DAIKIN

SiUS341012_A

R-410A

Service Manual

VRV III®

RXYQ72-360PBYD, PBTJ
R-410A Heat Pump 60Hz
REYQ72-336PBYD, PBTJ
R-410A Heat Recovery 60Hz

RXYQ72PBYD
RXYQ72PBTJ

RXYQ96, 120PBYD
RXYQ96, 120PBTJ

RXYQ144PBTJ
REYQ72, 96, 120PBYD
REYQ72, 96, 120, 144PBTJ

VRV III R-410A Heat Pump/ Heat Recovery 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.

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.

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.

1.1 PREFACE

Thank you for your continued patronage of Daikin products.

This is the new service manual for Daikin's Year 2011 VRVIII 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 series Heat Pump, Heat Recovery System.

Feb., 2011

After Sales Service Division

Part 1
General Information

1. Model Names of Indoor/Outdoor Units

Indoor Units

Type		Model Name												Power Supply, Compatibility Symbol
Ceiling Mounted Cassette Type (Round Flow)	FXFQ	—	09P	12P	18P	24P	30P	36P	—	48P	—	—	—	VJU
4 Way Ceiling Mounted Cassette Type (2'×2')	FXZQ	07M7	09M7	12M7	18M7	—	—	—	—	—	—	—	—	
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 Mounted Duct Type	FXMQ	—	—	—	—	—	—	—	—	—	—	72M	96M	
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	—	—	—	—	—	—	—	
Air Handling Unit	FXTQ	—	—	12PA	18PA	24PA	30PA	36PA	42PA	48PA	54PA	—	—	

Branch Selector Units

Type		Model Name			Power Supply, Compatibility Symbol
Heat Recovery Series	BSVQ	36P	60P	96P	VJU

Outdoor Air Processing Unit

Series	Model Name			Power Supply, Compatibility Symbol
FXMQ	48MF	72MF	96MF	VJU

Outdoor Units (Inverter Series)

Type			Model Name							Power Supply, Compatibility Symbol
			6 ton	8 ton	10 ton	12 ton	14 ton	16 ton	18 ton	
Heat Pump	230V	RXYQ-	72PB	96PB	120PB	144PB	168PB	192PB	216PB	TJ
	460V	RXYQ-	72PB	96PB	120PB	144PB	168PB	192PB	216PB	YD
Heat Recovery	230V	REYQ-	72PB	96PB	120PB	144PB	168PB	192PB	216PB	TJ
	460V	REYQ-	72PB	96PB	120PB	144PB	168PB	192PB	216PB	YD

Type			Model Name						Power Supply, Compatibility Symbol
			20 ton	22 ton	24 ton	26 ton	28 ton	30 ton	
Heat Pump	230V	RXYQ-	240PB	264PB	288PB	312PB	336PB	360PB	TJ
	460V	RXYQ-	240PB	264PB	288PB	312PB	336PB	360PB	YD
Heat Recovery	230V	REYQ-	240PB	264PB	288PB	312PB	336PB	—	TJ
	460V	REYQ-	240PB	264PB	288PB	312PB	336PB	—	YD

VJ: 1 phase, 208/230V, 60Hz
YD: 3 phase, 460V, 60Hz
TJ: 3 phase, 208/230V, 60Hz
U(VJU, TJU): Standard Compatibility Symbol

Combination of Outdoor Units

Heat Pump 460V

Model Name	RXYQ72PBYD	RXYQ96PBYD	RXYQ120PBYD	RXYQ144PBYD	RXYQ168PBYD
Outdoor Unit 1	RXYQ72PBYD	RXYQ96PBYD	RXYQ120PBYD	RXYQ72PBYD	RXYQ72PBYD
Outdoor Unit 2	—	—	—	RXYQ72PBYD	RXYQ96PBYD
Outdoor Unit 3	—	—	—	—	—

Model Name	RXYQ192PBYD	RXYQ216PBYD	RXYQ240PBYD	RXYQ264PBYD	RXYQ288PBYD
Outdoor Unit 1	RXYQ72PBYD	RXYQ96PBYD	RXYQ120PBYD	RXYQ72PBYD	RXYQ72PBYD
Outdoor Unit 2	RXYQ120PBYD	RXYQ120PBYD	RXYQ120PBYD	RXYQ96PBYD	RXYQ96PBYD
Outdoor Unit 3	—	—	—	RXYQ96PBYD	RXYQ120PBYD

Model Name	RXYQ312PBYD	RXYQ336PBYD	RXYQ360PBYD
Outdoor Unit 1	RXYQ72PBYD	RXYQ96PBYD	RXYQ120PBYD
Outdoor Unit 2	RXYQ120PBYD	RXYQ120PBYD	RXYQ120PBYD
Outdoor Unit 3	RXYQ120PBYD	RXYQ120PBYD	RXYQ120PBYD

Heat Pump 230V

Model Name	RXYQ72PBTJ	RXYQ96PBTJ	RXYQ120PBTJ	RXYQ144PBTJ	RXYQ168PBTJ
Outdoor Unit 1	RXYQ72PBTJ	RXYQ96PBTJ	RXYQ120PBTJ	RXYQ144PBTJ	RXYQ72PBTJ
Outdoor Unit 2	—	—	—	—	RXYQ96PBTJ
Outdoor Unit 3	—	—	—	—	—

Model Name	RXYQ192PBTJ	RXYQ216PBTJ	RXYQ240PBTJ	RXYQ264PBTJ	RXYQ288PBTJ
Outdoor Unit 1	RXYQ72PBTJ	RXYQ96PBTJ	RXYQ120PBTJ	RXYQ72PBTJ	RXYQ72PBTJ
Outdoor Unit 2	RXYQ120PBTJ	RXYQ120PBTJ	RXYQ120PBTJ	RXYQ96PBTJ	RXYQ96PBTJ
Outdoor Unit 3	—	—	—	RXYQ96PBTJ	RXYQ120PBTJ

Model Name	RXYQ312PBTJ	RXYQ336PBTJ	RXYQ360PBTJ
Outdoor Unit 1	RXYQ72PBTJ	RXYQ96PBTJ	RXYQ120PBTJ
Outdoor Unit 2	RXYQ120PBTJ	RXYQ120PBTJ	RXYQ120PBTJ
Outdoor Unit 3	RXYQ120PBTJ	RXYQ120PBTJ	RXYQ120PBTJ

Heat Recovery 460V

Model Name	REYQ72PBYD	REYQ96PBYD	REYQ120PBYD	REYQ144PBYD	REYQ168PBYD
Outdoor Unit 1	REYQ72PBYD	REYQ96PBYD	REYQ120PBYD	REMQ72PBYD	REMQ72PBYD
Outdoor Unit 2	—	—	—	REMQ72PBYD	REMQ96PBYD
Outdoor Unit 3	—	—	—	—	—

Model Name	REYQ192PBYD	REYQ216PBYD	REYQ240PBYD	REYQ264PBYD	REYQ288PBYD
Outdoor Unit 1	REMQ96PBYD	REMQ96PBYD	REMQ120PBYD	REMQ72PBYD	REMQ72PBYD
Outdoor Unit 2	REMQ96PBYD	REMQ120PBYD	REMQ120PBYD	REMQ96PBYD	REMQ96PBYD
Outdoor Unit 3	—	—	—	REMQ96PBYD	REMQ120PBYD

Model Name	REYQ312PBYD	REYQ336PBYD
Outdoor Unit 1	REMQ96PBYD	REMQ96PBYD
Outdoor Unit 2	REMQ96PBYD	REMQ120PBYD
Outdoor Unit 3	REMQ120PBYD	REMQ120PBYD

Heat Recovery 230V

Model Name	REYQ72PBTJ	REYQ96PBTJ	REYQ120PBTJ	REYQ144PBTJ	REYQ168PBTJ
Outdoor Unit 1	REYQ72PBTJ	REYQ96PBTJ	REYQ120PBTJ	REYQ144PBTJ	REMQ72PBTJ
Outdoor Unit 2	—	—	—	—	REMQ96PBTJ
Outdoor Unit 3	—	—	—	—	—

Model Name	REYQ192PBTJ	REYQ216PBTJ	REYQ240PBTJ	REYQ264PBTJ	REYQ288PBTJ
Outdoor Unit 1	REMQ96PBTJ	REMQ96PBTJ	REMQ120PBTJ	REMQ72PBTJ	REMQ72PBTJ
Outdoor Unit 2	REMQ96PBTJ	REMQ120PBTJ	REMQ120PBTJ	REMQ96PBTJ	REMQ96PBTJ
Outdoor Unit 3	—	—	—	REMQ96PBTJ	REMQ120PBTJ

Model Name	REYQ312PBTJ	REYQ336PBTJ
Outdoor Unit 1	REMQ96PBTJ	REMQ96PBTJ
Outdoor Unit 2	REMQ96PBTJ	REMQ120PBTJ
Outdoor Unit 3	REMQ120PBTJ	REMQ120PBTJ

2. External Appearance

2.1 Indoor Units

Ceiling mounted cassette type (Round flow)

FXFQ09PVJU
FXFQ12PVJU
FXFQ18PVJU
FXFQ24PVJU
FXFQ30PVJU
FXFQ36PVJU
FXFQ48PVJU

Wall mounted type

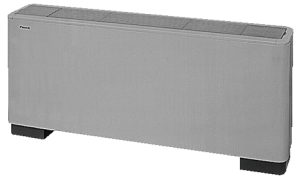
FXAQ07PVJU
FXAQ09PVJU
FXAQ12PVJU
FXAQ18PVJU
FXAQ24PVJU

4 way ceiling mounted cassette type (2'×2')

FXZQ07M7VJU
FXZQ09M7VJU
FXZQ12M7VJU
FXZQ18M7VJU

Floor standing type

FXLQ12MVJU9
FXLQ18MVJU9
FXLQ24MVJU9

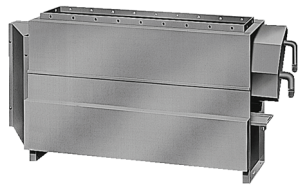


Slim ceiling mounted duct type

FXDQ07MVJU
FXDQ09MVJU
FXDQ12MVJU
FXDQ18MVJU
FXDQ24MVJU

Concealed floor standing type

FXNQ12MVJU9
FXNQ18MVJU9
FXNQ24MVJU9



Ceiling mounted duct type

FXMQ07PVJU
FXMQ09PVJU
FXMQ12PVJU
FXMQ18PVJU
FXMQ24PVJU
FXMQ30PVJU
FXMQ36PVJU
FXMQ48PVJU

Air handling unit

FXTQ12PAVJU
FXTQ18PAVJU
FXTQ24PAVJU
FXTQ30PAVJU
FXTQ36PAVJU
FXTQ42PAVJU
FXTQ48PAVJU
FXTQ54PAVJU

Ceiling mounted duct type

FXMQ72MVJU
FXMQ96MVJU

Branch Selector Units

BSVQ36PVJU
BSVQ60PVJU
BSVQ96PVJU

Ceiling suspended type

FXHQ12MVJU
FXHQ24MVJU
FXHQ36MVJU

2.2 Air Treatment Equipment

Outdoor air processing unit

FXMQ48MFVJU
FXMQ72MFVJU
FXMQ96MFVJU

2.3 Outdoor Units (RXYQ)

RXYQ72PBYD RXYQ72PBTJ	RXYQ96/120PBYD RXYQ96/120PBTJ	RXYQ144PBTJ
 6 ton	 8, 10 ton	 12 ton
RXYQ144PBYD	**RXYQ168/192PBYD RXYQ168/192PBTJ**	**RXYQ216/240PBYD RXYQ216/240PBTJ**
 12 ton	 14, 16 ton	 18, 20 ton
RXYQ264/288/312PBYD RXYQ264/288/312PBTJ	**RXYQ336/360PBYD RXYQ336/360PBTJ**	
 22, 24, 26 ton	 28, 30 ton	

2.4 Outdoor Units (REYQ)

REYQ72/96/120PBYD REYQ72/96/120/144PBTJ	REYQ144/168/192/216/240PBYD REYQ168/192/216/240PBTJ	REYQ264/288/312/336PBYD REYQ264/288/312/336PBTJ
 6, 8, 10, 12 ton	 12, 14, 16, 18, 20 ton	 22, 24, 26, 28 ton

3. Capacity Range

Outdoor Units

Capacity Range	6 ton	8 ton	10 ton	12 ton	14 ton	16 ton	18 ton
RXYQ	72PB	96PB	120PB	144PB	168PB	192PB	216PB
REYQ	72PB	96PB	120PB	144PB	168PB	192PB	216PB
Max. Number of Connectable Indoor Units	12	16	20	25	29	33	37
Total Capacity Index of Indoor Units to be Connected	36 ~ 93	48 ~ 124	60 ~ 156	72 ~ 187	84 ~ 218	96 ~ 249	108 ~ 280

Capacity Range	20 ton	22 ton	24 ton	26 ton	28 ton	30 ton
RXYQ	240PB	264PB	288PB	312PB	336PB	360PB
REYQ	240PB	264PB	288PB	312PB	336PB	—
Max. Number of Connectable Indoor Units	41	45	49	54	58	62
Total Capacity Index of Indoor Units to be Connected	120 ~ 312	132 ~ 343	144 ~ 374	156 ~ 405	168 ~ 436	180 ~ 468

Indoor Units

Capacity Range		0.6ton	0.8ton	1ton	1.5ton	2ton	2.5ton	3ton	3.5ton	4ton	4.5ton	6ton	8ton
Capacity Index		7.5	9.5	12	18	24	30	36	42	48	54	72	96
Ceiling Mounted Cassette Type (Round Flow)	FXFQ	—	09P	12P	18P	24P	30P	36P	—	48P	—	—	—
Ceiling Mounted Cassette Type (2'×2')	FXZQ	07M7	09M7	12M7	18M7	—	—	—	—	—	—	—	—
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 Mounted Duct Type	FXMQ	—	—	—	—	—	—	—	—	—	—	72M	96M
Ceiling Suspended Type	FXHQ	—	—	12M	—	24M	—	36M	—	—	—	—	—
Wall Mounted Type	FXAQ	07M	09M	12M	18M	24M	—	—	—	—	—	—	—
Floor Standing Type	FXLQ	—	—	12M	18M	24M	—	—	—	—	—	—	—
Connected Floor Standing Type	FXNQ	—	—	12M	18M	24M	—	—	—	—	—	—	—
Air Handling Unit	FXTQ	—	—	12PA	18PA	24PA	30PA	36PA	42PA	48PA	54PA	—	—

Indoor Unit Capacity

New refrigerant model code	07 type	09 type	12 type	18 type	24 type	30 type	36 type	42 type	48 type	54 type	72 type	96 type
Selecting model capacity	7,500 Btu/h	9,500 Btu/h	12,000 Btu/h	18,000 Btu/h	24,000 Btu/h	30,000 Btu/h	36,000 Btu/h	42,000 Btu/h	48,000 Btu/h	54,000 Btu/h	72,000 Btu/h	96,000 Btu/h
Equivalent output	0.6 ton	0.8 ton	1 ton	1.5 ton	2 ton	2.5 ton	3 ton	3.5 ton	4 ton	4.5 ton	6 ton	8 ton

Use the above tables to determine the capacities of indoor units to be connected. Make sure the total capacity of indoor units connected to each outdoor unit is within the specified value (Btu/h).

- The total capacity of connected indoor units must be within a range of 50 to 130% of the rated capacity of the outdoor unit.
- In some models, it is not possible to connect the maximum number of connectable indoor units. Select models so the total capacity of connected indoor units conforms to the specification.

Unit Number and Capacity of Indoor Unit Connectable to Branch Selector Unit

Capacity of Branch Selector unit	BSVQ36P	BSVQ60P	BSVQ96P
Unit number of connectable indoor unit	Five units or less	Eight units or less	Eight units or less
Total capacity of connectable indoor unit	Less than 36000 Btu/h	36000 Btu/h or more, less than 60000 Btu/h	60000 Btu/h or more, less than 96000 Btu/h
Connectable indoor unit	Types 07M to 36M	Types 07M to 48M	Types 07M to 96M

Part 2
VRVIII R-410A Heat Pump 60Hz

1. Specifications

1.1 Outdoor Units

Heat Pump 60Hz <RXYQ-PBYD> 460V

Model Name			RXYQ72PBYD	RXYQ96PBYD	RXYQ120PBYD
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	72,000	96,000	120,000
	Rated		69,000	92,000	114,000
★2 Heating Capacity	Maximum	Btu / h	81,000	108,000	135,000
	Rated		77,000	103,000	129,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765)	66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765)	66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	16.90	10.53+13.34	10.53+13.34
	Number of Revolutions	r/min	7980	2900, 6300	2900, 6300
	Motor Output×Number of Units	kW	4.7 × 1	(2.2+4.5) × 1	(3.5+4.5) × 1
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propellor Fan	Propellor Fan	Propellor Fan
	Motor Output	kW	0.75 × 1	0.35 × 2	0.35 × 2
	Airflow Rate	cfm	6,350	8,230	8,230
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ 3/8 (9.5) C1220T (Brazing Connection)	ϕ 3/8 (9.5) C1220T (Brazing Connection)	ϕ 1/2 (12.7) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ 3/4 (19.1) C1220T (Brazing Connection)	ϕ 7/8 (22.2) C1220T (Brazing Connection)	ϕ 1-1/8 (28.6) C1220T (Brazing Connection)
Mass		Lbs (kg)	433 (196)	633 (287)	633 (287)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	20~100	14~100	14~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	16.5 (7.5)	21.4 (9.7)	22.1(10)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070504	C: 4D070505	C: 4D070506

Notes:
- ★1 Indoor temp. : 80°FDB, 67°FWB (27°CDB)/(19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
- ★2 Indoor temp. : 70°FDB (21°CDB)/ outdoor temp. : 47°FDB, 43°FWB (8.3°CDB / 6°CWB) / Equivalent piping length : 25 ft , (7.5 m) level difference : 0 ft.

Heat Pump 60Hz <RXYQ-PBYD> 460V

Model Name (Combination Unit)			**RXYQ144PBYD**	**RXYQ168PBYD**	**RXYQ192PBYD**
Model Name (Independent Unit)			**RXYQ72PBYD RXYQ72PBYD**	**RXYQ72PBYD RXYQ96PBYD**	**RXYQ72PBYD RXYQ120PBYD**
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	144,000	168,000	192,000
	Rated		138,000	160,000	184,000
★2 Heating Capacity	Maximum	Btu / h	162,000	188,000	216,000
	Rated		154,000	180,000	206,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765) + 1680 x 1241 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765) + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	(16.90) × 2	16.90 + (10.53+13.34)	16.90 + (10.53+13.34)
	Number of Revolutions	r/min	(7980) × 2	7980, (2900, 6300)	7980, (2900, 6300)
	Motor Output×Number of Units	kW	(4.7) × 2	(4.7) × 1 + (2.2+4.5) × 1	(4.7) × 1 + (3.5+4.5) × 1
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propellor Fan	Propellor Fan	Propellor Fan
	Motor Output	kW	(0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.35) × 2	(0.75) × 1 + (0.35) × 2
	Airflow Rate	cfm	6,350+6,350	6,350+8,230	6,350+8,230
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ1/2 (12.7) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
Mass		Lbs (kg)	433 + 433 (196 + 196)	433 + 633 (196 + 287)	433 + 633 (196 + 287)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	10~100	9~100	8~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	16.5 + 16.5 (7.5 + 7.5)	16.5 + 21.4 (7.5 + 9.7)	16.5 + 22.1 (7.5 + 10)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070909	C: 4D070910	C: 4D070911

Notes:

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

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

Heat Pump 60Hz <RXYQ-PBYD> 460V

Model Name (Combination Unit)			RXYQ216PBYD	RXYQ240PBYD	RXYQ264PBYD
Model Name (Independent Unit)			RXYQ96PBYD RXYQ120PBYD	RXYQ120PBYD RXYQ120PBYD	RXYQ72PBYD RXYQ96PBYD RXYQ96PBYD
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	216,000	240,000	264,000
	Rated		206,000	228,000	251,000
★2 Heating Capacity	Maximum	Btu / h	243,000	270,000	297,000
	Rated		231,000	257,000	283,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	(10.53+13.34) × 2	(10.53+13.34) × 2	16.90 + (10.53+13.34) × 2
	Number of Revolutions	r/min	(2900, 6300) × 2	(2900, 6300) × 2	7980, (2900, 6300) × 2
	Motor Output×Number of Units	kW	(2.2+4.5) × 1 + (3.5+4.5) × 1	(3.5+4.5) × 2	(4.7) × 1 + (2.2+4.5) × 2
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propellor Fan	Propellor Fan	Propellor Fan
	Motor Output	kW	(0.35) × 2 + (0.35) × 2	(0.35) × 2 + (0.35) × 2	(0.75) × 1 + (0.35) × 2 + (0.35) × 2
	Airflow Rate	cfm	8,230+8,230	8,230+8,230	6,350+8,230+8,230
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)
Mass		Lbs (kg)	633 + 633 (287 + 287)	633 + 633 (287 + 287)	433 + 633+ 633 (196 + 287 + 287)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	7~100	7~100	6~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	21.4+22.1 (9.7 + 10)	22.1+22.1 (10 + 10)	16.5 + 21.4 + 21.4 (7.5 + 9.7 + 9.7)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070912	C: 4D070913	C: 4D070914

Notes:
- ★1 Indoor temp. : 80°FDB / 67°FWB (27°CDB / 19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
- ★2 Indoor temp. : 70°FDB (21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3°CDB, 6°CWB) / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.

Heat Pump 60Hz <RXYQ-PBYD> 460V

Model Name (Combination Unit)			**RXYQ288PBYD**	**RXYQ312PBYD**	**RXYQ336PBYD**
Model Name (Independent Unit)			**RXYQ72PBYD RXYQ96PBYD RXYQ120PBYD**	**RXYQ72PBYD RXYQ120PBYD RXYQ120PBYD**	**RXYQ96PBYD RXYQ120PBYD RXYQ120PBYD**
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	288,000	312,000	336,000
	Rated		274,000	297,000	320,000
★2 Heating Capacity	Maximum	Btu / h	324,000	351,000	378,000
	Rated		308,000	334,000	360,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	16.90 + (10.53+13.34) × 2	16.90 + (10.53+13.34) × 2	(10.53+13.34) × 3
	Number of Revolutions	r/min	7980, (2900, 6300) × 2	7980, (2900, 6300) × 2	(2900, 6300) × 3
	Motor Output×Number of Units	kW	(4.7) × 1 + (2.2+4.5) × 1 + (3.5+4.5) × 1	(4.7) × 1 + (3.5+4.5) × 2	(2.2+4.5) × 1 + (3.5+4.5) × 2
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propellor Fan	Propellor Fan	Propellor Fan
	Motor Output	kW	(0.75) × 1 + (0.35) × 2 + (0.35) × 2	(0.75) × 1 + (0.35) × 2 + (0.35) × 2	(0.35) × 2 + (0.35) × 2 + (0.35) × 2
	Airflow Rate	cfm	6,350+8,230+8,230	6,350+8,230+8,230	8,230+8,230+8,230
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ3/4 (19.1 mm) C1220T (Brazing Connection)	ϕ3/4 (19.1 mm) C1220T (Brazing Connection)	ϕ3/4 (19.1 mm) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)
Mass		Lbs (kg)	433+633+633 (196 + 287 + 287)	433 + 633 + 633 (196 + 287 + 287)	633 + 633 + 633 (287 + 287 + 287)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	5~100	5~100	4~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	16.5 + 21.4 + 22.1 (7.5 + 9.7 + 10)	16.5 + 22.1+ 22.1 (7.5 + 10 + 10)	21.4 + 22.1+ 22.1 (9.7 + 10 + 10)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070915	C: 4D070916	C: 4D070917

Notes:
- ★1 Indoor temp. : 80°FDB / 67°FWB (27°CDB) / 19.4°CWB)/ outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
- ★2 Indoor temp. : 70°FDB (21°CDB) / outdoor temp. : 47°FDB / 43°FWB (8.3°CDB / 6°CWB) / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.

Heat Pump 60Hz <RXYQ-PBYD> 460V

Model Name (Combination Unit)			RXYQ360PBYD
Model Name (Independent Unit)			RXYQ120PBYD RXYQ120PBYD RXYQ120PBYD
Power Supply			3 phase, 460V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	360,000
	Rated		342,000
★2 Heating Capacity	Maximum	Btu / h	405,000
	Rated		385,000
Casing Color			Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type
	Displacement	m^3/h	(10.53+13.34) × 3
	Number of Revolutions	r/min	(2900, 6300) × 3
	Motor Output×Number of Units	kW	(3.5+4.5) × 3
	Starting Method		Soft Start
Fan	Type		Propellor Fan
	Motor Output	kW	(0.35) × 2 + (0.35) × 2 + (0.35) × 2
	Airflow Rate	cfm	8,230 + 8,230 + 8,230
	Drive		Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-5/8 (41.3) C1220T (Brazing Connection)
Mass		Lbs (kg)	633+633+633 (287 + 287 + 287)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer
Capacity Control		%	5~100
Refrigerant	Refrigerant Name		R-410A
	Charge	Lbs (kg)	22.1+22.1+22.1 (10 + 10 + 10)
	Control		Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070918

Notes:
- ★1 Indoor temp. : 80°FDB / 67°FWB (27°CDB /19.4°CWB) / outdoor temp. :95°FDB (35°CDB) / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
- ★2 Indoor temp. : 70°FDB (21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3°CDB, 6°CWB) / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.

Heat Pump 60Hz <RXYQ-PBTJ> 208-230V

Model Name			RXYQ72PBTJ	RXYQ96PBTJ	RXYQ120PBTJ
Power Supply			3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	72,000	96,000	120,000
	Rated		69,000	92,000	114,000
★2 Heating Capacity	Maximum	Btu / h	81,000	108,000	135,000
	Rated		77,000	103,000	129,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765)	66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765)	66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	16.90	10.53+13.34	10.53+13.34
	Number of Revolutions	r/min	7980	2900, 6300	2900, 6300
	Motor Output×Number of Units	kW	4.5 × 1	(2.2+4.5) × 1	(3.5+4.5) × 1
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	0.75 × 1	0.35 × 2	0.35 × 2
	Airflow Rate	cfm	6,350	8,230	8,230
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ 3/8 (9.5) C1220T (Brazing Connection)	ϕ 3/8 (9.5) C1220T (Brazing Connection)	ϕ 1/2 (12.7) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ 3/4 (19.1) C1220T (Brazing Connection)	ϕ 7/8 (22.2) C1220T (Brazing Connection)	ϕ 1-1/8 (28.6) C1220T (Brazing Connection)
	Discharge Gas Pipe	in. (mm)	—	—	—
Mass		Lbs (kg)	420 (191)	620 (281)	620 (281)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	20~100	14~100	14~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	16.5 ((7.5)	21.4 (9.7)	22.1 (10)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070501	C: 4D070502	C: 4D070503

Notes:

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

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

Heat Pump 60Hz <RXYQ-PBTJ> 208-230V

Model Name (Combination Unit)			RXYQ144PBTJ	RXYQ168PBTJ	RXYQ192PBTJ
Model Name (Independent Unit)			—	RXYQ72PBTJ RXYQ96PBTJ	RXYQ72PBTJ RXYQ120PBTJ
Power Supply			3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	144,000	168,000	192,000
	Rated		138,000	160,000	184,000
★2 Heating Capacity	Maximum	Btu / h	162,000	188,000	216,000
	Rated		154,000	180,000	206,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 51-3/16 × 30-1/8 (1680 x 1300 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	16.90 + 16.90	16.90 + (10.53+13.34)	16.90 + (10.53+13.34)
	Number of Revolutions	r/min	7980, 7980	7980, (2900, 6300)	7980, (2900, 6300)
	Motor Output×Number of Units	kW	(3.8+3.8) ×1	(4.5) × 1 + (2.2+4.5) × 1	(4.5) × 1 + (3.5+4.5) × 1
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	0.75 × 2	(0.75) × 1 + (0.35) × 2	(0.75) × 1 + (0.35) × 2
	Airflow Rate	cfm	8,300	6,350+8,230	6,350+8,230
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ1/2 (12.7) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
Mass		Lbs (kg)	747 (339)	420 + 620 (191 + 281)	420 + 620 (191 + 281)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	10~100	9~100	8~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	24.5 (11)	16.5 + 21.4 (7.5 + 9.7)	16.5 + 22.1 (7.5 + 10)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070759	C: 4D070868	C: 4D070869

Notes:
- ★1 Indoor temp. : 80°FDB / 67°FWB (27°CDB /19.4°CWB)/ outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.
- ★2 Indoor temp. : 70°FDB (21°CDB) / outdoor temp. : 47°FDB / 43°FWB (8.3°CDB / 6°CWB)/ Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.

Heat Pump 60Hz <RXYQ-PBTJ> 208-230V

Model Name (Combination Unit)			RXYQ216PBTJ	RXYQ240PBTJ	RXYQ264PBTJ
Model Name (Independent Unit)			RXYQ96PBTJ RXYQ120PBTJ	RXYQ120PBTJ RXYQ120PBTJ	RXYQ72PBTJ RXYQ96PBTJ RXYQ96PBTJ
Power Supply			3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	216,000	240,000	264,000
	Rated		206,000	228,000	251,000
★2 Heating Capacity	Maximum	Btu / h	243,000	270,000	297,000
	Rated		231,000	257,000	283,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	(10.53+13.34) × 2	(10.53+13.34) × 2	16.90 + (10.53+13.34) × 2
	Number of Revolutions	r/min	(2900, 6300) × 2	(2900, 6300) × 2	7980, (2900, 6300) × 2
	Motor Output×Number of Units	kW	(2.2+4.5) × 1 + (3.5+4.5) × 1	(3.5+4.5) × 2	(4.5) × 1 + (2.2+4.5) × 2
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	(0.35) × 2 + (0.35) × 2	(0.35) × 2 + (0.35) × 2	(0.75) × 1 + (0.35) × 2 + (0.35) × 2
	Airflow Rate	cfm	8,230+8,230	8,230+8,230	6,350+8,230+8,230
	Drive		'Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-3/8 (35) C1220T (Brazing Connection)	ϕ1-3/8 (35) C1220T (Brazing Connection)
Mass		Lbs (kg)	620 + 620 (281 + 281)	620 + 620 (281 + 281)	420 + 620 + 620 (191 + 281 + 281)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	7~100	6~100	6~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	21.4 + 22.1 (9.7 + 10)	22.1 + 22.1 (10 + 10)	16.5 + 21.4 + 21.4 (7.5 + 9.7 + 9.7)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070870	C: 4D070871	C: 4D070872

Notes:

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

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

Heat Pump 60Hz <RXYQ-PBTJ> 208-230V

Model Name (Combination Unit)			RXYQ288PBTJ	RXYQ312PBTJ	RXYQ336PBTJ
Model Name (Independent Unit)			RXYQ72PBTJ RXYQ96PBTJ RXYQ120PBTJ	RXYQ72PBTJ RXYQ120PBTJ RXYQ120PBTJ	RXYQ96PBTJ RXYQ120PBTJ RXYQ120PBTJ
Power Supply			3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	288,000	312,000	336,000
	Rated		274,000	297,000	320,000
★2 Heating Capacity	Maximum	Btu / h	324,000	351,000	378,000
	Rated		308,000	334,000	360,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	16.90 + (10.53+13.34) × 2	16.90 + (10.53+13.34) × 2	(10.53+13.34) × 3
	Number of Revolutions	r/min	7980, (2900, 6300) × 2	7980, (2900, 6300) × 2	(2900, 6300) × 3
	Motor Output×Number of Units	kW	(4.5) × 1 + (2.2+4.5) × 1 + (3.5+4.5) × 1	(4.5) × 1 + (3.5+4.5) × 2	(2.2+4.5) × 1 + (3.5+4.5) × 2
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	(0.75) × 1 + (0.35) × 2 + (0.35) × 2	(0.75) × 1 + (0.35) × 2 + (0.35) × 2	(0.35) × 2 + (0.35) × 2 + (0.35) × 2
	Airflow Rate	cfm	6,350+8,230+8,230	6,350+8,230+8,230	8,230+8,230+8,230
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ3/4 (19.1 mm) C1220T (Brazing Connection)	ϕ3/4 (19.1 mm) C1220T (Brazing Connection)	ϕ3/4 (19.1 mm) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)	ϕ1-3/8 (34.9)C1220T (Brazing Connection)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)
Mass		Lbs (kg)	420 + 620 + 620 (191 + 281 + 281)	420 + 620 + 620 (191 + 281 + 281)	620 + 620 + 620 (281 +81 + 281)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	5~100	5~100	4~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	16.5 + 21.4 + 22.1 (7.5 + 9.7 + 10)	16.5 + 22.1 + 22.1 (7.5 + 10 + 10)	21.4 + 22.1 + 22.1 (9.7 + 10 + 10)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070873	C: 4D070874	C: 4D070875

Notes:
★1 Indoor temp. : 80°FDB, 67°FWB (27°CDB /19.4°CWB)/ outdoor temp. : 95°FDB (35°C) / Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.
★2 Indoor temp. : 70°FDB (21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3°CDB / 6°CWB) / Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.

Heat Pump 60Hz <RXYQ-PBTJ> 208-230V

Model Name (Combination Unit)			**RXYQ360PBTJ**
Model Name (Independent Unit)			**RXYQ120PBTJ RXYQ120PBTJ RXYQ120PBTJ**
Power Supply			3 phase, 208/230V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	360,000
	Rated		342,000
★2 Heating Capacity	Maximum	Btu / h	405,000
	Rated		385,000
Casing Color			Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 + 66-1/8 × 48-7/8 × 30-1/8 (1680 x 1241 x 765 + 1680 x 1241 x 765 + 1680 x 1241 x 765)
Heat Exchanger			Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type
	Displacement	m^3/h	(10.53+13.34) × 3
	Number of Revolutions	r/min	(2900, 6300) × 3
	Motor Output×Number of Units	kW	(3.5+4.5) × 3
	Starting Method		Soft Start
Fan	Type		Propeller Fan
	Motor Output	kW	(0.35) × 2 + (0.35) × 2 + (0.35) × 2
	Airflow Rate	cfm	8,230+8,230+8,230
	Drive		Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)
	Gas Pipe	in. (mm)	ϕ1-5/8 (41.3) C1220T (Brazing Connection)
Mass		Lbs (kg)	620 + 620 + 620 (281 + 281 + 281)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer
Capacity Control		%	5~100
Refrigerant	Refrigerant Name		R-410A
	Charge	Lbs (kg)	22.1 + 22.1 + 22.1 (10 +10 + 10)
	Control		Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070876

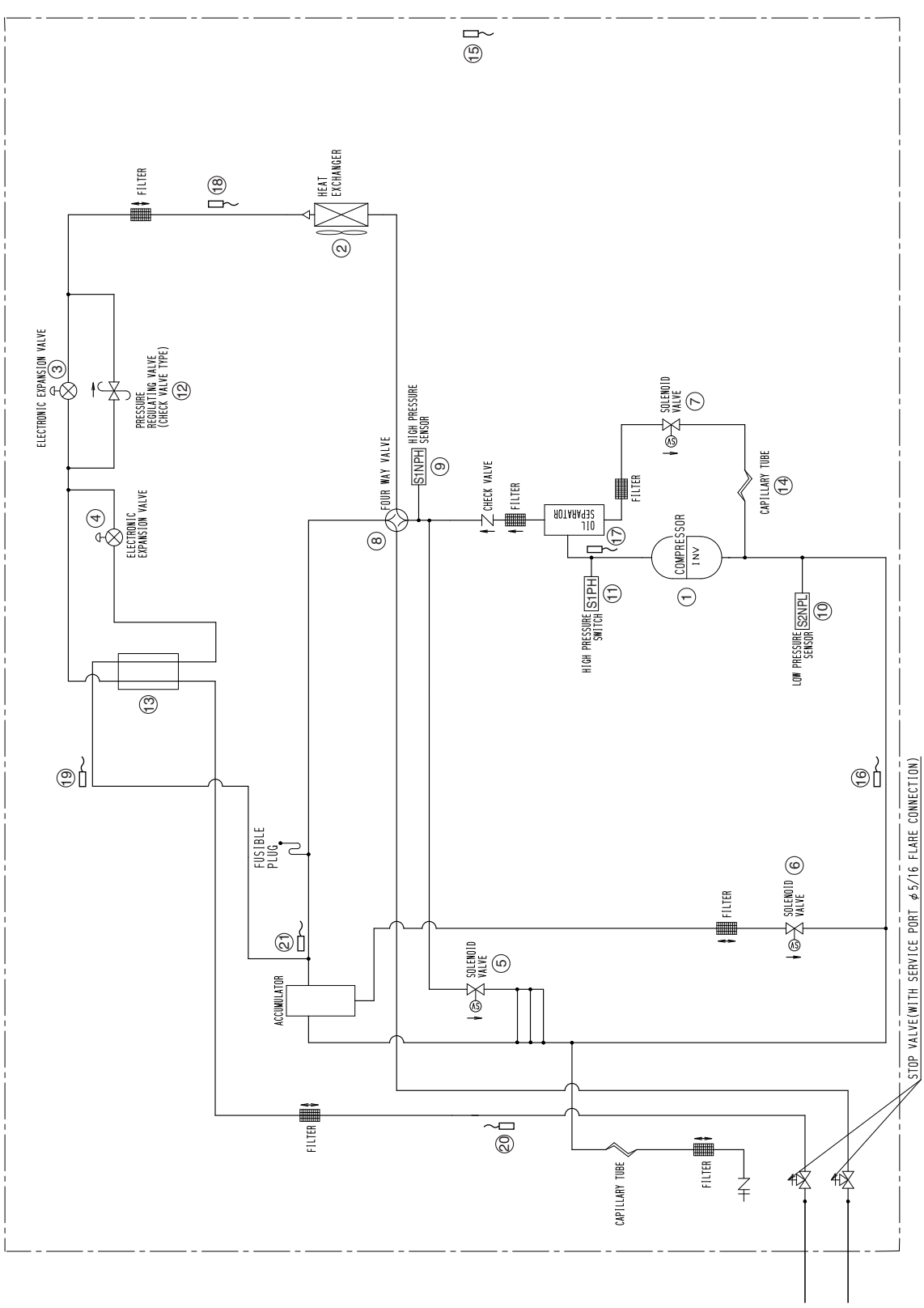
Notes:
- ★1 Indoor temp. : 80°FDB, 67°FWB (27°CDB)/(19.4°CWB)/ outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.
- ★2 Indoor temp. : 70°FDB (21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3°CDB / 6°CWB) / Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.

2. Refrigerant Circuit

2.1 RXYQ72PB

No. in refrigerant system diagram	Symbol	Name	Major Function
①	M1C	Inverter Compressor (INV.)	INV. compressor is operated on frequencies between 52Hz to 280Hz by using the inverter. The number of operating step is as follows. Compressor operation steps: Refer to P.46 ~.
②	M1F	Inverter fan	Because the system is an air heat exchange type, the fan is operated at 9-step rotation speed by using the inverter.
③	Y1E	Electronic expansion valve (Main: EVM)	While in heating, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
④	Y2E	Electronic expansion valve (Subcooling: EVT)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
⑤	Y1S	Solenoid valve (Hot gas: SVP)	Prevents low pressure from transient falling.
⑥	Y2S	Solenoid valve (Oil return: SVO)	Returns oil from the oil separator to the compressor.
⑦	Y4S	Solenoid valve (Accum. oil return: SVC)	Returns oil from the accumulator to the compressor.
⑧	Y3S	Four-way valve	Switches outdoor heat exchanger to evaporator or condenser.
⑨	S1NPH	High pressure sensor	Detects the high pressure.
⑩	S2NPL	Low pressure sensor	Detects the low pressure.
⑪	S1PH	High pressure switch (For INV. Compressor)	When pressure increases, stops operation and avoid high pressure increase in the fault operation.
⑫	—	Pressure regulating valve (Liquid pipe)	When pressure increases, prevents any damage on components caused by pressure increase in transport or storage.
⑬	—	Subcooling heat exchanger	Applies subcooling to liquid refrigerant.
⑭	—	Capillary tube	Returns the refrigerating oil separated through the oil separator to the INV. Compressor.
⑮	R1T	Thermistor (Outdoor air: Ta)	Detects outdoor air temperature, correct discharge pipe temperature and others.
⑯	R2T	Thermistor (Suction pipe: TsA)	Detects suction pipe temperature.
⑰	R3T	Thermistor (INV. discharge pipe: Tdi)	Detects discharge pipe temperature. Used for compressor temperature protection control.
⑱	R4T	Thermistor (Heat exchanger deicer: Tb)	Detects liquid pipe temperature of air heat exchanger. Used to make judgements on defrosting operation.
⑲	R5T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Detects gas pipe temperature on the evaporating side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooling heat exchanger.
⑳	R6T	Thermistor (Subcooling heat exchanger liquid pipe: Tl)	Detects temperature of liquid pipe between the main electronic expansion valve and subcooling heat exchanger.
㉑	R7T	Thermistor (Accumulator inlet: Ts1)	Detects gas pipe temperature at the accumulator inlet.

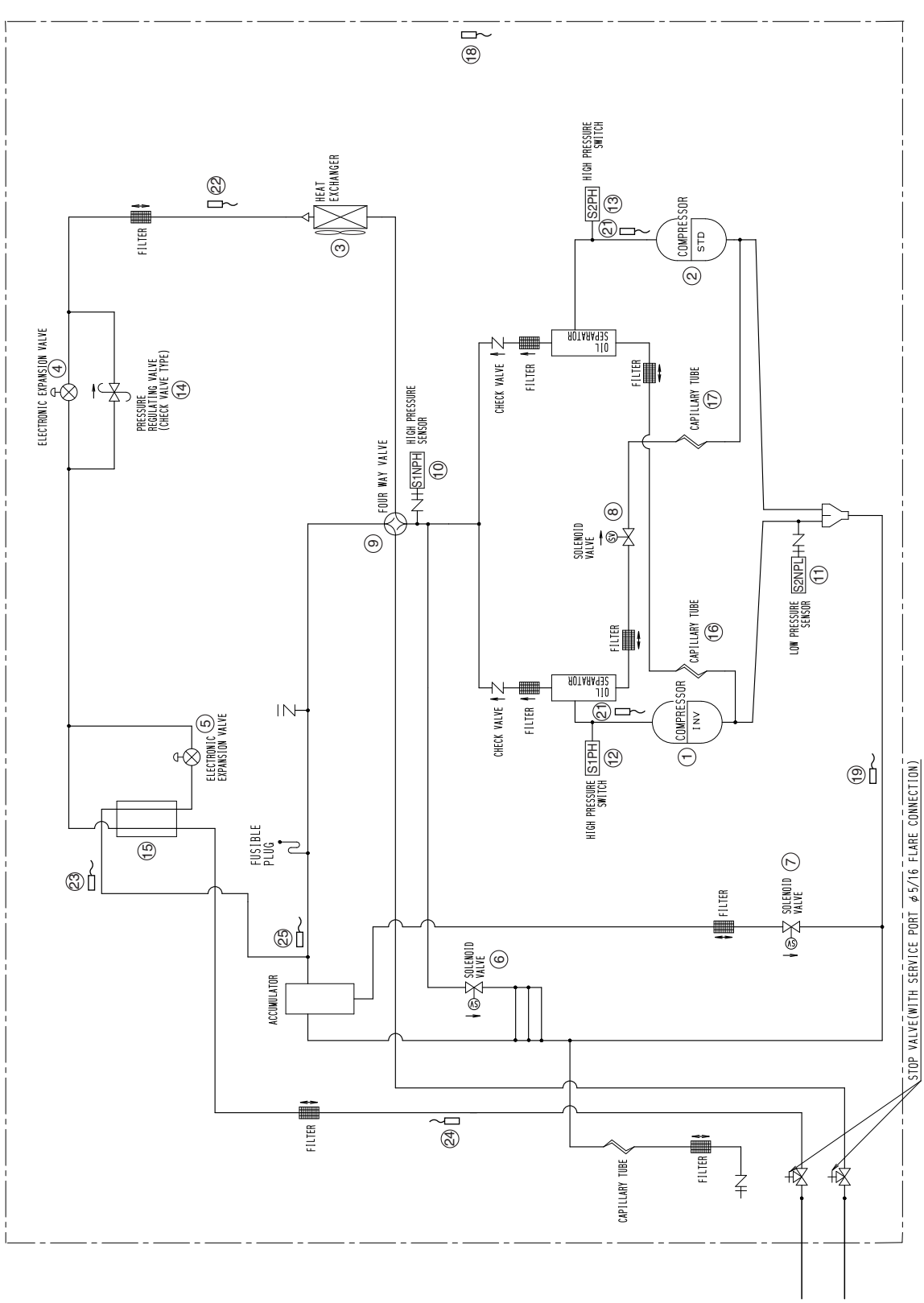
RXYQ72PB


C: 3D070507
FILTER
HEAT EXCHANGER
ELECTRONIC EXPANSION VALVE
PRESSURE REGULATING VALVE (CHECK VALVE TYPE)
ELECTRONIC EXPANSION VALVE
FOUR WAY VALVE
HIGH PRESSURE SENSOR
S1NPH
CHECK VALVE
FILTER
OIL SEPARATOR
SOLENOID VALVE
CAPILLARY TUBE
COMPRESSOR INV
HIGH PRESSURE SWITCH
S1PH
LOW PRESSURE SENSOR
S2NPL
FUSIBLE PLUG
ACCUMULATOR
SOLENOID VALVE
FILTER
SOLENOID VALVE
FILTER
CAPILLARY TUBE
FILTER
STOP VALVE(WITH SERVICE PORT φ5/16 FLARE CONNECTION)

2.2 RXYQ96PB, 120PB

No. in refrigerant system diagram	Symbol	Name	Major Function
①	M1C	Inverter Compressor (INV.)	Inverter compressor is operated on frequencies between 52Hz to 210Hz by using the inverter, while Standard compressor is operated with the commercial power supply only. The number of operating step is as follows when inverter compressor is operated in combination with STD compressor. Compressor operation steps: Refer to P.46 ~.
②	M2C	Standard Compressor (STD)	
③	M1F	Inverter fan	Because the system is an air heat exchange type, the fan is operated at 9-step rotation speed by using the inverter.
④	Y1E	Electronic expansion valve (Main: EVM)	While in heating, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
⑤	Y2E	Electronic expansion valve (Subcooling: EVT)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
⑥	Y1S	Solenoid valve (Hot gas: SVP)	Prevents the low pressure from transient falling.
⑦	Y2S	Solenoid valve (Oil return: SVO)	Returns oil from the oil separator to the compressor.
⑧	Y4S	Solenoid valve (Accum. oil return: SVC)	Returns oil from the accumulator to the compressor.
⑨	Y3S	Four-way valve	This is used to switch outdoor heat exchanger to evaporator or condenser.
⑩	S1NPH	High-pressure sensor	Detects the high pressure.
⑪	S2NPL	Low-pressure sensor	Detects the low pressure.
⑫	S1PH	High-pressure switch (For INV. Compressor)	Functions when pressure increases to stop operation and avoid high pressure increase in the fault operation.
⑬	S2PH	High-pressure switch (For STD Compressor)	
⑭	—	Pressure-regulating valve (Liquid pipe)	Used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
⑮	—	Subcooling heat exchanger	Apply subcooling to liquid refrigerant.
⑯	—	Capillary tube	Returns the refrigerating oil separated through the oil separator to the INV. Compressor.
⑰	—	Capillary tube	Returns the refrigerating oil separated through the oil separator to the STD Compressor.
⑱	R1T	Thermistor (Outdoor air: Ta)	Detects outdoor air temperature, correct discharge pipe temperature and others.
⑲	R2T	Thermistor (Suction pipe: TsA)	Detectst suction pipe temperature.
⑳	R31T	Thermistor (INV. discharge pipe: Tdi)	Detects discharge pipe temperature. Used for compressor temperature protection control.
㉑	R32T	Thermistor (STD discharge pipe: Tds1)	
㉒	R4T	Thermistor (Heat exchanger deicer: Tb)	Detects liquid pipe temperature of air heat exchanger. Used to make judgements on defrosting operation.
㉓	R5T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Detects gas pipe temperature on the evaporating side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooling heat exchanger.
㉔	R6T	Thermistor (Subcooling heat exchanger liquid pipe: TI)	Detects temperature of liquid pipe between the main electronic expansion valve and subcooling heat exchanger.
㉕	R7T	Thermistor (Accumulator inlet: Ts1)	Detects gas pipe temperature at the accumulator inlet.

RXYQ96, 120PB

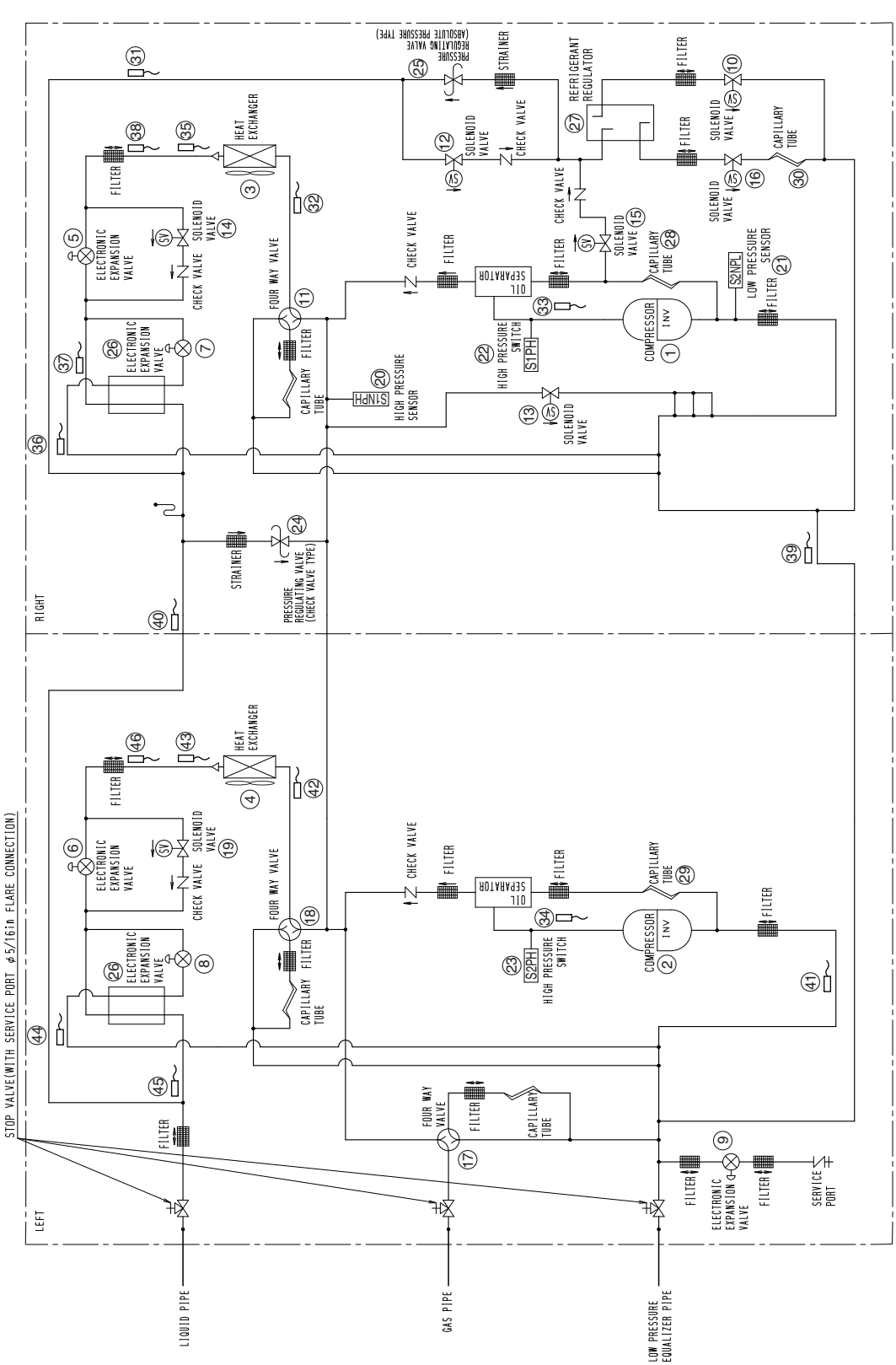


2.3 RXYQ144PB

No. in refrigerant system diagram	Symbol	Name	Major Function
①	M1C	Inverter Compressor (INV.1)	INV. compressor is operated on frequencies between 52Hz to 280Hz by using the inverter. The number of operating step is as follows. Compressor operation steps: Refer to P.46 ~.
②	M2C	Inverter Compressor (INV.2)	
③	M1F	Inverter fan	Because the system is an air heat exchange type, the fan is operated at 9-step rotation speed by using the inverter.
④	M2F	Inverter fan	
⑤	Y1E	Electronic expansion valve (Main 1: EVM1)	While in heating, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
⑥	Y3E	Electronic expansion valve (Main 2: EVM2)	
⑦	Y2E	Electronic expansion valve (Subcooling 1: EVT1)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
⑧	Y5E	Electronic expansion valve (Subcooling 2: EVT2)	
⑨	Y4E	Electronic expansion valve (Refrigerant charge: EVJ)	Opens/closes refrigerant charge port.
⑩	Y1S	Solenoid valve (Refrigerant regulator gas vent pipe: SVG)	Collects refrigerant to the refrigerant regulator.
⑪	Y2S	Four-way valve (Heat exchanger 1)	Switches outdoor heat exchanger to evaporator or condenser.
⑫	Y3S	Solenoid valve (Refrigerant regulator liquid pipe: SVL)	Collects refrigerant to the refrigerant regulator.
⑬	Y4S	Solenoid valve (Hot gas: SVP)	Prevents the low pressure from transient falling.
⑭	Y5S	Solenoid valve (Bypass 1: SVE1)	Opens in cooling operation.
⑮	Y6S	Solenoid valve (Discharge pipe of refrigerant regulator)	Bypasses the high pressure gas to the refrigerant regulator.
⑯	Y7S	Solenoid valve (Oil return: SVO)	Returns oil from the accumulator to the compressor.
⑰	Y8S	Four-way valve (Piping)	Switches dual pressure gas pipe to high pressure or low pressure.
⑱	Y9S	Four-way valve (Heat exchanger 2)	Switches outdoor heat exchanger to evaporator or condenser.
⑲	Y10S	Solenoid valve (Bypass 2: SVE2)	Opens in cooling operation.
⑳	S1NPH	High-pressure sensor	Detects the high pressure.
㉑	S2NPL	Low-pressure sensor	Detects the low pressure.
㉒	S1PH	High-pressure switch (For INV. Compressor)	Functions when pressure increases to stop operation and avoid high pressure increase in the fault operation.
㉓	S2PH		
㉔	—	Pressure-regulating valve (Liquid pipe)	Used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
㉕	—	Pressure-regulating valve (Refrigerant regulator)	
㉖	—	Subcooling heat exchanger	Apply subcooling to liquid refrigerant.
㉗	—	Refrigerant regulator	Surplus refrigerant is held according to the operation condition.
㉘	—	Capillary tube	Returns the refrigerating oil separated through the oil separator to the INV. Compressor.
㉙	—		
㉚	—	Capillary tube	Discharges refrigerant from the refrigerant regulator.
㉛	R1T	Thermistor (Outdoor air: Ta)	Detects outdoor air temperature, correct discharge pipe temperature and others.
㉜	R2T	Thermistor (Heat exchanger gas pipe: Tg1)	Detects temperature of gas pipe for air heat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
㉝	R31T	Thermistor (INV.1 discharge pipe: Tdi1)	Detects discharge pipe temperature.
㉞	R32T	Thermistor (INV.2 discharge pipe: Tdi2)	
㉟	R4T	Thermistor (Heat exchanger deicer 1: Tb1)	Detects liquid pipe temperature of air heat exchanger. Used to make judgements on defrosting operation.
㊱	R5T	Thermistor (Subcooling heat exchanger gas pipe 1: Tsh1)	Detects gas pipe temperature on the evaporating side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooling heat exchanger.
㊲	R6T	Thermistor (Subcooling heat exchanger liquid pipe: Tl)	Detects temperature of liquid pipe between the main electronic expansion valve and subcooling heat exchanger.
㊳	R7T	Thermistor (Heat exchanger liquid pipe 1: Tf1)	Detects temperature of liquid pipe between the air heat exchanger and main electronic expansion valve. Used to make judgements on the recover or discharge refrigerants to the refrigerant regulator.
㊴	R8T	Thermistor (Suction pipe 1: TsA1)	Detects suction pipe temperature.
㊵	R9T	Thermistor (Liquid pipe 1: Tsc1)	Detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.

No. in refrigerant system diagram	Symbol	Name	Major Function
㊶	R10T	Thermistor (Suction pipe 2: TsA2)	Detects suction pipe temperature.
㊷	R11T	Thermistor (Heat exchanger gas pipe: Tg2)	Detects temperature of gas pipe for air heat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
㊸	R12T	Thermistor (Heat exchanger deicer 2: Tb2)	Detects liquid pipe temperature of air heat exchanger. Used to make judgements on defrosting operation.
㊹	R13T	Thermistor (Subcooling heat exchanger gas pipe 2: Tsh2)	Detects gas pipe temperature on the evaporating side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooling heat exchanger.
㊺	R14T	Thermistor (Liquid pipe 2: Tsc2)	Detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.
㊻	R15T	Thermistor (Heat exchanger liquid pipe 2: Tf2)	Detects temperature of liquid pipe between the air heat exchanger and main electronic expansion valve. Used to make judgements on the recover or discharge refrigerants to the refrigerant regulator.

RXYQ144PB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RIGHT
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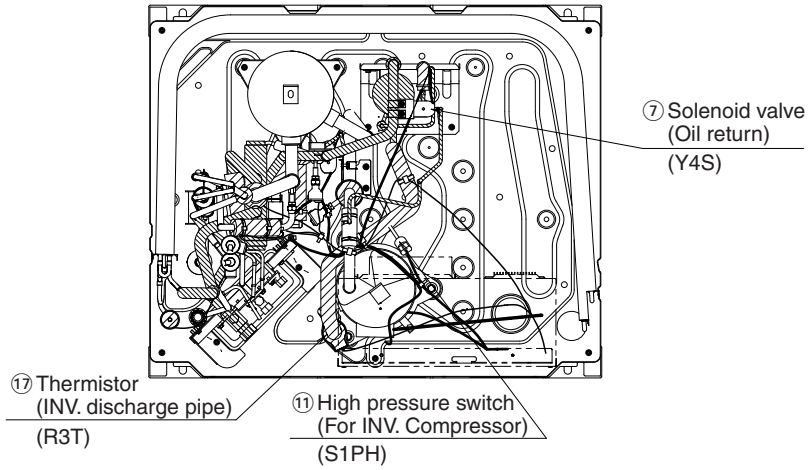
STOP VALVE(WITH SERVICE PORT φ5/16in FLARE CONNECTION)
LIQUID PIPE
GAS PIPE
LOW PRESSURE EQUALIZER PIPE
HEAT EXCHANGER
ELECTRONIC EXPANSION VALVE
SOLENOID VALVE
CHECK VALVE
FOUR WAY VALVE
CAPILLARY TUBE
FILTER
OIL SEPARATOR
COMPRESSOR
INV
HIGH PRESSURE SENSOR
HIGH PRESSURE SWITCH
LOW PRESSURE SENSOR
STRAINER
PRESSURE REGULATING VALVE (CHECK VALVE TYPE)
REFRIGERANT REGULATOR
SERVICE PORT
S1NPH
S1PH
S2PH
S1NPL

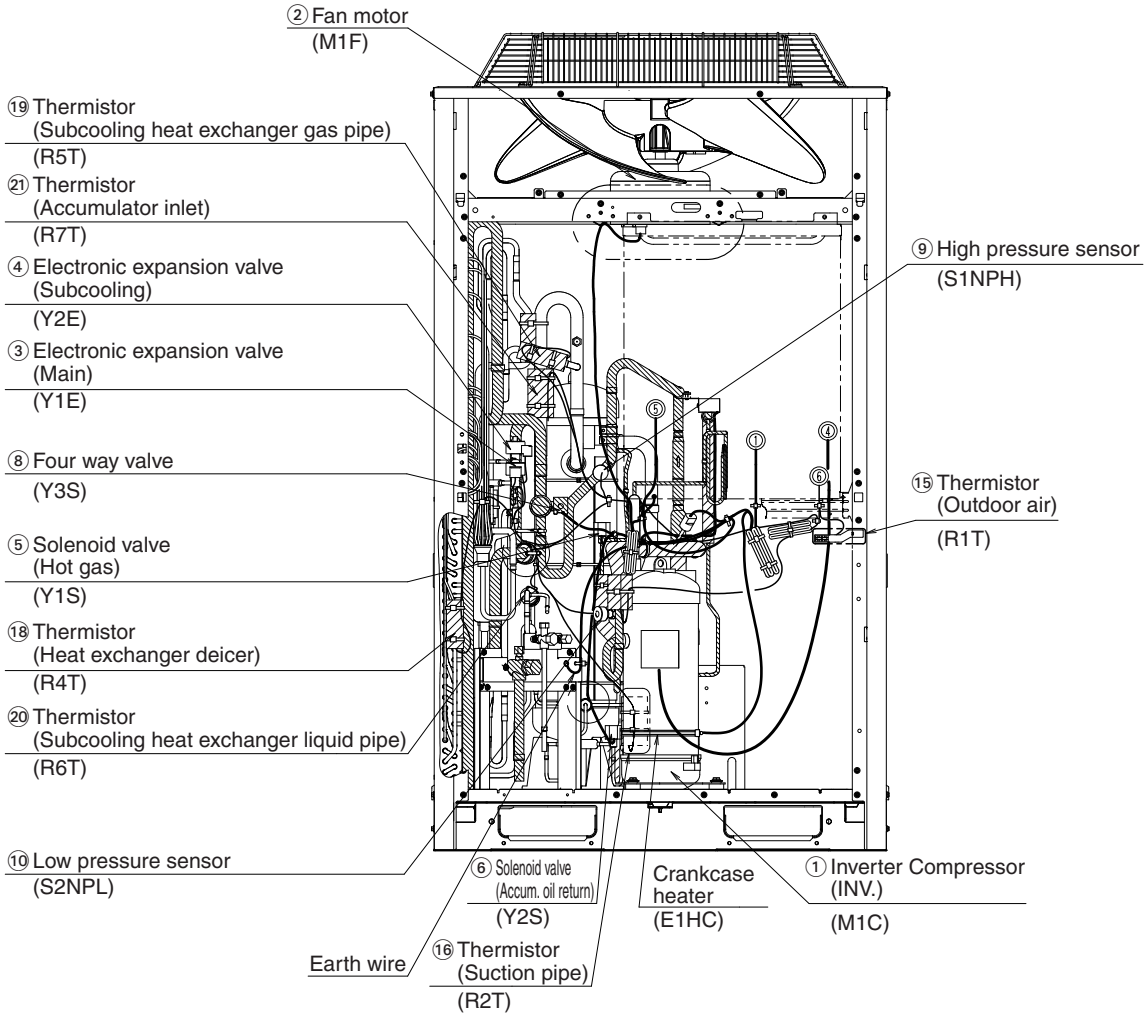
3. Functional Parts Layout

3.1 RXYQ72PB

Plan



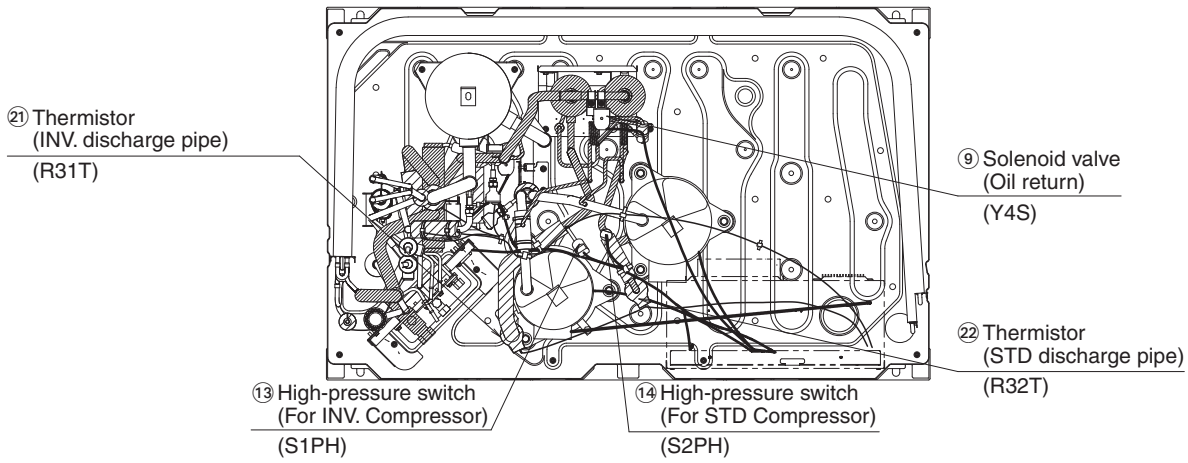
Front View



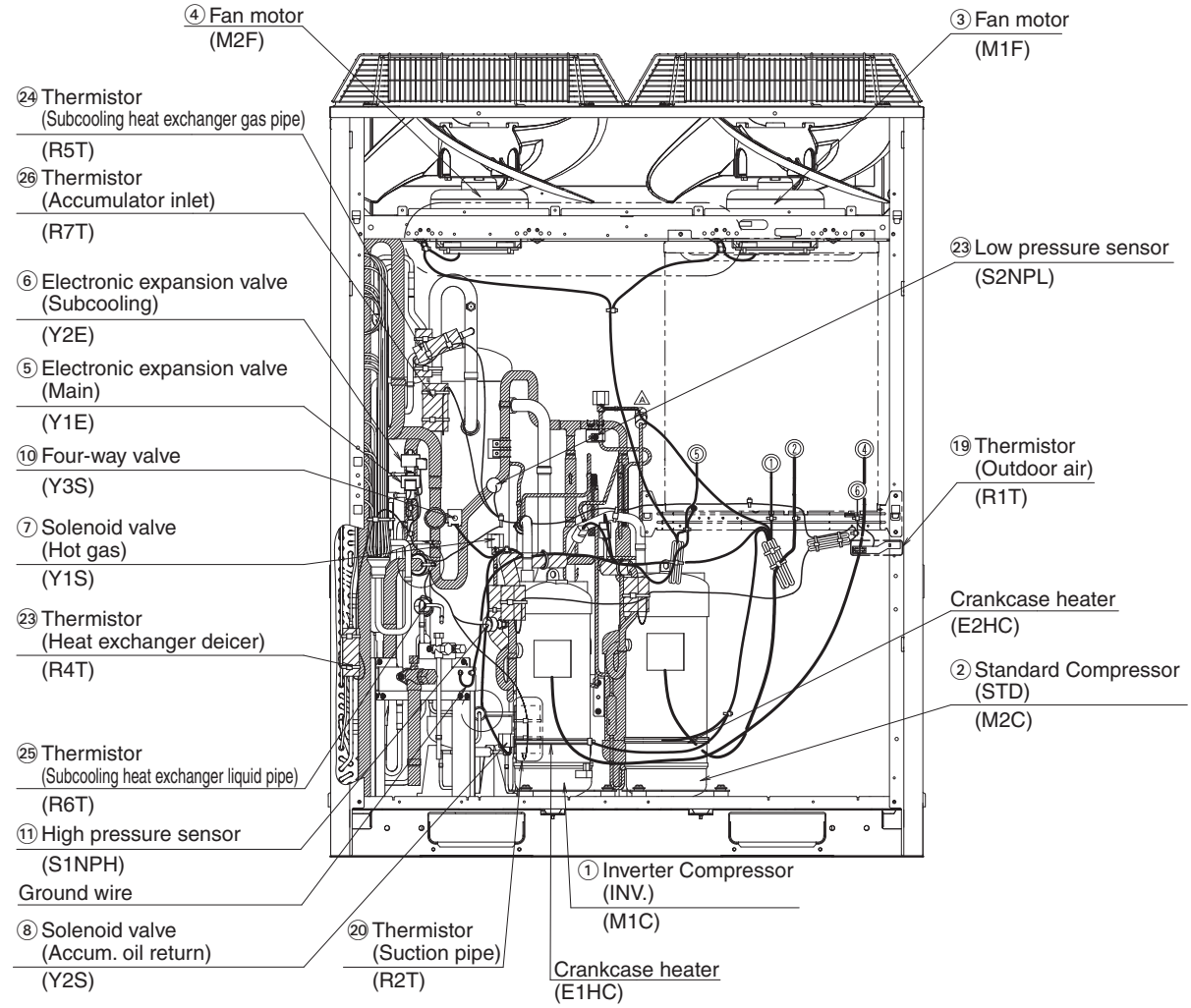
Note: For reference number, refer to P.21.

3.2 RXYQ96, 120PB

Plan



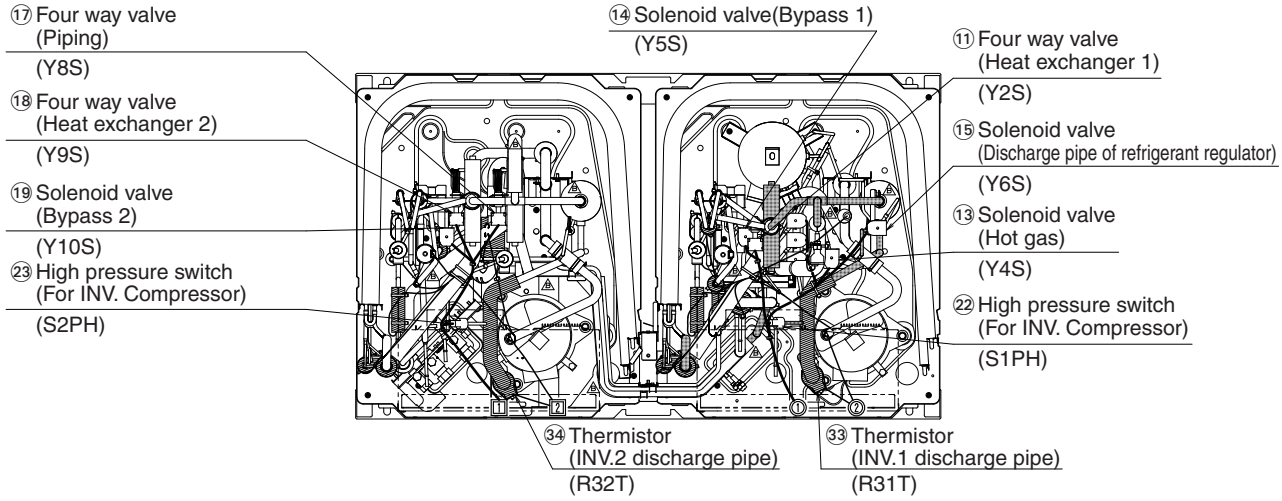
Front View



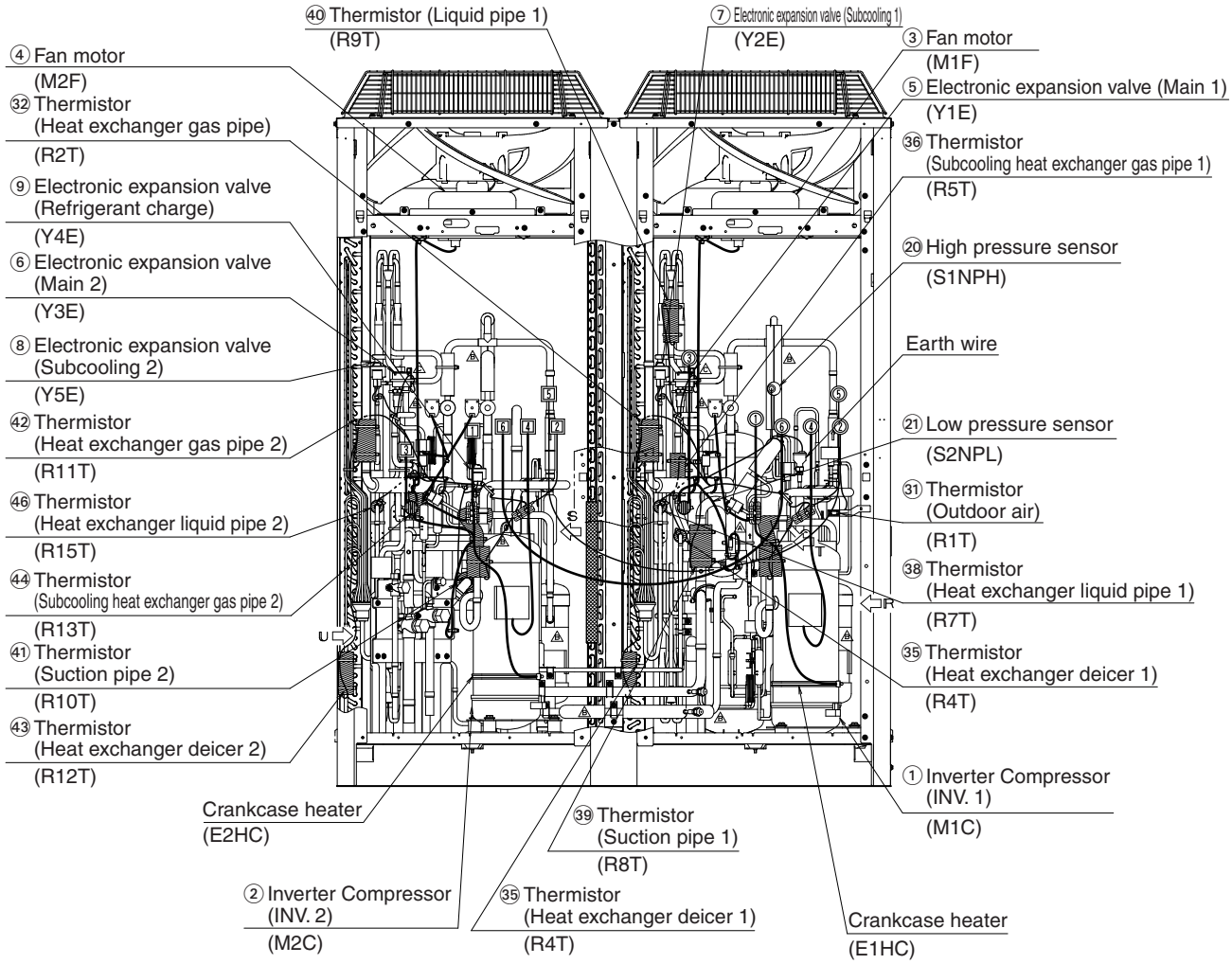
Note: For reference number, refer to P.23.

3.3 RXYQ144PBTJ

Plan



Front View

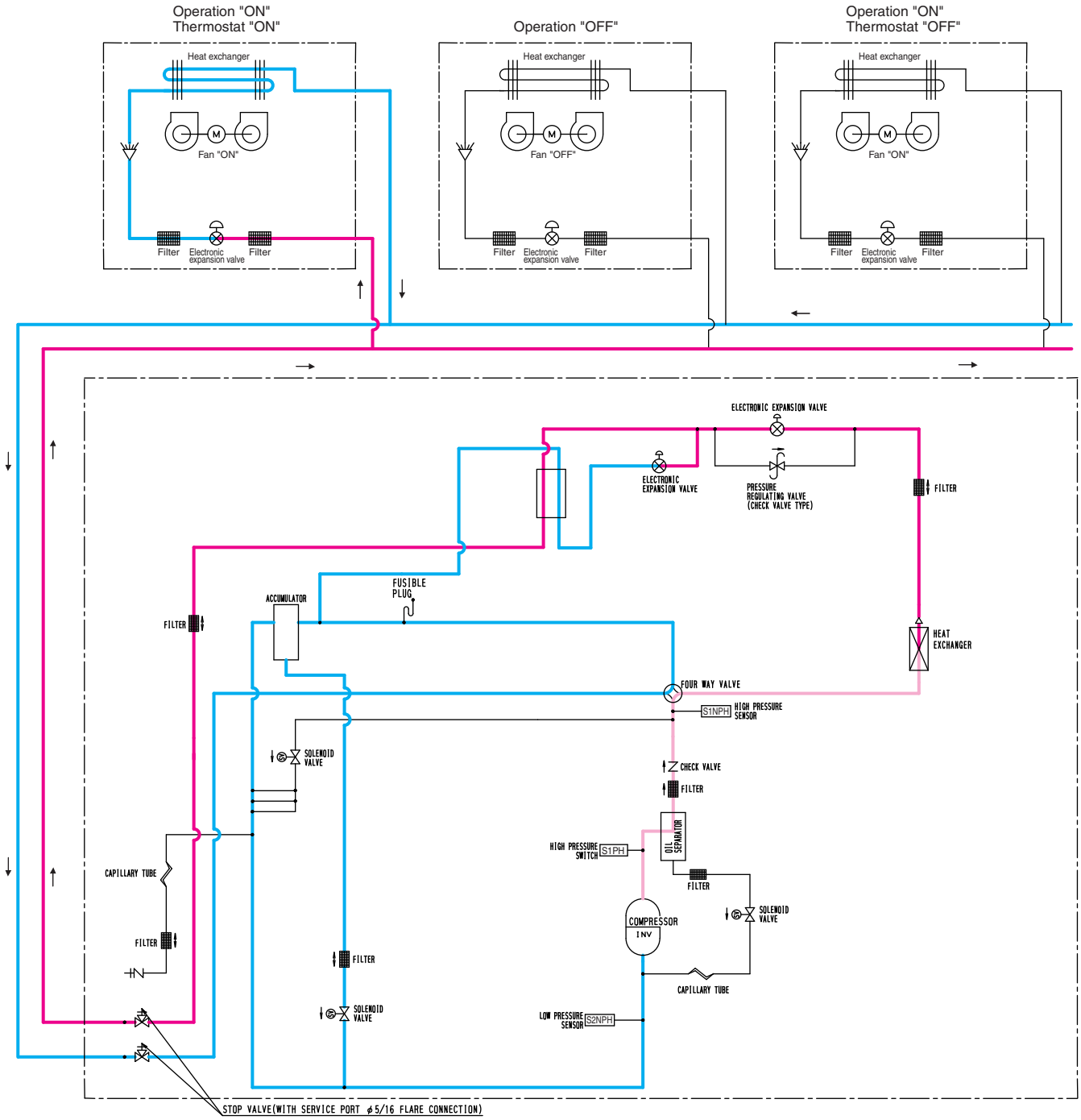


Note: For reference number, refer to P.25, 26.

4. Refrigerant Flow for Each Operation Mode

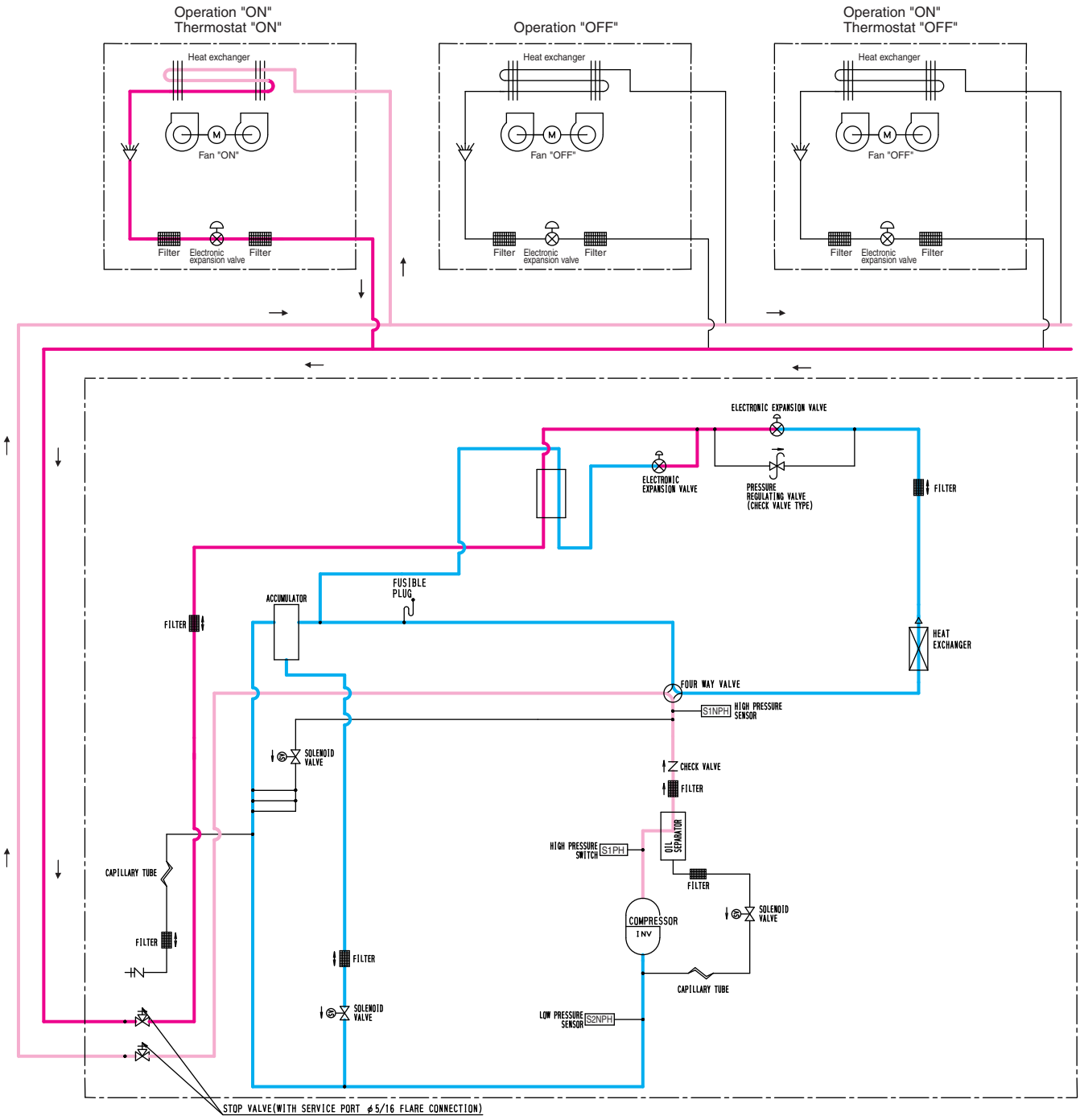
RXYQ72PBYD, PBTJ
Cooling Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



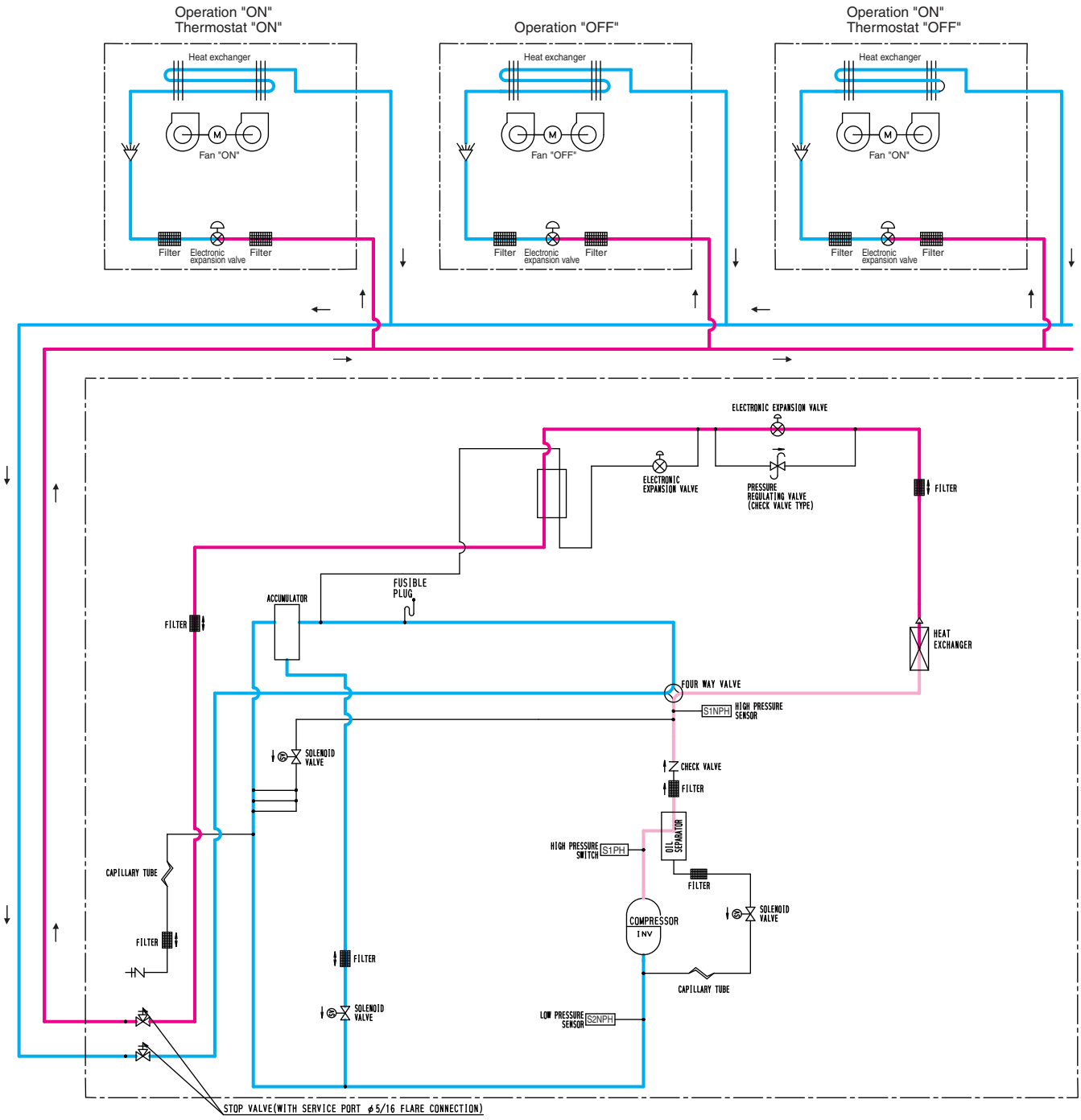
RXYQ72PBYD, PBTJ
Heating Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



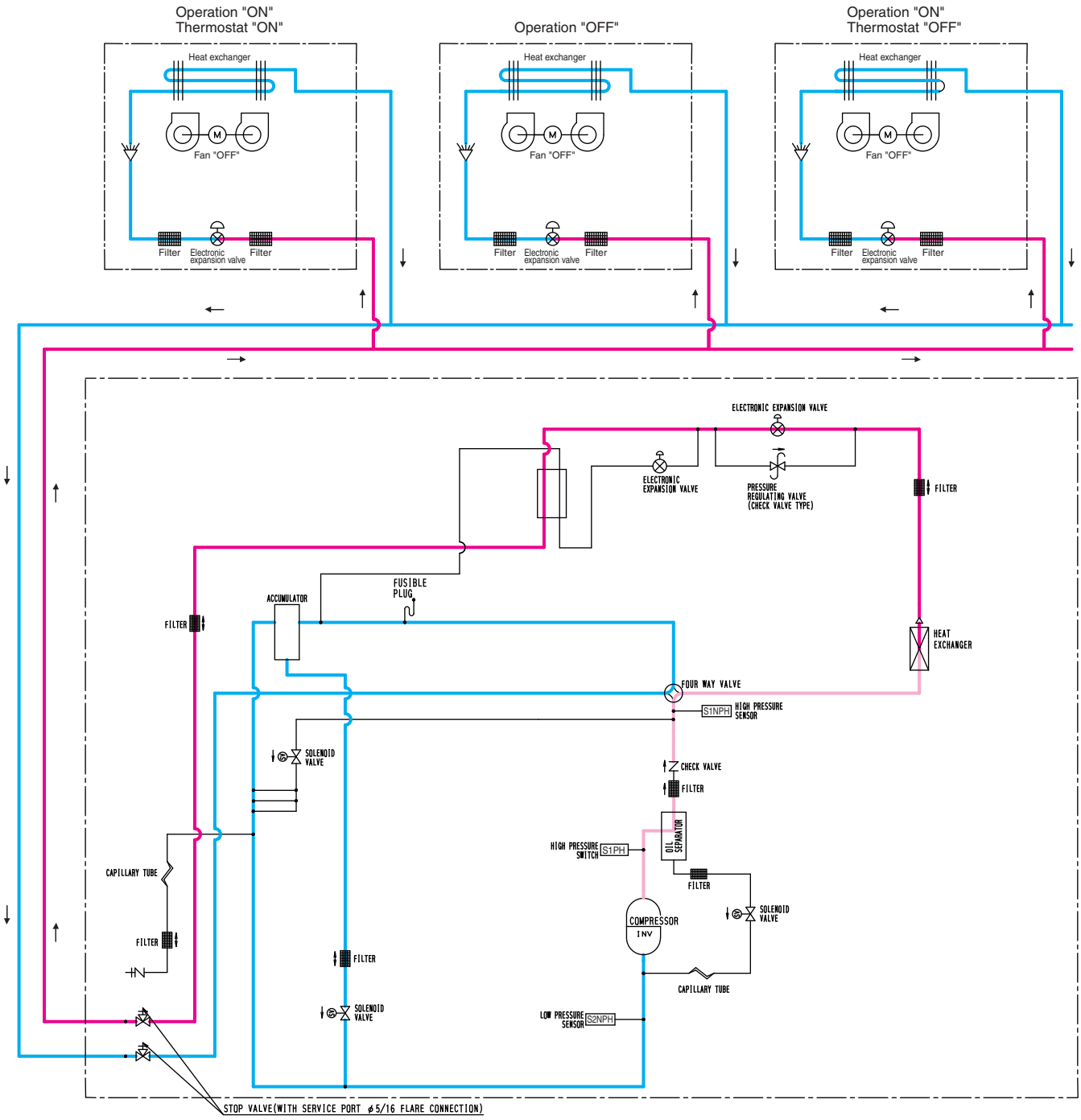
RXYQ72PBYD, PBTJ
Cooling Oil Return Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"

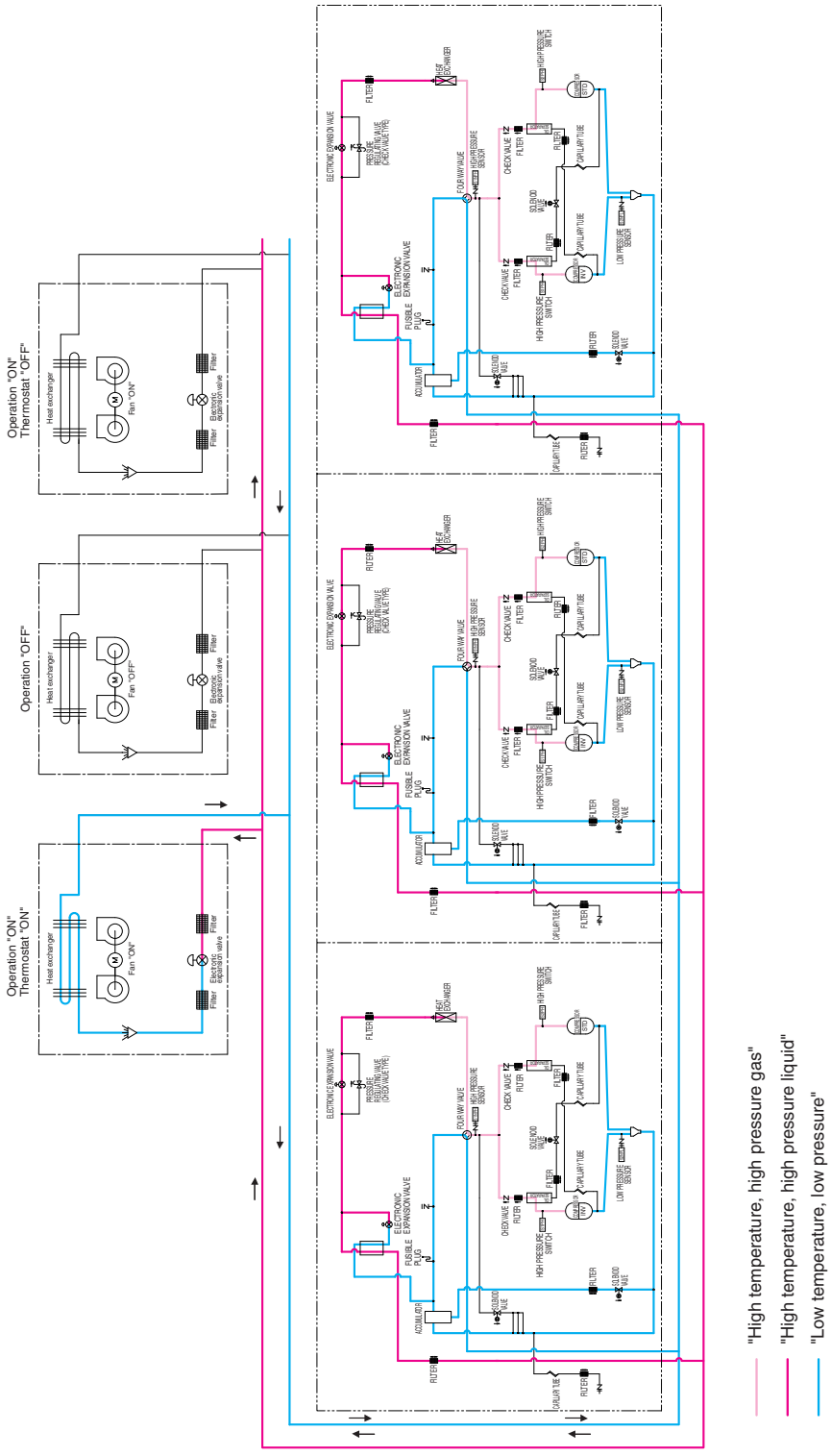


RXYQ72PBYD, PBTJ
Defrost, Heating Oil Return Operation

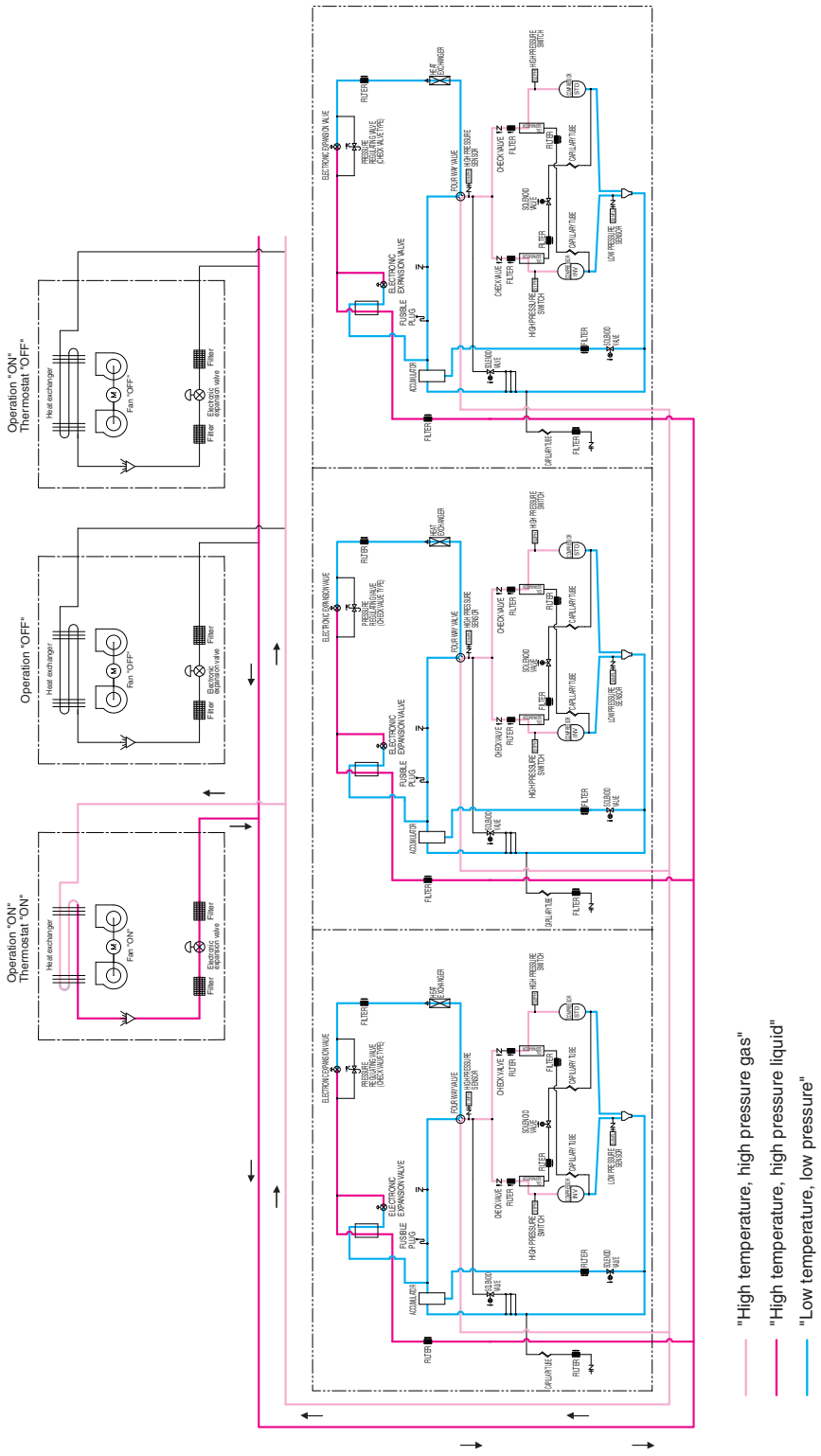
"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



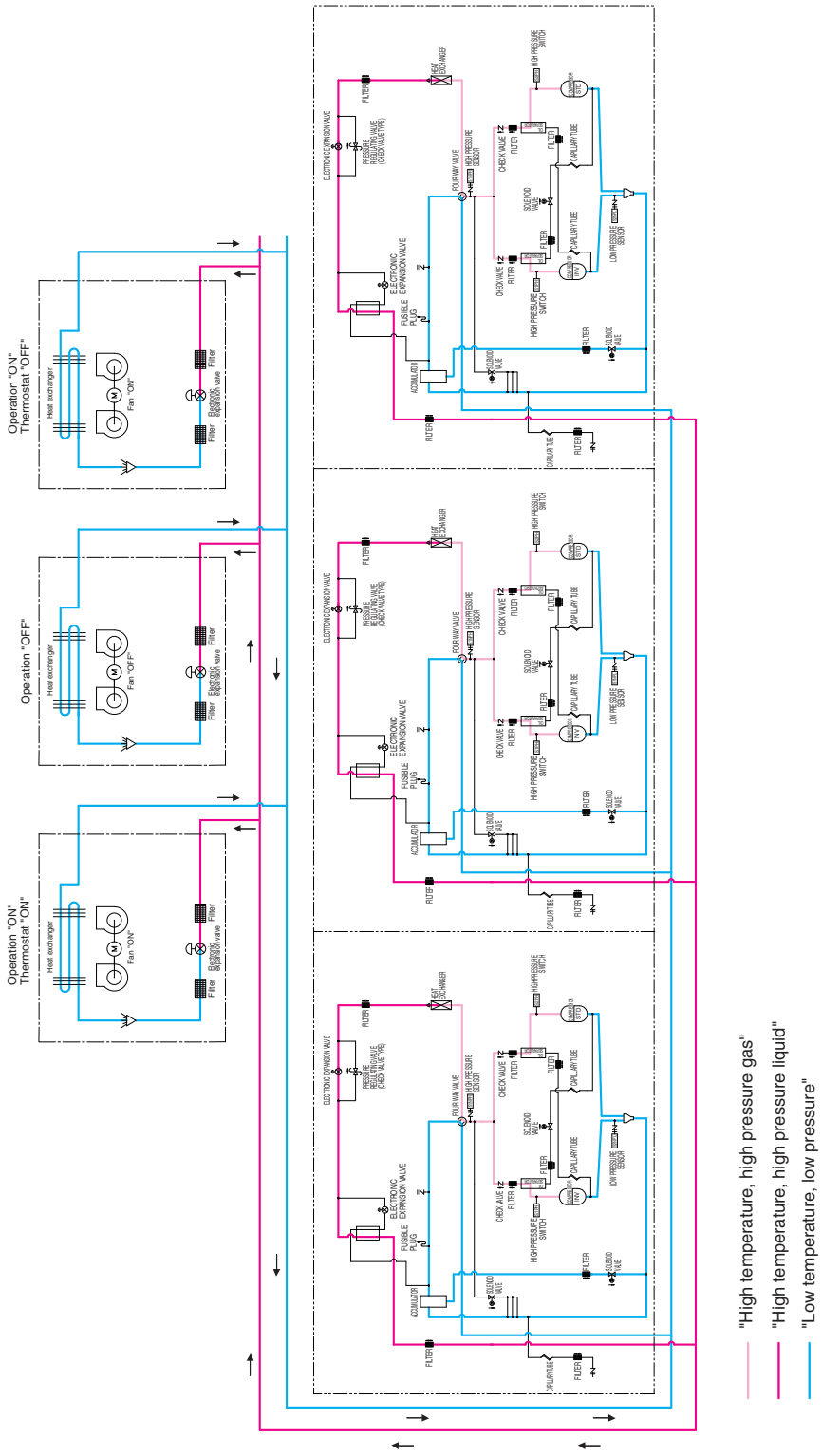
RXYQ144~360PBYD
RXYQ168~360PBTJ
Cooling Operation (When multiple units are connected)



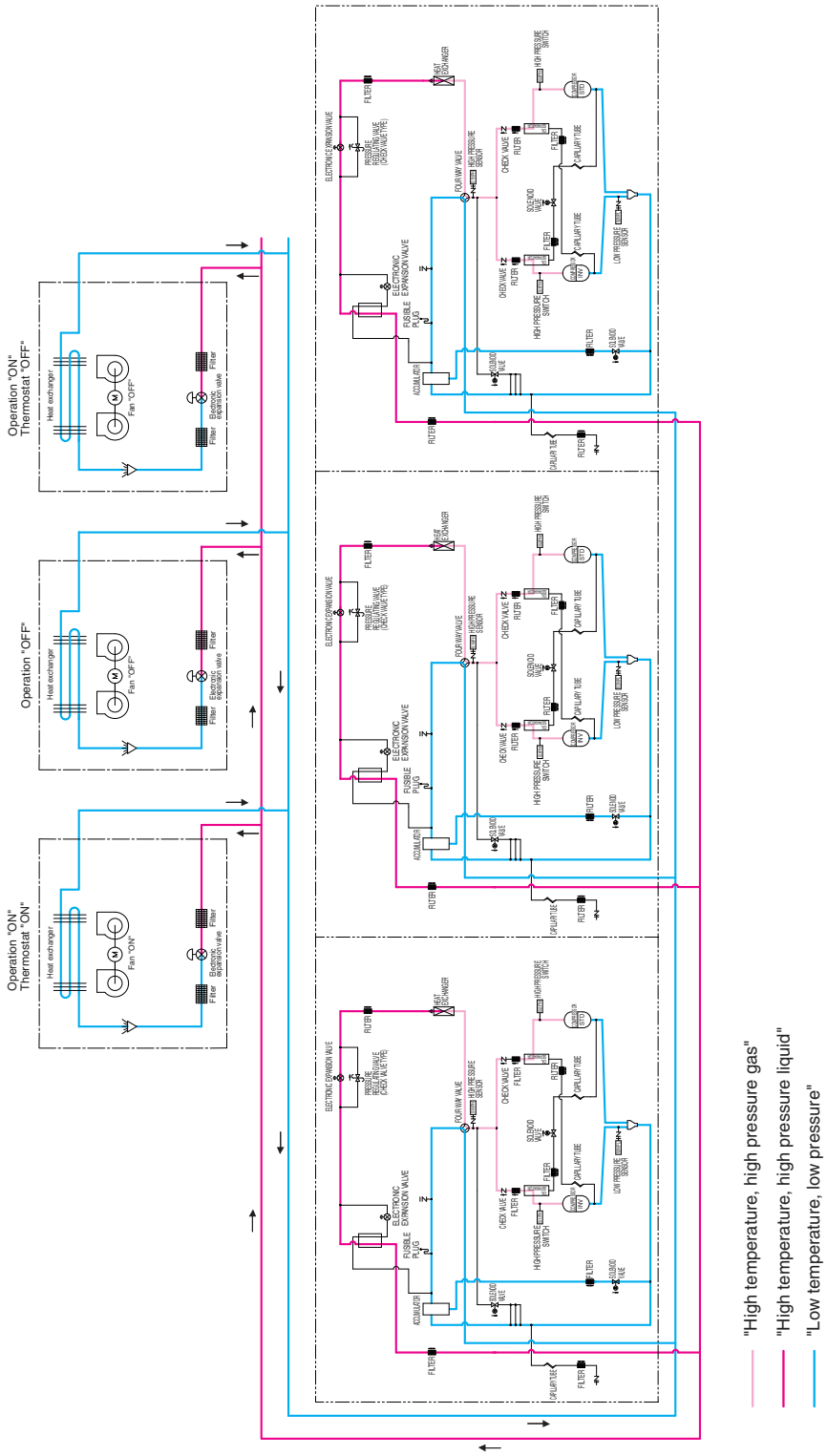
RXYQ144~360PBYD
RXYQ168~360PBTJ
Heating Operation (When multiple units are connected)



RXYQ144~360PBYD
RXYQ168~360PBTJ
Cooling Oil Return Operation (When multiple units are connected)

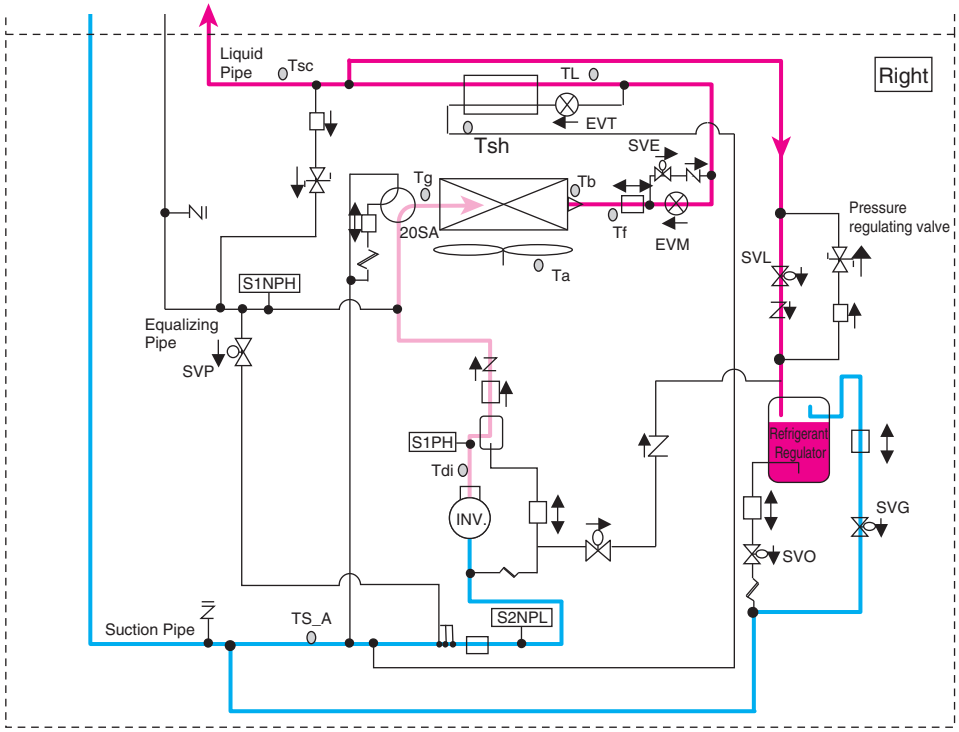


RXYQ144~360PBYD
RXYQ168~360PBTJ
Defrost, Heating Oil Return Operation (When multiple units are connected)

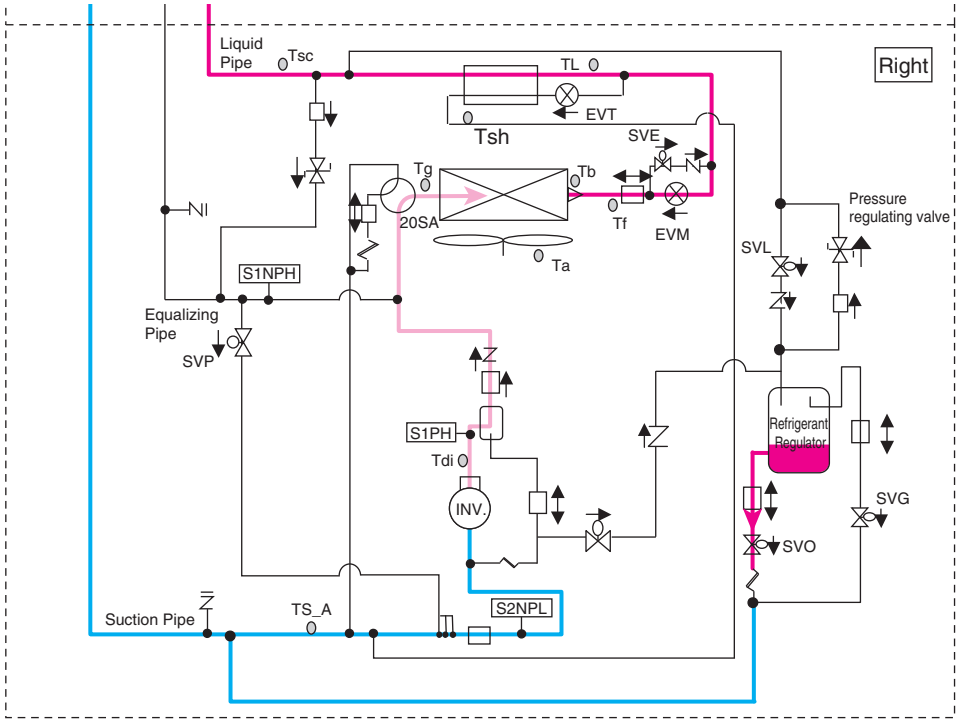


Operation of refrigerant regulator

1. **Recovery of refrigerant**
   Surplus refrigerant is recovered to refrigerant regulator by opening of SVL and SVG when the indoor unit load is small.



2. **Discharge of refrigerant**
   Discharge refrigerant from refrigerant regulator by opening of SVC when the load of the outdoor unit is large.



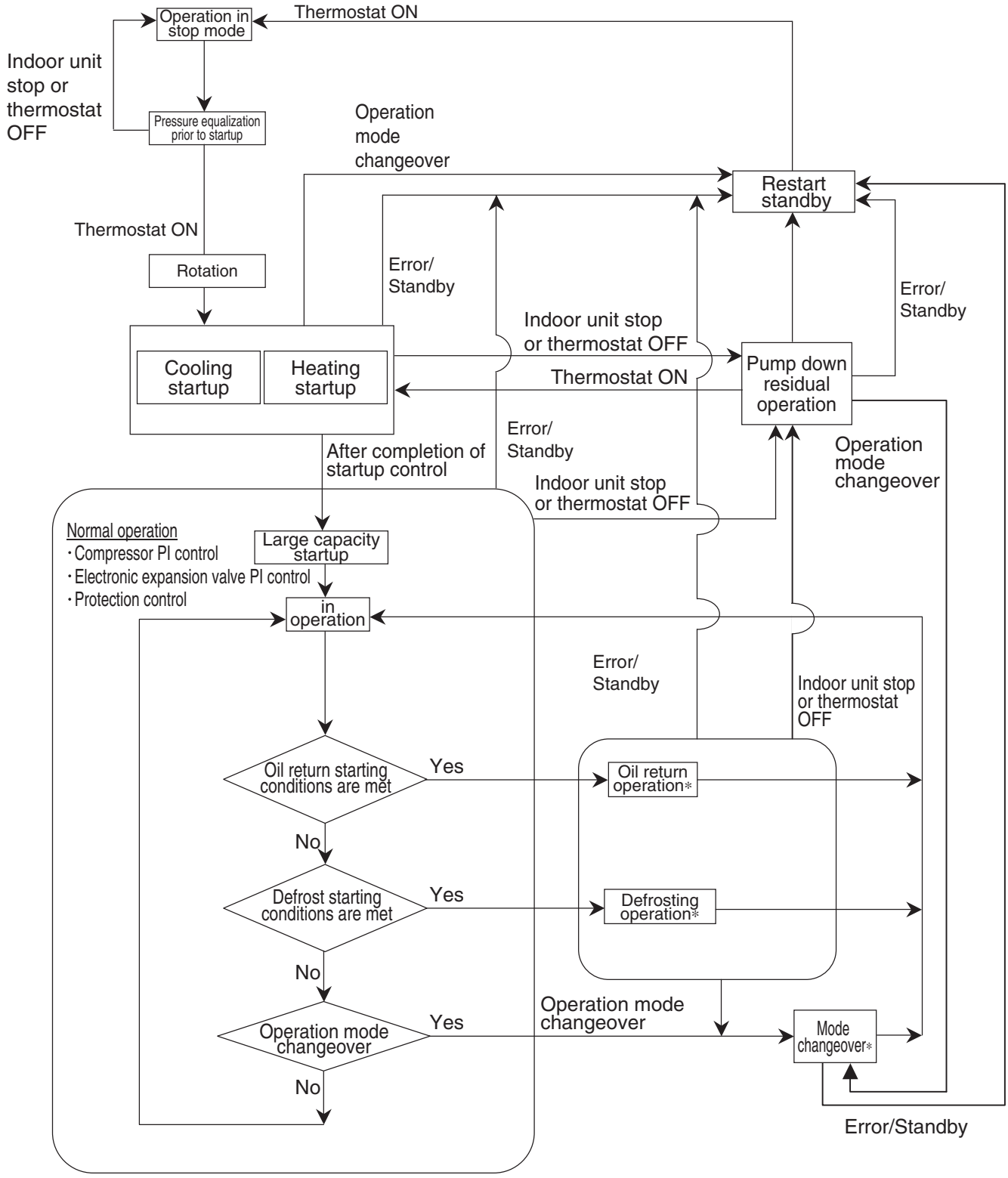
3. **Pressure regulating valve (Refrigerant regulator)**
   The circuit will be closed when SVL, SVO, SVG are all closed. In this case, the increased pressure in the refrigerant regulator will be transferred to the liquid refrigerant pipe side, to regulate the pressure.

5. Function General

5.1 Symbol

Symbol	Electric symbol			Description of function
	RXYQ72	RXYQ96•120	RXYQ144	
20SA	Y3S	Y3S	Y2S, Y9S	Four way valve (Heat exchanger switch)
20SB	—	—	Y8S	Four way valve (Dual pressure gas pipe switch)
DSH	—			Discharge pipe superheated degree (Discharge pipe temperature Td - High pressure equivalent saturation temperature Tc)
DSHi	—			Discharge pipe superheated degree of INV. compressor (Tdi - Tc)
DSHs	—			Discharge pipe superheated degree of STD compressor (Tds - Tc)
EV	—			Opening degree of electronic expansion valve
EVM	Y1E	Y1E	Y1E, Y3E	Electronic expansion valve for main heat exchanger
EVT	Y2E	Y2E	Y2E, Y5E	Electronic expansion valve for subcooling heat exchanger
EVJ	—	—	Y4E	Electronic expansion valve at the refrigerant charge port
HTDi	—			Value of INV. compressor discharge pipe temperature compensated with outdoor air temperature
HTDs	—			Value of STD compressor discharge pipe temperature compensated with outdoor air temperature
Pc	S1NPH			Value detected by high pressure sensor
Pe	S2NPL			Value detected by low pressure sensor
SH	—			Evaporator outlet superheated degree (Suction pipe temperature Ts1 - Low pressure equivalent saturation temperature Te)
SHS	—			Target of evaporator outlet superheated degree
SVP	Y1S	Y1S	Y4S	Solenoid valve for hot gas
SVO	Y2S	Y2S	Y7S	Solenoid valve for oil return
SVT	—	—	Y6S	Solenoid valve for injection
SVC	Y4S	Y4S	—	Solenoid valve (for accumulator oil return)
SVE	—	—	Y5S, Y10S	Bypass solenoid valve
SVG	—	—	Y1S	Solenoid valve for refrigerant regulator gas vent pipe
SVL	—	—	Y3S	Refrigerant regulator liquid pipe solenoid valve
Ta	R1T			Outdoor air temperature
Tb	R4T	R4T	R4T, R12T	Heat exchanger outlet temperature at cooling
Tc	—			High pressure equivalent saturation temperature
TcS	—			Target temperature of Tc
Tdi	R3T	R31T	R31T, R32T	Discharge pipe temperature of INV. compressor
Tds	—	R32T	—	Discharge pipe temperature of STD compressor
Te	—			Low pressure equivalent saturation temperature
TeS	—			Target temperature of Te
Tfin	R1T			Radiation fin temperature
Tsh	R5T	R5T	R5T, R13T	Temperature detected with the subcooling heat exchanger outlet thermistor
Tsc	—	—	R9T, R14T	Temperature of liquid pipe between liquid stop valve and subcooling heat exchanger
Ts1	R7T	R7T	—	Temperature of accumulator inlet
Tf	—	—	R7T, R15T	Temperature of liquid pipe between heat exchanger and main electronic expansion valve.
Tl	R6T	R6T	R6T	Liquid pipe temperature detected with the liquid pipe thermistor
TsA	R2T	R2T	R8T, R10T	Suction pipe temperature
Tp	—			Calculated value of compressor port temperature

5.2 Operation Mode



* "Oil return", "Defrost" and "Mode changeover" move on to the next process after the completion of above function in progress even if the thermostat is OFF during the operation.

6. Basic Control

6.1 Normal Operation

6.1.1 List of Functions in Normal Operation

Part Name	Symbol	Electric symbol			Function of Functional Part	
		RXYQ72	RXYQ96·120	RXYQ144	Normal Cooling	Normal Heating
Compressor 1	—	M1C	M1C	M1C	PI control, High pressure protection, Low pressure protection, Td protection, INV. protection,	PI control, High pressure protection, Low pressure protection, Td protection, INV. protection,
Compressor 2		—	M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	M1F	Cooling fan control	Outdoor unit heat exchanger: Condenser / Cooling fan control Outdoor unit heat exchanger: Evaporator / Fan step 7 or 8
Outdoor unit fan 2		—	M2F	M2F		
Electronic expansion valve (Main)	EVM	Y1E	Y1E	Y1E, Y3E	1375 pls	Outdoor unit heat exchanger: Condenser / Liquid pressure control Outdoor unit heat exchanger: Evaporator / PI control
Electronic expansion valve (Subcooling)	EVT	Y2E	Y2E	Y2E, Y5E	PI control	PI control
Electronic expansion valve (Refrigerant charge)	EVJ	—	—	Y4E	80 pls	80 pls
Four way valve (Heat exchanger switch)	20SA	Y3S	Y3S	Y2S, Y9S	OFF	Outdoor unit heat exchanger: Condenser / OFF Outdoor unit heat exchanger: Evaporator / ON
Four way valve (Dual pressure gas pipe switch)	20SB	—	—	Y8S	ON	OFF
Solenoid valve (Main bypass)	SVE	—	—	Y5S, Y10S	ON	OFF
Solenoid valve (Hot gas)	SVP	Y1S	Y1S	Y4S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	—	—	Y3S	ON for refrigerant recovery	ON for refrigerant recovery
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	—	—	Y1S	ON for refrigerant recovery	ON for refrigerant recovery
Solenoid valve (Refrigerant regulator discharge pipe)	SVO	Y2S	Y2S	Y7S	ON for refrigerant discharge	ON for refrigerant discharge
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	—	—	Y6S	ON for oil level control	ON for oil level control

Indoor unit actuator		Normal cooling	Normal heating
Fan	Thermostat ON unit	Remote controller setting	Remote controller setting
	Stopping unit	OFF	OFF
	Thermostat OFF unit	Remote controller setting	LL
Electronic expansion valve	Thermostat ON unit	Normal opening *1	Normal opening *2
	Stopping unit	0 pls	192 pls
	Thermostat OFF unit	0 pls	192 pls

*1. PI control : Evaporator outlet superheated degree (SH) constant.
*2. PI control : Condenser outlet subcooled degree (SC) constant.
*1 and 2 : Refer to “6 Control of Electronic Expansion Valve” on P.283.

6.2 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 set value (Make this setting while in Setting mode 2.)

Te setting

L	M (Normal) (factory setting)	H				
3	6	7	8	9	10	11

Te: Low pressure equivalent saturation temperature (°F)

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

∗On multi-outdoor-unit systems, this control is made according to values of the first-priority unit, which is detected with the pressure sensor.

[Heating operation]

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

Te set value (Make this setting while in Setting mode 2.)

Tc setting

L	M (Normal) (factory setting)	H
43	46	48

Tc: High pressure equivalent saturation temperature (°F)

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

∗On multi-outdoor-unit systems, this control is made according to values of the first-priority unit, which is detected with the pressure sensor.

Outdoor unit rotation

In the case of multi-outdoor-unit system, this outdoor unit rotation is used to prevent the compressor from burning out due to unbalanced oil level between outdoor units.

[Details of outdoor unit rotation]

In the case of multi-outdoor-unit system, each outdoor unit is given an operating priority for the control.

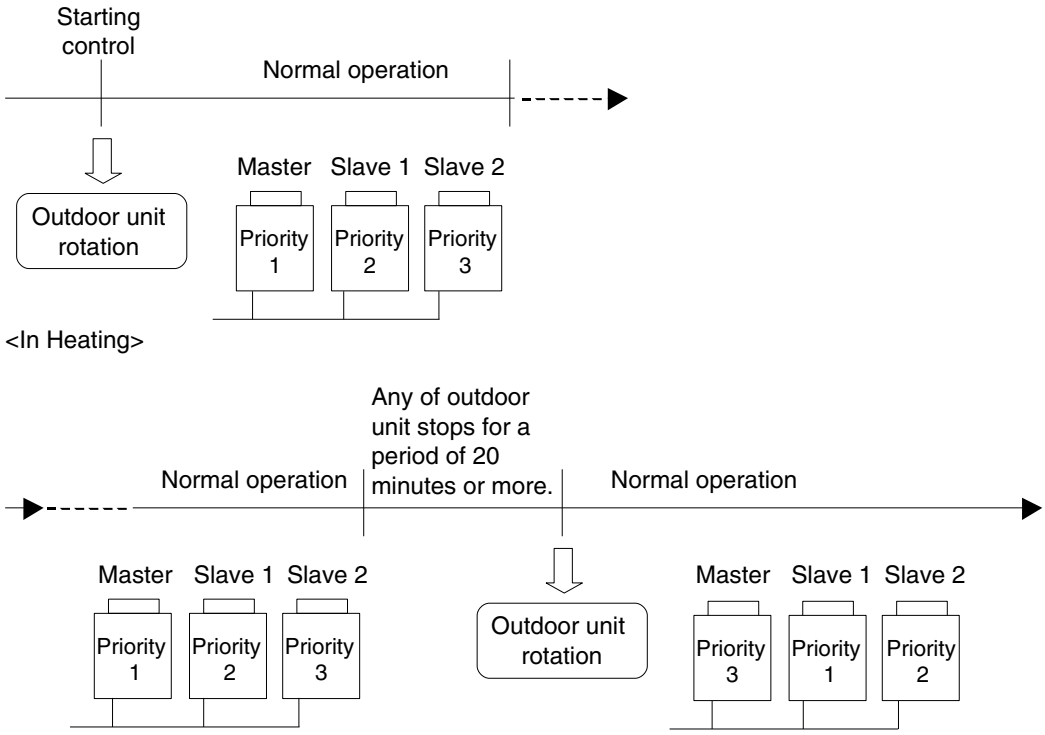
Outdoor unit rotation makes it possible to change the operating priority of outdoor units.

Thus, the system becomes free of compressors that stop over an extended period of time at the time of partial loading, preventing unbalanced oil level.

[Timing of outdoor unit rotation]

or
- At the beginning of the starting control
- When any of outdoor unit stops for a period of 20 minutes or more (in heating)

Example) The following diagram shows outdoor unit rotation in combination of 3 outdoor units. (in heating)



* "Master unit", "slave unit 1" and "slave unit 2" in this section are the names for installation. They are determined in installation work, and not changed thereafter. (These names are different from "master unit" and "slave unit" for control.)
The outdoor unit connected the control wires (F1 and F2) for the indoor unit should be designated as master unit.
Consequently, The LED display on the main PCB for "master unit", "slave unit 1" and "slave unit 2" do not change.

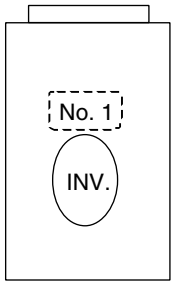
■ Operating Priority and Rotation of Compressors (For multi standard connection system)

Each compressor operates in the following order of priority.
In the case of multi-outdoor-unit system, each compressor operates in any of Pattern 1 through Pattern 3 according to the rotation of outdoor units.

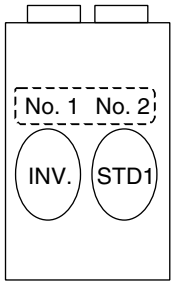
Pattern 1 Pattern 2 Pattern 3

INV: Inverter compressor
STD1: Standard compressor 1
STD2: Standard compressor 2

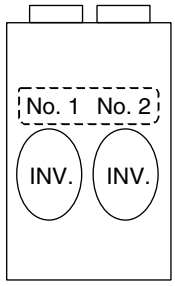
RXYQ72PBYD, TJ



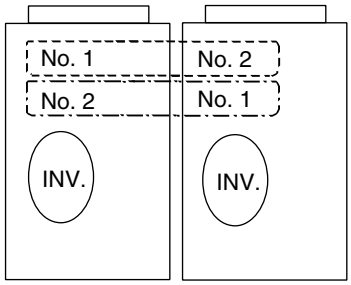
RXYQ96, 120PBYD, TJ



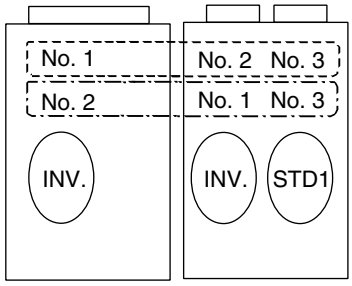
RXYQ144PBTJ



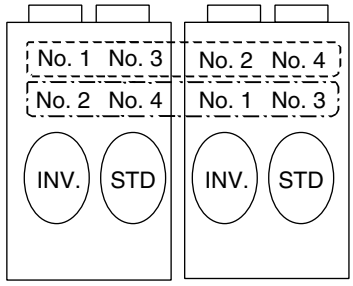
RXYQ144PBYD



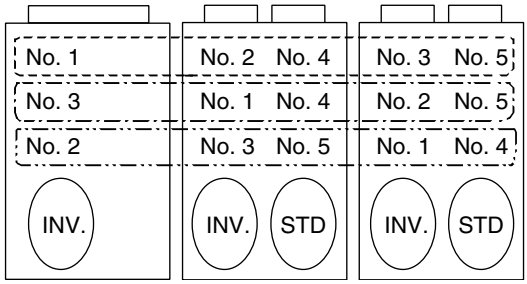
RXYQ168, 192PBYD, TJ



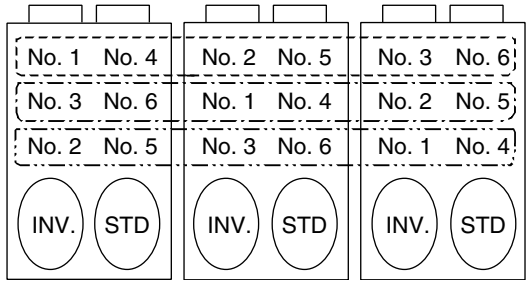
RXYQ216, 240PBYD, TJ



RXYQ264, 288, 312PBYD, TJ



RXYQ336, 360PBYD, TJ



*

- In the case of combination of 3 outdoor units, the above diagram shows master unit, slave unit 1, and slave unit 2 from left to right.
- Compressors may operate in any pattern other than those mentioned above according to the operating status.

■ Compressor Step Control (Multi outdoor unit connection is available on the standard connection system)
Compressor operations vary with the following steps according to information in "6.2 Compressor PI Control". Furthermore, the operating priority of compressors is subject to information in "■ Operating Priority and Rotation of Compressors".

RXYQ72PB

STEP No.	INV.
1	52 Hz
2	56 Hz
3	62 Hz
4	68 Hz
5	74 Hz
6	80 Hz
7	88 Hz
8	96 Hz
9	104 Hz
10	110 Hz
11	116 Hz
12	124 Hz
13	132 Hz
14	144 Hz
15	158 Hz
16	166 Hz
17	176 Hz
18	188 Hz
19	202 Hz
20	210 Hz
21	218 Hz
22	232 Hz
23	248 Hz
24	266 Hz
25	280 Hz

RXYQ96 · 120PB

STEP No.	INV.	STD1
1	52 Hz	OFF
2	56 Hz	OFF
3	62 Hz	OFF
4	68 Hz	OFF
5	74 Hz	OFF
6	80 Hz	OFF
7	88 Hz	OFF
8	96 Hz	OFF
9	104 Hz	OFF
10	110 Hz	OFF
11	116 Hz	OFF
12	124 Hz	OFF
13	132 Hz	OFF
14	144 Hz	OFF
15	158 Hz	OFF
16	166 Hz	OFF
17	176 Hz	OFF
18	188 Hz	OFF
19	202 Hz	OFF
20	210 Hz	OFF
21	52 Hz	ON
22	62 Hz	ON
23	68 Hz	ON
24	74 Hz	ON
25	80 Hz	ON
26	88 Hz	ON
27	96 Hz	ON
28	104 Hz	ON
29	116 Hz	ON
30	124 Hz	ON
31	132 Hz	ON
32	144 Hz	ON
33	158 Hz	ON
34	176 Hz	ON
35	188 Hz	ON
36	202 Hz	ON
37	210 Hz	ON

RXYQ144PBTJ

STEP No.	INV.1	INV.2
1	52 Hz	52 Hz
2	56 Hz	56 Hz
3	62 Hz	62 Hz
4	66 Hz	66 Hz
5	70 Hz	70 Hz
6	74 Hz	74 Hz
7	80 Hz	80 Hz
8	88 Hz	88 Hz
9	92 Hz	92 Hz
10	96 Hz	96 Hz
11	104 Hz	104 Hz
12	110 Hz	110 Hz
13	116 Hz	116 Hz
14	124 Hz	124 Hz
15	132 Hz	132 Hz
16	144 Hz	144 Hz
17	158 Hz	158 Hz
18	166 Hz	166 Hz
19	176 Hz	176 Hz
20	188 Hz	188 Hz
21	202 Hz	202 Hz
22	210 Hz	210 Hz
23	218 Hz	218 Hz
24	232 Hz	232 Hz
25	248 Hz	248 Hz
26	266 Hz	266 Hz
27	280 Hz	280 Hz

Note:

1. INV : Inverter compressor
   STD1 : Standard compressor 1
   STD2 : Standard compressor 2
2. Depending on the operating conditions of compressors, the compressors may run in patterns other than those aforementioned.

RXYQ144PBYD

STEP No.	INV.1	INV.2	STD
1	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	OFF
3	62 Hz	62 Hz	OFF
4	66 Hz	66 Hz	OFF
5	70 Hz	70 Hz	OFF
6	74 Hz	74 Hz	OFF
7	80 Hz	80 Hz	OFF
8	88 Hz	88 Hz	OFF
9	92 Hz	92 Hz	OFF
10	96 Hz	96 Hz	OFF
11	104 Hz	104 Hz	OFF
12	110 Hz	110 Hz	OFF
13	116 Hz	116 Hz	OFF
14	124 Hz	124 Hz	OFF
15	132 Hz	132 Hz	OFF
16	144 Hz	144 Hz	OFF
17	158 Hz	158 Hz	OFF
18	166 Hz	166 Hz	OFF
19	176 Hz	176 Hz	OFF
20	80 Hz	80 Hz	ON
21	88 Hz	88 Hz	ON
22	96 Hz	96 Hz	ON
23	104 Hz	104 Hz	ON
24	116 Hz	116 Hz	ON
25	124 Hz	124 Hz	ON
26	132 Hz	132 Hz	ON
27	144 Hz	144 Hz	ON
28	158 Hz	158 Hz	ON
29	176 Hz	176 Hz	ON
30	188 Hz	188 Hz	ON
31	202 Hz	202 Hz	ON
32	210 Hz	210 Hz	ON

RXYQ168 · 192PB

STEP No.	INV.1	INV.2	STD
1	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	OFF
3	62 Hz	62 Hz	OFF
4	66 Hz	66 Hz	OFF
5	70 Hz	70 Hz	OFF
6	74 Hz	74 Hz	OFF
7	80 Hz	80 Hz	OFF
8	88 Hz	88 Hz	OFF
9	92 Hz	92 Hz	OFF
10	96 Hz	96 Hz	OFF
11	104 Hz	104 Hz	OFF
12	110 Hz	110 Hz	OFF
13	116 Hz	116 Hz	OFF
14	124 Hz	124 Hz	OFF
15	132 Hz	132 Hz	OFF
16	144 Hz	144 Hz	OFF
17	158 Hz	158 Hz	OFF
18	166 Hz	166 Hz	OFF
19	176 Hz	176 Hz	OFF
20	80 Hz	80 Hz	ON
21	88 Hz	88 Hz	ON
22	96 Hz	96 Hz	ON
23	104 Hz	104 Hz	ON
24	116 Hz	116 Hz	ON
25	124 Hz	124 Hz	ON
26	132 Hz	132 Hz	ON
27	144 Hz	144 Hz	ON
28	158 Hz	158 Hz	ON
29	176 Hz	176 Hz	ON
30	188 Hz	188 Hz	ON
31	202 Hz	202 Hz	ON
32	210 Hz	210 Hz	ON
33	218 Hz	218 Hz	ON
34	232 Hz	232 Hz	ON
35	248 Hz	248 Hz	ON
36	266 Hz	266 Hz	ON
37	280 Hz	280 Hz	ON

Note:

1. INV : Inverter compressor
   STD1 : Standard compressor 1
   STD2 : Standard compressor 2
2. Depending on the operating conditions of compressors, the compressors may run in patterns other than those aforementioned.

RXYQ216 · 240PB

STEP No.	INV.1	INV.2	STD1	STD2
1	52 Hz	52 Hz	OFF	OFF
2	56 Hz	56 Hz	OFF	OFF
3	62 Hz	62 Hz	OFF	OFF
4	66 Hz	66 Hz	OFF	OFF
5	70 Hz	70 Hz	OFF	OFF
6	74 Hz	74 Hz	OFF	OFF
7	80 Hz	80 Hz	OFF	OFF
8	88 Hz	88 Hz	OFF	OFF
9	92 Hz	92 Hz	OFF	OFF
10	96 Hz	96 Hz	OFF	OFF
11	104 Hz	104 Hz	OFF	OFF
12	110 Hz	110 Hz	OFF	OFF
13	116 Hz	116 Hz	OFF	OFF
14	124 Hz	124 Hz	OFF	OFF
15	132 Hz	132 Hz	OFF	OFF
16	144 Hz	144 Hz	OFF	OFF
17	158 Hz	158 Hz	OFF	OFF
18	166 Hz	166 Hz	OFF	OFF
19	176 Hz	176 Hz	OFF	OFF
20	80 Hz	80 Hz	ON	OFF
21	88 Hz	88 Hz	ON	OFF
22	96 Hz	96 Hz	ON	OFF
23	104 Hz	104 Hz	ON	OFF
24	116 Hz	116 Hz	ON	OFF
25	124 Hz	124 Hz	ON	OFF
26	132 Hz	132 Hz	ON	OFF
27	88 Hz	88 Hz	ON	ON
28	96 Hz	96 Hz	ON	ON
29	104 Hz	104 Hz	ON	ON
30	124 Hz	124 Hz	ON	ON
31	144 Hz	144 Hz	ON	ON
32	158 Hz	158 Hz	ON	ON
33	166 Hz	166 Hz	ON	ON
34	176 Hz	176 Hz	ON	ON
35	188 Hz	188 Hz	ON	ON
36	202 Hz	202 Hz	ON	ON
37	210 Hz	210 Hz	ON	ON
38	218 Hz	218 Hz	ON	ON
39	232 Hz	232 Hz	ON	ON
40	248 Hz	248 Hz	ON	ON
41	266 Hz	266 Hz	ON	ON
42	280 Hz	280 Hz	ON	ON

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STEP No.	INV.1	INV.2	INV.3	STD1	STD2
1	52 Hz	52 Hz	52 Hz	OFF	OFF
2	56 Hz	56 Hz	56 Hz	OFF	OFF
3	62 Hz	62 Hz	62 Hz	OFF	OFF
4	66 Hz	66 Hz	66 Hz	OFF	OFF
5	68 Hz	68 Hz	68 Hz	OFF	OFF
6	70 Hz	70 Hz	70 Hz	OFF	OFF
7	74 Hz	74 Hz	74 Hz	OFF	OFF
8	80 Hz	80 Hz	80 Hz	OFF	OFF
9	88 Hz	88 Hz	88 Hz	OFF	OFF
10	96 Hz	96 Hz	96 Hz	OFF	OFF
11	104 Hz	104 Hz	104 Hz	OFF	OFF
12	110 Hz	110 Hz	110 Hz	OFF	OFF
13	116 Hz	116 Hz	116 Hz	OFF	OFF
14	124 Hz	124 Hz	124 Hz	OFF	OFF
15	80 Hz	80 Hz	80 Hz	ON	OFF
16	88 Hz	88 Hz	88 Hz	ON	OFF
17	96 Hz	96 Hz	96 Hz	ON	OFF
18	104 Hz	104 Hz	104 Hz	ON	OFF
19	116 Hz	116 Hz	116 Hz	ON	OFF
20	124 Hz	124 Hz	124 Hz	ON	OFF
21	132 Hz	132 Hz	132 Hz	ON	OFF
22	88 Hz	88 Hz	88 Hz	ON	ON
23	96 Hz	96 Hz	96 Hz	ON	ON
24	104 Hz	104 Hz	104 Hz	ON	ON
25	124 Hz	124 Hz	124 Hz	ON	ON
26	144 Hz	144 Hz	144 Hz	ON	ON
27	158 Hz	158 Hz	158 Hz	ON	ON
28	166 Hz	166 Hz	166 Hz	ON	ON
29	176 Hz	176 Hz	176 Hz	ON	ON
30	188 Hz	188 Hz	188 Hz	ON	ON
31	202 Hz	202 Hz	202 Hz	ON	ON
32	210 Hz	210 Hz	210 Hz	ON	ON
33	218 Hz	218 Hz	218 Hz	ON	ON
34	232 Hz	232 Hz	232 Hz	ON	ON
35	248 Hz	248 Hz	248 Hz	ON	ON
36	266 Hz	266 Hz	266 Hz	ON	ON
37	280 Hz	280 Hz	280 Hz	ON	ON

Note:

1. INV : Inverter compressor
   STD1 : Standard compressor 1
   STD2 : Standard compressor 2
2. Depending on the operating conditions of compressors, the compressors may run in patterns other than those aforementioned.

RXYQ336 · 360PB

STEP No.	INV.1	INV.2	INV.3	STD1	STD2	STD3
1	52 Hz	52 Hz	52 Hz	OFF	OFF	OFF
2	56 Hz	56 Hz	56 Hz	OFF	OFF	OFF
3	62 Hz	62 Hz	62 Hz	OFF	OFF	OFF
4	66 Hz	66 Hz	66 Hz	OFF	OFF	OFF
5	68 Hz	68 Hz	68 Hz	OFF	OFF	OFF
6	70 Hz	70 Hz	70 Hz	OFF	OFF	OFF
7	74 Hz	74 Hz	74 Hz	OFF	OFF	OFF
8	80 Hz	80 Hz	80 Hz	OFF	OFF	OFF
9	88 Hz	88 Hz	88 Hz	OFF	OFF	OFF
10	96 Hz	96 Hz	96 Hz	OFF	OFF	OFF
11	104 Hz	104 Hz	104 Hz	OFF	OFF	OFF
12	110 Hz	110 Hz	110 Hz	OFF	OFF	OFF
13	116 Hz	116 Hz	116 Hz	OFF	OFF	OFF
14	124 Hz	124 Hz	124 Hz	OFF	OFF	OFF
15	80 Hz	80 Hz	80 Hz	ON	OFF	OFF
16	88 Hz	88 Hz	88 Hz	ON	OFF	OFF
17	96 Hz	96 Hz	96 Hz	ON	OFF	OFF
18	104 Hz	104 Hz	104 Hz	ON	OFF	OFF
19	116 Hz	116 Hz	116 Hz	ON	OFF	OFF
20	124 Hz	124 Hz	124 Hz	ON	OFF	OFF
21	132 Hz	132 Hz	132 Hz	ON	OFF	OFF
22	88 Hz	88 Hz	88 Hz	ON	ON	OFF
23	96 Hz	96 Hz	96 Hz	ON	ON	OFF
24	104 Hz	104 Hz	104 Hz	ON	ON	OFF
25	124 Hz	124 Hz	124 Hz	ON	ON	OFF
26	144 Hz	144 Hz	144 Hz	ON	ON	OFF
27	92 Hz	92 Hz	92 Hz	ON	ON	ON
28	104 Hz	104 Hz	104 Hz	ON	ON	ON
29	116 Hz	116 Hz	116 Hz	ON	ON	ON
30	124 Hz	124 Hz	124 Hz	ON	ON	ON
31	144 Hz	144 Hz	144 Hz	ON	ON	ON
32	158 Hz	158 Hz	158 Hz	ON	ON	ON
33	166 Hz	166 Hz	166 Hz	ON	ON	ON
34	176 Hz	176 Hz	176 Hz	ON	ON	ON
35	188 Hz	188 Hz	188 Hz	ON	ON	ON
36	202 Hz	202 Hz	202 Hz	ON	ON	ON
37	210 Hz	210 Hz	210 Hz	ON	ON	ON
38	218 Hz	218 Hz	218 Hz	ON	ON	ON
39	232 Hz	232 Hz	232 Hz	ON	ON	ON
40	248 Hz	248 Hz	248 Hz	ON	ON	ON
41	266 Hz	266 Hz	266 Hz	ON	ON	ON
42	280 Hz	280 Hz	280 Hz	ON	ON	ON

Note:

1. INV : Inverter compressor
   STD1 : Standard compressor 1
   STD2 : Standard compressor 2
2. Depending on the operating conditions of compressors, the compressors may run in patterns other than those aforementioned.

6.3 Electronic Expansion Valve PI Control

Main electronic expansion valve EVM control

When the outdoor unit heat exchanging is performed via the evaporator (20SA is set to ON), this function is used to exert PI control on the electronic expansion valve (Y1E or Y3E) so that the evaporator outlet superheated degree (SH) will become constant.

SH = Tg - Te

SH : Evaporator outlet superheated degree (°F)
Tg : Suction pipe temperature (°F) detected by the heat exchanger gas pipe thermistor R2T.
Te : Low pressure equivalent saturation temperature (°F)

Subcooling electronic expansion valve EVT control

In order to make the maximum use of the subcooling heat exchanger, this function is used to exert PI control on the electronic expansion valve (Y2E, Y3E) so that the evaporator-side gas pipe superheated degree (SH) will become constant.

SH = Tsh - Te

SH: Evaporator outlet superheated degree (°F)
Tsh: Suction pipe temperature (°F) detected by the subcooling heat exchanger outlet thermistor R5T
Te: Low pressure equivalent saturation temperature (°F)

Refrigerant charge electronic expansion valve EVJ control

While in automatic refrigerant charge mode, this function is used to exert PI control on the opening degree of the electronic expansion valve (Y2E) in response to outdoor temperature and close the valve after the completion of refrigerant charge.
For normal operation, fully open this electronic expansion valve.

6.4 Step Control of Outdoor Unit Fans

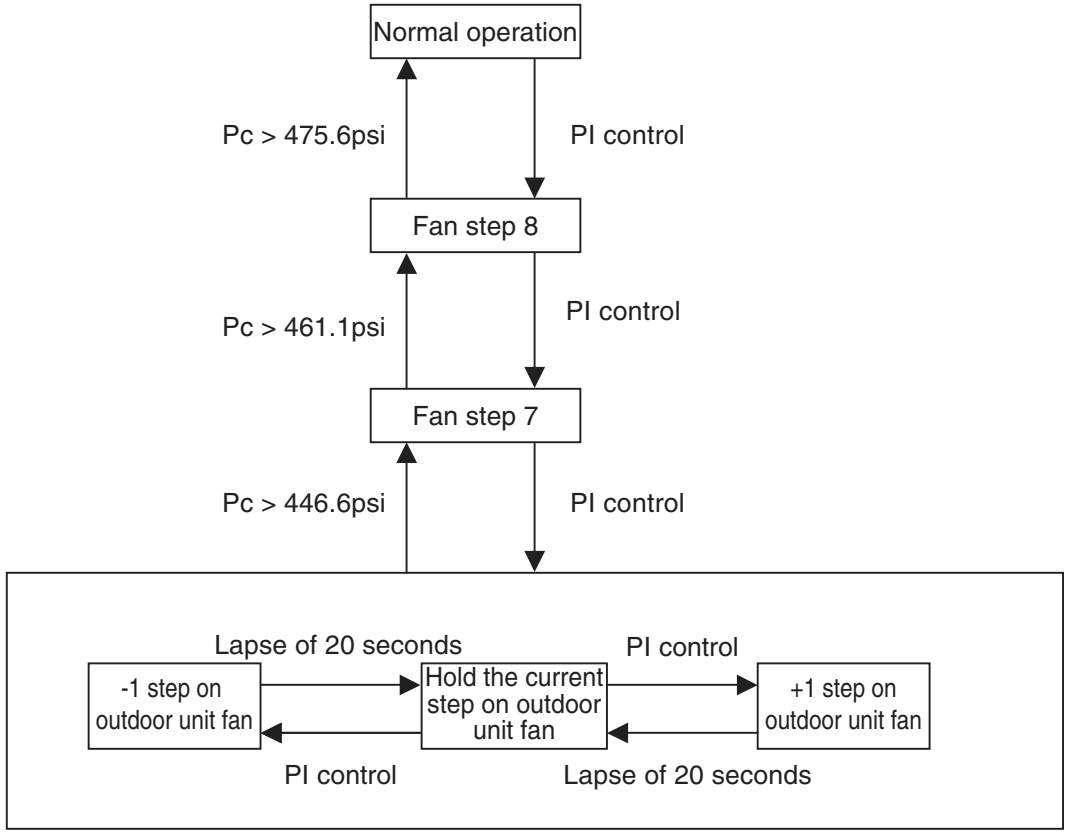
Used to control the revolutions of outdoor unit fans in the steps listed in table below, according to condition changes.

STEP No.	Fan revolutions (rpm)			
	RXYQ72PBYD, TJ	RXYQ96PBYD, TJ	RXYQ120PBYD, TJ	RXYQ144PBTJ
0	0	0	0	0
1	350	350	350	285/255
2	370	370	370	360/315
3	400	400	400	395/365
4	450	450	450	480/440
5	560	560	560	560/530
6	680	680	680	760/730
7	710	710	710	960/930
8	750	750	775	1155/1125
9	821	821	870	1200/1170
				Fan1/Fan2

* Figures listed above are all those controlled while in standard mode, which vary when the system is set to high static pressure or capacity precedence mode.

6.5 Outdoor Unit Fan Control in Cooling

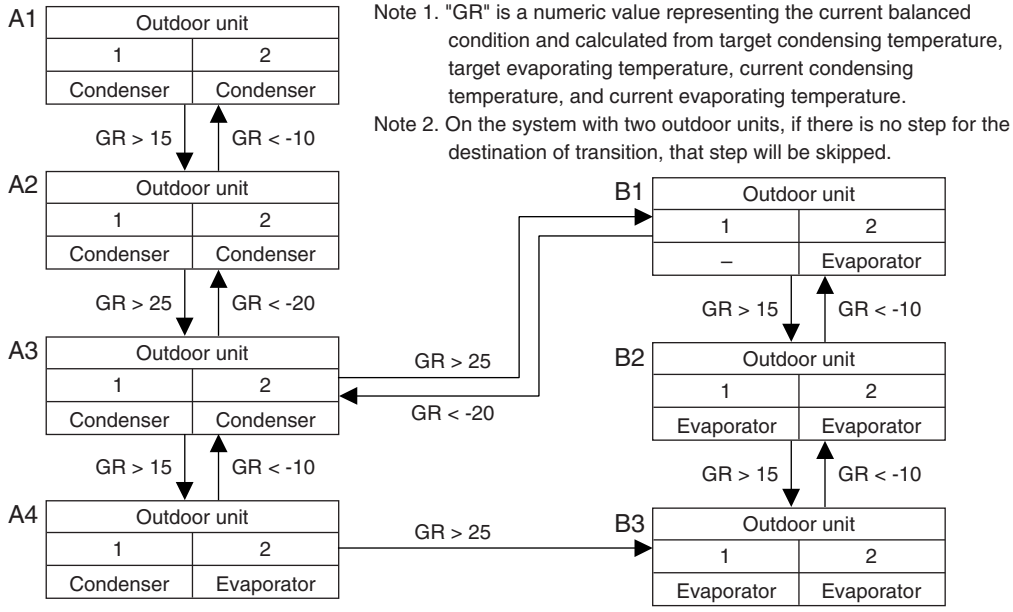
While in cooling operation, if the outdoor temperature is low, this mode provides high pressure control using the outdoor unit fan to retain appropriate liquid pressure, thus ensuring refrigerant circulation rate to be supplied to indoor units.



6.6 Heat Exchanger Control

In case of multi outdoor unit systems, this function is used to ensure condensing and evaporating temperatures by changing over the air heat exchanger of the outdoor unit to the evaporator or the condenser in response to loads while in heating operation.

[Multi outdoor unit system]



Note 1. "GR" is a numeric value representing the current balanced condition and calculated from target condensing temperature, target evaporating temperature, current condensing temperature, and current evaporating temperature.

Note 2. On the system with two outdoor units, if there is no step for the destination of transition, that step will be skipped.

7. Special Control

7.1 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. Furthermore, 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.

7.1.1 Startup Control in Cooling

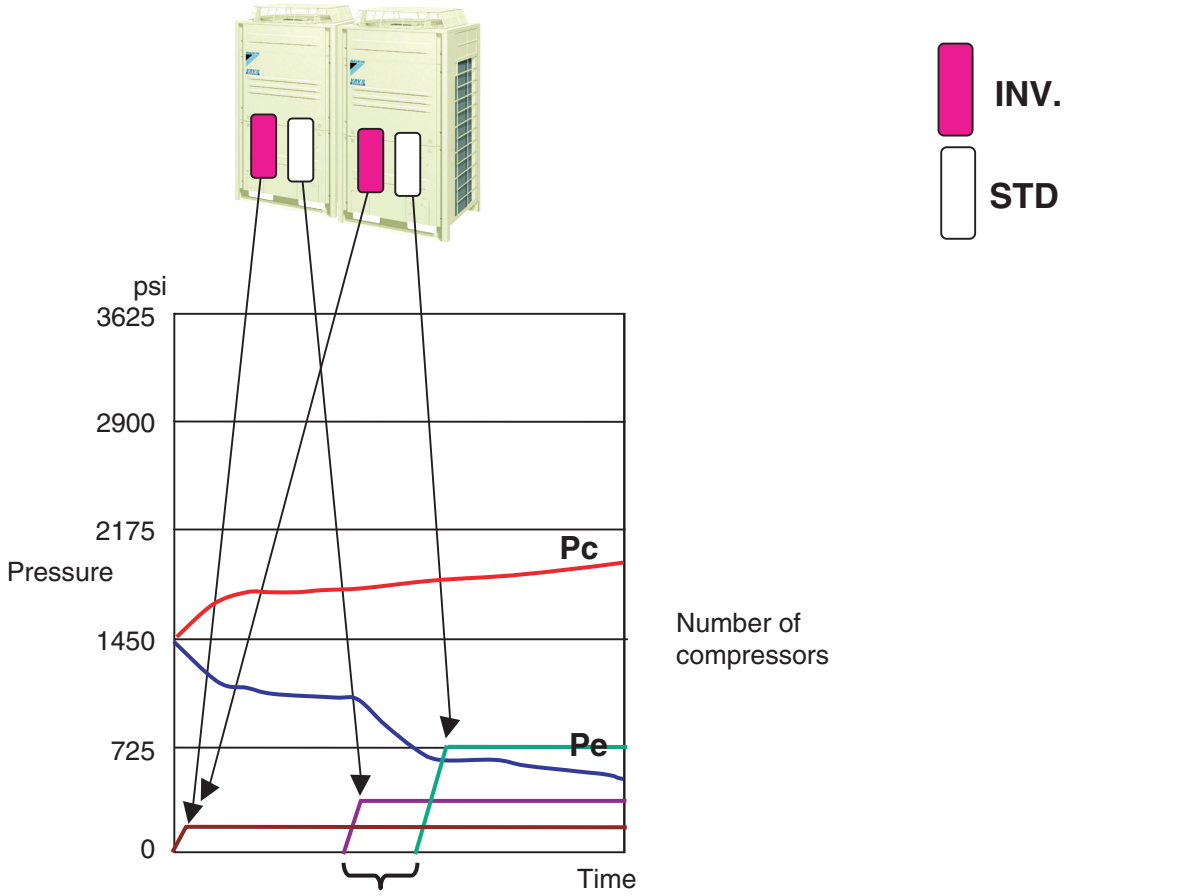
Actuator	Symbol	Electric symbol			Control before startup	Startup control	
		RXYQ72	RXYQ96·120	RXYQ144		STEP1	STEP2
Compressor 1	—	M1C	M1C	M1C	0 Hz	52 Hz + OFF	52Hz + OFF + 2STEP / 20 sec. (Until it reaches Pc - Pe > 56.55psi)
Compressor 2		—	M2C	M2C			
Outdoor unit fan 1	—	M1F	M1F	M1F	STEP4	Ta < 68°F: OFF Ta ≥ 68°F: STEP4	+1step/15 sec. (When Pc_max > 313.2psi) -1step/15 sec. (When Pc_max < 256.65psi)
Outdoor unit fan 2		—	M2F	M2F			
Electronic expansion valve (Main)	EVM	Y1E	Y1E	Y1E, Y3E	0 pls	1375 pls	1375 pls
Electronic expansion valve (Subcooling)	EVT	Y2E	Y2E	Y2E, Y5E	0 pls	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	—	—	Y4E	80 pls	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y3S	Y3S	Y2S, Y9S	OFF	OFF	OFF
Four-way valve (Dual pressure gas pipe switch)	20SB	—	—	Y8S	ON	ON	ON
Solenoid valve (Main bypass)	SVE	—	—	Y5S, Y10S	OFF	ON	ON
Solenoid valve (Hot gas)	SVP	Y1S	Y1S	Y4S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	—	—	Y3S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	—	—	Y1S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVO	Y2S	Y2S	Y7S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	—	—	Y6S	OFF	OFF	OFF
Ending conditions					A lapse of 60 sec.	A lapse of 15 sec.	OR • A lapse of 90 sec. • Pc - Pe > 52.2psi

7.1.2 Startup Control in Heating

Actuator	Symbol	Electric symbol			Control before startup	Startup control	
		RXYQ72	RXYQ96·120	RXYQ144		STEP1	STEP2
Compressor 1	—	M1C	M1C	M1C	0 Hz	52 Hz + OFF	52Hz + OFF + 2STEP / 20 sec. (Until it reaches Pc - Pe > 56.55psi)
Compressor 2		—	M2C	M2C			
Outdoor unit fan 1	—	M1F	M1F	M1F	STEP4	20SA = ON: STEP7 20SA = OFF +1step/15 sec. (When Pc_max > 313.2psi) -1step/15 sec. (When Pc_max < 256.65psi)	20SA = ON: STEP7 20SA = OFF +1step/15 sec. (When Pc_max > 313.2psi)
Outdoor unit fan 2		—	M2F	M2F			
Electronic expansion valve (Main)	EVM	Y1E	Y1E	Y1E, Y3E	0 pls	20SA = ON: SH Control 20SA = OFF: 1375 pls	20SA = ON: SH Control 20SA = OFF: 1375 pls
Electronic expansion valve (Subcooling)	EVT	Y2E	Y2E	Y2E, Y5E	0 pls	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	—	—	Y4E	80 pls	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y3S	Y3S	Y2S, Y9S	When outdoor heat exchanger is evaporator: ON When outdoor heat exchanger is condenser: OFF	When outdoor heat exchanger is evaporator: ON When outdoor heat exchanger is condenser: OFF	When outdoor heat exchanger is evaporator: ON When outdoor heat exchanger is condenser:
Four-way valve (Dual pressure gas pipe switch)	20SB	—	—	Y8S	OFF	OFF	OFF
Solenoid valve (Main bypass)	SVE	—	—	Y5S, Y10S	OFF	OFF	OFF
Solenoid valve (Hot gas)	SVP	Y1S	Y1S	Y4S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	—	—	Y3S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	—	—	Y1S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y2S	Y2S	Y7S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	—	—	Y6S	OFF	OFF	OFF
Ending conditions					A lapse of 60 sec.	A lapse of 15 sec.	OR • A lapse of 90 sec. • Pc - Pe > 56.55psi

7.2 Large Capacity Startup Control (Heating)

For startup, oil return operation, or setup after defrosting, startup multiple compressors at a high-speed according to the conditions of indoor units with thermostat ON, thus maximizing the equipment capacity.



Startup STD compressors at intervals of 15 seconds.

[Starting conditions]

OR
- The system starts heating operation with thermostat ON at a high load.
- The system completes defrosting operation.
- The system switches the operation mode from cooling to heating or simultaneous cooling and heating operation.

[Control]

1. Start multiple INV. compressors in the system at one time.
2. Start multiple STD compressors in the system at intervals of 15 seconds.

7.3 Oil Return Operation

This function is used to recover refrigerant oil that flows out from the compressor to the system side by conducting oil return operation in order to prevent the compressor from refrigerant shortage.

7.3.1 Oil Return Operation in Cooling

[Start conditions]

Referring to the following conditions, start cooling oil return operation.

OR
- Integral oil rise rate is reached to specified level.
- When cumulative compressor operating time exceeds 8 hours (2 hours when the power supply turns ON for the first time)

Furthermore, the integral oil rise rate is calculated by Tc, Te, and compressor loads.

The higher the compressor operating step No., the cumulative refrigerant oil consumption increases.

Outdoor unit actuator	Symbol	Electric symbol			Oil return operation	Operation after oil return
		RXYQ72	RXYQ96·120	RXYQ144		
Compressor 1	—	M1C	M1C	M1C	52Hz + ON (Subsequently, constant low pressure control) Maintain the number of compressors that were. used before oil return	52Hz + ON (Subsequently, constant low pressure control) Maintain the number of compressors that were. used before oil return
Compressor 2		—	M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	M1F	Cooling fan control	Cooling fan control
Outdoor unit fan 2		—	M2F	M2F		
Four-way valve (for heat exchanger switch)	20SA	Y3S	Y3S	Y2S, Y9S	OFF	OFF
Four-way valve (for dual pressure gas pipe switch)	20SB	—	—	Y8S	ON	ON
Electronic expansion valve (main)	EVM	Y1E	Y1E	Y1E, Y3E	1375pls	1375pls
Electronic expansion valve (subcooling)	EVT	Y2E	Y2E	Y2E, Y5E	SH control	SH control
Electronic expansion valve (refrigerant charge)	EVJ	—	—	Y4E	80pls	80pls
Solenoid valve (main bypass)	SVE	—	—	Y5S, Y10S	ON	ON
Solenoid valve (hot gas)	SVP	Y1S	Y1S	Y4S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	—	—	Y3S	0pls	0pls
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	—	—	Y1S	0pls	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y2S	Y2S	Y7S	0pls	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	—	—	Y6S	0pls	0pls
End conditions					OR • After a lapse of 5 min. • TsA - Te < 41°F	OR • After a lapse of 3 min. • Pe_min < 41°F • Pc_max > 526.35psi • HTdmax > 212°F

∗1: In case of multi outdoor unit system:
Master unit: It conducts the operation listed in the table above.
Slave units: Operating units conduct the operation listed in the table above.
Non-operating units conduct the operation listed in the table above after the ***Oil returning*** process.
(Non-operating units stop while in ***Preparation*** mode.)

Cooling indoor unit actuator		Oil return operation
Fan	Thermostat ON unit	Remote controller setting
	Unit not in operation	OFF
	Thermostat OFF unit	Remote controller setting
Electronic expansion valve	Thermostat ON unit	Normal opening degree
	Unit not in operation	192pls
	Thermostat OFF unit	Normal opening degree for forced thermostat ON

7.3.2 Oil Return Operation in Heating

[Start conditions]

Referring to the following conditions, start heating oil return operation.

OR
- Integral oil rise rate is reached to specified level.
- When cumulative compressor operating time exceeds 8 hours (2 hours when the power supply turns ON for the first time)

Furthermore, the integral oil rise rate is calculated by Tc, Te, and compressor loads.

The higher the compressor operating step No., the cumulative refrigerant oil consumption increases.

When high pressure reaches the high level (i.e., Pc > 27k), the system will switch to defrost operation (refer to Section 7.4 for detail).

Actuator	Symbol	Electric symbol			Oil return operation
		RXYQ72	RXYQ96·120	RXYQ144	
Compressor 1	—	M1C	M1C	M1C	Maintain load that was applied before oil return operation. When current circulation rate < circulation rate required for oil return operation, turn ON the STD compressor every 10 seconds (up to 3 units at maximum).
Compressor 2		—	M2C	M2C	
Outdoor unit fan 1	—	M1F	M1F	M1F	When outdoor unit heat exchanger is condenser, the fan will run under cooling fan control. When outdoor unit heat exchanger is evaporator, the fan will run at the fan step 7 or 8.
Outdoor unit fan 2		—	M2F	M2F	
Electronic expansion valve (main)	EVM	Y1E	Y1E	Y1E, Y3E	20SA = ON: PI control 20SA = OFF: 418pls
Electronic expansion valve (subcooling)	EVT	Y2E	Y2E	Y2E, Y5E	PI control
Electronic expansion valve (refrigerant charge)	EVJ	—	—	Y4E	80pls
Four-way valve (for heat exchanger switch)	20SA	Y3S	Y3S	Y2S, Y9S	When outdoor unit heat exchanger is condenser, the valve will turn OFF. When outdoor unit heat exchanger is evaporator, the valve will turn ON.
Four-way valve (for dual pressure gas pipe switch)	20SB	—	—	Y8S	OFF
Solenoid valve (main bypass)	SVE	—	—	Y5S, Y10S	OFF
Solenoid valve (hot gas)	SVP	Y1S	Y1S	Y4S	0pls
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	—	—	Y3S	0pls
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	—	—	Y1S	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y2S	Y2S	Y7S	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	—	—	Y6S	0pls
End conditions					OR • Pe_min < 31.9psi • After a lapse of 9 min.

∗1: In case of multi outdoor unit system:

Master unit: It conducts the operation listed in the table above.

Slave units: Operating units conduct the operation listed in the table above.

Non-operating units conduct the operation listed in the table above after the "Oil returning" process. (Non-operating units stop while in "Preparation" mode.)

Cooling indoor unit actuator		Oil return operation
Fan	Thermostat ON unit	Remote controller setting
	Unit not in operation	OFF
	Thermostat OFF unit	Remote controller setting
Electronic expansion valve	Thermostat ON unit	Normal opening degree
	Unit not in operation	192pls
	Thermostat OFF unit	Normal opening degree for forced thermostat ON

Heating indoor unit actuator		Oil return operation
Fan	Thermostat ON unit	Remote controller setting
	Unit not in operation	OFF
	Thermostat OFF unit	LL
Electronic expansion valve	Thermostat ON unit	Normal opening degree
	Unit not in operation	224 pls
	Thermostat OFF unit	Normal opening degree for forced thermostat ON

7.4 Defrost Operation

Evaporating outdoor unit actuator	Symbol	Electric symbol			Defrost operation	Operation after defrost
		RXYQ72	RXYQ96·120	RXYQ144		
Compressor 1	—	M1C	M1C	M1C	210Hz + ON	210Hz + ON
Compressor 2		—	M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	M1F	Fan control	Fan control
		—	M2F	M2F		
Fou- way valve (for heat exchanger switch)	20SA	Y3S	Y3S	Y2S, Y9S	ON	ON
Fou- way valve (for dual pressure gas pipe switch)	20SB	—	—	Y8S	Holds	Holds
Electronic expansion valve (main)	EVM	Y1E	Y1E	Y1E, Y3E	PI control	PI control
Electronic expansion valve (subcooling)	EVT	Y2E	Y2E	Y2E, Y5E	SH control	0pls
Electronic expansion valve (refrigerant charge)	EVJ	—	—	Y4E	80pls	80pls
Solenoid valve (main bypass)	SVE	—	—	Y5S, Y10S	OFF	OFF
Solenoid valve (hot gas)	SVP	Y1S	Y1S	Y4S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	—	—	Y3S	0pls	0pls
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	—	—	Y1S	0pls	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y2S	Y2S	Y7S	0pls	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	—	—	Y6S	0pls	0pls

Heating indoor unit actuator		Defrost operation
Fan	Thermostat ON unit	OFF
	Unit not in operation	OFF
	Thermostat OFF unit	OFF
Electronic expansion valve	Thermostat ON unit	0pls
	Unit not in operation	0pls
	Thermostat OFF unit	0pls

7.5 Pump down Residual Operation

7.5.1 Pump down Residual Operation in Cooling

If the liquid refrigerant stays in the evaporator at the startup of a compressor, this liquid refrigerant enters the compressor, thus resulting in diluted oil in the compressor and then degraded lubrication performance.
Consequently, in order to recover the refrigerant in the evaporator while the compressor stops, the pump down residual operation is conducted.

Actuator	Symbol	Electric symbol			Master unit operation	Slave unit operation
		RXYQ72	RXYQ96·120	RXYQ144		
Compressor 1	—	M1C	M1C	M1C	124 Hz + OFF	OFF
Compressor 2		—	M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	M1F	Fan control	Fan control
Outdoor unit fan 2		—	M2F	M2F		
Electronic expansion valve (Main)	EVM	Y1E	Y1E	Y1E, Y3E	1375 pls	1375 pls
Electronic expansion valve (Subcooling)	EVT	Y2E	Y2E	Y2E, Y5E	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	—	—	Y4E	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y3S	Y3S	Y2S, Y9S	OFF	OFF
Four-way valve (Dual pressure gas pipe switch)	20SB	—	—	Y8S	ON	ON
Solenoid valve (Main bypass)	SVE	—	—	Y5S, Y10S	ON	ON
Solenoid valve (Hot gas)	SVP	Y1S	Y1S	Y4S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	—	—	Y3S	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	—	—	Y1S	OFF	OFF
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y2S	Y2S	Y7S	OFF	OFF
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	—	—	Y6S	OFF	OFF
Ending conditions					OR • 5 min. • Pe_min < 71.05psi * • Pc_max < 426.3psi * • Master unit Tdi > 230°F • Master unit Tp > 257°F	

* Pe_min and Pc_max indicate the minimum and maximum values in the system, respectively.

7.5.2 Pump down Residual Operation in Heating

Actuator	Symbol	Electric symbol			Master unit operation	Slave unit operation
		RXYQ72	RXYQ96·120	RXYQ144		
Compressor 1	—	M1C	M1C	M1C	124 Hz + OFF	OFF
Compressor 2		—	M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	M1F	Fan control	Fan control
Outdoor unit fan 2		—	M2F	M2F		
Electronic expansion valve (Main)	EVM	Y1E	Y1E	Y1E, Y3E	When 20SA = ON: 0 pls When 20SA = OFF: 1375 pls	When 20SA = ON: 0 pls When 20SA = OFF: 1375 pls
Electronic expansion valve (Subcooling)	EVT	Y2E	Y2E	Y2E, Y5E	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	—	—	Y4E	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y3S	Y3S	Y2S, Y9S	When outdoor heat exchanger is	When outdoor heat exchanger is
Four-way valve (Dual pressure gas pipe switch)	20SB	—	—	Y8S	OFF	OFF
Solenoid valve (Main bypass)	SVE	—	—	Y5S, Y10S	OFF	OFF
Solenoid valve (Hot gas)	SVP	Y1S	Y1S	Y4S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	—	—	Y3S	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	—	—	Y1S	OFF	OFF
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y2S	Y2S	Y7S	OFF	OFF
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	—	—	Y6S	OFF	OFF
Ending conditions					OR • 3 min. • Pe_min < 36.25psi ∗ • Pc_max < 453.85psi ∗ • Master unit Tdi > 230°F • Master unit Tp > 284°F	

∗ Pe_min and Pc_max indicate the minimum and maximum values in the system, respectively.

7.6 Standby

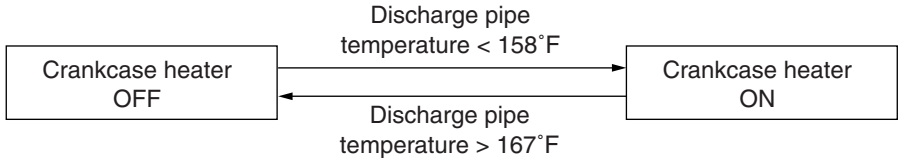
7.6.1 Restart Standby

Used to forcedly stop the compressor for a period of 2 minutes, in order to prevent the frequent ON/OFF of the compressor and equalize the pressure within the refrigerant system.

Actuator	Symbol	Electric symbol			Operation
		RXYQ72	RXYQ96·120	RXYQ144	
Compressor1	—	M1C	M1C	M1C	OFF
Compressor2	—	—	M2C	M2C	OFF
Outdoor unit fan1	—	M1F	M1F	M1F	Ta > 86°F: STEP4 Ta ≤ 86°F: OFF
Outdoor unit fan2		—	M2F	M2F	Ta > 86°F: STEP4 Ta ≤ 86°F: OFF
Electronic expansion valve (Main)	EVM	Y1E	Y1E	Y1E, Y3E	0 pls
Electronic expansion valve (Subcooling)	EVT	Y2E	Y2E	Y2E, Y5E	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	—	—	Y4E	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y3S	Y3S	Y2S, Y9S	Holds
Four-way valve (Dual pressure gas pipe switch)	20SB	—	—	Y8S	Holds
Solenoid valve (Main bypass)	SVE	—	—	Y5S, Y10S	OFF
Solenoid valve (Hot gas)	SVP	Y1S	Y1S	Y4S	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	—	—	Y3S	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	—	—	Y1S	OFF
Solenoid valve (Refrigerant of regulator discharge pipe)	SVO	Y2S	Y2S	Y7S	OFF
Solenoid valve (Refrigerant of regulator discharge pipe)	SVT	—	—	Y6S	OFF
Ending conditions	—				2 min.

7.6.2 Crankcase Heater Control

In order to prevent the refrigerant from melting in the compressor oil in the stopped mode, this mode is used to control the crankcase heater.



7.7 Stopping Operation

7.7.1 When System is in Stop Mode (Normal operation stop)

This mode is used to define actuator operations when the system stops.

Actuator	Symbol	Electric symbol			Operation
		RXYQ72	RXYQ96·120	RXYQ144	
Compressor1	—	M1C	M1C	M1C	OFF
Compressor2	—	—	M2C	M2C	OFF
Outdoor unit fan1	—	M1F	M1F	M1F	OFF
Outdoor unit fan2		—	M2F	M2F	OFF
Electronic expansion valve (Main)	EVM	Y1E	Y1E	Y1E, Y3E	0 pls
Electronic expansion valve (Subcooling)	EVT	Y2E	Y2E	Y2E, Y5E	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	—	—	Y4E	80 pls
Four way valve (Heat exchanger switch)	20SA	Y3S	Y3S	Y2S, Y9S	Holds
Four way valve (Dual pressure gas pipe switch)	20SB	—	—	Y8S	Holds
Solenoid valve (Main bypass)	SVE	—	—	Y5S, Y10S	OFF
Solenoid valve (Hot gas)	SVP	Y1S	Y1S	Y4S	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	—	—	Y3S	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	—	—	Y1S	OFF
Solenoid valve (Refrigerant of regulator discharge pipe)	SVO	Y2S	Y2S	Y7S	OFF
Solenoid valve (Refrigerant of regulator discharge pipe)	SVT	—	—	Y6S	OFF
Ending conditions	—				Indoor unit thermostat is turned ON.

7.7.2 Stop due to Error

In order to protect compressors, if any of the following items has an abnormal value, the system will make "stop with thermostat OFF" and the error will be determined according to the number of retry times.

Item	Judgement an Error	Error Code
1. Abnormal low pressure level	10.15psi	E4
2. Abnormal high pressure level	580psi	E3
3. Abnormal discharge pipe temperature level	275°F	F3
4. Abnormal power supply voltage	Reverse-phase power supply	U1
5. Abnormal inverter current level	(230V) 27.6A: 260 sec. (460V) 16.1A: 260 sec.	L8
6. Abnormal radiation fin temperature level	188.6°F	L4

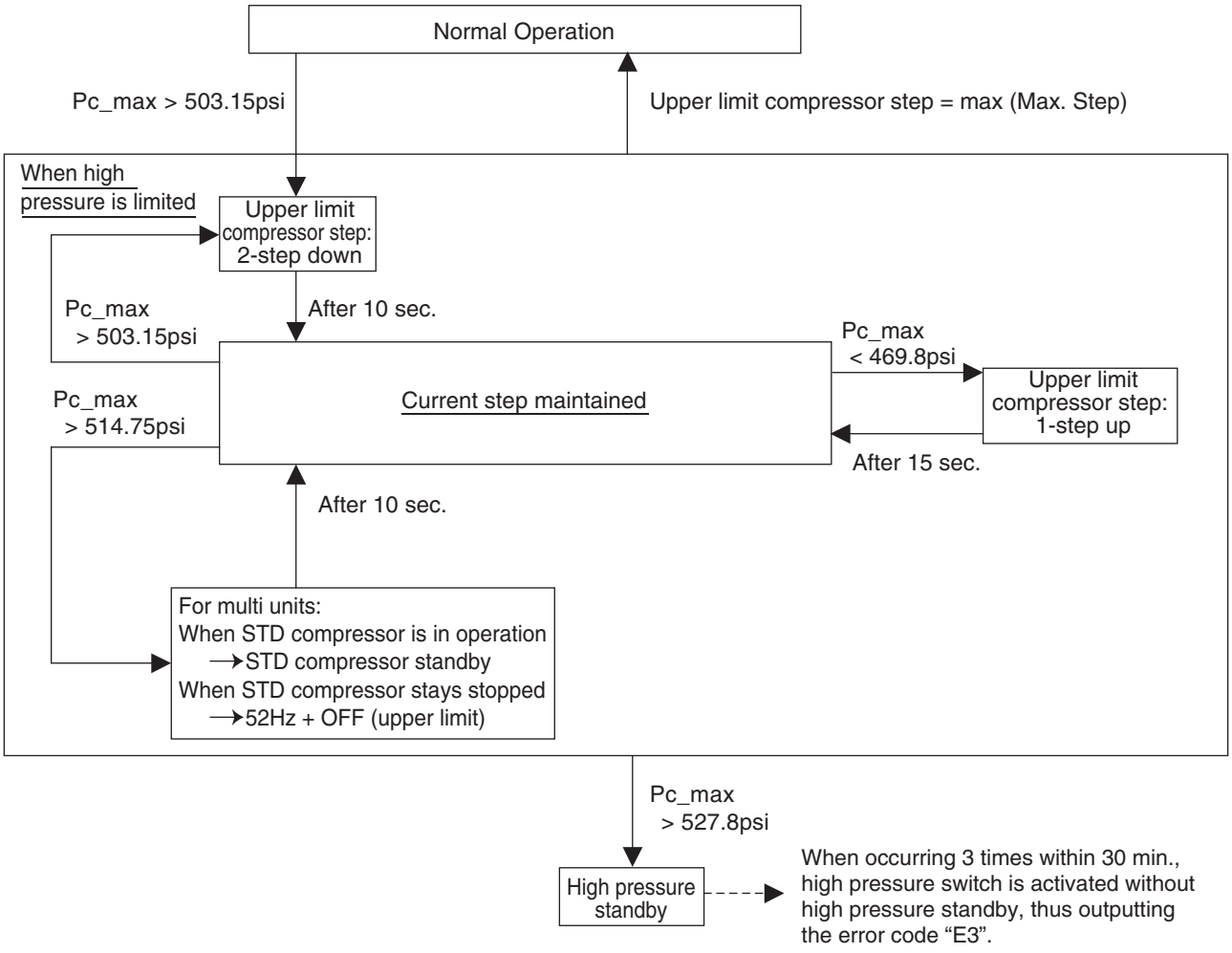
8. Protection Control

8.1 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.

