

Service Manual

SUPER MULTI *NX*

G-Series / J-Series



[Applied Models]

- Inverter Multi : Heat Pump

SUPER MULTI NX

G-Series / J-Series

●Heat Pump Indoor Unit

CTXS07JVJU
CTXS09HVJU
CTXS12HVJU
FTXS15HVJU
FTXS18HVJU
FDXS09DVJU
FDXS12DVJU

Outdoor Unit

2MXS18GVJU
3MXS24JVJU
4MXS32GVJU

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1. Safety Considerations

Read these **SAFETY CONSIDERATIONS** carefully before performing any repair work. Comply with these safety symbols without fail. Meanings of **DANGER**, **WARNING**, **CAUTION**, and **NOTE** Symbols:

-  **DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
-  **WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
-  **CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
-  **NOTE** Indicates situations that may result in equipment or property-damage accidents only.

1.1 Safety Considerations for Repair

- If refrigerant gas leaks during repair or service, ventilate the area immediately. Refrigerant gas may produce toxic gas if it comes into contact with flames. Refrigerant gas is heavier than air and replaces oxygen. In the event of an accident, a massive leak could lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death.
 - Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug if a plug is used. Plugging or unplugging the power cable plug to operate the equipment may cause an electrical shock or fire.
 - Use parts listed in the service parts list and appropriate tools to conduct repair work. The use of inappropriate parts or tools may cause an electrical shock or fire.
 - Disconnect power before disassembling the equipment for repairs. Working on the equipment that is connected to the power supply may cause an electric shock. If it is necessary to supply power to the equipment to conduct repairs or to inspect the circuits, do not touch any electrically charged sections of the equipment.
 - The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Discharge the capacitor completely before conducting repair work. A charged capacitor may cause an electrical shock.
 - If refrigerant gas is discharged during repair work, do not touch the discharged refrigerant gas. The refrigerant gas may cause frostbite.
 - Use only pipes, flare nuts, tools, and other materials designed specifically for R410A refrigerant systems.
- Never use tools or materials designed for R22 refrigerant systems on an R410A refrigerant system. Doing so can cause a serious accident or an equipment failure.
- Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections may cause excessive heat generation, fire, or electrical shock.
 - Prior to disconnecting the suction or discharge pipe from the compressor at the welded section, pump-down the refrigerant gas completely in a well-ventilated place first. If there is refrigerant gas or oil remaining inside the compressor, the refrigerant gas or oil can discharge when the pipe is being disconnected and it may cause an injury.
 - Wear a safety helmet, gloves, and a safety belt when working at an elevated height of more than 6.5 ft (2 m). Insufficient safety measures may cause a fall resulting in injury.
 - Do not mix air or gas other than the specified refrigerant R410A to the refrigerant system. If air enters the refrigerant systems, it can cause an excessive high pressure resulting in equipment damage and injury.
 - When relocating the equipment, check if the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and the equipment is not properly secured, the equipment may fall and cause injury.
 - Securely fasten the outside unit terminal cover (panel). If the terminal cover/panel is not fastened properly, dust or water may enter the outside unit causing fire or electric shock.
 - When relocating the system, keep the refrigerant circuit free from substances other than the specified refrigerant (R-410A) such as air. Any presence of air or other foreign substance in the refrigerant circuit can cause an abnormal pressure rise or rupture, resulting in injury.
 - If refrigerant gas leaks, locate the leaking point and repair it before charging refrigerant. After charging refrigerant, check for refrigerant leaks. If the leaking point cannot be located and the repair work must be stopped, perform a pump-down and close the service valve to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it may generate toxic gases if it comes into contact with flames.
 - Do not repair the electrical components with wet hands. Working on the equipment with wet hands may cause an electrical shock.

- Do not clean the air conditioner by splashing water on it. Washing the unit with water may cause an electrical shock.
- Ground the unit when repairing equipment in a humid or wet place to avoid electrical shocks.
- Turn off the power when cleaning the equipment to prevent internal fans that rotate at high speed from starting suddenly as they can cause injury.
- Let the refrigerant lines cool down before performing any repair work. Working on the unit when the refrigerant lines are hot may cause burns.
- All welding and cutting operations must be done in a well-ventilated place to prevent the accumulation of toxic fumes or possibly oxygen deficiency to occur.
- Check the grounding and repair it if the equipment is not properly grounded. Improper grounding may cause an electrical shock.
- Measure the insulation resistance after the repair. The resistance must be $1\text{M}\Omega$ or higher. Faulty insulation may cause an electrical shock.
- Check the drainage of the indoor unit after finishing repair work. Faulty drainage may cause water to enter the room resulting in wet floors and furniture.
- Do not tilt the unit when removing it. The water inside the unit may spill resulting in wet floors and furniture.
- Dismantling of the unit, disposal of the refrigerant, oil, and additional parts, should be done in accordance with the relevant local, state, and national regulations.
- Check the unit foundation for damage on a continual basis, especially if it has been in use for a long time. If left in a damaged condition, the unit may fall and cause injury. If the installation platform or frame has corroded, have it replaced. A corroded platform or frame may cause the unit to fall resulting in injury.
- If the unit has a power cable plug and it is dirty, clean the plug before securely inserting it into a power outlet. If the plug has a loose connection, tighten it or it may cause electrical shock or fire.
- After replacing the battery in the remote controller, dispose of the old battery to prevent children from swallowing it. If a child swallows the battery, see a doctor immediately.
- Never remove the fan guard of the unit. A fan rotating at high speed without the fan guard is very dangerous.
- Before cleaning the unit, stop the operation of the unit by turning the power off or by pulling the power cable plug out from its receptacle. Otherwise an electrical shock or injury may result.
- Do not wipe the controller operation panel with benzene, thinner, chemical dust cloth, etc. The panel may get discolored or the coating can peel off. If it is extremely dirty, soak a cloth in a water-diluted neutral detergent, squeeze it well, and wipe the panel clean. Then wipe it with another dry cloth.

1.2 Safety Considerations for Users

- Never attempt to modify the equipment. Doing so can cause electrical shock, excessive heat generation, or fire.
- If the power cable and lead wires have scratches or have become deteriorated, have them replaced. Damaged cable and wires may cause an electrical shock or fire.
- Do not use a joined power cable or an extension cord, or share the same power outlet with other electrical appliances as it may cause an electrical shock or fire.
- Use an exclusive power circuit for the equipment. Insufficient circuit amperage capacity may cause an electrical shock or fire.
- Do not damage or modify the power cable. Damaged or modified power cables may cause an electrical shock or fire. Placing heavy items on the power cable or pulling the power cable may damage the cable.

Part 1

List of Functions

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1. Functions

Category	Functions	CTXS09/12HVJU	Category	Functions	CTXS09/12HVJU
Basic Function	Inverter (with Inverter Power Control)	○	Health & Clean	Air-Purifying Filter	—
	Operation Limit for Cooling (°FDB)	—		Photocatalytic Deodorizing Filter	—
	Operation Limit for Heating (°FWB)	—		Air-Purifying Filter with Photocatalytic Deodorizing Function	○
	PAM Control	—		Titanium Apatite Photocatalytic Air-Purifying Filter	—
Compressor	Oval Scroll Compressor	—		Air Filter (Prefilter)	○
	Swing Compressor	—		Wipe-clean Flat Panel	○
	Rotary Compressor	—		Washable Grille	—
	Reluctance DC Motor	—		Filter Cleaning Indicator	—
Comfortable Airflow	Power-Airflow Flap	—	Timer	Good-Sleep Cooling Operation	—
	Power-Airflow Dual Flaps	○		24-Hour ON/OFF Timer	○
	Power-Airflow Diffuser	—		Night Set Mode	○
	Wide-Angle Louvers	○		Auto-Restart (after Power Failure)	○
	Vertical Auto-Swing (Up and Down)	○		Self-Diagnosis (Digital, LED) Display	○
	Horizontal Auto-Swing (Right and Left)	○		Wiring Error Check	—
	3-D Airflow	○		Anticorrosion Treatment of Outdoor Heat Exchanger	—
Comfort Control	Comfort Airflow Mode	—	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	—
	Auto Fan Speed	○		Flexible Voltage Correspondence	—
	Indoor Unit Quiet Operation	○		High Ceiling Application	—
	NIGHT QUIET Mode (Automatic)	—		Chargeless	—
	Outdoor Unit Quiet Operation (Manual)	—		Either Side Drain (Right or Left)	○
	INTELLIGENT EYE	○		Power Selection	—
	Quick Warming Function (Preheating Operation)	—		5-Rooms Centralized Controller (Option)	○
	Hot-Start Function	○		Remote Control Adaptor (Normal Open-Pulse Contact) (Option)	○
Operation	Automatic Defrosting	—	Remote Control	Remote Control Adaptor (Normal Open Contact) (Option)	○
	Automatic Operation	○		DIII-NET Compatible (Adaptor) (Option)	○
	Program Dry Function	○		Wireless	○
Lifestyle Convenience	Fan Only	○	Remote Controller	Wired	—
	New POWERFUL Operation (Non-Inverter)	—			
	Inverter POWERFUL Operation	○			
	Priority-Room Setting	—			
	COOL / HEAT Mode Lock	—			
	HOME LEAVE Operation	○			
	Indoor Unit ON/OFF Button	○			
	Signal Reception Indicator	○			
	Temperature Display	—			
	Another Room Operation	—			

Note: ○ : Holding Functions

— : No Functions

Category	Functions	FTXS15/18HVJU	Category	Functions	FTXS15/18HVJU
Basic Function	Inverter (with Inverter Power Control)	○	Health & Air Cleaning	Air-Purifying Filter	—
	Operation Limit for Cooling (°FDB)	—		Photocatalytic Deodorizing Filter	—
	Operation Limit for Heating (°FWB)	—		Air-Purifying Filter with Photocatalytic Deodorizing Function	○
	PAM Control	—		Titanium Apatite Photocatalytic Air-Purifying Filter	—
Compressor	Oval Scroll Compressor	—		Air Filter (Prefilter)	○
	Swing Compressor	—		Wipe-clean Flat Panel	○
	Rotary Compressor	—		Washable Grille	—
	Reluctance DC Motor	—		Filter Cleaning Indicator	—
Comfortable Airflow	Power-Airflow Louvers	—		Good-Sleep Cooling Operation	—
	Power-Airflow Dual Louvers	○	Timer	24-Hour ON/OFF Timer	○
	Power-Airflow Diffuser	—		Night Set Mode	○
	Wide-Angle Louvers	○	Worry Free “Reliability & Durability”	Auto-Restart (after Power Failure)	○
	Vertical Auto-Swing (Up and Down) Louvers	○		Self-Diagnosis (Digital, LED) Display	○
	Horizontal Auto-Swing (Right and Left) Fins	○		Wiring Error Check	—
	3-D Airflow	○		Anticorrosion Treatment of Outdoor Heat Exchanger	—
	Comfort Airflow Mode	—	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	○
Comfort Control	Auto Fan Speed	○		Flexible Voltage Correspondence	—
	Indoor Unit Quiet Operation	○		High Ceiling Application	—
	NIGHT QUIET Mode (Automatic)	—		Chargeless	—
	Outdoor Unit Quiet Operation (Manual)	—		Either Side Drain (Right or Left)	○
	INTELLIGENT EYE	○		Power Selection	—
	Quick Warming Function (Preheating Operation)	—	Remote Control	5-Rooms Centralized Controller (Option)	○
	Hot-Start Function	○		Remote Control Adaptor (Normal Open-Pulse Contact) (Option)	○
	Automatic Defrosting	—		Remote Control Adaptor (Normal Open Contact) (Option)	○
Operation	Automatic Operation	○		DIII-NET Compatible (Adaptor) (Option)	○
	Program Dry Function	○	Remote Controller	Wireless	○
	Fan Only	○		Wired	—
Lifestyle Convenience	New POWERFUL Operation (Non-Inverter)	—			
	Inverter POWERFUL Operation	○			
	Priority-Room Setting	—			
	COOL / HEAT Mode Lock	—			
	HOME LEAVE Operation	○			
	Indoor Unit ON/OFF Button	○			
	Signal Reception Indicator	○			
	Temperature Display	—			
	Another Room Operation	—			

Note: ○ : Holding Functions

— : No Functions

Category	Functions	FDXS09/12DVJU	Category	Functions	FDXS09/12DVJU
Basic Function	Inverter (with Inverter Power Control)	○	Health & Air Cleaning	Air-Purifying Filter	—
	Operation Limit for Cooling (°FDB)	—		Photocatalytic Deodorizing Filter	—
	Operation Limit for Heating (°FWB)	—		Air-Purifying Filter with Photocatalytic Deodorizing Function	—
	PAM Control	—		Titanium Apatite Photocatalytic Air-Purifying Filter	—
Compressor	Oval Scroll Compressor	—		Air Filter (Prefilter)	○
	Swing Compressor	—		Wipe-clean Flat Panel	—
	Rotary Compressor	—		Washable Grille	—
	Reluctance DC Motor	—		Filter Cleaning Indicator	—
Comfortable Airflow	Power-Airflow Louver	—		Good-Sleep Cooling Operation	—
	Power-Airflow Dual Louvers	—	Timer	24-Hour ON/OFF Timer	○
	Power-Airflow Diffuser	—		Night Set Mode	○
	Wide-Angle Louvers	—	Worry Free “Reliability & Durability”	Auto-Restart (after Power Failure)	○
	Vertical Auto-Swing (Up and Down)Louvers	—		Self-Diagnosis (Digital, LED) Display	○
	Horizontal Auto-Swing (Right and Left)Fins	—		Wiring Error Check	—
	3-D Airflow	—		Anticorrosion Treatment of Outdoor Heat Exchanger	—
	Comfort Airflow Mode	—	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	○
Comfort Control	Auto Fan Speed	○		Flexible Voltage Correspondence	—
	Indoor Unit Quiet Operation	○		High Ceiling Application	—
	NIGHT QUIET Mode (Automatic)	—		Chargeless	—
	Outdoor Unit Quiet Operation (Manual)	—		Either Side Drain (Right or Left)	—
	INTELLIGENT EYE	—		Power Selection	—
	Quick Warming Function (Preheating Operation)	—	Remote Control	5-Rooms Centralized Controller (Option)	○
	Hot-Start Function	○		Remote Control Adaptor (Normal Open-Pulse Contact) (Option)	○
	Automatic Defrosting	—		Remote Control Adaptor (Normal Open Contact) (Option)	○
Operation	Automatic Operation	○		DIII-NET Compatible (Adaptor) (Option)	○
	Program Dry Function	○	Remote Controller	Wireless	○
	Fan Only	○		Wired	—
Lifestyle Convenience	New POWERFUL Operation (Non-Inverter)	—			
	Inverter POWERFUL Operation	○			
	Priority-Room Setting	—			
	COOL / HEAT Mode Lock	—			
	HOME LEAVE Operation	○			
	Indoor Unit ON/OFF Button	○			
	Signal Reception Indicator	○			
	Temperature Display	—			
	Another Room Operation	—			

Note: ○ : Holding Functions

— : No Functions

Category	Functions	2MXS18GVJU	4MXS32GVJU	Category	Functions	2MXS18GVJU	4MXS32GVJU
Basic Function	Inverter (with Inverter Power Control)	○	○	Health & Clean	Air-Purifying Filter	—	—
	Operation Limit for Cooling (°FDB)	14~114.8	14~114.8		Photocatalytic Deodorizing Filter	—	—
	Operation Limit for Heating (°FWB)	5~59.9	5~59.9		Air-Purifying Filter with Photocatalytic Deodorizing Function	—	—
	PAM Control	○	○		Titanium Apatite Photocatalytic Air-Purifying Filter	—	—
Compressor	Oval Scroll Compressor	—	—		Air Filter (Prefilter)	—	—
	Swing Compressor	○	○		Wipe-clean Flat Panel	—	—
	Rotary Compressor	—	—		Washable Grille	—	—
	Reluctance DC Motor	○	○		Filter Cleaning Indicator	—	—
Comfortable Airflow	Power-Airflow Louver	—	—		Good-Sleep Cooling Operation	—	—
	Power-Airflow Dual Louvers	—	—	Timer	24-Hour ON/OFF Timer	—	—
	Power-Airflow Diffuser	—	—		Night Set Mode	—	—
	Wide-Angle Louvers	—	—	Worry Free "Reliability & Durability"	Auto-Restart (after Power Failure)	—	—
	Vertical Auto-Swing (Up and Down)	—	—		Self-Diagnosis (Digital, LED) Display	○	○
	Horizontal Auto-Swing (Right and Left) Fins	—	—		Wiring Error Check	○	○
	3-D Airflow	—	—		Anticorrosion Treatment of Outdoor Heat Exchanger	○	○
	Comfort Airflow Mode	—	—	Flexibility	Multi-Split / Split Type Compatible Indoor Unit	—	—
Comfort Control	Auto Fan Speed	—	—		Flexible Voltage Correspondence	—	—
	Indoor Unit Quiet Operation	—	—		High Ceiling Application	—	—
	NIGHT QUIET Mode (Automatic)	○	○		Chargeless	98.4ft	131.6ft
	Outdoor Unit Quiet Operation (Manual)	○	○		Either Side Drain (Right or Left)	—	—
	INTELLIGENT EYE	—	—		Power Selection	—	—
	Quick Warming Function (Preheating Operation)	○	○		5-Rooms Centralized Controller (Option)	—	—
	Hot-Start Function	—	—		Remote Control Adaptor (Normal Open-Pulse Contact) (Option)	—	—
	Automatic Defrosting	○	○		Remote Control Adaptor (Normal Open Contact) (Option)	—	—
Operation	Automatic Operation	—	—	Remote Control	DIII-NET Compatible (Adaptor) (Option)	—	—
	Program Dry Function	—	—		Wireless	—	—
	Fan Only	—	—		Wired	—	—
Lifestyle Convenience	New POWERFUL Operation (Non-Inverter)	—	—	Remote Controller			
	Inverter POWERFUL Operation	—	—				
	Priority-Room Setting	○	○				
	COOL / HEAT Mode Lock	○	○				
	HOME LEAVE Operation	—	—				
	Indoor Unit ON/OFF Button	—	—				
	Signal Reception Indicator	—	—				
	Temperature Display	—	—				
	Another Room Operation	—	—				

Notes: ○ : Holding Functions
 — : No Functions

Part 2

Specifications

1. Specifications9

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 1.2 Outdoor Unit..... 11

1. Specifications

1.1 Indoor Unit

Duct-Free System

60 Hz, 208 - 230 V

Model			CTXS07JVJU		CTXS09HVJU	
			Cooling	Heating	Cooling	Heating
Rated Capacity			7 kBtu/h Class		9 kBtu/h Class	
Front Panel Color			White		White	
Airflow Rates	cfm (m ³ /min)	H	388 (11.0)	400 (11.3)	388 (11.0)	400 (11.3)
		M	335 (9.5)	357 (10.1)	335 (9.5)	357 (10.1)
		L	283 (8.0)	314 (8.9)	283 (8.0)	314 (8.9)
Fan	Type		Cross Flow Fan		Cross Flow Fan	
	Motor Output	W	40		40	
	Speed	Steps	5 Steps, Quiet, Auto		5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downward		Right, Left, Horizontal, Downward	
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof	
Running Current (Rated)		A	0.18	0.2	0.18	0.2
Power Consumption (Rated)		W	40	45	40	45
Power Factor		%	96.6	97.8	96.6	97.8
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (H x W x D)		in. (mm)	11-7/16 x 31-5/16 x 9-3/8 (291 x 795 x 238)		11-7/16 x 31-5/16 x 9-3/8 (291 x 795 x 238)	
Packaged Dimensions (H x W x D)		in. (mm)	11 x 33-1/16 x 13-5/16 (279 x 840 x 338)		11 x 33-1/16 x 13-5/16 (279 x 840 x 354)	
Weight		Lbs (kg)	20		20	
Gross Weight		Lbs (kg)	29		29	
Operation Sound		H / M / L dBA	44 / 40 / 35	44 / 39 / 34	44 / 40 / 35	44 / 39 / 34
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	in. (mm)	φ 1/4 (6.4)		φ 1/4 (6.4)	
	Gas	in. (mm)	φ 3/8 (9.5)		φ 3/8 (9.5)	
	Drain	in. (mm)	φ 11/16 (17.5)		φ 11/16 (17.5)	
Drawing No.			3D066156A		3D062870A	

Model			CTXS12HVJU	
			Cooling	Heating
Rated Capacity			12 kBtu/h Class	
Front Panel Color			White	
Airflow Rates	cfm (m ³ /min)	H	388 (11.0)	400 (11.3)
		M	335 (9.5)	357 (10.1)
		L	283 (8.0)	314 (8.9)
Fan	Type		Cross Flow Fan	
	Motor Output	W	40	
	Speed	Steps	5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downward	
Air Filter			Removable / Washable / Mildew Proof	
Running Current (Rated)		A	0.18	0.2
Power Consumption (Rated)		W	40	45
Power Factor		%	96.6	97.8
Temperature Control			Microcomputer Control	
Dimensions (H x W x D)		in. (mm)	11-7/16 x 31-5/16 x 9-3/8 (291 x 795 x 238)	
Packaged Dimensions (H x W x D)		in. (mm)	11 x 33-1/16 x 13-5/16 (279 x 840 x 354)	
Weight		Lbs (kg)	20	
Gross Weight		Lbs (kg)	29	
Operation Sound		H / M / L dBA	45 / 41 / 36	45 / 40 / 35
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	in. (mm)	φ 1/4 (6.4)	
	Gas	in. (mm)	φ 3/8 (9.5)	
	Drain	in. (mm)	φ 11/16 (17.5)	
Drawing No.			3D062871A	

Conversion Formulae
kcal/h = kW x 860
Btu/h = kW x 3412
cfm = m ³ /min x 35.3

60 Hz, 230 V

Model			FTXS15HVJU		FTXS18HVJU	
			Cooling	Heating	Cooling	Heating
Rated Capacity			15 kBtu/h Class		18 kBtu/h Class	
Front Panel Color			White		White	
Airflow Rates	cfm (m ³ /min)	H	519 (14.7)	515 (14.6)	549 (15.5)	609 (17.2)
		M	436 (12.3)	459 (13.0)	476 (13.5)	529 (15.0)
		L	353 (10.0)	402 (11.4)	402 (11.4)	448 (12.7)
Fan	Type		Cross Flow Fan		Cross Flow Fan	
	Motor Output	W	43		43	
	Speed	Steps	5 Steps, Quiet, Auto		5 Steps, Quiet, Auto	
Air Direction Control			Right, Left, Horizontal, Downward		Right, Left, Horizontal, Downward	
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof	
Running Current (Rated)		A	0.18		0.18	
Power Consumption (Rated)		W	40		40	
Power Factor		%	96.6		96.6	
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (H x W x D)		in. (mm)	11-7/16 x 41-5/16 x 9-3/8 (291 x 1049 x 238)		11-7/16 x 41-5/16 x 9-3/8 (291 x 1049 x 238)	
Packaged Dimensions (H x W x D)		in. (mm)	13-1/4 x 45-3/16 x 14-7/16 (337 x 1148 x 367)		13-1/4 x 45-3/16 x 14-7/16 (337 x 1148 x 367)	
Weight		Lbs (kg)	26.5 (12 kg)		26.5 (12 kg)	
Gross Weight		Lbs (kg)	38 (17.2 kg)		38 (17.2 kg)	
Operation Sound		H / M / L	45 / 41 / 36	44 / 40 / 35	45 / 41 / 36	44 / 40 / 35
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	in. (mm)	φ 1/4		φ 1/4 (6.4)	
	Gas	in. (mm)	φ 1/2 (12.7)		φ 1/2 (12.7)	
	Drain	in. (mm)	φ 11/16 (17.5)		φ 11/16 (17.5)	
Drawing No.			3D062866A 3D062874A		3D062868A 3D062875A	

Slim Duct Built-in System

60 Hz, 230 V

Model			FDXS09DVJU		FDXS12DVJU	
			Cooling	Heating	Cooling	Heating
Rated Capacity			9 kBtu/h Class		12 kBtu/h Class	
External Static Pressure		"Wg	0.12		0.12	
Airflow Rates	cfm (m ³ /min)	H	305 (8.64)	305 (8.64)	305 (8.64)	305 (8.64)
		M	280 (7.93)	280 (7.93)	280 (7.93)	280 (7.93)
		L	260 (7.36)	260 (7.36)	260 (7.36)	260 (7.36)
Fan	Type		Sirocco Fan		Sirocco Fan	
	Motor Output	W	62		62	
	Speed	Steps	5 Steps, Quiet, Auto		5 Steps, Quiet, Auto	
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof	
Running Current (Rated)		A	0.52	0.52	0.52	0.52
Power Consumption (Rated)		W	72	72	72	72
Power Factor		%	60.2	60.2	60.2	60.2
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (H x W x D)		in. (mm)	7-7/8 x 27-9/16 x 24-7/16 (200 x 700 x 621)		7-7/8 x 27-9/16 x 24-7/16 (200 x 700 x 621)	
Packaged Dimensions (H x W x D)		in. (mm)	10-13/16 x 30-1/4 x 36-5/16 (275 x 768 x 922)		10-13/16 x 30-1/4 x 36-5/16 (275 x 768 x 922)	
Weight		Lbs (kg)	47 (21.3)		47 (21.3)	
Gross Weight		Lbs (kg)	64 (29)		64 (29)	
Operation Sound		H / M / L	35 / 33 / 31	35 / 33 / 31	35 / 33 / 31	35 / 33 / 31
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	in. (mm)	φ 1/4 (6.4)		φ 1/4 (6.4)	
	Gas	in. (mm)	φ 3/8 (9.5)		φ 3/8 (9.5)	
	Drain	in. (mm)	O.D.1-1/32, I.D.25/32		O.D.1-1/32, I.D.25/32	
Drawing No.			3D051781A		3D051782A	

Conversion Formulae

kcal/h = kW x 860
 Btu/h = kW x 3412
 cfm = m³/min x 35.3

1.2 Outdoor Unit

60 Hz, 208 - 230 V

Model			2MXS18GVJU	
			Cooling	Heating
Capacity		kW	—	
Power Consumption		W	—	
Running Current		A	—	
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Swing Type	
	Model		2YC45EXD	
	Motor Output	W	1,380	
Refrigerant Oil	Model		FVC50K	
	Charge	oz (g)	26.5 (751)	
Refrigerant	Type		R-410A	
	Charge	Lbs (kg)	5.73 (2.6)	
Airflow Rate	m ³ /min	H	49	41
		M	—	—
		L	43	39
	cfm	H	1,730	1,448
		M	—	—
		L	1,518	1,377
Fan	Type		Propeller	
	Motor Output	W	53	
	Running Current	A	H: 0.31 / L: 0.28	H: 0.27 / L: 0.25
	Power Consumption	W	H: 65 / L: 57	H: 55 / L: 52
Starting Current		A	10.6	
Dimension (H × W × D)		in. (mm)	28-15/16 × 32-1/2 × 11-13/16 (735 x 825 x 300)	
Packaged Dimension (H × W × D)		in. (mm)	31-7/16 × 39-5/16 × 15-3/8 (799 x 999 x 391)	
Weight		Lbs (kg)	139 (63)	
Gross Weight		Lbs (kg)	144 (65.3)	
Operation Sound		dBA	50	51
Piping Connection	Liquid	in. (mm)	φ 1/4 (6.4) × 2	
	Gas	in. (mm)	φ 3/8 (9.5) × 2	
	Drain	in. (mm)	φ 11/16 (17.5)	
Heat Insulation			Both Liquid & Gas Pipes	
No. of Wiring Connection			3 for Power Supply, 4 for Interunit Wiring	
Max. Piping Length		ft (m)	164 (50) (for Total of Each Room)	
			82 (25) (for One Room)	
Amount of Additional Charge		oz/ft (g/m)	0.22 (6.2) (98.4 ft (30) or more)	
Max. Installation Height Difference		ft (m)	49.2 (15) (between Indoor Unit and Outdoor Unit)	
			24.6 (7.5) (between Indoor Units)	
Drawing No.			3D058840	

Note:

1. The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor : 80°FDB(27°CDB), 67°FWB(19.4°CWB) Outdoor : 95°FDB(35°CDB)/ 75°FWB (24°CWB)	70°FDB(21°CDB), 60°FWB(15.5°CWB) Outdoor : 47°FDB(8°CDB)/ 43°FWB(6°CWB)	25 ft (7.5 m)

Conversion Formulae
kcal/h = kW x 860 Btu/h = kW x 3412 cfm = m ³ /min x 35.3

60 Hz, 208 - 230 V

Model			3MXS24JVJU	
			Cooling	Heating
Capacity		kW	—	
Power Consumption		W	—	
Running Current		A	—	
Casing Color			Ivory White	
Compressor	Type	Hermetically Sealed Swing Type		
	Model	2YC63EXD		
	Motor Output	W	1,920	
Refrigerant Oil	Model	FVC50K		
	Charge	oz	26.5 (751)	
Refrigerant	Type	R-410A		
	Charge	Lbs (kg)	6.61(3)	
Airflow Rate	m ³ /min	H	58.4	52.1
		M	52.1	52.1
		L	46.5	13.0
	cfm	H	2,062	1,840
		M	1,840	1,840
		L	1,642	459
Fan	Type	Propeller		
	Motor Output	W	66	
	Running Current	A	H: 1.02 / M: 0.87 / L: 0.69	H: 0.87 / M: 0.87 / L: 0.05
	Power Consumption	W	H: 95 / M: 74 / L: 55	H: 74 / M: 74 / L: 9
Starting Current		A	17.8	
Dimension (H × W × D)		in. (mm)	30-5/16 × 35-7/16 × 12-5/8 (770 x 900 x 321)	
Packaged Dimension (H × W × D)		in. (mm)	35-7/8 × 37-11/16 × 15-15/16 (911 x 957 x 389)	
Weight		Lbs (kg)	168 (76)	
Gross Weight		Lbs (kg)	196 (89)	
Operation Sound		dBA	52	54
Piping Connection	Liquid	in. (mm)	φ 1/4 × 3 (6.4 x 3)	
	Gas	in. (mm)	φ 3/8 × 1, φ 1/2 × 1, φ 5/8 × 1 (9.5 x 1, 12.7 x 1, 15.8 x 1)	
	Drain	in. (mm)	φ 1 (25.4)	
Heat Insulation			Both Liquid & Gas Pipes	
No. of Wiring Connection			3 for Power Supply, 4 for Interunit Wiring	
Max. Piping Length		ft (m)	230 (70) (for Total of Each Room)	
			82 (25) (for One Room)	
Amount of Additional Charge		oz/ft (g/m)	0.22 (131.6 ft or more) 6.23 (40 or more)	
Max. Installation Height Difference		ft (m)	49.2 (15) (between Indoor Unit and Outdoor Unit)	
			24.6 (7.5) (between Indoor Units)	
Drawing No.			3D066155	

Note: 1. The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor : 80°FDB(27°CDB), 67°FWB(19.4°CWB) Outdoor : 95°FDB(35°CDB)/ 75°FWB (24°CWB)	70°FDB(21°CDB), 60°FWB(15.5°CWB) Outdoor : 47°FDB(8°CDB)/ 43°FWB(6°CWB)	25 ft (7.5 m)

Conversion Formulae
kcal/h = kW x 860 Btu/h = kW x 3412 cfm = m ³ /min x 35.3

60 Hz, 208 - 230 V

Model			4MXS32GVJU	
			Cooling	Heating
Capacity	kW		—	
Power Consumption	W		—	
Running Current	A		—	
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Swing Type	
	Model		2YC63EXD	
	Motor Output	W	1,920	
Refrigerant Oil	Model		FVC50K	
	Charge	oz (g)	26.5 (751.3)	
Refrigerant	Type		R-410A	
	Charge	Lbs (kg)	6.83 (3.1)	
Airflow Rate	m ³ /min	H	58.4	52.1
		M	52.1	52.1
		L	46.5	13.0
	cfm	H	2,062	1,840
		M	1,840	1,840
		L	1,642	459
Fan	Type		Propeller	
	Motor Output	W	66	
	Running Current	A	H: 1.02 / M: 0.87 / L: 0.69	H: 0.87 / M: 0.87 / L: 0.05
	Power Consumption	W	H: 95 / M: 74 / L: 55	H: 74 / M: 74 / L: 9
Starting Current	A		18.0	
Dimension (H × W × D)	in. (mm)		30-5/16 × 35-7/16 × 12-5/8 (770 x 900 x 321)	
Packaged Dimension (H × W × D)	in. (mm)		35-7/8 × 37-11/16 × 15-15/16 (911 x 957 x 389)	
Weight	Lbs		168 (76)	
Gross Weight	Lbs		196 (89)	
Operation Sound	dBA		52	54
Piping Connection	Liquid	in. (mm)	φ 1/4 × 4 (6.4 × 4)	
	Gas	in. (mm)	φ 3/8 × 1, φ 1/2 × 1, φ 5/8 × 2 (9.5 × 1, 12.7 × 1, 15.8 × 2)	
	Drain	in. (mm)	φ 1 (25.4)	
Heat Insulation			Both Liquid & Gas Pipes	
No. of Wiring Connection			3 for Power Supply, 4 for Interunit Wiring	
Max. Piping Length	ft (m)		230 (70) (for Total of Each Room)	
			82 (25) (for One Room)	
Amount of Additional Charge	oz/ft (g/m)		0.22 (131.6 ft or more) (6.23 (40 or more)	
Max. Installation Height Difference	ft (m)		49.2 (15) (between Indoor Unit and Outdoor Unit)	
			24.6 (7.5) (between Indoor Units)	
Drawing No.			3D058873A	

Note:

1. The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor : 80°FDB(27°CDB), 67°FWB(19.4°CWB) Outdoor : 95°FDB(35°CDB)/ 75°FWB (24°CWB)	70°FDB(21°CDB), 60°FWB(15.5°CWB) Outdoor : 47°FDB(8°CDB)/ 43°FWB(6°CWB)	25ft (7.5 m)

Conversion Formulae

kcal/h = kW x 860
 Btu/h = kW x 3412
 cfm = m³/min x 35.3

Part 3

Printed Circuit Board Connector Wiring Diagram

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1.2 Indoor Unit - Slim Duct Built-in System	15
1.3 Outdoor Unit - 2MXS18GVJU	17
1.4 Outdoor Unit - 3MXS24JVJU, 4MXS32GVJU	20

1. Printed Circuit Board Connector Wiring Diagram

1.1 Indoor Unit - Duct-Free System

Connectors and Other Parts

PCB (1): Control PCB

- | | |
|-------------------|--|
| 1) S1 | Connector for fan motor |
| 2) S6 | Connector for swing motor (horizontal blades) |
| 3) S8 | Connector for swing motor (vertical blades) |
| 4) S21 | Connector for centralized control (HA) |
| 5) S26 | Connector for buzzer PCB |
| 6) S28 | Connector for signal receiver PCB |
| 7) S32 | Connector for indoor heat exchanger thermistor |
| 8) S35 | Connector for INTELLIGENT EYE sensor PCB |
| 9) H1, H2, H3, FG | Connector for terminal board |
| 10) JA | Address setting jumper |
| JB | Fan speed setting when compressor stops for thermostat OFF |
| JC | Power failure recovery function (auto-restart) |
| | * Refer to page 223 for detail. |
| 11) LED A | LED for service monitor (green) |
| 12) FU1 | Fuse (3.15 A, 250 V) |
| 13) V1 | Varistor |

PCB (2): Signal Receiver PCB

- | | |
|--------------|--------------------------------|
| 1) S29 | Connector for control PCB |
| 2) SW1 (S1W) | Forced operation ON/OFF button |

PCB (3): Buzzer PCB

- | | |
|---------------|-----------------------------|
| 1) S27 | Connector for control PCB |
| 2) S38 | Connector for display PCB |
| 3) RTH1 (R1T) | Room temperature thermistor |

PCB (4): Display PCB

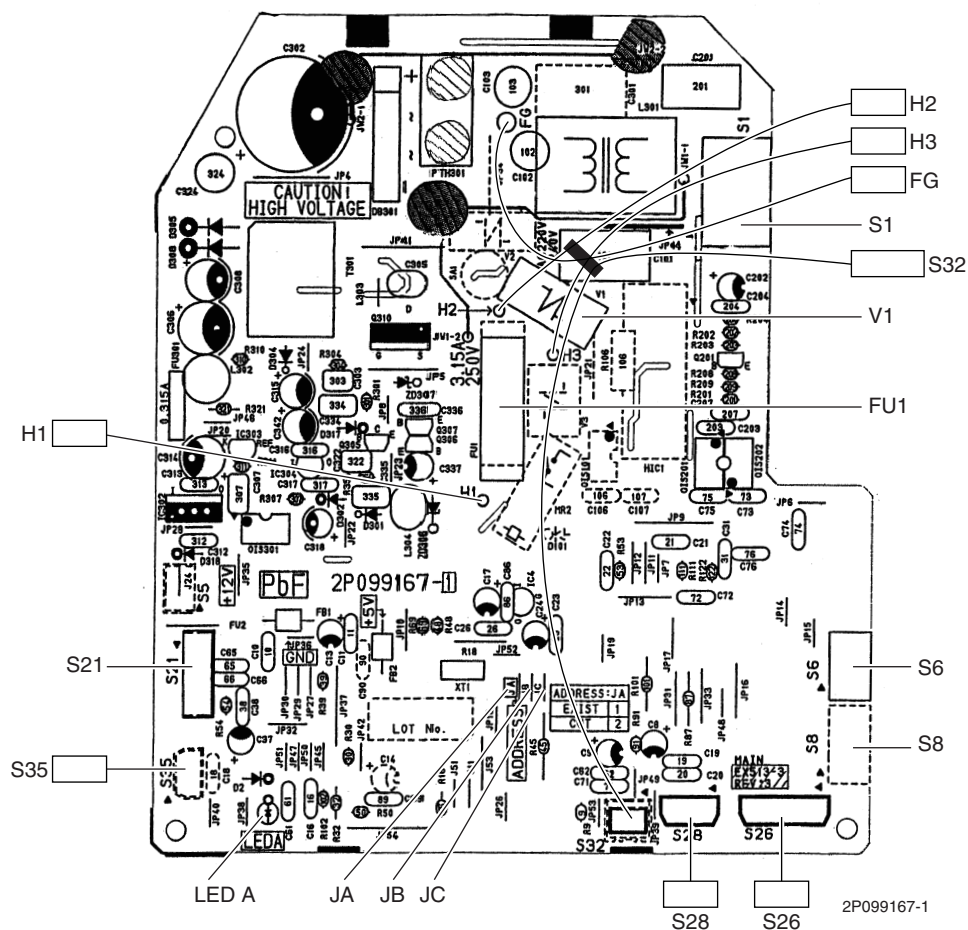
- | | |
|---------------|------------------------------------|
| 1) S37 | Connector for buzzer PCB |
| 2) LED1 (H1P) | LED for operation (green) |
| 3) LED2 (H2P) | LED for timer (yellow) |
| 4) LED3 (H3P) | LED for HOME LEAVE operation (red) |

PCB (5): INTELLIGENT EYE Sensor PCB

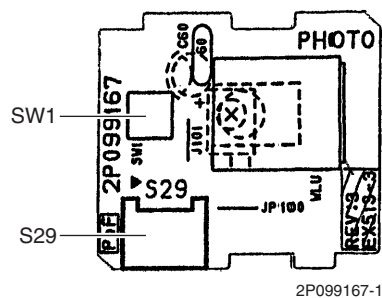
- | | |
|--------|---------------------------|
| 1) S36 | Connector for control PCB |
|--------|---------------------------|

PCB Detail

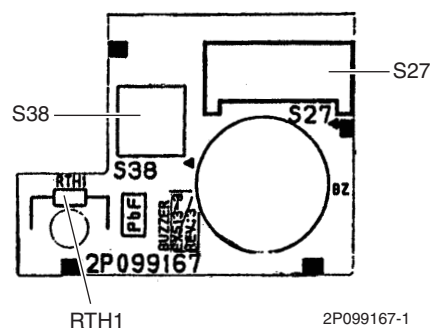
PCB (1): Control PCB



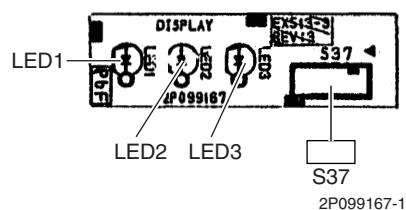
PCB (2): Signal Receiver PCB



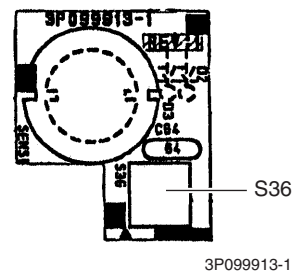
PCB (3): Buzzer PCB



PCB (4): Display PCB



PCB (5): INTELLIGENT EYE Sensor PCB



1.2 Indoor Unit - Slim Duct Built-in System

Connectors and Other Parts

PCB (1): Control PCB

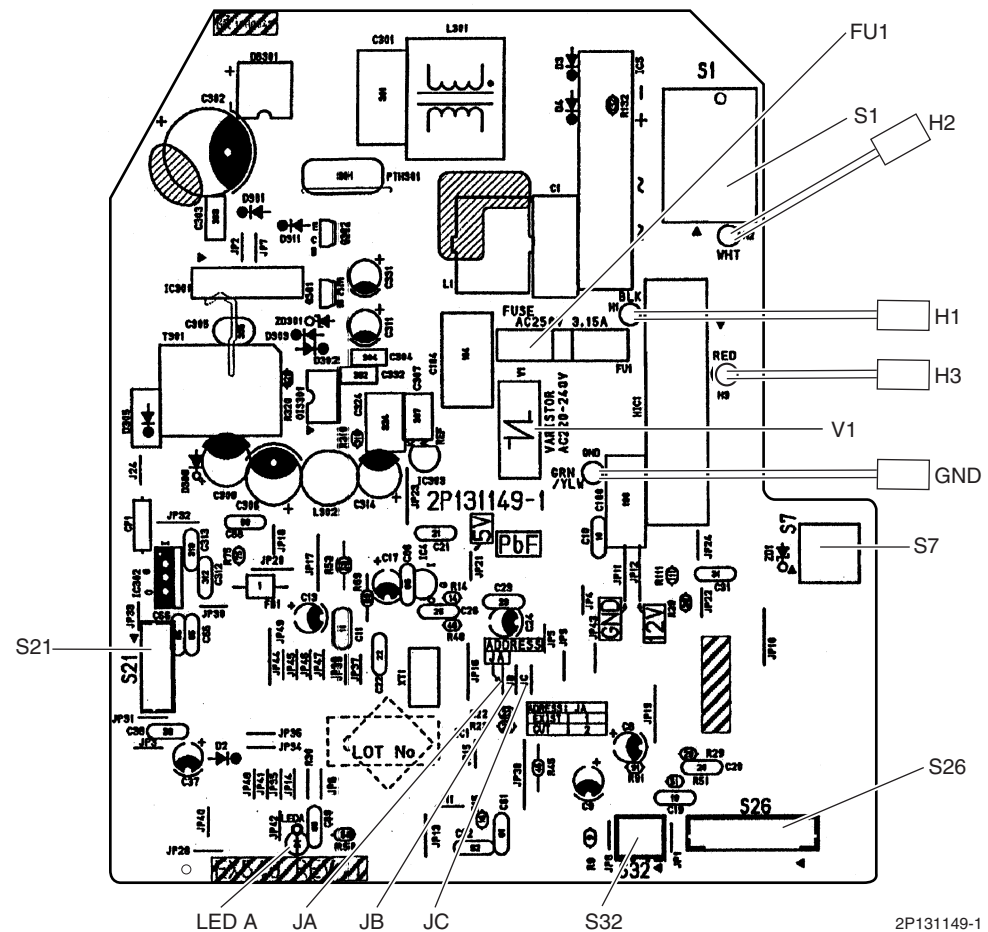
- | | |
|--------------------|--|
| 1) S1 | Connector for fan motor |
| 2) S7 | Connector for fan motor (Hall IC) |
| 3) S21 | Connector for centralized control (HA) |
| 4) S26 | Connector for display PCB |
| 5) S32 | Connector for indoor heat exchanger thermistor |
| 6) H1, H2, H3, GND | Connector for terminal board |
| 7) JA | Address setting jumper |
| JB | Fan speed setting when compressor stops for thermostat OFF |
| JC | Power failure recovery function (auto-restart) |
| | * Refer to page 223 for detail. |
| 8) LED A | LED for service monitor (green) |
| 9) FU1 (F1U) | Fuse (3.15 A, 250 V) |
| 10) V1 (V1TR) | Varistor |

PCB (2): Display PCB

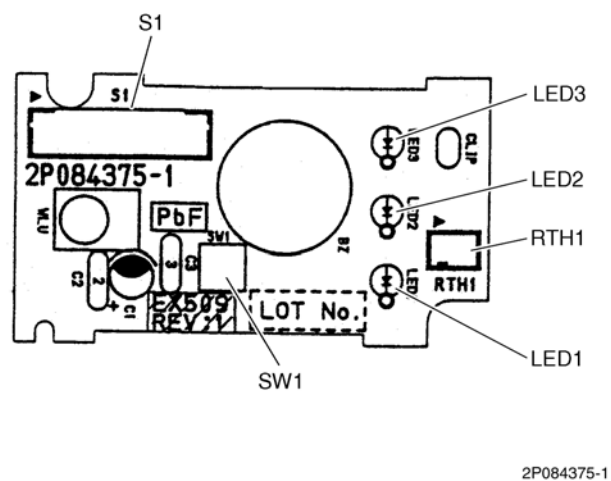
- | | |
|---------------|------------------------------------|
| 1) S1 | Connector for control PCB |
| 2) SW1 (S1W) | Forced operation ON/OFF button |
| 3) LED1 (H1P) | LED for HOME LEAVE operation (red) |
| 4) LED2 (H2P) | LED for timer (yellow) |
| 5) LED3 (H3P) | LED for operation (green) |
| 6) RTH1 (R1T) | Room temperature thermistor |

PCB Detail

PCB (1): Control PCB



PCB (2): Display PCB



1.3 Outdoor Unit - 2MXS18GVJU

Connectors and Other Parts

Main PCB

- | | |
|----------------|--|
| 1) S10 | Connector for MID1 (indoor - outdoor transmission) |
| 2) S15 | Connector for COOL / HEAT mode lock
* Refer to page 221 for detail. |
| 3) S20 (white) | Connector for electronic expansion valve coil A port |
| 4) S21 (red) | Connector for electronic expansion valve coil B port |
| 5) S31, S32 | Connector for SPM |
| 6) S33, S71 | Connector for MID2 (inverter PCB) |
| 7) S40 | Connector for overload protector |
| 8) S51, S101 | Connector for service monitor PCB |
| 9) S80 | Connector for four-way valve coil, defrost solenoid valve coil |
| 10) S90 | Connector for thermistors
(outdoor temperature, outdoor heat exchanger, discharge pipe) |
| 11) S91 | Connector for fin thermistor |
| 12) S92 | Connector for gas pipe thermistor |
| 13) S93 | Connector for liquid pipe thermistor |
| 14) AC1, AC2 | Connector for MID1 (power supply) |
| 15) E | Connector for ground |
| 16) H1, H2 | Connector for diode bridge |
| 17) FU2 | Fuse (3.15 A, 250 V) |
| 18) V2, V5 | Varistor |

Service Monitor PCB

- | | |
|-------------------------------|--|
| 1) S52, S102 | Connector for main PCB |
| 2) LED A (H1P) | LED for service monitor (green) |
| 3) LED1 - LED4
(H2P - H5P) | LED for service monitor (red) |
| 4) SW1 (S1W) | Forced operation ON/OFF switch
* Refer to page 59 for detail. |
| 5) SW2 (S2W) | Operation mode switch
* Refer to page 59 for detail. |
| 6) SW3 (S3W) | Wiring error check switch
* Refer to page 219 for detail. |
| 7) SW4 (S4W) | Priority room setting switch
* Refer to page 221 for detail. |
| 8) SW5 (S5W) | NIGHT QUIET mode setting switch
* Refer to page 222 for detail. |

MID1

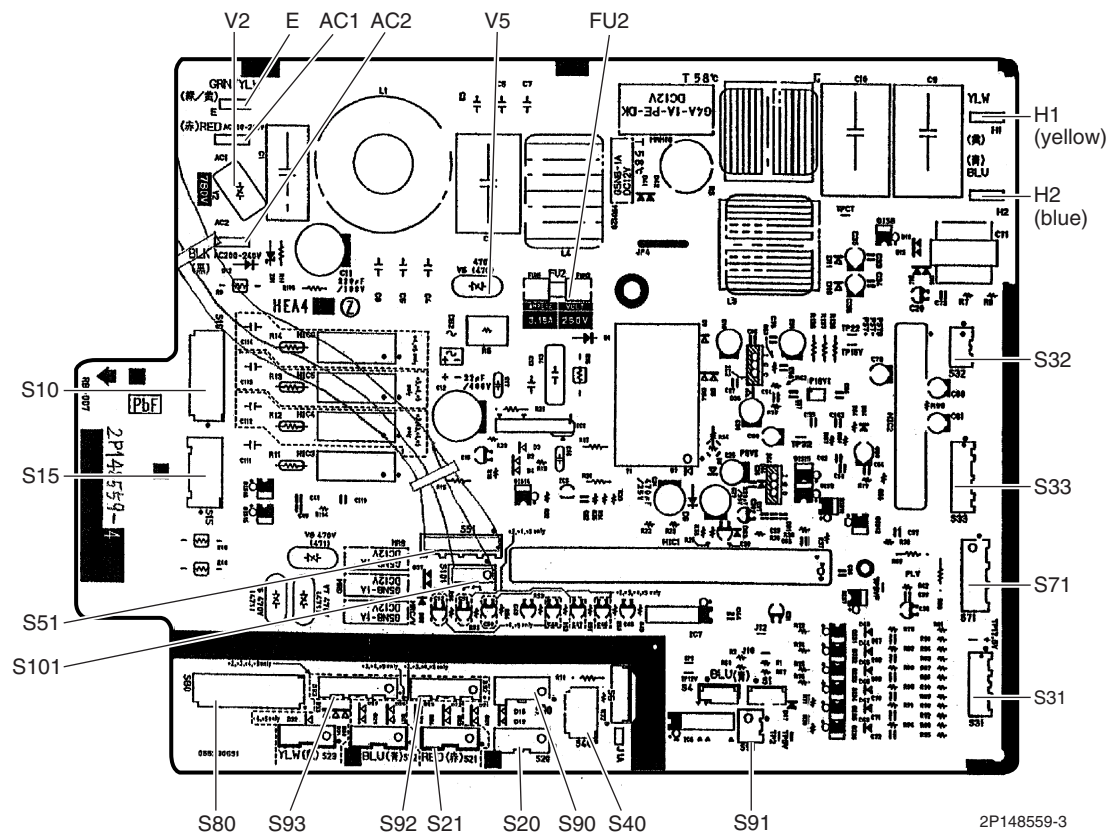
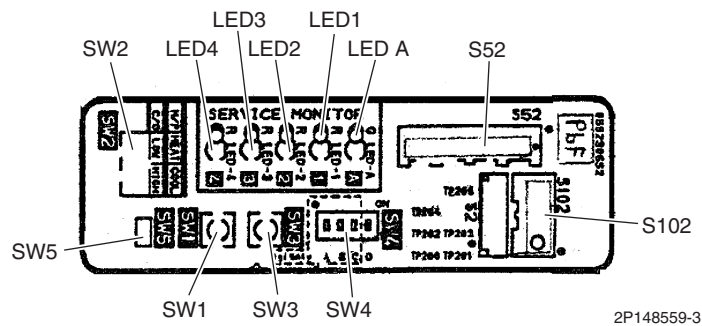
- | | |
|----------------|------------------------|
| 1) S11, HL, HN | Connector for main PCB |
| 2) HE | Connector for ground |
| 3) FU1 | Fuse (30 A, 250 V) |
| 4) V3 | Varistor |

MID2 (Inverter PCB)

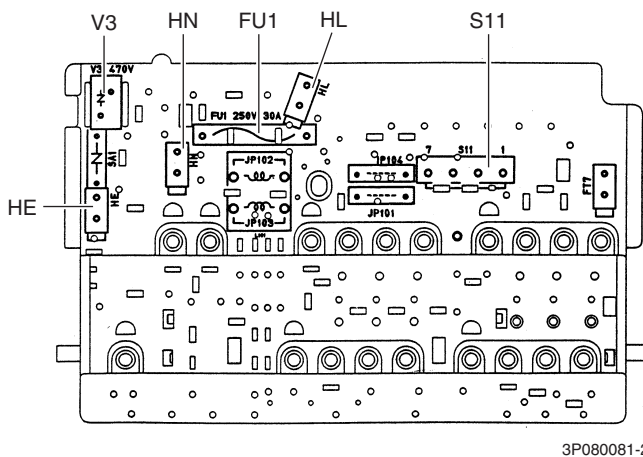
- | | |
|---------------|---------------------------------|
| 1) S34, S72 | Connector for main PCB |
| 2) S70 | Connector for outdoor fan motor |
| 3) FU201 | Fuse (3.15 A, 250 V) |
| 4) W, V, U, N | Connector for compressor |

SPM

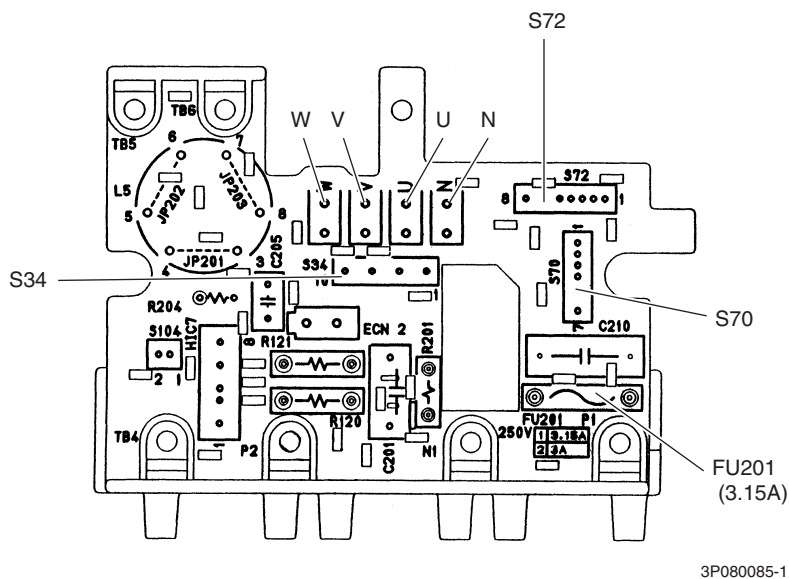
- | | |
|---------------|------------------------|
| 1) CN11, CN14 | Connector for main PCB |
| 2) L1, L2 | Connector for reactor |

PCB Detail**Main PCB****Service Monitor PCB**

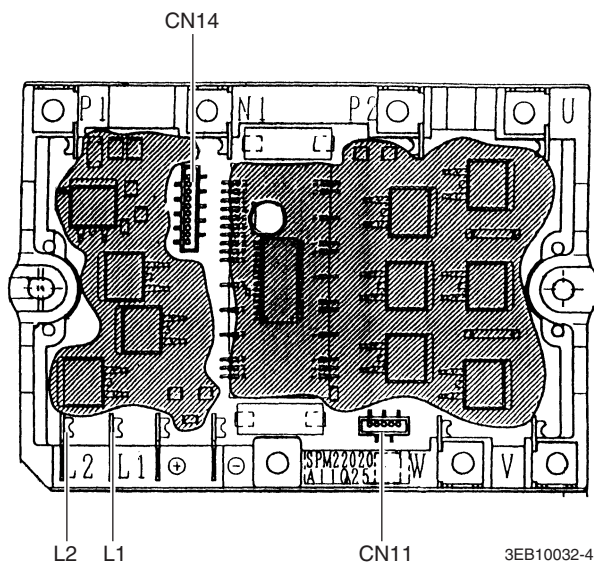
MID1



MID2 (Inverter PCB)



SPM



1.4 Outdoor Unit - 3MXS24JVJU, 4MXS32GVJU

Connectors and Other Parts

PCB (1): Main PCB

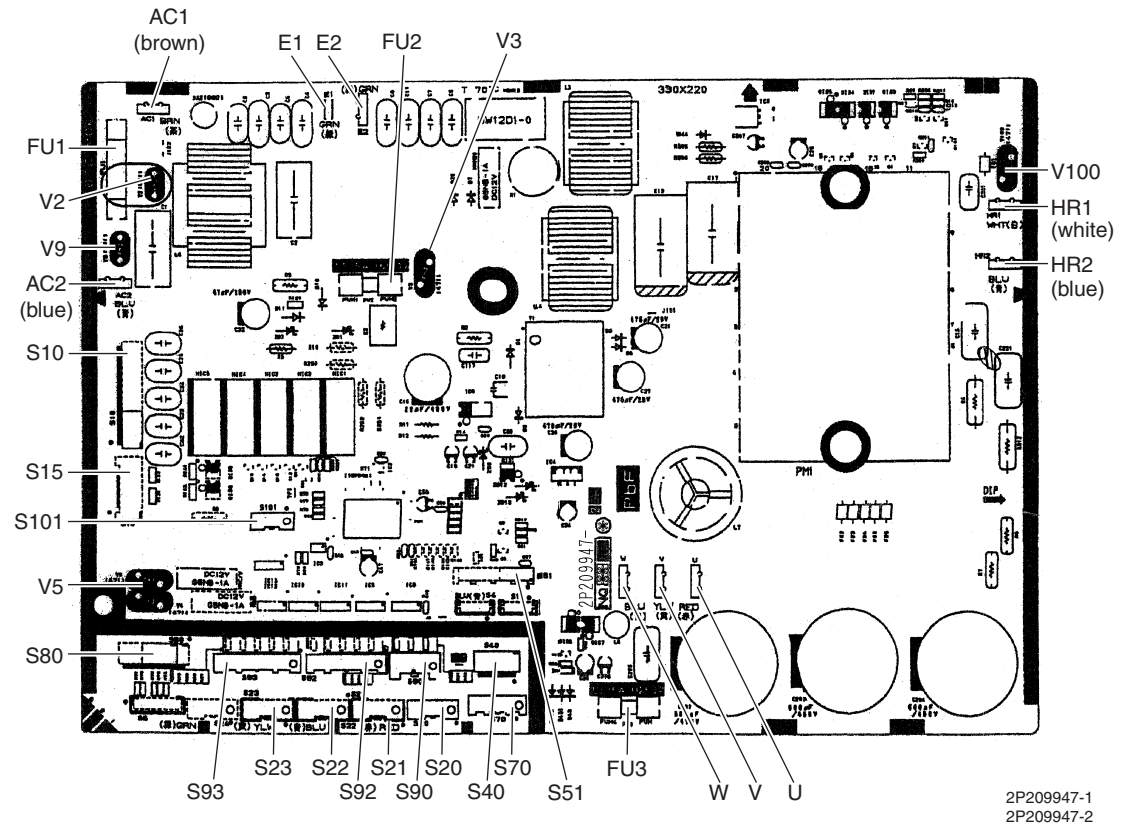
- | | |
|--------------------------|--|
| 1) S10 | Connector for terminal board (indoor - outdoor transmission) |
| 2) S15 | Connector for COOL / HEAT mode lock
* Refer to page 221 for detail. |
| 3) S20 (white) | Connector for electronic expansion valve coil A port |
| 4) S21 (red) | Connector for electronic expansion valve coil B port |
| 5) S22 (blue) | Connector for electronic expansion valve coil C port |
| 6) S23 (yellow) | Connector for electronic expansion valve coil D port (32 class) |
| 7) S40 | Connector for overload protector |
| 8) S51, S101 | Connector for service monitor PCB |
| 9) S70 | Connector for outdoor fan motor |
| 10) S80 | Connector for four-way valve coil |
| 11) S90 | Connector for thermistors
(outdoor temperature, outdoor heat exchanger, discharge pipe) |
| 12) S92 | Connector for gas pipe thermistor |
| 13) S93 | Connector for liquid pipe thermistor |
| 14) AC1, AC2 | Connector for terminal board (power supply) |
| 15) HR1, HR2 | Connector for reactor |
| 16) E1, E2 | Connector for ground |
| 17) U, V, W | Connector for compressor |
| 18) FU1 | Fuse (30 A, 250 V) |
| 19) FU2, FU3 | Fuse (3.15 A, 250 V) |
| 20) V2, V3, V5, V9, V100 | Varistor |

PCB (2): Service Monitor PCB

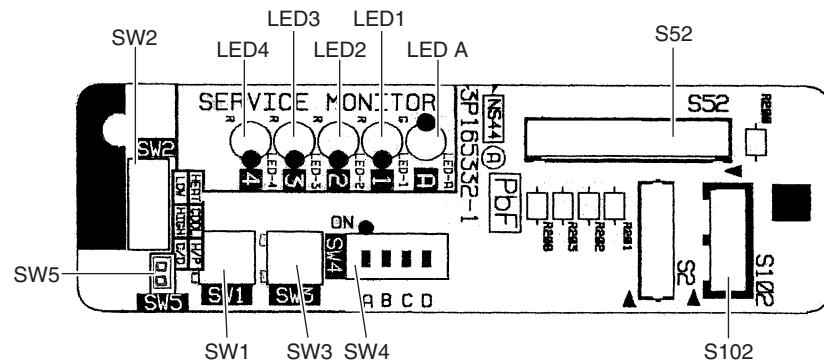
- | | |
|----------------|--|
| 1) S52, S102 | Connector for main PCB |
| 2) LED A | LED for service monitor (green) |
| 3) LED1 - LED4 | LED for service monitor (red) |
| 4) SW1 | Forced operation ON/OFF switch
* Refer to page 59 for detail. |
| 5) SW2 | Operation mode switch
* Refer to page 59 for detail. |
| 6) SW3 | Wiring error check switch
* Refer to page 219 for detail. |
| 7) SW4 | Priority room setting switch
* Refer to page 221 for detail. |
| 8) SW5 | NIGHT QUIET mode setting switch
* Refer to page 222 for detail. |

PCB Detail

PCB (1): Main PCB



PCB (2): Service Monitor PCB



Part 4

Function and Control

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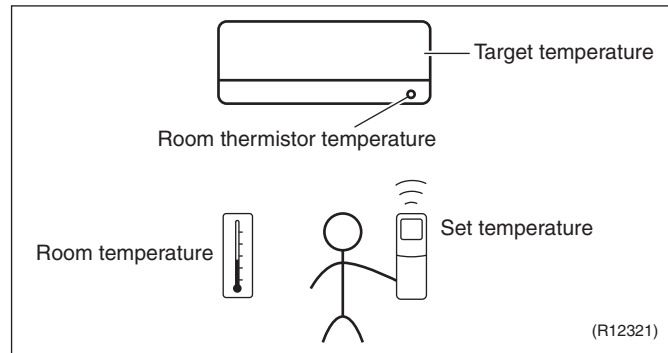
1. Main Functions

1.1 Temperature Control

Definitions of Temperatures

The definitions of temperatures are classified as following.

- ◆ Room temperature: temperature of the lower part of the room
- ◆ Set temperature: temperature set by remote controller
- ◆ Room thermistor temperature: temperature detected by room temperature thermistor
- ◆ Target temperature: temperature determined by microcomputer



★ The illustration is for wall mounted type as representative.

