DAIKIN

SiUS34-907

R-410A

Service Manual

VRV® III-S

RXYMQ36·48PVJU
R-410A
Heat Pump 60Hz

VRV III-S R-410A Heat Pump 60Hz

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 or heat pump 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 or heat pump by splashing water on it. Washing the unit with water may cause an electrical shock.
- 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 before repairing equipment in a humid or wet place to avoid electrical shocks. Improper grounding may cause an electrical shock.
- Measure the insulation resistance after the repair. The resistance must be 1MΩ 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.

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.
- 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.

1.3 PREFACE

Thank you for your continued patronage of Daikin products.

This is the new service manual for Daikin's Year 2010 VRVIII-S series Heat Pump System.
Daikin offers a wide range of models to respond to building and office air conditioning needs. We are confident that customers will be able to find the models that best suit their needs.

This service manual contains information regarding the servicing of VRVIII-S series R-410A Heat Pump System.

June, 2010
After Sales Service Division

Part 1
General Information

1. Model Names of Indoor/Outdoor Units

Indoor Units

Type		Model Name								Power Supply
Ceiling Mounted Cassette Type (Multi Flow)	FXFQ	—	—	12M	18M	24M	30M	36M	—	VJ
4-Way Ceiling Mounted Cassette Type Unit (2' × 2')	FXZQ	07M	09M	12M	18M	—	—	—	—	
Slim Ceiling Mounted Duct Type	FXDQ	07M	09M	12M	18M	24M	—	—	—	
Ceiling Mounted Duct Type	FXMQ	07P	09P	12P	18P	24P	30P	36P	48P	
Ceiling Suspended Type	FXHQ	—	—	12M	—	24M	—	36M	—	
Wall Mounted Type	FXAQ	07M	09M	12M	18M	24M	—	—	—	
Floor Standing Type	FXLQ	—	—	12M	18M	24M	—	—	—	
Concealed Floor Standing Type	FXNQ	—	—	12M	18M	24M	—	—	—	

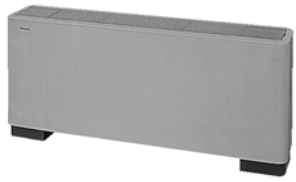
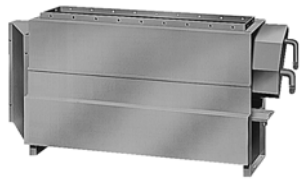
Outdoor Units (Inverter Series)

Series		Model Name			Power Supply
Inverter	Heat Pump	RXYMQ	36P	48P	VJ

VJ: 1ϕ, 208~230V, 60Hz

2. External Appearance

2.1 Indoor Units

Ceiling-mounted cassette type (Multi flow) FXFQ12MVJU FXFQ18MVJU FXFQ24MVJU FXFQ30MVJU FXFQ36MVJU 	Ceiling suspended type FXHQ12MVJU FXHQ24MVJU FXHQ36MVJU 
4-way ceiling mounted cassette unit (2'×2') FXZQ07M7 FXZQ09M7 FXZQ12M7 FXZQ18M7 	Wall mounted type FXAQ07MVJU FXAQ09MVJU FXAQ12MVJU FXAQ18MVJU FXAQ24MVJU 
Slim ceiling-mounted duct type FXDQ07MVJU FXDQ09MVJU FXDQ12MVJU FXDQ18MVJU FXDQ24MVJU 	Floor standing type FXLQ12MVJU FXLQ18MVJU FXLQ24MVJU 
Ceiling-mounted duct type FXMQ07PVJU FXMQ09PVJU FXMQ12PVJU FXMQ18PVJU FXMQ24PVJU FXMQ30PVJU FXMQ36PVJU FXMQ48PVJU 	Concealed floor-standing type FXNQ12MVJU FXNQ18MVJU FXNQ24MVJU 

2.2 Outdoor Units

RXYMQ36PVJU RXYMQ48PVJU
 3 • 4 ton

3. Capacity Range

Outdoor Units

Model	RXYMQ	
Capacity Range	3 ton	4 ton
Capacity Index	36P	48P
No of Indoor Units to be Connected	6	8
Total Capacity Index of Indoor Units to be Connected	18~46.8	24~62.4

Indoor Units

Capacity Range		0.6ton	0.8ton	1ton	1.5ton	2ton	2.5ton	3ton	4ton
Capacity Index		7.5	9.5	12	18	24	30	36	48
Ceiling Mounted Cassette Type (Multi Flow)	FXFQ	—	—	12M	18M	24M	30M	36M	—
4-Way Ceiling Mounted Cassette Type Unit (2' × 2')	FXZQ	07M	09M	12M	18M	—	—	—	—
Slim Ceiling Mounted Duct Type	FXDQ	07M	09M	12M	18M	24M	—	—	—
Ceiling Mounted Duct Type	FXMQ	07P	09P	12P	18P	24P	30P	36P	48P
Ceiling Suspended Type	FXHQ	—	—	12M	—	24M	—	36M	—
Wall Mounted Type	FXAQ	07M	09M	12M	18M	24M	—	—	—
Floor Standing Type	FXLQ	—	—	12M	18M	24M	—	—	—
Concealed Floor Standing Type	FXNQ	—	—	12M	18M	24M	—	—	—

Part 2
Specifications

1. Specifications

1.1 Outdoor Units

Heat Pump 60Hz <RXYMQ-PVJU>

Model Name			RXYMQ36PVJU	RXYMQ48PVJU
★1 Cooling Capacity		Btu / h	36,000	48,000
★2 Heating Capacity		Btu / h	40,000	54,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	52-15/16 × 35-7/16 × 12-5/8 (1345 x 900 x 321)	52-15/16 × 35-7/16 × 12-5/8 (1345 x 900 x 321)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Piston Displacement	ft^3/h (m^3/h)	791.5 (241)	791.5 (241)
	Number of Revolutions	r.p.m	6480	6480
	Motor Output (2.2kW/ 60rps)	kW	2.5	3.0
	Starting Method		Direct on line	Direct on line
Fan	Type		Propeller Fan	Propeller Fan
	Motor Output	kW	0.070 × 2	0.070 × 2
	Airflow Rate	cfm	3,740	3,740
	Drive		Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ3/8 (9.5) C1220T (Flare Connection)	ϕ3/8 (9.5) C1220T (Flare Connection)
	Gas Pipe	in. (mm)	ϕ5/8 (15.8) C1220T (Flare Connection)	ϕ5/8 (15.8) C1220T (Flare Connection)
Machine Weight (Mass)		Lbs (kg)	283 (128.4)	283 (128.4)
★3 Sound Level (Reference Value)		dBA	58	58
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Inverter Overload Protector, Fusible Plugs, Fuse	High Pressure Switch, Fan Driver Overload Protector, Inverter Overload Protector, Fusible Plugs, Fuse
Defrost Method			Reverse Cycle Defrosting	Reverse Cycle Defrosting
Capacity Control		%	29~100	29~100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	Lbs (kg)	8.8 (4)	8.8 (4)
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			Refer to the nameplate of compressor	Refer to the nameplate of compressor
Standard Accessories			Installation Manual, Operation Manual, Insulating tube, Clamps	Installation Manual, Operation Manual, Insulating tube, Clamps
Drawing No.			C : 4D065543	

Notes:

★1 Indoor temp. : 80°FDB (27°CDB), 67°FWB (19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25ft (7.5 m), level difference 0.

★2 Indoor temp. : 70°FDB (21°CDB), / outdoor temp. : 47°FDB (8.3°CDB) or 43°FWB (6°FWB)/ Equivalent piping length : 25ft (7.5 m), level difference: 0.

★3 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

1.2 Indoor Units

Ceiling Mounted Cassette Type (Multi-flow)

Model			FXFQ12MVJU	FXFQ18MVJU	FXFQ24MVJU
★1 Cooling Capacity		Btu/h	12,000	18,000	24,000
★2 Heating Capacity		Btu/h	13,500	20,000	27,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in. (mm)	9-1/8 × 33-1/8 × 33-1/8 (232 x 841 x 841)	9-1/8 × 33-1/8 × 33-1/8 (232 x 841 x 841)	9-1/8 × 33-1/8 × 33-1/8 (232 x 841 x 841)
Coil (Cross Fin Coil)	Rows × Stages × FPI		2 × 8 × 17	2 × 8 × 17	2×8×17
	Face Area	ft²(m²)	3.56 (0.09)	3.56 (0.09)	3.56 (0.09)
Fan	Model		QTS45B14M	QTS45B14M	QTS45B14M
	Type		Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output	HP	0.06	0.06	0.06
	Airflow Rate (H/L)	cfm	460/350	570/390	670/490
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene
Piping Connections	Liquid Pipes	in. (mm)	ϕ1/4 (6.4) (Flare Connection)	ϕ1/4 (6.4) (Flare Connection)	ϕ3/8 (9.5) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (12.7) (Flare Connection)	ϕ1/2 (12.7) (Flare Connection)	ϕ5/8 (15.8) (Flare Connection)
	Drain Pipe	in. (mm)	VP25 (External Dia. 1-1/4 (31.8) Internal Dia. 1 (25.4))	VP25 (External Dia. 1-1/4 (31.8) Internal Dia. 1 (25.4))	VP25 (External Dia. 1-1/4 Internal Dia. 1)
Machine Weight (Mass)		Lbs (kg)	55 (25)	55 (25)	55 (25)
★4 Sound Level (H/L)		dBA	31/28	33/28	34/29
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Decoration Panels (Option)	Model		BYC125K-W1	BYC125K-W1	BYC125K-W1
	Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	in. (mm)	1-5/8 × 37-3/8 × 37-3/8 (41 x 949 x 949)	1-5/8 × 37-3/8 × 37-3/8 (41 x 949 x 949)	1-5/8 × 37-3/8 × 37-3/8 (41 x 949 x 949)
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	Lbs (kg)	11(5)	11 (5)	11 (5)
Standard Accessories			Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.
Drawing No.			C:3D042686		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m) (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Ceiling Mounted Cassette Type (Multi-flow)

Model			FXFQ30MVJU	FXFQ36MVJU
★1 Cooling Capacity		Btu/h	30,000	36,000
★2 Heating Capacity		Btu/h	34,000	40,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in. (mm)	11-3/8 × 33-1/8 × 33-1/8 (289 x 841 x 841)	11-3/8 × 33-1/8 × 33-1/8 (289 x 841 x 841)
Coil (Cross Fin Coil)	Rows × Stages × FPI		2 × 12 × 17	2×12×17
	Face Area	$ft^2(m^2)$	5.35 (1.6)	5.35 (1.6)
Fan	Model		QTS45A17M	QTS45A17M
	Type		Turbo Fan	Turbo Fan
	Motor Output	HP	0.12	0.12
	Airflow Rate (H/L)	cfm	990/710	990/740
	Drive		Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene
Piping Connections	Liquid Pipes	in. (mm)	ϕ3/8 (9.5) (Flare Connection)	ϕ3/8 (9.5) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ5/8 (15.8) (Flare Connection)	ϕ5/8 (15.8) (Flare Connection)
	Drain Pipe	in. (mm)	VP25 (External Dia. 1-1/4 (31.8) Internal Dia. 1 (25.4))	VP25 (External Dia. 1-1/4 (31.8) Internal Dia. 1 (25.4))
Machine Weight (Mass)		Lbs	66 (30)	66 (30)
★4 Sound Level (H/L)		dBA	38/32	40/33
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series
Decoration Panels (Option)	Model		BYC125K-W1	BYC125K-W1
	Color		White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	in. (mm)	1-5/8 × 37-3/8 × 37-3/8 (41 x 949 x 949)	1-5/8 × 37-3/8 × 37-3/8 (41 x 949 x 949)
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	Lbs (kg)	11 (5)	11 (5)
Standard Accessories			Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.
Drawing No.			C:3D042686	

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m) (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

4 Way Ceiling Mounted Cassette Unit (2'×2')

Model			FXZQ07M7VJU	FXZQ09M7VJU	FXZQ12M7VJU	FXZQ18M7VJU
★1 Cooling Capacity		Btu/h	7,500	9,500	12,000	18,000
★2 Heating Capacity		Btu/h	8,700	11,100	14,000	21,000
Casing / Color			Galvanized Steel / Non Painted	Galvanized Steel / Non Painted	Galvanized Steel / Non Painted	Galvanized Steel / Non Painted
Dimensions: (H×W×D)		in. (mm)	10-1/4 (11-1/4) x 22-2/3 x 22-2/3 (260 (286) x 576 x 576) ( ): includes Electrical Componets Box	10-1/4 (11-1/4) x 22-2/3 x 22-2/3 (260 (286) x 576 x 576) ( ): includes Electrical Componets Box	10-1/4 (11-1/4) x 22-2/3 x 22-2/3 (260 (286) x 576 x 576) ( ): includes Electrical Componets Box	10-1/4 (11-1/4) x 22-2/3 x 22-2/3 (260 (286) x 576 x 576) ( ): includes Electrical Componets Box
Coil (Cross Fin Coil)	Rows×Stages×FPI		2×10×0.06	2×10×0.06	2×10×0.06	2×10×0.06
	Face Area	ft²(m²)	2.9 (0.9)	2.9 (0.9)	2.9 (0.9)	2.9 (0.9)
Fan	Model		QST32C15M	QST32C15M	QST32C15M	QST32C15M
	Type		Turbo Fan	Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output (High)	W	55	55	55	55
	Airflow Rate (H/L)	cfm	320/247	335/265	495/353	320/247
	Drive		Direct Drive	Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Air Filter			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	in. (mm)	ϕ1/4(6.4)(Flare Connection)	ϕ1/4(6.4) (Flare Connection)	ϕ1/4(6.4) (Flare Connection)	ϕ1/4(6.4) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (12.7) (Flare Connection)	ϕ1/2(12.7) (Flare Connection)	ϕ1/2(12.7)(Flare Connection)	ϕ1/2(12.7)(Flare Connection)
	Drain Pipe	in. (mm)	VP20 (External Dia. 1.02 (26) Internal Dia. 0.79 (20))	VP20 (External Dia. 1.02 (26) Internal Dia. 0.79 (20))	VP20 (External Dia. 1.02 (26) Internal Dia. 0.79 (20))	VP20 (External Dia. 1.02 (26) Internal Dia. 0.79 (20))
Machine Weight (Mass)		Lbs (kg)	42 (19)	42 (19)	42 (19)	42 (19)
★4 Sound Level (H/L)		dBA	31/29	33/29	41/34	41/34
Safety Devices			Fuse	Fuse	Fuse	Fuse
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series	R-410A Series
Decoration Panels (Option)	Model		BYFQ60BU	BYFQ60BU	BYFQ60BU	BYFQ60BU
	Color		White (RAL 9010)	White (RAL 9010)	White (RAL 9010)	White (RAL 9010)
	Dimensions: (H×W×D)	in. (mm)	2-1/4 x 27-1/2 x 27-1/2 (57 x 699 x 699)	2-1/4 x 27-1/2 x 27-1/2 (57 x 699 x 699)	2-1/4 x 27-1/2 x 27-1/2 (57 x 699 x 699)	2-1/4 x 27-1/2 x 27-1/2 (57 x 699 x 699)
	Weight	Lbs (kg)	6 (2.7)	6 (2.7)	6 (2.7)	6 (2.7)
Standard Accessories			Installation and Operation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanger bracket, Insulation for fitting.	Installation and Operation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanger bracket, Insulation for fitting.	Installation and Operation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanger bracket, Insulation for fitting.	Installation and Operation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanger bracket, Insulation for fitting.
Drawing No.			C:3TW30721-1			

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m) (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Slim Ceiling Mounted Duct Type

Model			FXDQ07MVJU	FXDQ09MVJU	FXDQ12MVJU
★1 Cooling Capacity		Btu/h	7,500	9,500	12,000
★2 Heating Capacity		Btu/h	8,500	10,500	13,500
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in. (mm)	7-7/8×27-9/16×24-7/16 (200 x 700 x 621)	7-7/8×27-9/16×24-7/16 (200 x 700 x 621)	7-7/8×27-9/16×24-7/16 (200 x 700 x 621)
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×12×17	2×12×17	3×12×17
	Face Area	ft²(m²)	1.36 (0.41)	1.36 (0.41)	1.36 (0.41)
Fan	Model		—	—	—
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.08	0.08	0.08
	Airflow Rate (H/L)	cfm	280/226 (H/L)	280/226 (H/L)	280/226 (H/L)
	External Static Pressure ★4	psi	0.0044-0.0015	0.0044-0.0015	0.0044-0.0015
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene
Air Filter			Removal, Washable, Mildew Proof	Removal, Washable, Mildew Proof	Removal, Washable, Mildew Proof
Piping Connections	Liquid Pipes	in. (mm)	ϕ1/4 (6.4) (Flare Connection)	ϕ1/4 (6.4) (Flare Connection)	ϕ1/4 (6.4) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ 1/2 (12.7) (Flare Connection)	ϕ 1/2 (12.7) (Flare Connection)	ϕ 1/2 (12.7) (Flare Connection)
	Drain Pipe	in. (mm)	VP20 (External Dia. 1-1/32 (26) Internal Dia. 25/32) (20)	VP20 (External Dia. 1-1/32 (26) Internal Dia. 25/32) (20)	VP20 (External Dia. 1-1/32 (26) Internal Dia. 25/32) (20)
Machine Weight (Mass)		Lbs (kg)	51 (23)	51 (23)	51 (23)
★5 Sound Level (H/L)		dBA	33/29	33/29	33/29
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Conduit Mounting Plate, Insulation Tube.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Conduit Mounting Plate, Insulation Tube.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Conduit Mounting Plate, Insulation Tube.
Drawing No.			C:3D051780A		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m) (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 External static pressure is changeable to change over the connectors inside electrical box, this pressure means "High static pressure – Standard – Low static pressure".

★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Slim Ceiling Mounted Duct Type

Model			FXDQ18MVJU	FXDQ24MVJU
★1 Cooling Capacity		Btu/h	18,000	24,000
★2 Heating Capacity		Btu/h	20,000	27,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in. (mm)	7-7/8 × 35-7/16 × 24-7/16 (200 x 900 x 621)	7-7/8 × 43-5/16 × 24-7/16 (200 x 1100 x 621)
Coil (Cross Fin Coil)	Rows × Stages × FPI		3 × 12 × 17	3 × 12 × 17
	Face Area	ft²(m²)	1.89 (0.6)	2.44 (0.7)
Fan	Model		—	—
	Type		Sirocco Fan	Sirocco Fan
	Motor Output	kw	0.13	0.13
	Airflow Rate (H/L)	cfm	440/350 (H/L)	580/460 (H/L)
	External Static Pressure ★4	psi	0.0064-0.0022	0.0064-0.0022
	Drive		Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polyethylene	Foamed Polyethylene
Air Filter			Removal, Washable, Mildew Proof	Removal, Washable, Mildew Proof
Piping Connections	Liquid Pipes	in. (mm)	ϕ1/4 (6.4) (Flare Connection)	ϕ 3/8 (9.5) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ 1/2 (12.7) (Flare Connection)	ϕ5/8 (15.8) (Flare Connection)
	Drain Pipe	in. (mm)	VP20 (External Dia. 1-1/32 (26.2) Internal Dia. 25/32 (19.9))	VP20 (External Dia. 1-1/32 (26.2) Internal Dia. 25/32 (19.9))
Machine Weight (Mass)		Lbs (kg)	63 (28.5)	71 (32)
★5 Sound Level (H/L)		dBA	35/31	36/32
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Conduit Mounting Plate, Insulation Tube.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Conduit Mounting Plate, Insulation Tube.
Drawing No.			C:3D051780A	

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m) (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 External static pressure is changeable to change over the connectors inside electrical box, this pressure means "High static pressure – Standard – Low static pressure".

★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Ceiling Mounted Duct Type

Model			FXMQ07PVJU	FXMQ09PVJU	FXMQ12PVJU
★1, ★3 Cooling Capacity		Btu/h	7,500	9,500	12,000
★2, ★3 Heating Capacity		Btu/h	8,500	10,500	13,500
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in. (mm)	11-13/16×21-5/8×27-9/16 (300 x 549 x 700)	11-13/16×21-5/8×27-9/16 (300 x 549 x 700)	11-13/16×21-5/8×27-9/16 (300 x 549 x 700)
Coil (Cross Fin Coil)	Rows×Stages×FPI		3×16×15	3×16×15	3×16×15
	Face Area	ft²(m²)	1.05 (0.32)	1.05 (0.32)	1.05 (0.32)
Fan	Model		—	—	—
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	HPkw	0.09	0.09	0.09
	Airflow Rate (HH/H/L)	cfm	317/264/229	317/264/229	335/282/246
	External Static Pressure ★4	"Wg	0.4-0.12	0.4-0.12	0.4-0.12
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber	Glass Fiber	Glass Fiber
Air Filter			★5	★5	★5
Piping Connections	Liquid Pipes	in. (mm)	ϕ1/4 (6.4)(Flare Connection)	ϕ1/4 (6.4) (Flare Connection)	ϕ1/4 (6.4)(Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (12.7)(Flare Connection)	ϕ1/2 (12.7) (Flare Connection)	ϕ1/2 (12.7) (Flare Connection)
	Drain Pipe	in. (mm)	VP25 (External Dia. 1-1/4(31.8) Internal Dia. 1(25.4))	VP25 (External Dia. 1-1/4(31.8) Internal Dia. 1(25.4))	VP25 (External Dia. 1-1/4(31.8) Internal Dia. 1(25.4))
Machine Weight (Mass)		Lbs (kg)	55 (25)	55 (25)	55 (25)
Sound Level (H/L)		dBA	45/41	45/41	48/45
Safety Devices			Fuse, Fan Driver Overload Protector	Fuse, Fan Driver Overload Protector	Fuse, Fan Driver Overload Protector
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Drain Hose, Sealing Pads, Clamp Metal, Air Discharge Flange, Air Suction Flange	Operation Manual, Installation Manual, Drain Hose, Sealing Pads, Clamp Metal, Air Discharge Flange, Air Suction Flange	Operation Manual, Installation Manual, Drain Hose, Sealing Pads, Clamp Metal, Air Discharge Flange, Air Suction Flange
Drawing No.			3D066117B		

Notes:

★ 1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Standard external static pressure
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★ 2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Standard external static pressure
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★ 3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★ 4 External static pressure is changeable in 7 (FXMQ07, 09, 12PVJU), 14 (FXMQ18, 24, 30, 36, 48PVJU) stages within the ( ) range by remote controller.

★ 5 Air filter is not standard accessory, but please mount it in the duct system of the suction side.
Select its colorimetric method (gravity method) 50% or more.

Ceiling Mounted Duct Type

Model			FXMQ18PVJU	FXMQ24PVJU	FXMQ30PVJU
★1, ★3 Cooling Capacity		Btu/h	18,000	24,000	30,000
★2, ★3 Heating Capacity		Btu/h	20,000	27,000	34,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in. (mm)	11-13/16 × 39-3/8 × 27-9/16 (300 x 1000 x 700)	11-13/16 × 39-3/8 × 27-9/16 (300 x 1000 x 700)	11-13/16 × 39-3/8 × 27-9/16 (300 x 1000 x 700)
Coil (Cross Fin Coil)	Rows×Stages×FPI		3×16×15	3×16×15	3×16×15
	Face Area	ft² (m²)	2.68 (0.81)	2.68 (0.81)	2.68 (0.81)
Fan	Model		—	—	—
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	kw	0.04	0.04	0.04
	Airflow Rate (HH/H/L)	cfm	635/582/529	688/618/565	882/794/706
	External Static Pressure ★4	"Wg	0.80-0.20	0.80-0.20	0.80-0.20
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber	Glass Fiber	Glass Fiber
Air Filter			★5	★5	★5
Piping Connections	Liquid Pipes	in. (mm)	ϕ1/4 (6.4) (Flare Connection)	ϕ3/8 (9.5) (Flare Connection)	ϕ3/8 (9.5) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (12.7) (Flare Connection)	ϕ5/8 (15.8) (Flare Connection)	ϕ5/8 (15.8) (Flare Connection)
	Drain Pipe	in. (mm)	VP25 (External Dia. 1-1/4(31.8) Internal Dia. 1(25.4))	VP25 (External Dia. 1-1/4(31.8) Internal Dia. 1(25.4))	VP25 VP25 (External Dia. 1-1/4(31.8) Internal Dia. 1(25.4))
Machine Weight (Mass)		Lbs (kg)	80 (36)	80 (36)	80 (36)
Sound Level (H/L)		dBA	45/41	45/41	48/45
Safety Devices			Fuse, Fan Driver Overload Protector	Fuse, Fan Driver Overload Protector	Fuse, Fan Driver Overload Protector
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Drain Hose, Sealing Pads, Clamp Metal, Air Discharge Flange, Air Suction Flange	Operation Manual, Installation Manual, Drain Hose, Sealing Pads, Clamp Metal, Air Discharge Flange, Air Suction Flange	Operation Manual, Installation Manual, Drain Hose, Sealing Pads, Clamp Metal, Air Discharge Flange, Air Suction Flange
Drawing No.			3D066117B		

Notes:

★ 1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Standard external static pressure
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★ 2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Standard external static pressure
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★ 3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★ 4 External static pressure is changeable in 7 (FXMQ07, 09, 12PVJU), 14 (FXMQ18, 24, 30, 36, 48PVJU) stages within the ( ) range by remote controller.

★ 5 Air filter is not standard accessory, but please mount it in the duct system of the suction side.
Select its colorimetric method (gravity method) 50% or more.

Ceiling Mounted Duct Type

Model			FXMQ36PVJU	FXMQ48PVJU
★1, ★3 Cooling Capacity		Btu/h	36,000	48,000
★2, ★3 Heating Capacity		Btu/h	40,000	54,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in. (mm)	11-13/16 × 55-1/8 × 27-9/16 (300 x 1400 x 700)	11-13/16×55-1/8×27-9/16 (300 x 1400 x 700)
Coil (Cross Fin Coil)	Rows×Stages×FPI		3×16×15	3×16×15
	Face Area	ft² (m²)	4.12 (1.3)	4.12 (1.3)
Fan	Model		—	—
	Type		Sirocco Fan	Sirocco Fan
	Motor Output	kw	0.04	0.04
	Airflow Rate (HH/H/L)	cfm	1130/953/812	1377/1165/988
	External Static Pressure ★4	"Wg	0.80-0.20	0.80-0.20
	Drive		Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber	Glass Fiber
Air Filter			★5	★5
Piping Connections	Liquid Pipes	in. (mm)	ϕ3/8 (9.5) (Flare Connection)	ϕ3/8 (9.5) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ5/8 (15.8) (Flare Connection)	ϕ5/8 (15.8) (Flare Connection)
	Drain Pipe	in. (mm)	VP25 (External Dia. 1-1/4 (31.8) Internal Dia. 1 (25.4))	VP25 (External Dia. 1-1/4 (31.8) Internal Dia. 1 (25.4))
Machine Weight (Mass)		Lbs (kg)	102 (46)	102 (46)
Sound Level (H/L)		dBA	45/41	45/41
Safety Devices			Fuse, Fan Driver Overload Protector	Fuse, Fan Driver Overload Protector
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Drain Hose, Sealing Pads, Clamp Metal, Air Discharge Flange, Air Suction Flange	Operation Manual, Installation Manual, Drain Hose, Sealing Pads, Clamp Metal, Air Discharge Flange, Air Suction Flange
Drawing No.			3D066117B	

Notes:

★ 1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Standard external static pressure
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★ 2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Standard external static pressure
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★ 3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★ 4 External static pressure is changeable in 7 (FXMQ07, 09, 12PVJU), 14 (FXMQ18, 24, 30, 36, 48PVJU) stages within the ( ) range by remote controller.

★ 5 Air filter is not standard accessory, but please mount it in the duct system of the suction side.
Select its colorimetric method (gravity method) 50% or more.

Ceiling Suspended Type

Model			FXHQ12MVJU	FXHQ24MVJU	FXHQ36MVJU
★1 Cooling Capacity		Btu/h	12,000	24,000	36,000
★2 Heating Capacity		Btu/h	13,500	27,000	40,000
Casing / Color			White(10Y9/0.5)	White(10Y9/0.5)	White(10Y9/0.5)
Dimensions: (H×W×D)		in. (mm)	7-11/16 × 37-13/16 × 26-3/4 (195 x 960 x 679)	7-11/16 × 55-1/8 × 26-3/4 (195 x 1400 x 679)	7-11/16 × 62-5/8 × 26-3/4 (195 x 1591 x 679)
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×12×15	3×12×15	2×12×15+2×10×15
	Face Area	ft² (m²)	1.96 (0.6)	3.15 (1.0)	3.66 + 2.95 (1.1 + 0.9)
Fan	Model		3D12K1AA1	3D12K2AA1	—
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	W	62	130	130
	Airflow Rate (H/L)	cfm	410/340	710/600	830/670
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Wool	Glass Wool	Glass Wool
Air Filter			Resin Net (with Mold Resistant)		
Piping Connections	Liquid Pipes	in. (mm)	ϕ1/4 (6.4) (Flare Connection)	ϕ3/8 (9.5) (Flare Connection)	ϕ3/8 (9.5) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (12.7) (Flare Connection)	ϕ5/8 (15.8) (Flare Connection)	ϕ5/8 (15.8)(Flare Connection)
	Drain Pipes	in. (mm)	VP20 (External Dia. 1 (25.4) Internal Dia. 3/4 (19.1))	VP20 (External Dia. 1 (25.4) Internal Dia. 3/4 (19.1))	VP20 (External Dia. 1 (25.4) Internal Dia. 3/4 (19.1))
Machine Weight (Mass)		Lbs (kg)	55 (25)	80 (36)	90 (41)
★4 Sound Level (H/L)		dBA	42	44	46
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable Outdoor Unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Drain Hose, Paper Pattern for Installation, Clamp Metal, Insulation for Fitting, Clamps, Washers.	Operation Manual, Installation Manual, Drain Hose, Paper Pattern for Installation, Clamp Metal, Insulation for Fitting, Clamps, Washers.	Operation Manual, Installation Manual, Drain Hose, Paper Pattern for Installation, Clamp Metal, Insulation for Fitting, Clamps, Washers.
Drawing No.			C:4D049326		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Wall Mounted Type

Model			FXAQ07MVJU	FXAQ09MVJU	FXAQ12MVJU
★1 Cooling Capacity		Btu/h	7,500	9,500	12,000
★2 Heating Capacity		Btu/h	8,500	10,500	13,500
Casing Color			White (3.0Y8.5/0.5)	White (3.0Y8.5/0.5)	White (3.0Y8.5/0.5)
Dimensions: (H×W×D)		in. (mm)	11–3/8 × 31–1/4 × 9 (289 x 794 x 229)	11–3/8 × 31–1/4 × 9 (289 x 794 x 229)	11–3/8×31–1/4×9 (289 x 794 x 229)
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×14×17	2×14×17	2×14×17
	Face Area	ft² (m²)	1.73 (0.5)	1.73 (0.5)	1.73 (0.5)
Fan	Model		QCL9661M	QCL9661M	QCL9661M
	Type		Cross Flow Fan	Cross Flow Fan	Cross Flow Fan
	Motor Output	kw	0.04	0.04	0.04
	Airflow Rate (H/L)	cfm	260/160	280/175	300/180
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene
Air Filter			Resin Net (Washable)	Resin Net (Washable)	Resin Net (Washable)
Piping Connections	Liquid Pipes	in. (mm)	ϕ1/4 (6.4) (Flare Connection)	ϕ1/4 (6.4) (Flare Connection)	ϕ1/4 (6.4) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (12.7) (Flare Connection)	ϕ1/2 (12.7) (Flare Connection)	ϕ1/2 (12.7) (Flare Connection)
	Drain Pipe	in. (mm)	VP13 (External Dia. 11/16 (17.5) Internal Dia. 1/2 (12.7))	VP13 (External Dia. 11/16 (17.5) Internal Dia. 1/2 (12.7))	VP13 (External Dia. 11/16 (17.5) Internal Dia. 1/2 (12.7))
Machine Weight (Mass)		Lbs (kg)	25 (11)	25 (11)	25 (11)
★4 Sound Level (H)		dBA	36	37	38
Safety Devices			Fuse	Fuse	Fuse
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tube, Clamps, Screws.	Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tube, Clamps, Screws.	Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tube, Clamps, Screws.
Drawing No.			C:3D046038A		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Wall Mounted Type

Model			FXAQ18MVJU	FXAQ24MVJU
★1 Cooling Capacity		Btu/h	18,000	24,000
★2 Heating Capacity		Btu/h	20,000	27,000
Casing Color			White (3.0Y8.5/0.5)	White (3.0Y8.5/0.5)
Dimensions: (H×W×D)		in. (mm)	11–3/8 × 41–3/8 × 9 (289 x 1051 x 229)	11–3/8 × 41–3/8 × 9 (289 x 1051 x 229)
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×14×17	2×14×17
	Face Area	ft² (m²)	2.29 (0.7)	2.29 (0.7)
Fan	Model		QCL9686	QCL9686
	Type		Cross Flow Fan	Cross Flow Fan
	Motor Output	kw	0.043	0.043
	Airflow Rate (H/L)	cfm	500/400	635/470
	Drive		Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene
Air Filter			Resin Net (Washable)	Resin Net (Washable)
Piping Connections	Liquid Pipes	in. (mm)	ϕ 1/4 (6.4) (Flare Connection)	ϕ3/8 (9.5) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ 1/2 (12.7) (Flare Connection)	ϕ5/8 (15.8 (Flare Connection)
	Drain Pipe	in. (mm)	VP13 (External Dia. 11/16 (17.5) Internal Dia. 1/2 (12.7))	VP13 (External Dia. 11/16 (17.5) Internal Dia. 1/2 (12.7))
Machine Weight (Mass)		Lbs (kg)	31(14)	31 (14)
★4 Sound Level (H)		dBA	43	47
Safety Devices			Fuse	Fuse
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tube, Clamps, Screws.	Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tube, Clamps, Screws.
Drawing No.			C:3D046038A	

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Floor Standing Type

Model			FXLQ12MVJU	FXLQ18MVJU	FXLQ24MVJU
★1 Cooling Capacity		Btu/h	12,000	18,000	24,000
★2 Heating Capacity		Btu/h	13,500	20,000	27,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	23–5/8 × 44–7/8 × 8–3/4 (600 x 1140 x 222)	23–5/8 × 55-7/8 × 8–3/4 (600 x 1419 x 222)	223–5/8 × 55-7/8 × 8–3/4 (600 x 1419 x 222)
Coil (Cross Fin Coil)	Rows × Stages × FPI		3×14×17	3×14×17	3×14×17
	Face Area	ft² (m²)	2.15 (0.7)	3.04 (0.9)	3.04 (0.9)
Fan	Model		2D14B13	2D14B20	2D14B20
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	kw	0.03	0.04	0.04
	Airflow Rate (H/L)	cfm	280/210	490/380	560/420
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber/ Urethane Foam	Glass Fiber/ Urethane Foam	Glass Fiber/ Urethane Foam
Air Filter			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	in. (mm)	ϕ 1/4 (6.4) (Flare Connection)	ϕ 1/4 (6.4) (Flare Connection)	ϕ 3/8 (9.5) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (12.7) (Flare Connection)	ϕ1/2 (12.7)(Flare Connection)	ϕ5/8 (15.8) (Flare Connection)
	Drain Pipe	in. (mm)	ϕ27/32 (21.4) O.D (Vinyl Chloride)	ϕ27/32 (21.4) O.D (Vinyl Chloride)	ϕ27/32 (21.4) O.D (Vinyl Chloride)
Machine Weight (Mass)		Lbs (kg)	66 (30)	80 (36)	80 (36)
★4 Sound Level (H/L)		dBA	36	40	41
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable Outdoor Unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.
Drawing No.			3D045640		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Concealed Floor Standing Type

Model			FXNQ12MVJU	FXNQ18MVJU	FXNQ24MVJU
★1 Cooling Capacity		Btu/h	12,000	18,000	24,000
★2 Heating Capacity		Btu/h	13,500	20,000	27,000
Casing Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in. (mm)	24 × 42–1/8 × 8–5/8 (610 x 1070 x 219)	24 × 53–1/8 × 8–5/8 (610 x 1349 x 219)	24 × 53–1/8 × 8–5/8 (610 x 1349 x 219)
Coil (Cross Fin Coil)	Rows × Stages × FPI		3×14×17	3×14×17	3×14×17
	Face Area	ft² (m²)	2.15 (0.6)	3.04 (0.9)	3.04 (0.9)
Fan	Model		2D14B13	2D14B20	2D14B20
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	kw	0.03	0.04	0.04
	Airflow Rate (H/L)	cfm	280/210	490/380	560/420
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber/ Urethane Foam	Glass Fiber/ Urethane Foam	Glass Fiber/ Urethane Foam
Air Filter			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	in. (mm)	ϕ1/4 (6.4)(Flare Connection)	ϕ1/4 (6.4) (Flare Connection)	ϕ 3/8 (9.5) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (12.7) (Flare Connection)	ϕ1/2 (12.7) (Flare Connection)	ϕ 5/8 (15.8) (Flare Connection)
	Drain Pipe	in. (mm)	ϕ27/32 (21.4) O.D (Vinyl Chloride)	ϕ27/32 (21.4) O.D (Vinyl Chloride)	ϕ27/32 (21.4) O.D (Vinyl Chloride)
Machine Weight (Mass)		Lbs (kg)	56 (25)	69 (31)	69 (31)
★4 Sound Level (H/L)		dBA	36	40	41
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable Outdoor Unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.
Drawing No.			3D045648		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB (27°CDB), 67°FWB (19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB (21°CDB).
Outdoor temperature: 47°FDB (8.3°CDB), 43°FWB (6°FWB)
Equivalent ref. piping length: 25ft (7.5 m), (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Part 3
List of Electrical and Functional Parts

1. List of Electrical and Functional Parts

1.1 Outdoor Unit

Item	Name		Symbol	Model	Remark (PCB terminal)
				RXYMQ-PVJU	
Compressor	Inverter	Type	M1C	JT100G-VDL@T	Relay
		Output		2.2kW	A1P X102A
	Crankcase heater (INV.)		E1HC	33W	A1P X28A
Fan motor	Motor		M1F·M2F	0.07kW	—
	Overcurrent relay		—	3.2A	—
Functional parts	Electronic expansion valve (Main)	Cooling	Y1E	480pls	A1P X21A
		Heating		PI control	
	Electronic expansion valve (Subcooling)	Cooling	Y3E	PI control	A1P X22A
		Heating		PI control	
	Four-way valve		Y1S	STF-01AQ1743A1	A1P X25A
	Solenoid valve (Hot gas)		Y2S	TEV-1620DQ2	A1P X26A
	Solenoid valve (Unload circuit)		Y3S	TEV-1620DQ2	A1P X27A
Pressure-related parts	Pressure switch (INV.)		S1PH	ACB-4UB10 OFF: 580+0/–21.8psi ON: 435±21.8psi	A1P X32A
	Fusible plug		—	DFP-3L 158~167°F	—
	Pressure sensor (HP)		S1NPH	PS8051A 0~602psi	A1P X17A
	Pressure sensor (LP)		S1NPL	PS8051A –7.25~247psi	A1P X18A
Thermistor	Main PCB	For outdoor air	R1T	3.5~360kΩ	A1P X11A
		For discharge pipe	R2T	5.0~640kΩ	A1P X12A 1-2Pin
		For suction pipe 1	R3T	3.5~360kΩ	A1P X12A 3-4Pin
		For heat exchanger	R4T	3.5~360kΩ	A1P X12A 5-6Pin
		For suction pipe 2	R5T	3.5~360kΩ	A1P X12A 7-8Pin
		For subcooling heat exchanger	R6T	3.5~360kΩ	A1P X13A 1-2Pin
		For liquid pipe	R7T	3.5~360kΩ	A1P X13A 3-4Pin
Others	Fuse (A3P)		F1U	AC250V 6.3A	—
	Fuse (A1P)		F4U	AC250V 6.3A	—
	Fuse (A1P)		F6U	AC250V 5.0A	—

1.2 Indoor Unit

Parts Name		Symbol	Model					Remark
			FXFQ 12MVJU	FXFQ 18MVJU	FXFQ 24MVJU	FXFQ 30MVJU	FXFQ 36MVJU	
Remote Controller	Wired Remote Controller		BRC1C71					Option
	Wireless Remote Controller		BRC7C812					
Motors	Fan Motor	M1F	1ϕ45W 6P			1ϕ90W 6P		
			Thermal Protector 266±9°F : OFF 176±36°F : ON					
	Capacitor, fan motor	C1	3.5μF 450VAC			5.0μF 450VAC		
	Drain Pump	M1P	PLD-12230DM Thermal Fuse 293°F					
	Swing Motor	M1S	MP35HCA [3P007482-1]					
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-1 ϕ4 L250 20kΩ (77°F)					
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605A-4 ϕ8 L800 20kΩ (77°F)					
	Thermistor (Heat Exchanger)	R2T	ST8602-5 ϕ6 L1000 20kΩ (77°F)					
Others	Float Switch	S1L	FS-0211B					
	Fuse	F1U	250V 5A ϕ5.2					
	Transformer	T1R	TR25H25R0					

Parts Name		Symbol	Model				Remark
			FXZQ 07MVJU	FXZQ 09MVJU	FXZQ 12MVJU	FXZQ 18MVJU	
Remote Controller	Wired Remote Controller		BRC1C71				Option
	Wireless Remote Controller		BRC7E530W				
Motors	Fan Motor	M1F	1ϕ55W 4P				
			Thermal Protector 266±41°F:OFF 181±68°F:ON				
	Capacitor, fan motor	C1	4.0μ F 400VAC				
	Drain Pump	M1P	PLD-12230DM Thermal Fuse 293°F				
	Swing Motor	M1S	MP35HCA [3P080801-1]				
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-1 ϕ4 L250 20kΩ (77°F)				
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-3 ϕ8 L630 20kΩ (77°F)				
	Thermistor (Heat Exchanger)	R2T	ST8602A-3 ϕ6 L630 20kΩ (77°F)				
Others	Float Switch	S1L	FS-0211				
	Fuse	F1U	250V 5A ϕ5.2				
	Transformer	T1R	TR22H21R8				

Parts Name		Symbol	Model					Remark
			FXDQ 07MVJU	FXDQ 09MVJU	FXDQ 12MVJU	FXDQ 18MVJU	FXDQ 24MVJU	
Remote Controller	Wired Remote Controller		BRC1C71					Option
	Wireless Remote Controller		BRC4C82					
Motors	Fan Motor	M1F	1ϕ62W 4P			1ϕ130W 4P		
			Thermal Protector 266±9°F : OFF 181±27°F : ON					
	Capacitor, fan motor	C1	4.0μF 450VAC			7.0μF 450VAC		
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-1 ϕ4 L250 20kΩ (77°F)					
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605A-4 ϕ8 L800 20kΩ (77°F)					
	Thermistor (Heat Exchanger)	R2T	ST8602A-4 ϕ6 L800 20kΩ (77°F)					
Others	Float Switch	S1L	FS-0211B					
	Fuse	F1U	250V 5A ϕ5.2					
	Transformer	T1R	TR25H25R0					

Parts Name		Symbol	Model								Remark
			FXMQ 07PVJU	FXMQ 09PVJU	FXMQ 12PVJU	FXMQ 18PVJU	FXMQ 24PVJU	FXMQ 30PVJU	FXMQ 36PVJU	FXMQ 48PVJU	
Remote Controller	Wired Remote Controller		BRC1C71								
Motors	Fan Motor	M1F	DC380V 90W 8P							DC373V 350W 8P	
	Drain Pump	M1P	AC220-240V (60Hz) PLD-12230DM-15 Thermal protector 145°C								
Thermistors	Thermistor (Suction Air)	R1T	ST8602A-6 ϕ4 L630 20kΩ (25°C)								
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8602A-6 ϕ8 L1000 20kΩ (25°C)								
	Thermistor (for Heat Exchanger)	R2T	ST8602A-6 ϕ6 L1250 20kΩ (25°C)								
Others	Float Switch	S1L	FS-0211-101								
	Fuse (A1P)	F1U	250V 3.15A								
	Fuse (A2P)	F3U F4U	250V 6.3A								
	Fuse (A2P)	F2U	250V 5A								

Parts Name		Symbol	Model			Remark
			FXHQ 12MVJU	FXHQ 24MVJU	FXHQ 36MVJU	
Remote Controller	Wired Remote Controller		BRC1C71			Option
	Wireless Controller		BRC7E83			
Motors	Fan Motor	M1F	1ϕ63W	1ϕ130W		
			Thermal protector 266±9°F : OFF 176±36°F : ON			
	Capacitor for Fan Motor	C1R	3.0μF-450V	9.0μF-450V		
	Swing Motor	M1S	MT8-L[3P058751-1] AC200~240V			
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-5 ϕ4 L1000 20kΩ (77°F)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605A-4 ϕ8 L = 800 20kΩ (77°F)		ST8605A-4 ϕ8 L = 800 20kΩ (77°F)	
	Thermistor (Heat Exchanger)	R2T	ST8602A-4 ϕ6 L = 800 20kΩ (77°F)		ST8602A-4 ϕ6 L = 800 20kΩ (77°F)	
Others	Fuse	F1U	250V 5A			
	Transformer	T1R	TR25H25R0			

Parts Name		Symbol	Model					Remark
			FXAQ 07MVJU	FXAQ 09MVJU	FXAQ 12MVJU	FXAQ 18MVJU	FXAQ 24MVJU	
Remote Controller	Wired Remote Controller		BRC1C71					Option
	Wireless Remote Controller		BRC7E818					Option
Motors	Fan Motor	M1F	1ϕ40W			1ϕ43W		
			Thermal protector 266°F : OFF 176°F : ON					
	Swing Motor	M1S	MP24Z[3SB40333-1] AC200~240V			MSFBC20C21 [3SB40550-1] AC200~240V		
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-2 ϕ4 L400 20kΩ (77°F)					
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-2 ϕ8 L400 20kΩ (77°F)					
	Thermistor (for Heat Exchanger)	R2T	ST8602A-2 ϕ6 L400 20kΩ (77°F)					
Others	Float Switch	S1L	OPTION					
	Fuse	F1U	250V 3.15A					

Parts Name		Symbol	Model			Remark
			FXLQ 12MVJU	FXLQ 18MVJU	FXLQ 24MVJU	
Remote Controller	Wired Remote Controller		BRC1C71			Option
	Wireless Remote Controller		—			
Motors	Fan Motor	M1F	1ϕ25W	1ϕ35W		
			Thermal protector 275°F : OFF 248°F : ON			
	Capacitor for Fan Motor	C1R	0.5μF-450V	1.5μF-450V	2.0μF-450V	
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-6 ϕ4 L1250 20kΩ (77°F)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-9 ϕ8 L2500 20kΩ (77°F)			
	Thermistor (for Heat Exchanger)	R2T	ST8602A-9 ϕ6 L2500 20kΩ (77°F)			
Others	Fuse	F1U	AC250V 5A			
	Transformer	T1R	TR25H25R0			

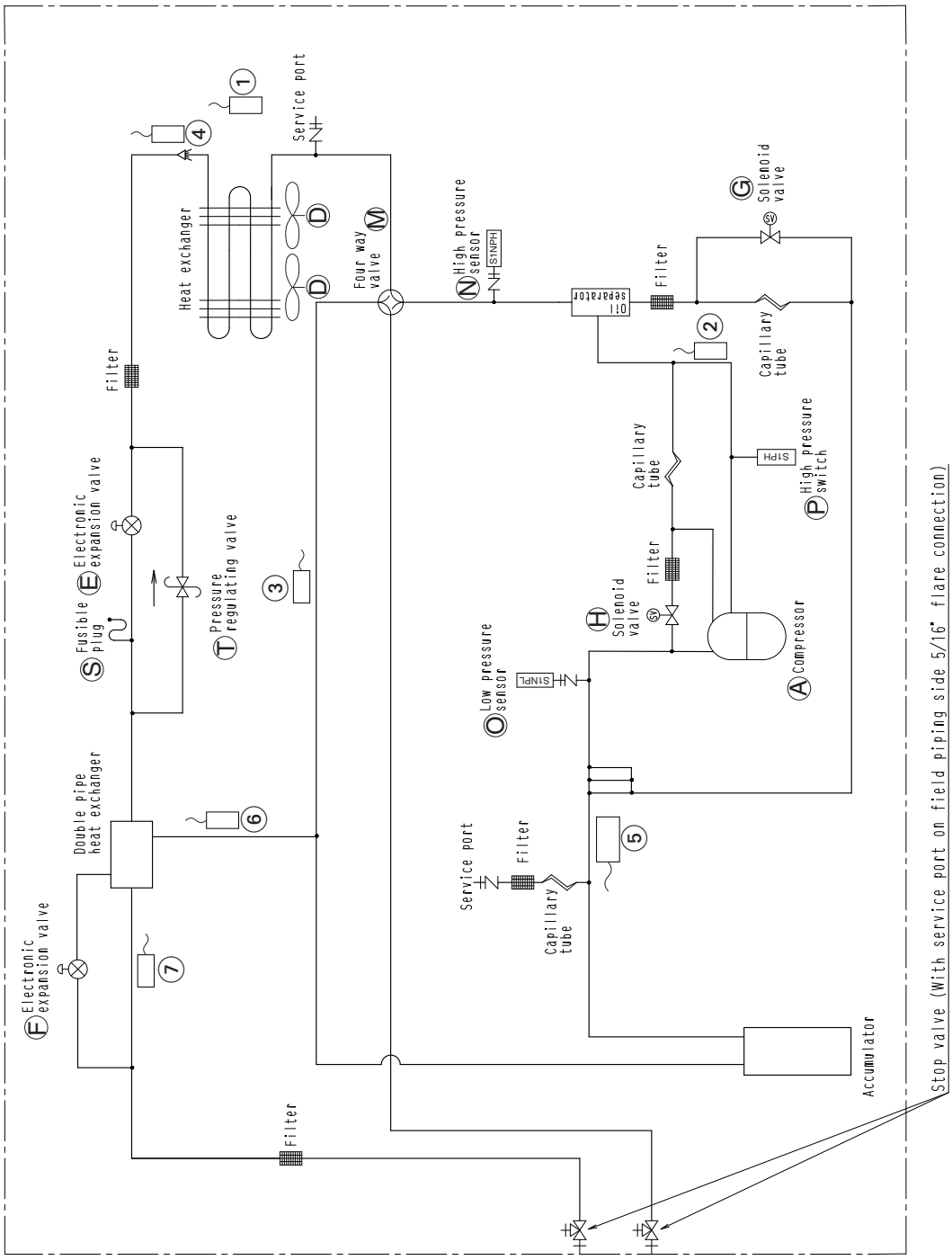
Parts Name		Symbol	Model			Remark
			FXNQ 12MVJU	FXNQ 18MVJU	FXNQ 24MVJU	
Remote Controller	Wired Remote Controller		BRC1C71			Option
	Wireless Remote Controller		—			
Motors	Fan Motor	M1F	1ϕ25W	1ϕ35W		
			Thermal protector 275°F : OFF 248°F : ON			
	Capacitor for Fan Motor	C1R	0.5μF-450V	1.5μF-450V	2.0μF-450V	
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-6 ϕ4 L1250 20kΩ (77°F)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-9 ϕ8 L2500 20kΩ (77°F)			
	Thermistor (for Heat Exchanger)	R2T	ST8602A-9 ϕ6 L2500 20kΩ (77°F)			
Others	Fuse	F1U	AC250V 5A			
	Transformer	T1R	TR25H25R0			

Part 4
Refrigerant Circuit

1. Refrigerant Circuit

1.1 RXYMQ36 · 48P

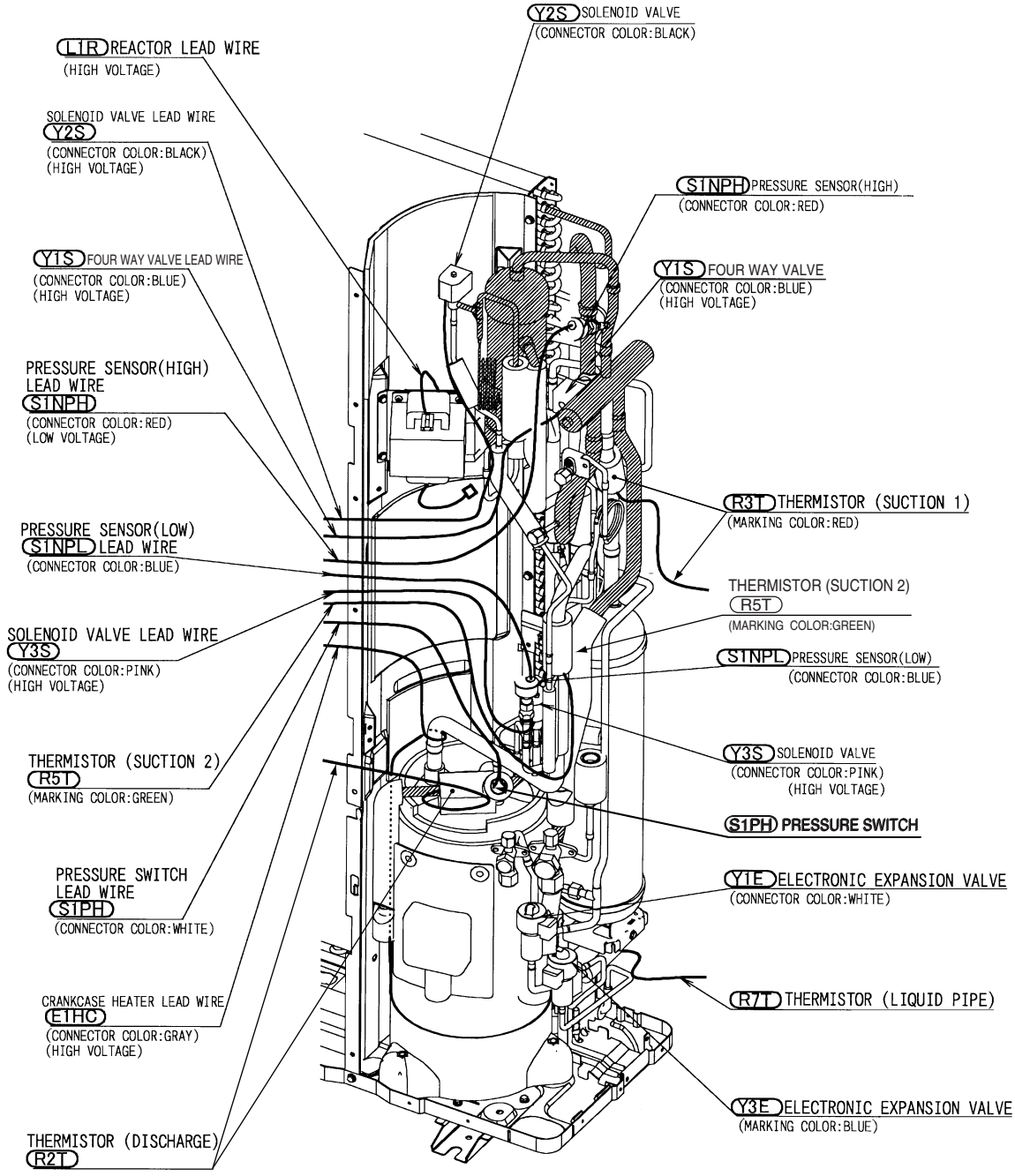
No. in refrigerant system diagram	Symbol	Name	Major Function
A	M1C	Inverter compressor (INV.)	Inverter compressor is operated on frequencies between 36Hz and 195Hz by using the inverter. 31 steps
D	M1F M2F	Inverter fan	Because the system is of an air heat exchange type, the fan is operated at 8-step rotation speed by using the inverter.
E	Y1E	Electronic expansion valve (Main: EV1)	While in heating operation, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
F	Y3E	Electronic expansion valve (Subcooling: EV3)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
G	Y2S	Solenoid valve (Hot gas: SVP)	Prevents the low pressure from transient falling.
H	Y3S	Solenoid valve (Unload circuit SVUL)	Unloading operation of compressor.
M	Y1S	Four-way valve	Switches the operation mode between cooling and heating.
N	S1NPH	High pressure sensor	Detects high pressure.
O	S1NPL	Low pressure sensor	Detects low pressure.
P	S1PH	High pressure switch (For INV. compressor)	In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 580psi or more to stop the compressor operation.
S	—	Fusible plug	In order to prevent the increase of pressure when abnormal heating is caused by fire or others, the fusible part of the plug is molten at a temperature of 158 to 167°F to release the pressure into the atmosphere.
T	—	Pressure regulating valve 1 (Receiver to discharge pipe)	This valve opens at a pressure of 580 psi for prevention of pressure increase, thus resulting in no damage of functional parts due to the increase of pressure in transportation or storage.
1	R1T	Thermistor (Outdoor air: Ta)	Detects outdoor temperature, correct discharge pipe temperature, and others.
2	R2T	Thermistor (INV. discharge pipe: Tdi)	Detects discharge pipe temperature, make the temperature protection control of compressor, and others.
3	R3T	Thermistor (Suction pipe1: Ts1)	Detects suction pipe temperature, keeps the suction superheated degree constant in heating operation.
4	R4T	Thermistor (Heat exchanger deicer: Tb)	Detects liquid pipe temperature of air heat exchanger, determine defrosting operation, and others.
5	R5T	Thermistor (Suction pipe2: Ts2)	Calculates internal temperature of compressor.
6	R6T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Detectst gas pipe temperature on the evaporation side of subcooling heat exchanger, keep the superheated degree at the outlet of subcooling heat exchanger constant, and others.
7	R7T	Thermistor (Liquid pipe: Tl)	Detects liquid pipe temperature.


Service port
Heat exchanger
Four way valve
High pressure sensor
S1NPH
Solenoid valve
Filter
Oil separator
Capillary tube
High pressure switch
S1PH
Compressor
Solenoid valve
Low pressure sensor
S1NPL
Filter
Capillary tube
Service port
Filter
Accumulator
Electronic expansion valve
Double pipe heat exchanger
Fusible plug
Electronic expansion valve
Pressure regulating valve
Filter
Filter
Stop valve (With service port on field piping side 5/16" flare connection)

C : 3D065366

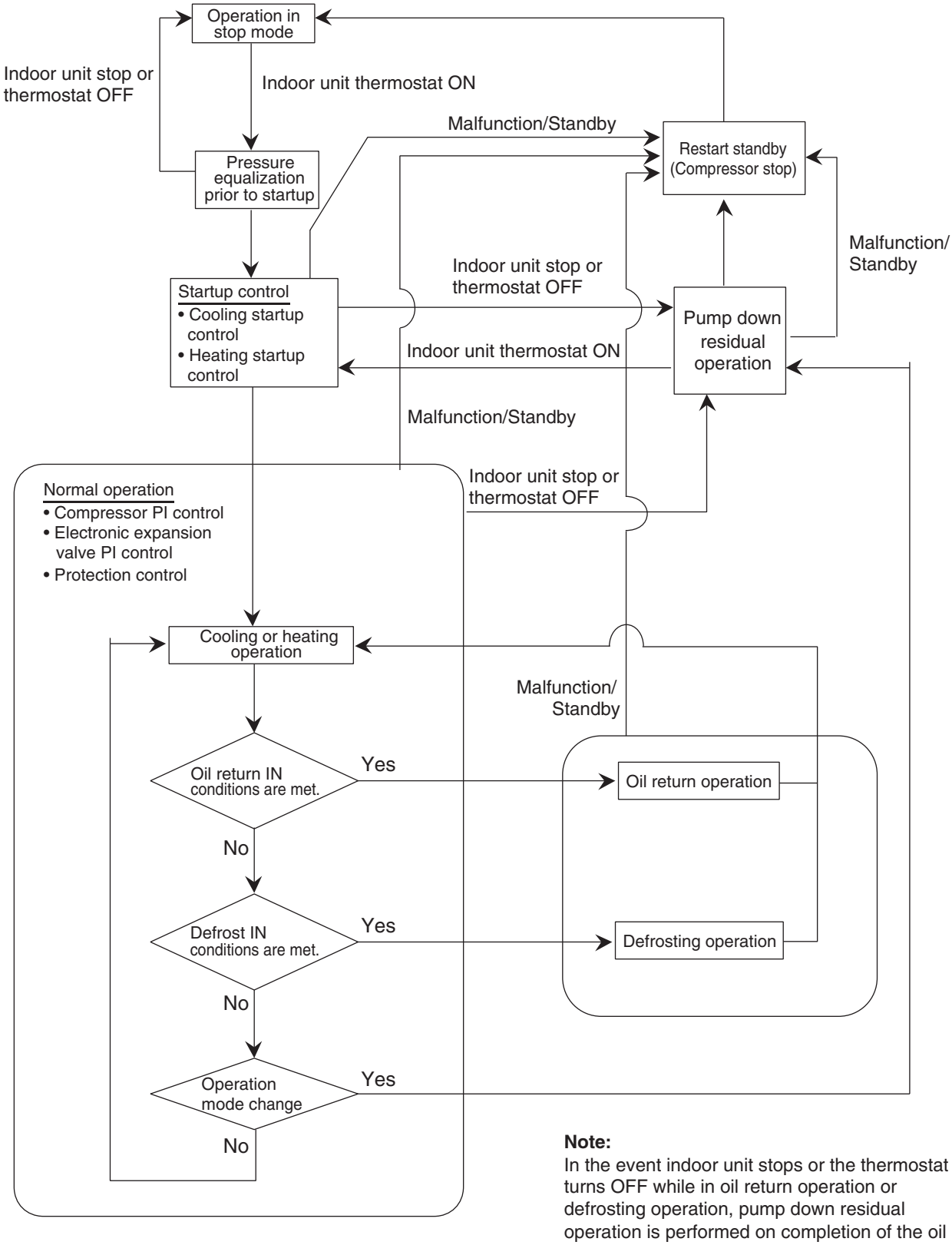
2. Functional Parts Layout

2.1 RXYMQ36 · 48P



Part 5
Function

1. Operation Mode



Note:
In the event indoor unit stops or the thermostat turns OFF while in oil return operation or defrosting operation, pump down residual operation is performed on completion of the oil return operation or defrosting operation.

2. Basic Control

2.1 Normal Operation

■ **Cooling Operation**

Actuator	Operation	Remarks
Compressor	Compressor PI control	Used for high pressure protection control, low pressure protection control, discharge pipe temperature protection control, and compressor operating frequency upper limit control with inverter protection control.
Outdoor unit fan	Cooling fan control	—
Four-way valve (Y1S)	OFF	—
Main electronic expansion valve (EV1)	480 pls	—
Subcooling electronic expansion valve (EV3)	PI control	—
Hot gas bypass valve (SVP)	OFF	This valve turns on with low pressure protection control.

■ **Heating Operation**

Actuator	Operation	Remarks
Compressor	Compressor PI control	Used for high pressure protection control, low pressure protection control, discharge pipe temperature protection control, and compressor operating frequency upper limit control with inverter protection control.
Outdoor unit fan	STEP 7 or 8	—
Four-way valve (Y1S)	ON	—
Main electronic expansion valve (EV1)	PI control	—
Subcooling electronic expansion valve (EV3)	PI control	—
Hot gas bypass valve (SVP)	OFF	This valve turns on with low pressure protection control.

★Heating operation is not functional at an outdoor air temperature of 75°FDB or more.

2.2 Compressor PI Control

Compressor PI Control

Carries out the compressor capacity PI control to maintain Te at constant during cooling operation and Tc at constant during heating operation to ensure stable unit performance.

[Cooling operation]

Controls compressor capacity to adjust Te to achieve target value (TeS).

Te : Low pressure equivalent saturation temperature (°F)

Te setting (Set in Set-up mode 2)

L	M (Normal) (factory setting)	H
3	6	9

TeS : Target Te value
(Varies depending on Te setting, operating frequency, etc.)

[Heating operation]

Controls compressor capacity to adjust Tc to achieve target value (TcS).

Tc : High pressure equivalent saturation temperature (°F)

Tc setting

L	M (Normal) (factory setting)	H
43	46	49

TcS : Target Tc value
(Varies depending on Tc setting, operating frequency, etc.)

RXYMQ36 · 48P

STn	INV.(Full-load)	INV.(Unload)
1		36.0Hz
2		39.0Hz
3		43.0Hz
4		47.0Hz
5		52.0Hz
6	52.0Hz	57.0Hz
7	57.0Hz	64.0Hz
8	62.0Hz	71.0Hz
9	68.0Hz	78.0Hz
10	74.0Hz	

STn	INV.(Full-load)	INV.(Unload)
11	80.0Hz	
12	86.0Hz	
13	92.0Hz	
14	98.0Hz	
15	104.0Hz	
16	110.0Hz	
17	116.0Hz	
18	122.0Hz	
19	128.0Hz	
20	134.0Hz	

STn	INV.(Full-load)	INV.(Unload)
21	140.0Hz	
22	146.0Hz	
23	152.0Hz	
24	158.0Hz	
25	164.0Hz	
26	170.0Hz	
27	175.0Hz	
28	180.0Hz	
29	185.0Hz	
30	190.0Hz	
31	195.0Hz	

* Compressors may operate in a pattern other than those listed in above tables subject to the operating conditions. Selection of full load operation to/from unload operation is made with the unload circuit solenoid valve (Y3S=SVUL). The full load operation is performed with the SVUL set to OFF, while the unload operation is performed with the SVUL set to ON.

2.3 Electronic Expansion Valve PI Control

Main Electronic Expansion Valve EV1 Control

Carries out the electronic expansion valve (Y1E) PI control to maintain the evaporator outlet superheated degree (SH) at constant during heating operation to make maximum use of the outdoor unit heat exchanger (evaporator).

SH = Ts1 - Te

SH : Evaporator outlet superheated degree (°F)

Ts1 : Suction pipe temperature detected by thermistor R3T (°F)

Te : Low pressure equivalent saturation temperature (°F)

The optimum initial value of the evaporator outlet superheated degree is 37°F, but varies depending on the discharge pipe superheated degree of inverter compressor.

Subcooling Electronic Expansion Valve EV3 Control

Makes PI control of the electronic expansion valve (Y3E) to keep the superheated degree (SH) of the outlet gas pipe on the evaporator side for the full use of the subcooling heat exchanger.

SH = Tsh -Te

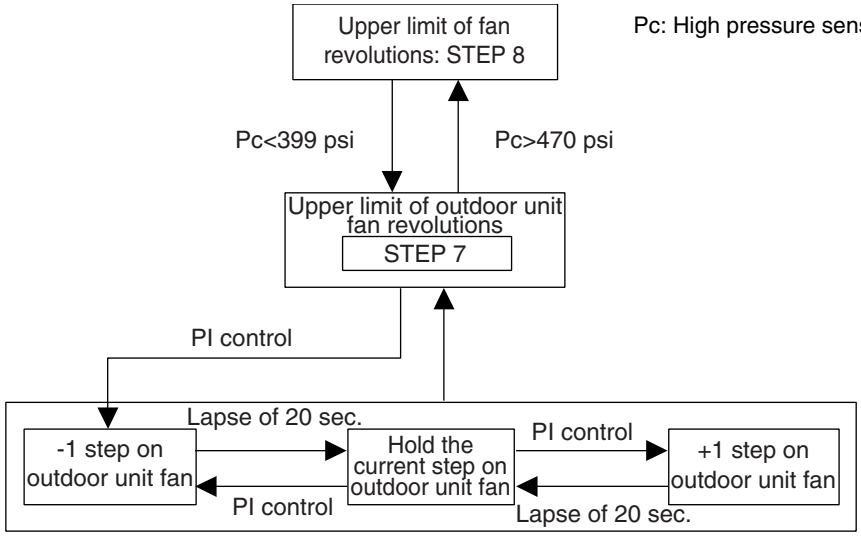
SH : Outlet superheated degree of evaporator (°F)

Tsh : Subcooling heat exchanger gas pipe temperature detected with the thermistor R6T (°F)

Te : Low pressure equivalent saturation temperature (°F)

2.4 Cooling Operation Fan Control

In cooling operation with low outdoor air temperature, this control is used to provide the adequate amount of circulation air with liquid pressure secured by high pressure control using the outdoor unit fan.
When the outdoor temperature ≥ 68°F, the compressor will run in Step 7 or higher.
When the outdoor temperature ≥ 64°F, it will run in Step 5 or higher.
When the outdoor temperature ≥ 54°F, it will run in Step 1 or higher.



Fan Steps

Cooling	M1F	M2F
STEP 0	0 rpm	0 rpm
STEP 1	250 rpm	0 rpm
STEP 2	400 rpm	0 rpm
STEP 3	285 rpm	250 rpm
STEP 4	360 rpm	325 rpm
STEP 5	445 rpm	410 rpm
STEP 6	580 rpm	545 rpm
STEP 7	715 rpm	680 rpm
STEP 8	850 rpm	815 rpm

3. Special Control

3.1 Startup Control

This control is used to equalize the pressure in the front and back of the compressor prior to the startup of the compressor, thus reducing startup loads. The inverter is turned ON to charge the capacitor.
In addition, to avoid stresses to the compressor due to oil return or else after the startup, the following control is made and the position of the four-way valve is also determined. To position the four-way valve, the master and slave units simultaneously start up.

3.1.1 Startup Control in Cooling Operation

Thermostat ON

	Pressure equalization control prior to startup	Startup control	
		STEP 1	STEP 2
Compressor	0 Hz	57 Hz Unload	57 Hz Unload +2 steps/20 sec. (until Pc - Pe>43.5 psi is achieved)
Outdoor unit fan	STEP 7	Ta<68°F: OFF Ta≥68°F: STEP 4	+1 step/15 sec. (when Pc>313 psi) -1 step/15 sec. (when Pc<257 psi)
Four-way valve (Y1S)	Holds	OFF	OFF
Main electronic expansion valve (EV1)	0 pls	480 pls	480 pls
Subcooling electronic expansion valve (EV3)	0 pls	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Ending conditions	OR • Pc - Pe<43.5 psi • A lapse of 1 to 5 min.	A lapse of 10 sec.	OR • A lapse of 130 sec. • Pc - Pe>56.6 psi

3.1.2 Startup Control in Heating Operation

Thermostat ON

	Pressure equalization control prior to startup	Startup control	
		STEP 1	STEP 2
Compressor	0 Hz	57 Hz Unload	57 Hz Unload +2 steps/20 sec. (until Pc - Pe>43.5 psi is achieved)
Outdoor unit fan	From starting ~ 1 min. : STEP 7 1 ~ 3 min. : STEP 3 3 ~ 5 min. : OFF	STEP 8	STEP 8
Four-way valve (Y1S)	Holds	ON	ON
Main electronic expansion valve (EV1)	0 pls	0 pls	0 pls
Subcooling electronic expansion valve (EV3)	0 pls	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Ending conditions	OR • Pc - Pe<43.5 psi • A lapse of 1 to 5 min.	A lapse of 10 sec.	OR • A lapse of 130 sec. • Pc>392 psi • Pc - Pe>56.6 psi

3.2 Oil Return Operation

In order to prevent the compressor from running out of oil, the oil return operation is conducted to recover oil flown out from the compressor to the system side.

3.2.1 Oil Return Operation in Cooling Operation

[Start conditions]

Referring to the set conditions for the following items, start the oil-return operation in cooling.

- Cumulative oil feed rate
- Timer setting (Make this setting to start the oil-return operation when the initial cumulative operating time reaches two hours after power supply is turned ON and then every eight hours.)

The cumulative oil feed rate is computed from Tc, Te, and compressor loads.

Outdoor unit actuator	Oil return preparation operation	Oil return operation	Post-oil-return operation
Compressor	Take the current step as the upper limit.	52 Hz Full load (→ Low pressure constant control)	Same as the “oil return operation” mode.
Outdoor unit fan	Fan control (Normal cooling)	Fan control (Normal cooling)	Fan control (Normal cooling)
Four-way valve (Y1S)	OFF	OFF	OFF
Main electronic expansion valve (EV1)	480 pls	480 pls	480 pls
Subcooling electronic expansion valve (EV3)	SH control	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Ending conditions	20 sec.	or • 3 min. • Ts - Te<41°F	or • 3 min. • Pe<87 psi • HTdi>230°F

Indoor unit actuator		Cooling oil return operation
Fan	Thermostat ON unit	Remote controller setting
	Stopping unit	OFF
	Thermostat OFF unit	Remote controller setting
Electronic expansion valve	Thermostat ON unit	Normal opening
	Stopping unit	224 pls
	Thermostat OFF unit	Normal opening with forced thermostat ON

3.2.2 Oil Return Operation in Heating Operation

[Conditions to start]

The heating oil-returning operation is started referring following conditions.

- Integrated amount of displaced oil
- Timer

  (After the power is turned on, integrated operating-time is 2 hours and subsequently every 8 hours.)

  In addition, integrated amount of displaced oil is derived from Tc, Te, and the compressor load.

Outdoor Unit Actuator	Oil return preparation operation	Oil return operation	Post-oil-return operation
Compressor	Upper limit control	140 Hz Full load	2-step increase from 36 Hz Unload to (Pc - Pe>58 psi) every 20 sec.
Outdoor unit fan	STEP 8	OFF	STEP 8
Four-way valve (Y1S)	ON	OFF	ON
Main electronic expansion valve (EV1)	SH control	480 pls	55 pls
Subcooling electronic expansion valve (EV3)	0 pls	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Ending conditions	2 min.	or (• 12 min. &{ • Ts1 - Te<41°F • Tb>52°F)	or (• 160 sec. • Pc - Pe>58 psi)

* From the preparing oil-returning operation to the oil-returning operation, and from the oil-returning operation to the operation after oil-returning, the compressor stops for 1 minute to reduce noise on changing of the four-way valve.

Indoor unit actuator		Heating oil return operation
Fan	Thermostat ON unit	OFF
	Stopping unit	OFF
	Thermostat OFF unit	OFF
Electronic expansion valve	Thermostat ON unit	416 pls
	Stopping unit	256 pls
	Thermostat OFF unit	416 pls

3.3 Defrosting Operation

The defrost operation is performed to solve frost on the outdoor unit heat exchanger when heating, and the heating capacity is recovered.

[Conditions to start]

The defrost operation is started referring following conditions.

- Outdoor heat exchanger heat transfer co-efficiency
- Temperature of heat-exchange (Tb)
- Timer (2 hours at the minimum)

  In addition, outdoor heat-exchange co-efficiency is derived from Tc, Te, and the compressor load.

Outdoor unit actuator	Defrost preparation operation	Defrost operation	Post Defrost operation
Compressor	Upper limit control	140 Hz Full load	2-step increase from 36 Hz Unload to (Pc - Pe>58 psi) every 20 sec.
Outdoor unit fan	STEP 8	OFF	STEP 8
Four-way valve (Y1S)	ON	OFF	ON
Main electronic expansion valve (EV1)	SH control	480 pls	55 pls
Subcooling electronic expansion valve (EV3)	0 pls	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	ON	ON
Ending conditions	2 min.	or • 15 min. &{ • Tb>4°F • Ts1 - Te<52°F	or • 160 sec. • Pc - Pe>58 psi

* From the preparing operation to the defrost operation, and from the defrost operation to the operation after defrost, the compressor stops for 1 minute to reduce noise on changing of the four-way valve.

Indoor unit actuator		Heating oil return operation
Fan	Thermostat ON unit	OFF
	Stopping unit	OFF
	Thermostat OFF unit	OFF
Electronic expansion valve	Thermostat ON unit	416 pls
	Stopping unit	256 pls
	Thermostat OFF unit	416 pls

3.4 Pump Down Residual Operation

When activating compressor, if the liquid refrigerant remains in the heatexchanger, the liquid enters into the compressor and dilutes oil therein resulting in decrease of lubricity.
Therefore, the pump down residual operation is performed to collect the refrigerant in the heatexchanger when the compressor is down.

3.4.1 Pump Down Residual Operation in Cooling Operation

Actuator	Pump down residual operation Step 1	Pump down residual operation Step 2
Compressor	124 Hz Full load	52 Hz Full load
Outdoor unit fan	Fan control	Fan control
Four-way valve (Y1S)	OFF	OFF
Main electronic expansion valve (EV1)	480 pls	240 pls
Subcooling electronic expansion valve (EV3)	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF
Ending conditions	2 sec.	2 sec.

3.4.2 Pump Down Residual Operation in Heating Operation

Actuator	Pump down residual operation
Compressor	124 Hz Full load
Outdoor unit fan	STEP 7
Four-way valve (Y1S)	ON
Main electronic expansion valve (EV1)	0 pls
Subcooling electronic expansion valve (EV3)	0 pls
Hot gas bypass valve (SVP)	OFF
Ending conditions	4 sec.

3.5 Restart Standby

Restart is stood by force to prevent frequent power-on/off and to equalize pressure in the refrigerant system.

Actuator	Operation	Remarks
Compressor	OFF	—
Outdoor unit fan	Ta>86°F: STEP 4 Ta≤86°F: OFF	—
Four-way valve (Y1S)	Keep former condition.	—
Main electronic expansion valve (EV1)	0 pls	—
Subcooling electronic expansion valve (EV3)	0 pls	—
Hot gas bypass valve (SVP)	OFF	—
Ending conditions	2 min.	—

3.6 Stopping Operation

Operation of the actuator when the system is down, is cleared up.

