DAIKIN

SiUS34 - 801A_b

R-410A

Service Manual

VRV III®

RXYQ72-240PYDN, PTJU
R-410A Heat Pump 60Hz
REYQ72-240PYDN, PTJU
R-410A Heat Recovery 60Hz

RXYQ72, 96, 120PYDN
RXYQ72, 96, 120PTJU

RXYQ144-240PYDN
RXYQ168-240PTJU

REYQ72, 96, 120PYDN
REYQ72, 96, 120, 144PTJU
RXYQ144PTJU

REYQ144-240PYDN
REYQ168-240PTJU

VRVIII R-410A Heat Pump/ Heat Recovery 60Hz

Part 3

VRVIII R-410A Heat Recovery 60Hz119

1. Introduction

1.1 Safety Considerations

Cautions and Warnings

Read these ***SAFETY CONSIDERATIONS*** carefully before installing air conditioning equipment, and be sure to install it correctly. After completing the installation, make sure that the unit operates properly during the start-up operation.

Instruct the customer how to operate and maintain the unit.

Inform customers that they should store this Installation Manual with the Operation Manual for future reference.

Always use a licensed installer or contractor to install this product. Improper installation can result in water or refrigerant leakage, electrical shock, fire, or explosion.

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. Be sure to read the following safety cautions before conducting repair work.

1.1.1 Caution in Repair

⚠ Warning	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shock. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas. The refrigerant gas can cause frostbite.	

⚠ Warning	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.	
The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work. A charged capacitor can cause an electrical shock.	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.	

Caution	
Do not repair the electrical components with wet hands. Working on the equipment with wet hands can cause an electrical shock.	
Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and can cause injury.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the refrigerating cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the refrigerating cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

1.1.2 Cautions Regarding Products after Repair

Warning	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	

Warning	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only
Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-410A) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	
When replacing the coin battery in the remote controller, be sure to dispose of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

Caution	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	
Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	For integral units only

1.1.3 Inspection after Repair

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

Caution	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	
Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	

Caution	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 ohm or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.2 PREFACE

Thank you for your continued patronage of Daikin products.

This is the new service manual for Daikin's Year 2008 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.

May, 2008

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 (Multi Flow)	FXFQ	—	—	12M	18M	24M	30M	36M	—	VJU
4 Way Ceiling Mounted Cassette Type Unit (2'×2')	FXZQ	07M7	09M7	12M7	18M7	—	—	—	—	
Slim Ceiling-Mounted Duct Type	FXDQ	07M	09M	12M	18M	24M	—	—	—	
Ceiling Mounted Built-In Type	FXSQ	—	—	12M	18M	24M	30M	36M	48M	
Ceiling Mounted Duct Type	FXMQ	—	—	—	—	—	30M	36M	48M	
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	—	—	—	

BS Units

Type		Model Name		Power Supply, Compatibility Symbol
Heat Recovery Series	BSVQ	36P	60P	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	20 ton	
Heat Pump	230V	RXYQ-	72P	96P	120P	144P	168P	192P	216P	240P	TJU
	460V	RXYQ-	72P	96P	120P	144P	168P	192P	216P	240P	YDN
Heat Recovery	230V	REYQ-	72P	96P	120P	144P	168P	192P	216P	240P	TJU
	460V	REYQ-	72P	96P	120P	144P	168P	192P	216P	240P	YDN

Combination of Outdoor Units

Heat Pump

Model Name	RXYQ72P	RXYQ96P	RXYQ120P	RXYQ144P		RXYQ168P	RXYQ192P	RXYQ216P	RXYQ240P
				230V	460V				
Outdoor unit 1	RXYQ72P	RXYQ96P	RXYQ120P	RXYQ144P	RXYQ72P	RXYQ72P	RXYQ72P	RXYQ96P	RXYQ120P
Outdoor unit 2	—	—	—	—	RXYQ72P	RXYQ96P	RXYQ120P	RXYQ120P	RXYQ120P

Heat Recovery

Model Name	REYQ72P	REYQ96P	REYQ120P	REYQ144P		REYQ168P	REYQ192P	REYQ216P	REYQ240P
				230V	460V				
Outdoor unit 1	REYQ72P	REYQ96P	REYQ120P	REYQ144P	REMQ72P	REMQ72P	REMQ72P	REMQ96P	REMQ120P
Outdoor unit 2	—	—	—	—	REMQ72P	REMQ96P	REMQ120P	REMQ120P	REMQ120P

VJ: 1ϕ, 208~230V, 60Hz
YDN: 3ϕ, 460V, 60Hz
TJ: 3ϕ, 208~230V, 60Hz
U(VJU, TJU): Standard Compatibility Symbol

2. External Appearance

2.1 Indoor Units

2.1.1 Indoor Units Heat Pump, Heat Recovery (60Hz)

Ceiling-mounted cassette type (Multi flow)

FXFQ12MVJU
FXFQ18MVJU
FXFQ24MVJU
FXFQ30MVJU
FXFQ36MVJU

Ceiling suspended type

FXHQ12MVJU
FXHQ24MVJU
FXHQ36MVJU

4 way ceiling-mounted cassette unit (2'×2')

FXZQ07M7
FXZQ09M7
FXZQ12M7
FXZQ18M7

Wall mounted type

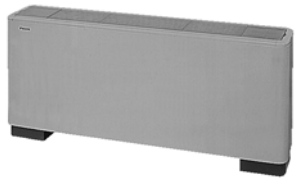
FXAQ07MVJU
FXAQ09MVJU
FXAQ12MVJU
FXAQ18MVJU
FXAQ24MVJU

Slim ceiling-mounted duct type

FXDQ07MVJU
FXDQ09MVJU
FXDQ12MVJU
FXDQ18MVJU
FXDQ24MVJU

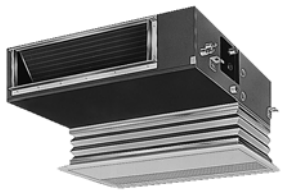
Floor standing type

FXLQ12MVJU
FXLQ18MVJU
FXLQ24MVJU



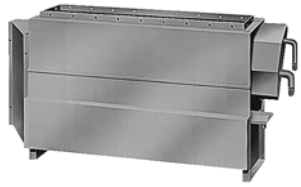
Ceiling mounted built-in type

FXSQ12MVJU
FXSQ18MVJU
FXSQ24MVJU
FXSQ30MVJU
FXSQ36MVJU
FXSQ48MVJU



Concealed floor standing type

FXNQ12MVJU
FXNQ18MVJU
FXNQ24MVJU



Ceiling-mounted duct type

FXMQ30MVJU
FXMQ36MVJU
FXMQ48MVJU

BS Units

BSVQ36PVJU
BSVQ60PVJU

2.2 Outdoor Units

H/P (460V)	RXYQ72P, 96P, 120PYDN	—		H/P (460V)	RXYQ144P, 168P, 192P, 216P, 240PYDN
H/P (230V)	RXYQ72P, 96P, 120PTJU	H/P (230V)	RXYQ144PTJU	H/P (230V)	RXYQ168P, 192P, 216P, 240PTJU
					

H/R (460V)	REYQ72P, 96P, 120PYDN	H/R (460V)	REYQ144P, 168P, 192P, 216P, 240PYDN
H/R (230V)	REYQ72P, 96P, 120P, 144PTJU	H/R (230V)	REYQ168P, 192P, 216P, 240PTJU
			