Temperature Control

The temperature of the room is detected by the room temperature thermistor. However, there is a difference between the “temperature detected by room temperature thermistor” and the “temperature of lower part of the room”, depending on the type of the indoor unit or installation condition. Practically, the temperature control is done by the “target temperature appropriately adjusted for the indoor unit” and the “temperature detected by room temperature thermistor”.

1.2 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 thermistor temperature and the target temperature

Additional Control Parameters

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

- Frequency restrictions
- Initial settings
- Forced cooling operation

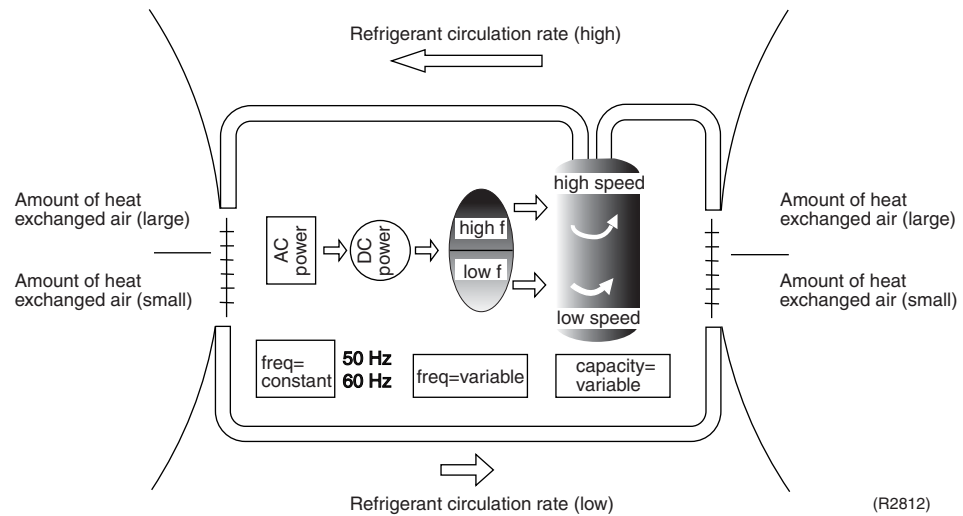
Inverter Principle

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

Drawing of Inverter

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



(R2812)

Inverter Features

The inverter provides the following features:

- The regulating capacity can be changed according to the changes in the outdoor temperature and cooling / heating load.
- Quick heating and quick cooling
The compressor rotational speed is increased when starting the heating (or cooling). This ensures reaching the set temperature quickly.
- Even during extremely cold weather, the high capacity is achieved and maintained even when the outdoor temperature is 2°C (36°F).
- Comfortable air conditioning
A fine adjustment is integrated to keep the room temperature constant.
- Energy-saving heating and cooling
Once the set temperature is reached, the energy saving operation enables to maintain the room temperature at low power.

Frequency Limits

The following functions regulate the minimum and maximum frequency:

Frequency	Functions
Low	<ul style="list-style-type: none"> ■ Four-way valve operation compensation. Refer to page 47.
High	<ul style="list-style-type: none"> ■ Compressor protection function. Refer to page 48. ■ Discharge pipe temperature control. Refer to page 49. ■ Input current control. Refer to page 49. ■ Freeze-up protection control. Refer to page 50. ■ Heating peak-cut control. Refer to page 50. ■ Defrost control. Refer to page 52.

Forced Cooling Operation

Refer to "Forced operation mode" on page 59 for detail.

1.3 Airflow Direction Control (Duct-Free System)

Power-Airflow Dual Louvers

The large louvers send a large volume of air downward to the floor, providing optimum control in cooling, dry, and heating mode.

Cooling / Dry Mode

During cooling or dry mode, the louver retracts into the indoor unit. Then, cool air can be blown far and distributed all over the room.

Heating Mode

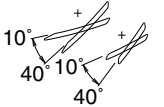
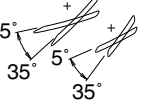
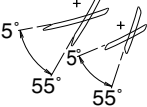
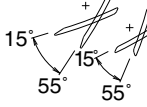
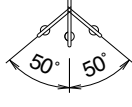
During heating mode, the large louver directs airflow downward to spread the warm air to the entire room.

Wide-Angle Fins

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

Auto-Swing

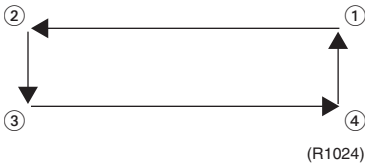
The following table explains the auto-swing process for cooling, dry, fan, and heating:

Vertical Swing (up and down)				Horizontal Swing (right and left)
Cooling	Dry	Fan	Heating	
 (R2814)	 (R281)	 (R281)	 (R2813)	 (R28)

3-D Airflow

Alternative repetition of vertical and horizontal swing motions enables uniform airconditioning 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 becomes 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 from the front side of the indoor unit.



1.4 Fan Speed Control for Indoor Units

Outline



Phase control and fan speed control contains 9 steps: LLL, LL, SL, L, ML, M, MH, H, and HH. The airflow rate can be automatically controlled depending on the difference between the room thermistor temperature and the target temperature. This is done through phase control and Hall IC control.




For more information about Hall IC, refer to the troubleshooting for fan motor on page 106, 107.

Automatic Fan Speed Control

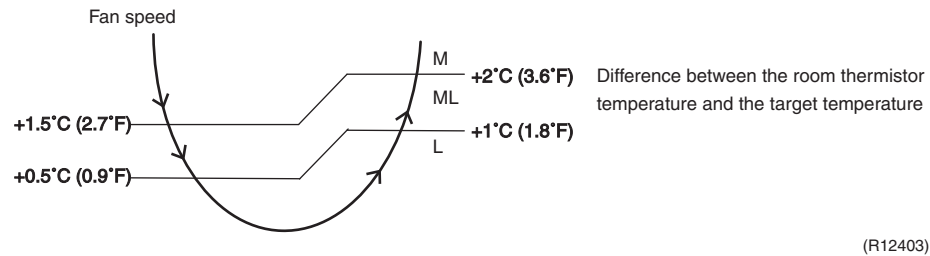
In automatic fan speed operation, the step "SL" is not available.

Step	Cooling	Heating	Dry
LLL	 (R6833)	 (R6833)	750 - 1000 rpm (During POWERFUL operation : 1050 rpm)
LL			
SL			
L			
ML			
M			
MH			
H			
HH (POWERFUL)			

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

<Cooling>

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



<Heating>

In heating mode, the fan speed is regulated according to the indoor heat exchanger temperature and the difference between the room thermistor temperature and the target temperature.



- Note:**
1. During POWERFUL operation, fan rotates at H tap + 50 ~ 90 rpm.
 2. Fan stops during defrost operation.

1.5 Program Dry Operation

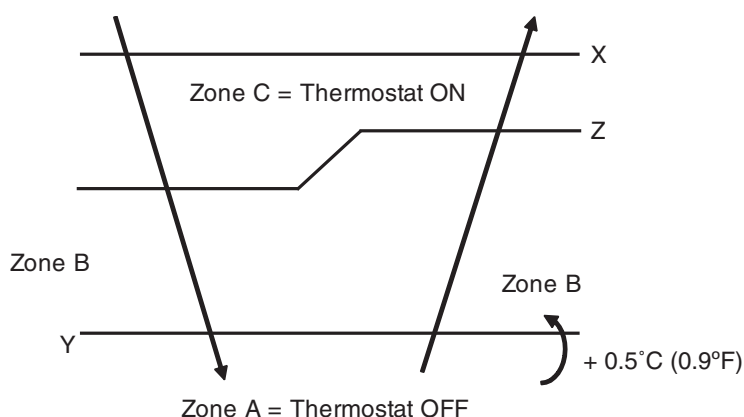
Outline

Program dry operation removes humidity while preventing the room temperature from lowering. Since the microcomputer controls both the temperature and airflow rate, the temperature adjustment and fan adjustment buttons are inoperable in this mode.

Detail

The microcomputer automatically sets the temperature and airflow rate. The difference between the room thermistor temperature at start-up and the target temperature is divided into two zones. Then, the unit operates in dry mode with an appropriate capacity for each zone to maintain the temperature and humidity at a comfortable level.

Room thermistor temperature at start-up	Target temperature X	Thermostat OFF point Y	Thermostat ON point Z
24°C (75°F) or more	Room thermistor temperature at start-up	$X - 2.5^{\circ}\text{C} (-4.5^{\circ}\text{F})$	$X - 0.5^{\circ}\text{C} (-0.9^{\circ}\text{F})$ or $Y + 0.5^{\circ}\text{C} (0.9^{\circ}\text{F})$ (zone B) continues for 10 min.
23.5°C (74°F) ↓ 18°C (64°F)		$X - 2.0^{\circ}\text{C} (-3.6^{\circ}\text{F})$	$X - 0.5^{\circ}\text{C} (-0.9^{\circ}\text{F})$ or $Y + 0.5^{\circ}\text{C} (0.9^{\circ}\text{F})$ (zone B) continues for 10 min.
17.5°C (63°F) ↓		$X - 2.0^{\circ}\text{C} (-3.6^{\circ}\text{F})$	$X - 0.5^{\circ}\text{C} (-0.9^{\circ}\text{F}) = 17.5^{\circ}\text{C} (63^{\circ}\text{F})$ or $Y + 0.5^{\circ}\text{C} (0.9^{\circ}\text{F})$ (zone B) continues for 10 min.



(R11587)

1.6 Automatic Operation

Outline

Automatic Cooling / Heating Function

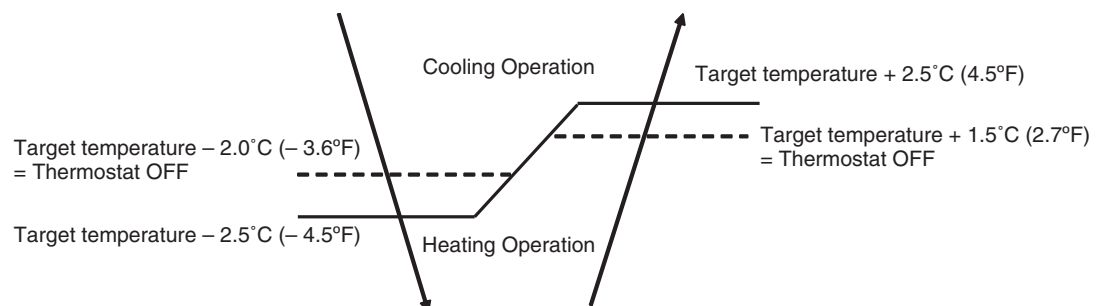
When the AUTO mode is selected with the remote controller, the microcomputer automatically determines the operation mode as cooling or heating according to the room temperature and the set temperature at start-up, and automatically operates in that mode.

The unit automatically switches the operation mode to maintain the room temperature at the set temperature.

Details

Ts: Set temperature (set by remote controller)
 Tt: target temperature (determined by microcomputer)
 Tr: room thermistor temperature (detected by room temperature thermistor)
 C: correction value

1. The set temperature (Ts) determines the target temperature (Tt).
 (Ts = 18 ~ 30°C, 64 ~ 86°F).
2. The target temperature (Tt) is calculated as;
 $Tt = Ts + C$
 where C is the correction value.
 C = 0°C (0°F): Cooling operation
 C = 2°C (3.6°F): Heating operation
3. Thermostat ON/OFF point and mode switching point are as follows.
 Tr means the room thermistor temperature.
 - ① Heating → Cooling switching point:
 $Tr \geq Tt + 2.5^\circ\text{C} (4.5^\circ\text{F})$
 - ② Cooling → Heating switching point:
 $Tr < Tt - 2.5^\circ\text{C} (4.5^\circ\text{F})$
 - ③ Thermostat ON/OFF point is the same as the ON/OFF point of cooling or heating operation.
4. During initial operation
 $Tr \geq Ts$: Cooling operation
 $Tr < Ts$: Heating operation



(R11722)

Ex: When the target temperature is 25°C (77°F)

Cooling → 23°C (73.4°F): Thermostat OFF → 22°C (72°F): Switch to heating

Heating → 26.5°C (79.7°F): Thermostat OFF → 27.5°C (81.5°F): Switch to cooling

1.7 Thermostat Control

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

Thermostat OFF Condition

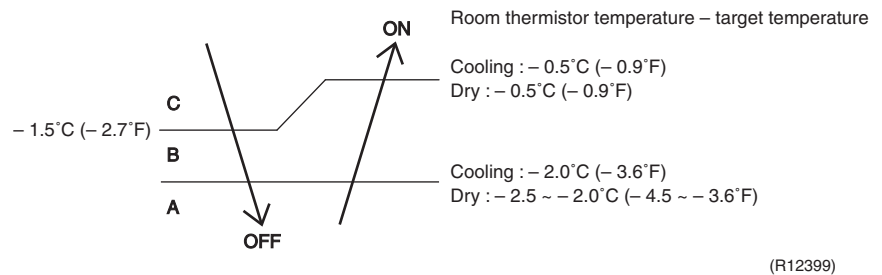
- ◆ The temperature difference is in zone A.

Thermostat ON Condition

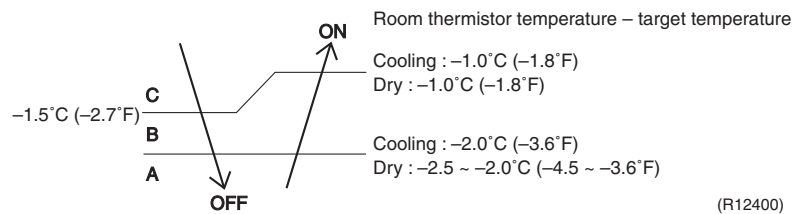
- ◆ The temperature difference returns to zone C after being in zone A.
- ◆ The system resumes from defrost control in any zone except A.
- ◆ The operation turns on in any zone except A.
- ◆ The monitoring time has passed while the temperature difference is in zone B.
(Cooling / Dry : 10 minutes, Heating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

Cooling / Dry

- ◆ Duct-Free System

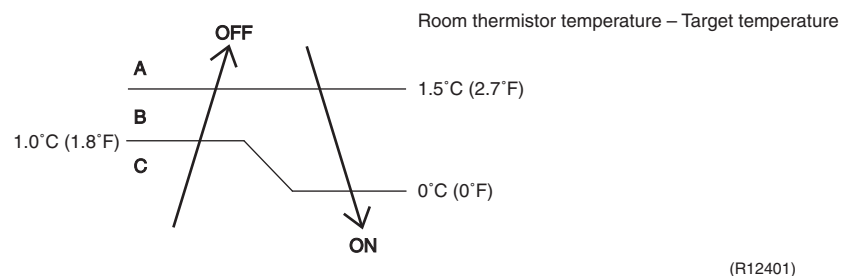


- ◆ Slim Duct Built-in System

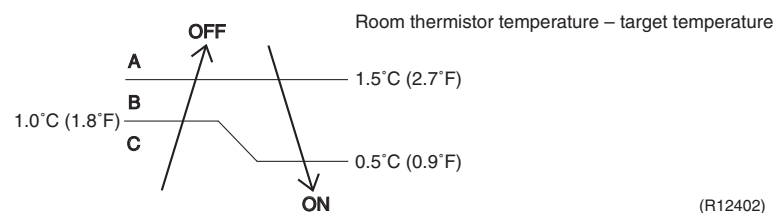


Heating

- ◆ Duct-Free System



- ◆ Slim Duct Built-in System



Refer to “Temperature Control” on page 29 for detail.

1.8 NIGHT SET Mode

Outline

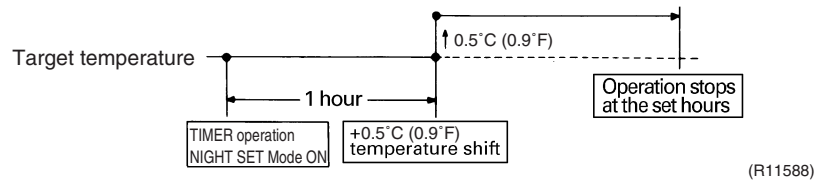
When the OFF timer is set, the NIGHT SET Mode is automatically activated. The NIGHT SET Mode keeps the airflow rate setting.

Detail

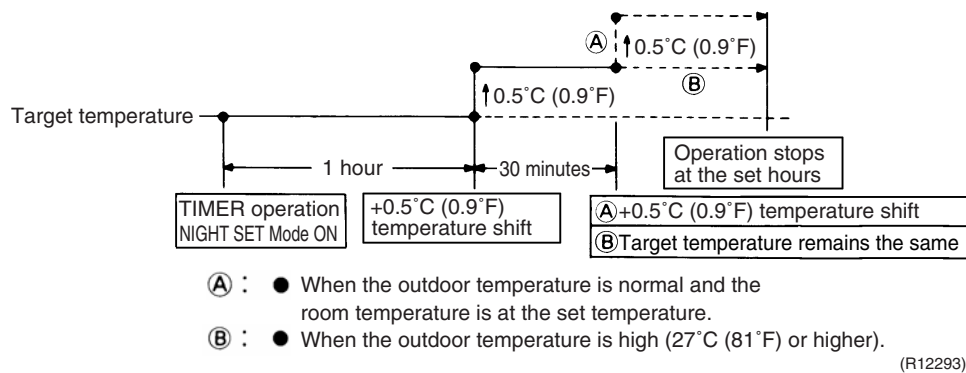
The NIGHT SET Mode continues operation at the target temperature for the first one hour, then automatically raises the target temperature slightly in the case of cooling, or lowers it slightly in the case of heating. This prevents excessive cooling in summer and excessive heating in winter to ensure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

Cooling

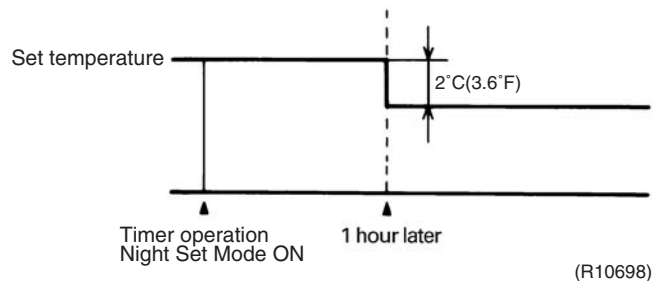
◆ Duct-Free System



◆ Slim Duct Built-in System



Heating



1.9 HOME LEAVE Operation

Outline

HOME LEAVE operation is a function that allows you to record your favorite set temperature and airflow rate. You can start your favorite operation mode simply by pressing the [HOME LEAVE] button on the remote controller.

Detail

1. Start of Function

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

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

2. Details of Function

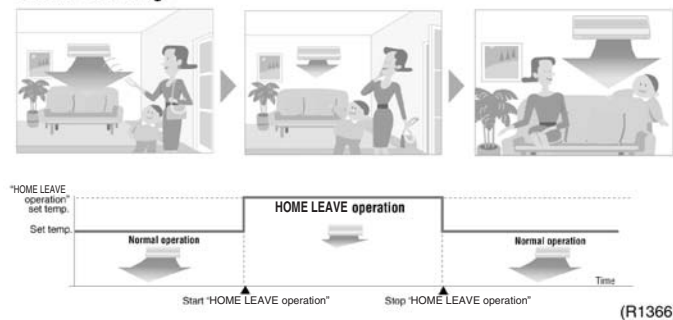
A mark representing HOME LEAVE is indicated on the display of the remote controller. The indoor unit is operated according to the set temperature and airflow rate for HOME LEAVE which were pre-set in the memory of the remote controller.

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

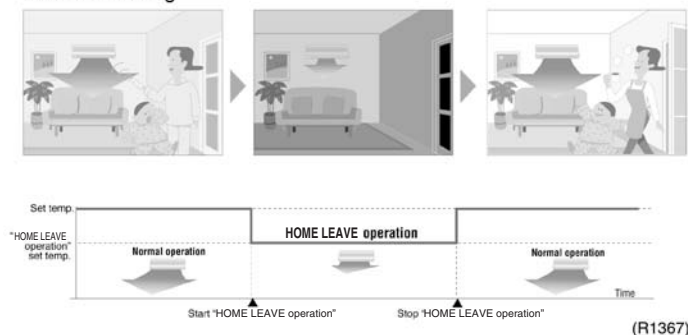
3. End of Function

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

Scene <cooling>



Scene <Heating>



Others

The set temperature and airflow rate are memorized in the remote controller. When the remote controller is reset due to replacement of battery, it is necessary to set the temperature and airflow rate again for HOME LEAVE operation.

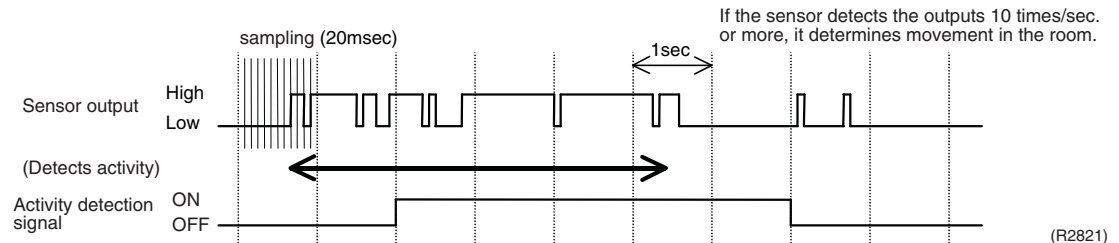
1.10 INTELLIGENT EYE Operation

Outline

This is the function that detects existence of humans in the room by a human motion sensor (INTELLIGENT EYE) and reduces the capacity when there is nobody in the room in order to save electricity.

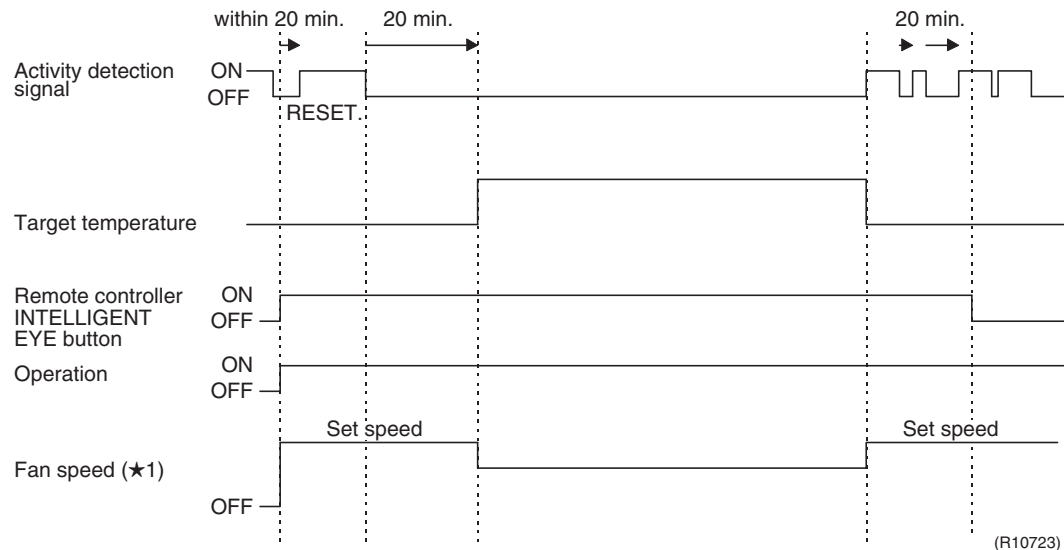
Detail

1. Detection method by INTELLIGENT EYE



- This sensor detects motion by receiving infrared rays and displays the pulse wave output.
- A microcomputer in the indoor unit carries out a sampling every 20 msec. and if it detects 10 cycles of the wave in one second in total (corresponding to 20 msec. x 10 = 200 msec.), it detects activity in the room and the motion signal is ON.

2. The motions (for example: in cooling)



- When the microcomputer does not have a signal from the sensor in 20 minutes, it determines no activity in the room and operates the unit within temperature shifted from the target temperature. (Cooling : 2°C (3.6°F) higher, Dry : 1°C (1.8°F) higher, Heating : 2°C (3.6°F) lower, Auto : according to the operation mode at that time.)

★1 In case of FAN mode, the fan speed reduces by 50 rpm.

Others

- For dry operation, you cannot set the temperature with a remote controller, but internally the target temperature is shifted by 1°C (1.8°F) (depending on the model).

1.11 Inverter POWERFUL Operation

Outline

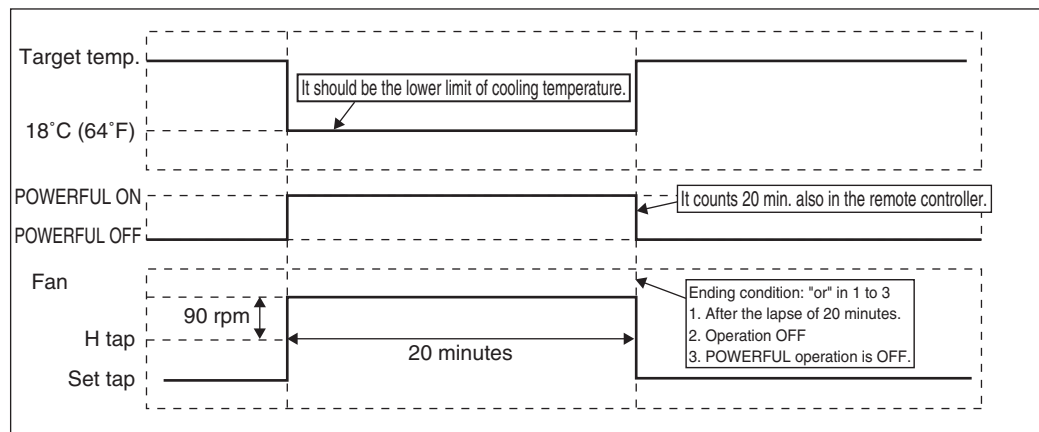
In order to maximize the benefits of the cooling and heating capacity, operate the air conditioner by increasing the indoor fan rotating speed and the compressor frequency.

Detail

When POWERFUL button is pressed, the fan speed and target temperature are converted to the following states for 20 minutes.

Operation mode	Fan speed	Target temperature
COOL	H tap + 90 rpm	18°C (64°F)
DRY	Dry rotating speed + 50 rpm	Lowered by 2°C (3.6°F)
HEAT	H tap + 90 rpm	30°C (86°F)
FAN	H tap + 90 rpm	—
AUTO	Same as cooling / heating in POWERFUL operation	The target temperature is kept unchanged.

Ex.) : POWERFUL operation in cooling mode.



(R12294)

1.12 Other Functions

1.12.1 Hot-Start Function

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

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

1.12.2 Signal Receiving Sign

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

1.12.3 Indoor Unit ON/OFF Button

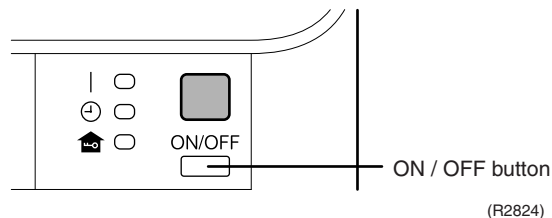
An ON/OFF button is provided on the display of the unit.

- Press this button once to start operation. Press once again to stop it.
- This button is useful when the remote controller is missing or the battery has run out.
- The operation mode refers to the following table.

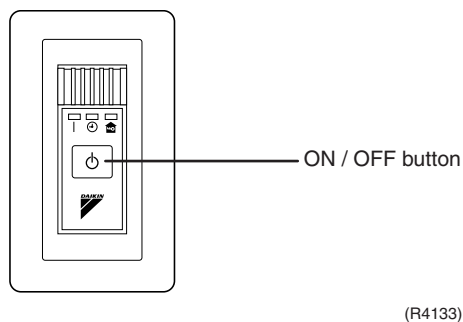
Mode	Temperature setting	Airflow rate
AUTO	25°C (77°F)	Automatic

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

Duct-Free System



Slim Duct Built-in System



<Forced operation mode>

Forced operation mode can be started by pressing the ON/OFF button for 5 to 9 seconds while the unit is not operating.

Refer to "Forced operation mode" on page 59 for detail.



Note: When the ON/OFF button is pressed for 10 seconds or more, the forced operation is stopped.

1.12.4 Air-Purifying Filter with Photocatalytic Deodorizing Function

Duct-Free System Only

This filter incorporates the benefits of a 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 odors and eliminate bacteria and viruses even in large living rooms. The filter can be used for approximately 3 years if periodic maintenance is performed.

1.12.5 Auto-restart Function

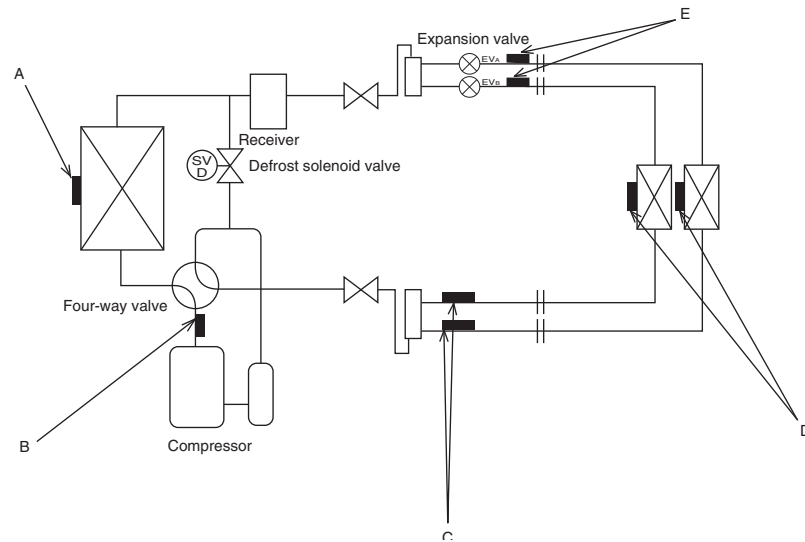
Even if a power failure (including one for just a moment) occurs during the operation, the operation restarts automatically when the power is restored in the same condition as before the power failure.



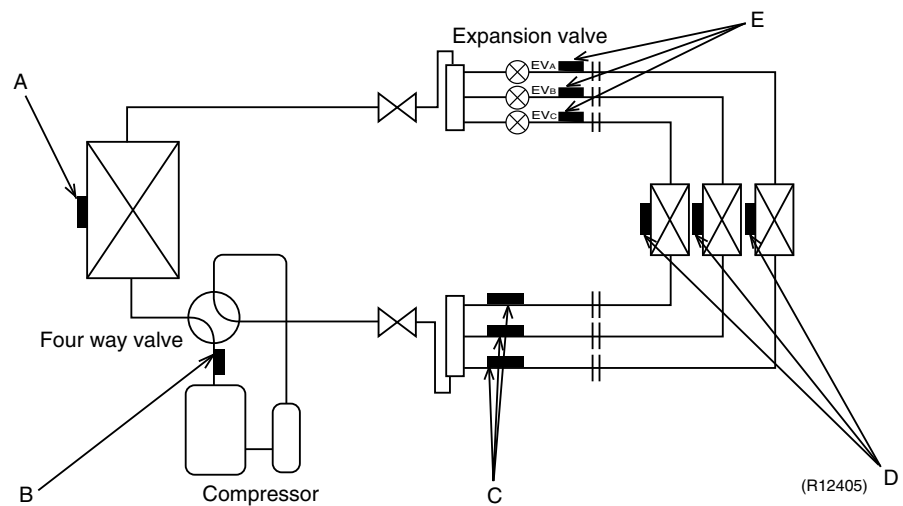
Note: It takes 3 minutes to restart the operation because the 3-minute standby function is activated.

2. Function of Thermistor

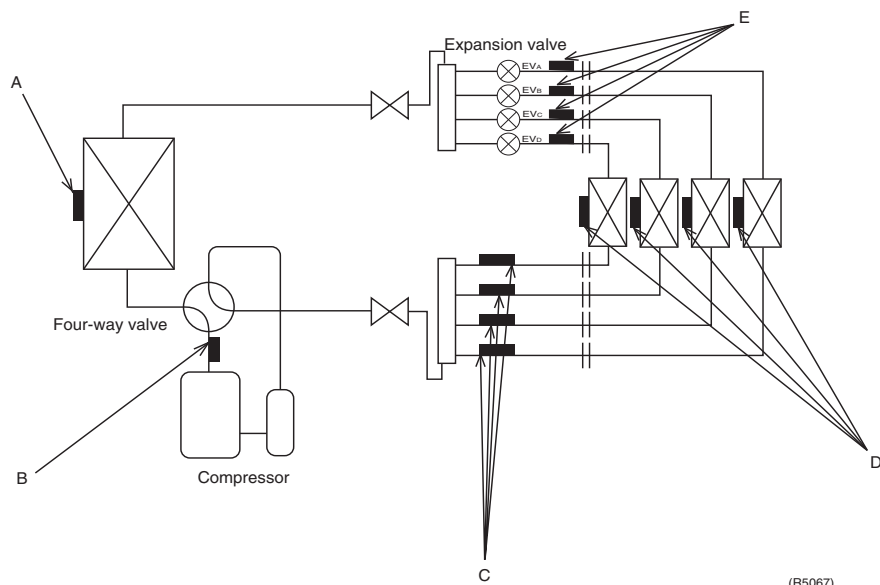
<2MXS18GVJU>



<3MXS24JVJU>



<4MXS32GVJU>



A Outdoor Heat Exchanger Thermistor

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

B Discharge Pipe Thermistor

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

C Gas Pipe Thermistor

1. In cooling operation, the gas pipe thermistor is used for gas pipe isothermal control. The system controls electronic expansion valve opening so that the gas pipe temperature in each room becomes equal.

D Indoor Heat Exchanger Thermistor

1. The indoor heat exchanger thermistor is used for controlling target discharge pipe temperature. The system sets the target discharge pipe temperature according to the outdoor and indoor heat exchanger temperature, and controls the electronic expansion valve opening so that the target discharge pipe temperature can be obtained.
2. In cooling operation, the indoor heat exchanger thermistor is used for freeze-up protection control. If the indoor heat exchanger temperature drops abnormally, the operating frequency becomes lower or the operation halts.
3. In cooling operation, the indoor heat exchanger thermistor is used for anti-icing function. If any of the following conditions are met in the room where operation halts, it is assumed as icing. The conditions are

$$T_c \leq -1^{\circ}\text{C} (-30^{\circ}\text{F})$$

$$T_r - T_c \geq 10^{\circ}\text{C} (18^{\circ}\text{F})$$
 where T_r is the room thermistor temperature and T_c is the indoor heat exchanger temperature.
4. In heating operation, the indoor heat exchanger thermistor is used for heating peak-cut control. If the indoor heat exchanger temperature rises abnormally, the operating frequency becomes lower or the operation halts.
5. In heating operation, the indoor heat exchanger thermistor is used for detecting disconnection of the discharge pipe thermistor. When the discharge pipe temperature becomes lower than the maximum indoor heat exchanger temperature, the discharge pipe thermistor is judged as disconnected.
6. When only one indoor unit is operating, the indoor heat exchanger thermistor is used for subcooling control. The actual subcool is calculated with the liquid pipe temperature and the indoor heat exchanger temperature. The system controls the electronic expansion valve openings to obtain the target subcool.
7. The indoor heat exchanger thermistor is used for wiring error check function. The refrigerant flows in order from port A to detect the indoor heat exchanger temperature one by one, and then wiring and piping can be checked.

E Liquid Pipe Thermistor

1. When only one indoor unit is in heating, the liquid pipe thermistor is used for subcooling control. The actual subcool is calculated with the liquid pipe temperature and the maximum indoor heat exchanger temperature. The system controls the electronic expansion valve openings to obtain the target subcool.
2. In heating operation, the liquid pipe thermistor is used for liquid pipes isothermal control. The system controls electronic expansion valve opening so that the liquid pipe temperatures in each room becomes equal.

3. Control Specification

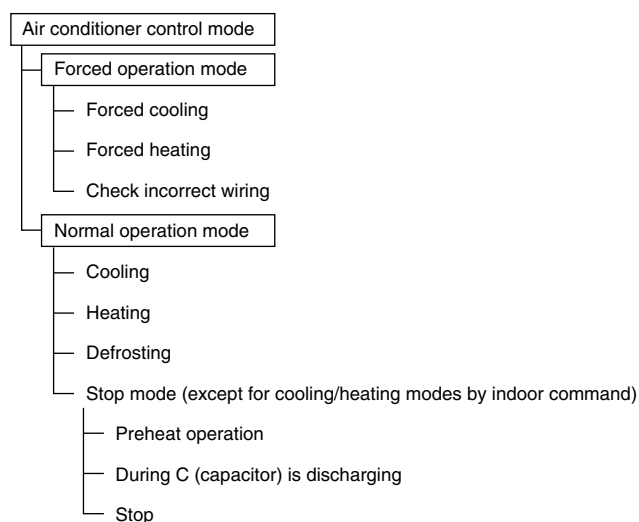
3.1 Mode Hierarchy

Outline

There are two modes; the one is the normal operation mode and the other is the forced operation mode for installation and providing service.

Detail

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



(R1373)



Note:

Unless specified otherwise, dry operation command is regarded as cooling operation. An indoor fan operation is not used with a multiple indoor unit. A forced fan command to the indoor unit from the outdoor unit is made during forced operation.

Determine Operation Mode

The system detects the operation mode command which is set by each room in accordance with the procedure, and determines the operation mode of the system.

The following procedure is taken when the modes conflict with each other.

*1. The system follows the mode which is set first. (First-push, first-set)

*2. For the rooms where the different mode is set, standby mode is activated. (The operation lamp blinks.)

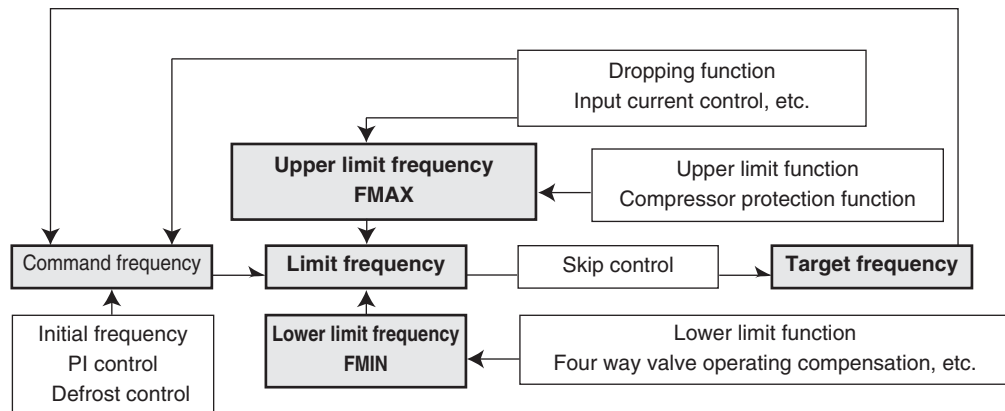
3.2 Frequency Control

Outline

Frequency that corresponds to each room's capacity is determined according to the difference between the target temperature and the thermistor temperature of each room. The function is explained as follows.

1. How to determine frequency
2. Frequency command from an indoor unit (Difference between a room thermistor temperature and the target temperature)
3. Frequency command from an indoor unit (The ranked capacity of the operating room)
4. Frequency initial setting
5. PI control

When the shift of the frequency is less than zero ($DF < 0$) by PI control, the target frequency is used as the command frequency.



(R2831)

Details

How to Determine Frequency

The compressor's frequency is determined by taking the following steps.

1. Determine command frequency

- ◆ Command frequency is determined in the following order of priority.
 1. Limiting defrost control time
 2. Forced cooling / heating
 3. Indoor frequency command

2. Determine upper limit frequency

- ◆ The minimum value is set as the upper limit frequency among the frequency upper limits of the following functions:
Compressor protection, input current, discharge pipe temperature, low Hz high pressure limit, heating peak-cut, freeze-up protection, defrost.

3. Determine lower limit frequency

- ◆ The maximum value is set as the lower limit frequency among the frequency lower limits of the following functions:
Four-way valve operation compensation, draft prevention, 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 thermistor temperature and the target temperature is 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
-2.0°C (-3.6°F)	*Th OFF	0°C (0°F)	4	2.0°C (3.6°F)	8	4.0°C (7.2°F)	C
-1.5°C (-2.7°F)	1	0.5°C (0.9°F)	5	2.5°C (4.5°F)	9	4.5°C (8.1°F)	D
-1.0°C (-1.8°F)	2	1.0°C (1.8°F)	6	3.0°C (5.4°F)	A	5.0°C (9°F)	E
-0.5°C (-0.9°F)	3	1.5°C (2.7°F)	7	3.5°C (6.3°F)	B	5.5°C (9.9°F)	F

Values depend on the type of indoor unit.

*Th OFF = Thermostat OFF

Indoor Unit Capacity (S value)

The capacity of the indoor unit is a "**S**" value and is used for frequency command.

Capacity	S value	Capacity	S value
9 kBtu	25	15 kBtu	50
12 kBtu	35	18 kBtu	60

Frequency Initial Setting**<Outline>**

When starting the compressor, or when conditions are varied due to the change of the operating room, the frequency must be initialized according to the total of a maximum ΔD value of each room and a total value of Q (ΣQ) of the operating room (the room in which the thermos is set to ON).

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

PI Control (Determine Frequency Up / Down by ΔD Signal)**1. P control**

A total of the ΔD value is calculated in each sampling time (20 seconds), and the frequency is adjusted 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, the frequency is adjusted according to the $\Sigma \Delta D$ value.

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

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

3. Limit of frequency variation width

When the difference between input current and input current dropping value is less than 1.5 A, the frequency increase width must be limited.

4. Frequency management when other controls are functioning

- ♦ When each frequency is dropping;
Frequency management is carried out only when the frequency drops.
- ♦ 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 the total of **S** values of a room.

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

3.3 Controls at Mode Changing / Start-up

3.3.1 Preheating Operation

Outline The inverter operation in open phase starts with the conditions of the preheating command from the indoor and outdoor temperatures, and the discharge pipe temperature.

Details

ON Condition

- When the outdoor temperature and the discharge pipe temperature are below 10.5°C (51°F), the inverter operation in open phase starts.

OFF Condition

- When the outdoor temperature or the discharge pipe temperature is higher than 12°C (54°F), the inverter operation in open phase stops.

3.3.2 Four-Way Valve Switching

Outline In heating operation, current is conducted, and in cooling and defrosting, current is not conducted. In order to eliminate the switching sound when heating is stopped, as the four-way valve coil switches from ON to OFF, the OFF delay switch of the four-way valve is carried out after the operation stopped.

Detail

OFF delay switch of four-way valve:

The four-way valve coil is energized for 150 seconds after the operation is stopped.

3.3.3 Four-Way Valve Operation Compensation

Outline At the beginning of the operation as the four-way valve is switched, acquire the differential pressure to activate the four-way valve by having an output frequency which is more than a certain fixed frequency, for a certain fixed time.

Detail

Starting Conditions

- When starting compressor for heating.
- When the operation mode changes from the previous time.
- When starting compressor for defrosting or resetting.
- When starting compressor for the first time after the reset with the power is ON.
Set the lower limit frequency to around Δ Hz for 70 seconds with any of the above conditions

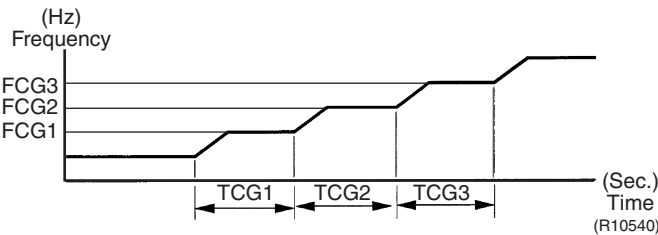
Δ (Hz)	Cooling	Heating
18 class	40	55
24/32 class	28	28

3.3.4 3-Minute Standby

Turning on the compressor is prohibited for 3 minutes after turning off.
(Except when defrosting.)

3.3.5 Compressor Protection Function

When turning the compressor from OFF to ON, the upper limit of frequency is set as follows. (The function is not used when defrosting.)



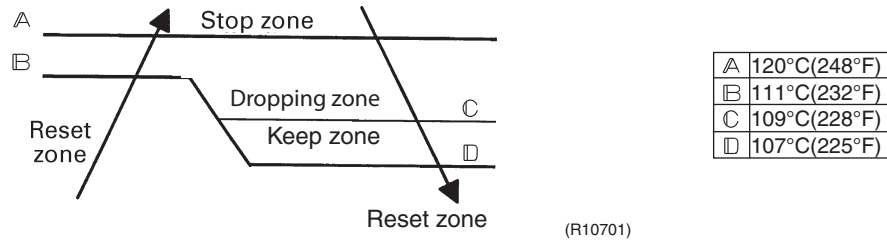
	Value	Unit
FCG 1	55	Hz
FCG 2	65	
FCG 3	80	
TCG 1	120	seconds
TCG 2	200	
TCG 3	470	

3.4 Discharge Pipe Temperature Control

Outline

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

Detail



Zone	Control
Stop zone	When the temperature reaches the stop zone, the compressor stops.
Dropping zone	The timer starts, and the frequency is dropping.
Keep zone	The upper limit of frequency is kept.
Reset zone	The upper limit of frequency is canceled.

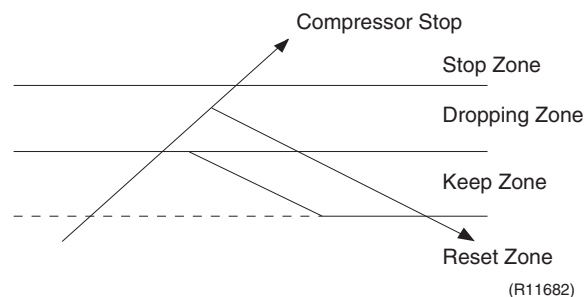
3.5 Input Current Control

Outline

An input current is detected by the CT when the compressor is running, and the frequency upper limit is set from the input current.

In case of heat pump model, this control, which is the upper limit control of the frequency, takes priority over the lower limit control of four-way valve operation compensation.

Detail



Frequency control in each zone

Stop zone

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

Dropping zone

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

Keep zone

- The present maximum frequency goes on.

Reset zone

- Limit of the frequency is canceled.

Limitation of current dropping and stop value according to the outdoor temperature

- The current drops when outdoor temperature becomes higher than a certain level (depending on the model).

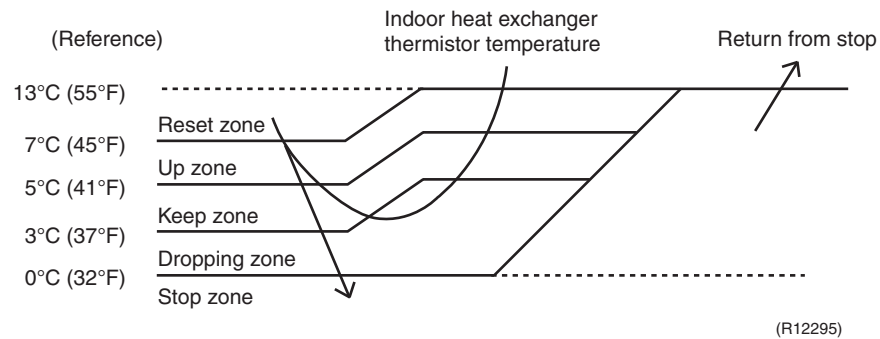
3.6 Freeze-up Protection Control

Outline

During cooling operation, the signals sent from the indoor unit allow the operating frequency limitation and prevent freezing of the indoor heat exchanger. (The signal from the indoor unit is divided into zones.)

Details

The operating frequency limitation is judged with the indoor heat exchanger temperature 2 seconds after operation starts and 30 seconds after the number of operation room is changed.



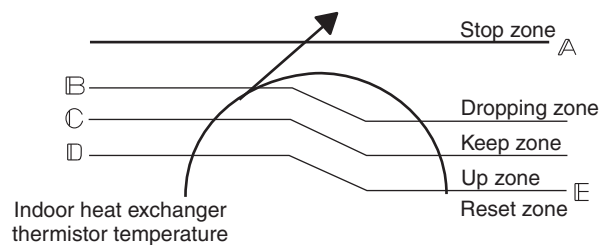
3.7 Heating Peak-cut Control

Outline

During heating operation, the indoor heat exchanger temperature determines the frequency upper limit to prevent abnormal high pressure.

Detail

- The operating frequency is judged with the indoor heat exchanger temperature 2 minutes after the operation starts and (Δ) seconds after the number of operation room is changed.
- The maximum value of the indoor heat exchanger temperature controls the following (excluding stopped rooms).



	Δ
When increase	30
When decrease	2

Zone	Control
Stop zone	When the temperature reaches the stop zone, the compressor stops.
Dropping zone	The timer starts, and the frequency is dropping.
Keep zone	The upper limit of frequency is kept.
Up zone	The upper limit of frequency is increased.
Reset zone	The upper limit of frequency is canceled.

	18 class	24/32 class
A	65°C (149°F)	65°C (149°F)
B	50°C (122°F)	54°C (129°F)
C	48°C (118°F)	53°C (127°F)
D	47.5°C (117.5°F)	51°C (124°F)
E	46.5°C (116°F)	49°C (120°F)

3.8 Outdoor Fan Control

1. Fan OFF delay when stopped

The outdoor fan is turned OFF 60 seconds after the compressor stops.

2. Fan ON control to cool down the electrical box

The outdoor fan is turned ON when the electrical box temperature is high while the compressor is OFF.

3. Fan OFF control while defrosting

The outdoor fan is turned OFF while defrosting.

4. Fan ON/OFF control when operation starts / stops

The outdoor fan is turned ON when the operation starts. The outdoor fan is turned OFF when the operation stops.

5. Fan control during forced operation

The outdoor fan is controlled as well as normal operation during forced operation.

6. Fan speed control during indoor / outdoor quiet operation

The rotation speed of the outdoor fan is reduced by the command of indoor / outdoor quiet operation.

7. Fan control when the number of heating rooms decreases

When the outdoor temperature is more than 10°C (50°F), the fan is turned off for 30 seconds.

8. Fan speed control for pressure difference upkeep

The rotation speed of the outdoor fan is controlled to keep the pressure difference while cooling with low outdoor temperature.

- ◆ When the pressure difference is small, the rotation speed of the outdoor fan is reduced.
- ◆ When the pressure difference is large, the rotation speed of the outdoor fan is increased.

3.9 Liquid Compression Protection Function

Outline

In order to maintain the dependability of the compressor, the compressor is stopped according to the outdoor temperature and temperature of the outdoor heat exchanger.

Detail

- Operation stops depending on the outdoor temperature

Compressor turns off under the conditions that the system is in cooling operation and outdoor temperature is below -12°C (10.4°F).

3.10 Defrost Control

Outline

Defrosting is carried out by the cooling cycle (reverse cycle). The defrosting time or outdoor heat exchanger temperature must be more than a certain value to finish.

Detail

Conditions for Starting Defrost

- The starting conditions are determined with the outdoor temperature and the outdoor heat exchanger temperature.
- The system is in heating operation.
- The compressor operates for 6 minutes.
- More than Δ minutes of accumulated time pass since the start of the operation, or ending the previous defrosting.

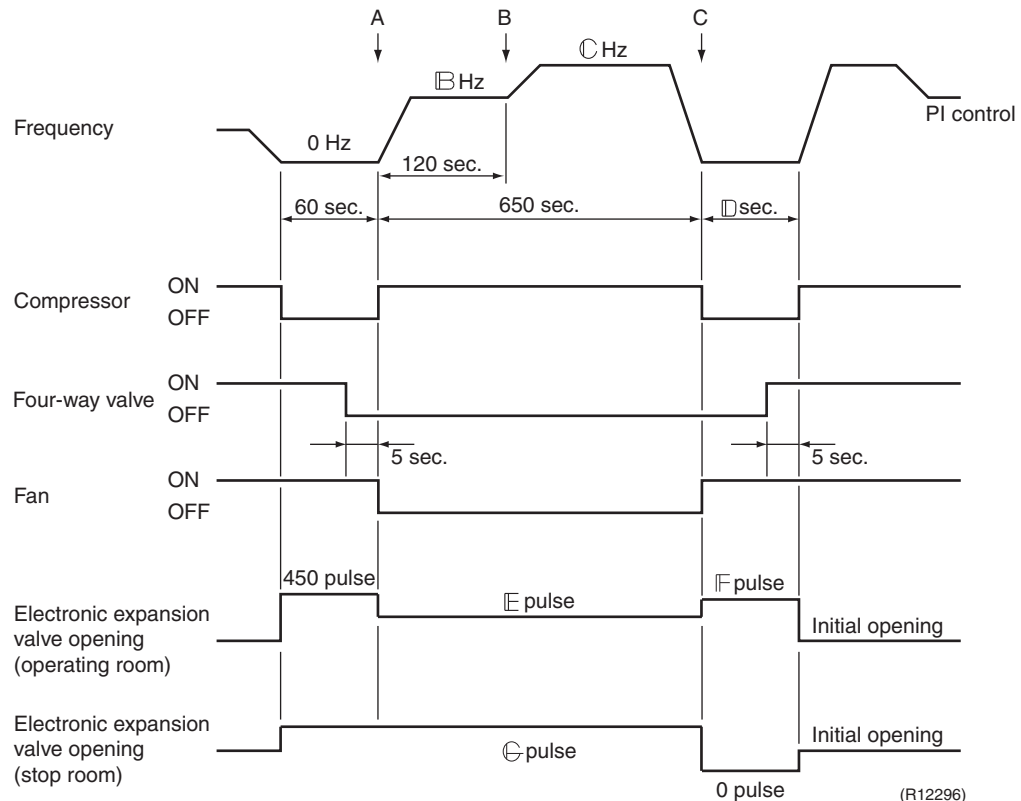
Conditions for Canceling Defrost

The target heat exchanger canceling condition temperature is selected in the range of 4 ~ 12°C (39 ~ 54°F) according to the outdoor temperature.

The defrost operation operates 120 seconds after the start. (A → B)

Then the defrost operation stops at the following conditions.

1. When the heat exchanger temperature reaches the target heat exchanger temperature. (B → C)
2. When 650 seconds have passed after the start even if the heat exchanger temperature does not reach the target heat exchanger temperature. (C)



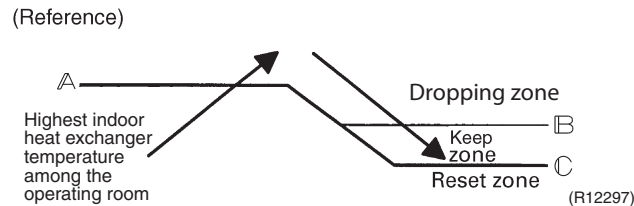
	18 class	24/32 class
Δ (minutes)	43	38
B (Hz)	54	39
C (Hz)	82	62
D (seconds)	120	60
E (pulse)	450	350
F (pulse)	450	400
G (pulse)	140	160

3.11 Low Hz High Pressure Limit

Outline

The upper limit of high pressure in a low Hz zone is set. The upper limit of the indoor heat exchanger temperature is also set by the operating frequency. There are 3 zones. Reset zone, keep zone, and dropping zone, and the frequency control is carried out according to each zone.

Detail



	18 class	24/32 class
A	60°C (140°F)	57°C (135°F)
B	59°C (138°F)	56°C (133°F)
C	56°C (133°F)	53°C (127°F)



Note: Dropping: The system stops 2 minutes after staying in the dropping zone.

3.12 Electronic Expansion Valve Control

Outline

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

Electronic expansion valve is fully closed

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

Room Distribution Control

1. Gas pipe isothermal control
2. SC (subcooling) control
3. Liquid pipe temperature control (with all ports connected and all rooms being air-conditioned)
4. Liquid pipe temperature control for stopped rooms
5. Condensation prevention control for indoor motor

Open Control

1. Electronic expansion valve control when starting operation
2. Electronic expansion valve control when frequency is changed
3. Electronic expansion valve control for defrosting
4. Electronic expansion valve control for oil recovery
5. Electronic expansion valve control when a discharge pipe temperature is abnormally high
6. Electronic expansion valve control when the discharge pipe thermistor is disconnected
7. Electronic expansion valve control for indoor unit freeze-up protection

Feedback Control

1. Discharge pipe temperature control

Detail

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

Operation pattern		Gas pipe isothermal control	SC (supercooling) control	Control when frequency changed	Control for abnormally high discharge pipe temperature	Oil recovery control	Indoor freeze-up protection control	Liquid pipe temperature control	Liquid pipe temperature control for stopped rooms	Dew prevention control for indoor roto
	○ : function × : not function									
When power is turned on	Fully closed when power is turned on	×	×	×	×	×	×	×	×	×
Cooling, 1 room operation	Open control when starting	×	×	×	○	○	○	×	×	×
	(Control of target discharge pipe temperature)	×	×	○	○	○	○	×	×	○
Cooling, 2 rooms operation to Cooling, 4 rooms operation	Control when the operating room is changed	×	×	×	○	○	○	×	×	○
	(Control of target discharge pipe temperature)	○	×	○	○	○	○	×	×	○
Stop	Pressure equalizing control	×	×	×	×	×	×	×	×	×
Heating, 1 room operation	Open control when starting	×	×	×	○	×	×	×	×	×
	(Control of target discharge pipe temperature)	×	○ All rooms ×	○	○	×	×	○ All rooms ○	○ All rooms ×	×
Heating, 2 rooms operation	Control when the operating room is changed	×	×	×	○	×	×	×	×	×
	(Control of target discharge pipe temperature)	×	○ All rooms ×	○	○	×	×	○ All rooms ○	○ All rooms ×	×
	(Defrost control)	×	×	×	×	×	×	×	×	×
Stop	Pressure equalizing control	×	×	×	×	×	×	×	×	×
Heating operation	Open control when starting	×	×	×	○	×	×	×	×	×
Control of discharge pipe thermistor disconnection	Continue	×	○ All rooms ×	×	×	×	×	○ All rooms ○	○ All rooms ×	×
Stop	Pressure equalizing control	×	×	×	×	×	×	×	×	×

(R10273)

★1: When all the indoor units are operating, “liquid pipe temperature control” is conducted.

★2: “SC (subcooling) control” is conducted for the operating indoor units, when some of the units are not operating.

★3: “Liquid pipe temperature control for stopped room” is conducted for the non-operating indoor units.

3.12.1 Fully Closing with Power on

The electronic expansion valve is initialized when the power is turned on. The opening position is set and the pressure equalization is developed.

3.12.2 Pressure Equalization Control

When the compressor is stopped, pressure equalization control is activated. The electronic expansion valve opens, and develops pressure equalization.

3.12.3 Opening Limit

Outline

A maximum and minimum opening of the electronic expansion valve is limited.

Detail

- A maximum electronic expansion valve opening in the operating room: 450 pulses
 - A minimum electronic expansion valve opening in the operating room: 75 pulses
- The electronic expansion valve is fully closed in the room where cooling is stopped and is opened at a fixed amount during defrosting.

3.12.4 Starting Operation Control / Changing Operation Room

Keep the electronic expansion valve from opening when the system is starting or the operating room is changed, and to prevent the system to be from being super heated or liquid back to the compressor.

3.12.5 High Discharge Pipe Temperature

When the compressor is operating, if the discharge pipe temperature exceeds a certain value, the electronic expansion valve opens and the refrigerant flows to the low pressure side.
This procedure lowers the discharge pipe temperature.

3.12.6 Oil Recovery Function

Outline

The electronic expansion valve opening in the cooling-stopped room must be set to open for a certain time and at specified intervals so that the oil does not accumulate in the room where cooling has stopped.

Detail

During cooling operation, every 1 hour of continuous operation, the electronic expansion valves in the operation stopped room is opened by 80 pulses for specified time.

3.12.7 Gas Pipe Isothermal Control During Cooling

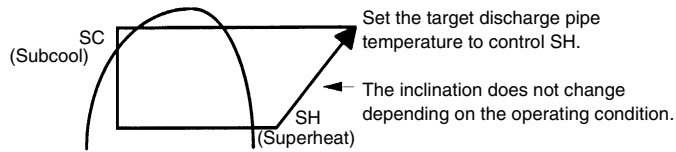
When units are operating in multiple rooms, the gas pipe temperature is detected and the electronic expansion valve opening is adjusted so that the gas pipe temperature in each room becomes equal.

- When the gas pipe temperature > the average gas pipe temperature,
→ open the electronic expansion valve in that room
- When the gas pipe temperature < the average gas pipe temperature,
→ close the electronic expansion valve in that room

The temperatures are monitored every 40 seconds.

3.12.8 Target Discharge Pipe Temperature Control

The target discharge pipe temperature is obtained from the indoor and outdoor heat exchanger temperature, and the electronic expansion valve opening is adjusted so that the actual discharge pipe temperature becomes close to the target discharge pipe temperature. (Indirect SH (superheat) control using the discharge pipe temperature).



(R10626)

The electronic expansion valve opening and the target discharge pipe temperature are adjusted every 20 seconds. The target discharge pipe temperature is controlled by indoor heat exchanger temperature and outdoor heat exchanger temperature. The opening degree of the electronic expansion valve is controlled by following:

- ◆ The target discharge pipe temperature
- ◆ The actual discharge pipe temperature
- ◆ The previous discharge pipe temperature

3.12.9 SC (Subcooling) Control

Outline

The liquid pipe temperature and the heat exchanger temperature are detected and the electronic expansion valve opening is compensated so that the SC of each room becomes the target SC.

- When the actual SC is > target SC, open the electronic expansion valve of the room.
- When the actual SC is < target SC, close the electronic expansion valve of the room.

Detail

Start Conditions

When the starting control (630 seconds) finishes, all of the electronic expansion valve(s) in the operating room are controlled.

Determine Electronic Expansion Valve Opening

The electronic expansion valve opening is adjusted so that the temperature difference between the maximum heat exchanger temperature of connected room and the liquid pipe temperature thermistor becomes constant.

3.12.10 Disconnection of the Discharge Pipe Thermistor

Outline

A disconnection of the discharge pipe thermistor is detected by comparing the discharge pipe temperature with the condensation temperature. If the discharge pipe thermistor is disconnected, the electronic expansion valve opens according to the outdoor temperature and the operating frequency, operates for a specified time, and then stops.

After 3 minutes of waiting, the operation restarts. Check if the discharge pipe thermistor is disconnected. If the discharge pipe thermistor is disconnected, the system stops after operating for a specified time.

If the disconnection is detected 4 times in succession, then the system is shut down. When the compressor runs for 60 minutes without any error, the error counter is reset.

Detail**Detect Disconnection**

When the starting control (630 seconds) finishes, and the 9-minute timer for the compressor operation continuation is not counting time, the following adjustment is 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 is ascertained.
2. When the operation mode is heating
When the discharge pipe temperature is lower than the maximum temperature of operating room heat exchanger, the discharge pipe thermistor disconnection is ascertained.

Adjustment when the thermistor is disconnected

When the compressor stops repeatedly, the system is down.

3.12.11 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, the target discharge pipe temperature control is canceled and the target opening of the electronic expansion valve is changed.

3.13 Malfunctions**3.13.1 Sensor Malfunction Detection**

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

Relating to Thermistor Malfunction

1. Outdoor heat exchanger thermistor
2. Discharge pipe thermistor
3. Fin thermistor
4. Gas pipe thermistor
5. Outdoor temperature thermistor
6. Liquid pipe thermistor

Relating to CT Malfunction

When the output frequency is more than A Hz, and the input current is less than B A, abnormal adjustment is carried out.

	18 class	24/32 class
A (Hz)	55	32
B (A)	1.25	0.5

3.13.2 Detection of Overcurrent and Overload**Outline**

In order to protect the inverter, an excessive output current is detected, the OL temperature is observed to protect the compressor.

