fin thermistor defective
- Connector in poor contact
- Outdoor unit PCB defective

Troubleshooting

Check No.06
Refer to P.112

Check No.07
Refer to P.113

Check No.09
Refer to P.114



4.21 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 93°C.

- If a radiation fin temperature rise takes place 255 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
- Silicon grease is not applied properly on the heat radiation fin after replacing outdoor unit PCB

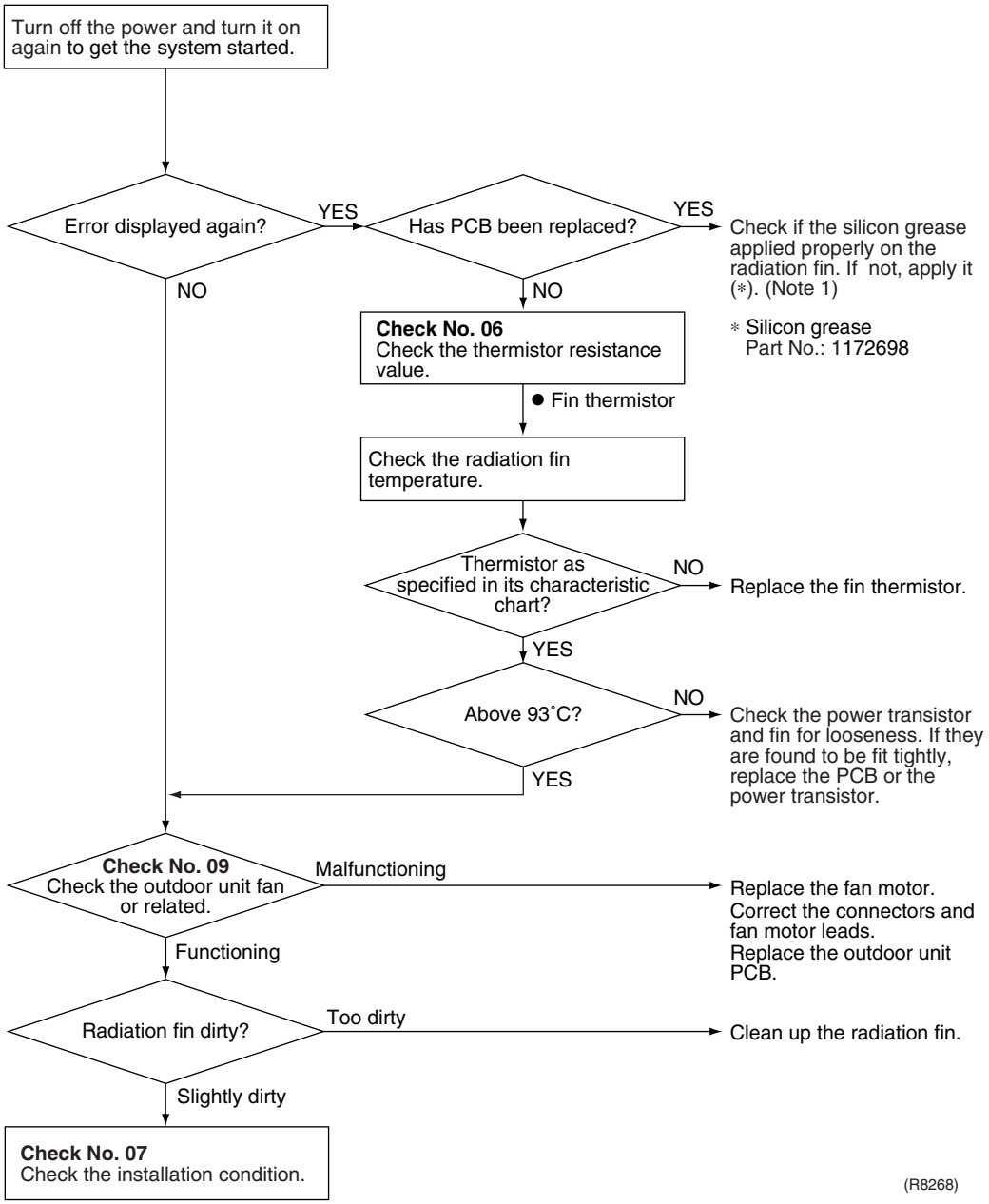
Troubleshooting

Check No.06
Refer to P.112

Check No.07
Refer to P.113

Check No.09
Refer to P.114

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



Note: Refer to “1.3 Application of Silicon grease to a power transistor and a diode bridge” on P160.

4.22 Output Over Current Detection

Remote Controller Display

L5

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 255 times.
- Clearing condition: Continuous run for about 10 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

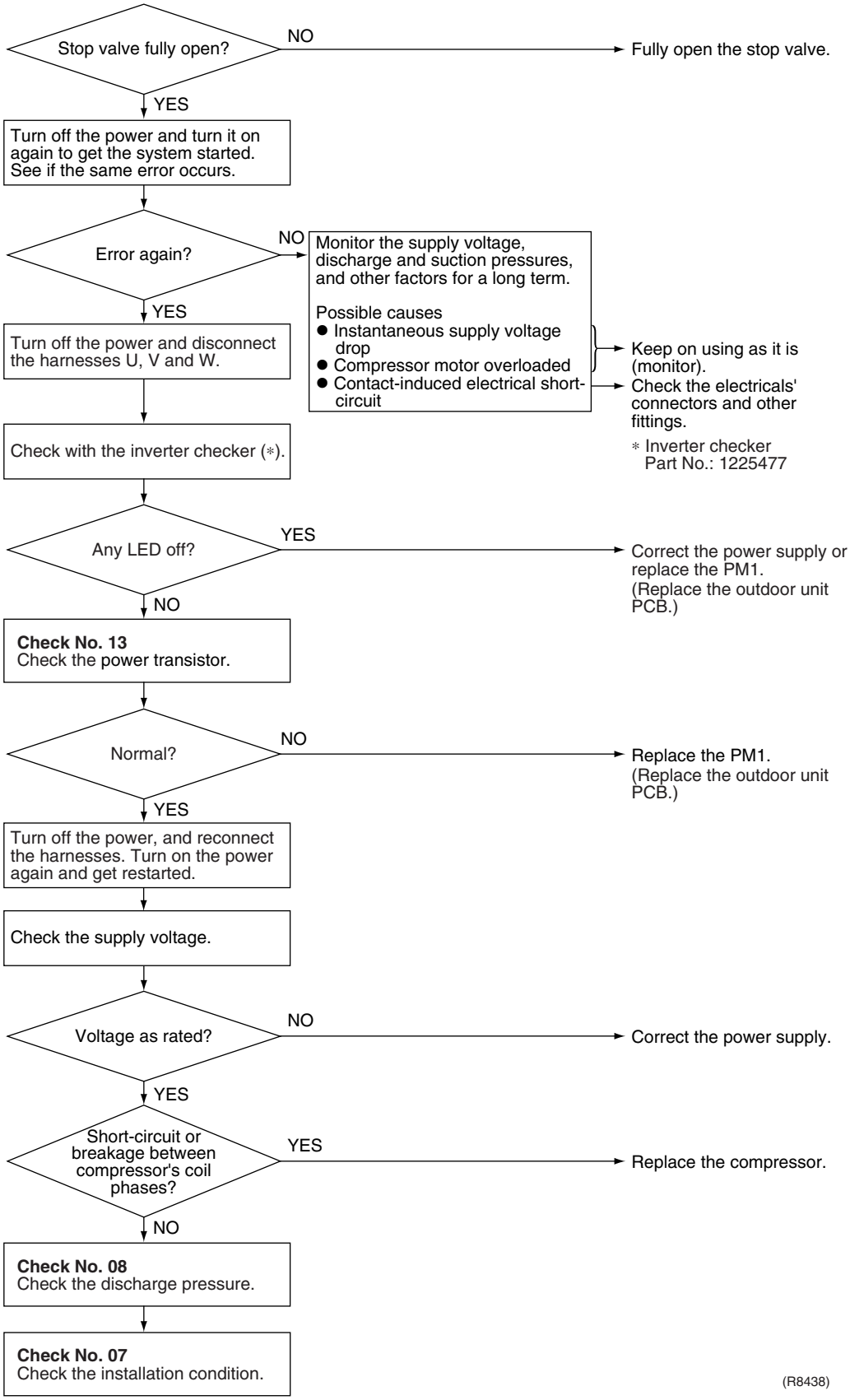
Check No.07
Refer to P.113

Check No.08
Refer to P.113

Check No.13
Refer to P.115

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.



4.23 Insufficient Gas

Remote Controller Display

U0

Method of Malfunction Detection

Gas shortage detection I :
A gas shortage is detected by checking the compressor running frequency.

Gas shortage detection II :
A gas shortage is detected by checking the difference between discharge pipe temperature and target temperature.

Malfunction Decision Conditions

Gas shortage detection I :
DC current × DC voltage < 𝔸 (A/Hz) × Compressor running frequency + 𝔹
However, when the status of running frequency > ℂ (Hz) is kept on for a certain time.
Note : The values are different from model to model.

	𝔸	𝔹	ℂ
20 / 25 class	828 / 256	–10	50
35 class	777 / 256	–15	50

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).

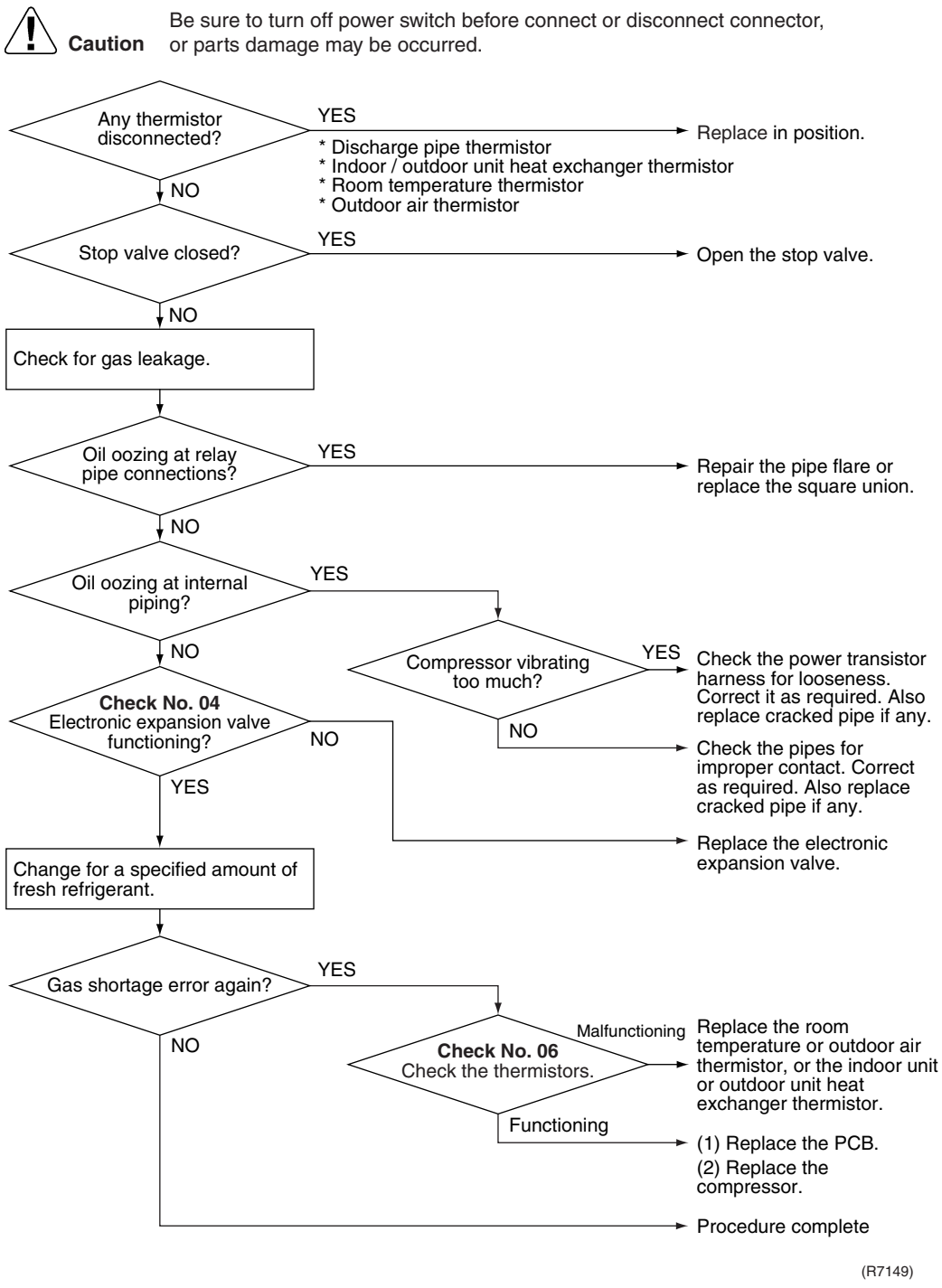
Supposed Causes

- 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 outdoor air temperature thermistor disconnected
- Stop valve closed
- Electronic expansion valve defective

Troubleshooting

Check No.04
Refer to P.110

Check No.06
Refer to P.112



4.24 Over-voltage Detection

Remote Controller Display

U2

Method of Malfunction Detection

An abnormal voltage rise is detected by checking the specified over-voltage detection circuit.

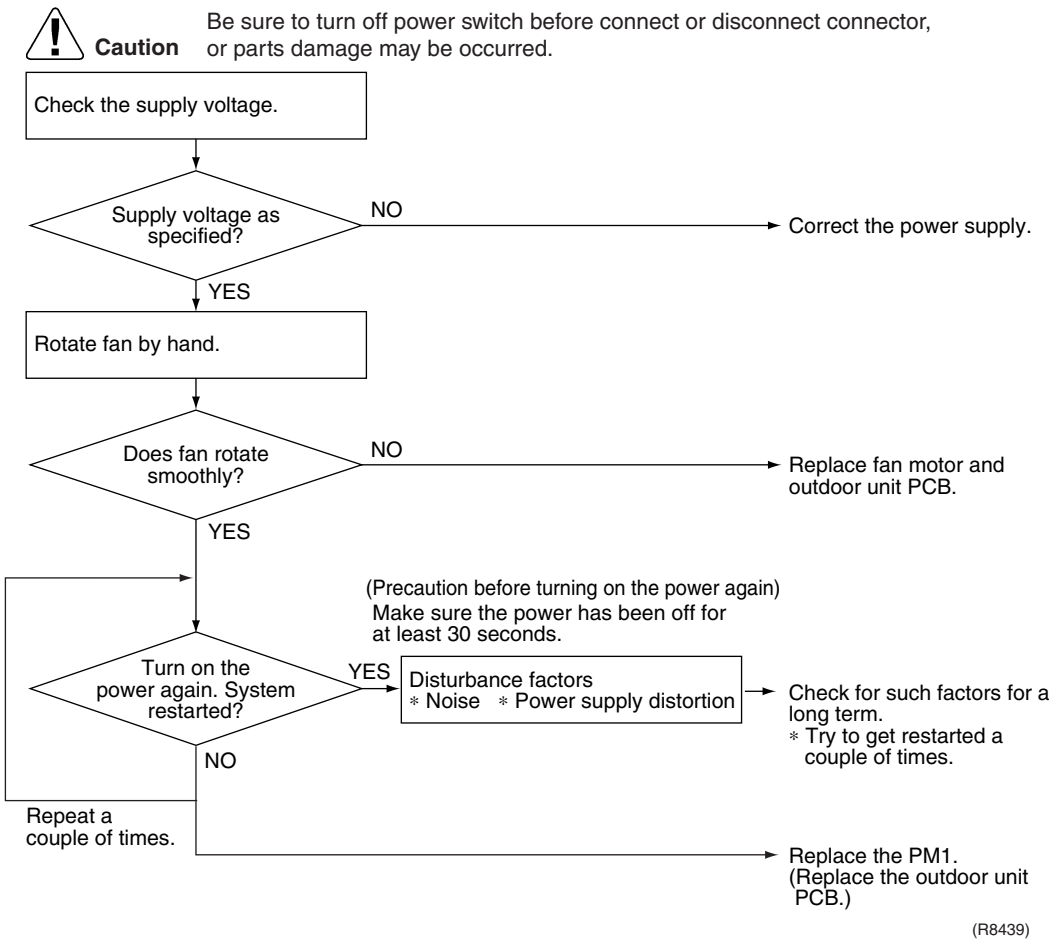
Malfunction Decision Conditions

- An over-voltage signal is fed from the over-voltage detection circuit to the microcomputer (The voltage is over 400V).
- The system will be shut down if the error occurs 255 times.
- Clearing condition: Continuous run for about 10 minutes (normal)

Supposed Causes

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

Troubleshooting



5. Check

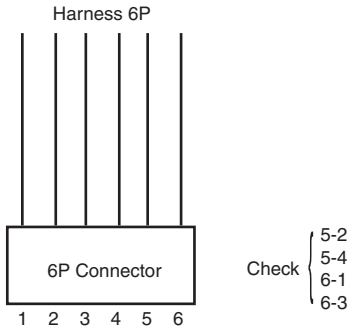
5.1 How to Check

5.1.1 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.



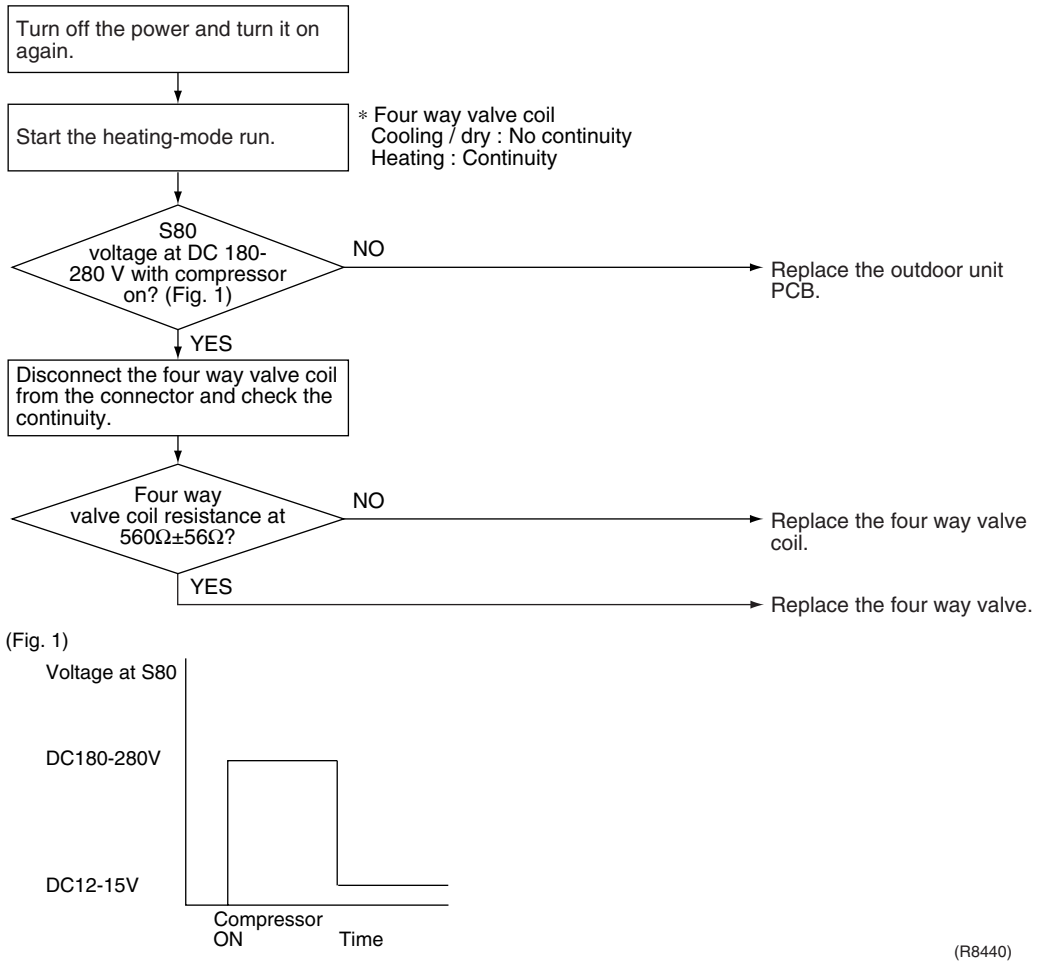
(R1082)

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.

5.1.2 Four Way Valve Performance Check

Check No.05



(Fig. 1)

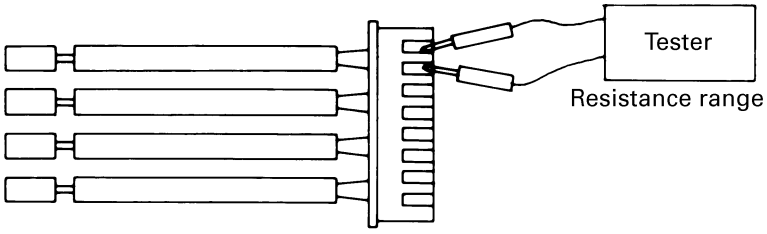
(R8440)

5.1.3 Thermistor Resistance Check

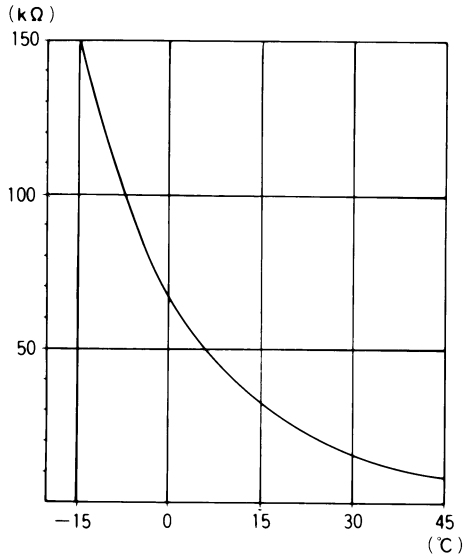
Check No.06

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.