3. Combination of Outdoor Units

Heat Pump
Single Use

Ton	Number of units	Single Unit				Outdoor Unit Multi Connection Piping Kit (Option)
		72	96	120	144	
6 ton	1	●				—
8 ton	1		●			
10 ton	1			●		
12 ton (230V)	1				●	

Multiple Use

Ton	Number of units	Multi Unit Module			Outdoor Unit Multi Connection Piping Kit (Option)
		72	96	120	
12 ton (460V)	2	●●			Heat Pump: BHFP22P100U
14 ton	2	●	●		
16 ton	2	●		●	
18 ton	2		●	●	
20 ton	2			●●	

Heat Recovery
Single Use

Ton	Number of units	Single Unit				Outdoor Unit Multi Connection Piping Kit (Option)
		72	96	120	144	
6 ton	1	●				—
8 ton	1		●			
10 ton	1			●		
12 ton (230V)					●	

Multiple Use

Ton	Number of units	Multi Unit Module			Outdoor Unit Multi Connection Piping Kit (Option)
		72	96	120	
12 ton (460V)	2	●●			Heat Recovery: BHFP26P90U
14 ton	2	●	●		
16 ton	2	●		●	
18 ton	2		●	●	
20 ton	2			●●	

Note: For multiple connection of 12 ton system or more, an optional Daikin Outdoor Unit Multi Connection Piping Kit is required.

4. Model Selection

VRVIII Series

Connectable Indoor Units Number and Capacity

Heat Pump

Ton	6 ton	8 ton	10 ton	12 ton (230V)	12 ton (460V)	14 ton	16 ton	18 ton	20 ton
System name	RXYQ72P	RXYQ96P	RXYQ120P	RXYQ144PTJU	RXYQ144P	RXYQ168P	RXYQ192P	RXYQ216P	RXYQ240P
Outdoor unit 1	RXYQ72P	RXYQ96P	RXYQ120P	RXYQ144PTJU	RXYQ72P	RXYQ72P	RXYQ72P	RXYQ96P	RXYQ120P
Outdoor unit 2	—	—	—	—	RXYQ72P	RXYQ96P	RXYQ120P	RXYQ120P	RXYQ120P
Total number of connectable indoor units	12	16	20	24	24	29	33	37	41
Total Capacity Index of Indoor Units to be Connected	36~93.5	48~124.5	60~156	72~187	72~187	84~218	96~249.5	108~280.5	120~312

Heat Recovery

Ton	6ton	8ton	10ton	12ton (230V)	12ton (460V)	14ton	16ton	18ton	20ton
System name	REYQ72P	REYQ96P	REYQ120P	REYQ144PTJU	REYQ144P	REYQ168P	REYQ192P	REYQ216P	REYQ240P
Outdoor unit 1	REYQ72P	REYQ96P	REYQ120P	REYQ144PTJU	REMQ72P	REMQ72P	REMQ72P	REMQ96P	REMQ120P
Outdoor unit 2	—	—	—	—	REMQ72P	REMQ96P	REMQ120P	REMQ120P	REMQ120P
Total number of connectable indoor units	12	16	20	24	24	29	33	37	41
Total Capacity Index of Indoor Units to be Connected	36~93.5	48~124.5	60~156	72~187	72~187	84~218	96~249.5	108~280.5	120~312

Connectable Indoor Unit

Type		Model Name								Power Supply
Capacity Range		0.6ton	0.8ton	1ton	1.5ton	2ton	2.5ton	3ton	4ton	
Capacity Index		7.5	9.5	12	18	24	30	36	48	
Ceiling Mounted-Cassette Type (Multi Flow)	FXFQ	—	—	12M	18M	24M	30M	36M	—	
4 Way Ceiling Mounted Cassette Unit (2' × 2')	FXZQ	07M	09M	12M	18M	—	—	—	—	
Slim Ceiling-Mounted Duct Type	FXDQ	07M	09M	12M	18M	24M	—	—	—	
Ceiling Mounted Built-In Type	FXSQ	—	—	12M	18M	24M	30M	36M	48M	VJU
Ceiling Mounted Duct Type	FXMQ	—	—	—	—	—	30M	36M	48M	
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	—	—	—	

Indoor Unit Capacity

New refrigerant model code	07 type	09 type	12 type	18 type	24 type	30 type	36 type	48 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	48,000 Btu/h
Equivalent output	0.6 ton	0.8 ton	1 ton	1.5 ton	2 ton	2.5 ton	3 ton	4 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 can be within a range of 50 to 200% of the rated capacity of the outdoor unit (rules apply).
- In some models, it is not possible to connect the maximum number of connectable indoor units. Select models so that the total capacity of connected indoor units conforms to the specification.

Unit Number and Capacity of Indoor Unit Connectable to BS Unit

Capacity of BS unit	BSVQ36P	BSVQ60P
Unit number of connectable indoor unit	Five 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
Connectable indoor unit	Types 07M to 36M	Types 07M to 48M

Differences from Conventional Models

Item	Differences		
	Object	New model (P Model)	Conventional model (M Model)
Compressor	Connection of equalizer oil pipe	● NONE (No particular changes in terms of service)	● YES
Workability	Equalizer oil pipe for multi-outdoor-unit system	● NONE	● YES
	Procedure for calculating refrigerant refilling quantity	● Refilling quantity due to piping length + Adjustment quantity according to models of outdoor units	● Refilling quantity due to piping length - Adjustment quantity according to models of outdoor units
Optional accessories	Branch pipe for outdoor unit connection	● Y branch Type: BHFP26P90U	● T branch Type: BHFP26M90U

Part 2
VRVIII R-410A Heat Pump 60Hz

1. Specifications

1.1 Outdoor Units

Heat Pump 60Hz <RXYQ-PYDN> 460V

Model Name			RXYQ72PYDN	RXYQ96PYDN	RXYQ120PYDN
Power Supply			3 Phase 60Hz 460V	3 Phase 60Hz 460V	3 Phase 60Hz 460V
★1 Cooling Capacity		Btu / h	72,000	96,000	120,000
★2 Heating Capacity		Btu / h	81,000	108,000	135,000
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 mm)	66-1/8 × 36-5/8 × 30-1/8" (1680 x 930 x 765 mm)	66-1/8 × 36-5/8 × 30-1/8" (1680 x 930 x 765 mm)
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
	Piston Displacement	m^3/h	10.53+13.34	10.53+13.34	10.53+13.34
	Number of Revolutions	r.p.m	(2900, 6300)	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		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	(0.75) × 1	(0.75) × 1	(0.75) × 1
	Air Flow Rate	cfm	6,530	6,530	7,060
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in(mm)	3/8" (9.5 mm) C1220T (Brazing Connection)	3/8" (9.5 mm) C1220T (Brazing Connection)	1/2" (12.7 mm) C1220T (Brazing Connection)
	Gas Pipe	in(mm)	3/4" (19.1 mm) C1220T (Brazing Connection)	7/8" (22.2 mm) C1220T (Brazing Connection)	1-1/8" (28.6 mm) in C1220T (Brazing Connection)
Mass		Lbs (kg)	573 (260 kg)	573 (260 kg)	573 (260 kg)
★3 Sound Level (Reference Value)		dBA	58	58	60
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	18.1	19.8	20.1
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Cramps	Installation Manual, Operation Manual, Connection Pipes, Cramps	Installation Manual, Operation Manual, Connection Pipes, Cramps
Drawing No.			4D058599B	4D058600A	4D058601A