3.6.1 When System is in Stop Mode

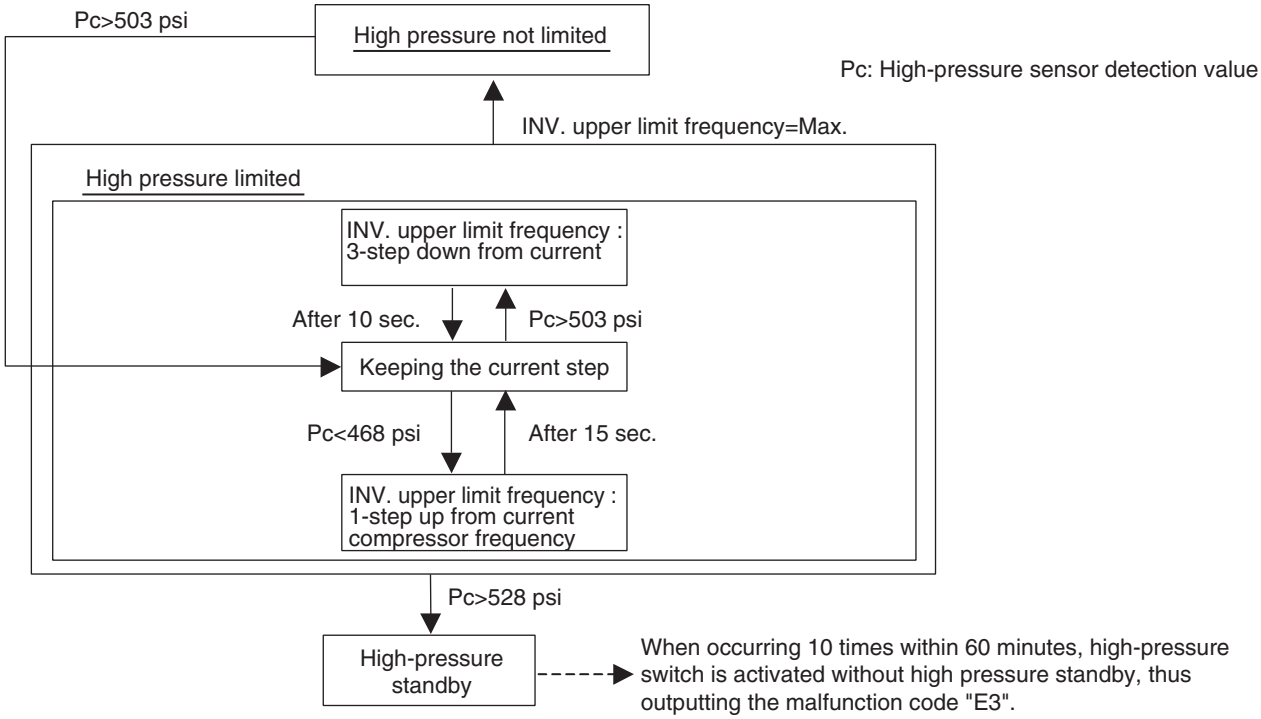
Actuator	Operation
Compressor	OFF
Outdoor unit fan	OFF
Four-way valve (Y1S)	Keep former condition.
Main electronic expansion valve (EV1)	0 pls
Subcooling electronic expansion valve (EV3)	0 pls
Hot gas bypass valve (SVP)	OFF
Ending conditions	Indoor unit thermostat is turned ON.

4. Protection Control

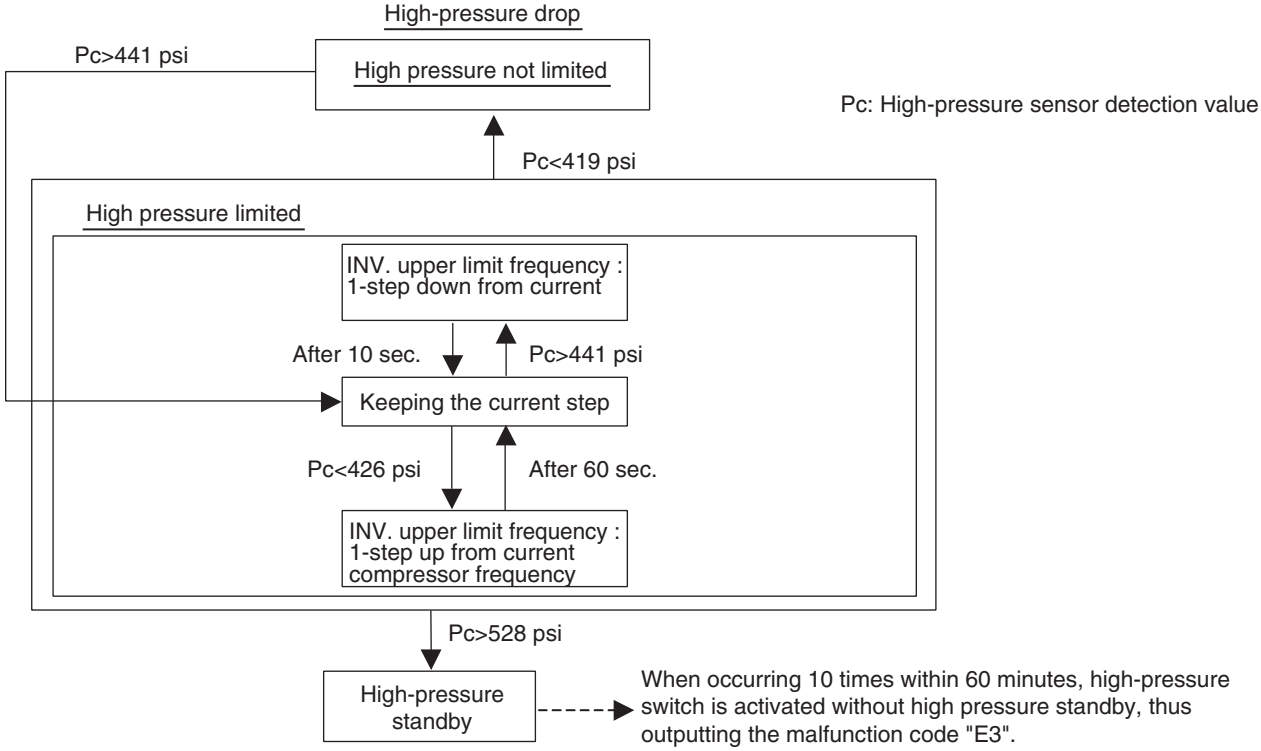
4.1 High Pressure Protection Control

This high-pressure protection control is used to prevent the activation of protection devices due to abnormal increase of high pressure and to protect compressors against the transient increase of high pressure.

[In cooling operation]



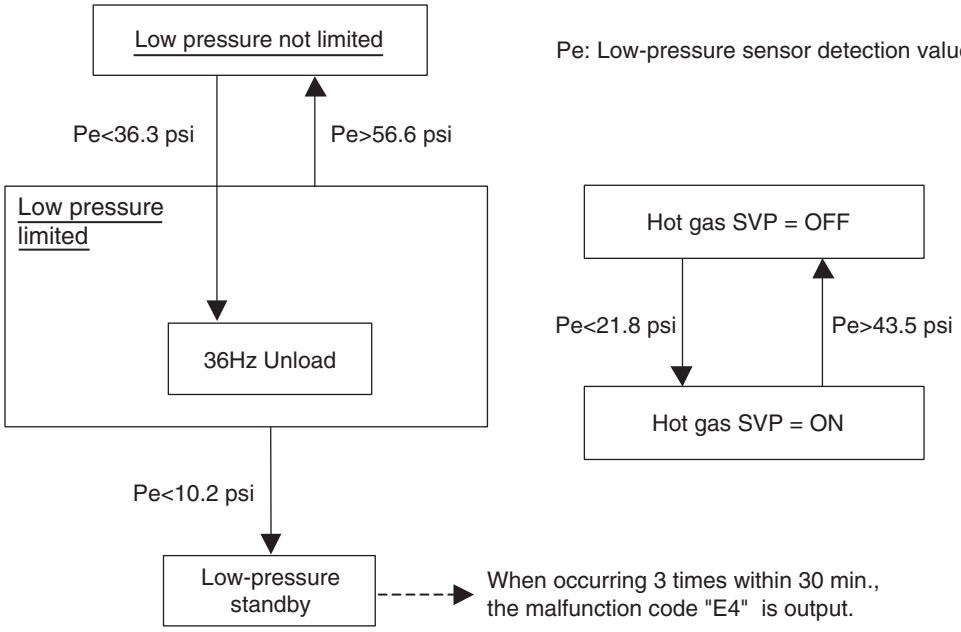
[In heating operation]



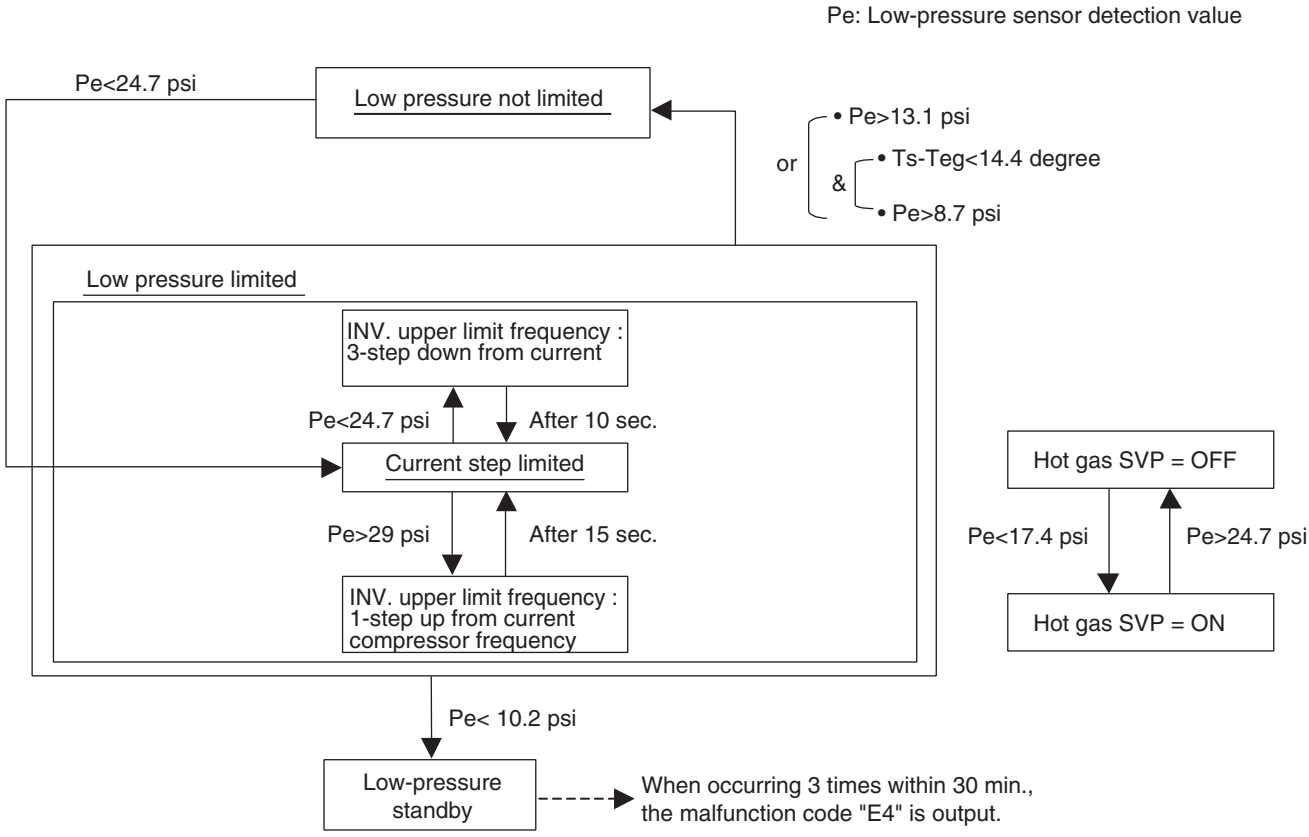
4.2 Low Pressure Protection Control

This low pressure protection control is used to protect compressors against the transient decrease of low pressure.

[In cooling operation]



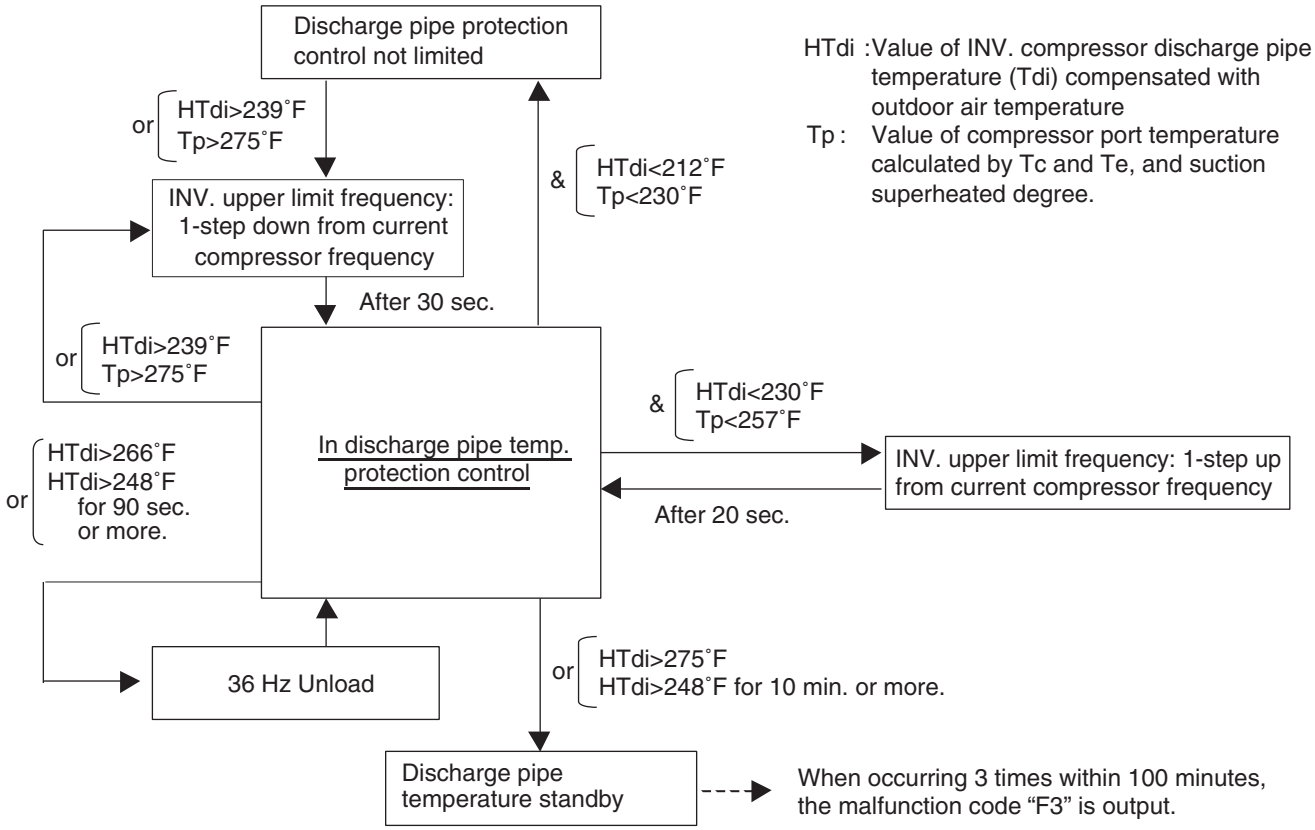
[In heating operation]



4.3 Discharge Pipe Protection Control

This discharge pipe protection control is used to protect the compressor internal temperature against a malfunction or transient increase of discharge pipe temperature.

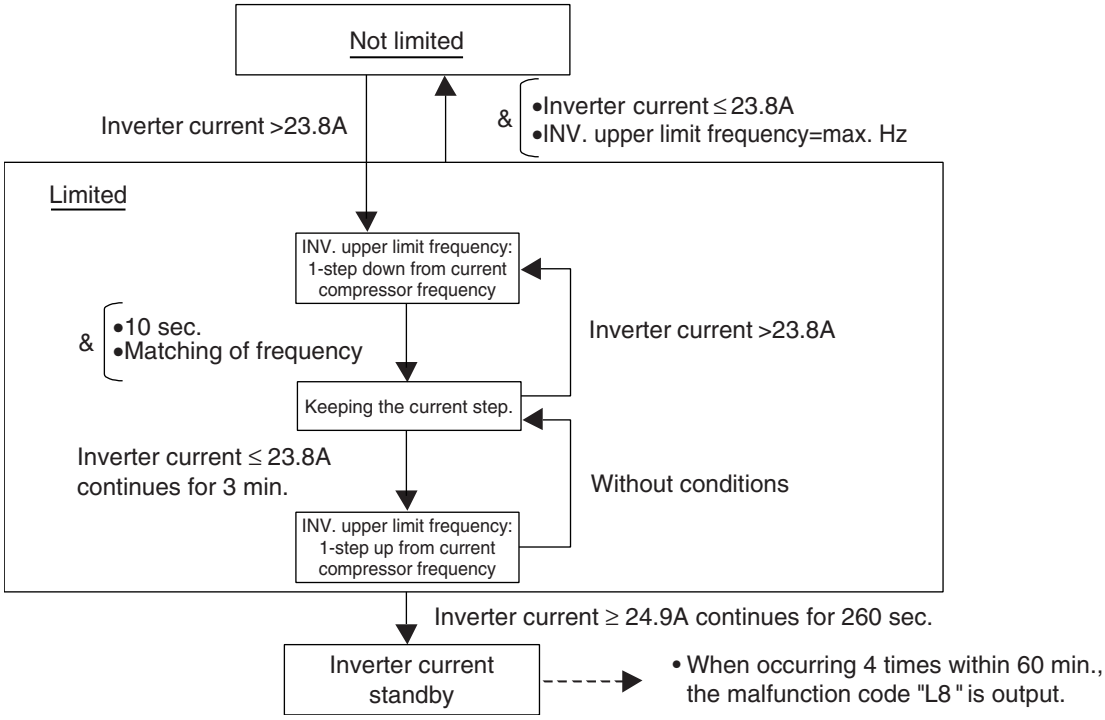
[INV. compressor]



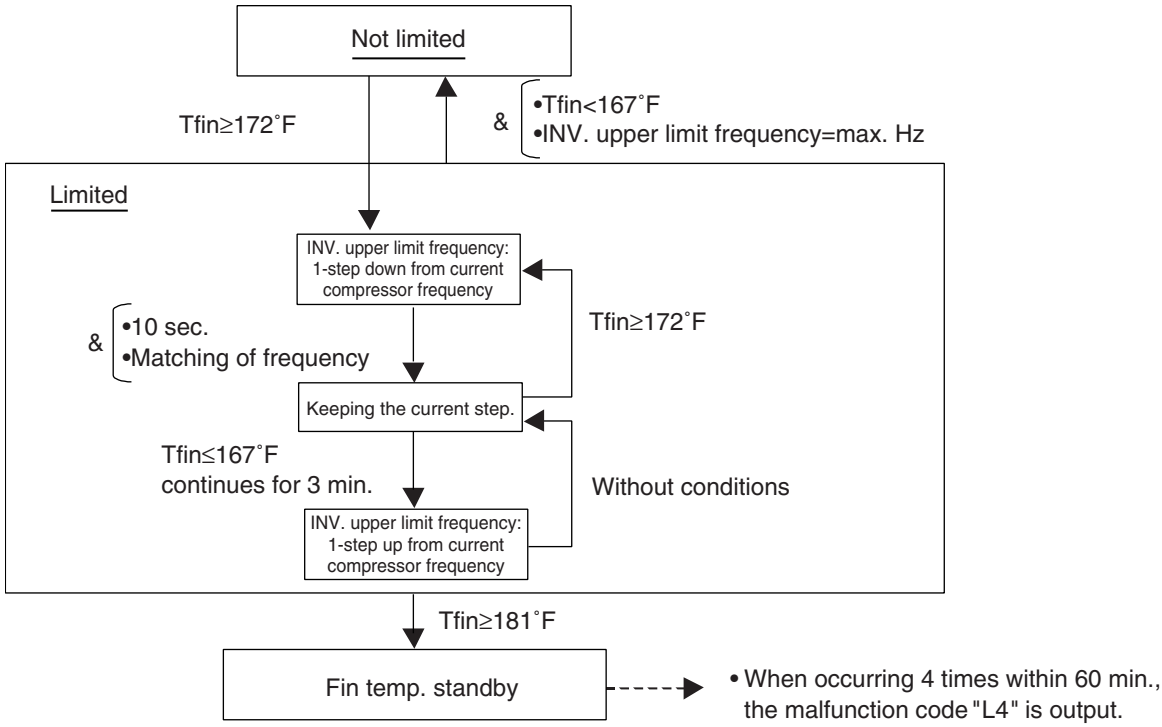
4.4 Inverter Protection Control

Inverter current protection control and inverter fin temperature control are performed to prevent tripping due to a malfunction, or transient inverter overcurrent, and fin temperature increase.

[Inverter overcurrent protection control]



[Inverter fin temperature control]



5. Other Control

5.1 Demand Operation

In order to save the power consumption, the capacity of outdoor unit is saved with control forcibly by using “Demand 1 Setting”.
To operate the unit with this mode, additional setting of “Continuous Demand Setting”.

[Demand 1 setting]

Setting	Standard for upper limit of power consumption
Demand 1 setting 1	Approx. 60%
Demand 1 setting 2 (factory setting)	Approx. 70%
Demand 1 setting 3	Approx. 80%

★ Other protection control functions have priority over the above operation.

5.2 Heating Operation Prohibition

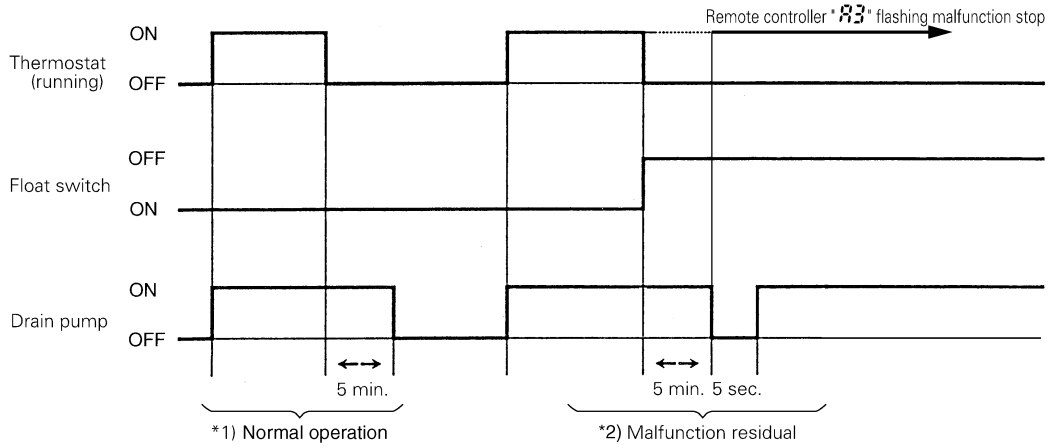
Heating operation is prohibited above 75°FDB outdoor air temperature.

6. Outline of Control (Indoor Unit)

6.1 Drain Pump Control

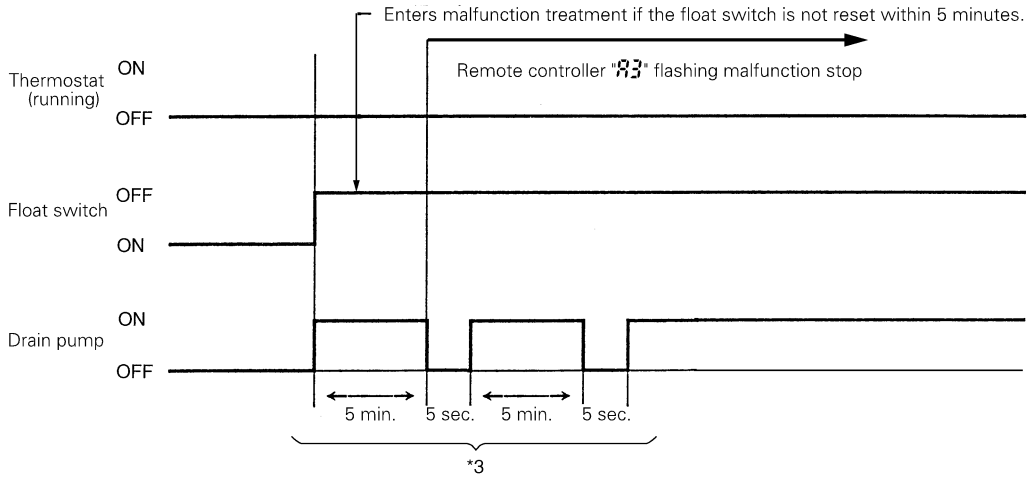
The drain pump is controlled by the ON/OFF buttons (4 button (1) - (4) given in the figure below).

6.1.1 When the Float Switch is Tripped while the Cooling Thermostat is ON:



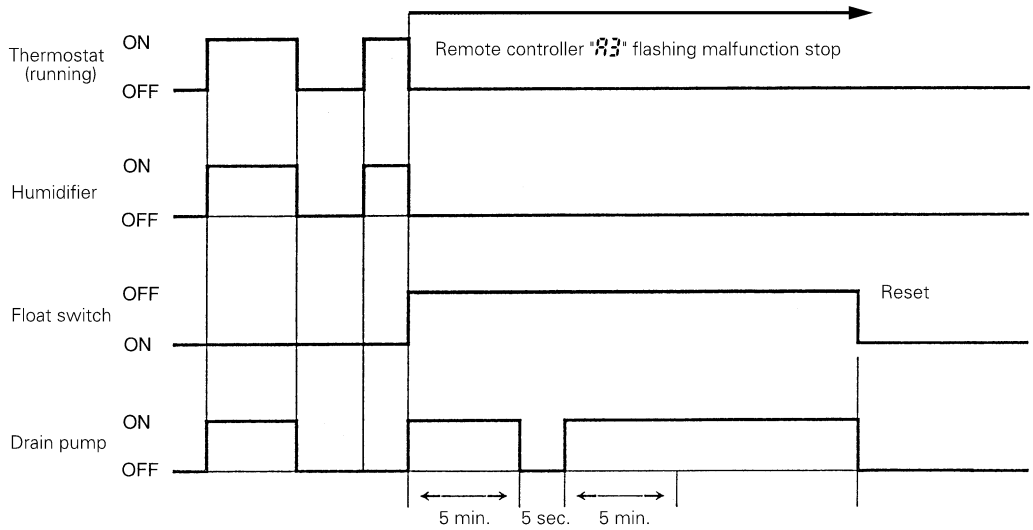
*1. (Normal operation):
The objective of residual operation is to completely drain any moisture adhering to the fin of the indoor unit heat exchanger when the thermostat goes off during cooling operation.
*2. (Malfunction residual):
The remote controller will display "A3" and the air conditioner will come to an abnormal stop in 5 minutes if the float switch is turned OFF while the cooling thermostat is ON.

6.1.2 When the Float Switch is Tripped while the Cooling Thermostat is OFF:



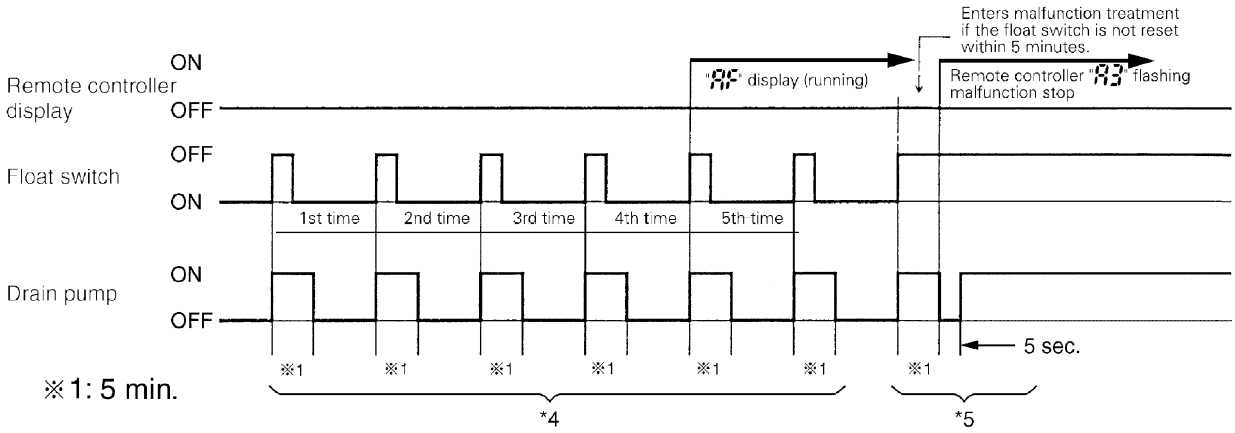
*3. (Malfunction residual):
The remote controller will display "A3" and the air conditioner will come to an abnormal stop if the float switch is turned OFF and not turned ON again within 5 minutes while the cooling thermo. is OFF.

6.1.3 When the Float Switch is Tripped during Heating Operation:



During heating operation, if the float switch is not reset even after the 5 minutes operation, 5 seconds stop, 5 minutes operation cycle ends, operation continues until the switch is reset.

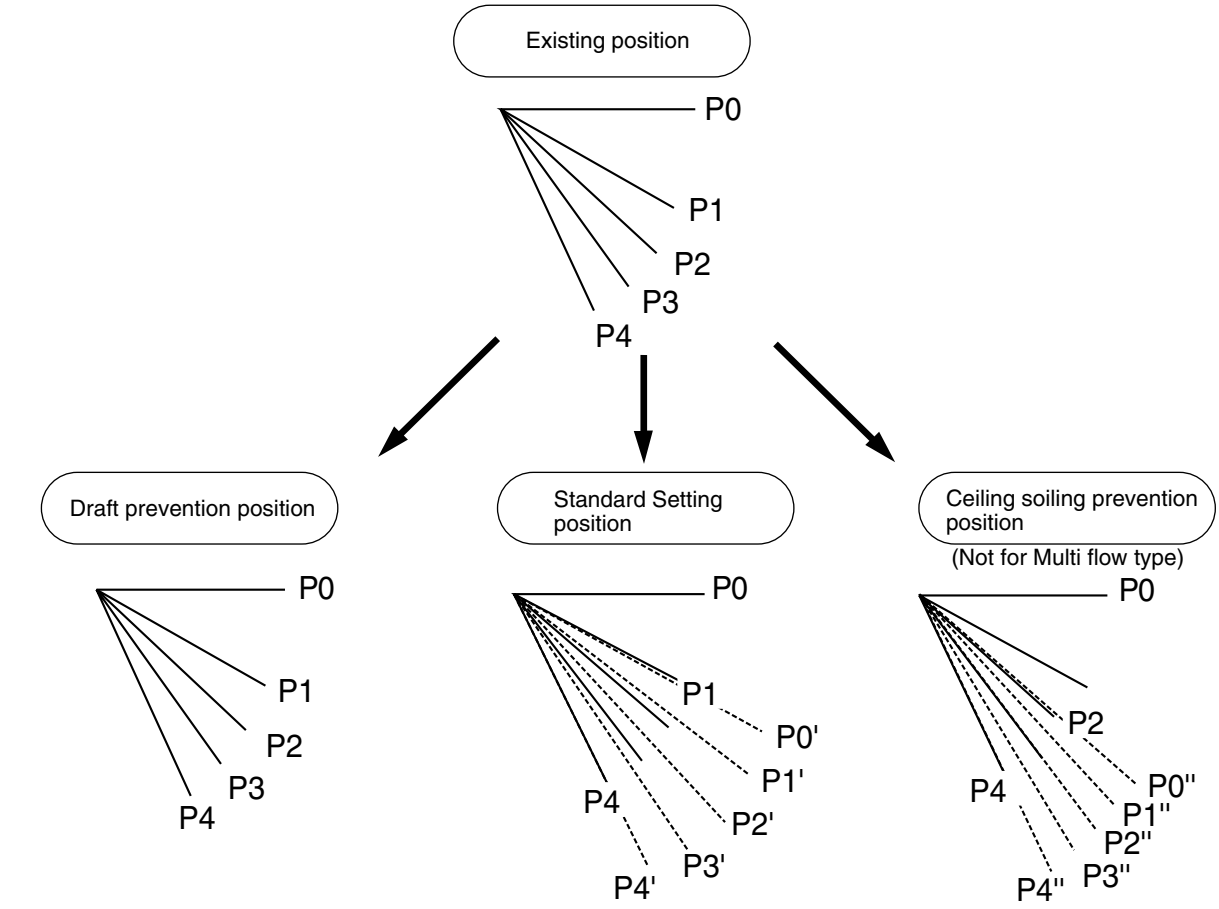
6.1.4 When the Float Switch is Tripped and "AF" is Displayed on the Remote Controller:



*4. (Malfunction residual):
If the float switch is tripped five times in succession, a drain malfunction is determined to have occurred. "AF" is then displayed as operation continues.
*5. (Malfunction residual):
The remote controller will display "A3" and the air conditioner will come to an abnormal stop if the float switch is OFF for more than 5 minutes in the case of *4.

6.2 Louver Control for Preventing Ceiling Dirt

We have added a control feature that allows you to select the range of in which air direction can be adjusted in order to prevent the ceiling surrounding the air discharge outlet of ceiling mounted cassette type units from being soiled.



Draft prevention position	P0	P1	P2	P3	P4	Same as existing position
			Range of direction adjustment			
Standard position	Prohibited	P0'	P1'	P2'	P3'	P4'	Separated into 5 positions (P1 - 4)
			Range of direction adjustment			
Dirt prevention position	Prohibited		P0"	P1"	P2"	P3"	P4"	Separated into 5 positions (P2 - 4)

The factory setting position is standard position.

6.3 Thermostat Sensor in Remote Controller

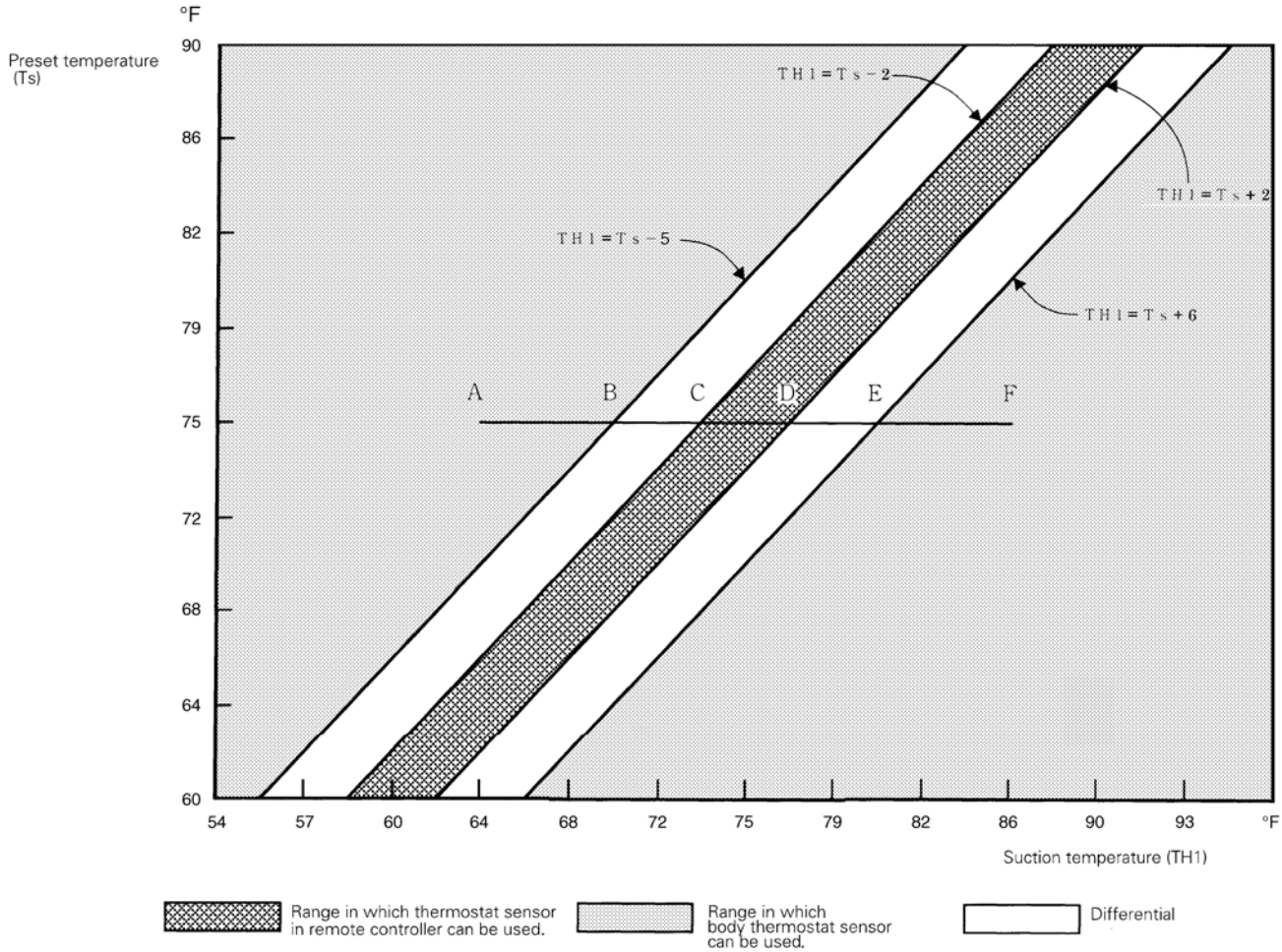
Temperature is controlled by both the thermostat sensor in remote controller and air suction thermostat in the indoor unit. (This is however limited to when the field setting for the thermostat sensor in remote controller is set to “Use.”)

Note:

When OA (outdoor air) is introduced to the airconditioner with mixed into indoor air, the room temperature may fail to be preset temperature, since TS and TH1 do not enter the area of “use range of remote control thermostat.” In such a case, put the remote sensor (optional accessory) in your room, and use it with setting “do not use remote control thermostat.”

Cooling

If there is a significant difference in the preset temperature and the suction temperature, fine adjustment control is carried out using a body thermostat sensor, or using the sensor in the remote controller near the position of the user when the suction temperature is near the preset temperature.



■ **Ex: When cooling**

Assuming the preset temperature in the figure above is 75°F, and the suction temperature has changed from 64°F to 86°F (A → F):

This example also assumes there are several other air conditioners, the VRV system is off, and that temperature changes even when the thermostat sensor is off.

Body thermostat sensor is used for temperatures from 64°F to 73°F (A → C).

Remote controller thermostat sensor is used for temperatures from 73°F to 81°F (C → E).

Body thermostat sensor is used for temperatures from 81°F to 86°F (E → F).

And, assuming suction temperature has changed from 86°F to 64°F (F → A):

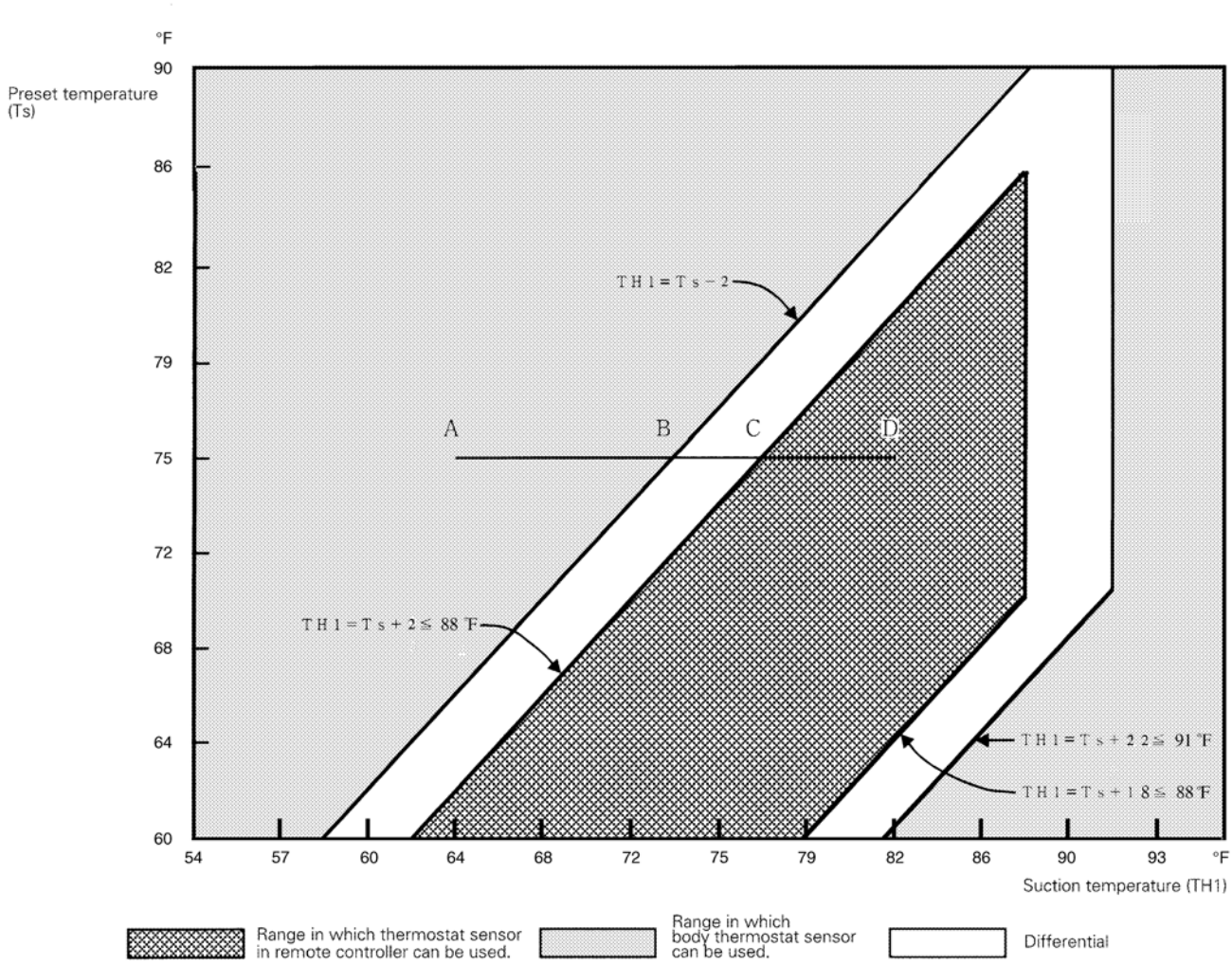
Body thermostat sensor is used for temperatures from 86°F to 77°F (F → D).

Remote controller thermostat sensor is used for temperatures from 77°F to 70°F (D → B).

Body thermostat sensor is used for temperatures from 70°F to 64°F (B → A).

Heating

When heating, the hot air rises to the top of the room, resulting in the temperature being lower near the floor where the occupants are. When controlling by body thermostat sensor only, the unit may therefore be turned off by the thermostat before the lower part of the room reaches the preset temperature. The temperature can be controlled so the lower part of the room where the occupants are does not become cold by widening the range in which thermostat sensor in remote controller can be used so that suction temperature is higher than the preset temperature.



■ **Ex: When heating**

Assuming the preset temperature in the figure above is 75°F, and the suction temperature has changed from 64°F to 82°F (A → D):

This example also assumes there are several other air conditioners, the VRV system is off, and that temperature changes even when the thermostat sensor is off.

Body thermostat sensor is used for temperatures from 64°F to 77°F (A → C).

Remote controller thermostat sensor is used for temperatures from 77°F to 82°F (C → D).

And, assuming suction temperature has changed from 82°F to 64°F (D → A):

Remote controller thermostat sensor is used for temperatures from 82°F to 73°F (D → B).

Body thermostat sensor is used for temperatures from 73°F to 64°F (B → A).

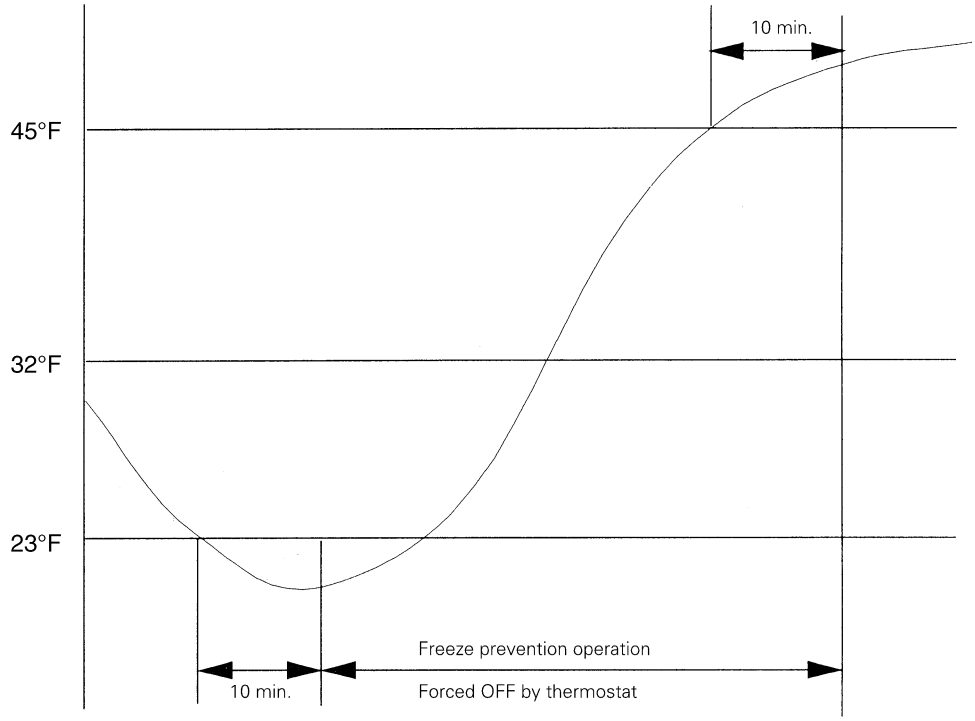
6.4 Freeze Prevention

Freeze Prevention by Off Cycle (Indoor Unit)

When the temperature detected by liquid pipe temperature thermistor (R2T) of the indoor unit heat exchanger drops too low, the unit enters freeze prevention operation in accordance with the following conditions, and is also set in accordance with the conditions given below.

Conditions for starting freeze prevention: Temperature is 30°F or less for total of 40 min., or temperature is 23°F or less for total of 10 min.
Conditions for stopping freeze prevention: Temperature is 45°F or more for 10 min. continuously.

Ex: Case where temperature is 23°F or less for total of 10 min.



6.5 View of Operations of Swing Flaps

Swing flaps work as following.

			Fan	Flap control		
				FCQ	FHQ	FAQ
Heating	Hot-start from defrosting	Swinging	OFF	Level	Level	Level
		Setting the wind direction	OFF	Level	Level	Level
	Defrosting	Swinging	OFF	Level	Level	Level
		Setting the wind direction	OFF	Level	Level	Level
	Thermostat is off	Swinging	LL	Level	Level	Level
		Setting the wind direction	LL	Level	Level	Level
	Hot-start from the state that the thermostat is off	Swinging	LL	Level	Level	Level
		Setting the wind direction	LL	Level	Level	Level
	Halt	Swinging	OFF	Level	Level	Level
		Setting the wind direction	OFF	Level	Level	Level
Cooling	Thermostat of micro-computer dry is on	Swinging	L[*1]	Swinging	Swinging	Swinging
		Setting the wind direction	L[*1]	Set up	Set up	Set up
	Thermostat of micro-computer dry is off	Swinging	OFF or L	Swinging	Swinging	Swinging
		Setting the wind direction		Set up	Set up	Set up
	Cooling thermostat is off	Swinging	Set up	Swinging	Swinging	Swinging
		Setting the wind direction	Set up	Set up	Set up	Set up
	Halt	Swinging	OFF	Level	Level	Level
		Setting the wind direction	OFF	Set up	Level	Level
	Micro-computer is controlled (including the cooling state)	Swinging	L	Swinging	Swinging	Swinging
		Setting the wind direction	L	Set up	Set up	Set up

* 1. Only in FCQ case, L or LL.

Part 6
Test Operation

1. Test Operation

1.1 Procedure and Outline

Follow the following procedure to conduct the initial test operation after installation.

1.1.1 Check Work Prior to Turn Power Supply On

Check the below items.
- Power wiring
- Control transmission wiring between units
- Ground wire

Check on refrigerant piping

Check on amount of refrigerant charge

- ○ Is the power supply single-phase 208-230V / 60Hz?
- ○ Have you finished a ductwork to drain?
- ○ Have you detached transport fitting?
- ○ Is the wiring performed as specified?
- ○ Are the designated wires used?
- ○ Is the grounding work completed?
  Use a 500V megger tester to measure the insulation.
  - Do not use a megger tester for other circuits than 208-230V circuit.
- ○ Are the setscrews of wiring not loose?
- ○ Is the electrical component box covered with an insulation cover completely?

- ○ Is pipe size proper? (The design pressure of this product is 580 psi.)
- ○ Are pipe insulation materials installed securely?
  Liquid and gas pipes need to be insulated. (Otherwise causes water leak.)
- ○ Are respective stop valves on liquid and gas line securely open?

- ○ Is refrigerant charged up to the specified amount?
  If insufficient, charge the refrigerant from the service port of stop valve on the liquid side with outdoor unit in stop mode after turning power on.
- ○ Has the amount of refrigerant charge been recorded on “Record Chart of Additional Refrigerant Charge Amount”?

1.1.2 Turn Power On

Turn outdoor unit power on.

Turn indoor unit power on.

Carry out field setting on outdoor PCB

- ○ Be sure to turn the power on 6 hours before starting operation to protect compressors.
- ○ Close outside panels of the outdoor unit.

1.1.3 Check Operation

* During check operation, mount front panel to avoid the misjudging.
* Check operation is mandatory for normal unit operation.
  (When the check operation is not executed, alarm code "U3" will be displayed.)

Press and hold the TEST OPERATION button (BS4) on outdoor unit PCB for 5 seconds.

↓

Check on operation

○ The test operation is started automatically.
The following judgements are conducted within 15 minutes(about 30 minutes at the maximum).
- "Check for wrong wiring"
- "Check stop valve for not open"
- "Pipe length automatic judgement"

The following indications are conducted while in test operation.
- LED lamp on outdoor unit PCB — H2P flickers (test operation)
- Remote controller — Indicates "UNDER CENTRALIZED CONTROL" on upper right.
  Indicates "TEST OPERATION" on lower left.

On completion of test operation, LED on outdoor unit PCB displays the following.
H3P ON: Normal completion
H2P and H3P ON: Abnormal completion →Check the indoor unit remote controller for abnormal display and correct it.

Malfunction code
In case of an alarm code displayed on remote controller:

Malfunction code	Installation malfunction	Remedial action
E3	The shutoff valve of an outdoor unit is left closed.	Open the gas-side shutoff valve and the liquid-side shutoff valve.
	Refrigerant overcharge	Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
E4	The shutoff valve of an outdoor unit is left closed.	Open the gas-side shutoff valve and the liquid-side shutoff valve.
	Insufficient refrigerant	Check if the additional refrigerant charge has been finished correctly.
		Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant.
F3	Refrigerant overcharge	Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
	The shutoff valve of an outdoor unit is left closed.	Open the gas-side shutoff valve and the liquid-side shutoff valve.
	Insufficient refrigerant	Check if the additional refrigerant charge has been finished correctly.
		Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant.
F6	Refrigerant overcharge	Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
U2	Insufficient supply voltage	Check to see if the supply voltage is supplied properly.
U3	If a check operation has not been performed.	Perform a check operation.
U4	No power is supplied to an outdoor unit.	Turn the power on for the outdoor unit.
UA	If no dedicated indoor unit is being used.	Check the indoor unit. If it is not a dedicated unit, replace the indoor unit.
UF	The shutoff valve of an outdoor unit is left closed.	Open the gas-side shutoff valve and the liquid-side shutoff valve.
	If the right indoor unit piping and wiring are not properly connected to the outdoor unit.	Make sure that the right indoor unit piping and wiring are properly connected to the outdoor unit.
UH	If the indoor unit wiring has not be connected or it has shorted.	Make sure the indoor unit wiring is correctly attached to terminals (X2M) F1/F2 (TO IN/D UNIT) on the outdoor unit circuit board.

1.1.4 Confirmation on Normal Operation

- Conduct normal unit operation after the check operation has been completed.
  (When outdoor air temperature is 75°FDB or higher, the unit can not be operated with heating mode. See the installation manual attached.)
- Confirm that the indoor/outdoor units can be operated normally.
  *NOTE: When an abnormal noise due to liquid compression by the compressor can be heard, stop the unit immediately, and turn on the crankcase heater to heat up it sufficiently, then start operation again.•Operate indoor units one by one to check that the corresponding outdoor unit operates.
- Confirm that the indoor unit discharges cold air (or warm air).
- Operate the air direction control button and flow rate control button to check the function of the devices.

1.2 Operation when Power is Turned On

1.2.1 When Turning On Power First Time

The unit cannot be run for up to 12 minutes to automatically set the master power and address (indoor-outdoor address, etc.).

Status

Outdoor unit	Test lamp H2P .... Blinks Can also be set during operation described above.
Indoor unit	If ON button is pushed during operation described above, the “UH” malfunction indicator blinks. (Returns to normal when automatic setting is complete.)

1.2.2 When Turning On Power the Second Time and Subsequent

Tap the RESET(BS5) button on the outdoor unit PCB. Operation becomes possible for about 2 minutes. If you do not push the RESET button, the unit cannot be run for up to 10 minutes to automatically set master power.

Status

Outdoor unit	Test lamp H2P .... Blinks Can also be set during operation described above.
Indoor unit	If ON button is pushed during operation described above, the operation lamp lights but the compressor does not operate. (Returns to normal when automatic setting is complete.)

1.2.3 When an Indoor Unit or Outdoor Unit has been Added, or Indoor or Outdoor Unit PCB has been Changed

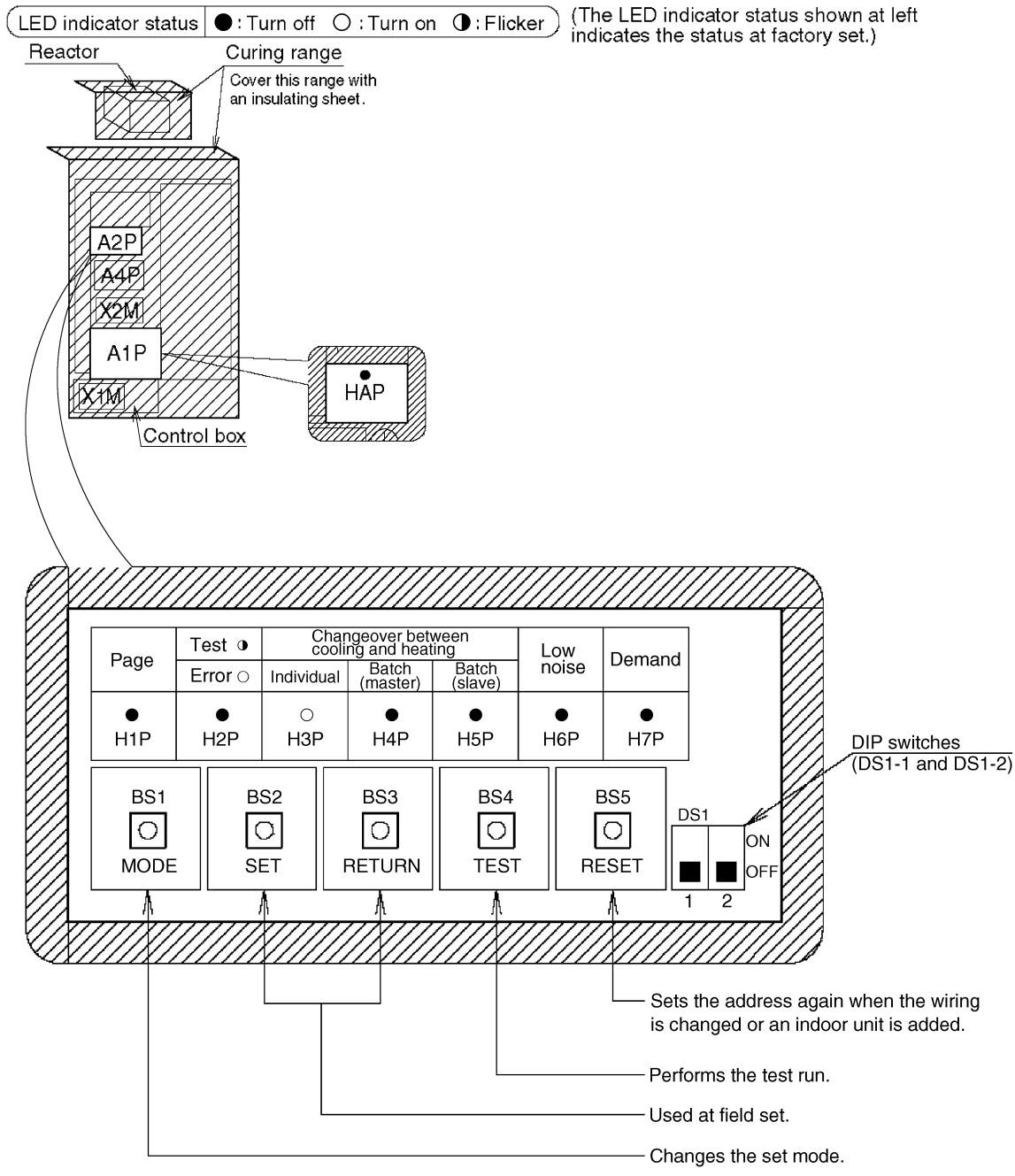
Be sure to push and hold the RESET button for 5 seconds. If not, the addition cannot be recognized. In this case, the unit cannot be run for up to 12 minutes to automatically set the address (indoor-outdoor address, etc.)

Status

Outdoor unit	Test lamp H2P .... ON Can also be set during operation described above.
Indoor unit	If ON button is pushed during operation described above, the “UH” or “U4” malfunction indicator blinks. (Returns to normal when automatic setting is complete.)

2. Outdoor Unit PCB Layout

Outdoor unit PCB



Caution

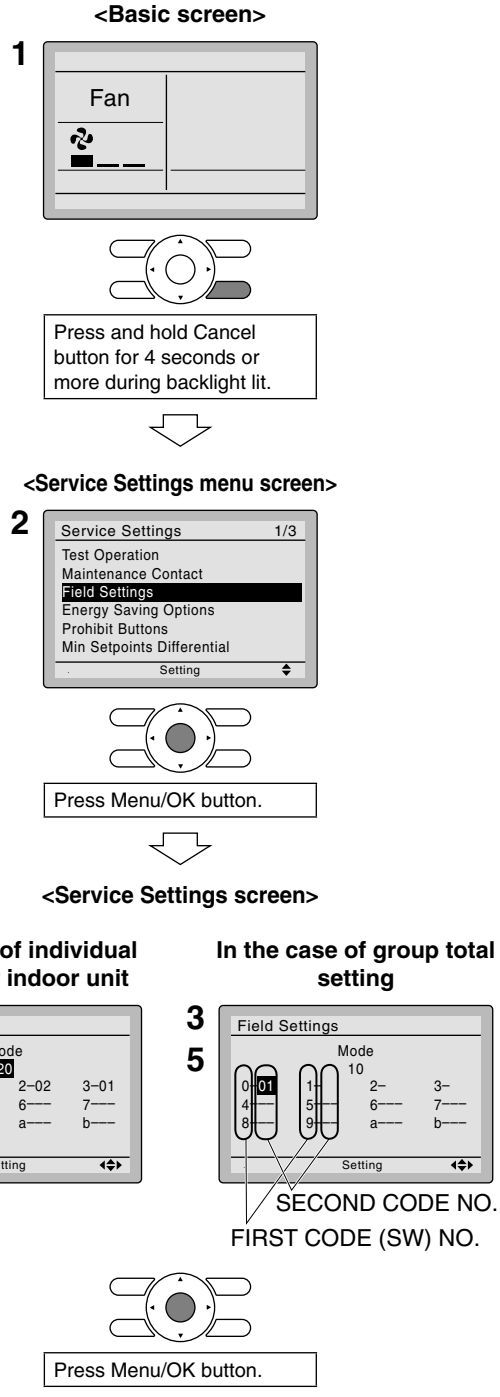
Cover electric parts with an insulating sheet during inspection to prevent electric shock.

3. Field Setting

3.1 Field Setting from Remote Controller

Individual function of indoor unit can be changed from the remote controller. At the time of installation or after service inspection / repair, make the local setting in accordance with the following description.
Wrong setting may cause malfunction.
When optional accessory is mounted on the indoor unit, setting for the indoor unit may be required to change. Refer to information in the option handbook.

3.1.1 Wired Remote Controller <BRC1E71>



1 Press and hold Cancel button for 4 seconds or more.
Service settings menu is displayed.

2 Select Field Settings in the Service Settings menu, and press Menu/OK button.
Field settings screen is displayed.

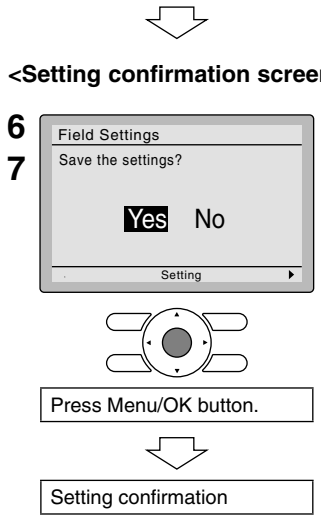
3 Highlight the mode, and select desired "Mode No." by using ▲▼ (Up/Down) button.

4 In the case of setting per indoor unit during group control (When Mode No. such as 20 , 21 , 22 , 23 , 25 are selected), highlight the unit No. and select "Indoor unit No." to be set by using ▲▼ (Up/Down) button.
(In the case of group total setting, this operation is not needed.)

> In the case of individual setting per indoor unit, current settings are displayed. And, SECOND CODE NO. " - " means no function.

5 Highlight SECOND CODE NO. of the FIRST CODE NO. to be changed, and select desired "SECOND CODE NO." by using ▲▼ (Up/Down) button. Multiple identical mode number settings are available.

> In case of setting for all indoor units in the remote control group, available SECOND CODE NO. is displayed as " ∗ " which means it can be changed.
> When SECOND CODE NO. is displayed as " - ", there is no function.



6 Press Menu/OK button. Setting confirmation screen is displayed.

7 Select Yes and press Menu/OK button. Setting details are determined and field settings screen returns.

8 In the case of multiple setting changes, repeat "**3**" to "**7**".

9 After all setting changes are completed, press Cancel button twice.

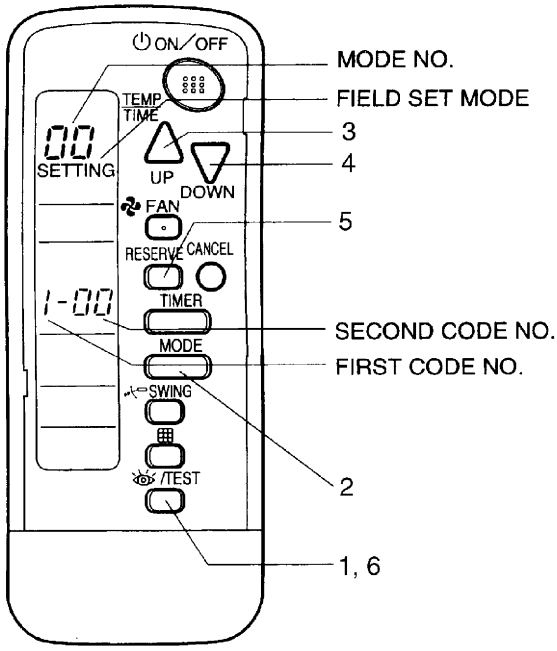
10 Backlight goes out, and "Checking the connection. Please stand by." is displayed for initialization. After the initialization, the basic screen returns.

NOTE

- Installation of optional accessories on the indoor unit may require changes to field settings. See the manual of the optional accessory.
- For field setting details related to the indoor unit, see installation manual shipped with the indoor unit.

3.1.2 Wireless Remote Controller - Indoor Unit

BRC7C812
BRC4C82
BRC7E818
BRC7E83

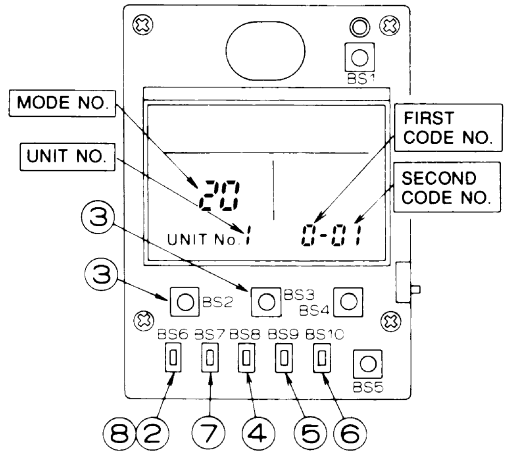


1. When in the normal mode, push the /TEST button for 4 seconds or more, and operation then enters the “field set mode.”
2. Select the desired “mode No.” with the MODE button.
3. Pushing the UP button, select the first code No.
4. Pushing the DOWN button, select the second code No.
5. Push the timer RESERVE button and check the settings.
6. Push the /TEST button to return to the normal mode.

(Example)
When setting the filter sign time to “Filter Dirtiness-High” in all group unit setting, set the Mode No. to “10”, Mode setting No. to “0” and setting position No. to “02”.

3.1.3 Simplified Remote Controller

BRC2A51
BRC2C51



1. Remove the upper part of remote controller.
2. When in the normal mode, press the [BS6] BUTTON (②) (field set), and the FIELD SET MODE is entered.
3. Select the desired MODE No. with the [BS2] BUTTON (③) (temperature setting ▲) and the [BS3] BUTTON (③) (temperature setting ▼).
4. During group control, when setting by each indoor unit (mode No. 20, 22, and 23 have been selected), push the [BS8] (④) BUTTON (unit No.) and select the INDOOR UNIT NO. to be set. (This operation is unnecessary when setting by group.)
5. Push the [BS9] BUTTON (⑤) (set A) and select FIRST CODE NO.
6. Push the [BS10] BUTTON (⑥) (set B) and select SECOND CODE NO.
7. Push the [BS7] BUTTON (⑦) (set/cancel) once and the present settings are SET.
8. Push the [BS6] BUTTON (⑧) (field set) to return to the NORMAL MODE.
9. (Example) If during group setting and the time to clean air filter is set to FILTER CONTAMINATION - HEAVY, SET MODE NO. to “10”, FIRST CODE NO. to “0”, and SECOND CODE NO. to “02”.

3.1.4 Setting Contents and Code No. – VRV Indoor unit

▭: Factory setting

	Mode No. Note 2	First Code No.	Setting Contents		Second Code No.								Details No
					01		02		03		04		
VRV system indoor unit settings	10(20)	0	Filter contamination heavy/light (Setting for display time to clean air filter) (Sets display time to clean air filter to half when there is heavy filter contamination.)	Ultra long-life filter	Light	Approx. 10,000 hrs.	Heavy	Approx. 5,000 hrs.	—		—		(1)
				Long-life filter		Approx. 2,500 hrs.		Approx. 1,250 hrs.					
				Standard filter		Approx. 200 hrs.		Approx. 100 hrs.					
		1	Long-life filter type		Long life filter		Ultra long-life filter		—		—		(2)
		2	Thermostat sensor in remote controller		Remote controller + Body thermostat		Only body thermostat		Only remote controller thermostat		—		(3)
		3	Display time to clean air filter calculation (Set when filter sign is not to be displayed.)		Display		No display		—		—		(4)
	12(22)	0	Optional accessories output selection (field selection of output for adaptor for wiring)		Indoor unit turned ON by thermostat		—		Operation output		Malfunction output		(5)
		1	ON/OFF input from outside (Set when ON/OFF is to be controlled from outside.)		Forced OFF		ON/OFF control		External protection device input		—		(6)
		2	Thermostat differential changeover (Set when remote sensor is to be used.)		1.8°F		0.9°F		—		—		(7)
		3	Airflow setting when heating thermostat is OFF		LL		Set fan speed		—		—		(8)
		4	Automatic mode differential (automatic temperature differential setting for VRV system heat recovery series cool/heat)		01:0	02:1	03:2	04:3	05:4	06:5	07:6	08:7	—
		5	Power failure automatic reset		Not equipped		Equipped		—		—		(9)
		6	Airflow setting when Cooling thermostat is OFF		LL		Set fan speed		—		—		(10)
	13(23)	0	Setting of normal airflow		N		H		S		—		(11)
		1	Selection of airflow direction (Set when a blocking pad kit has been installed.)		F (4 directions)		T (3 directions)		W (2 directions)		—		(12)
		3	Operation of downward flow flap: Yes/No		Equipped		Not equipped		—		—		(13)
		4	Field set airflow position setting		Draft prevention		Standard		Ceiling Soiling prevention		—		(14)
		5	Setting of static pressure selection		Standard		High static pressure		—		—		(15)
	15(25)	1	Thermostat OFF excess humidity		Not equipped		Equipped		—		—		(16)
		2	Direct duct connection (when the indoor unit and heat reclaim ventilation unit are connected by duct directly.) ∗Note 5		Not equipped		Equipped		—		—		(17)
		3	Drain pump humidifier interlock selection		Not equipped		Equipped		—		—		(18)
		5	Field set selection for individual ventilation setting by remote controller		Not equipped		Equipped		—		—		(19)

Notes :

1. Settings are made simultaneously for the entire group, however, if you select the mode No. inside parentheses, you can also set by each individual unit. Setting changes however cannot be checked except in the individual mode for those in parentheses.
2. The mode numbers inside parentheses cannot be used by wireless remote controllers, so they cannot be set individually. Setting changes also cannot be checked.
3. Do not make settings other than those described above. Nothing is displayed for functions the indoor unit is not equipped with.
4. “88” may be displayed to indicate the remote controller is resetting when returning to the normal mode.
5. If the setting mode to “Equipped”, heat reclaim ventilation fan conducts the fan residual operation by linking to indoor unit.

3.1.5 Applicable Range of Field setting

	Ceiling mounted cassette type		Slim ceiling mounted duct type	Ceiling mounted duct type	Ceiling suspended type	Wall mounted type	Floor standing type	Concealed floor standing type
	Multi flow							
	FXFQ	FXZQ	FXDQ	FXMQ	FXHQ	FXAQ	FXLQ	FXNQ
Filter sign	○	○	○	○	○	○	○	○
Ultra long-life filter sign	○	○	—	—	—	—	—	—
Remote controller thermostat sensor	○	○	○	○	○	○	○	○
Set fan speed when thermostat OFF	○	○	○	○	○	○	○	○
Airflow adjustment ceiling height	○	—	—	—	○	—	—	—
Airflow direction	○	○	—	—	—	—	—	—
Airflow direction adjustment (Down flow operation)	—	—	—	—	—	—	—	—
Airflow direction adjustment range	○	○	—	—	—	—	—	—
Field set fan speed selection	○	—	○*1	—	○	—	—	—

*1 Static pressure selection

3.1.6 Detailed Explanation of Setting Modes

(1) Filter Sign Setting

If switching the filter sign ON time, set as given in the table below.

Mode No.	First Code No.	Second Code No.	Standard	Long Life	Ultra Long Life	Setting
10 (20)	0	01	200 hrs.	2,500 hrs.	10,000 hrs.	Contamination Light
		02	100 hrs.	1,250 hrs.	5,000 hrs.	Contamination Heavy

(2) Ultra Long Life Filter Sign Setting

When a Ultra long-life filter is installed, the filter sign timer setting must be changed.

Mode No.	First Code No.	Second Code No.	Setting
10 (20)	1	01	Long-Life Filter
		02	Ultra Long-Life Filter

(3) Selection of Thermistor

Select the thermistor to control room temperature.

Mode No.	First Code No.	Second Code No.	Thermistor that controls room temperature
10 (20)	2	01	Indoor air thermistor for remote controller and suction air thermistor for indoor unit
		02	Suction air thermistor for indoor unit
		03	Thermistor for remote controller

The factory setting for the Second Code No. is "01" and room temperature is controlled by the indoor unit suction air thermistor and remote controller thermistor.

When the Second Code No. is set to "02", room temperature is controlled by the suction air thermistor.

When the Second Code No. is set to "03", room temperature is controlled by the remote controller thermistor.

(4) "Filter Cleaning" Displayed or Not Displayed

Whether or not to display "Filter Cleaning" after operation of certain duration can be selected.

Mode No.	First Code No.	Second Code No.	"Filter Cleaning" display
10 (20)	3	01	Display
		02	No display

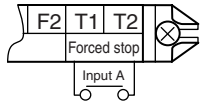
(5) Optional Output Switching

Using this setting, "operation output signal" and "abnormal output signal" can be provided. Output signal is output between terminals K1 and K2 of "customized wiring adaptor", an optional accessory.

Mode No.	First Code No.	Second Code No.	Remarks
12 (22)	0	01	Indoor unit thermostat ON/OFF signal is provided.
		03	Output linked with "Start/Stop" of remote controller is provided.
		04	In case of "Malfunction Display" appears on the remote controller, output is provided.

(6) External ON/OFF Input

This input is used for "ON/OFF operation" and "Protection device input" from the outside. The input is performed from the T1-T2 terminal of the operation terminal block (X1A) in the electric component box.



Mode No.	First Code No.	Second Code No.	Operation by input of the signal A
12 (22)	1	01	ON: Forced stop (prohibition of using the remote controller) OFF: Permission of using the remote controller
		02	OFF → ON: Permission of operation ON → OFF: Stop
		03	ON: Operation OFF: The system stops, then the applicable unit indicates "A0". The other indoor units indicate "U9".

(7) Thermostat Switching

Differential value during thermostat ON/OFF control can be changed.

Mode No.	First Code No.	Second Code No.	Differential value
12(22)	2	01	1.8°F
		02	0.9°F

(8) Airflow Setting when Heating Thermostat is OFF

This setting is used to set airflow when heating thermostat is OFF.

* When thermostat OFF airflow volume up mode is used, careful consideration is required before deciding installation location.

Mode No.	First Code No.	Second Code No.	Setting
12 (22)	3	01	LL airflow
		02	Preset airflow

(9) Setting of Operation Mode to "AUTO"

This setting makes it possible to change differential values for mode selection while in automatic operation mode.

Mode No.	First Code No.	Second Code No.							
		01	02	03	04	05	06	07	08
12 (22)	4	0°F	1.8°F	2.6°F	5.4°F	7.2°F	9.0°F	10.8°F	12.6°F

The automatic operation mode setting is made by the use of the "Operation Mode Selector" button.

(10) Auto Restart after Power Failure Reset

For the air conditioners with no setting for the function (same as factory setting), the units will be left in the stop condition when the power supply is reset automatically after power failure reset or the main power supply is turned on again after once turned off. However, for the air conditioners with the setting, the units may start automatically after power failure reset or the main power supply turned on again (return to the same operation condition as that of before power failure).

For the above reasons, when the unit is set enabling to utilize “Auto restart function after power failure reset”, utmost care should be paid for the occurrence of the following situation.

⚠ Caution

1. The air conditioner starts operation suddenly after power failure reset or the main power supply turned on again. Consequently, the user might be surprised (with question for the reason why).

2. In the service work, for example, turning off the main power switch during the unit is in operation, and turning on the switch again after the work is completed start the unit operation (the fan rotates).

(11) Airflow when Cooling Thermostat is OFF

This is used to set airflow to "LL airflow" when cooling thermostat is OFF.

Mode No.	First Code No.	Second Code No.	Setting
12 (22)	6	01	LL airflow
		02	Preset airflow

(12) Setting of Normal Airflow

Make the following setting according to the ceiling height. The setting position No. is set to “01” at the factory.

■ **In the Case of FXAQ, FXHQ**

Mode No.	First Code No.	Second Code No.	Setting
13(23)	0	01	Standard
		02	Slight increase
		03	Normal increase

■ **In the Case of FXFQ12~30**

Mode No.	First code No.	Second code No.	Setting	Ceiling height		
				4-way Outlets	3-way Outlets	2-way Outlets
13 (23)	0	01	Standard (N)	Lower than 8-29/32 ft	Lower than 9-29/32 ft	Lower than 11-1/2 ft
		02	High Ceiling (H)	Lower than 9-29/32 ft	Lower than 10-27/32 ft	Lower than 12-15/32 ft
		03	Higher Ceiling (S)	Lower than 11-1/2 ft	Lower than 11-1/2 ft	—

■ **In the Case of FXFQ36**

Mode No.	First code No.	Second code No.	Setting	Ceiling height		
				4-way Outlets	3-way Outlets	2-way Outlets
13 (23)	0	01	Standard (N)	Lower than 10-1/2 ft	Lower than 11-12/18 ft	Lower than 13-25/32 ft
		02	High Ceiling (H)	Lower than 11-12/18 ft	Lower than 13-1/8 ft	Lower than 13-25/32 ft
		03	Higher Ceiling (S)	Lower than 13-25/32 ft	Lower than 13-25/32 ft	—

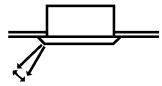
(13) Airflow Direction Setting

Set the airflow direction of indoor units as given in the table below. (Set when optional air outlet blocking pad has been installed.) The second code No. is factory setting to “01.”

Mode No.	First Code No.	Second Code No.	Setting
13 (23)	1	01	F : 4-direction airflow
		02	T : 3-direction airflow
		03	W : 2-direction airflow

(14) Setting of Airflow Direction Adjustment Range

Make the following airflow direction setting according to the respective purpose.



Mode No.	First Code No.	Second Code No.	Setting
13 (23)	4	01	Upward (Draft prevention)
		02	Standard
		03	Downward (Ceiling soiling prevention)

* Some indoor unit models are not equipped with draft prevention (upward) function.

(15) Setting of the Static Pressure Selection (for FXDQ model)

Model No.	First Code No.	Second Code No.	External static pressure
13 (23)	5	01	Standard (0.002psi)
		02	High static pressure (0.006psi)

(16) Humidification when Heating Thermostat is OFF

Setting to "Humidification Setting" turns ON the humidifier if suction temperature is 68°F or above and turns OFF the humidifier if suction temperature is 64°F or below when the heating thermostat is OFF.

Mode No.	First Code No.	Second Code No.	Setting
15 (25)	1	01	—
		02	Setting of humidifier

(17) Setting of Direct Duct Connection

This is used when "fresh air intake kit equipped with fan" is connected. The indoor fan carries out residual operation for one minute after the thermostat is stopped. (For the purpose of preventing dust on the air filter from falling off.)

Mode No.	First Code No.	Second Code No.	Contents
15 (25)	2	01	Without direct duct connection
		02	With direct duct connection equipped with fan

(18) Interlocked Operation between Humidifier and Drain Pump

This is used to interlock the humidifier with the drain pump. When water is drained out of the unit, this setting is unnecessary.

Mode No.	First Code No.	Second Code No.	Contents
15 (25)	3	01	Individual operation of humidifier
		02	Interlocked operation between humidifier and drain pump

(19) Individual Setting of Ventilation

This is set to perform individual operation of heat reclaim ventilation using the remote controller/central unit when heat reclaim ventilation is built in.
(Switch only when heat reclaim ventilation is built in.)

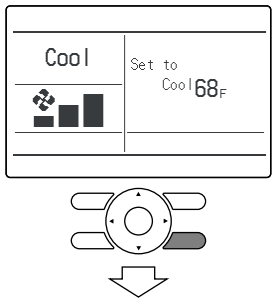
Mode No.	First Code No.	Second Code No.	Contents
15 (25)	5	01	—
		02	Individual operation of ventilation

3.1.7 Centralized Control Group No. Setting

BRC1E Type

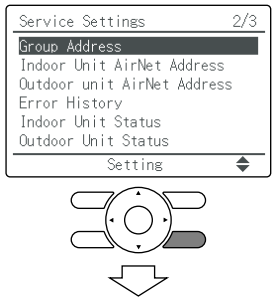
In order to conduct the centralized remote control using the centralized remote controller and the unified ON/OFF controller, Group No. settings should be made by group using the operating remote controller.
Make Group No. settings for centralized remote control using the operating remote controller.