Detail

- If the inverter current exceeds 30 A, the system shuts down the compressor.
- If the OL (compressor head) temperature exceeds 120 ~ 130°C (216 ~ 266°F), the compressor stops.

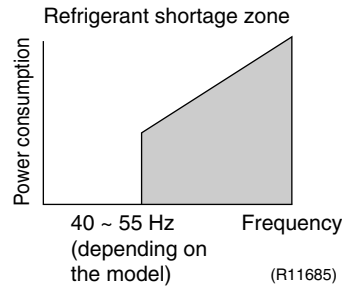
3.13.3 Refrigerant Shortage Control

Outline

I Detecting by power consumption

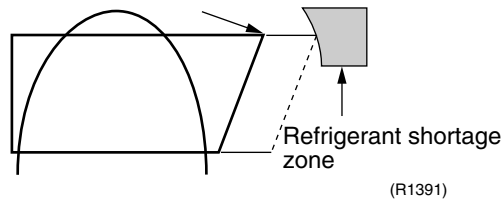
If the power consumption is below the specified value and the frequency is higher than the specified frequency, it is regarded as refrigerant shortage.

The power consumption is small comparing with that in the normal operation when refrigerant is insufficient, and refrigerant shortage is detected by checking a power consumption.



II Detecting by discharge pipe temperature

If the discharge pipe temperature is higher than the target discharge pipe temperature, and the electronic expansion valve is fully open for more than the specified time, it is regarded as a refrigerant shortage.



Refer to "Refrigerant shortage" on page 143 for detail.

3.13.4 Anti-icing Function

During cooling, if the heat exchanger temperature in the operation-stopped room lowers more than the specified temperature for the specified time, the electronic expansion valve is opened in the operation-stopped room, and fully closed operation is carried out. After this, if freezing abnormality occurs longer than the specified time, the system shuts down as a system abnormality.

3.14 Forced Operation Mode

Outline

Forced operation mode includes forced cooling and forced heating. Operation mode can be selected by the operation mode switch (SW2) on the outdoor unit. Press the forced operation ON/OFF switch (SW1) on the outdoor unit to start the operation.

Detail

Forced Cooling, Forced Heating

Item	Forced Cooling	Forced Heating
Conditions	1) The indoor unit is not abnormal, but the indoor unit which is not in the freezing prohibiting zone is present in more than 1 room.	1) The indoor unit is not abnormal. The indoor unit which is not in the peak-cut prohibited zone is present in more than 1 room.
	2) The outdoor unit is not abnormal and not in the 3-minute standby mode.	←
	3) The operating mode of the outdoor unit is the stop mode.	←
	4) The operation mode switch (SW2) on the outdoor unit is set to the cooling mode.	4) The operation mode switch (SW2) on the outdoor unit is set to the heating mode.
Start	Press the forced operation ON/OFF switch (SW1) on the outdoor unit.	←
Operating room	All rooms: The command is sent to all the rooms where the transmission is normal.	■ only 1 room: The command is sent to one of the rooms which can be operate and the order of priority is A>B>C>D. Other rooms operation must be stopped.
Command frequency	<ul style="list-style-type: none"> 18 class : 42 Hz 24/32 class : 31 Hz 	Outdoor temperature : 2°C (35.6°F) <ul style="list-style-type: none"> 18 class : 35 Hz 24/32 class : 26 Hz
Electronic expansion valve opening	It depends on the capacity of the operating indoor unit.	←
End	1) Press the forced operation ON/OFF switch (SW1) on the outdoor unit again.	←
	2) The operation ends automatically after 15 minutes.	2) The operation ends automatically after 60 minutes.
Others	The protection functions are prior to all others in the forced operation.	←

Part 5

Operation Manual

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1. System Configuration

After installation and test operation of the room air conditioner are completed, the air conditioner should be handled and operated as described the following pages. Every user should be informed on the correct method of operation and how to check if it can cool (or heat) well and how to use it most efficiently.

Providing instructions to the user can reduce requests for servicing by 80%. However proficient the installation and operating functions of the AC system are, the customer may blame either the room air conditioner or its installation work because of improper handling. The installation work and the handing over of the unit can only be considered completed when its handling has been fully explained to the user without using technical terms while imparting full knowledge of the equipment.

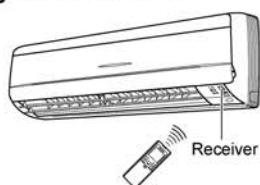
2. Duct-Free System

2.1 Remote Controller

Name of Parts

Remote Controller: ARC452A9

Signal transmitter



- 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 approximately 23ft (7m).

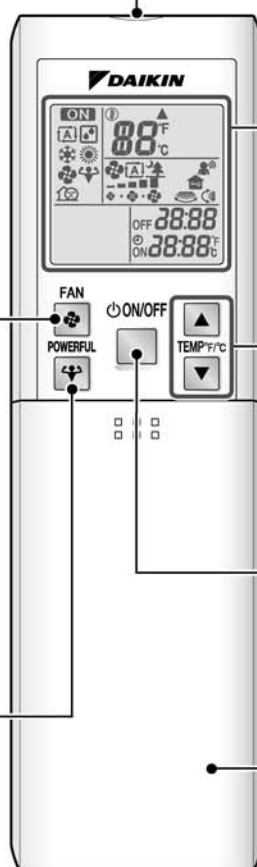
FAN setting button

- It selects the airflow rate setting.

▶Page 11

POWERFUL button

- POWERFUL operation ▶Page 16



Display (LCD)

- It displays the current settings. (In this illustration, each section is shown with its displays ON for the purpose of explanation.)

TEMPERATURE adjustment buttons

- It changes the temperature setting.

▶Page 10

ON/OFF button

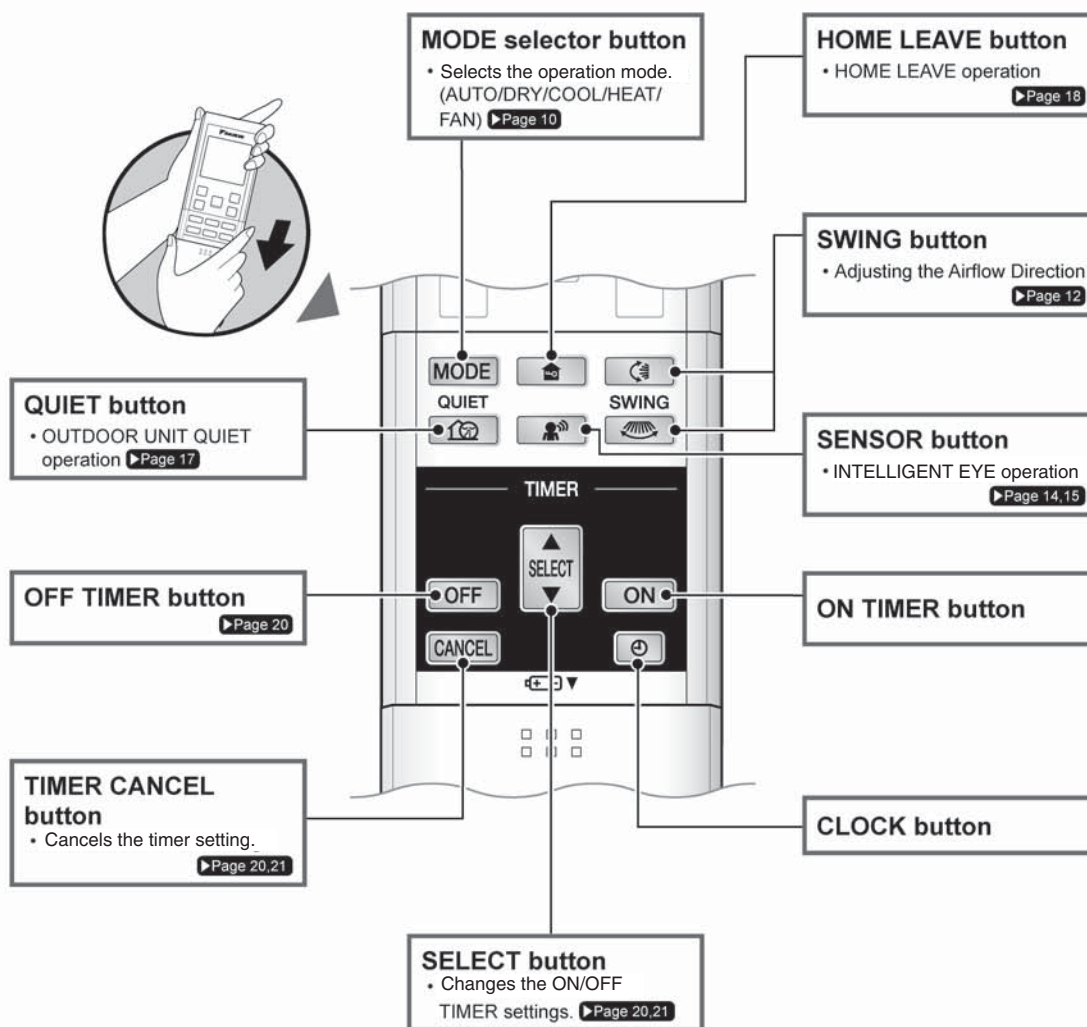
- Press this button once to start operation.

Press once again to stop it. ▶Page 10

Front cover

- Open the front cover. ▶Page 7

Open the front cover








2.2 AUTO · DRY · COOL · HEAT · FAN Operation

The air conditioner operates with the operation mode of your choice.
From the next time on, the air conditioner will operate with the same operation mode.

■ To start operation

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

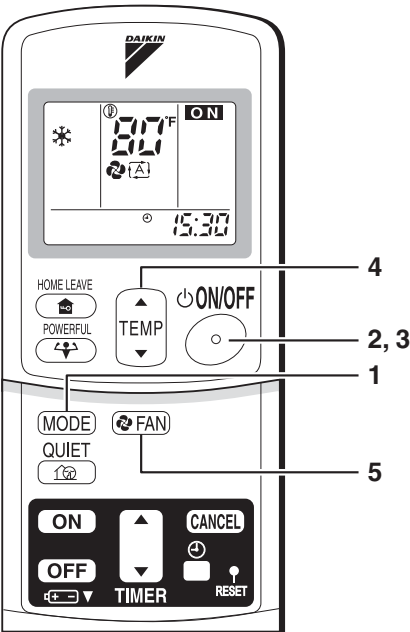
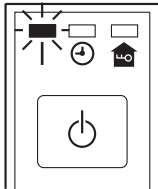
- Each pressing of the button advances the mode setting in sequence.

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



2. Press “ON/OFF button”.

- The OPERATION lamp lights up.




■ To stop operation

3. Press “ON/OFF button” again.

- Then OPERATION lamp goes off.






■ To change the temperature setting

4. Press “TEMPERATURE adjustment button”.


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

■ To change the air flow rate setting

5. Press “FAN setting button”.

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

- Indoor unit quiet operation

When the air flow is set to “”, the sound from the unit is lowered.

Use this setting to operate the indoor unit more quietly.

The unit might lose capacity when the fan strength is set to a lower level.

NOTE

■ Note on HEAT operation

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

■ Note on COOL operation

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

■ Note on DRY operation

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

■ Note on AUTO operation

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

■ Note on air flow rate setting

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

2.3 Adjusting the Airflow Direction



You can adjust the airflow direction to increase your comfort.


Adjusting the upper and lower airflow direction

■ To adjust the louvers (horizontal blades)

1. Press .

- "  " is displayed on the LCD and the louvers begin to swing.

2. When the louvers have reached the desired position, press  once more.


- The louvers will stop moving.
- "  " is no longer displayed on the LCD.


Adjusting the right and left airflow direction

■ To adjust the fins (vertical blades)

3. Press .

- "  " is displayed on the LCD and the fins begin to swing.

4. When the fins have reached the desired position, press the  once more.

- The fins will stop moving.
- "  " is no longer displayed on the LCD.

■ To start 3-D airflow

1. 3. Press the  and the  :
the “” and “” display will light up and the louvers and fins will move in turn.

■ To cancel 3-D airflow

2. 4. Press either the  or the .

NOTE

■ Note on the angles of the louvers

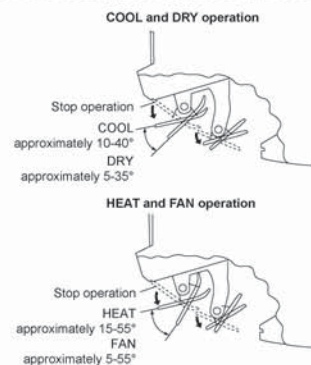
- When  is selected, the louvers swinging range depends on the operation. (See the figure.)

■ Note on 3-D airflow

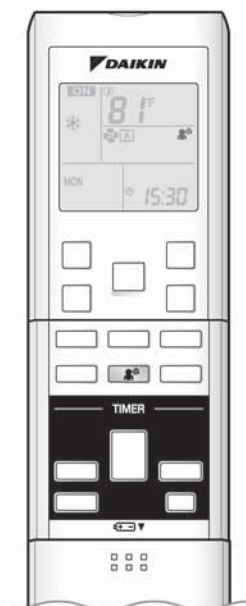
- Using 3-D airflow circulates cool or warm air to prevent the accumulation of too much cool air on the floor of a room or too much warm air rising to the room's ceiling, assuring a more even distribution of air.

■ ATTENTION

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




2.4 INTELLIGENT EYE Operation



"INTELLIGENT EYE" is the infrared sensor which detects the human movement.


■ To start INTELLIGENT EYE operation

1. Press  .

-  is displayed on the LCD.

■ To cancel the INTELLIGENT EYE operation

2. Press  again.

-  is no longer displayed on the LCD.

[EX.]

When somebody in the room

• Normal operation

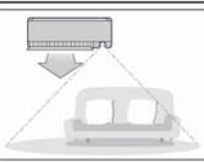
The air conditioner is in normal operation while the sensor is detecting movement. ple.



When nobody in the room

• 20 min. after, start energy saving operation.

The set temperature is shifted in in $\pm 3.6^{\circ}\text{F}$ ($\pm 2^{\circ}\text{C}$) steps.



Somebody back in the room

• Back to normal operation.

The air conditioner will return to normal operation when the sensor detects movement again. ple



“INTELLIGENT EYE” is useful for Energy Saving

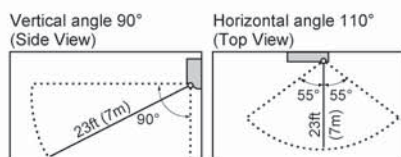
■ Energy saving operation

- Change the temperature -3.6°F (-2°C) in HEAT / $+3.6^{\circ}\text{F}$ ($+2^{\circ}\text{C}$) in COOL / $+1.8^{\circ}\text{F}$ ($+1^{\circ}\text{C}$) in DRY mode from set temperature.
- Decrease the airflow rate slightly in FAN mode only.
- If no presence detected in the room for 20 minutes.

NOTE

■ Notes on “INTELLIGENT EYE”

- Application range is as follows.



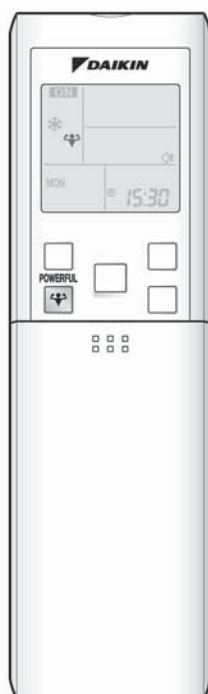
- Sensor may not detect moving objects further than 23ft (7m) away. (Check the application range)
- Sensor detection sensitivity changes according to indoor unit location, the speed of passersby, temperature range, etc.
- The sensor also mistakenly detects pets, sunlight, fluttering curtains and light reflected off the mirrors on passing vehicles.
- INTELLIGENT EYE operation will not go on during powerful operation.
- NIGHT SET MODE [▶Page 20](#) will not go on during use of INTELLIGENT EYE operation.

- The volume of air will be set to AUTO. If the upward and downward airflow direction is selected, the COMFORT AIRFLOW operation will be canceled.
Priority is given to the function of whichever button is pressed last.

⚠ CAUTION

- Do not place large objects near the sensor.
Also, keep heating units or humidifiers outside the sensor's detection area. This sensor can detect undesirable objects.
- Do not hit or forcibly push the INTELLIGENT EYE sensor. This can lead to damage and malfunction.


2.5 POWERFUL Operation



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


■ To start POWERFUL operation

Press  during operation.

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


■ To cancel POWERFUL operation

Press  again.

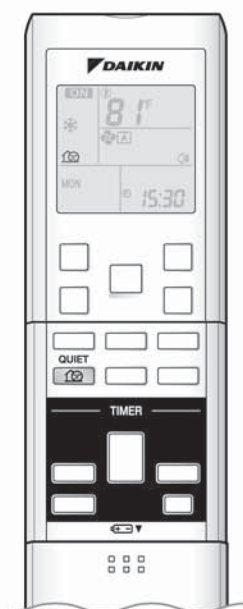
- “” is no longer displayed on the LCD.

NOTE

■ Notes on POWERFUL operation

- POWERFUL Operation cannot be used together with QUIET Operation. Priority is given to the function of whichever button is pressed last.
- POWERFUL Operation can only be set when the unit is running. Pressing the operation stop button causes the settings to be canceled, and the “” is no longer displayed on the LCD.
- **In COOL and HEAT mode**
To maximize the cooling (heating) effect, the capacity of outdoor unit must be increased and the airflow rate be fixed to the maximum setting. The temperature and airflow settings are not variable.
- **In DRY mode**
The temperature setting is lowered by 4.5°F (2.5°C) and the airflow rate is slightly increased.
- **In FAN mode**
The airflow rate is fixed to the maximum setting.
- **In AUTO mode**
To maximize the cooling (heating) effect, the capacity of outdoor unit must be increased and the airflow rate be fixed to the maximum setting.
- POWERFUL Operation will not increase the capacity of the air conditioner if the air conditioner is already in operation with its maximum capacity demonstrated.

2.6 OUTDOOR UNIT Quiet Operation



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

■ To start OUTDOOR UNIT QUIET operation

Press .

- "10" is displayed on the LCD.

■ To cancel OUTDOOR UNIT QUIET operation

Press  again.

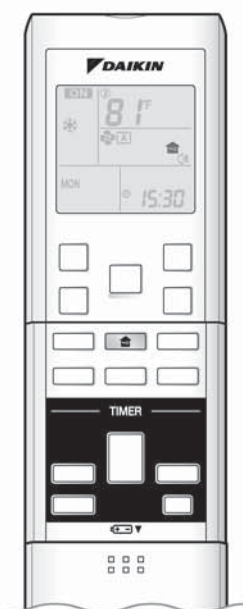
- "10" is no longer displayed on the LCD.

NOTE

■ Note on OUTDOOR UNIT QUIET operation

- If using a multi system, this function will work only when the OUTDOOR UNIT QUIET operation is set on all operated indoor units. However, if using priority-room setting, see "Note for multi system".
- This function is available in COOL, HEAT, and AUTO modes. (This is not available in FAN and DRY mode.)
- POWERFUL operation and OUTDOOR UNIT QUIET operation cannot be used at the same time. Priority is given to the function of whichever button is pressed last.
- If operation is stopped using the remote controller or the main unit ON/OFF switch when using OUTDOOR UNIT QUIET operation, "10" will remain on the remote controller display.
- OUTDOOR UNIT QUIET Operation will drop neither the frequency nor fan speed if the frequency and fan speed have been already dropped low enough.


2.7 HOME LEAVE Operation

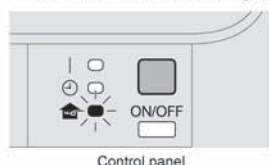


HOME LEAVE operation is a function which allows you to record your preferred temperature and airflow rate settings.

■ To start HOME LEAVE operation


1. Press .

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



■ To cancel HOME LEAVE operation





2. Press again.





- "  " is no longer displayed on the LCD.
- The HOME LEAVE lamp goes off.

Before using HOME LEAVE operation.

■ To set the temperature and airflow rate for HOME LEAVE operation

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

	Initial setting		Selectable range	
	Temperature	Airflow rate	Temperature	Airflow rate
Cooling	77°F(25°C)	AUTO	64-90°F(18-32°C)	5 step, "  " and "  "
Heating	77°F(25°C)	AUTO	50-86°F(10-30°C)	5 step, "  " and "  "

1. Press  . Make sure "  " is displayed in the remote controller display.
2. Adjust the set temperature with "  " or "  " as you like.
3. Adjust the airflow rate with "FAN" setting button as you like.

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

■ What's the HOME LEAVE operation?

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

■ Useful in these cases

1. Use as an energy-saving mode.

Set the temperature 3-5°F(2-3°C) higher (COOL) or lower (HEAT) than normal. Setting the fan speed to the lowest setting allows the unit to be used in energy-saving mode. Also convenient for use while you are out or sleeping.

• Every day before you leave the house...



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



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



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

• Before bed...



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



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



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

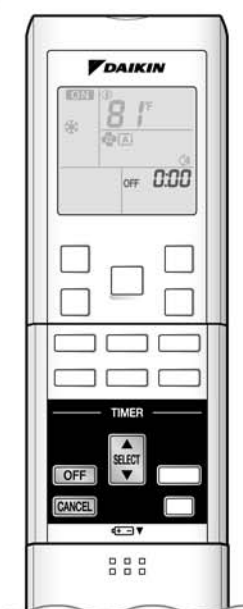
2. Use as a favorite mode.

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

NOTE

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

2.8 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.

1. Press **OFF**.



"0:00" is displayed.
"OFF" blinks.

2. Press **SELECT** 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** again.

- The TIMER lamp lights up.



Control panel

■ To cancel OFF TIMER Operation

Press **CANCEL**.

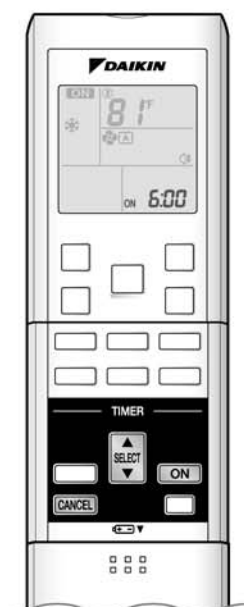
- The TIMER lamp goes off.

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 (0.9°F(0.5°C) up in COOL, 3.6°F(2.0°C) down in HEAT) to prevent excessive COOL (HEAT) for your pleasant sleep.



■ To use ON TIMER operation

- Check that the clock is correct.
If not, set the clock to the present time.

1. Press **ON**.



"6:00" is displayed.

"ON" blinks.

2. Press **SELECT** 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** again.

- The TIMER lamp lights up.



Control panel

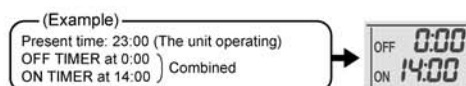
■ To cancel ON TIMER Operation

Press **CANCEL**.

- The TIMER lamp goes off.

■ To combine ON TIMER and OFF TIMER

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



ATTENTION

■ In the following cases, set the timer again.

- After a breaker has turned OFF.
- After a power failure.
- After replacing batteries in the remote controller.

2.9 Note for Multi System

What is a multi system?

This system has one outdoor unit connected to multiple indoor units.

■ Selecting the operation mode

1. With the priority room setting present but inactive or not present.

When more than one indoor unit is operating, priority is given to the first unit that was turned on.

In this case, set the units that are turned on later to the same operation mode (*1) as the first unit.

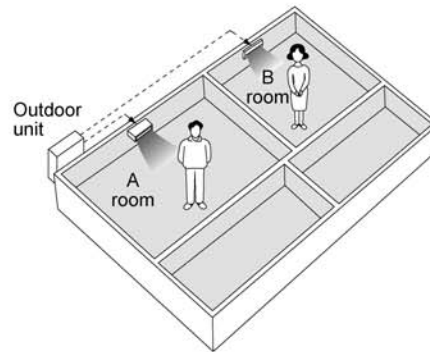
Otherwise, they will enter the standby state, and the OPERATION lamp will flash: this does not indicate malfunction.

(*1)

- COOL, DRY and FAN operation may be used at the same time.

- AUTO operation automatically selects COOL operation or HEAT operation based on the room temperature.

Therefore, AUTO operation is available when selecting the same operation mode as that of the room with the first unit to be turned on.



⚠ CAUTION

• Normally, the operation mode in the room where the unit is first run is given priority, but the following situations are exceptions, so please keep this in mind.

If the operation mode of the first room is FAN operation, then using HEAT operation in any room after this will give priority to HEAT operation. In this situation, the air conditioner running in FAN operation will go on standby, and the OPERATION lamp will flash.

2. With the priority room setting active.

See priority room setting on the next page.

■ NIGHT QUIET mode (Available only for COOL operation)

NIGHT QUIET mode requires initial programming during installation. Please consult your retailer or dealer for assistance.

NIGHT QUIET mode reduces the operation noise of the outdoor unit during the nighttime hours to prevent annoyance to neighbors.

- The NIGHT QUIET mode is activated when the temperature drops 9°F (5°C) or more below the highest temperature recorded that day. Therefore, when the temperature difference is less than 9°F (5°C), this function will not be activated.
- NIGHT QUIET mode reduces slightly the cooling efficiency of the unit.

■ Priority Room Setting

The Priority Room Setting requires initial programming during installation. Please consult your authorized dealer for assistance. The room designated as the Priority Room takes priority in the following situations;

1. Operation Mode Priority.

As the operation mode of the Priority Room takes precedence, the user can select a different operation mode from other rooms.

< Example >

* Room A is the Priority Room in the examples.

When COOL mode is selected in Room A while operating the following modes in Room B:

Operation mode in Room B	Status of Room B when the unit in Room A is in COOL mode
COOL or DRY or FAN	Current operation mode maintained
HEAT	The unit enters Standby Mode. Operation resumes when the Room A unit stops operating.
AUTO	If the unit is set to COOL mode, operation continues. If the unit is set to HEAT mode, it enters Standby Mode. Operation resumes when the Room A unit stops operating.

2. Priority when POWERFUL operation is used.

< Example >

* Room A is the Priority Room in the examples.

The indoor units in Rooms A and B are all operating. If the unit in Room A enters POWERFUL operation, operation capacity will be concentrated in Room A. In such a case, the cooling (heating) efficiency of the units in Room B may be slightly reduced.

3. Priority when using OUTDOOR UNIT QUIET operation.

< Example >

* Room A is the Priority Room in the examples.

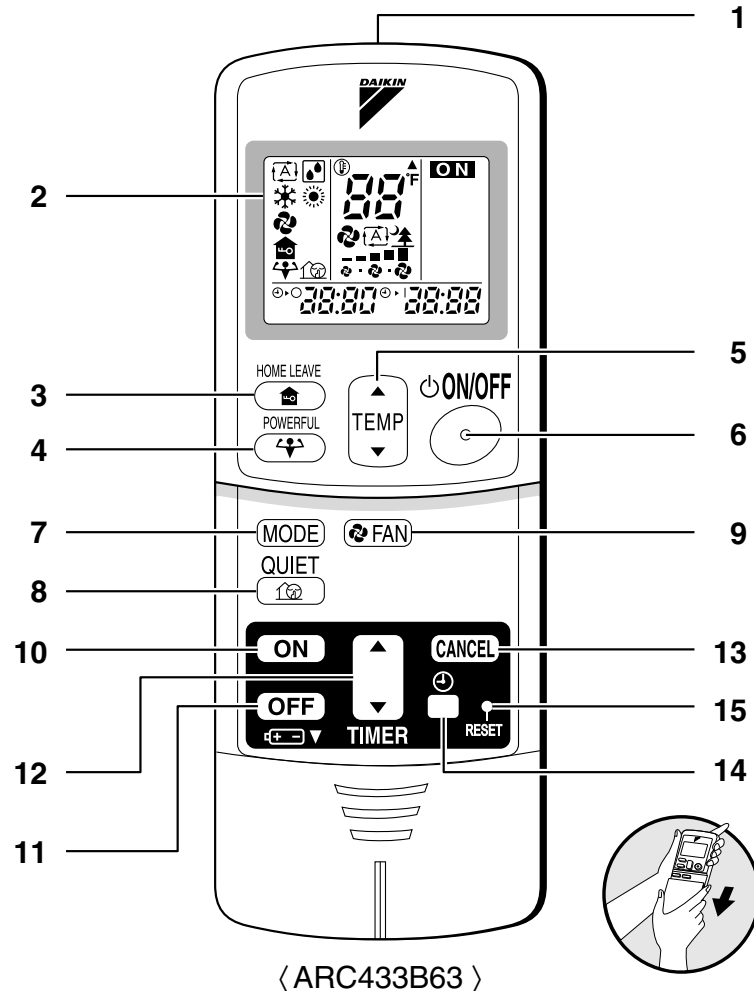
Just by setting the unit in Room A to QUIET operation, the air conditioner starts OUTDOOR UNIT QUIET operation.

You don't have to set all the operated indoor units to QUIET operation.

3. Slim Duct Built-In System

3.1 Remote Controller

■ Remote Controller



〈 ARC433B63 〉

1. Signal transmitter:

- It sends signals to the indoor unit.

2. Display:

- It displays the current settings.
(In this illustration, each section is shown with all its displays ON for the purpose of explanation.)

3. HOME LEAVE button:

- HOME LEAVE operation (page 14.)

4. POWERFUL button:

- POWERFUL operation (page 12.)

5. TEMPERATURE adjustment buttons:

- It changes the temperature setting.

6. ON/OFF button:

- Press this button once to start operation.
Press once again to stop it.

7. MODE selector button:

- It selects the operation mode.
(AUTO/DRY/COOL/HEAT/FAN) (page 10.)

8. QUIET button: OUTDOOR UNIT QUIET operation (page 13.)

9. FAN setting button:

- It selects the air flow rate setting.

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

15. RESET button:

- Restart the unit if it freezes.
• Use a thin object to push.

3.2 AUTO / DRY / COOL / HEAT / FAN Operation

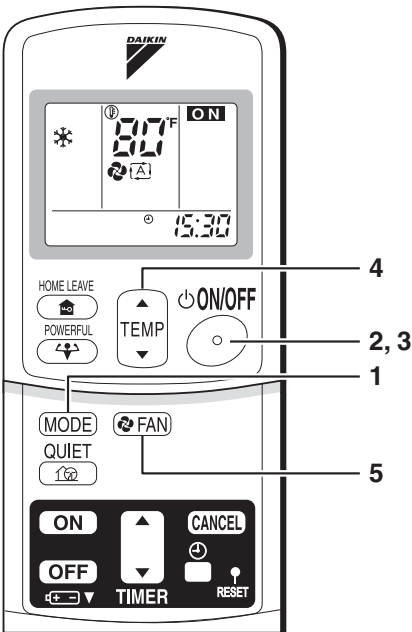
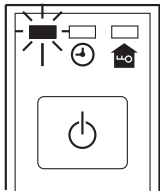
The air conditioner operates with the operation mode of your choice.
From the next time on, the air conditioner will operate with the same operation mode.

■ To start operation

1. Press “MODE selector button” and select a operation mode.
- Each pressing of the button advances the mode setting in sequence.
- : AUTO
- : DRY
- : COOL
- : HEAT
- : FAN



2. Press “ON/OFF button”.
- The OPERATION lamp lights up.



■ To stop operation

3. Press “ON/OFF button” again.
- Then OPERATION lamp goes off.






■ To change the temperature setting

4. Press “TEMPERATURE adjustment button”.


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

■ To change the air flow rate setting

5. Press “FAN setting button”.

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

- Indoor unit quiet operation

When the air flow is set to “”, the sound from the unit is lowered.

Use this setting to operate the indoor unit more quietly.

The unit might lose capacity when the fan strength is set to a lower level.

NOTE

■ Note on HEAT operation

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

■ Note on COOL operation

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

■ Note on DRY operation

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

■ Note on AUTO operation

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

■ Note on air flow rate setting


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

3.3 POWERFUL Operation

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


■ To start POWERFUL operation

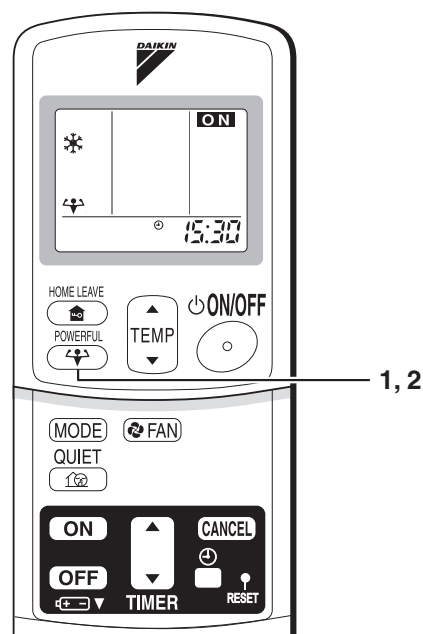
1. Press “POWERFUL button”.

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

■ To cancel POWERFUL operation


2. Press “POWERFUL button” again.

- “” is no longer displayed on the LCD.



NOTE

■ Notes on POWERFUL operation

- POWERFUL Operation cannot be used together with QUIET Operation. Priority is given to the function of whichever button is pressed last.
- POWERFUL Operation can only be set when the unit is running. Pressing the operation stop button causes the settings to be canceled, and the “” is no longer displayed on the LCD.
- **In COOL and HEAT mode**
To maximize the cooling (heating) effect, the capacity of outdoor unit must be increased and the air flow rate be fixed to the maximum setting.
The temperature and air flow settings are not variable.
- **In DRY mode**
The temperature setting is lowered by 4.5°F and the airflow rate is slightly increased.
- **In FAN mode**
The airflow rate is fixed to the maximum setting.

3.4 OUTDOOR UNIT QUIET Operation

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


■ To start OUTDOOR UNIT QUIET operation

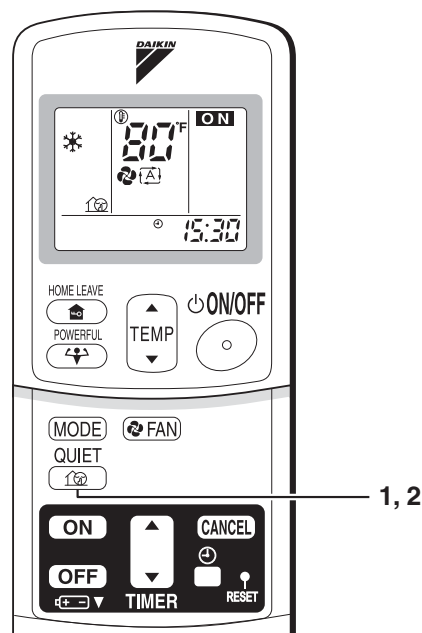
1. Press “QUIET button”.

- “” is displayed on the LCD.

■ To cancel OUTDOOR UNIT QUIET operation


2. Press “QUIET button” again.

- “” is no longer displayed on the LCD.



NOTE

■ Note on OUTDOOR UNIT QUIET operation


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

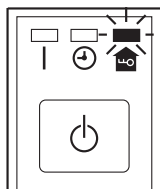
3.5 HOME LEAVE Operation

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

■ To start HOME LEAVE operation


1. Press “HOME LEAVE button”.

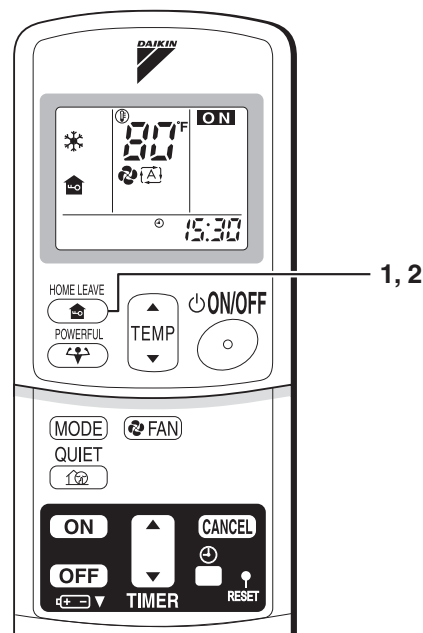
- “” is displayed on the LCD.
- The HOME LEAVE lamp lights up.



■ To cancel HOME LEAVE operation

2. Press “HOME LEAVE button” again.







- “” is no longer displayed on the LCD.
- The HOME LEAVE lamp goes off.






Before using HOME LEAVE operation.

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

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

	Initial setting		Selectable range	
	Temperature	Airflow rate	Temperature	Airflow rate
Cooling	77°F	“  ”	64-90°F	5 step, “  ” and “  ”
Heating	77°F	“  ”	50-86°F	5 step, “  ” and “  ”

1. Press “HOME LEAVE button”. Make sure “” is displayed in the remote controller display.
2. Adjust the set temperature with “” or “” as you like.
3. Adjust the airflow rate with “FAN” setting button as you like.

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

■ What's the HOME LEAVE operation?

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

■ Useful in these cases

1. Use as an energy-saving mode.

Set the temperature 4-5°F higher (cooling) or lower (heating) than normal. Setting the fan strength to the lowest setting allows the unit to be used in energy-saving mode. Also convenient for use while you are out or sleeping.

• Every day before you leave the house...



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



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



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

• Before bed...



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



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



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

2. Use as a favorite mode.

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

NOTE

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

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.

1. Press “OFF TIMER button”.

0:00 is displayed.

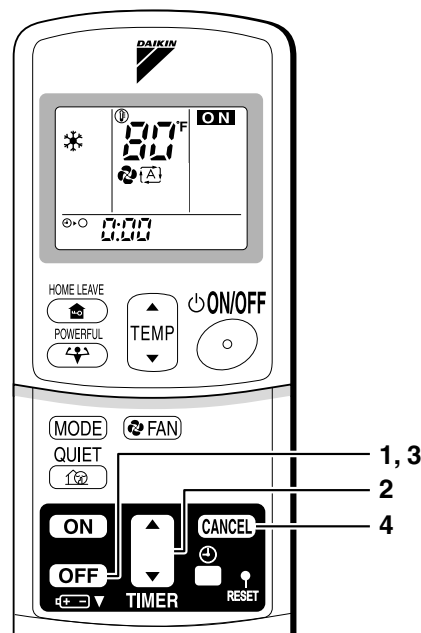
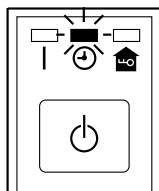
⦿-⦿ blinks.

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 (1°F up in COOL, 4°F down in HEAT) to prevent excessive cooling (heating) for your pleasant sleep.

■ To use ON TIMER operation

- Check that the clock is correct. If not, set the clock to the present time.

1. Press “ON TIMER button”.

6:00 is displayed.

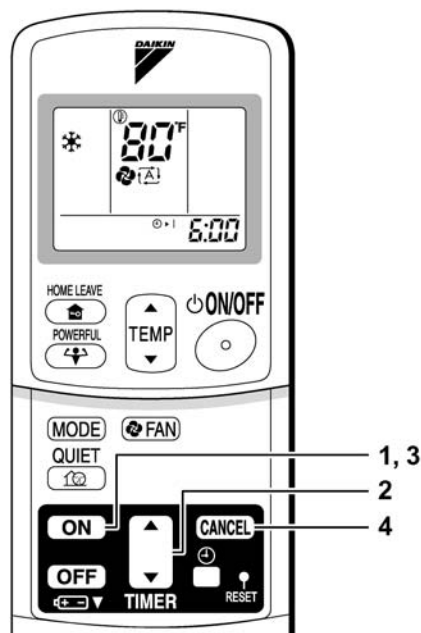
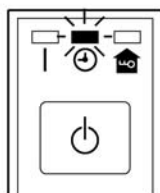
⊙·| blinks.

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.



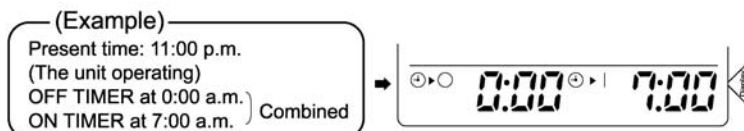
■ To cancel ON TIMER operation

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.



Part 6

Service Diagnosis

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1. Caution for Diagnosis

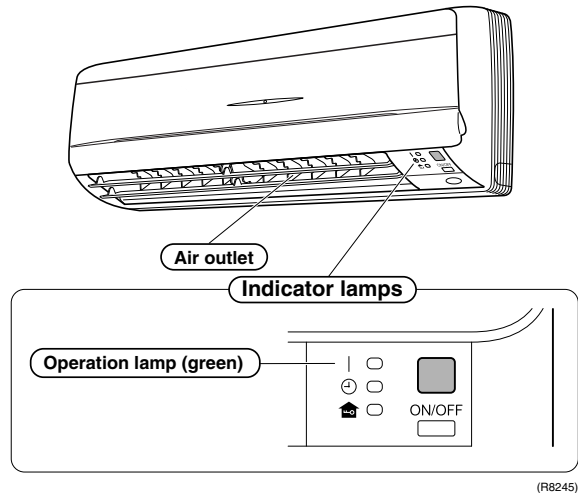
1.1 Troubleshooting with LED

Indoor unit

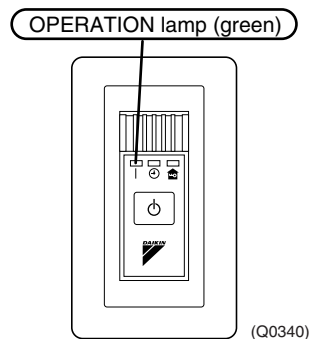
The operation lamp blinks when any of the following errors is detected.

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

Duct-Free System



Slim Duct Built-in System



Caution:

When operation stops suddenly and the operation lamp blinks, it could be "operation mode conflict".

Check the following:

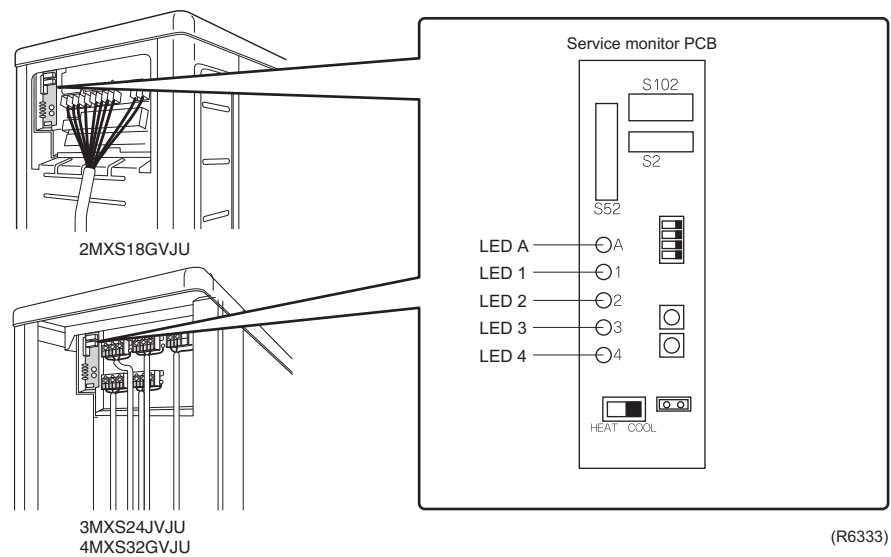
Are the operation modes all the same for the indoor units connected to multi system outdoor unit?
If not, set all the indoor units to the same operation mode and confirm that the operation lamp is not blinking.

Moreover, when the operation mode is automatic, set all the indoor unit operation modes as "cooling" or "heating" and check again if the operation lamp is normal.

If the lamp stops blinking after the above steps, there is no malfunction.

★Operation stops and the operation lamp blinks only for the indoor unit for which a different operation mode is set later. (The first set operation mode has priority.)

Outdoor Unit



There are a green LED (LED A) and red LEDs (LED 1- LED 4) on the outdoor unit PCB. The LED A indicates microcomputer operation condition. In normal condition, the LED A is blinking and the LED 1- LED 4 are OFF.

Even after the error is canceled and the unit operates in normal condition, the LED indication remains.

2. Problem Symptoms and Measures

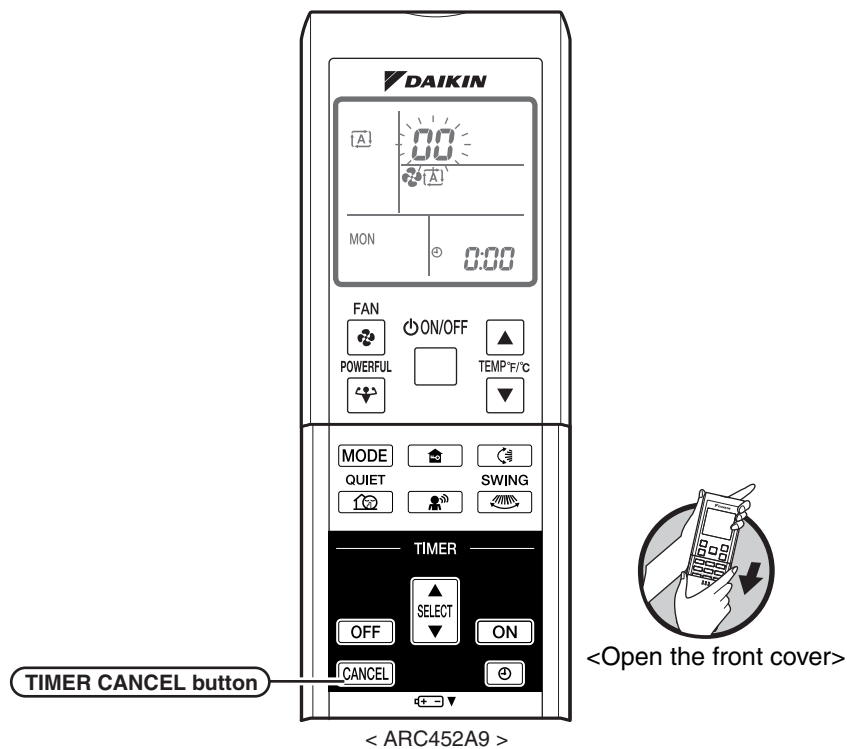
Symptom	Check Item	Details of Measure	Reference Page
None of the units operates.	Check the power supply.	Check to make sure that the rated voltage is supplied.	—
	Check the type of the indoor units.	Check to make sure that the indoor unit type is compatible with the outdoor unit.	—
	Check the outdoor temperature.	Heating operation cannot be used when the outdoor temperature is 15.5°C (59.9°F) or higher, and cooling operation cannot be used when the outdoor temperature is below -10°C (14°F).	—
	Diagnose with outdoor unit LED indication	—	102
	Check the remote controller addresses.	Check to make sure that address settings for the remote controller and indoor unit are correct.	223
Operation sometimes stops.	Check the power supply.	A power failure of 2 to 10 cycles can stop air conditioner operation. (Operation lamp OFF)	—
	Check the outdoor temperature.	Heating operation cannot be used when the outdoor temperature is 15.5°C (59.9°F) or higher, and cooling operation cannot be used when the outdoor temperature is below -10°C (14°F).	—
	Diagnose with outdoor unit LED indication.	—	102
Some indoor units do not operate.	Check the type of the indoor units.	Check to make sure that the indoor unit type is compatible with the outdoor unit.	—
	Diagnose with outdoor unit LED indication	—	102
Units operate but do not cool, or do not heat.	Check for wiring and piping errors in the connection between the indoor and outdoor units.	Conduct the wiring/piping error check described on the product diagnosis nameplate.	—
	Check for thermistor detection errors.	Check to make sure that the thermistor is mounted securely.	—
	Check for faulty operation of the electronic expansion valve.	Set all the units to cooling operation, and compare the temperatures of the liquid pipes to see the each electronic expansion valve works.	—
	Diagnose with outdoor unit LED indication.	—	102
	Diagnose by service port pressure and operating current	Check for refrigerant shortage.	143
Large operating noise and vibrations	Check the output voltage of the power transistor.	—	156
	Check the power transistor.	—	—
	Check the installation condition.	Check to make sure that the required spaces for installation (specified in the installation manual, etc.) are provided.	—

3. Service Check Function

3.1 ARC452 Series Remote Controller

Check Method 1

- When the timer cancel button is held down for 5 seconds, "00" indication is displayed on the temperature display section.



(R9673)

- Press the timer cancel button repeatedly until a long beep sounds.

■ The code indication changes in the sequence shown below.

No.	Code	No.	Code	No.	Code
1	00	13	07	25	UR
2	04	14	03	26	UR
3	15	15	08	27	P4
4	08	16	09	28	13
5	06	17	09	29	14
6	00	18	04	30	07
7	06	19	05	31	02
8	07	20	03	32	08
9	00	21	06	33	00
10	03	22	05	34	08
11	05	23	01	35	01
12	06	24	01	36	09

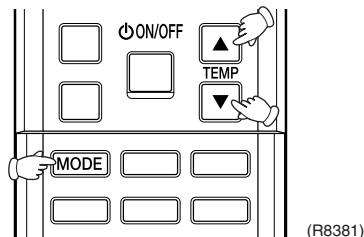


Note:

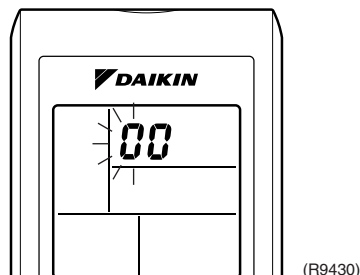
- A short beep and two consecutive beeps indicate non-corresponding codes.
- To return to the normal mode, hold the timer cancel button down for 5 seconds. When the remote controller is left untouched for 60 seconds, it also returns to the normal mode.

Check Method 2

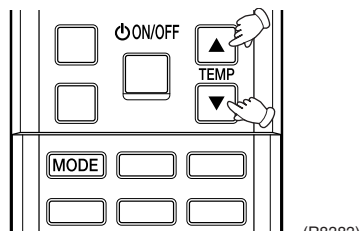
1. Press the 3 buttons (TEMP▲, TEMP▼, MODE) at the same time.



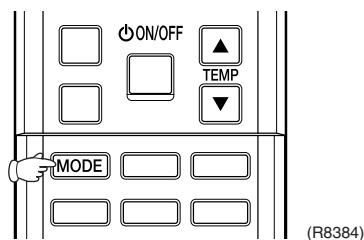
The left-side digit blinks.



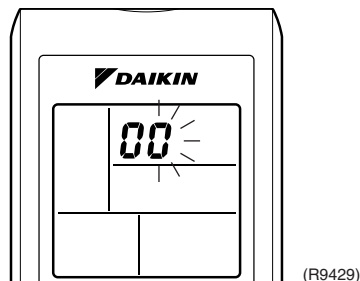
2. Press the TEMP▲ or ▼ button and change the figure until you hear the sound of *beep* or *beep-beep*.



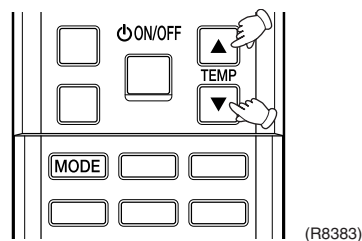
3. Diagnose by the sound.
 - ★*beep*: The left digit does not correspond with the error code.
 - ★*beep beep*: The figure of the left digit corresponds with the error code but the one's not.
 - ★*long beep*: Both the left and right digits correspond with the error code. (→ See 7.)
4. Press the MODE button.



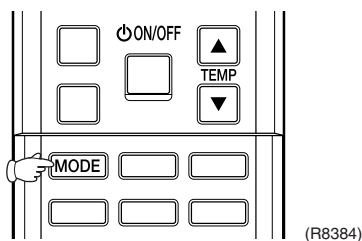
The right-side digit blinks.



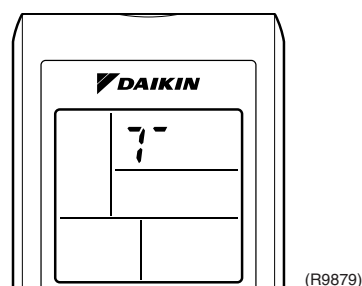
5. Press the TEMP▲ or ▼ button and change the figure until you hear the beep.



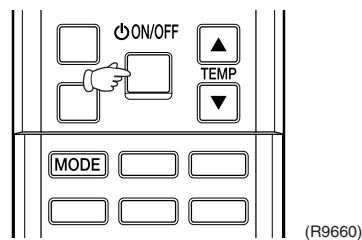
6. Diagnose by the sound.
- ★beep : The left digit does not correspond with the error code.
 - ★beep beep : The left digit corresponds with the error code but the right side digit does not.
 - ★long beep : Both digits correspond with the error code.
7. Determine the error code.
- The figures indicated when you hear the beep are error codes.
(Error codes and description → Refer to page 100.)
8. Press the MODE button to exit from the diagnosis mode.



The display “7-” means the trial operation mode.
(Refer to page 217 for trial operation.)



9. Press the ON/OFF button twice to return to the normal mode.

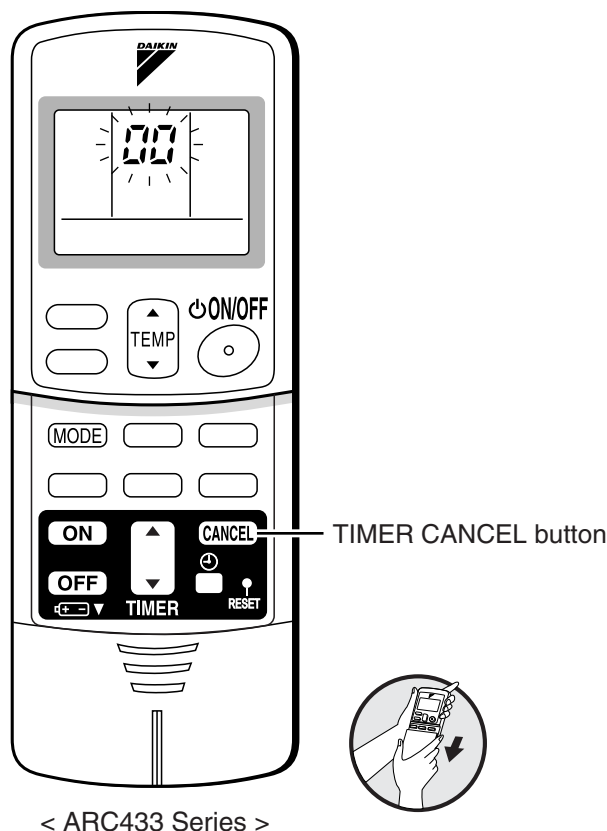


Note: When the remote controller is left untouched for 60 seconds, it returns to the normal mode.

3.2 ARC433 Series Remote Controller

Check Method 1

1. When the timer cancel button is held down for 5 seconds, "00" indication appears on the temperature display section.



(R11506)

2. Press the timer cancel button repeatedly until a long beep sounds.

■ The code indication changes in the sequence shown below.

No.	Code	No.	Code	No.	Code
1	00	12	07	23	40
2	04	13	48	24	01
3	F3	14	03	25	P4
4	06	15	R3	26	13
5	15	16	R1	27	14
6	R6	17	14	28	46
7	05	18	15	29	47
8	F6	19	49	30	02
9	09	20	06	31	04
10	00	21	0R	32	0R
11	07	22	R5	33	R4

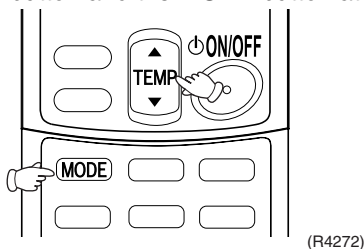


Note:

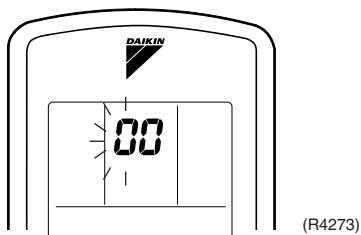
1. A short beep and two consecutive beeps indicate non-corresponding codes.
2. To return to the normal mode, hold the timer cancel button down for 5 seconds. When the remote controller is left untouched for 60 seconds, it also returns to the normal mode.

Check Method 2

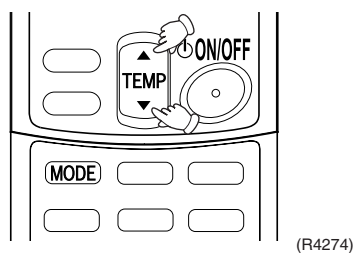
1. Press the center of the TEMP button and the MODE button at the same time.



The left-side digit blinks.

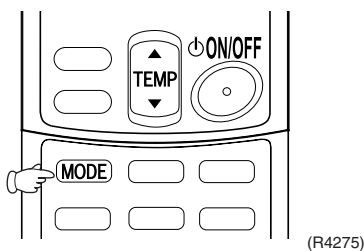


2. Press the TEMP▲ or ▼ button and change the figure until you hear the beep

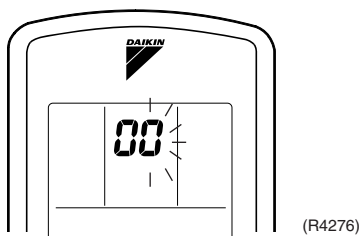


3. Diagnose by the sound.
 - ★beep : The left-side digit does not correspond with the error code.
 - ★beep beep : The left digit corresponds with the error code but the right-side digit does not.
 - ★“long beep” : Both digits correspond with the error code.
 (→ See 7.)

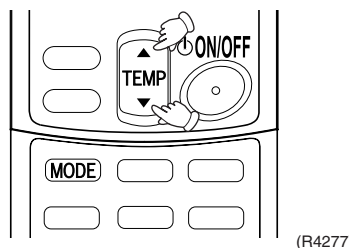
4. Press the MODE button.



The right-side digit blinks.

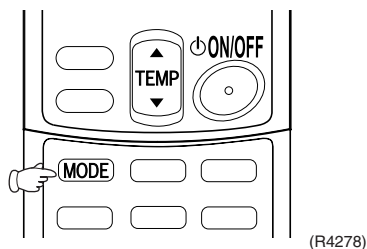


5. Press the TEMP▲ or ▼ button and change the figure until you hear the beep.



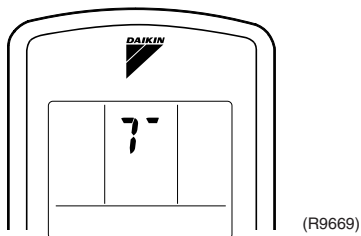
6. Diagnose by the sound.
- ★beep : The left digit does not correspond with the error code.
 - ★beep beep : The left digit corresponds with the error code but the right-side digit does not.
 - ★“long beep” : Both digits correspond with the error code.
7. Determine the error code.
- The figures indicated when you hear the beep are error codes.
- (Error codes and description → Refer to page 100.)

8. Press the MODE button to exit from the diagnosis mode.

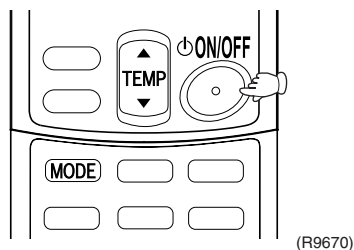


The display “7~” means the trial operation mode.

(Refer to page 217 for trial operation.)



9. Press the ON/OFF button twice to return to the normal mode.



Note: When the remote controller is left untouched for 60 seconds, it returns to the normal mode.

4. Code Indication on the Remote Controller

4.1 Error Codes and Description of Fault

	Error Codes	Description of Fault
System	00	Normal
	U0	Refrigerant shortage
	U2	Low-voltage detection or over-voltage detection
	U4	Signal transmission error (between indoor and outdoor units)
	U7	Signal transmission error (on outdoor unit PCB)
	UR	Unspecified voltage (between indoor and outdoor units)
	UX	Anti-icing function in other rooms
Indoor Unit	R1	Indoor unit PCB abnormality
	RS	Freeze-up protection control or heating peak-cut control
	RE	Fan motor or related abnormality
	E4	Indoor heat exchanger thermistor or related abnormality
	E9	Room temperature thermistor or related abnormality
Outdoor Unit	RS	Anti-icing function
	E1	Outdoor unit PCB abnormality
	ES	OL activation (compressor overload)
	EE	Compressor lock
	E7	DC fan lock
	EB	Input overcurrent detection
	ER	Four-way valve abnormality
	F3	Discharge pipe temperature control
	FE	High pressure control in cooling
	HO	Compressor sensor system abnormality
	HE	Position sensor abnormality
	HB	CT or related abnormality
	HS	Outdoor temperature thermistor or related abnormality
	J3	Discharge pipe thermistor or related abnormality
	JE	Outdoor heat exchanger thermistor or related abnormality
	JB	Liquid pipe thermistor or related abnormality
	JS	Gas pipe thermistor or related abnormality
	L3	Electrical box temperature rise
	L4	Radiation fin temperature rise
	LS	Output overcurrent detection
	PY	Radiation fin thermistor or related abnormality

5. Troubleshooting

5.1 Indoor Unit

Error Codes	Description of Fault		Reference Page
00	Normal condition		—
P1	Indoor unit PCB abnormality		103
P5	Freeze-up protection control or heating peak-cut control		104
P6	Fan motor or related abnormality	AC motor (Slim duct built-in)	106
		DC motor (Duct-free)	107
C4	Indoor heat exchanger thermistor or related abnormality		109
C9	Room temperature thermistor or related abnormality		109
U4	Signal transmission error (between indoor and outdoor units)		110
U9	Unspecified voltage (between indoor and outdoor units)		112

5.2 Outdoor Unit

☀: ON, ●: OFF, ⚡: Blinks

Normal condition : Green - blinks, Red - OFF

Outdoor Unit LED Indication					Error Codes	Description of Fault	Reference Page
Green	Red						
A	1	2	3	4			
	●	●	●	●	00	Normal condition	—
					UR	Unspecified voltage (between indoor and outdoor units)	148
					UH	Anti-icing function in other rooms	148
☀	●	●	☀	☀	(U0)	Refrigerant shortage	143
					U2	Low-voltage detection or over-voltage detection	146
					U7	Signal transmission error (on outdoor unit PCB) (24/32 class)	147
					RS	Anti-icing function	113
					E1	Outdoor unit PCB abnormality (24/32 class)	115
					(E5)	OL activation (compressor overload)	116
					(E6)	Compressor lock	117
					E7	DC fan lock	118
					E8	Input overcurrent detection	119
					ER	Four-way valve abnormality (18 class)	121
					F3	Discharge pipe temperature control	123
					F6	High pressure control in cooling	124
					H0	Compressor sensor system abnormality (24/32 class)	126
					H8	CT or related abnormality	131
					H6	Position sensor abnormality	128
					H9	Outdoor temperature thermistor or related abnormality	133
					J3	Discharge pipe thermistor or related abnormality	133
					J6	Outdoor heat exchanger thermistor or related abnormality	133
					J8	Liquid pipe thermistor or related abnormality	133
					J9	Gas pipe thermistor or related abnormality	133
					P4	Radiation fin thermistor or related abnormality	133
					L3	Electrical box temperature rise	135
					L4	Radiation fin temperature rise	138
					L5	Output overcurrent detection	141



Note:

- The error codes in the parenthesis () are displayed only when the system is shut down.
- When a sensor error occurs, check the remote controller display to determine which sensor is malfunctioning.
If the remote controller does not indicate the error code, conduct the following procedure.
*Turn the power switch off and back on again. If the same LED indication appears again immediately after the power is turned on, the fault is in the thermistor.
*If the above condition does not result, the fault is in the CT.
- The indoor unit error code may take the precedence in the remote controller display.