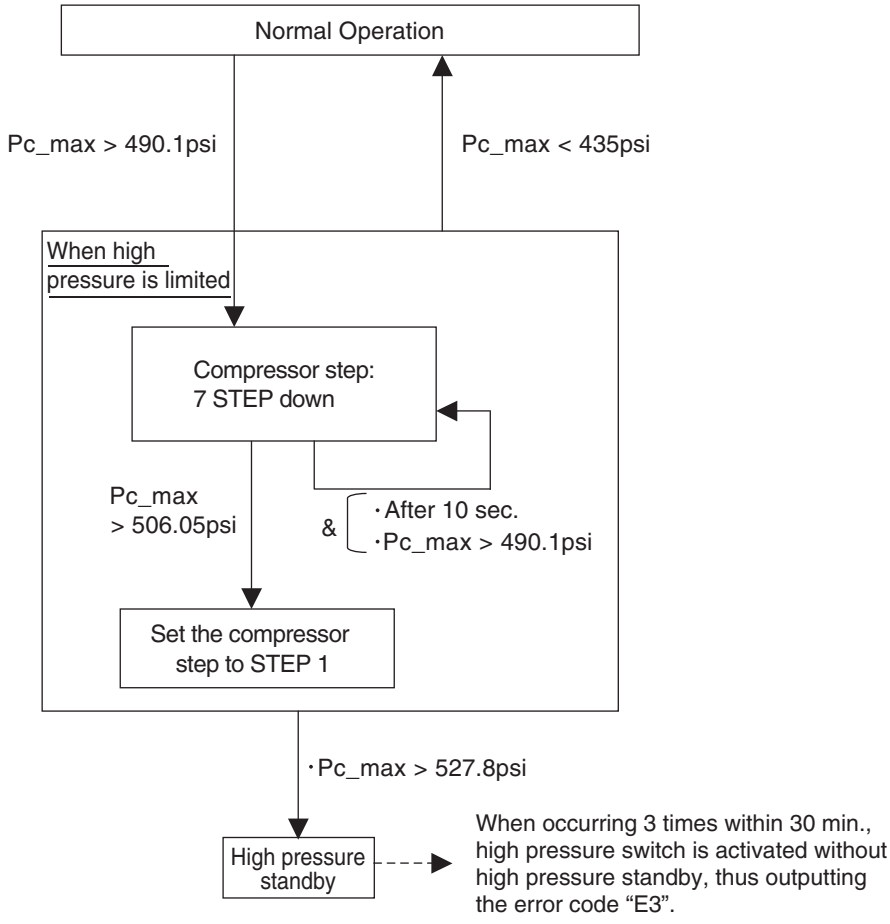
[In cooling]

* The following control is performed in the entire system.
  Pc_max indicates the maximum value within the system.



[In heating]

* The following control is performed in the entire system.
  Pc_max indicates the maximum value within the system.

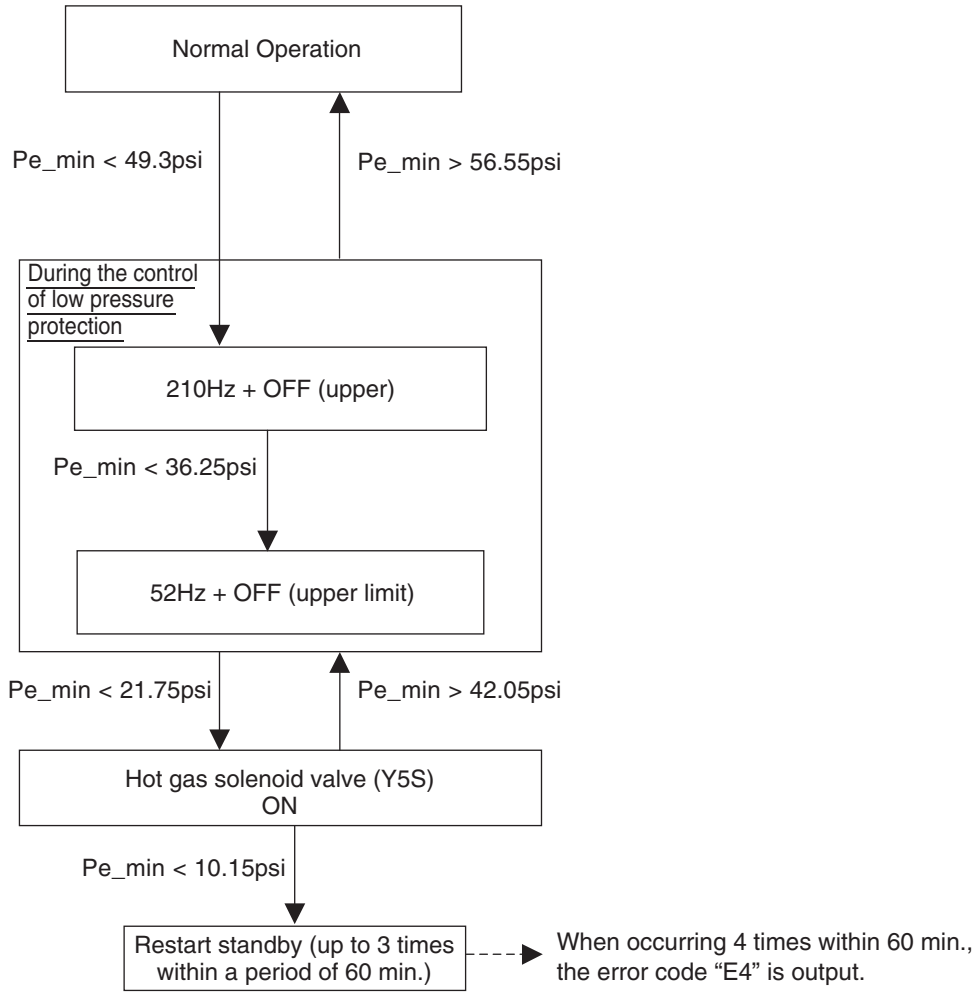


8.2 Low Pressure Protection Control

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

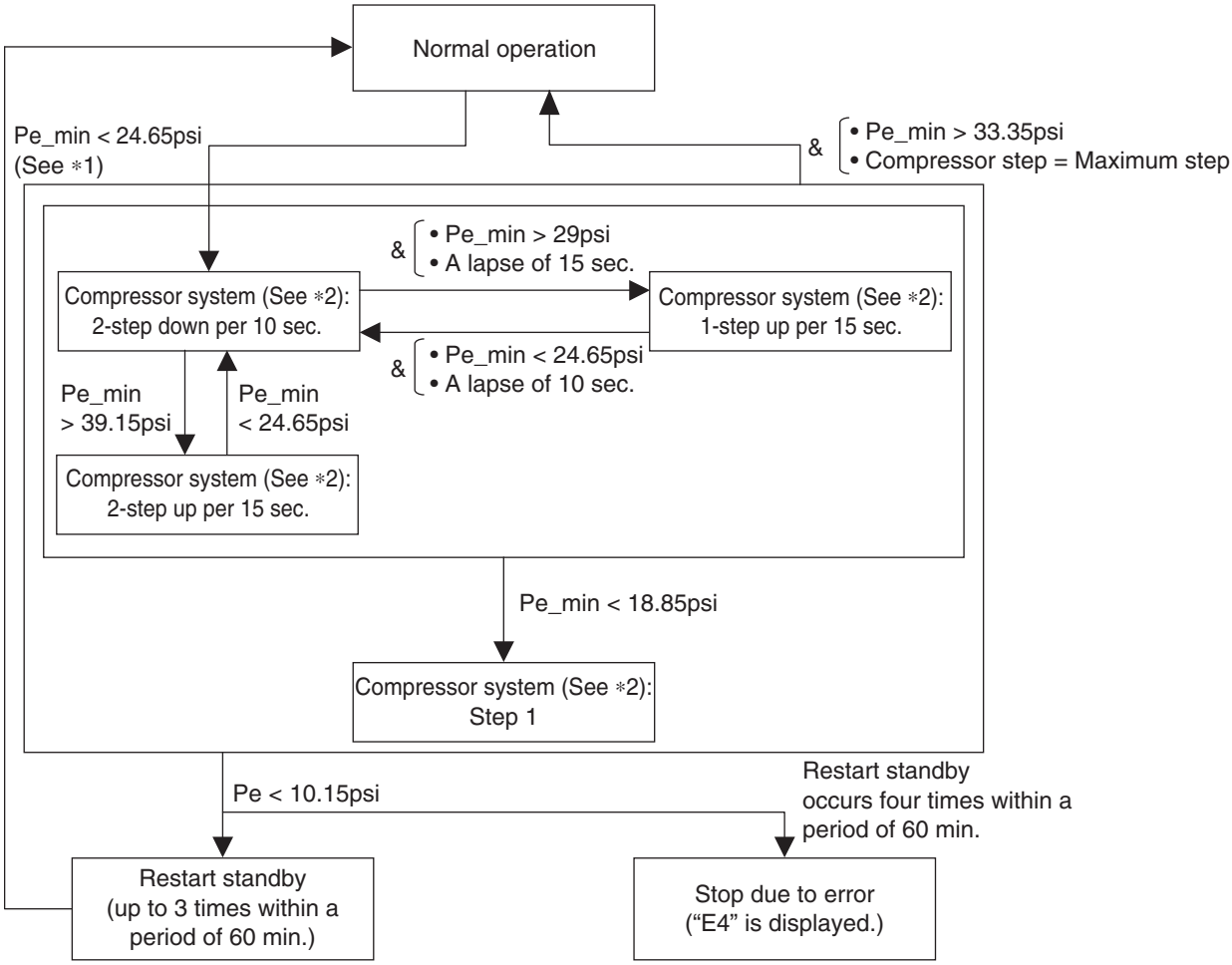
[In cooling]

* Because of common low pressure, the following control is performed in the system. Pe_min indicates the minimum value within the system.



[In heating]

∗ For multi-outdoor-unit systems, the entire system performs this control in the following sequence.



∗1: “Pe_min” represents a minimum low pressure value detected within the system.

∗2: For compressor steps, refer to information on P.46.

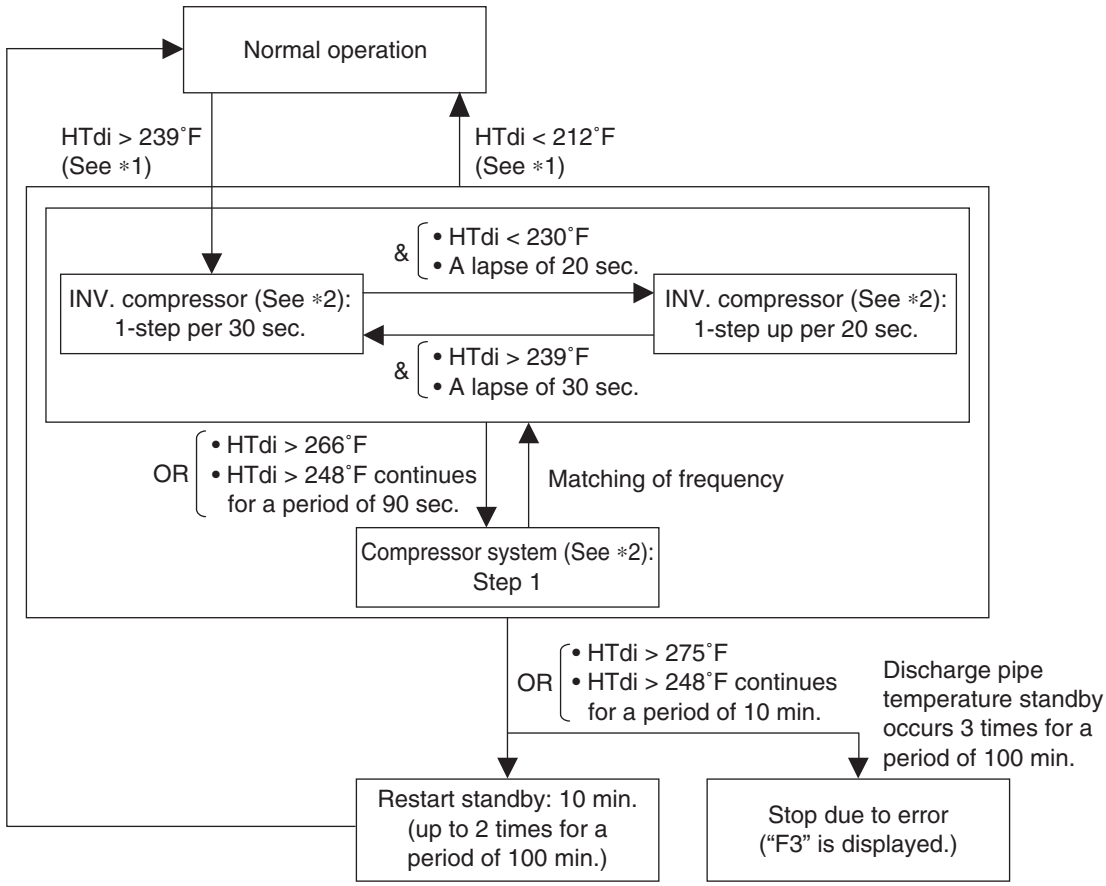
8.3 Discharge Pipe Protection Control

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

[Contents]

∗ The following control is performed for each compressor.

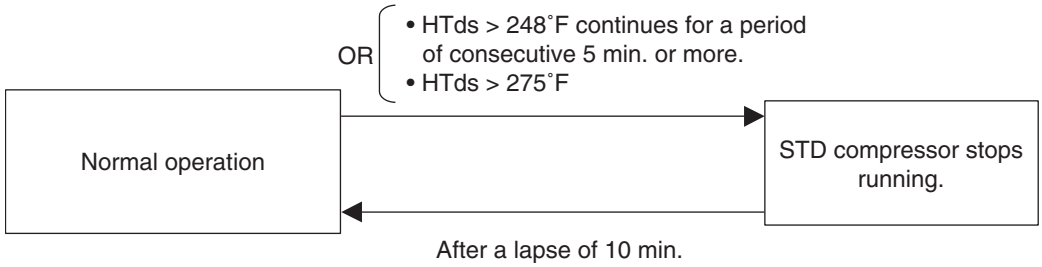
[INV. compressor]



∗1: “HTdi” represents a value obtained by correcting the discharge pipe temperature (Tdi) of INV. compressor with an outdoor temperature.

∗2: For INV. compressor steps, refer to information on P.46.

[STD compressor]



HTds: Represents a value obtained by correcting the discharge pipe temperature (Tds) of STD compressor with an outdoor temperature.

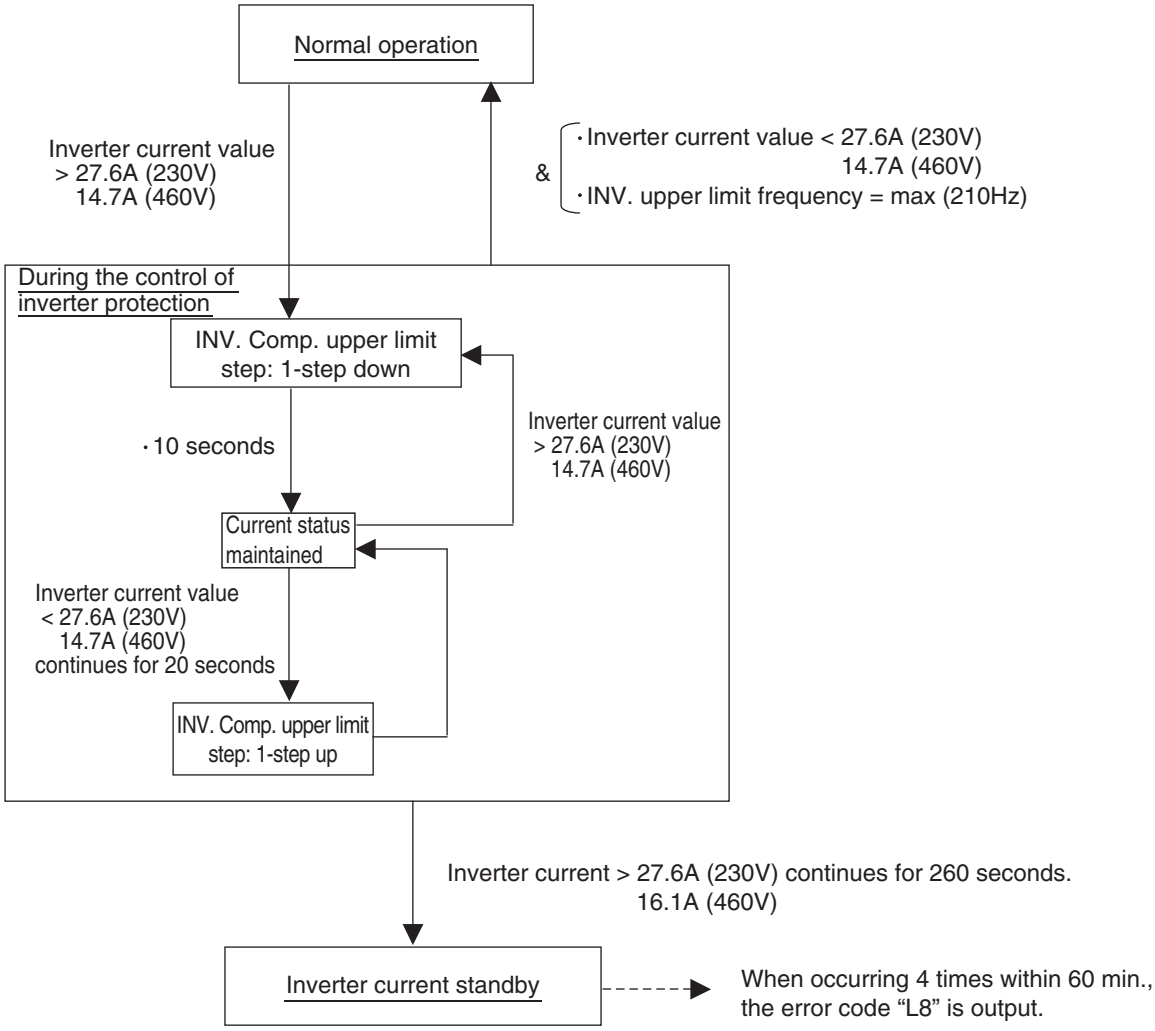
8.4 Inverter Protection Control

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

* In the case of multi-outdoor-unit system, each INV. compressor performs these controls in the following sequence.

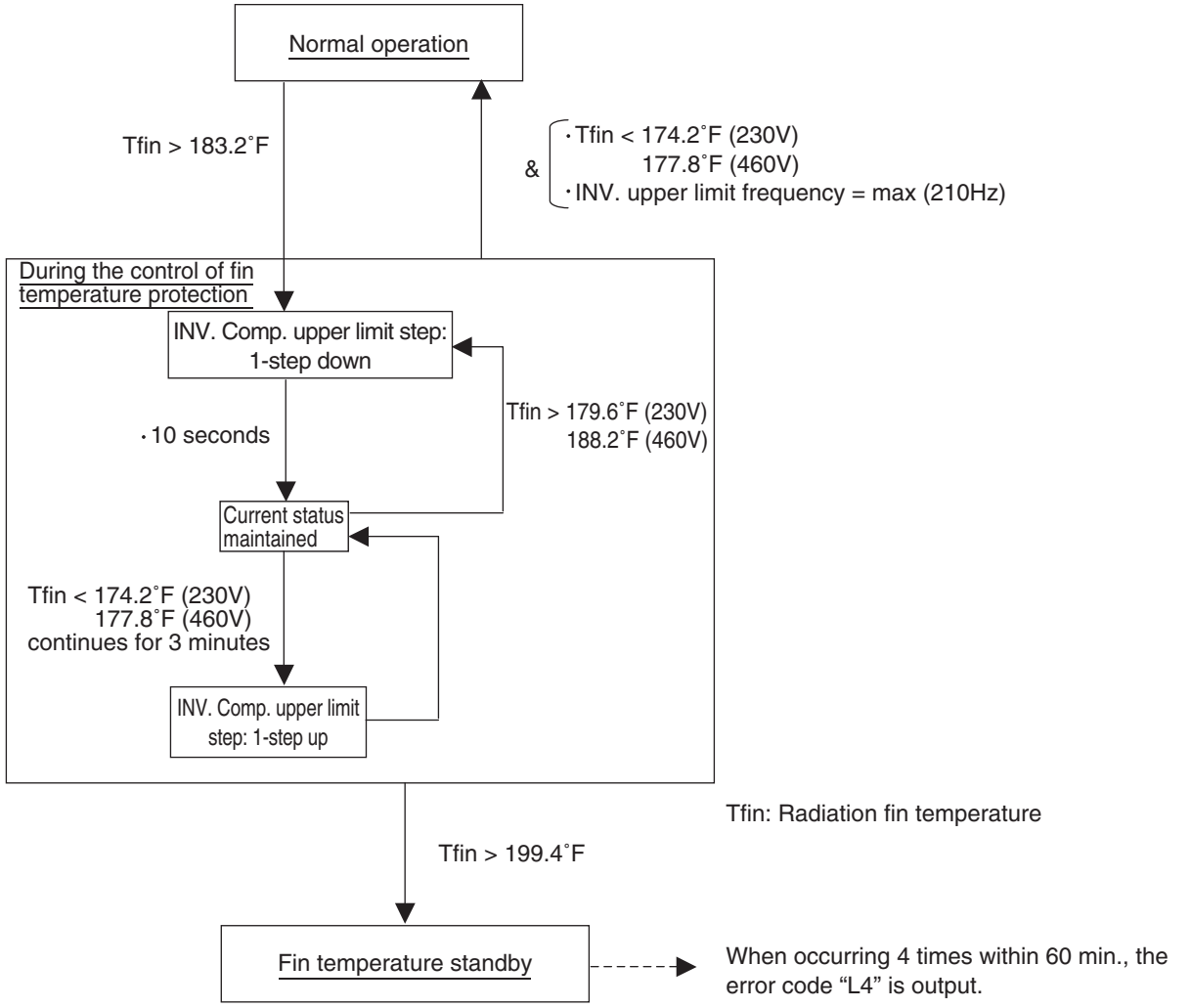
[Inverter overcurrent protection control]

* Perform the following control of integrated for each INV. compressor.



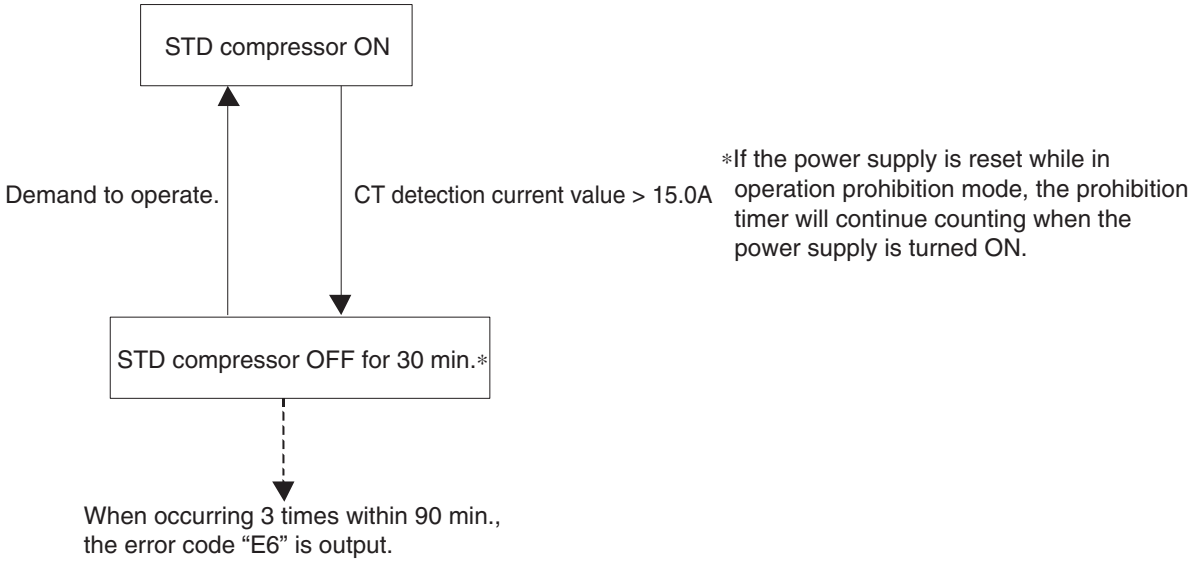
[Radiation fin temperature control]

∗ Perform the following control of integrated for each INV. compressor.



8.5 STD Compressor Overload Protection

This control is used to prevent abnormal heating due to overcurrent to the compressor resulting from failures of STD compressor such as locking.



9. Other Control

9.1 Backup Operation

If any of the compressors malfunction, disable the relevant compressor or the relevant outdoor unit from operating, and then conduct emergency operation only with operational compressors or outdoor units.
"Emergency operation with remote controller reset" and "Emergency operation with outdoor unit PCB setting" are available

Operating method / Applicable model	(1) Emergency operation with remote controller reset (Auto backup operation)	(2) Emergency operation with outdoor unit PCB setting (Manual backup operation)
RXYQ72~120PBYD RXYQ72~144PBTJ	–	Backup operation by the compressor
RXYQ144~360PBYD RXYQ168~360PBTJ	Backup operation by the indoor unit	Backup operation by the outdoor unit

(1) Emergency operation with remote controller reset
[Operating method]

Reset the remote controller. (Press the ON/OFF button for 4 seconds or more.)

[Details of operation]

Disable the defective outdoor unit from operating, and then only operate other outdoor units. (On systems with 1 outdoor unit, this emergency operation is not available.)

(2) Emergency operation with outdoor unit PCB setting
[Setting method]

Make setting of the compressor, "the operation of which is to be disabled", in field setting mode (setting mode 2).
(For detail of the setting method, refer to P.121.)

[Details of operation]

Disable the compressor with "operation disable setting" made from operating and only operate other compressors.

9.2 Demand Operation

In order to save the power consumption, the capacity of outdoor unit is saved with control forcibly by using “Demand 1 Setting” or “Demand 2 Setting”.
To operate the unit with this mode, additional setting of “Continuous Demand Setting” or external input by external control adaptor for outdoor unit is required.

Setting item	Condition	Content
Demand 1	Level 1	Operate with power of approx. 60% or less of the rating.
	Level 2	Operate with power of approx. 70% or less of the rating.
	Level 3	Operate with power of approx. 80% or less of the rating.
Demand 2	—	Operate with power of approx. 40% or less of the rating.
Demand 3	—	Operate with forced thermostat OFF.

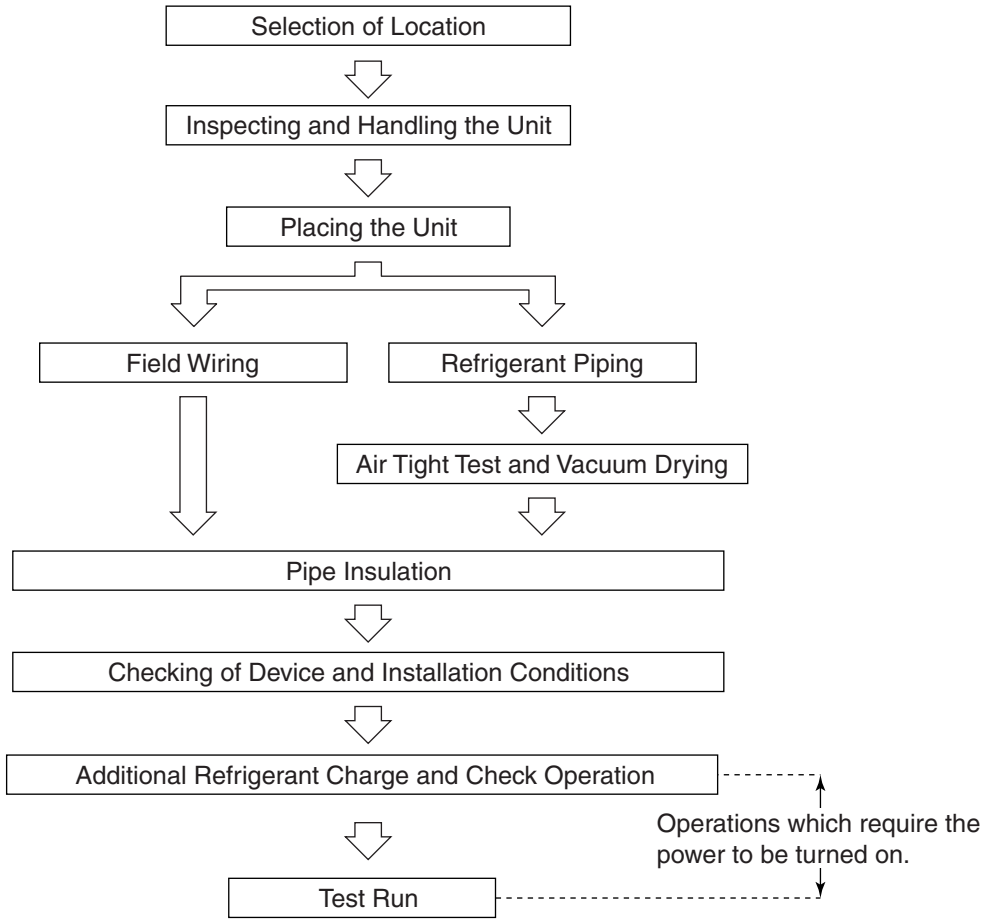
9.3 Heating Operation Prohibition

Heating operation is prohibited above 75.2°F outdoor air temperature.

10.Test Operation

10.1 Installation Process

Below Figure shows the installation process. Install in the order of the steps shown.



10.2 Procedure and Outline

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

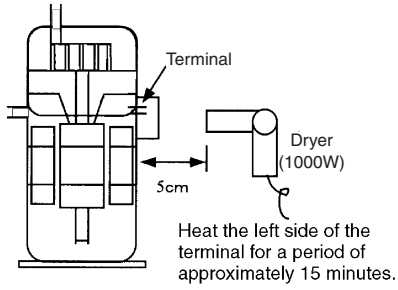
10.2.1 Check Work Prior to Turn Power Supply ON

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

⇩

- ○ Is the wiring performed as specified?
- ○ Is the designated wire used?
- ○ Is the wiring screw of wiring not loose?
- ○ Is the grounding work completed?
- ○ Is the insulation of the main power supply circuit deteriorated?
  Use a 500V megger tester to measure the insulation. (∗1)
  - Do not use a megger tester for other circuits than 200V (or 240V) circuit.

∗1:Measure to be taken against decreased insulation resistance in the compressor
If the compressor is left to stand for an extended period of time after the refrigerant charge with the stop valve open and the power supply OFF, the refrigerant may be mixed in the compressor, thus decreasing the insulation resistance.
Heat the compressor as shown on the right and then recheck the insulation.



Check on refrigerant piping / insulation materials

⇩

- ○ Is the pipe size proper?
- ○ Are the design pressures for the liquid pipe, gas pipe, and pressure equalizer pipe (in case of multi units) all not less than 580psi?
- ○ Is the pipe insulation material installed securely?
  Liquid, gas pipe need to be insulated. (Otherwise causes water leak.)

Check air tight test and vacuum drying.

⇩

- ○ Have the air tight test and the vacuum drying been conducted according to the procedure in the Installation Manual?

Check on amount of refrigerant charge

○ Is a proper quantity of refrigerant charged?
The following method is available for additional charging of refrigerant.
(1) Calculate additional refrigerant quantity.

- Calculate a necessary additional refrigerant charging amount according to the procedure for calculation shown below.

* Procedure for calculating additional refrigerant charging amount (Unit: 0.1 lb)

$$R = \left[\begin{array}{l} (\text{Total length (ft) of liquid piping size at } \phi 7/8) \times 0.249 + (\text{Total length (ft) of liquid piping size at } \phi 3/4) \times 0.175 \\ + (\text{Total length (ft) of liquid piping size at } \phi 5/8) \times 0.121 + (\text{Total length (ft) of liquid piping size at } \phi 1/2) \times 0.081 \\ + (\text{Total length (ft) of liquid piping size at } \phi 3/8) \times 0.040 + (\text{Total length (ft) of liquid piping size at } \phi 1/4) \times 0.015 \end{array} \right]$$

+

HEAT PUMP SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
RXYQ72~120PBYD RXYQ72~144PBTJ	—
RXYQ144~360PBYD RXYQ168~360PBTJ	2.2 lb

+

REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT	
INDOOR CONNECTION CAPACITY	MODEL NAME
	RXYQ72 ~ 360PB
MORE THAN 100% 120% OR LESS	1.1 lb
MORE THAN 120% 130% OR LESS	1.1 lb

- If there is a refrigerant shortage, charge a liquid refrigerant through the stop valve service port with the stop valves of liquid and those of gas closes after the completion of vacuum drying.
- If the refrigerant charging is still insufficient, "turn ON the power supply" following the information on the P.78 ~.

○ Has the additional refrigerant charging amount been recorded on the "Precautions for servicing" label?

Check the stop valves for conditions.

○ Check to be sure the stop valves are under the following conditions.

Liquid pipe stop valve	Equalizing pipe stop valve	Dual pressure gas pipe stop valve	Suction pipe stop valve
Open	Open	Open	Open

10.2.2 Turn Power ON

Turn outdoor unit and indoor unit power on.

○ Be sure to turn the power on 6 hours before starting operation to protect compressors. (to power on crankcase heater)

Check the LED display of the outdoor unit PCB.

○ Check to be sure the transmission is normal.
The transmission is normal if the LEDs display conditions as shown in table below.

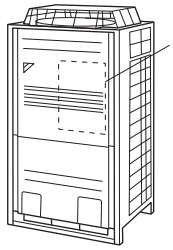
LED display ○ ON ● OFF ◑ Blinking

LED display (Default status before delivery)		Micro-computer operation monitor	MODE	TEST	COOL / HEAT select			Low noise	Demand	Multi
					IND	MASTER	SLAVE			
		HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
One outdoor unit installed		◑	●	●	○	●	●	●	●	●
When multiple outdoor unit installed (∗)	Master	◑	●	●	○	●	●	●	●	○
	Slave 1	◑	●	●	●	●	●	●	●	◑

(∗) The master unit is the outdoor unit to which the transmission wiring for the indoor units is connected.
The other outdoor units are slave units.

Make field settings with outdoor unit PCB.

○ Make field settings if needed.
(For the setting procedure, refer to information in "12.1 Field Setting from Outdoor Unit" on P.96 onward.)
For the outdoor-multi system, make field settings with the master unit.
(Field settings made with the slave unit will be all invalid.)



∗ Another switch box is provided on the front left side of the unit, but it requires no field settings.

Conduct check operations.

The check operations shown below will be automatically initiated.
- Check for erroneous wirings
- Check for failure to open stop valves
- Check for excessive refrigerant refilling
- Automatic judgement of piping length

Check for normal operation.

○ Before starting the normal operation after the completion of check operations, make sure indoor and outdoor units normally operate.

10.2.3 Air Tight Test and Vacuum Drying

- After finished piping work, carry out air tight test and vacuum drying.

Note:

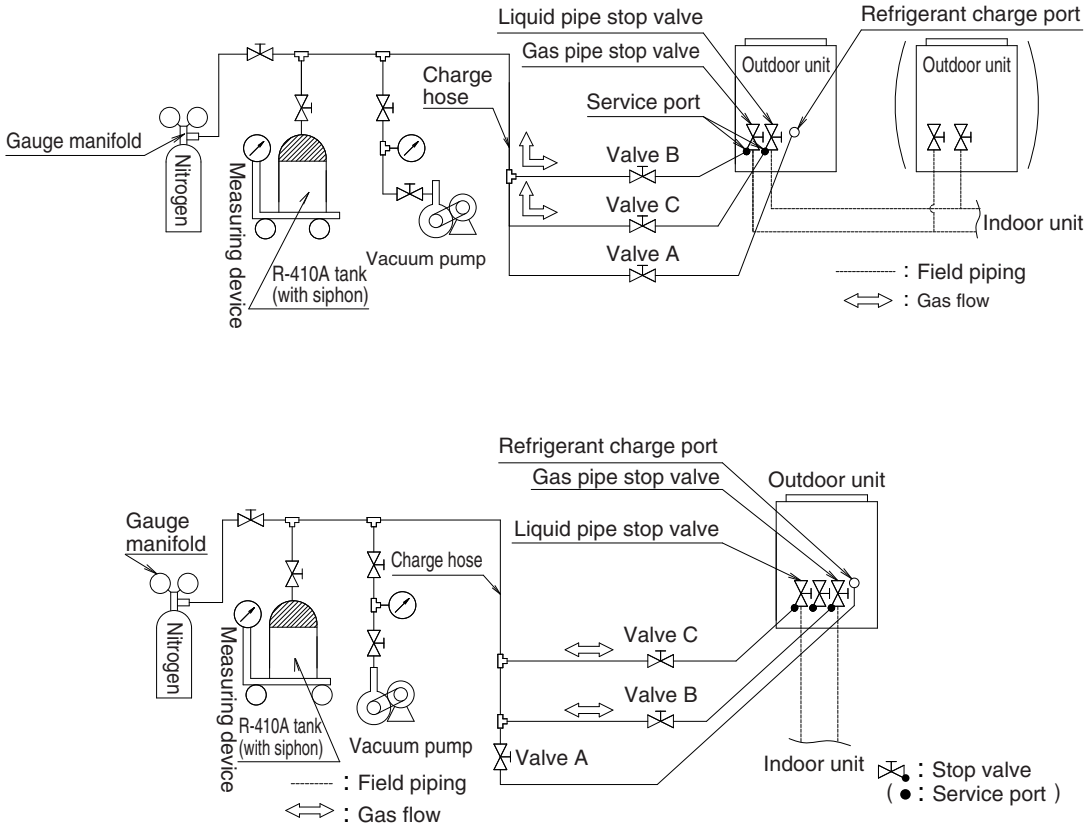
- Always use nitrogen gas for the air tight test.
- Absolutely do not open the stop valve until the main power circuit insulation measurement has been completed. (measuring after the stop valve is opened will cause the insulation value to drop.)

<Needed tools>

Gauge manifold Charge hose valve	● To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R-410A. ● Use charge hose that have pushing stick for connecting to service port of stop valves or refrigerant charge port.
Vacuum pump	● The vacuum pump for vacuum drying should be able to lower the pressure to –14.6 psi. ● Take care the pump oil never flow backward into the refrigerant pipe during the pump stops.

<The system for air tight test and vacuum drying>

- Referring to figure 1, connect an nitrogen tank, refrigerant tank, and a vacuum pump to the outdoor unit.
  The refrigerant tank and the charge hose connection to refrigerant charge port or the valve A in figure 1 are needed in **"10.2.5 Additional Refrigerant Charge and Check Operation"**.

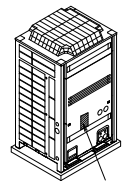


< RXYQ144PBTJ Only >

fig. 1

Note:

- The air tight test and vacuum drying should be done using the service ports of equalizer pipe, dual pressure gas pipe, suction gas pipe and liquid pipe stop valve.
- See the [R-410A] Label attached to the front plate of the outdoor unit for details on the location of the service port (see figure at right)
- See **[Stop valve operation procedure]** in **"10.2.5.1 Before working"** for details on handling the stop valve.
- The refrigerant charge port is connected to unit pipe.
  When shipped, the unit contains the refrigerant, so use caution when attaching the charge hose.


[R-410A] Label

<Air tight test>

Pressurize the liquid pipe, suction gas pipe, dual pressure gas pipe and equalizer pipe from the service ports of each stop valve to 478 psi (do not pressurize more than 478 psi). If the pressure does not drop within 24 hours, the system passes the test.
If there is a pressure drop, check for leaks, make repairs and perform the air tight test again.

<Vacuum drying>

Evacuate the system from the liquid pipe, suction gas pipe, dual pressure gas pipe and equalizer pipe stop valve service ports by using a vacuum pump for more than 2 hours and bring the system to –14.6 psi or less. After keeping the system under that condition for more than 1 hour, check if the vacuum gauge rises or not. If it rises, the system may either contain moisture inside or have leaks.
Note:
If moisture might enter the piping, follow belows.
(I.e., if doing work during the rainy season, if the actual work takes long enough that condensation may form on the inside of the pipes, if rain might enter the pipes during work, etc.)
After evacuating the system for 2 hours, pressurize the system to 7.25 psi (vacuum break) with nitrogen gas and evacuate the system again using the vacuum pump for 1 hour to –14.6 psi or less (vacuum drying). If the system cannot be evacuated to –14.6 psi within 2 hours, repeat the operation of vacuum break and vacuum drying.
Then, after leaving the system in vacuum for 1 hour, confirm that the vacuum gauge does not rise.

10.2.4 Pipe Insulation

- Insulation of pipes should be done after performing **"10.2.3 Air Tight Test and Vacuum Drying"**.
- Always insulate the liquid piping, the dual pressure gas piping, the gas piping, the equalizer pipe (between the outdoor units for the outdoor multi system) and these pipe connections.
  Failing to insulate the pipes may cause leaking or burns.
  Especially, be sure to insulate the dual pressure gas piping as withstanding as the suction pipe because the suction gas follows in the dual pressure gas piping when the system is whole cooling mode.
  Be sure to use insulation that is designed for use with HVAC systems.
- Reinforce the insulation on the refrigerant piping according to the installation environment.
  Condensation might form on the surface of the insulation. Refer to the below.
  - Outdoor air temperature : 86°F, humidity : 75% to 80% RH : min. thickness : 9/16 in.
  - If the outdoor air temperature exceeds 86°F and the humidity 80% RH, then the min. thickness is 3/4 in.
    See the Engineering data book for detail.

- If there is a possibility that condensation on the stop valve might drip down into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, etc., this must be prevented by caulking the connections, etc. **(Refer to figure 2)**
- The piping lead-out hole lid should be attached after opening a knock hole. **(Refer to figure 3)**
- If small animals and the like might enter the unit through the piping lead-out hole, close the hole with blocking material (procured on site) after completion of **"10.2.5 Additional Refrigerant Charge and Check Operation". (Refer to figure 6)**

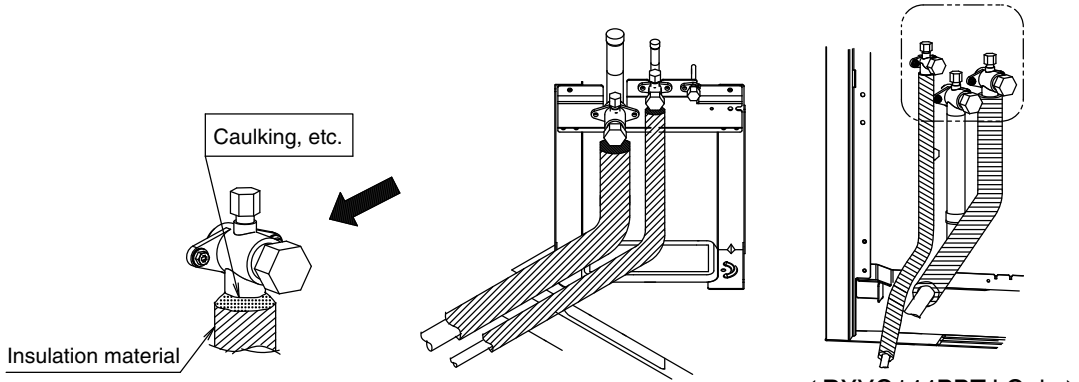


fig. 2

< RXYQ144PBTJ Only >

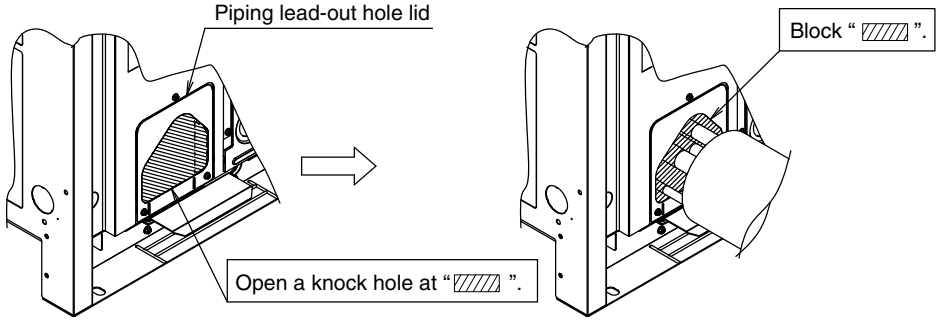


fig. 3

Note:

- After knocking out the holes, we recommend you remove burrs in the knock holes **(See figure 3)** and paint the edges and areas around the edges using the repair paint.

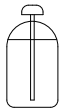
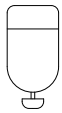
10.2.5 Additional Refrigerant Charge and Check Operation

The outdoor unit is charged with refrigerant when shipped from the factory, but depending on the size and length of the piping when installed, it may require additional charging.
For charging the additional refrigerant, follow the procedure in this chapter.
And then carry out the check operation.

Note:
Total amount of refrigerant should be 220.5 lb or less

10.2.5.1 Before Working

[About the refrigerant tank]
Check whether the tank has a siphon pipe before charging and place the tank so that the refrigerant is charged in liquid form.
(See the figure below.)

With siphon pipe
 Stand the tank upright and charge. (The siphon pipe goes all the way inside, so the tank does not need be put upside-down charge in liquid form.)
Other tanks
 Stand the tank upside-down and charge.

Note:

- Always use the proper refrigerant (R-410A). If charged with the refrigerant containing an improper material, it may cause an explosion or accident.
- R-410A is a mixed refrigerant, so charging it as a gas will cause the refrigerant composition to change, which may prevent normal operation.

[Stop valve operation procedure]

When operating the stop valve, follow the procedure instructed below.

Note:

- Do not open the stop valve until **"10.2.1 Check Work Prior to Turn Power Supply ON"** are completed. If the stop valve is left open without turning on the power, it may cause refrigerant to buildup in the compressor, leading insulation degradation.
- Be sure to use the correct tools.
  The stop valve is not a back-seat type. If forced it to open, it might break the valve body.
- When using a service port, use the charge hose.
- After tightening the cap, make sure no refrigerant gas is leaking.

Tightening torque

The sizes of the stop valves on each model and the tightening torque for each size are listed in the table below.

<Size of Stop Valve>

	72PB type	96PB type	120•144PB type
Liquid pipe stop valve	ϕ3/8 The 120•144PB type corresponds to the ϕ1/2 - diameter onsite piping using the accessory pipe.		
Gas stop valve	ϕ1 The 72PB type corresponds to the ϕ3/4 - diameter onsite piping using the accessory pipe. The 96PB type corresponds to the ϕ7/8 - diameter onsite piping using the accessory pipe. The 120•144PB type corresponds to the ϕ1-1/8 - diameter onsite piping using the accessory pipe.		
High side equalizer pipe stop valve	ϕ3/4		
Low side equalizer pipe stop valve	ϕ3/4		

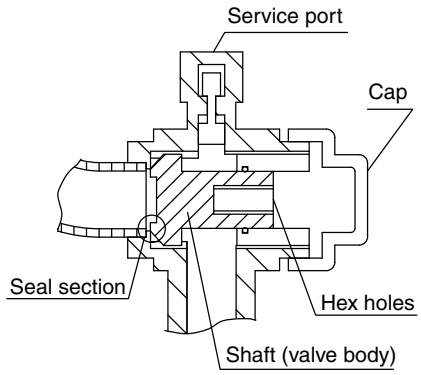


fig. 4

To open

1. Remove the cap and turn the shaft counterclockwise with the hexagon wrench.
2. Turn it until the shaft stops.
3. Make sure to tighten the cap securely.
   (For the tightening torque, refer to the item <Tightening Torque>.)

To close

1. Remove the cap and turn the shaft clockwise with the hexagon wrench.
2. Securely tighten the valve until the shaft contacts the main body seal.
3. Make sure to tighten the cap securely.
   (For the tightening torque, refer to the item <Tightening Torque>.)

<Tightening torque>

Stop valve size	Tightening torque ft · lbf (Turn clockwise to close)			
	Shaft (valve body)		Cap (valve lid)	Service port
ϕ 3/8	3.98 - 4.87	Hexagonal wrench 4mm	9.95 - 12.17	8.48 - 10.3
ϕ 1/2	5.97 - 7.30		13.3 - 16.2	
ϕ 3/4	19.9 - 24.3	Hexagonal wrench 8mm	16.6 - 20.3	
ϕ 1				

[How to Check How Many Units are Connected]

It is possible to find out how many indoor or outdoor unit in the system are turned on by operating the Branch Selector button on the PCB (A1P) of outdoor unit (In case of multi system master unit). Follow the procedure below to check how many indoor or outdoor units are turned on.

(LED display: ● ...OFF ○ ...ON ◑ ...Blinking ∗ ...Uncertain)		LED display						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P
(1) Press the MODE button (BS1) once at **Setting Mode 1** (H1P : off), and set the MONITOR MODE (H1P : Blinking).		◑	●	●	●	●	●	●
(2) Press the SET button (BS2) the number of times until the LED display matches that at right.	For checking the number of outside units : eight times	◑	●	●	○	●	●	●
	For checking the number of indoor units : five times	◑	●	●	●	○	●	○
(3) Press the RETURN button (BS3) and read the number of units from the display of H2P through H7P. [Reading Method] The display of H2P through H7P should be read as a binary number, with ◑ standing for "1" and ● standing for "0".		◑	∗	∗	∗	∗	∗	∗
Ex: For the LED display at right, this would be "0 1 0 1 1 0 ", which would mean 22 units are connected. 32 × **0** + 16 × **1** + 8 × **0** + 4 × **1** + 2 × **1** + 1 × **0** = 22 units Note: "000000" indicates 64 units.		◑	●	◑	●	◑	◑	●
(4) Press the MODE button (BS1) once. This returns to **Setting Mode 1** (H1P : OFF, default).		●	●	○	●	●	●	●

Note:

Press the "MODE button" (BS1) if you get confused while operating.
This returns to **Setting Mode 1** (H1P : OFF, default).

10.2.5.2 Procedure of Adding Refrigerant Charging and Check Operation

WARNING **Electric Shock Warning**

- Make sure to close the Electrical Components Box lid before turning on the power.
- Perform the setting on the PCB (A1P) of the outdoor unit and check the LED display after the power is on via the inspection door which is in the Electrical Components Box lid.

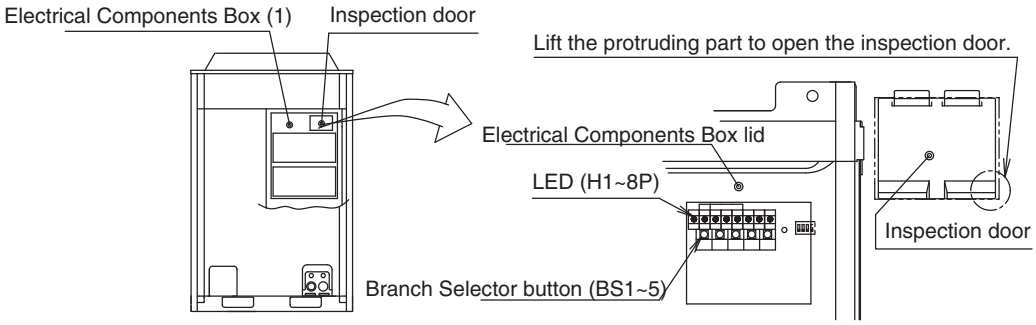


fig. 5

- Use an insulated rod to operate the Branch Selector buttons via the Electrical Components Box's inspection door.
  There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

Caution:

- Make sure to use the protect tool (protective groves and goggles) when charging the refrigerant.
- Due to a danger of liquid hammer, the refrigerant must not be charged over the allowable maximum amount when charging the refrigerant.
- Do not perform the refrigerant charging operation under working for the Branch Selector and indoor unit.
- When opening the front panel, make sure to take caution to the fan rotation during the working. After the outdoor unit stops operating, the fan may keep rotation for a while.

Note:

- If operation is performed within 12 minutes after the Branch Selector, indoor and outdoor units are turned on, H2P will be lit on and the compressor will not operate.
  Check the LED display indicate as shown below.

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

- In order to ensure uniform refrigerant distribution, it may take up to around 10 minutes for the compressor to start up after the unit starting operating. This is not an error.
- The refrigerant charge port is connected to the piping inside the unit.
  When the unit is shipped from the factory, the unit's internal piping is already charged with refrigerant, so be careful when connecting the charge hose.
- After adding the refrigerant, make sure to close the lid of the refrigerant charging port.
  The tightening torque for the lid is 8.48 to 10.3 ft · lbf.
- See [Stop valve operation procedure] in chapter 10.2.5.1 for details on how to handle stop valves.
- When done or when pausing the refrigerant charging operation, close the valve of the refrigerant tank immediately.
  The refrigerant charge port of this product have electronic expansion valve.
  The valve will be closed at end of refrigerant charging. However the valve will be opened on operation after refrigerant charging (check operation, normal operation, etc.).
  If the tank is left with the valve open, the amount of refrigerant which is properly charged may be off the point.
- Make sure to perform the check operation after installation. Otherwise, the error code "U3" will be displayed and normal operation cannot be performed.

And the failure of “Check of wrong wiring” may also cause abnormal operation. Performance may drop due to the failure of “Judgement of piping length”.

- Check operation must be performed for each refrigerant piping system.
  Checking is impossible if plural systems are being done at once.
- The individual problems of indoor units can not be checked.
  About these problems check by test run after the check operation is completed. (See chapter 13)
- The check operation cannot be performed in recovery or other service modes.

10.2.5.3 Procedure of Adding Refrigerant Charging

1. Make sure the following works are complete in accordance with the installation manual.
   - Piping work
   - Wiring work
   - Air tight test
   - Vacuum drying
   - Installation work for Branch Selector, indoor unit
2. Calculate the “additional charging amount” using “How to calculate the additional refrigerant to be charged” in **“Example of connection”** on P.501.
3. Open the valve B (**See the figure 6**. The valve A,C and the liquid pipe, suction gas pipe, dual pressure gas pipe, equalizer pipe stop valves must be left closed), and charge the refrigerant of the “additional charging amount” from the liquid side shutout valve service port.

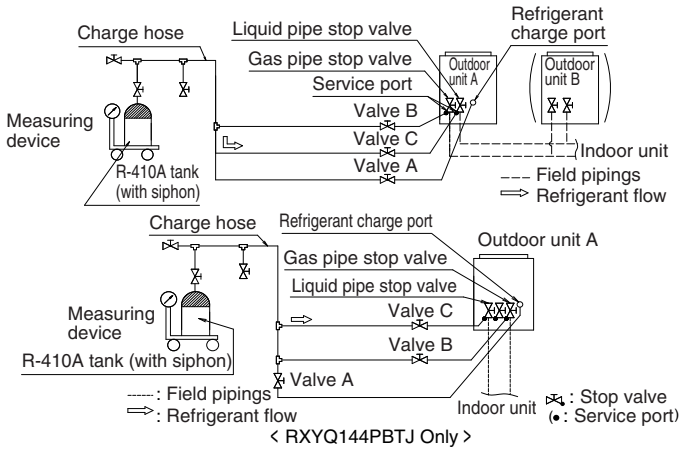


fig. 6

4. If the “additional charging amount” was charged fully, close the valve B and go to step 6.
   If the “additional charging amount” was not charged fully, close the valve B and go to step 5.
5. Perform the refrigerant charging following [Automatic refrigerant charging operation procedure] as shown below. And charge the remaining refrigerant of the “additional charging amount”.

Note:

- For performing the automatic refrigerant charging operation, the Branch Selector button on the PCB (A1) of outdoor unit are used. (See figure 5.)
  And the refrigerant are charged from the refrigerant charge port via the valve A. (See figure 7.)
  For operating the Branch Selector button and opening or closing the valves, follow the procedure.
- During Automatic refrigerant charging operation, the system will select charging mode (cooling mode or heating mode) by the temperature condition as follows.

Outdoor temp. : 32˚F DB ~ 109˚F DB Indoor temp. : 50˚F DB ~ 90˚F DB	➡	Cooling mode
Exclude above range	➡	Heating mode

When charging in cooling mode, the system will stop operation when the required amount of refrigerant is charged.

During charging in heating mode, a person must manually close valve A and stop operation. Beforehand, check the remaining refrigerant that is needed to charge based on the “additional charging amount” in step 2 and the charged amount in step 3.

- The refrigerant will be charged about 66 lb in one hour at outdoor temp. 86°F DB (about 26 lb at outdoor temp. 32°F DB).
- During Automatic refrigerant charging operation, you can stop the operation forcedly by pressing MODE button (BS1).

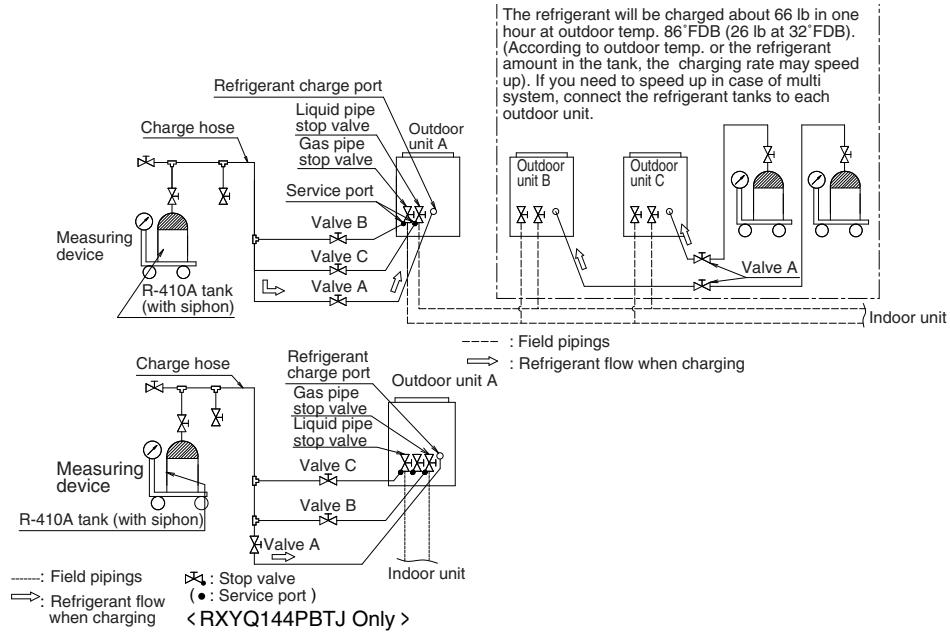


fig. 7

[Automatic refrigerant charging operation procedure]

Note: ● The marks of LED mean as follows.

● : OFF ○ : ON ◑ : Blinking ∗ : OFF, ON or Blinking

(1) Open the liquid pipe and gas pipe stop valves. (The valve A~C must be closed. See figure 31.)

(2) • Close the Electrical Components Box (1) lid and all front panel except on the Electrical Components Box (1) side. (∗1) And turn the power to the outdoor unit and all connected indoor units. (∗2)

• After H2P stop blinking (about 12 minutes after turning on the power), check H2P is OFF. If H2P is ON, check the error code in the remote controller of indoor unit and correct the error in accordance with **[Remote controller display error code]** in chapter 10.2.5.4.

(3) Check the LED. And press the MODE button (BS1) once if the LED displays is not as below.

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

(4) Press the TEST button (BS4) once. (The LED displays will change as below.)

H1P	H2P	H3P	H4P	H5P	H6P	H7P
○	○	○	○	○	○	○

(5) Hold the TEST button (BS4) down for 5 seconds or more.
(The LED displays will change as below and fan of outdoor unit will start rotation.)

H1P	H2P	H3P	H4P	H5P	H6P	H7P
●	◑	●	●	●	∗	∗

(6) When the compressor start working and the LED displays change any state in below (∗3), go to "In case of cooling mode" or "In case of heating mode" in accordance with the LED displays.

H1P	H2P	H3P	H4P	H5P	H6P	H7P	
◑	◑	◑	●	○	●	○	➡ Go to "In case of cooling mode"
◑	◑	●	●	○	●	○	➡ Go to "In case of heating mode"

——In case of cooling mode

(7) Press the TEST button (BS4) once within 5 minutes after procedure (5) (∗4) and close all the front panels (∗5).
After that, open the valve A immediately (See figure 31) (∗6) and watch the remote controller display of indoor unit.

(8) If the remote controller display shows "PE" code (∗7), ready to close the valve A.
And go to procedure (9).
If the remote controller display shows other code, close the valve A immediately and refer to **[Remote controller cooling mode error code]**

⚠ **Beware the fan running when open the front panel.**
The fan may continue rotation after the system stop the operation.

(9) When the compressor stop working (the fan may continue rotation.), close the valve A immediately (∗8).
And check the LED displays are as below and the remote controller display shows "P9" code.

H1P	H2P	H3P	H4P	H5P	H6P	H7P
○	◑	◑	○	○	○	○

After checking, press the MODE button (BS1) once and the charging is complete.

——In case of heating mode

(7) Press the TEST button (BS4) once within 5 minutes after procedure (5) (∗4) and close the all front panels.
After that, open the valve A immediately (See figure 7) (∗6) and check the charged amount by measuring device.
During operation, if the remote controller display shows "P2" or "P8" code, close the valve A immediately and refer to **[Remote controller heating mode error code]**.

⚠ **Beware the fan running when open the front panel.**
The fan may continue rotation after the system stop the operation.

(8) When the required amount of refrigerant is charged, close the valve A (See figure 6) (∗8) and press the RETURN button (BS3) once. And then go to procedure (9).

(9) Press the MODE button (BS1) once, and the charging is complete.

Note (∗1)~(∗9)

(∗1) Lead the refrigerant charge hose etc. from the pipe intake.
All front panels must be closed at the procedure (7).

(∗2) • If you perform the refrigerant charging operation within the refrigerant system that have the power off unit, the operation cannot finish properly.
Check the number of outside and indoor units that is powered.
For checking, see **[How to check how many units are connected]** in chapter 10.2.5.1.
• To energize the crankcase heater, make sure to turn on for 6 hours before starting operation.

(∗3) It takes about 2~10 minutes for getting stability of refrigerant state.
If the additional refrigerant is little and operation is started before getting stability, the system can not judge the charging amount precisely and it cause overcharge.

(∗4) If the TEST button (BS4) is not pressed within 5 minutes, [***P2***] code will displayed in the remote controller. In this case, refer to **[Remote controller cooling (or heating) mode error code]**.

(∗5) If the front panel is opened during the operation, the system cannot operate properly.

(∗6) If you leave the system without connecting the refrigerant tank or opening the valve A for 30 minutes or more, the system stop operation and [***P2***] code are displayed in remote controller. In this case, refer to **[Remote controller cooling (or heating) mode error code]**.

(∗7) Depending on the situation of operation such as the charging amount is little, the “PE” code may not be displayed and the [***P9***] code may be displayed.

(∗8) Always close the valve A and take the tank off.
The refrigerant charge port of this unit have electronic expansion valve and the valve are closed when charging is finished. However, the valve will opened when other operation (Check operation, normal operation, etc.). If you leave the tank connected, the refrigerant will charged and it cause overcharge.

[Remote controller cooling mode error code]

Code	The work contents	
PE	Charging is almost finished. Ready to close the valve A.	
PA PH	The refrigerant tank is empty. Close the valve A and replace the empty tank to the new tank. After changing the tank, open the valve A again. ⚠ **Beware the fan running.** **The outdoor unit does not stop operation.**	
P8	Close the valve A immediately, and restart the operation from procedure (3).	
P2	Operation is interrupted. Close the valve A immediately and check the below items. • Check if gas pipe or liquid pipe stop valve is opened. • Check the refrigerant tank is connected and the valve A was opened. • Check if the air inlet and outlet of the indoor unit are not closed by an obstruction.	After correcting the abnormality, restart the operation from procedure (3).
*	Operation is stopped abnormally. Close the valve A immediately. Confirm the error code and correct the abnormality following the **[Remote controller displays error code]** in chapter 10.2.5.4.	
P9	Charging is finished. Close the valve A and take the refrigerant tank off.	

[Remote controller heating mode error code]

Code	The work contents
P8	Close the valve A immediately and press the TEST button (BS4) once. And restart from procedure (7) of “In case of heating mode”.
P2	Operation is interrupted. Close the valve A immediately and check the below items. • Check if gas pipe or liquid pipe stop valve is opened. • Check the refrigerant tank is connected and the valve A was opened. • Check if the air inlet and outlet of the indoor unit are not closed by an obstruction.

6. After completing the additional refrigerant charging, record the charging amount on the accessory ***REQUEST FOR THE INDICATION*** label (Installation records) and adhere it to the back side of the front panel. Also, record the factory charged refrigerant amount, additional refrigerant amount in the field and total refrigerant amount of the system to ***ADDITIONAL REFRIGERANT CHARGE*** label and adhere in the proximity of the refrigerant charge port.

10.2.5.4 Procedure of Check Operation

- Check operation perform the following work. Do the check operation following below. Otherwise, error code [***U3***] will be displayed in the remote controller and normal operation can not be carried out.
  - Check of stop valve opening
  - Check of wrong wiring
  - Judgement of piping length
  - Check of refrigerant overcharge

Note:

- Check operation can not carried out at outdoor temp. less than 23°F. Perform the check operation at day or time that outdoor temp. is 23°F or more.

[Check Operation Procedure]

1. Close the Electrical Components Box lid and all front panels except as the side of the Electrical Components Box and turn on the power to the outdoor unit and all connected Branch Selector, indoor units. (Be sure to turn the power on at least 6 hours before operation in order to have power running to the crankcase heater.)
2. Make the onsite settings as needed using the Branch Selector button (BS1-BS5) on the outdoor unit PCB (A1P) with the power on. (See **"10.2.6 Onsite Settings"**)
3. Perform the check operation following the Check Operation Method of the [Service Precautions] label (lower) on the Electrical Components Box lid. (See figure 8) The system operation for about 40~60 minutes and automatically stops the check operation.
   If the error code is not displayed in the remote controller after the system stop, check operation is completed. Normal operation will be possible after 5 minutes. If the error code is displayed in the remote controller, correct the error following **[Remote controller displays error code]** and perform the check operation again.

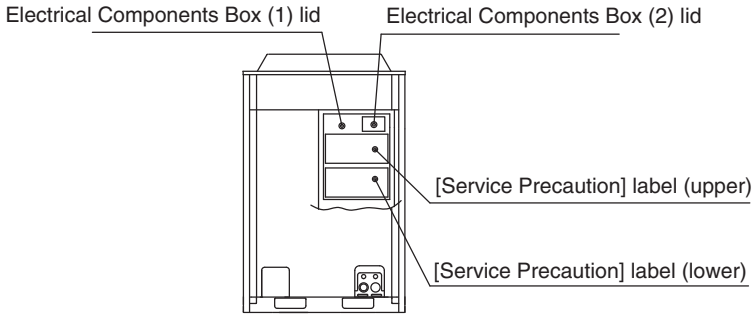


fig. 8

Note:

For interrupting the check operation, press RETURN button (BS3).

[Remote controller displays error code]

Error code	Installation error	Remedial action
E3, E4 F3, F6 UF	The stop valve of the outdoor unit is left closed.	Open the stop valve.
U1	The phases of the power to the outdoor unit is reversed.	Exchange two of the three phases (L1, L2, L3) to make a proper connection.
U1 U4 LC	No power is supplied to an outdoor, Branch Selector or indoor unit (including phase interruption).	Make sure the power supply wire is properly connected to the outdoor, Branch Selector or indoor unit and revise if necessary.
UF	There is conflict on the connection of transmission wiring in the system.	Check if the refrigerant piping line and the transmission wiring are consistent with each other.
E3 F6 UF	Refrigerant overcharge.	Recalculate the additional amount refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
E4 F3	Insufficient refrigerant.	• Check if the additional refrigerant charge has been finished correctly. • Recalculate the additional amount refrigerant from the piping length and add the adequate amount.
U7, U4 UF, UH	Field wiring is connected to "TO MULTI UNIT (Q1,Q2)" terminal on the outdoor unit PCB (A1P) when the system is one outdoor system.	Remove the line from the “TO MULTI UNIT (Q1, Q2)” terminal.

Note:

If any error codes other than the above are displayed, check the service manual for how to respond.

10.2.6 Onsite Settings

Note: In the case of a multi system, all onsite settings should be made on the master unit. Settings made on slave units are invalid.
The outdoor unit to which the indoor unit transmission wire are connected is the master unit, and all other units are slave units.

Use the Branch Selector buttons (BS1 through BS5) on the outdoor unit PCB (A1P) to make the necessary onsite settings.
See the “Service Precautions” label (upper) on the Electrical Components Box lid for details on the positions and operating method of the Branch Selector buttons and on the onsite setting.
Make sure to record the setting on the accessory “REQUEST FOR THE INDICATION” label.

WARNING **Electric Shock Warning**
Use an insulated rod to operate the Branch Selector buttons via the inspection door of Electrical Components Box lid.
There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

10.2.7 Test Run

10.2.7.1 Before Test Run

- Make sure the following works are completed in accordance with the installation manual.
  - Piping work
  - Wiring work
  - Air tight test
  - Vacuum drying
  - Additional refrigerant charge
  - Check operation
- Check that all work for the Branch Selector, indoor unit are finished and there are no danger to operate.

10.2.7.2Test Run

After all works are completed, operate the unit normally and check the following.
(1) Make sure the indoor and outdoor units are operating normally.
(2) Operate each indoor unit one by one and make sure the corresponding outdoor unit is also operating.
(3) Check to see if cold (or hot) air is coming out from the indoor unit.
(4) Press the fan direction and strength buttons on the remote controller to see if they operate properly.

Note:

- Heating is not possible if the outdoor temperature is 75°F or higher. Refer to the Operation manual.
- If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the crankcase heater for a sufficient length of time before restarting the operation.
- Once stopping, the compressor will not restart in about 5 minutes even if the ON/OFF button of the remote controller is pressed.
- When the system operation is stopped by the remote controller, the outdoor units may continue operating for further 5 minutes at maximum.
- The outdoor unit fan may rotate at low speeds if the low night noise setting or the external low noise level setting is made, but this is not an error.
- If the check operation was not performed at first installation, the error code “U3” will be displayed in the remote controller. Perform the check operation following **“10.2.5.4 Procedure of Check Operation”**.

10.2.7.3 Checks after Test Run

Perform the following checks after the test run is complete.

- Record the contents of field setting.

→ Record them on the accessory “REQUEST FOR THE INDICATION” label.
And attach the label on the back side of the front panel.

- Record the installation date.

→ Record the installation date on the accessory “REQUEST FOR THE INDICATION” label in accordance with the IEC60335-2-40.
And attach the label on the back side of the front panel.

Note:

After the test run, when handing the unit over to the customer, make sure the Electrical Components Box lid, the inspection door, and the unit casing are all attached.

10.3 Operation when Power is Turned ON

10.3.1 When Turning ON Power First Time

The unit cannot be run for up to 12 minutes to automatically set the main 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 pressed during operation described above, the "UH" error indicator blinks. (Returns to normal when automatic setting is complete.)

10.3.2 When Turning ON Power the Second Time and Subsequent

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

Status

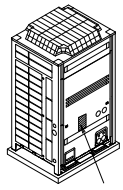
Outdoor unit	Test lamp H2P .... Blinks Can also be set during operation described above.
Indoor unit	If ON button is pressed during operation described above, the operation lamp lights but the compressor does not operate. (Returns to normal when automatic setting is complete.)

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

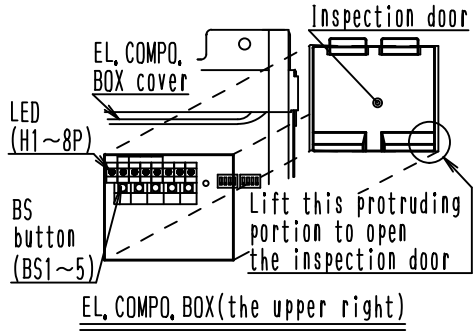
Be sure to press and hold the RESET button for 5 seconds. If not, the addition cannot be recognized. In this case, the unit cannot be run for up to 12 minutes to automatically set the address (indoor-outdoor address, etc.)

Status

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

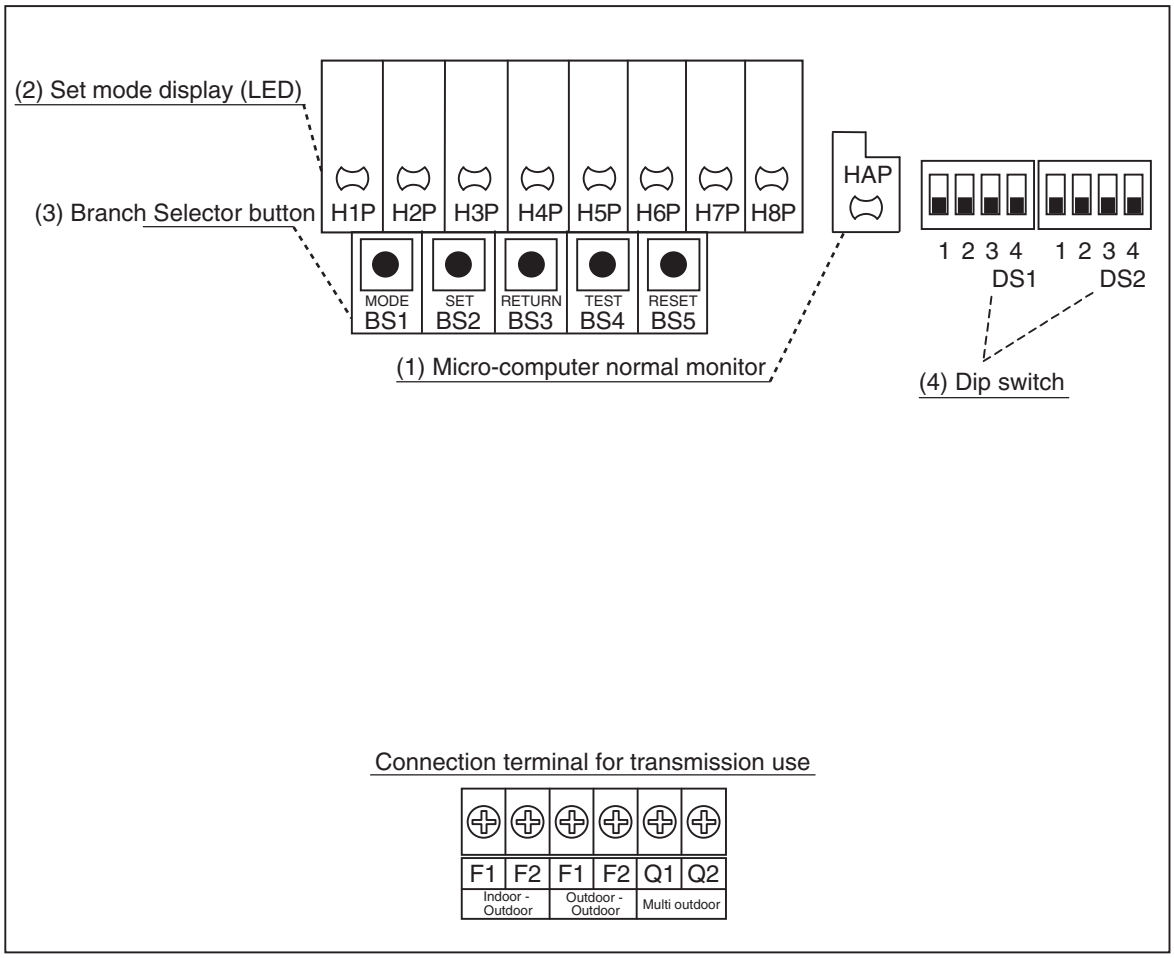


[R-410A] Label



11.Outdoor Unit PCB Layout

Outdoor unit PCB



(1) Micro-computer normal monitor
This monitor blinks while in normal operation, and turns ON or OFF when an error occurs.

(2) Set mode display (LED)
LEDs display mode according to the setting.

(3) Branch Selector button
Used to change mode.

(4) Dip switch
Used to make field settings.

12.Field Setting

12.1 Field Setting from Outdoor Unit

12.1.1 Field Setting from Outdoor Unit

■ **List of Field Setting Items**

This following section indicates the list of field setting items. For the lists of dip switch contents, Setting mode 1, and Setting mode 2, refer to information in tables shown on the following page onward.

For setting items of (∗1), refer to detailed information provided on P.114 onward.

Setting item			Content and objective of setting	Overview of setting procedure	Reference page
Function setting	2	Setting of Low night noise operation (∗1)	A. Use external input to step down the upper limit of the fan (factory setting to Step 8), providing low noise level. (1) Mode 1: Step 6 or lower (2) Mode 2: Step 5 or lower (3) Mode 3: Step 4 or lower	■ Use the "External control adaptor for outdoor unit". Set to "External control adaptor for outdoor unit" with No. 12 of "Setting mode 2" and select the mode with No. 25. If necessary, set the "Capacity priority setting" to ON with No. 29.	114~118
			B. The low night noise operation aforementioned is enabled in night-time automatic low night noise operation mode. Start time: Possible to select in the range of 20:00 to 24:00 hours. End time: Possible to select in the range of 06:00 to 08:00 hours. (Use the said time as a guide since the start time and the end time are estimated according to outdoor temperatures.)	■ Make this setting while in "Setting mode 2". Select a mode with No. 22 of "Setting mode 2". Select the start time with No. 26 and the end time with No. 27. If necessary, set the "Capacity priority setting" to ON with No. 29.	114~118
	3	Setting of demand operation (∗1)	■ Used to place limits on the compressor operating frequency to control the upper limit of power consumption. (1) Mode 1 of Demand 1: 60% or less of rating (2) Mode 2 of Demand 1: 70% or less of rating (3) Mode 3 of Demand 1: 80% or less of rating (4) Demand 2: 40% or less of rating	■ For setting with the use of "external control adaptor for outdoor unit": Set the system to "External control adaptor for outdoor unit" with No. 12 of Setting mode 2" and select the mode with No. 30.	114~118
				■ For setting only in "Setting mode 2": Set the system to Normal demand mode with No. 32 of "Setting mode 2" and select the mode with No. 30.	114~118
	4	Setting of AIRNET address	■ Used to make address setting with AIRNET connected.	■ Set the AIRNET to an intended address using binary numbers with No. 13 of "Setting mode 2".	103~106
	6	Setting of high static pressure	■ Make this setting to operate a system with diffuser duct while in high static pressure mode. (Use this setting mode when shields are installed on upper floors or balconies.) ∗ In order to mount the diffuser duct, remove the cover from the outdoor unit fan.	■ Set No. 18 of "Setting mode 2" to ON.	103~106
	7	Prevention of minute heating operation by heating thermostat OFF unit or non-heating-operation unit	■ Make this setting to prevent a rise in room temperature due to minute heating capacity generated by heating thermostat OFF unit or non-heating-operation unit while in heating operation.	■ Set the Setting item No. 41 of “Setting mode 2” to heating thermostat OFF unit or non-heating-operation unit. (Overseas unit: Default set to “ON”)	103~106
	8	Setting of Branch Selector Cool-Heat selection control time	■ Make this setting to shorten the Branch Selector Cool-Heat selection control time.	■ Set the Setting item No. 42 of “Setting mode 2” to “ON”.	103~106

Setting item			Content and objective of setting	Overview of setting procedure	Reference page
Service setting	1	Indoor unit fan forced H operation	■ Used to operate the indoor unit in the stopped state in forced H operation mode.	■ Set No. 5 of "Setting mode 2" to indoor unit forced fan H.	103~106
	2	Indoor unit forced operation	■ Used to operate the indoor unit in forced operation mode.	■ Set No. 6 of "Setting mode 2" to indoor unit forced operation mode.	103~106
	3	Change of targeted evaporating temperature (in cooling)	■ In cooling operation, used to change the targeted evaporating temperature for compressor capacity control.	■ Select high side or low side with No. 8 of "Setting mode 2".	103~106
	4	Change of targeted condensing temperature (in heating)	■ In heating operation, used to change the targeted condensing temperature for compressor capacity control.	■ Select high side or low side with No. 9 of "Setting mode 2".	103~106
	5	Setting of defrost selection	■ Used to change a temperature at which the defrost operation is initiated, thus making the initiation easy or hard.	■ Select fast side or slow side with No. 10 of "Setting mode 2".	103~106
	6	Setting of sequential startup	■ Used to start units not in sequence but simultaneously.	■ Set No. 11 of "Setting mode 2" to NONE.	103~106
	7	Emergency operation (∗1)	■ If the compressor has a failure, used to prohibit the operation of outdoor unit(s) concerned and to conduct emergency operation of the system only with operable or outdoor unit(s).	■ Make this setting while in "Setting mode 2". For system with multiple outdoor units: Set with No. 38, 39, or 40.	121~124
	8	Additional refrigerant charging	■ If a necessary amount of refrigerant cannot be charged due to the stop of outdoor unit, operate the outdoor unit and then refill refrigerant.	■ Set No. 20 of "Setting mode 2" to ON and then charge refrigerant.	82~91
	9	Refrigerant recovery mode (∗1)	■ Used to recover refrigerant on site. With operations of indoor and outdoor units prohibited, open the outdoor/indoor electronic expansion valve fully while indoor/outdoor operation is prohibited and turn ON some of the solenoid valves.	■ Set No. 21 of "Setting mode 2" to ON.	119
	10	Vacuuming mode (∗1)	■ Used to conduct vacuuming on site. Open the outdoor/indoor electronic expansion valve fully while indoor/outdoor operation is prohibited and turn ON some of the solenoid valves. Use a vacuum pump to conduct vacuuming.	■ Set No. 21 of "Setting mode 2" to ON.	119
	12	Power transistor check mode	■ Used for the troubleshooting of DC compressors. Inverter waveform output makes it possible to judge whether an error results from the compressor or the PCB.	■ Set No. 28 of "Setting mode 2" to ON.	103~106
	13	Setting of model with spare PCB	■ In order to replace the PCB by a spare one, be sure to make model setting.	■ For this setting, set the DS2-2, -3, and-4 switches on the PCB to the model concerned.	98~99

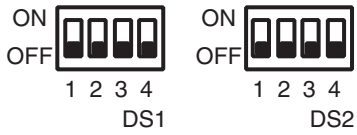
For setting items of (∗1), refer to detailed information provided on P.121 onward.

12.1.2 Setting by Dip Switches

(1) Factory setting of initial PCB.

Do not make any changes in all factory settings of the DIP switches on the service monitor PCB.

Status of DIP switches



■ : Represents the factory setting positions of the switches.

Setting at replacement by spare PCB

Caution

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

After the replacement by the spare PCB, be sure to make settings shown below.
When you change the main PCB (A1P) to spare PCB, please carry out the following setting.

Initial conditions of DIP switches

DIP Switch Detail

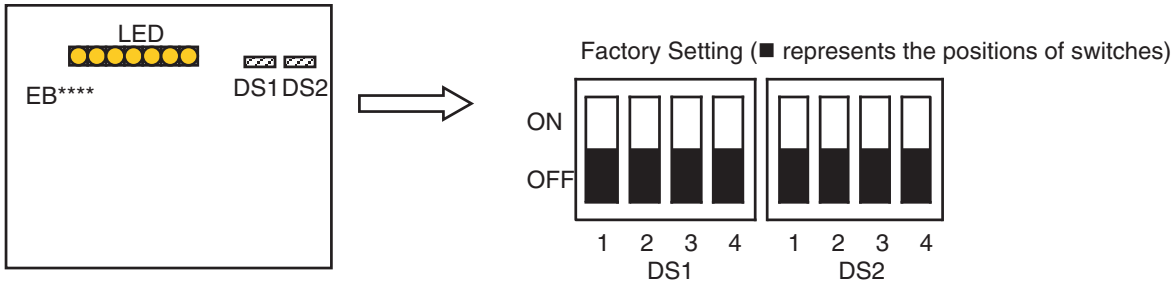
DS No.	Item	Contents	
DS1-2	Power supply specification	ON	200V class (220V)
		OFF (Factory setting of spare PCB)	400V class (380V)
DS1-3 Except Multiple use	Number of fans (Main PCB control)	Make the settings according to models of outdoor units. (All models are set to OFF at factory.) ∗ Refer to following pages for setting detail.	
DS1-4 DS2-1	Unit allocation setting	ON	Make the following settings according to allocation of unit. (All models are set to OFF at factory.)
		OFF (Factory setting of spare PCB)	

Multiple use or Single use	Domestic Japan	Overseas General	Europe	U.S.A.
DS1-4	OFF	OFF	ON	ON
DS2-1	OFF	ON	OFF	ON

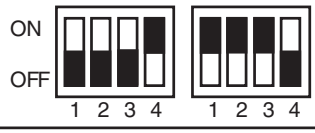
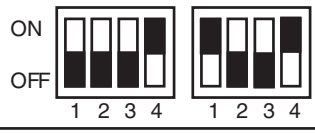
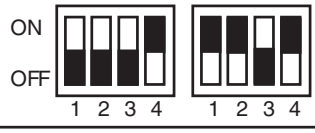
DS2-2 DS2-3 DS2-4	Model setting	Make the settings according to models of outdoor units. (All models are set to OFF at factory.) ∗ Refer to following pages for setting detail.

∗ For detail of the setting procedure, refer to information on the following pages.
While the PCB assembly is replaced, the "U3" error (Test run not carried out yet) code is displayed. In this case, carry out the test run again.
If the "PJ", "UA", or "U7" error code is displayed, recheck for DIP switch settings.
After the completion of rechecking for the settings, turn ON the power supply again.

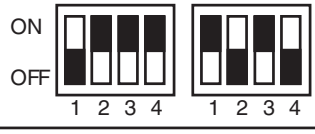
"Detail of DS1-1~4, DS2-1~4 setting"



460V

Application model	Setting method (■ represents the positions of switches)	
HEAT PUMP RXYQ72PBYD		Set DS1-4, DS2-1, DS2-2 and DS2-3 to ON.
HEAT PUMP RXYQ96PBYD		Set DS1-4, DS2-1 and DS2-4 to ON.
HEAT PUMP RXYQ120PBYD		Set DS1-4, DS2-1, DS2-2 and DS2-4 to ON.

208-230V

Application model	Setting method (■ represents the positions of switches)	
HEAT PUMP RXYQ72PBTJ		Set DS1-2, DS1-4, DS2-1, DS2-2 and DS2-3 to ON.
HEAT PUMP RXYQ96PBTJ		Set DS1-2, DS1-4, DS2-1 and DS2-4 to ON.
HEAT PUMP RXYQ120PBTJ		Set DS1-2, DS1-4, DS2-1, DS2-2 and DS2-4 to ON.
HEAT PUMP RXYQ144PBTJ		Set DS1-2, DS1-3, DS1-4, DS2-1 and DS2-3 to ON.

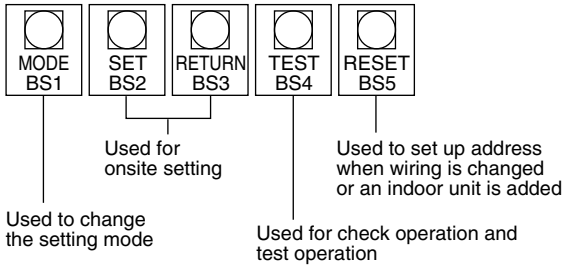
12.1.3 Setting by Branch Selector Buttons

The following settings are made by Branch Selector buttons on PCB.
In case of multi-outdoor unit system, various items should be set with the master unit.
(Setting with the slave unit is disabled.)
The master unit and slave unit can be discriminated with the LED display as shown below.

LED display

		MODE H1P	TEST H2P	COOL/HEAT select			Low noise H6P	Demand H7P	Multi; H8P
				IND H3P	MASTER H4P	SLAVE H5P			
Single-outdoor-unit system		●	●	○	●	●	●	●	●
Outdoor-multi system	Master	●	●	○	●	●	●	●	○
	Slave 1	●	●	●	●	●	●	●	◑

Branch Selector buttons



There are the following three setting modes.

① **Setting mode 1 (H1P off)**

Initial status (when normal) : Used to select the cool/heat setting. Also indicates during “abnormal”, “low noise control” and “demand control”.

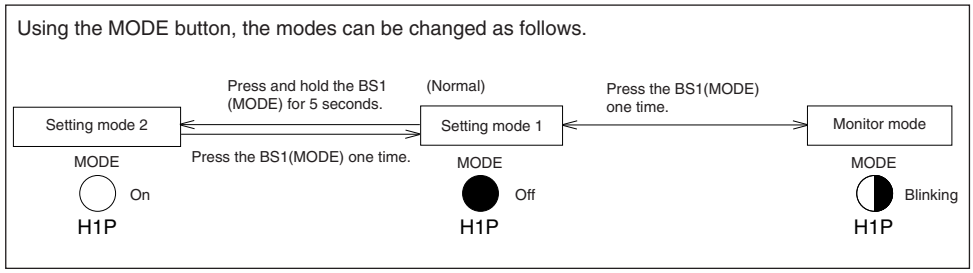
② **Setting mode 2 (H1P on)**

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

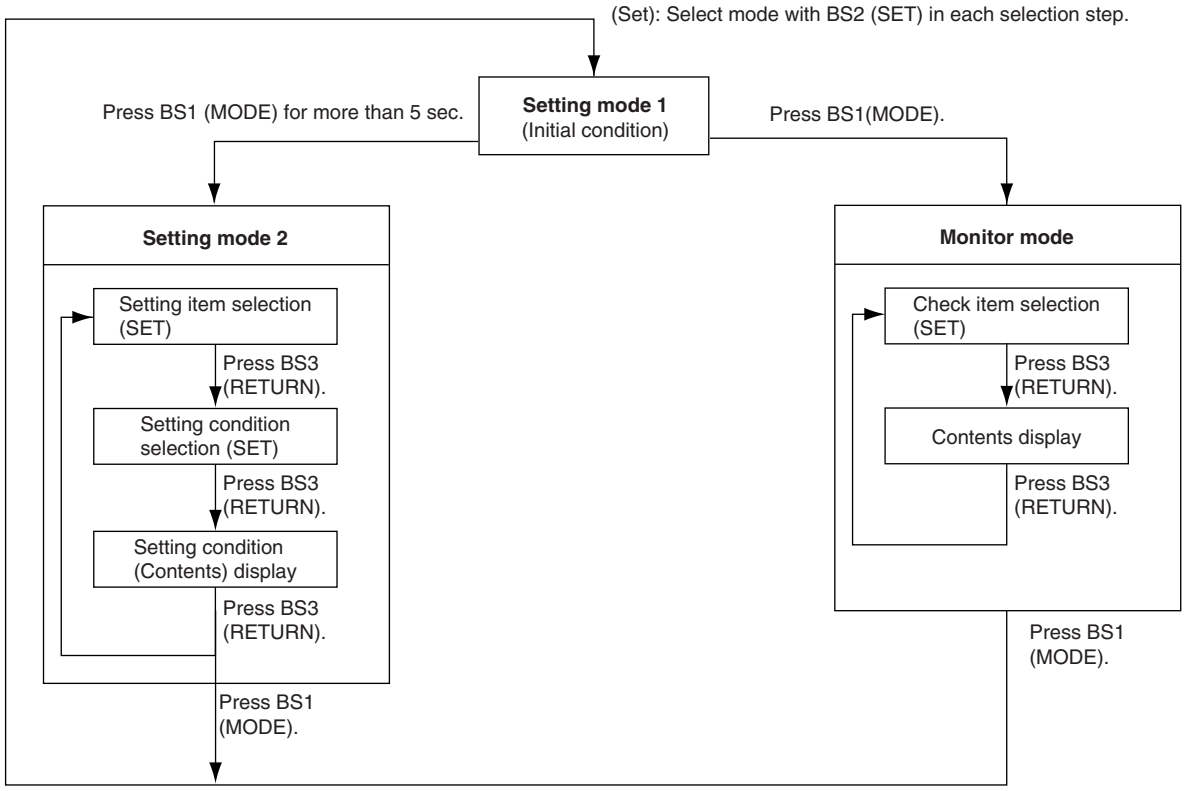
③ **Monitor mode (H1P blinks)**

Used to check the program made in Setting mode 2.

■ **Mode changing procedure 1**



■ **Mode changing procedure 2**



a. “Setting mode 1”

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

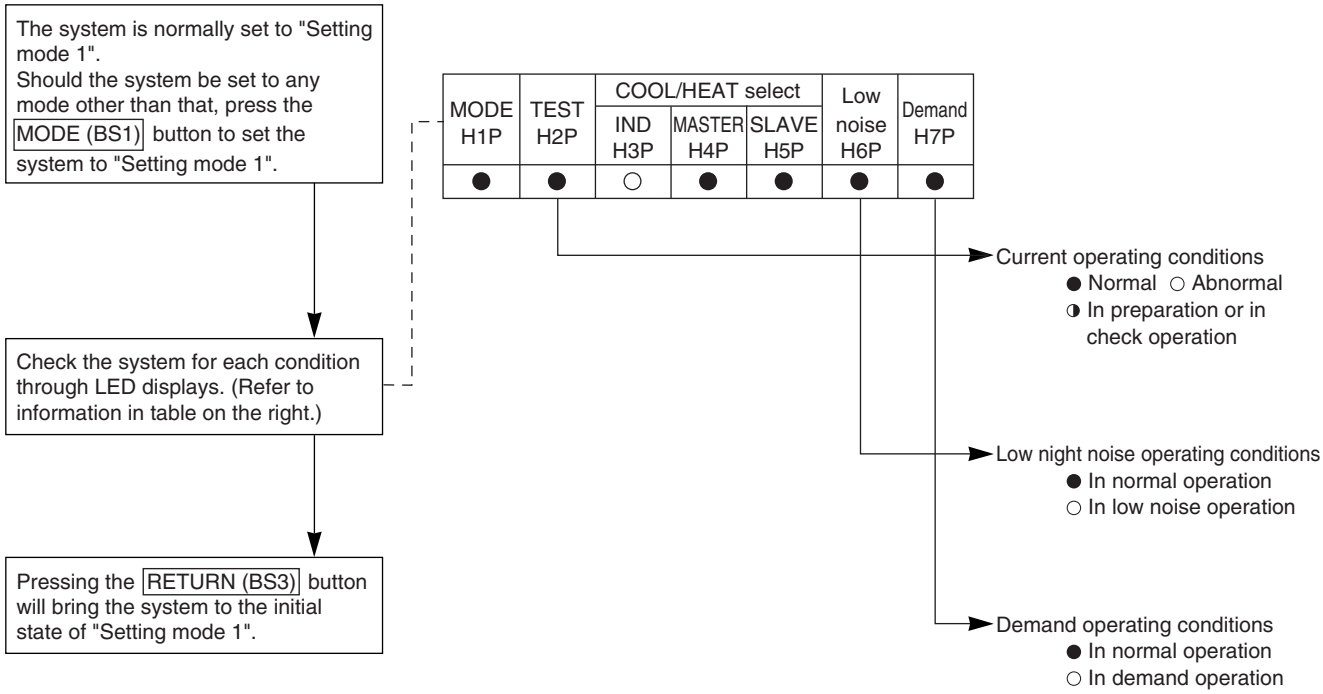
Check items ····· The following items can be checked.

(1) Current operating conditions (Normal / Abnormal / In check operation)

(2) Low noise operating conditions (In normal operation / In low night noise operation)

(3) Demand operating conditions (In normal operation / In demand operation)

Procedure for checking check items



b. “Setting mode 2”

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

<Selection of setting items>

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

<Selection of setting conditions>

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

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

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

No.	Setting item	Description
0	Digital pressure gauge kit display	Used to make setting of contents to display on the digital pressure gauges (e.g. pressure sensors and temperature sensors)
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. (Forced thermostat ON)
8	Te setting	Target evaporating temperature for cooling
9	Tc setting	Target condensing temperature for heating
10	Defrost changeover setting	Changes the temperature condition for defrost and sets to quick defrost or slow defrost.
11	Sequential operation setting	Sets sequential operation (Factory setting to ON)
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	Make this setting to conduct heating operation with hot water heater.
18	High static pressure setting	Make this setting in the case of operating in high static pressure mode with diffuser duct mounted. (In order to mount the diffuser duct, remove the cover from the outdoor unit fan.)
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	Low night noise setting	Sets automatic low night 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	Low night noise operation start setting	Sets starting time of low night noise operation. (Low night noise setting is also required.)
27	Low night noise operation end setting	Sets ending time of low night noise operation. (Low night noise setting is also required.)
28	Power transistor check mode *Check after disconnection of compressor wires	Used for service 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 precedence setting	If the capacity control is required, the low noise control is automatically released by this setting during carrying out low night noise operation and low night 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 that circuit breaker of small capacity is shut down due to large load.)

No.	Setting item	Description
38	Emergency operation (Setting for the unit 1 operation prohibition in multi-outdoor-unit system)	Used to temporarily prohibit the applicable outdoor unit from operating should there be any defective part in multi-outdoor-unit system. Since the comfortable environment is extremely impaired, prompt replacement of the part is required.
39	Emergency operation (Setting for the unit 2 operation prohibition in multi-outdoor-unit system)	
40	Emergency operation (Setting for the unit 3 operation prohibition in multi-outdoor-unit system)	
41	Prevention of minute heating operation by heating thermostat OFF unit or non-heating-operation unit	Make this setting to shorten the Branch Selector Cool-Heat selection control time. However, make the setting, pay careful attention to the following: • If the refrigerant piping between each Branch Selector unit connected to outdoor unit and indoor unit is not more than 10 m in length, this setting will be enabled. • If the refrigerant piping betweenBranch Selectorr unit and indoor unit is long in length, refrigerant passing sounds may become louder at the time of Branch Selector Cool-Heat selection. • This setting shortens the Cool-Heat selection time of all Branch Selector units provided in the same refrigerant system.
51	Set-up of master and slave units for multi outdoor units	Set up master and slave units for multi-connection outdoor units. After setting up, press the BS5 (RESET) button for 5 seconds or more.

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

No.	Setting item	Setting item display: MODE H1P	TEST H2P	C/H selection: IND H3P	C/H selection: Master H4P	C/H selection: Slave H5P	Low noise H6P	Demand H7P	Setting condition display (∗ Factory setting)
0	Digital pressure gauge kit display	○	●	●	●	●	●	●	Address 0 ○●●●●●∗ Binary number 1 ○●●●●●○ (4 digits) ~ 15 ○●●○○○○
1	Cool / Heat Unified address	○	●	●	●	●	●	○	Address 0 ○●●●●●∗ Binary number 1 ○●●●●●○ (6 digits) ~ 31 ○●○○○○○
2	Low noise/demand address	○	●	●	●	●	○	●	Address 0 ○●●●●●∗ Binary number 1 ○●●●●●○ (6 digits) ~ 31 ○●○○○○○
3	Test operation	○	●	●	●	●	○	○	Test operation: OFF ○●●●●●○∗ Test operation: ON ○●●●●○●
5	Indoor forced fan H	○	●	●	●	○	●	○	Normal operation ○●●●●●○∗ Indoor forced fan H ○●●●●○●
6	Indoor forced operation	○	●	●	●	○	○	●	Normal operation ○●●●●●○∗ Indoor forced operation ○●●●●○●
8	Te setting	○	●	●	○	●	●	●	Low (Level L) ○●●●●●○ Normal (Level M) ○●●●●○●∗ High① (Level H) ○●●●●○○ High② ○●●●○●● High③ ○●●●○●○ High④ ○●●●○○● High⑤ ○●●●○○○
9	Tc setting	○	●	●	○	●	●	○	Low ○●●●●●○ Normal (factory setting) ○●●●●○●∗ High ○●●●○●●
10	Defrost changeover setting	○	●	●	○	●	○	●	Slow defrost ○●●●●●○ Normal (factory setting) ○●●●●○●∗ Quick defrost ○●●●○●●
11	Sequential operation setting	○	●	●	○	●	○	○	OFF ○●●●●●○ ON ○●●●●○●∗
12	External low noise/ demand setting	○	●	●	○	○	●	●	External low noise/demand: NO ○●●●●●○∗ External low noise/demand: YES ○●●●●○●
13	AIRNET address	○	●	●	○	○	●	○	Address 0 ○●●●●●●∗ Binary number 1 ○●●●●●○ (6 digits) ~ 63 ○○○○○○○
16	Setting of hot water heater	○	●	○	●	●	●	●	OFF ○●●●●●○∗ ON ○●●●●○●
18	High static pressure setting	○	●	○	●	●	○	●	High static pressure setting: OFF ○●●●●●○∗ High static pressure setting: ON ○●●●●○●
20	Additional refrigerant charging operation setting	○	●	○	●	○	●	●	Refrigerant charging: OFF ○●●●●●○∗ Refrigerant charging: ON ○●●●●○●
21	Refrigerant recovery/vacuuming mode setting	○	●	○	●	○	●	○	Refrigerant recovery / vacuuming: OFF ○●●●●●○∗ Refrigerant recovery / vacuuming: ON ○●●●●○●

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			
22	Low night 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) ○●●●●○○
25	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	Low night noise operation start setting	○	●	○	○	●	○	●	About 20:00 ○●●●●●○ About 22:00 (factory setting) ○●●●●○●∗ About 24:00 ○●●●○●●
27	Low night noise operation end setting	○	●	○	○	●	○	○	About 6:00 ○●●●●●○ About 7:00 ○●●●●○● About 8:00 (factory setting) ○●●●○●●∗
28	Power transistor check mode	○	●	○	○	○	●	●	OFF ○●●●●●○∗ ON ○●●●●○●
29	Capacity precedence setting	○	●	○	○	○	●	○	OFF ○●●●●●○∗ ON ○●●●●○●
30	Demand setting 1	○	●	○	○	○	○	●	60 % demand ○●●●●●○ 70 % demand ○●●●●○●∗ 80 % demand ○●●●○●●
32	Normal demand setting	○	○	●	●	●	●	●	OFF ○●●●●●○∗ Demand 1 ○●●●●○● Demand 2 ○●●●○●●
38	Emergency operation (Master unit is inhibited to operate.)	○	○	●	●	○	○	●	OFF ○●●●●●○∗ Master unit operation: Inhibited ○●●●●○●
39	Emergency operation (Slave unit 1 is inhibited to operate.)	○	○	●	●	○	○	○	OFF ○●●●●●○∗ Slave unit 1 operation: Inhibited ○●●●●○●
40	Emergency operation (Slave unit 2 is inhibited to operate.)	○	○	●	○	●	●	●	OFF ○●●●●●○∗ Slave unit 2 operation: Inhibited ○●●●●○●
41	Prevention of minute heating operation by heating thermostat OFF unit or non-heating-operation unit	○	○	●	○	●	●	○	OFF ○●●●●●● Non-heating-operation unit ○●●●●●○ Heating thermostat OFF unit ○●●●●○● Non-heating-operation + Thermostat OFF ○●●●●○○∗
51	Master-slave set-up for multi outdoor units	○	○	○	●	●	○	○	Automatic judgement ○●●●●●●∗ Master ○●●●●●○ Slave 1 ○●●●●○● Slave 2 ○●●●●○○

↑ 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, press the MODE (BS1) button when in "Setting mode 1".

<Selection of setting item>

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

<Confirmation on setting contents>

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

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

∗ Press 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 settings	◑	●	●	●	●	●	●	Lower 4 digits
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 ∗1	◑	●	●	●	○	●	○	
7	Number of connected zone units (Fixed to "0")	◑	●	●	●	○	○	○	
8	Number of outdoor units ∗2	◑	●	●	○	●	●	●	
11	Number of zone units	◑	●	●	○	●	○	○	Lower 6 digits
12	Number of terminal units ∗3	◑	●	●	○	○	●	●	Lower 4 digits: upper
13	Number of terminal units ∗3	◑	●	●	○	○	●	○	Lower 4 digits: lower
14	Contents of error (the latest)	◑	●	●	○	○	○	●	Error code table Refer to P.329.
15	Contents of error (1 cycle before)	◑	●	●	○	○	○	○	
16	Contents of error (2 cycle before)	◑	●	○	●	●	●	●	
20	Contents of retry (the latest)	◑	●	○	●	○	●	●	
21	Contents of retry (1 cycle before)	◑	●	○	●	○	●	○	
22	Contents of retry (2 cycle before)	◑	●	○	●	○	○	●	
25	Number of multi connection outdoor units	◑	●	○	○	●	●	○	Lower 6 digits

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

∗1: Number of connected indoor units
Used to make setting of the number of indoor units connected to an outdoor unit.

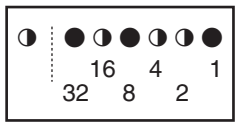
∗2: Number of outdoor units
Used to make setting of the number of outdoor units connected to DIII-NET that is one of the communication lines.

∗3: Number of terminal units
Used to make setting of the number of indoor units connected to DIII-NET that is one of the communication lines.
(Only available for VRV indoor units)

Setting item 0 Display contents of "Number of units for various settings"

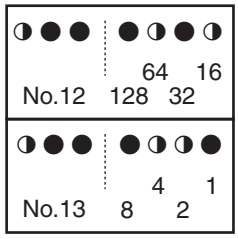
EMG operation / backup operation setting	ON	◑	●	●	○	●	●	●
	OFF	◑	●	●	●	●	●	●
Defrost select setting	Short	◑	●	●	●	○	●	●
	Medium	◑	●	●	●	◑	●	●
	Long	◑	●	●	●	●	●	●
Te setting	L	◑	●	●	●	●	●	●
	M	◑	●	●	●	●	◑	●
	H ①~⑤	◑	●	●	●	●	○	●
Tc setting	L	◑	●	●	●	●	●	●
	M	◑	●	●	●	●	●	◑
	H	◑	●	●	●	●	●	○

∗ 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.

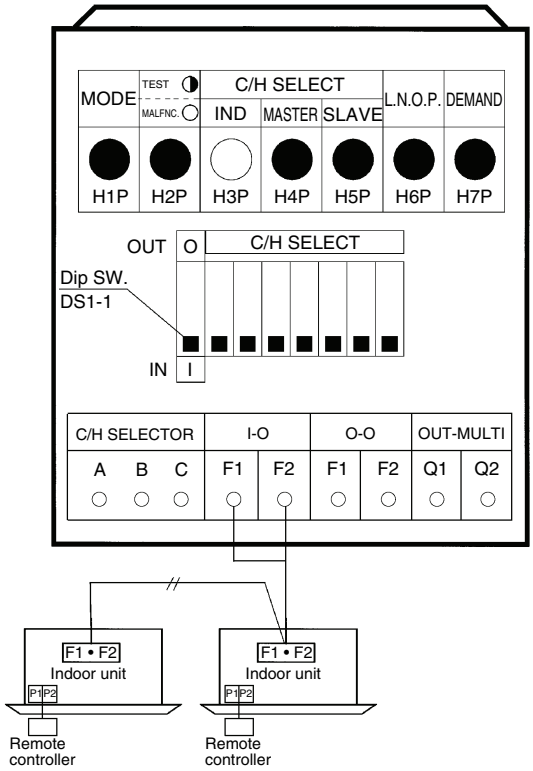
12.1.4 Cool / Heat Mode Switching

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 selector.
(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).



<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.

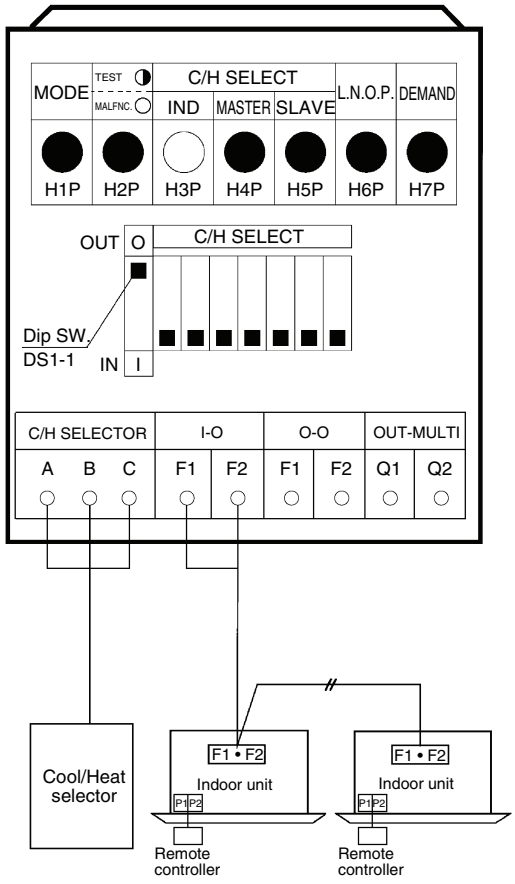
For the details, refer to the installation manual supplied together with the indoor unit.

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.

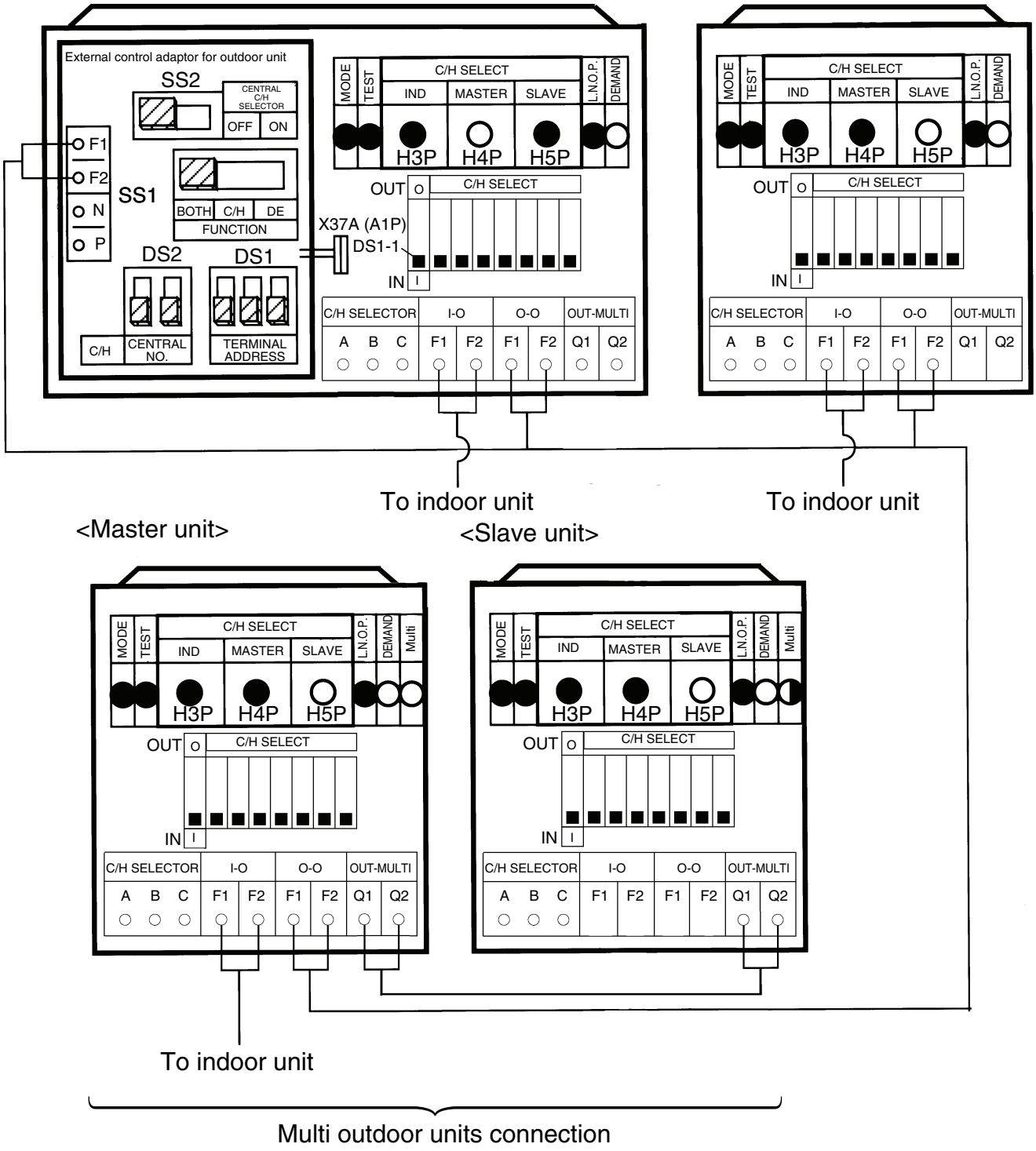
(2) Set Cool / Heat Separately for Each Outdoor Unit System by Cool / Heat Selector

- ◆ 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).



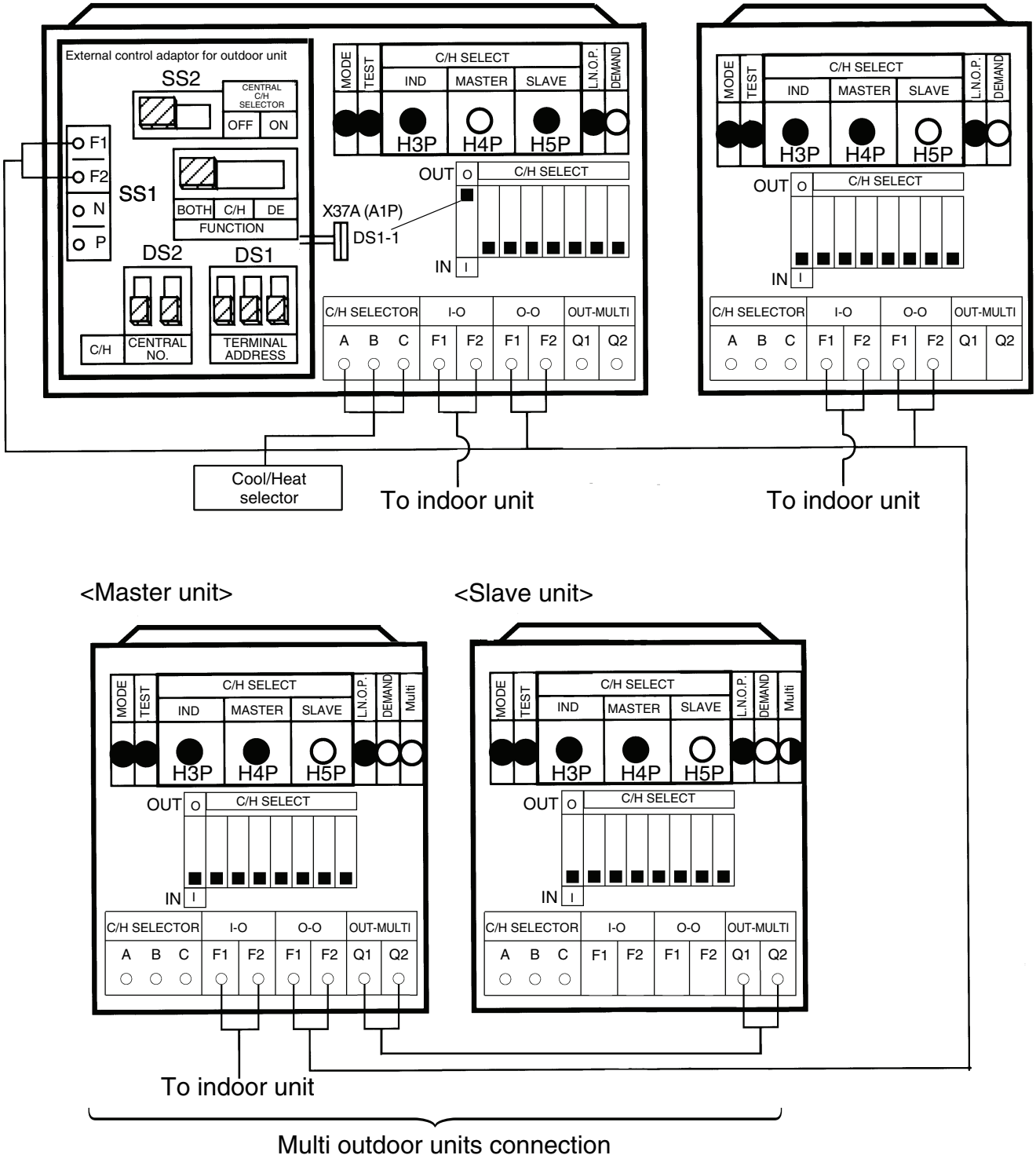
(3) Set Cool / Heat for More Than One Outdoor Unit System Simultaneously in Accordance with Unified Master Outdoor Unit by Indoor Unit Remote Controller

- Install the external control adaptor for outdoor unit on either the outdoor-outdoor, indoor-outdoor transmission line.
- Set outdoor unit PCB DS1-1 to IN (factory setting).
- In setting mode 1, set the outdoor unit you want to give cool/heat selection permission to as the group master, and set the other outdoor units as group slave units.
- Set the external control adaptor for outdoor unit SS1 to BOTH (factory setting) or C/H, and SS2 to OFF (factory setting).



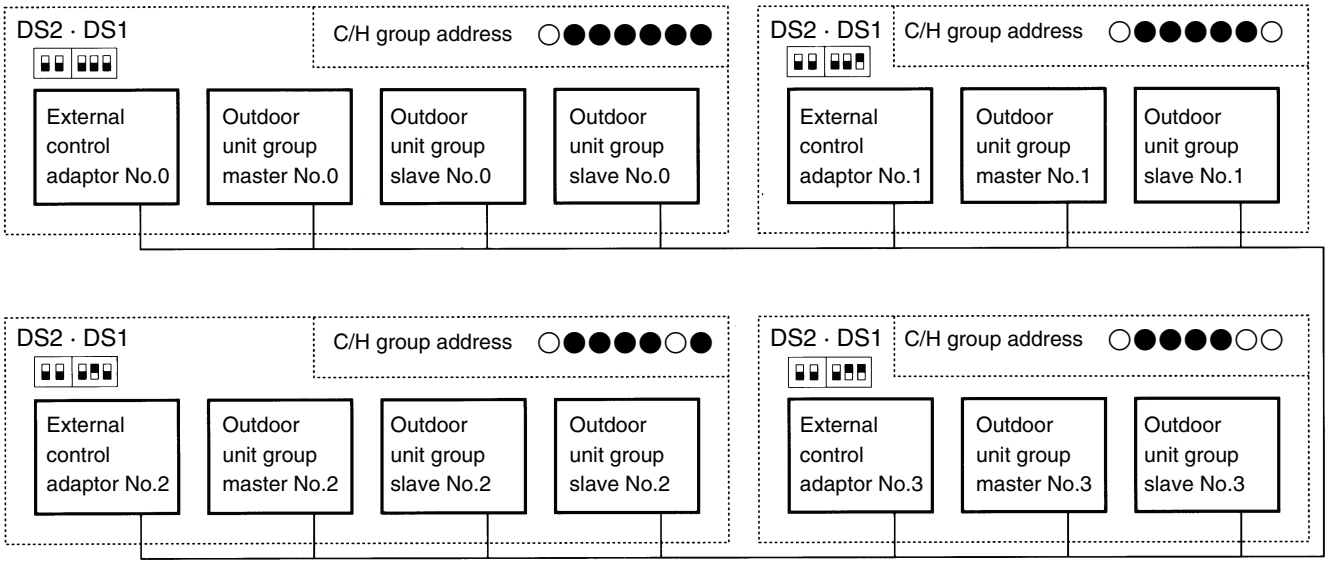
(4) Set Cool / Heat for More Than One Outdoor Unit System Simultaneously in Accordance with Unified Master Outdoor Unit by Cool / Heat Selector

- Install the external control adaptor for outdoor unit on either the outdoor-outdoor, indoor-outdoor transmission line.
- Mount the COOL/HEAT selector to the master outdoor unit for the unified control.
- Set the DS1-1 on the PCB of master outdoor unit to OUT.
- In setting mode 1, set the outdoor unit you want to give cool/heat selection permission to as the group master, and set the other outdoor units as group slave units.
- Set the external control adaptor for outdoor unit SS1 to BOTH (factory setting) or C/H, and SS2 to OFF (factory setting).



Supplementation on (3) and (4).

When switching cool/heat for each adaptor PCB with the use of more than one adaptor PCB, set the address of the external control adaptor for outdoor unit PCB DS1 and DS2 so that it matches the unified cool/heat address of outdoor unit main PCB.



Address setting for ③ and ④ (Set lower 5 digits with binary number.) [No.0 to No.31]

Address No.	Outdoor unit PCB LED Set with setting mode 2	External control adaptor for outdoor unit DS2 DS1
No 0	○ ● ● ● ● ● 0	0
No 1	○ ● ● ● ● ○ 1	1
No 2	○ ● ● ● ○ ● 2	2
No 3	○ ● ● ● ○ ○ 3	3
No 4	○ ● ● ● ○ ● ● 4	4
≀	≀	≀
No 30	○ ● ○ ○ ○ ○ ● 30	30
No 31	○ ● ○ ○ ○ ○ ○ 31	31

○ON ●OFF Upper position (ON) lower position (OFF)
(The shaded part shows knob)

12.1.5 Setting of Low Night Noise Operation and Demand Operation

Setting of Low Night Noise Operation

By connecting the external contact input to the low noise input of the outdoor unit external control adaptor for outdoor unit (optional), you can lower operating noise.

Setting	Content
Level 1	Set the outdoor unit fan to Step 6 or lower.
Level 2	Set the outdoor unit fan to Step 5 or lower.
Level 3	Set the outdoor unit fan to Step 4 or lower.

A. When the low night noise operation is carried out by external contact (with the use of the external control adaptor for outdoor unit)

1. Connect the external adaptor for the outdoor unit, and then connect the external input wiring to the low-noise operation input terminal on the terminal block (X1M). (Refer to the figure shown below.)
2. While in "Setting mode 2", set the setting condition for set item No. 12 (Setting of external low noise/demand operation) to "YES".
3. If necessary, while in "Setting mode 2", select the setting condition (i.e., Level 1", "Level 2", or "Level 3") for set item No. 25 (Setting of external low noise level).
4. If necessary, while in "Setting mode 2", set the setting condition for the set item No. 29 (Setting of capacity precedence) to "ON".
   (If the condition is set to "ON", when the air-conditioning load reaches a high level, the night-time quiet operation command will be ignored to put the system into normal operation mode.)

B. When the low night 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., "Level 1", "Level 2", or "Level 3") for set item No. 22 (Setting of night-time 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 low night 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 low night 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 (Setting of capacity precedence) 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 night-time.)

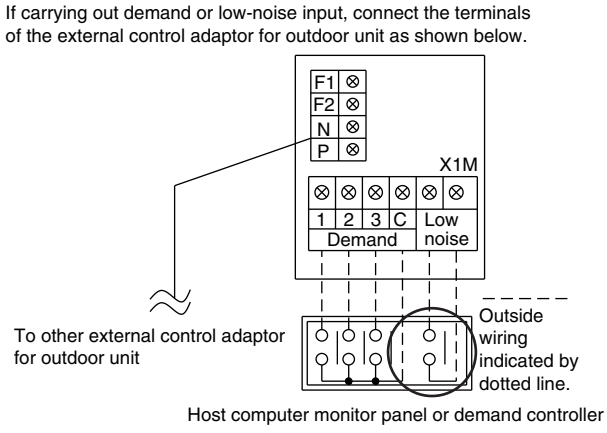


Image of operation in the case of A

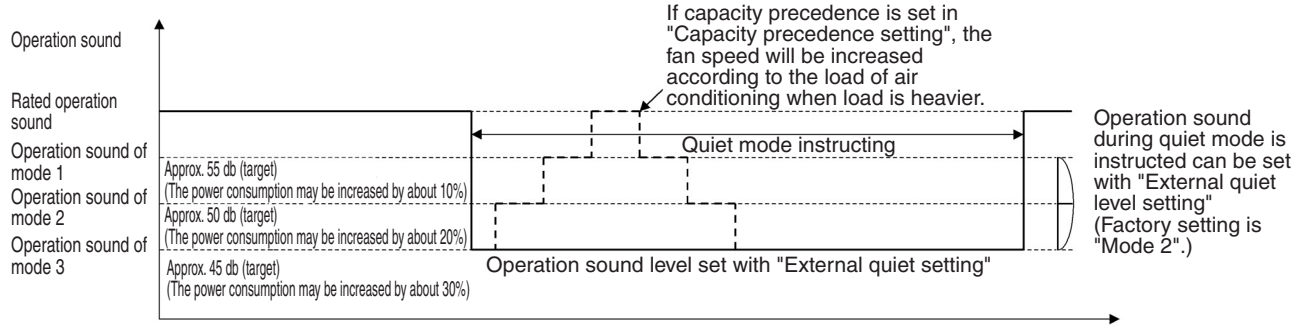


Image of operation in the case of B

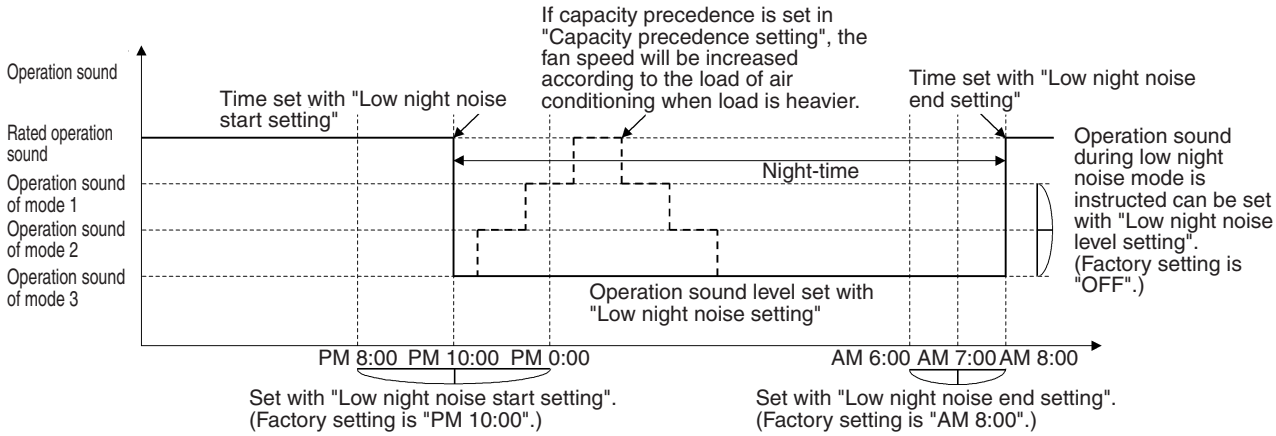
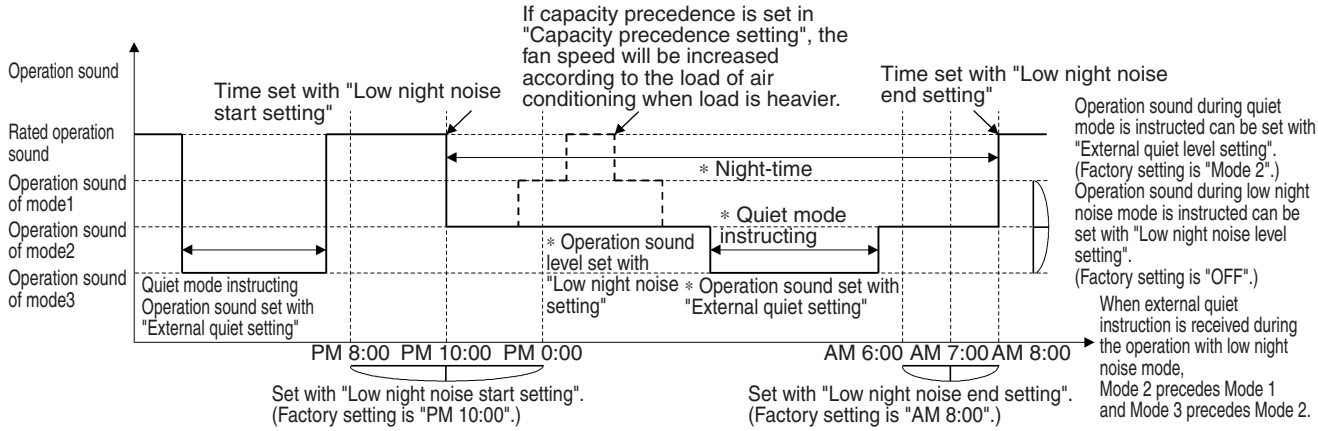


Image of operation in the case of A and B



Setting of Demand Operation

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

Description of setting			Setting procedure	
Setting item	Condition	Description	External control adaptor for outdoor unit	Outdoor unit PCB
Demand 1	Level 1	Operate with power of approx. 60% or less of the rating.	Short circuit between "1" and "C" of the terminal block (TeS1).	Set the setting item No. 32 to "Demand 1" and the setting item No. 30 to "Level 1".
	Level 2	Operate with power of approx. 70% or less of the rating.		Set the setting item No. 32 to "Demand 1" and the setting item No. 30 to "Level 2".
	Level 3	Operate with power of approx. 80% or less of the rating.		Set the setting item No. 32 to "Demand1" and the setting item No. 30 to "Level 3".
Demand 2	–	Operate with power of approx. 40% or less of the rating.	Short circuit between "2" and "C".	Set the setting item No. 32 to "Demand 2".
Demand 3	–	Operate with forced thermostat OFF	Short circuit between "3" and "C"	–

A. When the demand operation is carried out by external contact (with the use of the external control adaptor for outdoor unit).

1. Connect the external adaptor of the outdoor unit, and then connect the external input wiring to the low-noise operation input terminal on the terminal block (X1M). (Refer to the figure shown below.)
2. While in "Setting mode 2", set the setting condition for set item No. 12 (Setting of external low noise/demand operation) to "YES".
3. If necessary, 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.

B. 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.

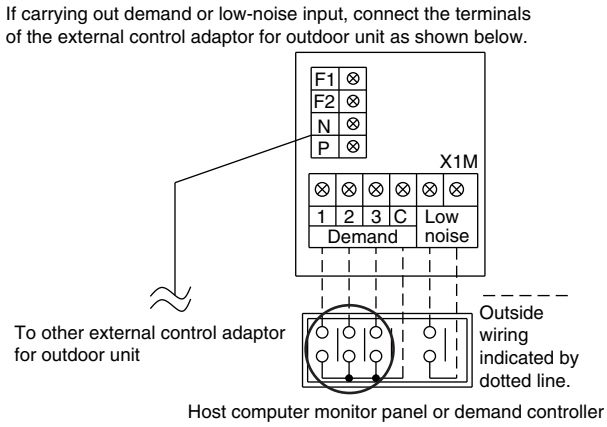


Image of operation in the case of A

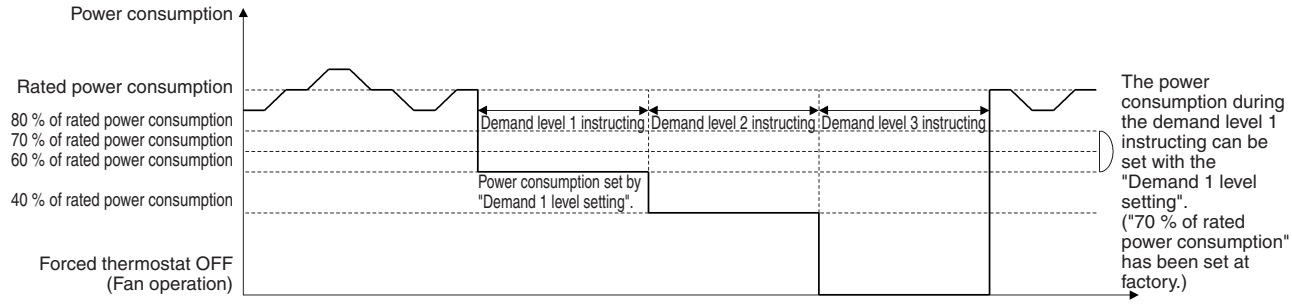


Image of operation in the case of B

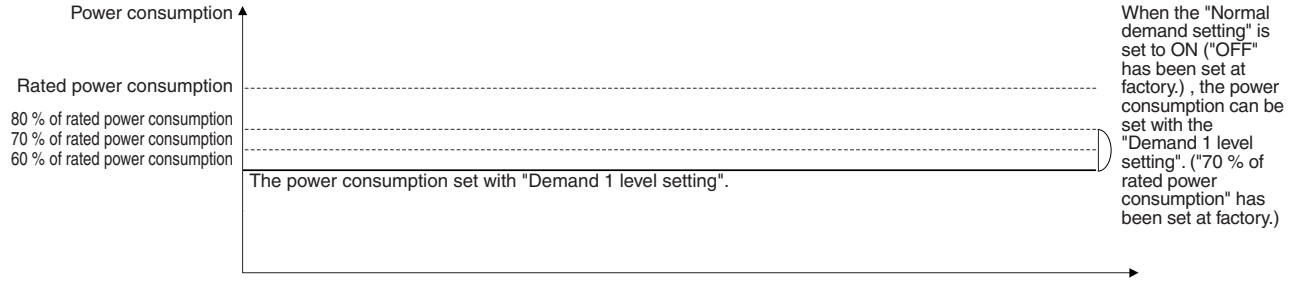
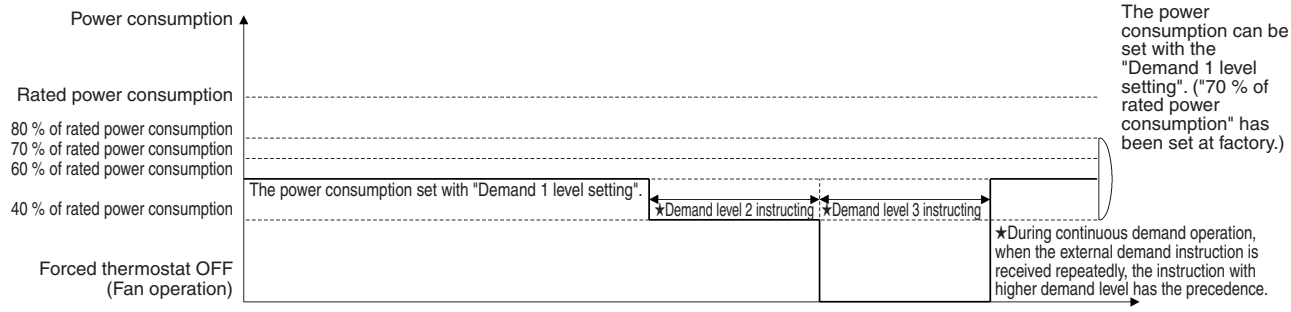


Image of operation in the case of A and B



Detailed Setting Procedure of Low Night Noise Operation and Demand Control

1. Setting mode 1 (H1P off)

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

2. Setting mode 2 (H1P on)

① In setting 1, press and hold the BS1 (MODE button) for more than 5 seconds. → Setting mode 2 is entered and H1P lights.
② Press the BS2 (SET button) several times and match the LED display with the Setting No. you want.
③ Press 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 below) you want.
④ Press the BS3 (RETURN button) two times. → Returns to ①.
⑤ Press the BS1 (MODE button) one time. → Returns to the setting mode 1 and turns H1P off.

① ② ③ ○: 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 / Demand setting	○	●	●	●	●	●	●	○	●	●	○	○	●	●	NO (Factory setting)	○	●	●	●	●	●	◑
																YES	○	●	●	●	●	◑	●
22	Low night noise setting								○	●	○	●	○	○	●	OFF (Factory setting)	○	●	●	●	●	●	●
																Mode 1	○	●	●	●	●	●	◑
																Mode 2	○	●	●	●	●	◑	●
																Mode 3	○	●	●	●	●	◑	◑
25	External low noise setting								○	●	○	○	●	●	○	Mode 1	○	●	●	●	●	●	◑
																Mode 2 (Factory setting)	○	●	●	●	●	◑	●
																Mode 3	○	●	●	●	◑	●	●
26	Low night noise start setting								○	●	○	○	●	○	●	PM 8:00	○	●	●	●	●	●	◑
																PM 10:00 (Factory setting)	○	●	●	●	●	◑	●
																PM 0:00	○	●	●	●	◑	●	●
27	Low night noise end setting								○	●	○	○	●	○	○	AM 6:00	○	●	●	●	●	●	◑
																AM 7:00	○	●	●	●	●	◑	●
																AM 8:00 (Factory setting)	○	●	●	●	◑	●	●
29	Capacity precedence setting								○	●	○	○	○	●	○	Low noise precedence (Factory setting)	○	●	●	●	●	●	◑
																Capacity precedence	○	●	●	●	●	◑	●
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

12.1.6 Setting of Refrigerant Recovery Mode

When carrying out the refrigerant collection on site, fully open the respective electronic 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 "Refrigerant Recovery / Vacuuming mode" to ON. The respective electronic expansion valve of indoor and outdoor units are fully opened. (H2P turns to display "TEST OPERATION" (blinks), "TEST OPERATION" and "UNDER CENTRALIZED CONTROL" are displayed on the remote controller, and all 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".

12.1.7 Setting of Vacuuming Mode

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

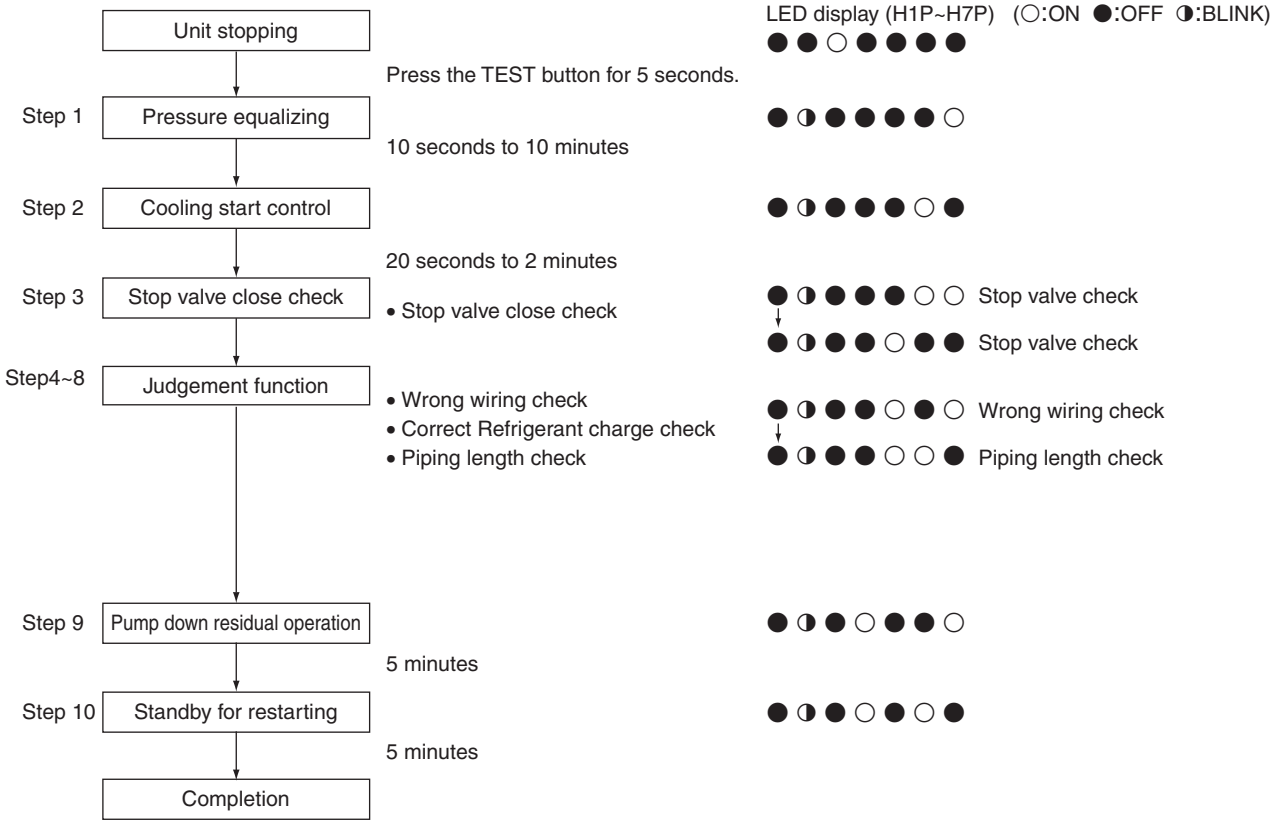
[Operating procedure]

① With **Setting Mode 2** while the unit stops, set "Refrigerant recovery / Vacuuming mode" to ON. The electronic expansion valves of indoor and outdoor units fully open and some of solenoid valves open.
(H2P blinks to indicate the test operation, and the remote controller displays "Test Operation" and "Under centralized control", thus prohibiting operation.)
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".

12.1.8 Check Operation Detail

CHECK OPERATION FUNCTION

(Press the MODE button BS1 once and set to SETTING MODE 1 (H1P: OFF))



12.1.9 Emergency Operation

If any of the compressors goes wrong, disable the relevant compressor or the relevant outdoor unit from operating, and then conduct emergency operation only with operational compressors or outdoor units.

There are two ways of conducting the Emergency operation : ① with remote controller reset and ② by setting outdoor unit PCB.

Operating method / Applicable model	① Emergency operation with remote controller reset (Auto backup operation)	② Emergency operation with outdoor unit PCB setting (Manual backup operation)
RXYQ72~120PBYD RXYQ72~144PBTJ	–	Backup operation by the compressor
RXYQ144~360PBYD RXYQ168~360PBTJ	Backup operation by the indoor unit	Backup operation by the outdoor unit

① **Emergency operation with remote controller reset**

On the multi outdoor unit system, if any of the outdoor unit line causes an error (in this case, the system will stop and the relevant error code will be displayed on the indoor remote controller), disable only the relevant outdoor unit from operating for a 8 hours using the indoor remote controller, and then conduct emergency operation with operational outdoor units.

[Emergency operation method]

- Reset the remote controller (i.e., press the ON/OFF button on the remote controller for 4 seconds or more) when the outdoor unit stops because of error state.

[Details of operation]

- Automatically disable the defective outdoor unit from operating, and then operate other outdoor units.
- The following section shows error codes on which this emergency operation is possible.

E3, E4, E5
F3
H9
J2, J3, J5, J6, J7, J9, JA, JC
L3, L4, L5, L8, L9, LC
U2, UJ

② **Emergency operation by setting outdoor unit PCB**

In error stop state of the outdoor unit due to defective compressor, by setting the relevant compressor or relevant outdoor unit to "Disabling operation setting", the emergency operation is conducted with operational compressors or outdoor units.

<RXYQ72~120PBYD, RXYQ72~144PBTJ>

○ Disabling the compressor 1 (INV. or INV.1) from operating:

Set No. 38 of setting mode 2 to "Disable-compressor-1 operation".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press and hold the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 38 times.	○○●●○○●
(3) Press the CHECK button (BS3) once.	○●●●●●◑ (Factory setting)
(4) Press the OPERATE button (BS2) once.	○●●●●◑●
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

○ Disabling the compressor 2 (STD or INV.2) from operating:

Set No. 39 of setting mode 2 to "Disable-compressor-2 operation".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 39 times.	○○●●○○○
(3) Press the CHECK button (BS3) once.	○●●●●●◑ (Factory setting)
(4) Press the OPERATE button (BS2) once.	○●●●●◑●
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

<RXYQ144~360PBYD, RXYQ168~360PBTJ>

Make disable-operation setting by each outdoor unit.

Make the following setting on the outdoor unit 1. (If this setting is made on an outdoor unit other than the outdoor unit 2, the setting will become invalid.)

∗ It is possible to tell the outdoor units 1 and 2 according the LED displays shown below.

LED display (○: ON, ●: OFF, ◑: Blink)

H1P-------H7P H8P

Outdoor unit 1: ●●○●●●● ○

Outdoor unit 2: ●●●●●●● ◑

○ Disabling the outdoor unit 1 to operate:

Set No. 38 of setting mode 2 to "Disable outdoor unit 1 operation".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press and hold the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 38 times.	○○●●○○●
(3) Press the CHECK button (BS3) once.	○●●●●●◑ (Factory setting)
(4) Press the OPERATE button (BS2) once.	○●●●●◑●
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

○ Disabling the outdoor unit 2 from operating:

Set No. 39 of setting mode 2 to "Disable-outdoor-unit-2 operation".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 39 times.	○○●●○○○
(3) Press the CHECK button (BS3) once.	○●●●●●◑ (Factory setting)
(4) Press the OPERATE button (BS2) once.	○●●●●◑●
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

[Cancel of Emergency Operation]

To cancel the emergency operation, conduct the following setting. (Return to Factory setting.)

<RXYQ72~120PBYD, RXYQ72~144PBTJ>

○ Cancel disabling the compressor 1 (INV. or INV.1) from operating:
Set No. 38 "Disable-compressor-1 operation" of setting mode 2 to "OFF".

	LED display (○: ON, ●: OFF, ◑: Blink)
(Step)	H1---------H7P
(1) Press and hold the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 38 times.	○○●●○○●
(3) Press the CHECK button (BS3) once.	○●●●●◑●
(4) Press the OPERATE button (BS2) once.	○●●●●●◑ (Factory setting)
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

○ Cancel disabling the compressor 2 (STD or INV.2) from operating:
Set No. 39 "Disable-compressor-2 operation" of setting mode 2 to "OFF".

	LED display (○: ON, ●: OFF, ◑: Blink)
(Step)	H1P-------H7P
(1) Press the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 39 times.	○○●●○○○
(3) Press the CHECK button (BS3) once.	○●●●●◑●
(4) Press the OPERATE button (BS2) once.	○●●●●●◑ (Factory setting)
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

<RXYQ144~360PBYD, RXYQ168~360PBTJ>

Cancel the disable-operation setting by each outdoor unit.

Make the following setting on the outdoor unit 1. (If this setting is made on an outdoor unit other than the outdoor unit 2, the setting will become invalid.)

∗It is possible to tell the outdoor units 1 and 2 according the LED displays shown below.

LED display (○: ON, ●: OFF, ◑: Blink)

H1P-------H7P H8P

Outdoor unit 1: ●●○●●●● ○

Outdoor unit 2: ●●●●●●● ◑

○ Cancel disabling the outdoor unit 1 from operating:

Set No. 38 "Disable outdoor unit 1 operation" of setting mode 2 to "OFF".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press and hold the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 38 times.	○○●●○○●
(3) Press the CHECK button (BS3) once.	○●●●●◑●
(4) Press the OPERATE button (BS2) once.	○●●●●●◑ (Factory setting)
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

○ Cancel disabling the outdoor unit 2 from operating:

Set No. 39 "Disable-outdoor-unit-2 operation" of setting mode 2 to "OFF".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 39 times.	○○●●○○○
(3) Press the CHECK button (BS3) once.	○●●●●◑●
(4) Press the OPERATE button (BS2) once.	○●●●●●◑ (Factory setting)
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

Part 3
VRVIII R-410A Heat Recovery 60Hz

1. Specifications

1.1 Outdoor Units

Heat Recovery 60Hz <REYQ-PBYD> 460V

Model Name			REYQ72PBYD	REYQ96PBYD	REYQ120PBYD
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	72,000	96,000	120,000
	Rated		69,000	92,000	114,000
★2 Heating Capacity	Maximum	Btu / h	81,000	108,000	135,000
	Rated		77,000	103,000	129,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 51-3/16 × 30-1/8 (1680 x 1300 x 765)	66-1/8 × 51-3/16 × 30-1/8 (1680 x 1300 x 765)	66-1/8 × 51-3/16 × 30-1/8 (1680 x 1300 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	7.88+10.53	13.34+10.53	13.34+10.53
	Number of Revolutions	r/min	3720, 2900	6300, 2900	6300, 2900
	Motor Output×Number of Units	kW	(1.0+4.5) × 1	(2.2+4.5) × 1	(3.3+4.5) × 1
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	(0.35) × 2	(0.35) × 2	(0.35) × 2
	Airflow Rate	cfm	6,700	6,700	7,410
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ3/8 (9.5) C1220T (Brazing Connection)	ϕ3/8 (9.5) C1220T (Brazing Connection)	ϕ1/2 (12.7) C1220T (Brazing Connection)
	Suction Gas Pipe	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ7/8 (22.2) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe	in. (mm)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
Mass		Lbs (kg)	732 (332)	732 (332)	732 (332)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	20~100	14~100	14~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	22.7 (10.3)	23.4 (10.6)	23.8 (10.8)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070746	C: 4D070747	C: 4D070748

Notes:
- ★1 Indoor temp. : 80°FDB, 67°FWB (27°CDB)/(19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
- ★2 Indoor temp. : 70°FDB (21°CDB)/ outdoor temp. : 47°FDB, 43°FWB (8.3°CDB / 6°CWB) / Equivalent piping length : 25 ft , (7.5 m) level difference : 0 ft.

Heat Recovery 60Hz <REYQ-PBYD> 460V

Model Name (Combination Unit)			REYQ144PBYD	REYQ168PBYD	REYQ192PBYD
Model Name (Independent Unit)			REMQ72PBYD REMQ72PBYD	REMQ72PBYD REMQ96PBYD	REMQ96PBYD REMQ96PBYD
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	144,000	168,000	192,000
	Rated		138,000	160,000	184,000
★2 Heating Capacity	Maximum	Btu / h	162,000	188,000	216,000
	Rated		154,000	180,000	206,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	(16.90) × 2	16.90 + (10.53+13.34)	(10.53+13.34) × 2
	Number of Revolutions	r/min	(7980) × 2	7980, (2900, 6300)	(2900, 6300) × 2
	Motor Output×Number of Units	kW	(4.7) × 2	(4.7) × 1 + (2.2+4.5) × 1	(2.2+4.5) × 2
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	(0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1
	Airflow Rate	cfm	6,350+6,350	6,350+6,530	6,530+6,530
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ1/2 (12.7) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)
	Suction Gas Pipe	in. (mm)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe	in. (mm)	ϕ7/8 (22.2) C1220T (Brazing Connection)	ϕ7/8 (22.2) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
	Pressure Equalizer tube	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
Mass		Lbs (kg)	463 + 463 (210 + 210)	463 + 573 (210 + 260)	573+573 (260 + 260)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	13~100	9~100	7~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	18.1 + 18.1 (8.2 + 8.2)	18.1 + 19.8 (8.2 + 9)	19.8 + 19.8 (9 + 9)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070887	C: 4D070888	C: 4D070889

Notes:
- ★1 Indoor temp. : 80°FDB(27°CDB), 67°FWB(19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
- ★2 Indoor temp. : 70°FDB (21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3°CDB, 6°CWB)/ Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.

Heat Recovery 60Hz <REYQ-PBYD> 460V

Model Name (Combination Unit)			REYQ216PBYD	REYQ240PBYD	REYQ264PBYD
Model Name (Independent Unit)			REMQ96PBYD REMQ120PBYD	REMQ120PBYD REMQ120PBYD	REMQ72PBYD REMQ96PBYD REMQ96PBYD
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	216,000	240,000	264,000
	Rated		206,000	240,000	251,000
★2 Heating Capacity	Maximum	Btu / h	243,000	270,000	297,000
	Rated		231,000	257,000	283,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765 + 1680 x 930 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	(10.53+13.34) × 2	(10.53+13.34) × 2	16.90 + (10.53+13.34) × 2
	Number of Revolutions	r/min	(2900, 6300) × 2	(2900, 6300) × 2	7980, (2900, 6300) × 2
	Motor Output×Number of Units	kW	(2.2+4.5) × 1 + (3.5+4.5) × 1	(3.5+4.5) × 2	(4.7) × 1 + (2.2+4.5) × 2
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	(0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1 + (0.75) × 1
	Airflow Rate	cfm	6,530+7,060	7,060+7,060	6,350+6,530+6,530
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
	Suction Gas Pipe	in. (mm)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe	in. (mm)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
	Pressure Equalizer tube	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
Mass		Lbs (kg)	573 + 573 (260 + 260)	573 + 573 (260 + 260)	463 + 573 + 573 (210 + 260 + 260)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	7~100	6~100	6~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	19.8 + 20.1 (9 +9.1)	20.1+20.1 (9.1 + 9.1)	18.1+19.8+19.8 8.2 + 9 +9))
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070890	C: 4D070891	C: 4D070902

Notes:

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

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

Heat Recovery 60Hz <REYQ-PBYD> 460V

Model Name (Combination Unit)			**REYQ288PBYD**	**REYQ312PBYD**	**REYQ336PBYD**
Model Name (Independent Unit)			**REMQ72PBYD REMQ96PBYD REMQ120PBYD**	**REMQ96PBYD REMQ96PBYD REMQ120PBYD**	**REMQ96PBYD REMQ120PBYD REMQ120PBYD**
Power Supply			3 phase, 460V, 60Hz	3 phase, 460V, 60Hz	3 phase, 460V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	288,000	312,000	336,000
	Rated		274,000	297,000	320,000
★2 Heating Capacity	Maximum	Btu / h	324,000	351,000	378,000
	Rated		308,000	334,000	360,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765 + 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765 + 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765 + 1680 x 930 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	16.90 + (10.53+13.34) × 2	(10.53+13.34) × 3	(10.53+13.34) × 3
	Number of Revolutions	r/min	7980, (2900, 6300) × 2	(2900, 6300) × 3	(2900, 6300) × 3
	Motor Output×Number of Units	kW	(4.7) × 1 + (2.2+4.5) × 1 + (3.5+4.5) × 1	(2.2+4.5) × 2 + (3.5+4.5) × 1	(2.2+4.5) × 1 + (3.5+4.5) × 2
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	(0.75) × 1 + (0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1 + (0.75) × 1
	Airflow Rate	cfm	6,350+6,530+7,060	6,530+6,530+7,060	6,530+7,060+7,060
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
	Suction Gas Pipe	in. (mm)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe	in. (mm)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
	Pressure Equalizer tube	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
Mass		Lbs (kg)	46 3 + 573 + 573 (210 + 260 + 260)	573 + 573 + 573 (260 + 260 + 260)	573 + 573 + 573 (260 + 260 + 260)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	5~100	5~100	4~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	18.1 + 19.8 + 20.1 (8.2 + 9 + 9.1)	19.8 + 19.8 + 20.1 (9+ 9 + 9.1)	19.8 + 20.1 + 20.1 (9+ 9.1 + 9.1)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070903	C: 4D070904	C: 4D070905

Notes:

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

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

Heat Recovery 60Hz <REYQ-PBTJ> 208-230V

Model Name			REYQ72PBTJ	REYQ96PBTJ	REYQ120PBTJ	REYQ144PBTJ
Power Supply			3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	72,000	96,000	120,000	144,000
	Rated		69,000	92,000	114,000	138,000
★2 Heating Capacity	Maximum	Btu / h	81,000	108,000	135,000	162,000
	Rated		77,000	103,000	129,000	154,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 51-3/16 × 30-1/8 (1680 x 1300 x 765)	66-1/8 × 51-3/16 × 30-1/8 (1680 x 1300 x 765)	66-1/8 × 51-3/16 × 30-1/8 (1680 x 1300 x 765)	66-1/8 × 51-3/16 × 30-1/8 (1680 x 1300 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	7.88+10.53	13.34+10.53	13.34+10.53	16.90+16.90
	Number of Revolutions	r/min	3720, 2900	6300, 2900	6300, 2900	7980, 7980
	Motor Output×Number of Units	kW	(1.0+4.5) × 1	(2.2+4.5) × 1	(3.3+4.5) × 1	(3.8+3.8) × 1
	Starting Method		Soft Start	Soft Start	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	(0.35) × 2	(0.35) × 2	(0.35) × 2	(0.75) × 2
	Airflow Rate	cfm	6,700	6,700	7,410	8,300
	Drive		Direct Drive	Direct 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)	ϕ1/2 (12.7) C1220T (Flare Connection)	ϕ1/2 (12.7) C1220T (Flare Connection)
	Suction Gas Pipe	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ7/8 (22.2) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe	in	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ7/8 (22.2) C1220T (Brazing Connection)
Mass		Lbs (kg)	730 (331)	730 (331)	730 (331)	747 (338)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer	Deicer
Capacity Control		%	20~100	14~100	14~100	10~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A	R-410A
	Charge	Lbs (kg)	22.7 (10.3)	23.4 (10.6)	23.8 (10.8)	24.5 (11.1)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070742	C: 4D070744	C: 4D070745	C: 4D070749

Notes:
- ★1 Indoor temp. : 80°FDB (27°CDB), 67°FWB (19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
- ★2 Indoor temp. : 70°FDB (21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3°CDB, 6°CWB)/ Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.

Heat Recovery 60Hz <REYQ-PBTJ> 208-230V

Model Name (Combination Unit)			REYQ168PBTJ	REYQ192PBTJ	REYQ216PBTJ
Model Name (Independent Unit)			REMQ72PBTJ REMQ96PBTJ	REMQ96PBTJ REMQ96PBTJ	REMQ96PBTJ REMQ120PBTJ
Power Supply			3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	168,000	192,000	216,000
	Rated		160,000	184,000	206,000
★2 Heating Capacity	Maximum	Btu / h	188,000	216,000	243,000
	Rated		180,000	206,000	231,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	16.90 + (10.53+13.34)	(10.53+13.34) × 2	(10.53+13.34) × 2
	Number of Revolutions	r/min	7980, (2900, 6300)	(2900, 6300) × 2	(2900, 6300) × 2
	Motor Output×Number of Units	kW	(4.7) × 1 + (2.2+4.5) × 1	(2.2+4.5) × 2	(2.2+4.5) × 1 + (3.5+4.5) × 1
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	(0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1
	Airflow Rate	cfm	6,350+6,530	6,530+6,530	6,530 + 7,060
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ5/8 (15.8) C1220T (Brazing Connection)
	Suction Gas Pipe	in. (mm)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe	in. (mm)	ϕ7/8 (22.2) C1220T (Brazing Connection)	ϕ1-1/8 C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
	Pressure Equalizer Tube	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
Mass		Lbs (kg)	450 + 560 (204 + 254)	560 + 560 (254 + 254)	560 + 560 (254 + 254)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	9~100	7~100	7~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	18.1 + 19.8 (8.2 + 9)	19.8 + 19.8 (9 + 9)	19.8+20.1(9 + 9.1)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070892	C: 4D070893	C: 4D070894

Notes:

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

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

Heat Recovery 60Hz <REYQ-PBTJ> 208-230V

Model Name (Combination Unit)			REYQ240PBTJ	REYQ264PBTJ	REYQ288PBTJ
Model Name (Independent Unit)			REMQ120PBTJ REMQ120PBTJ	REMQ72PBTJ REMQ96PBTJ REMQ96PBTJ	REMQ72PBTJ REMQ96PBTJ REMQ120PBTJ
Power Supply			3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	240,000	264,000	288,000
	Rated		240,000	251,000	274,000
★2 Heating Capacity	Maximum	Btu / h	270,000	297,000	324,000
	Rated		257,000	283,000	308,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765 1680 x 930 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	(10.53+13.34) × 2	16.90 + (10.53+13.34) × 2	16.90 + (10.53+13.34) × 2
	Number of Revolutions	r/min	(2900, 6300) × 2	7980, (2900, 6300) × 2	7980, (2900, 6300) × 2
	Motor Output×Number of Units	kW	(3.5+4.5) × 2	(4.7) × 1 + (2.2+4.5) × 2	(4.7) × 1 + (2.2+4.5) × 1+ (3.5+4.5) × 1
	Starting Method		Soft Start	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	(0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1 + (0.75) × 1
	Airflow Rate	cfm	7,060+7,060	6,350+6,530+6,530	6,350+6,530+7,060
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ5/8 (15.8) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
	Suction Gas Pipe	in. (mm)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)	ϕ1-3/8 (34.9)C1220T (Brazing Connection)	ϕ1-3/8 (34.9) C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe	in. (mm)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
	Pressure Equalizer Tube	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
Mass		Lbs (kg)	560 + 560 (254 + 254)	450 + 560 + 560 (204 + 254 + 254)	450 + 560 + 560 (204 + 254 + 254)
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer	Deicer
Capacity Control		%	6~100	6~100	5~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs (kg)	20.1 + 20.1 (9.1 + 9.1)	18.1 + 19.8 + 19.8 (8.2 + 9 + 9)	18.1+19.8+20.1(8.2 + 9 + 9.1)
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070895	C: 4D070898	C: 4D070899

Notes:
- ★1 Indoor temp. : 80°FDB (27°CDB), 67°FWB (19.4°CWB) / outdoor temp. : 95°FDB (35°CDB) / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
- ★2 Indoor temp. : 70°FDB (21°CDB) / outdoor temp. : 47°FDB, 43°FWB (8.3°CDB, 6°CWB)/ Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.

Heat Recovery 60Hz <REYQ-PBTJ> 208-230V

Model Name (Combination Unit)			REYQ312PBTJ	REYQ336PBTJ
Model Name (Independent Unit)			REMQ96PBTJ REMQ96PBTJ REMQ120PBTJ	REMQ96PBTJ REMQ120PBTJ REMQ120PBTJ
Power Supply			3 phase, 208/230V, 60Hz	3 phase, 208/230V, 60Hz
★1 Cooling Capacity	Maximum	Btu / h	312,000	336,000
	Rated		297,000	320,000
★2 Heating Capacity	Maximum	Btu / h	351,000	378,000
	Rated		334,000	360,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in. (mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765 1680 x 930 x 765)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8 (1680 x 930 x 765 + 1680 x 930 x 765 1680 x 930 x 765)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Displacement	m^3/h	(10.53+13.34) × 3	(10.53+13.34) × 3
	Number of Revolutions	r/min	(2900, 6300) × 3	(2900, 6300) × 3
	Motor Output×Number of Units	kW	(2.2+4.5) × 2 + (3.5+4.5) × 1	(2.2+4.5) × 1 + (3.5+4.5) × 2
	Starting Method		Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan
	Motor Output	kW	(0.75) × 1 + (0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1 + (0.75) × 1
	Airflow Rate	cfm	6,530+6,530+7,060	6,530+7,060+7,060
	Drive		Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing Connection)	ϕ3/4 (19.1) C1220T (Brazing Connection)
	Suction Gas Pipe	in. (mm)	ϕ1-3/8 C1220T (Brazing Connection)	ϕ1-3/8 C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe	in. (mm)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)	ϕ1-1/8 (28.6) C1220T (Brazing Connection)
	Pressure Equalizer Tube	in. (mm)	ϕ3/4 C1220T (Brazing Connection)	ϕ3/4 C1220T (Brazing Connection)
Mass		Lbs (kg)	560+560+560	560+560+560
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer
Capacity Control		%	5~100	4~100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	Lbs (kg)	19.8+19.8+20.1	19.8+20.1+20.1
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D070900	C: 4D070901

Notes: ★1 Indoor temp. : 80°FDB, 67°FWB / outdoor temp. : 95°FDB / Equivalent piping length : 25 ft, level difference: 0 ft.
★2 Indoor temp. : 70°FDB / outdoor temp. : 47°FDB, 43°FWB / Equivalent piping length : 25 ft, level difference: 0 ft.

1.2 Branch Selector Units

Model				BSVQ36PVJU	BSVQ60PVJU	BSVQ96PVJU
Power supply				1 phase 60Hz 208~230V	1 phase 60Hz 208~230V	1 phase 60Hz 208~230V
Total capacity index of connectable indoor unit				Less than 36	Less than 60	Less than 96
No. of connectable indoor units				Max. 5	Max. 8	Max. 8
Casing				Galvanized steel plate	Galvanized steel plate	Galvanized steel plate
Dimensions: (H×W×D)			in. (mm)	8-1/8 × 15-1/4 × 12-13/16 (206 x 387 x 325)	8-1/8 × 15-1/4 × 12-13/16 (206 x 387 x 325)	8-1/8 × 15-1/4 × 12-13/16 (206 x 387 x 325)
Sound absorbing thermal insulation material				Foamed polyurethane. Frame resisting needle felt.	Foamed polyurethane. Frame resisting needle felt.	Foamed polyurethane. Frame resisting needle felt.
Piping connection	Indoor unit	Liquid pipes	in. (mm)	ϕ 3/8 (9.5) C1220T (Brazing connection) ★1	ϕ 3/8 (9.5) C1220T (Brazing connection)	ϕ 3/8 (9.5) C1220T (Brazing connection)
		Gas pipes	in. (mm)	ϕ 5/8 (15.8) C1220T (Brazing connection) ★1	ϕ 5/8 (15.8) C1220T (Brazing connection) ★2	ϕ 7/8 (22.2) C1220T (Brazing connection) ★3
	Outdoor unit	Liquid pipes	in. (mm)	ϕ 3/8 (9.5) C1220T (Brazing connection)	ϕ 3/8 (9.5) C1220T (Brazing connection)	ϕ 3/8 (9.5) C1220T (Brazing connection)
		Suction gas pipes	in. (mm)	ϕ 5/8 (15.8) C1220T (Brazing connection)	ϕ 5/8 (15.8) C1220T (Brazing connection) ★2	ϕ 7/8 (22.2) C1220T (Brazing connection) ★3
		Discharge gas pipes	in. (mm)	ϕ 1/2 (12.7) C1220T (Brazing connection)	ϕ 1/2 (12.7) C1220T (Brazing connection) ★2	ϕ 3/4 (19.1) C1220T (Brazing connection) ★3
Mass (Weight)			Lbs (kg)	26 (11.8)	26 (11.8)	33 (15)
Standard accessories				Installation manual. Attached pipe. Insulation pipe cover. Clamps.	Installation manual. Attached pipe. Insulation pipe cover. Clamps.	Installation manual. Attached pipe. Insulation pipe cover. Clamps.
Drawing No.				4D058233A	4D058234A	4D065539

Notes:
- ★1 In case of connecting with a 07~18 type indoor unit, match to the size of field pipe using the attached pipe. (Connection between the attached pipe and the field pipe must be brazed.)
- ★2 In case of connecting with indoor unit capacity index 54 or more and 60 or less, match to the size of the field pipe using the attached pipe. (Connection between the attached pipe and the field pipe must be brazed.)
- ★3 In case of connecting with a 72 type indoor unit or indoor unit capacity index more than 60 and less than 72, match to the size of the field pipe using the attached pipe. (Connection between the attached pipe and the field pipe must be brazed.)

Connection Range for Branch Selector Unit

Components	Outdoor unit/Branch Selector unit model name	Total capacity of connectable indoor units	Number of connectable indoor units	
Indoor unit total capacity	REYQ72PB	36~93	12	Same number of Branch Selector units
	REYQ96PB	48~124	16	
	REYQ120PB	60~156	20	
	REYQ144PB	72~187	25	
	REYQ168PB	84~218	29	
	REYQ192PB	96~249	33	
	REYQ216PB	108~280	37	
	REYQ240PB	120~312	41	
	REYQ264PB	132~343	45	
	REYQ288PB	144~374	49	
	REYQ312PB	156~405	54	
	REYQ336PB	168~436	58	

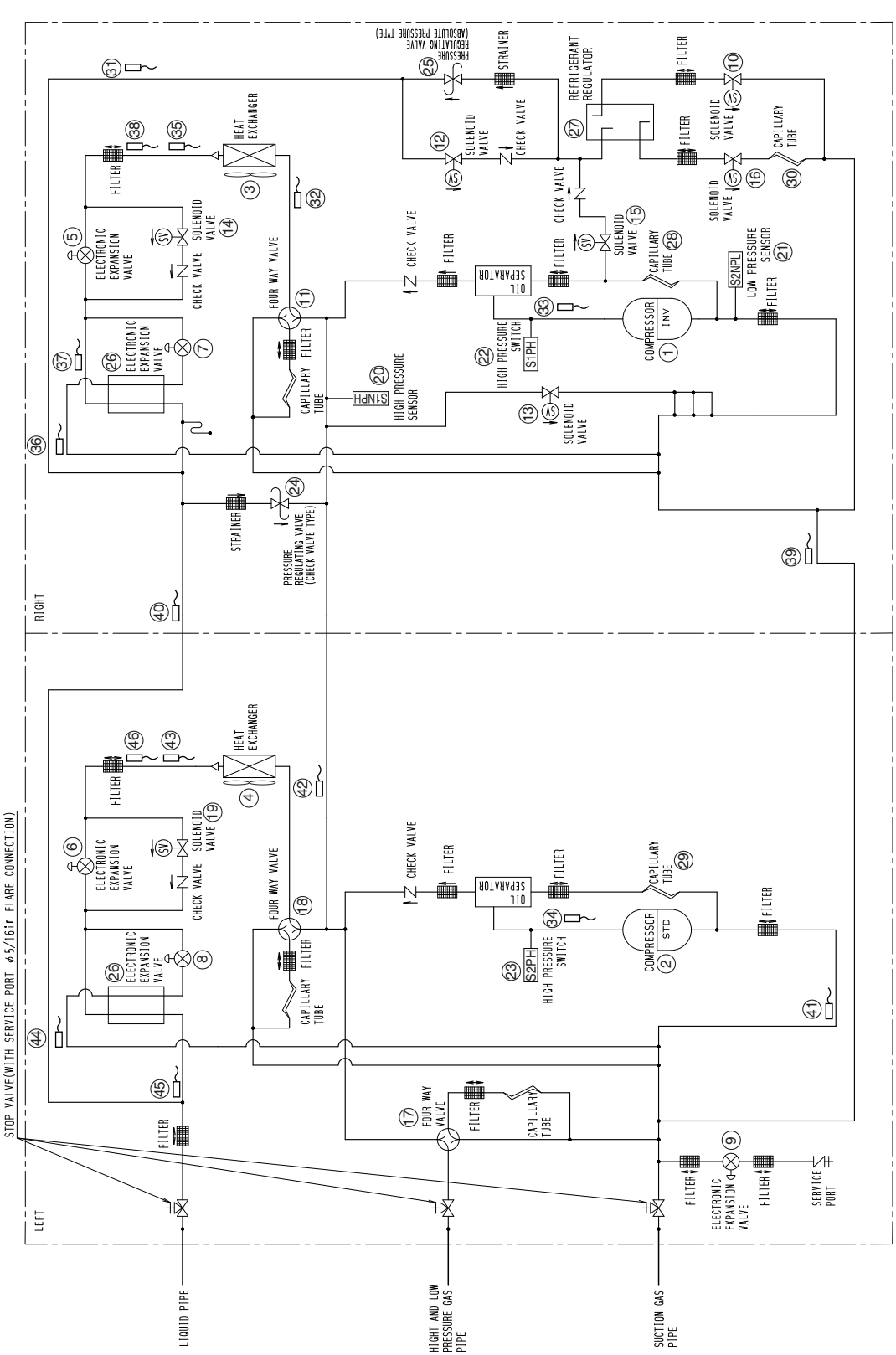
2. Refrigerant Circuit

2.1 REYQ72, 96, 120PBYD, PBTJ

No. in refrigerant system diagram	Symbol	Name	Major Function
①	M1C	Inverter Compressor (INV.)	Inverter compressor is operated on frequencies between 52Hz to 210Hz by using the inverter, while Standard compressor is operated with the commercial power supply only. The number of operating step is as follows when inverter compressor is operated in combination with STD compressor. Compressor operation steps: Refer to P.179~.
②	M2C	Standard Compressor 1 (STD 1)	
③	M1F	Inverter fan	Because the system is an air heat exchange type, the fan is operated at 9-step rotation speed by using the inverter.
④	M2F	Inverter fan	
⑤	Y1E	Electronic expansion valve (Main 1: EVM1)	While in heating, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
⑥	Y3E	Electronic expansion valve (Main 2: EVM2)	
⑦	Y2E	Electronic expansion valve (Subcooling 1: EVT1)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
⑧	Y5E	Electronic expansion valve (Subcooling 2: EVT2)	
⑨	Y4E	Electronic expansion valve (Refrigerant charge: EVJ)	This is used to open/close refrigerant charge port.
⑩	Y1S	Solenoid valve (Refrigerant regulator gas vent pipe: SVG)	This is used to collect refrigerant to the refrigerant regulator.
⑪	Y2S	Four-way valve (Heat exchanger 1)	This is used to switch outdoor heat exchanger to evaporator or condenser.
⑫	Y3S	Solenoid valve (Refrigerant regulator liquid pipe: SVL)	This is used to collect refrigerant to the refrigerant regulator.
⑬	Y4S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
⑭	Y5S	Solenoid valve (Bypass 1: SVE1)	This opens in cooling operation.
⑮	Y6S	Solenoid valve (Discharge pipe of refrigerant regulator)	Bypass the high pressure gas to the refrigerant regulator.
⑯	Y7S	Solenoid valve (Oil return: SVO)	Used to return oil from the accumulator to the compressor.
⑰	Y8S	Four way valve (Piping)	This is used to switch dual pressure gas pipe to high pressure or low pressure.
⑱	Y9S	Four way valve (Heat exchanger 2)	This is used to switch outdoor heat exchanger to evaporator or condenser.
⑲	Y10S	Solenoid valve (Bypass 2: SVE2)	This opens in cooling operation.
⑳	S1NPH	High pressure sensor	Used to detect the high pressure.
㉑	S2NPL	Low pressure sensor	Used to detect the low pressure.
㉒	S1PH	High pressure switch (For INV. Compressor)	This functions when pressure increases to stop operation and avoid high pressure increase in the fault operation.
㉓	S2PH	High pressure switch (For STD Compressor)	
㉔	—	Pressure regulating valve (Liquid pipe)	This is used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
㉕	—	Pressure regulating valve (Refrigerant regulator)	
㉖	—	Subcooling heat exchanger	Apply subcooling to liquid refrigerant.
㉗	—	Refrigerant regulator	Surplus refrigerant is held according to the operation conditioned.
㉘	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV. compressor.
㉙	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the STD compressor.
㉚	—	Capillary tube	This is used to discharge refrigerant from the refrigerant regulator.
㉛	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor air temperature, correct discharge pipe temperature and others.
㉜	R2T	Thermistor (Heat exchanger gas pipe: Tg1)	This detects temperature of gas pipe for air heat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
㉝	R31T	Thermistor (INV. discharge pipe: Tdi)	Used to detect discharge pipe temperature.
㉞	R32T	Thermistor (STD discharge pipe: Tds1)	

No. in refrigerant system diagram	Symbol	Name	Major Function
㉟	R4T	Thermistor (Heat exchanger deicer 1: Tb1)	Used to detect liquid pipe temperature of air heat exchanger. Used to make judgements on defrosting operation.
㊱	R5T	Thermistor (Subcooling heat exchanger gas pipe 1: Tsh1)	Used to detect gas pipe temperature on the evaporating side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooled heat exchanger.
㊲	R6T	Thermistor (Subcooling heat exchanger liquid pipe: TI)	This detects temperature of liquid pipe between the main electronic expansion valve and subcooling heat exchanger.
㊳	R7T	Thermistor (Heat exchanger liquid pipe 1: Tf1)	This detects temperature of liquid pipe between the air heat exchanger and main electronic expansion valve. Used to make judgements on the recover or discharge refrigerants to the refrigerant regulator.
㊴	R8T	Thermistor (Suction pipe 1: TsA1)	Used to detect suction pipe temperature.
㊵	R9T	Thermistor (Liquid pipe 1: Tsc1)	This detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.
㊶	R10T	Thermistor (Suction pipe 2: TsA2)	Used to detect suction pipe temperature.
㊷	R11T	Thermistor (Heat exchanger gas pipe: Tg2)	This detects temperature of gas pipe for air heat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
㊸	R12T	Thermistor (Heat exchanger deicer 2: Tb2)	Used to detect liquid pipe temperature of air heat exchanger. Used to make judgements on defrosting operation.
㊹	R13T	Thermistor (Subcooling heat exchanger gas pipe 2: Tsh2)	Used to detect gas pipe temperature on the evaporating side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooled heat exchanger.
㊺	R14T	Thermistor (Liquid pipe 2: Tsc2)	This detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.
㊻	R15T	Thermistor (Heat exchanger liquid pipe 2: Tf2)	This detects temperature of liquid pipe between the air heat exchanger and main electronic expansion valve. Used to make judgements on the recover or discharge refrigerants to the refrigerant regulator.