Thermistor Temperature (°C)	R25°C=20kΩ B=3950
–20	197.8 (kΩ)
–15	148.2
–10	112.1
–5	85.6
0	65.93
5	51.14
10	39.99
15	31.52
20	25.02
25	20.00
30	16.10
35	13.04
40	10.62
45	8.707
50	7.176



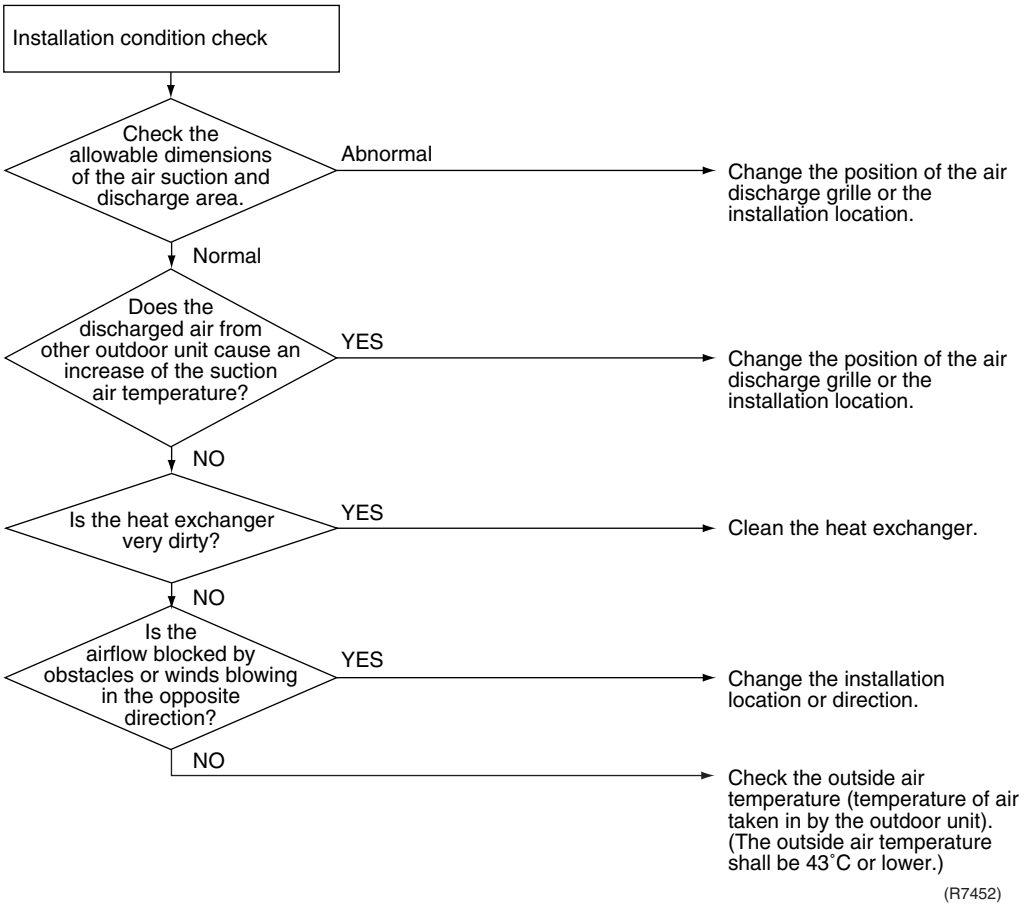
（R25＝20kΩ、B＝3950）



(R1437)

5.1.4 Installation Condition Check

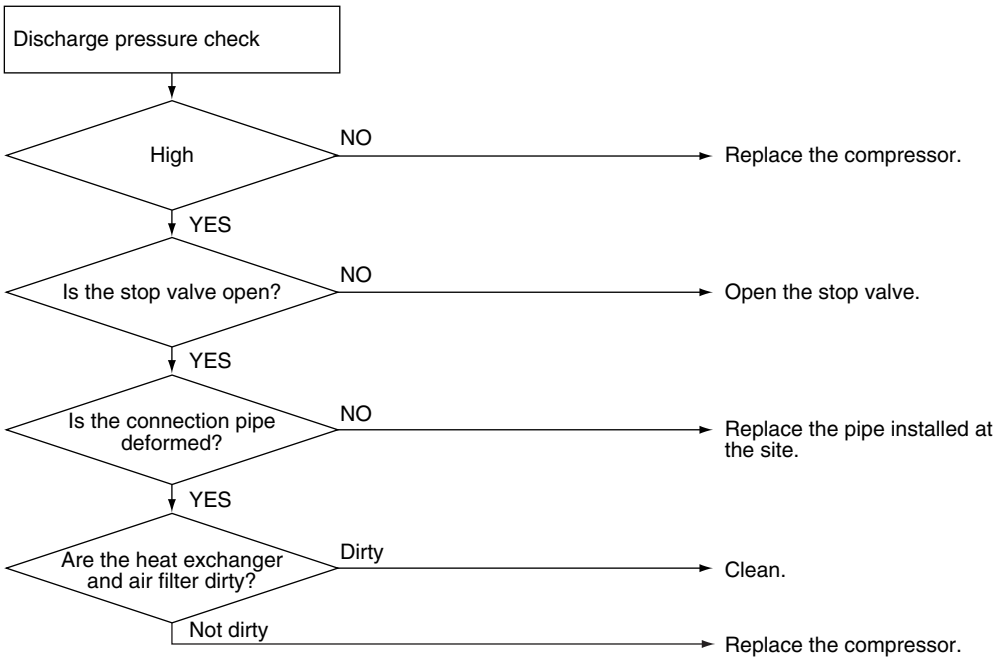
Check No.07



(R7452)

5.1.5 Discharge Pressure Check

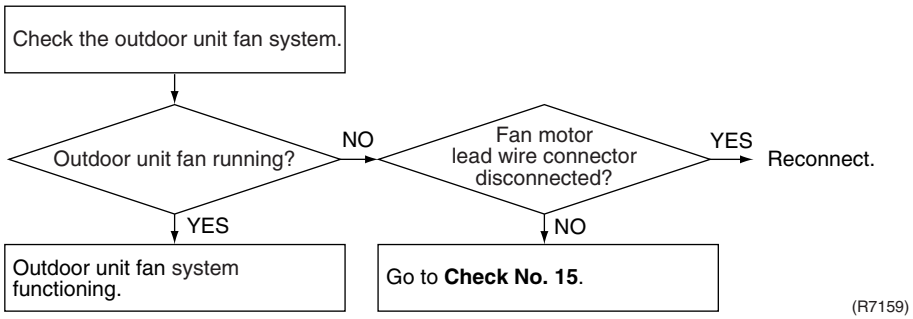
Check No.08



(R7158)

5.1.6 Outdoor Unit Fan System Check (With DC Motor)

Check No.09



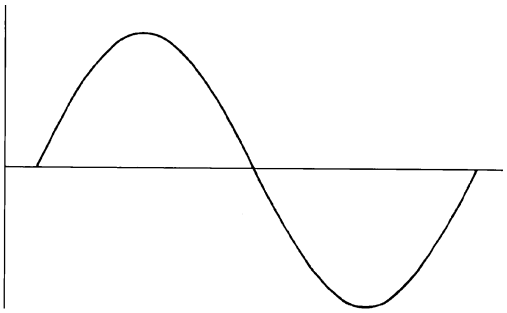
5.1.7 Power Supply Waveforms Check

Check No.10

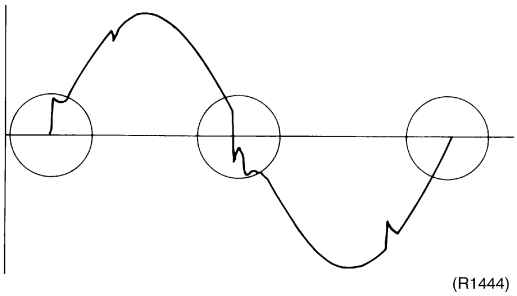
Measure the power supply waveform between pins 1 and 2 on the terminal board, and check the waveform disturbance.

- 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]

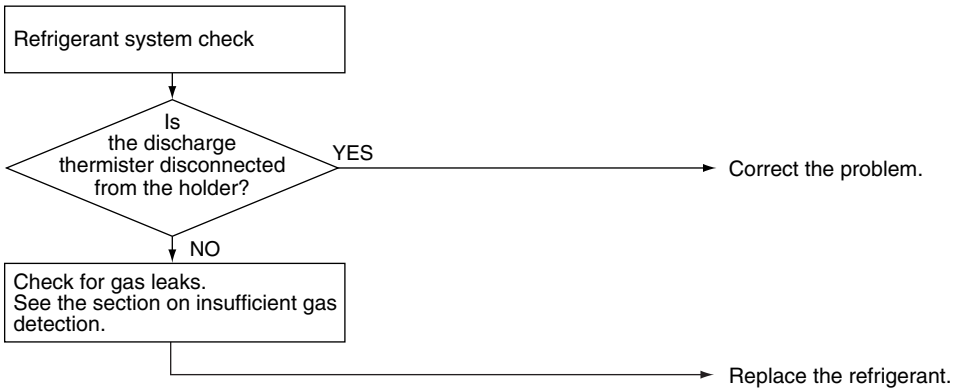


[Fig.2]



5.1.8 Inverter Units Refrigerant System Check

Check No.11



(R8270)

5.1.9 Power Transistor Check

Check No.13

Note: Check to make sure that the voltage between the terminal of Power transistor (+) and (-) is approx. 0 volt before checking power transistor.

< Measuring method >
Disconnect the compressor harness connector from the outdoor unit PCB. To disengage the connector, press the protrusion on the connector.
Then, follow the procedure below to measure resistance between power transistor (+) and (-) and the U, V and W terminals of the compressor connector with a multi-tester. Evaluate the measurement results for a pass/fail judgment.

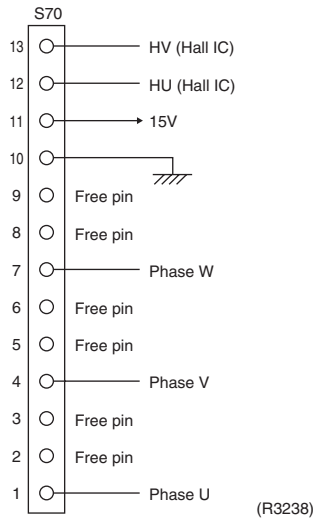
<Power transistor check>

Negative (-) terminal of tester (positive terminal (+) for digital tester)	Power transistor (+)	UVW	Power transistor (-)	UVW
Positive (+) terminal of tester (negative terminal (-) for digital tester)	UVW	Power transistor (+)	UVW	Power transistor (-)
Normal resistance	Several kΩ to several MΩ (*)			
Unacceptable resistance	Short (0 Ω) or open			

5.1.10 Turning Speed Pulse Input on the Outdoor Unit PCB Check

Check No.15

<Propeller fan motor>
(1) Make sure the control voltage of DC15V is being applied.
(2) Make a turn of the fan motor with hand, and make sure the pulse (0~15V) appears 4 times at pins 10 and 13.

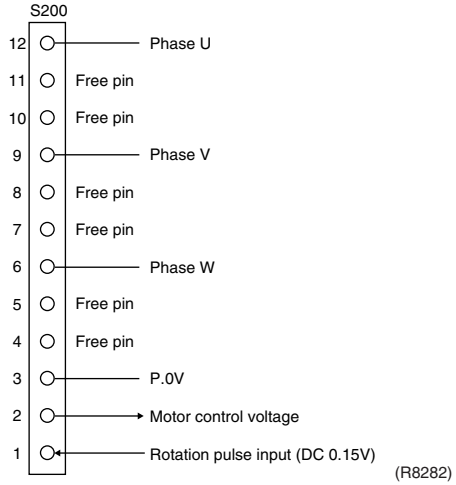


* Propeller fan motor : S70

5.1.11 Indoor PCB Output Check

Check No.18

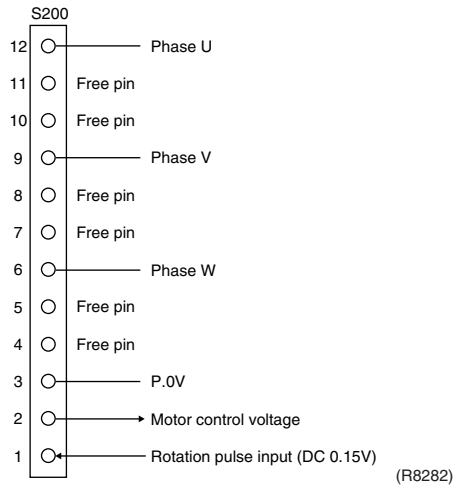
(1) Check the connector for connection.
(2) Check the motor power voltage is generated (between pins 2 and 3).



5.1.12 Turning Speed Pulse on the Indoor Unit PCB Check

Check No.19

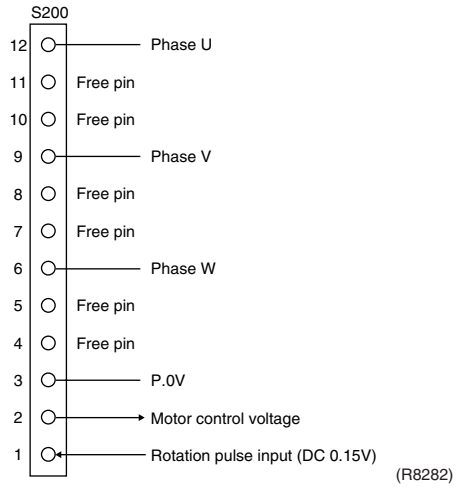
(1) Check the connector for connection.
(2) Turn the power on and stop the operation.
(3) Check if the rotation pulse is input 4 times when the fan motor is manually rotated once (between pins 1 and 3).



5.1.13 Fan Motor Wire/Short Circuit Check

Check No.20

(1) Check the connector for connection.
(2) Turn the power off.
(3) Check if each resistance at the phases U, V and W is between 10Ω and 20Ω (between pins 9 and 7, and between 7 and 5).



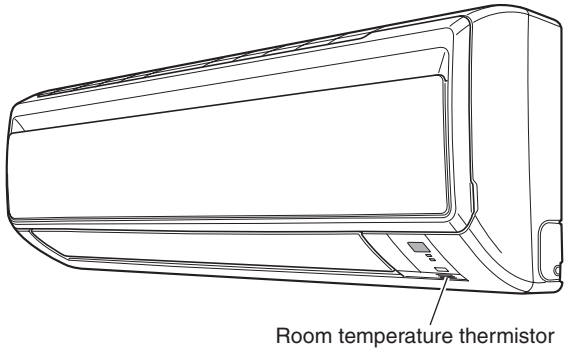
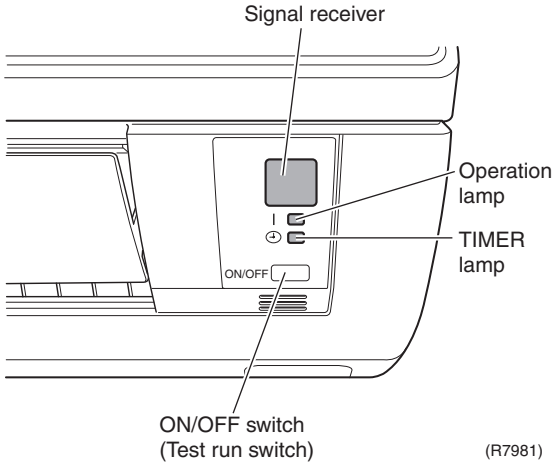
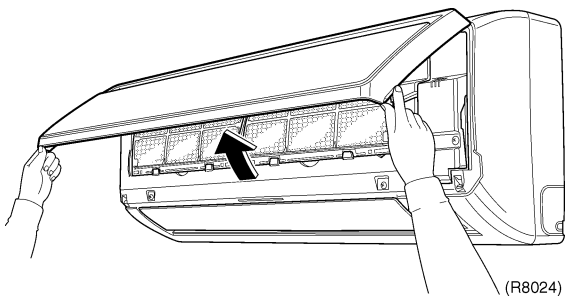
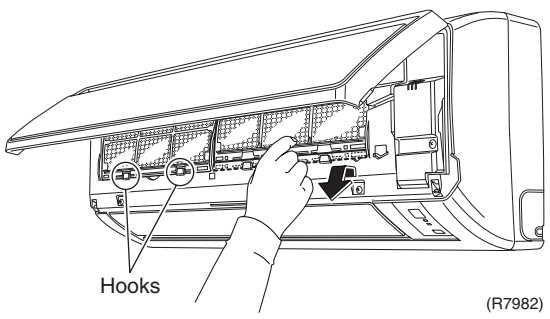
Part 7
Removal Procedure

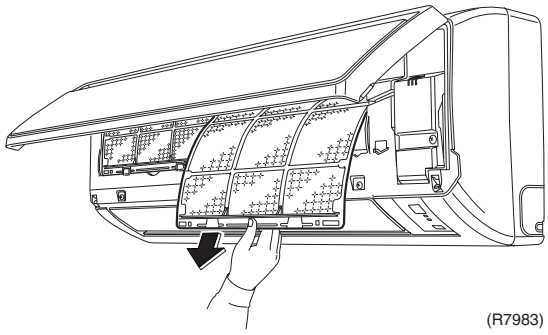
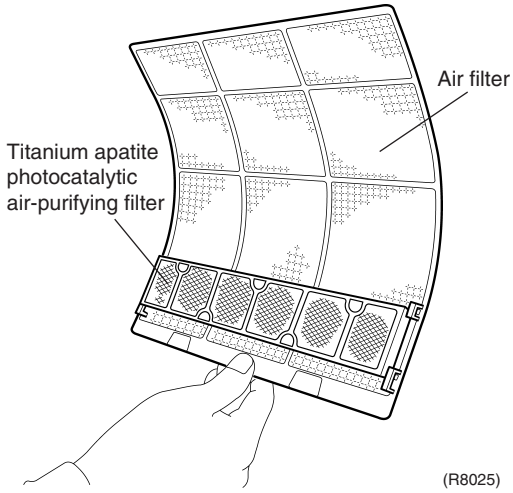
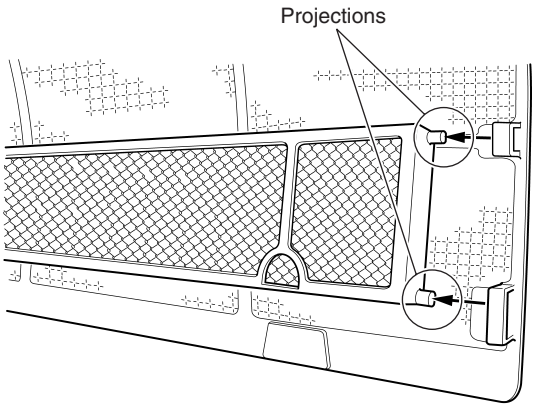
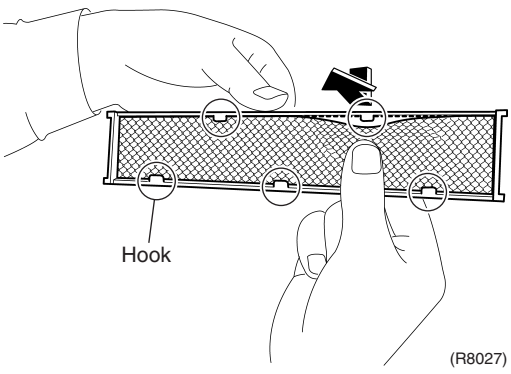
1. Indoor Unit

1.1 Removal of Air Filter

Procedure

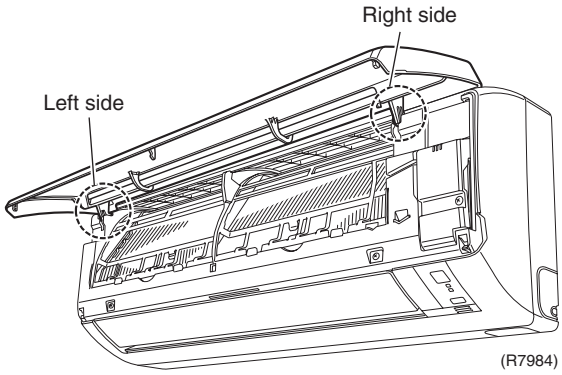
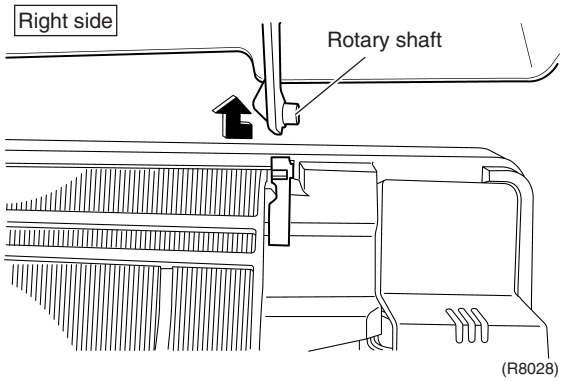
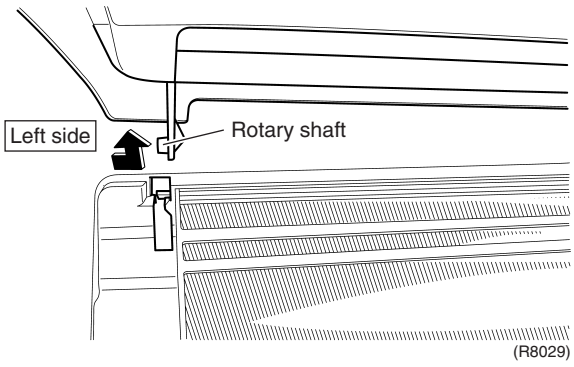
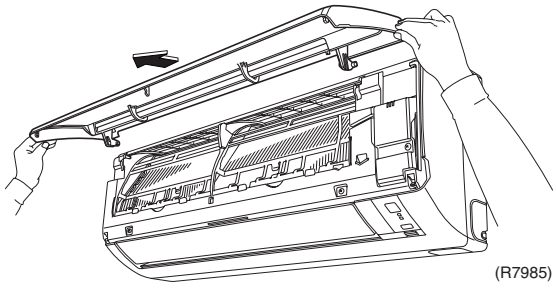
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure	Points
1. Appearance feature		**Warning** **Dangerous: High voltage** **A high voltage is applied to all the electric circuits of this product including thermistors.**
		■ When a signal from the remote controller is received, the receiving tone sounds and the operation lamp flickers immediately to confirm the signal reception. ■ When the ON/OFF switch is kept pressed for 5 seconds, the forced cooling operation is performed for about 15 minutes.
2. Removing the air filter		
1 Put your fingers on the right and left projections of the front panel, and open the panel to the position where it will stop.		
2 Slightly push up the knob at the center of the air filter.		■ The air filter is not marked for difference between the right and left sides. ■ The air filter can be set easily by inserting it along the guides. ■ Insert the air filter with the “FRONT”-marked face up. ■ Be sure to insert the hooks (at 2 lower positions) when mounting the air filter.