5.3 Indoor Unit PCB Abnormality

Remote
Controller
Display

81

Method of
Malfunction
Detection

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

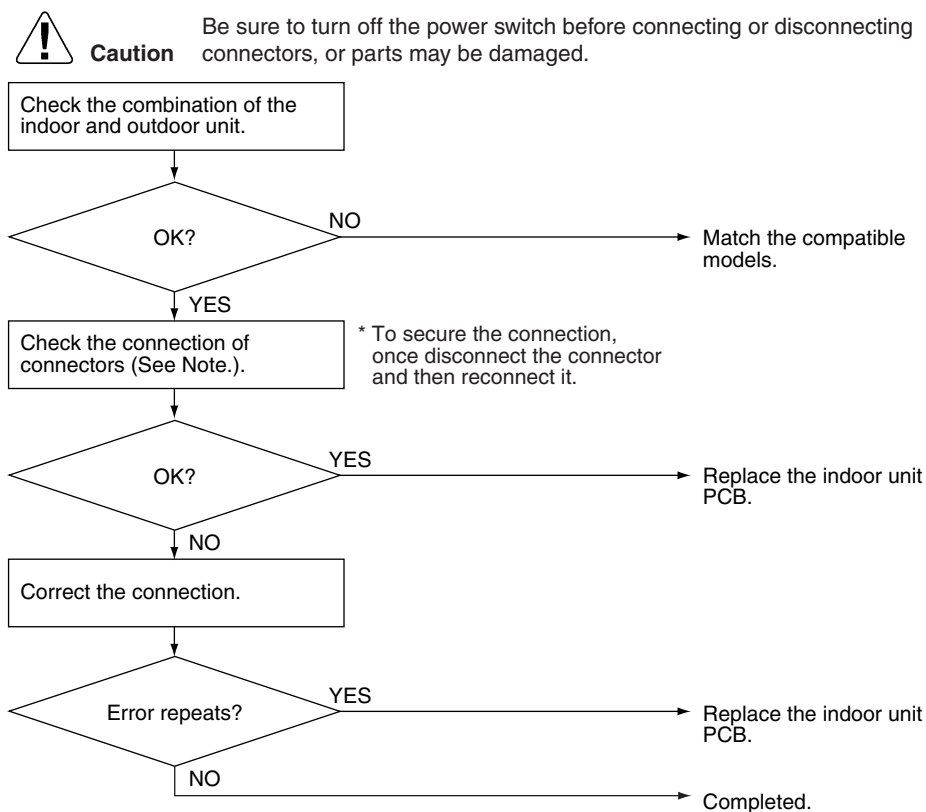
Malfunction
Decision
Conditions

There is no zero-cross detection in approximately 10 seconds.

Supposed
Causes

- Wrong models interconnected
- Defective indoor unit PCB
- Disconnection of connector

Troubleshooting



(R11930)



Note: Check the following connector.

Model Type	Connector
Duct-free system	Terminal board ~ Control PCB
Slim duct built-in system	Terminal board ~ Control PCB

5.4 Freeze-up Protection Control or Heating Peak-cut Control

Remote
Controller
Display

85

Method of
Malfunction
Detection

- Freeze-up protection control
During cooling operation, the freeze-up protection control (operation halt) is activated according to the temperature detected by the indoor heat exchanger thermistor.
- Heating peak-cut control
During heating operation, the temperature detected by the indoor heat exchanger thermistor is used for the heating peak-cut control (operation halt, outdoor fan stop, etc.).

Malfunction
Decision
Conditions

- Freeze-up protection control
During cooling operation, the indoor heat exchanger temperature is below 0°C (32°F).
- Heating peak-cut control
During heating operation, the temperature detected by the indoor heat exchanger thermistor is above 65°C (149°F).

Supposed
Causes

- Clogged air filter of the indoor unit
- Dust accumulation on the indoor heat exchanger
- Short-circuited air
- Defective indoor heat exchanger thermistor
- Defective indoor unit PCB

Troubleshooting

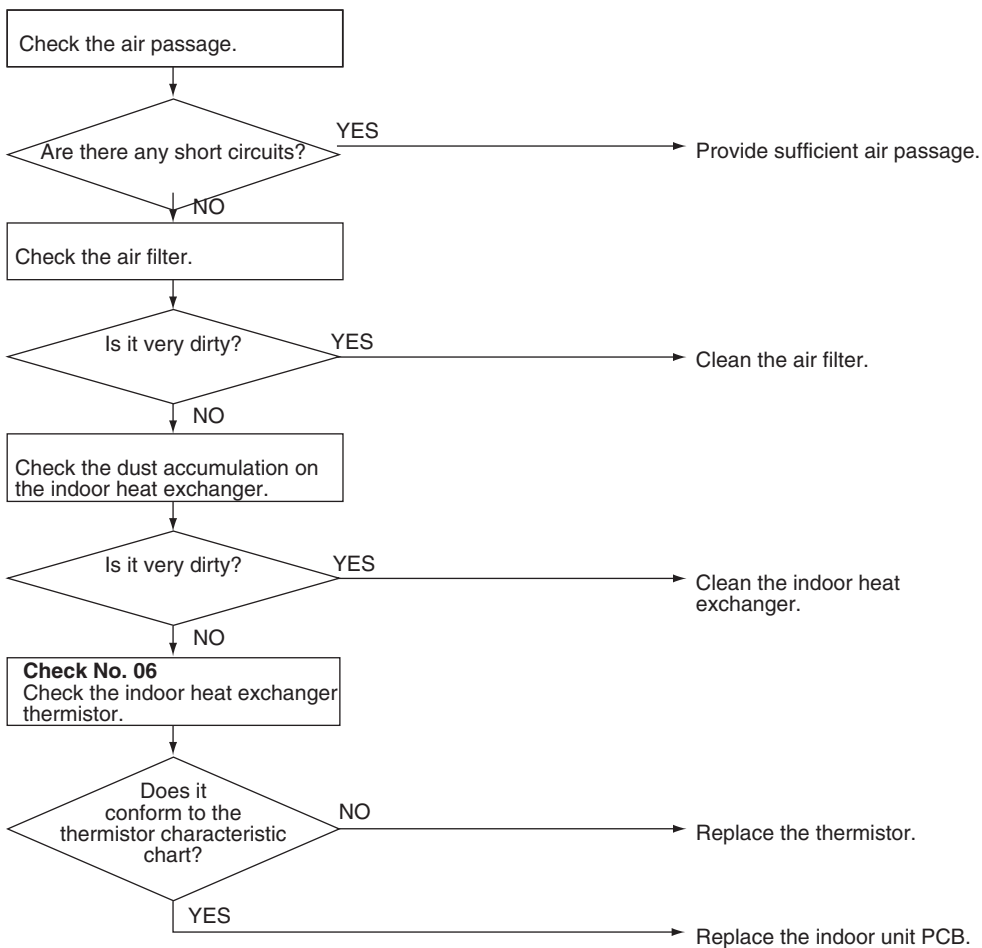


Check No.06
Refer to P.152



Caution

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R7131)



Note: If the outdoor temperature is below -10°C (14°F) in the cooling mode, the unit may be suspended with error $R5$ displayed. The system is reset, but this suspension is recorded in the error history memory.

5.5 Fan Motor or Related Abnormality

5.5.1 AC Motor (Slim Duct Built-in System)

Remote
Controller
Display

RG

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

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

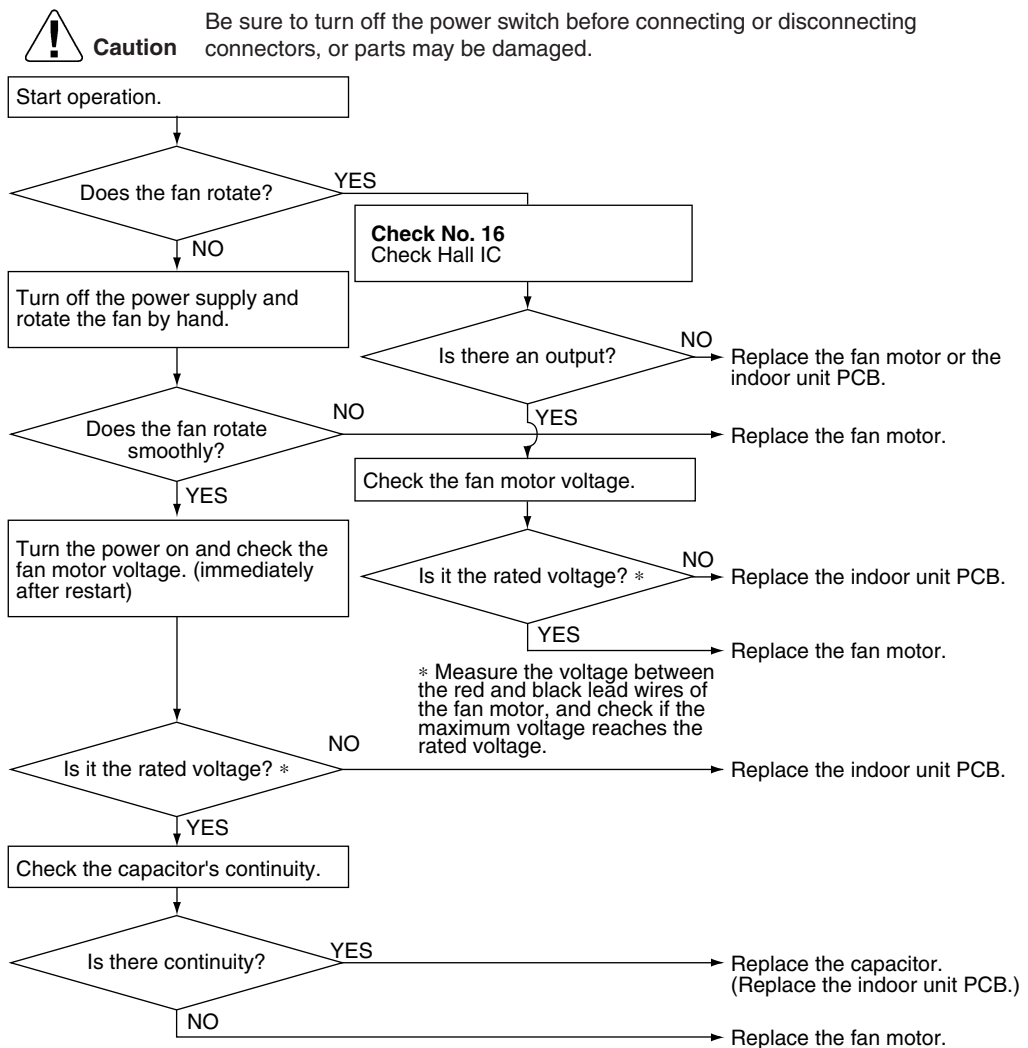
Supposed
Causes

- Layer short inside the fan motor winding
- Breaking of wire inside the fan motor
- Breaking of the fan motor lead wires
- Defective capacitor of the fan motor
- Defective indoor unit PCB

Troubleshooting




Check No.16
Refer to P.158



(R11411)

5.5.2 DC Motor (Duct-Free System)

Remote Controller Display	
Method of Malfunction Detection	The rotation speed detected by the Hall IC during fan motor operation is used to determine abnormal fan motor operation.
Malfunction Decision Conditions	The detected rotation speed does not reach the demanded rotation speed of the target tap, and is less than 50% of the maximum fan motor rotation speed.
Supposed Causes	<ul style="list-style-type: none">■ Layer short inside the fan motor winding■ Breaking of wire inside the fan motor■ Breaking of the fan motor lead wires■ Defective capacitor of the fan motor■ Defective indoor unit PCB

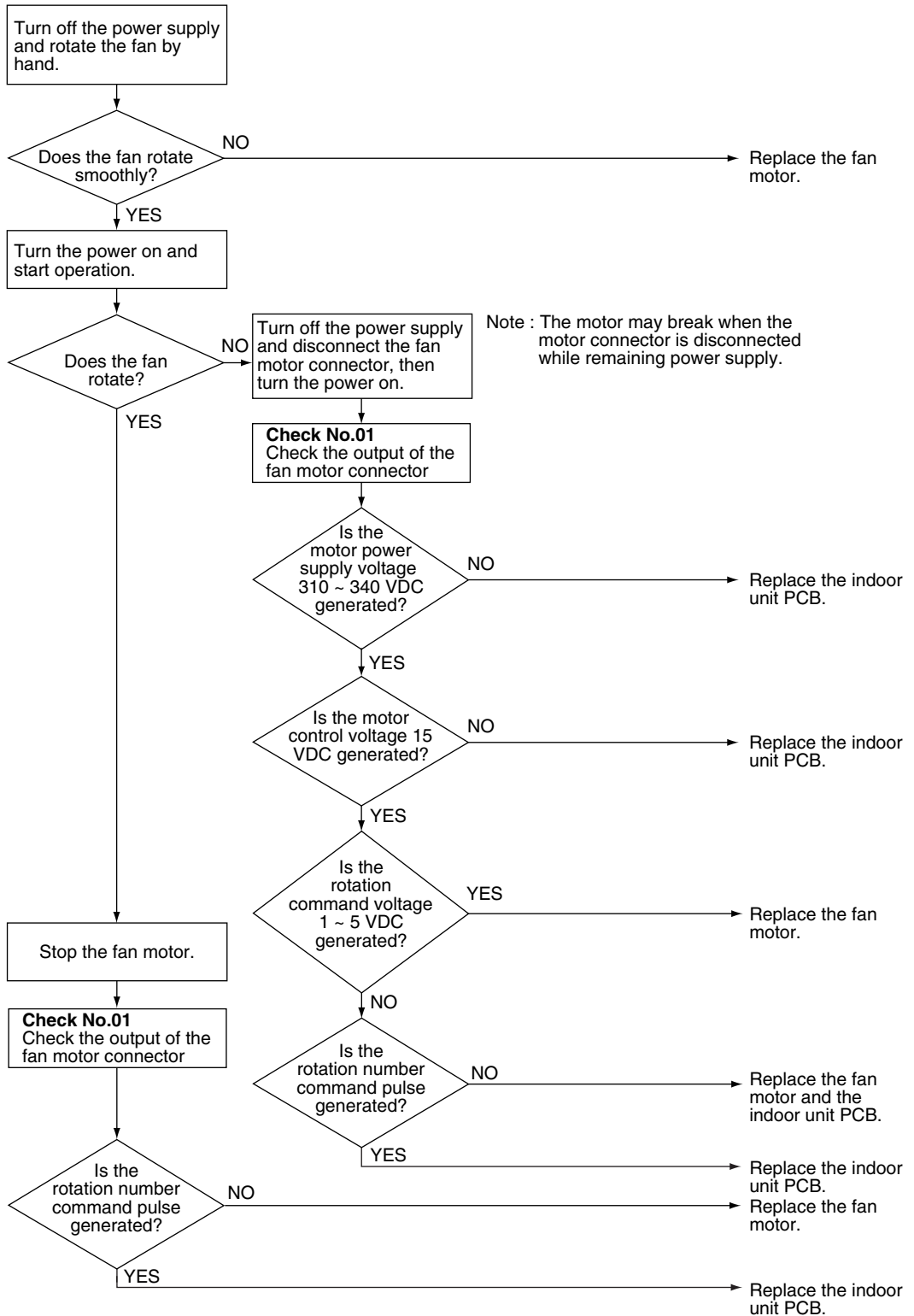
Troubleshooting



Check No.01
Refer to P.149

**Caution**

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R11293)

5.6 Thermistor or Related Abnormality (Indoor Unit)

Remote
Controller
Display

Ⓔ4,Ⓔ9

Method of
Malfunction
Detection

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

Malfunction
Decision
Conditions

The thermistor input is more than 4.96 V or less than 0.04 V during compressor operation.

Supposed
Causes

- Disconnection of connector
- Defective thermistor
- Defective indoor unit PCB

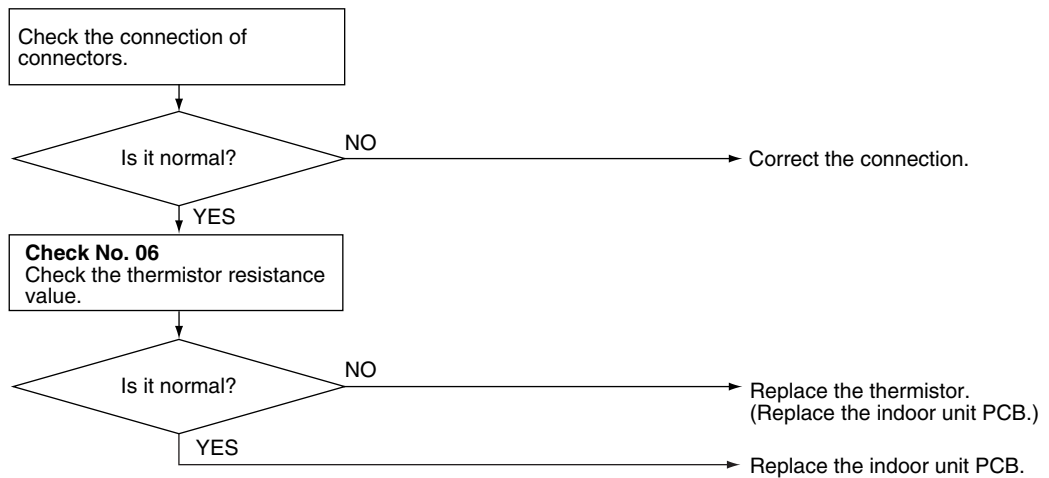
Troubleshooting


Check No.06
Refer to P.152



Caution

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R7134)

Ⓔ4 : Indoor heat exchanger thermistor
Ⓔ9 : Room temperature thermistor

5.7 Signal Transmission Error (between Indoor and Outdoor Units)

**Remote
Controller
Display**



**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**

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

**Supposed
Causes**

- Defective outdoor unit PCB
- Defective indoor unit PCB
- Wiring error
- Disturbed power supply waveform
- Breaking of the connection wires between the indoor and outdoor units (wire No. 3)

Troubleshooting

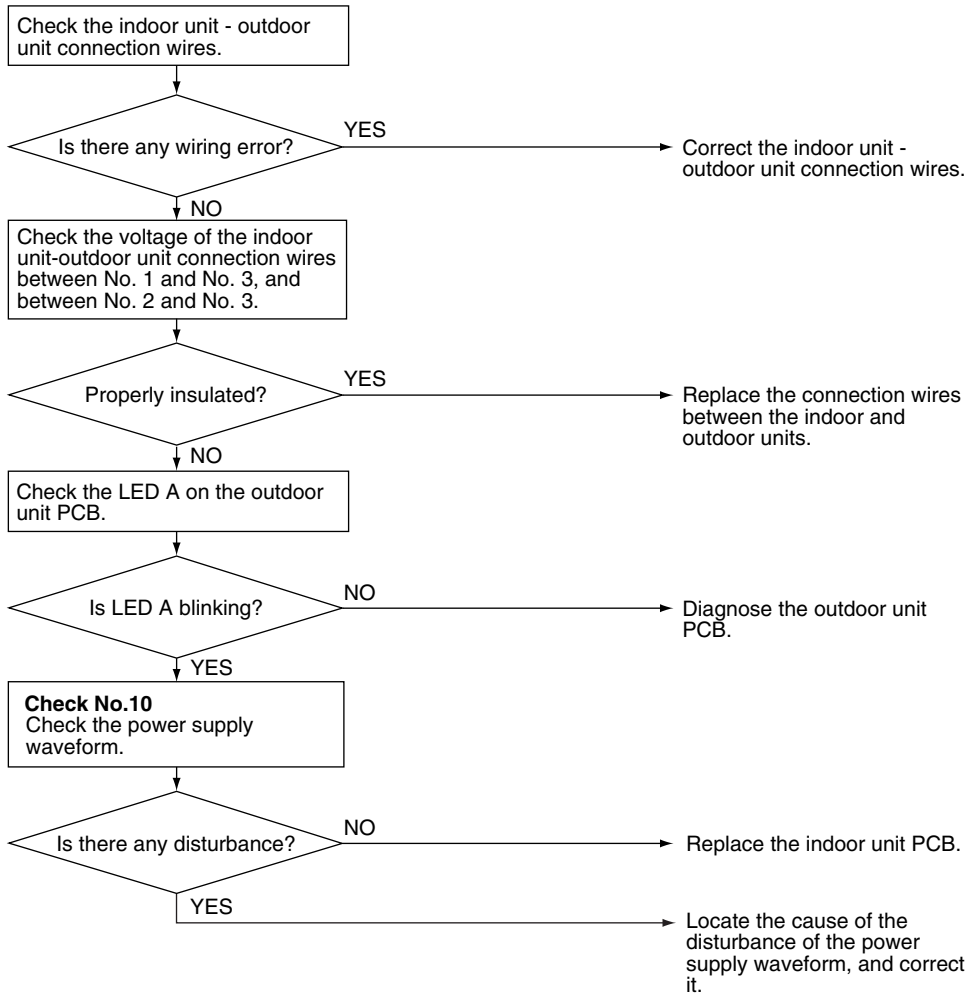


Check No.10
Refer to P.155



Caution

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R11706)

5.8 Unspecified Voltage (between Indoor and Outdoor Units)

Remote
Controller
Display



Method of
Malfunction
Detection

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

Malfunction
Decision
Conditions

The pair type and multi type are interconnected.

Supposed
Causes

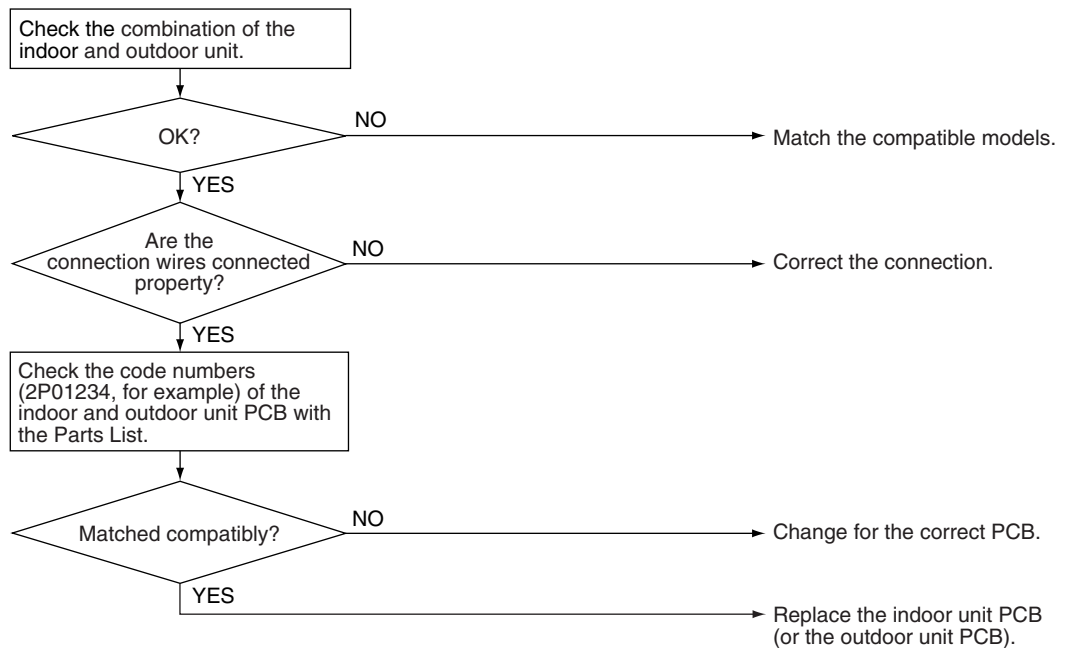
- Wrong models interconnected
- Wrong wiring of connecting wires
- Wrong indoor unit PCB or outdoor unit PCB mounted
- Defective indoor unit PCB
- Defective outdoor unit PCB

Troubleshooting



Caution

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R11707)

5.9 Anti-icing Function

Remote Controller Display

RS

Outdoor Unit LED Display

A 1 2 3 4

Method of Malfunction Detection

During cooling operation, indoor unit icing is detected by checking the temperatures sensed by the indoor heat exchanger thermistor and the room temperature thermistor that are located in a shut-down room.

Malfunction Decision Conditions

- In cooling operation, the both conditions (A) and (B) are met for 5 minutes.
 (A) Room thermistor temperature – Indoor heat exchanger temperature $\geq 10^{\circ}\text{C}$ (18°F)
 (B) Indoor heat exchanger temperature $\leq -1^{\circ}\text{C}$ (30°F)
- If the error repeats 4 times, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

Supposed Causes

- Wrong wiring or piping
- Defective electronic expansion valve
- Short-circuited air
- Defective indoor heat exchanger thermistor
- Defective room temperature thermistor

Troubleshooting



Check No.04
Refer to P.150



Check No.06
Refer to P.152

**Caution**

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



5.10 Outdoor Unit PCB Abnormality (24/32 Class)

Remote
Controller
Display

E1

Outdoor Unit LED
Display

A 1 2 3 4

Method of
Malfunction
Detection

Detect within the program of the microcomputer.

Malfunction
Decision
Conditions

The program of the microcomputer is in abnormal running order.

Supposed
Causes

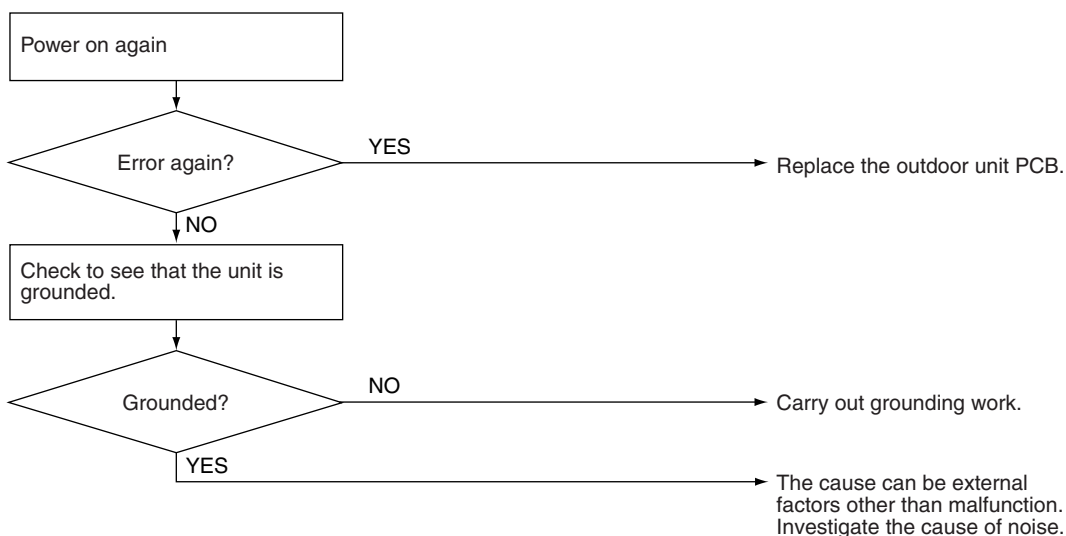
- Noise
- Momentary fall of voltage
- Momentary power failure
- Defective outdoor unit PCB

Troubleshooting



Caution

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R7183)

5.11 OL Activation (Compressor Overload)

Remote
Controller
Display

ES

Outdoor Unit LED
Display

A 1 ☀ 2 ● 3 ☀ 4 ●

Method of
Malfunction
Detection

A compressor overload is detected through compressor OL.

Malfunction
Decision
Conditions

- If the error repeats twice, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error
- * The operating temperature condition is not specified.

Supposed
Causes

- Refrigerant shortage
- Defective four-way valve
- Defective outdoor unit PCB
- Water mixed in refrigerant
- Defective electronic expansion valve
- Defective stop valve

Troubleshooting



Check No.04
Refer to P.150



Check No.05
Refer to P.151



Check No.06
Refer to P.152

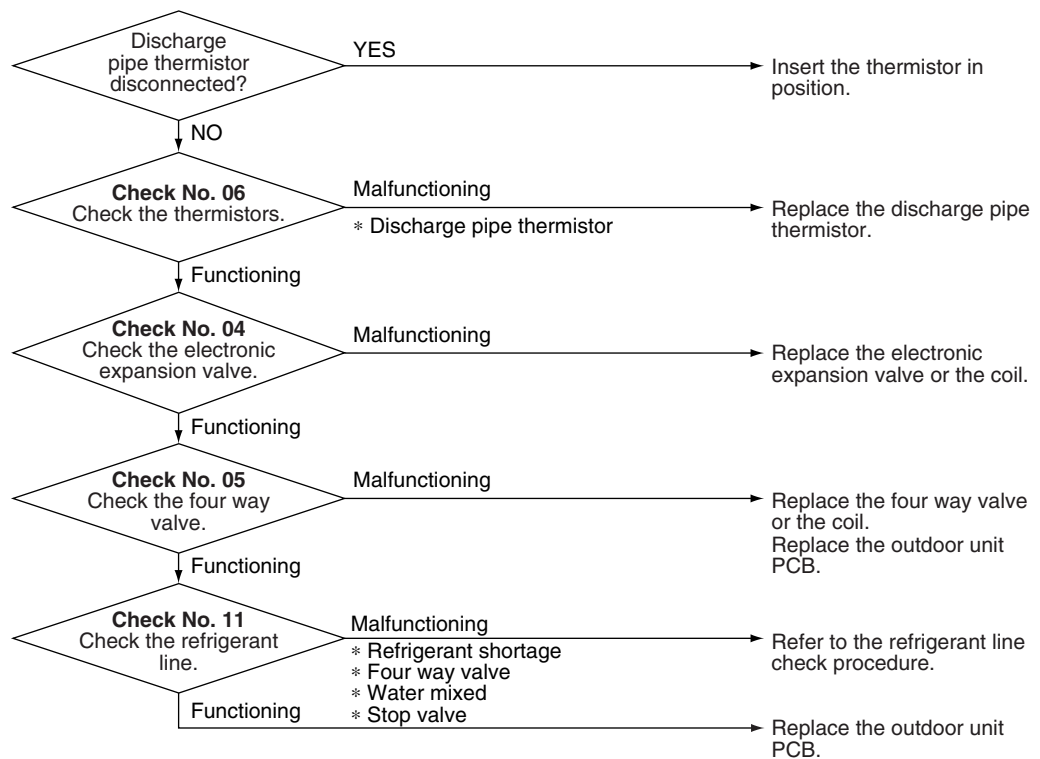


Check No.11
Refer to P.155



Caution

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



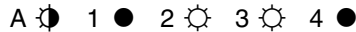
(R7137)

5.12 Compressor Lock

Remote
Controller
Display



Outdoor Unit LED
Display



Method of
Malfunction
Detection

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

Malfunction
Decision
Conditions

- Judging from the current waveform generated when high-frequency voltage is applied to the compressor.
- If the error repeats 16 times, the system is shut down.
- Reset condition: Continuous run for about 5 minutes without any other error

Supposed
Causes

- Compressor locked

Troubleshooting

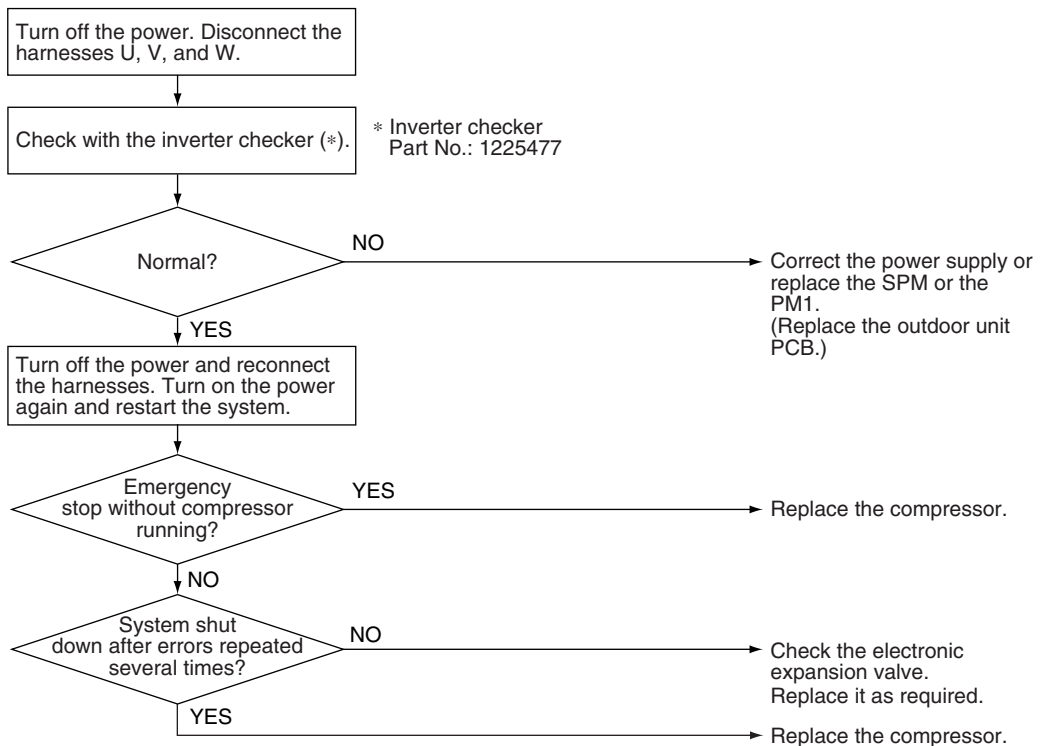


Caution

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

(Precaution before turning on the power again)

Make sure the power has been off for at least 30 seconds.



(R11301)

5.13 DC Fan Lock

Remote
Controller
Display



Outdoor Unit LED
Display

A 1 2 3 4

Method of
Malfunction
Detection

An error is determined with the high-voltage fan motor rotation speed detected by the Hall IC.

Malfunction
Decision
Conditions

- The fan does not start in 30 seconds even when the fan motor is running.
- If the error repeats 16 times, the system is shut down.
- Reset condition: Continuous run for about 5 minutes without any other error

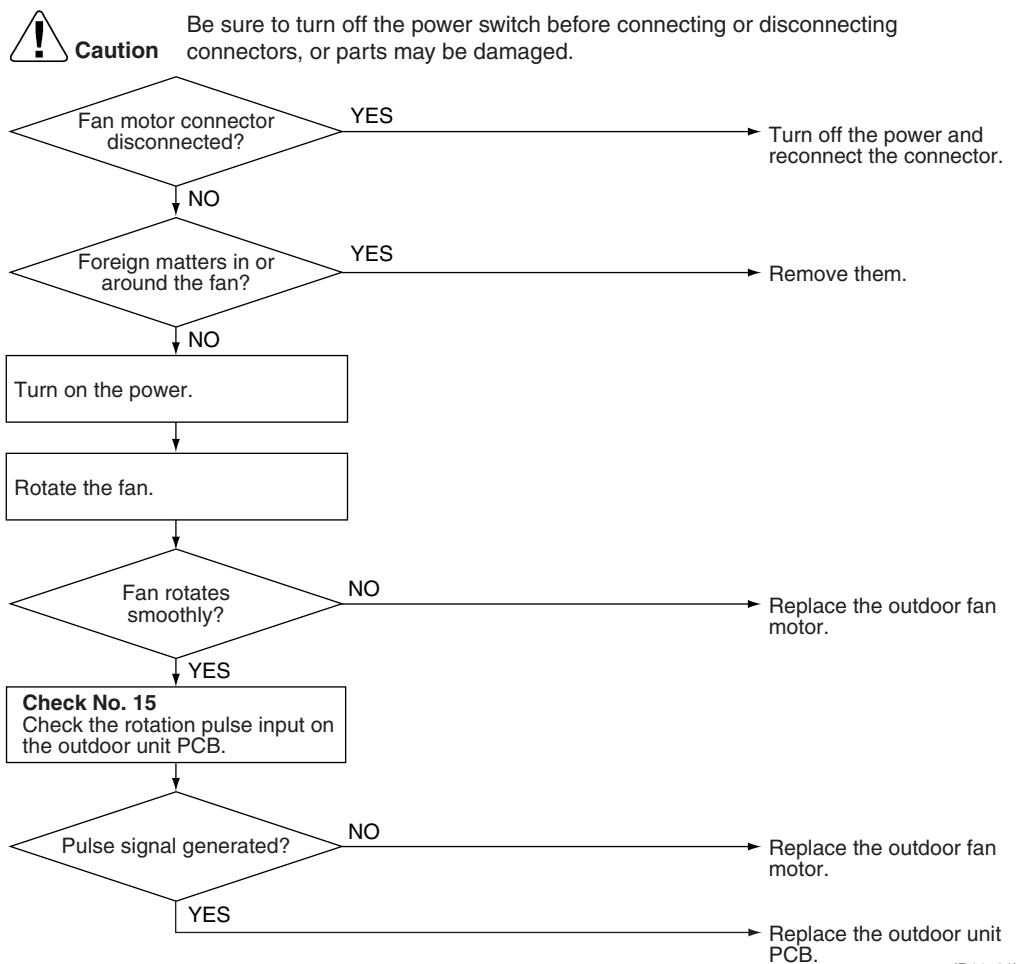
Supposed
Causes

- Defective fan motor
- Disconnection of the fan motor
- Foreign matters stuck in the fan

Troubleshooting








Check No.15
Refer to P.157



(R11708)

5.14 Input Overcurrent Detection

Remote Controller Display	EE
Outdoor Unit LED Display	A  1  2  3  4 
Method of Malfunction Detection	Detected by checking the input current value
Malfunction Decision Conditions	<ul style="list-style-type: none">■ The input current is at a certain value (depending on the condition) for 2.5 seconds.■ The compressor halts if the error occurs, and restarts automatically after 3-minute standby.
Supposed Causes	<ul style="list-style-type: none">■ Defective compressor■ Defective power transistor■ Defective inverter main circuit electrolytic capacitor■ Defective outdoor unit PCB■ Short circuit

Troubleshooting



Check No.07
Refer to P.153



Check No.08
Refer to P.154

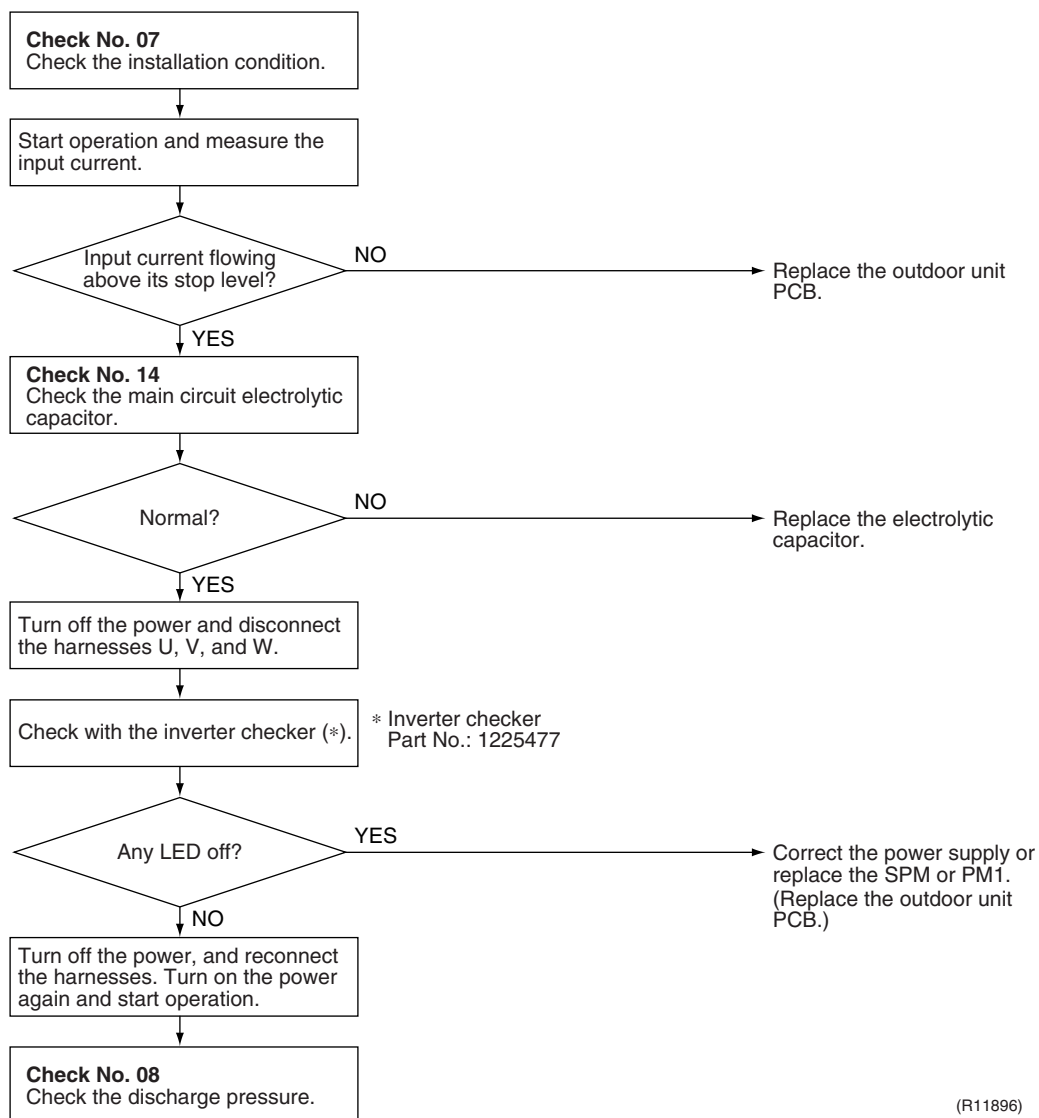


Check No.14
Refer to P.157



Caution Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

* An input overcurrent may result from wrong internal wiring. If the wires have been disconnected and reconnected, and the system is interrupted by an input overcurrent, take the following procedure.



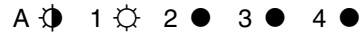
(R11896)

5.15 Four-Way Valve Abnormality (18 Class)

Remote
Controller
Display



Outdoor Unit LED
Display



Method of
Malfunction
Detection

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

Malfunction
Decision
Conditions

Either of the following conditions occurs 6 minutes after the compressor has started.

- Cooling operation
Lowest temperature among the running indoor heat exchangers > 5°C (41°F)
- Heating operation
Highest temperature among the running indoor heat exchangers < 0°C (32°F)

Supposed
Causes

- Poor connector contact
- Defective thermistor
- Defective outdoor unit PCB
- Defective four-way valve coil or harness
- Defective four-way valve
- Foreign substance mixed in refrigerant

Troubleshooting



Check No.05
Refer to P.151



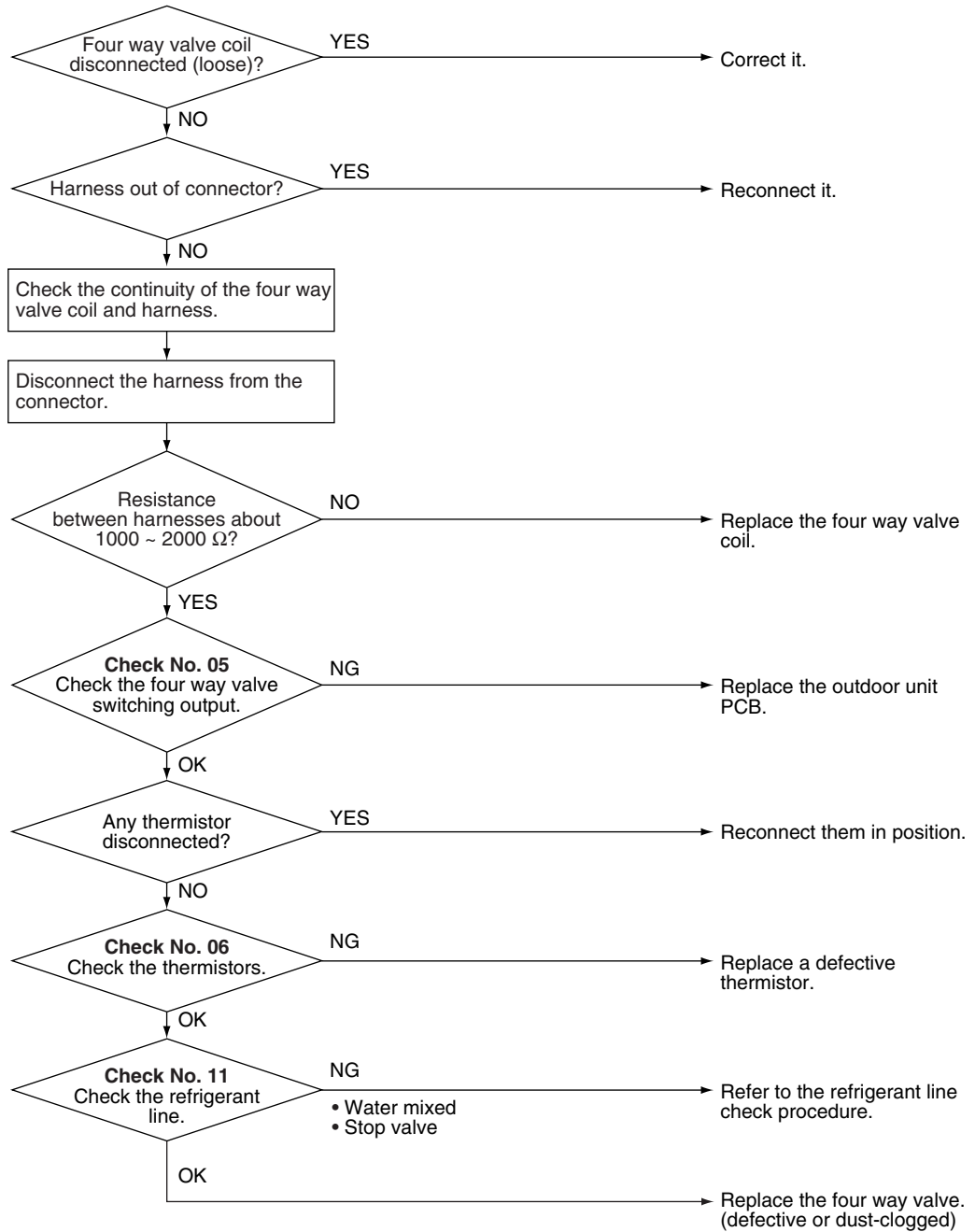
Check No.06
Refer to P.152



Check No.11
Refer to P.155

**Caution**

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R11931)

5.16 Discharge Pipe Temperature Control

Remote
Controller
Display



Outdoor Unit LED
Display

A 1 2 3 4

Method of
Malfunction
Detection

Detected by the discharge pipe thermistor

Malfunction
Decision
Conditions

- If the temperature detected by the discharge pipe thermistor rises above A, the compressor stops.
- The error is cleared when the discharge pipe temperature is dropped below B.

A	120°C (248°F)
B	107°C (225°F)

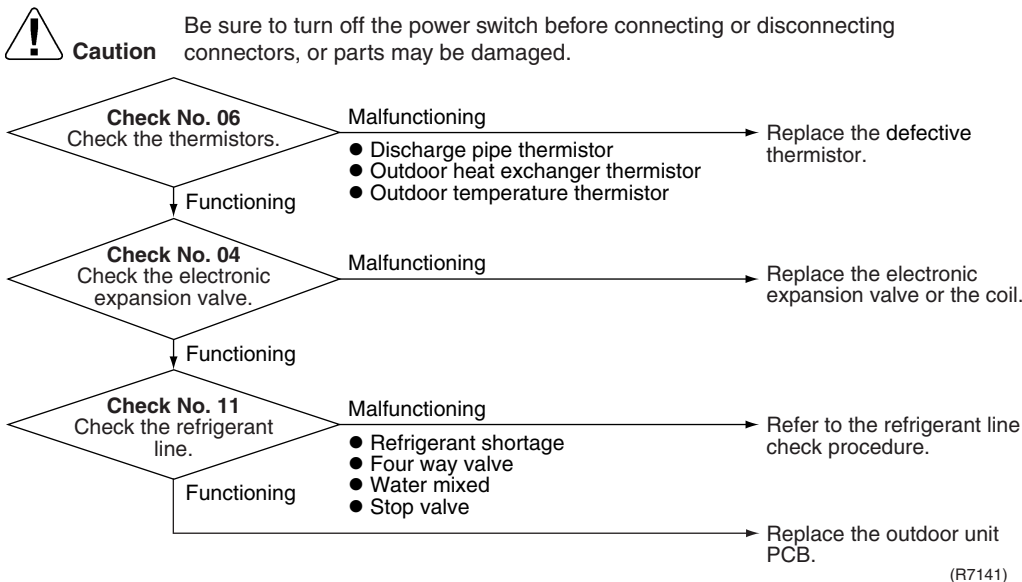
- If the error repeats 6 times, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

Supposed
Causes

- Refrigerant shortage
- Defective four-way valve
- Defective discharge pipe thermistor
(Defective outdoor heat exchanger thermistor or outdoor temperature thermistor)
- Defective outdoor unit PCB
- Water mixed in refrigerant
- Defective electronic expansion valve
- Defective stop valve

Troubleshooting

- Check No.04**
Refer to P.150
- Check No.06**
Refer to P.152
- Check No.11**
Refer to P.155

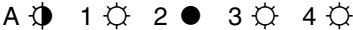


5.17 High Pressure Control in Cooling

Remote
Controller
Display



Outdoor Unit LED
Display



Method of
Malfunction
Detection

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

Malfunction
Decision
Conditions

- The temperature sensed by the outdoor heat exchanger thermistor rises above A.
- The error is cleared when the temperature drops below B.

	18 class	24/32 class
A	65°C (149°F)	65°C (149°F)
B	47.5°C (118°F)	49°C (120°F)

Supposed
Causes

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

Troubleshooting



Check No.04
Refer to P.150



Check No.06
Refer to P.152



Check No.07
Refer to P.153



Check No.08
Refer to P.154



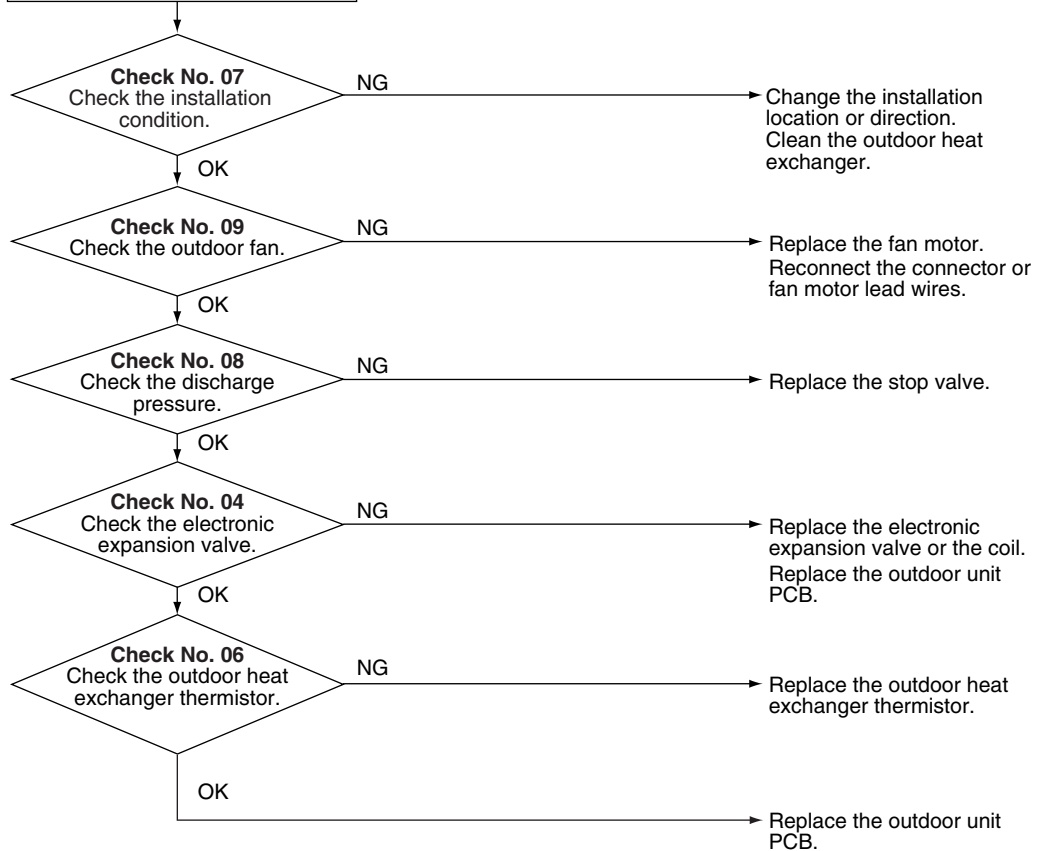
Check No.09
Refer to P.154



Caution






Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

Check the installation space.

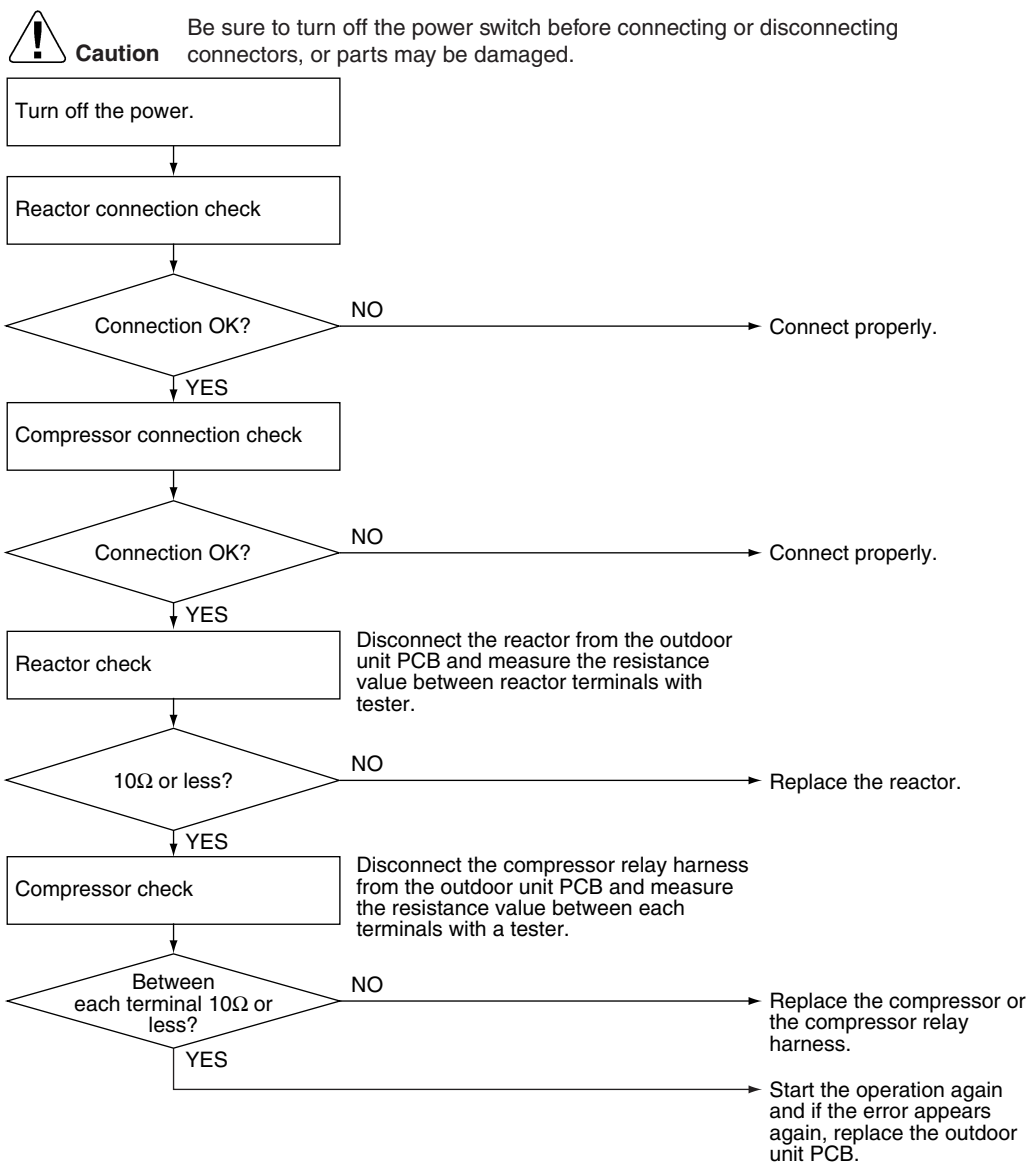


(R11897)

5.18 Compressor Sensor System Abnormality (24/32 Class)

Remote Controller Display	HO
Outdoor Unit LED Display	A  1  2  3  4 
Method of Malfunction Detection	<ul style="list-style-type: none"> ■ Fault condition is identified by the supply voltage and the DC voltage which is detected before the compressor startup. ■ Fault condition is identified by the compressor current which is detected right after the compressor startup. ■ If the error repeats 16 times, the system is shut down. ■ Reset condition: Continuous run for about 5 minutes without any other error
Malfunction Decision Conditions	<ul style="list-style-type: none"> ■ The detected value of the supply voltage and the DC voltage is obviously low or high. ■ The compressor current does not run when the compressor is started.
Supposed Causes	<ul style="list-style-type: none"> ■ Disconnection of reactor ■ Disconnection of compressor ■ Defective outdoor unit PCB ■ Defective compressor

Troubleshooting








(R7174)

5.19 Position Sensor Abnormality

Remote
Controller
Display

H6

Outdoor Unit LED
Display

A  1  2  3  4 

Method of
Malfunction
Detection

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

Malfunction
Decision
Conditions

- If the error repeats 8 times, the system is shut down.
- Reset condition: Continuous run for about 5 minutes without any other error

Supposed
Causes

- Disconnection of the compressor relay cable
- Defective compressor
- Defective outdoor unit PCB
- Startup failure caused by the closed stop valve
- Input voltage out of specification

Troubleshooting

18 class

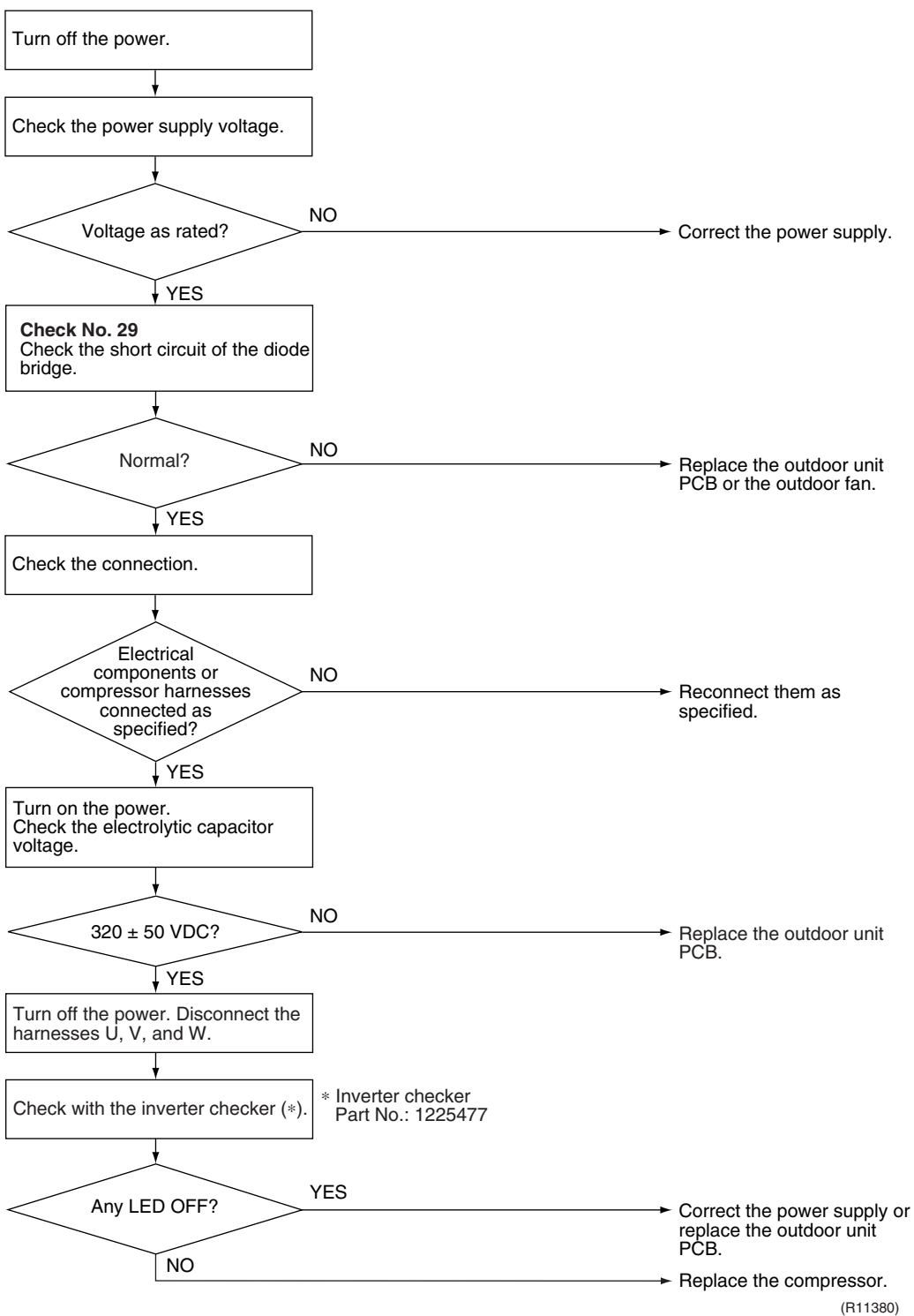


Check No.29
Refer to P.158



Caution

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

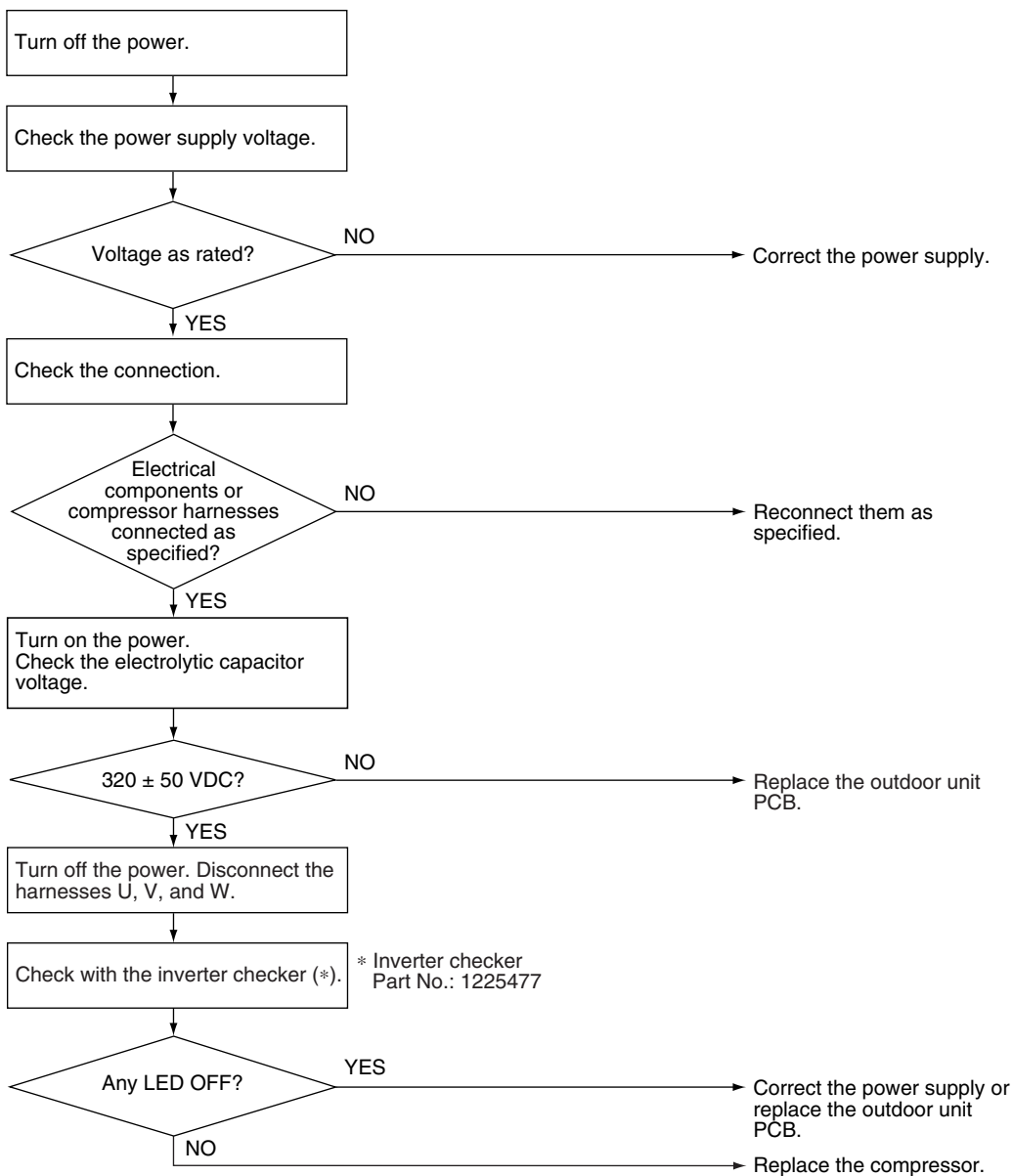


Troubleshooting

24/32 class

**Caution**

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R11471)

5.20 CT or Related Abnormality

Remote Controller Display

H8

Outdoor Unit LED Display

A 1 2 3 4

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 more than Δ Hz and input current is below ∇ A.