REYQ72, 96, 120PBYD, PBTJ (6ton, 8ton, 10ton Single Type) (INV. Unit + STD Unit)



2.2 REYQ144PB

No. in refrigerant system diagram	Symbol	Name	Major Function
①	M1C	Inverter Compressor (INV. 1)	INV. compressor is operated on frequencies between 52Hz to 266Hz by using the inverter. The number of operating step is as follows. Compressor operation steps: Refer to P.179~.
②	M2C	Inverter Compressor (INV. 2)	
③	M1F	Inverter fan	Because the system is an air heat exchange type, the fan is operated at 9-step rotation speed by using the inverter.
④	M2F	Inverter fan	
⑤	Y1E	Electronic expansion valve (Main 1: EVM1)	While in heating, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
⑥	Y3E	Electronic expansion valve (Main 2: EVM2)	
⑦	Y2E	Electronic expansion valve (Subcooling 1: EVT1)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
⑧	Y5E	Electronic expansion valve (Subcooling 2: EVT2)	
⑨	Y4E	Electronic expansion valve (Refrigerant charge: EVJ)	Opens/closes refrigerant charge port.
⑩	Y1S	Solenoid valve (Refrigerant regulator gas vent pipe: SVG)	Collects refrigerant to the refrigerant regulator.
⑪	Y2S	Four way valve (Heat exchanger 1)	Switches outdoor heat exchanger to evaporator or condenser.
⑫	Y3S	Solenoid valve (Refrigerant regulator liquid pipe: SVL)	Collects refrigerant to the refrigerant regulator.
⑬	Y4S	Solenoid valve (Hot gas: SVP)	Prevents the low pressure from transient falling.
⑭	Y5S	Solenoid valve (Bypass 1: SVE1)	This opens in cooling operation.
⑮	Y6S	Solenoid valve (Discharge pipe of refrigerant regulator)	Bypass the high pressure gas to the refrigerant regulator.
⑯	Y7S	Solenoid valve (Oil return: SVO)	Return oil from the accumulator to the compressor.
⑰	Y8S	Four way valve (Piping)	Switches dual pressure gas pipe to high pressure or low pressure.
⑱	Y9S	Four way valve (Heat exchanger 2)	Switches outdoor heat exchanger to evaporator or condenser.
⑲	Y10S	Solenoid valve (Bypass 2: SVE2)	This opens in cooling operation.
⑳	S1NPH	High pressure sensor	Detects the high pressure.
㉑	S2NPL	Low pressure sensor	Detects the low pressure.
㉒	S1PH	High pressure switch (For INV. Compressor)	Functions when pressure increases to stop operation and avoid high pressure increase in the fault operation.
㉓	S2PH		
㉔	—	Pressure regulating valve (Liquid pipe)	This is used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
㉕	—	Pressure regulating valve (Refrigerant regulator)	
㉖	—	Subcooling heat exchanger	Apply subcooling to liquid refrigerant.
㉗	—	Refrigerant regulator	Surplus refrigerant is held according to the operation condition.
㉘	—	Capillary tube	Returns the refrigerating oil separated through the oil separator to the INV. Compressor.
㉙	—		
㉚	—	Capillary tube	This is used to discharge refrigerant from the refrigerant regulator.
㉛	R1T	Thermistor (Outdoor air: Ta)	Detects outdoor air temperature, correct discharge pipe temperature and others.
㉜	R2T	Thermistor (Heat exchanger gas pipe: Tg1)	This detects temperature of gas pipe for air heat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
㉝	R31T	Thermistor (INV.1 discharge pipe: Tdi1)	Used to detect discharge pipe temperature.
㉞	R32T	Thermistor (INV.2 discharge pipe: Tdi2)	
㉟	R4T	Thermistor (Heat exchanger deicer 1: Tb1)	Detects liquid pipe temperature of air heat exchanger. Used to make judgements on defrosting operation.
㊱	R5T	Thermistor (Subcooling heat exchanger gas pipe 1: Tsh1)	Detects gas pipe temperature on the evaporating side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooling heat exchanger.
㊲	R6T	Thermistor (Subcooling heat exchanger liquid pipe: TI)	Detects temperature of liquid pipe between the main electronic expansion valve and subcooling heat exchanger.
㊳	R7T	Thermistor (Heat exchanger liquid pipe 1: Tf1)	Detects temperature of liquid pipe between the air heat exchanger and main electronic expansion valve. Used to make judgements on the recover or discharge refrigerants to the refrigerant regulator.
㊴	R8T	Thermistor (Suction pipe 1: TsA1)	Detects suction pipe temperature.
㊵	R9T	Thermistor (Liquid pipe 1: Tsc1)	Detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.

No. in refrigerant system diagram	Symbol	Name	Major Function
㊶	R10T	Thermistor (Suction pipe 2: TsA2)	Used to detect suction pipe temperature.
㊷	R11T	Thermistor (Heat exchanger gas pipe: Tg2)	This detects temperature of gas pipe for air heat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
㊸	R12T	Thermistor (Heat exchanger deicer 2: Tb2)	Used to detect liquid pipe temperature of air heat exchanger. Used to make judgements on defrosting operation.
㊹	R13T	Thermistor (Subcooling heat exchanger gas pipe 2: Tsh2)	Used to detect gas pipe temperature on the evaporating side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooling heat exchanger.
㊺	R14T	Thermistor (Liquid pipe 2: Tsc2)	This detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.
㊻	R15T	Thermistor (Heat exchanger liquid pipe 2: Tf2)	This detects temperature of liquid pipe between the air heat exchanger and main electronic expansion valve. Used to make judgements on the recover or discharge refrigerants to the refrigerant regulator.

REYQ144PB

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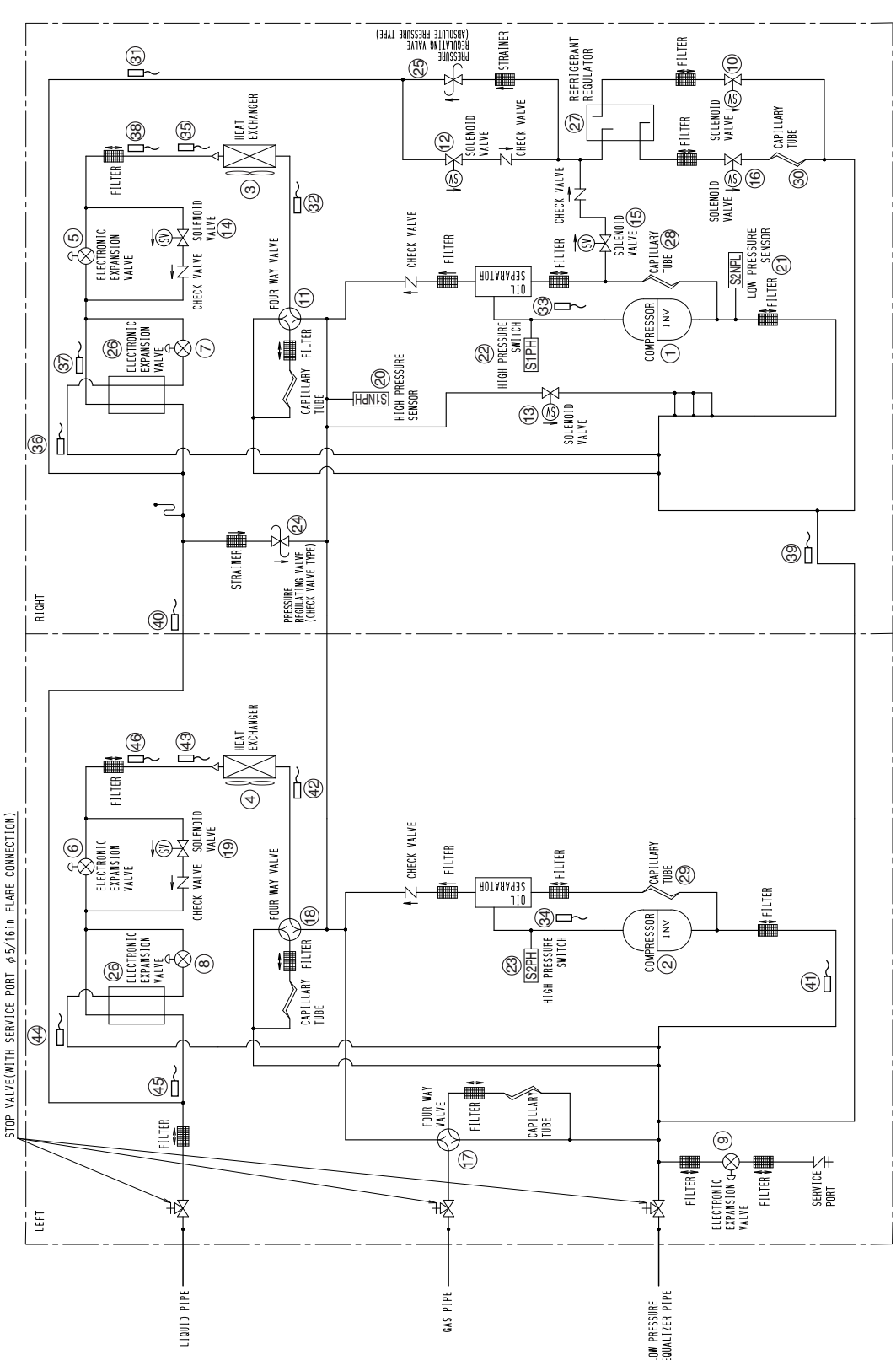
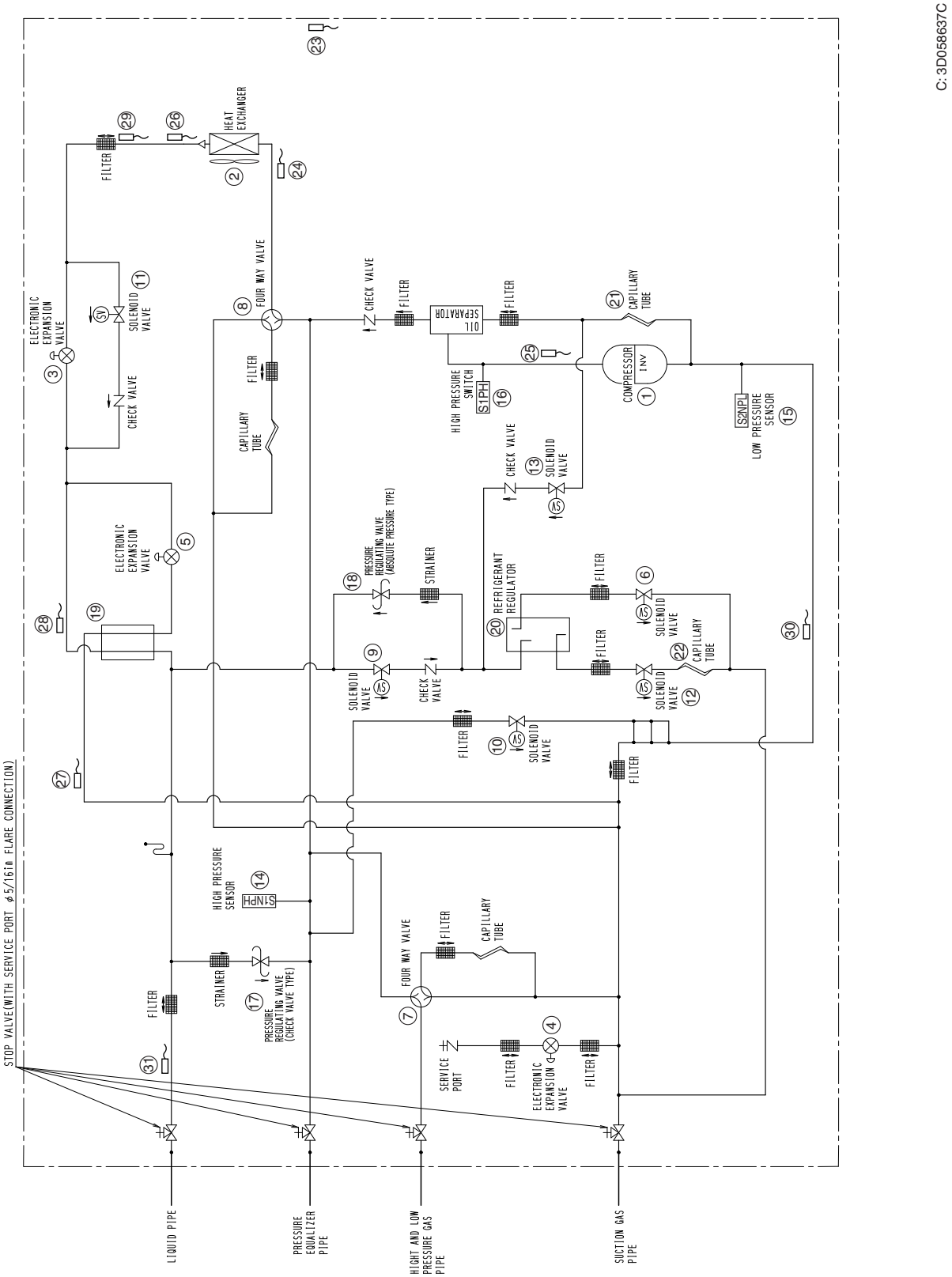


2.3 REMQ72PBYD, PBTJ (Multi 6ton)

No. in refrigerant system diagram	Symbol	Name	Major Function
①	M1C	Inverter Compressor (INV.)	INV. compressor is operated on frequencies between 52Hz to 210Hz by using the inverter. The number of operating step is as follows. Compressor operation steps: Refer to P.179~.
②	M1F	Inverter fan	Because the system is an air heat exchange type, the fan is operated at 9-step rotation speed by using the inverter.
③	Y1E	Electronic expansion valve (Main: EVM)	While in heating, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
④	Y2E	Electronic expansion valve (Refrigerant charge: EVJ)	This is used to open/close refrigerant charge port.
⑤	Y3E	Electronic expansion valve (Subcooling: EVT)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
⑥	Y1S	Solenoid valve (Refrigerant regulator gas vent pipe: SVG)	This is used to collect refrigerant to the refrigerant regulator.
⑦	Y2S	Four way valve (Dual pressure gas pipe switch: 20SB)	This is used to switch dual pressure gas pipe to high pressure or low pressure.
⑧	Y3S	Four way valve (Heat exchanger switch: 20SA)	This is used to switch outdoor heat exchanger to evaporator or condenser.
⑨	Y4S	Solenoid valve (Refrigerant regulator liquid pipe: SVL)	This is used to collect refrigerant to the refrigerant regulator.
⑩	Y5S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
⑪	Y6S	Solenoid valve (Main bypass: SVE)	This opens in cooling operation.
⑫	Y7S	Solenoid valve (Refrigerant regulator discharge pipe: SVO)	This is used to discharge refrigerant from the refrigerant regulator.
⑬	Y8S	Solenoid valve (Discharge pipe of refrigerant regulator)	Bypass the high pressure gas to the refrigerant regulator.
⑭	S1NPH	High pressure sensor	Used to detect the high pressure.
⑮	S2NPL	Low pressure sensor	Used to detect the low pressure.
⑯	S1PH	High pressure switch (For INV. Compressor)	This functions when pressure increases to stop operation and avoid high pressure increase in the fault operation.
⑰	—	Pressure regulating valve (Liquid pipe)	This is used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
⑱	—	Pressure regulating valve (Refrigerant regulator)	
⑲	—	Subcooling heat exchanger	Apply subcooling to liquid refrigerant.
⑳	—	Refrigerant regulator	Surplus refrigerant is held according to the operation condition.
㉑	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV. compressor.
㉒	—	Capillary tube	This is used to discharge refrigerant from the refrigerant regulator.
㉓	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor air temperature, correct discharge pipe temperature and others.
㉔	R2T	Thermistor (Heat exchanger gas pipe: Tg)	This detects temperature of gas pipe for air heat exchanger. Used to exercise the constant control of superheated degree an evaporator is used for outdoor unit heat exchanging.
㉕	R31T	Thermistor (INV. discharge pipe: Tdi)	Used to detect discharge pipe temperature.
㉖	R4T	Thermistor (Heat exchanger deicer: Tb)	Used to detect liquid pipe temperature of air heat exchanger. Used to make judgements on defrosting operation.
㉗	R5T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Used to detect gas pipe temperature on the evaporating side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooling heat exchanger.
㉘	R6T	Thermistor (Subcooling heat exchanger liquid pipe: Tl)	This detects temperature of liquid pipe between the main electronic expansion valve and subcooling heat exchanger.
㉙	R7T	Thermistor (Heat exchanger liquid pipe: Tf)	This detects temperature of liquid pipe between the air heat exchanger and main electronic expansion valve. Used to make judgements on the recover or discharge refrigerants to the refrigerant regulator.
㉚	R8T	Thermistor (Suction pipe: TsA)	Used to detect suction pipe temperature.
㉛	R9T	Thermistor (Liquid pipe: Tsc)	This detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.

REMQ72PBYD, PBTJ

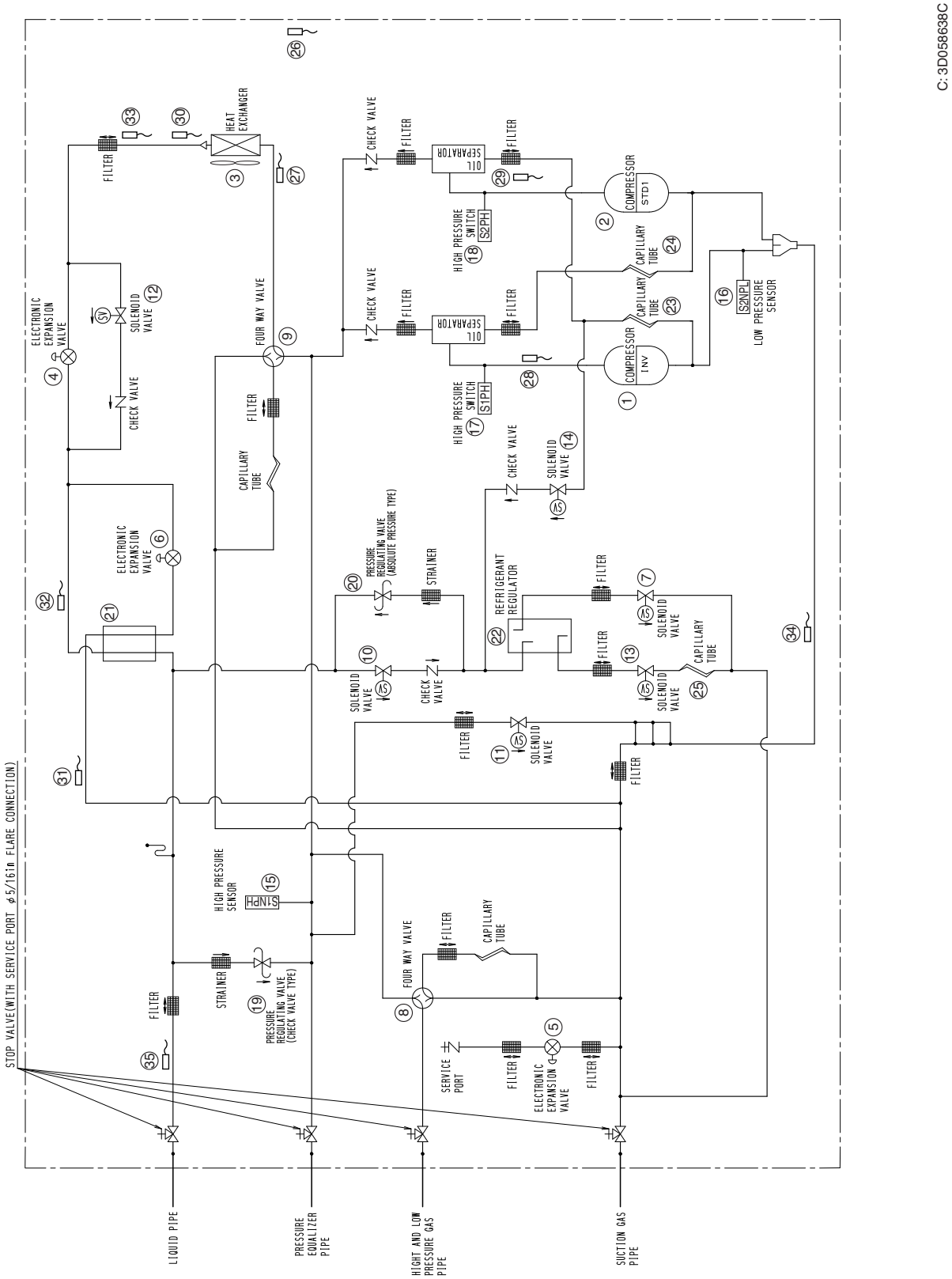


2.4 REMQ96·120PBYD, PBTJ (Multi 8, 10ton)

No. in refrigerant system diagram	Symbol	Name	Major Function
①	M1C	Inverter Compressor (INV.)	Inverter compressor is operated on frequencies between 52Hz to 210Hz by using the inverter, while Standard compressor is operated with the commercial power supply only. The number of operating step is as follows when inverter compressor is operated in combination with STD compressor. Compressor operation steps: Refer to P.179~.
②	M2C	Standard Compressor 1 (STD1)	
③	M1F	Inverter fan	Because the system is an air heat exchange type, the fan is operated at 9-step rotation speed by using the inverter.
④	Y1E	Electronic expansion valve (Main: EVM)	While in heating, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
⑤	Y2E	Electronic expansion valve (Refrigerant charge: EVJ)	This is used to open/close refrigerant charge port.
⑥	Y3E	Electronic expansion valve (Subcooling: EVT)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
⑦	Y1S	Solenoid valve (Refrigerant regulator gas vent pipe: SVG)	This is used to collect refrigerant to the refrigerant regulator.
⑧	Y2S	Four way valve (Dual pressure gas pipe switch: 20SB)	This is used to switch dual pressure gas pipe to high pressure or low pressure.
⑨	Y3S	Four way valve (Heat exchanger switch: 20SA)	This is used to switch outdoor heat exchanger to evaporator or condenser.
⑩	Y4S	Solenoid valve (Refrigerant regulator liquid pipe: SVL)	This is used to collect refrigerant to the refrigerant regulator.
⑪	Y5S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
⑫	Y6S	Solenoid valve (Main bypass: SVE)	This opens in cooling operation.
⑬	Y7S	Solenoid valve (Refrigerant regulator discharge pipe: SVO)	This is used to discharge refrigerant from the refrigerant regulator.
⑭	Y8S	Solenoid valve (Discharge pipe of refrigerant regulator)	Bypass the high pressure gas to the refrigerant regulator.
⑮	S1NPH	High pressure sensor	Used to detect the high pressure.
⑯	S2NPL	Low pressure sensor	Used to detect the low pressure.
⑰	S1PH	High pressure switch (For INV. Compressor)	This functions when pressure increases to stop operation and avoid high pressure increase in the fault operation.
⑱	S2PH	High pressure switch (For STD1 Compressor)	
⑲	—	Pressure regulating valve (Liquid pipe)	This is used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
⑳	—	Pressure regulating valve (Refrigerant regulator)	
㉑	—	Subcooling heat exchanger	Apply subcooling to liquid refrigerant.
㉒	—	Refrigerant regulator	Surplus refrigerant is held according to the operation condition.
㉓	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV. compressor.
㉔	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the STD Compressor.
㉕	—	Capillary tube	This is used to discharge refrigerant from the refrigerant regulator.
㉖	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor air temperature, correct discharge pipe temperature and others.
㉗	R2T	Thermistor (Heat exchanger gas pipe: Tg)	This detects temperature of gas pipe for air heat exchanger. Used to exercise the constant control of superheated degree an evaporator is used for outdoor unit heat exchanging.
㉘	R31T	Thermistor (INV. discharge pipe: Tdi)	Used to detect discharge pipe temperature.
㉙	R32T	Thermistor (STD1 discharge pipe: Tds1)	
㉚	R4T	Thermistor (Heat exchanger deicer: Tb)	Used to detect liquid pipe temperature of air heat exchanger. Used to make judgements on defrosting operation.
㉛	R5T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Used to detect gas pipe temperature on the evaporating side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooling heat exchanger.

No. in refrigerant system diagram	Symbol	Name	Major Function
㉜	R6T	Thermistor (Subcooling heat exchanger liquid pipe: Tl)	This detects temperature of liquid pipe between the main electronic expansion valve and subcooling heat exchanger.
㉝	R7T	Thermistor (Heat exchanger liquid pipe: Tf)	This detects temperature of liquid pipe between the air heat exchanger and main electronic expansion valve. Used to make judgements on the recover or discharge refrigerants to the refrigerant regulator.
㉞	R8T	Thermistor (Suction pipe: TsA)	Used to detect suction pipe temperature.
㉟	R9T	Thermistor (Liquid pipe: Tsc)	This detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.

REMQ96·120PBYD, PBTJ

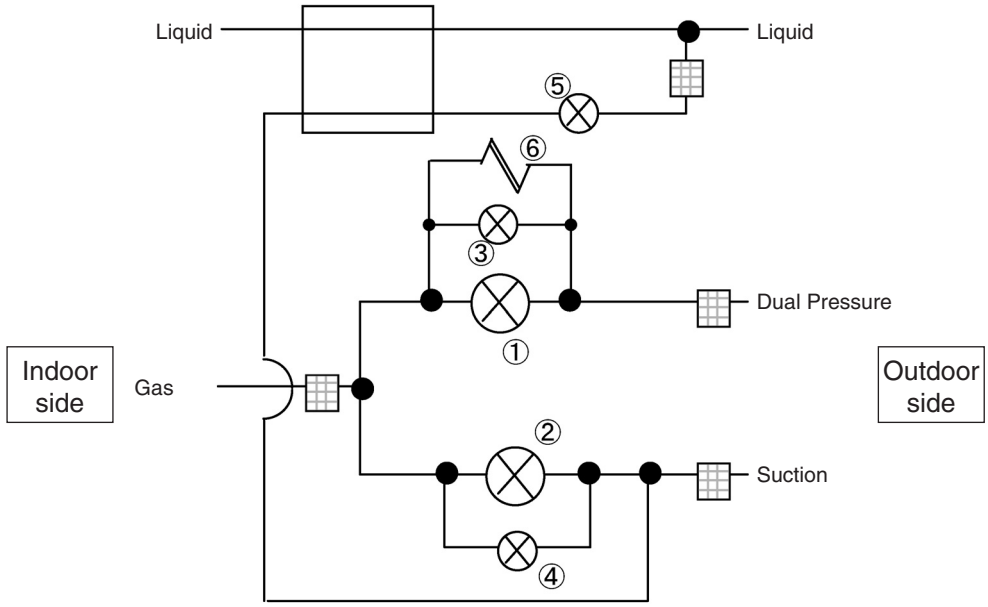


2.5 Branch Selector Unit Functional Parts

BSVQ36, 60, 96PVJU

No.	Name	Symbol	Function
1	Electronic expansion valve (EVH)	Y4E	Opens while in heating operation or all indoor units are in cooling. (Max : 760pls)
2	Electronic expansion valve (EVL)	Y5E	Opens while in cooling. (Max : 760pls)
3	Electronic expansion valve (EVHS)	Y2E	Opens while in heating operation or all indoor units are in cooling. (Max : 480pls)
4	Electronic expansion valve (EVLS)	Y3E	Opens while in cooling. (Max : 480pls)
5	Electronic expansion valve (EVSC)	Y1E	In simultaneous cooling and heating operation, it is used to subcooling liquid refrigerants when an indoor unit downstream of this Branch Selector unit is in heating. (Max : 480pls)
6	Capillary tube		Used to bypass high pressure gas to low pressure side to protect “Refrigerant accumulation” in dual pressure gas pipes.

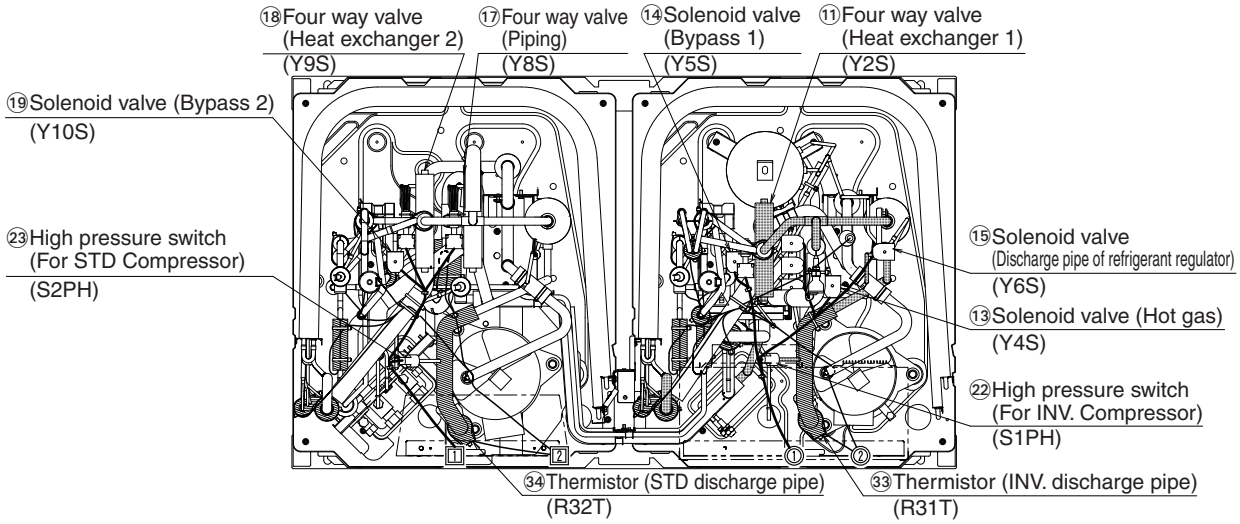
Note: Factory set of all EV opening: 60pls



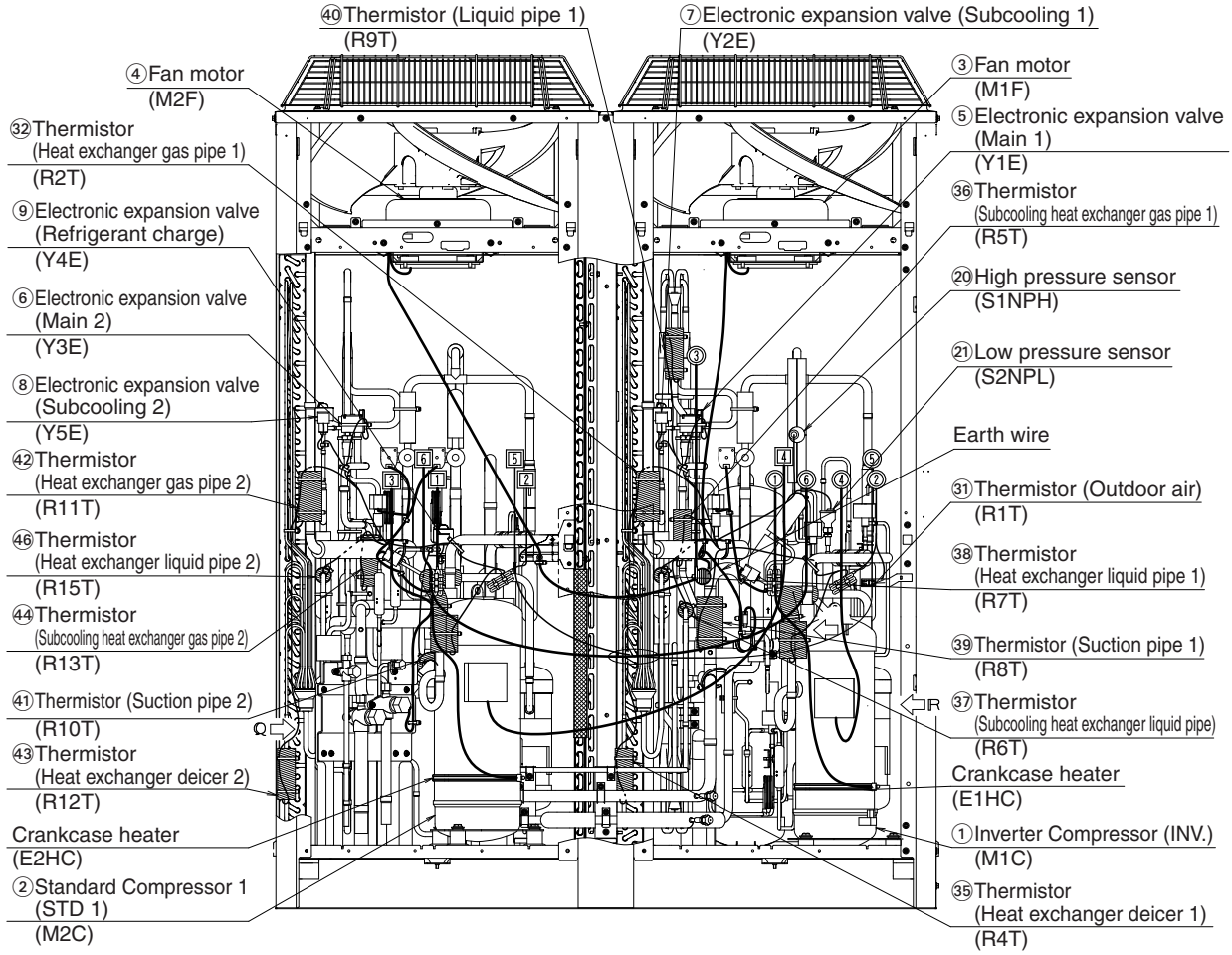
3. Functional Parts Layout

3.1 REYQ72P, 96P, 120PB

Plan



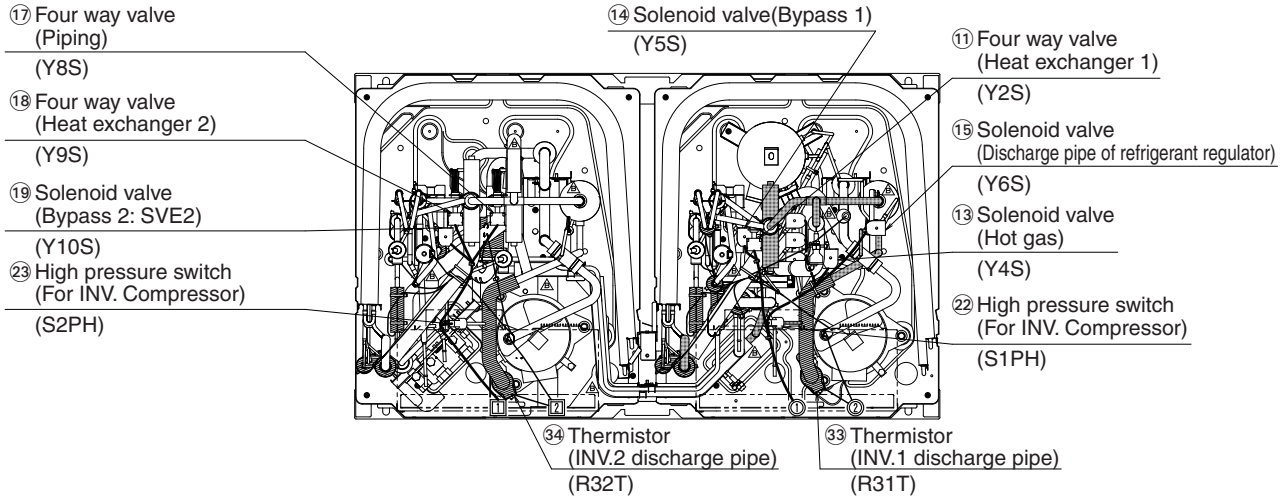
Front View



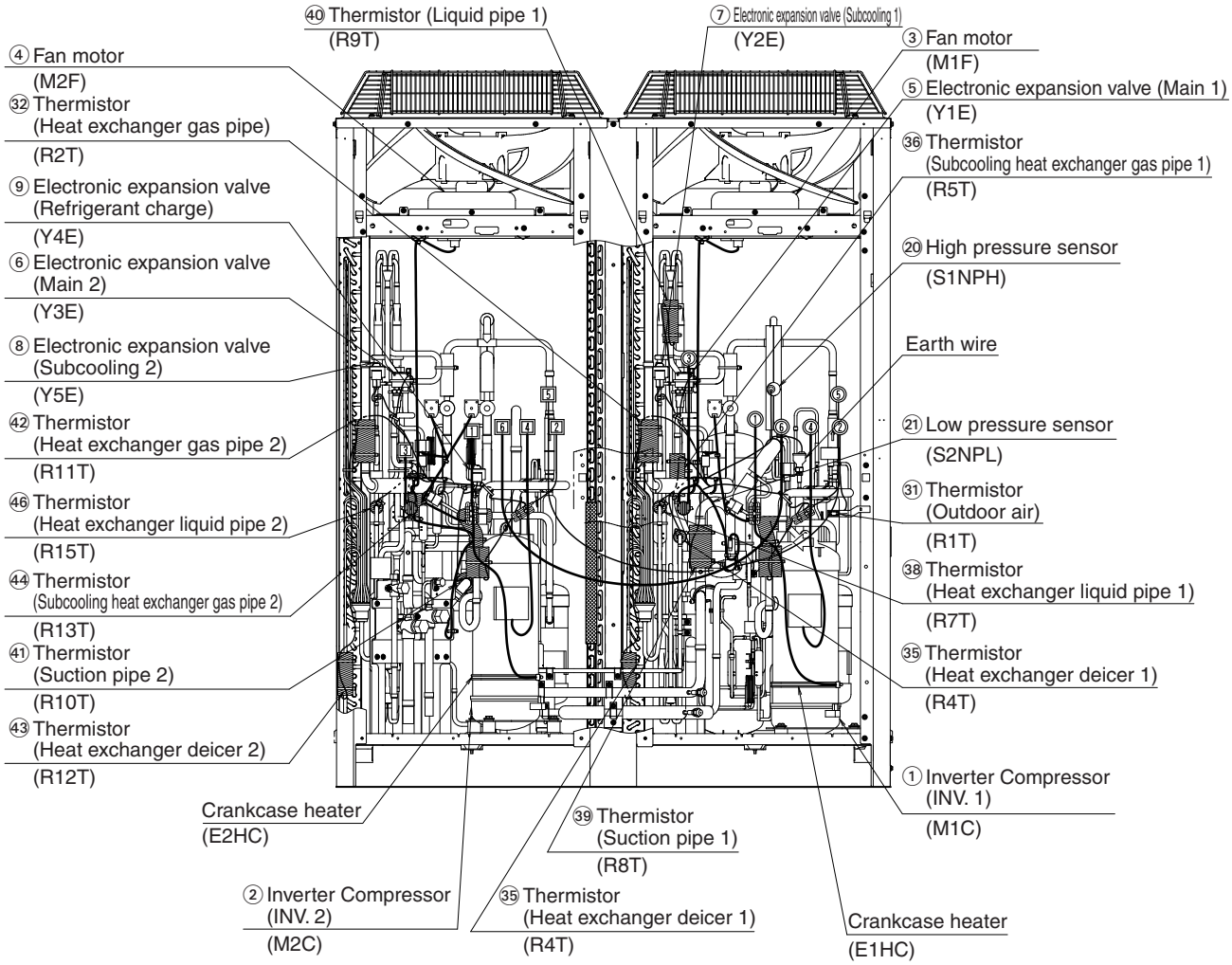
Note: For reference numbers, refer to P.136, 137.

3.2 REYQ144PBTJ

Plan



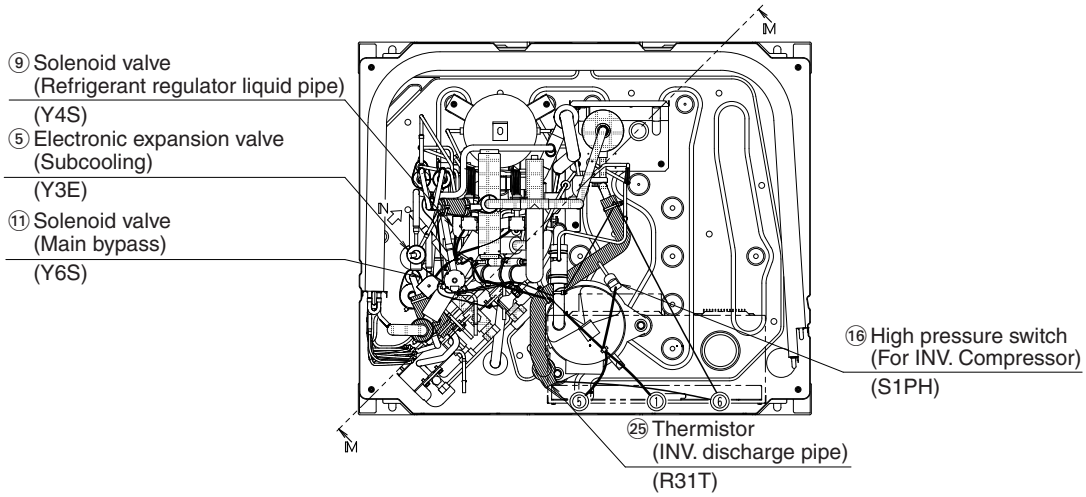
Front View



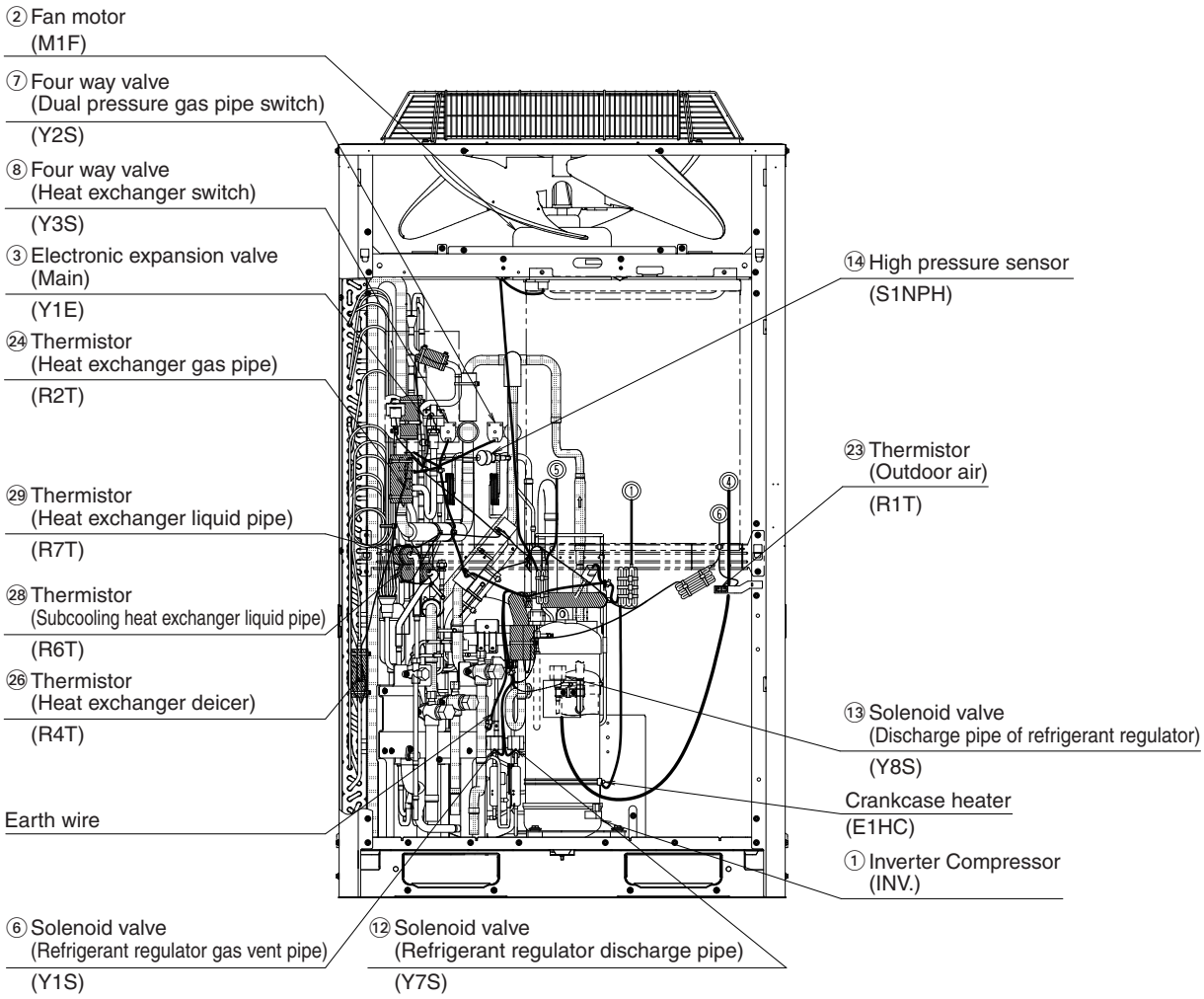
Note: For reference numbers, refer to P.139, 140.

3.3 REMQ72PB

Plan



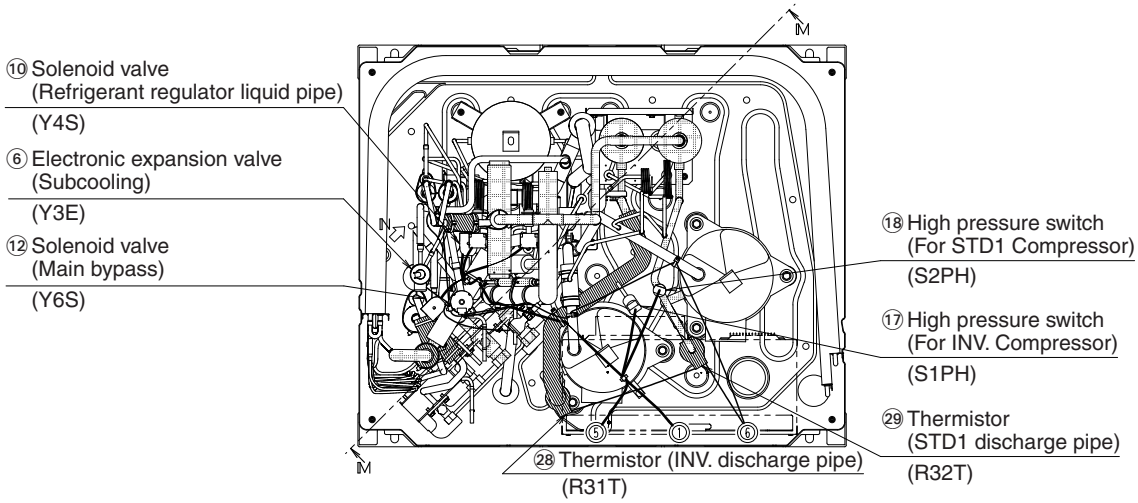
Front View



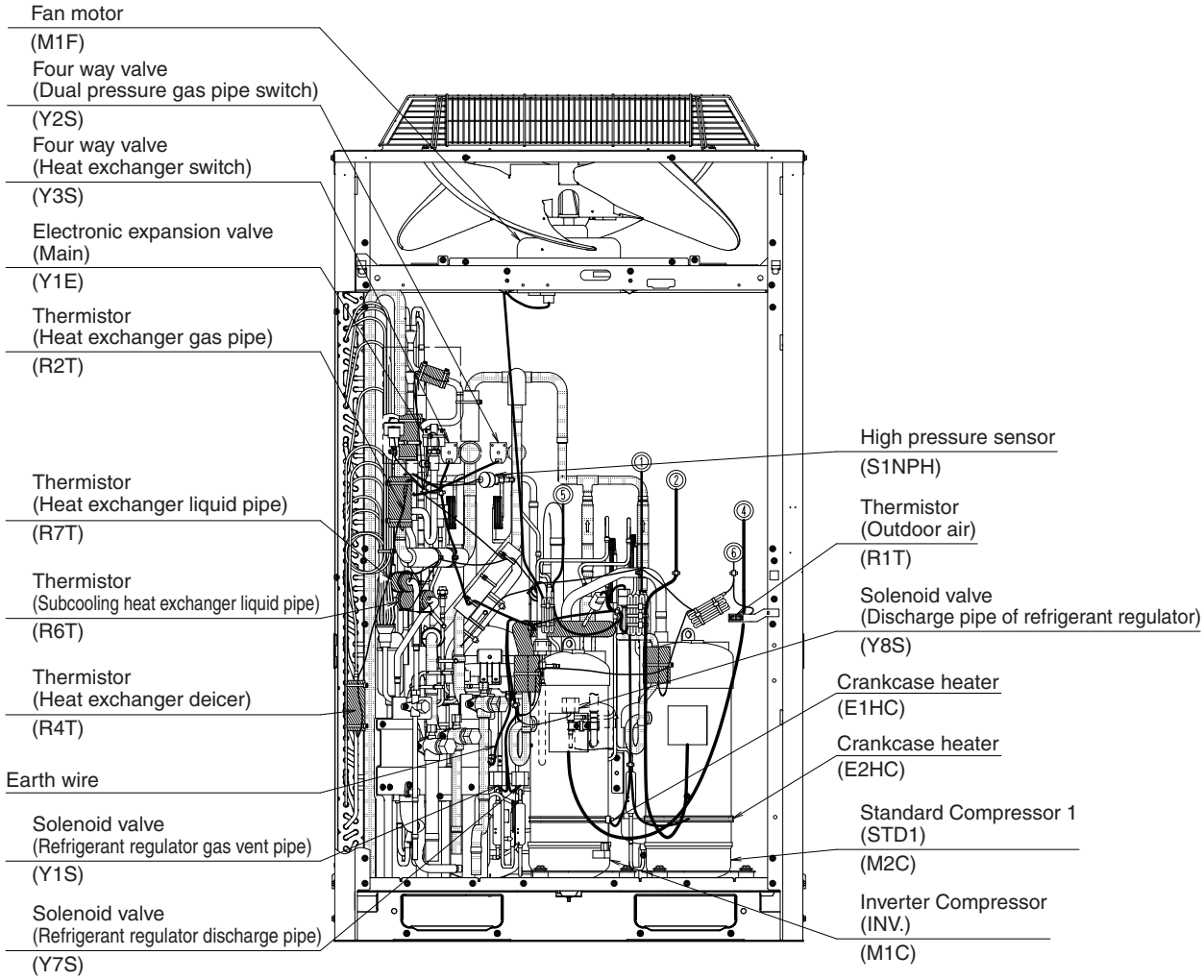
Note: For reference numbers, refer to P.142.

3.4 REMQ96, 120PB

Plan



Front View

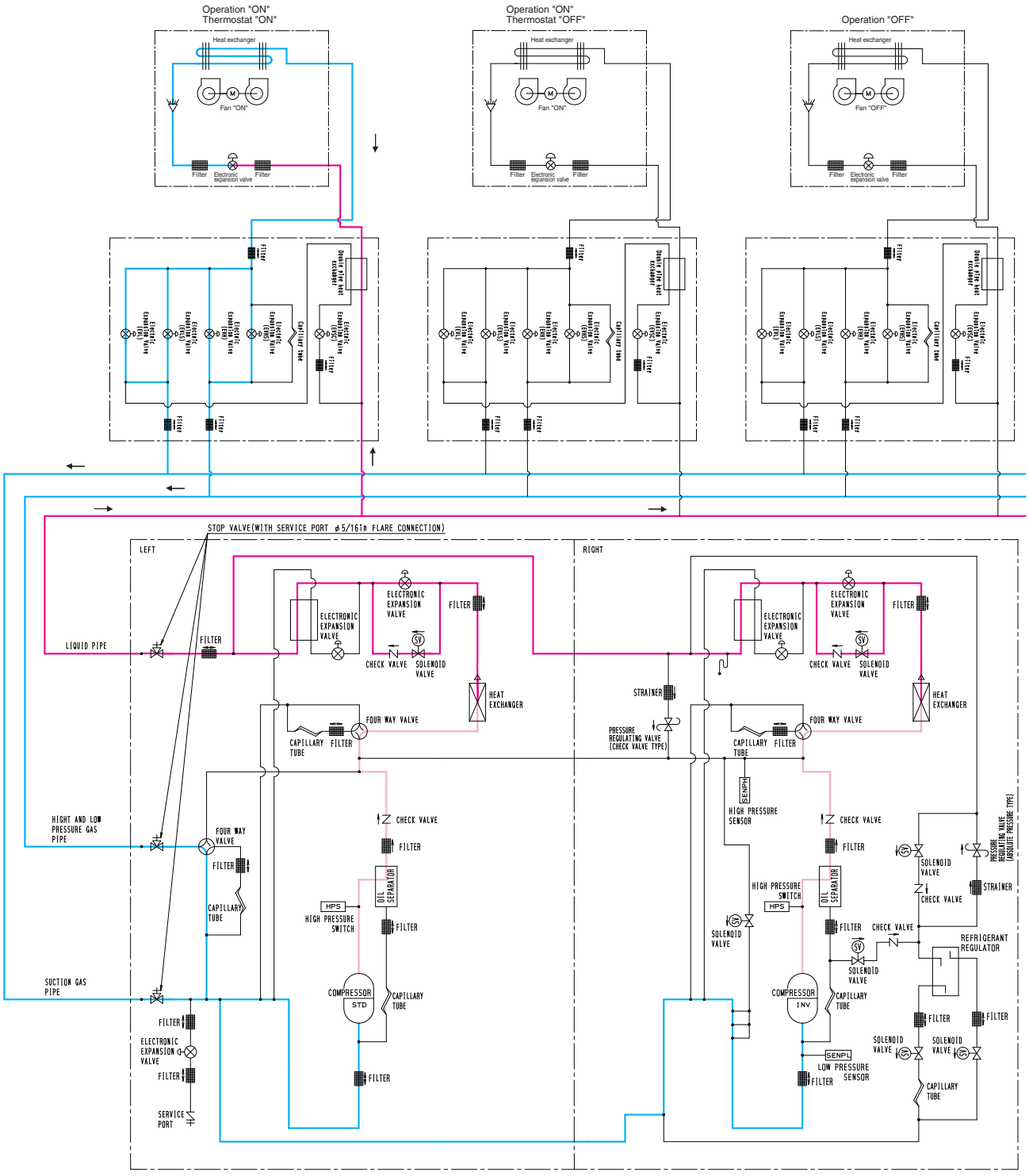


Note: For reference number, refer to P.144, 145.

4. Refrigerant Flow for Each Operation Mode

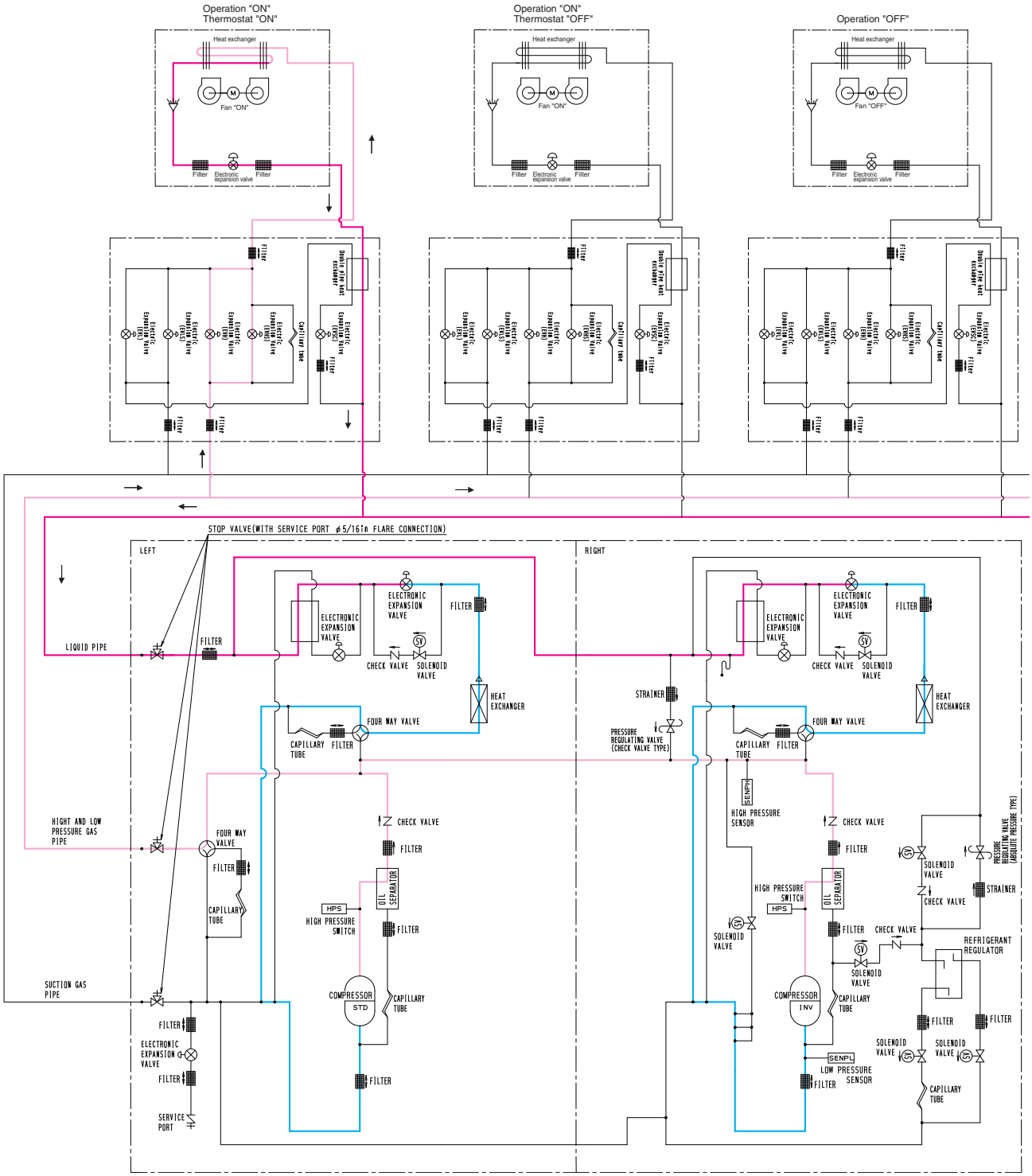
REYQ72, 96, 120PB
Cooling Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



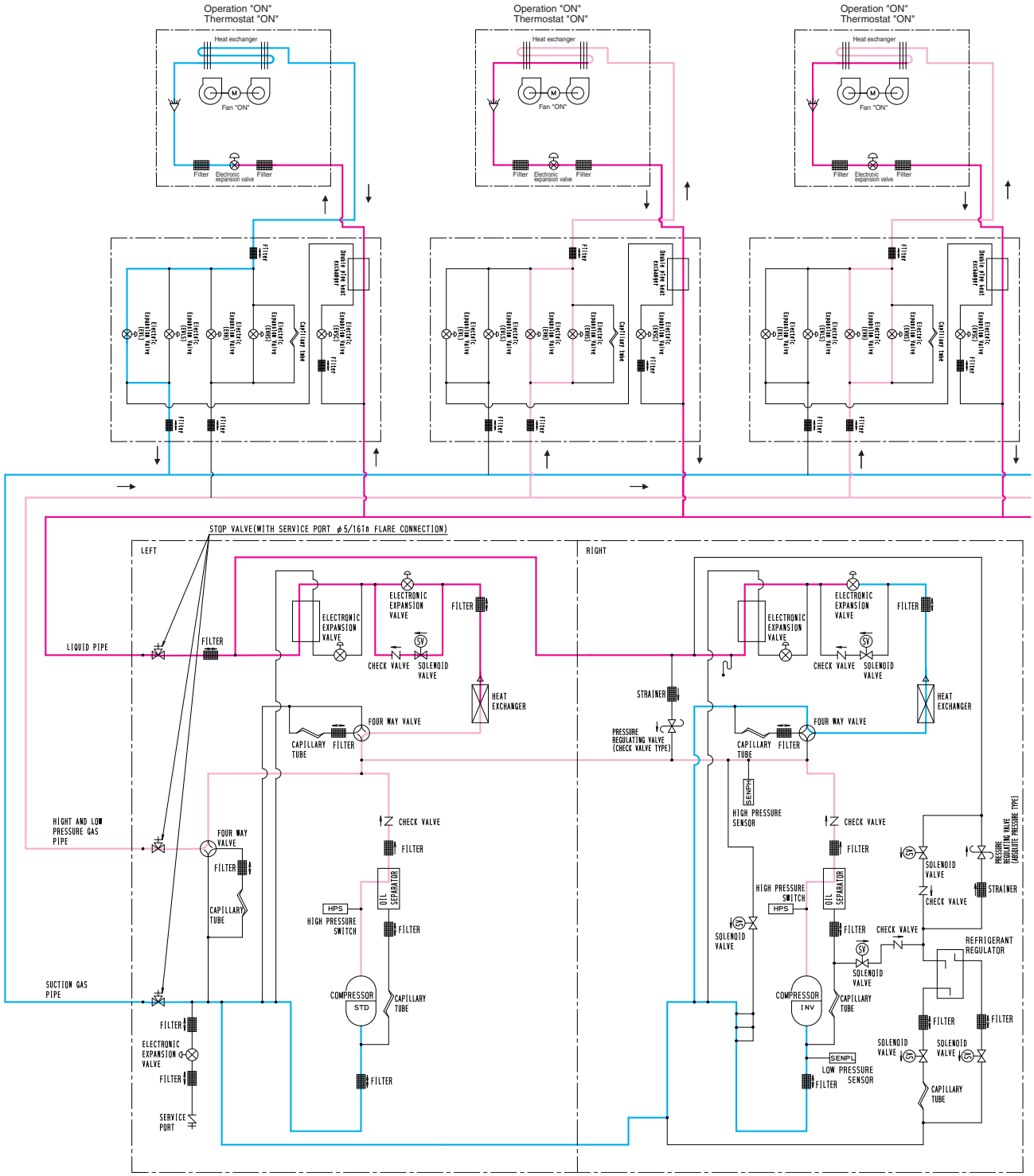
REYQ72, 96, 120PB
Heating Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



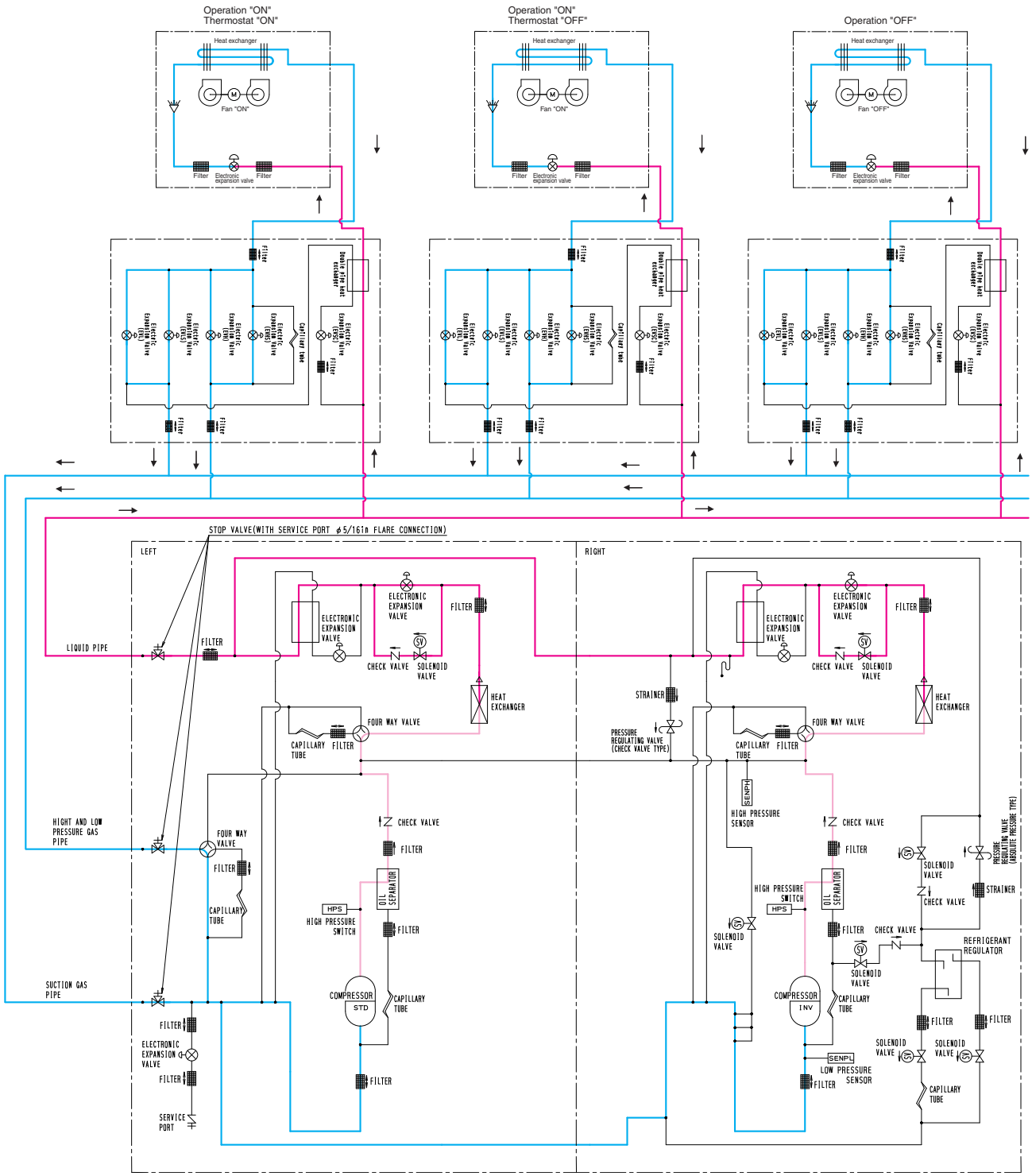
REYQ72, 96, 120PB
Simultaneous Cooling / Heating Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



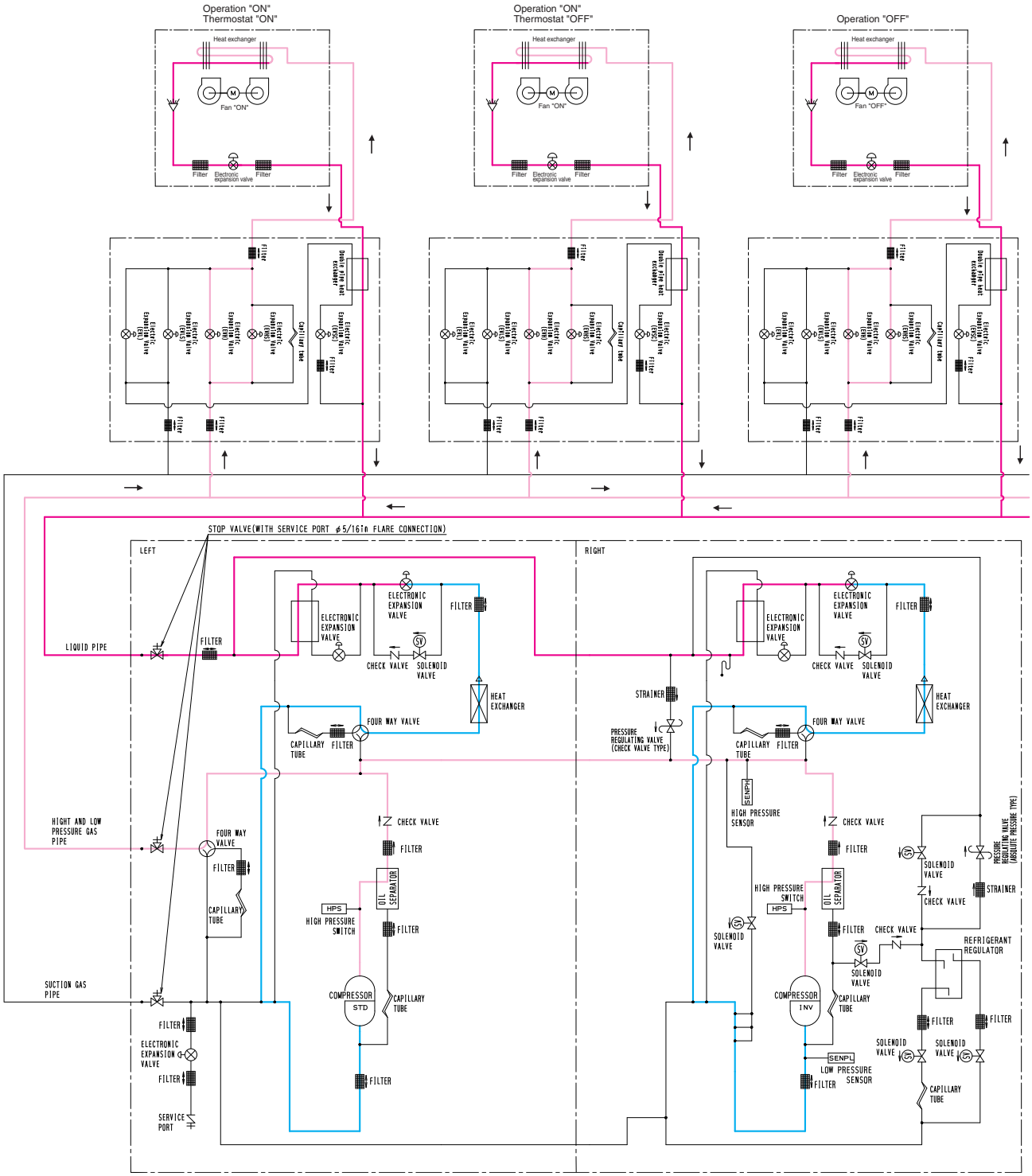
REYQ72, 96, 120PB
Cooling Oil Return Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



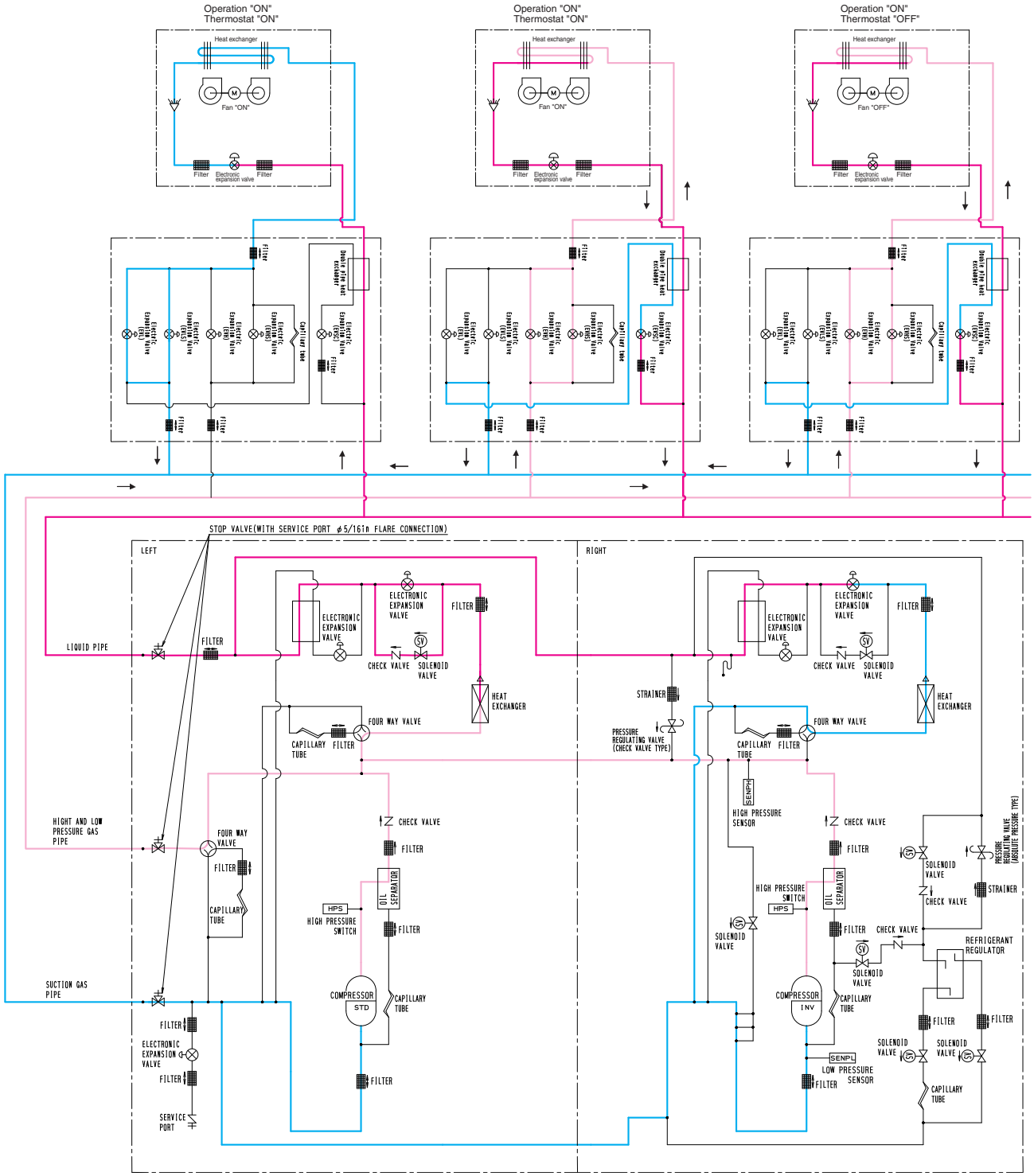
REYQ72, 96, 120PB
Heating Oil Return Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



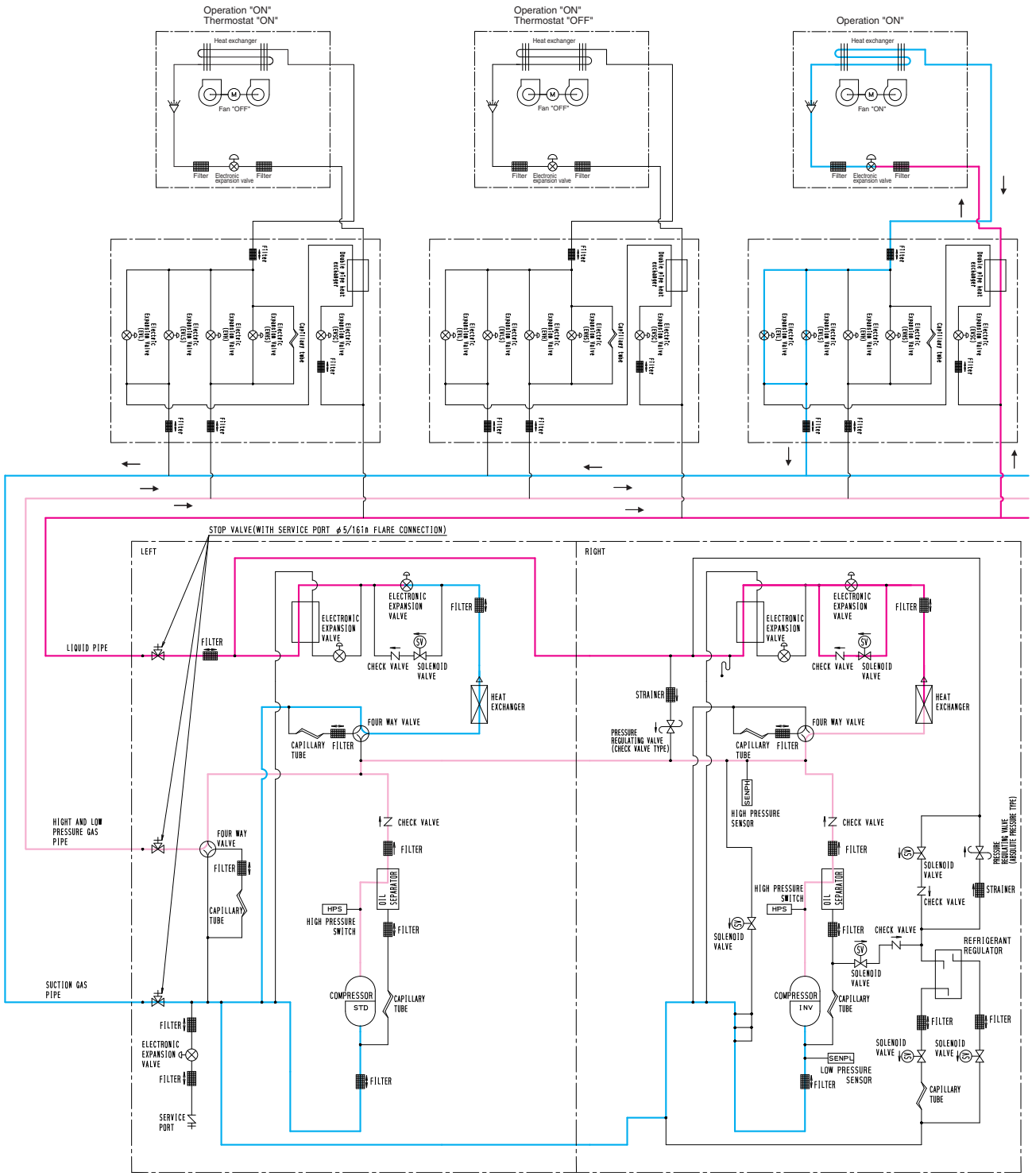
REYQ72, 96, 120PB
Oil Return Operation at Simultaneous Cooling / Heating Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



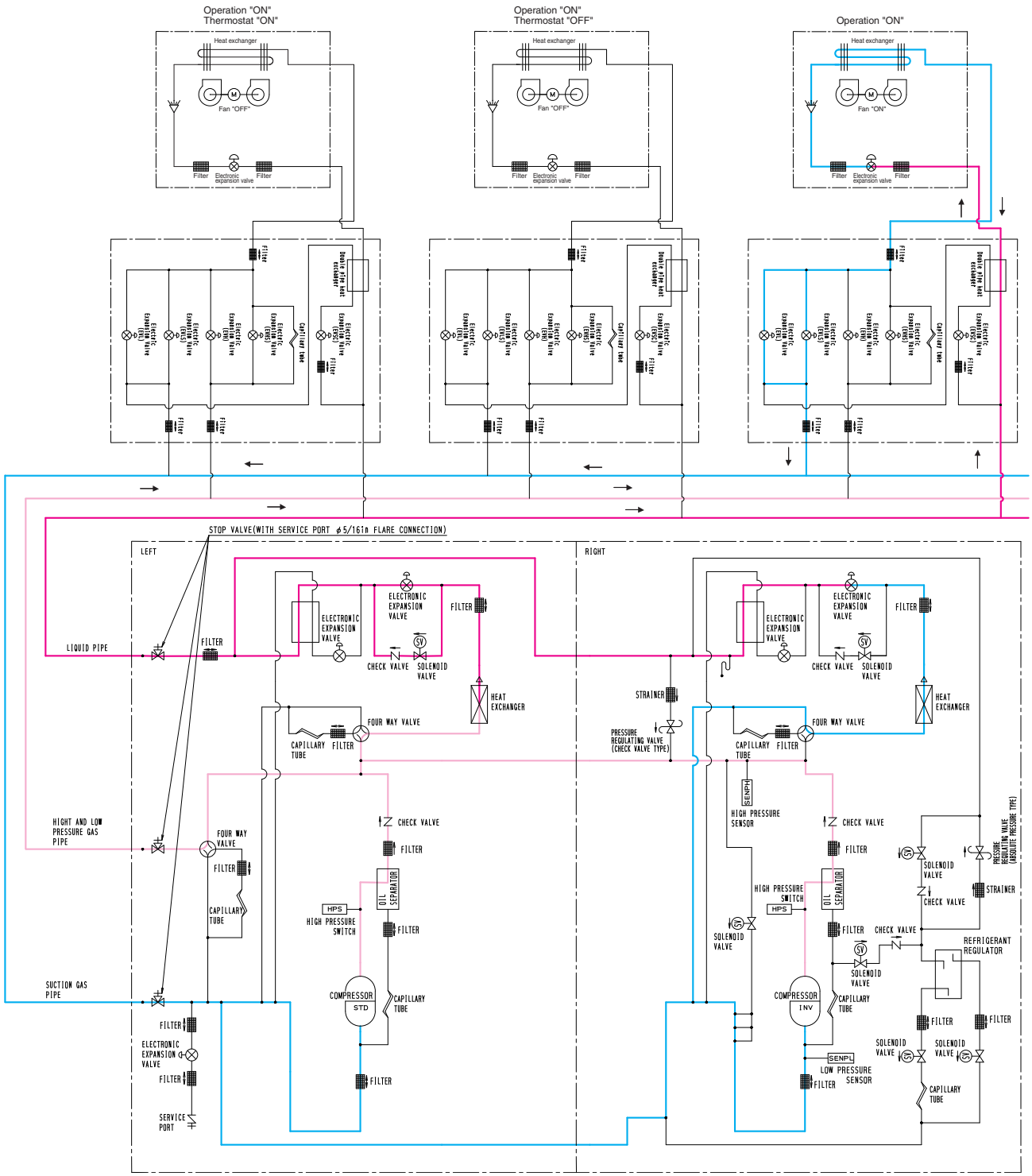
REYQ72, 96, 120PB
Partial Defrosting 1 (Defrosting in the Right Unit)

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



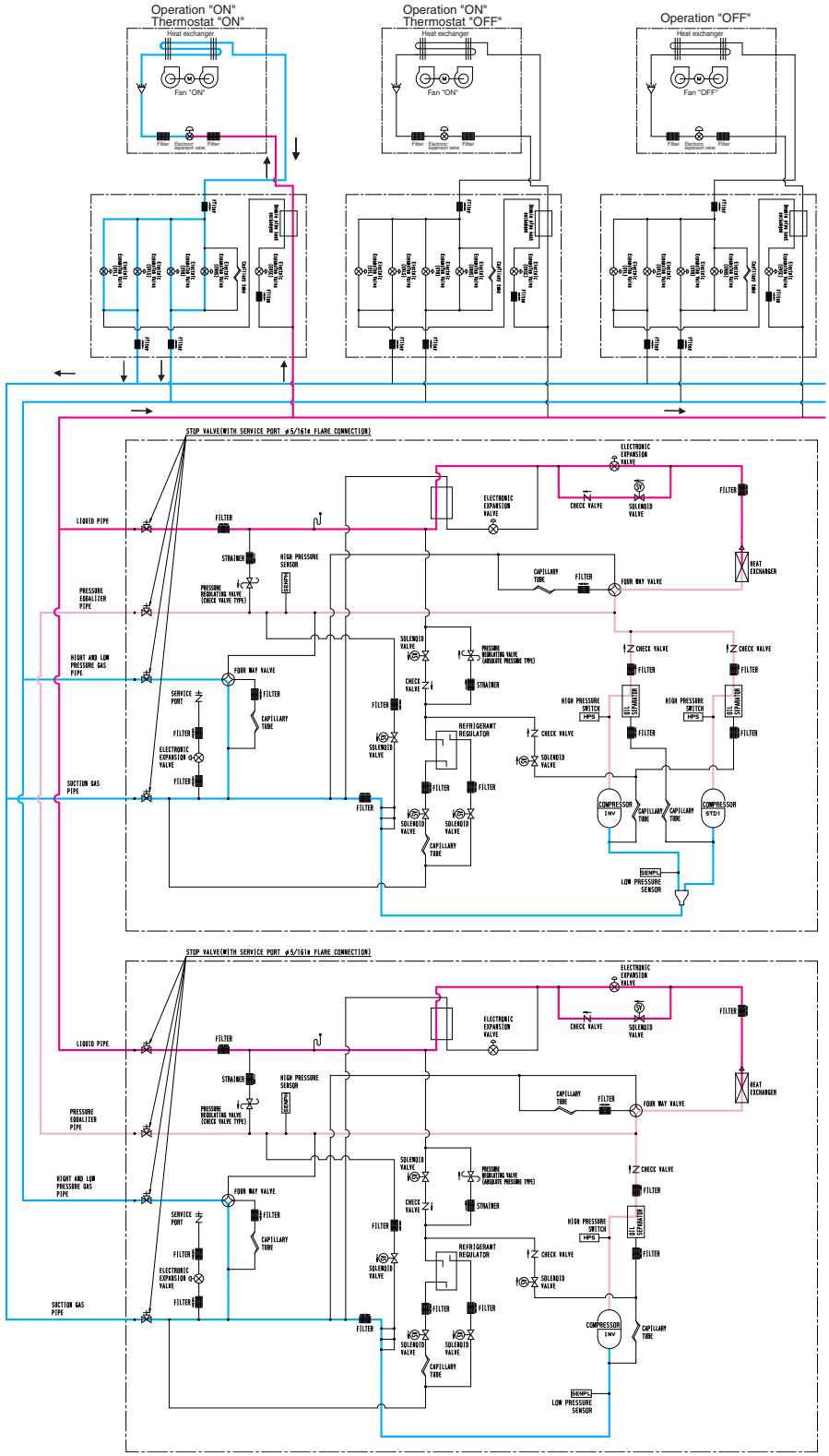
REYQ72, 96, 120PB
Partial Defrosting 2 (Defrosting in the Left Unit)

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



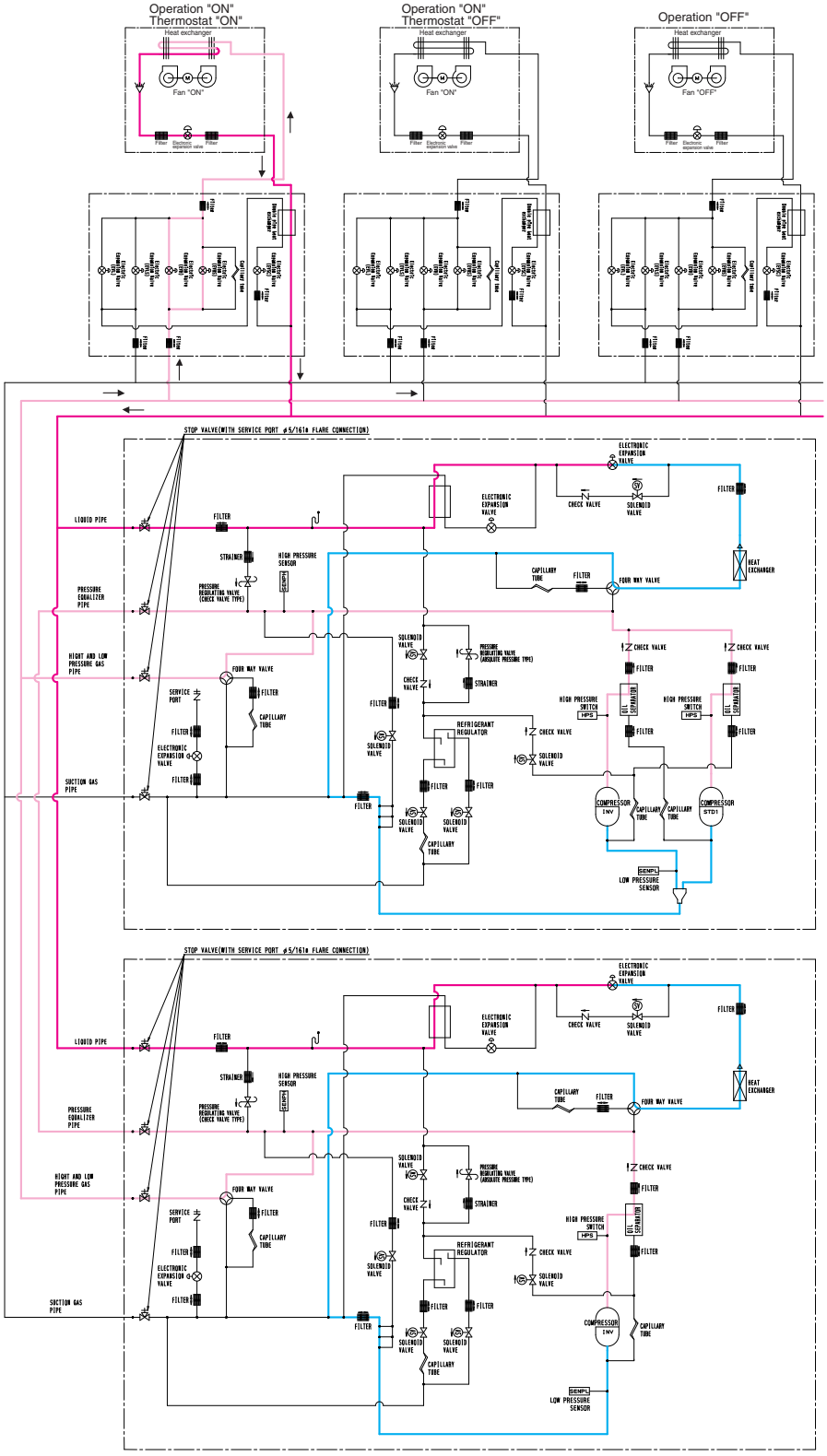
REYQ (Multi-connection)
Cooling Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



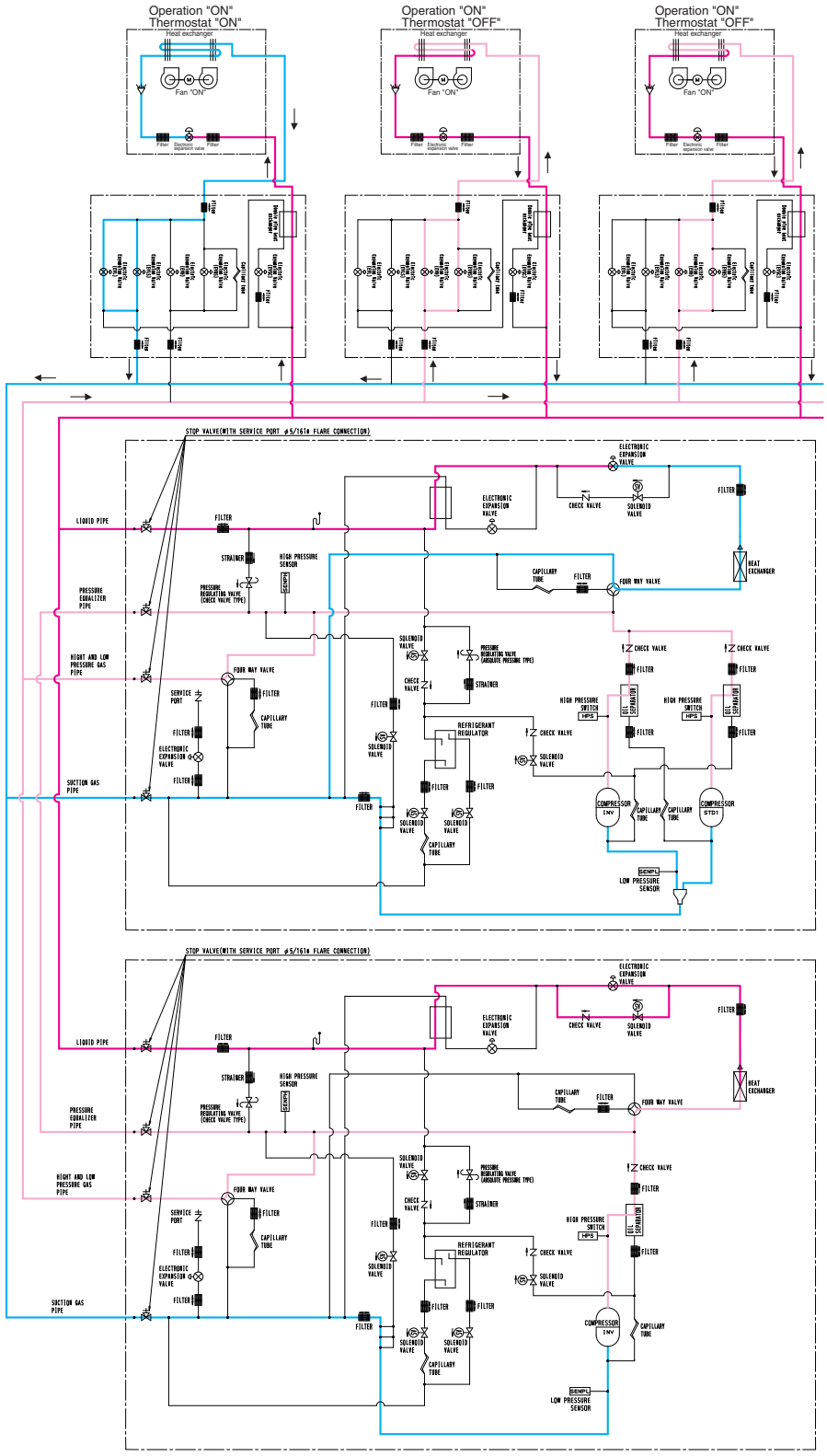
Heating Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



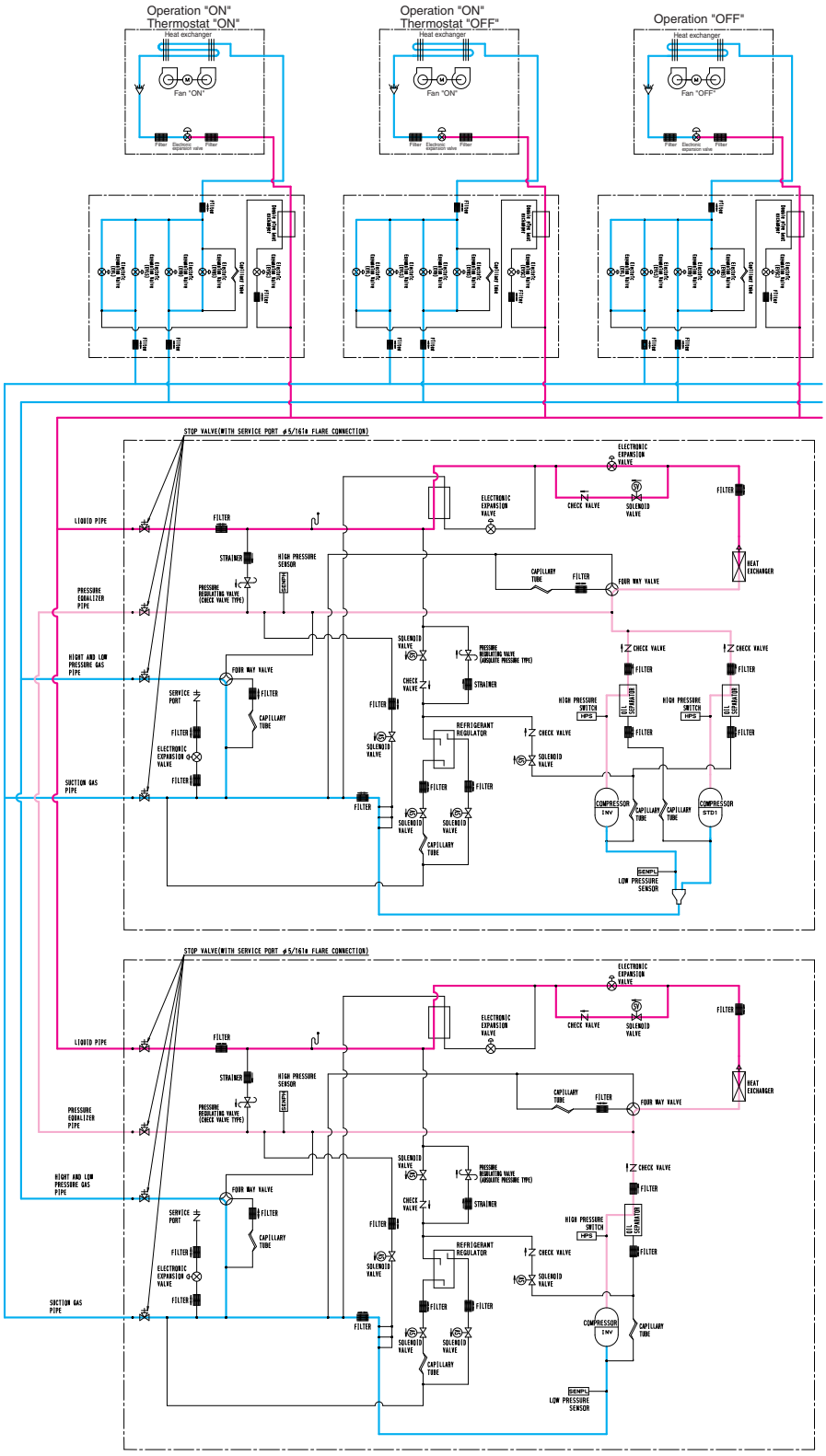
Simultaneous Cooling / Heating Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



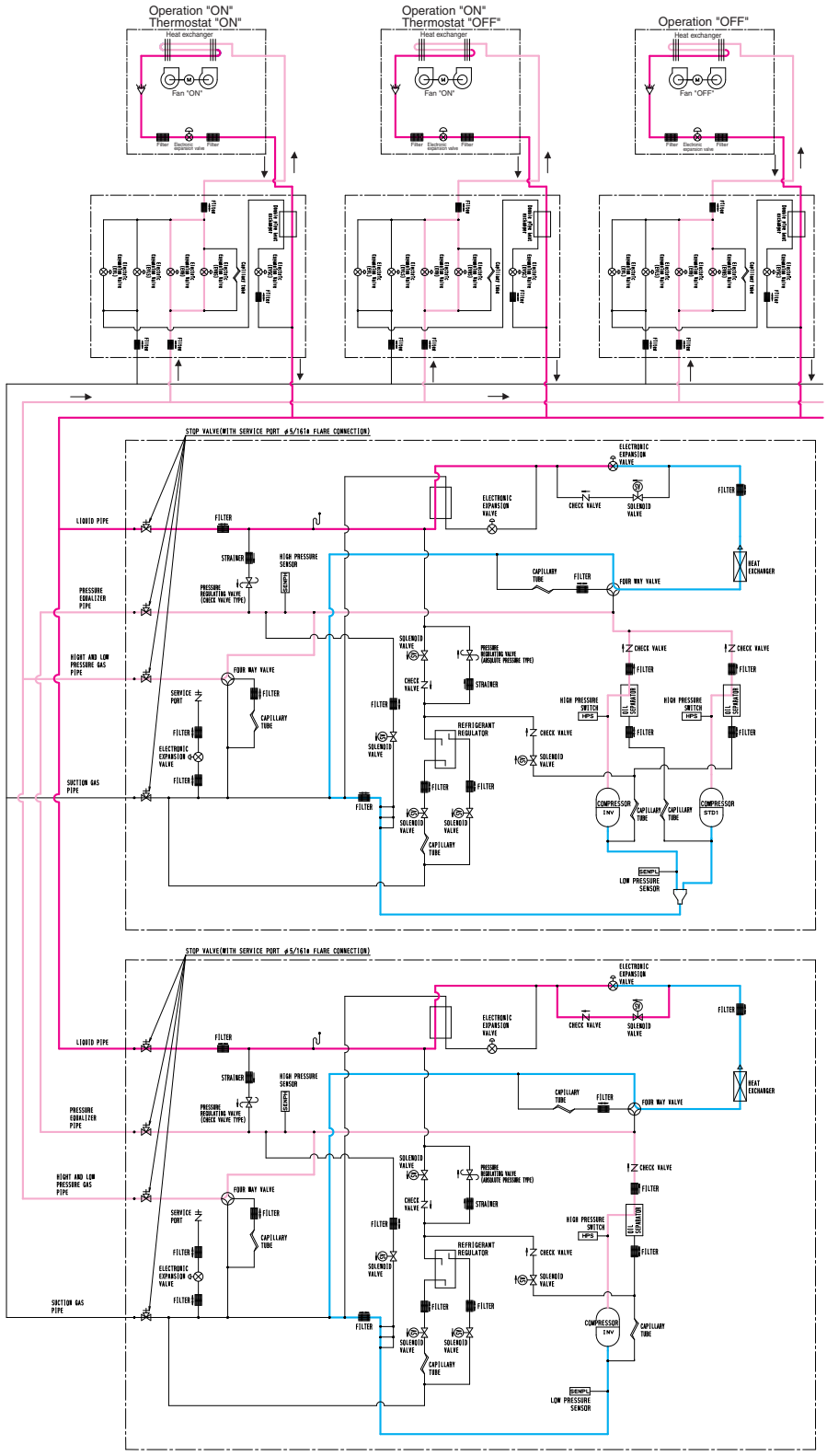
Cooling Oil Return Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



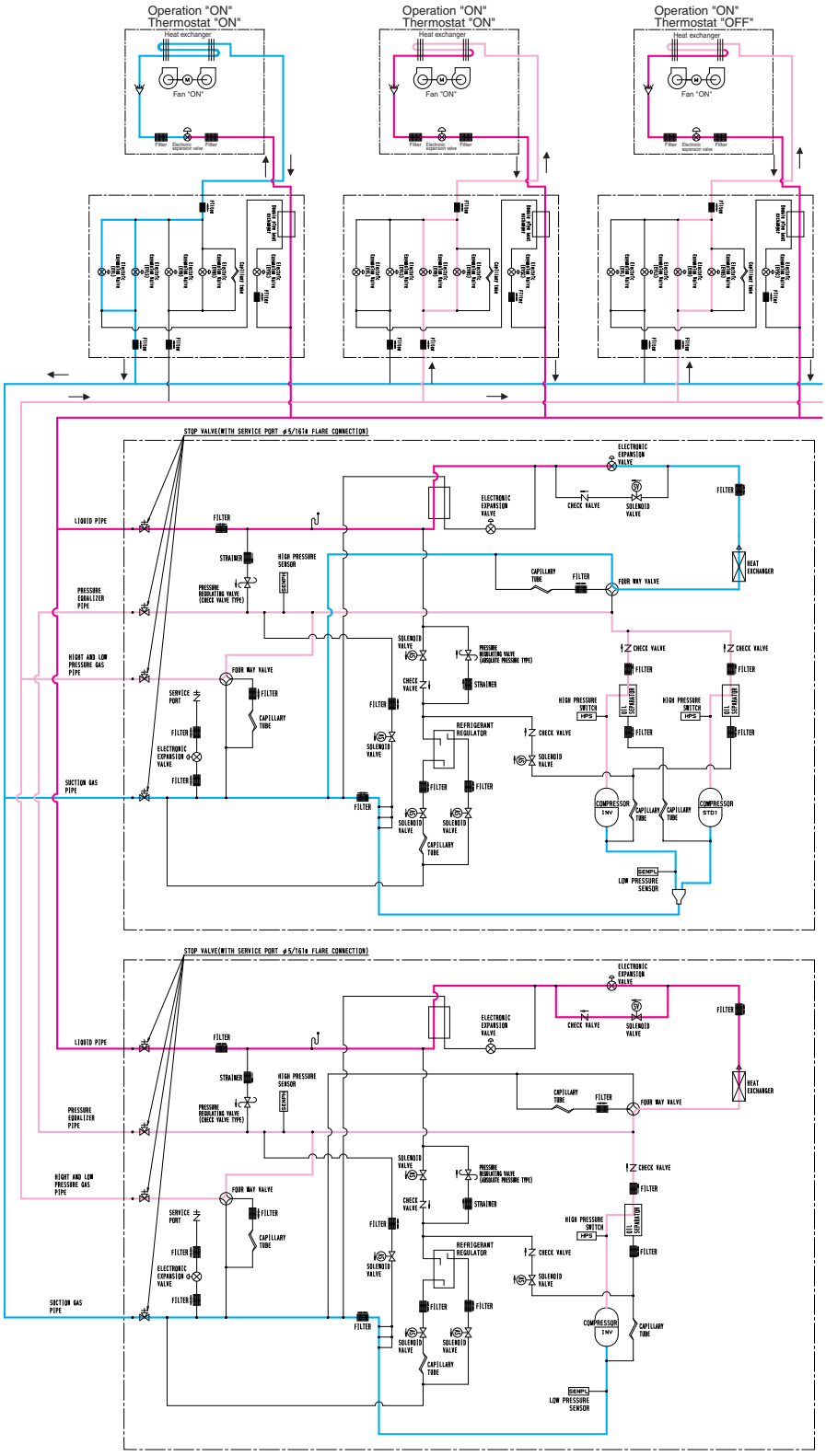
Heating Oil Return Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



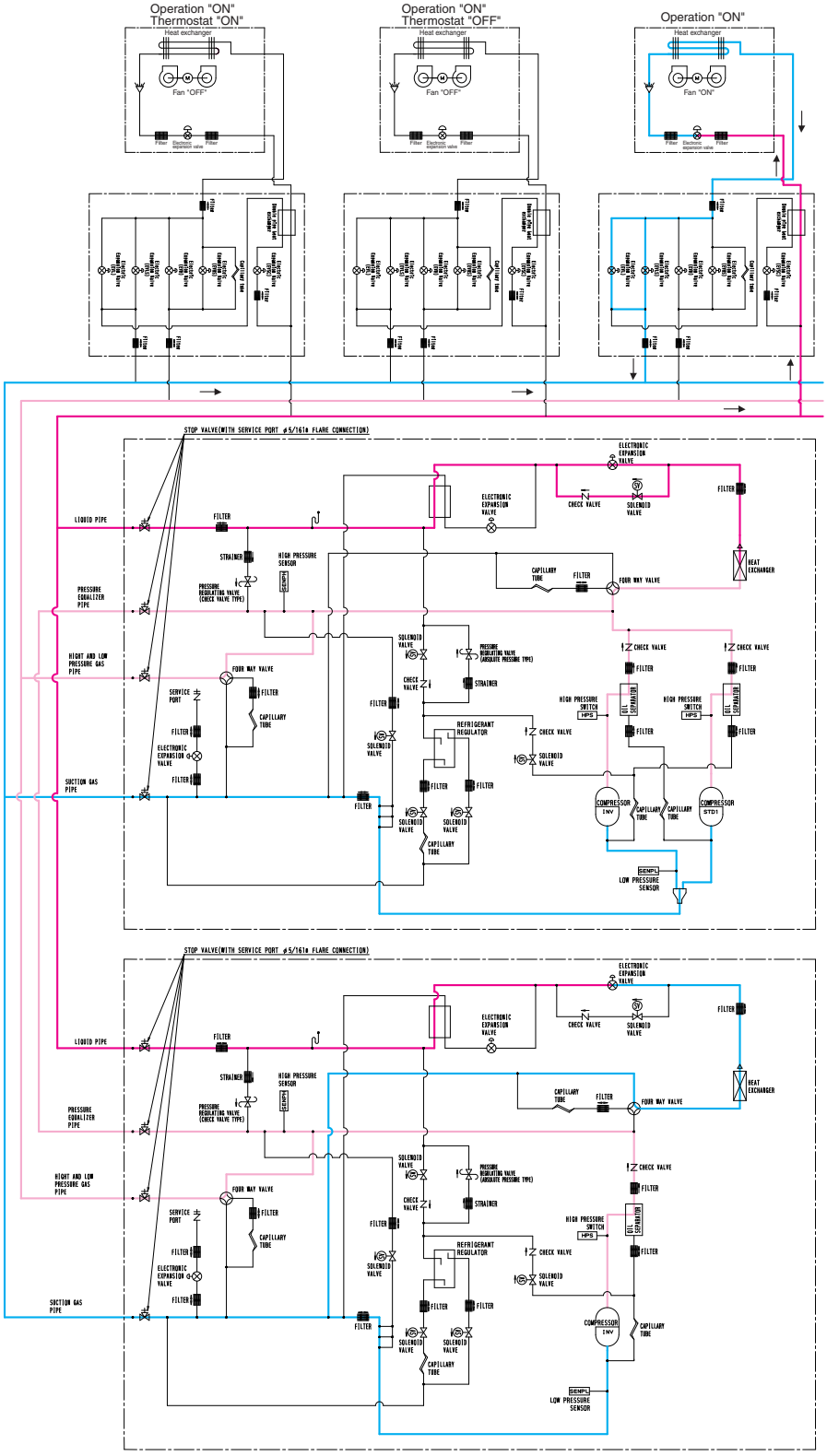
Oil Return Operation at Simultaneous Cooling / Heating Operation

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



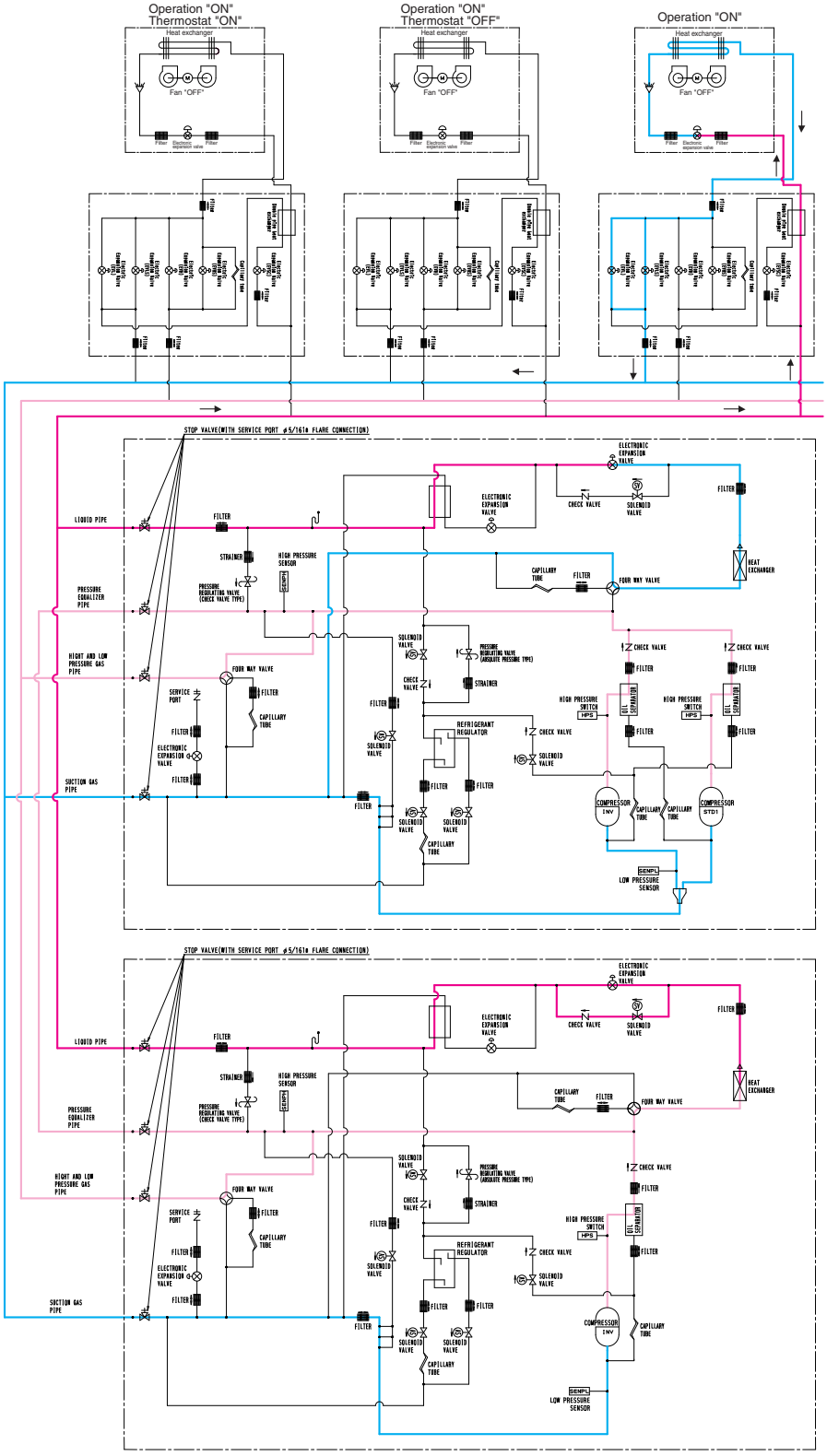
Partial Defrosting 1

"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



Partial Defrosting 2

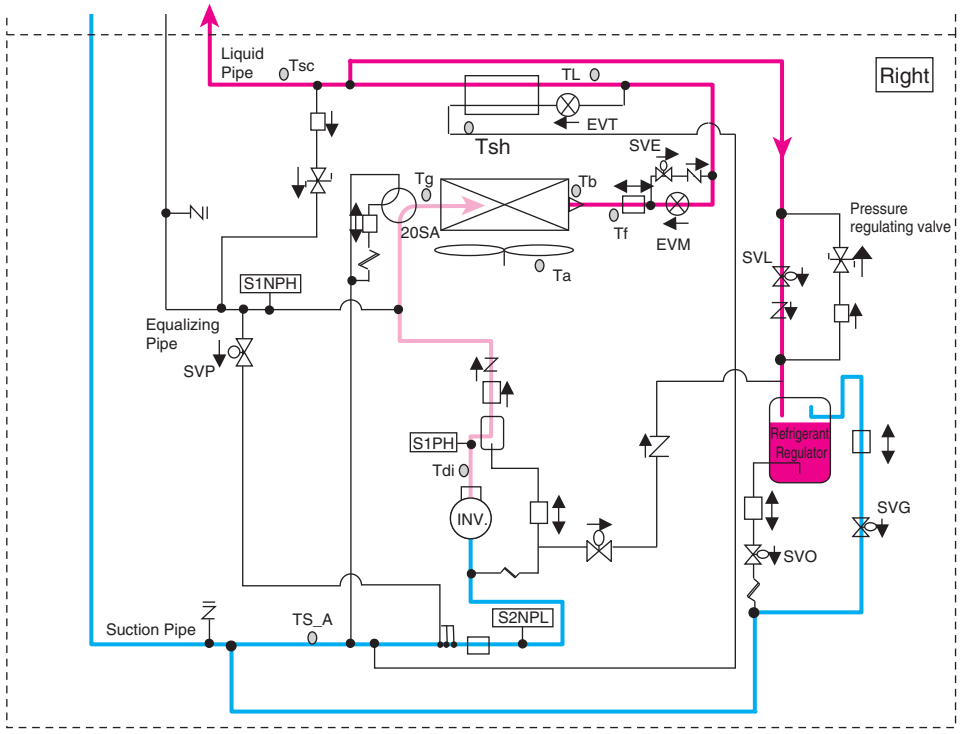
"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



Operation of refrigerant regulator

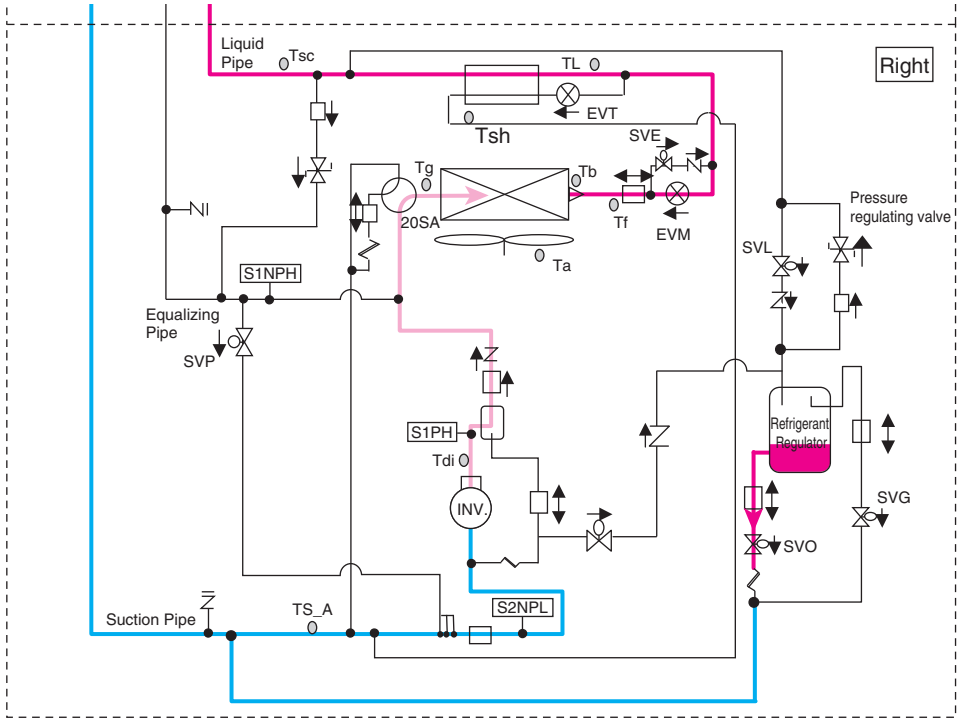
1. **Recovery of refrigerant**

   Surplus refrigerant is recovered to refrigerant regulator by opening of SVL and SVG when the indoor unit load is small.



2. **Discharge of refrigerant**

   Discharge refrigerant from refrigerant regulator by opening of SVC when the load of the outdoor unit is large.

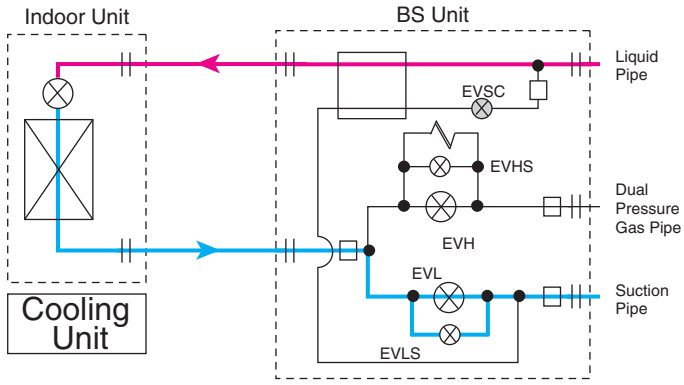


3. **Pressure regulating valve (Refrigerant regulator)**
   The circuit will be closed when SVL, SVO, SVG are all closed. In this case, the increased pressure in the refrigerant regulator will be transferred to the liquid refrigerant pipe side, to regulate the pressure.

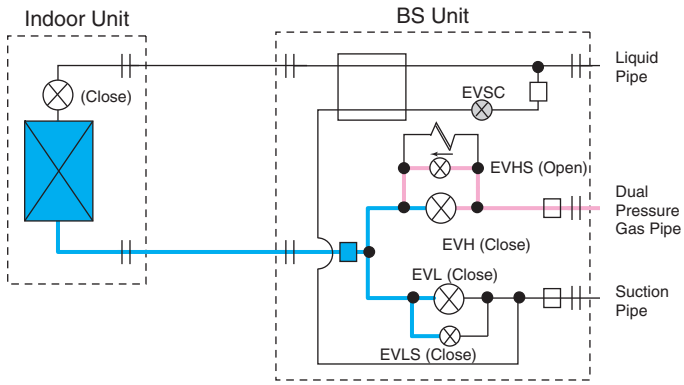
Pressure equalizing when switching operation cooling/ heating

1. **When switching operation from to cooling to heating**
   First, the electronic expansion valves for EVHS, EVH, EVL and EVLS of the indoor unit will be closed.
   Next, open the EVHS, and it makes to balance the system pressure.
   Finally, EVH and EVHS are opened and the electronic expansion valve of the indoor unit is opened to start the operation as a heating circuit.

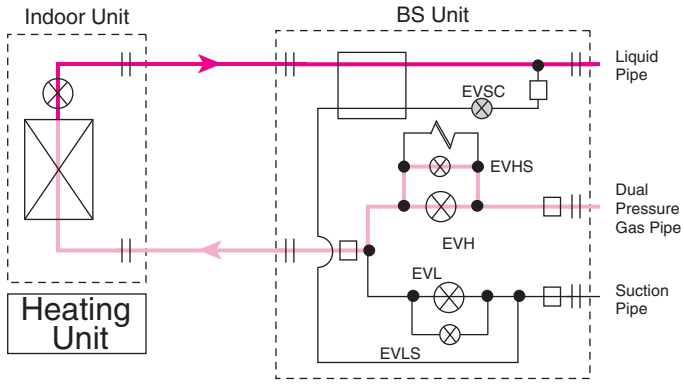
In cooling operation



In equalization



To heating operation



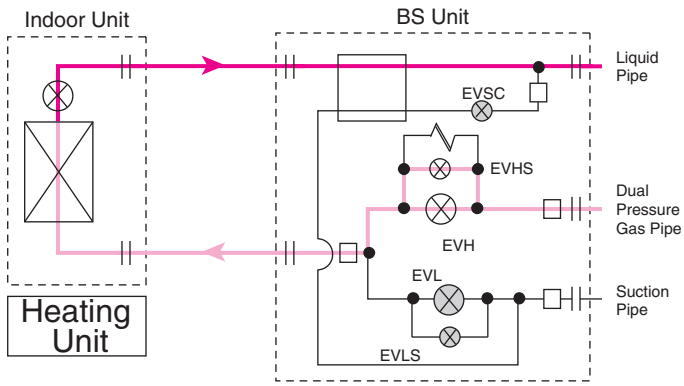
2. When switching operation from heating to cooling

First, the electronic expansion valve and the solenoid valve for EVHS, EVH, EVL and EVLS of the indoor unit will be closed.

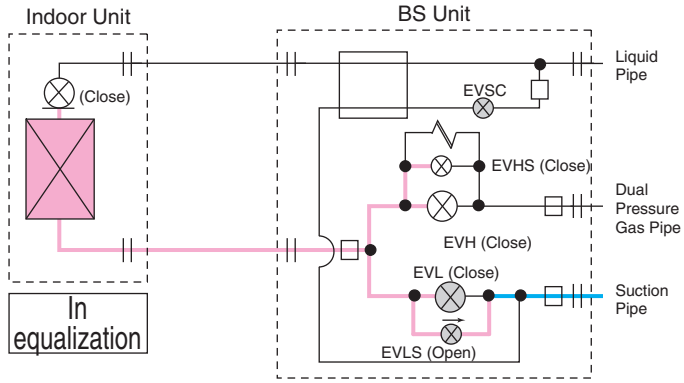
Next, open the EVLS, and it makes to balance the system pressure.

Finally, EVL and EVLS are opened and the electronic expansion valve of the indoor unit is opened to start the operation as a cooling circuit.

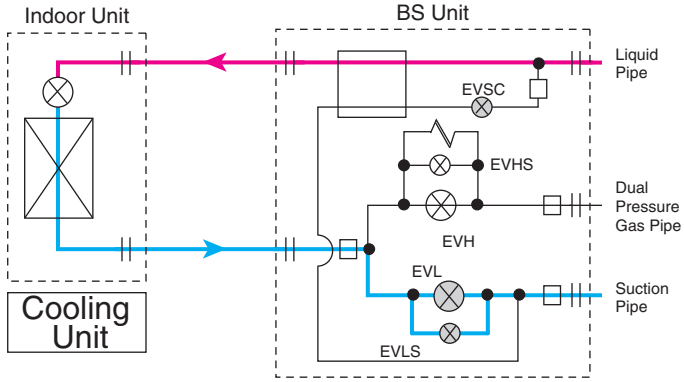
In heating operation



In equalization



To cooling operation

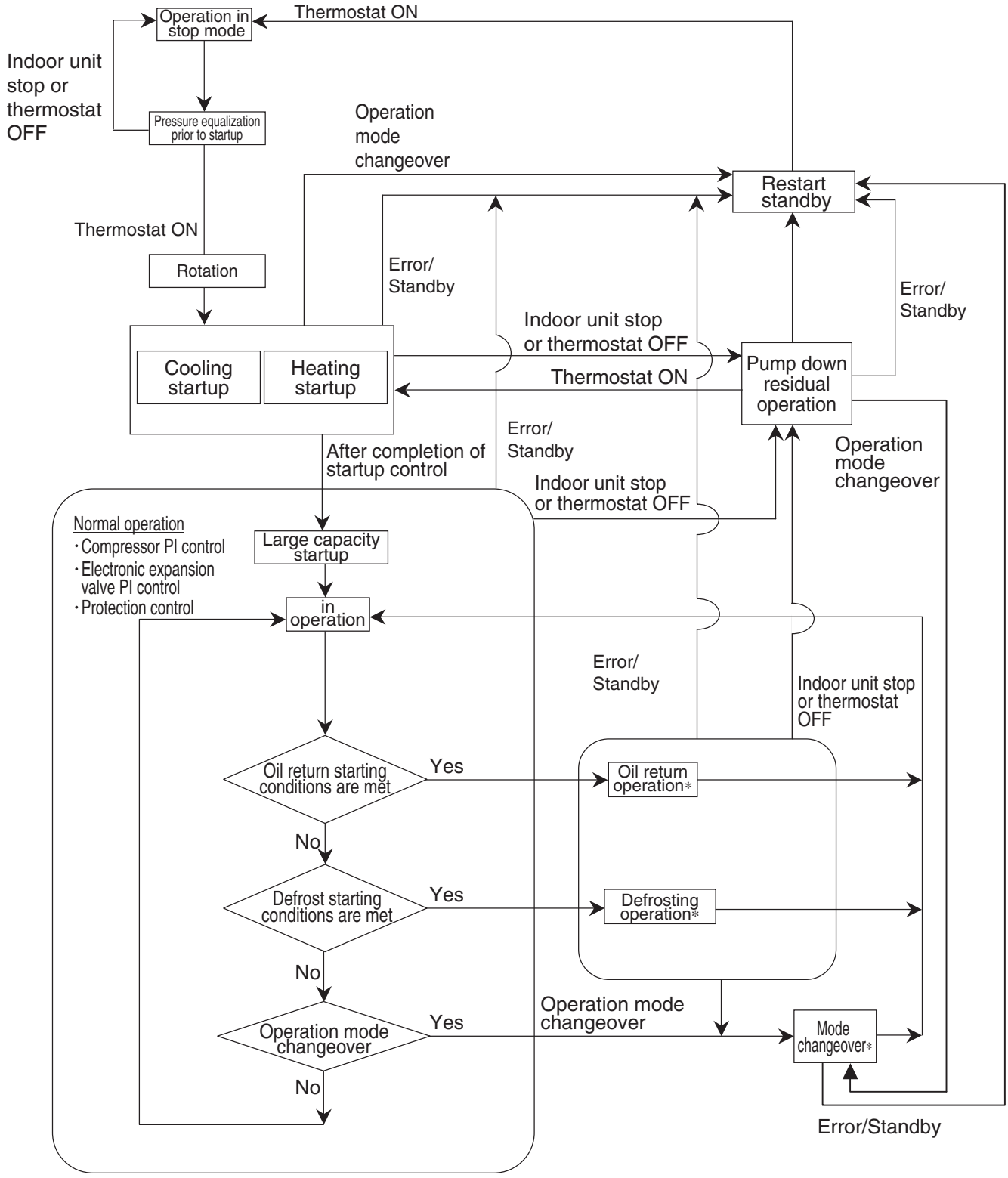


5. Function General

5.1 Symbol

Symbol	Electric symbol				Description of function
	REYQ72· 96·120	REYQ144	REMQ72	REMQ96· 120	
20SA	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	Four way valve (Heat exchanger switch)
20SB	Y8S	Y8S	Y2S	Y2S	Four way valve (Dual pressure gas pipe switch)
DSH	—				Discharge pipe superheated degree (Discharge pipe temperature Td - High pressure equivalent saturation temperature Tc)
DSHi	—				Discharge pipe superheated degree of INV. compressor (Tdi - Tc)
DSHs	—				Discharge pipe superheated degree of STD compressor (Tds - Tc)
EV	—				Opening degree of electronic expansion valve
EVM	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	Electronic expansion valve for main heat exchanger
EVT	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	Electronic expansion valve for subcooling heat exchanger
EVJ	Y4E	Y4E	Y2E	Y2E	Electronic expansion valve at the refrigerant charge port
HTDi	—				Value of INV. compressor discharge pipe temperature compensated with outdoor air temperature
HTDs	—				Value of STD compressor discharge pipe temperature compensated with outdoor air temperature
Pc	S1NPH				Value detected by high pressure sensor
Pe	S2NPL				Value detected by low pressure sensor
SH	—				Evaporator outlet superheated degree (Suction pipe temperature Ts1 - Low pressure equivalent saturation temperature Te)
SHS	—				Target of evaporator outlet superheated degree
SVP	Y4S	Y4S	Y5S	Y5S	Solenoid valve for hot gas
SVO	Y7S	Y7S	Y7S	Y7S	Solenoid valve for oil return
SVT	Y6S	Y6S	Y8S	Y8S	Solenoid valve for injection
SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	Bypass solenoid valve
SVG	Y1S	Y1S	Y1S	Y1S	Solenoid valve for refrigerant regulator gas vent pipe
SVL	Y3S	Y3S	Y4S	Y4S	Refrigerant regulator liquid pipe solenoid valve
Ta	R1T				Outdoor air temperature
Tb	R4T, R12T	R4T, R12T	R4T	R4T	Heat exchanger outlet temperature at cooling
Tc	—				High pressure equivalent saturation temperature
TcS	—				Target temperature of Tc
Tdi	R31T	R31T, R32T	R31T	R31T	Discharge pipe temperature of INV. compressor
Tds	R32T	—	—	R32T	Discharge pipe temperature of STD compressor
Te	—				Low pressure equivalent saturation temperature
TeS	—				Target temperature of Te
Tfin	R1T				Radiation fin temperature
Tsh	R5T, R13T	R5T, R13T	R5T	R5T, R13T	Temperature detected with the subcooling heat exchanger outlet thermistor
Tsc	R9T, R14T	R9T, R14T	R9T	R9T	Temperature of liquid pipe between liquid stop valve and subcooling heat exchanger
Tf	R7T, R15T	R7T, R15T	R7T	R7T	Temperature of liquid pipe between heat exchanger and main electronic expansion valve.
Tl	R6T	R6T	R6T	R6T	Liquid pipe temperature detected with the liquid pipe thermistor
TsA	R8T, R10T	R8T, R10T	R8T	R8T	Suction pipe temperature
Tp	—				Calculated value of compressor port temperature

5.2 Operation Mode



* "Oil return", "Defrost" and "Mode changeover" move on to the next process after the completion of above function in progress even if the thermostat is OFF during the operation.

6. Basic Control

6.1 Normal Operation

6.1.1 List of Functions in Normal Operation

Part Name	Symbol	Electric symbol				Function of Functional Part		
		RXYQ72·96·120	RXYQ144	REMQ72	REMQ92·96·120	Normal Cooling	Normal Heating	Normal Simultaneous Cooling / Heating
Compressor 1	—	M1C	M1C	M1C	M1C	PI control, High pressure protection, Low pressure protection, Td protection, control, INV. protection	PI control, High pressure protection, Low pressure protection, Td protection, control, INV. protection	PI control, High pressure protection, Low pressure protection, Td protection, control, INV. protection
Compressor 2		M2C	M2C	—	M2C			
Outdoor unit fan 1	—	M1F	M1F	M1F	M1F	Cooling fan control	Outdoor unit heat exchanger: Condenser / Cooling fan control Outdoor unit heat exchanger: Evaporator / Fan step 7 or 8	Outdoor unit heat exchanger: Condenser / Cooling fan control Outdoor unit heat exchanger: Evaporator / Fan step 7 or 8
Outdoor unit fan 2		M2F	M2F	—	—			
Electronic expansion valve (Main)	EVM	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	1375 pls	Outdoor unit heat exchanger: Condenser / Liquid pressure control Outdoor unit heat exchanger: Evaporator / PI control	Outdoor unit heat exchanger: Condenser / Liquid pressure control Outdoor unit heat exchanger: Evaporator / PI control
Electronic expansion valve (Subcooling)	EVT	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	PI control	PI control	PI control
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y4E	Y2E	Y2E	80 pls	80 pls	80 pls
Four way valve (Heat exchanger switch)	20SA	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	OFF	Outdoor unit heat exchanger: Condenser / OFF Outdoor unit heat exchanger: Evaporator / ON	Outdoor unit heat exchanger: Condenser / OFF Outdoor unit heat exchanger: Evaporator / ON
Four way valve (Dual pressure gas pipe switch)	20SB	Y8S	Y8S	Y2S	Y2S	ON	OFF	OFF
Solenoid valve (Main bypass)	SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	ON	OFF	OFF
Solenoid valve (Hot gas)	SVP	Y4S	Y4S	Y5S	Y5S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y3S	Y4S	Y4S	ON for refrigerant recovery	ON for refrigerant recovery	ON for refrigerant recovery
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	Y1S	Y1S	ON for refrigerant recovery	ON for refrigerant recovery	ON for refrigerant recovery
Solenoid valve (Refrigerant regulator discharge pipe)	SVO	Y7S	Y7S	Y7S	Y7S	ON for refrigerant discharge	ON for refrigerant discharge	ON for refrigerant discharge
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	Y6S	Y8S	Y8S	ON for oil level control	ON for oil level control	ON for oil level control

Indoor unit actuator		Normal cooling	Normal heating
Fan	Thermostat ON unit	Remote controller setting	Remote controller setting
	Stopping unit	OFF	OFF
	Thermostat OFF unit	Remote controller setting	LL
Electronic expansion valve	Thermostat ON unit	Normal opening *1	Normal opening *2
	Stopping unit	0 pls	192 pls
	Thermostat OFF unit	0 pls	192 pls

*1. PI control : Evaporator outlet superheated degree (SH) constant.
*2. PI control : Condenser outlet subcooled degree (SC) constant.
*1 and 2 : Refer to “6. Control of Electronic Expansion Valve” on P. 283.

Branch Selector unit actuator	Electric symbol	Normal cooling	Normal heating / Normal simultaneous Cooling / Heating operation
Electronic expansion valve (EVH)	Y4E	760 pls (fully opened)	760 pls (fully opened)
Electronic expansion valve (EVL)	Y5E	760 pls (fully opened)	0 pls
Electronic expansion valve (EVHS)	Y2E	480 pls (fully opened)	480 pls (fully opened)
Electronic expansion valve (EVLS)	Y3E	480 pls (fully opened)	0 pls
Electronic expansion valve (EVSC)	Y1E	0 pls	0 pls (simultaneous Cooling / Heating operation : PI control)

6.2 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 set value (Make this setting while in Setting mode 2.)

Te setting

L	M (Normal) (factory setting)	H				
3	6	7	8	9	10	11

Te: Low pressure equivalent saturation temperature (°F)

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

∗On multi-outdoor-unit systems, this control is made according to values of the first-priority unit, which is detected with the pressure sensor.

[Heating operation]

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

Te set value (Make this setting while in Setting mode 2.)

Tc setting

L	M (Normal) (factory setting)	H
43	46	48

Tc: High pressure equivalent saturation temperature (°F)

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

∗On multi-outdoor-unit systems, this control is made according to values of the first-priority unit, which is detected with the pressure sensor.

Outdoor Unit Rotation

In the case of multi-outdoor-unit system, this outdoor unit rotation is used to prevent the compressor from burning out due to unbalanced oil level between outdoor units.

[Details of outdoor unit rotation]

In the case of multi-outdoor-unit system, each outdoor unit is given an operating priority for the control.

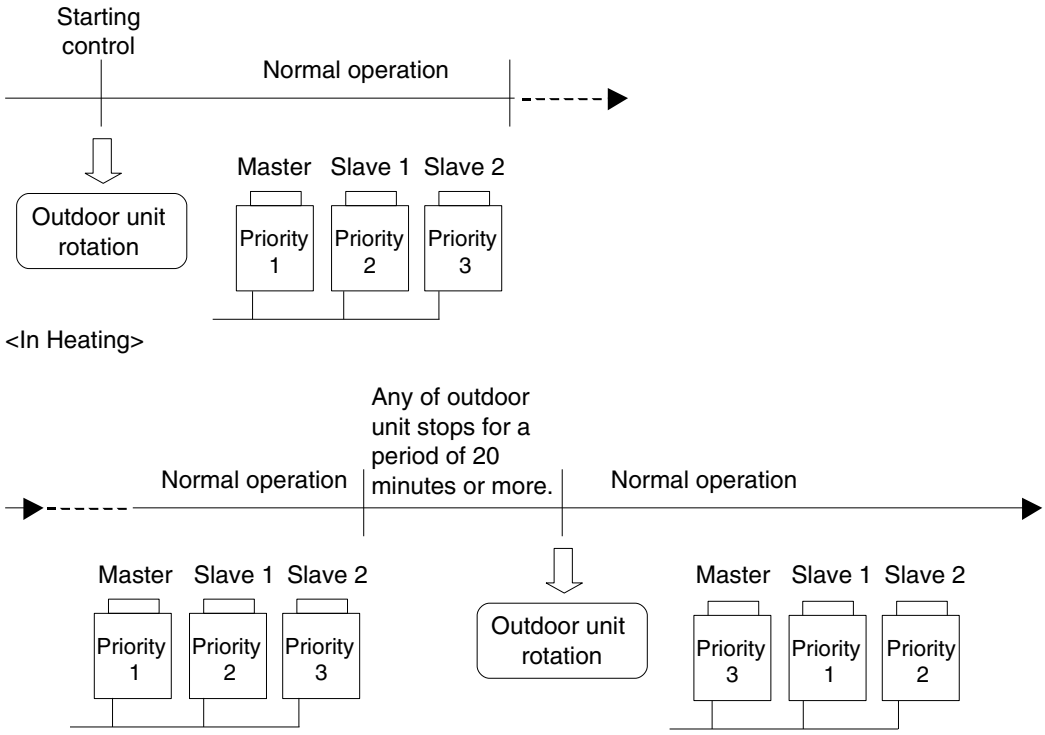
Outdoor unit rotation makes it possible to change the operating priority of outdoor units.

Thus, the system becomes free of compressors that stop over an extended period of time at the time of partial loading, preventing unbalanced oil level.

[Timing of outdoor unit rotation]

OR
- At the beginning of the starting control
- When any of outdoor unit stops for a period of 20 minutes or more (in heating)

Example) The following diagram shows outdoor unit rotation in combination of 3 outdoor units. (in heating)



* "Master unit", "slave unit 1" and "slave unit 2" in this section are the names for installation. They are determined in installation work, and not changed thereafter. (These names are different from "master unit" and "slave unit" for control.)
The outdoor unit connected the control wires (F1 and F2) for the indoor unit should be designated as master unit.
Consequently, The LED display on the main PCB for "master unit", "slave unit 1" and "slave unit 2" do not change.

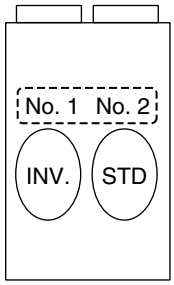
■ Operating Priority and Rotation of Compressors

Each compressor operates in the following order of priority.
In the case of multi-outdoor-unit system, each compressor operates in any of Pattern 1 through Pattern 3 according to the rotation of outdoor units.

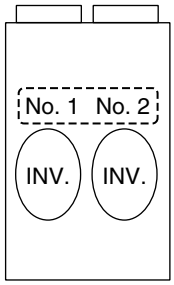
INV.: Inverter compressor
STD1: Standard compressor 1

Pattern 1 Pattern 2 Pattern 3

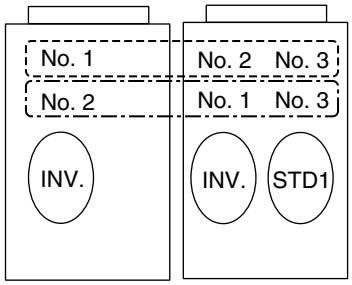
REYQ72, 96, 120PBYD, TJ



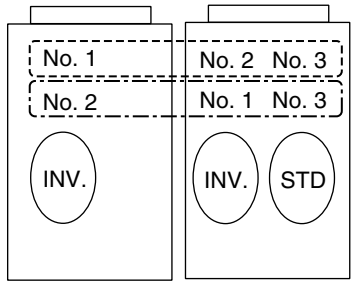
REYQ144PBTJ



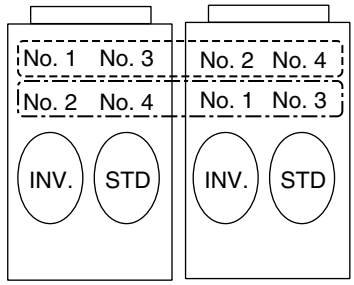
REYQ144PBYD



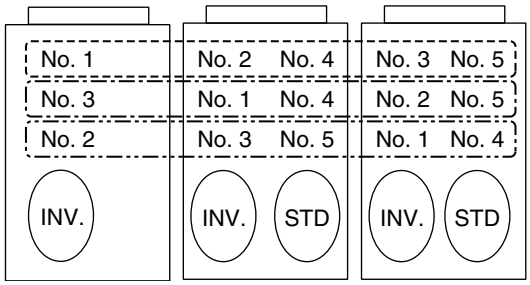
REYQ168PBYD, TJ



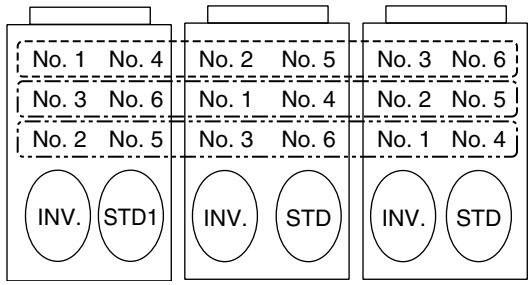
REYQ192, 216, 240PBYD, TJ



REYQ264, 288PBYD, TJ



REYQ312, 336PBYD, TJ



- Compressors may operate in any pattern other than those mentioned above according to the operating status.

■ Compressor Step Control
Compressor operations vary with the following steps according to information in "6.2 Compressor PI Control". Furthermore, the operating priority of compressors is subject to information in "■ Operating Priority and Rotation of Compressors".

REYQ72 · 96 · 120PB

STEP No.	INV.	STD1
1	52 Hz	
2	56 Hz	
3	62 Hz	
4	68 Hz	
5	74 Hz	
6	80 Hz	
7	88 Hz	
8	96 Hz	
9	104 Hz	
10	110 Hz	
11	116 Hz	
12	124 Hz	
13	132 Hz	
14	144 Hz	
15	158 Hz	
16	166 Hz	
17	176 Hz	
18	188 Hz	
19	202 Hz	
20	210 Hz	
21	52 Hz	ON
22	62 Hz	ON
23	68 Hz	ON
24	74 Hz	ON
25	80 Hz	ON
26	88 Hz	ON
27	96 Hz	ON
28	104 Hz	ON
29	116 Hz	ON
30	124 Hz	ON
31	132 Hz	ON
32	144 Hz	ON
33	158 Hz	ON
34	176 Hz	ON
35	188 Hz	ON
36	202 Hz	ON
37	210 Hz	ON

REYQ144PBTJ

STEP No.	INV.1	INV.2
1	52 Hz	52 Hz
2	56 Hz	56 Hz
3	62 Hz	62 Hz
4	66 Hz	66 Hz
5	70 Hz	70 Hz
6	74 Hz	74 Hz
7	80 Hz	80 Hz
8	88 Hz	88 Hz
9	92 Hz	92 Hz
10	96 Hz	96 Hz
11	104 Hz	104 Hz
12	110 Hz	110 Hz
13	116 Hz	116 Hz
14	124 Hz	124 Hz
15	132 Hz	132 Hz
16	144 Hz	144 Hz
17	158 Hz	158 Hz
18	166 Hz	166 Hz
19	176 Hz	176 Hz
20	188 Hz	188 Hz
21	202 Hz	202 Hz
22	210 Hz	210 Hz
23	218 Hz	218 Hz
24	232 Hz	232 Hz
25	248 Hz	248 Hz
26	266 Hz	266 Hz

Note:

1. INV.: Inverter compressor
   STD: Standard compressor
   Figures after ON represent the number of STD compressors in operation.
2. “Master unit”, and “slave unit” in this section are the names for control, and they will be transferred according to the priority of rotation system.
3. Depending on the operating conditions of compressors, the compressors may run in patterns other than those aforementioned.

REYQ168 · 192PB

(To increase STEP No.)

STEP No.	Master INV.	Slave INV.	STD
1	52 Hz	52 Hz	
2	56 Hz	56 Hz	
3	62 Hz	62 Hz	
4	66 Hz	66 Hz	
5	70 Hz	70 Hz	
6	74 Hz	74 Hz	
7	80 Hz	80 Hz	
8	88 Hz	88 Hz	
9	92 Hz	92 Hz	
10	96 Hz	96 Hz	
11	104 Hz	104 Hz	
12	110 Hz	110 Hz	
13	116 Hz	116 Hz	
14	124 Hz	124 Hz	
15	132 Hz	132 Hz	
16	144 Hz	144 Hz	
17	158 Hz	158 Hz	
18	166 Hz	166 Hz	
19	176 Hz	176 Hz	
20	80 Hz	80 Hz	ON
21	88 Hz	88 Hz	ON
22	96 Hz	96 Hz	ON
23	104 Hz	104 Hz	ON
24	116 Hz	116 Hz	ON
25	124 Hz	124 Hz	ON
26	132 Hz	132 Hz	ON
27	144 Hz	144 Hz	ON
28	158 Hz	158 Hz	ON
29	176 Hz	176 Hz	ON
30	188 Hz	188 Hz	ON
31	202 Hz	202 Hz	ON
32	210 Hz	210 Hz	ON

(To decrease STEP No.)

STEP No.	Master INV.	Slave INV.	STD
1	52 Hz	0 Hz	
2	56 Hz	0 Hz	
3	62 Hz	0 Hz	
4	68 Hz	0 Hz	
5	74 Hz	0 Hz	
6	80 Hz	0 Hz	
7	88 Hz	0 Hz	
8	96 Hz	0 Hz	
9	104 Hz	0 Hz	
10	52 Hz	52 Hz	
11	56 Hz	56 Hz	
12	62 Hz	62 Hz	
13	66 Hz	66 Hz	
14	70 Hz	70 Hz	
15	74 Hz	74 Hz	
16	80 Hz	80 Hz	
17	88 Hz	88 Hz	
18	92 Hz	92 Hz	
19	96 Hz	96 Hz	
20	104 Hz	104 Hz	
21	110 Hz	110 Hz	
22	116 Hz	116 Hz	
23	124 Hz	124 Hz	
24	132 Hz	132 Hz	
25	52 Hz	52 Hz	ON
26	62 Hz	62 Hz	ON
27	68 Hz	68 Hz	ON
28	74 Hz	74 Hz	ON
29	80 Hz	80 Hz	ON
30	88 Hz	88 Hz	ON
31	96 Hz	96 Hz	ON
32	104 Hz	104 Hz	ON
33	116 Hz	116 Hz	ON
34	124 Hz	124 Hz	ON
35	132 Hz	132 Hz	ON
36	144 Hz	144 Hz	ON
37	158 Hz	158 Hz	ON
38	176 Hz	176 Hz	ON
39	188 Hz	188 Hz	ON
40	202 Hz	202 Hz	ON
41	210 Hz	210 Hz	ON

Note:

1. INV.: Inverter compressor
   STD: Standard compressor
   Figures after ON represent the number of STD compressors in operation.
2. “Master unit”, and “slave unit” in this section are the names for control, and they will be transferred according to the priority of rotation system.
3. Depending on the operating conditions of compressors, the compressors may run in patterns other than those aforementioned.

REYQ216 · 240PB

(To increase STEP No.)

STEP No.	Master INV.	Slave INV.	STD
1	52 Hz	52 Hz	
2	56 Hz	56 Hz	
3	62 Hz	62 Hz	
4	66 Hz	66 Hz	
5	70 Hz	70 Hz	
6	74 Hz	74 Hz	
7	80 Hz	80 Hz	
8	88 Hz	88 Hz	
9	92 Hz	92 Hz	
10	96 Hz	96 Hz	
11	104 Hz	104 Hz	
12	110 Hz	110 Hz	
13	116 Hz	116 Hz	
14	124 Hz	124 Hz	
15	132 Hz	132 Hz	
16	144 Hz	144 Hz	
17	158 Hz	158 Hz	
18	166 Hz	166 Hz	
19	176 Hz	176 Hz	
20	80 Hz	80 Hz	ON 1
21	88 Hz	88 Hz	ON 1
22	96 Hz	96 Hz	ON 1
23	104 Hz	104 Hz	ON 1
24	116 Hz	116 Hz	ON 1
25	124 Hz	124 Hz	ON 1
26	132 Hz	132 Hz	ON 1
27	88 Hz	88 Hz	ON 2
28	96 Hz	96 Hz	ON 2
29	104 Hz	104 Hz	ON 2
30	124 Hz	124 Hz	ON 2
31	144 Hz	144 Hz	ON 2
32	158 Hz	158 Hz	ON 2
33	166 Hz	176 Hz	ON 2
34	176 Hz	158 Hz	ON 2
35	188 Hz	188 Hz	ON 2
36	202 Hz	202 Hz	ON 2
37	210 Hz	210 Hz	ON 2
38	202 Hz	202 Hz	ON 2
39	210 Hz	210 Hz	ON 2

(To decrease STEP No.)

STEP No.	Master INV.	Slave INV.	STD
1	52 Hz	0 Hz	
2	56 Hz	0 Hz	
3	62 Hz	0 Hz	
4	68 Hz	0 Hz	
5	74 Hz	0 Hz	
6	80 Hz	0 Hz	
7	88 Hz	0 Hz	
8	96 Hz	0 Hz	
9	104 Hz	0 Hz	
10	52 Hz	52 Hz	
11	56 Hz	56 Hz	
12	62 Hz	62 Hz	
13	66 Hz	66 Hz	
14	70 Hz	70 Hz	
15	74 Hz	74 Hz	
16	80 Hz	80 Hz	
17	88 Hz	88 Hz	
18	92 Hz	92 Hz	
19	96 Hz	96 Hz	
20	104 Hz	104 Hz	
21	110 Hz	110 Hz	
22	116 Hz	116 Hz	
23	124 Hz	124 Hz	
24	132 Hz	132 Hz	
25	52 Hz	52 Hz	ON 1
26	62 Hz	62 Hz	ON 1
27	68 Hz	68 Hz	ON 1
28	74 Hz	74 Hz	ON 1
29	80 Hz	80 Hz	ON 1
30	88 Hz	88 Hz	ON 1
31	96 Hz	96 Hz	ON 1
32	104 Hz	104 Hz	ON 1
33	52 Hz	52 Hz	ON 2
34	62 Hz	62 Hz	ON 2
35	74 Hz	74 Hz	ON 2
36	88 Hz	88 Hz	ON 2
37	96 Hz	96 Hz	ON 2
38	104 Hz	104 Hz	ON 2
39	124 Hz	124 Hz	ON 2
40	144 Hz	144 Hz	ON 2
41	158 Hz	158 Hz	ON 2
42	166 Hz	166 Hz	ON 2
43	176 Hz	176 Hz	ON 2
44	188 Hz	188 Hz	ON 2
45	202 Hz	202 Hz	ON 2
46	210 Hz	210 Hz	ON 2
47	202 Hz	202 Hz	ON 2
48	210 Hz	210 Hz	ON 2

Note:

1. INV.: Inverter compressor
   STD: Standard compressor
   Figures after ON represent the number of STD compressors in operation.
2. “Master unit”, and “slave unit” in this section are the names for control, and they will be transferred according to the priority of rotation system.
3. Depending on the operating conditions of compressors, the compressors may run in patterns other than those aforementioned.

REYQ264 · 288 · 312PB

STEP No.	INV.1	INV.2	INV.3	STD1	STD2
1	52 Hz	52 Hz	52 Hz	OFF	OFF
2	56 Hz	56 Hz	56 Hz	OFF	OFF
3	62 Hz	62 Hz	62 Hz	OFF	OFF
4	66 Hz	66 Hz	66 Hz	OFF	OFF
5	68 Hz	68 Hz	68 Hz	OFF	OFF
6	70 Hz	70 Hz	70 Hz	OFF	OFF
7	74 Hz	74 Hz	74 Hz	OFF	OFF
8	80 Hz	80 Hz	80 Hz	OFF	OFF
9	88 Hz	88 Hz	88 Hz	OFF	OFF
10	96 Hz	96 Hz	96 Hz	OFF	OFF
11	104 Hz	104 Hz	104 Hz	OFF	OFF
12	110 Hz	110 Hz	110 Hz	OFF	OFF
13	116 Hz	116 Hz	116 Hz	OFF	OFF
14	124 Hz	124 Hz	124 Hz	OFF	OFF
15	80 Hz	80 Hz	80 Hz	ON	OFF
16	88 Hz	88 Hz	88 Hz	ON	OFF
17	96 Hz	96 Hz	96 Hz	ON	OFF
18	104 Hz	104 Hz	104 Hz	ON	OFF
19	116 Hz	116 Hz	116 Hz	ON	OFF
20	124 Hz	124 Hz	124 Hz	ON	OFF
21	132 Hz	132 Hz	132 Hz	ON	OFF
22	88 Hz	88 Hz	88 Hz	ON	ON
23	96 Hz	96 Hz	96 Hz	ON	ON
24	104 Hz	104 Hz	104 Hz	ON	ON
25	124 Hz	124 Hz	124 Hz	ON	ON
26	144 Hz	144 Hz	144 Hz	ON	ON
27	158 Hz	158 Hz	158 Hz	ON	ON
28	166 Hz	166 Hz	166 Hz	ON	ON
29	176 Hz	176 Hz	176 Hz	ON	ON
30	188 Hz	188 Hz	188 Hz	ON	ON
31	202 Hz	202 Hz	202 Hz	ON	ON
32	210 Hz	210 Hz	210 Hz	ON	ON
33	218 Hz	218 Hz	218 Hz	ON	ON
34	232 Hz	232 Hz	232 Hz	ON	ON
35	248 Hz	248 Hz	248 Hz	ON	ON
36	266 Hz	266 Hz	266 Hz	ON	ON
37	280 Hz	280 Hz	280 Hz	ON	ON

REYQ336PB

STEP No.	INV.1	INV.2	INV.3	STD1	STD2	STD3
1	52 Hz	52 Hz	52 Hz	OFF	OFF	OFF
2	56 Hz	56 Hz	56 Hz	OFF	OFF	OFF
3	62 Hz	62 Hz	62 Hz	OFF	OFF	OFF
4	66 Hz	66 Hz	66 Hz	OFF	OFF	OFF
5	68 Hz	68 Hz	68 Hz	OFF	OFF	OFF
6	70 Hz	70 Hz	70 Hz	OFF	OFF	OFF
7	74 Hz	74 Hz	74 Hz	OFF	OFF	OFF
8	80 Hz	80 Hz	80 Hz	OFF	OFF	OFF
9	88 Hz	88 Hz	88 Hz	OFF	OFF	OFF
10	96 Hz	96 Hz	96 Hz	OFF	OFF	OFF
11	104 Hz	104 Hz	104 Hz	OFF	OFF	OFF
12	110 Hz	110 Hz	110 Hz	OFF	OFF	OFF
13	116 Hz	116 Hz	116 Hz	OFF	OFF	OFF
14	124 Hz	124 Hz	124 Hz	OFF	OFF	OFF
15	80 Hz	80 Hz	80 Hz	ON	OFF	OFF
16	88 Hz	88 Hz	88 Hz	ON	OFF	OFF
17	96 Hz	96 Hz	96 Hz	ON	OFF	OFF
18	104 Hz	104 Hz	104 Hz	ON	OFF	OFF
19	116 Hz	116 Hz	116 Hz	ON	OFF	OFF
20	124 Hz	124 Hz	124 Hz	ON	OFF	OFF
21	132 Hz	132 Hz	132 Hz	ON	OFF	OFF
22	88 Hz	88 Hz	88 Hz	ON	ON	OFF
23	96 Hz	96 Hz	96 Hz	ON	ON	OFF
24	104 Hz	104 Hz	104 Hz	ON	ON	OFF
25	124 Hz	124 Hz	124 Hz	ON	ON	OFF
26	144 Hz	144 Hz	144 Hz	ON	ON	OFF
27	96 Hz	96 Hz	96 Hz	ON	ON	ON
28	104 Hz	104 Hz	104 Hz	ON	ON	ON
29	116 Hz	116 Hz	116 Hz	ON	ON	ON
30	124 Hz	124 Hz	124 Hz	ON	ON	ON
31	144 Hz	144 Hz	144 Hz	ON	ON	ON
32	158 Hz	158 Hz	158 Hz	ON	ON	ON
33	166 Hz	166 Hz	166 Hz	ON	ON	ON
34	176 Hz	176 Hz	176 Hz	ON	ON	ON
35	188 Hz	188 Hz	188 Hz	ON	ON	ON
36	202 Hz	202 Hz	202 Hz	ON	ON	ON
37	210 Hz	210 Hz	210 Hz	ON	ON	ON
38	218 Hz	218 Hz	218 Hz	ON	ON	ON
39	232 Hz	232 Hz	232 Hz	ON	ON	ON
40	248 Hz	248 Hz	248 Hz	ON	ON	ON
41	266 Hz	266 Hz	266 Hz	ON	ON	ON
42	280 Hz	280 Hz	280 Hz	ON	ON	ON

Note:

1. INV.: Inverter compressor
   STD: Standard compressor
   Figures after ON represent the number of STD compressors in operation.
2. “Master unit”, and “slave unit” in this section are the names for control, and they will be transferred according to the priority of rotation system.
3. Depending on the operating conditions of compressors, the compressors may run in patterns other than those aforementioned.

6.3 Electronic Expansion Valve PI Control

Main electronic expansion valve EVM control

When the outdoor unit heat exchanging is performed via the evaporator (20SA is set to ON), this function is used to exert PI control on the electronic expansion valve (Y1E or Y3E) so that the evaporator outlet superheated degree (SH) will become constant.

SH = Tg - Te

SH: Evaporator outlet superheated degree (°F)
Tg : Suction pipe temperature (°F) detected by the heat exchanger gas pipe thermistor R2T.
Te : Low pressure equivalent saturation temperature (°F)

Subcooling electronic expansion valve EVT control

In order to make the maximum use of the subcooling heat exchanger, this function is used to exert PI control on the electronic expansion valve (Y2E, Y5E or Y3E) so that the evaporator-side gas pipe superheated degree (SH) will become constant.

SH = Tsh - Te

SH: Evaporator outlet superheated degree (°F)
Tsh: Suction pipe temperature (°F) detected by the subcooling heat exchanger outlet thermistor R5T
Te: Low pressure equivalent saturation temperature (°F)

Refrigerant charge electronic expansion valve EVJ control

While in automatic refrigerant charge mode, this function is used to exert PI control on the opening degree of the electronic expansion valve (Y2E or Y4E) in response to outdoor temperature and close the valve after the completion of refrigerant charge.
For normal operation, fully open this electronic expansion valve.

6.4 Step Control of Outdoor Unit Fans

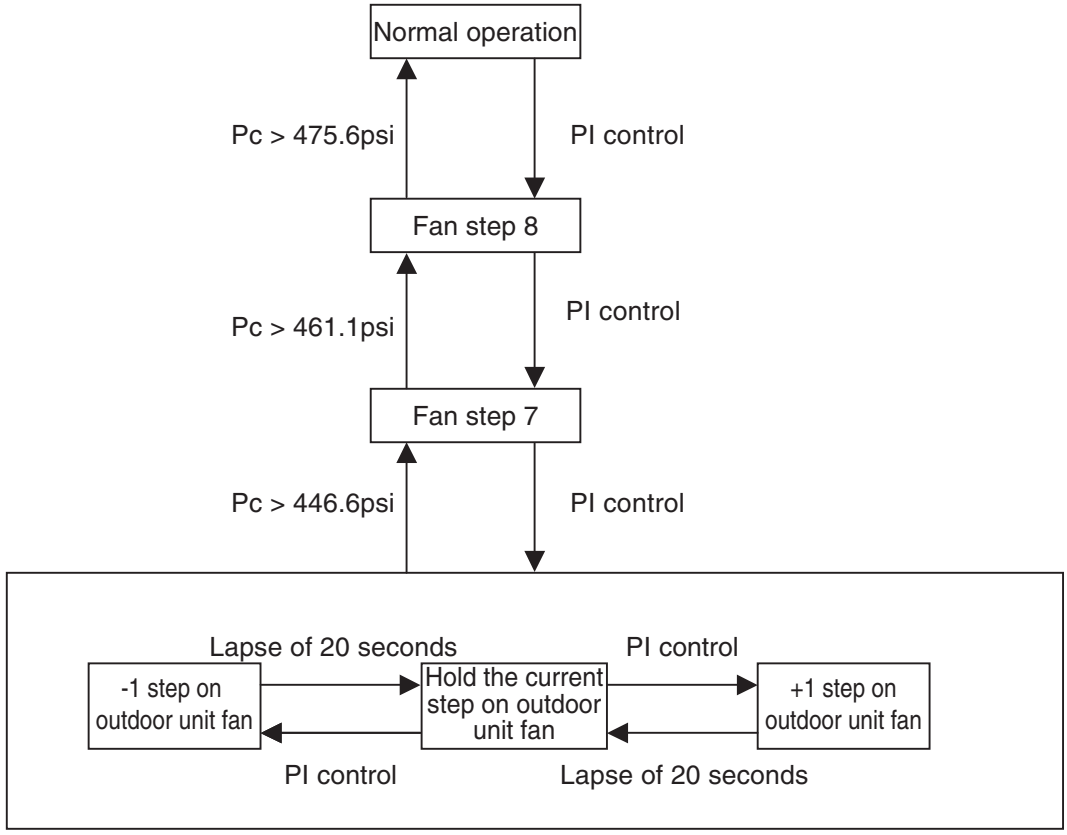
Used to control the revolutions of outdoor unit fans in the steps listed in table below, according to condition changes.

STEP No.	Fan revolutions (rpm)						
	Single type				Multiple type		
	REYQ72PBYD, TJ	REYQ96PBYD, TJ	REYQ120PBYD, TJ	REYQ144PBTJ	REMQ72PB	REMQ96PB	REMQ120PB
0	0	0	0	0	0	0	0
1	285/255	285/255	285/255	285/255	350	350	350
2	315/285	315/285	315/285	360/315	370	370	370
3	360/330	360/330	360/330	395/365	400	400	400
4	430/400	430/400	430/400	480/440	450	450	450
5	590/560	590/560	590/560	560/530	540	560	560
6	690/660	690/660	690/660	760/730	610	680	680
7	820/790	820/790	820/790	960/930	680	710	710
8	920/890	920/890	951/931	1155/1125	710	750	775
9	920/890	920/890	1020/990	1200/1170	796	821	870
	Fan1/Fan2	Fan1/Fan2	Fan1/Fan2	Fan1/Fan2			

* Figures listed above are all those controlled while in standard mode, which vary when the system is set to high static pressure or capacity precedence mode.

6.5 Outdoor Unit Fan Control in Cooling

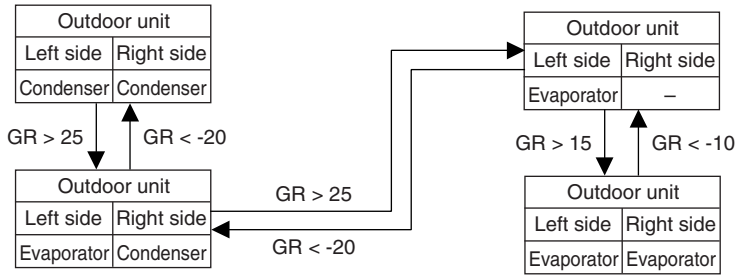
While in cooling operation, if the outdoor temperature is low, this mode provides high pressure control using the outdoor unit fan to retain appropriate liquid pressure, thus ensuring refrigerant circulation rate to be supplied to indoor units.



6.6 Heat Exchanger Control

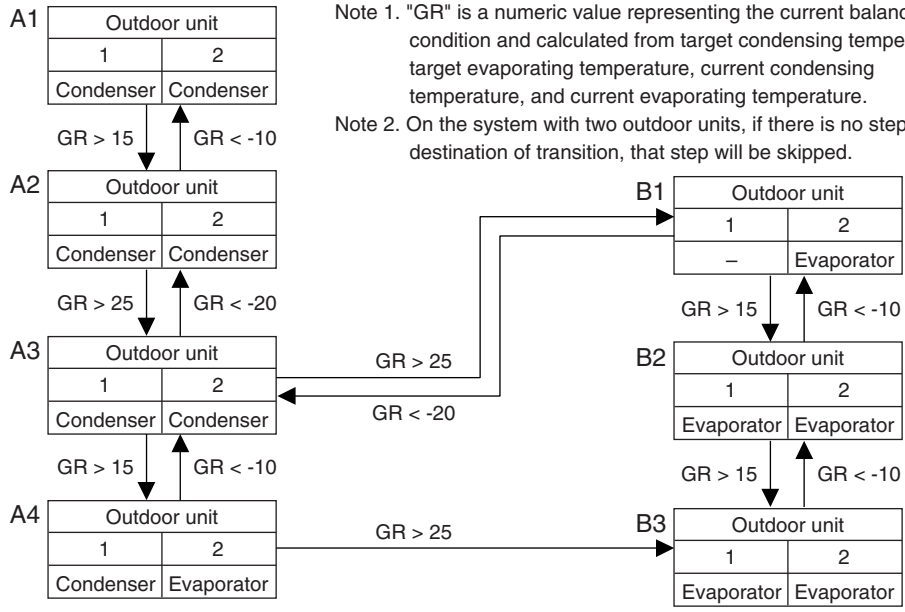
While in heating or cool/heat simultaneous operation, ensure target condensing and evaporating temperature by changing over the air heat exchange of outdoor unit to the evaporator or the condenser in response to loads.

[Single system]



Note 1. "GR" is a numeric value representing the current balanced condition and calculated from target condensing temperature, target evaporating temperature, current condensing temperature, and current evaporating temperature.

[Multi outdoor unit system]



Note 1. "GR" is a numeric value representing the current balanced condition and calculated from target condensing temperature, target evaporating temperature, current condensing temperature, and current evaporating temperature.

Note 2. On the system with two outdoor units, if there is no step for the destination of transition, that step will be skipped.

7. Special Control

7.1 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. Furthermore, 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.

7.1.1 Startup Control in Cooling

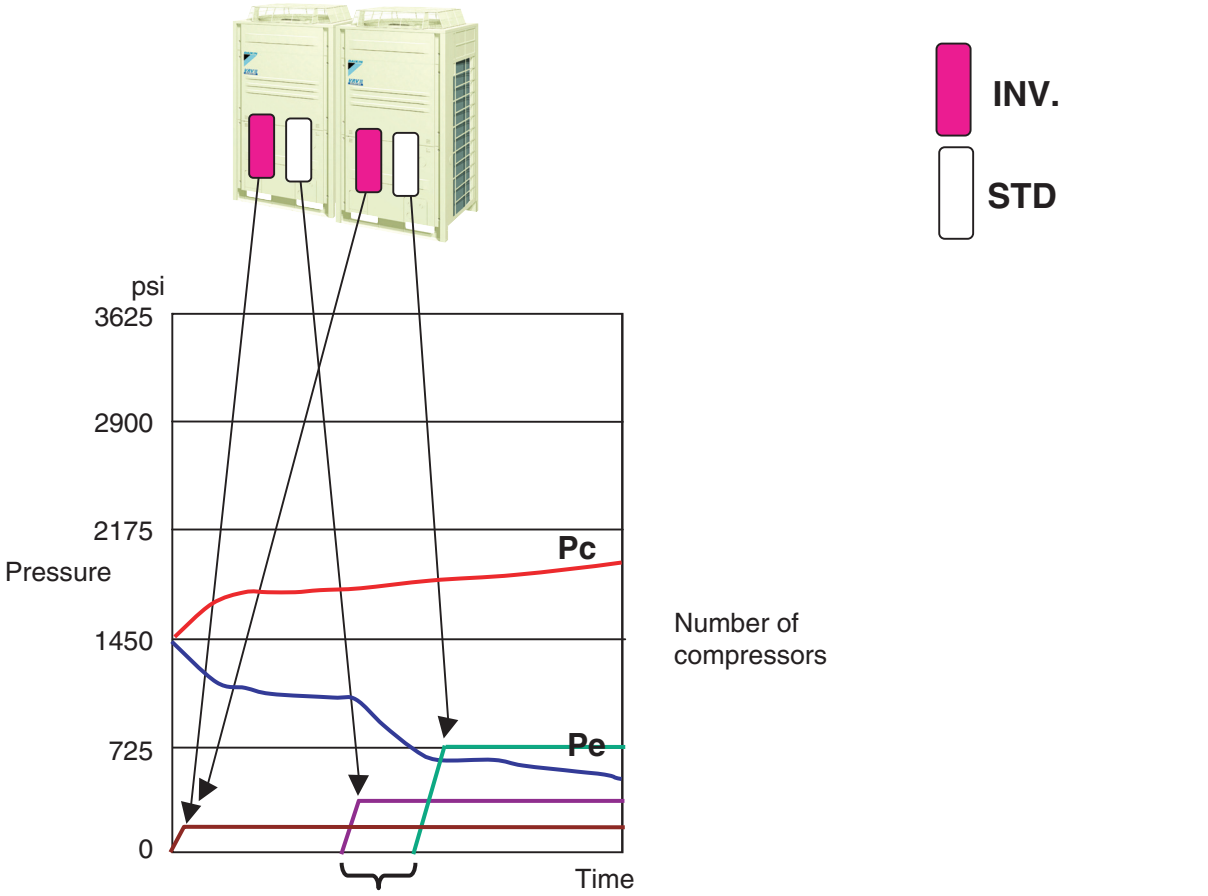
Actuator	Symbol	Electric symbol				Control before startup	Startup control	
		RXYQ72·96·120	RXYQ144	REMQ72	REMQ96·120		STEP1	STEP2
Compressor 1	—	M1C	M1C	M1C	M1C	0 Hz	52 Hz + OFF	52Hz + OFF + 2STEP / 20 sec. (Until it reaches Pc - Pe > 56.55 psi)
Compressor 2		M2C	M2C	—	M2C			
Outdoor unit fan 1	—	M1F	M1F	M1F	M1F	STEP4	Ta < 68°F: OFF Ta ≥ 68°F: STEP4	+1step/15 sec. (When Pc_max > 313.2 psi) -1step/15 sec. (When Pc_max < 256.65 psi)
Outdoor unit fan 2		M2F	M2F	—	—			
Electronic expansion valve (Main)	EVM	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	0 pls	1375 pls	1375 pls
Electronic expansion valve (Subcooling)	EVT	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	0 pls	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y4E	Y2E	Y2E	80 pls	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	OFF	OFF	OFF
Four- way valve (Dual pressure gas pipe switch)	20SB	Y8S	Y8S	Y2S	Y2S	ON	ON	ON
Solenoid valve (Main bypass)	SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	OFF	ON	ON
Solenoid valve (Hot gas)	SVP	Y4S	Y4S	Y5S	Y5S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y3S	Y4S	Y4S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	Y1S	Y1S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVO	Y7S	Y7S	Y7S	Y7S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	Y6S	Y8S	Y8S	OFF	OFF	OFF
Ending conditions						A lapse of 60 sec.	A lapse of 15 sec.	OR • A lapse of 90 sec. • Pc - Pe > 56.55 psi

7.1.2 Startup Control in Heating

Actuator	Symbol	Electric symbol				Control before startup	Startup control	
		RXYQ72·96·120	RXYQ144	REMQ72	REMQ96·120		STEP1	STEP2
Compressor 1	—	M1C	M1C	M1C	M1C	0 Hz	52 Hz + OFF	52Hz + OFF + 2STEP / 20 sec. (Until it reaches Pc - Pe > 56.55 psi)
Compressor 2		M2C	M2C	—	M2C			
Outdoor unit fan 1	—	M1F	M1F	M1F	M1F	STEP4	20SA = ON: STEP7 20SA = OFF +1step/15 sec. (When Pc_max > 313.2 psi) -1step/15 sec. (When Pc_max < 256.65 psi)	20SA = ON: STEP7 20SA = OFF +1step/15 sec. (When Pc_max > 313.2 psi) -1step/15 sec. (When Pc_max < 256.65 psi)
Outdoor unit fan 2		M2F	M2F	—	—			
Electronic expansion valve (Main)	EVM	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	0 pls	20SA = ON: SH Control 20SA = OFF: 1375 pls	20SA = ON: SH Control 20SA = OFF: 1375 pls
Electronic expansion valve (Subcooling)	EVT	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	0 pls	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y4E	Y2E	Y2E	80 pls	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	When outdoor heat exchanger is evaporator: ON When outdoor heat exchanger is condenser: OFF	When outdoor heat exchanger is evaporator: ON When outdoor heat exchanger is condenser: OFF	When outdoor heat exchanger is evaporator: ON When outdoor heat exchanger is condenser: OFF
Four-way valve (Dual pressure gas pipe switch)	20SB	Y8S	Y8S	Y2S	Y2S	OFF	OFF	OFF
Solenoid valve (Main bypass)	SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	OFF	OFF	OFF
Solenoid valve (Hot gas)	SVP	Y4S	Y4S	Y5S	Y5S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y3S	Y4S	Y4S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	Y1S	Y1S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y7S	Y7S	Y7S	Y7S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	Y6S	Y6S	Y8S	Y8S	OFF	OFF	OFF
Ending conditions						A lapse of 60 sec.	A lapse of 15 sec.	OR • A lapse of 90 sec. • Pc - Pe > 56.55 psi

7.2 Large Capacity Startup Control (Heating)

For startup, oil return operation, or setup after defrosting, start up multiple compressors at a high-speed according to the conditions of indoor units with thermostat ON, thus maximizing the equipment capacity.



Startup STD compressors at intervals of 15 seconds.

[Starting conditions]

OR
- The system starts heating operation with thermostat ON at a high load.
- The system completes defrosting operation.
- The system switches the operation mode from cooling to heating or simultaneous cooling and heating operation.

[Control]

1. Start multiple INV. compressors in the system at one time.
2. Start multiple STD compressors in the system at intervals of 15 seconds.

7.3 Oil Return Operation

This function is used to recover refrigerant oil that flows out from the compressor to the system side by conducting oil return operation in order to prevent the compressor from running refrigerant shortage.

7.3.1 Oil Return Operation in Cooling

[Start conditions]

Referring to the following conditions, start cooling oil return operation.

OR
- Integral oil rise rate is reached to specified level.
- When cumulative compressor operating time exceeds 8 hours (2 hours when the power supply turns ON for the first time)

Furthermore, the integral oil rise rate is calculated by Tc, Te, and compressor loads.

The higher the compressor operating step No., the cumulative refrigerant oil consumption increases.

Outdoor unit actuator	Symbol	Electric symbol				Oil return operation	Operation after oil return
		RXYQ72·96·120	RXYQ144	REMQ72	REMQ96·120		
Compressor 1	—	M1C	M1C	M1C	M1C	52Hz + ON (Subsequently, constant low pressure control) Maintain the number of compressors that were used before oil return	52Hz + ON (Subsequently, constant low pressure control) Maintain the number of compressors that were used before oil return
Compressor 2		M2C	M2C	—	M2C		
Outdoor unit fan 1	—	M1F	M1F	M1F	M1F	Cooling fan control	Cooling fan control
Outdoor unit fan 2		M2F	M2F	—	—		
Four-way valve (for heat exchanger switch)	20SA	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	OFF	OFF
Four-way valve (for dual pressure gas pipe switch)	20SB	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	ON	ON
Electronic expansion valve (main)	EVM	Y4E	Y4E	Y2E	Y2E	1375pls	1375pls
Electronic expansion valve (subcooling)	EVT	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	SH control	SH control
Electronic expansion valve (refrigerant charge)	EVJ	Y8S	Y8S	Y2S	Y2S	80pls	80pls
Solenoid valve (main bypass)	SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	ON	ON
Solenoid valve (hot gas)	SVP	Y4S	Y4S	Y5S	Y5S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y3S	Y4S	Y4S	0pls	0pls
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	Y1S	Y1S	0pls	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y7S	Y7S	Y7S	Y7S	0pls	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	Y6S	Y6S	Y8S	Y8S	0pls	0pls
End conditions						OR • After a lapse of 5 min. • TsA - Te < 41°F	OR • After a lapse of 3 min. • Pe_min < 41°F • Pc_max > 526.35 psi • HTdmax > 212°F

∗1: In case of multi outdoor unit system:
Master unit: It conducts the operation listed in the table above.
Slave units: Operating units conduct the operation listed in the table above.
Non-operating units conduct the operation listed in the table above after the "Oil returning" process. (Non-operating units stop while in "Preparation" mode.)

Cooling indoor unit actuator		Oil return operation
Fan	Thermostat ON unit	Remote controller setting
	Unit not in operation	OFF
	Thermostat OFF unit	Remote controller setting
Electronic expansion valve	Thermostat ON unit	Normal opening degree
	Unit not in operation	192pls
	Thermostat OFF unit	Normal opening degree for forced thermostat ON

Cooling Branch Selector unit actuator	Electric symbol	Oil return operation
Electronic expansion valve (EVH)	Y4E	0pls
Electronic expansion valve (EVL)	Y5E	760pls
Electronic expansion valve (EVHS)	Y2E	0~60pls
Electronic expansion valve (EVLS)	Y3E	480pls
Electronic expansion valve (EVSC)	Y1E	0pls

7.3.2 Oil Return Operation in Heating (including cooling / heating simultaneous operation)

[Start conditions]

Referring to the following conditions, start heating oil return operation.

OR
- Integral oil rise rate is reached to specified level.
- When cumulative compressor operating time exceeds 8 hours (2 hours when the power supply turns ON for the first time)

Furthermore, the integral oil rise rate is calculated by Tc, Te, and compressor loads.

The higher the compressor operating step No., the cumulative refrigerant oil consumption increases.

Actuator	Symbol	Electric symbol				Oil return operation
		RXYQ72·96·120	RXYQ144	REMQ72	REMQ96·120	
Compressor 1	—	M1C	M1C	M1C	M1C	Maintain load that was applied before oil return operation. When current circulation rate < circulation rate required for oil return operation, turn ON the STD compressor every 10 seconds (up to 3 units at maximum).
Compressor 2		M2C	M2C	—	M2C	
Outdoor unit fan 1	—	M1F	M1F	M1F	M1F	When outdoor unit heat exchanger is condenser, the fan will run under cooling fan control. When outdoor unit heat exchanger is evaporator, the fan will run at the fan step 7 or 8.
Outdoor unit fan 2		M2F	M2F	—	—	
Electronic expansion valve (main)	EVM	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	20SA = ON: PI control 20SA = OFF: 418pls
Electronic expansion valve (subcooling)	EVT	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	PI control
Electronic expansion valve (refrigerant charge)	EVJ	Y4E	Y4E	Y2E	Y2E	80pls
Four-way valve (for heat exchanger switch)	20SA	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	When outdoor unit heat exchanger is condenser, the valve will turn OFF. When outdoor unit heat exchanger is evaporator, the valve will turn ON.
Four-way valve (for dual pressure gas pipe switch)	20SB	Y8S	Y8S	Y2S	Y2S	OFF
Solenoid valve (main bypass)	SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	OFF
Solenoid valve (hot gas)	SVP	Y4S	Y4S	Y5S	Y5S	0pls
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y3S	Y4S	Y4S	0pls
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	Y1S	Y1S	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y7S	Y7S	Y7S	Y7S	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	Y6S	Y6S	Y8S	Y8S	0pls
End conditions						OR • Pe_min < 31.9psi • After a lapse of 9 min.