(1) <Basic screen>



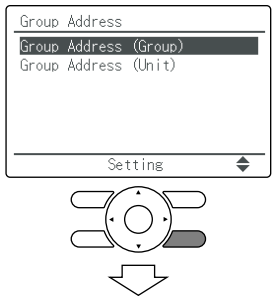
1. Press and hold Cancel button for 4 seconds or more.
   Service Settings menu in displayed.

(2) <Service Settings menu screen>



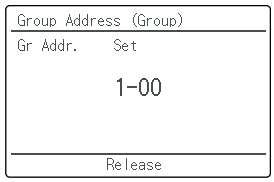
2. Select Group Address , and press Menu/OK button.
   Group Address screen is displayed.

(3) <Group Address>



3. Select Group Address (Group), and press Menu/OK button.
   Group Address (Group) screen is displayed.

(3) <Group Address (Group)>



4. Select the group No. by using ▲▼ (Up/Down) button.
   Press Menu/OK button.

Notes:

- For wireless remote controller, see the following.
- For setting group No. of HRV and wiring adaptor for other air conditioners, refer to the instruction manual attached.

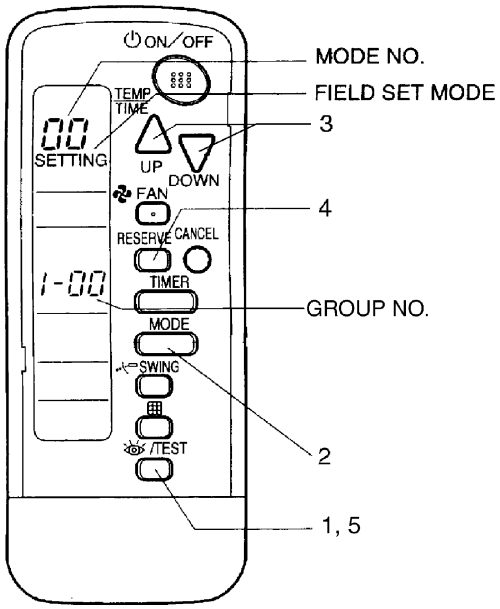
NOTICE

Enter the group No. and installation place of the indoor unit into the attached installation table. Be sure to keep the installation table with the operation manual for maintenance.

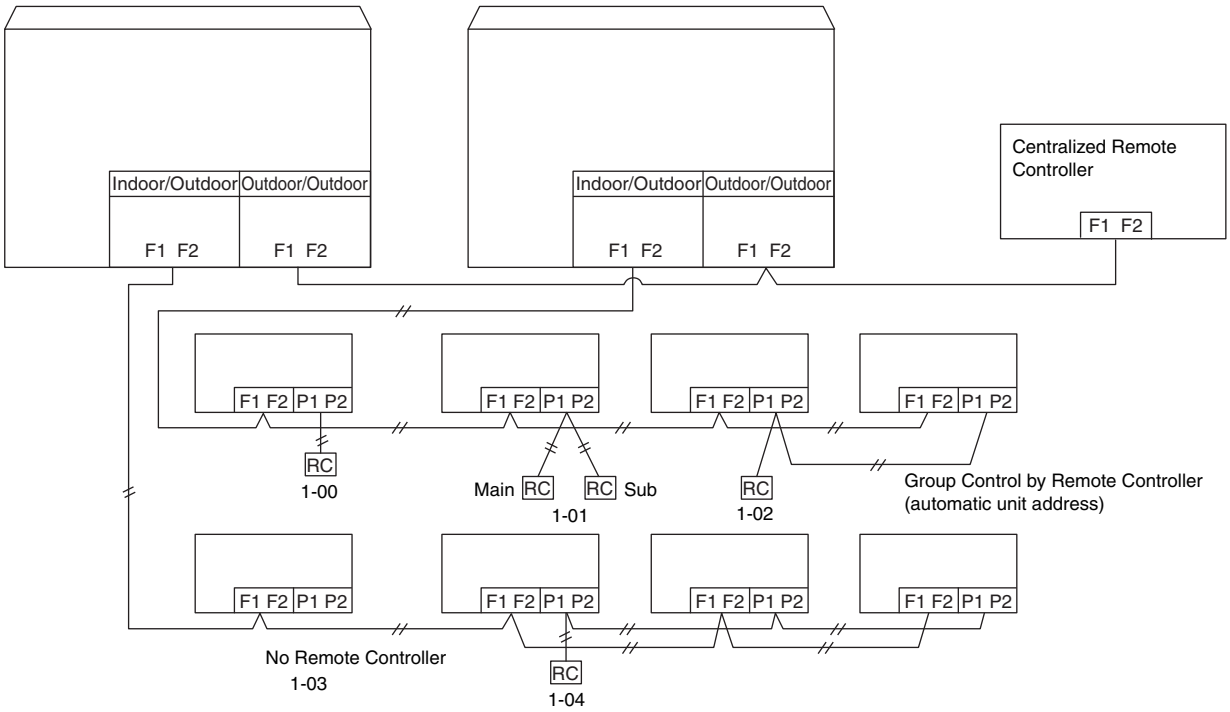
BRC7C Type / BRC7E Type / BRC4C Type

■ Group No. setting by wireless remote controller for centralized control

1. When in the normal mode, push " /TEST " button for 4 seconds or more, and operation then enters the "field set mode."
2. Set mode No. "00" with " MODE " button.
3. Set the group No. for each group with " UP " " DOWN " button (advance/backward).
4. Enter the selected group numbers by pushing " RESERVE " button.
5. Push " /TEST " button and return to the normal mode.



Group No. Setting Example



Caution

When turning the power supply on, the unit may often not accept any operation while "88" is displaying after all indications were displayed once for about 1 minute on the liquid crystal display. This is not an operative fault.

3.1.8 Setting of Operation Control Mode from Remote Controller (Local Setting)

The operation control mode is compatible with a variety of controls and operations by limiting the functions of the operation remote controller. Furthermore, operations such as remote controller ON/OFF can be limited in accordance with the combination conditions. (Refer to information in the next page.)
Centralized remote controller is normally available for operations. (Except when centralized monitor is connected)

3.1.9 Contents of Control Modes

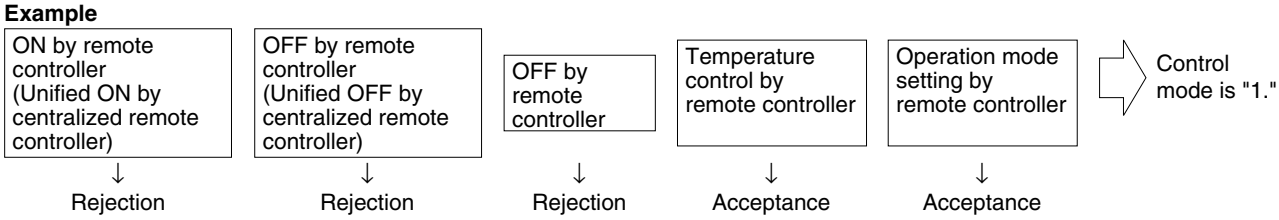
Twenty modes consisting of combinations of the following five operation modes with temperature and operation mode setting by remote controller can be set and displayed by operation modes 0 through 19.

- ON/OFF control impossible by remote controller
  Used when you want to turn on/off by centralized remote controller only.
  (Cannot be turned on/off by remote controller.)
- OFF control only possible by remote controller
  Used when you want to turn on by centralized remote controller only, and off by remote controller only.
- Centralized
  Used when you want to turn on by centralized remote controller only, and turn on/off freely by remote controller during set time.
- Individual
  Used when you want to turn on/off by both centralized remote controller and remote controller.
- Timer operation possible by remote controller
  Used when you want to turn on/off by remote controller during set time and you do not want to start operation by centralized remote controller when time of system start is programmed.

How to Select Operation Mode

Whether operation by remote controller will be possible or not for turning on/off, controlling temperature or setting operation mode is selected and decided by the operation mode given on the right edge of the table below.

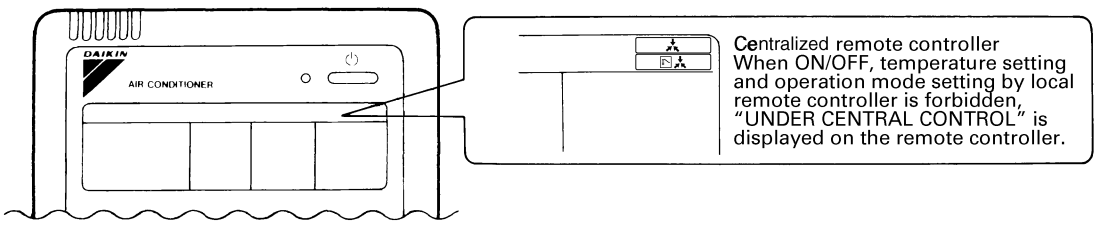
Example



Control mode	Control by remote controller					Control mode
	Operation		OFF	Temperature control	Operation mode setting	
	Unified operation, individual operation by centralized remote controller, or operation controlled by timer	Unified OFF, individual stop by centralized remote controller, or timer stop				
ON/OFF control impossible by remote controller	Rejection (Example)	Rejection (Example)	Rejection (Example)	Rejection	Acceptance	0
					Rejection	10
				Acceptance (Example)	Acceptance (Example)	1(Example)
					Rejection	11
OFF control only possible by remote controller			Acceptance	Rejection	Acceptance	2
					Rejection	12
				Acceptance	Acceptance	3
					Rejection	13
Centralized	Acceptance			Rejection	Acceptance	4
					Rejection	14
				Acceptance	Acceptance	5
					Rejection	15
Individual		Acceptance		Rejection	Acceptance	6
					Rejection	16
				Acceptance	Acceptance	7 ∗1
					Rejection	17
Timer operation possible by remote controller	Acceptance (During timer at ON position only)	Acceptance (During timer at ON position only)		Rejection	Acceptance	8
					Rejection	18
				Acceptance	Acceptance	9
					Rejection	19

Do not select “timer operation possible by remote controller” if not using a remote controller. Operation by timer is impossible in this case.

∗1. Factory setting



3.2 Field Setting from Outdoor Unit

3.2.1 Setting by Dip Switches

The following field settings are made by dip switches on PCB.

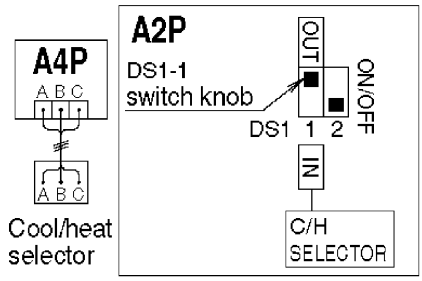
Dipswitch		Setting item	Description
No.	Setting		
DS1-1	ON	Cool / Heat change over setting	Used to set cool / heat change over setting by remote controller equipped with outdoor unit.
	OFF (Factory setting)		
DS1-2	ON	Not used	Do not change the factory settings.
	OFF (Factory setting)		

Cool/heat selector connection procedure

- Set the remote controller only when changing over the operation mode between cooling and heating using the remote controller installed in the outdoor.

① Connect the cool/heat selector (optional accessory) to the terminals (A, B and C) on the outdoor PC board (A4P).

② Set the cool/heat selector switch DS1-1 from "IN (inside) " (which is selected at the factory before shipment) to "OUT (outside) ".



Caution

DIP switch Setting after changing the main PCB(A1P) to spare parts PCB

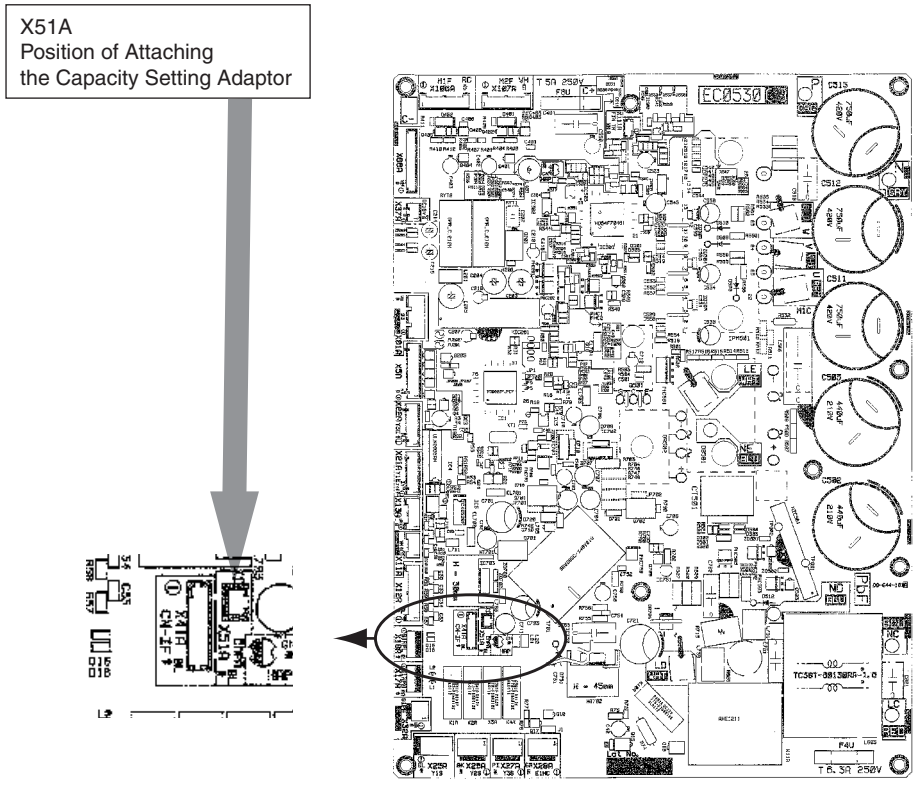
When you change the main PCB(A1P) to spare parts PCB, please carry out the following setting.

Please Attach the Capacity Setting Adaptor corresponding to Capacity Class (ex. 112, 140, 160) in connector X51A. (See Below)

Capacity Setting Adaptor

	Capacity Class	Note
①	4 (112)	CAPACITY SETTING ADAPTOR (for 100/J112)
②	5 (140)	CAPACITY SETTING ADAPTOR (for 125/J140)
③	6 (160)	CAPACITY SETTING ADAPTOR (for 140/J160)

Position of Attaching the Capacity Setting Adaptor

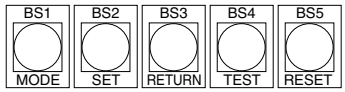


■ **Setting by push button switches**

The following settings are made by push button switches on PCB.

	H1P	H2P	H3P	H4P	H5P	H6P	H7P
LED indication	●	●	○	●	●	●	●

(Factory setting)



There are the following three setting modes.

① **Setting mode 1 (H1P off)**

Initial status (when normal) : Also indicates during “abnormal”.

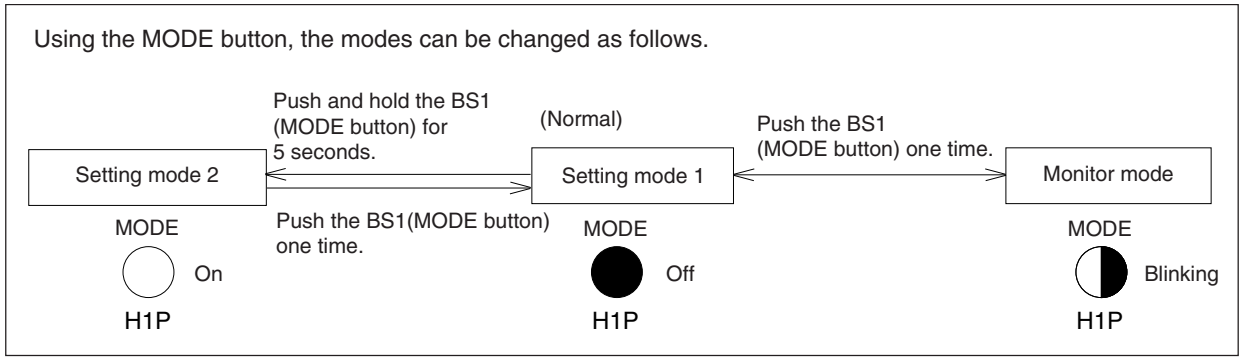
② **Setting mode 2 (H1P on)**

Used to modify the operating status and to set program addresses, etc. Usually used in servicing the system.

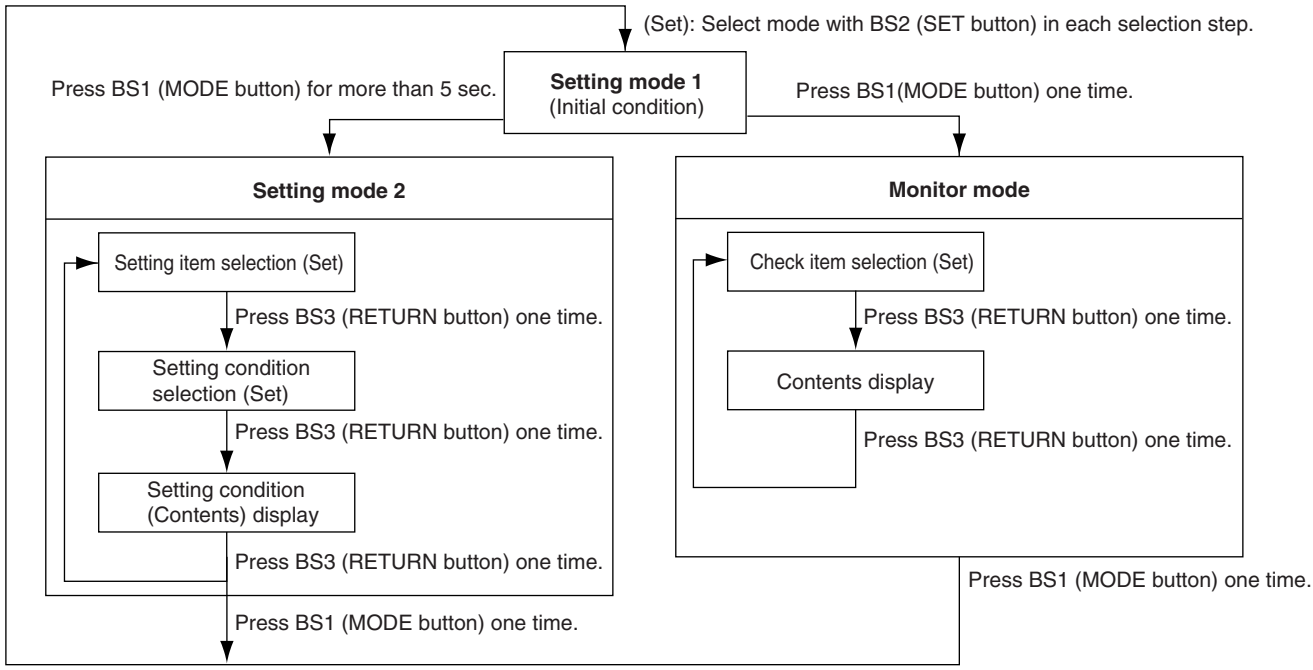
③ **Monitor mode (H1P blinks)**

Used to check the program made in Setting mode 2.

■ **Mode changing procedure**



■ **Mode changing procedure**

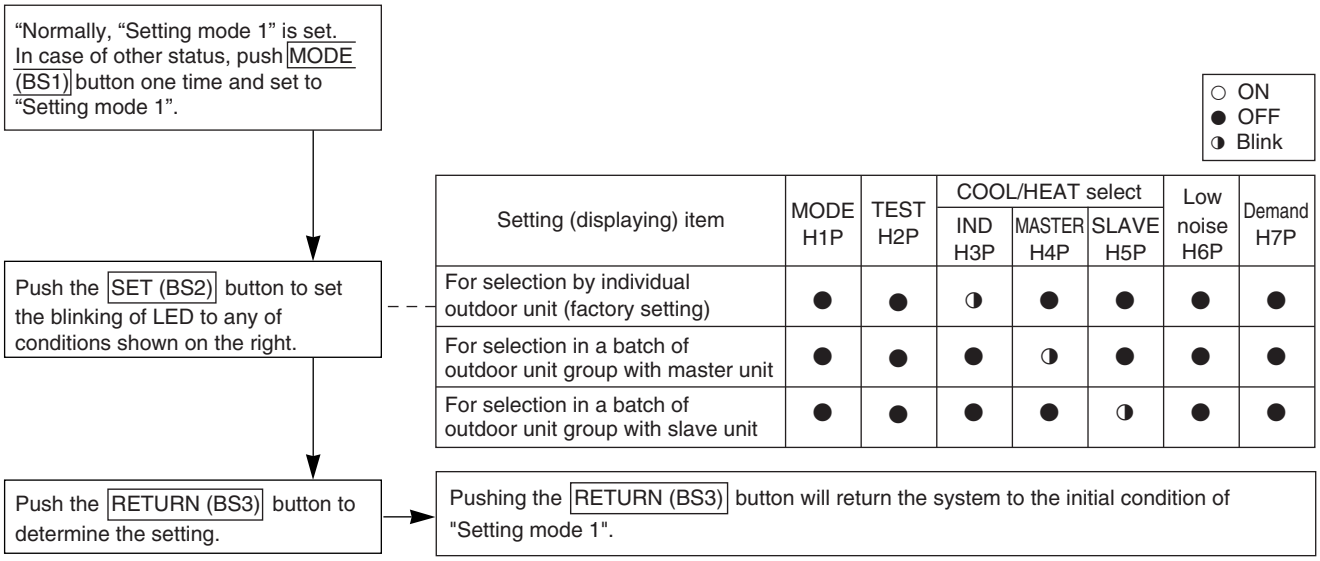


a. “Setting mode 1”

This mode is used to set and check the following items.

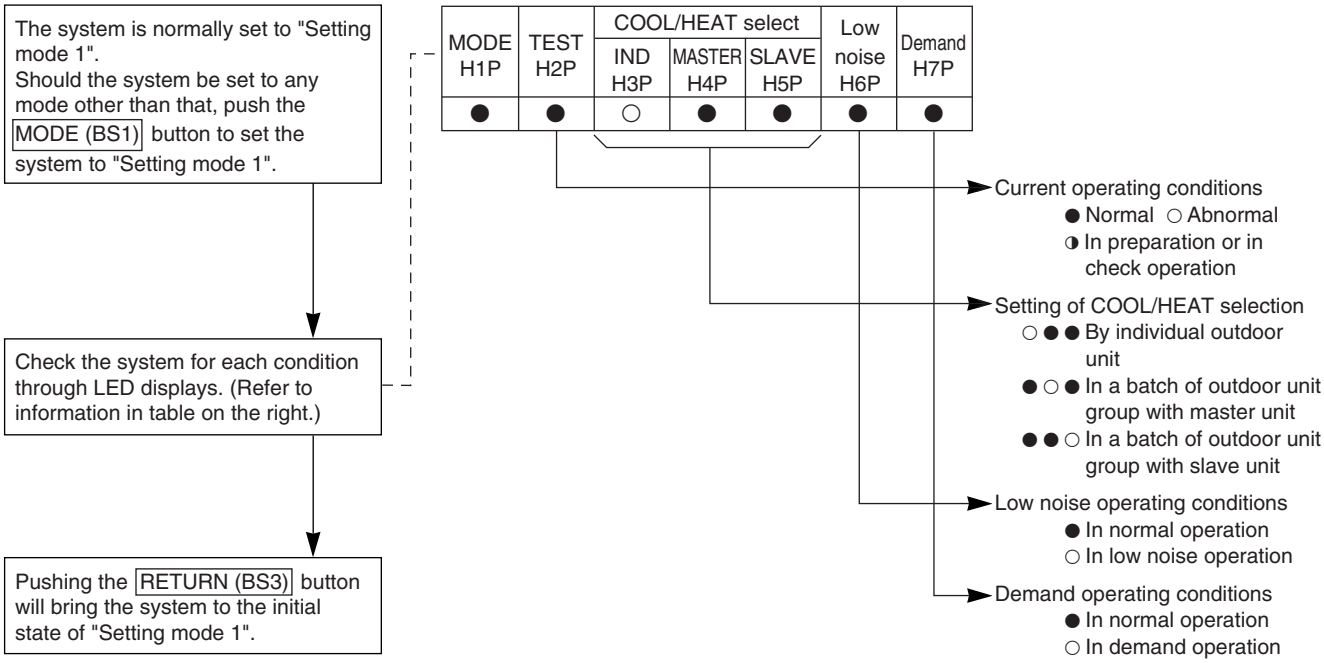
1. Set items ····· In order to make COOL/HEAT selection in a batch of outdoor unit group, change the setting.
   - • COOL/HEAT selection (IND) ····· Used to select COOL or HEAT by individual outdoor unit (factory setting).
   - • COOL/HEAT selection (MASTER) ····· Used to select COOL or HEAT by outdoor unit group with the master unit.
   - • COOL/HEAT selection (SLAVE)····· Used to select COOL or HEAT by outdoor unit group with the slave unit.
2. Check items ····· The following items can be checked.
   - (1) Current operating conditions (Normal / Abnormal / In check operation)
   - (2) Setting conditions of COOL/HEAT selection (Individual / Batch master / Batch slave)
   - (3) Low noise operating conditions (In normal operation / In low noise operation)
   - (4) Demand operating conditions (In normal operation / In demand operation)

Procedure for changing COOL/HEAT selection setting



Setting (displaying) item	MODE H1P	TEST H2P	COOL/HEAT select			Low noise H6P	Demand H7P
			IND H3P	MASTER H4P	SLAVE H5P		
For selection by individual outdoor unit (factory setting)	●	●	◑	●	●	●	●
For selection in a batch of outdoor unit group with master unit	●	●	●	◑	●	●	●
For selection in a batch of outdoor unit group with slave unit	●	●	●	●	◑	●	●

Procedure for checking check items



b. “Setting mode 2”

Push and hold the MODE (BS1) button for 5 seconds and set to “Setting mode 2”.

<Selection of setting items>

Push the SET (BS2) button and set the LED display to a setting item shown in the table on the right.
↓
Push the RETURN (BS3) button and decide the item. (The present setting condition is blinked.)

<Selection of setting conditions>

Push the SET (BS2) button and set to the setting condition you want.
↓
Push the RETURN (BS3) button and decide the condition.

Push the RETURN (BS3) button and set to the initial status of “Setting mode 2”.

∗ If you become unsure of how to proceed, push the MODE (BS1) button and return to setting mode 1.

No.	Setting item	Description
1	Cool/heat unified address	Sets address for cool/heat unified operation.
2	Low noise/demand address	Address for low noise/demand operation
3	Test operation settings	Used to conduct test operation without making changes to the PCB and replacing the refrigerant, after the completion of maintenance.
5	Indoor unit forced fan H	Allows forced operation of indoor unit fan while unit is stopped. (H tap)
6	Indoor unit forced operation	Allows forced operation of indoor unit.
8	Te setting	Target evaporation temperature for cooling
9	Tc setting	Target condensation temperature for heating
10	Defrost changeover setting	Changes the temperature condition for defrost and sets to quick defrost or slow defrost.
12	External low noise setting / Demand setting	Reception of external low noise or demand signal
13	AIRNET address	Set address for AIRNET.
16	Setting of hot water heater	Make this setting to conduct heating operation with hot water heater.
20	Additional refrigerant charge operation setting	Carries out additional refrigerant charge operation.
21	Refrigerant recovery / vacuuming mode setting	Sets to refrigerant recovery or vacuuming mode.
22	Night-time low noise setting	Sets automatic nighttime low noise operation in a simple way. The operating time is based on “Starting set” and “Ending set”.
25	Setting of external low noise level	Sets low noise level when the low noise signal is input from outside.
26	Night-time low noise operation start setting	Sets starting time of nighttime low noise operation. (Night-time low noise setting is also required.)
27	Night-time low noise operation end setting	Sets ending time of nighttime low noise operation. (Night-time low noise setting is also required.)
28	Power transistor check mode ∗Check after disconnection of compressor wires	Used for trouble diagnosis of DC compressor. Since the waveform of inverter is output without wiring to the compressor, it is convenient to probe whether the trouble comes from the compressor or PCB.
29	Capacity priority setting	If the capacity control is required, the low noise control is automatically released by this setting during carrying out low noise operation and nighttime low noise operation.
30	Demand setting 1	Changes target value of power consumption when demand control 1 is input.
32	Normal demand setting	Normally enables demand control 1 without external input. (Effective to prevent a problem when a circuit breaker of small capacity is shut down due to large load.)

The numbers in the "No." column represent the number of times to press the SET (BS2) button.

No.	Setting item display								Setting condition display			
	Setting item	MODE H1P	TEST H2P	C/H selection			Low noise H6P	Demand H7P				
				IND H3P	Master H4P	Slave H5P						✻ Factory setting
1	Cool / Heat Unified address	○	●	●	●	●	●	○	Address (6 digits) Binary number	0 1 ~ 31	○●●●●●● ○●●●●●○ ○●○○○○○	✻
2	Low noise/demand address	○	●	●	●	●	○	●	Address (6 digits) Binary number	0 1 ~ 31	○●●●●●● ○●●●●●○ ○●○○○○○	✻
3	Test operation settings	○	●	●	●	●	○	○	Test operation : OFF Test operation : ON		○●●●●●○ ○●●●●○●	✻
5	Indoor unit forced fan H	○	●	●	●	○	●	○	Normal operation Indoor forced fan H		○●●●●●○ ○●●●●○●	✻
6	Indoor unit forced operation	○	●	●	●	○	○	●	Normal operation Indoor forced operation		○●●●●●○ ○●●●●○●	✻
8	Te setting	○	●	●	○	●	●	●	High Normal (factory setting) Low		○●●●○●● ○●●●●○● ○●●●●●○	✻
9	Tc setting	○	●	●	○	●	●	○	High Normal (factory setting) Low		○●●●○●● ○●●●●○● ○●●●●●○	✻
10	Defrost changeover setting	○	●	●	○	●	○	●	Quick defrost Normal (factory setting) Slow defrost		○●●●○●● ○●●●●○● ○●●●●●○	✻
12	External low noise setting/demand setting	○	●	●	○	○	●	●	External low noise/demand: NO External low noise/demand: YES		○●●●●●○ ○●●●●○●	✻
13	AIRNET address	○	●	●	○	○	●	○	Address (6 digits) Binary number	0 1 ~ 63	○●●●●●● ○●●●●●○ ○○○○○○○	✻
16	Setting of hot water heater	○	●	○	●	●	●	●	OFF ON		○●●●●●○ ○●●●●○●	✻
20	Additional refrigerant charge operation setting	○	●	○	●	○	●	●	Refrigerant charging: OFF Refrigerant charging: ON		○●●●●●○ ○●●●●○●	✻
21	Refrigerant recovery / vacuuming mode setting	○	●	○	●	○	●	○	Refrigerant recovery / vacuuming: OFF Refrigerant recovery / vacuuming: ON		○●●●●●○ ○●●●●○●	✻
22	Night-time low noise setting	○	●	○	●	○	○	●	OFF Level 1 (outdoor fan with 6 step or lower) Level 2 (outdoor fan with 5 step or lower) Level 3 (outdoor fan with 4 step or lower)		○●●●●●● ○●●●●●○ ○●●●●○● ○●●●●○○	✻

The numbers in the "No." column represent the number of times to press the SET (BS2) button.

No.	Setting item display								Setting condition display
	Setting item	MODE H1P	TEST H2P	C/H selection			Low noise H6P	Demand H7P	✻ Factory setting
				IND H3P	Master H4P	Slave H5P			
25	Setting of external low noise setting	○	●	○	○	●	●	○	Level 1 (outdoor fan with 6 step or lower) ○●●●●●○ Level 2 (outdoor fan with 5 step or lower) ○●●●●○● ✻ Level 3 (outdoor fan with 4 step or lower) ○●●●○●●
26	Night-time low noise operation start setting	○	●	○	○	●	○	●	About 20:00 ○●●●●●○ About 22:00 (factory setting) ○●●●●○● ✻ About 24:00 ○●●●○●●
27	Night-time low noise operation end setting	○	●	○	○	●	○	○	About 6:00 ○●●●●●○ About 7:00 ○●●●●○● About 8:00 (factory setting) ○●●●○●● ✻
28	Power transistor check mode	○	●	○	○	○	●	●	OFF ○●●●●●○ ✻ ON ○●●●●○●
29	Capacity priority setting	○	●	○	○	○	●	○	OFF ○●●●●●○ ✻ ON ○●●●●○●
30	Demand setting 1	○	●	○	○	○	○	●	60 % demand ○●●●●●○ 70 % demand ○●●●●○● ✻ 80 % demand ○●●●○●●
32	Normal demand setting	○	○	●	●	●	●	●	OFF ○●●●●●○ ✻ ON ○●●●●○●

The numbers in the "No." column represent the number of times to press the SET (BS2) button.

c. Monitor mode

To enter the monitor mode, push the MODE (BS1) button when in "Setting mode 1".

<Selection of setting item>

Push the SET (BS2) button and set the LED display to a setting item.

<Confirmation on setting contents>

Push the RETURN (BS3) button to display different data of set items.

Push the RETURN (BS3) button and switches to the initial status of "Monitor mode".

∗ Push the MODE (BS1) button and returns to "Setting mode 1".

No.	Setting item	LED display							Data display
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	
0	Various setting	◑	●	●	●	●	●	●	See below
1	C/H unified address	◑	●	●	●	●	●	○	Lower 6 digits
2	Low noise/demand address	◑	●	●	●	●	○	●	
3	Not used	◑	●	●	●	●	○	○	
4	AIRNET address	◑	●	●	●	○	●	●	
5	Number of connected indoor units	◑	●	●	●	○	●	○	
7	Number of connected zone units (excluding outdoor and BS unit)	◑	●	●	●	○	○	○	
8	Number of outdoor units	◑	●	●	○	●	●	●	
11	Number of zone units (excluding outdoor and BS unit)	◑	●	●	○	●	○	○	Lower 6 digits
12	Number of terminal blocks	◑	●	●	○	○	●	●	Lower 4 digits: upper
13	Number of terminal blocks	◑	●	●	○	○	●	○	Lower 4 digits: lower
14	Contents of malfunction (the latest)	○	●	●	○	○	○	●	Malfunction code table Refer to P.103.
15	Contents of malfunction (1 cycle before)	○	●	●	○	○	○	○	
16	Contents of malfunction (2 cycle before)	○	●	○	●	●	●	●	
20	Contents of retry (the latest)	○	●	○	●	○	●	●	
21	Contents of retry (1 cycle before)	○	●	○	●	○	●	○	
22	Contents of retry (2 cycle before)	○	●	○	●	○	○	●	
25	Normal judgement of outdoor units PCB	◑	●	○	○	●	●	○	Lower 2 digits: ○● Abnormal ●○ Normal ●● Unjudgement

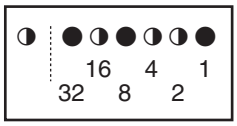
The numbers in the "No." column represent the number of times to press the SET (BS2) button.

Setting item 0 Display contents of "Various setting"

EMG operation / backup operation setting	ON	◑	●	●	○	●	●	●
	OFF	◑	●	●	●	●	●	●
Defrost select setting	Short	◑	●	●	●	○	●	●
	Medium	◑	●	●	●	◑	●	●
	Long	◑	●	●	●	●	●	●
Te setting	H	◑	●	●	●	●	○	●
	M	◑	●	●	●	●	◑	●
	L	◑	●	●	●	●	●	●
Tc setting	H	◑	●	●	●	●	●	○
	M	◑	●	●	●	●	●	◑
	L	◑	●	●	●	●	●	●

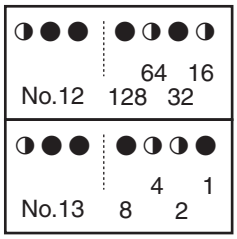
Push the SET button and match with the LEDs No. 1 - 15, push the RETURN button, and confirm the data for each setting.

★ Data such as addresses and number of units is expressed as binary numbers; the two ways of expressing are as follows:



The No. 1 cool/heat unified address is expressed as a binary number consisting of the lower 6 digits. (0 - 63)

In ① the address is 010110 (binary number), which translates to 16 + 4 + 2 = 22 (base 10 number). In other words, the address is 22.



The number of terminal blocks for No. 12 and 13 is expressed as an 8-digit binary number, which is the combination of four upper, and four lower digits for No. 12 and 13 respectively. (0 - 128)
In ② the address for No. 12 is 0101, the address for No. 13 is 0110, and the combination of the two is 01010110 (binary number), which translates to 64 + 16 + 4 + 2 = 86 (base 10 number). In other words, the number of terminal block is 86.

★ See the preceding page for a list of data, etc. for No. 0 - 25.

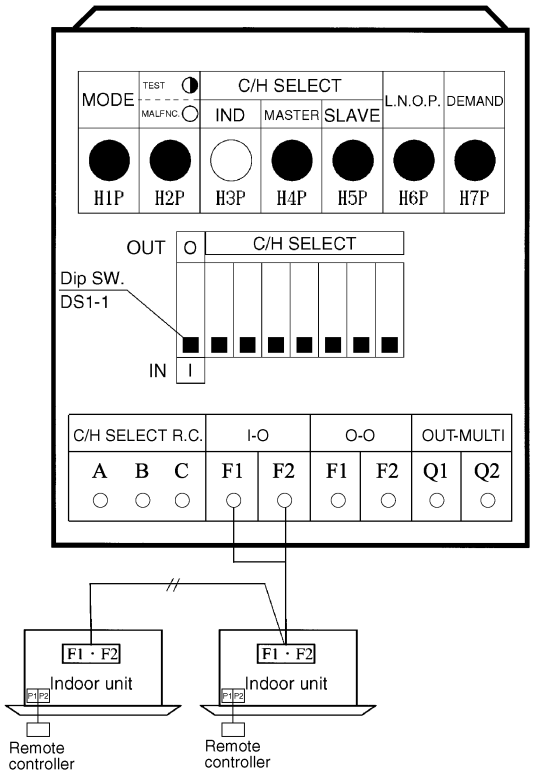
3.2.2 Cool / Heat Mode Switching

There are the following 4 cool/heat switching modes.

① Set cool/heat separately for each outdoor unit system by indoor unit remote controller.
② Set cool/heat separately for each outdoor unit system by cool/heat switching remote controller.
③ Set cool/heat for more than one outdoor unit system simultaneously in accordance with unified master outdoor unit by indoor unit remote controller.
④ Set cool/heat for more than one outdoor unit system simultaneously in accordance with unified master outdoor unit by cool/heat switching remote controller.

① Set Cool / Heat Separately for Each Outdoor Unit System by Indoor Unit Remote Controller

- ◆ It does not matter whether or not there is outdoor - outdoor unit wiring.
- ◆ Set outdoor unit PCB DS1-1 to IN (factory setting).
- ◆ Set cool/heat switching to IND (individual) for “Setting mode 1” (factory setting).



<Set the master unit (= indoor unit having the right to select the cooling/heating operation mode).>

In the case of wired remote controllers

- After the check operation, **“CHANGEOVER UNDER CONTROL”** is flashing in all connected remote controllers.
- Select an indoor unit to be used as the master unit in accordance with the request from the customer. (It is recommended to select an indoor unit which will be used most often as the master unit.)
- Press the operation mode selector button in the remote controller of the indoor unit selected as the master unit.
- In that remote controller, **“CHANGEOVER UNDER CONTROL”** disappears. That remote controller will control changeover of the cooling/heating operation mode.
- In other remote controllers, **“CHANGEOVER UNDER CONTROL”** lights.

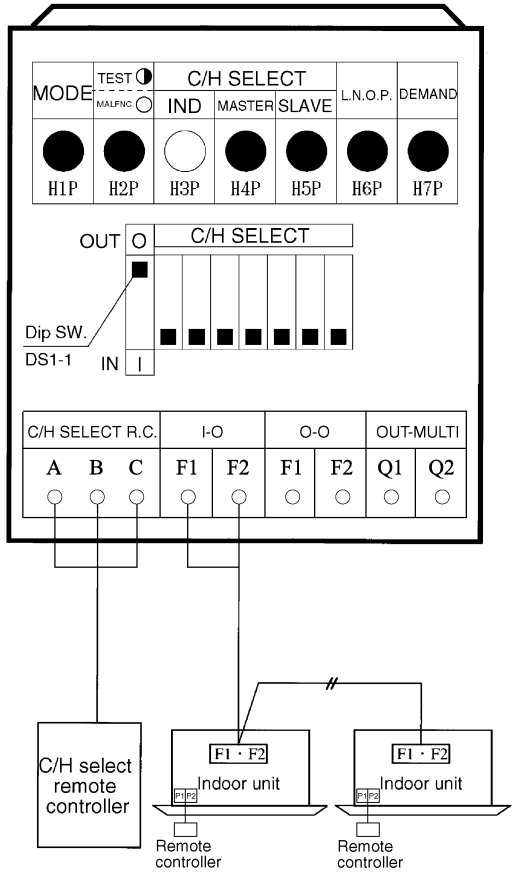
For the details, refer to the installation manual supplied together with the indoor unit.

In the case of wireless remote controllers

- After the check operation, the timer lamp is flashing in all connected indoor units.
- Select an indoor unit to be used as the master unit in accordance with the request from the customer. (It is recommended to select an indoor unit which will be used most often as the master unit.)
- Press the operation selector mode button in the remote controller of the indoor unit selected as the master unit. A “peep” sound is emitted, and the timer lamp turns off in all indoor units.
- That indoor unit will control changeover of the cooling/heating operation mode.

② **Set Cool / Heat Separately for Each Outdoor Unit System by Cool/Heat Switching Remote Controller**

- ◆ It does not matter whether or not there is outdoor - outdoor unit wiring.
- ◆ Set outdoor unit PCB DS1-1 to OUT (factory setting).
- ◆ Set cool/heat switching to IND (individual) for “Setting mode 1” (factory setting).



3.2.3 Setting of Low Noise Operation and Demand Operation

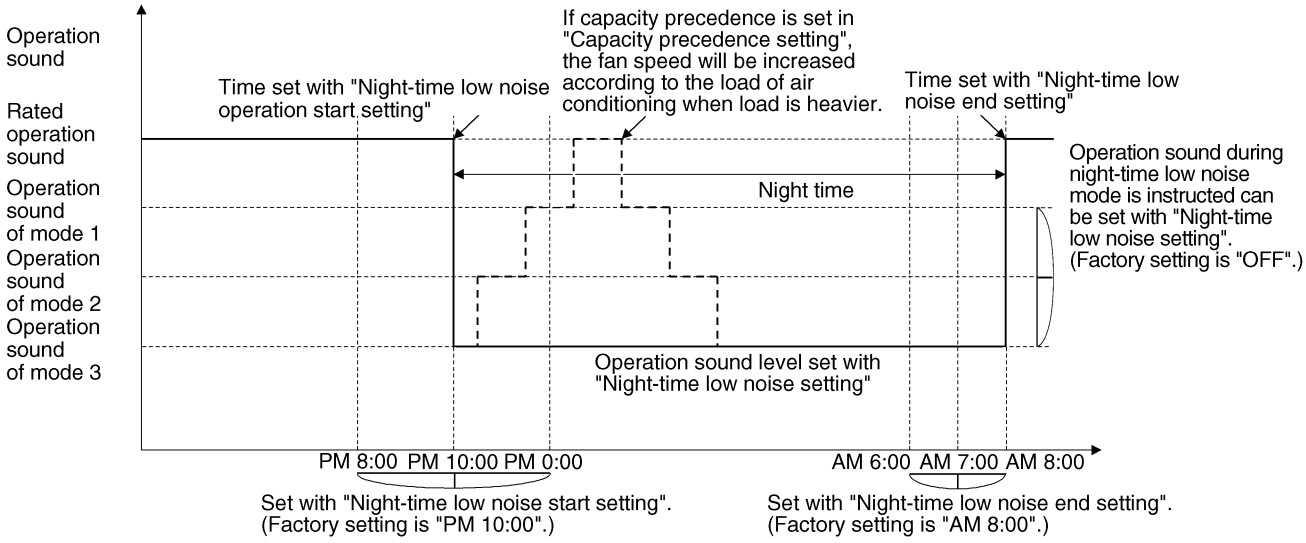
Setting of Low Noise Operation

By connecting the external contact input to the low noise input of the outdoor unit external control adaptor (optional), you can lower operating noise by 2-3 dB.

When the low noise operation is carried out automatically at night (The external control adaptor for outdoor unit is not required)

1. While in "Setting mode 2", select the setting condition (i.e., "Mode 1", "Mode 2", or "Mode 3") for set item No. 22 (Setting of nighttime low noise level).
2. If necessary, while in "Setting mode 2", select the setting condition (i.e., "20:00", "22:00", or "24:00") for set item No. 26 (Setting of start time of nighttime low noise operation).
   (Use the start time as a guide since it is estimated according to outdoor temperatures.)
3. If necessary, while in "Setting mode 2", select the setting condition (i.e., "06:00", "07:00", or "08:00") for set item No. 27 (Setting of end time of nighttime low noise operation).
   (Use the end time as a guide since it is estimated according to outdoor temperatures.)
4. If necessary, while in "Setting mode 2", set the setting condition for set item No. 29 (Capacity priority setting) to "ON".
   (If the condition is set to "ON", when the air conditioning load reaches a high level, the system will be put into normal operation mode even during nighttime.)

Image of operation



Setting of Demand Operation

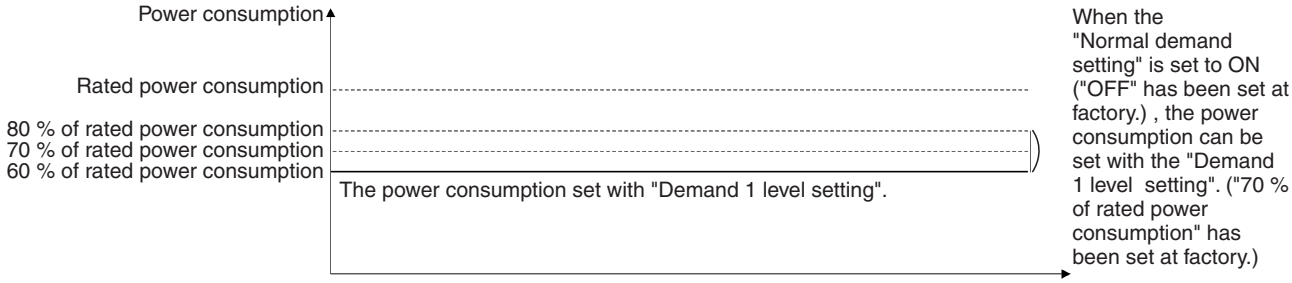
By connecting the external contact input to the demand input of the outdoor unit external control adaptor (optional), the power consumption of unit operation can be saved suppressing the compressor operating condition.

Set item	Condition	Content
Demand	Mode 1	The compressor operates at approx. 60% or less of rating.
	Mode 2	The compressor operates at approx. 70% or less of rating.
	Mode 3	The compressor operates at approx. 80% or less of rating.

When the normal demand operation is carried out. (Use of the external control adaptor for outdoor unit is not required.)

1. While in "Setting mode 2", make setting of the set item No. 32 (Setting of alternate demand) to "ON".
2. While in "Setting mode 2", select the set item No. 30 (Setting of Demand 1 level) and then set the setting condition to targeted mode.

Image of operation



Detailed Setting Procedure of Low Noise Operation and Demand Control

1. Setting mode 1 (H1P off)

① In setting mode 2, push the BS1 (MODE button) one time. → Setting mode 1 is entered and H1P off. During the setting mode 1 is displayed, “In low noise operation” and “In demand control” are displayed.

2. Setting mode 2 (H1P on)

① In setting 1, push and hold the BS1 (MODE button) for more than 5 seconds. → Setting mode 2 is entered and H1P lights.
② Push the BS2 (SET button) several times and match the LED display with the Setting No. you want.
③ Push the BS3 (RETURN button) one time, and the present setting content is displayed.
→ Push the BS2 (SET button) several times and match the LED display with the setting content (as shown on next page) you want.
④ Push the BS3 (RETURN button) two times. → Returns to ①.
⑤ Push the BS1 (MODE button) one time. → Returns to the setting mode 1 and turns H1P off.

○: ON ●: OFF ◑: Blink

Setting No.	Setting contents	Setting No. indication							Setting No. indication							Setting contents	Setting contents indication (Initial setting)						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P		H1P	H2P	H3P	H4P	H5P	H6P	H7P
12	External low noise setting / Demand setting	○	●	●	●	●	●	●	○	●	●	○	○	●	●	NO (Factory setting)	○	●	●	●	●	●	◑
																YES	○	●	●	●	●	◑	●
22	Night-time low noise setting								○	●	○	●	○	○	●	OFF (Factory setting)	○	●	●	●	●	●	●
																Mode 1	○	●	●	●	●	●	◑
																Mode 2	○	●	●	●	●	◑	●
																Mode 3	○	●	●	●	●	◑	◑
26	Night-time low noise start setting								○	●	○	○	●	○	●	PM 8:00	○	●	●	●	●	●	◑
																PM 10:00 (Factory setting)	○	●	●	●	●	◑	●
																PM 0:00	○	●	●	●	◑	●	●
27	Night-time low noise end setting								○	●	○	○	●	○	○	AM 6:00	○	●	●	●	●	●	◑
																AM 7:00	○	●	●	●	●	◑	●
																AM 8:00 (Factory setting)	○	●	●	●	◑	●	●
29	Capacity priority setting								○	●	○	○	○	●	○	Low noise priority (Factory setting)	○	●	●	●	●	●	◑
																Capacity priority	○	●	●	●	●	◑	●
30	Demand setting 1								○	●	○	○	○	○	●	60 % of rated power consumption	○	●	●	●	●	●	◑
																70 % of rated power consumption (Factory setting)	○	●	●	●	●	◑	●
																80 % of rated power consumption	○	●	●	●	◑	●	●
32	Normal demand setting								○	●	●	●	●	●	●	OFF (Factory setting)	○	●	●	●	●	●	◑
																ON	○	●	●	●	●	◑	●

Setting mode indication section

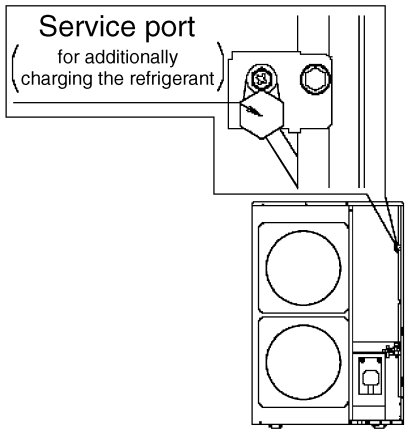
Setting No. indication section

Set contents indication section

3.2.4 Setting of Refrigerant Additional Charging Operation

*** When the outdoor unit is stopped and the entire quantity of refrigerant cannot be charged from the stop valve on the liquid side, make sure to charge the remaining quantity of refrigerant using this procedure. If the refrigerant quantity is insufficient, the unit may malfunction.**

① Turn ON the power of the indoor unit and the outdoor unit.
② Make sure to completely open the stop valve on the gas side and the stop valve on the liquid side.
③ Connect the refrigerant charge hose to the service port (for additionally charging the refrigerant).
④ In the stopped status, set to ON the refrigerant additional charging operation Ⓐ in set mode 2 (H1P: Turn on).
⑤ The operation is automatically started.
(The LED indicator H2P flickers, and "Test run" and "Under centralized control" are displayed in the remote controller.)
⑥ After charging the specified quantity of refrigerant, press the RETURN button (BS3) to stop the operation.
(The operation is automatically stopped within 30 minutes.
If charging is not completed within 30 minutes, set and perform the refrigerant additional charging operation Ⓐ again.
If the refrigerant additional charging operation is stopped soon, the refrigerant may be overcharged.
Never charge extra refrigerant.)
⑦ Disconnect the refrigerant charge hose.



3.2.5 Setting of Refrigerant Recovery Mode

When carrying out the refrigerant collection on site, fully open the respective expansion valve of indoor and outdoor units.
All indoor and outdoor unit's operation are prohibited.

[Operation procedure]

① In "Setting Mode 2" with units in stop mode, set "B Refrigerant Recovery / Vacuuming mode" to ON. The respective expansion valve of indoor and outdoor units are fully opened. "TEST OPERATION" and "UNDER CENTRALIZED CONTROL" are displayed on the remote controller, and the indoor / outdoor unit operation is prohibited.
After setting, do not cancel "Setting Mode 2" until completion of refrigerant recovery operation.

② Collect the refrigerant using a refrigerant recovery unit. (See the instruction attached to the refrigerant recovery unit for more detail.)

③ Press Mode button "BS1" once and reset "Setting Mode 2".

3.2.6 Setting of Vacuuming Mode

In order to perform vacuuming operation at site, fully open the expansion valves of indoor and outdoor units and turn on some solenoid valves.

[Operating procedure]

① In “Setting Mode 2” with units in stop mode, set “B Refrigerant Recovery / Vacuuming mode” to ON. The respective expansion valve of indoor and outdoor units are fully opened. “TEST OPERATION” and “UNDER CENTRALIZED CONTROL” are displayed on the remote controller, and the indoor / outdoor unit operation is prohibited.
After setting, do not cancel “Setting Mode 2” until completion of Vacuuming operation.

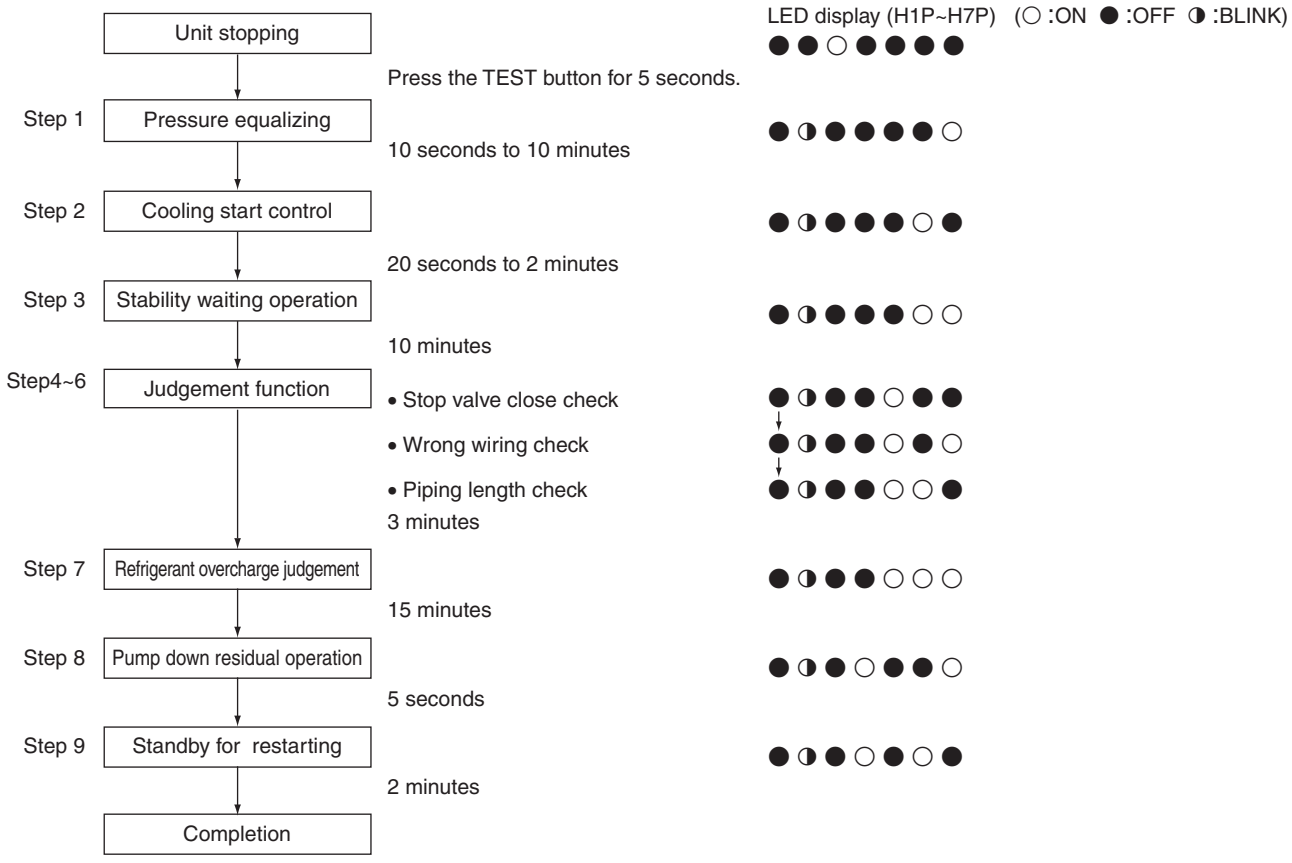
② Use the vacuum pump to perform vacuuming operation.

③ Press Mode button “BS1” once and reset “Setting Mode 2”.

3.2.7 Check Operation

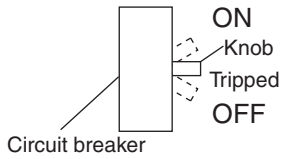
To prevent any trouble in the period of installation at site, the system is provided with a test operation mode enabling check for incorrect wiring, stop valve left in closed, coming out (or misplacing with suction pipe thermistor) or discharge pipe thermistor and judgement of piping length, refrigerant overcharging, and learning for the minimum opening degree of electronic expansion valve.

CHECK OPERATION FUNCTION



Part 7
Troubleshooting

1. Symptom-based Troubleshooting

	Symptom		Supposed Cause	Countermeasure
1	The system does not start operation at all.		Blowout of fuse(s)	Turn Off the power supply and then replace the fuse(s).
			Cutout of breaker(s)	• If the knob of any breaker is in its OFF position, turn ON the power supply. • If the knob of any circuit breaker is in its tripped position, do not turn ON the power supply. 
			Power failure	After the power failure is reset, restart the system.
2	The system starts operation but makes an immediate stop.		Blocked air inlet or outlet of indoor or outdoor unit	Remove obstacle(s).
			Clogged air filter(s)	Clean the air filter(s).
3	The system does not cool or heat air well.		Blocked air inlet or outlet of indoor or outdoor unit	Remove obstacle(s).
			Clogged air filter(s)	Clean the air filter(s).
			Enclosed outdoor unit(s)	Remove the enclosure.
			Improper set temperature	Set the temperature to a proper degree.
			Airflow rate set to **LOW**	Set it to a proper airflow rate.
			Improper direction of air diffusion	Set it to a proper direction.
			Open window(s) or door(s)	Shut it tightly.
		[In cooling]	Direct sunlight received	Hang curtains or shades on windows.
		[In cooling]	Too many persons staying in a room	
		[In cooling]	Too many heat sources (e.g. OA equipment) located in a room	
4	The system does not operate.	The system stops and immediately restarts operation.	If the **OPERATION** lamp on the remote controller turns ON, the system will be normal. These symptoms indicate that the system is controlled so as not to put unreasonable loads on the system.	Normal operation. The system will automatically start operation after a lapse of five minutes.
		Pressing the **TEMP ADJUST** button immediately resets the system.		
		The remote controller displays **UNDER CENTRALIZED CONTROL**, which blinks for a period of several seconds when the **OPERATION** button is depressed.	The system is controlled with centralized controller. Blinking display indicates that the system cannot be operated using the remote controller.	Operate the system using the **COOL/HEAT** centralized remote controller.
		The system stops immediately after turning **ON** the power supply.	The system is in preparation mode of micro computer operation.	Wait for a period of approximately one minute.
5	The system makes intermittent stops.	The remote controller displays malfunction codes **U4** and **U5**, and the system stops but restarts after a lapse of several minutes.	The system stops due to an interruption in communication between units caused by electrical noises coming from equipment other than air conditioners.	Remove causes of electrical noises. If these causes are removed, the system will automatically restart operation.

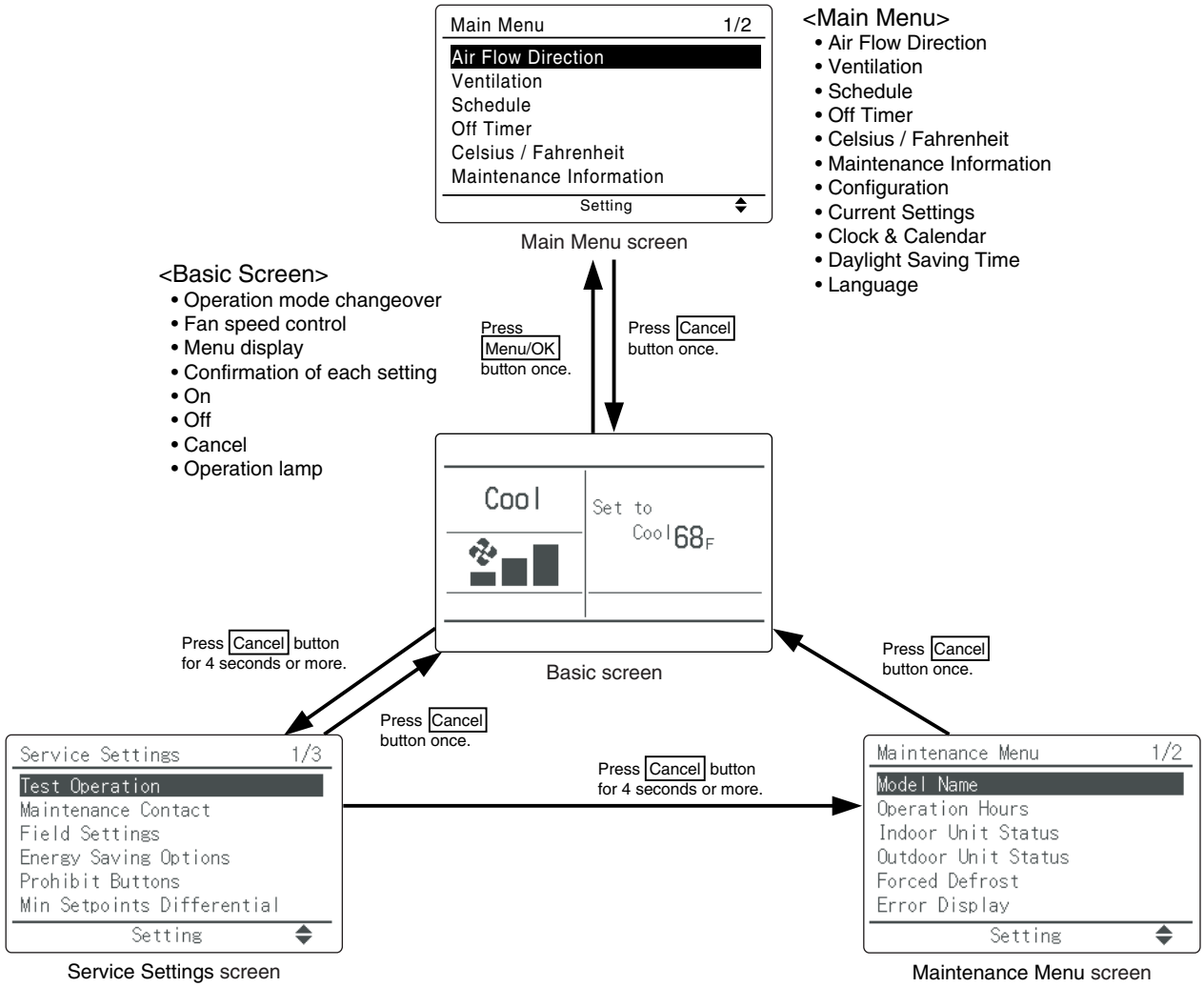
	Symptom		Supposed Cause	Countermeasure
6	**COOL-HEAT** selection is disabled.	The remote controller displays **UNDER CENTRALIZED CONTROL**.	This remote controller has no option to select cooling operation.	Use a remote controller with option to select cooling operation.
		The remote controller displays **UNDER CENTRALIZED CONTROL**, and the COOL-HEAT selection remote controller is provided.	**COOL-HEAT** selection is made using the **COOL-HEAT** selection remote controller.	Use the **COOL-HEAT** selection remote controller to select cool or heat.
7	The system conducts fan operation but not cooling or heating operation.	This symptom occurs immediately after turning ON the power supply.	The system is in preparation mode of operation.	Wait for a period of approximately 10 minutes.
8	The airflow rate is not reproduced according to the setting.	Even pressing the **AIRFLOW RATE SET** button makes no changes in the airflow rate.	In heating operation, when the room temperature reaches the set degree, the outdoor unit will stop while the indoor unit is brought to fan LL operation so that no one gets cold air. Furthermore, if fan operation mode is selected when other indoor unit is in heating operation, the system will be brought to fan LL operation. (The fan LL operation is also enabled while in oil return mode in cooling operation.)	Normal operation.
9	The airflow direction is not reproduced according to the setting.	The airflow direction is not corresponding to that displayed on the remote controller. The flap does not swing.	Automatic control	Normal operation.
10	A white mist comes out from the system.	<**Indoor unit**> In cooling operation, the ambient humidity is high. (This indoor unit is installed in a place with much oil or dust.)	Uneven temperature distribution due to heavy stain of the inside of the indoor unit	Clean the inside of the indoor unit.
		<**Indoor unit**> Immediately after cooling operation stopping, the ambient temperature and humidity are low.	Hot gas (refrigerant) flown in the indoor unit results to be vapor from the unit.	Normal operation.
		<**Indoor and outdoor units**> After the completion of defrosting operation, the system is switched to heating operation.	Defrosted moisture turns to be vapor and comes out from the units.	Normal operation.

	Symptom		Supposed Cause	Countermeasure
11	The system produces sounds.	<**Indoor unit**> Immediately after turning ON the power supply, indoor unit produces "ringing" sounds.	These are operating sounds of the electronic expansion valve of the indoor unit.	Normal operation. This sound becomes low after a lapse of approximately one minute.
		<**Indoor and outdoor units**> "Hissing" sounds are continuously produced while in cooling or defrosting operation.	These sounds are produced from gas (refrigerant) flowing respectively through the indoor and outdoor units.	Normal operation.
		<**Indoor and outdoor units**> "Hissing" sounds are produced immediately after the startup or stop of the system, or the startup or stop of defrosting operation.	These sounds are produced when the gas (refrigerant) stops or changes flowing.	Normal operation.
		<**Indoor unit**> Faint sounds are continuously produced while in cooling operation or after stopping the operation.	These sounds are produced from the drain discharge device in operation.	Normal operation.
		<**Indoor unit**> "Creaking" sounds are produced while in heating operation or after stopping the operation.	These sounds are produced from resin parts expanding and contracting with temperature changes.	Normal operation.
		<**Indoor unit**> Sounds like "trickling" or the like are produced from indoor units in the stopped state.	On VRV systems, these sounds are produced when other indoor units in operation. The reason is that the system runs in order to prevent oil or refrigerant from dwelling.	Normal operation.
		<**Outdoor unit**> Pitch of operating sounds changes.	The reason is that the compressor changes the operating frequency.	Normal operation.
12	Dust comes out from the system.	Dust comes out from the system when it restarts after the stop for an extended period of time.	Dust, which has deposited on the inside of indoor unit, is blown out from the system.	Normal operation.
13	Odors come out from the system.	In operation	Odors of room, cigarettes or else adsorbed to the inside of indoor unit are blown out.	The inside of the indoor unit should be cleaned.
14	Outdoor unit fan does not rotate.	In operation	The reason is that fan revolutions are controlled to put the operation to the optimum state.	Normal operation.
15	LCD display "88" appears on the remote controller.	Immediately after turning ON the power supply	The reason is that the system is checking to be sure the remote controller is normal.	Normal operation. This code is displayed for a period of approximately one minute at maximum.
16	The outdoor unit compressor or the outdoor unit fan does not stop.	After stopping operation	It stops in order to prevent oil or refrigerant from dwelling.	Normal operation. It stops after a lapse of approximately 5 to 10 minutes.
17	The outdoor gets hot.	While stopping operation	The reason is that the compressor is warmed up to provide smooth startup of the system.	Normal operation.
18	Hot air comes out from the system even though it stops.	Hot air is felt while the system stops.	On VRV systems, small quantity of refrigerant is fed to indoor units in the stopped state when other indoor units are in operation.	Normal operation.
19	The system does not cool air well.	The system is in dry operation.	The reason is that the dry operation serves not to reduce the room temperature where possible.	Change the system to cooling operation.

2. Troubleshooting by Remote Controller

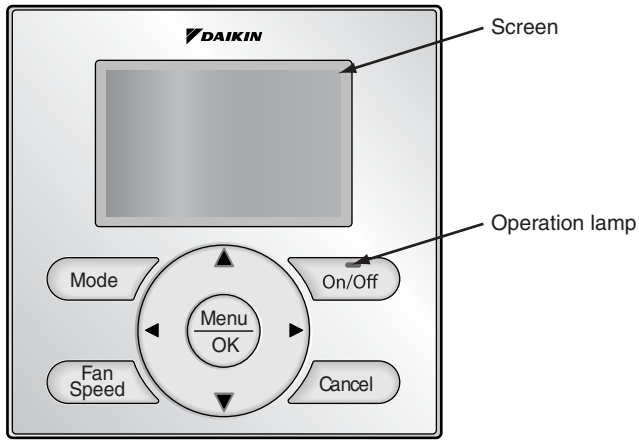
On power-up, the message ***Checking the connection. Please stand by***. is displayed on the remote controller screen. Then that message is no longer displayed and the basic screen displays. . To access a mode from the basic screen, refer to the figure below.

When any of the operation buttons is pressed, the backlight will come on and remains lit for about 30 seconds. Be sure to press a button while the backlight is on (this does not apply to the On/Off button.)

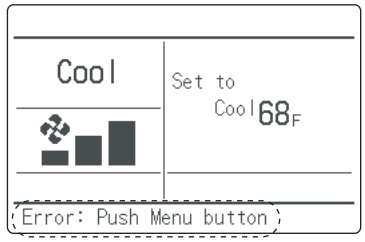
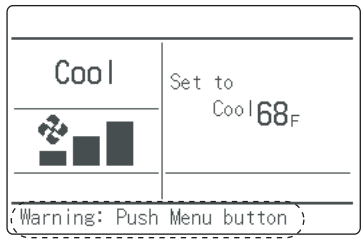


2.1 Self-diagnosis by Wired Remote Controller

The following will be displayed on the screen when a error (or a warning) occurs during operation.
Check the error code and take the corrective action specified for the particular model.



(1) Checking a error or warning

	Operation Status	Display	
Abnormal shutdown	The system stops operating.	The operation lamp (green) starts to blink. The message "Error: Press Menu button" will appear and blink at the bottom of the screen.	
Warning	The system continues its operation.	The operation lamp (green) remains on. The message "Warning: Press Menu button" will appear and blink at the bottom of the screen.	

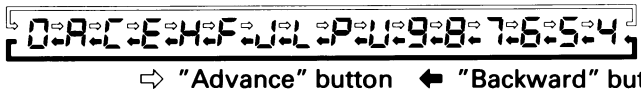
2.2 Self-diagnosis by Wireless Remote Controller

In the Case of BRC7C Type / BRC7E Type / BRC4C Type

If equipment stops due to a malfunction, the operation indicating LED on the light reception section flashes. The malfunction code can be determined by following the procedure described below. (The malfunction code is displayed when an operation error has occurred. In normal condition, the malfunction code of the last problem is displayed.)

1. Press the INSPECTION/TEST button to select “Inspection.”
   The equipment enters the inspection mode. The “Unit” indication lights and the Unit No. display shows flashing “0” indication.
2. Set the Unit No.
   Press the UP or DOWN button and change the Unit No. display until the buzzer (*1) is generated from the indoor unit.
   *1 Number of beeps
   3 short beeps : Conduct all of the following operations.
   1 short beep : Conduct steps 3 and 4.
   Continue the operation in step 4 until a buzzer remains ON. The continuous buzzer indicates that the malfunction code is confirmed.
   Continuous beep : No abnormality.
3. Press the MODE selector button.
   The left “0” (left-side digit) indication of the malfunction code flashes.
4. Malfunction code left-side digit diagnosis
   Press the UP or DOWN button and change the malfunction code left-side digit until the malfunction code matching buzzer (*2) is generated.

■ The left-side digit of the code changes as shown below when the UP and DOWN buttons are pressed.

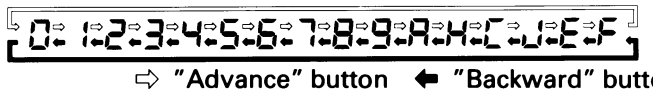


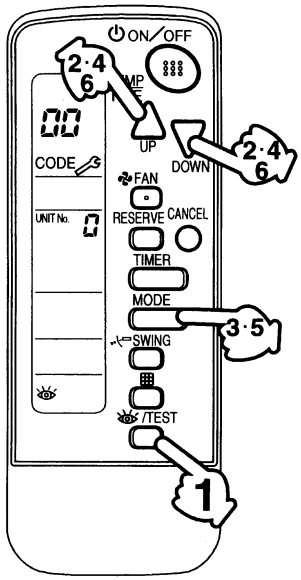
⇨ ”Advance” button ⇦ ”Backward” button

*2 Number of beeps
Continuous beep : Both left-side and right-side digits matched. (Malfunction code confirmed)
2 short beeps : Left-side digit matched.
1 short beep : Right-side digit matched.

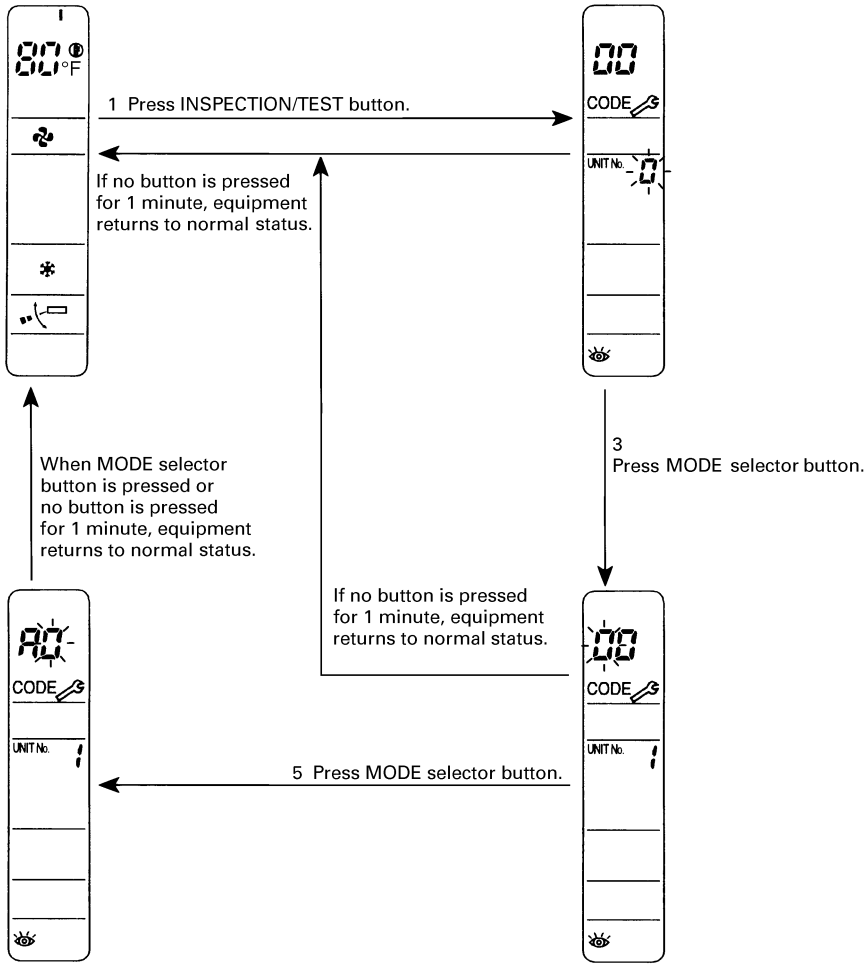
5. Press the MODE selector button.
   The right “0” (right-side digit) indication of the malfunction code flashes.
6. Malfunction code right-side digit diagnosis
   Press the UP or DOWN button and change the malfunction code right-side digit until the continuous malfunction code matching buzzer (*2) is generated.

■ The right-side digit of the code changes as shown below when the UP and DOWN buttons are pressed.



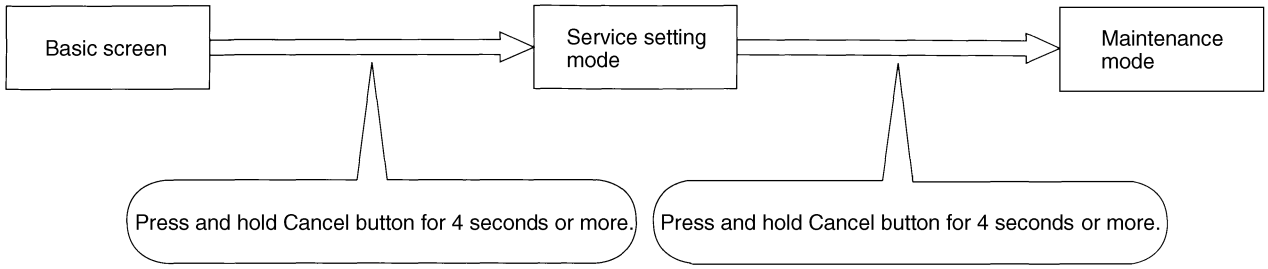


Normal status
Enters inspection mode from normal status when the INSPECTION/ TEST button is pressed.



2.3 Remote Controller Maintenance Mode

How to Enter the Maintenance Mode



Maintenance Mode Operation Method

1. Select the mode No.

Select the desired item from the Maintenance menu, and then press Menu/OK button.

2. Select the Item 2.

Select the desired Unit No. using the ▲/▼ (Up/Down) buttons. The corresponding data is displayed.

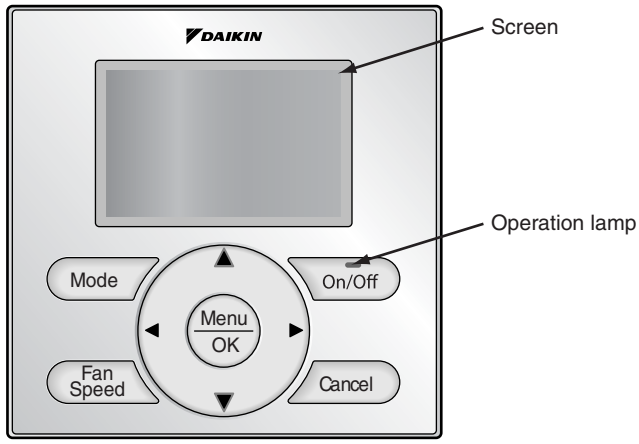
For details, refer to the table in next page.