	18 class	24/32 class
Δ (Hz)	55	32
∇ (A)	1.25	0.5

- If the error repeats 4 times, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

Supposed Causes

- Defective power transistor
- Breaking of wiring or disconnection
- Defective reactor
- Defective outdoor unit PCB

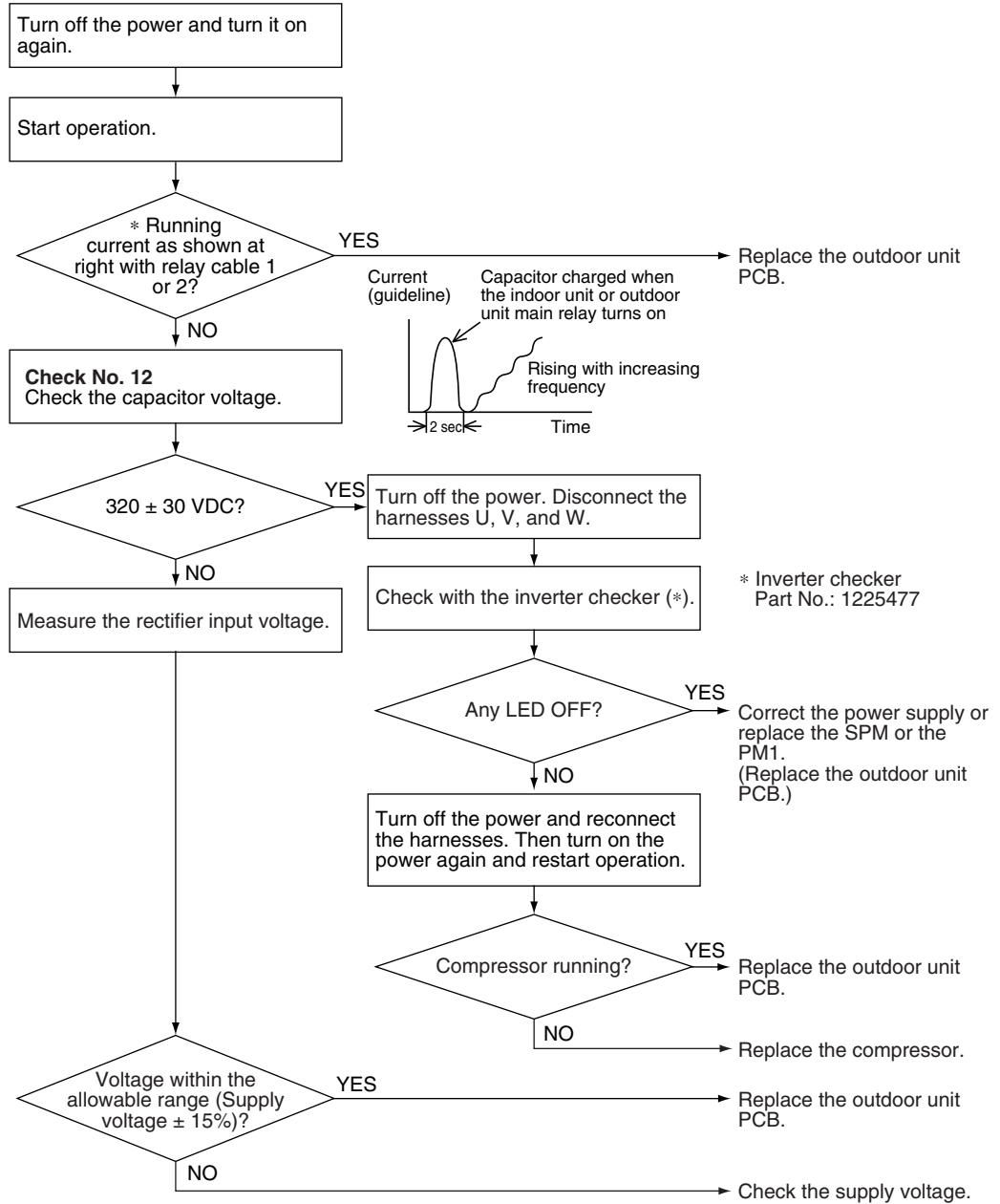
Troubleshooting



Check No.12
Refer to P.156

**Caution**

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R11304)

5.21 Thermistor or Related Abnormality (Outdoor Unit)

Remote
Controller
Display

H9, U3, U6, U8, U9, P4

Outdoor Unit LED
Display

A 1 2 3 4

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 sensed by each thermistor.

Malfunction
Decision
Conditions

- The thermistor input is above 4.96 V or below 0.04 V with the power on.
- U3 error is judged if the discharge pipe temperature is lower than the heat exchanger temperature.
- The system is shut down if all the units are judged as the U3 error.

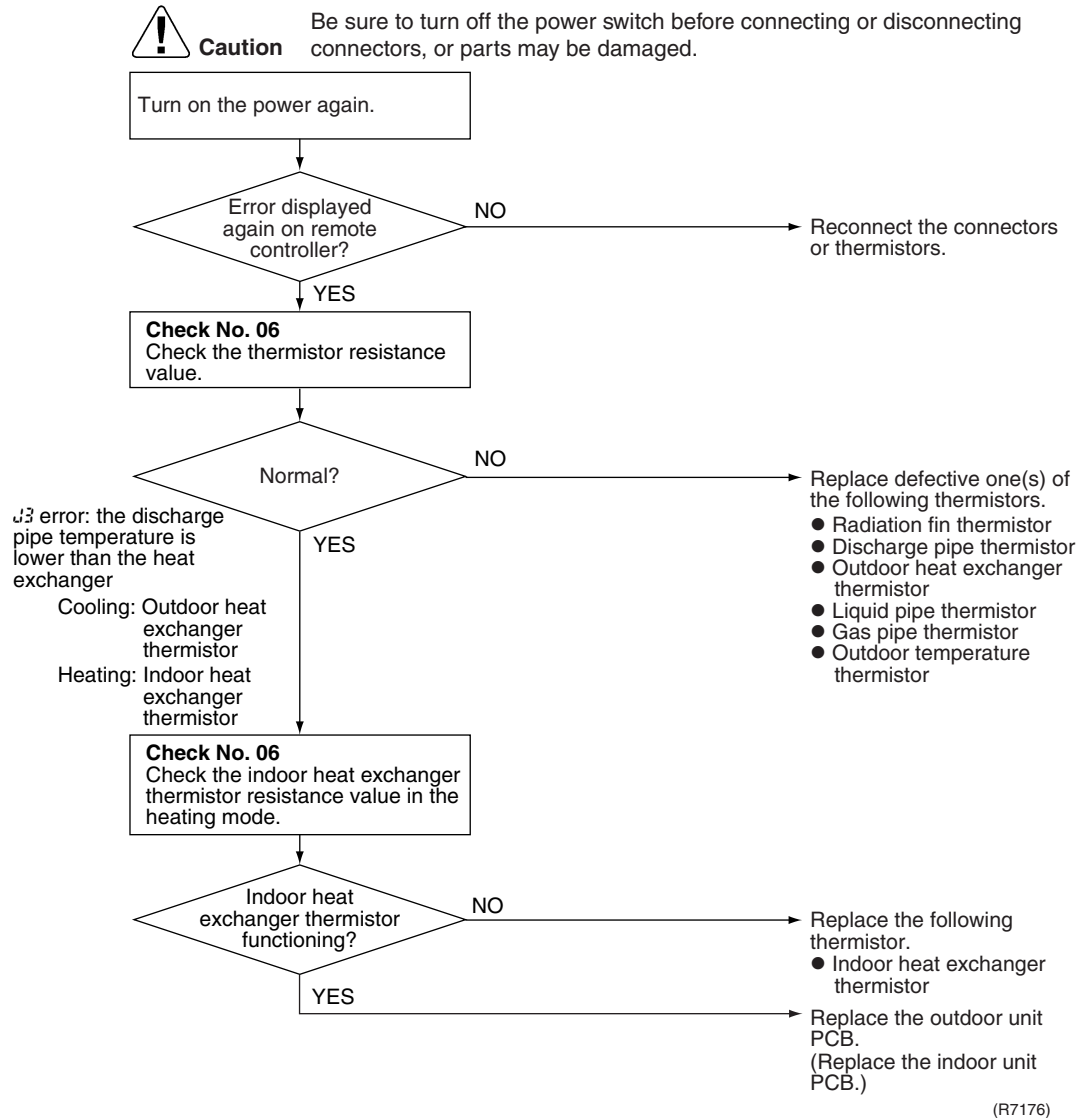
Supposed
Causes

- Disconnection of the connector for the thermistor
- Defective thermistor
- Defective outdoor unit PCB
- Defective indoor unit PCB
- Defective heat exchanger thermistor in the case of U3 error (outdoor heat exchanger thermistor in cooling mode, or indoor heat exchanger thermistor in heating mode)

Troubleshooting



Check No.06
Refer to P.152

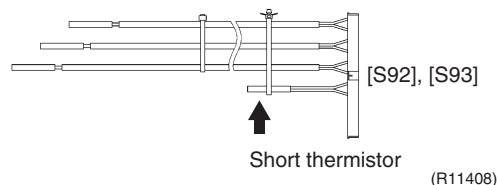


⚠ : Outdoor temperature thermistor
 ⚠ : Discharge pipe thermistor
 ⚠ : Outdoor heat exchanger thermistor
 ⚠ : Liquid pipe thermistor
 ⚠ : Gas pipe thermistor
 ⚠ : Radiation fin thermistor



Note: For 3MXS24JVJU

The short thermistors which locate near the connectors [S92] and [S93] each are indispensable for control. When you check the liquid pipe thermistors or the gas pipe thermistors, check the short thermistor also.



5.22 Electrical Box Temperature Rise

Remote
Controller
Display



Outdoor Unit LED
Display

A 1 2 3 4

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 A.
- The error is cleared when the temperature drops below B.
- To cool the electrical components, the outdoor fan starts when the radiation fin temperature rises above C and stops when it drops below B.

	A	B	C
18 class	80°C (176°F)	70°C (158°F)	75°C (167°F)
24/32 class	100°C (212°F)	70°C (158°F)	85°C (185°F)

Supposed
Causes

- Defective outdoor unit fan
- Short circuit
- Defective fin thermistor
- Disconnection of connector
- Defective outdoor unit PCB

Troubleshooting

18 class



Check No.06
Refer to P.152



Check No.07
Refer to P.153



Check No.09
Refer to P.154

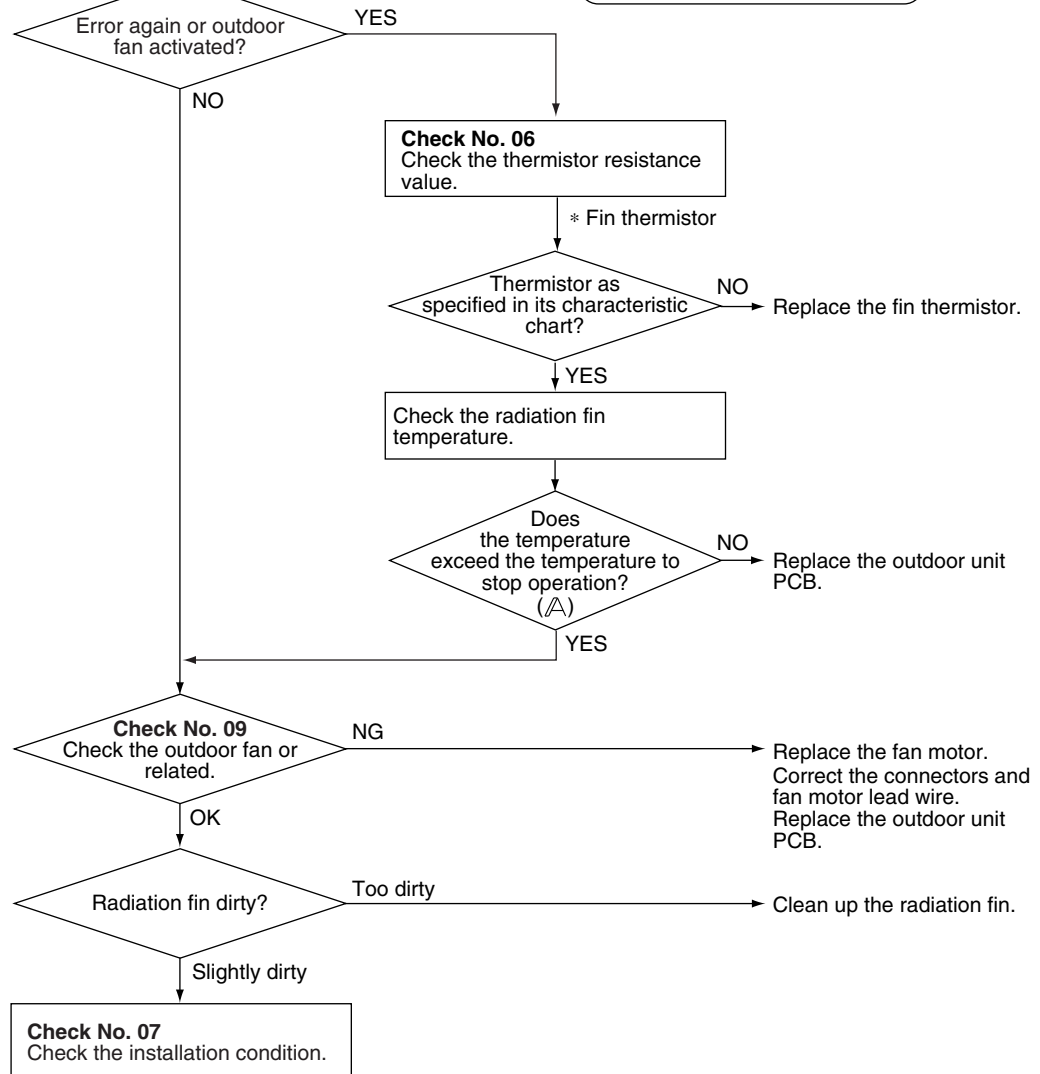
**Caution**

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

Turn off the power and turn it on again.

**WARNING**

To cool the electrical components, the outdoor fan starts when the radiation fin temperature rises above C and stops when it drops below B .



(R12298)

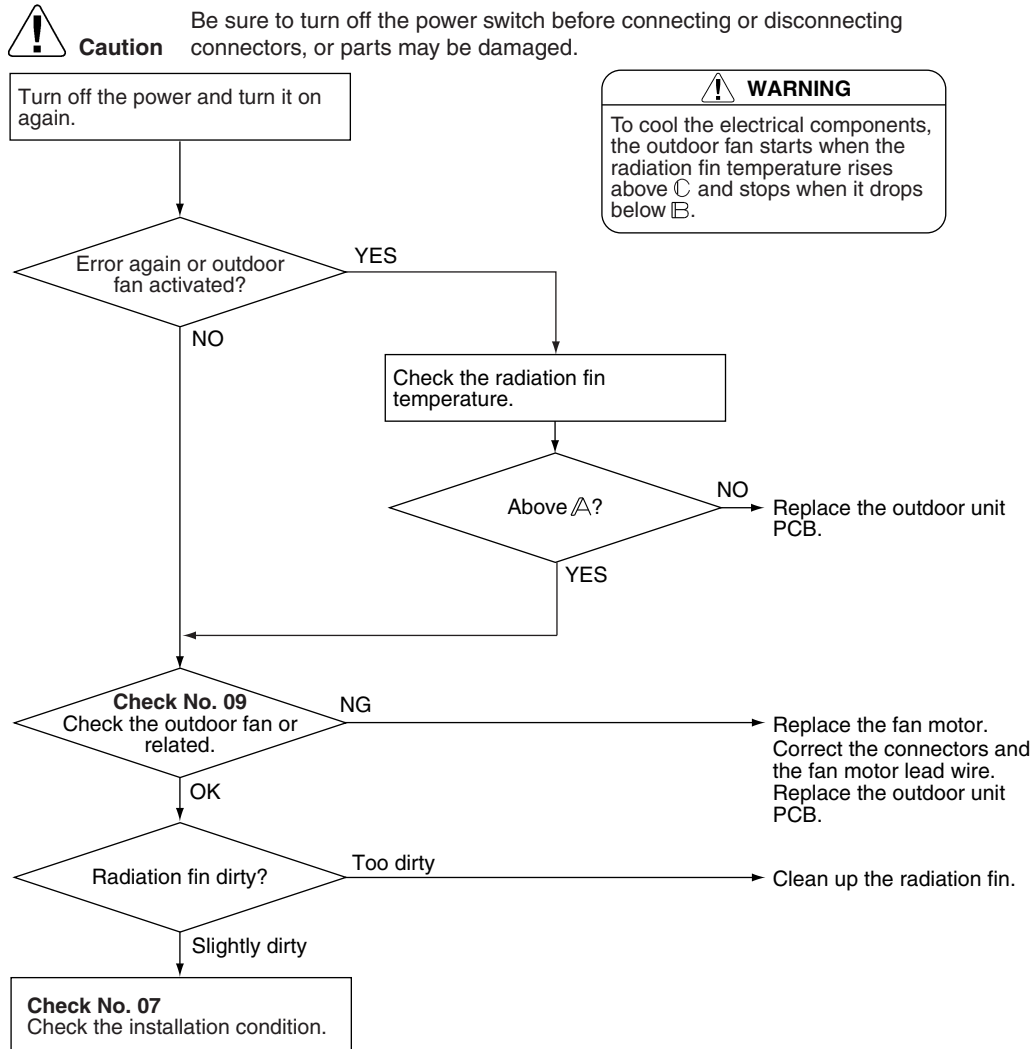
	A	B	C
18 class	80°C (176°F)	70°C (158°F)	75°C (167°F)

Troubleshooting

24/32 class


Check No.07
Refer to P.153


Check No.09
Refer to P.154



(R11713)

	A	B	C
24/32 class	100°C (212°F)	70°C (158°F)	85°C (185°F)

5.23 Radiation Fin Temperature Rise

Remote
Controller
Display

L4

Outdoor Unit LED
Display

A 1 2 3 4

Method of
Malfunction
Detection

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

Malfunction
Decision
Conditions

- The radiation fin temperature with the compressor on is above A.
- The error is cleared when the temperature drops below B.

	A	B
18 class	90°C (194°F)	85°C (185°F)
24/32 class	105°C (221°F)	97°C (207°F)

- If the error repeats, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

Supposed
Causes

- Defective outdoor unit fan
- Short circuit
- Defective fin thermistor
- Disconnection of connector
- Defective outdoor unit PCB
- Silicon grease is not applied properly on the radiation fin after replacing the outdoor unit PCB.

Troubleshooting

18 class


Check No.06
Refer to P.152

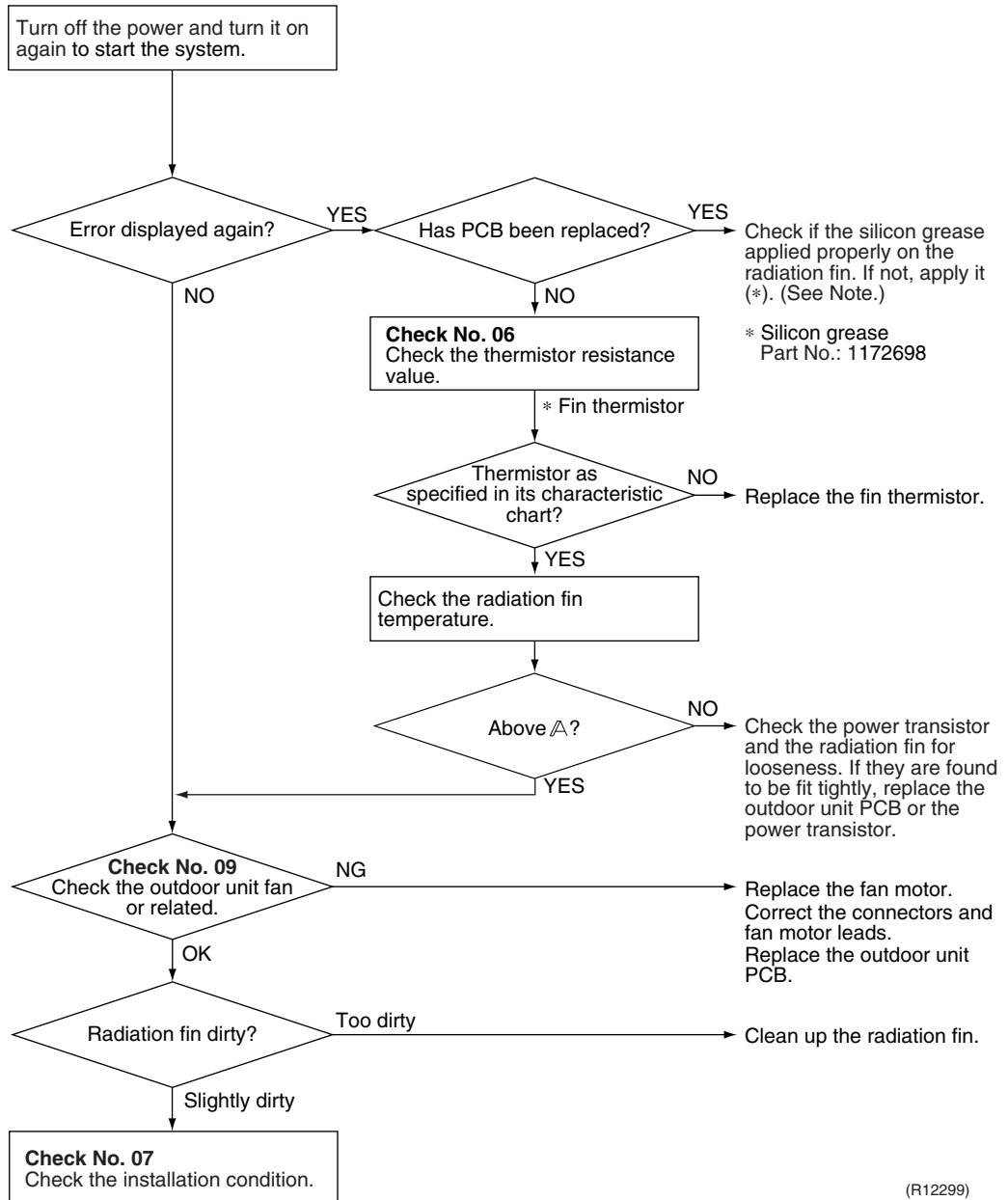

Check No.07
Refer to P.153


Check No.09
Refer to P.154



Caution

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.
(Precaution before turning on the power again)
Make sure the power has been off for at least 30 seconds.



(R12299)

	Δ
18 class	90°C (194°F)



Note:

Refer to “Application of silicon grease to a power transistor and a diode bridge” on page 224 for detail.

Troubleshooting

24/32 class



Check No.07
Refer to P.153

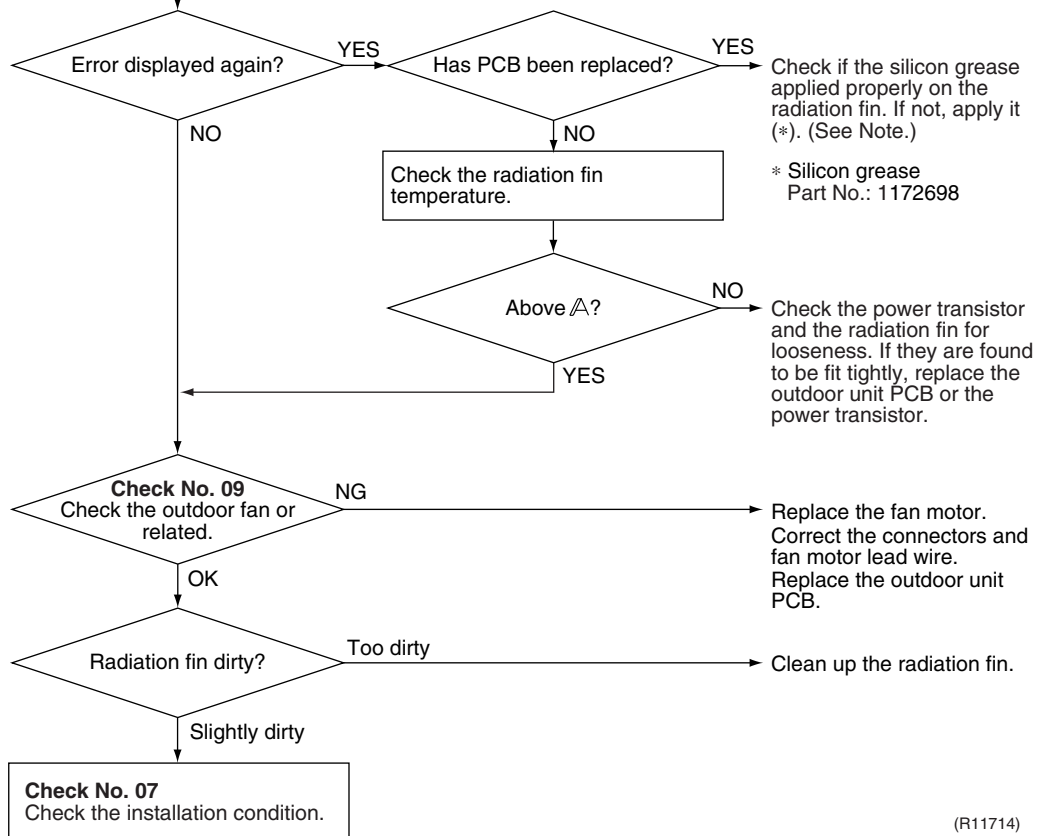


Check No.09
Refer to P.154

**Caution**

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

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



(R11714)

	Δ
24/32 class	105°C (221°F)



Note: Refer to “Application of silicon grease to a power transistor and a diode bridge” on page 224 for detail.

5.24 Output Overcurrent Detection

Remote Controller Display	L5				
Outdoor Unit LED Display	A	1	2	3	4
Method of Malfunction Detection	An output overcurrent is detected by checking the current that flows in the inverter DC section.				
Malfunction Decision Conditions	<ul style="list-style-type: none">■ A position signal error occurs while the compressor is running.■ A speed error occurs while the compressor is running.■ An output overcurrent signal is fed from the output overcurrent detection circuit to the microcomputer.■ If the error repeats 16 times, the system is shut down.■ Reset condition: Continuous run for about 5 minutes without any other error				
Supposed Causes	<ul style="list-style-type: none">■ Defective power transistor■ Wrong internal wiring■ Abnormal supply voltage■ Defective outdoor unit PCB■ Closed stop valve■ Defective compressor■ Poor installation condition				

Troubleshooting



Check No.07
Refer to P.153



Check No.08
Refer to P.154

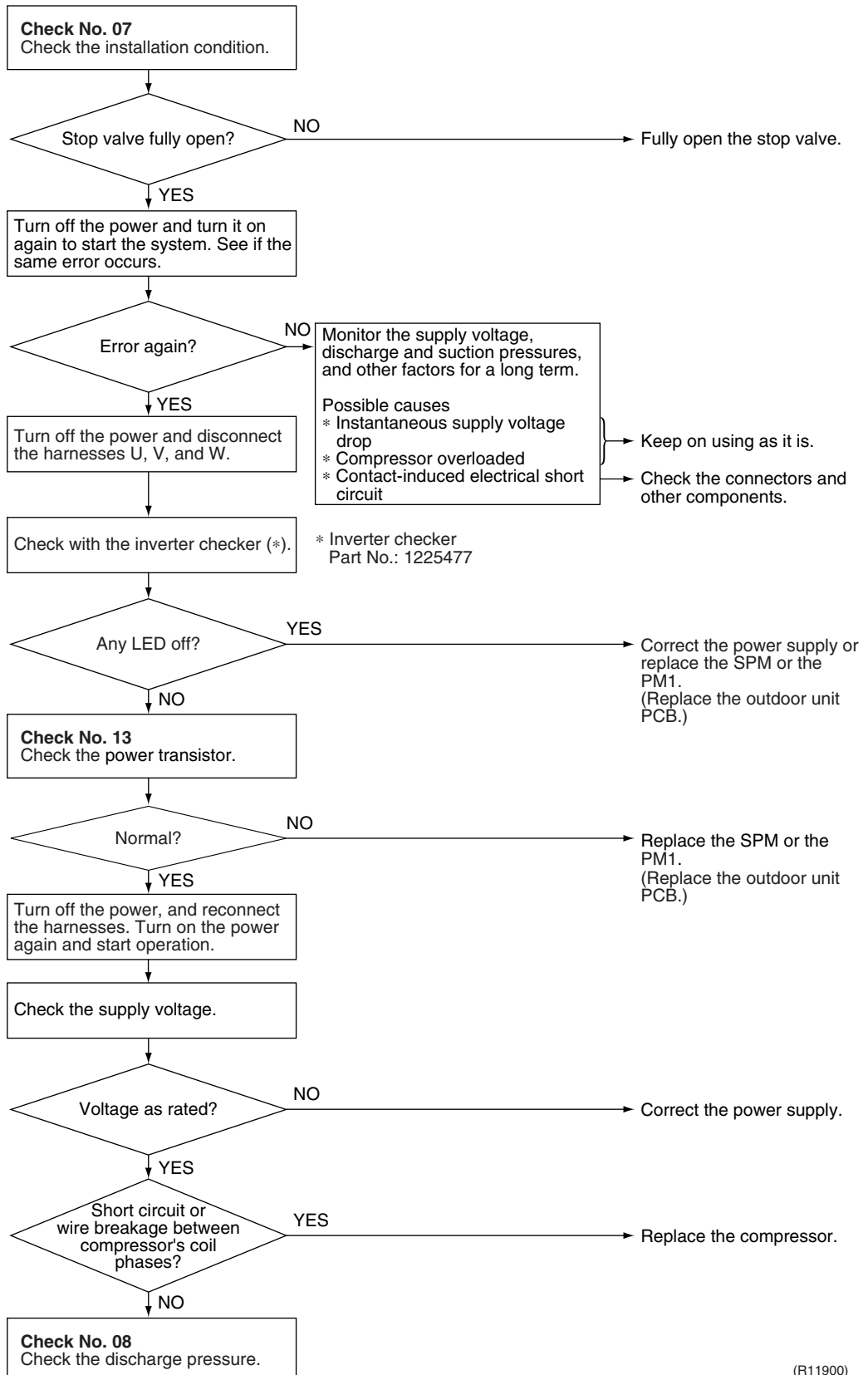


Check No.13
Refer to P.156

**Caution**

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

* An output overcurrent signal may result from wrong internal wiring. If the wires have been disconnected and reconnected and the system is interrupted by an output overcurrent, take the following procedure.



(R11900)

5.25 Refrigerant Shortage

Remote Controller Display



Outdoor Unit LED Display

A 1 2 3 4

Method of Malfunction Detection

Refrigerant shortage detection I :

Refrigerant shortage is detected by checking the input current value and the compressor output frequency. If the refrigerant is short, the input current is smaller than the normal value.

Refrigerant shortage detection II :

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

Malfunction Decision Conditions

Refrigerant shortage detection I :

The following conditions continue for 7 minutes.

<18 class>

- ◆ $\text{DC current} \times \text{DC voltage} \leq \text{A} \times \text{Compressor output frequency} + \text{B}$
- ◆ $\text{Output frequency} > \text{C}$

A (-)	B (W)	C (Hz)
1756/256	50	55

<24/32 class>

- ◆ $\text{DC current} \leq \text{D} \times \text{Compressor output frequency} + \text{E}$
- ◆ $\text{Output frequency} > \text{F}$

D (-)	E (A)	F (Hz)
27/1000	2	40

Refrigerant shortage detection II :

The following conditions continue for 80 seconds.

- ◆ $\text{Opening of the electronic expansion valve} \geq \text{G}$
- ◆ $\text{Discharge pipe temperature (}^{\circ}\text{C)} > \text{H} \times \text{target discharge pipe temperature (}^{\circ}\text{C)} + \text{J (}^{\circ}\text{C)}$
 $(\text{Discharge pipe temperature (}^{\circ}\text{F)} > \text{H} \times \text{target discharge pipe temperature (}^{\circ}\text{F)} + \text{K (}^{\circ}\text{F)})$

	G (pulse)	H (-)	J (°C)	K (°F)
Cooling	450	255/256	20	36.1
Heating		255/256	40	72.1

- If the error repeats 4 times, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

Supposed Causes

- Refrigerant shortage (refrigerant leakage)
- Poor compression performance of compressor
- Disconnection of the discharge pipe thermistor, indoor or outdoor heat exchanger thermistor, room or outdoor temperature thermistor
- Closed stop valve
- Defective electronic expansion valve

Troubleshooting

18 class



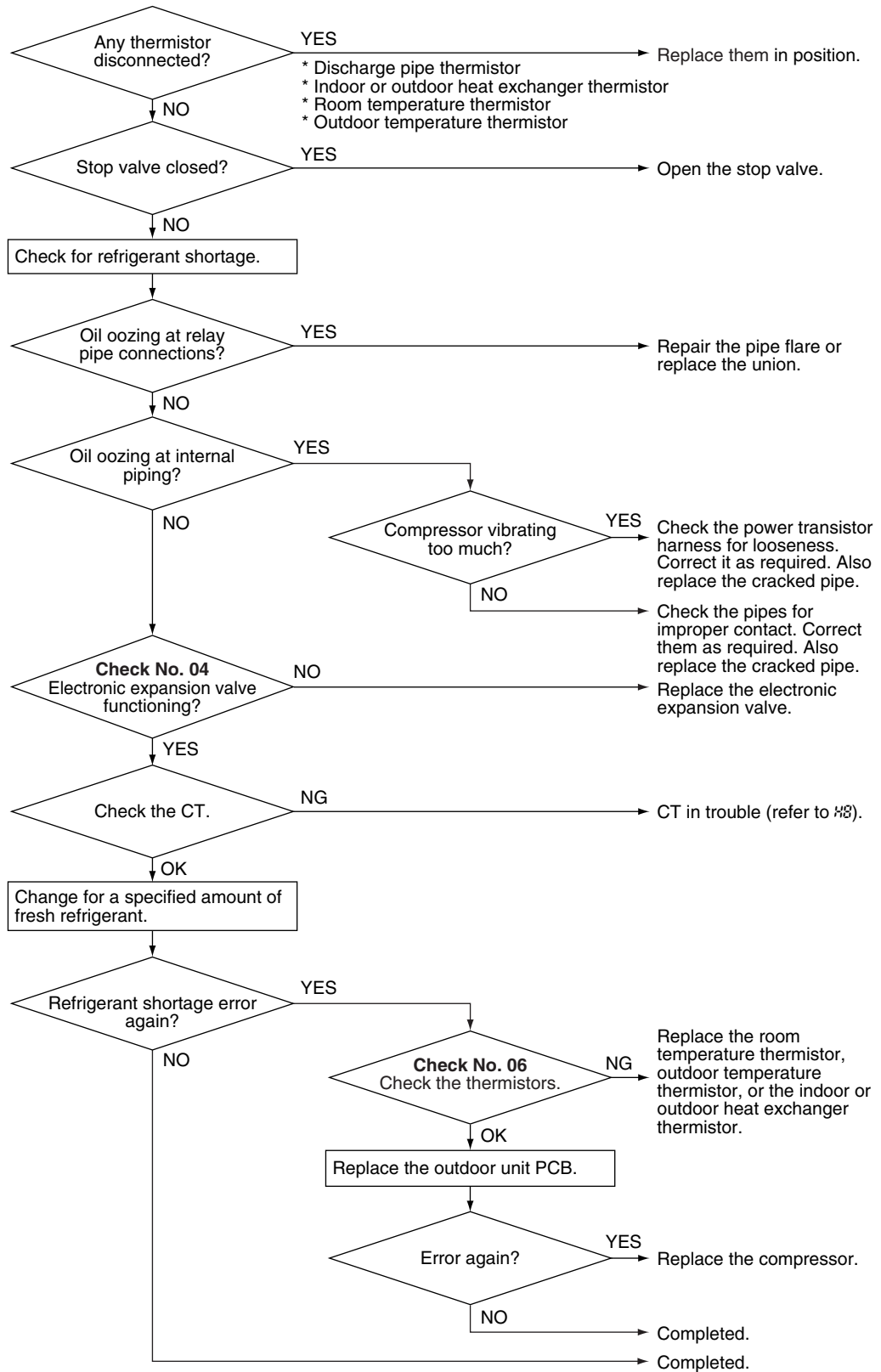
Check No.04
Refer to P.150



Check No.06
Refer to P.152

**Caution**

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R11901)

Troubleshooting

24/32 class



Check No.04
Refer to P.150

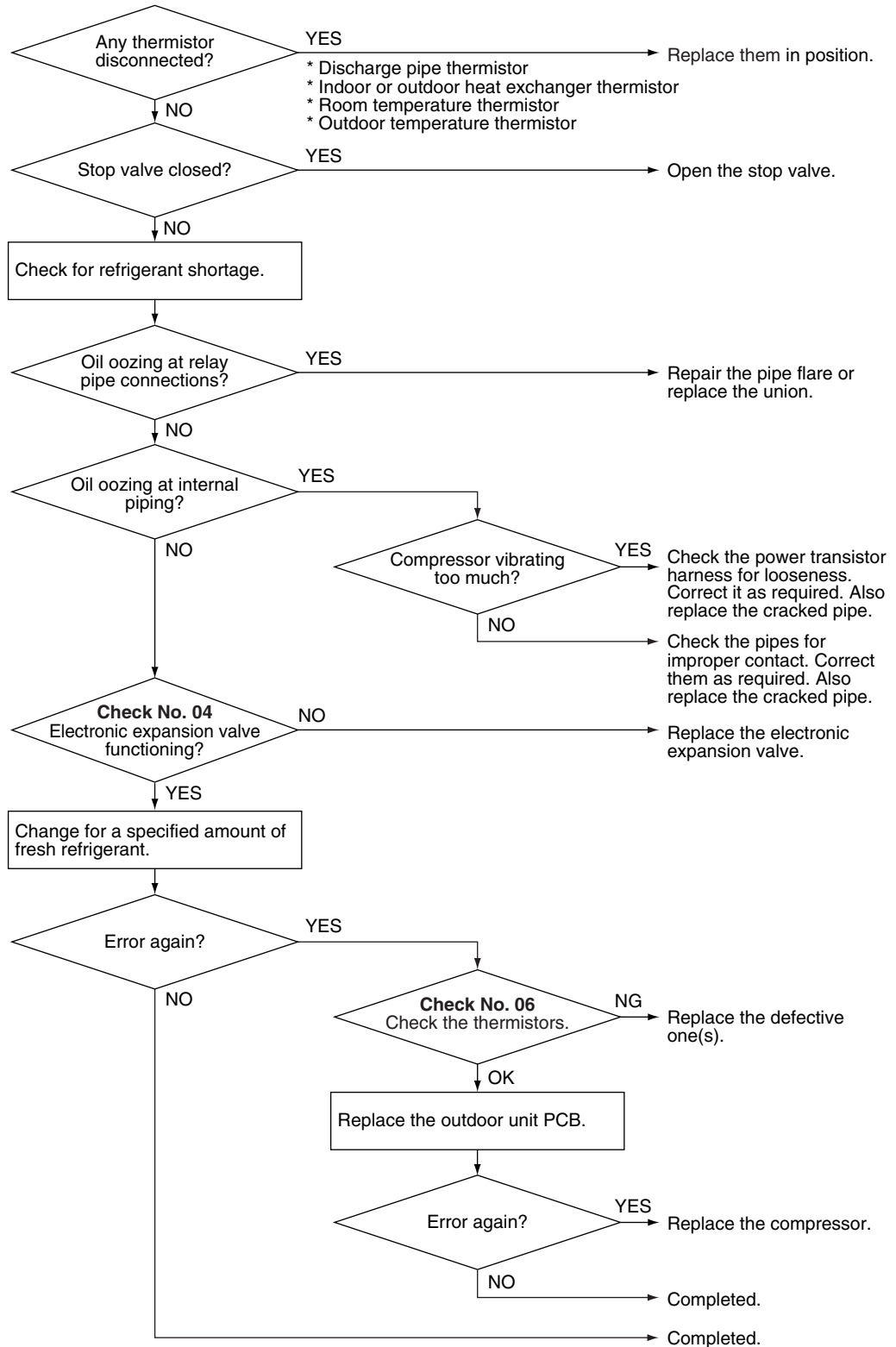


Check No.06
Refer to P.152



Caution

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.



(R12027)

5.26 Low-voltage Detection or Over-voltage Detection

Remote
Controller
Display

U2

Outdoor Unit LED
Display

A 1 2 3 4

Method of
Malfunction
Detection

Low-voltage detection:

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

Over-voltage detection:

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

Malfunction
Decision
Conditions

Low-voltage detection:

- The voltage detected by the DC voltage detection circuit is below 150 V for 0.1 second.
- If the error repeats 16 times, the system is shut down.
- Reset condition: Continuous run for about 60 minutes without any other error

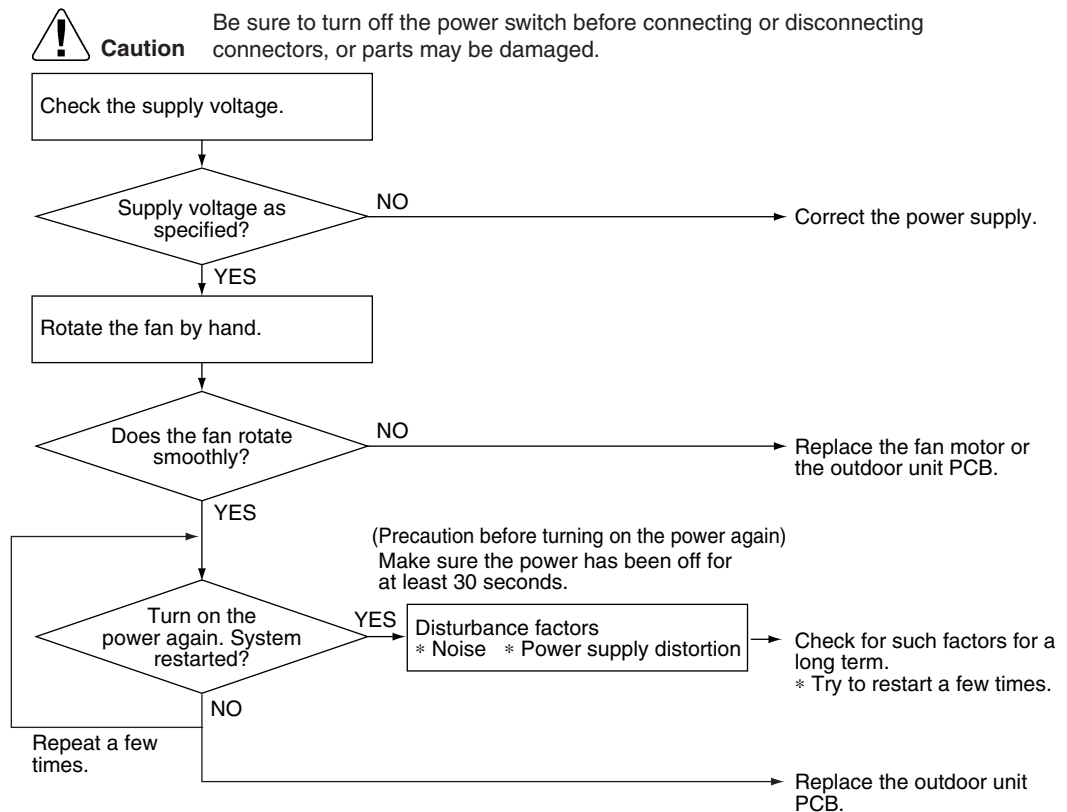
Over-voltage detection:

- An over-voltage signal is fed from the over-voltage detection circuit to the microcomputer.
- The compressor stops if the error occurs, and restarts automatically after 3-minute standby.

Supposed
Causes

- Supply voltage is not as specified.
- Defective DC voltage detection circuit
- Defective over-voltage detection circuit
- Defective PAM control part

Troubleshooting



(R7150)

5.27 Signal Transmission Error (on Outdoor Unit PCB) (24/32 Class)

Remote
Controller
Display



Outdoor Unit LED
Display

A 1 2 3 4

Method of
Malfunction
Detection

Communication error between microcomputer mounted on the main PCB and PM1.

Malfunction
Decision
Conditions

- The abnormality is determined when the data sent from the PM1 can not be received for 9 seconds.
- The error counter is reset when the data from the PM1 can be successfully received.

Supposed
Causes

- Defective outdoor unit PCB

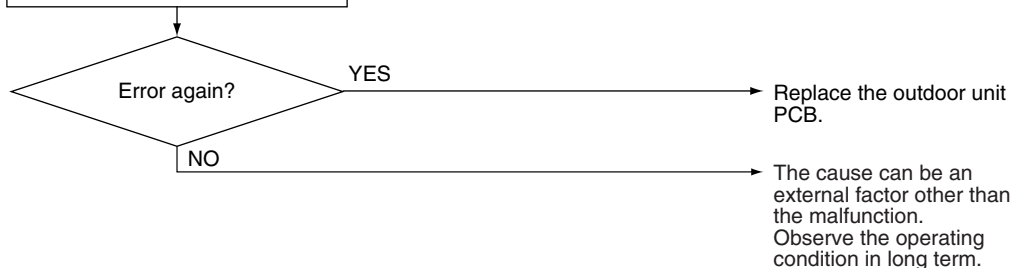
Troubleshooting



Caution

Be sure to turn off the power switch before connecting or disconnecting connectors, or parts may be damaged.

Turn off the power and turn it on again.



(R7185)

5.28 Unspecified Voltage (between Indoor and Outdoor Units) / Anti-icing Function in Other Rooms

Remote
Controller
Display

UR, UR

Outdoor Unit LED
Display

A 1 2 3 4

Method of
Malfunction
Detection

A wrong connection is detected by checking the combination of indoor and outdoor units on the microcomputer.

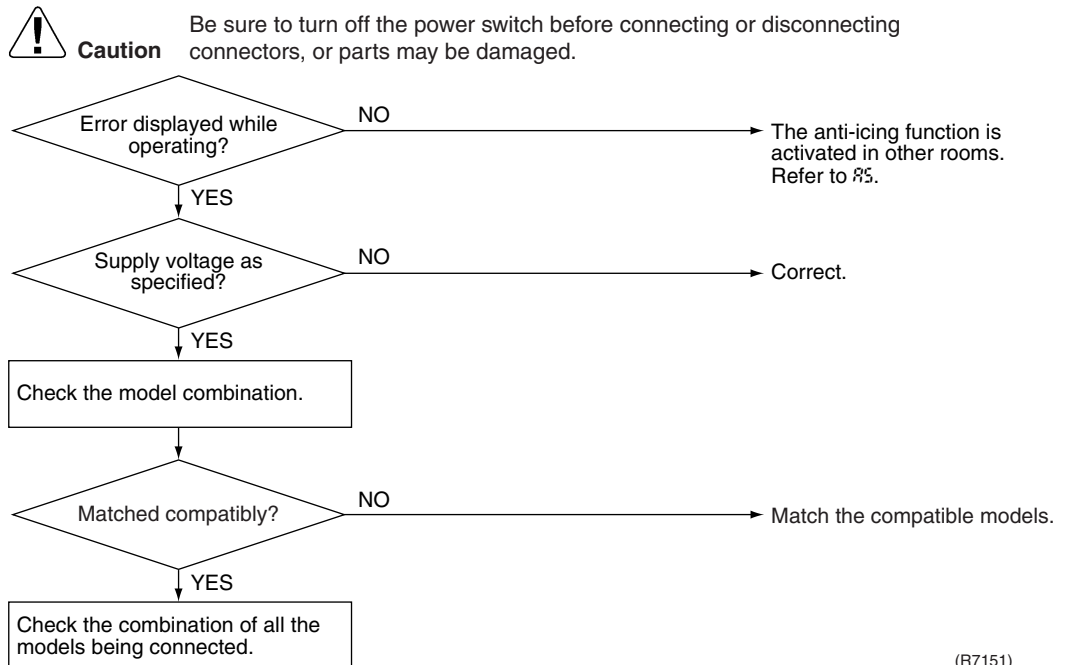
Malfunction
Decision
Conditions

- Anti-icing function in other rooms
- Unspecified internal and/or external voltages
- Mismatching of indoor and outdoor units

Supposed
Causes

- Anti-icing function in other rooms
- Wrong models interconnected
- Wrong indoor unit PCB or outdoor unit PCB mounted

Troubleshooting



(R7151)



Note: Refer to “Anti-icing function” on page 113 for detail.

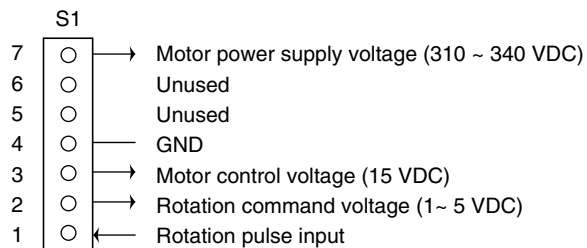
6. Check

6.1 How to Check

6.1.1 Fan Motor Connector Output Check

Check No.01

1. Check the connection of connector.
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).



(R12404)

6.1.2 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. Match the EV unit number and the connector number.
2. Turn the power off and on again, and check to see if all the EVs generate latching sound.
3. If any of the EVs does not generate latching sound in the above step 2, disconnect that connector and check the continuity using a tester.

Check the continuity between the pins 1 - 6 and 3 - 6, and between the pins 2 - 5 and 4 - 5. If there is no continuity 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 continuity is confirmed in the above step 3, 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.



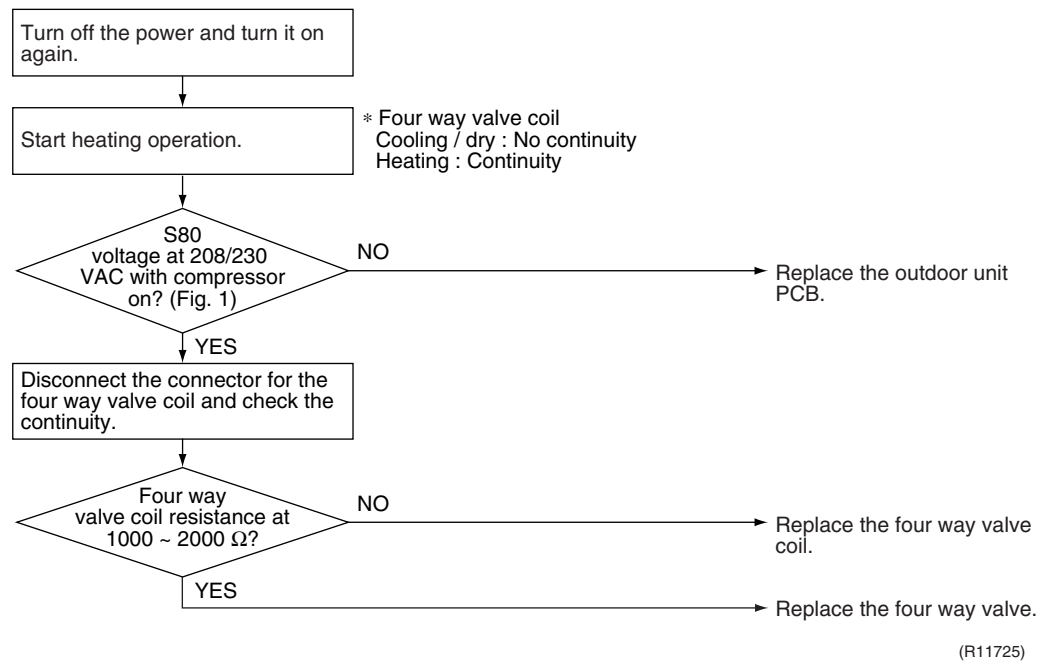
Note: Please note that the latching sound varies depending on the valve type.

If the system keeps operating with a defective electronic expansion valve, the following problem may occur.

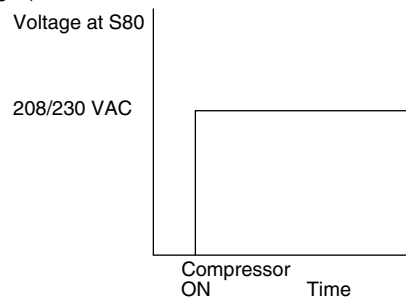
Valve opening position	Possible problem	Check method
Open	<p>Cooling:</p> <ul style="list-style-type: none"> ■ Flowing noise of refrigerant in the unit which is not in operation ■ Water leakage at the unit which is not in operation ■ Operation halt due to anti-icing function <p>Heating:</p> <ul style="list-style-type: none"> ■ Flowing noise of refrigerant in the unit which is not in operation ■ The unit does not heat the room. 	<p>Reset power supply and conduct cooling operation unit by unit.</p> <p>Check the liquid pipe temperature of no-operation unit.</p> <p>Is it almost same as the outdoor temperature?</p> <p>NO → The EV is not defective.</p> <p>YES → Replace the EV of the room.</p> <p>(R11266)</p>
Close	<p>Cooling:</p> <ul style="list-style-type: none"> ■ The problem unit does not cool the room. ■ Only the problem unit is in operation, the unit starts pump down. (The low pressure of the unit becomes vacuum.) ■ Abnormal discharge pipe temperature <p>Heating:</p> <ul style="list-style-type: none"> ■ Refrigerant shortage due to stagnation of liquid refrigerant inside the faulty indoor unit ■ The unit does not heat the room. ■ Abnormal discharge pipe temperature 	<p>Reset power supply and conduct cooling operation unit by unit.</p> <p>Check the low pressure</p> <p>Does the pressure become into vacuum zone?</p> <p>NO → The EV is not defective.</p> <p>YES → Replace the EV of the room.</p> <p>(R11267)</p>

6.1.3 Four-Way Valve Performance Check

Check No.05



(Fig. 1)



(R11717)

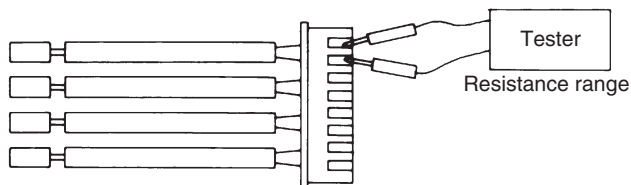
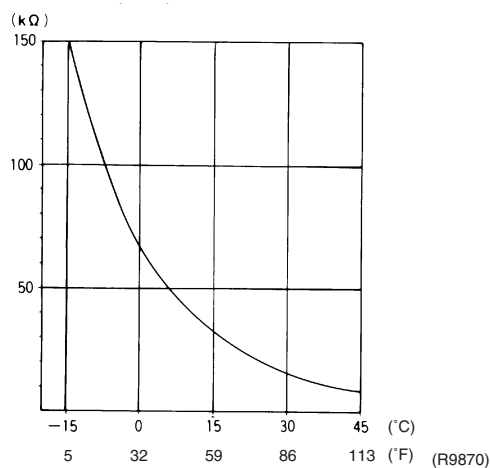
6.1.4 Thermistor Resistance Check

Check No.06

Disconnect the connectors of the thermistors from the PCB, and measure the resistance of each thermistor using tester.

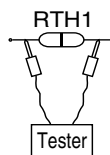
The relationship between normal temperature and resistance is shown in the graph and the table below.

Thermistor Temperature (°C / °F)	R25°C (77°F) = 20 kΩ B = 3950
-20 / -4	211.0 (kΩ)
-15 / 5	150.0
-10 / 14	116.5
-5 / 23	88.0
0 / 32	67.2
5 / 41	51.9
10 / 50	40.0
15 / 59	31.8
20 / 68	25.0
25 / 77	20.0
30 / 86	16.0
35 / 95	13.0
40 / 104	10.6
45 / 113	8.7
50 / 122	7.2



(R11906)

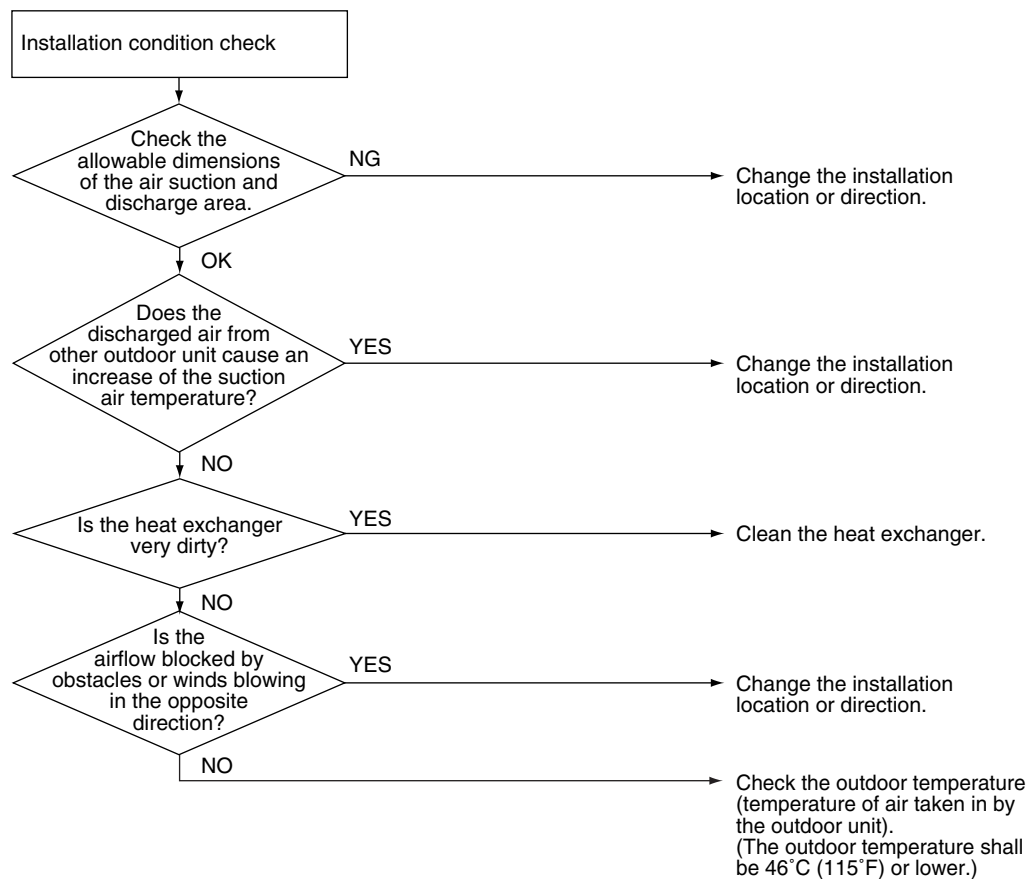
- For the models in which the thermistor is directly mounted on the PCB, disconnect the connector for the PCB and measure.



(R3460)

6.1.5 Installation Condition Check

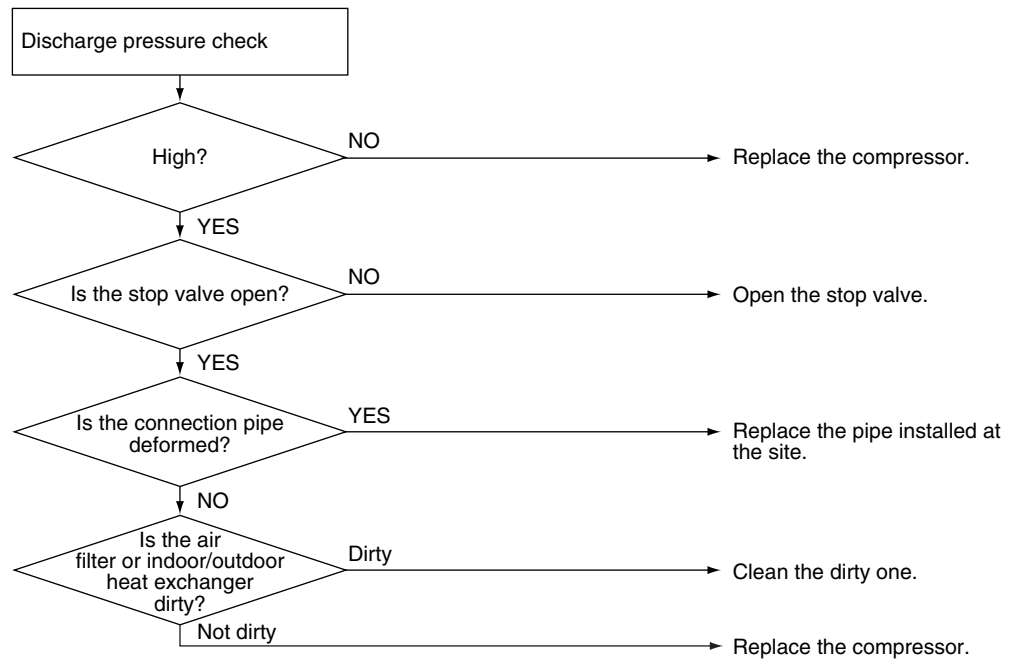
Check No.07



(R12300)

6.1.6 Discharge Pressure Check

Check No.08

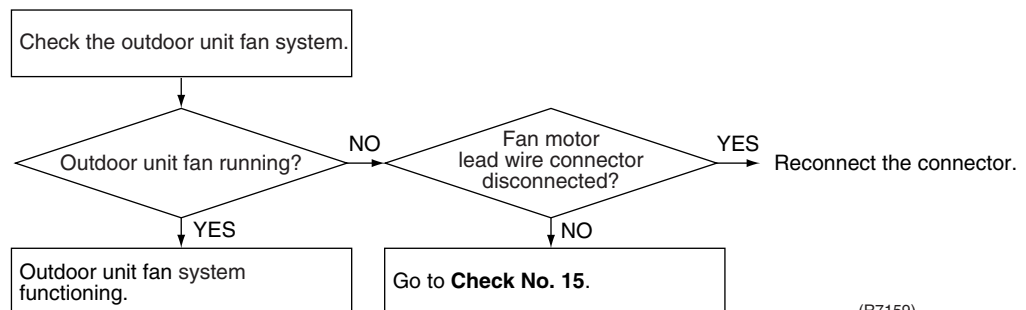


(R11718)

6.1.7 Outdoor Unit Fan System Check

Check No.09

DC motor



(R7159)

6.1.8 Power Supply Waveforms Check

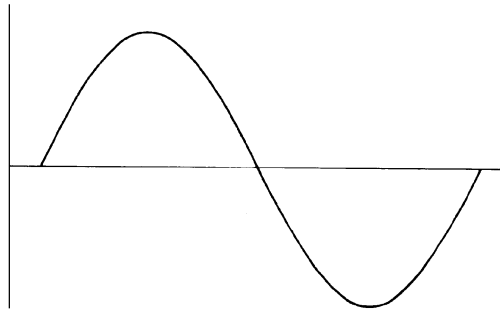
Check No.10

Measure the power supply waveform between No. 1 and No. 2 on the terminal board, and check the waveform disturbance.