∗1: In case of multi outdoor unit system:

Master unit: It conducts the operation listed in the table above.

Slave units: Operating units conduct the operation listed in the table above.

Non-operating units conduct the operation listed in the table above after the "Oil returning" process. (Non-operating units stop while in "Preparation" mode.)

Cooling indoor unit actuator		Oil return operation
Fan	Thermostat ON unit	Remote controller setting
	Unit not in operation	OFF
	Thermostat OFF unit	Remote controller setting
Electronic expansion valve	Thermostat ON unit	Normal opening degree
	Unit not in operation	192pls
	Thermostat OFF unit	Normal opening degree for forced thermostat ON

Heating indoor unit actuator		Oil return operation
Fan	Thermostat ON unit	Remote controller setting
	Unit not in operation	OFF
	Thermostat OFF unit	LL
Electronic expansion valve	Thermostat ON unit	Normal opening degree
	Unit not in operation	224 pls
	Thermostat OFF unit	Normal opening degree for forced thermostat ON

Cooling Branch Selector unit actuator	Electric symbol	Oil return operation
Electronic expansion valve (EVH)	Y4E	0pls
Electronic expansion valve (EVL)	Y5E	760pls
Electronic expansion valve (EVHS)	Y2E	0~60pls (Pc_max > 413.25psi)
Electronic expansion valve (EVLS)	Y3E	480pls
Electronic expansion valve (EVSC)	Y1E	0pls (PI control)

Heating Branch Selector unit actuator	Electric symbol	Oil return operation
Electronic expansion valve (EVH)	Y4E	760pls
Electronic expansion valve (EVL)	Y5E	0pls
Electronic expansion valve (EVHS)	Y2E	60pls
Electronic expansion valve (EVLS)	Y3E	0~60pls (Pc_max > 413.25psi)
Electronic expansion valve (EVSC)	Y1E	0pls (PI control at simultaneous cooling / heating operation)

7.4 Defrost Operation

[Start conditions]

Referring to the following conditions, start defrost operation.

& [
- When there is a decrease in the coefficient of heat transfer of outdoor unit heat exchanger
- When there is a drop in the temperature of outdoor unit heat exchanger outlet (Tb)
- When the low pressure stays low for a certain amount of time (2 hours minimum)

]

Furthermore, the thermal continuity of outdoor unit heat exchanger is calculated by Tc, Te, and compressor loads.

Defrosting outdoor unit actuator	Symbol	Electric symbol				Defrost operation	Operation after defrost
		RXYQ72·96·120	RXYQ144	REMQ72	REMQ96·120		
Compressor 1	—	M1C	M1C	M1C	M1C	REYQ72·96·120·144PB: 232Hz + ON REMQ72PB: 210Hz REMQ96·120PB: 210Hz + ON	REYQ72·96·120·144PB: upper limit 124Hz(STD Holds) REMQ72PB: 210Hz REMQ96·120PB: 210Hz + ON
Compressor 2		M2C	M2C	—	M2C		
Outdoor unit fan 1	—	M1F	M1F	M1F	M1F	OFF Pcmax > 355.25psi ↓ ↑ Pcmax < 340.75psi FANSTEP4 Pcmax > 440.8psi ↓ ↑ Pcmax < 427.75psi FANSTEP6	OFF Pcmax > 355.25psi ↓ ↑ Pcmax < 340.75psi FANSTEP4 Pcmax > 440.8psi ↓ ↑ Pcmax < 427.75psi FANSTEP6
Outdoor unit fan 2		M2F	M2F	—	—		
Four-way valve (for heat exchanger switch)	20SA	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	OFF	OFF
Four-way valve (for dual pressure gas pipe switch)	20SB	Y8S	Y8S	Y2S	Y2S	Holds	Holds
Electronic expansion valve (main)	EVM	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	1375pls	0pls
Electronic expansion valve (subcooling)	EVT	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	SH control	0pls
Electronic expansion valve (refrigerant charge)	EVJ	Y4E	Y4E	Y2E	Y2E	80pls	80pls
Solenoid valve (main bypass)	SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	ON	OFF
Solenoid valve (hot gas)	SVP	Y4S	Y4S	Y5S	Y5S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y3S	Y4S	Y4S	0pls	0pls
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	Y1S	Y1S	0pls	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y7S	Y7S	Y7S	Y7S	0pls	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	Y6S	Y6S	Y8S	Y8S	0pls	0pls
End conditions						REYQ72 to 120PBYD (by unit) REYQ72 to 144PBTJ (by unit) OR [• 6 min. and 30 sec. • Tb > 51.8°F continues for a period of 90 consecutive sec. • Pc_max > 440.8psi] REMQ72 to 120PB (by unit) OR [• 5 min. and 30 sec. • Tb > 51.8°F for a period of 10 consecutive sec. • Pc_max > 440.8psi]	OR [• 30 sec. • Pc_max > 440.8psi]

Evaporating outdoor unit actuator	Symbol	Electric symbol				Defrost operation	Operation after defrost
		RXYQ72·96·120	RXYQ144	REMQ72	REMQ96·120		
Compressor 1	—	M1C	M1C	M1C	M1C	REYQ72·96·120·144PB: 232Hz + ON REMQ72PB: 210Hz REMQ96·120PB: 210Hz + ON	REYQ72·96·120·144PB: Upper limit 124Hz (STD Holds) REMQ72PB: 210Hz REMQ96·120PB: 210Hz + ON
Compressor 2		M2C	M2C	—	M2C		
Outdoor unit fan 1	—	M1F	M1F	M1F	M1F	Fan control	Fan control
Outdoor unit fan 2		M2F	M2F	—	—		
Four-way valve (for heat exchanger switch)	20SA	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	ON	ON
Four-way valve (for dual pressure gas pipe switch)	20SB	Y8S	Y8S	Y2S	Y2S	Holds	Holds
Electronic expansion valve (main)	EVM	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	PI control	PI control
Electronic expansion valve (subcooling)	EVT	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	SH control	0pls
Electronic expansion valve (refrigerant charge)	EVJ	Y4E	Y4E	Y2E	Y2E	80pls	80pls
Solenoid valve (main bypass)	SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	OFF	OFF
Solenoid valve (hot gas)	SVP	Y4S	Y4S	Y5S	Y5S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y3S	Y4S	Y4S	0pls	0pls
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	Y1S	Y1S	0pls	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y7S	Y7S	Y7S	Y7S	0pls	0pls
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	Y6S	Y6S	Y8S	Y8S	0pls	0pls

Cooling indoor unit actuator		Defrost operation
Fan	Thermostat ON unit	Remote controller setting
	Unit not in operation	OFF
	Thermostat OFF unit	Remote controller setting
Electronic expansion valve	Thermostat ON unit	Normal opening degree
	Unit not in operation	0pls
	Thermostat OFF unit	0pls

Heating indoor unit actuator		Defrost operation	
		REYQ	REMQ
Fan	Thermostat ON unit	OFF	OFF
	Unit not in operation	OFF	OFF
	Thermostat OFF unit	OFF	OFF
Electronic expansion valve	Thermostat ON unit	0pls	0pls
	Unit not in operation	0pls	0pls
	Thermostat OFF unit	0pls	0pls

Cooling Branch Selector unit actuator	Electric symbol	Defrost operation
Electronic expansion valve (EVH)	Y4E	0pls
Electronic expansion valve (EVL)	Y5E	760pls
Electronic expansion valve (EVHS)	Y2E	0pls
Electronic expansion valve (EVLS)	Y3E	480pls
Electronic expansion valve (EVSC)	Y1E	0pls

Heating Branch Selector unit actuator	Electric symbol	Defrost operation
Electronic expansion valve (EVH)	Y4E	760pls
Electronic expansion valve (EVL)	Y5E	0pls
Electronic expansion valve (EVHS)	Y2E	60pls
Electronic expansion valve (EVLS)	Y3E	0pls (REYQ72 · 96 · 120PB) 60pls (REMQ72 · 96 · 120PB)
Electronic expansion valve (EVSC)	Y1E	0pls (PI control for cool/heat concurrent operation)

7.5 Pump down Residual Operation

7.5.1 Pump down Residual Operation in Cooling

If the liquid refrigerant stays in the evaporator at the startup of a compressor, this liquid refrigerant enters the compressor, thus resulting in diluted oil in the compressor and then degraded lubrication performance.
Consequently, in order to recover the refrigerant in the evaporator while the compressor stops, the pump down residual operation is conducted.

Actuator	Symbol	Electric symbol				Master unit operation	Slave unit operation
		RXYQ72·96·120	RXYQ144	REMQ72	REMQ96·120		
Compressor 1	—	M1C	M1C	M1C	M1C	124 Hz + OFF	OFF
Compressor 2		M2C	M2C	—	M2C		
Outdoor unit fan 1	—	M1F	M1F	M1F	M1F	Fan control	Fan control
Outdoor unit fan 2		M2F	M2F	—	—		
Electronic expansion valve (Main)	EVM	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	1375 pls	1375 pls
Electronic expansion valve (Subcooling)	EVT	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y4E	Y2E	Y2E	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	OFF	OFF
Four-way valve (Dual pressure gas pipe switch)	20SB	Y8S	Y8S	Y2S	Y2S	ON	ON
Solenoid valve (Main bypass)	SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	ON	ON
Solenoid valve (Hot gas)	SVP	Y4S	Y4S	Y5S	Y5S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y3S	Y4S	Y4S	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	Y1S	Y1S	OFF	OFF
Solenoid valve (Refrigerant regulator of discharge pipe)	SVO	Y7S	Y7S	Y7S	Y7S	OFF	OFF
Solenoid valve (Refrigerant regulator of discharge pipe)	SVT	Y6S	Y6S	Y8S	Y8S	OFF	OFF
Ending conditions						OR • 5 min. • Pe_min < 71.05psi * • Pc_max < 426.3psi * • Master unit Tdi > 230°F • Master unit Tp > 257°F	

* Pe_min and Pc_max indicate the minimum and maximum values in the system, respectively.

7.5.2 Pump down Residual Operation in Heating and Simultaneous Cooling / Heating

Actuator	Symbol	Electric symbol				Master unit operation	Slave unit operation
		RXYQ72·96·120	RXYQ144	REMQ72	REMQ96·120		
Compressor 1	—	M1C	M1C	M1C	M1C	124 Hz + OFF	OFF
Compressor 2		M2C	M2C	—	M2C		
Outdoor unit fan 1	—	M1F	M1F	M1F	M1F	Fan control	Fan control
Outdoor unit fan 2		M2F	M2F	—	—		
Electronic expansion valve (Main)	EVM	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	When 20SA = ON: 0 pls When 20SA = OFF: 1375 pls	When 20SA = ON: 0 pls When 20SA = OFF: 1375 pls
Electronic expansion valve (Subcooling)	EVT	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y4E	Y2E	Y2E	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	When outdoor heat exchanger is evaporator: ON When outdoor heat exchanger is condenser: OFF	When outdoor heat exchanger is evaporator: ON When outdoor heat exchanger is condenser: OFF
Four-way valve (Dual pressure gas pipe switch)	20SB	Y8S	Y8S	Y2S	Y2S	OFF	OFF
Solenoid valve (Main bypass)	SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	OFF	OFF
Solenoid valve (Hot gas)	SVP	Y4S	Y4S	Y5S	Y5S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y3S	Y4S	Y4S	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	Y1S	Y1S	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVO	Y7S	Y7S	Y7S	Y7S	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	Y6S	Y8S	Y8S	OFF	OFF
Ending conditions						OR • 3 min. • Pe_min < 36.25psi * • Pc_max < 453.85psi * • Master unit Tdi > 230°F • Master unit Tp > 284°F	

* Pe_min and Pc_max indicate the minimum and maximum values in the system, respectively.

7.6 Standby

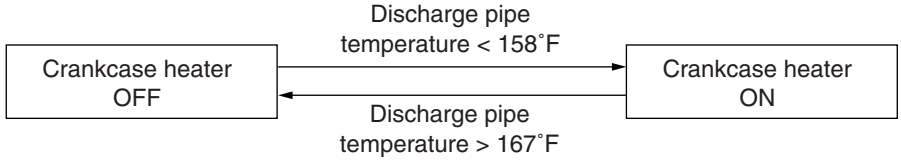
7.6.1 Restart Standby

Used to forcedly stop the compressor for a period of 2 minutes, in order to prevent the frequent ON/OFF of the compressor and equalize the pressure within the refrigerant system.

Actuator	Symbol	Electric symbol				Operation		
		RXYQ72·96·120	RXYQ144	REMQ72	REMQ96·120	REYQ72~144PB	REMQ72PB	REMQ96·120PB
Compressor1	—	M1C	M1C	M1C	M1C	OFF	OFF	OFF
Compressor2	—	M2C	M2C	—	M2C	OFF	—	OFF
Outdoor unit fan1	—	M1F	M1F	M1F	M1F	Ta > 86°F: STEP4 Ta ≤ 86°F: OFF	Ta > 86°F: STEP4 Ta ≤ 86°F: OFF	Ta > 86°F: STEP4 Ta ≤ 86°F: OFF
Outdoor unit fan2	—	M2F	M2F	—	—	Ta > 86°F: STEP4 Ta ≤ 86°F: OFF	—	—
Electronic expansion valve (Main)	EVM	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	0 pls		
Electronic expansion valve (Subcooling)	EVT	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	0 pls		
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y4E	Y2E	Y2E	80 pls		
Four-way valve (Heat exchanger switch)	20SA	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	Holds		
Four-way valve (Dual pressure gas pipe switch)	20SB	Y8S	Y8S	Y2S	Y2S	Holds		
Solenoid valve (Main bypass)	SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	OFF		
Solenoid valve (Hot gas)	SVP	Y4S	Y4S	Y5S	Y5S	OFF		
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y3S	Y4S	Y4S	OFF		
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	Y1S	Y1S	OFF		
Solenoid valve (Refrigerant regulator discharge pipe)	SVO	Y7S	Y7S	Y7S	Y7S	OFF		
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	Y6S	Y8S	Y8S	OFF		
Ending conditions	—					2 min.		

7.6.2 Crankcase Heater Control

In order to prevent the refrigerant from melting in the compressor oil in the stopped mode, this mode is used to control the crankcase heater.



7.7 Stopping Operation

7.7.1 When System is in Stop Mode (Normal operation stop)

This mode is used to define actuator operations when the system stops.

Actuator	Symbol	Electric symbol				Operation		
		RXYQ72·96·120	RXYQ144	REMQ72	REMQ96·120	REYQ72~144PB	REMQ72PB	REMQ96·120PB
Compressor1	—	M1C	M1C	M1C	M1C	OFF	OFF	OFF
Compressor2	—	M2C	M2C	—	M2C	OFF	—	OFF
Outdoor unit fan1	—	M1F	M1F	M1F	M1F	OFF	OFF	OFF
Outdoor unit fan2	—	M2F	M2F	—	—	OFF	—	—
Electronic expansion valve (Main)	EVM	Y1E, Y3E	Y1E, Y3E	Y1E	Y1E	0 pls		
Electronic expansion valve (Subcooling)	EVT	Y2E, Y5E	Y2E, Y5E	Y3E	Y3E	0 pls		
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y4E	Y2E	Y2E	80 pls		
Four-way valve (Heat exchanger switch)	20SA	Y2S, Y9S	Y2S, Y9S	Y3S	Y3S	Holds		
Four-way valve (Dual pressure gas pipe switch)	20SB	Y8S	Y8S	Y2S	Y2S	Holds		
Solenoid valve (Main bypass)	SVE	Y5S, Y10S	Y5S, Y10S	Y6S	Y6S	OFF		
Solenoid valve (Hot gas)	SVP	Y4S	Y4S	Y5S	Y5S	OFF		
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y3S	Y4S	Y4S	OFF		
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	Y1S	Y1S	OFF		
Solenoid valve (Refrigerant regulator discharge pipe)	SVO	Y7S	Y7S	Y7S	Y7S	OFF		
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	Y6S	Y8S	Y8S	OFF		
Ending conditions	—					Indoor unit thermostat is turned ON.		

7.7.2 Stop due to Error

In order to protect compressors, if any of the following items has an abnormal value, the system will make "stop with thermostat OFF" and the error will be determined according to the number of retry times.

Item	Judgement an Error	Error Code
1. Abnormal low pressure level	10.15psi	E4
2. Abnormal high pressure level	580psi	E3
3. Abnormal discharge pipe temperature level	275°F	F3
4. Abnormal power supply voltage	Reverse-phase power supply	U1
5. Abnormal inverter current level	(230V) 27.6A: 260 sec. (460V) 16.1A: 260 sec.	L8
6. Abnormal radiation fin temperature level	199.4°F	L4

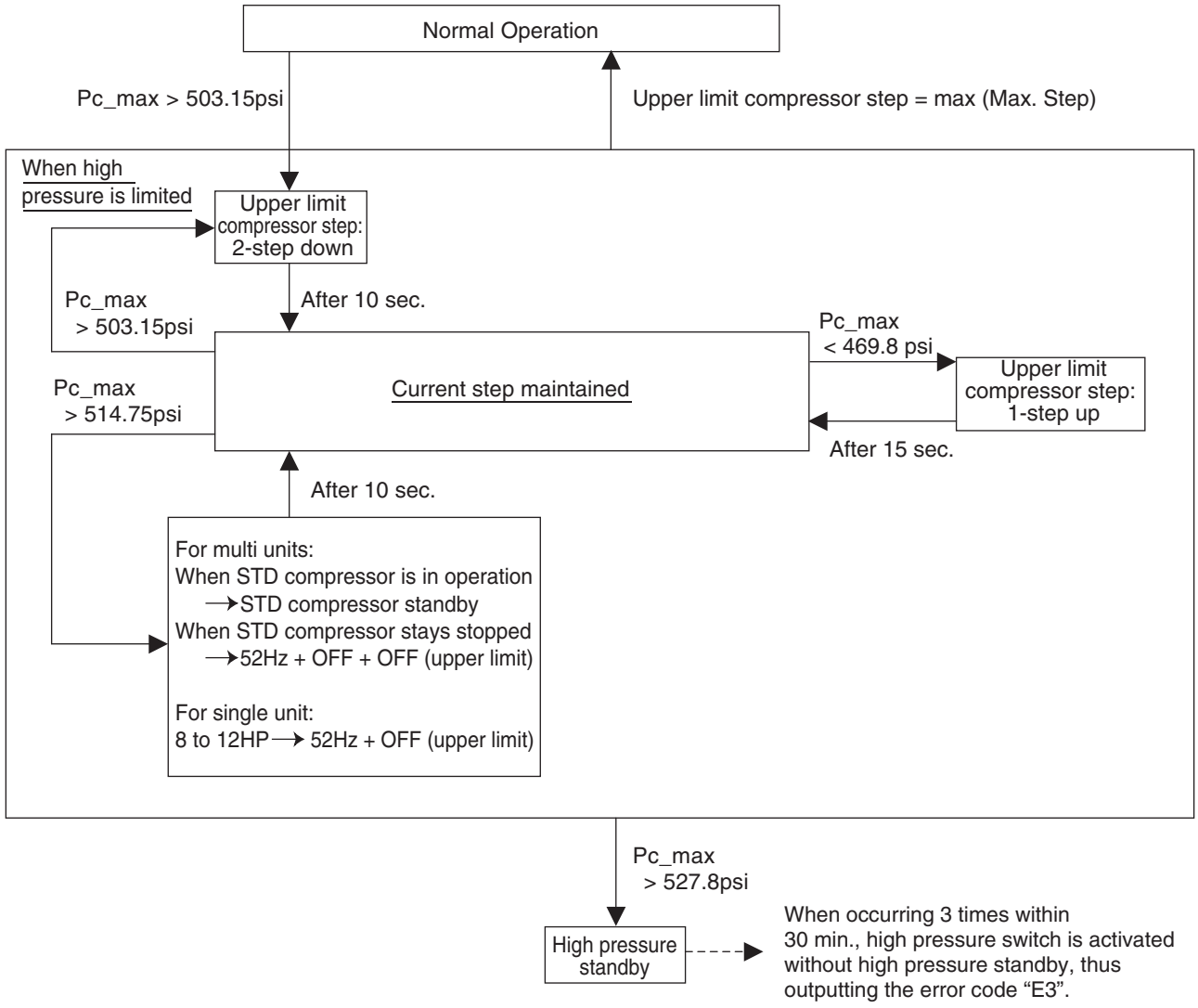
8. Protection Control

8.1 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.

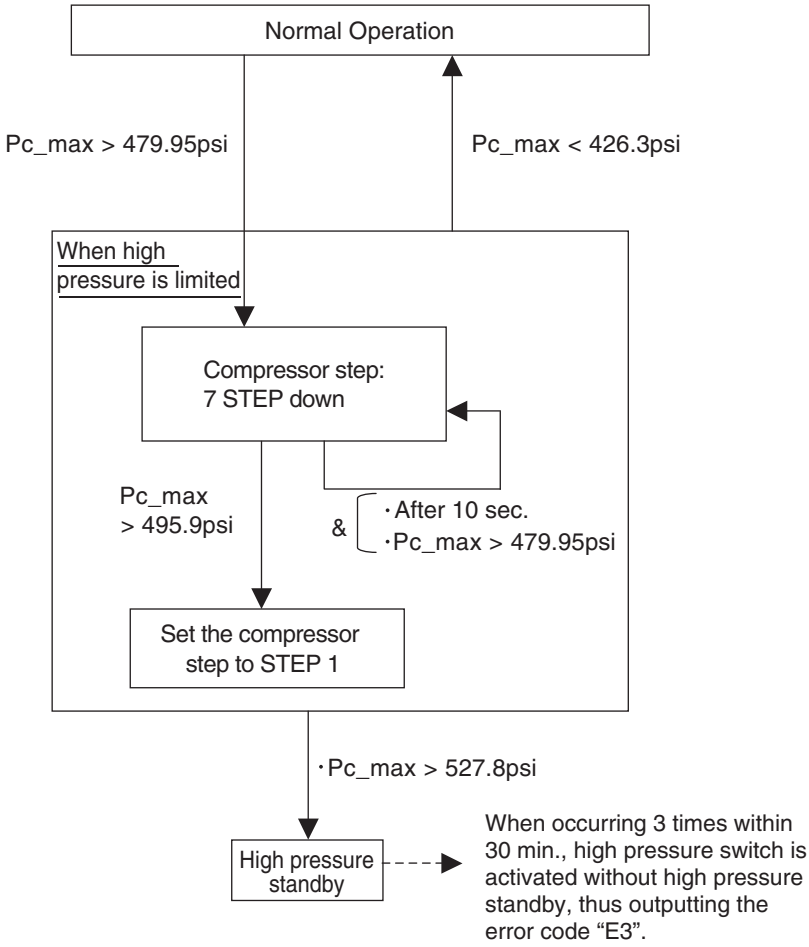
[In cooling]

* The following control is performed in the entire system.
  Pc_max indicates the maximum value within the system.



[In heating and Simultaneous Cooling / Heating]

* The following control is performed in the entire system.
  Pc_max indicates the maximum value within the system.

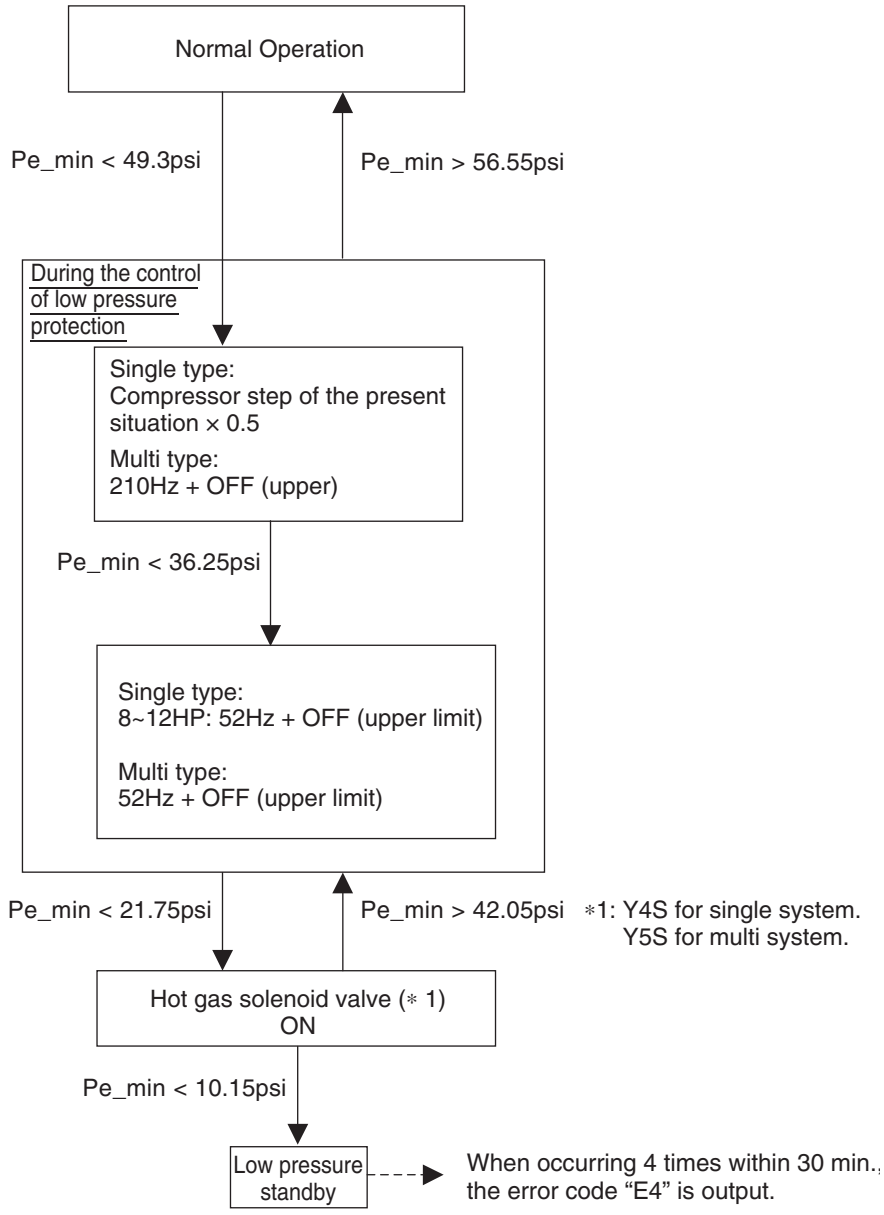


8.2 Low Pressure Protection Control

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

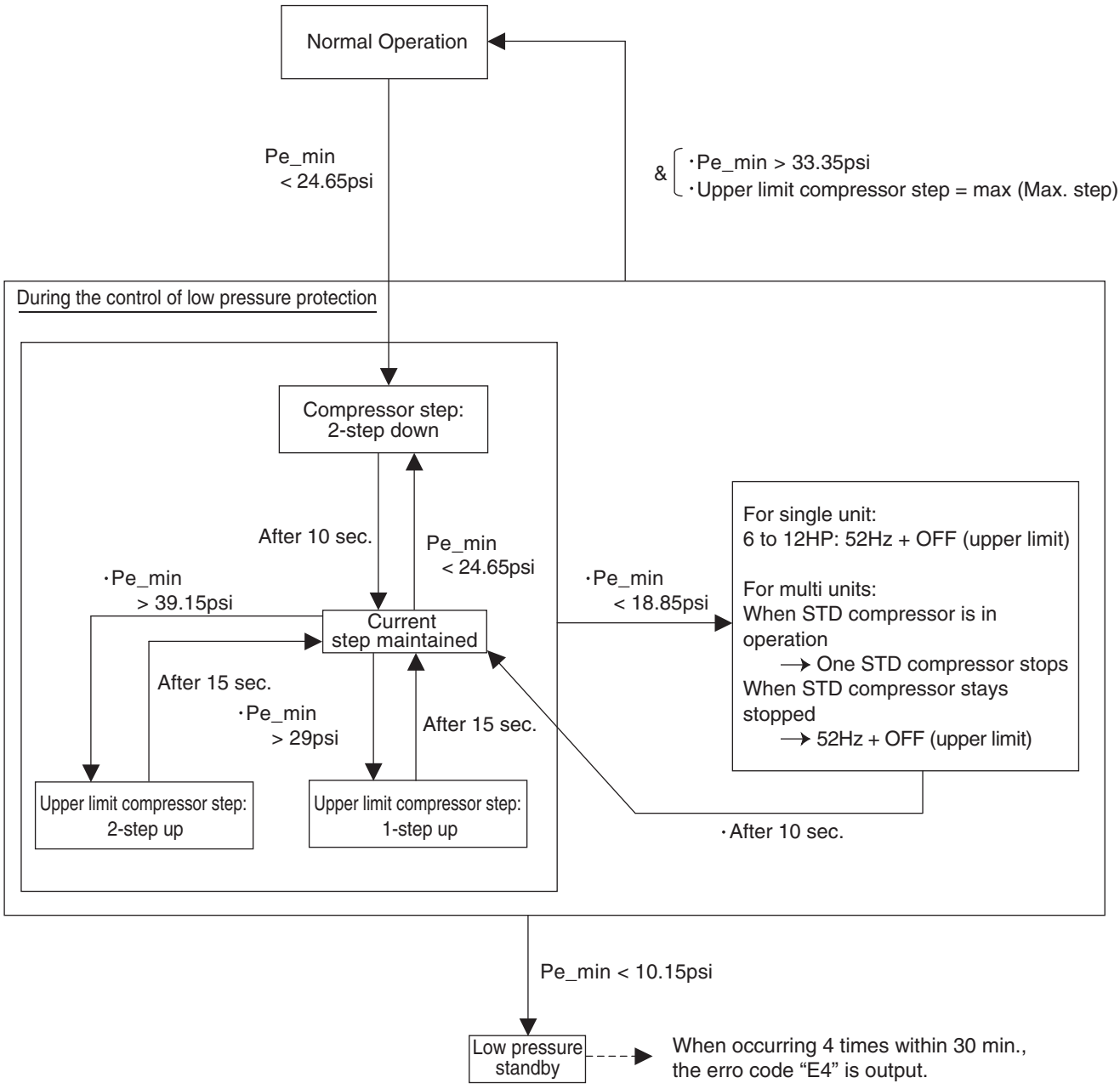
[In cooling]

∗ Because of common low pressure, the following control is performed in the system.
Pe_min indicates the minimum value within the system.



[In heating and Simultaneous Cooling / Heating]

* The following control is performed in the system.
  Pe_min indicates the minimum value within the system.



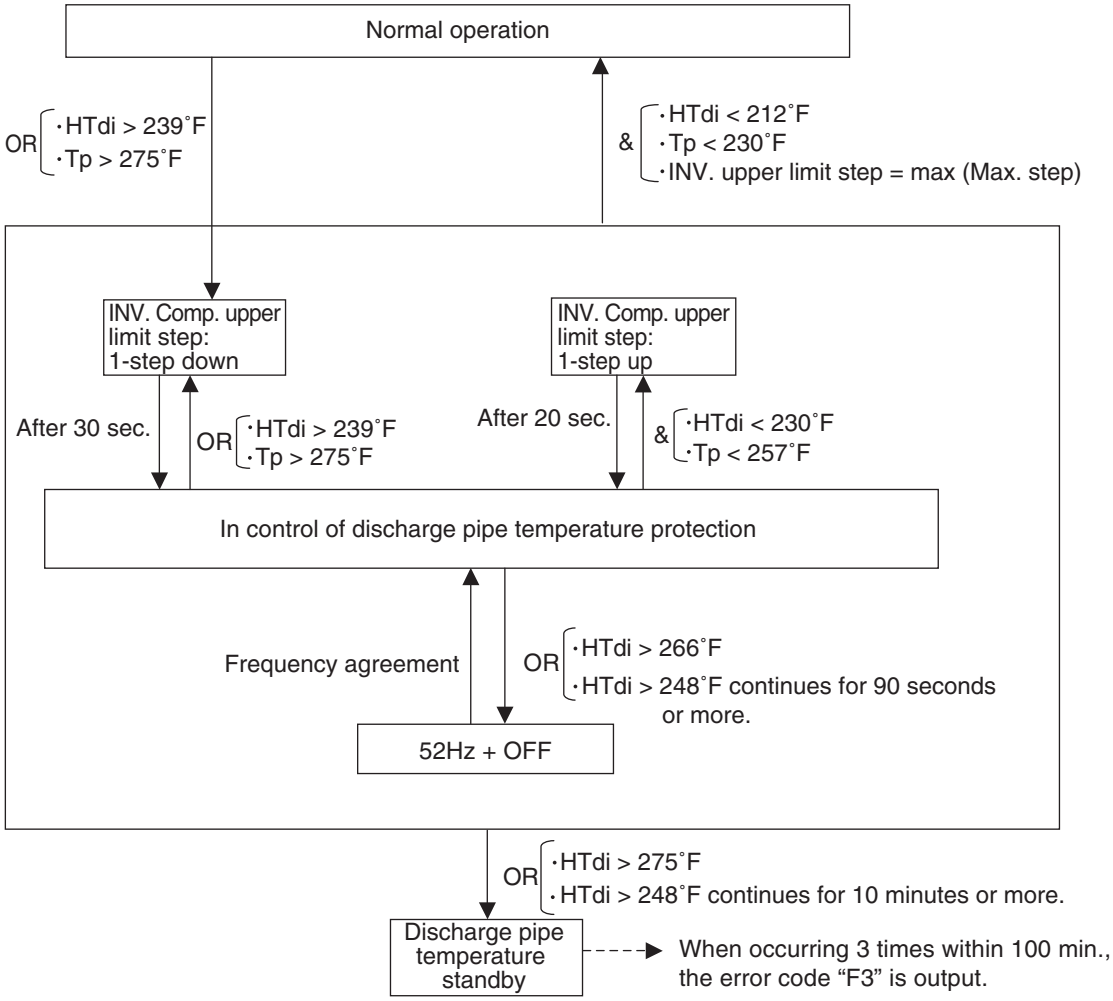
8.3 Discharge Pipe Protection Control

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

[Contents]

∗ The following control is performed for each compressor of single unit as well as multi units.

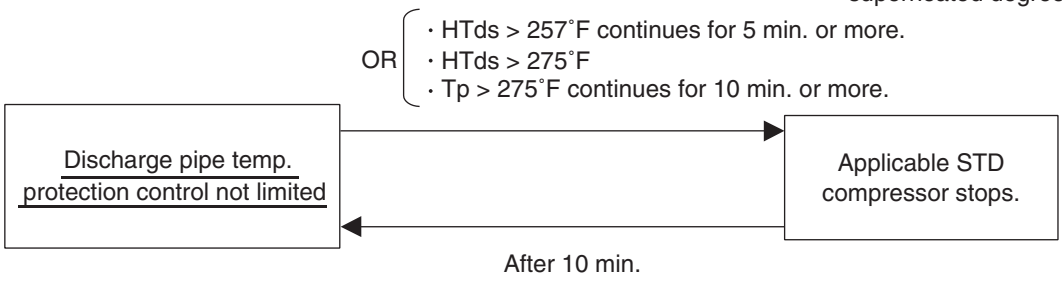
[INV. compressor]



[STD compressor]

HTds: Value of STD compressor discharge pipe temperature (Tds) compensated with outdoor air temperature

Tp: Value of compressor port temperature calculated by Tc and Te, and suction superheated degree.



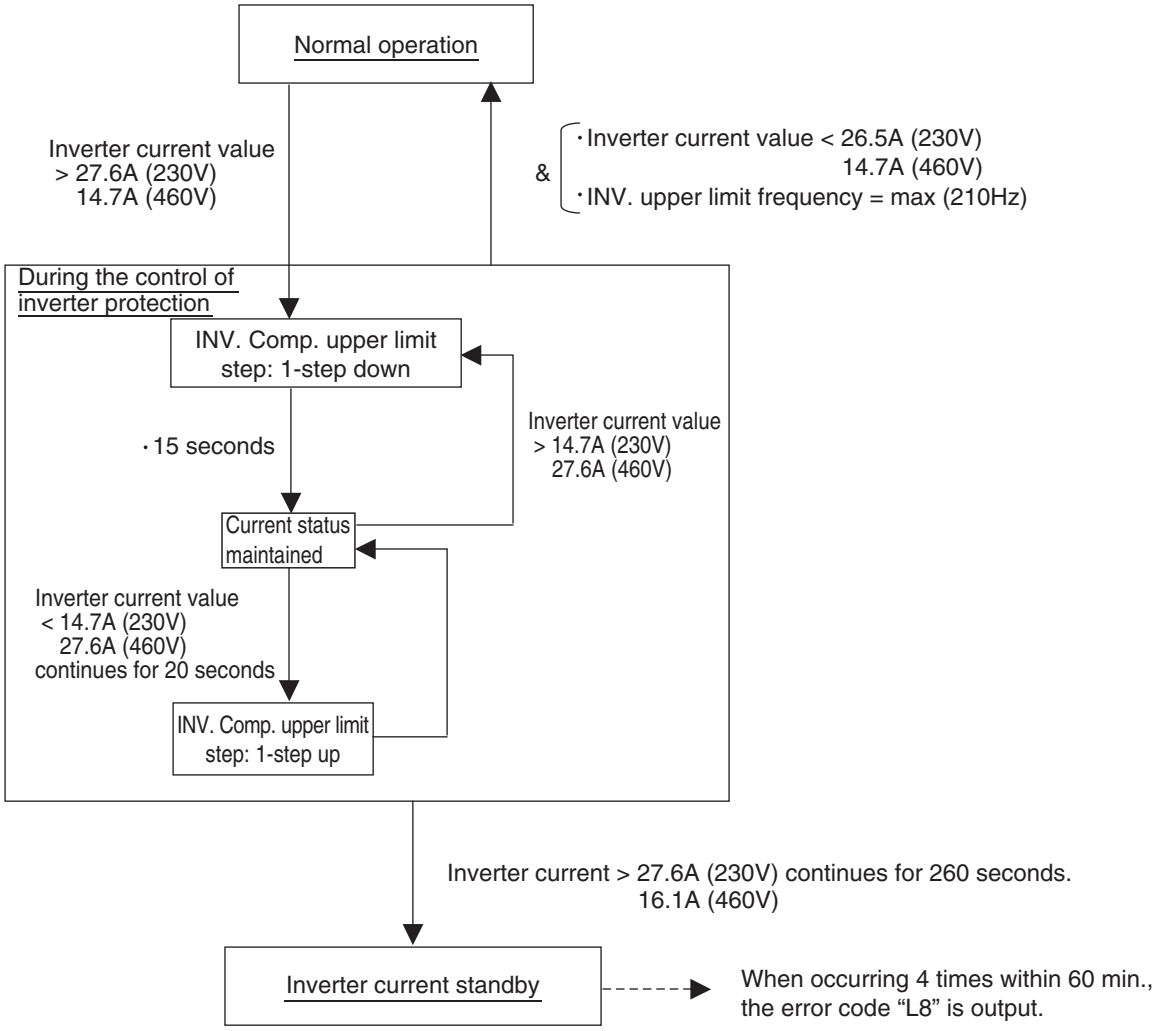
8.4 Inverter Protection Control

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

* In the case of multi-outdoor-unit system, each INV. compressor performs these controls in the following sequence.

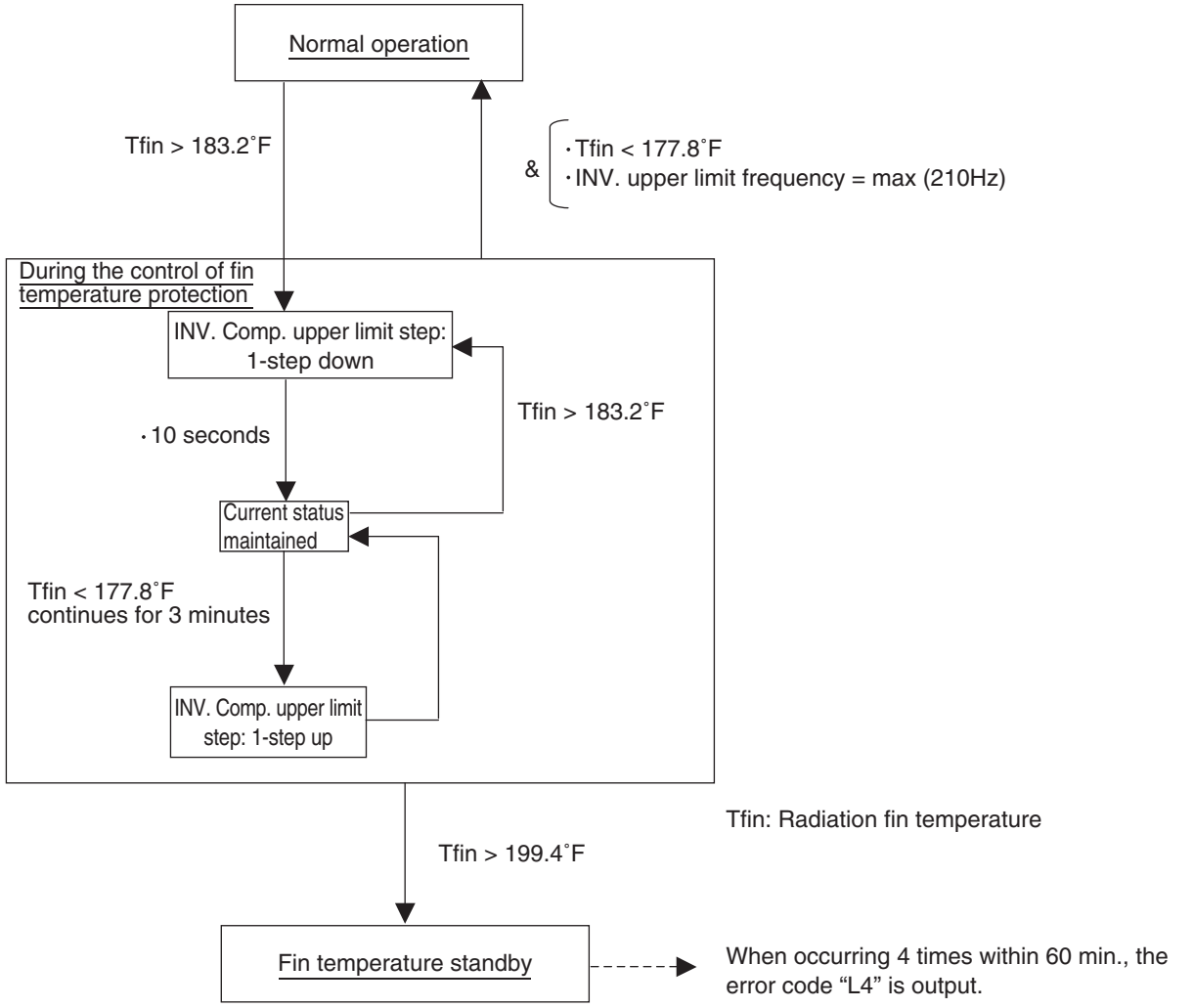
[Inverter overcurrent protection control]

* Perform the following control of integrated as well as multi units for each INV. compressor.



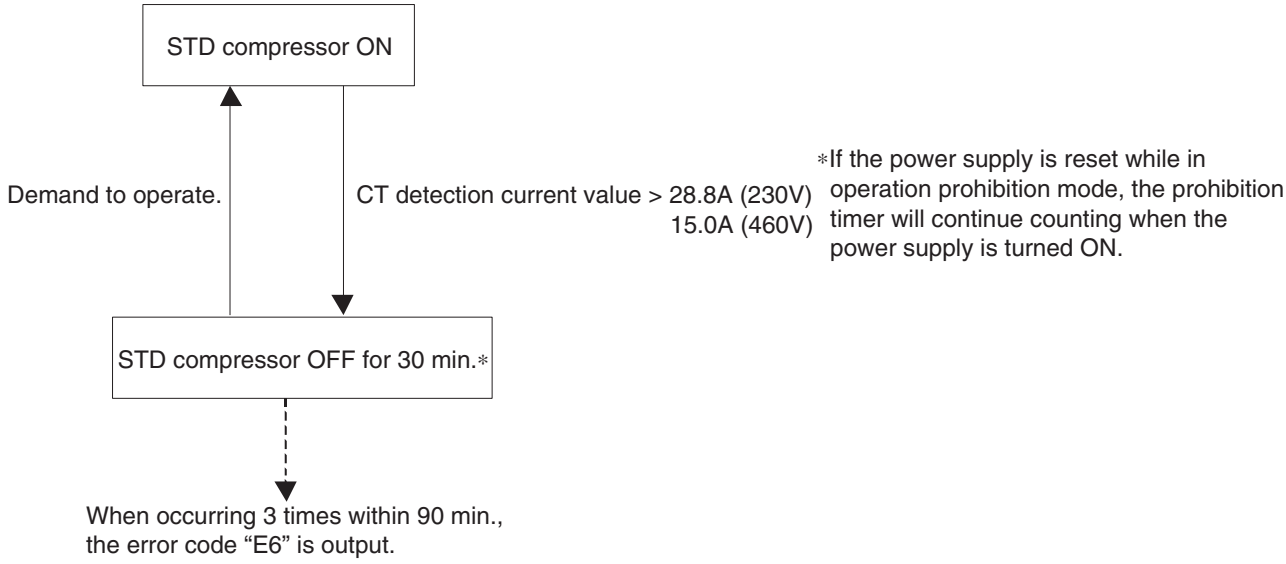
[Radiation fin temperature control]

* Perform the following control of integrated as well as multi units for each INV. compressor.



8.5 STD Compressor Overload Protection

This control is used to prevent abnormal heating due to overcurrent to the compressor resulting from failures of STD compressor such as locking.



9. Other Control

9.1 Backup Operation

If any of the compressors goes wrong, disable the relevant compressor or the relevant outdoor unit from operating, and then conduct emergency operation only with operational compressors or outdoor units.
"Emergency operation with remote controller reset" and "Emergency operation with outdoor unit PCB setting" are available

Operating method / Applicable model	(1) Emergency operation with remote controller reset (Auto backup operation)	(2) Emergency operation with outdoor unit PCB setting (Manual backup operation)
REYQ72~120PBYD REYQ72~144PBTJ	–	Backup operation by the compressor
REYQ144~336PBYD REYQ168~336PBTJ	Backup operation by the indoor unit	Backup operation by the outdoor unit

(1) Emergency operation with remote controller reset
[Operating method]

Reset the remote controller. (Press the ON/OFF button for 4 seconds or more.)

[Details of operation]

Disable the defective outdoor unit from operating, and then only operate other outdoor units. (On systems with 1 outdoor unit, this emergency operation is not available.)

(2) Emergency operation with outdoor unit PCB setting
[Setting method]

Make setting of the compressor, "the operation of which is to be disabled", in field setting mode (setting mode 2).
(For detail of the setting method, refer to P.252.)

[Details of operation]

Disable the compressor with "operation disable setting" made from operating and only operate other compressors.

9.2 Demand Operation

In order to save the power consumption, the capacity of outdoor unit is saved with control forcibly by using “Demand 1 Setting” or “Demand 2 Setting”.
To operate the unit with this mode, additional setting of “Continuous Demand Setting” or external input by external control adaptor for outdoor unit is required.

Setting item	Condition	Content
Demand 1	Level 1	Operate with power of approx. 60% or less of the rating.
	Level 2	Operate with power of approx. 70% or less of the rating.
	Level 3	Operate with power of approx. 80% or less of the rating.
Demand 2	—	Operate with power of approx. 40% or less of the rating.
Demand 3	—	Operate with forced thermostat OFF.

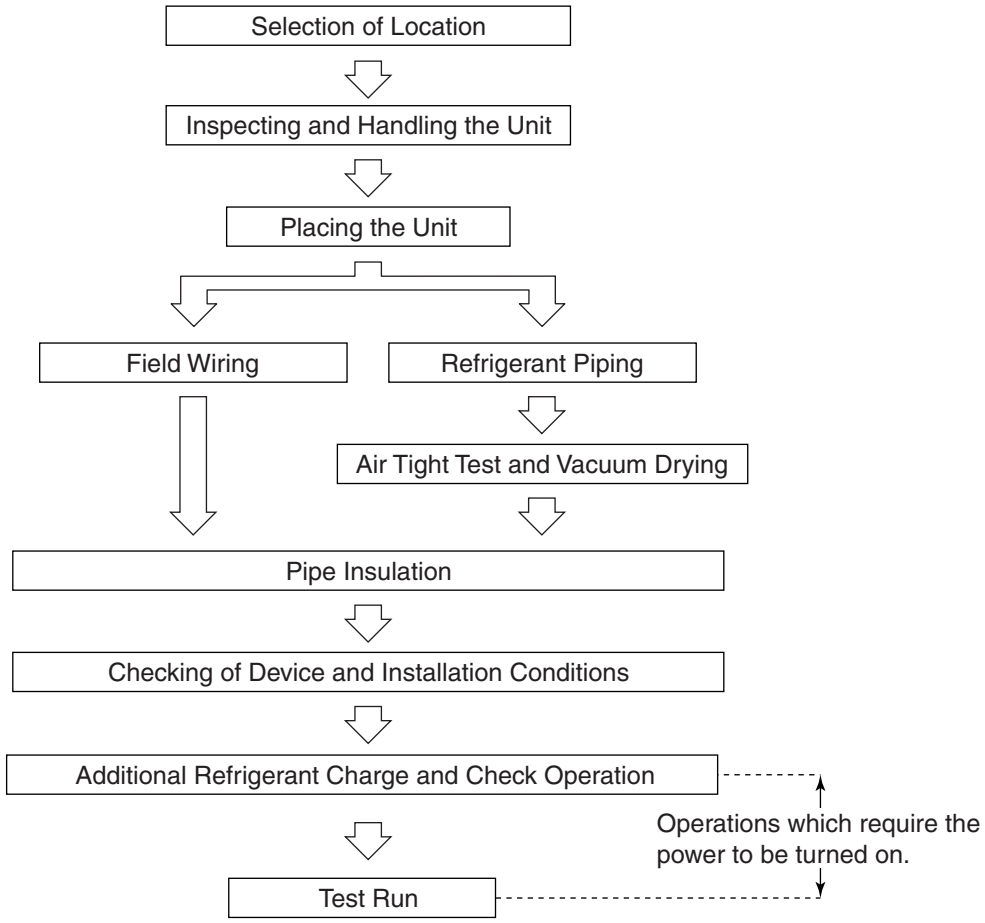
9.3 Heating Operation Prohibition

Heating operation is prohibited above 75.2°F outdoor air temperature.

10. Test Operation

10.1 Installation Process

Below figure shows the installation process. Install in the order of the steps shown.



10.2 Procedure and Outline

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

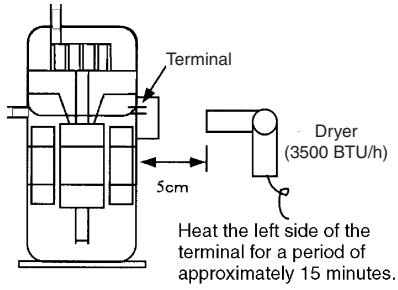
10.2.1 Check Work Prior to Turn Power Supply ON

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

⇩

- ○ Is the wiring performed as specified?
- ○ Is the designated wire used?
- ○ Is the wiring screw of wiring not loose?
- ○ Is the grounding work completed?
- ○ Is the insulation of the main power supply circuit deteriorated?
  Use a 500V megger tester to measure the insulation. (∗1)
  - Do not use a megger tester for other circuits than 200V (or 240V) circuit.

∗1:Measure to be taken against decreased insulation resistance in the compressor
If the compressor is left to stand for an extended period of time after the refrigerant charge with the stop valve open and the power supply OFF, the refrigerant may be mixed in the compressor, thus decreasing the insulation resistance.
Heat the compressor as shown on the right and then recheck the insulation.



Check on refrigerant piping / insulation materials

⇩

- ○ Is the pipe size proper?
- ○ Are the design pressures for the liquid pipe, suction pipe, dual pressure gas pipe, and pressure equalizer pipe (in case of multi units) all not less than 580psi?
- ○ Is the pipe insulation material installed securely?
  Liquid, suction and high & low pressure gas pipe need to be insulated. (Otherwise causes water leak.)

Check air tight test and vacuum drying.

⇩

- ○ Have the air tight test and the vacuum drying been conducted according to the procedure in the Installation Manual?

Check on amount of refrigerant charge

○ Is a proper quantity of refrigerant charged?
The following method is available for additional charging of refrigerant.
(1) Calculate additional refrigerant quantity.

- Calculate a necessary additional refrigerant charging amount according to the procedure for calculation shown below.

* Procedure for calculating additional refrigerant charging amount (Unit: 0.1 lb)

$$R = \left[\begin{array}{l} (\text{Total length (ft) of liquid piping size at } \phi 7/8) \times 0.249 + (\text{Total length (ft) of liquid piping size at } \phi 3/4) \times 0.175 \\ + (\text{Total length (ft) of liquid piping size at } \phi 5/8) \times 0.121 + (\text{Total length (ft) of liquid piping size at } \phi 1/2) \times 0.081 \\ + (\text{Total length (ft) of liquid piping size at } \phi 3/8) \times 0.040 + (\text{Total length (ft) of liquid piping size at } \phi 1/4) \times 0.015 \end{array} \right] \times 1.02$$

Correction amount with indoor unit

HEAT RECOVER SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
REYQ72~120PBYD REYQ72~144PBTJ	7.9 lb
REYQ144~336PBYD REYQ168~336PBTJ	2.2 lb

+

Correction amount with a total capacity of indoor units

REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT	
INDOOR CONNECTION CAPACITY	MODEL NAME
	REYQ72 ~ 336PB
MORE THAN 100% 120% OR LESS	1.1 lb
MORE THAN 120% 130% OR LESS	1.1 lb

+

- If there is a refrigerant shortage, charge a liquid refrigerant through the stop valve service port with the stop valves of liquid and those of gas closes after the completion of vacuum drying.
- If the refrigerant charging is still insufficient, "turn ON the power supply" following the information on the P.211 ~.

○ Has the additional refrigerant charging amount been recorded on the "Precautions for servicing" label?

Check the stop valves for conditions.

○ Check to be sure the stop valves are under the following conditions.

Liquid pipe stop valve	Equalizing pipe stop valve	Dual pressure gas pipe stop valve	Suction pipe stop valve
Open	Open	Open	Open

10.2.2 Turn Power ON

Turn outdoor unit and indoor unit power on.

○ Be sure to turn the power on 6 hours before starting operation to protect compressors. (to power on crankcase heater)

Check the LED display of the outdoor unit PCB.

○ Check to be sure the transmission is normal.
The transmission is normal if the LEDs display conditions as shown in table below.

LED display ○ ON ● OFF ◑ Blinking

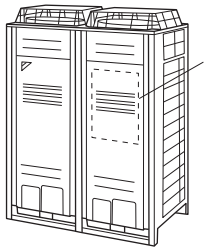
LED display (Default status before delivery)		Micro-computer operation monitor	MODE	TEST	COOL / HEAT select			Low noise	Demand	Multi
					IND	MASTER	SLAVE			
		HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
One outdoor unit installed		◑	●	●	○	●	●	●	●	●
When multiple outdoor unit installed (*)	Master	◑	●	●	○	●	●	●	●	○
	Slave 1	◑	●	●	●	●	●	●	●	◑
	Slave 2	◑	●	●	●	●	●	●	●	●

(*) The master unit is the outdoor unit to which the transmission wiring for the indoor units is connected.
The other outdoor units are slave units.

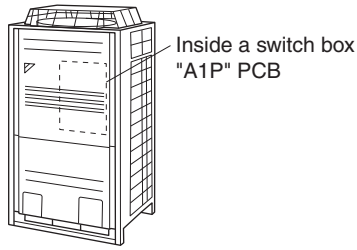
Make field settings with outdoor unit PCB.

○ Make field settings if needed.
(For the setting procedure, refer to information in "12.1 Field Setting from Outdoor Unit" on P.225 onward.)
For the outdoor-multi system, make field settings with the master unit.
(Field settings made with the slave unit will be all invalid.)

<REYQ72~120PB>



<REMQ72~120PB>



* Another switch box is provided on the front left side of the unit, but it requires no field settings.

Conduct check operations.

The check operations shown below will be automatically initiated.
- Check for erroneous wirings
- Check for failure to open stop valves
- Check for excessive refrigerant refilling
- Automatic judgement of piping length

Check for normal operation.

○ Before starting the normal operation after the completion of check operations, make sure indoor and outdoor units normally operate.

10.2.3 Air Tight Test and Vacuum Drying

- After finished piping work, carry out air tight test and vacuum drying.

Note:

- Always use nitrogen gas for the air tight test.
- Absolutely do not open the stop valve until the main power circuit insulation measurement has been completed. (measuring after the stop valve is opened will cause the insulation value to drop.)

<Needed tools>

Gauge manifold Charge hose valve	• To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R-410A. • Use charge hose that have pushing stick for connecting to service port of stop valves or refrigerant charge port.
Vacuum pump	• The vacuum pump for vacuum drying should be able to lower the pressure to –14.6 psi. • Take care the pump oil never flow backward into the refrigerant pipe during the pump stops.

<The system for air tight test and vacuum drying>

- Referring to figure 9, connect an nitrogen tank, refrigerant tank, and a vacuum pump to the outdoor unit.
  The refrigerant tank and the charge hose connection to refrigerant charge port or the valve A in figure 9 are needed in **"10.2.6 Additional Refrigerant Charge and Check Operation"**.

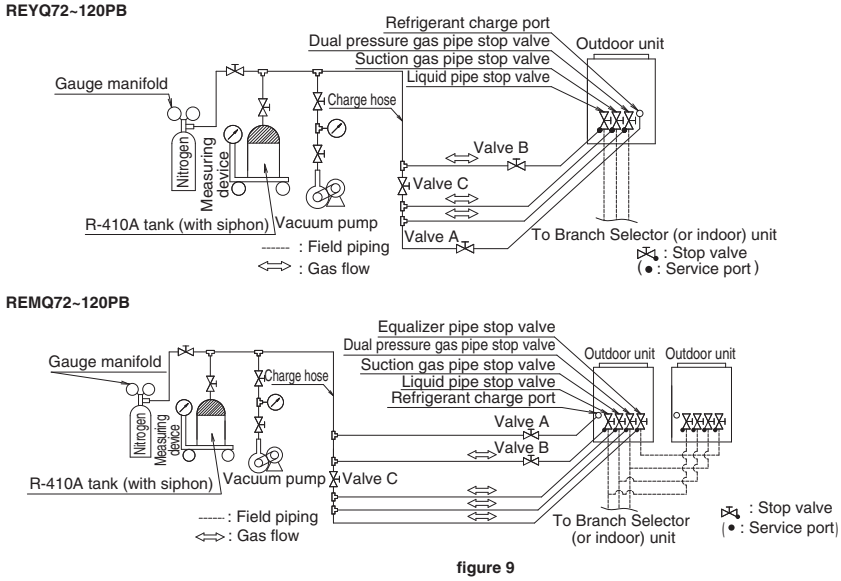


figure 9

Note:

- The air tight test and vacuum drying should be done using the service ports of equalizer pipe, dual pressure gas pipe, suction gas pipe and liquid pipe stop valve.
  See the [R-410A] Label attached to the front plate of the outdoor unit for details on the location of the service port (see figure in P.227)
- See **[Stop valve operation procedure]** in **"10.2.6.1 Before working"** for details on handling the stop valve.
- The refrigerant charge port is connected to unit pipe.
  When shipped, the unit contains the refrigerant, so use caution when attaching the charge hose.

<Air tight test>

Pressurize the liquid pipe, suction gas pipe, dual pressure gas pipe and equalizer pipe from the service ports of each stop valve to 478 psi (do not pressurize more than 478 psi). If the pressure does not drop within 24 hours, the system passes the test.

If there is a pressure drop, check for leaks, make repairs and perform the air tight test again.

<Vacuum drying>

Evacuate the system from the liquid pipe, suction gas pipe, dual pressure gas pipe and equalizer pipe stop valve service ports by using a vacuum pump for more than 2 hours and bring the system to –14.6 psi or less. After keeping the system under that condition for more than 1 hour, check if the vacuum gauge rises or not. If it rises, the system may either contain moisture inside or have leaks.

Note:

If moisture might enter the piping, follow belows.

(I.e., if doing work during the rainy season, if the actual work takes long enough that condensation may form on the inside of the pipes, if rain might enter the pipes during work, etc.)

After evacuating the system for 2 hours, pressurize the system to 7.25 psi (vacuum break) with nitrogen gas and evacuate the system again using the vacuum pump for 1 hour to –14.6 psi or less (vacuum drying). If the system cannot be evacuated to –14.6 psi within 2 hours, repeat the operation of vacuum break and vacuum drying.

Then, after leaving the system in vacuum for 1 hour, confirm that the vacuum gauge does not rise.

10.2.4 Pipe Insulation

- Insulation of pipes should be done after performing **"10.2.3 Air Tight Test And Vacuum Drying"**.
- Always insulate the liquid piping, the dual pressure gas piping, the gas piping, the equalizer pipe (between the outdoor units for the outdoor multi system) and these pipe connections.
  Failing to insulate the pipes may cause leaking or burns.
  Especially, be sure to insulate the dual pressure gas piping as withstanding as the suction pipe because the suction gas follows in the dual pressure gas piping when the system is whole cooling mode.
  Be sure to use insulation that is designed for use with HVAC systems.
- Reinforce the insulation on the refrigerant piping according to the installation environment.
  Condensation might form on the surface of the insulation. Refer to the below.
  - Outdoor air temperature : 86°F, humidity : 75% to 80% RH : min. thickness : 9/16 in.
  - If the outdoor air temperature exceeds 86°F and the humidity 80% RH, then the min. thickness is 3/4 in.

  See the Engineering data book for detail.
- If there is a possibility that condensation on the stop valve might drip down into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, etc., this must be prevented by caulking the connections, etc. **(Refer to figure 10)**
- The piping lead-out hole lid should be attached after opening a knock hole. **(Refer to figure 11)**
- If small animals and the like might enter the unit through the piping lead-out hole, close the hole with blocking material (procured on site) after completion of **"10.2.6 Additional Refrigerant Charge and Check Operation". (Refer to figure 14)**

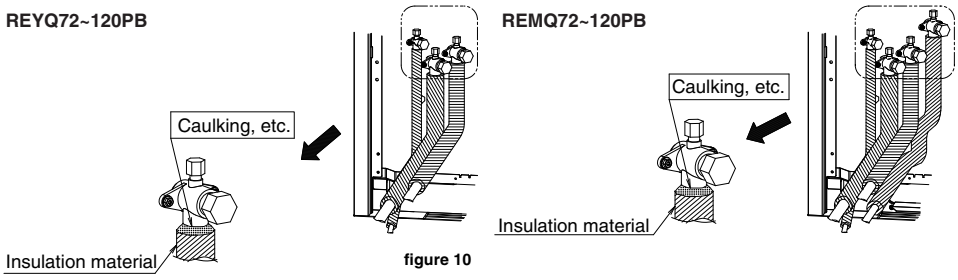


figure 10

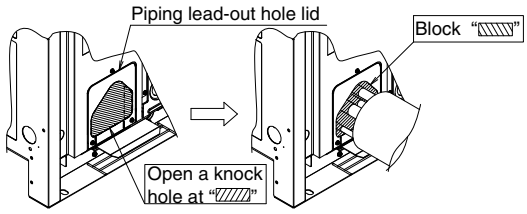


figure 11

Note:

- After knocking out the holes, we recommend you remove burrs in the knock holes **(See figure 11)** and paint the edges and areas around the edges using the repair paint.

10.2.5 Checking of Device and Installation Conditions

Be sure to check the followings.

For those doing electrical work

1. Make sure there is no defective transmission wiring or loosing of a nut.
2. Make sure there is no defective power wiring or loosing of a nut.
3. Has the insulation of the main power circuit deteriorated?
   Measure the insulation and check the insulation is above regular value in accordance with relevant local and national regulations.

For those doing pipe work

1. Make sure piping size is correct.
2. Make sure insulation work is done.
   See **"10.2.4 Pipe Insulation"**.
3. Make sure there is no defective refrigerant piping.

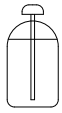
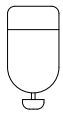
10.2.6 Additional Refrigerant Charge and Check Operation

The outdoor unit is charged with refrigerant when shipped from the factory, but depending on the size and length of the piping when installed, it may require additional charging.
For charging the additional refrigerant, follow the procedure in this chapter.
And then carry out the check operation.

10.2.6.1 Before Working

[About the refrigerant tank]

Check whether the tank has a siphon pipe before charging and place the tank so that the refrigerant is charged in liquid form.
(See the figure below.)

With siphon pipe
 Stand the tank upright and charge. (The siphon pipe goes all the way inside, so the tank does not need be put upside-down charge in liquid form.)
Other tanks
 Stand the tank upside-down and charge.

Note:

- Always use the proper refrigerant (R-410A). If charged with the refrigerant containing an improper material, it may cause an explosion or accident.
- R-410A is a mixed refrigerant, so charging it as a gas will cause the refrigerant composition to change, which may prevent normal operation.

[Stop valve operation procedure]

When operating the stop valve, follow the procedure instructed below.

Note:

- Do not open the stop valve until **"10.2.5 Checking of Device and Installation Conditions"** are completed. If the stop valve is left open without turning on the power, it may cause refrigerant to buildup in the compressor, leading insulation degradation.
- Be sure to use the correct tools.
  The stop valve is not a back-seat type. If forced it to open, it might break the valve body.
- When using a service port, use the charge hose.
- After tightening the cap, make sure no refrigerant gas is leaking.

Tightening torque

The sizes of the stop valves on each model and the tightening torque for each size are listed in the table below.

<Size of Stop Valve>

	72PB type	96PB type	120PB/144PBTJ type
Liquid pipe stop valve	ϕ3/8 The 120PB·144PB type corresponds to the ϕ1/2 - diameter onsite piping using the accessory pipe.		
Suction gas stop valve	ϕ3/4 The 96PB type corresponds to the ϕ7/8 - diameter onsite piping using the accessory pipe. The 120PB·144PB type corresponds to the ϕ1-1/8 - diameter onsite piping using the accessory pipe.		
Dual pressure gas stop valve	ϕ5/8 The 96PB·120PB type corresponds to the ϕ3/4 - diameter onsite piping using the accessory pipe. The 144PB type corresponds to the ϕ7/8 - diameter onsite piping using the accessory pipe.		
Equalizer pipe stop valve	ϕ3/4		

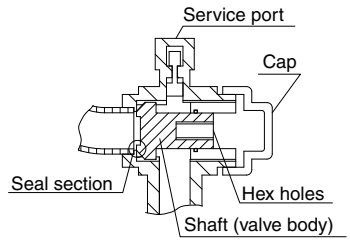


figure 12

To open

1. Remove the cap and turn the shaft counterclockwise with the hexagon wrench.
2. Turn it until the shaft stops.
3. Make sure to tighten the cap securely.
   (For the tightening torque, refer to the item <Tightening Torque>.)

To close

1. Remove the cap and turn the shaft clockwise with the hexagon wrench.
2. Securely tighten the valve until the shaft contacts the main body seal.
3. Make sure to tighten the cap securely.
   (For the tightening torque, refer to the item <Tightening Torque>.)

<Tightening torque>

Stop valve size	Tightening torque ft · lbf (Turn clockwise to close)			
	Shaft (valve body)		Cap (valve lid)	Service port
ϕ 3/8	3.98 - 4.87	Hexagonal wrench 4mm	9.95 - 12.17	8.48 - 10.3
ϕ 1/2	5.97 - 7.30		13.3 - 16.2	
ϕ 3/4	19.9 - 24.3	Hexagonal wrench 8mm	16.6 - 20.3	
ϕ 1				

[How to Check How Many Units are Connected]

It is possible to find out how many indoor or outdoor unit in the system are turned on by operating the Branch Selector button on the PCB (A1P) of outdoor unit (In case of multi system master unit). Follow the procedure below to check how many indoor or outdoor units are turned on.

(LED display: ● ...OFF ○ ...ON ◑ ...Blinking ＊ ...Uncertain)		LED display						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P
(1) Press the MODE button (BS1) once at **Setting Mode 1** (H1P : off), and set the MONITOR MODE (H1P : Blinking).		◑	●	●	●	●	●	●
(2) Press the SET button (BS2) the number of times until the LED display matches that at right.	For checking the number of outdoor units : eight times	◑	●	●	○	●	●	●
	For checking the number of indoor units : five times	◑	●	●	●	○	●	○
(3) Press the RETURN button (BS3) and read the number of units from the display of H2P through H7P. [Reading Method] The display of H2P through H7P should be read as a binary number, with ◑ standing for "1" and ● standing for "0".		◑	＊	＊	＊	＊	＊	＊
Ex: For the LED display at right, this would be "0 1 0 1 1 0", which would mean 22 units are connected. $32 \times \mathbf{0} + 16 \times \mathbf{1} + 8 \times \mathbf{0} + 4 \times \mathbf{1} + 2 \times \mathbf{1} + 1 \times \mathbf{0} = 22$ units Note: "000000" indicates 64 units.		◑	●	◑	●	◑	◑	●
(4) Press the MODE button (BS1) once. This returns to **Setting Mode 1** (H1P : OFF, default).		●	●	○	●	●	●	●

Note:

Press the "MODE button" (BS1) if you get confused while operating.

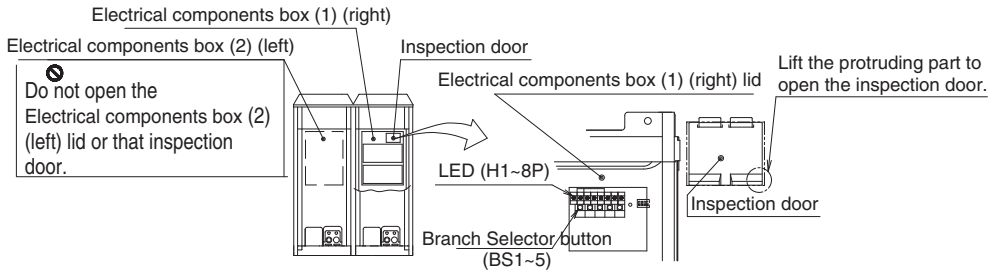
This returns to **Setting Mode 1** (H1P : OFF, default).

10.2.6.2 Procedure of Adding Refrigerant Charging and Check Operation

Warning **Electric Shock Warning**

- Make sure to close the electrical components box lid before turning on the power.
- Perform the setting on the PCB (A1P) of the outdoor unit and check the LED display after the power is on via the inspection door which is in the electrical components box lid.

REYQ72~120PB



REMQ72~120PB

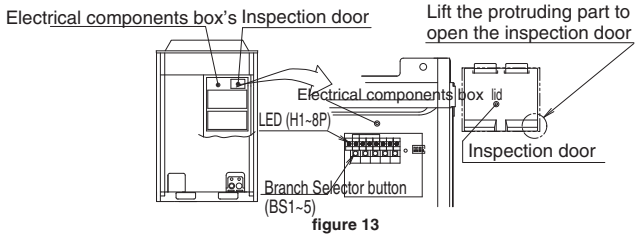


figure 13

- Use an insulated rod to operate the Branch Selector buttons via the electrical components box's inspection door.

There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

Caution

- Make sure to use the protect tool (protective groves and goggles) when charging the refrigerant.
- Due to a danger of liquid hammer, the refrigerant must not be charged over the allowable maximum amount when charging the refrigerant.
- Do not perform the refrigerant charging operation under working for the Branch Selector and indoor unit.
- When opening the front panel, make sure to take caution to the fan rotation during the working. After the outdoor unit stops operating, the fan may keep rotation for a while.

Note:

- If operation is performed within 12 minutes after the Branch Selector, indoor and outdoor units are turned on, H2P will be lit on and the compressor will not operate.
  Check the LED display indicate as shown below.

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

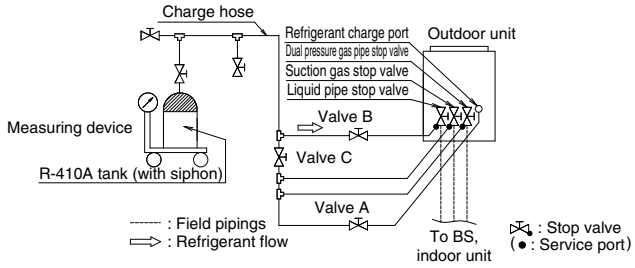
- In order to ensure uniform refrigerant distribution, it may take up to around 10 minutes for the compressor to start up after the unit starting operating. This is not an error.
- The refrigerant charge port is connected to the piping inside the unit.
  When the unit is shipped from the factory, the unit's internal piping is already charged with refrigerant, so be careful when connecting the charge hose.
- After adding the refrigerant, make sure to close the lid of the refrigerant charging port.
  The tightening torque for the lid is 8.48 to 10.3 ft · lbf.
- See [Stop valve operation procedure] in chapter 10.2.6.1 for details on how to handle stop valves.
- When done or when pausing the refrigerant charging operation, close the valve of the refrigerant tank immediately.
  The refrigerant charge port of this product have electronic expansion valve.
  The valve will be closed at end of refrigerant charging. However the valve will be opened on operation after refrigerant charging (check operation, normal operation, etc.).
  If the tank is left with the valve open, the amount of refrigerant which is properly charged may be off the point.
- Make sure to perform the check operation after installation. Otherwise, the error code "U3" will be displayed and normal operation cannot be performed.
  And the failure of "Check of wrong wiring" may also cause abnormal operation. Performance may drop due to the failure of "Judgement of piping length".
- Check operation must be performed for each refrigerant piping system.
  Checking is impossible if plural systems are being done at once.
- The individual problems of indoor units can not be checked.
  About these problems check by test run after the check operation is completed. (See chapter 10.2.8.2)
- The check operation cannot be performed in recovery or other service modes.

10.2.6.2.1 Procedure of Adding Refrigerant Charging

1. Make sure the following works are complete in accordance with the installation manual.
   ■Piping work
   ■Wiring work
   ■Air tight test
   ■Vacuum drying
   ■Installation work for Branch Selector, indoor unit
2. Calculate the "additional charging amount" using "How to calculate the additional refrigerant to be charged" in **"6. Example of connection"** on P.501.

3. Open the valve B (**See the figure 14**. The valve A,C and the liquid pipe, suction gas pipe, dual pressure gas pipe, equalizer pipe stop valves must be left closed), and charge the refrigerant of the “additional charging amount” from the liquid side shutout valve service port.

REYQ72~120PB



REMQ72~120PB

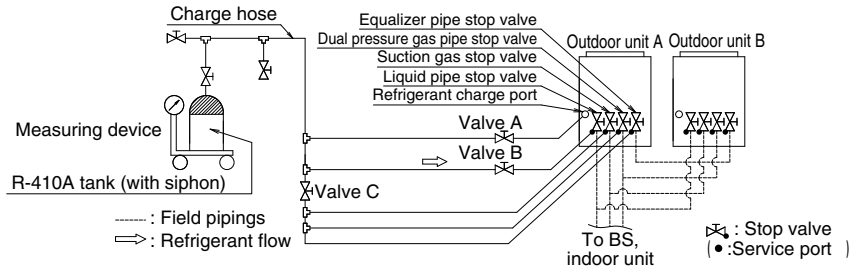


figure 14

4. If the “additional charging amount” was charged fully, close the valve B and go to step 6.
   If the “additional charging amount” was not charged fully, close the valve B and go to step 5.
5. Perform the refrigerant charging following [Automatic refrigerant charging operation procedure] as shown below. And charge the remaining refrigerant of the “additional charging amount”.

Note:

- For performing the automatic refrigerant charging operation, the Branch Selector button on the PCB (A1) of outdoor unit are used. (See figure 13.)
  And the refrigerant are charged from the refrigerant charge port via the valve A. (See figure 15.)
  For operating the Branch Selector button and opening or closing the valves, follow the procedure.
- During Automatic refrigerant charging operation, the system will select charging mode (cooling mode or heating mode) by the temperature condition as follows.

Outdoor temp. : 32˚F DB ~ 109˚F DB Indoor temp. : 50˚F DB ~ 90˚F DB	➡	Cooling mode
Exclude above range	➡	Heating mode

  When charging in cooling mode, the system will stop operation when the required amount of refrigerant is charged.
  During charging in heating mode, a person must manually close valve A and stop operation. Beforehand, check the remaining refrigerant that is needed to charge based on the “additional charging amount” in step 2 and the charged amount in step 3.
- The refrigerant will be charged about 66 lb in one hour at outdoor temp. 86°F DB (about 26 lb at outdoor temp. 32°F DB).

- During Automatic refrigerant charging operation, you can stop the operation forcedly by pressing MODE button (BS1).

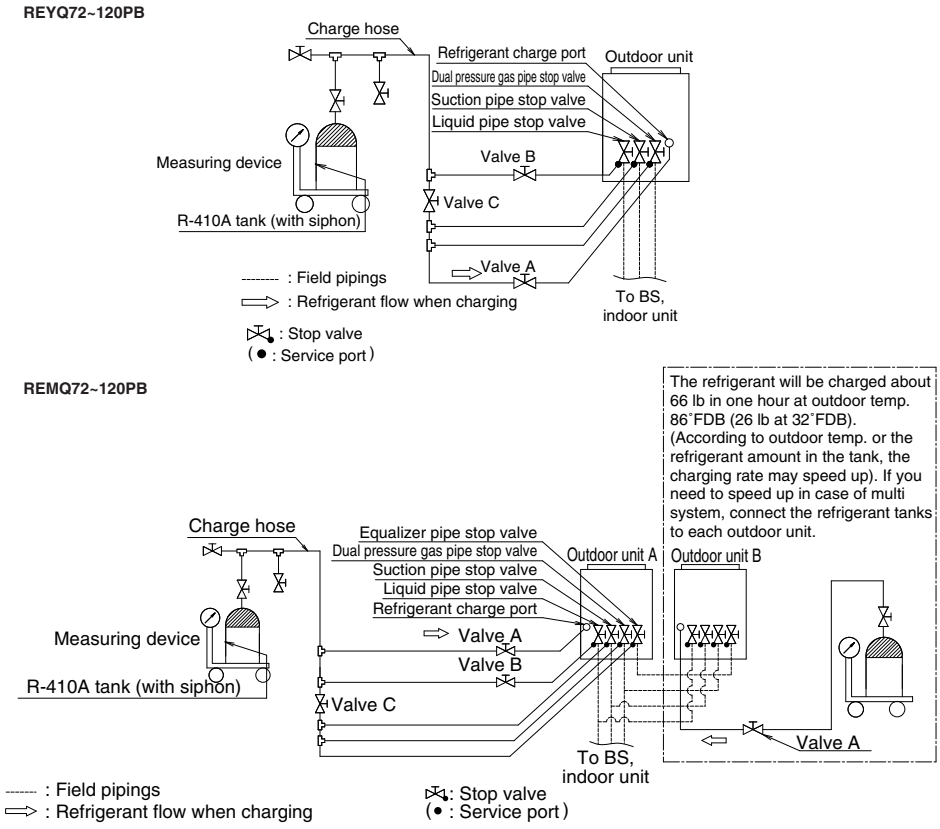


figure 15

[Automatic refrigerant charging operation procedure]

Note:

- The marks of LED mean as follows.
  ● : OFF ○ : ON ◑ : Blinking ∗ : OFF, ON or Blinking

(1) Open the liquid pipe, suction gas pipe and dual pressure gas pipe stop valves. (The valve A~C must be closed. See figure 15.)

(2) • Close the electrical components box (1) lid and all front panel except on the electrical components box (1)
side. (∗1) And turn the power to the outdoor unit and all connected Branch Selector, indoor units. (∗2)
• After H2P stop blinking (about 12 minutes after turning on the power), check H2P is OFF. If H2P is ON, check the error code in the remote controller of indoor unit and correct the error in accordance with [Remote controller display error code] in chapter 11-2-2.

(3) Check the LED. And press the MODE button (BS1) once if the LED displays is not as below.

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

(4) Press the TEST button (BS4) once. (The LED displays will change as below.)

H1P	H2P	H3P	H4P	H5P	H6P	H7P
○	○	○	○	○	○	○

(5) Hold the TEST button (BS4) down for 5 seconds or more.
(The LED displays will change as below and fan of outdoor unit will start rotation.)

H1P	H2P	H3P	H4P	H5P	H6P	H7P
●	◑	●	●	●	*	*

(6) When the compressor start working and the LED displays change any state in below (∗3), go to "In case of cooling mode" or "In case of heating mode" in accordance with the LED displays.

H1P	H2P	H3P	H4P	H5P	H6P	H7P	
◑	◑	◑	●	○	●	○	➡ Go to "In case of cooling mode"
◑	◑	●	●	○	●	○	➡ Go to "In case of heating mode"

In case of cooling mode

(7) Press the TEST button (BS4) once within 5 minutes after procedure (5) (∗4) and close all the front panels (∗5).
After that, open the valve A immediately (See figure 15) (∗6) and watch the remote controller display of indoor unit.

(8) If the remote controller display shows "PE" code (∗7), ready to close the valve A.
And go to procedure (9).
If the remote controller display shows other code, close the valve A immediately and refer to [Remote controller cooling mode error code]

⚠ **Beware the fan running when open the front panel.**
The fan may continue rotation after the system stop the operation.

(9) When the compressor stop working (the fan may continue rotation.), close the valve A immediately (∗8).
And check the LED displays are as below and the remote controller display shows "P9" code.

H1P	H2P	H3P	H4P	H5P	H6P	H7P
○	◑	◑	○	○	○	○

After checking, press the MODE button (BS1) once and the charging is complete.

In case of heating mode

(7) Press the TEST button (BS4) once within 5 minutes after procedure (5) (∗4) and close all the front panels.
After that, open the valve A immediately (See figure 15) (∗6) and check the charged amount by measuring device.
During operation, if the remote controller display shows "P2" or "P8" code, close the valve A immediately and refer to **[Remote controller heating mode error code]**.

⚠ **Beware the fan running when open the front panel.**
The fan may continue rotation after the system stop the operation.

(8) When the required amount of refrigerant is charged, close the valve A (See figure 15) (∗8) and press the RETURN button (BS3) once. And then go to procedure (9).

(9) Press the MODE button (BS1) once, and the charging is complete.

Note (∗1)~(∗9)

(∗1) Lead the refrigerant charge hose etc. from the pipe intake.
All front panels must be closed at the procedure (7).

(∗2) • If you perform the refrigerant charging operation within the refrigerant system that have the power off unit, the operation cannot finish properly.
Check the number of outside and indoor units that is powered.
For checking, see **[How to check how many units are connected]** in chapter 10.2.6.1.
• To energize the crankcase heater, make sure to turn on for 6 hours before starting operation.

(∗3) It takes about 2~10 minutes for getting stability of refrigerant state.
If the additional refrigerant is little and operation is started before getting stability, the system can not judge the charging amount precisely and it cause overcharge.

(∗4) If the TEST button (BS4) is not pressed within 5 minutes, “P2.” code will displayed in the remote controller. In this case, refer to [Remote controller cooling (or heating) mode error code].

(∗5) If the front panel is opened during the operation, the system cannot operate properly.

(∗6) If you leave the system without connecting the refrigerant tank or opening the valve A for 30 minutes or more, the system stop operation and “P2” code are displayed in remote controller. In this case, refer to **[Remote controller cooling (or heating) mode error code]**.

(∗7) Depending on the situation of operation such as the charging amount is little, the “PE” code may not be displayed and the “P9” code may be displayed.

(∗8) Always close the valve A and take the tank off.
The refrigerant charge port of this unit have electronic expansion valve and the valve are closed when charging is finished. However, the valve will opened when other operation (Check operation, normal operation, etc.). If you leave the tank connected, the refrigerant will charged and it cause overcharge.

[Remote controller cooling mode error code]

<table>
<tr><th>Code</th><th colspan="2">The work contents</th></tr>
<tr><td>PE</td><td colspan="2">Charging is almost finished. Ready to close the valve A.</td></tr>
<tr><td>PA
PH</td><td colspan="2">The refrigerant tank is empty. Close the valve A and replace the empty tank to the new tank. After changing the tank, open the valve A again.
⚠ Beware the fan running. The outdoor unit does not stop operation.</td></tr>
<tr><td>P8</td><td colspan="2">Close the valve A immediately, and restart the operation from procedure (3).</td></tr>
<tr><td>P2</td><td>Operation is interrupted. Close the valve A immediately and check the below items.
●Check if dual pressure gas pipe, suction gas pipe or liquid pipe stop valve is opened.
●Check the refrigerant tank is connected and the valve A was opened.
●Check if the air inlet and outlet of the indoor unit are not closed by an obstruction.</td><td rowspan="2">After correcting the abnormality, restart the operation from procedure (3).</td></tr>
<tr><td>*</td><td>Operation is stopped abnormally. Close the valve A immediately. Confirm the error code and correct the abnormality following the [Remote controller displays error code] in chapter 10.2.6.2.2.</td></tr>
<tr><td>P9</td><td colspan="2">Charging is finished. Close the valve A and take the refrigerant tank off.</td></tr>
</table>

[Remote controller heating mode error code]

Code	The work contents
P8	Close the valve A immediately and press the TEST button (BS4) once. And restart from procedure (7) of “In case of heating mode”.
P2	Operation is interrupted. Close the valve A immediately and check the below items. ●Check if dual pressure gas pipe, suction gas pipe or liquid pipe stop valve is opened. ●Check the refrigerant tank is connected and the valve A was opened. ●Check if the air inlet and outlet of the indoor unit are not closed by an obstruction.

6. After completing the additional refrigerant charging, record the charging amount on the accessory “REQUEST FOR THE INDICATION” label (Installation records) and adhere it to the back side of the front panel. Also, record the factory charged refrigerant amount, additional refrigerant amount in the field and total refrigerant amount of the system to “ADDITIONAL REF. CHARGE” label and adhere in the proximity of the refrigerant charge port.

10.2.6.2.2 Procedure of Check Operation

- Check operation perform the following work. Do the check operation following below. Otherwise, error code “U3” will be displayed in the remote controller and normal operation can not be carried out.
  - ■Check of stop valve opening
  - ■Check of wrong wiring
  - ■Judgement of piping length
  - ■Check of refrigerant overcharge

Note:

- Check operation can not carried out at outdoor temp. less than 23°F. Perform the check operation at day or time that outdoor temp. is 23°F or more.

[Check Operation Procedure]

(1) Close the electrical components box lid and all front panels except as the side of the electrical components box and turn on the power to the outdoor unit and all connected Branch Selector, indoor units. (Be sure to turn the power on at least 6 hours before operation in order to have power running to the crankcase heater.)

(2) Make the onsite settings as needed using the push button (BS1-BS5) on the outdoor unit PCB (A1P) with the power on. (See **“10.2.7 Onsite Settings”**)

(3) Perform the check operation following the Check Operation Method of the [Service Precautions] label (lower) on the electrical components box lid. (See figure 16) The system operation for about 40~60 minutes and automatically stops the check operation.
If the error code is not displayed in the remote controller after the system stop, check operation is completed. Normal operation will be possible after 5 minutes. If the error code is displayed in the remote controller, correct the error following **[Remote controller displays error code]** and perform the check operation again.

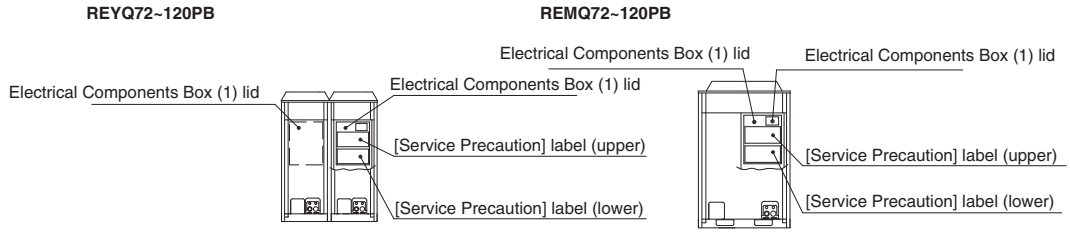


figure 16

Note:

For interrupting the check operation, press RETURN button (BS3).

[Remote controller displays error code]

Error code	Installation error	Remedial action
E3, E4 F3, F6 UF	The stop valve of the outdoor unit is left closed.	Open the stop valve.
U1	The phases of the power to the outdoor unit is reversed.	Exchange two of the three phases (L1, L2, L3) to make a proper connection.
U1 U4 LC	No power is supplied to an outdoor, Branch Selector or indoor unit (including phase interruption).	Make sure the power supply wire is properly connected to the outdoor, Branch Selector or indoor unit and revise if necessary.
UF	There is conflict on the connection of transmission wiring in the system.	Check if the refrigerant piping line and the transmission wiring are consistent with each other.
E3 F6 UF	Refrigerant overcharge.	Recalculate the additional amount refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
E4 F3	Insufficient refrigerant.	● Check if the additional refrigerant charge has been finished correctly. ● Recalculate the additional amount refrigerant from the piping length and add the adequate amount.
U7, U4 UF, UH	Field wiring is connected to "TO MULTI UNIT (Q1,Q2)" terminal on the outdoor unit PCB (A1P) when the system is one outdoor system.	Remove the line from the “TO MULTI UNIT (Q1, Q2)” terminal.

Note:
If any error codes other than the above are displayed, check the service manual for how to respond.

10.2.7 Onsite Settings

Note:
In the case of a multi system, all onsite settings should be made on the master unit. Settings made on slave units are invalid.
The outdoor unit to which the indoor unit transmission wire are connected is the master unit, and all other units are slave units.

Use the Branch Selector buttons (BS1 through BS5) on the outdoor unit PCB (A1P) to make the necessary onsite settings.
See the “Service Precautions” label (upper) on the electrical components box lid for details on the positions and operating method of the Branch Selector buttons and on the onsite setting.
Make sure to record the setting on the accessory “REQUEST FOR THE INDICATION” label.

Warning **Electric Shock Warning**
Use an insulated rod to operate the Branch Selector buttons via the inspection door of electrical components box lid.
There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

10.2.8 Test Run

10.2.8.1 Before Test Run

- Make sure the following works are completed in accordance with the installation manual.
  - ■Piping work
  - ■Wiring work
  - ■Air tight test
  - ■Vacuum drying
  - ■Additional refrigerant charge
  - ■Check operation
- Check that all work for the Branch Selector, indoor unit are finished and there are no danger to operate.

10.2.8.2 Test Run

After all works are completed, operate the unit normally and check the following.
(1) Make sure the indoor and outdoor units are operating normally.
(2) Operate each indoor unit one by one and make sure the corresponding outdoor unit is also operating.
(3) Check to see if cold (or hot) air is coming out from the indoor unit.
(4) Press the fan direction and strength buttons on the remote controller to see if they operate properly.

Note:

- Heating is not possible if the outdoor temperature is 75°F or higher. Refer to the Operation manual.
- If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the crankcase heater for a sufficient length of time before restarting the operation.
- Once stopping, the compressor will not restart in about 5 minutes even if the ON/OFF button of the remote controller is pressed.
- When the system operation is stopped by the remote controller, the outdoor units may continue operating for further 5 minutes at maximum.
- The outdoor unit fan may rotate at low speeds if the low night noise setting or the External low noise level setting is made, but this is not an error.
- If the check operation was not performed at first installation, the error code “U3” will be displayed in the remote controller. Perform the check operation following **“10.2.6.2.2 Procedure of Check Operation”**.

10.2.8.3 Checks after Test Run

Perform the following checks after the test run is complete.

- Record the contents of field setting.
  →Record them on the accessory “REQUEST FOR THE INDICATION” label.
  And attach the label on the back side of the front panel.
- Record the installation date.
  →Record the installation date on the accessory “REQUEST FOR THE INDICATION” label in accordance with the IEC60335-2-40.
  And attach the label on the back side of the front panel.

Note:

After the test run, when handing the unit over to the customer, make sure the electrical components box lid, the inspection door, and the unit casing are all attached.

10.2.9 Caution for Refrigerant Leaks

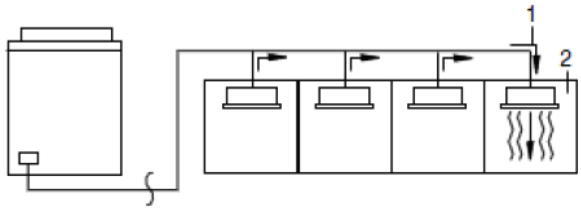
(Points to note in connection with refrigerant leaks)

Introduction:

The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available.
The VRV System, like other air conditioning systems, uses R-410A as refrigerant. R-410A is an entirely safe non-toxic, non-combustible refrigerant. Nevertheless care must be taken to ensure that air conditioning facilities are installed in a room that is sufficiently large. This assures that the maximum concentration level of refrigerant gas is not exceeded, in the unlikely event of major leak in the system and this in accordance to the local applicable regulations and standards.

Maximum concentration level
The maximum charge of refrigerant and the calculation of the maximum concentration of refrigerant is directly related to the humanly occupied space in to which it could leak.
The unit of measurement of the concentration is lb/ft^3 (the weight in lb of the refrigerant gas in 1 ft^3 volume of the occupied space).

Compliance to the local applicable regulations and standards for the maximum allowable concentration level is required.



1. direction of the refrigerant flow
2. room where refrigerant leak has occurred (outflow of all the refrigerant from the system)

Pay special attention to the place, such as a basement, etc., where refrigerant can stay, since refrigerant is heavier than air.

Procedure for checking maximum concentration

Check the maximum concentration level in accordance with steps 1–2 below and take whatever action is necessary to comply.

1. Calculate the amount of refrigerant (lb) charged to each system separately.

amount of refrigerant in a single unit system (amount of refrigerant with which the system is charged before leaving the factory)	+	additional charging amount (amount of refrigerant added locally in accordance with the length or diameter of the refrigerant piping)	=	total amount of refrigerant (lb) in the system

- Where a single refrigerant facility is divided into 2 entirely independent refrigerant systems then use the amount of refrigerant with which each separate system is charged.

2. Follow local code requirements (ASHRAE-15 2007 & ASHRAE-34 2007).

10.3 Operation when Power is Turned ON

10.3.1 When Turning ON Power First Time

The unit cannot be run for up to 12 minutes to automatically set the main 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 pressed during operation described above, the "UH" error indicator blinks. (Returns to normal when automatic setting is complete.)

10.3.2 When Turning ON Power the Second Time and Subsequent

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

Status

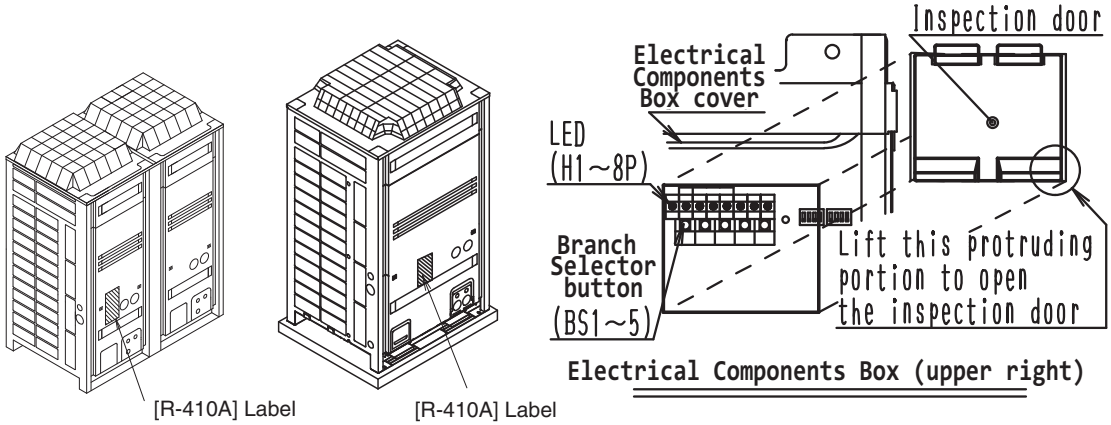
Outdoor unit	Test lamp H2P .... Blinks Can also be set during operation described above.
Indoor unit	If ON button is pressed during operation described above, the operation lamp lights but the compressor does not operate. (Returns to normal when automatic setting is complete.)

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

Be sure to press 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.)

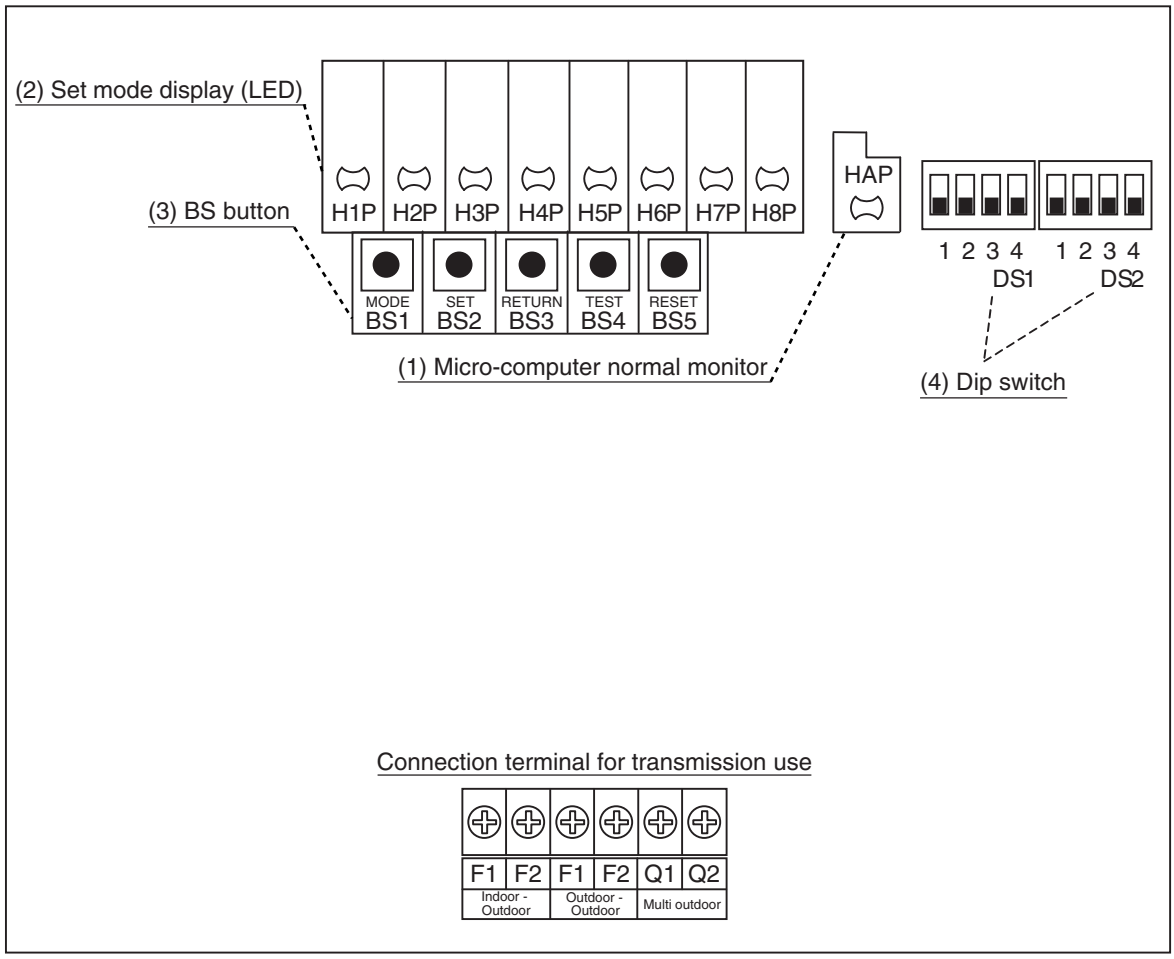
Status

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



11. Outdoor Unit PCB Layout

Outdoor unit PCB



(1) Micro-computer normal monitor
This monitor blinks while in normal operation, and turns ON or OFF when an error occurs.

(2) Set mode display (LED)
LEDs display mode according to the setting.

(3) Branch Selector button
Used to change mode.

(4) Dip switch
Used to make field settings.

12. Field Setting

12.1 Field Setting from Outdoor Unit

12.1.1 Field Setting from Outdoor Unit

■ **List of Field Setting Items**

This following section indicates the list of field setting items. For the lists of dip switch contents, Setting mode 1, and Setting mode 2, refer to information in tables shown on the following page onward.

For setting items of (∗1), refer to detailed information provided on P.237 onward.

Setting item			Content and objective of setting	Overview of setting procedure	Reference page
Function setting	2	Setting of low night noise operation (∗1)	A. Use external input to step down the upper limit of the fan (factory setting to Step 8), providing low noise level. (1) Mode 1: Step 6 or lower (2) Mode 2: Step 5 or lower (3) Mode 3: Step 4 or lower	■ Use the "External control adaptor for outdoor unit". Set to "External control adaptor for outdoor unit" with No. 12 of "Setting mode 2" and select the mode with No. 25. If necessary, set the "Capacity priority setting" to ON with No. 29.	244~249
			B. The low night noise operation aforementioned is enabled in night-time automatic low night noise operation mode. Start time: Possible to select in the range of 20:00 to 24:00 hours. End time: Possible to select in the range of 06:00 to 08:00 hours. (Use the said time as a guide since the start time and the end time are estimated according to outdoor temperatures.)	■ Make this setting while in "Setting mode 2". Select a mode with No. 22 of "Setting mode 2". Select the start time with No. 26 and the end time with No. 27. If necessary, set the "Capacity priority setting" to ON with No. 29.	244~249
	3	Setting of demand operation (∗1)	■ Used to place limits on the compressor operating frequency to control the upper limit of power consumption. (1) Mode 1 of Demand 1: 60% or less of rating (2) Mode 2 of Demand 1: 70% or less of rating (3) Mode 3 of Demand 1: 80% or less of rating (4) Demand 2: 40% or less of rating	■ For setting with the use of "external control adaptor for outdoor unit": Set the system to "External control adaptor for outdoor unit" with No. 12 of Setting mode 2" and select the mode with No. 30.	244~249
				■ For setting only in "Setting mode 2": Set the system to Normal demand mode with No. 32 of "Setting mode 2" and select the mode with No. 30.	244~249
	4	Setting of AIRNET address	■ Used to make address setting with AIRNET connected.	■ Set the AIRNET to an intended address using binary numbers with No. 13 of "Setting mode 2".	237~240
	6	Setting of high static pressure	■ Make this setting to operate a system with diffuser duct while in high static pressure mode. (Use this setting mode when shields are installed on upper floors or balconies.) ∗ In order to mount the diffuser duct, remove the cover from the outdoor unit fan.	■ Set No. 18 of "Setting mode 2" to ON.	237~240
	7	Prevention of minute heating operation by heating thermostat OFF unit or non-heating-operation unit	■ Make this setting to prevent a rise in room temperature due to minute heating capacity generated by heating thermostat OFF unit or non-heating-operation unit while in heating operation.	■ Set the Setting item No. 41 of “Setting mode 2” to heating thermostat OFF unit or non-heating-operation unit. (Overseas unit: Default set to “ON”)	237~240
	8	Setting of Branch Selector Cool-Heat selection control time	■ Make this setting to shorten the Branch Selector Cool-Heat selection control time.	■ Set the Setting item No. 42 of “Setting mode 2” to “ON”.	237~240

Setting item			Content and objective of setting	Overview of setting procedure	Reference page
Service setting	1	Indoor unit fan forced H operation	■ Used to operate the indoor unit in the stopped state in forced H operation mode.	■ Set No. 5 of "Setting mode 2" to indoor unit forced fan H.	237~240
	2	Indoor unit forced operation	■ Used to operate the indoor unit in forced operation mode.	■ Set No. 6 of "Setting mode 2" to indoor unit forced operation mode.	237~240
	3	Change of targeted evaporating temperature (in cooling)	■ In cooling operation, used to change the targeted evaporating temperature for compressor capacity control.	■ Select high side or low side with No. 8 of "Setting mode 2".	237~240
	4	Change of targeted condensing temperature (in heating)	■ In heating operation, used to change the targeted condensing temperature for compressor capacity control.	■ Select high side or low side with No. 9 of "Setting mode 2".	237~240
	5	Setting of defrost selection	■ Used to change a temperature at which the defrost operation is initiated, thus making the initiation easy or hard.	■ Select fast side or slow side with No. 10 of "Setting mode 2".	237~240
	6	Setting of sequential startup	■ Used to start units not in sequence but simultaneously.	■ Set No. 11 of "Setting mode 2" to NONE.	237~240
	7	Emergency operation (∗1)	■ If the compressor has a failure, used to prohibit the operation of outdoor unit(s) concerned and to conduct emergency operation of the system only with operable or outdoor unit(s).	■ Make this setting while in "Setting mode 2". For system with multiple outdoor units: Set with No. 38, 39, or 40.	252~255
	8	Additional refrigerant charging	■ If a necessary amount of refrigerant cannot be charged due to the stop of outdoor unit, operate the outdoor unit and then refill refrigerant.	■ Set No. 20 of "Setting mode 2" to ON and then charge refrigerant.	215~224
	9	Refrigerant recovery mode (∗1)	■ Used to recover refrigerant on site. With operations of indoor and outdoor units prohibited, open the outdoor/indoor electronic expansion valve fully while indoor/outdoor operation is prohibited and turn ON some of the solenoid valves.	■ Set No. 21 of "Setting mode 2" to ON.	250
	10	Vacuuming mode (∗1)	■ Used to conduct vacuuming on site. Open the outdoor/indoor electronic expansion valve fully while indoor/outdoor operation is prohibited and turn ON some of the solenoid valves. Use a vacuum pump to conduct vacuuming.	■ Set No. 21 of "Setting mode 2" to ON.	250
	12	Power transistor check mode	■ Used for the troubleshooting of DC compressors. Inverter waveform output makes it possible to judge whether an error results from the compressor or the PCB.	■ Set No. 28 of "Setting mode 2" to ON.	237~240
	13	Setting of model with spare PCB	■ In order to replace the PCB by a spare one, be sure to make model setting.	■ For this setting, set the DS2-2, -3, and-4 switches on the PCB to the model concerned.	231~234

For setting items of (∗1), refer to detailed information provided on P.237 onward.

12.1.2 Setting by Dip Switches

(1) Factory setting of initial PCB.

Do not make any changes in all factory settings of the DIP switches on the service monitor PCB.

Status of DIP switches

■ : Represents the factory setting positions of the switches.

Setting at replacement by spare PCB

Caution

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

After the replacement by the spare PCB, be sure to make settings shown below.
When you change the main PCB(A1P) to spare PCB, please carry out the following setting.

Initial conditions of DIP switches

DIP Switch Detail

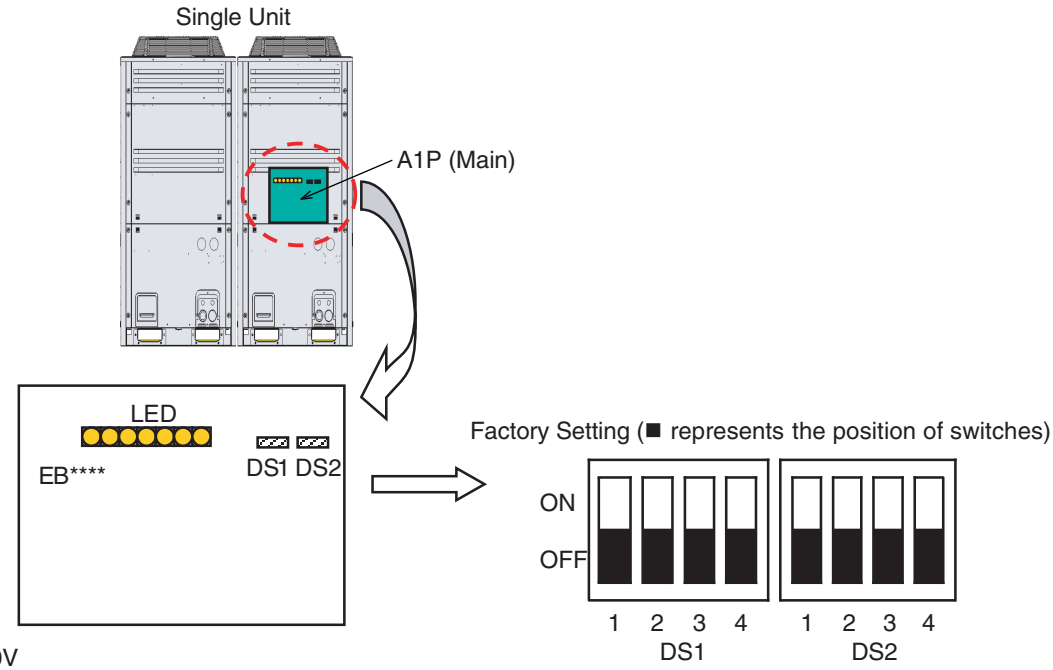
DS No.	Item	Contents	
DS1-2	Power supply specification	ON	200V class (220V)
		OFF (Factory setting of spare PCB)	400V class (380V)
DS1-3 Except Multiple use	Cooling only/Heat-pump setting	ON	Cooling only setting
		OFF (Factory setting of spare PCB)	Heat pump setting
DS1-4	Unit allocation setting	ON	Make the following settings according to allocation of unit. (All models are set to OFF at factory.)
DS2-1		OFF (Factory setting of spare PCB)	

Multiple use or Single use (Master)	Single use (Slave)	Domestic Japan	Overseas General	Europe	U.S.A.
DS1-4	DS1-3	OFF	OFF	ON	ON
DS2-1	DS1-4	OFF	ON	OFF	ON

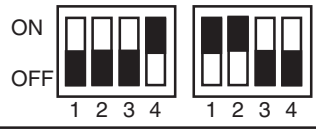
DS2-2	Model setting	Make the settings according to models of outdoor units. (All models are set to OFF at factory.) ∗ Refer to following pages for setting detail.
DS2-3		
DS2-4		

∗ For detail of the setting procedure, refer to information on the following pages.
While the PCB assembly is replaced, the "U3" error (Test run not carried out yet) code is displayed. In this case, carry out the test run again.
If the "PJ", "UA", or "U7" error code is displayed, recheck for DIP switch settings.
After the completion of rechecking for the settings, turn ON the power supply again.

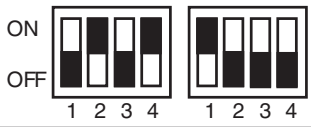
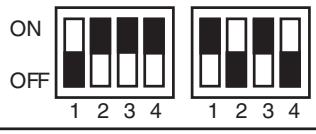
"Detail of DS1-1~4, DS2-1~4 setting"

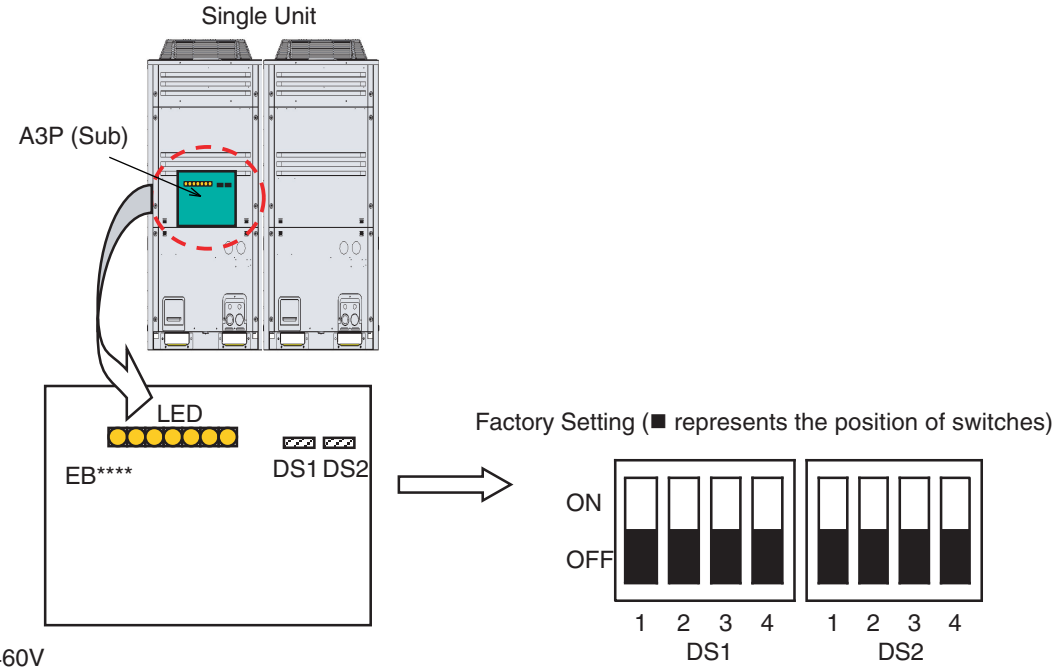


460V

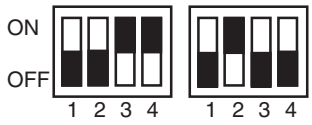
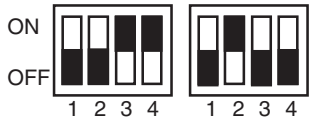
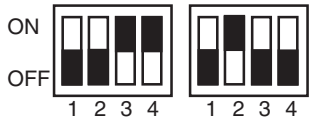
Application model	Setting method (■ represents the position of switches)	
HEAT RECOVERY(6ton) REYQ72PBYD		Set DS1-4, DS2-1 and DS2-3 to ON.
HEAT RECOVERY(8ton) REYQ96PBYD		Set DS1-4 and DS2-1 to ON.
HEAT RECOVERY(10ton) REYQ120PBYD		Set DS1-4, DS2-1 and DS2-2. to ON.

208-230V

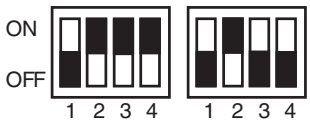
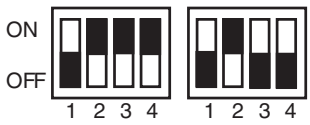
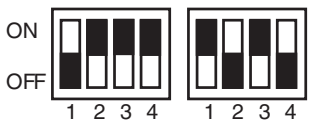
Application model	Setting method (■ represents the position of switches)	
HEAT RECOVERY (6ton) REYQ72PBTJ		Set DS1-2, DS1-4, DS2-1 and DS2-3 to ON.
HEAT RECOVERY (8ton) REYQ96PBTJ		Set DS1-2, DS1-4 and DS2-1 to ON.
HEAT RECOVERY (10ton) REYQ120PBTJ		Set DS1-2, DS1-4, DS2-1 and DS2-2 to ON.
HEAT RECOVERY (12ton) REYQ144PBTJ		Set DS1-2, DS1-3, DS1-4, DS2-1 and DS2-3 to ON.



460V

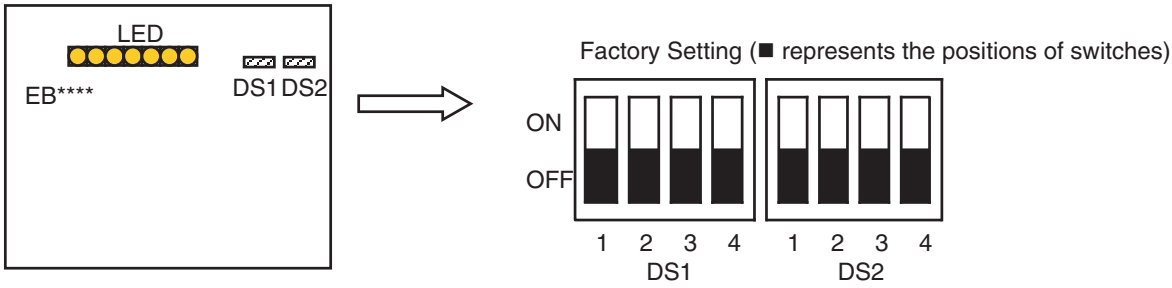
Application model	Setting method (■ represents the position of switches)	
HEAT RECOVERY(6ton) REYQ72PBYD		Set DS1-3, DS1-4 and DS2-2 to ON.
HEAT RECOVERY(8ton) REYQ96PBYD		Set DS1-3, DS1-4 and DS2-2 to ON.
HEAT RECOVERY(10ton) REYQ120PBYD		Set DS1-3, DS1-4 and DS2-2 to ON.

208-230V

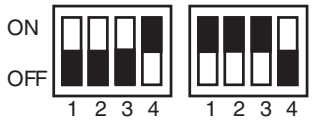
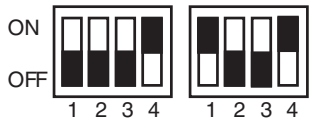
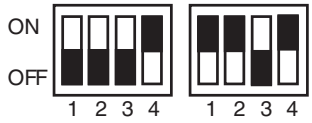
Application model	Setting method (■ represents the position of switches)	
HEAT RECOVERY (6ton) REYQ72PBTJ		Set DS1-2, DS1-3, DS1-4 and DS2-2 to ON.
HEAT RECOVERY (8ton) REYQ96PBTJ		Set DS1-2, DS1-3, DS1-4 and DS2-2 to ON.
HEAT RECOVERY (10ton) REYQ120PBTJ		Set DS1-2, DS1-3, DS1-4 and DS2-2 to ON.
HEAT RECOVERY (12ton) REYQ144PBTJ		Set DS1-2, DS1-3, DS1-4, DS2-1 and DS2-3 to ON.

"Detail of DS1-1~4, DS2-1~4 setting"

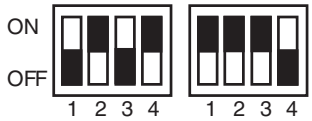
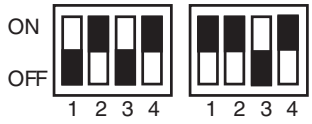
Multi-unit



460V

Application model	Setting method (■ represents the positions of switches)	
HEAT RECOVERY REMQ72PBYD		Set DS1-4, DS2-1, DS2-2 and DS2-3 to ON.
HEAT RECOVERY REMQ96PBYD		Set DS1-4, DS2-1 and DS2-4 to ON.
HEAT RECOVERY REMQ120PBYD		Set DS1-4, DS2-1, DS2-2 and DS2-4 to ON.

208-230V

Application model	Setting method (■ represents the positions of switches)	
HEAT RECOVERY (6ton) REMQ72PBTJ		Set DS1-2, DS1-4, DS2-1, DS2-2 and DS2-3 to ON.
HEAT RECOVERY (8ton) REMQ96PBTJ		Set DS1-2, DS1-4, DS2-1 and DS2-4 to ON.
HEAT RECOVERY (10ton) REMQ120PBTJ		Set DS1-2, DS1-4, DS2-1, DS2-2 and DS2-4 to ON.

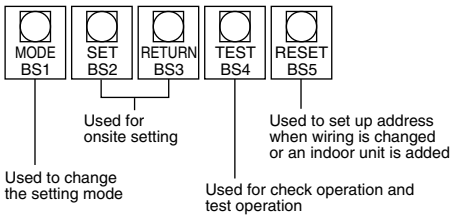
12.1.3 Setting by Branch Selector BUTTONS

The following settings are made by Branch Selector buttons on PCB.
In case of multi-outdoor unit system, various items should be set with the master unit.
(Setting with the slave unit is disabled.)
The master unit and slave unit can be discriminated with the LED display as shown below.

LED display

		MODE H1P	TEST H2P	COOL/HEAT select			Low noise H6P	Demand H7P	Multi; H8P
				IND H3P	MASTER H4P	SLAVE H5P			
Single-outdoor-unit system		●	●	○	●	●	●	●	●
Outdoor-multi system	Master	●	●	○	●	●	●	●	○
	Slave 1	●	●	●	●	●	●	●	◑

Branch Selector buttons



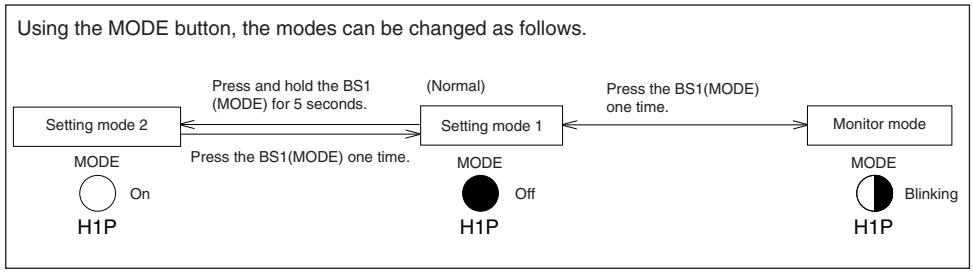
There are the following three setting modes.

① **Setting mode 1 (H1P off)**
Initial status (when normal) : Used to select the cool/heat setting. Also indicates during “abnormal”, “low noise control” and “demand control”.

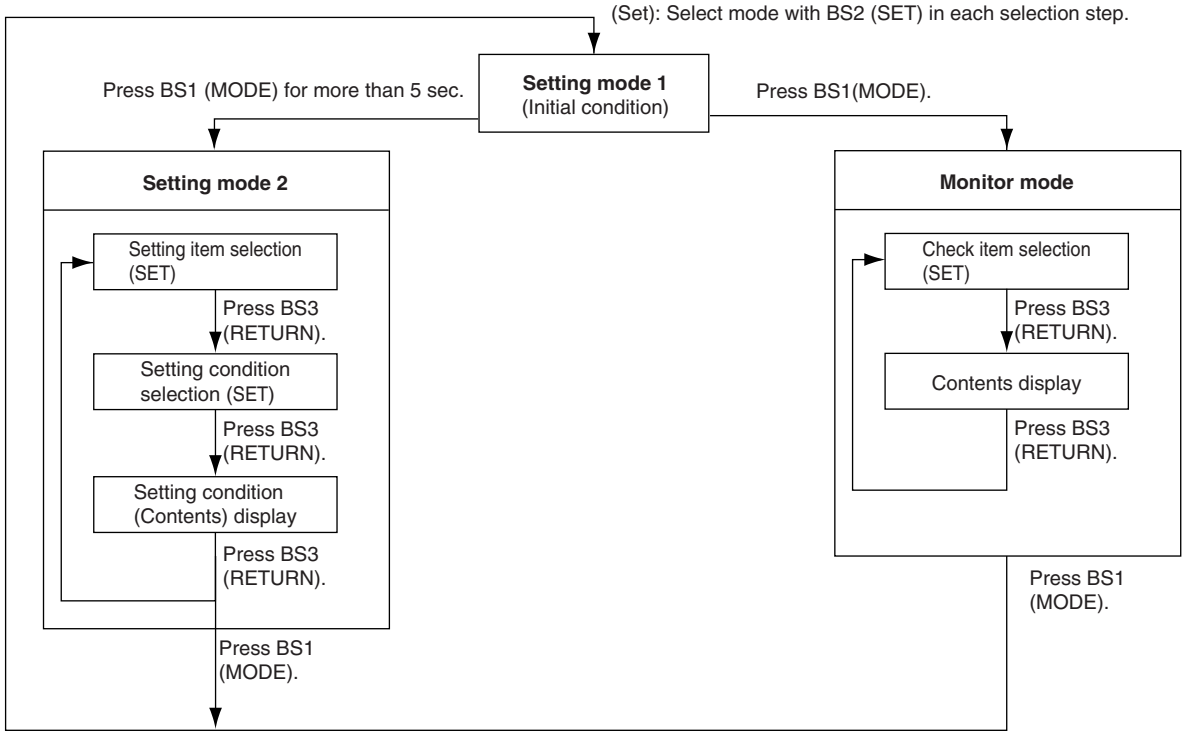
② **Setting mode 2 (H1P on)**
Used to modify the operating status and to set program addresses, etc. Usually used in servicing the system.

③ **Monitor mode (H1P blinks)**
Used to check the program made in Setting mode 2.

■ **Mode changing procedure 1**



■ **Mode changing procedure 2**



a. “Setting mode 1”

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

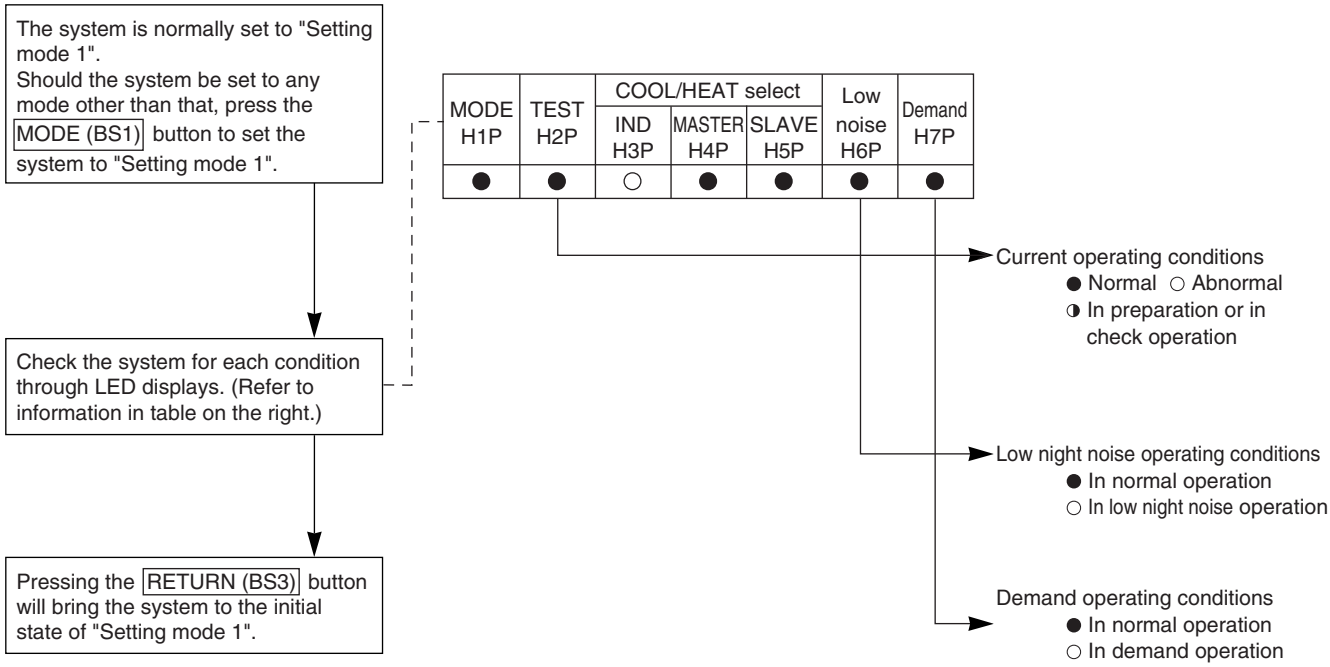
Check items ····· The following items can be checked.

(1) Current operating conditions (Normal / Abnormal / In check operation)

(2) Low noise operating conditions (In normal operation / In low night noise operation)

(3) Demand operating conditions (In normal operation / In demand operation)

Procedure for checking check items



b. “Setting mode 2”

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

<Selection of setting items>

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

<Selection of setting conditions>

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

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

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

No.	Setting item	Description
0	Digital pressure gauge kit display	Used to make setting of contents to display on the digital pressure gauges (e.g. pressure sensors and temperature sensors)
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. (Forced thermostat ON)
8	Te setting	Target evaporating temperature for cooling
9	Tc setting	Target condensing temperature for heating
10	Defrost changeover setting	Changes the temperature condition for defrost and sets to quick defrost or slow defrost.
11	Sequential operation setting	Sets sequential operation (Factory setting to ON)
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	Make this setting to conduct heating operation with hot water heater.
18	High static pressure setting	Make this setting in the case of operating in high static pressure mode with diffuser duct mounted. (In order to mount the diffuser duct, remove the cover from the outdoor unit fan.)
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	Low night noise setting	Sets automatic low night 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	Low night noise operation start setting	Sets starting time of low night noise quiet operation. (Low night noise setting is also required.)
27	Low night noise operation end setting	Sets ending time of night-time quiet operation. (Low night noise setting is also required.)
28	Power transistor check mode ∗Check after disconnection of compressor wires	Used for service 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 precedence setting	If the capacity control is required, the low noise control is automatically released by this setting during carrying out low night noise operation and low night 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 that circuit breaker of small capacity is shut down due to large load.)

No.	Setting item	Description
38	Emergency operation (Setting for the unit 1 operation prohibition in multi-outdoor-unit system)	Used to temporarily prohibit the applicable outdoor unit from operating should there be any defective part in multi-outdoor-unit system. Since the comfortable environment is extremely impaired, prompt replacement of the part is required.
39	Emergency operation (Setting for the unit 2 operation prohibition in multi-outdoor-unit system)	
40	Emergency operation (Setting for the unit 3 operation prohibition in multi-outdoor-unit system)	
41	Prevention of minute heating operation by heating thermostat OFF unit or non-heating-operation unit	Make this setting to prevent a rise in room temperature due to minute heating capacity generated by heating thermostat OFF unit or non-heating-operation unit while in heating operation. • Used to prevent minute heating operation by setting the Branch Selector unit to COOL while in heating thermostat OFF or non-heating-operation mode. • With the Branch Selector unit set to default, enabling the minute heating prevention setting of outdoor unit will enable the minute heating prevention setting of all Branch Selector units connected to the outdoor unit. (Branch Selector unit default setting) • To make this setting by Branch Selector unit, make a change to the minute heating prevention setting of the Branch Selector unit. (In this case, enable the outdoor unit setting.)
42	Setting of Branch Selector Cool-Heat selection control time	Make this setting to shorten the Branch Selector Cool-Heat selection control time. However, make the setting, pay careful attention to the following: • If the refrigerant piping between each Branch Selector unit connected to outdoor unit and indoor unit is not more than 10 m in length, this setting will be enabled. • If the refrigerant piping between Branch Selector unit and indoor unit is long in length, refrigerant passing sounds may become louder at the time of Branch Selector Cool-Heat selection. • This setting shortens the Cool-Heat selection time of all Branch Selector units provided in the same refrigerant system.
51	Set-up of master and slave units for multi outdoor units	Set up master and slave units for multi-connection outdoor units. After setting up, press the BS5 (RESET) button for 5 seconds or more.

↑ 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 IND H3P	C/H selection Master H4P	C/H selection Slave H5P	Low noise H6P	Demand H7P			∗ Factory setting
0	Digital pressure gauge kit display	○	●	●	●	●	●	●	Address Binary number (4 digits)	0 1 ~ 15	○●●●●●●∗ ○●●●●●○ ○●●○○○○
1	Cool / Heat Unified address	○	●	●	●	●	●	○	Address Binary number (6 digits)	0 1 ~ 31	○●●●●●●∗ ○●●●●●○ ○●○○○○○
2	Low noise/demand address	○	●	●	●	●	○	●	Address Binary number (6 digits)	0 1 ~ 31	○●●●●●●∗ ○●●●●●○ ○●○○○○○
3	Test operation	○	●	●	●	●	○	○	Test operation: OFF Test operation: ON		○●●●●○∗ ○●●●○●
5	Indoor forced fan H	○	●	●	●	○	●	○	Normal operation Indoor forced fan H		○●●●●○∗ ○●●●○●
6	Indoor forced operation	○	●	●	●	○	○	●	Normal operation Indoor forced operation		○●●●●○∗ ○●●●○●
8	Te setting	○	●	●	○	●	●	●	Low (Level L) Normal (Level M) High① (Level H) High② High③ High④ High⑤		○●●●●○ ○●●●●○●∗ ○●●●●○○ ○●●●○●● ○●●●○●○ ○●●●○○● ○●●●○○○
9	Tc setting	○	●	●	○	●	●	○	Low Normal (factory setting) High		○●●●●●○ ○●●●●○●∗ ○●●●○●●
10	Defrost changeover setting	○	●	●	○	●	○	●	Slow defrost Normal (factory setting) Quick defrost		○●●●●●○ ○●●●●○●∗ ○●●●○●●
11	Sequential operation setting	○	●	●	○	●	○	○	OFF ON		○●●●●●○ ○●●●●○●∗
12	External low noise/ demand setting	○	●	●	○	○	●	●	External low noise/demand: NO External low noise/demand: YES		○●●●●○∗ ○●●●●○●
13	AIRNET address	○	●	●	○	○	●	○	Address Binary number (6 digits)	0 1 ~ 63	○●●●●●●∗ ○●●●●●○ ○○○○○○○
16	Setting of hot water heater	○	●	○	●	●	●	●	OFF ON		○●●●●●○∗ ○●●●●○●
18	High static pressure setting	○	●	○	●	●	○	●	High static pressure setting: OFF High static pressure setting: ON		○●●●●●○∗ ○●●●●○●
20	Additional refrigerant charging operation setting	○	●	○	●	○	●	●	Refrigerant charging: OFF Refrigerant charging: ON		○●●●●●○∗ ○●●●●○●
21	Refrigerant recovery/vacuuming mode setting	○	●	○	●	○	●	○	Refrigerant recovery / vacuuming: OFF Refrigerant recovery / vacuuming: ON		○●●●●●○∗ ○●●●●○●

No.	Setting item display								Setting condition display	
	Setting item	MODE H1P	TEST H2P	C/H selection IND H3P	C/H selection Master H4P	C/H selection Slave H5P	Low noise H6P	Demand H7P		✻ Factory setting
22	Low night 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)	○●●●●●✻ ○●●●●○ ○●●●○● ○●●●○○
25	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	Low night noise operation start setting	○	●	○	○	●	○	●	About 20:00 About 22:00 (factory setting) About 24:00	○●●●●○ ○●●●○●✻ ○●●○●●
27	Low night noise operation end setting	○	●	○	○	●	○	○	About 6:00 About 7:00 About 8:00 (factory setting)	○●●●●○ ○●●●○● ○●●○●●✻
28	Power transistor check mode	○	●	○	○	○	●	●	OFF ON	○●●●●○✻ ○●●●○●
29	Capacity precedence setting	○	●	○	○	○	●	○	OFF ON	○●●●●○✻ ○●●●○●
30	Demand setting 1	○	●	○	○	○	○	●	60 % demand 70 % demand 80 % demand	○●●●●○ ○●●●○●✻ ○●●○●●
32	Normal demand setting	○	○	●	●	●	●	●	OFF Demand 1 Demand 2	○●●●●○✻ ○●●●○● ○●●○●●
38	Emergency operation (Master unit is inhibited to operate.)	○	○	●	●	○	○	●	OFF Master unit operation: Inhibited	○●●●●○✻ ○●●●○●
39	Emergency operation (Slave unit 1 is inhibited to operate.)	○	○	●	●	○	○	○	OFF Slave unit 1 operation: Inhibited	○●●●●○✻ ○●●●○●
40	Emergency operation (Slave unit 2 is inhibited to operate.)	○	○	●	○	●	●	●	OFF Slave unit 2 operation: Inhibited	○●●●●○✻ ○●●●○●
41	Prevention of minute heating operation by heating thermostat OFF unit or non-heating-operation unit	○	○	●	○	●	●	○	OFF Non-heating-operation unit Heating thermostat OFF unit Non-heating-operation + Thermostat OFF	○●●●●● ○●●●●○ ○●●●○● ○●●●○○✻
42	Setting of Branch Selector Cool-Heat selection control	○	○	●	○	●	○	●	6 min. 4 min.	○●●●●●✻ ○●●●●○
51	Master-slave set-up for multi outdoor units	○	○	○	●	●	○	○	Automatic judgement Master Slave 1 Slave 2	○●●●●●✻ ○●●●●○ ○●●●○● ○●●●○○

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, press the MODE (BS1) button when in "Setting mode 1".

<Selection of setting item>

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

<Confirmation on setting contents>

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

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

∗ Press 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 settings	◑	●	●	●	●	●	●	Lower 4 digits
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 ∗1	◑	●	●	●	○	●	○	
6	Number of connected Branch Selector units ∗2	◑	●	●	●	○	○	●	
7	Number of connected zone units (Fixed to "0")	◑	●	●	●	○	○	○	
8	Number of outdoor units ∗3	◑	●	●	○	●	●	●	
9	Number of Branch Selector units ∗4	◑	●	●	○	●	●	○	Lower 4 digits: upper
10	Number of Branch Selector units ∗4	◑	●	●	○	●	○	●	Lower 4 digits: lower
11	Number of zone units	◑	●	●	○	●	○	○	Lower 6 digits
12	Number of terminal units ∗5	◑	●	●	○	○	●	●	Lower 4 digits: upper
13	Number of terminal units ∗5	◑	●	●	○	○	●	○	Lower 4 digits: lower
14	Contents of error (the latest)	◑	●	●	○	○	○	●	Error code table
15	Contents of error (1 cycle before)	◑	●	●	○	○	○	○	Refer to P.329.
16	Contents of error (2 cycle before)	◑	●	○	●	●	●	●	
20	Contents of retry (the latest)	◑	●	○	●	○	●	●	
21	Contents of retry (1 cycle before)	◑	●	○	●	○	●	○	
22	Contents of retry (2 cycle before)	◑	●	○	●	○	○	●	
25	Number of multi connection outdoor units	◑	●	○	○	●	●	○	Lower 6 digits

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

∗1: Number of connected indoor units
Used to make setting of the number of indoor units connected to an outdoor unit.

∗2: Number of connected Branch Selector units
Used to make setting of the number of Branch Selector units connected to an outdoor unit.

∗3: Number of outdoor units
Used to make setting of the number of outdoor units connected to DIII-NET that is one of the communication lines.

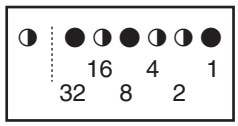
∗4: Number of Branch Selector units
Used to make setting of the number of Branch Selector units connected to DIII-NET that is one of the communication lines.

∗5: Number of terminal units
Used to make setting of the number of indoor units connected to DIII-NET that is one of the communication lines.
(Only available for VRV indoor units)

Setting item 0 Display contents of "Number of units for various settings"

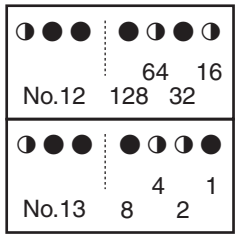
EMG operation / backup operation setting	ON	◑	●	●	○	●	●	●
	OFF	◑	●	●	●	●	●	●
Defrost select setting	Short	◑	●	●	●	○	●	●
	Medium	◑	●	●	●	◑	●	●
	Long	◑	●	●	●	●	●	●
Te setting	L	◑	●	●	●	●	●	●
	M	◑	●	●	●	●	◑	●
	H ①~⑤	◑	●	●	●	●	○	●
Tc setting	L	◑	●	●	●	●	●	●
	M	◑	●	●	●	●	●	◑
	H	◑	●	●	●	●	●	○

∗ 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.

12.1.4 Cool / Heat Mode Changeover

Set Cool/Heat Separately for Each Branch Selector Unit by Cool/Heat Selector.

Set remote controller changeover switch (SS1, SS2) as following:

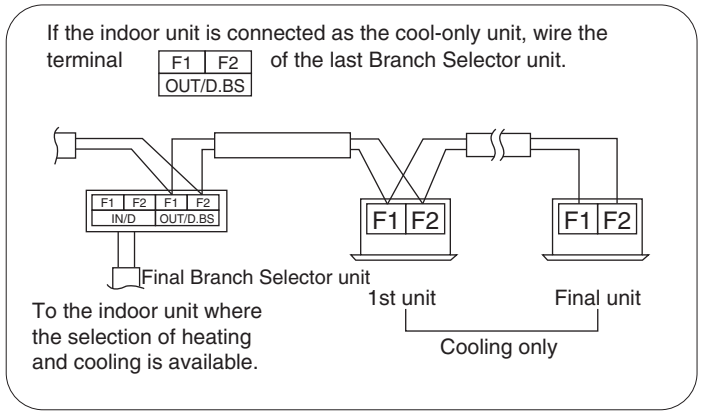
- When using COOL/HEAT selector, turn this switch to the Branch Selector side.

NOTE: This setting must be completed before turning power supply ON.

When using cool/heat selector, connect to the terminal A, B and C on the EC of the electric parts box.

EXAMPLE OF TRANSMISSION LINE CONNECTION

- Example of connecting transmission wiring.
  Connect the transmission wirings as shown in the Fig. 17.



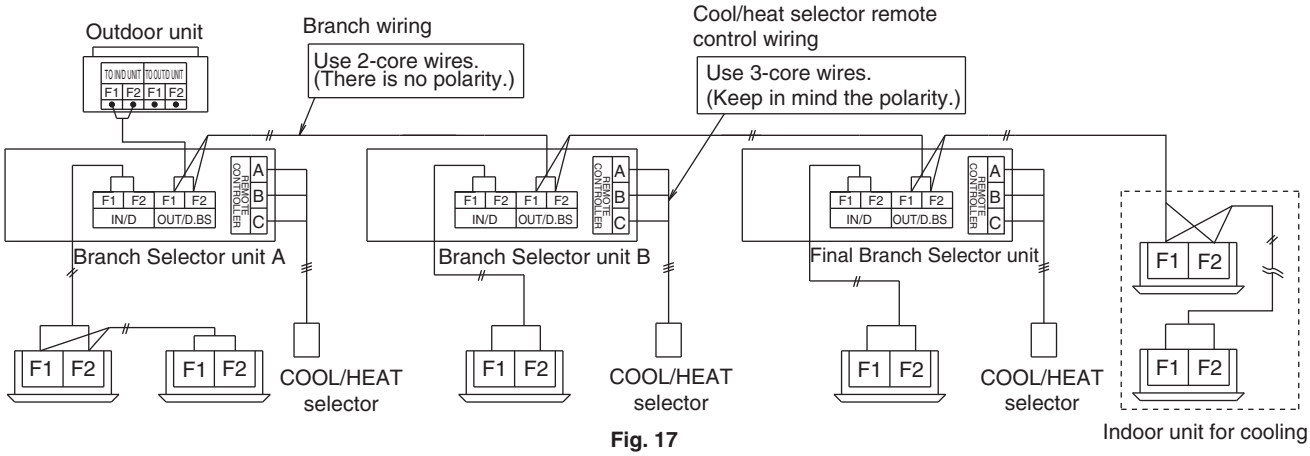


Fig. 17

12.1.5 Setting of Low Night Noise Operation and Demand Operation

Setting of Low Night Noise Operation

By connecting the external contact input to the low noise input of the outdoor unit external control adaptor for outdoor unit (optional), you can lower operating noise.

Setting	Content
Level 1	Set the outdoor unit fan to Step 6 or lower.
Level 2	Set the outdoor unit fan to Step 5 or lower.
Level 3	Set the outdoor unit fan to Step 4 or lower.

A. When the low night noise operation is carried out by external contact (with the use of the external control adaptor for outdoor unit)

1. Connect the external adaptor for the outdoor unit, and then connect the external input wiring to the low-noise operation input terminal on the terminal block (X1M). (Refer to the figure shown below.)
2. While in "Setting mode 2", set the setting condition for set item No. 12 (Setting of external low noise/demand operation) to "YES".
3. If necessary, while in "Setting mode 2", select the setting condition (i.e., Level 1", "Level 2", or "Level 3") for set item No. 25 (Setting of external low noise level).
4. If necessary, while in "Setting mode 2", set the setting condition for the set item No. 29 (Setting of capacity precedence) to "ON".
   (If the condition is set to "ON", when the air conditioning load reaches a high level, the night-time quiet operation command will be ignored to put the system into normal operation mode.)

B. When the low night 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., "Level 1", "Level 2", or "Level 3") for set item No. 22 (Setting of low night 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 low night 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 low night 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 (Setting of capacity precedence) 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 night-time.)

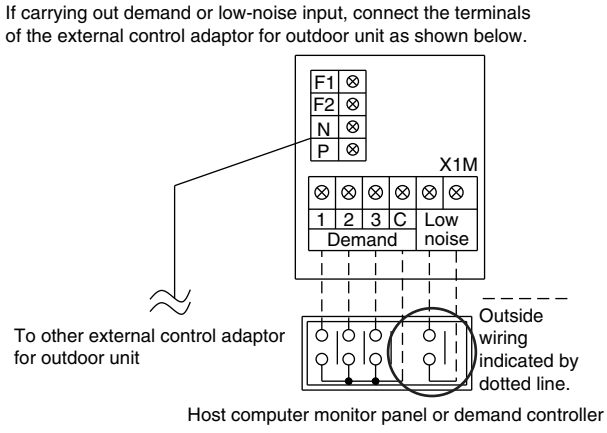
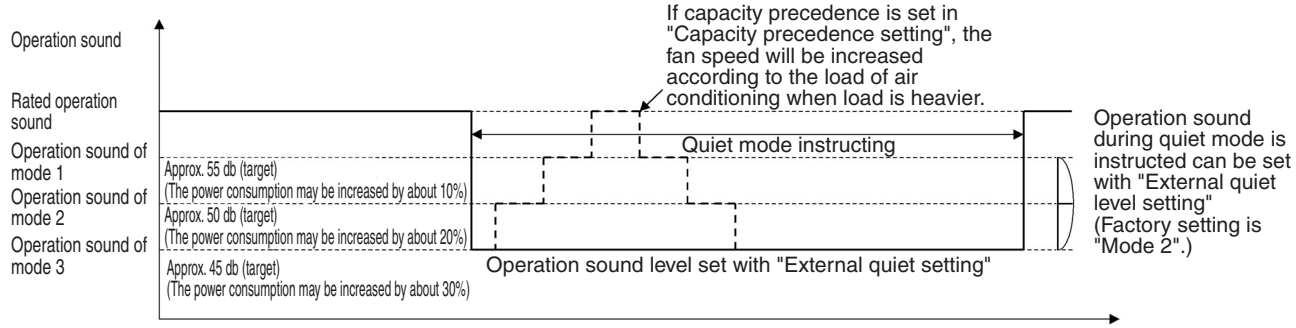


Image of operation in the case of A



Note1: Above values are reference only (measured in silent room)
Note2: Above values are for 1 module only.

Image of operation in the case of B

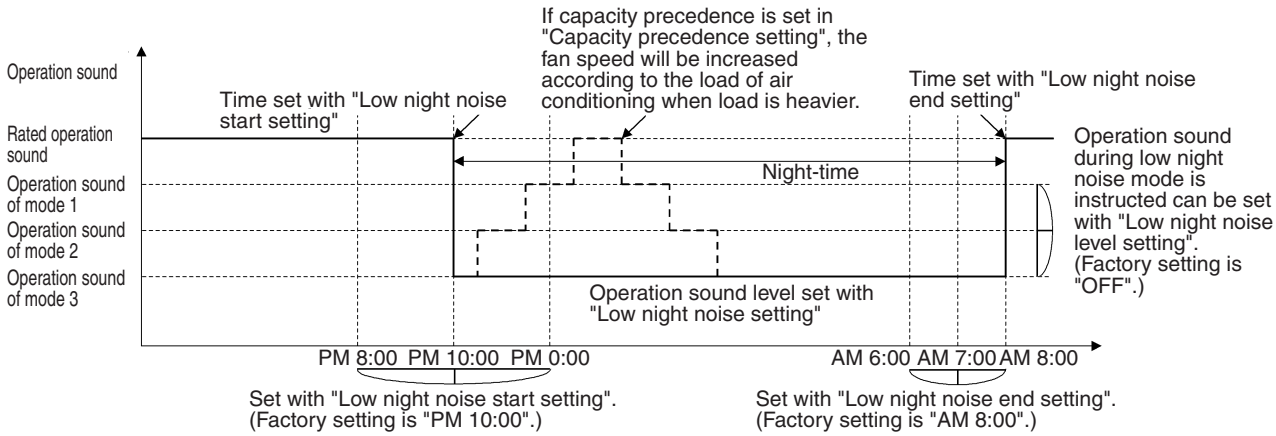
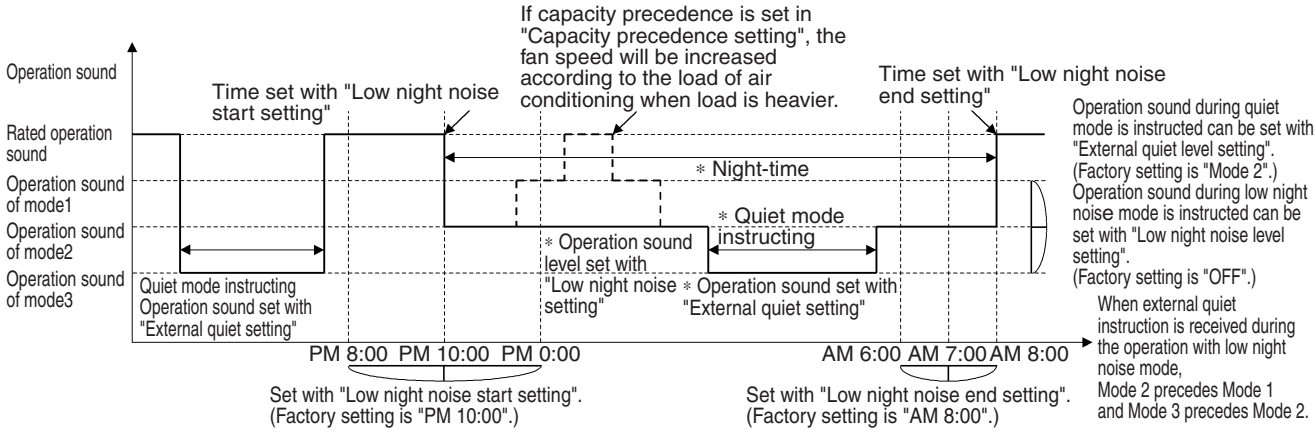


Image of operation in the case of A and B



Setting of Demand Operation

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

Description of setting			Setting procedure	
Setting item	Condition	Description	External control adaptor for outdoor unit	Outdoor unit PCB
Demand 1	Level 1	Operate with power of approx. 60% or less of the rating.	Short circuit between "1" and "C" of the terminal block (TeS1).	Set the setting item No. 32 to "Demand 1" and the setting item No. 30 to "Level 1".
	Level 2	Operate with power of approx. 70% or less of the rating.		Set the setting item No. 32 to "Demand 1" and the setting item No. 30 to "Level 2".
	Level 3	Operate with power of approx. 80% or less of the rating.		Set the setting item No. 32 to "Demand1" and the setting item No. 30 to "Level 3".
Demand 2	–	Operate with power of approx. 40% or less of the rating.	Short circuit between "2" and "C".	Set the setting item No. 32 to "Demand 2".
Demand 3	–	Operate with forced thermostat OFF	Short circuit between "3" and "C"	–

A. When the demand operation is carried out by external contact (with the use of the external control adaptor for outdoor unit).

1. Connect the external adaptor of the outdoor unit, and then connect the external input wiring to the low-noise operation input terminal on the terminal block (X1M). (Refer to the figure shown below.)
2. While in "Setting mode 2", set the setting condition for set item No. 12 (Setting of external low noise/demand operation) to "YES".
3. If necessary, 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.

B. 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.

If carrying out demand or low-noise input, connect the terminals of the external control adaptor for outdoor unit as shown below.

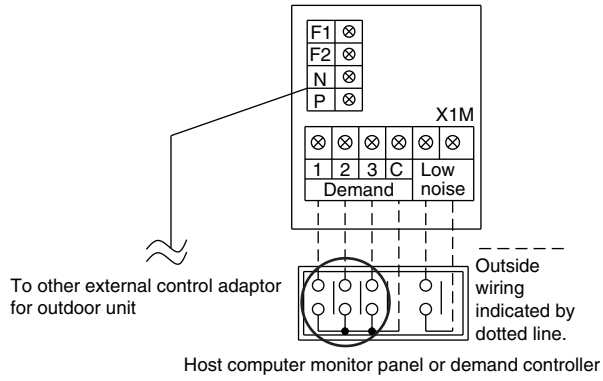


Image of operation in the case of A

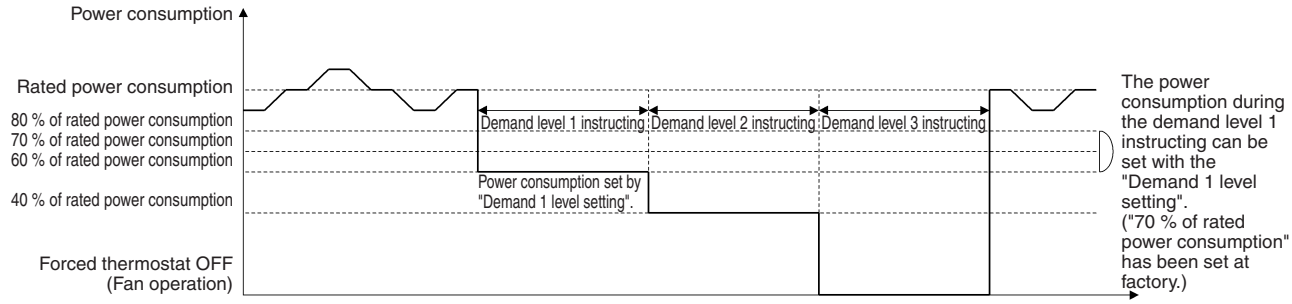


Image of operation in the case of B

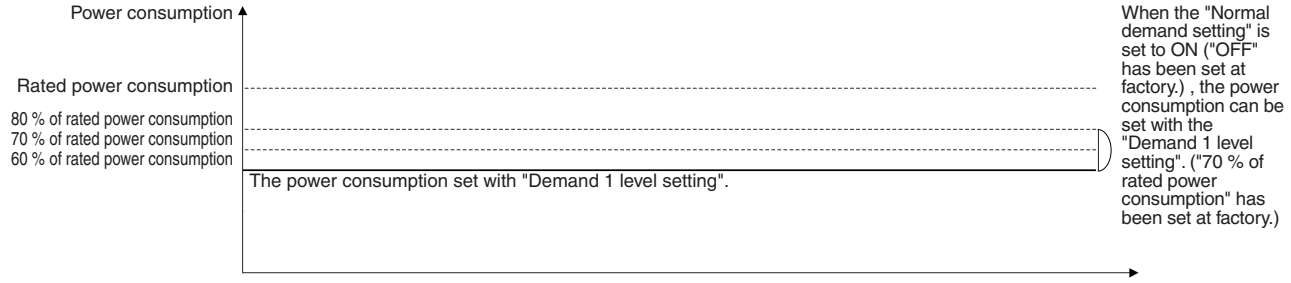
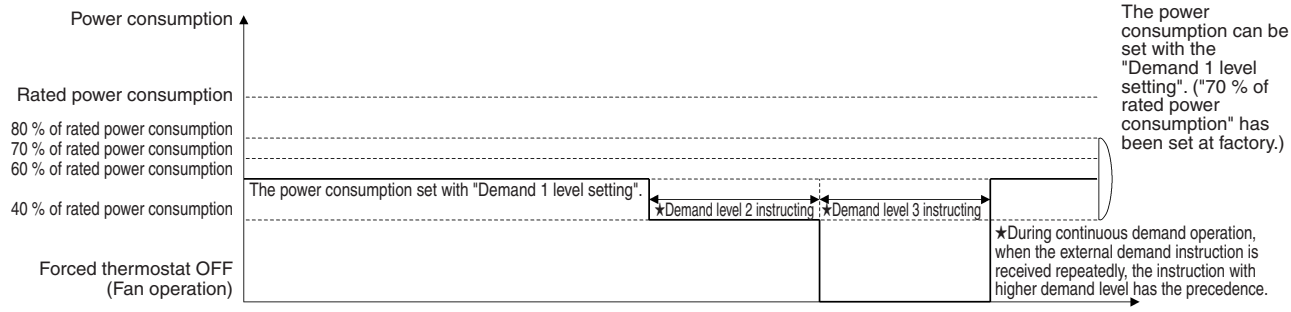


Image of operation in the case of A and B



Detailed Setting Procedure of Low Night Noise Operation and Demand Control

1. Setting mode 1 (H1P off)

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

2. Setting mode 2 (H1P on)

① In setting 1, press and hold the BS1 (MODE button) for more than 5 seconds. → Setting mode 2 is entered and H1P lights.

② Press the BS2 (SET button) several times and match the LED display with the Setting No. you want.

③ Press the BS3 (RETURN button) one time, and the present setting content is displayed.
→ Press the BS2 (SET button) several times and match the LED display with the setting content (as shown below) you want.

④ Press the BS3 (RETURN button) two times. → Returns to ①.

⑤ Press the BS1 (MODE button) one time. → Returns to the setting mode 1 and turns H1P off.

○: ON ●: OFF ◑: Blink

Setting No.	Setting contents	① Setting No. indication							② Setting No. indication							Setting contents	③ 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 / Demand setting	○	●	●	●	●	●	●	○	●	●	○	○	●	●	NO (Factory setting)	○	●	●	●	●	●	◑
																YES	○	●	●	●	●	◑	●
22	Low night noise setting								○	●	○	●	○	○	●	OFF (Factory setting)	○	●	●	●	●	●	●
																Mode 1	○	●	●	●	●	●	◑
																Mode 2	○	●	●	●	●	◑	●
																Mode 3	○	●	●	●	●	◑	◑
25	External quiet setting								○	●	○	○	●	●	○	Mode 1	○	●	●	●	●	●	◑
																Mode 2 (Factory setting)	○	●	●	●	●	◑	●
																Mode 3	○	●	●	●	◑	●	●
26	Low night noise start setting								○	●	○	○	●	○	●	PM 8:00	○	●	●	●	●	●	◑
																PM 10:00 (Factory setting)	○	●	●	●	●	◑	●
																PM 0:00	○	●	●	●	◑	●	●
27	Low night noise end setting								○	●	○	○	●	○	○	AM 6:00	○	●	●	●	●	●	◑
																AM 7:00	○	●	●	●	●	◑	●
																AM 8:00 (Factory setting)	○	●	●	●	◑	●	●
29	Capacity precedence setting								○	●	○	○	○	●	○	Low noise precedence (Factory setting)	○	●	●	●	●	●	◑
																Capacity precedence	○	●	●	●	●	◑	●
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

12.1.6 Setting of Refrigerant Recovery Mode

When carrying out the refrigerant collection on site, fully open the respective electronic 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 "Refrigerant Recovery / Vacuuming mode" to ON. The respective electronic expansion valve of indoor and outdoor units are fully opened. (H2P turns to display "TEST OPERATION" (blinks), "TEST OPERATION" and "UNDER CENTRALIZED CONTROL" are displayed on the remote controller, and all 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".

12.1.7 Setting of Vacuuming Mode

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

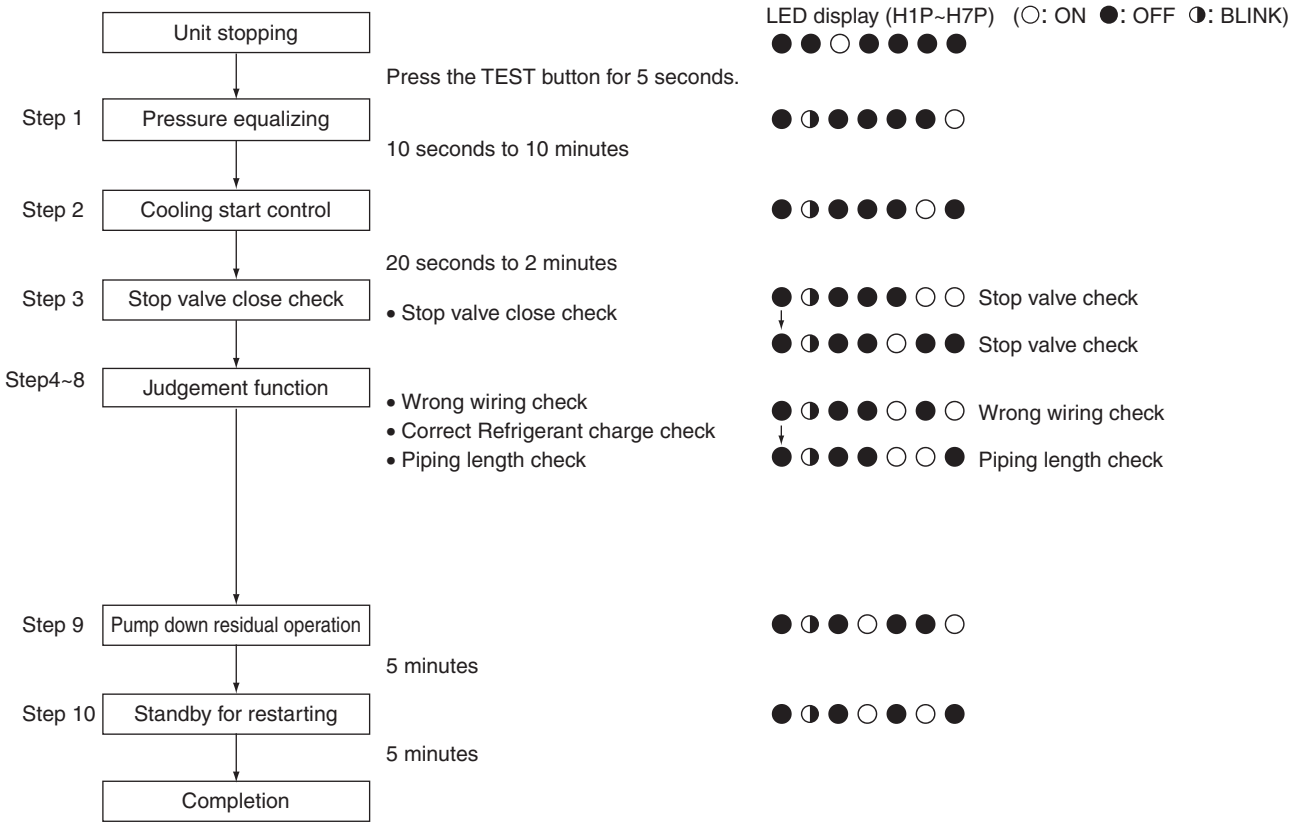
[Operating procedure]

① With **Setting Mode 2** while the unit stops, set "Refrigerant recovery / Vacuuming mode" to ON. The electronic expansion valves of indoor and outdoor units fully open and some of solenoid valves open.
(H2P blinks to indicate the test operation, and the remote controller displays "Test Operation" and "Under centralized control", thus prohibiting operation.)
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".

12.1.8 Check Operation Detail

CHECK OPERATION FUNCTION

(Press the MODE button BS1 once and set to SETTING MODE 1 (H1P: OFF))



12.1.9 Emergency Operation

If any of the compressors goes wrong, disable the relevant compressor or the relevant outdoor unit from operating, and then conduct emergency operation only with operational compressors or outdoor units.

There are two ways of conducting the Emergency operation : ① with remote controller reset and ② by setting outdoor unit PCB.

Operating method / Applicable model	① Emergency operation with remote controller reset (Auto backup operation)	② Emergency operation with outdoor unit PCB setting (Manual backup operation)
REYQ72 to 120PBYD REYQ72 to 144PBTJ	–	Backup operation by the compressor
REYQ144 to 336PBYD REYQ168 to 336PBTJ	Backup operation by the indoor unit	Backup operation by the outdoor unit

① **Emergency operation with remote controller reset**

On the multi outdoor unit system, if any of the outdoor unit line causes an error (in this case, the system will stop and the relevant error code will be displayed on the indoor remote controller), disable only the relevant outdoor unit from operating for a 8 hours using the indoor remote controller, and then conduct emergency operation with operational outdoor units.

[Emergency operation method]

- Reset the remote controller (i.e., press the ON/OFF button on the remote controller for 4 seconds or more) when the outdoor unit stops because of error state.

[Details of operation]

- Automatically disable the defective outdoor unit from operating, and then operate other outdoor units.
- The following section shows error codes on which this emergency operation is possible.

E3, E4, E5
F3
H9
J2, J3, J5, J6, J7, J9, JA, JC
L3, L4, L5, L8, L9, LC
U2, UJ

② **Emergency operation by setting outdoor unit PCB**

In error stop state of the outdoor unit due to defective compressor, by setting the relevant compressor or relevant outdoor unit to "Disabling operation setting", the emergency operation is conducted with operational compressors or outdoor units.

<REYQ72 ~ 120PBYD, REYQ72 ~ 144PBTJ>

○ Disabling the compressor 1 (on the right side) from operating:

Set No. 38 of setting mode 2 to "Disable-compressor-1 operation".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press and hold the PAGE button (BS1) for 5 seconds or more.	○●●●●●
(2) Press the OPERATE button (BS2) 38 times.	○○●●○○●
(3) Press the CHECK button (BS3) once.	○●●●●◑ (Factory setting)
(4) Press the OPERATE button (BS2) once.	○●●●◑●
(5) Press the CHECK button (BS3) twice.	○●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●

○ Disabling the compressor 2 (on the left side) from operating:

Set No. 39 of setting mode 2 to "Disable-compressor-2 operation".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press the PAGE button (BS1) for 5 seconds or more.	○●●●●●
(2) Press the OPERATE button (BS2) 39 times.	○○●●○○○
(3) Press the CHECK button (BS3) once.	○●●●●◑ (Factory setting)
(4) Press the OPERATE button (BS2) once.	○●●●◑●
(5) Press the CHECK button (BS3) twice.	○●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●

<REYQ144 ~ 336PBYD, REYQ168 ~ 336PBTJ>

Make disable-operation setting by each outdoor unit.

Make the following setting on the outdoor unit 1. (If this setting is made on an outdoor unit other than the outdoor unit 2, the setting will become invalid.)

∗ It is possible to tell the outdoor units 1 and 2 according the LED displays shown below.

LED display (○: ON, ●: OFF, ◑: Blink)

H1P-------H7P H8P

Outdoor unit 1: ●●○●●●● ○

Outdoor unit 2: ●●●●●●● ◑

○ Disabling the outdoor unit 1 to operate:

Set No. 38 of setting mode 2 to "Disable outdoor unit 1 operation".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press and hold the PAGE button (BS1) for 5 seconds or more.	○●●●●●
(2) Press the OPERATE button (BS2) 38 times.	○○●●○○●
(3) Press the CHECK button (BS3) once.	○●●●●◑ (Factory setting)
(4) Press the OPERATE button (BS2) once.	○●●●◑●
(5) Press the CHECK button (BS3) twice.	○●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●

○ Disabling the outdoor unit 2 from operating:

Set No. 39 of setting mode 2 to "Disable-outdoor-unit-2 operation".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press the PAGE button (BS1) for 5 seconds or more.	○●●●●●
(2) Press the OPERATE button (BS2) 39 times.	○○●●○○○
(3) Press the CHECK button (BS3) once.	○●●●●◑ (Factory setting)
(4) Press the OPERATE button (BS2) once.	○●●●◑●
(5) Press the CHECK button (BS3) twice.	○●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●

[Cancel of Emergency Operation]

To cancel the emergency operation, conduct the following setting. (Return to Factory setting.)

<REYQ72 ~ 120PBYD, REYQ72 ~ 144PBTJ>

○ Cancel disabling the compressor 1 (on the right side) from operating:
Set No. 38 "Disable-compressor-1 operation" of setting mode 2 to "OFF".

	LED display (○: ON, ●: OFF, ◑: Blink)
(Step)	H1P-------H7P
(1) Press and hold the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 38 times.	○○●●○○●
(3) Press the CHECK button (BS3) once.	○●●●●◑●
(4) Press the OPERATE button (BS2) once.	○●●●●●◑ (Factory setting)
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

○ Cancel disabling the compressor 2 (on the left side) from operating:
Set No. 39 "Disable-compressor-2 operation" of setting mode 2 to "OFF".

	LED display (○: ON, ●: OFF, ◑: Blink)
(Step)	H1P-------H7P
(1) Press the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 39 times.	○○●●○○○
(3) Press the CHECK button (BS3) once.	○●●●●◑●
(4) Press the OPERATE button (BS2) once.	○●●●●●◑ (Factory setting)
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

<REYQ144 ~ 336PBYD, REYQ168 ~ 336PBTJ>

Cancel the disable-operation setting by each outdoor unit.

Make the following setting on the outdoor unit 1. (If this setting is made on an outdoor unit other than the outdoor unit 2, the setting will become invalid.)

∗It is possible to tell the outdoor units 1 and 2 according the LED displays shown below.

LED display (○: ON, ●: OFF, ◑: Blink)

H1P-------H7P H8P

Outdoor unit 1: ●●○●●●● ○

Outdoor unit 2: ●●●●●●● ◑

○ Cancel disabling the outdoor unit 1 from operating:

Set No. 38 "Disable outdoor unit 1 operation" of setting mode 2 to "OFF".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press and hold the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 38 times.	○○●●○○●
(3) Press the CHECK button (BS3) once.	○●●●●◑●
(4) Press the OPERATE button (BS2) once.	○●●●●●◑ (Factory setting)
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

○ Cancel disabling the outdoor unit 2 from operating:

Set No. 39 "Disable-outdoor-unit-2 operation" of setting mode 2 to "OFF".

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P-------H7P
(1) Press the PAGE button (BS1) for 5 seconds or more.	○●●●●●●
(2) Press the OPERATE button (BS2) 39 times.	○○●●○○○
(3) Press the CHECK button (BS3) once.	○●●●●◑●
(4) Press the OPERATE button (BS2) once.	○●●●●●◑ (Factory setting)
(5) Press the CHECK button (BS3) twice.	○●●●●●●
(6) Press the PAGE button (BS1) once.	●●○●●●●

12.1.10 Prevention of Small Heating in Non-operating Unit

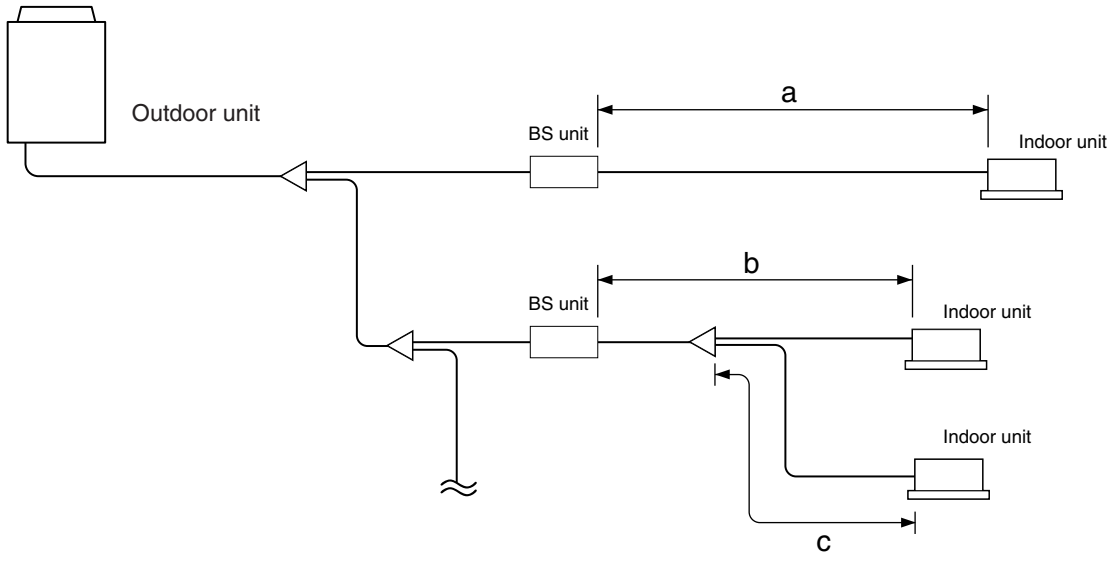
In heating operation, this setting is made to prevent room temperature from rising due to small heating capacity generated in the unit with its heating thermostat OFF or in the unit with its heating operation stopped.

- By switching the Branch Selector units to cooling when the system turns OFF the heating thermostat or stops heating operation, small heating is prevented.
- By enabling the small heating prevention setting of the outdoor unit, prevention of small heating of all Branch Selector units connected to the outdoor unit is enabled. (Default setting of Branch Selector unit)
- Setting by Branch Selector unit is enabled by changing the small heating prevention setting of every Branch Selector unit. (In this case, enable the outdoor unit setting.)

12.1.11 Reduction of Cooling/Heating Selection Time of Branch Selector Units

Make this setting to reduce selection time between cooling and heating of the Branch Selector units, with careful attention paid to the following points.

- This setting is only enabled in case the refrigerant piping length between every Branch Selector unit connected to the outdoor unit and the indoor unit is not more than 10 m. (Refer to the figure shown below: (a) ≤ 10 m and (b) + (c) ≤ 10 m and …)
- In case the refrigerant piping length between the Branch Selector units and the indoor units is long, refrigerant passing sounds may become louder when the Branch Selector unit selects operation mode between cooling and heating.
- This setting reduces the operation mode selection time in all the Branch Selector units within the same refrigerant circuit.



Part 4
Indoor Unit

1. Specifications

Ceiling Mounted Cassette Type (Multi-flow)

Model			FXFQ09PVJU	FXFQ12PVJU	FXFQ18PVJU	FXFQ24PVJU
★1, ★3 Cooling Capacity		Btu/h	9,500	12,000	18,000	24,000
★2, ★3 Heating Capacity		Btu/h	10,500	13,500	20,000	27,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in. (mm)	9-11/16 × 33-1/16 × 33-1/16 (246 x 840 x 840)	9-11/16 × 33-1/16 × 33-1/16 (246 x 840 x 840)	9-11/16 × 33-1/16 × 33-1/16 (246 x 840 x 840)	9-11/16 × 33-1/16 × 33-1/16 (246 x 840 x 840)
Coil (Cross Fin Coil)	Rows×Stages×FPI		2×6×21	2×6×21	2×6×21	2×10×21
	Face Area	ft² (m²)	2.87 (0.9)	2.87 (0.9)	2.87 (0.9)	4.80 (1.5)
Fan	Model		QTS48C15M	QTS48C15M	QTS48C15M	QTS48C15M
	Type		Turbo Fan	Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output	W	56	56	56	56
	Air Flow Rate (HH/H/L)	cfm	460/390/350	460/390/350	560/470/390	780/620/470
	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
Sound Absorbing Thermal Insulation Material			Polyurethane Form	Polyurethane Form	Polyurethane Form	Polyurethane Form
Weight		Lbs (kg)	43 (19.5)	43 (19.5)	43 (19.5)	48.5 (19.5)
Piping Connections	Liquid Pipes	in. (mm)	ϕ1/4 (6.4) (Flare Connection)	ϕ1/4 (6.4) (Flare Connection)	ϕ1/4 (6.4) (Flare Connection)	ϕ3/8 (9.5) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (12.7) (Flare Connection)	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 (31.8) Internal Dia. 1 (25.4)	VP25 External Dia. 1-1/4 (31.8) Internal Dia. 1 (25.4)
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 VRV Series	R-410A VRV Series	R-410A VRV Series	R-410A VRV Series
Standard Accessories			Operation Manual. Installation Manual. Paper Pattern for Installation. Drain Hose. Sealing Pads. Clamps. Washers. Screws. Insulation for Fitting. Clamp Metal.	Operation Manual. Installation Manual. Paper Pattern for Installation. Drain Hose. Sealing Pads. Clamps. Washers. Screws. Insulation for Fitting. Clamp Metal.	Operation Manual. Installation Manual. Paper Pattern for Installation. Drain Hose. Sealing Pads. Clamps. Washers. Screws. Insulation for Fitting. Clamp Metal.	Operation Manual. Installation Manual. Paper Pattern for Installation. Drain Hose. Sealing Pads. Clamps. Washers. Screws. Insulation for Fitting. Clamp Metal.
Decoration Panels (Option)	Model		BYCP125K-W1	BYCP125K-W1	BYCP125K-W1	BYCP125K-W1
	Color		Fresh White	Fresh White	Fresh White	Fresh White
	Dimensions: (H×W×D)	in. (mm)	2 × 37-3/8 ×37-3/8 (51 x 949 x 949)	2 × 37-3/8 ×37-3/8 (51 x 949 x 949)	2 × 37-3/8 ×37-3/8 (51 x 949 x 949)	2 × 37-3/8 ×37-3/8 (51 x 949 x 949)
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	Lbs (kg)	12.2 (5.5)	12.2 (5.5)	12.2 (5.5)	12.2 (5.5)
Drawing No.			C: 3D070521			

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB / 67°FWB (27°CDB /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, 43°FWB (8.3°CDB / 6°CWB)
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.