Maintenance Menu	Item 2	Remarks	
1. Model Name	1. Unit No.	Select the Unit No. you want to check.	
	2. Indoor unit		
	3. Outdoor unit		
2. Operating Hours	1. Unit No.	Select the Unit No. you want to check.	
	2. Indoor unit operating time	All of these are displayed in hours.	
	3. Indoor fan operation		
	4. Indoor unit energized time		
	5. Outdoor operating time		
	6. Outdoor fan 1 operation		
	7. Outdoor fan 2 operation		
	8. Outdoor comp. 1 operation		
	9. Outdoor comp. 2 operation		
3. Indoor Unit Status	1. Unit No.	Select the Unit No. you want to check.	
	2. FAN	Fan tap	
	3. FLAP	Swing, fixed	
	4. Speed	Fan speed (rpm)	
	5. EV	Degree that electronic expansion valve is open (pls)	
	6. MP	Drain pump ON/OFF	
	7. EH	Electric heater ON/OFF	
	8. Hu	Humidifier ON/OFF	
	9. TBF	Anti-freezing control ON/OFF	
	10. FLOAT		
	11. T1/T2		
	12. Unit No.	Select the Unit No. you want to check.	
		SkyAir	VRV
	13. Th1	Suction air thermistor	Suction air thermistor
	14. Th2	Heat exchanger thermistor	Heat exchanger liquid pipe thermistor
	15. Th3	—	Heat exchanger gas pipe thermistor
	16. Th4	Discharge air thermistor	Discharge air thermistor
	17. Th5	—	—
	18. Th6	—	—
4. Outdoor Unit Status	1. Unit No.	Select the Unit No. you want to check.	
	2. FAN step	Fan tap	
	3. COMP	Compressor power supply frequency (Hz)	
	4. EV1	Degree that electronic expansion valve is open (pls)	
	5. SV1	Solenoid valve ON/OFF	
		SkyAir	VRV
	6. Th1	Outdoor air thermistor	—
	7. Th2	Heat exchanger thermistor	—
	8. Th3	Discharge pipe thermistor	—
	9. Th4	Heat exchanger deicer thermistor	—
	10. Th5	Heat exchanger gas pipe thermistor	—
	11. Th5	Liquid pipe thermistor	—
5. Forced Defrost (SkyAir only)	1. Forced defrost ON	Enables the forced defrost operation.	
	2. Forced defrost OFF	Disables the forced defrost operation.	

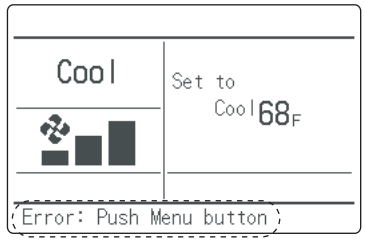
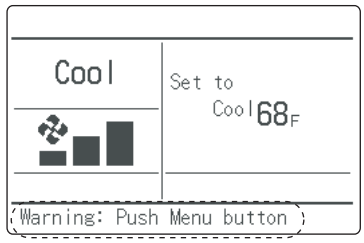
Maintenance Menu	Item 2	Remarks
6. Error Display	1. Display Warning ON	Displays a warning on the screen if an error occurs.
	2. Display Warning OFF	No warning is displayed.
	3. Display Error ON	Displays the error on the screen.
	4. Display Error OFF	Displays neither errors nor warnings.
7. Swap Unit No.	1. Current Unit No.	A unit No. can be transferred to another.
	2. Transfer Unit No.	
8. Addressed Sensor Value	○ Unit No.: 0 - 15	Select the Unit No. you want to check.
	○ Code 00: 01: 02: 03: 04: 05: 06: 07: 08: 09:	 Remote controller thermistor (°F) Suction air thermistor (°F) Heat exchanger liquid pipe thermistor (°F) Heat exchanger gas pipe thermistor (°F) Indoor unit address No. Outdoor unit address No. BS unit address No. Zone control address No. Cooling/Heating batch address No. Demand/low-noise address No.
	○ Data	The corresponding data is displayed, based on the Unit No. and Code selected.

2.4 Remote Controller Self-Diagnosis Function

The following will be displayed on the screen when a error (or a warning) occurs during operation.
Check the error code and take the corrective action specified for the particular model.



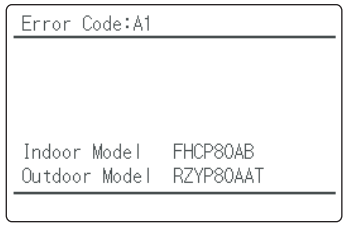
(1) Checking a error or warning

	Operation Status	Display	
Abnormal shutdown	The system stops operating.	The operation lamp (green) starts to blink. The message "Error: Press Menu button" is displayed and blink at the bottom of the screen.	
Warning	The system continues its operation.	The operation lamp (green) remains on. The message "Warning: Press Menu button" is displayed and blink at the bottom of the screen.	

(2) Taking corrective action

· Press the Menu/OK button to check the error code.

· Take the corrective action specific to the model.



— Error code

⊢ Applicable model names

○ : ON ● : OFF ◑ : Blink

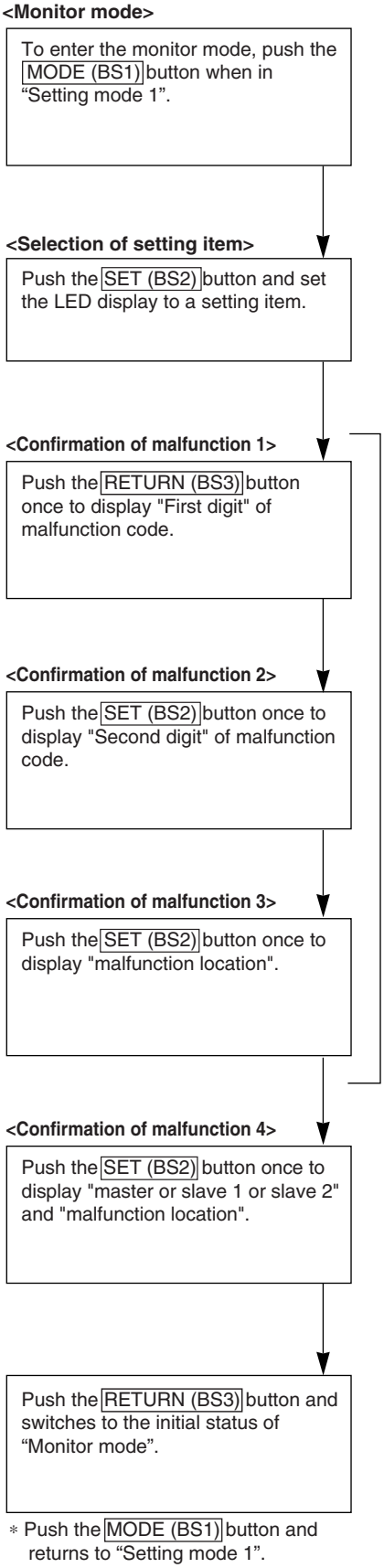
	Malfunction code	Operation lamp	Malfunction contents	Page Referred
Indoor Unit	A0	◑	Error of External Protection Device	109
	A1	◑	PCB Defect	110
	A3	◑	Malfunction of Drain Level Control System (S1L)	111
	A6	◑	Fan Motor (M1F) Lock, Overload	113 115 116
	A7	○	Malfunction of Swing Flap Motor (M1S)	119
	A9	◑	Malfunction of Moving Part of Electronic Expansion Valve (Y1E)	121
	AF	○	Drain Level above Limit	123
	AJ	◑	Malfunction of Capacity Determination Device	124
	C4	◑	Malfunction of Thermistor (R2T) for Heat Exchanger	125
	C5	◑	Malfunction of Thermistor (R3T) for Gas Pipes	126
	C9	◑	Malfunction of Thermistor (R1T) for Suction Air	127
	CJ	○	Malfunction of Thermostat Sensor in Remote Controller	128
Outdoor Unit	E1	◑	PCB Defect	129
	E3	◑	Actuation of High Pressure Switch	130
	E4	◑	Actuation of Low Pressure Sensor	133
	E5	◑	Inverter Compressor Motor Lock	135
	E6	◑	STD Compressor Motor Overcurrent/Lock	—
	E7	◑	Malfunction of Outdoor Unit Fan Motor	138
	E9	◑	Malfunction of Moving Part of Electronic Expansion Valve (Y1E, Y2E)	141
	F3	◑	Abnormal Discharge Pipe Temperature	143
	F6	◑	Refrigerant Overcharged	145
	H3	○	Failure of High Pressure Switch	—
	H4	◑	Actuation of Low Pressure Switch	—
	H7	◑	Abnormal Outdoor Fan Motor Signal	—
	H9	◑	Malfunction of Thermistor (R1T) for Outdoor Air	146
	J2	◑	Current Sensor Malfunction	—
	J3	◑	Malfunction of Discharge Pipe Thermistor (R2T)	147
	J5	◑	Malfunction of Thermistor (R3T, R5T) for Suction Pipe	148
	J6	◑	Malfunction of Thermistor (R4T) for Outdoor Unit Heat Exchanger	149
	J7	◑	Malfunction of Liquid Pipe Thermistor (R7T)	150
	J9	◑	Malfunction of Subcooling Heat Exchanger Gas Pipe Thermistor (R6T)	151
	JA	◑	Malfunction of High Pressure Sensor	152
	JC	◑	Malfunction of Low Pressure Sensor	154
	L0	◑	Inverter System Error	—
	L1	◑	Malfunction of PCB	157
	L4	◑	Malfunction of Inverter Radiating Fin Temperature Rise	159
	L5	◑	Inverter Compressor Abnormal	162
	L8	◑	Inverter Current Abnormal	164
	L9	◑	Inverter Start up Error	166
	LA	◑	Malfunction of Power Unit	—
	P1	◑	Inverter Over-Ripple Protection	169
	P4	○	Malfunction of Inverter Radiating Fin Temperature Rise Sensor	171

○ : ON ● : OFF ◑ : Blink

	Malfunction code	Operation lamp	Malfunction contents	Page Referred
System	U0	○	Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure	173
	U1	◑	Reverse Phase, Open Phase	—
	U2	◑	Power Supply Insufficient or Instantaneous Failure	175
	U3	◑	Check Operation not Executed	178
	U4	◑	Malfunction of Transmission between Indoor Units	179
	U5	◑	Malfunction of Transmission between Remote Controller and Indoor Unit	183
	U5	●	Failure of Remote Controller PCB or Setting during Control by Remote Controller	—
	U7	◑	Malfunction of Transmission between Outdoor Units	—
	U8	◑	Malfunction of Transmission between Main and Sub Remote Controllers	185
	U9	◑	Malfunction of Transmission between Indoor and Outdoor Units in the Same System	186
	UA	◑	Improper Combination of Indoor and Outdoor Units, Indoor Units and Remote Controller	187
	UC	○	Address Duplication of Centralized Controller	190
	UE	◑	Malfunction of Transmission between Centralized Controller and Indoor Unit	191
	UF	◑	System is not Set yet	194
	UH	◑	Malfunction of System, Refrigerant System Address Undefined	195
Centralized Remote Controller and Schedule Timer	UE	◑	Malfunction of Transmission between Centralized Controller and Indoor Unit	191
	M1	○ or ●	PCB Defect	197
	M8	○ or ●	Malfunction of Transmission between Optional Controllers for Centralized Control	198
	MA	○ or ●	Improper Combination of Optional Controllers for Centralized Control	200
	MC	○ or ●	Address Duplication, Improper Setting	202
Heat Reclaim Ventilation	64	○	Indoor Unit's Air Thermistor Error	—
	65	○	Outside Air Thermistor Error	—
	68	○	Malfunction of HVU	—
	6A	○	Damper System Alarm	—
	6A	◑	Damper System + Thermistor Error	—
	6F	○	Malfunction of Simplified Remote Controller	—
	94	◑	Internal Transmission Error	—

The system operates for malfunction codes indicated in black squares, however, be sure to check and repair.

Malfunction code indication by outdoor unit PCB



Detail description on next page.

Contents of malfunction		Malfunction code
In-phase malfunction of DIII-NET	Detection of DIII-NET	E1
Abnormal discharge pressure	High pressure switch activated	E3
Abnormal suction pressure	Abnormal Pe	E4
Compressor lock	Detection of INV. compressor lock	E5
Over load, overcurrent, abnormal lock of outdoor unit fan	Detection of DC fan 1 motor lock	E7
	Detection of DC fan 2 motor lock	
Malfunction of electronic expansion valve	EV1	E9
	EV3	
Faulty sensor of outdoor air temperature	Faulty Ta sensor (short)	H9
Abnormal discharge pipe	Abnormal Td	F3
Abnormal heat exchanger	Refrigerant overcharge	F6
Faulty sensor of discharge pipe temperature	Faulty Tdi sensor (short)	J3
Faulty sensor of suction pipe temperature	Faulty Ts1 sensor (short)	J5
	Faulty Ts2 sensor (short)	
Faulty sensor of heat exchanger temperature	Faulty Tb sensor (short)	J6
Malfunction of the liquid pipe temperature sensor	Faulty Tl sensor (short)	J7
Faulty sensor of subcooling heat exchanger temperature	Faulty Tsh sensor (short)	J9
Faulty sensor of discharge	Faulty Pc sensor (short)	JA
Faulty sensor of suction pressure	Faulty Pe sensor (short)	JC
Faulty Inverter PCB	Faulty IPM	L1
	Abnormal current sensor offset	
	Abnormal IGBT	
	Faulty current sensor	
	Abnormal SP-PAM overvoltage	
Inverter radiation fin temperature rising	Over heating of inverter radiation fin temperature	L4
DC output overcurrent	Inverter instantaneous	L5
Electronic thermal	Electronic thermal switch 1	L8
	Electronic thermal switch 2	
	Out-of-step	
	Speed down after startup	
	Lightening detection	
Stall prevention (Limit time)	Stall prevention (Current	L9
	Stall prevention (Faulty start up)	
	Abnormal wave form in startup	
	Out-of-step	

○ : ON ● : OFF ◑ : Blink

Malfunction code	Confirmation of malfunction 1							Confirmation of malfunction 2							Confirmation of malfunction 3							Confirmation of malfunction 4						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P
E1	◑			●	●	◑	◑	◑			●	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	●	◑	◑
E3								◑			●	●	◑	◑	◑			●	●	●	●	◑			●	●		
E4								◑			●	◑	●	●	◑			●	●	●	●	◑			●	●		
E5								◑			●	◑	●	◑	◑			●	●	●	●	◑			●	●		
E7								◑			●	◑	◑	◑	◑			●	●	●	●	◑			●	◑	∗1	
															◑			●	●	●	◑	◑			●	◑		
E9								◑			◑	●	●	◑	◑			●	●	●	●	◑			●	●		
															◑			●	●	●	●	◑			◑	●		
H9								◑			◑	●	●	◑	◑			●	●	●	●	◑			●	●	∗1	
F3	◑			●	◑	●	◑	◑			●	●	◑	◑	◑			●	●	●	●	◑			●	●	∗1	
F6								◑			●	◑	◑	●	◑			●	●	●	●	◑			●	●	◑	◑
J3	◑			●	◑	◑	●	◑			●	●	◑	◑	◑			●	●	●	●	◑			●	●		
J5								◑			●	◑	●	◑	◑			●	●	●	●	◑			●	●		
															◑			●	●	●	●	◑			●	◑		
J6								◑			●	◑	◑	●	◑			●	●	●	●	◑			●	●		
J7								◑			●	◑	◑	◑	◑			●	●	●	●	◑			●	●	∗1	
J9								◑			◑	●	●	◑	◑			●	●	●	●	◑			●	●		
JA								◑			◑	●	◑	●	◑			●	●	●	●	◑			●	●		
JC								◑			◑	◑	●	●	◑			●	●	●	●	◑			●	●		
L1	◑			●	◑	◑	◑	◑			●	●	●	◑	◑			●	●	●	●	◑			●	●	●	●
								◑			●	●	●	◑	◑			●	●	●	●	◑			●	●	●	◑
								◑			●	●	●	◑	◑			●	●	●	●	◑			●	●	◑	●
								◑			●	●	●	◑	◑			●	●	●	●	◑			●	●	◑	◑
								◑			●	●	●	◑	◑			●	●	●	●	◑			●	◑	●	●
L4								◑			●	◑	●	●	◑			●	●	●	●	◑			●	●		
L5								◑			●	◑	●	◑	◑			●	●	●	●	◑			●	●		
L8								◑			◑	●	●	●	◑			●	●	●	●	◑			●	●		
															◑			●	●	●	●	◑			●	◑		
															◑			●	●	●	●	◑			◑	●	∗1	
															◑			●	●	●	◑	◑			●	●		
L9								◑			◑	●	●	◑	◑			●	●	●	●	◑			●	●		
															◑			●	●	●	●	◑			●	◑		
															◑			●	●	●	●	◑			◑	●		

Display of contents of malfunction (first digit)

Display of contents of malfunction (second digit)

Display 1 of malfunction in detail

Display 2 of malfunction in detail

∗1

● ●	Master
● ◑	Slave1
◑ ●	Slave2
◑ ◑	System

<Monitor mode>

To enter the monitor mode, push the MODE (BS1) button when in "Setting mode 1".

<Selection of setting item>

Push the SET (BS2) button and set the LED display to a setting item.

<Confirmation of malfunction 1>

Push the RETURN (BS3) button once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>

Push the SET (BS2) button once to display "Second digit" of malfunction code.

Detail description on next page.

<Confirmation of malfunction 3>

Push the SET (BS2) button once to display "malfunction location".

<Confirmation of malfunction 4>

Push the SET (BS2) button once to display "master or slave 1 or slave 2" and "malfunction location".

Push the RETURN (BS3) button and switches to the initial status of "Monitor mode".

* Push the MODE (BS1) button and returns to "Setting mode 1".

Contents of malfunction		Malfunction code
Open phase/Power supply imbalance	Imbalance of inverter power supply voltage	P1
Faulty temperature sensor of inverter radiation fin	Faulty thermistor of inverter fin	P4
Refrigerant shortage	Refrigerant shortage alarm	U0
Abnormal power supply voltage	Insufficient Inverter voltage	U2
	Faulty charge of capacitor in main inverter circuit	
	Malfunction due to SP-PAM overvoltage	
	Malfunction due to P-N short circuit	
No implementation of test-run		U3
Transmission error between indoor and outdoor unit	I/O transmission error	U4
	I/O transmission error	
Transmission error of other system	Indoor unit system abnormal in other system or other indoor unit system abnormal in own system	U9
Erroneous field setting	System transmission malfunction	UA
	Overconnection malfunction of indoor units	
	Malfunction of field setting	
	Refrigerant abnormal	
	Connection error (BP unit)	
Faulty system malfunction	Wiring error (Auto-address error)	UH
Conflict in wiring and piping, no setting for system	Conflict in wiring and piping	UF

○ : ON ● : OFF ◑ : Blink

Malfunction code	Confirmation of malfunction 1							Confirmation of malfunction 2							Confirmation of malfunction 3							Confirmation of malfunction 4						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P
P1	◑			◑	●	●	●	◑			●	●	●	◑	◑			●	●	●	●	◑			●	●	∗1	
P4								◑			●	◑	●	●	◑			●	●	●	●	◑			●	●		
U0	◑			◑	●	●	◑	◑			●	●	●	●	◑			●	●	●	●	◑			●	●	◑	◑
U2								◑			●	●	◑	●	◑			●	●	●	●	◑			●	●	∗1	
															◑			●	●	●	●				●	◑		
															◑			●	●	●	●	◑			●	●	◑	●
															◑			●	●	●	●	◑			●	●	●	◑
U3								◑			●	●	◑	◑	◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			●	◑	◑	◑
U4								◑			●	◑	●	●	◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			●	◑	◑	◑
U9								◑			◑	●	●	◑	◑			●	●	●	●	◑			●	●	◑	◑
UA								◑			◑	●	◑	●	◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			●	◑	◑	◑
															◑			●	●	●	●	◑			◑	●	◑	◑
															◑			●	●	●	◑	◑			●	●	◑	◑
															◑			●	●	◑	●	◑			●	◑	◑	◑
UH								◑			◑	●	◑	◑	◑			●	●	●	●	◑			●	●	◑	◑
UF								◑			◑	◑	◑	◑	◑			●	●	●	●	◑			●	●	◑	◑

Display of contents of malfunction (first digit)

Display of contents of malfunction (second digit)

Display 1 of malfunction in detail

Display 2 of malfunction in detail

∗1

● ●	Master
● ◑	Slave1
◑ ●	Slave2
◑ ◑	System

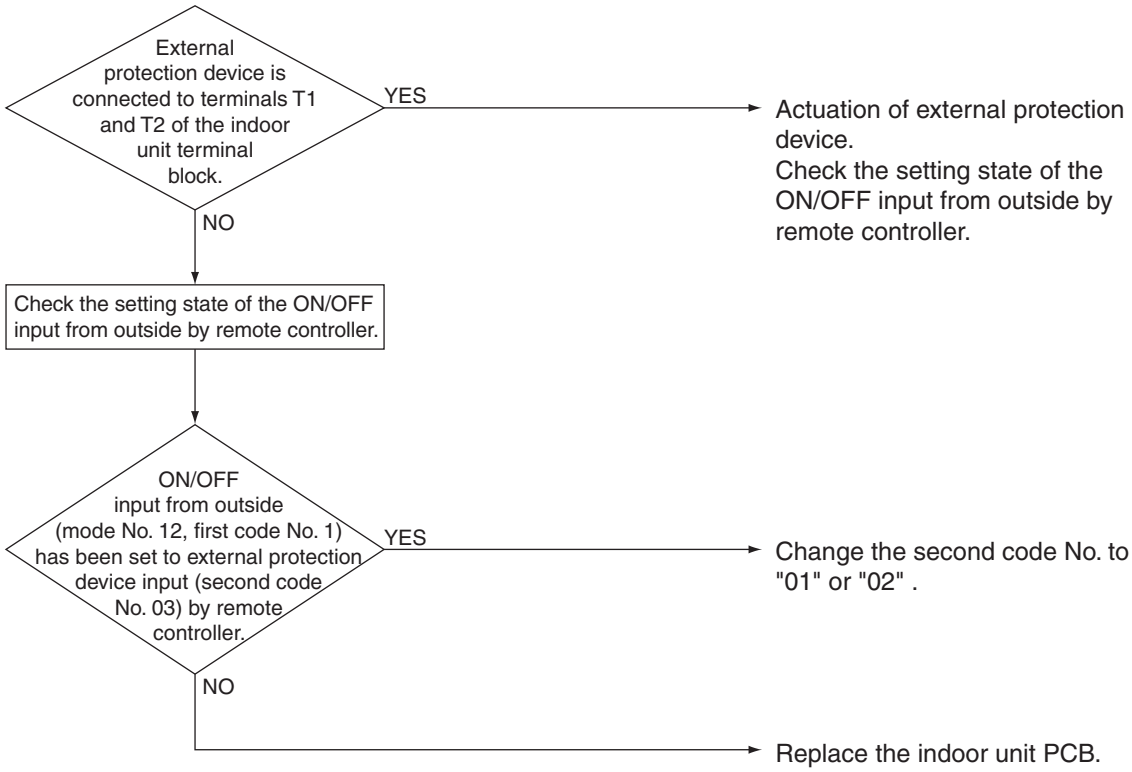
3. Troubleshooting by Indication on the Remote Controller

3.1 "A0" Error of External Protection Device

Remote Controller Display	A0
Applicable Models	All indoor unit models
Method of Malfunction Detection	Detect open or short circuit between external input terminals in indoor unit.
Malfunction Decision Conditions	When an open circuit occurs between external input terminals with the remote controller set to "external ON/OFF terminal"
Supposed Causes	■ Actuation of external protection device ■ Improper field set ■ Defect of indoor unit PCB

Troubleshooting

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

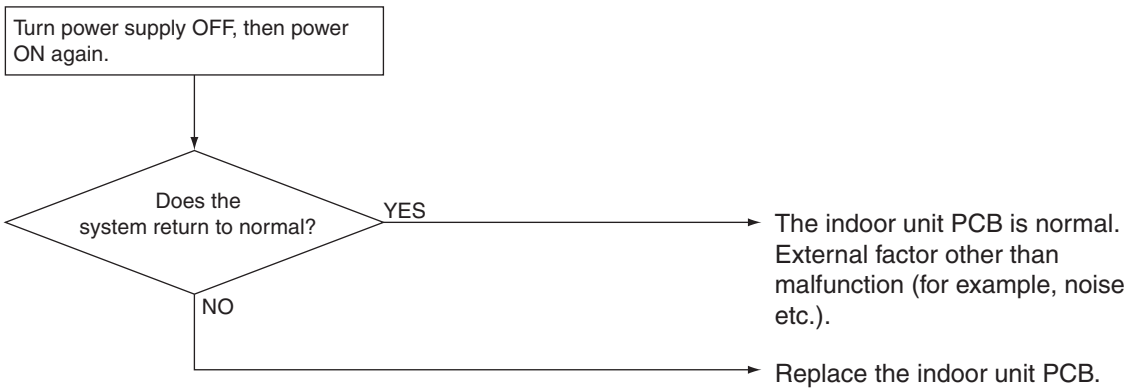


3.2 "A1" PCB Defect

Remote Controller Display	A1
Applicable Models	All indoor unit models
Method of Malfunction Detection	Check data from E²PROM.
Malfunction Decision Conditions	When data could not be correctly received from the E²PROM E²PROM : Type of nonvolatile memory. Maintains memory contents even when the power supply is turned off.
Supposed Causes	■ Defect of indoor unit PCB ■ External factors such as noise

Troubleshooting

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

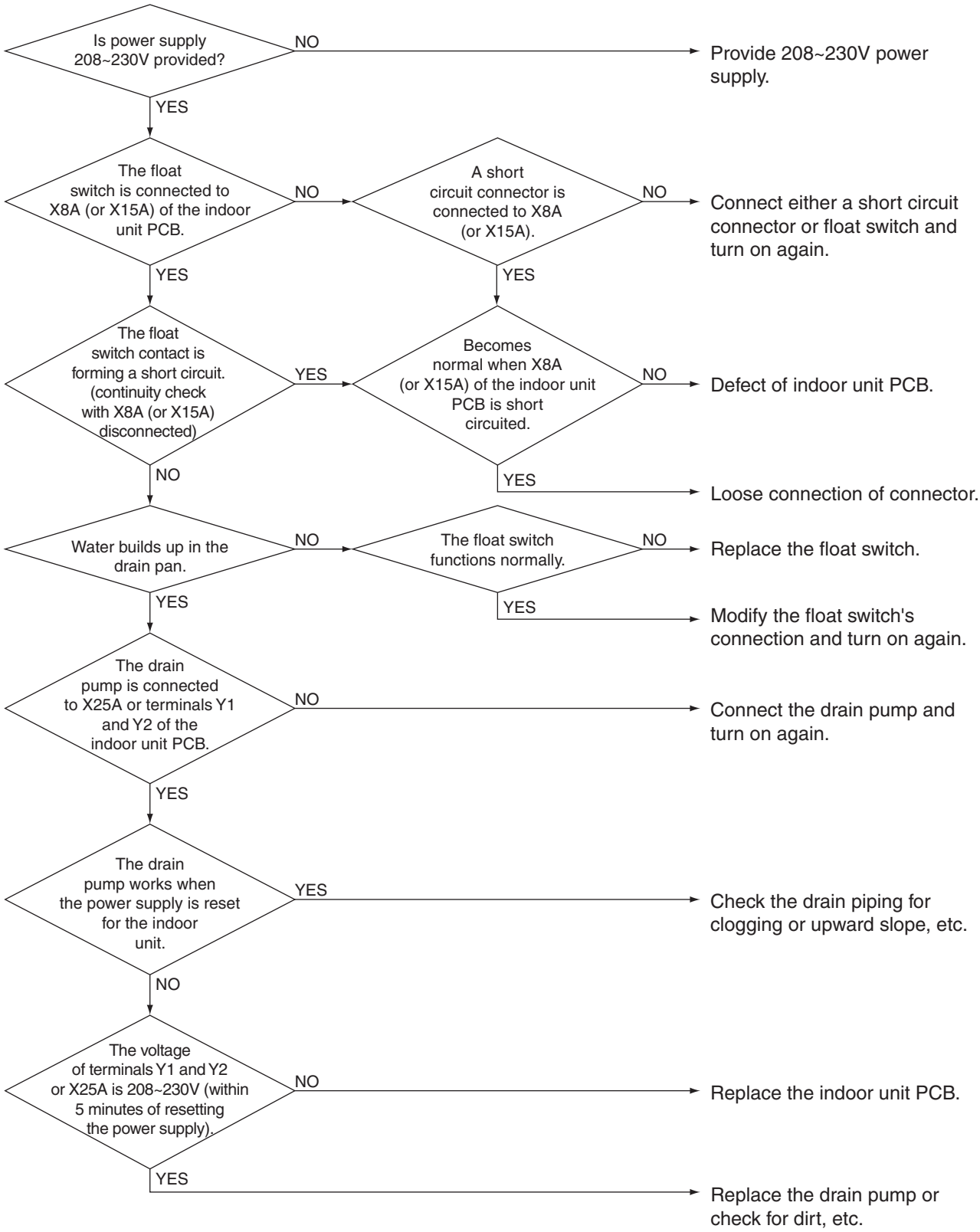


3.3 "A3" Malfunction of Drain Level Control System (S1L)

Remote Controller Display	A3
Applicable Models	FXFQ, FXMQ, FXDQ FXHQ (Option), FXAQ (Option)
Method of Malfunction Detection	By float switch OFF detection
Malfunction Decision Conditions	When rise of water level is not a condition and the float switch goes OFF
Supposed Causes	■ 208~230V power supply is not provided ■ Defect of float switch or short circuit connector ■ Defect of drain pump ■ Drain clogging, upward slope, etc. ■ Defect of indoor unit PCB ■ Loose connection of connector

Troubleshooting

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



3.4 "A6" Fan Motor (M1F) Lock, Overload

Remote Controller Display

A6

Applicable Models

FXAQ, FXFQ

Method of Malfunction Detection

Abnormal fan revolutions are detected by a signal output from the fan motor.

Malfunction Decision Conditions

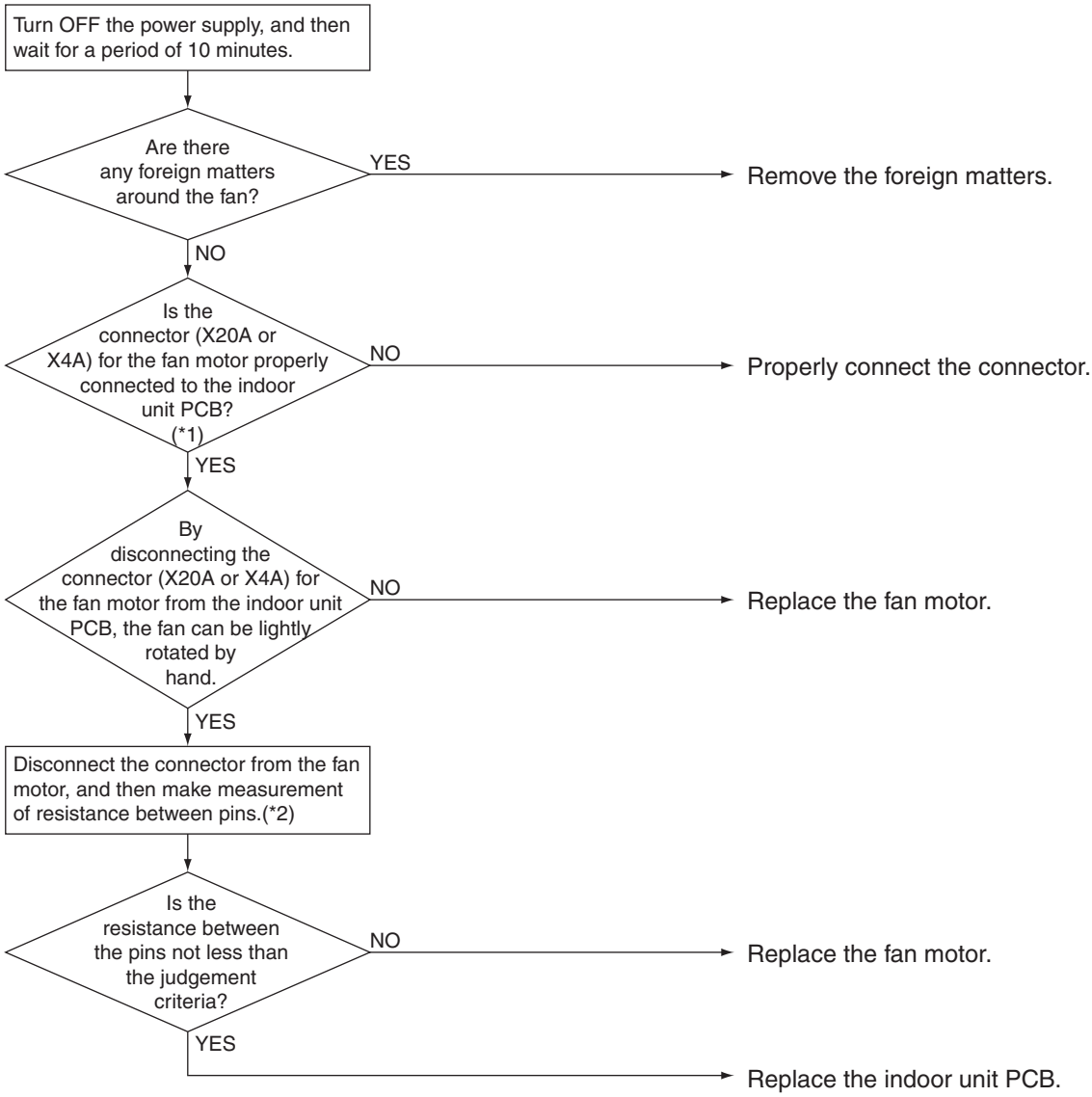
When the fan revolutions do not increase

Supposed Causes

- Broken wires in, short circuit of, or disconnection of connectors from the fan motor harness
- Faulty fan motor
  (Broken wires or faulty insulation)
- Abnormal signal output from the fan motor (Faulty circuit)
- Faulty PCB
- Instantaneous disturbance in the power supply voltage
- Fan motor lock
  (Due to motor or external causes)
- The fan does not rotate due to foreign matters blocking the fan.
- Disconnection of the connector between the high-power PCB (A1P) and the low-power PCB (A2P)

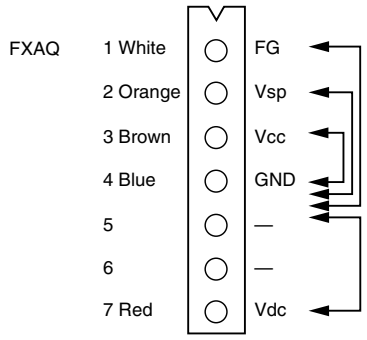
Troubleshooting

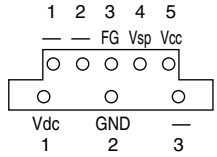
Caution Be sure to turn off the power switch before connecting or disconnecting the connector, or parts may be damaged.



*1. If any junction connector is provided between the connector (X20A or X4A) on the indoor unit PCB and the fan motor, also check whether or not the junction connector is properly connected.

*2. All resistance measuring points and judgement criteria





Judgement Criteria

Measuring point	Criteria
FG-GND	Not less than 1MΩ
Vsp-GND	Not less than 100kΩ
Vcc-GND	Not less than 100Ω
Vdc-GND	Not less than 100kΩ

"A6" Malfunction of Indoor Unit Fan Motor

Remote Controller Display

A6

Applicable Models

FXHQ, FXDQ

Method of Malfunction Detection

This malfunction is detected if there is no revolutions detection signal output from the fan motor.

Malfunction Decision Conditions

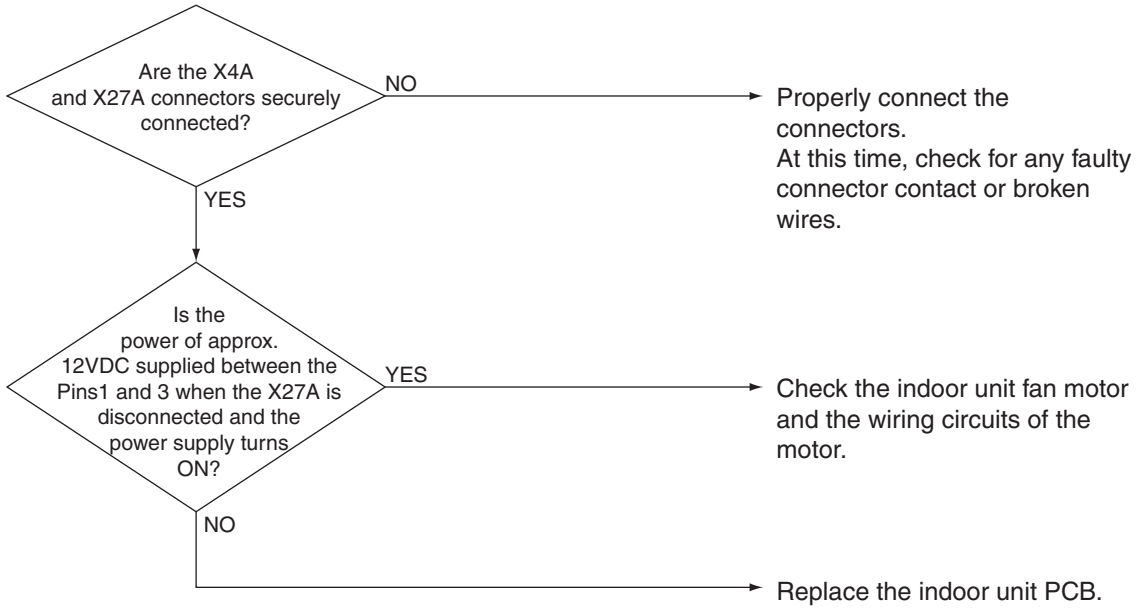
When no revolutions can be detected even at the maximum output voltage to the fan.

Supposed Causes

- Faulty indoor fan motor
- Broken wires
- Faulty contact

Troubleshooting

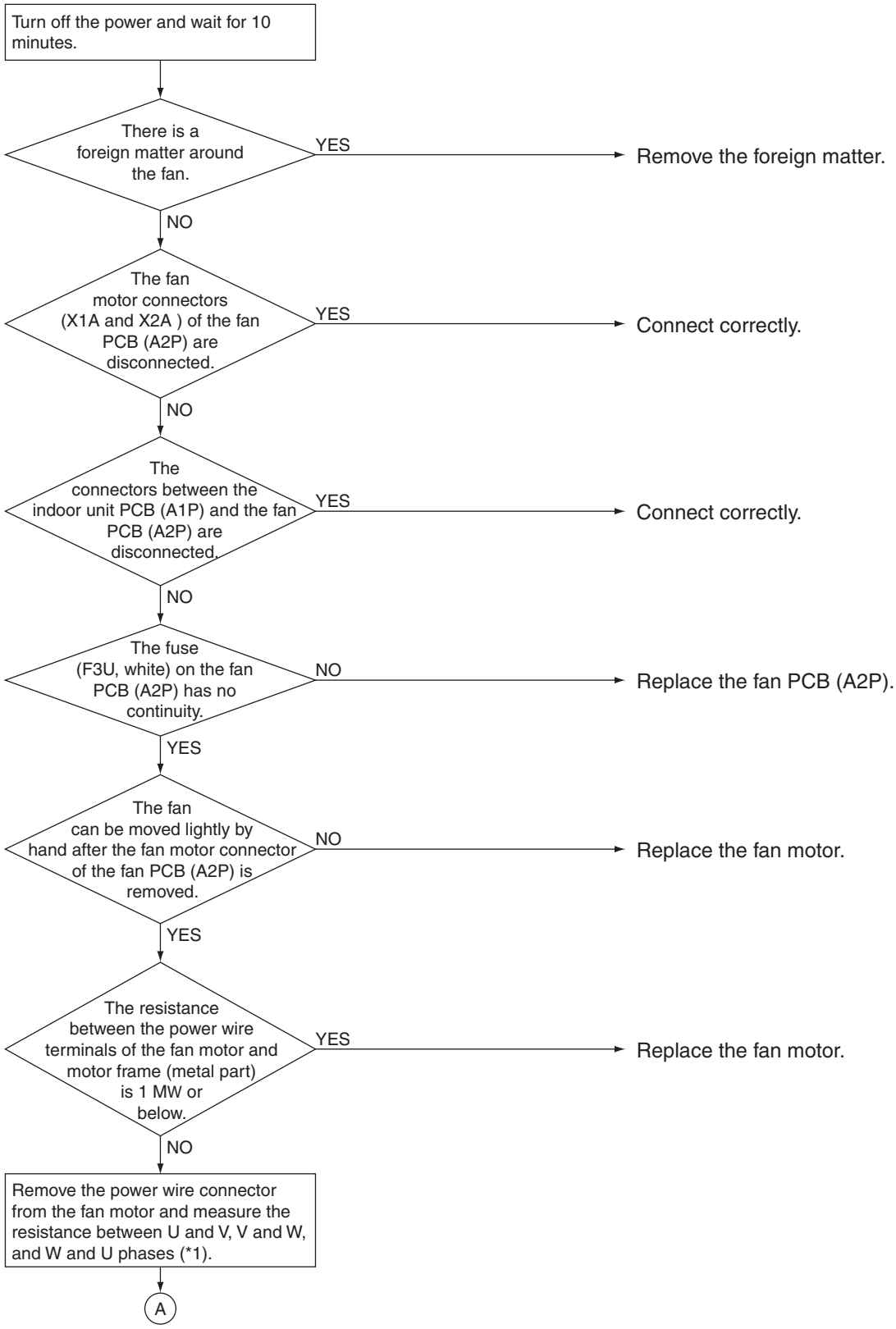
Caution Be sure to turn off the power switch before connecting or disconnecting the connector, or parts may be damaged.

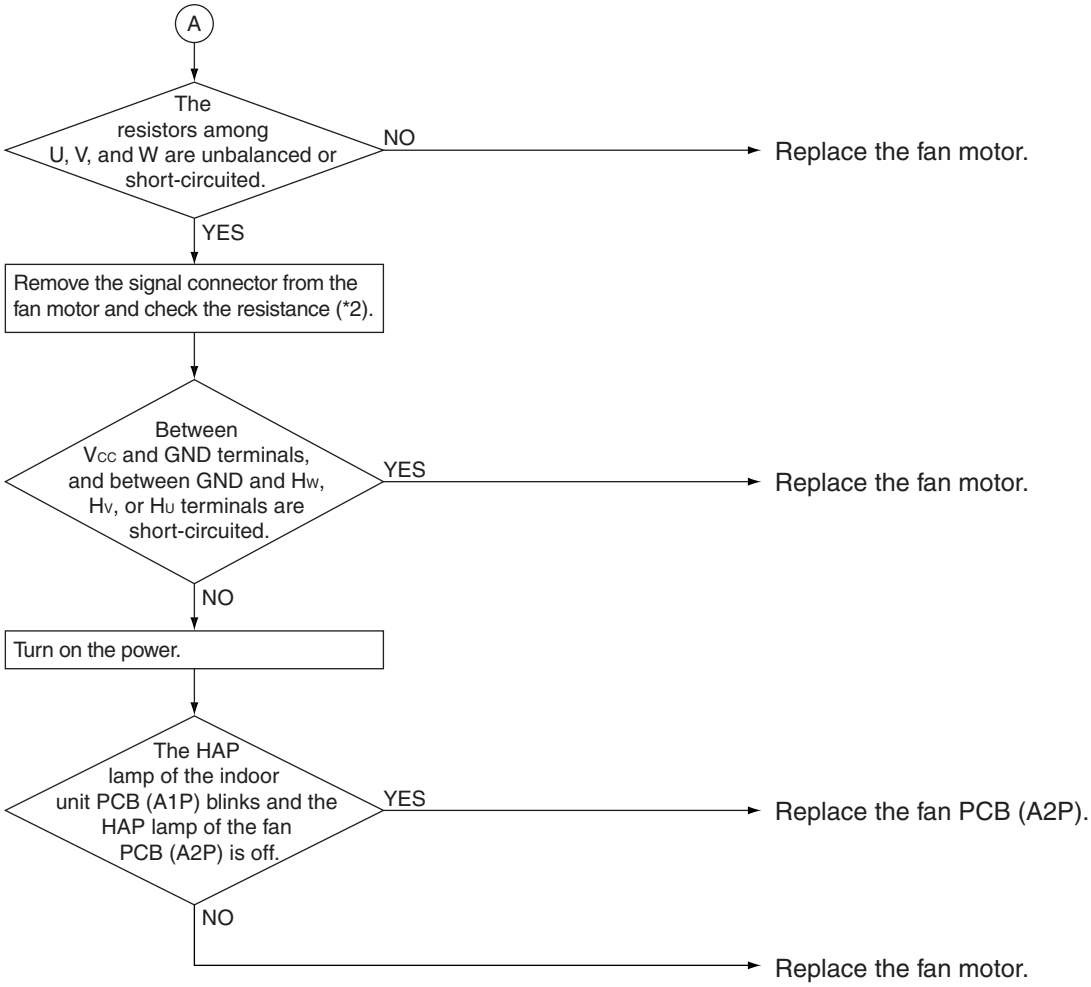


Remote Controller Display	A6
Applicable Models	FXMQ
Method of Malfunction Detection	Detection from the current flow on the fan PCB Detection from the RPM of the fan motor in operation Detection from the position signal of the fan motor Detection from the current flow on the fan PCB when the fan motor starting operation
Malfunction Decision Conditions	■ An overcurrent flows. ■ The RPM is less than a certain level for 6 seconds. ■ A position error in the fan rotor continues for 5 seconds or more.
Supposed Causes	■ The clogging of a foreign matter ■ The disconnection of the fan motor connectors (X1A and X2A) ■ The disconnection of the connectors between the indoor unit PCB (A1P) and fan PCB (A2P) ■ Failure of fan PCB (A2P) ■ Failure of the fan motor

Troubleshooting

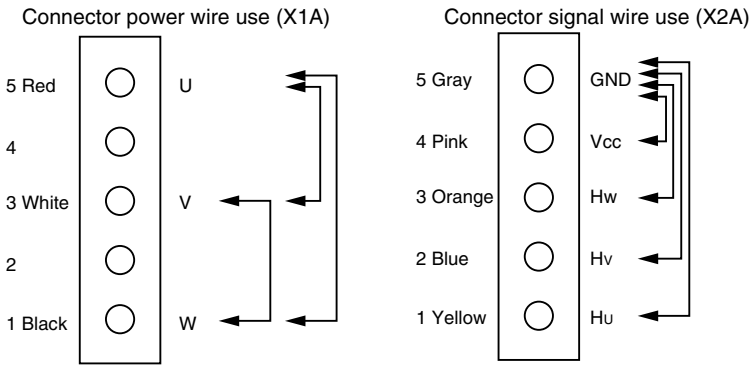
Caution Be sure to turn off the power switch before connecting or disconnecting the connector, or parts may be damaged.





*1. Measurement of power wire connector.
Remove the X1A connector from the fan PCB (A2P) and measure the resistance between the U and V, V and W, and W and U phases of the motor connector (with five conductors) and check that each phase is balanced (within a permissible dispersion range of ±20%).

*2. Measurement of signal wire connector.
Remove the X2A connector and measure the resistance between GND and Vcc, Hw, Hv, or Hu terminals of the motor connector (with five conductors).

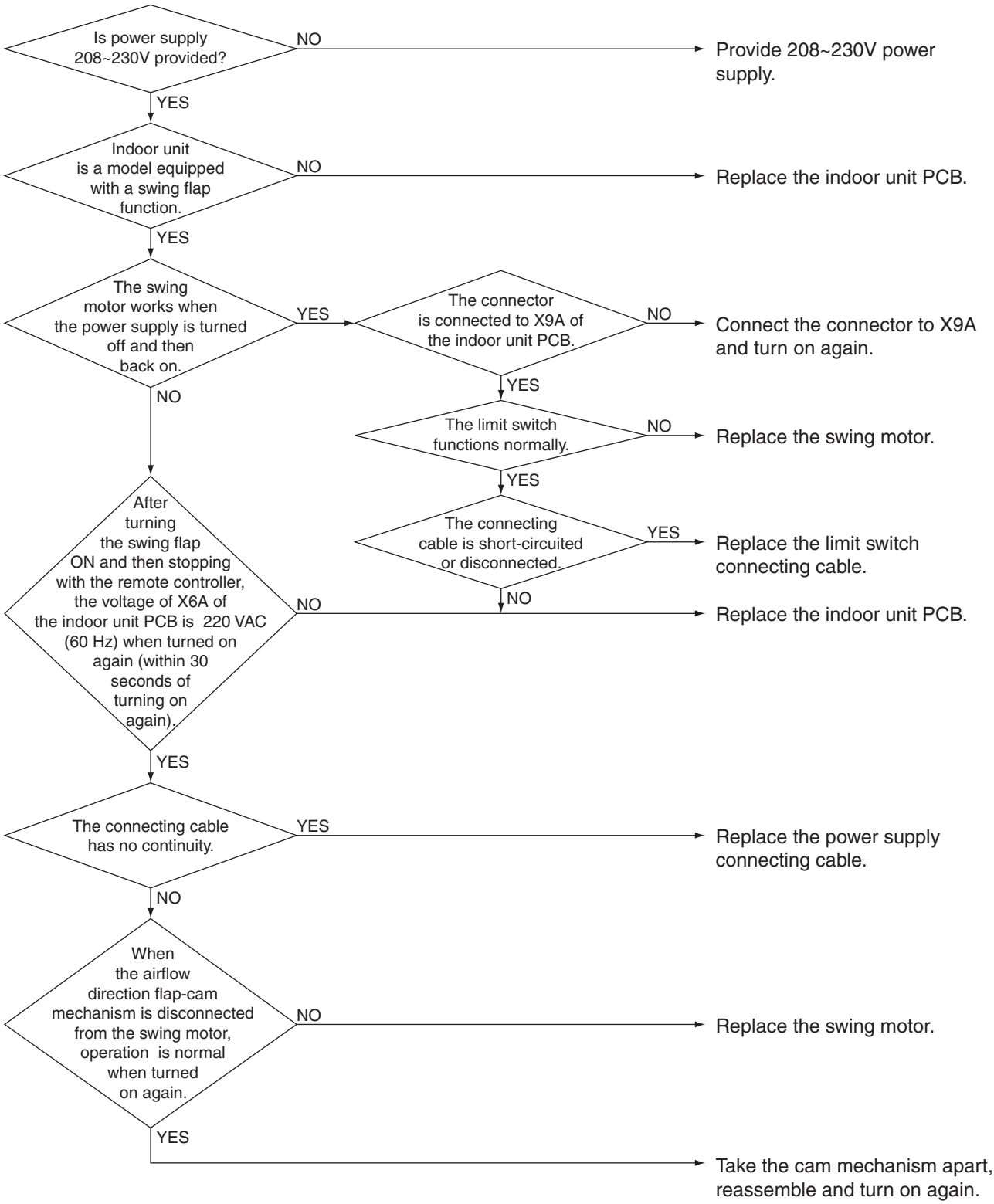


3.5 "A7" Malfunction of Swing Flap Motor (M1S)

Remote Controller Display	A7
Applicable Models	FXFQ, FXHQ, FXAQ
Method of Malfunction Detection	Utilizes ON/OFF of the limit switch when the motor turns
Malfunction Decision Conditions	When ON/OFF of the micro-switch for positioning cannot be reversed even though the swing flap motor is energized for a specified amount of time (about 30 seconds)
Supposed Causes	■ Defect of swing motor ■ Defect of connection cable (power supply and limit switch) ■ Defect of airflow direction adjusting flap-cam ■ Defect of indoor unit PCB

Troubleshooting

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



3.6 "A9" Malfunction of Moving Part of Electronic Expansion Valve (Y1E)

Remote Controller Display

A9

Applicable Models

All indoor unit models

Method of Malfunction Detection

Check coil condition of electronic expansion valve by using micro-computer

Malfunction Decision Conditions

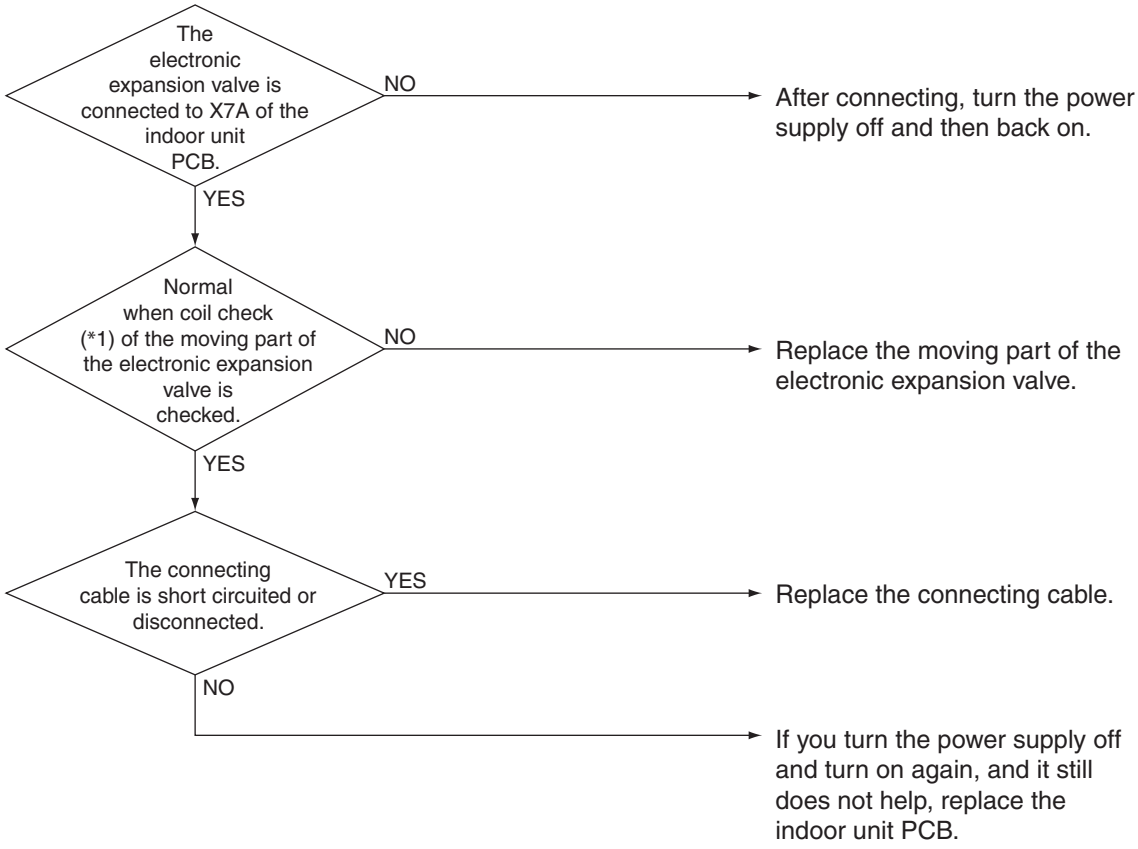
Pin input for electronic expansion valve coil is abnormal when initializing micro-computer.

Supposed Causes

- Malfunction of moving part of electronic expansion valve
- Defect of indoor unit PCB
- Defect of connecting cable

Troubleshooting

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



∗1: Coil check method for the moving part of the electronic expansion valve
Discount the electronic expansion valve from the PCB and check the continuity between the connector pins.

(Normal)

Pin No.	1. White	2. Yellow	3. Orange	4. Blue	5. Red	6. Brown
1. White		×	○ Approx. 300Ω	×	○ Approx. 150Ω	×
2. Yellow			×	○ Approx. 300Ω	×	○ Approx. 150Ω
3. Orange				×	○ Approx. 150Ω	×
4. Blue					×	○ Approx. 150Ω
5. Red						×
6. Brown						

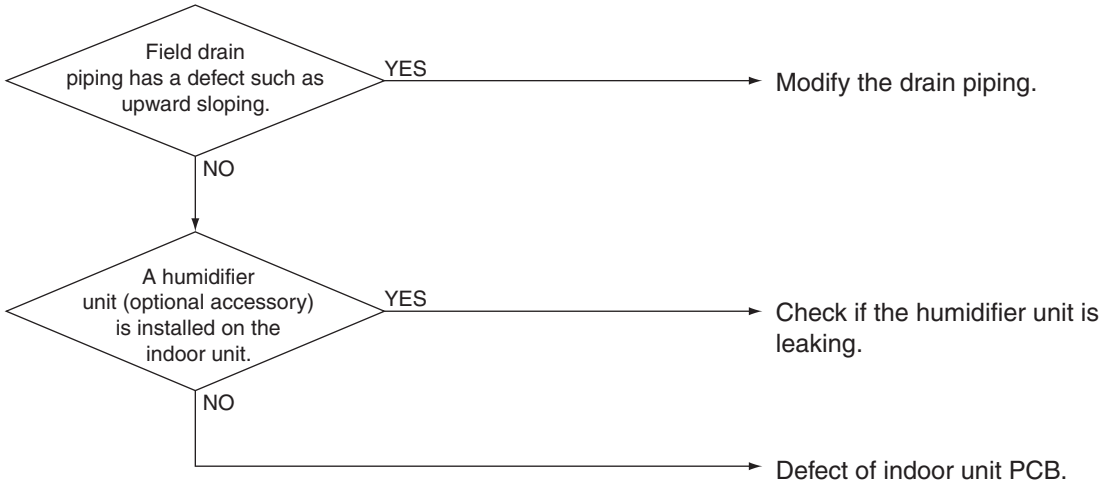
○: Continuity
× : No continuity

3.7 "AF" Drain Level above Limit

Remote Controller Display	AF
Applicable Models	FXMQ, FXDQ
Method of Malfunction Detection	Water leakage is detected based on float switch ON/OFF operation while the compressor is in non-operation.
Malfunction Decision Conditions	When the float switch changes from ON to OFF while the compressor is in non-operation
Supposed Causes	■ Humidifier unit (optional accessory) leaking ■ Defect of drain pipe (upward slope, etc.) ■ Defect of indoor unit PCB

Troubleshooting

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

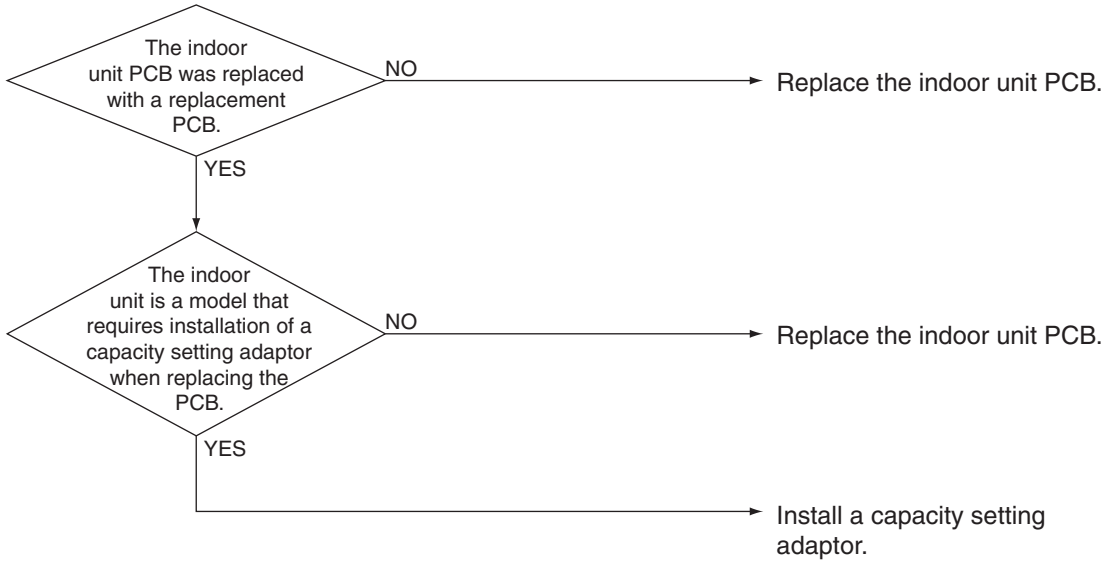


3.8 "A1" Malfunction of Capacity Determination Device

Remote controller display	A1
Applicable Models	All indoor unit models
Method of Malfunction Detection	Capacity is determined according to resistance of the capacity setting adaptor and the memory inside the IC memory on the indoor unit PCB, and whether the value is normal or abnormal is determined.
Malfunction Decision Conditions	Operation and: 1. When the capacity code is not saved to the PCB, and the capacity setting adaptor is not connected. 2. When a capacity that does not exist for that unit is set.
Supposed Causes	■ You have forgotten to install the capacity setting adaptor. ■ Defect of indoor unit PCB.

Troubleshooting

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

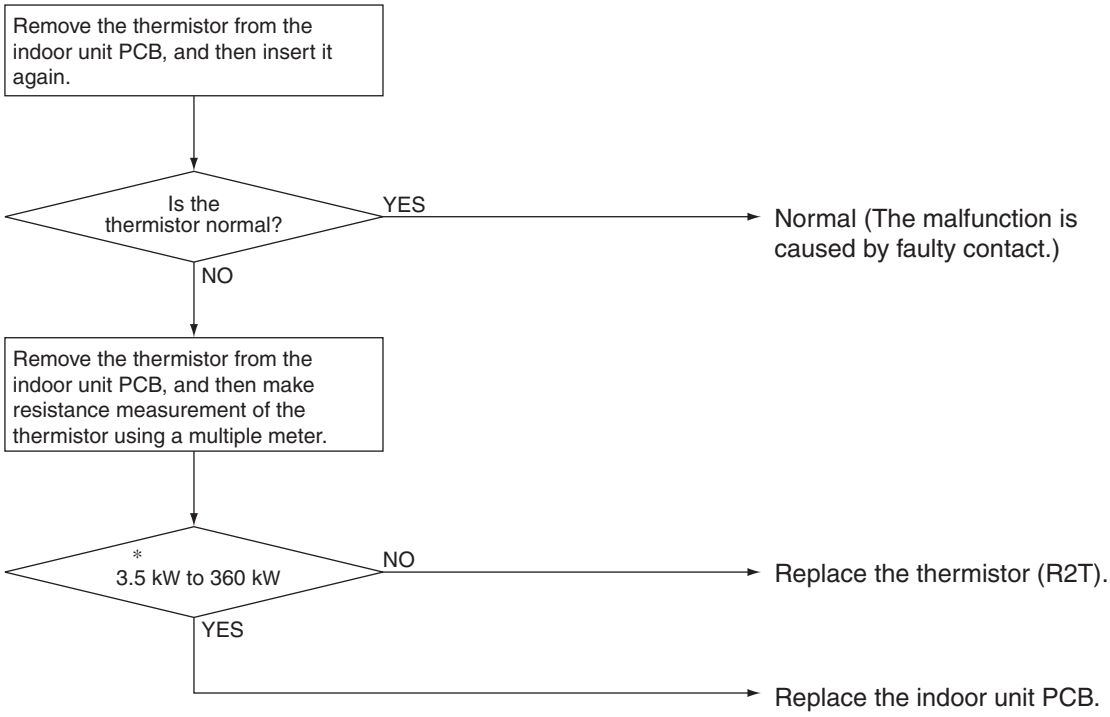


3.9 "E4" Malfunction of Thermistor (R2T) for Heat Exchanger

Remote Controller Display	E4
Applicable Models	All indoor unit models
Method of Malfunction Detection	Malfunction detection is carried out by temperature detected by heat exchanger thermistor.
Malfunction Decision Conditions	When the heat exchanger thermistor becomes disconnected or shorted while the unit is running.
Supposed Causes	■ Defect of connection of thermistor ■ Defect of thermistor (R2T) for liquid pipe ■ Defect of indoor unit PCB

Troubleshooting

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



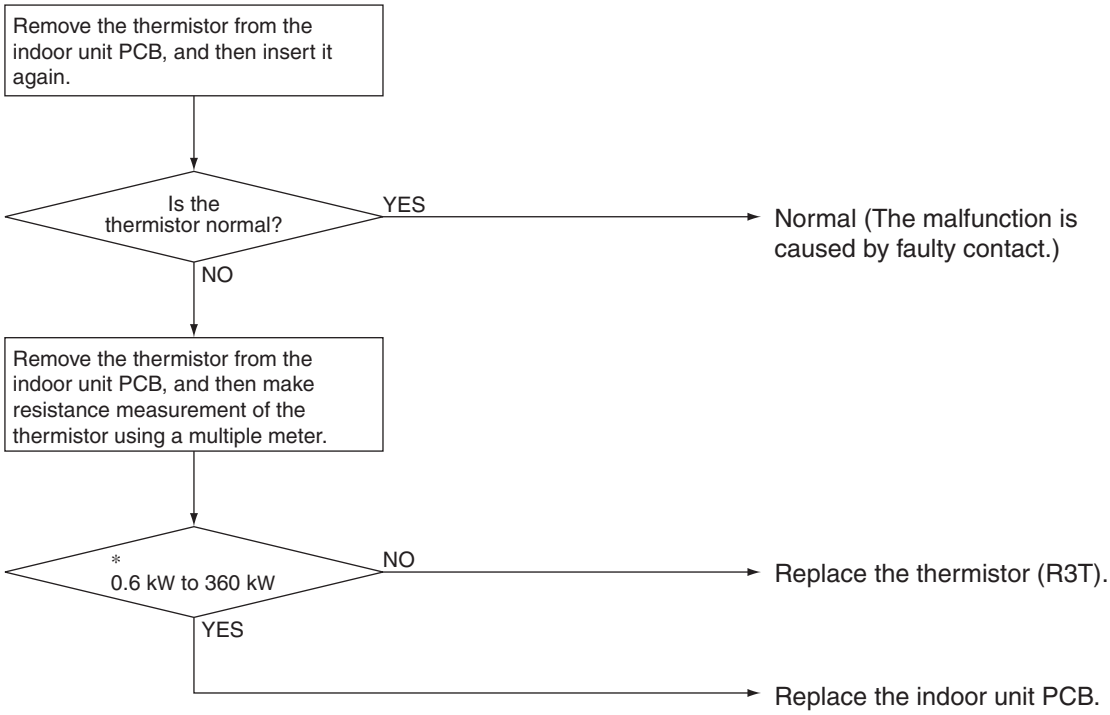
* Refer to "Thermistor Resistance / Temperature Characteristics" table on P.241.

3.10 "C5" Malfunction of Thermistor (R3T) for Gas Pipe

Remote Controller Display	C5
Applicable Models	All indoor unit models
Method of Malfunction Detection	Malfunction detection is carried out by temperature detected by gas pipe thermistor.
Malfunction Decision Conditions	When the gas pipe thermistor becomes disconnected or shorted while the unit is running
Supposed Causes	■ Defect of connection of thermistor ■ Defect of indoor unit thermistor (R3T) for gas pipe ■ Defect of indoor unit PCB

Troubleshooting

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



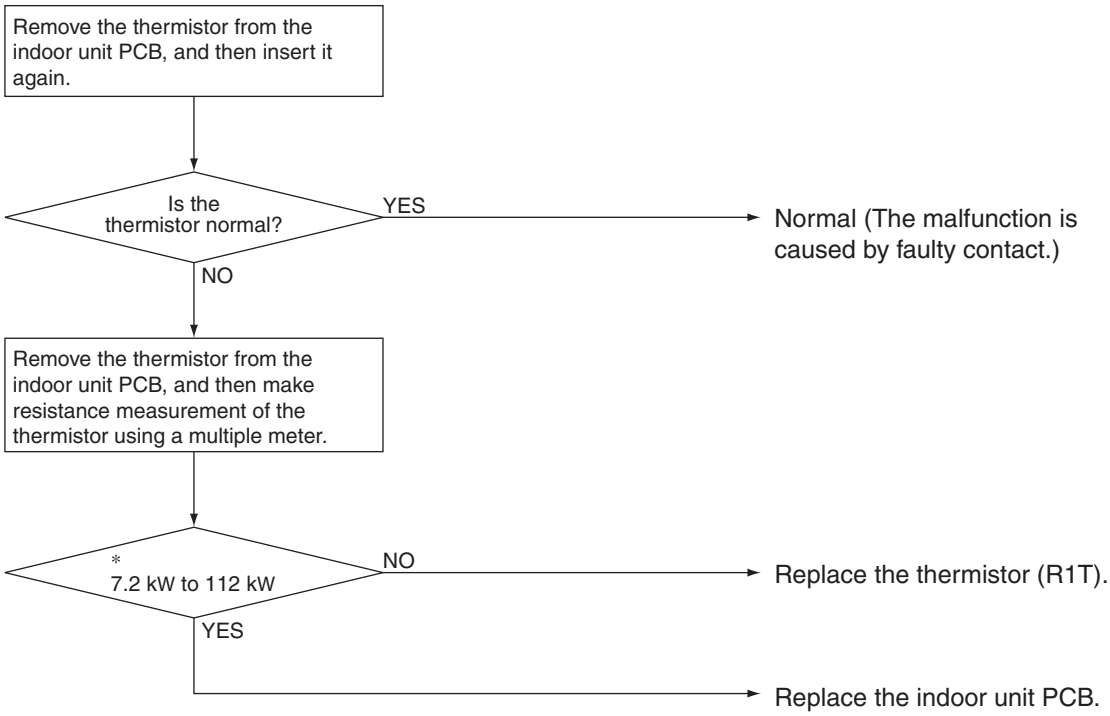
* Refer to "Thermistor Resistance / Temperature Characteristics" table on P.241.

3.11 "C9" Malfunction of Thermistor (R1T) for Suction Air

Remote Controller Display	C9
Applicable Models	All indoor unit models
Method of Malfunction Detection	Malfunction detection is carried out by temperature detected by suction air temperature thermistor.
Malfunction Decision Conditions	When the suction air temperature thermistor becomes disconnected or shorted while the unit is running
Supposed Causes	■ Defect of connection of thermistor ■ Defect of indoor unit thermistor (R1T) for air inlet ■ Defect of indoor unit PCB

Troubleshooting

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



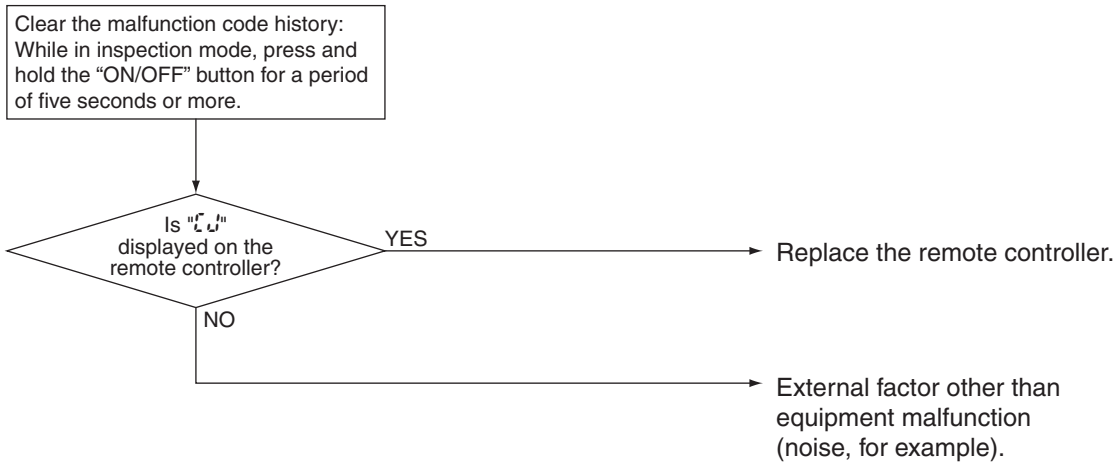
* Refer to "Thermistor Resistance / Temperature Characteristics" table on P.241.

3.12 "C.J" Malfunction of Thermostat Sensor in Remote Controller

Remote Controller Display	C.J
Applicable Models	All indoor unit models
Method of Malfunction Detection	Malfunction detection is carried out by temperature detected by remote controller air temperature thermistor. (Note1)
Malfunction Decision Conditions	When the remote controller air temperature thermistor becomes disconnected or shorted while the unit is running
Supposed Causes	■ Defect of remote controller thermistor ■ Defect of remote controller PCB

Troubleshooting

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



Note:

∗1: How to delete "the record of malfunction codes".
Press the "On/Off" button for 4 seconds and more while the malfunction code is displayed in the inspection mode.

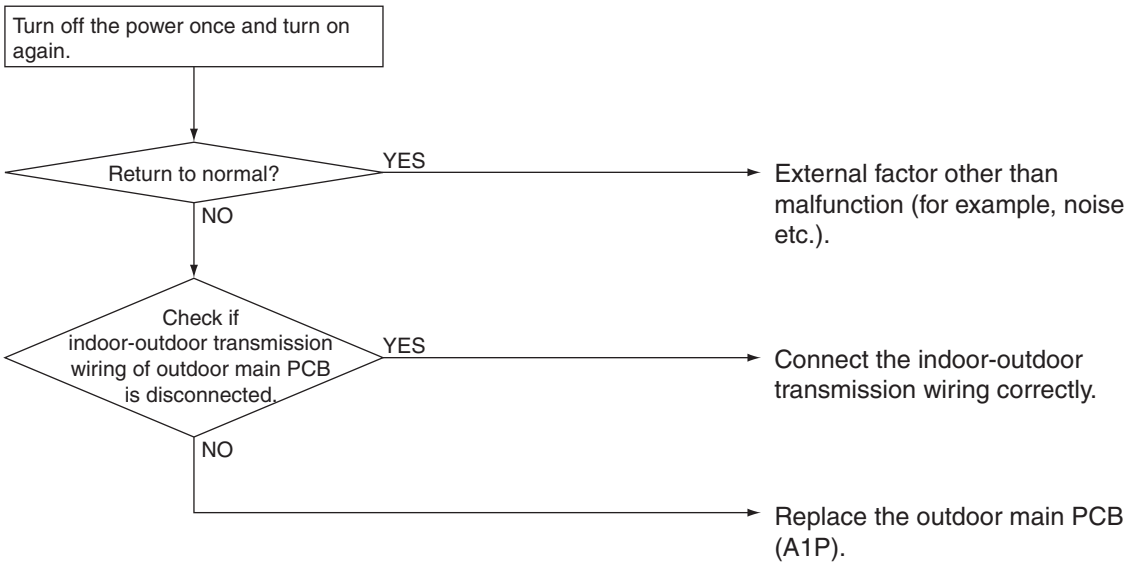
∗ Refer to "Thermistor Resistance / Temperature Characteristics" table on P.241.

3.13 "E 1" PCB Defect

Remote Controller Display	E 1
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Abnormality is detected under the communication conditions in the hardware section between the indoor unit and outdoor unit.
Malfunction Decision Conditions	When the communication conditions in the hardware section between the indoor unit and the outdoor unit are not normal
Supposed Causes	■ Defect of outdoor unit PCB (A1P) ■ Defective connection of indoor-outdoor transmission wiring

Troubleshooting

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



3.14 "E3" Actuation of High Pressure Switch

Remote Controller Display

E3

Applicable Models

RXYMQ36 · 48PVJU

Method of Malfunction Detection

Abnormality is detected when the contact of the high pressure protection switch opens.

Malfunction Decision Conditions

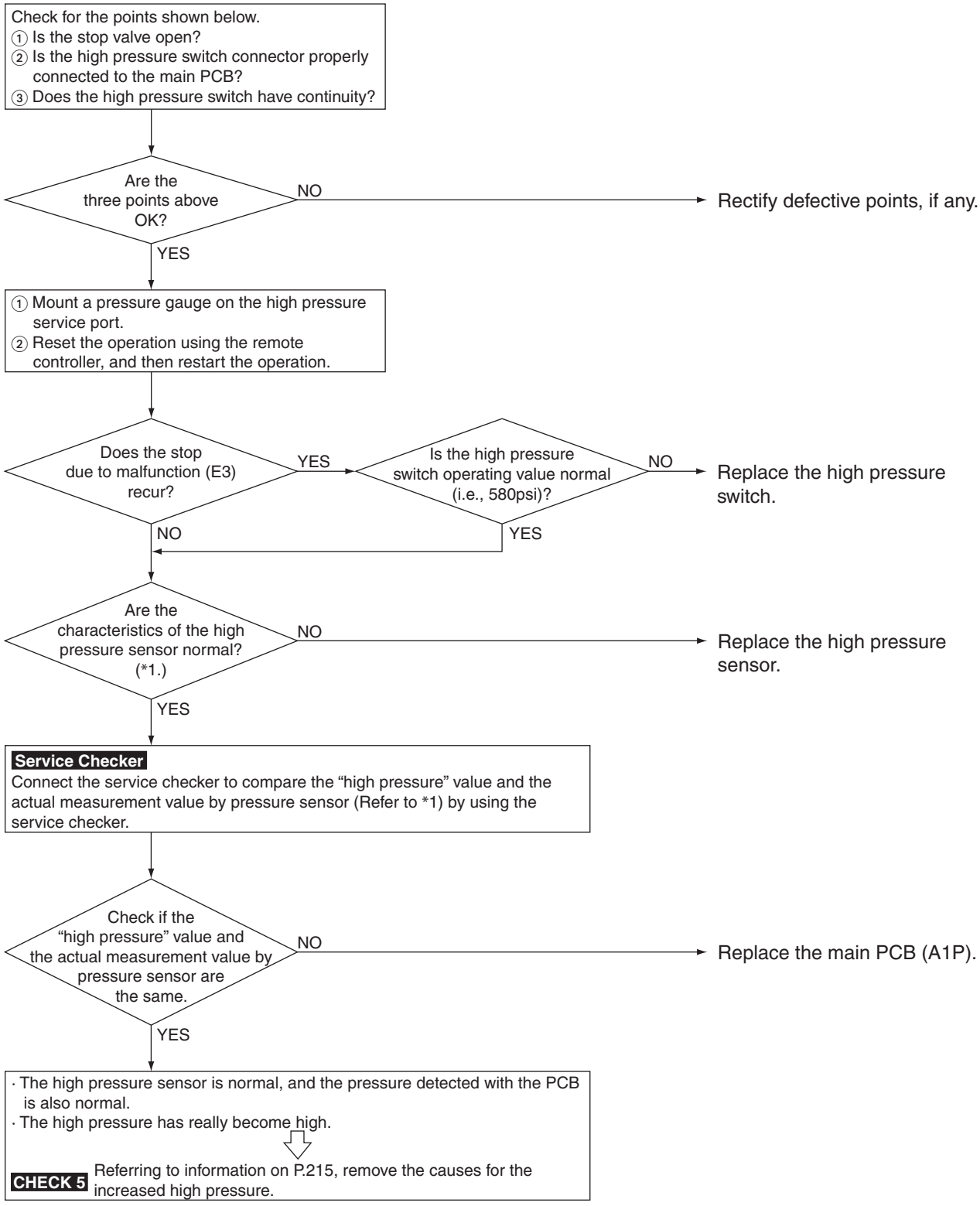
Error is generated when the high pressure switch activation count reaches the number specific to the operation mode.
(Reference) Operating pressure of high pressure switch
Operating pressure: 580psi
Reset pressure: 435psi

Supposed Causes

- Actuation of outdoor unit high pressure switch
- Defect of high pressure switch
- Defect of outdoor unit PCB
- Instantaneous power failure
- Faulty high pressure sensor

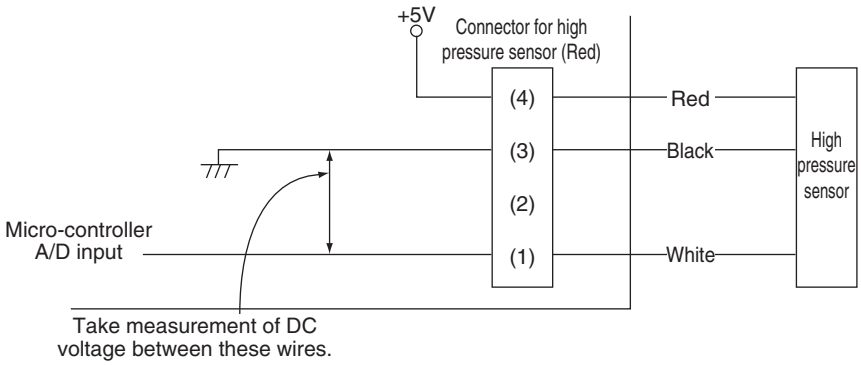
Troubleshooting

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



*1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge. For the pressure sensor voltage, measure voltage at the connector, and then convert it to pressure according to information on P.243.)