Step	Procedure		Points
3	Pull out the air filter downwards and remove it.	 (R7983)	
3. Removing the titanium apatite photocatalytic air-purifying filter			
1	The titanium apatite photocatalytic air-purifying filter is attached to the back of the air filter.	 (R8025)	
2	Remove the titanium apatite photocatalytic air-purifying filter frame by bending the air filter and unfastening the projections from the air filter frame.	 (R8026)	
3	Remove the titanium apatite photocatalytic air-purifying filter from its frame (at 5 positions) by bending it.	 (R8027)	■ To prevent the damage, do not remove the flame when cleaning the filter. ■ The shape of filter varies depending on the model. ■ The titanium apatite photocatalytic air-purifying filter is not marked for difference between the right and left sides.

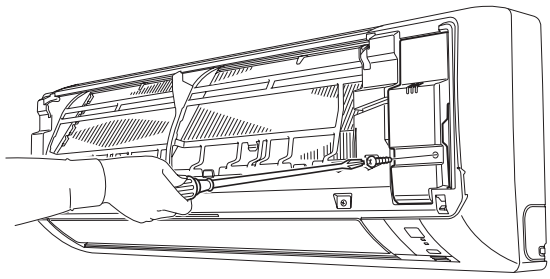
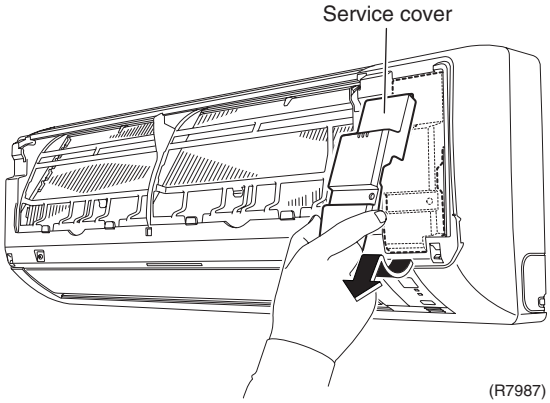
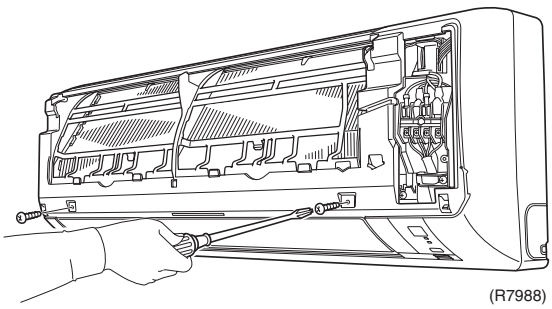
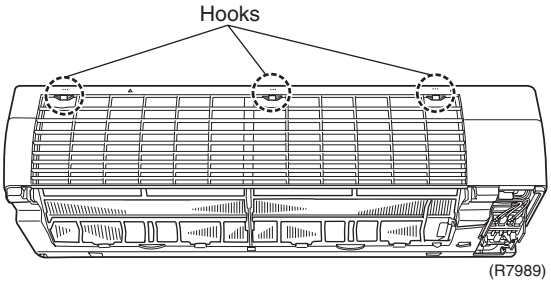
1.2 Removal of Front Panel

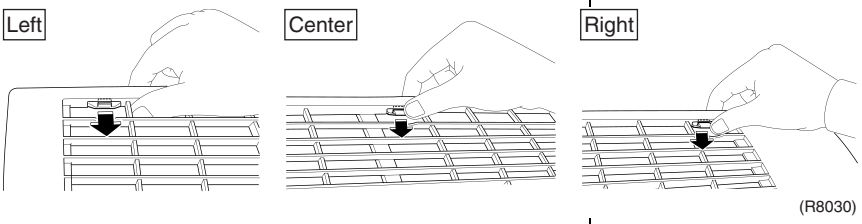
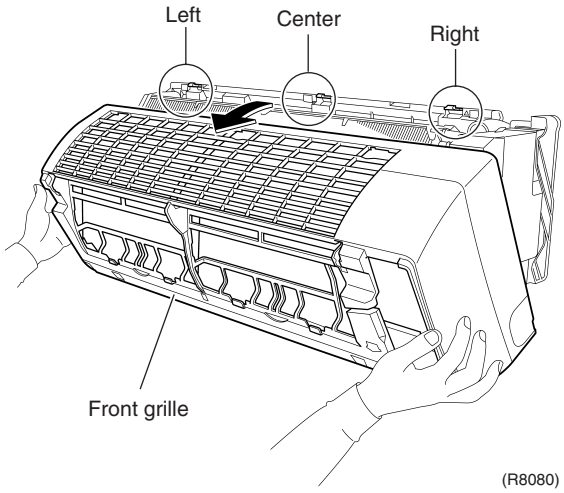
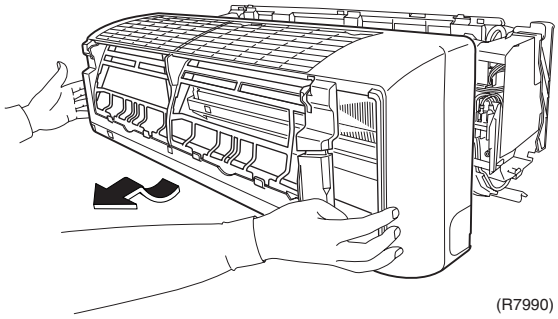
Procedure ⚠ **Warning** **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure		Points
1	Open the front panel over the position where it will stop.		**Preparation** ■ Remove the air filter according to the “Removal of Air Filter”.
2	Slide the right rotary shaft to the left and release it.		■ The rotary shaft on the each side can be removed easily by sliding each shaft inwards.
3	Slide the left rotary shaft to the right and release it.		
4	Remove the front panel.		**Caution on Mounting** ■ When mounting the front panel, fit the right and left rotary shafts one by one into the grooves and fully push them in position.

1.3 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
1. Removing the service cover			
1	Remove the screw of the service cover.	 (R7986)	**Preparation** ■ Remove the front panel according to the “Removal of Front Panel”. ■ No field setting switch is inside it. ■ You can remove the front grille without detaching the service cover.
2	Pull out the service cover diagonally down in the direction of the arrow.	 (R7987)	
2. Removing the front grille			
1	Remove the 2 screws, in the right and the left, which fix the main body with the front grille.	 (R7988)	
2	Undo the 3 hooks on the top of the front grille. The front grille has 3 hooks on the center and the both sides of the upper part.	 (R7989)	■ Refer to the removal procedure in a reverse way when reassembling.

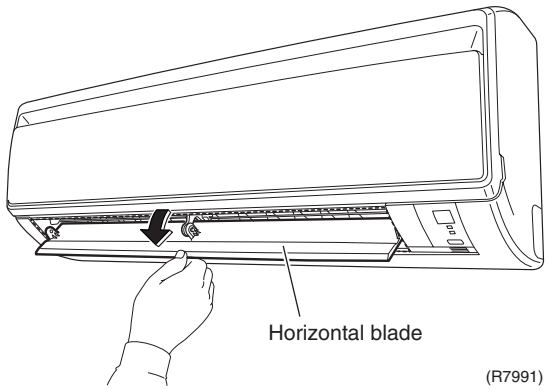
Step	Procedure		Points
3	Press each hook, and also lift the grille up to unfasten the hooks.		
4	Pull the upper part of the front grille towards yourself.		
5	Lift the lower part up, and then remove the front grille.		**Caution on Mounting** ■ When mounting the front grille, make sure that the hooks are fastened as they were.

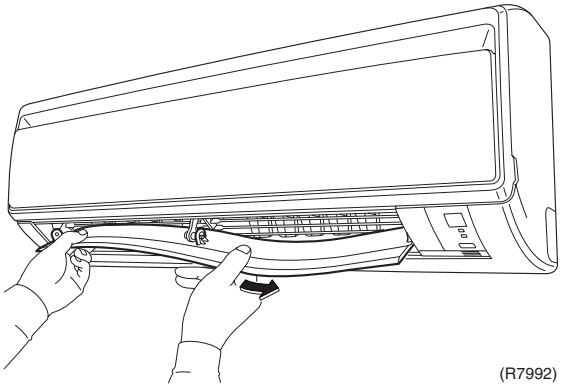
1.4 Removal of Horizontal Blades and Safety Net

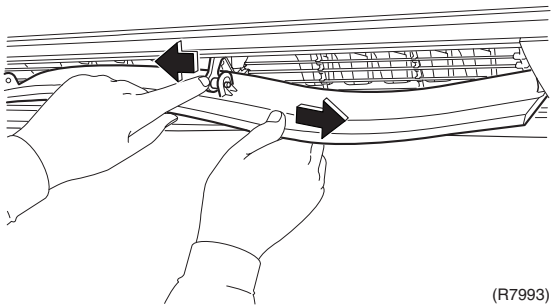
Procedure

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

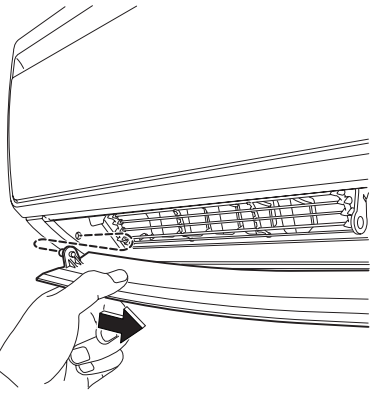
Step	Procedure	Points
1. Removing the horizontal blade (large)		
1	Open the horizontal blade.	
2	Unfasten the center fixing shaft while bending the horizontal blade slightly.	**Cautions on Mounting** ■ The center fixing shaft can be removed easily by bending the blade.
3	Unfasten the left fixing shaft of the horizontal blade.	**Cautions on Mounting** 1. Since key pattern hook is provided, rotate the blades and fit it to the right pivot first. 2. Fit the blades to the center and left pivots.
4	Unfasten the right fixing shaft of the horizontal blade.	



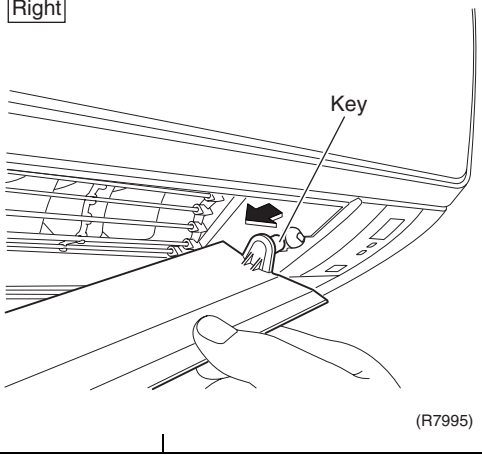


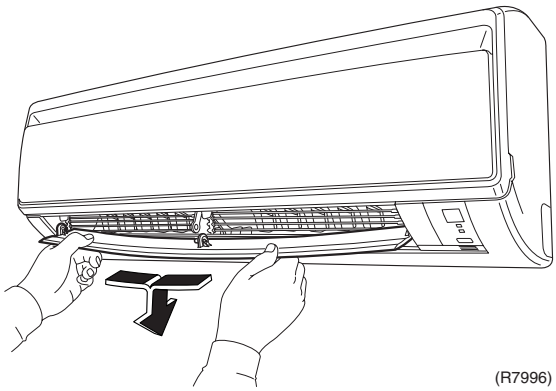
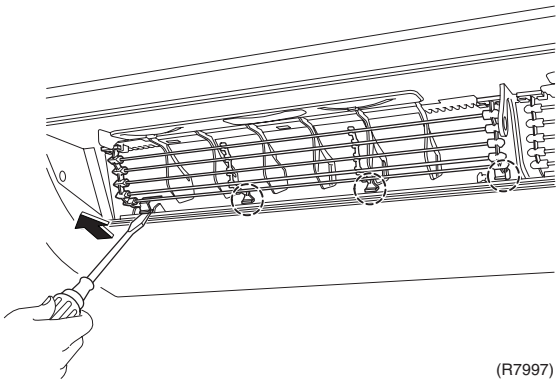
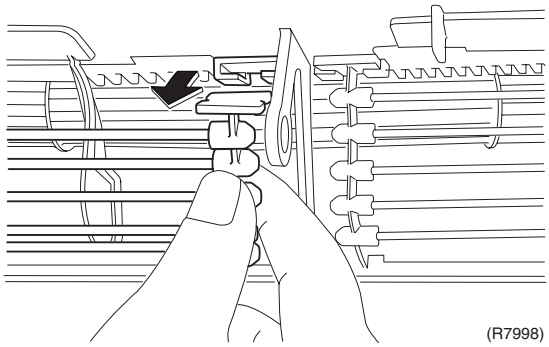
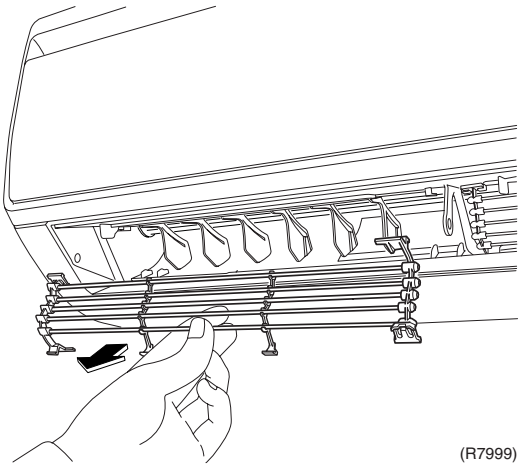


Left



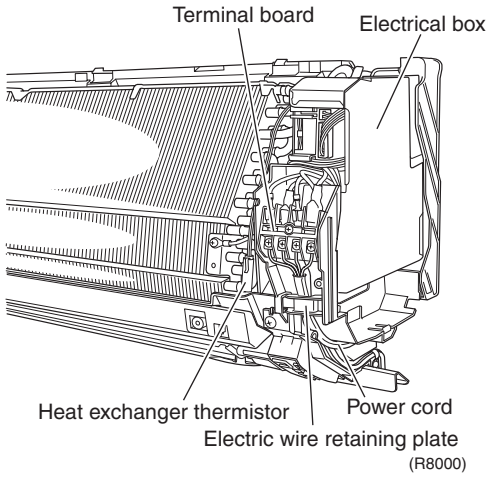
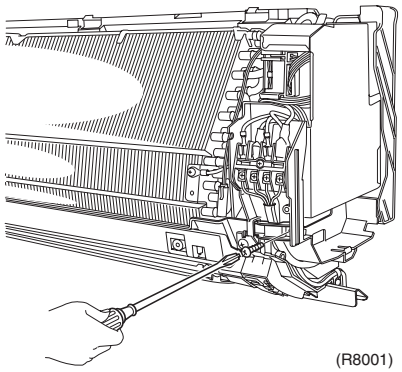
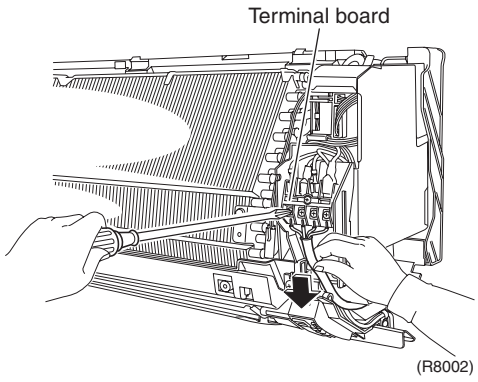
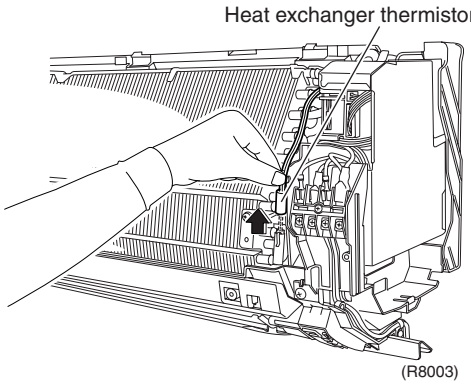
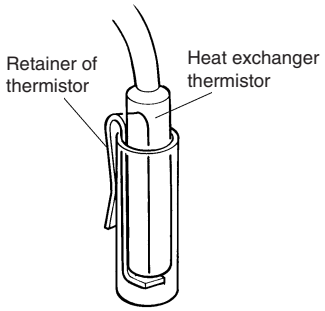
Right

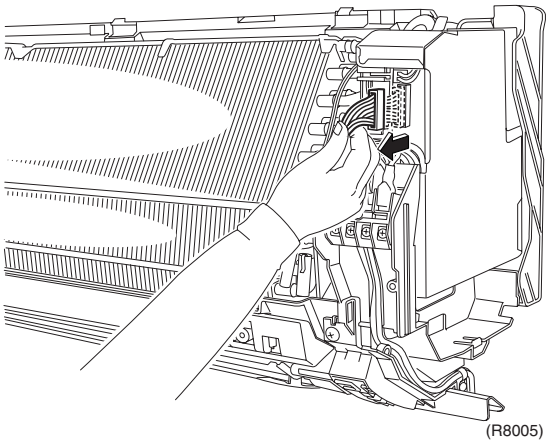
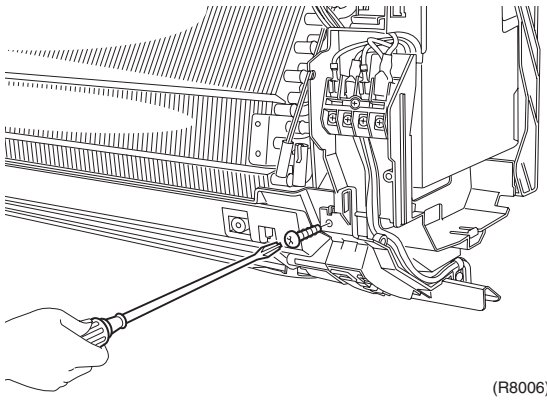
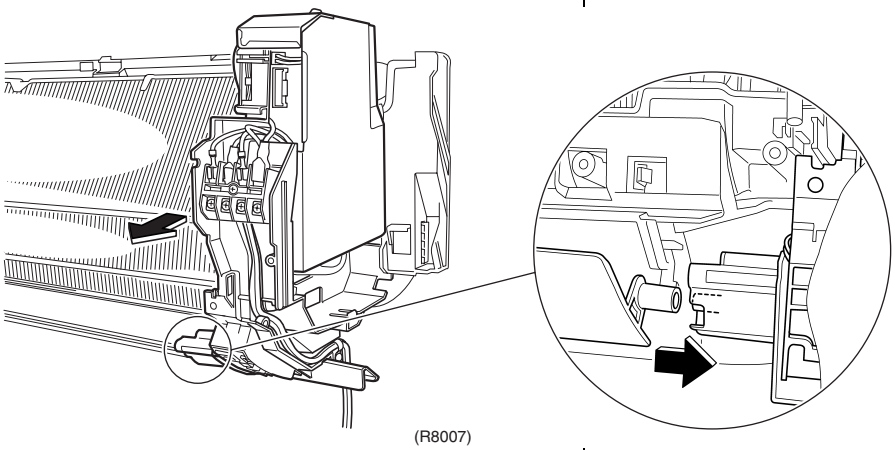
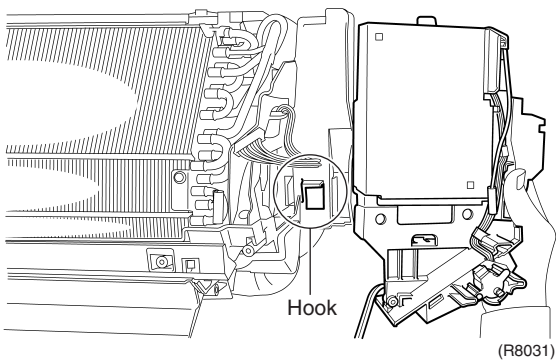


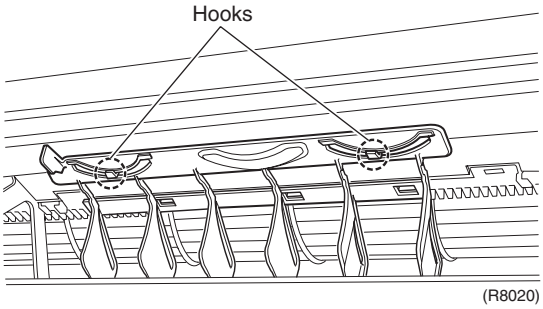
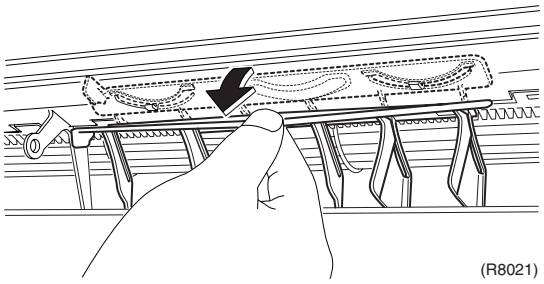
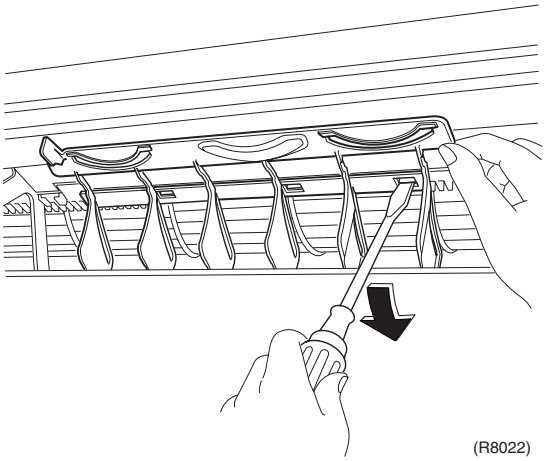
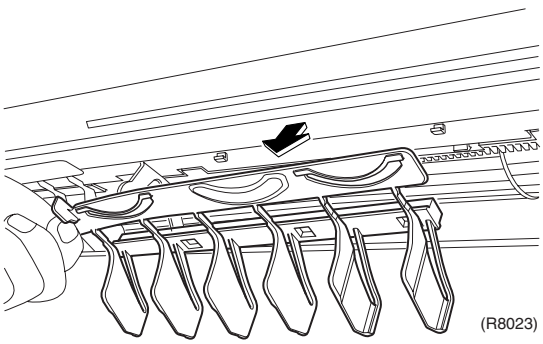
Step	Procedure		Points
5	Remove the horizontal blade.	 (R7996)	
2. Removing the safety net			
1	Unfasten the hooks at the lower part with a flat screwdriver.	 (R7997)	
2	Unfasten the hooks at the upper 2 positions.	 (R7998)	
3	Remove the safety net toward yourself.	 (R7999)	■ Repeat the same procedure to remove the safety net on the other side.