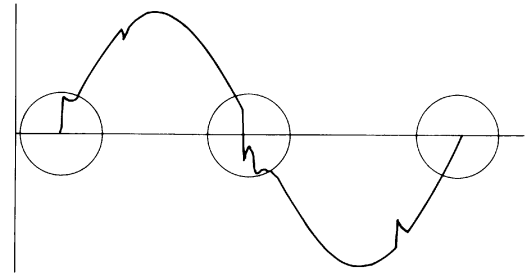
- Check to see if the power supply waveform is a sine wave (Fig.1).
- Check to see if there is waveform disturbance near the zero cross (sections circled in Fig.2)

[Fig.1]

[Fig.2]



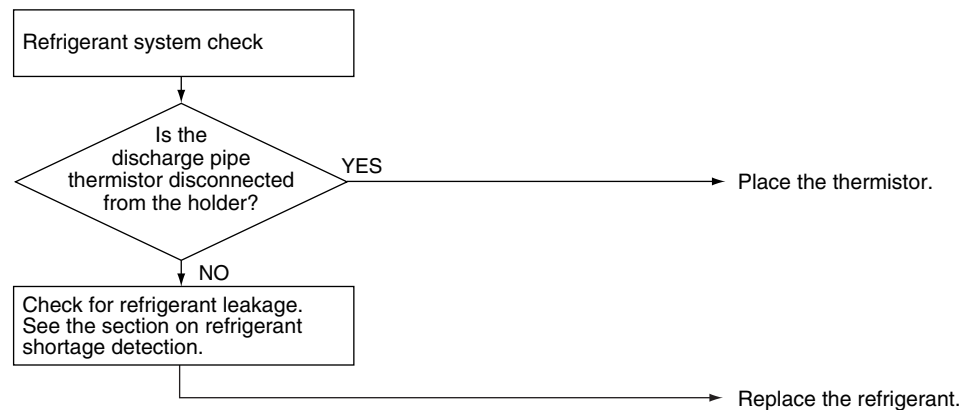
(R1736)



(R1444)

6.1.9 Inverter Units Refrigerant System Check

Check No.11



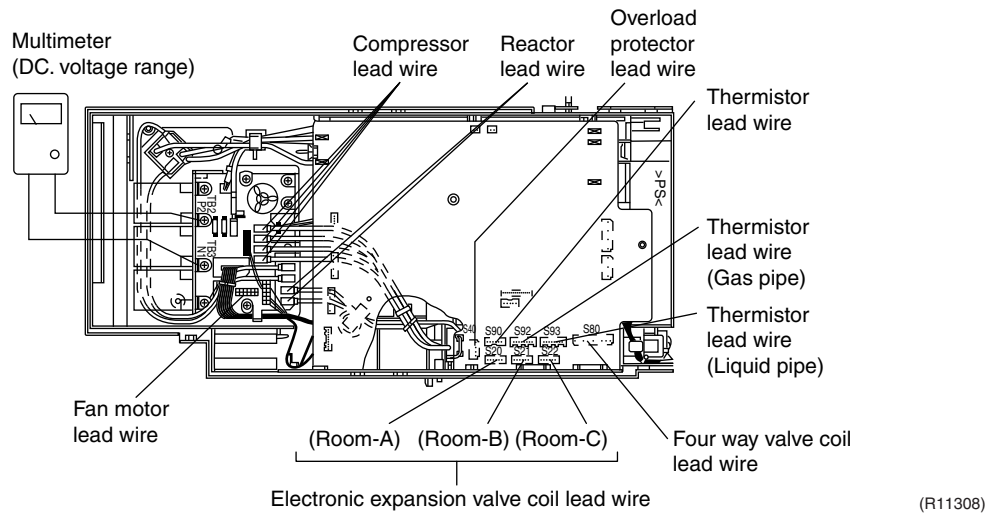
(R8380)

6.1.10 Capacitor Voltage Check

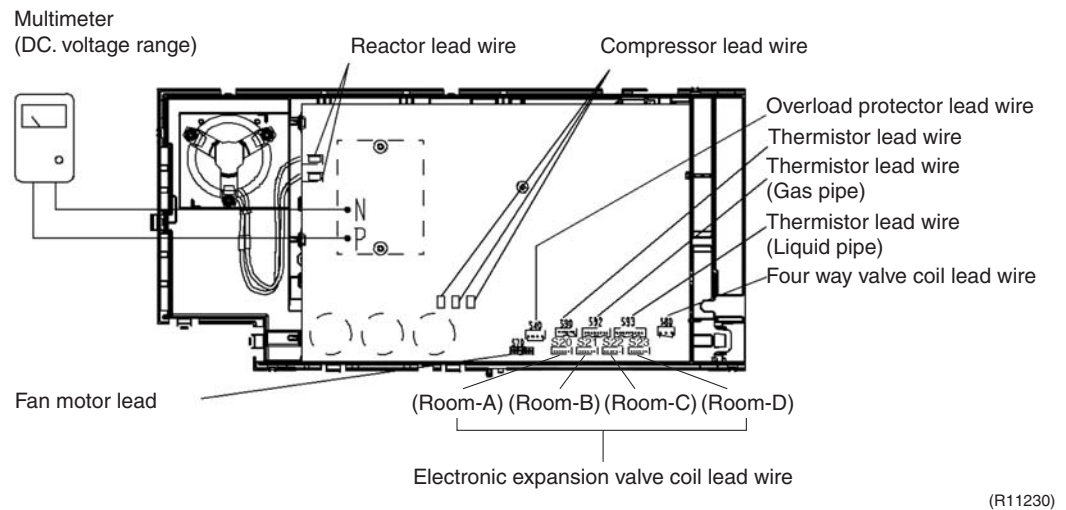
Check No.12

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

18 class



24/32 class



6.1.11 Power Transistor Check

Check No.13

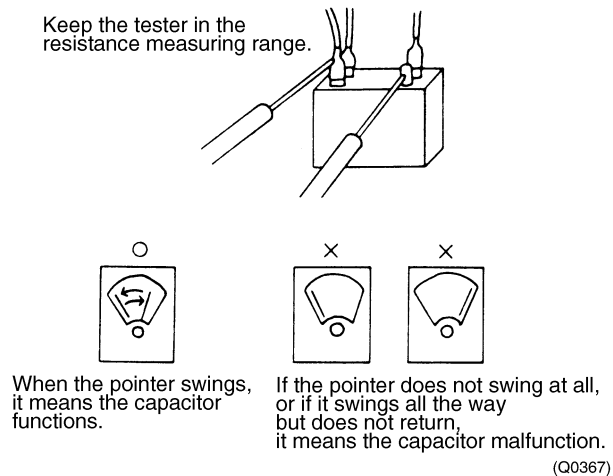
- Never touch any live parts for at least 10 minutes after turning off the circuit breaker.
- If unavoidably necessary to touch a live part, make sure the power transistor's supply voltage is below 50 V using the tester.
- For the UVW, make measurements at the terminal on the PCB or the relay connector.

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

6.1.12 Main Circuit Electrolytic Capacitor Check

Check No.14

- 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.



6.1.13 Rotating Pulse Input on the Outdoor Unit PCB Check

Check No.15

<Outdoor fan motor>

Make sure that the voltage of 320 ± 30 V is applied.

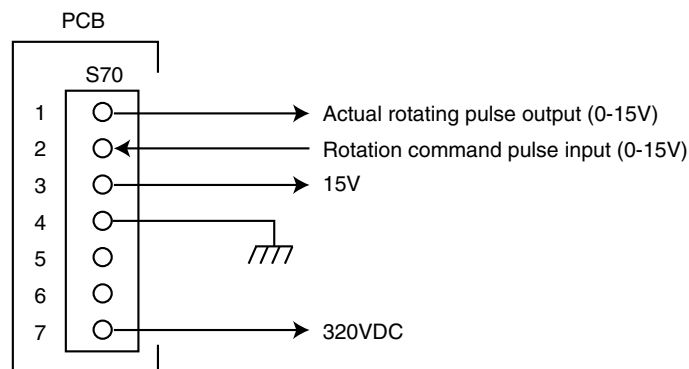
1. Set operation off and power off. Disconnect the connector S70.
2. Check that the voltage between the pins 4 - 7 is 320 VDC.
3. Check that the control voltage between the pins 3 - 4 is 15 VDC.
4. Check that the rotation command voltage between the pins 2 - 4 is 0 ~ 15 VDC.
5. Keep operation off and power off. Connect the connector S70.
6. Check whether 2 pulses (0 ~ 15 VDC) are output at the pins 1 - 4 when the fan motor is rotated 1 turn by hand.

When the fuse is melted, check the outdoor fan motor for proper function.

If NG in step 2 → Defective PCB → Replace the PCB.

If NG in step 4 → Defective Hall IC → Replace the outdoor fan motor.

If OK in both steps 2 and 4 → Replace the PCB.



6.1.14 Hall IC Check

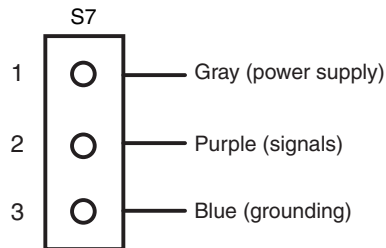
Check No.16

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.

If NG in step 1 → Defective PCB → Replace the PCB.

If NG in step 2 → Defective Hall IC → Replace the fan motor.

If OK in both steps 1 and 2 → Replace the PCB.



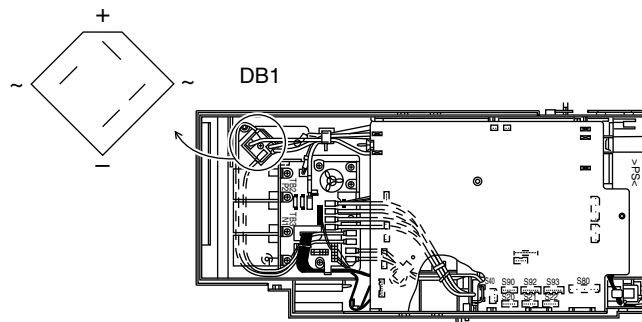
(R12398)

6.1.15 Main Circuit Short Check

Check No.29

- Measure the resistance between pins at both ends of DB1.
- If the resistance is ∞ or less than 1 k Ω , the main circuit short.

(-) terminal of the tester (in case of digital, (+) terminal)	(~)	(+)	(~)	(-)
(+) terminal of the tester (in case of digital, (-) terminal)	(+)	(~)	(-)	(~)
Resistance in OK	several k Ω ~several M Ω	∞	∞	several k Ω ~several M Ω
Resistance in NG	0 or ∞	0	0	0 or ∞



(R11690)

Part 7

Removal Procedure

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1. Outdoor Unit – 2MXS18GVJU

1.1 Removal of the Outer Panels

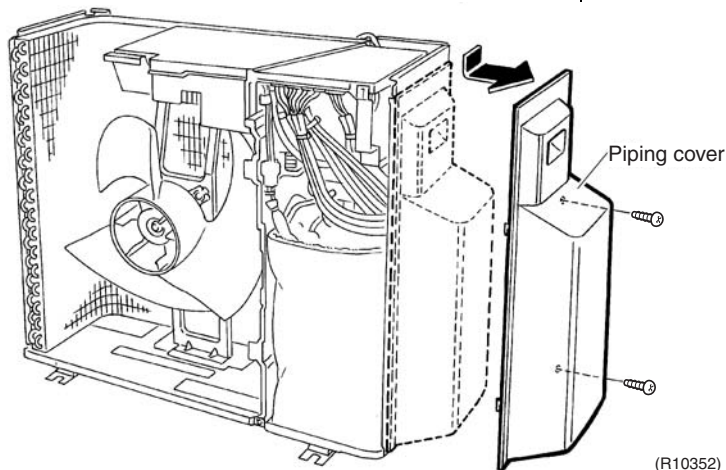
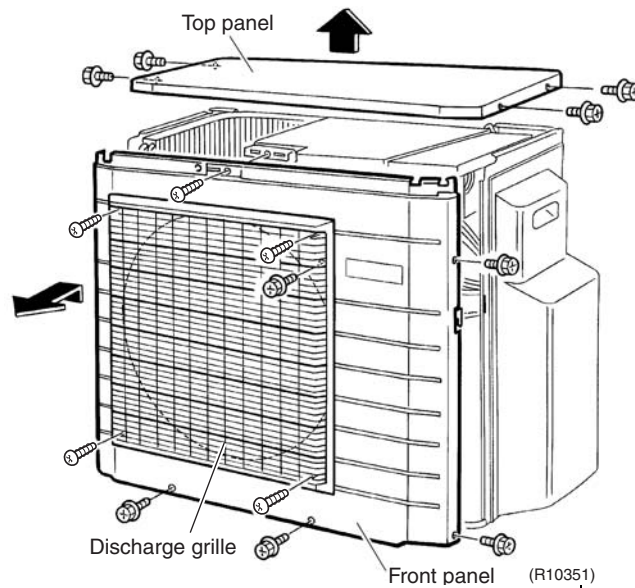
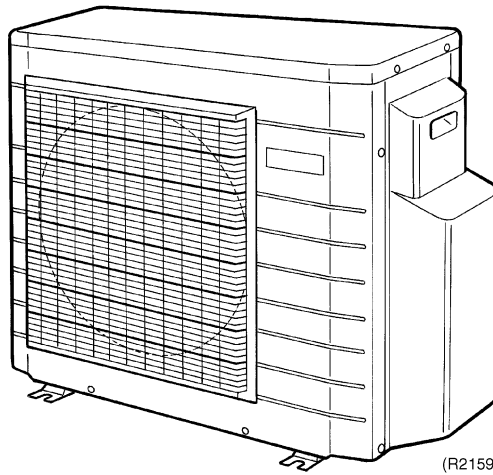
Procedure



Warning

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

Step	Procedure	Points
1	External appearance	
2	Remove the 4 screws of the top panel and the 6 screws of the front panel.	
3	Remove the 4 screws of the discharge grille.	
4	Remove the 2 screws of the piping cover.	

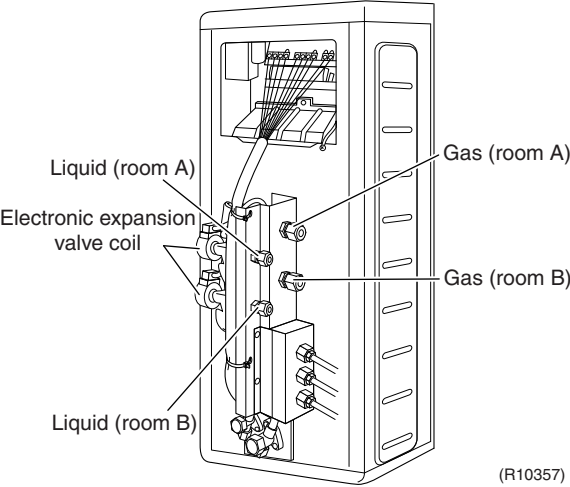
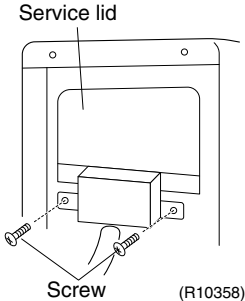
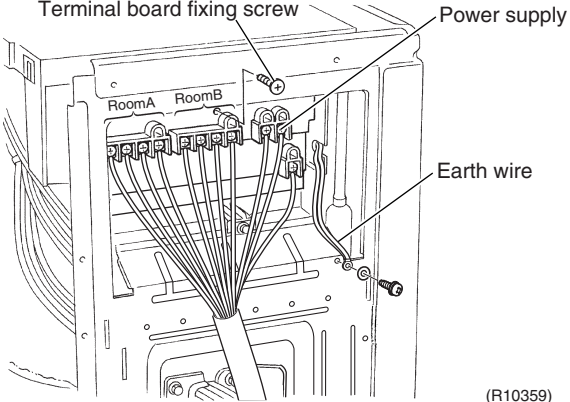
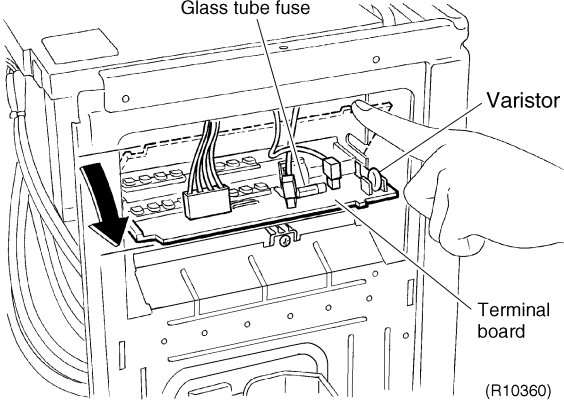


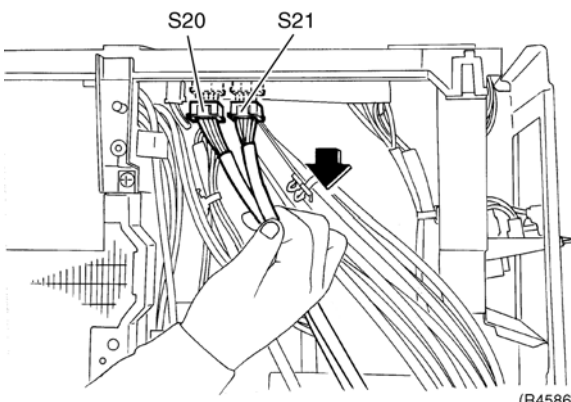
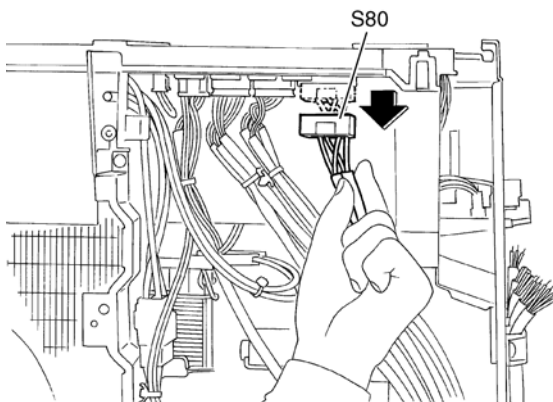
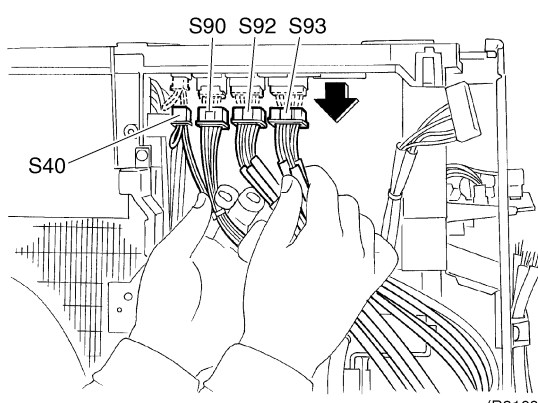
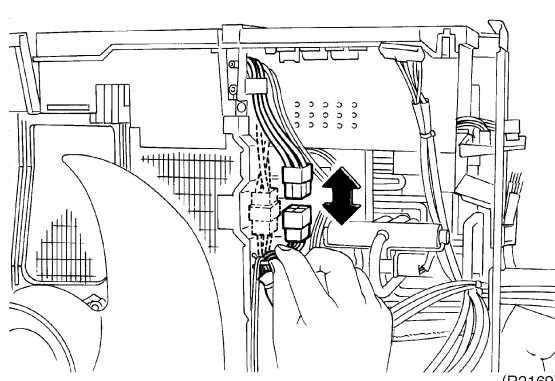
1.2 Removal of the Electrical Box

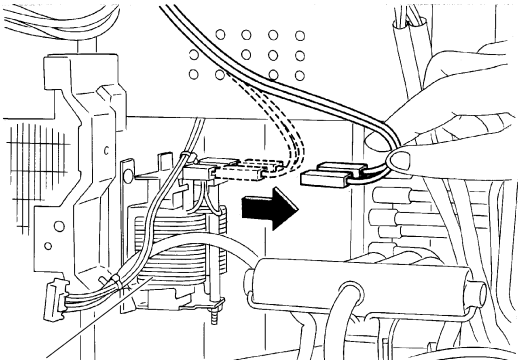
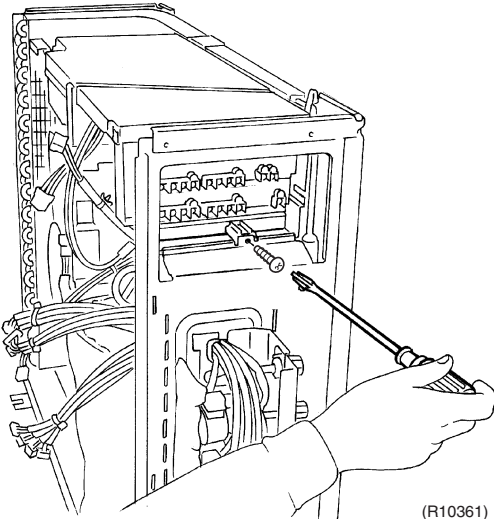
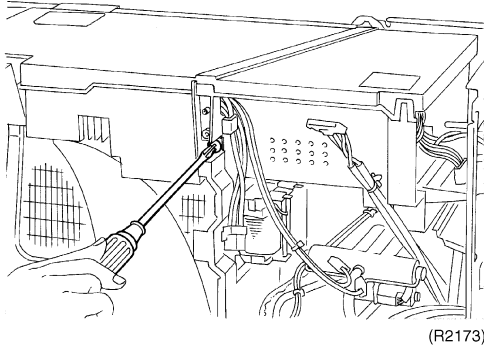
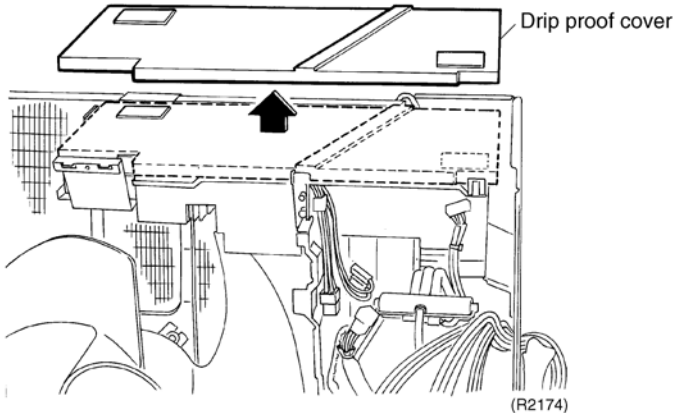
Procedure

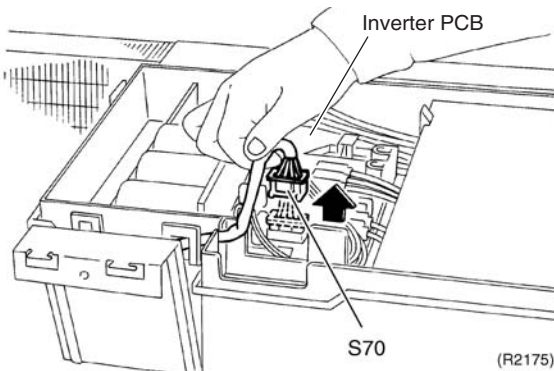
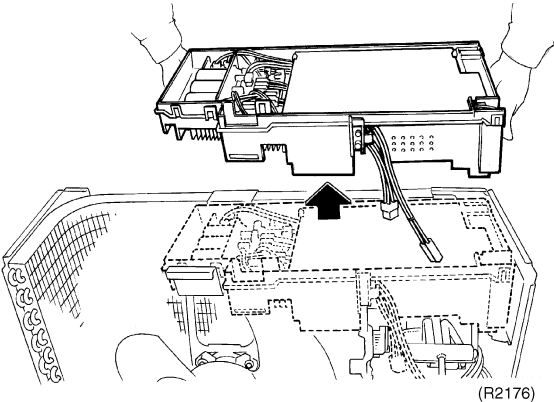


Warning Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
1. Disconnect the connection wires.		
1	<div>The figure shows the connection wires.</div> <div></div>	<div>■ The US model has a service lid on the right side panel. Remove the 2 screws to remove the service lid.</div> <div></div>
2	<div>Remove the terminal board fixing screw.</div> <div>Remove all screws of the connection wires to enable removal.</div> <div>Remove the screw of the ground wire.</div> <div></div>	<div>■ Match the colors of the connection wires to A and B ports as follows. (1) - Black: Power (2) - White: Power (3) - Red: Transmission</div> <div>■ The wires are fixed to the terminal board with screws.</div>
3	<div>Pull out the terminal board to open.</div> <div></div>	

Step	Procedure		Points									
2. Disconnect the harnesses												
1	Disconnect the 2 connectors of the electronic expansion valve coil lead wires (S20, S21).		<table border="1"><thead><tr><th>Connector</th><th>Electronic expansion valve No.</th><th>Harness length</th></tr></thead><tbody><tr><td>S20 (White)</td><td>EVA</td><td>630</td></tr><tr><td>S21 (Red)</td><td>EVB</td><td>730</td></tr></tbody></table> <p>■ When reconnecting, make sure to match the wire to the correct connector.</p>	Connector	Electronic expansion valve No.	Harness length	S20 (White)	EVA	630	S21 (Red)	EVB	730
Connector	Electronic expansion valve No.	Harness length										
S20 (White)	EVA	630										
S21 (Red)	EVB	730										
2	Disconnect the four-way valve coil connector (S80).											
3	Disconnect the thermistor connectors (S90, S92, S93) and the overload protector connector (S40).		<p>S40:Overload protector S90:Thermistor (Outdoor temperature, heat exchanger, discharge pipe) S92:Gas pipe thermistor S93:Liquid pipe thermistor</p>									
4	Disconnect the relay connector of the compressor.											

Step		Procedure	Points
5	Disconnect the reactor lead wires.	 <p>Reactor (R2170)</p>	
3. Removal of the electrical box.		<div data-bbox="553 648 1045 1163">  <p>(R10361)</p> </div> <div data-bbox="558 1199 1040 1541">  <p>(R2173)</p> </div> <div data-bbox="521 1572 1192 1982">  <p>Drip proof cover (R2174)</p> </div>	

Step		Procedure	Points
4	Disconnect the connector for the fan motor (S70) from the inverter PCB. Release the fan motor lead wire.		
5	Lift up the electrical box and dismount it.		

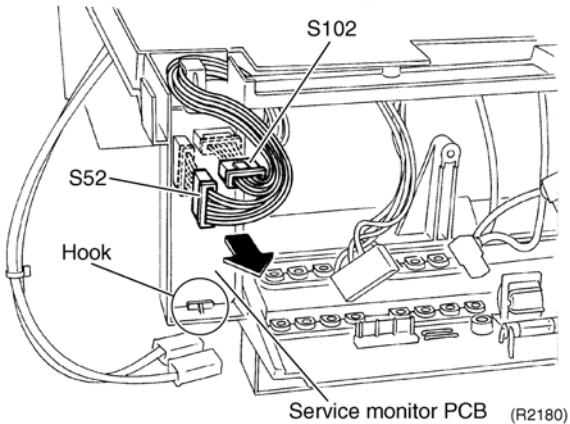
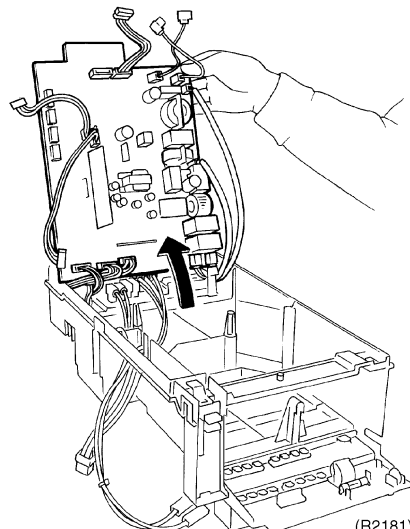
1.3 Removal of the PCB

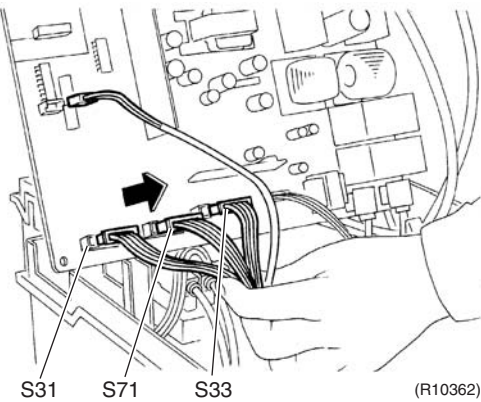
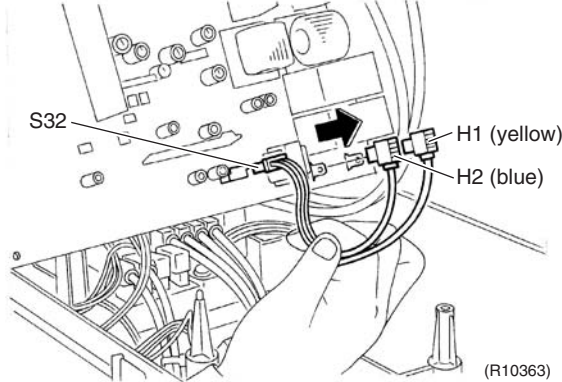
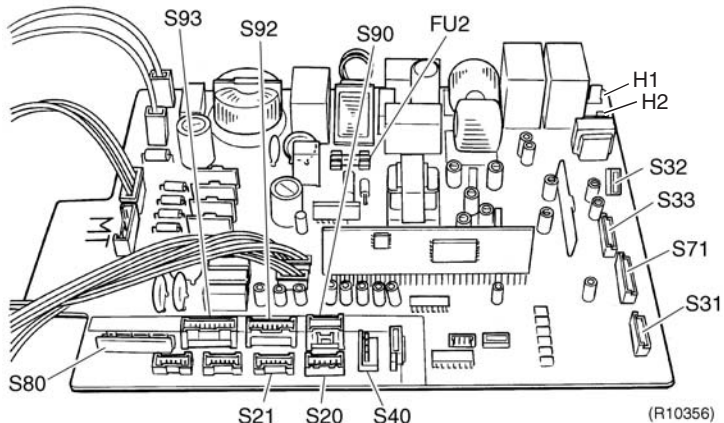
Procedure

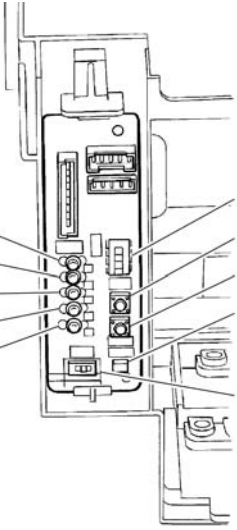
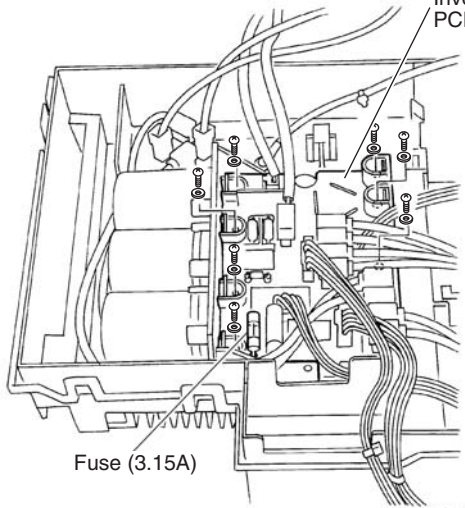
Warning

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

Step	Procedure	Points
1. Removal of the control PCB		
1	Remove the 1 screw of the PCB, and unfasten the 2 hooks.	
2	Unfasten the hook of the terminal board, and open the terminal board.	
3	Disconnect each connector on the back of the terminal board (S11, HL, HN).	

Step		Procedure	Points
4	Disconnect the connectors on the service monitor PCB (S52, S102).		■ Unfasten the hooks to remove the service monitor PCB.
5	Lift up the main PCB.		

Step	Procedure	Points
6	<p>Disconnect the connectors (S31, S32, S33, S71, H1, H2).</p>  	<p>■ For details, refer to page 21.</p>
7	<p>The figure shows the main PCB.</p> 	<p>■ FU2: Glass tube fuse 3.15A</p>

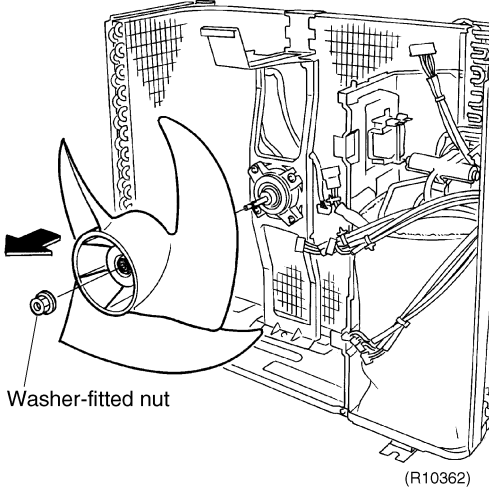
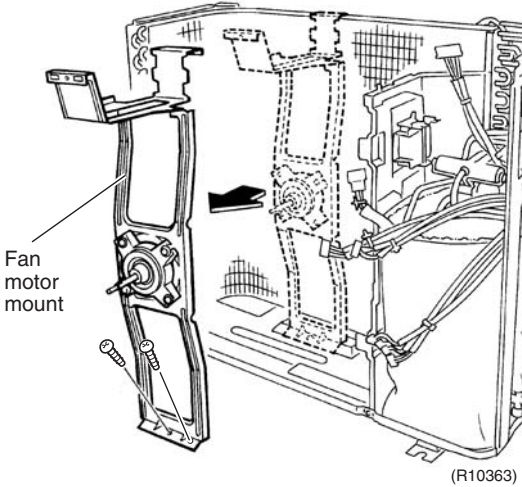
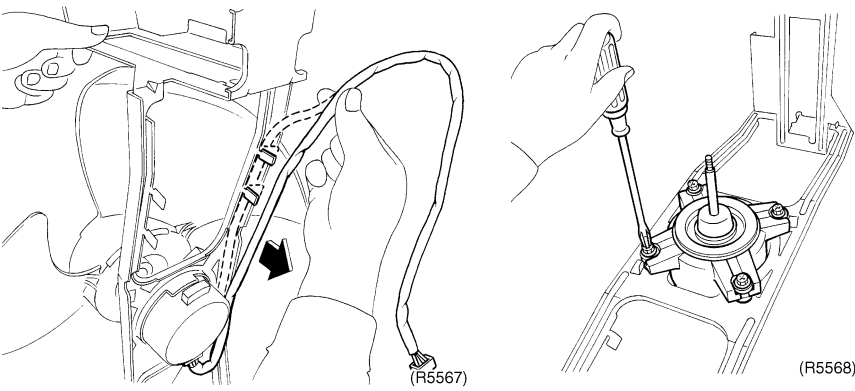
Step	Procedure	Points
8	<p data-bbox="204 243 496 338">Unfasten the 2 hooks and remove the service monitor PCB.</p> <div data-bbox="505 243 1097 789">  <p data-bbox="505 464 578 611">LED A LED 1 LED 2 LED 3 LED 4</p> <p data-bbox="821 411 1097 684">Priority room setting switch (SW4) Wiring error check switch (SW3) Forced operation ON/OFF switch (SW1) NIGHT QUIET mode setting switch (SW5) Operation mode switch (SW2)</p> <p data-bbox="1024 747 1097 779">(R3064)</p> </div>	
9	<p data-bbox="204 831 496 905">Remove the 7 screws to remove the inverter PCB.</p> <div data-bbox="553 831 1097 1392">  <p data-bbox="618 1304 748 1335">Fuse (3.15A)</p> <p data-bbox="976 842 1065 894">Inverter PCB</p> <p data-bbox="951 1356 1024 1388">(R10355)</p> </div>	

1.4 Removal of the 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 connector for the fan motor and release the fan motor lead wire.		■ When reassembling, align ▼ mark of propeller fan with D-cut section of motor shaft.
1 Remove the washer-fitted nut and remove the outdoor fan.		■ Nut size : M6 Spanner size : 10mm
2 Remove the 2 screws of the fan motor mount.		■ When reassembling, fix the fan motor lead wire to avoid contact with the outdoor fan.
3 Open the 2 clamps and release the fan motor lead wire. Remove the 4 screws to remove the fan motor.	<div>(Backside)</div> 	

1.5 Removal of the Sound Blanket

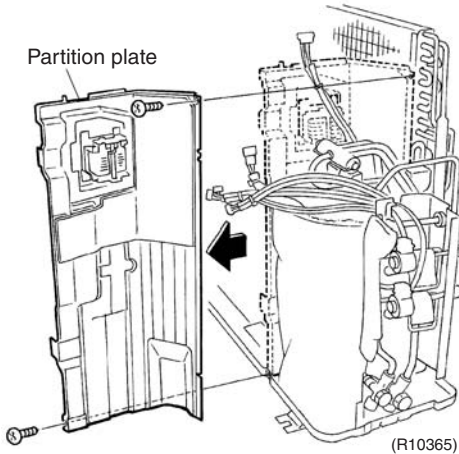
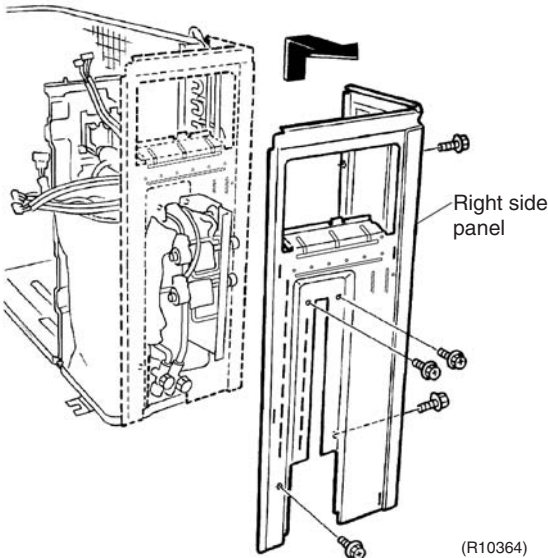
Procedure

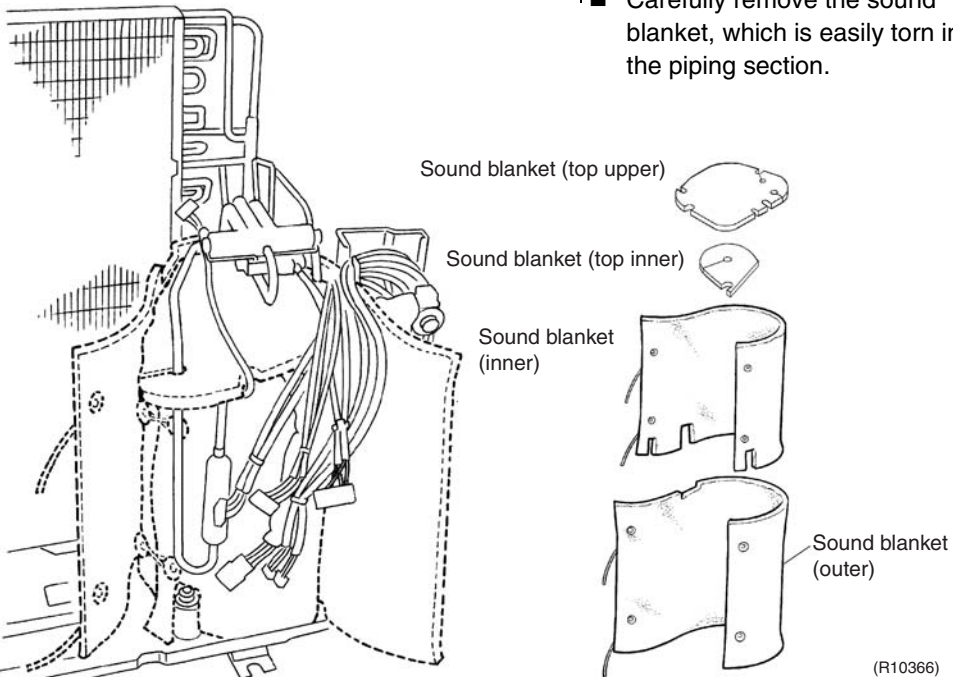


Warning

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

Step	Procedure	Points
1	Remove the 5 screws of the right side panel.	
2	Remove the 2 screws of the partition plate, and remove it.	



Step		Procedure	Points
3	Remove the sound blankets (top upper, top inner, outer, and inner).		<ul style="list-style-type: none">■ Carefully remove the sound blanket, which is easily torn in the piping section. <p>(R10366)</p>

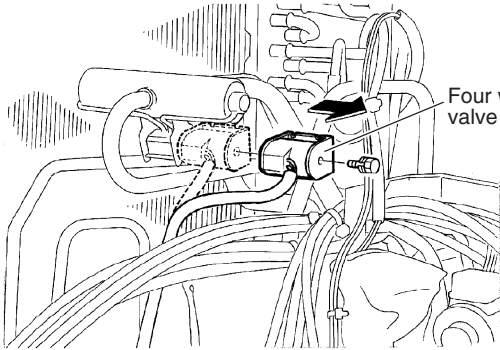
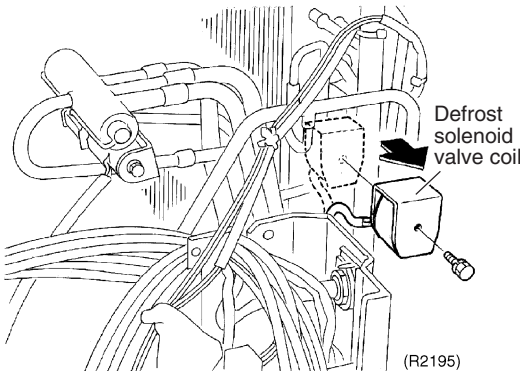
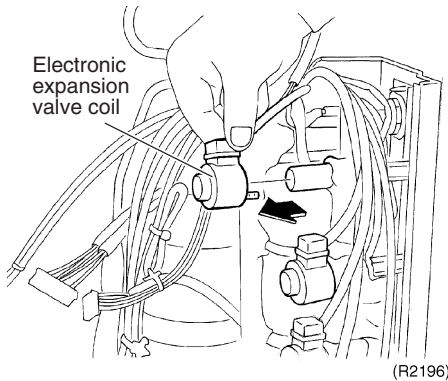
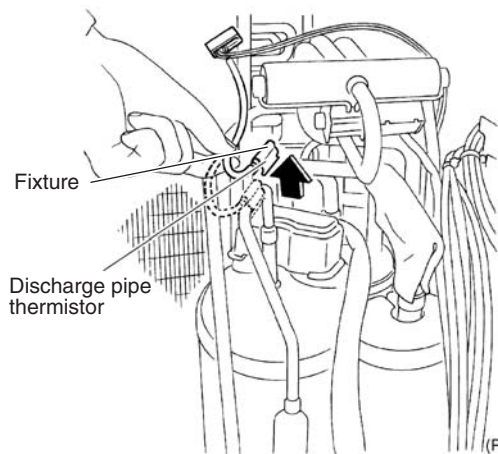
1.6 Removal of the Coils and Thermistors

Procedure

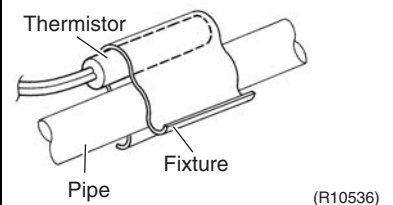


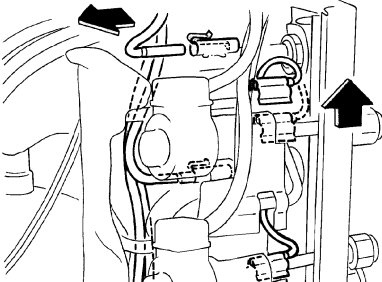
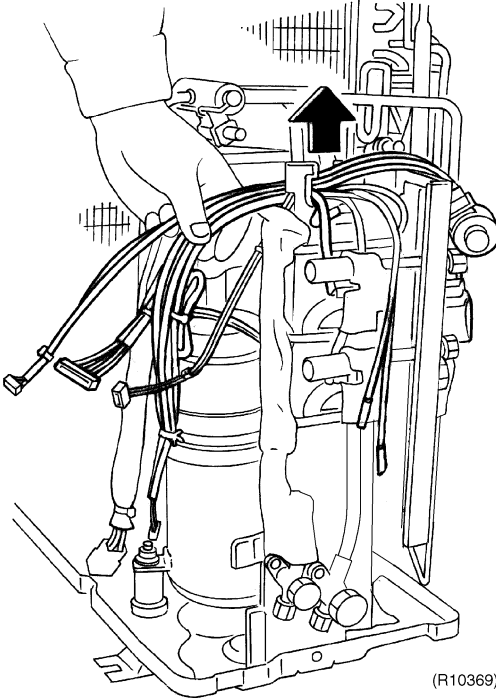
Warning

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

Step	Procedure	Points
1	Remove the screw and remove the four-way valve coil.	 <p>(R2194)</p>  <p>(R2195)</p>  <p>(R2196)</p>  <p>(R10367)</p>
2	Remove the screw and remove the defrost solenoid valve coil.	
3	Pull out the electronic expansion valve coil for each room.	
4	Remove the discharge pipe thermistor.	

- Place the thermistor so that its end comes up to the end of the fixture.
- Be careful not to lose the fixture for the discharge pipe thermistor.



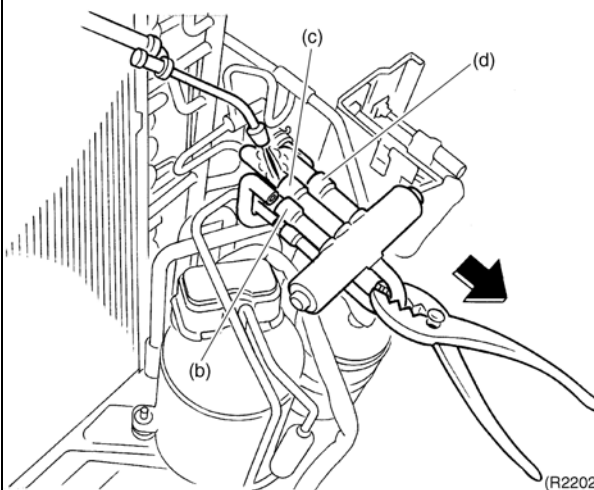
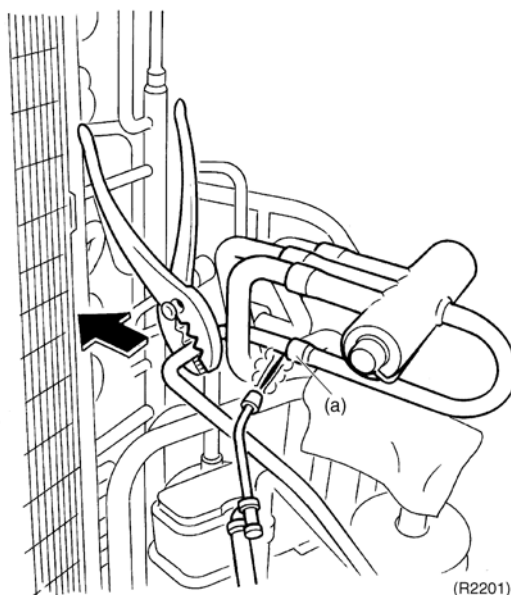
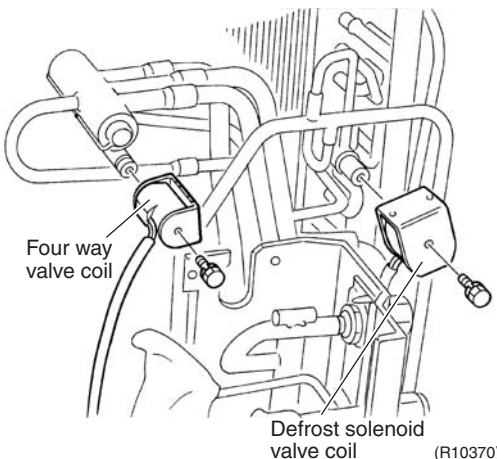
Step		Procedure	Points
5	Take off the putty, and remove each thermistor.	 <p>(R10368)</p>	<ul style="list-style-type: none"> ■ Place the thermistor so that its end comes up to the end of the fixture. ■ Be careful not to lose the clip or fixture for thermistors.
6	Remove the wire harnesses.	 <p>(R10369)</p>	<ul style="list-style-type: none"> ■ S90: Outdoor temperature thermistor (Blue) Outdoor heat exchanger thermistor (Gray) Discharge pipe thermistor (Black) ■ S92: Gas pipe thermistor Room A (Black) Room B (Gray) ■ S93: Liquid pipe thermistor Room A (Black) Room B (Gray)

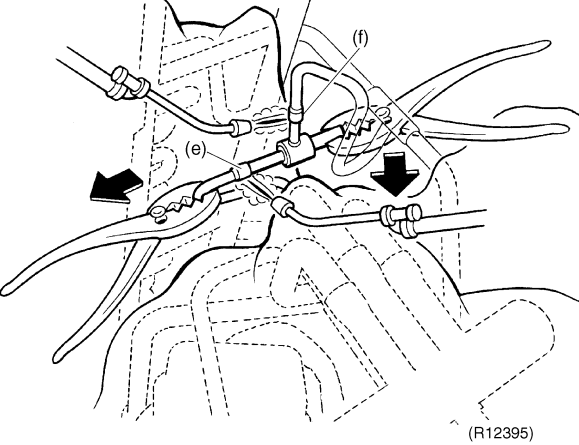
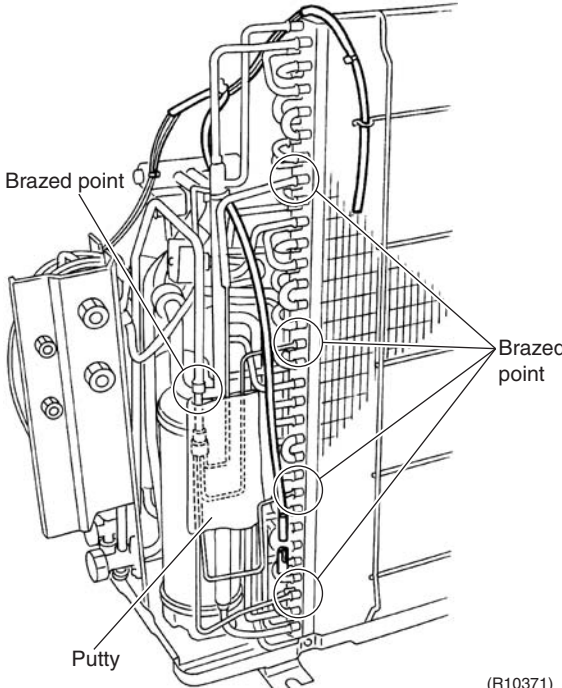
1.7 Removal of the Four-Way Valve and Defrost Solenoid Valve Procedure

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



Step	Procedure	Points
1 2	Remove the screw of the four-way valve coil to remove the coil. Remove the screw and remove the defrost solenoid valve coil.	Warning 1. Be careful to not burn yourself with pipes and other parts that are heated by the gas brazing machine. 2. If the refrigerant gas leaks during work, ventilate the room. If the refrigerant gas is exposed to flames, toxic gas may be generated. Caution 1. To consider global environmental protection, do not discharge the refrigerant gas into the atmosphere. Make sure to collect all refrigerant gas. Cautions for Restoration: 1. Restore the piping with non-oxidation brazing. 2. It is required to prevent the carbonization of oil inside the four-way valve and the deterioration of the gaskets affected by the heat (keep below 120°C/248°F). Wrap the four-way valve with a wet cloth and provide water to prevent the cloth from drying out. ■ In pulling the pipes, be careful not to over-tighten them with pliers to avoid deformation. In case of difficulty with the gas brazing machine: 1. Disconnect the brazed part where it is easy to disconnect and restore. 2. Cut pipes on the main unit with a tube cutter in order to make it easy to disconnect.
■ Before working, make sure that the refrigerant gas is empty in the circuit. ■ Be sure to apply nitrogen replacement when heating us up the brazed part. 3 4 5	Heat the 4 brazed points of the four-way valve. Disconnect point (a) first. Disconnect points (b) and (c). Disconnect point (d). Remove the four-way valve.	



Step	Procedure	Points
<p>■ Before proceeding, make sure there is no refrigerant gas left in the refrigerant pipes.</p>		
<p>6</p> <p>Disconnect the 2 brazed points, first (e), and then (f). Remove the defrost solenoid valve.</p> <p>Note:</p> <ul style="list-style-type: none"> ■ Do not use a metal saw for cutting pipes because sawdust enters the circuit. ■ When withdrawing the pipes, be careful not to pinch them firmly with pliers. The pipes may get deformed. ■ Provide a protective sheet or a steel plate so that the brazing flame cannot influence peripheries. 	 <p>(R12395)</p>  <p>(R10371)</p>	<p>Caution</p> <p>Be careful not to burn yourself with the pipes and other parts that are heated by the gas welding rod.</p> <p>Warning</p> <p>If refrigerant gas leaks during the job, ventilate the room. If the refrigerant gas is exposed to flames, noxious gas may be generated.</p> <p>Reassembling precautions</p> <p>Wrap the four-way valve with wet cloth. Splash water over the cloth before it dries to prevent the valve from being overheated.</p>

1.8 Removal of the Compressor

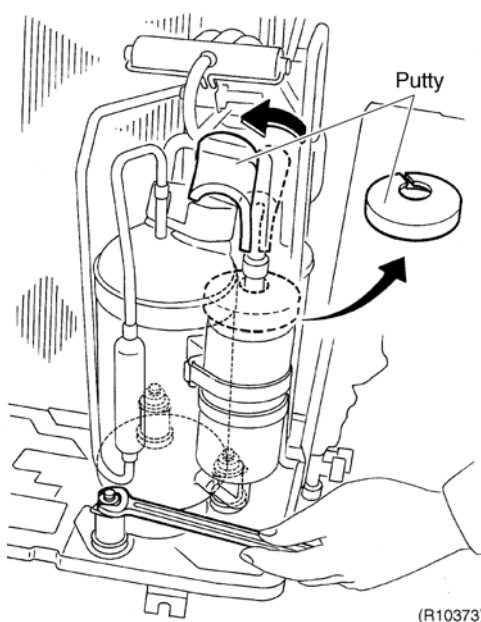
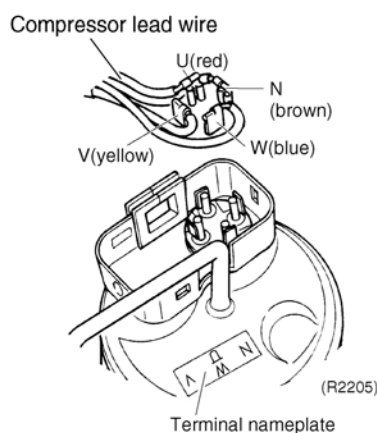
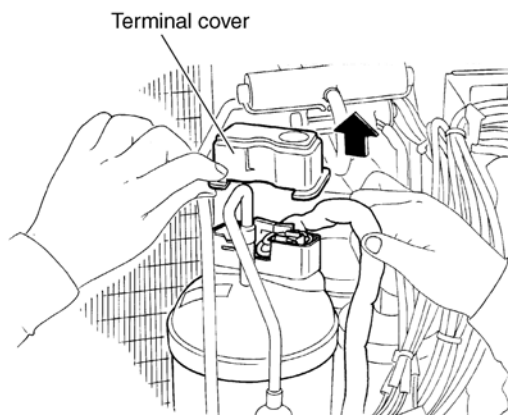
Procedure



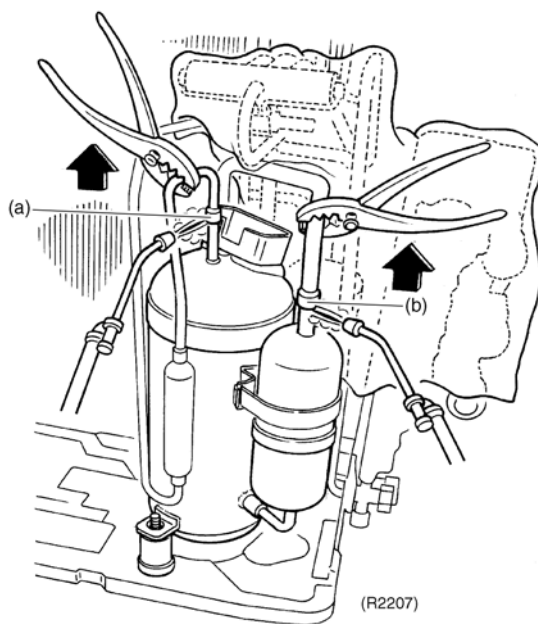
Warning

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

Step	Procedure	Points
1	Remove the terminal cover.	<p>■ Be careful to avoid burning the compressor terminals or the nameplate.</p>
2	Disconnect the compressor lead wires.	
3	Remove the 2 sheets of putty.	
4	Remove the 3 nuts with an open-end spanner.	
<p>■ Make sure there is no refrigerant gas left inside the refrigerant pipes before starting the job.</p>		



Step	Procedure	Points
<ul style="list-style-type: none"> Before working, make sure that the refrigerant is empty in the circuit. Be sure to apply nitrogen replacement when heating up the brazed part. 		<p>Warning Be careful not burn yourself with pipes and other parts that are heated by the gas brazing machine.</p>
5	Disconnect the brazed part (a) at discharge side of the compressor.	
6	Disconnect the brazed part (b) at suction side of the compressor.	
7	Lift the compressor up and remove it.	
	<p>Note:</p> <ul style="list-style-type: none"> Do not use a metal saw for cutting pipes because the sawdust comes into the circuit. When withdrawing the pipes, be careful not to pinch them firmly with pliers. The pipes may get deformed. Provide a protective sheet or a steel plate so that the brazing flame cannot influence peripheries. <p>Be careful so as not to burn the compressor terminals, the name plate, the heat exchanger fin.</p>	<p>Warning If the refrigerant gas leaks during work, ventilate the room. (If the refrigerant gas is exposed to flames, toxic gas may be generated.) Since it may happen that the refrigerant oil in the compressor catches fire, prepare wet cloth so as to extinguish fire immediately.</p> <p>Caution For global environment protection, do not discharge the refrigerant gas in the atmosphere. Make sure to collect all the refrigerant gas.</p> <p>Cautions for restoration</p> <ol style="list-style-type: none"> Restore the piping by non-oxidation brazing. It is required to prevent the carbonization of the oil inside the four way valve and the deterioration of the gaskets affected by heat. Keep below 120°C (248°F). Wrap the four-way valve with a wet cloth and provide water so that the cloth does not dry out and excessive heating is avoided. <p>In case of difficulty with gas brazing machine</p> <ol style="list-style-type: none"> Disconnect the brazed part where it is easy to disconnect and restore. Cut pipes on the main unit with a tube cutter in order to make it easy to disconnect.



