DAIKIN

Si01 - 501

Service Manual

SPLIT Pair
D-Series

[Applied Models]

●**Non-Inverter Pair : Cooling Only**

Non Inverter Pair D-Series

●Cooling Only

Indoor Unit

FT09DV2S	**FT25DVM**	**FT25DSG**	**FT50DSG**
FT13DV2S	**FT35DVM**	**FT35DSG**	**FT60DSG**
FT15DV2S			

Outdoor Unit

R09DV2S	**R25DV1**	**R25DSG**	**R50DSG**
R13DV2S	**R35DV1**	**R35DSG**	**R60DSG**
R15DV2S			

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 an item for which caution must be exercised.
The pictogram shows the item to which attention must be paid.

◯ This symbol indicates a prohibited action.
The prohibited item or action is shown inside or near the symbol.

● This symbol indicates an action that must be taken, or an instruction.
The instruction is shown inside 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 Caution in Repair

⚠ **Warning**	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can 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 discharges during the repair work, do not touch the discharging refrigerant gas. The refrigerant gas can cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release 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 can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can 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 can 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 can cause an electrical shock or fire.	

Caution	
Do not repair the electrical components with wet hands. Working on the equipment with wet hands can cause an electrical shock.	
Do not clean the air conditioner by splashing water. Washing the unit with water can 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.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the refrigerating cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the refrigerating cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

1.1.2 Cautions Regarding Products after Repair

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 can cause an electrical shock, excessive heat generation or fire.	
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 can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only
Be sure to use an exclusive power circuit for the equipment, and follow the 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 can cause an electrical shock or fire.	

Warning	
Be sure to use the specified cable to connect 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 can cause excessive heat generation or fire.	
When connecting the cable 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 can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (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 leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak 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 can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	
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 a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	For integral units only

1.1.3 Inspection after Repair

Warning	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire.	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can 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 can cause an electrical shock, excessive heat generation or fire.	

Caution	
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 can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	
Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 Mohm or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.1.4 Using 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:

1.1.5 Using Icons List

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 Function

1. Functions

Category	Functions	FT09DV2S R09DV2S	FT13DV2S R13DV2S	FT15DV2S R15DV2S	Category	Functions	FT09DV2S R09DV2S	FT13DV2S R13DV2S	FT15DV2S R15DV2S
Basic Function	Inverter (with Inverter Power Control)	—	—	—	Health & Clean	Air Purifying Filter with Bacteriostatic, Virustatic Functions	○	—	—
	Operation Limit for Cooling (°C)	19.4 ~46	19.4 ~46	19.4 ~46		Photocatalytic Deodorizing Filter	○	—	—
	Operation Limit for Heating (°C)	—	—	—		Air Purifying Filter with Photocatalytic Deodorizing Function	—	○	○
	PAM Control	—	—	—		Titanium Apatite Photocatalytic Air-Purifying Filter	—	—	—
Compressor	Oval Scroll Compressor	—	—	—		Longlife Filter	—	—	—
	Swing Compressor	—	—	—		Mold Proof Air Filter	○	○	○
	Rotary Compressor	○	○	○		Wipe-clean Flat Panel	○	○	○
	Reluctance DC Motor	—	—	—		Washable Grille	—	—	—
Comfortable Airflow	Power-Airflow Flap	—	—	—		Mold Proof Operation	—	—	—
	Power-Airflow Dual Flaps	○	○	○		Heating Dry Operation	—	—	—
						Good-Sleep Cooling Operation	—	—	—
	Power-Airflow Diffuser	—	—	—	Timer	24-Hour On/Off Timer	○	○	○
	Wide-Angle Louvers	○	○	○		Night Set Mode	○	○	○
	Vertical Auto-Swing (Up and Down)	○	○	○	Worry Free “Reliability & Durability”	Auto-Restart (after Power Failure)	○	○	○
	Horizontal Auto-Swing (Right and Left)	—	—	—		Self-Diagnosis (Digital, LED) Display	○★	○★	○★
	3-D Airflow	—	—	—		Wiring Error Check	—	—	—
	Comfort Airflow Mode	—	—	—		Anticorrosion Treatment of Outdoor Heat Exchanger	○	○	○
	3-Step Airflow (H/P Only)	—	—	—					
Comfort Control	Auto Fan Speed	○	○	○	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	—	—	—
	Indoor Unit Silent Operation	—	—	—					
	Night Quiet Mode (Automatic)	—	—	—		Flexible Voltage Correspondence	—	—	—
	Outdoor Unit Silent Operation (Manual)	—	—	—		High Ceiling Application	—	—	—
	Intelligent Eye	—	—	—		Chargeless	10m	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	—	—	—		Remote Control Adaptor (Normal Open-Pulse Contact) (Option)	○	○	○
	Programme Dry Function	○	○	○					
	Fan Only	○	○	○		Remote Control Adaptor (Normal Open Contact)(Option)	○	○	○
Lifestyle Convenience	New Powerful Operation (Non-Inverter)	○	○	○					
	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 ★ : Digital Only
— : No Functions

Category	Functions	FT25-35DVM R25-35DV1	FT25-35DSG R25-35DSG	Category	Functions	FT25-35DVM R25-35DV1	FT25-35DSG R25-35DSG
Basic Function	Inverter (with Inverter Power Control)	—	—	Health & Clean	Air Purifying Filter with Bacteriostatic, Virustatic Functions	—	—
	Operation Limit for Cooling (°C)	19.4 ~46	19.4 ~46		Photocatalytic Deodorizing Filter	—	—
	Operation Limit for Heating (°C)	—	—		Air Purifying Filter with Photocatalytic Deodorizing Function	○	○
	PAM Control	—	—		Titanium Apatite Photocatalytic Air-Purifying Filter	—	—
Compressor	Oval Scroll Compressor	—	—		Longlife Filter	—	—
	Swing Compressor	—	—		Mold Proof Air Filter	○	○
	Rotary Compressor	○	○		Wipe-clean Flat Panel	○	○
	Reluctance DC Motor	—	—		Washable Grille	—	—
Comfortable Airflow	Power-Airflow Flap	—	—		Mold Proof Operation	—	—
	Power-Airflow Dual Flaps	○	○		Heating Dry Operation	—	—
	Power-Airflow Diffuser	—	—		Good-Sleep Cooling Operation	—	—
	Wide-Angle Louvers	○	○	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	—	—		Wiring Error Check	—	—
	3-Step Airflow (H/P Only)	—	—		Anticorrosion Treatment of Outdoor Heat Exchanger	○	○
Comfort Control	Auto Fan Speed	○	○				
	Indoor Unit Silent Operation	—	—	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	○	—
	Night Quiet Mode (Automatic)	—	—				
	Outdoor Unit Silent Operation (Manual)	—	—		Flexible Voltage Correspondence	—	—
	Intelligent Eye	—	—		High Ceiling Application	—	—
	Quick Warming Function	—	—		Chargeless	10m	10m
	Hot-Start Function	—	—		Either Side Drain (Right or Left)	○	○
	Automatic Defrosting	—	—		Power Selection	—	—
Operation	Automatic Operation	—	—	Remote Control	5-Rooms Centralized Controller (Option)	○	○
	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 ★ : Digital Only

— : No Functions

Category	Functions	FT50DSG R50DSG	FT60DSG R60DSG	Category	Functions	FT50DSG R50DSG	FT60DSG R60DSG
Basic Function	Inverter (with Inverter Power Control)	—	—	Health & Clean	Air Purifying Filter with Bacteriostatic, Virustatic Functions	—	—
	Operation Limit for Cooling (°CDB)	19.4 ~46	–5 ~46		Photocatalytic Deodorizing Filter	—	—
	Operation Limit for Heating (°CWB)	—	—		Air Purifying Filter with Photocatalytic Deodorizing Function	○	○
	PAM Control	—	—		Titanium Apatite Photocatalytic Air-Purifying Filter	—	—
Compressor	Oval Scroll Compressor	—	—				
	Swing Compressor	—	○		Longlife Filter	—	—
	Rotary Compressor	○	—		Mold Proof Air Filter	○	○
	Reluctance DC Motor	—	—		Wipe-clean Flat Panel	○	○
Comfortable Airflow	Power-Airflow Flap	—	—		Washable Grille	—	—
	Power-Airflow Dual Flaps	○	○		Mold Proof Operation	—	—
	Power-Airflow Diffuser	—	—		Heating Dry Operation	—	—
	Wide-Angle Louvers	○	○		Good-Sleep Cooling Operation	—	—
	Vertical Auto-Swing (Up and Down)	○	○	Timer	24-Hour On/Off Timer	○	○
					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 Silent Operation	—	—				
	Night Quiet Mode (Automatic)	—	—	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	—	—
	Outdoor Unit Silent Operation (Manual)	—	—				
					Flexible Voltage Correspondence	—	—
	Intelligent Eye	—	—		High Ceiling Application	—	—
	Quick Warming Function	—	—		Chargeless	10m	10m
	Hot-Start Function	—	—		Either Side Drain (Right or Left)	○	○
	Automatic Defrosting	—	—		Power Selection	—	—
Operation	Automatic Operation	—	—	Remote Control	5-Rooms Centralized Controller (Option)	○	○
	Programme Dry Function	○	○				
	Fan Only	○	○		Remote Control Adaptor (Normal Open-Pulse Contact) (Option)	○	○
Lifestyle Convenience	New Powerful Operation (Non-Inverter)	○	○				
	Inverter Powerful Operation	—	—		Remote Control Adaptor (Normal Open Contact)(Option)	○	○
	Priority-Room Setting	—	—				
	Cooling / Heating Mode Lock	—	—		DIII-NET Compatible (Adaptor)(Option)	—	—
	Home Leave Operation	—	—				
	ECONO Mode	—	—	Remote Controller	Wireless	○	○
	Indoor Unit On/Off Switch	○	○		Wired	—	—
	Signal Reception Indicator	○	○				
	Temperature Display	—	—				
	Another Room Operation	—	—				

Note: ○ : Holding Functions ★ : Digital Only

— : No Functions

Part 2
Specifications

1. Specifications

50Hz 220V

Models	Indoor Units		FT09DV2S	FT13DV2S
	Outdoor Units		R09DV2S	R13DV2S
Capacity (Rated)		kW	2.6	3.70
		Btu/h	8,900	12,700
		kcal/h	2,240	3,200
Moisture Removal		L/h	1.2	1.9
Running Current (Rated)		A	3.94	5.17
Power Consumption (Rated)		W	810	1,105
Power Factor		%	93.4	97.2
COP (Rated)		W/W	3.21	3.35
Piping Connections	Liquid	mm	ϕ6.4	ϕ6.4
	Gas	mm	ϕ12.7	ϕ12.7
	Drain	mm	ϕ18.0	ϕ18.0
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Indoor Units			**FT09DV2S**	**FT13DV2S**
Front Panel Color			White	White
Air Flow Rate	m³/min (cfm)	H	8.8(311)	11(388)
		M	7.4(261)	8.9(314)
		L	5.9(208)	6.8(240)
Fan	Type		Cross Flow Fan	Cross Flow Fan
	Motor Output	W	18	40
	Speed	Steps	5 Steps, Auto	5 Steps, Auto
Air Direction Control			Right, Left, Horizontal, Downward	Right, Left, Horizontal, Downward
Air Filter			Removable/Washable/Mildew Proof	Removable/Washable/Mildew Proof
Running Current		A	0.17	0.19
Power Consumption		W	35	40
Power Factor		%	93.6	95.7
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (H×W×D)		mm	283×800×195	283×800×195
Packaged Dimensions (H×W×D)		mm	265×855×340	265×855×340
Weight		kg	9	9
Gross Weight		kg	12	12
Operation Sound	H/L	dBA	36/28	42/31
Outdoor Units			**R09DV2S**	**R13DV2S**
Casing Color			Ivory White	Ivory White
Compressor	Type		Hermetically Sealed Rotary Type	Hermetically Sealed Rotary Type
	Model		RC30BV1R2T	RH207VHST
	Motor Output	W	700	1,000
Refrigerant Oil	Type		SUNISO 4GSD. I.	DIAMOND MS56
	Charge	L	0.4	0.52
Refrigerant	Type		R22	R22
	Charge	kg	1.25	1.15
Air Flow Rate		m³/min	28	28
		cfm	986	988
Fan	Type		Propeller	Propeller
	Motor Output	W	27	27
Running Current (Rated)		A	3.77	4.98
Power Consumption (Rated)		W	775	1,065
Power Factor		%	93.4	97.2
Starting Current		A	20	23
Dimensions (H×W×D)		mm	540×750×270	540×750×270
Packaged Dimensions (H×W×D)		mm	609×940×360	609×940×360
Weight		kg	33	38
Gross Weight		kg	37	42
Operation Sound		dBA	48	48
Drawing No.			3D048874	3D049255

Note:

- MAX. interunit piping length: 25m
- MAX. interunit height difference: 15m
- Amount of additional charge of refrigerant 20g/m for piping length exceeding 10m
- The data are based on the conditions shown in the table below.

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

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

50Hz 220V

Models	Indoor Units		FT15DV2S
	Outdoor Units		R15DV2S
Capacity (Rated)		kW	4.2
		Btu/h	14,400
		kcal/h	3,620
Moisture Removal		L/h	1.9
Running Current (Rated)		A	5.88
Power Consumption (Rated)		W	1,270
Power Factor		%	98.2
COP (Rated)		W/W	3.31
Piping Connections	Liquid	mm	ϕ6.4
	Gas	mm	ϕ12.7
	Drain	mm	ϕ18.0
Heat Insulation			Both Liquid and Gas Pipes
Indoor Units			**FT15DV2S**
Front Panel Color			White
Air Flow Rate	m³/min (cfm)	H	18.5(653)
		M	15.1(533)
		L	11.6(409)
Fan	Type		Cross Flow Fan
	Motor Output	W	43
	Speed	Steps	5 Steps, Auto
Air Direction Control			Right, Left, Horizontal, Downward
Air Filter			Removable/Washable/Mildew Proof
Running Current		A	0.23
Power Consumption		W	50
Power Factor		%	98.8
Temperature Control			Microcomputer Control
Dimensions (HxWxD)		mm	290x1,050x238
Packaged Dimensions (HxWxD)		mm	337x1,147x366
Weight		kg	12
Gross Weight		kg	17
Operation Sound	H/L	dBA	45/34
Outdoor Units			**R15DV2S**
Casing Color			Ivory White
Compressor	Type		Hermetically Sealed Rotary Type
	Model		RC46AV1TRT
	Motor Output	W	1,100
Refrigerant Oil	Type		SUNISO 4GSD. I.
	Charge	L	0.5
Refrigerant	Type		R22
	Charge	kg	1.25
Air Flow Rate		m³/min	28
		cfm	988
Fan	Type		Propeller
	Motor Output	W	27
Running Current (Rated)		A	5.65
Power Consumption (Rated)		W	1,220
Power Factor		%	98.1
Starting Current		A	29
Dimensions (HxWxD)		mm	540x750x270
Packaged Dimensions (HxWxD)		mm	609x940x360
Weight		kg	37
Gross Weight		kg	41
Operation Sound		dBA	48
Drawing No.			3D049256

Note:

- MAX. interunit piping length: 25m
- MAX. interunit height difference: 15m
- Amount of additional charge of refrigerant 20g/m for piping length exceeding 10m
- The data are based on the conditions shown in the table below.

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

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

50Hz 220/240V

Models	**Indoor Units**		**FT25DVM**	**FT35DVM**
	Outdoor Units		**R25DV1**	**R35DV1**
			Cooling	Cooling
Capacity		kW	2.62 / 2.62	3.58 / 3.58
		Btu/h	8,900 / 8,900	1,2200 / 1,2200
		kcal/h	2,250 / 2,250	3,050 / 3,050
Moisture Removal		L/h	1.2	1.9
Running Current		A	3.94 / 4.25	5.52 / 5.45
Power Consumption		W	815 / 880	1,120 / 1,190
Power Factor		%	94.0 / 86.3	92.2 / 91.0
COP		W/W	3.21 / 2.98	3.20 / 3.01
Piping Connections	Liquid	mm	ϕ6.4	ϕ6.4
	Gas	mm	ϕ9.5	ϕ12.7
	Drain	mm	ϕ18.0	ϕ18.0
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Indoor Units			**FT25DVM**	**FT35DVM**
Front Panel Color			White	White
Air Flow Rate	m³/min (cfm)	H	8.8 (311)	9.9 (350)
		M	7.4 (261)	8.3 (293)
		L	5.9 (208)	6.8 (240)
Fan	Type		Cross Flow Fan	Cross Flow Fan
	Motor Output	W	18	18
	Speed	Steps	5 Steps, Auto	5 Steps, Auto
Air Direction Control			Right, Left, Horizontal, Downward	Right, Left, Horizontal, Downward
Air Filter			Removable / Washable / Mildew Proof	Removable / Washable / Mildew Proof
Running Current		A	0.17 / 0.15	0.19 / 0.17
Power Consumption		W	35 / 35	40 / 40
Power Factor		%	93.6 / 97.2	95.7 / 98.0
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (H×W×D)		mm	283×800×195	283×800×195
Packaged Dimensions (H×W×D)		mm	265×855×340	265×855×340
Weight		kg	9	9
Gross Weight		kg	12	12
Operation Sound	H/L	dBA	36 / 28	39 / 31
Outdoor Units			**R25DV1**	**R35DV1**
Casing Color			Ivory White	Ivory White
Compressor	Type		Hermetically Sealed Rotary Type	Hermetically Sealed Rotary Type
	Model		RC30BV1R2T	RC46AV1TRT
	Motor Output	W	700	1,100
Refrigerant Oil	Type		SUNISO 4GSD.I.	SUNISO 4GSD.I.
	Charge	L	0.4	0.5
Refrigerant	Type		R22	R22
	Charge	kg	0.76	0.95
Air Flow Rate	m³/min		28 /30	26.5 / 28
	cfm		988 /1,059	935 / 988
Fan	Type		Propeller	Propeller
	Motor Output	W	25	25
Running Current		A	3.77 / 4.1	5.33 / 5.28
Power Consumption		W	780 / 845	1,080 / 1,150
Power Factor		%	94.0 / 85.9	92.1 / 90.8
Starting Current		A	19 / 21	26 / 28
Dimensions (H×W×D)		mm	560×695×265	560×695×265
Packaged Dimensions (H×W×D)		mm	599×797×310	599×797×310
Weight		kg	27	33
Gross Weight		kg	30	35
Operation Sound		dBA	H : 46 / 48	H : 48 /49
Drawing No.			3D049542	3D049543A

Note:

- MAX. interunit piping length: 25m
- MAX. interunit height difference: 15m
- Amount of additional charge of refrigerant 20g/m for piping length exceeding 10m
- The data are based on the conditions shown in the table below.

Cooling	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	5.0m

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

50Hz 230V

Models	Indoor Units			FT25DSG	FT35DSG
	Outdoor Units			R25DSG	R35DSG
Capacity (Rated)			kW	2.65	3.7
			Btu/h	9,000	12,600
			kcal/h	2,270	3,180
Moisture Removal			L/h	1.2	1.9
Running Current (Rated)			A	4.09	5.23
Power Consumption (Rated)			W	850	1,150
Power Factor			%	90.4	95.6
COP (Rated)			W/W	3.12	3.22
Piping Connections	Liquid		mm	ϕ6.4	ϕ6.4
	Gas		mm	ϕ12.7	ϕ12.7
	Drain		mm	ϕ18.0	ϕ18.0
Heat Insulation				Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Indoor Units				**FT25DSG**	**FT35DSG**
Front Panel Color				White	White
Air Flow Rate		m^3/min (cfm)	H	8.8(311)	11.0(388)
			M	7.4(261)	8.9(314)
			L	5.9(208)	6.8(240)
Fan	Type			Cross Flow Fan	Cross Flow Fan
	Motor Output		W	18	40
	Speed		Steps	5 Steps, Auto	5 Steps, Auto
Air Direction Control				Right, Left, Horizontal, Downward	Right, Left, Horizontal, Downward
Air Filter				Removable/Washable/Mildew Proof	Removable/Washable/Mildew Proof
Running Current			A	0.16	0.18
Power Consumption			W	35	40
Power Factor			%	95.1	96.6
Temperature Control				Microcomputer Control	Microcomputer Control
Dimensions (HxWxD)			mm	283x800x195	283x800x195
Packaged Dimensions (HxWxD)			mm	265x855x340	265x855x340
Weight			kg	9	9
Gross Weight			kg	12	12
Operation Sound	H/L		dBA	36/28	42/31
Outdoor Units				**R25DSG**	**R35DSG**
Casing Color				Ivory White	Ivory White
Compressor	Type			Hermetically Sealed Rotary Type	Hermetically Sealed Rotary Type
	Model			RC30BV1R2T	RH207VHST
	Motor Output		W	700	1,000
Refrigerant Oil	Type			SUNISO 4GSD. I.	DIAMOND MS56
	Charge		L	0.4	0.52
Refrigerant	Type			R22	R22
	Charge		kg	1.25	1.15
Air Flow Rate			m^3/min	28.5	28.5
			cfm	1,006	1,006
Fan	Type			Propeller	Propeller
	Motor Output		W	27	27
Running Current (Rated)			A	3.93	5,05
Power Consumption (Rated)			W	815	1,110
Power Factor			%	90.2	95.6
Starting Current			A	20	23
Dimensions (HxWxD)			mm	540x750x270	540x750x270
Packaged Dimensions (HxWxD)			mm	609x940x360	609x940x360
Weight			kg	33	38
Gross Weight			kg	37	42
Operation Sound			dBA	48	48
Drawing No.				3D049520	3D049521

Note:

- MAX. interunit piping length: 25m
- MAX. interunit height difference: 15m
- Amount of additional charge of refrigerant 20g/m for piping length exceeding 10m
- The data are based on the conditions shown in the table below.

Cooling	Piping Length
Indoor ; 27°CDB/19°CWB Outdoor ; 35°CDB/24°CWB	5.0m

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

50Hz 230V

Models	**Indoor Units**		**FT50DSG**	**FT60DSG**
	Outdoor Units		**R50DSG**	**R60DSG**
Capacity (Rated)		kW	5.3	5.9
		Btu/h	18,090	20,140
		kcal/h	4,560	5,070
Moisture Removal		L/h	2.9	3.9
Running Current (Rated)		A	7.31	8.0
Power Consumption (Rated)		W	1,650	1,800
Power Factor		%	98.1	97.8
COP (Rated)		W/W	3.21	3.28
Piping Connections	Liquid	mm	ϕ 6.4	ϕ 9.5
	Gas	mm	ϕ15.9	ϕ15.9
	Drain	mm	ϕ18.0	ϕ18.0
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Indoor Units			**FT50DSG**	**FT60DSG**
Front Panel Color			White	White
Air Flow Rate	m³/min (cfm)	H	18.5 (653)	17.9 (632)
		M	15.1 (533)	15.0 (528)
		L	11.9 (420)	12.4 (437)
Fan	Type		Cross Flow Fan	Cross Flow Fan
	Motor Output	W	43	43
	Speed	Steps	5 Steps, Auto	5 Steps, Silent, Auto
Air Direction Control			Right, Left, Horizontal, Downward	Right, Left, Horizontal, Downward
Air Filter			Removable/Washable/Mildew Proof	Removable/Washable/Mildew Proof
Running Current		A	0.18	0.22
Power Consumption		W	40	50
Power Factor		%	96.6	98.8
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (HxWxD)		mm	290x1,050x238	290x1,050x238
Packaged Dimensions (HxWxD)		mm	337x1,147x366	337x1,147x366
Weight		kg	12	12
Gross Weight		kg	17	17
Operation Sound	H/M/L	dBA	45/41/35	46/42/37
Outdoor Units			**R50DSG**	**R60DSG**
Casing Color			Ivory White	Ivory White
Compressor	Type		Hermetically Sealed Rotary Type	Hermetically Sealed Swing Type
	Model		RC60V1TNRT	2YC45ZXD
	Motor Output	W	1,500	1,900
Refrigerant Oil	Type		SUNISO 4GSD. I.	SUNISO 4GSD. I.
	Charge	L	0.85	0.75
Refrigerant	Type		R22	R22
	Charge	kg	1.35	1.70
Air Flow Rate	m³/min (cfm)	H	40.0 (1,412)	51.5 (1,818)
		L	— (—)	41.5 (1,465)
Fan	Type		Propeller	Propeller
	Motor Output	W	53	53
Running Current (Rated)		A	7.13	7.78
Power Consumption (Rated)		W	1,610	1,750
Power Factor		%	98.2	97.8
Starting Current		A	33.5	8.0
Dimensions (HxWxD)		mm	685x800x300	735x825x300
Packaged Dimensions (HxWxD)		mm	732x955x390	784x960x390
Weight		kg	49	54
Gross Weight		kg	54	59
Operation Sound	H	dBA	54	52
Drawing No.			3D048631	3D048630A

Note:
- MAX. interunit piping length: 30m
- MAX. interunit height difference: 15m
- Amount of additional charge of refrigerant for piping length exceeding 10m : 20 g/m (50class), 50g/m (60 class)
- The data are based on the conditions shown in the table below.

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

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

Part 3
Printed Circuit Board Connector Wiring Diagram

1. Printed Circuit Board Connector Wiring Diagram

1.1 Indoor Unit

1.1.1 FT25/35DVM, FT25DSG, FT09DV2S

Connectors

PCB (1) (Control PCB)

1)	S1	Connector for AC fan motor
2)	S6	Connector for swing motor (horizontal blades)
3)	S7	Connector for AC fan motor (Hall IC)
4)	S21	Connector for centralized control (HA)
5)	S26	Connector for display PCB
6)	S28	Connector for signal receiver PCB
7)	S32	Connector for heat exchanger thermistor

PCB (2) (Signal Receiver PCB)

1)	S29	Connector for control PCB

PCB (3) (Display PCB)

1)	S27	Connector for control PCB

Note: Other designations

PCB (1) (Control PCB)

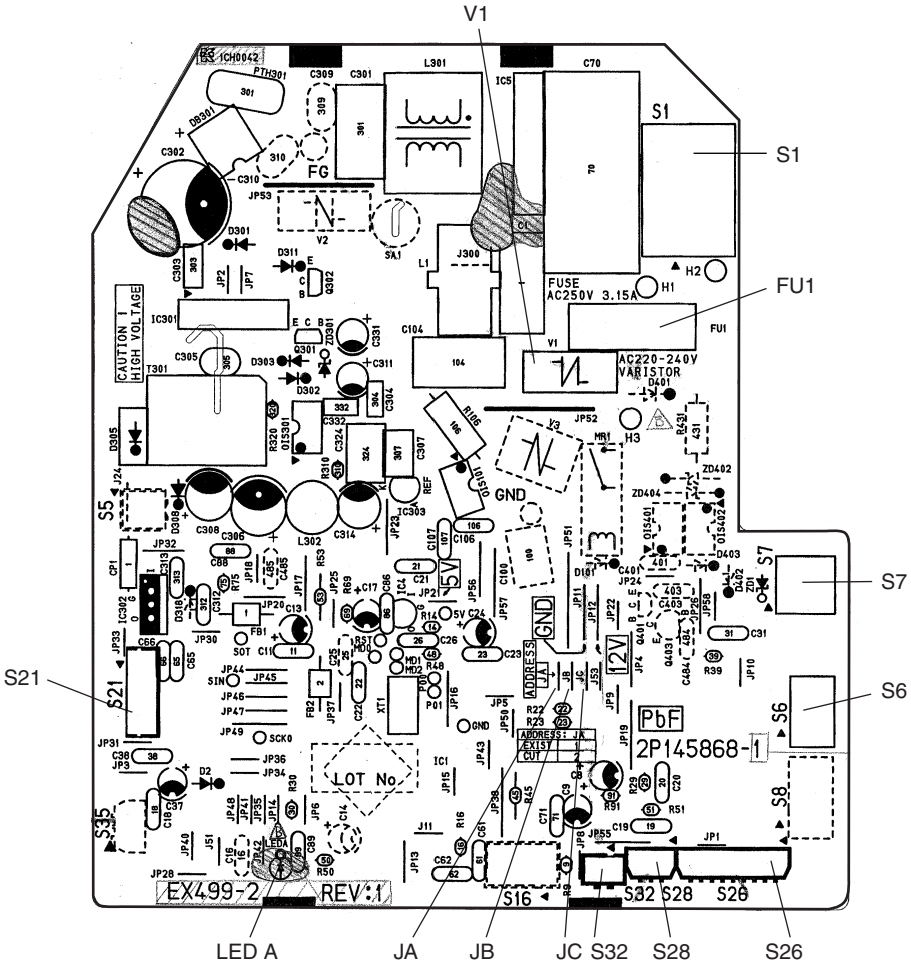
1)	V1	Varistor
2)	JA	Address setting jumper
	JB	Fan speed setting when compressor is OFF on thermostat
	JC	Power failure recovery function (auto-restart)
		∗ Refer to page 235 for detail.
3)	LED A	LED for service monitor (green)
4)	FU1	Fuse (3.15A)

PCB (3) (Display PCB)

1)	SW1	Forced operation ON / OFF switch
2)	LED1	LED for operation (green)
3)	LED2	LED for timer (yellow)
4)	RTH1	Room temperature thermistor

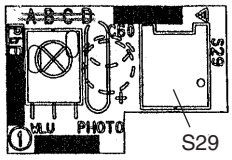
PCB Detail

PCB(1): Control PCB



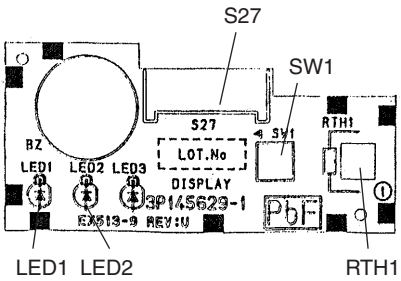
(R4826)

PCB(2): Signal Receiver PCB



(R4289)

PCB(3): Display PCB



(R4827)

1.1.2 FT35DSG, FT13DV2S

Connectors

PCB (1) (Control PCB)

1) S1 Connector for DC fan motor
2) S6 Connector for swing motor (horizontal blades)
3) S21 Connector for centralized control (HA)
4) S26 Connector for display PCB
5) S28 Connector for signal receiver PCB
6) S32 Connector for heat exchanger thermistor

PCB (2) (Signal Receiver PCB)

1) S29 Connector for control PCB

PCB (3) (Display PCB)

1) S27 Connector for control PCB

Note: Other designations

PCB (1) (Control PCB)

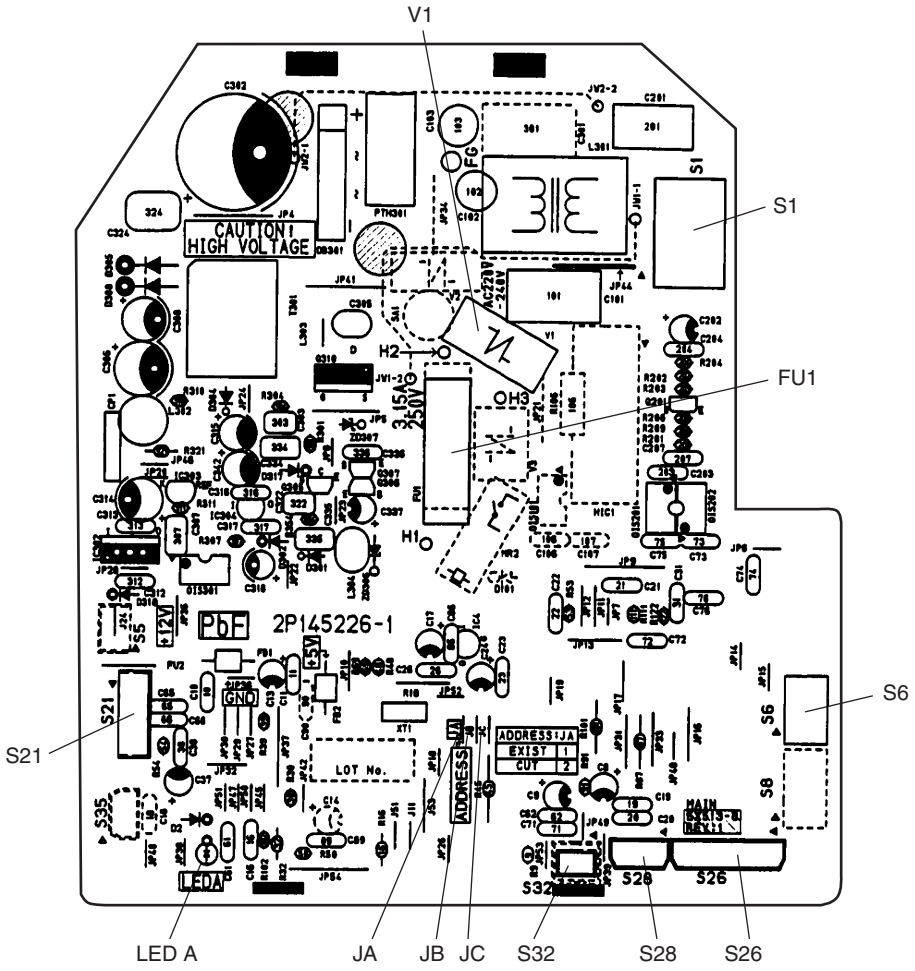
1) V1 Varistor
2) JA Address setting jumper
   JB Fan speed setting when compressor is OFF on thermostat
   JC Power failure recovery function (auto-restart)
   ∗ Refer to page 235 for detail.
3) LED A LED for service monitor (green)
4) FU1 Fuse (3.15A)

PCB (3) (Display PCB)

1) SW1 Forced operation ON / OFF switch
2) LED1 LED for operation (green)
3) LED2 LED for timer (yellow)
4) RTH1 Room temperature thermistor

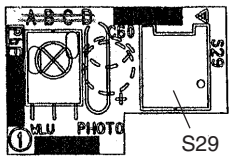
PCB Detail

PCB(1): Control PCB



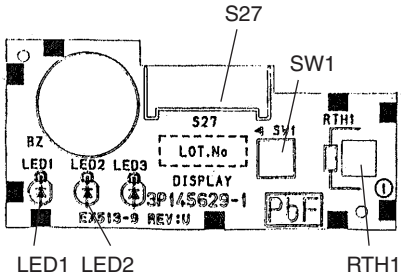
(R4828)

PCB(2): Signal Receiver PCB



(R4289)

PCB(3): Display PCB



(R4829)

1.1.3 FT15DV2S, FT50/60DSG

Connectors

PCB (1) (Control PCB)

1)	S1	Connector for DC fan motor
2)	S6	Connector for swing motor (horizontal blades)
3)	S8	Connector for swing motor (vertical blades) (FT50/60DSG model)
4)	S21	Connector for centralized control (HA)
5)	S26	Connector for buzzer PCB
6)	S28	Connector for signal receiver PCB
7)	S32	Connector for heat exchanger thermistor
8)	H1, H2, H3	Connector for terminal strip

PCB (2) (Signal Receiver PCB)

1)	S29	Connector for control PCB

PCB (3) (Buzzer PCB)

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

PCB (4) (Display PCB)

1)	S37	Connector for buzzer PCB

Note: Other designations

PCB (1) (Control PCB)

1)	V1, V2	Varistor
2)	JA	Address setting jumper
	JB	Fan speed setting when compressor is OFF on thermostat
	JC	Power failure recovery function
		∗ Refer to page 235 for detail.
3)	FU1	Fuse (3.15A)
4)	LED A	LED for service monitor (green)

PCB (2) (Signal Receiver PCB)

1)	SW1	ON/OFF switch

PCB (3) (Buzzer PCB)

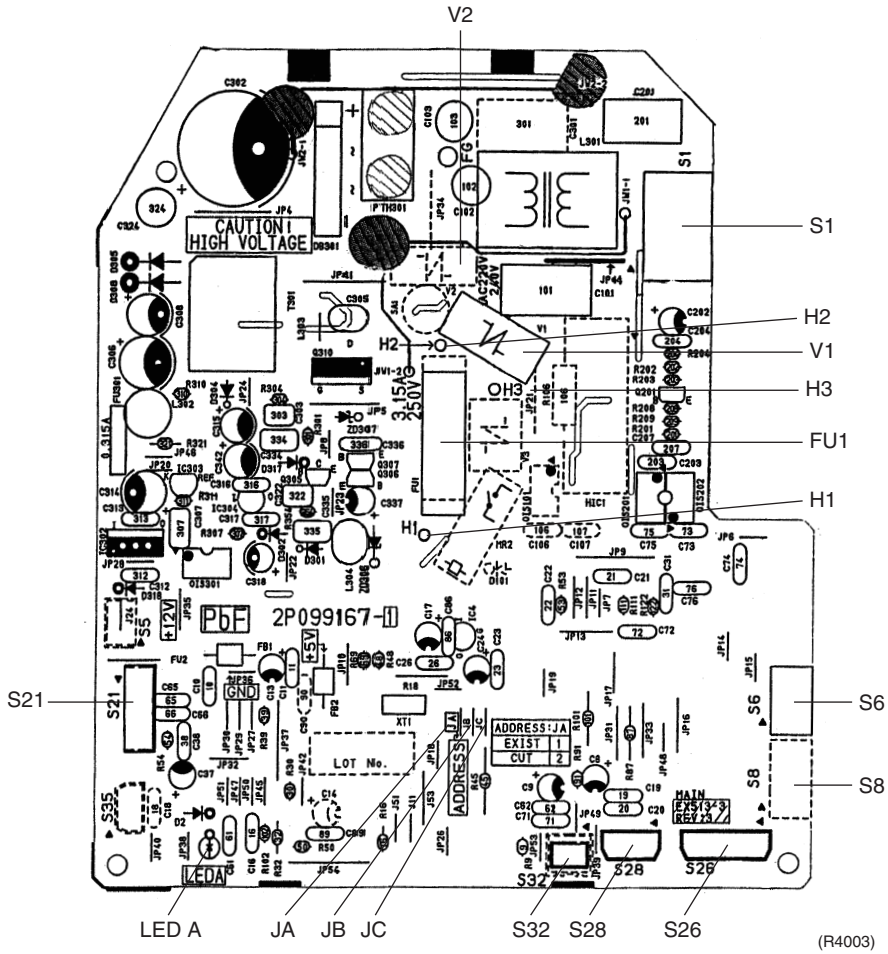
1)	RTH1	Room temperature thermistor

PCB (4) (Display PCB)

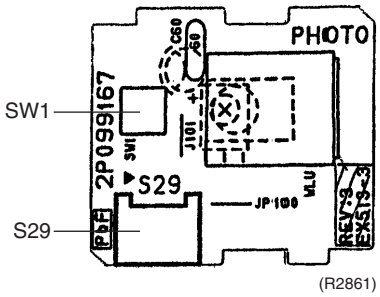
1)	LED1	LED for operation (green)
2)	LED2	LED for timer (yellow)

PCB Detail

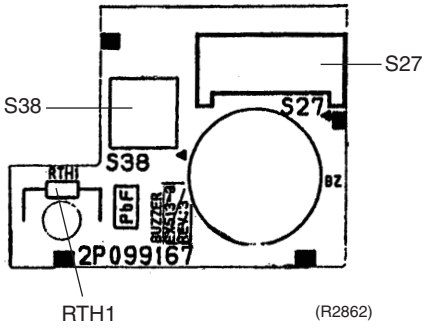
PCB(1): Control PCB



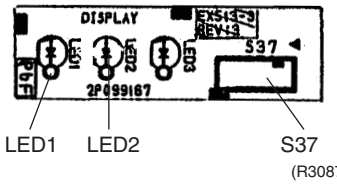
PCB(2): Signal Receiver PCB



PCB(3): Buzzer PCB



PCB(4): Display PCB



1.2 Outdoor Unit

1.2.1 R60DSG

Connectors

PCB (1)(Control PCB)

1)	S10, AC2	Connector for terminal strip
2)	S20	Connector for electronic expansion valve coil
3)	S31, S32	Connector for SPM
4)	S33, S71	Connector for MID
5)	S40	Connector for overload protector
6)	S51, S101	Connector for service monitor PCB
7)	S90	Connector for thermistors (outdoor air, heat exchanger, and discharge pipe)
8)	S91	Connector for fin thermistor
9)	AC1, E	Connector for power supply PCB
10)	H1, H2	Connector for diode bridge

PCB (2)(Power Supply PCB)

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

PCB (3)(Service Monitor PCB)

1)	S52, S102	Connector for control PCB

MID

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

SPM

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

Note: Other Designations

PCB (1)(Control PCB)

1)	FU2	Fuse (3.15A)

PCB (2)(Power Supply PCB)

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

PCB (3)(Service Monitor PCB)

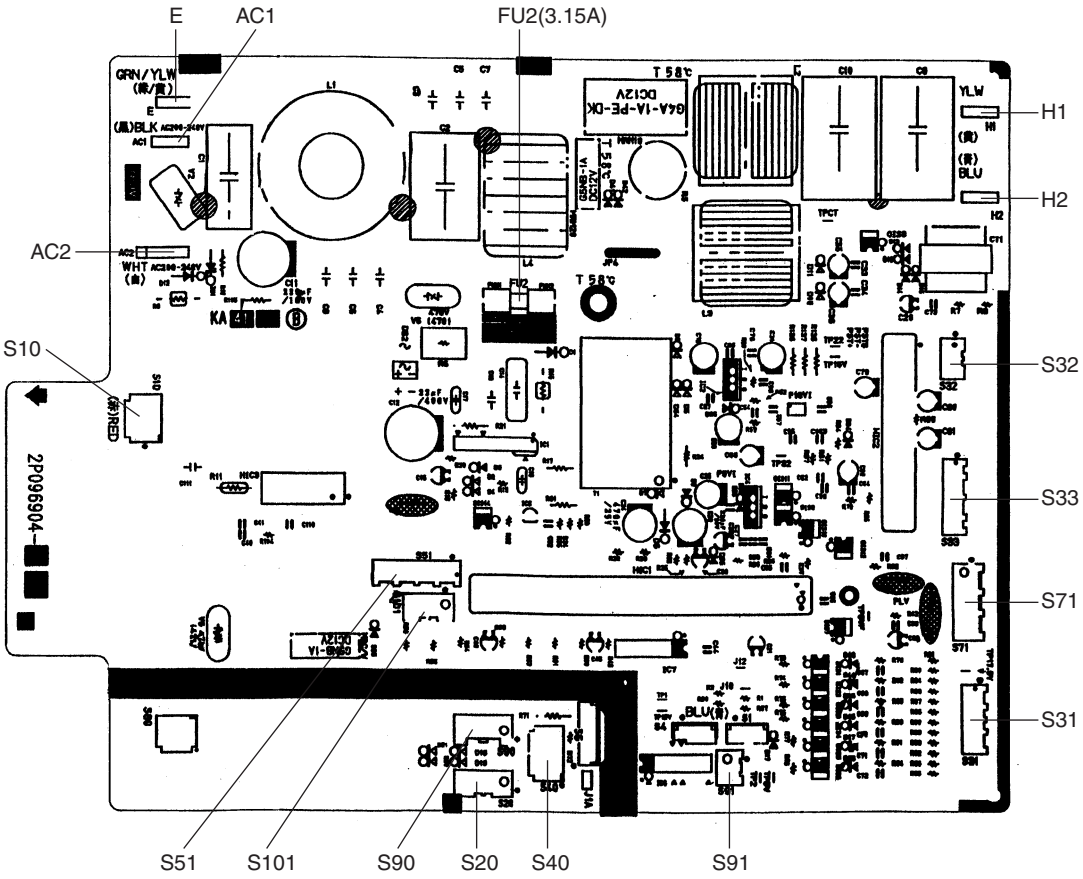
1)	LED A	Service monitor LED
2)	SW1	Forced operation ON/OFF switch

MID

1)	FU201	Fuse (3.15A)

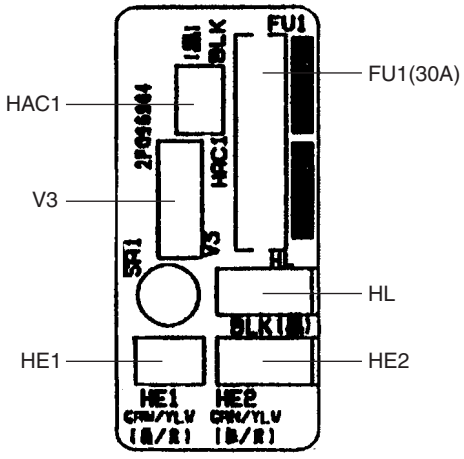
PCB Detail

PCB(1): Control PCB (outdoor unit)



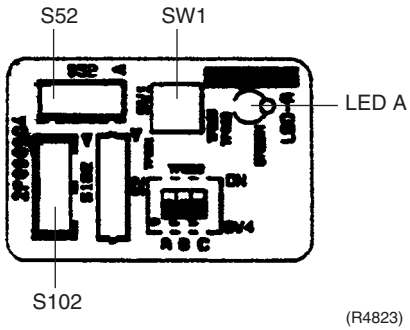
(R2865)

PCB(2): Power Supply PCB



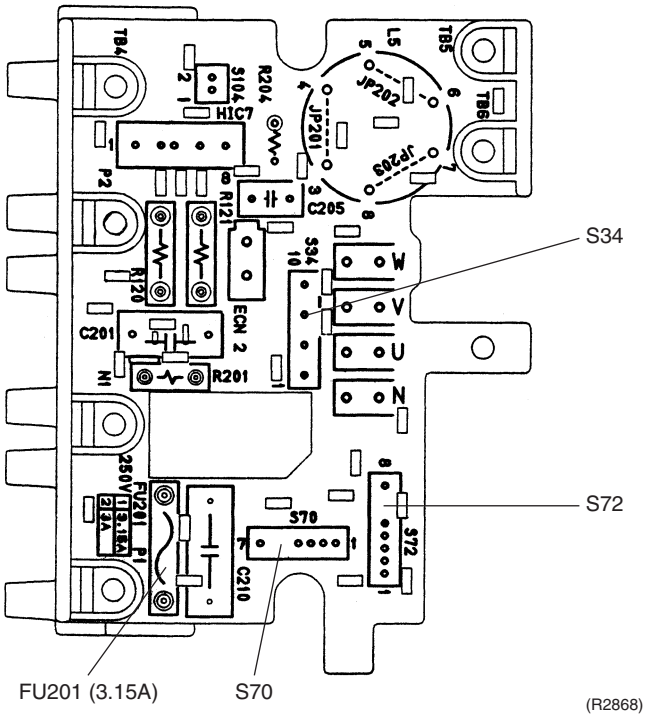
(R2866)

Service Monitor PCB

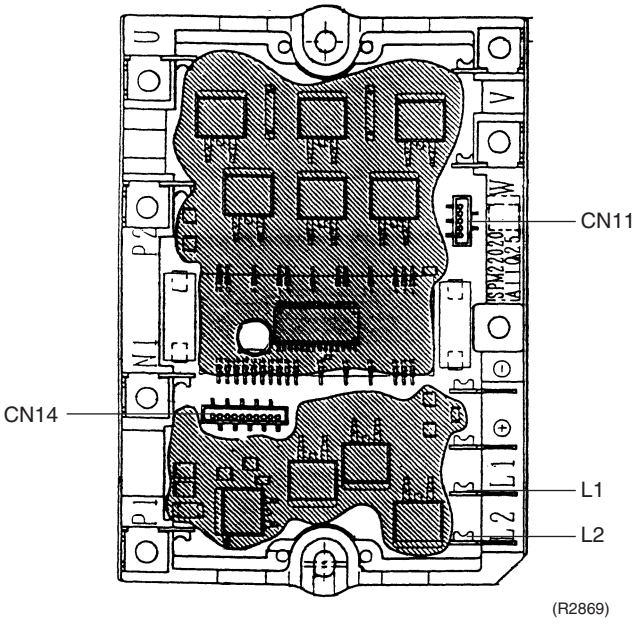


(R4823)

MID



SPM



Part 4
Details of Functions

1. Functions of FT25/35/50D, FT09/13/15D Models

1.1 Air Flow 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 and dry mode.

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.

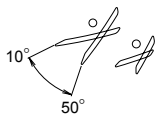
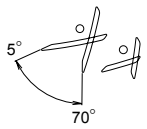
Wide-Angle Louvres

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

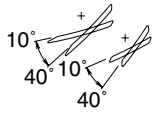
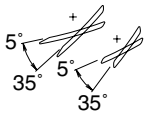
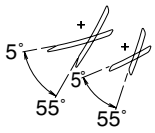
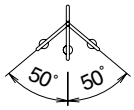
Auto-Swing

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

In case of FT25/35D, FT09/13D

Vertical Swing (up and down)		Horizontal Swing (right and left: manual)
Cooling / Dry	Fan	
 (R4281)	 (R4283)	 (R4284)

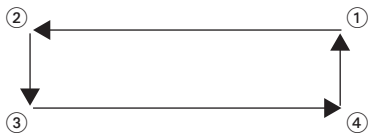
In case of FT50D, FT15D

Vertical Swing (up and down)			Horizontal Swing (right and left)
Cooling	Dry	Fan	
 (R2814)	 (R2815)	 (R2816)	 (R2817)

3-D Airflow

FT50DSG

- Alternative repetition of vertical and horizontal swing motions enables uniform air-conditioning of the entire room. This function is effective for starting the air conditioner.
- When the horizontal swing and vertical swing are both set to auto mode, the airflow become 3-D airflow and the horizontal swing and vertical swing motions are alternated. The order of swing motion is such that it turns counterclockwise, starting from the right upper point as viewed to the front side of the indoor unit.



(R1024)

1.2 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 rotation speed control, or phase and Hall IC control.

For more information about Hall IC, refer to trouble shooting for fan motor on page 109.

Fan Speed Steps

Fan speed control contains 7 steps: LLL, LL, L, ML, M, MH, H.

Step	Cooling	Dry mode
LLL	 (R4830)	940 - 970 rpm (During powerful operation : 990 - 1020 rpm)
LL		
L		
ML		
M		
MH		
H		

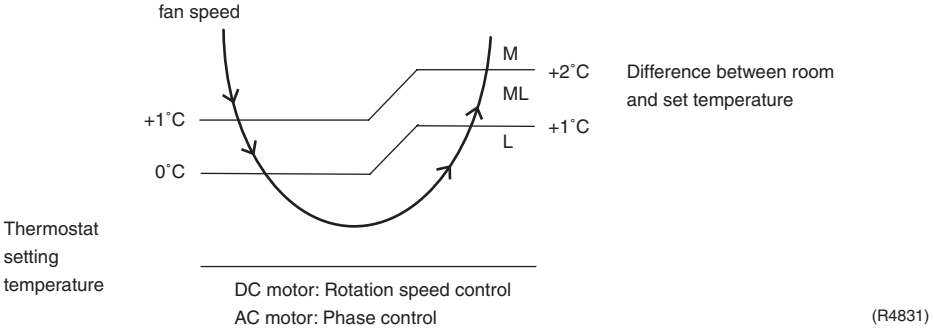
= Within this range the airflow rate is automatically controlled when the FAN setting button is set to automatic.

Note:

1. During powerful operation, fan rotates at H tap + 80 rpm.
2. In time of cooling thermostat OFF, the fan keeps rotating at the set tap.

Automatic Air Flow Control for Cooling

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



1.3 Thermostat Control

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

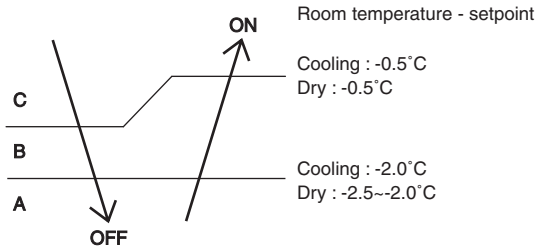
Thermostat OFF Condition

- 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.)

Cooling / Dry



(R4668)

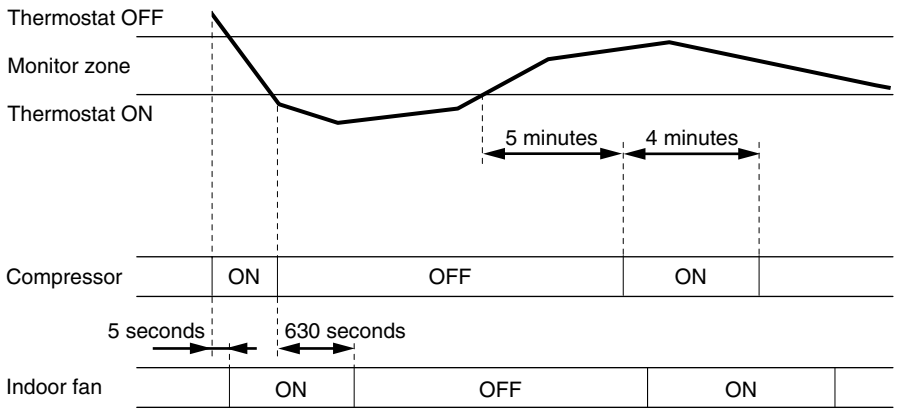
1.4 Programme Dry Function

By the function of the microcomputer, programme dry operation reduces the humidity keeping the temperature in a minimum drop. Room temperature and air flow rate can not be controlled by the adjusting buttons because they are controlled automatically. When the program dry function starts, dry operation is provided, and then it repeats 5-minute suspension and 4-minute dry operation alternately. When the room temperature rises, it repeats the above process from the beginning.

Room temperature at starting of programme dry operation	Program dry activating temperature ∗1	Differential ∗2
Above 24°C	Room temperature at starting of programme dry operation	2.0 deg
18°C ~ 24°C	Room temperature at starting of programme dry operation	1.5 deg
Below 18°C	18°C	1.0 deg

∗1 Dry operation activating (compressor ON) temperature

∗2 Room temperature difference between activation and suspension of dry operation



Note:
1. The programme dry function is not operated when the room temperature is at 18°C or less.
2. In monitoring operation, fan rotates 5 seconds after the compressor starts its operation.

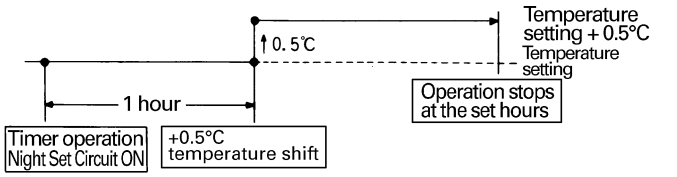
1.5 NIGHT SET Mode

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

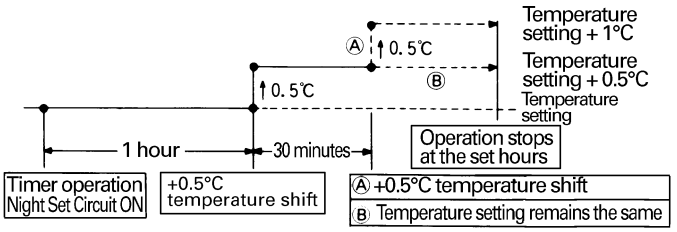
The NIGHT SET circuit continues cooling the room at the set temperature for the first one hour, then automatically raises the temperature setting slightly for economical operations. This prevents excessive cooling to ensure comfortable sleeping conditions, and also conserves electricity.

Cooling Operation



(R4421)

In case of FT50DSG



Ⓐ : ● When outside temperature is normal and room temperature is at set temperature.
Ⓑ : ● When outside temperature is high (27°C or higher).

(R1361)

1.6 POWERFUL Operation

Outline

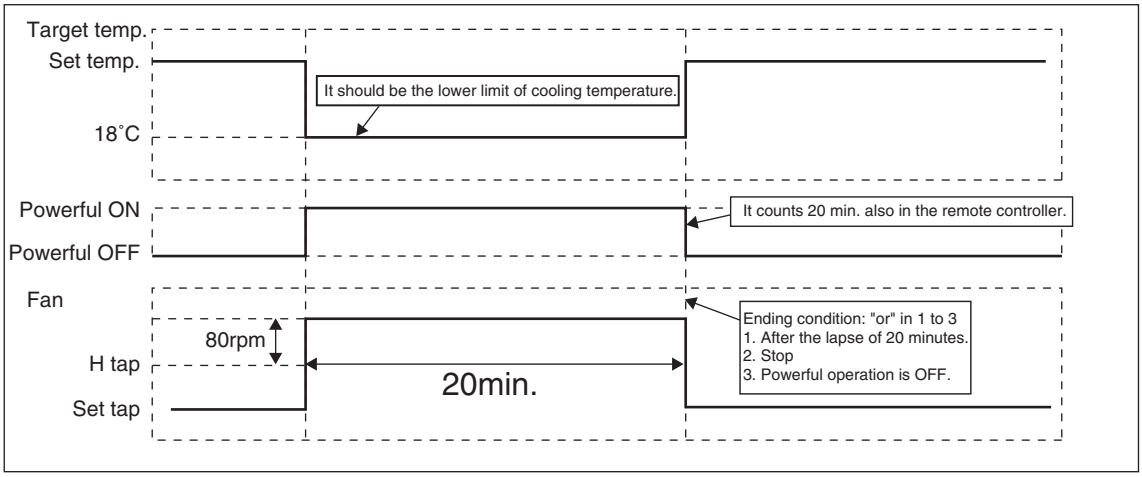
In order to exploit the cooling capacity to full extent, operate the air conditioner by increasing the indoor fan rotating speed and the compressor frequency.

Details of the Control

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

Operation mode	Fan speed	Target set temperature
COOL	H tap + 80 rpm	18°C
DRY	990 ~ 1020 rpm	Normally targeted temperature in dry operation; Approx. –3°C
FAN	H tap + 80 rpm	—

Ex.) : Powerful operation in cooling mode.



(R4832)

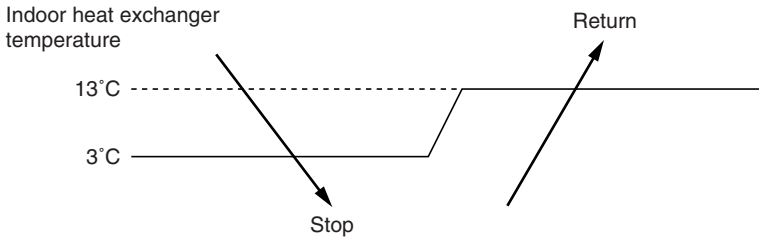
1.7 Freeze-up Protection Control

When the indoor heat exchanger temperature falls below 3°C in cooling or in dry operation,

- the compressor and the outdoor fan are forced to turn OFF.
- the indoor fan rotates at the L tap (in cooling operation) or LL tap (in dry operation).

Note that this function is not activated for 6 minutes after compressor turns ON.

When the indoor heat exchanger reaches 13 °C, the compressor and the outdoor fan restart the operations.



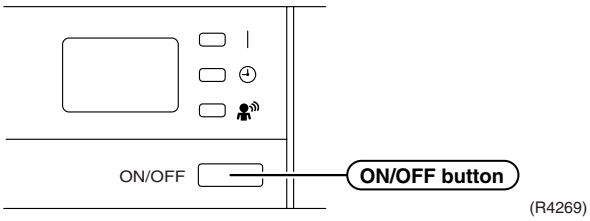
1.8 Other Functions

1.8.1 Signal Receiving Sign

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

1.8.2 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.



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

Mode	Temperature setting	Air flow rate
COOL	22°C	AUTO

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

1.8.3 Mold Proof Air Filter

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

1.8.4 Photocatalytic Deodorizing Filter

Photocatalytic Deodorizing Filter demonstrates powerful oxidation characteristics when subjected to harmless ultraviolet light. Photocatalytic deodorizing power is recovered simply by exposing the filter to the sun for 6 hours once every 6 months.

1.8.5 Air-Purifying Filter

A double structure made up of a bacteriostatic filter and an Air-Purifying Filter traps dust, mildew, mites, tobacco smoke, and allergy-causing pollen. Replace the Air-Purifying Filter once every 3 months.

1.8.6 Air Purifying Filter with Photocatalytic Deodorizing Function

This filter incorporates the benefits the Air Purifying Filter and Photocatalytic Deodorizing Filter in a single unit. Combining the two filters in this way increases the active surface area of the new filter. This larger surface area allows the filter to effectively trap microscopic particles, decompose odours and deactivate bacteria and viruses even for the high volume of air required to air-condition large living rooms. The filter can be used for approximately 3 years if periodic maintenance is performed.

1.8.7 Self-Diagnosis Digital Display

The microcomputer continuously monitors 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.

1.8.8 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-minutes standby function is activated.

2. Functions of FT60D Model

2.1 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

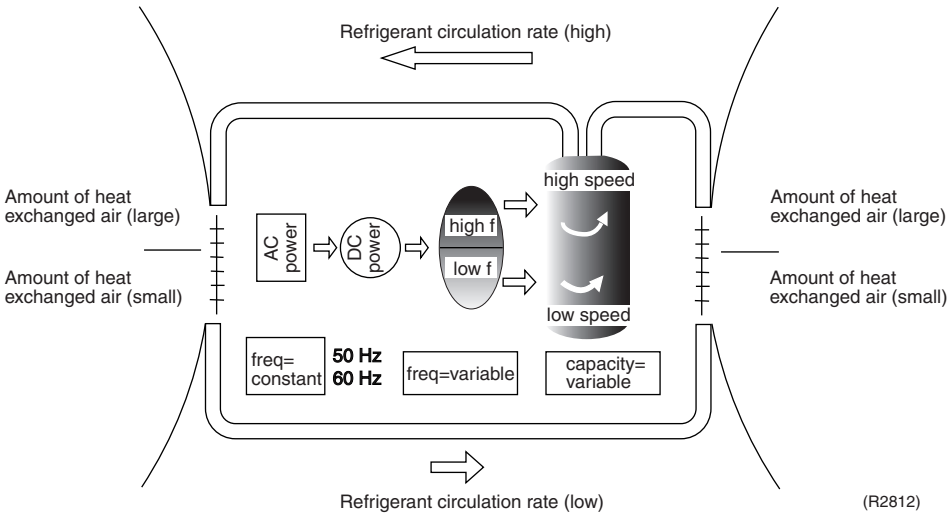
Inverter Principle

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 outside temperature and cooling load.
- Quick cooling
  The compressor rotational speed is increased when starting cooling. This enables a quick set temperature.
- 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 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
High	■ Input current control. Refer to page 44. ■ Compressor protection function. Refer to page 43. ■ Freeze-up protection control. Refer to page 44.

Forced Cooling Operation

For more information, refer to “Forced operation mode” on page 50.

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

Power-airflow Dual Flaps

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

Cooling Mode

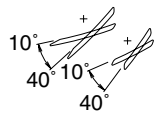
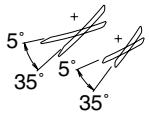
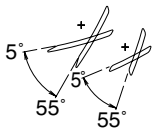
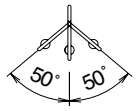
During cooling mode, the flap retracts into the indoor unit. Then, cool air can be blown far and pervaded all over the room.

Wide-Angle Louvres

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

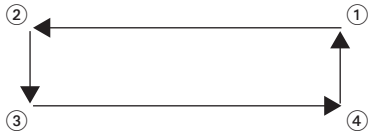
Auto-Swing

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

Vertical Swing (up and down)			Horizontal Swing (right and left)
Cooling	Dry	Fan	
 (R2814)	 (R2815)	 (R2816)	 (R2817)

3-D Airflow

- Alternative repetition of vertical and horizontal swing motions enables uniform air-conditioning of the entire room. This function is effective for starting the air conditioner.
- When the horizontal swing and vertical swing are both set to auto mode, the airflow become 3-D airflow and the horizontal swing and vertical swing motions are alternated. The order of swing motion is such that it turns counterclockwise, starting from the right upper point as viewed to the front side of the indoor unit.



(R1024)

2.3 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 rotation speed control and Hall IC control.

For more information about Hall IC, refer to the troubleshooting for fan motor on page 109.

Fan Speed Steps

Fan speed control contains 9 steps: LLL, LL, SL, L, ML, M, MH, H and HH.

Step	Cooling	Dry mode
LL	 (R2818)	800 - 950 rpm
SL (Silent)		
L		
ML		
M		
MH		
H		
HH (Powerful)		

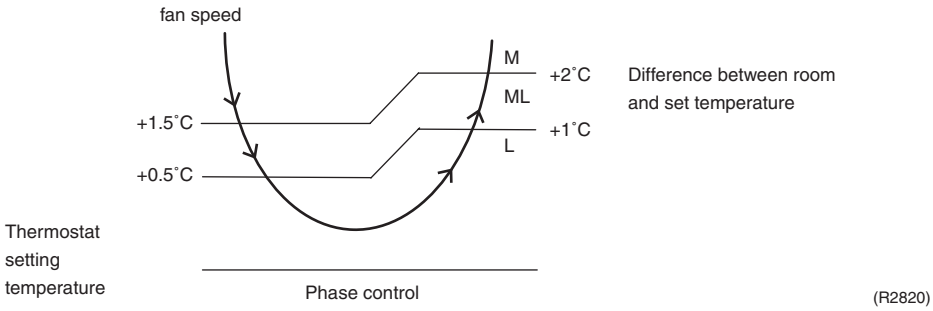
= Within this range the airflow rate is automatically controlled when the FAN setting button is set to automatic.

Note:

1. During powerful operation, fan operates H tap + 90 rpm.
2. In time of thermostat OFF, the fan rotates at the set tap.

Automatic Air Flow Control for Cooling

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



2.4 Thermostat Control

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

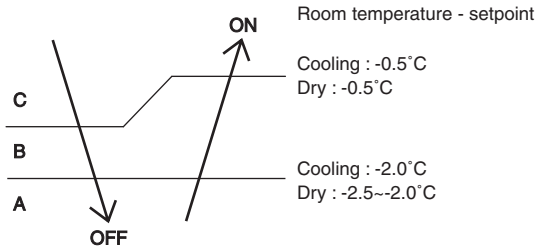
Thermostat OFF Condition

- 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.)

Cooling / Dry



(R4668)

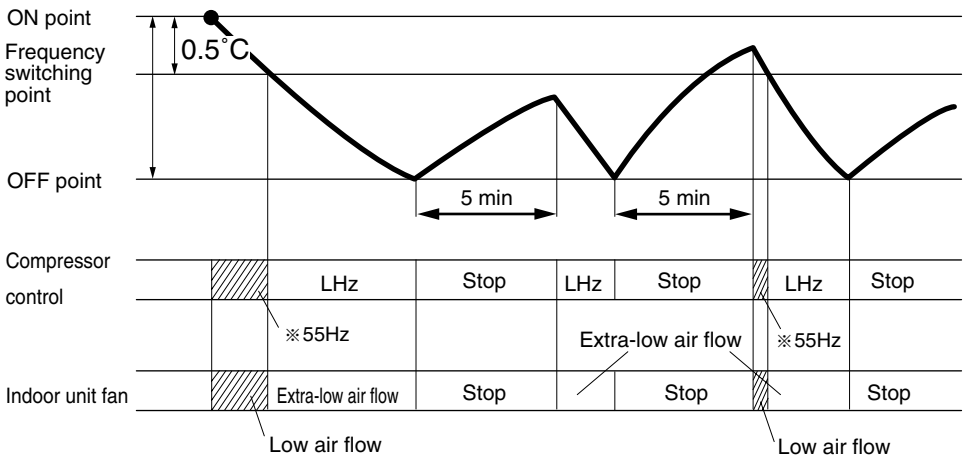
2.5 Programme Dry Function

Programme dry function removes humidity while preventing the room temperature from lowering.
Since the microcomputer controls both the temperature and air flow volume, the temperature adjustment and fan adjustment buttons are inoperable in this mode.

In Case of Inverter Units

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

Room temperature at startup	Temperature (ON point) at which operation starts	Frequency switching point	Temperature difference for operation stop
24°C	Room temperature at startup	0.5°C	1.5°C
18°C	18°C		1.0°C
17°C		—	



LHz indicates low frequency. Item marked with varies depending on models.

(R1359)

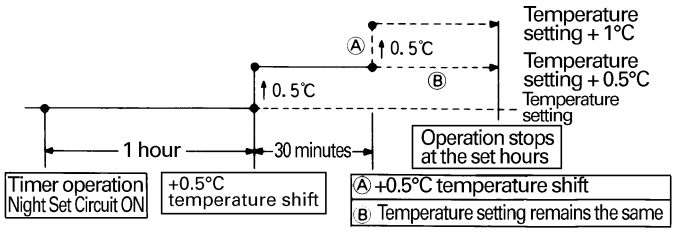
2.6 Night Set Mode

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 cooling the room at the set temperature for the first one hour, then automatically raises the temperature setting slightly for economical operations. This prevents excessive cooling to ensure comfortable sleeping conditions, and also conserves electricity.

Cooling Operation



Ⓐ : ● When outside temperature is normal and room temperature is at set temperature.
Ⓑ : ● When outside temperature is high (27°C or higher).

(R1361)

2.7 POWERFUL Operation

Outline

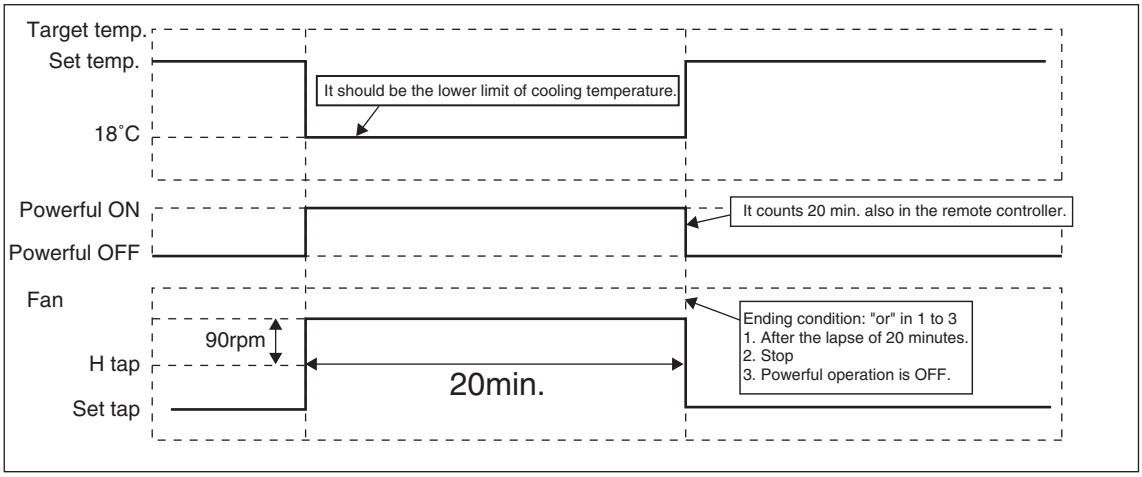
In order to exploit the cooling capacity to full extent, operate the air conditioner by increasing the indoor fan rotating speed and the compressor frequency.

Details of the Control

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

Operation mode	Fan speed	Target set temperature
Cooling	H tap + 90 rpm	18°C
Dry	Dry rotating speed + 50 rpm	Normally targeted temperature in dry operation; Approx. –2°C
Fan	H tap + 90 rpm	—

Ex.) : Powerful operation in cooling mode.



(R4834)

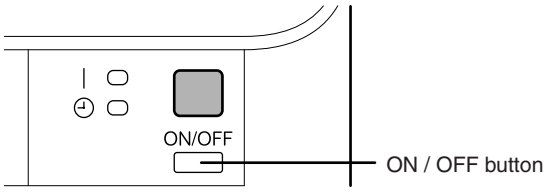
2.8 Other Functions

2.8.1 Signal Receiving Sign

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

2.8.2 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.



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

Mode	Temperature setting	Air flow rate
COOL	22°C	AUTO

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

2.8.3 Air Purifying Filter with Photocatalytic Deodorizing Function

This filter incorporates the benefits the Air Purifying Filter and Photocatalytic Deodorizing Filter in a single unit. Combining the two filters in this way increases the active surface area of the new filter. This larger surface area allows the filter to effectively trap microscopic particles, decompose odours and deactivate bacteria and viruses even for the high volume of air required to air-condition large living rooms. The filter can be used for approximately 3 years if periodic maintenance is performed.

2.8.4 Mold Proof Air Filter

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

2.8.5 Self-Diagnosis Digital Display

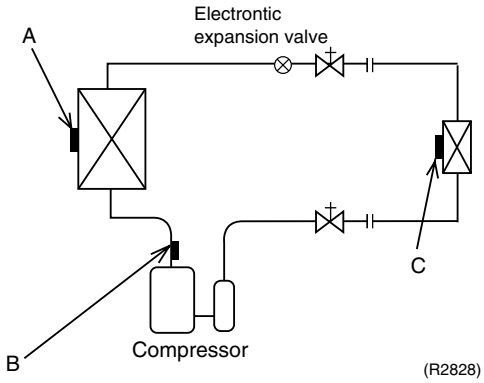
The microcomputer continuously monitors main operating conditions of the indoor unit, outdoor unit and the entire system. When an abnormality occur, the LCD remote controller displays error code. These indications allow prompt maintenance operations.

2.8.6 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.

3. Control Specification of R60D Model

3.1 Function of Thermistor



A Outdoor Heat Exchanger Thermistor (DCB)

1. The outdoor heat exchanger thermistor is used for controlling target discharge temperature.
   Set a target discharge temperature depending on the outdoor and indoor heat exchanger temperature.
   Control the electronic expansion valve opening so that the target discharge temperature can be obtained.
2. When cooling: an outdoor heat exchanger thermistor is used for detecting the discharge thermistor disconnected.
   When the temperature of the discharge piping is lower than the temperature of outdoor heat exchanger, a disconnected discharge thermistor can be detected.
3. The outdoor heat exchanger thermistor is used for high pressure protection during cooling operation.

B Discharge Pipe Thermistor (DOT)

1. The discharge pipe thermistor is used to control 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 must be halted.
2. The discharge pipe thermistor is used for detecting the discharge thermistor disconnected.

C Indoor Heat Exchanger Thermistor (DCN)

1. The indoor heat exchanger thermistor is used for controlling target discharge pipe temperature.
   Set a target discharge pipe temperature according to the outdoor and indoor heat exchanger temperature.
   Control the electronic expansion valve opening so that the target discharge pipe temperature can be obtained.
2. The indoor heat exchanger thermistor is used to prevent freezing.
   During the cooling operation, if the temperature drops abnormally, the operating frequency becomes lower, then the operation must be halted.