Notes:
★1 Indoor temp. : 80°FDB or 67°FWB / outdoor temp. : 95°FDB / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
★2 Indoor temp. : 70°FDB / outdoor temp. : 47°FDB or 43°FWB / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
★3 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

Heat Pump 60Hz <RXYQ-PYDN> 460V

Model Name (Combination Unit)			**RXYQ144PYDN**	**RXYQ168PYDN**	**RXYQ192PYDN**
Model Name (Independent Unit)			**RXYQ72PYDN RXYQ72PYDN**	**RXYQ72PYDN RXYQ96PYDN**	**RXYQ72PYDN RXYQ120PYDN**
Power Supply			3 Phase 60Hz 460V	3 Phase 60Hz 460V	3 Phase 60Hz 460V
★1 Cooling Capacity		Btu / h	144,000	168,000	192,000
★2 Heating Capacity		Btu / h	162,000	189,000	216,000
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 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 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 mm)
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
	Piston Displacement	m^3/h	16.90 + (10.53+13.34)	16.90 + (10.53+13.34)	16.90 + (10.53+13.34)
	Number of Revolutions	r.p.m	7980, (2900, 6300)	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		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
	Air Flow Rate	cfm	6,530+6,530	6,530+6,530	6,530+7,060
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe ★3	in(mm)	ϕ1/2" (12.7 mm) C1220T (Brazing Connection)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)
	High Pressure Equalizer 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 ★3	in(mm)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)
	Low Pressure Equalizer 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)
Mass		Lbs (kg)	573 + 573 (260 + 260 kg)	573 + 573 (260 + 260 kg)	573 + 573 (260 + 260 kg)
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	18.1+18.1	18.1+19.8	18.1+20.1
	Control		Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Cramps	Installation Manual, Operation Manual, Connection Pipes, Cramps	Installation Manual, Operation Manual, Connection Pipes, Cramps
Drawing No.			4D059661B	4D059662B	4D059663B

Notes:
★1 Indoor temp. : 80°FDB or 67°FWB / outdoor temp. : 95°FDB / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
★2 Indoor temp. : 70°FDB / outdoor temp. : 47°FDB or 43°FWB / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
★3 BHFP22P100U is necessary for the connection.
Concerning about the piping connection for each outdoor unit to the main line as shown above, use REFNET.

Heat Pump 60Hz <RXYQ-PYDN> 460V

Model Name (Combination Unit)			RXYQ216PYDN	RXYQ240PYDN
Model Name (Independent Unit)			RXYQ96PYDN RXYQ120PYDN	RXYQ120PYDN RXYQ120PYDN
Power Supply			3 Phase 60Hz 460V	3 Phase 60Hz 460V
★1 Cooling Capacity		Btu / h	216,000	240,000
★2 Heating Capacity		Btu / h	243,000	270,000
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 (1680 x 930 x 765 + (1680 x 930 x 765 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 mm)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Piston Displacement	m^3/h	(10.53+13.34) × 2	(10.53+13.34) × 2
	Number of Revolutions	r.p.m	(2900, 6300) × 2	(2900, 6300) × 2
	Motor Output×Number of Units	kW	(2.2+4.5) × 1 + (3.5+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
	Air Flow Rate	cfm	6,530+7,060	7,060+7,060
	Drive		Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe ★3	in(mm)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)
	High Pressure Equalizer Pipe	in(mm)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)
	Gas Pipe ★3	in(mm)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)	ϕ1-3/8" (34.9 mm) C1220T (Brazing Connection)
	Low Pressure Equalizer Pipe	in(mm)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)
Mass		Lbs (kg)	573 + 573 (260 + 260 kg)	573 + 573 (260 + 260 kg)
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		%	7~100	6~100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	Lbs	19.8+20.1	20.1+20.1
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Cramps	Installation Manual, Operation Manual, Connection Pipes, Cramps
Drawing No.			4D059664A	4D059665A

Notes:
- ★1 Indoor temp. : 80°FDB or 67°FWB / outdoor temp. : 95°FDB / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
- ★2 Indoor temp. : 70°FDB / outdoor temp. : 47°FDB or 43°FWB / Equivalent piping length : 25 ft (7.5 m), level difference : 0 ft.
- ★3 BHFP22P100U is necessary for the connection.
  Concerning about the piping connection for each outdoor unit to the main line as shown above, use REFNET.

Heat Pump 60Hz <RXYQ-PTJU> 230V

Model Name				RXYQ72PTJU	RXYQ96PTJU	RXYQ120PTJU
Power Supply				3 Phase 60Hz 208V-230V	3 Phase 60Hz 208V-230V	3 Phase 60Hz 208V-230V
★1 Cooling Capacity			Btu / h	72,000	96,000	120,000
★2 Heating Capacity			Btu / h	81,000	108,000	135,000
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 mm)	66-1/8 × 36-5/8 × 30-1/8" (1680 x 930 x 765 mm)	66-1/8 × 36-5/8 × 30-1/8" (1680 x 930 x 765 mm)
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
	Piston Displacement		m^3/h	10.53+13.34	10.53+13.34	10.53+13.34
	Number of Revolutions		r.p.m	(2900, 6300)	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			Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output		kW	(0.75) × 1	(0.75) × 1	(0.75) × 1
	Air Flow Rate		cfm	6,530	6,530	7,060
	Drive			Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe		in (mm)	ϕ 3/8" (9.5 mm) C1220T (Brazing Connection)	ϕ 3/8" (9.5 mm) C1220T (Brazing Connection)	ϕ1/2" (12.7 mm) C1220T (Brazing Connection)
	Gas Pipe		in (mm)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ 7/8" (22.2 mm) C1220T (Brazing Connection)	ϕ1-1/8" (28.6 mm C1220T (Brazing Connection) —
Mass			Lbs (kg)	560 (254 kg)	560 (254 kg)	560 (254 kg)
★3 Sound Level (Reference Value)			dBA	58	58	60
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	18.1	19.8	20.1
	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.				4D058605A	4D058606A	4D058607A

Notes:
★1 Indoor temp. : 80°FDB or 67°FWB / outdoor temp. : 95°FDB / Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.
★2 Indoor temp. : 70°FDB / outdoor temp. : 47°FDB or 43°FWB / Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.
★3 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

Heat Pump 60Hz <RXYQ-PTJU> 230V

Model Name			RXYQ144PTJU	RXYQ168PTJU	RXYQ192PTJU
Model (Independent Unit)			—	RXYQ72PTJU RXYQ96PTJU	RXYQ72PTJU RXYQ120PTJU
Power Supply			3 Phase 60Hz 208V-230V	3 Phase 60Hz 208V-230V	3 Phase 60Hz 208V-230V
★1 Cooling Capacity		Btu / h	144,000	168,000	192,000
★2 Heating Capacity		Btu / h	162,000	189,000	216,000
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 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 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 mm)
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
	Piston Displacement	m^3/h	16.90+16.90	16.90 + (10.53+13.34)	16.90 + (10.53+13.34)
	Number of Revolutions	r.p.m	7980, 7980	7980, (2900, 6300)	7980, (2900, 6300)
	Motor Output×Number of Units	kW	(3.8+3.8)×1	(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		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	0.75 × 2	(0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1
	Air Flow Rate	cfm	8,299	6,530+6,530	6,530+7,060
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in (mm)	ϕ1/2" (12.7 mm) C1220T (Flare Connection)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)★3	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)★3
	High Pressure Equalizer Pipe	in (mm)	—	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)
	Gas Pipe	in (mm)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)	ϕ7/8" (22.2) C1220T (Brazing Connection)★3	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)★3
	Low Pressure Gas Pipe	in (mm)	—	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1) C1220T (Brazing Connection)
Mass		Lbs (kg)	747 (338.8 kg)	560 + 560 (254 + 254 kg)	560 + 560 (254 + 254 kg)
★4 Sound Level (Reference Value)		dBA	62	—	—
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	7~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs	24.5	18.1+19.8	18.1+20.1
	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.			4D058608A	4D060126A	4D060127A

Notes:

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

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

★3 BHFP22P100U is necessary for the connection.
Concerning about the piping connection for each outdoor unit to the main line as shown above, use REFNET.