2. Outdoor Unit – 3MXS24JVJU / 4MXS32GVJU

2.1 Removal of the Outer Panels

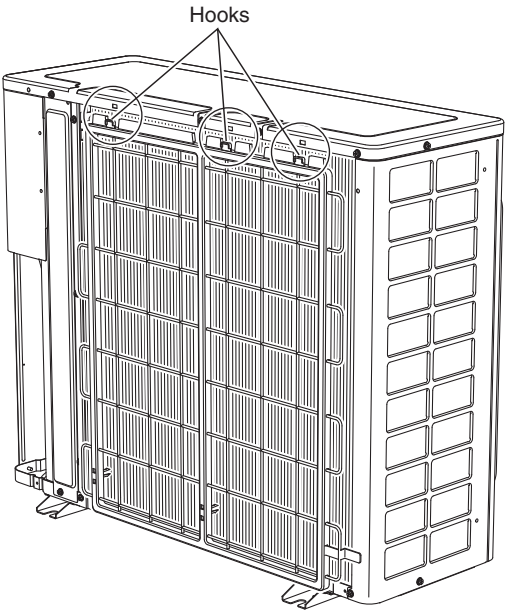
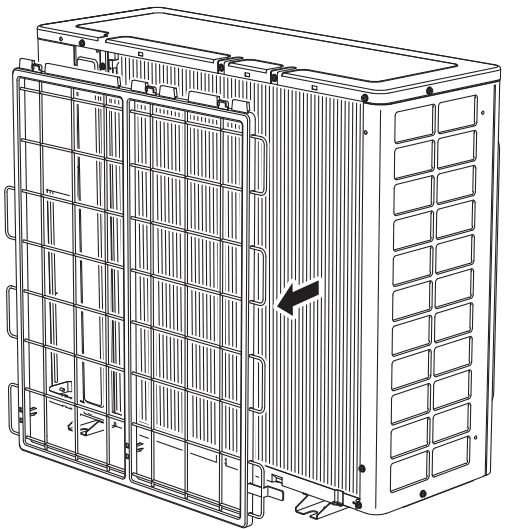
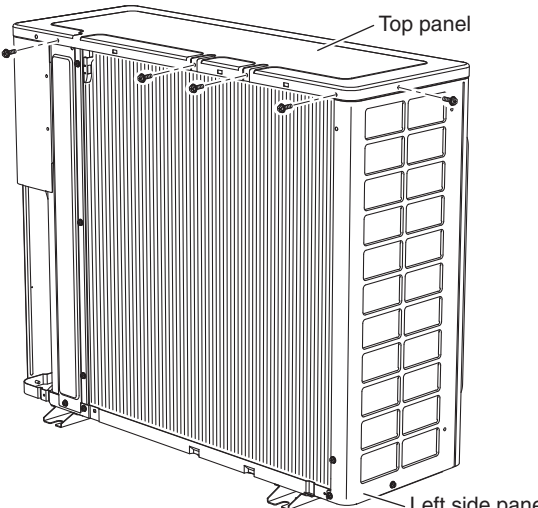
Procedure

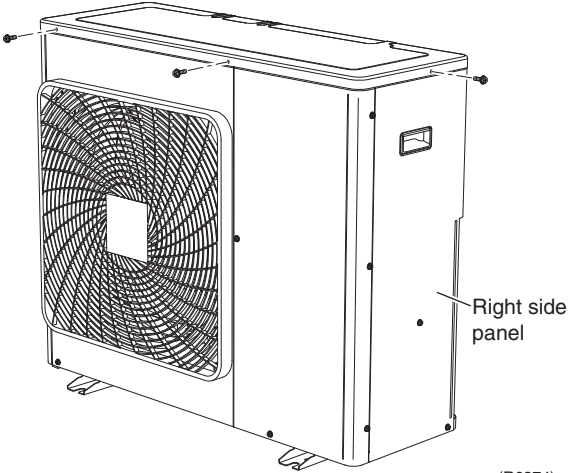
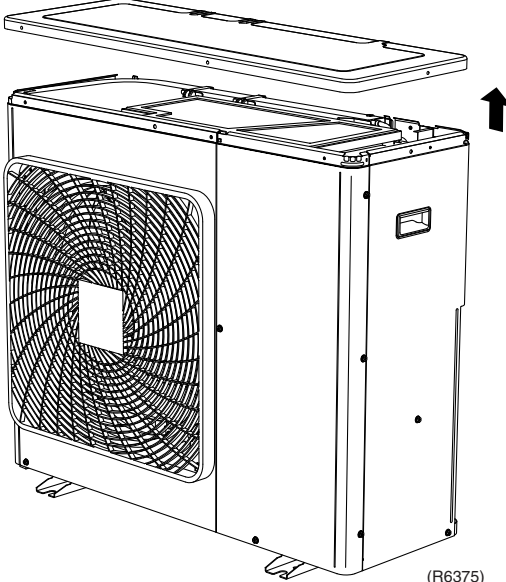
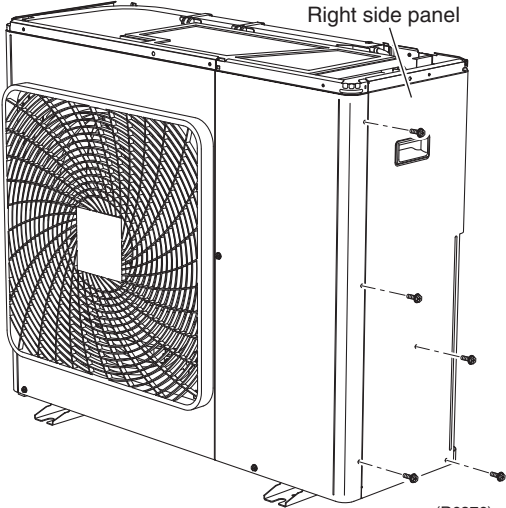


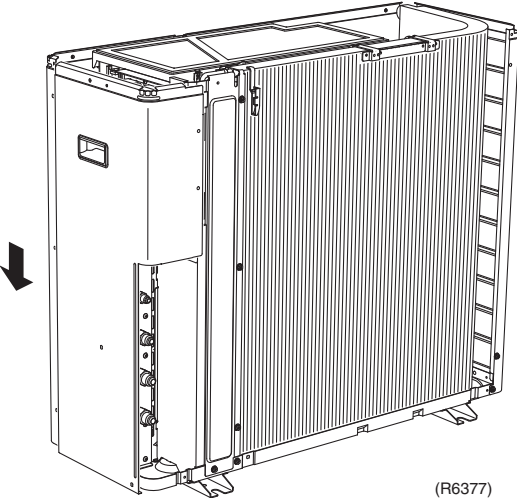
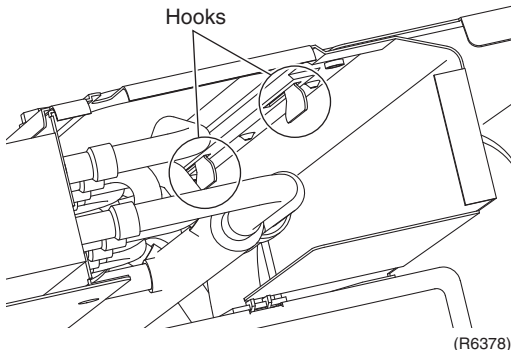
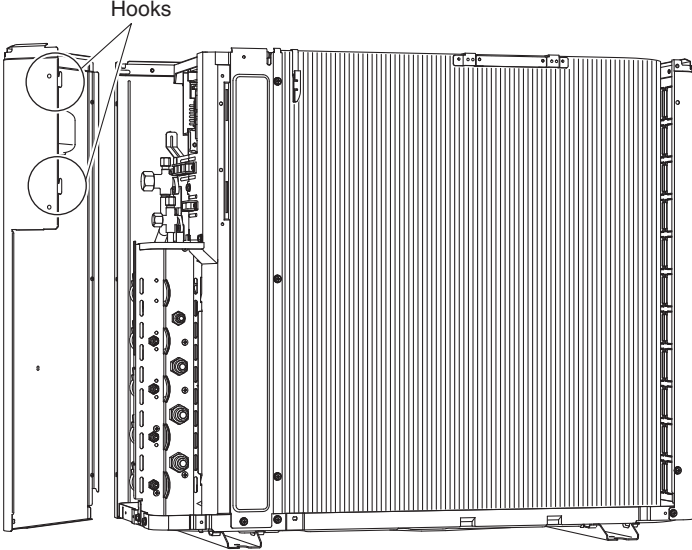
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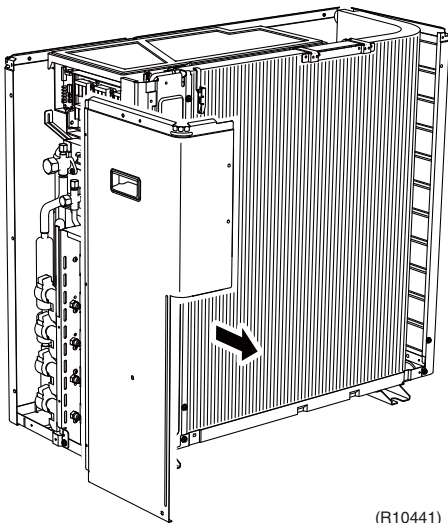
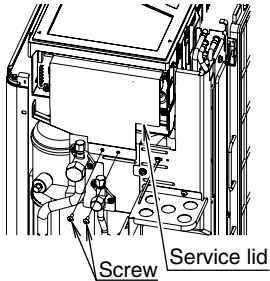
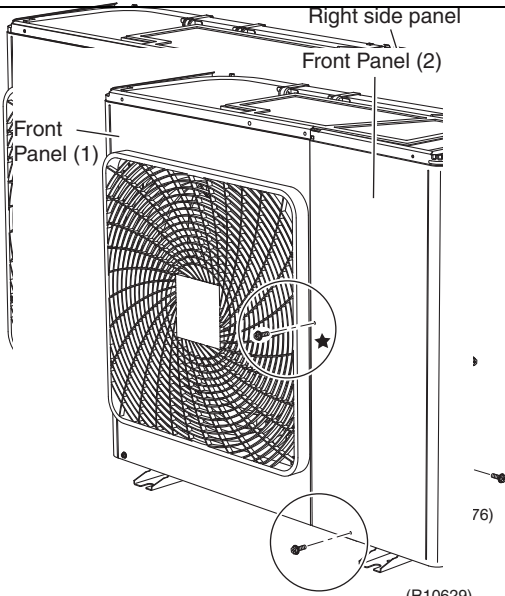
Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

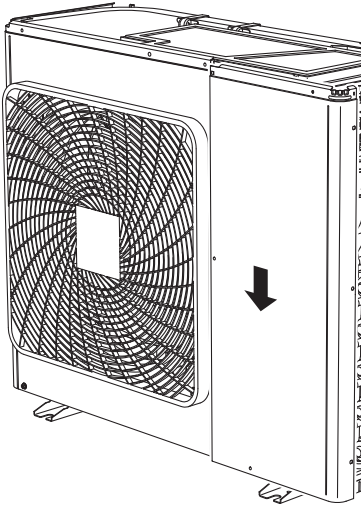
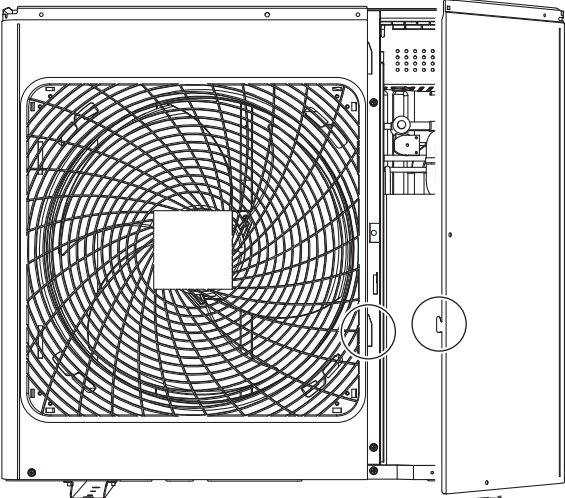
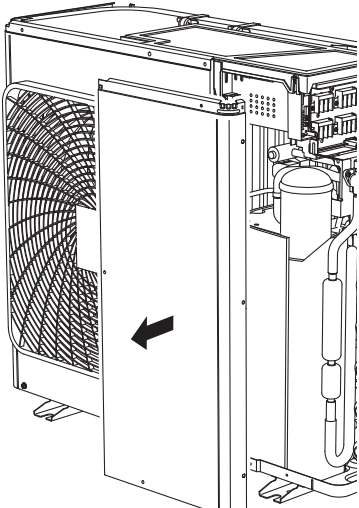
Step	Procedure	Points
1	External appearance.	
1. Removal of the suction grille.		
1	Unfasten the 2 hooks at the bottom first.	<div>■ The hooks are secured in the clearances of the heat exchanger fins.</div>

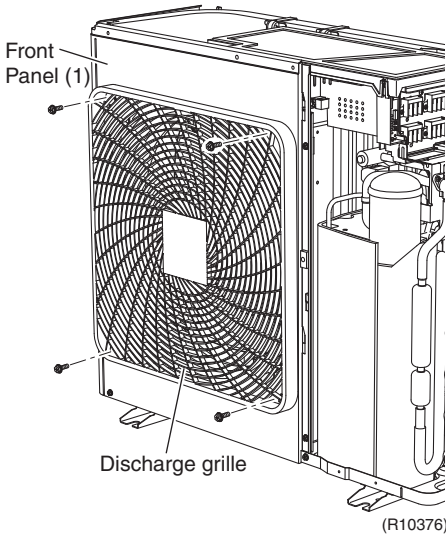
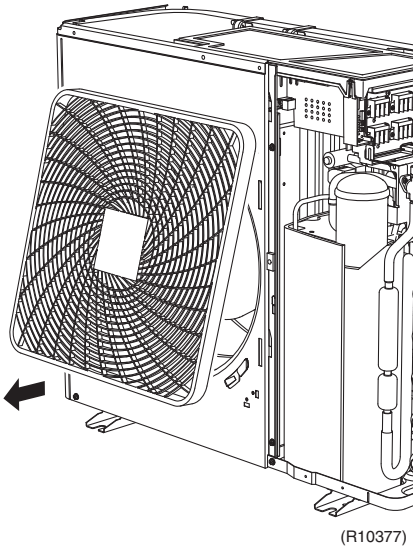
Step		Procedure	Points
2	Slide the suction grille downward to unfasten the 3 top hooks.	 <p>(R6371)</p>	
3	Remove the suction grille.	 <p>(R6372)</p>	
2. Removal of the top panel.		<p>1 Remove the 4 screws on the back and the 1 screw on the left side panel.</p>  <p>(R6373)</p>	

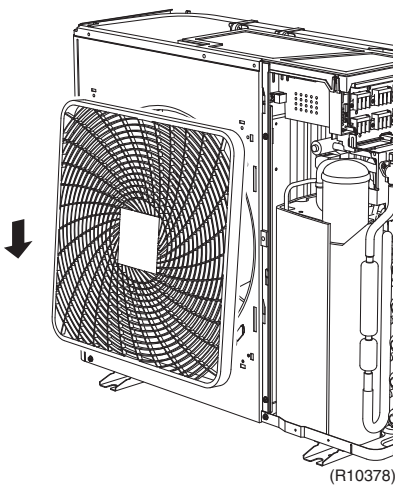
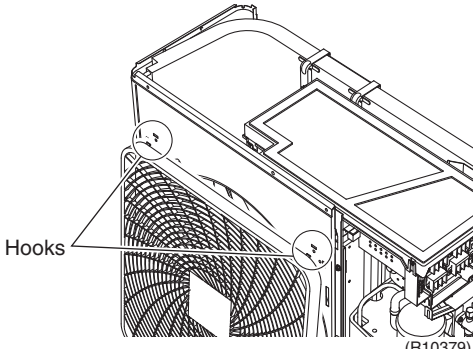
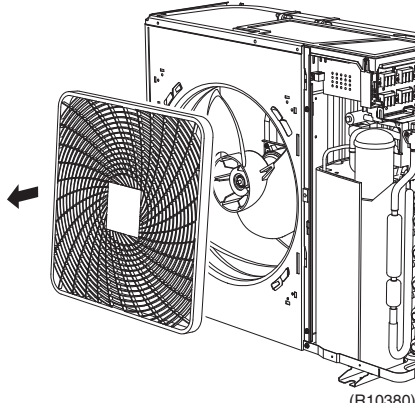
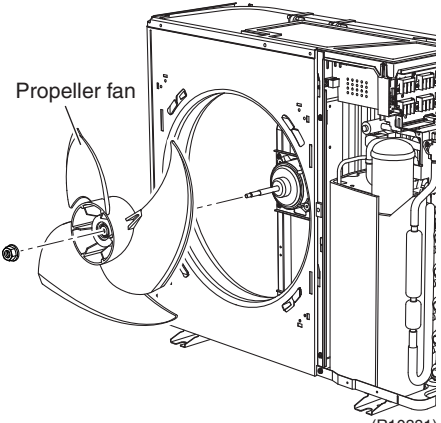
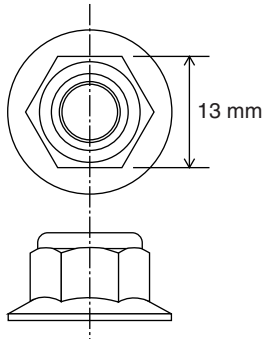
Step		Procedure	Points
2	Remove the 2 screws on the front and the 1 screw on the right side panel.	 <p>Right side panel</p> <p>(R6374)</p>	
3	Lift the top panel and remove it.	 <p>(R6375)</p>	
3. Removal of the right side panel.		 <p>Right side panel</p> <p>(R6376)</p>	
1	Remove the 5 screws.		

Step		Procedure	Points
2	Slide the panel downward to release the 2 hooks on the back side.	 <p>(R6377)</p>  <p>Hooks</p> <p>(R6378)</p>  <p>Hooks</p> <p>(R6379)</p>	

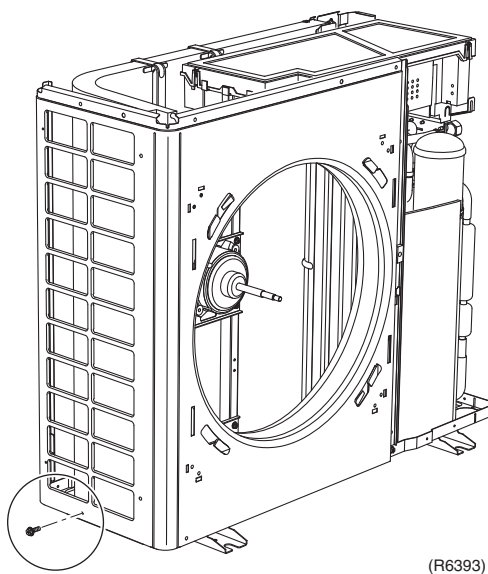
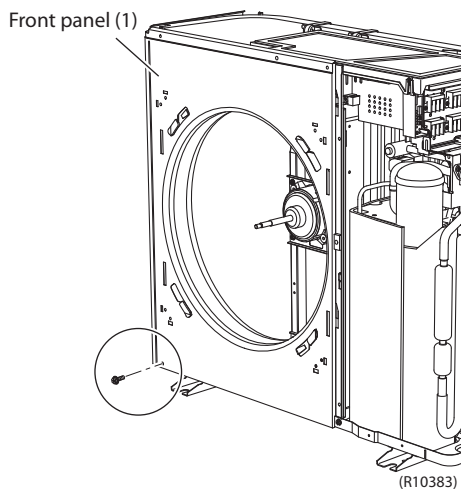
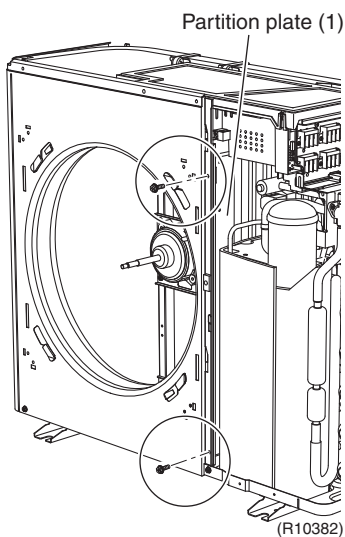
Step		Procedure	Points
3	Remove the right side panel.	 <p>(R10441)</p>	<p>■ The US model has a service lid on the stop valve mounting plate. Remove the 2 screws to remove the service lid.</p>  <p>Screw Service lid</p> <p>(R10372)</p>
4. Removal of the front panel (2).	1 Remove the 2 screws.	 <p>Right side panel</p> <p>Front Panel (2)</p> <p>Front Panel (1)</p> <p>76)</p> <p>(R10629)</p>	<p>★ This screw is M5 × 16</p>

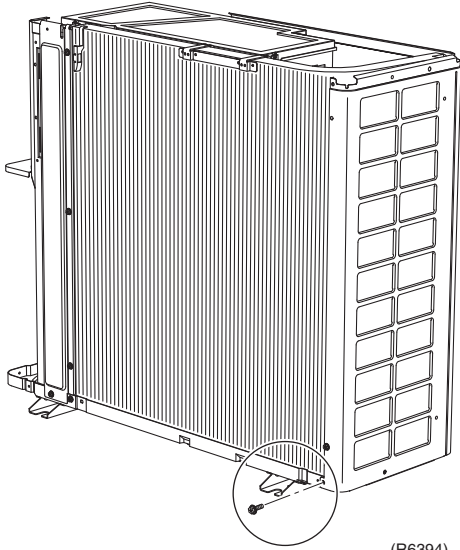
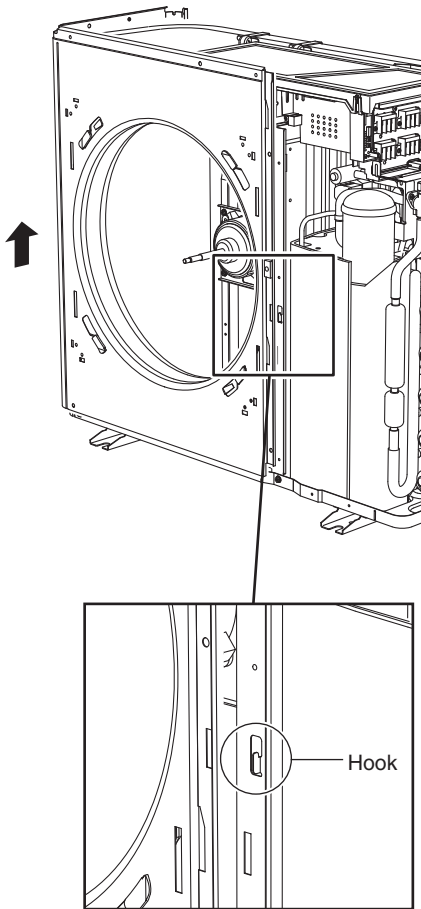
Step		Procedure	Points
2	Slide the front panel (2) panel downward to unfasten the hook.	 <p>(R10374)</p>  <p>(R6383)</p>	
3	Remove the front panel (2).	 <p>(R10375)</p>	

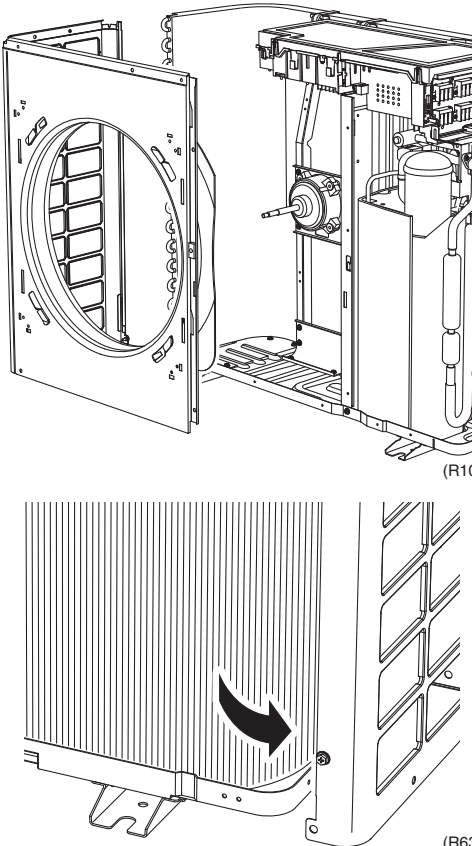
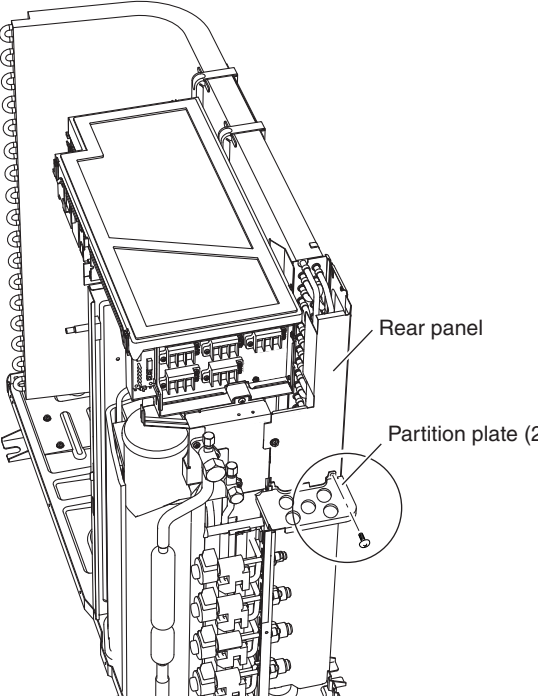
Step	Procedure	Points
5. Removal of the front panel (1).		■ Remove the discharge grille and propeller fan first to remove the front panel (1).
1	Remove the 4 screws on the discharge grille.	
	 <p>(R10376)</p>	
2	Pull the bottom of the discharge grille toward yourself.	
	 <p>(R10377)</p>	

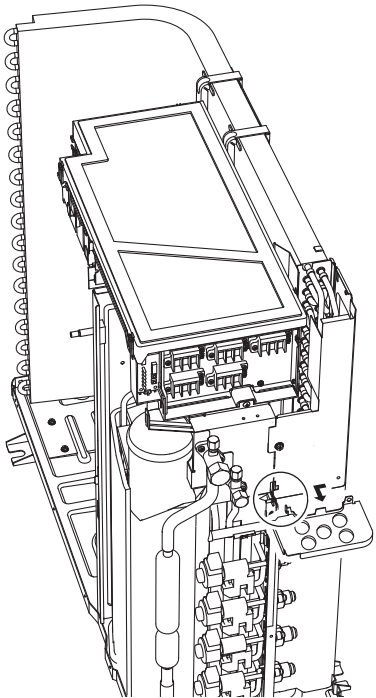
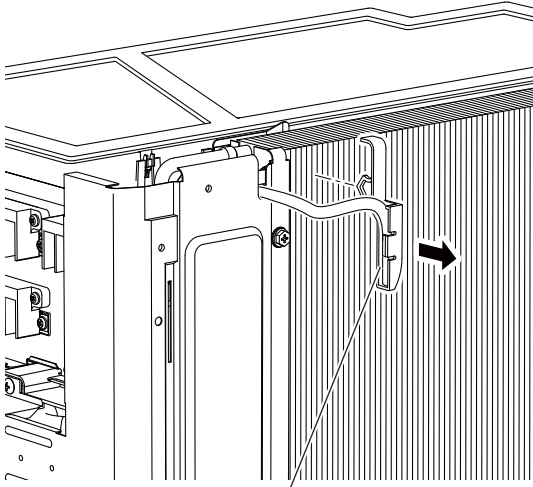
Step		Procedure	Points
3	Slide the discharge grille downward to unfasten the 2 hooks at the top.	 <p>(R10378)</p>  <p>Hooks</p> <p>(R10379)</p>	
4	Remove the discharge grille.	 <p>(R10380)</p>	
5	Remove the washer-fitted nut and remove the outdoor fan.	 <p>Propeller fan</p> <p>(R10381)</p>	<p>■ Nut size : M8</p>  <p>13 mm</p> <p>(R12301)</p>

Step	Procedure	Points
6	Remove the 2 screws on the partition plate (1).	
7	Remove the screw at the bottom left of the front.	
8	Remove the screw at the bottom of the left side.	

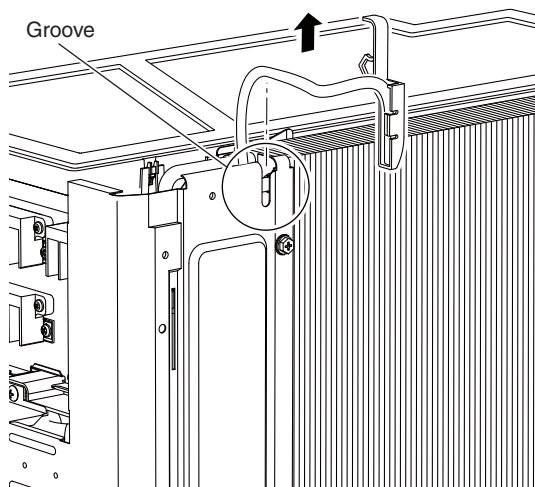


Step		Procedure	Points
9	Remove the screw at the bottom of the back side.	 <p>(R6394)</p>	
10	Lift the front panel (1) to unfasten the hook.	 <p>(R10384)</p>	

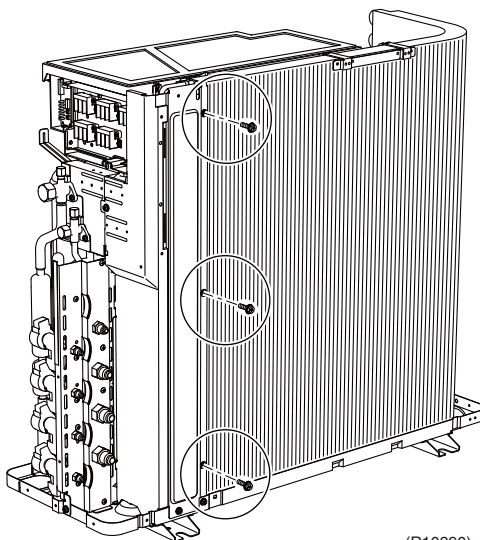
Step		Procedure	Points
11	Remove the front panel (1).	 <p>(R10385)</p> <p>(R6396)</p>	<p>■ Be sure to detach the front panel (1) carefully so as not to deform it.</p>
6. Removal of the rear panel			
1	Remove the screw on the partition plate (2).	 <p>Rear panel</p> <p>Partition plate (2)</p> <p>(R10386)</p>	

Step		Procedure	Points
2	Slide the partition plate (2) to the left, and remove it.	 <p>(R10387)</p>	
3	Undo the holder of the thermistor.	 <p>Outdoor temperature thermistor</p> <p>(R10388)</p>	<ul style="list-style-type: none">■ The holder is secured in the clearances of the heat exchanger fins.

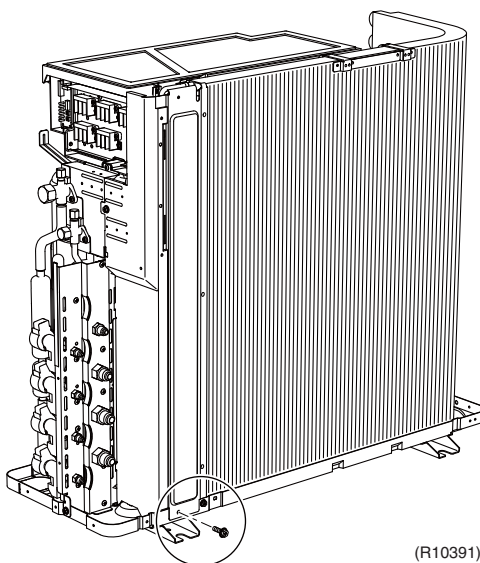
Step	Procedure	Points
4	Release the thermistor wire from the groove	
5	Remove the 3 screws on the rear panel.	
6	Remove the screw on the bottom frame.	



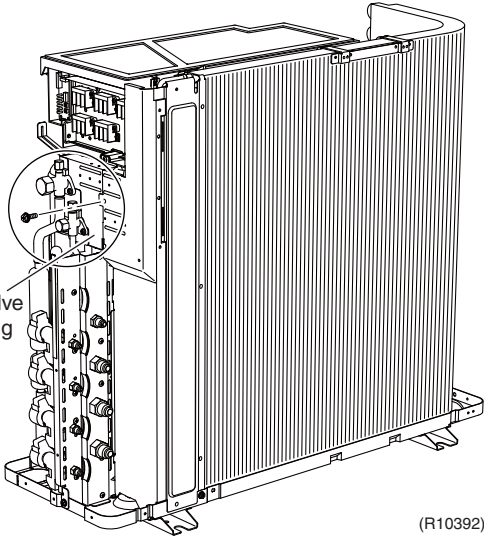
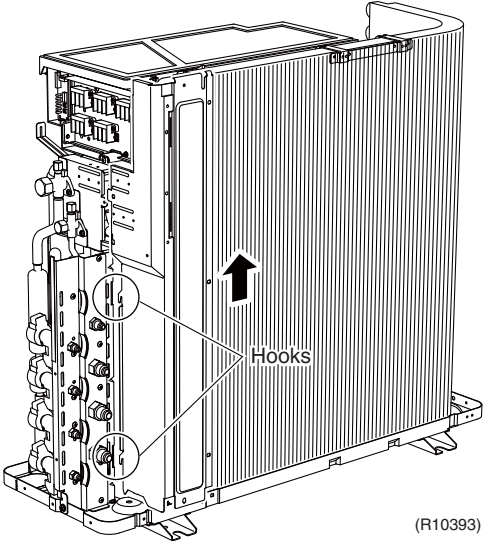
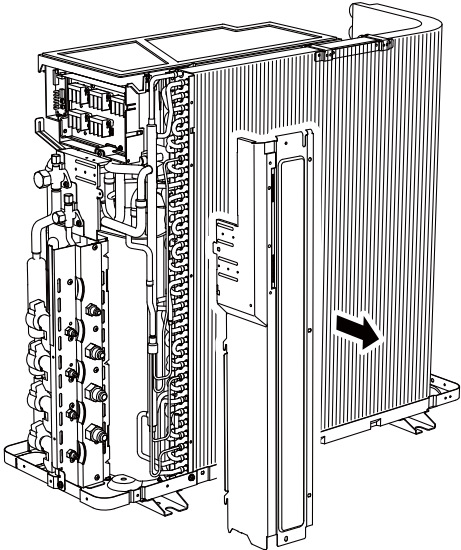
(R10389)



(R10390)



(R10391)

Step		Procedure	Points
7	Remove the screw on the stop valve mounting plate.	 <p>Stop valve mounting plate</p> <p>(R10392)</p>	
8	Lift the rear panel upward to unfasten the 2 hooks.	 <p>Hooks</p> <p>(R10393)</p>	
9	Remove the rear panel.	 <p>(R10394)</p>	

2.2 Removal of the Electrical Box

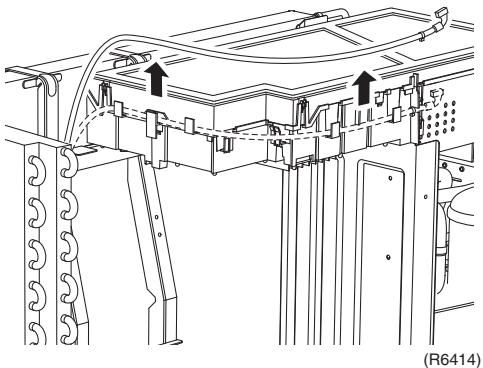
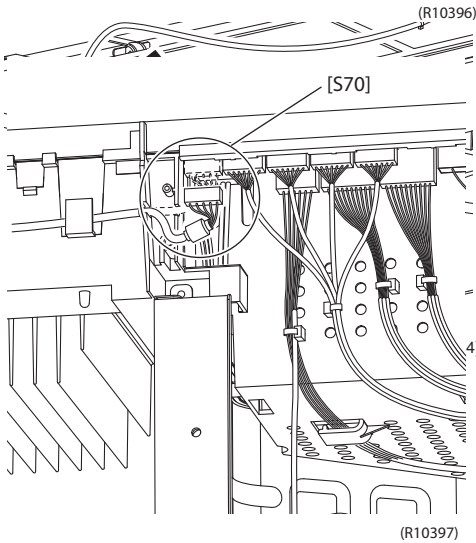
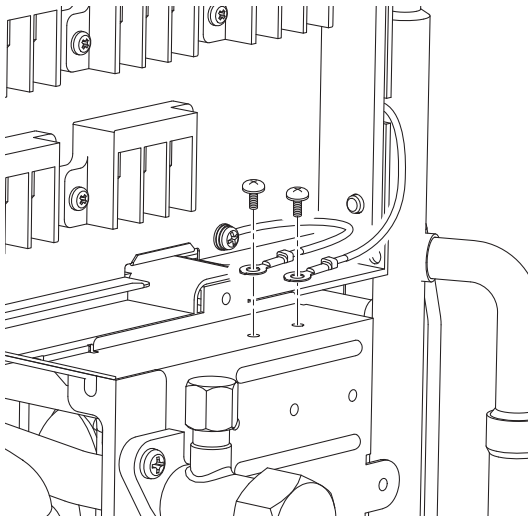
Procedure

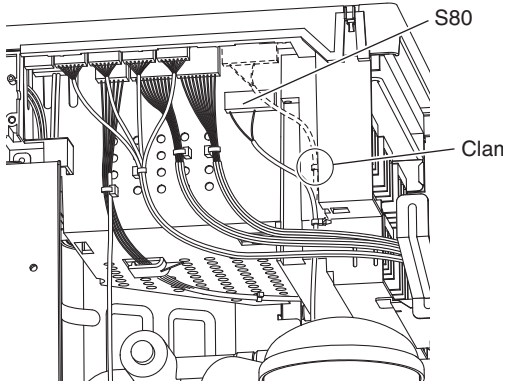
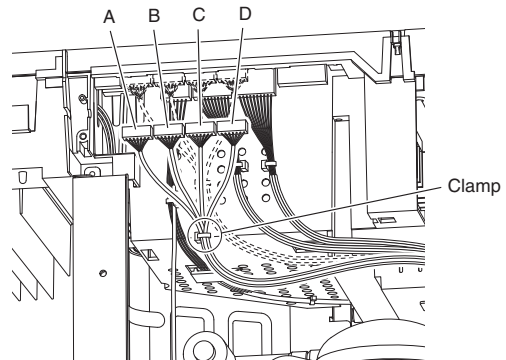
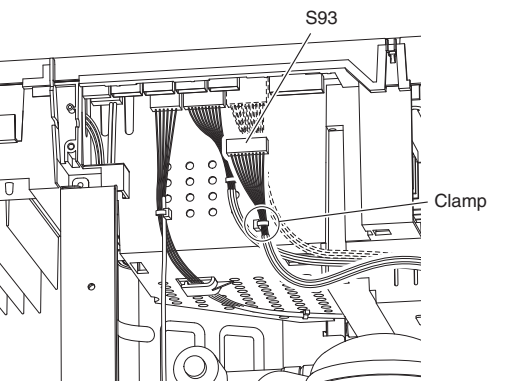
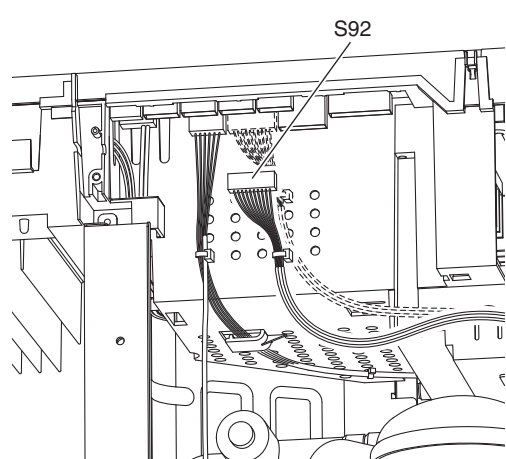


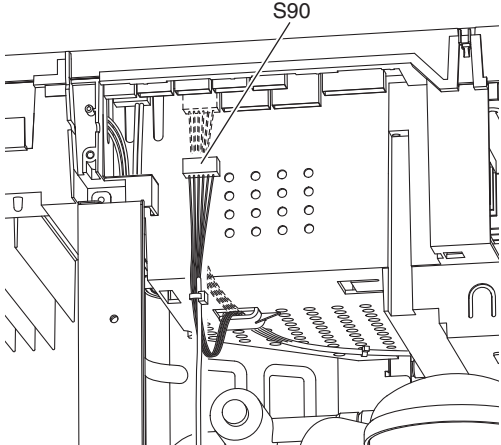
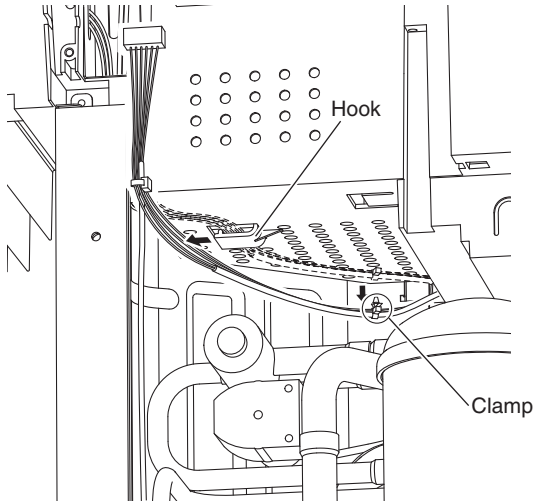
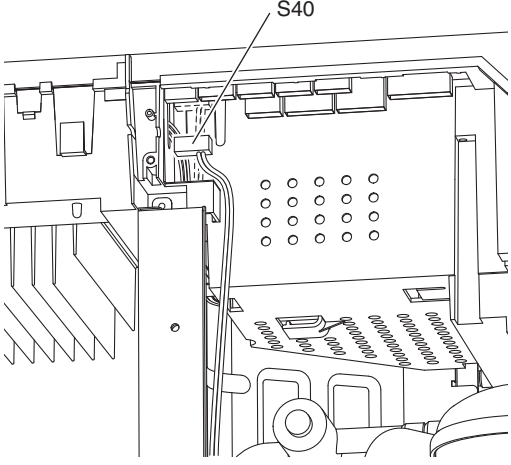
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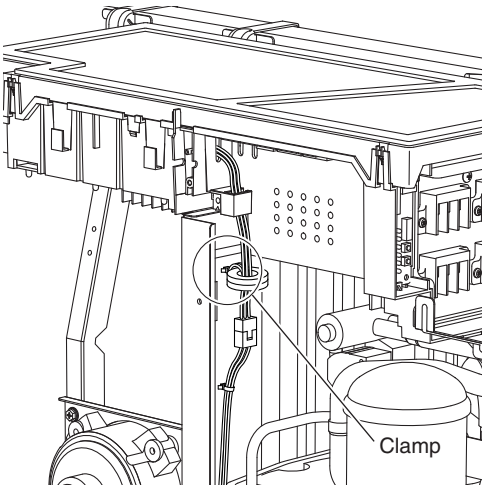
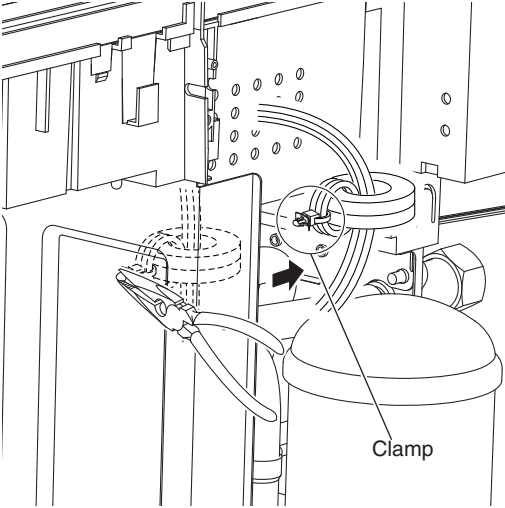
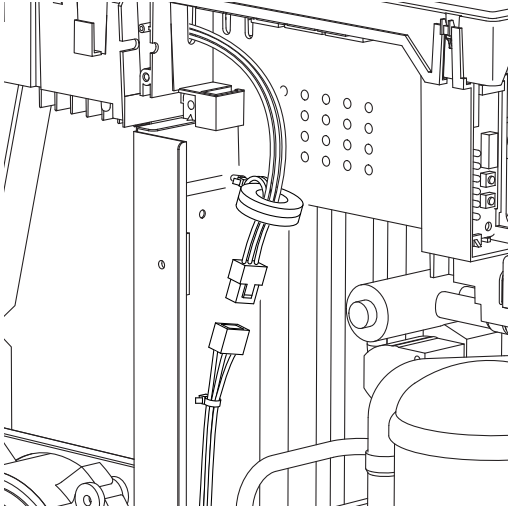
Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

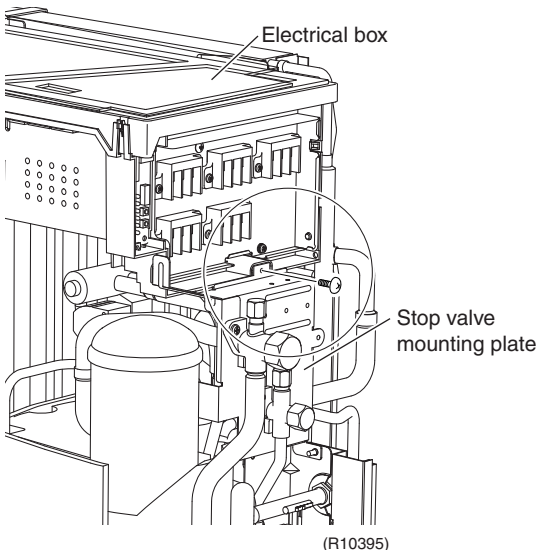
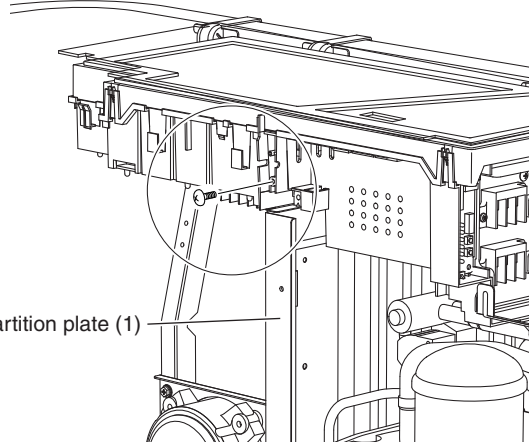
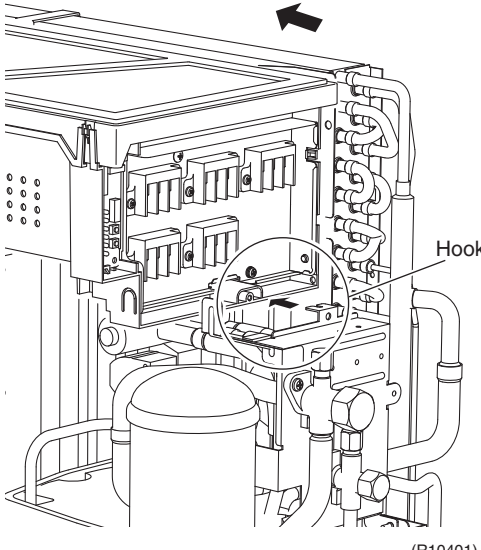
Step	Procedure	Points
1	Remove the 2 screws to detach the grounds.	
2	Disconnect the connector for the fan motor [S70].	
3	Release the fan motor lead wire.	

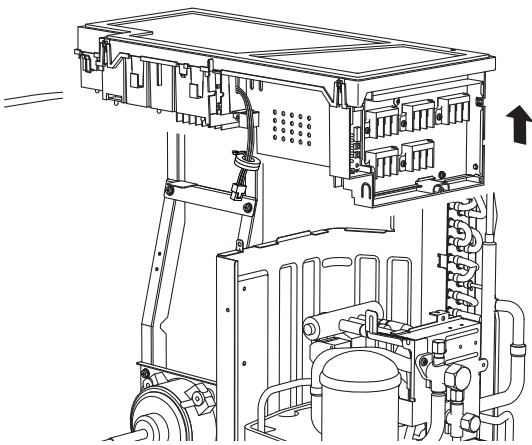


Step		Procedure	Points
4	Disconnect the connector for the four-way valve coil [S80].	 <p>(R10398)</p>	Pull out the clamp.
5	Disconnect the 4 connectors for the electronic expansion valve coils (for room A, B, C, D).		<ul style="list-style-type: none"> ■ A : [S20] (white) ■ B : [S21] (red) ■ C : [S22] (blue) ■ D : [S23] (yellow) ■ The 3MXS model does not have [S23].
6	Disconnect the connector for the liquid pipe thermistor [S93].	 <p>(R10400)</p>	■ Pull out the clamp.
7	Disconnect the connector for the gas pipe thermistor [S92].	 <p>(R10503)</p>	■ Pull out the clamp.

Step		Procedure	Points
8	Disconnect the connector for the thermistors [S90]	 <p>(R10538)</p>	<ul style="list-style-type: none"> ■ Pull out the clamp.
9	The wire harness of the thermistors is hooked under the electrical box. Unhook it and pull out the clamp.	 <p>(R6420)</p>	<ul style="list-style-type: none"> ■ Pull out the clamp.
10	Disconnect the connector for the overload protector [S40].	 <p>(R10539)</p>	<ul style="list-style-type: none"> ■ Pull out the clamp.

Step		Procedure	Points
11	The wire harness for the compressor is attached to the partition plate (1) by the clamp.	 <p>(R6422)</p>	
12	Pull out the clamp with pliers	 <p>Clamp</p>	
13	Disconnect the relay connector of the compressor.	 <p>(R6469)</p>	

Step		Procedure	Points
14	Remove the screw on the stop valve mounting plate.	 <p>Electrical box</p> <p>Stop valve mounting plate</p> <p>(R10395)</p>	
15	Remove the screw on the partition plate (1).	 <p>Partition plate (1)</p> <p>(R6411)</p>	
16	Slide the electrical box leftward to unfasten the hook on the right side.	 <p>Hook</p> <p>(R10401)</p>	

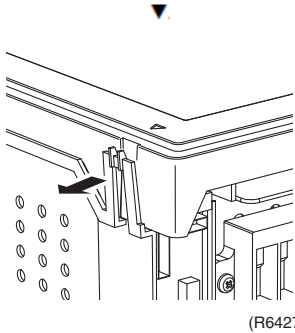
Step		Procedure	Points
17	Lift up the electrical box to remove it.	 <p>(R10402)</p>	

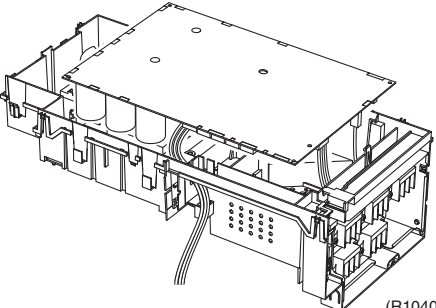
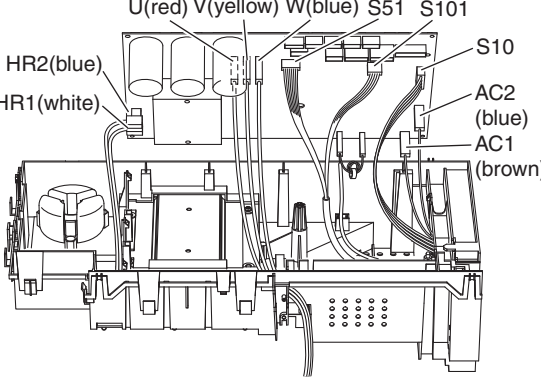
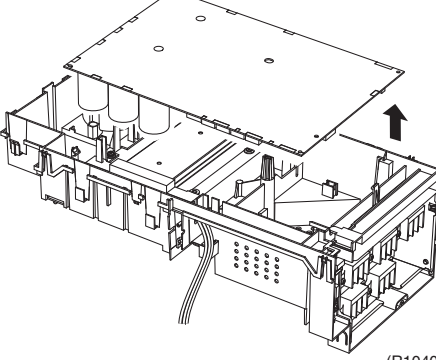
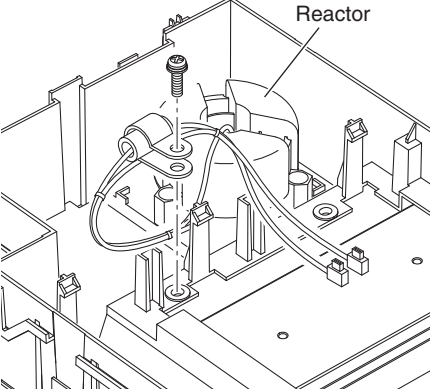
2.3 Removal of the PCB

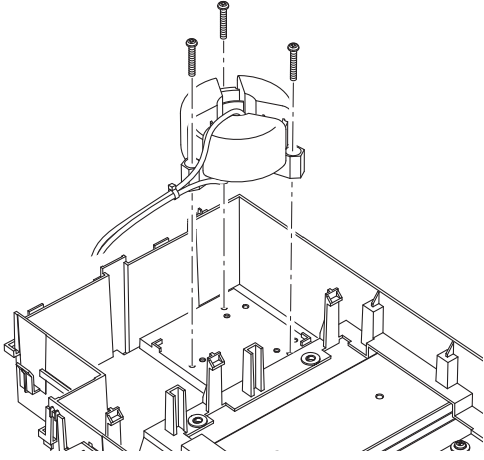
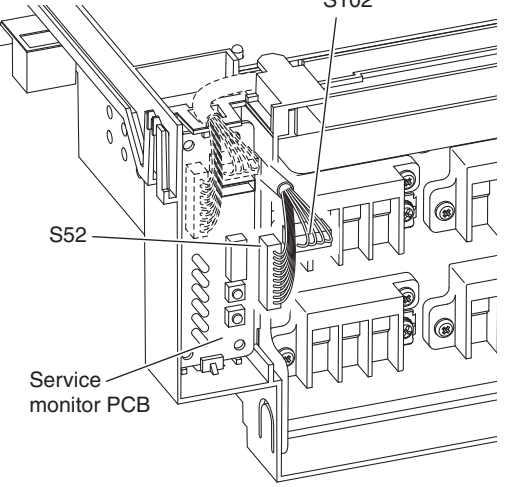
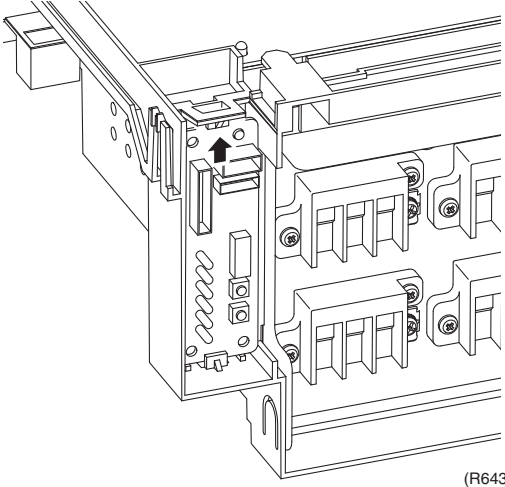
Procedure

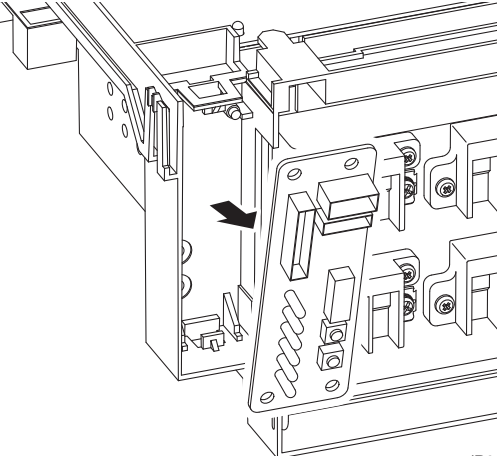
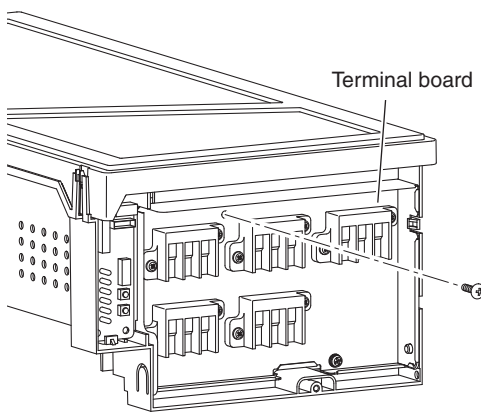
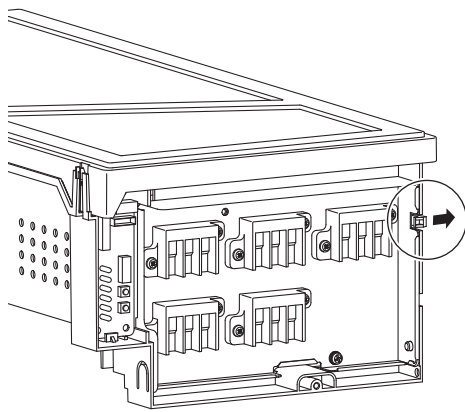


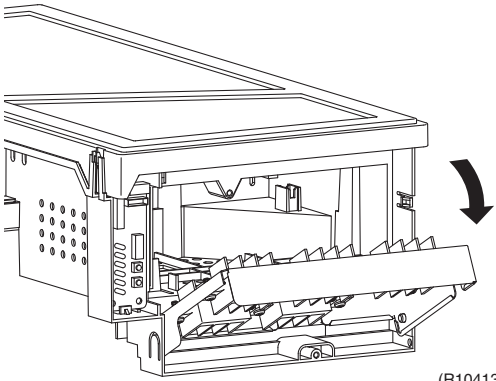
Warning Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
1. Removal of the control PCB		
1	Open the cover of the electrical box.	<div>■ Unfasten the 4 hooks. The hooks are marked with:</div> 
2	Remove the 3 screws.	
3	Unfasten the 4 hooks.	

Step		Procedure	Points
4	Lift up the main PCB.	 <p>(R10406)</p>	
5	Disconnect the connectors.	 <p>(R10407)</p>	<p>■ Refer to page 21 for details.</p> <p>[S51] [S101] : service monitor PCB [S10] : terminal board (transmission) [HR1] [HR2] : reactor [AC1] [AC2] : terminal board (power supply) ■ [U] [V] [W] : compressor</p>
6	Remove the main PCB.	 <p>(R10408)</p>	
2. Removal of the reactor			
1	Remove the screw.	 <p>(R10409)</p>	

Step		Procedure	Points
2	Remove the 3 screws and lift the reactor upward to remove it.	 <p>(R6434)</p>	
3. Removal of the service monitor PCB.			
1	Disconnect the connectors from the service monitor PCB (S52, S102).	 <p>(R10410)</p>	
2	Slightly lift the top hook to unfasten.	 <p>(R6436)</p>	

Step		Procedure	Points
3	Unfasten the bottom hook to remove the service monitor PCB.	 <p>(R6437)</p>	
4. Removal of the terminal board.			
1	Remove the screw.	 <p>Terminal board</p> <p>(R10411)</p>	
2	Unfasten the hook.	 <p>(R10412)</p>	

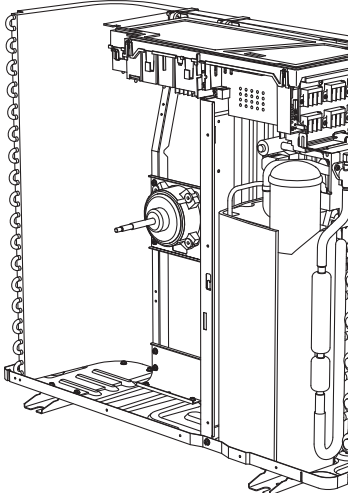
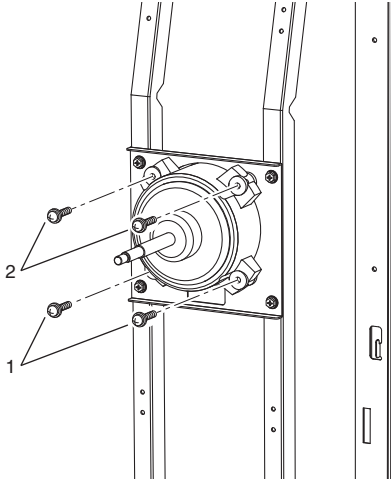
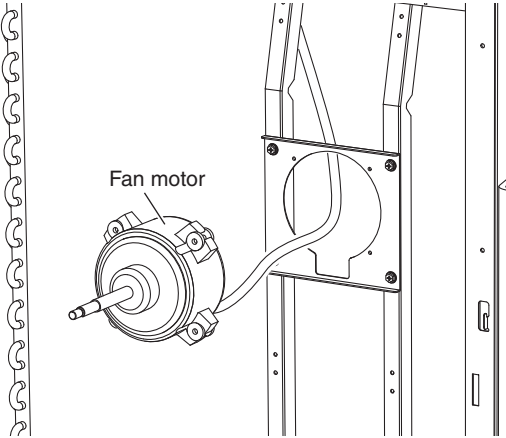
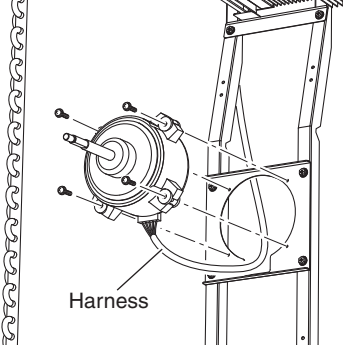
Step		Procedure	Points
3	Remove the terminal board.	 <p>(R10413)</p>	

2.4 Removal of the 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	Remove the 2 lower screws at the bottom.	 (R10414)  (R6442)  (R10542)	<div>■ Be sure to remove the lower screws first. If the upper screws are removed first, the fan motor may tilt or fall because the center of its gravity is toward the front. It may cause injuries.</div> <div>■ When reassembling, be sure to place the wire harness lower.</div>  (R6444)
2	Remove the 2 upper screws.		
3	Remove the fan motor.		