3.2 Mode Hierarchy

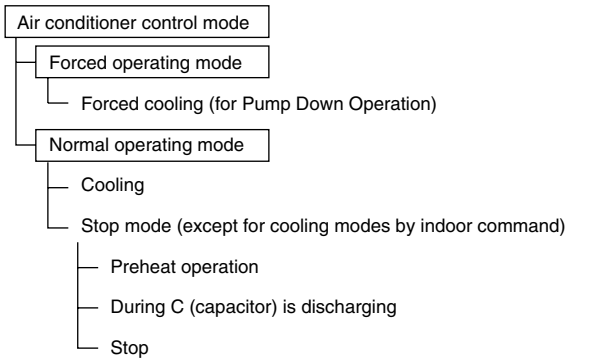
Outline

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

For cooling only model

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



(R2830)

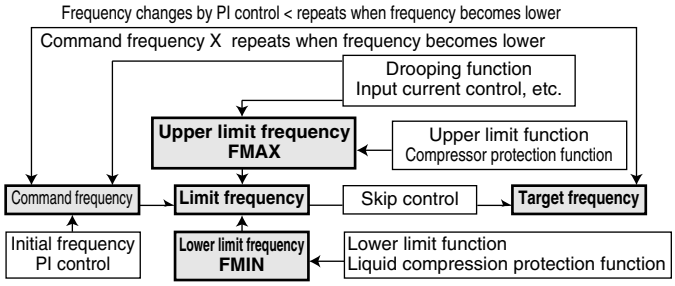
Note: Unless specified otherwise, an indoor dry operation command must be regarded as cooling operation.

3.3 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.



(R4167)

Detail

How to Determine Frequency

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

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 prevention, 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 prevention, 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 total of a maximum ΔD value of the indoor unit and the Q value of the indoor unit.

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

PI Control (Determine Frequency Up/Down by 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...lower the frequency.
   When the ΔD value is large...increase the frequency.

3. **Limit of frequency variation width**
   When the difference between input current and input current drooping value is less than 1.5 A, the frequency increase width must be limited.

4. **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.

5. **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.

3.4 Controls at Mode Changing / Start-up

3.4.1 Preheating Operation

Outline

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

Detail

Preheating ON Condition

- When outdoor air temperature is below 10.5°C and discharge pipe temperature is below 10.5°C, inverter in open phase operation starts.

OFF Condition

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

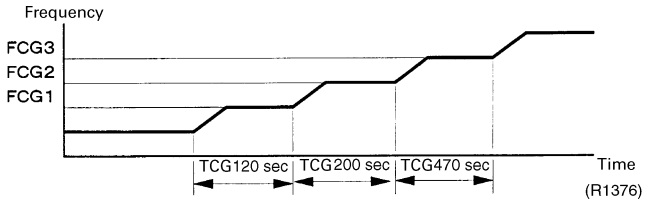
3.4.2 3 Minutes Stand-by

Prohibit to turn ON the compressor for 3 minutes after turning it off.

3.4.3 Compressor Protection Function

When turning the compressor from OFF to ON, the upper limit of frequency must be set as follows.

FCG 3	85
FCG 2	70
FCG 1	55



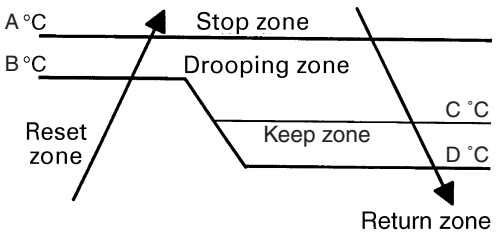
3.5 Discharge Pipe Temperature Control

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



A	120
B	111
C	109
D	107

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.

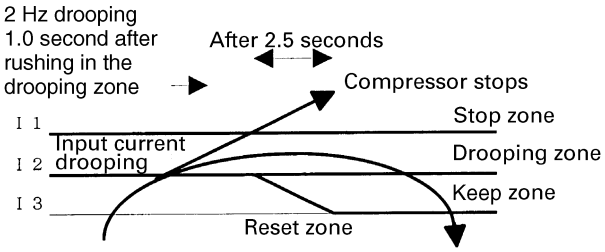
3.6 Input Current Control

Outline

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

Detail

The frequency control will be made within the following zones.



When a “stop current” continues for 2.5 seconds after rushing on the stop zone, the compressor operation stops.
If a “drooping current” is continues for 1.0 second after rushing on the drooping zone, the frequency will be 2 Hz drooping.
Repeating the above drooping continues until the current rushes on the drooping zone without change.
In the keep zone, the frequency limit will remain.
In the return / reset zone, the frequency limit will be cancelled.

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

1. In case the operation mode is cooling

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

3.7 Freeze-up Protection Control

Outline

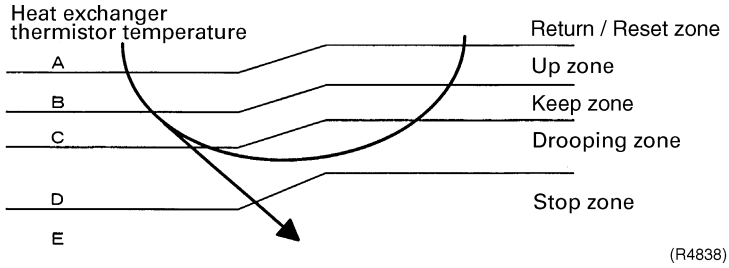
During cooling operation, the signals being sent from the indoor unit allow the operating frequency limitation and then prevent freezing of the indoor heat exchanger. (The signal from the indoor unit must be divided into the zones as the followings.

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



3.8 Fan Control

Outline

Fan control is carried out according to the following priority.

1. Fan ON control for electric component cooling fan
2. Fan OFF delay when stopped
3. ON/OFF control in cooling operation
4. Tap control when drooping function is working
5. Fan control in forced operation
6. Fan control in indoor/outdoor unit silent operation
7. Fan control in powerful mode
8. Fan control in normal operation

Detail

Fan OFF Control when Stopped

- Fan OFF delay for 60 seconds must be made when the compressor is stopped.

Tap Control in indoor/outdoor unit silent operation

1. When Cooling Operation
   When the outdoor air temperature is lower than 38°C, the fan tap is set to L.

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

Compressor operation turns OFF when the outdoor air temperature is below –5°C.

3.10 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

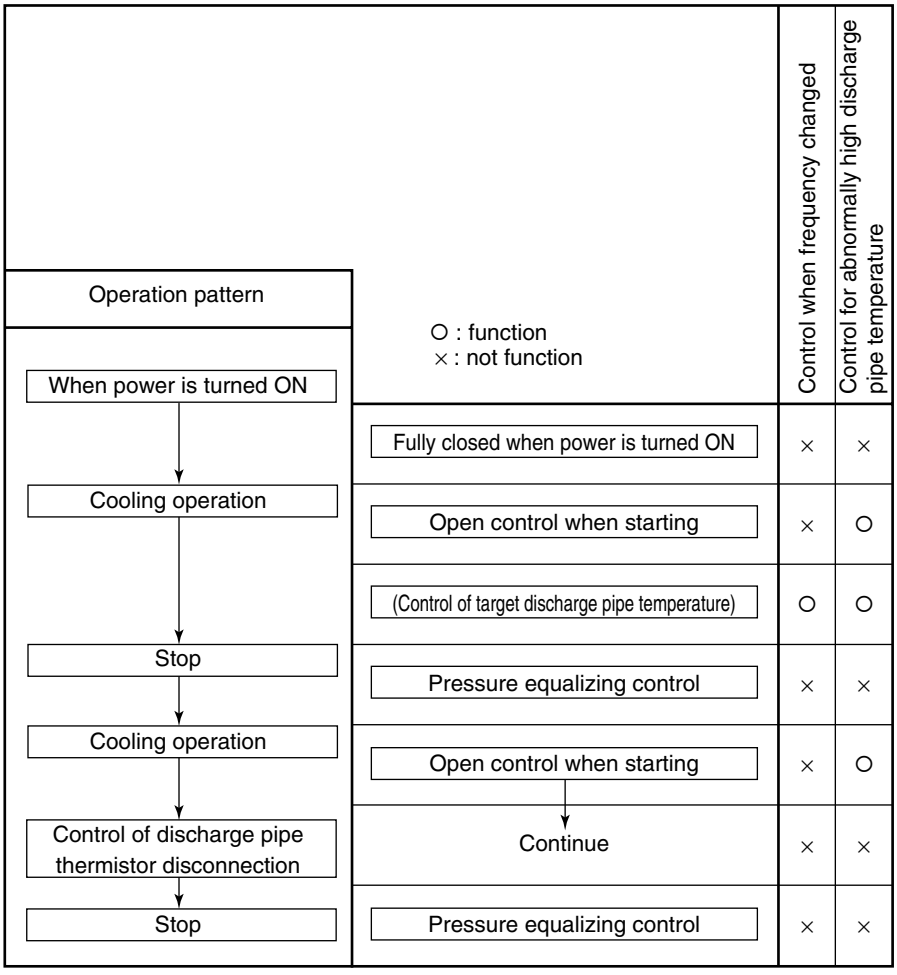
1. Electronic expansion valve control when starting operation
2. Control when frequency changed
3. Control when a discharge pipe temperature is abnormally high
4. Control when the discharge pipe thermistor is disconnected

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.



3.10.1 Fully Closing with Power ON

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

3.10.2 Pressure Equalization Control

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

3.10.3 Opening Limit

Outline

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

Detail

- A maximum electronic expansion valve opening : 450 pulses
- A minimum electronic expansion valve opening : 54 pulses

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

3.10.4 Starting Operation Control

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

3.10.5 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.

3.10.6 Disconnection of the Discharge Pipe Thermistor

Outline

Detect a disconnected discharge pipe thermistor by comparing the discharge pipe temperature with the condensation temperature. If any is disconnected, open the electronic expansion valve according to the outdoor air temperature and the operating frequency, and operate for a specified time, and then stop.
After 3 minutes of waiting, restart the unit and check if any is disconnected. If any is disconnected stop the system after operating for a specified time. If the disconnection is detected 4 times in succession, then the system will be down.

Detail

Detect Disconnection

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

1. When the operation mode is cooling
   When the discharge pipe temperature is lower than the outdoor heat exchanger temperature, the discharge pipe thermistor disconnection must be ascertained.

Adjustment when the thermistor is disconnected

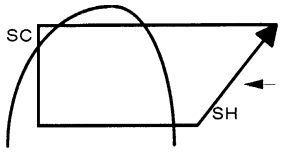
When compressor stop repeats specified time, the system should be down.

3.10.7 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.

3.10.8 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.

3.11 Malfunctions

3.11.1 Sensor Malfunction Detection

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

Relating to Thermistor Malfunction

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

Relating to CT Malfunction

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

3.11.2 Detection of Overload and Over Current

Outline

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

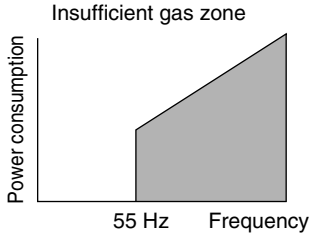
Detail

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

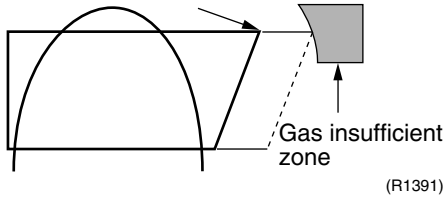
3.11.3 Insufficient Gas Control

Outline

If a power consumption is below the specified value in which the frequency is higher than the specified frequency, it must be regarded as gas insufficient.
In addition to such conventional function, if the discharge temperature is higher than the target discharge pipe temperature, and the electronic expansion valve is fully open (450 pulses) more than the specified time, it is considered as an insufficient gas.



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



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

Detail

Judgment by Input Current

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

Judgment by Discharge Pipe Temperature

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

3.12 Forced Operation Mode

Outline

Forced operating mode includes only forced cooling.

Detail

Forced Cooling

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

3.13 Additional Function

3.13.1 Powerful Operation Mode

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

3.13.2 Voltage Detection Function

Power supply voltage is detected each time equipment operation starts.

Part 5
System Configuration

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 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. Instructions

2.1 Safety Precautions

Safety precaution

- 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 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 abnormality such as smell of fire, stop the operation and turn off the breaker. And call your dealer for instructions.

⚠ CAUTION

- The air conditioner must be earthed. Incomplete earthing may result in electric shocks. Do not connect the earth line to a gas pipe, water pipe, lightning rod, or a telephone earth line.

- In order to avoid any quality deterioration, do not use the unit for cooling precision instruments, food, plants, animals or works of art.
- Never expose little children, plants or animals directly to the air flow.
- Do not place appliances which produce open fire in places exposed to the air flow from the unit or under the indoor unit. It may cause incomplete combustion or deformation of the unit due to the heat.
- Do not block air inlets nor outlets. Impaired air flow may result in insufficient performance or trouble.

- Do not stand or sit on the outdoor unit. Do not place any object on the unit to avoid injury, do not 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.
- Depending on the environment, an earth leakage breaker must be installed. Lack of an earth leakage breaker may result in electric shocks.
- Arrange the drain hose to ensure smooth drainage. Incomplete draining may cause wetting of the building, furniture etc.

- Do not 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.

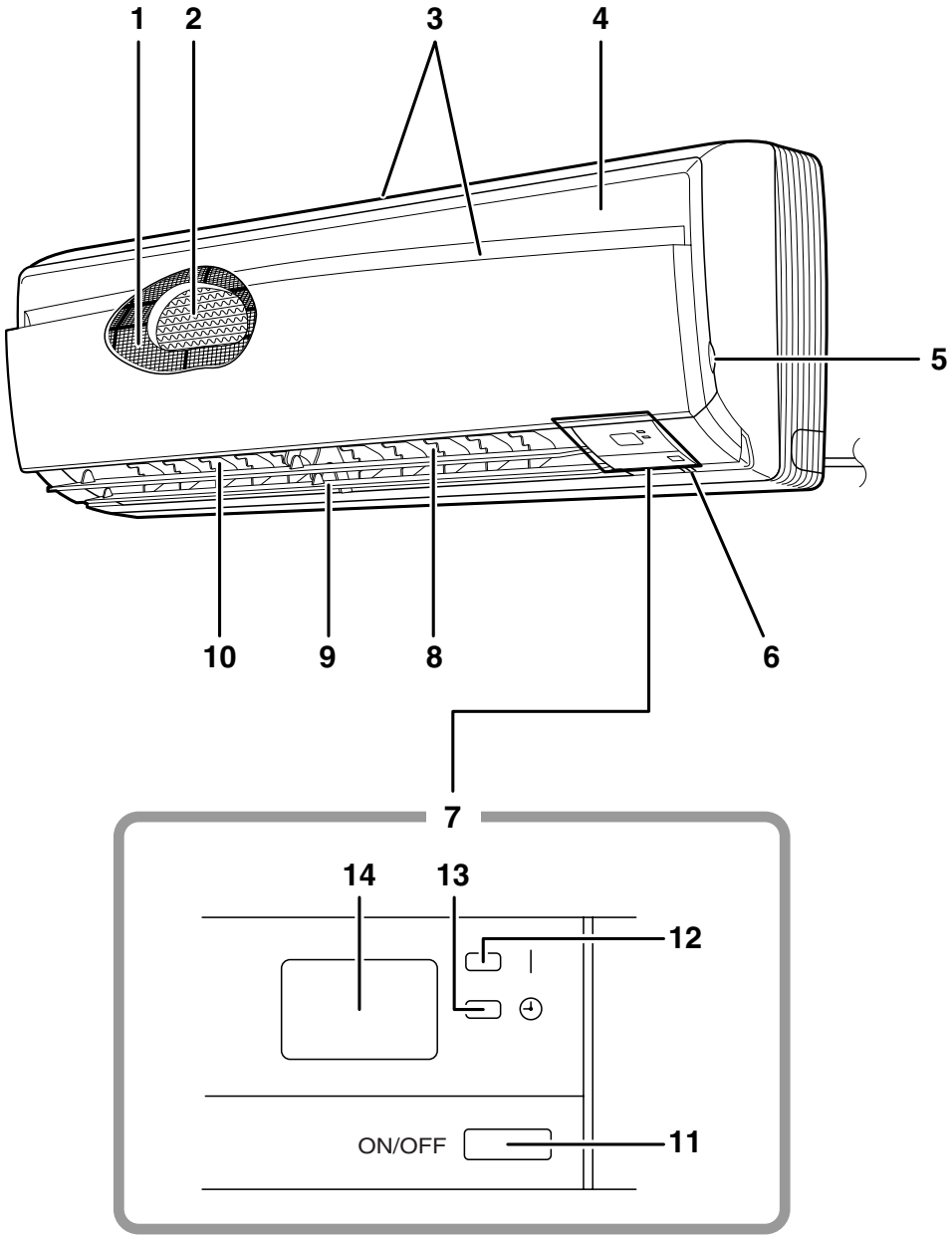
2.2 25/35 Class

Note: This instruction is appropriate for FT25/35DVM models.

2.2.1 Names of Parts

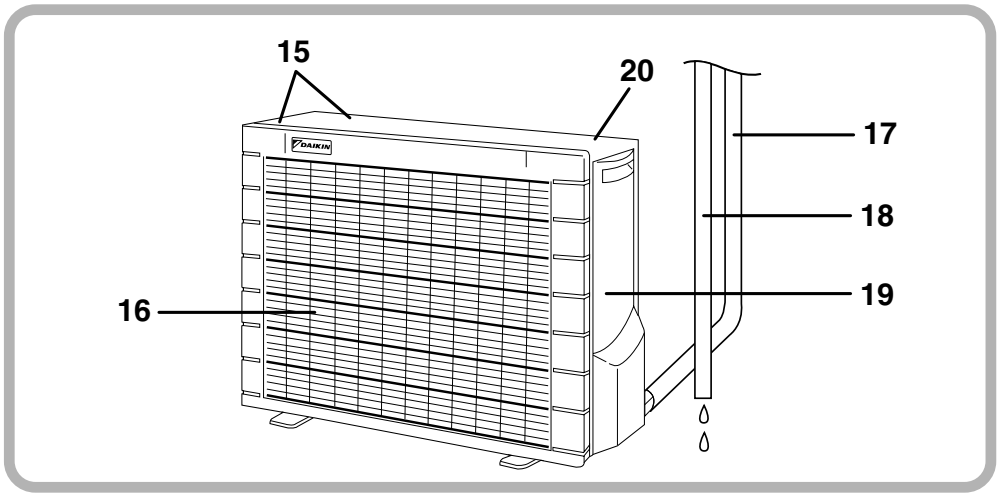
Names of parts

■ Indoor Unit



4

■ Outdoor Unit



■ Indoor Unit

1. **Air filter**
2. **Air purifying filter with photocatalytic deodorizing function:**
   - 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. **Flaps (horizontal blades):** (page 12.)
10. **Louvers (vertical blades):**
    - The louvers are inside of the air outlet. (page 13.)
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	Air flow rate
COOL	22˚C	AUTO

    - This switch is useful when the remote controller is missing.
12. **Operation lamp (green)**
13. **TIMER lamp (yellow):** (page 15.)
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

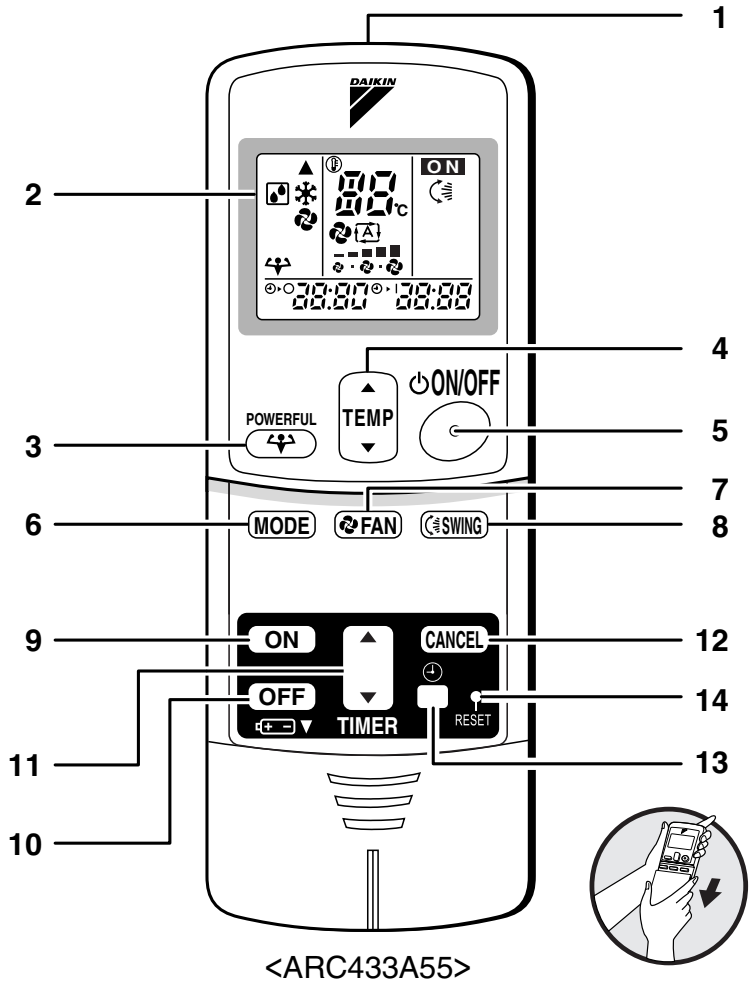
■ Outdoor Unit

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.
20. **Outside air temperature sensor:**
    - It senses the ambient temperature around the unit.

Appearance of the outdoor unit may differ from some models.

5

■ Remote Controller



<ARC433A55>

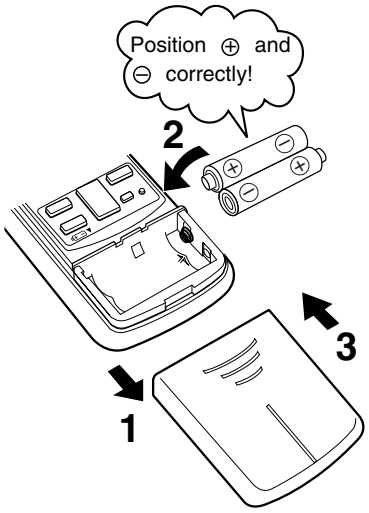
1. **Signal transmitter:**
   - It sends signals to the indoor unit.
2. **Display:**
   - It displays the current settings. (In this illustration, each section is shown with all its displays ON for the purpose of explanation.)
3. **POWERFUL button:**
   POWERFUL operation (page 14.)
4. **TEMPERATURE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

2.2.2 Preparation before Operation

Preparation Before Operation

■ To set the batteries

1. **Press with a finger and slide the front cover to take it off.**
2. **Set two dry batteries (AAA).**
3. **Set the front cover as before.**



ATTENTION

■ **About batteries**

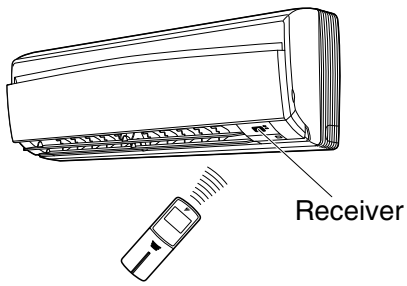
- When replacing the batteries, use batteries of the same type, and replace the two old batteries together.
- When the system is not used for a long time, take the batteries out.
- We recommend replacing once a year, although if the remote controller display begins to fade or if reception deteriorates, please replace with new alkali batteries. Do not use manganese 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

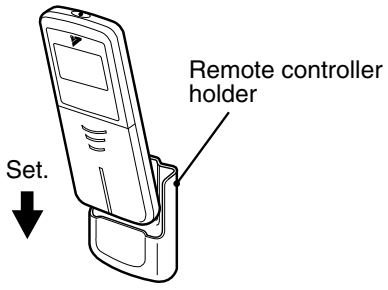
■ To operate the remote controller

- 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, etc. with the screws supplied with the holder.**
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 control 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.

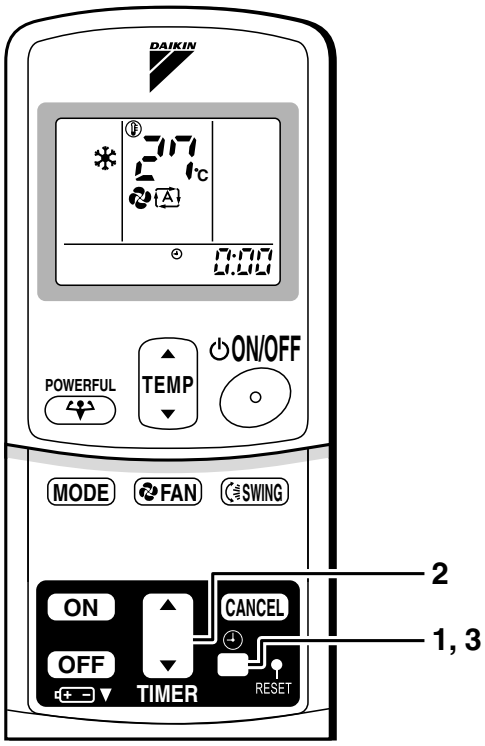
   ◷ blinks.

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 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 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

■ **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.

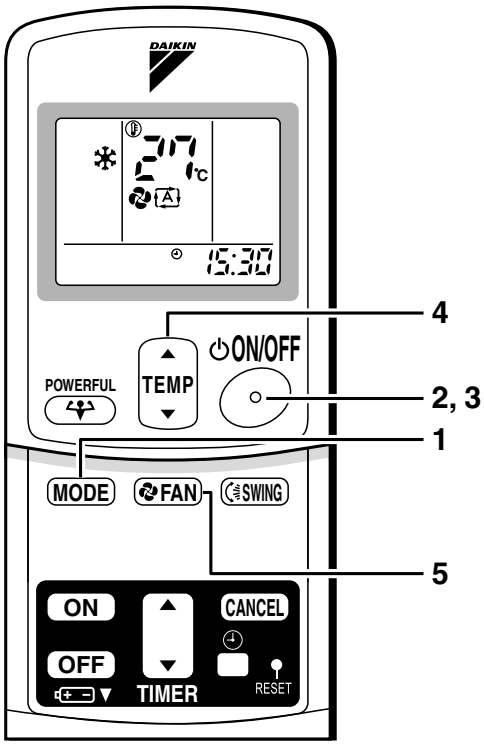
Mode	Operating conditions	If operation is continued out of this range
COOL	Outdoor temperature: 20 to 46˚C Indoor temperature: 18 to 32˚C Indoor humidity: 80% max.	• A safety device may work to stop the operation. • Condensation may occur on the indoor unit and drip.
DRY	Outdoor temperature: 20 to 46˚C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

2.2.3 DRY·COOL·FAN Operation

DRY · COOL · 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.

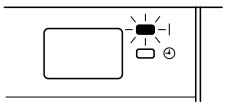
: DRY

: COOL

: FAN

2. Press “ON/OFF button” .

- The OPERATION lamp lights up.



■ To stop operation

3. Press “ON/OFF button” again.

- Then OPERATION lamp goes off.

■ To change the temperature setting

4. Press “TEMPERATURE adjustment button”.

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

10

■ To change the air flow rate setting

5. Press “FAN setting button”.

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

NOTE

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

■ **Note on air flow rate setting**
- At smaller air flow rates, the cooling effect is also smaller.

11

2.2.4 Adjusting the Air Flow Direction

Adjusting the Air Flow Direction

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

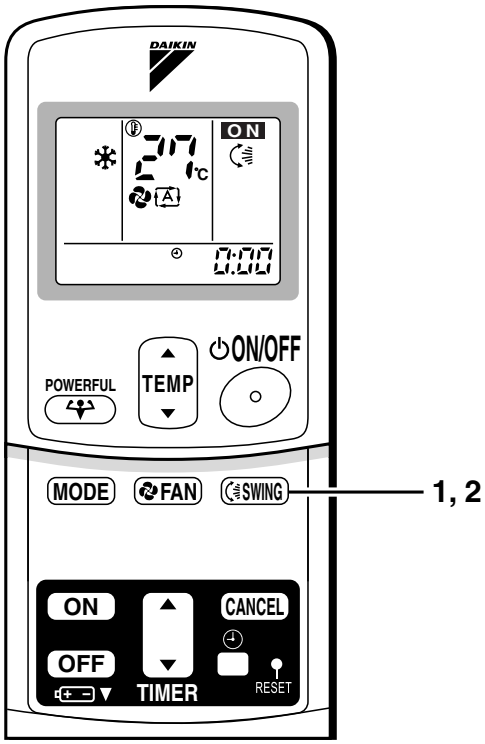
■ To adjust the horizontal blades (flaps)

1. **Press “SWING button”.**

   is displayed on the LCD and the flaps will begin to swing.

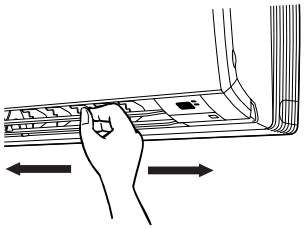
2. **When the flaps have reached the desired position, press “SWING button” once more.**

   The display will go blank.
   The flaps will stop moving.



■ 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.)



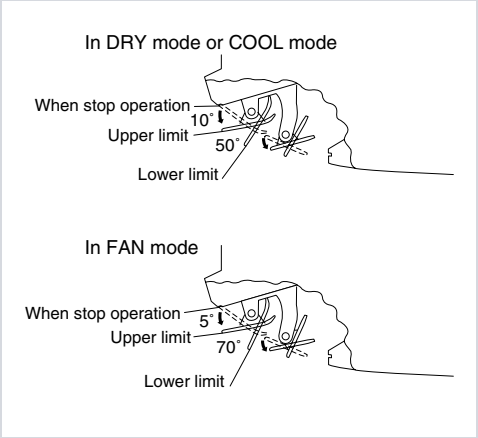
- When the unit is installed in the corner of a room, the direction of the louvers should be facing away from the wall.
  If they face the wall, the wall will block off the wind, causing the cooling efficiency to drop.

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.

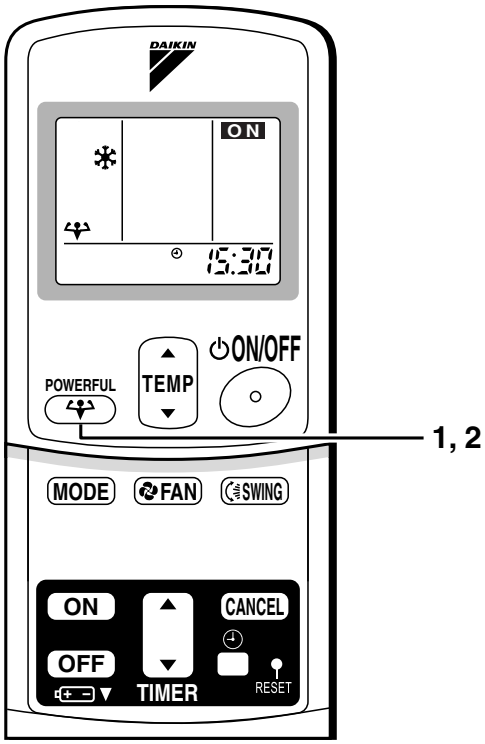


13

2.2.5 POWERFUL Operation

POWERFUL Operation

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



■ To start POWERFUL operation

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

■ To cancel POWERFUL operation

2. **Press "POWERFUL button" again.**
   - "" disappears from the LCD.

NOTE

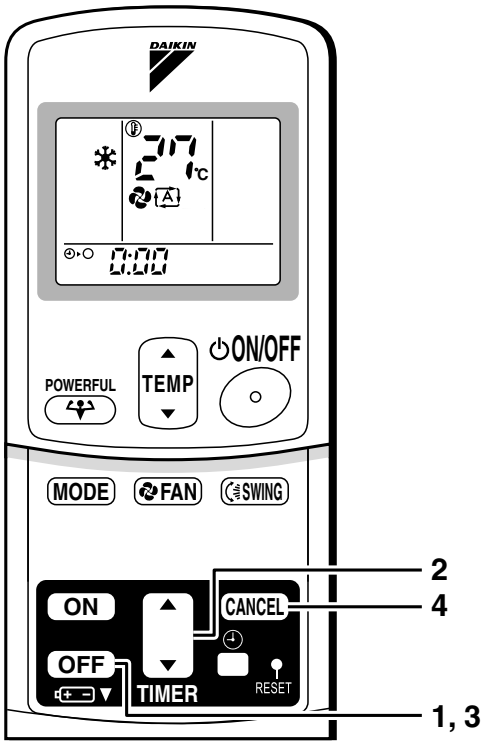
■ **Notes on POWERFUL operation**

- POWERFUL Operation 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 mode**
  The air flow rate is fixed to the maximum setting.
  The temperature and air flow settings are not variable.
- **In DRY mode**
  The temperature setting is lowered by 2.5˚C and the air flow rate is slightly increased.
- **In FAN mode**
  The air flow rate is fixed to the maximum setting.

2.2.6 TIMER Operation

TIMER Operation

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



■ To use OFF TIMER operation

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

1. Press “OFF TIMER button”.

0:00 is displayed.

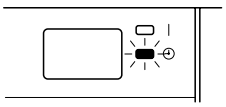
⏲ blinks.

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

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

3. Press “OFF TIMER button” again.

- The TIMER lamp lights up.



■ To cancel the OFF TIMER operation

4. Press “CANCEL button”.

- The TIMER lamp goes off.

NOTE

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

■ NIGHT SET MODE

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

TIMER Operation

■ 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.

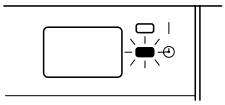
blinks.

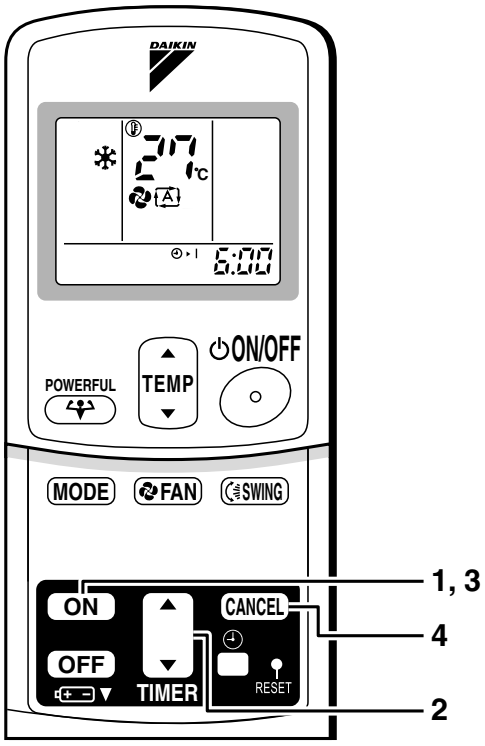
2. Press “TIMER Setting button” until the time setting reaches the point you like.

- 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.

2.2.7 Care and Cleaning

Care and Cleaning

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

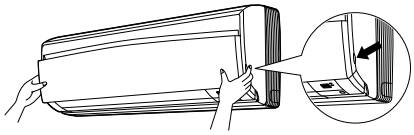
Units

■ Indoor unit, Outdoor unit and Remote controller

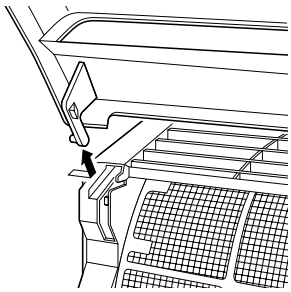
1. Wipe them with dry soft cloth.

■ Front panel

1. Open the front panel.
- Hold the panel by the tabs on the two sides and lift it unitl it stops with a click.

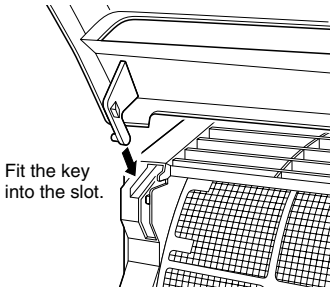


2. Remove the front panel.
- Lift the front panel up, slide it slightly to the right, and remove it from the horizontal axle.



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

4. Attach the front panel.
- Set the 2 keys of the front panel into the slots and push them in all the way.
- Close the front panel slowly and push the panel at the 3 points.
  (1 on each sides and 1 in the middle.)

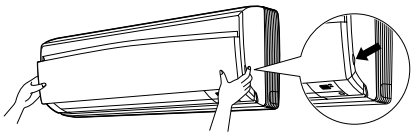


⚠ CAUTION

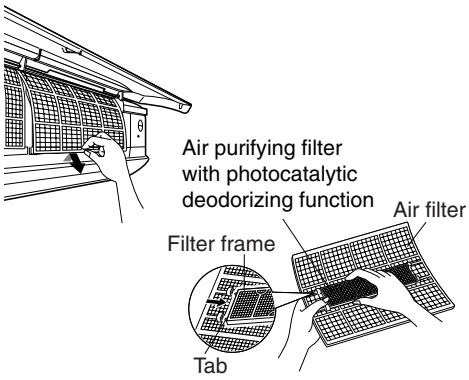
- Don't touch the metal parts of the indoor unit. If you touch those parts, this may cause an injury.
- When removing or attaching the front panel, use a robust and stable stool and watch your steps carefully.
- When removing or attaching the front panel, support the panel securely with hand to prevent 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

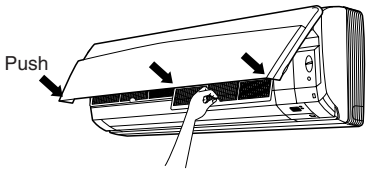
1. **Open the front panel. (page 17.)**
2. **Pull out the air filters.**
   - Push a little upwards the tab at the center of each air filter, then pull it down.



3. **Take off the air purifying filter with photocatalytic deodorizing function.**
   - Hold the recessed parts of the frame and unhook the four claws.
4. **Clean or replace each filter.**
   See figure.

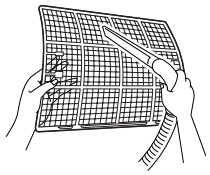


5. **Set the air filter and the air purifying filter with photocatalytic deodorizing function as they were and close the front panel.**
   - Insert claws of the filters into slots of the front panel. Close the front panel slowly and push the panel at the 3 points. (1 on each sides and 1 in the middle.)

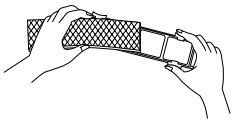


■ Air Filter

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.



■ Air purifying filter with photocatalytic deodorizing function (gray)



The Air purifying filter with photocatalytic deodorizing function 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 detergent.**
3. **Do not remove filter from frame when washing with water.**
4. **After washing, shake off remaining water and dry in the shade.**
5. **Since the material is made out of paper, do not wring out the filter when removing water from it.**

[Replacement]

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

NOTE

- Operation with dirty filters:
  (1) cannot deodorize the air. (2) cannot clean the air.
  (3) results in poor cooling. (4) may cause odour.
- To order air purifying filter with photocatalytic deodorizing function contact to the service shop there you bought the air conditioner.
- Dispose of old filters as flammable waste.

Item	Part No.
Air purifying filter with photocatalytic deodorizing function. (without frame) 1 set	KAF970A44

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. **Clean the air filters and set them again.**
3. **Take out batteries from the remote controller.**
4. **Turn OFF the breaker for the room air conditioner.**

2.2.8 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.
The outdoor unit emits water or steam.	■ In COOL or DRY mode • Moisture in the air condenses into water on the cool surface of outdoor unit piping and drips.
Mists come out of the indoor unit.	■ This happens when the air in the room is cooled into mist by the cold air flow 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 air flow. (If this happens, we recommend you to have the indoor unit washed by a technician. Consult the service shop where you bought the air conditioner.)
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 outdoor 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.

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 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 air flow 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.

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.

3P153868-2B

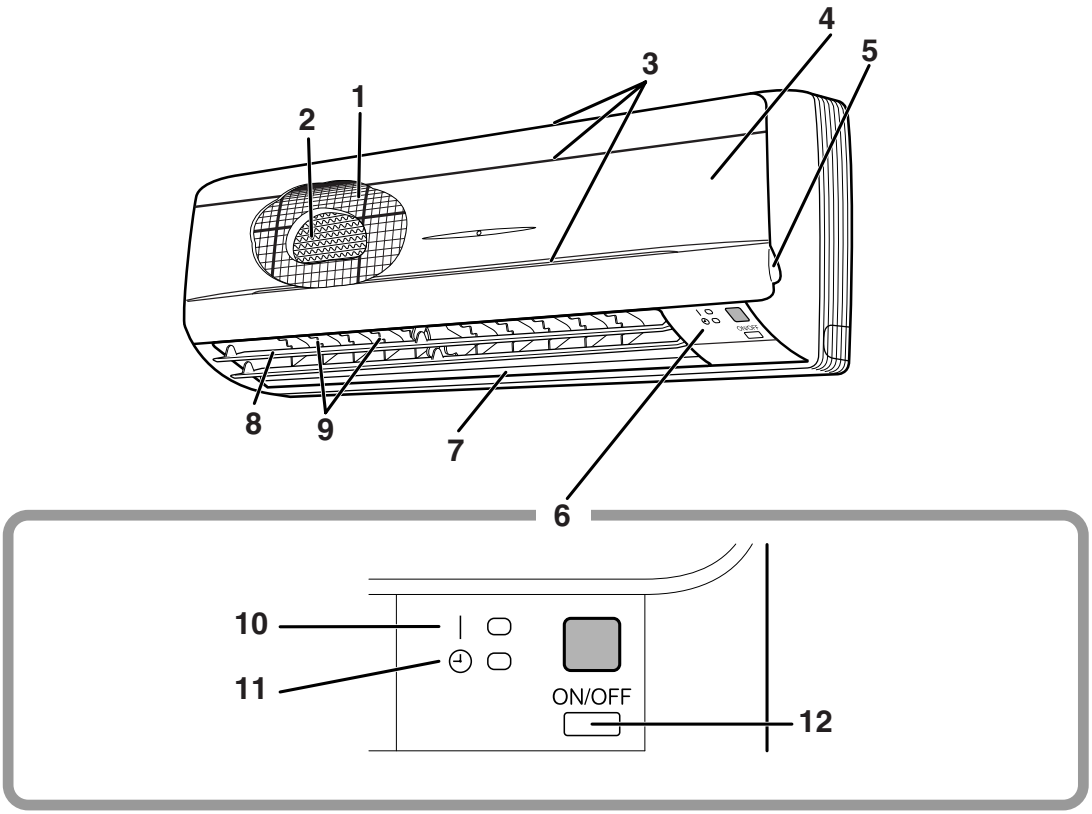
2.3 50/60 Class

Note: This instruction is appropriate for FT50/60DSG models.

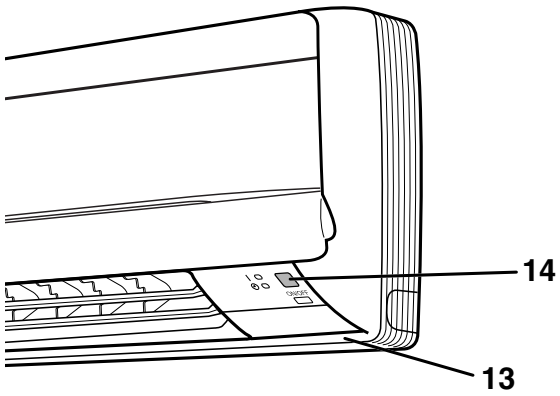
2.3.1 Names of Parts

Names of parts

■ Indoor Unit



■ Main unit control panel



4

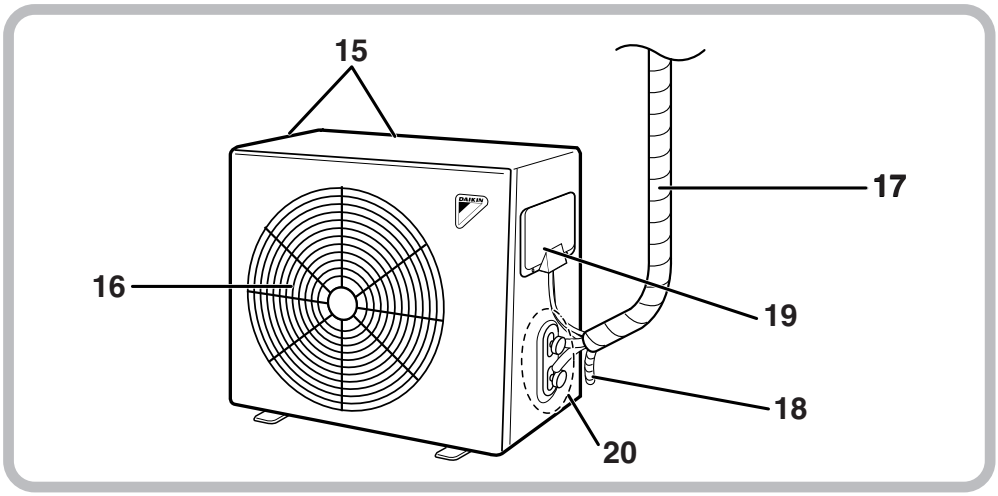
■ Indoor Unit

1. **Air filter**
2. **Air purifying filter with photocatalytic deodorizing function:**
   - These filters are attached to the inside of the air filters.
3. **Air inlet**
4. **Front panel**
5. **Panel tab**
6. **Display**
7. **Air outlet**
8. **Flaps (horizontal blades):** (page 13.)
9. **Louvers (vertical blades):**
   - The louvers are inside of the air outlet. (page 13.)
10. **Operation lamp (green)**
11. **TIMER lamp (yellow):** (page 16.)
12. **Indoor Unit ON/OFF switch:**
    - Push this switch once to start operation. Push once again to stop it.
    - The operation mode refers to the following table.

Mode	Temperature setting	Air flow rate
COOL	22°C	AUTO

    - This switch is useful when the remote controller is missing.
13. **Room temperature sensor:**
    It senses the air temperature around the unit.
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 (50 class)

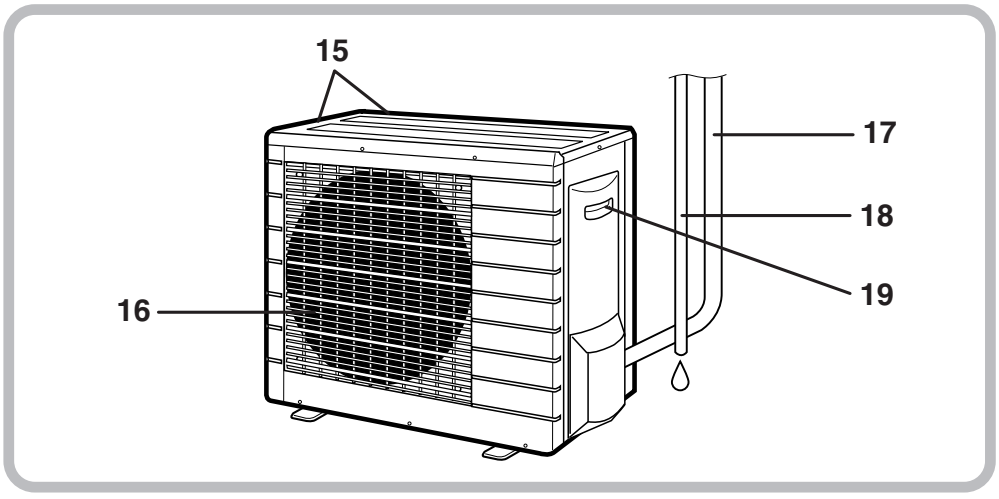


■ Outdoor Unit

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.

20. Stop valve:
- Dew condensation may form on the stop valve during operation. This does not indicate any type of malfunction in the outdoor unit.

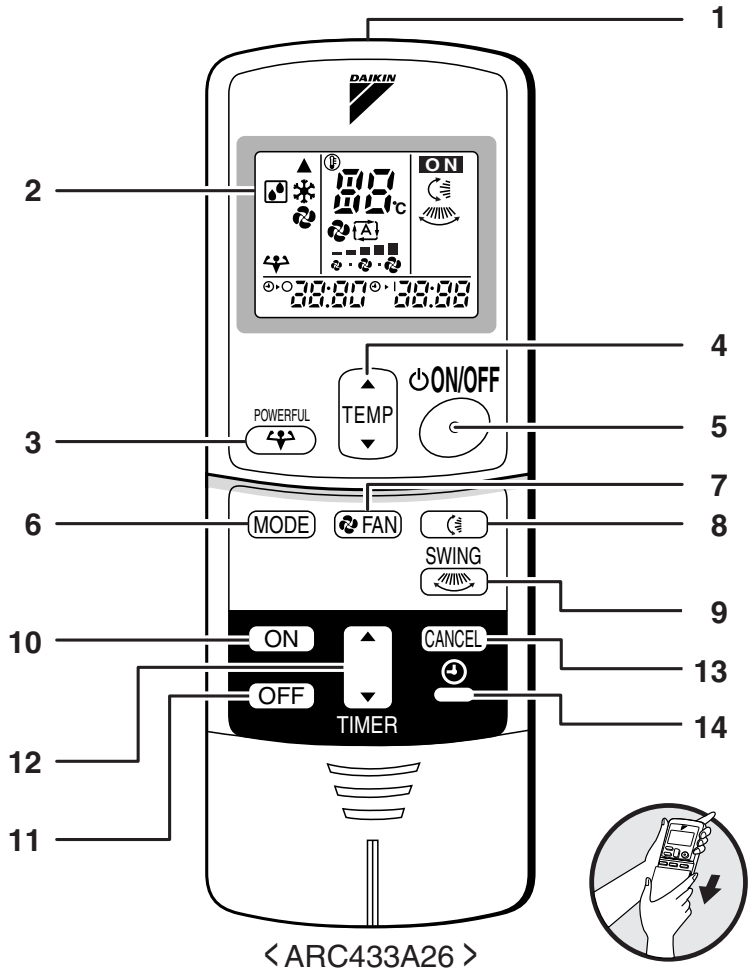
■ Outdoor Unit (60 class)



■ 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.

■ Remote Controller



< ARC433A26 >

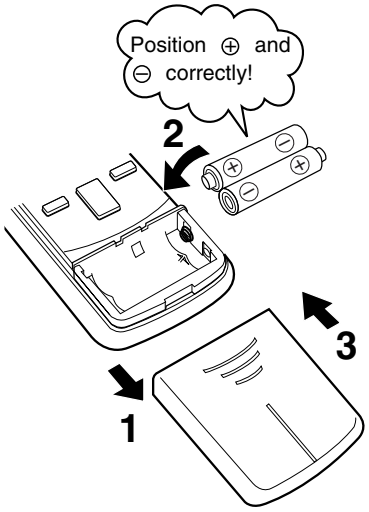
1. **Signal transmitter:**
   - It sends signals to the indoor unit.
2. **Display:**
   - It displays the current settings. (In this illustration, each section is shown with all its displays ON for the purpose of explanation.)
3. **POWERFUL button:** POWERFUL operation (page 15.)
4. **TEMPERATURE adjustment buttons:**
   - It changes the temperature setting.
5. **ON/OFF button:**
   - Press this button once to start operation. Press once again to stop it.
6. **MODE selector button:**
   - It selects the operation mode. (DRY/COOL/FAN) (page 11.)
7. **FAN setting button:**
   - It selects the air flow rate setting.
8. **SWING button:** (page 13.)
   - Flaps (Horizontal blades)
9. **SWING button:** (page 13.)
   - Louvers (Vertical blades)
10. **ON TIMER button:** (page 17.)
11. **OFF TIMER button:** (page 16.)
12. **TIMER Setting button:**
    - It changes the time setting.
13. **TIMER CANCEL button:**
    - It cancels the timer setting.
14. **CLOCK button:** (page 10.)

2.3.2 Preparation Before Operation

Preparation Before Operation

■ To set the batteries

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



ATTENTION

■ **About batteries**

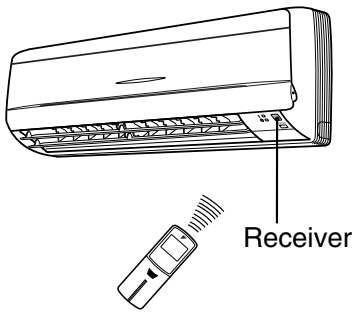
- When replacing the batteries, use batteries of the same type, and replace the two old batteries together.
- When the system is not used for a long time, take the batteries out.
- We recommend replacing once a year, although if the remote controller display begins to fade or if reception deteriorates, please replace with new alkali batteries. Do not use manganese 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.

8

Preparation Before Operation

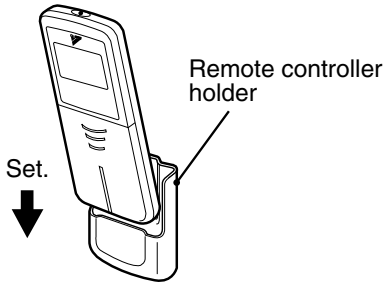
■ To operate the remote controller

- 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, etc. with the screws supplied with the holder.**
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.

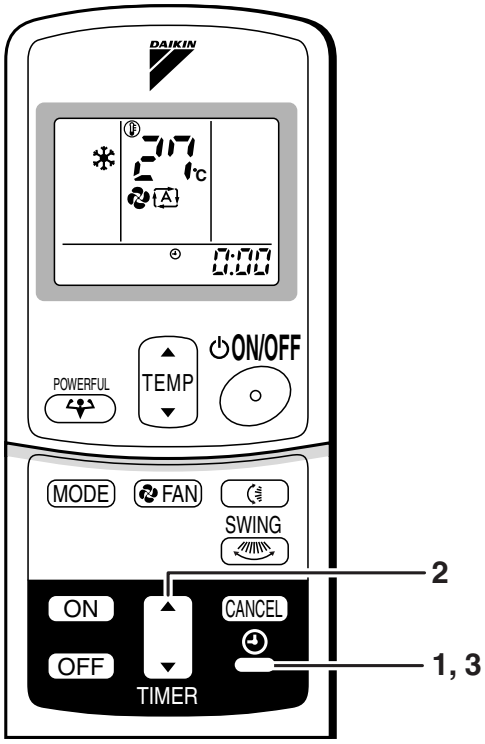
   " " blinks.

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 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 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

■ **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.

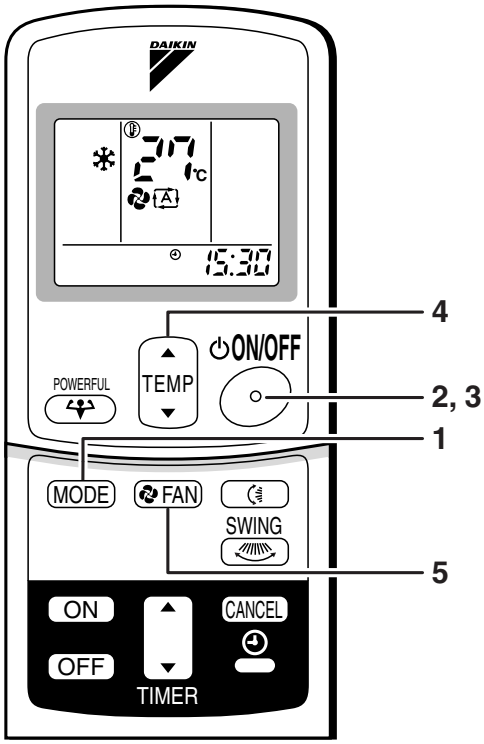
Mode	Operating conditions	If operation is continued out of this range
COOL	Outdoor temperature: 20 to 46 ˚C Indoor temperature: 18 to 32 ˚C Indoor humidity: 80% max.	• A safety device may work to stop the operation. • Condensation may occur on the indoor unit and drip.
DRY	Outdoor temperature: 20 to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

2.3.3 DRY·COOL·FAN Operation

DRY · COOL · 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.

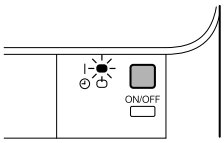
: DRY

: COOL

: FAN

2. Press “ON/OFF button”.

- The Operation lamp lights up.



■ To stop operation

3. Press “ON/OFF button” again.

- Then Operation lamp goes off.

■ To change the temperature setting

4. Press “TEMPERATURE adjustment button”.

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

■ To change the air flow rate setting

5. Press “FAN setting button”.

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

NOTE

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

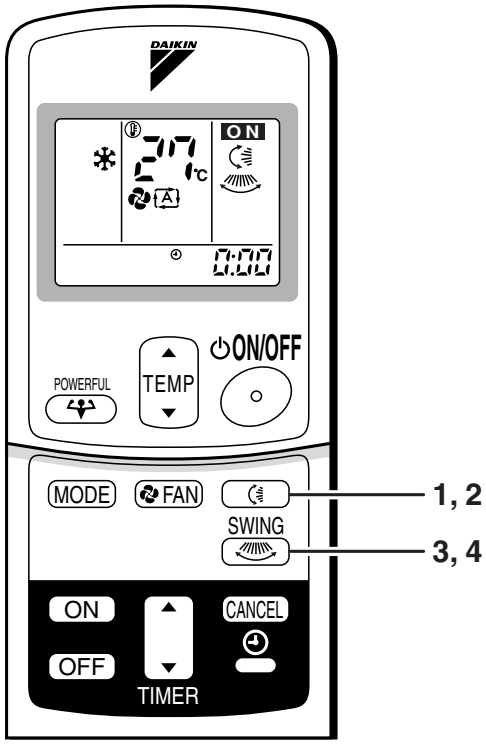
■ **Note on air flow rate setting**
- At smaller air flow rates, the cooling effect is also smaller.

12

2.3.4 Adjusting the Air Flow Direction

Adjusting the Air Flow Direction

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



■ To adjust the horizontal blades (flaps)

1. **Press "SWING button ".**
   - " " is displayed on the LCD.
2. **When the flaps have reached the desired position, press "SWING button " once more.**
   - The flap will stop moving.

■ To adjust the vertical blades (louvers)

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

■ To 3-D Airflow

1. 3. Press the "SWING button ↻" and the "SWING button ≋": the "↻" and "≋" display will light up and the flaps and louvers will move in turn.

■ To cancel 3-D Airflow

2. 4. Press either the "SWING button ↻" or the "SWING button ≋"

NOTE

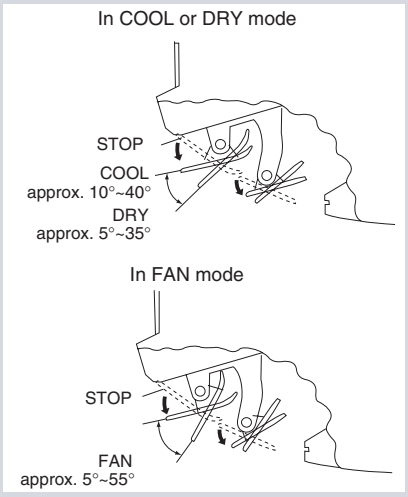
- When "**SWING button ↻**" is selected, the flaps swinging range depends on the operation mode. (See the figure.)

Three-Dimensional (3-D) Airflow

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

■ **ATTENTION**

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

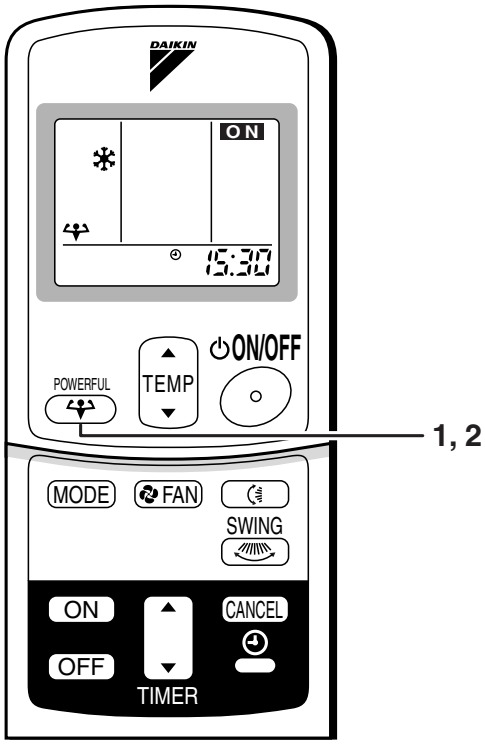


14

2.3.5 POWERFUL Operation

POWERFUL Operation

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



■ To start POWERFUL operation

1. Press “POWERFUL button”.

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

■ To cancel POWERFUL operation

2. Press “POWERFUL button” again.

- “ ” disappears from the LCD.

NOTE

■ **Notes on POWERFUL operation**

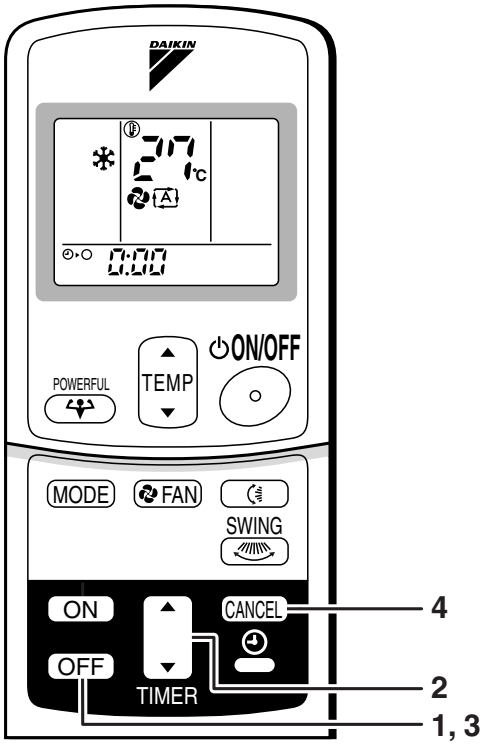
- **In COOL mode**
  To maximize the cooling effect, the capacity of outdoor unit must be increased and the air flow rate be fixed to the maximum setting.
  The temperature and air flow settings are not variable.
- **In DRY mode**
  The temperature setting is lowered by 2.5˚C and the air flow rate is slightly increased.
- **In FAN mode**
  The air flow rate is fixed to the maximum setting.

15

2.3.6 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 10.)

1. Press “OFF TIMER button”.

“ 0:00 ” is displayed.

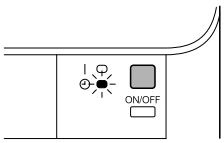
“ ⏲○ ” blinks.

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 “TIMER CANCEL button”.

- The TIMER lamp goes off.

NOTE

- When TIMER is set, the present time is not displayed.
- Once you set ON, OFF TIMER, the time setting is kept in the memory. (The memory is canceled when remote controller batteries are replaced.)
- When operating the unit via the ON/OFF Timer, the actual length of operation may vary from the time entered by the user. (Maximum approx. 10 minutes)
- Reserving the ON TIMER will cause the unit to start running up to one hour before, in order to make sure the temperature reaches the temperature set on the remote controller by the set time.

■ **NIGHT SET MODE**

When the OFF TIMER is set, the air conditioner automatically adjusts the temperature setting (0.5˚C up in COOL) to prevent excessive cooling 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 10.).

1. Press "ON TIMER button".

"6:00" is displayed.

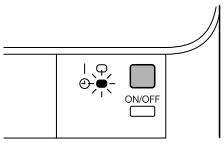
" ⏲▸| " blinks.

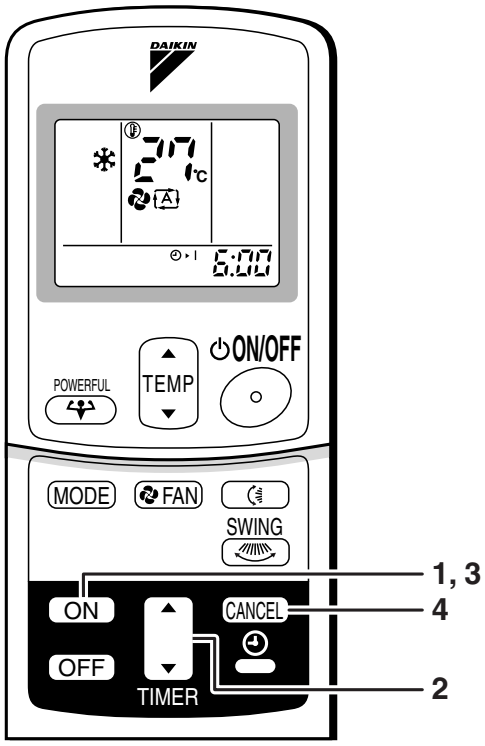
2. Press "TIMER Setting button" until the time setting reaches the point you like.

• 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

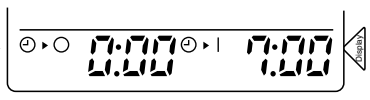
4. Press "TIMER CANCEL button".

• 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.

2.3.7 Care and Cleaning

Care and Cleaning

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

Units

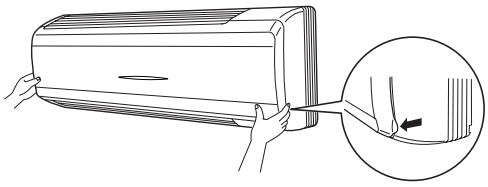
■ Indoor unit, Outdoor unit and Remote controller

1. Wipe them with dry soft cloth.

■ Front panel

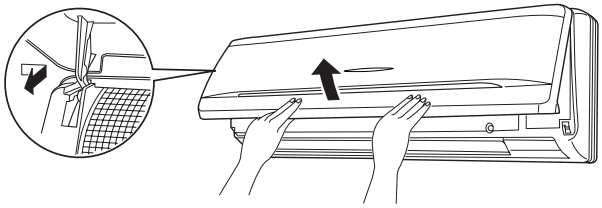
1. Open the front panel.

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



2. Remove the front panel.

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

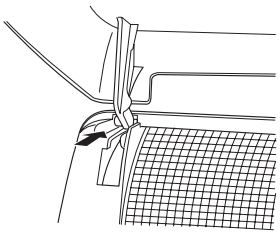


3. Clean the front panel.

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

4. Attach the front panel.

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

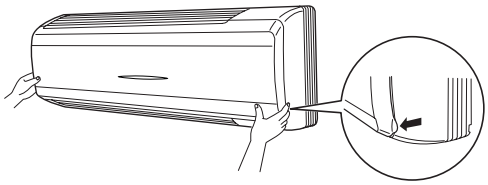


⚠ CAUTION

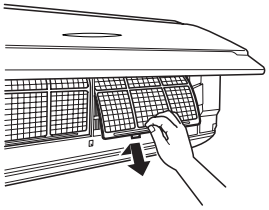
- Don't touch the metal parts of the indoor unit. If you touch those parts, this may cause an injury.
- When removing or attaching the front panel, use a robust and stable stool and watch your steps carefully.
- When removing or attaching the front panel, support the panel securely with hand to prevent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

Filters

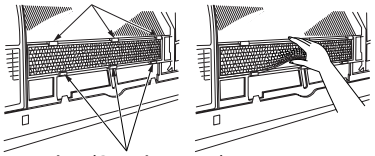
1. **Open the front panel. (page 18.)**
2. **Pull out the air filters.**
   - Push a little upwards the tab at the center of each air filter, then pull it down.



3. **Take off the air purifying filter with photocatalytic deodorizing function.**
   - Raise the lower side of the air purifying filter with photocatalytic deodorizing function and remove it from the tabs (3 at top and 3 at bottom).

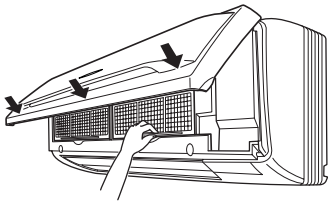


tabs (3 at top)



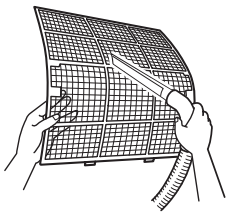
tabs (3 at bottom)

4. **Clean or replace each filter.**
   See below.
5. **Set the air filter, air purifying filter with photocatalytic deodorizing function as they were and close the front panel.**
   - Press the top of the air purifying filter with photocatalytic deodorizing function onto the tabs (3 at top). Then press the bottom of the filter up slightly, and press it onto the tabs (3 at bottom).
   - Press the front panel at both sides and the center.



■ Air Filter

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



■ Air purifying filter with photocatalytic deodorizing function. (gray)

The air purifying capacity of the air purifying filter with photocatalytic deodorizing function 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 detergent.**
3. **After washing, shake off remaining water and dry in the shade.**
4. **Since the material is made out of paper, do not wring out the filter when removing water from it.**

[Replacement]

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

NOTE

- Operation with dirty filters:
  (1) cannot deodorize the air. (2) cannot clean the air.
  (3) results in poor cooling. (4) may cause odour.
- To order air purifying filter with photocatalytic deodorizing function contact to the service shop where you bought the air conditioner.
- Dispose of air purifying filter with photocatalytic deodorizing function as burnable waste.

Item	Part No.
Air purifying filter with photocatalytic deodorizing function (without frame) 1 set	KAF952A42

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. **Clean the air filters and set them again.**
3. **Take out batteries from the remote controller.**
4. **Turn OFF the breaker for the room air conditioner.**

2.3.8 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.
The outdoor unit emits water or steam.	■ In COOL or DRY mode • Moisture in the air condenses into water on the cool surface of outdoor unit piping and drips.
Mists come out of the indoor unit.	■ This happens when the air in the room is cooled into mist by the cold air flow 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 air flow. (If this happens, we recommend you to have the indoor unit washed by a technician. Consult the service shop where you bought the air conditioner.)
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 outdoor 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.

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 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 air flow 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 lightening 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.

We recommend periodical maintenance.

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

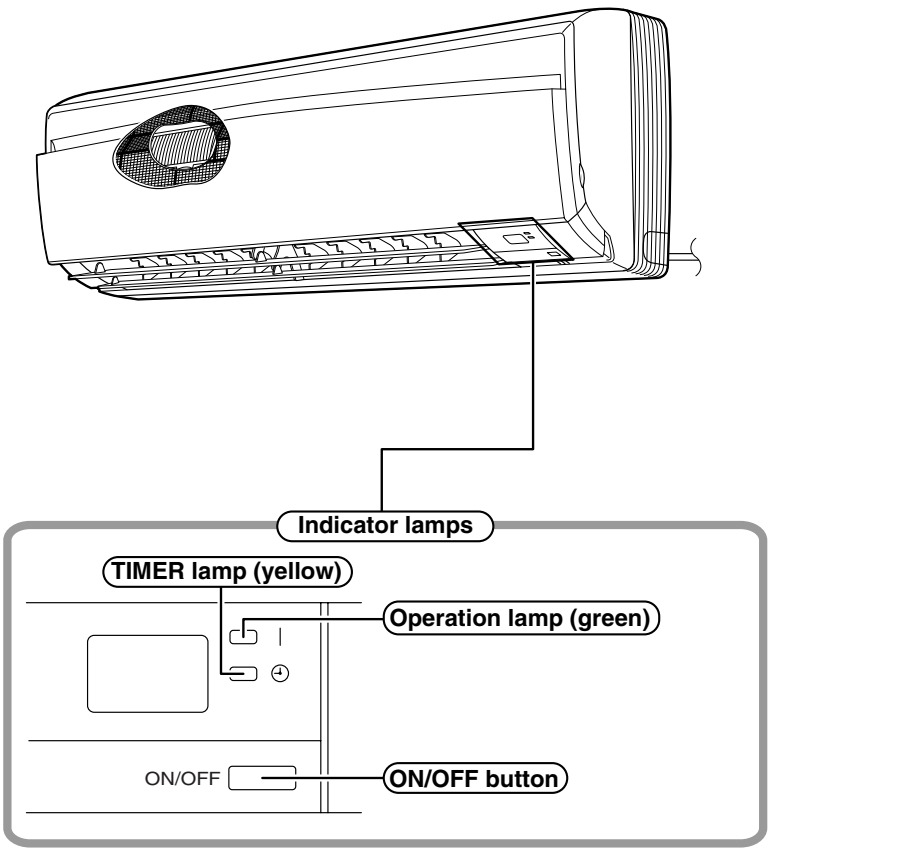
Part 6
Service Diagnosis

1. Caution for Diagnosis

The operation lamp flashes when any of the following errors is detected.
When a protection device of the indoor or outdoor unit is activated or when the thermistor malfunctions, disabling equipment operation.