*2: Take the measurement of voltage of the pressure sensor.



3.15 "E4" Actuation of Low Pressure Sensor

Remote Controller Display

E4

Applicable Models

RXYMQ36 · 48PVJU

Method of Malfunction Detection

Abnormality is detected by the pressure value with the low pressure sensor.

Malfunction Decision Conditions

Error is generated when the low pressure is dropped under specific pressure.
Operating pressure:10.2psi

Supposed Causes

- Abnormal drop of low pressure (Lower than 10.2psi)
- Defect of low pressure sensor
- Defect of outdoor unit PCB
- Stop valve is not opened.

Troubleshooting

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

Is the stop valve open?
- NO → Open the stop valve.
- YES →

① Mount a pressure gauge on the low pressure service port.
② Reset the operation using the remote controller, and then restart the operation.

Are the characteristics of the low pressure sensor normal? (*1.)
- NO → Replace the low pressure sensor.
- YES →

Service Checker
Connect the service checker to compare the “low pressure” value and the actual measurement value by pressure sensor (*1) by using the service checker.

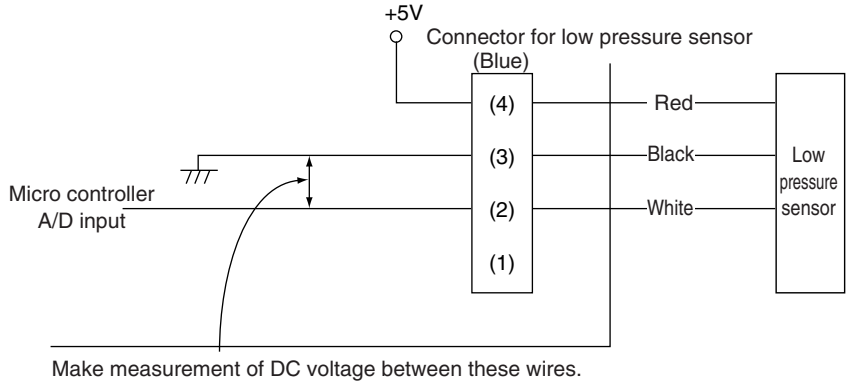
Check if the “low pressure” value and the actual measurement value by pressure sensor are the same.
- NO → Replace the main PCB (A1P).
- YES →

· The low pressure sensor is normal, and the pressure detected with the PCB is also normal.
· The low pressure has become very low.

CHECK 2 Referring to information on P.211, remove the cause of the increased low pressure.

*1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge. As to the voltage of the pressure sensor, take measurement of voltage at the connector, and then convert it to pressure according to information on P.243.

*2: Take measurement of voltage of the pressure sensor.



3.16 "E5" Inverter Compressor Motor Lock

Remote Controller Display

E5

Applicable Models

RXYMQ36 · 48PVJU

Method of Malfunction Detection

Inverter PCB takes the position signal from UVW line connected between the inverter and compressor, and the malfunction is detected when any abnormality is observed in the phase-current waveform.

Malfunction Decision Conditions

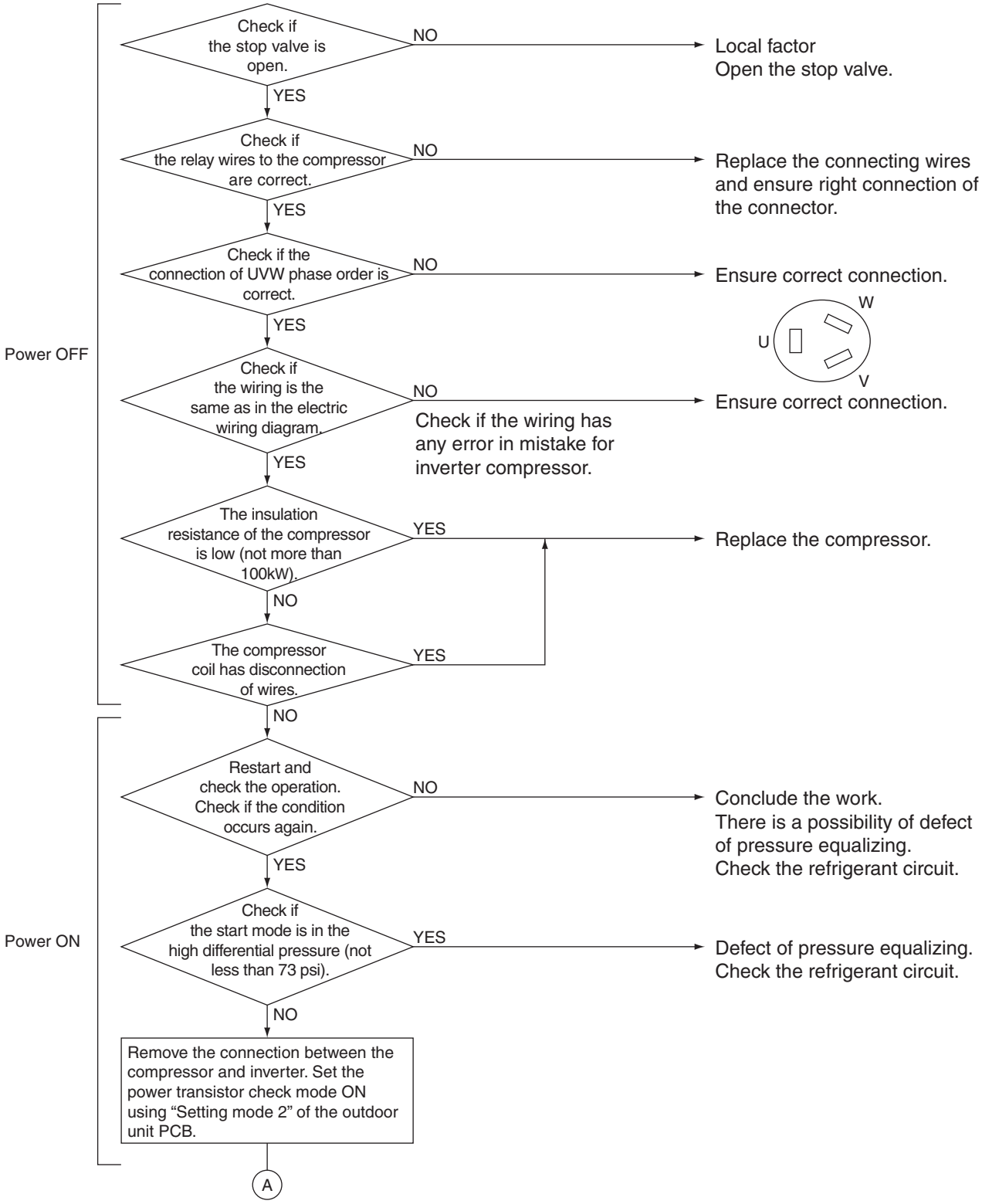
This malfunction will be output when the inverter compressor motor does not start up even in forced startup mode.

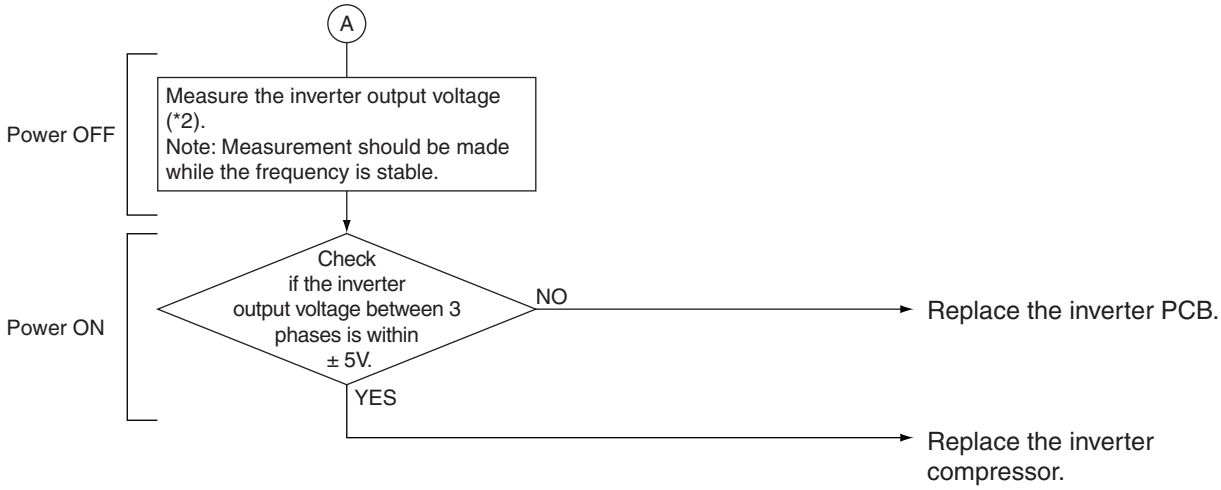
Supposed Causes

- Inverter compressor lock
- High differential pressure (72.5psi or more)
- Incorrect UVW wiring
- Defect of inverter PCB
- Stop valve is left in closed / not opened.

Troubleshooting

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





*1: Pressure difference between high pressure and low pressure before starting.

*2: The quality of power transistors / diode modules can be judged by executing **CHECK 4** (P.213).

3.17 "E7" Malfunction of Outdoor Unit Fan Motor

Remote Controller Display	E7
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Detect a malfunction based on the current value in the inverter PCB (as for motor 2, current value in the fan PCB). Detect a malfunction for the fan motor circuit based on the number of rotation detected by hole IC during the fan motor operation.
Malfunction Decision Conditions	■ Overcurrent is detected for inverter PCB (A2P) or fan inverter PCB (A3P) (System down is caused by 4 times of detection.) ■ In the condition of fan motor rotation, the number of rotation is below the fixed number for more than 6 seconds. (System down is caused by 4 times of detection.)
Supposed Causes	■ Failure of fan motor ■ Defect or connect ion error of the connectors/ harness between the fan motor and PCB ■ The fan can not rotate due to any foreign substances entangled. ■ Clear condition: Continue normal operation for 5 minutes

Troubleshooting

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

Check in the monitor mode
4HP ~ 5HP class models have 2 fans.
Check electric motor (electric motor 1 or 2) corresponding to malfunction code "E7" in the monitor mode of outdoor unit PCB. (Refer to P.104, 105 for how to check)

Cut the power supply OFF and wait for 10 minutes.

Check if any foreign substances around the fan.
YES → Remove the foreign substances.
NO

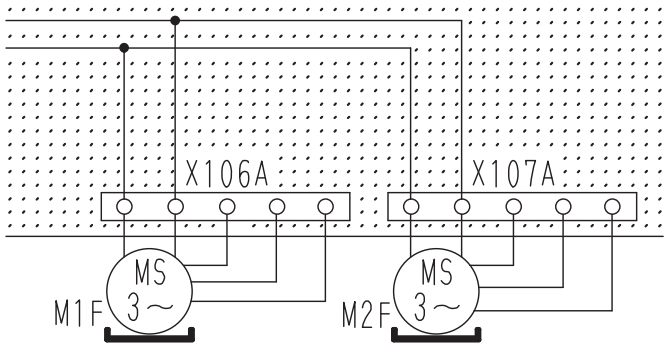
Check the connection status of the connectors
○ Fan motor 1: X106A of PCB
○ Fan motor 2: X107A of PCB

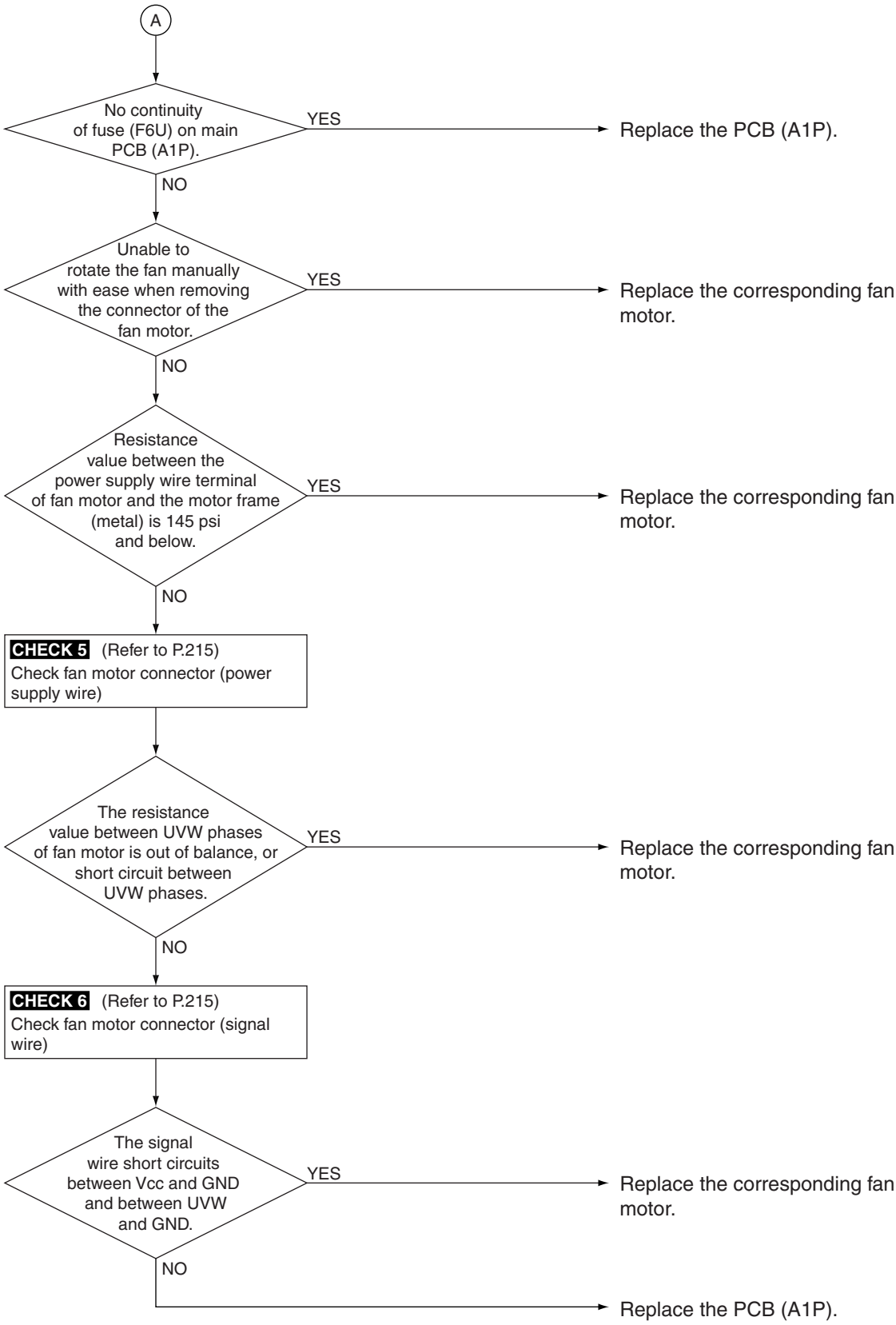
Check if any connector is disconnected.
YES → Insert the connector.
NO

[redacted]
○ Fan motor 1: Both power supply wire and signal wire are all white.
○ Fan motor 2: Both power supply wire and signal wire are red in the PCB side and white in the motor side.

Relay connectors have any connection error.
YES → Correct the connection of the relay connectors.
NO

(A)




A
No continuity of fuse (F6U) on main PCB (A1P).
YES
Replace the PCB (A1P).
NO
Unable to rotate the fan manually with ease when removing the connector of the fan motor.
YES
Replace the corresponding fan motor.
NO
Resistance value between the power supply wire terminal of fan motor and the motor frame (metal) is 145 psi and below.
YES
Replace the corresponding fan motor.
NO
CHECK 5 (Refer to P.215)
Check fan motor connector (power supply wire)
The resistance value between UVW phases of fan motor is out of balance, or short circuit between UVW phases.
YES
Replace the corresponding fan motor.
NO
CHECK 6 (Refer to P.215)
Check fan motor connector (signal wire)
The signal wire short circuits between Vcc and GND and between UVW and GND.
YES
Replace the corresponding fan motor.
NO
Replace the PCB (A1P).

3.18 "E9" Malfunction of Moving Part of Electronic Expansion Valve (Y1E, Y3E)

Remote Controller Display	E9
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Check disconnection of connector To be detected based on continuity existence of coil of electronic expansion valve
Malfunction Decision Conditions	No current is detected in the common (COM [+]) when power supply is ON.
Supposed Causes	■ Disconnection of connectors for electronic expansion valve (Y1E) or (Y3E) ■ Defect of moving part of electronic expansion valve ■ Defect of outdoor unit main PCB (A1P)

Troubleshooting

Caution Be sure to turn off the power switch before connecting or disconnecting the connector, or parts may be damage

Turn power supply off, and turn power supply on again.

Return to normal?

YES → External factor other than malfunction (noise, for example).

NO

Check the electronic expansion valve corresponding to the malfunction code "E9" in the monitor mode.
(Refer to P.105, 106 for how to check.)

○ When Confirmation of malfunction 4 shows as follows:
◑○○●●※※ Electronic expansion valve for main use (Y1E)

○ When Confirmation of malfunction 4 shows as follows:
◑○○◑●※※ Electronic expansion valve for subcooling (Y3E)

○ Explanation of "※※"

●	●	Master unit
●	◑	Slave unit 1
◑	●	Slave unit 2
◑	◑	System

The connector of outdoor unit PCB (A1P) for electronic expansion valve is connected.

NO → Ensure correct connection.

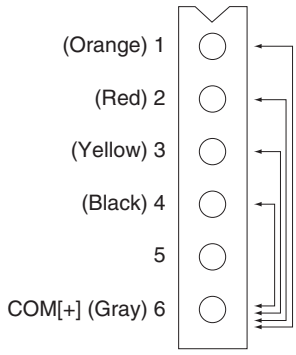
YES

The coil resistance of electronic expansion valve is normal. (*1)

NO → Replace the connecting cable.

YES → Replace the outdoor unit PCB (A1P).

* Make measurement of resistance between the connector pins, and then make sure the resistance falls in the range of 40 to 50Ω.



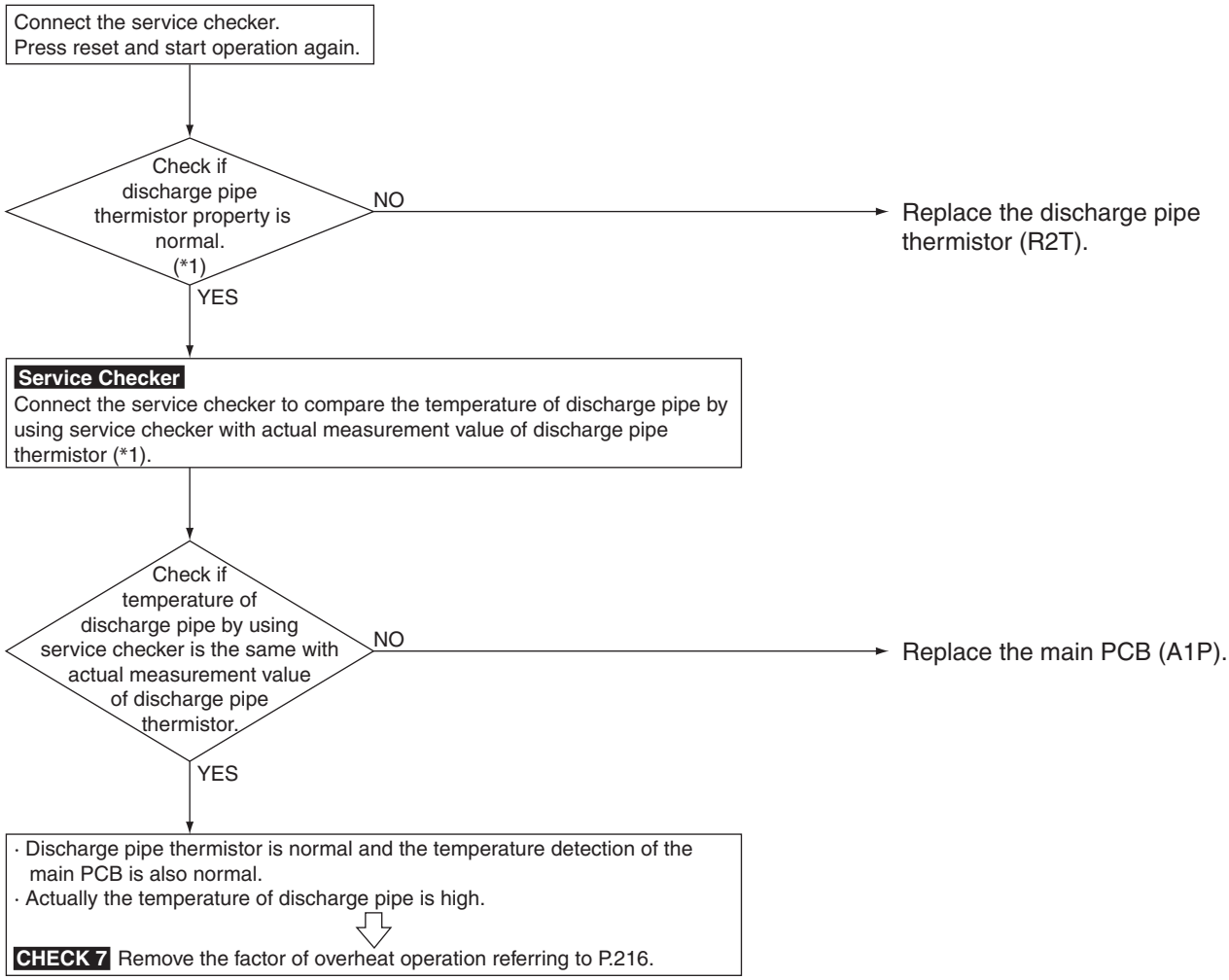
Measuring points	Judgement criteria
1 - 6	40~50Ω
2 - 6	
3 - 6	
4 - 6	

3.19 "F3" Abnormal Discharge Pipe Temperature (R2T)

Remote Controller Display	F3
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Abnormality is detected according to the temperature detected by the discharge pipe thermistor.
Malfunction Decision Conditions	When the discharge pipe temperature rises to an abnormally high level (275 °F and above) When the discharge pipe temperature rises suddenly (248 °F and above for 10 successive minutes)
Supposed Causes	■ Faulty discharge pipe temperature ■ Faulty discharge pipe thermistor (R2T) ■ Faulty outdoor unit PCB

Troubleshooting

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



*1: Compare the resistance value of discharge pipe thermistor and the value based on the surface thermometer. (Refer to “Thermistor Resistance / Temperature Characteristics” table on P.241.

3.20 "F6" Refrigerant Overcharged

Remote Controller Display

F6

Applicable Models

RXYMQ36 · 48PVJU

Method of Malfunction Detection

Excessive charging of refrigerant is detected by using the outside air temperature, heat exchanging deicer temperature and liquid pipe temperature during a check run.

Malfunction Decision Conditions

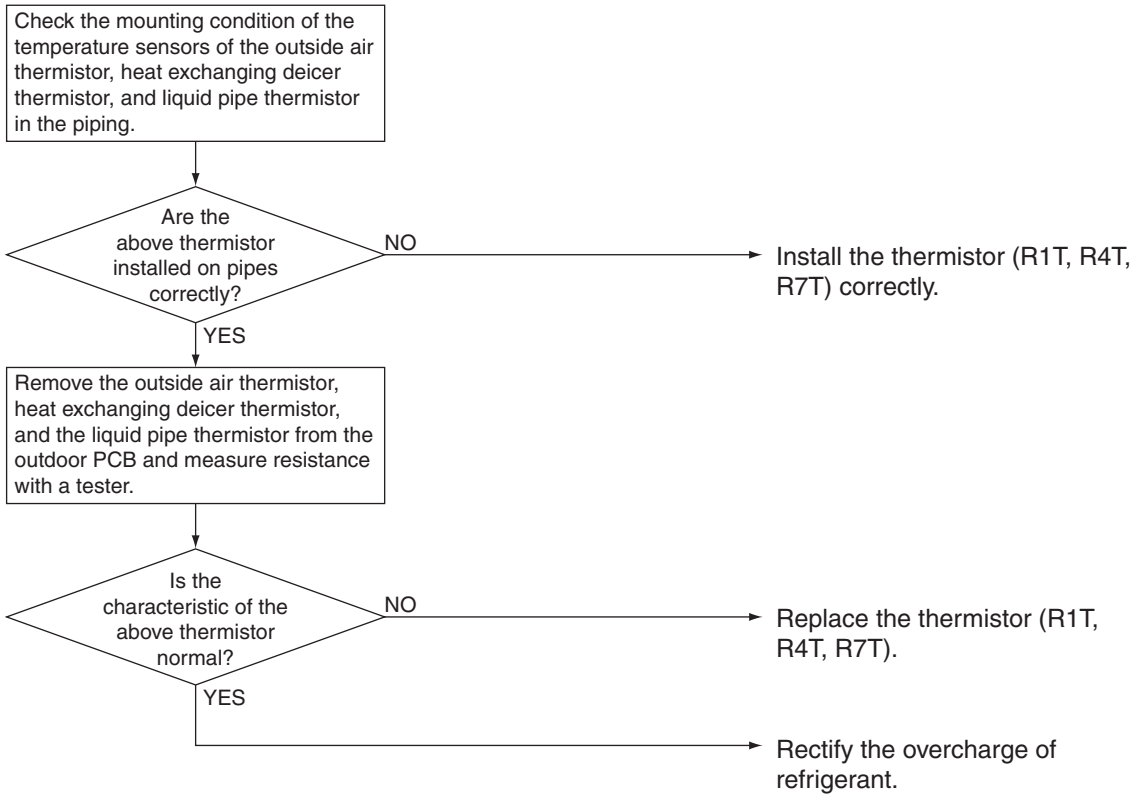
When the amount of refrigerant (calculated by using the outside air temperature), heat exchanging deicer temperature, and liquid pipe temperature exceed the standard during a check run.

Supposed Causes

- Refrigerant overcharge
- Misalignment of the outside air thermistor
- Misalignment of the heat exchanging deicer thermistor
- Misalignment of the liquid pipe thermistor

Troubleshooting

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



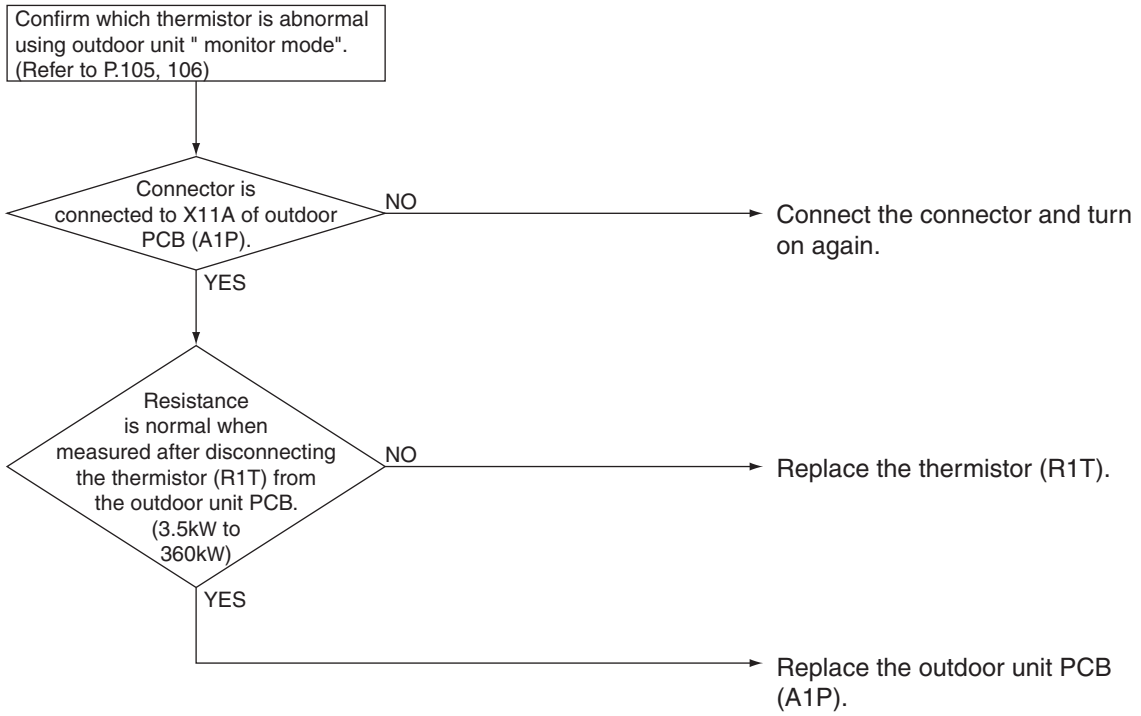
* Refer to "Thermistor Resistance / Temperature Characteristics" table on P.241.

3.21 "H9" Malfunction of Thermistor (R1T) for Outdoor Air

Remote Controller Display	H9
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Malfunction is detected from the temperature detected by the outdoor air thermistor.
Malfunction Decision Conditions	When the outside air temperature thermistor has short circuit or open circuit in operation
Supposed Causes	■ Defective thermistor connection ■ Defect of thermistor (R1T) for outdoor air ■ Defect of outdoor unit PCB (A1P)

Troubleshooting

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



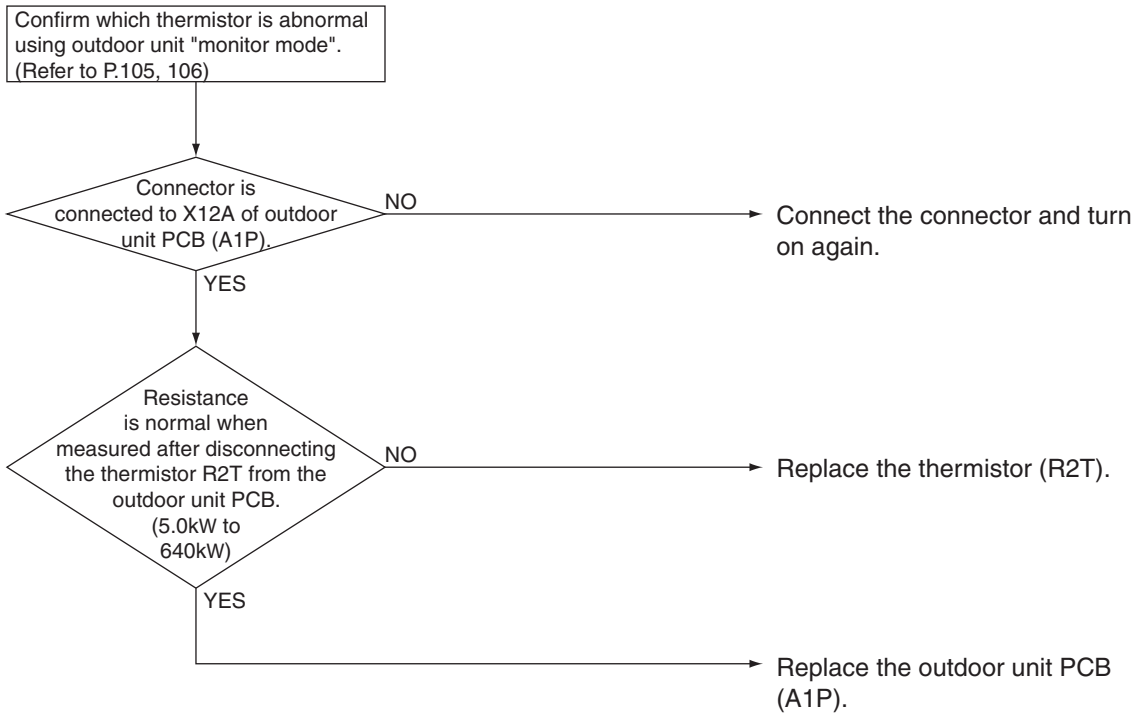
∗ Refer to "Thermistor Resistance / Temperature Characteristics" table on P.241.

3.22 "J3" Malfunction of Discharge Pipe Thermistor (R2T)

Remote Controller Display	J3
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Malfunction is detected from the temperature detected by discharge pipe temperature thermistor.
Malfunction Decision Conditions	When a short circuit or an open circuit in the discharge pipe temperature thermistor is detected.
Supposed Causes	■ Defect of thermistor (R2T) for outdoor unit discharge pipe ■ Defect of outdoor unit PCB (A1P) ■ Defect of thermistor connection

Troubleshooting

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



The alarm indicator is displayed when the fan is being used also.

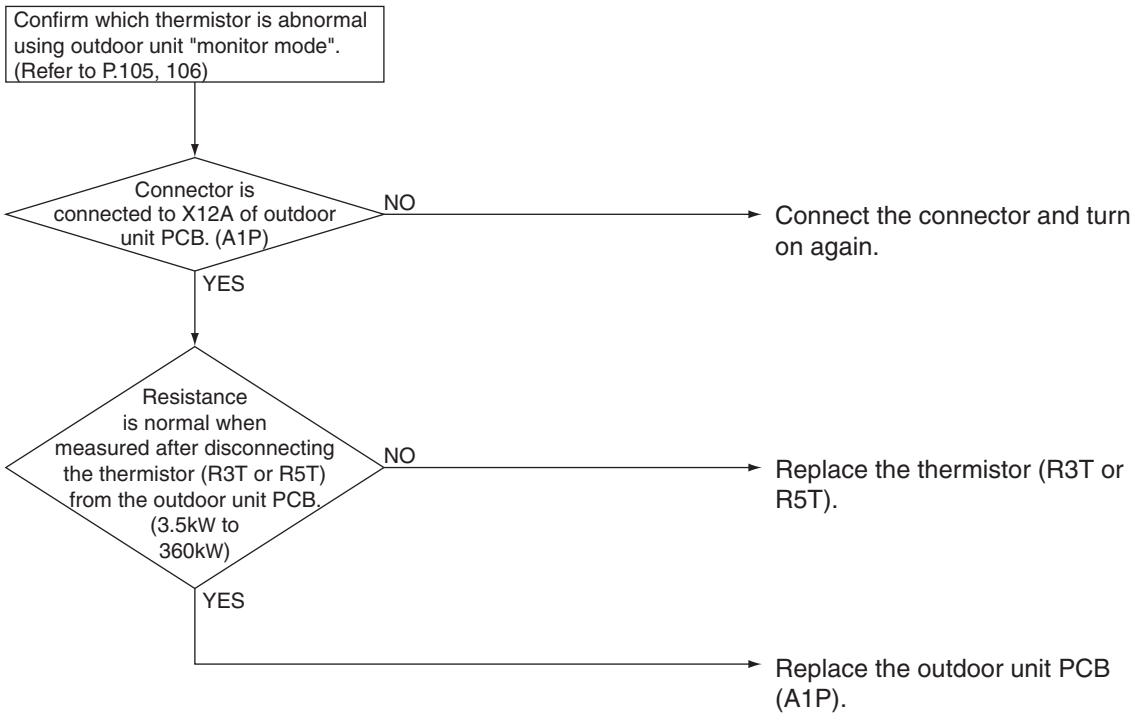
* Refer to "Thermistor Resistance / Temperature Characteristics" table on P.241.

3.23 "J5" Malfunction of Thermistor (R3T, R5T) for Suction Pipe 1, 2

Remote Controller Display	J5
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Malfunction is detected from the temperature detected by the thermistor for suction pipe 1, 2.
Malfunction Decision Conditions	When a short circuit or an open circuit in the thermistor for suction pipe 1, 2 are detected
Supposed Causes	■ Defect of thermistor (R3T or R5T) for outdoor unit suction pipe ■ Defect of outdoor unit PCB (A1P) ■ Defect of thermistor connection

Troubleshooting

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



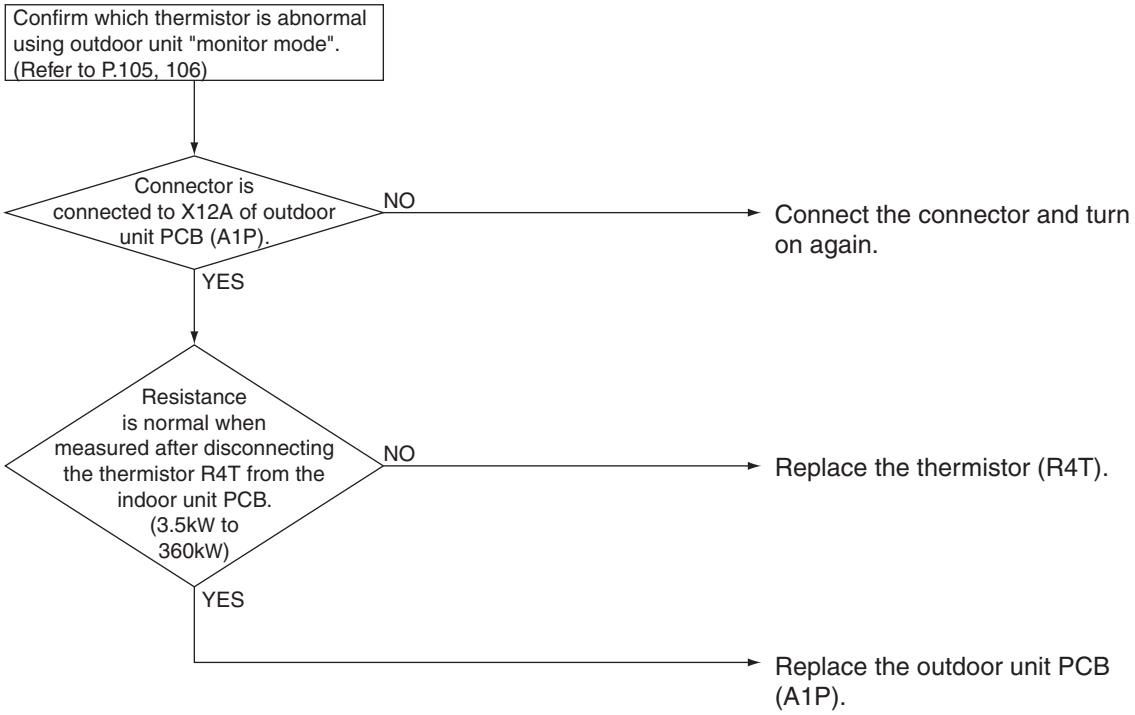
∗ Refer to "Thermistor Resistance / Temperature Characteristics" table on P.241.

3.24 "J6" Malfunction of Thermistor (R4T) for Outdoor Unit Heat Exchanger

Remote Controller Display	J6
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Malfunction is detected from the temperature detected by the heat exchanger thermistor.
Malfunction Decision Conditions	When a short circuit or an open circuit in the heat exchanger thermistor is detected
Supposed Causes	■ Defect of thermistor (R4T) for outdoor unit coil ■ Defect of outdoor unit PCB (A1P) ■ Defect of thermistor connection

Troubleshooting

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



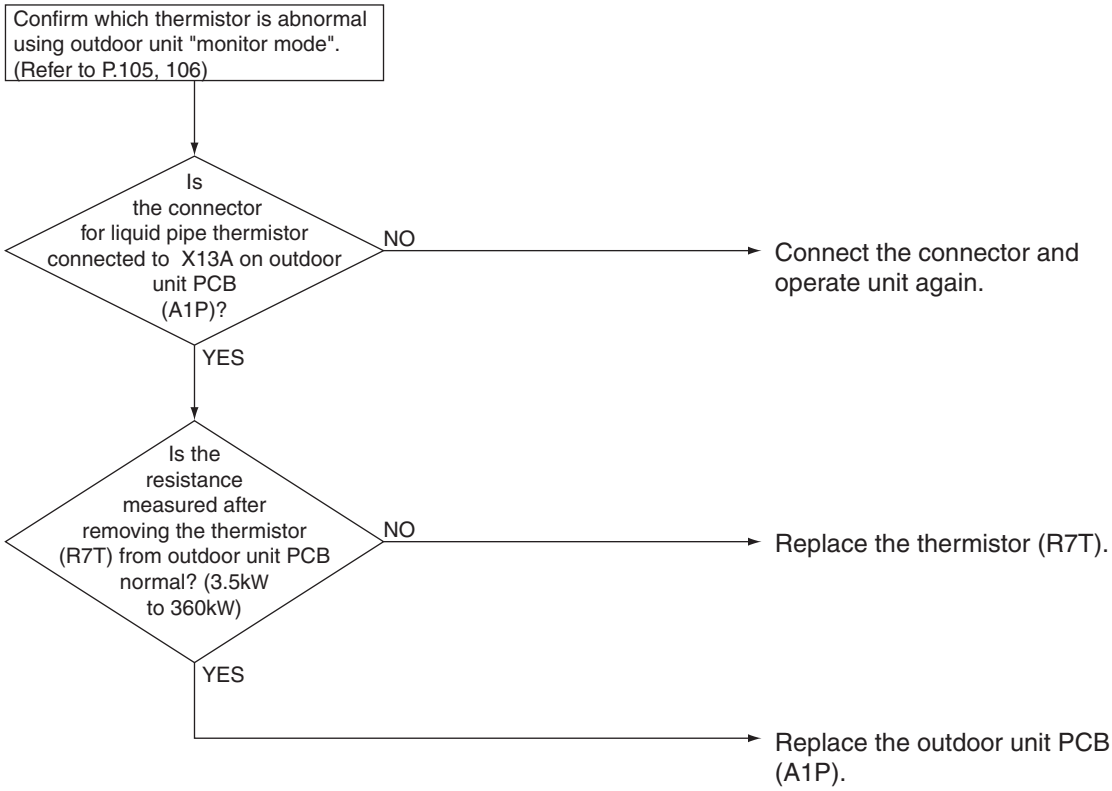
∗ Refer to "Thermistor Resistance / Temperature Characteristics" table on P.241.

3.25 "J7" Malfunction of Thermistor (R7T) for Outdoor Unit Liquid Pipe

Remote Controller Display	J7
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Malfunction is detected from the temperature detected by the liquid pipe thermistor.
Malfunction Decision Conditions	When a short circuit or an open circuit in the heat exchanger thermistor is detected
Supposed Causes	■ Faulty liquid pipe thermistor 1 (R7T) ■ Faulty outdoor unit PCB ■ Defect of thermistor connection

Troubleshooting

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



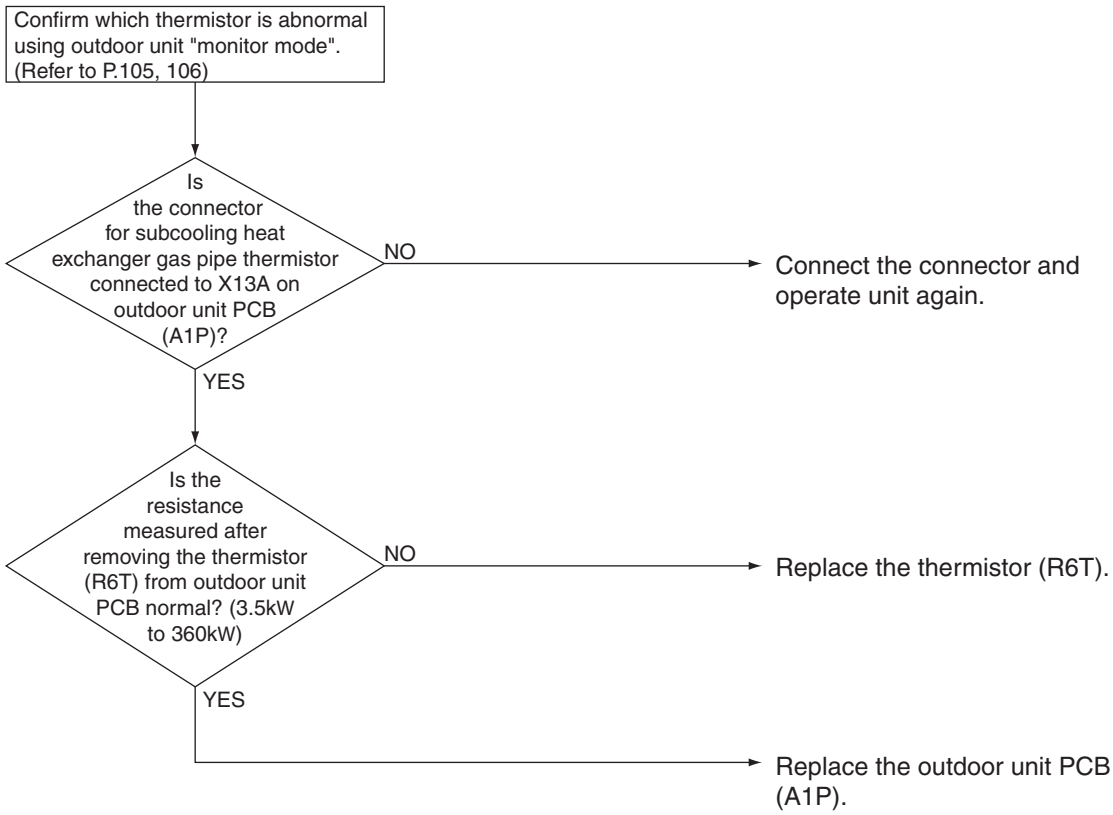
∗ Refer to "Thermistor Resistance / Temperature Characteristics" table on P.241.

3.26 "J9" Malfunction of Subcooling Heat Exchanger Gas Pipe Thermistor (R6T)

Remote Controller Display	J9
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Malfunction is detected according to the temperature detected by subcooling heat exchanger gas pipe thermistor.
Malfunction Decision Conditions	When the subcooling heat exchanger gas pipe thermistor is short circuit or open circuit.
Supposed Causes	■ Faulty subcooling heat exchanger gas pipe thermistor (R6T) ■ Faulty outdoor unit PCB

Troubleshooting

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



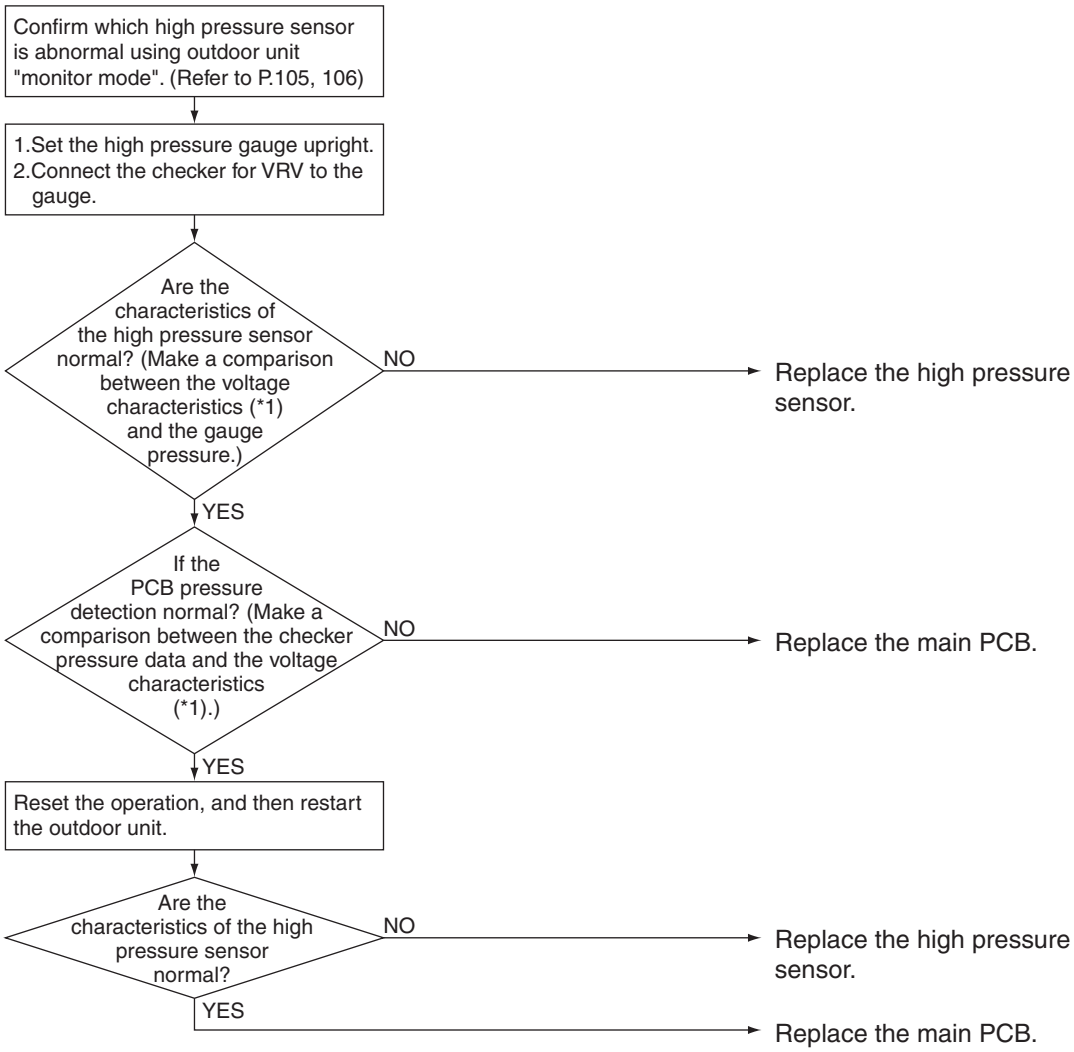
∗ Refer to "Thermistor Resistance / Temperature Characteristics" table on P.241.

3.27 "J9" Malfunction of High Pressure Sensor

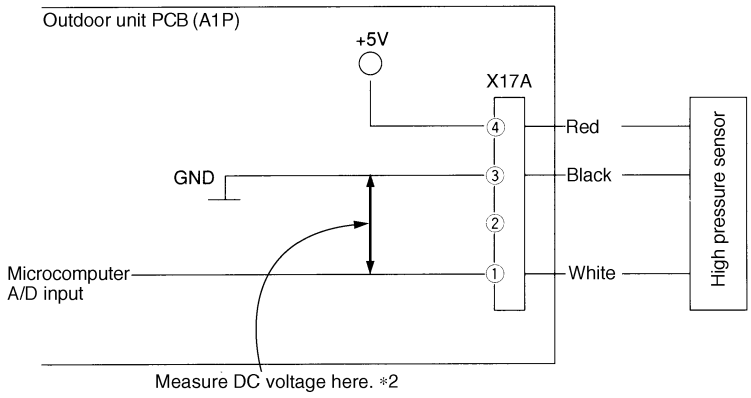
Remote Controller Display	J9
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Malfunction is detected from the pressure detected by the high pressure sensor.
Malfunction Decision Conditions	When the high pressure sensor is short circuit or open circuit (Not less than 612psi, or 1.45psi and below)
Supposed Causes	■ Defect of high pressure sensor system ■ Connection of low pressure sensor with wrong connection ■ Defect of outdoor unit PCB ■ Defective connection of high pressure sensor

Troubleshooting

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



∗1: Voltage measurement point



∗2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on P.243.

3.28 "UE" Malfunction of Low Pressure Sensor

Remote Controller Display

UE

Applicable Models

RXYMQ36 · 48PVJU

Method of Malfunction Detection

Malfunction is detected from pressure detected by low pressure sensor.

Malfunction Decision Conditions

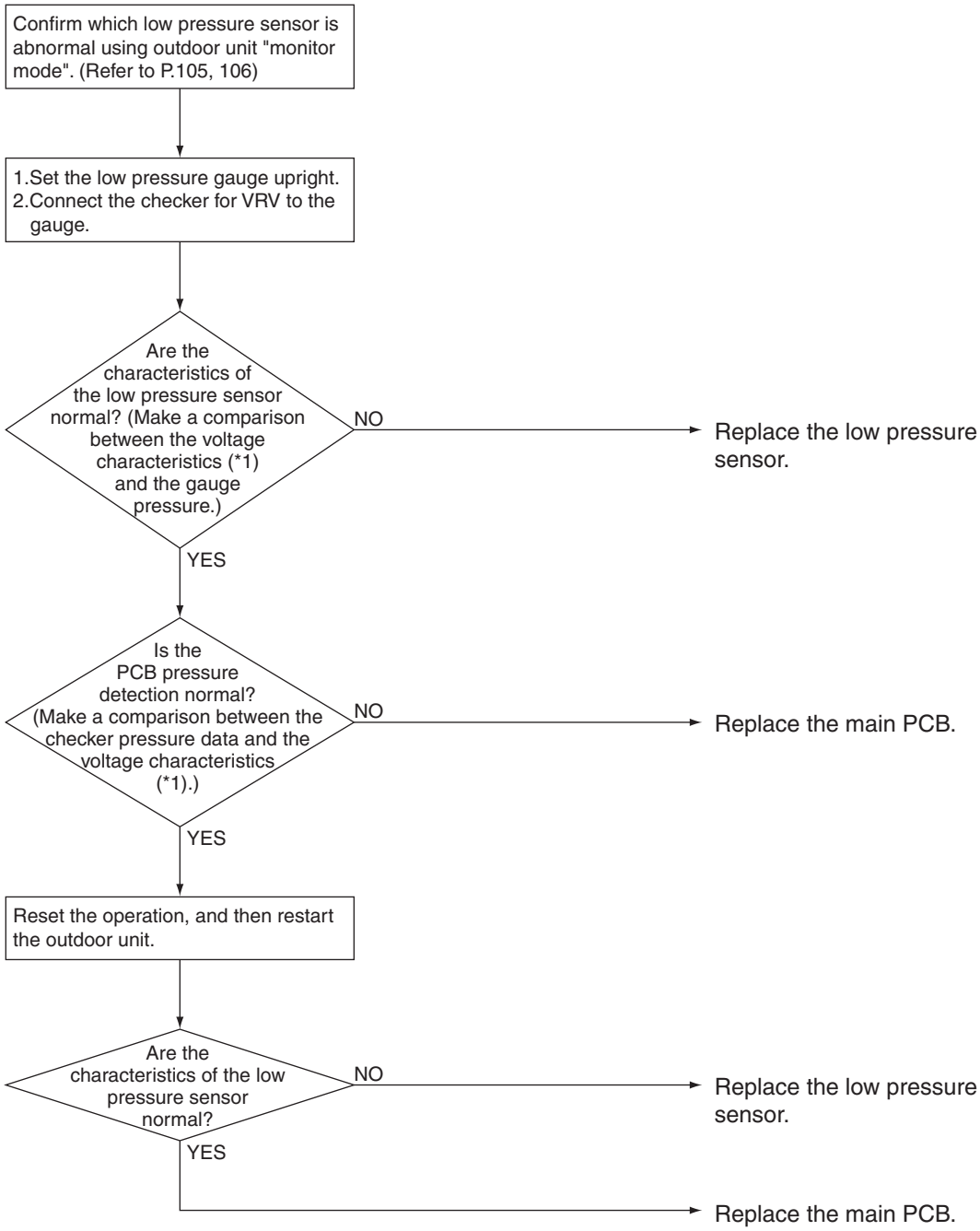
When the low pressure sensor is short circuit or open circuit
(Not less than 257psi, or 1.45psi and below)

Supposed Causes

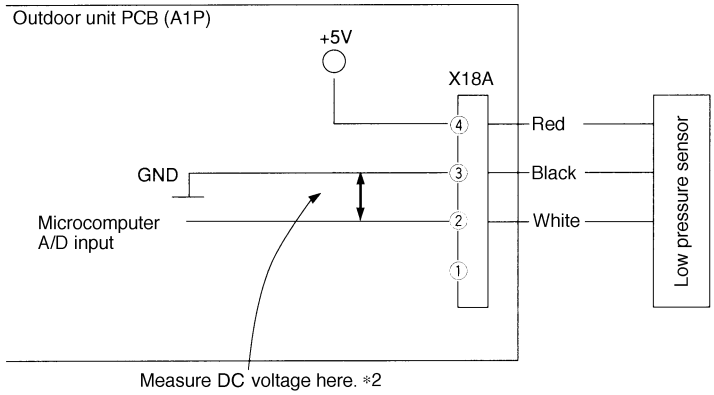
- Defect of low pressure sensor system
- Connection of high pressure sensor with wrong connection
- Defect of outdoor unit PCB
- Defective connection of low pressure sensor

Troubleshooting

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



∗1: Voltage measurement point



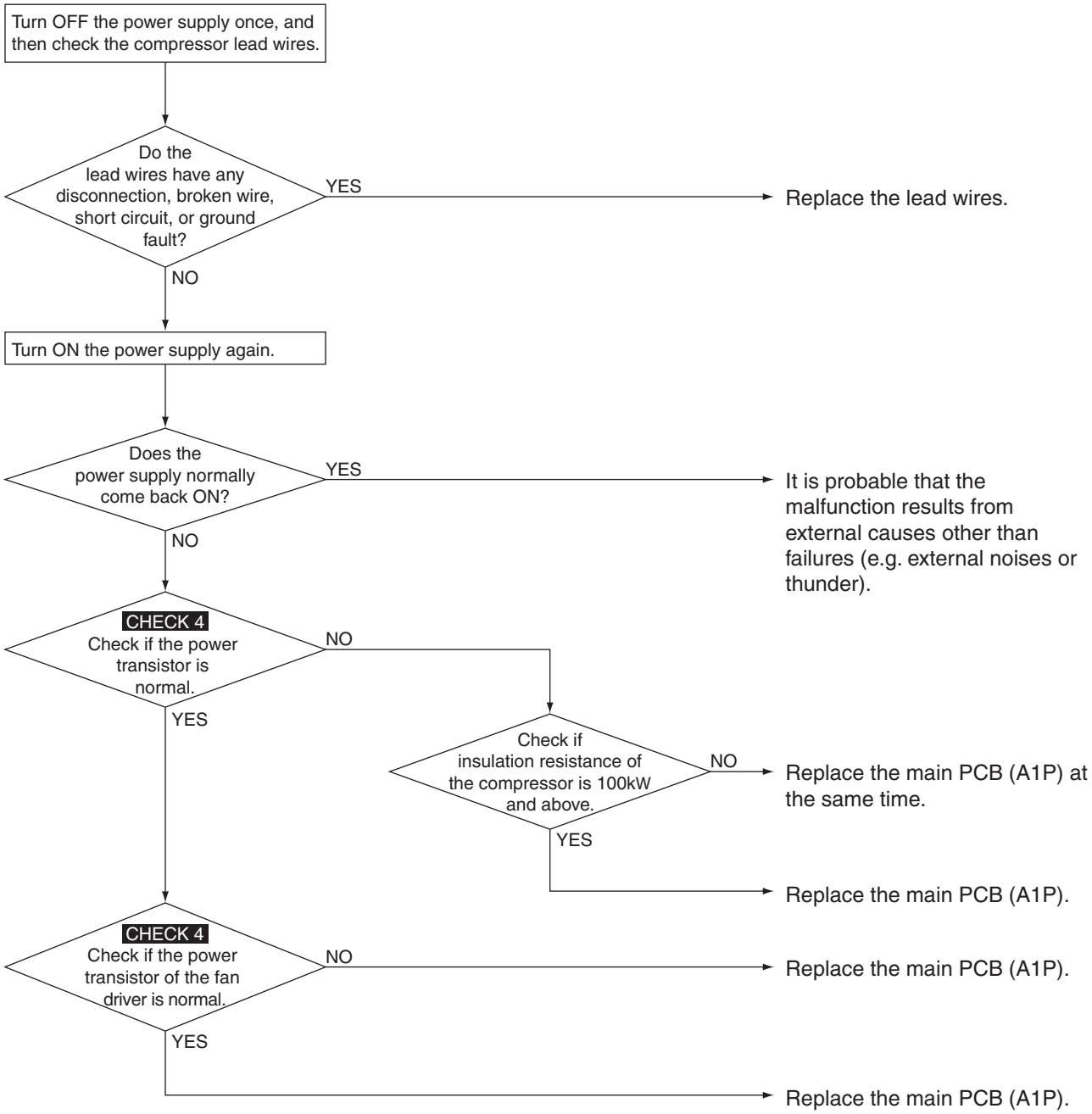
∗2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on P.243.

3.29 "L 1" Malfunction of PCB

Remote Controller Display	L 1
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Malfunction is detected based on the current value during waveform output before starting compressor. Malfunction is detected based on the value from current sensor during synchronous operation when starting the unit.
Malfunction Decision Conditions	Overcurrent (OCP) flows during waveform output Malfunction of current sensor during synchronous operation IPM failure
Supposed Causes	■ Main PCB (A1P) ●IPM failure ●Current sensor failure ●Drive circuit failure

Troubleshooting

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



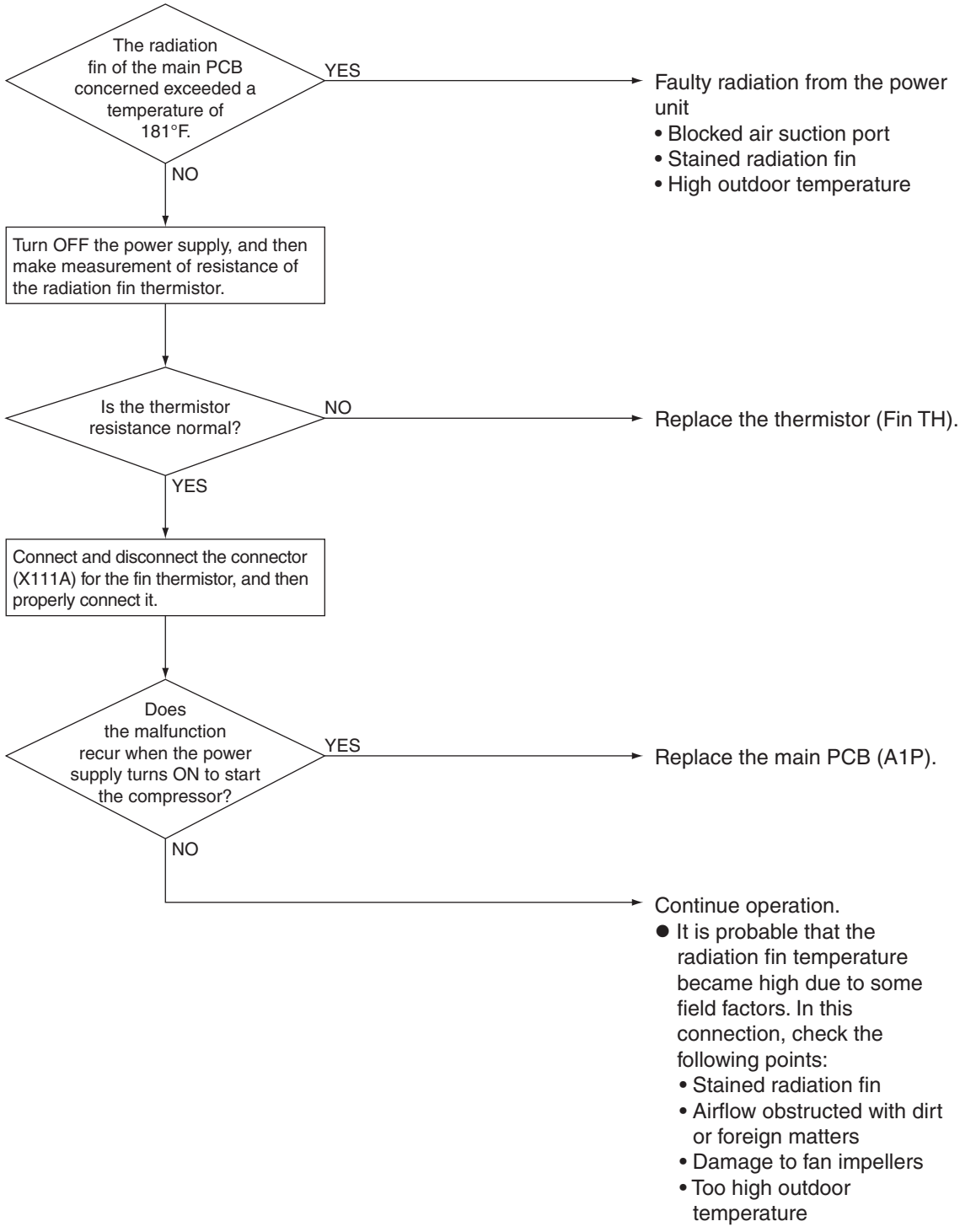
CHECK 4 : Refer to the information on P.213.

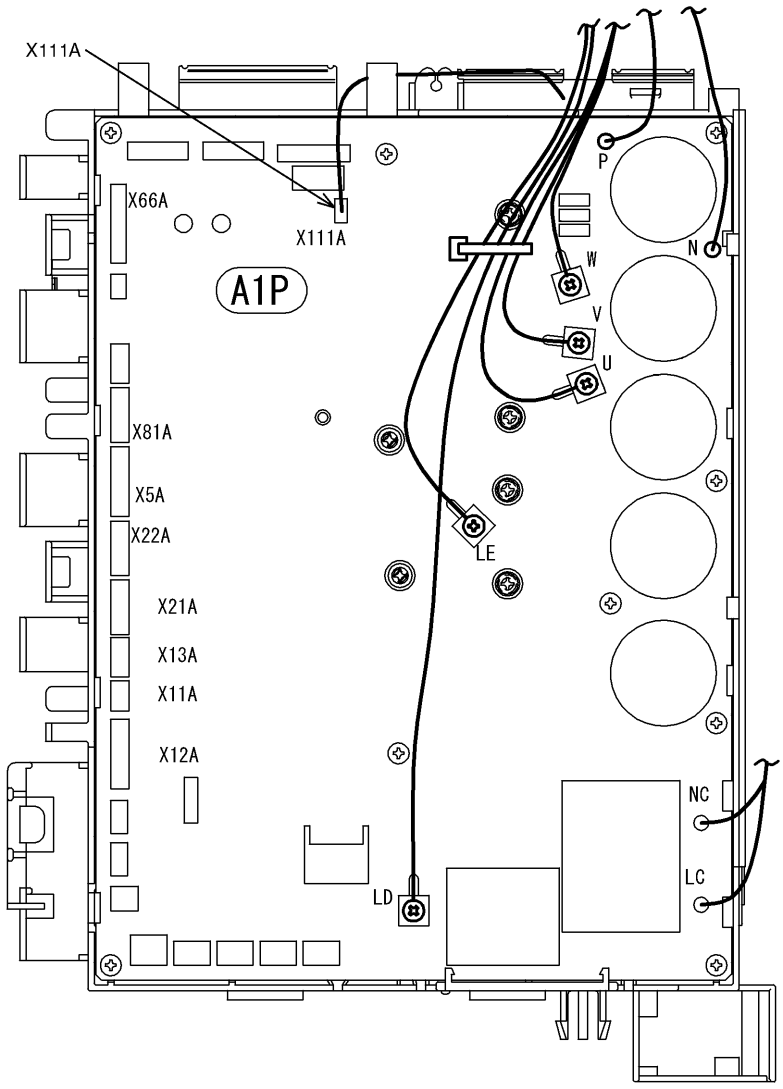
3.30 "L4" Malfunction of Inverter Radiation Fin Temperature Rise

Remote Controller Display	L4
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Fin temperature is detected by the thermistor of the radiation fin.
Malfunction Decision Conditions	When the temperature of the inverter radiation fin increases above 181°F
Supposed Causes	■ Actuation of fin thermal (Actuates above 181°F) ■ Defect of main PCB ■ Defect of fin thermistor

Troubleshooting

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





Main PCB

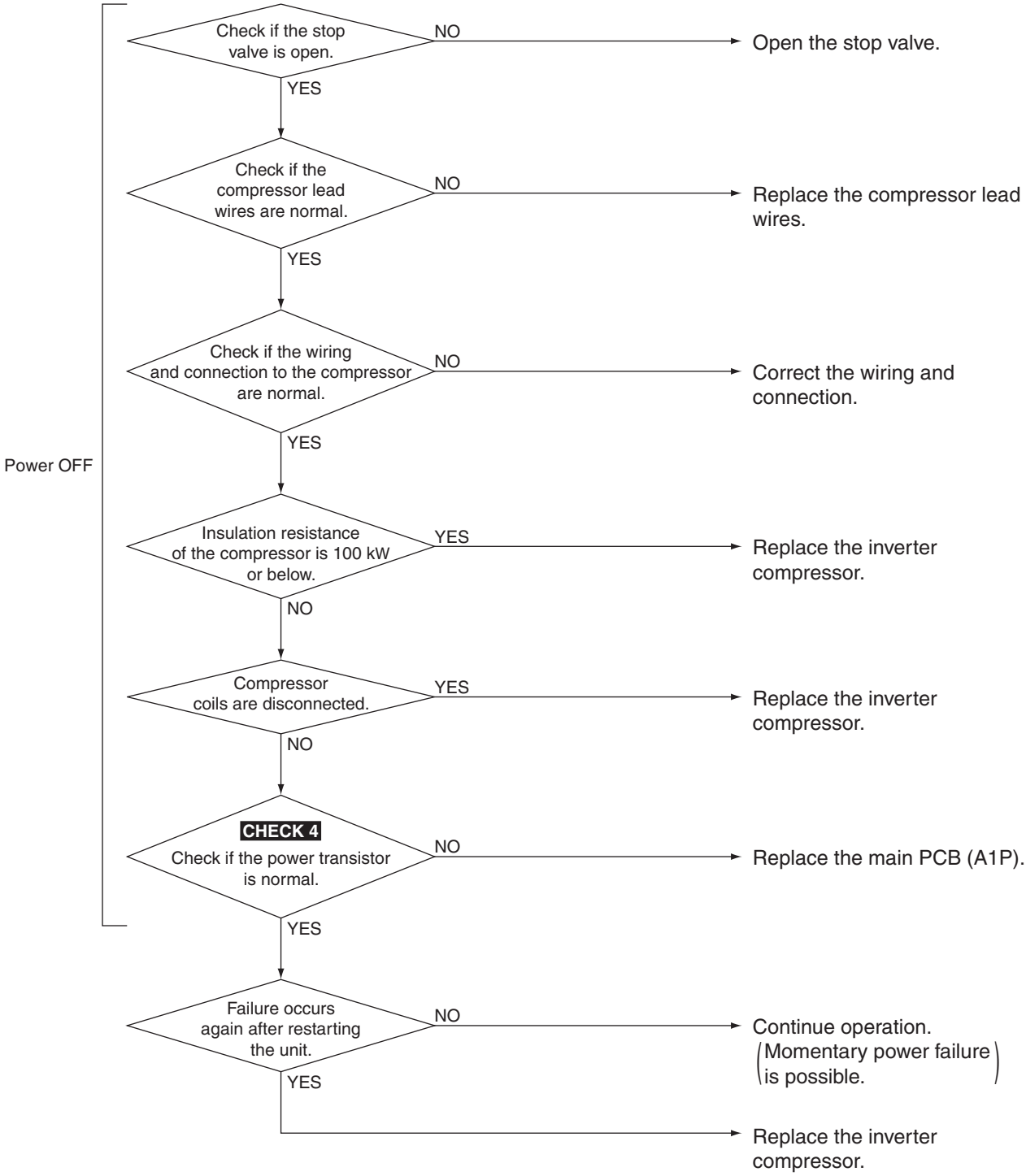
＊ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.241.

3.31 "L5" Inverter Compressor Abnormal

Remote Controller Display	L5
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Malfunction is detected from current flowing in the power transistor.
Malfunction Decision Conditions	When an excessive current flows in the power transistor (Instantaneous overcurrent also causes activation.)
Supposed Causes	■ Defect of compressor coil (disconnected, defective insulation) ■ Compressor start-up malfunction (mechanical lock) ■ Defect of main PCB

Troubleshooting Compressor inspection

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



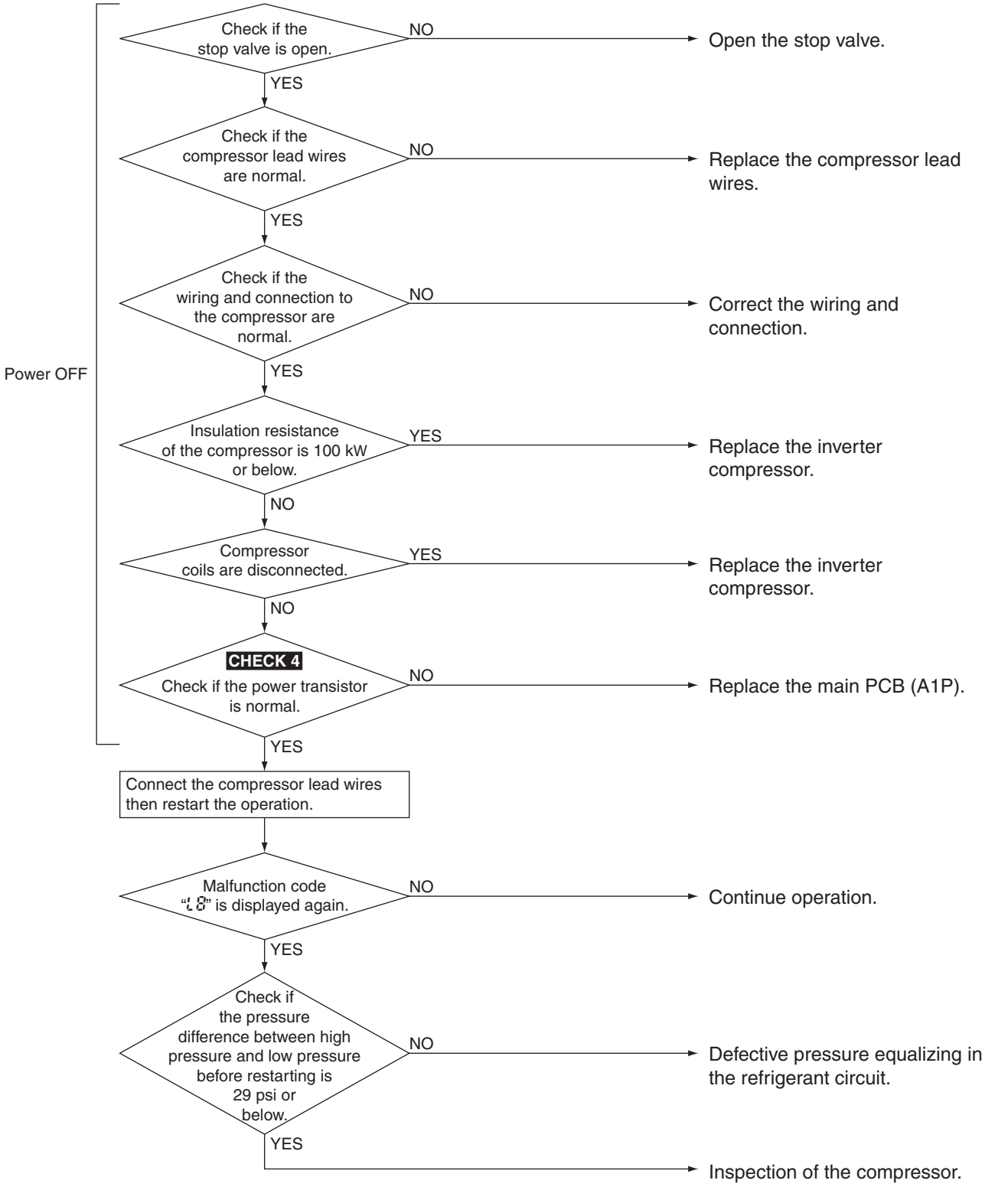
CHECK 4 : Refer to the information on P.213.

3.32 "L8" Inverter Current Abnormal

Remote Controller Display	L8
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Malfunction is detected by current flowing in the power transistor.
Malfunction Decision Conditions	When overload in the compressor is detected. (Inverter secondary current 16.1A) (1) 19.0A and over continues for 5 seconds. (2) 16.1A and over continues for 260 seconds.
Supposed Causes	■ Compressor overload ■ Compressor coil disconnected ■ Defect of main PCB

Troubleshooting

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



CHECK 4 : Refer to the information on P.213.

3.33 "L9" Inverter Compressor Start up Error

Remote Controller Display

L9

Applicable Models

RXYMQ36 · 48PVJU

Method of Malfunction Detection

Detect the failure based on the signal waveform of the compressor.