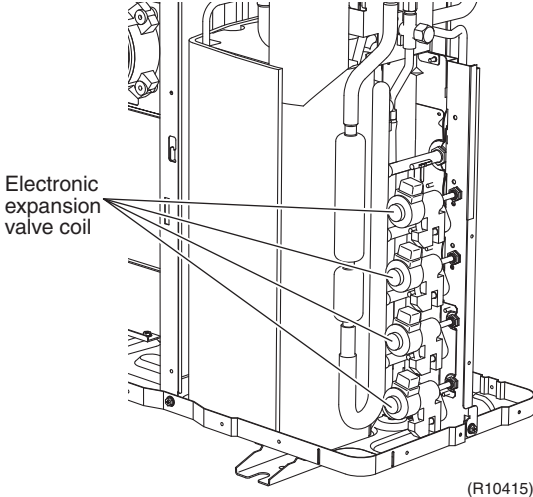
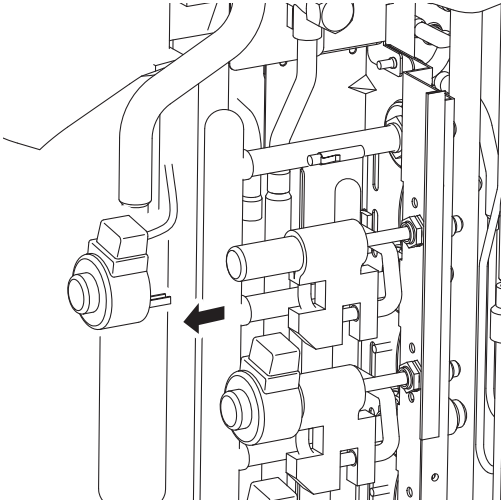
2.5 Removal of the Coils and Thermistors

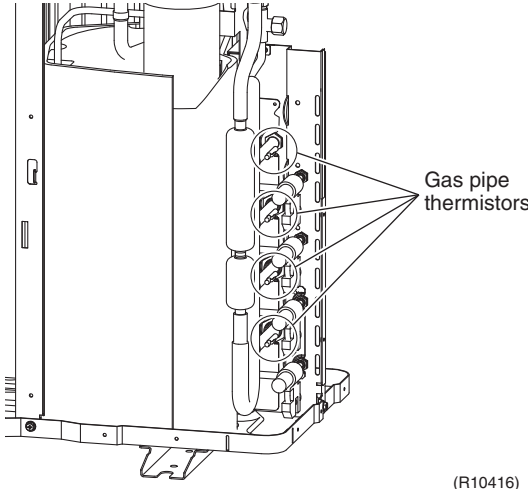
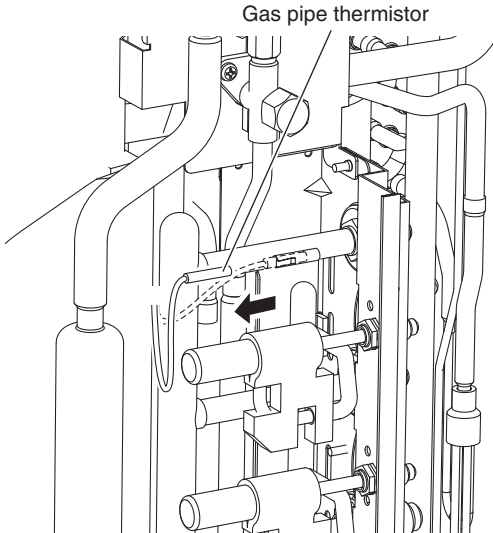
Procedure

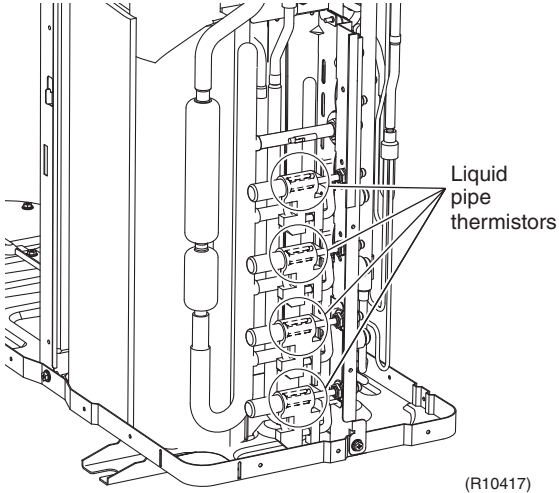
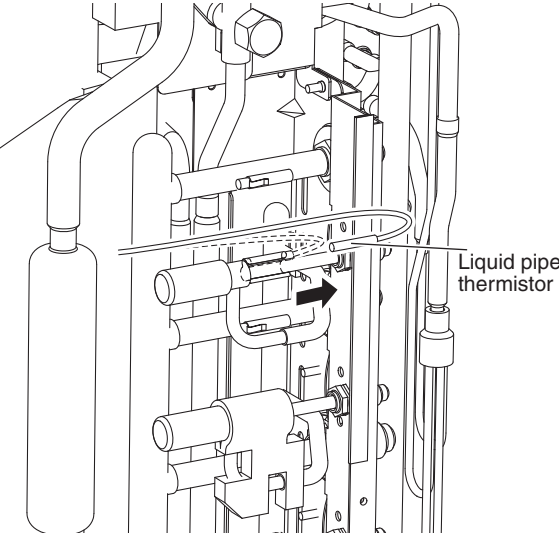
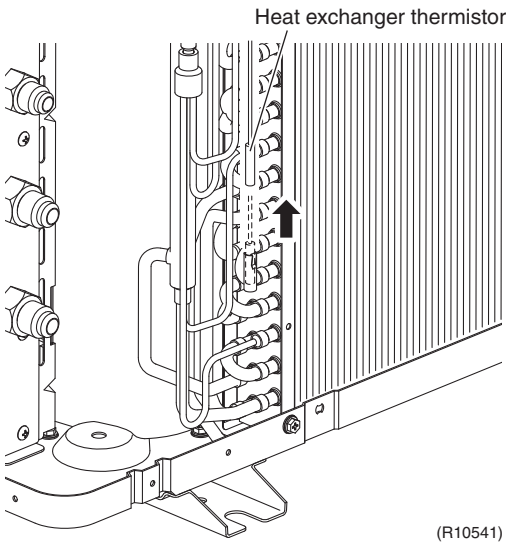


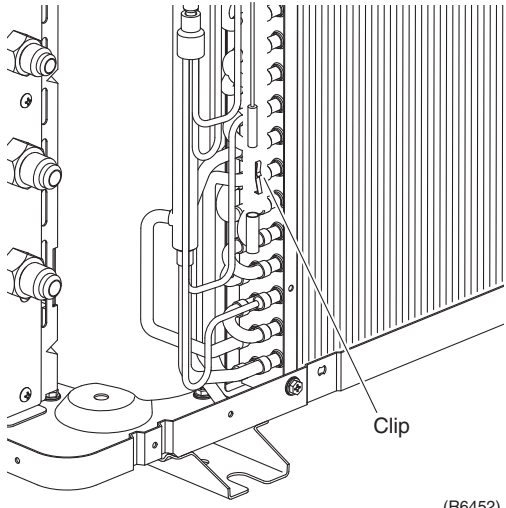
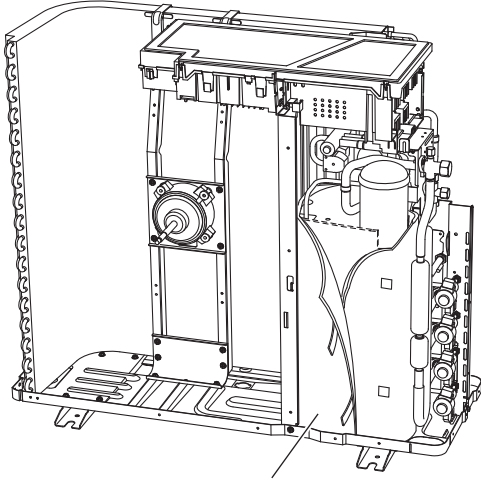
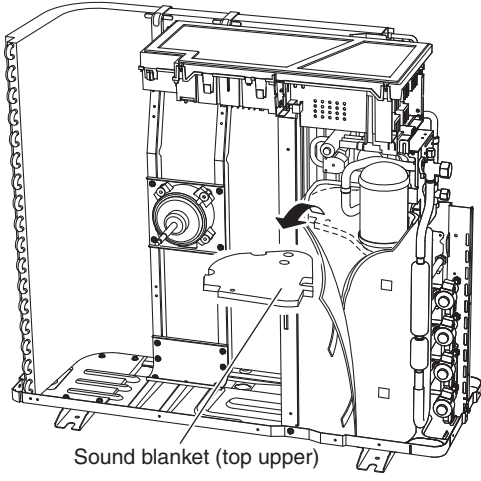
Warning

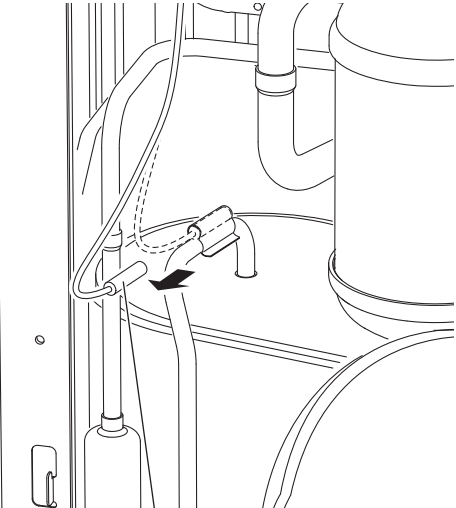
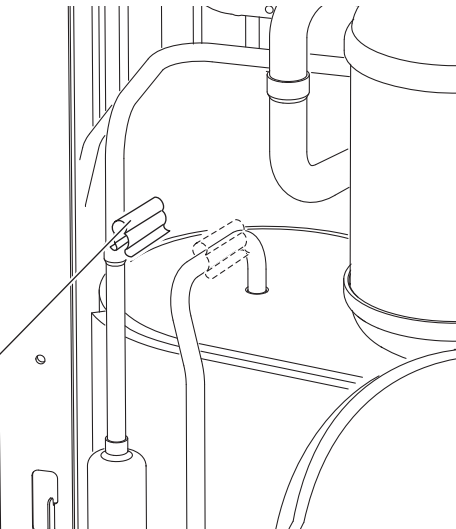
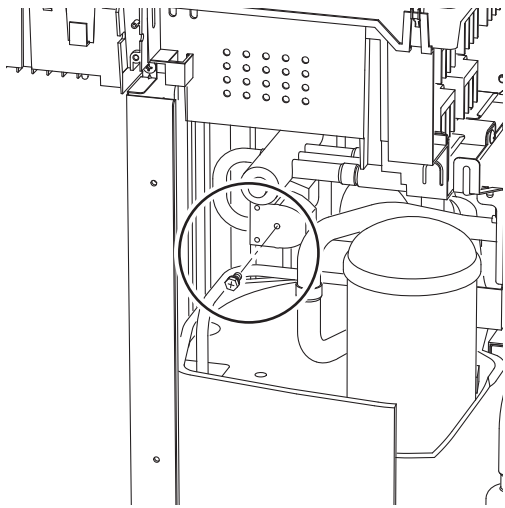
Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

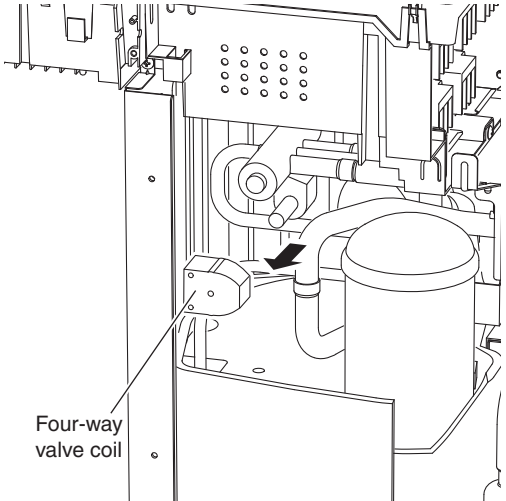
Step	Procedure	Points
1. Removal of the electronic expansion valve coil		
1	<div><div><div>Pull the electronic expansion valve coils out.</div></div><div><div>(R10415)</div></div></div> <div><div>(R6446)</div></div>	

Step	Procedure	Points
2. Removal of the thermistors		
1	<p>Pull out the gas pipe thermistors.</p>  <p>(R10416)</p>  <p>(R6448)</p>	<p>■ Be careful not to lose the clips for the thermistors.</p>

Step		Procedure	Points
2	Peel the putty, and pull out the liquid pipe thermistors.	 <p>(R10417)</p>  <p>(R6450)</p>	<p>■ Be careful not to lose the fixtures for the thermistors.</p>
3	Pull out the heat exchanger thermistor.	 <p>(R10541)</p>	

Step		Procedure	Points
4	Remove the clip from the heat exchanger thermistor.	 <p>Clip (R6452)</p>	<p>■ Be careful not to lose the clip for the thermistor.</p>
5	Slightly open the sound blanket (outer).	 <p>Sound blanket (outer) (R10418)</p>	
6	Remove the sound blanket (top upper).	 <p>Sound blanket (top upper) (R10419)</p>	

Step		Procedure	Points
7	Remove the discharge pipe thermistor.	 <p>Discharge pipe thermistor (R10420)</p>	
8	Remove the fixture.	 <p>Fixture (R10430)</p>	
3. Removal of the four-way valve coil		 <p>(R10431)</p>	
1	Remove the screw.		

Step		Procedure	Points
2	Remove the four-way valve coil.	 <p data-bbox="581 667 673 716">Four-way valve coil</p> <p data-bbox="992 772 1057 793">(R10432)</p>	

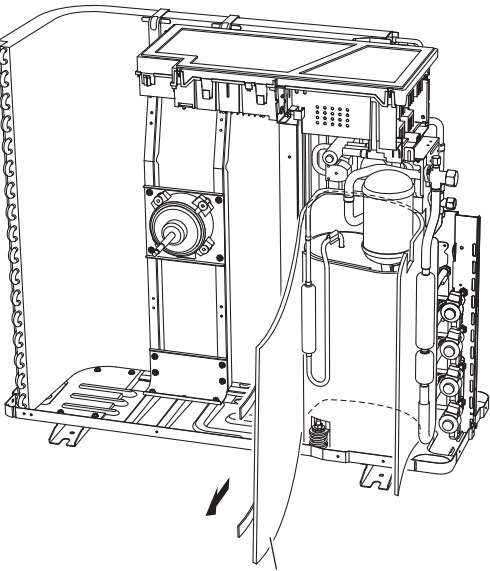
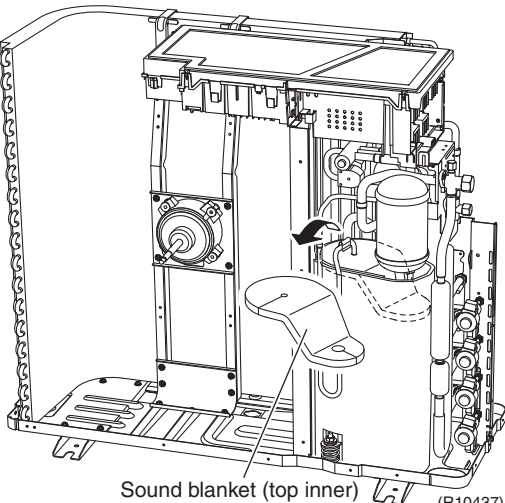
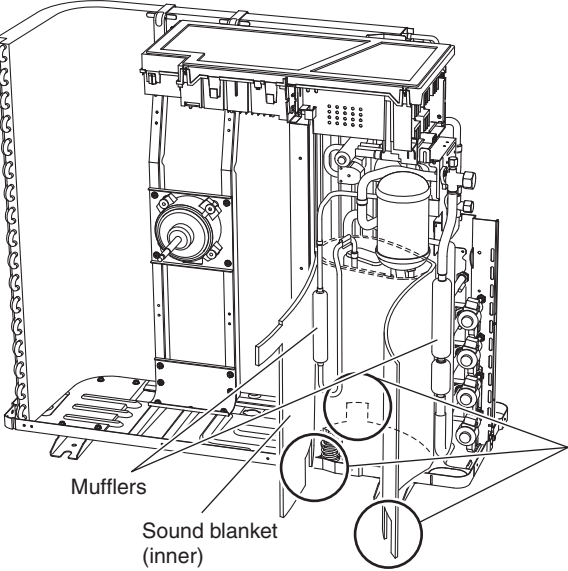
2.6 Removal of the Sound Blanket

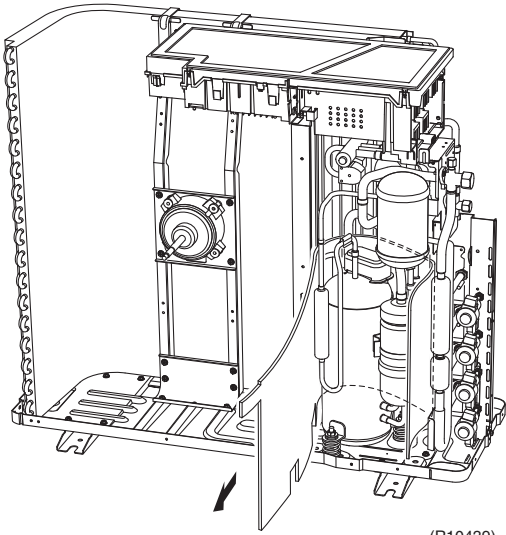
Procedure



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

Step	Procedure	Points
1	Open the sound blanket (outer).	<div>■ The sound blanket is fragile. Carefully pass the discharge pipe through it.</div>
2	Remove the sound blanket (top upper).	
3	Remove the screw from the partition plate and push the plate slightly to the left for easy access to work.	

Step		Procedure	Points
4	Remove the sound blanket (outer).	 <p>Sound blanket (outer) (R10436)</p>	<ul style="list-style-type: none"> ■ The sound blanket is fragile.
5	Remove the sound blanket (top inner).	 <p>Sound blanket (top inner) (R10437)</p>	<ul style="list-style-type: none"> ■ The sound blanket is fragile. Carefully pass the discharge pipe through it.
6	Open the sound blanket (inner) and pass it through the mufflers.	 <p>Mufflers Sound blanket (inner) (R10438)</p>	<ul style="list-style-type: none"> ■ The sound blanket is fragile. Be careful of the notches of the compressor mount (3 locations).

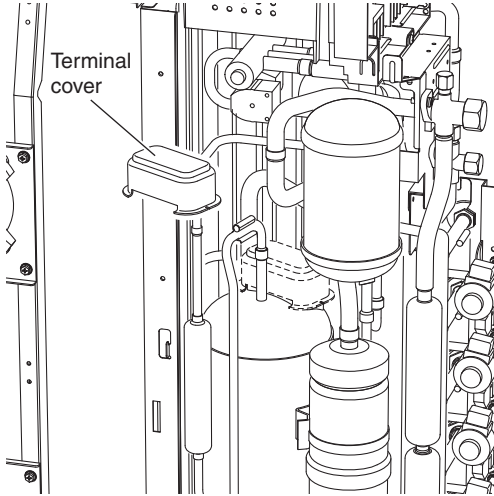
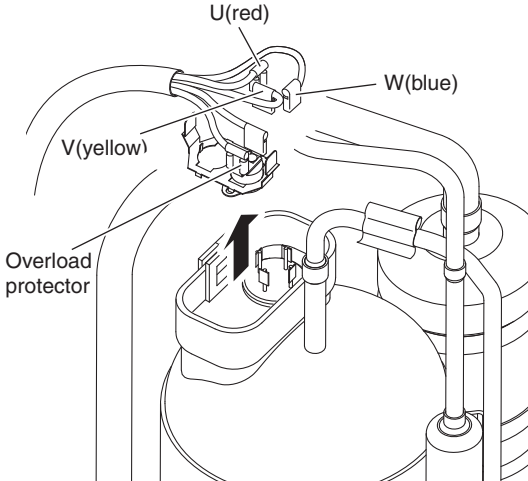
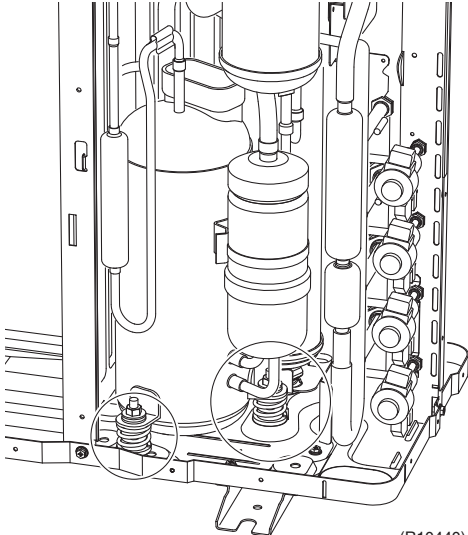
Step		Procedure	Points
7	Remove the sound blanket (inner).	 <p>The diagram shows a side view of an outdoor unit. A large, rectangular sound blanket is shown being removed from the front of the unit. An arrow points to the bottom edge of the blanket, indicating the removal direction. The unit's internal components, including the compressor, condenser coils, and various pipes, are visible. The reference code (R10439) is located at the bottom right of the diagram.</p> <p>(R10439)</p>	

2.7 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.	<div> (R6466)</div> <div> (R9471)</div> <div> (R10440)</div>
2	Disconnect the compressor lead wires.	
3	Remove the overload protector.	
4	Remove the 2 nuts.	

Part 8

Trial Operation and Field Settings

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3.4 When 2 Units are Installed in 1 Room	223
4. Application of Silicon Grease to a Power Transistor and a Diode Bridge	224

1. Trial Operation

Outline

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 backs up the operation mode. The system then restarts operation with the previous mode when the circuit breaker is restored.

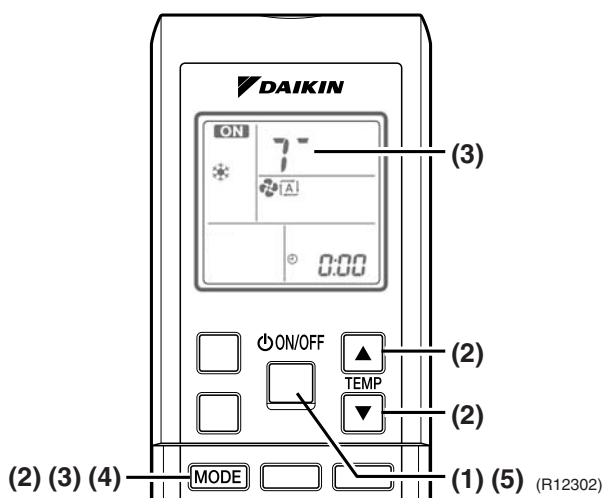
In cooling mode, select the lowest programmable temperature; in heating mode, select the highest programmable temperature.

- Trial operation may be disabled in either mode depending on the room temperature.
- After trial operation is complete, set the temperature to a normal level.
(26°C to 28°C (78°F to 82°F) in cooling mode, 20°C to 24°C (68°F to 75°F) in heating mode)
- For protection, the system does not start for 3 minutes after it is turned off.

Detail

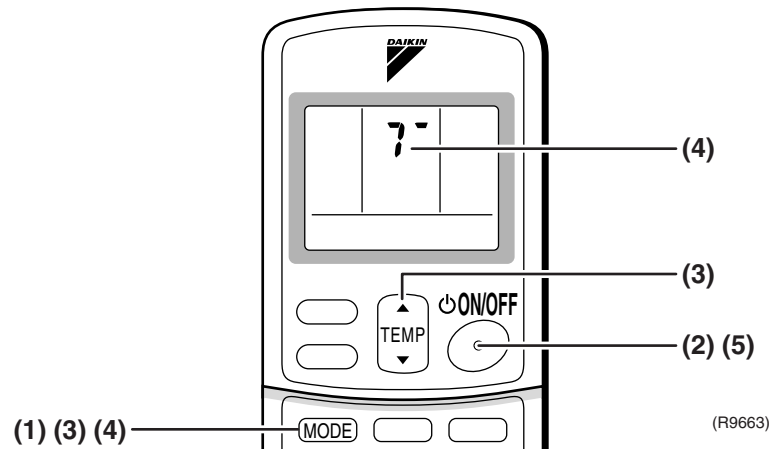
ARC452 Series

- (1) Press the ON/OFF button to turn on the system.
- (2) Press the both of TEMP buttons and the MODE button at the same time.
- (3) Press the MODE button twice.
(7° is displayed on the display to indicate that trial operation is selected.)
- (4) Press the MODE button and select operation mode.
- (5) Trial operation terminates in approximately 30 minutes and switches into normal mode. To quit a trial operation, press the ON/OFF button.



ARC433 Series

- (1) Press the ON/OFF button to turn on the system.
- (2) Press the center of the TEMP button and the MODE button at the same time.
- (3) Press the MODE button twice.
(7° is displayed on the display to indicate that trial operation is selected.)
- (4) Press the MODE button and select operation mode.
- (5) Trial operation terminates in approx. 30 minutes and switches into normal mode. To quit a trial operation, press the ON/OFF button.



2. Wiring Error Check Function

Outline

The convenient wiring error check function is designed for the microcomputer to correct wiring errors itself.

If local wiring is unclear in the case of buried piping, for example, just press the wiring error check switch that is behind the right side panel of the outdoor unit. Even if the connections for Room A and Room B are confused, the system may run without a hassle. Note that this check function does not work in the following cases:

- For about 1 minute after the power is turned on (during initial setup).
- For 3-minute standby period after the compressor has stopped.
- When the outdoor temperature is below 5°C (41°F).
- If the indoor unit is malfunctioning(also in case of all-room transmission failure).

When the piping and wiring are perfect, there is no need to use this function.

Operation

1. Remove the stop valve cover or the right side panel.
2. Press the wiring error check switch (SW3) on the service monitor PCB of the outdoor unit, and the wiring error check function is activated.
3. In about 10 ~ 20 minutes, the check finishes automatically.
4. When the check is over, the service monitor LED indicators start blinking.

LED	1	2	3	4	Judgment
Status	All blinking at once				Self-correction impossible
	Blinking one after another				Self-correction complete

- Self-correction complete...The LED indicators 1 ~ 2 (18 class), 1 ~ 3 (24 class), or 1 ~ 4 (32 class) blink one after another.
- Self-correction impossible...The LED indicators blink all at the same time.
 - * Transmission failure occurs at any of the indoor units.
 - * The indoor unit heat exchanger thermistor is disconnected.
 - * An indoor unit is in trouble (if a trouble occurs during the wiring error checking).
- Emergency stop...Any of the LED indicators 1 ~ 4 stays on.



Note:

1. It takes about 10 ~ 20 minutes (after pressing the wiring error check switch) to complete the checking.
2. Wrongly connected liquid and gas pipes cannot be self-corrected. Be sure to make the liquid pipe and the gas pipe in pairs.
3. To cancel the wiring error check procedure halfway, press the wiring error check switch again. In this case, the memory of the microcomputer returns to its initial status (Room A wiring → Port A piping, Room B wiring → Port B piping).
4. When replacing the outdoor unit PCB, be sure to use this function.
5. Be sure to make the power side setting after doing the wiring error check because if the wiring is reversed, the airconditioners being connected are set up in the reverse way.

Basic Knowledge

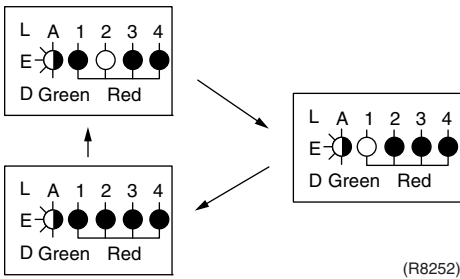
- Refrigerant flows from Port A and on. The temperatures of the indoor heat exchanger thermistors are detected one by one to check up the matching between the piping and wiring.
- With this function on, freezing (crackling) noise may be heard from the indoor unit. This is not a problem. This is because the heat exchanger temperature is made to drop below 0°C (32°F) in order to increase the detection accuracy.
- The indoor fan is made to turn on and off at the same time.

Checking the current setting data on the microcomputer memory

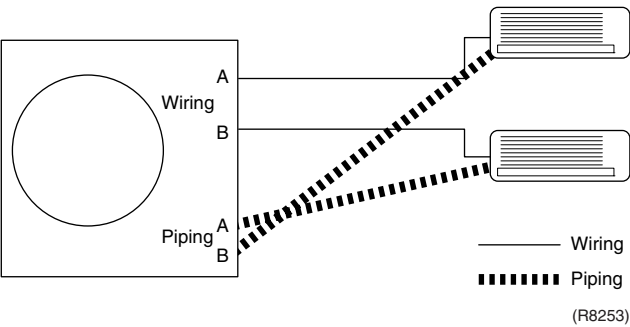
Those data can be checked by looking at the service monitor LED indicators, when the wiring error checking is over, during forced operation, at the stop of the system.
The LED indicators stop blinking when the forced operation is over.
LED1...Room A wiring, LED2...Room B wiring
1st blinking LED...Port A piping, 2nd blinking LED...Port B piping
The 1st blinking LED means the room that is connected with Port A. The 2nd blinking LED means the one connected with Port B.

Example

Ex.) Suppose the LED indicators are blinking as follows.



The above means that Port A is connected with Port B, and Port B with Room A (or self-corrected this way.)



3. Field Settings

3.1 Priority Room Setting

Electronic expansion valves are controlled to provide more capacity to the prioritized room.

- Setting method

Turn off the circuit breaker before changing the setting.

Only one room can be set as the priority room (By turning on one of A to D of SW4 on service monitor PCB of the outdoor unit).

- The control starts when all the following conditions are met.

- * Priority room setting is made.

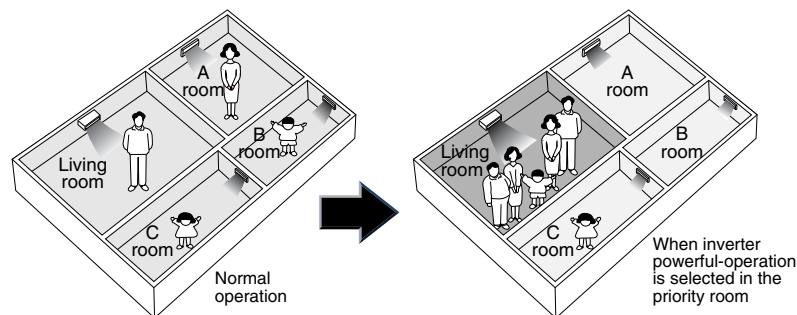
- * **POWERFUL** signal from the priority room unit is received.



Note: The operation mode of the priority room unit has precedence.

- Cancellation of control

The control function is canceled when the **POWERFUL** operation mode is switched off or 20 minutes elapse after **POWERFUL** Operation started.



The prioritized room will be heated/cooled much more quickly

(R1396)

3.2 COOL / HEAT Mode Lock

Use the [S15] connector to set the unit to cooling only or heating only.

Setting to heating only (H): Short-circuit pins 1 and 3 of the connector [S15].

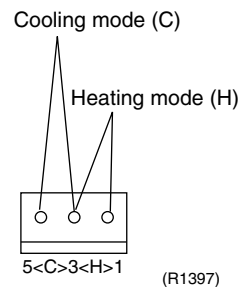
Setting to cooling only (C): Short-circuit pins 3 and 5 of the connector [S15].

The following specifications apply to the connector housing and pins.

JST products Housing: VHR-5N

Pin: SVH-21T-1, 1

Note that forced operation is also possible in cooling / heating mode.



(R1397)

3.3 NIGHT QUIET Mode

If NIGHT QUIET mode is to be used, initial settings must be made when the unit is installed.

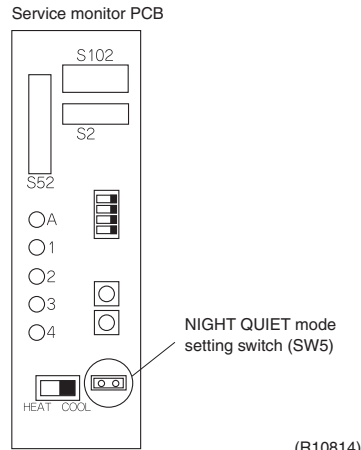
Explain the function of NIGHT QUIET mode, as described below, to the customer, and confirm whether or not the customer wants to use NIGHT QUIET mode.

NIGHT QUIET mode function reduces operating noise of the outdoor unit at nighttime. This function is useful if the customer is worried about the effects of the operating noise on the neighbors.

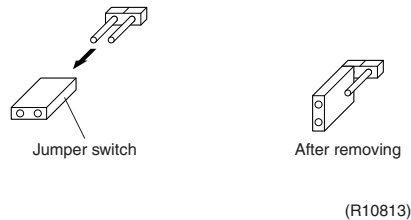
However, if NIGHT QUIET mode is running, cooling capacity is reduced.

■ Procedure

1. Remove the SW5 jumper switch on the service monitor PCB of the outdoor unit.
Once the settings are complete, reset the power.



2. Install the removed jumper switch as described below. This jumper switch is needed later to disable this setting.



3.4 When 2 Units are Installed in 1 Room

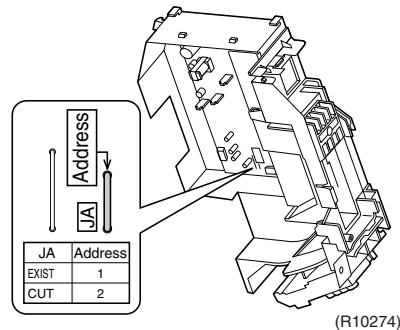
When 2 indoor units are installed in 1 room, 1 of the 2 pairs of indoor unit and wireless remote controller can be set for different addresses.

Both the indoor unit PCB and the wireless remote controller need alteration.

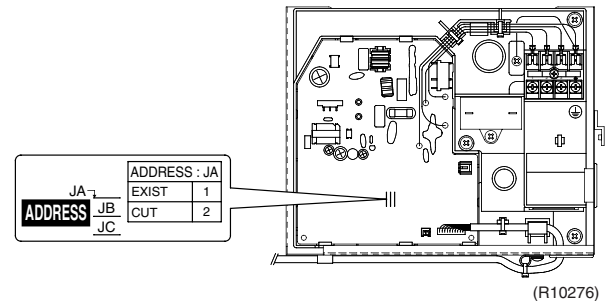
Indoor Unit PCB

- Cut the jumper JA on PCB.

< Duct-Free System >



< Slim Duct Built-in System >

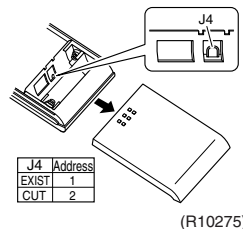


- 1) Remove the front grille.
- 2) Remove the electrical box.
- 3) Remove the metal plate of the electrical box.

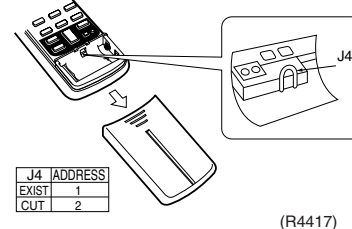
Wireless remote controller

- Cut the jumper J4.

< Duct-Free System >



< Duct Built-in System >



3.4.1 Jumper Settings

Jumper	Function	When connected (factory set)	When cut
JB (on indoor unit PCB)	Fan speed setting when compressor stops for thermostat OFF. (Effective only at cooling operation)	Fan speed setting ; Remote controller setting	Fan speed setting; "0" (The fan stops.)
JC (on indoor unit PCB)	Power failure recovery function	Auto-restart	The unit does not resume operation after recovering from a power failure. Timer settings are cleared.



For the location of the jumper, refer to the page 18 and 20.

4. Application of Silicon Grease to a Power Transistor and a Diode Bridge

Applicable Models

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

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

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

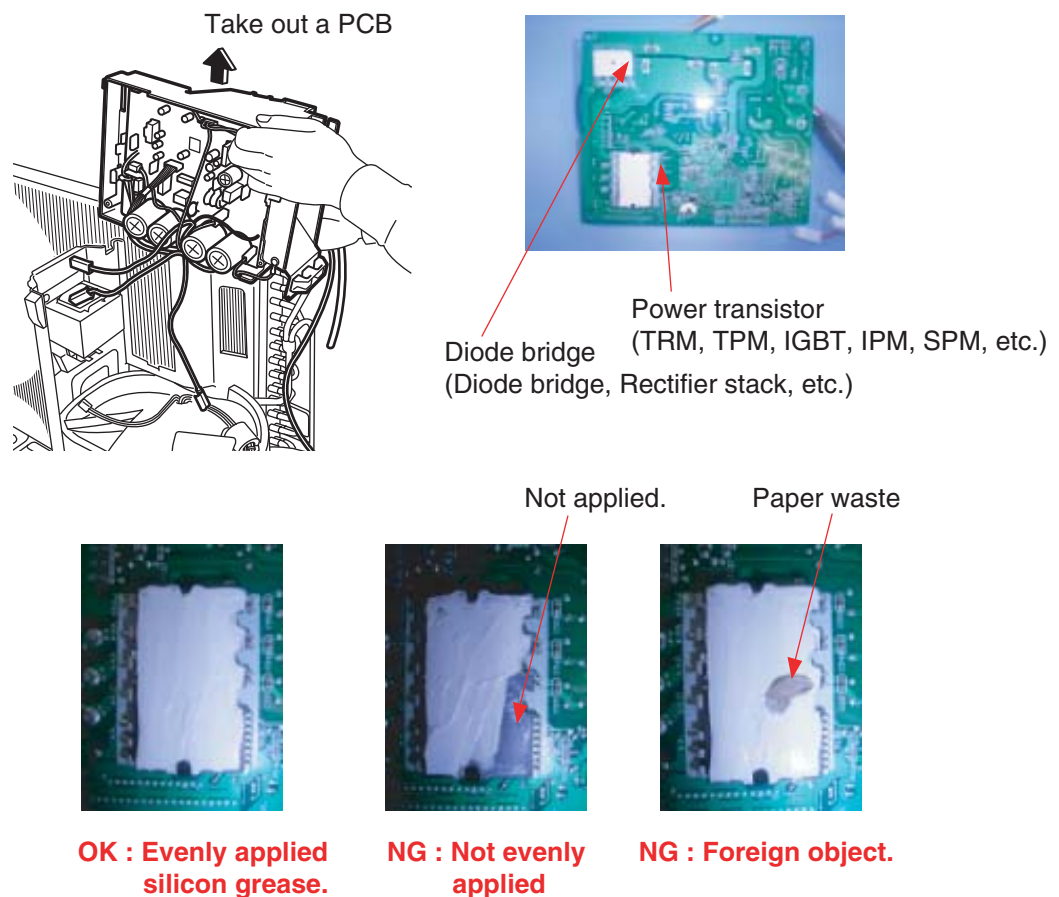
Details

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

Note: There is the possibility of failure caused by smoke from bad heat radiation.

- Completely wipe off the old silicon grease on a radiation fin.
- Evenly apply the silicon grease to the whole.
- Do not have any foreign object such as solder or paper waste between the power transistor, the diode bridge and the radiation fin.
- Firmly tighten the screws of the power transistor and the diode bridge, and to securely connect them to the radiation fin without any gap.

<Example>



(R9056)

Part 9

Appendix

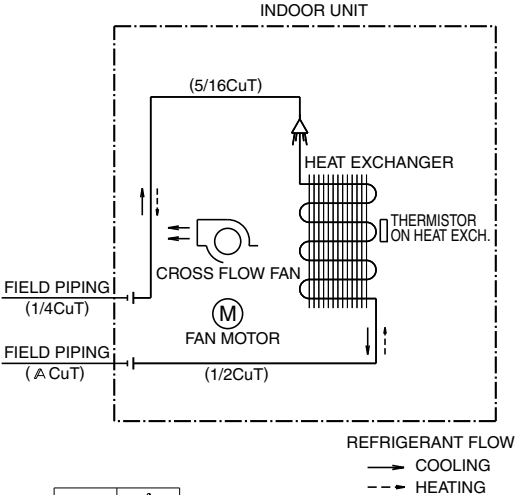
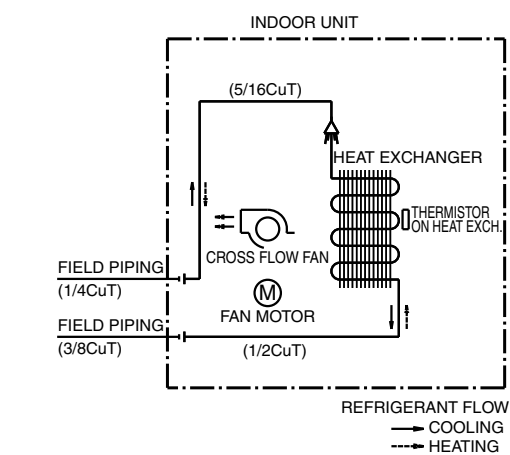
1. Piping Diagrams.....	2
1.1 Indoor Unit.....	2
1.2 Outdoor Unit.....	3
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2.1 Indoor Unit.....	5
2.2 Outdoor Unit.....	7

1. Piping Diagrams

1.1 Indoor Unit

CTXS07JVJU, CTXS09/12HVJU

FTXS15/18HVJU

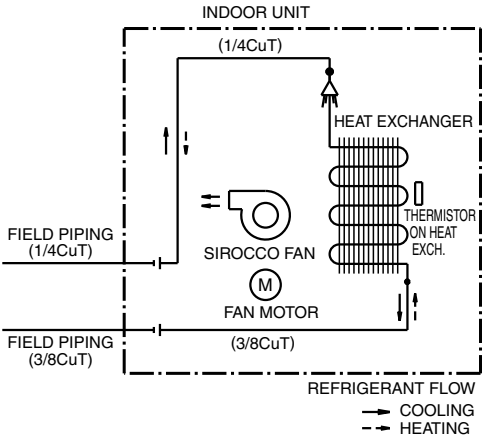


	A
FTXS15	1/2
FTXS18	1/2
FTXS24	5/8

4D048251C

4D047162A

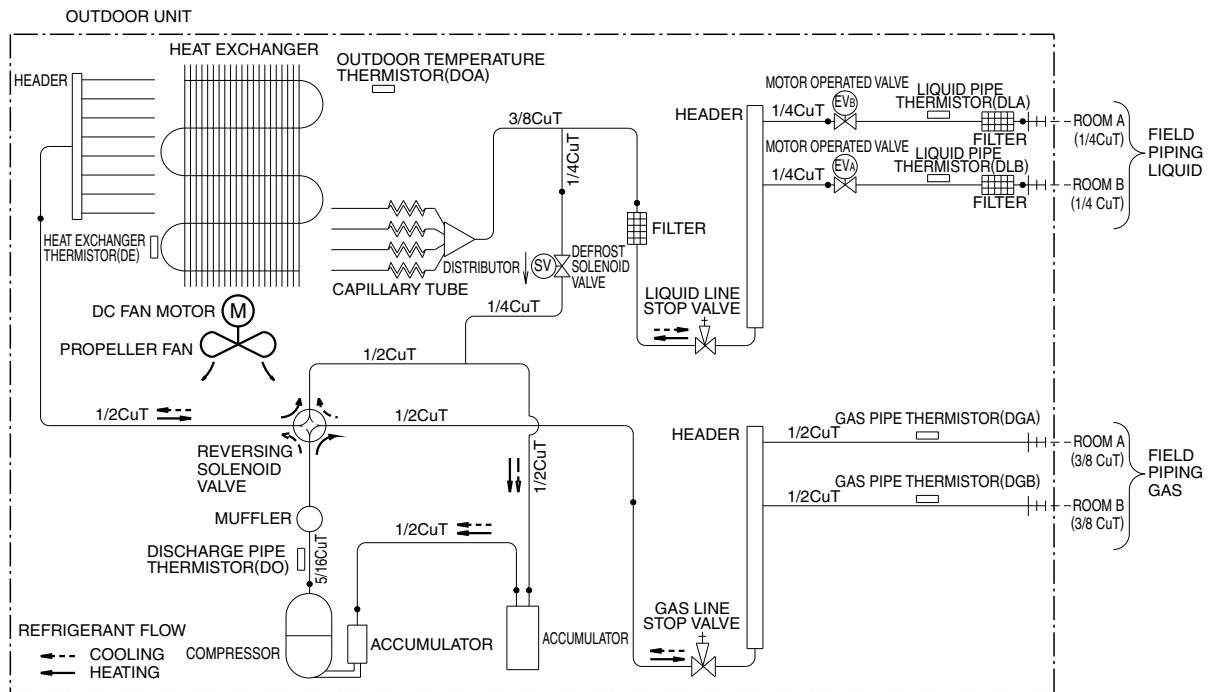
FDXS09/12DVJU



4D051787

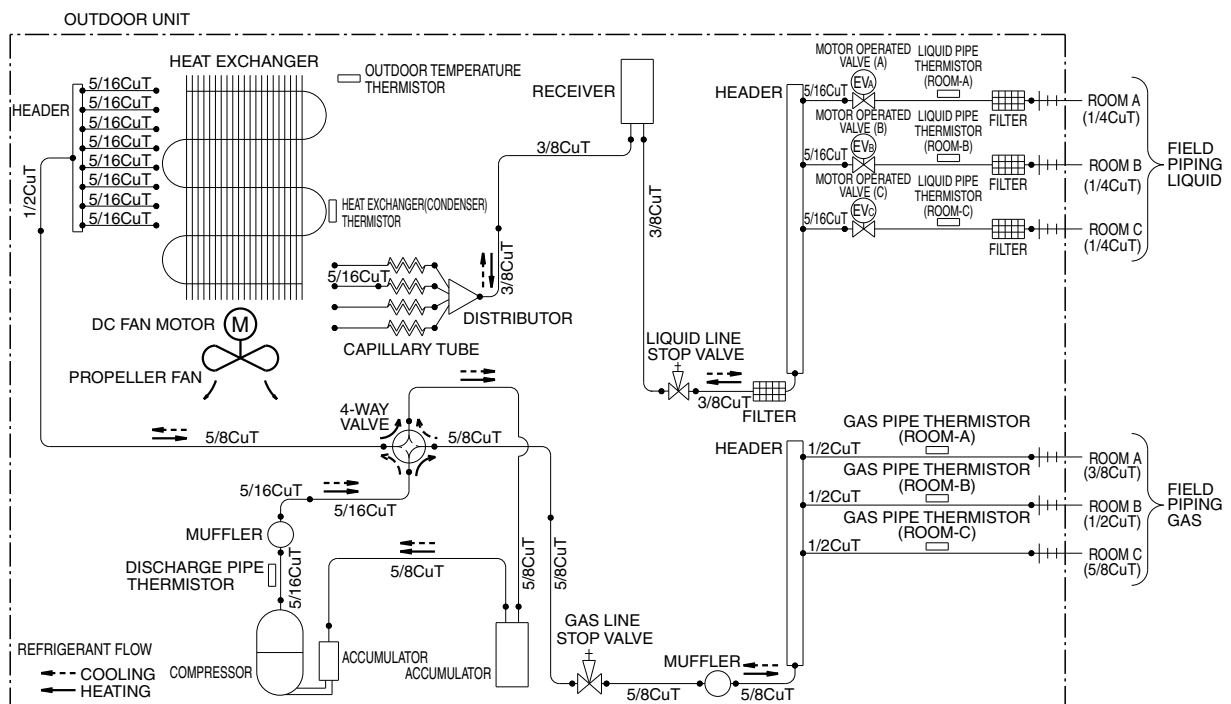
1.2 Outdoor Unit

2MXS18GVJU



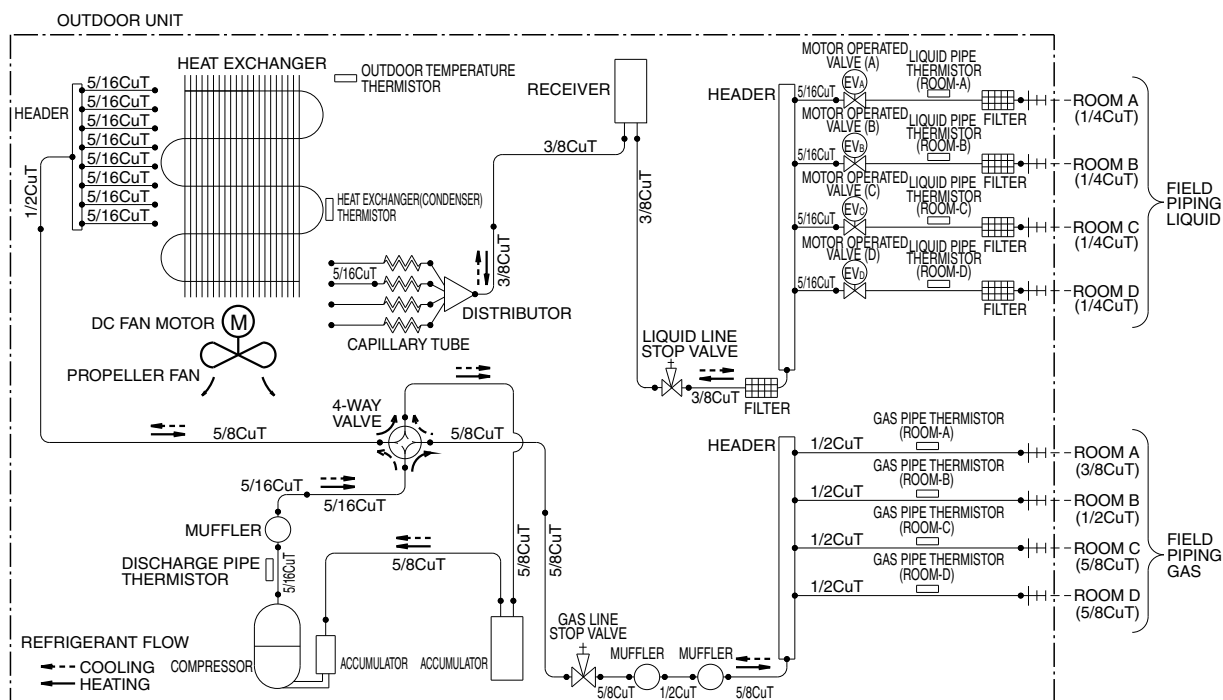
3D048177A

3MXS24JVJU



3D066157

4MXS32GVJU

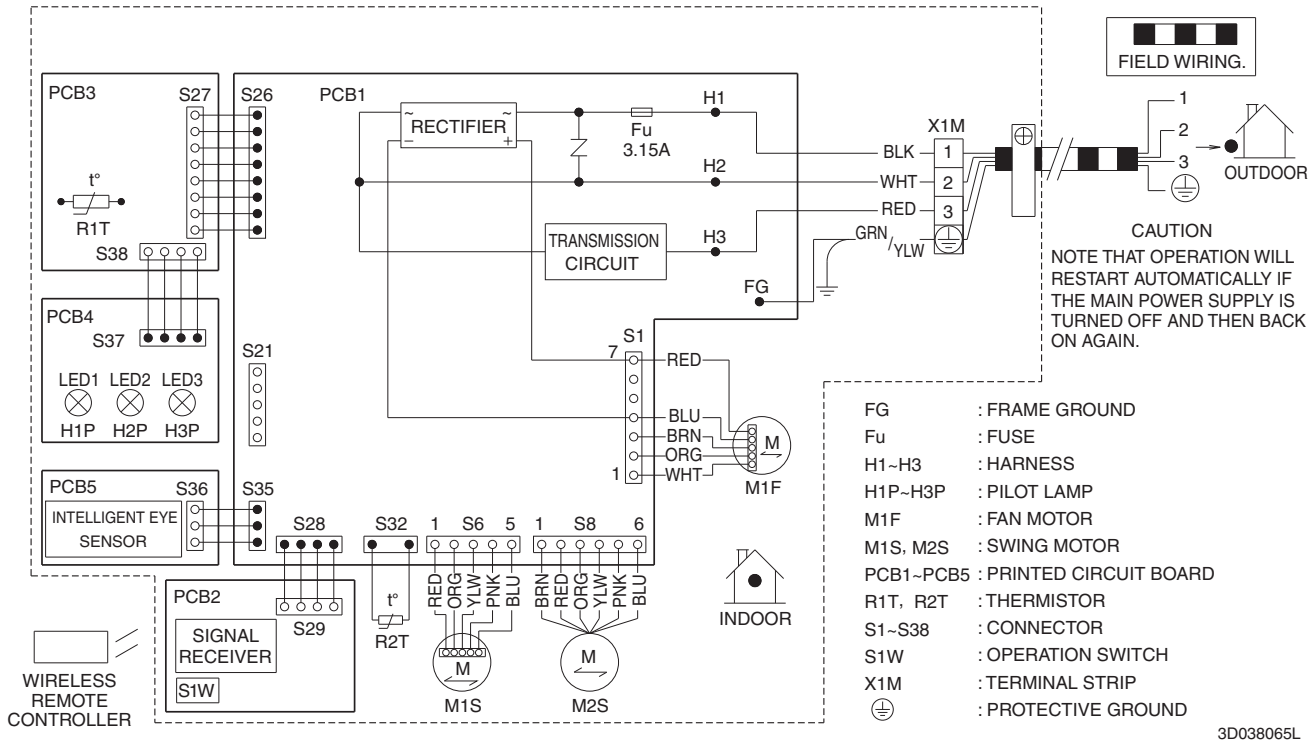


3D058508

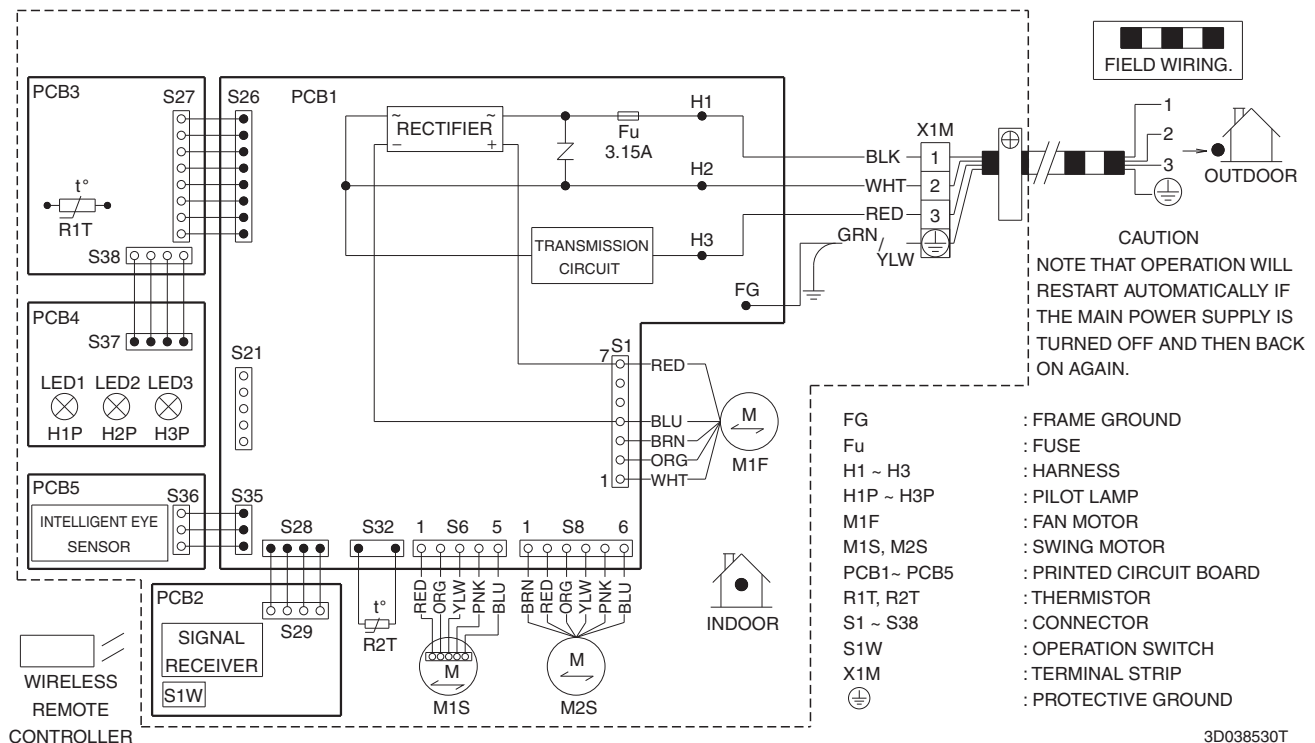
2. Wiring Diagrams

2.1 Indoor Unit

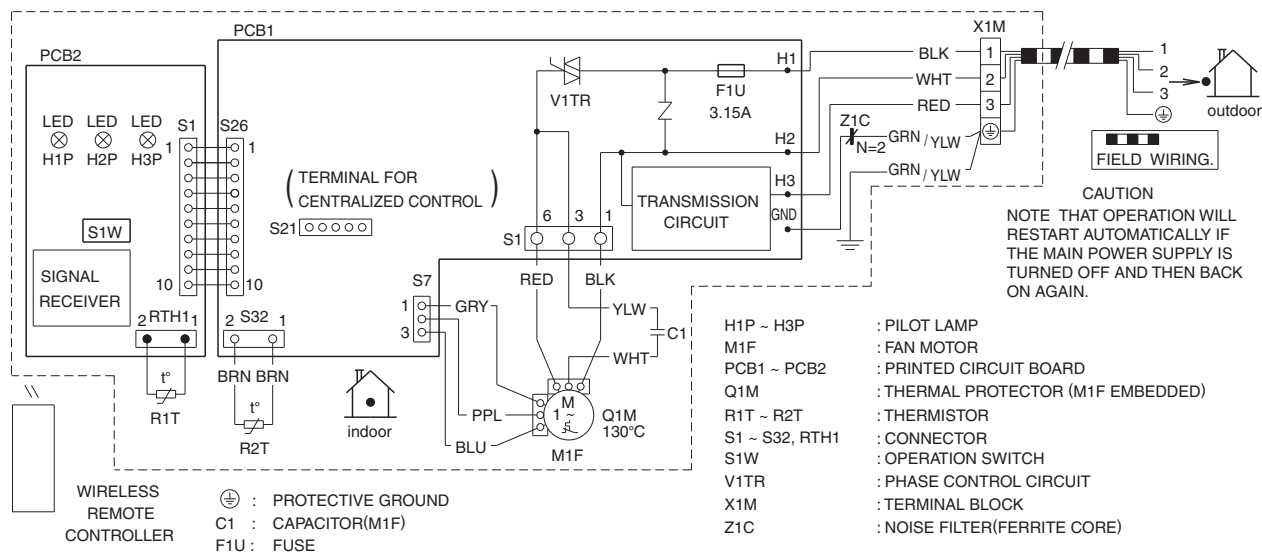
CTXS07JVJU, CTXS09/12HVJU



FTXS15/18HVJU



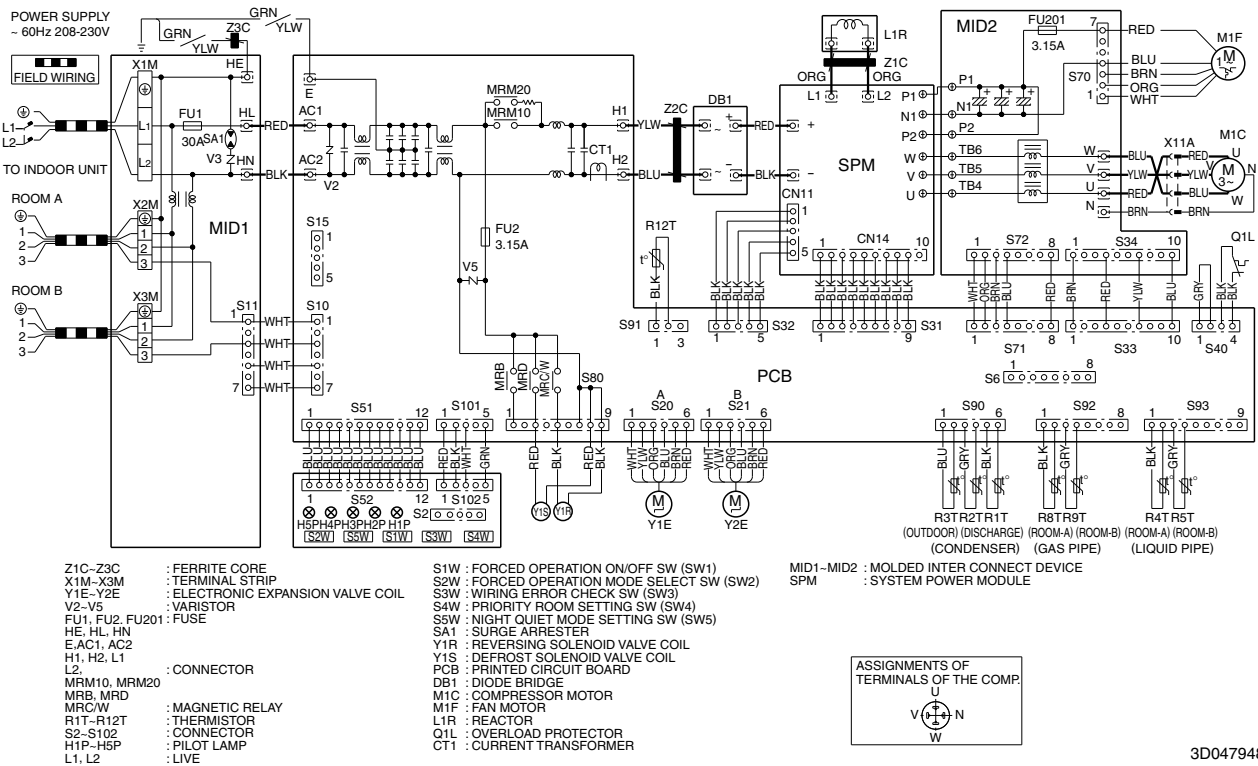
FDXS09/12DVJU



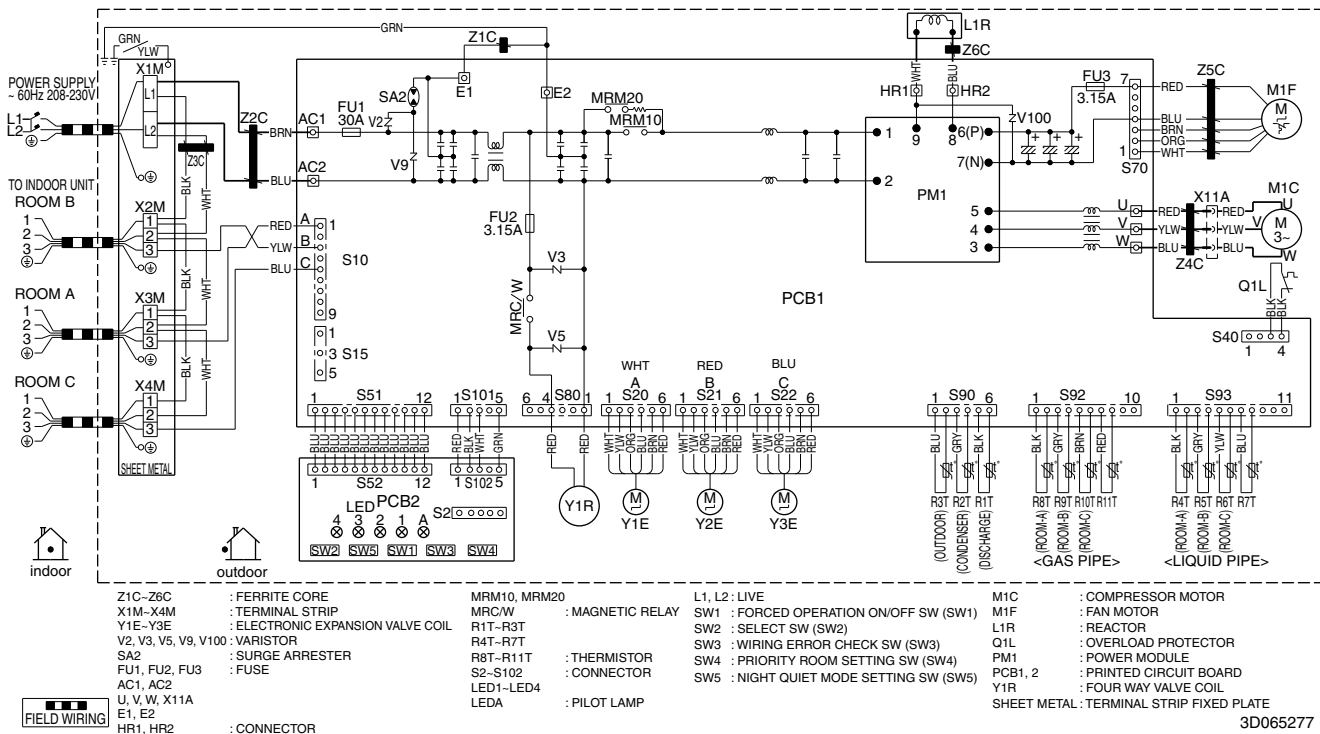
3D045012L

2.2 Outdoor Unit

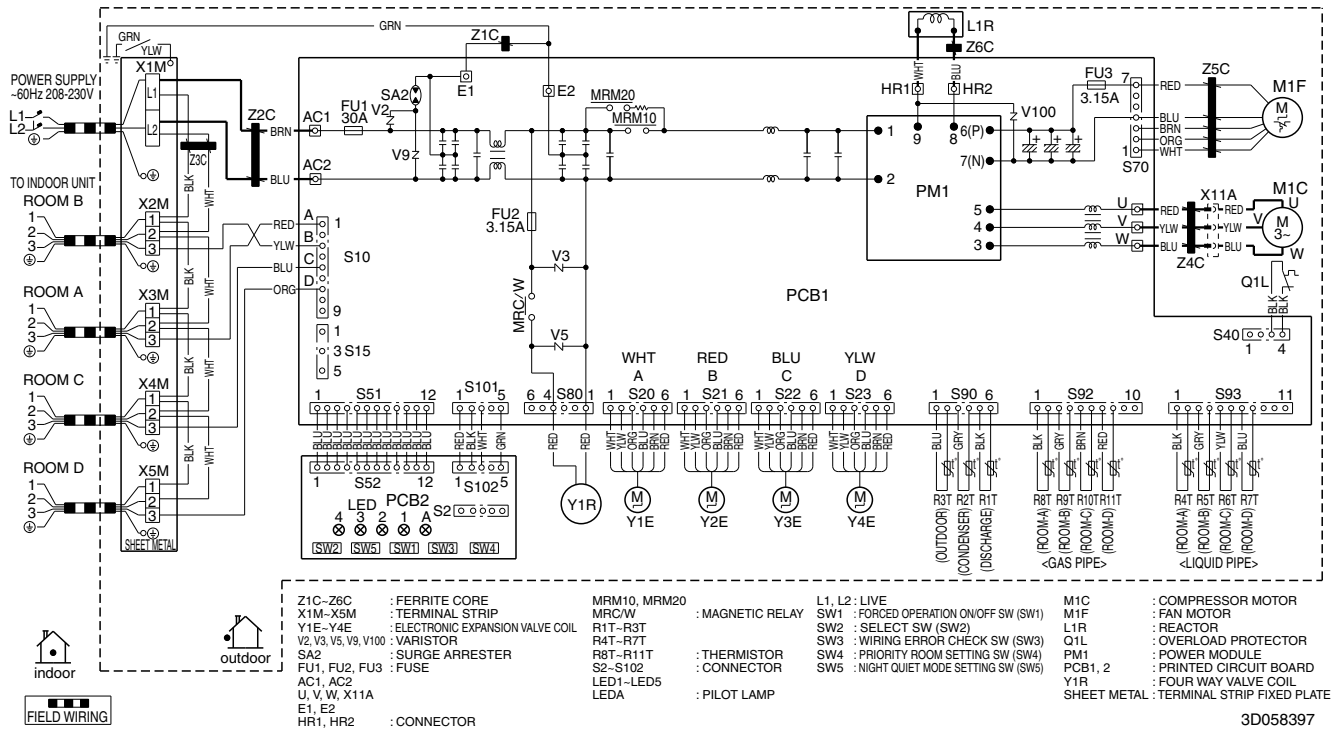
2MXS18GVJU



3MXS24JVJU



4MXS32GVJU



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JQA-1452

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EC99J2044

About ISO 14001

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