Ceiling Mounted Cassette Type (Round Flow)

Model			FXFQ30PVJU	FXFQ36PVJU	FXFQ48PVJU
★1, ★3 Cooling Capacity		Btu/h	30,000	36,000	48,000
★2, ★3 Heating Capacity		Btu/h	34,000	40,000	54,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in. (mm)	9-11/16 × 33-1/16 × 33-1/16 (246 x 840 x 840)	11-5/16 × 33-1/16 × 33-1/16 (287 x 840 x 840)	11-5/16 × 33-1/16 × 33-1/16 (287 x 840 x 840)
Coil (Cross Fin Coil)	Rows×Stages×FPI		2×10×21	2×12×21	2×12×21
	Face Area	ft² (m²)	4.80 (1.5)	5.76 (1.8)	5.76 (1.8)
Fan	Model		QTS48C15M	QTS48C15M	QTS48C15M
	Type		Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output	W	56	120	120
	Air Flow Rate (HH/H/L)	cfm	830/670/530	1180/910/700	1220/970/790
	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			Polyurethane Form	Polyurethane Form	Polyurethane Form
Weight		Lbs (kg)	48.5 (22)	55 (25)	55 (25)
Piping Connections	Liquid Pipes	in. (mm)	ϕ3/8 (9.5) (Flare Connection)	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)	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 (31.8) Internal Dia. 1 (25.4)
Safety Devices			Fuse	Fuse	Fuse
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A VRV Series	R-410A VRV Series	R-410A VRV Series
Standard Accessories			Operation Manual. Installation Manual. Paper Pattern for Installation. Drain Hose. Sealing Pads. Clamps. Washers. Screws. Insulation for Fitting. Clamp Metal.	Operation Manual. Installation Manual. Paper Pattern for Installation. Drain Hose. Sealing Pads. Clamps. Washers. Screws. Insulation for Fitting. Clamp Metal.	Operation Manual. Installation Manual. Paper Pattern for Installation. Drain Hose. Sealing Pads. Clamps. Washers. Screws. Insulation for Fitting. Clamp Metal.
Decoration Panels (Option)	Model		BYCP125K-W1	BYCP125K-W1	BYCP125K-W1
	Color		Fresh White	Fresh White	Fresh White
	Dimensions: (H×W×D)	in. (mm)	2 × 37-3/8 × 37-3/8 (51 x 949 x 949)	2 × 37-3/8 × 37-3/8 (51 x 949 x 949)	2 × 37-3/8 × 37-3/8 (51 x 949 x 949)
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	Lbs (kg)	12.2 (5.5)	12.2 (5.5)	12.2 (5.5)
Drawing No.			C: 3D070521		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB / 67°FWB (27°CDB / 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, 43°FWB (8.3°CDB / 6°CWB)
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-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)	10.24 (11.26) × 22.64 × 22.64 10-1/4 (11-1/4) x 22-2/3 x 22-2/3 (260 x (286) x 576) ( ): include Electrical Component Box	10.24 (11.26) × 22.64 × 22.64 10-1/4 (11-1/4) x 22-2/3 x 22-2/3 (260 x (286) x 576) ( ): include Electrical Component Box	10.24 (11.26) × 22.64 × 22.64 10-1/4 (11-1/4) x 22-2/3 x 22-2/3 (260 x (286) x 576) ( ): include Electrical Component Box	10.24 (11.26) × 22.64 × 22.64 10-1/4 (11-1/4) x 22-2/3 x 22-2/3 (260 x (286) x 576) ( ): include Electrical Component 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	320/247	335/265	495/353
	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. 1-1/8 (28.5) Internal Dia. 7/8 (22.2)	VP20 External Dia. 1-1/8 (28.5) Internal Dia. 7/8 (22.2)	VP20 External Dia. 1-1/8 (28.5) Internal Dia. 7/8 (22.2)	VP20 External Dia. 1-1/8 (28.5) Internal Dia. 7/8 (22.2)
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)	2.17 × 27.56 × 27.56 2-1/8 x 27-5/8 x 27-5/8) (55 x 702 x 700)	2.17 × 27.56 × 27.56 2-1/8 x 27-5/8 x 27-5/8) (55 x 702 x 700)	2.17 × 27.56 × 27.56 2-1/8 x 27-5/8 x 27-5/8) (55 x 702 x 700)	2.17 × 27.56 × 27.56 2-1/8 x 27-5/8 x 27-5/8) (55 x 702 x 700)
	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 / 67°FWB (27°CDB /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, 43°FWB (8.3°CDB / 6°CWB)
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	"Wg (psi)	0.12-0.04 (0.004-0.002)	0.12-0.04 (0.004-0.002)	0.12-0.04 (0.004-0.002)
	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 (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (12.7) (Flare Connection)	ϕ1/2 (12.7) (Flare Connection)	ϕ1/2 (Flare Connection)
	Drain Pipe	in. (mm)	VP20 External Dia. 1-1/32 (26.2) Internal Dia. 25/32 (19.8)	VP20 External Dia. 1-1/32 (26.2) Internal Dia. 25/32 (19.8)	VP20 External Dia. 1-1/32 (26.2) Internal Dia. 25/32 (19.8)
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, 67°FWB (27°CDB / 19.4°CWB)
Outdoor temperature: 95°FDB (35°C)
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, 43°FWB (8.3°CDB / 6°CWB)
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 the electrical components 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.

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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	HP	0.17	0.17
	Airflow Rate (H/L)	cfm	440/350 (H/L)	580/460 (H/L)
	External Static Pressure ★4	"Wg (psi)	0.18-0.06 (0.006-0.002)	0.18-0.06 (0.006-0.002)
	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)	ϕ3/8 (9.5) (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (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 (19.8))	VP20 (External Dia. 1-1/32 (26.2) Internal Dia. 25/32 (19.8))
Machine Weight (Mass)		Lbs (kg)	63 (28.6)	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 / 67°FWB (27°CDB /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, 43°FWB (8.3°CDB / 6°CWB)
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 the electrical components 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	HP	0.12	0.12	0.12
	Airflow Rate (HH/H/L)	cfm	317 / 264 / 229	317 / 264 / 229	335 / 282 / 246
	External Static Pressure ★4	"Wg (psi)	0.4-0.12 (0.014-0.004)	0.4-0.12 (0.014-0.004)	0.4-0.12 (0.014-0.004)
	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 / 67°FWB (27°CDB / 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, 43°FWB (8.3°CDB / 6°CWB)
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 (0.8)	2.68 (0.8)	2.68 (0.8)
Fan	Model		—	—	—
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.47	0.47	0.47
	Airflow Rate (HH/H/L)	cfm	635/582/529	688/618/565	882/794/706
	External Static Pressure ★4	"Wg (psi)	0.80-0.20 (0.029-0.007)	0.80-0.20 (0.0289-0.0072)	0.80-0.20 (0.029-0.007)
	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 (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (12.7) (Flare Connection)	ϕ5/8 (15.8) (Flare Connection)	ϕ5/8 (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)	80 (36.3)	80 (36.3)	80 (36.3)
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 / 67°FWB (27°CDB / 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, 43°FWB (8.3°CDB / 6°CWB)
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	4.12
Fan	Model		—	—
	Type		Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.47	0.47
	Airflow Rate (HH/H/L)	cfm	1130/953/812	1377/1165/988
	External Static Pressure ★4	"Wg (psi)	0.80-0.20 (0.029-0.007)	0.80-0.20 (0.029-0.007)
	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 (46.3)	102 (46.3)
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 / 67°FWB (27°CDB / 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, 43°FWB (8.3°CDB / 6°CWB)
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 649)	7-11/16 × 55-1/8 × 26-3/4 (195 x 1400 x 649)	7-11/16 × 62-5/8 × 26-3/4 (195 x 1591 x 649)
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	3.66+2.95
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 (36.3)	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 / 67°FWB (27°CDB / 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, 43°FWB (8.3°CDB / 6°CWB)
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			FXAQ07PVJU	FXAQ09PVJU	FXAQ12PVJU
★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	HP	0.054	0.054	0.054
	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 Internal Dia. 1/2)	VP13 (External Dia. 11/16 Internal Dia. 1/2)	VP13 (External Dia. 11/16 Internal Dia. 1/2)
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 / 67°FWB (27°CDB / 19.4°CWB)
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB (8.3°CDB / 6°CWB)
Equivalent ref. piping length: 25ft (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			FXAQ18PVJU	FXAQ24PVJU
★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	HP	0.058	0.058
	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)	ϕ1/4 (6.4) (Flare Connection)	ϕ3/8 (Flare Connection)
	Gas Pipes	in. (mm)	ϕ1/2 (Flare Connection)	ϕ5/8 (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 / 67°FWB (27°CDB / 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, 43°FWB (8.3°CDB / 6°CWB)
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			FXLQ12MVJU9	FXLQ18MVJU9	FXLQ24MVJU9
★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)	23–5/8 × 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 (0.6)	3.04 (0.9)	3.04 (0.9)
Fan	Model		2D14B13	2D14B20	2D14B20
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.034	0.047	0.047
	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)	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)	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 / 67°FWB (27°CDB / 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, 43°FWB (8.3°CDB / 6°CWB)
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			FXNQ12MVJU9	FXNQ18MVJU9	FXNQ24MVJU9
★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 (0.7)	3.04 (0.9)	3.04 (0.9)
Fan	Model		2D14B13	2D14B20	2D14B20
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.034	0.047	0.047
	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)	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)	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 / 67°FWB (27°CDB / 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, 43°FWB (8.3°CDB / 6°CWB)
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.

Air Handling Unit

Model				FXTQ12PAVJU	FXTQ18PAVJU	FXTQ24PAVJU	FXTQ30PAVJU
Power Supply				1 phase, 208/230V, 60Hz			
★1, ★3 Cooling capacity			Btu/h	12,000	18,000	24,000	30,000
★2, ★3 Heating capacity			Btu/h	13,500	20,000	27,000	34,000
Dimensions: (H×W×D)			in. (mm)	46-3/4 × 19-1/2 × 22 (1187 x 495 x 559)		53-1/4 × 22 × 24 (1353 x 559 x 610)	
Coil	Type			Cross fin coil			
	Rows×Stages×FPI			6 × 14 × 15		4 × 22 × 15	
	Face area		ft² (m²)	3.30 (1)		6.02 (1.8)	
Fan	Model			ECM (1/2HP)		ECM (3/4HP)	
	Type			Sirocco fan			
	Motor output		HP	1/2		3/4	
	Airflow rate (H/L)		CFM	400/280	600/420	800/560	1,000/700
	External static pressure		in.H_2O "Wg (psi)	Up to 0.5 (0.180)			
	Drive			Direct drive			
Temperature control				Microprocessor thermostat for cooling and heating			
Air filter				— ★4			
Weight			Lbs (kg)	121 (55)		149 (67.5)	
Piping connections		Liquid	in. (mm)	ϕ1/4 (6.4) (Brazed)		ϕ3/8 (9.5) (Brazed)	
		Gas	in. (mm)	ϕ1/2 (12.7) (Brazed)		ϕ5/8 (15.8) (Brazed)	
		Drain	in. (mm)	ϕ3/4 (19.1) ★5			
Safety devices				Fuse, Fan driver overload protector			
Refrigerant control				Electronic expansion valve			
Connectable outdoor unit				R-410A VRV Series			
Standard accessories				Operation manual, Installation manual			
Drawing No.				C: 3D068193			

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB / 67°FWB (27°CDB / 19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping: 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, 43°FWB (8.3°CDB / 6°CWB)
Equivalent ref. piping: 25ft (7.5 m) (Horizontal)
(★1 and ★2 are the performance for vertical installation.
For horizontal installation, capacity could decrease for about 10%)

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

★4 Air filter is not standard accessory, but please mount it in the duct system of the suction side.

★5 The second drain pan (sub drain pan) must be needed as field supply parts.

Air Handling Unit

Model				FXTQ36PAVJU	FXTQ42PAVJU	FXTQ48PAVJU	FXTQ54PAVJU
Power Supply				1 phase, 208/230V, 60Hz			
★1, ★3 Cooling capacity			Btu/h	36,000	42,000	48,000	54,000
★2, ★3 Heating capacity			Btu/h	40,000	47,000	54,000	60,000
Dimensions: (H×W×D)			in. (mm)	53-1/4 × 22 × 24 (1353 x 559 x 610)			
Coil	Type			Cross fin coil			
	Rows×Stages×FPI			4×22×15	8×22×15		
	Face area		ft² (m²)	6.02 (1.8)			
Fan	Model			ECM(3/4HP)			
	Type			Sirocco fan			
	Motor output		HP	3/4			
	Airflow rate (H/L)		CFM	1,200/840	1,400/980	1,600/1,120	1,800/1,260
	External static pressure		"Wg (psi)	Up to 0.5 (0.0180)			
	Drive			Direct drive			
Temperature control				Microprocessor thermostat for cooling and heating			
Air filter				— ★4			
Weight			Lbs (kg)	149 (67.5)	169 (77)		
Piping connections		Liquid	in. (mm)	ϕ3/8 (9.5) (Brazed)			
		Gas	in. (mm)	ϕ5/8 (15.8) (Brazed)			
		Drain	in. (mm)	ϕ3/4 (19.1) ★5			
Safety devices				Fuse, Fan driver overload protector			
Refrigerant control				Electronic expansion valve			
Connectable outdoor unit				R-410A VRV Series			
Standard accessories				Operation manual, Installation manual			
Drawing No.				C: 3D068193			

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB / 67°FWB (27°CDB / 19.4°CWB)
Outdoor temperature: 95°FDB (35°CDB)
Equivalent ref. piping: 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, 43°FWB (8.3°CDB / 6°CWB)
Equivalent ref. piping: 25ft (7.5 m) (Horizontal)
(★1 and ★2 are the performance for vertical installation.
For horizontal installation, capacity could decrease for about 10%)

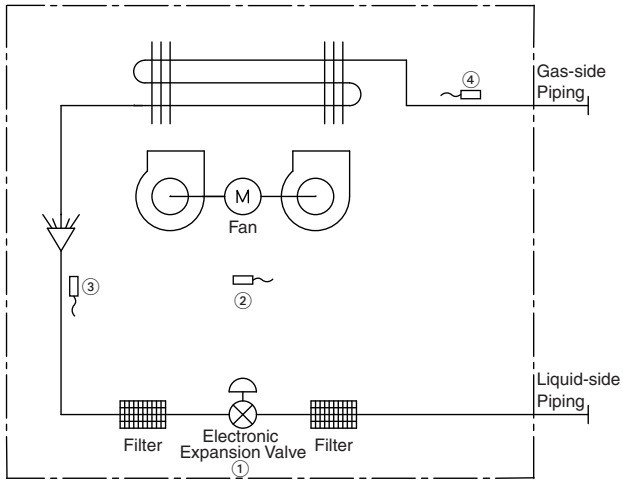
★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Air filter is not standard accessory, but please mount it in the duct system of the suction side.

★5 The second drain pan (sub drain pan) must be needed as field supply parts.

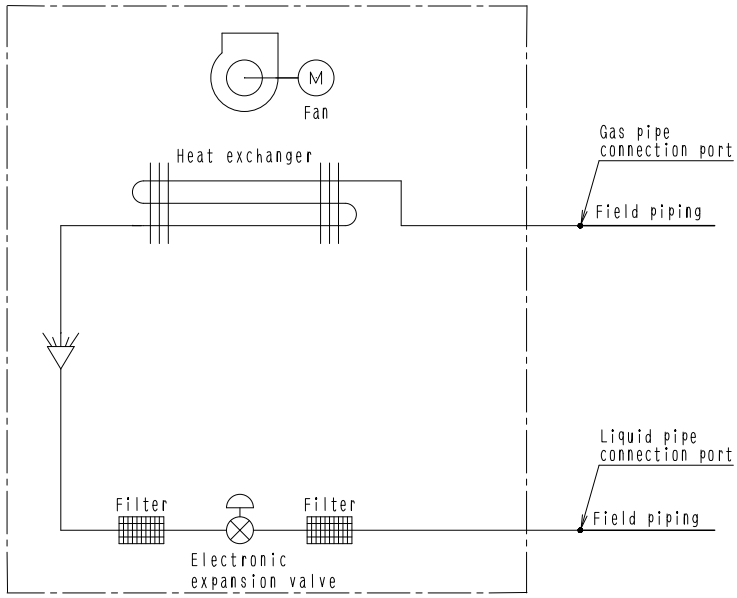
2. Refrigerant Circuit

FXFQ, FXZQ, FXDQ, FXMQ, FXHQ, FXAQ, FXLQ, FXNQ



No.	Name	Symbol	Function
①	Electronic expansion valve	Y1E	Used to control superheated degree of gas when cooling and subcooled degree when heating. (Max. 2000 pls)
②	Suction air thermistor	R1T	Used for thermostat control.
③	Liquid pipe thermistor	R2T	Used to control superheated degree of gas when cooling and subcooled degree when heating.
④	Gas pipe thermistor	R3T	Used for gas superheated degree control when cooling.

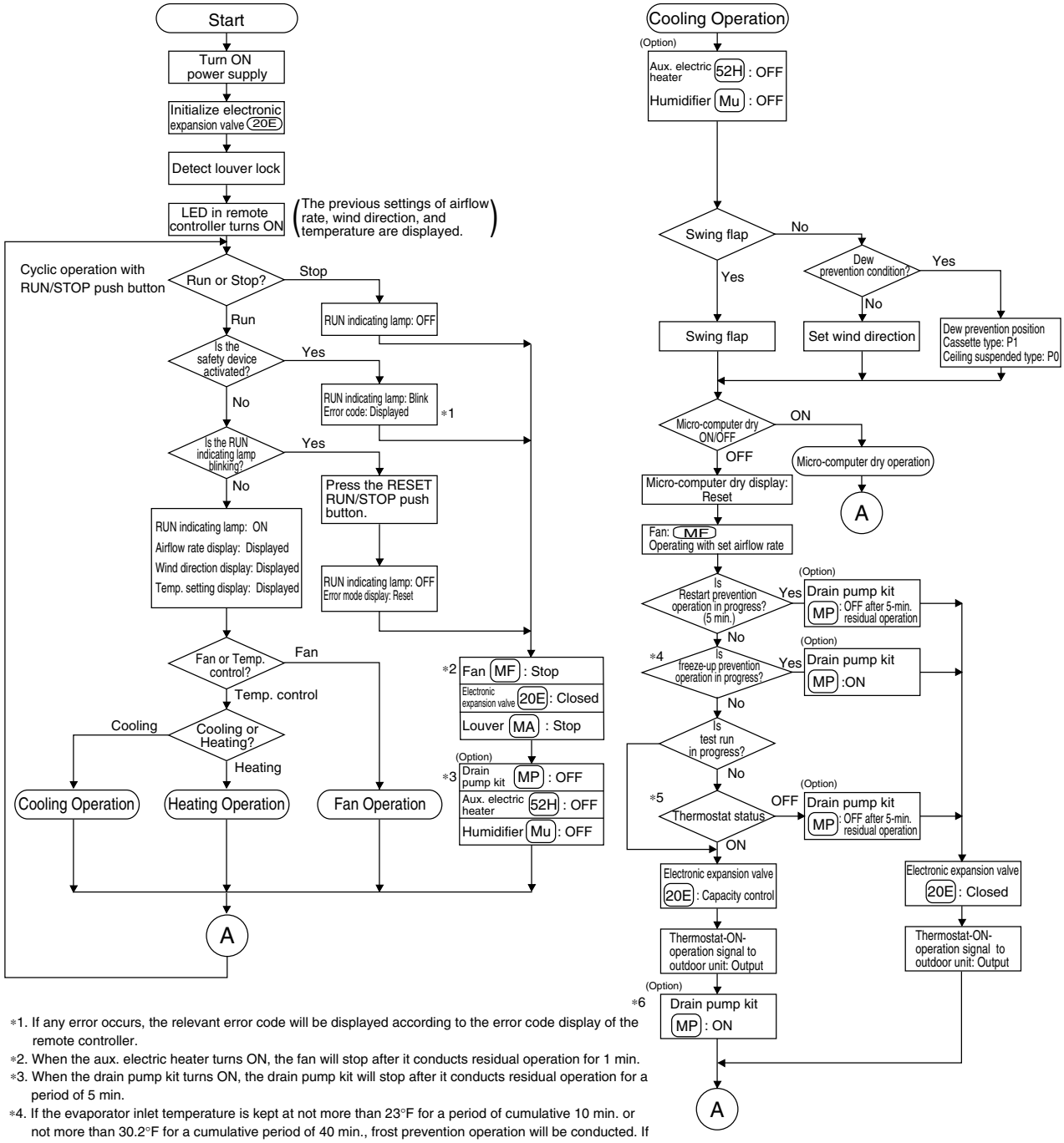
FXTQ



C: 4D068194

Capacity	GAS	Liquid
12/18PA	ϕ1/2	ϕ1/4
24/30/36/42/48/54PA	ϕ5/8	ϕ3/8

3. Operation Flow Chart



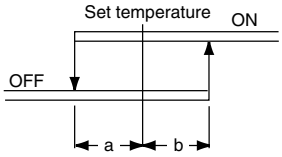
*1. If any error occurs, the relevant error code will be displayed according to the error code display of the remote controller.

*2. When the aux. electric heater turns ON, the fan will stop after it conducts residual operation for 1 min.

*3. When the drain pump kit turns ON, the drain pump kit will stop after it conducts residual operation for a period of 5 min.

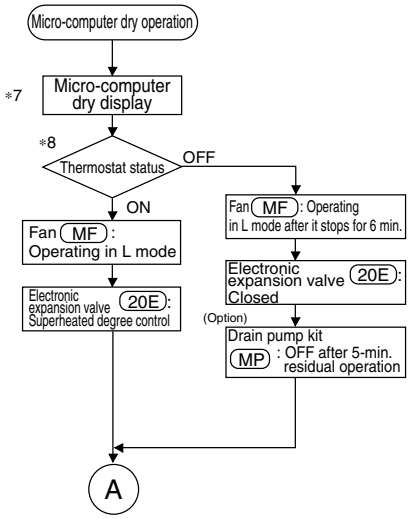
*4. If the evaporator inlet temperature is kept at not more than 23°F for a period of cumulative 10 min. or not more than 30.2°F for a cumulative period of 40 min., frost prevention operation will be conducted. If the evaporator inlet temperature is kept at not less than 44.6°F for a consecutive period of 10 min., the frost prevention operation will be reset.

*5. Thermostat status



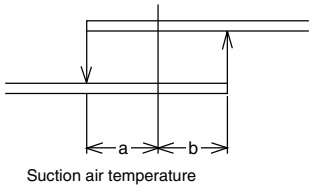
Suction air temperature
a = b = 1
(a = b = 0.5 is only available for the FXFQ and FXHQ series.)

*6. The FXFQ and FXKQ series have the drain pump as standard equipment.

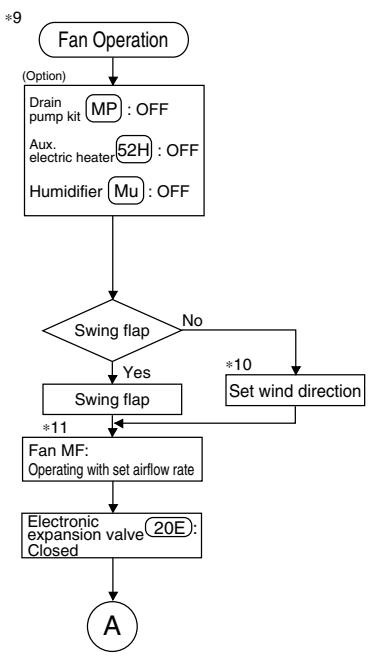


∗7. Micro-computer dry display
No set temperature and airflow rate of the remote controller are displayed.

∗8. Thermostat status
Set temperature when operating the micro-computer dry mechanism.



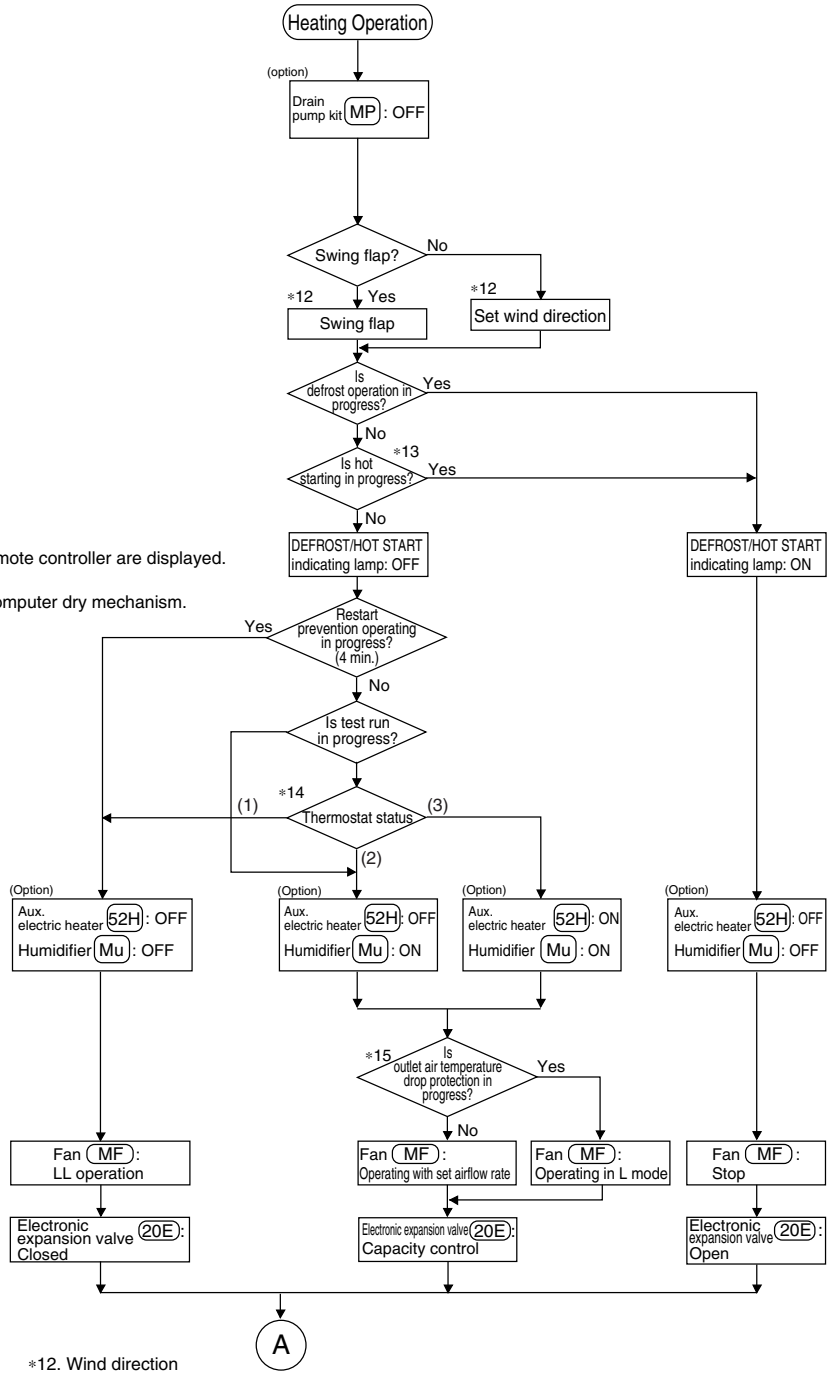
Suction air temperature



∗9. Fan operation
By setting the remote controller to Fan, the fan will operate with thermostat OFF in set temperature control operation mode.

∗10. Set wind direction
According to wind direction instruction from the remote controller, the wind direction is set to 100% horizontal while in heating operation.

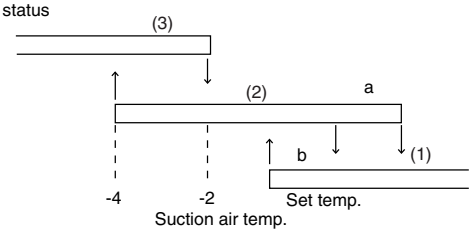
∗11. Fan
According to fan speed instruction from the remote controller, the fan is put into operation in LL mode while in heating operation.



∗12. Wind direction
When the heating thermostat turns OFF, the wind direction will be set to 100% horizontal.

∗13. Hot start
If the condenser inlet temperature exceeds 93.2°F at the time of starting operation or after the completion of defrost operation, or until 3 minutes pass or Tc is above 125.6°F, hot starting will be conducted.

∗14. Thermostat status



Suction air temp.

∗15. Outlet air temperature drop protection
When the set temperature is below 75.2°F or the electronic expansion valve opening is small, the protection will be activated.

4. Thermistor in Remote Controller

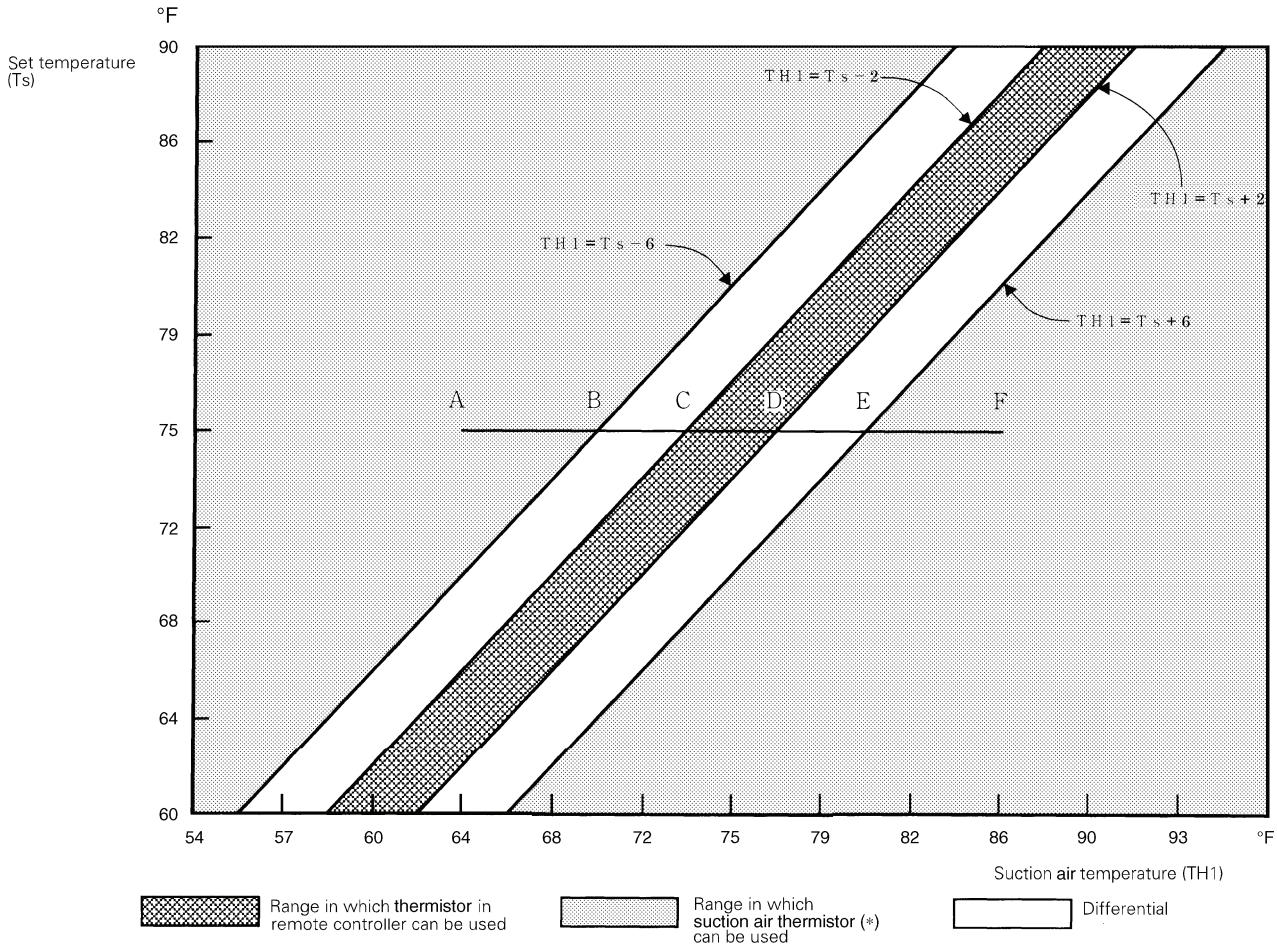
Temperature is controlled by both the thermistor in remote controller and suction air thermistor (∗) in the indoor unit. (This is however limited to when the field setting for the thermistor in remote controller is set to “Use.”)

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

∗ For FTQ: Remote sensor (Optional accessory)

Cooling

If there is a significant difference in the set temperature and the suction air temperature, fine adjustment control is carried out using suction air thermistor (∗) in the indoor unit, or using the sensor in the remote controller near the position of the user when the suction air temperature is near the set temperature.



■ **Ex: When cooling**

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

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

Suction air thermistor (∗) is used for temperatures from 64°F to 73°F (A → C).

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

Suction air thermistor (∗) is used for temperatures from 81°F to 86°F (E → F).

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

Suction air thermistor (∗) is used for temperatures from 86°F to 77°F (F → D).

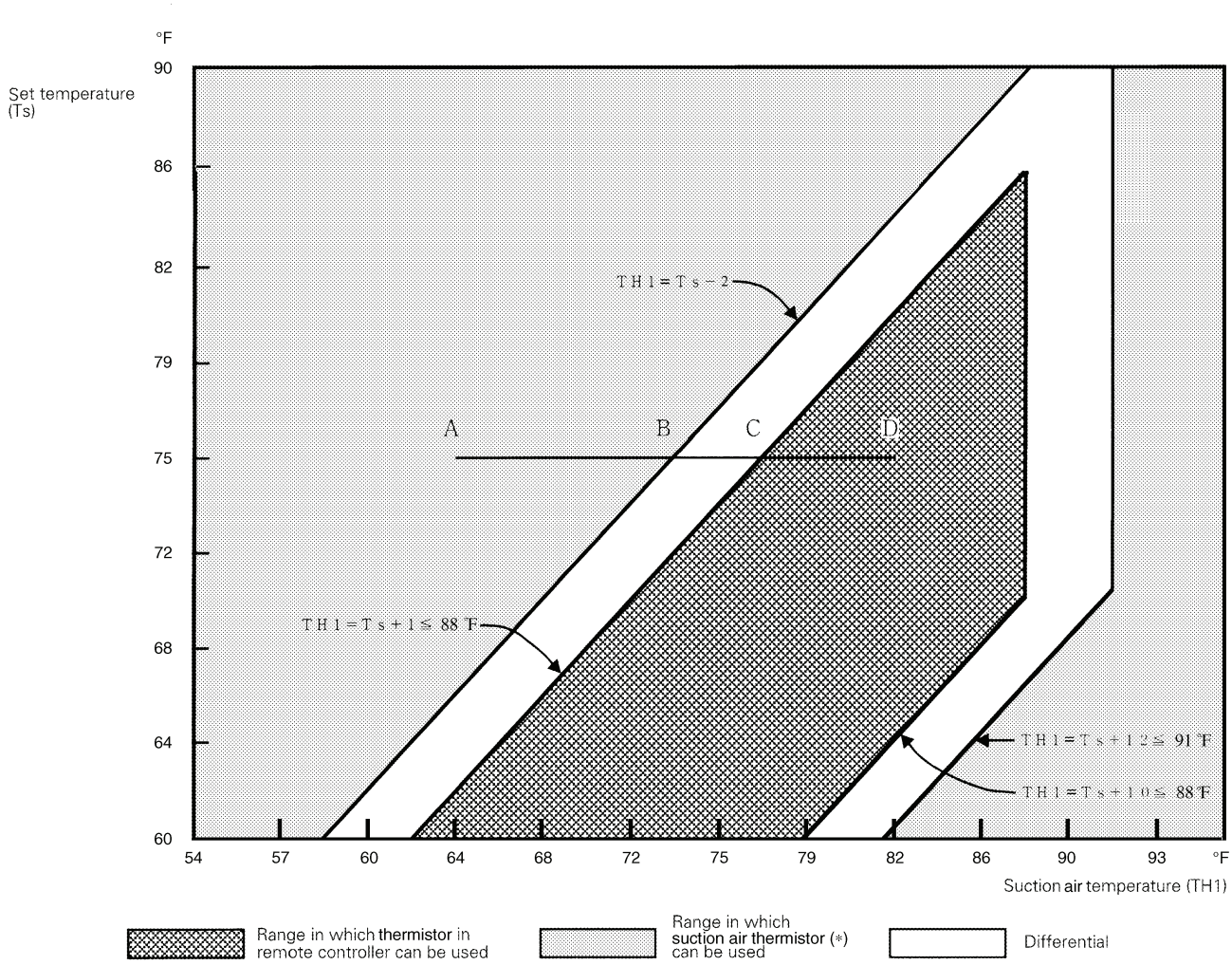
Remote controller thermistor is used for temperatures from 77°F to 70°F (D → B).

Suction air thermistor (∗) is used for temperatures from 70°F to 64°F (B → A).

Note: ∗ For FTQ: Remote sensor (Optional accessory)

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 suction air thermistor (∗) only, the unit may therefore be turned off by the thermostat before the lower part of the room reaches the set 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 thermistor in remote controller can be used so that suction air temperature is higher than the set temperature.



■ **Ex: When heating**

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

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

Suction air thermistor (∗) is used for temperatures from 64°F to 77°F (A → C).

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

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

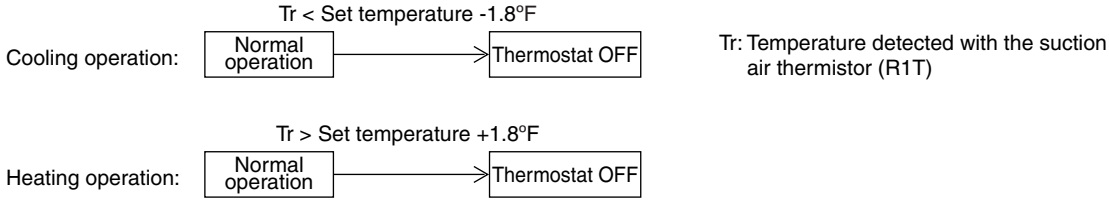
Remote controller thermistor is used for temperatures from 82°F to 73°F (D → B).

Suction air thermistor (∗) is used for temperatures from 73°F to 64°F (B → A).

Note: ∗ For FTQ: Remote sensor (Optional accessory)

4.1 Thermostat Control while in Normal Operation

VRV multi systems are set at factory to thermostat control mode using the remote controller. While in normal thermostat differential control mode (i.e., factory setting mode), the thermostat turns OFF when the system reaches a temperature of -1.8°F from the set temperature while in cooling operation or of +1.8°F from that while in heating operation.

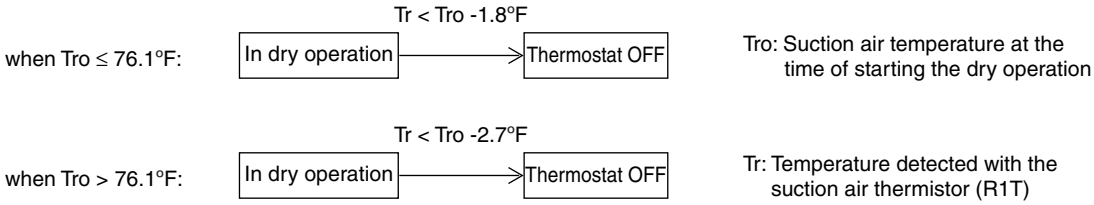


While in a single remote controller group control, the body thermostat is only used from this control. Furthermore, while in heating operation, cassette-mounted indoor units conduct the thermostat control by a value compensated by -3.6°F for the value detected with the body thermostat. (Through field settings, the thermostat differential setting can be changed from 1.8°F to 0.9°F. For details on the changing procedure, refer to information on page onward.)

4.2 Thermostat Control in Dry Operation

While in dry operation, the thermostat control is conducted according to a suction air temperature at the time of starting the dry operation.

Assuming that the suction air temperature at the time of starting the dry operation is Tro and the suction air temperature in operation is Tr,



Furthermore, while in dry operation mode, fans operate at L flow rate, stops for a period of 6 minutes while the thermostat is OFF, and then return to operation at L flow rate. (This control is used to prevent a rise in indoor temperature while in thermostat OFF mode.)

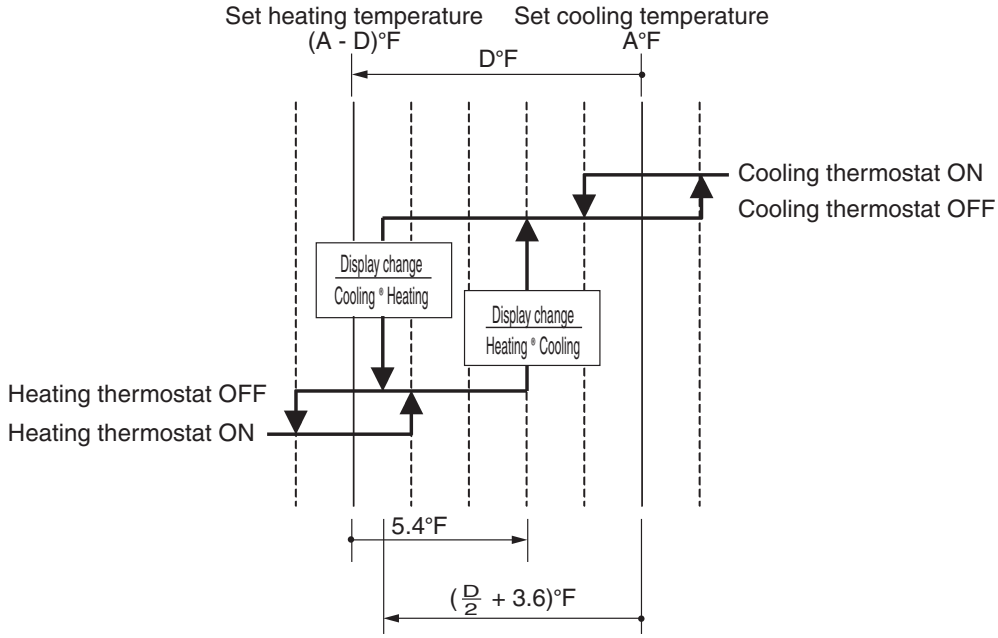
4.3 Thermostat Control with Operation Mode Set to "AUTO"

When the operation mode is set to "AUTO" on the remote controller, the system will conduct the temperature control shown below.

Furthermore, setting changes of the differential value (D°F) can be made according to information in the "Field settings from remote controller (P.297 and later)" section.

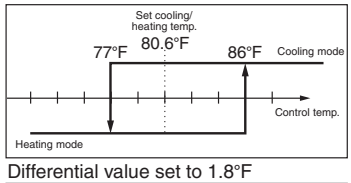
Mode No.	First code No.	Contents of setting	Second code No.							
			01	02	03	04	05	06	07	08
12	4	Differential value while in "AUTO" operation mode	0°F	1.8°F	3.6°F	5.4°F	7.2°F	9.0°F	10.8°F	12.6°F

: Factory setting

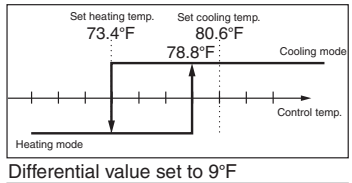


(Ex.) When automatic cooling temperature is set to 80.6°F:

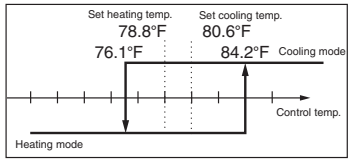
Differential value :0°F



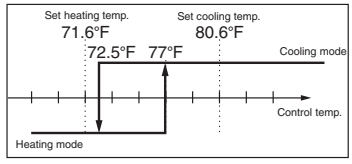
Differential value set to 7.2°F



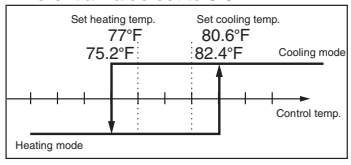
Differential value set to 1.8°F



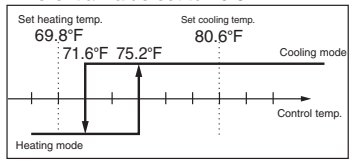
Differential value set to 9°F



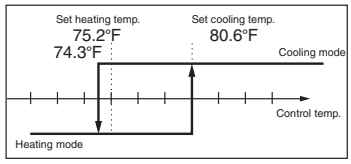
Differential value set to 3.6°F



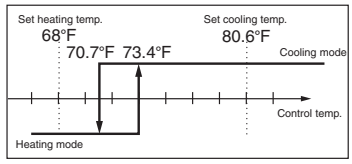
Differential value set to 10.8°F



Differential value set to 5.4°F



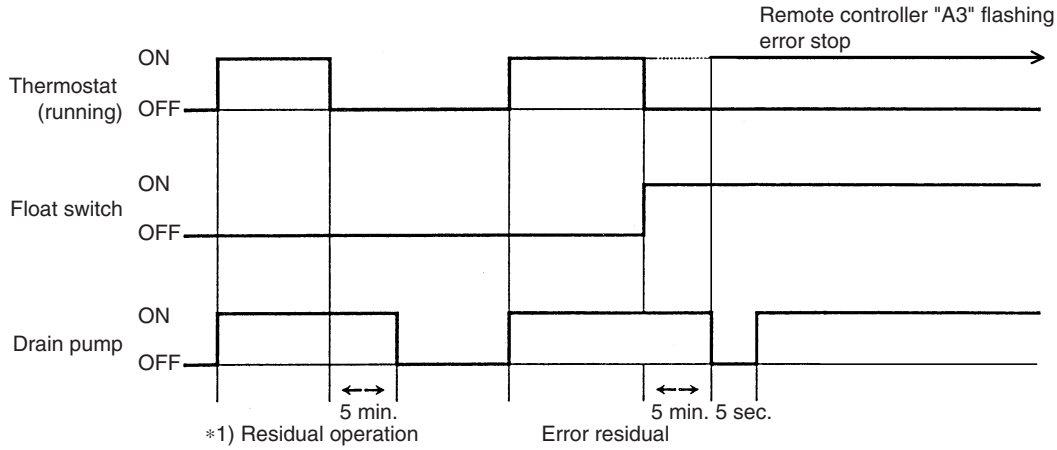
Differential value set to 12.6°F



5. Drain Pump Control

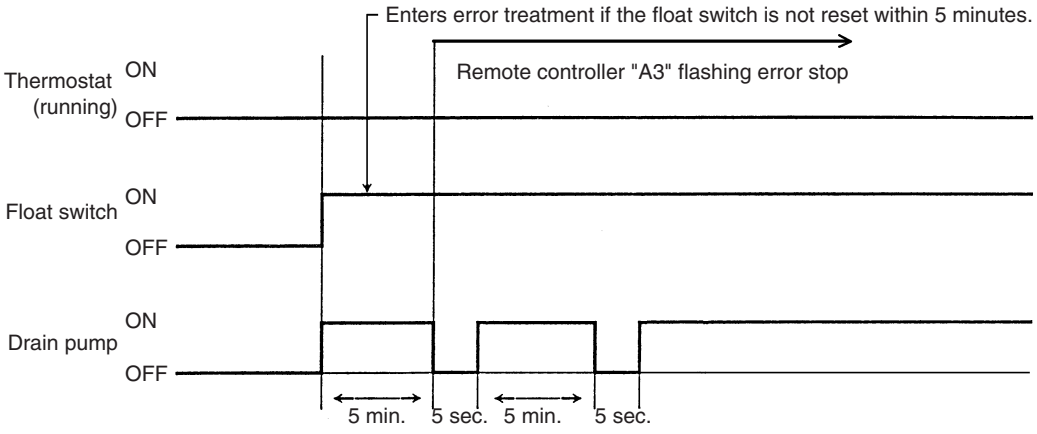
1. The drain pump is controlled by the ON/OFF buttons (4 button (1) - (4) given in the figure below).

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

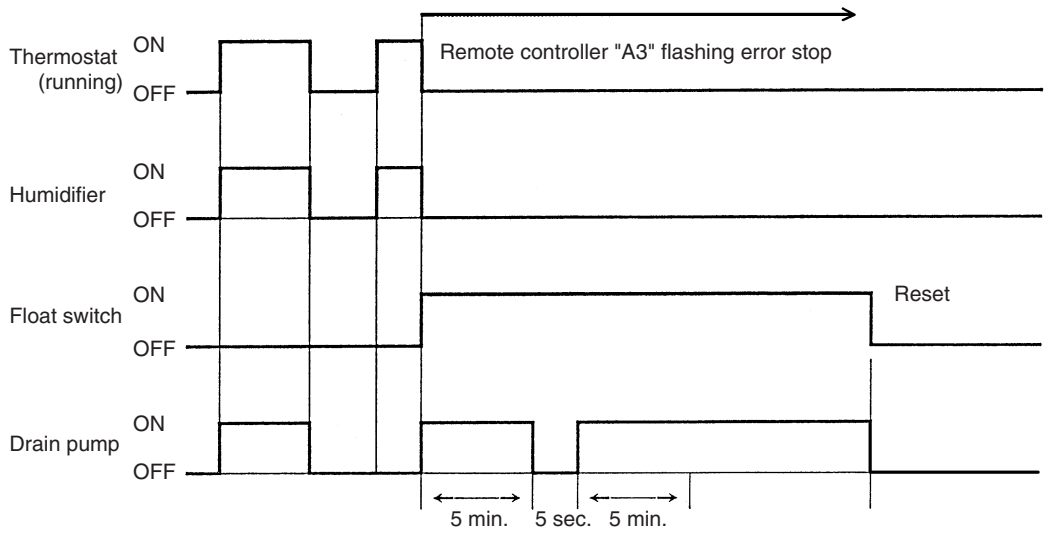


∗ 1. The objective of residual operation is to completely drain any moisture adhering to the fin of the indoor unit heat exchanger when the thermostat goes off during cooling operation.

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

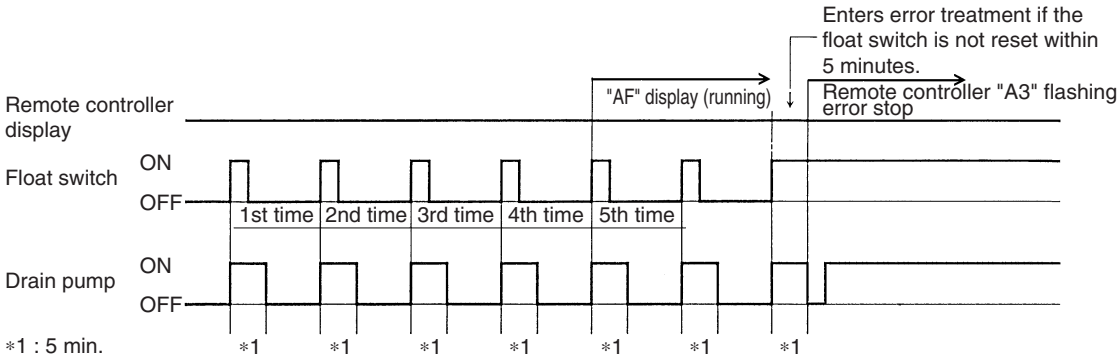


5.3 When the Float Switch is Tripped During Heating Operation:



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.

5.4 When the Float Switch is Tripped and “AF” is Displayed on the Remote Controller:



Note: If the float switch is tripped five times in succession, a drain error is determined to have occurred. “AF” is then displayed as operation continues.

6. Control of Electronic Expansion Valve

Electronic expansion valves in indoor units have the functions of conducting superheated degree control in cooling operation and subcooled degree control in heating operation. However, if the indoor units receive any control command such as a protection control command or a special control command from the outdoor unit, the units will give a priority to the control command.

• Superheated degree control in cooling operation

This function is used to adjust the opening of the electronic expansion valve so that superheated degree (SH), which is calculated from the detection temperature (Tg) of the gas pipe thermistor (R3T) and the detection temperature (T1) of the liquid temperature thermistor (R2T) of the indoor unit, will come close to a target superheated degree (SHS).
At that time, correction to the superheated degree is made according to the differences (ΔT) between set temperature and suction air thermistor temperature.

SH = Tg - T1
SH: Evaporator outlet superheated degree (°F)
Tg: Indoor unit gas pipe temperature (R3T)
T1: Indoor unit liquid pipe temperature (R2T)

SHS (Target SH value)
SHS: Target superheated degree
- Normally 9°F.
- As ΔT (Remote controller set temp. - Suction air temp.) becomes larger, SHS becomes lower.
- As ΔT (Remote controller set temp. - Suction air temp.) becomes smaller, SHS becomes higher.

• Subcooled degree control in heating operation

This function is used to adjust the opening of the electronic expansion valve so that the high pressure equivalent saturated temperature (Tc), which is converted from the detected pressure of the high pressure sensor in the outdoor unit, and the subcooled degree (SC), which is calculated from the detected temperature (T1) of the liquid temperature thermistor (R2T) in the indoor unit, will come close to the target subcooled degree (SCS).
At that time, corrections to the subcooled degree are made according to differences (ΔT) between set temperature and suction air thermistor temperatures.

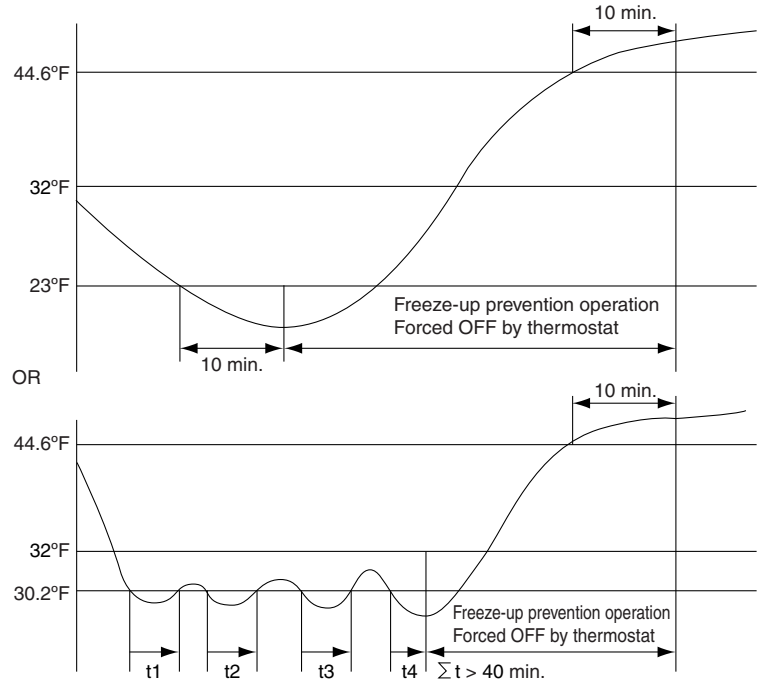
SC = Tc - T1
SC: Condenser outlet subcooled degree (°F)
Tc: High pressure equivalent saturated temperature detected by the high pressure sensor (S1NPH)
T1: Indoor unit liquid pipe temperature (R2T)

SCS (Target SC value)
SCS: Target subcooled degree
- Normally 9°F.
- As ΔT (Remote controller set temp. - Suction air temp.) becomes larger, SCS becomes lower.
- As ΔT (Remote controller set temp. - Suction air temp.) becomes lower, SCS becomes larger.

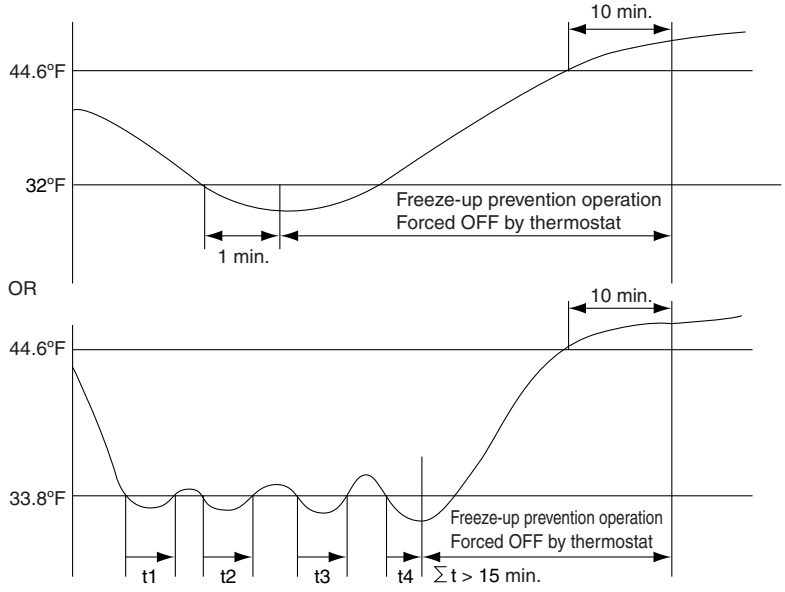
7. Freeze-up Prevention

Freeze-up 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-up prevention operation in accordance with the following conditions, and is also set in accordance with the conditions given below.
When freeze-up prevention is activated, the electronic expansion valve is closed, the drain pump turns ON and the fan tap is fixed to L airflow. When the following conditions for stopping are satisfied, it returns.
Conditions for starting freeze-up prevention: Temperature is 30.2°F or less for total of 40 min., or temperature is 23°F or less for total of 10 min.
Conditions for stopping freeze-up prevention: Temperature is 44.6°F or more for 10 min. continuously



[Conditions for starting when air flow direction is two-way or three-way]
Conditions for starting: Temperature is 33.8°F or less for a total of 15 minutes or 32°F or less for 1 minute continuously.

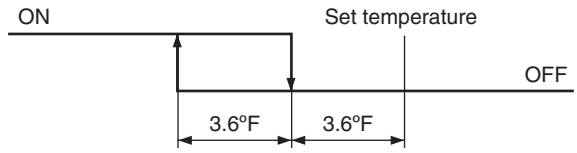


8. Heater Control (Optional PCB KRP1B ... is required.)

The heater control is conducted in the following manner.

[Normal control]

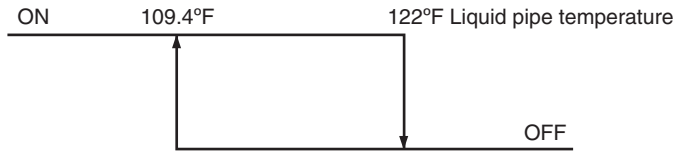
While in heating operation, the heater control (ON/OFF) is conducted as shown on the right.



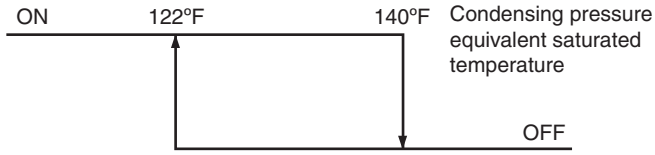
[Overload control]

When the system is overloaded in heating operation, the heater will be turned OFF in the following two manners.

(1) The heater control (ON/OFF) is conducted through the liquid pipe temperature (R2T) of the indoor unit.



(2) The heater control (ON/OFF) is conducted by converting the heater temperature into the condensing pressure equivalent saturated temperature (Tc) according to the temperature detection through the high pressure sensor (S1NPH) of the outdoor unit.



[Fan residual operation]

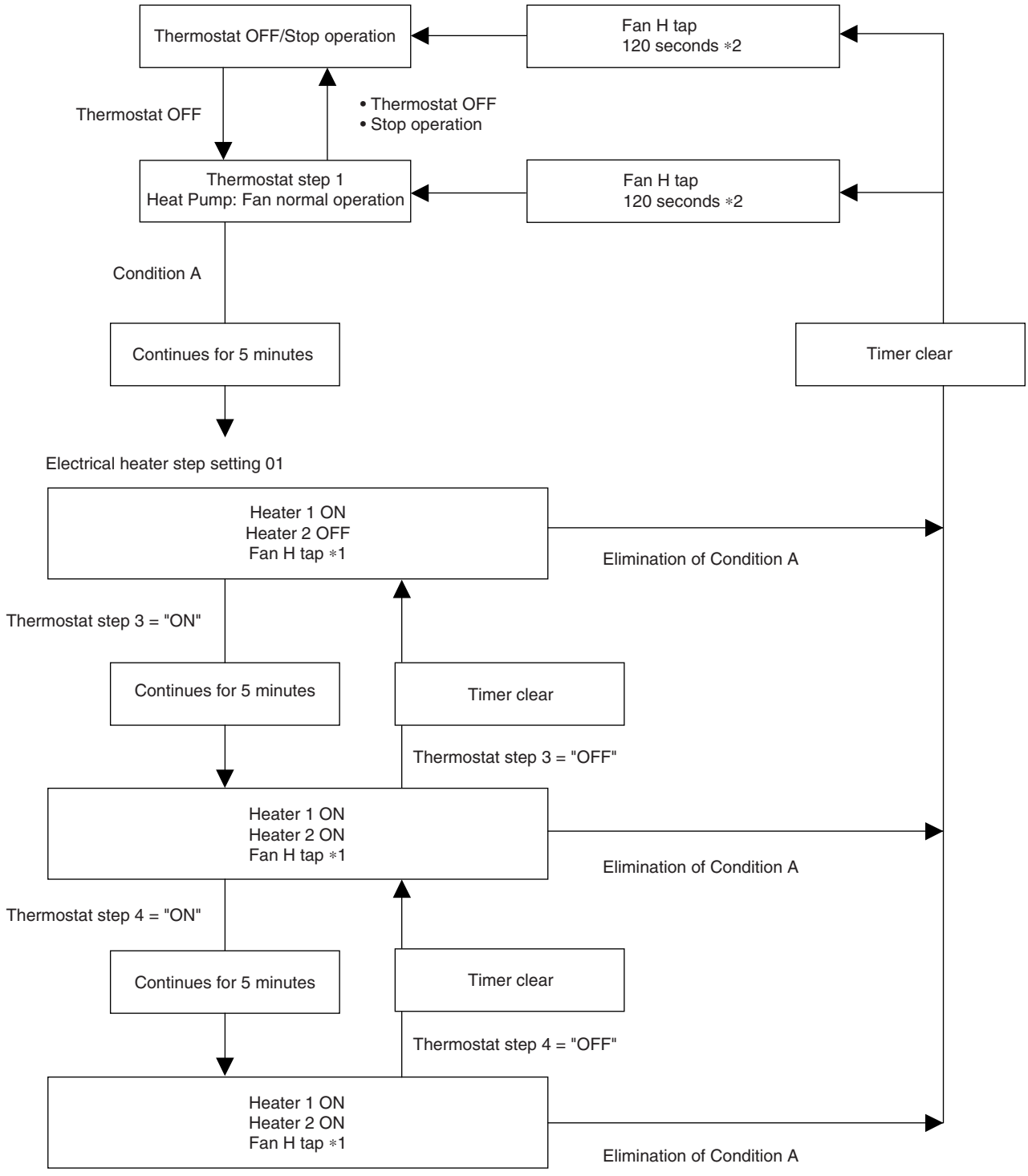
While the heater turns OFF, in order to prevent the activation of the thermal protector, the fan conducts residual operation for a given period of time after the heater turns OFF. (This operation is conducted regardless of with or without heater equipped.)

Residual operation time = 100 seconds on ceiling suspended type or 60 seconds on other types

8.1 Heater Control (FXTQ)

8.1.1 Auxiliary Heater Control

If heating is insufficient in heat pump system alone, an electrical heater is to be used as the auxiliary heater. The following shows the ON/OFF conditions for the electric heater.



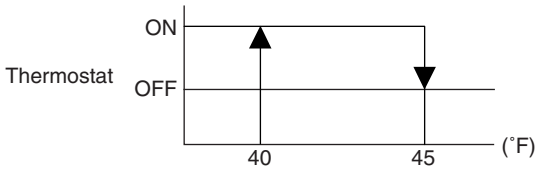
Condition A

& (
- Thermostat step 2 = "ON"
- Heating mode
- Not during test operation
- Not during control operation
- High pressure condition = "ON" ∗3
- Liquid pipe temperature condition = "ON" ∗4
- Electrical heater setting = "3"

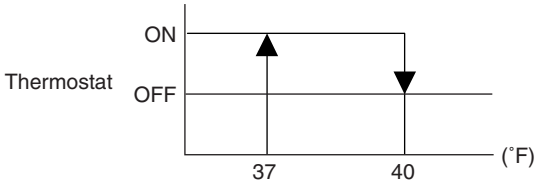
Note: ∗1: Fixing of the fan H tap

∗2: The operation should continue for a certain period of time after the heater turns OFF.

∗3: High pressure condition



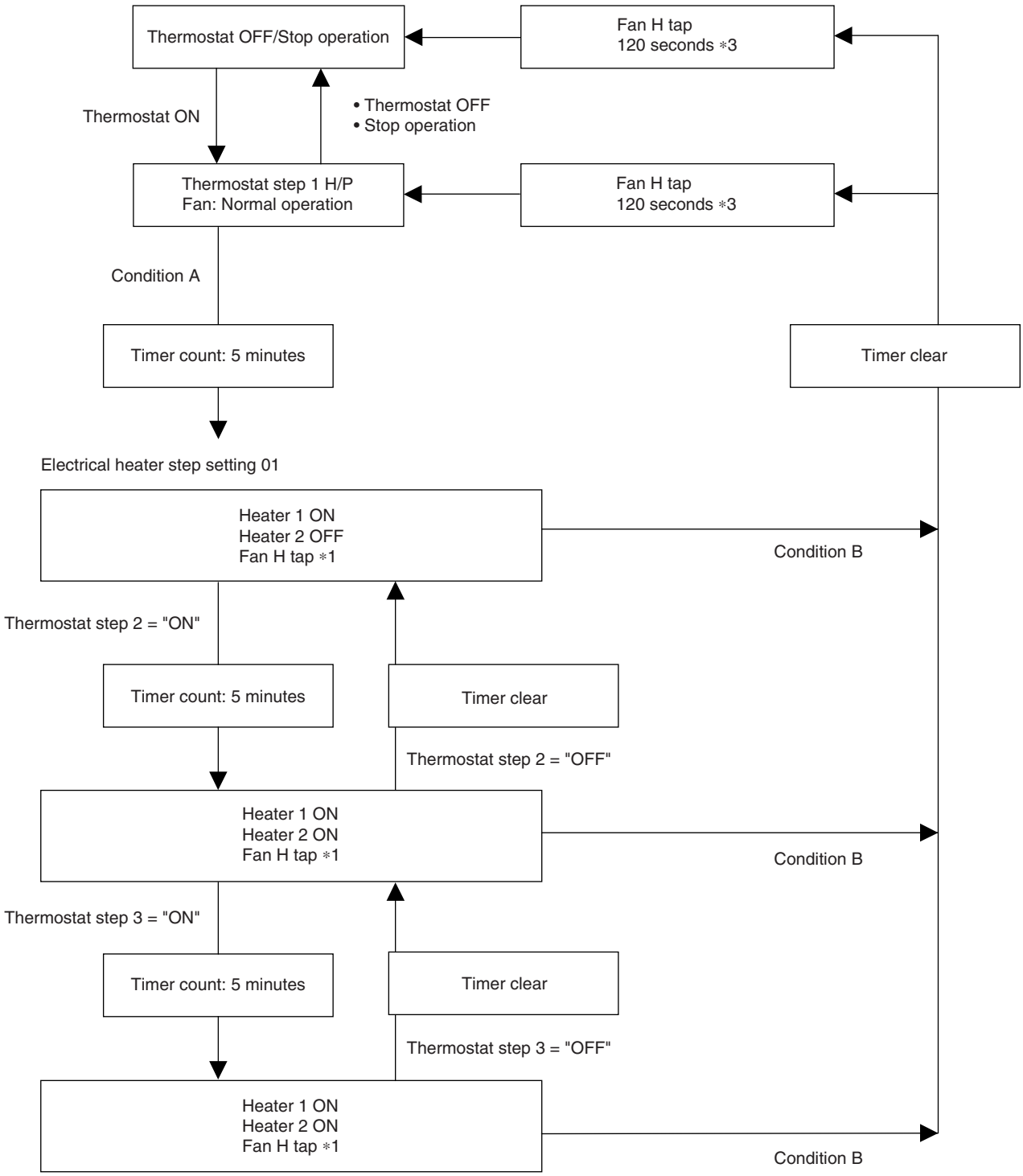
∗4: Liquid pipe temperature condition



8.1.2 Heat Pump Lockout Mode

During heating operation, users can select an electrical heater for heating. For this, signals are sent using ABC terminal of outdoor unit PCB.

When the hot-water heating signal is received from the outdoor unit PCB, heating operation is performed only with the heater as manual backup operation. The ON/OFF conditions for this electrical heater are shown below.



Condition A

& (• Heating mode
• Thermostat step 1 = "ON"
• Not during fan residual operation
& (OR (• [Electrical heater setting] = "01"
• [Electrical heater setting] = "03")
• Hot-water heater = "1" (ON))

Condition B

OR (• Elimination of Condition A
• Indoor unit error [Stop due to error]
• Indoor unit error [Abnormal stop]
• Indoor unit error [Remote control thermistor error]
• Indoor unit error [Suction air thermistor error]
• During defrosting or oil return operation) } Heater backup prohibiting conditions ∗2

Note: ∗1: Fixing of the fan H tap.
∗2: The heater backup prohibiting conditions are prioritized. Even when the heater ON conditions are met, the heater is turned OFF when the prohibiting conditions are met.
∗3: The operation must continue for a certain period of time after the heater turns OFF.
4: The thermostat steps for this control comply with the “9. 4 Step Thermostat Processing (FXTQ)”.

9. 4 Step Thermostat Processing (FXTQ)

[Outline]

The thermostat ON/OFF for the indoor unit is controlled in accordance with [Thermostat Step 1]. The heater ON/OFF operation during heating is controlled in accordance with [Thermostat Step 2, 3, or 4] or [Thermostat Step 1, 2, or 3].
For more details of the heater, see 8. Heater control.

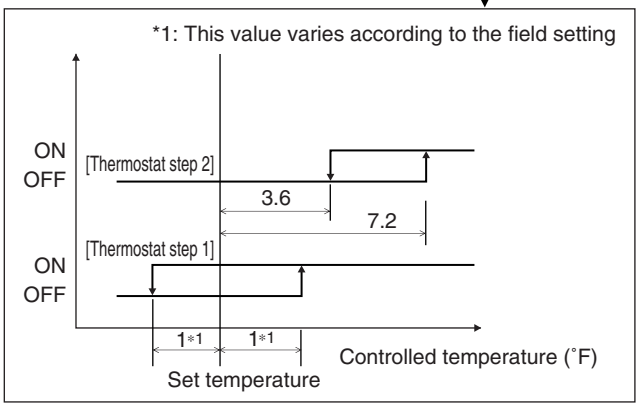
[Detail]

& (• Drain pump abnormal output = OFF
• Thermostat OFF error has not occurred.
• Forced thermostat OFF = "0" (OFF)
• Normal operation = ON
OR (• Remote control operation mode = "Heating"
• Not during anti-freeze operation)

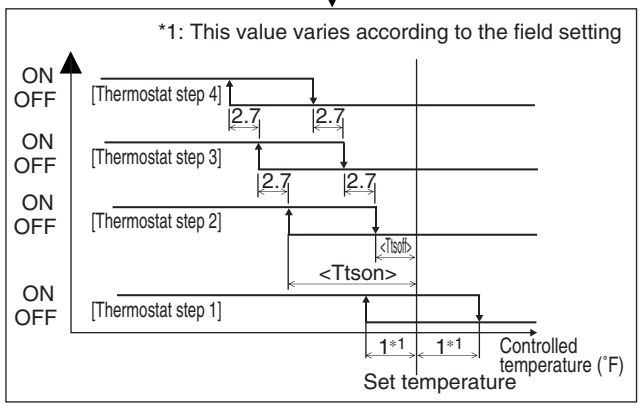
• [Thermostat step 1] = "OFF"
• [Thermostat step 2] = "OFF"
• [Thermostat step 3] = "OFF"
• [Thermostat step 4] = "OFF"

→ Perform the processing in the following chart.
← Elimination conditions of the above

① Cooling



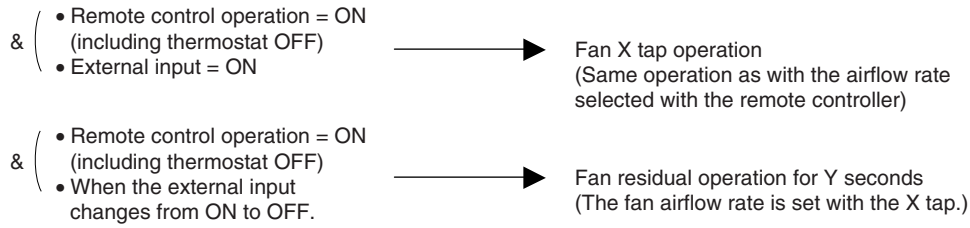
② Heating



10.Interlocked with External Equipment (Only for FTQ)

10.1 Humidifier

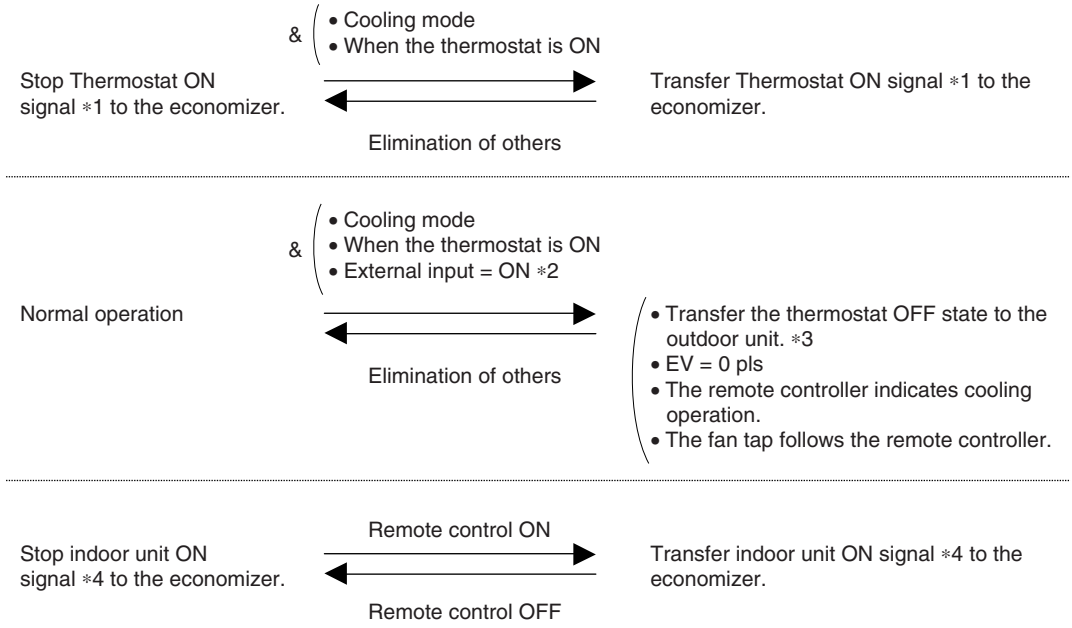
When a humidifier is connected onsite, the fan operates with the airflow rate set of the remote controller or with the H tap.



Note:
1. This control is different from connection of humidifier and it is used for humidifiers locally connected in North America.
2. External input ON is an input signal to the “X12A” terminal on the PCB for additional I/O.

10.2 Economizer

When indoor and outdoor temperatures are reversed, the compressor is stopped to let in the outdoor air to save energy.
This operation is called economizer operation, and the equipment to detect indoor and outdoor temperatures and open and close the damper to perform this operation is called an economizer.
The economizer detects indoor and outdoor temperatures, informs the air conditioner that the economizer operation is ready, and opens and closes the damper.
The indoor unit stops the outdoor unit when it receives a signal from the economizer and performs air supply operation.
When the indoor temperature is cooled down sufficiently by the economizer operation, and it is no longer necessary (thermostat OFF), the indoor unit outputs a signal to the economizer to close the damper.



Note:
∗1 Thermostat ON signal: A signal to turn ON the indoor unit thermostat and allow the economizer to open the damper.
It turns ON the relay on the “X8A side of X23A” on the PCB for additional I/O.
∗2 External input ON is an input signal to the “X11A” terminal on the PCB for additional I/O.
∗3 To stop the compressor while the economizer is in operation to save energy.
∗4 Remote control ON signal: Contact output which shows the operating status of the indoor unit.
This signal turns on the relay “on the opposite side of X8A of X23A” on the PCB for additional I/O.

10.3 Air Purifier (UV lamp)

When an air purifier is connected onsite, the fan is operated with the airflow rate set of the remote controller or with the H tap.

Note: ∗1 External input ON is an input signal to the “X25A” terminal on the PCB for additional I/O.

11.List of Swing Flap Operations

Swing flaps operate as shown in table below.

			Fan	Flap		
				FXFQ	FXHQ	FXAQ
Heating	Hot start from defrosting operation	Swing	OFF	Horizontal	Horizontal	Horizontal
		Wind direction set	OFF	Horizontal	Horizontal	Horizontal
	Defrosting operation	Swing	OFF	Horizontal	Horizontal	Horizontal
		Wind direction set	OFF	Horizontal	Horizontal	Horizontal
	Thermostat OFF	Swing	LL	Horizontal	Horizontal	Horizontal
		Wind direction set	LL	Horizontal	Horizontal	Horizontal
	Hot start from thermostat OFF mode (for prevention of cold air)	Swing	LL	Horizontal	Horizontal	Horizontal
		Wind direction set	LL	Horizontal	Horizontal	Horizontal
	Stop	Swing	OFF	Horizontal	Horizontal	Totally closed
		Wind direction set	OFF	Horizontal	Horizontal	Totally closed
Cooling	Thermostat ON in dry operation using micro-computer	Swing	L*1	Swing	Swing	Swing
		Wind direction set	L*1	Set	Set	Set
	Thermostat OFF in dry operation using micro-computer	Swing	OFF or L	Swing	Swing	Swing
		Wind direction set		Set	Set	Set
	Thermostat OFF in cooling	Swing	Set	Swing	Swing	Swing
		Wind direction set	Set	Set	Set	Set
	Stop	Swing	OFF	Horizontal	Horizontal	Totally closed
		Wind direction set	OFF	Set	Horizontal	Totally closed
	Micro-computer control (including cooling operation)	Swing	L	Swing	Swing	Swing
		Wind direction set	L	Set	Set	Set

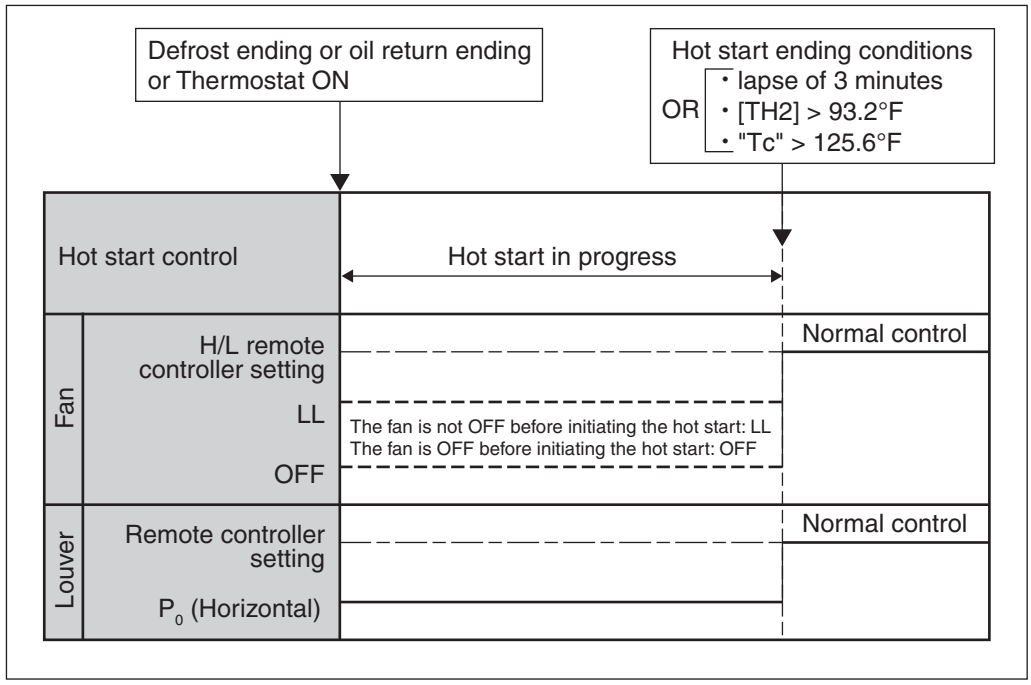
*1. L or LL only on FXFQ models

12.Hot Start Control (In Heating Only)

At startup with thermostat ON or after the completion of defrosting in heating operation, the indoor unit fan is controlled to prevent cold air from blasting out and ensure startup capacity.

[Detail of operation]

When either the **start condition 1** or the **start condition 2** is established, the operations shown below will be conducted.

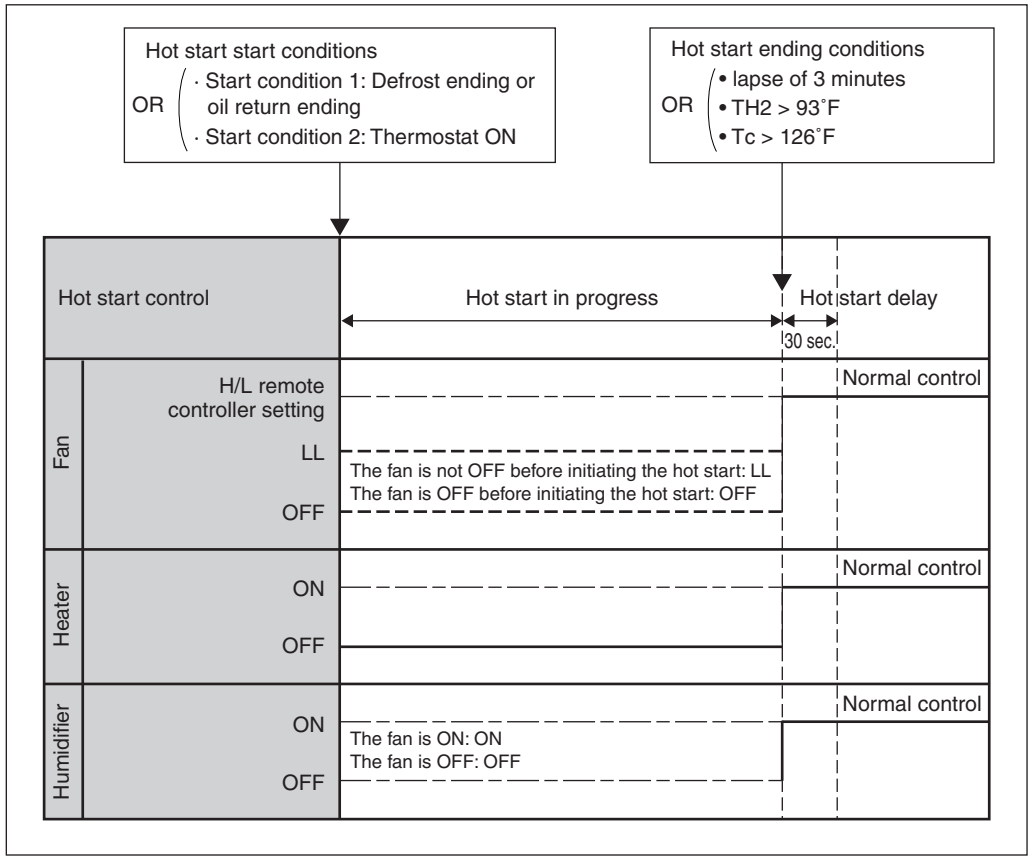


■ **FTQ**

At startup with thermostat ON or after the completion of defrosting in heating operation, the indoor unit fan is controlled to prevent cold air from blasting out and ensure startup capacity.

[Detail of operation]

When either the **start condition 1** or the **start condition 2** is established, the operations shown below will be conducted.

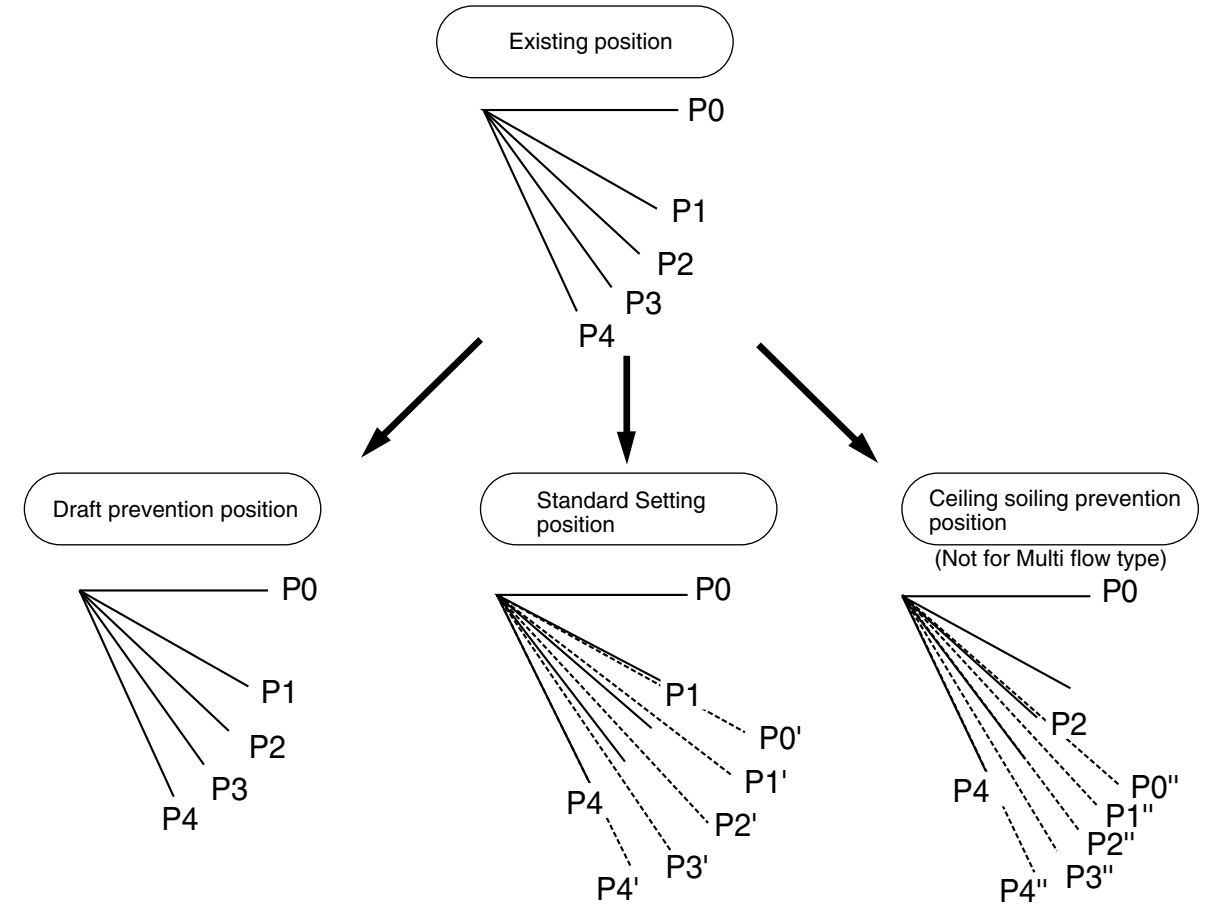


TH_2: Temperature detected with the gas thermistor

TC : High pressure equivalent saturated temperature

13.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. (This feature is available on double flow, multi-flow and corner types.)



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.

14.Field Setting

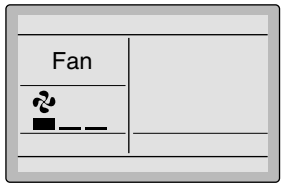
14.1 Field Setting from Remote Controller

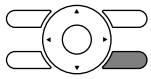
Individual function of indoor unit can be changed from the remote controller. At the time of installation or after service inspection / repair, make the local setting in accordance with the following description. Wrong setting may cause error.
(When optional accessory is mounted on the indoor unit, setting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

14.1.1 Wired Remote Controller <BRC1E71>

<Basic screen>

1

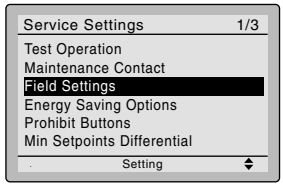


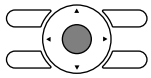


Press and hold Cancel button for 4 seconds or more during backlight lit.

<Service Settings menu screen>

2



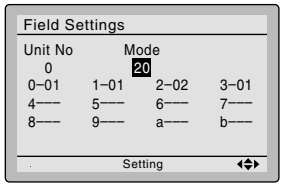


Press Menu/OK button.

<Service Settings screen>

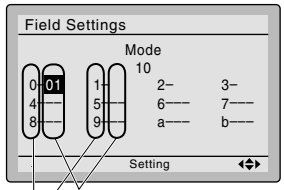
In the case of individual setting per indoor unit

3
4
5

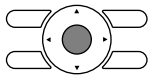


In the case of group total setting

3
5



SECOND CODE No.
FIRST CODE (SW) No.



Press Menu/OK button.

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.

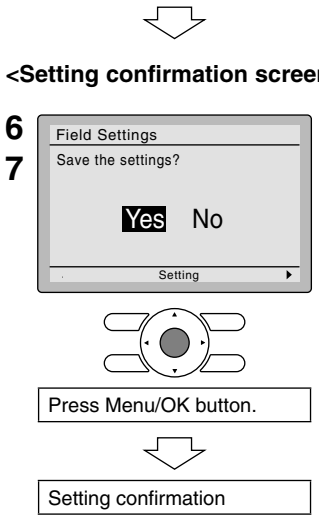
3 Highlight the mode, and select desired “Mode No.” by using ▲▼ (Up/Down) button.

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.

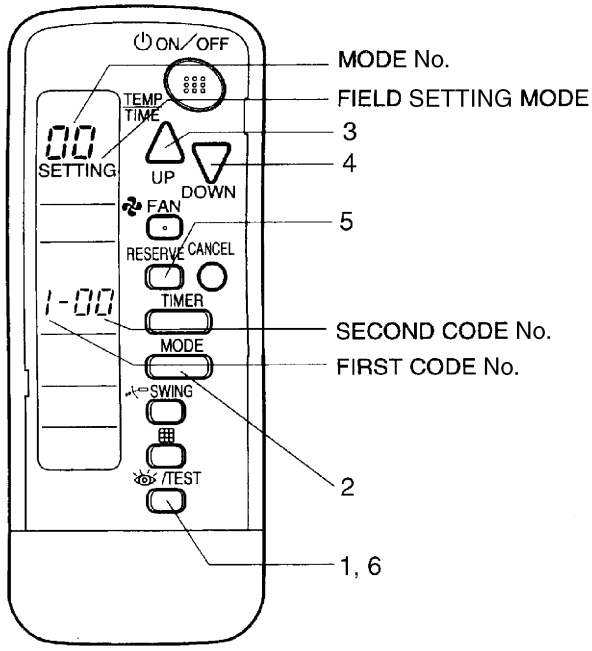
10 Backlight goes out, and "Checking the connection. Please standby." is displayed for initialization. After the initialization, the basic screen returns.

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.

14.1.2 Wireless Remote Controller - Indoor Unit

BRC7C812
BRC4C82
BRC7E818
BRC7E83

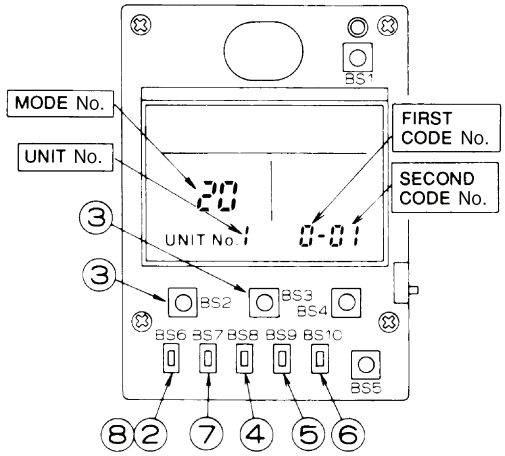


1. When in the normal mode, press the /TEST button for 4 seconds or more, and operation then enters the “field setting mode.”
2. Select the desired “mode No.” with the MODE button.
3. Pressing the UP button, select the first code No.
4. Pressing the DOWN button, select the second code No.
5. Press the timer RESERVE button and check the settings.
6. Press 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 second code No. to “02”.

14.1.3 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 setting), and the FIELD SETTING 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), press the [BS8] (④) BUTTON (unit No.) and select the INDOOR UNIT NO. to be set. (This operation is unnecessary when setting by group.)
5. Press the [BS9] BUTTON (⑤) (set A) and select FIRST CODE No.
6. Press the [BS10] BUTTON (⑥) (set B) and select SECOND CODE No.
7. Press the [BS7] BUTTON (⑦) (set/cancel) once and the present settings are SET.
8. Press the [BS6] BUTTON (⑧) (field setting) 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”.

14.1.4 Setting Contents and Code No. – VRV Indoor unit

: Factory setting

	Mode No. Note 2	First Code No.	Setting Contents		Second Code 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.	—	—
				Long life filter		Approx. 2,500 hrs.		Approx. 1,250 hrs.		
				Standard filter		Approx. 200 hrs.		Approx. 100 hrs.		
		0 ∗6	Filter dirt		Light		Heavy		—	—
		1	Long life filter type		Long life filter		Ultra long life filter		—	—
		1 ∗6	Filter cleaning sign time (Light/Heavy)		2,500/1,250		10,000/5,000		—	—
		2	Room temperature thermistor in remote controller		Remote controller + Body thermostat		Only body thermostat		Only remote controller thermostat	—
		2 ∗6	Remote sensor and remote controller thermistor		Both		Remote thermistor		Remote controller thermistor	—
		3	Display time to clean air filter calculation (Set when filter sign is not to be displayed.)		Display		No display		—	—
		7	4-step thermostat processing		Symbol ∗8: 01 / 02 / 03 / 04 / 05 / 06 Ttson: -7.2°F / -6.3°F / -5.4°F / -4.5°F / -3.6°F / -2.7°F Ttsoff: -3.6°F / -2.7°F / -1.8°F / -0.9°F / 0°F / -0.9°F					
	11 (21)	3 ∗6	Electric heater setting		Heat Pump lockout mode		—		Auxiliary electric heater + Heat Pump lockout mode	—
		4 ∗6	Electric heater step setting		With heater		—		Without heater	
	12(22)	0	Optional accessories output selection (field selection of output for adaptor for wiring)		Indoor unit turned ON by thermostat		—		Operation output	Error output
		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	—
		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		—	—
		4	Automatic mode differential (automatic temperature differential setting for VRV system heat recovery series cool/heat)		01:0	02:1.8	03:3.6	04:5.4	05:7.2	06:9.0 / 07:10.8 / 08:12.6
		5	Power failure automatic reset		Not equipped		Equipped		—	—
		6	Airflow setting when Cooling thermostat is OFF		LL		Set fan speed		—	—
	13(23)	0	Setting of normal airflow		N		H		S	—
		1	Selection of airflow direction (Set when a blocking pad kit has been installed.)		F (4 directions)		T (3 directions)		W (2 directions)	—
		3	Operation of downward flow flap: Yes/No		Equipped		Not equipped		—	—
		4	Field setting airflow position setting		Draft prevention		Standard		Ceiling Soiling prevention	—
		5	Setting of static pressure selection		Standard		High static pressure		—	—
	14 (24)	4 ∗6	Setting of humidifier / air purifier fan tap		Remote controller setting		H tap		—	—
		5 ∗6	Humidifier residual operation time		30 sec.		60 sec.		120 sec.	—
	15(25)	1	Thermostat OFF excess humidity		Not equipped		Equipped		—	—
		2	Direct duct connection (when the indoor unit and heat reclaim ventilation unit are connected by duct directly.) ∗Note 5		Not equipped		Equipped		—	—
		3	Drain pump humidifier interlock selection		Not equipped		Equipped		—	—
		5	Field setting selection for individual ventilation setting by remote controller		Not equipped		Equipped		—	—

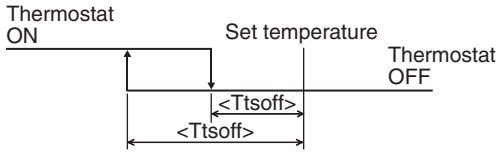
Note :

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.

∗6. Only for FTQ

∗7. For FTQ: Factory setting is “02”.

∗8.



14.1.5 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	○	○	○	○	○	○	○	○
Set fan speed when thermostat OFF	○	○	○	○	○	○	○	○
Airflow adjustment ceiling height	○	—	—	—	○	—	—	—
Airflow direction	○	○	—	—	—	—	—	—
Airflow direction adjustment (Down flow operation)	—	—	—	—	—	—	—	—
Airflow direction adjustment range	○	○	—	—	—	—	—	—
Field setting fan speed selection	○	—	○∗1	—	○	—	—	—

∗1 Static pressure selection

14.1.6 Detailed Explanation of Setting Modes

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

■ **FXTQ**

Mode No.	First Code No.	Second Code No.	Setting
10 (20)	0	01	Low
		02	High

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

■ **FXTQ**

Mode No.	First Code No.	Second Code No.	Setting
10 (20)	1	01	Display time : 2500/1250
		02	Display time : 10000/5000

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.

"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

4-step Thermostat Processing (for FXTQ model)

Auxiliary electric heater ON/OFF temperature setting

Mode No.	First Code No.	Symbol	Second Code No.					
			01	02	03	04	05	06
10 (20)	7	<Ttson>	-7.2°F	-6.3°F	-5.4°F	-4.5°F	-3.6°F	-2.7°F
		<Ttsoff>	-3.6°F	-2.7°F	-1.8°F	-0.9°F	0°F	-0.9°F

Electric Heater Setting (for FXTQ model)

Selection of the heater

The capacity of the electric heater should be selected locally/

Mode No.	First Code No.	Second Code No.	Setting
11 (21)	3	01	Heat Pump lockout mode
		03	Auxiliary electric heater + Heat Pump lockout mode

01: When the heating capacity of the heat pump is insufficient during heating, the heat pump is stopped and heating operation is performed with an electric heater. (It is switched by a hot water heating instruction from the outdoor unit.)

03: If heating is insufficient in heat pump system alone, an electric heater is used as the auxiliary electric heater.

Electric Heater Step Setting (for FXTQ model)

Mode No.	First Code No.	Second Code No.	Setting
11 (21)	4	01	With heater
		03	Without heater

01: Controls ON/OFF of the heater in accordance with the thermostat step.

03: Without heater

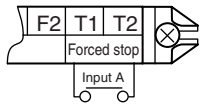
Optional Output Switching

Using this setting, "operation output signal" and "abnormal output signal" can be provided. Output signal is output between terminals X1 and X2 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 "Error Display" appears on the remote controller, output is provided.

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 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".

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

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

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	3.6°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.

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).

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

Setting of Normal Airflow

Make the following setting according to the ceiling height. The second code 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	—

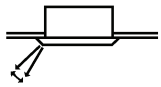
Airflow Direction Setting

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

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.

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)

Setting of Humidifier / Air Purifier Fan Tap (for FXTQ model)

Mode No.	First Code No.	Second Code No.	Setting
14 (24)	4	01	Remote controller setting
		02	H tap

Residual Operation Time (for FXTQ model)

Mode No.	First Code No.	Second Code No.	Setting
14 (24)	5	01	30 seconds
		02	60 seconds
		03	120 seconds

Humidification when Heating Thermostat is OFF

Setting to "Humidification Setting" turns ON the humidifier if suction air temperature is 68°F or above and turns OFF the humidifier if suction air 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

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

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

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.)

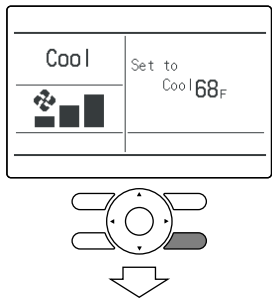
Mode No.	First Code No.	Second Code No.	Contents
15 (25)	5	01	—
		02	Individual operation of ventilation

14.1.7 Centralized Control Group No. Setting

BRC1E Type

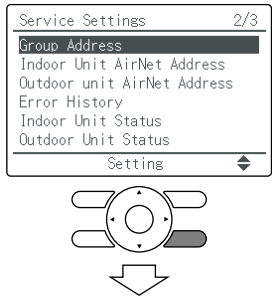
In order to conduct the centralized remote control using the centralized remote controller and the unified ON/OFF controller, Group No. settings should be made by group using the operating remote controller.
Make Group No. settings for centralized remote control using the operating remote controller.

(1) <Basic screen>



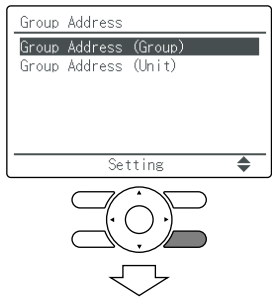
1. Press and hold Cancel button for 4 seconds or more. Service Settings menu in displayed.

(2) <Service Settings menu screen>



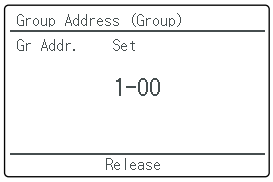
2. Select Group Address , and press Menu/OK button. Group Address screen is displayed.

(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.

Note:

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

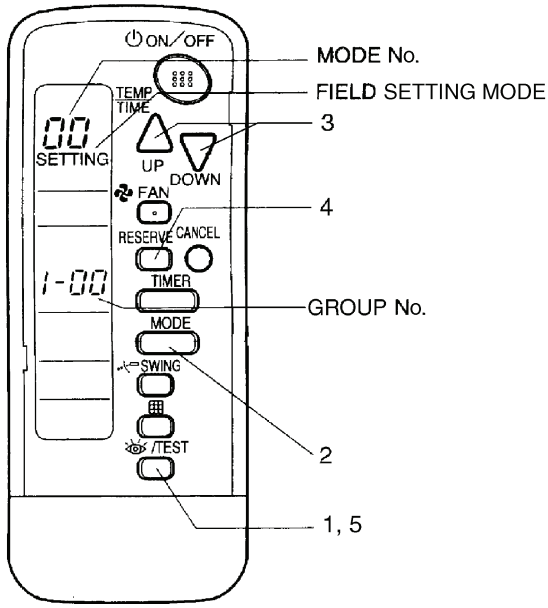
NOTICE

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.

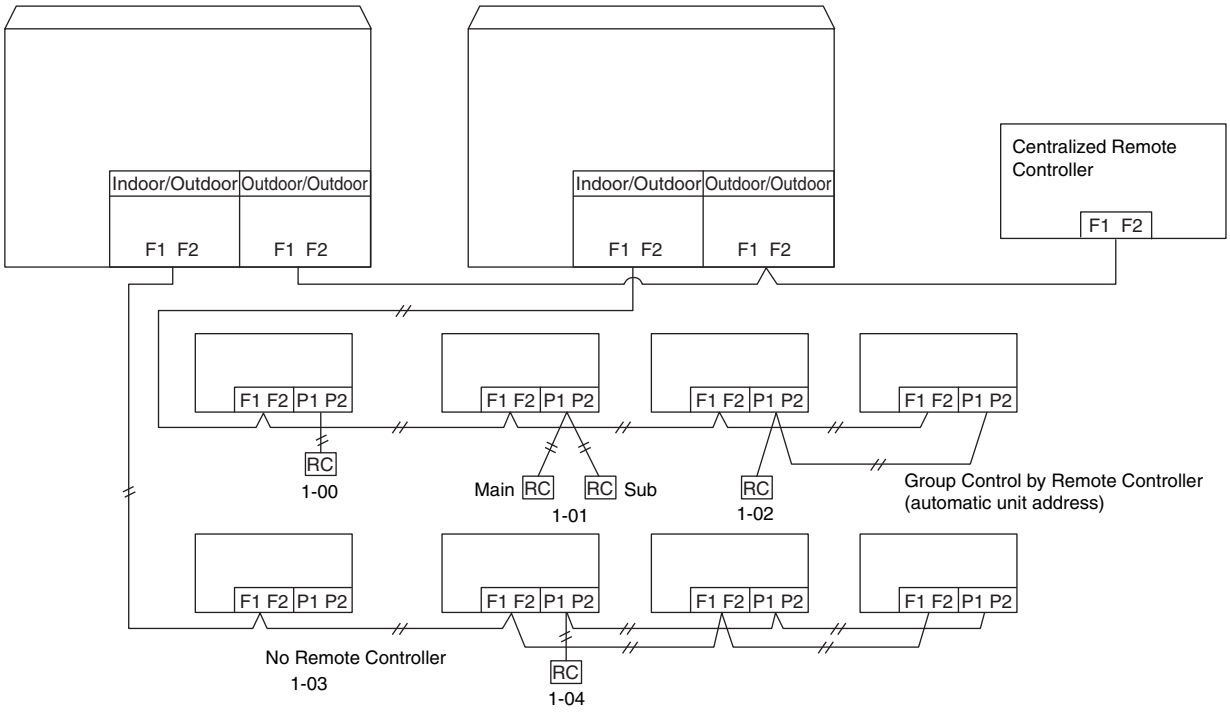
BRC7C Type / BRC7E Type / BRC4C Type

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

1. When in the normal mode, press " /TEST " button for 4 seconds or more, and operation then enters the "field setting 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 pressing " RESERVE " button.
5. Press " /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.

14.1.8 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)

14.1.9 Contents of Control Modes

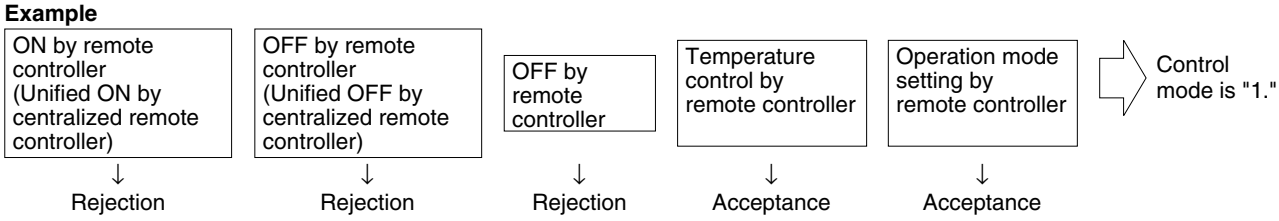
Twenty modes consisting of combinations of the following five operation modes with temperature and operation mode setting by remote controller can be set and displayed by operation modes 0 through 19.

- 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.

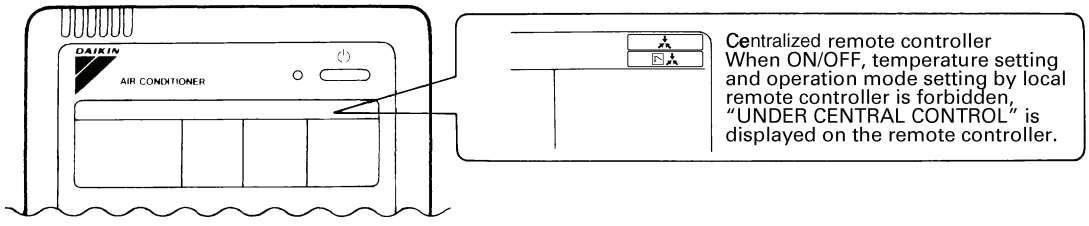
Example



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

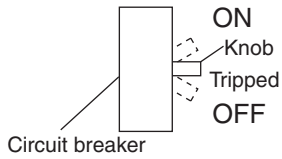
Do not select “timer operation possible by remote controller” if not using a remote controller. Operation by timer is impossible in this case.

∗1. Factory setting



Part 5
Service Diagnosis

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	The model must be selected to match the air conditioning load.
		[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 error 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.

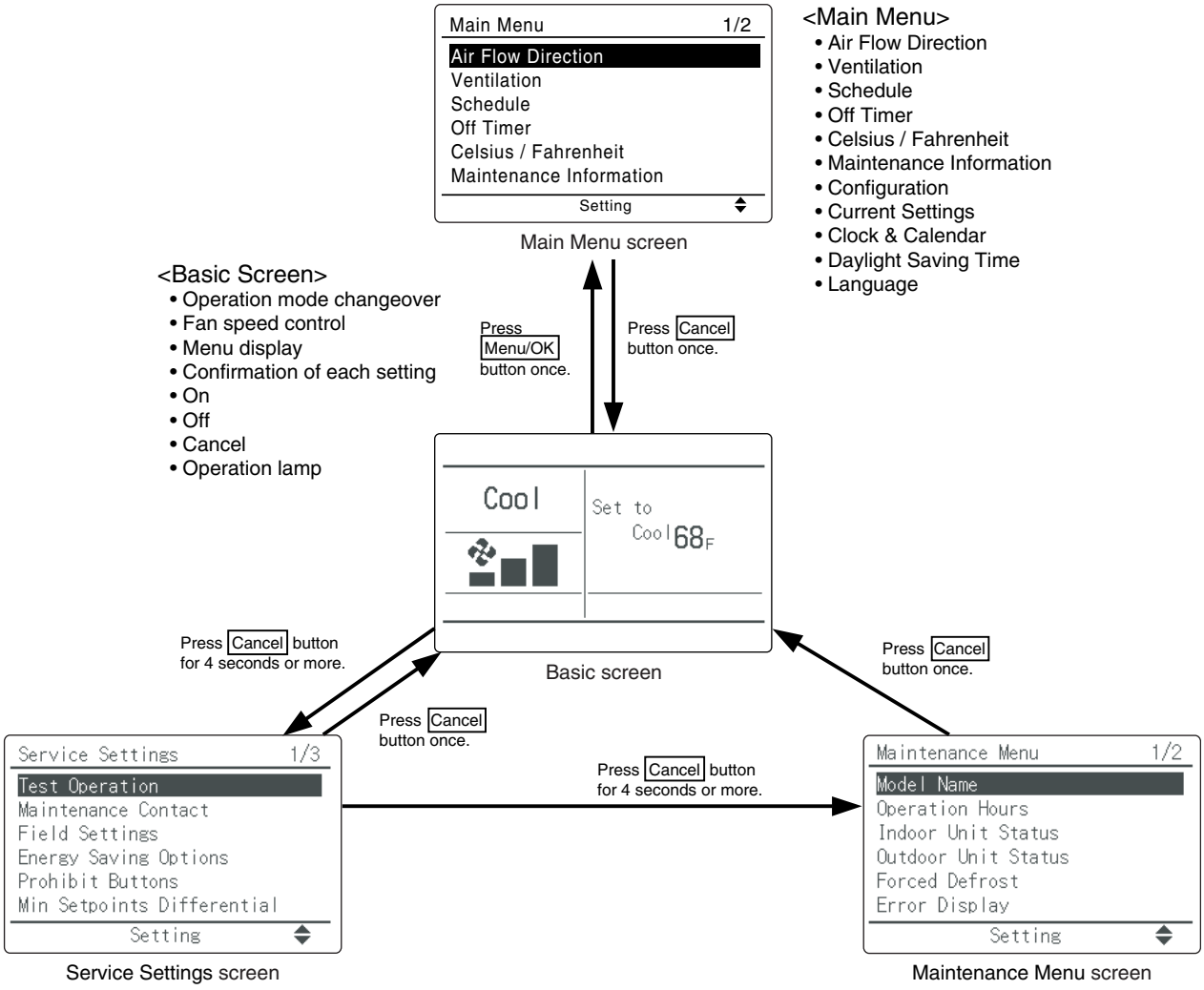
	Symptom		Supposed Cause	Countermeasure
6	COOL-HEAT selection is disabled.	The remote controller displays "UNDER CENTRALIZED CONTROL".	This remote controller has no option to select cooling operation.	Use a remote controller with option to select cooling operation.
		The remote controller displays "UNDER 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 outdoor air 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 displays [88] 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

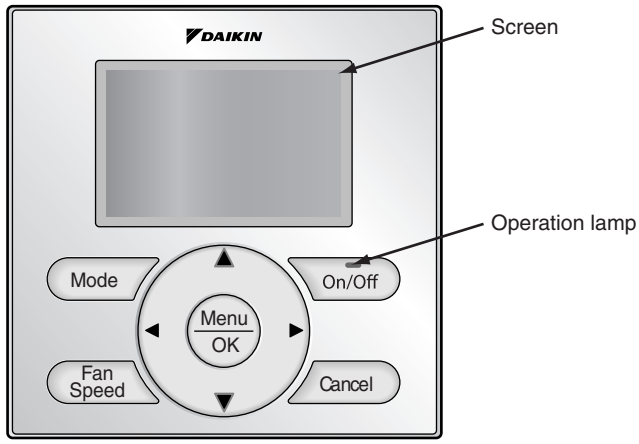
On power-up, the screen displays ***Checking the connection. Please standby*** on the remote controller screen, followed by the basic Menu screen. To access a mode from the basic screen, refer to the figure below.

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.)

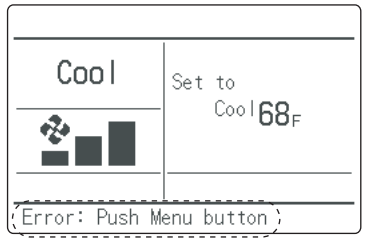
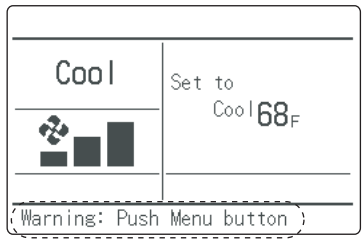


2.1 Self-diagnosis by Wired Remote Controller

The following is 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: Push 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: Push Menu button" will appear and blink at the bottom of the screen.	

2.2 Self-diagnosis by Wireless Remote Controller

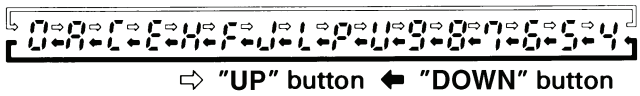
In the Case of BRC7C Type / BRC7E Type / BRC4C Type

If equipment stops due to an error, the operation indicating LED on the light reception section flashes.

The error code can be determined by following the procedure described below. (The error code is displayed when an operation error has occurred. In normal condition, the error 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 error code is confirmed.
   Continuous beep : No abnormality.
3. Press the MODE selector button.
   The left “0” (upper digit) indication of the error code flashes.
4. Error code upper digit diagnosis
   Press the UP or DOWN button and change the error code upper digit until the error code matching buzzer (∗2) is generated.

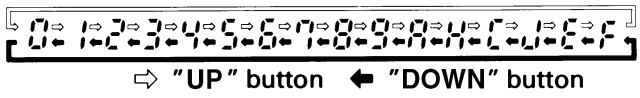
■ The upper digit of the code changes as shown below when the UP and DOWN buttons are pressed.

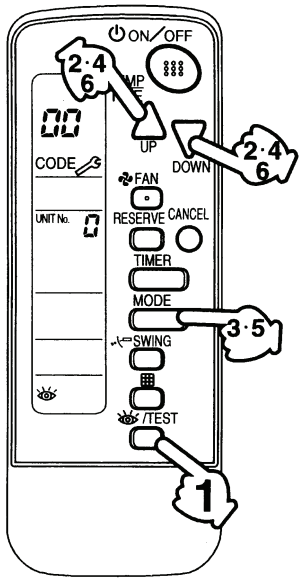


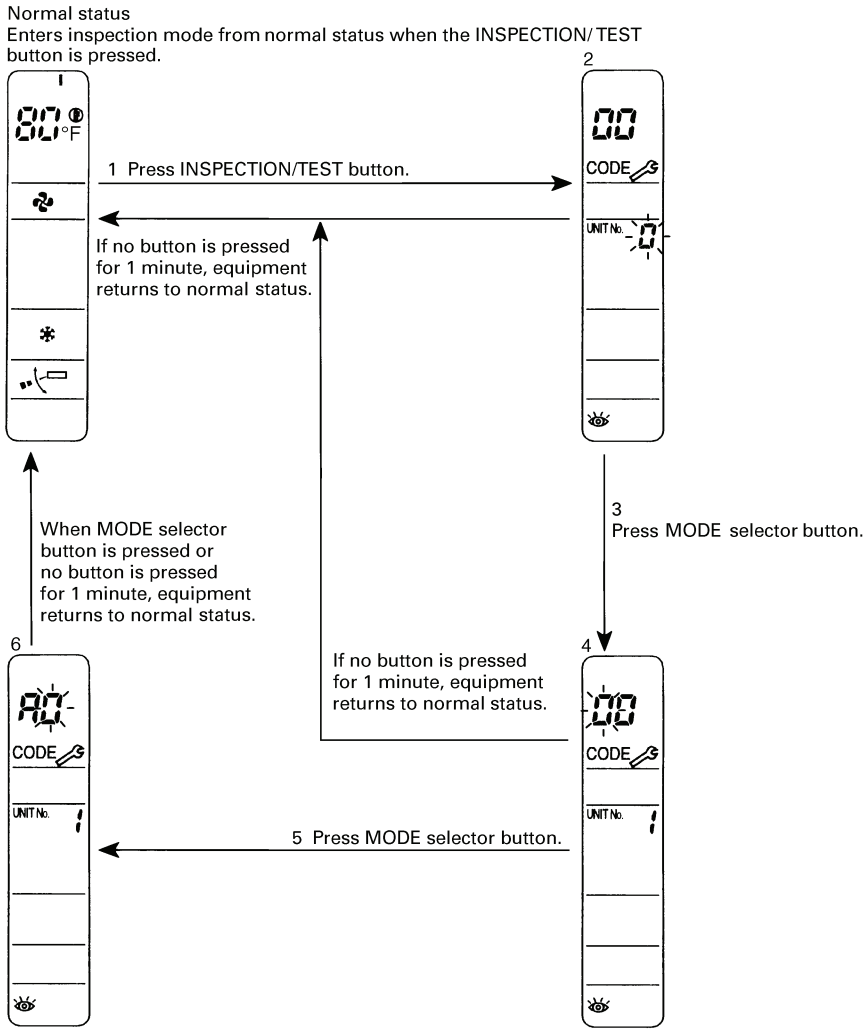
∗2 Number of beeps
Continuous beep : Both upper and lower digits matched. (Error code confirmed)
2 short beeps : Upper digit matched.
1 short beep : Lower digit matched.

5. Press the MODE selector button.
   The right “0” (lower digit) indication of the error code flashes.
6. Error code lower digit diagnosis
   Press the UP or DOWN button and change the error code lower digit until the continuous error code matching buzzer (∗2) is generated.

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

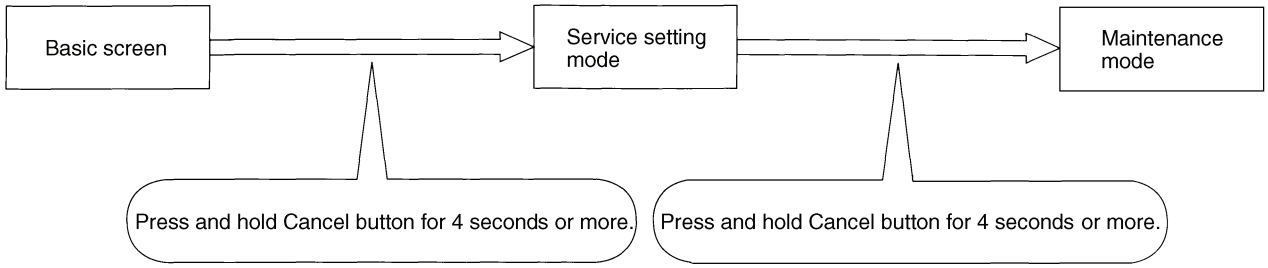






2.3 Remote Controller Maintenance Mode

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 will be displayed.

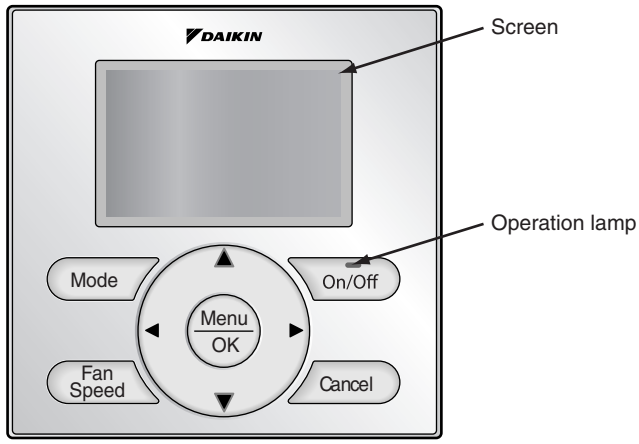
For details, refer to the table in next page.

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.
		VRV
	13.Th1	Suction air thermistor
	14.Th2	Heat exchanger liquid pipe thermistor
	15.Th3	Heat exchanger gas pipe thermistor
	16.Th4	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
		VRV
	6. Th1	—
	7. Th2	—
	8. Th3	—
	9. Th4	—
	10.Th5	—
	11.Th5	—
5. 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.
6. Swap Unit No.	1. Current Unit No.	A unit No. can be transferred to another.
	2. Transfer Unit No.	

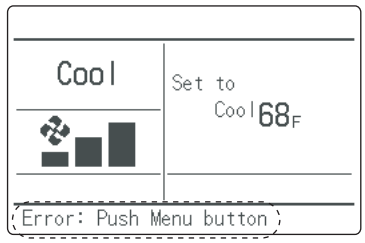
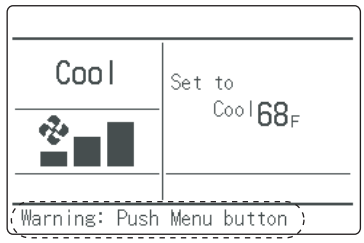
Maintenance Menu	Item 2	Remarks
7. Addressed Sensor Value	○ Unit No.: 0 - 15	Select the Unit No. you want to check.
	○ Code 00: 01: 02: 03: 04: 05: 06: 07: 08: 09:	 Remote controller thermistor (°F) Suction air thermistor (°F) Heat exchanger liquid pipe thermistor (°F) Heat exchanger gas pipe thermistor (°F) Indoor unit address No. Outdoor unit address No. Branch Selector unit address No. Zone control address No. Cooling/Heating batch address No. Demand/low-noise address No.
	○ Data	The corresponding data will be 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.



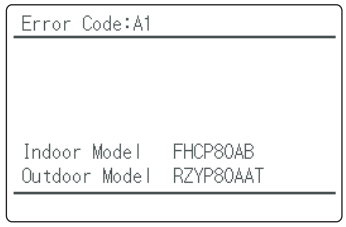
(1) Checking a error or warning

	Operation Status	Display	
Abnormal shutdown	The system stops operating.	The operation lamp (green) starts to blink. The message "Error: Push 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: Push Menu button" will appear 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.



○: ON ●: OFF ◑: Blink

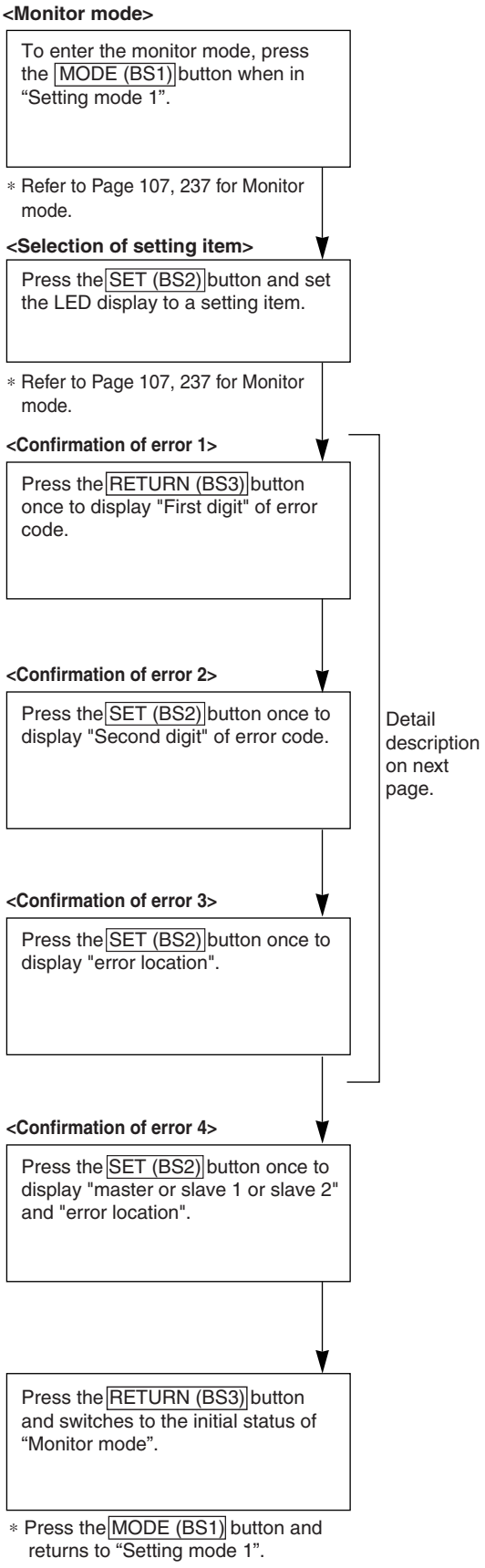
	Error code	Operation lamp	Error contents	Page Referred
Indoor Unit	A0	◑	External Protection Device Abnormality	333
	A1	◑	PCB Abnormality	334
	A3	◑	Drain Level Control System (S1L) Abnormality	335
	A6	◑	Fan Motor (M1F) Lock, Overload Indoor Unit Fan Motor Abnormality Overload / Overcurrent / Lock of Indoor Unit Fan Motor	337 339 340
	A7	○	Swing Flap Motor (M1S) Abnormality	341
	A8	◑	Power Supply Voltage Abnormality	343
	A9	◑	Electronic Expansion Valve Abnormality / Dust Clogging Electronic Expansion Valve Coil Abnormality	344 346
	AF	○	Drain Level above Limit	348
	AJ	◑	Capacity Determination Device Abnormality	349
	C1	◑	Transmission Abnormality (between Indoor unit PCB and Fan PCB)	350
	C4	◑	Thermistor (R2T) for Liquid Pipe Abnormality	352
	C5	◑	Thermistor (R3T) for Gas Pipe Abnormality	353
	C6	◑	Failure of Combination (between Indoor unit PCB and Fan PCB	354
	C9	◑	Thermistor (R1T) for Suction Air Abnormality Remote Sensor Abnormality	355 356
	CC	○	Humidity Sensor System Abnormality	357
	CJ	○	Room Temperature Thermistor in Remote Controller Abnormality	358
Outdoor Unit	E1	◑	PCB Defect	359
	E2	◑	Earth Leakage by Leak Detection PCB Assy	360
	E3	◑	Actuation of High Pressure Switch	362
	E4	◑	Actuation of Low Pressure Sensor	364
	E5	◑	Inverter Compressor Motor Lock	366
	E6	◑	STD Compressor Motor Overcurrent/Lock	368
	E7	◑	Outdoor Unit Fan Motor Abnormality	370
	E9	◑	Electronic Expansion Valve Coil (Y1E~Y5E) Abnormality	373
	F3	◑	Abnormal Discharge Pipe Temperature	375
	F6	◑	Refrigerant Overcharged	377
	H7	◑	Outdoor Fan Motor Signal Abnormality	378
	H9	◑	Thermistor (R1T) for Outdoor Air Abnormality	380
	J2	◑	Current Sensor Abnormality	381
	J3	◑	Discharge Pipe Temperature Thermistor Abnormality	383
	J4	◑	Thermistor for Heat Exchanger Gas pipe Abnormality	384
	J5	◑	Thermistor for Suction Pipe Temperature Abnormality	385
	J6	◑	Thermistor for Outdoor Unit Heat Exchanger Abnormality	386
	J7	◑	Liquid Pipe Thermistor 1 (R6T) Abnormality	387
	J8	◑	Liquid Pipe Thermistor 2 (R7T, R14T or R15T) Abnormality	388
	J9	◑	Subcooling Heat Exchanger Gas Pipe Thermistor (R5T or R13T) Abnormality	389
	JA	◑	High Pressure Sensor Abnormality	390
	JC	◑	Low Pressure Sensor Abnormality	392
	L1	◑	Inverter PCB Abnormality	394
	L4	◑	Inverter Radiation Fin Temperature Rise Abnormality	396
	L5	◑	Momentary Overcurrent of Inverter Compressor	398
	L8	◑	Momentary Overcurrent of Inverter Compressor	400
	L9	◑	Inverter Compressor Starting Failure	402

○: ON ●: OFF ◑: Blink

	Error code	Operation lamp	Error contents	Page Referred
Outdoor Unit	LC	◑	Transmission Error between Inverter and Service Monitor PCB	405
	P1	◑	Inverter Over-Ripple Protection	408
	P4	◑	Inverter Radiation Fin Temperature Thermistor Rise Abnormality	410
	PJ	◑	Field Setting Abnormality after Replacing Main PCB or Combination of PCB Abnormality	411
System	U0	○	Refrigerant Shortage Alert	413
	U1	◑	Open Phase	415
	U2	◑	Power Supply Insufficient or Instantaneous Failure	416
	U3	◑	Check Operation is not Executed	419
	U4	◑	Transmission Error between Indoor Units and Outdoor Units	420
	U5	◑	Transmission Error between Remote Controller and Indoor Unit	425
	U7	◑	Transmission Error (Across Outdoor Units)	426
	U8	◑	Transmission Error between Main and Sub Remote Controllers	432
	U9	◑	Transmission Error between Indoor and Outdoor Units in the Same System	433
	UA	◑	Improper Combination of Indoor and Outdoor Units, Indoor Units and Remote Controller	434
	UC	○	Address Duplication of Centralized Controller	440
	UE	◑	Transmission Error between Centralized Controller and Indoor Unit	441
	UF	◑	System is not Set yet	444
	UH	◑	System Abnormality, Refrigerant System Address Undefined	445

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

Error code indication by outdoor unit PCB



Errors		Error code
Description of error	Description of error (PGF)	Remote controller
PCB abnormality	PCB abnormality	E1
	Faulty PCB	
Leak detection PCB	Indicate electric leakage detected by the leak detection PCB	E2
Abnormal discharge pressure	High pressure switch activated	E3
Abnormal suction pressure	Pe abnormality	E4
Compressor lock	INV compressor lock detected	E5
OC activation	STD1 compressor lock detected	E6
	STD2 compressor lock detected	
Overload, overcurrent and abnormal lock of outdoor unit fan motor	Instantaneous overcurrent of DC fan motor for fan 1	E7
	DC fan motor lock detected for fan 1	
	Instantaneous overcurrent of DC fan motor for fan 2	
	DC fan motor lock detected for fan 2	
Electronic expansion valve abnormality	EVM	E9
	EV2	
	EVT	
Positioning signal error of outdoor unit fan motor	DC fan motor positioning signal error for fan 1	H7
	DC fan motor positioning signal error for fan 2	
Abnormal outdoor temperature	Ta sensor error (short circuited)	H9
	Ta sensor error (open)	
Abnormal discharge pipe temperature	Td abnormality	F3
Abnormal heat exchanger temperature	Refrigerant overcharged	F6
Current sensor error	CT1 sensor error	J2
	CT2 sensor error	
Discharge pipe temperature sensor error	Tdi sensor error (short circuited)	J3
	Tds1 sensor error (short circuited)	
	Tds2 sensor error (short circuited)	
	Tdi sensor error (open)	
	Tds1 sensor error (open)	
	Tds2 sensor error (open)	
Heat exchanger gas temperature sensor error	Tg sensor error (short circuited)	J4
	Tg sensor error (open)	
Suction pipe temperature sensor error	TsA sensor error (short circuited)	J5
	TsA sensor error (open)	
Heat exchanger temperature sensor error	Tb sensor error (short circuited)	J6
	Tb sensor error (open)	
Liquid pipe temperature sensor error 1	Tsc sensor error (short circuited)	J7
	Tsc sensor error (open)	
	TL sensor error (short circuited)	
	TL sensor error (open)	
Liquid pipe temperature sensor error 2	Tf sensor error (short circuited)	J8
	Tf sensor error (open)	
Subcooling heat exchanger temperature sensor error	Tsh sensor error (short circuited)	J9
	Tsh sensor error (open)	
Discharge pressure sensor error	Pc sensor error (short circuited)	JA
	Pc sensor error (open)	
Suction pressure sensor error	Pe sensor error (short circuited)	JC
	Pe sensor error (open)	

○ : ON
● : OFF
◑ : Blink

○: ON ●: OFF ◑:Blink

Error code	Confirmation of error 1 (Check 1)							Confirmation of error 2 (Check 2)							Confirmation of error 3 (Check 3)							Confirmation of error 4 (Check 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	◑	◑	●	●	●	◑	◑	◑	●	○	●	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	●	◑	◑
								◑	●	○	●	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑
E2								◑	●	○	●	●	◑	●	◑	○	●	●	●	●	●	◑	○	○	●	●		
E3								◑	●	○	●	●	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	●		
E4								◑	●	○	●	◑	●	●	◑	○	●	●	●	●	●	◑	○	○	●	●		
E5								◑	●	○	●	◑	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	●		
E6								◑	●	○	●	◑	◑	●	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	●	◑	○	○	●	◑		
E7								◑	●	○	●	◑	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	●		∗1
															◑	○	●	●	●	●	●	◑	○	○	●	◑		
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	◑		
E9								◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	●	◑	○	○	●	◑		
															◑	○	●	●	●	●	●	◑	○	○	◑	●		
H7	◑	◑	●	●	◑	●	●	◑	●	○	●	◑	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
H9								◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	●		∗1
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
F3	◑	◑	●	●	◑	●	◑	◑	●	○	●	●	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	●		
F6								◑	●	○	●	◑	◑	●	◑	○	●	●	●	●	●	◑	○	○	●	●	◑	◑
J2	◑	◑	●	●	◑	◑	●	◑	●	○	●	●	◑	●	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	●	◑	○	○	●	◑		
J3								◑	●	○	●	●	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	●	◑	○	○	●	◑		
															◑	○	●	●	●	●	●	◑	○	○	◑	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	◑		
															◑	○	●	●	●	●	◑	◑	○	○	◑	●		
J4								◑	●	○	●	◑	●	●	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
J5								◑	●	○	●	◑	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
J6								◑	●	○	●	◑	◑	●	◑	○	●	●	●	●	●	◑	○	○	●	●		∗1
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
J7								◑	●	○	●	◑	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
								◑	●	○	●	◑	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	◑		
															◑	○	●	●	●	●	◑	◑	○	○	●	◑		
J8								◑	●	○	◑	●	●	●	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
J9								◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
JA								◑	●	○	◑	●	◑	●	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
JC								◑	●	○	◑	◑	●	●	◑	○	●	●	●	●	●	◑	○	○	●	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	●		

Display of contents of error (first digit)

Display of contents of error (second digit)

Display 1 of error in detail

Display 2 of error in detail

∗1: Defective system

			Individual system	Multi system
●	●	→	Right-hand system	Master
●	◑	→	Left-hand system	Slave 1
◑	●	→	—	Slave 2
◑	◑	→	All systems	System

<Monitor mode>

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

∗ Refer to Page 107, 237 for Monitor mode.

<Selection of setting item>

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

∗ Refer to Page 107, 237 for Monitor mode.

<Confirmation of error 1>

Press the RETURN (BS3) button once to display "First digit" of error code.

<Confirmation of error 2>

Press the SET (BS2) button once to display "Second digit" of error code.

Detail description on next page.

<Confirmation of error 3>

Press the SET (BS2) button once to display "error location".

<Confirmation of error 4>

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

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

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

Errors		Error code
Description of error	Description of error (PGF)	Remote controller
INV PCB abnormality	Faulty IPM	L1
	Current sensor failure confirmation 1	
	IGBT abnormality	
	Others	
	Faulty inverter setting	
Rise in INV radiation fin temperature	Overheat of INV radiation fin temperature	L4
DC output overcurrent	Instantaneous overcurrent of INV	L5
Electronic thermal	Electronic thermal 1	L8
	Electronic thermal 2	
	Loss of synchronization	
	Speed degradation after startup	
	Thunder detected	
Stall prevention (time limit)	Stall prevention (increased current)	L9
	Stall prevention (startup failure)	
	Abnormal starting waveform	
	Loss of synchronization	
INV-Outdoor unit transmission error	INV transmission error	LC
Open phase and unbalanced power supply	Unbalanced INV power supply voltage	P1
Switch box inside temperature sensor error	INV-box temperature thermistor error	P3
INV radiation fin temperature sensor error	INV fin thermistor error	P4
Defective combination of INV and fan driver	Defective combination of INV	PJ
	Defective combination of fan driver 1	
	Defective combination of fan driver 2	
Shortage gas	Shortage gas alarm	U0
Reversed phase	Reversed phase abnormality	U1
Abnormal power supply voltage	Insufficient INV voltage	U2
	INV open phase (T phase)	
	Abnormal charge of capacitor of INV main circuit	
Test run not carried out yet	Test run not carried out yet	U3
	Alarm given when failing to measure the amount of refrigerant during test run	
Faulty transmission between indoor and outdoor units	IN-OUT transmission error	U4
	System error	
Faulty transmission between outdoor units	Sequential start ADP alarm	U7
	Sequential start ADP abnormality	
	Multi transmission error (Multi 1)	
	Multi transmission error (Multi 2)	
	Faulty multi horsepower setting	
	Erroneous multi address	
	Excess multi connection	
	Multi system error	
Faulty transmission with other systems	Other system or other unit in the same system	U9
Faulty field setting	System transmission error	UA
	Excess indoor units connected	
	Faulty field setting	
	Erroneous refrigerant	
	Multi ID error	
	TSS field setting alarm	
	CT address alarm	
	Faulty connection of Branch Selector units by heat pump equipment	
	Faulty connection between multi heat pump and heat recovery equipment	
Faulty system line	Wrong wiring (auto address error)	UH
Faulty transmission with accessory equipment	Multi level converter abnormality	UJ
	Multi level converter alarm	
Unmatched wiring/piping, no system settings	Unmatched wiring/piping	UF

○ : ON
● : OFF
◑ : Blink

○: ON ●: OFF ◑:Blink

Error code	Confirmation of error 1 (Check 1)							Confirmation of error 2 (Check 2)							Confirmation of error 3 (Check 3)							Confirmation of error 4 (Check 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
L1	◑	◑	●	●	◑	◑	◑	◑			●	●	●	◑	◑			●	●	●	●	◑			●	●		
																						◑			●	◑		
																						◑			◑	●		
																						◑			◑	◑		
															◑			●	●	●	◑	◑			●	●		
L4								◑			●	◑	●	●	◑			●	●	●	●	◑			●	●		
L5								◑			●	◑	●	◑	◑			●	●	●	●	◑			●	●		
L8								◑			◑	●	●	●	◑			●	●	●	●	◑			●	●		
															◑	○	●	●	●	●	●	◑	○	○	●	◑	*1	
															◑	○	●	●	●	●	●	◑	○	○	◑	●		
															◑	○	●	●	●	●	◑	◑	○	○	●	●		
L9								◑			◑	●	●	◑	◑			●	●	●	●	◑			●	●		
															◑	○	●	●	●	●	●	◑	○	○	●	◑		
															◑	○	●	●	●	●	●	◑	○	○	◑	●		
LC								◑			◑	◑	●	●	◑			●	●	●	●	◑			●	●		
P1	◑	◑	●	◑	●	●	●	◑			●	●	●	◑	◑			●	●	●	●	◑			●	●		
P3								◑			●	●	◑	◑	◑			●	●	●	●	◑			●	●		
P4								◑			●	◑	●	●	◑			●	●	●	●	◑			●	●		
PJ								◑			◑	◑	●	◑	◑			●	●	●	●	◑			●	●	*1	
															◑			●	●	●	●	◑			●	◑		
															◑			●	●	●	●	◑			◑	●		
U0	◑	◑	●	◑	●	●	◑	◑			●	●	●	●	◑			●	●	●	●	◑			●	●	◑	◑
U1								◑			●	●	●	◑	◑			●	●	●	●	◑			●	●		
U2								◑			●	●	◑	●	◑			●	●	●	●	◑			●	●	*1	
															◑			●	●	●	●	◑			●	◑		
U3								◑			●	●	◑	◑	◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			●	◑	◑	◑
U4								◑			●	◑	●	●	◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			●	◑	◑	◑
U7								◑			●	◑	◑	◑	◑			●	●	●	●	◑			●	◑	◑	◑
															◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			◑	●	◑	◑
															◑			●	●	●	●	◑			◑	◑	◑	◑
															◑			●	●	●	◑	◑			●	●	◑	◑
															◑			●	●	●	◑	◑			●	◑	◑	◑
															◑			●	●	●	◑	◑			◑	●	◑	◑
															◑			●	●	●	◑	◑			◑	◑	◑	◑
U9								◑			◑	●	●	◑	◑			●	●	●	●	◑			●	●	◑	◑
UA								◑			◑	●	◑	●	◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			●	◑	◑	◑
															◑			●	●	●	●	◑			◑	●	◑	◑
															◑			●	●	●	◑	◑			●	●	◑	◑
															◑			●	●	●	◑	◑			●	◑	◑	◑
															◑			●	●	●	◑	◑			◑	●	◑	◑
															◑			●	●	●	◑	◑			◑	◑	◑	◑
															◑			●	◑	●	●	◑			●	●	◑	◑
															◑			●	◑	●	●	◑			●	◑	◑	◑
UH								◑			◑	●	◑	◑	◑			●	●	●	●	◑			●	●	◑	◑
UJ								◑			◑	◑	●	◑	◑			●	●	●	●	◑			●	●	*1	
															◑			●	●	●	●	◑			●	◑		
UF								◑			◑	◑	◑	◑	◑			●	●	●	●	◑			●	●	◑	◑

Display of contents of error (first digit)

Display of contents of error (second digit)

Display 1 of error in detail

Display 2 of error in detail

*1: Defective system

			Individual system	Multi system
●	●	→	Right-hand system	Master
●	◑	→	Left-hand system	Slave 1
◑	●	→	—	Slave 2
◑	◑	→	All systems	System

3. Troubleshooting by Indication on the Remote Controller

3.1 External Protection Device Abnormality

Remote Controller Display

A07

Applicable Models

All models of indoor unit

Method of Error Detection

Detect open or short circuit between external input terminals in indoor unit.

Error Decision Conditions

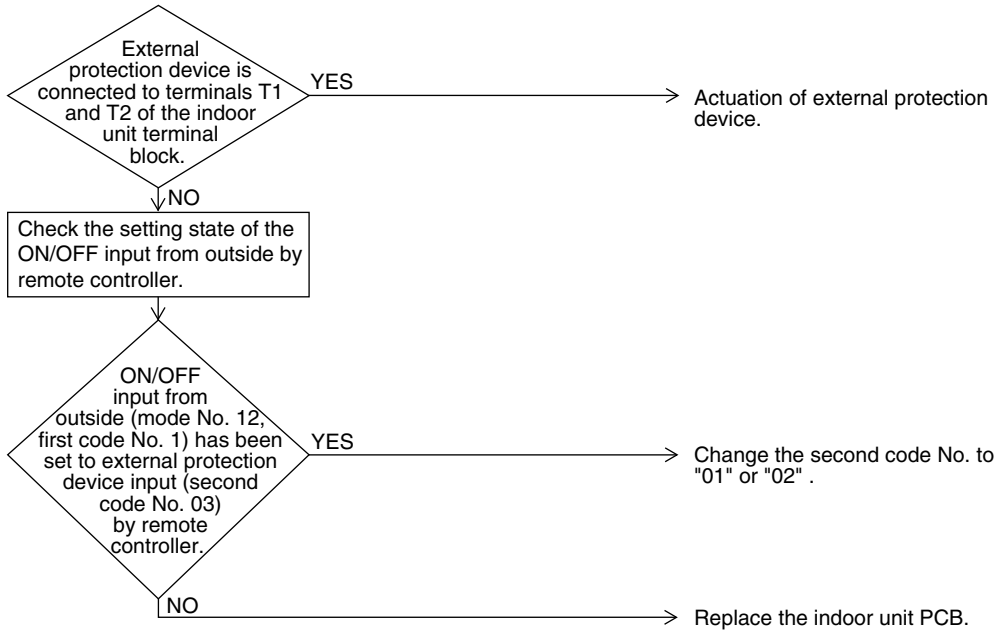
When an open circuit occurs between external input terminals with the remote controller set to "external ON/OFF terminal".

Supposed Causes

- Actuation of external protection device
- Improper field setting
- Defective of indoor unit PCB

Troubleshooting

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



3.2 PCB Abnormality

Remote Controller Display

A1

Applicable Models

All models of indoor unit

Method of Error Detection

Check data from E²PROM.

Error 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

- Defective of indoor unit PCB
- External factor (Noise etc.)

Troubleshooting

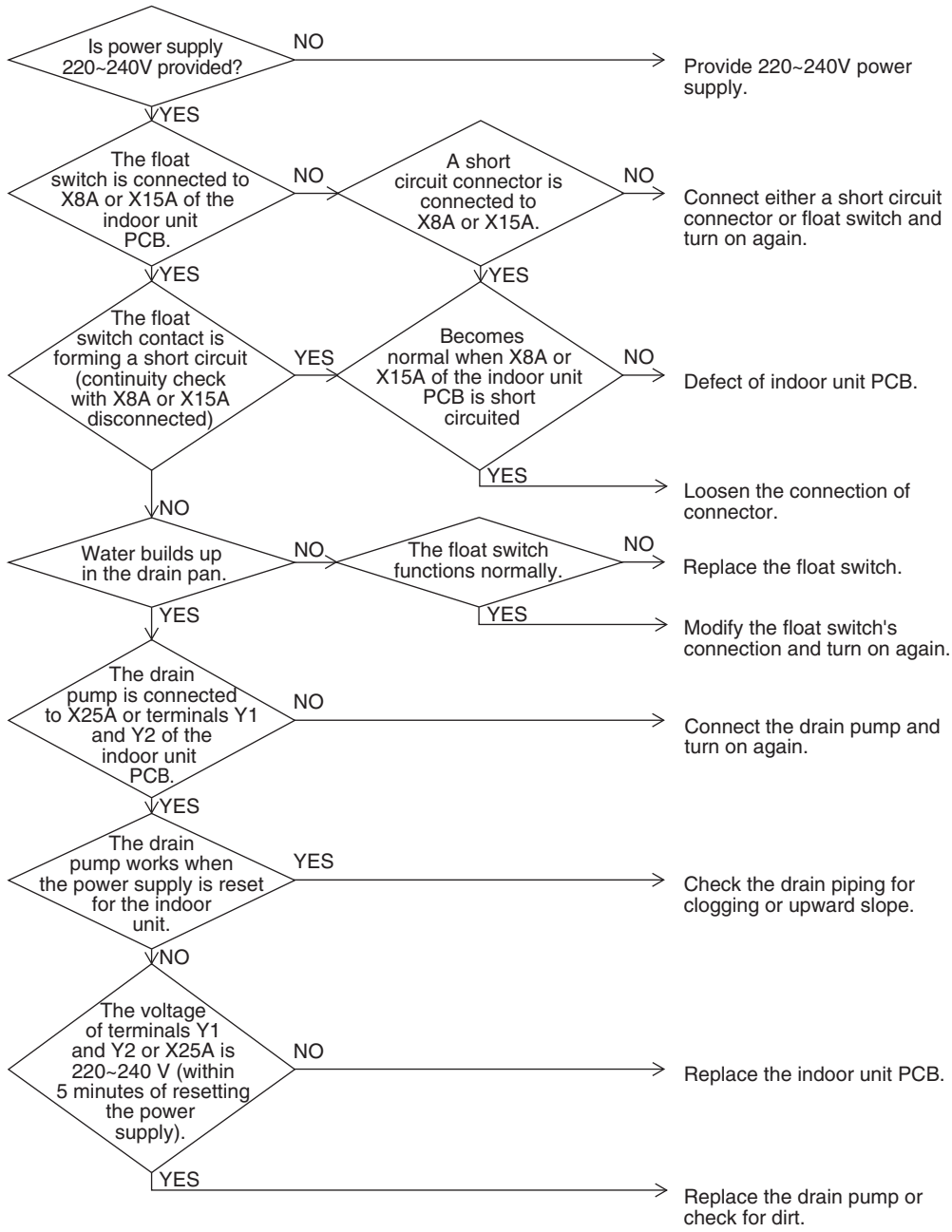
Caution Be sure to turn off the power switch before connecting or disconnecting the connector or parts may be damaged.

3.3 Drain Level Control System (S1L) Abnormality

Remote Controller Display	A3
Applicable Models	FXFQ, FXZQ, FXDQ, FXMQ-P, FXHQ (Option), FXAQ (Option)
Method of Error Detection	By float switch OFF detection
Error Decision Conditions	When rise of water level is not a condition and the float switch goes OFF.
Supposed Causes	■ 220~240V power supply is not provided ■ Defective float switch or short circuit connector ■ Defective drain pump ■ Drain clogging, upward slope, etc. ■ Defective indoor unit PCB ■ Loose connection of connector

Troubleshooting

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



3.4 Fan Motor (M1F) Lock, Overload

Remote Controller Display

A6

Applicable Models

FXAQ, FXFQ

Method of Error Detection

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

Error Decision Conditions

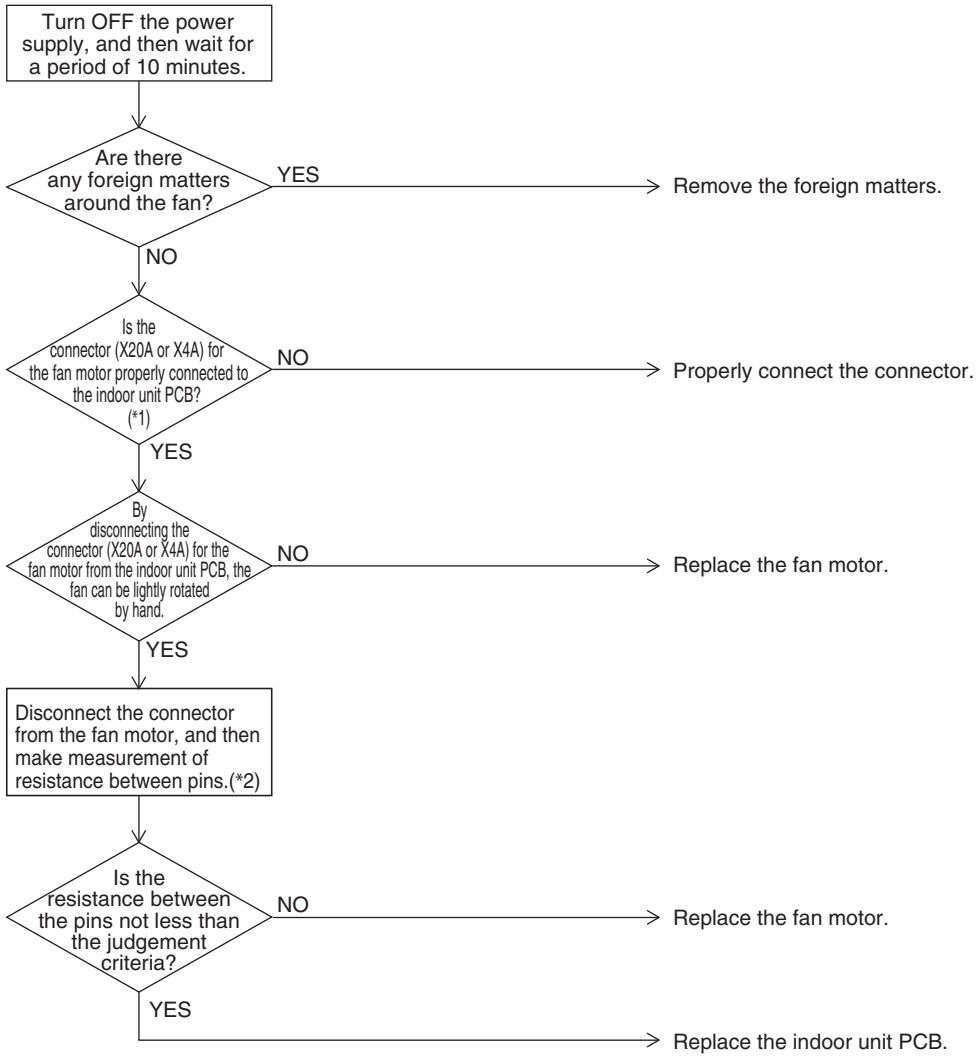
When the fan revolutions do not increase

Supposed Causes

- Broken wires in, short circuit of, or disconnection of connectors from the fan motor harness
- Defective fan motor
  (Broken wires or defective insulation)
- Abnormal signal output from the fan motor (defective circuit)
- Defective 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

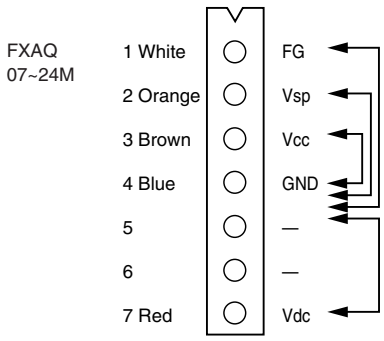
Caution Be sure to turn off the power switch before connecting or disconnecting the connector or parts may be damaged.

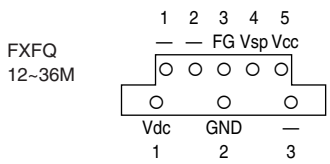


Note:

∗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

Indoor Unit Fan Motor Abnormality

Remote Controller Display

A6

Applicable Models

FXHQ, FXDQ

Method of Error Detection

This error is detected if there is not a revolutions-detection signal output from the fan motor.

Error Decision Conditions

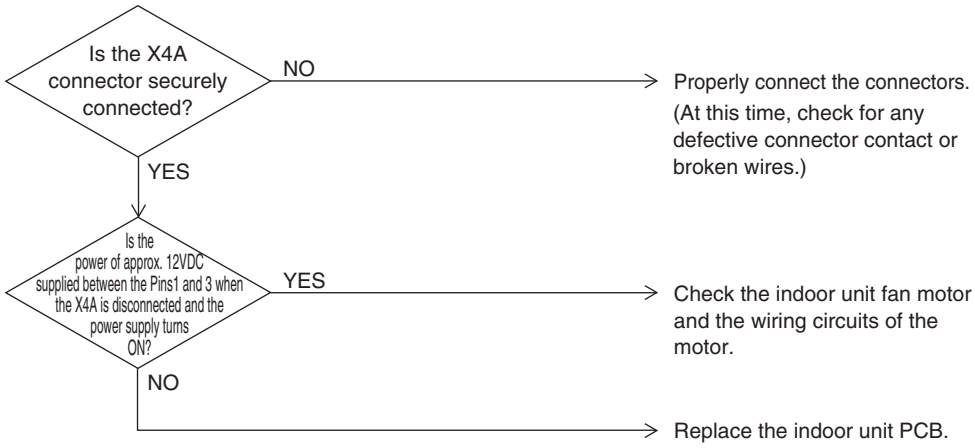
When no revolutions can be detected even at the maximum output voltage to the fan

Supposed Causes

- Defective indoor fan motor
- Broken wires
- Defective contact

Troubleshooting

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



Overload / Overcurrent / Lock of Indoor Unit Fan Motor

Remote Controller Display

A6

Applicable Models

FXMQ

Method of Error Detection

This error is detected by detecting that the individual power supply for the fan turns OFF.

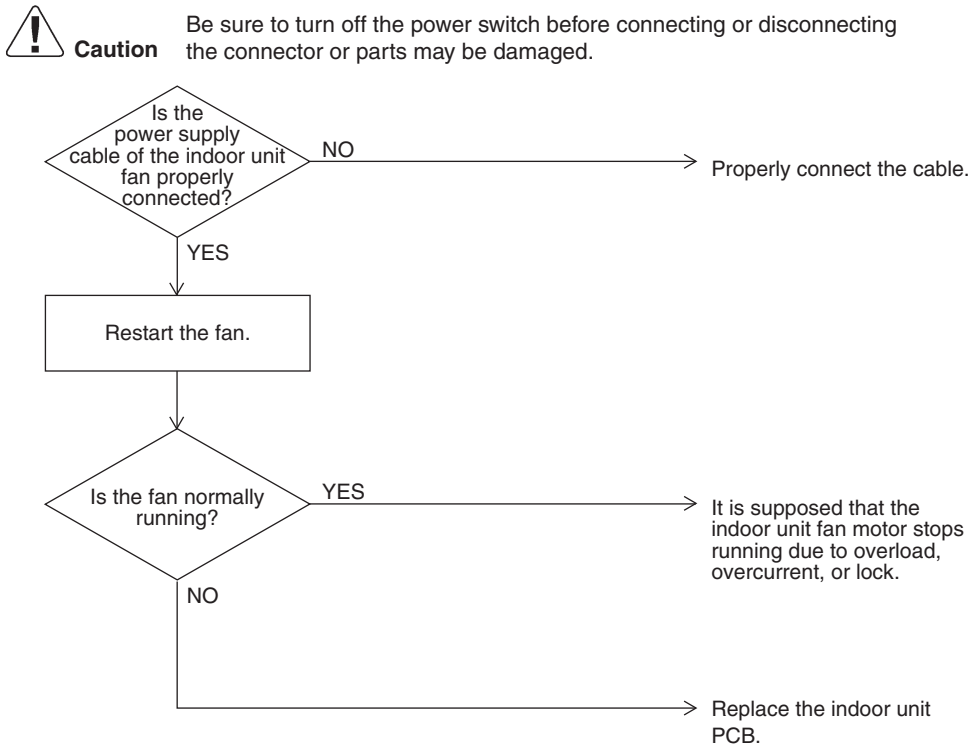
Error Decision Conditions

When it is not detected that the individual power supply for the indoor unit fan turns ON while in operation.

Supposed Causes

- Defective power supply for the indoor unit fan motor
- Clogged drain piping
- Actuation of the indoor unit safety device
- Defective contact in the fan wiring circuit

Troubleshooting

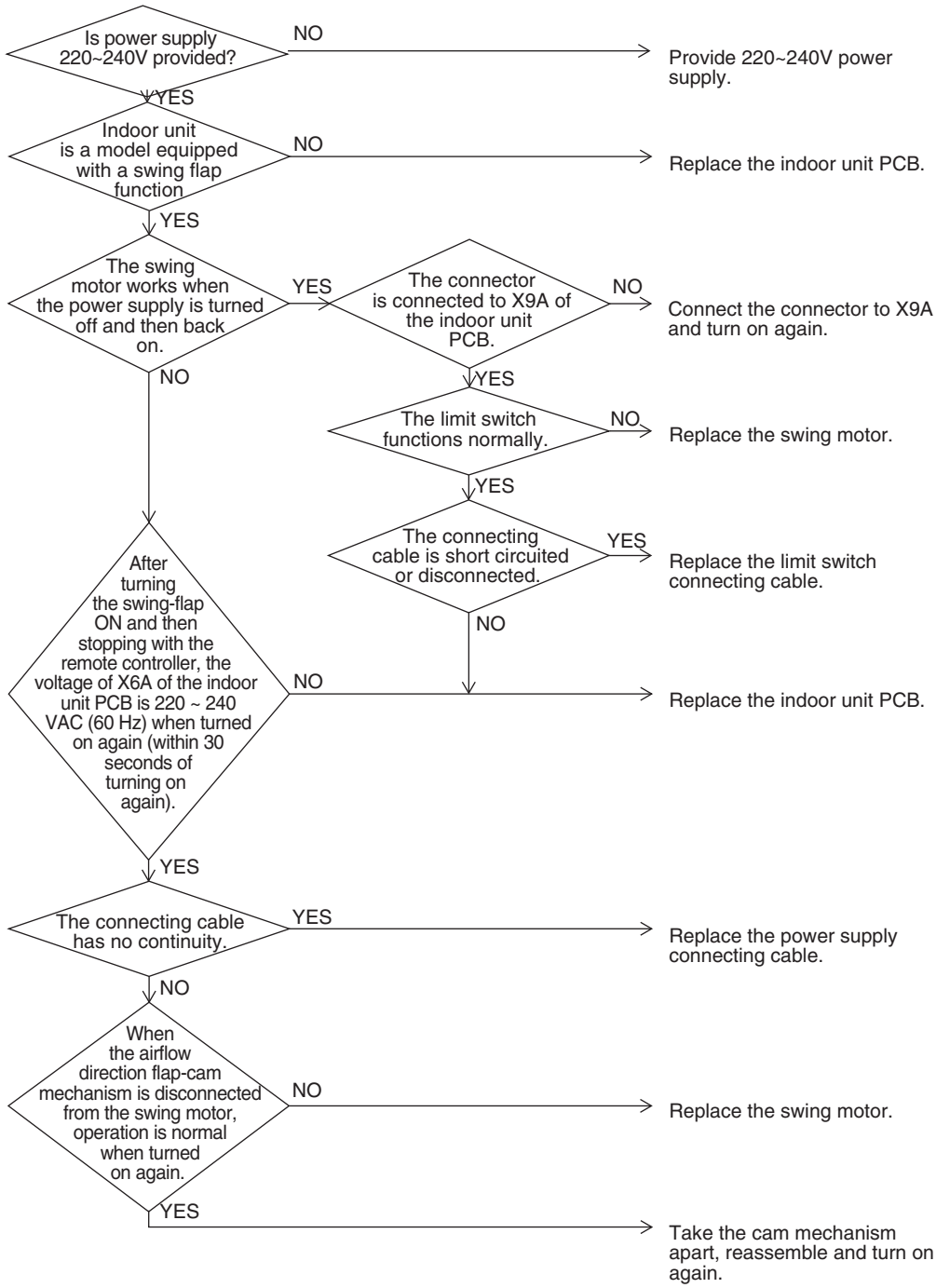


3.5 Swing Flap Motor (M1S) Abnormality

Remote Controller Display	A7
Applicable Models	FXHQ
Method of Error Detection	Utilizes ON/OFF of the limit switch when the motor turns.
Error 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). ∗ Error code is displayed but the system operates continuously.
Supposed Causes	■ Defective swing motor ■ Defective connection cable (power supply and limit switch) ■ Defective airflow direction adjusting flap-cam ■ Defective 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 Power Supply Voltage Abnormality

Remote Controller Display

Applicable Models

FXMQ07~48P

Method of Error Detection

Detects error checking of the input voltage of fan motor.

Error Decision Conditions

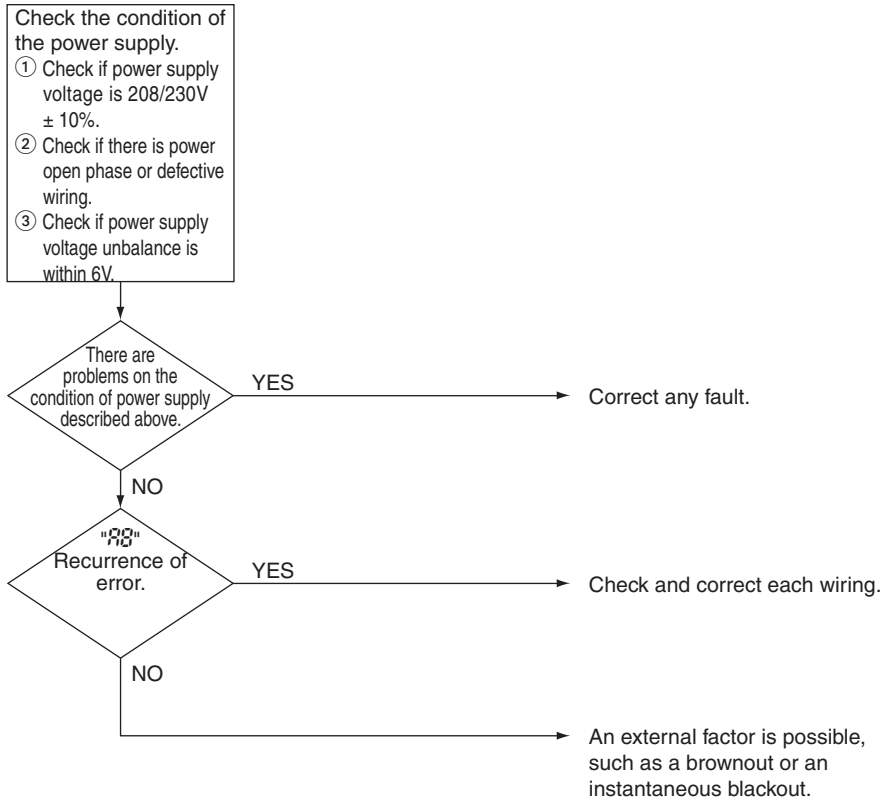
When the input voltage of fan motor is 150V or less, or 386V or more.

Supposed Causes

- Defective power supply voltage.
- Defective connection on signal line.
- Defective wiring.
- Instantaneous blackout, others.

Troubleshooting

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

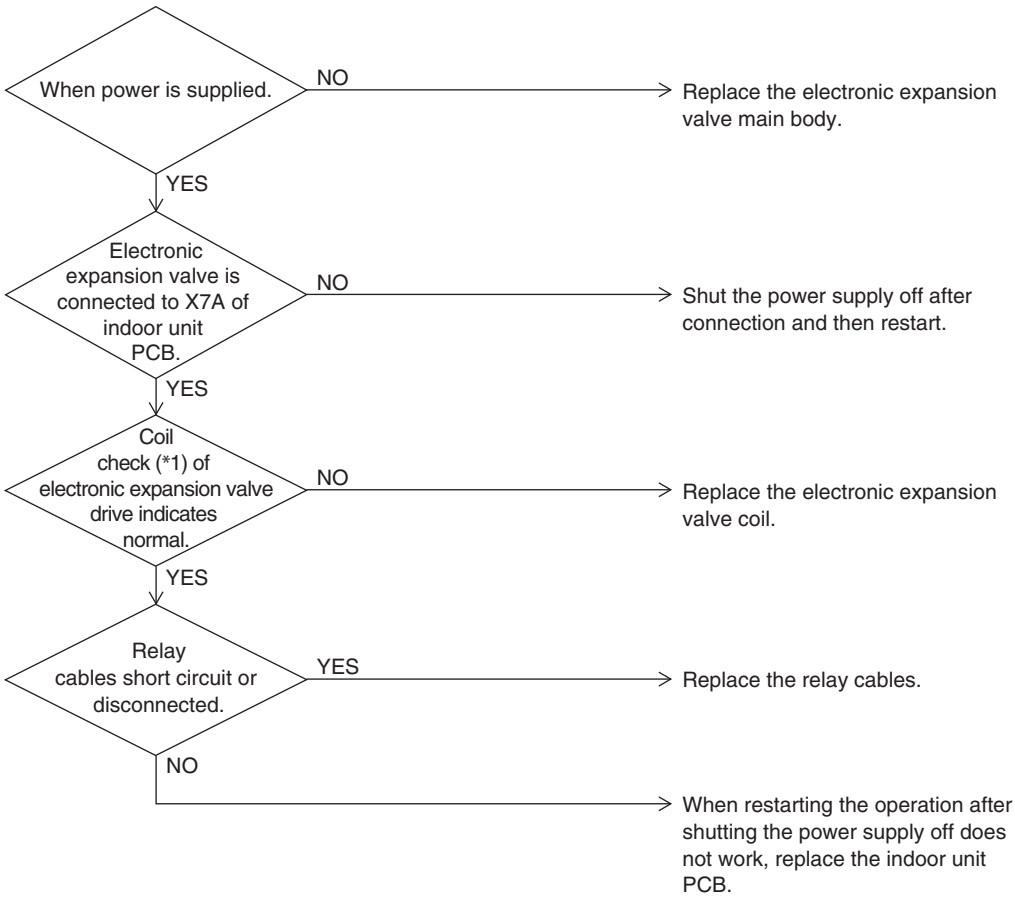


3.7 Electronic Expansion Valve Abnormality / Dust Clogging

Remote Controller Display	A9
Applicable Models	FXFQ
Method of Error Detection	Check coil condition of electronic expansion valve by using micro-computer. Check dust clogging condition of electronic expansion valve main body by using micro-computer.
Error Decision Conditions	Pin input for electronic expansion valve coil is abnormal when initializing micro-computer. Either of the following conditions is seen/caused/ occurs while the unit stops operation. ● Temperature of suction air (R1T) – temperature of liquid pipe of heat exchanger (R2T) > 46.4°F. ● Temperature of liquid pipe of heat exchanger (R2T) shows fixed degrees or below.
Supposed Causes	■ Defective of electronic expansion valve coil ■ Defective PCB indoor unit ■ Defective relay cables

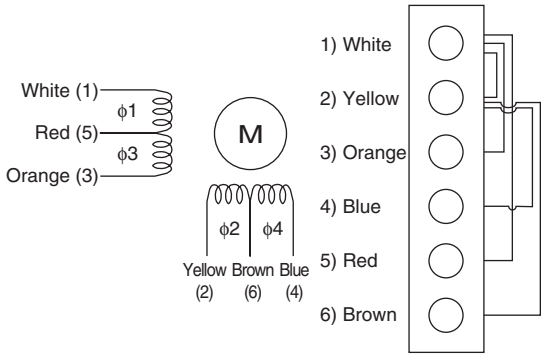
Troubleshooting

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



Note:

∗1: How to check the electronic expansion valve coil
Remove the connector for electronic expansion valve (X7A) from PCB. Measure the resistance value between pins and check the continuity to judge the condition.



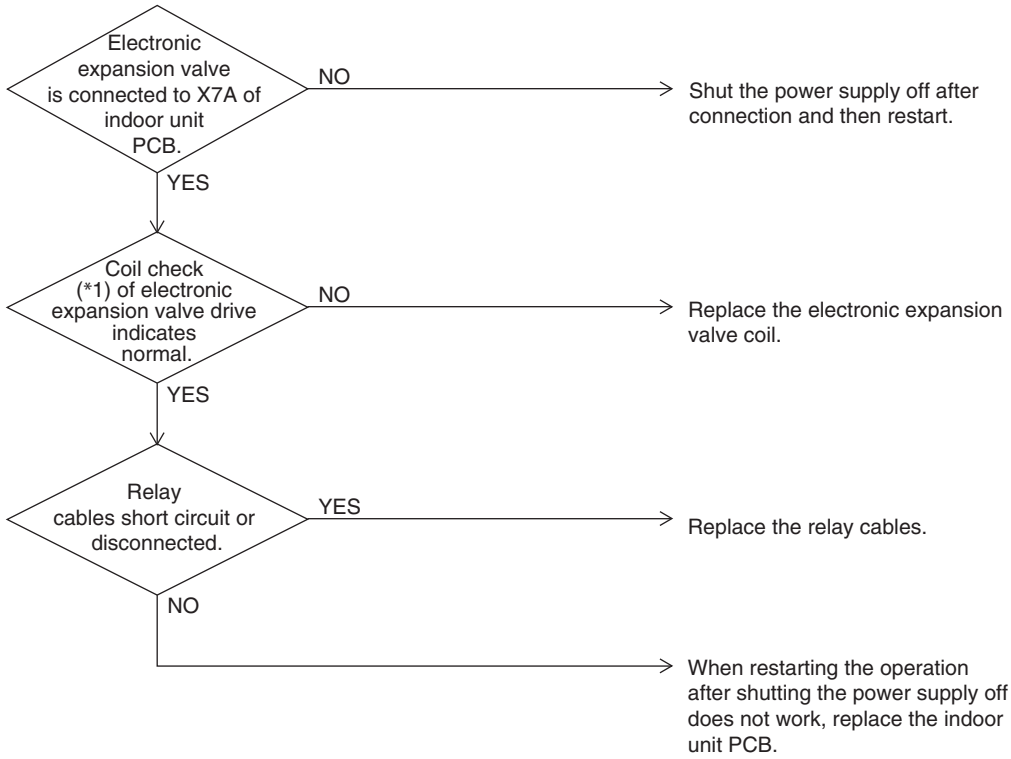
The normal products will show the following conditions:
① No continuity between (1) and (2)
② Resistance value between (1) and (3) is approx. 300 Ω
③ Resistance value between (1) and (5) is approx. 150 Ω
④ Resistance value between (2) and (4) is approx. 300 Ω
⑤ Resistance value between (2) and (6) is approx. 150 Ω

Electronic Expansion Valve Coil Abnormality

Remote Controller Display	A9
Applicable Models	Indoor units except FXFQ models
Method of Error Detection	Check coil condition of electronic expansion valve by using micro-computer.
Error Decision Conditions	Pin input for electronic expansion valve coil is abnormal when initializing micro-computer.
Supposed Causes	■ Defective of electronic expansion valve coil ■ Defective PCB indoor unit ■ Defective relay cables

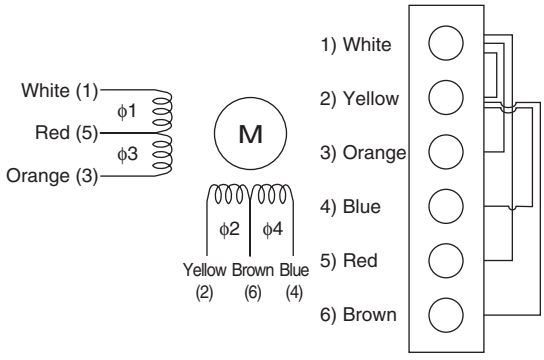
Troubleshooting

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



Note:

∗1: How to check the electronic expansion valve drive coil
Remove the connector for electronic expansion valve (X7A) from PCB. Measure the resistance value between pins and check the continuity to judge the condition.



The normal products will show the following conditions:
① No continuity between (1) and (2)
② Resistance value between (1) and (3) is approx. 300 Ω
③ Resistance value between (1) and (5) is approx. 150 Ω
④ Resistance value between (2) and (4) is approx. 300 Ω
⑤ Resistance value between (2) and (6) is approx. 150 Ω

3.8 Drain Level above Limit

Remote Controller Display

Applicable Models

FXFQ, FXZQ, FXMQ, FXDQ

Method of Error Detection

Water leakage is detected based on float switch ON/OFF operation while the compressor is in non-operation.

Error Decision Conditions

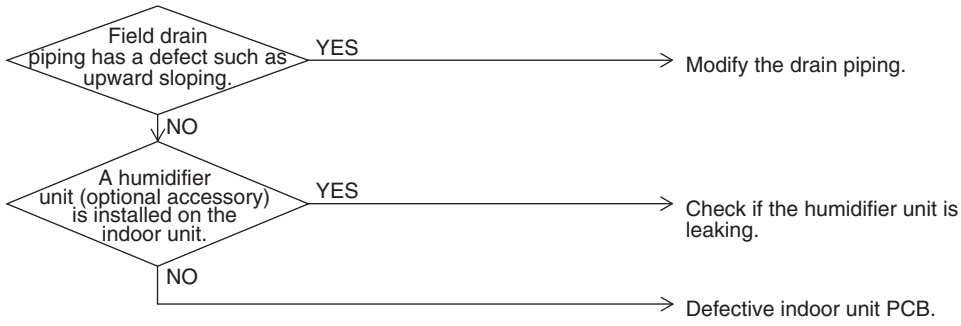
When the float switch changes from ON to OFF while the compressor is in non-operation.
∗ Error code is displayed but the system operates continuously.

Supposed Causes

- Humidifier unit (optional accessory) leaking
- Defective drain pipe (upward slope, etc.)
- Defective indoor unit PCB

Troubleshooting

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



3.9 Capacity Determination Device Abnormality

Remote controller display

A1

Applicable Models

All indoor unit models

Method of Error 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.

Error Decision Conditions

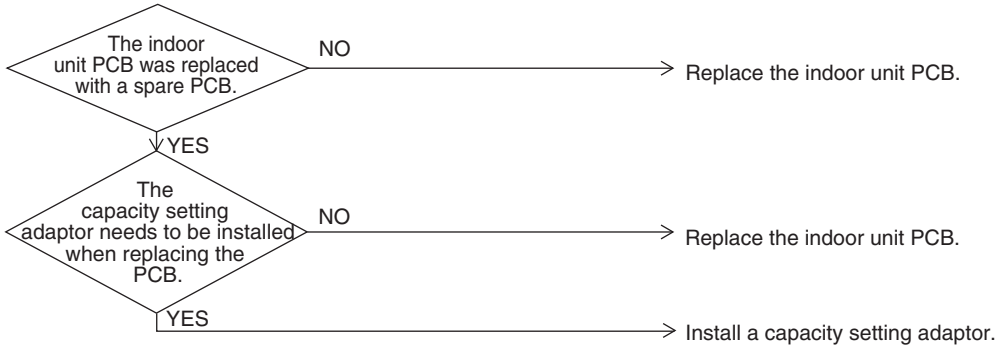
When the capacity code is not saved to the PCB, and the capacity setting adaptor is not connected. When a capacity that does not exist for that unit is set.

Supposed Causes

- The capacity setting adaptor was not installed.
- Defective indoor unit PCB

Troubleshooting

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



3.10 Transmission Abnormality (between Indoor unit PCB and Fan PCB)

Remote Controller Display

E 1

Applicable Models

FXMQ07~48P

Method of Error Detection

Check the condition of transmission between indoor unit PCB (A1P) and PCB for fan (A2P) using computer.