1.5 Removal of Electrical Box / Vertical Blade

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

Step	Procedure	Points
1. Disconnect the connecting wires		**Preparation** ■ Remove the front grille according to the “Removal of Front Grille”.
1 The figure shows the connections of wire harnesses.		
2 Remove the screw of the electric wire retaining plate.		■ The thermal fuse is a part of the terminal board.
3 Loosen the screws of the terminal board and disconnect the connecting wires.		■ (1) Black - Power Supply (2) White - Power Supply (3) Red - Signal
4 Pull out the heat exchanger thermistor.		■ Take care not to lose the retainer of thermistor. 

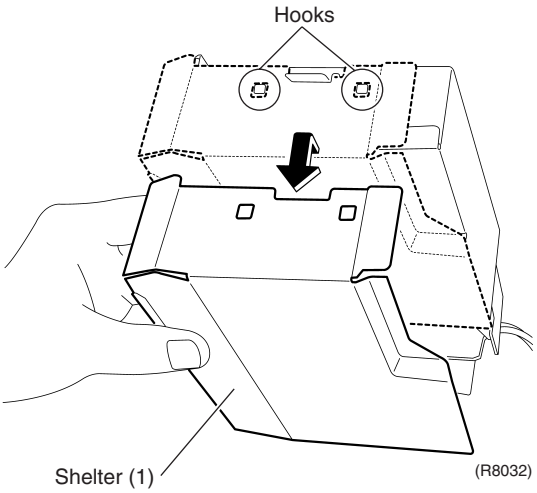
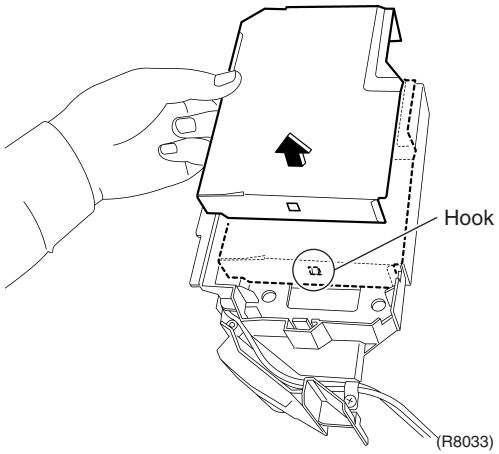
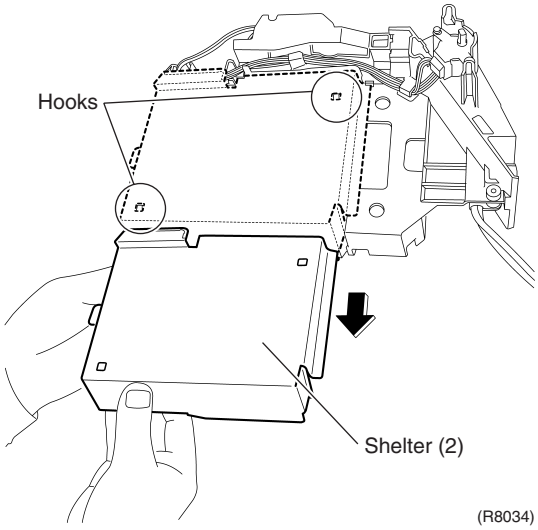
Step	Procedure	Points
2. Remove the electrical box.		
1	Disconnect the earth wire by removing the screw.	
2	Remove the connector of the fan motor [S200].	
	 (R8005)	
3	Remove the fixing screw of the electrical box.	
	 (R8006)	
4	Slide the electrical box to the right and remove the horizontal blade from the electrical box.	
5	Pull the electrical box towards yourself.	
	 (R8007)	
6	When mounting, join the position of the hook and the groove.	■ There are a groove and a hook on the rear side.
	 (R8031)	

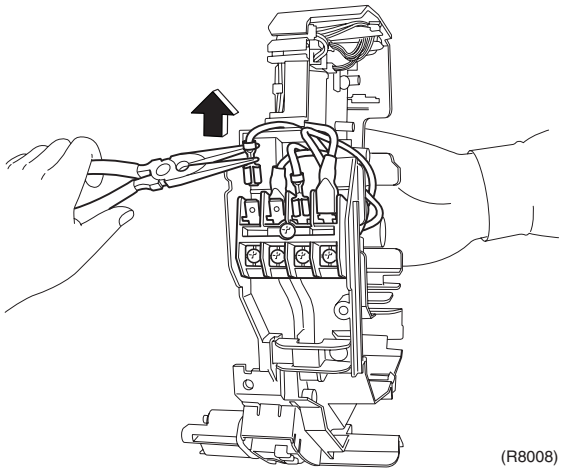
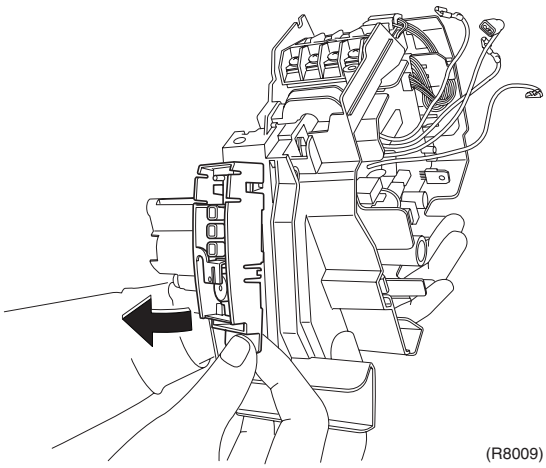
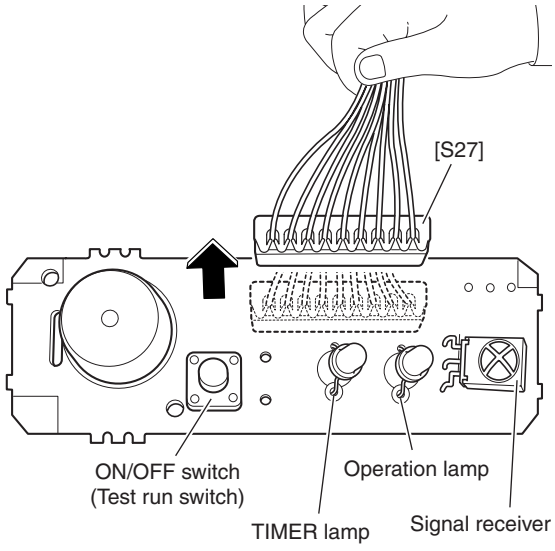
Step	Procedure	Points
3. Removing the vertical blade	 (R8020)	■ Six vertical blades are united as a set. (It is impossible to replace only one blade.) ■ The set of blades is not marked for difference between right and left.
1 Unfasten the hooks at the upper 2 positions.	 (R8021)	
2 Unfasten the 3 hooks at the shaft mounting part by pressing them with a flat screwdriver.	 (R8022)	
3 Remove the vertical blade toward yourself.	 (R8023)	■ Repeat the same procedure to remove the vertical blade on the other side.

1.6 Removal of PCB / Swing Motor

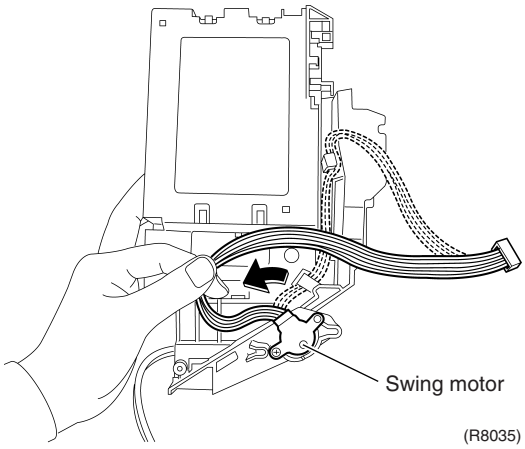
Procedure

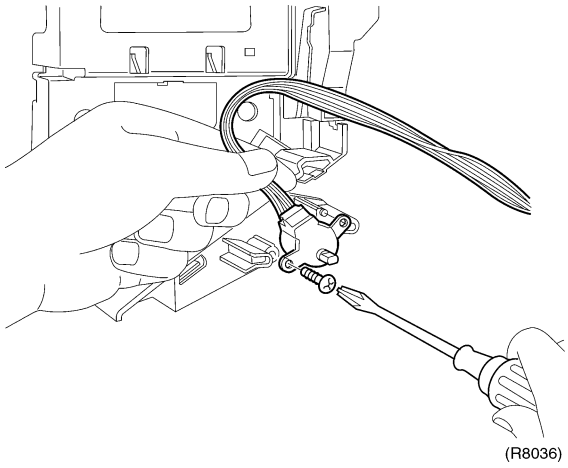
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

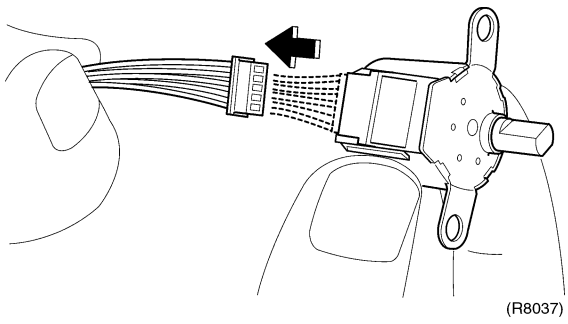
Step	Procedure		Points
1. Removing the shelter			**Preparation** ■ Remove the electrical box according to the “Removal of Electrical Box”.
1	To remove the shelter (1), unfasten the hooks at the upper 2 positions of the shelter.		
2	Unfasten the hook at the lower position, and remove the shelter (1).		
3	Lift the shelter (2) and unfasten the 2 hooks.		
4	Slide the shelter (2), and remove.		

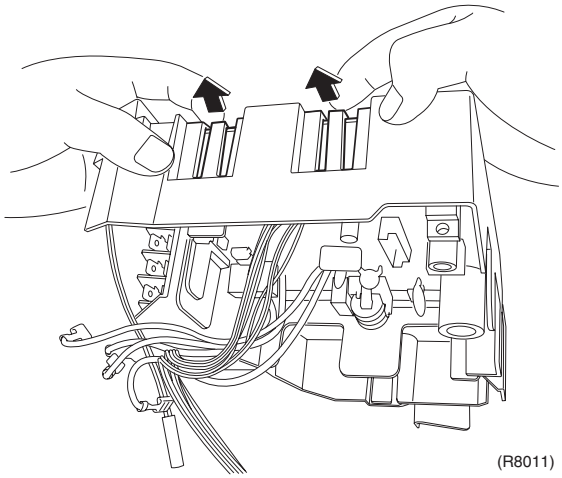
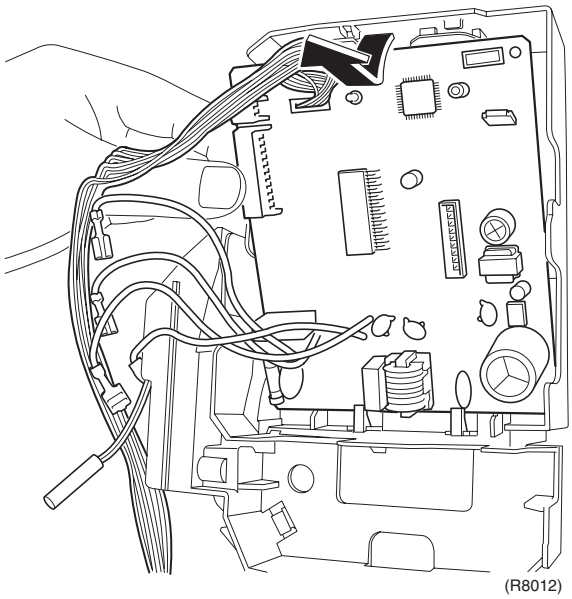
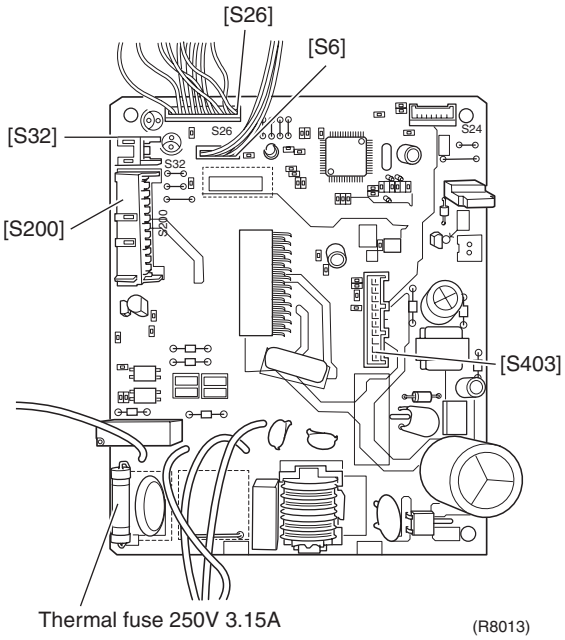
Step	Procedure		Points
5	Disconnect the wire harness with pliers.	 (R8008)	
2. Removing the display PCB		 (R8009)	**Preparation** ■ Remove the electrical box according to the “Removal of Electrical Box”.
1	Lift the lower part of the display PCB to remove.		
2	Disconnect the connector from the display PCB.		
3	The figure shows the names of the display PCB component parts.	 (R8010)	[S27] To control PCB

Step	Procedure	Points
3. Removing the swing motor		
1	Remove the screw of the swing motor.	
2	Disconnect the connector.	





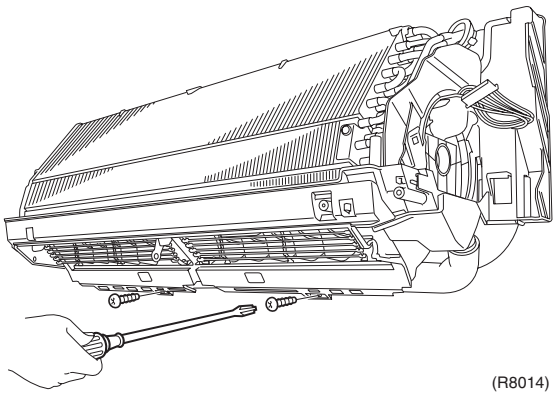
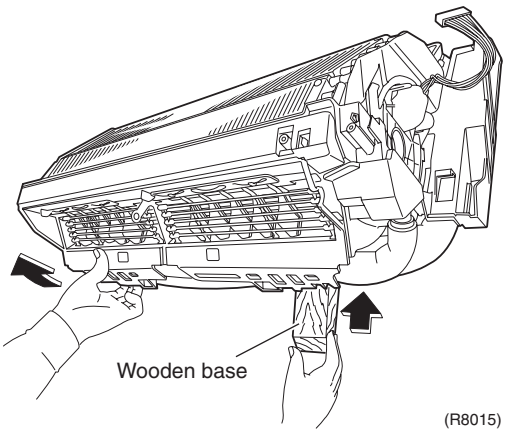
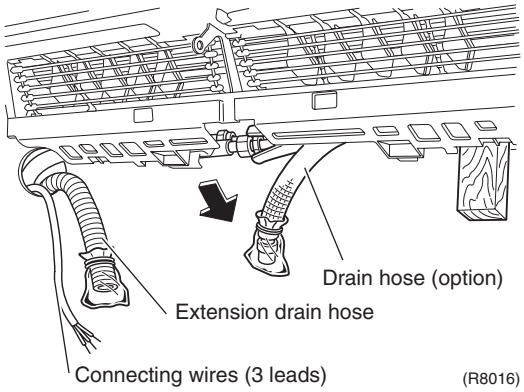
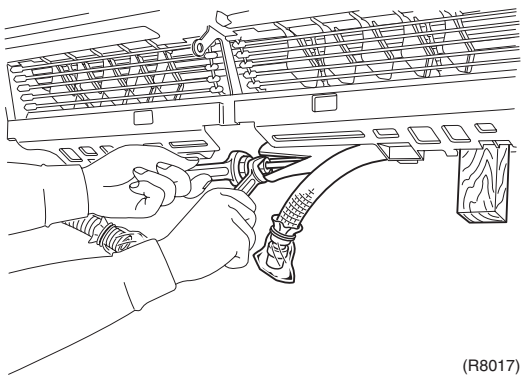


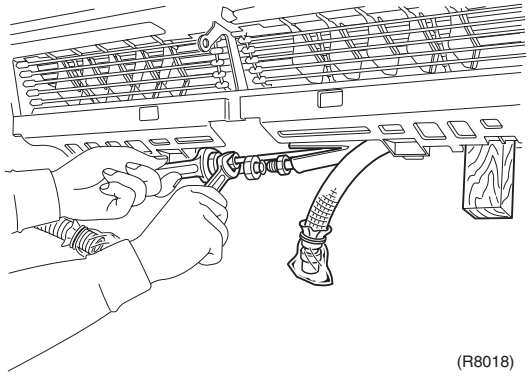
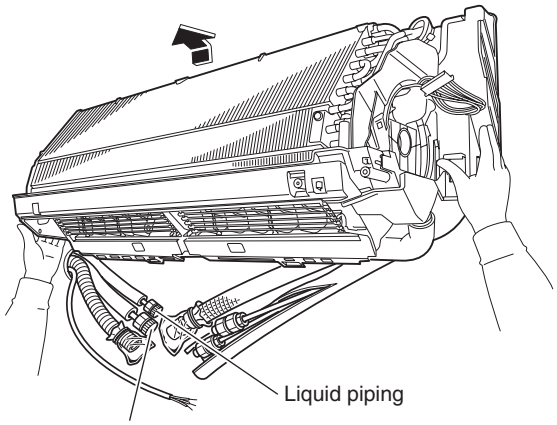
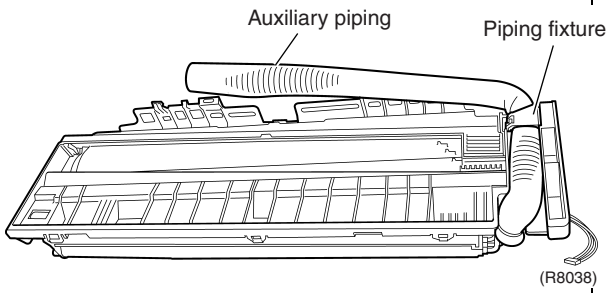
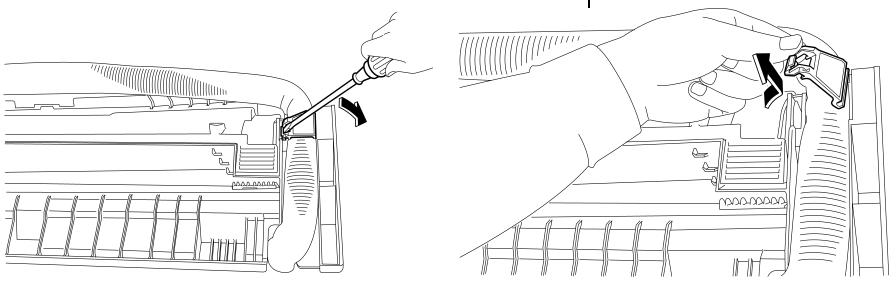
Step	Procedure		Points
3	To remove the control PCB, unfasten the 2 hooks at the upper part from the rear side.	 (R8011)	
4	Lift up the upper part of the control PCB, and remove.	 (R8012)	
5	The figures show the names of the control PCB component parts.	 (R8013)	[S6] To swing motor [S26] To display PCB [S32] To heat exchanger thermistor [S200]To fan motor [S403]HA connector (for optional accessory)

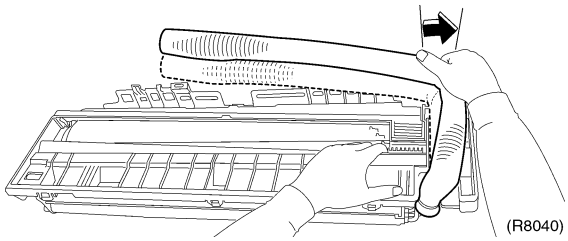
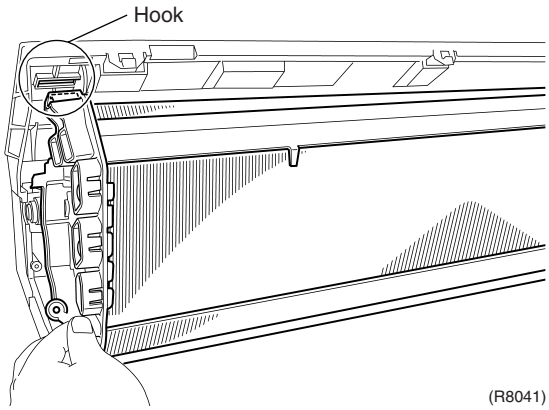
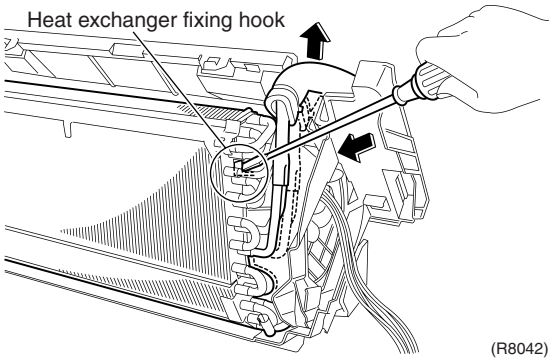
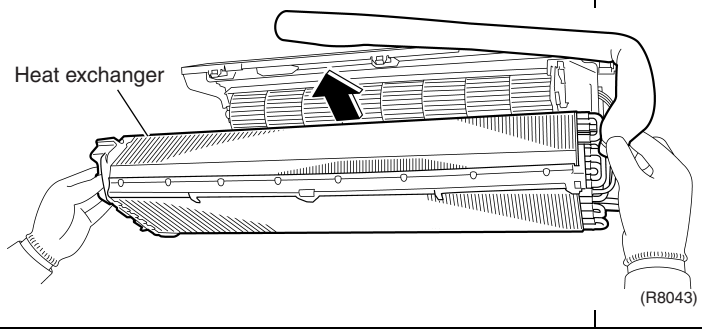
1.7 Removal of Heat Exchanger