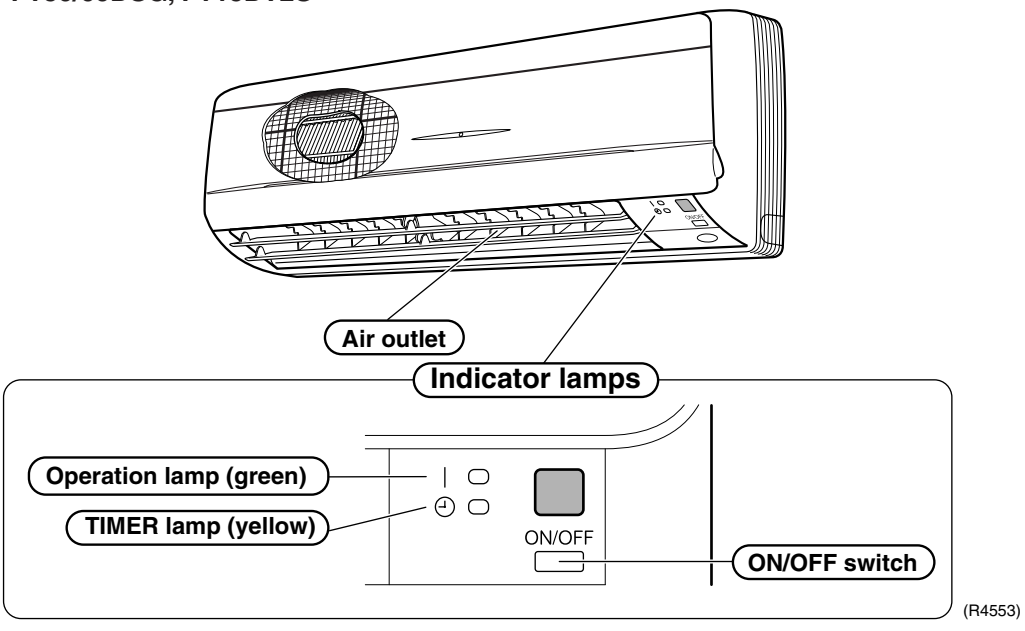
Location of Operation Lamp

FT25/35DVM, FT25/35DSG, FT09/13DV2S



(R4839)

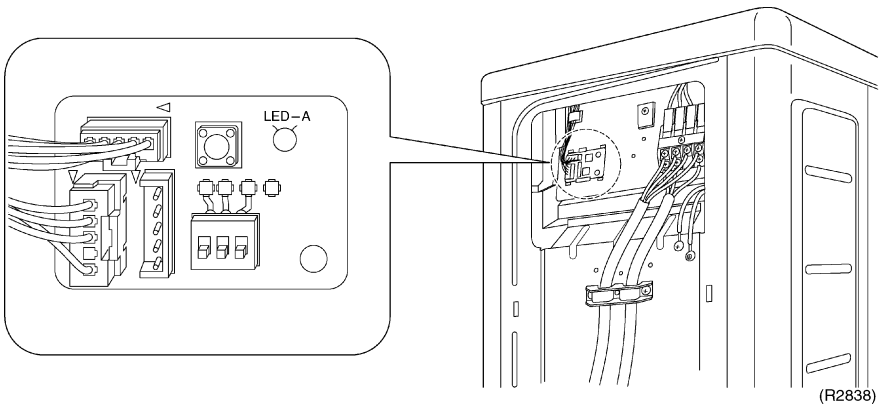
FT50/60DSG, FT15DV2S



(R4553)

Troubleshooting with the LED Indication

R60DSG only



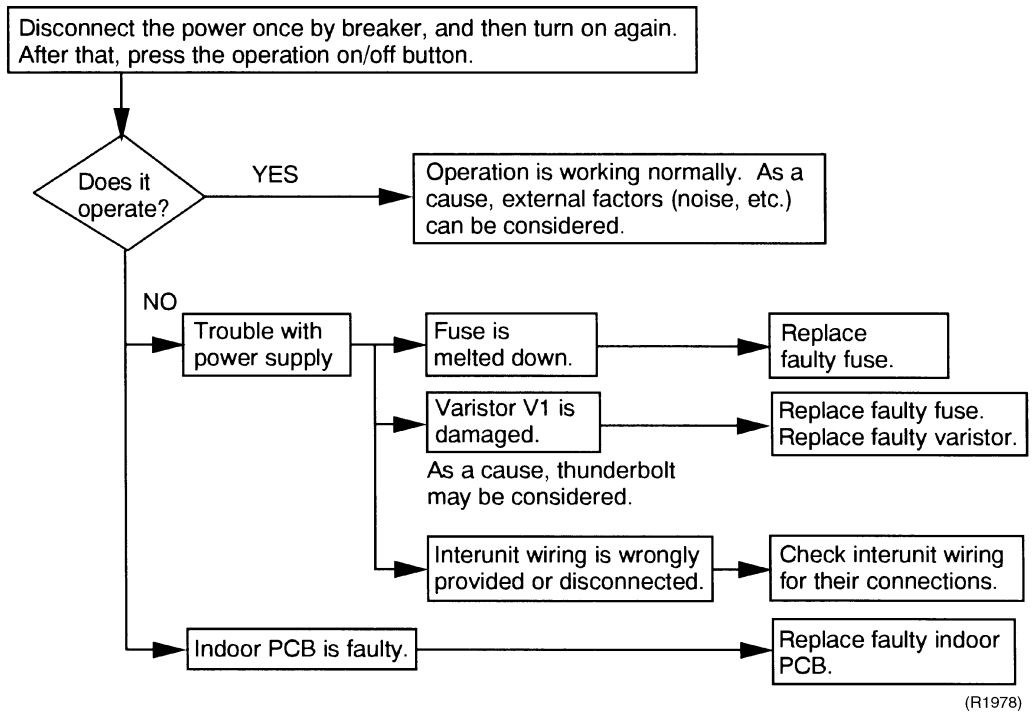
The outdoor unit has one green LED (LED A) on the PCB. The flashing green LED indicates normal condition of microcomputer operation.

2. Troubleshooting by Symptoms

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 outside air temperature.	Operation cannot be used when the outside temperature is below 19.4 °C (–5°C for R60DSG).	—
	Diagnose with remote controller indication.	—	106
	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 outside air temperature.	Operation cannot be used when the outside temperature is below 19.4°C (–5°C for R60DSG).	—
	Diagnose with remote controller indication.	—	106
Equipment operates but does not cool.	Check for thermistor detection errors.	Check to make sure that the main unit's thermistor has not dismounted from the pipe holder.	—
	Diagnose with remote controller indication.	—	106
	Diagnose by service port pressure and operating current.	Check for insufficient gas.	—
Large operating noise and vibrations	Check the installation condition.	Check to make sure that the required spaces for installation (specified in the Engineering data, etc.) are provided.	—

Case 1

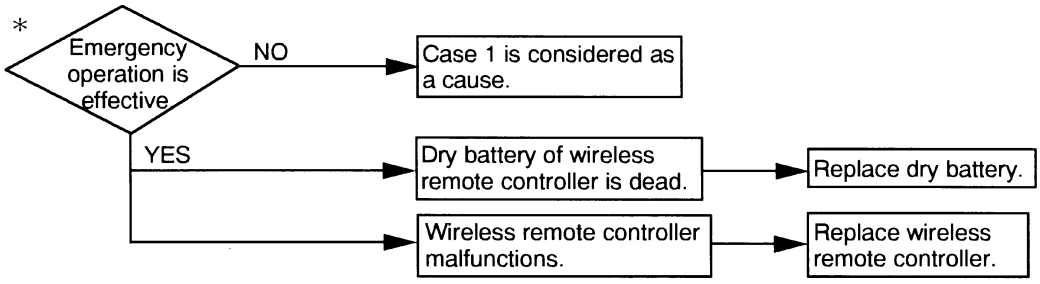
Phenomenon : Air conditioner does not operate.



(R1978)

Case 2

Phenomenon : Air conditioner does not operate with wireless remote controller.

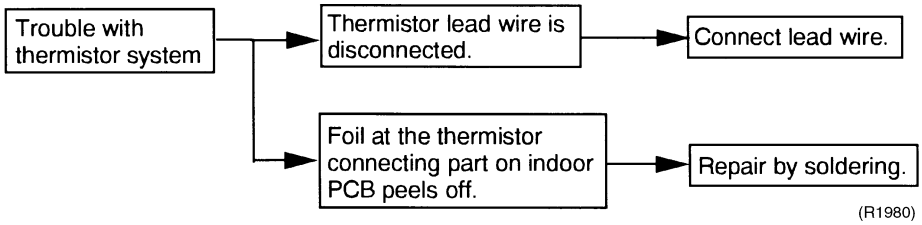


* Indoor unit has emergency operation switch.

(R1979)

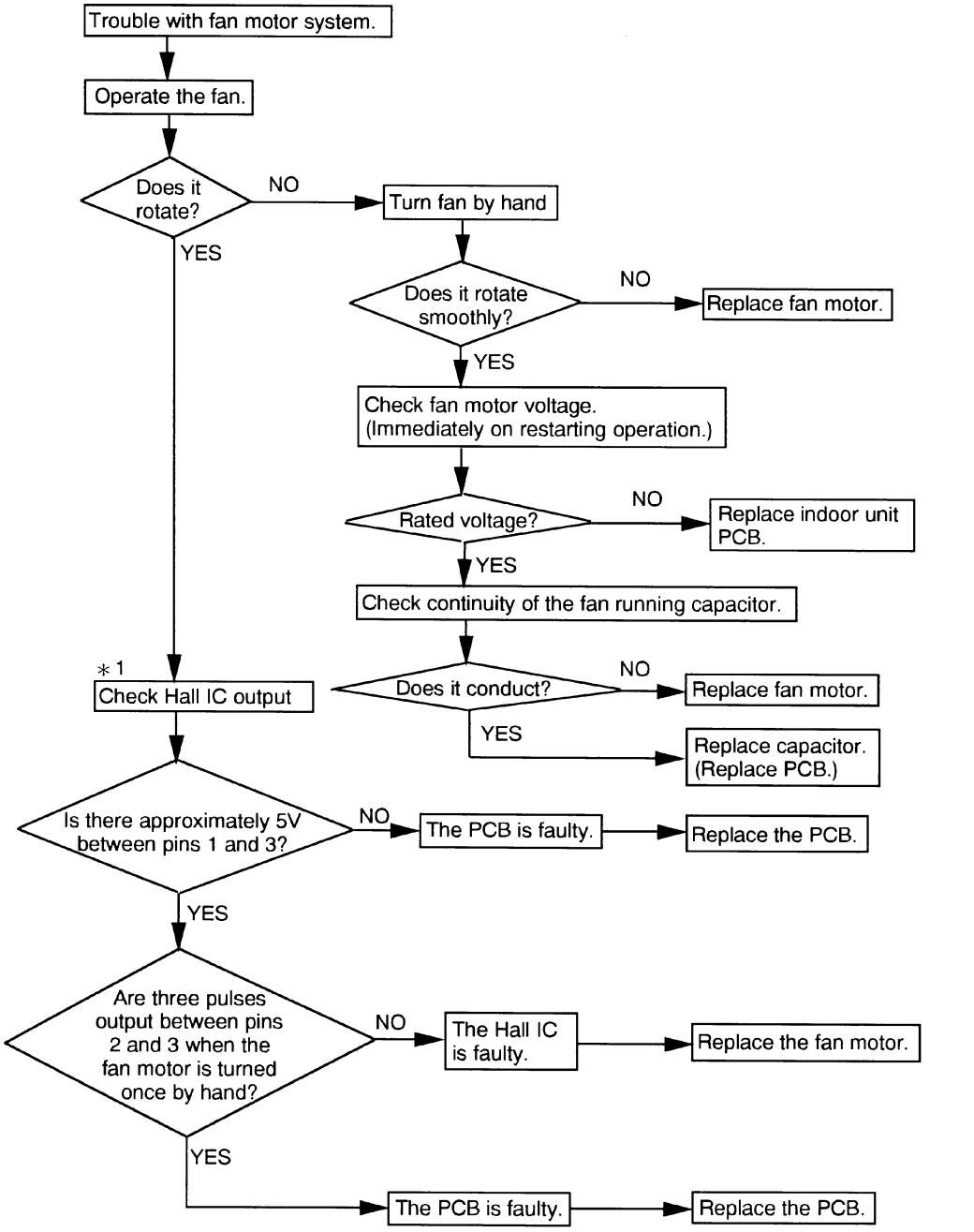
Case 3

Phenomenon : Air conditioner does not operate, and LED for operation blinks.

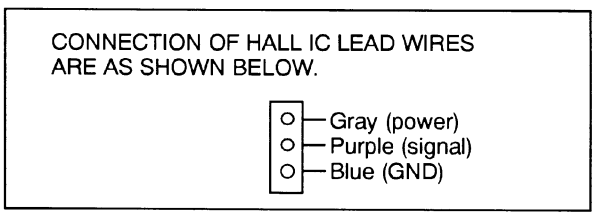


(R1980)

Case 4 **Phenomenon : Air conditioner does not operate, and LED for operation blinks.**



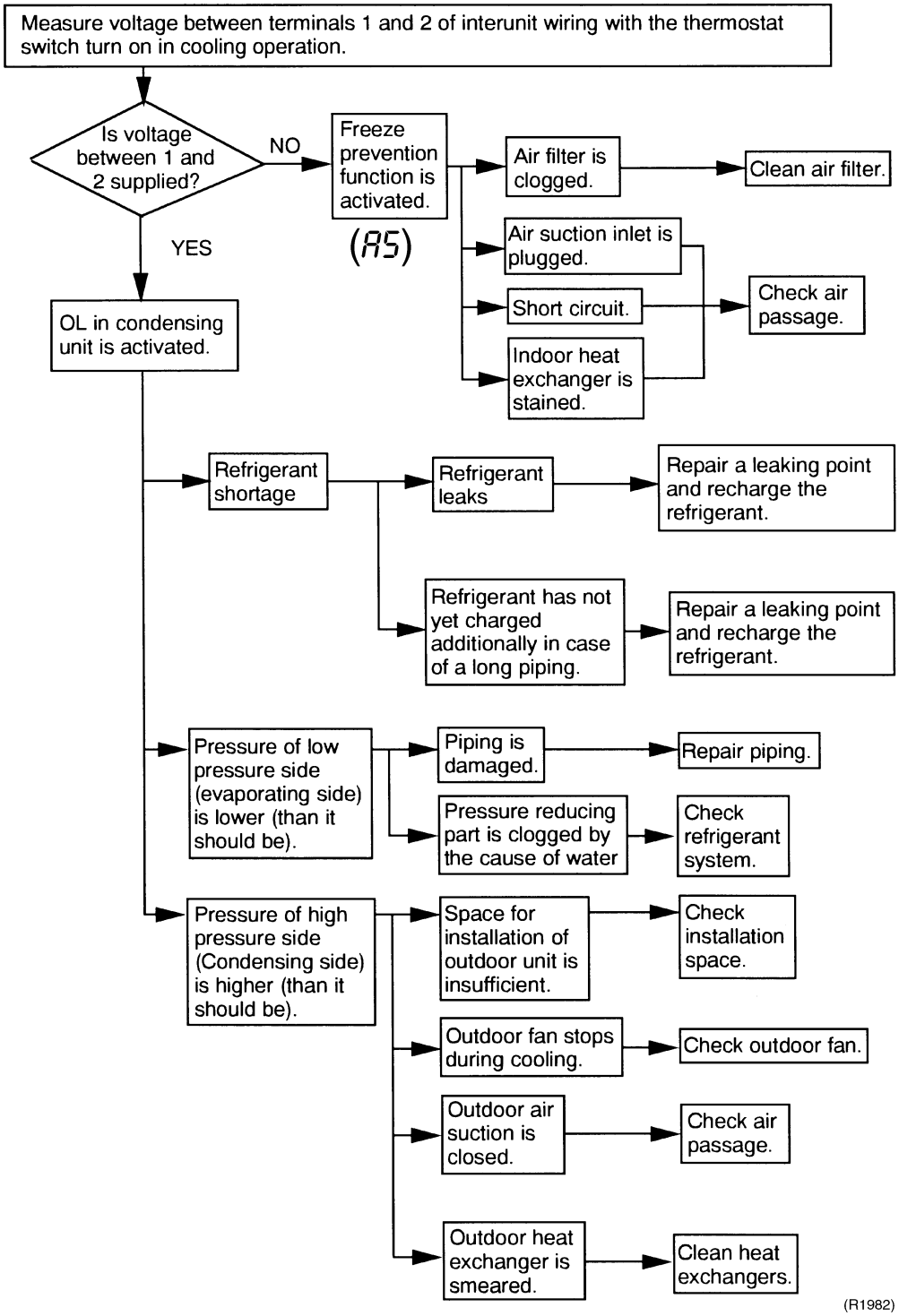
∗1 Hall IC should be checked with power on, operation off and connectors connected.



(R1981)

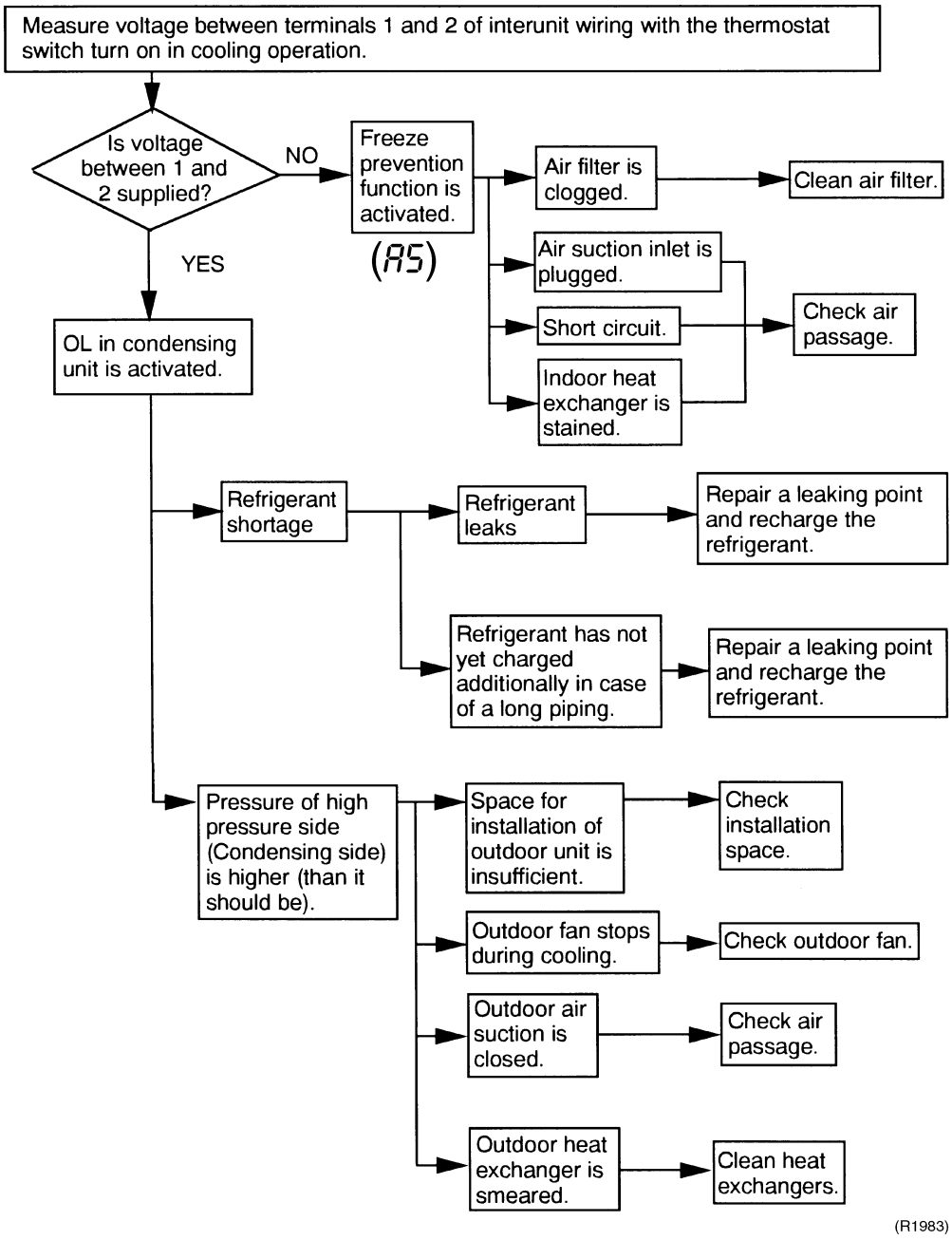
Case 5

Phenomenon : Air conditioner does not come into cooling though indoor fan is operating.



Case 6

Phenomenon : Air conditioner does not come into cooling though indoor fan is operating.

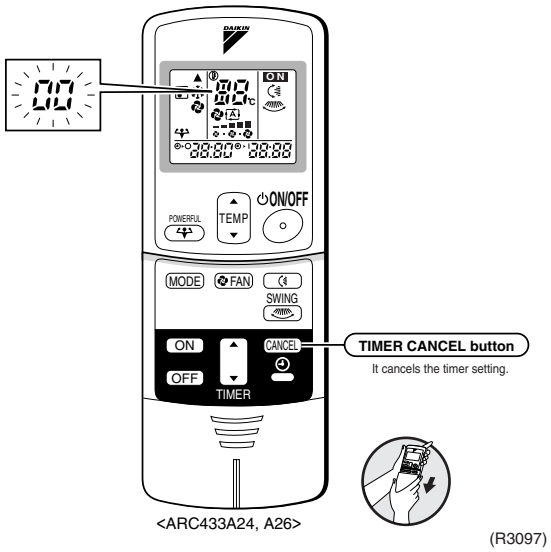


3. Service Check Function

In the ARC433A 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.



<ARC433A24, A26>

(R3097)

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	C7	23	H0
2	U4	13	H8	24	E1
3	F3	14	J3	25	P4
4	E6	15	A3	26	L3
5	L5	16	A1	27	L4
6	A6	17	C4	28	H6
7	E5	18	C5	29	H7
8	F6	19	H9	30	U2
9	C9	20	J6	31	UH
10	U0	21	UA	32	ER
11	E7	22	A5	33	AH

<In case of ARC433A55>

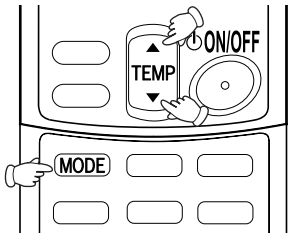
No.	Code	No.	Code	No.	Code
1	00	12	F6	23	A1
2	U4	13	C7	24	E1
3	L5	14	A3	25	UA
4	E6	15	H8	26	UH
5	H6	16	H9	27	P4
6	H0	17	C9	28	L3
7	A6	18	C4	29	L4
8	E7	19	C5	30	H7
9	U0	20	J3	31	U2
10	F3	21	J6	32	ER
11	A5	22	E5	33	AH

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.

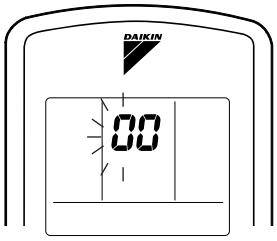
Check Method 2

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



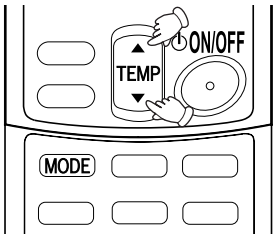
(R4272)

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



(R4273)

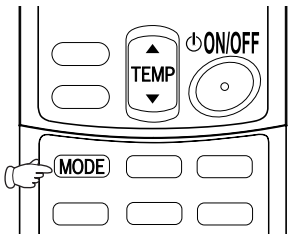
2. Press the TEMP button.
   Press TEMP▲ or TEMP▼ and change the digit until you hear the sound of “beep” or “pi pi”.



(R4274)

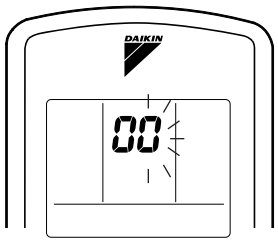
3. Diagnose by the sound.
   ★“ pi ” : The number of tens does not accord with the error code.
   ★“ pi pi ” : The number of tens accords with the error code.
   ★“ beep ” : The both numbers of tens and units accord with the error code. (→See 7.)

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



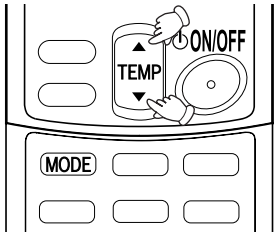
(R4275)

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”.

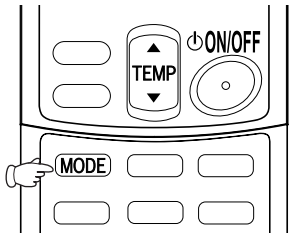


(R4277)

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 106.)

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		133
	U2	Low-voltage detection		135
	U4	Signal transmission error (between indoor and outdoor units)		113
Indoor Unit	A1	Indoor unit PCB abnormality		107
	A5	Freeze-up protection control		108
	A6	Fan motor or related abnormality	AC motor	109
			DC motor	110
	C4	Heat exchanger thermistor abnormality		112
	C9	Room temperature thermistor abnormality		112
Outdoor Unit	E5★	OL activation (compressor overload)		114
	E6★	Compressor lock		115
	E7	DC fan lock		116
	E8	Input over current detection		117
	F3	Discharge pipe temperature control		119
	F6	High pressure control in cooling		120
	H6	Position sensor abnormality		122
	H8	CT or related abnormality		123
	H9	Outdoor air thermistor or related abnormality		125
	J3	Discharge pipe thermistor or related abnormality		125
	J6	Heat exchanger thermistor or related abnormality		125
	L3	Electrical box temperature rise		127
	L4	Radiation fin temperature rise		129
	L5	Output over current detection		131
	P4	Radiation fin thermistor or related abnormality		125

★: 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

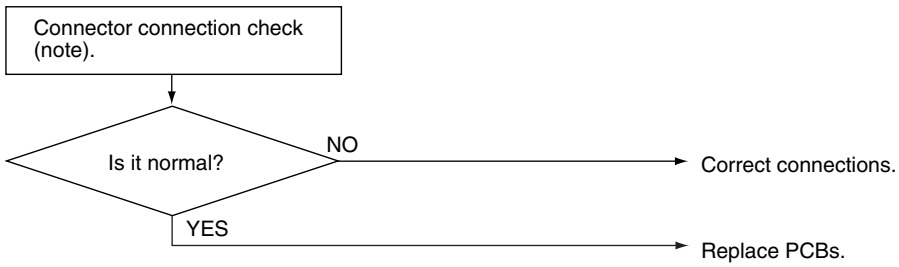
When there is no zero-cross detection in approximately 10 continuous seconds.

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.



(R1400)

Note: Connector Nos. vary depending on models.

Model Type	Connector No.
All models	Terminal strip~Control PCB (indoor unit)

4.3 Freeze-up Protection Control

Remote Controller Display

A5

Method of Malfunction Detection

- The freeze-up protection control (operation halt) is activated during cooling operation according to the temperature detected by the indoor unit heat exchanger thermistor.

Malfunction Decision Conditions

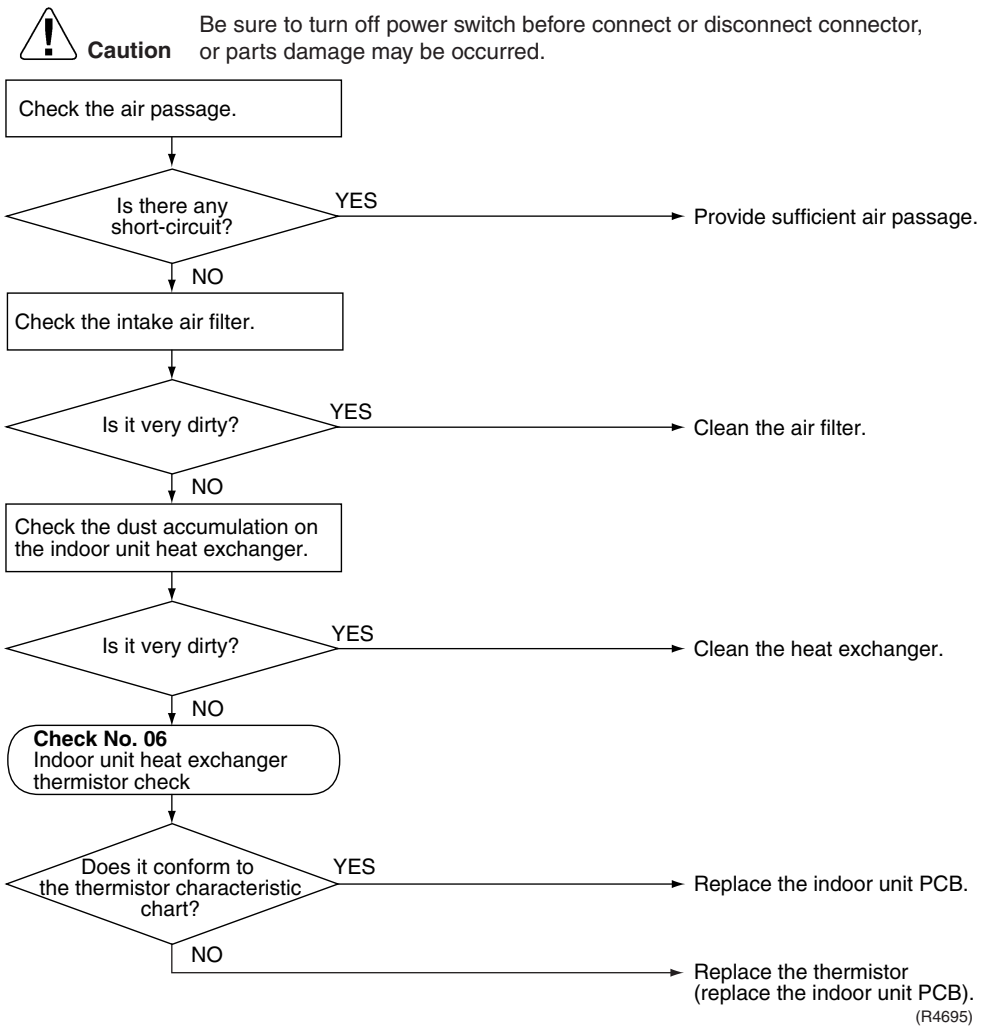
- Freeze-up protection
  When the indoor unit heat exchanger temperature is below 0°C during cooling operation.

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.137



4.4 Fan Motor or Related Abnormality

4.4.1 AC motor (FT25/35DVM, FT25DSG, FT09DV2S)

Remote Controller Display

A6

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 HH tap under maximum fan motor rotation demand.

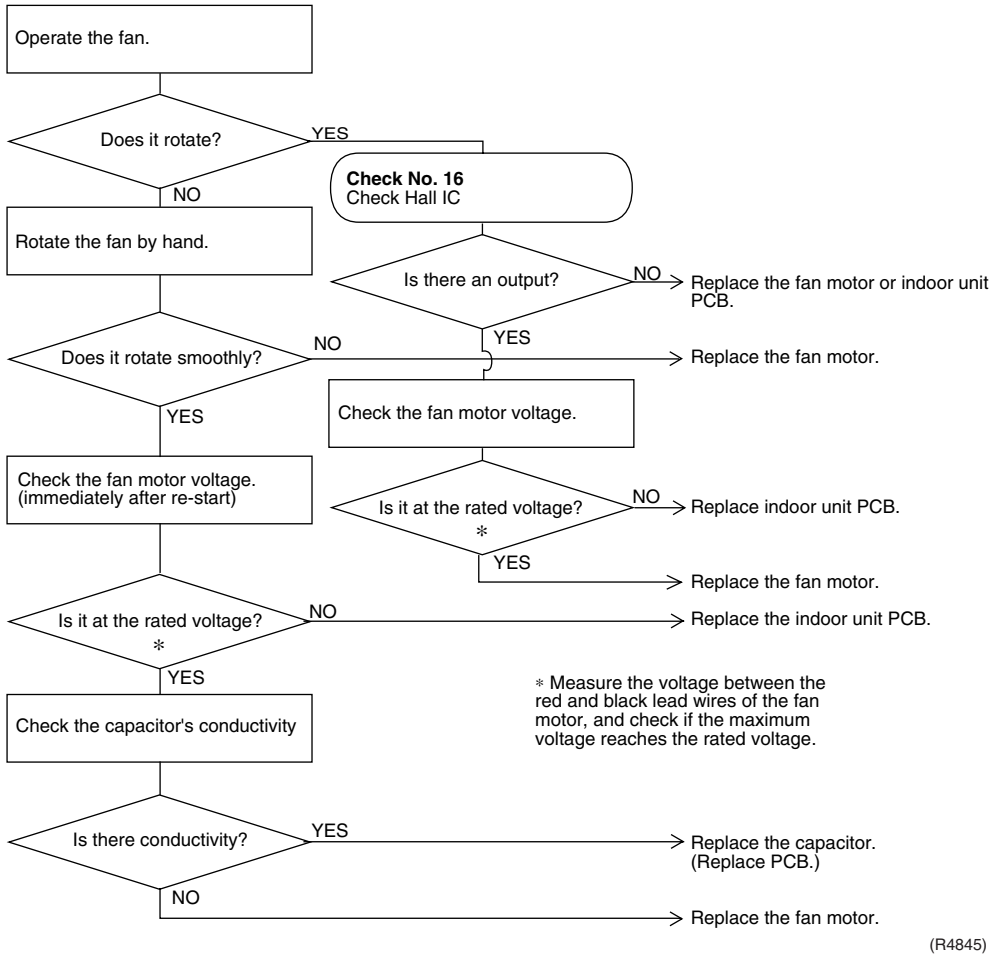
Supposed Causes

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

Troubleshooting

Check No.16
Refer to P.143

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



4.4.2 DC motor (FT13/15DV2S, FT35/50/60DSG)

Remote Controller Display

A6

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

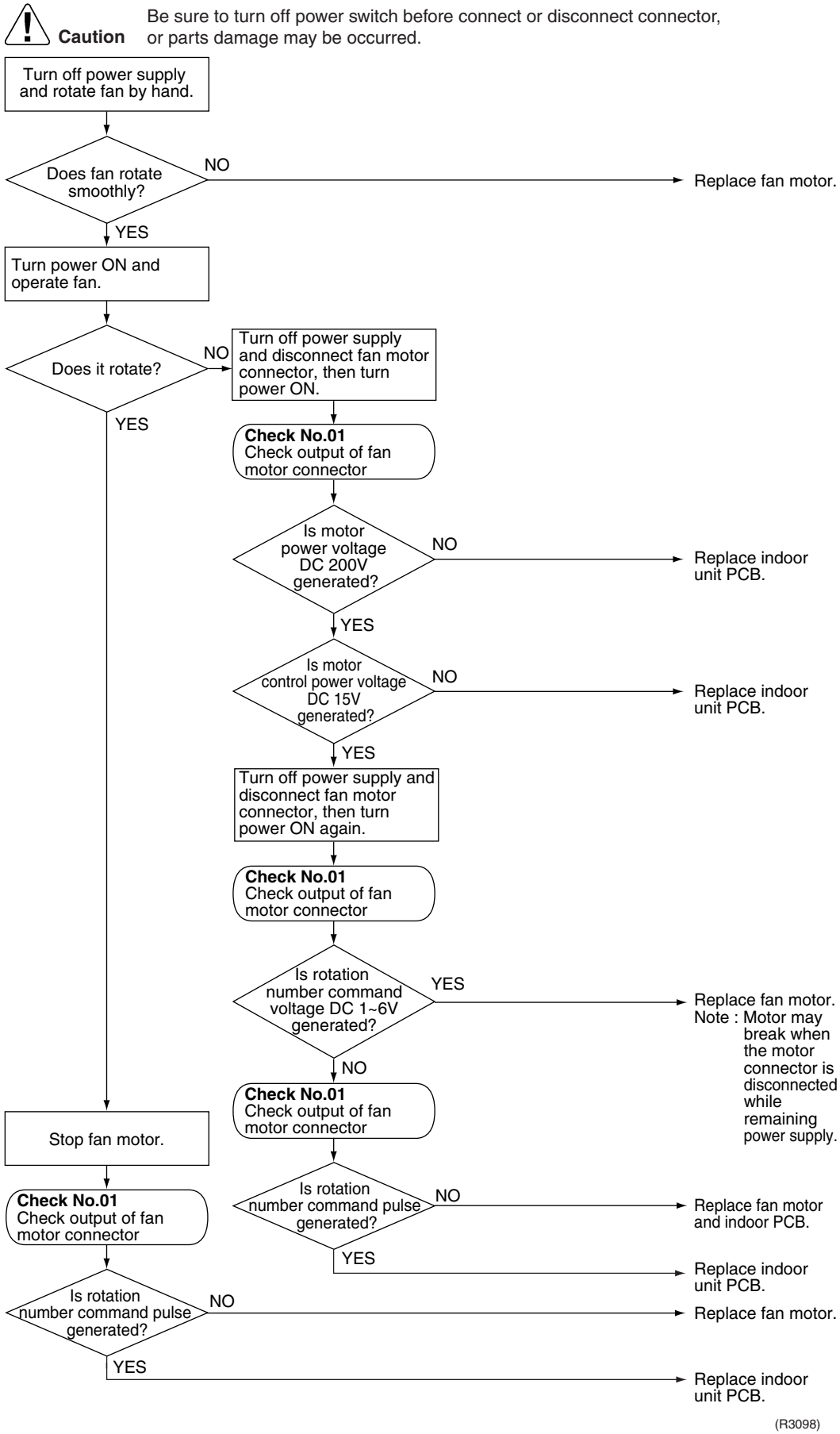
When the detected rotation speed is less than 50% of the H tap under maximum fan motor rotation demand.

Supposed Causes

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

Troubleshooting

Check No.01
Refer to P.136



(R3098)

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

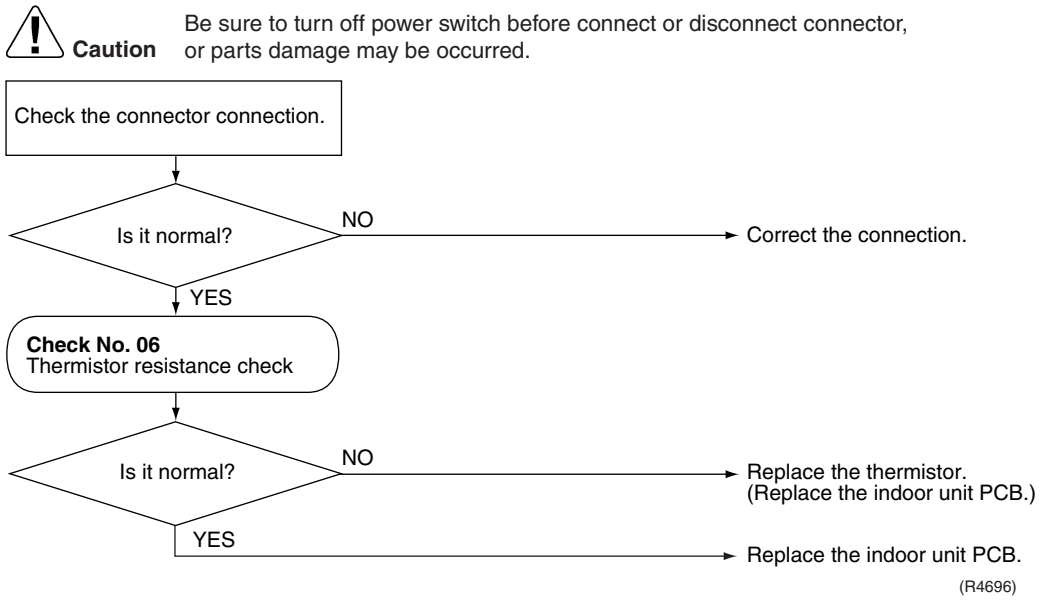
Note: The values vary slightly in some models.

Supposed Causes

- Faulty connector connection
- Faulty thermistor
- Faulty PCB

Troubleshooting

Check No.06
Refer to P.137



C4 : Indoor heat exchanger thermistor
C9 : Room temperature thermistor

4.6 Signal Transmission Error (between Indoor and Outdoor Units)

Remote Controller Display

U4

Method of Malfunction Detection

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

Malfunction Decision Conditions

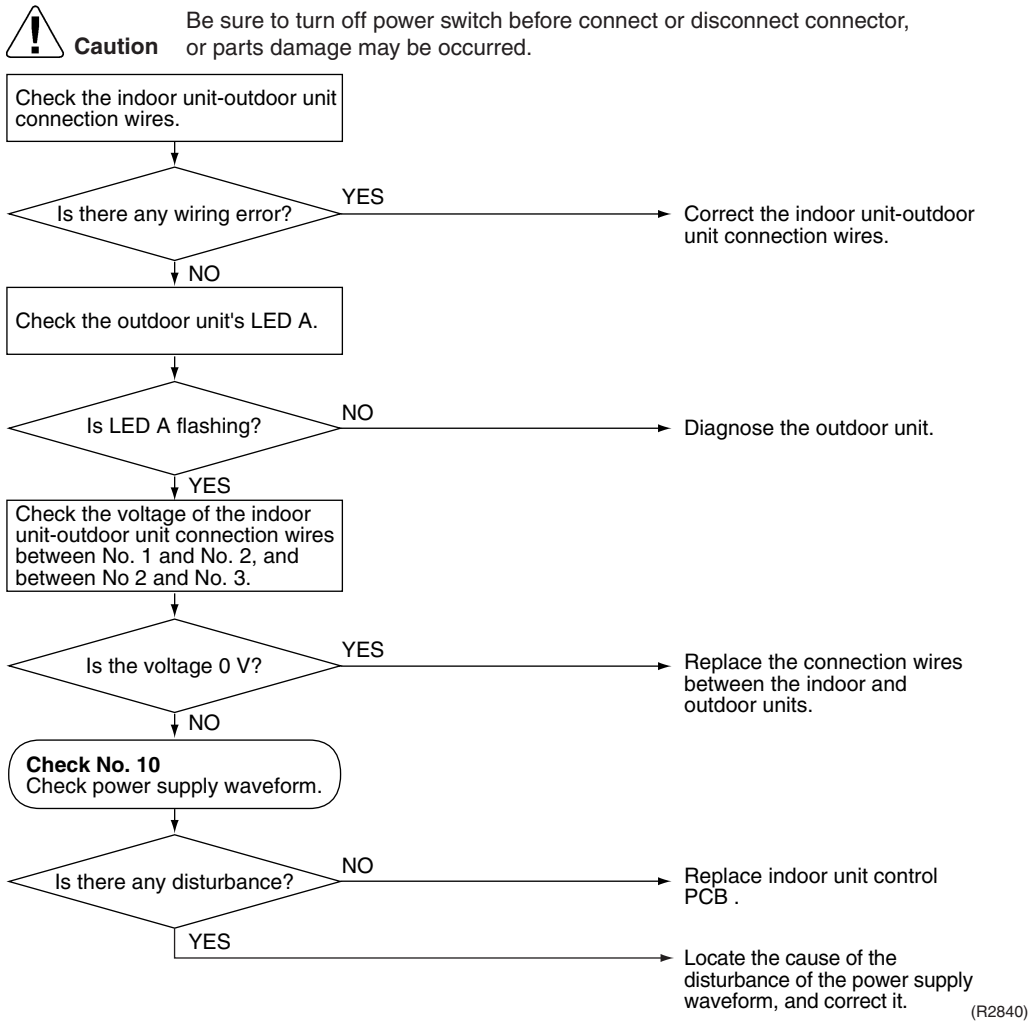
When the data sent from the outdoor unit cannot be received normally, or when the content of the data is abnormal.

Supposed Causes

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

Troubleshooting

Check No.10
Refer to P.140



4.7 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
- Outdoor unit PCB defective
- Water mixed in the local piping
- Electronic expansion valve defective
- Stop valve defective

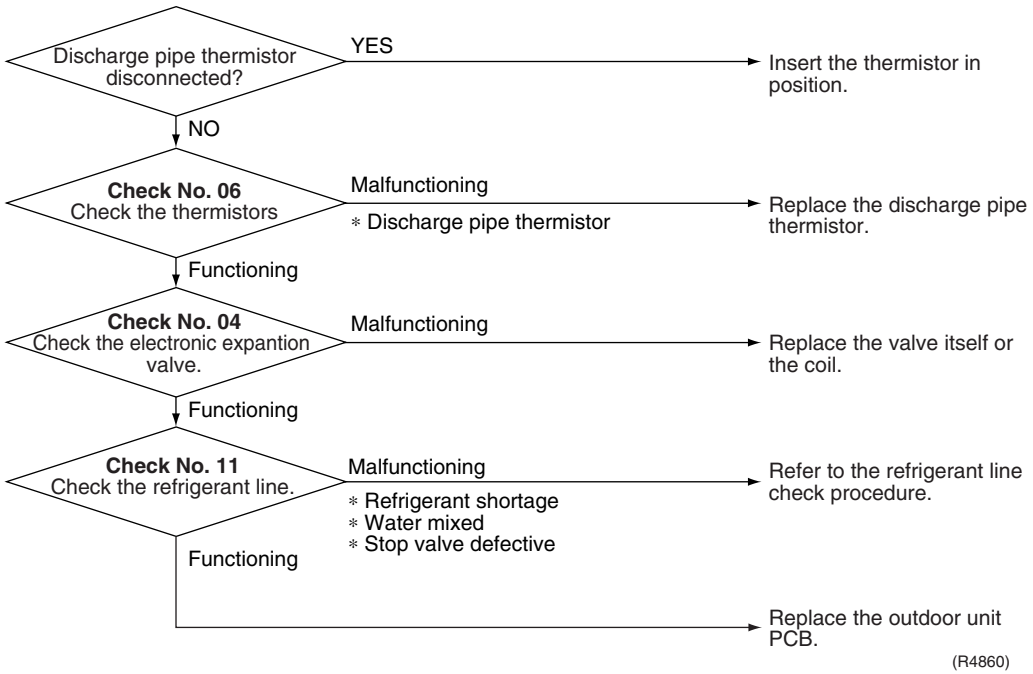
Troubleshooting

Check No.04
Refer to P.136

Check No.06
Refer to P.137

Check No.11
Refer to P.140

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



4.8 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.

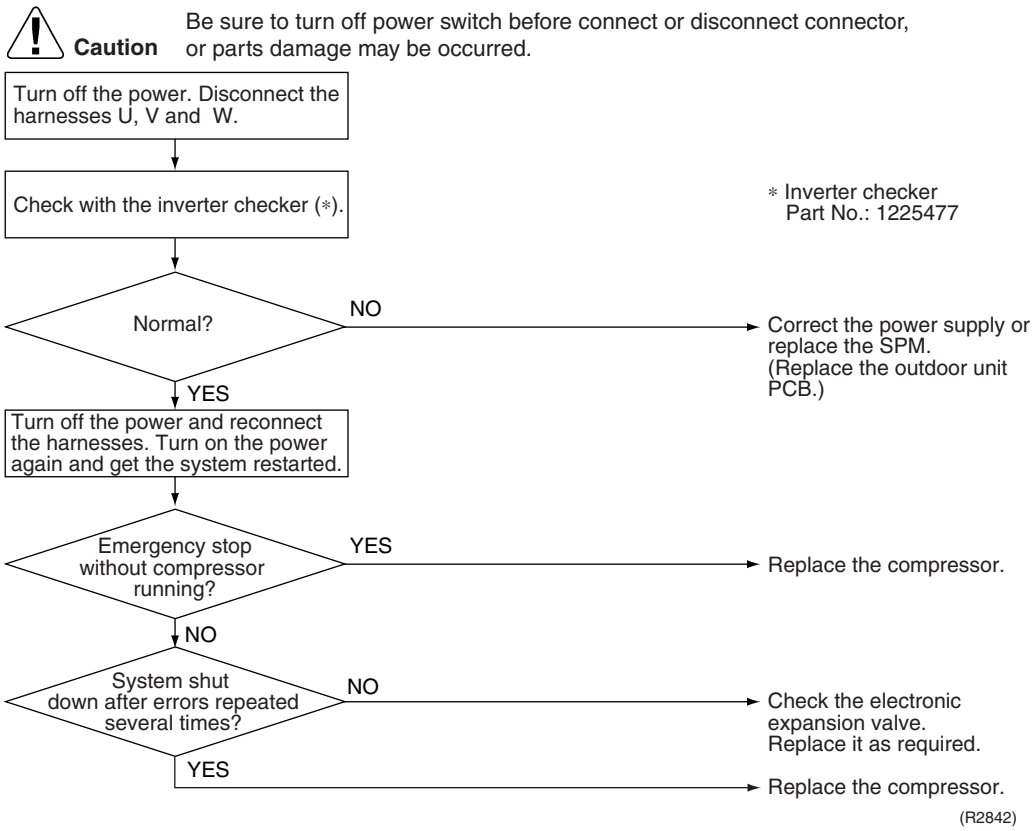
Malfunction Decision Conditions

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

Supposed Causes

- Compressor locked

Troubleshooting



4.9 DC Fan Lock

Remote Controller Display

E7

Method of Malfunction Detection

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

Malfunction Decision Conditions

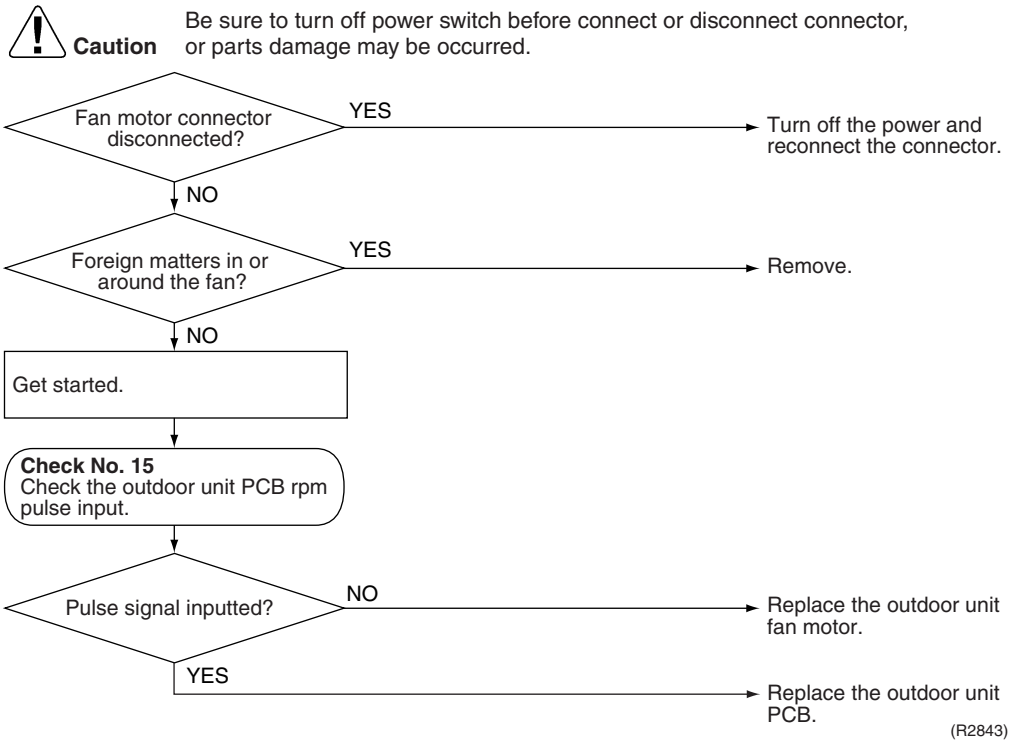
- The fan does not start in 30 seconds even when the fan motor is running.
- The system will be shut down if the error occurs 16 times.
- Clearing condition: Continuous run for about 5 minutes (normal)

Supposed Causes

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

Troubleshooting

Check No.15
Refer to P.142



4.10 Input Over Current Detection

Remote Controller Display

E8

Method of Malfunction Detection

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

Malfunction Decision Conditions

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

Supposed Causes

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

Troubleshooting

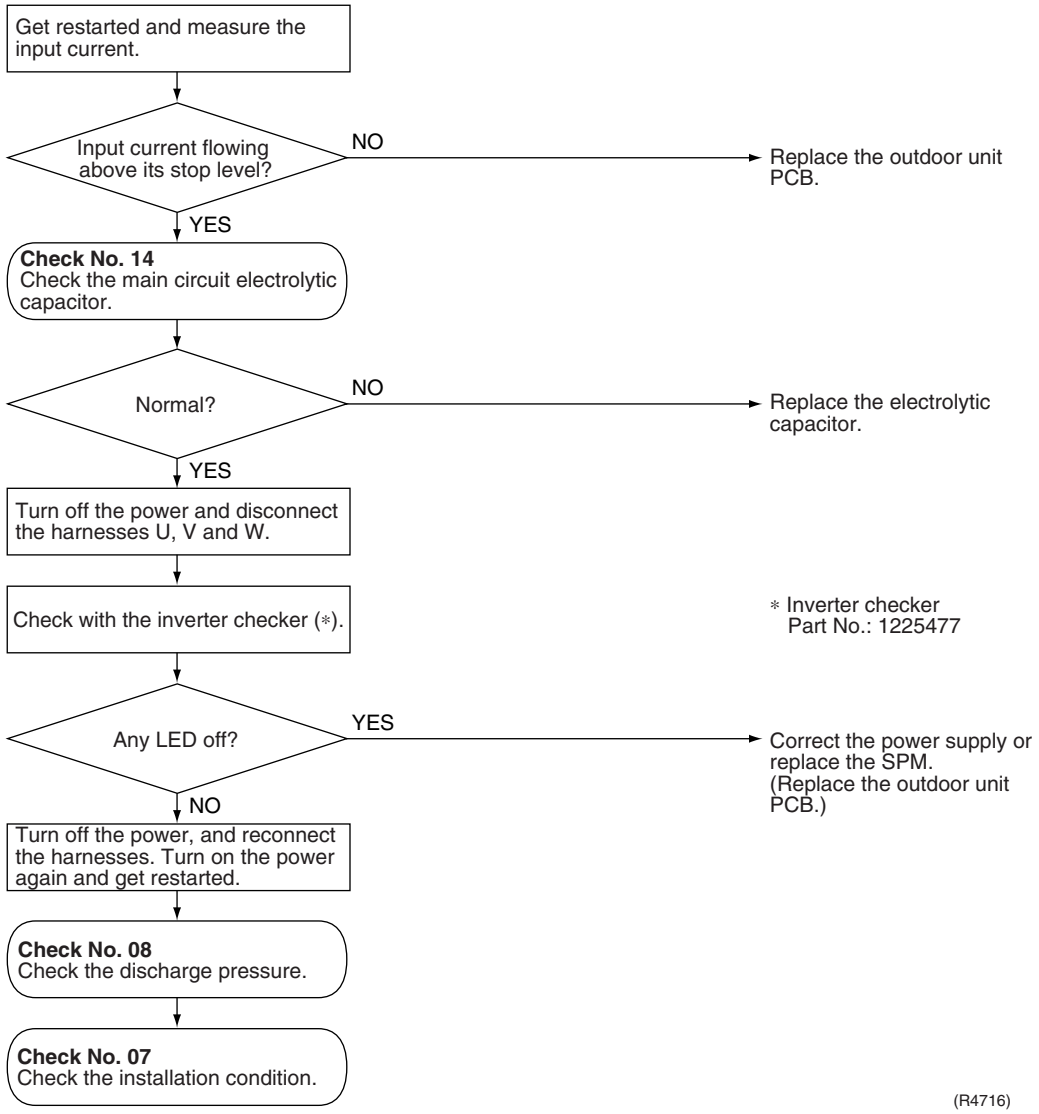
Check No.07
Refer to P.138

Check No.08
Refer to P.139

Check No.14
Refer to P.142

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

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



(R4716)

4.11 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 6 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 120°C, the compressor will stop. (The error is cleared when the temperature has dropped below 107°C.)
- 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

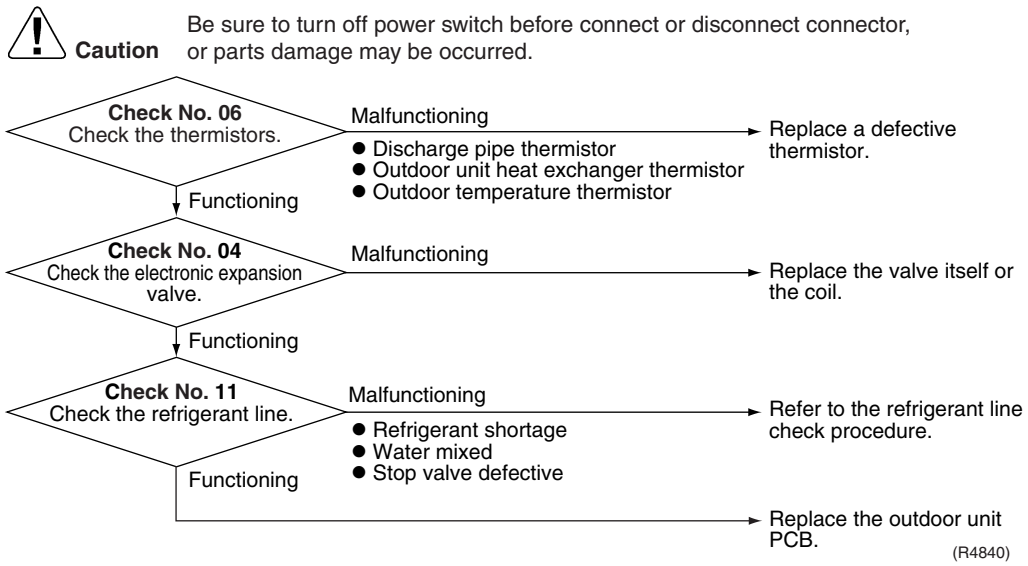
- Refrigerant shortage
- Discharge pipe thermistor defective
  (heat exchanger or outdoor temperature thermistor defective)
- Outdoor unit PCB defective
- Water mixed in the local piping
- Electronic expansion valve defective
- Stop valve defective

Troubleshooting

Check No.04
Refer to P.136

Check No.06
Refer to P.137

Check No.11
Refer to P.140



4.12 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 69.5°C. (Deactivated when the temperature drops below 55°C.)

Supposed Causes

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

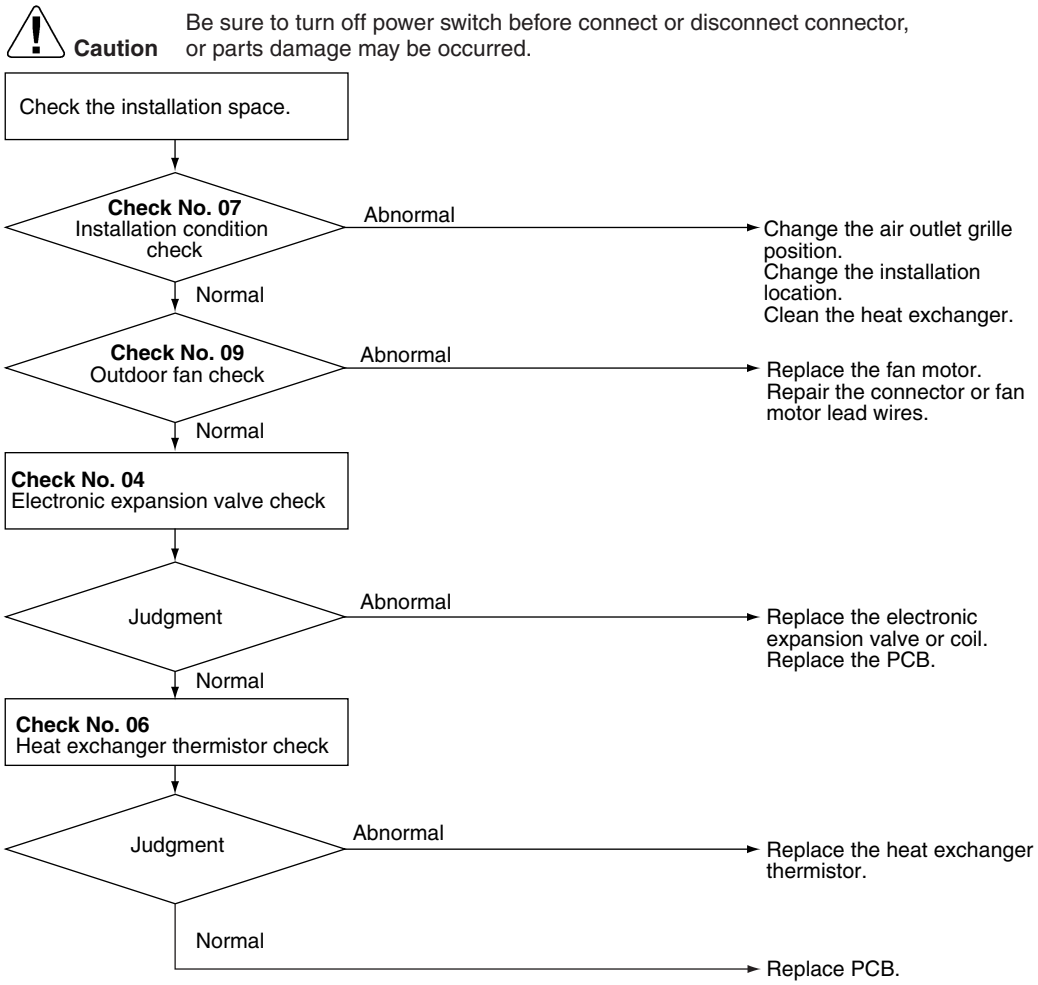
Troubleshooting

Check No.04
Refer to P.136

Check No.06
Refer to P.137

Check No.07
Refer to P.138

Check No.09
Refer to P.139



(R4701)

4.13 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

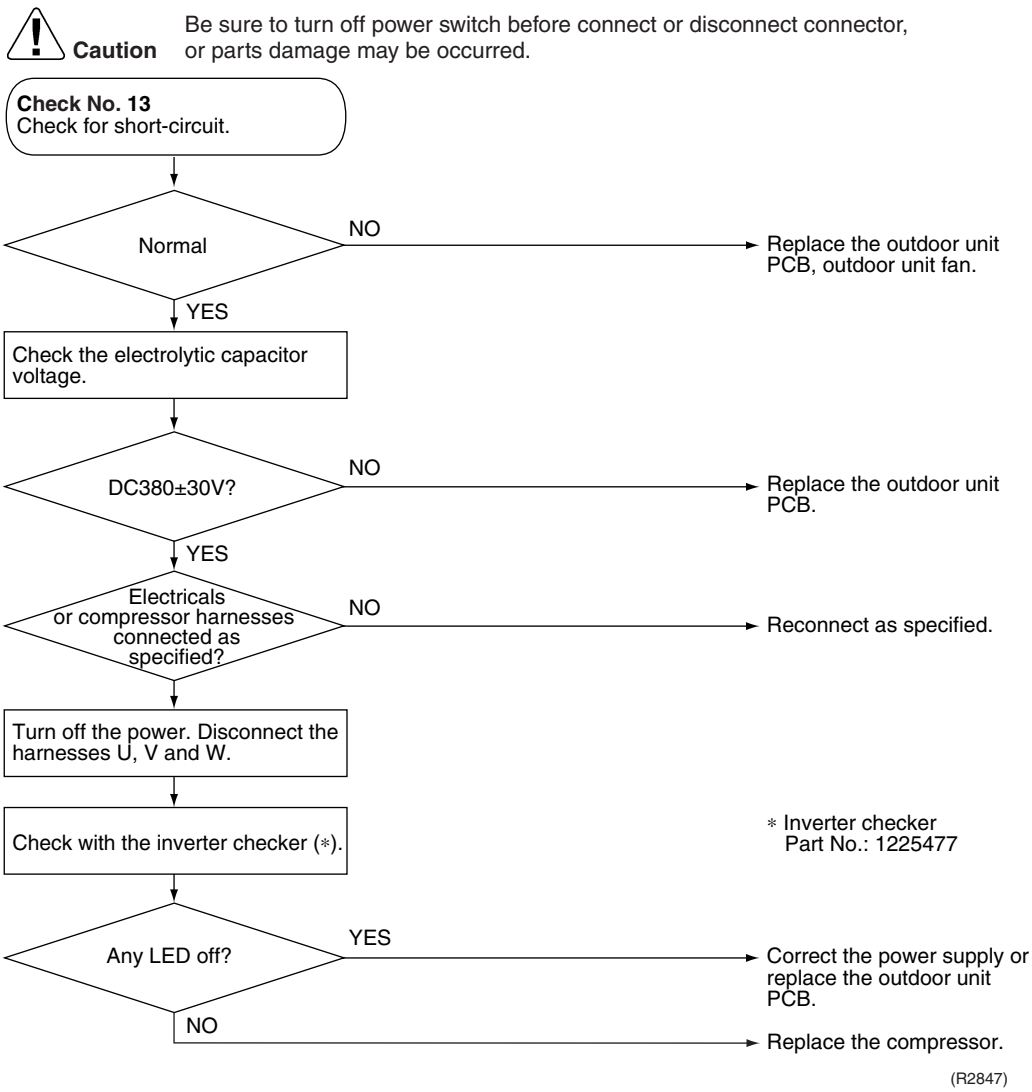
- The compressor fails to start in about 15 seconds after the compressor run command signal is sent.
- Clearing condition: Continuous run for about 5 minutes (normal)
- The system will be shut down if the error occurs 8 times.

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.141

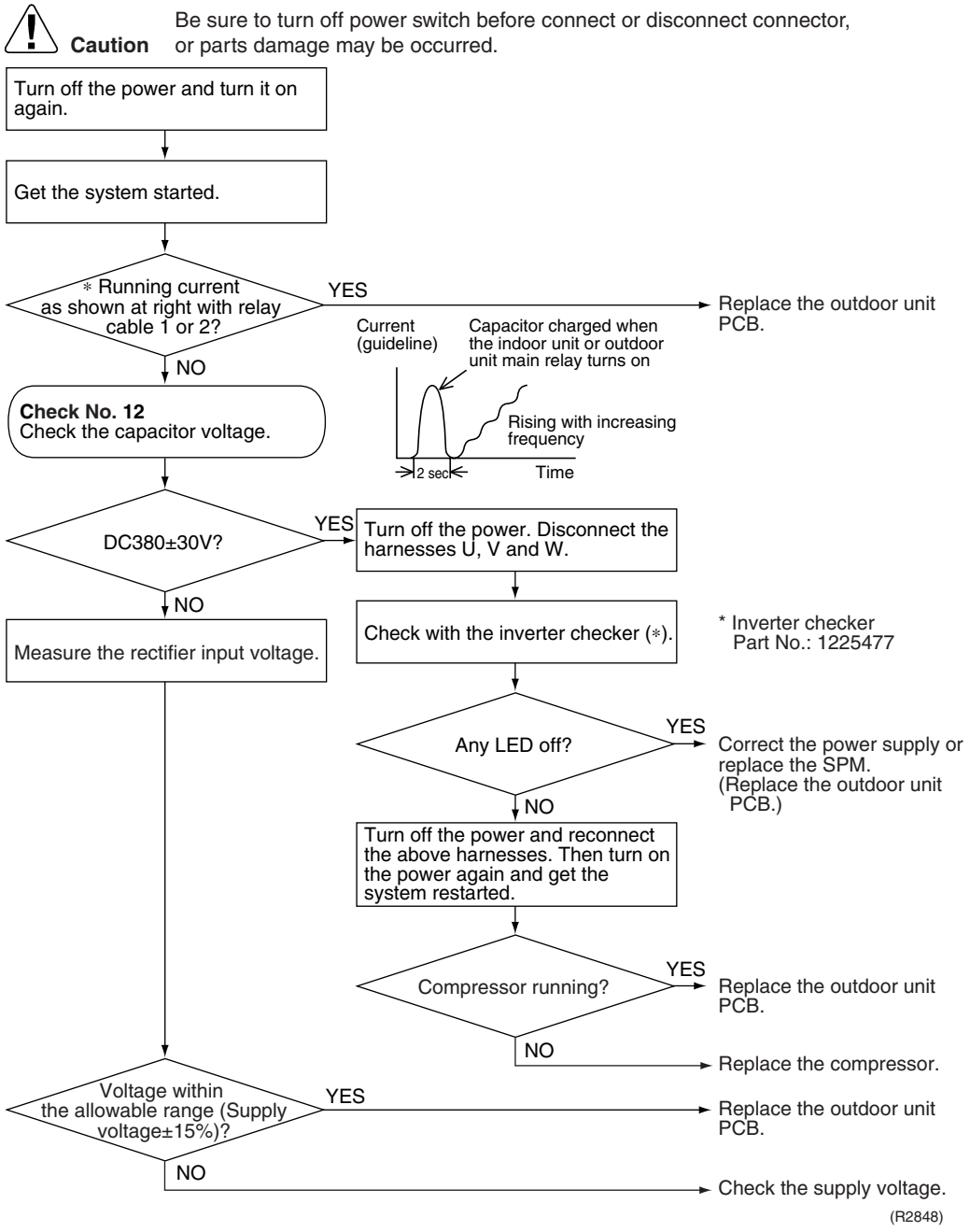


4.14 CT or Related Abnormality

Remote Controller Display	H8
Method of Malfunction Detection	A CT or related error is detected by checking the compressor running frequency and CT-detected input current.
Malfunction Decision Conditions	The compressor running frequency is below 55 Hz and the CT input is below 0.1 V. (The input current is also below 1.25 A.) ■ If this error repeats 4 times, the system will be shut down. ■ The error counter will reset itself if this or any other error does not occur during the following 60-minute compressor running time (total time).
Supposed Causes	■ Power transistor defective ■ Internal wiring broken or in poor contact ■ Reactor defective ■ Outdoor unit PCB defective

Troubleshooting

Check No.12
Refer to P.141



4.15 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

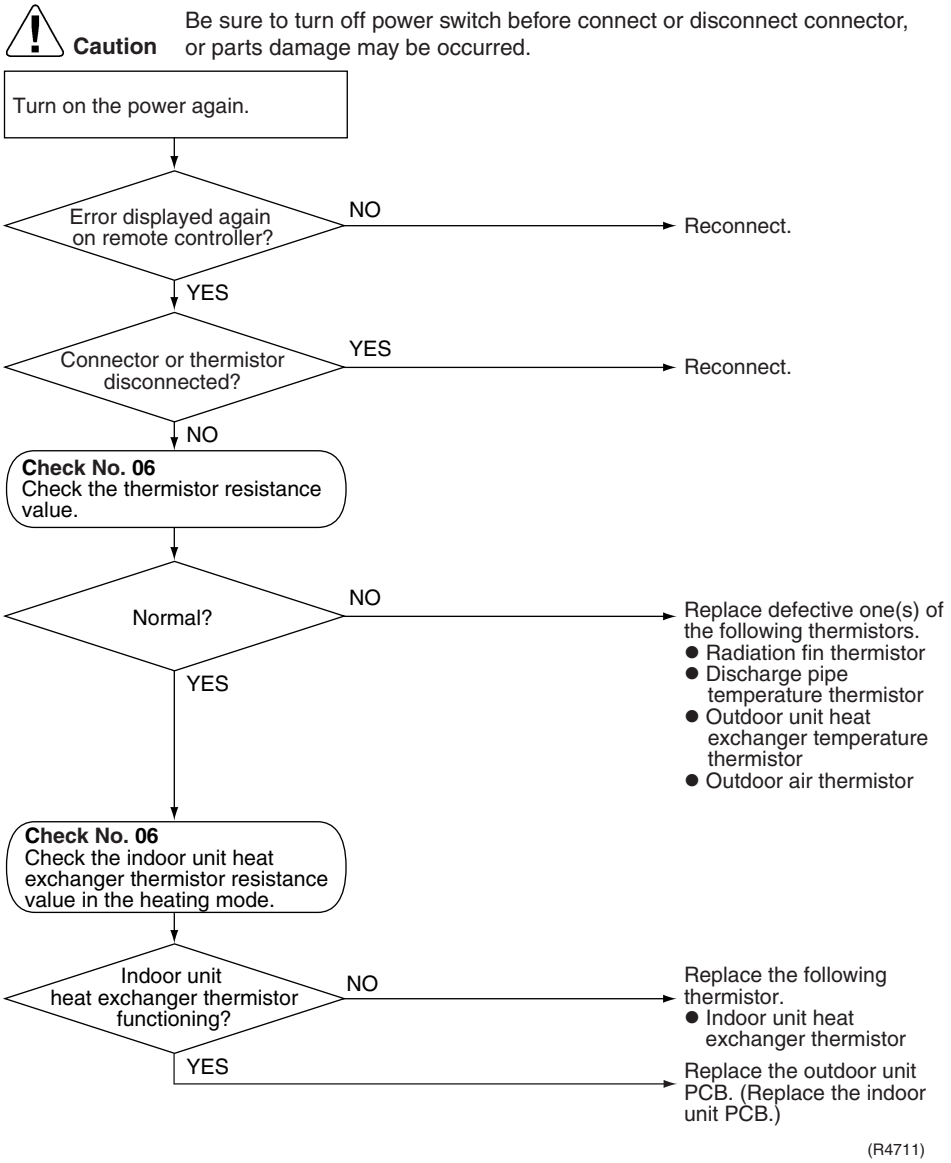
The thermistor input is above 4.96 V or below 0.04 V with the power on.
Error J3 is judged if the discharge pipe thermistor temperature is smaller than the condenser thermistor temperature.

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.137



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

4.16 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 75°C. (Reset is made when the temperature drops below 70°C.)