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

Heat Pump 60Hz <RXYQ-PTJU> 230V

Model Name (Combination Unit)			**RXYQ216PTJU**	**RXYQ240PTJU**
Model Name (Independent Unit)			**RXYQ96PTJU** **RXYQ120PTJU**	**RXYQ120PTJU** **RXYQ120PTJU**
Power Supply			3 Phase 60Hz 208V-230V	3 Phase 60Hz 208V-230V
★1 Cooling Capacity		Btu / h	216,000	240,000
★2 Heating Capacity		Btu / h	243,000	270,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in	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 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 mm)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Piston Displacement	m^3/h	(10.53+13.34) × 2	(10.53+13.34) × 2
	Number of Revolutions	r.p.m	(2900, 6300) × 2	(2900, 6300) × 2
	Motor Output×Number of Units	kW	(2.2+4.5) × 1 + (3.5+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
	Air Flow Rate	cfm	6,530+7,060	7,060+7,060
	Drive		Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe ★3	in	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)
	High Pressure Equalizer Pipe	in	ϕ3/4" (19.1mm) C1220T (Brazing Connection)	ϕ3/4" (19.1mm) C1220T (Brazing Connection)
	Gas Pipe ★3	in	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)	ϕ1-3/8" (34.9 mm) C1220T (Brazing Connection)
	Low Pressure Equalizer Pipe	in	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)
Mass		Lbs (kg)	560 + 560 (254 + 254 kg)	560 + 560 (254 + 254 kg)
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		%	7~100	6~100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	Lbs	19.8+20.1	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.			4D060128A	4D060129A

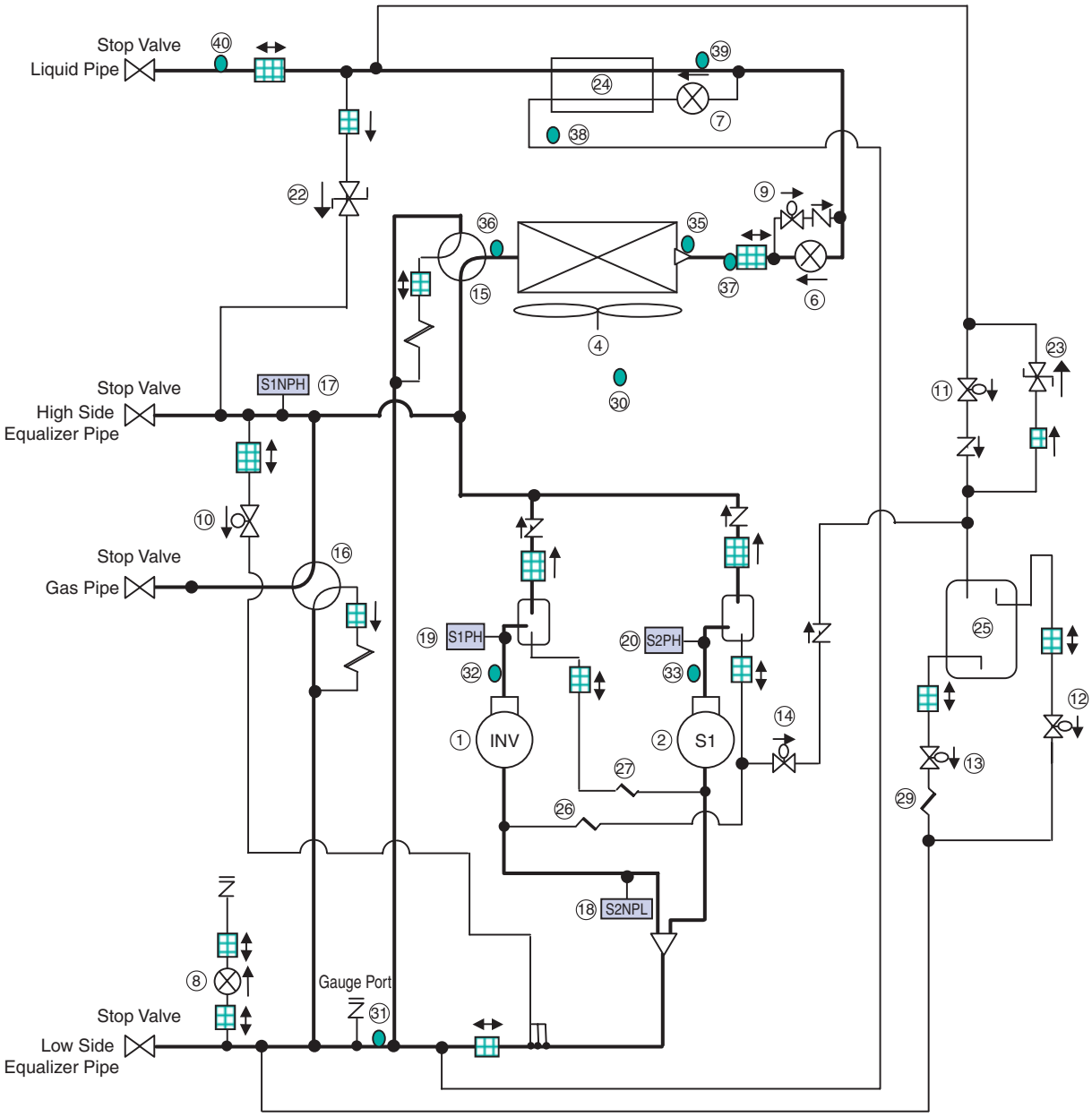
Notes:
★1 Indoor temp. : 80°FDB or 67°FWB / outdoor temp. : 95°FDB / Equivalent piping length : 25 ft (7.5 m), level difference: 0.
★2 Indoor temp. : 70°FDB / outdoor temp. : 47°FDB or 43°FWB / Equivalent piping length : 25 ft (7.5 m), level difference: 0.
★3 BHFP22P100U is necessary for the connection.
Concerning about the piping connection for each outdoor unit to the main line as shown above, use REFNET.