Procedure

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

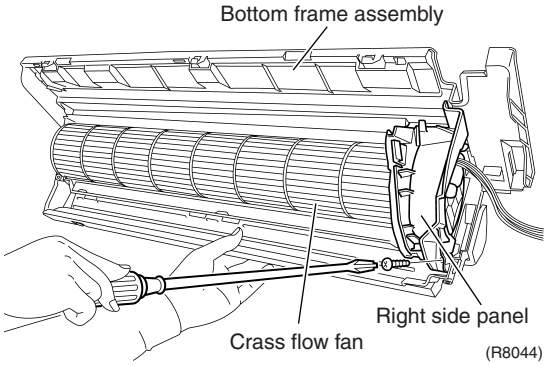
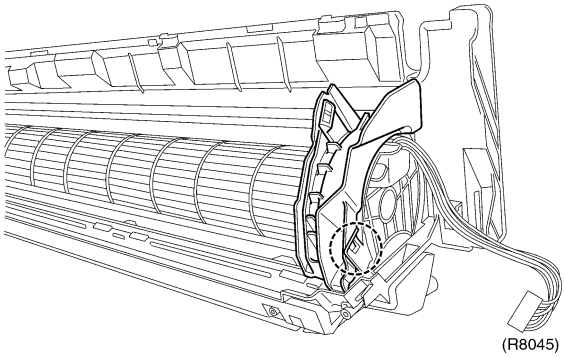
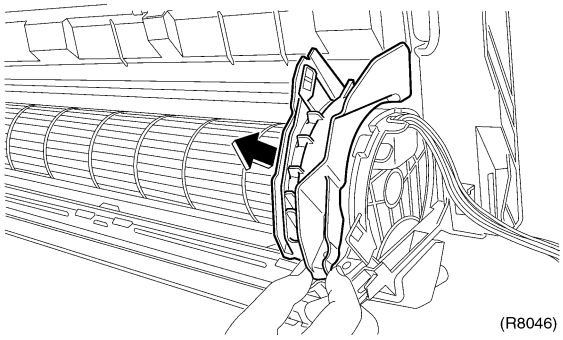
Step	Procedure		Points
1. Disconnecting the refrigerant pipe			**Preparation** ■ Remove the electrical box according to the “Removal of Electrical Box”.
1	Remove the screws which fix the heat exchanger to the installation plate.	 (R8014)	**Caution** **In pump-down work, be sure to stop the compressor before disconnecting the refrigerant pipe. If the refrigerant pipe is disconnected with the compressor being operated and the stop valve being open, air may be sucked in to generate an over-pressure in refrigeration cycle, thus resulting in pipe rupture or accidental injury.**
2	Lift the indoor unit by a wooden base.	 (R8015)	■ If the drain hose is embedded in the wall, disconnect the drain hose beforehand.
3	Place a plastic bag under the drain pan to prevent from wetting the floor with remaining drain.	 (R8016)	
4	Unscrew the flare nut for gas piping by 2 wrenches.	 (R8017)	**Caution** **From the point of view of environmental protection, be sure to use a vacuum pump for air purging.**

Step	Procedure		Points
5	Unscrew the flare nut for liquid piping by 2 wrenches.	 (R8018)	
2. Removing the indoor unit			■ When the pipes are disconnected, protect the both openings of pipe side and unit side from entering of moisture.
1	Remove the indoor unit from the installation plate.	 Liquid piping Gas piping (R8019)	
2	Release the hook of the piping fixture on the back of the unit.	 Auxiliary piping Piping fixture (R8038)  (R8039)	

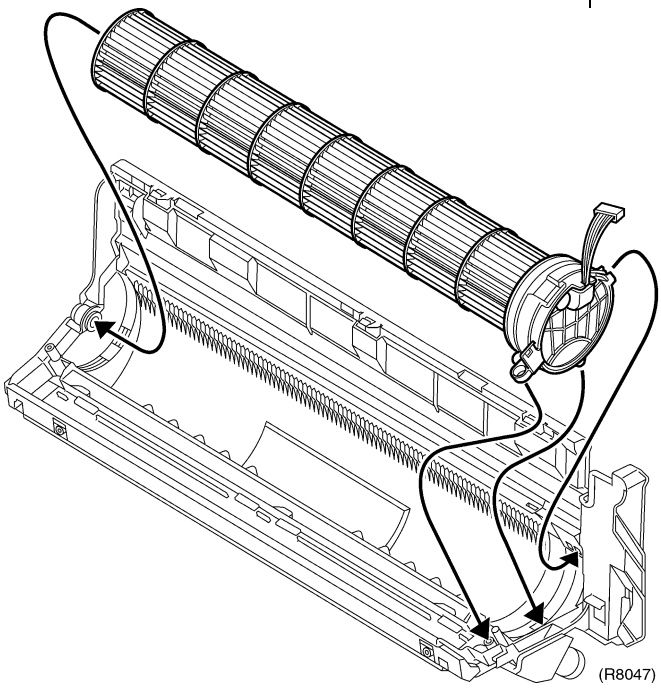
Step	Procedure		Points
3	Widen the auxiliary piping to the extent of 10°~20°.	 (R8040)	■ At an angle of 10°~20°
4	Unscrew the fixing screw on the left side and undo the hook on the rear side.	 Hook (R8041)	⚠ **Caution** **When dismounting or mounting the heat exchanger, be sure to wear gloves or wrap it with cloth before proceeding to the work. (You may be injured by the fins.)**
5	Push and undo the heat exchanger fixing hook on the right side and lift up the heat exchanger.	 Heat exchanger fixing hook (R8042)	
6	Pull the heat exchanger to the front side and undo the hooks completely, and then lift it.	 Heat exchanger (R8043)	

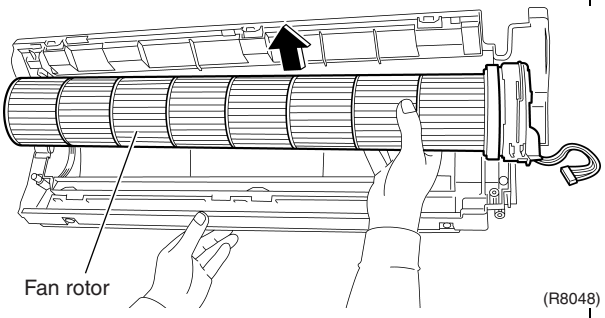
1.8 Removal of Fan Rotor

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

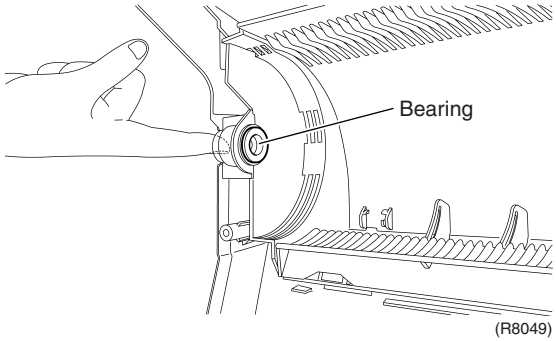
Step	Procedure		Points
1. Remove the right side panel			**Preparation** ■ Remove the heat exchanger according to the “Removal of Heat Exchanger”.
1	Loosen the screw of the side panel (right).		
2	Undo the hook of the side panel (right).		
3	Remove the side panel (right).		

Step	Procedure	Points
2. Remove the fan rotor and fan motor		
1	The cross flow fan and the fan motor have the 3 projections.	
2	Lift up the right side and slide, then remove the fan rotor.	
3	Press the rubber-made bearing with force from outside.	
4	Remove the bearing.	

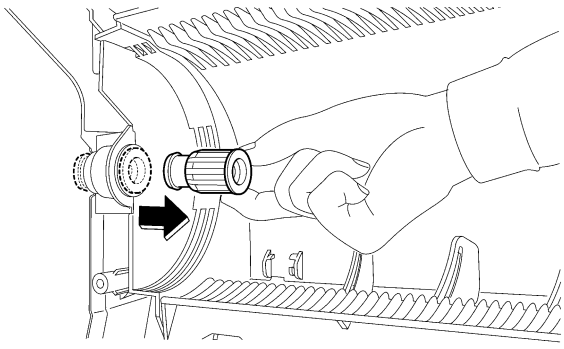

(R8047)

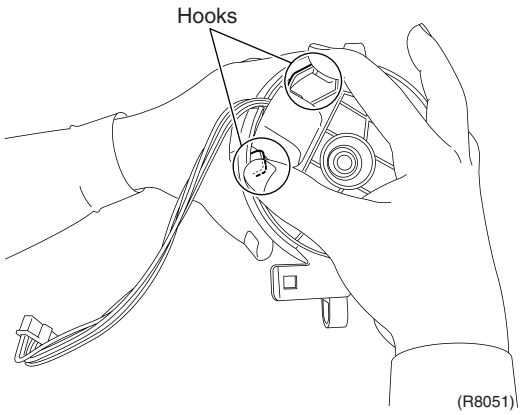
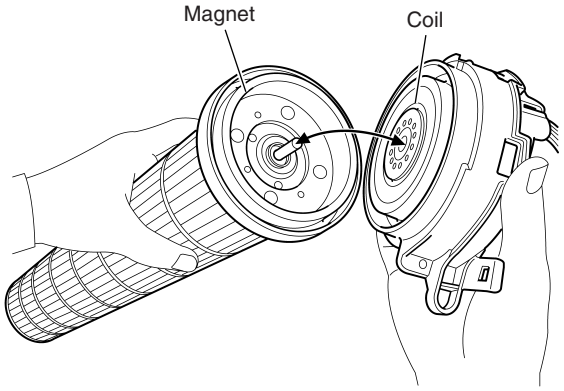
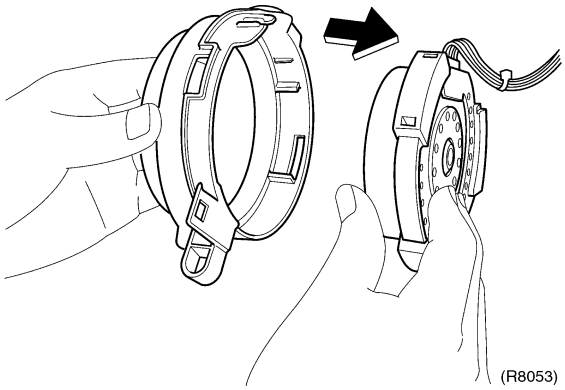


(R8048)



(R8049)

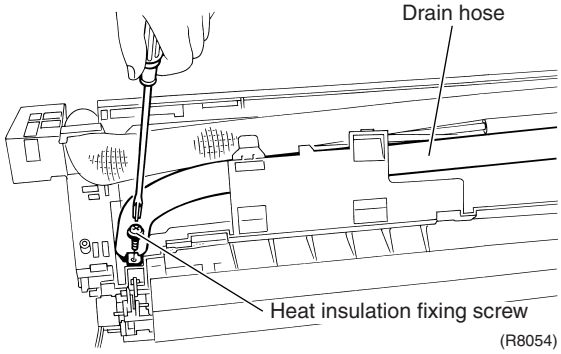
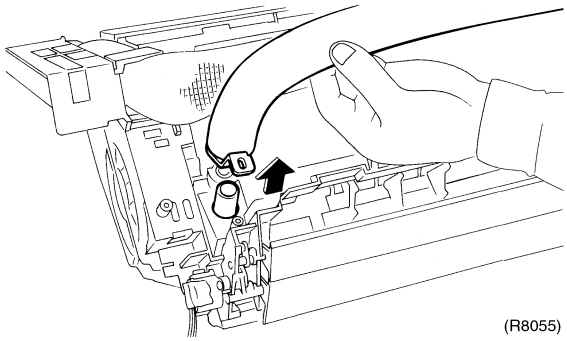
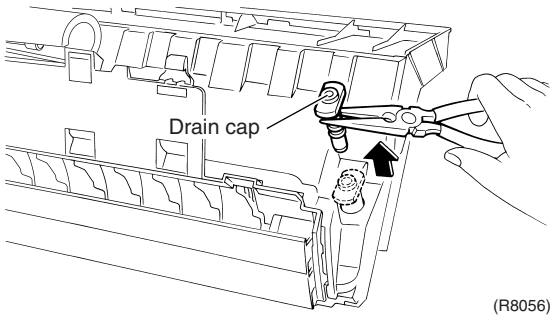
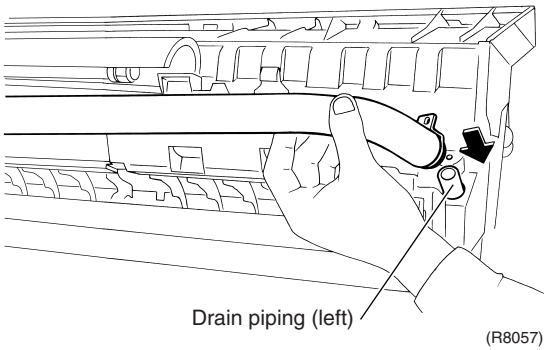

(R8050)

Step	Procedure		Points
5	Unfasten the 2 hooks of the motor cover.		
6	Pull out the fan motor from fan rotor to remove.	 	■ The magnet of the fan motor is united with fan rotor. Be careful that metal waste does not adhere to the magnet. Besides, keep away from the materials that can be affected by magnetic force.

1.9 Exchange of Drain Hose

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 heat insulation fixing screw on the right side and remove the drain hose.	 	■ To prevent water leakage, make sure to mount the heat insulation fixing screw as it was.
2	Remove the drain cap located at the left side with pliers and press the removed drain plug into the right side with an Allen wrench (4mm).		■ Use a 4mm Allen wrench.
3	Insert the drain hose to the left side, and tighten with the heat insulate fixing screw.		**Caution** **Do not thrust in the drain plug with a sharp-pointed tool like a screwdriver. (The drain plug may be broken, resulting in water leakage.)**

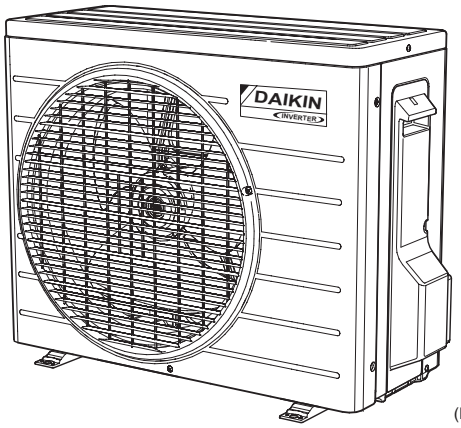
2. Outdoor Unit

2.1 Removal of Panels

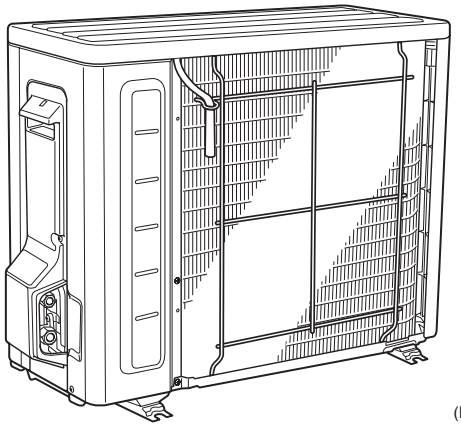
Procedure

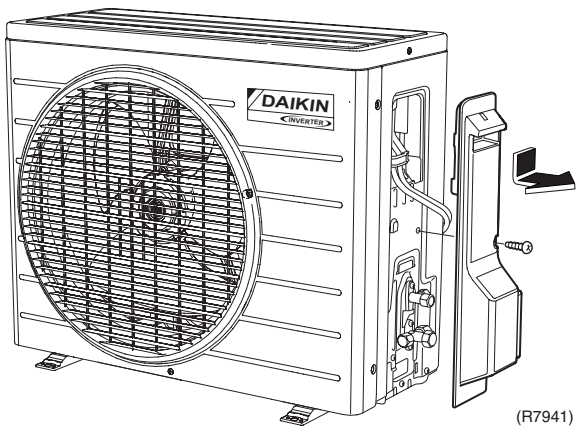
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure	Points
1. Features		
1	Loosen the screw of the stop valve cover. Pull down the stop valve cover and remove it.	■ Take care not to cut your finger by the fins of the heat exchanger. ■ The stop valve cover is united with the shelter. ■ When reassembling, make sure to fit the 3 hooks.

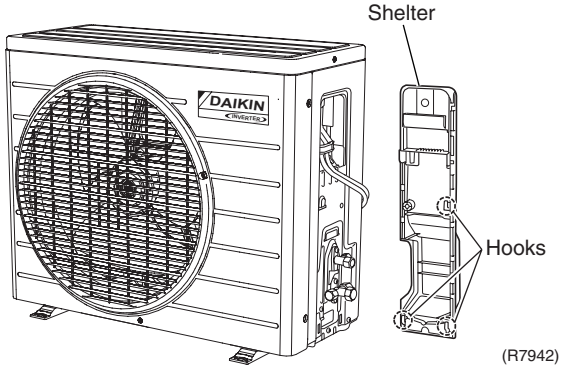


(R7940)


(R7371)

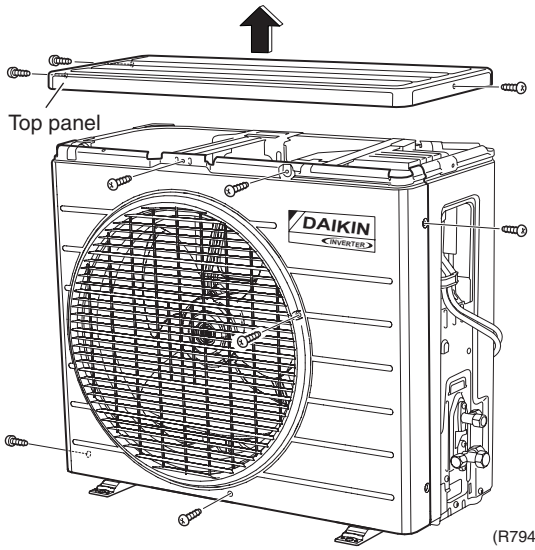


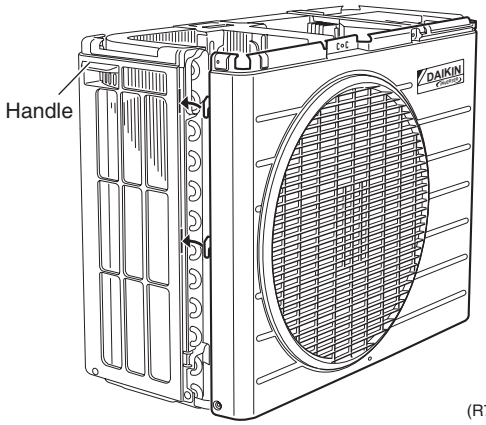
(R7941)

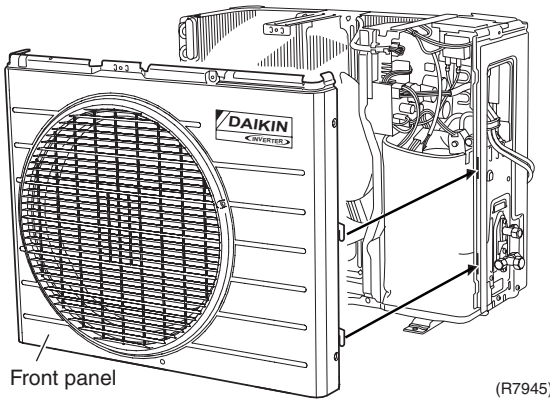


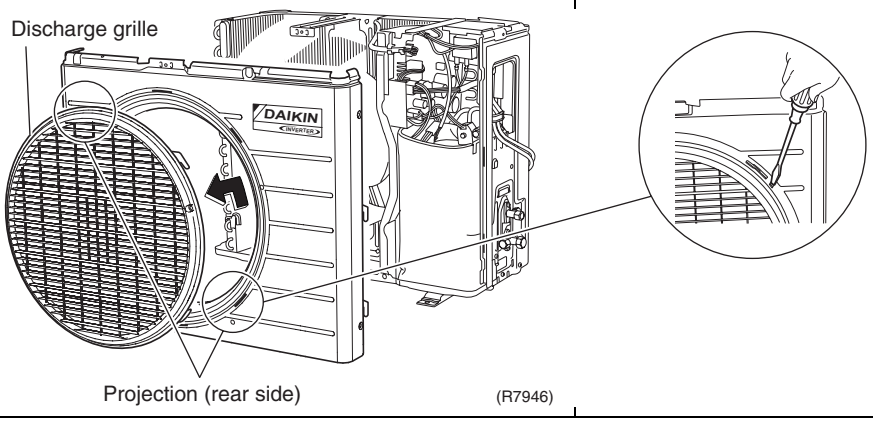
(R7942)

Step	Procedure	Points
2. Remove the panels.		
1	Loosen the 3 screws (left: 2 screws, right: 1 screw) and lift the top panel from the rear side at first.	
2	Loosen the 6 screws of the front panel.	
3	Lift up the left side and undo the hook.	
4	Undo the right side hook and remove the front panel.	
5	Undo the 6 hooks and remove the discharge grille.	
6	The discharge grille has 2 projections to prevent its rotation. Press the projection from the rear side and remove it clockwise.	