Supposed Causes

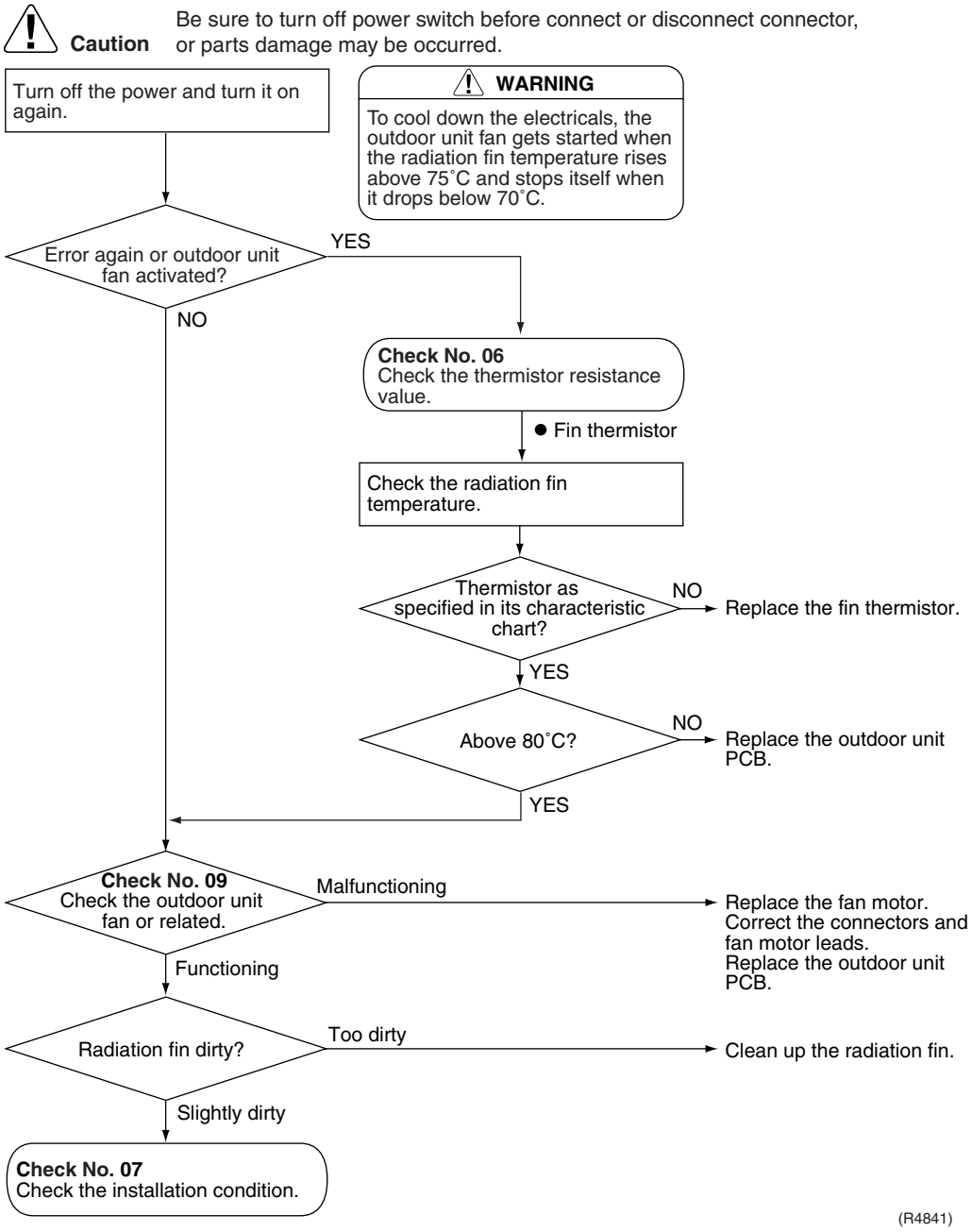
- Fin temperature rise due to defective outdoor unit fan
- Fin temperature rise due to short-circuit
- Fin thermistor defective
- Connector in poor contact
- Outdoor unit PCB defective

Troubleshooting

Check No.06
Refer to P.137

Check No.07
Refer to P.138

Check No.09
Refer to P.139



4.17 Radiation Fin Temperature Rise

Remote Controller Display

L4

Method of Malfunction Detection

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

Malfunction Decision Conditions

If the radiation fin temperature with the compressor on is above 90°C,

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

Supposed Causes

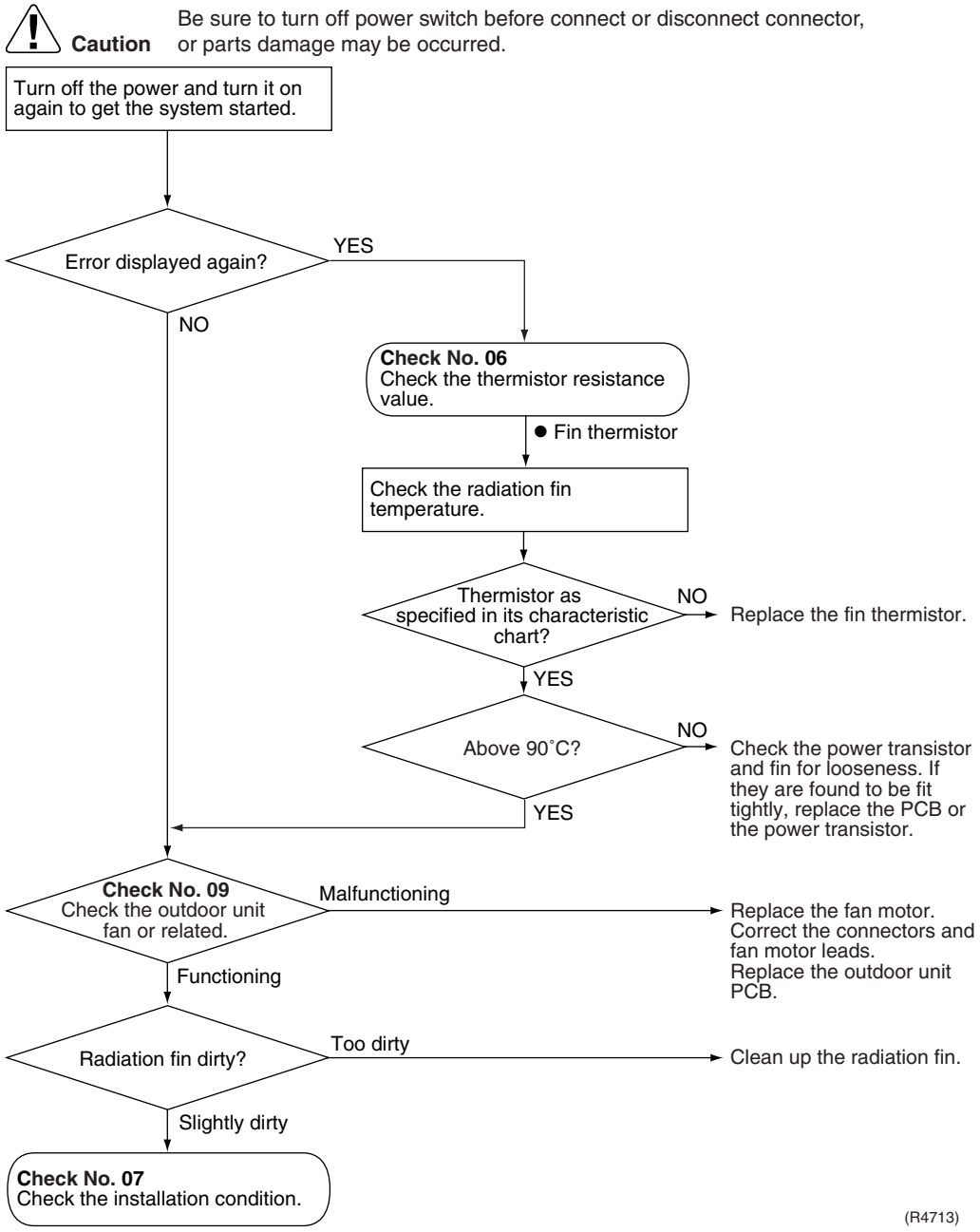
- Fin temperature rise due to defective outdoor unit fan
- Fin temperature rise due to short-circuit
- Fin thermistor defective
- Connector in poor contact
- Outdoor unit PCB defective

Troubleshooting

Check No.06
Refer to P.137

Check No.07
Refer to P.138

Check No.09
Refer to P.139



4.18 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 16 times.
- Clearing condition: Continuous run for about 5 minutes (normal)

Supposed Causes

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

Troubleshooting

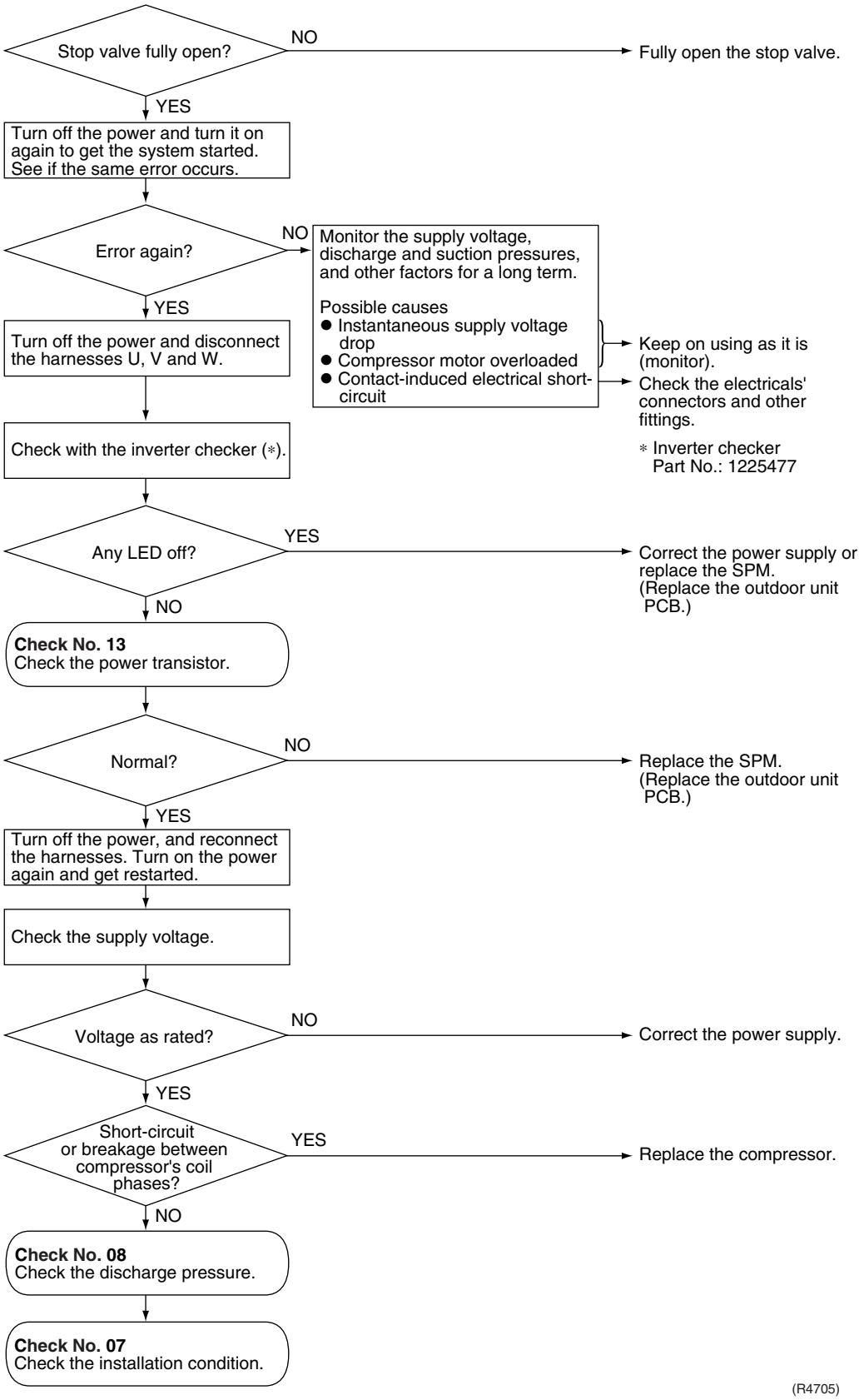
Check No.07
Refer to P.138

Check No.08
Refer to P.139

Check No.13
Refer to P.141

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

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



(R4705)

4.19 Insufficient Gas

Remote Controller Display

U0

Method of Malfunction Detection

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

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

Malfunction Decision Conditions

Gas shortage detection I (typical value):
The following conditions continue for 7 minutes.

- Input current × input voltage ≤ 2600 / 256 × output frequency –300 (W)
- Output frequency > 54 (Hz)

Gas shortage detection II:
The following conditions continue for 80 seconds.

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

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

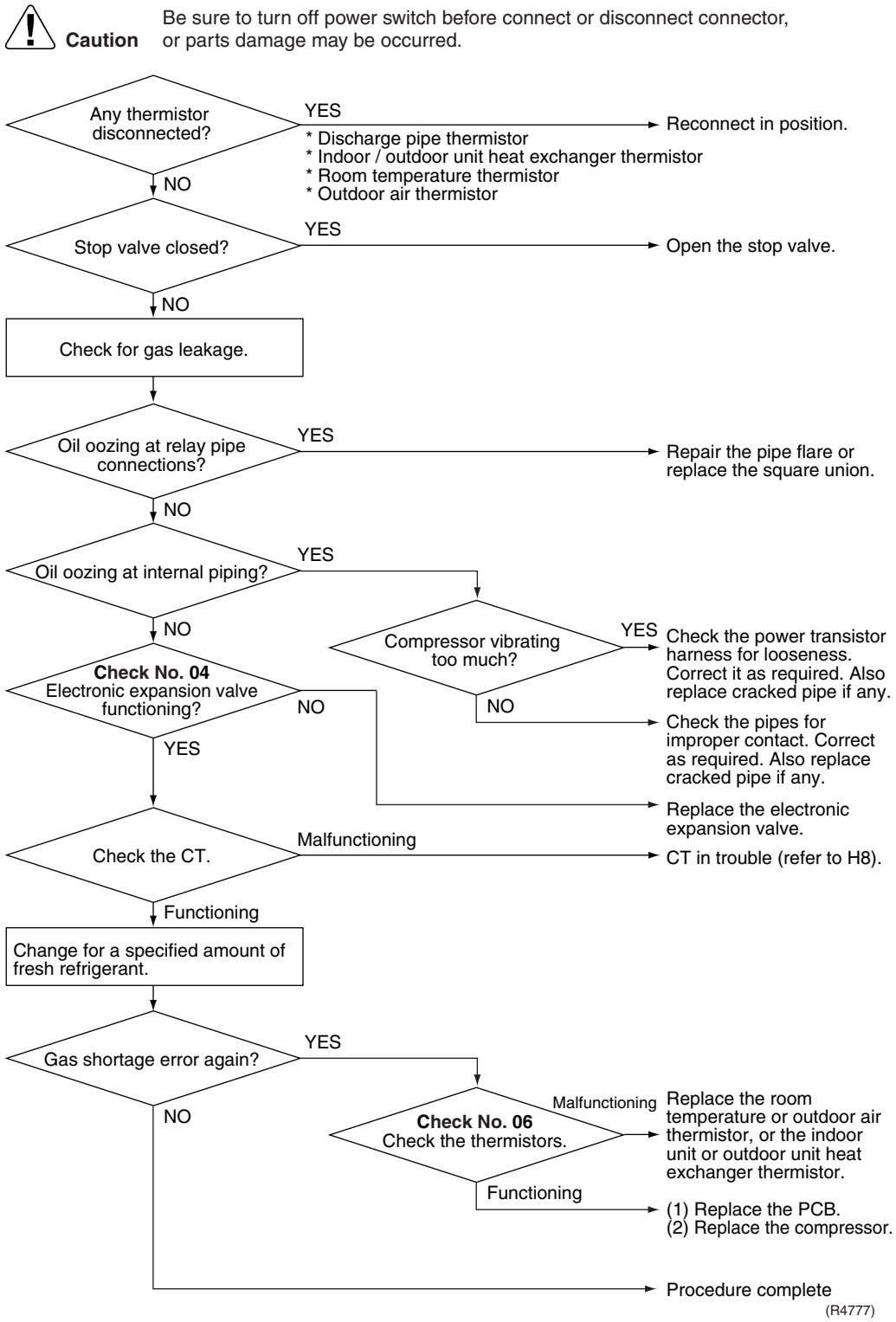
Supposed Causes

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

Troubleshooting

Check No.04
Refer to P.136

Check No.06
Refer to P.137



4.20 Low-voltage Detection

Remote Controller Display

U2

Method of Malfunction Detection

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

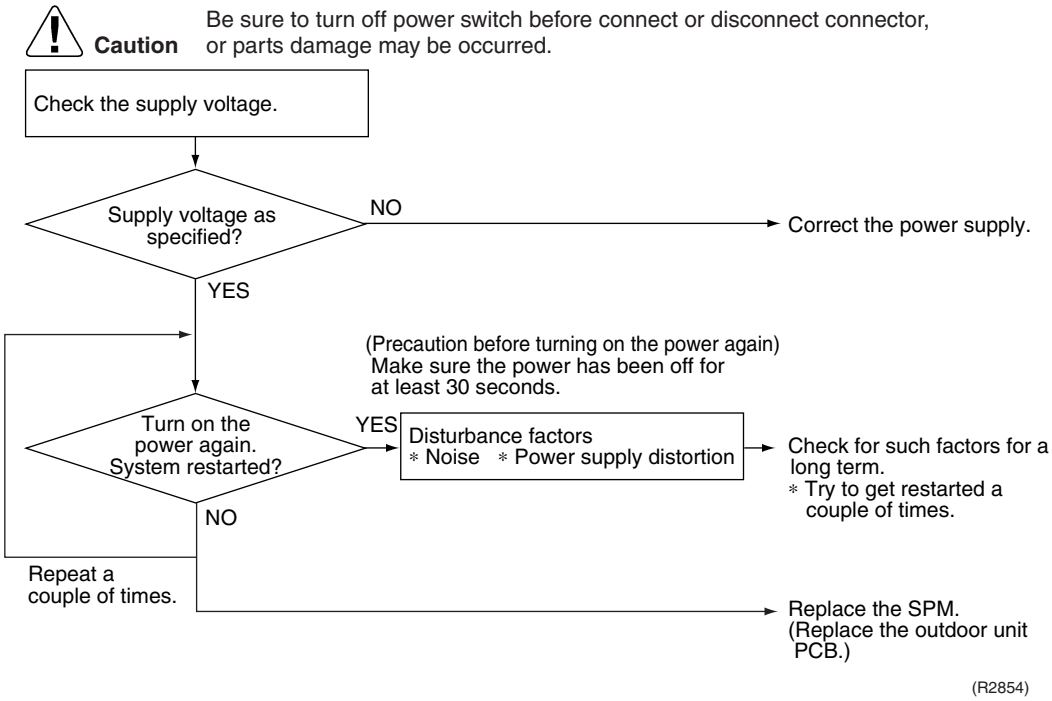
Malfunction Decision Conditions

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

Supposed Causes

- Supply voltage not as specified
- Over-voltage detector or DC voltage detection circuit defective
- PAM control part(s) defective

Troubleshooting



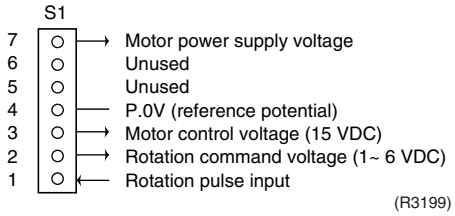
5. Check

5.1 How to Check

5.1.1 Fan Motor Connector Output Check

Check No.01

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

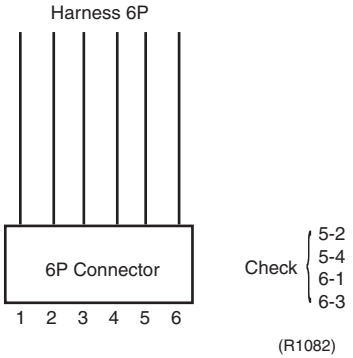


5.1.2 Electronic Expansion Valve Check

Check No.04

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

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



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

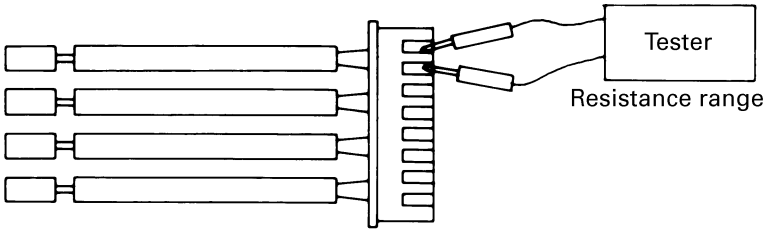
Note: Please note that the latching sound varies depending on the valve type.

5.1.3 Thermistor Resistance Check

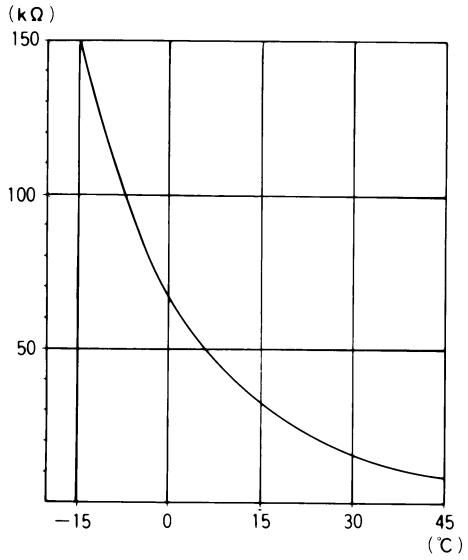
Check No.06

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	211.0 (kΩ)
–15	150
–10	116.5
–5	88
0	67.2
5	51.9
10	40
15	31.8
20	25
25	20
30	16
35	13
40	10.6
45	8.7
50	7.2



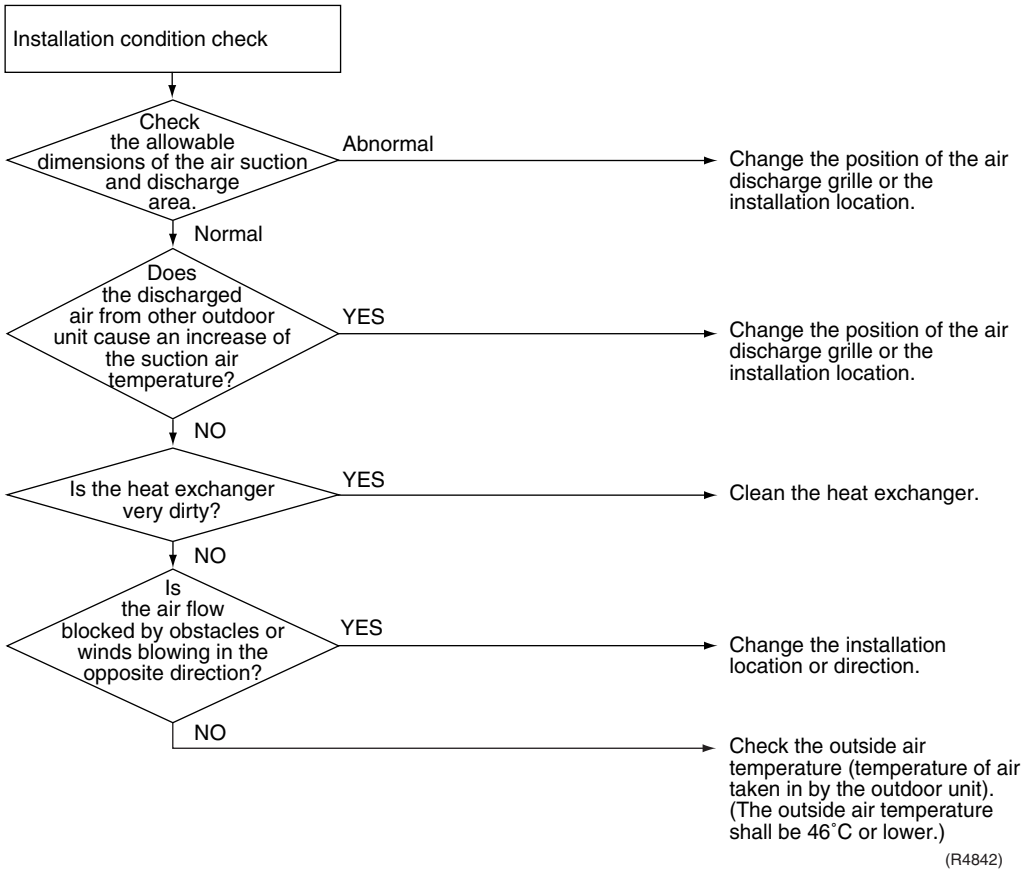
（R25＝20kΩ、B＝3950）



(R1437)

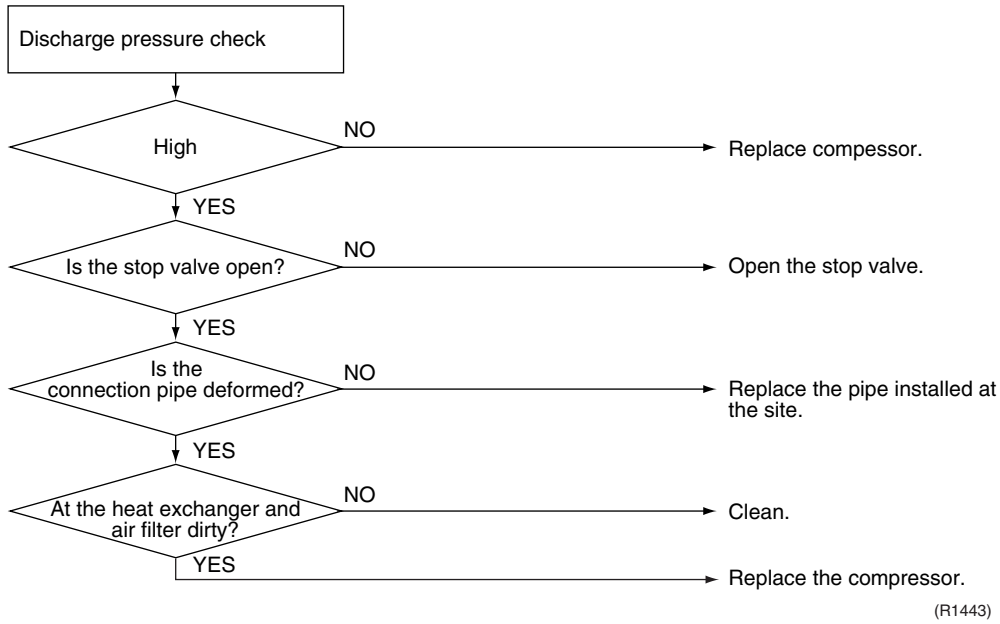
5.1.4 Installation Condition Check

Check No.07



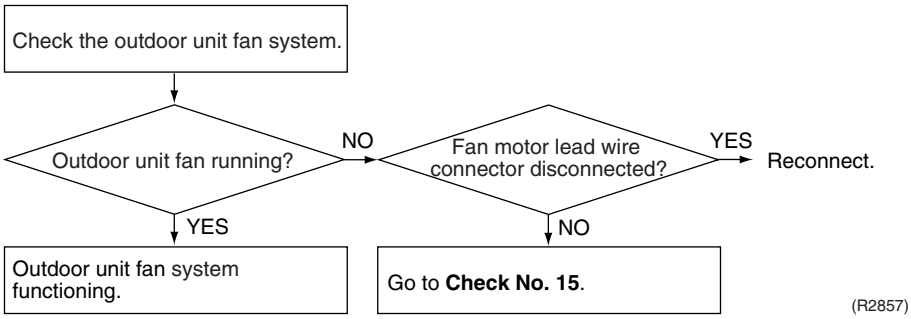
5.1.5 Discharge Pressure Check

Check No.08



5.1.6 Outdoor Unit Fan System Check (With DC Motor)

Check No.09



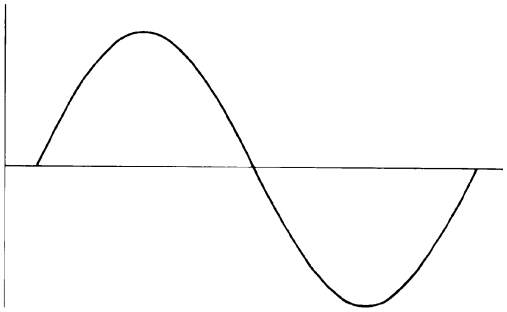
5.1.7 Power Supply Waveforms Check

Check No.10

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

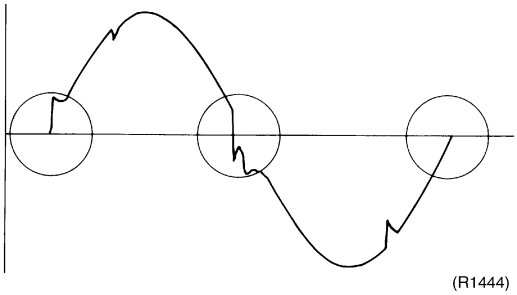
- Check to see if the power supply waveform is a sine wave (Fig.1).
- Check to see if there is waveform disturbance near the zero cross (sections circled in Fig.2)

[Fig.1]



(R1736)

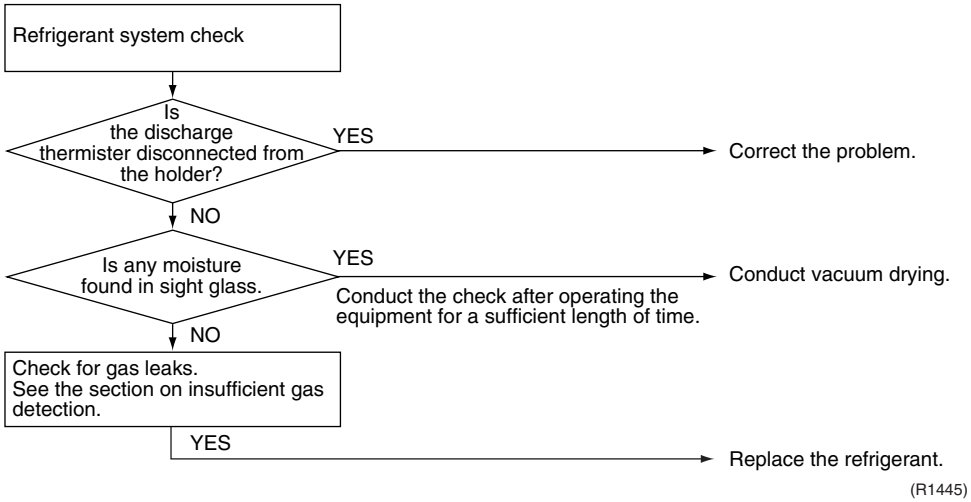
[Fig.2]



(R1444)

5.1.8 Inverter Units Refrigerant System Check

Check No.11



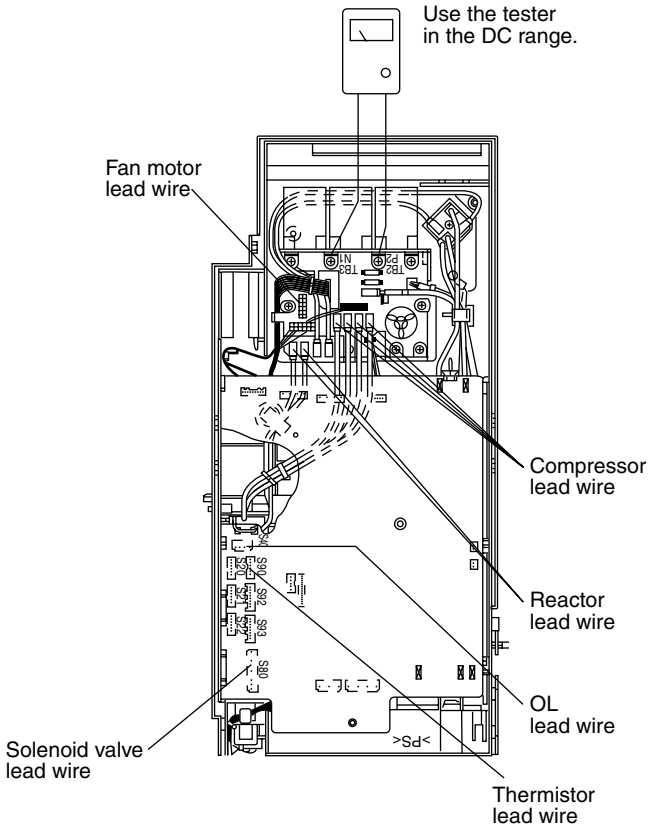
(R1445)

5.1.9 Capacitor Voltage Check

Check No.12

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

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



5.1.10 Power Transistor Check

Check No.13

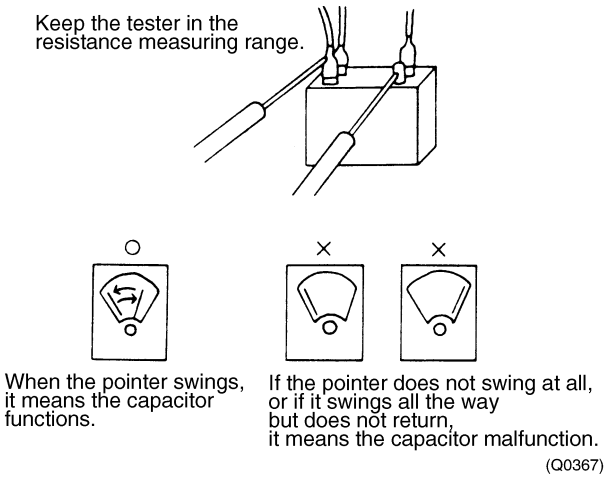
- Checking the power transistor
- Never touch any live parts for at least 10 minutes after turning off the circuit breaker.
- If unavoidably necessary to touch a live part, make sure the power transistor's supply voltage is below 50 V using the tester.
- For the UVW, make measurements at the Faston terminal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

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

5.1.11 Main Circuit Electrolytic Capacitor Check

Check No.14

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

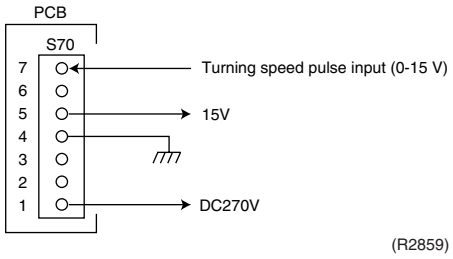


5.1.12 Turning Speed Pulse Input on the Outdoor Unit PCB Check

Check No.15

<Propeller fan motor>
Make sure the voltage of 270±30V is being applied.
(1) Stop the operation first and then the power off, and disconnect the connector S70.
(2) Make sure there is about DC 270 V between pins 4 and 7.
(3) With the system and the power still off, reconnect the connector S70.
(4) Make a turn of the fan motor with a hand, and make sure the pulse (0-15 V) appears twice at pins 1 and 4.

If the fuse is blown out, the outdoor-unit fan may also be in trouble. Check the fan too.
If the voltage in Step (2) is not applied, it means the PCB is defective. Replace the PCB.
If the pulse in Step (4) is not available, it means the Hall IC is defective. Replace the DC fan motor.If there are both the voltage (2) and the pulse (4), replace the PCB.



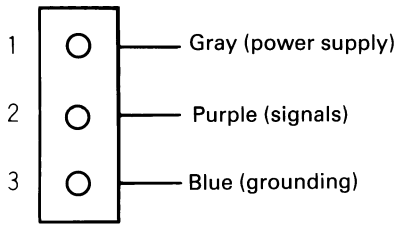
∗ Propeller fan motor : S70

5.1.13 Hall IC Check

Check No.16

1. Check the connector connection.
2. With the power ON, operation OFF, and the connector connected, check the following.
   ∗Output voltage of about 5 V between pins 1 and 3.
   ∗Generation of 3 pulses between pins 2 and 3 when the fan motor is operating.

Failure of (1) → faulty PCB → Replace the PCB.
Failure of (2) → faulty Hall IC → Replace the fan motor.
Both (1) and (2) result → Replace the PCB.



(R1968)

Part 7
Removal Procedure

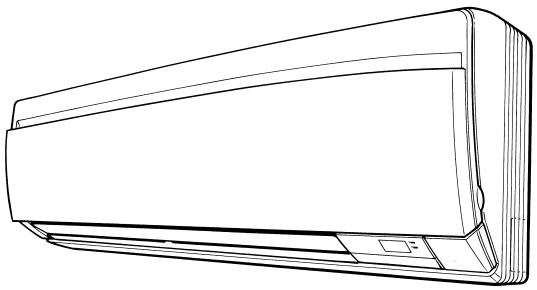
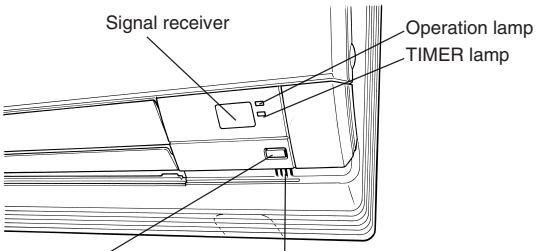
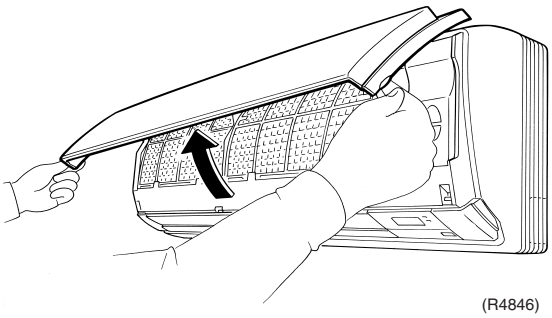
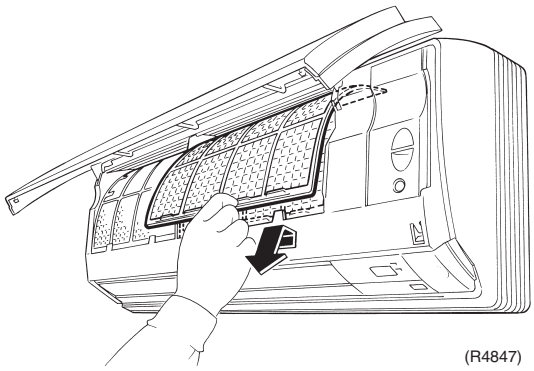
Note:
The removal procedures for R09/13/15DV2S and R25/35DSG are not described.

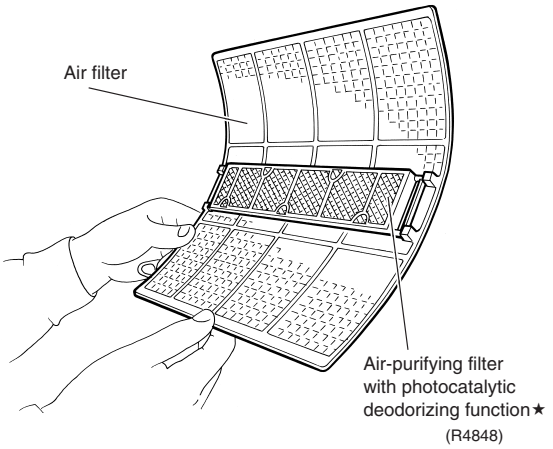
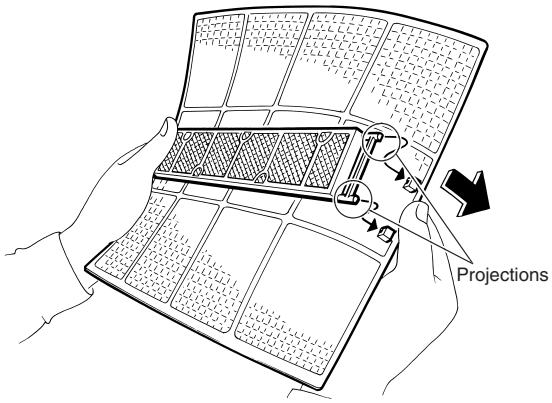
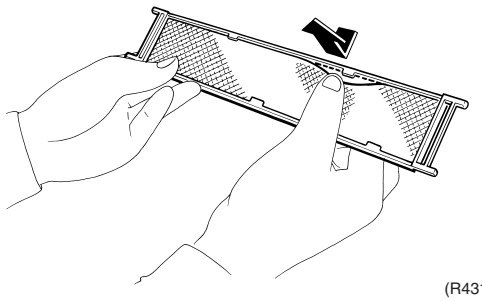
1. FT09/13DV2S, FT25/35DVM, FT25/35DSG

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.**

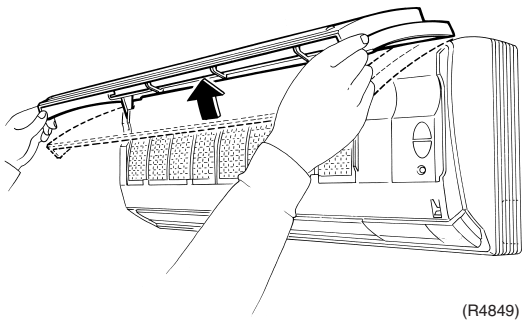
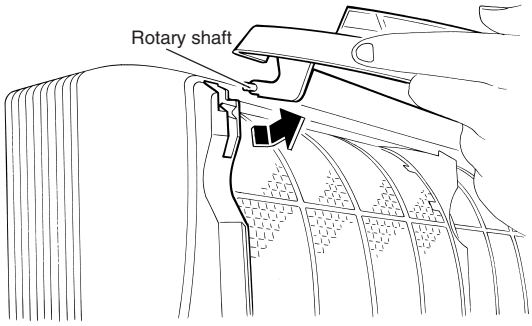
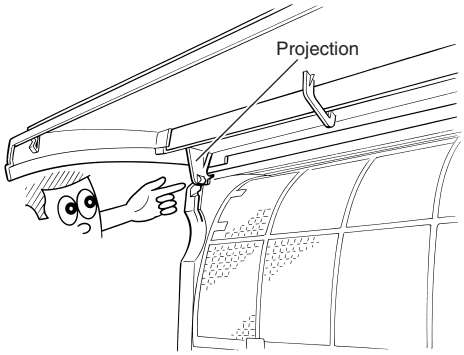
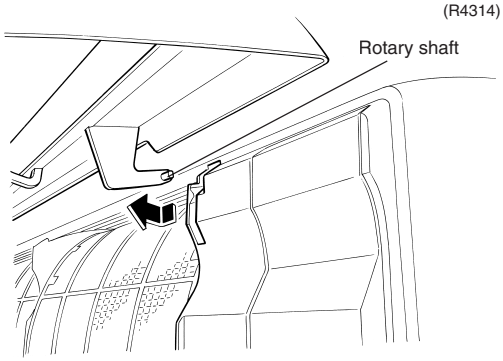
Step	Procedure	Points
1. Appearance feature	 (R4844)  (R4845)	**Warning** **Dangerous: High voltage** **A high voltage is applied to all the electric circuits of this product including thermistors.** ■ When a signal from the remote controller is received, the receiving tone sounds and the operation lamp 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 and release the hook. 3 Pull out the air filter downwards and remove it.	 (R4846)  (R4847)	■ 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.

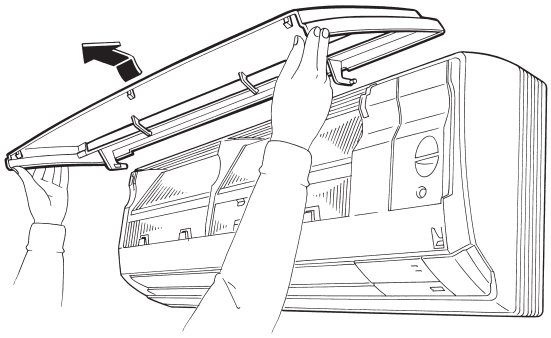
Step	Procedure	Points
3. Removing the air-purifying filter with photocatalytic deodorizing function ★		
1 The air-purifying filter with photocatalytic deodorizing function is attached to the back of the air filter.	 (R4848)	■ The air-purifying filter with photocatalytic deodorizing function is not marked for difference between the right and left sides. ★ Air purifying filter and photocatalytic deodorizing filter for FT09DV2S model.
2 Remove the air-purifying filter frame by bending the air filter and unfastening the projections from the air filter frame.	 (R4310)	
3 Remove the air-purifying filter with photocatalytic deodorizing function from its frame (at 5 positions) by bending it.	 (R4311)	

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.**

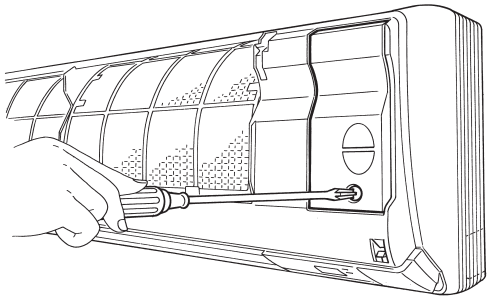
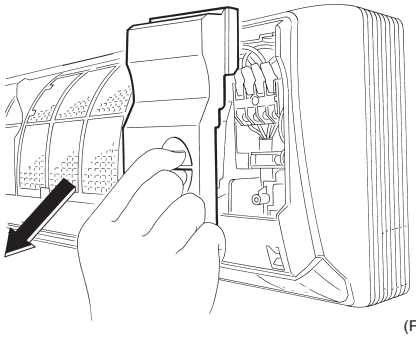
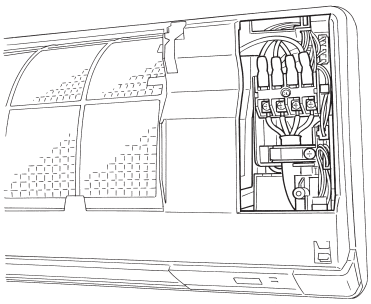
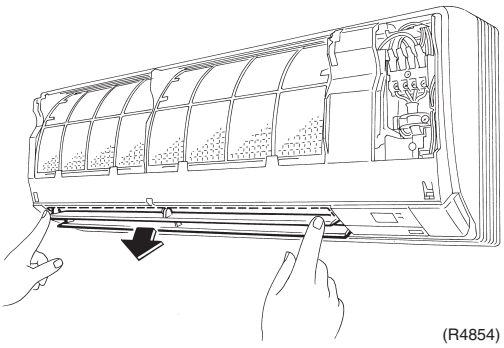
Step	Procedure		Points
1. Removing the front panel			
1	Put your fingers on the right and left projections of the front panel, and open the panel over the position where it will stop.	 (R4849)	
2	Slide the left rotary shaft to the right and release it.	 (R4313)	
3	When mounting the front panel, make sure that the projection is fitted in the guide before closing the panel.	 (R4314)	
4	Slide the right rotary shaft to the left and release it.	 (R4315)	

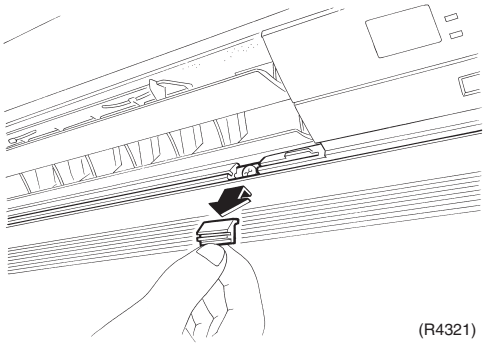
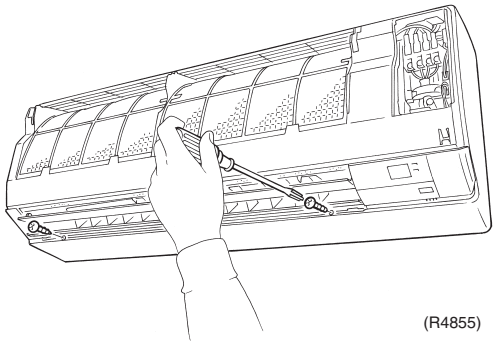
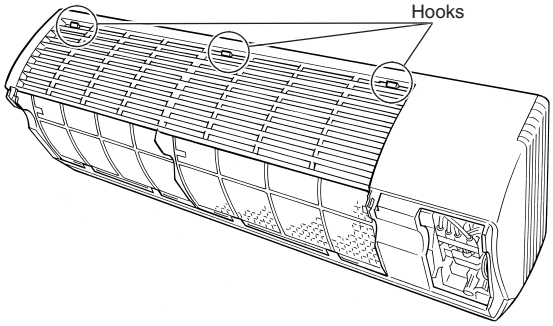
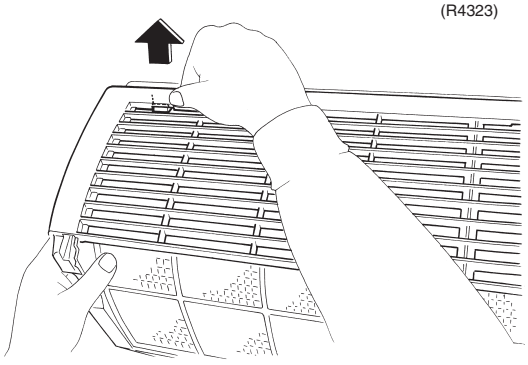
Step	Procedure		Points
5	Remove the front panel.	 (R4850)	**Caution on Mounting** ■ When mounting the front panel, fit the right and left rotary shafts one by one into the grooves and fully push them in position.

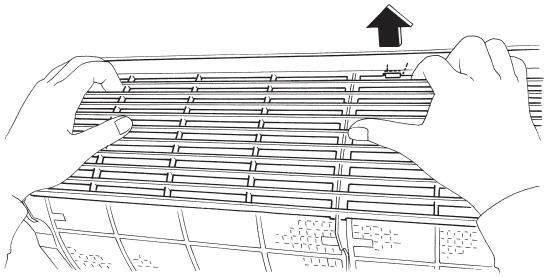
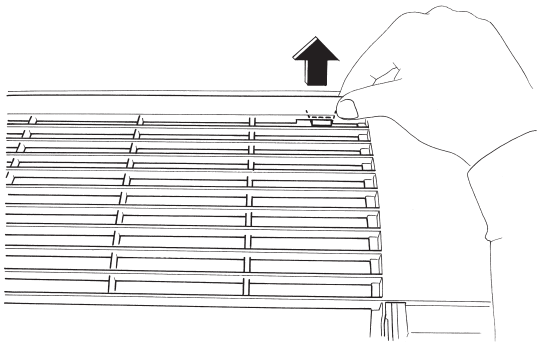
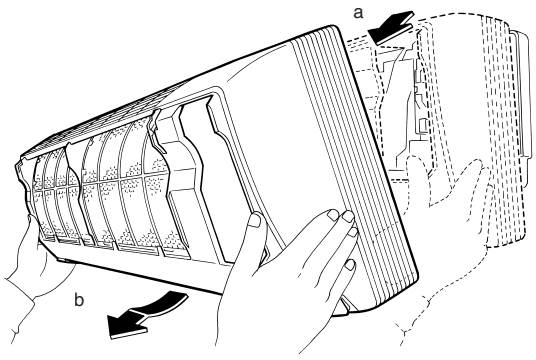
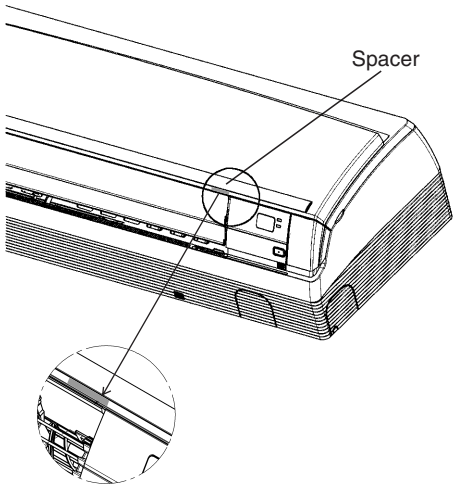
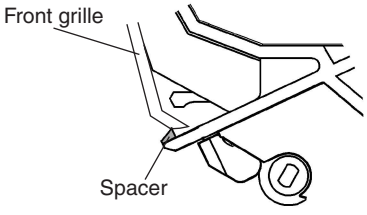
1.3 Removal of Front Grille

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.	 (R4851)	**Preparation** ■ Remove the front panel according to the “Removal of Front Panel.”
2	Pull out the service cover diagonally down in the direction of the arrow.	 (R4852)	
3	The figure shows the appearance of the inside.	 (R4853)	■ There are no switches to be set in the field.
2. Removing the front grille			
1	Open the horizontal blades.	 (R4854)	

Step	Procedure		Points
2	Remove the screw covers (one each at the right and left).	 (R4321)	
3	Remove the screws (one each at the right and left).	 (R4855)	■ When installing the indoor unit, drive the screws with the horizontal blades open or removed.
4	Release the 3 hooks at the top.	 (R4323)	
5	Put your fingers into the front grille to the depth and lift the grille up to unhook.	 (R4324)	

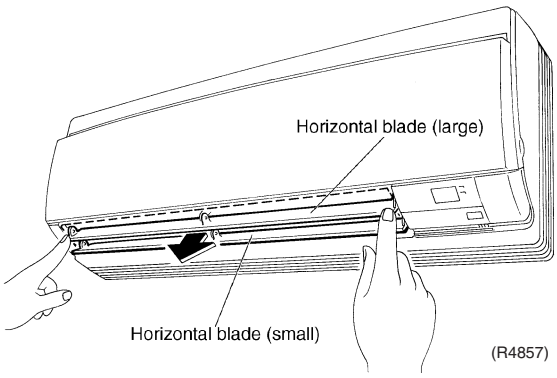
Step	Procedure		Points
6	Put your fingers into the front grille and lift the grille up to unfasten the center hook.	 (R4325)	
7	Unfasten the right hook also by putting your fingers into the grille and lifting it.	 (R4326)	
8	Remove the front grille by tilting the upper part to the front (a) and lifting and pulling the lower part toward yourself (b).	 (R4327)	**Caution on Mounting** ■ When mounting the front grille, make sure that the hooks are fastened as they were.
		 (R4856)	■ When mounting the front grille, be sure not to get it stuck on the spacer of the drain pan.  **Section View** (R4590)

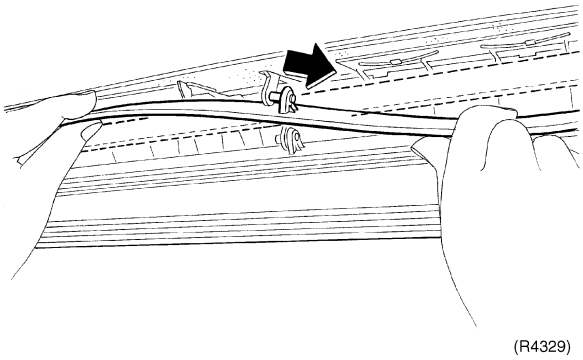
1.4 Removal of Horizontal Blades and Vertical Blades

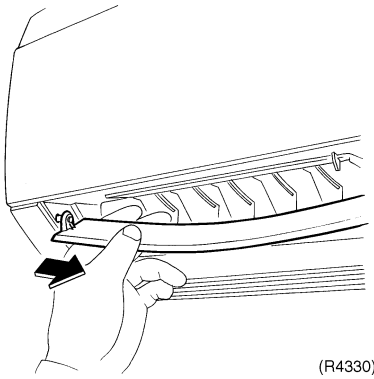
Procedure

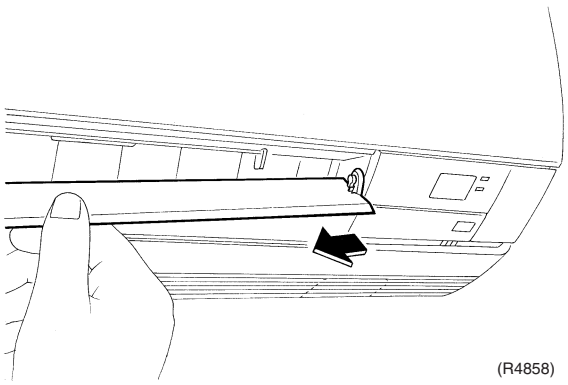
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

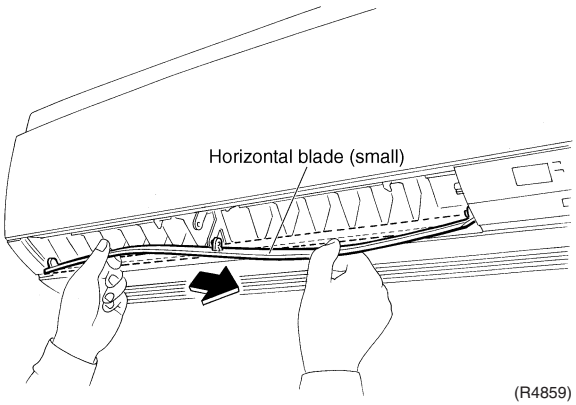
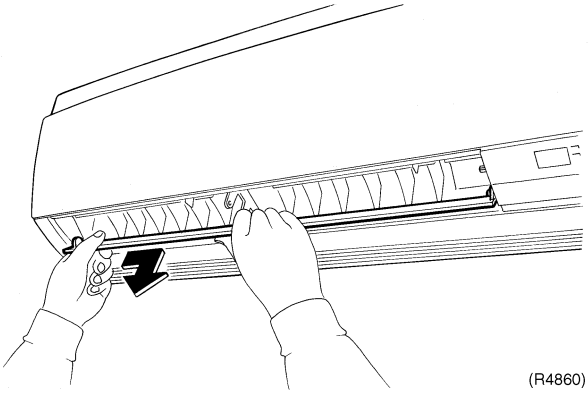
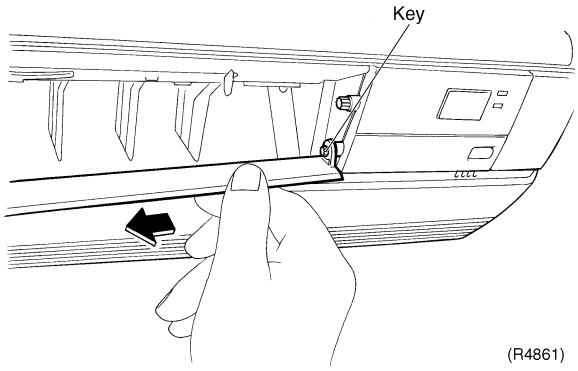
Step	Procedure	Points
1. Removing the horizontal blade (large)		
1	Open the horizontal blade (large).	**Cautions on Mounting** ■ Mount the large horizontal blade to the upper side and the small horizontal blade to the lower side. Do not put them in the wrong place.
2	Unfasten the center fixing shaft while bending the horizontal blade slightly.	■ There is a key alignment mark at the right side. Insert the key first while turning.
3	Unfasten the left fixing shaft of the horizontal blade (large).	■ After key alignment at the right side, mount the flap first to the center fixing shaft and then to the left fixing shaft.
4	Unfasten the right fixing shaft of the horizontal blade (large).	



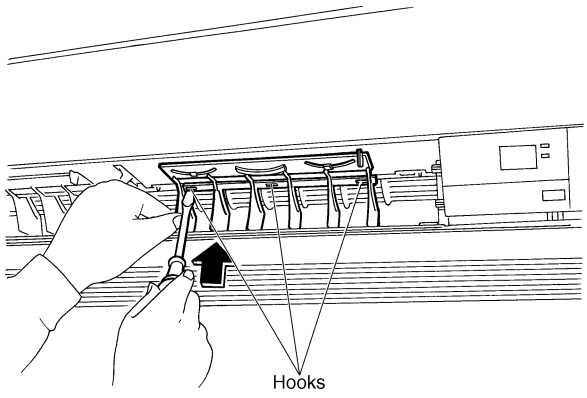




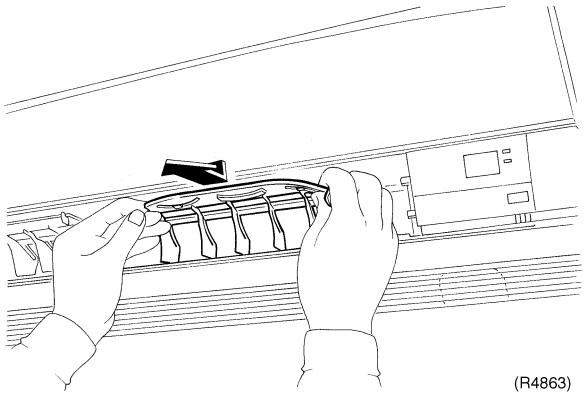


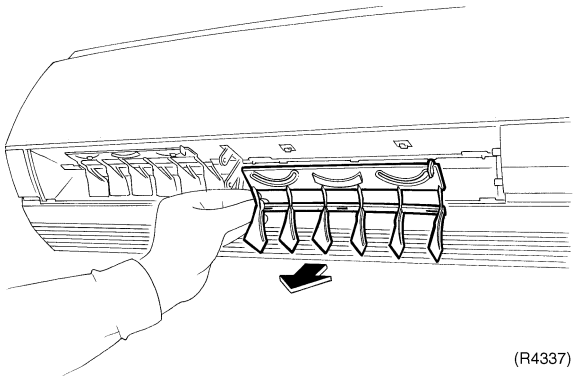
Step	Procedure	Points
2. Removing the horizontal blade (small)		
1 Remove the horizontal blade (small) while bending the fixed part at the center slightly.		
2 Unfasten the left side.		
3 Unfasten the key type fixing shaft at the right side.		

Step	Procedure	Points
3. Removing the vertical blade		
1	Unfasten the hooks at the shaft mounting part by pressing them with a flat screwdriver.	
2	Unfasten the hooks at the upper 2 positions.	
3	Remove the vertical blade toward yourself.	■ 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.



(R4862)

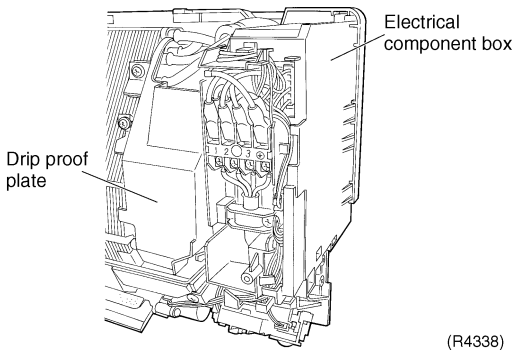
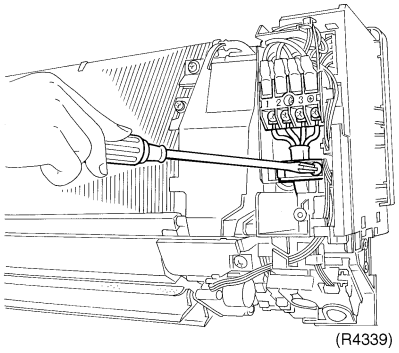
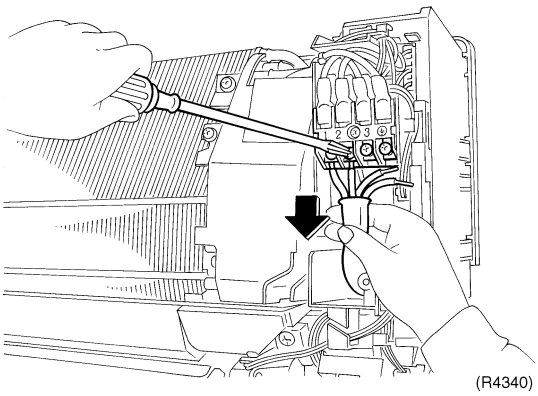
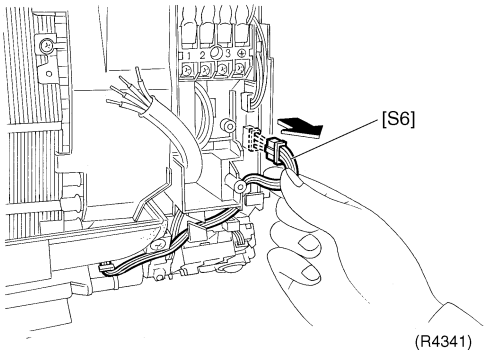

(R4863)

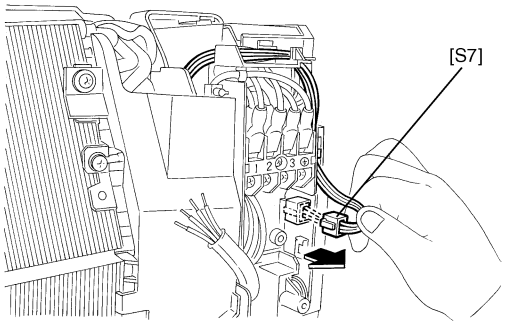
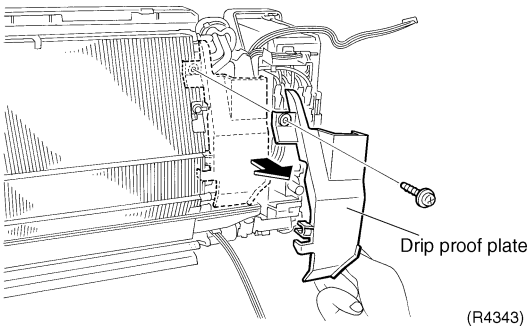
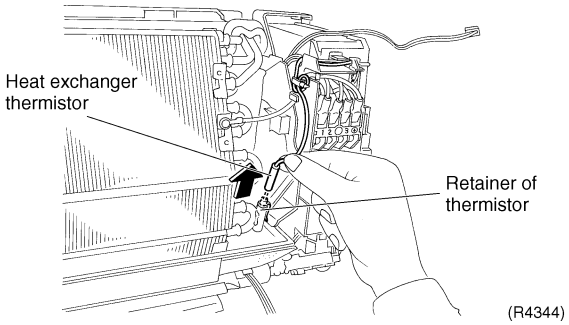
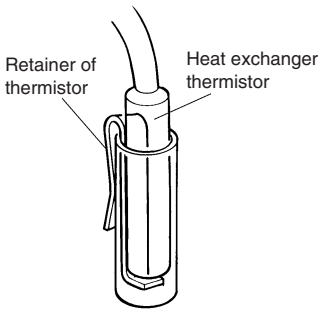
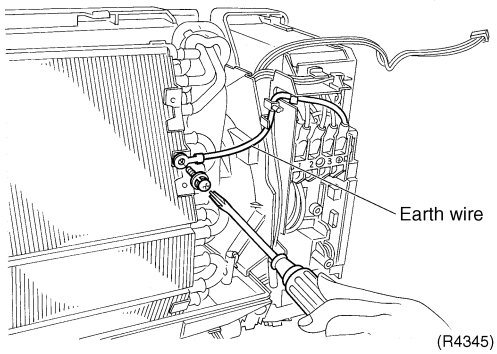

(R4337)

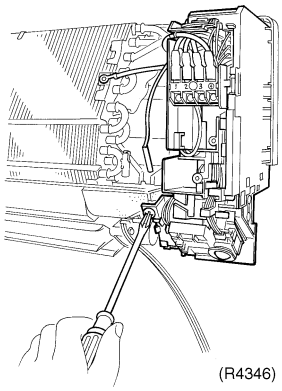
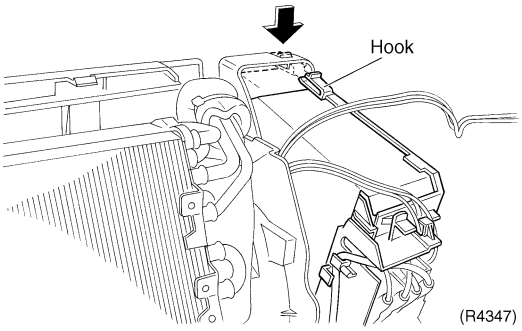
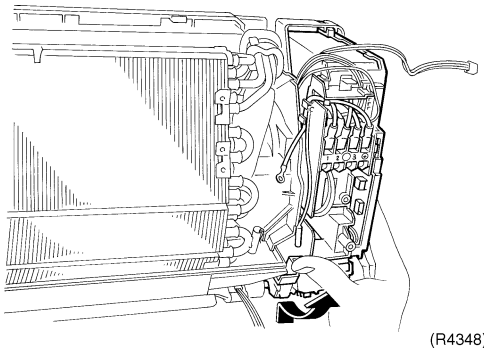
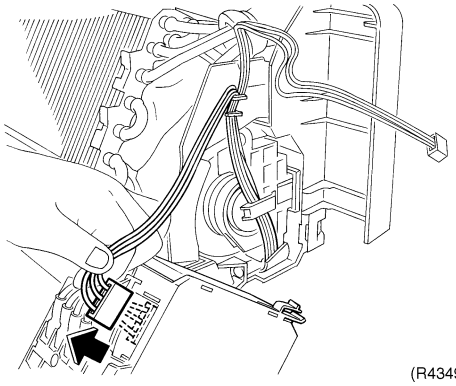
1.5 Removal of Electrical Box

Procedure

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

Step	Procedure		Points
1	The figure shows the connections of wire harnesses.		**Preparation** ■ Remove the front grille according to the “Removal of Front Grille.”
2	Remove the screw of the electric wire retaining plate.		
3	Loosen the screws of the terminal board and disconnect the connecting wires.		
4	Remove the connector of the swing motor [S6].		

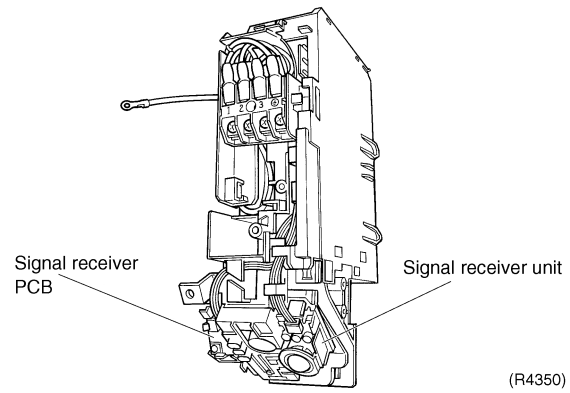
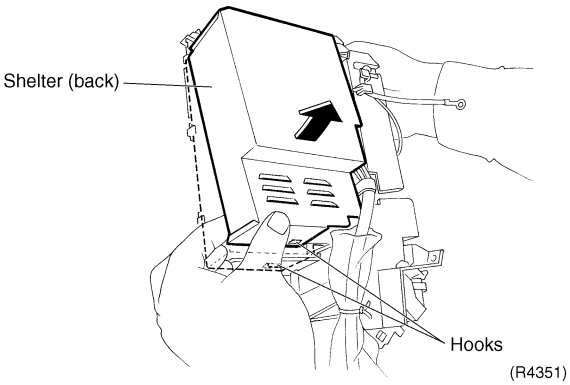
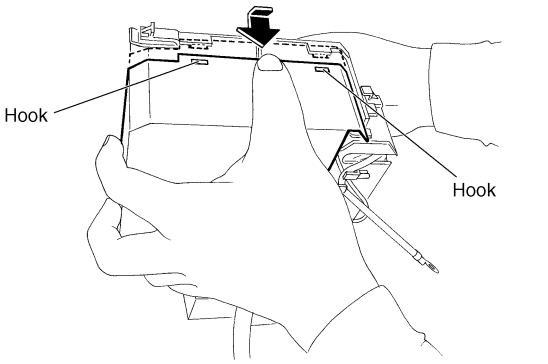
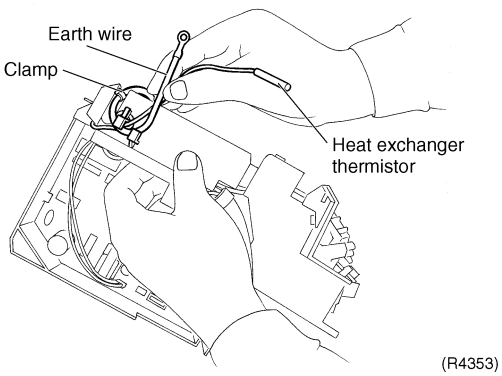
Step	Procedure		Points
5	Remove the connector of the fan motor [S7].		■ In case of FT09DV2S, FT25/35DVM and FT25DSG.
6	Remove the drip proof plate by removing the screw.		■ Put any excess wires behind the power supply lead wire.
7	Replace the heat exchanger thermistor.		■ Use care not to lose the retainer of thermistor. 
8	Disconnect the earth wire by removing the screw.		