2. Refrigerant Circuit

2.1 RXYQ72P, 96P, 120P

No. in refrigerant system diagram	Symbol	Name	Major Function
1	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 52Hz and 210Hz by using the inverter, while Standard compressor is operated with commercial power supply only. The number of operating steps is as follows when Inverter compressor is operated in combination with Standard compressor. Compressor operation steps : Refer to page 45~46.
2	M2C	Standard compressor 1 (STD1)	
4	M1F	Inverter fan	Since the system is of the outdoor unit heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
6	Y1E	Electronic expansion valve (Main: EVM)	While in heating operation, PI control is applied to keep the outlet superheated degree of the outdoor unit heat exchanger constant.
7	Y3E	Electronic expansion valve (Subcool: EVT)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
8	Y2E	Electronic expansion valve (Refrigerant charge EVJ)	Opens/closes refrigerant charge port.
9	Y6S	Solenoid valve (Main bypass SVE)	Opens in cooling operation.
10	Y5S	Solenoid valve (Hot gas: SVP)	Prevents the low pressure from transient falling.
11	Y4S	Solenoid valve (Refrigerant regulator liquid pipe SVL)	Collects refrigerant to the refrigerant regulator.
12	Y1S	Solenoid valve (Refrigerant regulator gas purging pipe SVG)	Collects refrigerant to the refrigerant regulator.
13	Y7S	Solenoid valve (Refrigerant regulator discharge pipe SVO)	Discharges refrigerant from the refrigerant regulator.
14	Y8S	Solenoid valve (Discharge pipe of refrigerant regulator)	Bypasses the high pressure gas to the refrigerant regulator.
15	Y3S	4 way valve (Heat exchanger switch 20SA)	Switches outdoor heat exchanger to evaporator or condenser.
16	Y2S	4 way valve (Dual pressure gas pipe switch 20SB)	Switches dual pressure gas pipe to high pressure or low pressure.
17	S1NPH	High pressure sensor	Detects high pressure.
18	S2NPL	Low pressure sensor	Detects low pressure.
19	S1PH	HP pressure switch (For INV compressor)	Functions when pressure increases to stop operation and avoid high pressure increase in the event of a fault.
20	S2PH	HP pressure switch (For STD compressor 1)	
22	—	Pressure regulating valve (Liquid pipe)	Used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
23	—	Pressure regulating valve (Refrigerant regulator)	Used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
24	—	Subcooling heat exchanger	Applies subcooling to liquid refrigerant.
25	—	Refrigerant regulator	Surplus refrigerant is held according to the operation conditions.
26	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV compressor.
27	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the STD1 compressor.
29	—	Capillary tube	Used to discharge refrigerant from the refrigerant regulator.
30	R1T	Thermistor (Outdoor air: Ta)	Detects outdoor temperature, correct discharge pipe temperature, and others.
31	R8T	Thermistor (Suction pipe: TsA)	Detects suction pipe temperature.
32	R31T	Thermistor (INV discharge pipe: Tdi)	Detects discharge pipe temperature. Used for compressor temperature protection control.
33	R32T	Thermistor (STD1 discharge pipe: Tds1)	
35	R4T	Thermistor (Heat exchanger deicer: Tb)	Detects liquid pipe temperature of the outdoor unit heat exchanger. Used to make judgments on defrosting operation.
36	R2T	Thermistor (Heat exchanger gas pipe Tg)	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.
37	R7T	Thermistor (Heat exchanger liquid pipe Tf)	Detects temperature of liquid pipe between the the outdoor unit heat exchanger and main electronic expansion valve. Used to make judgments on the recover or discharge refrigerants to the refrigerant regulator.
38	R5T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Detects gas pipe temperature on the evaporation side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooled heat exchanger.
39	R6T	Thermistor (Subcooling heat exchanger liquid pipe Tl)	Detects temperature of liquid pipe between the main expansion valve and subcooling heat exchanger.
40	R9T	Thermistor (Liquid pipe Tsc)	Detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.

RXYQ72P, 96P, 120P

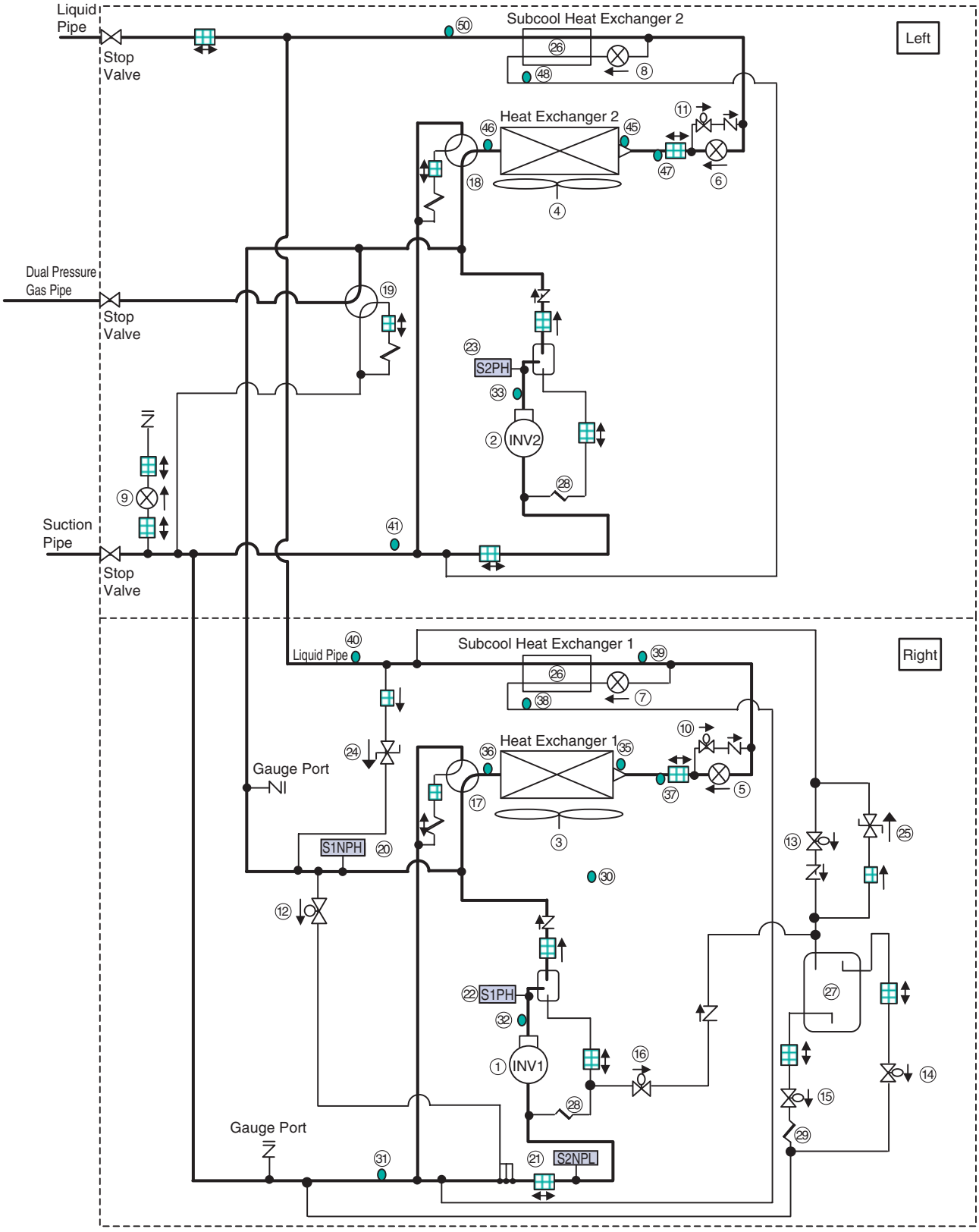


2.2 RXYQ144PTJU

No. in refrigerant system diagram	Symbol	Name	Major Function
1	M1C	Inverter compressor (INV1)	Inverter compressor is operated on frequencies between 52Hz and 266Hz by using the inverter. The number of operating steps is as follows. RXYQ144PTJU : 26 step
2	M2C	Standard compressor 1 (INV2)	
3	M1F	Inverter fan	Since the system is the outdoor unit heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
4	M2F	Inverter fan	Since the system is the outdoor unit heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.