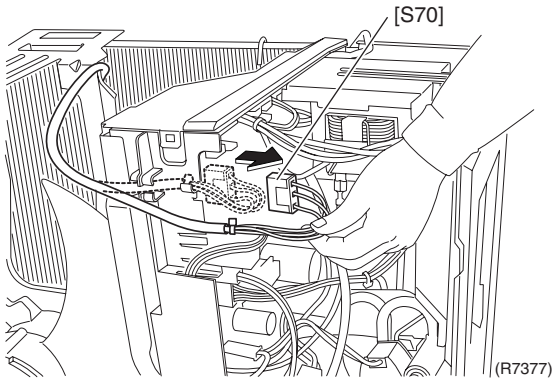
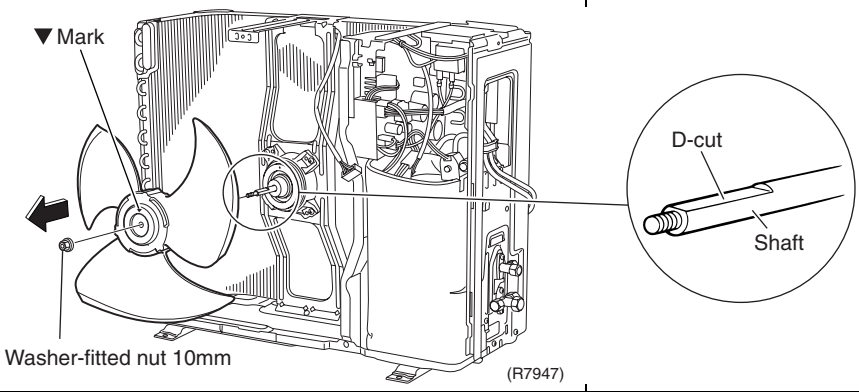
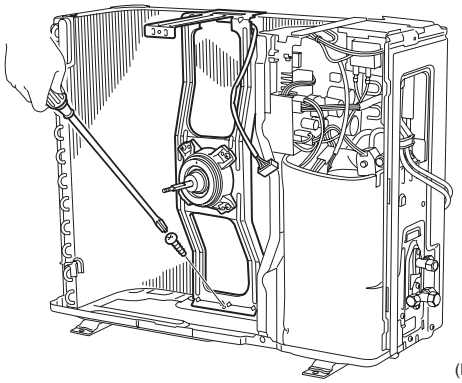
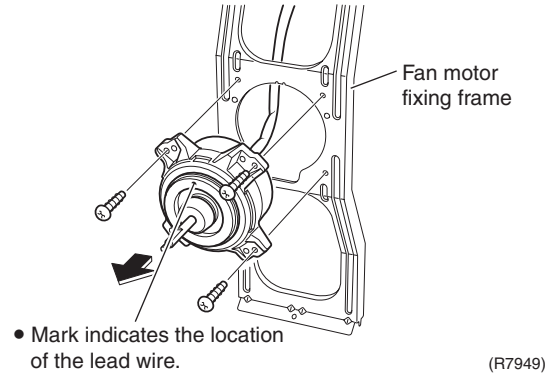
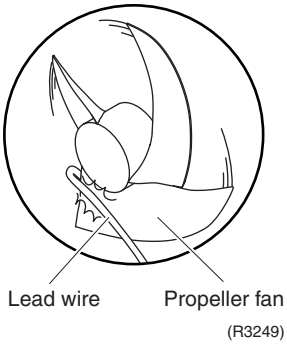




2.2 Removal of Fan Motor / Propeller Fan

Procedure

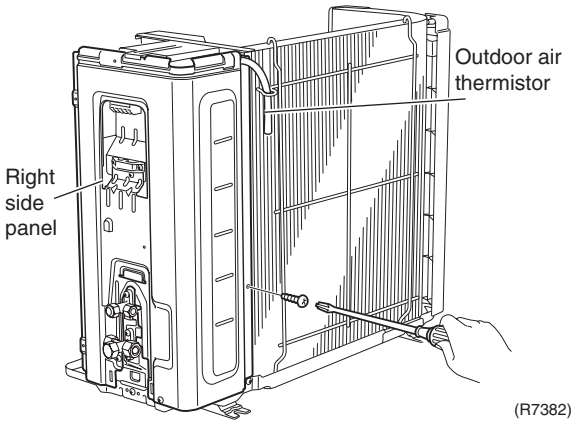
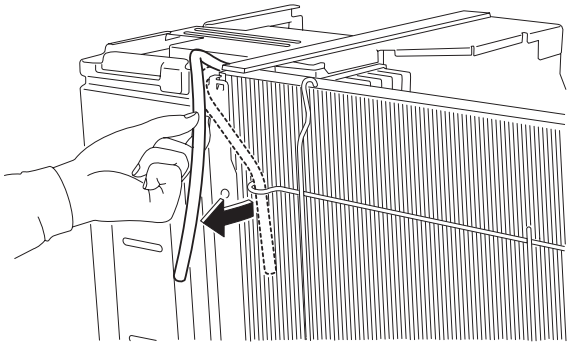
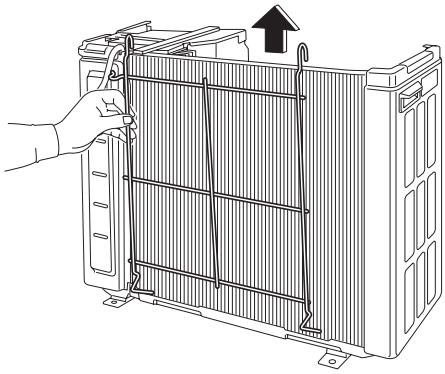
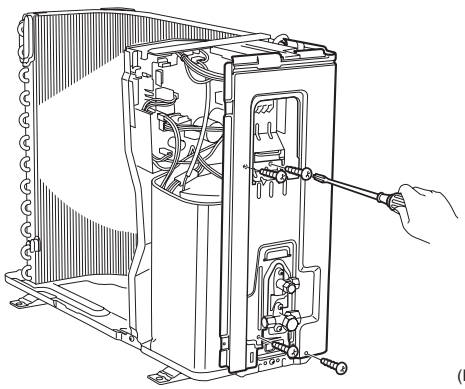
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

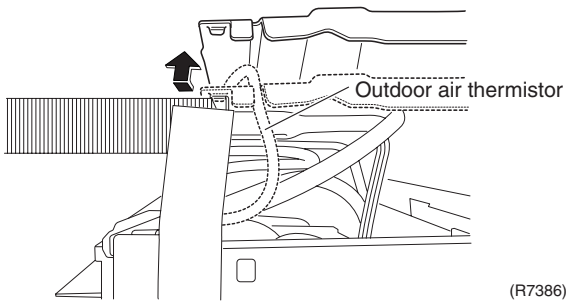
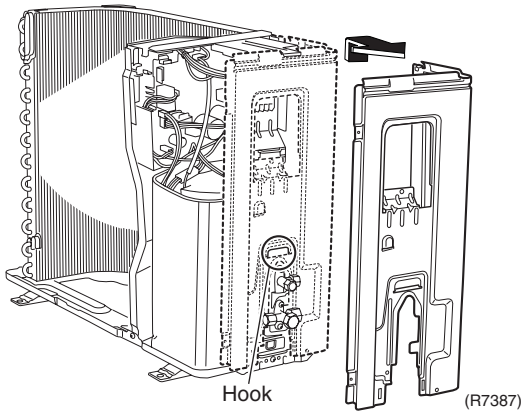
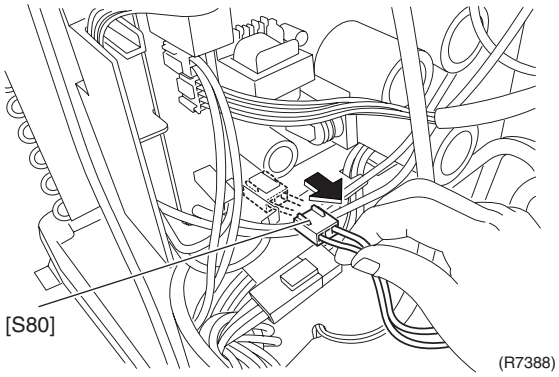
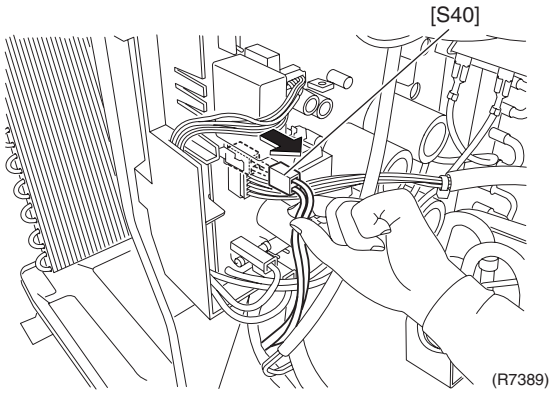
Step	Procedure	Points
■ Remove the panels.		
1. Remove the propeller fan.		
1 Disconnect the fan motor connector (S70).		
2 Loosen the fixing hooks and release the lead wire.		■ The screw has reverse winding. ■ Align ▼ mark of the propeller fan with D-cut section of the motor shaft when reassembling.
3 Unscrew the washer-fitted nut (M10) of the propeller fan with a spanner.		
4 Remove the propeller fan.		
2. Remove the fan motor.		■ Put the lead wire through the back of the motor when reassembling. (so as not to be entangled with the propeller fan)
1 Loosen the screw to remove the fan motor fixing frame.		
2 Loosen the fixing hooks and release the lead wire.		
3 Loosen the 3 screws to remove the fan motor.		

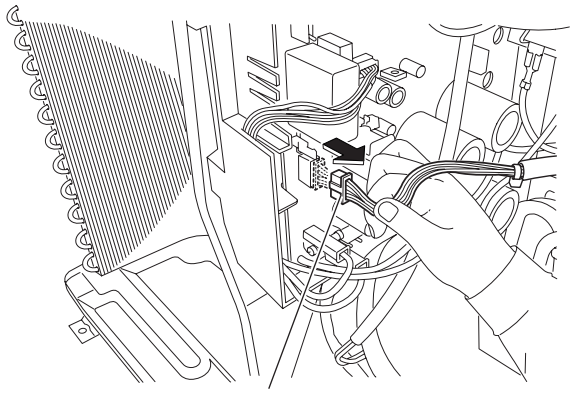
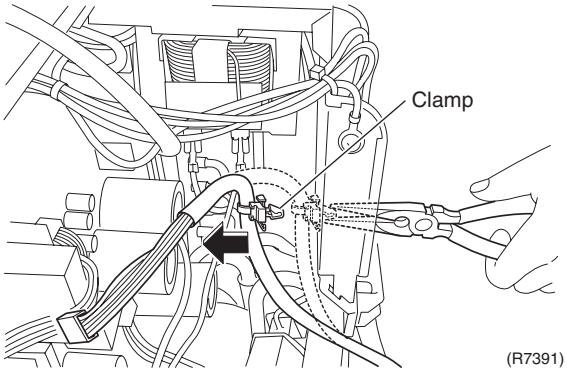
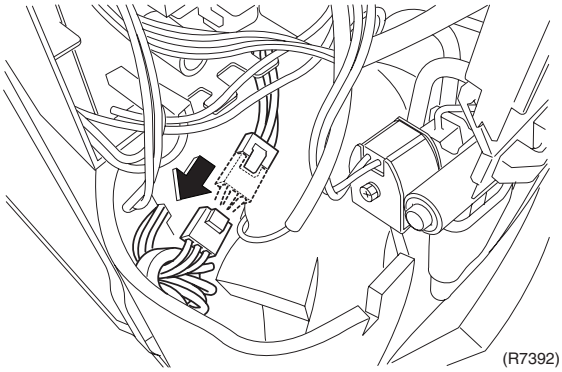
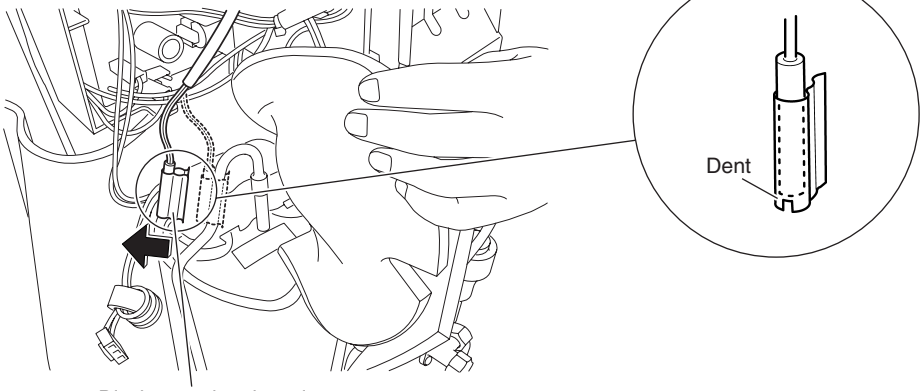
2.3 Removal of PCB

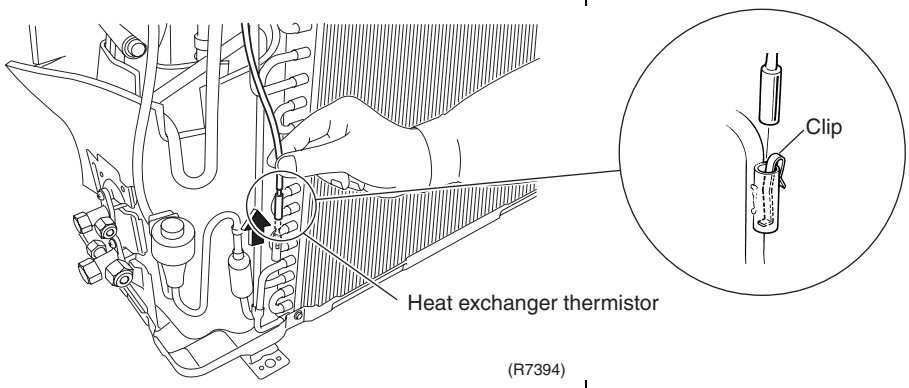
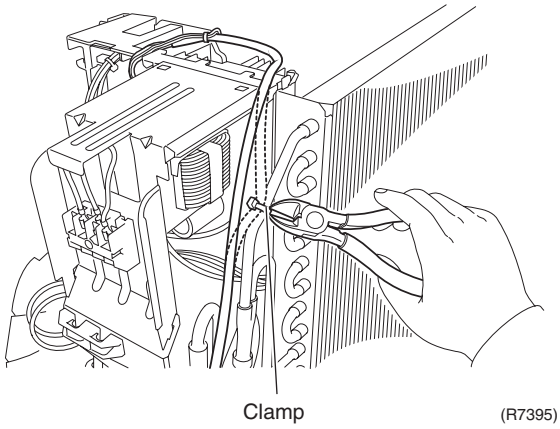
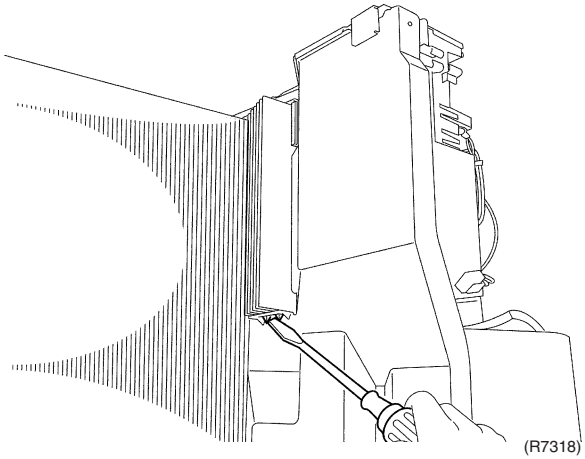
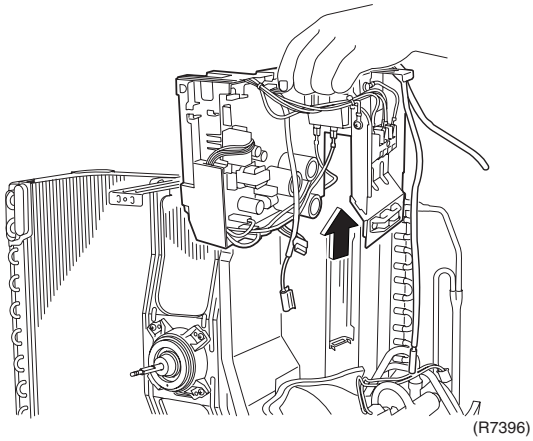
Procedure

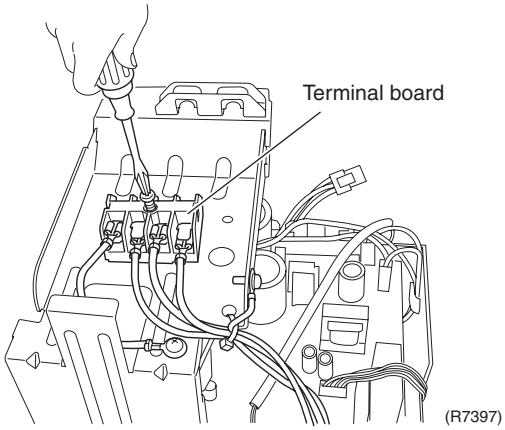
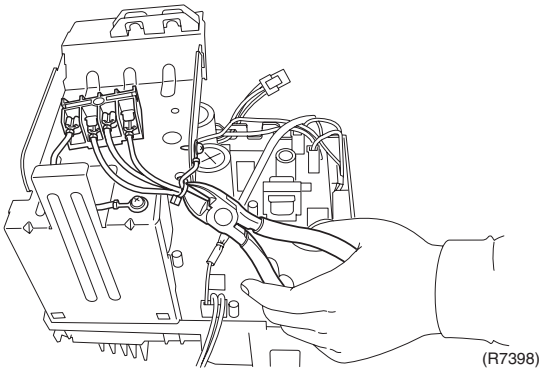
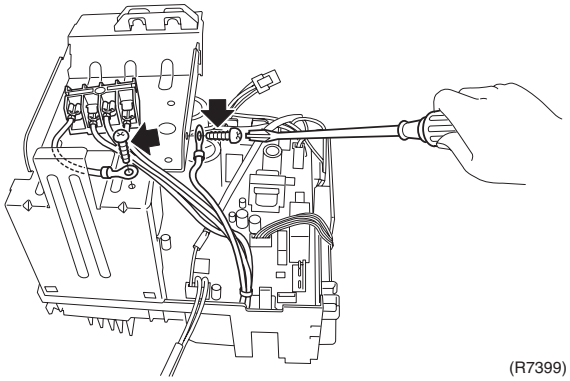
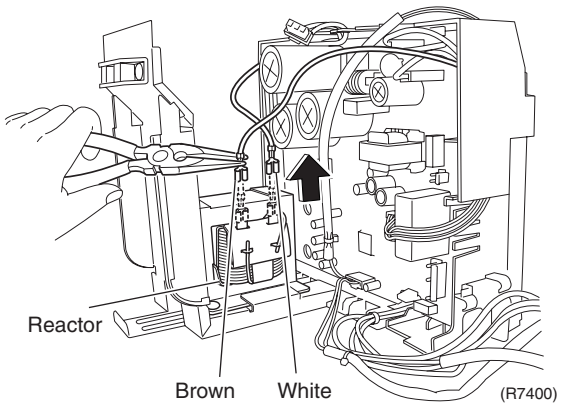
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

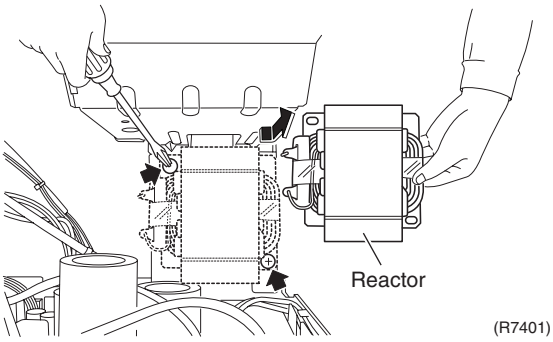
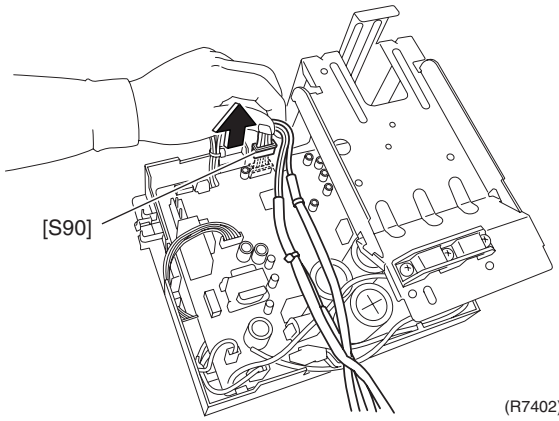
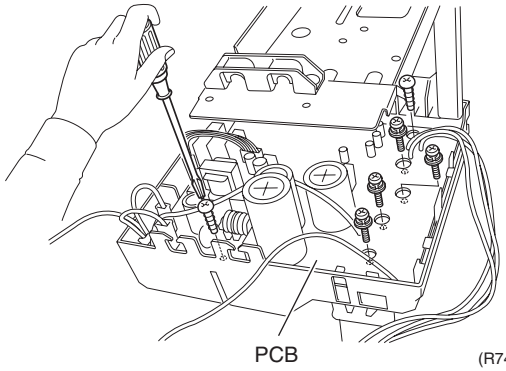
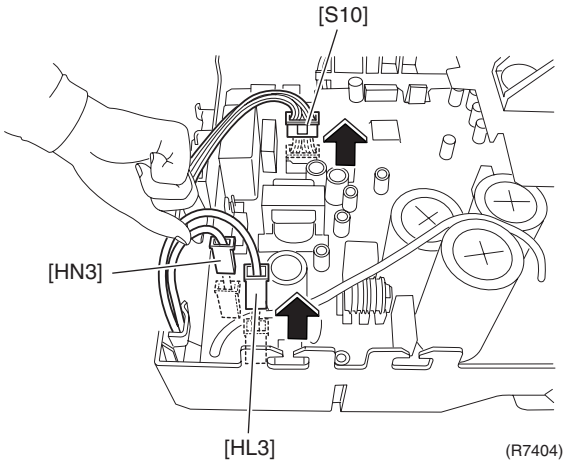
Step	Procedure	Points
■ Remove the panels.	 (R7382)	■ The outdoor air thermistor is hooked on the guard net.
1. Remove the right side panel.		
1 Loosen the screw on the rear side.		
2 Unhook the outdoor air thermistor.	 (R7383)	
3 Lift up the guard net to remove.	 (R7384)	
4 Loosen the 4 screws on the right side.	 (R7385)	

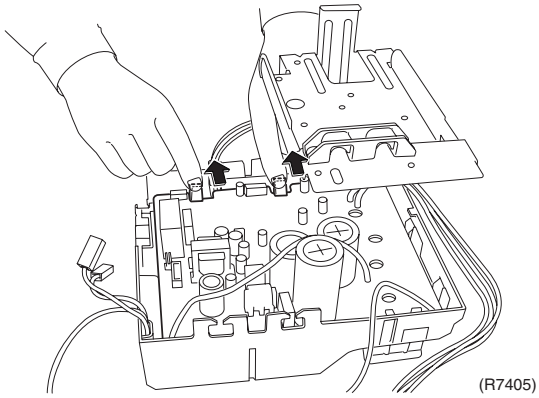
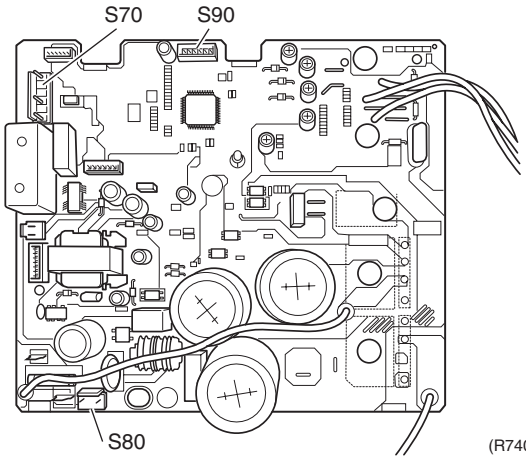
Step	Procedure		Points
5	Undo the rear side hook.		■ When reassembling, make sure to fit the hook.
6	Lift up the right side panel to remove.		
2. Remove the electrical box.			
1	Disconnect the connector for four way valve coil (S80).		
2	Disconnect the connector for overload protector.		