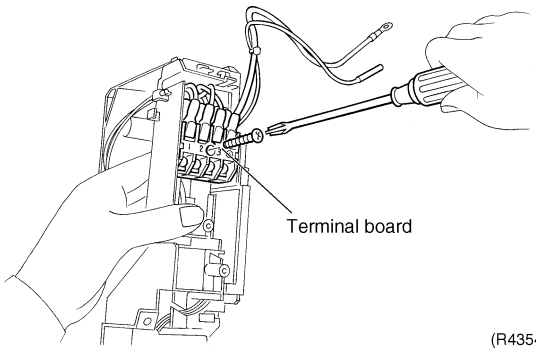
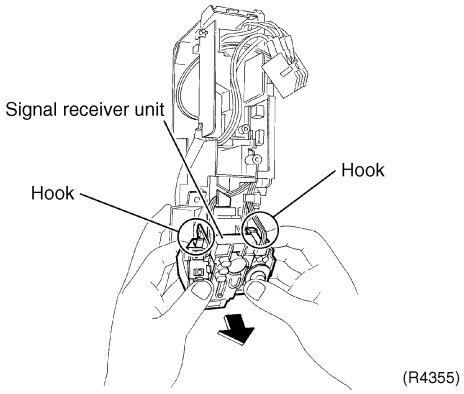
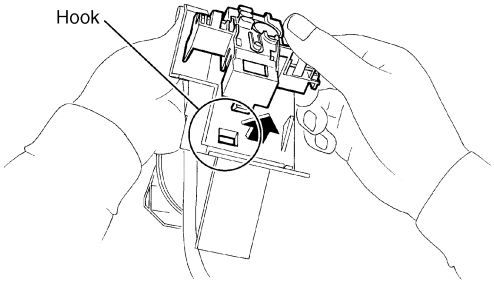
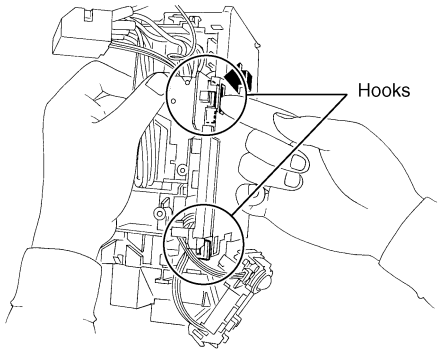
Step	Procedure		Points
9	Remove the screw of the electrical box.	 (R4346)	
10	Release the hook at the upper far side by pressing it from above and pulling the box toward yourself.	 (R4347)	
11	Lift up the electrical box and pull it toward yourself.	 (R4348)	■ There is a hook also at the lower part of the back. When mounting the box, make sure that it is securely fastened.
12	When the connector of the fan motor [S1] is removed, the electrical box can be dismounted.	 (R4349)	

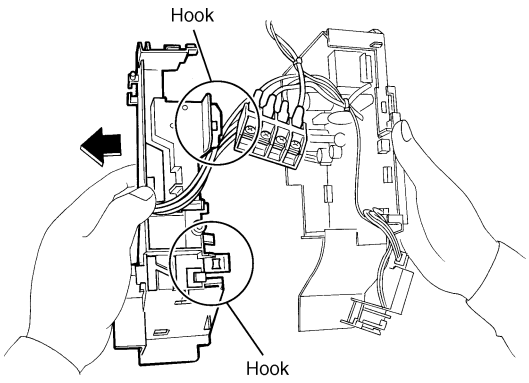
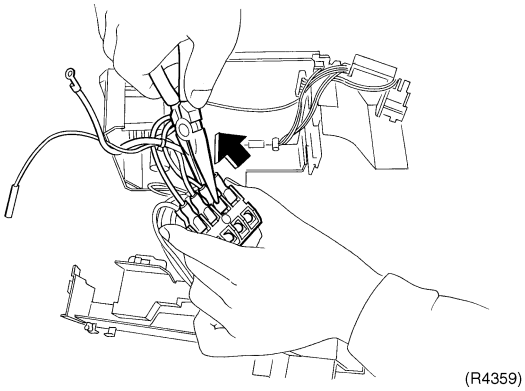
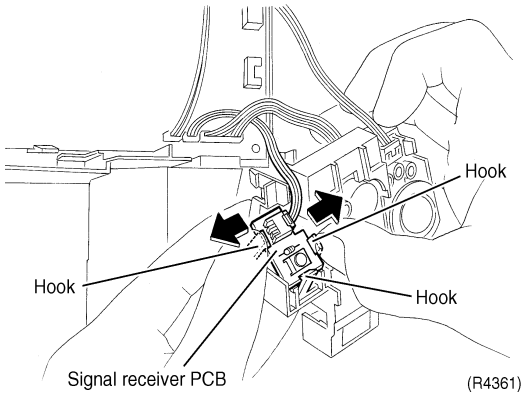
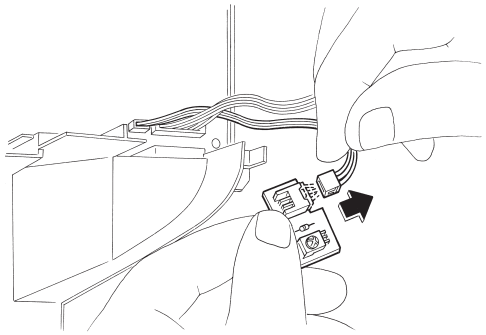
1.6 Removal of PCB

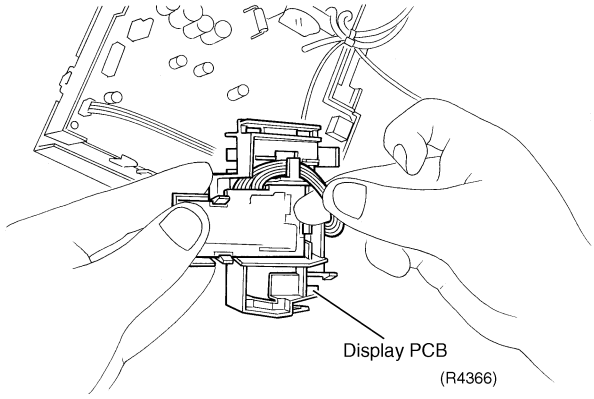
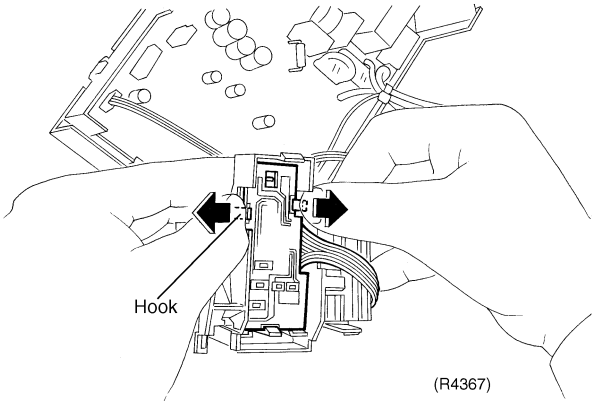
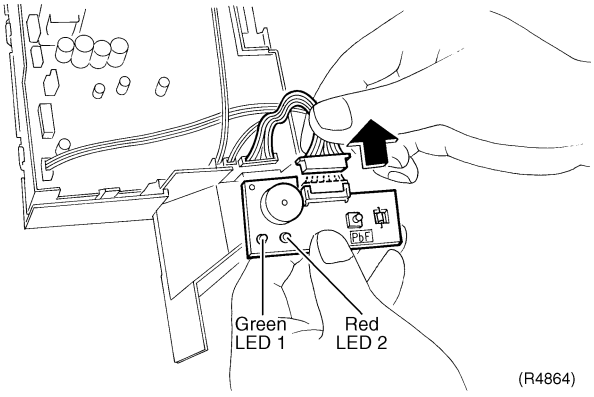
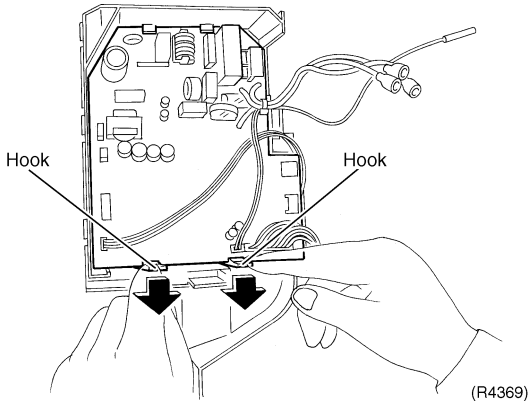
Procedure

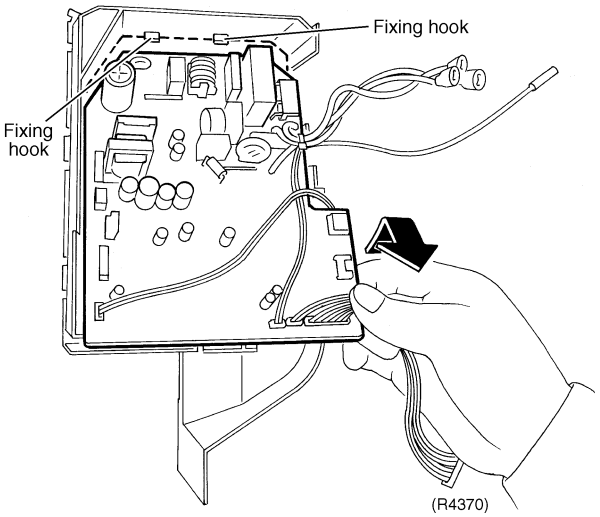
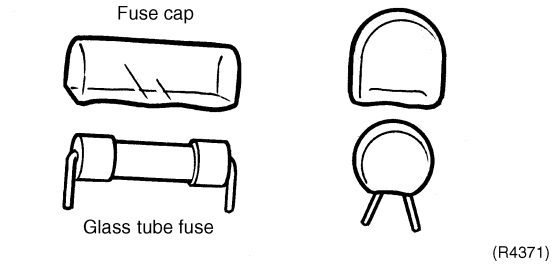
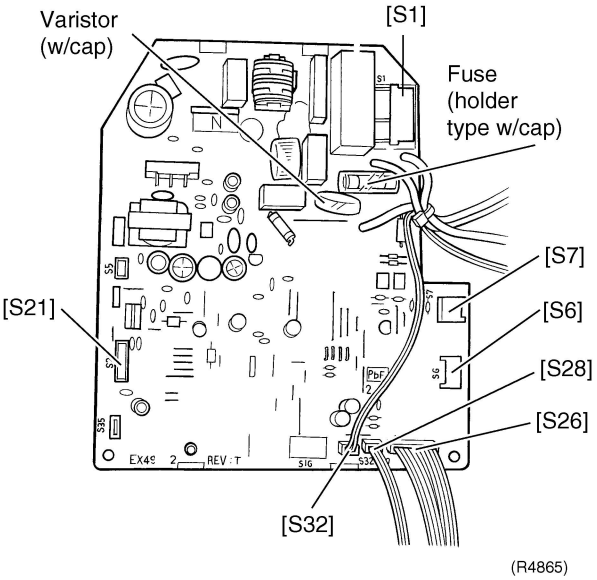
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

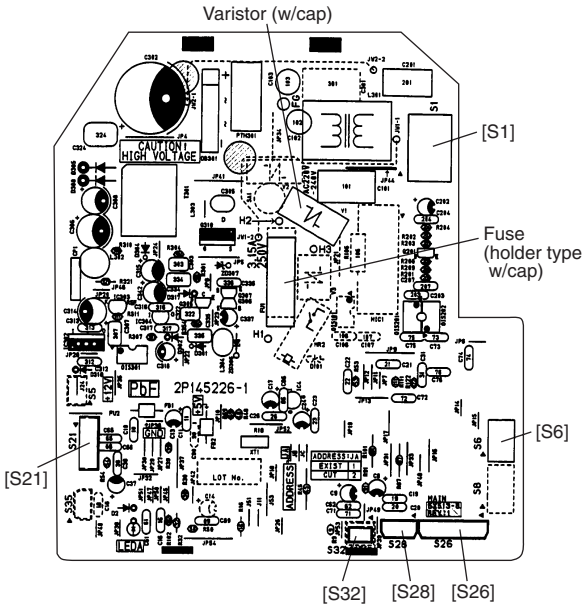
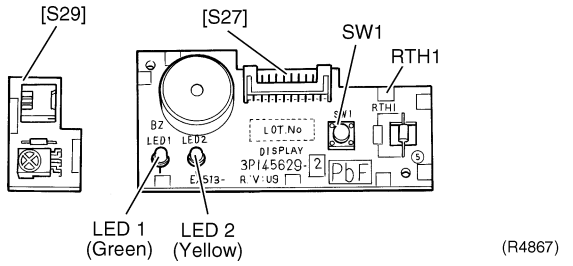
Step	Procedure	Points
1. Removing the shelter	 (R4350)	**Preparation** ■ Remove the electrical box according to the “Removal of Electrical Box.”
1 The figure shows the appearance of the electrical box.		
2 Open the shelter (at the back).	 (R4351)	
3 Push the upper center of the shelter and unfasten the hooks at the upper 2 positions of the shelter.	 (R4352)	
2. Removing the heat exchanger thermistor	 (R4353)	
1 Remove the heat exchanger thermistor and disconnect the earth wire.		

Step	Procedure	Points
3. Removing the terminal board	 (R4354)	
1 Dismount the terminal board by removing the screw.		
4. Removing the signal receiver unit	 (R4355)	
1 Remove the signal receiver unit by unfastening the hooks (one each at the right and left).	 (R4356)	
2 Remove the electrical box (cover) by unfastening the hooks at 2 positions.	 (R4357)	

Step	Procedure		Points
3	Remove the electrical box by sliding it to the left.	 (R4358)	
4	Disconnect the wire harness.	 (R4359)	
5. Removing the signal receiver PCB			
1	Remove the signal receiver PCB by opening the hooks at 3 positions.	 (R4361)	
2	Disconnect the connector from the signal receiver PCB.	 (R4362)	

Step	Procedure	Points
6. Removing the display PCB		
1 The figure shows the connection of wire harness for the display PCB.		
2 Remove the display PCB by unfastening the 2 hooks.		
3 Disconnect the connector from the display PCB.		
7. Removing the control PCB		
1 Dismount the control PCB by removing the 2 hooks.		

Step	Procedure		Points
2	Lift up the bottom of the control PCB and pull it out.		■ When mounting the control PCB, make sure that it is fixed by upper hooks.
3	The figures show the names of the PCB component parts.		■ Lead-free solder (PbF) is used for the PCB. When replacing the PCB, use the specific solder and soldering iron.
			■ In case of FT25/35DVM, FT25DSG, FT09DV2S. [S1] To AC fan motor [S6] To swing motor [S7] To AC fan motor (Hall IC) [S21] HA connector [S26] To display PCB [S28] To signal receiver PCB [S32] To heat exchanger thermistor

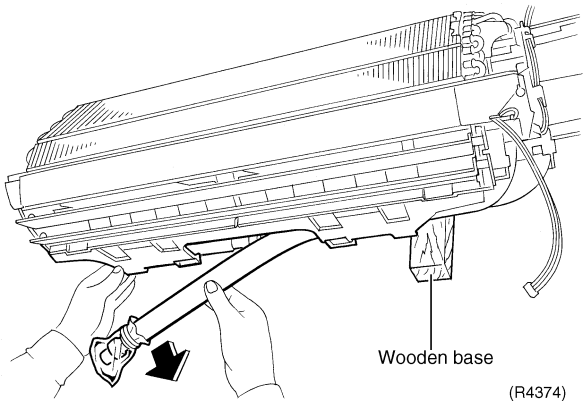
Step	Procedure	Points
	 (R4866)  (R4867)	■ In case of FT35DSG, FT13DV2S. [S1] To DC fan motor [S6] To swing motor [S21] HA connector [S26] To display PCB [S28] To signal receiver PCB [S32] To heat exchanger thermistor

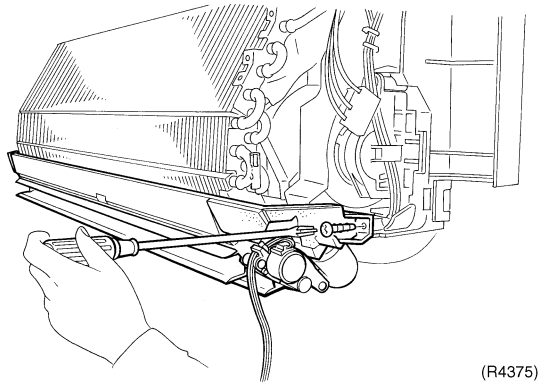
1.7 Removal of Drain Pan Unit

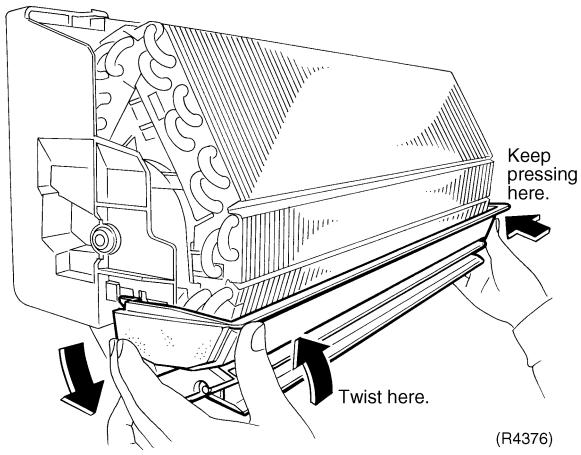
Procedure

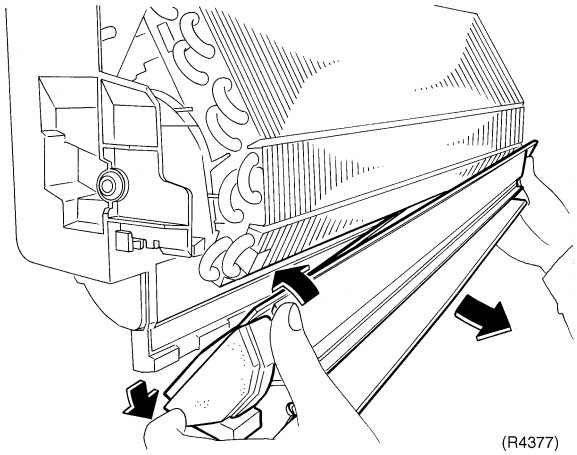
Warning **Be sure to turn off all power supplies at least 10 min. before disassembling work.**

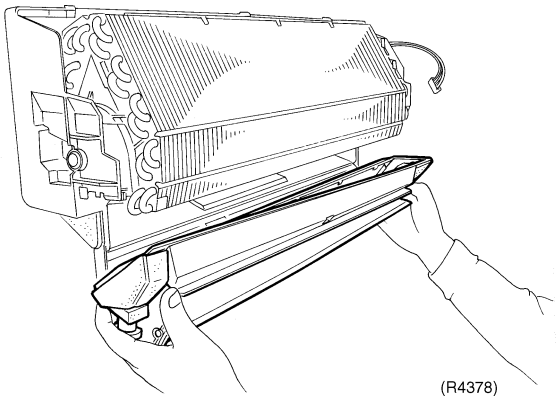
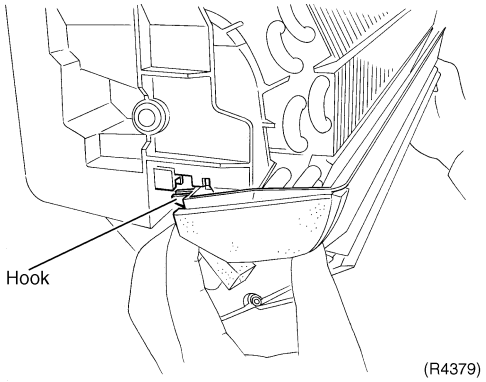
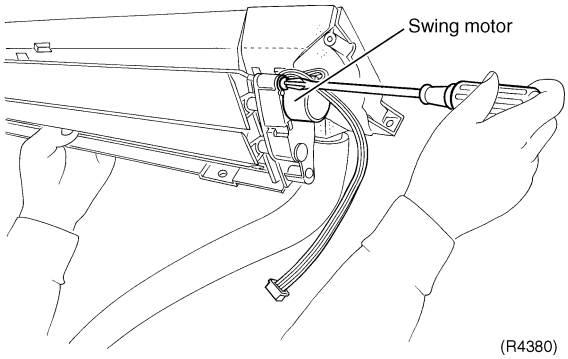
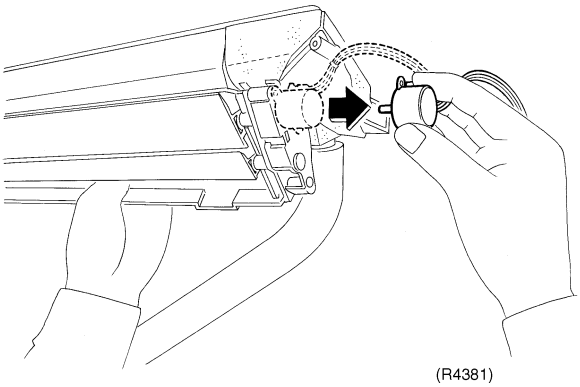
Step	Procedure	Points
1. Removing the drain pan unit		**Preparation** ■ Remove the electrical box according to the “Removal of Electrical Box.” ■ Inserting of the wooden base facilitates the removing work. ■ Place a plastic bag under the drain pan to prevent from wetting the floor with remaining drain.
1	Lift up the indoor unit body slightly and pull out the drain hose. (In the case of left piping)	
2	Remove the screw at the left side of the drain pan.	
3	Remove the drain pan from the heat exchanger by pressing its right side and twisting its left side.	

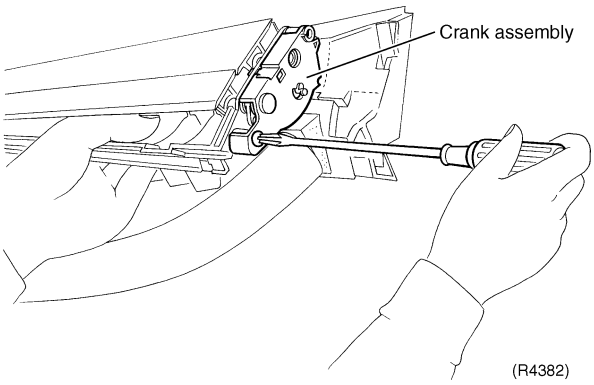
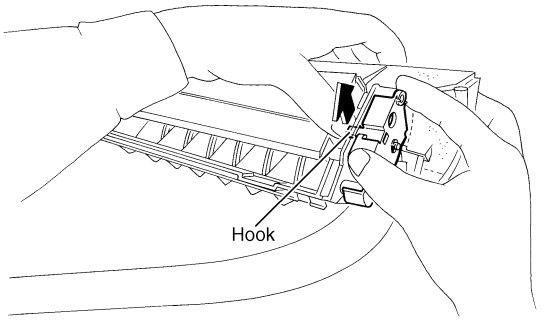
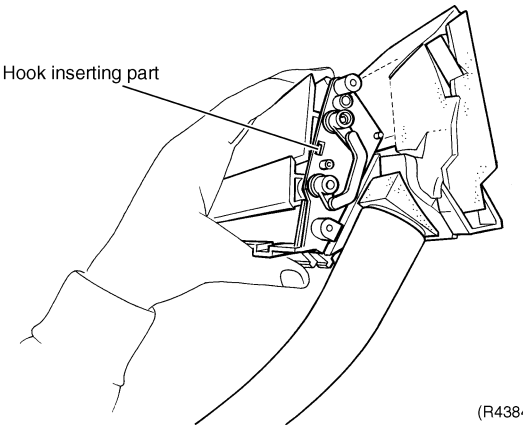
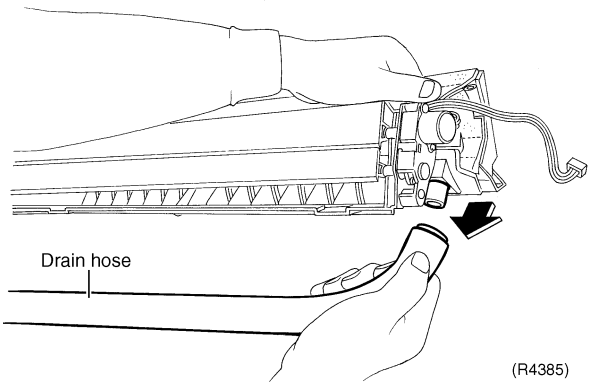


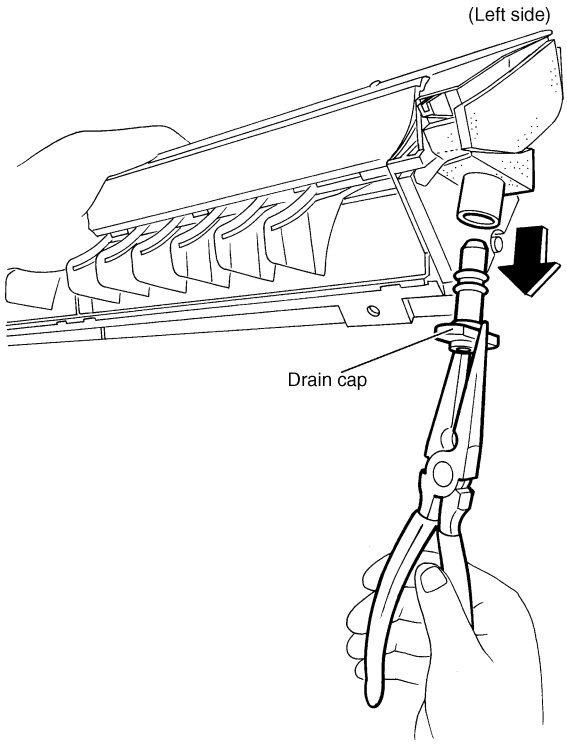
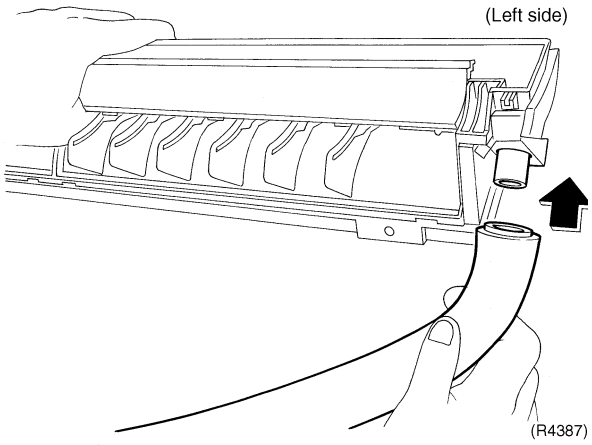
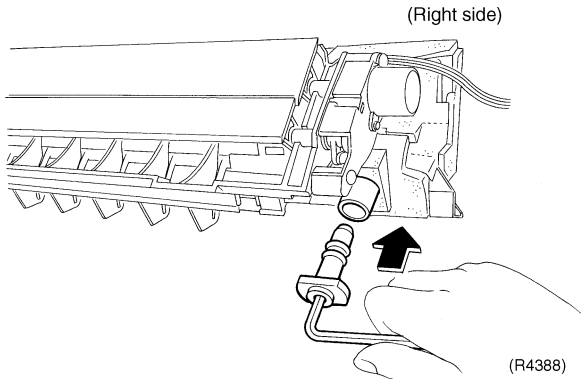






Step	Procedure		Points
4	Remove the drain pan toward yourself from the indoor unit body.	 (R4378)  (R4379)	**Caution on Mounting** ■ Make sure that the hook at the left side is fitted in the groove.
2. Removing the swing motor			
1	Remove the screw of the swing motor.	 (R4380)	
2	Pull out the swing motor.	 (R4381)	

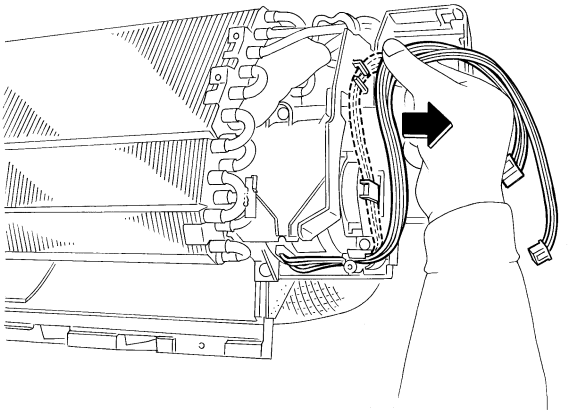
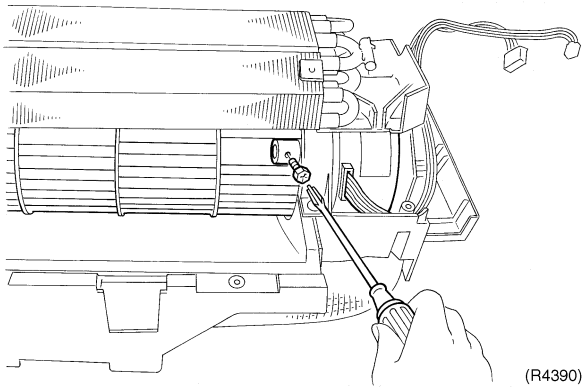
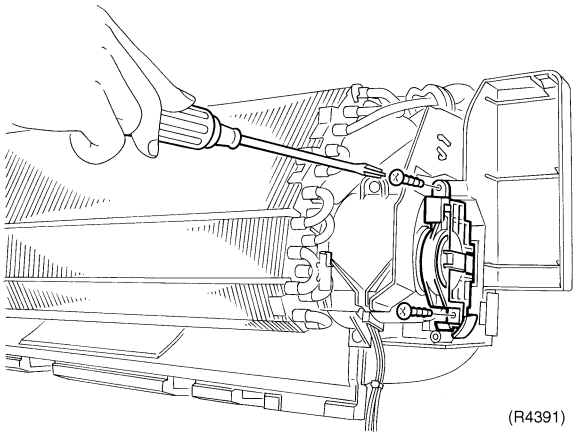
Step	Procedure	Points
3. Removing the crank assembly		
1 Remove the screw of the crank assembly.	 (R4382)	
2 Remove the crank assembly by unfastening the hook.	 (R4383)	
3 The figure shows the position of the hook when the crank assembly has been removed.	 (R4384)	
4. How to connect the drain hose in right piping		
1 Pull out the drain hose from its right side connection.	 (R4385)	

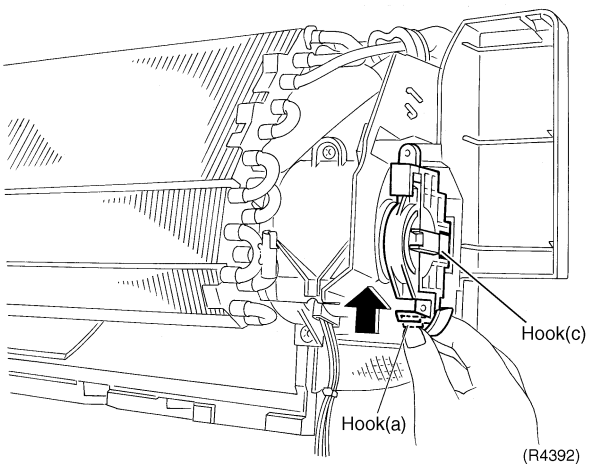
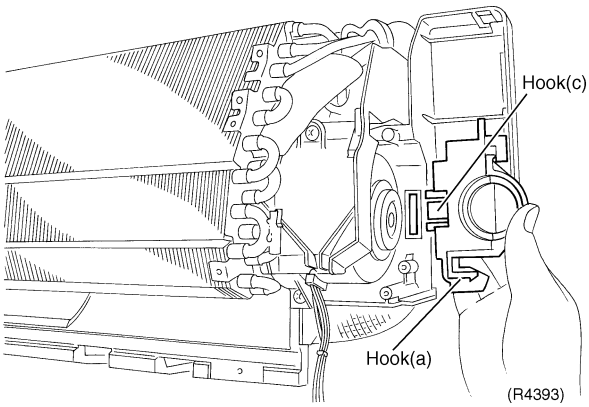
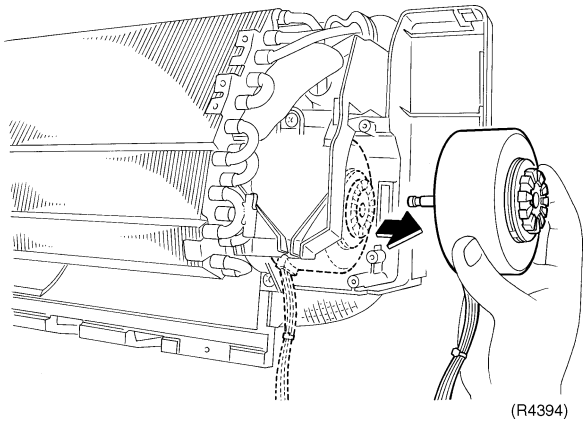
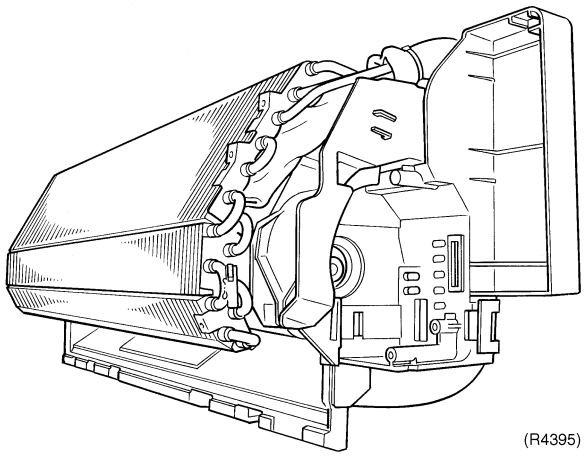
Step	Procedure		Points
2	Remove the drain cap located at the left side of the drain pan unit.		
3	Insert the drain hose to the left side.		
4	Press the removed drain plug into the right side with an Allen wrench (4mm).		■ Use a 4mm Allen wrench. **Caution** **Do not thrust in the drain plug with a sharp-pointed tool like a screwdriver. (The drain plug may be broken, resulting in water leakage.)**

1.8 Removal of Fan Motor

Procedure

Warning **Be sure to turn off all power supplies at least 10 min. before disassembling work.**

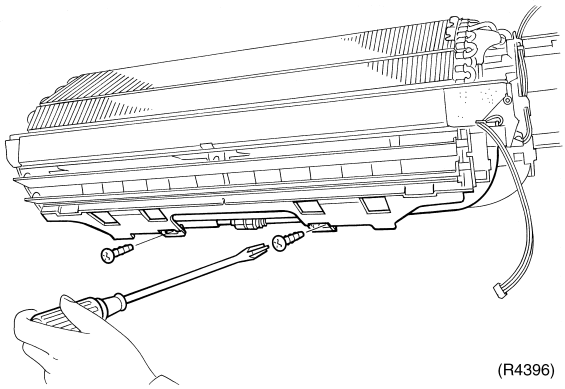
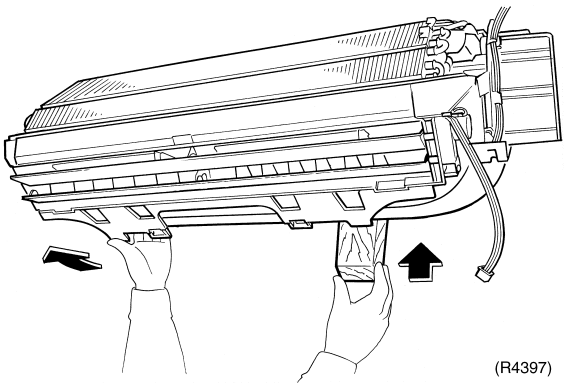
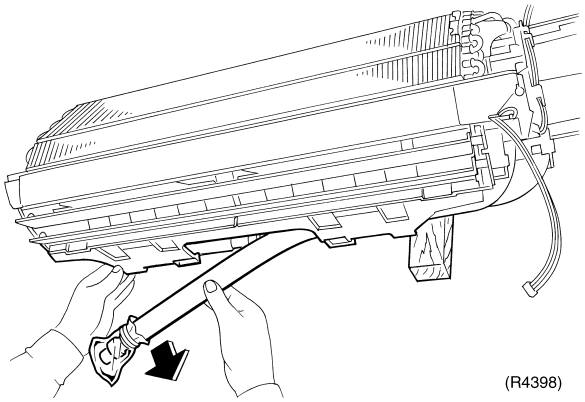
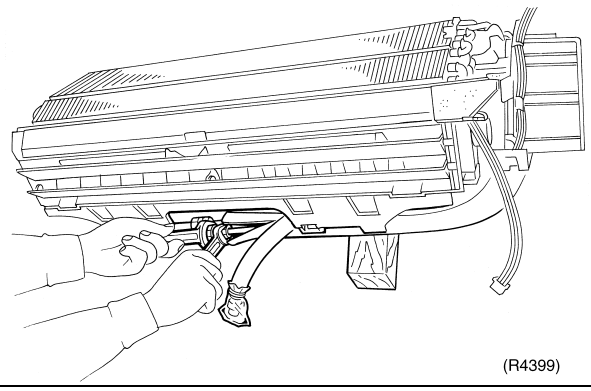
Step	Procedure		Points
1	Undo the fan motor lead wires from the hooks.	 (R4389)	**Preparation** ■ Remove the drain pan unit according to the “Removal of Drain Pan Unit.” ■ You can remove the fan motor with the heat exchanger left. It is easy to clean up the heat exchanger.
2	Loosen and remove the fan rotor lock screw.	 (R4390)	
3	Remove the 2 screws of the fan motor fixing plate.	 (R4391)	

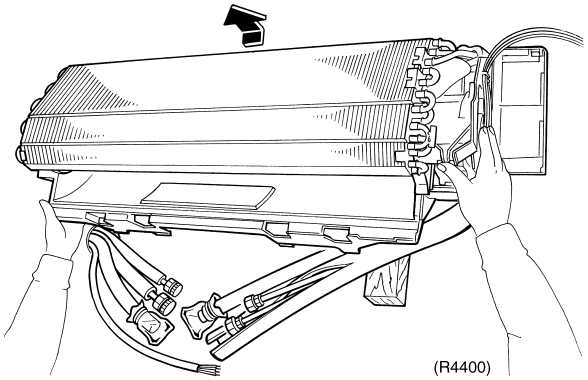
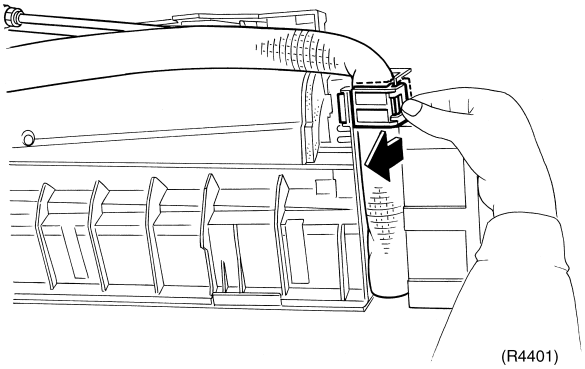
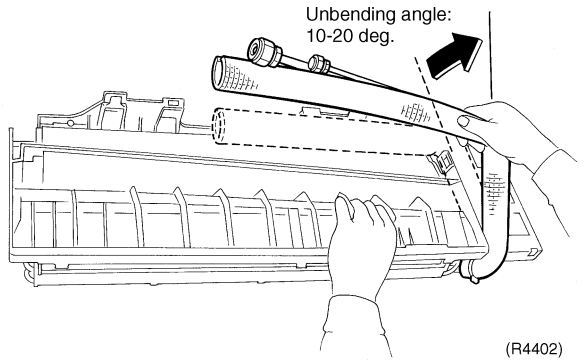
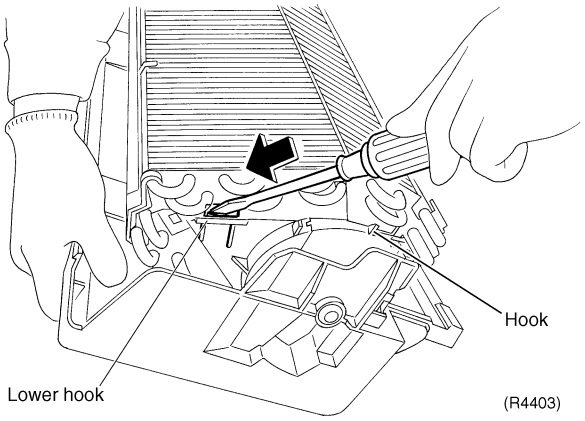
Step	Procedure		Points
4	Unfasten the hook (a) of the fan motor fixing plate with your thumb.		
5	Unfasten the hook (c).		
6	Remove the fan motor.	 	

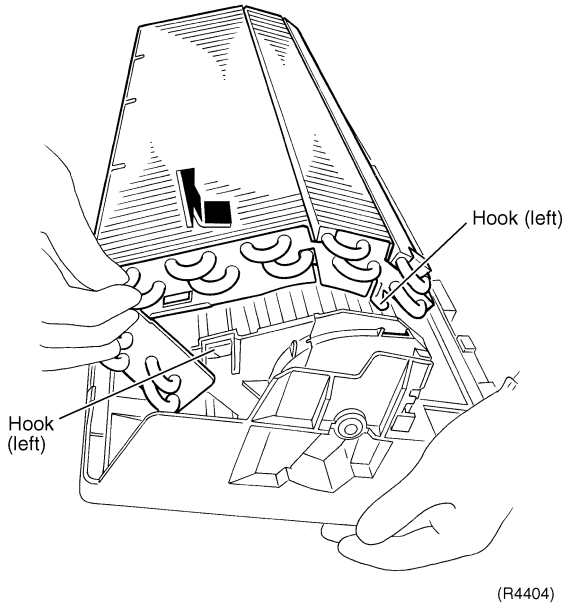
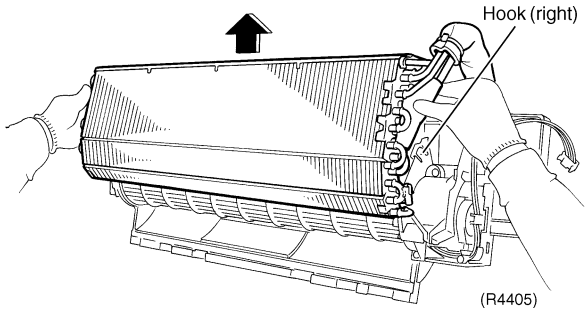
1.9 Removal of Heat Exchanger

Procedure

Warning **Be sure to turn off all power supplies at least 10 min. before disassembling work.**

Step	Procedure		Points
1. Disconnecting the refrigerant pipe			**Preparation** ■ Remove the drain pan unit according to the “Removal of Drain Pan Unit.”
1	Remove the screws which fix the heat exchanger to the installation plate.	 (R4396)	
2	Lift the indoor unit by a wooden base.	 (R4397)	**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.**
3	Lift up the indoor unit body slightly and pull out the drain hose. (In the case of left piping)	 (R4398)	■ Place a plastic bag under the drain pan to prevent from wetting the floor with remaining drain. ■ If the drain hose is embedded in the wall, disconnect the drain hose beforehand.
4	Disconnect the pipe connection with 2 pair of spanners. **Caution** **From the point of view of environmental protection, be sure to use a vacuum pump for air purging.**	 (R4399)	■ Carry out the removal works with 2 pair of spanners. ■ When the pipes are disconnected, protect the both openings of pipe side and unit side from entering of moisture.

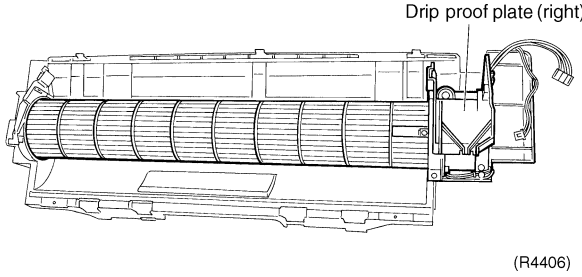
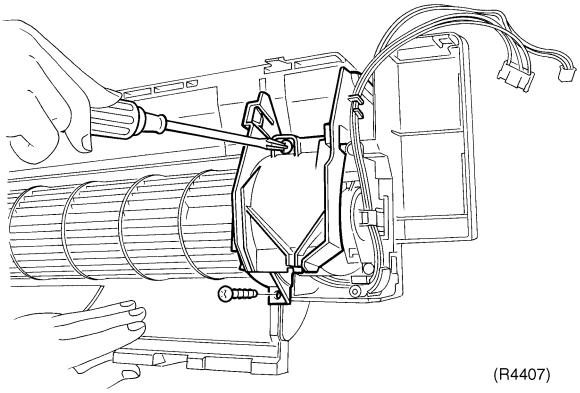
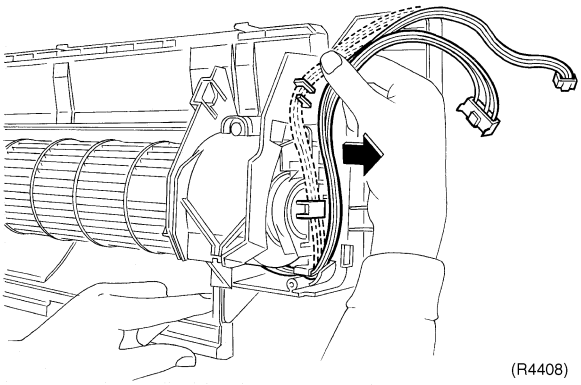
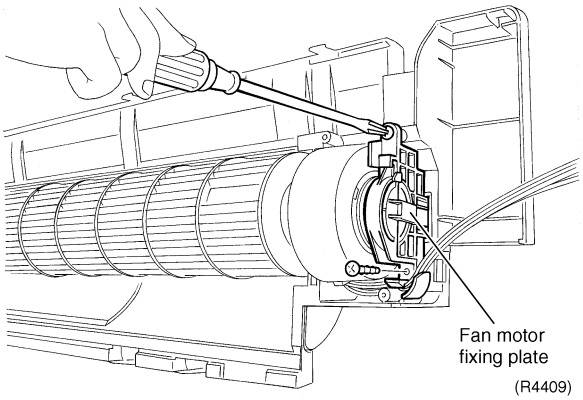
Step	Procedure		Points
2. Removing the indoor unit			
1	Remove the indoor unit from the installation plate.	 (R4400)	
3. Removing the heat exchanger			
1	Unfasten the hook of the pipe fixing plate at the back of the unit and pull out the pipe.	 (R4401)	
2	Widen the auxiliary pipe by about 10-20 degrees.	 (R4402)	
3	Unfasten the lower hook with a flat screwdriver.	 (R4403)	**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.)**

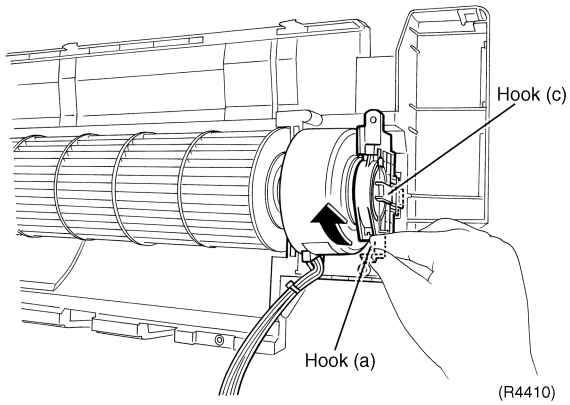
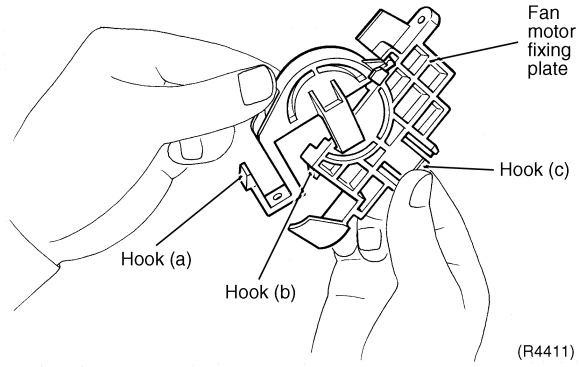
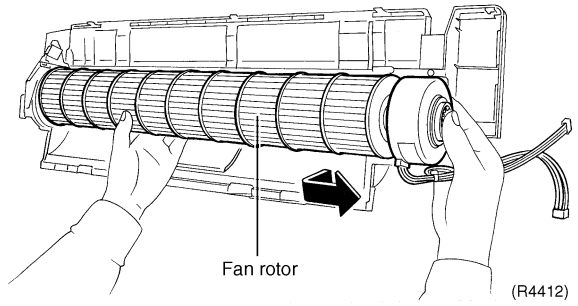
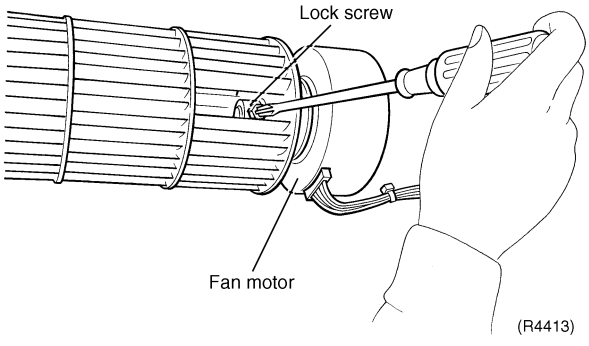
Step	Procedure		Points
4	After unfastening the lower hooks, hold up the heat exchanger by its left side and lift it up toward yourself.		■ When mounting the heat exchanger, make sure that the hook (left) is fastened.
5	When the left side is lifted, the hook at the right side comes off position.		
6	Remove the heat exchanger.		

1.10 Removal of Fan Rotor

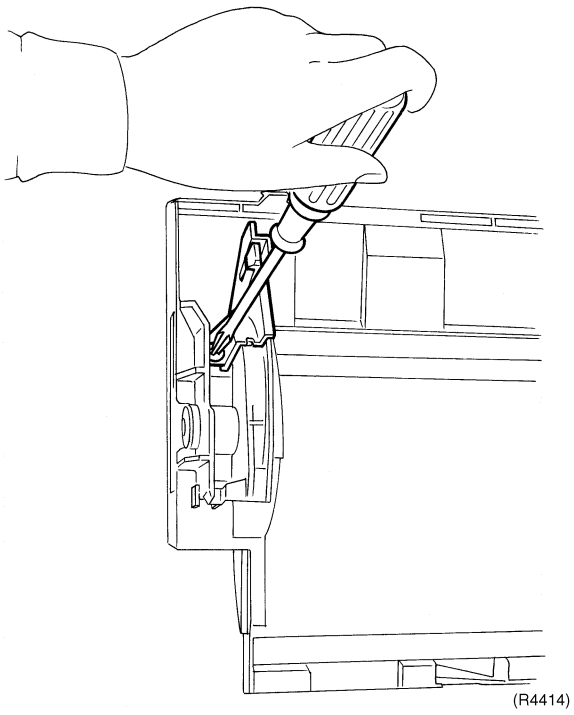
Procedure

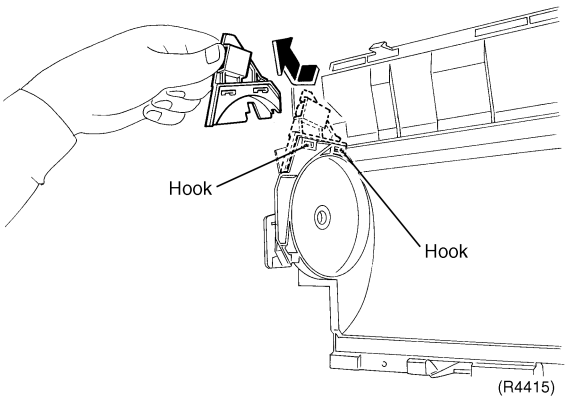
Warning **Be sure to turn off all power supplies at least 10 min. before disassembling work.**

Step	Procedure	Points
1. Removing the drip proof plate		**Preparation** ■ Remove the heat exchanger according to the “Removal of Heat Exchanger.”
1 Dismount the drip proof plate (right) by removing the 2 screws.		
2 Unhook the fan motor wire harness.		
3 Remove the 2 screws of the fan motor fixing plate.		

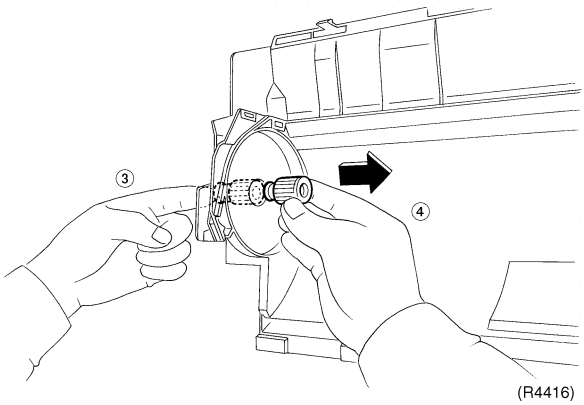
Step	Procedure		Points
4	Unfasten the hook (a) of the fan motor fixing plate with your thumb and unfasten the hook (b).		
5	The fan motor fixing plate can be removed from the unit when the hook (c) is unfastened.		
2. Removing the fan rotor			
1	Dislocate the fan rotor by sliding it to the right.		
2	Remove the fan rotor by loosening the lock screw.		

Step	Procedure	Points
3. Removing the bearing		
1	Remove the screw of the drip proof plate (left).	
2	The drip proof plate can be removed when the hooks at 2 positions are unfastened.	
3	Press the rubber-made bearing with force from outside.	
4	Remove the bearing.	


(R4414)



(R4415)



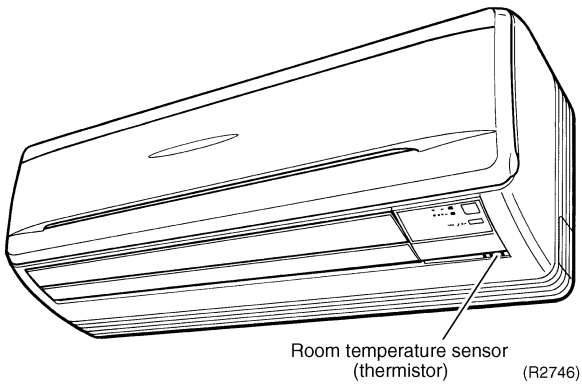
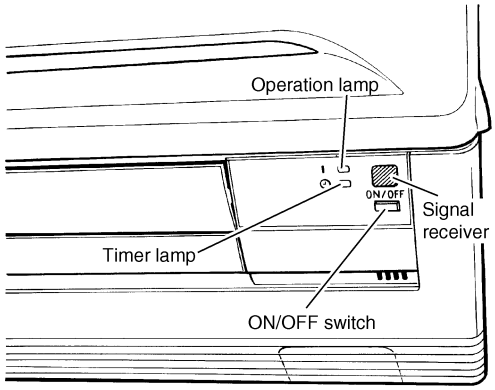
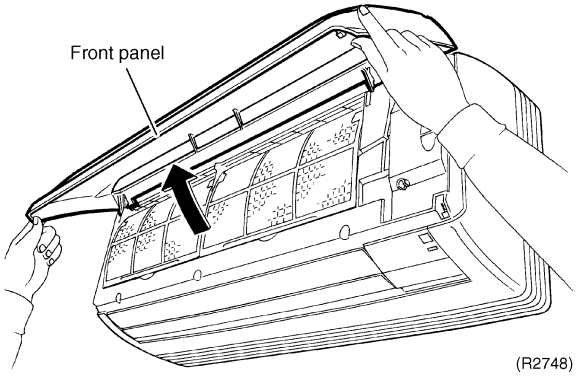
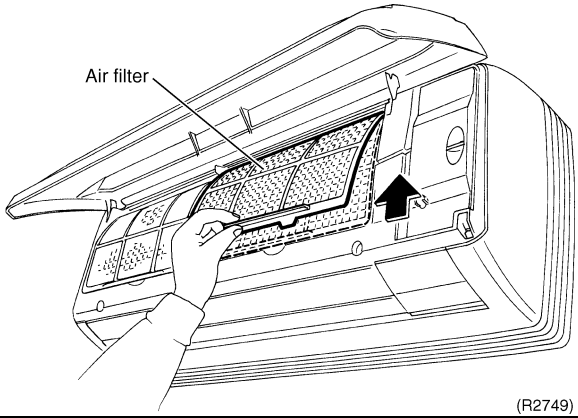
(R4416)

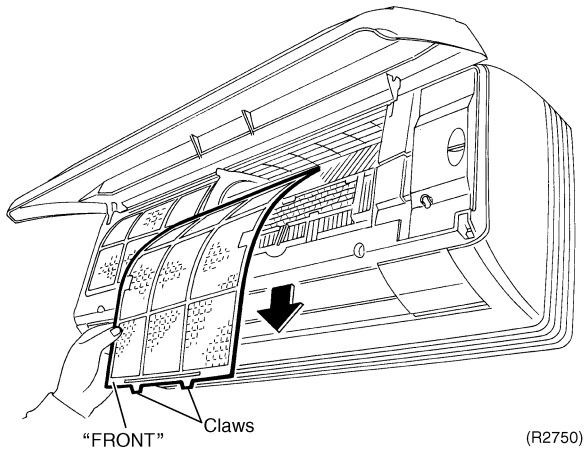
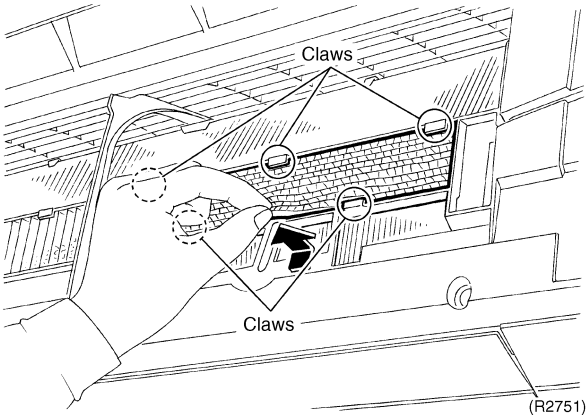
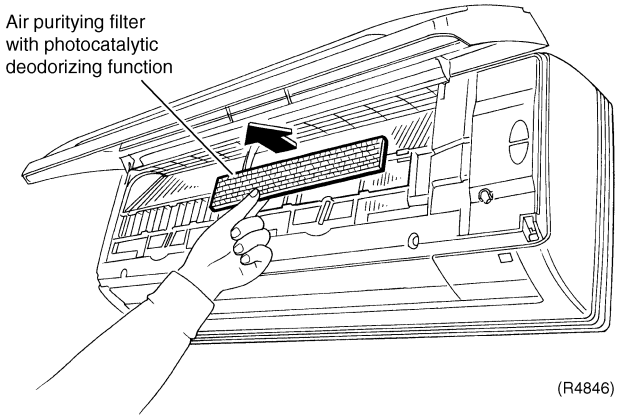
2. FT15DV2S, FT50/60DSG

2.1 Removal of Air Filter / Front Panel

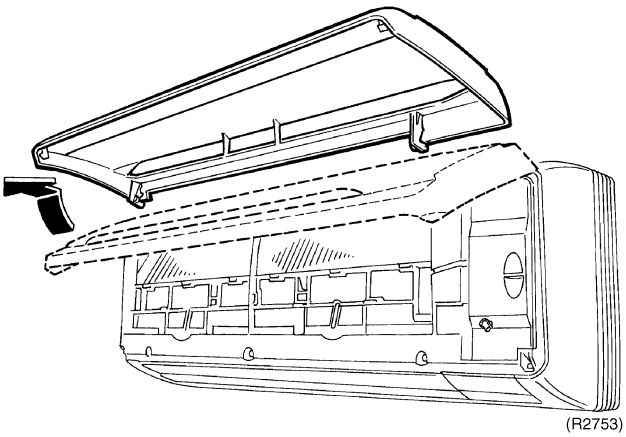
Procedure

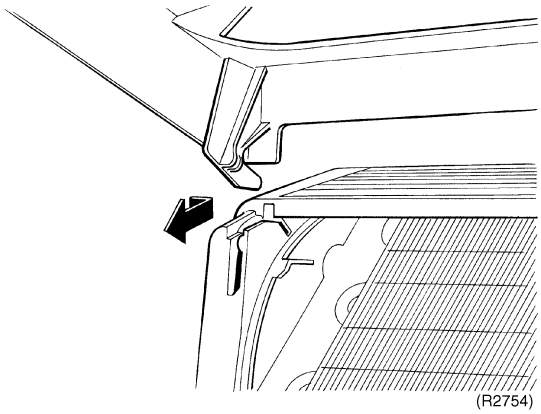
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

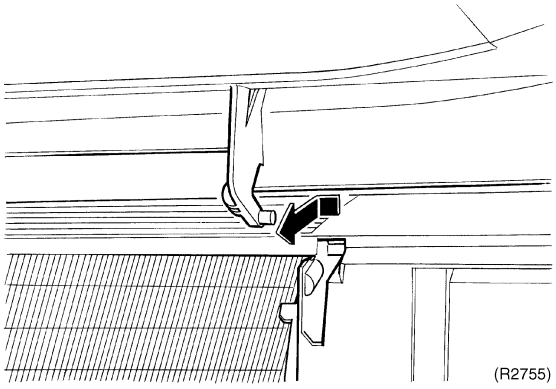
Step	Procedure	Points
1. Features	  (R4868)	■ When the signal receiver catches a signal from the remote controller, it produces beep sound and the operation lamp blinks.
2. Removing the air filters.		
1 Hold the front panel by the tabs on the both sides and lift it until it stops with a click.	 (R2748)	
2 Lift an air filter upwards slightly by the center knob, and then pull it out downwards.	 (R2749)	

Step	Procedure		Points
			■ The right and left filters are interchangeable. ■ Insert the air filters along grooves when installing. ■ Set the air filters with displaying "FRONT" on the front side. ■ Insert two claws of the air filter completely.
3. Removing an "air purifying filter with photocatalytic deodorizing function".			
1	Push up the bottom of an air purifying filter to undo the claws (2 on lower, 3 on upper) and take the filter out.	 	■ The right and left filters are interchangeable.

Step	Procedure	Points
4. Removing the front panel.		
1	While opening the front panel further than it stops, release both axes and remove the front panel.	■ Slide the front panel side to side to release each axis. ■ Align the right and left axes with grooves in turn and insert them to the end when installing.


(R2753)


(R2754)

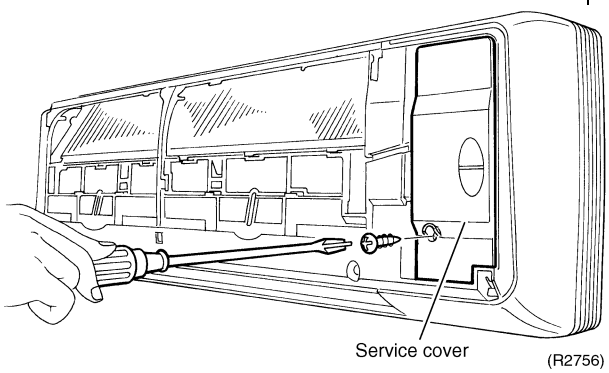

(R2755)

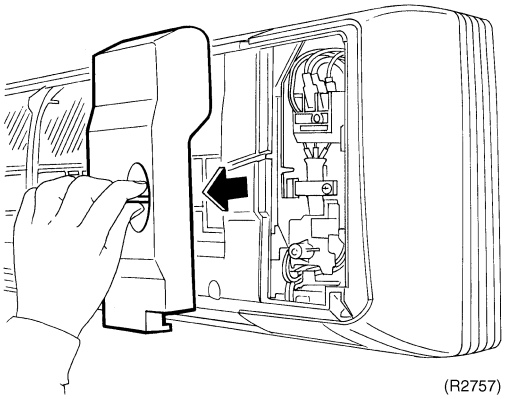
2.2 Removal of Front Grille

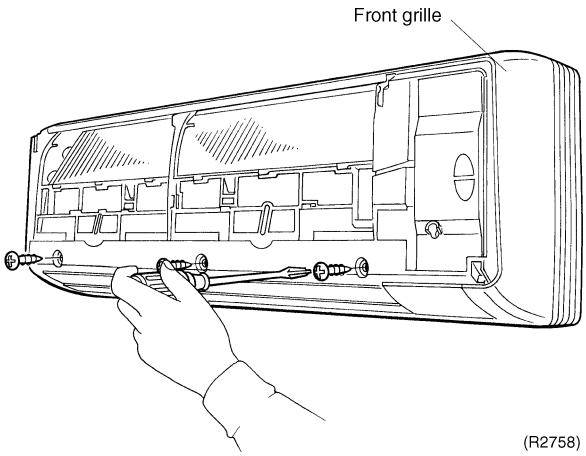
Procedure

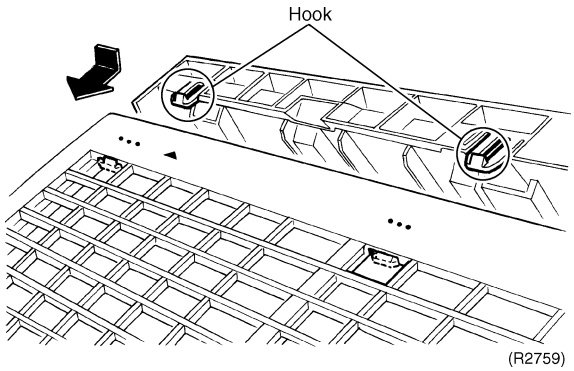
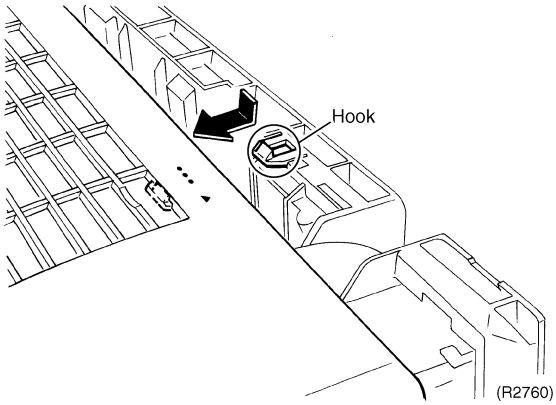
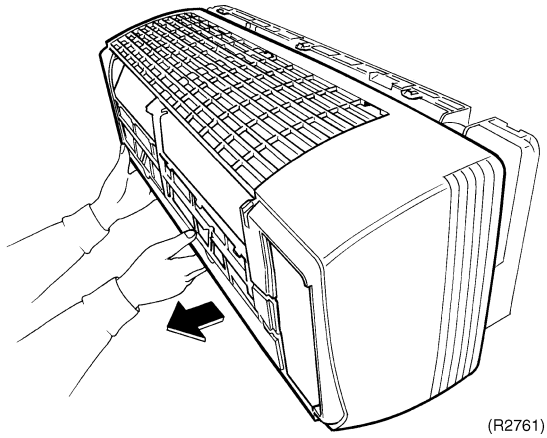
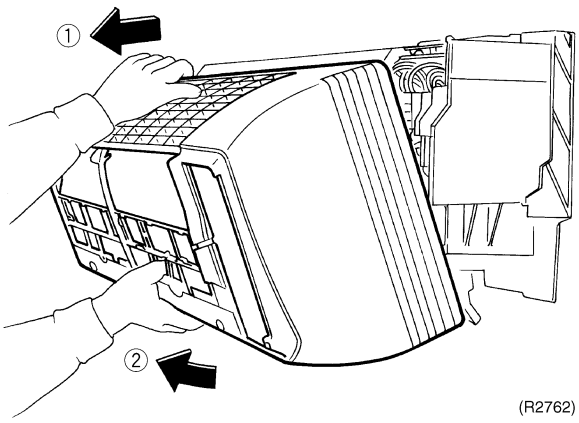
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure	Points
1. Removing the service cover.		
1	Loosen the screw and remove the service cover by the knob.	■ No field setting switch is inside it. ■ You can remove the front grille without detaching the service cover.
2. Removing the front grille.		
1	Loosen the three fixing screws of the front grille.	■ It has no fixing screws inside blades, though previous models had.





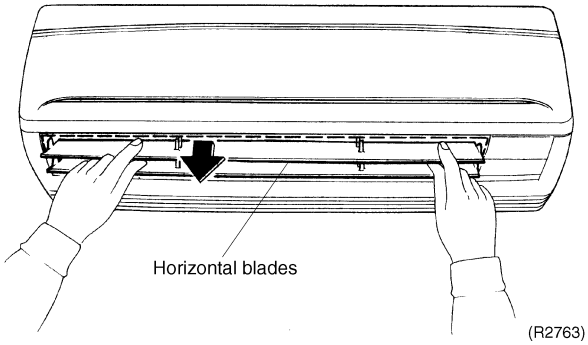


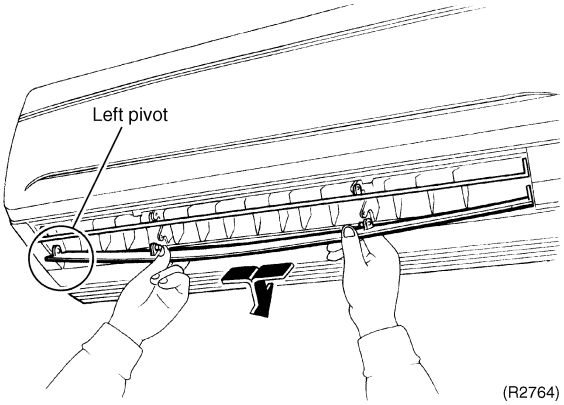
Step	Procedure		Points
2	Undo the three hooks on the top of the front grille.	 (R2759)  (R2760)  (R2761)	■ The front grille has three hooks on the center and the both sides of the upper part. ■ Refer to the removal procedure in a reverse way when reassembling.
3	Pull the upper part of the front grille out and lift the lower part up, and then remove the front grille.	 (R2762)	■ Make sure that all the hooks are placed securely when reassembling.

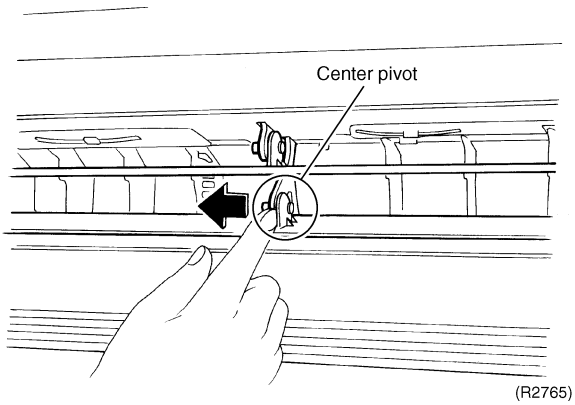
2.3 Removal of Horizontal Blades / Vertical Blades

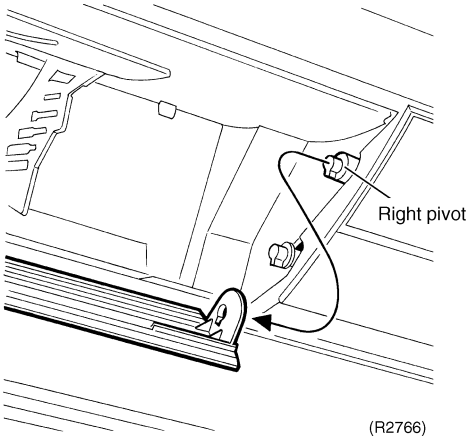
Procedure **Warning** **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure	Points
1. Removing the horizontal blades.		
1	Open the horizontal blades.	■ It has no fixing screws inside blades, though previous models had.
2	Undo the left pivot of the horizontal blades.	
3	Bend the horizontal blades slightly and release the center pivots. Slide the horizontal blades to the left and release the right pivot.	■ Installation procedure 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.

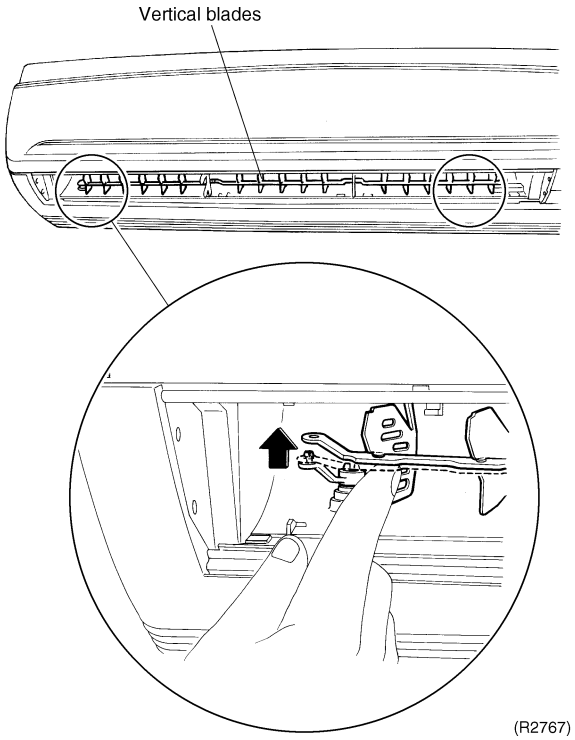


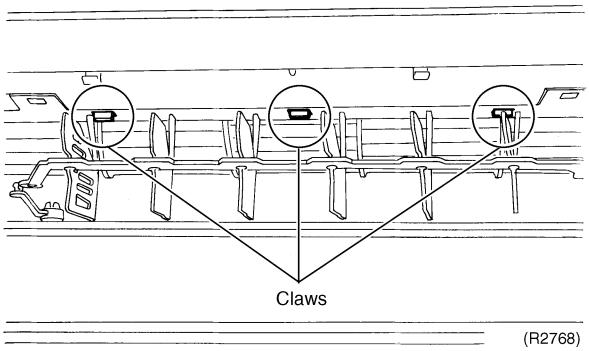


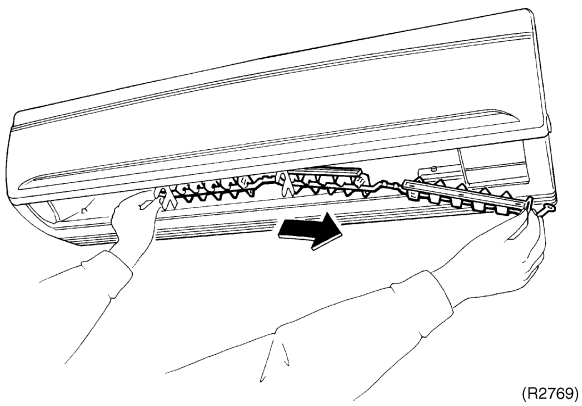




Step	Procedure	Points
2. Removing the vertical blades.		
1	Undo the right and left pivots.	
2	Undo the three claws.	
3	Pull the vertical blades rightwards and remove it.	



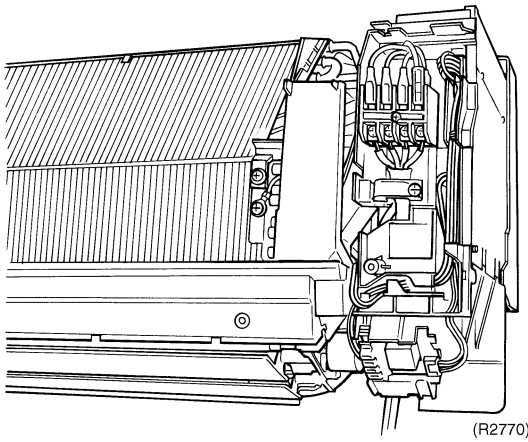
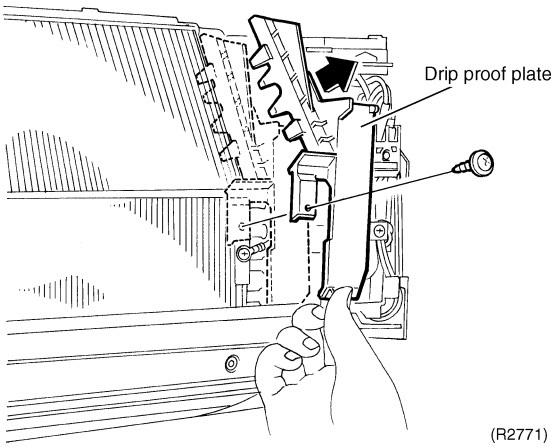
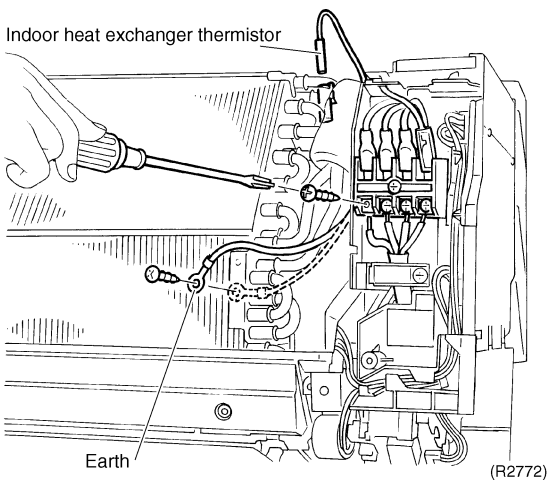




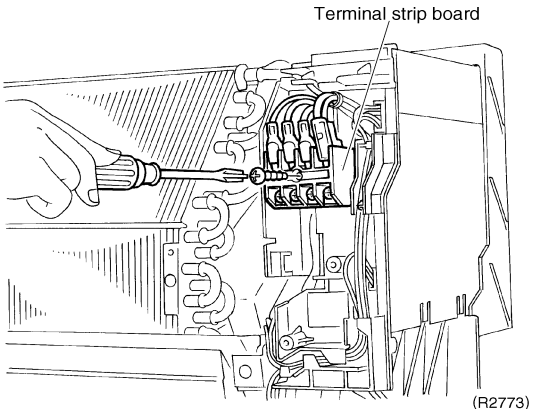
2.4 Removal of Electrical Box / PCB / Swing Motor

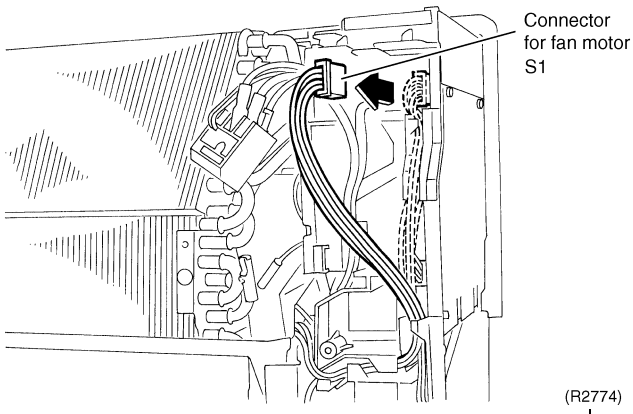
Procedure

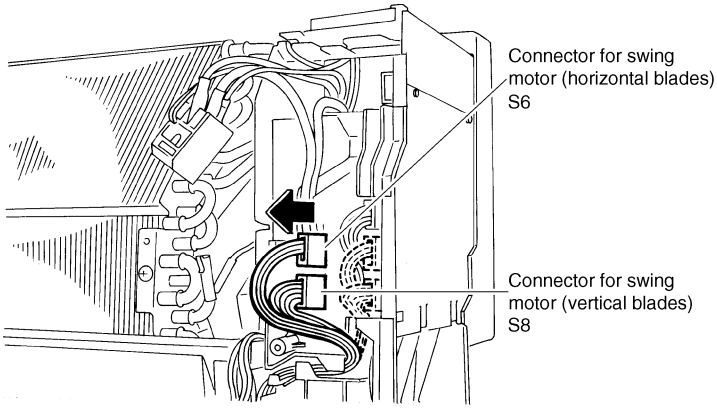
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

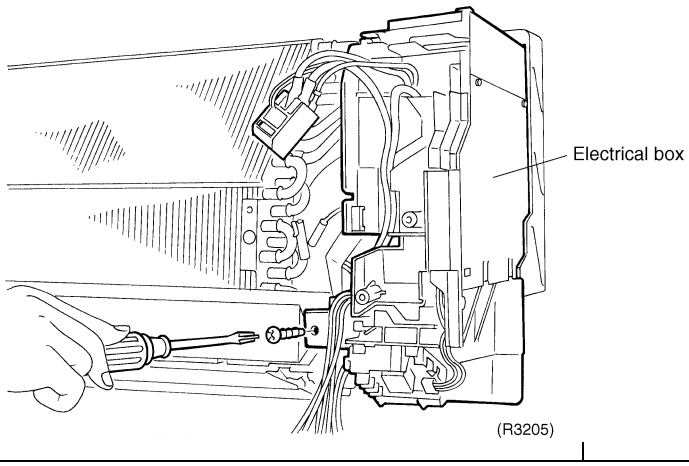
Step	Procedure	Points
1. Removing the front grille.	 (R2770)	■ Parts layout
2. Removing the drip proof plate. 1 Loosen the screw.	 (R2771)	
3. Disconnect the indoor heat exchanger thermistor and the earth.	 (R2772)	■ Mind that not to lose the clip for the thermistor.