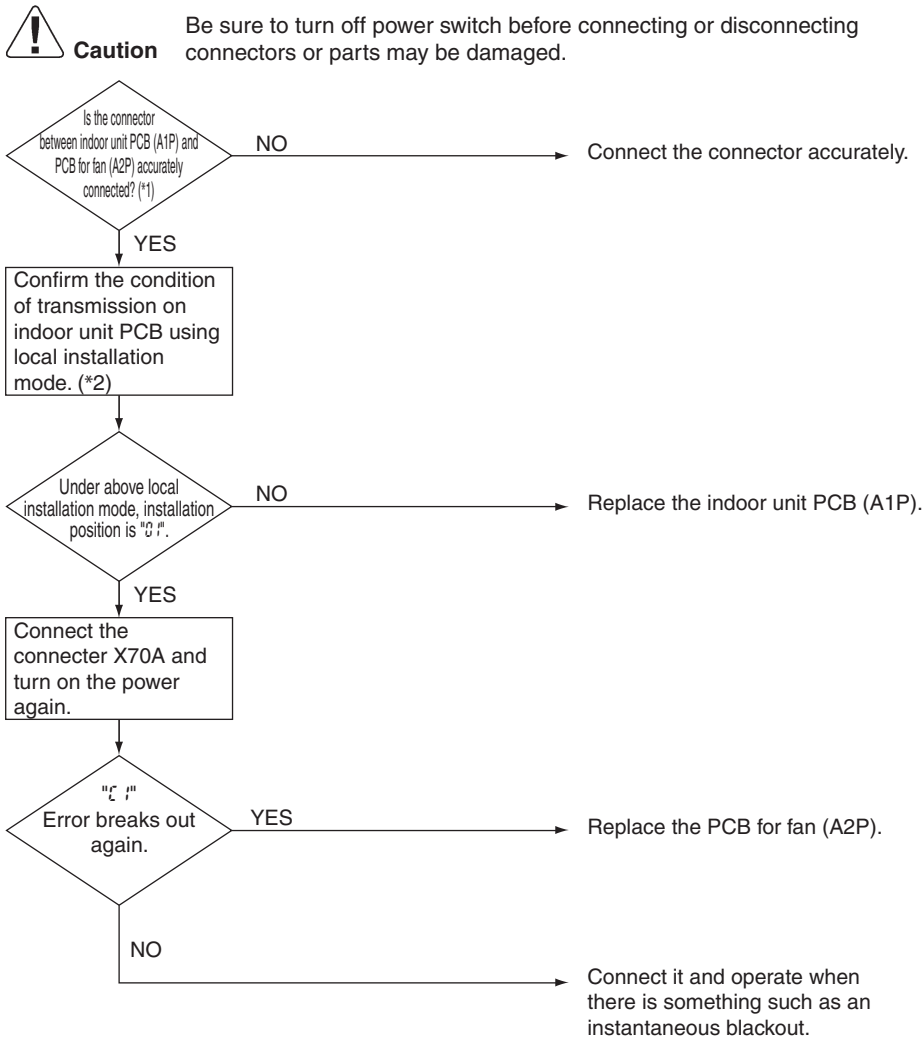
Error Decision Conditions

When normal transmission is not conducted for certain duration.

Supposed Causes

- Connection defect of the connecter between indoor unit PCB (A1P) and PCB for fan (A2P).
- Defective indoor unit PCB (A1P).
- Defective PCB for fan (A2P).
- External factor, such as an instantaneous blackout.

Troubleshooting



Note:

∗1. Pull out and insert the connecter once to check that it is securely connected.

∗2. Method to check transmission part of indoor unit PCB:

① Turn off the power and remove the connecter X70A of indoor unit PCB (A1P).

② Short circuit X70A.

③ After turning on the power, check below numbers under local setting remote control.
(Confirmation: Second code No. at the condition of first code No. 21 on mode No. 41)

↓

Determination
- 01: Normal
- Other than 01: Transmission defect on indoor unit PCB

∗ After confirmation, turn off the power, take off the short circuit and connect X70A back to original condition.

3.11 Thermistor (R2T) for Liquid Pipe Abnormality

Remote Controller Display

C4

Applicable Models

All models of indoor unit

Method of Error Detection

Error detection is carried out by temperature detected by liquid pipe thermistor.

Error Decision Conditions

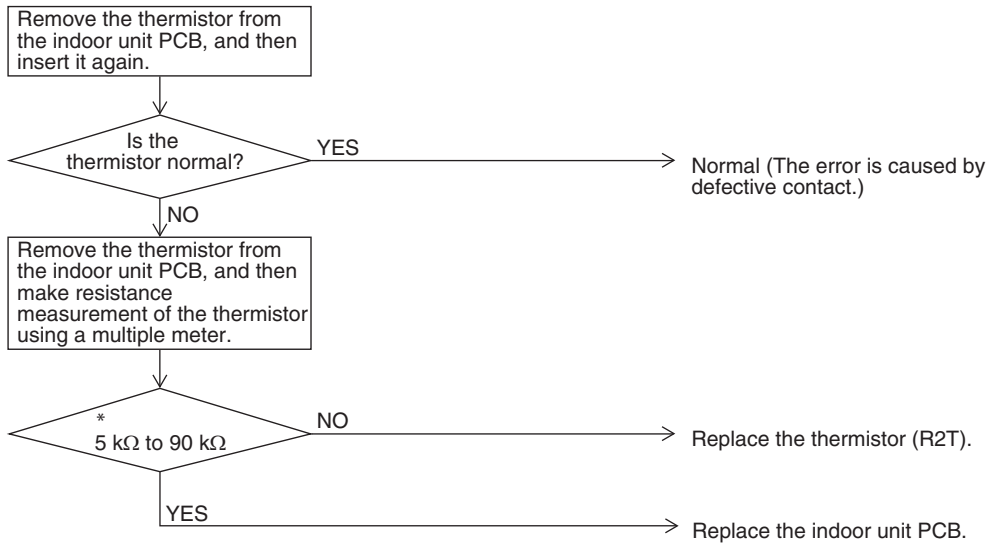
When the liquid pipe thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defective thermistor (R2T) for liquid pipe
- Defective indoor unit PCB

Troubleshooting

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



∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.12 Thermistor (R3T) for Gas Pipe Abnormality

Remote Controller Display

C5

Applicable Models

All models of indoor unit

Method of Error Detection

Error detection is carried out by temperature detected by gas pipe thermistor.

Error Decision Conditions

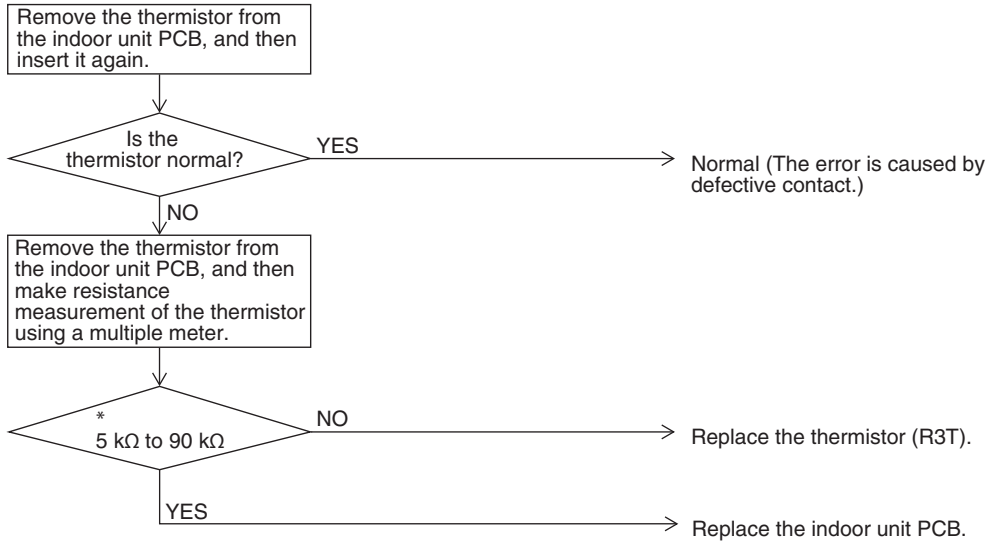
When the gas pipe thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defective indoor unit thermistor (R3T) for gas pipe
- Defective indoor unit PCB

Troubleshooting

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



∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.13 Failure of Combination (between Indoor unit PCB and Fan PCB

Remote Controller Display

C6

Applicable Models

FXMQ07~48P

Method of Error Detection

Conduct open line detection with PCB for fan (A2P) using indoor unit PCB (A1P).

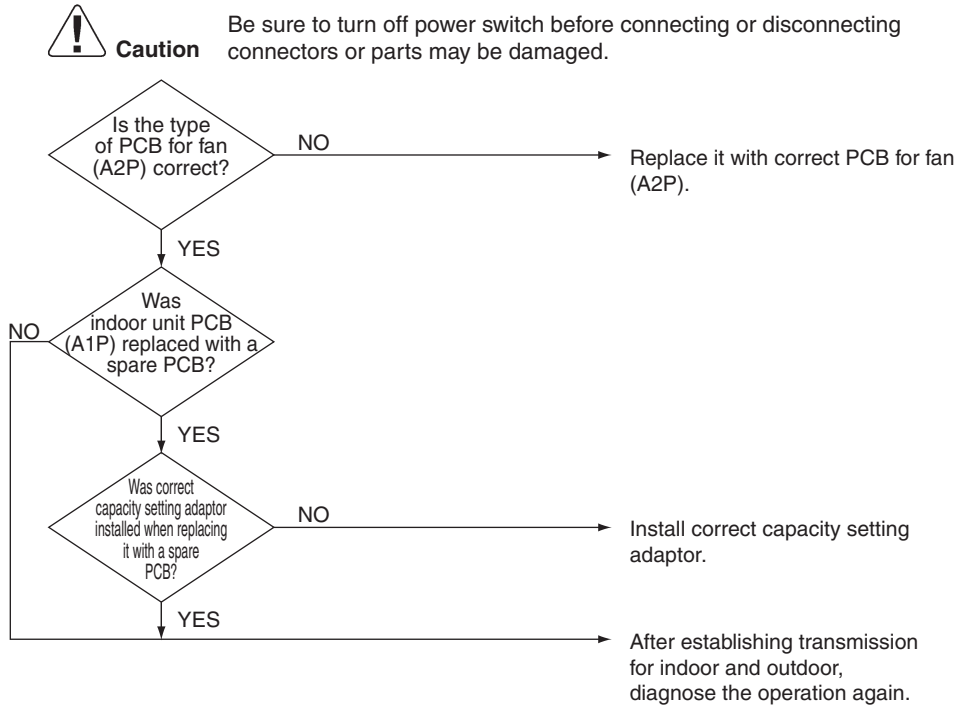
Error Decision Conditions

When the communication data of PCB for fan (A2P) is determined as incorrect.

Supposed Causes

- Defective PCB for fan (A2P).
- Defective connection of capacity setting adaptor.
- Setting mistake onsite.

Troubleshooting



3.14 Thermistor (R1T) for Suction Air Abnormality

Remote Controller Display

C9

Applicable Models

All models of indoor unit (except FXTQ)

Method of Error Detection

Error detection is carried out by temperature detected by suction air temperature thermistor.

Error Decision Conditions

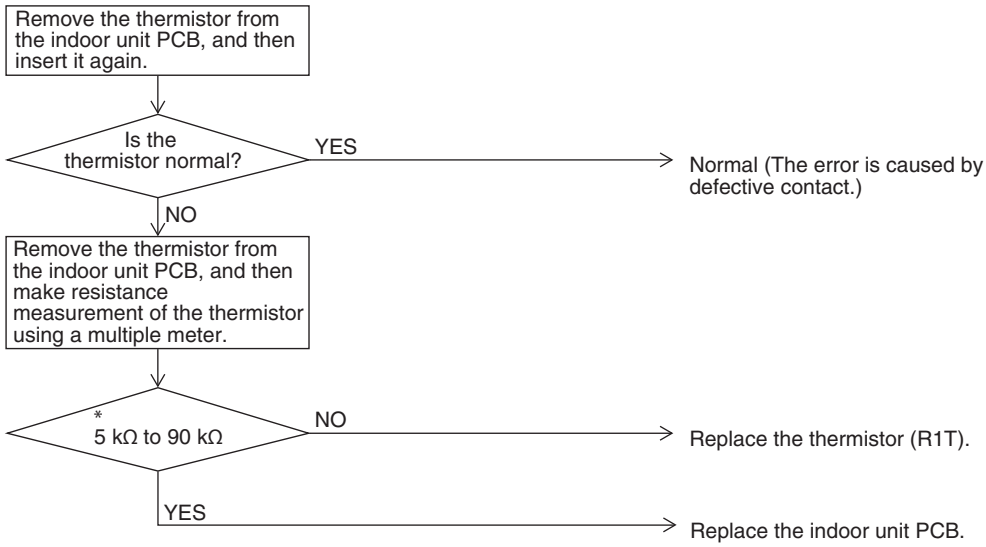
When the suction air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defective indoor unit thermistor (R1T) for air inlet
- Defective indoor unit PCB

Troubleshooting

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



∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

Remote Sensor Abnormality

Remote Controller Display

C9

Applicable Models

FXTQ

Method of Error Detection

The error is detected out by temperature detected by remote sensor.

Error Decision Conditions

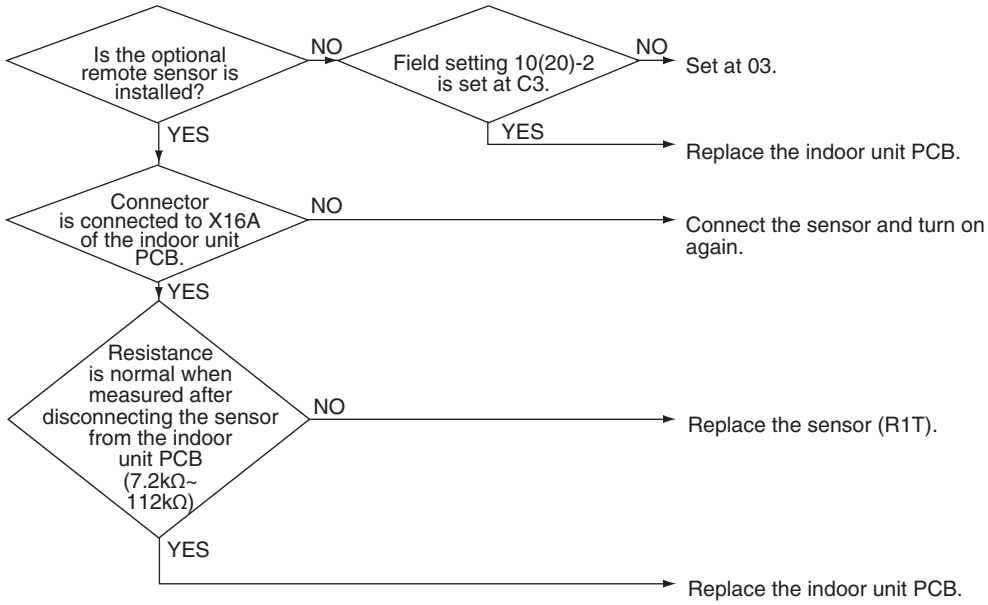
When the remote sensor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defective indoor unit thermistor (R1T) for air inlet
- Defective indoor unit PCB

Troubleshooting

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



∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.15 Humidity Sensor System Abnormality

Remote Controller Display

CC

Applicable Models

FXFQ

Method of Error Detection

Even if an error occurs, operation still continues.
Error is detected according to the moisture (output voltage) detected by the moisture sensor.

Error Decision Conditions

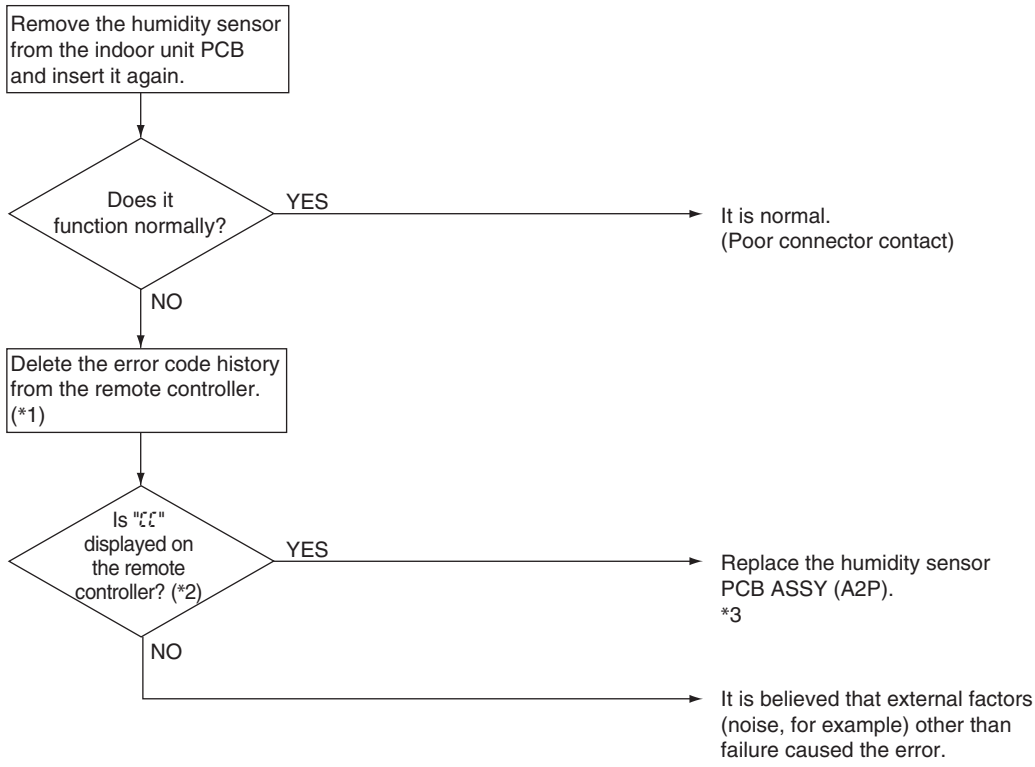
When the moisture sensor is disconnected or short circuited

Supposed Causes

- Defective sensor
- Disconnection

Troubleshooting

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



*1: To delete the history, the ON/OFF button of the remote controller must be pressed and held for 5 seconds in the check mode.
*2: To display the code, the Inspection/Test Operation button of the remote controller must be pressed and held in the normal mode.
*3: If "CC" is displayed even after replacing the humidity sensor PCB assy (A2P) and taking the steps *1 and 2, replace the indoor unit PCB assy (A1P).

3.16 Room Temperature Thermistor in Remote Controller Abnormality

Remote Controller Display

E1

Applicable Models

All models of indoor units

Method of Error Detection

Error detection is carried out by temperature detected by room temperature thermistor in remote controller. (Note:)

Error Decision Conditions

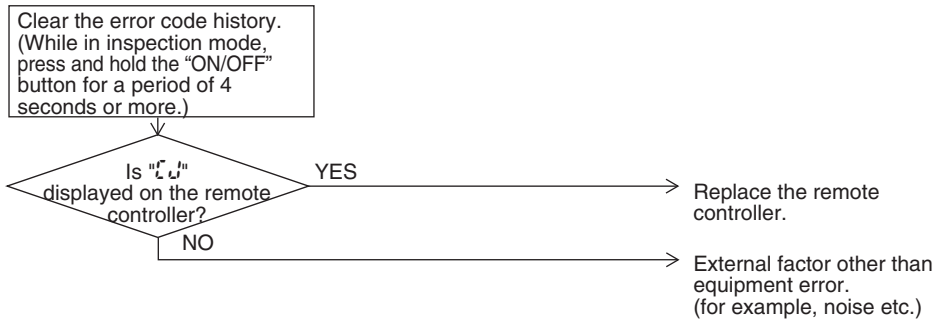
When the room temperature thermistor in remote controller becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defective room temperature thermistor in remote controller
- Defective remote controller PCB

Troubleshooting

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



Note: ∗1: How to delete “the history of error codes”.
Press the “ON/ OFF” button for 4 seconds and more while the error code is displayed in the inspection mode.

∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.17 PCB Defect

Remote Controller Display

E1

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Abnormality is detected under the communication conditions in the hardware section between the indoor unit and outdoor unit.

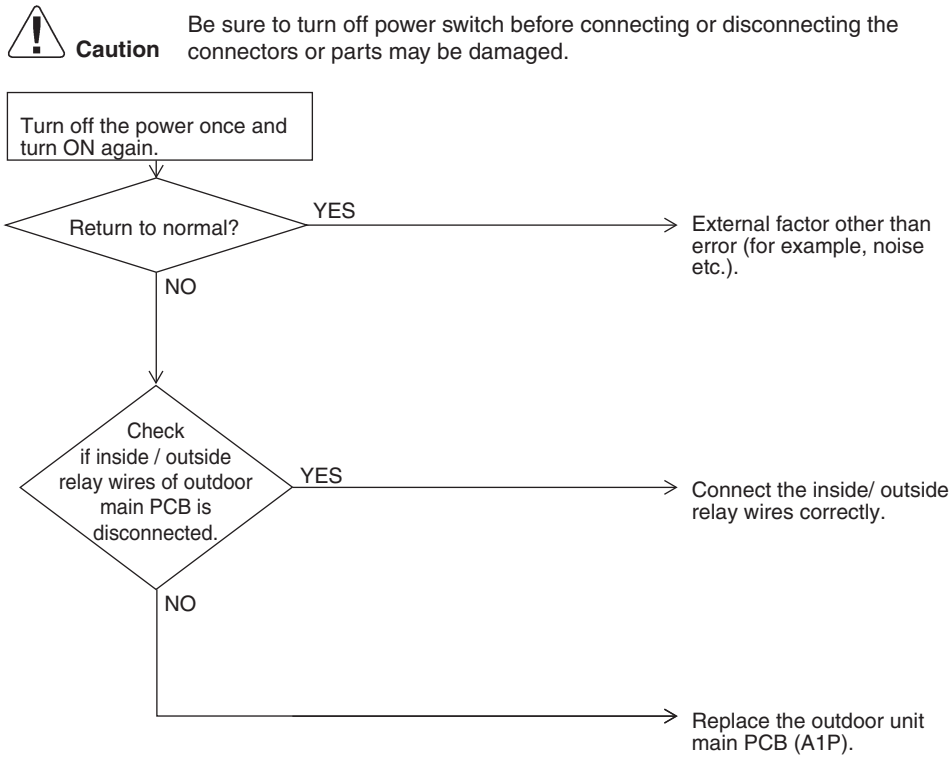
Error Decision Conditions

When the communication conditions in the hardware section between the indoor unit and the outdoor unit are not normal.

Supposed Causes

- Defective outdoor unit PCB (A1P)
- Defective connection of inside/ outside relay wires

Troubleshooting

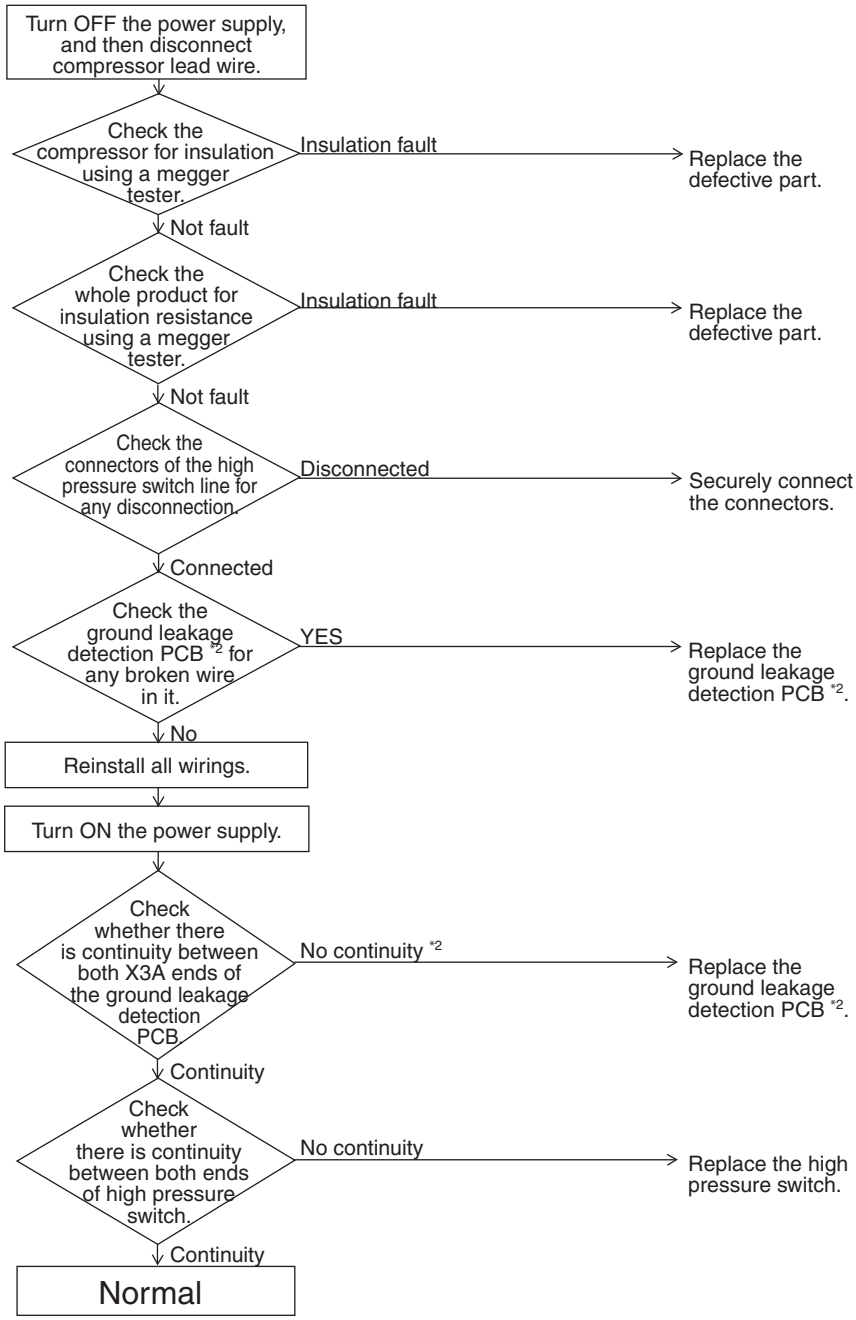


3.18 Earth Leakage by Leak Detection PCB Assy

Remote Controller Display	E2
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Failure is to be detected by using leak detection PCB assy.
Error Decision Conditions	Leakage is detected under the conditions outside of the scope of high pressure switch operation.
Supposed Causes	■ Defective of compressor

Troubleshooting

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



It is supposed that ground leakage occurs due to temporary liquid back or accumulation of refrigerant. This phenomenon can occur when power fails while in operation or is cut off for an extended period of time.

Note:

∗1: It is normal that there is no continuity between both ends of X3A when the power supply turns OFF and for a period of 9 seconds at maximum after the power supply turns ON.

∗2:

Model	460V	208/230V
RXYQ72, 96, 120PB	9P	7P
RXYQ144PB	—	6P
REYQ72, 96, 120PB	9P	7P
REYQ144PB	—	6P
REMQ72PB	7P	4P
REMQ96, 120PB	7P	5P

3.19 Actuation of High Pressure Switch

Remote Controller Display	E3
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Abnormality is detected when the contact of the high pressure protection switch opens.
Error 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 ■ Defective high pressure switch ■ Defective outdoor unit main PCB (A1P) ■ Instantaneous power failure ■ Defective high pressure sensor

Troubleshooting

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

Check for the points shown below.
① Is the stop valve open?
② Is the high pressure switch connector properly connected to the main PCB?
③ Does the high pressure switch have continuity?

Are the three points above OK?
- NO → Rectify the defective points, if any.
- YES ↓

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

Does the stop due to error (E3) recur?
- YES → **Is the high pressure switch operating value normal (i.e., 580psi)?**
  - NO → Replace the high pressure switch.
  - YES ↓
- NO ↓

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

Service Checker
Connect the service checker to compare the "high pressure" value and the actual measurement value by pressure sensor (Refer to *1) by using the service checker.

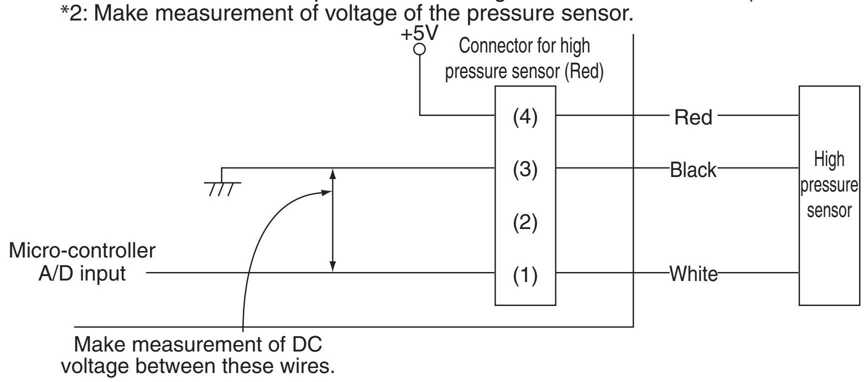
Check if the "high pressure" value and the actual measurement value by pressure sensor are the same.
- NO → Replace the main PCB (A1P).
- YES ↓

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

CHECK 5 Remove the causes by which the high pressure has become high.

Note:

*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, make measurement of voltage at the connector, and then convert it to pressure according to information on P.518.)
*2: Make measurement of voltage of the pressure sensor.



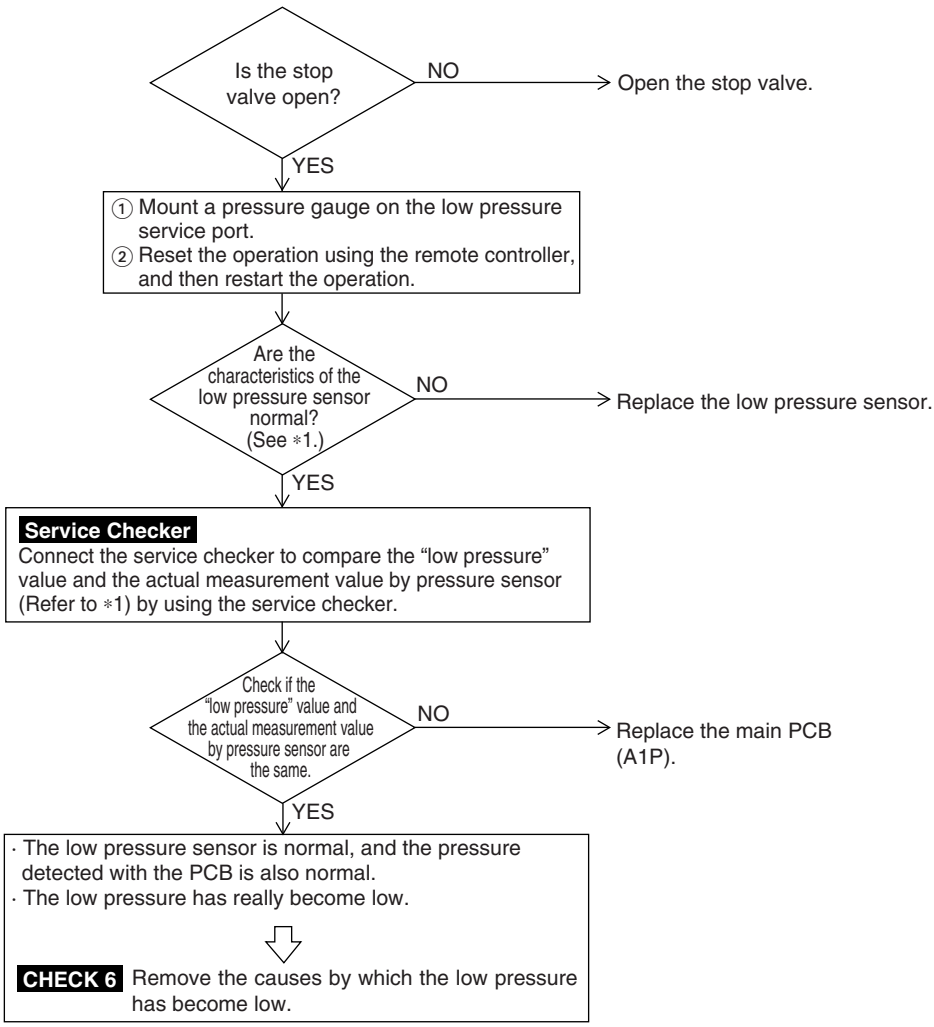
CHECK 5 Refer to P.450.

3.20 Actuation of Low Pressure Sensor

Remote Controller Display	E4
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Abnormality is detected by the pressure value with the low pressure sensor.
Error Decision Conditions	Error is generated when the low pressure is dropped under compressor operation. Operating pressure: 10.15psi
Supposed Causes	■ Abnormal drop of low pressure (Lower than 10.15psi) ■ Defective low pressure sensor ■ Defective outdoor unit PCB ■ Stop valve is not opened. ■ Clogged filter

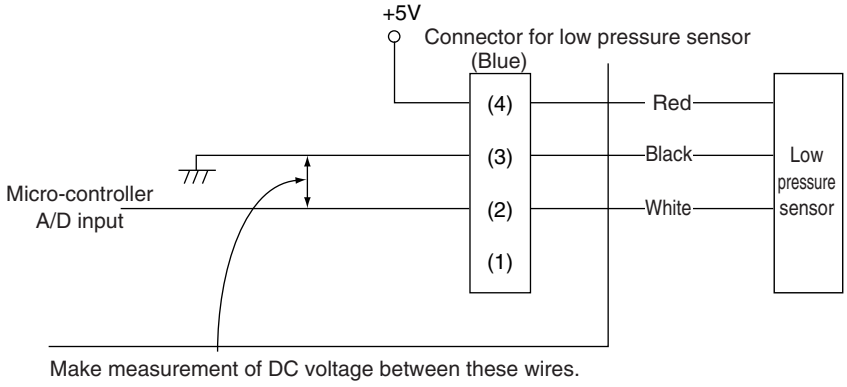
Troubleshooting

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



Note:

∗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, make measurement of voltage at the connector, and then convert it to pressure according to information on P.518.)
∗2: Make measurement of voltage of the pressure sensor.



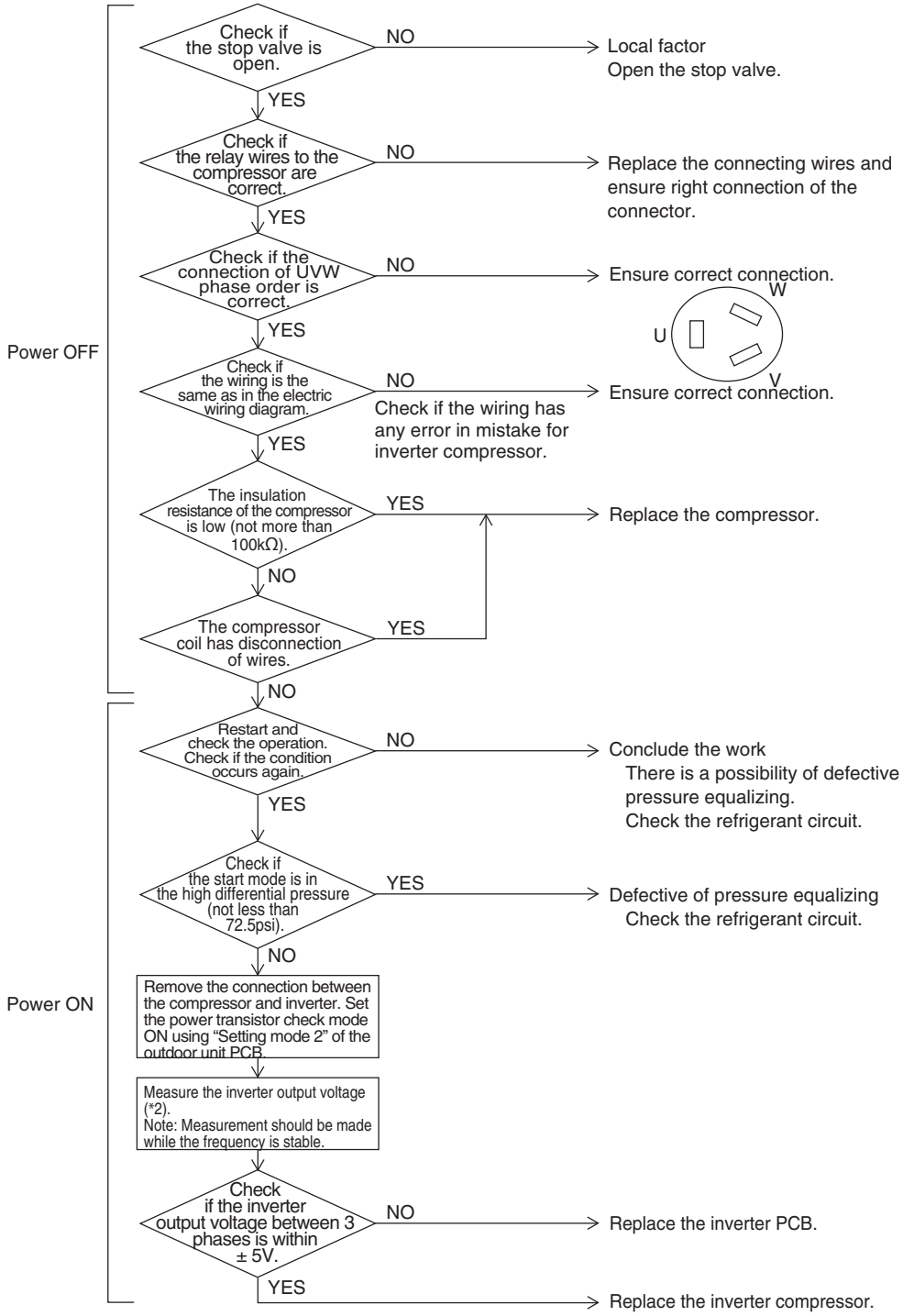
CHECK 6 Refer to P.451.

3.21 Inverter Compressor Motor Lock

Remote Controller Display	E5
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Inverter PCB takes the position signal from UVW line connected between the inverter and compressor, and the error is detected when any abnormality is observed in the phase-current waveform.
Error Decision Conditions	This error 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 ■ Defective inverter PCB ■ Stop valve is not opened.

Troubleshooting

Caution Be sure to turn off power switch before connecting or disconnecting the connectors 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.439).

Note:

∗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.

CHECK 4 Refer to P.449.

3.22 STD Compressor Motor Overcurrent/Lock

Remote Controller Display

E6

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Detects the overcurrent with current sensor (CT).

Error Decision Conditions

Error is decided when the detected current value exceeds the below mentioned value for 2 seconds.

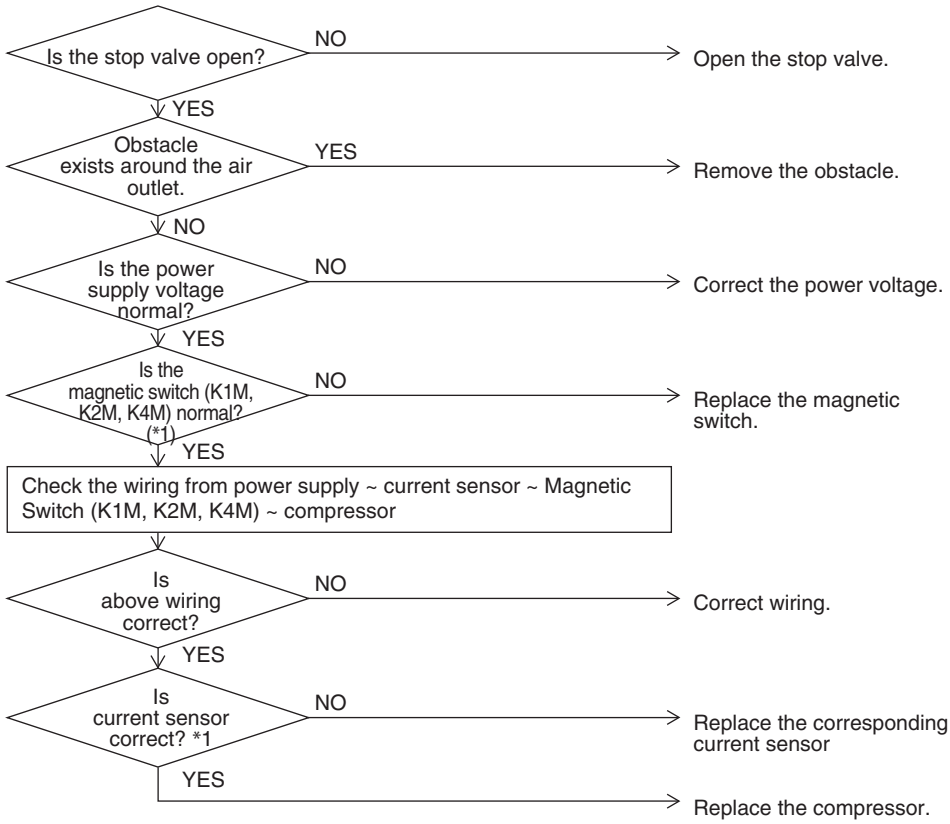
- 230V unit : 28.8A
  460V unit : 15.0A

Supposed Causes

- Stop valve is not opened
- Obstacles at the air outlet
- Improper power voltage
- Defective magnetic switch
- Defective compressor
- Defective current sensor

Troubleshooting

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



Note: ∗1 One of the possible factors may be chattering due to rough magnetic switch contact.
∗2 Abnormal case
- The current sensor value is 0 during STD compressor operation.
- The current sensor value is more than 230V: 28.8A during STD compressor stop.
  460V: 15.0A

3.23 Outdoor Unit Fan Motor Abnormality

Remote Controller Display	E7
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Detect an error based on the current value in the inverter PCB (as for motor 2, current value in the fan PCB). Detect an error for the fan motor circuit based on the number of rotation detected by hole IC during the fan motor operation.
Error Decision Conditions	■ Overcurrent is detected for inverter PCB (A2P) or fan inverter PCB (A5P) (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 power switch before connecting or disconnecting the connectors or parts may be damaged.

Check in the monitor mode
Check electric motor (electric motor 1 or 2) corresponding to error code "ε7" in the monitor mode of outdoor unit PCB. (Refer to P.319, P.320 for how to check)

↓

Turn 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: relay connector or X1A, X2A of compressor inverter PCB.
- Fan motor 2: relay connector or X1A, X2A of fan inverter PCB.

↓

Check if any connector is disconnected. — YES → Insert the connector.

NO ↓

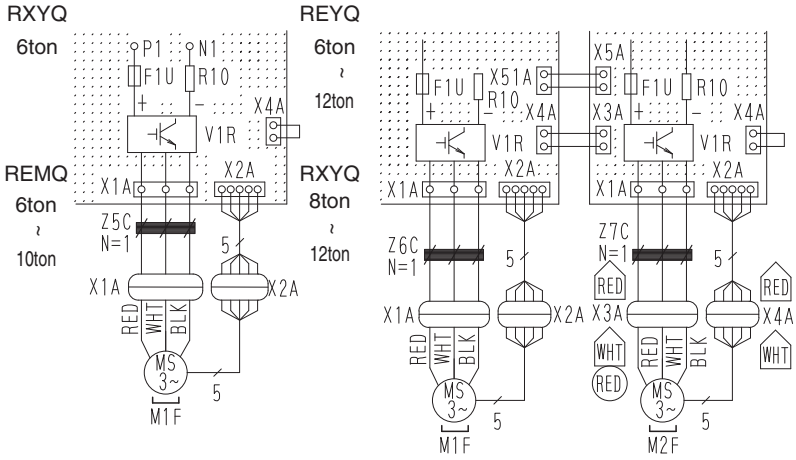
Check the color of relay connectors
- Fan motor 1: Both power supply wire and signal wire are all white.
- Fan motor 2: Both power supply wire and signal wire are red in the PCB side and white in the motor side.

↓

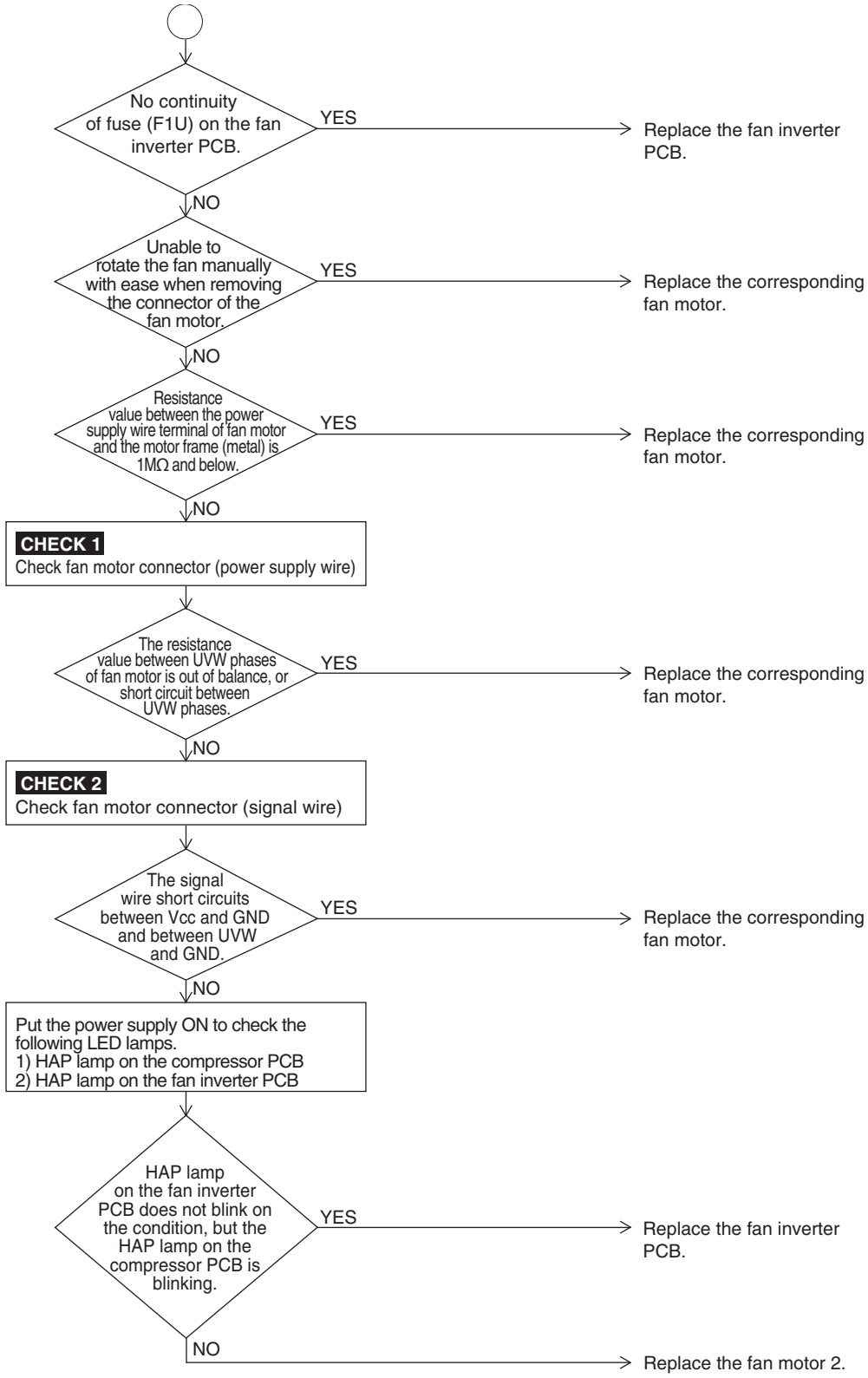
Relay connectors have any connection error. — YES → Correct the connection of the relay connectors.

NO ↓

A



Troubleshooting



CHECK 1 Refer to P.447.

CHECK 2 Refer to P.447.

3.24 Electronic Expansion Valve Coil (Y1E~Y5E) Abnormality

Remote Controller Display	E9
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Check disconnection of connector To be detected based on continuity existence of electronic expansion valve coil
Error Decision Conditions	No current is detected in the common (COM [+]) when power supply is ON.
Supposed Causes	■ Disconnection of connectors for electronic expansion valve ■ Defective electronic expansion valve coil ■ Defective outdoor unit main PCB (A1P)

Troubleshooting

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

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

Return to normal?

YES → External factor other than error (noise,for examplee).

NO

Check the electronic expansion valve corresponding to the error code "E9" in the monitor mode.
(Refer to P.325, P.326 for how to check.)

○ When Check 4 shows as follows:
◑○○●●※※® Electronic expansion valve for main use (Y1E, Y3E for Single, Y1E for Multi)

○ When Check 4 shows as follows:
◑○○●◑※※® Electronic expansion valve for refrigerant charge (Y4E for Single, Y2E for Multi)

○ When Check 4 shows as follows:
◑○○◑●※※® Electronic expansion valve for subcooling (Y2E, Y5E for Single, Y3E for Multi)

○ 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

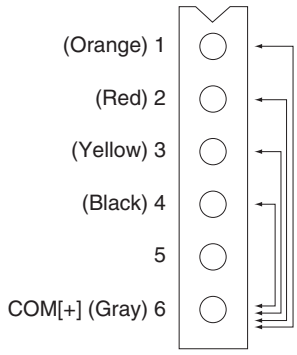
The coil resistance of electronic expansion valve is normal. (Refer to *1)

NO → Replace the connecting cable.

YES → Replace the outdoor unit PCB (A1P).

Note:

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



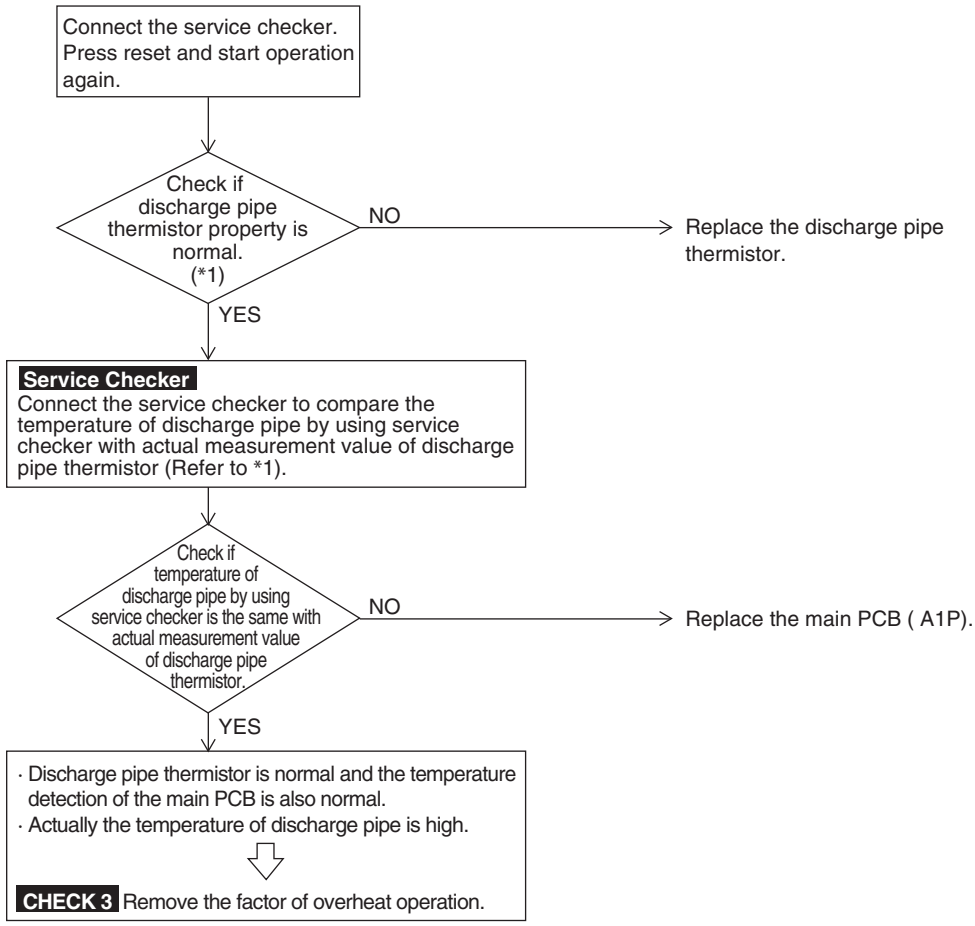
Measuring points	Judgement criteria
1 - 6	40~50Ω
2 - 6	
3 - 6	
4 - 6	

3.25 Abnormal Discharge Pipe Temperature

Remote Controller Display	F3
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Abnormality is detected according to the temperature detected by the discharge pipe temperature thermistor.
Error 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	■ Defective discharge pipe temperature thermistor ■ Defective connection of discharge pipe temperature thermistor ■ Defective outdoor unit PCB

Troubleshooting

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



*1: Compare the resistance value of discharge pipe thermistor and the value based on the surface thermometer.
(Refer to P.505 for the temperature of thermistor and the resistance property)

CHECK 3 Refer to P.448.

∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.26 Refrigerant Overcharged

Remote Controller Display

F6

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Excessive charging of refrigerant is detected by using the outdoor air temperature, heat exchanger deicer temperature and liquid pipe temperature during check operation.

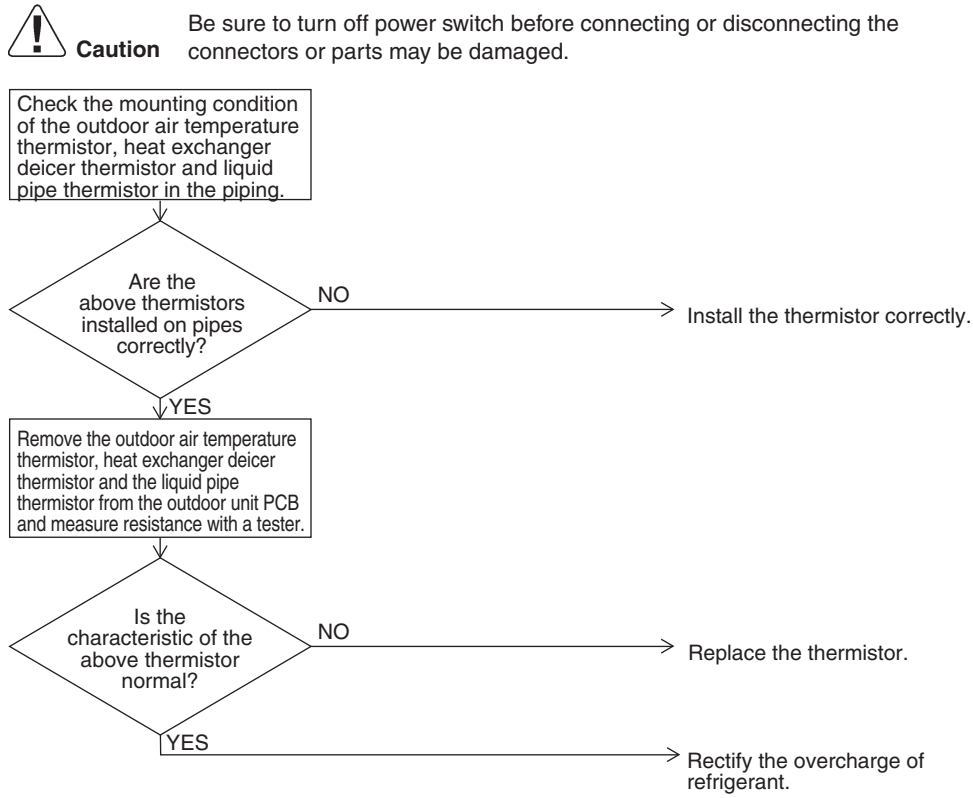
Error Decision Conditions

When the amount of refrigerant, which is calculated by using the outdoor air temperature, heat exchanging deicer temperature and liquid pipe temperature during check operation, exceeds the criteria.

Supposed Causes

- Refrigerant overcharge
- Disconnection of outdoor air thermistor
- Disconnection of heat exchanger deicer thermistor
- Disconnection of liquid pipe thermistor

Troubleshooting



∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.27 Outdoor Fan Motor Signal Abnormality

Remote Controller Display

H7

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Detection of abnormal signal from fan motor.

Error Decision Conditions

In case of detection of abnormal signal at starting fan motor.

Supposed Causes

- Defective fan motor signal (circuit error)
- Broken, short circuited or disconnection connector of fan motor connection cable
- Defective fan Inverter PCB

Troubleshooting

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

Check the fan motor corresponding to the error code "H7" in the monitor mode.
(Refer to P.325, P.326 for how to check)
When check 3 shows as follows:
◑○●●●●●● ® Fan motor 1 (M1F)
When check 3 shows as follows:
◑○●●●●◑ ® Fan motor 2 (M2F)
Identify outdoor unit based on Check 4.
◑○○●●※※

Explanation for "※※"

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

Turn the power supply off.

Check if signal wire connector for the corresponding fan motor is normal.
NO → Ensure correct connection.
YES

Check the connector of the fan motor (*1).

Check if the resistance of the fan motor lead wire between Vcc and UVW, and between GND and UVW are balanced.
NO → Replace the fan motor.
YES → Replace the inverter PCB.
- For fan motor 1: replace the inverter PCB
- For fan motor 2: replace the fan inverter PCB

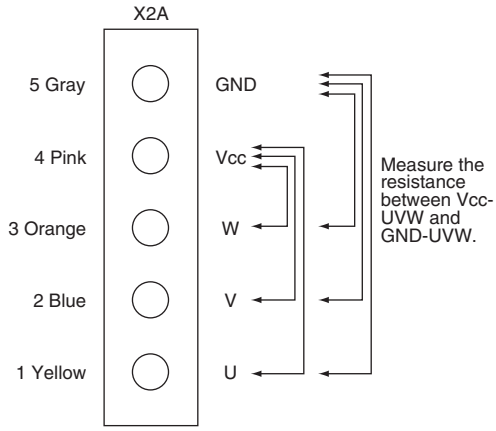
Note: ∗1. Check procedure for fan motor connector

(1) Power OFF the fan motor.

(2) Remove the connector (X2A or X4A) on the PCB to measure the following resistance value.

Judgement criteria: resistance value between each phase is within ±20%

Connector for signal wires (X2A or X4A)



3.28 Thermistor (R1T) for Outdoor Air Abnormality

Remote Controller Display

H9

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Error is detected from the temperature detected by the outdoor air thermistor.

Error Decision Conditions

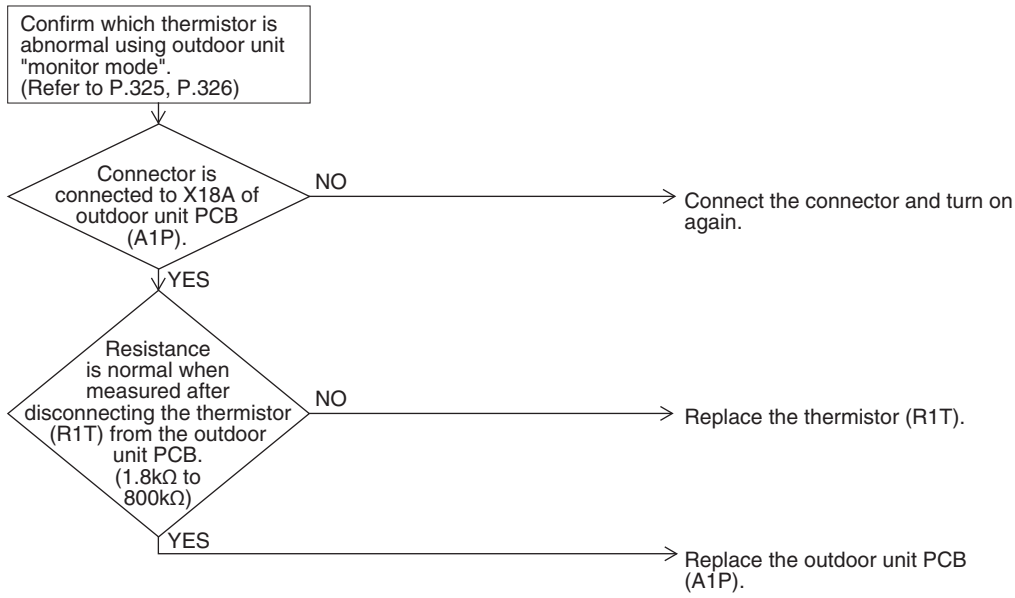
When the outdoor air temperature thermistor has short circuit or open circuit.

Supposed Causes

- Defective thermistor connection
- Defective thermistor (R1T) for outdoor air
- Defective outdoor unit PCB (A1P)

Troubleshooting

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



∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.29 Current Sensor Abnormality

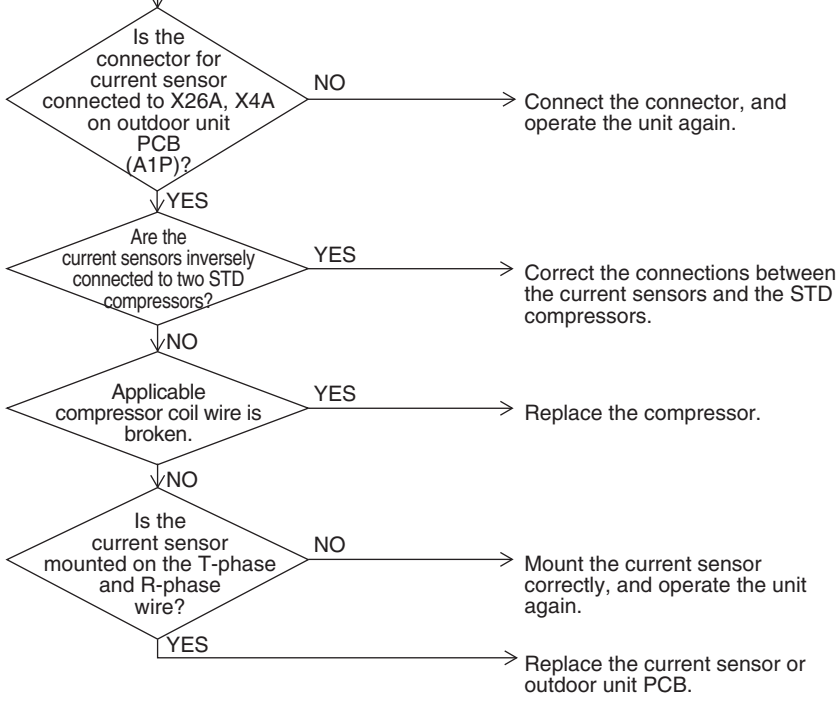
Remote Controller Display	
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Error is detected according to the current value detected by current sensor.
Error Decision Conditions	When the current value detected by current sensor becomes 5A or lower, or 40A or more during standard compressor operation.
Supposed Causes	■ Defective current sensor ■ Defective outdoor unit PCB ■ Defective compressor

Troubleshooting

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

Check the current sensor corresponding to the error code "U2" in the monitor mode.
(Refer to P.325, P.326 for how to check)
○ Check 4 shows as follows:
◑○○●●※※® Current sensor for constant rate compressor 1
○ Check 4 shows as follows:
◑○○●◑※※® Current sensor for constant rate compressor 2
○ Explanation for "※※"

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



3.30 Discharge Pipe Temperature Thermistor Abnormality

Remote Controller Display

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Error is detected from the temperature detected by discharge pipe temperature thermistor*.

Error Decision Conditions

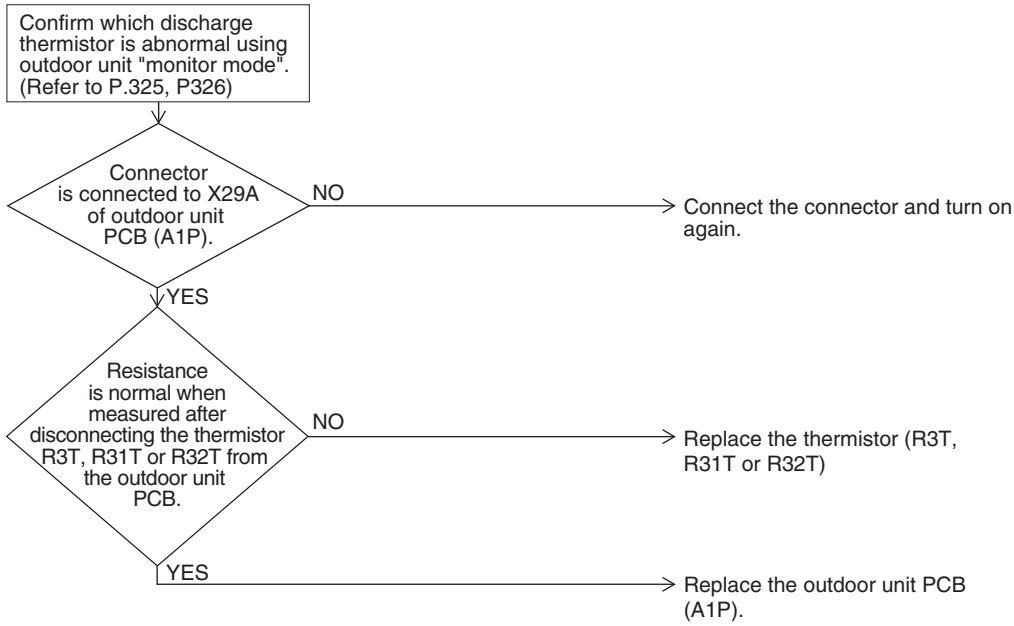
When a short circuit or an open circuit in the discharge pipe temperature thermistor is detected.

Supposed Causes

- Defective thermistor (R3T, R31T, R32T) for outdoor unit discharge pipe
- Defective outdoor unit PCB (A1P)
- Defective thermistor connection

Troubleshooting

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



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

Model	6 ton	8 ton	10 ton	12 ton
RXYQ	R3T	R31T, R32T		
REYQ	R31T, R32T			
REMQ	R31T	R31T, R32T		

* Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.31 Thermistor for Heat Exchanger Gas pipe Abnormality

Remote Controller Display

U4

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Detect error based on the temperature detected by the heat exchanger gas pipe thermistor*.

Error Decision Conditions

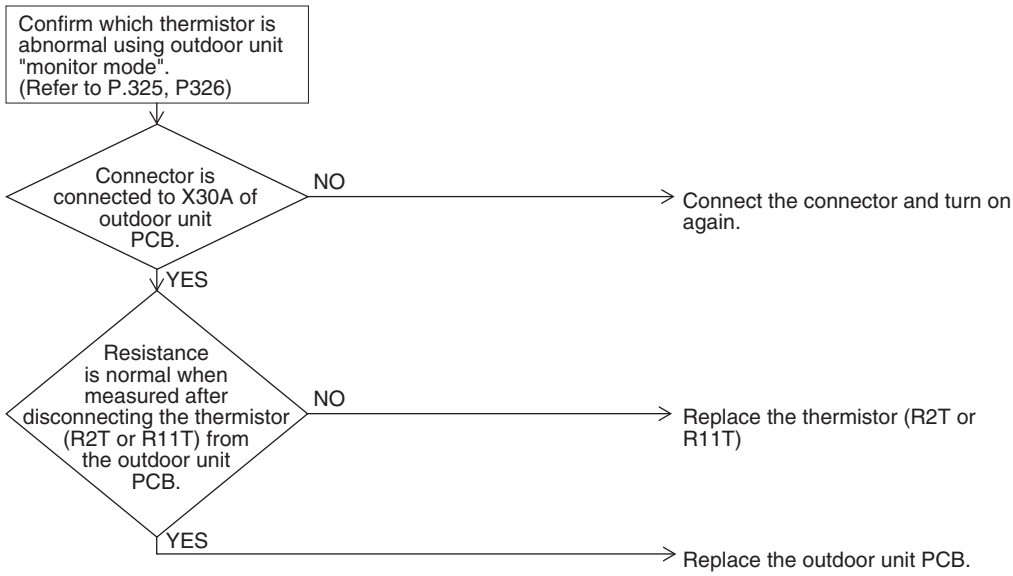
In operation, when a thermistor is disconnected or short circuits.

Supposed Causes

- Defective connection of thermistor
- Defective thermistor
- Defective outdoor unit PCB

Troubleshooting

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



Note:

Model	6 ton	8 ton	10 ton	12 ton
RXYQ	—			R2T, R11T
REYQ	R2T, R11T			
REMQ	—	R2T		

* Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.32 Thermistor for Suction Pipe Temperature Abnormality

Remote Controller Display

U5

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Error is detected from the temperature detected by the suction pipe temperature thermistor*.

Error Decision Conditions

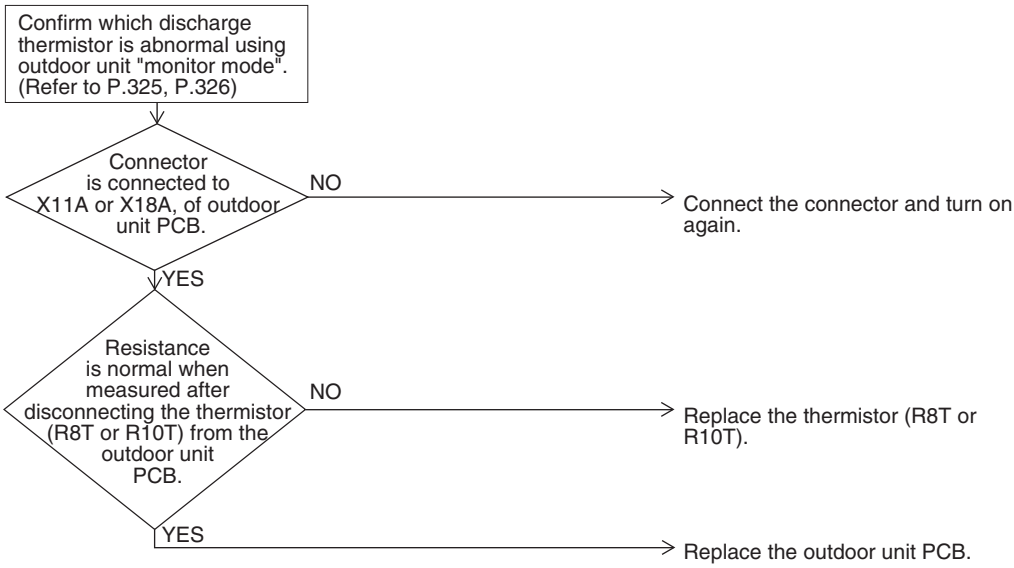
When a short circuit or an open circuit in the suction pipe temperature thermistor is detected.

Supposed Causes

- Defective thermistor (R8T or R10T) for outdoor unit suction pipe
- Defective outdoor unit PCB
- Defective thermistor connection

Troubleshooting

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



Note:

Model	6 ton	8 ton	10 ton	12 ton
RXYQ	R2T	R2T		R8T, R10T
REYQ	R8T, R10T			
REMQ	R8T			

* Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.33 Thermistor for Outdoor Unit Heat Exchanger Abnormality

Remote Controller Display

U6

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Error is detected from the temperature detected by the outdoor unit heat exchanger thermistor*.

Error Decision Conditions

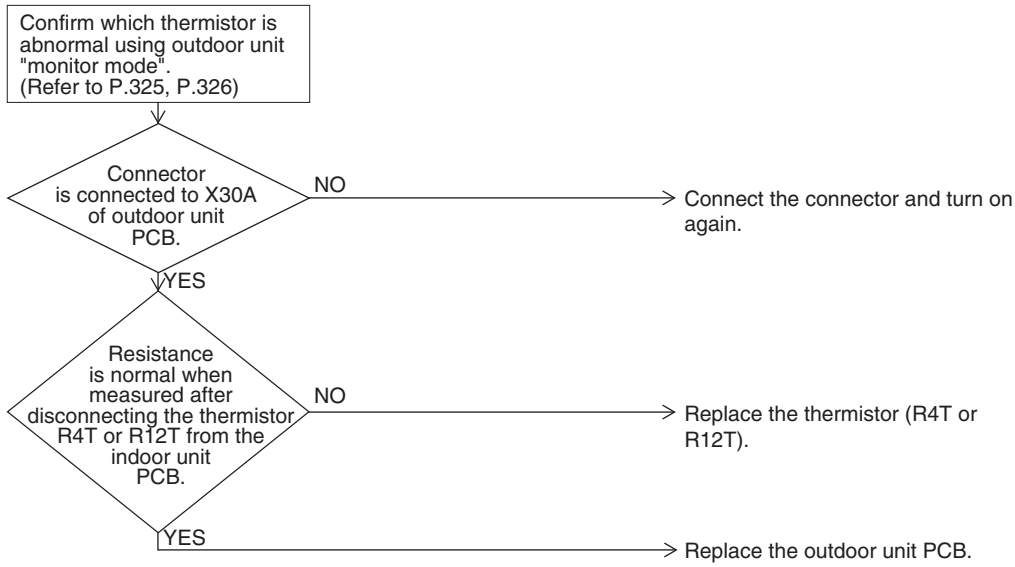
When a short circuit or an open circuit in the heat exchanger thermistor is detected.

Supposed Causes

- Defective thermistor (R4T or R12T) for outdoor unit coil
- Defective outdoor unit PCB
- Defective thermistor connection

Troubleshooting

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



Note:

Model	6 ton	8 ton	10 ton	12 ton
RXYQ	R4T			R4T, R12T
REYQ	R4T, R12T			
REMQ	R4T			

* Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.34 Liquid Pipe Thermistor 1 (R6T) Abnormality

Remote Controller Display

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Error is detected according to the temperature detected by liquid pipe thermistor.

Error Decision Conditions

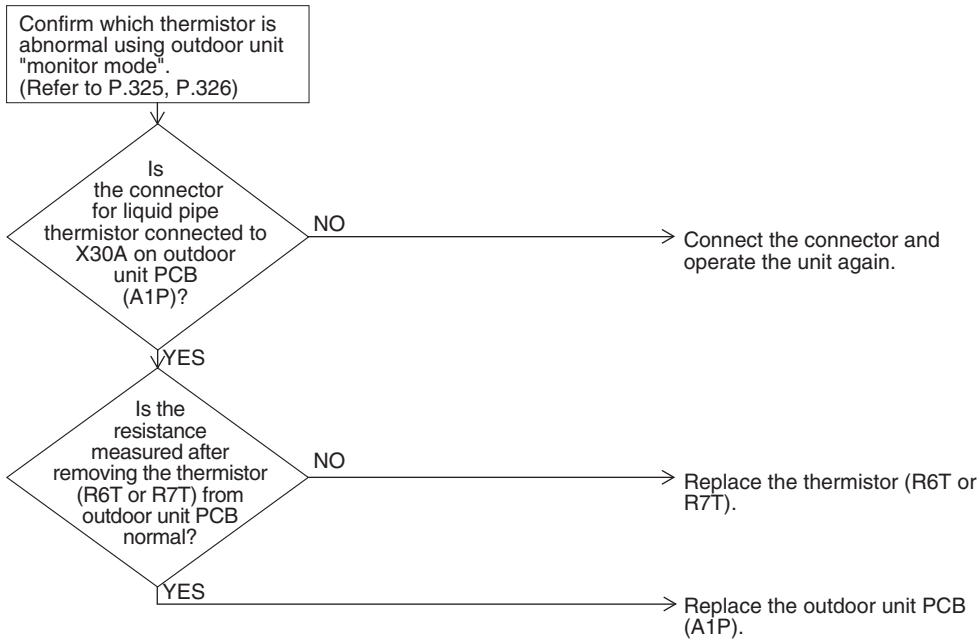
When the liquid pipe thermistor is short circuited or open circuited.

Supposed Causes

- Defective liquid pipe thermistor 1 (R6T) or (R7T)
- Defective outdoor unit PCB
- Defective thermistor connection

Troubleshooting

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



∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.35 Liquid Pipe Thermistor 2 (R7T, R14T or R15T) Abnormality

Remote Controller Display

J8

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Error is detected according to the temperature detected by liquid pipe thermistor.

Error Decision Conditions

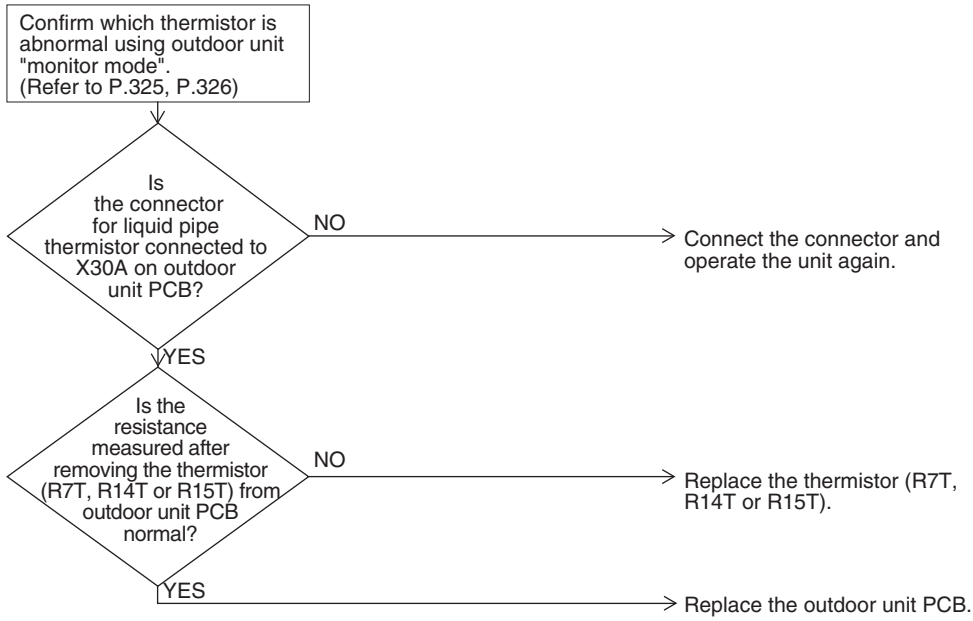
When the liquid pipe thermistor is short circuited or open circuited.

Supposed Causes

- Defective liquid pipe thermistor 2 (R7T, R14T or R15T)
- Defective outdoor unit PCB
- Defective thermistor connection

Troubleshooting

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



∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.36 Subcooling Heat Exchanger Gas Pipe Thermistor (R5T or R13T) Abnormality

Remote Controller Display

J9

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Error is detected according to the temperature detected by subcooling heat exchanger gas pipe thermistor.

Error Decision Conditions

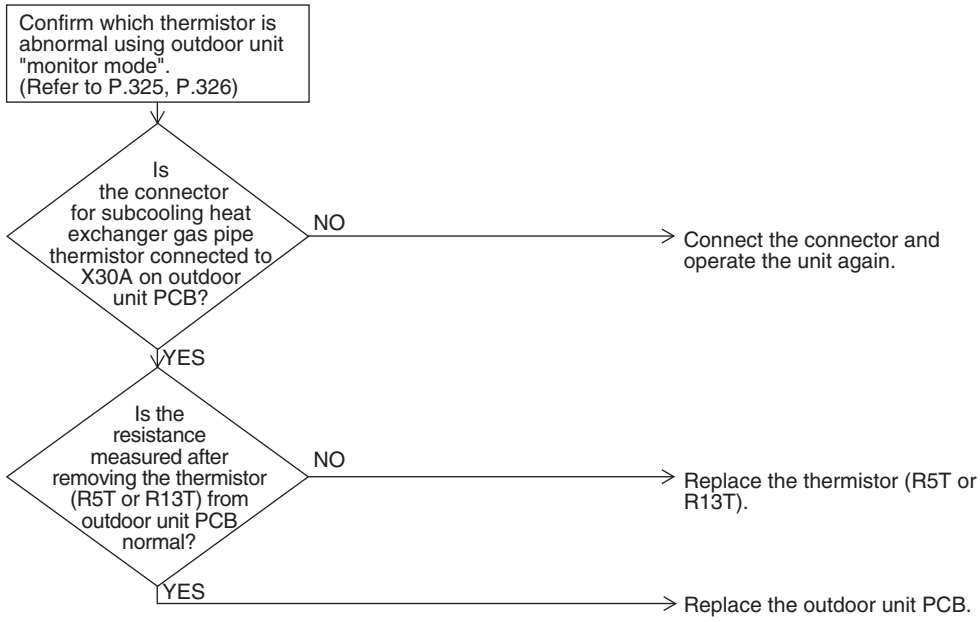
When the subcooling heat exchanger gas pipe thermistor is short circuited or open circuited.

Supposed Causes

- Defective subcooling heat exchanger gas pipe thermistor (R5T or R13T)
- Defective outdoor unit PCB

Troubleshooting

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



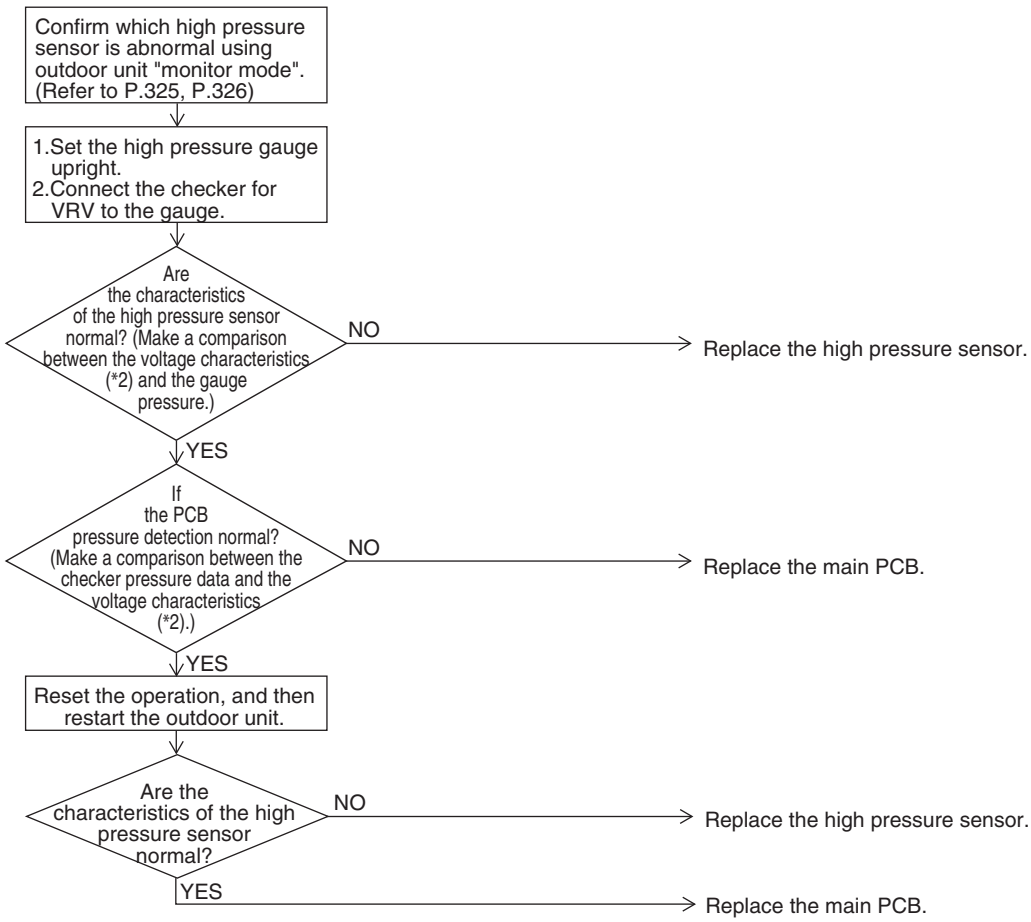
∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.37 High Pressure Sensor Abnormality

Remote Controller Display	
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Error is detected from the pressure detected by the high pressure sensor.
Error Decision Conditions	When the high pressure sensor is short circuit or open circuit. (Not less than 611.9psi, or 1.45psi and below)
Supposed Causes	■ Defective high pressure sensor system ■ Connection of low pressure sensor with wrong connection. ■ Defective outdoor unit PCB. ■ Defective connection of high pressure sensor

Troubleshooting

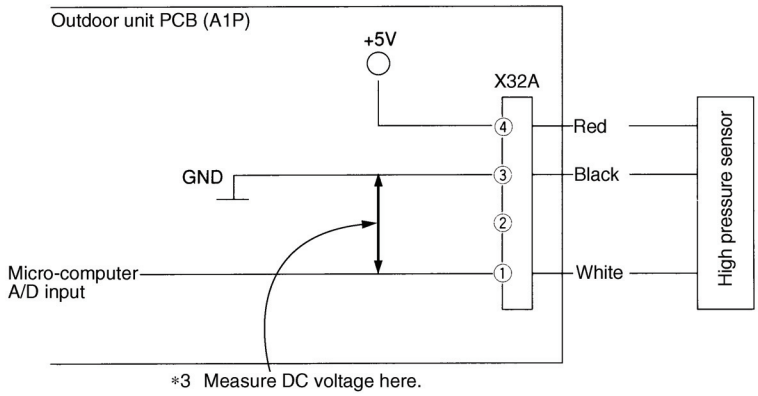
Caution Be sure to turn off power switch before connecting or disconnecting the connectors or parts may be damaged.



*1: Pressure sensor subject to error code

Error code	Pressure sensor subject to error code	Electric symbol
JA	High pressure sensor	S1NPH

∗2: Voltage measurement point



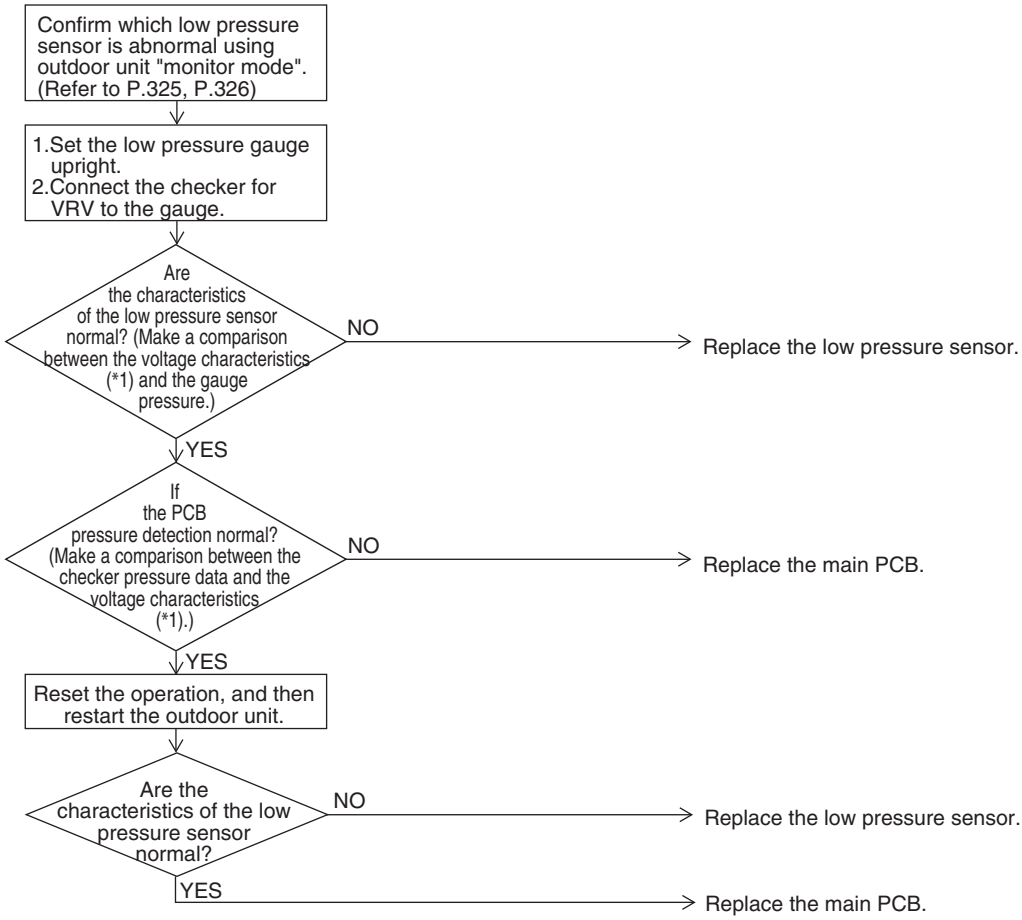
∗3: Refer to “Pressure Sensor” table on P.512.

3.38 Low Pressure Sensor Abnormality

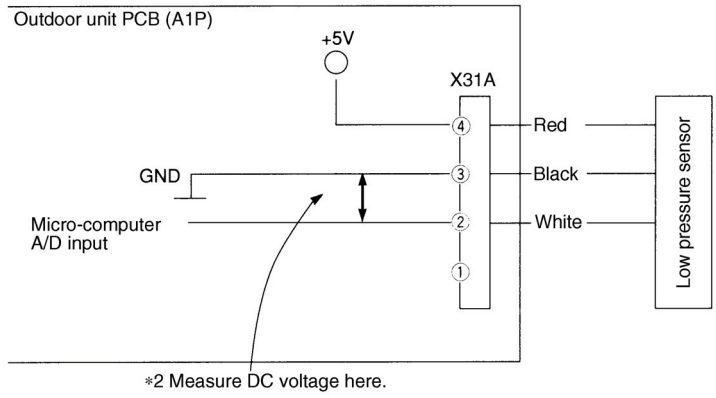
Remote Controller Display	
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Error is detected from pressure detected by low pressure sensor.
Error Decision Conditions	When the low pressure sensor is short circuit or open circuit. (Not less than 256.65psi, or -1.45psi and below)
Supposed Causes	■ Defective low pressure sensor system ■ Connection of high pressure sensor with wrong connection. ■ Defective outdoor unit PCB. ■ Defective connection of low pressure sensor

Troubleshooting

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



∗1: Voltage measurement point



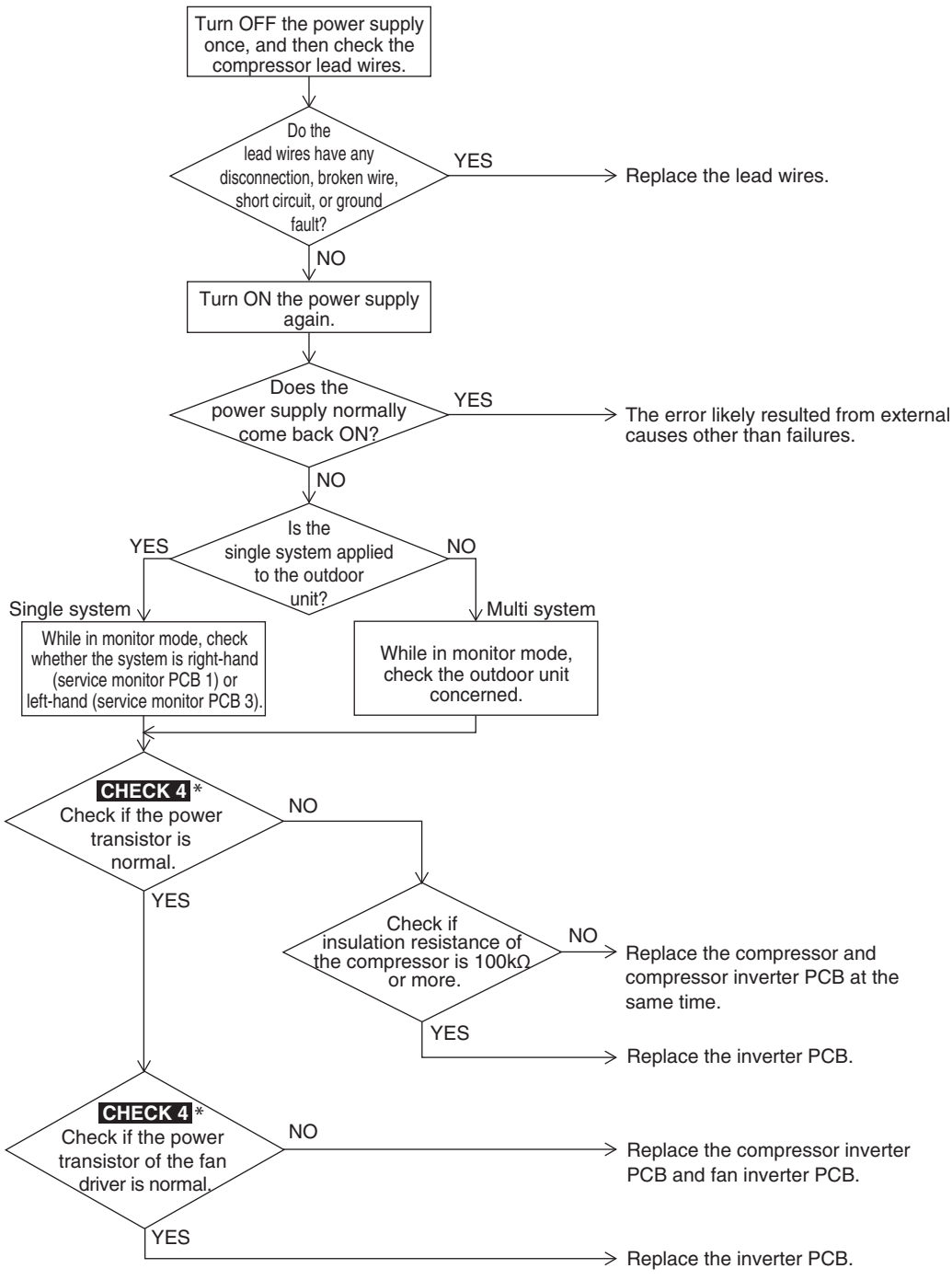
∗2: Refer to “Pressure Sensor” table on P.512.

3.39 Inverter PCB Abnormality

Remote Controller Display	L 1
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Error is detected based on the current value during waveform output before starting compressor. Error is detected based on the value from current sensor during synchronous operation when starting the unit.
Error Decision Conditions	Overcurrent (OCP) flows during waveform output. Defective of current sensor during synchronous operation. IPM failure.
Supposed Causes	■ Inverter PCB ● IPM failure ● Current sensor failure ● Drive circuit failure

Troubleshooting

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



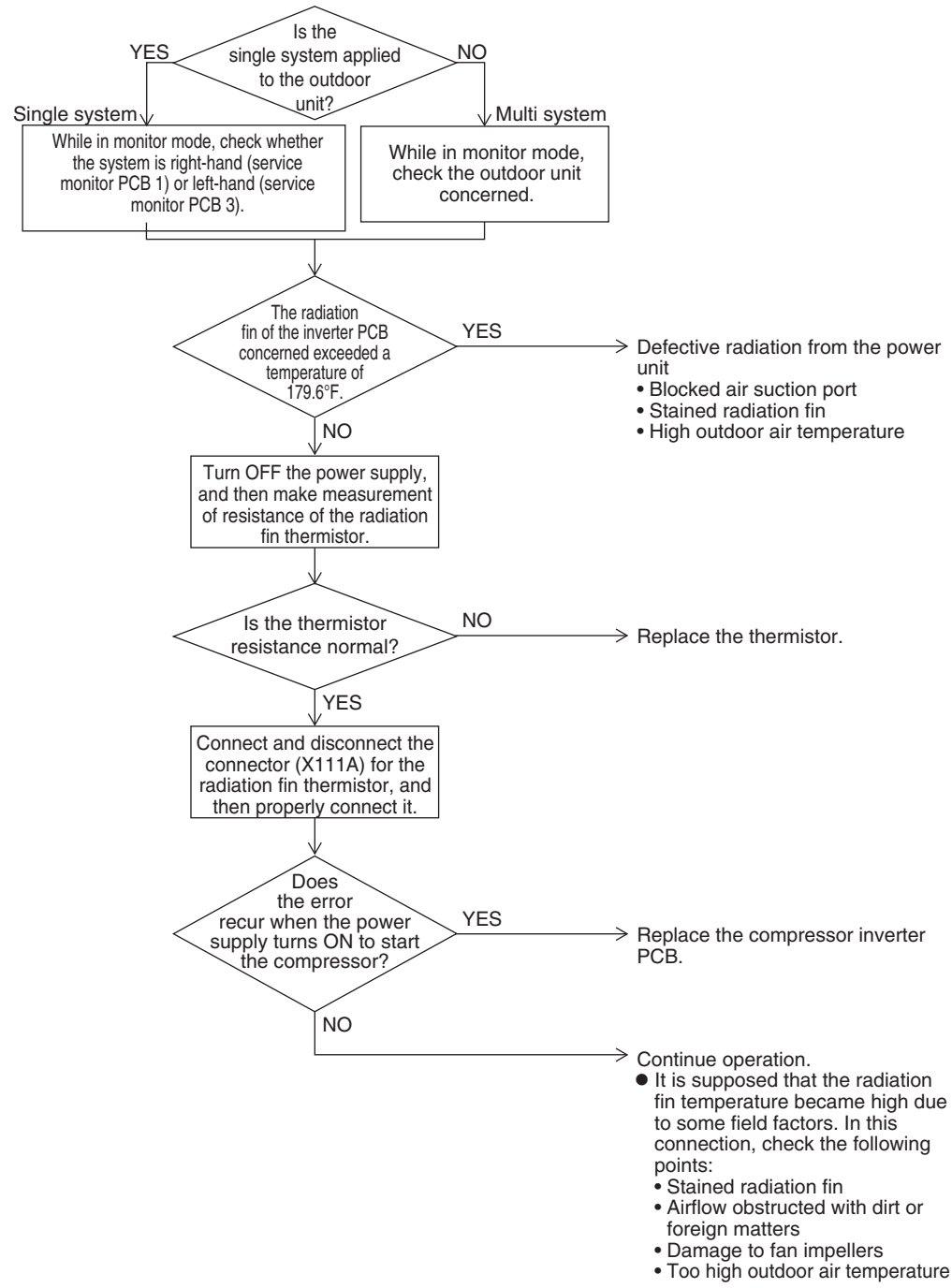
CHECK 4 Refer to P.449.

3.40 Inverter Radiation Fin Temperature Rise Abnormality

Remote Controller Display	L4
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Fin temperature is detected by the thermistor of the radiation fin.
Error Decision Conditions	When the temperature of the inverter radiation fin increases above 179.6°F (230V).
Supposed Causes	■ Actuation of radiation fin thermal (Actuates above 179.6°F (230V)) ■ Defective inverter PCB ■ Defective radiation fin thermistor

Troubleshooting

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



∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

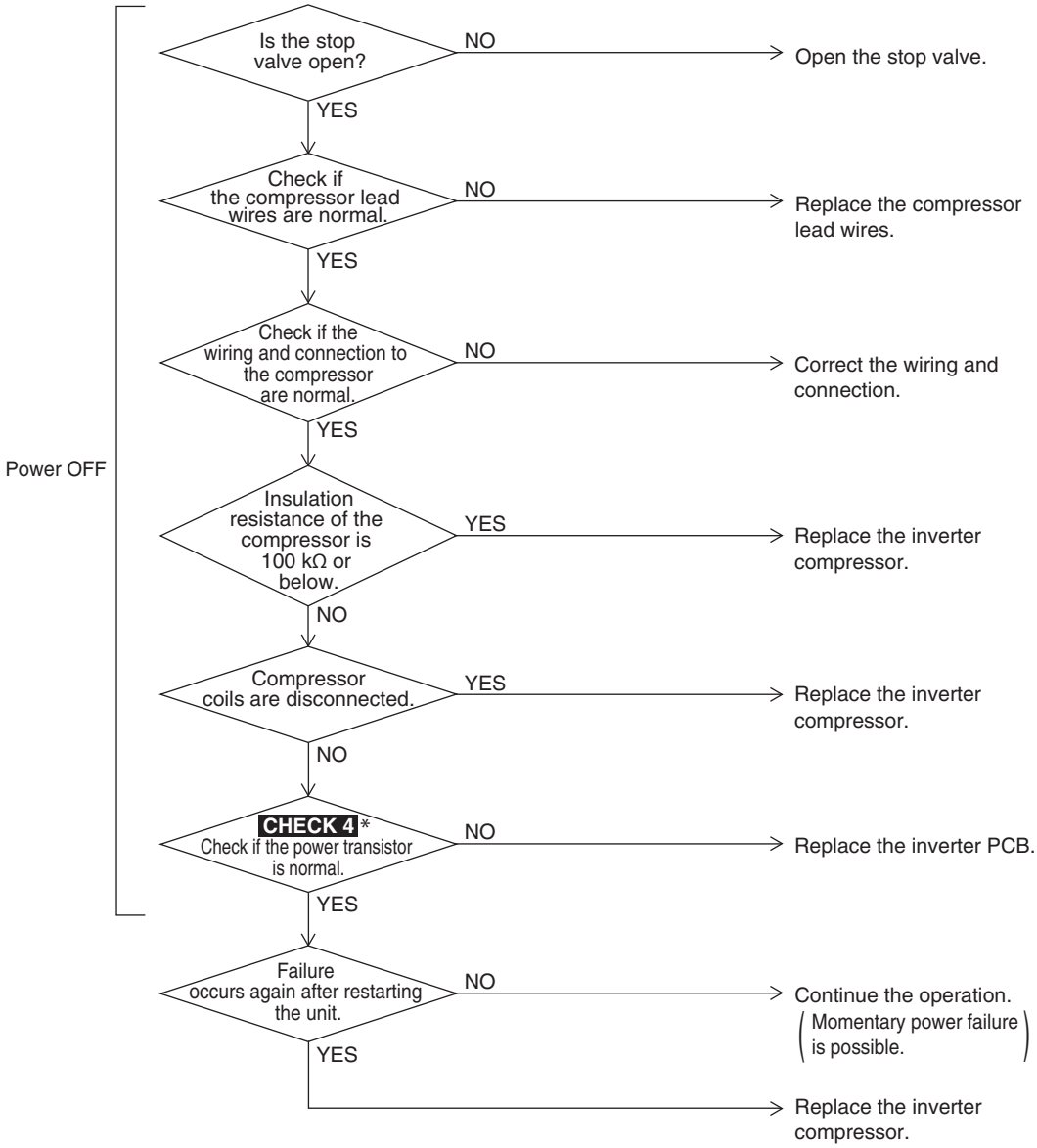
3.41 Momentary Overcurrent of Inverter Compressor

Remote Controller Display	L5
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Error is detected from current flowing in the power transistor.
Error Decision Conditions	When an excessive current flows in the power transistor. (Instantaneous overcurrent also causes activation.)
Supposed Causes	■ Defective compressor coil (disconnected, defective insulation) ■ Compressor startup error (mechanical lock) ■ Defective inverter PCB

Troubleshooting

Compressor inspection

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



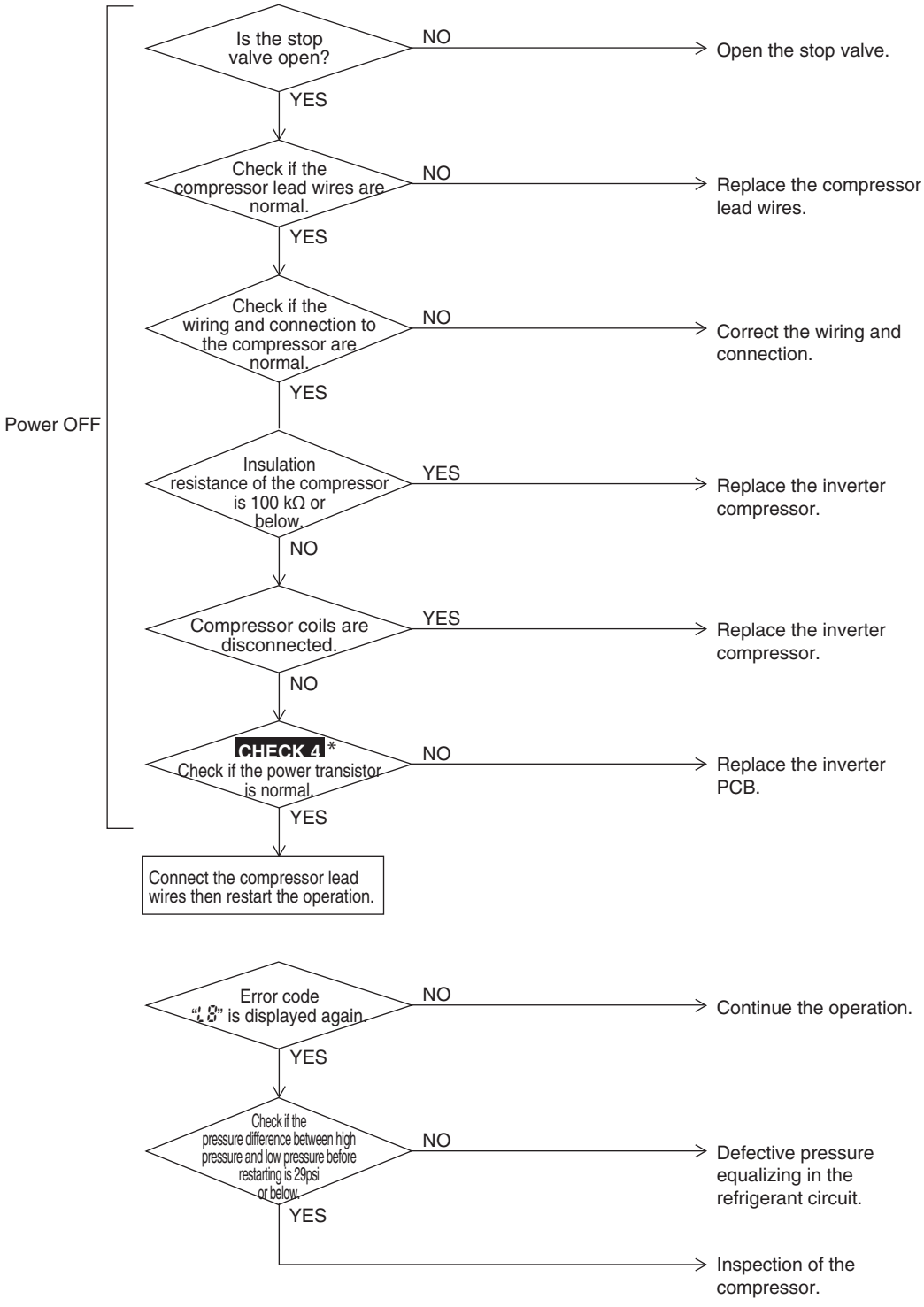
CHECK 4 Refer to P.449.

3.42 Momentary Overcurrent of Inverter Compressor

Remote Controller Display	L8
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Error is detected by current flowing in the power transistor.
Error Decision Conditions	When overload in the compressor is detected For 460V units (1) 19.0A and over continues for 5 seconds. (2) 16.1A and over continues for 260 seconds. For 230V units (1) A current of 33.5A or more continues for a period of consecutive 5 sec. (2) A current of 27.6A or more continues for a period of consecutive 260 sec.
Supposed Causes	■ Compressor overload ■ Compressor coil disconnected ■ Defective inverter PCB ■ Defective compressor

Troubleshooting Output current check

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



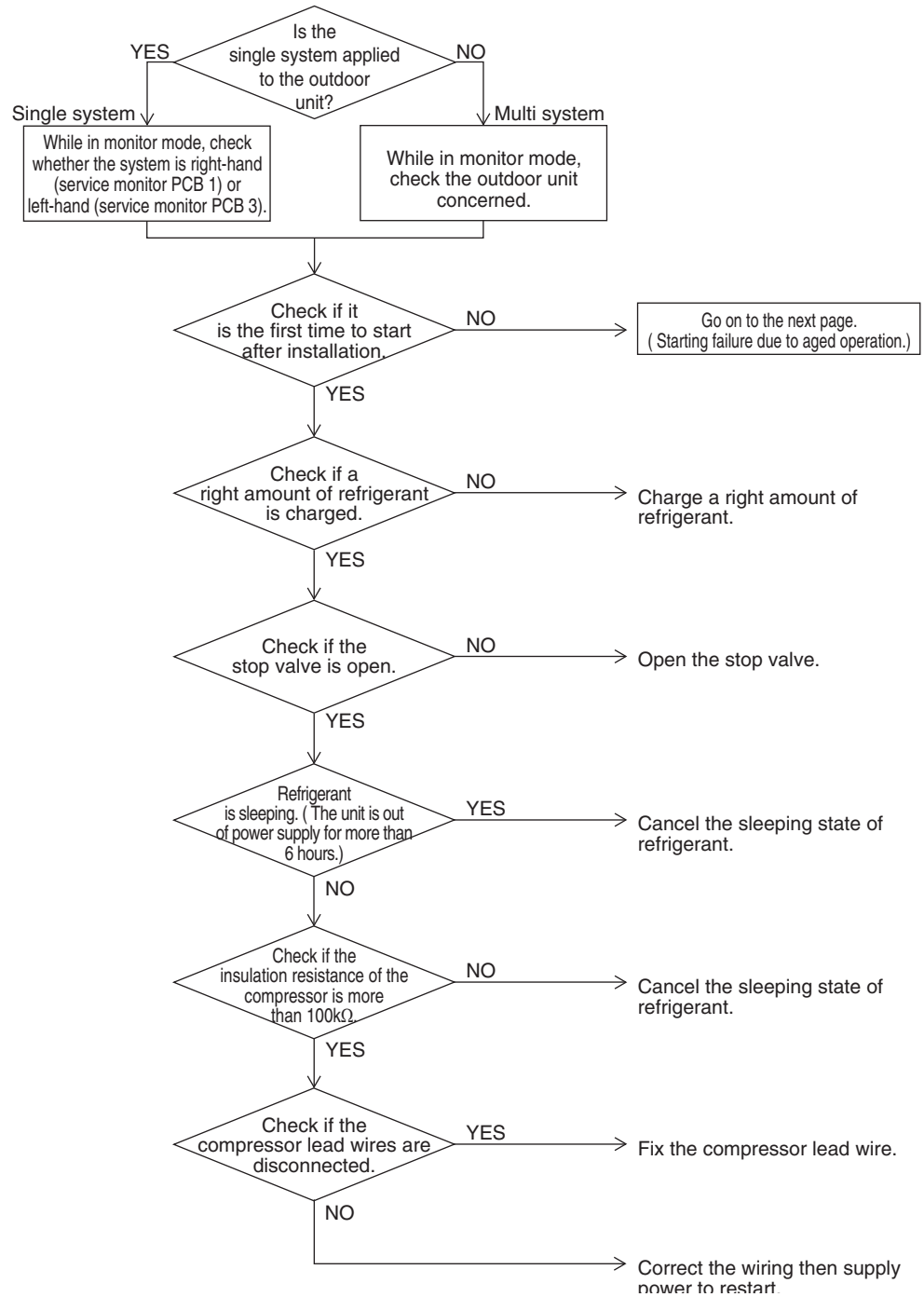
CHECK 4 Refer to P.449.

3.43 Inverter Compressor Starting Failure

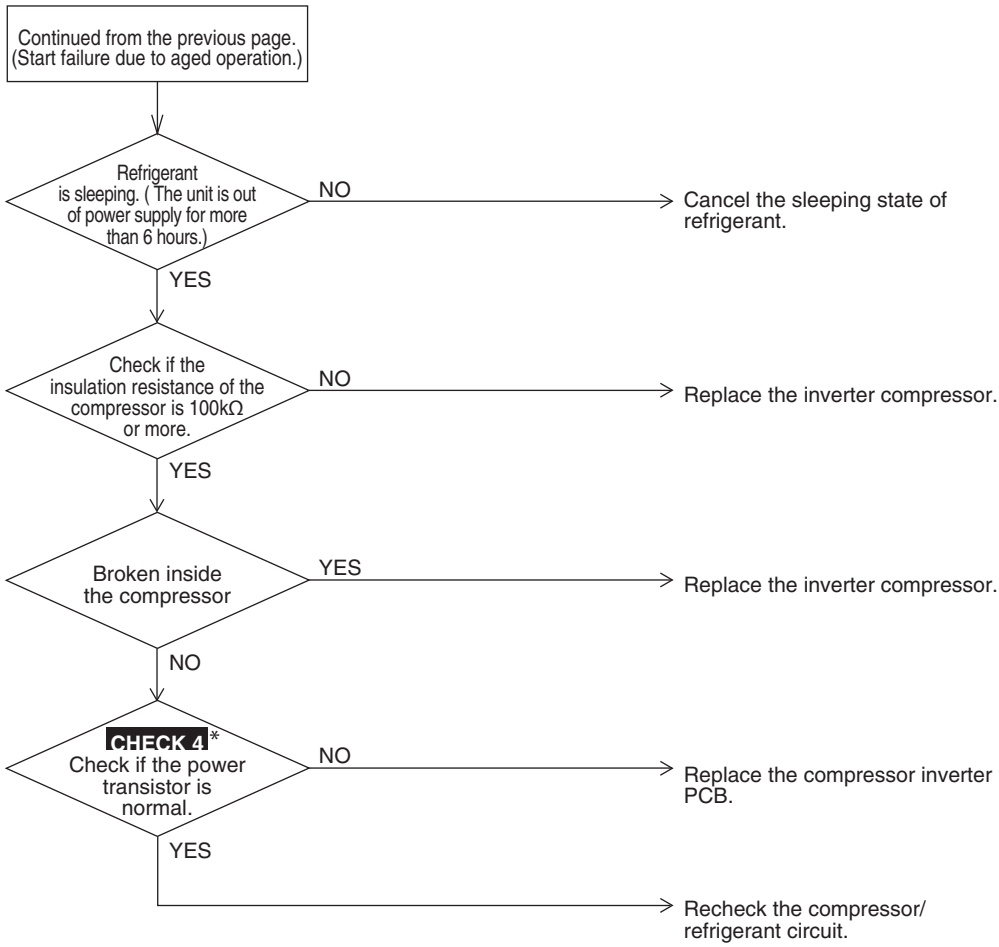
Remote Controller Display	L9
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Detect the failure based on the signal waveform of the compressor.
Error Decision Conditions	Starting the compressor does not complete.
Supposed Causes	■ Failure to open the stop valve ■ Defective compressor ■ Defective compressor connection ■ Large pressure difference before starting the compressor ■ Defective inverter PCB

Troubleshooting

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



Troubleshooting

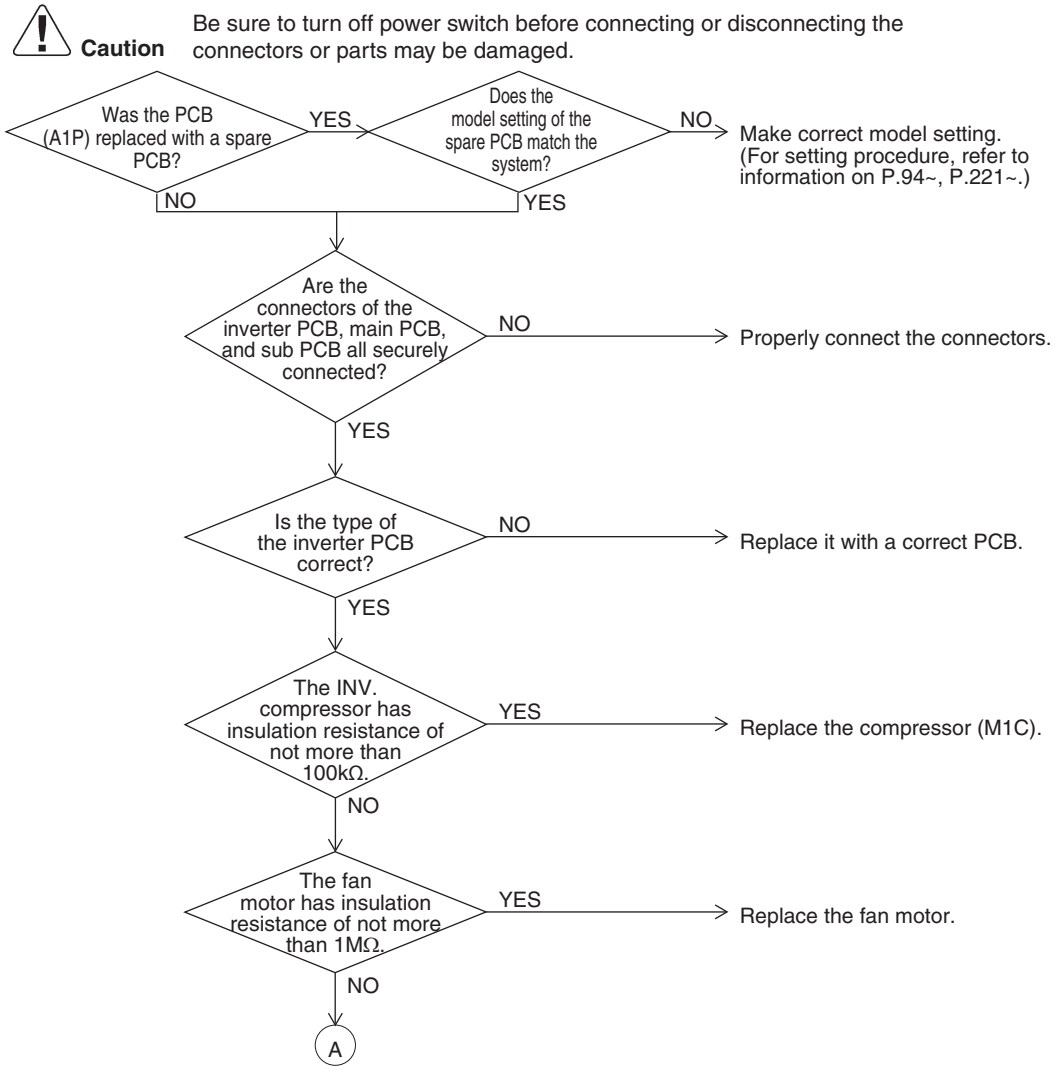


CHECK 4 Refer to P.449.

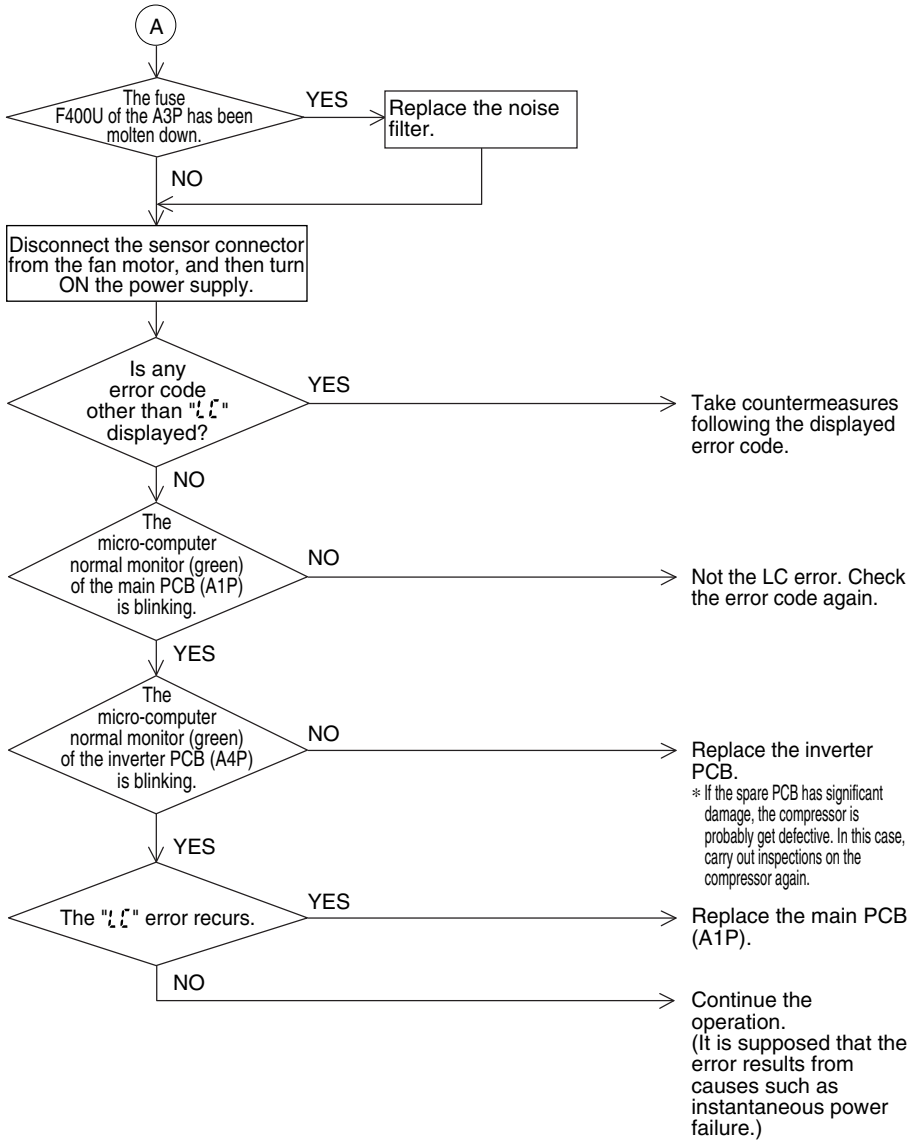
3.44 Transmission Error between Inverter and Service Monitor PCB

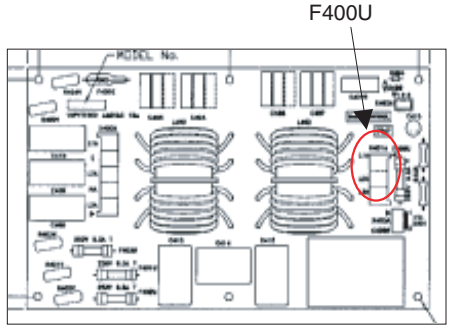
Remote Controller Display	LC
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Check the communication state between inverter PCB and service monitor PCB by micro-computer.
Error Decision Conditions	When the correct communication is not conducted in certain period.
Supposed Causes	■ Defective connection between the inverter PCB and outdoor main PCB ■ Defective outdoor main PCB (transmission section) ■ Defective inverter PCB ■ Defective noise filter ■ Defective fan inverter ■ Incorrect type of inverter PCB ■ Defective inverter compressor ■ Defective fan motor ■ External factor (noise etc.)

Troubleshooting



Troubleshooting





3.45 Inverter Over-Ripple Protection

Remote Controller Display

P1

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Imbalance in supply voltage is detected in PCB.
Imbalance in the power supply voltage causes increased ripple of voltage of the main circuit capacitor in the inverter. Consequently, the increased ripple is detected.

Error Decision Conditions

When the resistance value of thermistor becomes a value equivalent to open or short circuited status.

* Error is not decided while the unit operation is continued.
  "P1" will be displayed by pressing the inspection button.

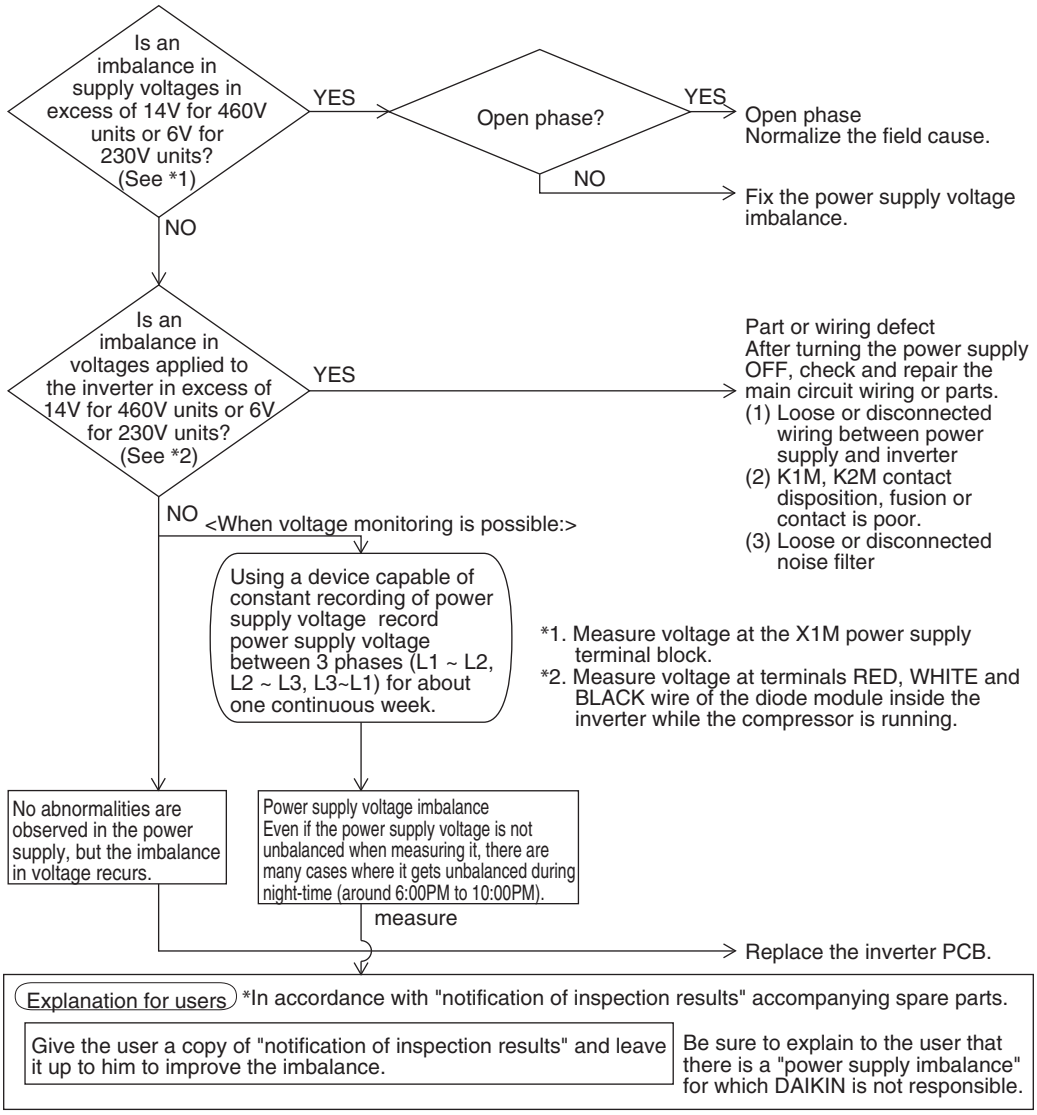
When the amplitude of the ripple exceeding a certain value is detected for consecutive 4 minutes.

Supposed Causes

- Open phase
- Voltage imbalance between phases
- Defective main circuit capacitor
- Defective inverter PCB
- Defective K1M, K2M relay in inverter PCB
- Improper main circuit wiring

Troubleshooting

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



3.46 Inverter Radiation Fin Temperature Thermistor Rise Abnormality

Remote Controller Display

P4

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

Resistance of radiation fin thermistor is detected when the compressor is not operating.

Error Decision Conditions

When the resistance value of thermistor becomes a value equivalent to open circuited or short circuited status

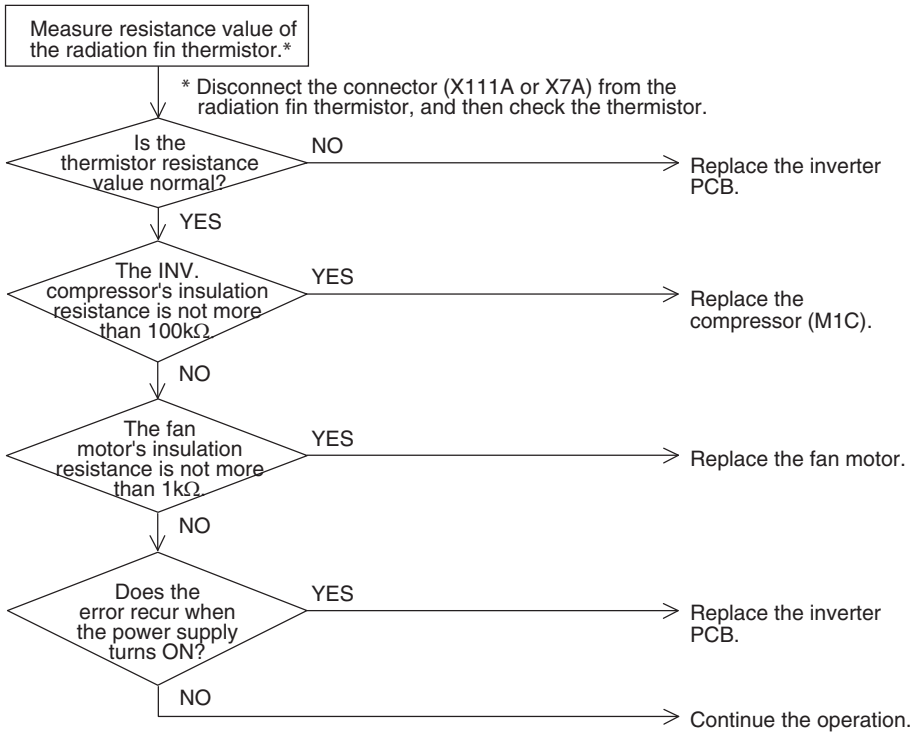
∗ Error is not decided while the unit operation is continued.
"P4" will be displayed by pressing the inspection button.

Supposed Causes

- Defective radiation fin temperature thermistor
- Defective inverter PCB
- Defective inverter compressor
- Defective fan motor

Troubleshooting

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



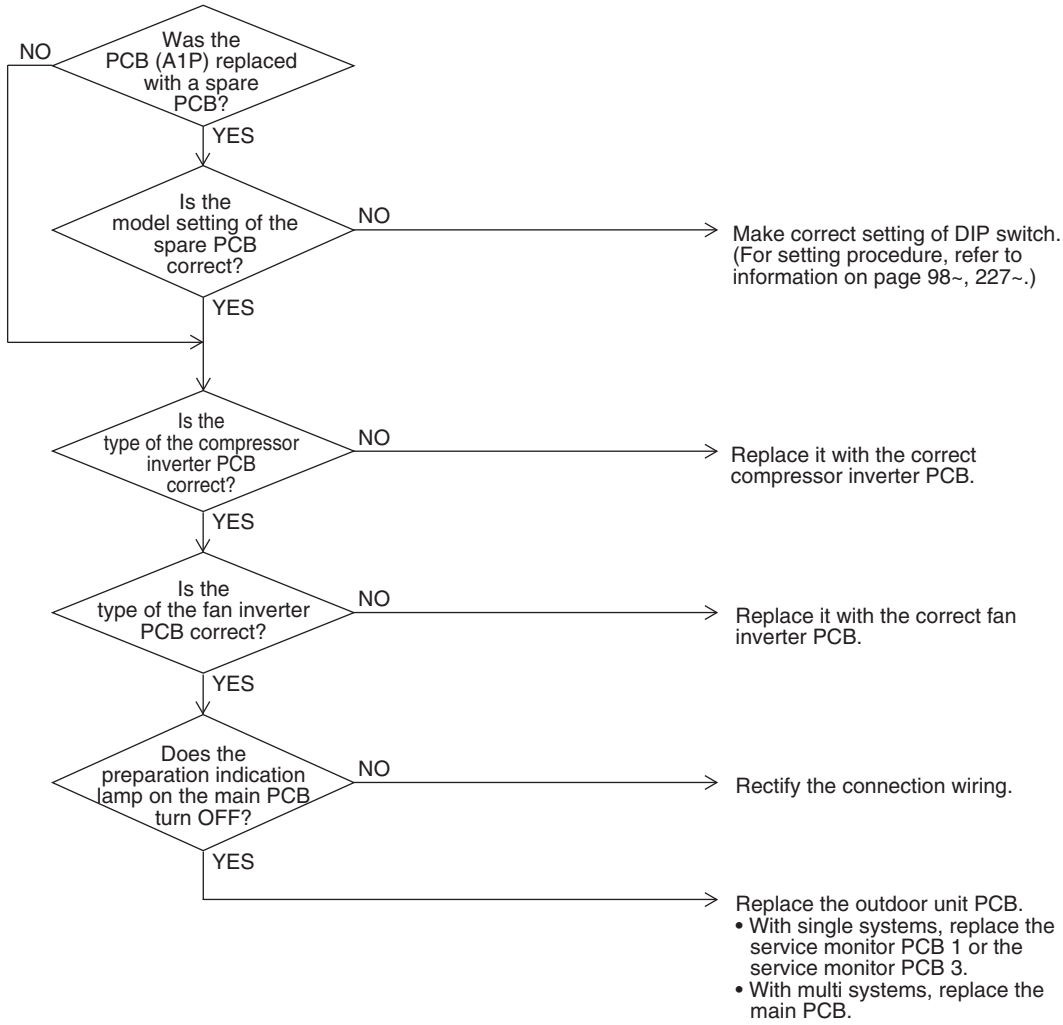
∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P.510.

3.47 Field Setting Abnormality after Replacing Main PCB or Combination of PCB Abnormality

Remote Controller Display	P1
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	This error is detected according to communications with the inverter.
Error Decision Conditions	Make judgement according to communication data on whether or not the type of the inverter PCB is correct.
Supposed Causes	■ Defective (or no) field setting after replacing main PCB ■ Mismatching of type of PCB

Troubleshooting

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



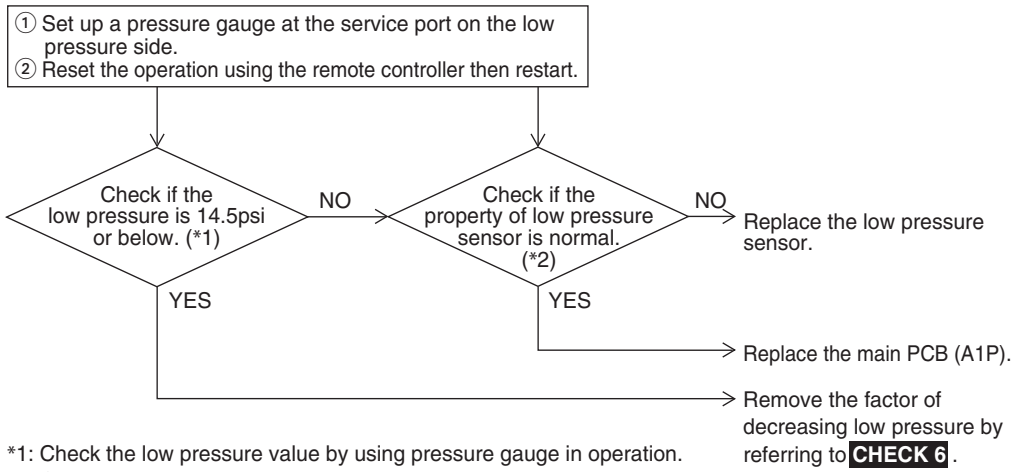
3.48 Refrigerant Shortage Alert

Remote Controller Display	
Applicable Models	RXYQ72P~360PBYD, PBTJ REYQ72P~336PBYD, PBTJ
Method of Error Detection	Detect refrigerant shortage based on the temperature difference between low pressure or suction pipe and heat exchanger.
Error Decision Conditions	[In cooling mode] Low pressure becomes 14.5psi or below. [In heating mode] The degree of superheat of suction gas becomes 68°F and over. SH= Ts1 –Te Ts1: Suction pipe temperature detected by thermistor Te : Saturated temperature corresponding to low pressure ∗Error is not determined. The unit continues the operation.
Supposed Causes	■ Refrigerant shortage or refrigerant clogging (piping error) ■ Defective thermistor ■ Defective low pressure sensor ■ Defective outdoor unit PCB (A1P)

Troubleshooting

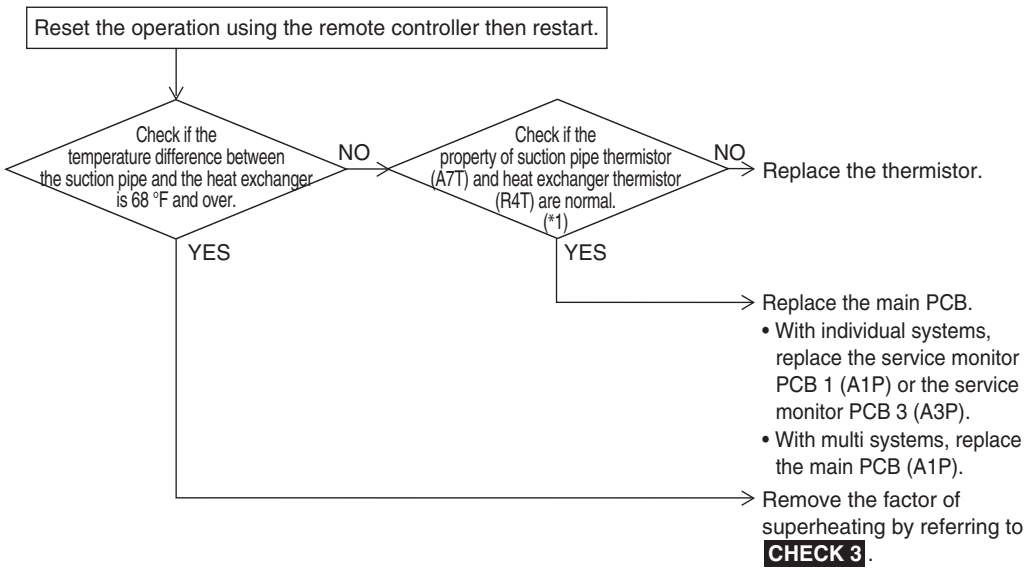
Caution Be sure to turn off power switch before connecting or disconnecting connectors or parts may be damaged.

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.518.)

In heating mode



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

CHECK 6 Refer to P.451.

CHECK 3 Refer to P.448.

3.49 Open Phase

Remote Controller Display

U1

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

The phase of each phase are detected by reverse phase detection circuit and right phase or reverse phase are judged.

Error Decision Conditions

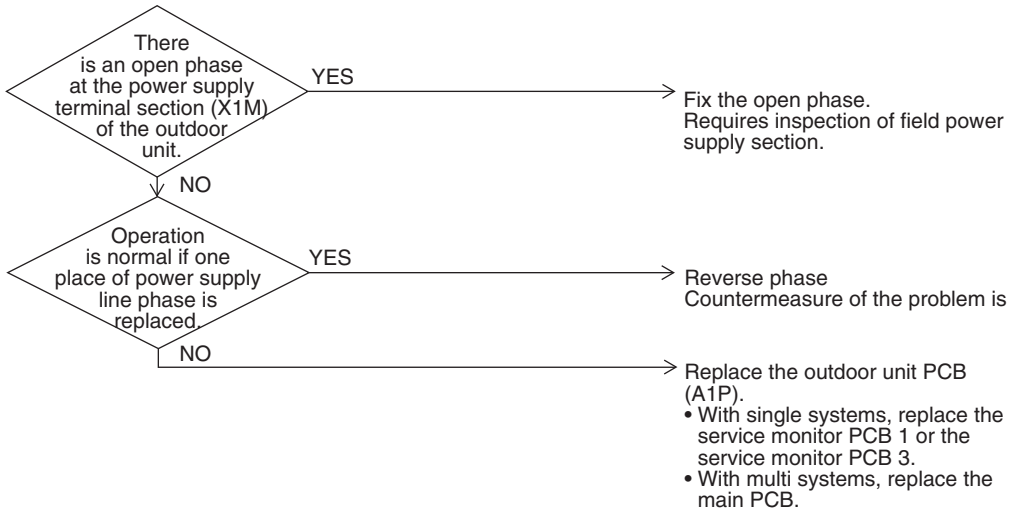
When a significant phase difference is made between phases.

Supposed Causes

- Power supply reverse phase
- Power supply open phase
- Defective outdoor unit PCB (A1P)

Troubleshooting

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



3.50 Power Supply Insufficient or Instantaneous Failure

Remote Controller Display

U2

Applicable Models

RXYQ72P~360PBYD, PBTJ
REYQ72P~336PBYD, PBTJ

Method of Error Detection

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

Error Decision Conditions

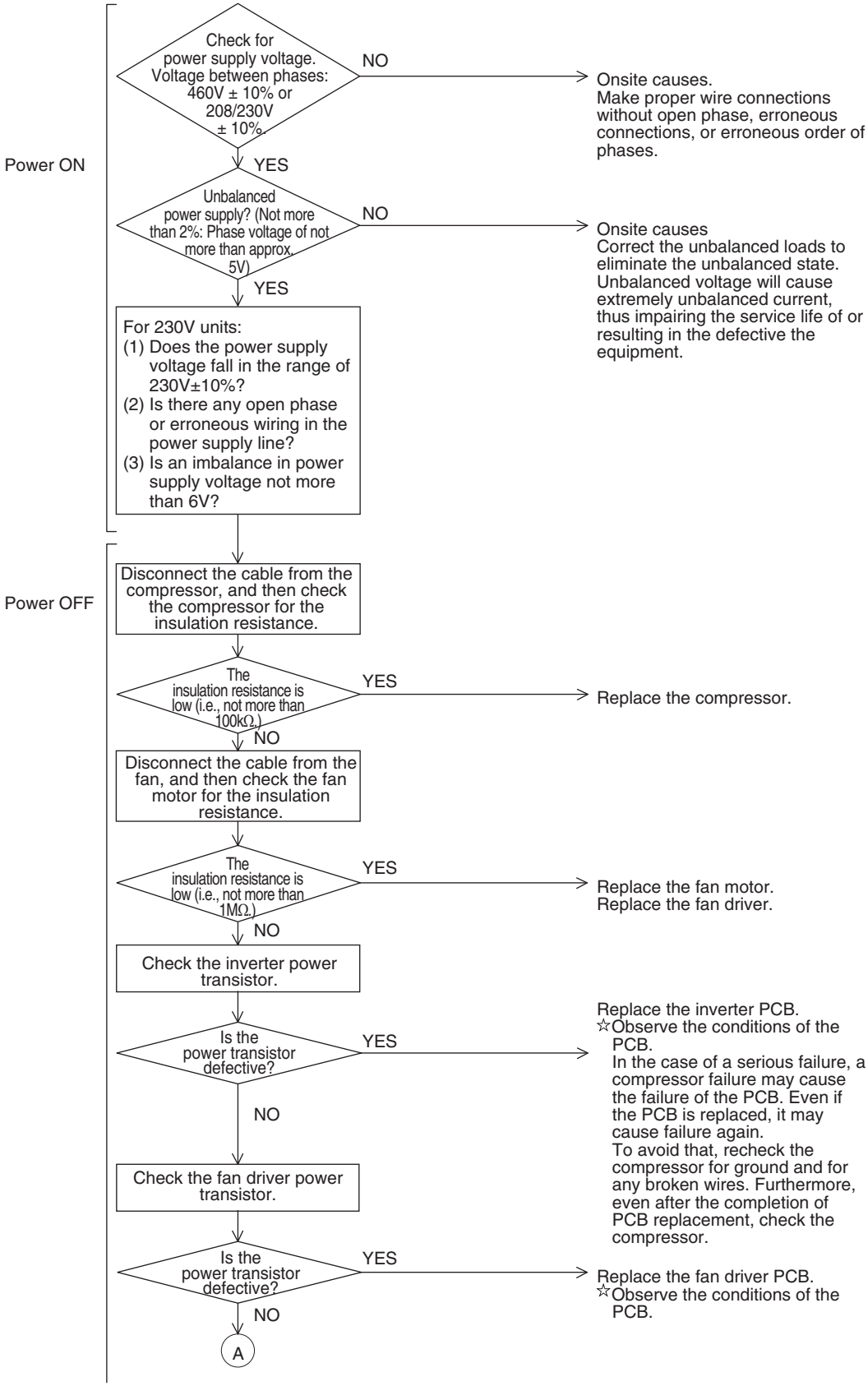
When the voltage aforementioned is not less than 780V or not more than 320V, or when the current-limiting voltage does not reach 200V or more or exceeds 740V
For 230V units: When the voltage aforementioned is not more than 190V

Supposed Causes

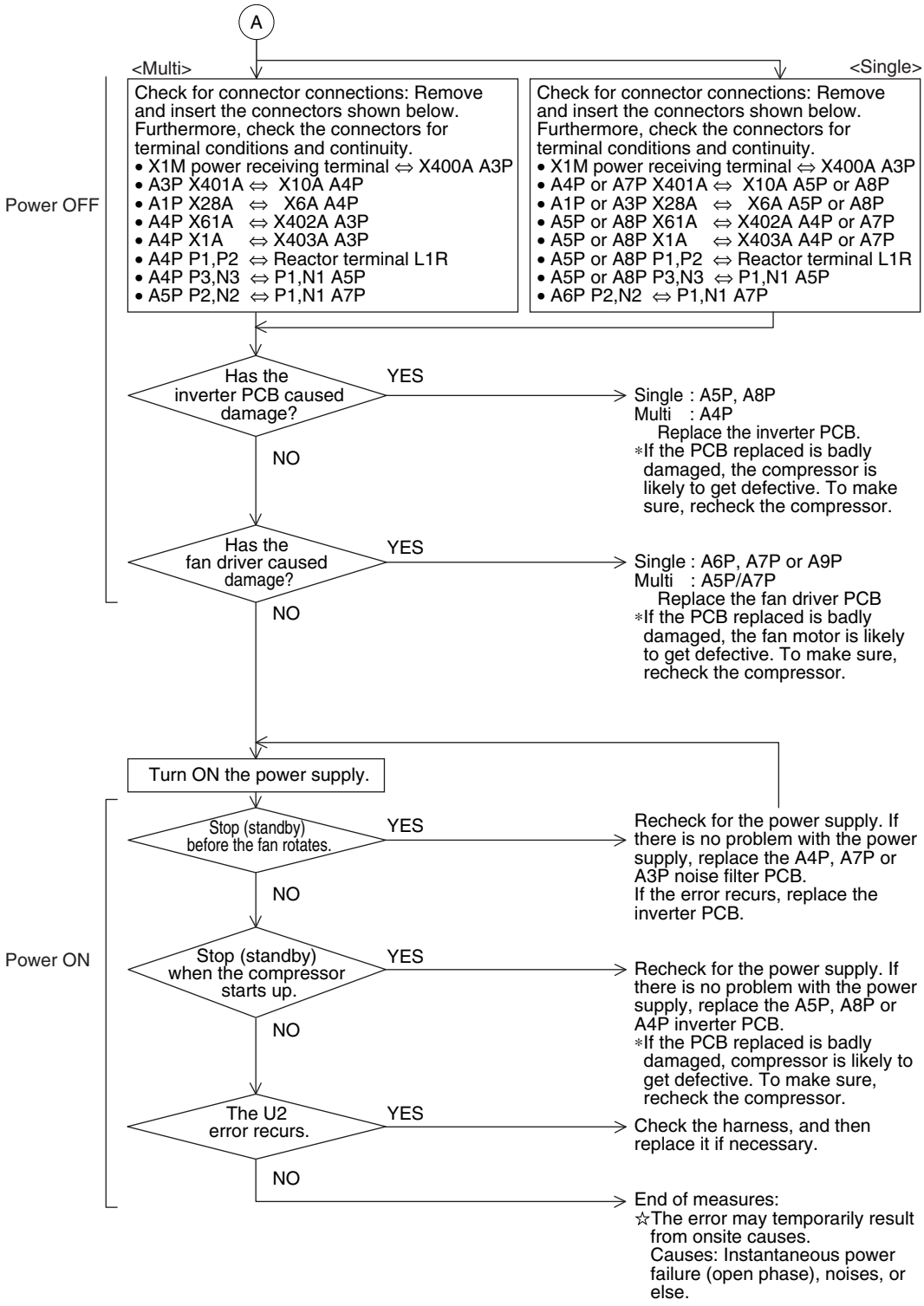
- Power supply insufficient
- Instantaneous power failure
- Open phase
- Defective inverter PCB
- Defective outdoor service monitor PCB
- Defective main circuit wiring
- Defective compressor
- Defective fan motor
- Defective connection of signal cable

Troubleshooting

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



Troubleshooting



3.51 Check Operation is not Executed

Remote Controller Display

U3

Applicable Models

RXYQ72P~192PBYD, PBTJ
REYQ72P~192PBYD, PBTJ

Method of Error Detection

Check operation is executed or not executed.

Error Decision Conditions

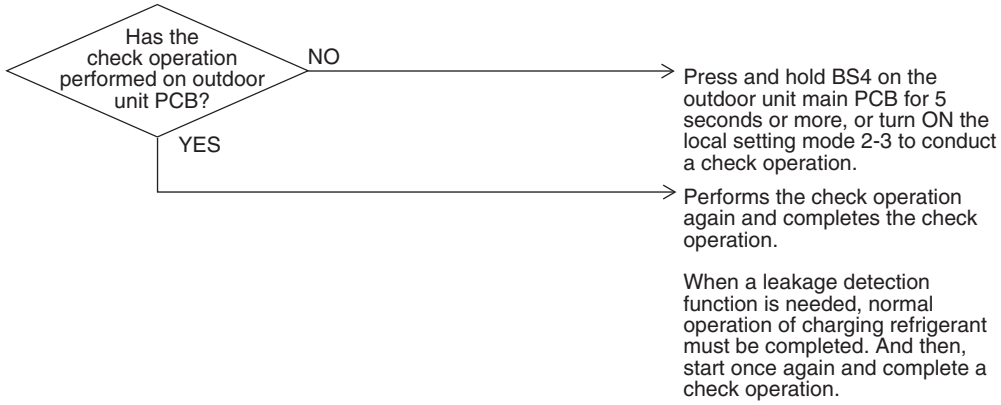
Error is decided when the unit starts operation without check operation.

Supposed Causes

- Check operation is not executed.

Troubleshooting

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



3.52 Transmission Error between Indoor Units and Outdoor Units

Remote Controller Display

U4

Applicable Models

All model of indoor unit
RXYQ72P~192PBYD, PBTJ
REYQ72P~192PBYD, PBTJ

Method of Error Detection

Micro-computer checks if transmission between indoor and outdoor units is normal.

Error Decision Conditions

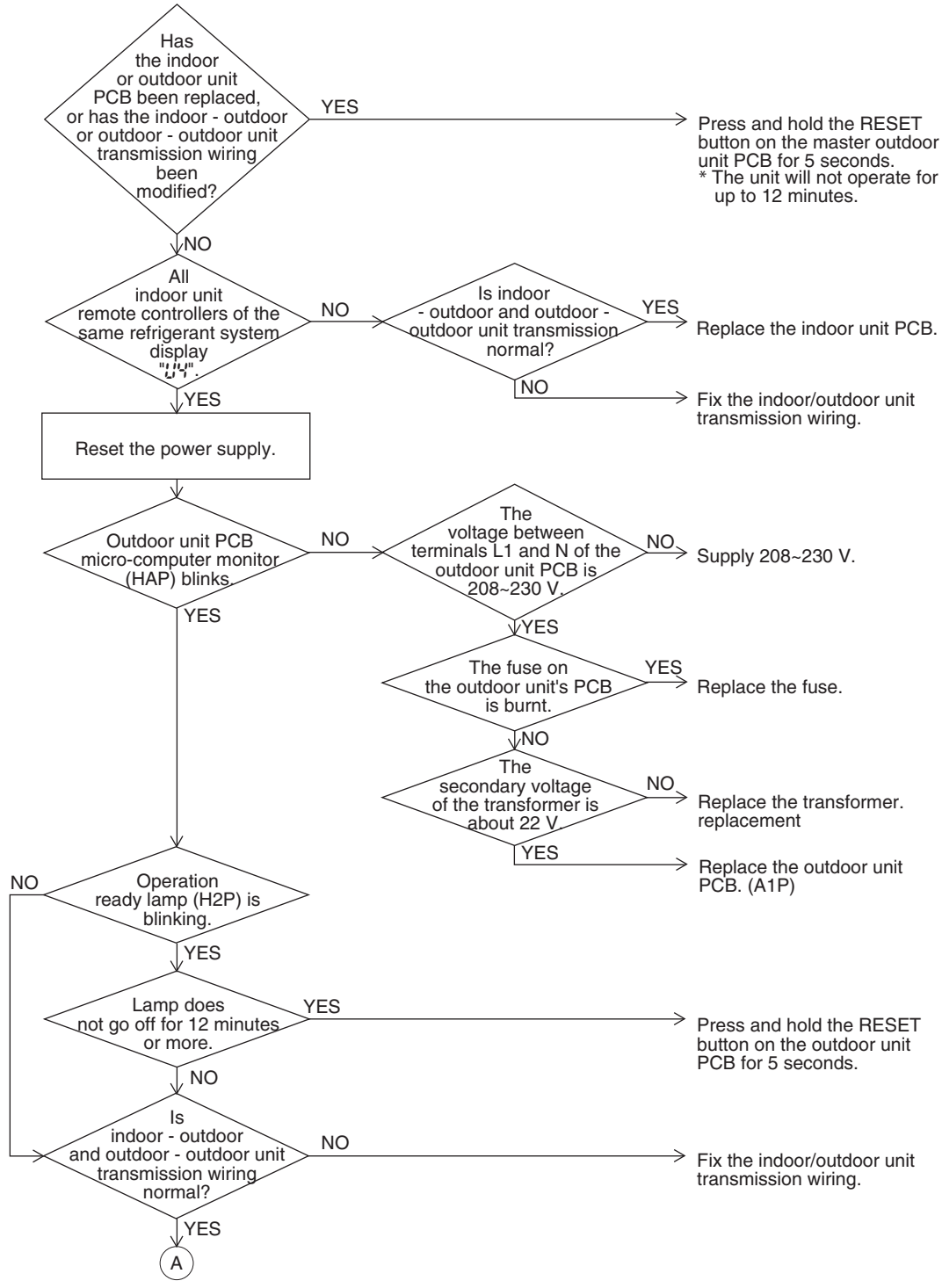
When transmission is not carried out normally for a certain amount of time

Supposed Causes

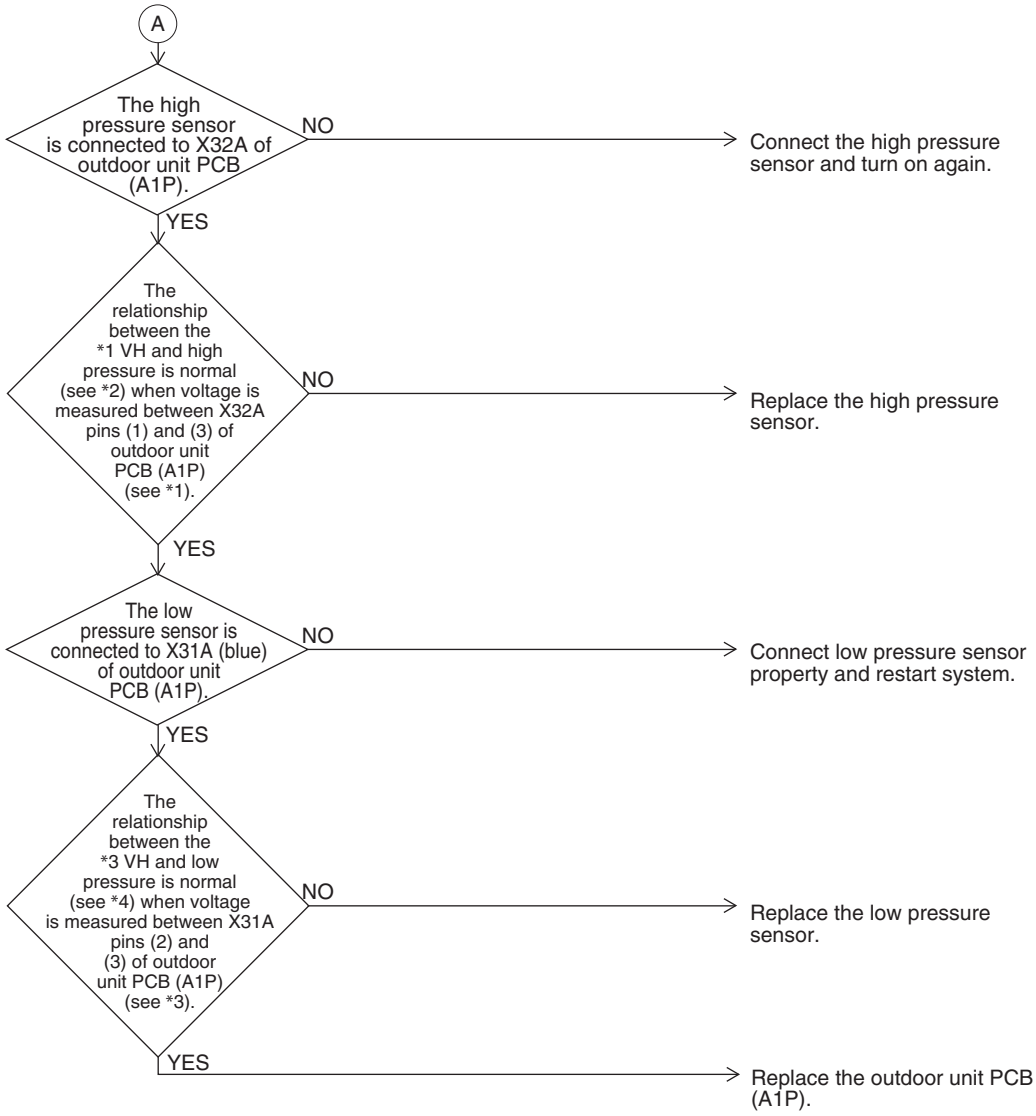
- Indoor to outdoor, outdoor to outdoor transmission wiring F1, F2 disconnection, short circuit or wrong wiring
- Outdoor unit power supply is OFF
- System address does not match
- Defective indoor unit PCB
- Defective outdoor unit PCB
- Defective high pressure sensor system
- Defective low pressure sensor system
- Incorrect connection of pressure sensor(s)

Troubleshooting

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

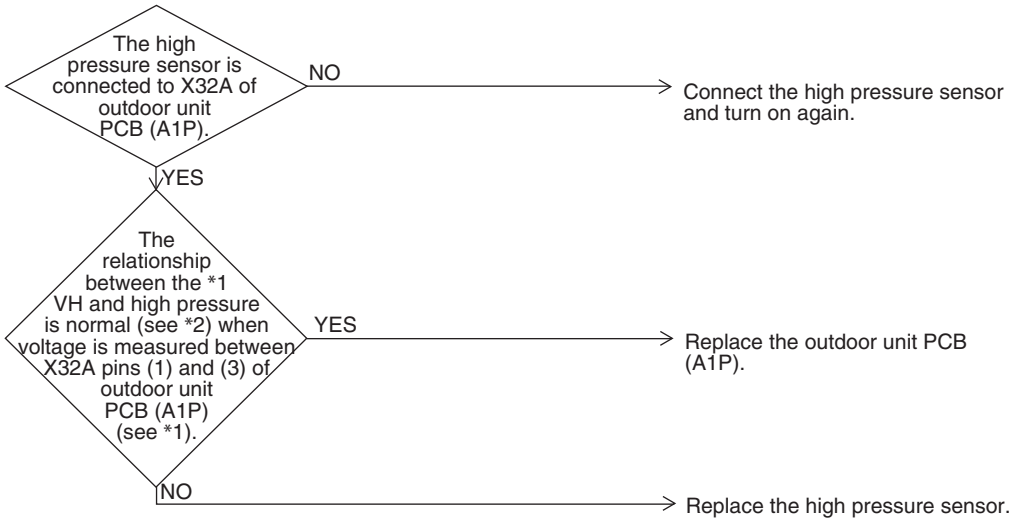


Caution Be sure to turn off power switch before connecting or disconnecting connectors or parts may be damaged.

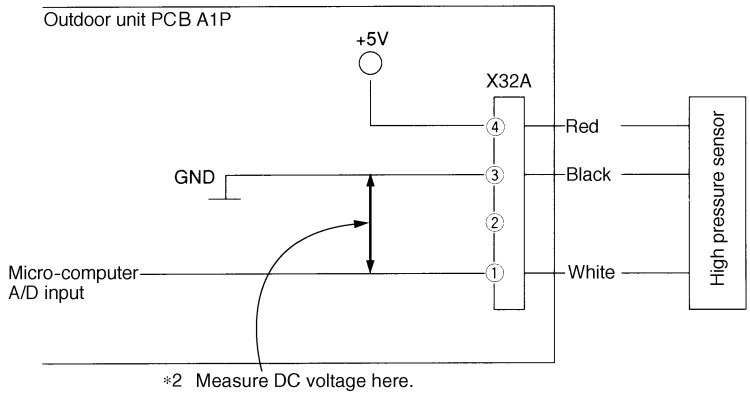


Note: ∗1, ∗2; See the chart and foot note on P.423
∗3, ∗4; See the chart and foot note on P.424

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

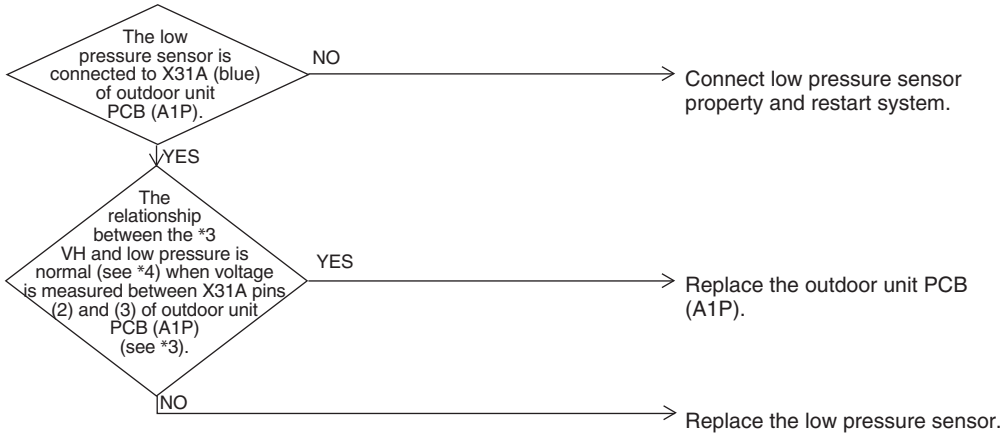


∗1: Voltage measurement point

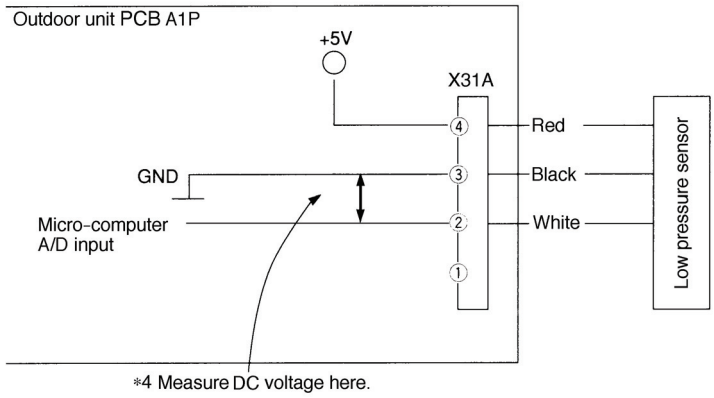


∗2: Refer to “Pressure Sensor” table on P.512.

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



∗3: Voltage measurement point



∗4: Refer to “Pressure Sensor” table on P.512.

3.53 Transmission Error between Remote Controller and Indoor Unit

Remote Controller Display

U5

Applicable Models

All models of indoor unit

Method of Error Detection

In case of controlling with 2-remote controller, check the system using micro-computer is signal transmission between indoor unit and remote controller (main and sub) is normal.

Error Decision Conditions

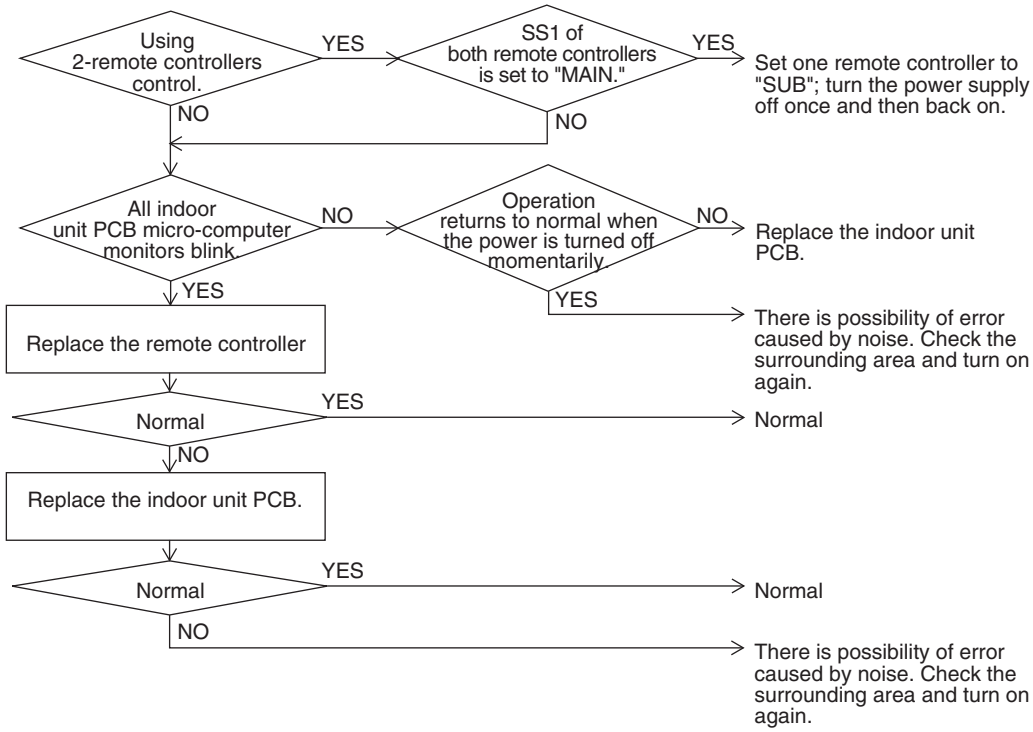
Normal transmission does not continue for specified period.

Supposed Causes

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

Troubleshooting

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



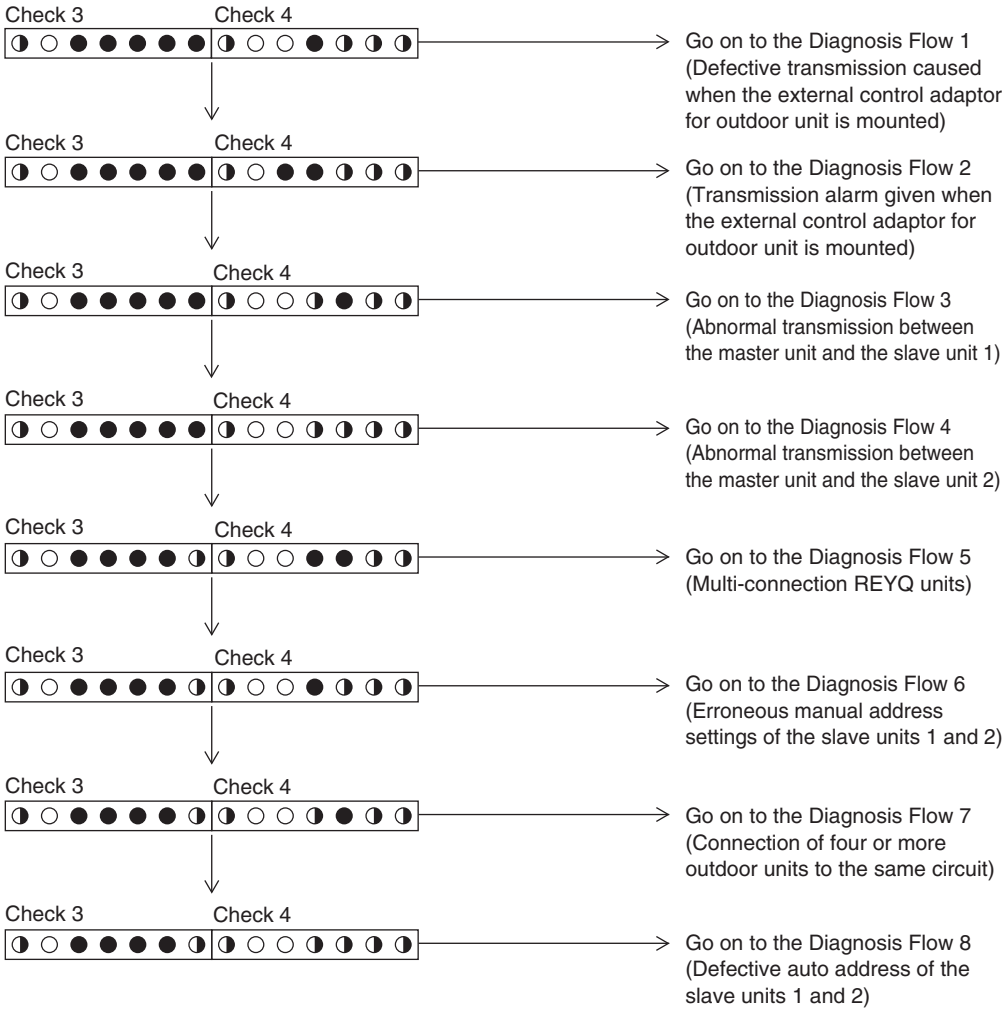
3.54 Transmission Error (Across Outdoor Units)

Remote Controller Display	U7
Applicable Models	RXYQ72P~192PBYD, PBTJ REYQ72P~192PBYD, PBTJ
Method of Error Detection	Micro-computer checks if transmission between outdoor units.
Error Decision Conditions	When transmission is not carried out normally for a certain amount of time
Supposed Causes	■ Connection error in connecting wires between outdoor unit and external control adaptor for outdoor unit ■ Connection error in connecting wires across outdoor units ■ Setting error in switching cooling/ heating ■ Integrated address setting error for cooling/ heating (function unit, external control adaptor for outdoor unit) ■ Defective outdoor unit PCB ■ Defective external control adaptor for outdoor unit

Troubleshooting

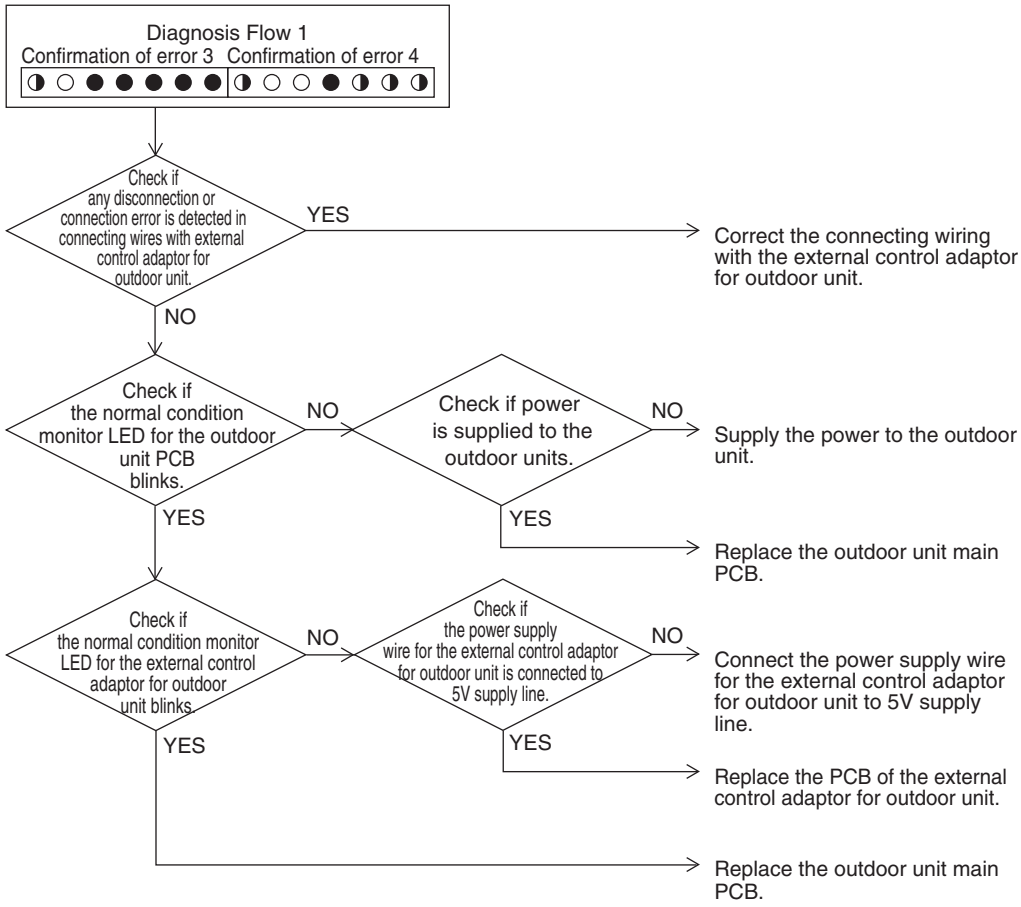
Caution Be sure to turn off power switch before connecting or disconnecting connectors or parts may be damaged.