Step	Procedure		Points
3	Disconnect the connector for electronic expansion valve coil.	 [S20] (R7390)	
4	Detach the clamp.	 (R7391)	
5	Disconnect the connector for compressor motor.	 (R7392)	■ Pay attention so as not to lose the clip for thermistor. ■ When reassembling, do not cover the dent of clip by inserting the thermistor.
6	Release the discharge pipe thermistor.	 Discharge pipe thermistor (R7958)	

Step	Procedure	Points
7	Release the heat exchanger thermistor. 	
8	Cut the clamp. 	■ Pay attention so as not to lose the clip.
9	Undo the hook from the partition plate. 	■ The electrical box can be removed by lifting itself without a screw driver.
10	Lift and remove the electrical box. 	

Step	Procedure		Points
3. Remove the PCB.			The lead-free solder (PbF) is used on PCB. When exchange, use exclusive solder and soldering gun.
1	Loosen the screw on the terminal board.	 (R7397)	
2	Cut the clamp.	 (R7398)	
3	Loosen the 2 screws of the earth terminal.	 (R7399)	
4	Disconnect the 2 connectors of the reactor.	 (R7400)	

Step	Procedure		Points
5	Loosen the 2 screws to remove the reactor.	 (R7401)	
6	Disconnect the connector for thermistor (S90).	 (R7402)	
7	Loosen the 6 screws.	 (R7403)	
8	Disconnect the 3 connectors for filter PCB (S10, HN3, HL3).	 (R7404)	

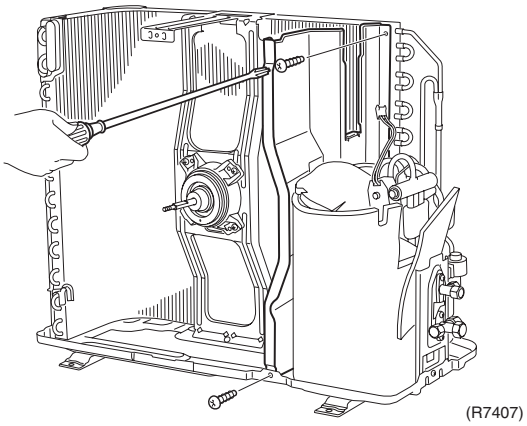
Step	Procedure		Points
9 10	Undo the 2 hooks. Lift and Remove the PCB.	 (R7405)	
11	Feature of the PCB. S70: fan motor S80: four way valve S90: thermistor	 (R7406)	

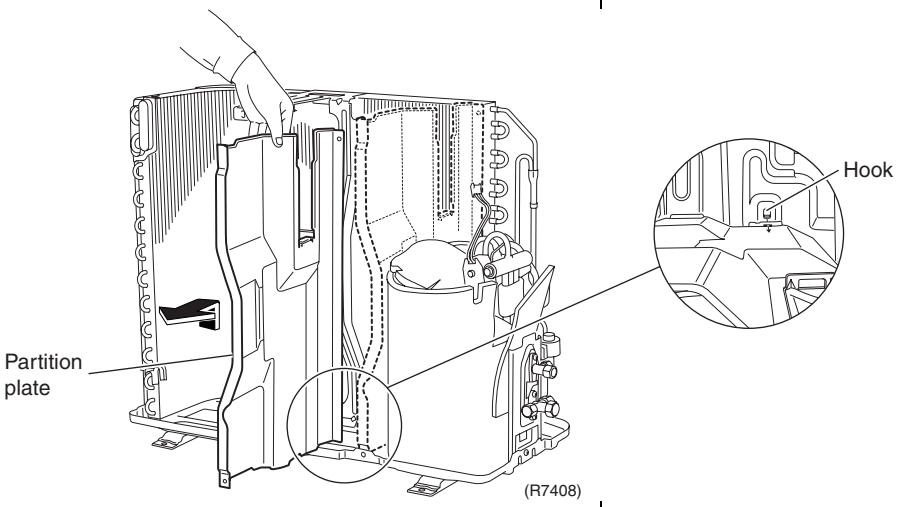
2.4 Removal of Sound Blanket

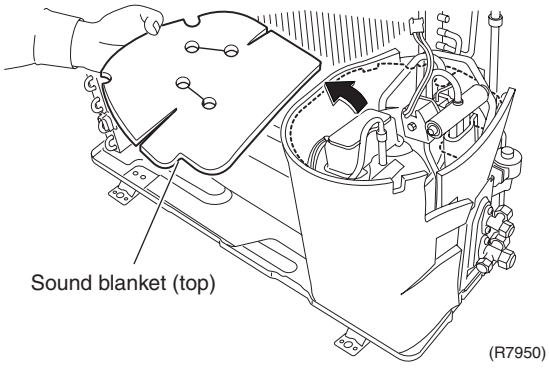
Procedure

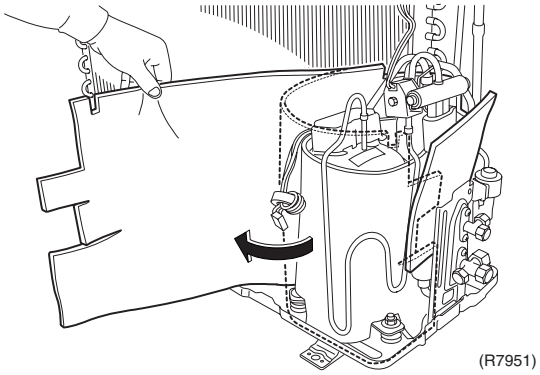
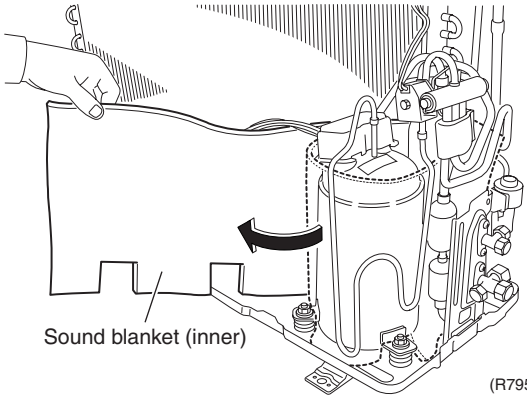
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure	Points
1. Remove the partition plate.		
1	Loosen the 2 screws.	
2	The partition plate has a hook on the lower side. Lift and pull the partition plate to remove.	■ When reassembling, fit the lower hook into the bottom frame.
2. Remove the sound blanket.		■ Since the piping ports on the sound blanket are torn easily, remove the blanket carefully.
1	Lift and remove the sound blanket (top).	







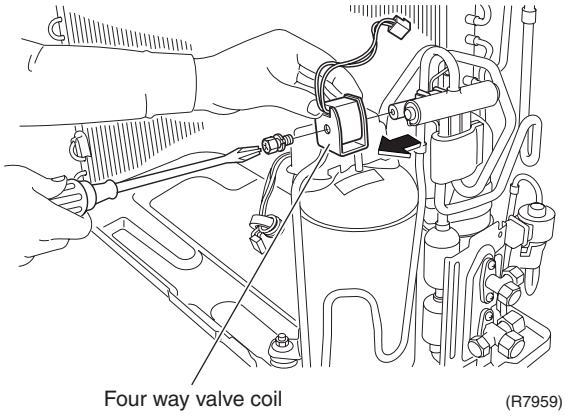
Step	Procedure		Points
2	Lift and remove the sound blanket (body) as it is opened.	 (R7951)	
3	Pull the sound blanket (inner) out.	 Sound blanket (inner) (R7952)	■ Since the piping ports on the sound blanket are torn easily, remove the blanket carefully.

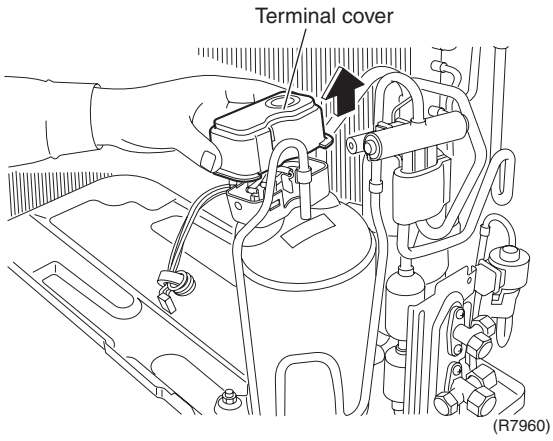
2.5 Removal of Four Way Valve

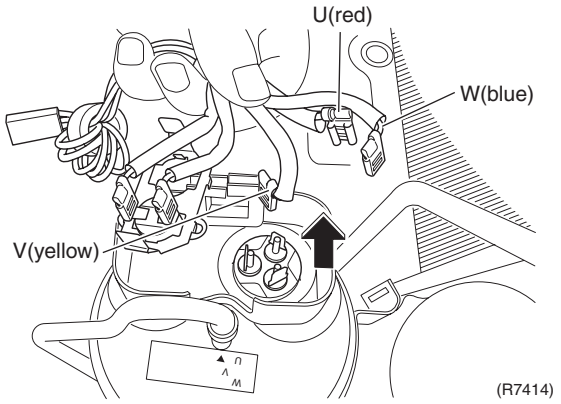
Procedure

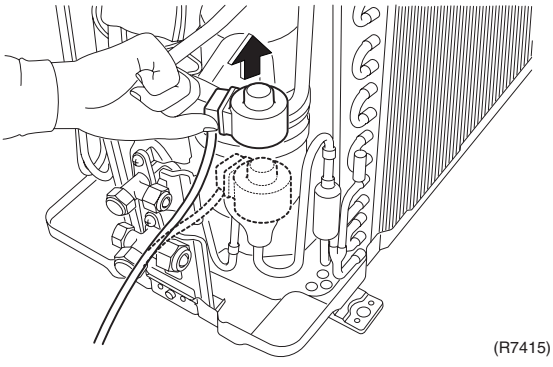
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

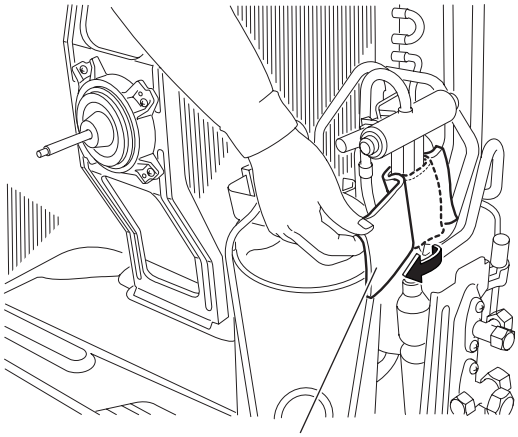
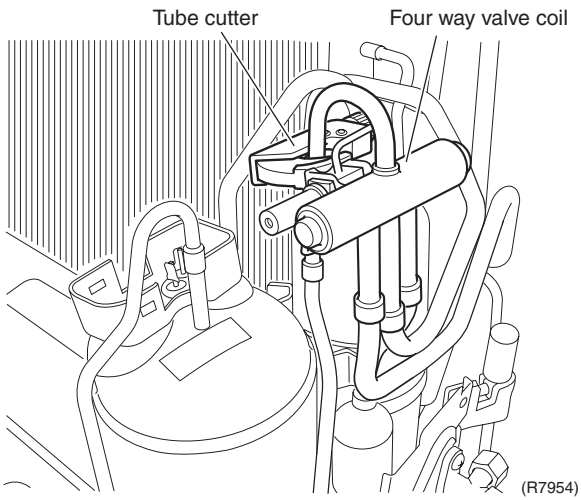
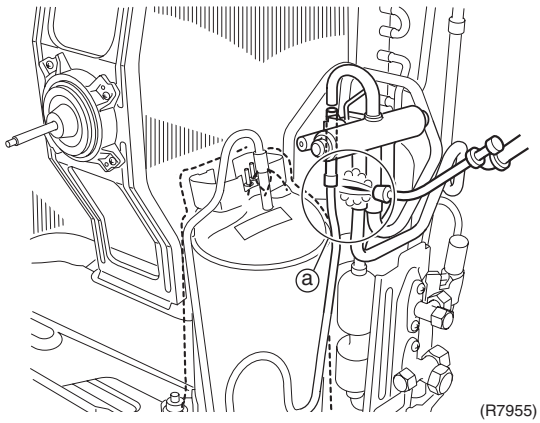
Step	Procedure	Points
1. Remove the peripheries.		
	■ Remove the four way valve and the sheets of putty so as not to burn them.	
1	Loosen the screw of the four way valve coil.	
2	Remove the terminal cover.	
3	Disconnect the terminal.	■ Be careful so as not to burn the compressor terminals or the name plate. Make a note. U: Red V: Yellow W: Blue
4	Remove the electronic expansion valve coil.	

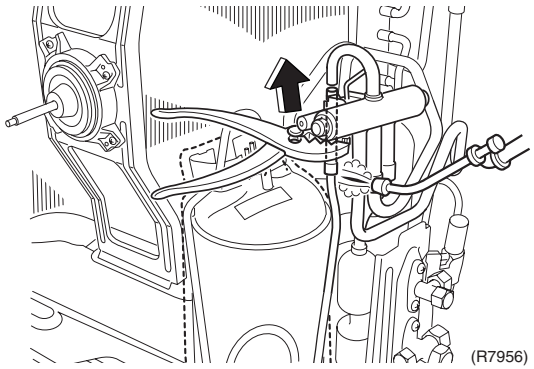
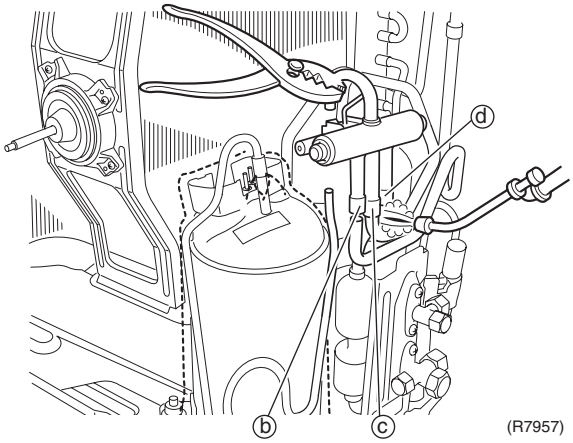






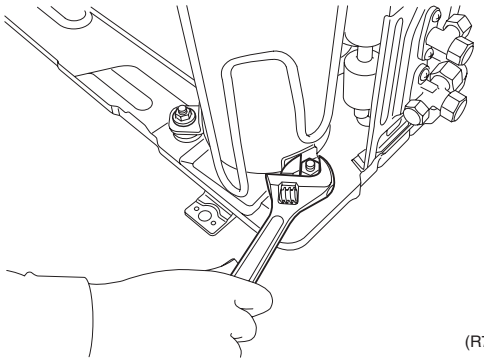
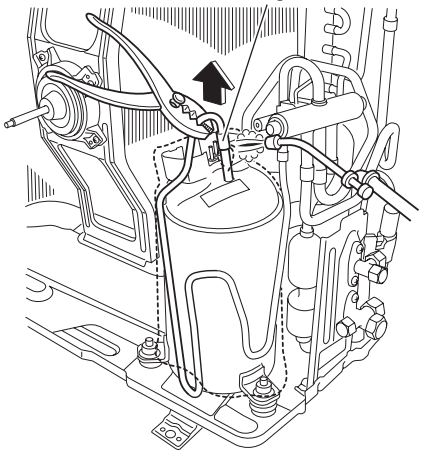
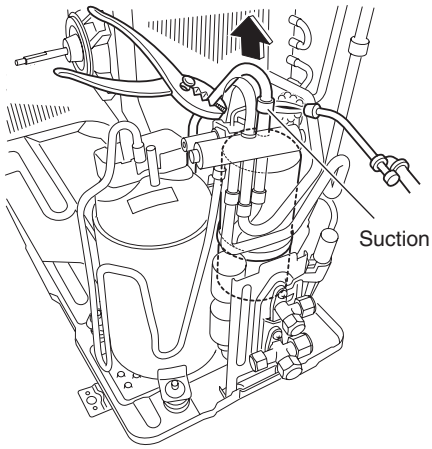
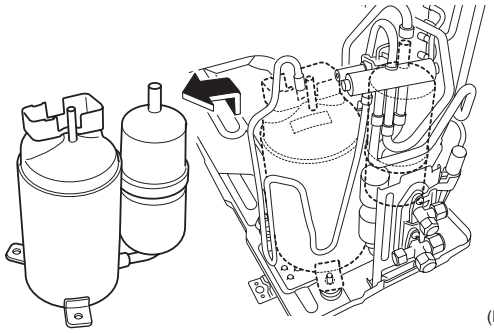


Step	Procedure		Points
5	Remove the putty.		
6	Cut the pipe with a tube cutter. ■ Before working, make sure that the refrigerant is empty in the circuit. ■ Be sure to apply nitrogen replacement when heating up the brazed part.		**Caution** **Be careful not to get yourself burnt with the pipes and other parts that are heated by the gas welding rod.** **Caution** **From the viewpoint of global environment protection, do not discharge the refrigerant gas in the atmosphere. Make sure to recover the refrigerant gas with the recovery system.**
2. Remove the four way valve.			**Reassembling precautions** 1. Use non-oxidizing brazing method. If nitrogen gas is not available, braze the parts speedily. 2. Avoid deterioration of the gaskets due to carbonization of oil inside the four way valve or thermal influence. For this purpose, wrap the four way valve with wet cloth. Splash water over the cloth against becoming too hot (keep it below 120°C).
1	Heat up the brazed part (a) and withdraw the piping with pliers.		

Step	Procedure		Points
2 3	Heat the 3 brazed points of the four way valve. Disconnect the point (b) first. Disconnect the points (c) and (d). **Warning** **If refrigerant gas leaks during the job, ventilate the room. (Bear in mind that if the refrigerant gas is exposed to open flames, noxious gas may be generated.)**	 (R7956)  (R7957)	■ In pulling the pipes, be careful not to over-tighten them with pliers. The pipes may get deformed. If the gas welding machine fails to remove the four way valve, take the steps below. 1. Disconnect the brazed pipe sections that are readily easy to separate and join together later. 2. With a small copper tube cutter, cut off the internal pipes to easily take out the four way valve. **Note:** Never use a hack saw. The sawdust may come into the circuit.

2.6 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 peripheries.	 (R7961)	**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.
■ Remove the four way valve, the terminal cover and the lead wire for compressor so as not to burr them.		
1 Unscrew the nut of the compressor.		
2. Remove the compressor.	Discharge side  (R7962)	**Warning** **Since it may happen that refrigeration oil in the compressor will catch fire, prepare wet cloth so as to extinguish fire immediately.** **In case of the difficulty with gas brazing machine** 1. Disconnect the brazed part where is easy to disconnect and restore. 2. Cut pipes on the main unit by a miniature copper tube cutter in order to make it easy to disconnect.
■ Before working, make sure that the refrigerant is empty in the circuit. ■ Be sure to apply nitrogen replacement when heating up the brazed part.		
1 Heat up the brazed part of the discharge side and disconnect.		
2 Heat up the brazed part of the suction side and disconnect.	Suction side  (R7963)	**Cautions for restoration** 1. Restore the piping by non-oxidation brazing. 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)
3 Lift the compressor up and remove it. **Caution** **From the viewpoint of global environment protection, do not discharge the refrigerant gas in the atmosphere. Make sure to recover the refrigerant gas with the recovery system.** **Caution** **From the viewpoint of global environment protection, make sure to use the vacuum pump for air purge.**	 (R7964)	Note: Do not use a metal saw for cutting pipes by all means because the sawdust come into the circuit.

Part 8
Others

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.