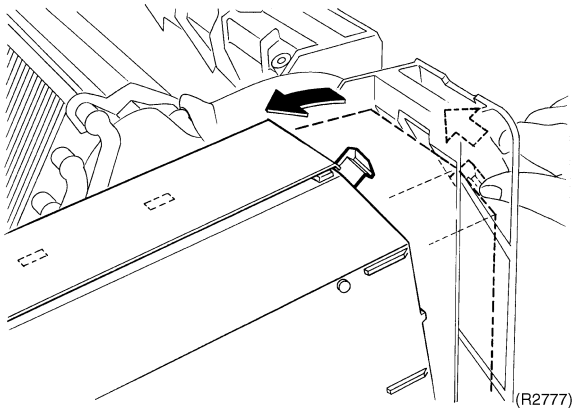
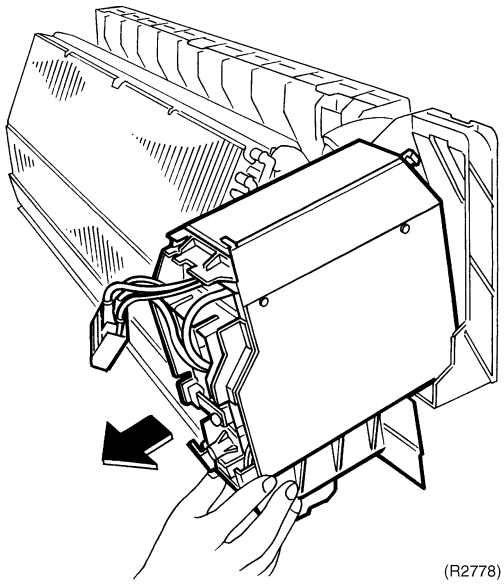
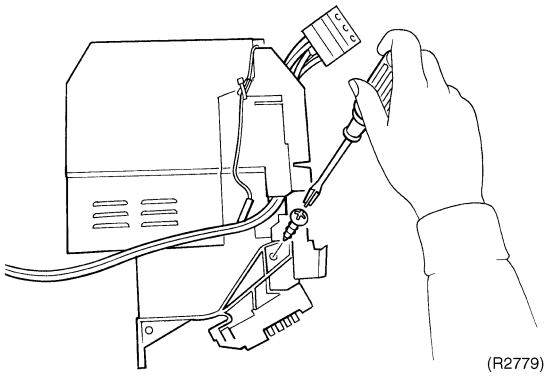
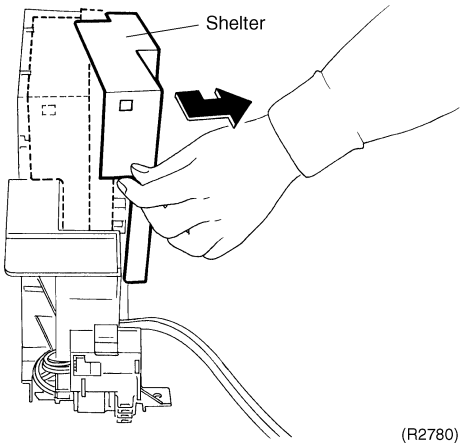
Step	Procedure	Points
4. Removing the electrical box.		
1	Disconnect the four connection wirings. Loosen the screw and remove the terminal strip board.	■ You can remove the electrical parts box without detaching the terminal strip board. ■ Screw: M4×25
2	Disconnect the connectors for fan motor (S1).	
3	Disconnect the connectors for swing motor (S6, S8).	★ S8: for FT50/60DSG models only
4	Loosen the fixing screw of the electrical box.	

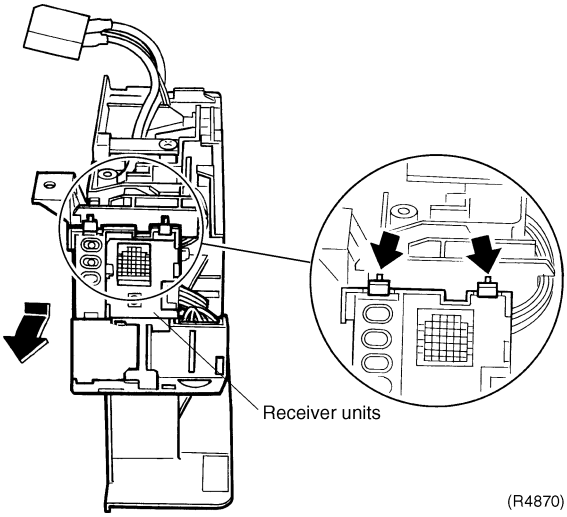
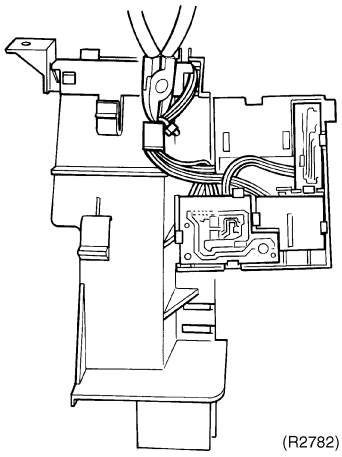
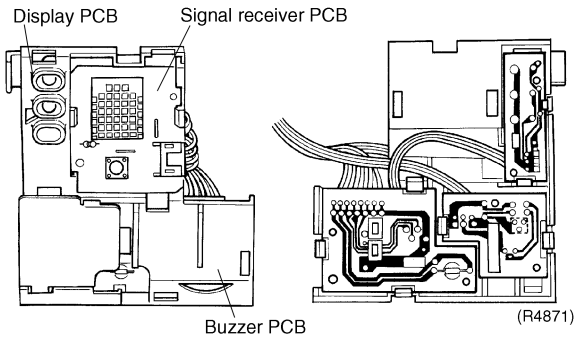
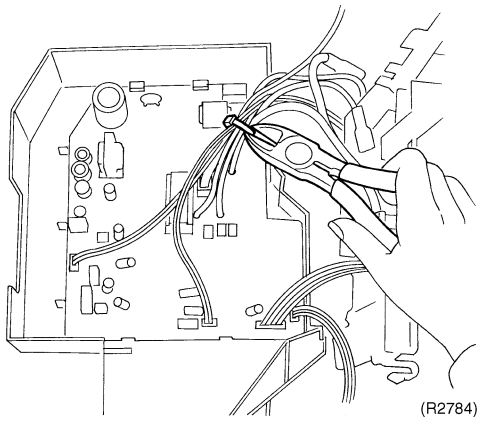




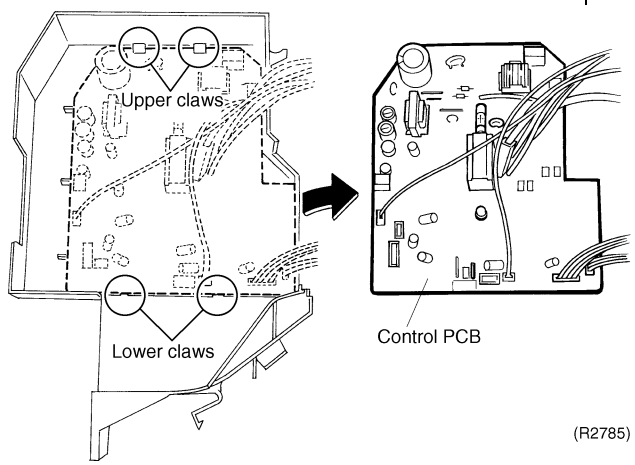


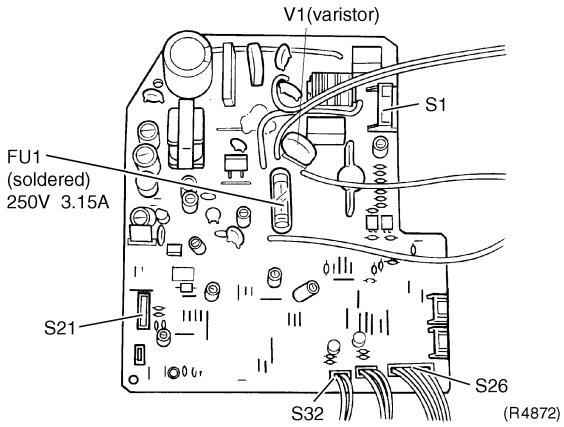


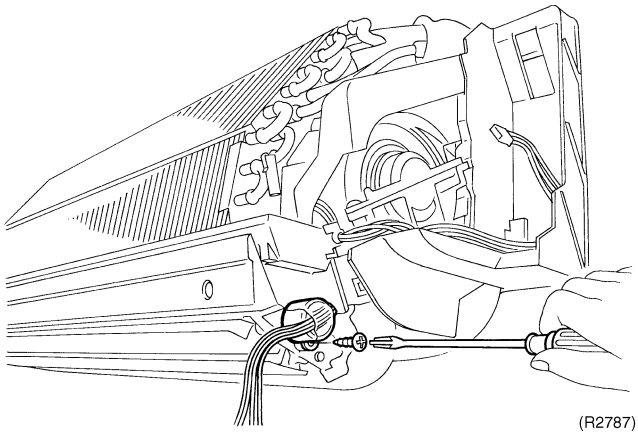
Step	Procedure		Points
5	Dislocate the electrical box to the left and undo the back claw.	 (R2777)	■ The electrical box has a claw on its back.
6	Pull the electrical box out towards you.	 (R2778)	■ Hook the back claw of the electrical box when reassembling.
7	Loosen the screw on the electrical box.	 (R2779)	■ Screw: M4×16
8	Push the shelter up and undo the claw.	 (R2780)	

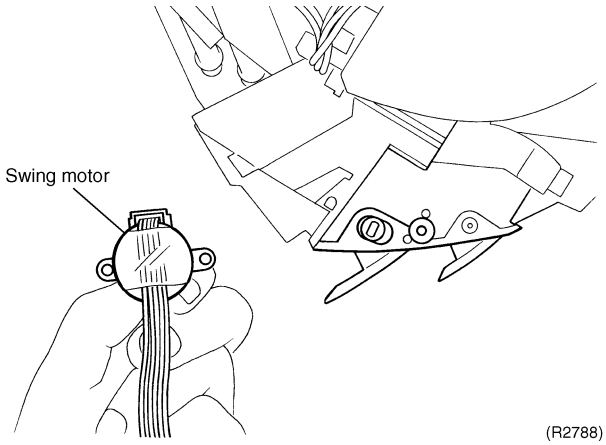
Step	Procedure		Points
9	Press the receiver units down and release the claws on the upper side, and then undo the claws on the lower side.		■ Release the claws on the upper side.
10	Cut the clamp.		
11	The receiver units contain four PCBs. Remove each PCB with releasing claws. Disconnect every connector from each PCB.		■ Remove the receiver units while pushing the claws of connectors.
12	Cut the clamp.		■ Clamps should be always available. Fix it as it was before.

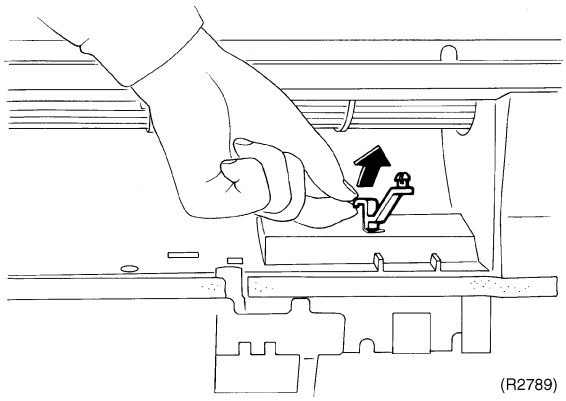
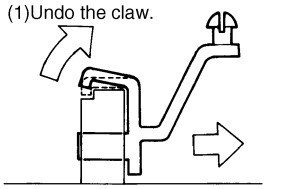
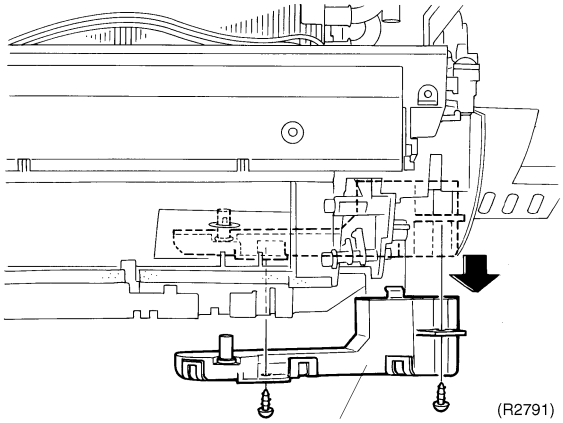
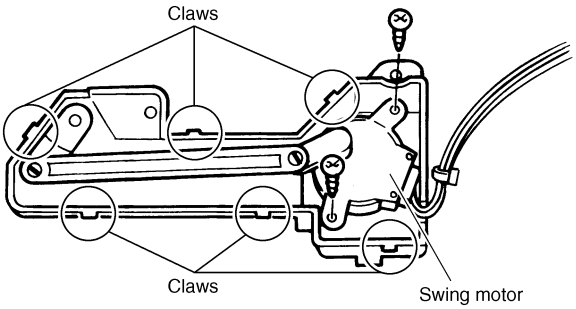
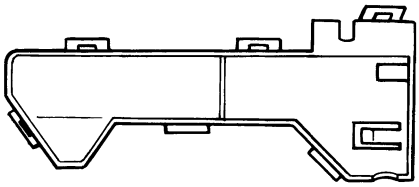
Step	Procedure	Points
5. Removing the control PCB.		
1	Undo the two claws on the lower side, and then the two claws on the upper side. Remove the control PCB.	
2	Control PCB (indoor unit) S1: connector for the fan motor S21: HA S26: connector for the room temperature thermistor S32: connector for the heat exchanger thermistor	
6. Removing the swing motor for horizontal blades.		
1	Remove the screw of the swing motor.	







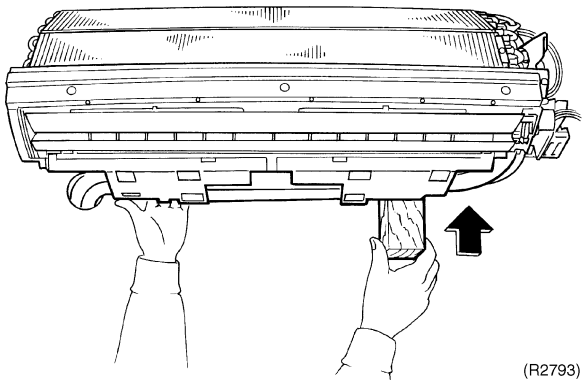
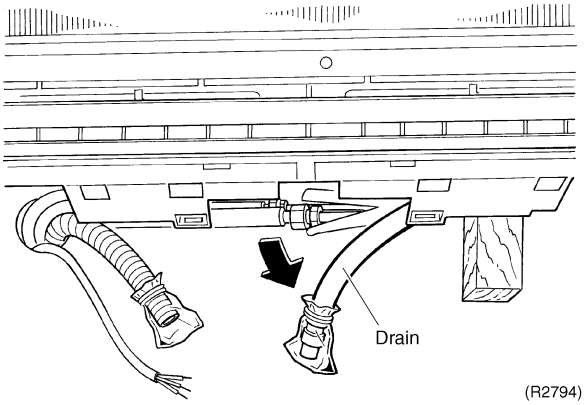
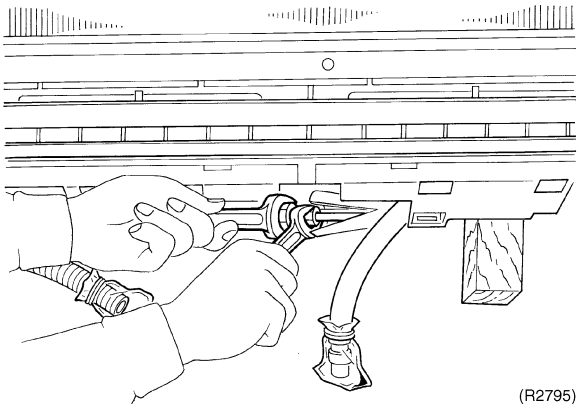
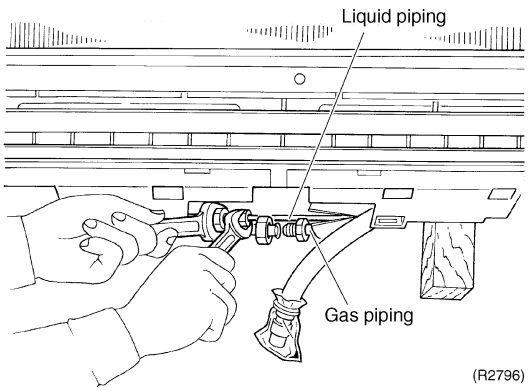


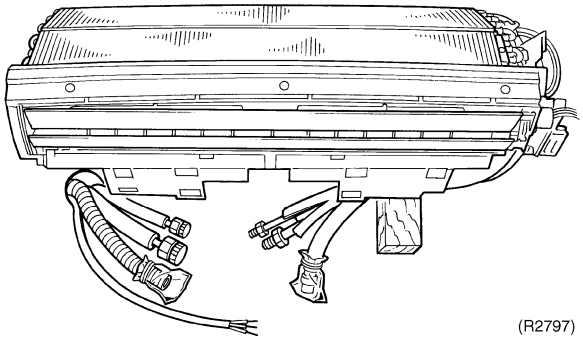
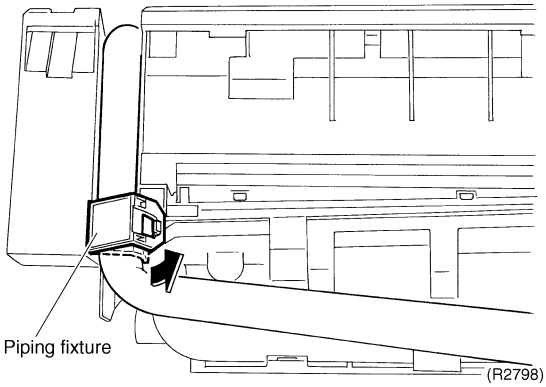
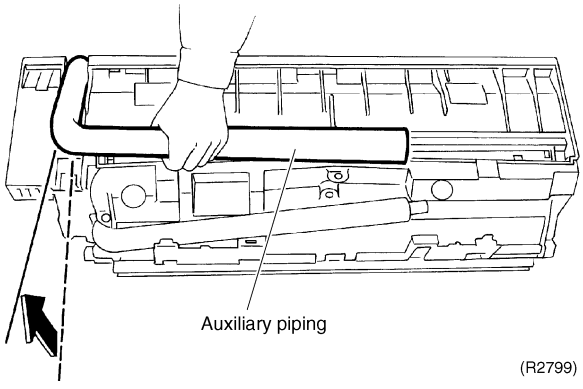
Step	Procedure	Points
7. Removing the swing motor for vertical blades. (★ for FT50/60DSG models only)		
1 Release the swing axis on the right side.	 (R2789)	■ Releasing the swing axis  (1)Undo the claw. (2)Pull it out. (R2790)
2 Loosen the two screws and detach the swing motor assembly.	 Swing motor assembly (R2791)	
3 Loosen the two screws and remove the swing motor.	 Claws Claws Swing motor  (R2792)	■ Six claws hold the assembly.

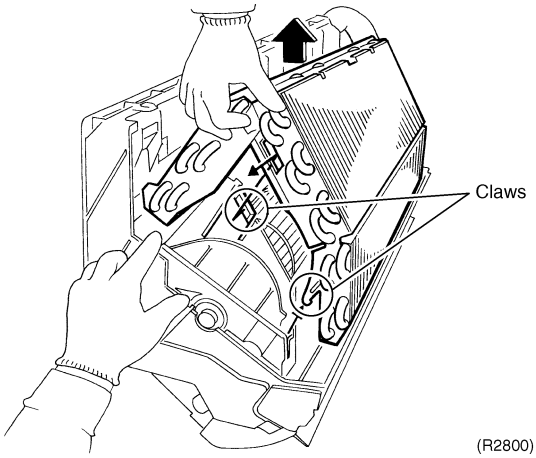
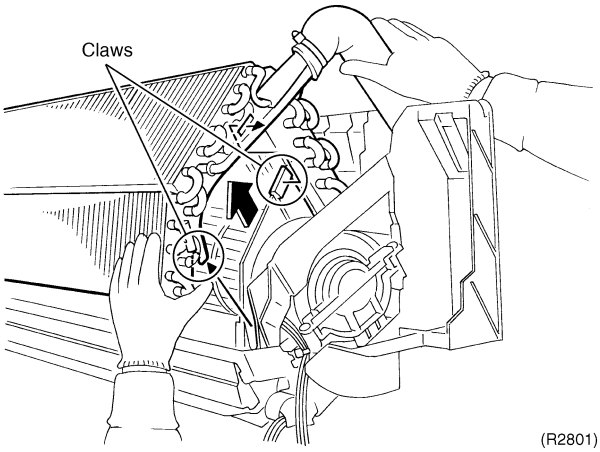
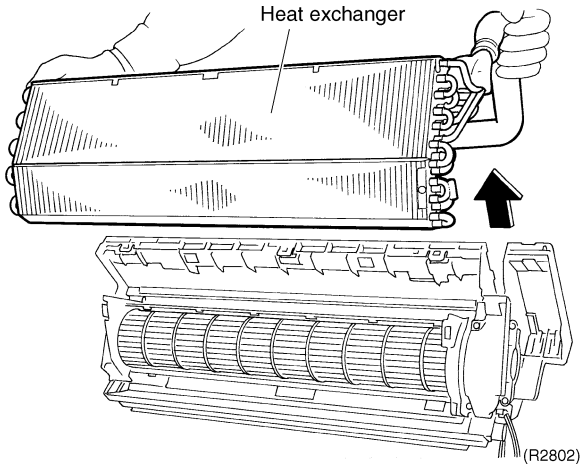
2.5 Removal of Heat Exchanger

Procedure

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

Step	Procedure	Points
■ Removing the electrical box.		**Caution** **If gas leaks, repair the spot of leaking, then collect all refrigerant from the unit. After conducting vacuum drying, recharge proper amount of refrigerant.**
1. Disconnect the refrigerant piping.		**Caution** **Do not contaminate any gas (including air) other than the specified refrigerant (R22 or R410A, depending on the model) into refrigerant cycle. (Contaminating of air or other gas causes abnormal high pressure in refrigerating cycle, and this results in pipe breakage or personal injuries.)**
1 Hold the indoor unit up by a piece of wood etc..	 (R2793)	■ Pay attention so that the residual water in the drain will not make the floor wet. ■ In case that a drain hose is buried inside a wall, remove it after the drain hose in the wall is pulled out.
	 (R2794)	
2 Unscrew the flare nut for gas piping by two wrenches.	 (R2795)	■ Use two wrenches to disconnected pipes. ■ When disconnecting pipes, cover every nozzle with caps so as not to let dust and moisture in.
3 Unscrew the flare nut for liquid piping by two wrenches.	 (R2796)	

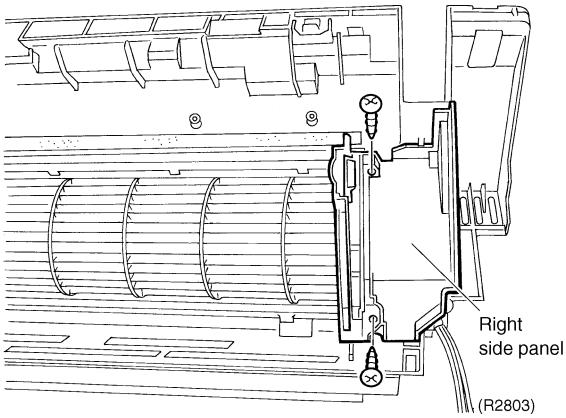
Step	Procedure	Points
2. Removing the indoor unit.		
1 Detach the indoor unit from the installation plate.	 (R2797)	
3. Removing the piping fixture.		
1 Release the claw on the upper side of the piping fixture on the back of the unit.	 Piping fixture (R2798)	
4. Removing the heat exchanger.		
1 Widen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

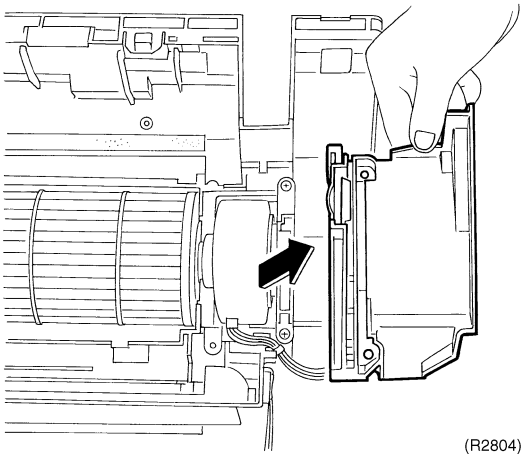
Step	Procedure		Points
2	Releasing the claws on the left side.		
3	Push the fixing claws on the right side and release.		
4	Pull the heat exchanger to the front side and undo the claws completely, and then lift it.		**Caution** **When removing or reinstalling heat exchanger, be sure to wear protective gloves or wrap the heat exchanger with cloths. (Fins can cut fingers.)**

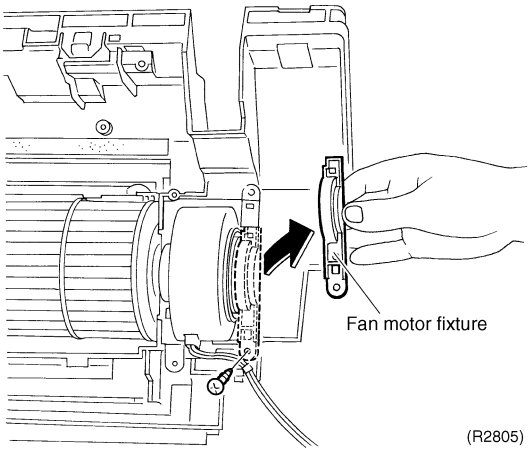
2.6 Removal of Fan Rotor / Fan Motor

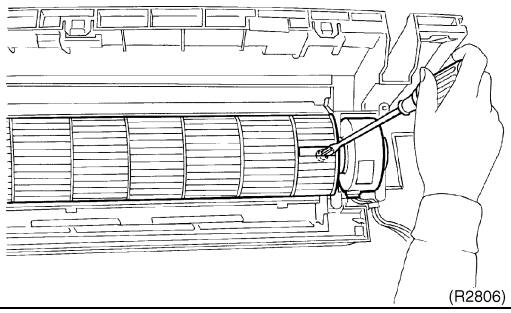
Procedure **Warning** **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

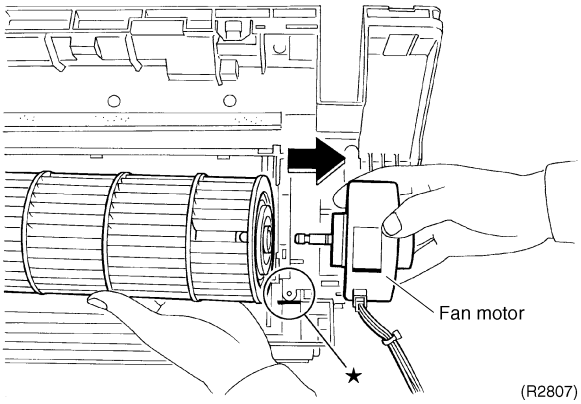
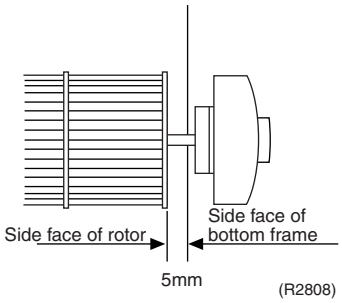
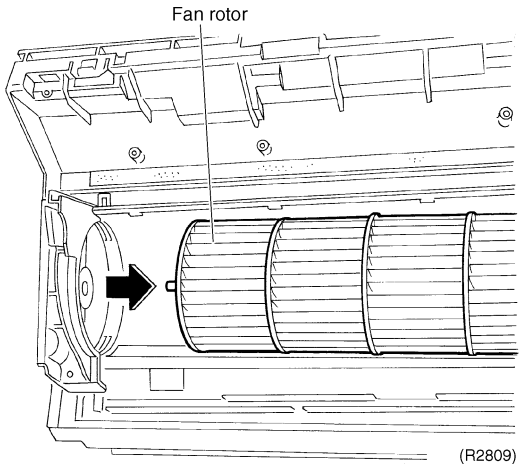
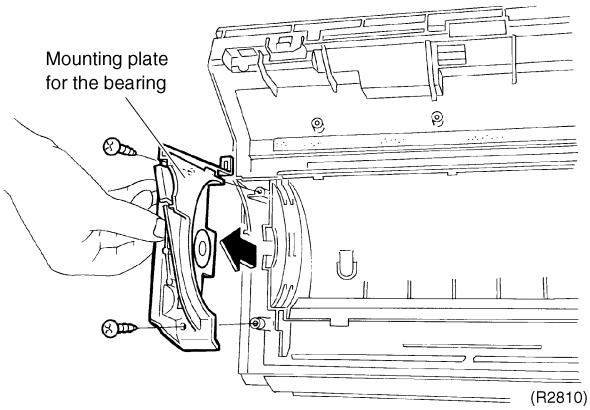
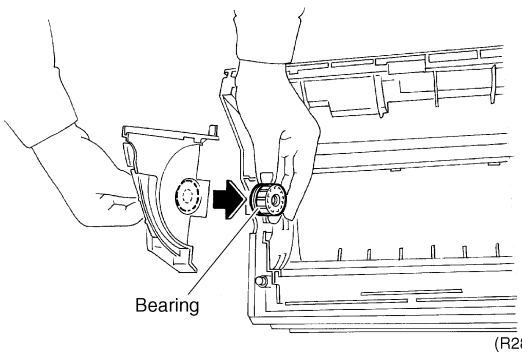
Step	Procedure	Points
1. Removing the right side panel.		■ You can remove the fan rotor without detaching the right side panel.
1	Loosen the two screws.	
2	Lift the right side panel and remove it.	
2. Removing the fan rotor.		
1	Loosen the screw and remove the fan motor fixture.	
2	Loosen the fixing screw of the fan rotor.	









Step	Procedure	Points
3. Removing the fan motor.		
1 Remove the fan rotor.		■ Reassembling the fan motor (1) When reassembling the fan rotor, provide as much as 5mm of play between the side face of the rotor and the bottom frame. 
4. Removing the bearing.		
1 Remove the fan rotor. The bearing is on the left side.		(2) When reassembling the fan motor, align the end of the connector with the height of ★ for play.
2 Loosen the two screws and remove the mounting plate for the bearing.		
3 The bearing is made of rubber. Push it inwards firmly and remove it.		

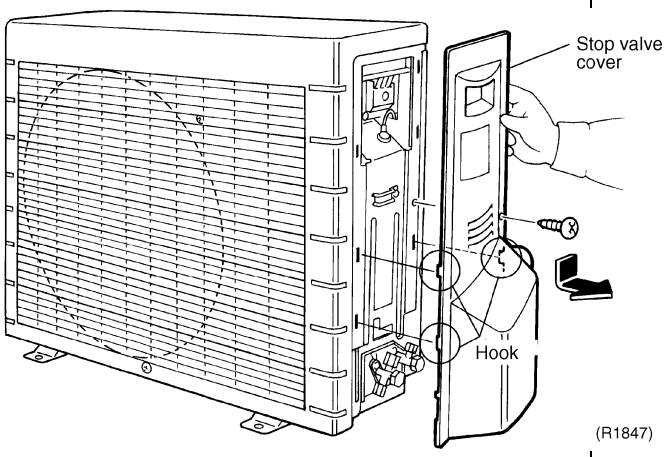
3. R25/35DV1

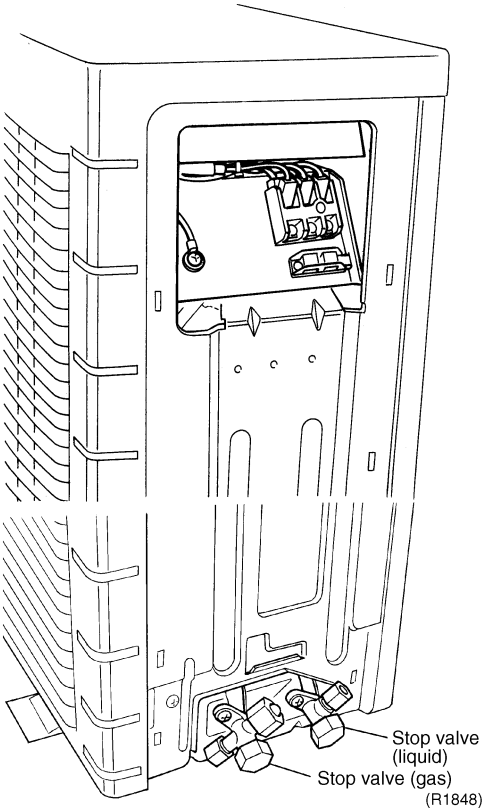
3.1 Removal of Panels

Procedure

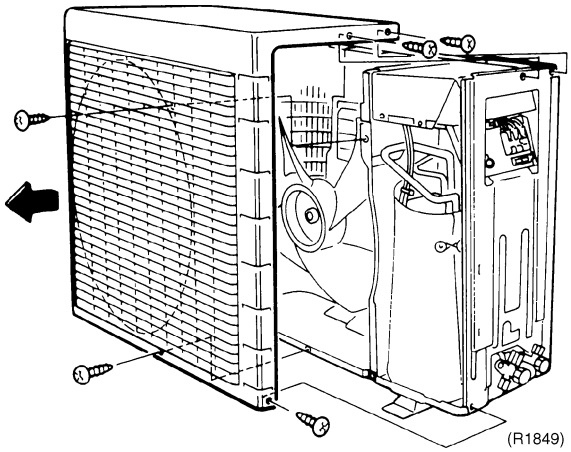
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

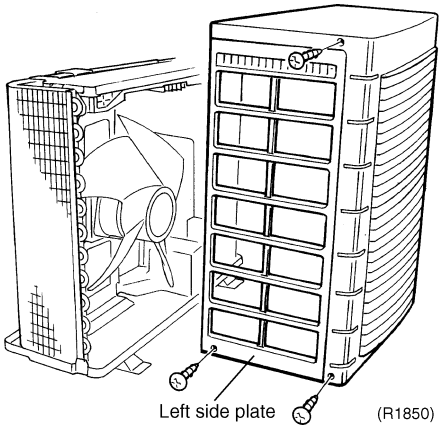
Step	Procedure	Points
1	The stop valve cover can be removed when the fixed screw is removed.	■ As three hooks are provided (at three portions), slide the cover downward to remove. ■ The forced cooling operation in the pumping down mode can be carried out by pushing the operation switch on the main unit for five seconds. (The existing models can do it through the switch on the PC board just as well.) ■ The layout of the connection ports for the flares has been changed to horizontal position from vertical position.



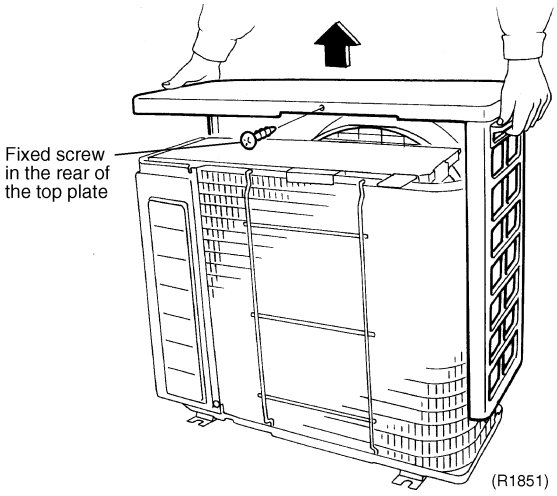


Step	Procedure	Points
2	The top plate and the front plate are constructed in a monoblock. Remove the three screws at the right side and the two screws at the front plate.	
3	Remove the three screws at the left side.	
4	Remove the one fixed screw in the rear of the top plate. Once lift the top plate and then remove it forward.	■ The left side plate and the bellmouth can be removed all at once. ■ When restoring the top plate, move it horizontally and get it down for the easy work.
5	The front plate and the left side plate can be removed when the one fixed screw is removed.	■ Sectional view at the front.

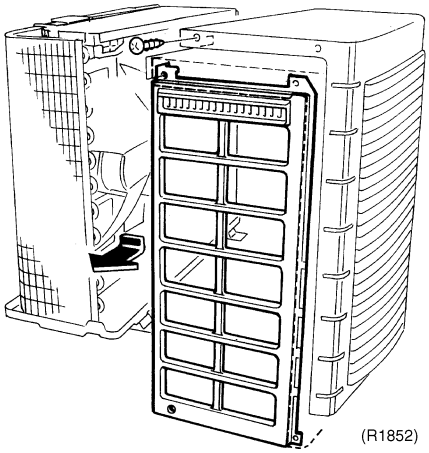

(R1849)

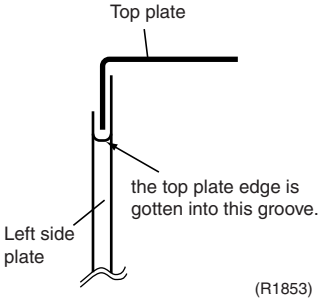


(R1850)



(R1851)


(R1852)

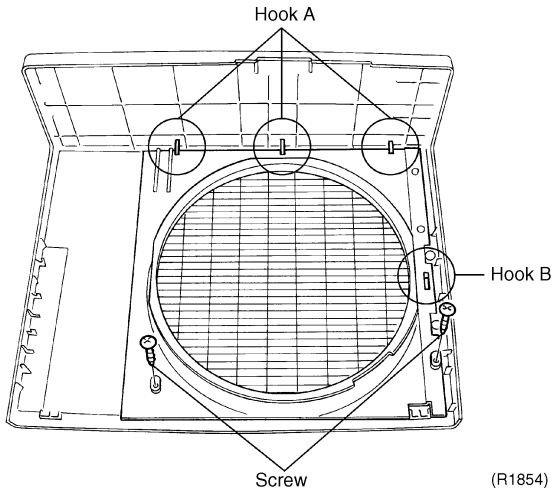
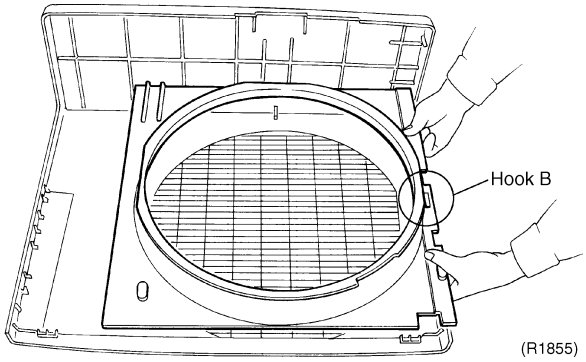
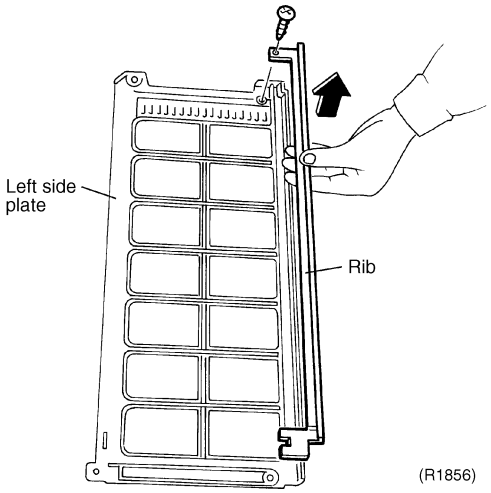


(R1853)

3.2 Removal of Bellmouth and Left Side Plate

Procedure

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

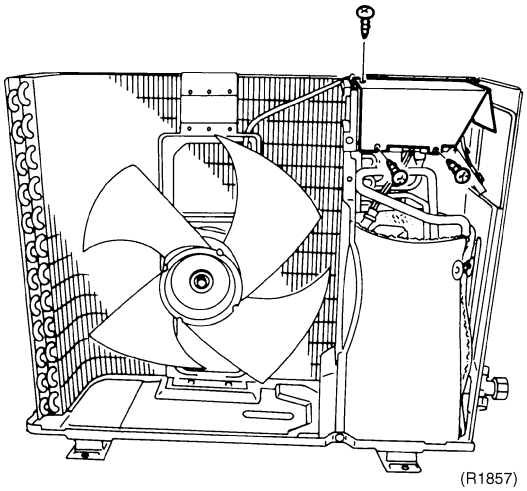
Step	Procedure		Points
1	The bellmouth is attached with two screws and four hooks.		■ Remove the bellmouth, beginning the front plate after removing the two screws which are set below.
2	Remove the two screws and pull the bellmouth forward to remove, as the four hooks are provided.		■ Slide the bellmouth in the arrow direction to disengage the hook B.
3	The rib is equipped on the left side plate and it can be disengaged when the one fixed screw is removed.		

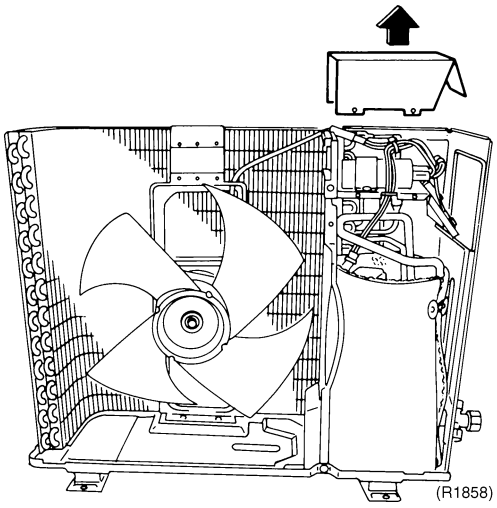
3.3 Removal of Electrical Device Mounting Plate

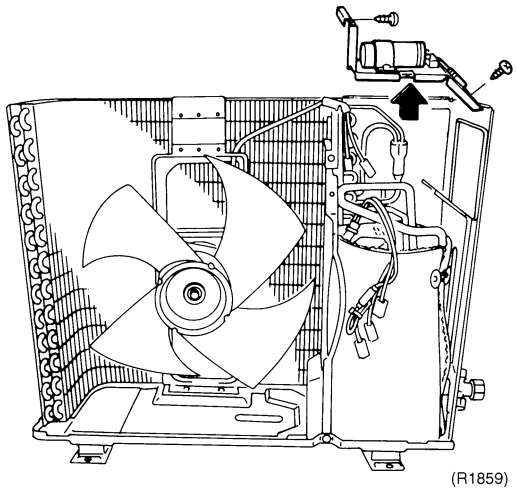
Procedure

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.		
1	Remove the three fixed screws for removing the shelter.	
2	Remove the shelter.	
2. Removing the switch box.		
1	Remove all the harness.	
2	Remove two fixing screws of electrical device mounting plate.	
3	Remove the electrical device mounting plate.	


(R1857)

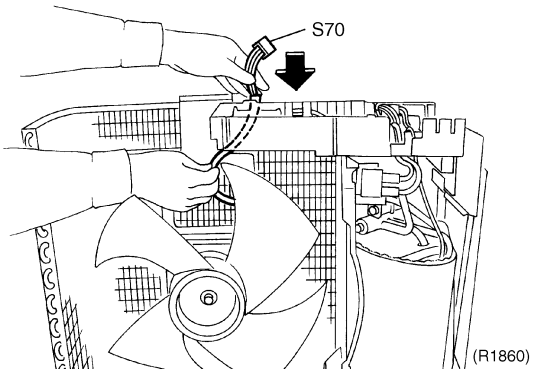
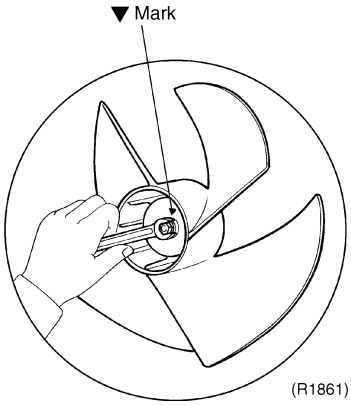
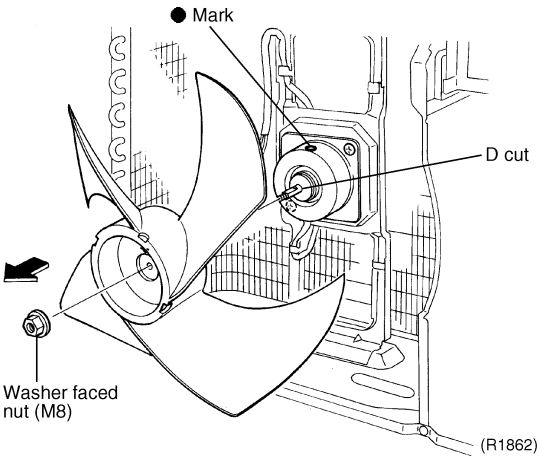
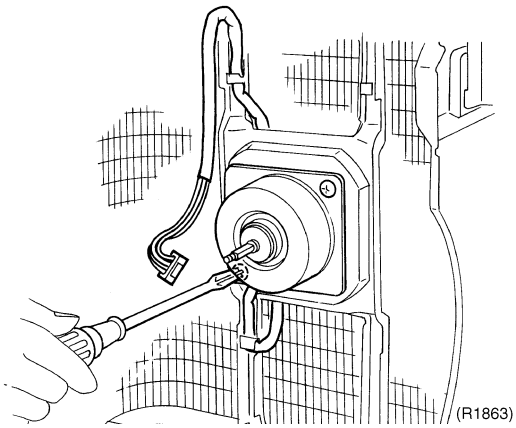
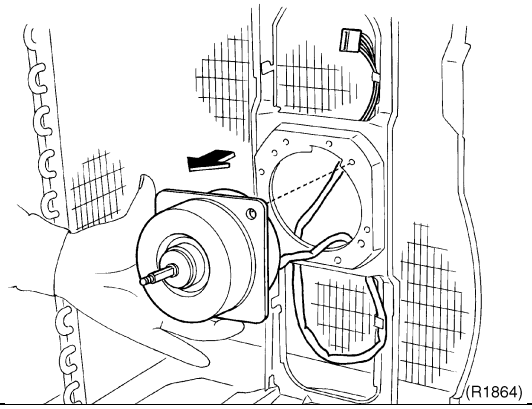

(R1858)


(R1859)

3.4 Removal of Propeller Fan and Fan Motor

Procedure

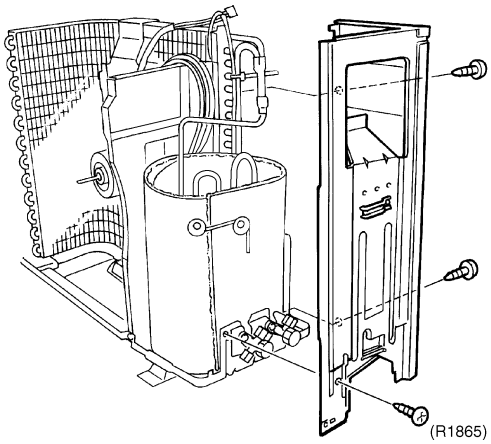
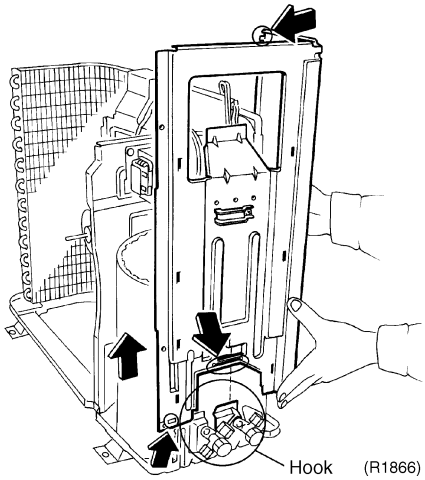
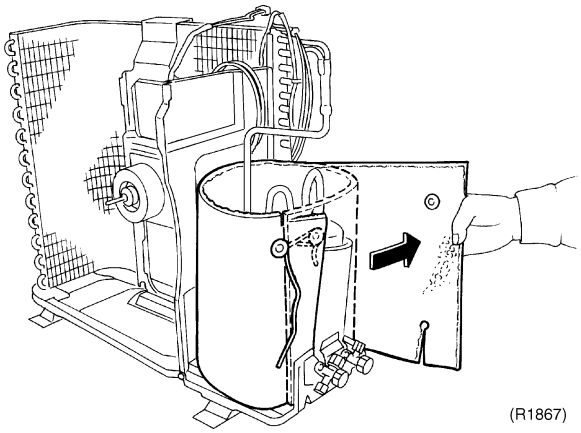
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

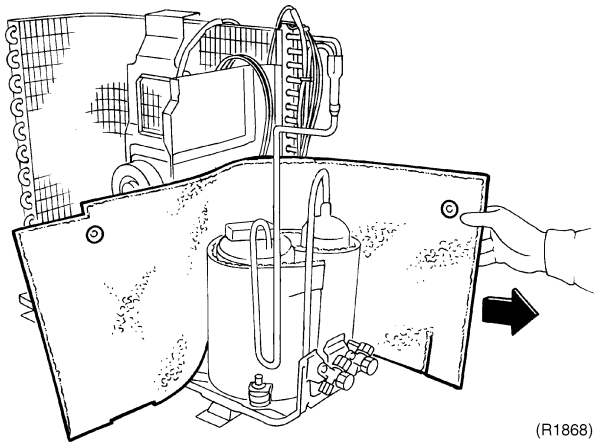
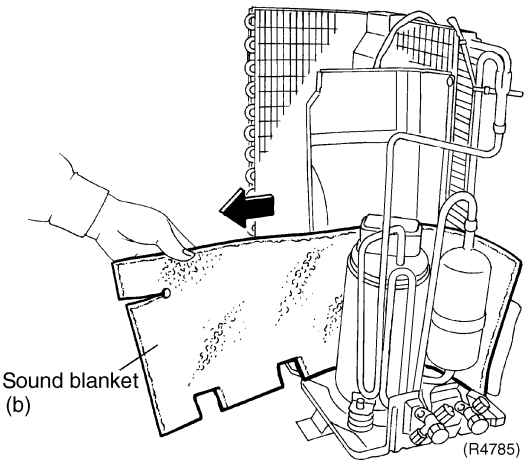
Step	Procedure	Points
■ Disconnect the fan motor connector S70.		■ Remove the external plates and the drip proof cover protecting the electric parts. ■ Be sure to avoid forgetting to restore the shelter and to avoid losing or damaging it.
1 The lead-wires of the fan motor can be disengaged by passing through the clearance between the heat exchanger and the switch box.		
2 The propeller fan can be removed when the washer faced nut (M8) is removed.		■ When restoring, match the ▼ mark of the propeller fan with the D-cut of the motor shaft. ■ The fan should be restored so that the mark ● will be at upper part of the fan motor.
3 Remove two screws for removing the fan motor. The lead wires are disengaged by raising the hooks which fix the lead wires.		
4 Remove the fan motor.		

3.5 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. Removing the right side plate.		
1 Remove the three screws for removing the right side plate.	 (R1865)	
2 Lift the right side plate to disengage the hooks.	 Hook (R1866)	■ Insert the three hooks for the restoration.
2. Removing the noise absorber		
1 Untie the string fixing the body of the sound blanket.	 (R1867)	■ Since the slit prepared for the piping connection on the sound blanket is torn easily, remove it carefully. ■ When restoring, the sound blanket should pass the internal side of the piping.

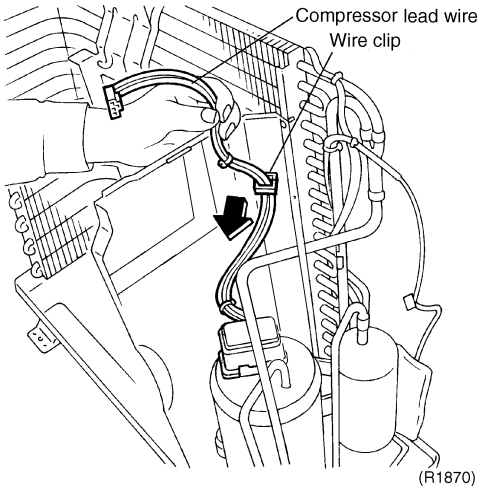
Step	Procedure		Points
2	Pull out the body of the sound blanket.	 (R1868)	■ Since the slit prepared for the piping on the sound blanket is torn easily, remove the pad carefully. ■ When restoring, the sound blanket should pass the internal side of the piping.
3	Pull out the body of the sound blanket (b).	 (R4785)	

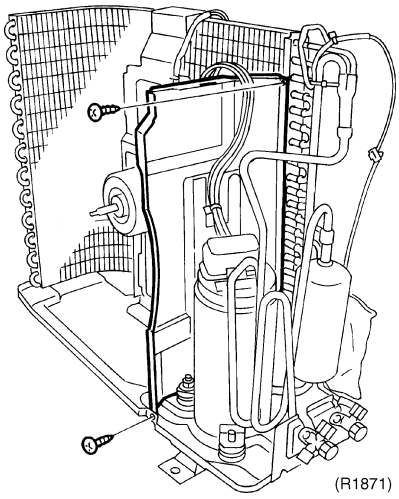
3.6 Removal of Partition Plate

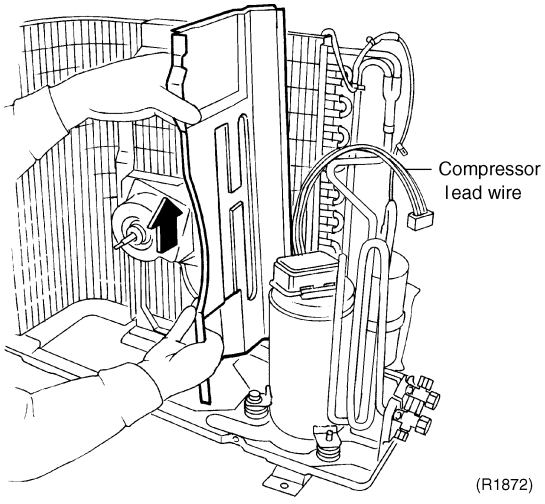
Procedure

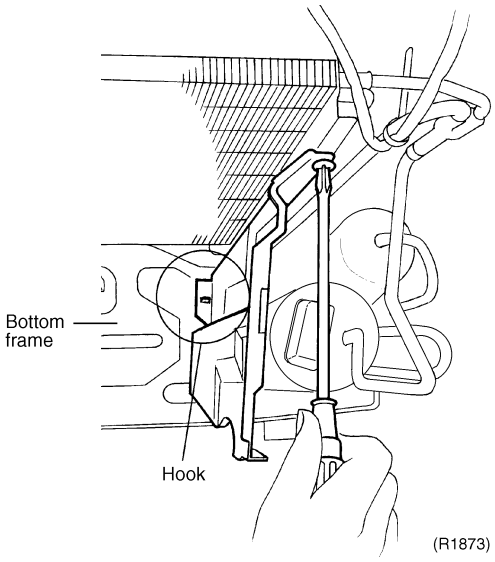
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure	Points
1. Removing the partition plate.		
1	Disengage the lead wires from the wire clip.	
2	Remove the two screws fixing the partition plate.	
3	Pull the partition plate upward to remove.	







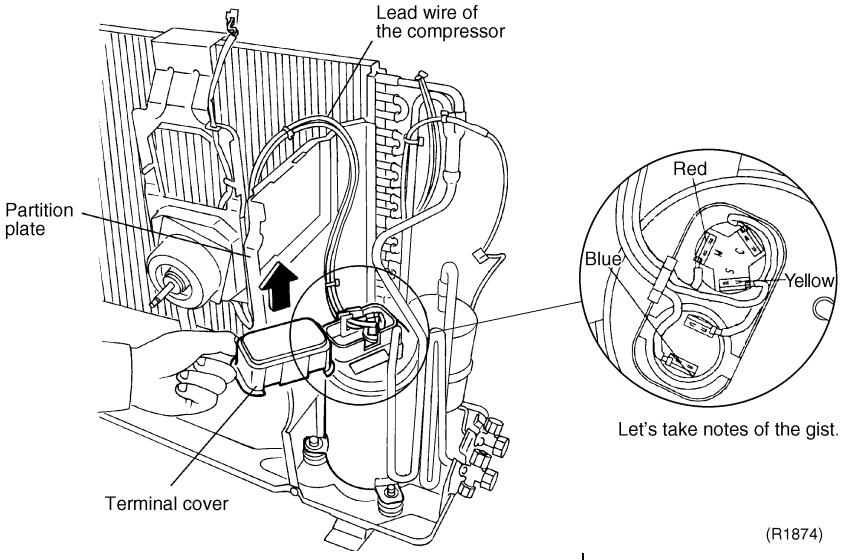
Step	Procedure		Points
4	When restoring the partition plate, put the hook into the bottom frame.		

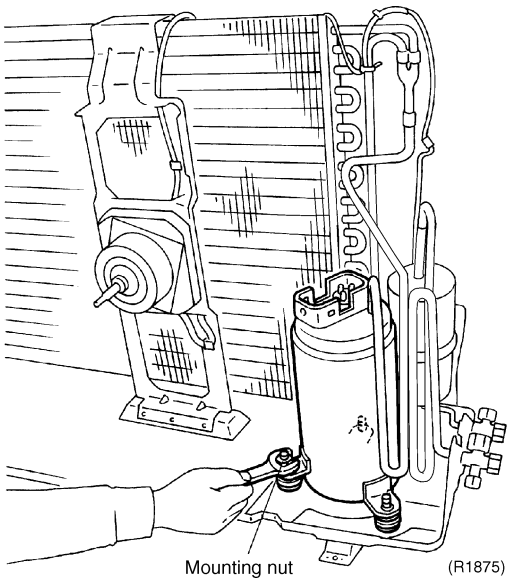
3.7 Removal of Compressor

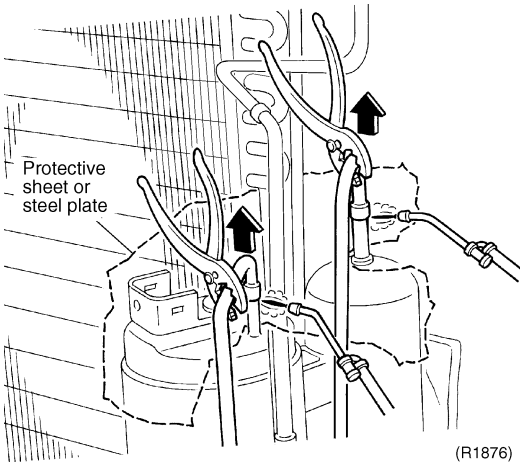
Procedure

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

Step	Procedure	Points
1. Removing the parts around the compressor.		■ Be careful so as not to burn the compressor terminals or the name plate.
1	Remove the terminal cover, the lead wires of the compressor and the partition plate so as not to be burnt out by a gas brazing machine.	
2	The compressor's mounting nut to be removed is one piece.	
3	Remove the nut by means of an open-end wrench.	
■ Begin your work after recognizing complete empty of refrigerant in the refrigerant circuit.		**Warning** **Since it may happen that refrigeration oil in the compressor will catch fire, prepare wet cloth so as to extinguish fire quickly.**
■ Be sure to apply nitrogen's permutation when heating up the brazing part.		**Warning** **Ventilate when refrigerant leaks during the work.(If refrigerant contacts fire, it will cause to arise toxic gas).**
1	Remove the brazing part on the compressor discharge side.	
2	Heat up the brazing part on the compressor suction part and then remove it.	**Caution** **Be careful about pipes and so on, which were heated up by a gas brazing machine, so as not to get burnt on your hands.**
3	Lift the compressor and remove it.	■ Pay attention so that the heat exchanger's fins will not be burnt.







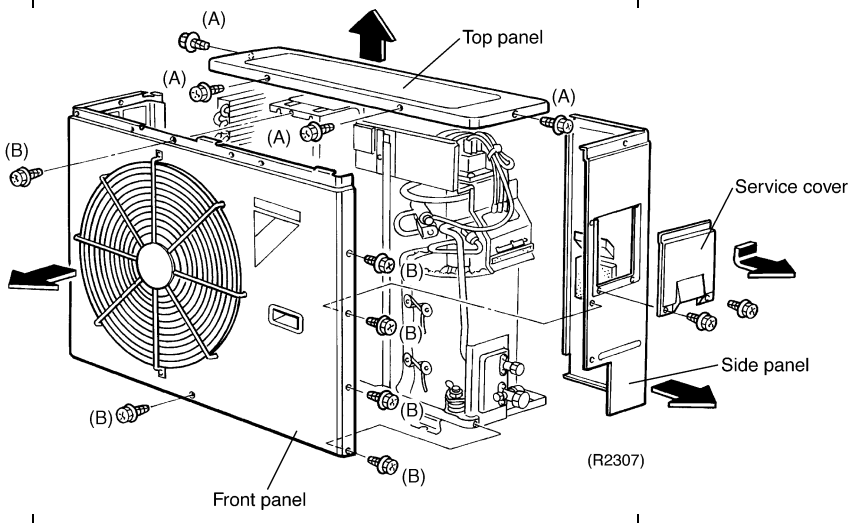
4. R50DSG

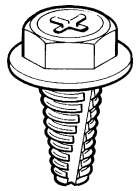
4.1 Removal of Panels

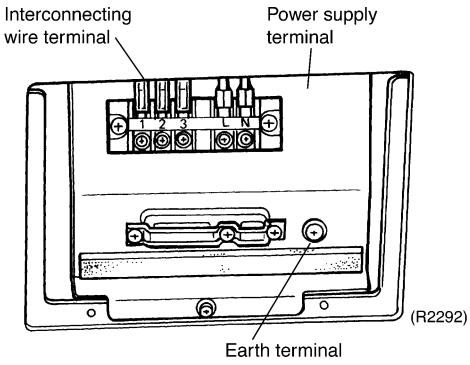
Procedure

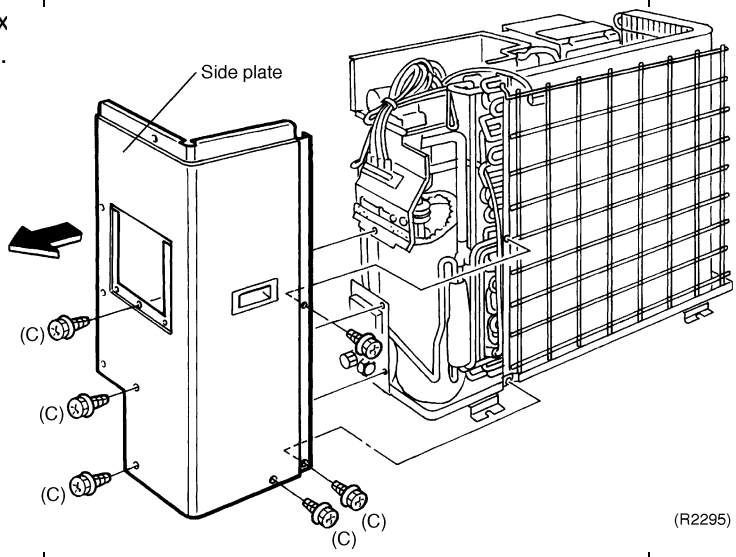
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure	Points
1	To dismount the top panel, remove the four mounting screws (A).	
2	To dismount the front panel, remove the six mounting screws (B).	
3	To dismount the service cover, remove the two mounting screws.	
4	To dismount the side panel, remove the six mounting screws (C).	







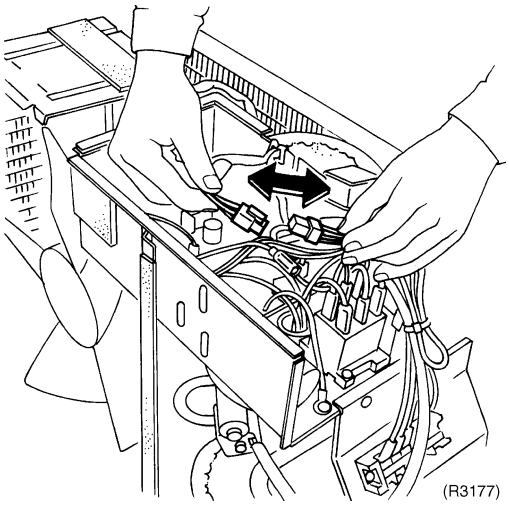


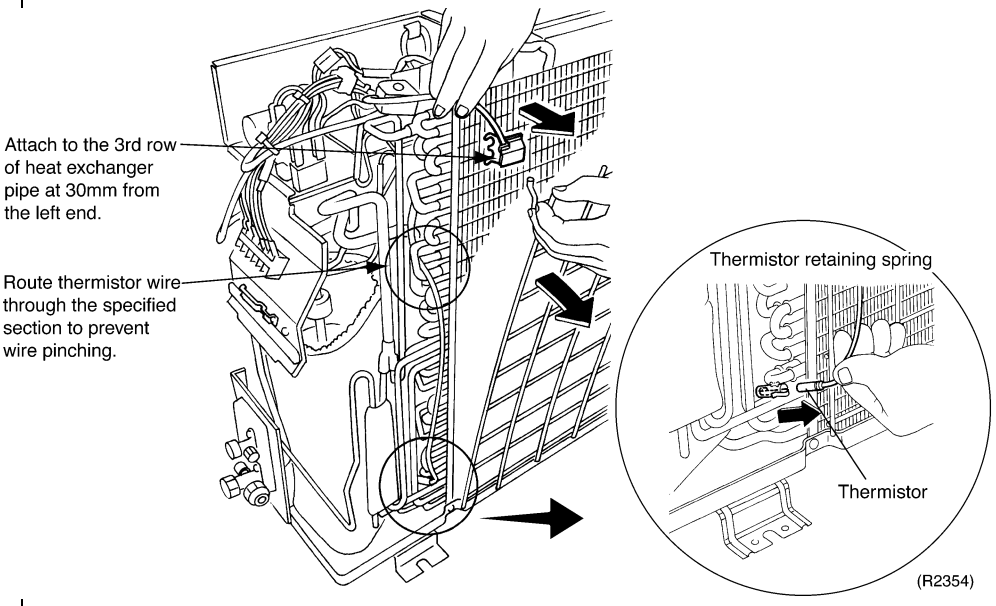
4.2 Removal of Electrical Box

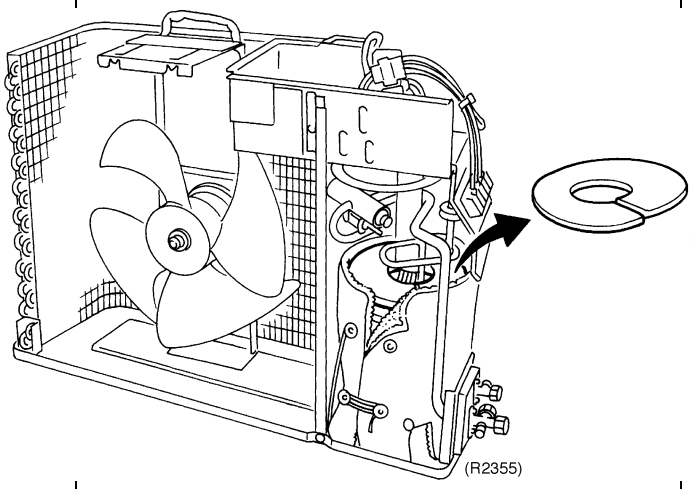
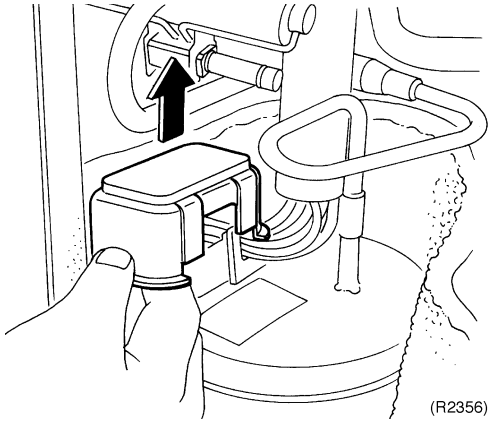
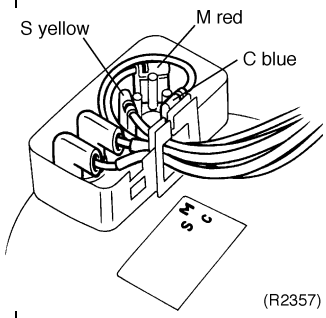
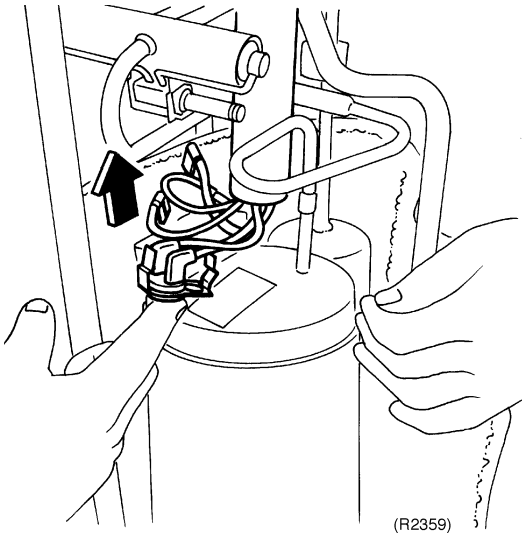
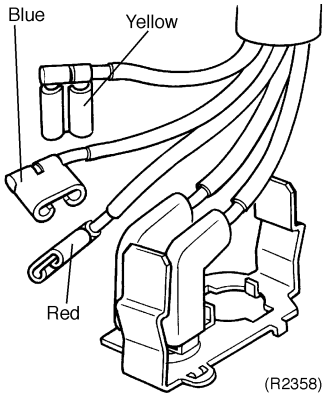
Procedure

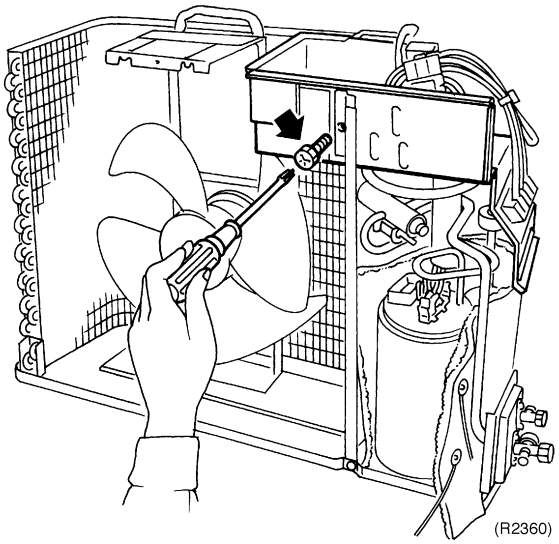
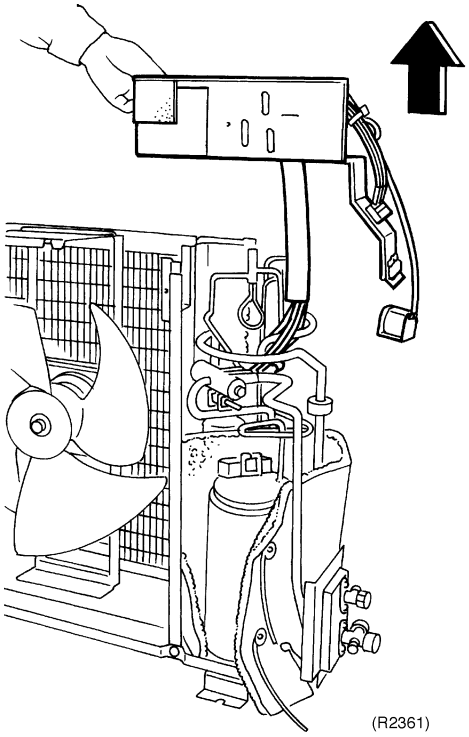
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure	Points
1	Remove the wire harness connectors from the PCB.	
2	Dismount the outdoor air thermistor and the heat exchanger thermistor.	