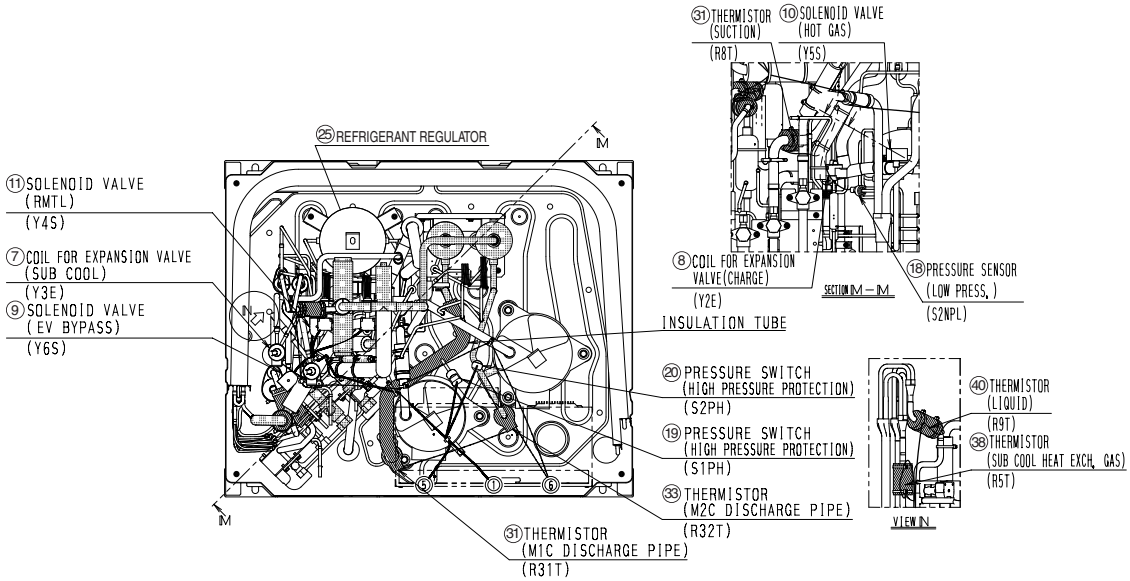
5(6)	Y1E (Y3E)	Electronic expansion valve (Main1 (Main2))	While in heating operation, PI control is applied to keep the outlet superheated degree of the outdoor unit heat exchanger constant.
7(8)	Y2E (Y5E)	Electronic expansion valve (Subcool1 (Subcool2))	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
9	Y4E	Electronic expansion valve (Refrigerant charge EVJ)	Opens/closes refrigerant charge port.
10(11)	Y5S (Y10S)	Solenoid valve (Main bypass1 (Main bypass2))	Opens in cooling operation.
12	Y4S	Solenoid valve (Hot gas: SVP)	Prevents the low pressure from transient falling.
13	Y3S	Solenoid valve (Refrigerant regulator liquid pipe SVL)	Collects refrigerant to the refrigerant regulator.
14	Y1S	Solenoid valve (Refrigerant regulator gas purging pipe SVG)	Collects refrigerant to the refrigerant regulator.
15	Y7S	Solenoid valve (Refrigerant regulator discharge pipe SVO)	Discharges refrigerant from the refrigerant regulator.
16	Y6S	Solenoid valve (Discharge pipe of refrigerant regulator)	Bypasses the high pressure gas to the refrigerant regulator.
17(18)	Y2S (Y9S)	4 way valve (Heat exchanger switch 20SA)	Used to switch outdoor heat exchanger to evaporator or condenser.
19	Y8S	4 way valve (Dual pressure gas pipe switch 20SB)	Used to switch dual pressure gas pipe to high pressure or low pressure.
20	S1NPH	High pressure sensor	Detects high pressure.
21	S2NPL	Low pressure sensor	Detects low pressure.
22(23)	S1PH (S2PH)	HP pressure switch (For INV compressor)	Functions when pressure increases to stop operation and avoid high pressure increase in the event of a fault.
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)	Used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
26	—	Subcooling heat exchanger	Applies subcooling to liquid refrigerant.
27	—	Refrigerant regulator	Surplus refrigerant is held according to the operation conditions.
28	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV compressor.
29	—	Capillary tube	Discharges refrigerant from the refrigerant regulator.
30	R1T	Thermistor (Outdoor air: Ta)	Detects outdoor temperature, correct discharge pipe temperature, and others.
31(41)	R8T (R10T)	Thermistor (Suction pipe: TsA)	Detects suction pipe temperature.
32	R31T	Thermistor (INV1 discharge pipe: Tdi)	Detects discharge pipe temperature. Used for compressor temperature protection control.
33	R32T	Thermistor (INV2 discharge pipe: Tds1)	
35(45)	R4T (R12T)	Thermistor (Heat exchanger deicer: Tb)	Detects liquid pipe temperature of the outdoor unit heat exchanger. Used to make judgments on defrosting operation.
36(46)	R2T (R11T)	Thermistor (Heat exchanger gas pipe Tg)	Detects temperature of gas pipe for the outdoor unit heat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
37(47)	R7T (R15T)	Thermistor (Heat exchanger liquid pipe Tf)	Detects temperature of liquid pipe between the the outdoor unit heat exchanger and main electronic expansion valve. Used to make judgments on the recover or discharge refrigerants to the refrigerant regulator.
38(48)	R5T (R13T)	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Detects temperature of gas pipe on the evaporator side for the subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooled heat exchanger.
39	R6T	Thermistor (Subcooling heat exchanger liquid pipe Tl)	Detects temperature of liquid pipe between the main expansion valve and subcooling heat exchanger.
40(50)	R9T (R14T)	Thermistor (Liquid pipe Tsc)	Detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.

RXYQ144PTJU
(12ton Single Type)
(INV Unit × 2)