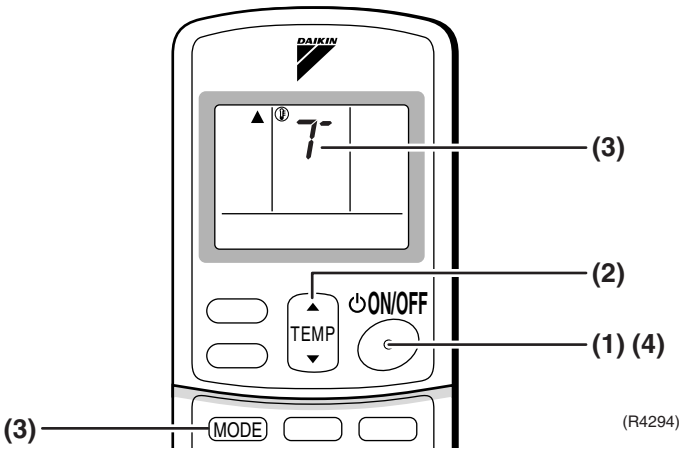
Trial Operation and Testing

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.

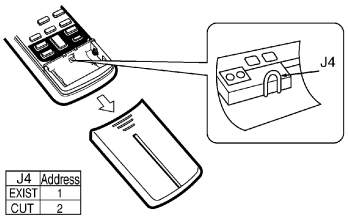
How to set the different addresses

■ Control PCB of the indoor unit

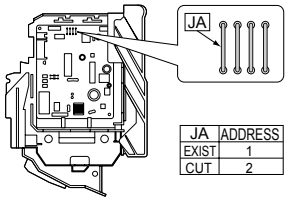
(1) Remove the front grille. (2 screws)
(2) Remove the service cover (1-screw).
(3) Remove the drip proof plate. (3 tabs)
(4) Cut the address jumper JA on the control PCB.

■ Wireless remote controller

(1) Slide the front cover and take it off.
(2) Cut the address jumper J4.



(R2871)



(R8277)

1.2.2 Jumper Setting

Jumper (On indoor control PCB)	Function	When connected (factory set)	When cut
JC	Power failure recovery function	Auto-restart	Unit does not resume operation after recovering from a power failure. Timer ON-OFF settings are cleared.
JB	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>

1.3 Application of Silicon Grease to a Power Transistor and a Diode Bridge

Applicable Models

All outdoor units using inverter type compressor for room air conditioner.

When the printed circuit board of an outdoor unit is replaced, it is required that silicon grease (*1) is certainly applied to the heat radiation part (the contact point to the heat radiation fin) of the power transistor and diode bridge.

*1: Parts number of the silicon grease – 1172698 (Drawing number 3FB03758-1)

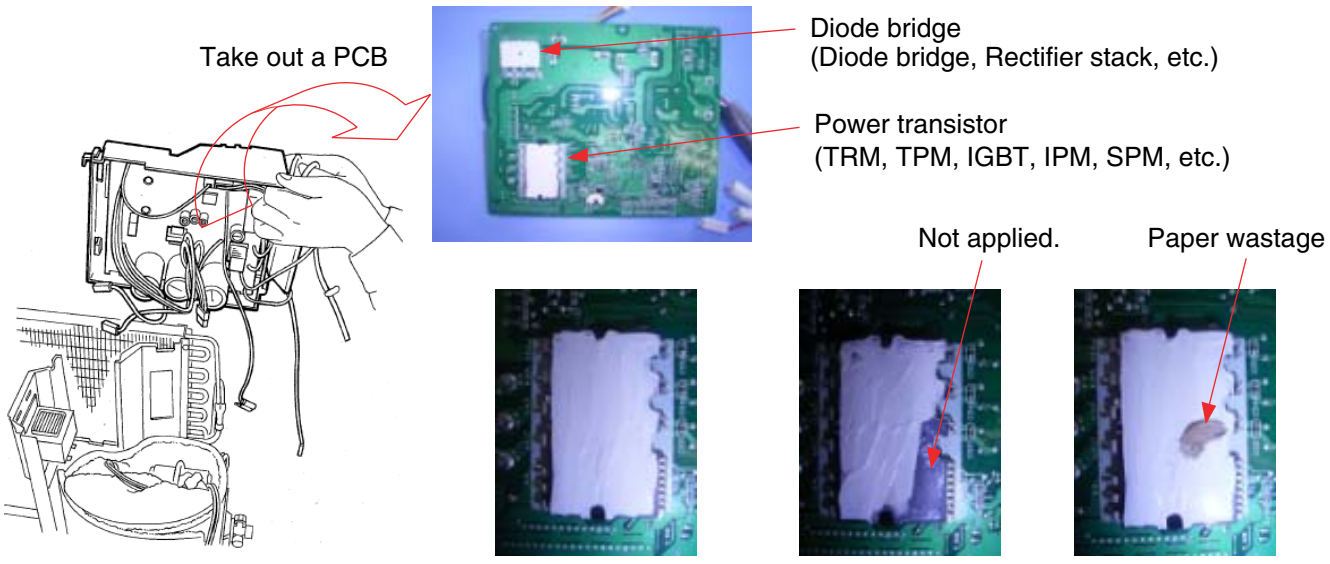
Details

The silicon grease is an essential article for encouraging the heat radiation of the power transistor and the diode bridge. Applying the paste should be implemented in accordance with the following instruction.

Remark: There is the possibility of failure with smoke in case of bad heat radiation.

- To completely wipe off the old silicon grease on a heat radiation fin.
- To evenly apply the silicon grease to the whole.
- Do not have any foreign object such as solder or paper waste between the power transistor, the diode bridge and the heat radiation fin.
- To firmly tighten the screws of the power transistor and the diode bridge, and to surely contact to the heat radiation fin without any gap.

<Example>



(R7100)

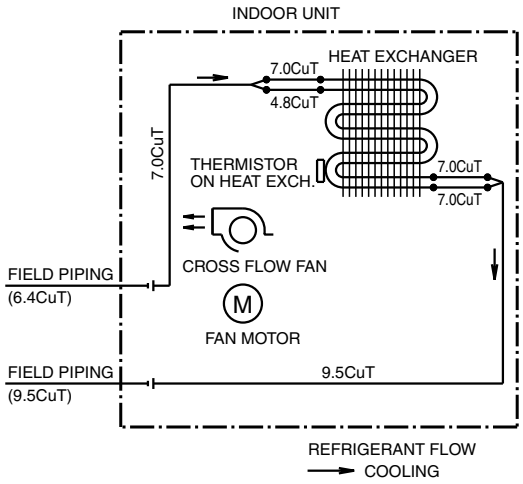
Part 9
Appendix

1. Piping Diagrams

1.1 Indoor Units

1.1.1 Cooling Only

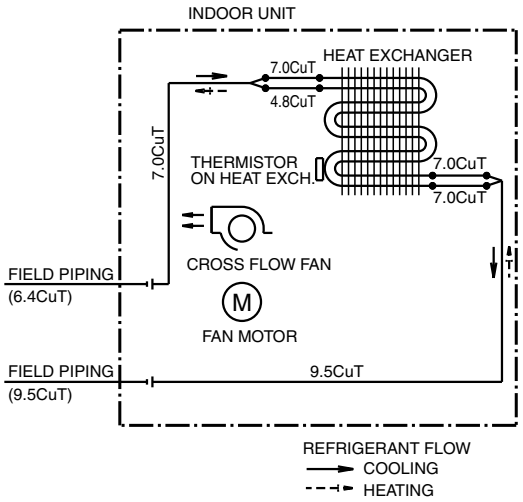
FTK20/25/35GV1B



4D058927A

1.1.2 Heat Pump

FTX20/25/35GV1B, ATX20/25/35GV1B

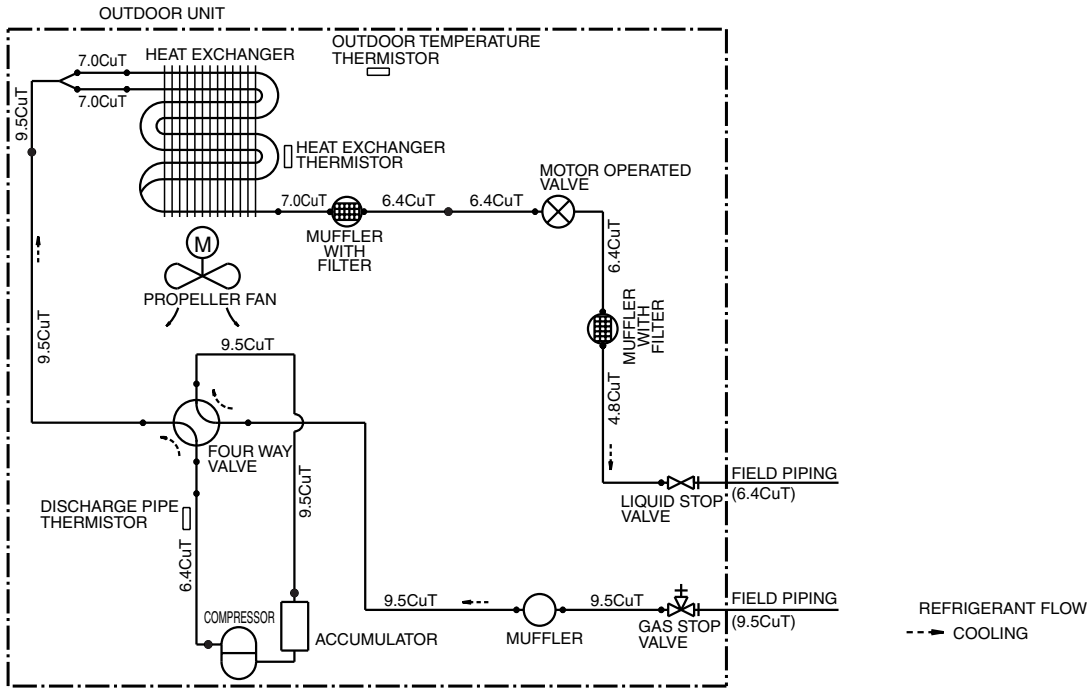


4D058926A

1.2 Outdoor Units

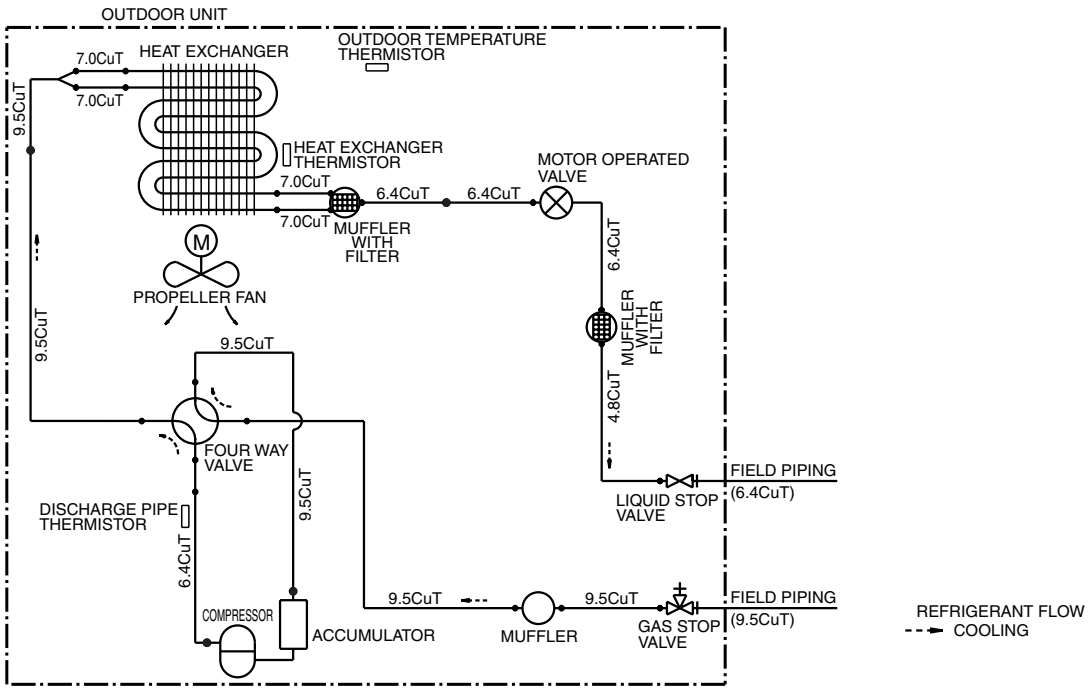
1.2.1 Cooling Only

RK20/25GV1B



3D058717A

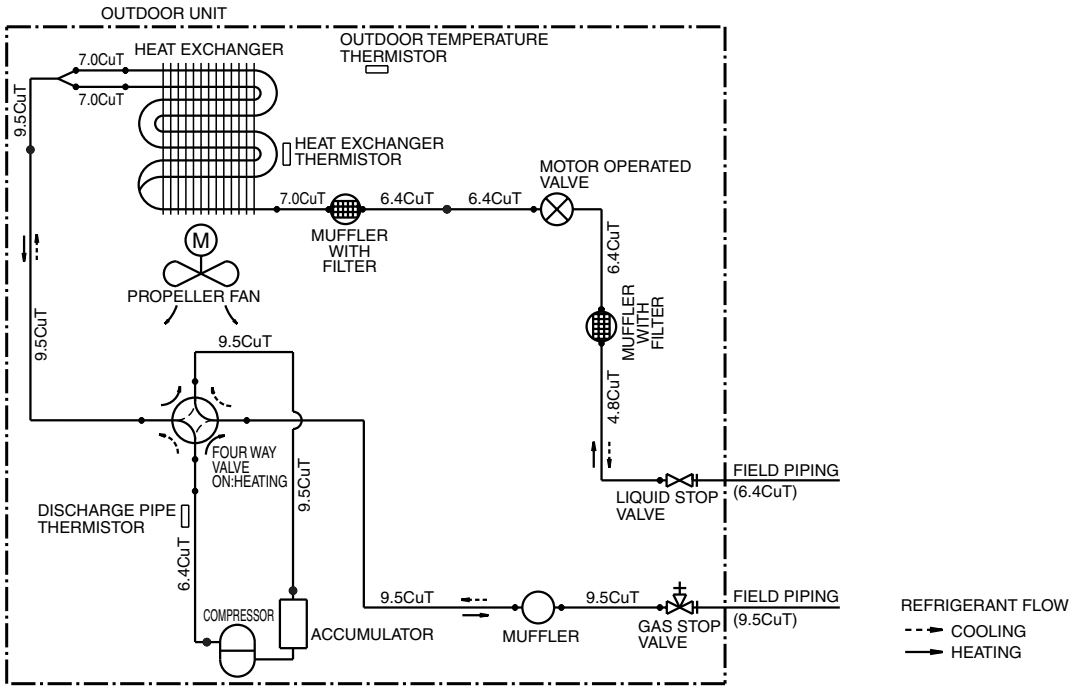
RK35GV1B



3D058715A

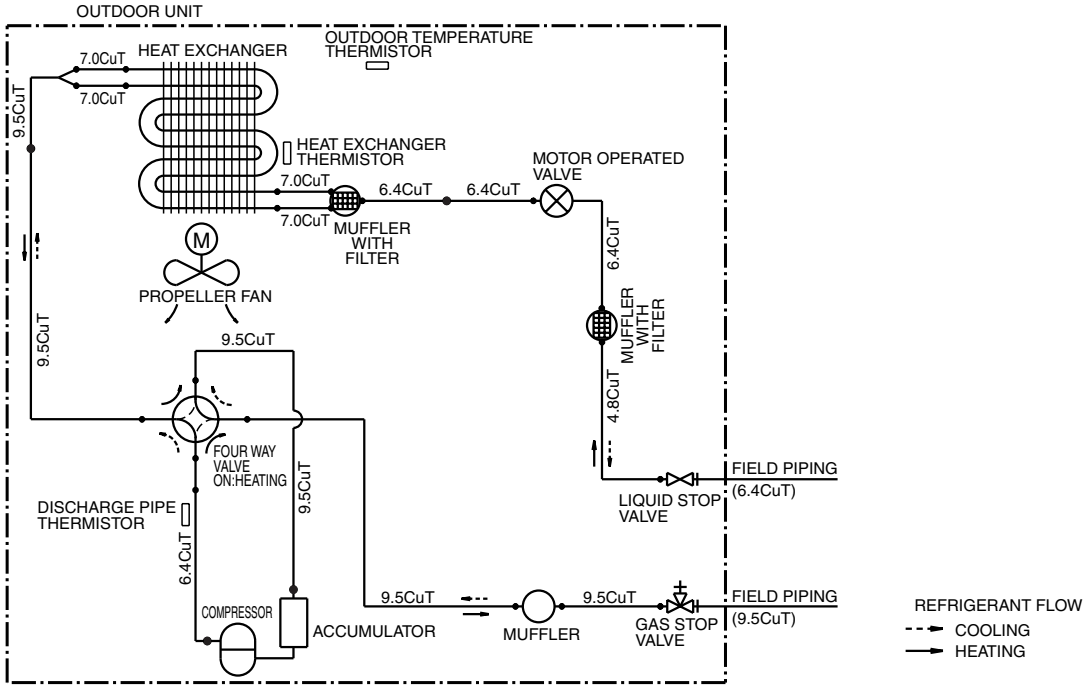
1.2.2 Heat Pump

RX20/25GV1B, ARX20/25GV1B



3D058716A

RX35GV1B, ARX35GV1B

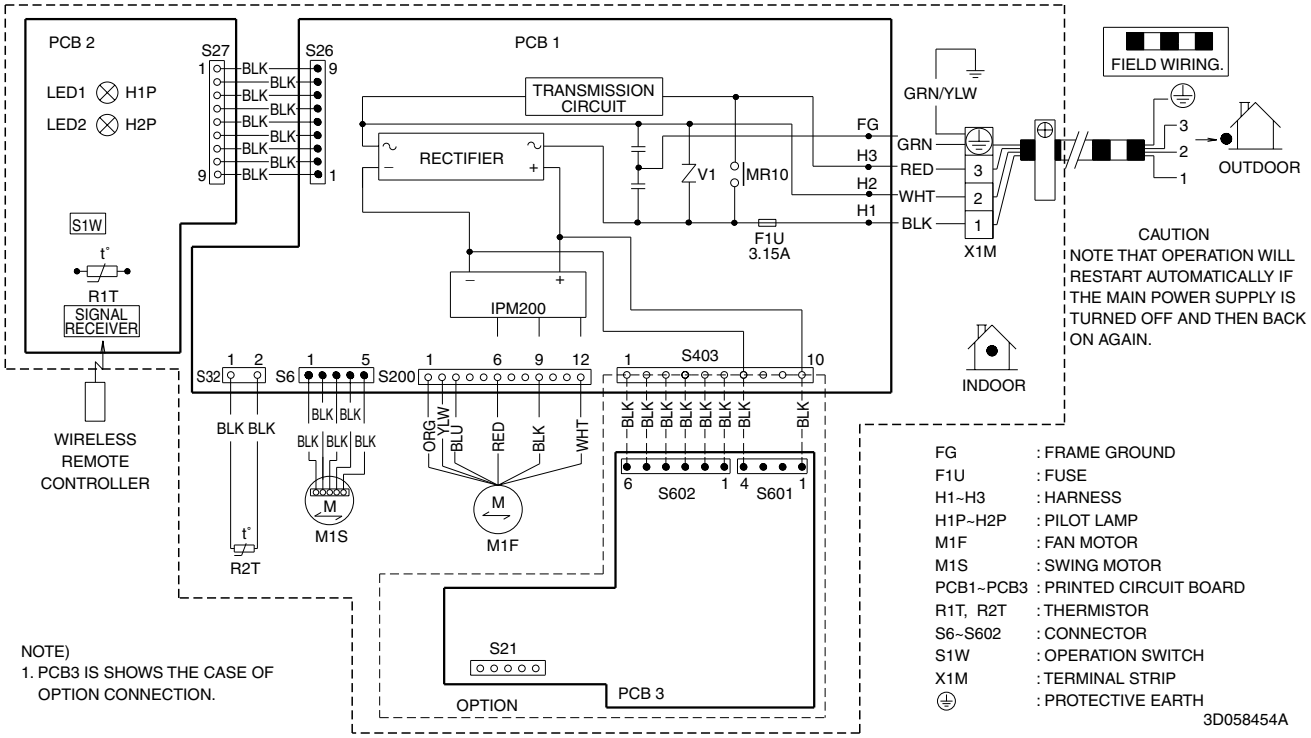


3D058714A

2. Wiring Diagrams

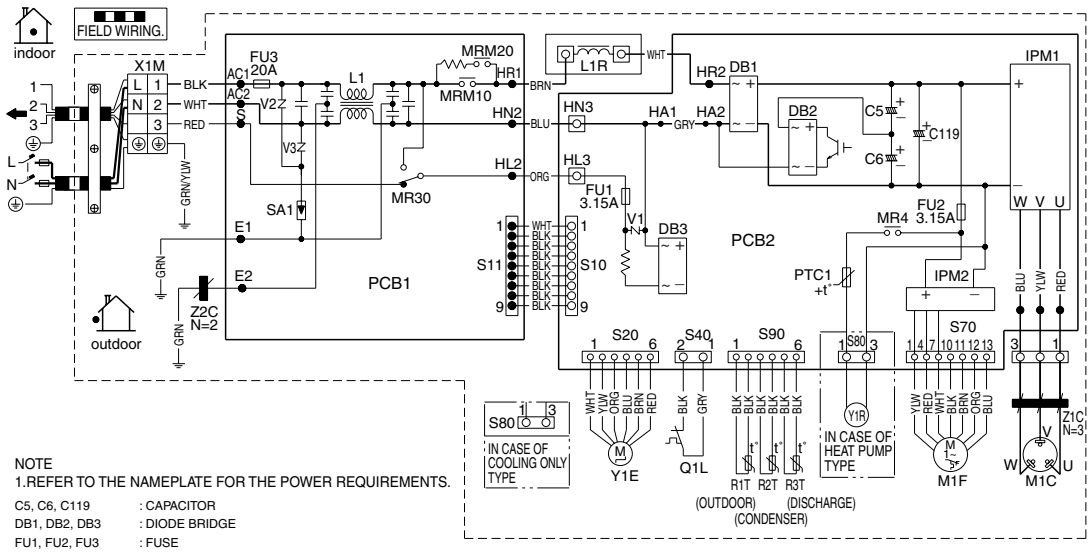
2.1 Indoor Units

FTK20/25/35GV1B, FTX20/25/35GV1B, ATX20/25/35GV1B



2.2 Outdoor Units

RK20/25/35GV1B, RX20/25/35GV1B, ARX20/25/35GV1B



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Warning

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- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorised parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.
- 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.

EC99J2044

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.

Dealer

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