Malfunction Decision Conditions

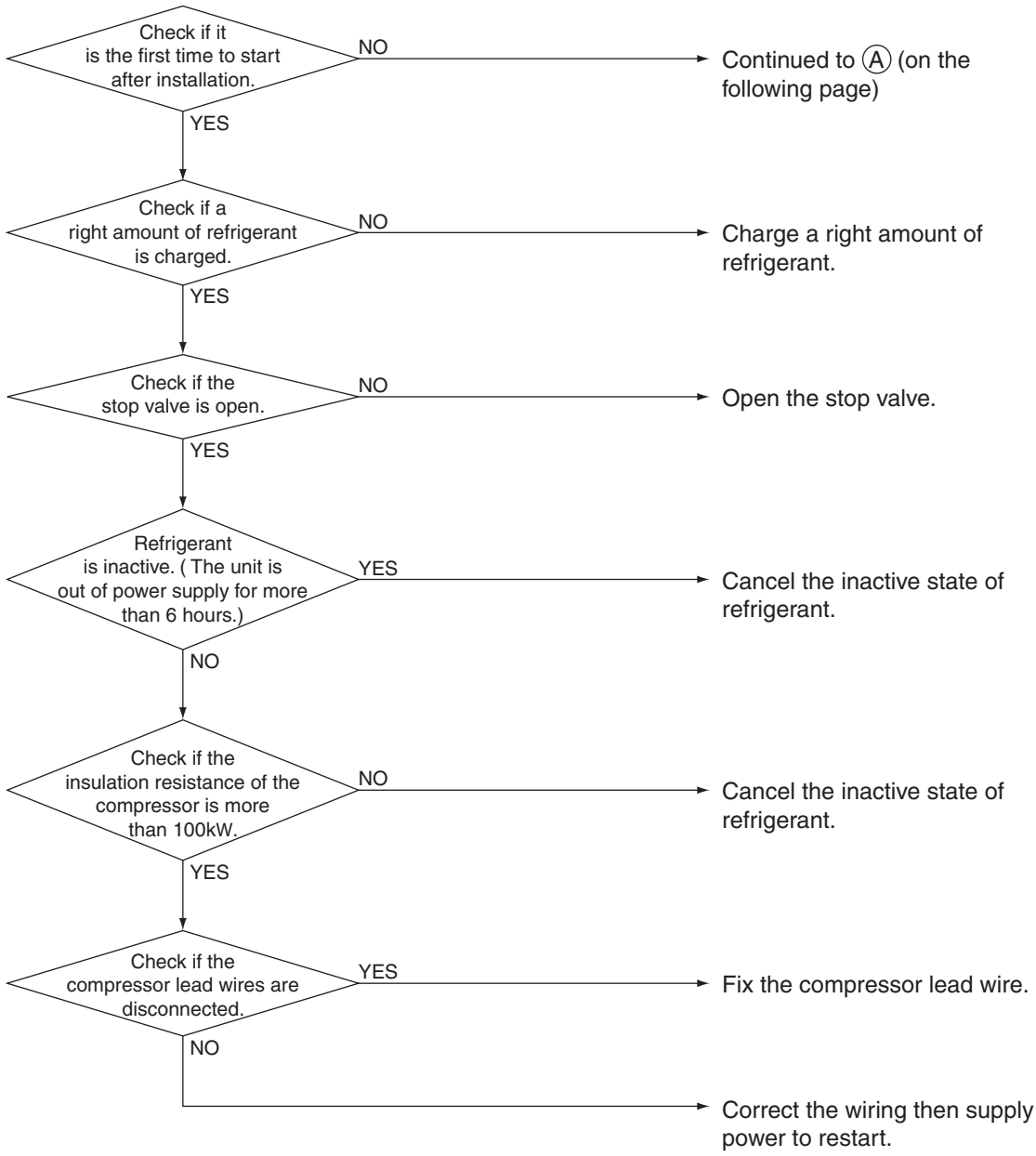
Starting the compressor does not complete.

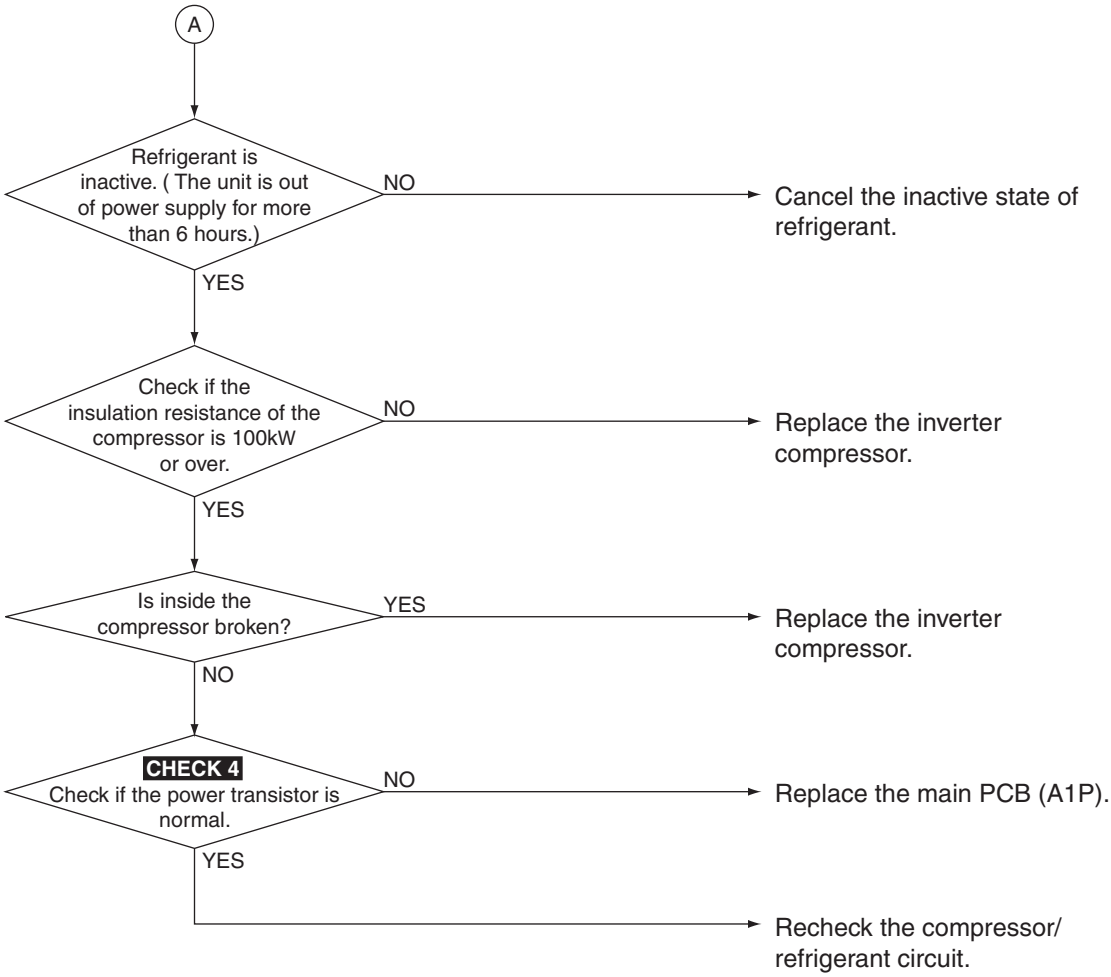
Supposed Causes

- Failure to open the stop valve
- Defective compressor
- Wiring connection error to the compressor
- Large pressure difference before starting the compressor
- Defective main PCB

Troubleshooting

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





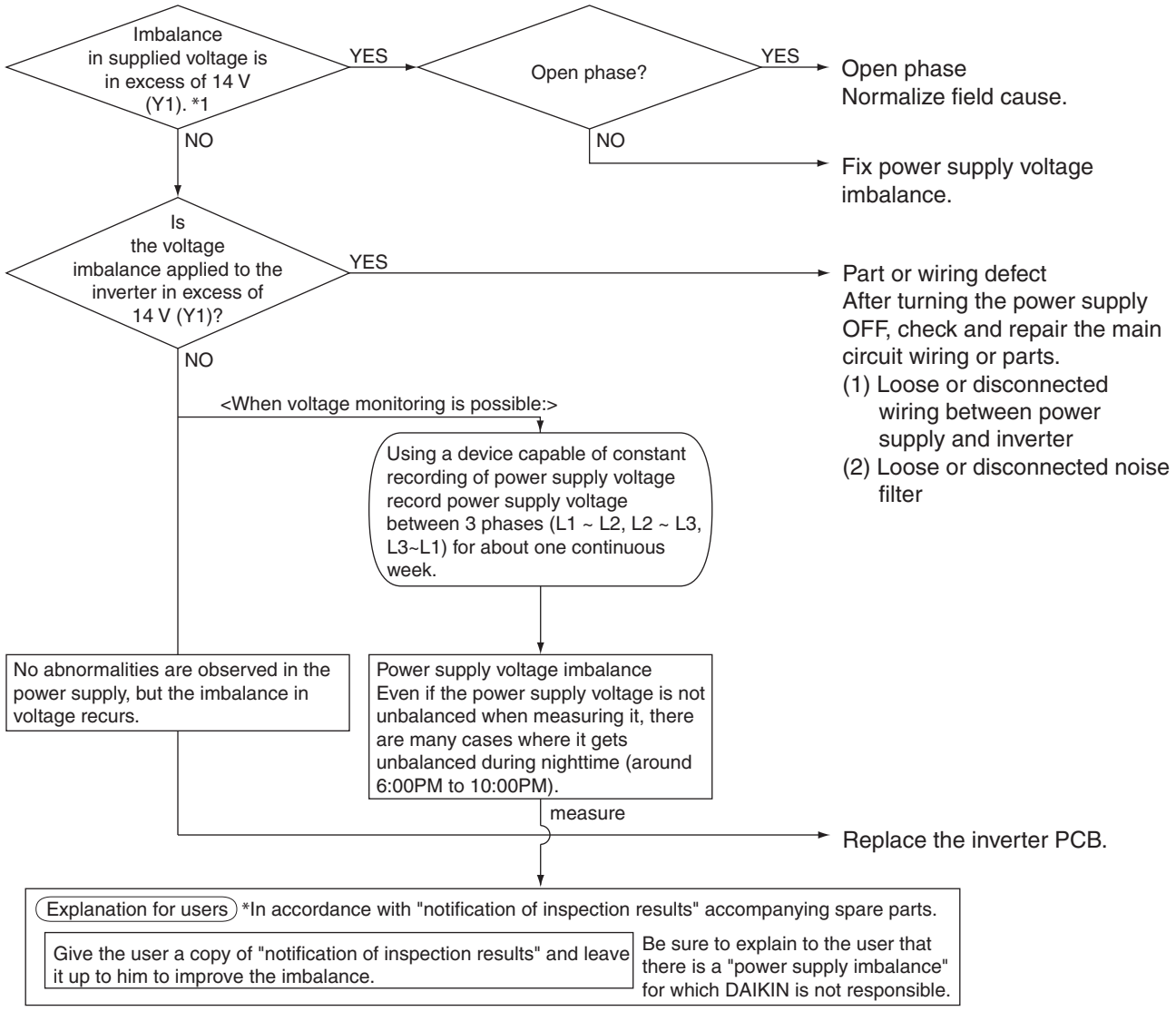
CHECK 4 : Refer to the information on P.213.

3.34 "P 1" High Voltage of Capacitor in Main Inverter Circuit

Remote Controller Display	P 1
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Imbalance in supply voltage is detected in PCB.
Malfunction Decision Conditions	When the imbalance in the power supply voltage becomes more than 6V The unit operation is continued without malfunction decision. "P 1" will be displayed by pressing the inspection button.
Supposed Causes	■ Open phase ■ Voltage imbalance between phases ■ Defect of main circuit capacitor ■ Defect of main PCB ■ Improper main circuit wiring

Troubleshooting

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



*1.Measure voltage at the X1M power supply terminal block.

3.35 "P4" Malfunction of Inverter Radiating Fin Temperature Rise Sensor

Remote Controller Display

P4

Applicable Models

RXYMQ36 · 48PVJU

Method of Malfunction Detection

Resistance of radiation fin thermistor is detected when the compressor is not operating.
Malfunction Decision Conditions:
When the resistance value of thermistor becomes a value equivalent to open or short circuited status

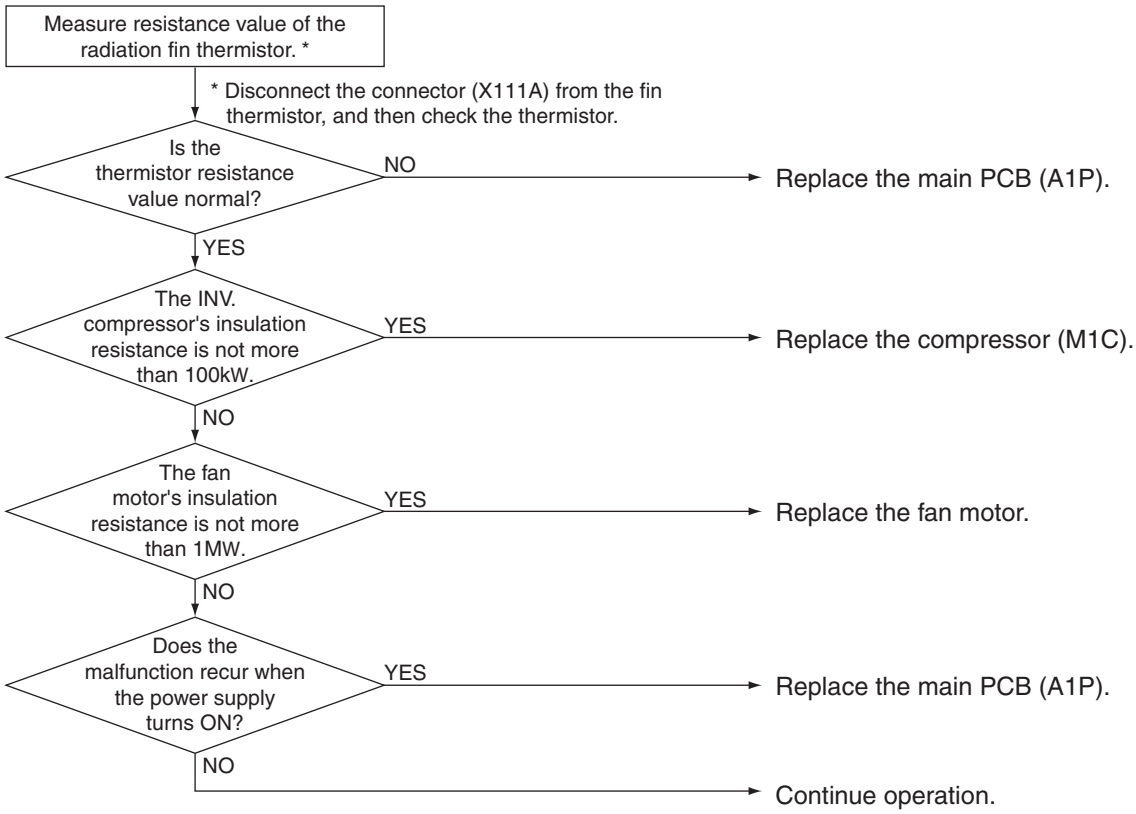
★ Malfunction is not decided while the unit operation is continued.
"P4" will be displayed by pressing the inspection button.

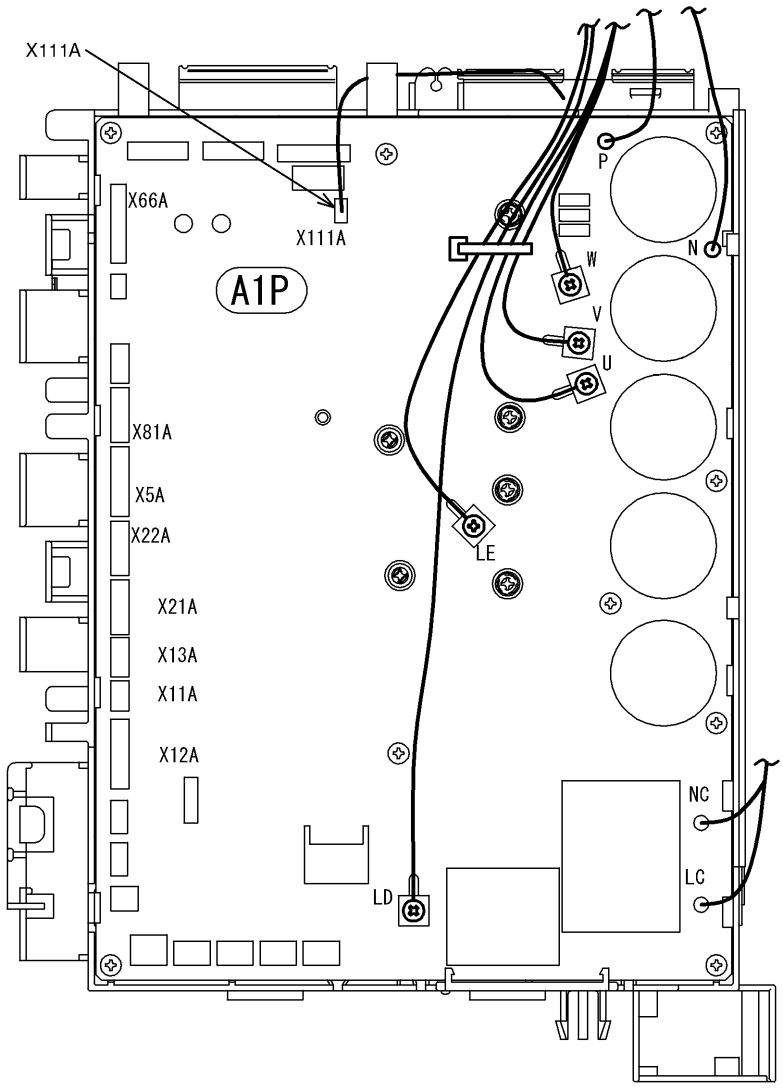
Supposed Causes

- Defect of radiator fin temperature sensor
- Defect of main PCB (A1P)
- Faulty inverter compressor
- Faulty fan motor

Troubleshooting

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





Main PCB

* Refer to “Thermistor Resistance / Temperature Characteristics” table on P.241.

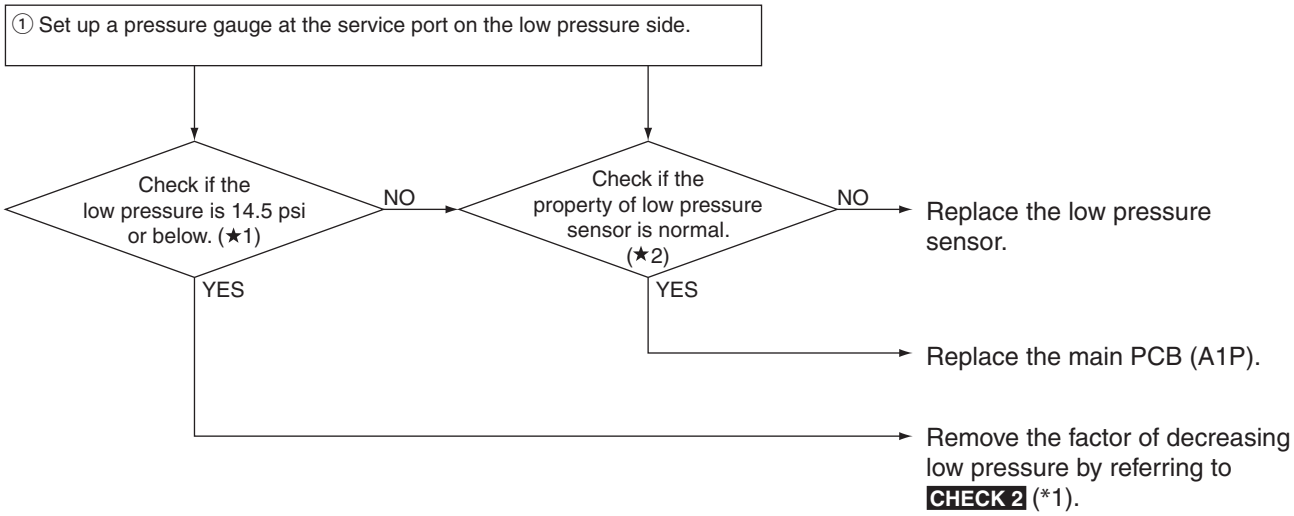
3.36 "UD" Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure

Remote Controller Display	UD
Applicable Models	RXYMQ36 · 48PVJU
Malfunction Decision Conditions	[In cooling mode] Low pressure becomes 14.5psi or below. [In heating mode] The degree of superheat of suction gas becomes 36 degrees and over. SH= Ts1 –Te Ts1: Suction pipe temperature detected by thermistor Te : Saturated temperature corresponding to low pressure ★Malfunction is not determined. The unit continues operation.
Supposed Causes	■ Gas shortage or refrigerant clogging (piping error) ■ Defective thermistor (R4T, R7T) ■ Defective low pressure sensor ■ Defective outdoor unit PCB (A1P)

Troubleshooting

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

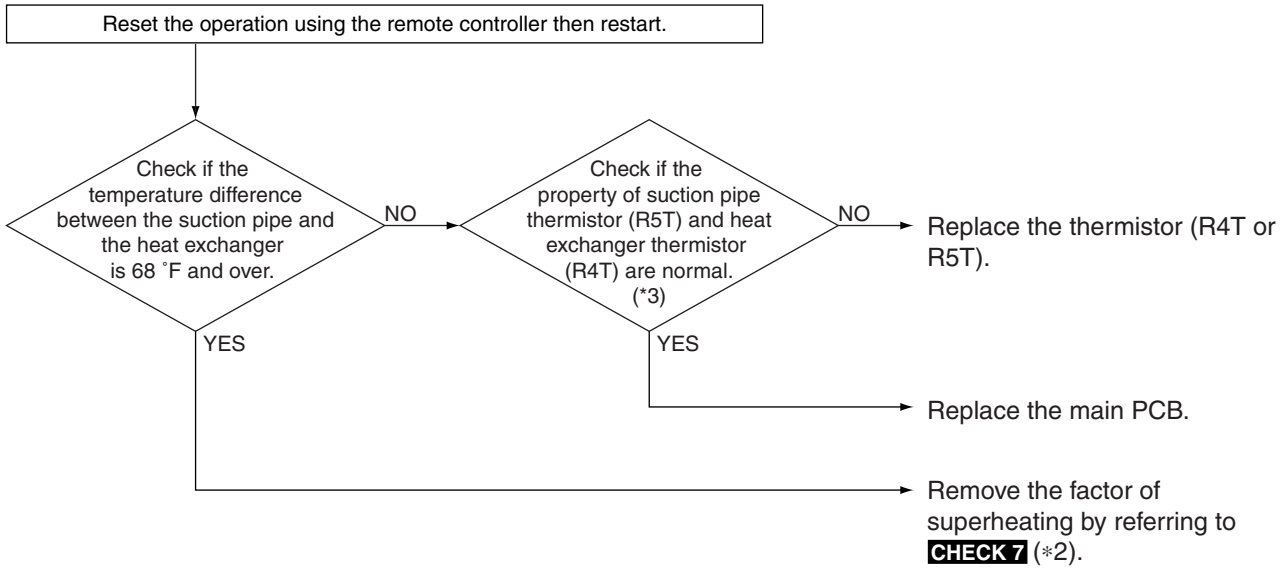
In cooling mode



*1: Check the low pressure value by using pressure gauge in operation.

*2: Compare the actual measurement value by pressure sensor with the value by the pressure gauge. (To gain actual measurement value by pressure sensor, measure the voltage at the connector [between (2)-(3)] and then convert the value into pressure referring to P.242.)

In heating mode



*1 **CHECK 2** : Refer to the information on P.211.

*2 **CHECK 7** : Refer to the information on P.216.

*3: Compare the thermistor resistance value with the value on the surface thermometer.

3.37 "U2" Power Supply Insufficient or Instantaneous Failure

Remote Controller Display

U2

Applicable Models

RXYMQ36 · 48PVJU

Method of Malfunction Detection

Detection of voltage of main circuit capacitor built in the inverter and power supply voltage.

Malfunction Decision Conditions

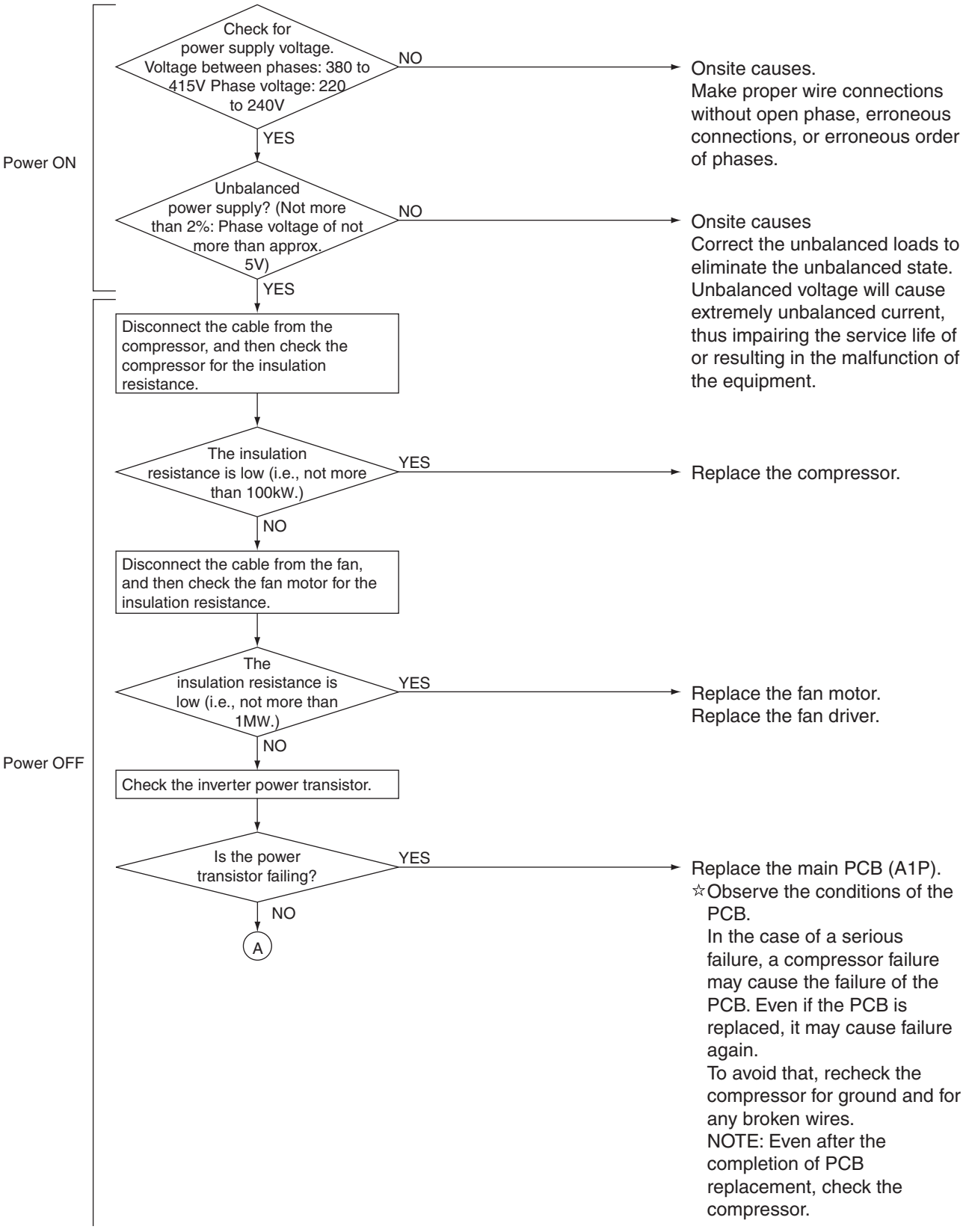
When the voltage aforementioned is not less than 780V or not more than 320V, or when the current-limiting voltage does not reach 200V or more or exceeds 740V

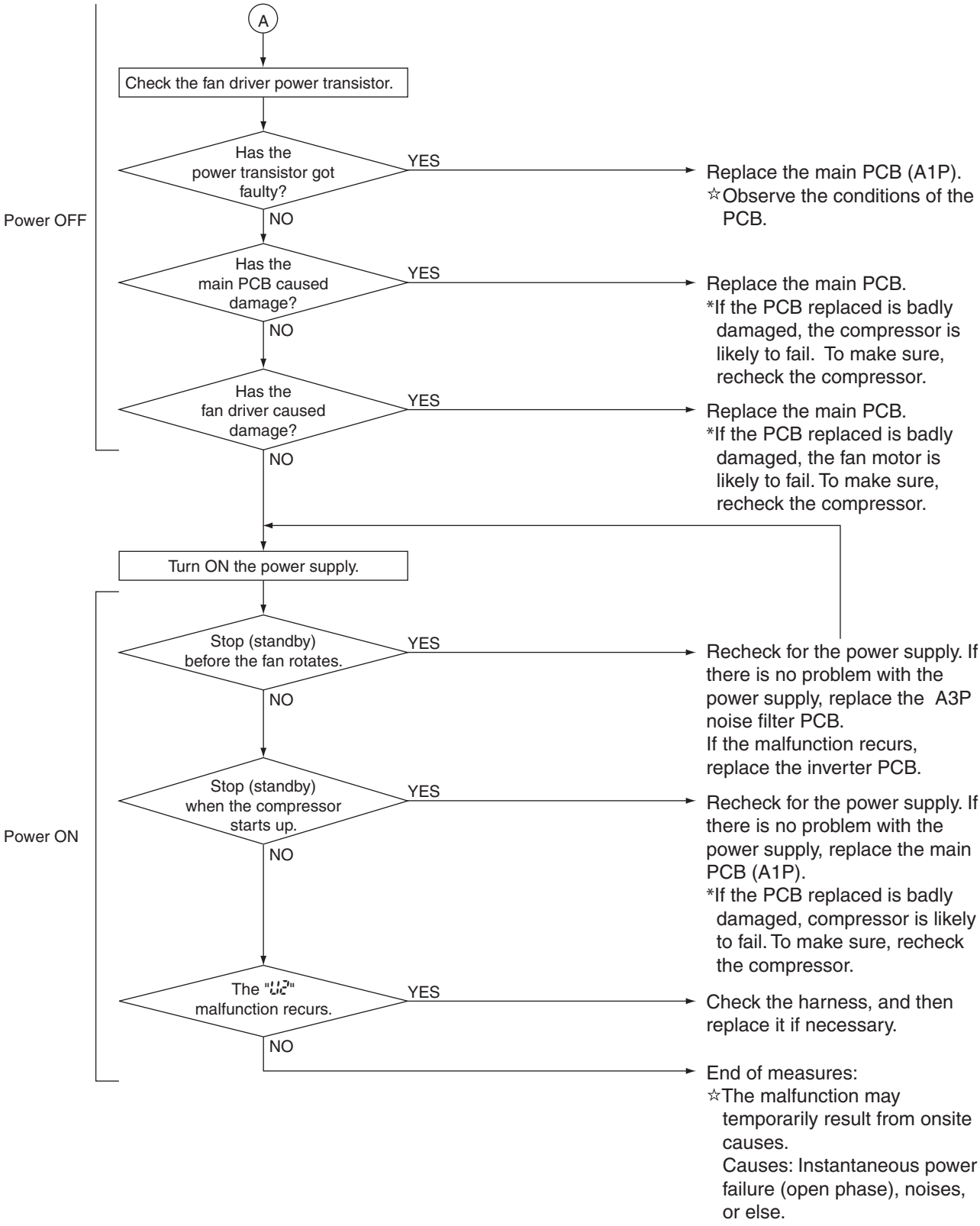
Supposed Causes

- Power supply insufficient
- Instantaneous power failure
- Open phase
- Defect of outdoor control PCB
- Main circuit wiring defect
- Faulty compressor
- Faulty fan motor
- Faulty connection of signal cable

Troubleshooting

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



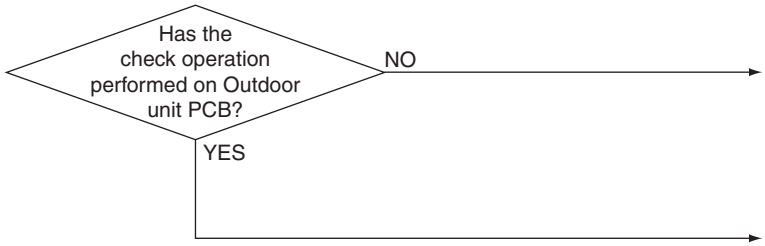

A
Check the fan driver power transistor.
Has the power transistor got faulty?
YES
Replace the main PCB (A1P).
☆Observe the conditions of the PCB.
Power OFF
NO
Has the main PCB caused damage?
YES
Replace the main PCB.
*If the PCB replaced is badly damaged, the compressor is likely to fail. To make sure, recheck the compressor.
NO
Has the fan driver caused damage?
YES
Replace the main PCB.
*If the PCB replaced is badly damaged, the fan motor is likely to fail. To make sure, recheck the compressor.
NO
Turn ON the power supply.
Stop (standby) before the fan rotates.
YES
Recheck for the power supply. If there is no problem with the power supply, replace the A3P noise filter PCB.
If the malfunction recurs, replace the inverter PCB.
NO
Stop (standby) when the compressor starts up.
YES
Recheck for the power supply. If there is no problem with the power supply, replace the main PCB (A1P).
*If the PCB replaced is badly damaged, compressor is likely to fail. To make sure, recheck the compressor.
Power ON
NO
The "UC" malfunction recurs.
YES
Check the harness, and then replace it if necessary.
NO
End of measures:
☆The malfunction may temporarily result from onsite causes.
Causes: Instantaneous power failure (open phase), noises, or else.

3.38 "U3" Check Operation is not Executed

Remote Controller Display	U3
Applicable Models	RXYMQ36 · 48PVJU
Method of Malfunction Detection	Check operation is executed or not
Malfunction Decision Conditions	Malfunction is decided when the unit starts operation without check operation.
Supposed Causes	■ Check operation is not executed.

Troubleshooting

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



Press and hold BS4 on the outdoor master PCB for 5 seconds or more, or turn ON the local setting mode 2-3 to conduct a check operation.

Performs the check operation again and completes the check operation.

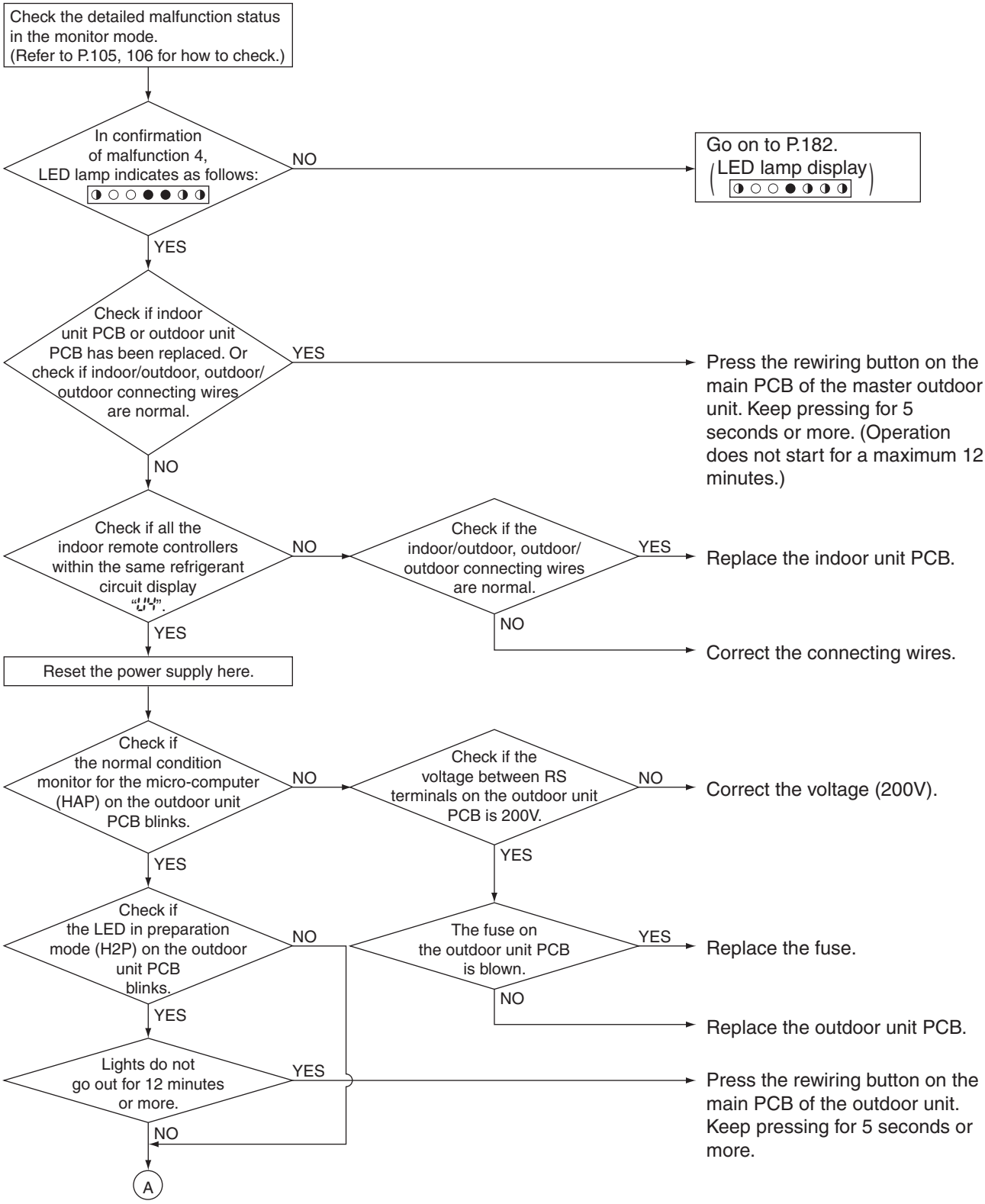
When a leakage detection function is needed, normal operation of charging refrigerant must be completed. Then start once again and complete a check operation.

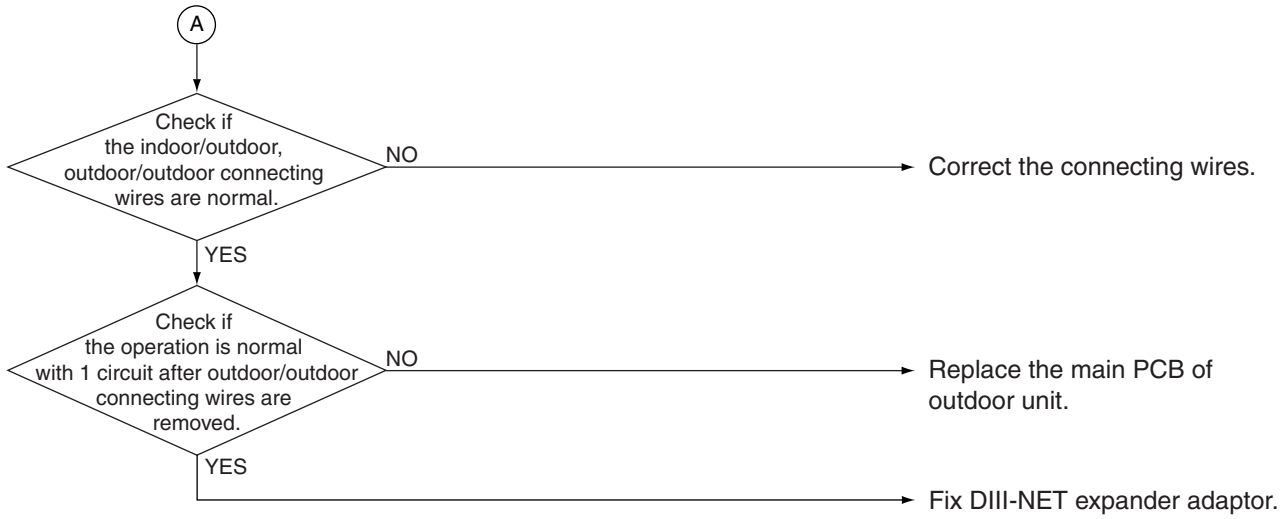
3.39 "U4" Malfunction of Transmission between Indoor Units and Outdoor Units

Remote Controller Display	U4
Applicable Models	All indoor unit models RXYMQ36 · 48PVJU
Method of Malfunction Detection	Micro-computer checks if transmission between indoor and outdoor units is normal.
Malfunction Decision Conditions	When transmission is not carried out normally for a certain amount of time
Supposed Causes	■ Indoor to outdoor, outdoor to outdoor transmission wiring F1, F2 disconnection, short circuit or wrong wiring ■ Outdoor unit power supply is OFF ■ System address does not match ■ Defect of outdoor unit PCB ■ Defect of indoor unit PCB

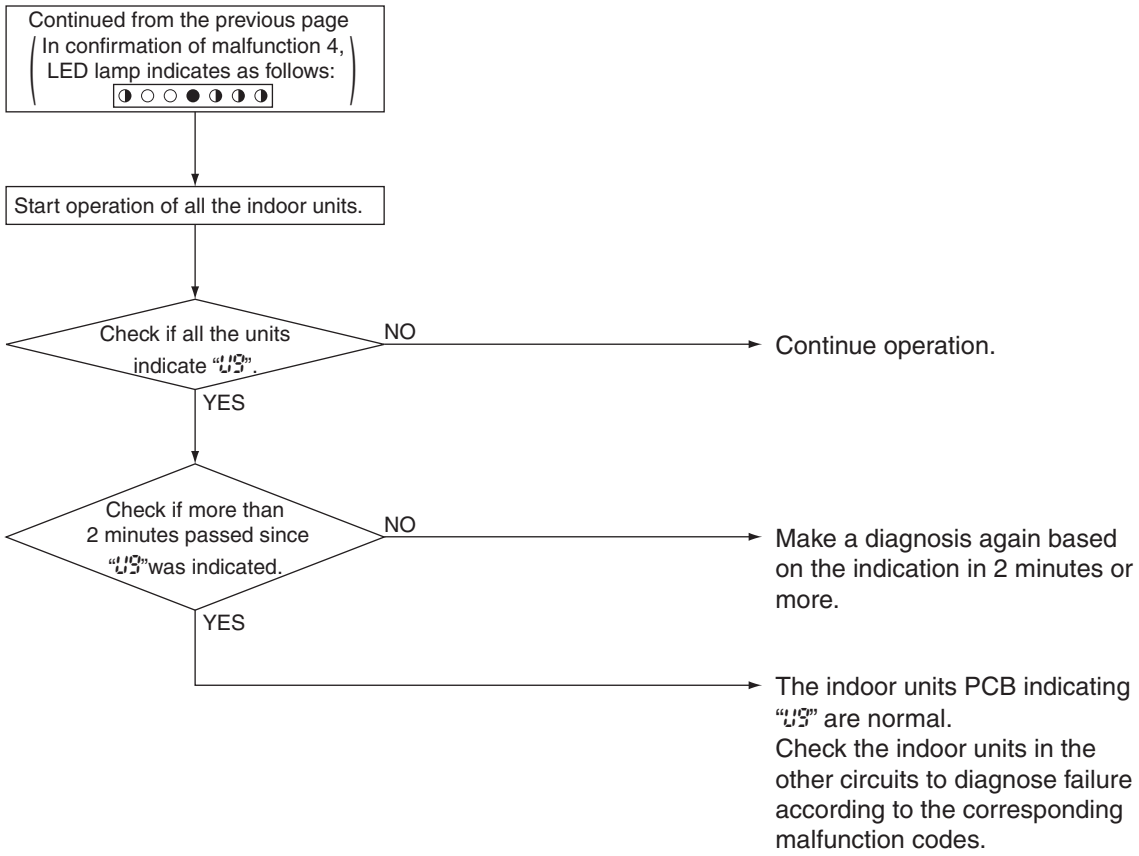
Troubleshooting

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




A
Check if the indoor/outdoor, outdoor/outdoor connecting wires are normal.
NO
Correct the connecting wires.
YES
Check if the operation is normal with 1 circuit after outdoor/outdoor connecting wires are removed.
NO
Replace the main PCB of outdoor unit.
YES
Fix DIII-NET expander adaptor.

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



3.40 "U5" Malfunction of Transmission between Remote Controller and Indoor Unit

Remote Controller Display

U5

Applicable Models

All indoor unit models

Method of Malfunction Detection

If controlling with 2remote controllers, check the system using a micro-computer to ensure that the signal transmission between the indoor unit and the remote controllers (main and sub) is normal.

Malfunction Decision Conditions

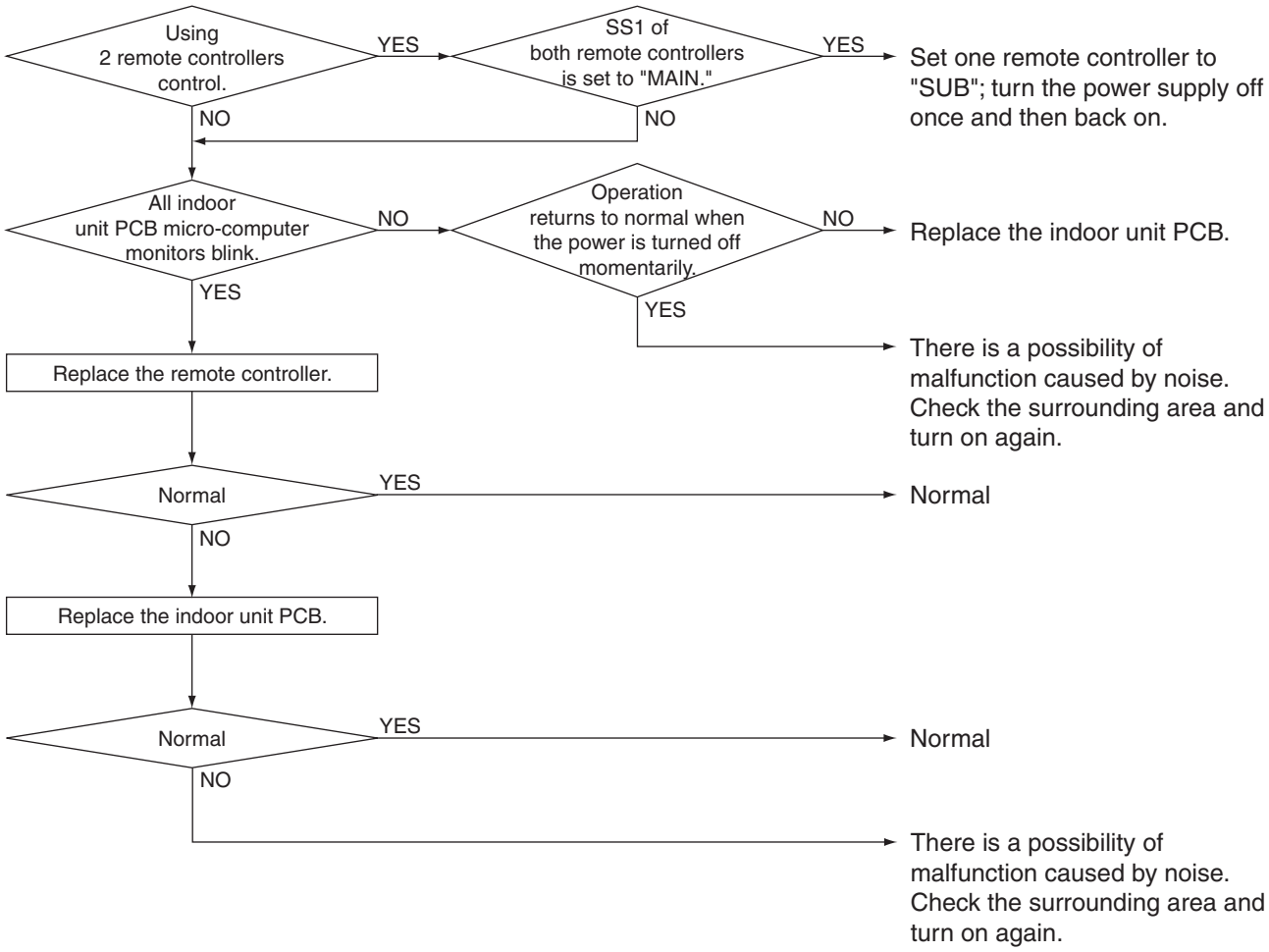
Normal transmission does not continue for specified period.

Supposed Causes

- Malfunction of indoor unit remote controller transmission
- Connection of two main remote controllers (when using 2 remote controllers)
- Defect of indoor unit PCB
- Defect of remote controller PCB
- Malfunction of transmission caused by noise

Troubleshooting

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

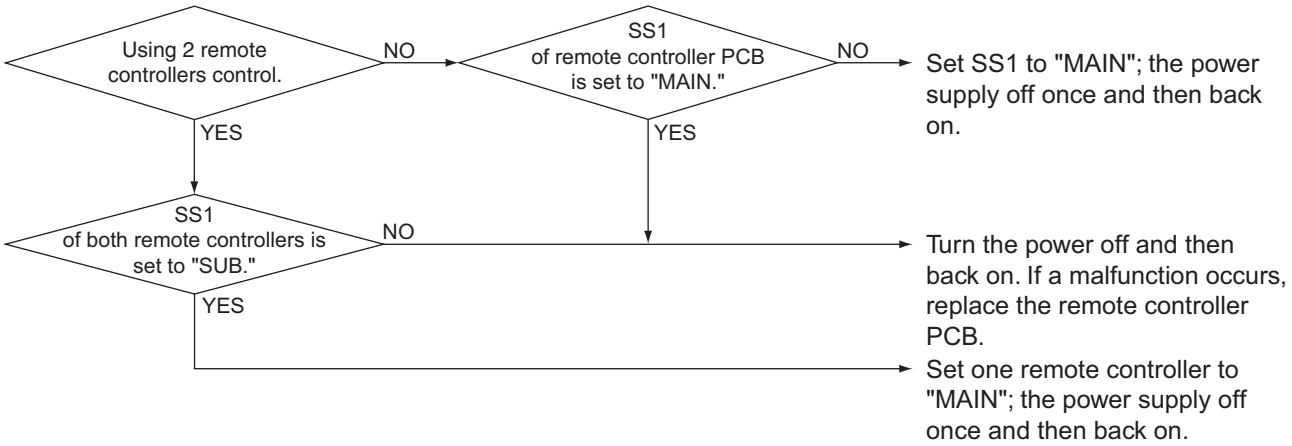


3.41 "U8" Malfunction of Transmission between Main and Sub Remote Controllers

Remote Controller Display	U8
Applicable Models	All indoor unit models
Method of Malfunction Detection	If controlling with 2remote controllers, check the system using a micro-computer to ensure that the signal transmission between the indoor unit and the remote controllers (main and sub) is normal.
Malfunction Decision Conditions	Normal transmission does not continue for specified period.
Supposed Causes	■ Malfunction of transmission between main and sub remote controller ■ Connection between sub remote controllers ■ Defect of remote controller PCB

Troubleshooting

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



3.42 "U9" Malfunction of Transmission between Indoor Units and Outdoor Units in the Same System

Remote Controller Display

U9

Applicable Models

All indoor unit models

Method of Malfunction Detection

Detect malfunction signal for the other indoor units within the circuit by outdoor unit PCB.

Malfunction Decision Conditions

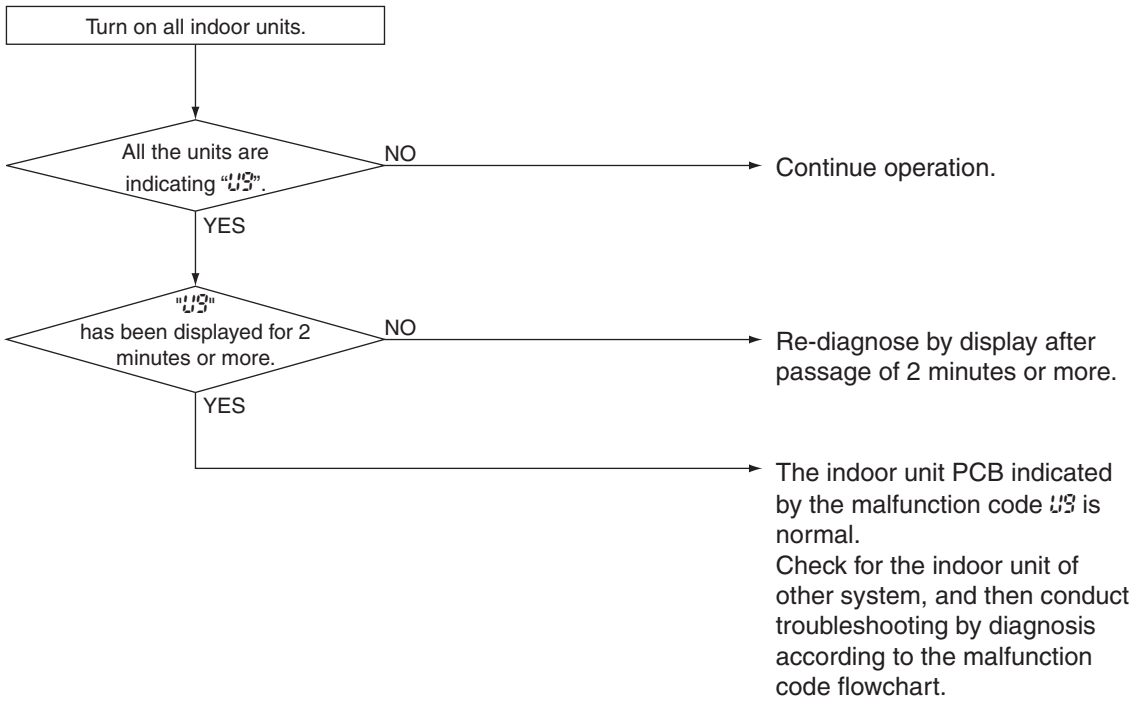
When the malfunction decision is made on any other indoor unit within the system.

Supposed Causes

- Malfunction of transmission between indoor and outdoor unit
- Malfunction of electronic expansion valve in indoor unit of other system
- Defect of PCB of indoor unit in other system
- Improper connection of transmission wiring between indoor and outdoor unit

Troubleshooting

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



3.43 "UA" Improper Combination of Indoor and Outdoor Units etc.

Remote Controller Display

UA

Applicable Models

All indoor unit models

Method of Malfunction Detection

A difference occurs in data by the type of refrigerant between indoor and outdoor units.
The number of indoor units is out of the allowable range.
Incorrect signals are transmitted among the indoor unit and outdoor unit.

Malfunction Decision Conditions

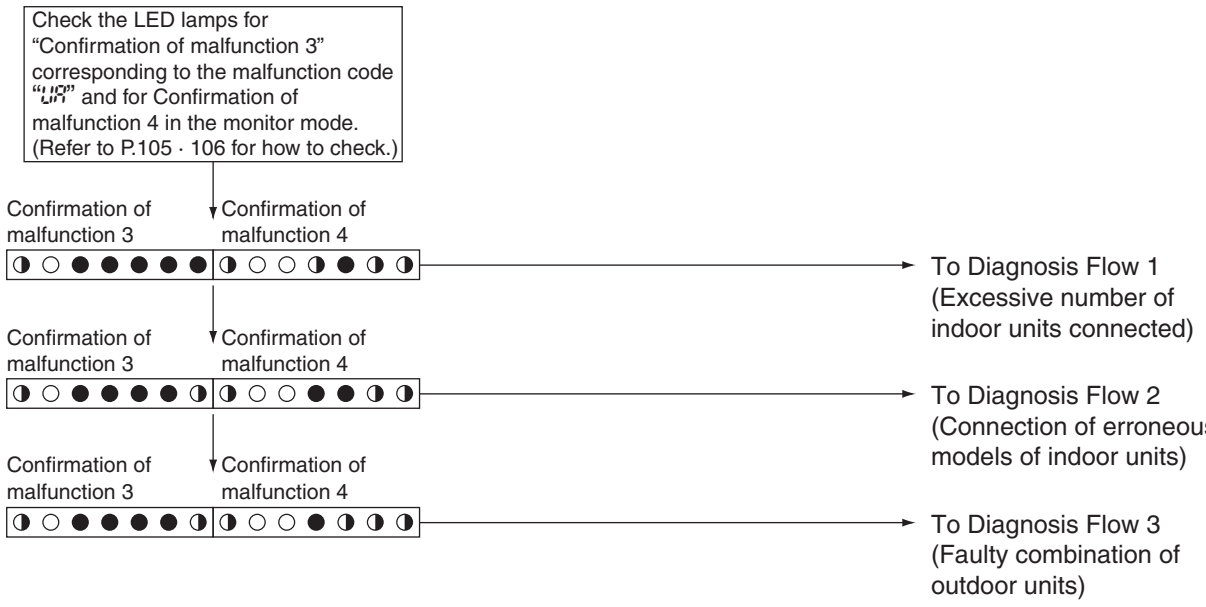
The malfunction decision is made as soon as either of the abnormalities is detected.

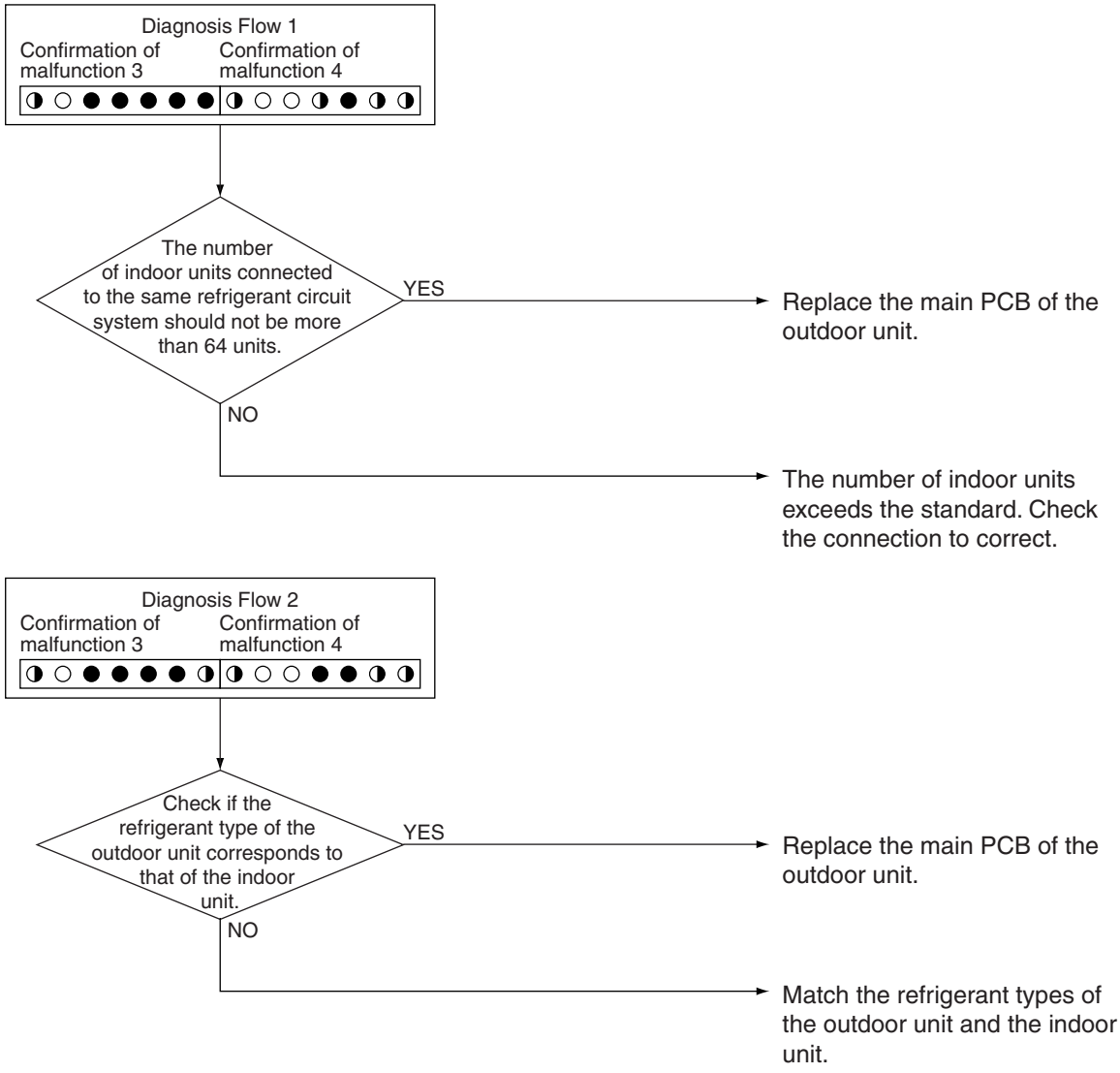
Supposed Causes

- Excess of connected indoor units
- Defect of outdoor unit PCB (A1P)
- Mismatching of the refrigerant type of indoor and outdoor unit
- Setting of outdoor PCB was not conducted after replacing with spare PCB.

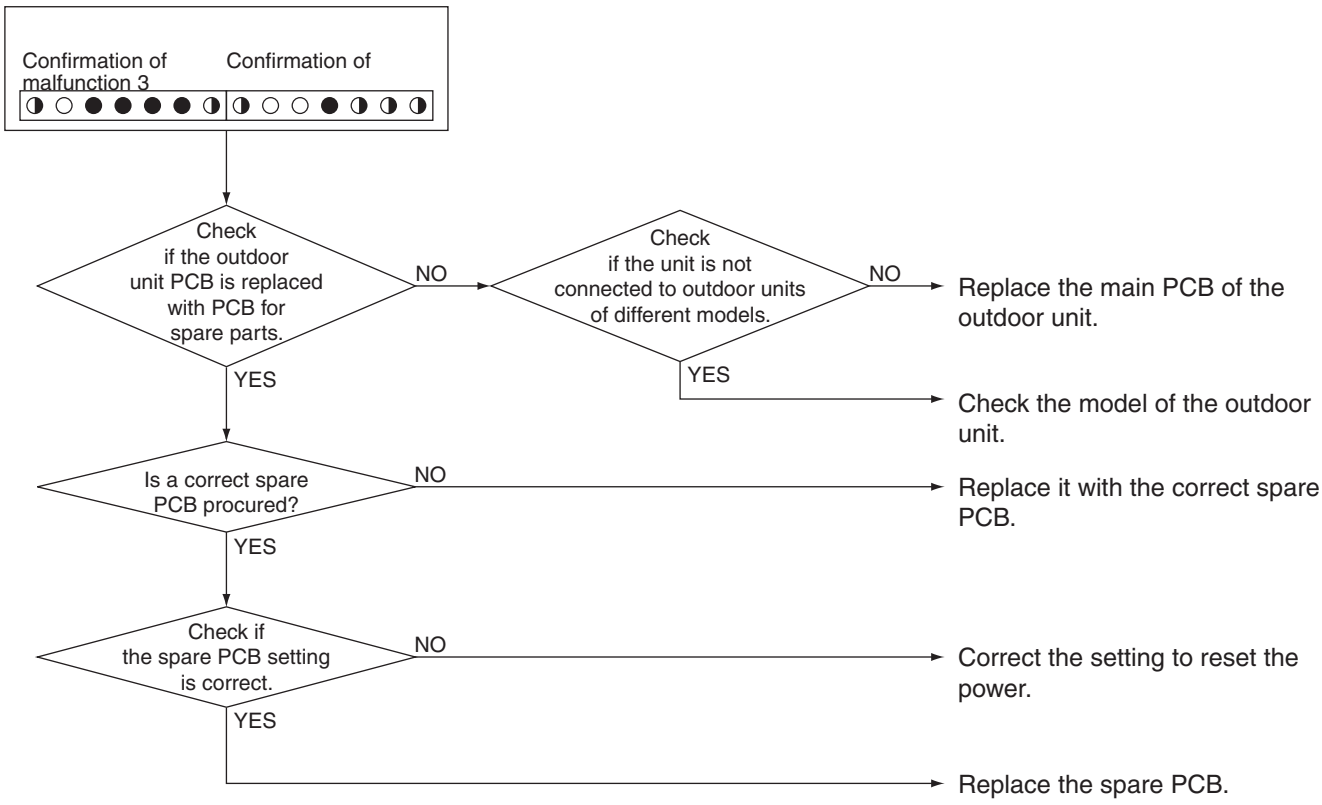
Troubleshooting

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




Diagnosis Flow 1
Confirmation of malfunction 3
Confirmation of malfunction 4
The number of indoor units connected to the same refrigerant circuit system should not be more than 64 units.
YES
Replace the main PCB of the outdoor unit.
NO
The number of indoor units exceeds the standard. Check the connection to correct.
Diagnosis Flow 2
Confirmation of malfunction 3
Confirmation of malfunction 4
Check if the refrigerant type of the outdoor unit corresponds to that of the indoor unit.
YES
Replace the main PCB of the outdoor unit.
NO
Match the refrigerant types of the outdoor unit and the indoor unit.

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



3.44 "UC" Address Duplication of Centralized Remote Controller

Remote Controller Display	UC
Applicable Models	All indoor unit models
Method of Malfunction Detection	The principal indoor unit detects the same address as that of its own on any other indoor unit.
Malfunction Decision Conditions	The malfunction decision is made as soon as the abnormality is detected.
Supposed Causes	■ Address duplication of centralized remote controller ■ Defect of indoor unit PCB

Troubleshooting

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

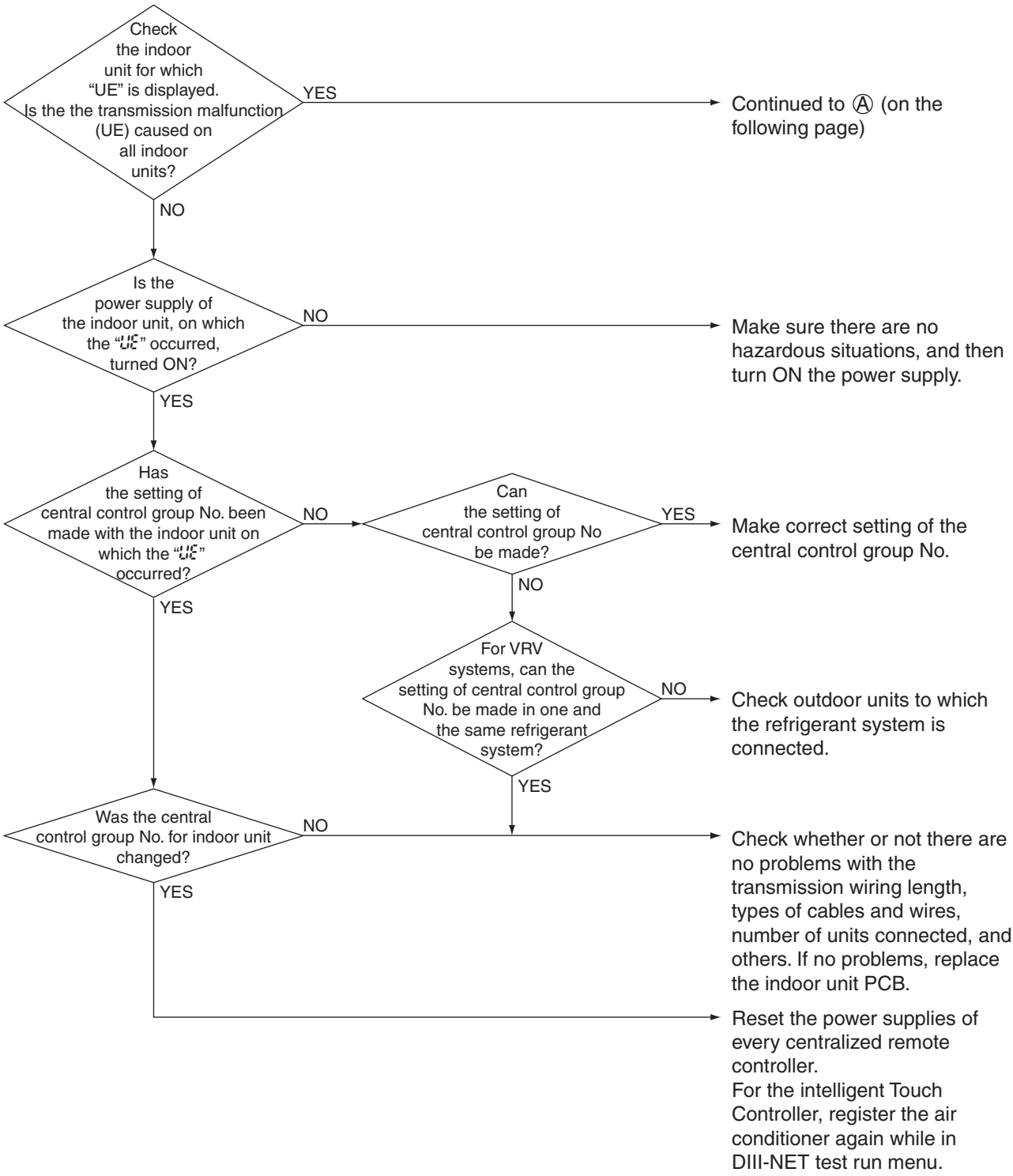
The centralized address is duplicated. → Make setting change so that the centralized address will not be duplicated.

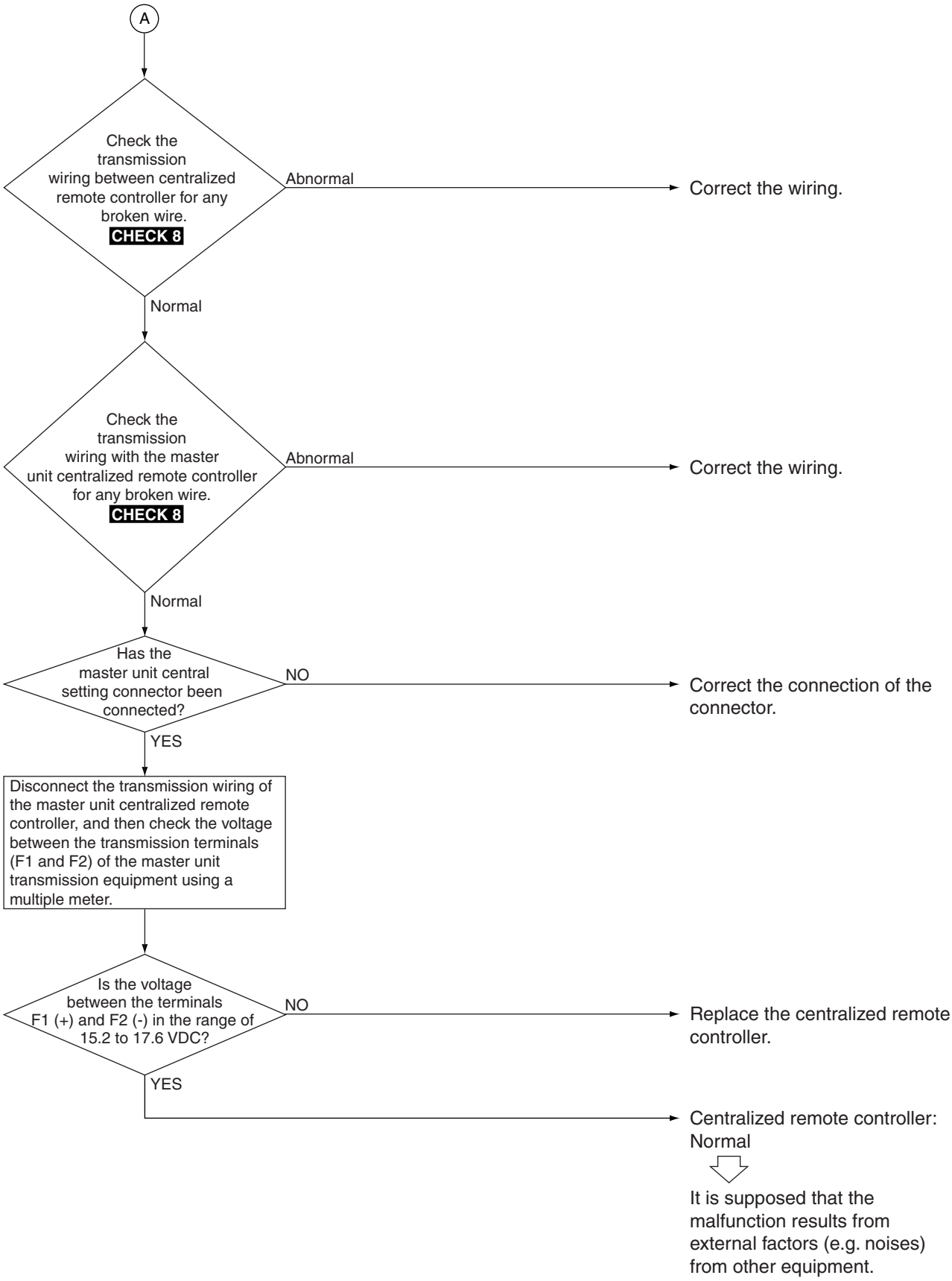
3.45 "UE" Malfunction of Transmission between Centralized Remote Controller and Indoor Unit

Remote Controller Display	UE
Applicable Models	All indoor unit models Centralized remote controller, intelligent Touch Controller, Schedule timer
Method of Malfunction Detection	Micro-computer checks if transmission between indoor unit and centralized remote controller is normal.
Malfunction Decision Conditions	When transmission is not carried out normally for a certain amount of time
Supposed Causes	■ Malfunction of transmission between optional controllers for centralized control and indoor unit ■ Connector for setting master controller is disconnected. (or disconnection of connector for independent / combined use changeover switch.) ■ Failure of PCB for centralized remote controller ■ Defect of indoor unit PCB

Troubleshooting

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





CHECK 8 : Refer to the information on P.217.

3.46 "UF" System is not Set yet

Remote Controller Display

UF

Applicable Models

All indoor unit models
RXYMQ36 · 48PVJU

Method of Malfunction Detection

On check operation, the number of indoor units in terms of transmission is not corresponding to that of indoor units that have made changes in temperature.

Malfunction Decision Conditions

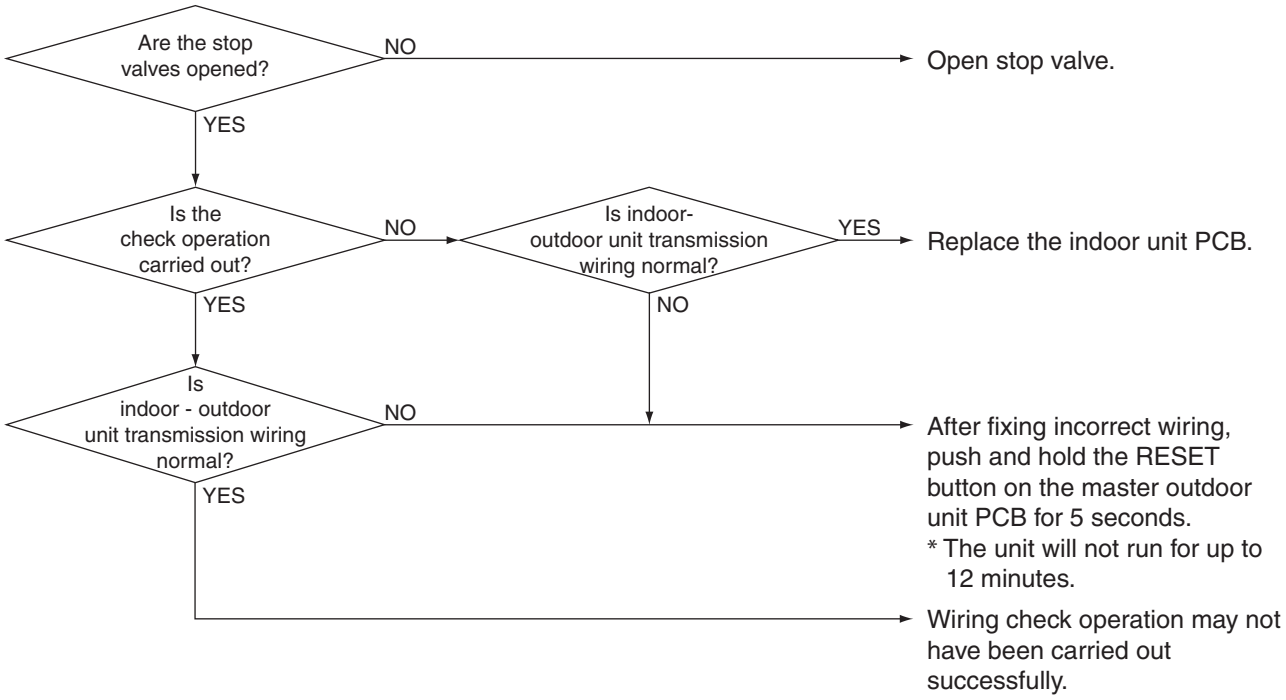
The malfunction is determined as soon as the abnormality aforementioned is detected through checking the system for any erroneous connection of units on the check operation.

Supposed Causes

- Improper connection of transmission wiring between indoor-outdoor units
- Failure to execute check operation
- Defect of indoor unit PCB
- Stop valve is left in closed position.

Troubleshooting

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



Note:

Wiring check operation may not be successful if carried out after the outdoor unit has been off for more than 12 hours, or if it is not carried out after running all connected indoor units in the fan mode for at least an hour.

3.47 "UH" Malfunction of System, Refrigerant System Address Undefined

Remote Controller Display

UH

Applicable Models

All indoor unit models
RXYMQ36 · 48PVJU

Method of Malfunction Detection

Detect an indoor unit with no auto address setting.