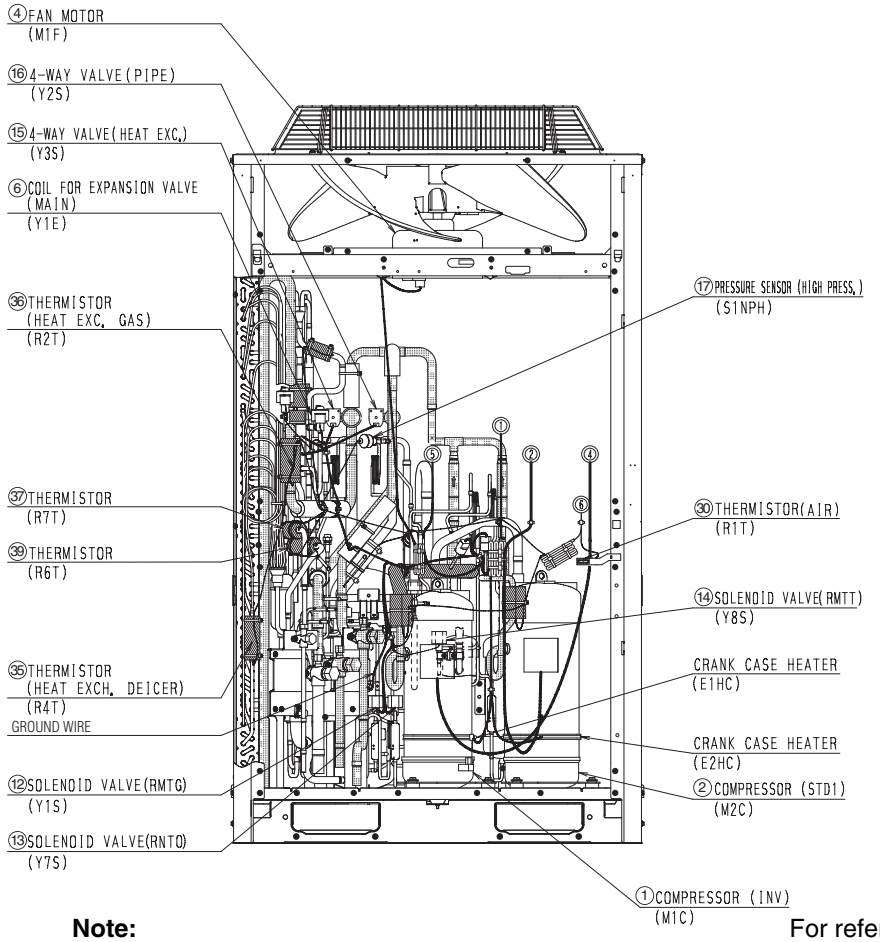


3. Functional Parts Layout RXYQ72P, 96P, 120P

Plan



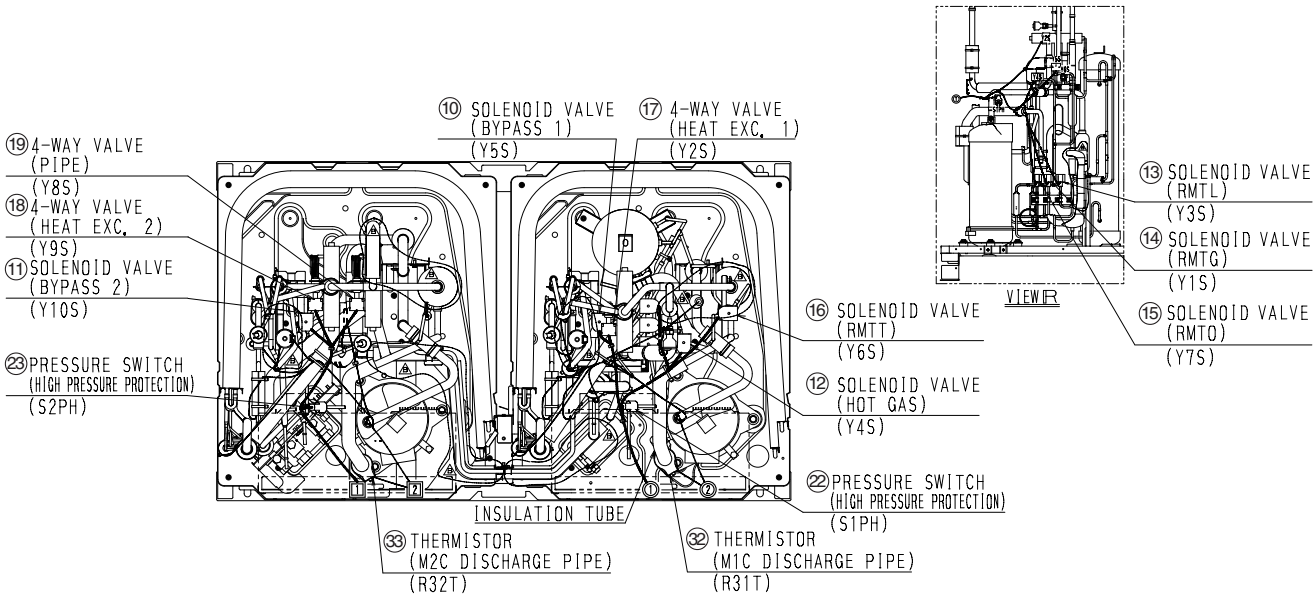
Front View



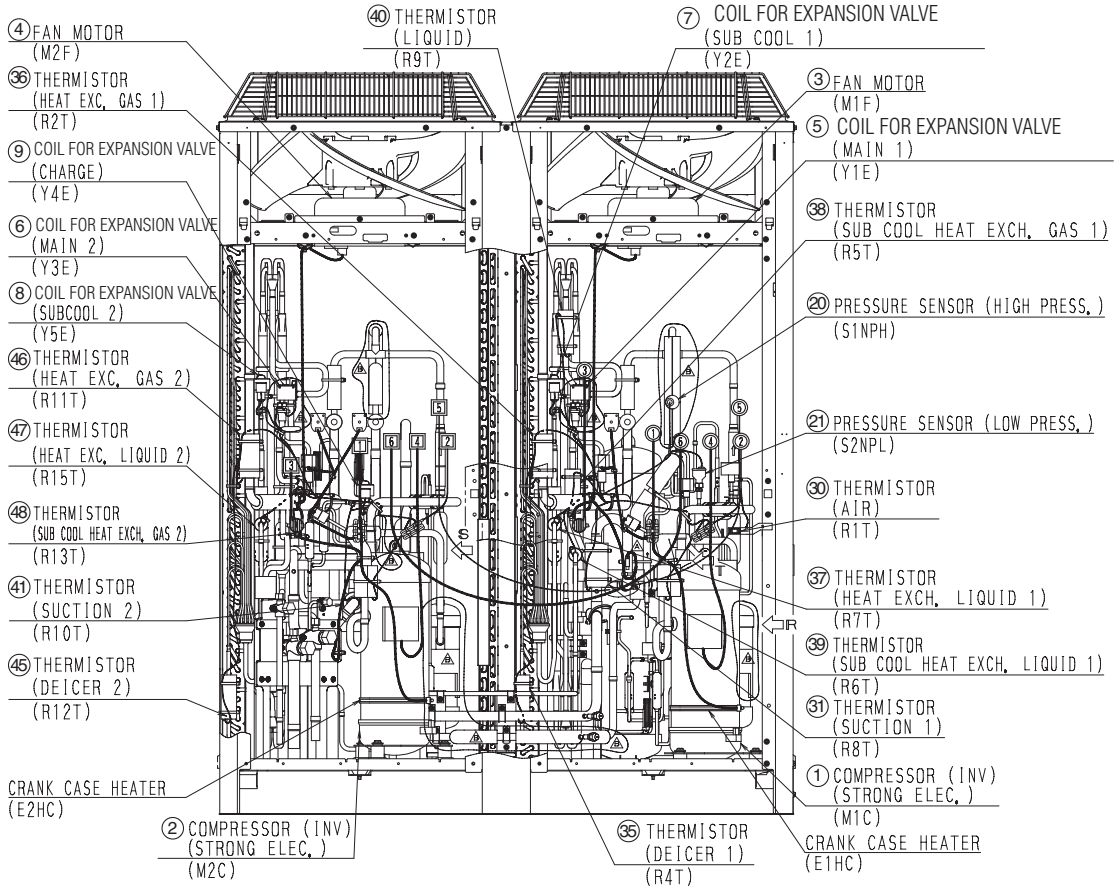
Note: For reference number, refer to page 17.