Step	Procedure	Points
3	Remove top insulation material from compressor.  (R2355)	■ Terminal code is printed. Do not scorch the indication with the flame of welder. Also record terminal code on a memo paper in case the indication becomes illegible.
4	Remove terminal cover.  (R2356)	 (R2357)
5	Remove compressor protective device and three terminals together with mounting plate.  (R2359)	 (R2358) ■ Connect lead wires to proper fasten terminals. S ·····Yellow M·····Red C ·····Blue

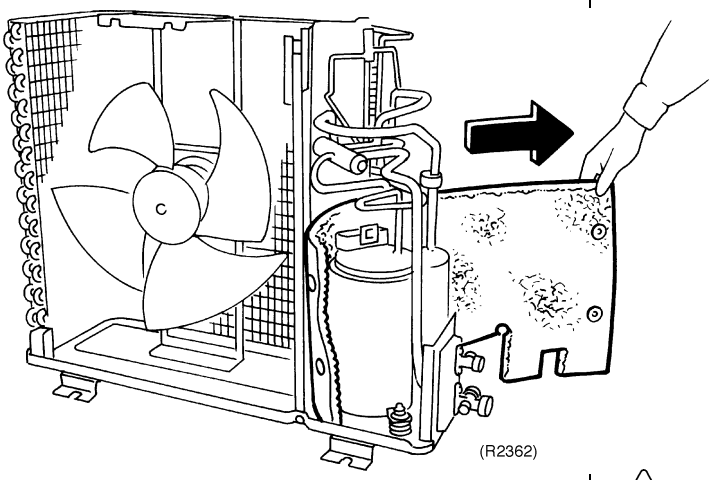
Step	Procedure		Points
6	Remove the screw.	 (R2360)	
7	Take off the electrical box.	 (R2361)	

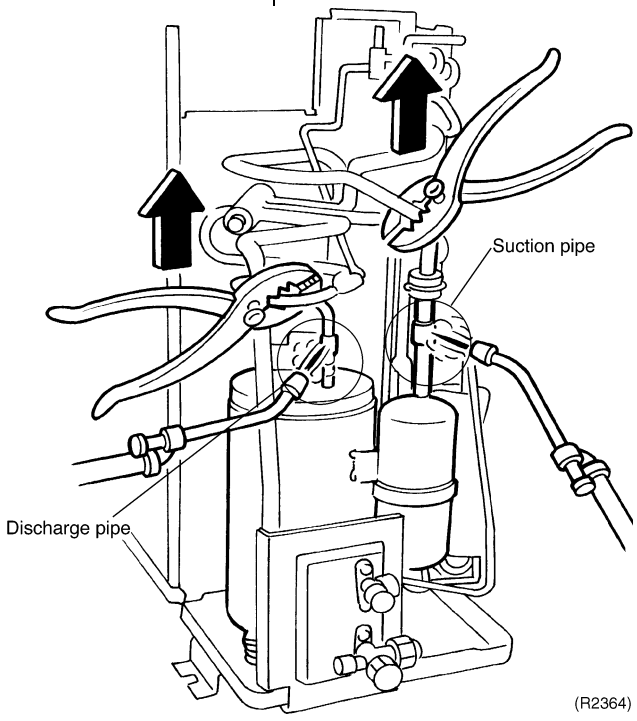
4.3 Removal of Compressor

Procedure

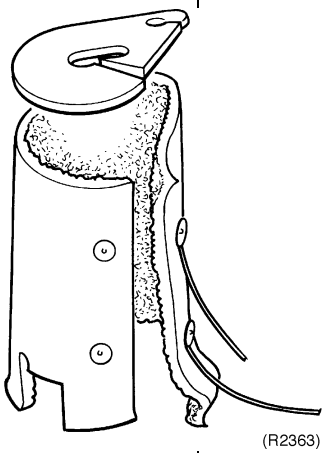
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure	Points
■ Make sure that there is no refrigerant in the unit before disassembling.		
1	Pull out sound blanket (side insulation) from right side.	
2	Disconnect suction pipe and discharge pipe of compressor at brazed sections.	**WARNING** **If refrigerant gas leaks during servicing work, ventilate the area. (If refrigerant gas contacts flames, hazardous gas can generate.)** ■ When removing sound blanket, do not pull it with excessive force, since it is inserted between pipes.

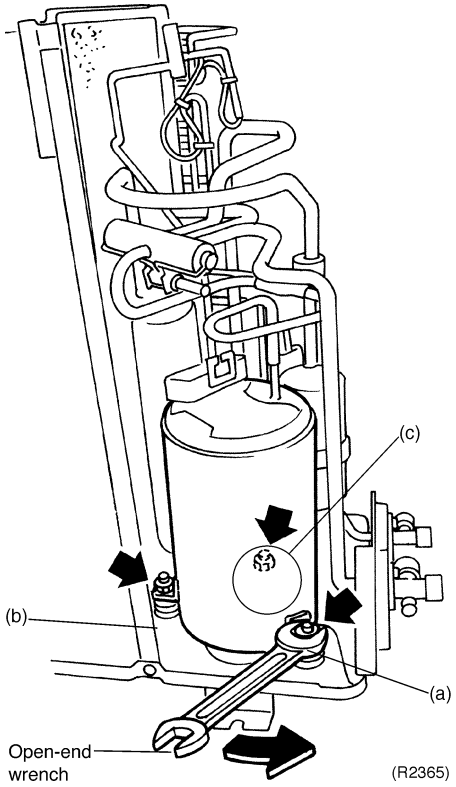

(R2362)

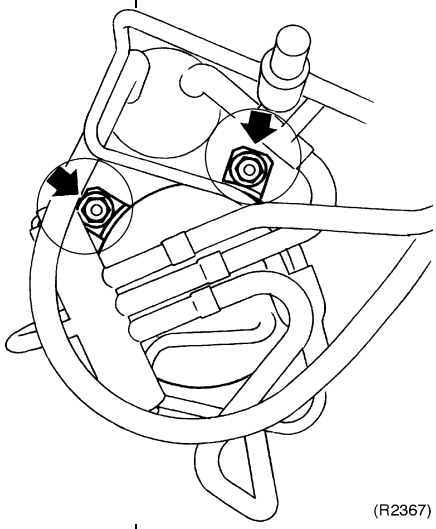


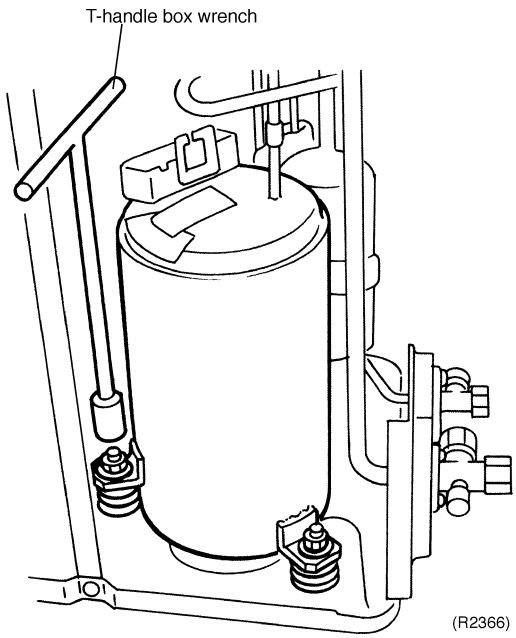
(R2364)


(R2363)

Step	Procedure	Points
3	After disconnecting refrigerant pipes, remove three washer nuts that secure compressor in place. Use open-end wrench to remove washer nut (a) located on right front side.	
4	Use T-handle box wrench to loosen nuts (b) and (c).	







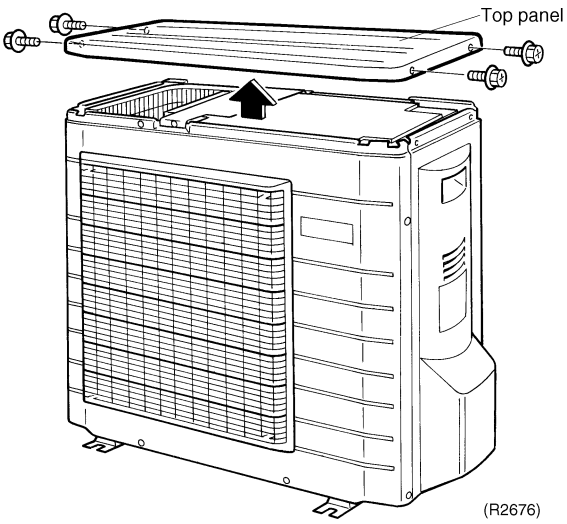
5. R60DSG

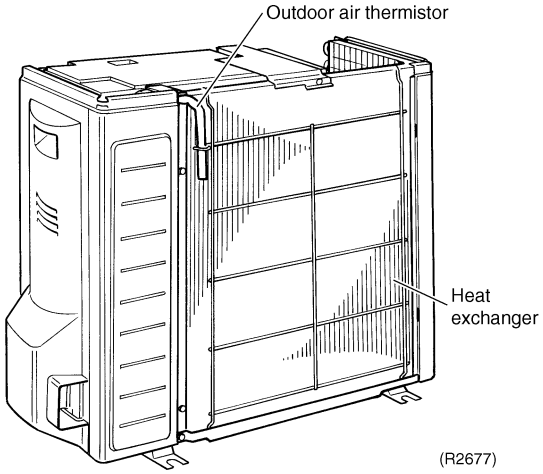
5.1 Removal of the Panels and Plates

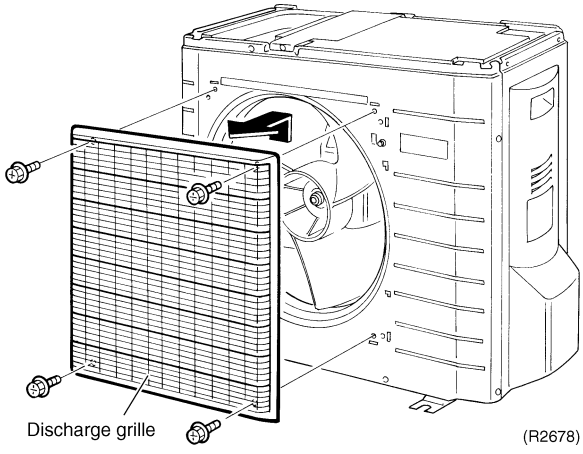
Procedure

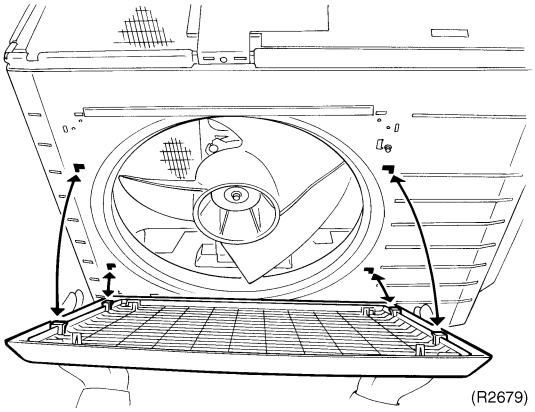
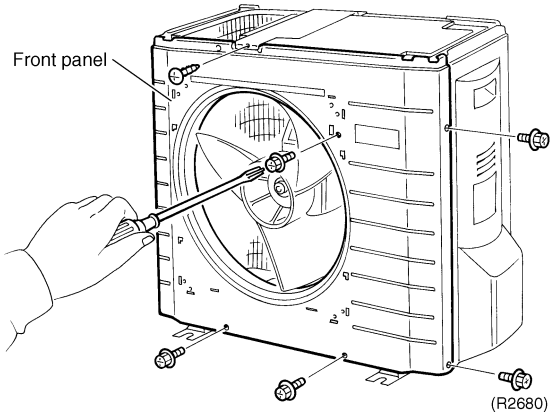
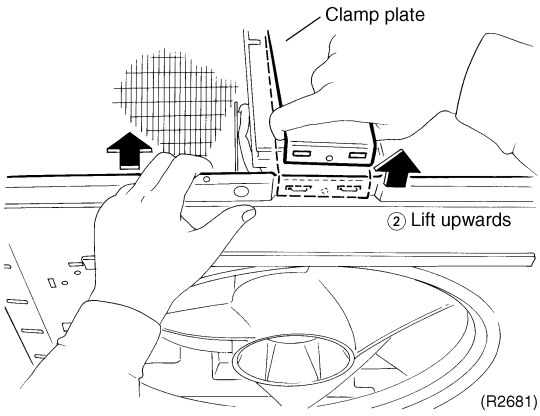
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

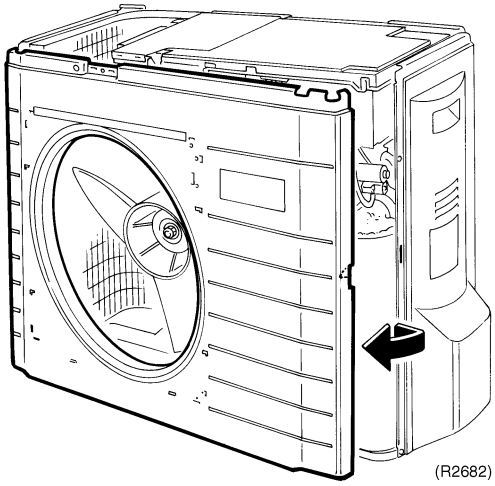
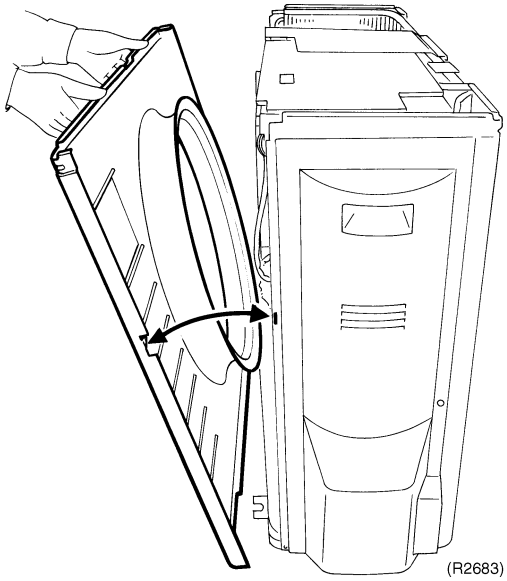
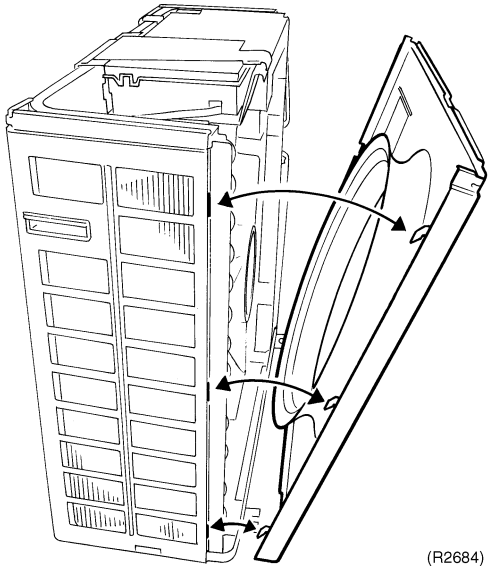
Step	Procedure	Points
1. Removing the panels and plates.		
1	Loosen the four screws and lift the top panel.	■ Take care not to cut your finger by the fins of the heat exchanger.
2	Loosen the four screws and remove the discharge grille.	



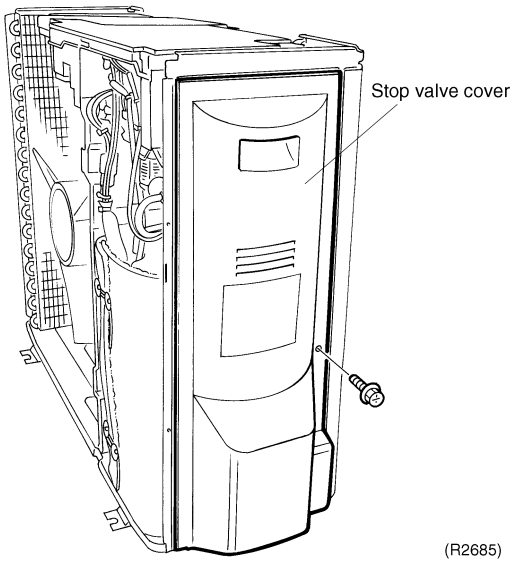




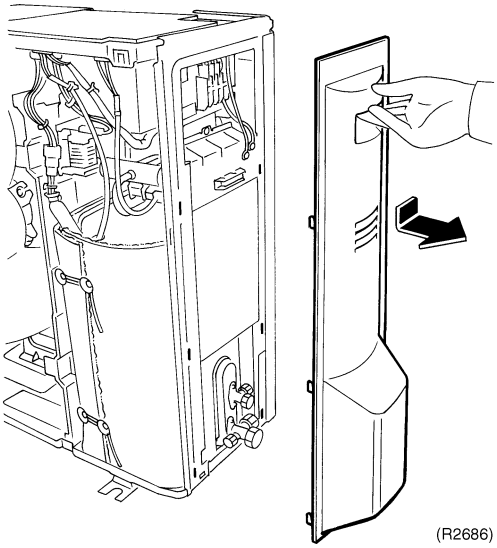
Step	Procedure		Points
		 (R2679)	■ The front grille has four claws. Slide the discharge grille upwards and remove it.
3	Loosen the six screws of the front panel.	 (R2680)	
4	Push the front panel and undo the claw. Lift the clamp plate and remove it.	 (R2681)	

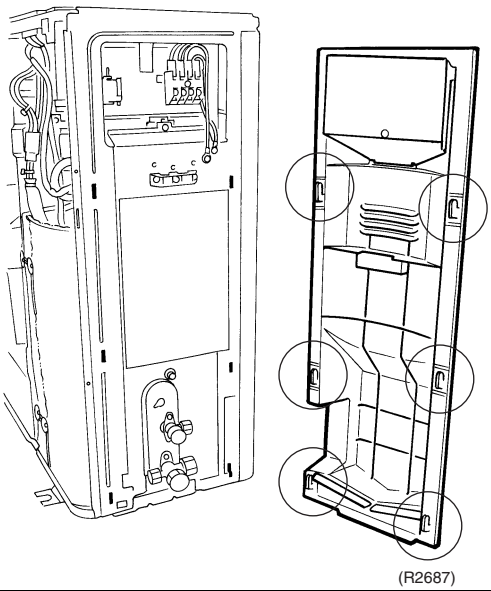
Step	Procedure		Points
5	Undo the right side claw, and then the left side claws. Remove the front panel.	 (R2682)  (R2683)  (R2684)	■ Lift the front panel and remove it while pushing the right side panel inwards. ■ Lift the front panel and undo the left side claws. ■ Fit the left side of the front panel first when installing.

Step	Procedure	Points
2. Removing the stop valve cover.		
1	Loosen the screw of the stop valve cover.	
2	Pull down the stop valve cover to undo the claws and remove it.	■ The stop valve cover has six claws.



(R2685)

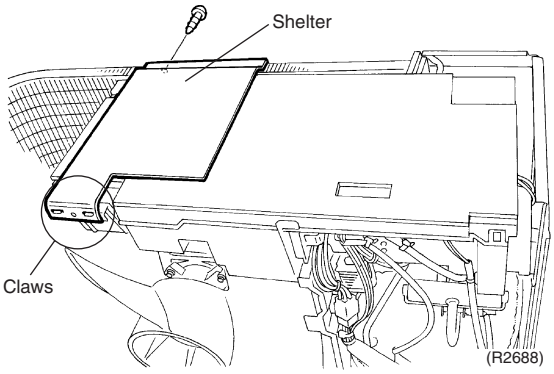
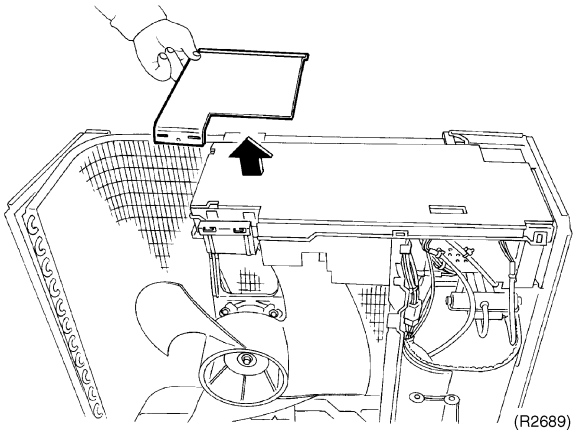
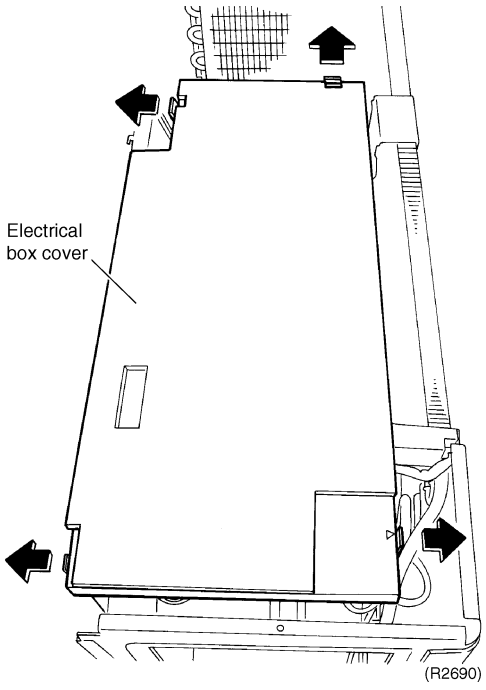

(R2686)

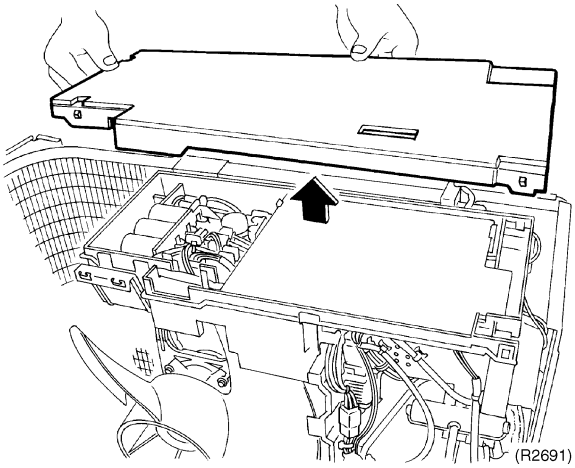
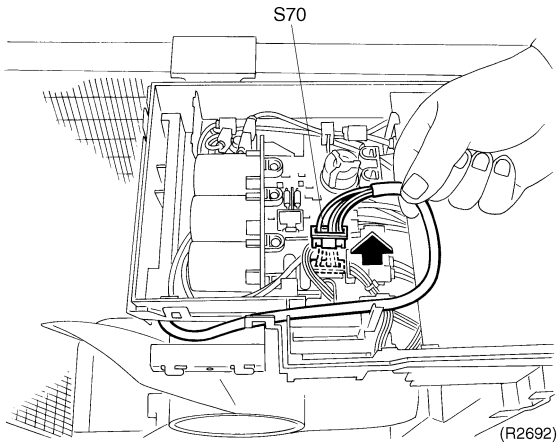
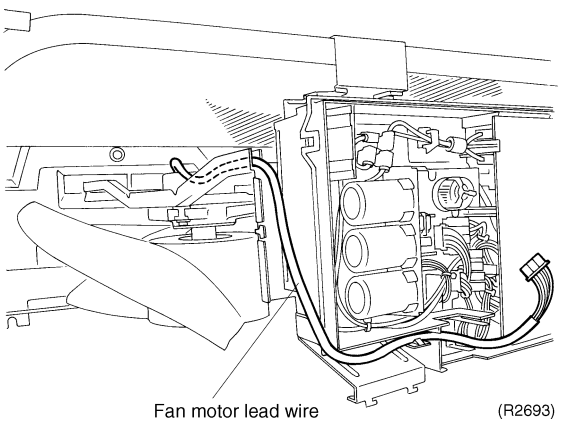

(R2687)

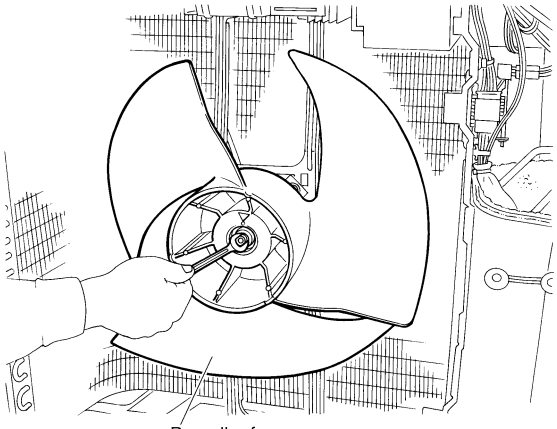
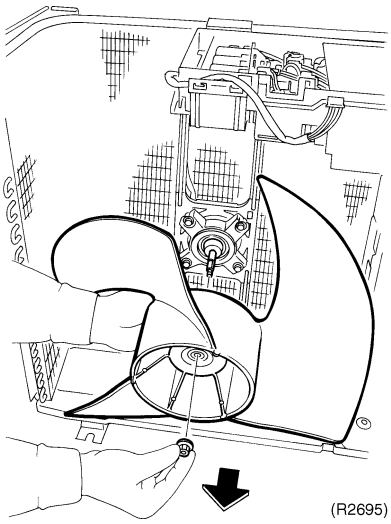
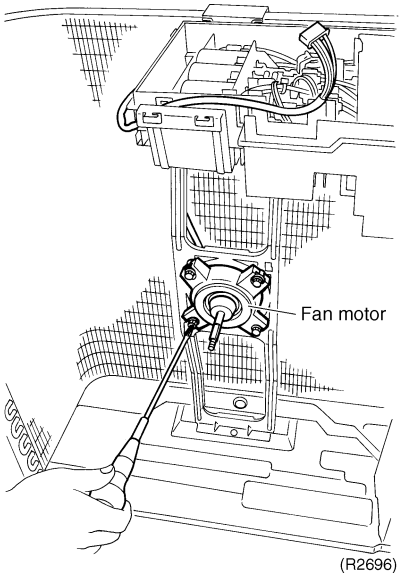
5.2 Removal of the Fan Motor / Propeller Fan

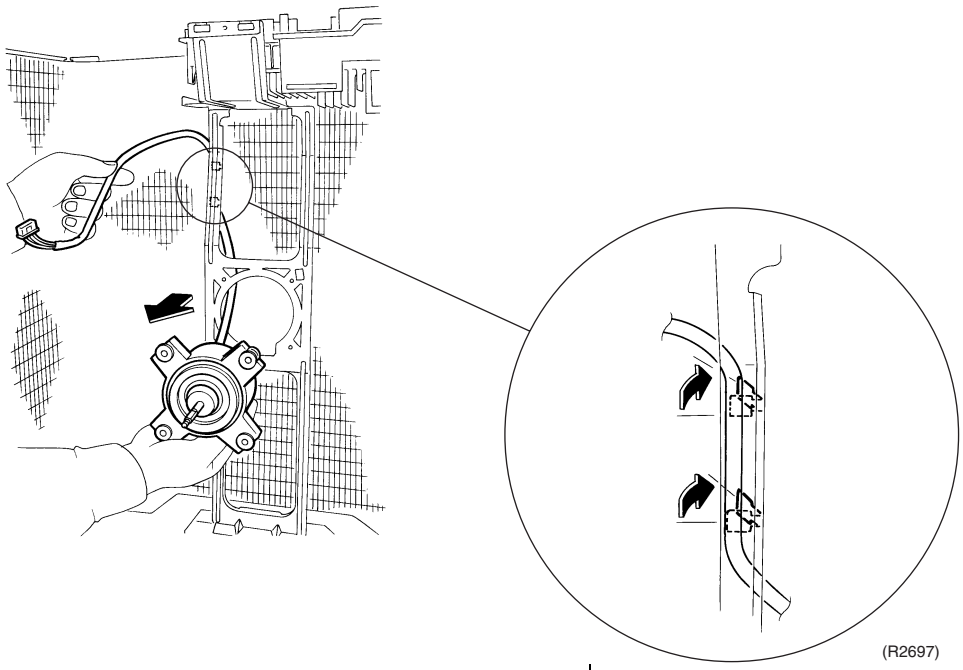
Procedure

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

Step	Procedure	Points
■ Removing the top panel and the front panel.		■ This procedure is not necessary to remove the propeller fan only.
1. Removing the electrical box cover.		
1 Loosen the screw on the back of the shelter.		
2 Undo the two claws and remove it.		■ The claws have been released since the front panel was removed.
3 Release the four claws of the electrical box cover and remove it.		

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

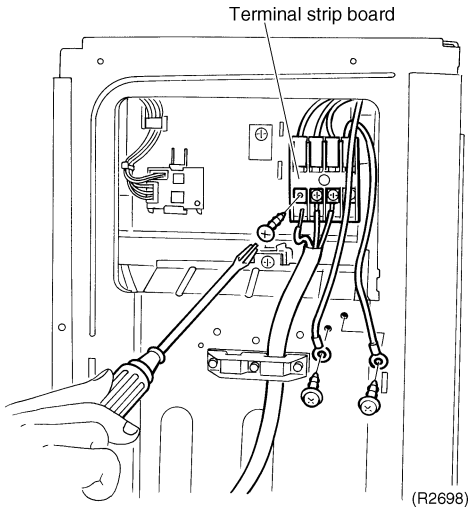
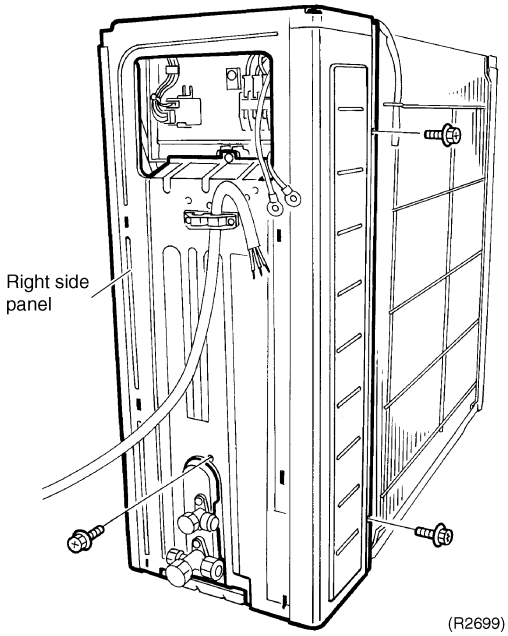
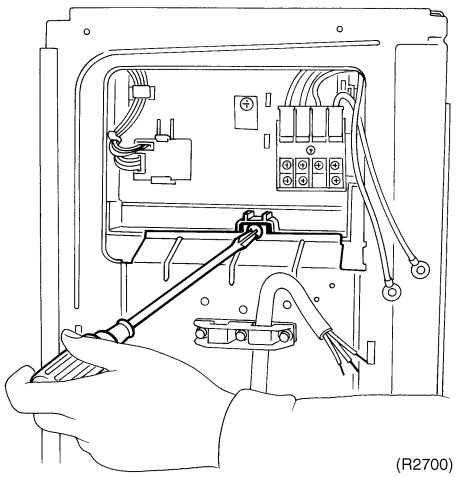
Step	Procedure		Points
3	Unscrew the washer-fitted nut (M10) of the propeller fan with a spanner.	 (R2694)	■ Align ▼ mark of the propeller fan with D-cut section of the motor shaft when reassembling.
		 (R2695)	
4	Remove the four screws from the fan motor.	 (R2696)	

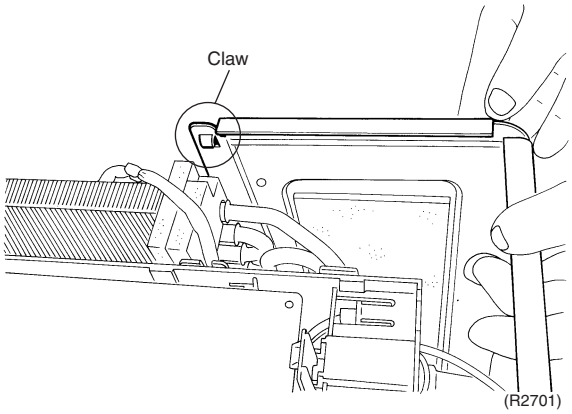
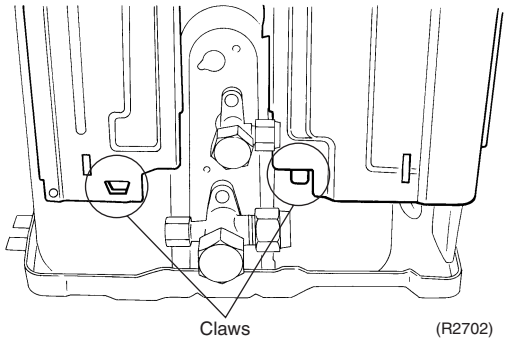
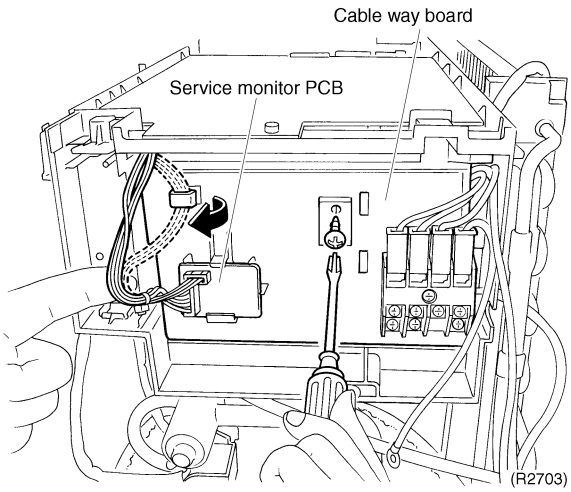
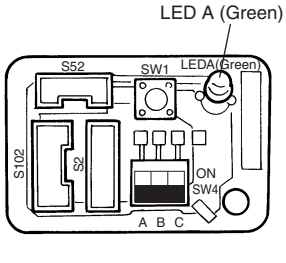
Step	Procedure		Points
5	Pull the fan motor out.	 (R2697)	■ Put the lead wire through the back of the motor when reassembling. (so as not to be entangled with the propeller fan)

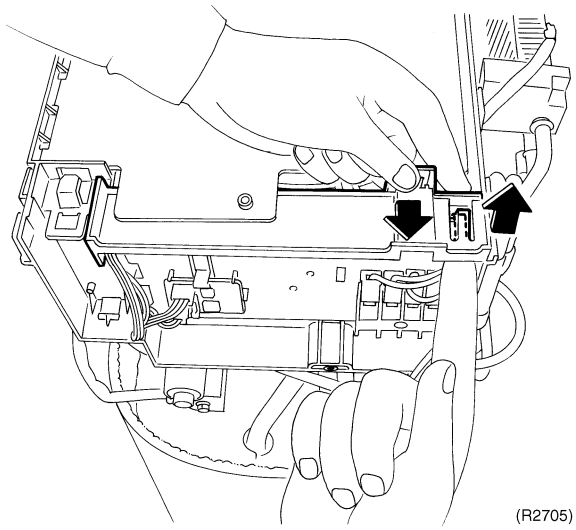
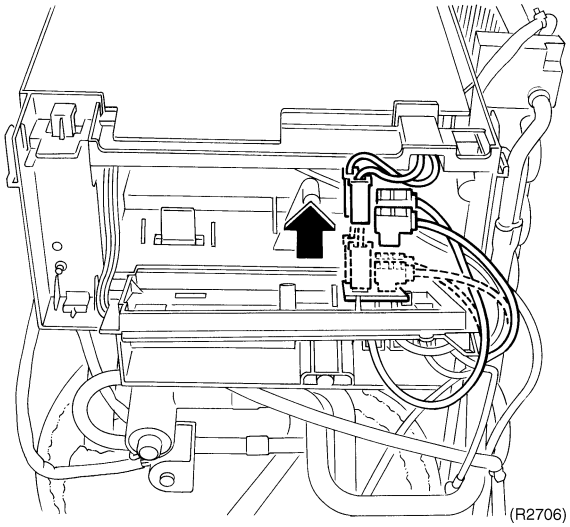
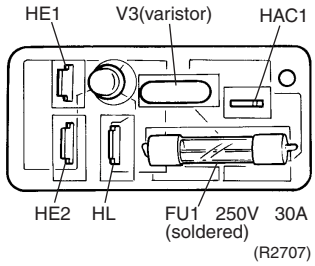
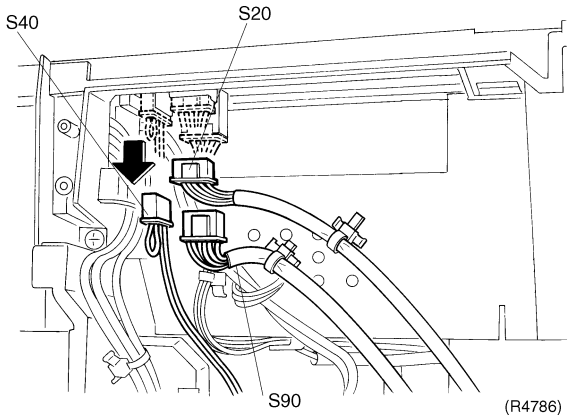
5.3 Removal of the PCB / Electrical Box

Procedure

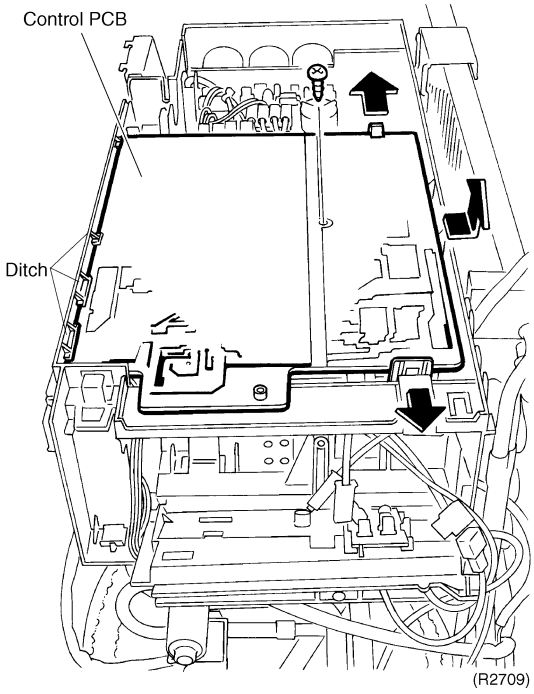
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

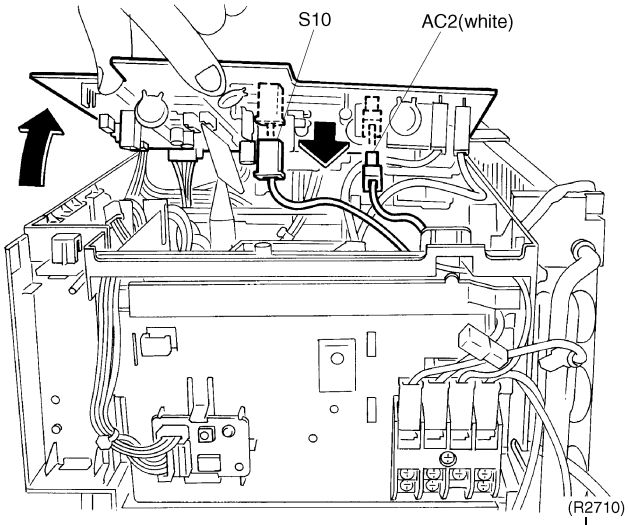
Step	Procedure	Points
■ Removing the top panel and the front panel.		
1. Removing the right side panel.		
1 Disconnect the three connection wirings and the two earth wires.	 (R2698)	Terminal strip number black (1) ----- power supply white (2) ----- power supply red (3) ----- transmission yellow / green (⏚) ----- earth
2 Loosen the three screws of the right side panel.	 (R2699)	
3 Loosen the fixing screw of the electrical box.	 (R2700)	

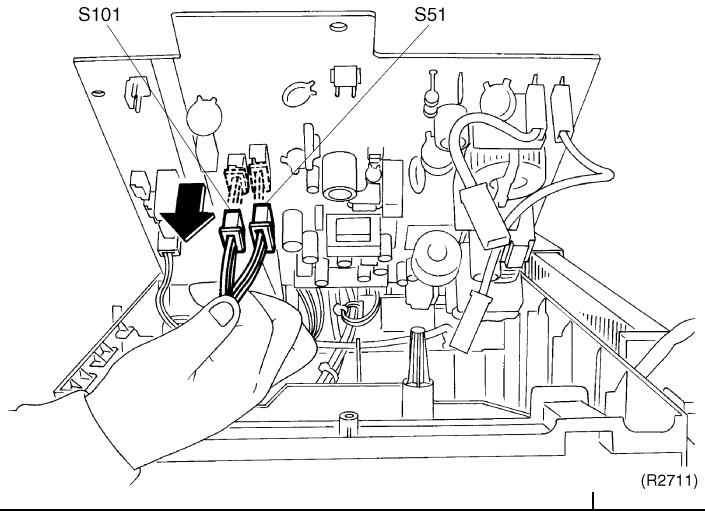
Step	Procedure		Points
		 	■ Insert the two claws of the lower part and the one claw of the upper back when reassembling.
2. Disconnect harnesses.			
1	Loosen the fixing screw of the cable way board.		■ Service monitor PCB 

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

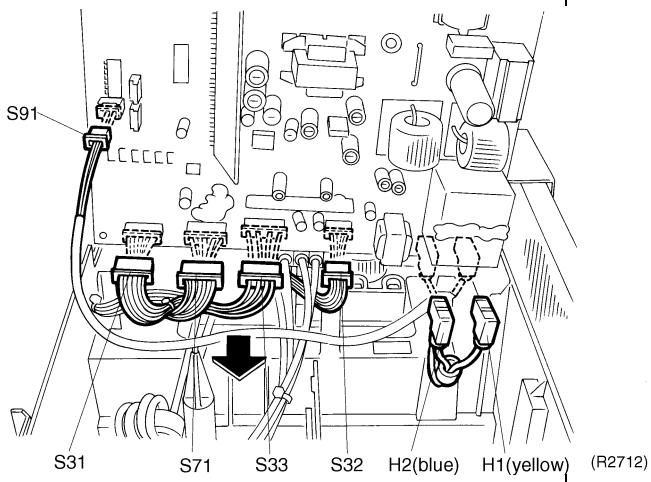
Step	Procedure	Points
5	Loosen the screw of the control PCB.	
6	Undo the two claws and release the control PCB from the ditch of the front side.	
7	Disconnect the harnesses while opening the control PCB. S10: to the terminal strip AC2: to the terminal strip	
8	Disconnect the connectors. S51: to the service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

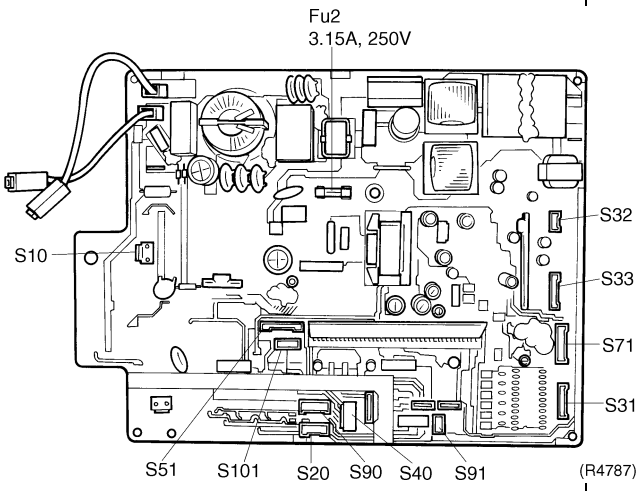




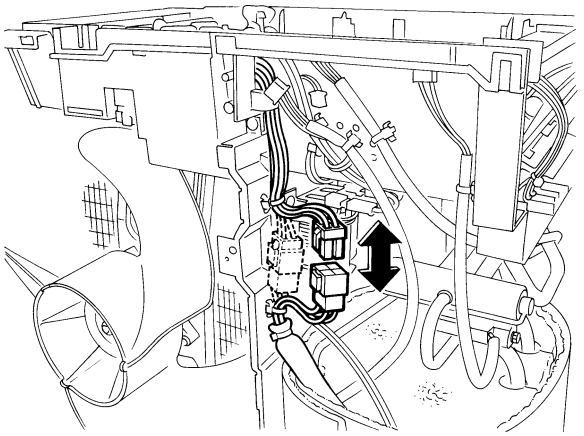


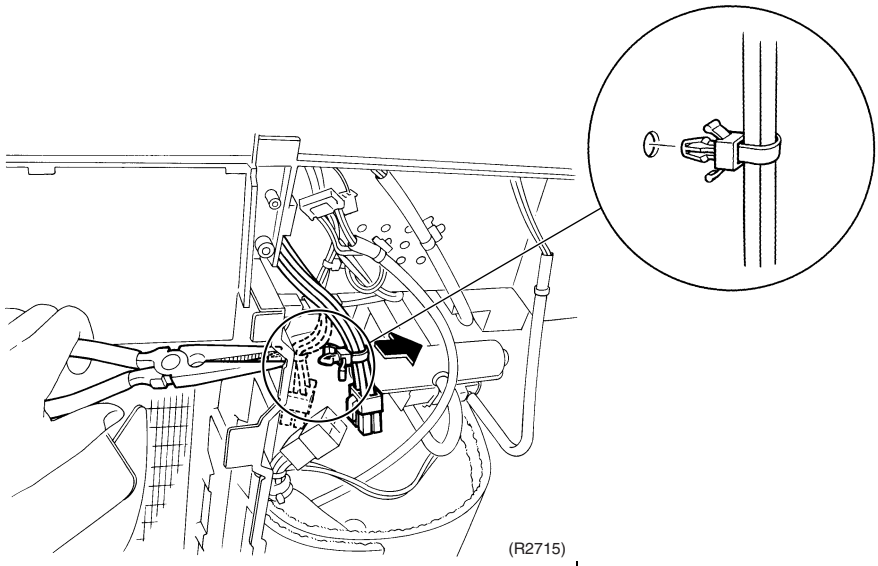
Step	Procedure	Points
9	Disconnect the connectors. S31: to the SPM S32: to the SPM S33: to the MID S71: to the MID S91: fin thermistor	
10	Control PCB (outdoor unit) S10: to the terminal strip S20: electronic expansion valve S31: to CN14 of the SPM S32: to CN11 of the SPM S33: to S34 of the MID S40: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

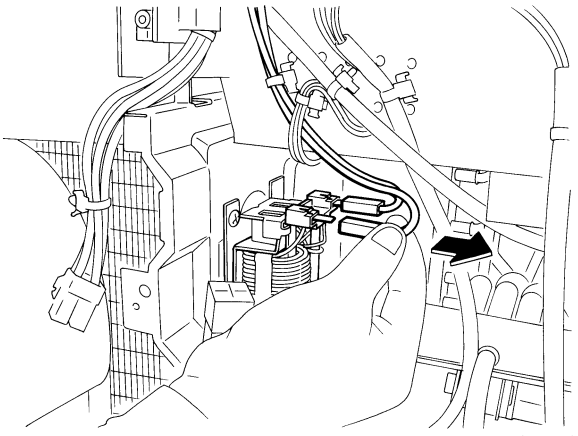




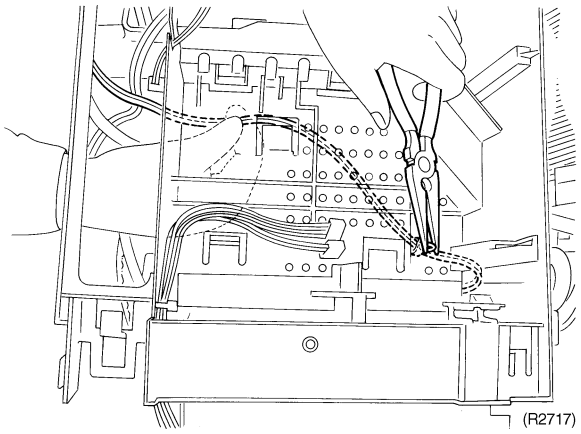
Step	Procedure	Points
11	Disconnect the relaying wire connector for the compressor.	
12	Release the clamp by pliers.	
13	Disconnect the reactor harness.	

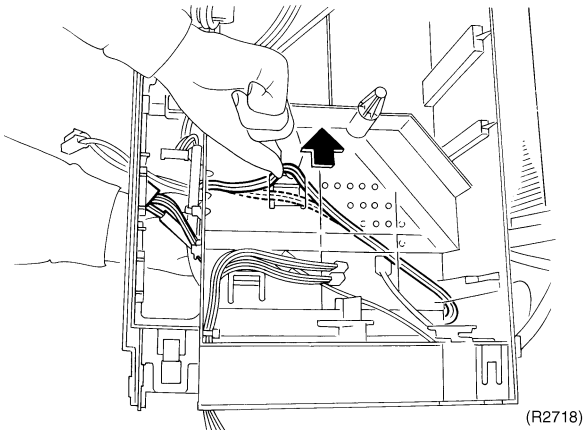

(R2714)

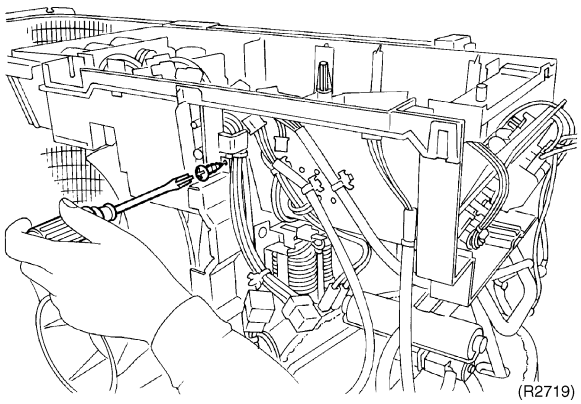

(R2715)

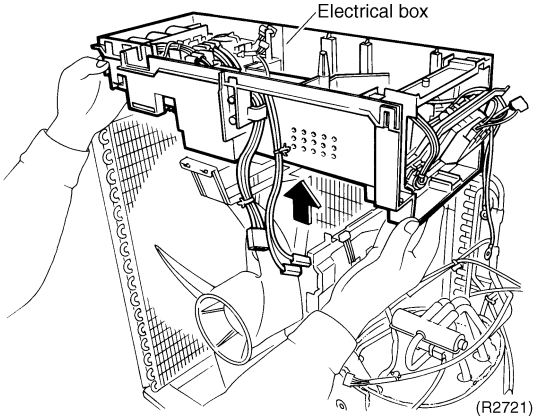

(R2716)

Step	Procedure	Points
14	Pull the clamp and draw the thermistor harness out from the back of the electrical box.	
15	Loosen the screw of the electrical box.	
16	Lift the electrical box and remove it.	


(R2717)


(R2718)


(R2719)



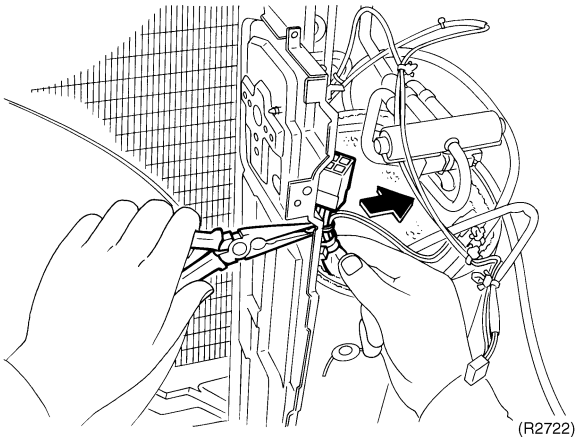
(R2721)

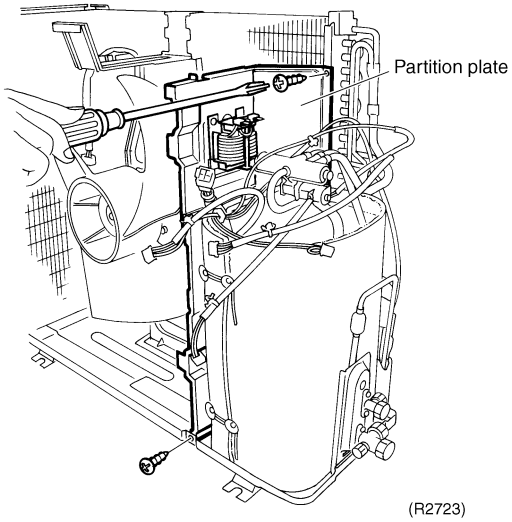
5.4 Removal of the Reactor

Procedure

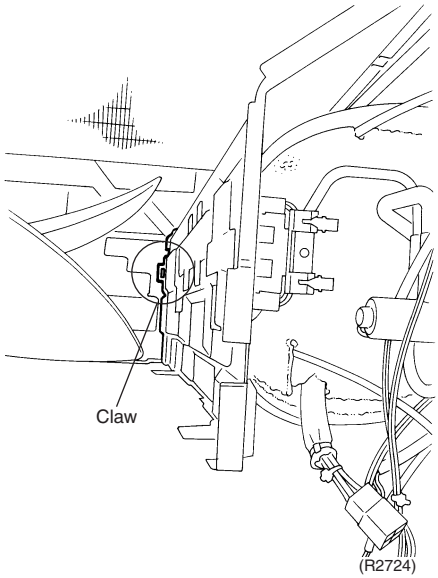
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

Step	Procedure	Points
■ Removing the electrical box.		
1. Removing the partition plate.		
1	Release the clamp by pliers.	
2	Loosen the two screws of the partition plate.	■ The partition plate is fixed to the bottom frame with a claw.

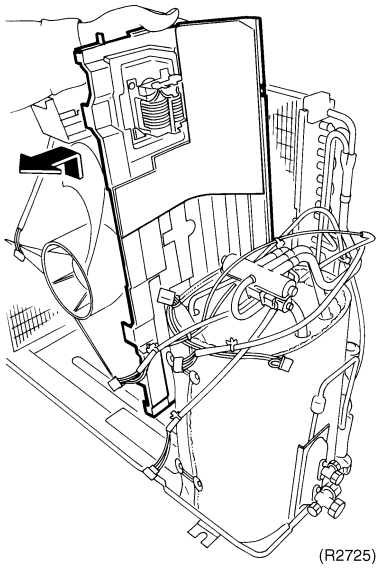
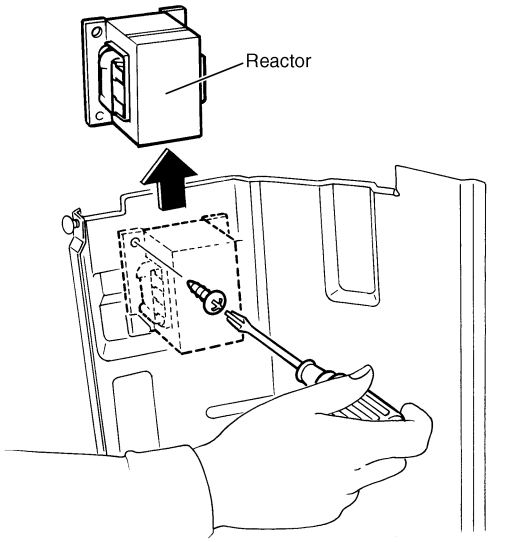

(R2722)



(R2723)



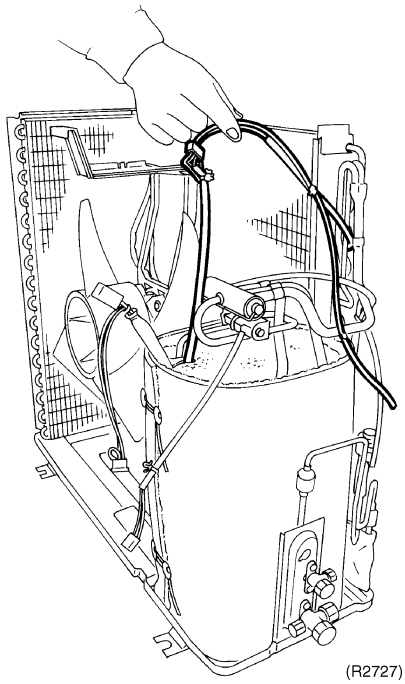
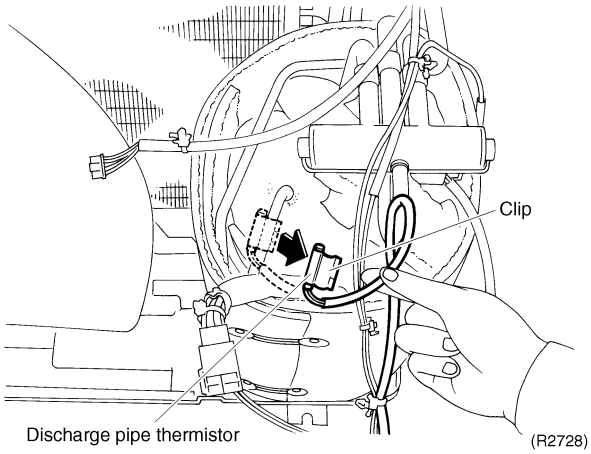
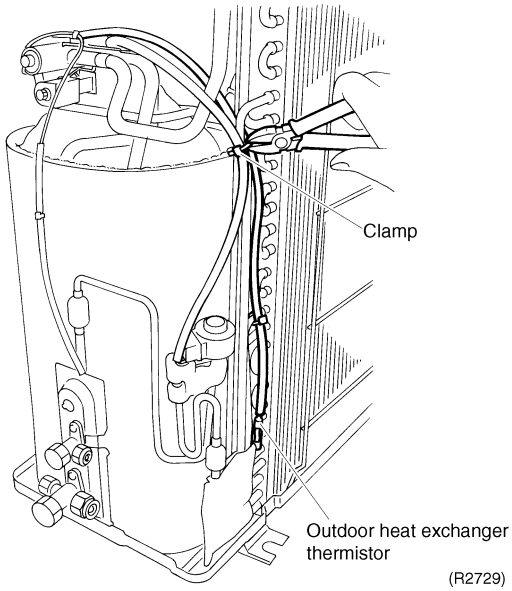
(R2724)

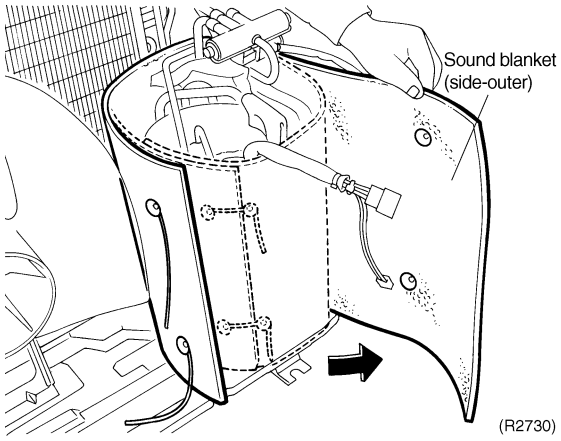
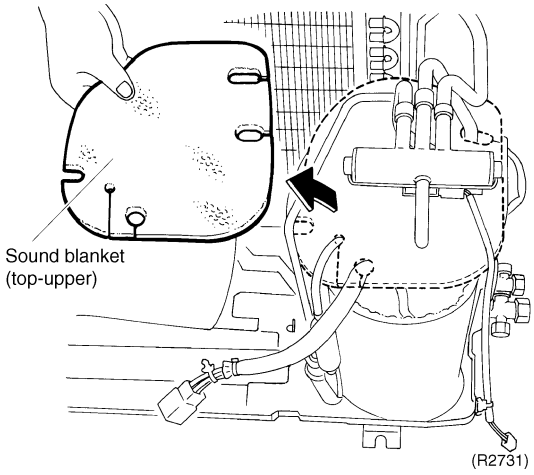
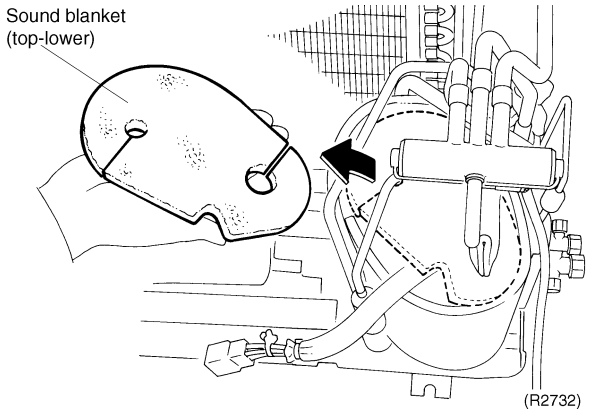
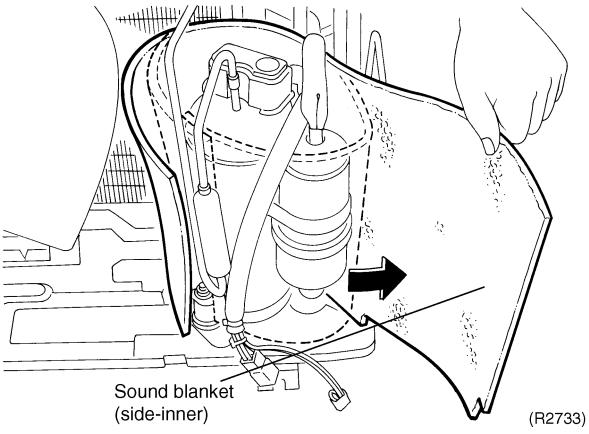
Step	Procedure		Points
3	Lift the partition plate and remove it.	 (R2725)	
4	Loosen the screw. Slide the reactor and remove it from the partition plate.	 (R2726)	

5.5 Removal of the Sound Blanket

Procedure

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

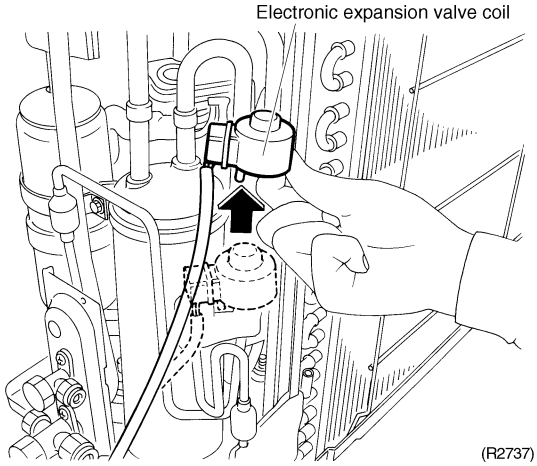
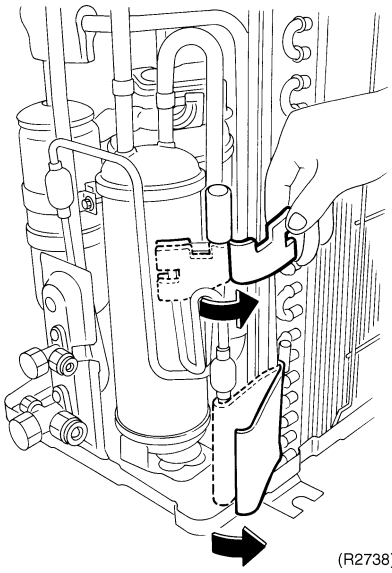
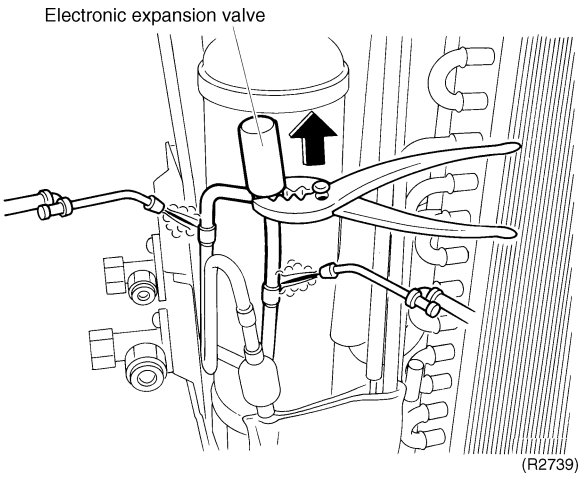
Step	Procedure		Points
1	Disconnect the harness of each thermistor.	 (R2727)	
2	Release the discharge pipe thermistor.	 (R2728)	■ Pay attention to the direction of the clip so as not to touch the lead wire of the thermistor when reassembling.
3	Cut the clamp by nippers. Disconnect the outdoor heat exchanger thermistor.	 (R2729)	■ Clamps should be always available. Fix it as it was before.

Step	Procedure		Points
4	Remove the sound blanket (side-outer).		■ Since the piping ports on the sound blanket (side-outer) are torn easily, remove the blanket carefully.
5	Remove the sound blanket (top-upper).		
6	Remove the sound blanket (top-lower).		
7	Remove the sound blanket (side-inner).		■ Since the piping ports on the sound blanket (side-inner) are torn easily, remove the blanket carefully.

5.6 Removal of the Electronic Expansion Valve

Procedure

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

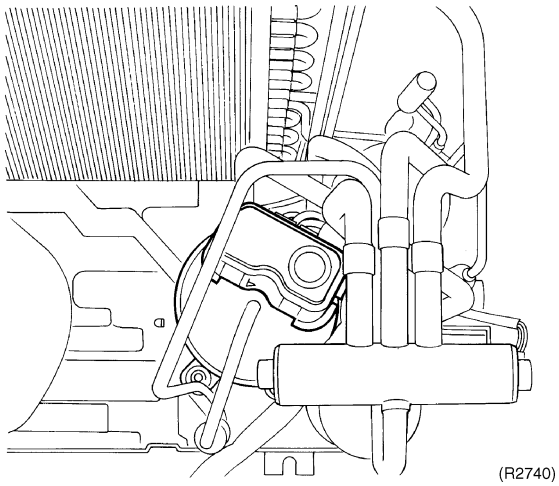
Step	Procedure		Points
1	Remove the electronic expansion valve coil.		
2	Remove the sheets of putty. ■ Before working, make sure that the refrigerant is empty in the circuit.		
3	Heat up the two brazed parts of the electronic expansion valve and disconnect. ■ Be sure to apply nitrogen replacement when heating up the brazed part.		**Caution** **Be careful about the electronic expansion valve, pipes and so on, which were heated up by a gas brazing machine, so as not to get burnt your hands.** **Warning** **Ventilate when refrigerant leaks during the work.** **(If refrigerant contacts fire, it will cause to arise toxic gas.)**

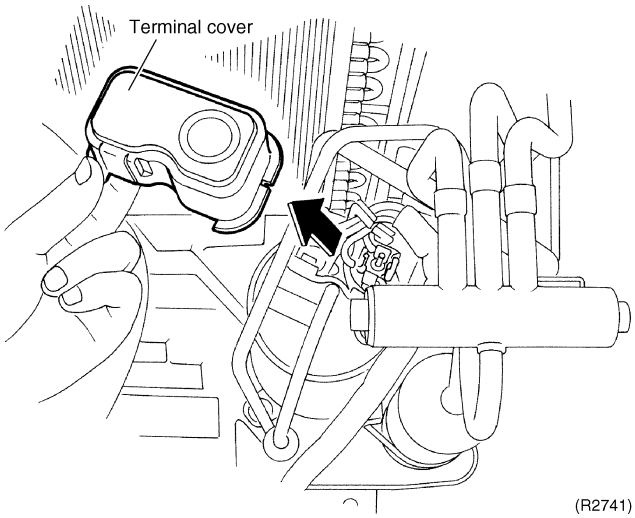
5.7 Removal of the Compressor

Procedure

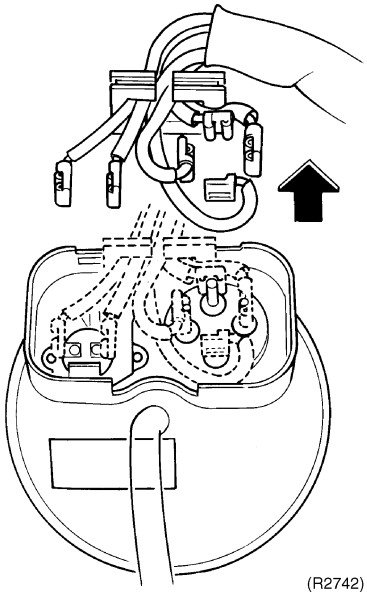
Warning **Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.**

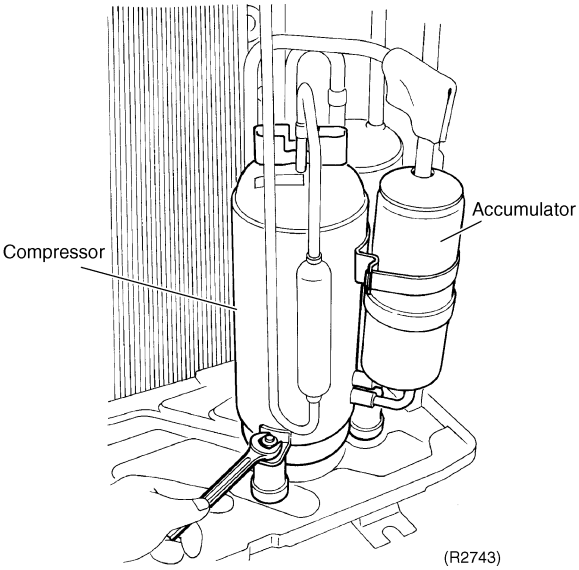
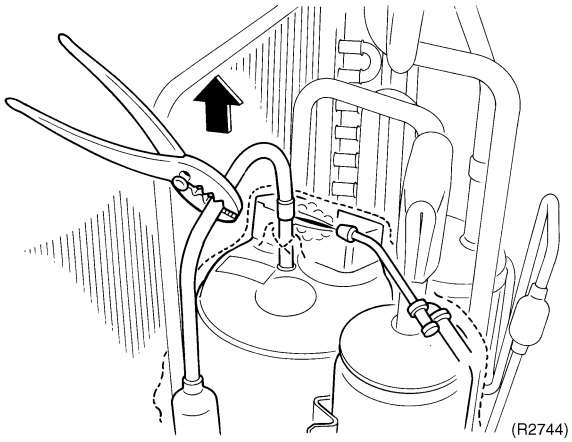
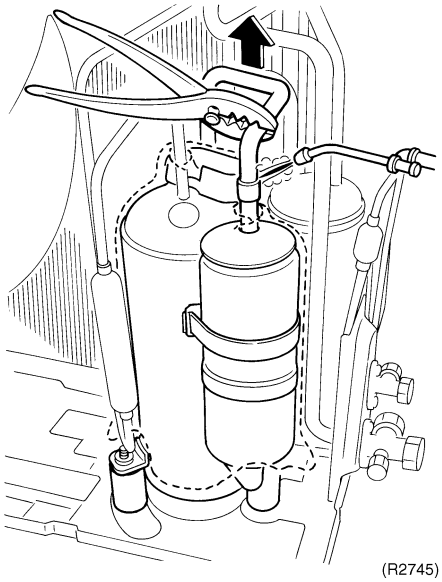
Step	Procedure	Points
1	Remove the terminal cover.	
2	Disconnect the lead wires of the compressor.	■ Be careful so as not to burn the compressor terminals or the name plate. Make a note. U V N W U : red V : yellow W: blue N : brown


(R2740)



(R2741)


(R2742)

Step	Procedure		Points
3	Unscrew the nut of the compressor.	 (R2743)	
4	Remove the putty of the accumulator.		
	■ Before working, make sure that the refrigerant is empty in the circuit. ■ Be sure to apply nitrogen replacement when heating up the brazed part.		**Warning** **Ventilate when refrigerant leaks during the work.** **(If refrigerant contacts fire, it will cause to arise toxic gas.)**
5	Heat up the brazed part of the discharge side and disconnect.	 (R2744)	■ 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.
6	Heat up the brazed part of the suction side and disconnect.	 (R2745)	■ Be careful so as not to burn the heat exchanger fin.
7	Lift the compressor up and remove it.		**Warning** **Since it may happen that refrigeration oil in the compressor will catch fire, prepare wet cloth so as to extinguish fire immediately.**

Part 8
Others

1. Others

1.1 Test Run from the Remote Controller

ARC433 series

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.

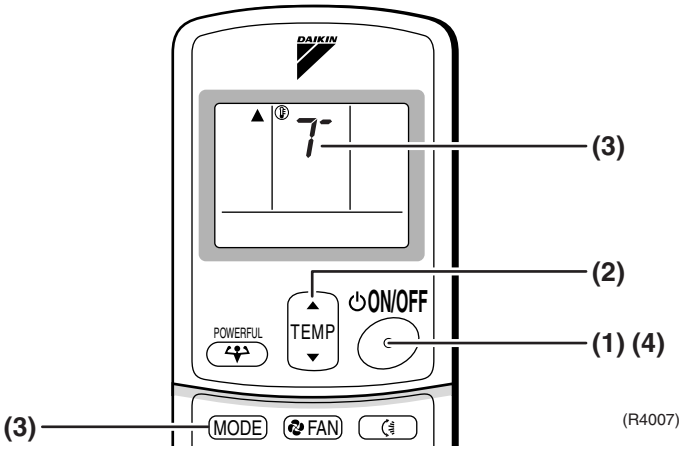
Trial Operation and Testing

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.
("7" 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

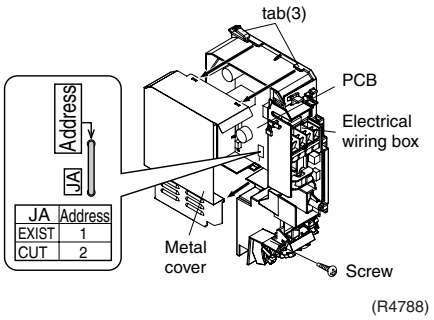
1.2.1 When Two Units are Installed in One Room

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

PCB in the indoor unit

FT25/35DVM, FT25/35DSG, FT09/13DV2S

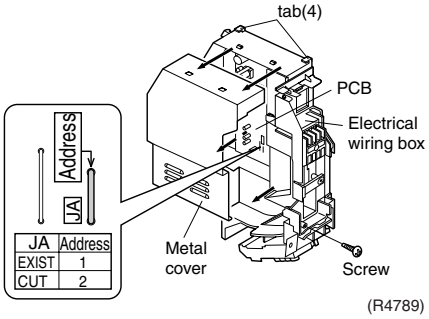
- Remove the front grille. (2 screws)
- Remove the electrical wiring box. (1 screw)
- Remove the metal plate electrical wiring cover. (3 tabs)
- Cut the address jumper JA on the printed circuit board.



(R4788)

FT50/60DSG, FT15DV2S

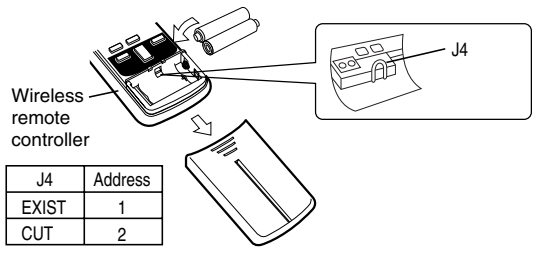
- Remove the front grille. (3 screws)
- Remove the electrical box (1-screw).
- Remove the metal plate. (4 tabs)
- Cut the address jumper JA on control PCB.



(R4789)

Wireless remote controller

- Cut the jumper J4.