Check the LED lamps for "Check 3" corresponding to the error code "*UH*" and for Check 4 in the monitor mode. (Refer to P.327, P.328 for how to check)



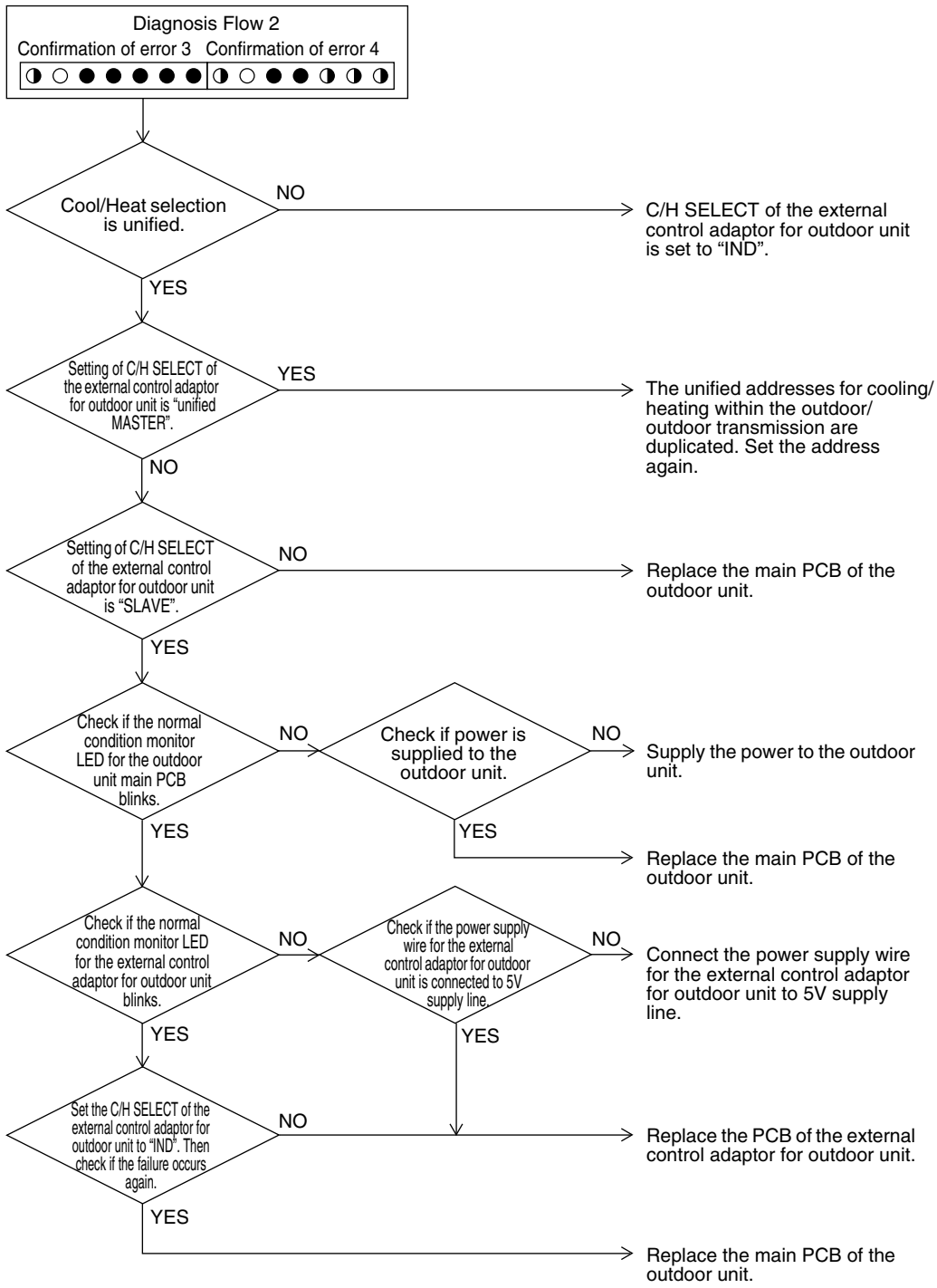
Troubleshooting

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



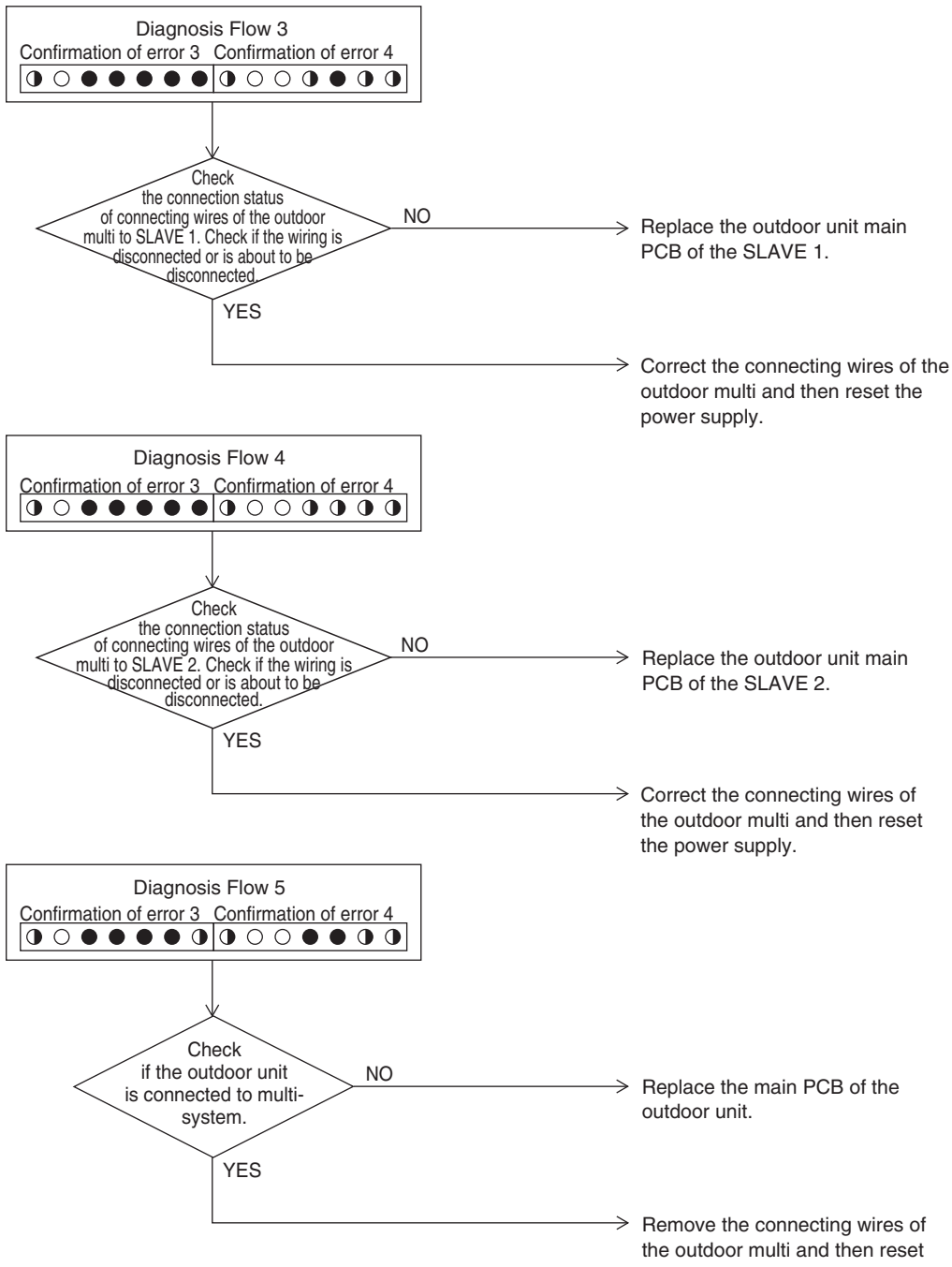
Troubleshooting

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



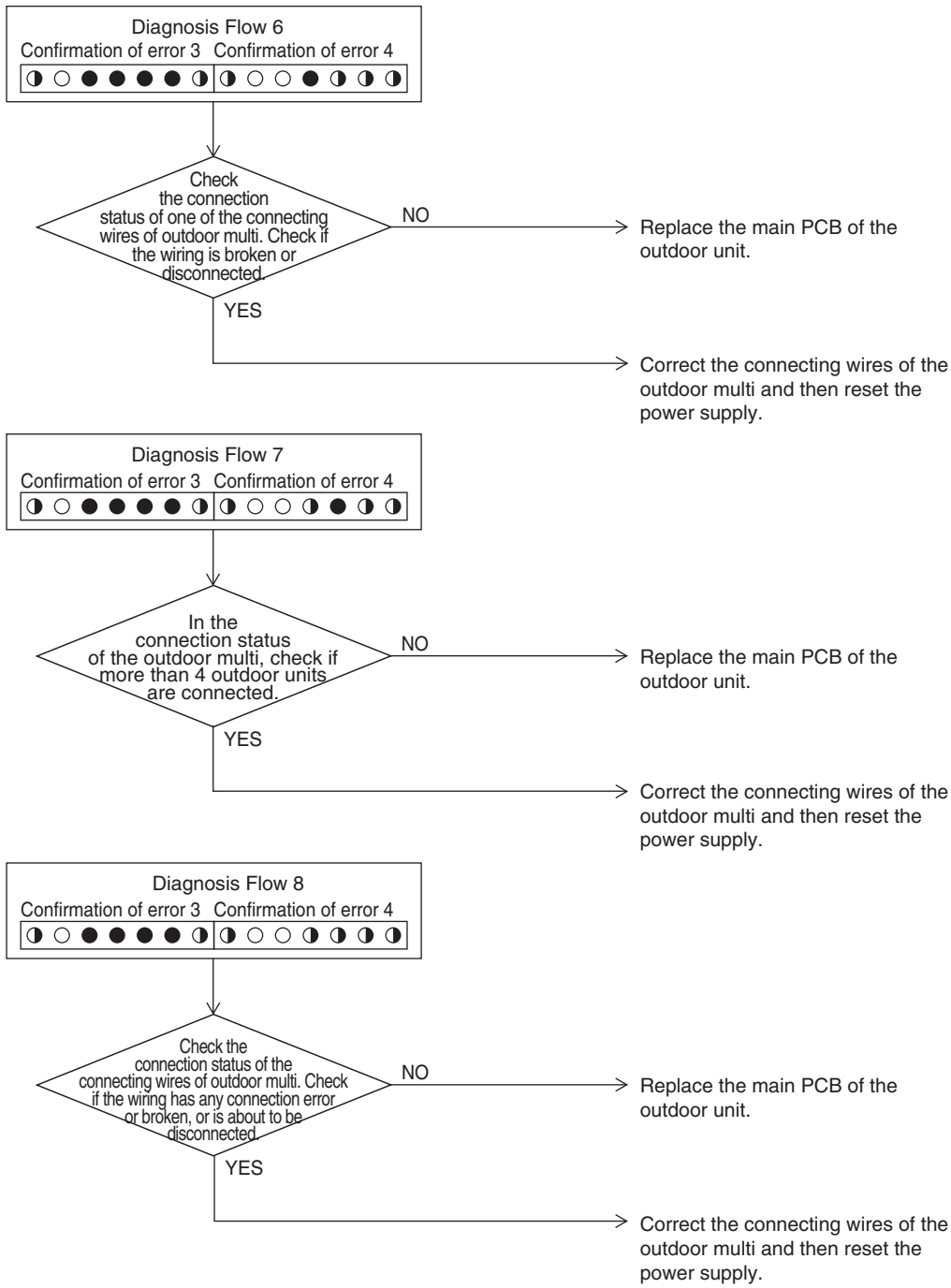
Troubleshooting

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



Troubleshooting

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



3.55 Transmission Error between Main and Sub Remote Controllers

Remote Controller Display

U8

Applicable Models

All models of indoor unit

Method of Error Detection

In case of controlling with 2-remote controllers, check the system using the micro-computer if the signal transmission between indoor unit and remote controller (main and sub) is normal.

Error Decision Conditions

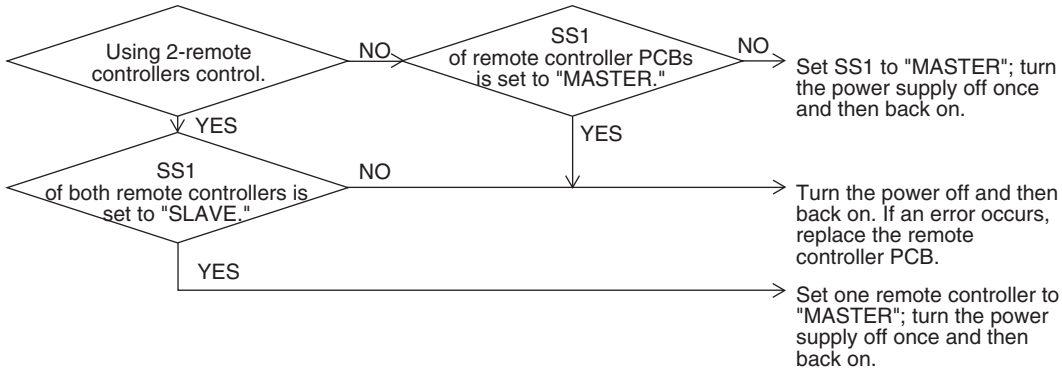
Normal transmission does not continue for specified period.

Supposed Causes

- Defective transmission between main and sub remote controller
- Connection between sub remote controllers
- Defective remote controller PCB

Troubleshooting

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



3.56 Transmission Error between Indoor and Outdoor Units in the Same System

Remote Controller Display

U9

Applicable Models

All models of indoor unit
RXYQ72P~192PBYD, PBTJ
REYQ72P~192PBYD, PBTJ

Method of Error Detection

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

Error Decision Conditions

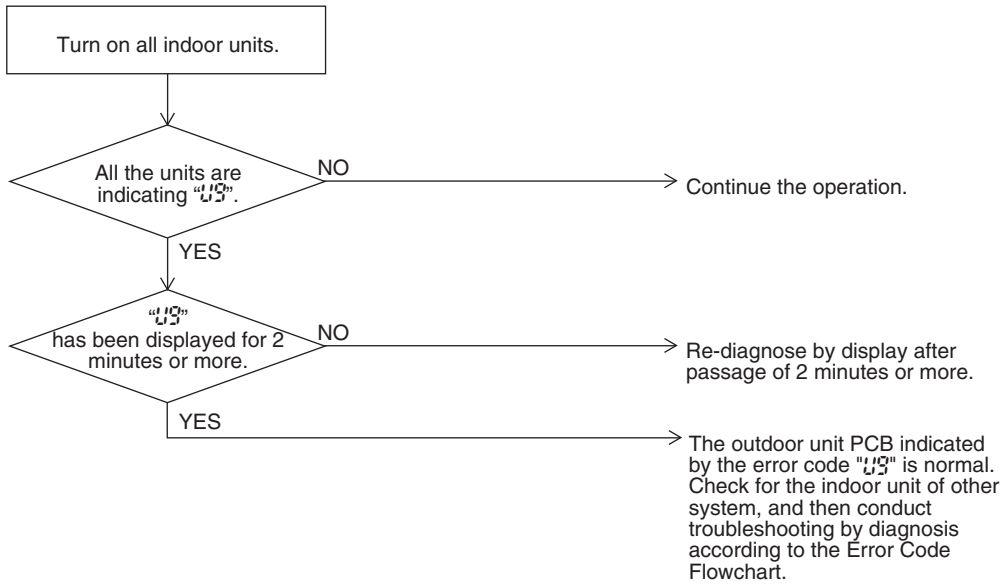
When the error decision is made on any other indoor unit within the system concerned

Supposed Causes

- Defective transmission within or outside of other system
- Defective electronic expansion valve in indoor unit of other system
- Defective PCB of indoor unit in other system
- Improper connection of transmission wiring between indoor and outdoor unit

Troubleshooting

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



3.57 Improper Combination of Indoor and Outdoor Units, Indoor Units and Remote Controller

Remote Controller Display

U9

Applicable Models

All models of indoor unit
RXYQ72P~192PBYD, PBTJ
REYQ72P~192PBYD, PBTJ

Method of Error 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, Branch Selector unit, and outdoor unit.

Error Decision Conditions

The error decision is made as soon as either of these abnormalities is detected.

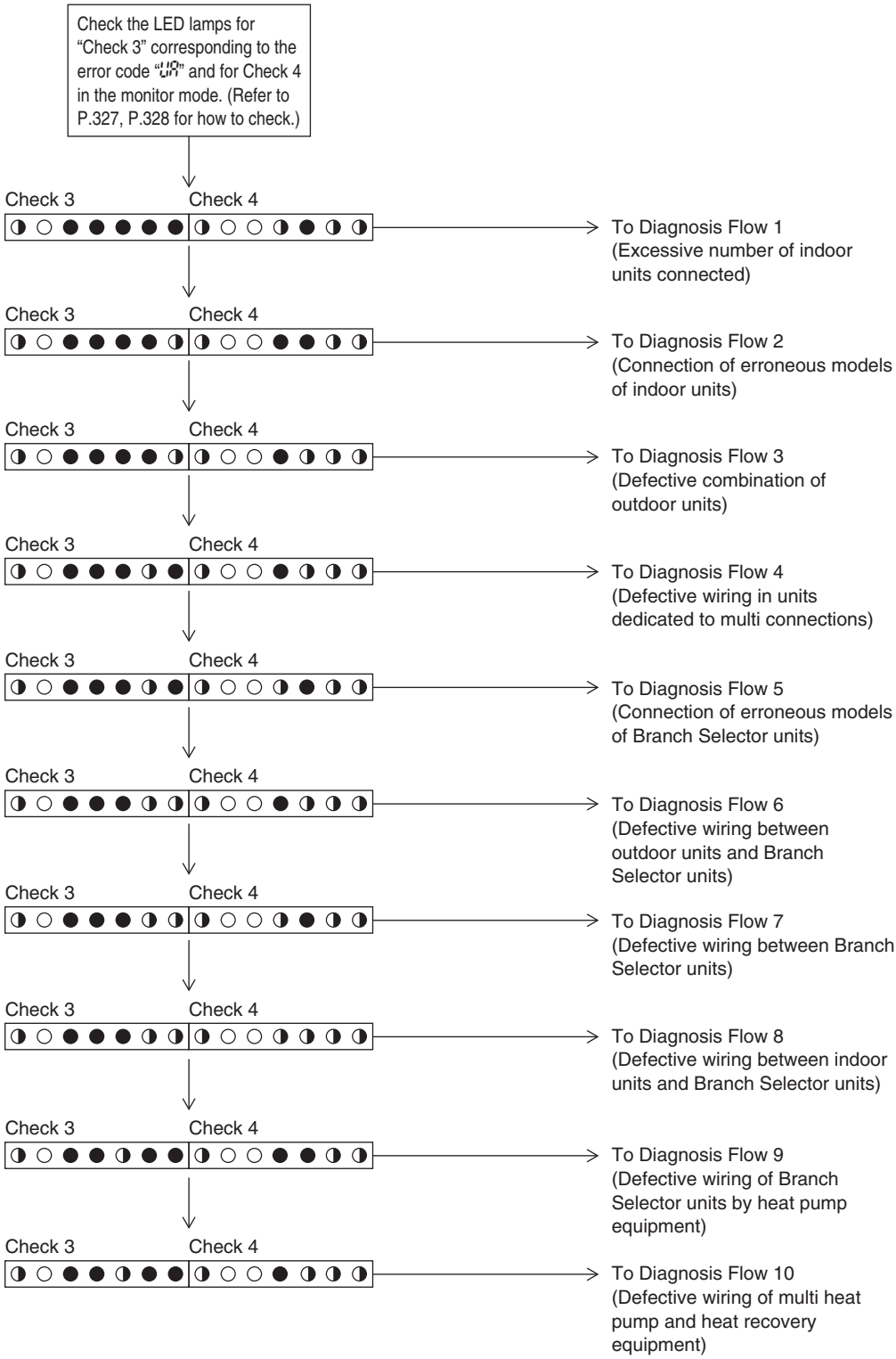
Supposed Causes

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

Troubleshooting

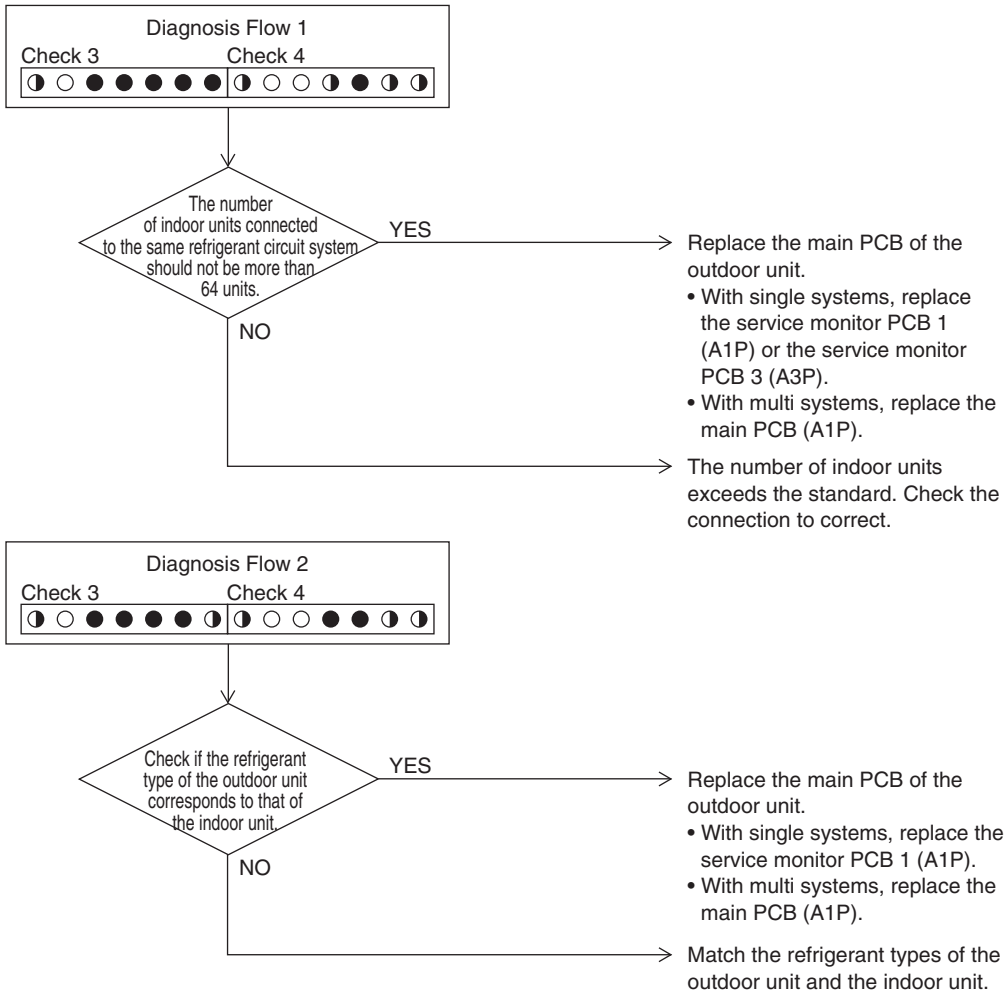
Caution Be sure to turn off power switch before connecting or disconnecting connectors or parts may be damaged.

Check the LED lamps for "Check 3" corresponding to the error code "UA" and for Check 4 in the monitor mode. (Refer to P.327, P.328 for how to check.)



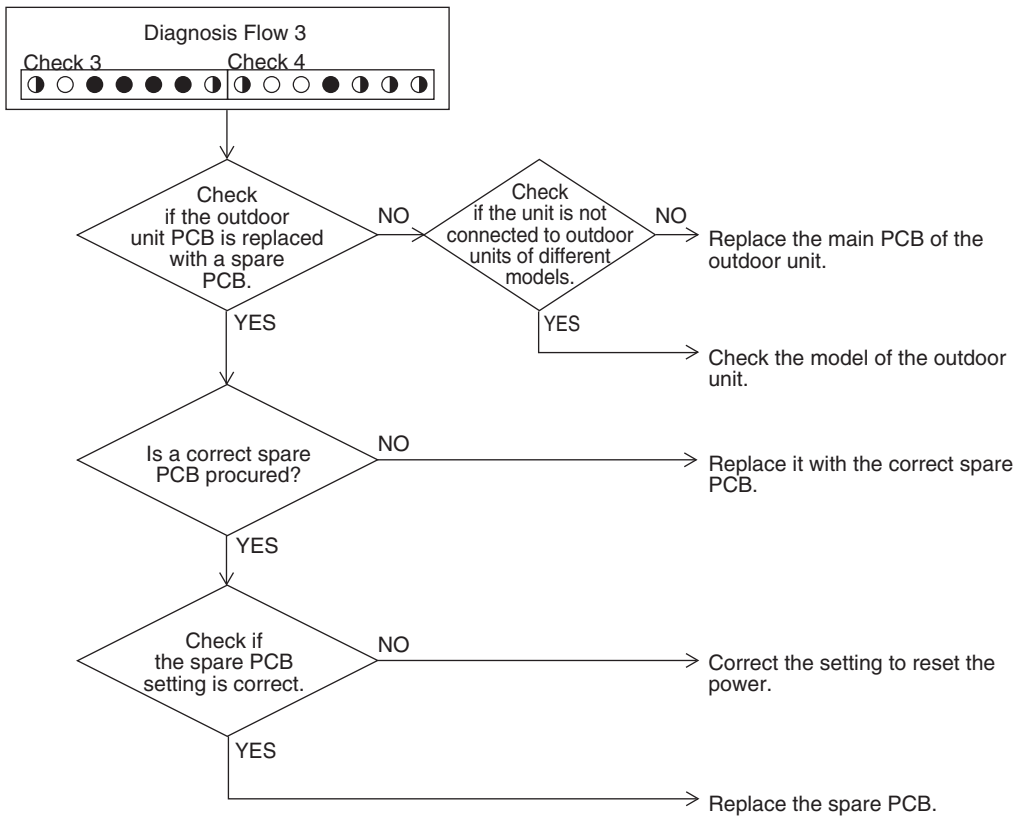
Troubleshooting

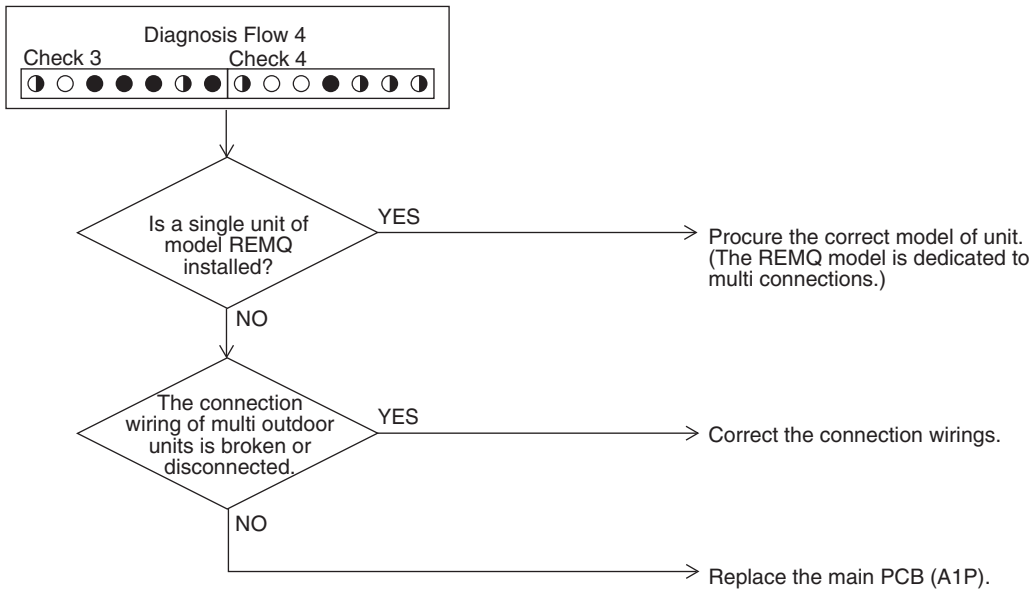
Caution Be sure to turn off power switch before connecting or disconnecting connectors or parts may be damaged.



Troubleshooting

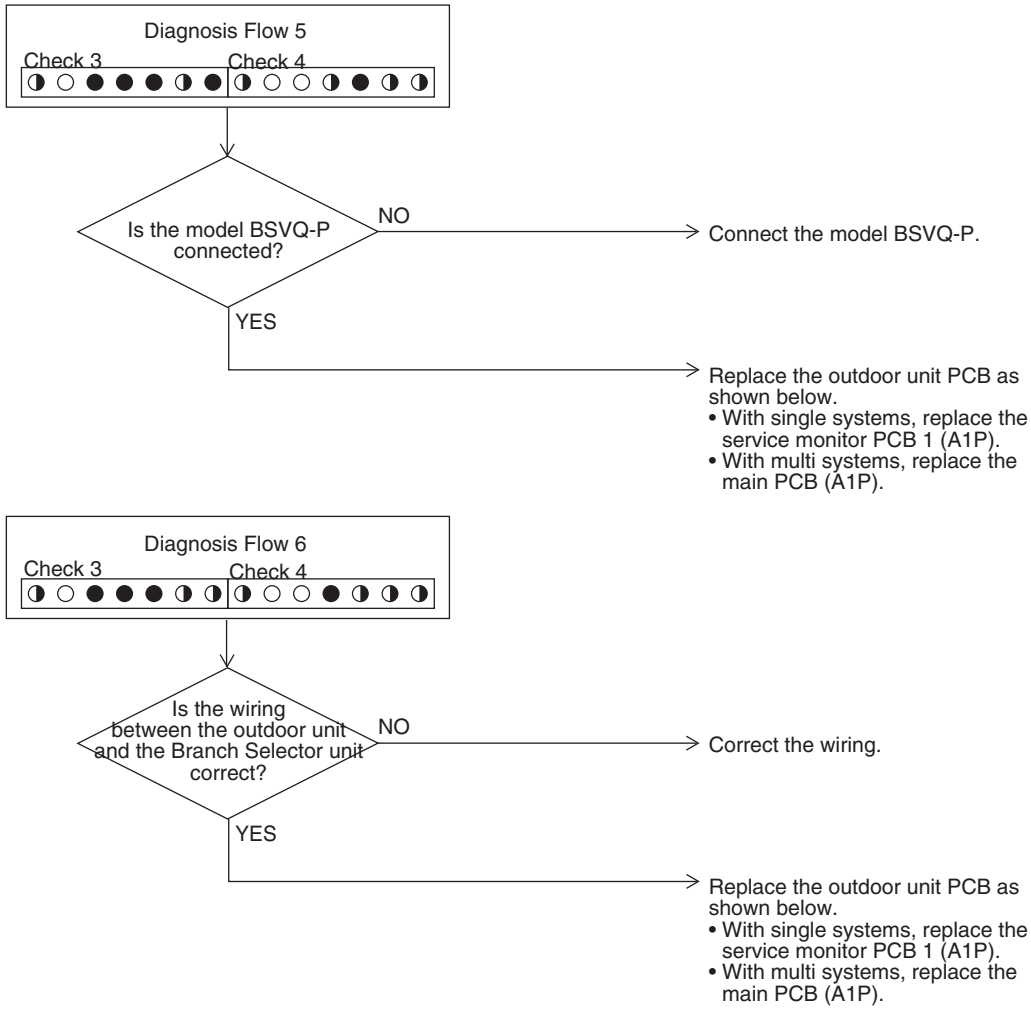
Caution Be sure to turn off power switch before connecting or disconnecting connectors or parts may be damaged.





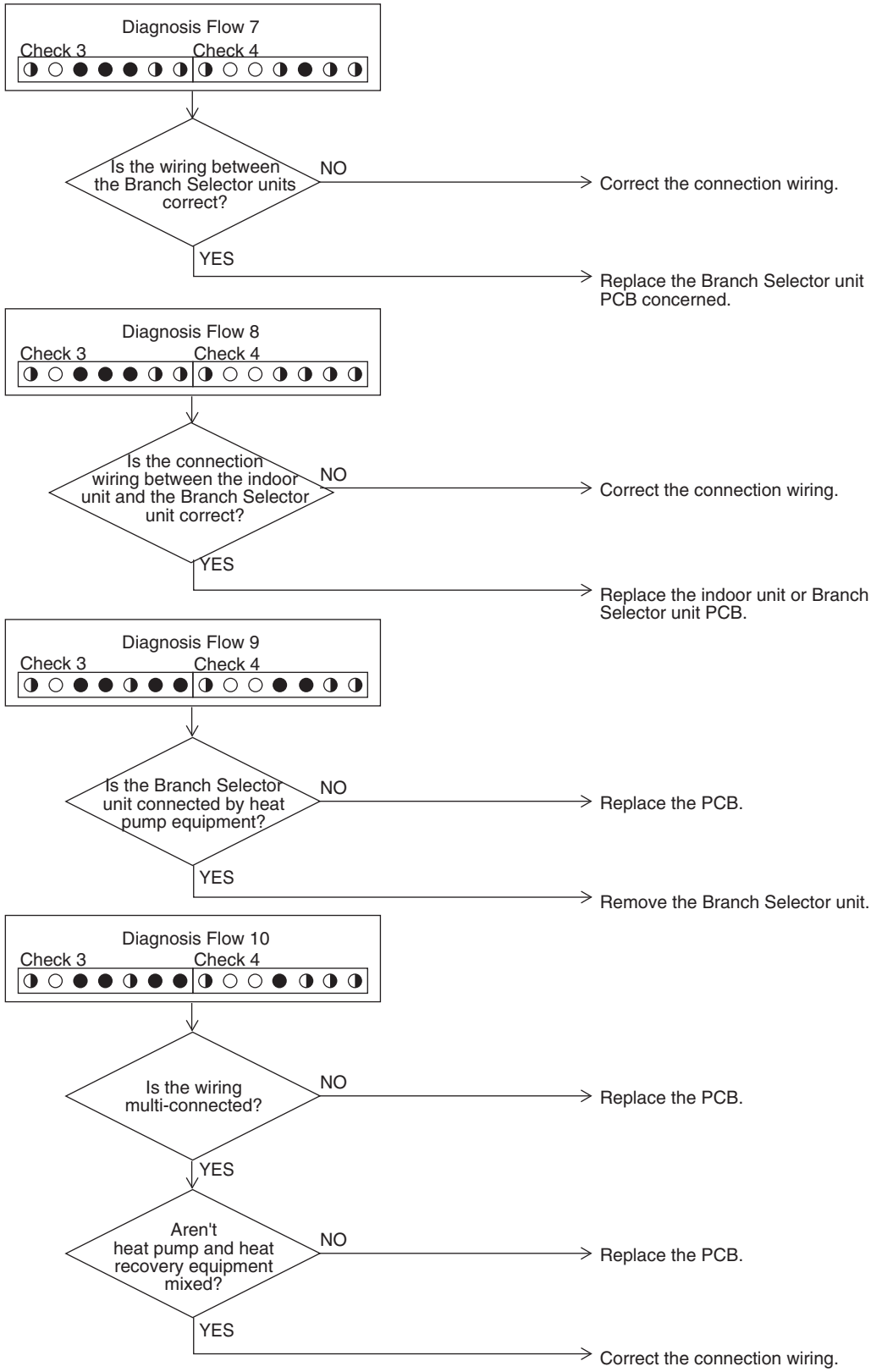
Troubleshooting

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



Troubleshooting

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



3.58 Address Duplication of Centralized Controller

Remote Controller Display

Applicable Models

All models of indoor unit
Centralized controller

Method of Error Detection

The principal indoor unit detects the same address as that of its own on any other indoor unit.

Error Decision Conditions

The error decision is made as soon as this abnormality is detected.

Supposed Causes

- Address duplication of centralized controller

Troubleshooting

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

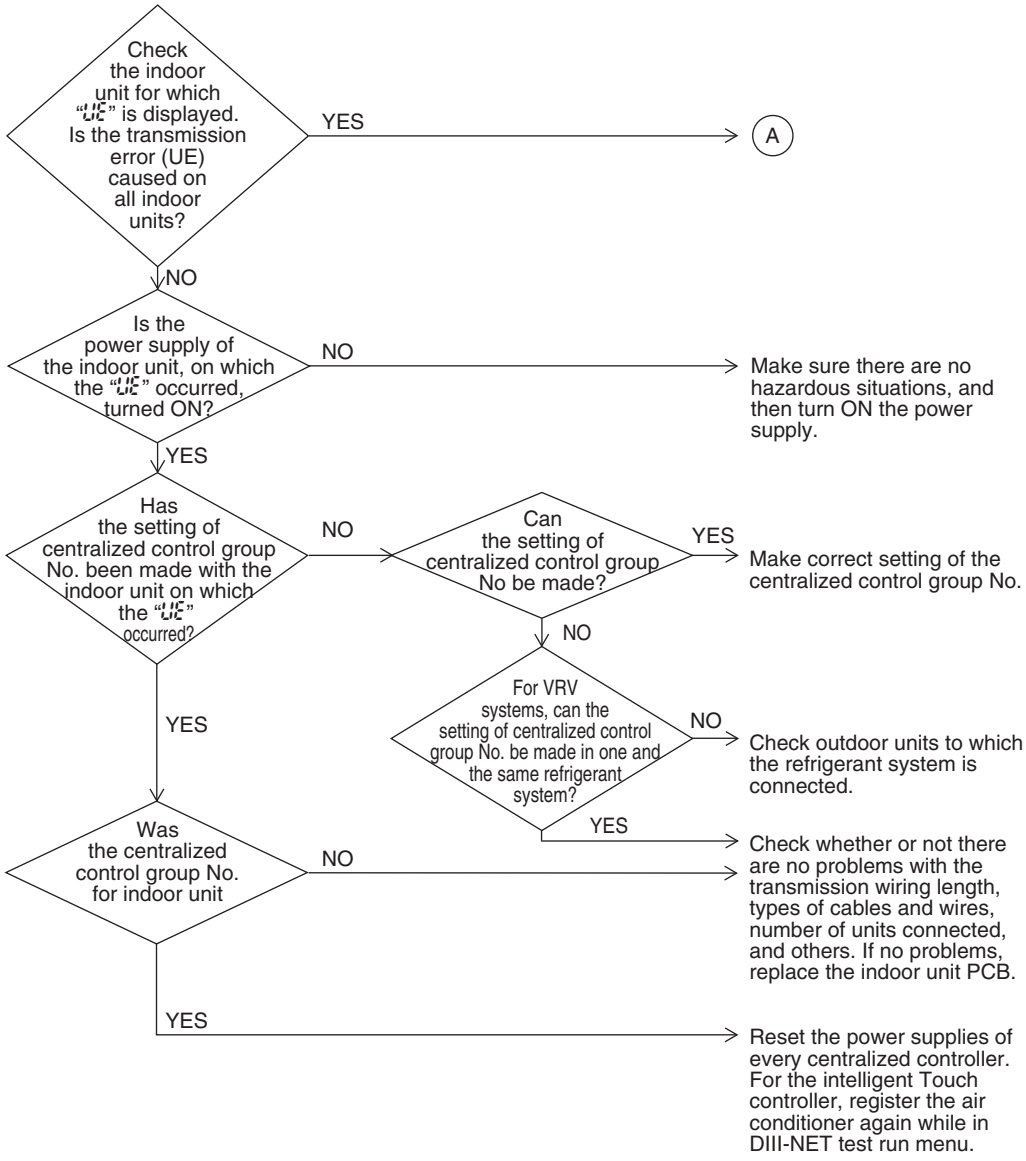
The centralized address is → Make setting change so that the centralized address will not be duplicated.

3.59 Transmission Error between Centralized Controller and Indoor Unit

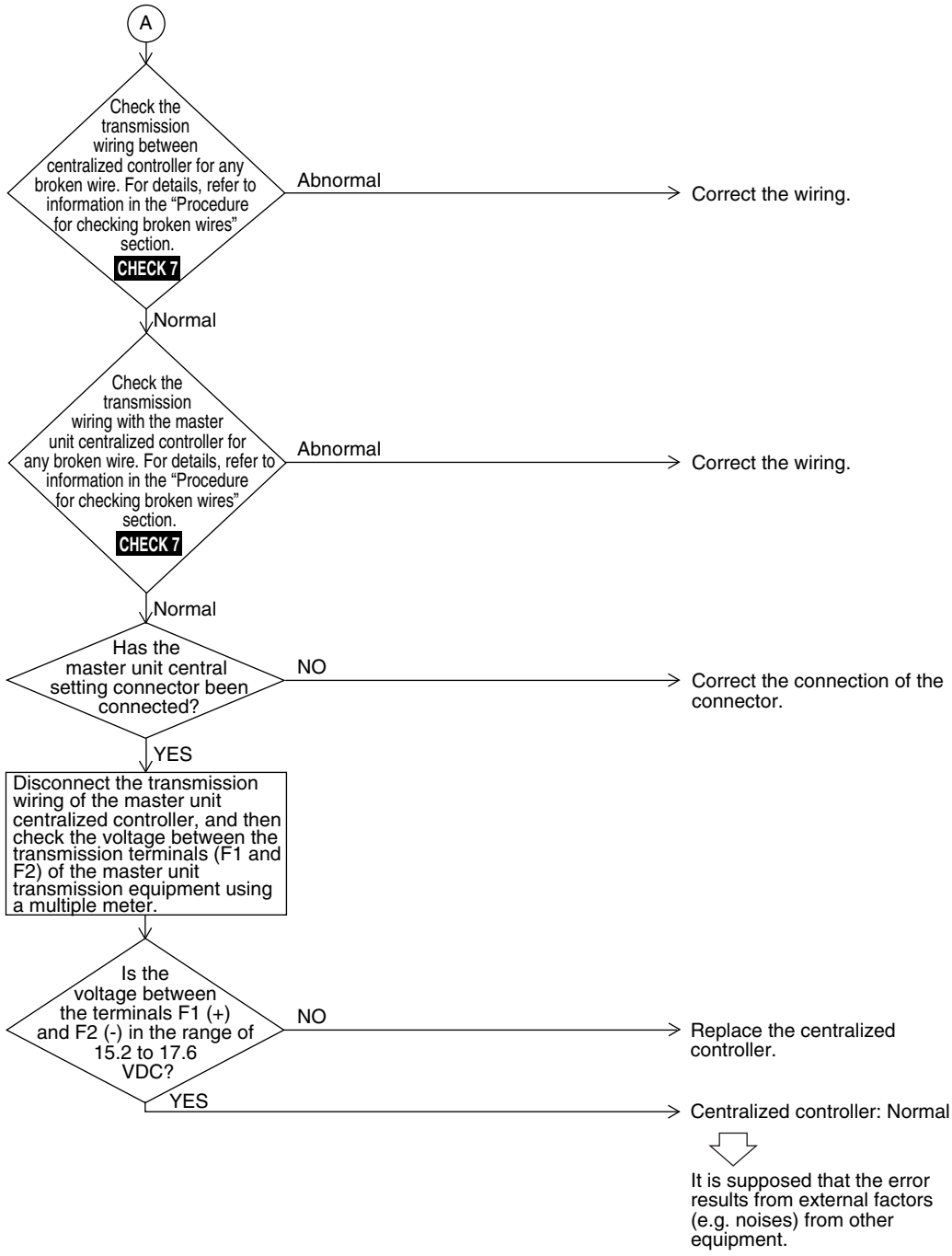
Remote Controller Display	UE
Applicable Models	All models of indoor unit intelligent Touch Controller Centralized controller Schedule timer
Method of Error Detection	Micro-computer checks if transmission between indoor unit and centralized controller is normal.
Error Decision Conditions	When transmission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

Troubleshooting

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



Troubleshooting



CHECK 7 Refer to P.452.

3.60 System is not Set yet

Remote Controller Display

UF

Applicable Models

All models of indoor unit
RXYQ72P~192PBYD, PBTJ
REYQ72P~192PBYD, PBTJ

Method of Error 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.

Error Decision Conditions

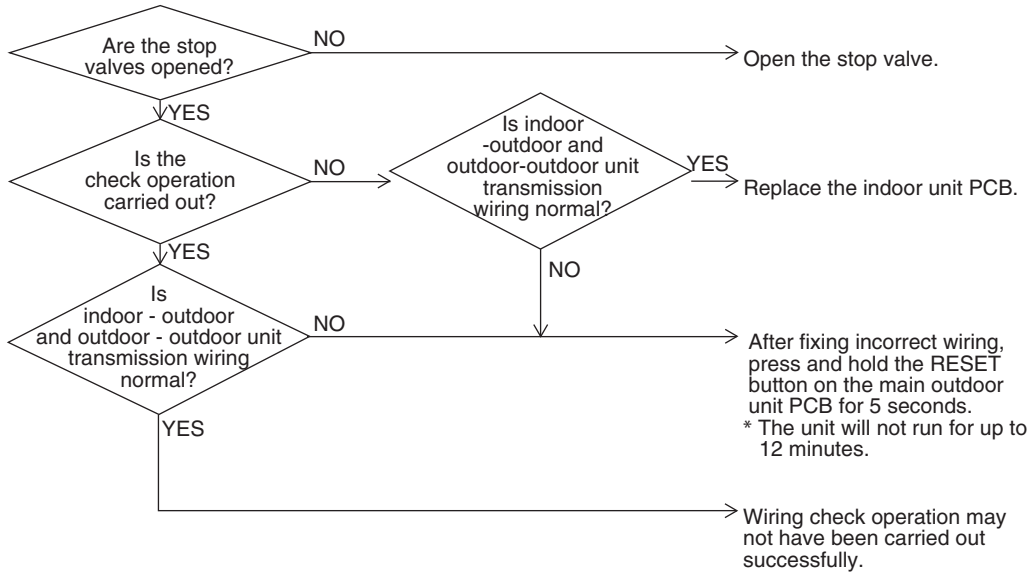
The error is determined as soon as this abnormality is detected through checking the system for any erroneous connection of units on the check operation.

Supposed Causes

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

Troubleshooting

Caution Be sure to turn off power switch before connecting or disconnecting connectors 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.

3.61 System Abnormality, Refrigerant System Address Undefined

Remote Controller Display

Applicable Models

All models of indoor unit
RXYQ72P~192PBYD, PBTJ
REYQ72P~192PBYD, PBTJ

Method of Error Detection

Detect an indoor unit with no address setting.

Error Decision Conditions

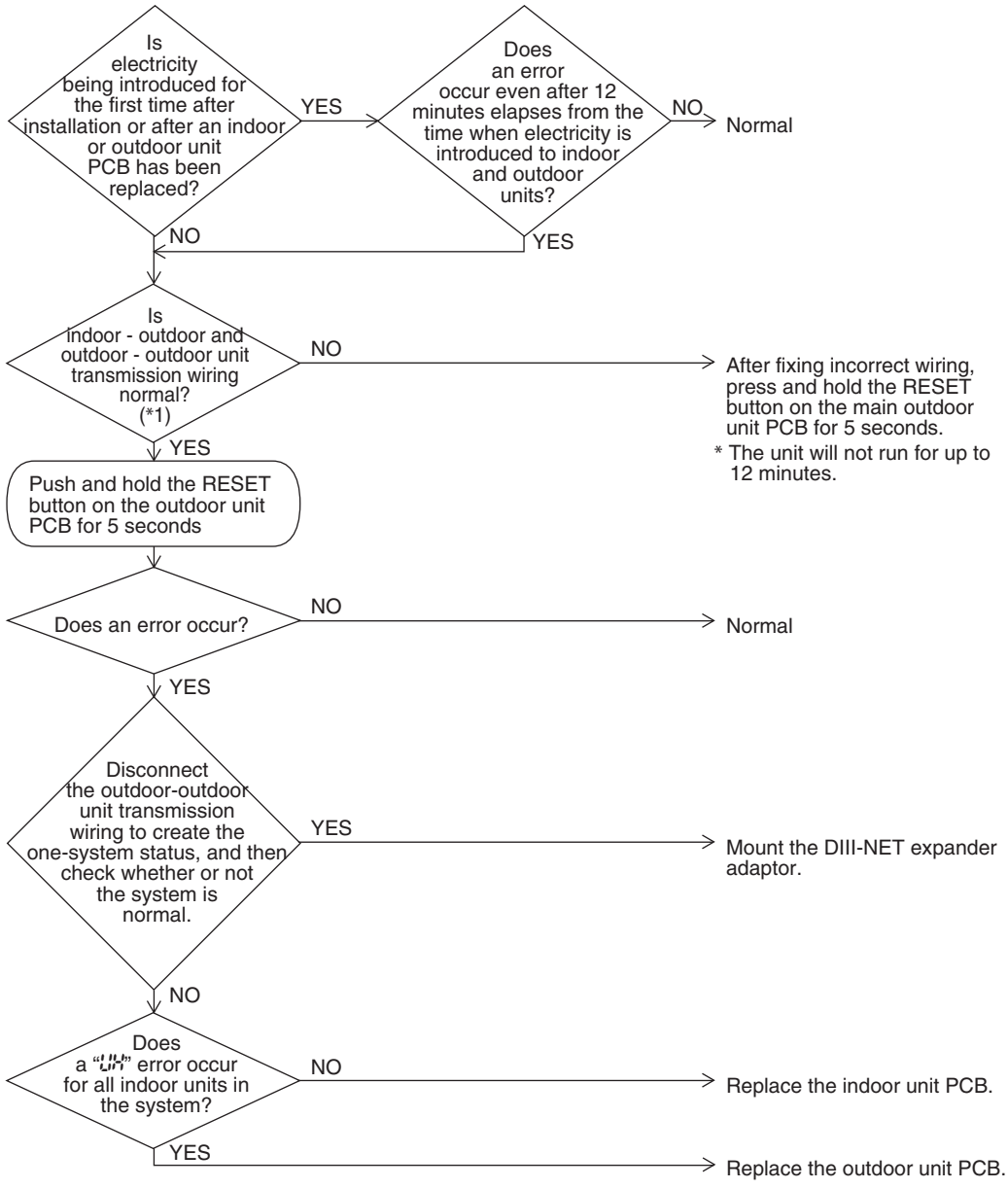
The error decision is made as soon as this abnormality is detected.

Supposed Causes

- Improper connection of transmission wiring between indoor-outdoor units and outdoor-outdoor units
- Defective indoor unit PCB
- Defective outdoor unit main PCB

Troubleshooting

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



Note: ∗1: Check the correct wiring "indoor-outdoor" and "outdoor-outdoor" by Installation manual.

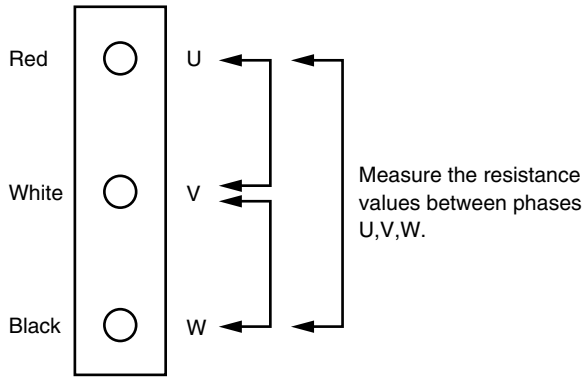
∗2: What is Auto Address?

This is the address automatically assigned to indoor units and outdoor units after initial power supply upon installation, or after executing rewiring (Keep pressing the RESET button for more than 4 seconds).

CHECK 1

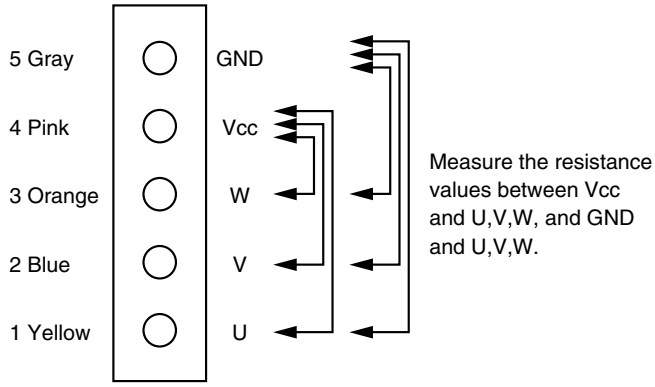
Check on connector of fan motor (Power supply cable)

(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.



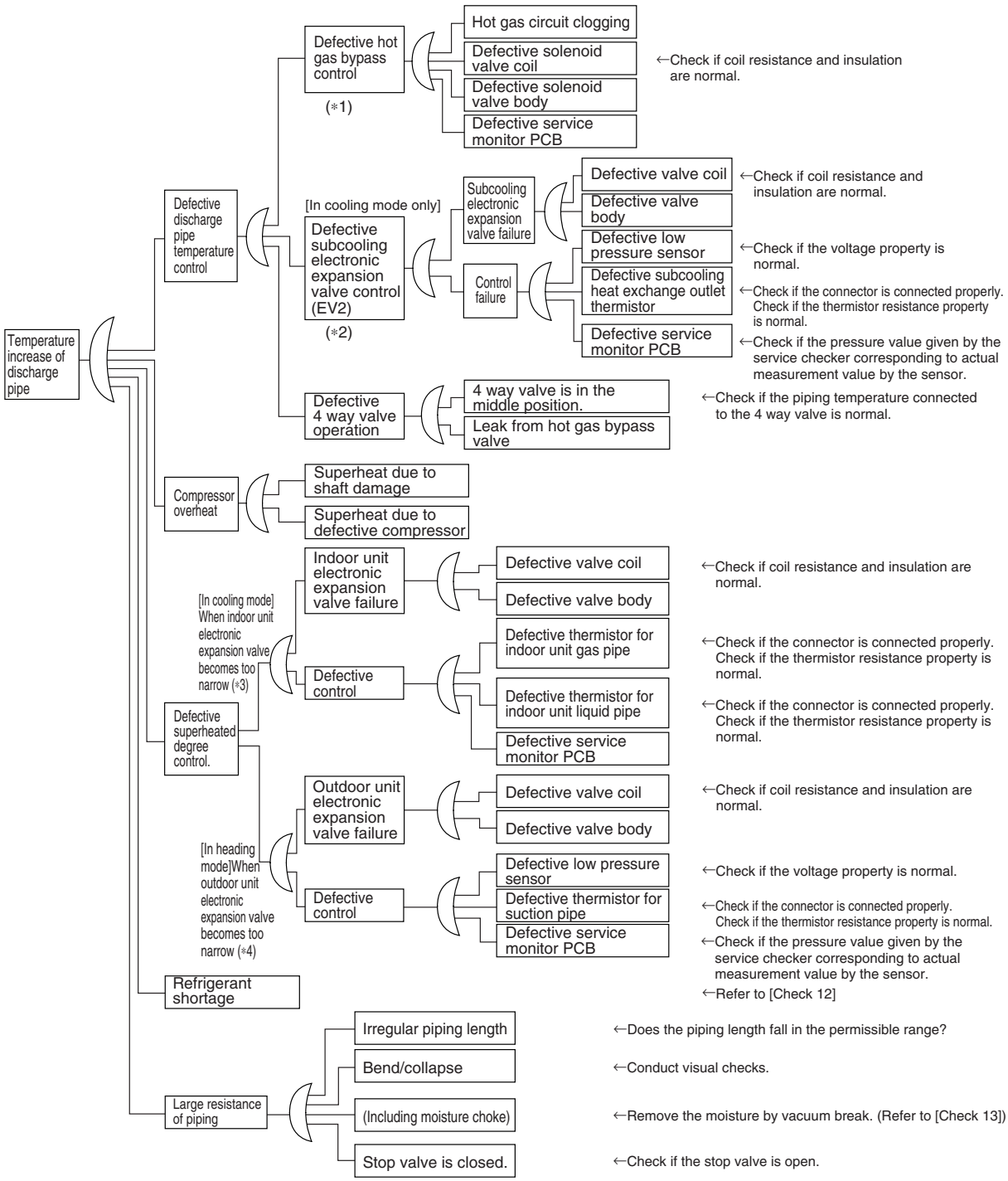
CHECK 2

(1) Turn off the power supply.
(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 multiple meter for measurement, connect the probe of negative pole to Vcc and that of positive pole to GND.



CHECK 3 Check the Factors of Overheat Operation

Identify the defective points referring to the failure factor analysis (FTA) as follows.



∗1: Refer to “Low pressure protection control” for hot gas bypass control.
∗2: Refer to “Subcooling electronic expansion valve control”.
∗3: “Superheating temperature control” in cooling mode is conducted by indoor unit electronic expansion valve.
∗4: Superheating temperature control in heating mode is conducted by outdoor unit electronic expansion valve (EVM).
∗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 drooping control, etc.
(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 4 Power Transistor Check

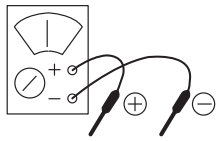
Perform the following procedures prior to check.

(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.

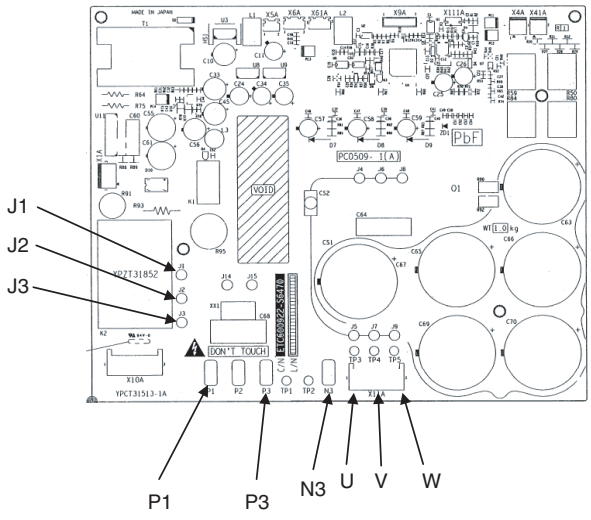
To use analog tester:
Measurement in the resistance value mode in the range of multiplying 1kΩ.

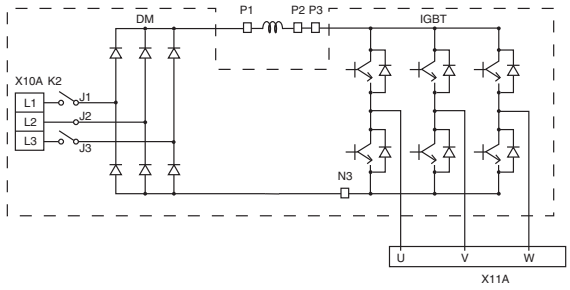
No.	Point of Measurement		Judgement Criteria	Remarks
	+	–		
1	P2	U	2 ~ 15kΩ	
2	P2	V		
3	P2	W		
4	U	P2	15kΩ and above (including ∞)	Due to condenser charge and so on, resistance measurement may require some time.
5	V	P2		
6	W	P2		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	2 ~ 15kΩ	
11	V	N3		
12	W	N3		

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		

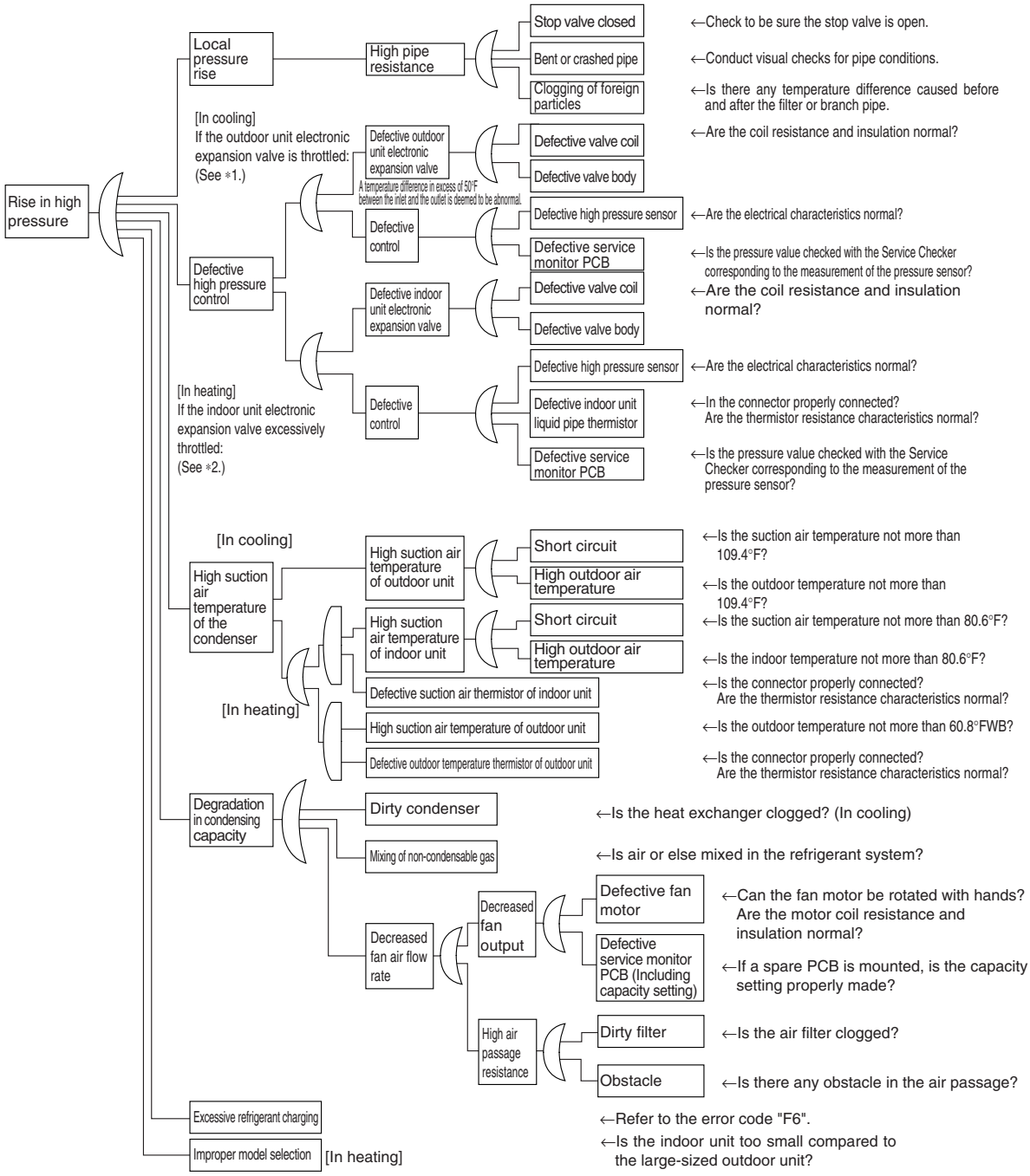
[PCB and Circuit Diagram]





CHECK 5 Check for causes of rise in high pressure

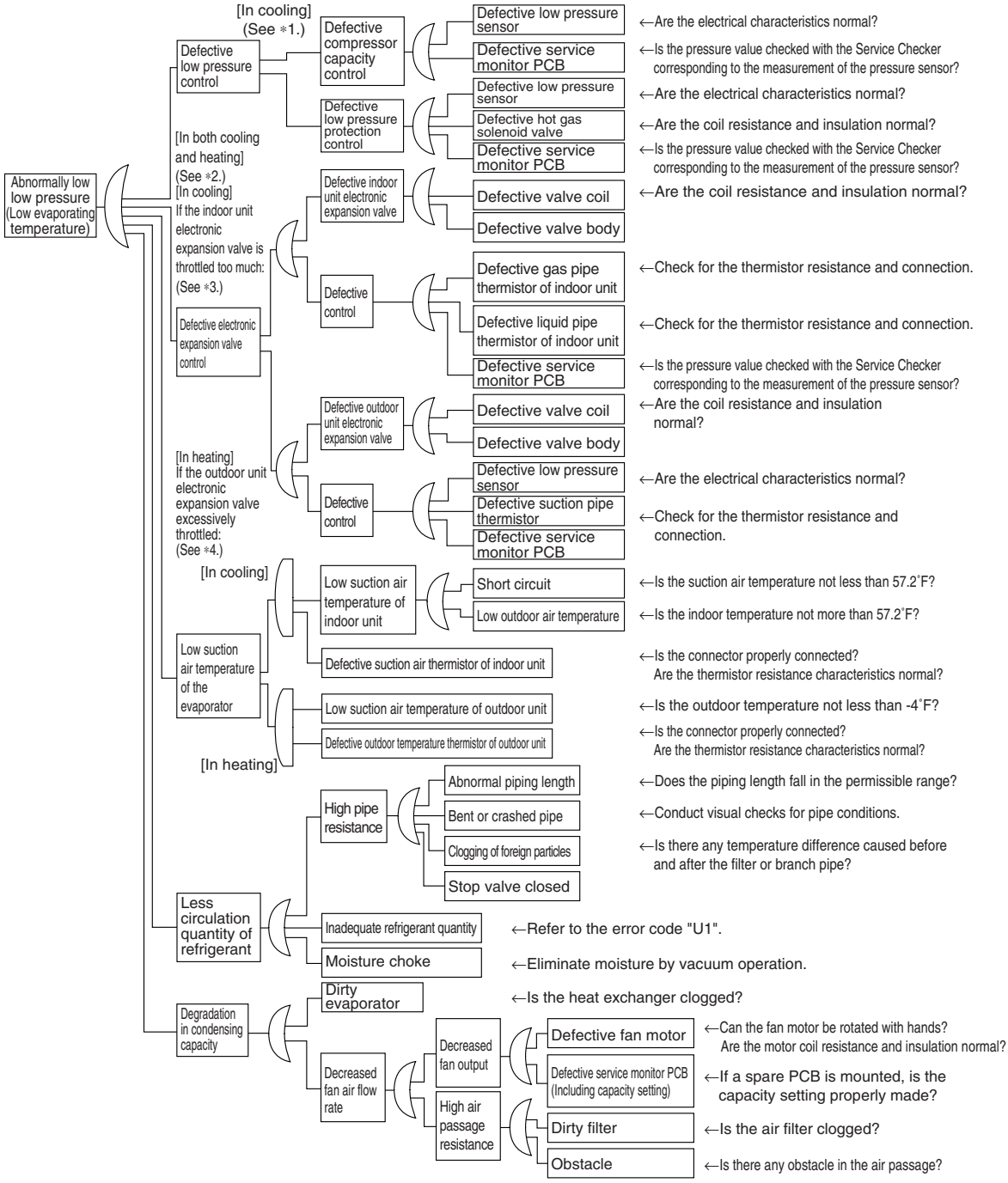
Referring to the Fault Tree Analysis (FTA) shown below, probe the defective points.



∗1: In cooling, it is normal if the outdoor unit electronic expansion valve (EVM) is fully open.
∗2: In heating, the indoor unit electronic expansion valve is used for “subcooled degree control”.

CHECK 6 Check for causes of drop in low pressure

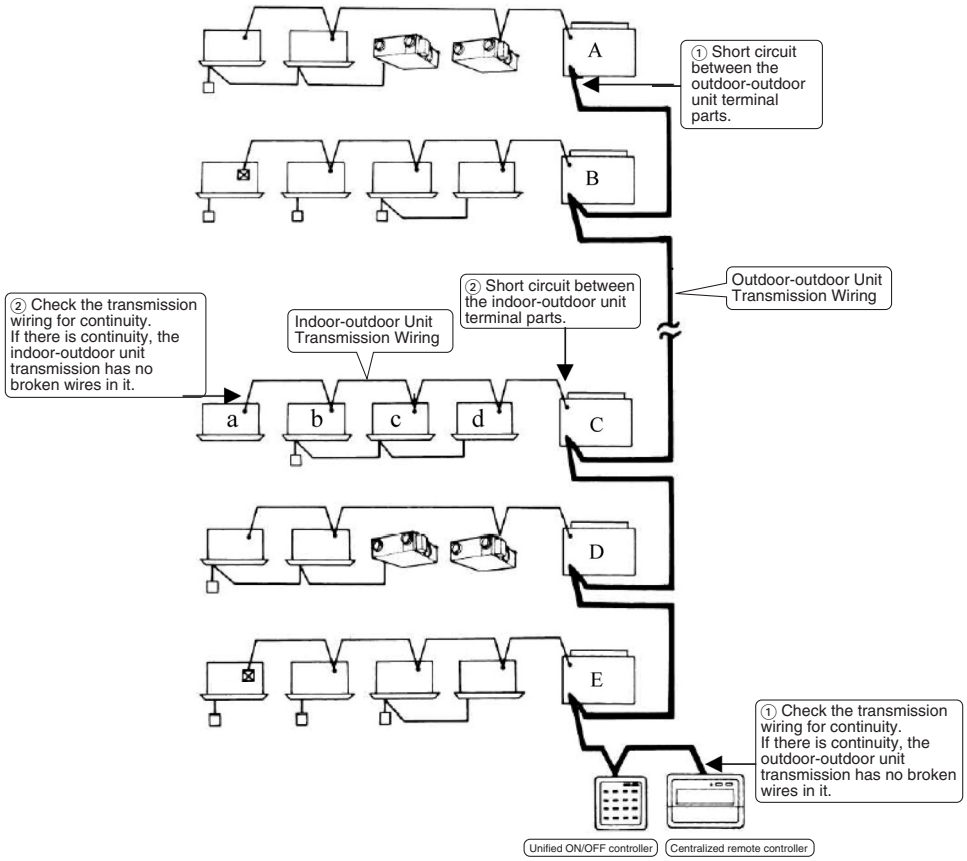
Referring to the Fault Tree Analysis (FTA) shown below, probe the defective points.



∗1: The “low pressure protection control” includes low pressure protection control and hot gas bypass control.
∗2: In cooling, the indoor unit electronic expansion valve is used for “superheated degree control”.
∗3: In heating, the outdoor unit electronic expansion valve (EVM) is used for “superheated degree control of outdoor unit heat exchanger”.

CHECK 7 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 multiple 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 multiple 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 8 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 master unit, in the PCB (CN1/X1A).
  (Independent-use connector = Master unit central setting connector)
- To use two or more centralized controller in combination, make settings according to the table shown below.

<table>
<tr><th rowspan="2">Pattern</th><th colspan="4">Centralized 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="3">1 to 8 units</td><td>× (∗1)</td><td rowspan="3">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 rowspan="4"></td><td rowspan="4">1 to 4 units</td><td rowspan="3">1 to 16 units</td><td rowspan="3">1 unit</td><td rowspan="4"></td><td rowspan="4">Only a single unit: "Provided", Others: "Not provided"</td><td rowspan="3">All "Not provided"</td><td rowspan="3">Not provided</td></tr>
<tr><td>⑥</td></tr>
<tr><td>⑦</td></tr>
<tr><td>⑧</td><td></td><td>1 unit</td><td></td><td>Not provided</td></tr>
<tr><td>⑨</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 master unit.

CHECK 9 Master-Slave Unit Setting Table

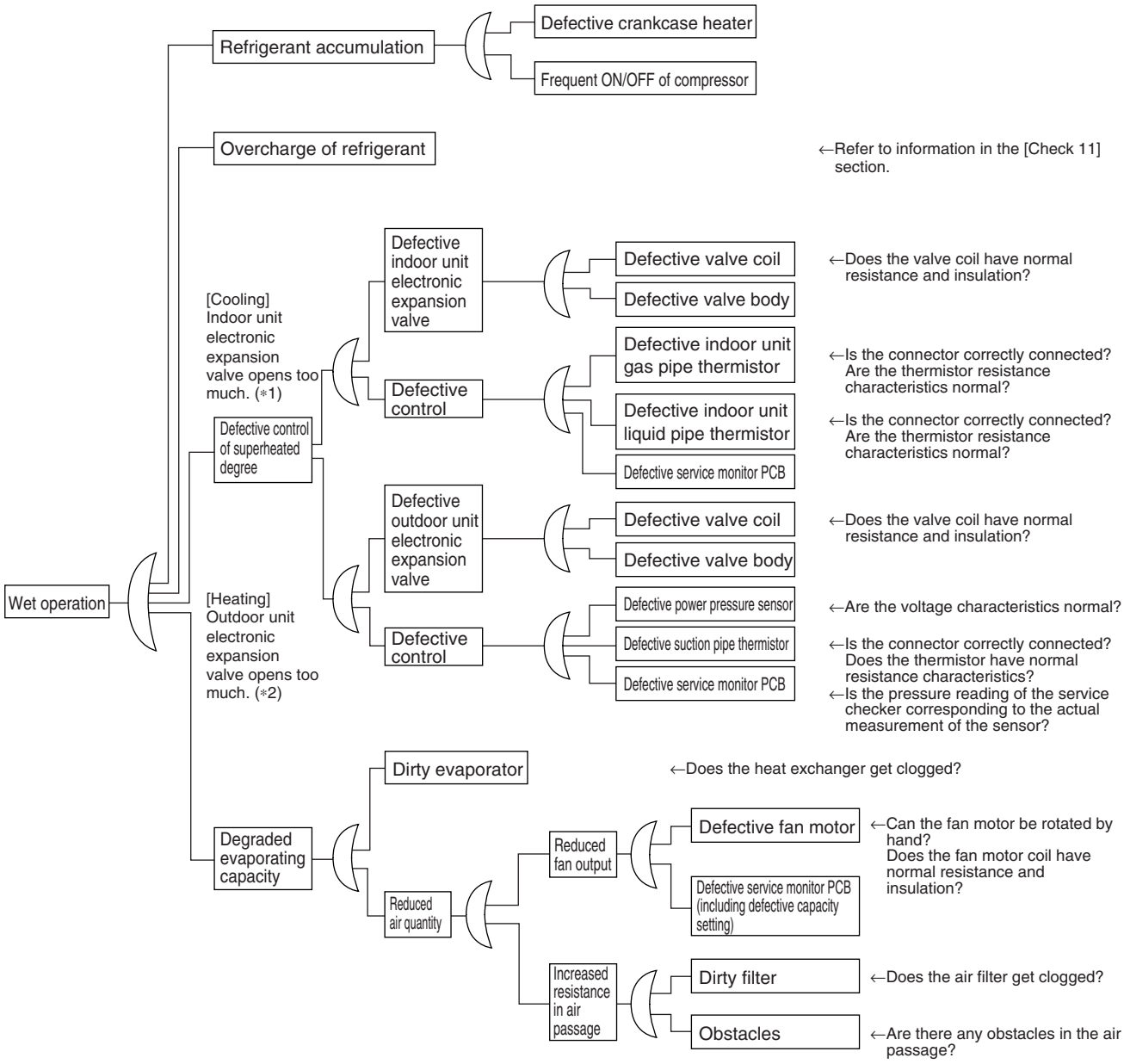
Combination of intelligent Touch Controller and Centralized Remote Controller

*	#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 10 **Check for causes of wet operation.**

Referring to the Fault Tree Analysis (FTA) shown below, identify defective points.



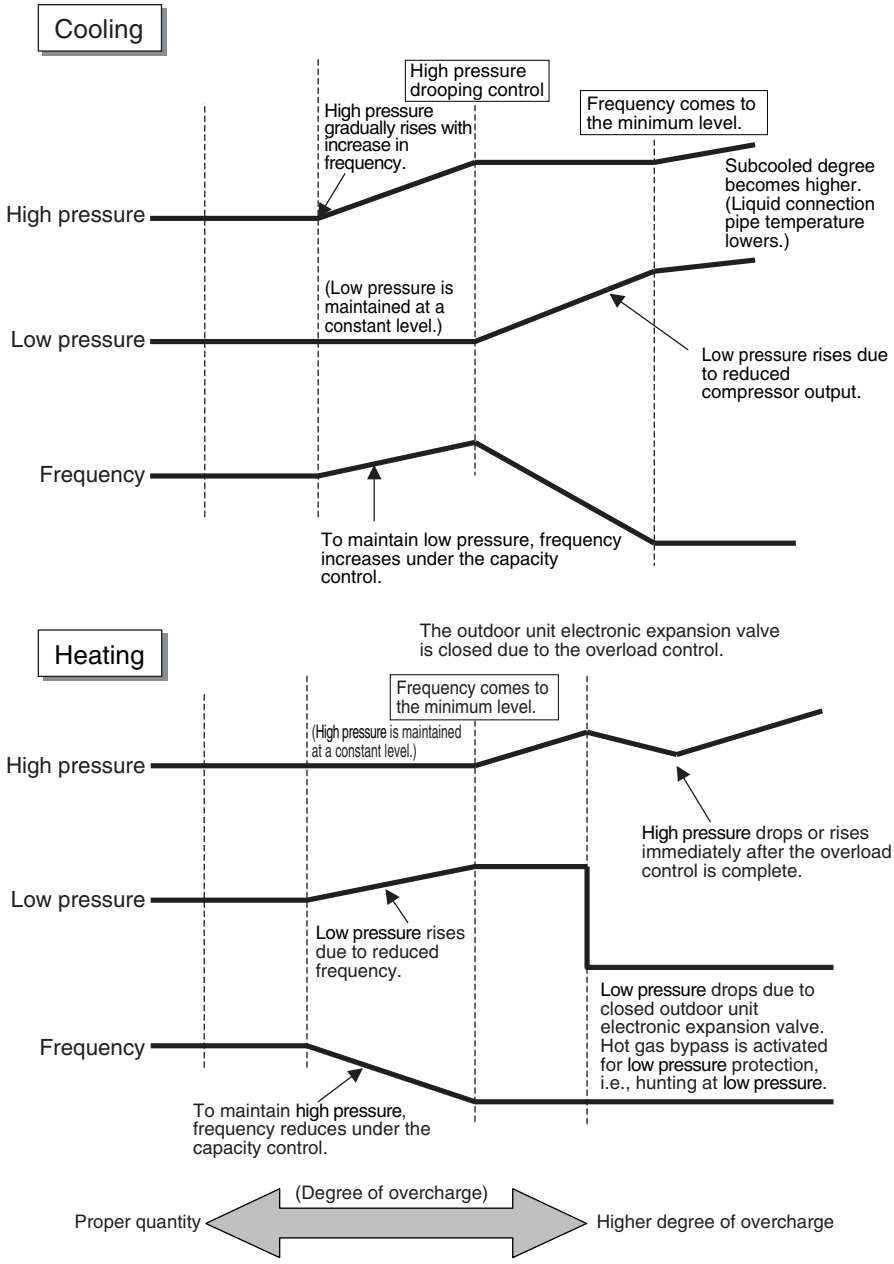
∗1: "Superheated degree control" in cooling operation is exercised with the indoor unit electronic expansion valve.
∗2: "Superheated degree control" in heating operation is exercised with the outdoor unit electronic expansion valve (EV1).
∗3: Guideline of superheated degree to judge as wet operation
①Suction gas superheated degree: Not more than 37.4°F; ②Discharge gas superheated degree: Not more than 59°F, except immediately after compressor starts up or is running under drooping control.
(Use the values shown above as a guideline. Even if the superheated degree falls in the range, the compressor may be normal depending on other conditions.)

CHECK 11 **Check for overcharge of refrigerant.**

In case of VRV Systems, the only way to judge as the overcharge of refrigerant is with operating conditions due to the relationship to pressure control and electronic expansion valve control. As information for making a judgement, refer to information provided below.

Diagnosis of overcharge of refrigerant

1. High pressure rises. Consequently, overload control is exercised to cause scant cooling capacity.
2. The superheated degree of suction gas lowers (or the wet operation is performed). Consequently, the compressor becomes lower in discharge pipe temperature despite of pressure loads.
3. The subcooled degree of condensate rises. Consequently, in heating operation, the temperature of outlet air passing through the subcooled section becomes lower.

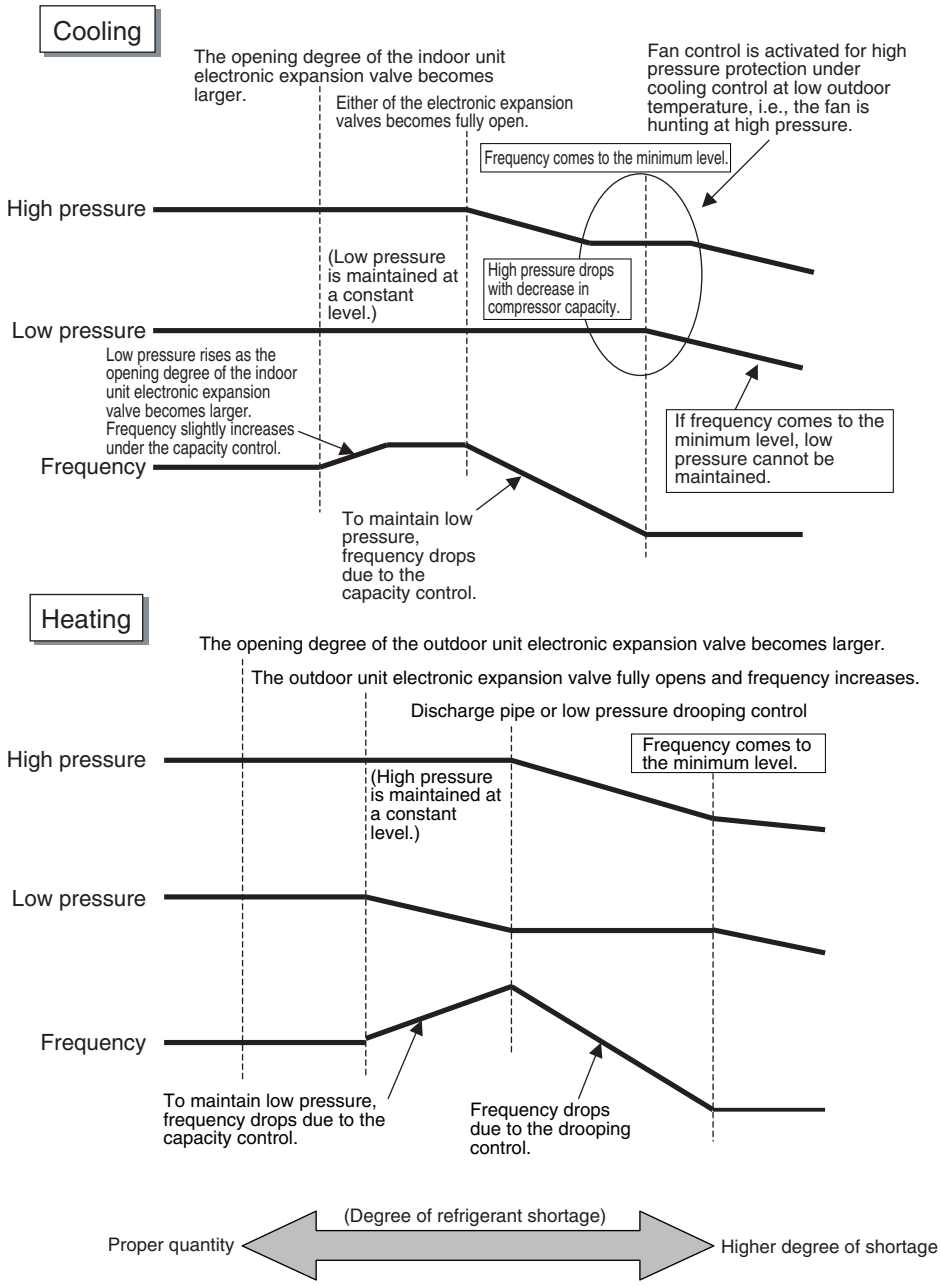


CHECK 12 **Check for shortage of refrigerant.**

In case of VRV Systems, the only way to judge as the shortage of refrigerant is with operating conditions due to the relationship to pressure control and electronic expansion valve control. As information for making a judgement, refer to information provided below.

Diagnosis of shortage of refrigerant

1. The superheated degree of suction gas rises. Consequently, the compressor discharge gas temperature becomes higher.
2. The superheated degree of suction gas rises. Consequently, the electronic expansion valve turns open.
3. Low pressure drops to cause the unit not to demonstrate cooling capacity (heating capacity).



CHECK 13 Vacuuming and dehydration procedure

Conduct vacuuming and dehydration in the piping system following the procedure for <Normal vacuuming and dehydration> described below.
Furthermore, if moisture may get mixed in the piping system, follow the procedure for <Special vacuuming and dehydration> described below.

<Normal vacuuming and dehydration>

① Vacuuming and dehydration
- Use a vacuum pump that enables vacuuming up to 14.60psi (5 torr, -755 mmHg).
- Connect manifold gauges to the service ports of liquid pipe and gas pipe and run the vacuum pump for a period of two or more hours to conduct evacuation to -100.7kPa or less.
- If the degree of vacuum does not reach -14.60psi or less even though evacuation is conducted for a period of two hours, moisture will have entered the system or refrigerant leakage will have been caused. In this case, conduct evacuation for a period of another one hour.
- If the degree of vacuum does not reach -14.60psi or less even though evacuation is conducted for a period of three hours, conduct leak tests.

② Leaving in vacuum state
- Leave the compressor at the degree of vacuum of -14.60psi or less for a period of one hour or more, and then check to be sure that the vacuum gauge reading does not rise. (If the reading rises, moisture may have remained in the system or refrigerant leakage may have been caused.)

③ Refrigerant charge
- Purge air from the manifold gauge connection hoses, and then charge a necessary quantity of refrigerant.

<Special vacuuming and dehydration> - In case moisture may get mixed in the piping*

① Vacuuming and dehydration
- Follow the same procedure as that for 1) Normal vacuuming and dehydration described above.

② Vacuum break
- Pressurize with nitrogen gas up to 7.25psi.

③ Vacuuming and dehydration
- Conduct vacuuming and dehydration for a period of one hour or more. If the degree of vacuum does not reach -14.60psi or less even though evacuation is conducted for a period of two hours or more, repeat vacuum break - vacuuming and dehydration.

④ Leaving in vacuum state
- Leave the compressor at the degree of vacuum of -14.60psi or less for a period of one hour or more, and then check to be sure that the vacuum gauge reading does not rise.

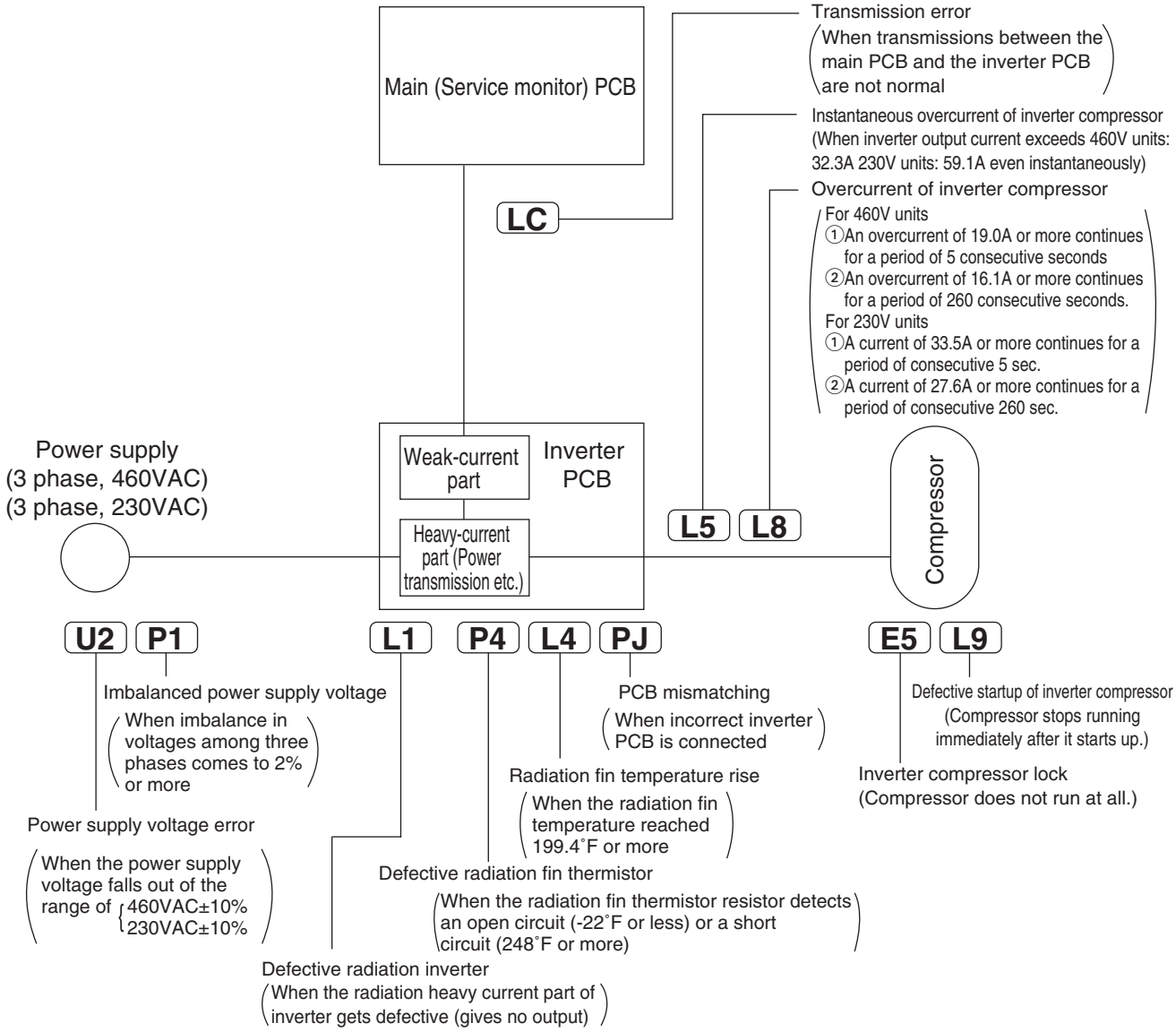
⑤ Refrigerant charge
- Purge air from the manifold gauge connection hoses, and then charge a necessary quantity of refrigerant.

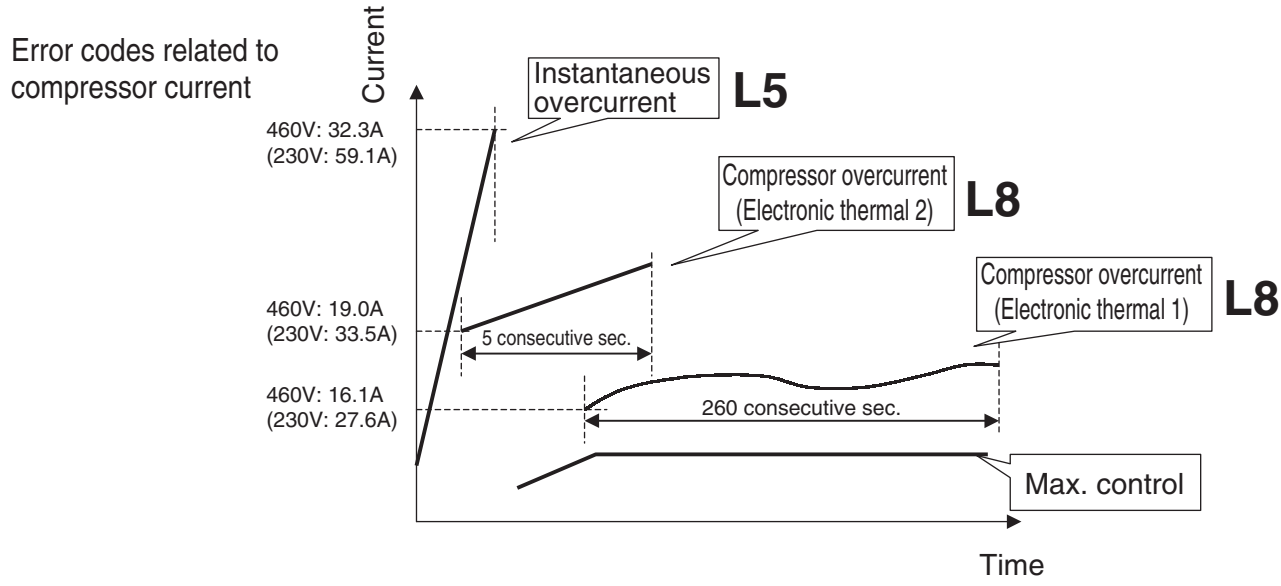
* In case of construction during rainy reason, if dew condensation occurs in the piping due to extended construction period, or rainwater or else may enter the piping during construction work:

CHECK 14 List of inverter-related error codes

	Code	Name	Condition for determining error	Major cause
Compressor current	L5	Instantaneous overcurrent of inverter compressor	• Inverter output current exceeds 32.3A even instantaneously.	• Liquid sealing • Defective compressor • Defective inverter PCB
	L8	Overcurrent of inverter compressor (Electronic thermal)	• Compressor overload running An overcurrent of 19.0A or more continues for a period of 5 consecutive seconds or that of 16.1A or more continues for a period of 260 consecutive seconds. For 230V units: A current of 33.5A or more continues for a period of consecutive 5 sec. or that of 27.6A or more continues for a period of consecutive 260 sec. • The inverter loses synchronization.	• Back-flow of compressor liquid • Sudden changes in loads • Disconnected compressor wiring • Defective inverter PCB
Protection device and others	L1	Defective inverter PCB	• No output is given.	• Defective heavy current part of compressor
	L9	Defective startup of inverter compressor	• The compressor motor fails to start up.	• Liquid sealing or defective compressor • Excessive oil or refrigerant • Defective inverter PCB
	E5	Inverter compressor lock	• The compressor is in the locked status (does not rotate).	• Defective compressor
	L4	Radiation fin temperature rise	• The radiation fin temperature reaches 188.6°F or more (while in operation).	• Defective fan • Running in overload for an extended period of time • Defective inverter PCB
	U2	Power supply voltage error	• The inverter power supply voltage is high or low.	• Power supply error • Defective inverter PCB
	P1	Imbalanced power supply	• Power supply voltages get significantly imbalanced among three phases.	• Power supply error (imbalanced voltages of 2% or more) • Defective inverter PCB • Dead inverter PCB
	LC	Transmission error (between inverter PCB and service monitor PCB)	• With the outdoor unit PCB, no communications are carried out across service monitor PCB - inverter PCB - fan PCB.	• Broken wire in communication line • Defective service monitor PCB • Defective inverter PCB • Defective fan PCB
	PJ	PCB mismatching	• Any PCB of specification different from that of the product is connected.	• PCB of different specification mounted
	P4	Defective radiation fin thermistor	• The radiation fin thermistor gets short circuited or open.	• Defective radiation fin thermistor

CHECK 15 Concept of inverter-related error codes



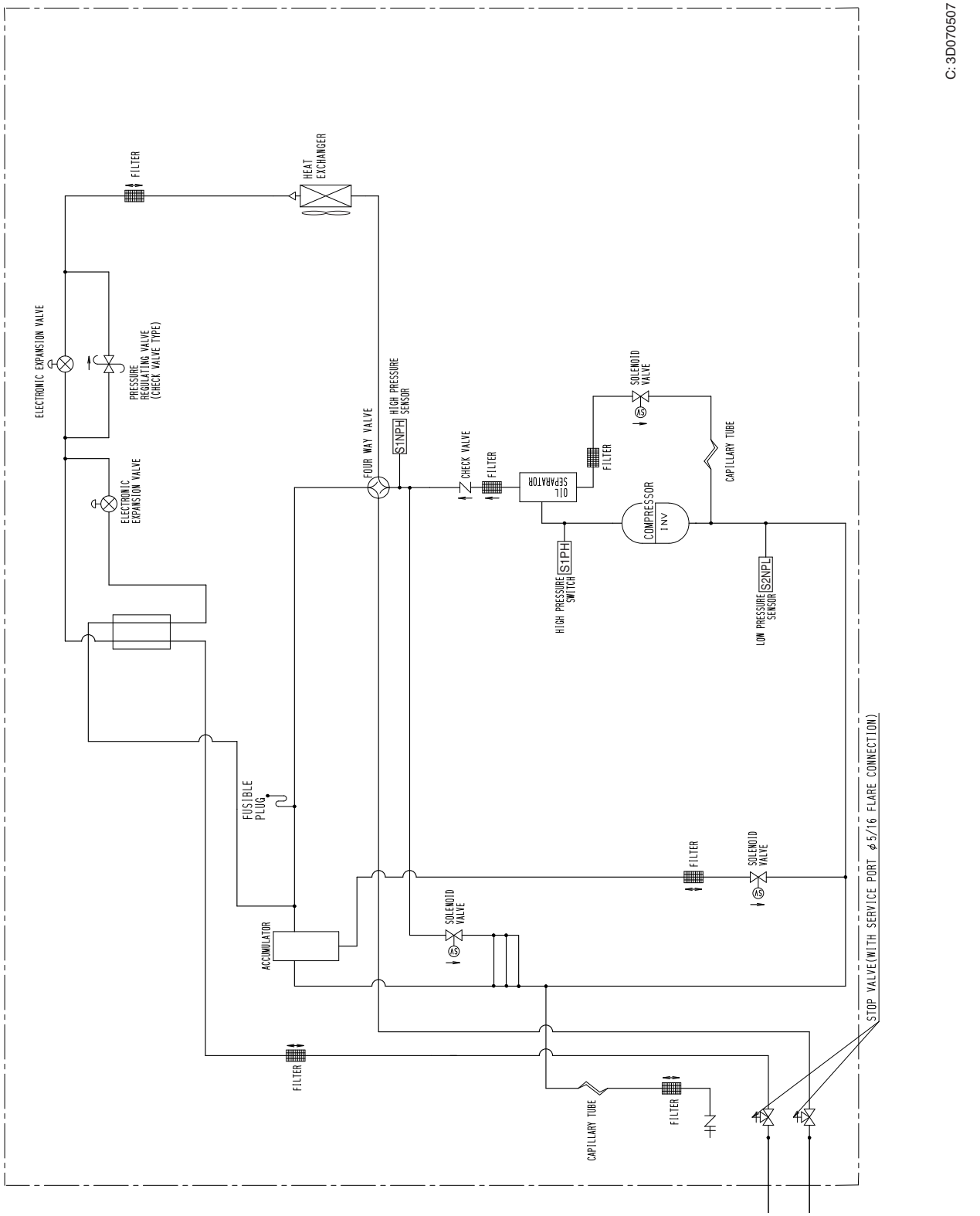


Part 6
Appendix

1. Piping Diagrams

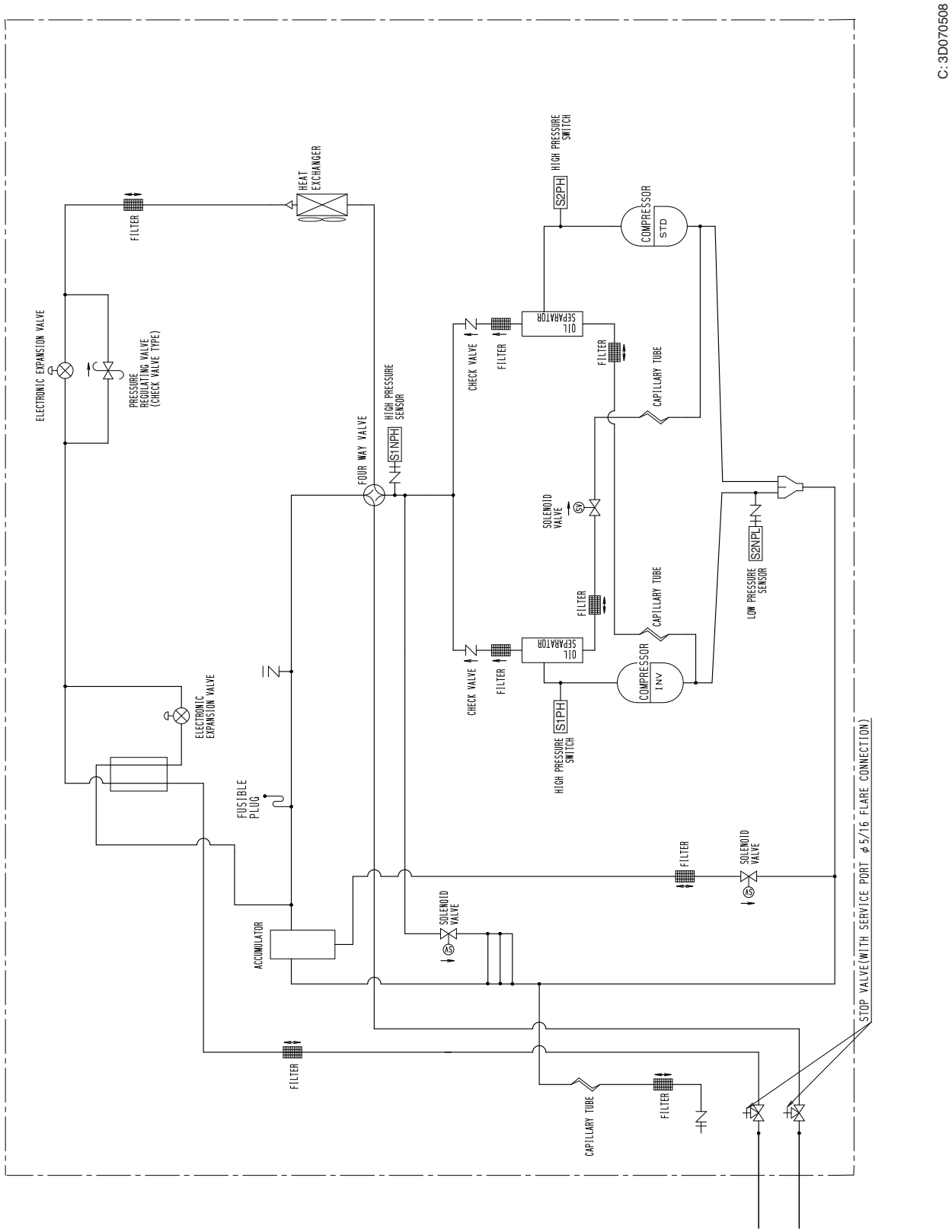
1.1 Outdoor Unit

Heat Pump
460V: RXYQ72PBYD
230V: RXYQ72PBTJ



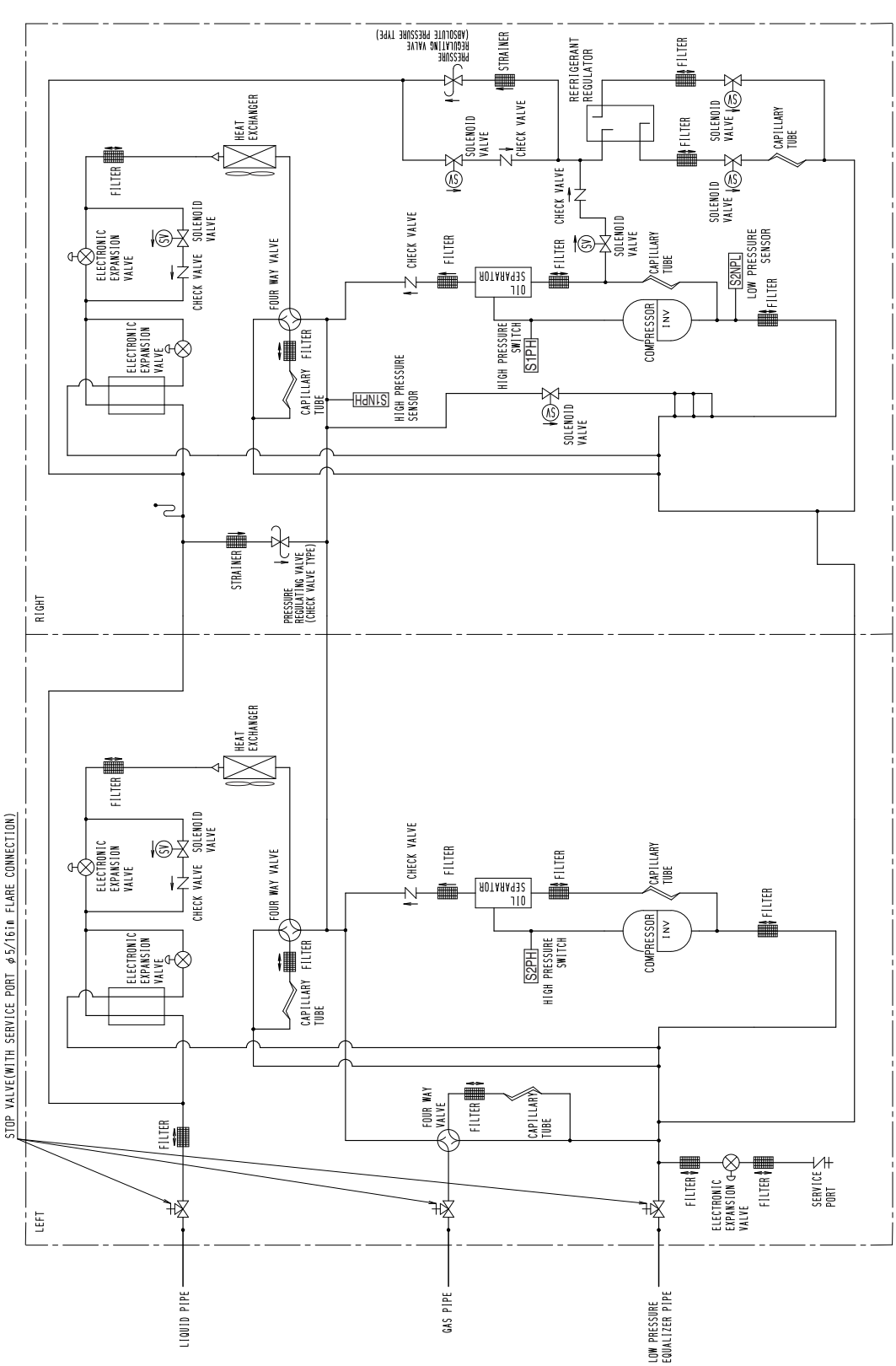
Heat Pump

460V: RXYQ96, 120PBYD
230V: RXYQ96, 120PBTJ



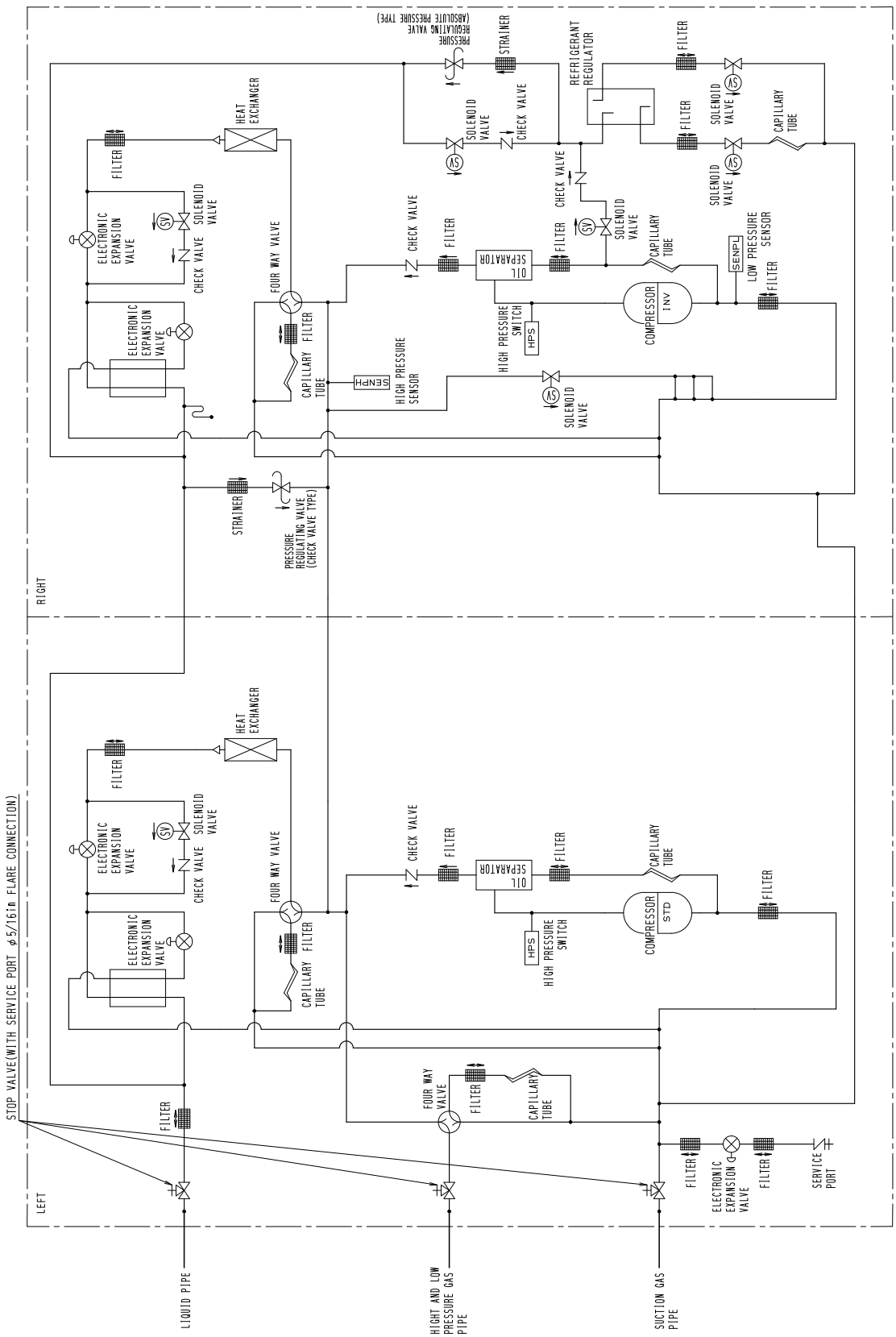
Heat Pump

230V: RXYQ144PBTJ



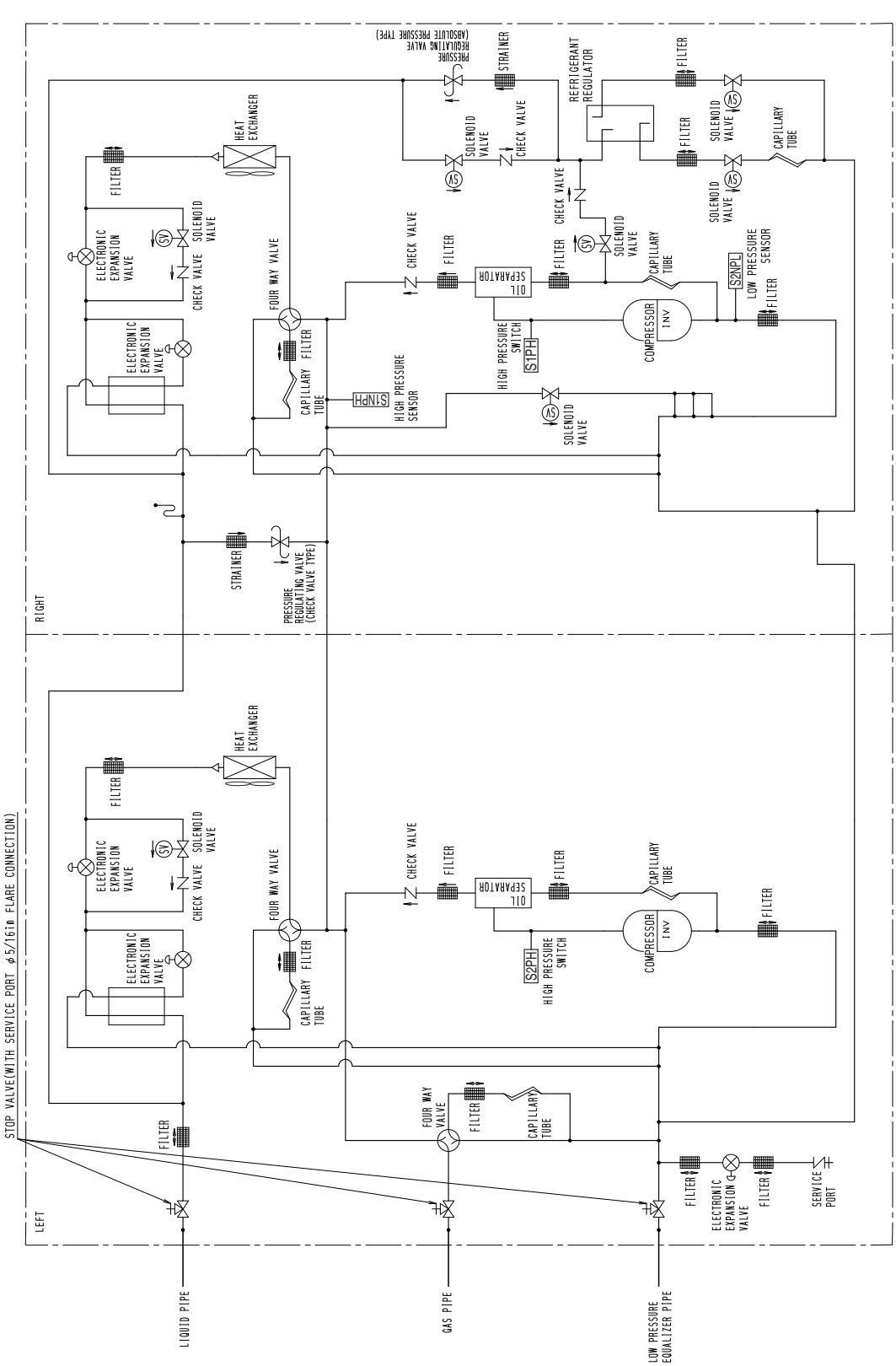
Heat Recovery

460V: REYQ72, 96, 120PBYD
230V: REYQ72, 96, 120PBTJ



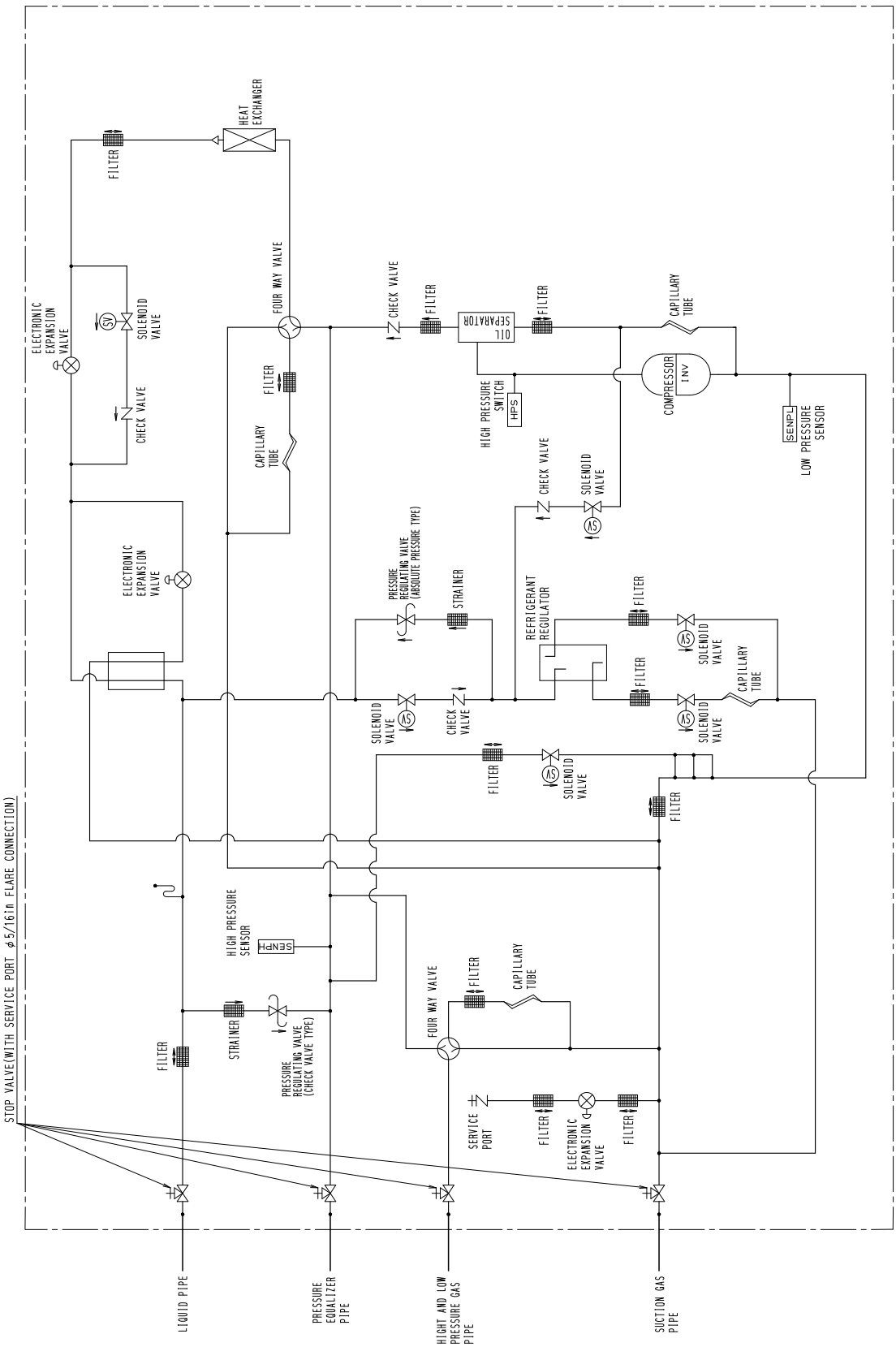
Heat Recovery

230V: REYQ144PBTJ



Heat Recovery

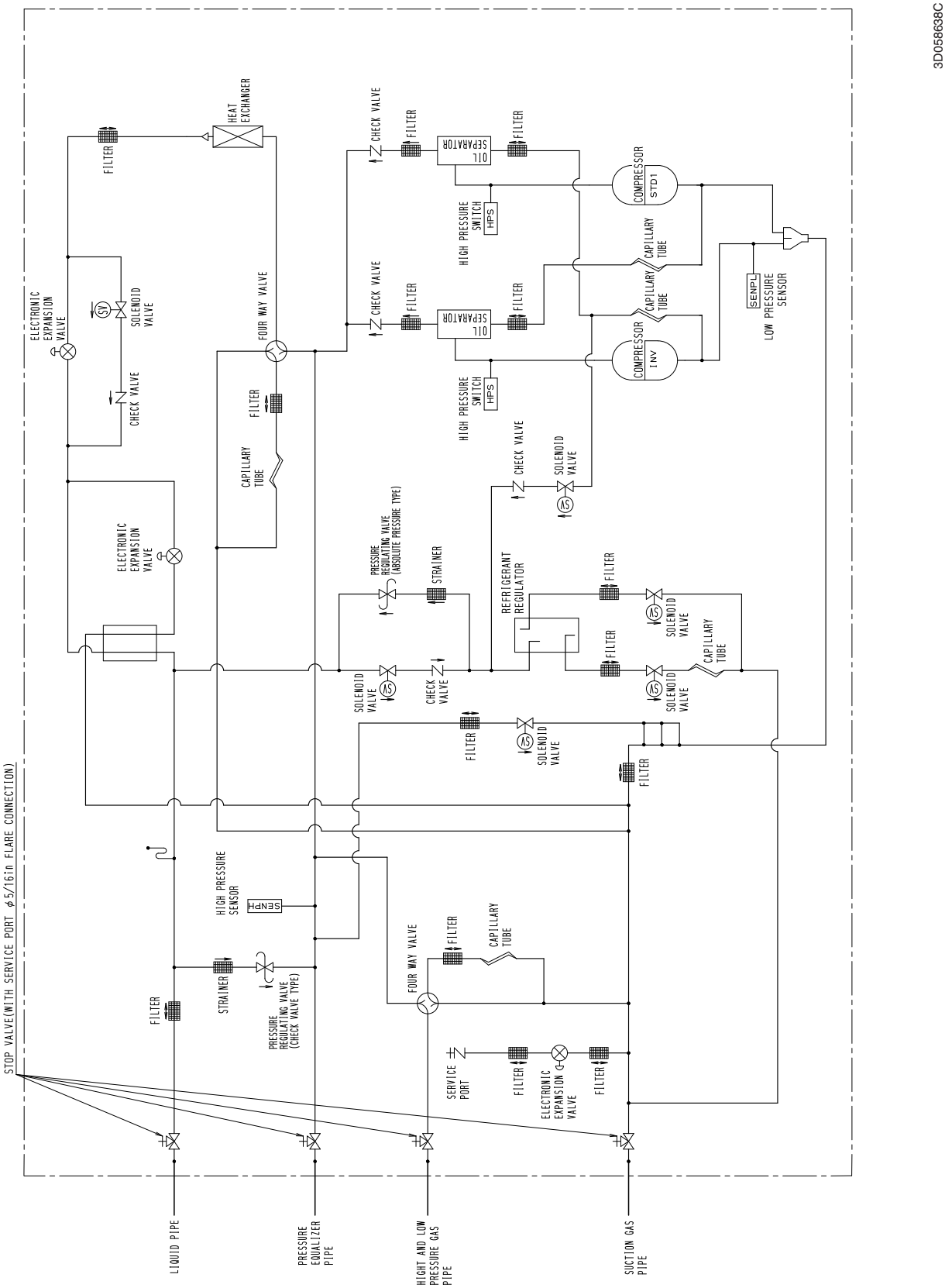
460V: REMQ72PBYD
230V: REMQ72PBTJ



Heat Recovery

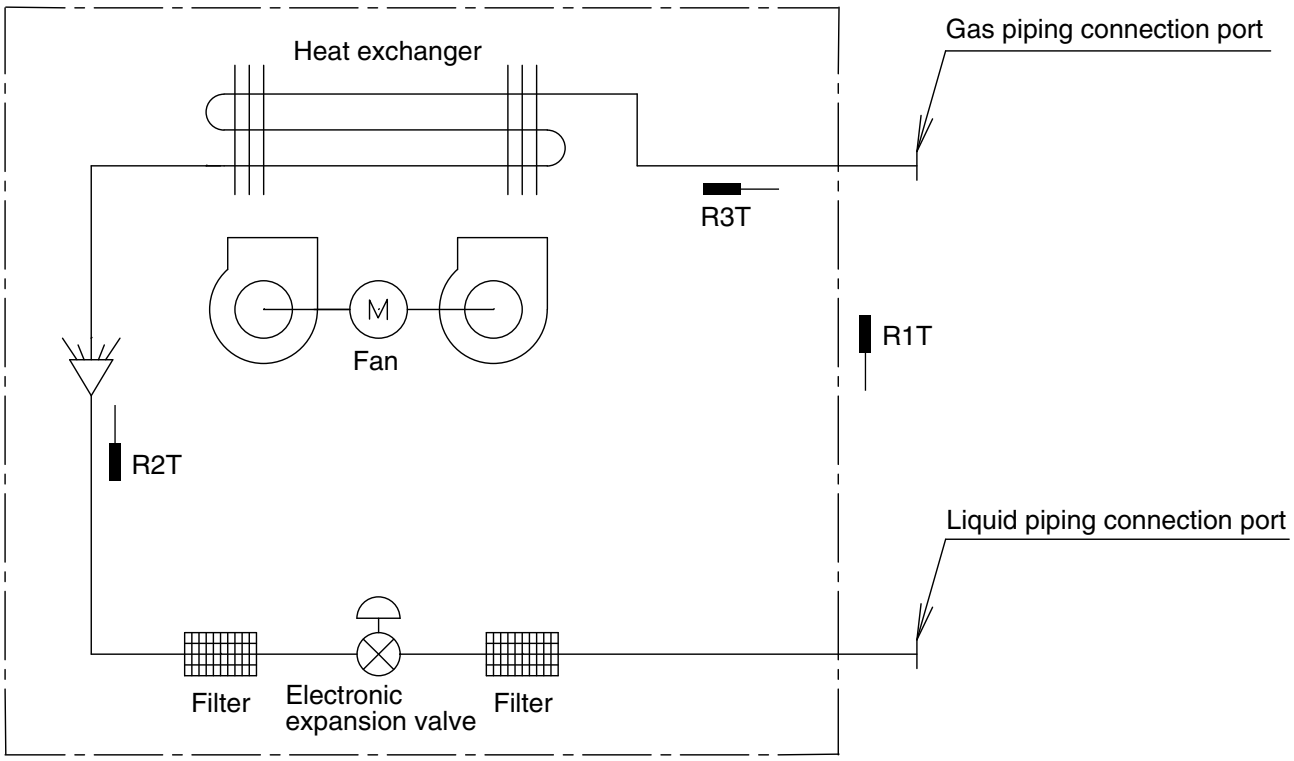
460V: REMQ96, 120PBYD

230V: REMQ96, 120PBTJ



1.2 Indoor Unit

FXFQ 12M / 18M / 24M / 30M / 36MVJU
FXZQ 07M7 / 09M7 / 12M7 / 18M7VJU
FXMQ 07P / 09P / 12P / 18P / 24P / 30P / 36P / 48PVJU
FXMQ 72M / 96MVJU
FXHQ 12M / 24M / 36MVJU
FXAQ 07M / 09M / 12M / 18M / 24PVJU
FXLQ 12M / 18M / 24MVJU9
FXNQ 12M / 18M / 24MVJU9

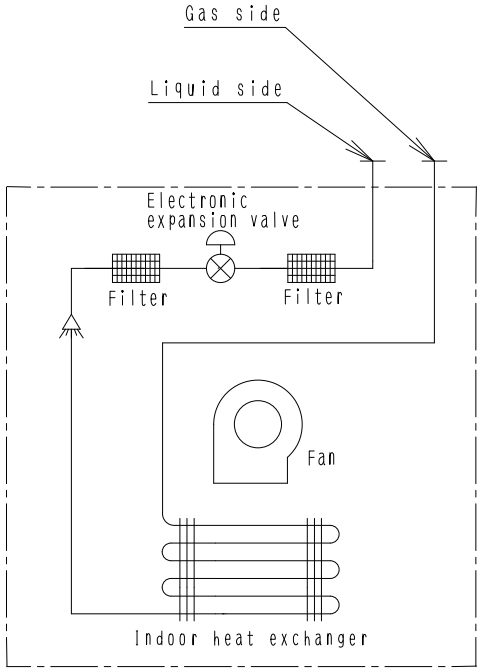


J:DU220-602K

R1T: Thermistor for suction air temperature
R2T: Thermistor for liquid line temperature
R3T: Thermistor for gas line temperature

Capacity	GAS	Liquid
07/09/12/18M(7) 07P/09P/12P/18P	ϕ1/2	ϕ1/4
24/30/36/48M 24/30/36/48P	ϕ5/8	ϕ3/8
72M	ϕ3/4	ϕ3/8
96M	ϕ7/8	ϕ3/8

FXDQ

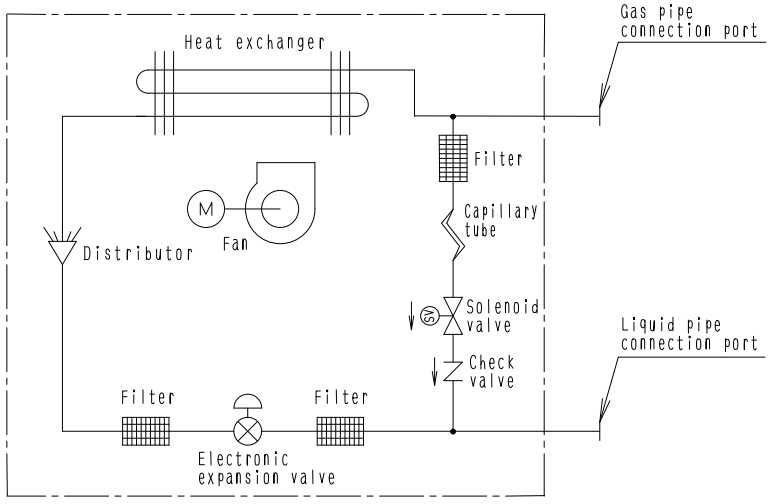


4D043864N

■ **Refrigerant pipe connection port diameters**

Model	Gas	Liquid
FXDQ07M / 09M / 12M / 18MVJU	ϕ1/2	ϕ1/4
FXDQ24MVJU	ϕ5/8	ϕ3/8

1.3 Air Treatment Equipment

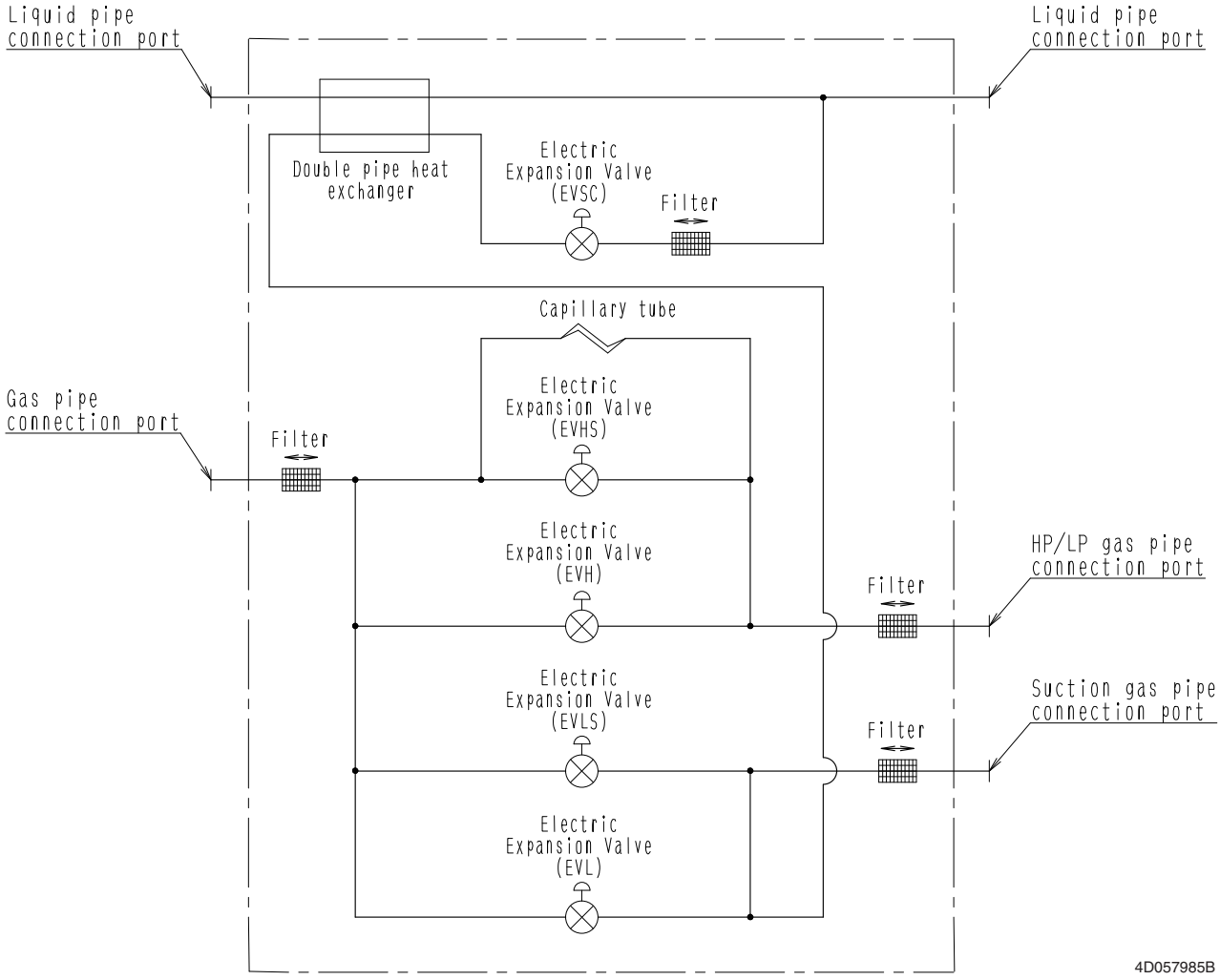


4D018650C

■ **Refrigerant pipe connection port diameters**

Model	Gas	Liquid
48MF	ϕ5/8	ϕ3/8
72MF	ϕ3/4	ϕ3/8
96MF	ϕ7/8	ϕ3/8

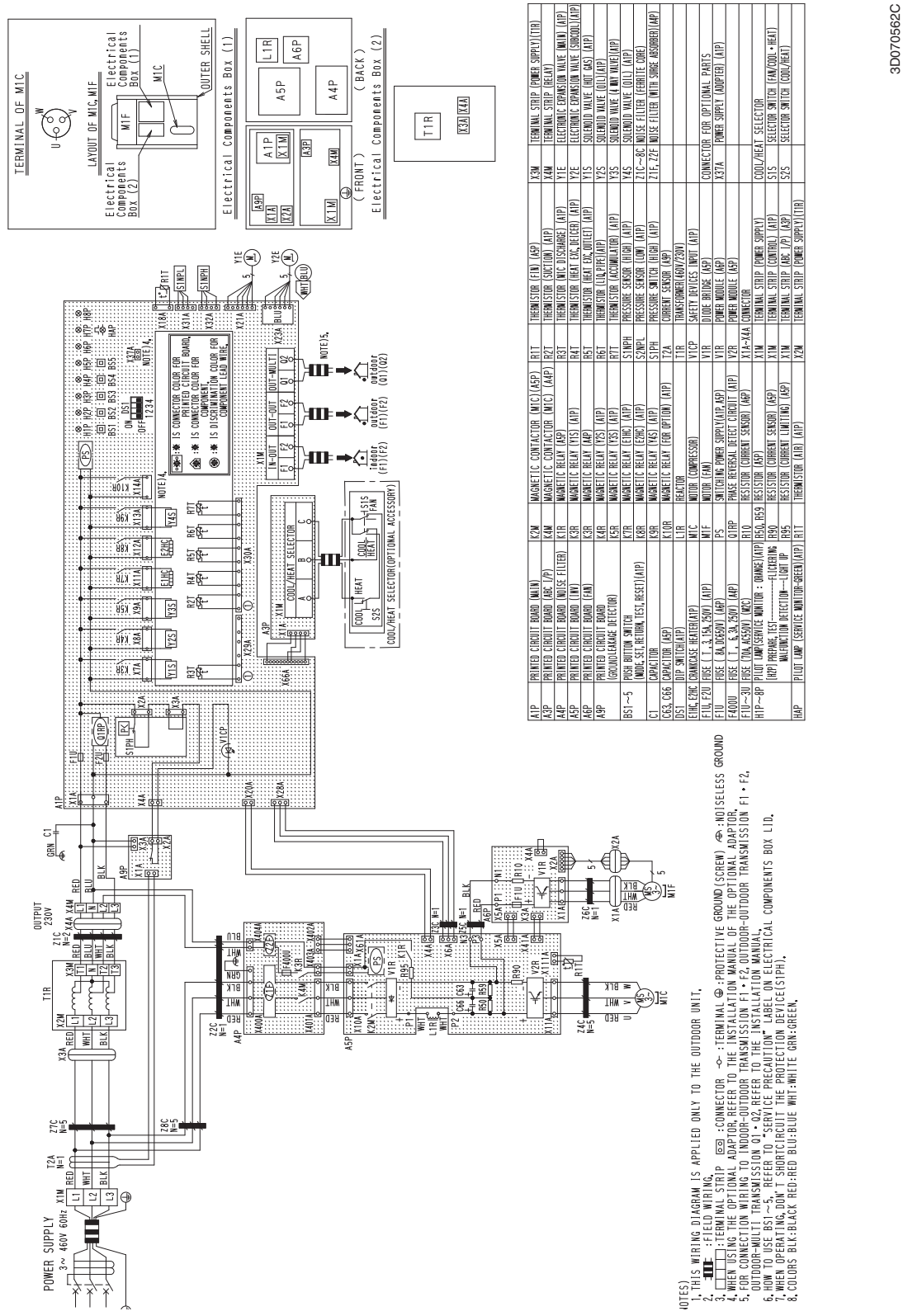
1.4 Branch Selector Unit



2. Wiring Diagrams for Reference

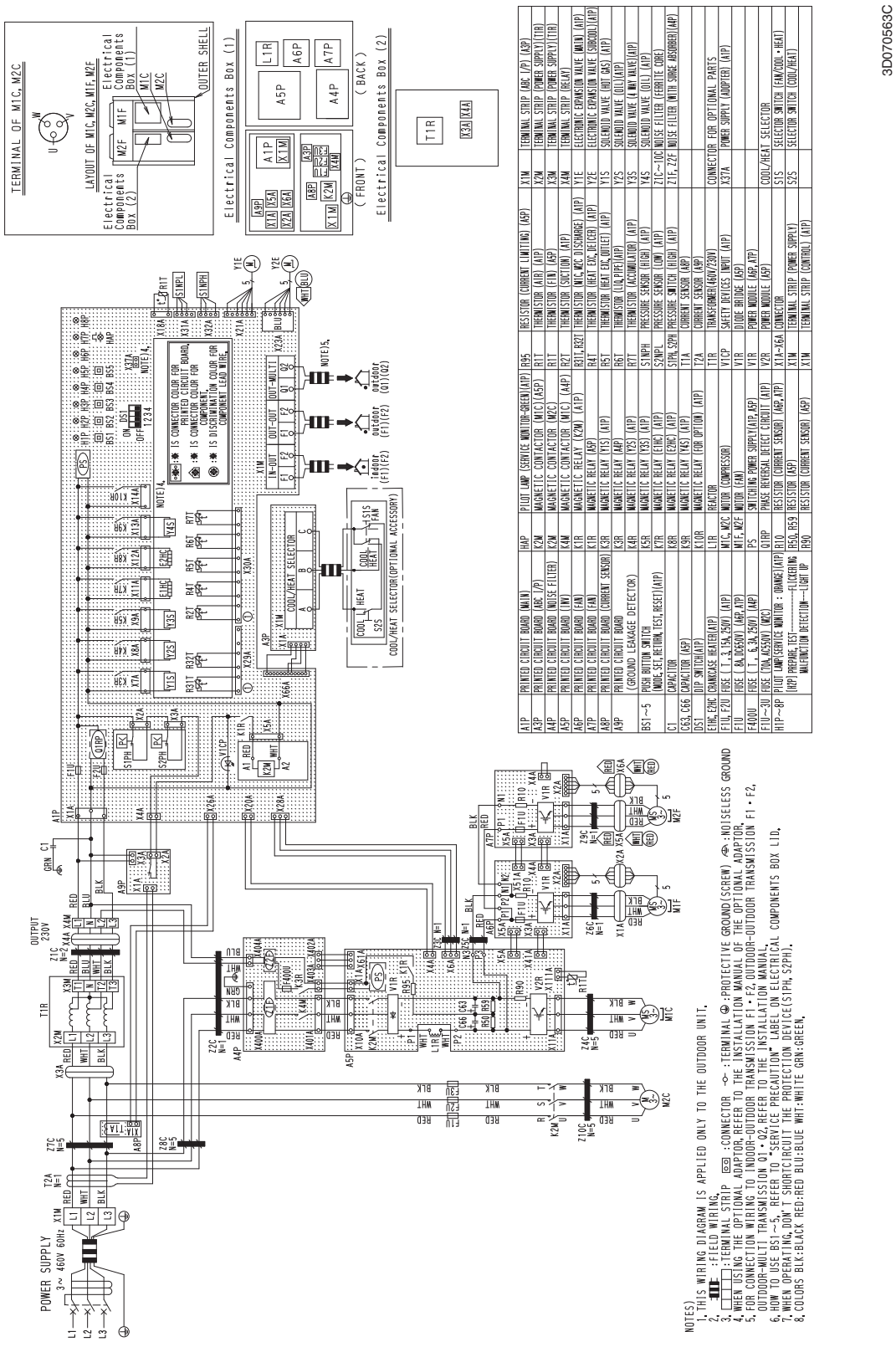
2.1 Outdoor Unit

Heat Pump 460V
RXYQ72PBYD



A1P	PRINTED CIRCUIT BOARD (MAIN)	K2M	MAGNETIC CONTACTOR (M1C)(A5P)	R1T	THERMISTOR (F1N) (A5P)	X3M	TERMINAL STRIP (POWER SUPPLY)(T1R)		
A3P	PRINTED CIRCUIT BOARD (ADC (7P))	K4M	MAGNETIC CONTACTOR (M1C) (A4P)	R2T	THERMISTOR (SUCTION) (A1P)	X4M	TERMINAL STRIP (RELAY)		
A4P	PRINTED CIRCUIT BOARD (NOISE FILTER)	K1R	MAGNETIC RELAY (A5P)	R3T	THERMISTOR (M1C DISCHARGE) (A1P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN) (A1P)		
A5P	PRINTED CIRCUIT BOARD (INV)	K2R	MAGNETIC RELAY (Y1S) (A1P)	R4T	THERMISTOR (HEAT EX.C.DEFROST) (A1P)	Y2E	ELECTRONIC EXPANSION VALVE (SUBCOOL)(A1P)		
A6P	PRINTED CIRCUIT BOARD (FAN)	K3R	MAGNETIC RELAY (A4P)	R5T	THERMISTOR (HEAT EX.C.OUTLET) (A1P)	Y1S	SOLENOID VALVE (HOT GAS) (A1P)		
A9P	PRINTED CIRCUIT BOARD (GROUND LEAKAGE DETECTOR)	K4R	MAGNETIC RELAY (Y2S) (A1P)	R6T	THERMISTOR (LIQUTPIPE)(A1P)	Y2S	SOLENOID VALVE (OIL)(A1P)		
		K5R	MAGNETIC RELAY (Y3S) (A1P)	R7T	THERMISTOR (ACCUMULATOR) (A1P)	Y3S	SOLENOID VALVE (4 WAY VALVE)(A1P)		
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)(A1P)	K7R	MAGNETIC RELAY (E1HC) (A1P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)	Y4S	SOLENOID VALVE (OIL) (A1P)		
		K8R	MAGNETIC RELAY (E2HC) (A1P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)	Z1C~8C	NOISE FILTER (FERRITE CORE)		
C1	CAPACITOR	K9R	MAGNETIC RELAY (Y4S) (A1P)	S1PH	PRESSURE SWITCH (HIGH) (A1P)	Z1F, Z2F	NOISE FILTER (WITH SURGE ABSORBER)(A4P)		
C65, C66	CAPACITOR (A5P)	K10R	MAGNETIC RELAY (FOR OPTION) (A1P)	T2A	CURRENT SENSOR (A5P)				
DS1	DIP SWITCH(A1P)	L1R	REACTOR	T1R	TRANSFORMER(460V/230V)				
E1HC, E2HC	CRANKCASE HEATER(A1P)	M1C	MOTOR (COMPRESSOR)	V1CP	SAFETY DEVICES (MOT (A1P)				
F1U, F2U	FUSE (T, 6.3A, 250V) (A1P)	M1F	MOTOR (FAN)	V1R	DIODE BRIDGE (A5P)		CONNECTOR FOR OPTIONAL PARTS		
F1U	FUSE (8A, DC650V) (A6P)	PS	SWITCHING POWER SUPPLY(A1P, A5P)	V1R	POWER MODULE (A5P)	X37A	POWER SUPPLY (ADAPTER) (A1P)		
F4U0U	FUSE (T, 6.3A, 250V) (A4P)	Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P)	V2R	POWER MODULE (A5P)				
F1U~3U	FUSE (10A, AC500V) (M1C)	R1D	RESISTOR (CURRENT SENSOR) (A6P)	X1A~X4A	CONNECTOR				
H1P~6P	PILOT LAMP (SERVICE MONITOR : ORANGE)(A1P)	R5U, R5V	RESISTOR (A5P)	X1M	TERMINAL STRIP (POWER SUPPLY)		COOL/HEAT SELECTOR		
	H2P) PREPARE TEST	R5Q	RESISTOR (CURRENT SENSOR) (A5P)	X1M	TERMINAL STRIP (CONTROL) (A1P)	S1S	SELECTOR SWITCH (FAN/COOL•HEAT)		
	H3P) MALFUNCTION DETECTION	R9S	RESISTOR (CURRENT LIMIT) (A6P)	X1M	TERMINAL STRIP (ADC (7P) (A3P)	S2S	SELECTOR SWITCH (COOL/HEAT)		
HAP	PILOT LAMP (SERVICE MONITOR-GREEN) (A1P)	R1T	THERMISTOR (AIR) (A1P)	X2M	TERMINAL STRIP (POWER SUPPLY)(T1R)				

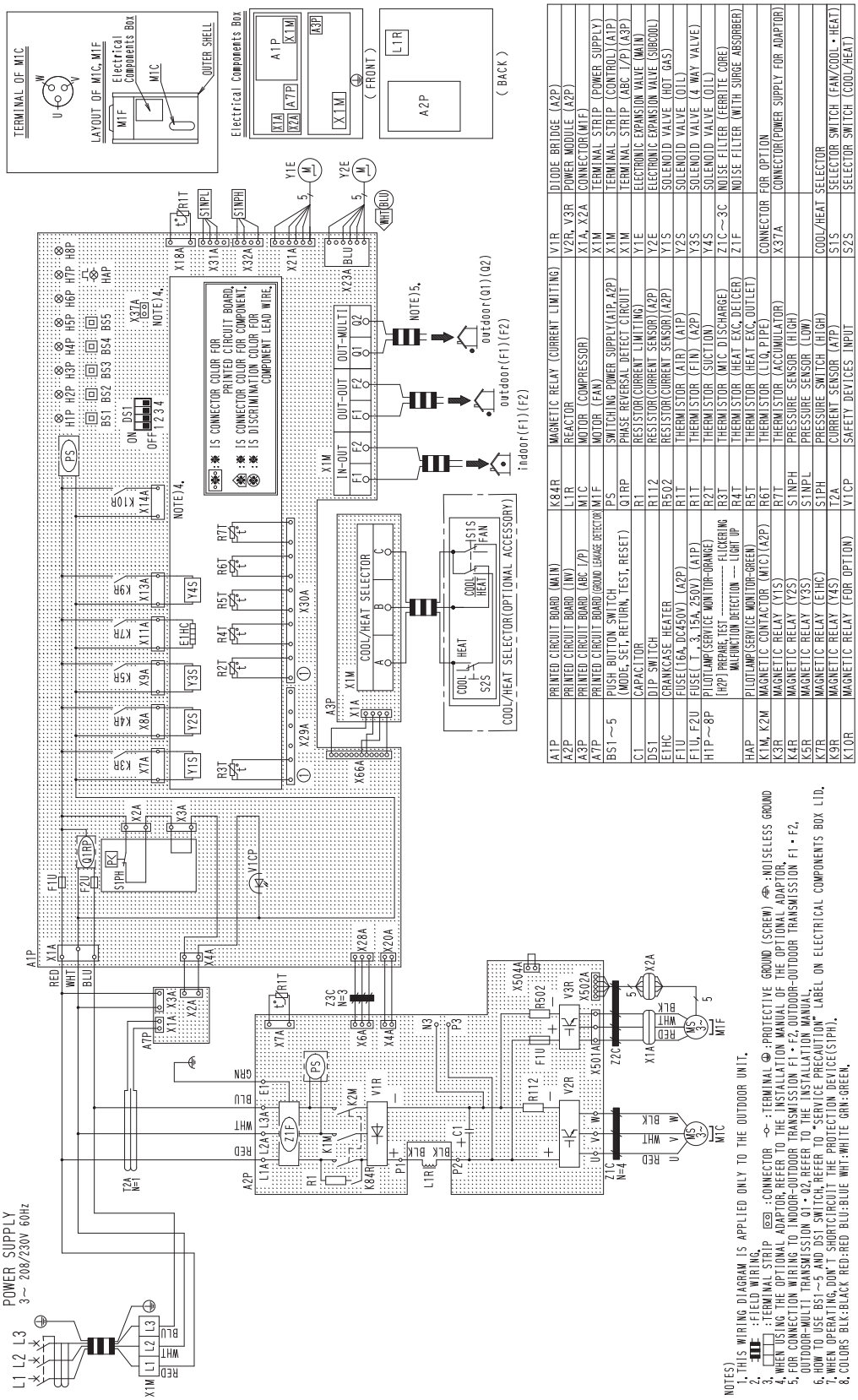
RXYQ96, 120PBYD



A1P	PRINTED CIRCUIT BOARD (MAIN)	HAP	PILOT LAMP (SERVICE MONITOR-GREEN)(A1P)	R95	RESISTOR (CURRENT LIMITING) (A5P)	X1M	TERMINAL STRIP (ABC /P) (A2P)
A3P	PRINTED CIRCUIT BOARD (ABC /P)	K2M	MAGNETIC CONTACTOR (M1C) (A5P)	R1T	THERMISTOR (AIR) (A1P)	X2M	TERMINAL STRIP (POWER SUPPLY)(T1R)
A4P	PRINTED CIRCUIT BOARD (NOISE FILTER)	K2M	MAGNETIC CONTACTOR (M2C)	R1T	THERMISTOR (FIN) (A5P)	X3M	TERMINAL STRIP (POWER SUPPLY)(T1R)
A5P	PRINTED CIRCUIT BOARD (INV)	K4M	MAGNETIC CONTACTOR (M1C) (A4P)	R2T	THERMISTOR (SUCTION) (A1P)	X4M	TERMINAL STRIP (RELAY)
A6P	PRINTED CIRCUIT BOARD (FAN)	K1R	MAGNETIC RELAY (K2M) (A1P)	R31T,R32T	THERMISTOR (M1C, M2C DISCHARGE) (A1P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN) (A1P)
A7P	PRINTED CIRCUIT BOARD (FAN)	K1R	MAGNETIC RELAY (A5P)	R4T	THERMISTOR (HEAT EXC.DEFROST) (A1P)	Y2E	ELECTRONIC EXPANSION VALVE (SUBCOOL)(A1P)
A8P	PRINTED CIRCUIT BOARD (CURRENT SENSOR)	K3R	MAGNETIC RELAY (Y1S) (A1P)	R5T	THERMISTOR (HEAT EXC.OUTLET) (A1P)	Y1S	SOLENOID VALVE (HOT GAS) (A1P)
A9P	PRINTED CIRCUIT BOARD (GROUND LEAKAGE DETECTOR)	K3R	MAGNETIC RELAY (A4P)	R6T	THERMISTOR (LIQ.PIPE)(A1P)	Y2S	SOLENOID VALVE (OIL)(A1P)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)(A1P)	K4R	MAGNETIC RELAY (Y2S) (A1P)	R7T	THERMISTOR (ACCUMULATOR) (A1P)	Y3S	SOLENOID VALVE (4 WAY VALVE)(A1P)
		K5R	MAGNETIC RELAY (Y3S) (A1P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)	Y4S	SOLENOID VALVE (OIL) (A1P)
		K7R	MAGNETIC RELAY (E1HC) (A1P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)	Z1C~10C	NOISE FILTER (FERRITE CORE)
C1	CAPACITOR	K8R	MAGNETIC RELAY (E2HC) (A1P)	S1PH, S2PH	PRESSURE SWITCH (HIGH) (A1P)	Z1F, Z2F	NOISE FILTER (WITH SURGE ABSORBER)(A4P)
C63, C66	CAPACITOR (A5P)	K9R	MAGNETIC RELAY (Y4S) (A1P)	T1A	CURRENT SENSOR (A5P)		
DS1	DIP SWITCH(A1P)	K10R	MAGNETIC RELAY (FOR OPTION) (A1P)	T2A	CURRENT SENSOR (A8P)		
E1HC, E2HC	CRANKCASE HEATER(A1P)	L1R	REACTOR	T1R	TRANSFORMER(460V/230V)		
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P)	M1C, M2C	MOTOR (COMPRESSOR)	V1CP	SAFETY DEVICES INPUT (A1P)	CONNECTOR FOR OPTIONAL PARTS	
F1U	FUSE (8A, DC650V) (A6P,A7P)	M1F, M2F	MOTOR (FAN)	V1R	DIODE BRIDGE (A5P)	X37A	POWER SUPPLY ADAPTER (A1P)
F4000	FUSE (T, 6.3A, 250V) (A4P)	PS	SWITCHING POWER SUPPLY(A1P, A5P)	V1R	POWER MODULE (A5P, A7P)		
F1U~3U	FUSE (20A, AC500V) (M1C)	Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P)	V2R	POWER MODULE (A5P)	COOL/HEAT SELECTOR	
H1P~4P	PILOT LAMP(SERVICE MONITOR : ORANGE)(A1P)	R10	RESISTOR (CURRENT SENSOR) (A6P, A7P)	X1A~X6A	CONNECTOR	S1S	SELECTOR SWITCH (FAN/COOL+HEAT)
	(H2P) PREPARE TEST-----FLICKERING	R50, R53	RESISTOR (A5P)	X1M	TERMINAL STRIP (POWER SUPPLY)	S2S	SELECTOR SWITCH (COOL/HEAT)
	MALFUNCTION DETECTION---LIGHT UP	R90	RESISTOR (CURRENT SENSOR) (A5P)	X1M	TERMINAL STRIP (CONTROL) (A1P)		

3D070563C

Heat Pump 230V
RXYQ72PBTJ



A1P	PRINTED CIRCUIT BOARD (MAIN)	K84R	MAGNETIC RELAY (CURRENT LIMITING)	V1R	DIODE BRIDGE (A2P)
A2P	PRINTED CIRCUIT BOARD (INV)	L1R	REACTOR	V2R, V3R	POWER MODULE (A2P)
A3P	PRINTED CIRCUIT BOARD (ABC I/P)	M1C	MOTOR (COMPRESSOR)	X1A, X2A	CONNECTOR(M1F)
A7P	PRINTED CIRCUIT BOARD(GROUND LEAKAGE DETECTOR)	M1F	MOTOR (FAN)	X1M	TERMINAL STRIP (POWER SUPPLY)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)	PS	SWITCHING POWER SUPPLY(A1P, A2P)	X1M	TERMINAL STRIP (CONTROL)(A1P)
		Q1RP	PHASE REVERSAL DETECT CIRCUIT	X1M	TERMINAL STRIP (ABC I/P)(A3P)
C1	CAPACITOR	R1	RESISTOR(CURRENT LIMITING)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN)
DS1	DIP SWITCH	R112	RESISTOR(CURRENT SENSOR)(A2P)	Y2E	ELECTRONIC EXPANSION VALVE (SUBCOOL)
E1HC	CRANKCASE HEATER	R502	RESISTOR(CURRENT SENSOR)(A2P)	Y1S	SOLENOID VALVE (HOT GAS)
F1U	FUSE(16A, DC450V) (A2P)	R1T	THERMISTOR (AIR) (A1P)	Y2S	SOLENOID VALVE (OIL)
F1U, F2U	FUSE(T 3.15A, 250V) (A1P)	R1T	THERMISTOR (FIN) (A2P)	Y3S	SOLENOID VALVE (4 WAY VALVE)
H1P~8P	PILOTLAMP(SERVICE MONITOR-ORANGE) (H2P) PREPARE TEST ---------- FLICKERING MALFUNCTION DETECTION ---- LIGHT UP	R2T	THERMISTOR (SUCTION)	Y4S	SOLENOID VALVE (OIL)
		R3T	THERMISTOR (M1C DISCHARGE)	Z1C~3C	NOISE FILTER (FERRITE CORE)
		R4T	THERMISTOR (HEAT EXC. DETCER)	Z1F	NOISE FILTER (WITH SURGE ABSORBER)
HAP	PILOTLAMP(SERVICE MONITOR-GREEN)	R5T	THERMISTOR (HEAT EXC. OUTLET)		
K1M, K2M	MAGNETIC CONTACTOR (M1C)(A2P)	R6T	THERMISTOR (LIQ. PIPE)	CONNECTOR	FOR OPTION
K3R	MAGNETIC RELAY (Y1S)	R7T	THERMISTOR (ACCUMULATOR)	X37A	CONNECTOR(POWER SUPPLY FOR ADAPTOR)
K4R	MAGNETIC RELAY (Y2S)	S1NPH	PRESSURE SENSOR (HIGH)		
K5R	MAGNETIC RELAY (Y3S)	S1NPL	PRESSURE SENSOR (LOW)		
K7R	MAGNETIC RELAY (E1HC)	S1PH	PRESSURE SWITCH (HIGH)	COOL/HEAT	SELECTOR
K9R	MAGNETIC RELAY (Y4S)	T2A	CURRENT SENSOR (A7P)	S1S	SELECTOR SWITCH (FAN/COOL • HEAT)
K10R	MAGNETIC RELAY (FOR OPTION)	V1CP	SAFETY DEVICES INPUT	S2S	SELECTOR SWITCH (COOL/HEAT)

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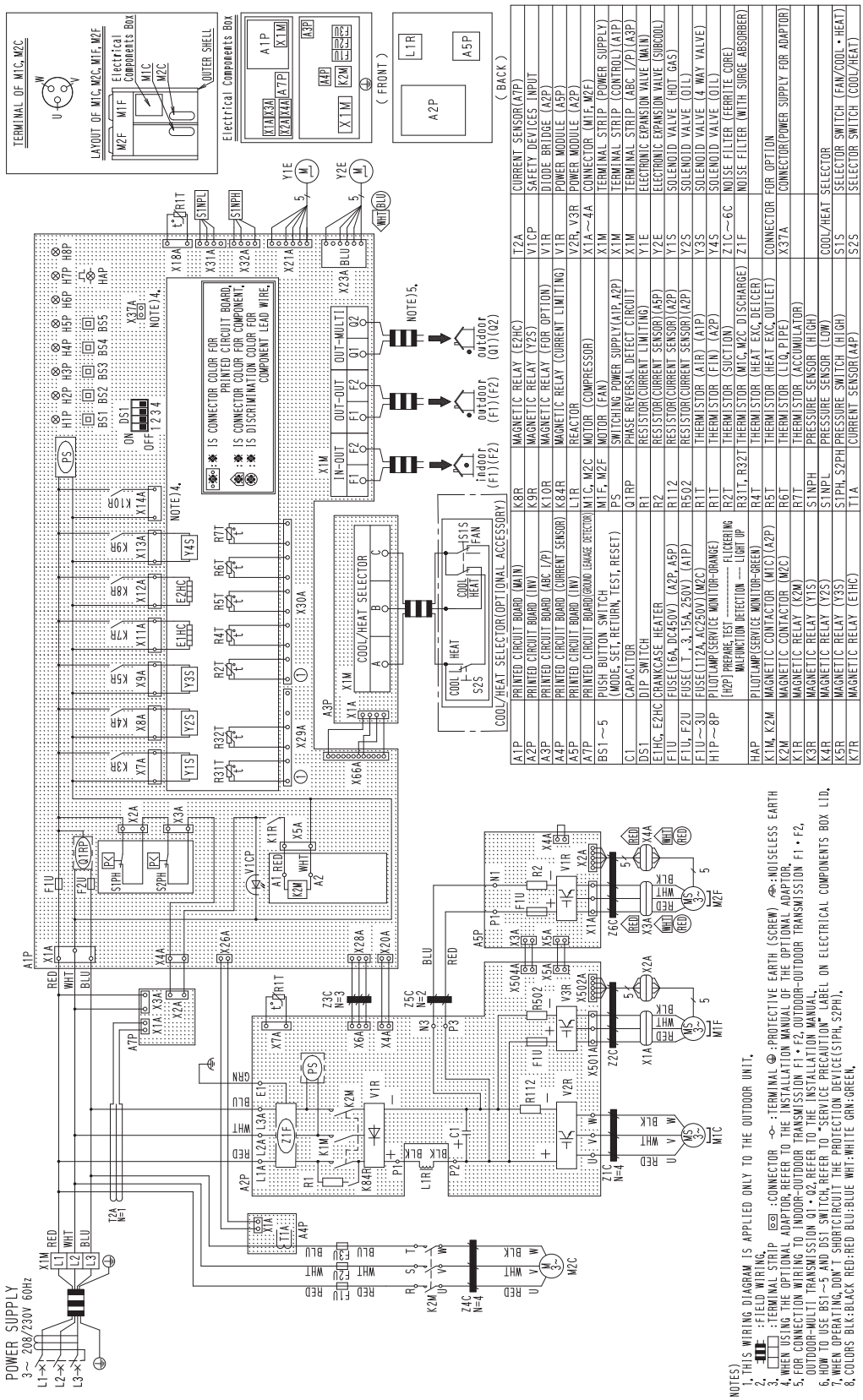

A1P	PRINTED CIRCUIT BOARD (MAIN)	K8R	MAGNETIC RELAY (E2HC)
A2P	PRINTED CIRCUIT BOARD (INV)	K9R	MAGNETIC RELAY (Y2S)
A3P	PRINTED CIRCUIT BOARD (ABC I/P)	K10R	MAGNETIC RELAY (FOR OPTION)
A4P	PRINTED CIRCUIT BOARD (CURRENT SENSOR)	K84R	MAGNETIC RELAY (CURRENT LIMITING)
A5P	PRINTED CIRCUIT BOARD (INV)	L1R	REACTOR
A7P	PRINTED CIRCUIT BOARD(GROUD LEAKAGE DETECTOR)	M1C, M2C	MOTOR (COMPRESSOR)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)	M1F, M2F	MOTOR (FAN)
C1	CAPACITOR	PS	SWITCHING POWER SUPPLY(A1P, A2P)
DS1	DIP SWITCH	Q1RP	PHASE REVERSAL DETECT CIRCUIT
E1HC, E2HC	CRANKCASE HEATER	R1	RESISTOR(CURRENT LIMITING)
F1U	FUSE(16A, DC450V) (A2P, A5P)	R2	RESISTOR(CURRENT SENSOR)(A5P)
F1U, F2U	FUSE(T 3.15A 250V) (A1P)	R112	RESISTOR(CURRENT SENSOR)(A2P)
F1U~3U	FUSE(L12A, AC250V)(M2C)	R502	RESISTOR(CURRENT SENSOR)(A2P)
H1P~8P	PILOTLAMP(SERVICE MONITOR-ORANGE) [H2P] PREPARE TEST ---------- FLICKERING MALFUNCTION DETECTION ---- LIGHT UP	R1T	THERMISTOR (AIR) (A1P)
		R2T	THERMISTOR (SUCTION)
		R31T, R32T	THERMISTOR (M1C, M2C DISCHARGE)
HAP	PILOTLAMP(SERVICE MONITOR-GREEN)	R4T	THERMISTOR (HEAT EXC, DEICER)
K1M, K2M	MAGNETIC CONTACTOR (M1C)(A2P)	R5T	THERMISTOR (HEAT EXC, OUTLET)
K2M	MAGNETIC CONTACTOR (M2C)	R6T	THERMISTOR (LIQ PIPE)
K1R	MAGNETIC RELAY (K2M)	R7T	THERMISTOR (ACCUMULATOR)
K3R	MAGNETIC RELAY (Y1S)	S1NPH	PRESSURE SENSOR (HIGH)
K4R	MAGNETIC RELAY (Y2S)	S1NPL	PRESSURE SENSOR (LOW)
K5R	MAGNETIC RELAY (Y3S)	S1PH, S2PH	PRESSURE SWITCH (HIGH)
K7R	MAGNETIC RELAY (E1HC)	T1A	CURRENT SENSOR(A4P)
T2A	CURRENT SENSOR(A7P)
V1CP	SAFETY DEVICES INPUT
V1R	DIODE BRIDGE (A2P)
V1R	POWER MODULE (A5P)
V2R, V3R	POWER MODULE (A2P)
X1A~4A	CONNECTOR (M1F, M2F)
X1M	TERMINAL STRIP (POWER SUPPLY)
X1M	TERMINAL STRIP (CONTROL)(A1P)
Y1E	TERMINAL STRIP (ABC I/P)(A3P)
Y2E	ELECTRONIC EXPANSION VALVE (MAIN)
Y1S	ELECTRONIC EXPANSION VALVE (SUBCOOL)
Y2S	SOLENOID VALVE (HOT GAS)
Y3S	SOLENOID VALVE (OIL)
Y4S	SOLENOID VALVE (4 WAY VALVE)
Z1C~6C	NOISE FILTER (FERRITE CORE)
Z1F	NOISE FILTER (WITH SURGE ABSORBER)
CONNECTOR	FOR OPTION
X37A	CONNECTOR(POWER SUPPLY FOR ADAPTOR)
COOL/HEAT	SELECTOR
S1S	SELECTOR SWITCH (FAN/COOL • HEAT)
S2S	SELECTOR SWITCH (COOL/HEAT)

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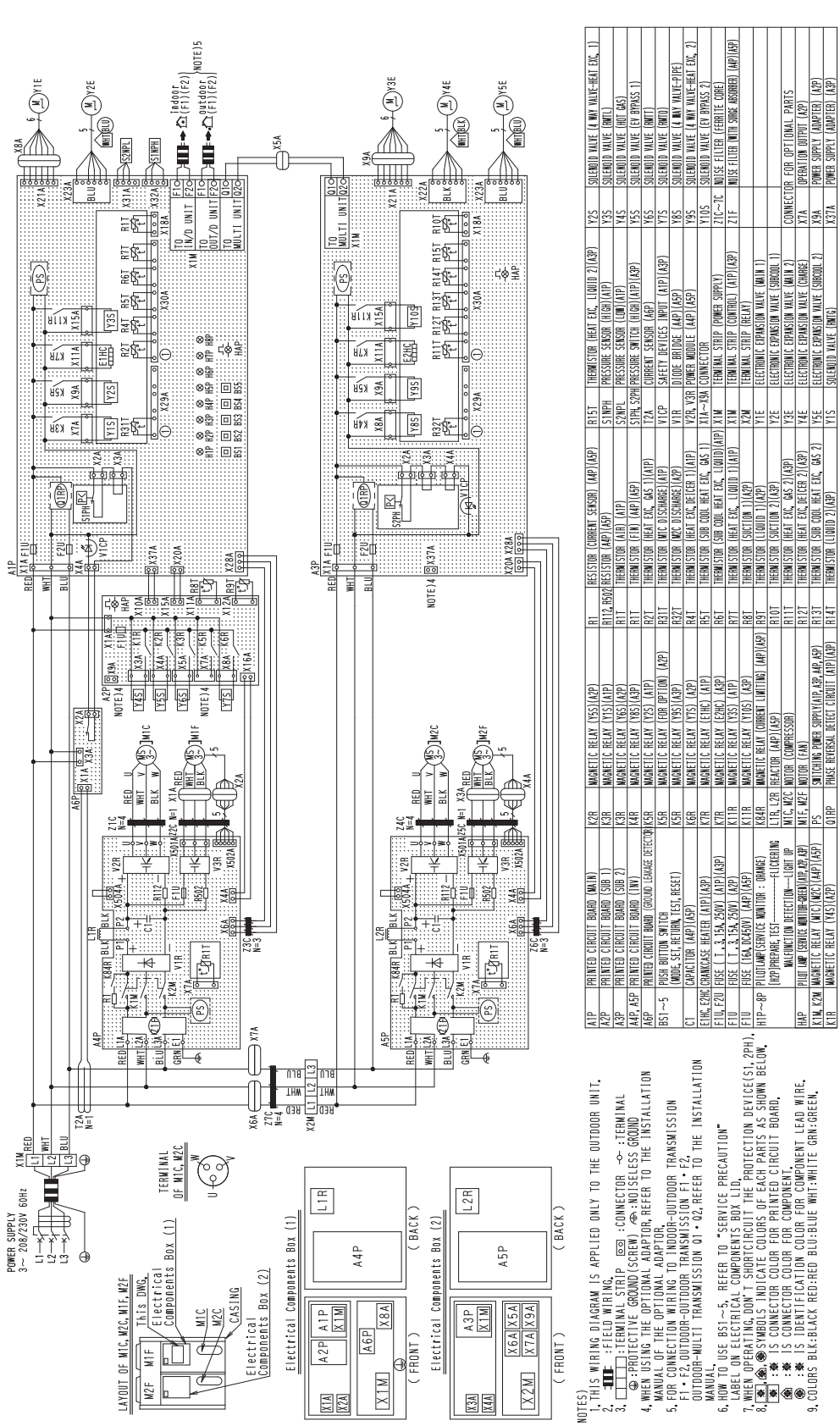
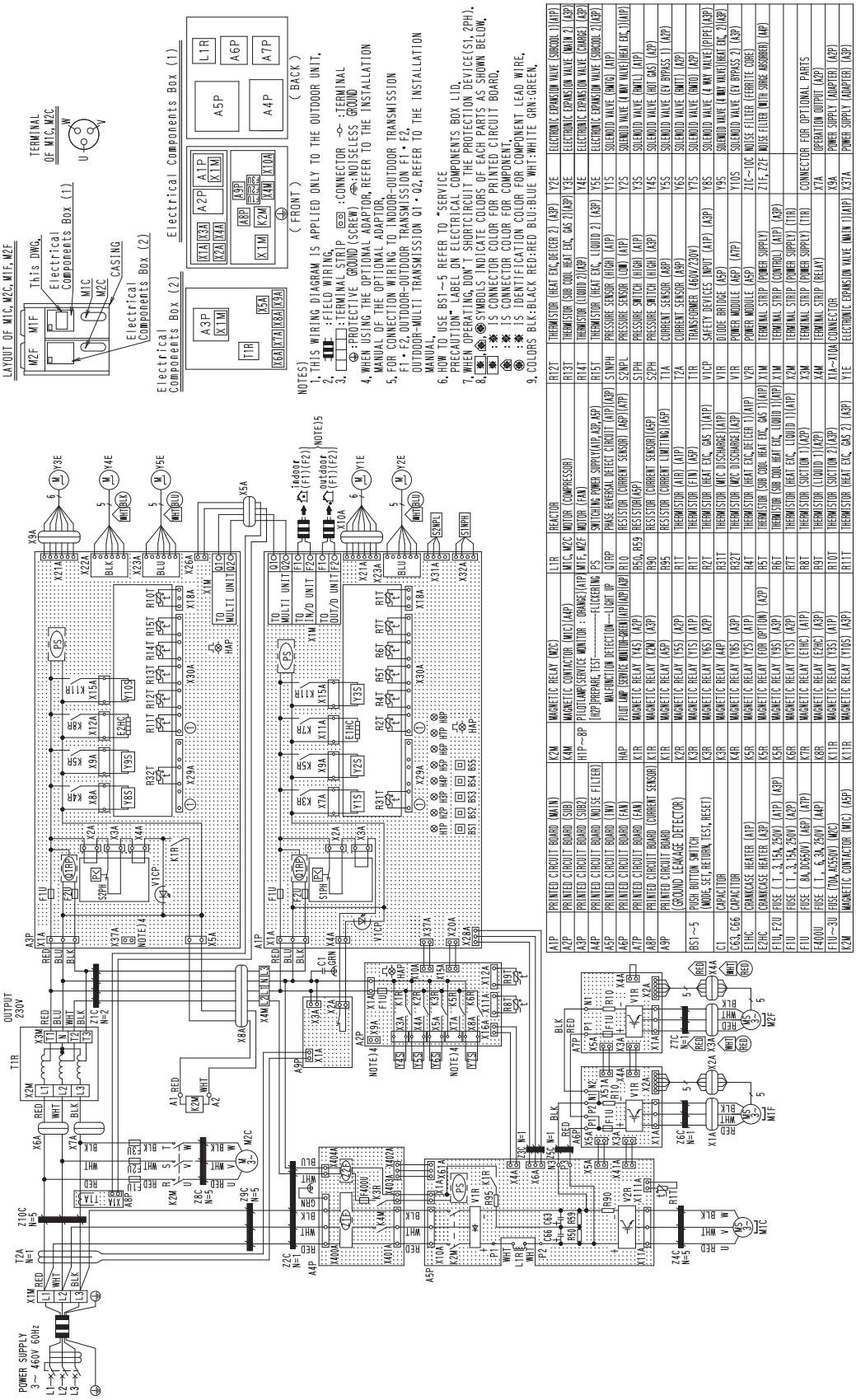


A1P	PRINTED CIRCUIT BOARD (MAIN)	K2R	MAGNETIC RELAY (Y6S)(A2P)	R1	RESISTOR (CURRENT SENSOR) (A4P)(A5P)	R15T	THERMISTOR (HEAT EXC. LIQUID 2)(A3P)	Y2S	SOLENOID VALVE (4 WAY VALVE-HEAT EXC. 1)
A2P	PRINTED CIRCUIT BOARD (SUB 1)	K3R	MAGNETIC RELAY (Y1S)(A1P)	R11A, R502	RESISTOR (A4P)(A5P)	S1NPH	PRESSURE SENSOR (HIGH)(A1P)	Y3S	SOLENOID VALVE (HWL)
A3P	PRINTED CIRCUIT BOARD (SUB 2)	K3R	MAGNETIC RELAY (Y6S)(A2P)	R1T	THERMISTOR (AIR) (A1P)	S2NPL	PRESSURE SENSOR (LOW)(A1P)	Y4S	SOLENOID VALVE (HOT GAS)
A4P, A5P	PRINTED CIRCUIT BOARD (INV)	K4R	MAGNETIC RELAY (Y8S)(A3P)	R11T	THERMISTOR (FIN) (A4P)(A5P)	S1PH, S2PH	PRESSURE SWITCH (HIGH)(A1P)(A3P)	Y5S	SOLENOID VALVE (BY BYPASS 1)
A6P	PRINTED CIRCUIT BOARD (GROUND LEAKAGE DETECTOR)	K5R	MAGNETIC RELAY (Y2S) (A1P)	R2T	THERMISTOR (HEAT EXC. GAS 1)(A1P)	T2A	CURRENT SENSOR (A6P)	Y6S	SOLENOID VALVE (HWT)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R31T	THERMISTOR (M1C DISCHARGE)(A2P)	V1CP	SAFETY DEVICES INPUT (A1P)(A3P)	Y7S	SOLENOID VALVE (HWTO)
		K5R	MAGNETIC RELAY (Y9S)(A3P)	R32T	THERMISTOR (M2C DISCHARGE)(A2P)	V1R	DIODE BRIDGE (A4P)(A5P)	Y8S	SOLENOID VALVE (4 WAY VALVE-PIPE)
C1	CAPACITOR (A4P)(A5P)	K6R	MAGNETIC RELAY (Y7S) (A2P)	R41	THERMISTOR (HEAT EXC. DEICER 1)(A1P)	V2R, V3R	POWER MODULE (A4P)(A5P)	Y9S	SOLENOID VALVE (4 WAY VALVE-HEAT EXC. 2)
E1HC, E2HC	CRANKCASE HEATER (A1P)(A3P)	K7R	MAGNETIC RELAY (E1HC) (A1P)	R5T	THERMISTOR (SUB COOL HEAT EXC. GAS 1)	X1A~X9A	CONNECTOR	Y10S	SOLENOID VALVE (BY BYPASS 2)
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P)(A3P)	K7R	MAGNETIC RELAY (E2HC) (A3P)	R6T	THERMISTOR (SUB COOL HEAT EXC. LIQUID)(A1P)	X1M	TERMINAL STRIP (POWER SUPPLY)	Z1C~7C	NOISE FILTER (FERRITE CORE)
F1U	FUSE (T, 3.15A, 250V) (A2P)	K11R	MAGNETIC RELAY (Y3S) (A1P)	R7T	THERMISTOR (HEAT EXC. LIQUID 1)(A1P)	X1W	TERMINAL STRIP (CONTROL) (A1P)(A3P)	Z1F	NOISE FILTER (WITH SURGE ABSORBER) (A4P)(A5P)
F1U	FUSE (16A, AC450V) (A4P)(A5P)	K11R	MAGNETIC RELAY (Y10S) (A3P)	R8T	THERMISTOR (SUCTION 1)(A2P)	X2M	TERMINAL STRIP (RELAY)		
H1P~8P	PILOT LAMP (SERVICE MONITOR : ORANGE) (A2P) PREPARE TEST ---------- FLICKERING MALFUNCTION DETECTION ---------- LIGHT UP	K84R	MAGNETIC RELAY (CURRENT LIMITING) (A4P)(A5P)	R9T	THERMISTOR (LIQUID 1)(A2P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN 1)		
		L1R, L2R	REACTOR (A4P)(A5P)	R10T	THERMISTOR (SUCTION 2)(A3P)	Y2E	ELECTRONIC EXPANSION VALVE (SUBCOOL 1)		
		M1C, M2C	MOTOR (COMPRESSOR)	R11T	THERMISTOR (HEAT EXC. GAS 2)(A3P)	Y3E	ELECTRONIC EXPANSION VALVE (MAIN 2)		CONNECTOR FOR OPTIONAL PARTS
H4P	PILOT LAMP (SERVICE MONITOR-GREEN)(A1P, A2P, A3P)	M1F, M2F	MOTOR (FAN)	R12T	THERMISTOR (HEAT EXC. DEICER 2)(A2P)	Y4E	ELECTRONIC EXPANSION VALVE (CHARGE)	X7A	OPERATION OUTPUT (A2P)
K1M, K2M	MAGNETIC RELAY (M1C) (M2C) (A4P)(A5P)	PS	SWITCHING POWER SUPPLY (A1P, A2P, A3P, A4P, A5P)	R13T	THERMISTOR (SUB COOL HEAT EXC. GAS 2)	Y5E	ELECTRONIC EXPANSION VALVE (SUBCOOL 2)	X9A	POWER SUPPLY (ADAPTER) (A2P)
K7R	MAGNETIC RELAY (Y4S)(A2P)	Q1MP	PHASE REVERSAL DETECT CIRCUIT (A1P)(A2P)	R14T	THERMISTOR (LIQUID 2)(A2P)	Y1S	SOLENOID VALVE (HWL)	X37A	POWER SUPPLY (ADAPTER) (A3P)

Heat Recovery 460V
REYQ72, 96, 120PBYD



A1P	PRINTED CIRCUIT BOARD (MAIN)	K2M	MAGNETIC RELAY (M2C)	L1R	REACTOR	R12T	THERMISTOR (HEAT EXC, DEICER 2) (A3P)	Y2E	ELECTRONIC EXPANSION VALVE (SUBCOOL 1) (A1P)
A2P	PRINTED CIRCUIT BOARD (SUB)	K4M	MAGNETIC CONTACTOR (M1C) (A4P)	M1C, M2C	MOTOR (COMPRESSOR)	R13T	THERMISTOR (SUB COOL HEAT EXC, GAS 2) (A3P)	Y3E	ELECTRONIC EXPANSION VALVE (MAIN 2) (A3P)
A3P	PRINTED CIRCUIT BOARD (SUB2)	H1P~6P	PILOT LAMP (SERVICE MONITOR : ORANGE) (A1P)	M1F, M2F	MOTOR (FAN)	R14T	THERMISTOR (LIQUID 2) (A4P)	Y4E	ELECTRONIC EXPANSION VALVE (CHARGE) (A3P)
A4P	PRINTED CIRCUIT BOARD (NOISE FILTER)		(H2P:PREPARE, TEST----------FLICKERING	PS	SWITCHING POWER SUPPLY (A1P, A3P, A5P)	R15T	THERMISTOR (HEAT EXC, LIQUID 2) (A3P)	Y5E	ELECTRONIC EXPANSION VALVE (SUBCOOL 2) (A3P)
A5P	PRINTED CIRCUIT BOARD (INV)		MALFUNCTION DETECTION----LIGHT UP	Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P) (A3P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)	Y1S	SOLENOID VALVE (RMNG) (A1P)
A6P	PRINTED CIRCUIT BOARD (FAN)	H4P	PILOT LAMP (SERVICE MONITOR-GREEN) (A1P) (A3P) (A4P)	R1Q	RESISTOR (CURRENT SENSOR) (A3P) (A7P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)	Y2S	SOLENOID VALVE (4 WAY VALVE) (HEAT EXC, 1) (A1P)
A7P	PRINTED CIRCUIT BOARD (FAN)	K1R	MAGNETIC RELAY (Y4S) (A2P)	R50, R59	RESISTOR (A5P)	S1PH	PRESSURE SWITCH (HIGH) (A1P)	Y3S	SOLENOID VALVE (BMTL) (A1P)
A8P	PRINTED CIRCUIT BOARD (CURRENT SENSOR)	K1R	MAGNETIC RELAY (Y2M) (A3P)	R90	RESISTOR (CURRENT SENSOR) (A5P)	S2PH	PRESSURE SWITCH (HIGH) (A2P)	Y4S	SOLENOID VALVE (HOT GAS) (A2P)
A9P	PRINTED CIRCUIT BOARD (GROUND LEAKAGE DETECTOR)	K1R	MAGNETIC RELAY (A5P)	R95	RESISTOR (CURRENT LIMITING) (A5P)	T1A	CURRENT SENSOR (A5P)	Y5S	SOLENOID VALVE (EH BYPASS 1) (A2P)
	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)	K2R	MAGNETIC RELAY (Y5S) (A2P)	R1T	THERMISTOR (AIR) (A1P)	T2A	CURRENT SENSOR (A9P)	Y6S	SOLENOID VALVE (BMTF) (A2P)
BS1~5		K3R	MAGNETIC RELAY (Y1S) (A1P)	R1T	THERMISTOR (FIN) (A5P)	T1R	TRANSFORMER (460V/230V)	Y7S	SOLENOID VALVE (BMTD) (A2P)
C1	CAPACITOR	K3R	MAGNETIC RELAY (Y6S) (A2P)	R2T	THERMISTOR (HEAT EXC, GAS 1) (A1P)	V1CP	SAFETY DEVICES INPUT (A1P) (A3P)	Y8S	SOLENOID VALVE (4 WAY VALVE) (PIPE) (A3P)
C63, C66	CAPACITOR	K3R	MAGNETIC RELAY (A4P)	R31T	THERMISTOR (M1C DISCHARGE) (A1P)	V1R	DIODE BRIDGE (A5P)	Y9S	SOLENOID VALVE (4 WAY VALVE) (HEAT EXC, 2) (A3P)
E1HC	CRANKCASE HEATER (A1P)	K4R	MAGNETIC RELAY (Y8S) (A3P)	R32T	THERMISTOR (M2C DISCHARGE) (A3P)	V1R	POWER MODULE (A6P) (A7P)	Y10S	SOLENOID VALVE (EH BYPASS 2) (A3P)
E2HC	CRANKCASE HEATER (A3P)	K5R	MAGNETIC RELAY (Y2S) (A1P)	R4T	THERMISTOR (HEAT EXC, DEICER 1) (A1P)	V2R	POWER MODULE (A5P)	Z1C~10C	NOISE FILTER (FERRITE CORE)
E3HC	CRANKCASE HEATER (A3P)	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R5T	THERMISTOR (SUB COOL HEAT EXC, GAS 1) (A1P)	X1M	TERMINAL STRIP (POWER SUPPLY)	Z1F, Z2F	NOISE FILTER (WITH RING ABSORBER) (A4P)
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P, A3P)	K5R	MAGNETIC RELAY (Y9S) (A3P)	R6T	THERMISTOR (SUB COOL HEAT EXC, LIQUID 1) (A1P)	X1M	TERMINAL STRIP (CONTROL) (A1P, A3P)		
F1U	FUSE (T, 3.15A, 250V) (A2P)	K6R	MAGNETIC RELAY (Y7S) (A2P)	R7T	THERMISTOR (HEAT EXC, LIQUID 1) (A1P)	X2M	TERMINAL STRIP (POWER SUPPLY) (T1R)		
F1U	FUSE (30A, DC650V) (A6P) (A7P)	K7R	MAGNETIC RELAY (E1HC) (A1P)	R8T	THERMISTOR (SUCTION 1) (A2P)	X3M	TERMINAL STRIP (POWER SUPPLY) (T1R)		CONNECTOR FOR OPTIONAL PARTS
F400U	FUSE (T, 6.3A, 250V) (A4P)	K8R	MAGNETIC RELAY (E2HC) (A3P)	R9T	THERMISTOR (LIQUID 1) (A2P)	X4M	TERMINAL STRIP (RELAY)	X7A	OPERATION OUTPUT (A2P)
F11~31U	FUSE (70A, AC550V) (M2C)	K11R	MAGNETIC RELAY (Y3S) (A1P)	R10T	THERMISTOR (SUCTION 2) (A3P)	X1A~X10A	CONNECTOR	X9A	POWER SUPPLY (ADAPTER) (A2P)
K2M	MAGNETIC CONTACTOR (M1C) (A5P)	K11R	MAGNETIC RELAY (Y10S) (A3P)	R11T	THERMISTOR (HEAT EXC, GAS 2) (A3P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN 1) (A1P)	X37A	POWER SUPPLY (ADAPTER) (A3P)