Malfunction Decision Conditions

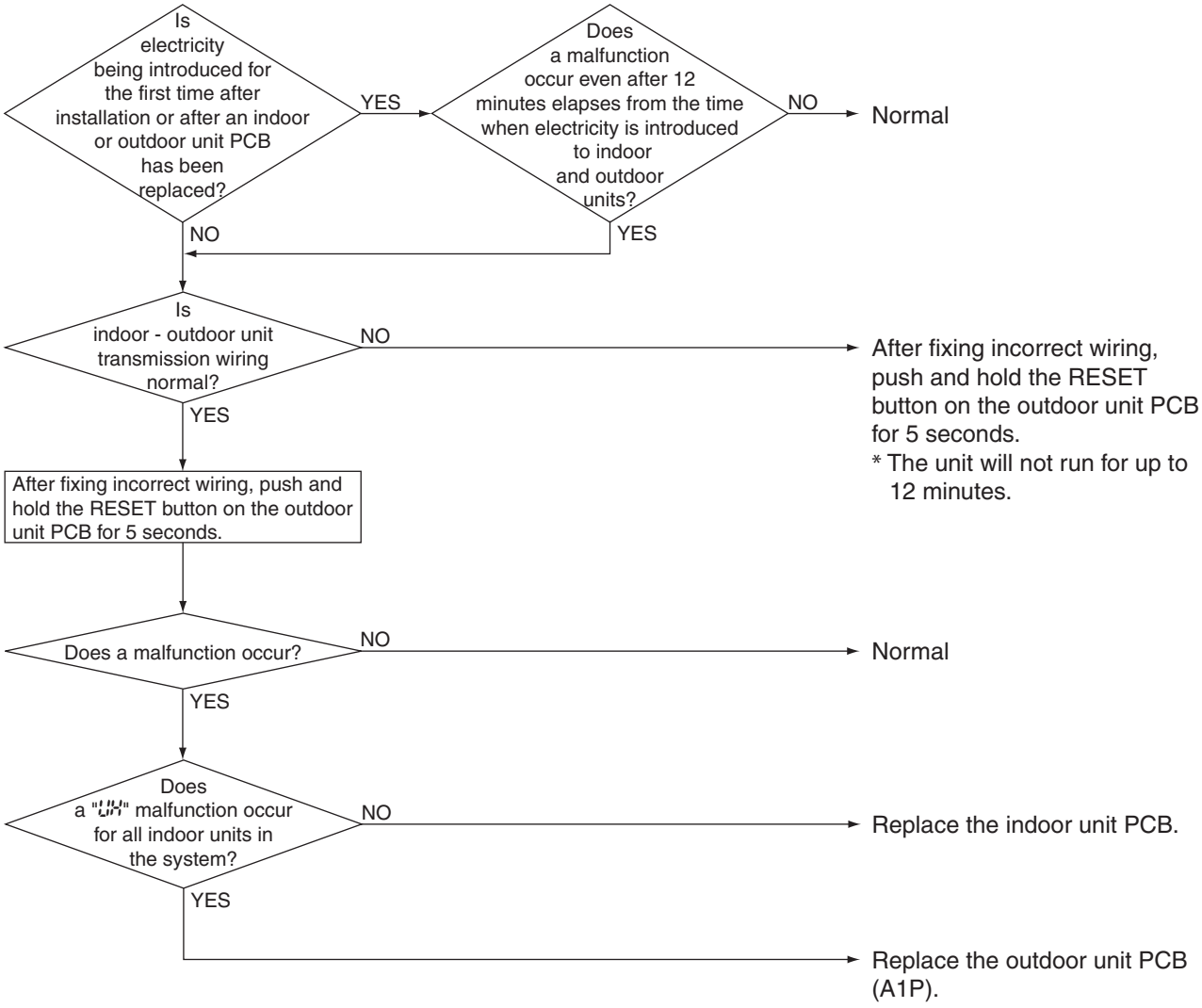
The malfunction decision is made as soon as the abnormality is detected.

Supposed Causes

- Improper connection of transmission wiring between indoor and outdoor unit
- Defect of indoor unit PCB
- Defect of outdoor unit PCB (A1P)

Troubleshooting

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

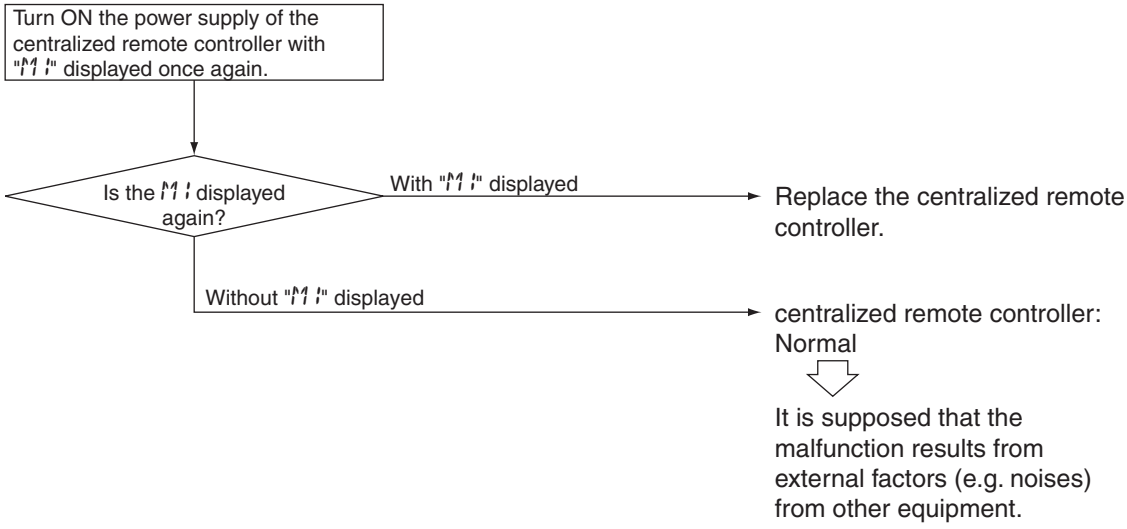


4. Troubleshooting (OP: Centralized Remote Controller)

4.1 "M1" PCB Defect

Remote Controller Display	M1
Applicable Models	Centralized remote controller intelligent Touch Controller Schedule timer
Method of Malfunction Detection	Detect an abnormality in the DIII-NET polarity circuit.
Malfunction Decision Conditions	When + polarity and - polarity are detected at the same time.
Supposed Causes	■ Defect of centralized remote controller PCB ■ Defect of intelligent Touch Controller PCB ■ Defect of Schedule timer PCB
Troubleshooting	Replace the centralized remote controller.

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

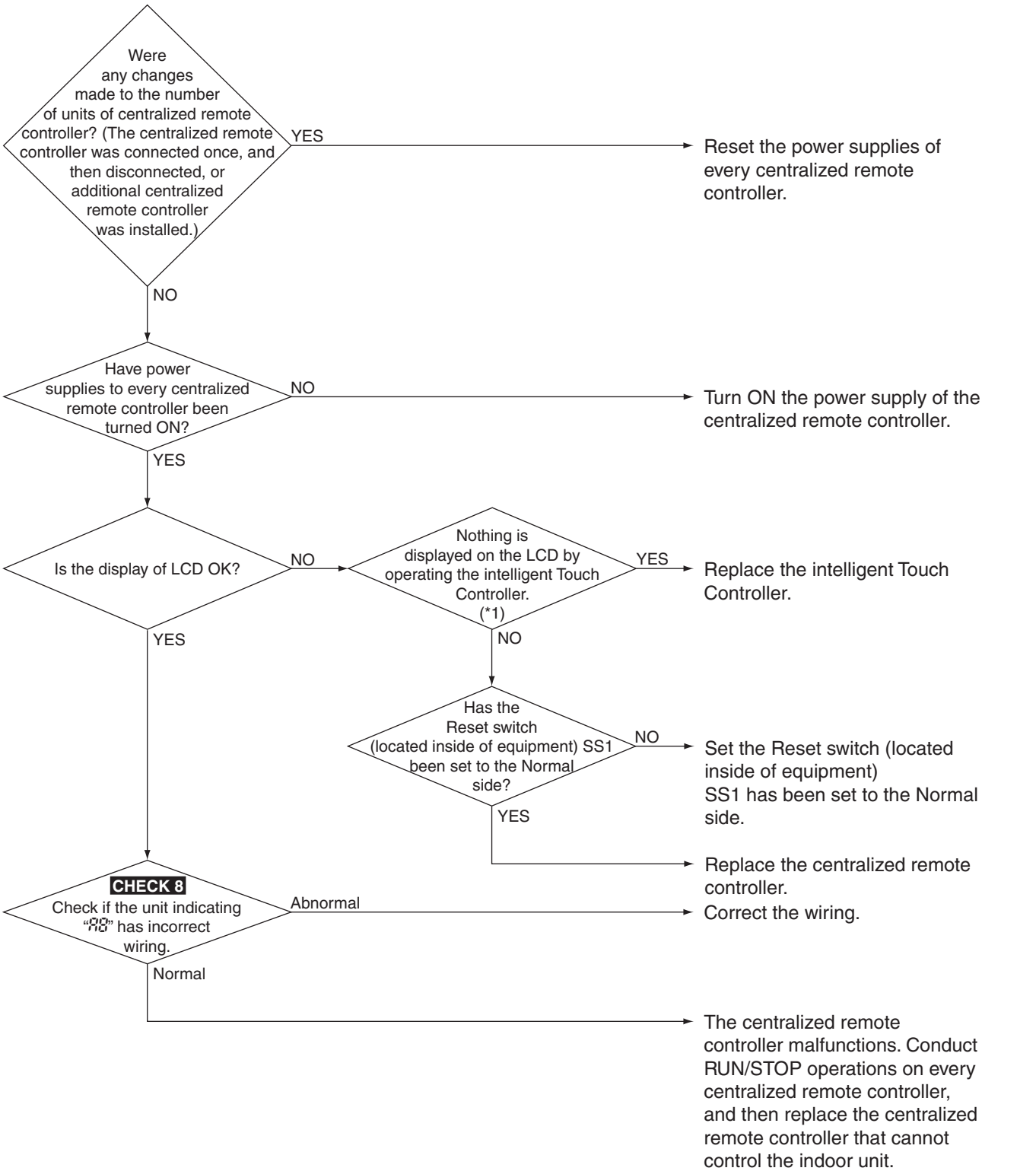


4.2 "M8" Malfunction of Transmission between Optional Controllers for Centralized Control

Remote Controller Display	M8
Applicable Models	Centralized remote controller / intelligent Touch Controller Schedule timer
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data. (The system will be automatically reset.)
Malfunction Decision Conditions	When no master controller is present at the time of the startup of slave controller. When the centralized controller, which was previously connected, shows no response.
Supposed Causes	■ Malfunction of transmission between optional controllers for centralized control ■ Defect of PCB of optional controllers for centralized control

Troubleshooting

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



*1: Display screen control using the intelligent Touch Controller:When the screen displays nothing by touching the screen, adjust the contrast volume.

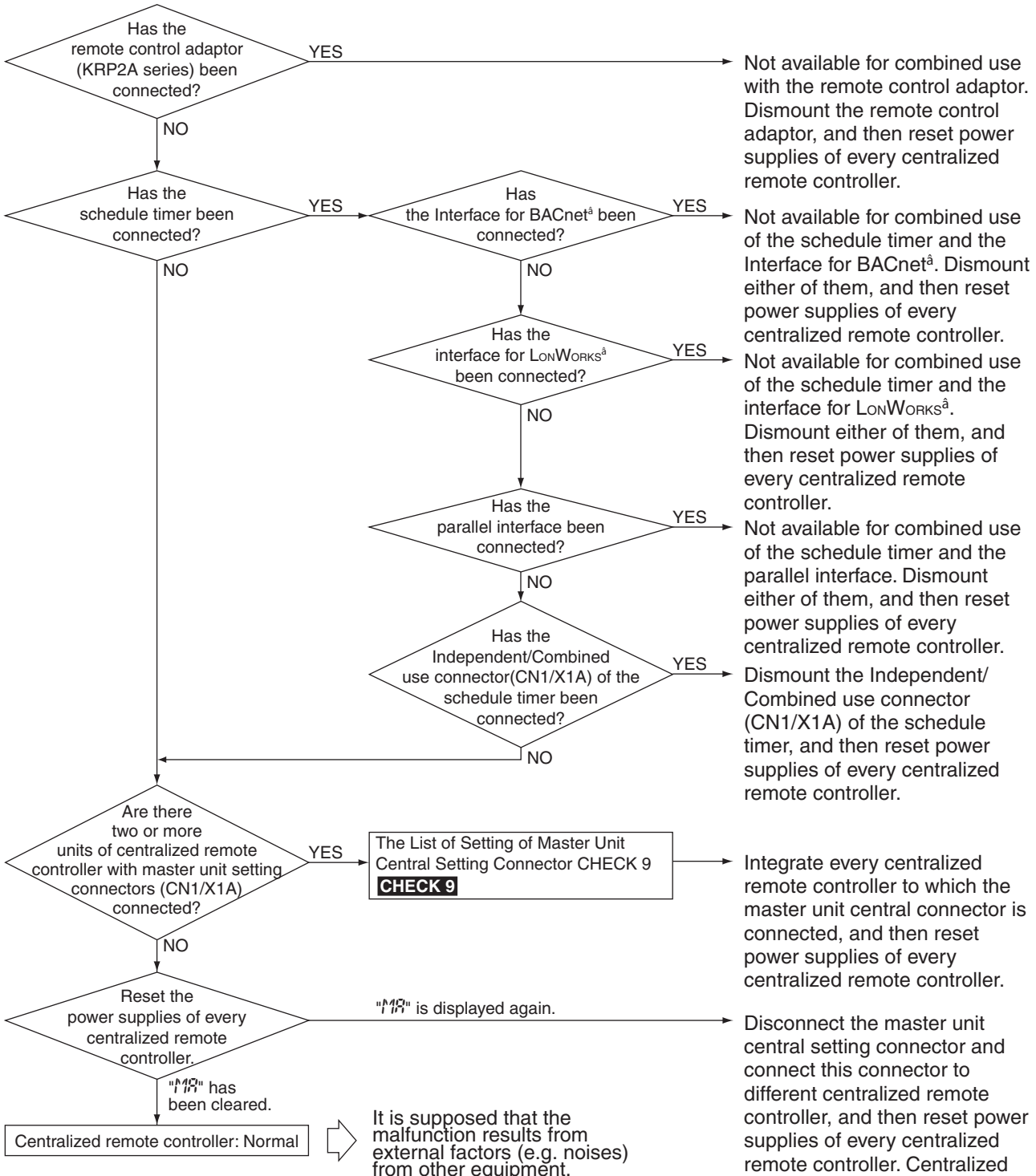
CHECK 8 : Refer to the information on P.217.

4.3 "MA" Improper Combination of Optional Controllers for Centralized Control

Remote Controller Display	MA
Applicable Models	Centralized remote controller / intelligent Touch Controller Schedule timer
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data.
Malfunction Decision Conditions	When the schedule timer is set to individual-use mode, another central component is present. When multiple master controllers are present When the remote control adaptor is present
Supposed Causes	■ Improper combination of optional controllers for centralized control ■ More than one master controller is connected ■ Defective PCB of optional controller for centralized control

Troubleshooting

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



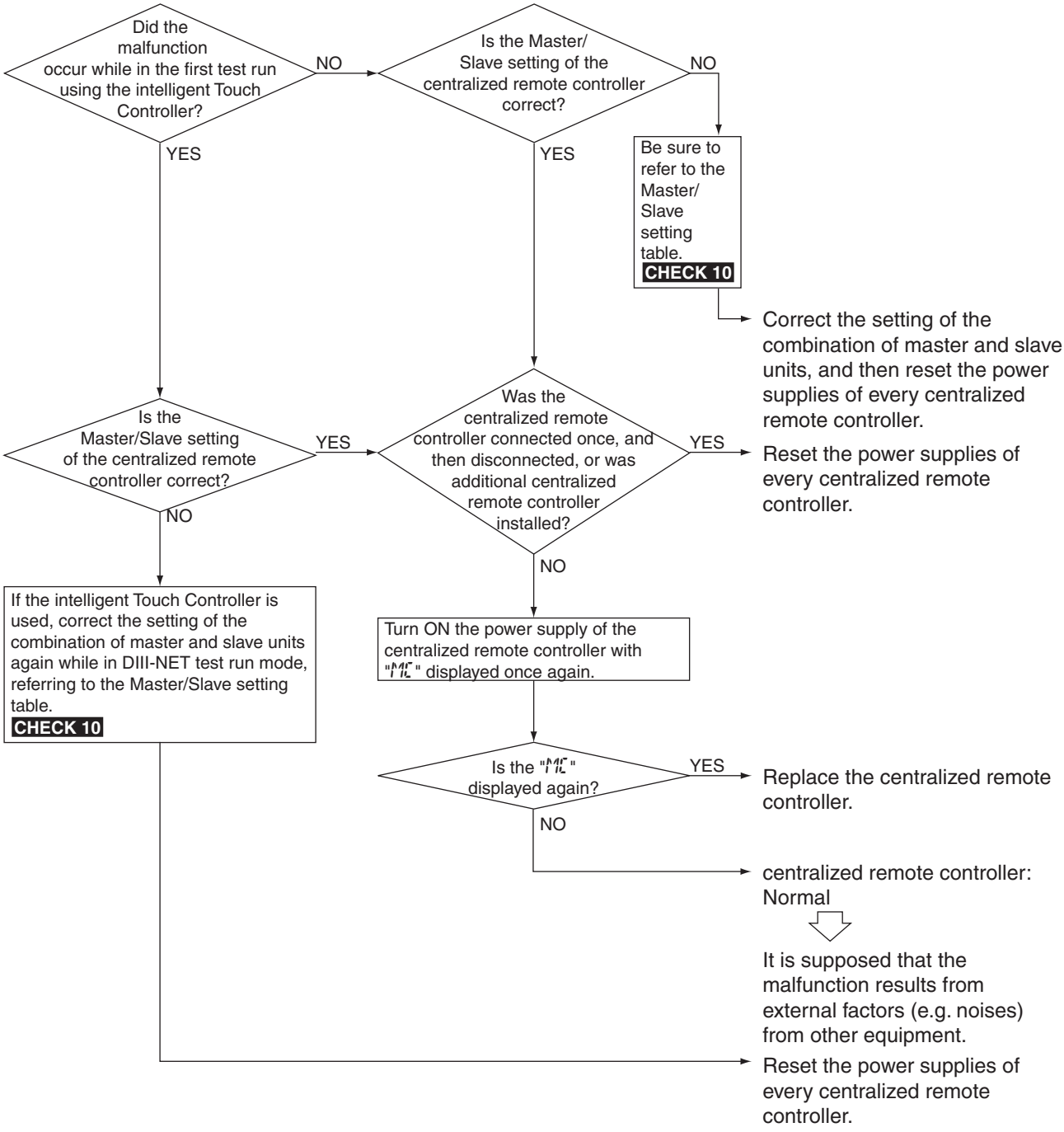
CHECK 9 : Refer to the information on P.218.

4.4 "MC" Address Duplication, Improper Setting

Remote Controller Display	MC
Applicable Models	Centralized remote controller / intelligent Touch Controller Schedule timer
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data.
Malfunction Decision Conditions	■ Two or more units of centralized remote controllers and intelligent Touch Controllers are connected, and all of them are set to master unit central setting or slave unit central setting. ■ Two units of schedule timers are connected.
Supposed Causes	■ Address duplication of centralized controller

Troubleshooting

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



CHECK 10 : Refer to the information on P.219.

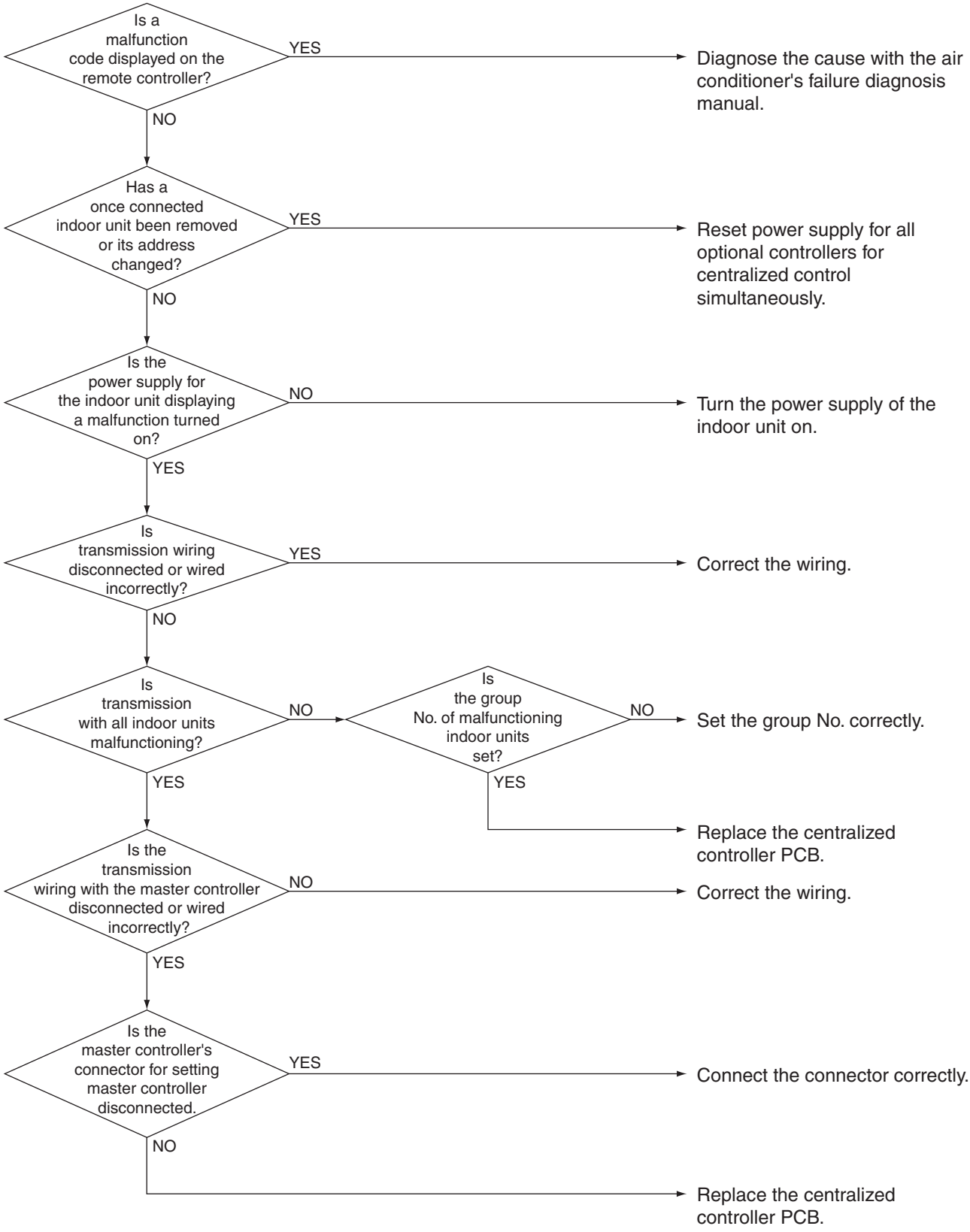
5. Troubleshooting (OP: Unified ON/OFF Controller)

5.1 Operation Lamp Blinks

Remote Controller Display	Operation lamp blinks
Applicable Models	All model of indoor units Unified ON/OFF controller
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data.
Malfunction Decision Conditions	
Supposed Causes	■ Malfunction of transmission between optional central controller and indoor unit ■ Connector for setting master controller is disconnected ■ Defect of unified ON/OFF controller PCB ■ Defect of indoor unit PCB ■ Malfunction of air conditioner

Troubleshooting

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



5.2 Display “Under Centralized Control” Blinks (Repeats Single Blink)

Remote Controller Display

“under centralized control” (Repeats single blink)

Applicable Models

Unified ON/OFF controller
Centralized remote controller, Schedule timer

Method of Malfunction Detection

Detect the malfunction according to DIII-NET transmission data.

Malfunction Decision Conditions

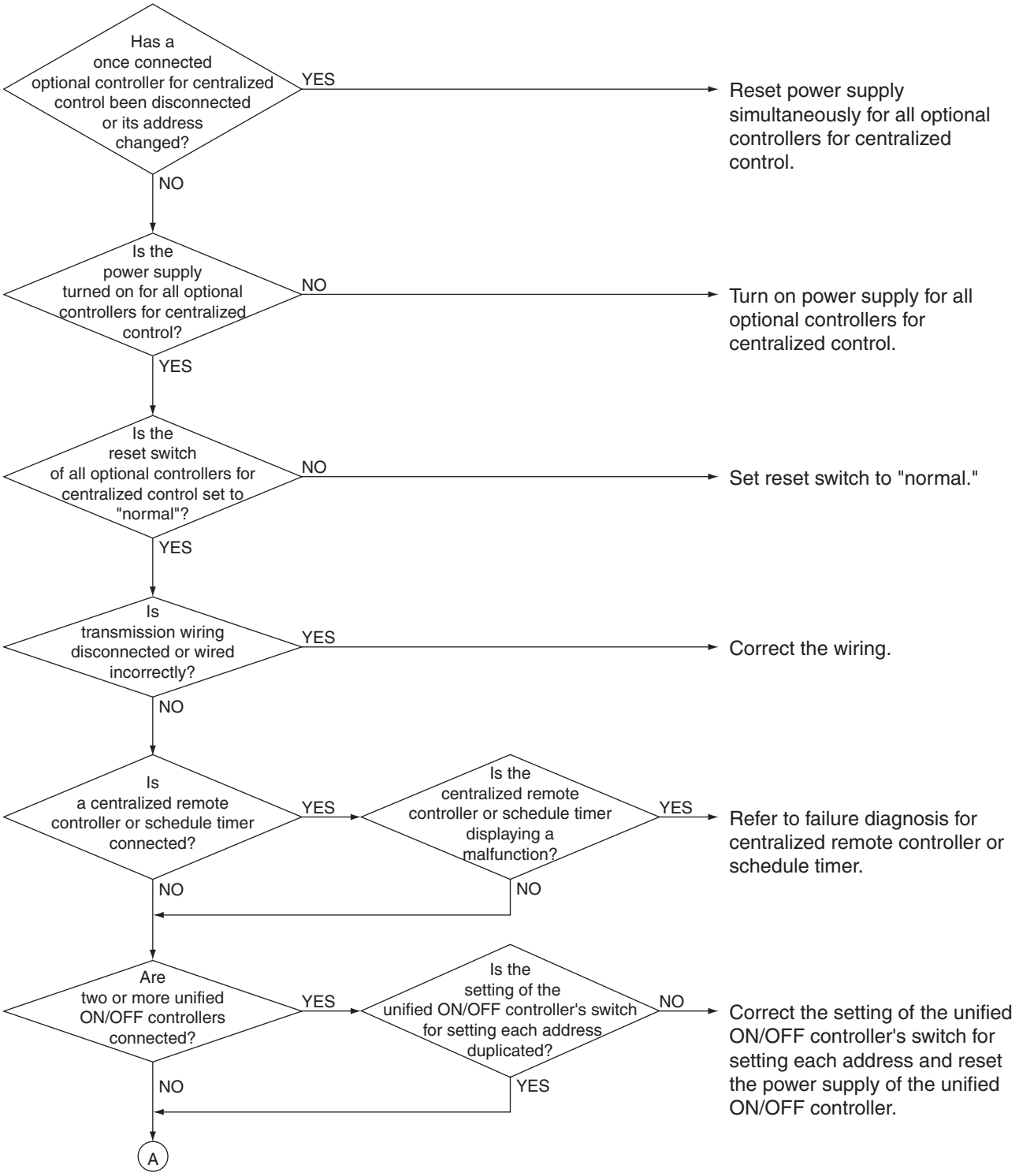
When the centralized controller, which was connected once, shows no response.
The control ranges are overlapped.
When multiple master central controllers are present
When the schedule timer is set to individual use mode, other central controller is present.
When the wiring adaptor for electrical appendices is present

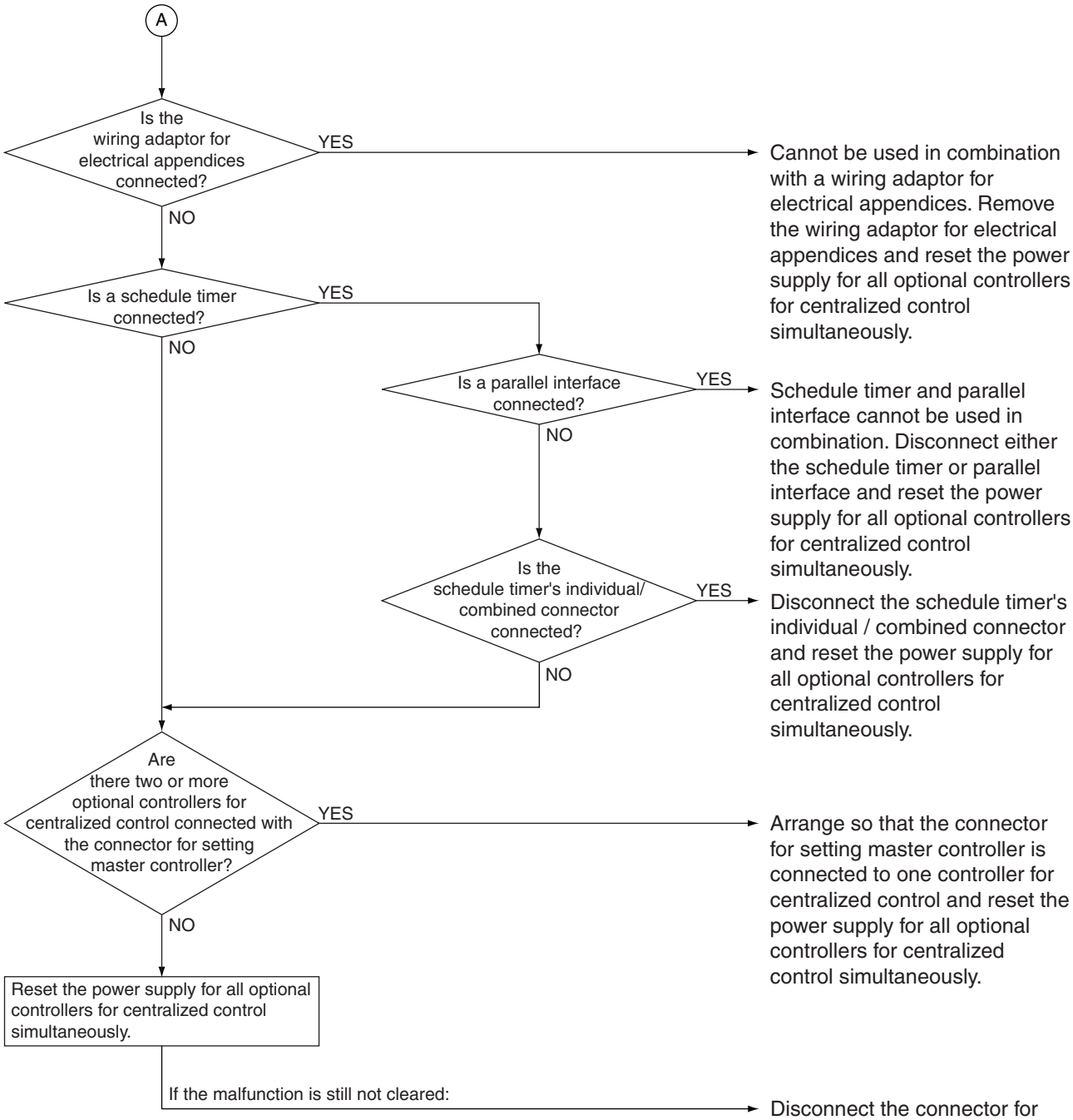
Supposed Causes

- Address duplication of optional controllers for centralized control
- Improper combination of optional controllers for centralized control
- Connection of more than one master controller
- Malfunction of transmission between optional controllers for centralized control
- Defect of PCB of optional controllers for centralized control

Troubleshooting

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



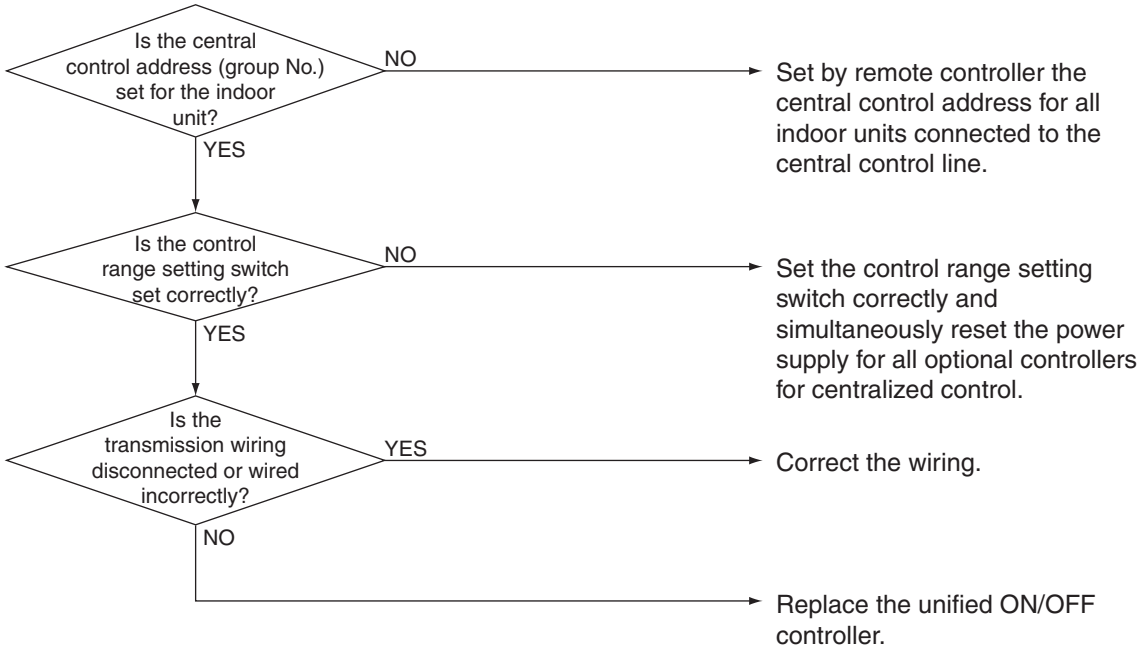

A
Is the wiring adaptor for electrical appendices connected?
YES
Cannot be used in combination with a wiring adaptor for electrical appendices. Remove the wiring adaptor for electrical appendices and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Is a schedule timer connected?
YES
NO
Is a parallel interface connected?
YES
Schedule timer and parallel interface cannot be used in combination. Disconnect either the schedule timer or parallel interface and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Is the schedule timer's individual/ combined connector connected?
YES
Disconnect the schedule timer's individual / combined connector and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Are there two or more optional controllers for centralized control connected with the connector for setting master controller?
YES
Arrange so that the connector for setting master controller is connected to one controller for centralized control and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Reset the power supply for all optional controllers for centralized control simultaneously.
If the malfunction is still not cleared:
Disconnect the connector for setting master controller from the master controller, connect to another optional controller for centralized control and simultaneously reset all optional controllers for centralized control again. The controller connected by the connector for setting master controller when the malfunction is cleared is defective and must be replaced.

5.3 Display “Under Centralized Control” Blinks (Repeats Double Blink)

Remote Controller Display	“under centralized control” (Repeats double blink)
Applicable Models	Unified ON/OFF controller
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data.
Malfunction Decision Conditions	When no central control addresses are set to indoor units When no indoor units are connected within the control range
Supposed Causes	■ Central control address (group No.) is not set for indoor unit. ■ Improper control range setting switch ■ Improper wiring of transmission wiring

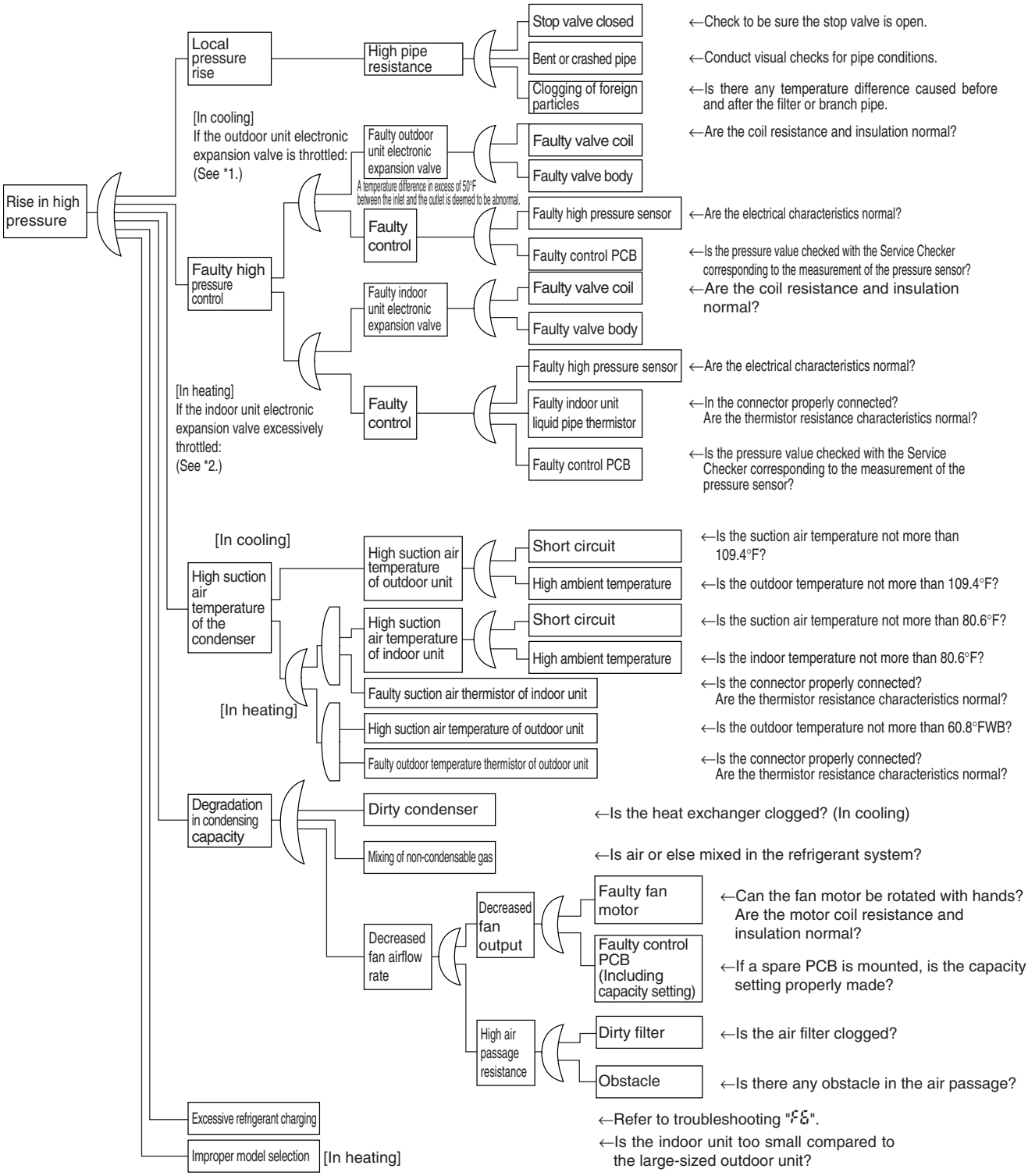
Troubleshooting

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



CHECK 1 Check for Causes of Rise in High Pressure

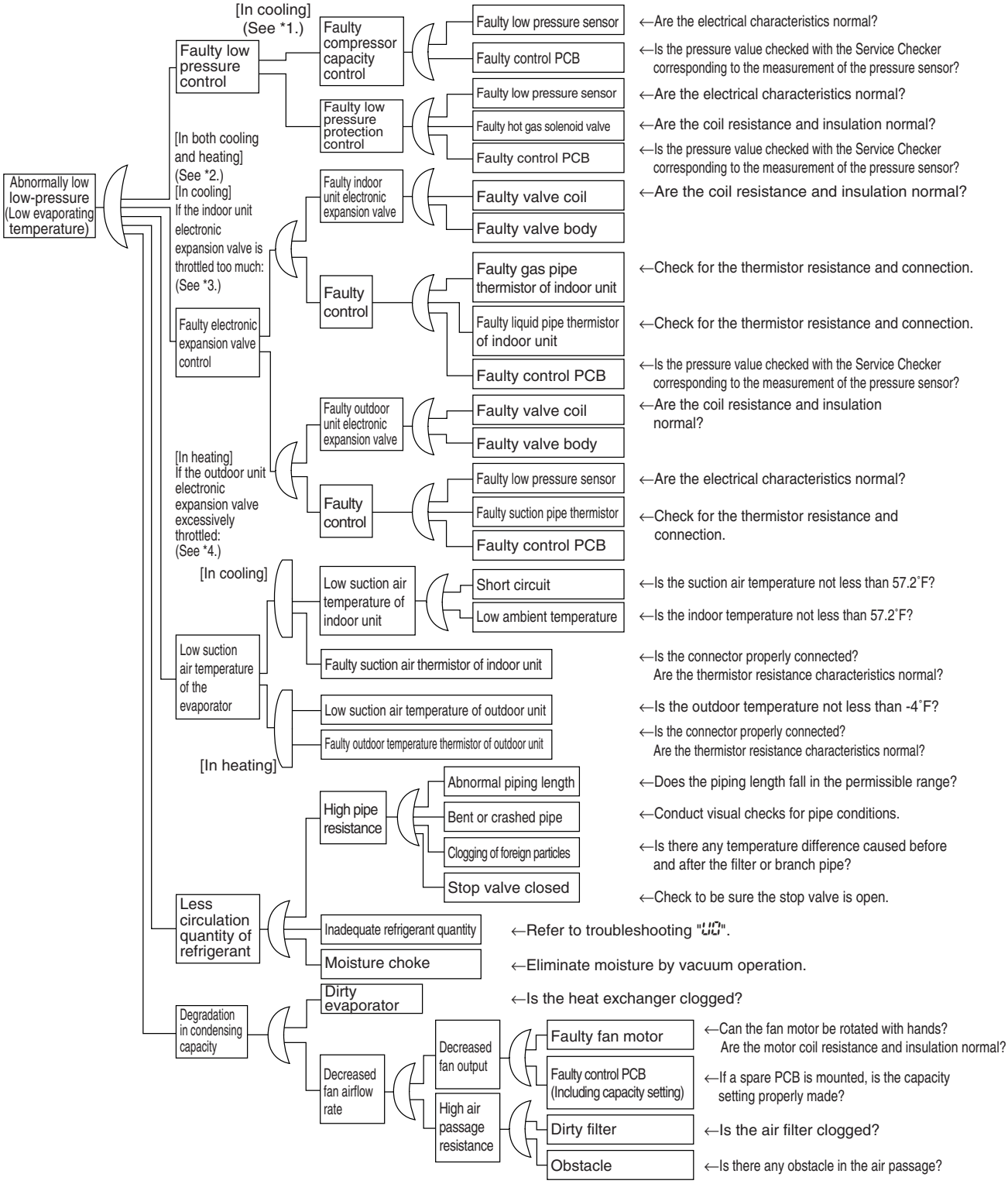
Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.



*1: In cooling, it is normal if the outdoor unit electronic expansion valve (EV1) is fully open.
*2: In heating, the indoor unit electronic expansion valve is used for “subcooled degree control”.
(For details, refer to “Electronic Expansion Valve Control”.)

CHECK 2 Check for Causes of Drop in Low Pressure

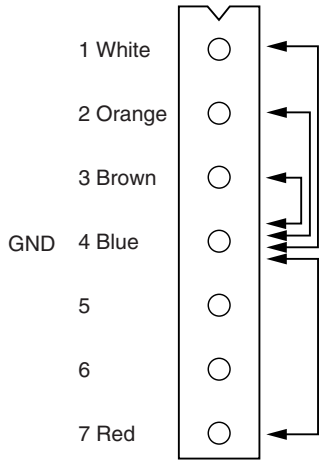
Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.



*1: For details of the compressor capacity control while in cooling, refer to “Compressor PI Control”.
*2: The “Low Pressure Protection Control” includes low pressure protection control and hot gas bypass control.
*3: In cooling, the indoor unit electronic expansion valve is used for “superheated degree control”. (For details, refer to "Electronic Expansion Valve Control.)
*4: In heating, the outdoor unit electronic expansion valve (EV1) is used for “superheated degree control of outdoor unit heat exchanger”.
(For details, refer to "Electronic Expansion Valve PI Control".)

CHECK 3 Check for Fan Motor Connector

(1) Turn the power supply off.
(2) With the fan motor connector disconnected, measure the resistance between each pin, then make sure that the resistance is more than the value mentioned in the following table.

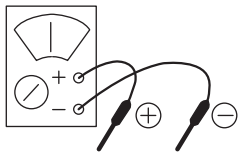


Measurement point	Judgement
1 - 4	1MΩ or more
2 - 4	100kΩ or more
3 - 4	100Ω or more
4 - 7	100kΩ or more

CHECK 4 Power Transistor Check

Perform the following procedures prior to check.
(1) Power Off.
(2) Remove all the wiring connected to the PCB where power transistors are mounted on.

[Preparation]
· Tester



* Preparing a tester in the analog system is recommended. A tester in the digital system with diode check function will be usable.

[Point of Measurement and Judgement Criteria]
· Measure the resistance value using a tester at each point of measurement below, 10 minutes later after power OFF.

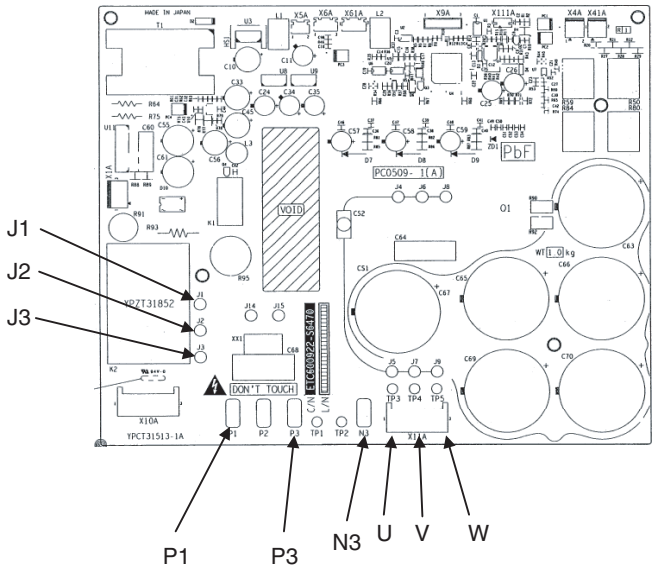
To use analog tester:
Measurement in the resistance value mode in the range of multiplying 1kΩ.

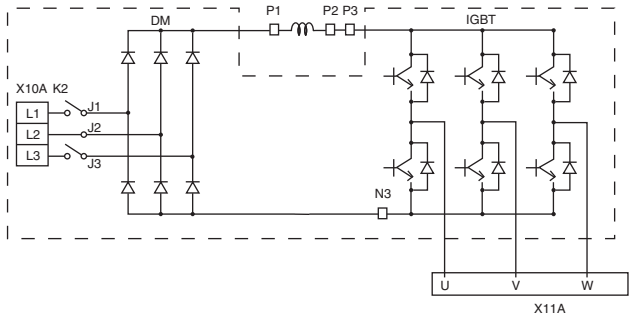
No.	Point of Measurement		Judgement Criteria	Remarks
	+	–		
1	P2	U	2 ~ 15kΩ	
2	P2	V		
3	P2	W		
4	U	P2	15kΩ and above (including ∞)	Due to condenser charge and so on, resistance measurement may require some time.
5	V	P2		
6	W	P2		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	2 ~ 15kΩ	
11	V	N3		
12	W	N3		

To use digital tester:
Measurement is executed in the diode check mode.(→|—)

No.	Point of Measurement		Judgement Criteria	Remarks
	+	–		
1	P2	U	1.2V and over	Due to condenser charge and so on, resistance measurement may require some time.
2	P2	V		
3	P2	W		
4	U	P2	0.3 ~ 0.7V	
5	V	P2		
6	W	P2		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	1.2V and over	Due to condenser charge and so on, resistance measurement may require some time.
11	V	N3		
12	W	N3		

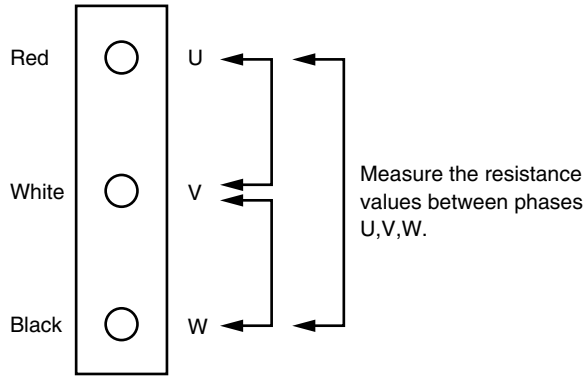
[PCB and Circuit Diagram]





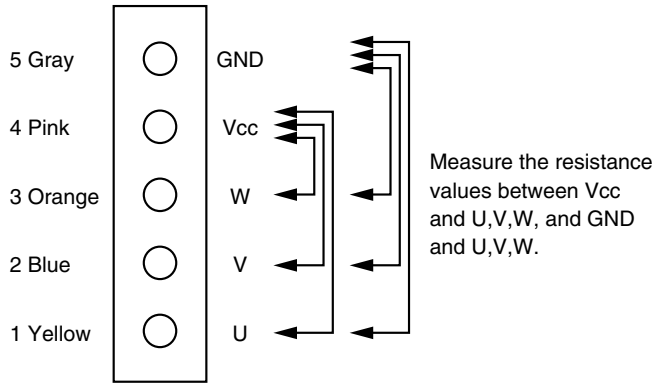
CHECK 5 Check on connector of fan motor (Power supply wire)

(1) Turn off the power supply.
Measure the resistance between phases of U,V,W at the motor side connectors (three-core wire) to check that the values are balanced and there is no short circuiting, while connector or relay connector is disconnected.



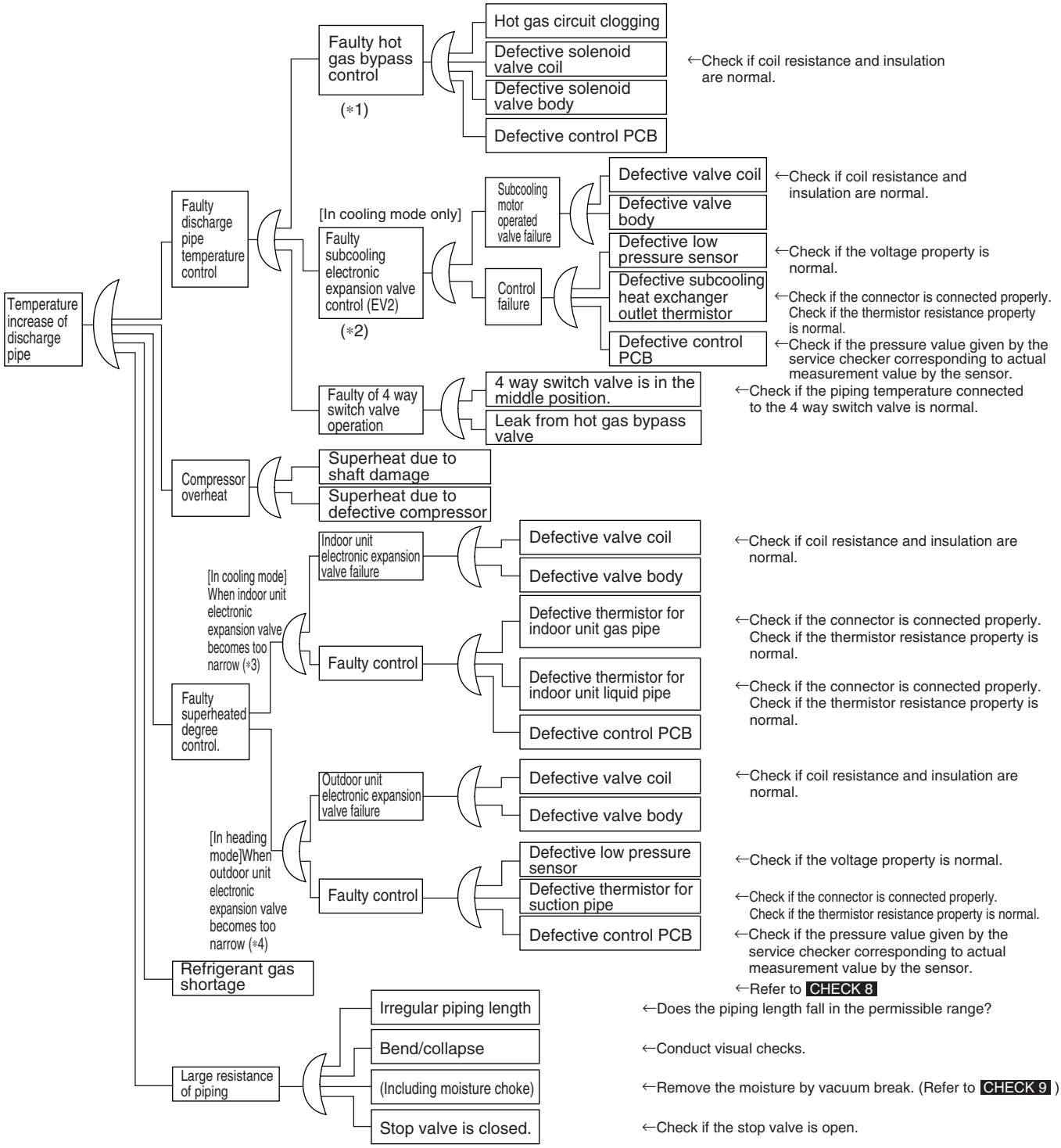
CHECK 6

(1) Turn off the power supply. (Signal wire)
(2) Measure the resistance between Vcc and each phase of U,V,W, and GND and each phase at the motor side connectors (five-core wire) to check that the values are balanced within the range of ± 20 %, while connector or relay connector is disconnected.
Furthermore, to use a multi-meter for measurement, connect the probe of negative pole to Vcc and that of positive pole to GND.



CHECK 7 Check the Factors of Overheat Operation

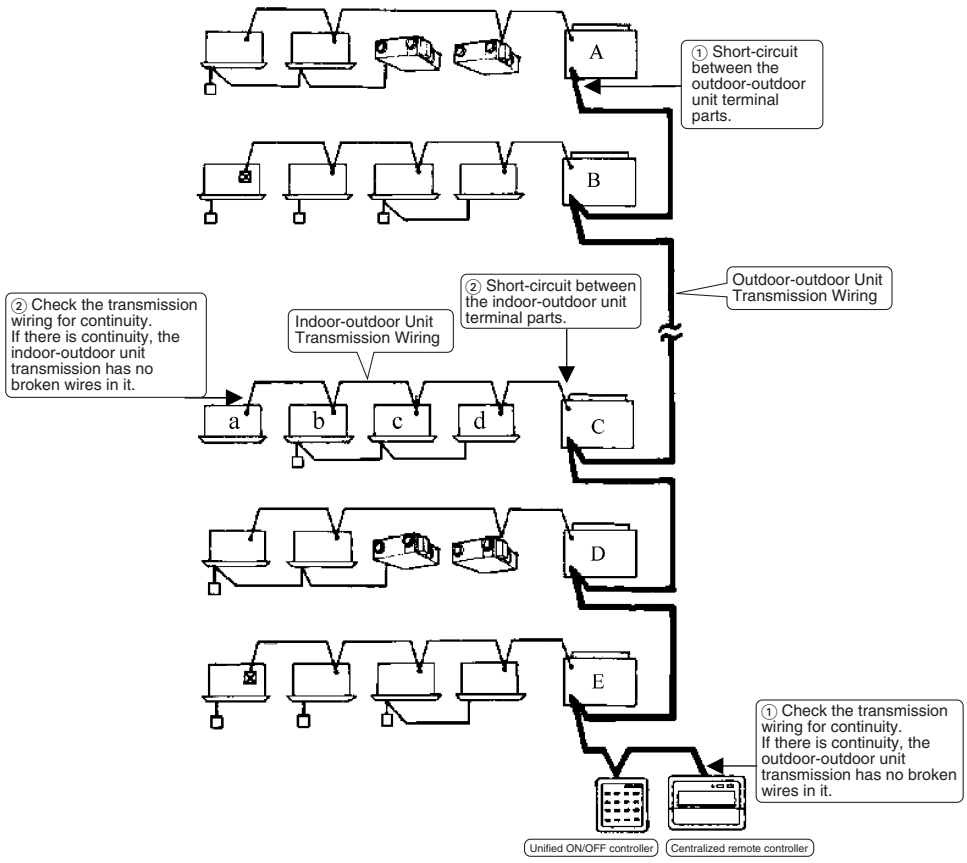
Identify the defective points referring to the Fault Tree Analysis (FTA) as follows.



∗1: Refer to “Low Pressure Protection Control” for hot gas bypass control.
∗2: Refer to "Electronic Expansion Valve PI Control" for "subcooling electronic expansion valve control".
∗3: “Superheating temperature control” in cooling mode is conducted by indoor unit electronic expansion valve. (Refer to "Electronic Expansion Valve Control")
∗4: Superheating temperature control in heating mode is conducted by outdoor unit electronic expansion valve (EVM). (Refer to "Electronic Expansion Valve PI Control").
∗5: Judgement criteria of superheat operation:
① Suction gas superheating temperature: 18 degrees and over. ② Discharge gas superheating temperature: 81 degrees and over, except for immediately after starting and dropping control.
(Use the above stated values as a guide. Depending on the other conditions, the unit may be normal despite the values within the above scope.)

CHECK 8 Broken Wire Check of the Connecting Wires

1. Procedure for checking outdoor-outdoor unit transmission wiring for broken wires:
   On the system shown below, turn OFF the power supply to all equipment, short-circuit between the outdoor-outdoor unit terminal parts F1 and F2 in the "Outdoor Unit A" that is farthest from the centralized remote controller, and then conduct continuity checks between the transmission wiring terminal blocks F1 and F2 of the centralized remote controller using a multi-meter. If there is continuity between the said terminal blocks, the outdoor-outdoor unit transmission wiring has no broken wires in it.
   If there is no continuity, the transmission wiring may have broken wires. With the outdoor-outdoor unit terminal parts of the "Outdoor Unit A" short-circuited, conduct continuity checks between the transmission wiring terminal blocks F1 and F2 of the unified ON/OFF controller. If there is no continuity as well, conduct continuity checks between the outdoor-outdoor unit terminal parts of the "Outdoor Unit E", between the outdoor-outdoor unit terminal parts of the "Outdoor Unit D", between the outdoor-outdoor unit terminal parts of the "Outdoor Unit C", … in the order described, thus identifying the place with continuity.
   If the place with continuity can be identified, there may be broken wires in places before the said place with continuity.
2. Procedure for checking indoor-outdoor unit transmission wiring for broken wires (for checking the indoor-outdoor unit transmission wiring of the "Outdoor Unit C" for broken wires)
   Turn OFF the power supply to all equipment, short-circuit between the indoor-outdoor unit terminal parts F1 and F2 in the "Outdoor Unit C, and then conduct continuity checks between the transmission wirings F1 and F2 of the "Indoor Unit a" that is farthest from the "Outdoor Unit C" using a multi-meter. If there is continuity between the said transmission wirings, the indoor-outdoor unit transmission wiring has no broken wires in it.
   If there is no continuity, the transmission wiring may have broken wires. With the indoor-outdoor unit terminal parts of the "Outdoor Unit C" short-circuited, identify the place with continuity in the transmission wiring of the "Indoor Unit b", transmission wiring of the "Indoor Unit c", and transmission wiring of the "Indoor Unit D" in the order described. If the place with continuity can be identified, there may be broken wires in places before the said place with continuity.



CHECK 9 Master Unit Central Connector Setting Table

The master unit central setting connector (CN1/X1A) is mounted at the factory.

- To independently use a single unit of the intelligent Touch Controller or a single unit of the centralized remote controller, do not dismount the master unit central setting connector (i.e., use the connector with the factory setting unchanged).
- To independently use the schedule timer, insert an independent-use setting connector.
  No independent-use setting connector has been mounted at the factory. Insert the connector, which is attached to the casing of the main unit, in the PCB (CN1/X1A).
  (Independent-use connector=Master unit central setting connector)
- To use two or more centralized remote controller in combination, make settings according to the table shown below.

<table>
<tr><th rowspan="3">Pattern</th><th colspan="4">centralized remote controller connection pattern</th><th colspan="4">Setting of master unit central setting connector(*2)</th></tr>
<tr><th>intelligent Touch Controller</th><th>Centralized remote controller</th><th>Unified ON/OFF controller</th><th>Schedule timer</th><th>intelligent Touch Controller</th><th>Centralized remote controller</th><th>Unified ON/OFF controller</th><th>Schedule timer</th></tr>
<tr><td>①</td><td>1 to 2 units</td><td></td><td></td><td>× (*1)</td><td>Only a single unit: "Provided", Others: "Not provided"</td><td></td><td></td><td></td></tr>
<tr><td>②</td><td rowspan="2">1 unit</td><td rowspan="2">1 unit</td><td></td><td>× (*1)</td><td rowspan="2">Provided</td><td rowspan="2">Not provided</td><td></td><td></td></tr>
<tr><td>③</td><td rowspan="2">1 to 8 units</td><td>× (*1)</td><td rowspan="2">All "Not provided"</td><td></td></tr>
<tr><td>④</td><td>1 to 2 units</td><td></td><td>× (*1)</td><td>Only a single unit: "Provided", Others: "Not provided"</td><td></td><td></td></tr>
<tr><td>⑤</td><td></td><td rowspan="4">1 to 4 units</td><td></td><td></td><td></td><td rowspan="4">Only a single unit: "Provided", Others: "Not provided"</td><td></td><td></td></tr>
<tr><td>⑥</td><td></td><td rowspan="2">1 to 16 units</td><td>1 unit</td><td></td><td rowspan="2">All "Not provided</td><td>Not provided</td></tr>
<tr><td>⑦</td><td></td><td></td><td></td><td></td></tr>
<tr><td>⑧</td><td></td><td></td><td>1 unit</td><td></td><td></td><td>Not provided</td></tr>
<tr><td>⑨</td><td></td><td></td><td rowspan="2">1 to 16 units</td><td></td><td></td><td></td><td rowspan="2">Only a single unit: "Provided", Others: "Not provided"</td><td></td></tr>
<tr><td>⑩</td><td></td><td></td><td>1 unit</td><td></td><td></td><td>Not provided</td></tr>
<tr><td>⑪</td><td></td><td></td><td></td><td>1 unit</td><td></td><td></td><td></td><td>Provided</td></tr>
</table>

(*1)The intelligent Touch Controller and the schedule timer are not available for combined use.

(*2)The intelligent Touch Controller, centralized remote controller, and the unified ON/OFF controller have been set to "Provided with the master unit central setting connector" at the factory. The schedule timer has been set to "Not provided with the master unit central setting connector" at the factory, which is attached to the casing of the main unit.

CHECK 10 Master-Slave Unit Setting Table

Combination of intelligent Touch Controller and Centralized Remote Controller

*	#1		#2		#3		#4	
Pattern	1-00~4-15	Master/ Slave	5-00~8-15	Master/ Slave	1-00~4-15	Master/ Slave	5-00~8-15	Master/ Slave
①	CRC	Master	CRC	Master	CRC	Slave	CRC	Slave
②	CRC	Master	—	—	CRC	Slave	—	—
③	intelligent Touch Controller	Master	—	—	intelligent Touch Controller	Slave	—	—
④	CRC	Master	—	—	intelligent Touch Controller	Slave	—	—
⑤	intelligent Touch Controller	Master	—	—	CRC	Slave	—	—
⑥	CRC	Master	—	—	—	—	—	—
⑦	intelligent Touch Controller	Master	—	—	—	—	—	—

CRC: Centralized remote controller <DCS302CA61>

intelligent Touch Controller: < DCS601C51 >

∗The patterns marked with "∗" have nothing to do with those described in the list of Setting of master unit central setting connector.

CHECK 11 Method of Replacing the Inverter's Power Transistors Modules

Checking failures in power semiconductors mounted on inverter PCB

Check the power semiconductors mounted on the inverter PCB by the use of a multiple tester.

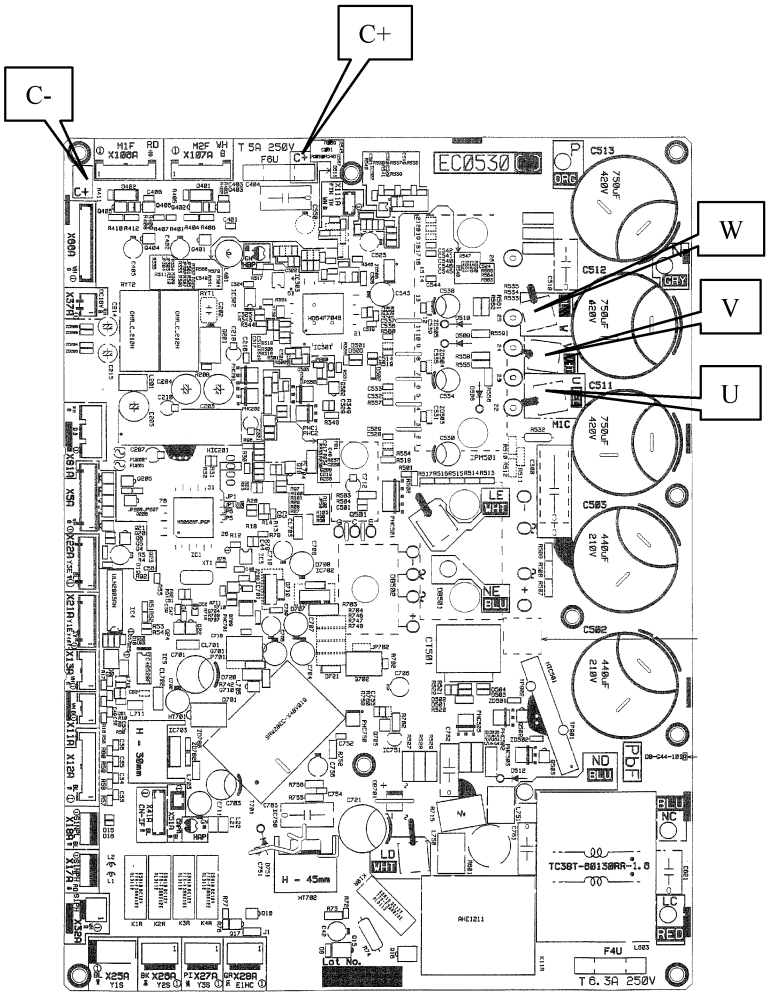
<Items to be prepared>

- Multiple tester : Prepare the digital type of multiple tester with diode check function.

<Preparation>

- Turn OFF the power supply. Then, after a lapse of 10 minutes or more, make measurement of resistance.
- To make measurement, disconnect all connectors and terminals.

Inverter PCB



Power module checking

When using the digital type of multiple tester, make measurement in diode check mode.

Tester terminal		Criterion	Remark
+	-		
C+	U	Not less than 0.3V (including ∞)*	It may take time to determine the voltage due to capacitor charge or else.
	V		
	W		
U	C-	Not less than 0.3V (including ∞)*	
V			
W			
U	C+	0.3 to 0.7V (including ∞)*	
V			
W			
C-	U	0.3 to 0.7V (including ∞)*	
	V		
	W		

*There needs to be none of each value variation.

The following abnormalities are also doubted besides the PCB abnormality.

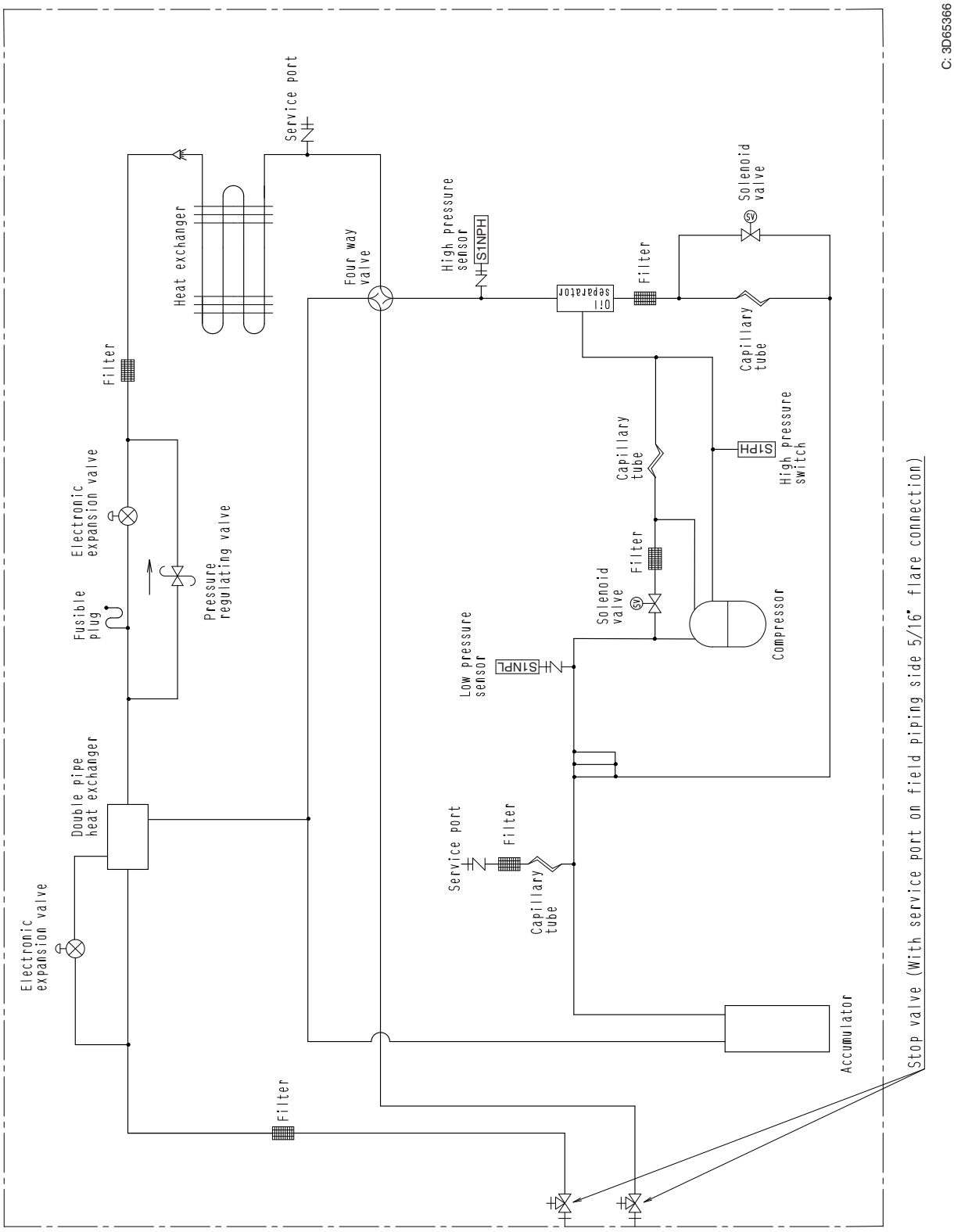
- Faulty compressor (ground fault, ground leakage)
- Faulty fan motor (ground leakage)

Part 8
Appendix

1. Piping Diagrams

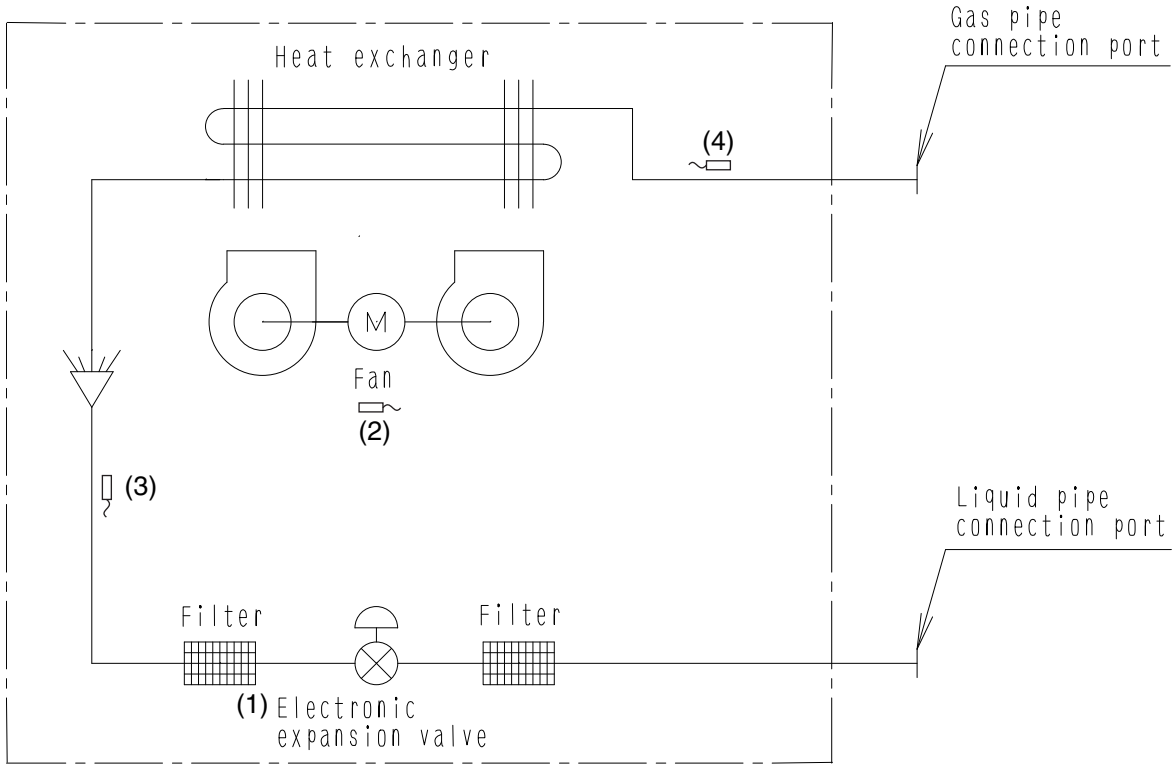
1.1 Outdoor Unit

RXYMQ36 · 48PVJU



1.2 Indoor Unit

FXFQ, FXHQ



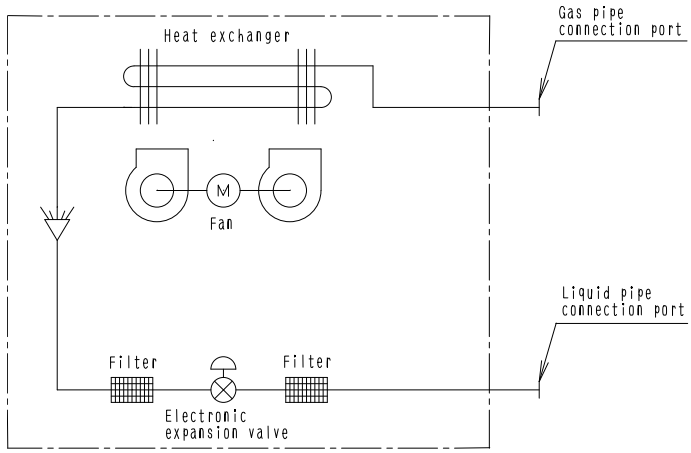
4D024460D

Code	Name	Code	Main function
(1)	Electronic expansion valve	Y1E	Used for gas superheated degree control while in cooling operation or subcooled degree control while in heating operation.
(2)	Suction air temperature thermistor	R1T	Used for thermostat control.
(3)	Liquid pipe temperature thermistor	R2T	Used for gas superheated degree control while in cooling operation or subcooled degree control while in heating operation.
(4)	Gas pipe temperature thermistor	R3T	Used for gas superheated degree control while in cooling operation.