1.2.2 Jumper Setting

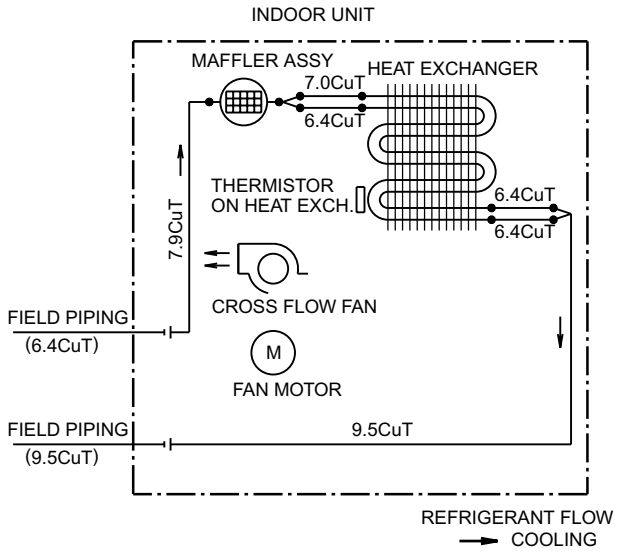
Jumper (On indoor control PCB)	Function	When connected (factory set)	When cut
JC	Power failure recovery function	Auto re-start	Unit does not resume operation after recovering from a power failure. Timer ON-OFF settings are cleared.
JB	Fan speed setting when compressor is OFF on thermostat.	Fan speed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

Part 9
Appendix

1. Piping Diagrams

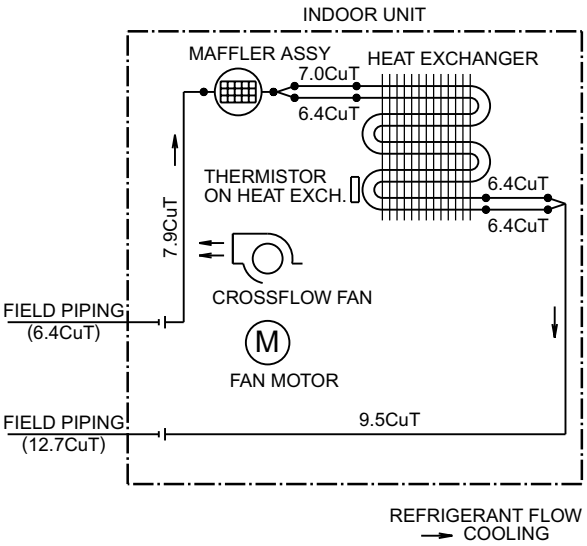
1.1 Indoor Units

FT25DVM



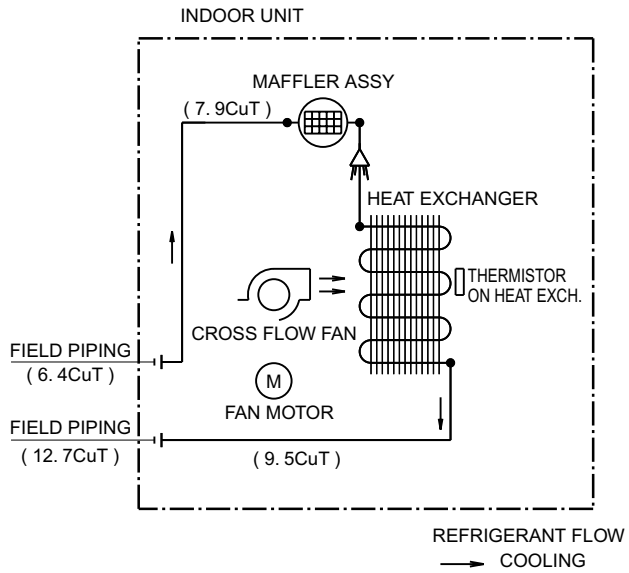
C : 4D047912A

FT35DVM, FT09DV2S, FT25DSG



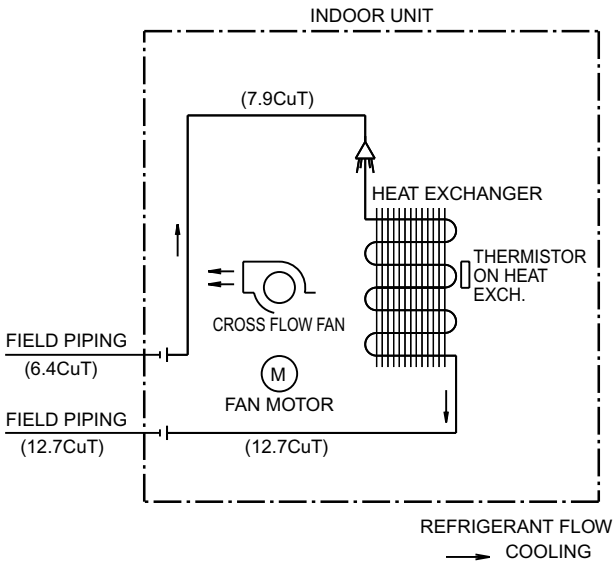
C: 4D047913A

FT13DV2S, FT35DSG



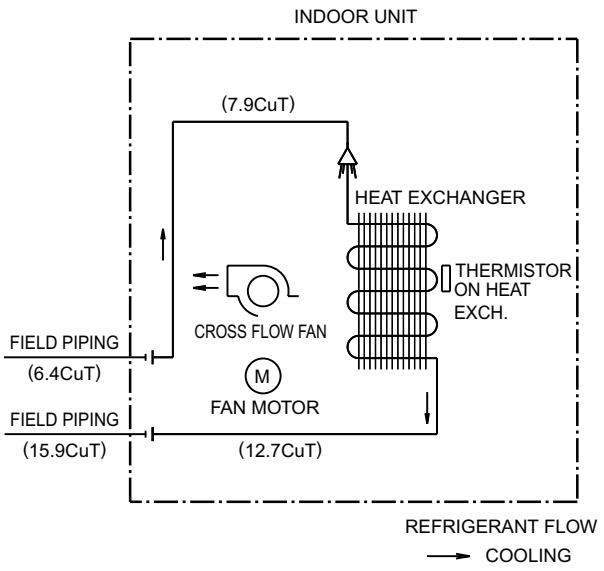
4D048555A

FT15DV2S



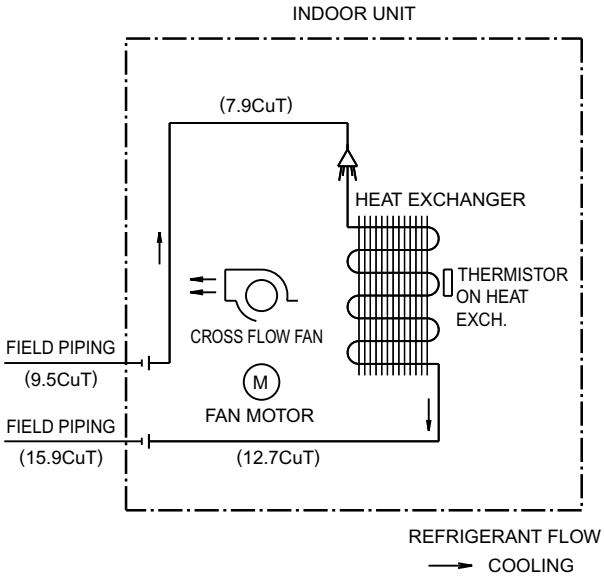
C: 4D040081J

FT50DSG



C : 4D040082J

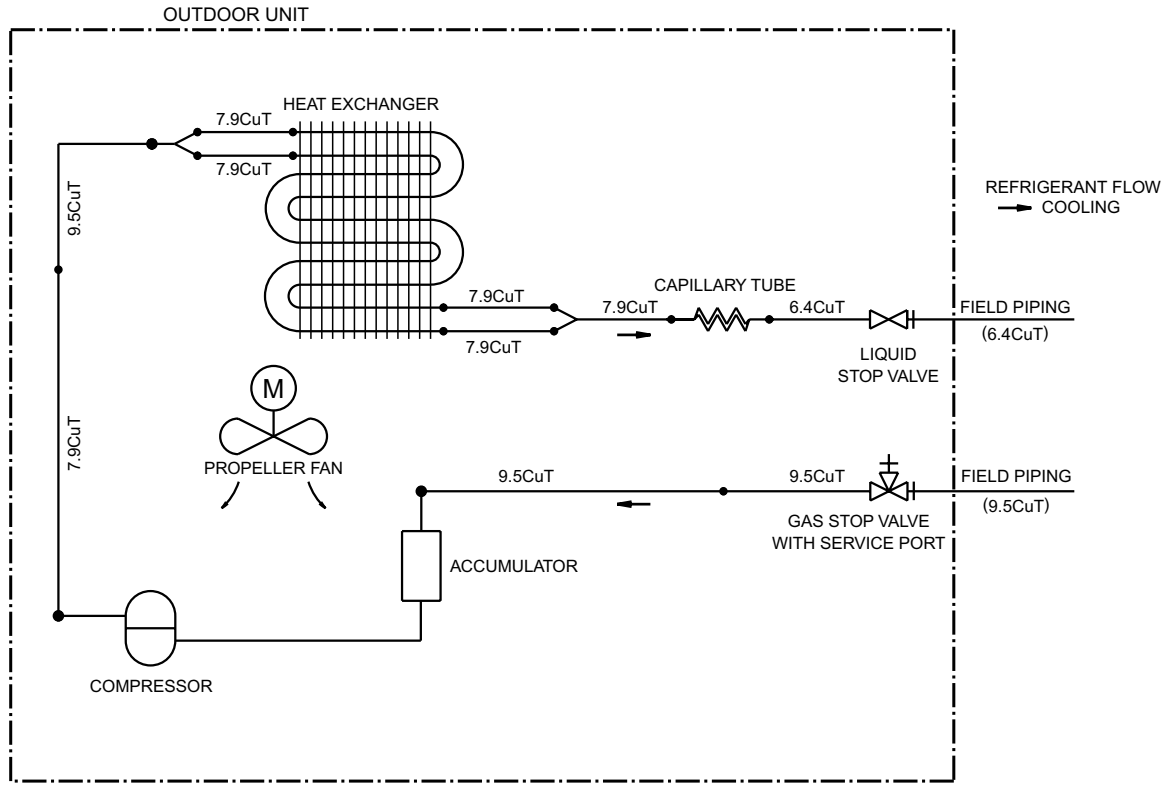
FT60DSG



C : 4D040083F

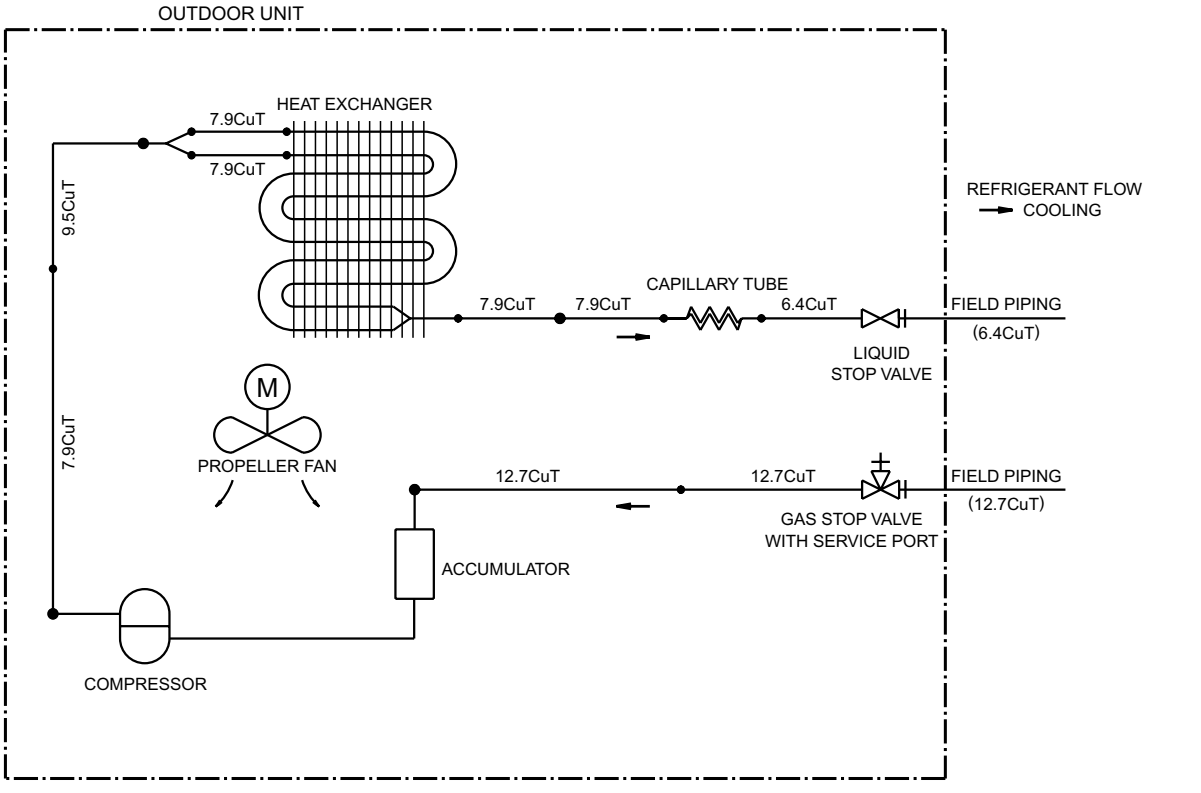
1.2 Outdoor Units

R25DV1



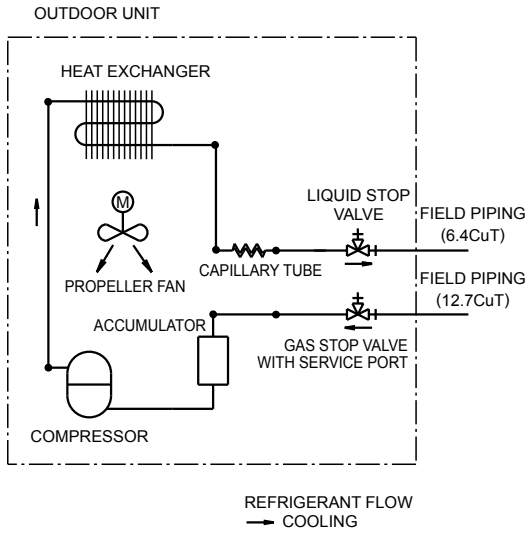
3D020878E

R35DV1



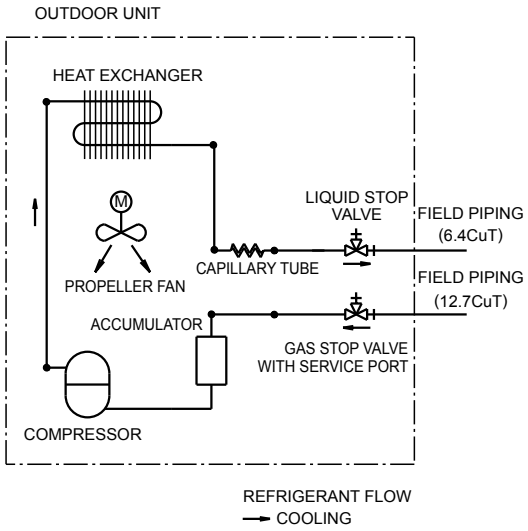
3D020877D

R09DV2S, R25DSG



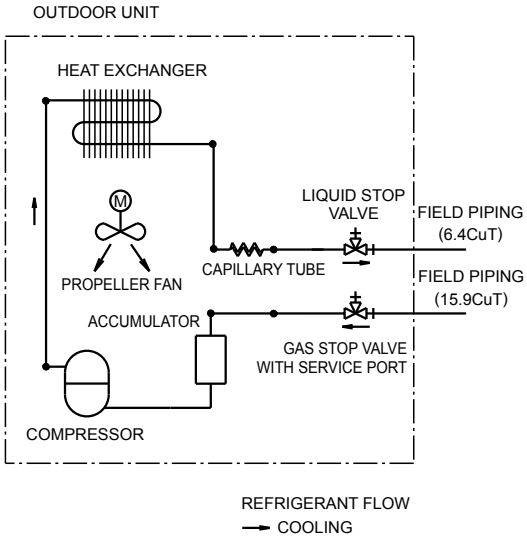
4D000892G

R13DV2S, R15DV2S, R35DSG



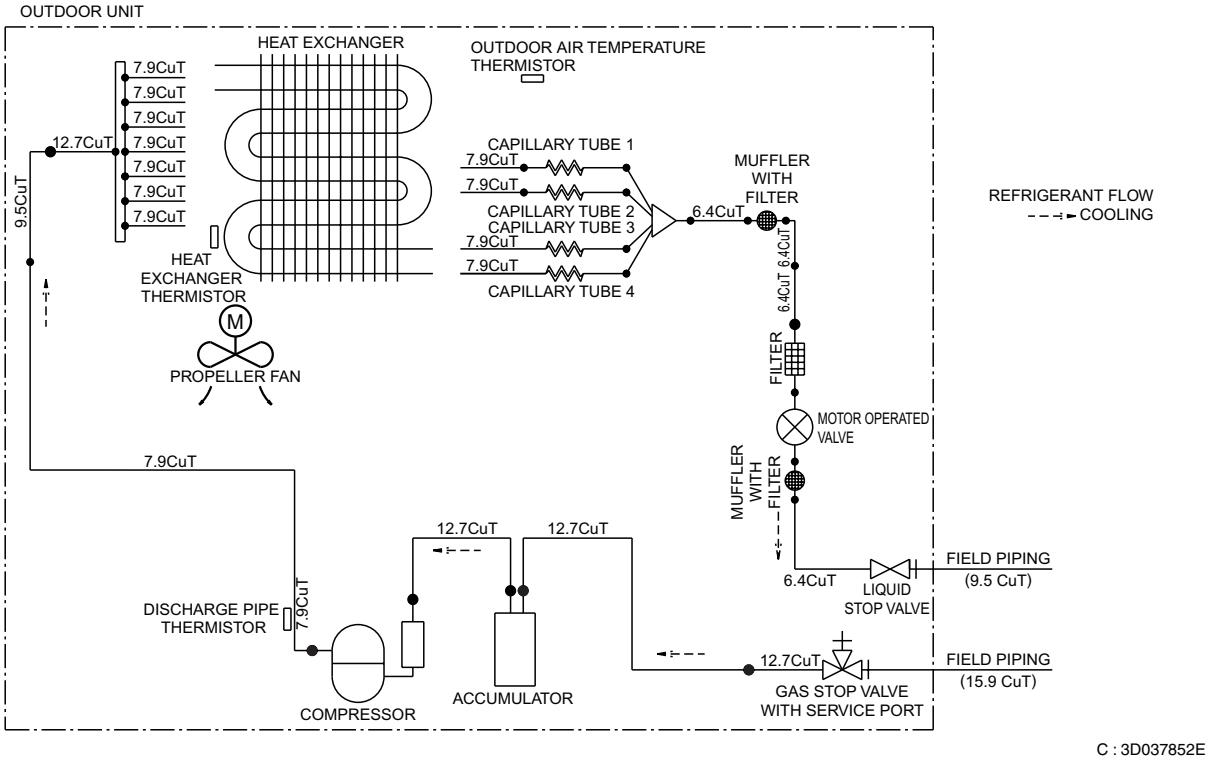
4D000695F

R50DSG



4D048564

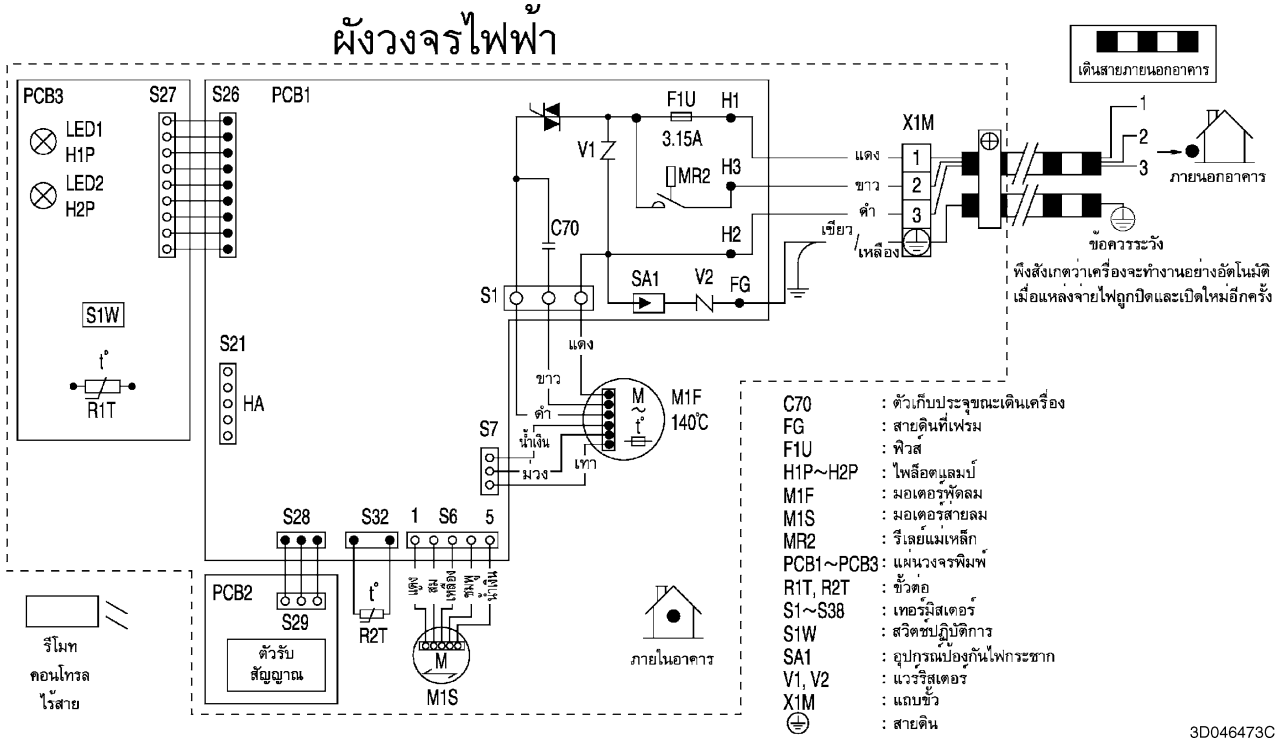
R60DSG


OUTDOOR UNIT
HEAT EXCHANGER
OUTDOOR AIR TEMPERATURE THERMISTOR
7.9CuT
7.9CuT
7.9CuT
7.9CuT
7.9CuT
7.9CuT
7.9CuT
12.7CuT
9.5CuT
CAPILLARY TUBE 1
7.9CuT
7.9CuT
CAPILLARY TUBE 2
CAPILLARY TUBE 3
7.9CuT
7.9CuT
CAPILLARY TUBE 4
MUFFLER WITH FILTER
6.4CuT
6.4CuT
6.4CuT
FILTER
MOTOR OPERATED VALVE
MUFFLER WITH FILTER
HEAT EXCHANGER THERMISTOR
M
PROPELLER FAN
7.9CuT
12.7CuT
12.7CuT
DISCHARGE PIPE THERMISTOR
7.9CuT
6.4CuT
LIQUID STOP VALVE
FIELD PIPING (9.5 CuT)
12.7CuT
GAS STOP VALVE WITH SERVICE PORT
FIELD PIPING (15.9 CuT)
COMPRESSOR
ACCUMULATOR
REFRIGERANT FLOW
COOLING
C : 3D037852E

2. Wiring Diagrams

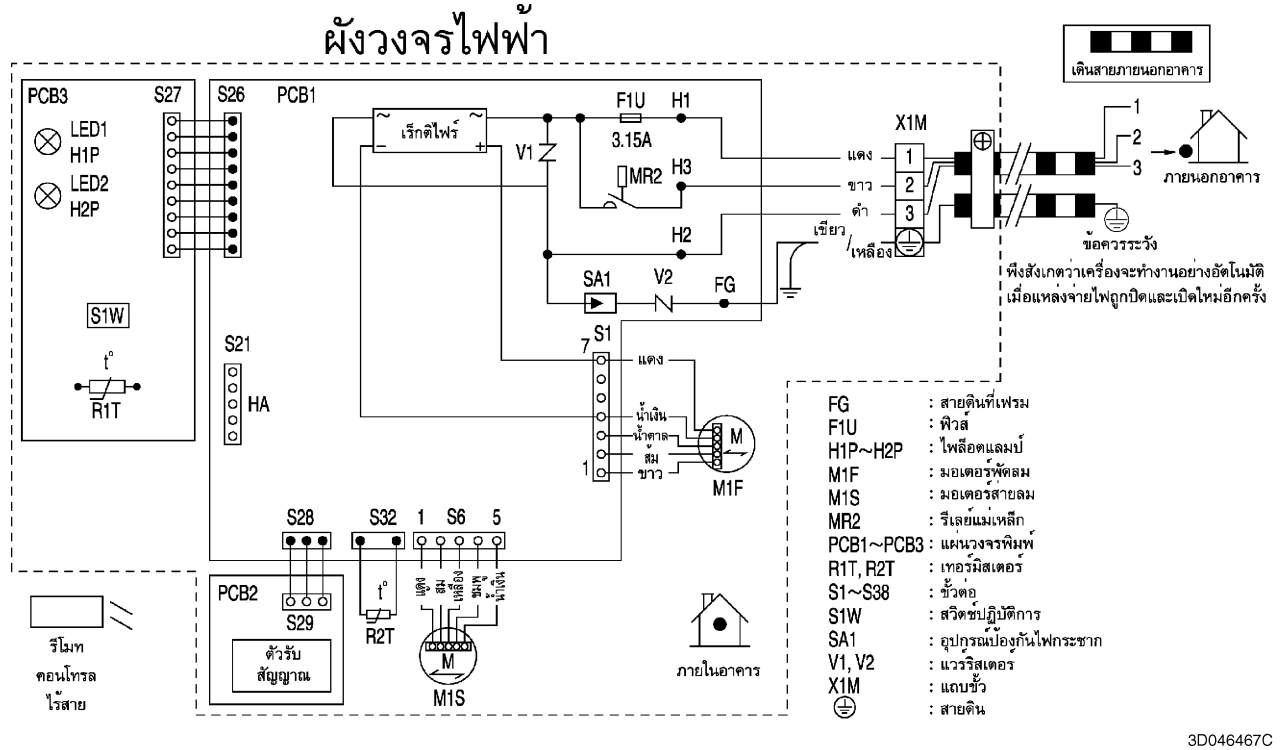
2.1 Indoor Units

FT09DV2S



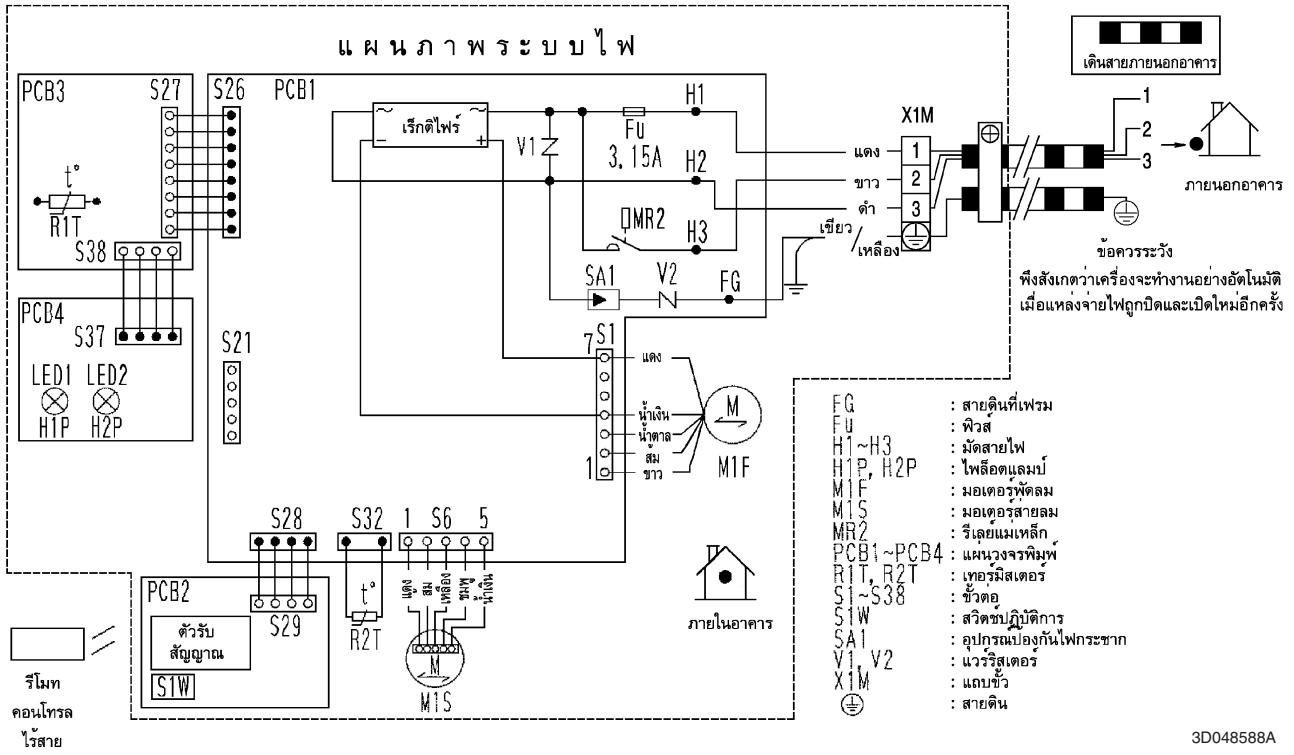
3D046473C

FT13DV2S

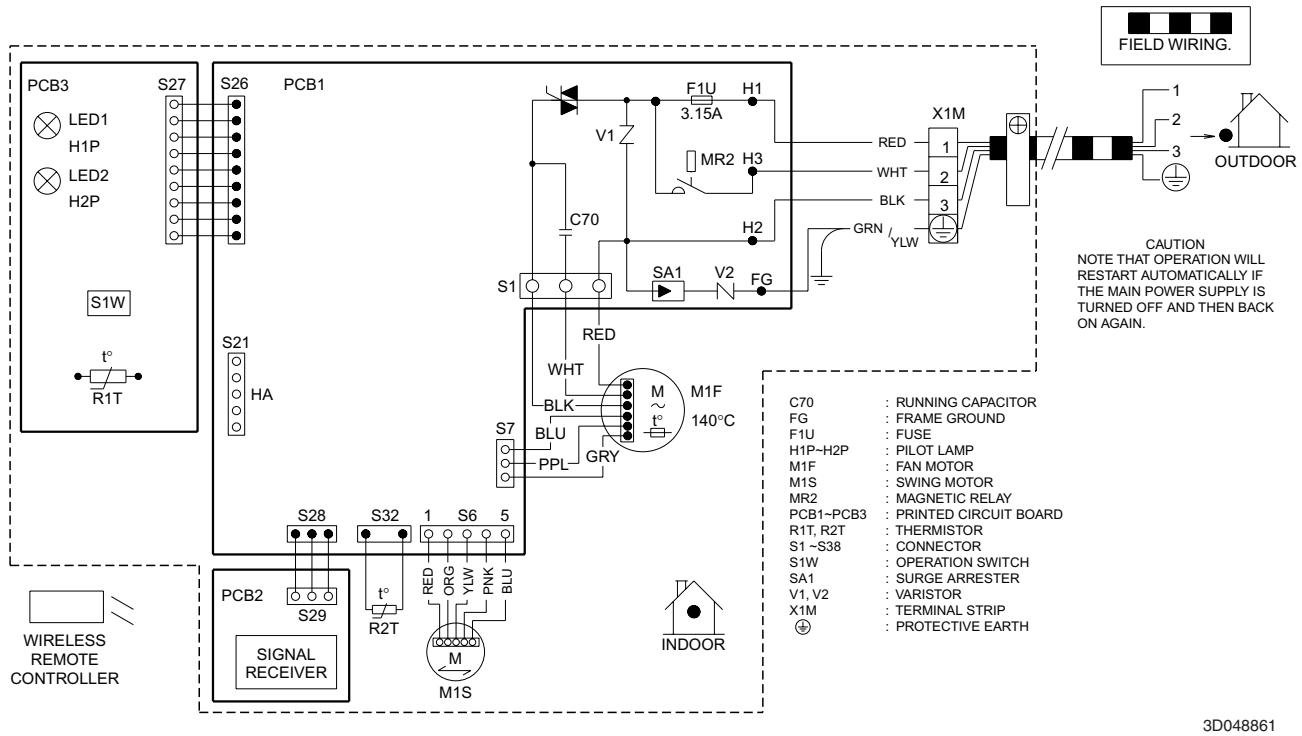


3D046467C

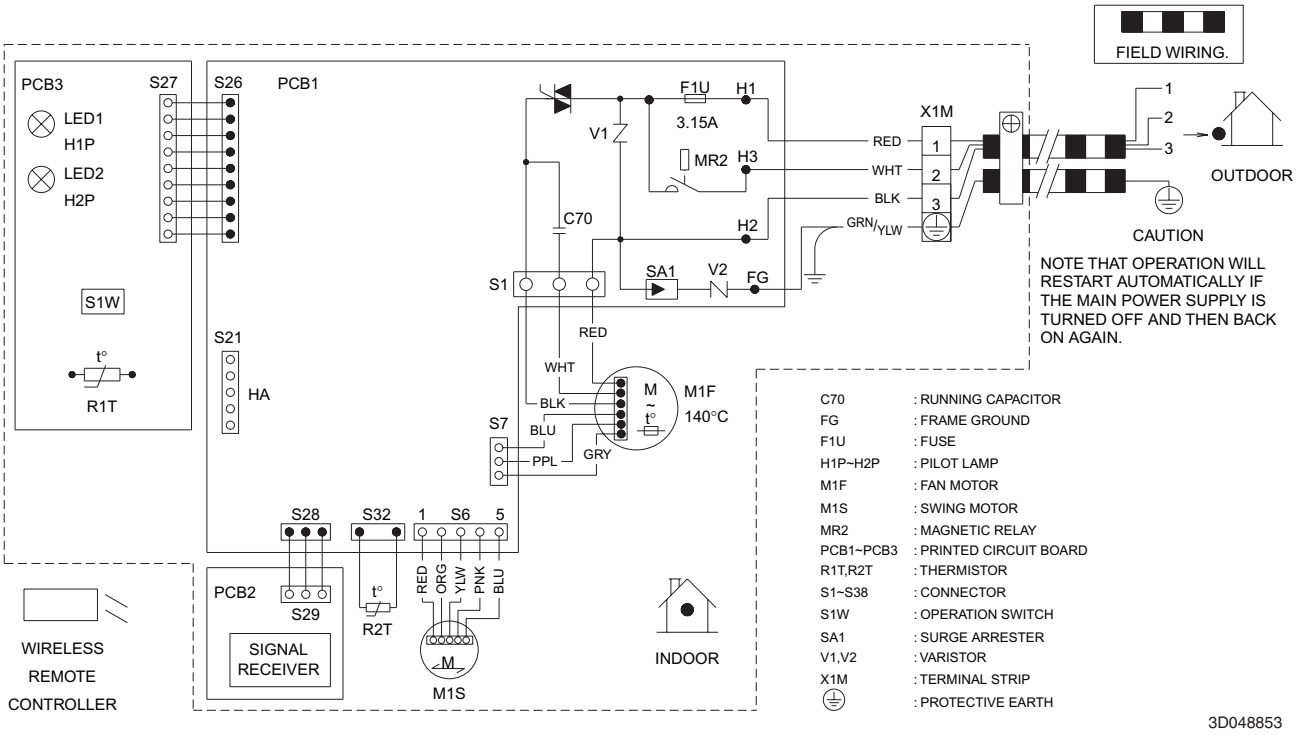
FT15DV2S



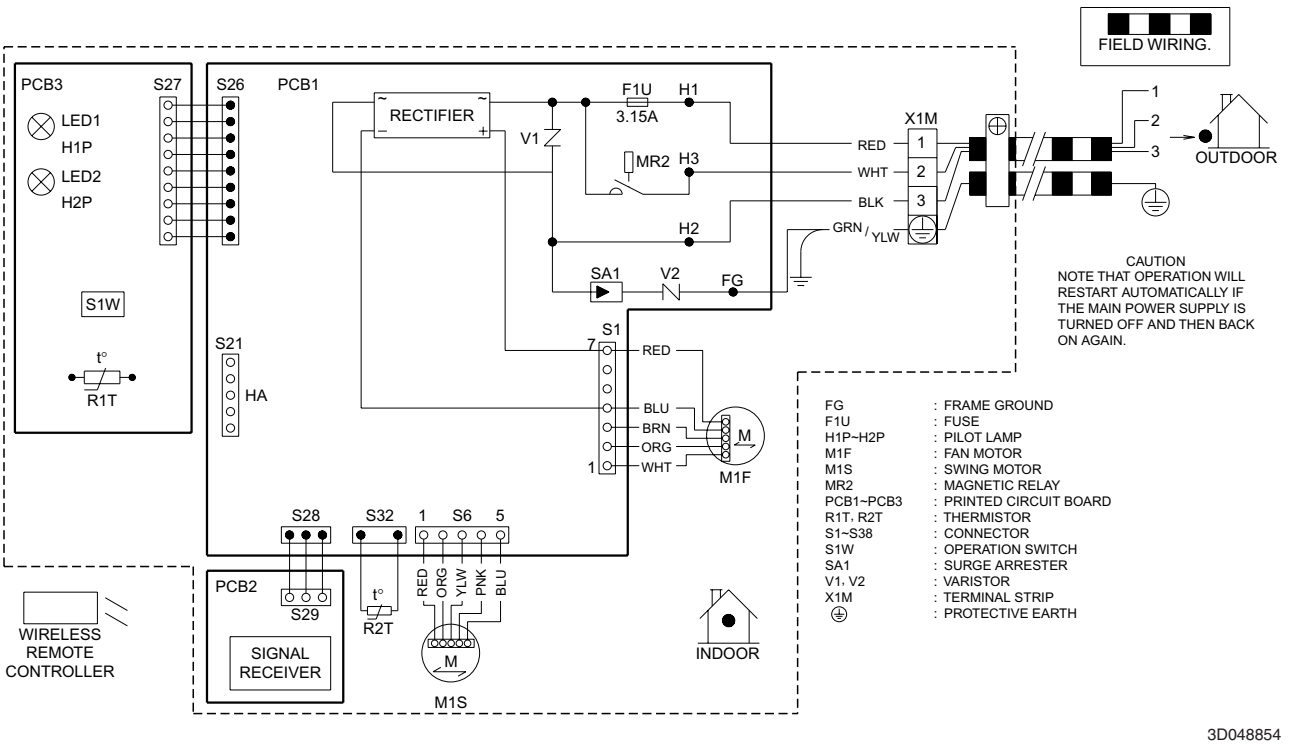
FT25DVM, FT35DVM



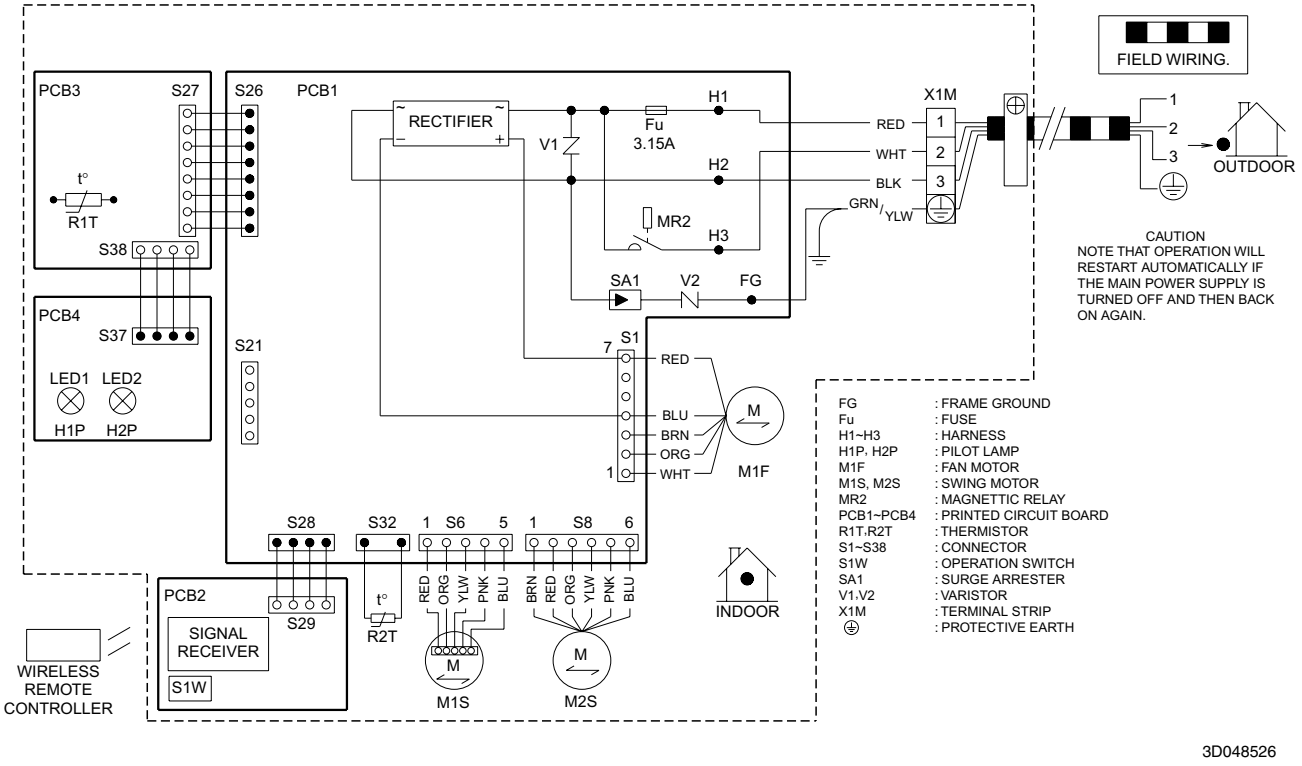
FT25DSG



FT35DSG

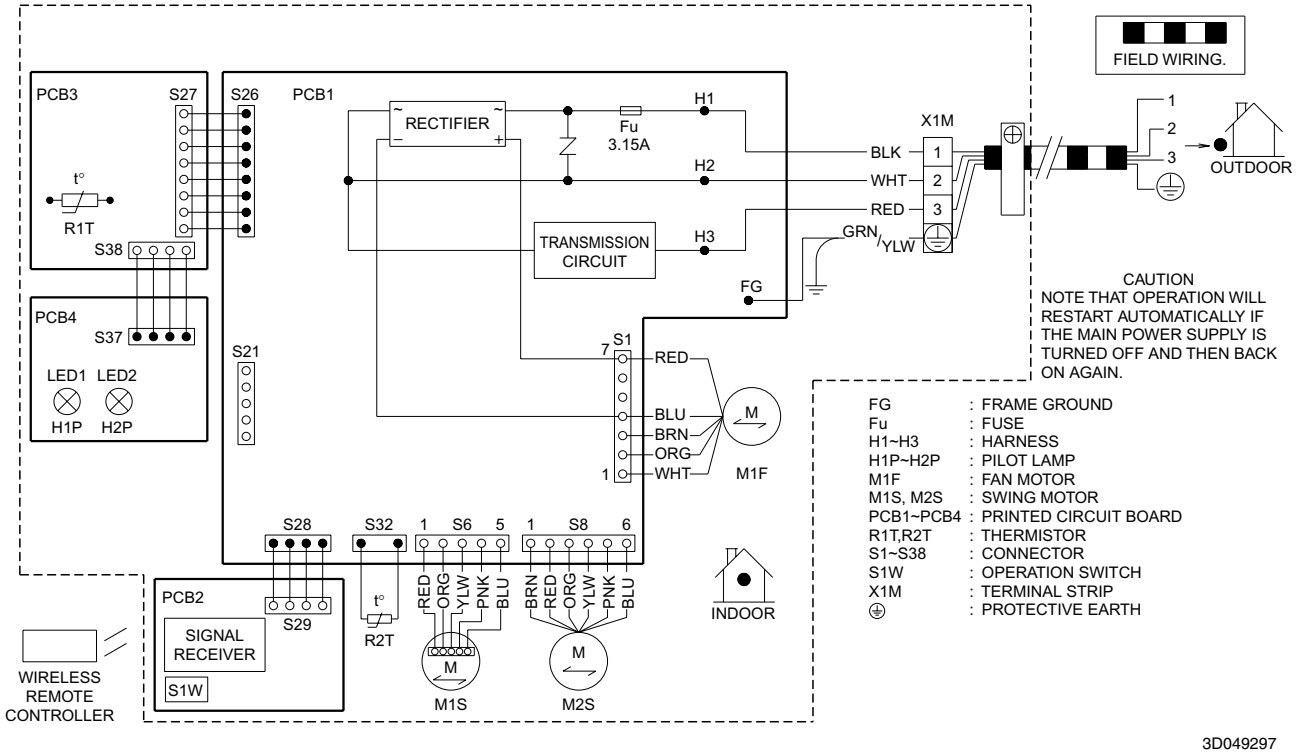


FT50DSG



3D048526

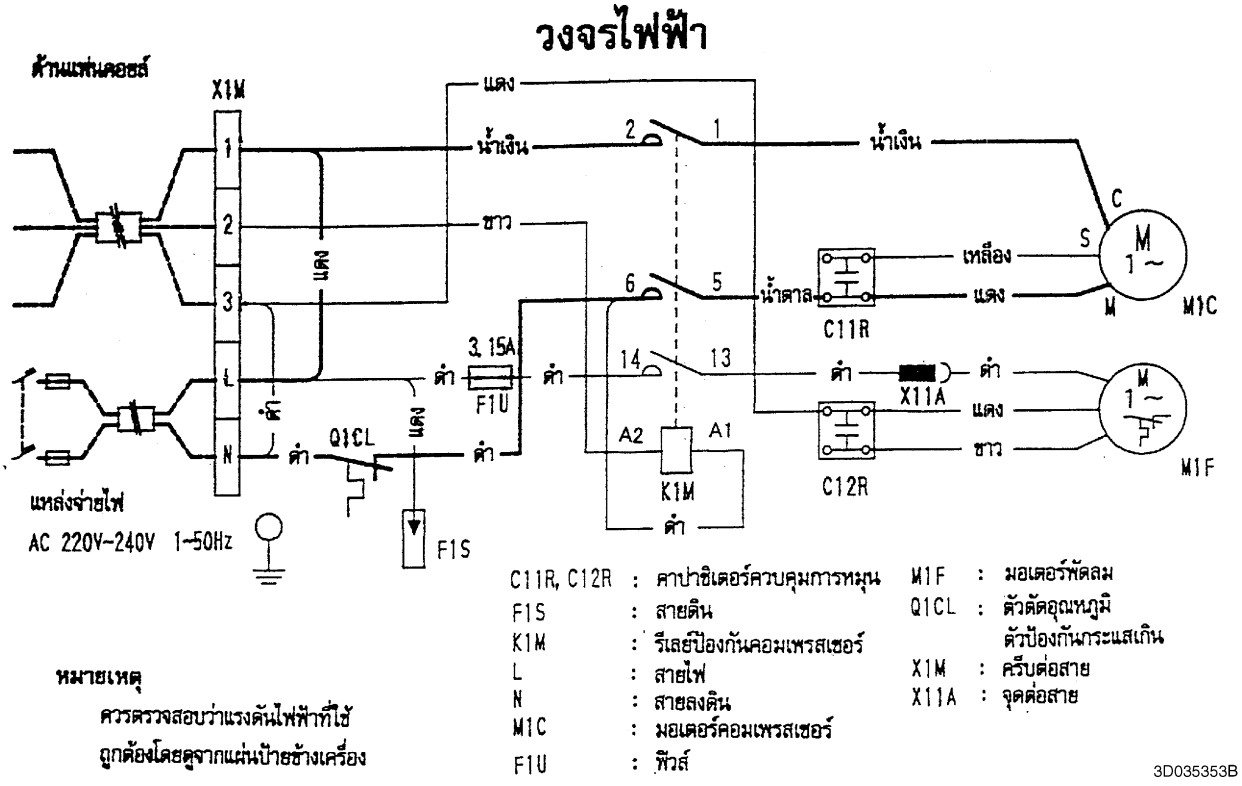
FT60DSG



3D049297

2.2 Outdoor Units

R09DV2S

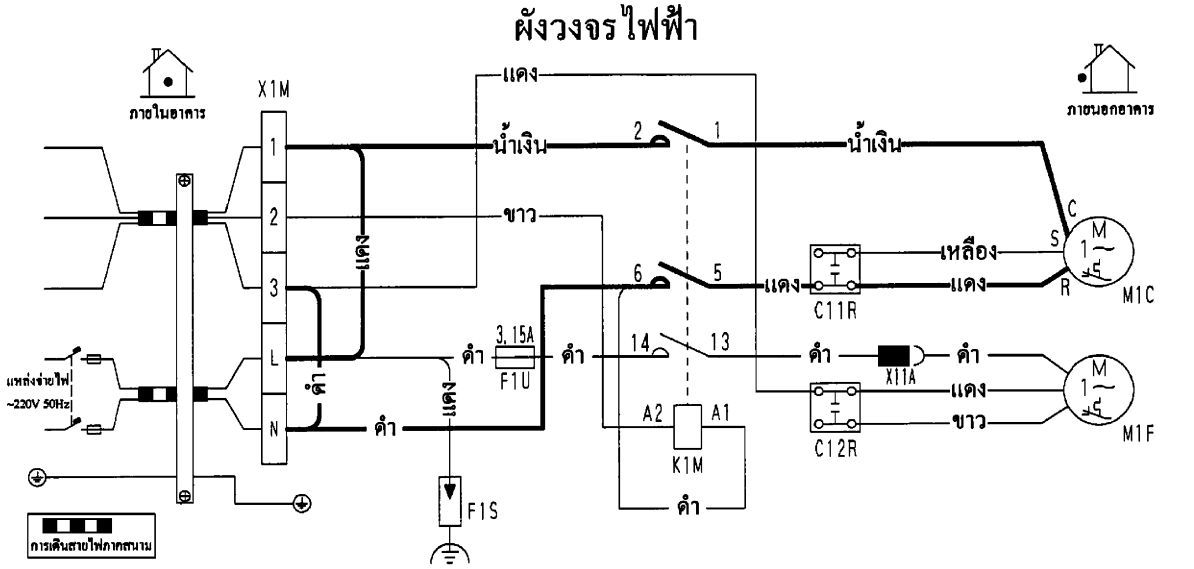


C11R, C12R : คาปาซิเตอร์ควบคุมการหมุน
F1S : สายดิน
K1M : รีเลย์ป้องกันคอมเพรสเซอร์
L : สายไฟ
N : สายลงดิน
M1C : มอเตอร์คอมเพรสเซอร์
F1U : ฟิวส์
M1F : มอเตอร์พัดลม
Q1CL : ตัวตัดอุณหภูมิ ตัวป้องกันกระแสเกิน
X1M : ครีบต่อสาย
X11A : จุดต่อสาย

หมายเหตุ
ควรตรวจสอบว่าแรงดันไฟฟ้าที่ใช้ถูกต้องโดยดูจากแผ่นป้ายข้างเครื่อง

3D035353B

R13DV2S

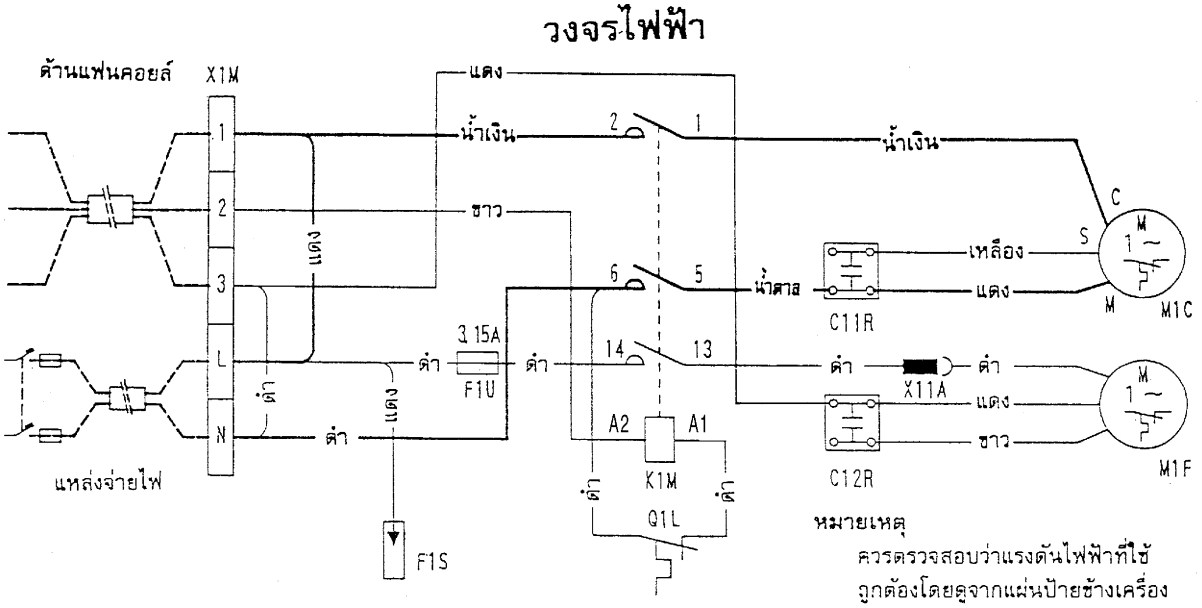


C11R, C12R : ตัวเก็บประจุขณะเดินเครื่อง
F1S : อุปกรณ์ป้องกันไฟกระชาก
K1M : รีเลย์ป้องกันคอมเพรสเซอร์
L : สายไฟ
N : สายดิน
M1C : มอเตอร์คอมเพรสเซอร์
F1U : ฟิวส์
M1F : มอเตอร์พัดลม
X1M : ครีบต่อสายไฟ
X11A : จุดต่อ
⊕ สายดิน

หมายเหตุ
ตรวจสอบว่าแรงดันไฟฟ้าที่ใช้ถูกต้อง โดยดูจากฉลากข้างเครื่อง

3D047979A

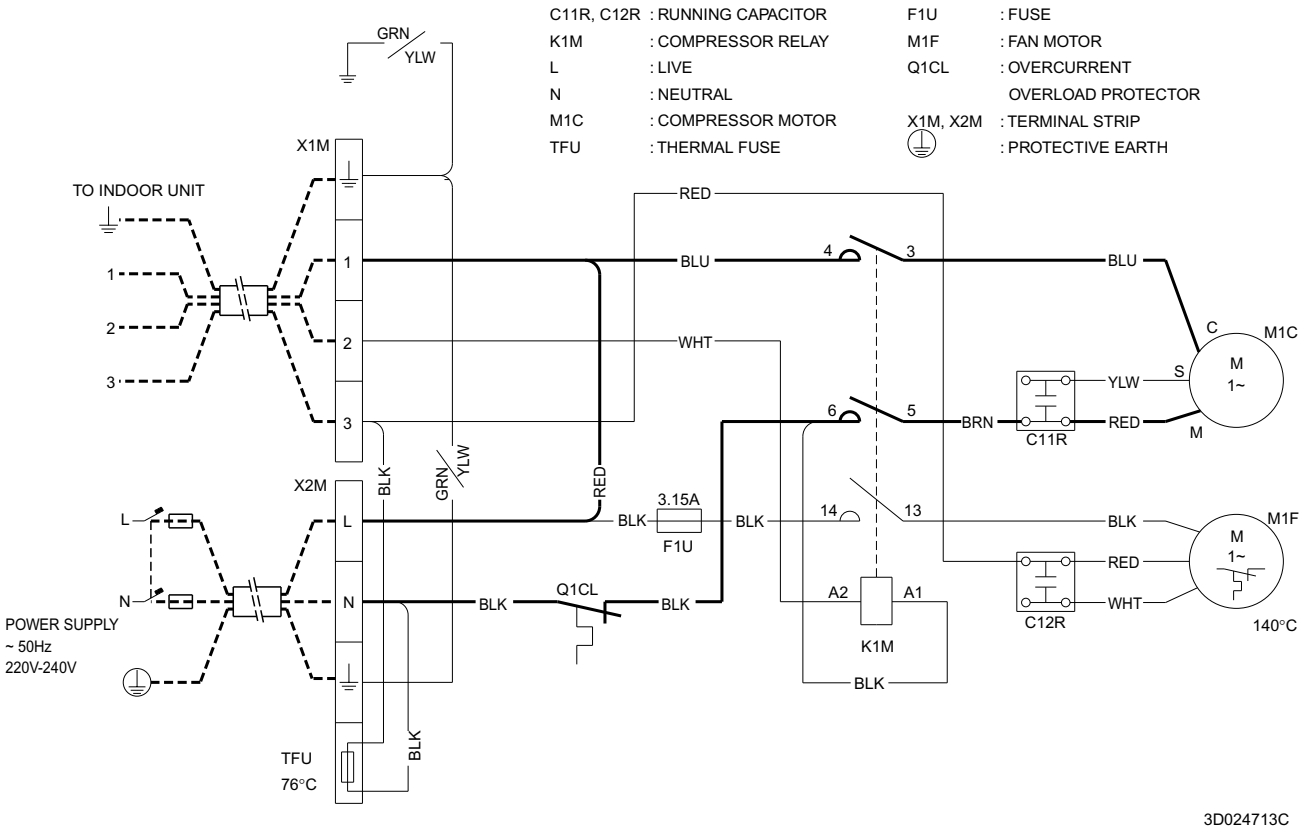
R15DV2S



C11R, C12R : คาปาซิเตอร์ควบคุมการหมุน
F1S : สายลงดิน
F1U : ฟิวส์
K1M : รีเลย์ป้องกันคอมเพรสเซอร์
L : สายไฟ
M1C : มอเตอร์คอมเพรสเซอร์
M1F : มอเตอร์พัดลม
N : สายดิน
Q1L : ตัวป้องกันกระแสเกิน
X11A : จุดต่อสาย
X1M : ครีบต่อสาย

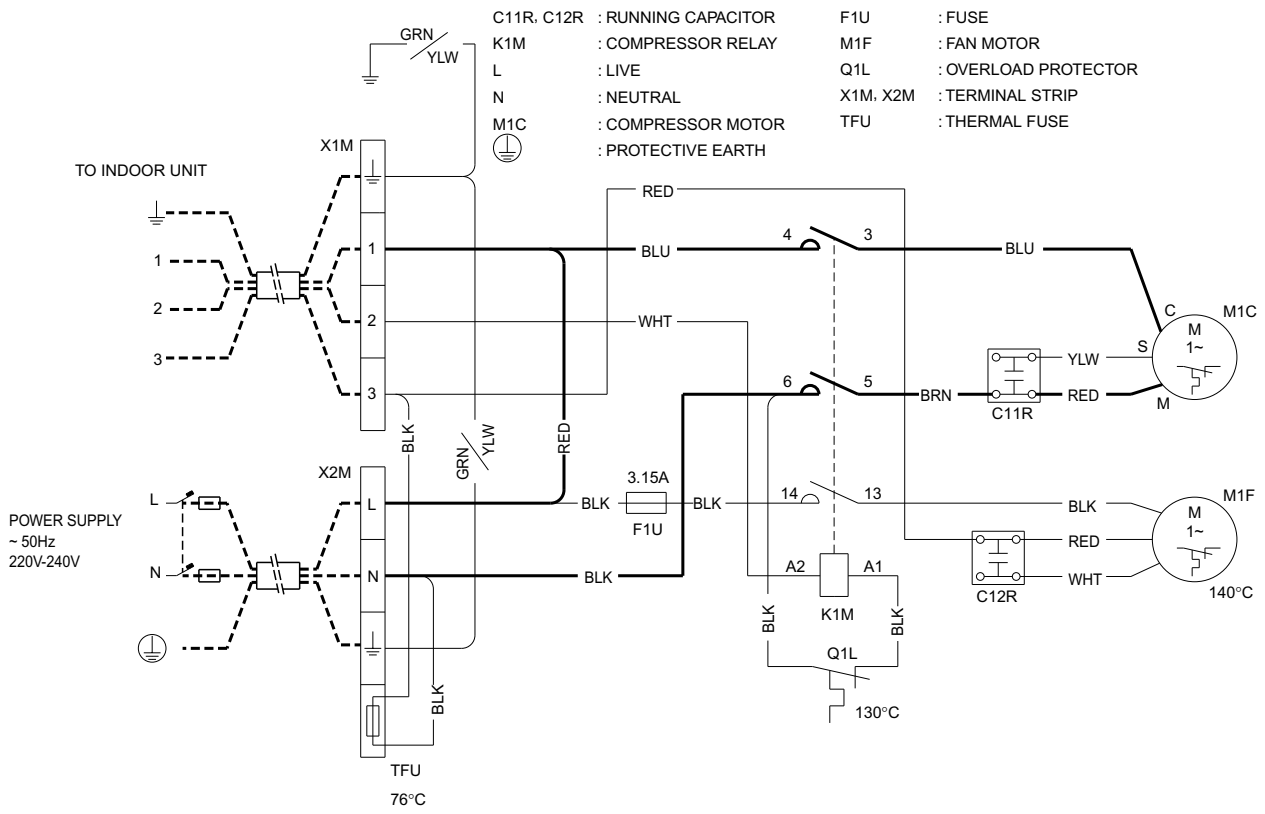
C : 3D013107D

R25DV1



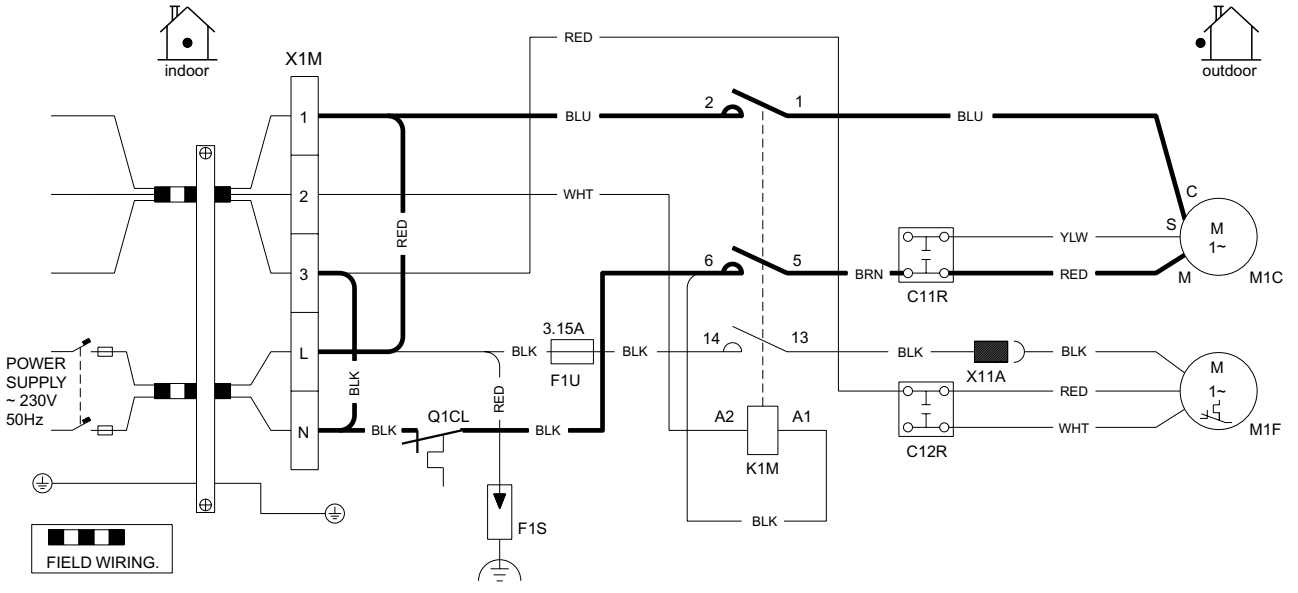
3D024713C

R35DV1



3D024714C

R25DSG



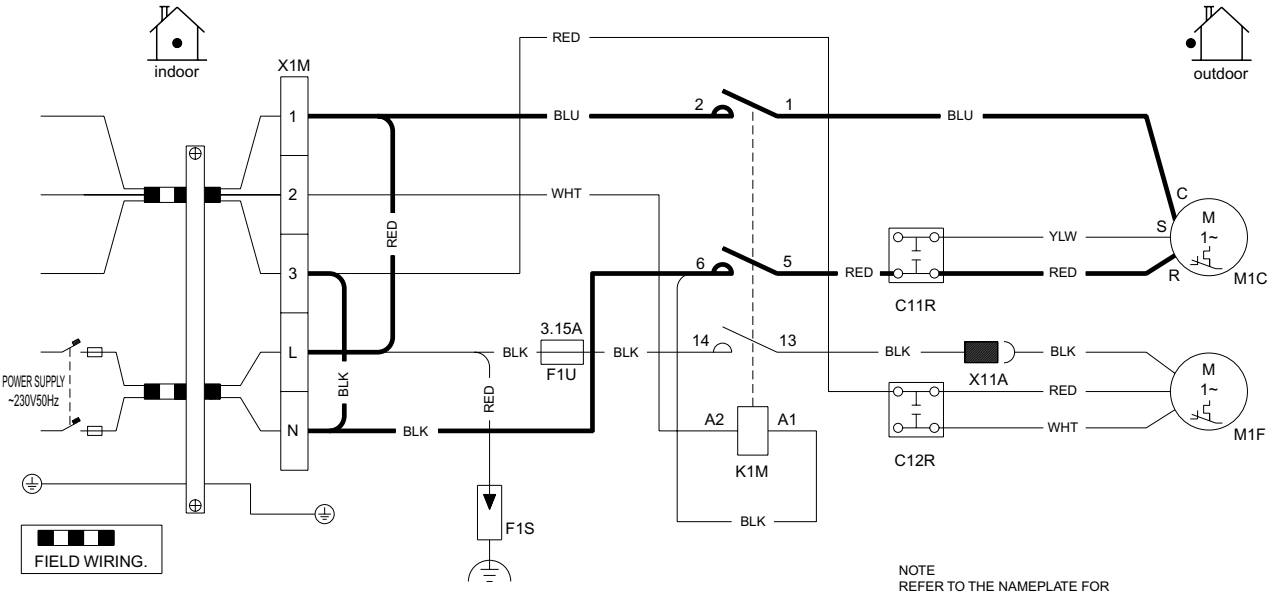
C11R,C12R : RUNNING CAPACITOR
F1S : SURGE ARRESTER
K1M : COMPRESSOR RELAY
L : LIVE
N : NEUTRAL
M1C : COMPRESSOR MOTOR
Q1CL : OVERLOAD PROTECTER
F1U : FUSE
M1F : FAN MOTOR
X1M : TERMINAL STRIP
X11A : CONNECTOR

NOTE
REFER TO THE NAMEPLATE FOR THE POWER REQUIREMENTS.

PROTECTIVE EARTH

3D049050

R35DSG

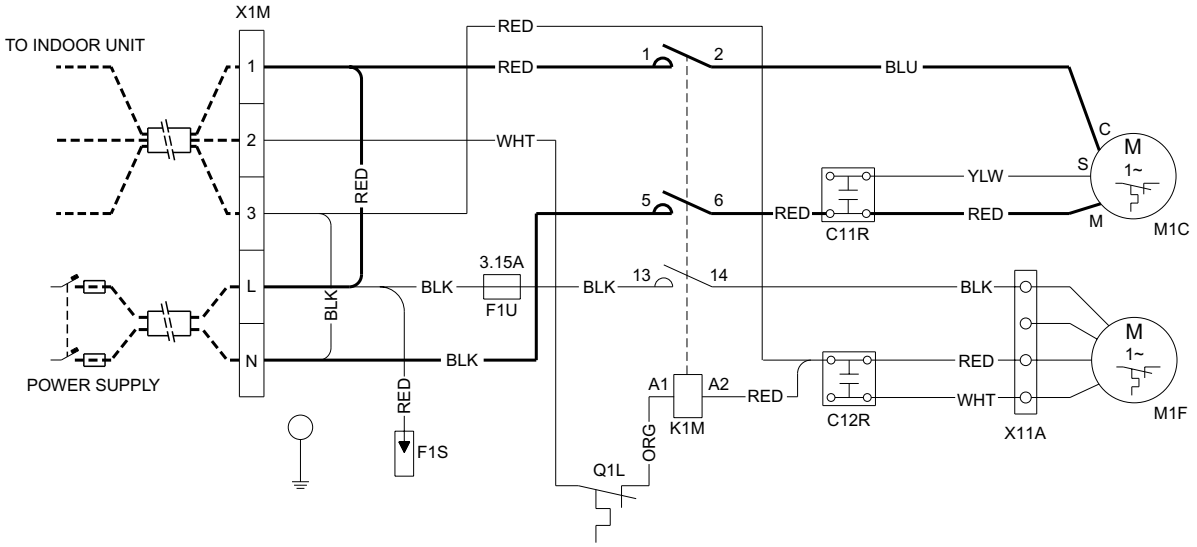


NOTE
REFER TO THE NAMEPLATE FOR THE POWER REQUIREMENTS.

C11R, C12R : RUNNING CAPACITOR
F1S : SURGE ARRESTER
K1M : COMPRESSOR RELAY
L : LIVE
N : NEUTRAL
M1C : COMPRESSOR MOTOR
F1U : FUSE
M1F : FAN MOTOR
X1M : TERMINAL STRIP
X11A : CONNECTOR
⏚ PROTECTIVE EARTH

3D048819

R50DSG

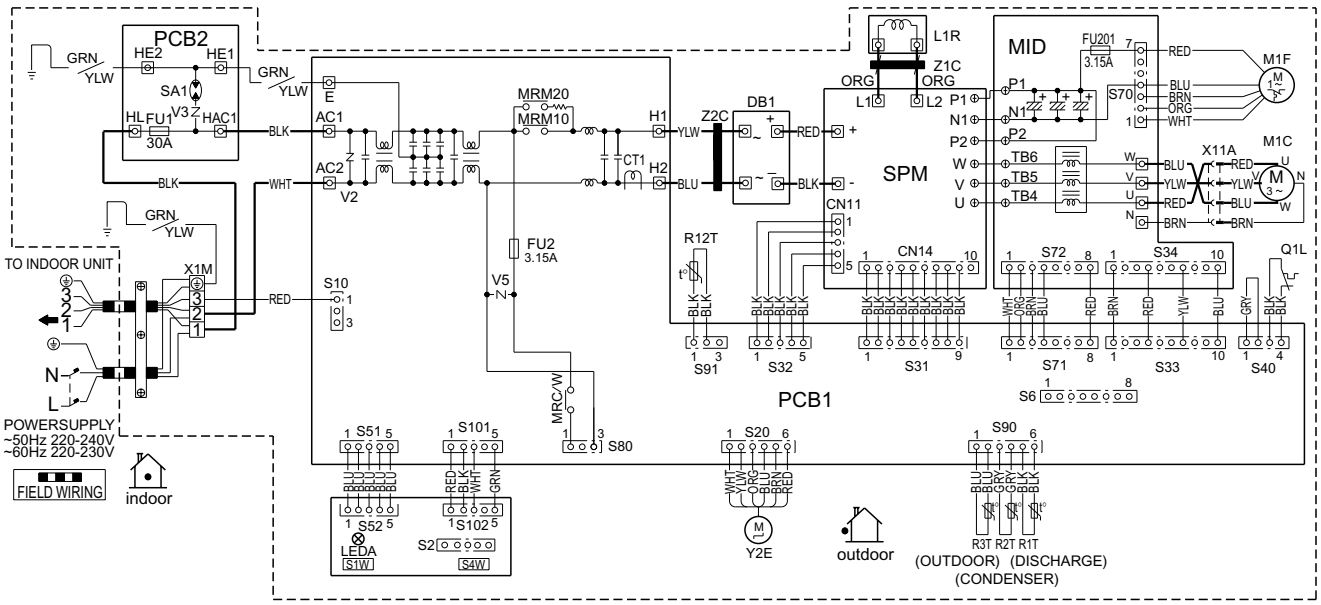


C11R, C12R : RUNNING CAPACITOR
F1U : FUSE
F1S : SURGE ARRESTER
K1M : COMPRESSOR RELAY
L : LIVE
M1C : COMPRESSOR MOTOR
M1F : FAN MOTOR
N : NEUTRAL
Q1L : OVERLOAD PROTECTOR
X11A : CONNECTOR
X1M : TERMINAL STRIP

NOTES
1. REFER TO THE NAMEPLATE FOR THE POWER REQUIREMENTS.

3D040743A

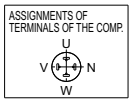
R60DSG



Z1C, Z2C : FERRITE CORE
X1M : TERMINAL STRIP
Y2E : ELECTRONIC EXPANSION VALVE
V2~V5 : VARISTOR
FU1, FU2. FU201 : FUSE
HE1, HE2, HAC1
E, AC1, AC2
H1, H2, HL
L1, L2, X11A : CONNECTOR
MRM10, MRM20
MRC/W : MAGNETIC RELAY
R1T~R3T : THERMISTOR

S2~S102 : CONNECTOR
LEDA : PILOT LAMP
PCB1, PCB2 : PRINTED CIRCUIT BOARD
L : LIVE
N : NEUTRAL
S1W : FORCED OPERATION ON/OFF SW (SW1)
S4W : LOCAL SETTING SW (SW4)
SA1 : SURGE ARRESTER
DB1 : DIODE BRIDGE
M1C : COMPRESSOR MOTOR
M1F : FAN MOTOR
L1R : REACTOR

Q1L : OVERLOAD PROTECTOR
CT1 : CURRENT TRANSFORMER
MID : MOLDED INTER CONNECT DEVICE
SPM : SYSTEM POWER MODULE



3D037866G

Index

Numerics

A

B

C

D

E

F

G

H

I

J

L

M

N

O

P

R

S

T

U

V

W

Drawings & Flow Charts

Numerics

A

B

C

D

E

F

H

I

J

L

M

N

O

P

R

S

T

W

Warning

- 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 unauthorized 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.

For any inquiries, contact your local distributor.

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 and choose an outdoor unit with anti-corrosion treatment.

The air conditioners manufactured by Daikin Industries have received **ISO 9001** certification for quality assurance.

Certificate Number. **JMI-0107**
JQA-0495
JQA-1452

All Daikin Industries locations and subsidiaries in Japan have received environmental management system standard **ISO 14001** certification.

Daikin Industries, Ltd.
Domestic Group
Certificate Number. 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

DAIKIN INDUSTRIES, LTD.
Head Office:
Umeda Center Bldg., 2-4-12, Nakazaki-Nishi,
Kita-ku, Osaka, 530-8323 Japan

Tokyo Office:
JR Shinagawa East Bldg., 2-18-1, Konan,
Minato-ku, Tokyo, 108-0075 Japan

http://www.daikin.com/global/

•The specifications, designs, and information in this brochure are subject to change without notice.

Si01-501
Printed in Singapore 07/2005 AK COS