Heat Recovery 460V
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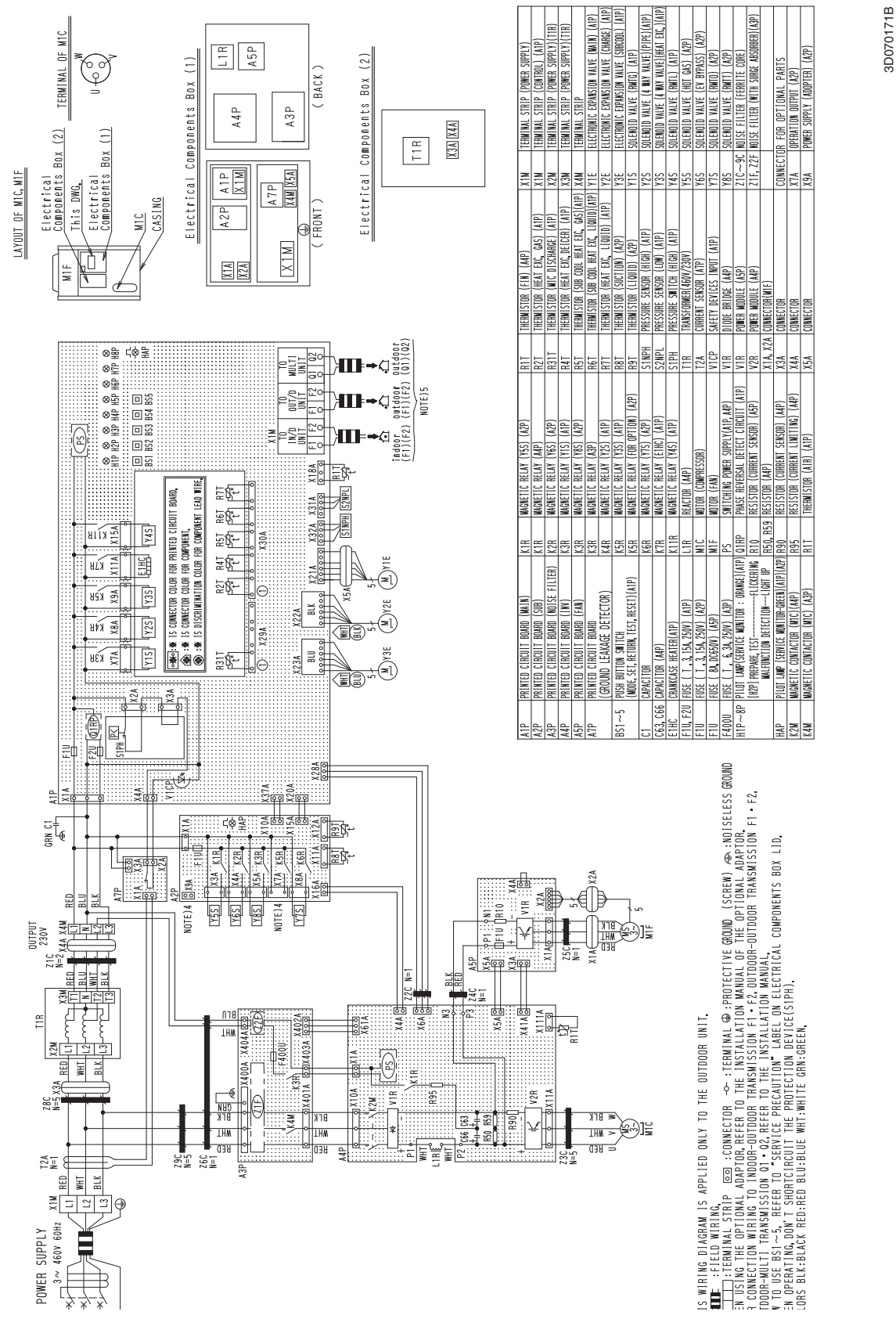
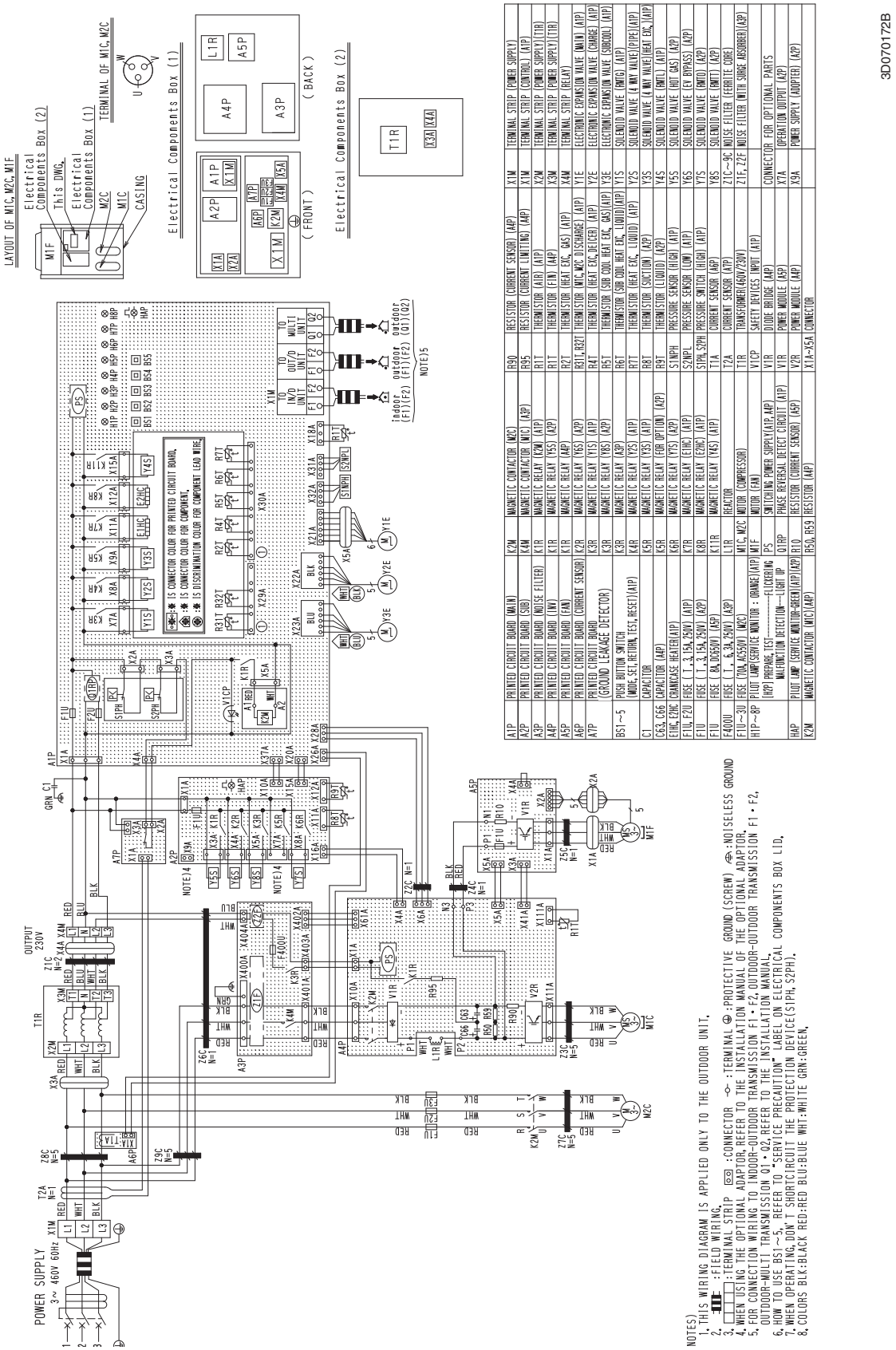
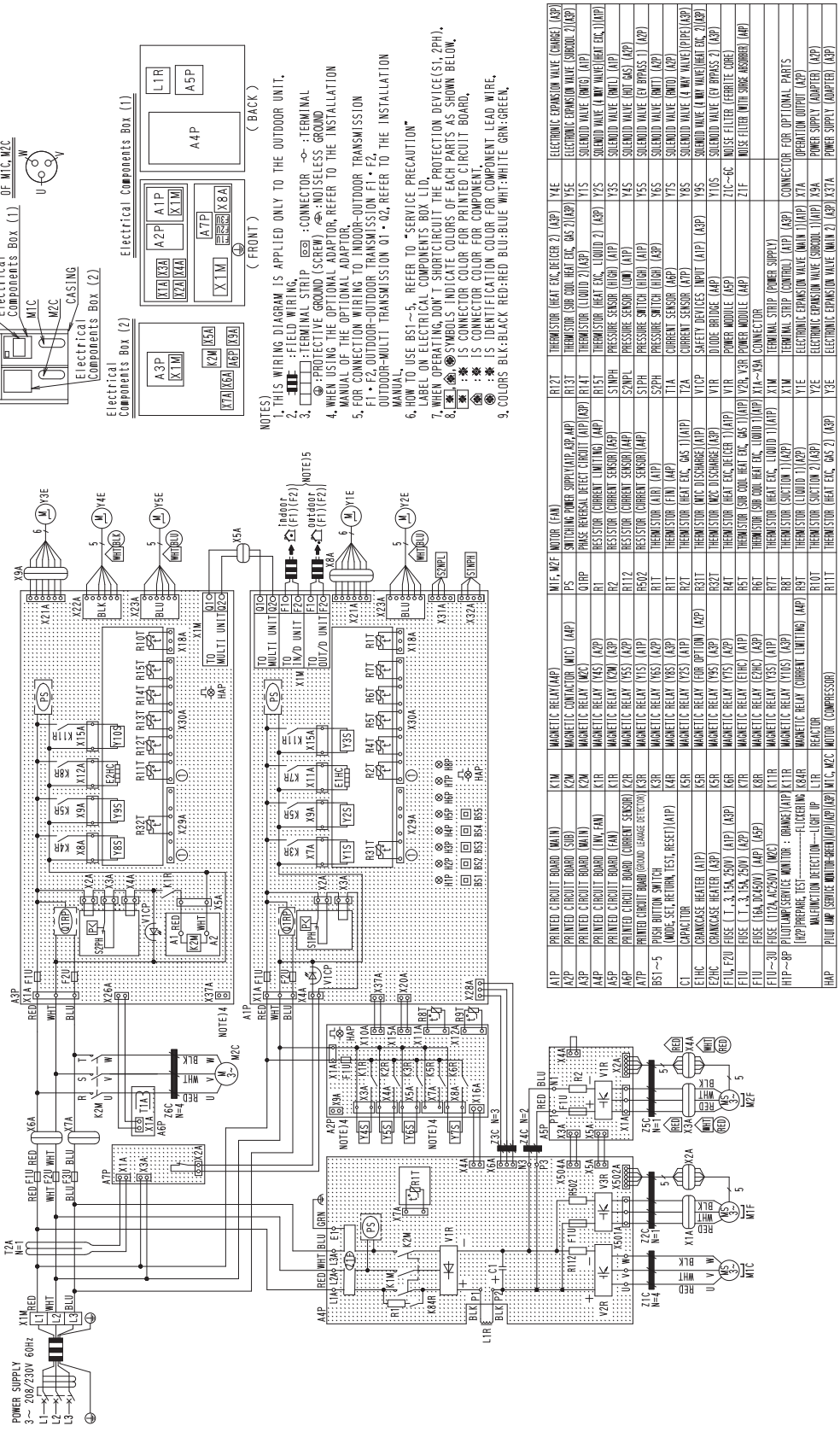


Heat Recovery 460V
REMQ96, 120PBYD

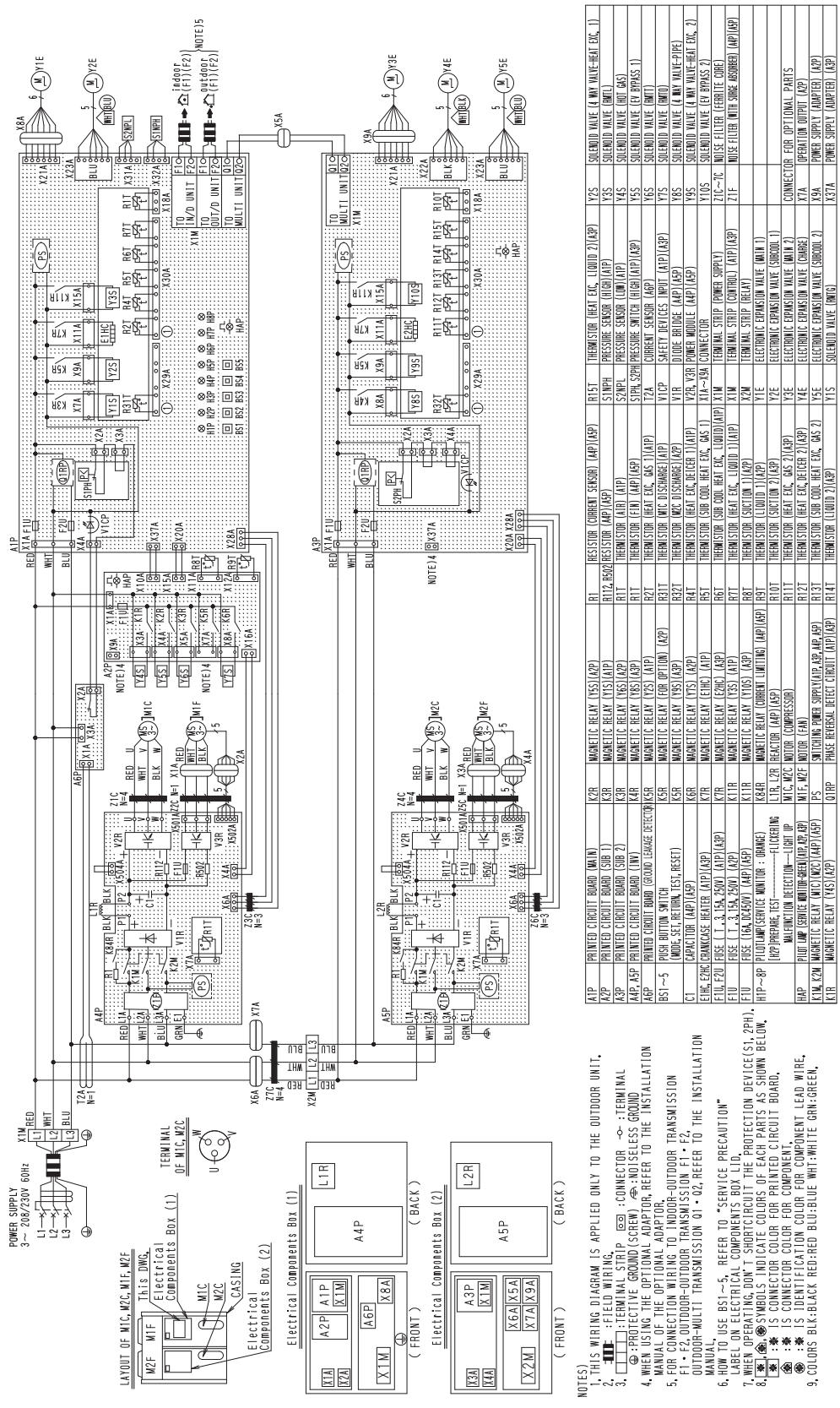


Heat Recovery 230V
REYQ72, 96, 120PBTJ

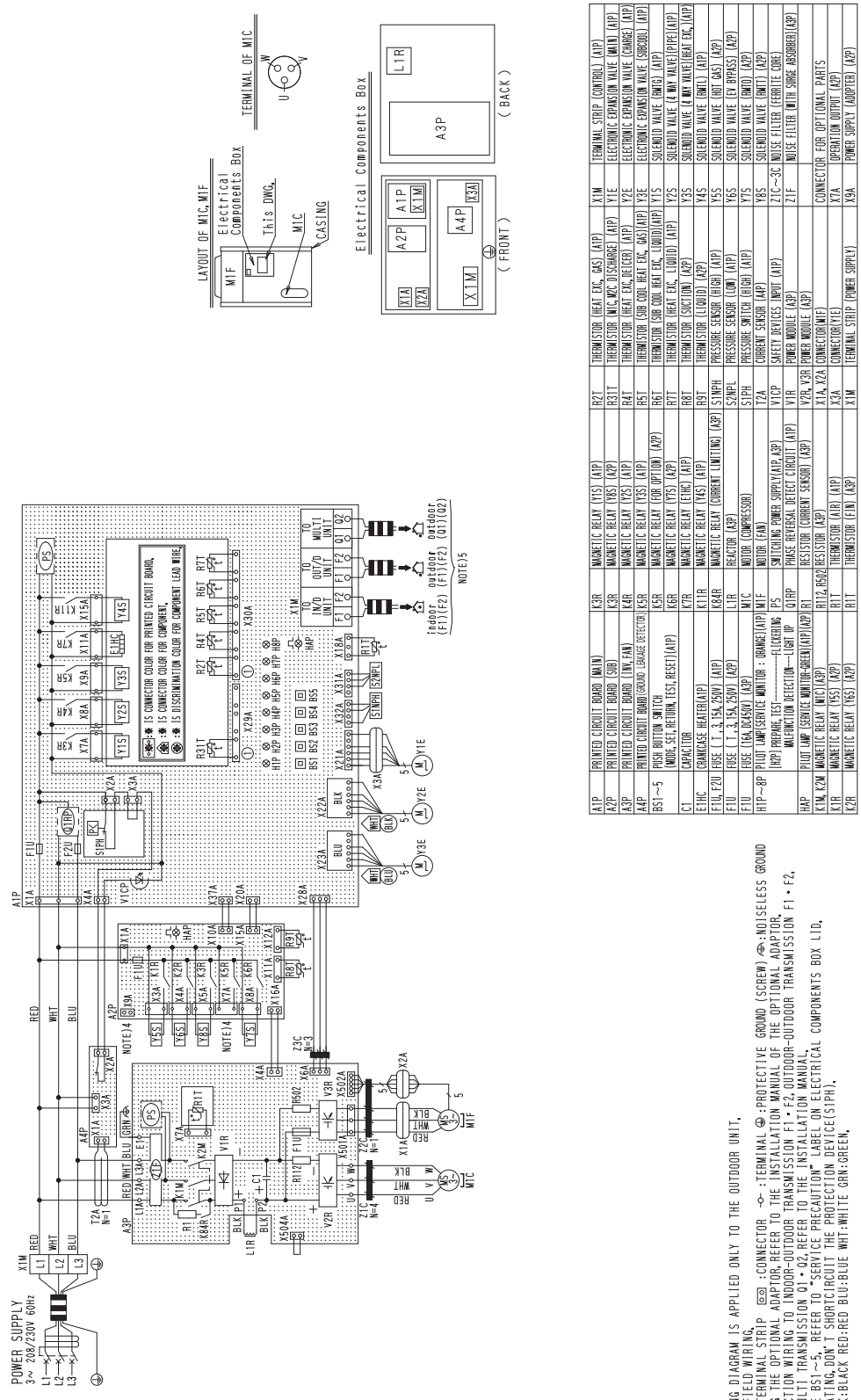


A1P	PRINTED CIRCUIT BOARD (MAIN)	K1M	MAGNETIC RELAY(A4P)	M1F, M2F	MOTOR (FAN)	R12T	THERMISTOR (HEAT EXC,DEICER 2) (A2P)	Y4E	ELECTRONIC EXPANSION VALVE (CHARGE) (A2P)
A2P	PRINTED CIRCUIT BOARD (SUB)	K2M	MAGNETIC CONTACTOR (M1C) (A4P)	PS	SWITCHING POWER SUPPLY(A1P, A3P, A4P)	R13T	THERMISTOR (SUB COOL HEAT EXC, GAS 2)(A2P)	Y5E	ELECTRONIC EXPANSION VALVE (SUBCOOL 2)(A2P)
A3P	PRINTED CIRCUIT BOARD (MAIN)	K2M	MAGNETIC RELAY (M2C)	Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P)	R14T	THERMISTOR (LIQUID 2)(A2P)	Y1S	SOLENOID VALVE (SWING) (A1P)
A4P	PRINTED CIRCUIT BOARD (INV, FAN)	K1R	MAGNETIC RELAY (Y1S) (A2P)	R1	RESISTOR (CURRENT LIMITING) (A4P)	R15T	THERMISTOR (HEAT EXC, LIQUID 2) (A3P)	Y2S	SOLENOID VALVE (4 WAY VALVE)(HEAT EXC,1)(A1P)
A5P	PRINTED CIRCUIT BOARD (FAN)	K1R	MAGNETIC RELAY (K2M) (A3P)	R2	RESISTOR (CURRENT SENSOR) (A5P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)	Y3S	SOLENOID VALVE (BWTL) (A1P)
A6P	PRINTED CIRCUIT BOARD (CURRENT SENSOR)	K2R	MAGNETIC RELAY (Y5S) (A2P)	R112	RESISTOR (CURRENT SENSOR)(A4P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)	Y4S	SOLENOID VALVE (HOT GAS) (A2P)
A7P	PRINTED CIRCUIT BOARD (GROUND LEAKAGE DETECTOR)	K3R	MAGNETIC RELAY (Y1S) (A1P)	R502	RESISTOR (CURRENT SENSOR)(A4P)	S1PH	PRESSURE SWITCH (HIGH) (A1P)	Y5S	SOLENOID VALVE (EX BYPASS 1) (A2P)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)(A1P)	K3R	MAGNETIC RELAY (Y6S) (A2P)	R1T	THERMISTOR (AIR) (A1P)	S2PH	PRESSURE SWITCH (HIGH) (A3P)	Y6S	SOLENOID VALVE (BWTD) (A1P)
C1	CAPACITOR	K4R	MAGNETIC RELAY (Y7S) (A1P)	R2T	THERMISTOR (HEAT EXC, GAS 1)(A1P)	T1A	CURRENT SENSOR (A6P)	Y7S	SOLENOID VALVE (BWTD) (A2P)
E1HC	CRANKCASE HEATER (A1P)	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R31T	THERMISTOR (M1C DISCHARGE)(A1P)	T2A	CURRENT SENSOR (A7P)	Y8S	SOLENOID VALVE (4 WAY VALVE)(PIPE)(A3P)
E2HC	CRANKCASE HEATER (A3P)	K5R	MAGNETIC RELAY (Y9S) (A3P)	R32T	THERMISTOR (M2C DISCHARGE)(A3P)	V1CP	SAFETY DEVICES INPUT (A1P) (A3P)	Y9S	SOLENOID VALVE (4 WAY VALVE)(HEAT EXC, 2)(A3P)
F11U, F2U	FUSE (T, 3.15A, 250V) (A1P) (A3P)	K6R	MAGNETIC RELAY (Y7S) (A2P)	R4T	THERMISTOR (HEAT EXC,DEICER 1)(A1P)	V1R	POWER MODULE (A5P)	Z1C~6C	NOISE FILTER (FERRITE CORE)
F1U	FUSE (T, 3.15A, 250V) (A2P)	K7R	MAGNETIC RELAY (E1HC) (A1P)	R5T	THERMISTOR (SUB COOL HEAT EXC, GAS 1)(A1P)	V2R, V3R	POWER MODULE (A4P)	Z1F	NOISE FILTER (WITH 30turns ABSORBER) (A4P)
F1U	FUSE (16A, DC450V) (A4P) (A5P)	K8R	MAGNETIC RELAY (E2HC) (A3P)	R6T	THERMISTOR (SUB COOL HEAT EXC, LIQUID 1)(A1P)	X1A~X9A	CONNECTOR		
F1U~3U	FUSE (12A, AC250V) (M2C)	K11R	MAGNETIC RELAY (Y3S) (A1P)	R7T	THERMISTOR (HEAT EXC, LIQUID 1)(A1P)	X1M	TERMINAL STRIP (POWER SUPPLY)		
H1P~8P	PILOT LAMP (SERVICE MONITOR : ORANGE)(A1P)	K11R	MAGNETIC RELAY (Y10S) (A3P)	R8T	THERMISTOR (SUCTION 1)(A2P)	X1M	TERMINAL STRIP (CONTROL) (A1P) (A3P)	CONNECTOR FOR OPTIONAL PARTS	
	(H2P:PREPARE, TEST ---------- FLICKERING	K84R	MAGNETIC RELAY (CURRENT LIMITING) (A4P)	R9T	THERMISTOR (LIQUID 1)(A2P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN 1)(A1P)	X7A	OPERATION OUTPUT (A2P)
	MALFUNCTION DETECTION — LIGHT ON	L1R	REACTOR	R10T	THERMISTOR (SUCTION 2)(A3P)	Y2E	ELECTRONIC EXPANSION VALVE (SUBCOOL 1)(A1P)	X9A	POWER SUPPLY (ADAPTER) (A2P)
HAP	PILOT LAMP (SERVICE MONITOR (ORANGE)(A1P)(A2P)(A3P)	M1C, M2C	MOTOR (COMPRESSOR)	R11T	THERMISTOR (HEAT EXC, GAS 2) (A3P)	Y3E	ELECTRONIC EXPANSION VALVE (MAIN 2) (A3P)	X37A	POWER SUPPLY (ADAPTER) (A3P)

REYQ144PBTJ



Heat Recovery 230V
REMQ72PBTJ

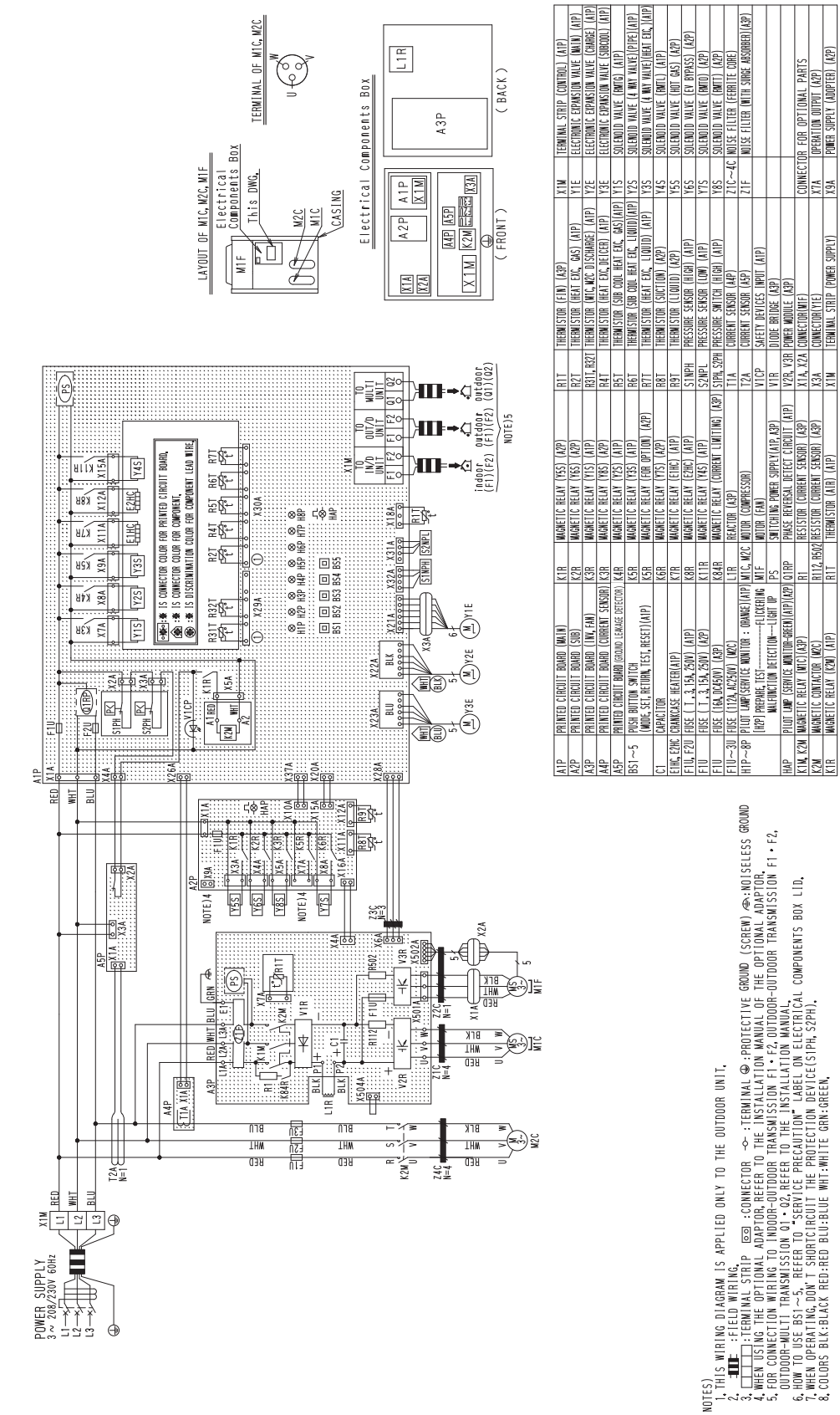


A1P	PRINTED CIRCUIT BOARD (MAIN)	K3R	MAGNETIC RELAY (Y1S) (A1P)	R2T	THERMISTOR (HEAT EXC, GAS) (A1P)	X1M	TERMINAL STRIP (CONTROL) (A1P)
A2P	PRINTED CIRCUIT BOARD (SUB)	K3R	MAGNETIC RELAY (Y6S) (A2P)	R31T	THERMISTOR (M1C, M2C DISCHARGE) (A1P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN) (A1P)
A3P	PRINTED CIRCUIT BOARD (INV, FAN)	K4R	MAGNETIC RELAY (Y2S) (A1P)	R4T	THERMISTOR (HEAT EXC.DEFROST) (A1P)	Y2E	ELECTRONIC EXPANSION VALVE (CHARGE) (A1P)
A4P	PRINTED CIRCUIT BOARD (GROUND LEAKAGE DETECTOR)	K5R	MAGNETIC RELAY (Y3S) (A1P)	R5T	THERMISTOR (SUB COOL HEAT EXC, GAS)(A1P)	Y3E	ELECTRONIC EXPANSION VALVE (SUBCOOL) (A1P)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)(A1P)	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R6T	THERMISTOR (SUB COOL HEAT EXC, LIQUID)(A1P)	Y1S	SOLENOID VALVE (SMCG) (A1P)
		K6R	MAGNETIC RELAY (Y7S) (A2P)	R7T	THERMISTOR (HEAT EXC, LIQUID) (A1P)	Y2S	SOLENOID VALVE (4 WAY VALVE)(P1P6)(A1P)
C1	CAPACITOR	K7R	MAGNETIC RELAY (E1HC) (A1P)	R8T	THERMISTOR (SUCTION) (A2P)	Y3S	SOLENOID VALVE (4 WAY VALVE)(HEAT EXC.)(A1P)
E1HC	CRANKCASE HEATER(A1P)	K11R	MAGNETIC RELAY (Y4S) (A1P)	R9T	THERMISTOR (LIQUID) (A2P)	Y4S	SOLENOID VALVE (BMTL) (A1P)
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P)	K04R	MAGNETIC RELAY (CURRENT LIMITING) (A3P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)	Y5S	SOLENOID VALVE (HOT GAS) (A2P)
F1U	FUSE (T, 3.15A, 250V) (A2P)	L1R	REACTOR (A3P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)	Y6S	SOLENOID VALVE (CV BYPASS) (A2P)
F1U	FUSE (16A, DC450V) (A3P)	M1C	MOTOR (COMPRESSOR)	S1PH	PRESSURE SWITCH (HIGH) (A1P)	Y7S	SOLENOID VALVE (BMTO) (A2P)
H1P~8P	PILOT LAMP (SERVICE MONITOR : ORANGE)(A1P)	M1F	MOTOR (FAN)	T2A	CURRENT SENSOR (A4P)	Y8S	SOLENOID VALVE (BMTL) (A2P)
	(M2P) PREPARE, TEST ---------- ALL BLINKING	PS	SWITCHING POWER SUPPLY(A1P, A2P)	V1CP	SAFETY DEVICES INPUT (A1P)	Z1C~3C	NOISE FILTER (FERRITE CORE)
	MALFUNCTION DETECTION ---- LIGHT UP	Q1HP	PHASE REVERSAL DETECT CIRCUIT (A1P)	V1R	POWER MODULE (A3P)	Z1F	NOISE FILTER (WITH SURGE ABSORBER)(A2P)
HAP	PILOT LAMP (SERVICE MONITOR-GREEN)(A2P)	R1	RESISTOR (CURRENT SENSOR) (A3P)	V2R, V3R	POWER MODULE (A3P)		
K1M, K2M	MAGNETIC RELAY (M1C)(A3P)	R11Z, R5V2	RESISTOR (A2P)	X1A, X2A	CONNECTOR(M1F)		CONNECTOR FOR OPTIONAL PARTS
K1R	MAGNETIC RELAY (Y6S) (A2P)	R1T	THERMISTOR (AIR) (A1P)	X3A	CONNECTOR(Y1E)	X7A	(OPERATION OUTPUT (A2P)
K2R	MAGNETIC RELAY (Y6S) (A2P)	R1T	THERMISTOR (FIN) (A3P)	X1M	TERMINAL STRIP (POWER SUPPLY)	X9A	POWER SUPPLY (ADOPTED) (A2P)

NOTES)
1. THIS WIRING DIAGRAM IS APPLIED ONLY TO THE OUTDOOR UNIT.
2. : FIELD WIRING.
3. : TERMINAL STRIP : CONNECTOR : TERMINAL : PROTECTIVE GROUND (SCREW) : NOISELESS GROUND
4. WHEN USING THE OPTIONAL ADAPTOR, REFER TO THE INSTALLATION MANUAL OF THE OPTIONAL ADAPTOR.
5. FOR CONNECTION WIRING TO INDOOR-OUTDOOR TRANSMISSION F1 • F2, OUTDOOR-OUTDOOR TRANSMISSION F1 • F2, OUTDOOR-MULTI TRANSMISSION Q1 • Q2, REFER TO THE INSTALLATION MANUAL.
6. HOW TO USE BS1~5, REFER TO "SERVICE PRECAUTION" LABEL ON ELECTRICAL COMPONENTS BOX LID.
7. WHEN OPERATING, DON'T SHORT CIRCUIT THE PROTECTION DEVICE (S1PH).
8. COLORS BLK:BLACK RED:RED BLU:BLUE WHT:WHITE GRN:GREEN.

3D069810B

Heat Recovery 230V
REMQ96, 120PBTJ



A1P	PRINTED CIRCUIT BOARD (MAIN)	K1R	MAGNETIC RELAY (Y6S) (A2P)	R1T	THERMISTOR (FIN) (A3P)	X1M	TERMINAL STRIP (CONTROL) (A1P)
A2P	PRINTED CIRCUIT BOARD (SUB)	K2R	MAGNETIC RELAY (Y6S) (A2P)	R2T	THERMISTOR (HEAT EXC, GAS) (A1P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN) (A1P)
A3P	PRINTED CIRCUIT BOARD (INV, FAN)	K3R	MAGNETIC RELAY (Y1S) (A1P)	R31T, R32T	THERMISTOR (M1C, M2C DISCHARGE) (A1P)	Y2E	ELECTRONIC EXPANSION VALVE (CHARGE) (A1P)
A4P	PRINTED CIRCUIT BOARD (CURRENT SENSOR)	K3R	MAGNETIC RELAY (Y6S) (A2P)	R4T	THERMISTOR (HEAT EXC, DEICER) (A1P)	Y3E	ELECTRONIC EXPANSION VALVE (SUBCOOL) (A1P)
A5P	PRINTED CIRCUIT BOARD (GROUND LEAKAGE DETECTION)	K4R	MAGNETIC RELAY (Y2S) (A1P)	R5T	THERMISTOR (SUB COOL HEAT EXC, GAS) (A1P)	Y1S	SOLENOID VALVE (DMTG) (A1P)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET) (A1P)	K5R	MAGNETIC RELAY (Y3S) (A1P)	R6T	THERMISTOR (SUB COOL HEAT EXC, LIQUID) (A1P)	Y2S	SOLENOID VALVE (4 WAY VALVE) (PIPE) (A1P)
		K5R	MAGNETIC RELAY (Y2R OPTION) (A2P)	R7T	THERMISTOR (HEAT EXC, LIQUID) (A1P)	Y3S	SOLENOID VALVE (4 WAY VALVE) (HEAT EXC) (A1P)
C1	CAPACITOR	K6R	MAGNETIC RELAY (Y7S) (A2P)	R8T	THERMISTOR (SUCTION) (A2P)	Y4S	SOLENOID VALVE (DMTL) (A1P)
E1HC, E2HC	CRANKCASE HEATER (A1P)	K7R	MAGNETIC RELAY (E1HC) (A1P)	R9T	THERMISTOR (LIQUID) (A2P)	Y5S	SOLENOID VALVE (HOT GAS) (A2P)
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P)	K8R	MAGNETIC RELAY (E2HC) (A1P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)	Y6S	SOLENOID VALVE (EV BYPASS) (A2P)
F1U	FUSE (T, 3.15A, 250V) (A2P)	K11R	MAGNETIC RELAY (Y4S) (A1P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)	Y7S	SOLENOID VALVE (DMTO) (A2P)
F1U	FUSE (16A, DC450V) (A3P)	K44R	MAGNETIC RELAY (CURRENT LIMITING) (A3P)	S1PH, S2PH	PRESSURE SWITCH (HIGH) (A1P)	Y8S	SOLENOID VALVE (DMTI) (A2P)
F1U~3U	FUSE (T172A, AC250V) (M2C)	L1R	REACTOR (A3P)	T1A	CURRENT SENSOR (A4P)	Z1C~4C	NOISE FILTER (FERRITE CORE)
H1P~8P	PILOT LAMP (SERVICE MONITOR : ORANGE) (A1P)	M1C, M2C	MOTOR (COMPRESSOR)	T2A	CURRENT SENSOR (A5P)	Z1F	NOISE FILTER (WITH SURGE ABSORBER) (A3P)
	(H2P) PREPARE TEST ----------FLICKERING	M1F	MOTOR (FAN)	V1CP	SAFETY DEVICES INPUT (A1P)		
	MALFUNCTION DETECTION ----LIGHT UP	PS	SWITCHING POWER SUPPLY (A1P, A2P)	V1R	DIODE BRIDGE (A2P)		
HAP	PILOT LAMP (SERVICE MONITOR-GREEN) (A2P)	Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P)	V2R, V3R	POWER MODULE (A3P)		
K1M, K2M	MAGNETIC RELAY (M1C) (A3P)	R1	RESISTOR (CURRENT SENSOR) (A3P)	X1A, X2A	CONNECTOR (M1F)		CONNECTOR FOR OPTIONAL PARTS
K2M	MAGNETIC CONTACTOR (M2C)	R112, R502	RESISTOR (CURRENT SENSOR) (A3P)	X3A	CONNECTOR (Y1E)	X7A	OPERATION OUTPUT (A2P)
K1R	MAGNETIC RELAY (K2M) (A1P)	R1T	THERMISTOR (AIR) (A1P)	X1M	TERMINAL STRIP (POWER SUPPLY)	X9A	POWER SUPPLY (ADAPTER) (A2P)

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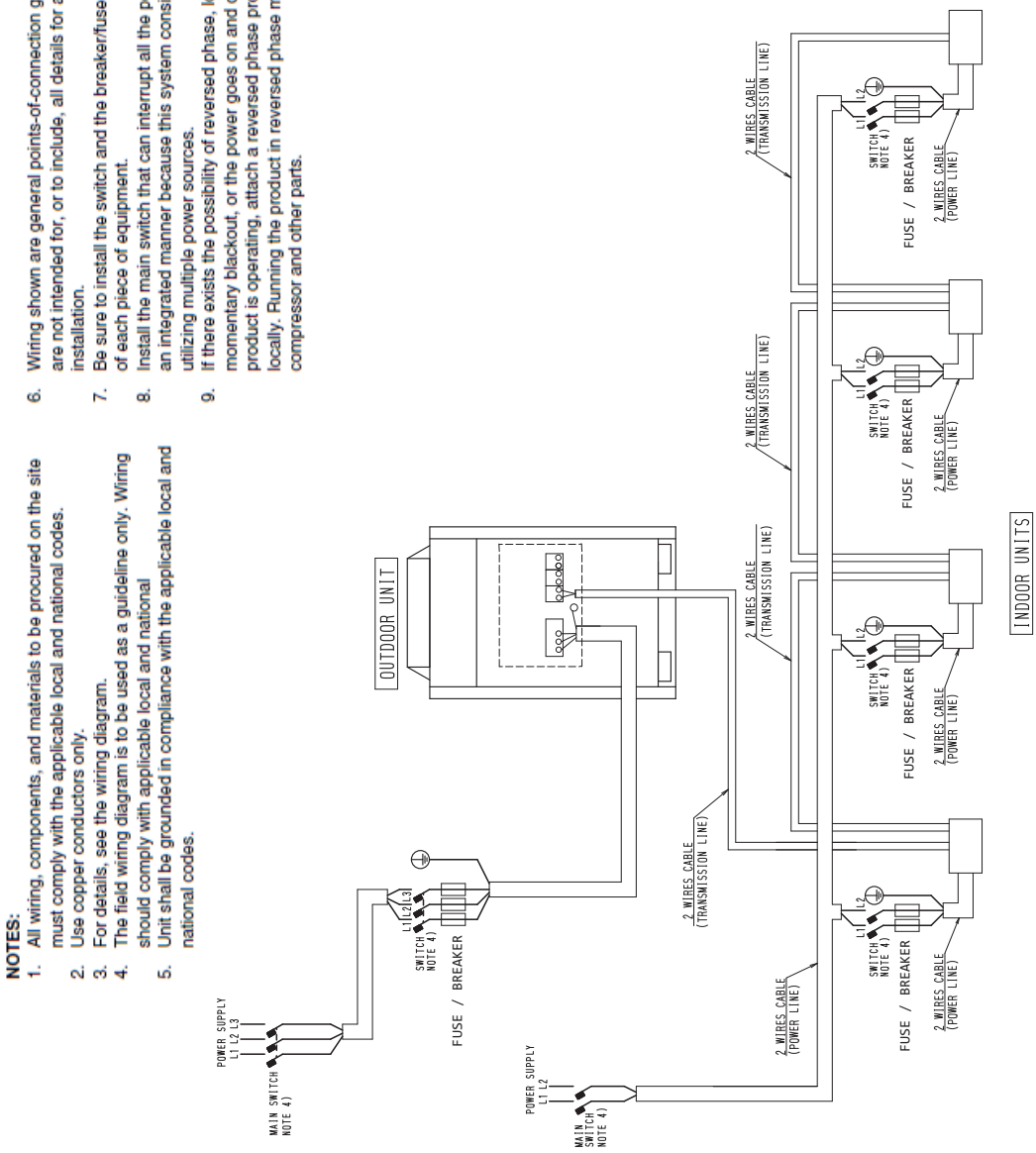
2.2 Field Wiring

Heat Pump

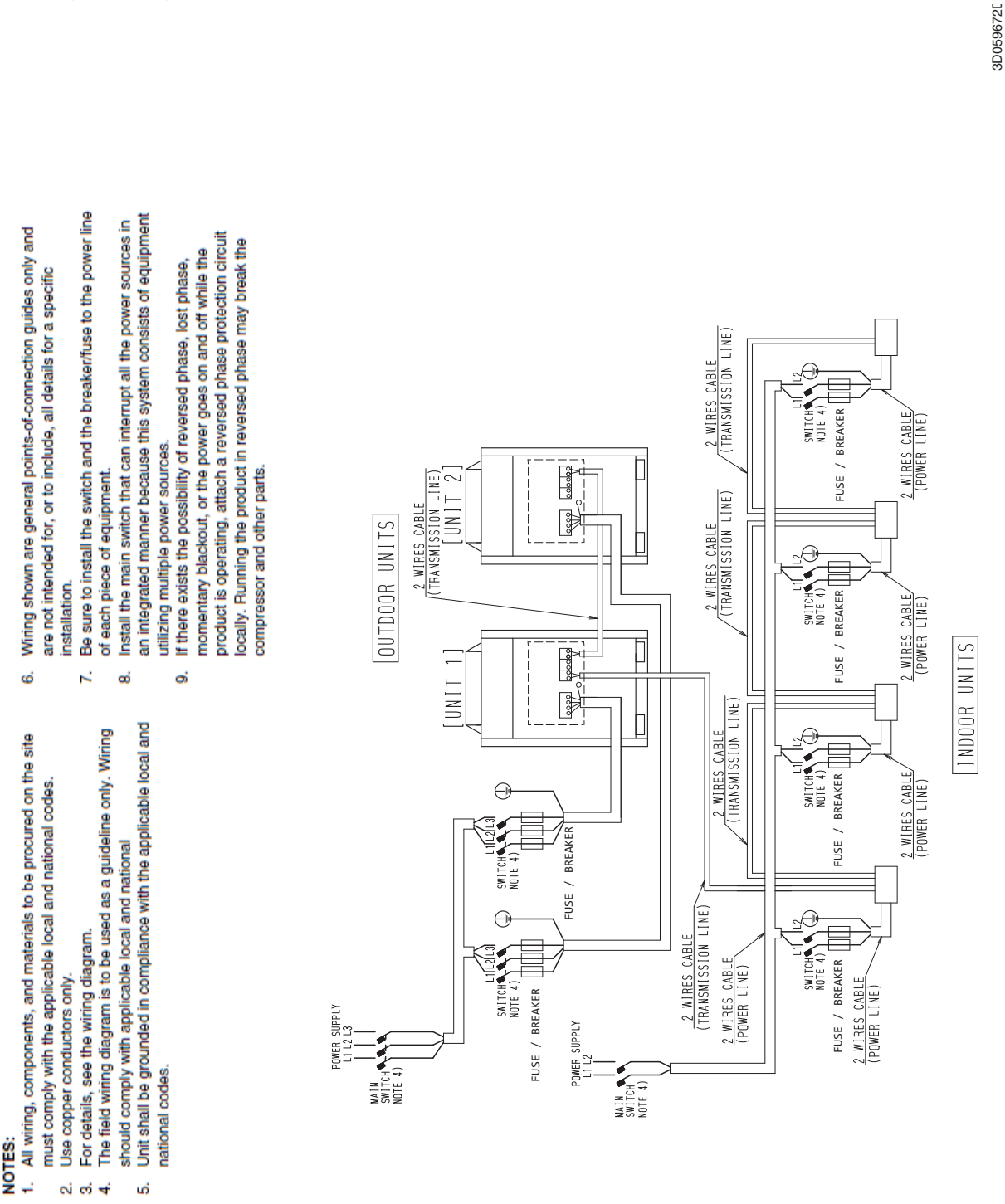
460V: RXYQ72, 96, 120PBYD

230V: RXYQ72, 96, 120, 144PBTJ



Heat Pump

460V: RXYQ144, 168, 192, 216, 240PBYD
230V: RXYQ168, 192, 216, 240PBTJ



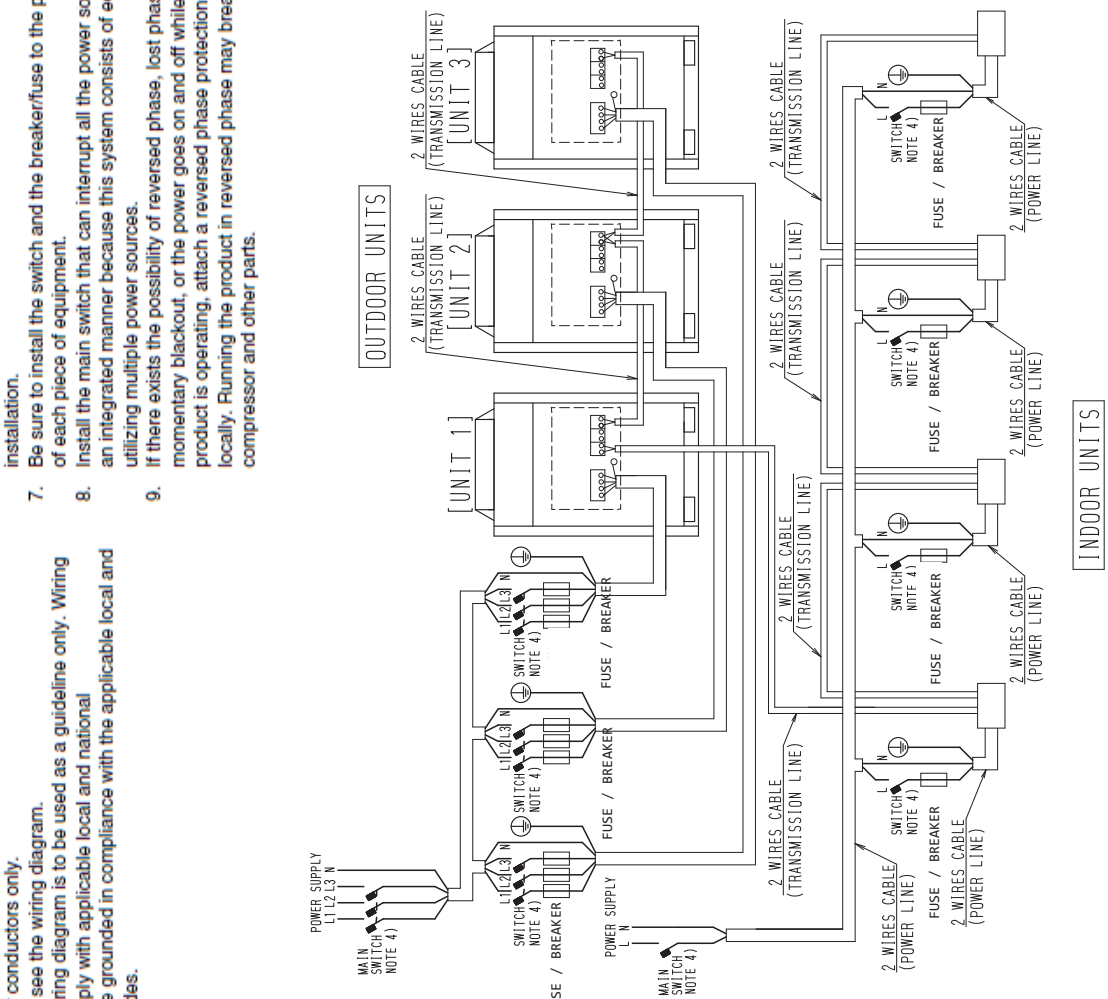
Heat Pump

460V: RXYQ264, 288, 312, 336, 360PBYD
230V: RXYQ264, 288, 312, 336, 360PBTJ

3D070846

NOTES:

1. All wiring, components, and materials to be procured on the site must comply with the applicable local and national codes.
2. Use copper conductors only.
3. For details, see the wiring diagram.
4. The field wiring diagram is to be used as a guideline only. Wiring should comply with applicable local and national
5. Unit shall be grounded in compliance with the applicable local and national codes.
6. Wiring shown are general points-of-connection guides only and are not intended for, or to include, all details for a specific installation.
7. Be sure to install the switch and the breaker/fuse to the power line of each piece of equipment.
8. Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of equipment utilizing multiple power sources.
9. If there exists the possibility of reversed phase, lost phase, momentary blackout, or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.

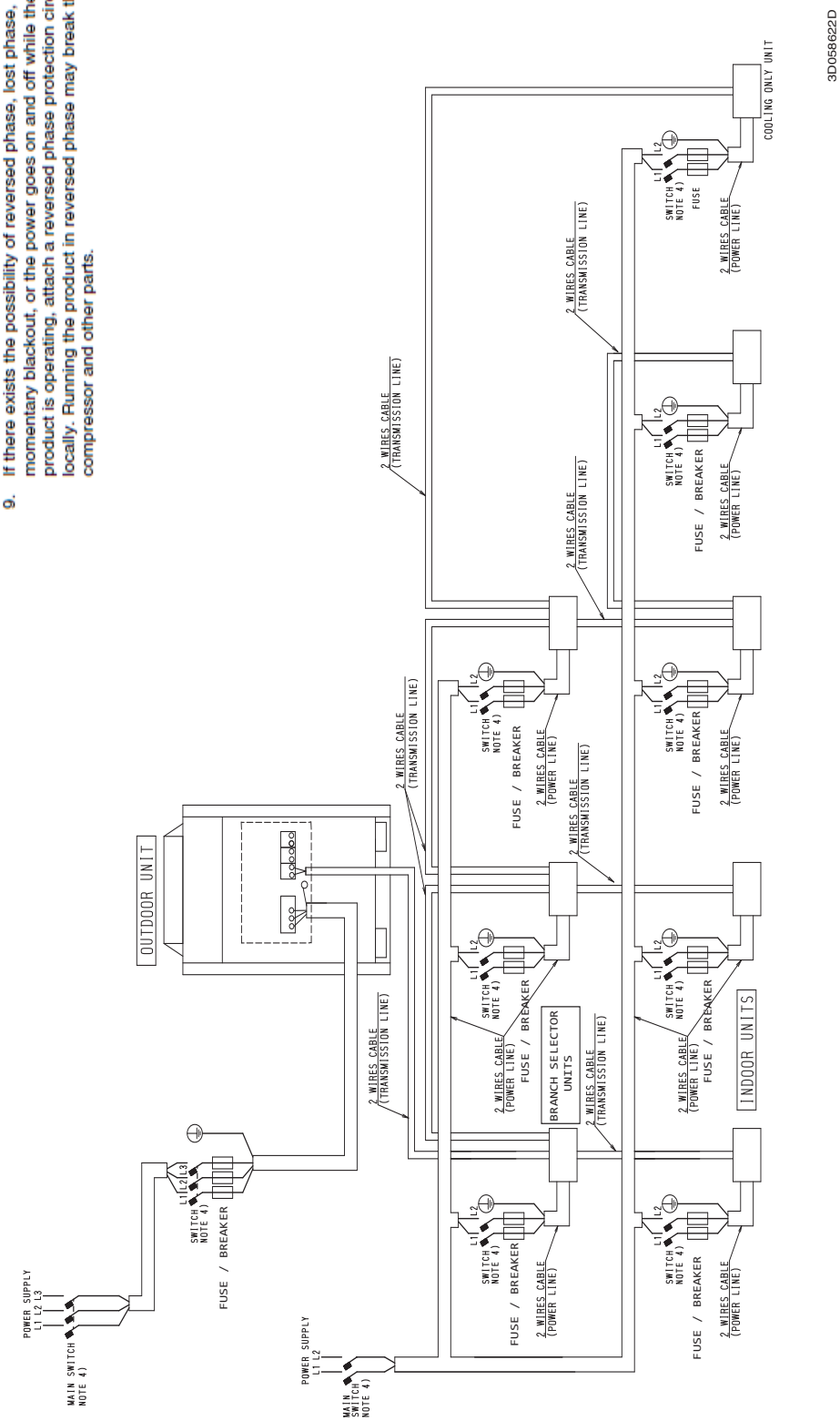


Heat Recovery

460V: REYQ72, 96, 120PBYD
230V: REYQ72, 96, 120, 144PBTJ

NOTES:

1. All wiring, components, and materials to be procured on the site must comply with the applicable local and national codes.
2. Use copper conductors only.
3. For details, see the wiring diagram.
4. The field wiring diagram is to be used as a guideline only. Wiring should comply with applicable local and national
5. Unit shall be grounded in compliance with the applicable local and national codes.
6. Wiring shown are general points-of-connection guides only and are not intended for, or to include, all details for a specific installation.
7. Be sure to install the switch and the breaker/fuse to the power line of each piece of equipment.
8. Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of equipment utilizing multiple power sources.
9. If there exists the possibility of reversed phase, lost phase, momentary blackout, or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.

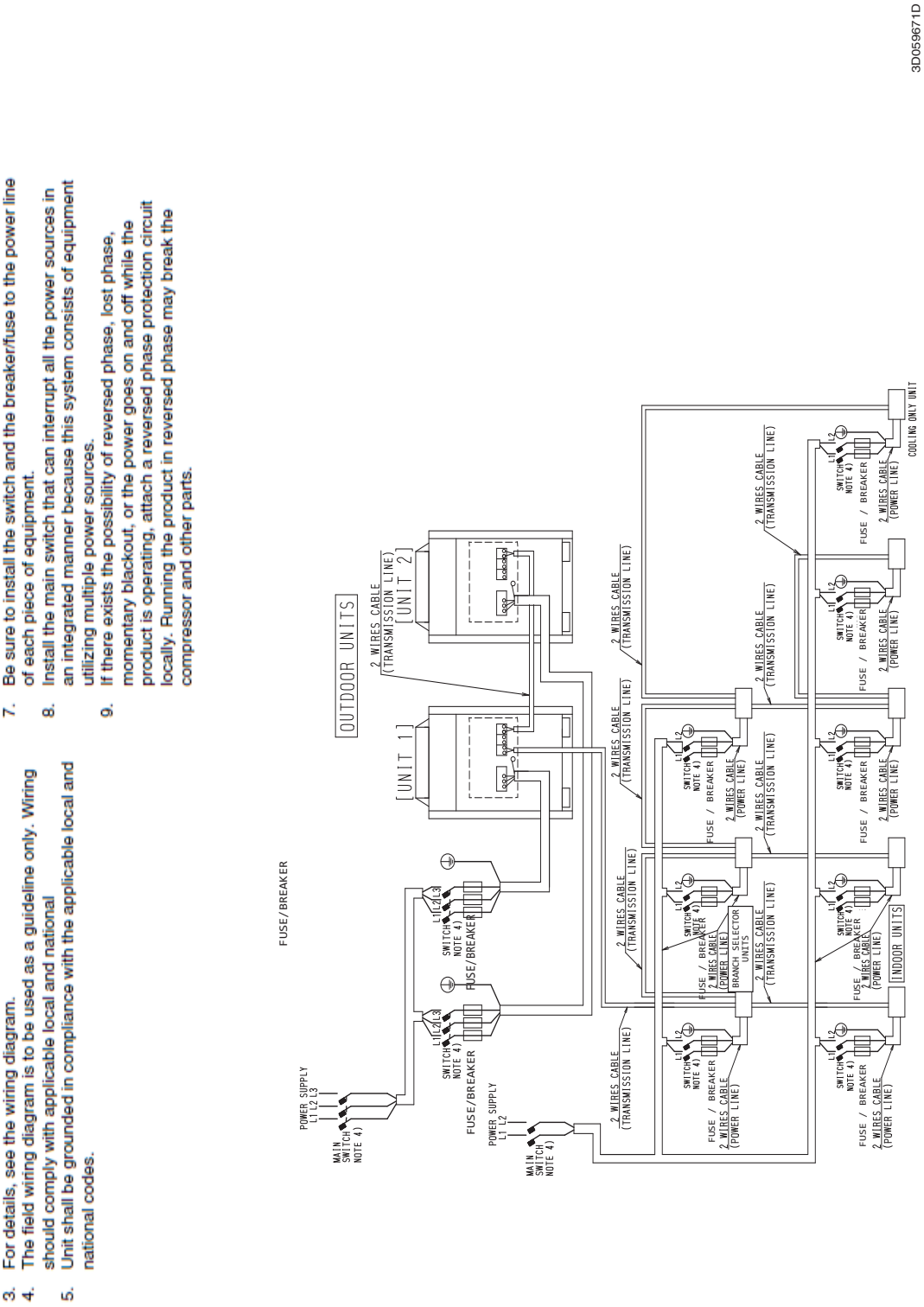


Heat Recovery

460V: REYQ144, 168, 192, 216, 240PBYD
230V: REYQ168, 192, 216, 240PBTJ

NOTES:

1. All wiring, components, and materials to be procured on the site must comply with the applicable local and national codes.
2. Use copper conductors only.
3. For details, see the wiring diagram.
4. The field wiring diagram is to be used as a guideline only. Wiring should comply with applicable local and national
5. Unit shall be grounded in compliance with the applicable local and national codes.
6. Wiring shown are general points-of-connection guides only and are not intended for, or to include, all details for a specific installation.
7. Be sure to install the switch and the breaker/fuse to the power line of each piece of equipment.
8. Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of equipment utilizing multiple power sources.
9. If there exists the possibility of reversed phase, lost phase, momentary blackout, or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.

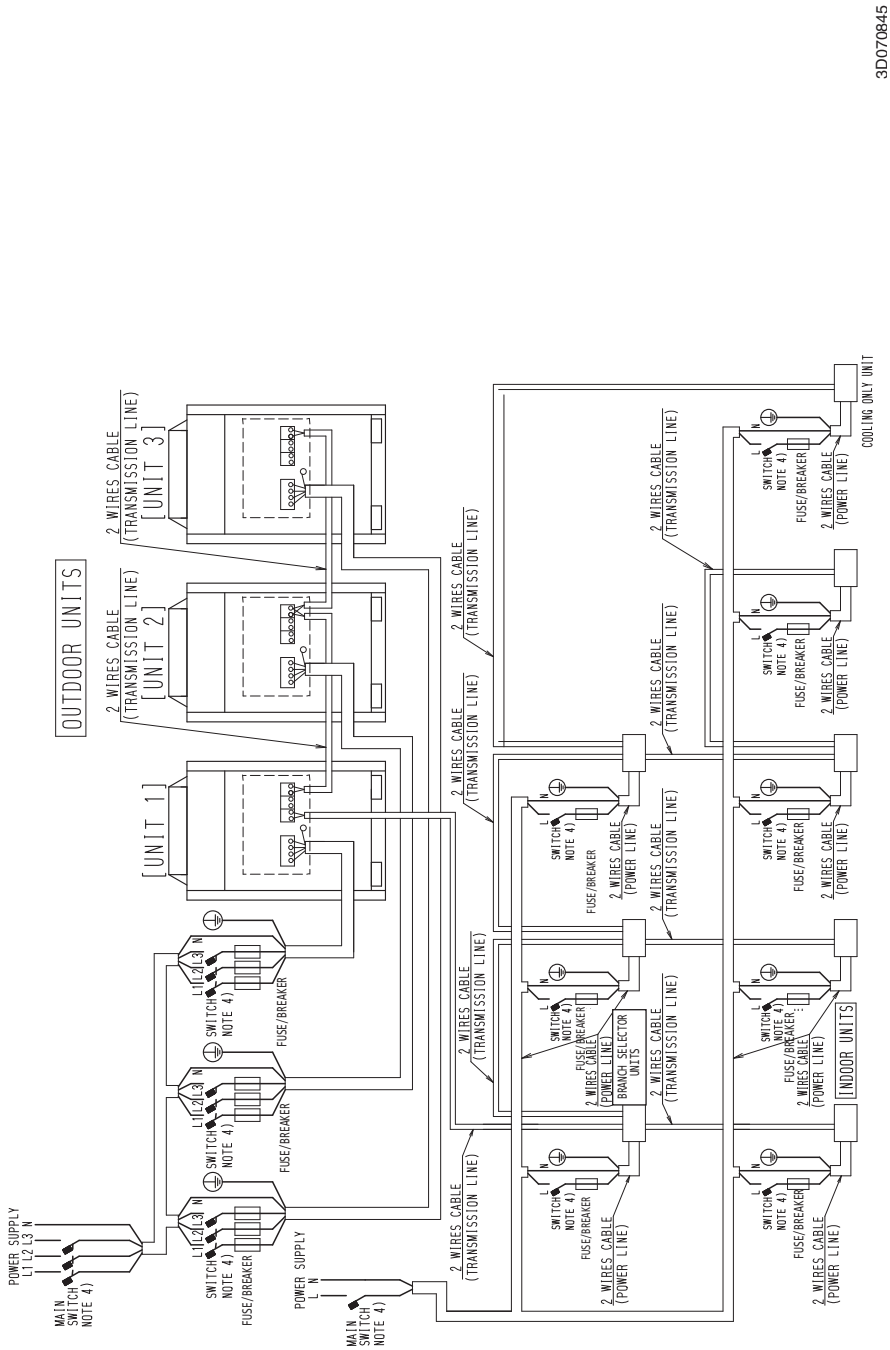


Heat Recovery

460V: REYQ264, 288, 312, 336PBYD
230V: REYQ264, 288, 312, 336PBTJ

NOTES:

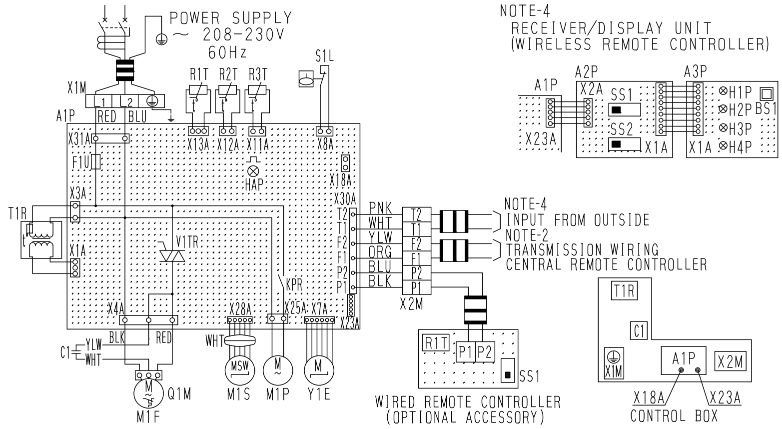
1. All wiring, components, and materials to be procured on the site must comply with the applicable local and national codes.
2. Use copper conductors only.
3. For details, see the wiring diagram.
4. The field wiring diagram is to be used as a guideline only. Wiring should comply with applicable local and national
5. Unit shall be grounded in compliance with the applicable local and national codes.
6. Wiring shown are general points-of-connection guides only and are not intended for, or to include, all details for a specific installation.
7. Be sure to install the switch and the breaker/fuse to the power line of each piece of equipment.
8. Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of equipment utilizing multiple power sources.
9. If there exists the possibility of reversed phase, lost phase, momentary blackout, or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.



2.3 Indoor Unit

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

INDOOR UNIT		RECEIVER/DISPLAY UNIT(ATTACHED TO WIRELESS REMOTE CONTROLLER)	
A1P	PRINTED CIRCUIT BOARD		
C1	CAPACITOR (M1F)	A2P	PRINTED CIRCUIT BOARD
F1U	FUSE (Ⓑ5A/250V)	A3P	PRINTED CIRCUIT BOARD
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)	BS1	PUSH BUTTON(ON/OFF)
KPR	MAGNETIC RELAY(M1P)	H1P	LIGHT EMITTING DIODE (ON-RED)
M1F	MOTOR(INDOOR FAN)	H2P	LIGHT EMITTING DIODE (TIMER-GREEN)
M1P	MOTOR(DRAIN PUMP)		
M1S	MOTOR(SWING FLAP)	H3P	LIGHT EMITTING DIODE (FILTER SIGN-RED)
Q1M	THERMO SWITCH(M1F EMBEDDED)		
R1T	THERMISTOR(AIR)	H4P	LIGHT EMITTING DIODE (DEFROST-ORANGE)
R2T·3T	THERMISTOR(COIL)		
S1L	FLOAT SWITCH	SS1	SELECTOR SWITCH (MAIN/SUB)
T1R	TRANSFOMER(208-230V/22V)		
V1TR	TRIAC	SS2	SELECTOR SWITCH (WIRELESS ADDRESS SET)
X1M	TERMINAL STRIP(POWER)		
X2M	TERMINAL STRIP(CONTROL)	CONNECTOR FOR OPTIONAL PARTS	
Y1E	ELECTRONIC EXPANSION VALVE	X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTORICAL APPENDICES)
WIRED REMOTE CONTROLLER		X23A	CONNECTOR(WIRELESS REMOTE CONTROLLER)
R1T	THERMISTOR(AIR)		
SS1	SELECTOR SWITCH(MAIN/SUB)		

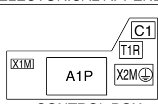


NOTES)
1. ▭▭▭▭ : TERMINAL
   ◎◎ , ⫼ : CONNECTOR
   ▬▮▮▬ : FIELD WIRING
2. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTION MANUAL.
3. X23A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS BEING USED.
4. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER.
   IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
5. SYMBOLS SHOW AS FOLLOWS
   (BLK:BLACK BLU:BLUE ORG:ORANGE PNK:PINK
   RED:RED WHT:WHITE YLW:YELLOW)
6. USE COPPER CONDUCTORS ONLY.

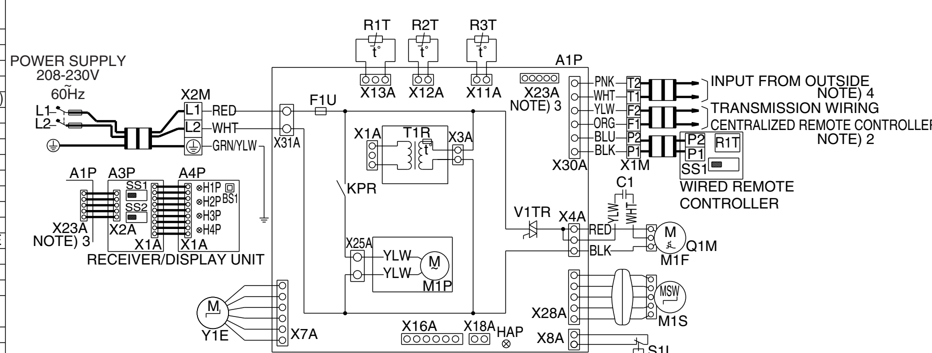
3D042620C

FXZQ07M/09M/12M/18M7VJU

A1P	PRINTED CIRCUIT BOARD
C1	CAPACITOR (M1F)
F1U	FUSE (Ⓑ, 5A, 250V)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)
KPR	MAGNETIC RELAY (M1P)
M1F	MOTOR (INDOOR FAN)
M1P	MOTOR (DRAIN PUMP)
M1S	MOTOR (SWING FLAP)
Q1M	THERMAL PROTECTOR (M1F EMBEDDED)
R1T	THERMISTOR (AIR)
R2T	THERMISTOR (COIL-LIQUID)
R3T	THERMISTOR (COIL-GAS)
S1L	FLOAT SWITCH
T1R	TRANSFORMER (208-230V/22V)
V1TR	TRIAC
X1M	TERMINAL BLOCK
X2M	TERMINAL BLOCK
Y1E	ELECTRONIC EXPANSION VALVE
WIRED REMOTE CONTROLLER	
R1T	THERMISTOR (AIR)
SS1	SELECTOR SWITCH (MAIN/SUB)
WIRELESS REMOTE CONTROLLER (RECEIVER/DISPLAY UNIT)	
A3P	PRINTED CIRCUIT BOARD
A4P	PRINTED CIRCUIT BOARD
BS1	PUSH BUTTON (ON/OFF)
H1P	LIGHT EMITTING DIODE (ON-RED)
H2P	LIGHT EMITTING DIODE (TIMER-GREEN)
H3P	LIGHT EMITTING DIODE (FILTER SIGN-RED)
H4P	LIGHT EMITTING DIODE (DEFROST-ORANGE)
SS1	SELECTOR SWITCH (MAIN/SUB)
SS2	SELECTOR SWITCH (WIRELESS ADDRESS SET)
CONNECTOR FOR OPTIONAL PARTS	
X16A	CONNECTOR (ADAPTOR FOR WIRING)
X18A	CONNECTOR (WIRING ADAPTOR FOR ELECTORICAL APPENDICES)



CONTROL BOX

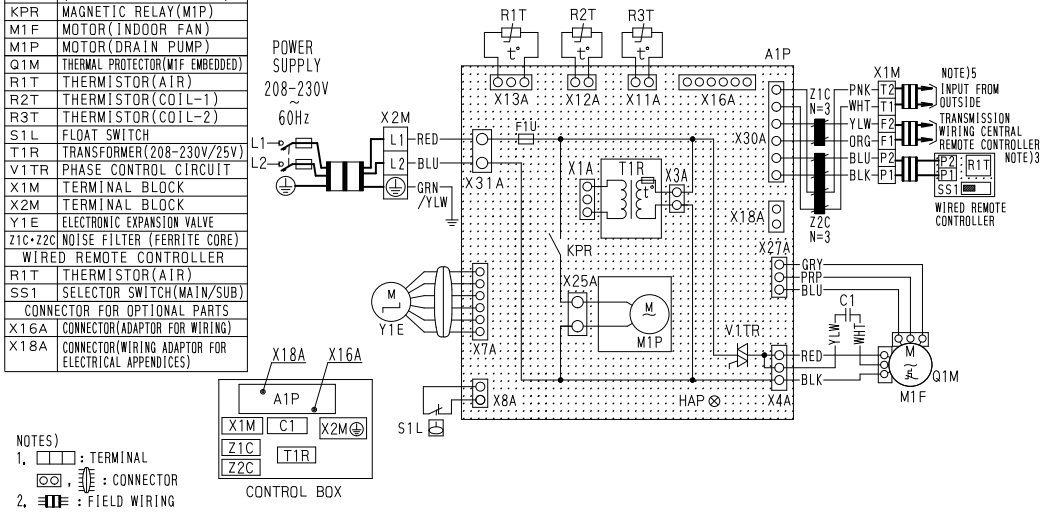


NOTES)
1. ▭▭ : TERMINAL
   ◎◎, ⫼ : CONNECTOR
   ▬▮▬ : FIELD WIRING
2. IN CASE USING CENTRALIZED REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
3. X23A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS BEING USED.
4. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
5. REMOTE CONTROLLER MODEL VARIES ACCORDING TO THE COMBINATION SYSTEM, CONFIRM ENGINEERING MATERIALS AND CATALOGS, ETC. BEFORE CONNECTING.
6. SYMBOLS SHOW AS FOLLOWS: RED : RED BLK : BLACK WHT : WHITE YLW : YELLOW PNK : PINK ORG : ORANGE GRN : GREEN BLU : BLUE

3D059263

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

A1P	PRINTED CIRCUIT BOARD
C1	CAPACITOR(M1F)
F1U	FUSE(F5A/250V)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)
KPR	MAGNETIC RELAY(M1P)
M1F	MOTOR(INDOOR FAN)
M1P	MOTOR(DRAIN PUMP)
Q1M	THERMAL PROTECTOR(M1F EMBEDDED)
R1T	THERMISTOR(AIR)
R2T	THERMISTOR(COIL-1)
R3T	THERMISTOR(COIL-2)
S1L	FLOAT SWITCH
T1R	TRANSFORMER(208-230V/25V)
V1TR	PHASE CONTROL CIRCUIT
X1M	TERMINAL BLOCK
X2M	TERMINAL BLOCK
Y1E	ELECTRONIC EXPANSION VALVE
Z1C・Z2C	NOISE FILTER (FERRITE CORE)
WIRED REMOTE CONTROLLER	
R1T	THERMISTOR(AIR)
SS1	SELECTOR SWITCH(MAIN/SUB)
CONNECTOR FOR OPTIONAL PARTS	
X16A	CONNECTOR(ADAPTOR FOR WIRING)
X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTRICAL APPENDICES)

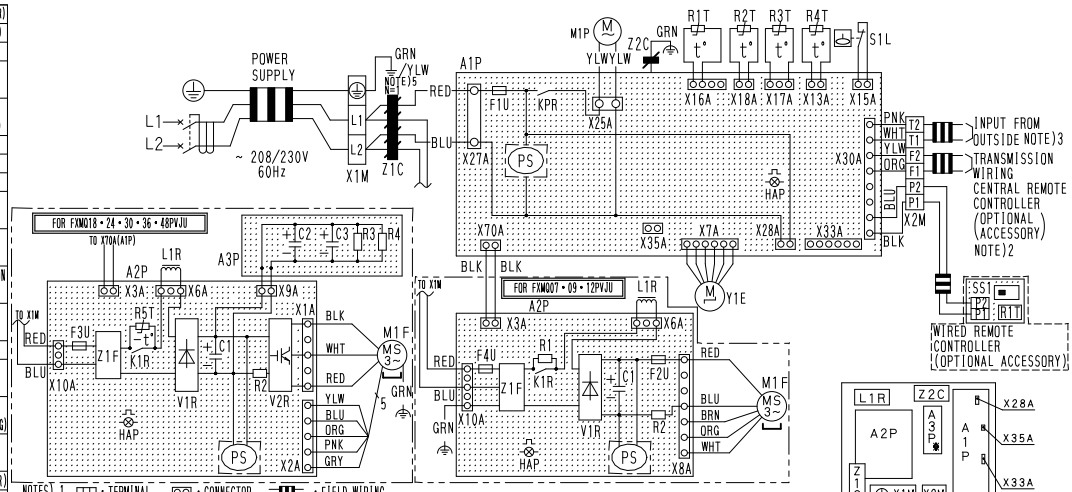


NOTES)
1. □□□ : TERMINAL
   ⊙⊙ , ⫼ : CONNECTOR
2. ⫼ : FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
4. REMOTE CONTROLLER MODEL VARIES ACCORDING TO THE COMBINATION SYSTEM, CONFIRM ENGINEERING MATERIALS AND CATALOGS, ETC. BEFORE CONNECTING.
5. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED TO THE UNIT.
6. SYMBOLS SHOW AS FOLLOWS: RED:RED BLK:BLACK WHT:WHITE YLW:YELLOW PRP:PURPLE GRY:GRAY BLU:BLUE PNK:PINK ORG:ORANGE GRN:GREEN

3D050501A

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

	INDOOR UNIT		
A1P	PRINTED CIRCUIT BOARD	R1T	THERMISTOR(SUCTION AIR)
		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 (POWER SUPPLY)
F4U	FUSE(T, 6, 3A, 250V)		
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		
L1R	REACTOR		
M1F	MOTOR(FAN)	Z1F	NOISE FILTER
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)



NOTES) 1. □□□ : TERMINAL ⊙⊙ : CONNECTOR ⫼ : FIELD WIRING
2. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
3. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
4. COLORS BLK:BLACK RED:RED BLU:BLUE WHT:WHITE PNK:PINK YLW:YELLOW BRN:BROWN GRY:GRAY GRN:GREEN ORG:ORANGE.
NOTES) 5. FOR FXMQ18・24・30・36・48PVJU ARE N=2

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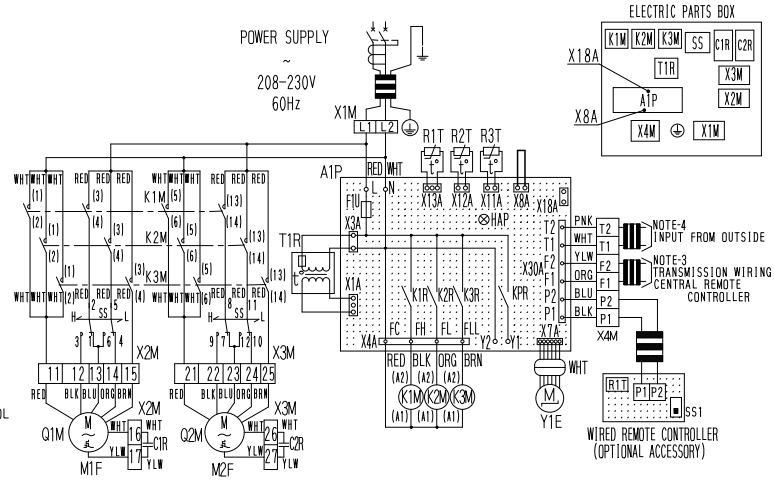
FXMQ72M/96MVJU

INDOOR UNIT		R1T	THERMISTOR(AIR)
A1P	PRINTED CIRCUIT BOARD	R2T・R3T	THERMISTOR(COIL)
C1R・C2R	CAPACITOR (M1F・2F)	SS	SELECTOR SWITCH (STATIC PRESSURE)
F1U	FUSE(Ⓑ,5A, 250V)		
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)	T1R	TRANSFORMER(208V/230V 25VA)
		X1M	TERMINAL BLOCK(POWER)
K1M	MAGNETIC CONTACTOR(M1F・2F)	X2M—X3M	TERMINAL BLOCK
K2M	MAGNETIC CONTACTOR(M1F・2F)	X4M	TERMINAL BLOCK(CONTROL)
K3M	MAGNETIC CONTACTOR(M1F・2F)	Y1E	ELECTRONIC EXPANSION VALVE
K1R—K3R	MAGNETIC RELAY(M1F・2F)	WIRED REMOTE CONTROLLER	
KPR	MAGNETIC RELAY(M1P)	R1T	THERMISTOR(AIR)
M1F・M2F	MOTOR (INDOOR FAN)	SS1	SELECTOR SWITCH(MAIN/SUB)
Q1M・Q2M	THERMO SWITCH (M1F・2F EMBEDDED)	CONNECTOR FOR OPTIONAL PARTS	
		X8A	CONNECTOR(FLOAT SWITCH)
		X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTORICAL APPENDICES)

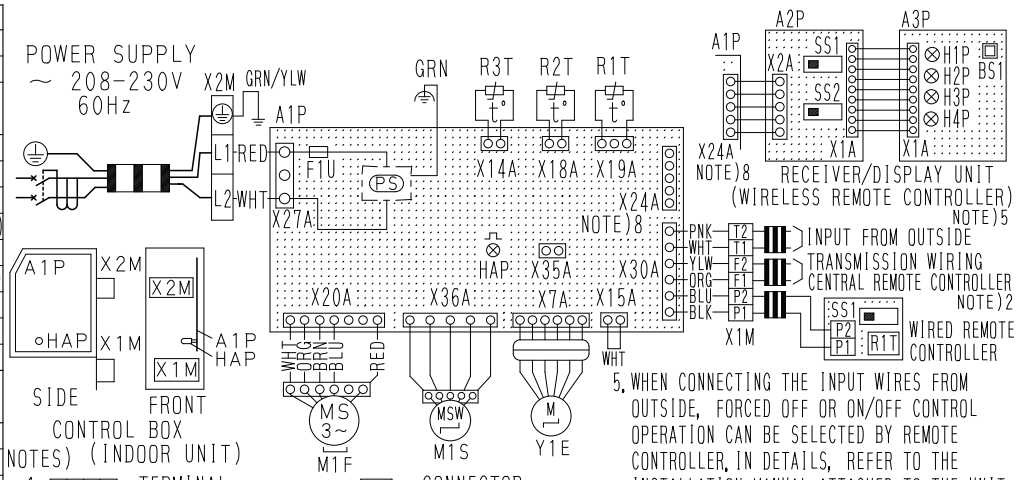
NOTES)
1. : TERMINAL BLOCK
, D—: CONNECTOR
: SHORT CIRCUIT CONNECTOR
: TERMINAL
2. : FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTION MANUAL.
4. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER, IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
5. SYMBOLS SHOW AS FOLLOWS, (PNK:PINK WHT:WHITE YLW:YELLOW ORG:ORANGE BLU:BLUE BLK:BLACK RED:RED BRN:BROWN)
6. USE COPPER CONDUCTORS ONLY.
7. IN CASE HIGH E.S.P. OPERATION , CHANGE THE SWITCH(SS) FOR "H ".



3D065414C

FXAQ07M/09M/12M/18M/24PVJU

INDOOR UNIT					
A1P	PRINTED CIRCUIT BOARD				
F1U	FUSE(T 3.15AH 250V)				
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)				
M1F	MOTOR(INDOOR FAN)				
M1S	MOTOR(SWING FLAP)				
R1T	THERMISTOR(AIR)				
R2T	THERMISTOR(COIL LIQUID PIPE)				
R3T	THERMISTOR(COIL GAS PIPE)				
X1M	TERMINAL BLOCK(CONTROL)				
X2M	TERMINAL BLOCK(POWER)				
Y1E	ELECTRONIC EXPANSION VALVE				
PS	SWITCHING POWER SUPPLY				
RECEIVER/DISPLAY UNIT(ATTACHED TO WIRELESS REMOTE CONTROLLER)					
A2P	PRINTED CIRCUIT BOARD				
A3P	PRINTED CIRCUIT BOARD				
BS1	PUSH BUTTON(ON/OFF)				
H1P	LIGHT EMITTING DIODE(ON-RED)				
H2P	LIGHT EMITTING DIODE (TIMER-GREEN)				
H3P	LIGHT EMITTING DIODE (FILTER SIGN-RED)				
H4P	LIGHT EMITTING DIODE (DEFROST-ORENGE)				
SS1	SELECTOR SWITCH(MAIN/SUB)	WIRED REMOTE CONTROLLER		CONNECTOR FOR OPTIONAL PARTS	
SS2	SELECTOR SWITCH (WIRELESS ADDRESS SET)	R1T	THERMISTOR(AIR)	X15A	CONNECTOR(FLOAT SWITCH)
		SS1	SELECTOR SWITCH(MAIN/SUB)	X35A	CONNECTOR(GROUP CONTROL ADAPTOR)



NOTES) (INDOOR UNIT)
1. : TERMINAL : FIELD WIRING : CONNECTOR : CONNECTOR
2. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
3. SYMBOLS SHOWS AS FOLLOWS: RED:RED WHT:WHITE GRN:GREEN PNK:PINK YLW:YELLOW BLK:BLACK ORG:ORANGE BRN:BROWN BLU:BLUE
4. SHOWS SHORT CIRCUIT CONNECTOR.
5. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER, IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED TO THE UNIT.
6. REMOTE CONTROLLER MODEL VARIES ACCORDING TO THE COMBINATION SYSTEM, CONFIRM ENGINEERING DATA AND CATALOGS, ETC. BEFORE CONNECTING.
7. CONFIRM THE METHOD OF SETTING THE SELECTOR SWITCH(SS1, SS2) OF WIRED REMOTE CONTROLLER AND WIRELESS REMOTE CONTROLLER BY INSTALLATION MANUAL AND ENGINEERING DATA, ETC.
8. X24A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS USED.

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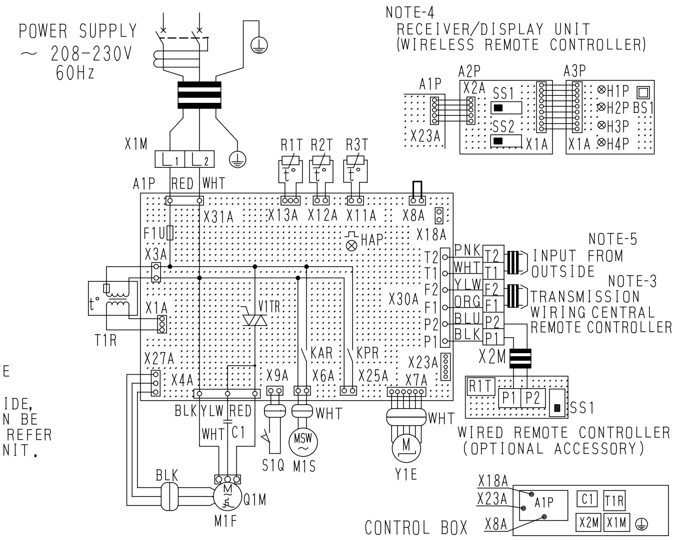
FXHQ12M/24M/36MVJU

INDOOR UNIT	
A1P	PRINTED CIRCUIT BOARD
C1	CAPACITOR (M1F)
F1U	FUSE (Ⓑ5A, 250V)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)
KAR	MAGNETIC RELAY (M1S)
KPR	MAGNETIC RELAY
M1F	MOTOR (INDOOR FAN)
M1S	MOTOR (SWING FLAP)
Q1M	THERMO SWITCH (M1F EMBEDDED)
R1T	THERMISTOR (AIR)
R2T	THERMISTOR (COIL LIQUID)
R3T	THERMISTOR (COIL GAS)
S1Q	LIMIT SWITCH (SWING FLAP)
T1R	TRANSFORMER (208-230V/25V)
V1TR	TRIAC
X1M	TERMINAL BLOCK (POWER)
X2M	TERMINAL BLOCK (CONTROL)
Y1E	ELECTRONIC EXPANSION VALVE
WIRED REMOTE CONTROLLER	
R1T	THERMISTOR (AIR)
SS1	SELECTOR SWITCH (MAIN/SUB)
RECEIVER/DISPLAY UNIT (ATTACHED TO WIRELESS REMOTE CONTROLLER)	
A2P	PRINTED CIRCUIT BOARD
A3P	PRINTED CIRCUIT BOARD
BS1	PUSH BUTTON (ON/OFF)
H1P	LIGHT EMITTING DIODE (ON-RED)
H2P	LIGHT EMITTING DIODE (TIMER-GREEN)
H3P	LIGHT EMITTING DIODE (FILTER SIGN-RED)
H4P	LIGHT EMITTING DIODE (DEFROST-ORANGE)
SS1	SELECTOR SWITCH (MAIN/SUB)
SS2	SELECTOR SWITCH (WIRELESS ADDRESS SET)
CONNECTOR FOR OPTIONAL PARTS	
X18A	CONNECTOR (WIRING ADAPTOR FOR ELECTRICAL APPENDICES)
X23A	CONNECTOR (WIRELESS REMOTE CONTROLLER)

NOTES)
1. ▭▭▭ : TERMINAL BLOCK ⊡⊡, ⊐⊏ : CONNECTOR
   ⊡⊐ : SHORT CIRCUIT CONNECTOR
2. ═▮▮═ : FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTION MANUAL.
4. X23A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS BEING USED.
5. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
6. SYMBOLS SHOW AS FOLLOWS. (BLU:BLUE BLK:BLACK ORG:ORANGE PNK:PINK RED:RED WHT:WHITE YLW:YELLOW)
7. USE COPPER CONDUCTORS ONLY.



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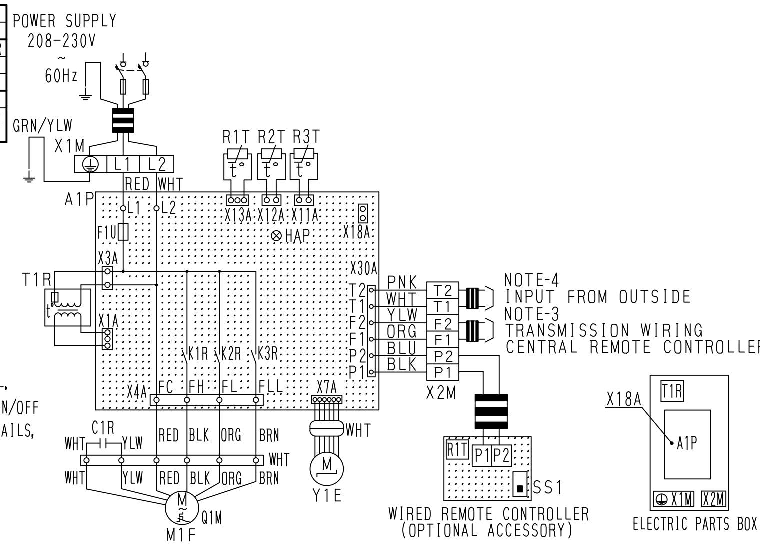
FXLQ12M/18M/24MVJU9
FXNQ12M/18M/24MVJU9

INDOOR UNIT	
A1P	PRINTED CIRCUIT BOARD
C1R	CAPACITOR (M1F)
F1U	FUSE (Ⓑ5A, 250V)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)
K1R-K3R	MAGNETIC RELAY (M1F)
M1F	MOTOR (INDOOR FAN)
Q1M	THERMO SWITCH (M1F EMBEDDED)
R1T	THERMISTOR (AIR)
R2T・R3T	THERMISTOR (COIL)
T1R	TRANSFORMER (208-230V/25V)
X1M	TERMINAL BLOCK (POWER)
X2M	TERMINAL BLOCK (CONTROL)
Y1E	ELECTRONIC EXPANSION VALVE
WIRED REMOTE CONTROLLER	
R1T	THERMISTOR (AIR)
SS1	SELECTOR SWITCH (MAIN/SUB)
CONNECTOR FOR OPTIONAL PARTS	
X18A	CONNECTOR (WIRING ADAPTOR FOR ELECTORICAL APPENDICES)

NOTES)
1. ▭▭▭ : TERMINAL BLOCK, ⊡⊡, ⊐— : CONNECTOR, -o- : TERMINAL
2. ═▮▮═ : FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
4. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED TO THE UNIT.
5. SYMBOLS SHOW AS FOLLOWS. (PNK:PINK WHT:WHITE YLW:YELLOW ORG:ORANGE BLU:BLUE BLK:BLACK RED:RED BRN:BROWN)
6. USE COPPER CONDUCTORS ONLY.



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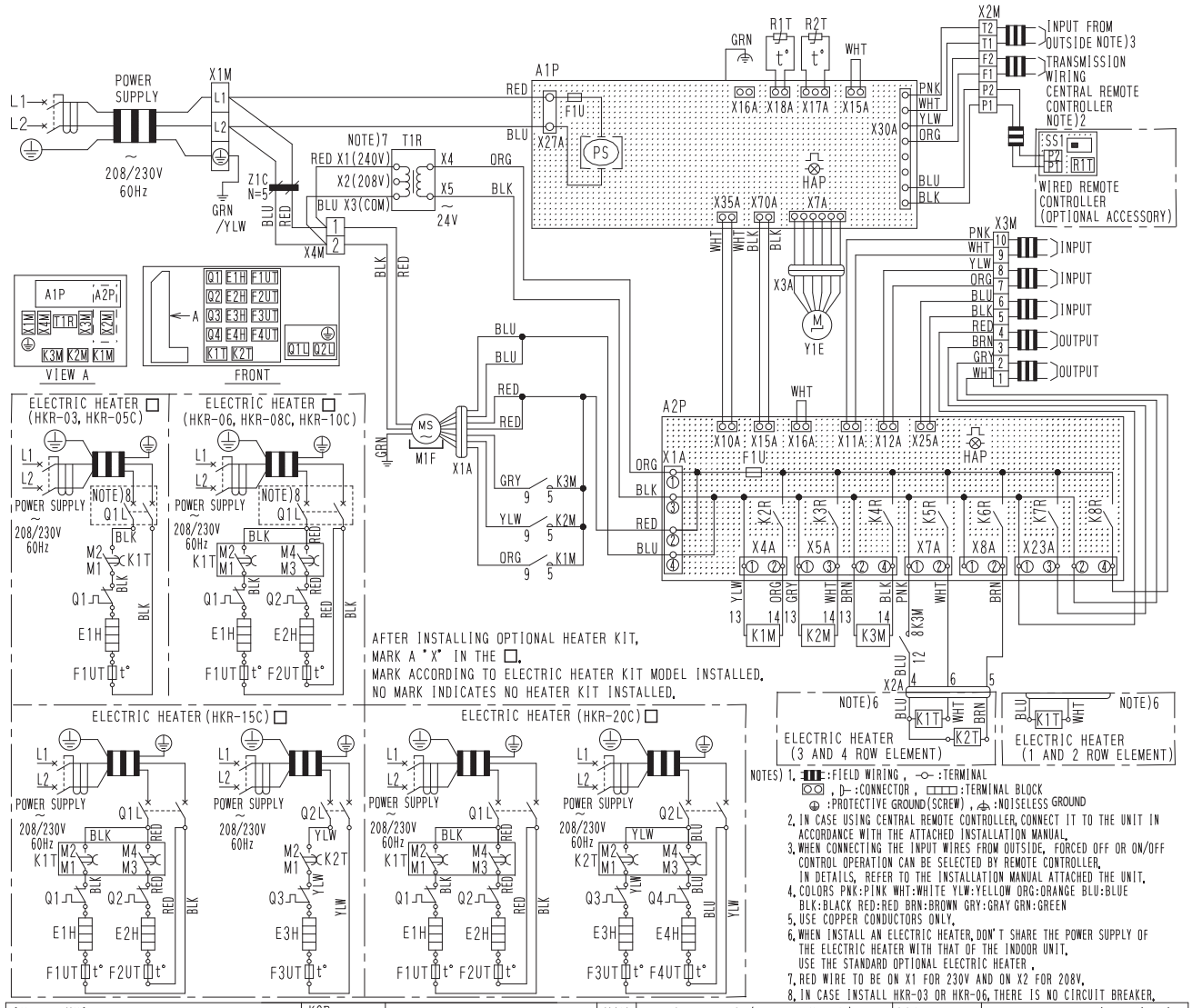
FXTQ12PAVJU / FXTQ18PAVJU / FXTQ24PAVJU / FXTQ30PAVJU / FXTQ36PAVJU / FXTQ42PAVJU / FXTQ48PAVJU / FXTQ54PAVJU



INDOOR UNIT		K2R ~ K8R	MAGNETIC RELAY(A2P)	X1M	TERMINAL STRIP(POWER SUPPLY)	SS1	SELECTOR SWITCH(MAIN/SUB)
A1P	PRINTED CIRCUIT BOARD(MAIN)			X2M	TERMINAL STRIP(CONTROL)	ELECTRIC HEATER	
A2P	PRINTED CIRCUIT BOARD(SUB)	M1F	MOTOR(FAN)	X3M	TERMINAL STRIP(CONTROL)	E1H～E4H	ELECTRIC HEATER
F1U	FUSE(T, 3, 15A, 250V) FOR (A1P, A2P)	PS	SWITCHING POWER SUPPLY(A1P)	X4M	TERMINAL STRIP(POWER SUPPLY)	F1UT～F4UT	TEMPERATURE FUSE(199, 4 °F)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)(A1P, A2P)	R1T	THERMISTOR(LIQUID)	Y1E	ELECTRONIC EXPANSION VALVE	K1T, K2T	TIME DELAY RELAY
		R2T	THERMISTOR(GAS)	Z1C	NOISE FILTER(FERRITE CORE)	Q1～Q4	THERMAL LIMIT
K1M ~ K3M	MAGNETIC RELAY	T1R	TRANSFORMER 208V/24V, 240V/24V	WIRED REMOTE CONTROLLER		Q1L, Q2L	CIRCUIT BREAKERS
		X1A～X3A	CONNECTOR	R1T	THERMISTOR(AIR)		

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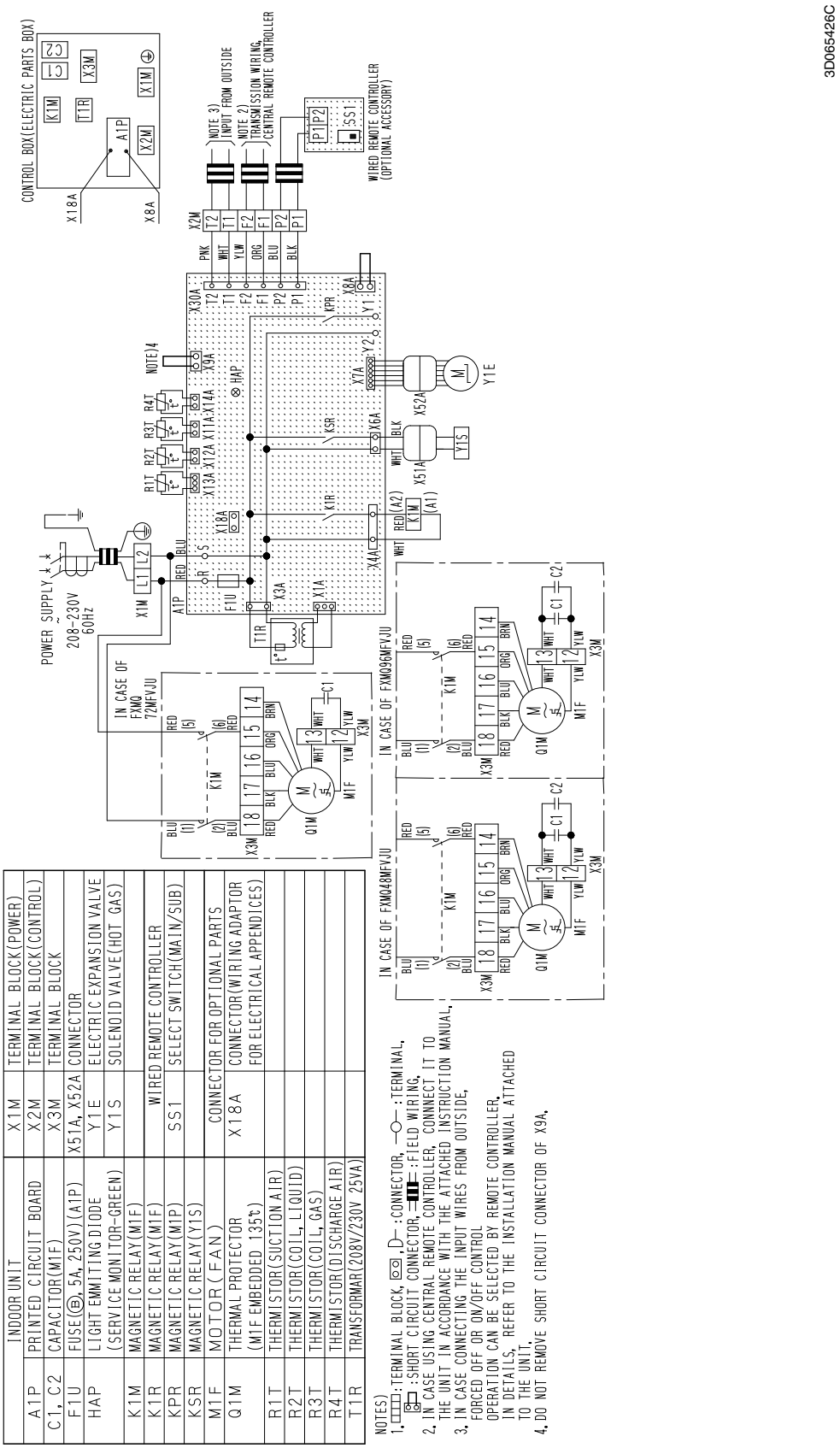
2.4 Air Treatment Equipment

FXMQ48MF/72MF/96MFVJU

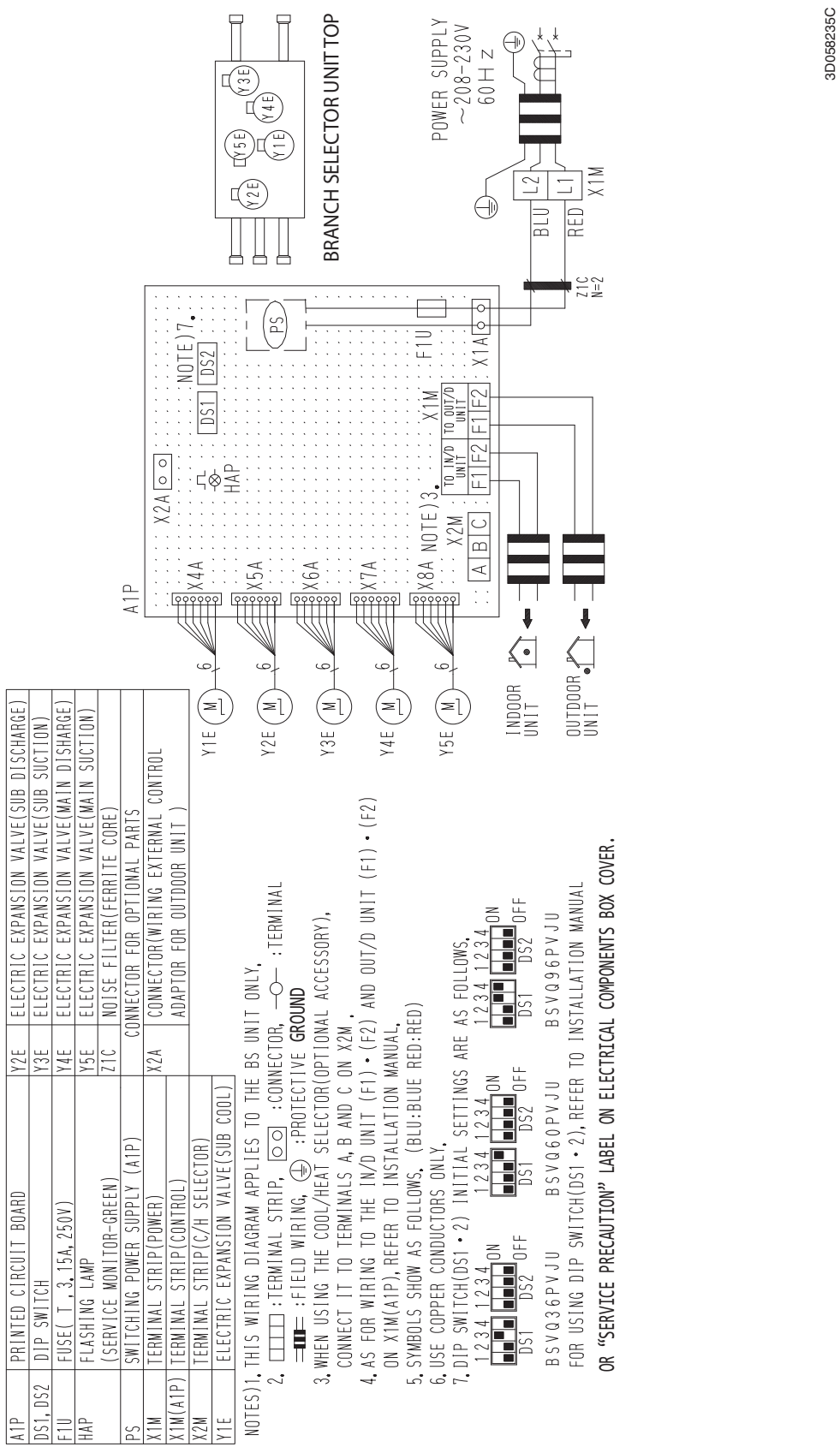


INDOOR UNIT		X1M	TERMINAL BLOCK(POWER)
A1P	PRINTED CIRCUIT BOARD	X2M	TERMINAL BLOCK(CONTROL)
C1, C2	CAPACITOR(M1F)	X3M	TERMINAL BLOCK
F1U	FUSE(Ⓑ, 5A, 250V)(A1P)	X51A, X52A	CONNECTOR
HAP	LIGHT EMMITING DIODE (SERVICE MONITOR-GREEN)	Y1E	ELECTRIC EXPANSION VALVE
		Y1S	SOLENOID VALVE(HOT GAS)
K1M	MAGNETIC RELAY(M1F)		
K1R	MAGNETIC RELAY(M1F)		WIRED REMOTE CONTROLLER
KPR	MAGNETIC RELAY(M1P)	SS1	SELECT SWITCH(MAIN/SUB)
KSR	MAGNETIC RELAY(Y1S)		
M1F	MOTOR(FAN)		CONNECTOR FOR OPTIONAL PARTS
Q1M	THERMAL PROTECTOR (M1F EMBEDDED 135℃)	X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTRICAL APPENDICES)
R1T	THERMISTOR(SUCTION AIR)		
R2T	THERMISTOR(COIL, LIQUID)		
R3T	THERMISTOR(COIL, GAS)		
R4T	THERMISTOR(DISCHARGE AIR)		
T1R	TRANSFORMAR(208V/230V 25VA)		

NOTES)
1. □□:TERMINAL BLOCK, ▭,D-:CONNECTOR, —○—:TERMINAL, ⊗:SHORT CIRCUIT CONNECTOR, ═:FIELD WIRING,
2. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTION MANUAL.
3. IN CASE CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED TO THE UNIT.
4. DO NOT REMOVE SHORT CIRCUIT CONNECTOR OF X9A.

2.5 Branch Selector Unit

BSVQ36P/60P/96PVJU



3. Option List

3.1 Option List of Controllers

Optional Accessories of Operation Control System

No.	Item	Type	FXFQ~PVJU	FXZQ-MVJU	FXMQ~PVJU	FXAQ~PVJU	FXLQ~MVJU9 FXNQ~MVJU9	FXHQ~MVJU	FXDQ~MVJU	FXTQ-PAVJU
1	Remote controller	Wireless	BRC7F812	BRC7E530W	BRC4C82	BRC7E818	—	BRC7E83	BRC4C82	—
		Wired	BRC1E71							
			BRC1D71							
2	Set back time clock		BRC15A71							
3	Remote sensor		KRCS01-1							KRCS01-4B
4	Installation box for adaptor PCB		KRP1B98	KRP1BA101	—			KRP1C93	KRP1B101	
5	Centralized remote controller		DCS302C71							
5-1	Electrical Components Box		KJB311AA							
6	Unified on/off controller		DCS301C71							
6-1	Electrical Components Box		KJB212AA							
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	—	KRC1C75
12	Wiring adaptor for electrical appendices (2)		∗KRP4A73	KRP4A53	KRP4A71			∗KRP4A72	∗KRP4A74	

C:3D043022D

Note:

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.

Note:

∗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 Lists (Outdoor Unit)

RXYQ72~360PB

Series			VRV III				
Models / Optional accessories			RXYQ72PBYD RXYQ96PBYD RXYQ72PBTJ RXYQ96PBTJ	RXYQ120PBYD RXYQ120PBTJ RXYQ144PBTJ	RXYQ144PBYD RXYQ168PBYD RXYQ168PBTJ	RXYQ192PBYD RXYQ216PBYD RXYQ240PBYD RXYQ192PBTJ RXYQ216PBTJ RXYQ240PBTJ	RXYQ264PBYD RXYQ288PBYD RXYQ312PBYD RXYQ336PBYD RXYQ360PBYD RXYQ264PBTJ RXYQ288PBTJ RXYQ312PBTJ RXYQ336PBTJ RXYQ360PBTJ
Distributive piping	Refnet header	Model	KHRP26M22H (Max. 4 branch) KHRP26M33H (Max. 8 branch)	KHRP26M22H (Max. 4 branch) KHRP26M33H (Max. 8 branch) KHRP26M72H (Max. 8 branch)		KHRP26M22H (Max. 4 branch) KHRP26M33H (Max. 8 branch) KHRP26M72H (Max. 8 branch) KHRP26M73HU (Max. 8 branch)	
		AS No.	AS3802560	AS3802560		AS3803567	
		Z No.	—	—		—	
	Refnet joint	Model	KHRP26M22T KHRP26M33T	KHRP26M22T KHRP26M33T KHRP26M72TU		KHRP26M22T KHRP26M33T KHRP26M72TU KHRP26M73TU	
		AS No.	AS3802560 (KHRP26M22T, KHRP26M33T)	AS3803118 (KHRP26M72TU)		AS3803566 (KHRP26M73TU)	
		Z No.	—	—		—	
Outdoor unit multi connection piping kit		Model	—		BHFP22P100U		BHFP22P151U
		AS No.	—		—		
		Z No.	—		—		

C: 3D060089D

REYQ72~336PB

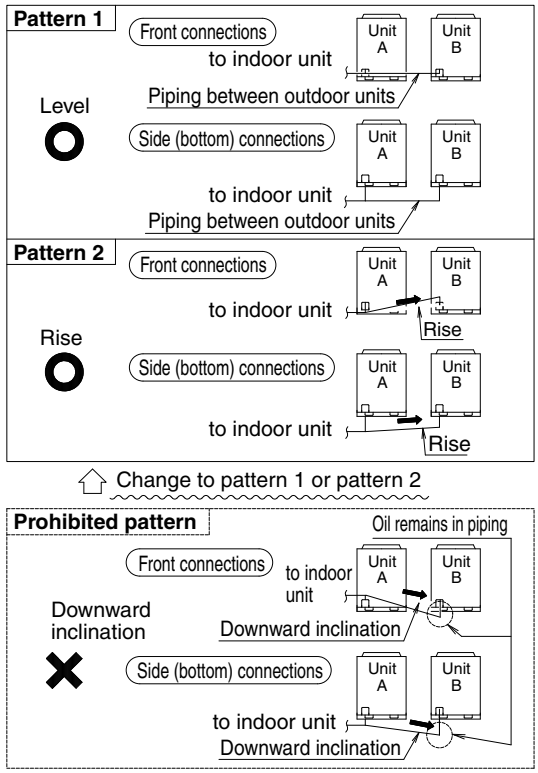
Series			VRV III				
Models / Optional accessories			REYQ72PBYD REYQ72PBTJ	REYQ96PBYD REYQ120PBYD REYQ96PBTJ REYQ120PBTJ REYQ144PBTJ	REYQ144PBYD REYQ168PBYD REYQ168PBTJ	REYQ192PBYD REYQ216PBYD REYQ240PBYD REYQ192PBTJ REYQ216PBTJ REYQ240PBTJ	REYQ264PBYD REYQ288PBYD REYQ312PBYD REYQ336PBYD REYQ264PBTJ REYQ288PBTJ REYQ312PBTJ REYQ336PBTJ
Distributive piping	Refnet header	Model	KHRP25M33H (Max. 8 branch)	KHRP25M33H (Max. 8 branch) KHRP25M72H (Max. 8 branch)		KHRP25M33H (Max. 8 branch) KHRP25M72H (Max. 8 branch) KHRP25M73HU (Max. 8 branch)	
		AS No.	—	—		—	
		Z No.	—	—		—	
	Refnet joint	Model	KHRP25M22T KHRP25M33T	KHRP25M22T KHRP25M33T KHRP25M72TU		KHRP25M22T KHRP25M33T KHRP25M72TU KHRP25M73TU	
		AS No.	—	AS3803118 (KHRP25M72TU)		AS3803566 (KHRP25M73TU)	
		Z No.	—	—		—	
Outdoor unit multi connection piping kit		Model	—		BHFP26P90U		BHFP26P136U
		AS No.	—		—		—
		Z No.	—		—		—

C: 3D059681C

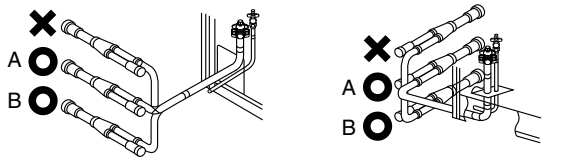
4. Piping Installation Point

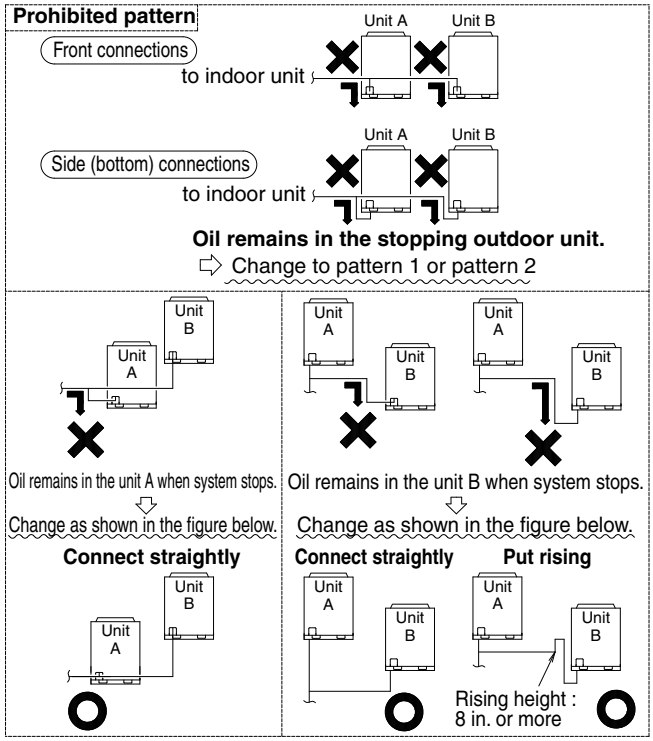
4.1 Piping between Outdoor Units

(1) The piping between outdoor units must be installed level (Pattern 1) or with a rise (Pattern 2). Otherwise oil may pool in the pipes.

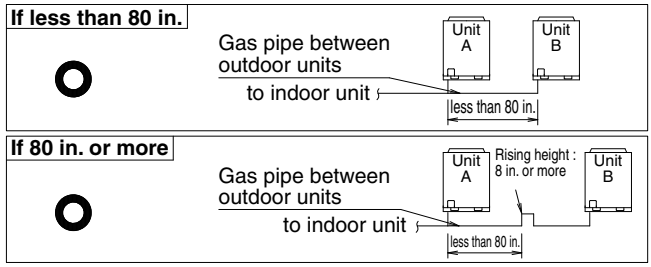


(2) To avoid the risk of oil detention in the stopping unit, always connect the stop valve and the piping between outdoor units as shown A or B in the figure below.



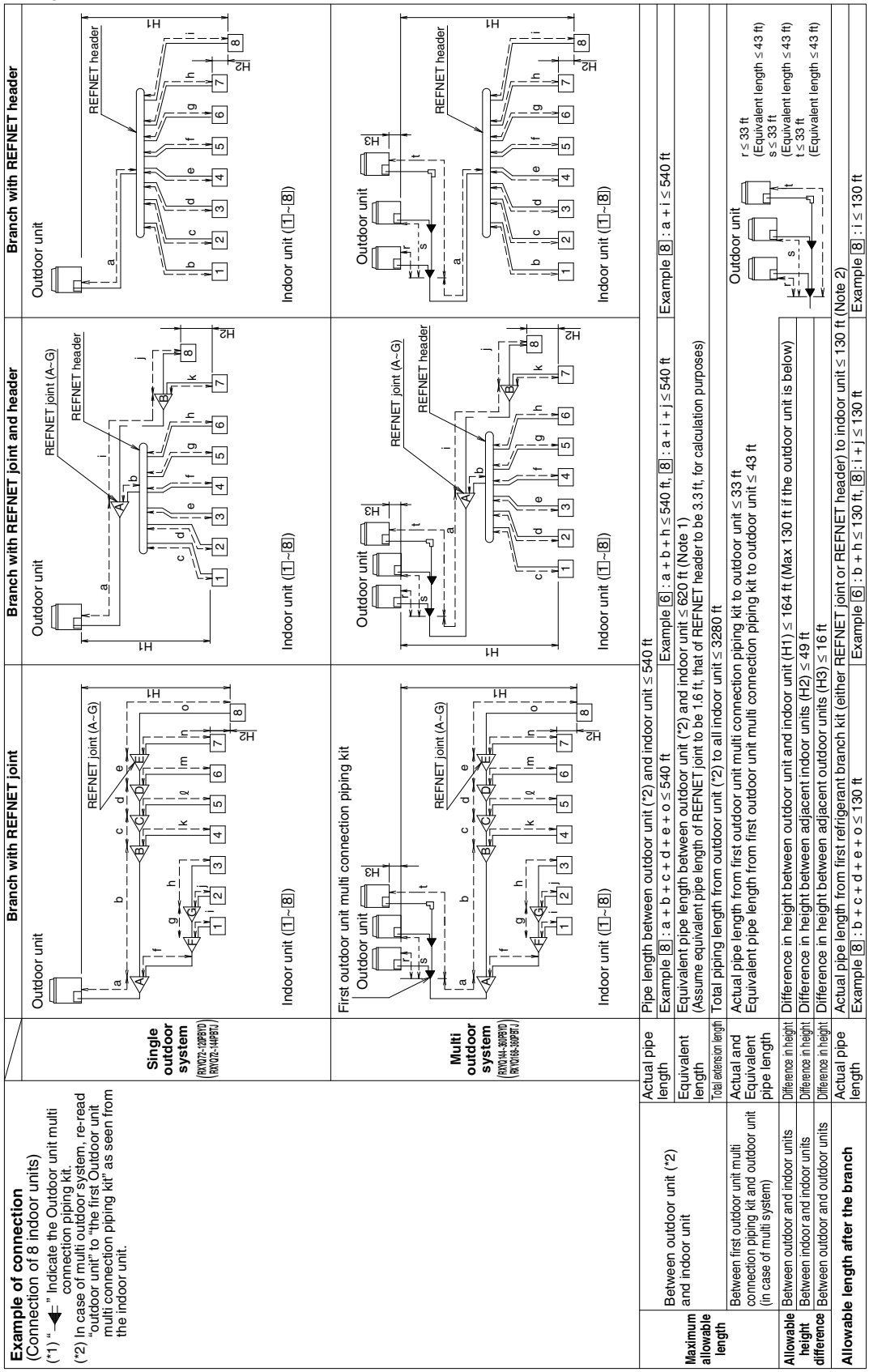


(3) If the piping length between the outdoor units exceeds 80 in., create a rise of 8 in. or more in the gas piping under a length of 80 in. from the outdoor unit multi connection piping kit.



5. Example of Connection

Heat Pump



3P215731-10R

Outdoor unit multi connection piping kit and Refrigerant branch kit selection

- Refrigerant branch kits can only be used with R410A.
- When multi outdoor system are installed, be sure to use the special separately sold Outdoor unit multi connection piping kit. (BHFP22P100U), (BHFP22P151U)
  (For how to select the proper kit, follow the table at right.)
- Never use BHFP26M90U, BHFP22M90U for M type of this series or T joint (field supplied).

How to select the REFNET joint

- When using REFNET joint at the first branch counted from the outdoor unit side, choose from the following table in accordance with the outdoor unit capacity type. (Example :REFNET joint A)

Outdoor unit capacity type	Refrigerant branch kit name
RXYQ72 · 96P type	KHRP26M33T
RXYQ120 ~ 216P type	KHRP26M72TU9
RXYQ240P ~ 360P type	KHRP26M73TU9

- Choose the REFNET joints other than the first branch from the following table in a accordance with the total capacity index of all the indoor units connected below the REFNET joint.

Indoor unit total capacity index	Refrigerant branch kit name
x < 72	KHRP26M22T
72 ≤ x < 111	KHRP26M33T
111 ≤ x < 246	KHRP26M72TU9
246 ≤ x	KHRP26M73TU9

How to select the REFNET header

- Choose form the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.

Indoor unit total capacity index	Refrigerant branch kit name
x < 72	KHRP26M22H9 or KHRP26M33H9
72 ≤ x < 111	KHRP26M33H9
111 ≤ x < 230	KHRP26M72H9
230 ≤ x	KHRP26M73H9

How to select the outdoor unit multi connection piping kit
(This is required when the system is multi outdoor unit system.)

- Choose from the following table in accordance with the number of outdoor units.

Number of outdoor unit	Connecting piping kit name
2 units	BHFP22P100U
3 units	BHFP22P151U

Example for indoor units connected downstream

Example REFNET joint C : Indoor units 5+6+7+8

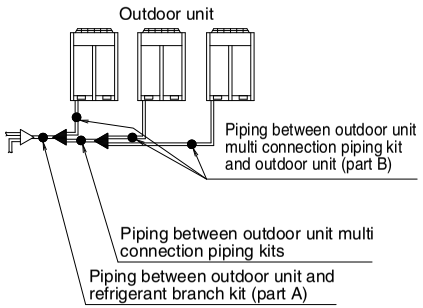
Example REFNET joint B : Indoor units 7+8
Example REFNET header : Indoor units 1+2+3+4+5+6

Example REFNET header : indoor units 1+2+3+4+5+6+7+8

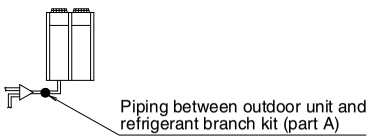
Pipe size selection

⚠ The thickness and material shall be selected in accordance with local code.

For an outdoor unit installation, make the settings in accordance with the following figure.



<In case of RXYQ144PBTJ>



Piping between outdoor unit (*2) and refrigerant branch kit (part A)

- Choose from the following table in accordance with the outdoor units system capacity type. (unit : in.)

Outdoor unit capacity type	Piping size (O. D.)	
	Gas pipe	Liquid pipe
RXYQ72P type	ϕ3/4	ϕ3/8
RXYQ96P type	ϕ7/8	
RXYQ120P type	ϕ1-1/8	ϕ1/2
RXYQ144P type		
RXYQ168P type		ϕ5/8
RXYQ192 · 216P type		
RXYQ240P type	ϕ1-3/8	
RXYQ264~336P type		ϕ3/4
RXYQ360P type	ϕ1-5/8	

Piping between outdoor unit multi connection piping kit and outdoor unit (part B)

- Choose from the following table in accordance with the capacity type of the outdoor unit connected. (unit : in.)

Outdoor unit capacity type	Piping size (O. D.)	
	Gas pipe	Liquid pipe
RXYQ72P type	ϕ3/4	ϕ3/8
RXYQ96P type	ϕ7/8	
RXYQ120P type	ϕ1-1/8	ϕ1/2

Piping between refrigerant branch kits

- Choose from the following table in accordance with the total capacity type of all the indoor units connected downstream.

*1 Connection piping must not exceed the refrigerant Piping size between outdoor unit and refrigerant branch kit (part A) (unit : in.)

Indoor capacity index	Piping size (O. D.)	
	Gas pipe	Liquid pipe
x < 54	ϕ5/8	ϕ3/8
54 ≤ x < 72	ϕ3/4	
72 ≤ x < 111	ϕ7/8	
111 ≤ x < 162	ϕ1-1/8	ϕ1/2
162 ≤ x < 230		ϕ5/8
230 ≤ x < 300	ϕ1-3/8	ϕ3/4
300 ≤ x	ϕ1-5/8	

Piping between refrigerant branch kit and indoor unit.

- Match to the size of the connection piping on the indoor unit. (unit : in.)

Indoor unit capacity type	Piping size (O. D.)	
	Gas pipe	Liquid pipe
07 · 09 · 12 · 18	ϕ1/2	ϕ1/4
24 · 30 · 36 · 48 · 54	ϕ5/8	ϕ3/8
72	ϕ3/4	
96	ϕ7/8	

How to calculate the additional refrigerant to be charged

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

$$R = \left(\begin{array}{l} (\text{Total length (ft) of liquid piping size at } \phi 7/8) \times 0.249 + (\text{Total length (ft) of liquid piping size at } \phi 3/4) \times 0.175 \\ + (\text{Total length (ft) of liquid piping size at } \phi 5/8) \times 0.121 + (\text{Total length (ft) of liquid piping size at } \phi 1/2) \times 0.081 \\ + (\text{Total length (ft) of liquid piping size at } \phi 3/8) \times 0.040 + (\text{Total length (ft) of liquid piping size at } \phi 1/4) \times 0.015 \end{array} \right) +$$

HEAT PUMP SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
RXYQ96, 120, 216, 240, 336, 360P	0.0 lb
RXYQ72, 168, 192, 264, 288, 312P	1.1 lb
RXYQ144PBYD	2.2 lb
RXYQ144PBTJ	7.9 lb

+

REFRIGERANT AMOUNT FOR EXCEEDINGCONNECTION CAPACITY OF INDOOR UNIT		
INDOOR CONNECTION CAPACITY	MODEL NAME	
	RXYQ72 ~ 312PBYD RXYQ72 ~ 312PBTJ	RXYQ336 · 360PBYD RXYQ336 · 360PBTJ
MORE THAN 100% 120% OR LESS	1.1 lb	
MORE THAN 120% 130% OR LESS	1.1 lb	2.2 lb

Example for refrigerant branch using REFNET joint and REFNET header for systems and each pipe length as shown below.

Outdoor system : RXYQ240PBYD
Total capacity of indoor unit : 116%

a : ϕ3/4 × 15ft.	e : ϕ3/8 × 5ft.	i : ϕ3/8 × 5ft.	m : ϕ3/8 × 10ft.	r : ϕ1/2 × 1ft.
b : ϕ3/4 × 10ft.	f : ϕ3/8 × 5ft.	j : ϕ3/8 × 5ft.	n : ϕ3/8 × 5ft.	s : ϕ3/8 × 1ft.
c : ϕ3/8 × 5ft.	g : ϕ3/8 × 5ft.	k : ϕ3/8 × 10ft.	o : ϕ1/4 × 5ft.	t : ϕ3/8 × 1ft.
d : ϕ3/8 × 5ft.	h : ϕ3/8 × 5ft.	ℓ : ϕ3/8 × 10ft.	p : ϕ1/4 × 5ft.	u : ϕ5/8 × 1ft.

$$R = (\underbrace{25 \times 0.175}_{a,\,b} + \underbrace{1 \times 0.121}_{u} + \underbrace{1 \times 0.081}_{r} + \underbrace{75 \times 0.040}_{c\sim n,\,s,\,t} + \underbrace{10 \times 0.015}_{o,\,p}) + \underbrace{1.1}_{116\%}$$

$$= 12.127 \Longrightarrow \boxed{12.1\ \text{lb}}$$

Round off in units of 0.1 lb.

Note 1.

When the equivalent pipe length between outdoor and indoor units is 295 ft or more, the size of main pipes (both gas side and liquid side (refer to figure 16) must be increased according to the right table.

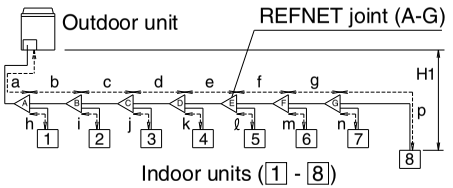
(Refer to figure 16)
1.Outdoor unit
2.Main pipes
3.Increase
4.First refrigerant branch kit
5.Indoor unit

System	Gas pipe	Liquid pipe
RXYQ72P type	ϕ3/4 → ϕ7/8	ϕ3/8 → ϕ1/2
RXYQ96P type	ϕ7/8 → ϕ1	ϕ3/8 → ϕ1/2
RXYQ120P type	Not Increased	ϕ1/2 → ϕ5/8
RXYQ144P type	ϕ1-1/8 → ϕ1-1/4	ϕ1/2 → ϕ5/8
RXYQ168P type	ϕ1-1/8 → ϕ1-1/4	ϕ5/8 → ϕ3/4
RXYQ192P type	ϕ1-1/8 → ϕ1-1/4	ϕ5/8 → ϕ3/4
RXYQ216P type	ϕ1-1/8 → ϕ1-1/4	ϕ5/8 → ϕ3/4
RXYQ240P type	Not Increased	ϕ5/8 → ϕ3/4

System	Gas pipe	Liquid pipe
RXYQ264P	ϕ1-3/8 → ϕ1-1/2	ϕ3/4 → ϕ7/8
RXYQ288P	ϕ1-3/8 → ϕ1-1/2	ϕ3/4 → ϕ7/8
RXYQ312P	ϕ1-3/8 → ϕ1-1/2	ϕ3/4 → ϕ7/8
RXYQ336P	ϕ1-3/8 → ϕ1-1/2	ϕ3/4 → ϕ7/8
RXYQ360P	Not Increased	ϕ3/4 → ϕ7/8

Note 2.

Allowable length after the first refrigerant branch kit to indoor units is 130 ft or less, however it can be extended up to 295 ft if all the following conditions are satisfied. (In case of “Branch with REFNET joint”)

Required Conditions	Example Drawings	
1. It is necessary to increase the pipe size if the pipe length between the first branch kit and the final branch kit is over than 130 ft. (Reducers must be procured on site) If the increased pipe size is larger than main pipe size, then increase the main pipe size to the same pipe size.	8 b+c+d+e+f+g+p≤ 295 ft. increase the pipe size of b, c, d, e, f, g	Increase the pipe size as follows ϕ3/8 → ϕ1/2 ϕ5/8 → ϕ3/4 ϕ7/8 → ϕ1* ϕ1-3/8 → ϕ1-1/2* ϕ1/2 → ϕ5/8 ϕ3/4 → ϕ7/8 ϕ1-1/8 → ϕ1-1/4*
2. For calculation of Total extension length, the actual length of above pipes must be doubled. (except main pipe and the pipes that are not increased)	a+b×2+c×2+d×2+e×2+f×2+g×2 +h+i+j+k+ℓ+m+n+p≤ 3280 ft.	
3. Indoor unit to the nearest branch kit ≤ 130 ft.	h, i, j..... p ≤ 130 ft.	
4. The difference between [Outdoor unit to the farthest indoor unit] and [Outdoor unit to the nearest indoor unit] ≤ 130 ft.	The farthest indoor unit 8 The nearest indoor unit 1 (a+b+c+d+e+f+g+p)-(a+h)≤ 130 ft.	

*If available on the site, use this size. Otherwise it can not be increased.

Heat Recovery

Maximum allowable length	Between outdoor unit and indoor unit	Actual pipe length	Pipe length between outdoor unit and indoor unit ≤ 540 ft		
			Example 8 : a + b + c + d + e ≤ 540 ft	Example 6 : a + b + ℓ ≤ 540 ft, 8 : a + m + n + p ≤ 540 ft	Example 8 : a + o ≤ 540 ft
		Equivalent length	Equivalent pipe length between outdoor unit and indoor unit ≤ 620 ft (Note 1) (Assume equivalent pipe length of REFNET joint to be 1.6 ft, that of REFNET header to be 3.3 ft, that of BSVQ36 · 60 · 96 to be 13 ft, for calculation purposes)		
		Total extension length	Total piping length from outdoor unit to all indoor unit ≤ 3280 ft		
Allowable height difference	Between outdoor and indoor units	Difference in height	Difference in height between outdoor unit and indoor unit (H1) ≤ 164 ft (Max 130 ft if the outdoor unit is below)		
	Between indoor and indoor units	Difference in height	Difference in height between adjacent indoor units (H2) ≤ 49 ft		
Allowable length after the branch		Actual pipe length	Actual pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to indoor unit ≤ 130 ft (Note 2)		
			Example 8 : b + c + d + e + s ≤ 130 ft	Example 6 : b + ℓ ≤ 130 ft, 8 : m + n + p ≤ 130 ft	Example 8 : o ≤ 130 ft

3P215731-12R

Refrigerant branch kit selection

· Refrigerant branch kits can only be used with R410A.

How to select the REFNET joint

- When using REFNET joint at the first branch counted from the outdoor unit side, choose from the following table in accordance with the outdoor unit capacity type. (Example : REFNET joint A)

Outdoor unit capacity type	Refrigerant branch kit name
REYQ72 · 96P type	KHRP25M33T
REYQ120 · 144P type	KHRP25M72TU9

- Choose the REFNET joints other than the first branch from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET joint.

Indoor unit total capacity index	Refrigerant branch kit name	
	3 pipes	2 pipes
x < 72	KHRP25M22T	KHRP26M22T
72 ≤ x < 111	KHRP25M33T	KHRP26M33T
111 ≤ x	KHRP25M72TU9	KHRP26M72TU9

How to select the REFNET header

- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.

Indoor unit total capacity index	Refrigerant branch kit name	
	3 pipes	2 pipes
x < 72	KHRP25M33H9	KHRP26M22H9 or KHRP26M33H9
72 ≤ x < 111		KHRP26M33H9
111 ≤ x	KHRP25M72H9	KHRP26M72H9

Example for indoor units connected downstream

Example REFNET joint C : Indoor units 5 + 6 + 7 + 8

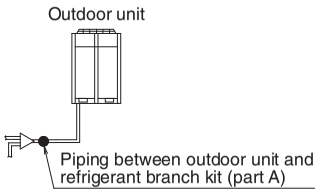
Example REFNET joint B : Indoor units 7 + 8
Example REFNET header : Indoor units 1 + 2 + 3 + 4 + 5 + 6

Example REFNET header :
Indoor units 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8

Pipe size selection

⚠ The thickness and material shall be selected in accordance with local code.

For an outdoor unit installation, make the settings in accordance with the following figure.



Piping between outdoor unit (*2 and refrigerant branch kit (part A)

- Choose from the following table in accordance with the outdoor units system capacity type. (unit : in.)

Outdoor unit capacity type	Piping size (O. D.)		
	Suction gas pipe	HP/LP gas pipe	Liquid pipe
REYQ72P type	ϕ3/4	ϕ5/8	ϕ3/8
REYQ96P type	ϕ7/8	ϕ3/4	
REYQ120P type	ϕ1-1/8		ϕ1/2
REYQ144P type		ϕ7/8	

Piping between refrigerant branch kits
Piping between refrigerant branch kit and Branch Selector unit
Piping between Branch Selector unit and refrigerant branch kit

- Choose from the following table in accordance with the total capacity type of all the indoor units connected downstream.

*1 Connection piping must not exceed the refrigerant Piping size between outdoor unit and refrigerant branch kit (part A)

*2 When selecting 2 pipes line(gas pipe and liquid pipe), use Suction gas pipe column for gas pipe and Liquid pipe column for liquid pipe. (unit : in.)

Indoor capacity index	Piping size (O. D.)		
	Suction gas pipe	HP/LP gas pipe	Liquid pipe
x < 54	ϕ5/8	ϕ1/2	ϕ3/8
54 ≤ x < 72	ϕ3/4	ϕ5/8	
72 ≤ x < 111	ϕ7/8	ϕ3/4	
111 ≤ x < 162	ϕ1-1/8		ϕ1/2
162 ≤ x		ϕ1-1/8	ϕ5/8

Piping between refrigerant branch kit, Branch Selector unit and indoor unit.

- Match to the size of the connection piping on the indoor unit. (unit : in.)

Indoor unit capacity type	Piping size (O. D.)	
	gas pipe	Liquid pipe
07 · 09 · 12 · 18	ϕ1/2	ϕ1/4
24 · 30 · 36 · 48 · 54	ϕ5/8	ϕ3/8
72	ϕ3/4	
96	ϕ7/8	

How to calculate the additional refrigerant to be charged

[HEAT RECOVER SYSTEM]

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

$$R = \left(\begin{array}{l} (\text{Total length (ft) of liquid piping size at } \phi 5/8) \times 0.121 + (\text{Total length (ft) of liquid piping size at } \phi 1/2) \times 0.081 \\ + (\text{Total length (ft) of liquid piping size at } \phi 3/8) \times 0.040 + (\text{Total length (ft) of liquid piping size at } \phi 1/4) \times 0.015 \end{array} \right) \times 1.02 + \text{HEAT RECOVER SYSTEM} + \text{REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT}$$

HEAT RECOVER SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
REYQ72 ~ 120PBYD	7.9 lb
REYQ72 ~ 144PBTJ	

REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT	
INDOOR CONNECTION CAPACITY	MODEL NAME
	REYQ72 ~ 120PBYD REYQ72 ~ 144PBTJ
MORE THAN 100% 120% OR LESS	1.1 lb
MORE THAN 120% 130% OR LESS	1.1 lb

Example for refrigerant branch using REFNET joint and REFNET header for systems and each pipe length as shown below.

Outdoor system : REYQ120PBYD
Total capacity of indoor unit : 116%

a : ϕ3/8 × 15ft.	e : ϕ3/8 × 5ft.	i : ϕ3/8 × 5ft.	m : ϕ1/2 × 10ft.
b : ϕ3/8 × 10ft.	f : ϕ3/8 × 5ft.	j : ϕ3/8 × 5ft.	n : ϕ3/8 × 5ft.
c : ϕ3/8 × 5ft.	g : ϕ3/8 × 5ft.	k : ϕ3/8 × 10ft.	o : ϕ1/4 × 5ft.
d : ϕ3/8 × 5ft.	h : ϕ3/8 × 5ft.	ℓ : ϕ3/8 × 10ft.	p : ϕ1/2 × 5ft.

$R = (10 \times 0.081 + 90 \times 0.040 + 5 \times 0.015) \times 1.02 + 7.9 + 1.1$

(m; a~ℓ, n; o; REYQ120PBYD; 116%)

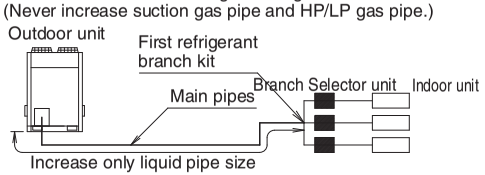
$= 13.574 \Longrightarrow 13.6$ lb

Round off in units of 0.1 lb.

Note 1.

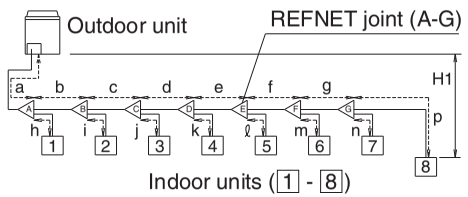
When the equivalent pipe length between outdoor and indoor units is 295 ft or more, the size of main pipes on the liquid side (refer to figure 15) must be increased according to the right table.
(Never increase suction gas pipe and HP/LP gas pipe.)

System	Liquid pipe
REYQ72 · 96P type	ϕ3/8 → ϕ1/2
REYQ120 · 144P type	ϕ1/2 → ϕ5/8



Note 2.

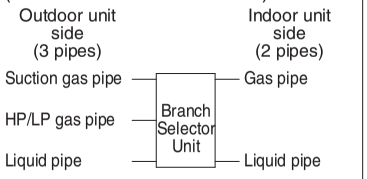
Allowable length after the first refrigerant branch kit to indoor units is 130 ft or less, however it can be extended up to 295 ft if all the following conditions are satisfied. (In case of "Branch with REFNET joint")

Required Conditions	Example Drawings	
1. It is necessary to increase the pipe size if the pipe length between the first branch kit and the final branch kit is over than 130 ft. (Reducers must be procured on site) If the increased pipe size is larger than main pipe size, then increase the main pipe size to the same pipe size.	[8] b+c+d+e+f+g+p ≤ 295 ft. increase the pipe size of b, c, d, e, f, g	Increase the pipe size as follows ϕ3/8 → ϕ1/2 ϕ5/8 → ϕ3/4 ϕ7/8 → ϕ1* ϕ1-3/8 → ϕ1-1/2* ϕ1/2 → ϕ5/8 ϕ3/4 → ϕ7/8 ϕ1-1/8 → ϕ1-1/4*
2. For calculation of Total extension length, the actual length of above pipes must be doubled. (except main pipe and the pipes that are not increased)	a+b×2+c×2+d×2+e×2+f×2+g×2 +h+i+j+k+ℓ+m+n+p ≤ 3280 ft.	
3. Indoor unit to the nearest branch kit ≤ 130 ft.	h, i, j..... p ≤ 130 ft.	
4. The difference between [Outdoor unit to the farthest indoor unit] and [Outdoor unit to the nearest indoor unit] ≤ 130 ft.	The farthest indoor unit [8] The nearest indoor unit [1] (a+b+c+d+e+f+g+p)-(a+h) ≤ 130 ft.	

*If available on the site, use this size. Otherwise it can not be increased.

C: 3P215731-12R

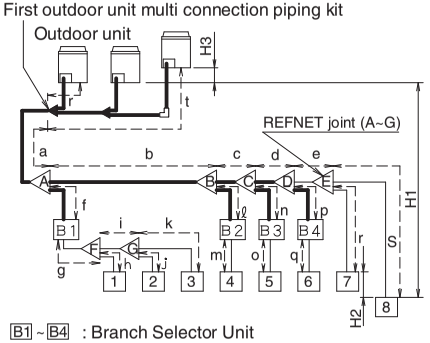
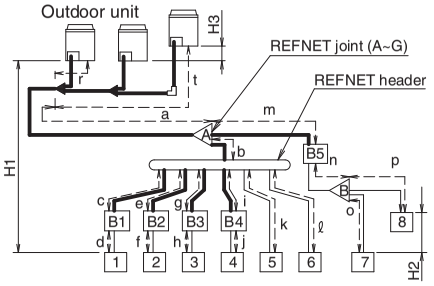
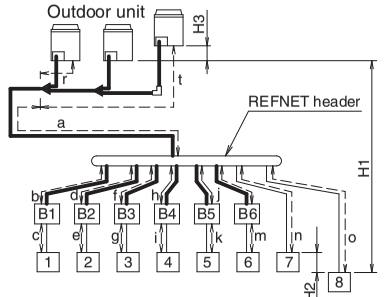
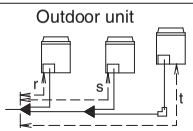
Example of connection
(Connection of 8 indoor units)



- Piping from outdoor unit to Branch Selector unit
  - (Bold) : 3 pipes { Suction gas pipe / HP/LP gas pipe / Liquid pipe
- Piping from Branch Selector unit to indoor unit or Piping from Refrigerant branch kit to indoor unit used as cooling only
  - (Thin) : 2 pipes { (Suction) gas pipe / Liquid pipe

(*1) "◀" Indicate the Outdoor unit multi connection piping kit.
(*2) In case of multi outdoor system, re-read "outdoor unit" to "the first Outdoor unit multi connection piping kit" as seen from the indoor unit.

Multi outdoor system
REYQ 144~336 PBYD
REYQ 168~336 PBTJ

	Branch with REFNET joint	Branch with REFNET joint and header	Branch with REFNET header
	First outdoor unit multi connection piping kit  B1 ~ B4 : Branch Selector Unit 1~6 : Indoor unit (Cool/Heat selection possible) 7, 8 : Indoor unit (Cooling only)	 B1 ~ B5 : Branch Selector Unit 1~4, 7, 8 : Indoor unit (Cool/Heat selection possible) 5, 6 : Indoor unit (Cooling only)	 B1 ~ B6 : Branch Selector Unit 1~6 : Indoor unit (Cool/Heat selection possible) 7, 8 : Indoor unit (Cooling only)
Maximum allowable length — Between outdoor unit (*2) and indoor unit — Actual pipe length	Pipe length between outdoor unit (*2) and indoor unit ≤ 540 ft		
	Example 8 : a + b + c + d + e ≤ 540 ft	Example 6 : a + b + ℓ ≤ 540 ft, 8 : a + m + n + p ≤ 540 ft	Example 8 : a + o ≤ 540 ft
Equivalent length	Equivalent pipe length between outdoor unit (*2) and indoor unit ≤ 620 ft (Note 1) (Assume equivalent pipe length of REFNET joint to be 1.6 ft, that of REFNET header to be 3.3 ft, that of BSVQ36 · 60 · 96 to be 13 ft, for calculation purposes)		
Total extension length	Total piping length from outdoor unit (*2) to all indoor unit ≤ 3280 ft		
Between first outdoor unit multi connection piping kit and outdoor unit — Actual and Equivalent pipe length	Actual pipe length from first outdoor unit multi connection piping kit to outdoor unit ≤ 33 ft Equivalent pipe length from first outdoor unit multi connection piping kit to outdoor unit ≤ 43 ft		Outdoor unit  r ≤ 33 ft (Equivalent length ≤ 43 ft) s ≤ 33 ft (Equivalent length ≤ 43 ft) t ≤ 33 ft (Equivalent length ≤ 43 ft)
Allowable height difference — Between outdoor and indoor units — Difference in height	Difference in height between outdoor unit and indoor unit (H1) ≤ 164 ft (Max 130 ft if the outdoor unit is below)		
Between indoor and indoor units — Difference in height	Difference in height between adjacent indoor units (H2) ≤ 49 ft		
Between outdoor and outdoor units — Difference in height	Difference in height between adjacent outdoor units (H3) ≤ 16 ft		
Allowable length after the branch — Actual pipe length	Actual pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to indoor unit ≤ 130 ft (Note 2)		
	Example 8 : b + c + d + e + s ≤ 130 ft	Example 6 : b + ℓ ≤ 130 ft, 8 : m + n + p ≤ 130 ft	Example 8 : o ≤ 130 ft

Outdoor unit multi connection piping kit and Refrigerant branch kit selection

- Refrigerant branch kits can only be used with R410A.
- When multi outdoor system are installed, be sure to use the special separately sold Outdoor unit multi connection piping kit. (BHFP26P90U).
  (For how to select the proper kit, follow the table at right.)
- Never use BHFP26M90U, BHFP22M90U for M type of this series or T joint (field supplied).

How to select the REFNET joint

- When using REFNET joint at the first branch counted from the outdoor unit side, choose from the following table in accordance with the outdoor unit capacity type. (Example : REFNET joint A)

Outdoor unit capacity type	Refrigerant branch kit name
REYQ144~216P type	KHRP25M72TU9
REYQ240~336P type	KHRP25M73TU9

- Choose the REFNET joints other than the first branch from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET joint.

Indoor unit total capacity index	Refrigerant branch kit name	
	3 pipes	2 pipes
X < 72	KHRP25M22T	KHRP26M22T
72 ≤ X < 111	KHRP25M33T	KHRP26M33T
111 ≤ X < 246	KHRP25M72TU9	KHRP26M72TU9
246 ≤ X	KHRP25M73TU9	KHRP26M73TU9

How to select the REFNET header

- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.

Indoor unit total capacity index	Refrigerant branch kit name	
	3 pipes	2 pipes
X < 72	KHRP25M33H9	KHRP26M22H9 or KHRP26M33H9
72 ≤ X < 111		KHRP26M33H9
111 ≤ X < 230	KHRP25M72H9	KHRP26M72H9
230 ≤ X	KHRP25M73H9	KHRP26M73H9

How to select the outdoor unit multi connection piping kit
(This is required when the system is multi outdoor unit system.)

- Choose from the following table in accordance with the number of outdoor units.

Number of outdoor unit	Connecting piping kit name
2 units	BHFP26P90U
3 units	BHFP26P136U

Example for indoor units connected downstream

Example REFNET joint C : Indoor units 5 + 6 + 7 + 8

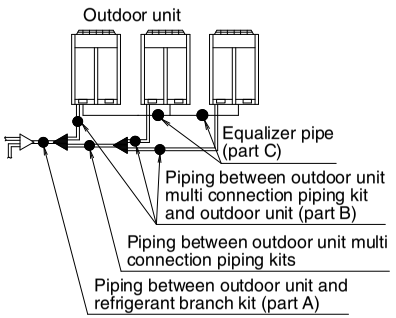
Example REFNET joint B : Indoor units 7 + 8
Example REFNET header : Indoor units 1 + 2 + 3 + 4 + 5 + 6

Example REFNET header :
Indoor units 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8

Pipe size selection

⚠ The thickness and material shall be selected in accordance with local code.

For an outdoor unit installation, make the settings in accordance with the following figure.



Piping between outdoor unit (*2 and refrigerant branch kit (part A)

- Choose from the following table in accordance with the outdoor units system capacity type.

(unit : in.)

Outdoor unit capacity type	Piping size (O. D.)		
	Suction gas pipe	HP/LP gas pipe	Liquid pipe
REYQ144P type	ϕ1-1/8	ϕ7/8	ϕ1/2
REYQ168P type			ϕ5/8
REYQ192 · 216P type		ϕ1-1/8	
REYQ240P type	ϕ1-3/8		
REYQ264~336P type			ϕ3/4

Piping between outdoor unit multi connection piping kit and outdoor unit (part B)

- Choose from the following table in accordance with the capacity type of the outdoor unit connected.

(unit : in.)

Outdoor unit capacity type	Piping size (O. D.)		
	Suction gas pipe	HP/LP gas pipe	Liquid pipe
REMQ72 · 96P type	ϕ7/8	ϕ3/4	ϕ3/8
REMQ120P type	ϕ1-1/8		ϕ1/2

Piping between refrigerant branch kits
Piping between refrigerant branch kit and BS unit
Piping between BS unit and refrigerant branch kit

- Choose from the following table in accordance with the total capacity type of all the indoor units connected downstream.

*1 Connection piping must not exceed the refrigerant Piping size between outdoor unit and refrigerant branch kit (part A)

*2 When selecting 2 pipes line(gas pipe and liquid pipe), use Suction gas pipe column for gas pipe and Liquid pipe column for liquid pipe.

(unit : in.)

Indoor capacity index	Piping size (O. D.)		
	Suction gas pipe	HP/LP gas pipe	Liquid pipe
X < 54	ϕ5/8	ϕ1/2	ϕ3/8
54 ≤ X < 72	ϕ3/4	ϕ5/8	
72 ≤ X < 111	ϕ7/8	ϕ3/4	
111 ≤ X < 162	ϕ1-1/8		ϕ1/2
162 ≤ X < 230		ϕ1-1/8	ϕ5/8
230 ≤ X < 300	ϕ1-3/8		ϕ3/4
300 ≤ X	ϕ1-5/8		

Piping between refrigerant branch kit, BS unit and indoor unit.

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

(unit : in.)

Indoor unit capacity type	Piping size (O. D.)	
	gas pipe	Liquid pipe
07 · 09 · 12 · 18	ϕ1/2	ϕ1/4
24 · 30 · 36 · 48 · 54	ϕ5/8	ϕ3/8
72	ϕ3/4	
96	ϕ7/8	

Equalizer pipe (part C)

(unit : in.)

Piping size (O. D.)	ϕ3/4

How to calculate the additional refrigerant to be charged

[HEAT RECOVER SYSTEM]
Additional refrigerant to be charged : R(lb)
(R should be rounded off in units of 0.1 lb.)

$$R = \left(\begin{array}{l} (\text{Total length (ft) of liquid piping size at } \phi 7/8) \times 0.249 + (\text{Total length (ft) of liquid piping size at } \phi 3/4) \times 0.175 \\ + (\text{Total length (ft) of liquid piping size at } \phi 5/8) \times 0.121 + (\text{Total length (ft) of liquid piping size at } \phi 1/2) \times 0.081 \\ + (\text{Total length (ft) of liquid piping size at } \phi 3/8) \times 0.040 + (\text{Total length (ft) of liquid piping size at } \phi 1/4) \times 0.015 \end{array} \right) \times 1.02 +$$

HEAT RECOVERY SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
REYQ144PBYD REYQ168 ~ 192P	2.2 lb
REYQ216 ~ 240P	3.3 lb
REYQ264 ~ 288P	5.5 lb
REYQ312 ~ 336P	6.6 lb

+

REFRIGERANT AMOUNT FOR EXCEEDINGCONNECTION CAPACITY OF INDOOR UNIT		
INDOOR CONNECTION CAPACITY	MODEL NAME	
	REYQ144 ~ 312PBYD REYQ168 ~ 312PBTJ	REYQ336PBYD REYQ336PBTJ
MORE THAN 100% 120% OR LESS	1.1 lb	
MORE THAN 120% 130% OR LESS	1.1 lb	2.2 lb

Example for refrigerant branch using REFNET joint and REFNET header for systems and each pipe length as shown below.

Outdoor system : REYQ240PBYD
Total capacity of indoor unit : 116%

a : ϕ3/4 × 15ft.	e : ϕ3/8 × 5ft.	i : ϕ3/8 × 5ft.	m : ϕ3/8 × 10ft.	r : ϕ1/2 × 1ft.
b : ϕ3/4 × 10ft.	f : ϕ3/8 × 5ft.	j : ϕ3/8 × 5ft.	n : ϕ3/8 × 5ft.	s : ϕ3/8 × 1ft.
c : ϕ3/8 × 5ft.	g : ϕ3/8 × 5ft.	k : ϕ3/8 × 10ft.	o : ϕ1/4 × 5ft.	t : ϕ3/8 × 1ft.
d : ϕ3/8 × 5ft.	h : ϕ3/8 × 5ft.	ℓ : ϕ3/8 × 10ft.	p : ϕ1/4 × 5ft.	u : ϕ5/8 × 1ft.

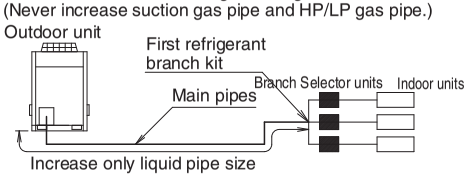
$$R = (\boxed{25 \times 0.175}_{a,\,b} + \boxed{1 \times 0.121}_{u} + \boxed{1 \times 0.081}_{r} + \boxed{75 \times 0.040}_{c\sim n,\,s,\,t} + \boxed{10 \times 0.015}_{o,\,p}) \times 1.02 + \boxed{3.3}_{\text{REYQ240PBYD}} + \boxed{1.1}_{116\%}$$

$$= 12.282 \Longrightarrow \boxed{12.3\ \text{lb}}$$

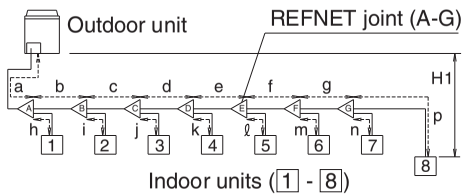
Round off in units of 0.1 lb.

Note 1.
When the equivalent pipe length between outdoor and indoor units is 295 ft or more, the size of main pipes on the liquid side (refer to figure 16) must be increased according to the right table.
(Never increase suction gas pipe and HP/LP gas pipe.)

System	Liquid pipe
REYQ72 · 96P type	ϕ3/8 → ϕ1/2
REYQ120 · 144P type	ϕ1/2→ ϕ5/8
REYQ168 ~ 240P type	ϕ5/8 → ϕ3/4
REYQ264 ~ 336P type	ϕ3/4 → ϕ7/8



Note 2.
Allowable length after the first refrigerant branch kit to indoor units is 130 ft or less, however it can be extended up to 295 ft if all the following conditions are satisfied. (In case of "Branch with REFNET joint")

Required Conditions	Example Drawings	
1. It is necessary to increase the pipe size if the pipe length between the first branch kit and the final branch kit is over than 130 ft. (Reducers must be procured on site) If the increased pipe size is larger than main pipe size, then increase the main pipe size to the same pipe size.	8 b+c+d+e+f+g+p≤ 295 ft. increase the pipe size of b, c, d, e, f, g	Increase the pipe size as follows ϕ3/8 ® ϕ1/2 ϕ5/8 ® ϕ3/4 ϕ7/8 ® ϕ1* ϕ1-3/8 ® ϕ1-1/2* ϕ1/2 ® ϕ5/8 ϕ3/4 ® ϕ7/8 ϕ1-1/8 ® ϕ1-1/4*
2. For calculation of Total extension length, the actual length of above pipes must be doubled. (except main pipe and the pipes that are not increased)	a+b×2+c×2+d×2+e×2+f×2+g×2 +h+i+j+k+ℓ+m+n+p≤ 3280 ft.	
3. Indoor unit to the nearest branch kit ≤ 130 ft.	h, i, j..... p ≤ 130 ft.	
4. The difference between [Outdoor unit to the farthest indoor unit] and [Outdoor unit to the nearest indoor unit] ≤ 130 ft.	The farthest indoor unit 8 The nearest indoor unit 1 (a+b+c+d+e+f+g+p)-(a+h) ≤ 130 ft.	

*If available on the site, use this size. Otherwise it can not be increased.

6. Thermistor Resistance / Temperature Characteristics

Indoor unit	For suction air	R1T
	For liquid pipe	R2T (FXTQ: R1T)
	For gas pipe	R3T (FXTQ: R2T)
Outdoor unit	For outdoor air	R1T
	For heat exchanger gas	R2T, R11T
	For heat exchanger deicer	R4T, R12T
	For subcooling heat exchanger gas	R5T, R13T
	For subcooling heat exchanger liquid	R6T
	For heat exchanger liquid	R7T, R15T
	For suction	R8T, R10T
	For liquid	R9T, R14T

Outdoor unit radiation fin thermistor R1T

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 (R31T, R32T)

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

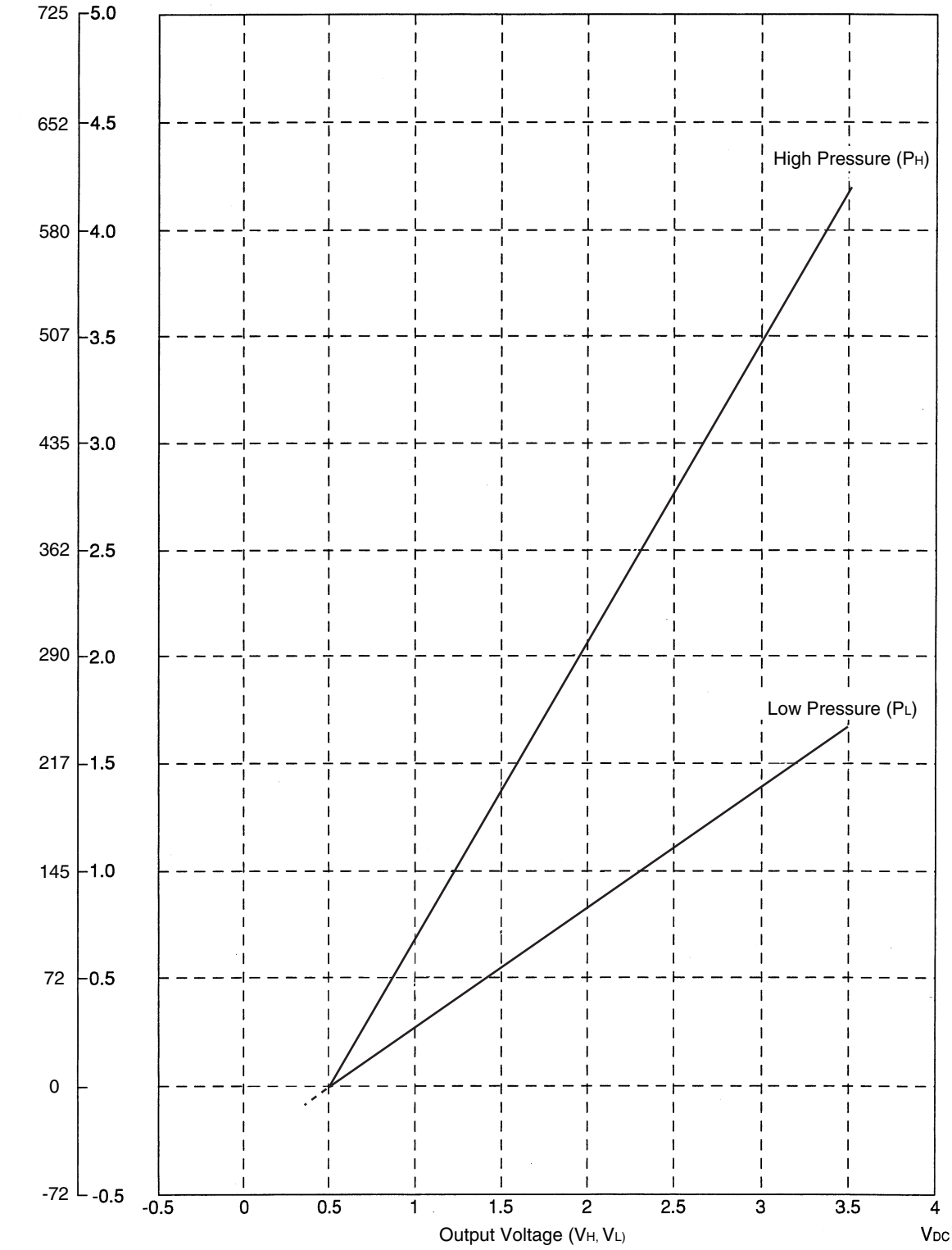
T°F	T°C	kΩ
122.0	50	72.32
123.8	51	69.64
125.6	52	67.06
127.4	53	64.60
129.2	54	62.24
131.0	55	59.97
132.8	56	57.80
134.6	57	55.72
136.4	58	53.72
138.2	59	51.98
140.0	60	49.96
141.8	61	48.19
143.6	62	46.49
145.4	63	44.86
147.2	64	43.30
149.0	65	41.79
150.8	66	40.35
152.6	67	38.96
154.4	68	37.63
156.2	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

7. 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}



8. Method of Checking the Inverter's Power Transistors and Diode Modules

8.1 Method of Checking the Inverter's Power Transistors and Diode 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 analog type of multiple tester.
  For the digital type of multiple tester, those with diode check function are available for the checking.

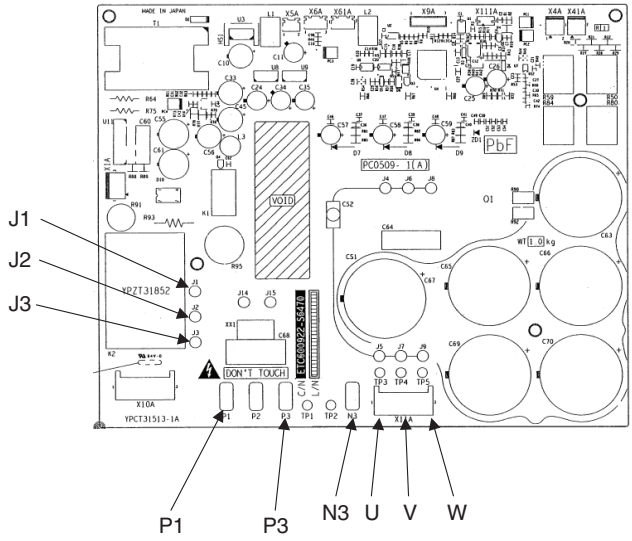
<Test points>

- Turn OFF the power supply. Then, after a lapse of 10 minutes or more, make measurement of resistance.

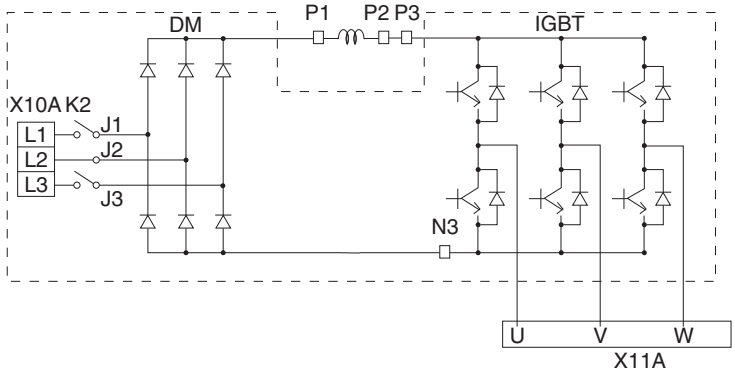
<Preparation>

- To make measurement, disconnect all connectors and terminals.

Inverter PCB



Electronic circuit



- According to the checking aforementioned, it is determined that the error results from the defective inverter. The following section describes supposed causes of the defective inverter.
- Defective compressor (ground leakage)
- Defective fan motor (ground leakage)
- Entry of conductive foreign particles
- Abnormal voltage (e.g. overvoltage, surge (thunder), or unbalanced voltage)

In order to replace the defective inverter, be sure to check for the points aforementioned.

1. Power module checking

When using the analog type of multiple tester, make measurement in resistance measurement mode in the x1kΩ range.

No.	Measuring point		Criterion	Remark
	+	-		
1	P3	U	2 to 15kΩ	
2	P3	V		
3	P3	W		
4	U	P3	Not less than 15kΩ (including)	It may take time to determine the resistance due to capacitor charge.
5	V	P3		
6	W	P3		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	2 to 15kΩ	
11	V	N3		
12	W	N3		

When using the digital type of multiple tester, make measurement in diode check mode (→|←).

No.	Measuring point		Criterion	Remark
	+	-		
1	P3	U	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge.
2	P3	V		
3	P3	W		
4	U	P3	0.3 to 0.7V	
5	V	P3		
6	W	P3		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge.
11	V	N3		
12	W	N3		

2. Diode module checking

When using the analog type of multiple tester, make measurement in resistance measurement mode in the x1kΩ range.

No.	Measuring point		Criterion	Remark
	+	-		
1	P1	J1	2 to 15kΩ	
2	P1	J2		
3	P1	J3		
4	J1	P1	Not less than 15kΩ (including)	It may take time to determine the resistance due to capacitor charge.
5	J2	P1		
6	J3	P1		
7	N3	J1		
8	N3	J2		
9	N3	J3		
10	J1	N3	2 to 15kΩ	
11	J2	N3		
12	J3	N3		

When using the digital type of multiple tester, make measurement in diode check mode (→|←).

No.	Measuring point		Criterion	Remark
	+	-		
1	P1	J1	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge.
2	P1	J2		
3	P1	J3		
4	J1	P1	0.3 to 0.7V	
5	J2	P1		
6	J3	P1		
7	N3	J1		
8	N3	J2		
9	N3	J3		
10	J1	N3	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge.
11	J2	N3		
12	J3	N3		

Part 7
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 HFC125 (∗2)	Single-component refrigerant
Design pressure (∗3)	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

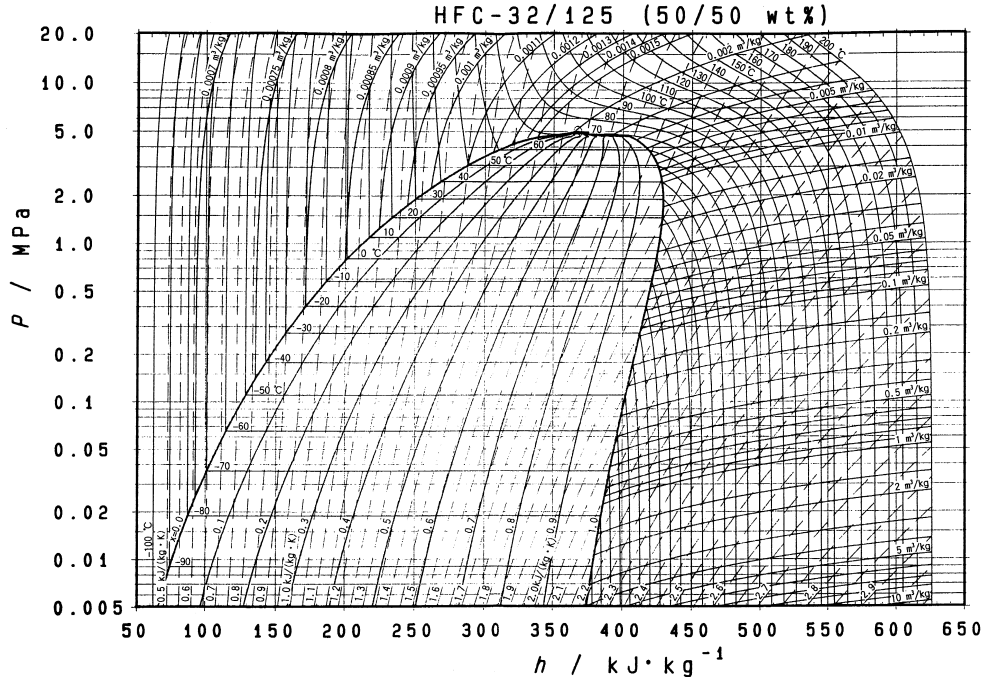
∗1. Non-azeotropic mixture refrigerant: mixture of two or more refrigerants having different boiling points.

∗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 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".

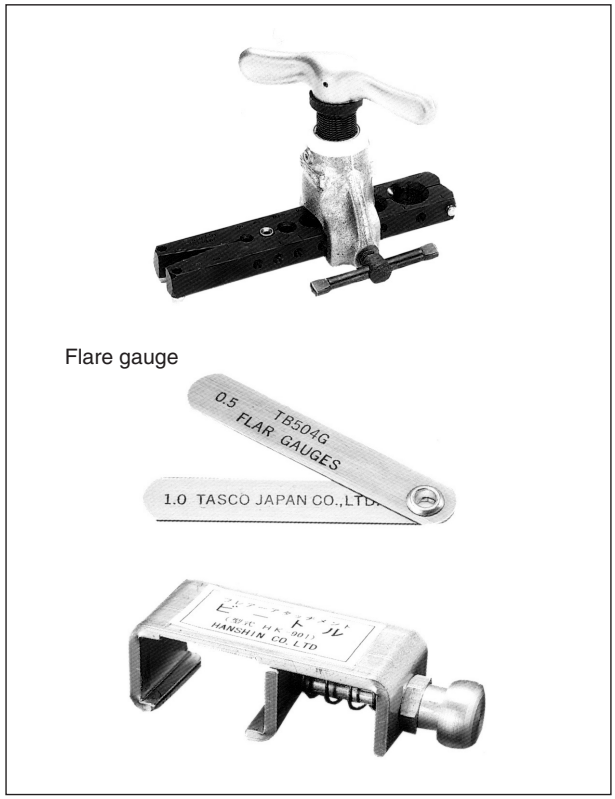
As for the charge mouthpiece and packing, 1/2UNF20 is necessary for mouthpiece size of charge hose.

■ 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

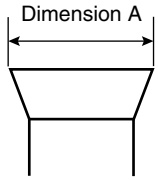
• Dimension A

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

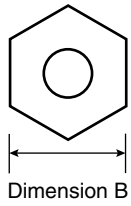
• Dimension B Unit: in.

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

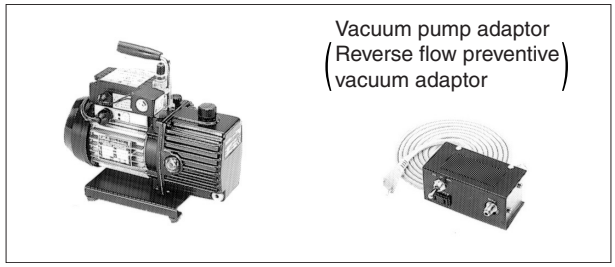
■ Differences

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



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

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

■ 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.

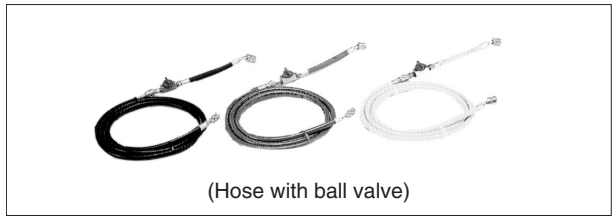
6. Gauge manifold for R-410A

■ Specifications
- High pressure gauge
  15 to 770 psi (-76 cmHg to 53 kg/cm^2)
- Low pressure gauge
  15 to 550 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 3685 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. Weigher for refrigerant charge

■ Specifications
- High accuracy
  TA101A (for 22.05 lb (10kg) cylinder) = ± 0.004 lb (2g)
  TA101B (for 44.1 lb (20kg) cylinder) = ± 0.011 lb (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.

Regarding purchasing of service tools, please contact following address.
Daikin U. S. Corporation (Dallas Office)
1645 Wallace Dr, Ste 110 Carrollton, TX 75006
“Tel : 1-972-245-1510 Fax : 1-972-245-1038”

Warning

Daikin Industries, Ltd.'s products are manufactured for export to numerous countries throughout the world. Daikin Industries, Ltd. does not have control over which products are exported to and used in a particular country. Prior to purchase, please therefore confirm with your local authorized importer, distributor and/or retailer whether this product conforms tot he applicable standards, and is suitable for use, in the region where the product will be used. This statement does not purport to exclude, restrict or modify the application of any local legislation.

Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire, or explosion.

Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorized parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire, or explosion.

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

If you have any inquiries, please contact your local importer, distributor, or retailer.

CAUTIONS ON PRODUCT CORROSION:

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

JMI-0107

Organization:
DAIKIN INDUSTRIES, LTD.
AIR CONDITIONING MANUFACTURING DIVISION

Scope of registraton:
THE DESIGN/DEVELOPMENT AND MANUFACTURE OF COMMERCIAL AIR CONDITIONING, HEATING, COOLING, REFRIGERANT EQUIPMENT, COMMERCIAL HEATING EQUIPMENT, RESIDENTIAL AIR CONDITONING EQUIPMENT, HEAT RECLAIM VENTILATION, AIR CLEANING EQUIPMENT, MARINE TYPE CONTRAINER REFRIGERANT UNITS, COMPRESSORS, AND VALVES.

JQA-1452

Organization:
DAIKIN INDUSTRIES (THAILAND) LTD.

Scope of registraton:
THE DESIGN/DEVELOPMENT AND MANUFACTURE OF AIR CONDITIONERS, AND THE COMPONENTS INCLUDING COMPRESSORS USED FOR THEM.

EC99J2044

All of the Daikin Group's business facilities and subsidiaries in Japan are certified under the ISO 14001 international standard for environment management.

Dealer

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