(in)

Capacity	GAS	Liquid
FXFQ12 / 18MVJU FXHQ12MVJU	ϕ1/2	ϕ1/4
FXFQ24 / 30 / 36MVJU FXHQ24 / 36MVJU	ϕ5/8	ϕ3/8

FXZQ



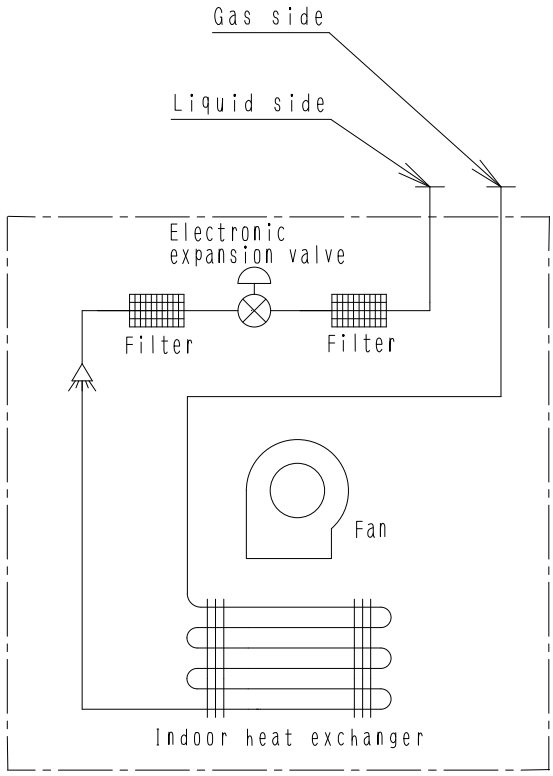
4D040157

■ **Refrigerant pipe connection port diameters**

(in)

Model	Gas	Liquid
FXZQ07 / 09 / 12 / 18MVJU	ϕ1/2	ϕ1/4

FXDQ



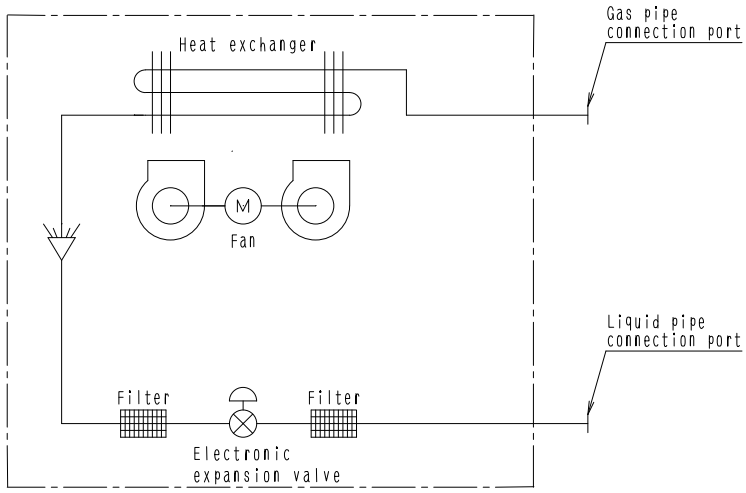
4D043864M

■ **Refrigerant pipe connection port diameters**

(in)

Model	Gas	Liquid
FXDQ07 / 09 / 12 / 18MVJU	ϕ1/2	ϕ1/4
FXDQ24MVJU	ϕ5/8	ϕ3/8

FXMQ, FXLQ, FXNQ



4D034245D

■ Refrigerant pipe connection port diameters

(in)

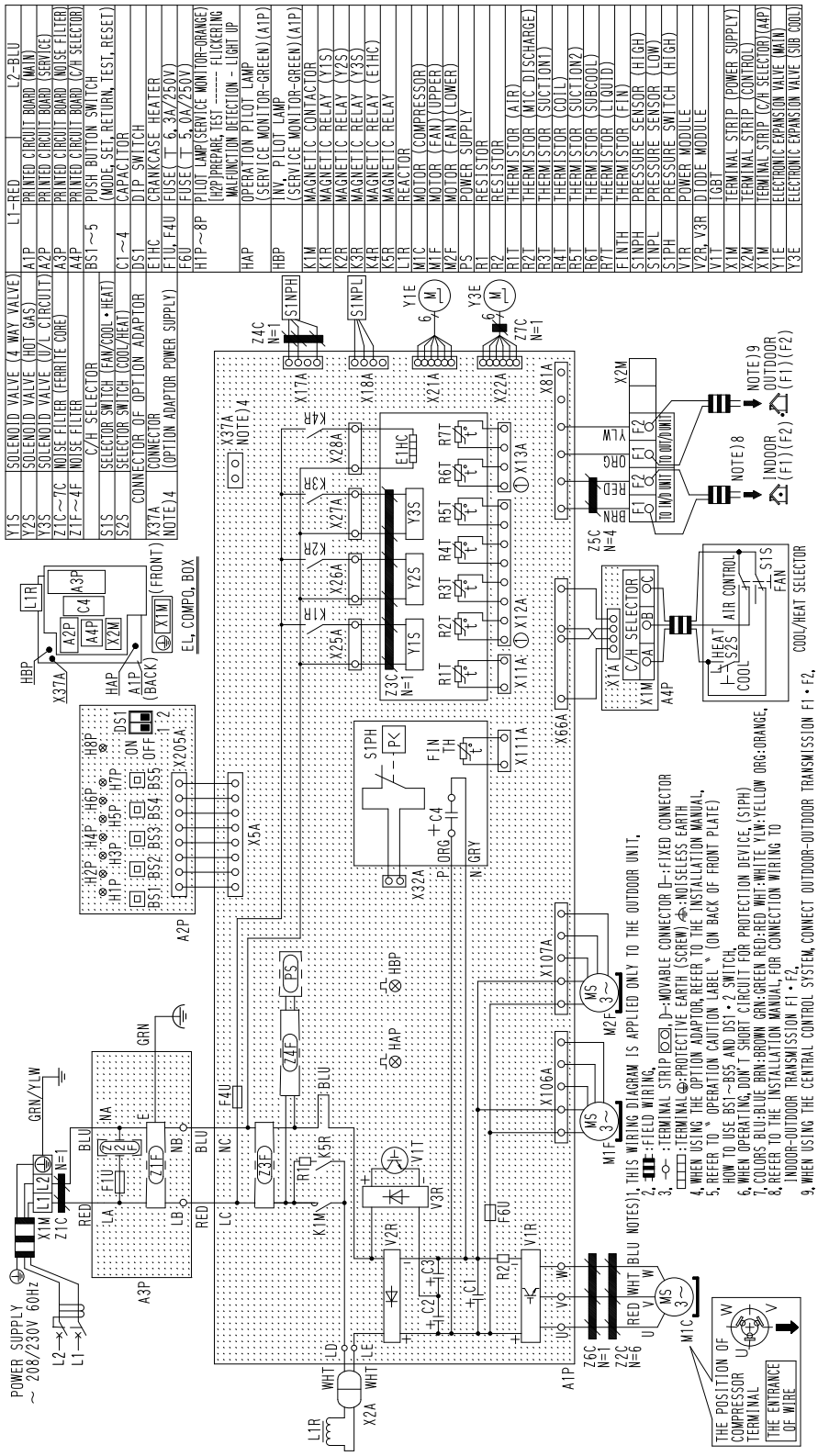
Model	Gas	Liquid
FXMQ07 / 09 / 12 / 18PVJU FXLQ12 / 18MVJU FXNQ12 / 18MVJU	ϕ1/2	ϕ1/4
FXMQ24 / 30PVJU FXLQ24MVJU FXNQ24MVJU	ϕ5/8	ϕ3/8

2. Wiring Diagrams

2.1 Outdoor Unit

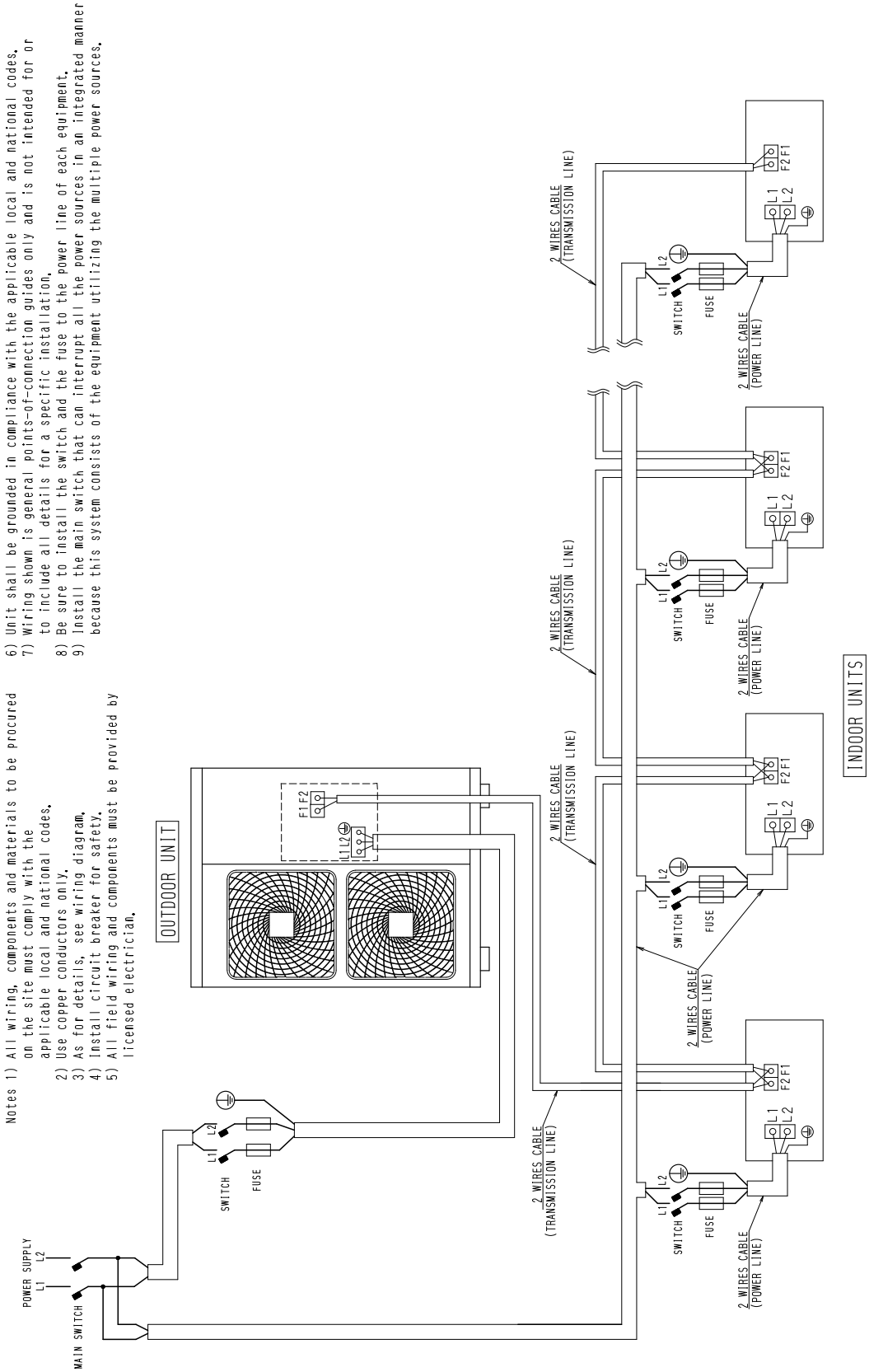
2.1.1 Heat Pump

RXYMQ36 · 48PVJU



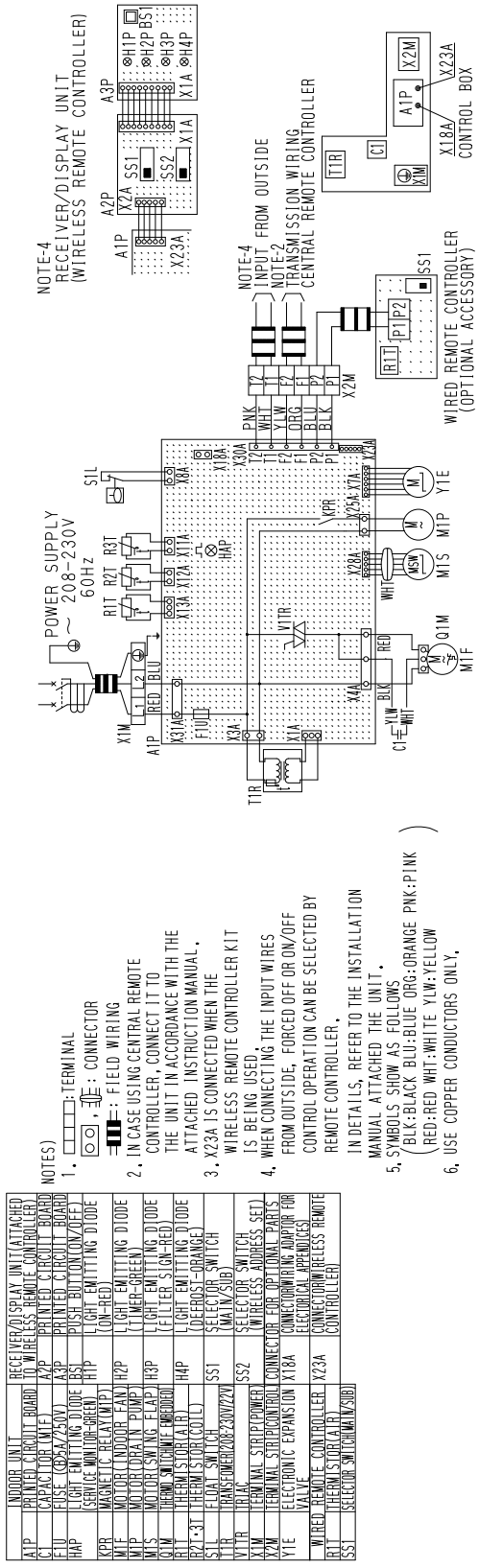
2.2 Field Wiring

RXYMQ36 / 48PVJU

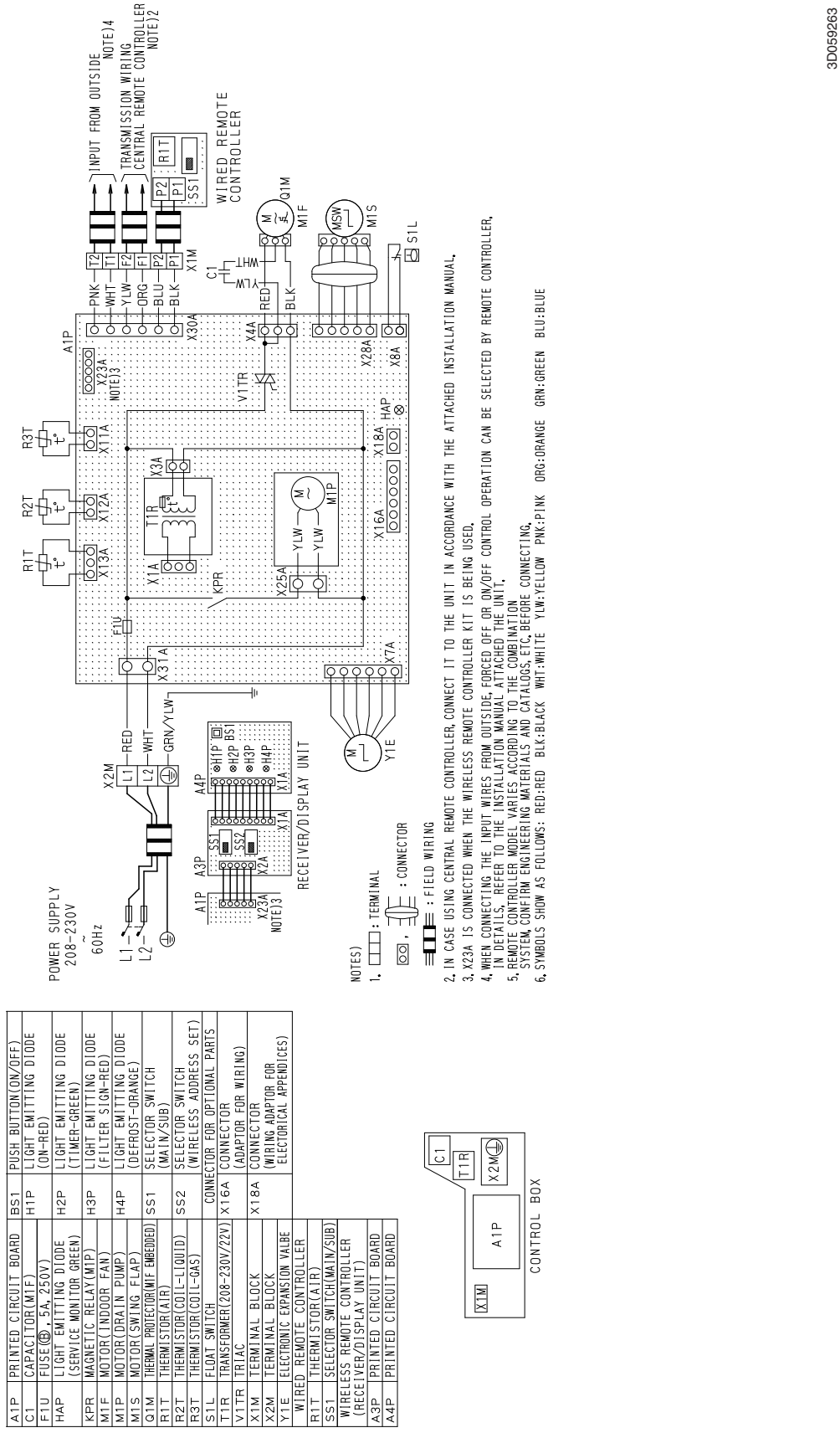


2.3 Indoor Unit

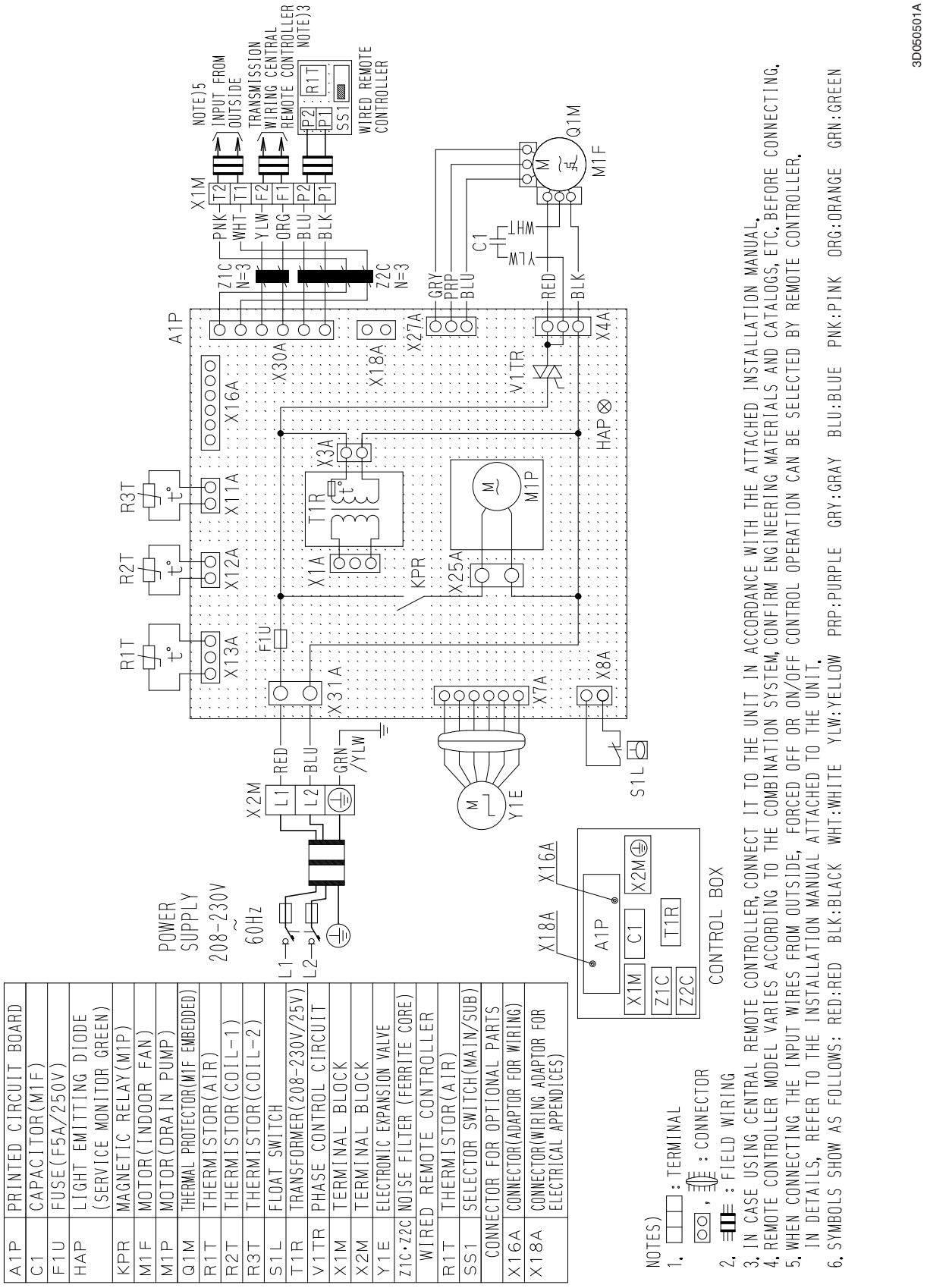
FXFQ12M / 18M / 24M / 30M / 36MVJU



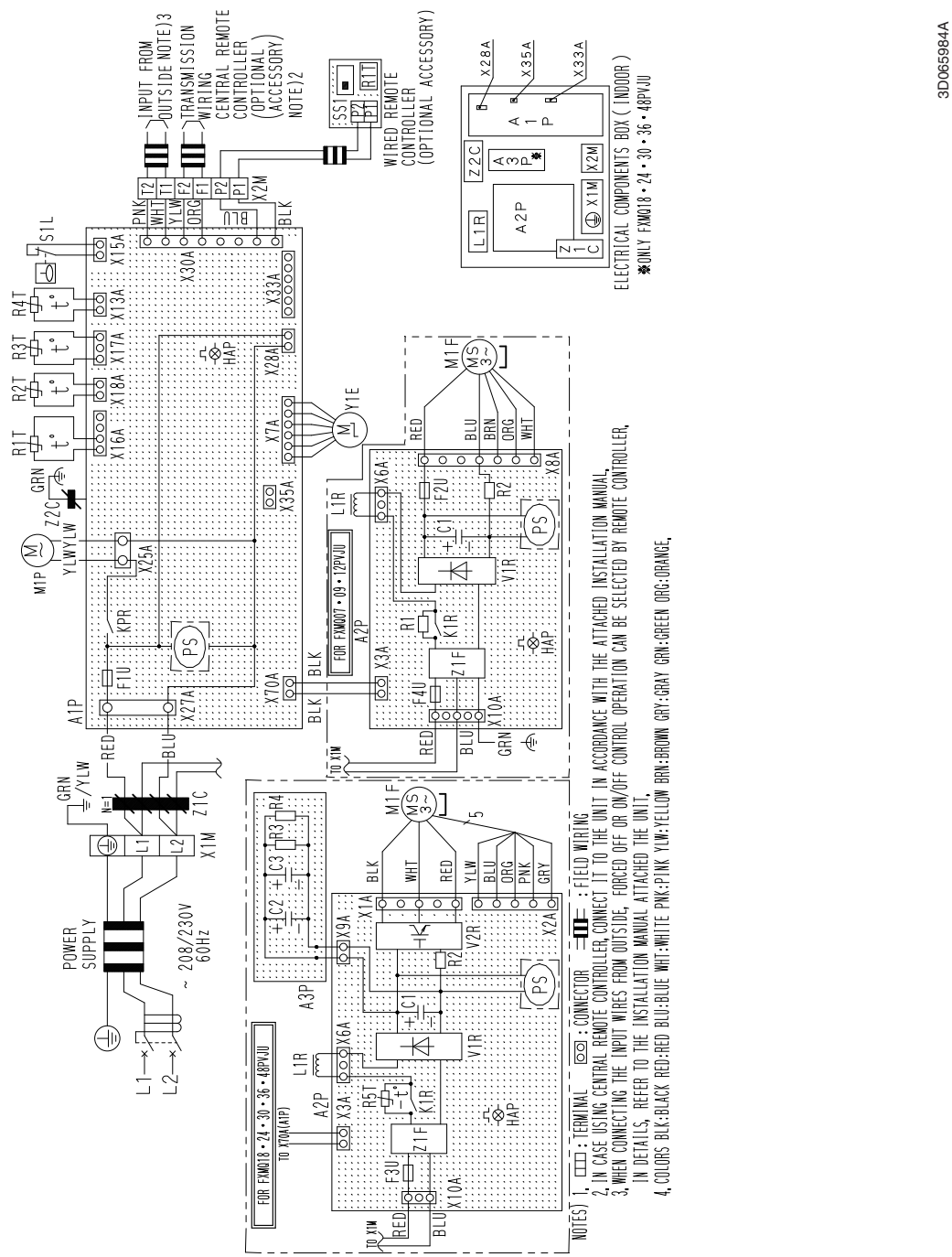
FXZQ07M / 09M / 12M / 18MVJU



FXDQ07M / 09M / 12M / 18M / 24MVJU

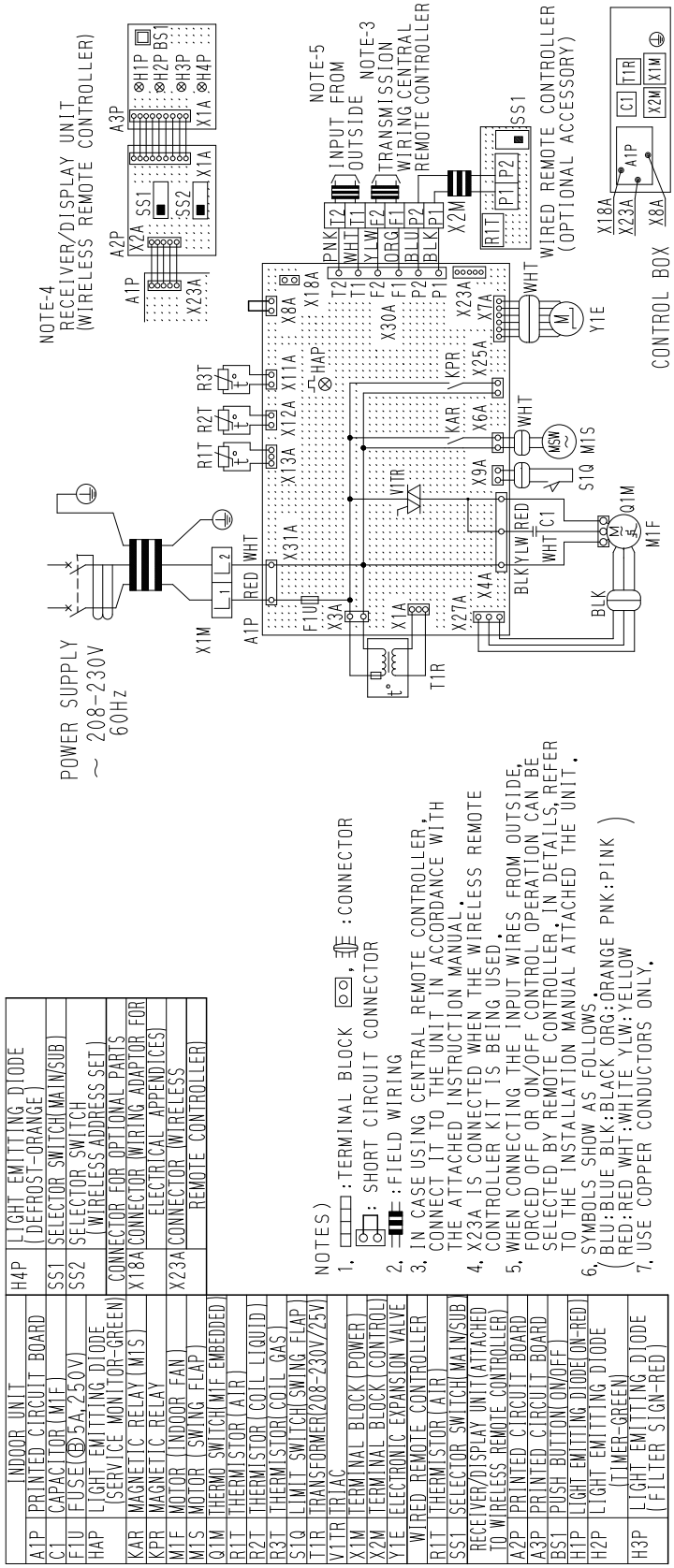


FXMQ07P / 09P / 12P / 18P / 24P / 30P / 36P / 48PVJU

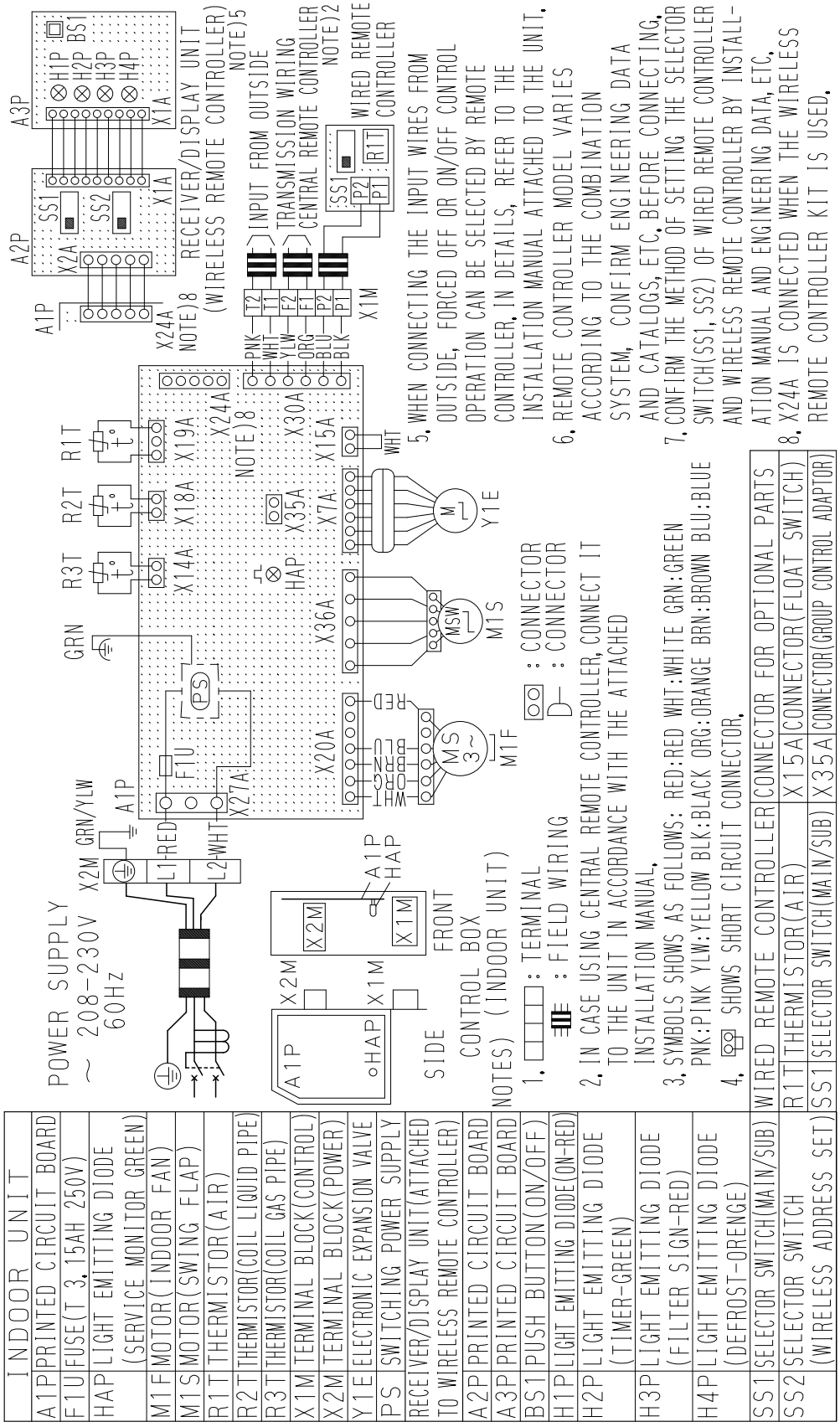


	INDOOR UNIT	R1T	THERMISTOR(SUCTION AIR)
A1P	PRINTED CIRCUIT BOARD	R2T	THERMISTOR(LIQUID)
		R3T	THERMISTOR(GAS)
A2P	PRINTED CIRCUIT BOARD(FAN)	R4T	THERMISTOR (DISCHARGE AIR)
A3P	PRINTED CIRCUIT BOARD(CAPACITOR)	R5T	THERMISTOR NTC (CURRENT LIMITING)
C1,C2,C3	CAPACITOR	S1L	FLOAT SWITCH
F1U	FUSE(T, 3.15A, 250V)	V1R	DIODE BRIDGE
F2U	FUSE(T, 5A, 250V)	V2R	POWER MODULE
F3U	FUSE(T, 6.3A, 250V)	X1M	TERMINAL STRIP
F4U	FUSE(T, 6.3A, 250V)		(POWER SUPPLY)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)	X2M	TERMINAL STRIP (CONTROL)
	(A1P, A2P)	Y1E	ELECTRONIC EXPANSION VALVE
KPR	MAGNETIC RELAY	Z1C, Z2C	NOISE FILTER (FERRITE CORE)
K1R	MAGNETIC RELAY	Z1F	NOISE FILTER
L1R	REACTOR		
M1F	MOTOR(FAN)		
M1P	MOTOR(DRAIN PUMP)		CONNECTOR OPTIONAL ACCESSORY
PS	SWITCHING POWER SUPPLY(A1P, A2P)	X28A	CONNECTOR (POWER SUPPLY FOR WIRING)
R1	RESISTOR (CURRENT LIMITING)	X33A	CONNECTOR (FOR WIRING)
R2	CURRENT SENSING DEVICE	X35A	CONNECTOR(ADAPTER)
R3,R4	RESISTOR (ELECTRIC DISCHARGE)		WIRED REMOTE CONTROLLER
		R1T	THERMISTOR(AIR)
		SS1	SELECTOR SWITCH (MAIN/SUB)

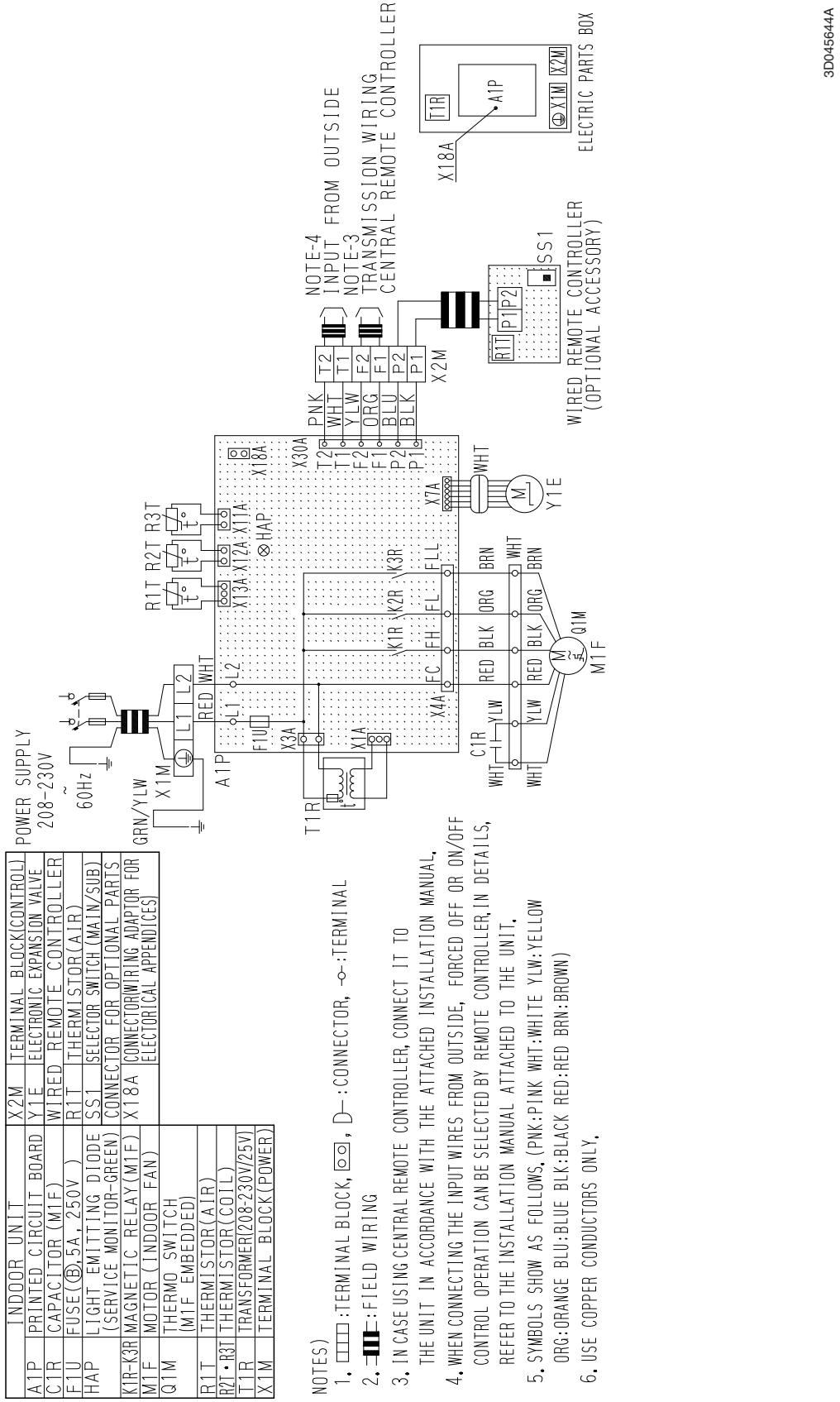
FXHQ12M / 24M / 36MVJU



FXAQ07M / 09M / 12M / 18M / 24MVJU



FXLQ12M / 18M / 24MVJU
FXNQ12M / 18M / 24MVJU



3. Option List

3.1 Option List of Controllers

Optional Accessories of Operation Control System

No.	Item	Type	FXFQ~MVJU	FXZQ-MVJU	FXMQ~PVJU	FXAQ~MVJU	FXLQ~MVJU FXNQ~MVJU	FXHQ~MVJU	FXDQ~MVJU
1	Remote controller	Wireless	BRC7C812	—	BRC4C82	BRC7E818	—	BRC7E83	BRC4C82
		Wired	BRC1C71						
			BRC1D71						
2	Set back time clock		BRC15A71						
3	Remote sensor		KRCS01-1						
4	Installation box for adaptor PCB		KRP1B98	KRP1BA101	—			KRP1C93	KRP1B101
5	Centralized remote controller		DCS302C71						
5-1	Electrical box		KJB311A						
6	Unified on/off controller		DCS301C71						
6-1	Electrical box		KJB212A						
7	Schedule timer		DST301B61						
8	External control adaptor for outdoor unit		★DTA104A62		DTA104A61	—	DTA104A61	★DTA104A62	★DTA104A53
9	D3-NET Expander adaptor		DTA109A51						
10	Simplified remote controller		—		BRC2A71	—	BRC2A71	—	BRC2A71
11	Adaptor for wiring		★KRP1B72	KRP1B57	KRP1B71			★KRP1B73	—
12	Wiring adaptor for electrical appendices (2)		★KRP4A73	KRP4A53	KRP4A71			★KRP4A72	★KRP4A74

C:3D043022D

Notes:

1. Installation box (No.4) is necessary for each adaptor marked ★.
2. Electrical box (5-1/6-1) is required for controller (No. 5/6).

Building management system

	Part name			Model No.	Function
intelligent Touch Controller	Basic	Hardware	intelligent Touch Controller	DCS601C71	• Air Conditioning management system that can be controlled by a compact all-in-one unit.
	Option	Software	Web	DCS004A71	• Monitors and controls the air conditioning system using the Internet and Web browser application on a PC.
Communication Line	∗2 Interface for use in BACnet®			DMS502A71	Interface unit to allow communications between VRV and BMS. Operation and monitoring of air-conditioning systems through BACnet® communications.
	Optional DIII board			DAM411A1	Expansion kit, installed on DMS502A71, to provide 3 more DIII-NET communication ports. Not usable independently.
	Optional Di board			DAM412A1	Expansion kit, installed on DMS502A71, to provide 16 more wattmeter pulse input points. Not usable independently.
	∗3 Interface for use in LONWORKS®			DMS504B71	Interface unit to allow communications between VRV and BMS. Operation and monitoring of air-conditioning systems through LONWORKS® communication.
Contact/Analog signal	Unification adaptor for computerized control			DCS302A72	Interface between the central monitoring board and central control units
	Wiring adaptor for electrical appendices (2)			KRP4A71-74	To control the group of indoor units collectively, which are connected by the transmission wiring of remote controller.
	External control adaptor for outdoor unit (Must be installed on indoor units.)			DTA104A53, 61, 62	Cooling/Heating mode change over. Demand control and Low noise control are available between the plural outdoor units.

Notes:

★1. BACnet® is a registered trademark of American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).

★2. LonWorks® is a registered trade mark of Echelon Corporation.

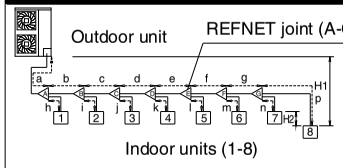
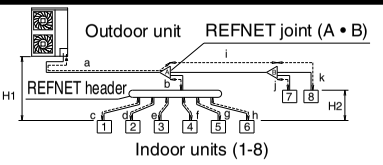
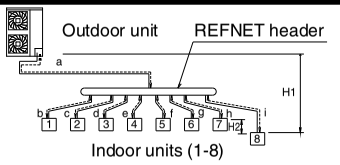
3.2 Option List of Outdoor Unit

RXYQM36 · 48MVJU

Optional accessories		RXYMQ36MVJU, RXM48MVJU
Cool/Heat Selector		KRC19-26A
Fixing box		KJB111A
Distributive Piping	REFNET header	KHRP26M22H, KHRP26M33H (MAX. 4 branch) (MAX. 8 branch)
	REFNET joint	KHRP26M22T
Central drain plug		KKPJ5F180
Fixture for preventing overturning		KPT-60B160
Wire fixture for preventing overturning		K-KYZP15C

C: 3D047388B

4. Example of Connection

Example of connection (Connection of 8 indoor units Heat Pump system)			**Branch with REFNET joint**	**Branch with REFNET joint and REFNET header**	**Branch with REFNET header**
					
Maximum allowable length	Between outdoor and indoor units	Actual pipe length	Pipe length between outdoor and indoor units ≤ 492ft.		
			Example unit 8: a + b + c + d + e + f + g + p ≤ 492ft.	Example unit 6: a + b + h ≤ 393ft., unit 8: a + i + k ≤ 492ft.	Example unit 8: a + i ≤ 492ft.
		Equivalent length	Equivalent pipe length between outdoor and indoor units ≤ 580ft. (assume equivalent pipe length of REFNET joint to be 1.6ft., that of REFNET header to be 3.2ft., calculation purposes)		
		Total extension length	Total piping length from outdoor unit to all indoor units ≥33ft., ≤ 1000ft.		
Allowable height length	Between outdoor and indoor units	Difference in height	Difference in height between outdoor and indoor units (H1) ≤ 164ft. (Max 130ft. if the outdoor unit is below)		
	Between indoor and indoor units	Difference in height	Difference in height between adjacent indoor units (H2) ≤ 49ft.		
Allowable length after the branch		Actual pipe length	Pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to indoor unit ≤ 130ft.		
			Example unit 8: b + c + d + e + f + g + p ≤ 130ft.	Example unit 6: b + h ≤ 130ft., unit 8:i + k ≤ 130ft.	Example unit 8: i ≤ 130ft.

Refrigerant branch kit selection

Refrigerant branch kits can only be used with R-410A.

Use REFNET joint from the following table.

Outdoor unit capacity type	Refrigerant branch kit name
RXYMQ36,48 type	KHRP26M22T

How to select the REFNET header

- Choose from the following table below the REFNET header according to the number of units on the system.

Outdoor unit capacity type	Refrigerant branch kit name
RXYMQ36,48 type	KHRP26M22H (Max. 4 branch)
	KHRP26M33H (Max. 8 branch)

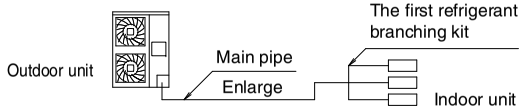
Pipe size selection

〈Caution on selecting connection pipes〉

- When the equivalent piping length between the outdoor unit and the indoor unit is 295ft. or more, make sure to use a thicker pipe as the main pipe on the gas side.
  When the air conditioning ability is reduced due to the refrigerant piping distance, a thicker pipe may be used also as the main pipe.

[Gas side]

ϕ5/8" (15.9mm) → ϕ3/4" (19.1mm)



Caution) In brazing connection in the size increase area in the piping, use a different-diameter joint for connection. (The different-diameter joint should be arranged in the local field.)
The connection area is located near the outdoor unit (usually after the first bending outside the unit).

Piping between outdoor unit and refrigerant branch kit

- Match to the size of the connection piping on the outdoor unit.

Outdoor unit connection pipe size (Unit: in.)

Outdoor unit capacity type	Piping size (outer diameter)	
	Gas pipe	Liquid pipe
RXYMQ36,48 type	ϕ5/8" (15.9mm)	ϕ 3/8 (9.5mm)
	ϕ3/4" (19.1mm)	

* When the size is larger

Piping between refrigerant branch kits

- Use the pipe size from the following table.

Connection pipe size (Unit: in.)

Piping size (outer diameter)	
Gas pipe	Liquid pipe
ϕ5/8" (15.9mm)	ϕ3/8" (9.5mm)

Between refrigerant branch kit and indoor unit

- Pipe size for direct connection to indoor unit must be the same as the connection size of indoor unit.

Indoor unit connection pipe size (Unit: in.)

Indoor unit capacity type	Piping size (outer diameter)	
	Gas pipe	Liquid pipe
07 · 09 ·12 · 18 type	ϕ1/2" (12.7mm)	ϕ1/4" (6.4mm)
24 · 30 · 36 · 48 type	ϕ5/8" (15.9mm)	ϕ3/8" (9.4mm)

How to calculate the additional refrigerant to be charged

Additional refrigerant to be charged R (lb.)
R should be rounded off in units of 0.1lb.

$$R = \left(\begin{array}{l}\text{Total length (ft.)}\\ \text{of liquid piping}\\ \text{size at } \phi 3/8"\end{array}\right) \times 0.036 + \left(\begin{array}{l}\text{Total length (ft.)}\\ \text{of liquid piping}\\ \text{size at } \phi 1/4"\end{array}\right) \times 0.015$$

Example for refrigerant branch using REFNET joint and REFNET header

The piping lengths are as at right

a: ϕ3/8" × 100ft.	d: ϕ3/8" × 40ft.	g: ϕ1/4" × 30ft.	j : ϕ1/4" × 30ft.
b: ϕ3/8" × 30ft.	e: ϕ1/4" × 30ft.	h: ϕ1/4" × 60ft.	k: ϕ1/4" × 30ft.
c: ϕ3/8" × 30ft.	f : ϕ1/4" × 30ft.	i : ϕ 3/8" × 30ft.	

R= 220 × 0.036 + 210 × 0.015 = 11.07 ⇩ 11.1

a+b+c+d+i e+f+g+h+j+k

5. Thermistor Resistance / Temperature Characteristics

Indoor unit	For air suction	R1T
	For liquid pipe	R2T
	For gas pipe	R3T
Outdoor unit for fin thermistor		R1T
Outdoor unit	For outdoor air	R1T
	For suction pipe 1	R3T
	For heat exchanger	R4T
	For suction pipe 2	R5T
	For Subcooling heat exchanger outlet	R6T
	For Liquid pipe	R7T

T°F	T°C	kΩ
14	-10	—
18	-8	—
21	-6	88.0
25	-4	79.1
28	-2	71.1
32	0	64.1
35	2	57.8
39	4	52.3
43	6	47.3
46	8	42.9
50	10	38.9
54	12	35.3
57	14	32.1
61	16	29.2
64	18	26.6
68	20	24.3
72	22	22.2
75	24	20.3
79	26	18.5
82	28	17.0
86	30	15.6
90	32	14.2
93	34	13.1
97	36	12.0
100	38	11.1
104	40	10.3
108	42	9.5
111	44	8.8
115	46	8.2
118	48	7.6
122	50	7.0
126	52	6.7
129	54	6.0
133	56	5.5
136	58	5.2
140	60	4.79
144	62	4.46
147	64	4.15
151	66	3.87
154	68	3.61
158	70	3.37
162	72	3.15
165	74	2.94
169	76	2.75
172	78	2.51
176	80	2.41
180	82	2.26
183	84	2.12
187	86	1.99
190	88	1.87
194	90	1.76
198	92	1.65
201	94	1.55
205	96	1.46
208	98	1.38

T°F	T°C	kΩ
-4.0	-20	197.81
-2.2	-19	186.53
-0.4	-18	175.97
1.4	-17	166.07
3.2	-16	156.80
5.0	-15	148.10
6.8	-14	139.94
8.6	-13	132.28
10.4	-12	125.09
12.2	-11	118.34
14.0	-10	111.99
15.8	-9	106.03
17.6	-8	100.41
19.4	-7	95.14
21.2	-6	90.17
23.0	-5	85.49
24.8	-4	81.08
26.6	-3	76.93
28.4	-2	73.01
30.2	-1	69.32
32.0	0	65.84
33.8	1	62.54
35.6	2	59.43
37.4	3	56.49
39.2	4	53.71
41.0	5	51.09
42.8	6	48.61
44.6	7	46.26
46.4	8	44.05
48.2	9	41.95
50.0	10	39.96
51.8	11	38.08
53.6	12	36.30
55.4	13	34.62
57.2	14	33.02
59.0	15	31.50
60.8	16	30.06
62.6	17	28.70
64.4	18	27.41
66.2	19	26.18
68.0	20	25.01
69.8	21	23.91
71.6	22	22.85
73.4	23	21.85
75.2	24	20.90
77.0	25	20.00
78.8	26	19.14
80.6	27	18.32
82.4	28	17.54
84.2	29	16.80
86.0	30	16.10

T°F	T°C	kΩ
86.0	30	16.10
87.8	31	15.43
89.6	32	14.79
91.4	33	14.18
93.2	34	13.59
95.0	35	13.04
96.8	36	12.51
98.6	37	12.01
100.4	38	11.52
102.2	39	11.06
104.0	40	10.63
105.8	41	10.21
107.6	42	9.81
109.4	43	9.42
111.2	44	9.06
113.0	45	8.71
114.8	46	8.37
116.6	47	8.05
118.4	48	7.75
120.2	49	7.46
122.0	50	7.18
123.8	51	6.91
125.6	52	6.65
127.4	53	6.41
129.2	54	6.65
131.0	55	6.41
132.8	56	6.18
134.6	57	5.95
136.4	58	5.74
138.2	59	5.14
140.0	60	4.96
141.8	61	4.79
143.6	62	4.62
145.4	63	4.46
147.2	64	4.30
149.0	65	4.16
150.8	66	4.01
152.6	67	3.88
154.4	68	3.75
156.2	69	3.62
158.0	70	3.50
159.8	71	3.38
161.6	72	3.27
163.4	73	3.16
165.2	74	3.06
167.0	75	2.96
168.8	76	2.86
170.6	77	2.77
172.4	78	2.68
174.2	79	2.60
176.0	80	2.51

Outdoor Unit Thermistors for Discharge Pipe (R2T)

T°F	T°C	kΩ
32.0	0	640.44
33.8	1	609.31
35.6	2	579.96
37.4	3	552.00
39.2	4	525.63
41.0	5	500.66
42.8	6	477.01
44.6	7	454.60
46.4	8	433.37
48.2	9	413.24
50.0	10	394.16
51.8	11	376.05
53.6	12	358.88
55.4	13	342.58
57.2	14	327.10
59.0	15	312.41
60.8	16	298.45
62.6	17	285.18
64.4	18	272.58
66.2	19	260.60
68.0	20	249.00
69.8	21	238.36
71.6	22	228.05
73.4	23	218.24
75.2	24	208.90
77.0	25	200.00
78.8	26	191.53
80.6	27	183.46
82.4	28	175.77
84.2	29	168.44
86.0	30	161.45
86.0	31	154.79
87.8	32	148.43
89.6	33	142.37
91.4	34	136.59
93.2	35	131.06
95.0	36	125.79
96.8	37	120.76
98.6	38	115.95
100.4	39	111.35
102.2	40	106.96
104.0	41	102.76
105.8	42	98.75
107.6	43	94.92
109.4	44	91.25
111.2	45	87.74
113.0	46	84.38
114.8	47	81.16
116.6	48	78.09
118.4	49	75.14
120.2	50	72.32

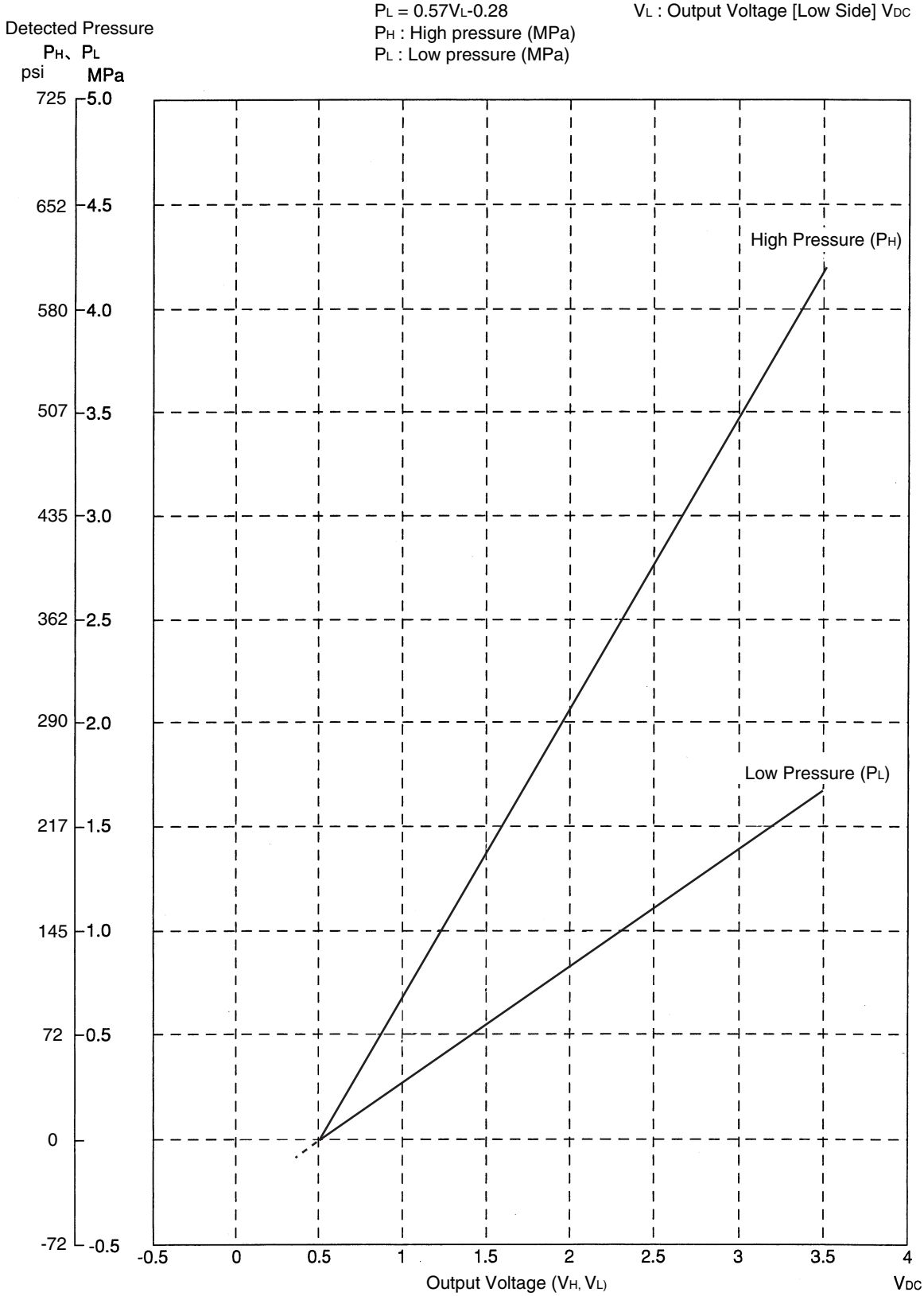
T°F	T°C	kΩ
122.0	50	72.32
123.8	51	69.64
125.6	52	67.06
127.4	53	64.60
129.2	54	62.24
131.0	55	59.97
132.8	56	57.80
134.6	57	55.72
136.4	58	53.72
138.2	59	51.98
140.0	60	49.96
141.8	61	48.19
143.6	62	46.49
145.4	63	44.86
147.2	64	43.30
149.0	65	41.79
150.8	66	40.35
152.6	67	38.96
154.4	68	37.63
156.2	69	36.34
158.0	70	35.11
159.8	71	33.92
161.6	72	32.78
163.4	73	31.69
165.2	74	30.63
167.0	75	29.61
168.8	76	28.64
170.6	77	27.69
172.4	78	26.79
174.2	79	25.91
176.0	80	25.07
177.8	81	24.26
179.6	82	23.48
181.4	83	22.73
183.2	84	22.01
185.0	85	21.31
186.8	86	20.63
188.6	87	19.98
190.4	88	19.36
192.2	89	18.75
194.0	90	18.17
195.8	91	17.61
197.6	92	17.07
199.4	93	16.54
201.2	94	16.04
203.0	95	15.55
204.8	96	15.08
206.6	97	14.62
208.4	98	14.18
210.2	99	13.76
212.0	100	13.35

T°F	T°C	kΩ
212.0	100	13.35
213.8	101	12.95
215.6	102	12.57
217.4	103	12.20
219.2	104	11.84
221.0	105	11.49
222.8	106	11.15
224.6	107	10.83
226.4	108	10.52
228.2	109	10.21
230.0	110	9.92
231.8	111	9.64
233.6	112	9.36
235.4	113	9.10
237.2	114	8.84
239.0	115	8.59
240.8	116	8.35
242.6	117	8.12
244.4	118	7.89
246.2	119	7.68
248.0	120	7.47
249.8	121	7.26
251.6	122	7.06
253.4	123	6.87
255.2	124	6.69
257.0	125	6.51
258.8	126	6.33
260.6	127	6.16
262.4	128	6.00
264.2	129	5.84
266.0	130	5.69
267.8	131	5.54
269.6	132	5.39
271.4	133	5.25
273.2	134	5.12
275.0	135	4.98
276.8	136	4.86
278.6	137	4.73
280.4	138	4.61
282.2	139	4.49
284.0	140	4.38
285.8	141	4.27
287.6	142	4.16
289.4	143	4.06
291.2	144	3.96
293.0	145	3.86
294.8	146	3.76
296.6	147	3.67
298.4	148	3.58
300.2	149	3.49
302.0	150	3.41

6. Pressure Sensor

$P_H = 1.38V_H-0.69$
$P_L = 0.57V_L-0.28$
P_H : High pressure (MPa)
P_L : Low pressure (MPa)

V_H : Output Voltage [High Side] V_{DC}
V_L : Output Voltage [Low Side] V_{DC}



Part 9
Precautions for New Refrigerant (R-410A)

1. Precautions for New Refrigerant (R-410A)

1.1 Outline

1.1.1 About Refrigerant R-410A

■ Characteristics of new refrigerant, R-410A

1. Performance
   Almost the same performance as R-22 and R-407C
2. Pressure
   Working pressure is approx. 1.4 times more than R-22 and R-407C.
3. Refrigerant composition
   Few problems in composition control, since it is a Quasi-azeotropic mixture refrigerant.

	HFC units (Units using new refrigerants)		HCFC units
Refrigerant name	R-407C	R-410A	R-22
Composing substances	Non-azeotropic mixture of HFC32, HFC125 and HFC134a (*1)	Quasi-azeotropic mixture of HFC32 and JFC125 (*1)	Single-component refrigerant
Design pressure	3.2 MPa (gauge pressure) = 32.6 kgf/cm^2 =464 psi	4.0 MPa (gauge pressure) = 40.8 kgf/cm^2 =580 psi	2.75MPa (gauge pressure) = 28.0 kgf/cm^2 =399 psi
Refrigerant oil	Synthetic oil (Ether)		Mineral oil (Suniso)
Ozone destruction factor (ODP)	0	0	0.05
Combustibility	None	None	None
Toxicity	None	None	None

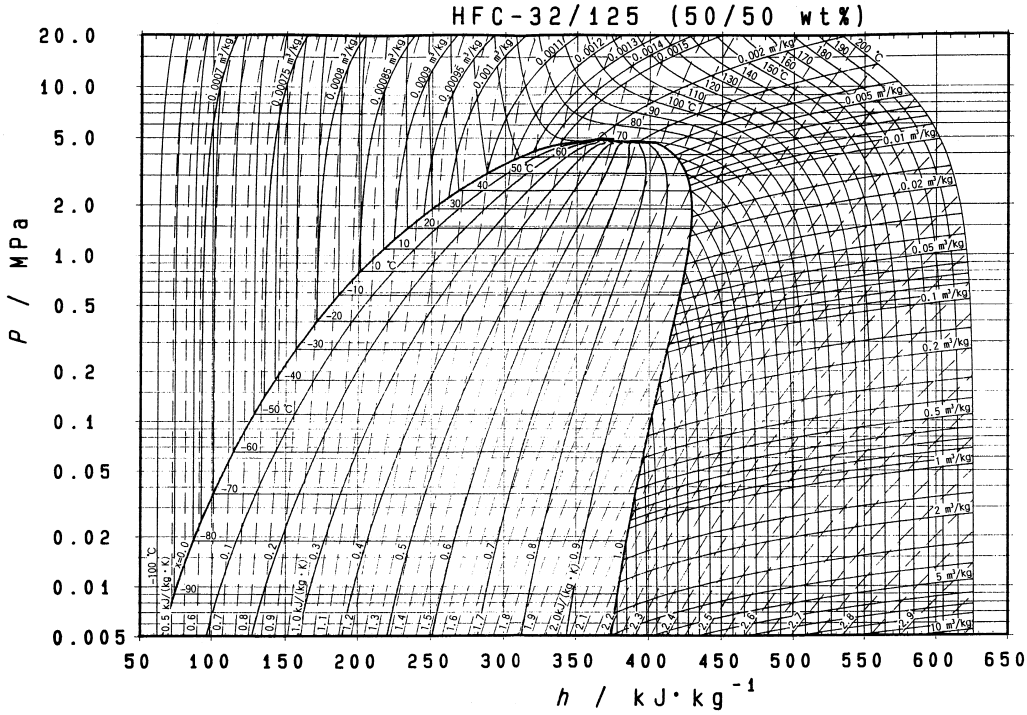
★1. Non-azeotropic mixture refrigerant: mixture of two or more refrigerants having different boiling points.

★2. Quasi-azeotropic mixture refrigerant: mixture of two or more refrigerants having similar boiling points.

★3. The design pressure is different at each product. Please refer to the installation manual for each product.

(Reference) 1 MPa ≒ 10.19716 kgf / cm^2

1 MPa ≒ 145 psi



Pressure-Enthalpy curves of HFC-32/125 (50/50wt%)

■ Thermodynamic characteristic of R-410A

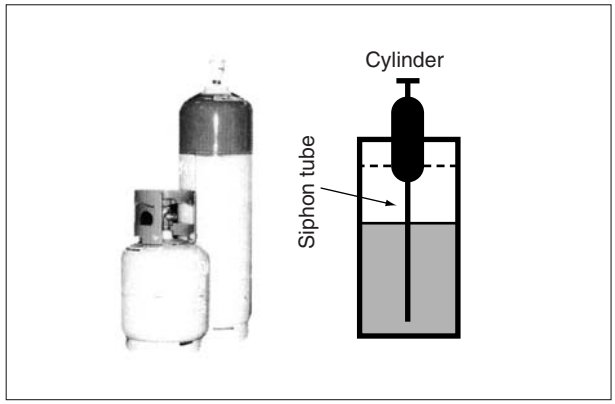
DAIREP ver2.0

Temperature (°F)	Steam pressure (psi)		Density (kg/m³)		Specific heat at constant pressure (kJ/kgK)		Specific enthalpy (kJ/kg)		Specific entropy (kJ/KgK)	
	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor
-94	5.24	5.24	1410.7	1.582	1.372	0.695	100.8	390.6	0.649	2.074
-90	5.92	5.92	1404.7	1.774	1.374	0.700	103.6	391.8	0.663	2.066
-87	6.68	6.67	1398.6	1.984	1.375	0.705	106.3	393.0	0.676	2.058
-83	7.50	7.50	1392.5	2.213	1.377	0.710	109.1	394.1	0.689	2.051
-80	8.41	8.40	1386.4	2.463	1.378	0.715	111.9	395.3	0.702	2.044
-76	9.41	9.40	1380.2	2.734	1.379	0.720	114.6	396.4	0.715	2.037
-72	10.50	10.49	1374.0	3.030	1.380	0.726	117.4	397.6	0.728	2.030
-69	11.69	11.67	1367.8	3.350	1.382	0.732	120.1	398.7	0.741	2.023
-65	12.98	12.96	1361.6	3.696	1.384	0.737	122.9	399.8	0.754	2.017
-62	14.39	14.36	1355.3	4.071	1.386	0.744	125.7	400.9	0.766	2.010
-61	14.70	14.68	1354.0	4.153	1.386	0.745	126.3	401.1	0.769	2.009
-58	15.91	15.88	1349.0	4.474	1.388	0.750	128.5	402.0	0.779	2.004
-54	17.56	17.53	1342.7	4.909	1.391	0.756	131.2	403.1	0.791	1.998
-51	19.34	19.31	1336.3	5.377	1.394	0.763	134.0	404.1	0.803	1.992
-47	21.27	21.22	1330.0	5.880	1.397	0.770	136.8	405.2	0.816	1.987
-44	23.34	23.29	1323.5	6.419	1.401	0.777	139.6	406.2	0.828	1.981
-40	25.56	25.51	1317.0	6.996	1.405	0.785	142.4	407.3	0.840	1.976
-36	27.95	27.89	1310.5	7.614	1.409	0.792	145.3	408.3	0.852	1.970
-33	30.51	30.44	1304.0	8.275	1.414	0.800	148.1	409.3	0.864	1.965
-29	33.26	33.17	1297.3	8.980	1.419	0.809	150.9	410.2	0.875	1.960
-26	36.19	36.09	1290.6	9.732	1.424	0.817	153.8	411.2	0.887	1.955
-22	39.31	39.21	1283.9	10.53	1.430	0.826	156.6	412.1	0.899	1.950
-18	42.64	42.52	1277.1	11.39	1.436	0.835	159.5	413.1	0.911	1.946
-15	46.19	46.06	1270.2	12.29	1.442	0.844	162.4	414.0	0.922	1.941
-11	49.96	49.81	1263.3	13.26	1.448	0.854	165.3	414.9	0.934	1.936
-8	53.97	53.80	1256.3	14.28	1.455	0.864	168.2	415.7	0.945	1.932
-4	58.22	58.03	1249.2	15.37	1.461	0.875	171.1	416.6	0.957	1.927
0	62.72	62.51	1242.0	16.52	1.468	0.886	174.1	417.4	0.968	1.923
3	67.48	67.25	1234.8	17.74	1.476	0.897	177.0	418.2	0.980	1.919
7	72.51	72.27	1227.5	19.04	1.483	0.909	180.0	419.0	0.991	1.914
10	77.83	77.56	1220.0	20.41	1.491	0.921	182.9	419.8	1.003	1.910
14	83.44	83.14	1212.5	21.86	1.499	0.933	185.9	420.5	1.014	1.906
18	89.36	89.03	1204.9	23.39	1.507	0.947	189.0	421.2	1.025	1.902
21	95.59	95.23	1197.2	25.01	1.516	0.960	192.0	421.9	1.036	1.898
25	102.14	101.75	1189.4	26.72	1.524	0.975	195.0	422.6	1.048	1.894
28	109.03	108.61	1181.4	28.53	1.533	0.990	198.1	423.2	1.059	1.890
32	116.26	115.81	1173.4	30.44	1.543	1.005	201.2	423.8	1.070	1.886
36	123.86	123.37	1165.3	32.46	1.552	1.022	204.3	424.4	1.081	1.882
39	131.82	131.30	1157.0	34.59	1.563	1.039	207.4	424.9	1.092	1.878
43	140.16	139.60	1148.6	36.83	1.573	1.057	210.5	425.5	1.103	1.874
46	148.90	148.30	1140.0	39.21	1.584	1.076	213.7	425.9	1.114	1.870
50	158.04	157.40	1131.3	41.71	1.596	1.096	216.8	426.4	1.125	1.866
54	167.60	166.91	1122.5	44.35	1.608	1.117	220.0	426.8	1.136	1.862
57	177.59	176.85	1113.5	47.14	1.621	1.139	223.2	427.2	1.147	1.859
61	188.02	187.24	1104.4	50.09	1.635	1.163	226.5	427.5	1.158	1.855
64	198.90	198.07	1095.1	53.20	1.650	1.188	229.7	427.8	1.169	1.851
68	210.24	209.37	1085.6	56.48	1.666	1.215	233.0	428.1	1.180	1.847
72	222.06	221.15	1075.9	59.96	1.683	1.243	236.4	428.3	1.191	1.843
75	234.38	233.42	1066.0	63.63	1.701	1.273	239.7	428.4	1.202	1.839
79	247.02	246.19	1055.9	67.51	1.721	1.306	243.1	428.6	1.214	1.834
82	260.55	259.49	1045.5	71.62	1.743	1.341	246.5	428.6	1.225	1.830
86	274.43	273.31	1034.9	75.97	1.767	1.379	249.9	428.6	1.236	1.826
90	288.85	287.67	1024.1	80.58	1.793	1.420	253.4	428.6	1.247	1.822
93	303.81	302.61	1012.9	85.48	1.822	1.465	256.9	428.4	1.258	1.817
97	319.36	318.18	1001.4	90.68	1.855	1.514	260.5	428.3	1.269	1.813
100	335.50	334.20	989.5	96.22	1.891	1.569	264.1	428.0	1.281	1.808
104	352.25	350.91	977.3	102.1	1.932	1.629	267.8	427.7	1.292	1.803
108	369.61	368.23	964.6	108.4	1.979	1.696	271.5	427.2	1.303	1.798
111	387.61	386.19	951.4	115.2	2.033	1.771	275.3	426.7	1.315	1.793
115	406.25	404.80	937.7	122.4	2.095	1.857	279.2	426.1	1.327	1.788
118	425.54	424.08	923.3	130.2	2.168	1.955	283.2	425.4	1.339	1.782
122	445.53	444.04	908.2	138.6	2.256	2.069	287.3	424.5	1.351	1.776
126	466.20	464.69	892.2	147.7	2.362	2.203	291.5	423.5	1.363	1.770
129	487.58	486.07	875.1	157.6	2.493	2.363	295.8	422.4	1.376	1.764
133	509.69	508.20	856.8	168.4	2.661	2.557	300.3	421.0	1.389	1.757
136	532.54	531.07	836.9	180.4	2.883	2.799	305.0	419.4	1.403	1.749
140	556.15	554.71	814.9	193.7	3.191	3.106	310.0	417.6	1.417	1.741
144	580.52	579.16	790.1	208.6	3.650	3.511	315.3	415.5	1.433	1.732
147	605.70	604.41	761.0	225.6	4.415	4.064	321.2	413.0	1.450	1.722

1.2 Refrigerant Cylinders

■ Cylinder specifications

- The cylinder is painted refrigerant color (pink).
- The cylinder valve is equipped with a siphon tube.



Refrigerant can be charged in liquid state with cylinder in upright position.

Caution: Do not lay cylinder on its side during charging, since it cause refrigerant in gas state to enter the system.

■ Handling of cylinders

(1) Laws and regulations

R-410A is liquefied gas, and the High Pressure Gas Safety Law must be observed in handling them. Before using, refer to the High Pressure Gas Safety Law.

The Law stipulates standards and regulations that must be followed to prevent accidents with high pressure gases. Be sure to follow the regulations.

(2) Handing of vessels

Since R-410A is high pressure gas, it is contained in high pressure vessels.

Although those vessels are durable and strong, careless handling can cause damage that can lead to unexpected accidents. Do not drop vessels, let them fall, apply impact or roll them on the ground.

(3) Storage

Although R-410A is not flammable, it must be stored in a well-ventilated, cool, and dark place in the same way as any other high pressure gases.

It should also be noted that high pressure vessels are equipped with safety devices that releases gas when the ambient temperature reaches more than a certain level (fusible plug melts) and when the pressure exceeds a certain level (spring-type safety valve operates).

1.3 Service Tools

R-410A is used under higher working pressure, compared to previous refrigerants (R-22, R-407C). Furthermore, the refrigerating machine oil has been changed from Suniso oil to Ether oil, and if oil mixing is occurred, sludge results in the refrigerants and causes other problems. Therefore, gauge manifolds and charge hoses that are used with a previous refrigerant (R-22, R-407C) can not be used for products that use new refrigerants.
Be sure to use dedicated tools and devices.

■ Tool compatibility

Tool	Compatibility			Reasons for change
	HFC		HCFC	
	R-410A	R-407C	R-22	
Gauge manifold Charge hose	×			• Do not use the same tools for R-22 and R-410A. • Thread specification differs for R-410A and R-407C.
Charging cylinder	×		○	• Weighting instrument used for HFCs.
Gas detector	○		×	• The same tool can be used for HFCs.
Vacuum pump (pump with reverse flow preventive function)	○			• To use existing pump for HFCs, vacuum pump adaptor must be installed.
Weighting instrument	○			
Charge mouthpiece	×			• Seal material is different between R-22 and HFCs. • Thread specification is different between R-410A and others.
Flaring tool (Clutch type)	○			• For R-410A, flare gauge is necessary.
Torque wrench	○			• Torque-up for 1/2 and 5/8
Pipe cutter	○			
Pipe expander	○			
Pipe bender	○			
Pipe assembling oil	×			• Due to refrigerating machine oil change. (No Suniso oil can be used.)
Refrigerant recovery device	Check your recovery device.			
Refrigerant piping	See the chart below.			• Only ϕ19.1 is changed to 1/2H material while the previous material is "O".

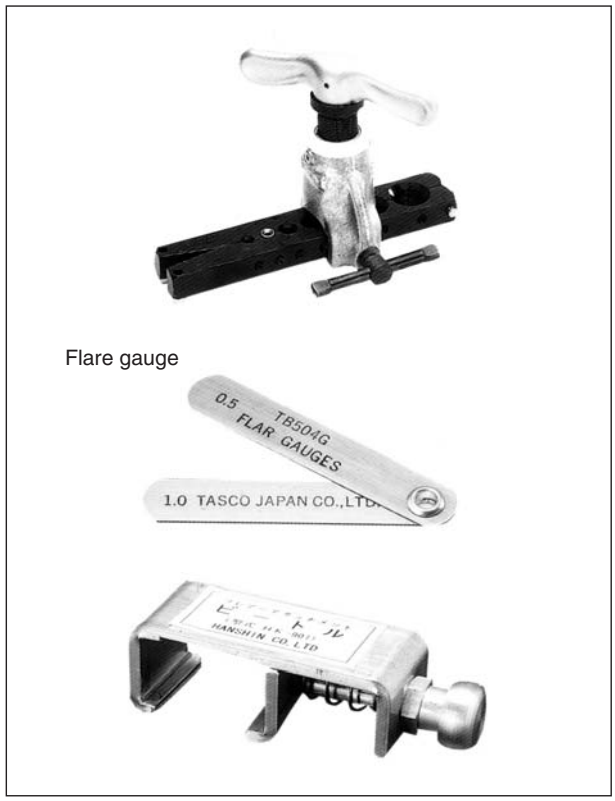
As for the charge mouthpiece and packing, 1/2UNF20 is necessary for mouthpiece size of charge hose.

■ Copper tube material and thickness

Pipe size	R-407C		R-410A	
	Material	Thickness t (in.)	Material	Thickness t (in.)
ϕ1/4"	O	0.031	O	0.031
ϕ3/8"	O	0.031	O	0.031
ϕ1/2"	O	0.031	O	0.031
ϕ5/8"	O	0.039	O	0.039
ϕ3/4"	O	0.039	1/2H	0.039
ϕ7/8"	1/2H	0.039	1/2H	0.039
ϕ1	1/2H	0.039	1/2H	0.039
ϕ1'1/8"	1/2H	0.039	1/2H	0.039
ϕ1'1/4"	1/2H	0.047	1/2H	0.043
ϕ1'1/2"	1/2H	0.055	1/2H	0.055
ϕ1'3/4"	1/2H	0.063	1/2H	0.063

* O: Soft (Annealed)
H: Hard (Drawn)

1. Flaring tool



■ Specifications

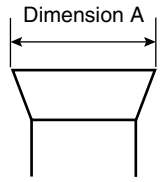
• Dimension A

Unit:in.

Nominal size	Tube O.D.	$A^{+0}_{-0.4}$	
	Do	Class-2 (R-410A)	Class-1 (Conventional)
1/4	1/4	0.36	0.35
3/8	3/8	0.52	0.51
1/2	1/2	0.65	0.64
5/8	5/8	0.78	0.76
3/4	3/4	0.94	0.92

■ Differences

• Change of dimension A



For class-1: R-407C
For class-2: R-410A

Conventional flaring tools can be used when the work process is changed.
(change of work process)
Previously, a pipe extension margin of 0 to 0.02in. was provided for flaring. For R-410A air conditioners, perform pipe flaring with a pipe extension margin of 0.04 to 0.06in.
(For clutch type only)
Conventional tool with pipe extension margin adjustment can be used.

2. Torque wrench

■ Specifications

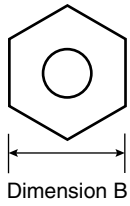
• Dimension B Unit:in.

Nominal size	Class-1	Class-2	Previous
1/2	0.94	1.02	0.94
5/8	1.06	1.14	1.06

No change in tightening torque
No change in pipes of other sizes

■ Differences

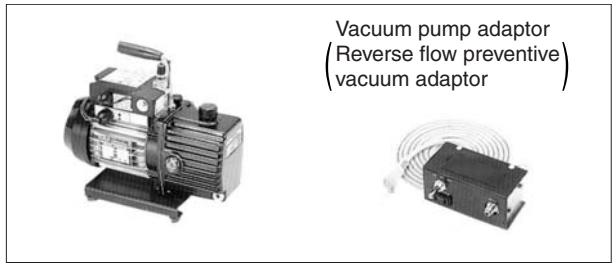
• Change of dimension B
Only 1/2", 5/8" are extended



For class-1: R-407C
For class-2: R-410A

Dimension B

3. Vacuum pump with check valve



■ Specifications

• Discharge speed
50 l/min (50Hz)
60 l/min (60Hz)

• Suction port UNF7/16-20(1/4 Flare)
UNF1/2-20(5/16 Flare) with adaptor

● Maximum degree of vacuum
Select a vacuum pump which is able to keep the vacuum degree of the system in excess of – 14.6 psi (5 torr – 755 mmHg).

■ Differences

• Equipped with function to prevent reverse oil flow
• Previous vacuum pump can be used by installing adaptor.

4. Leak tester

■ Specifications
- Hydrogen detecting type, etc.
- Applicable refrigerants
  R-410A, R-407C, R-404A, R-507A, R-134a, etc.

■ Differences
- Previous testers detected chlorine. Since HFCs do not contain chlorine, new tester detects hydrogen.

5. Refrigerant oil (Air cCompal)

■ Specifications
- Contains synthetic oil, therefore it can be used for piping work of every refrigerant cycle.
- Offers high rust resistance and stability over long period of time.

■ Differences
- Can be used for R-410A and R-22 units.

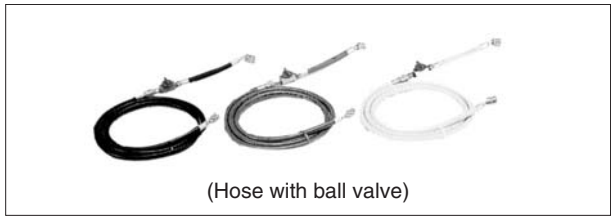
6. Gauge manifold for R-410A

■ Specifications
- High pressure gauge
  – 14.5 to 769 psi (– 76 cmHg to 53 kg/cm^2)

- Low pressure gauge
  – 14.5 to 551 psi (– 76 cmHg to 38 kg/cm^2)
- 1/4" → 5/16" (2min → 2.5min)
- No oil is used in pressure test of gauges.
  → For prevention of contamination
- Temperature scale indicates the relationship between pressure and temperature in gas saturated state.

■ Differences
- Change in pressure
- Change in service port diameter

7. Charge hose for R-410A



(Hose with ball valve)

■ Specifications
- Working pressure 737 psi (51.8 kg/cm^2)
- Rupture pressure 3684 psi (259 kg/cm^2)
- Available with and without hand-operate valve that prevents refrigerant from outflow.

■ Differences
- Pressure proof hose
- Change in service port diameter
- Use of nylon coated material for HFC resistance

8. Charging cylinder

■ Specifications
- Use weigher for refrigerant charge listed below to charge directly from refrigerant cylinder.

■ Differences
- The cylinder can not be used for mixed refrigerant since mixing ratio is changed during charging.

  When R-410A is charged in liquid state using charging cylinder, foaming phenomenon is generated inside charging cylinder.

9. Weigher for refrigerant charge

■ Specifications
- High accuracy
  TA101A (for 10-kg cylinder) = ± 2g
  TA101B (for 20-kg cylinder) = ± 5g
- Equipped with pressure-resistant sight glass to check liquid refrigerant charging.
- A manifold with separate ports for HFCs and previous refrigerants is equipped as standard accessories.

■ Differences
- Measurement is based on weight to prevent change of mixing ratio during charging.

10. Charge mouthpiece

■ Specifications
- For R-410A, 1/4"→ 5/16" (2min. → 2.5min.)
- Material is changed from CR to H-NBR.

■ Differences
- Change of thread specification on hose connection side (For the R-410A use)
- Change of sealer material for the HFCs use.

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