3.1 RXYQ144PTJU

Plan



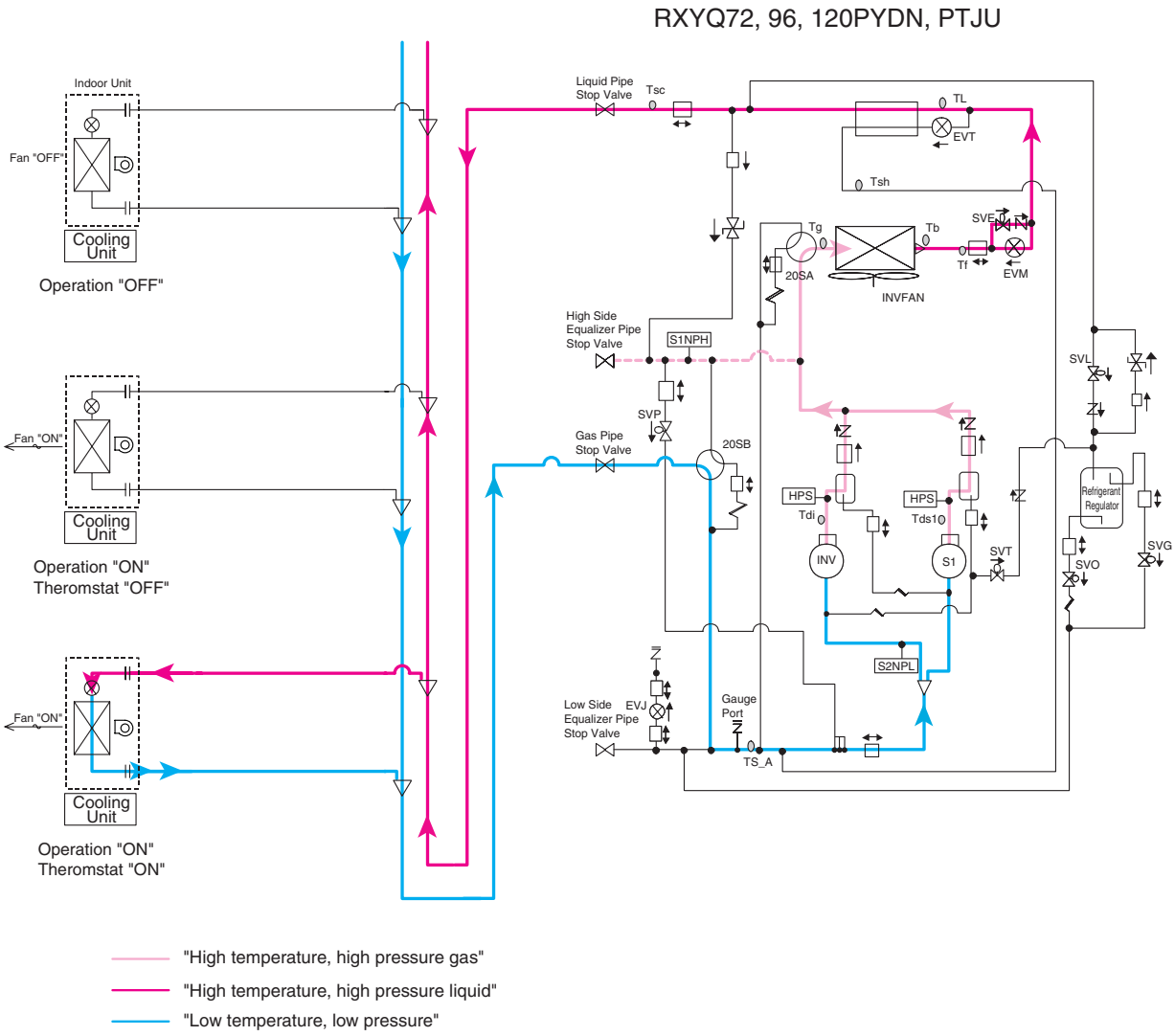
Front View



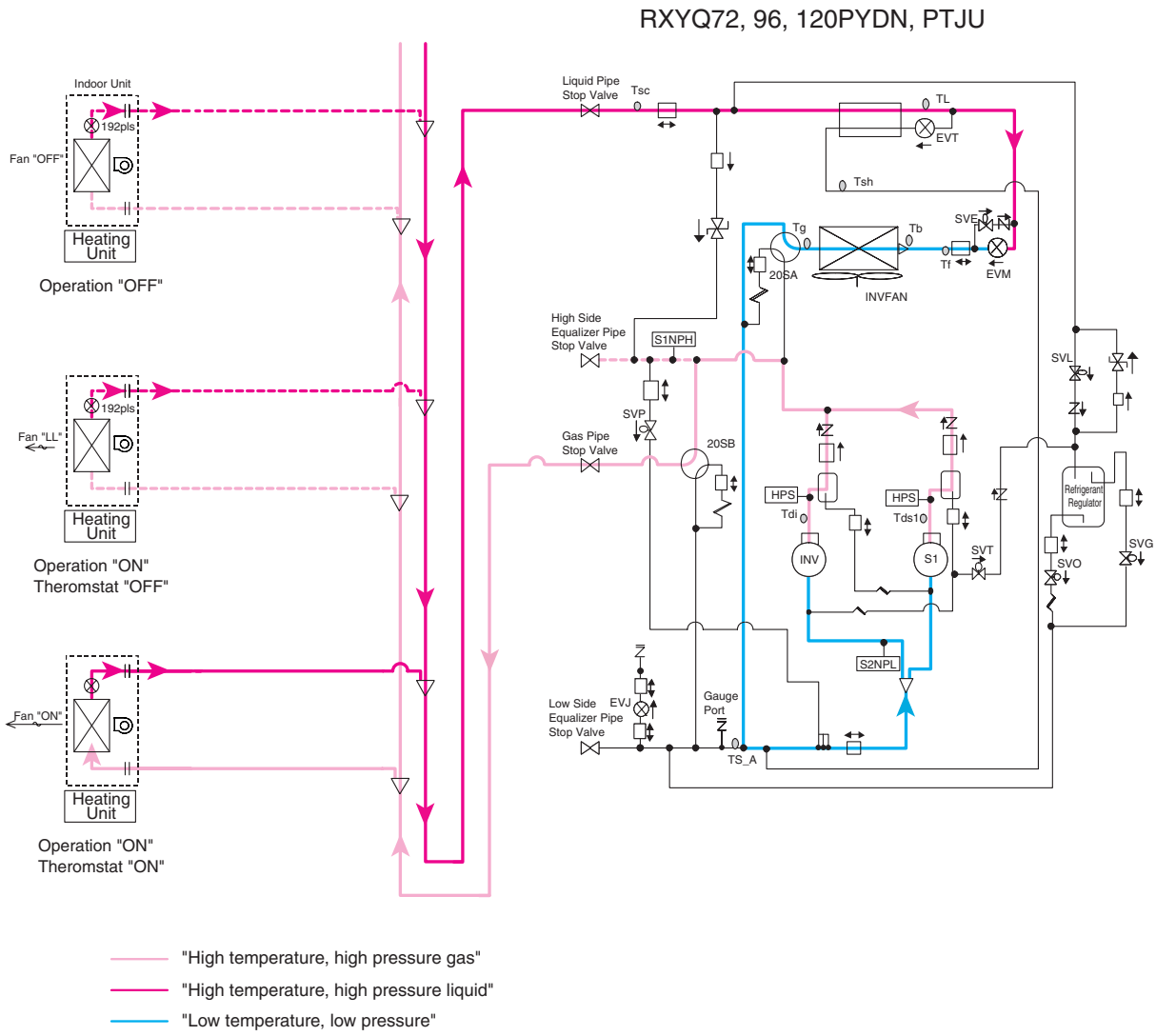
Note: For reference numbers, refer to page 18.

4. Refrigerant Flow for Each Operation Mode

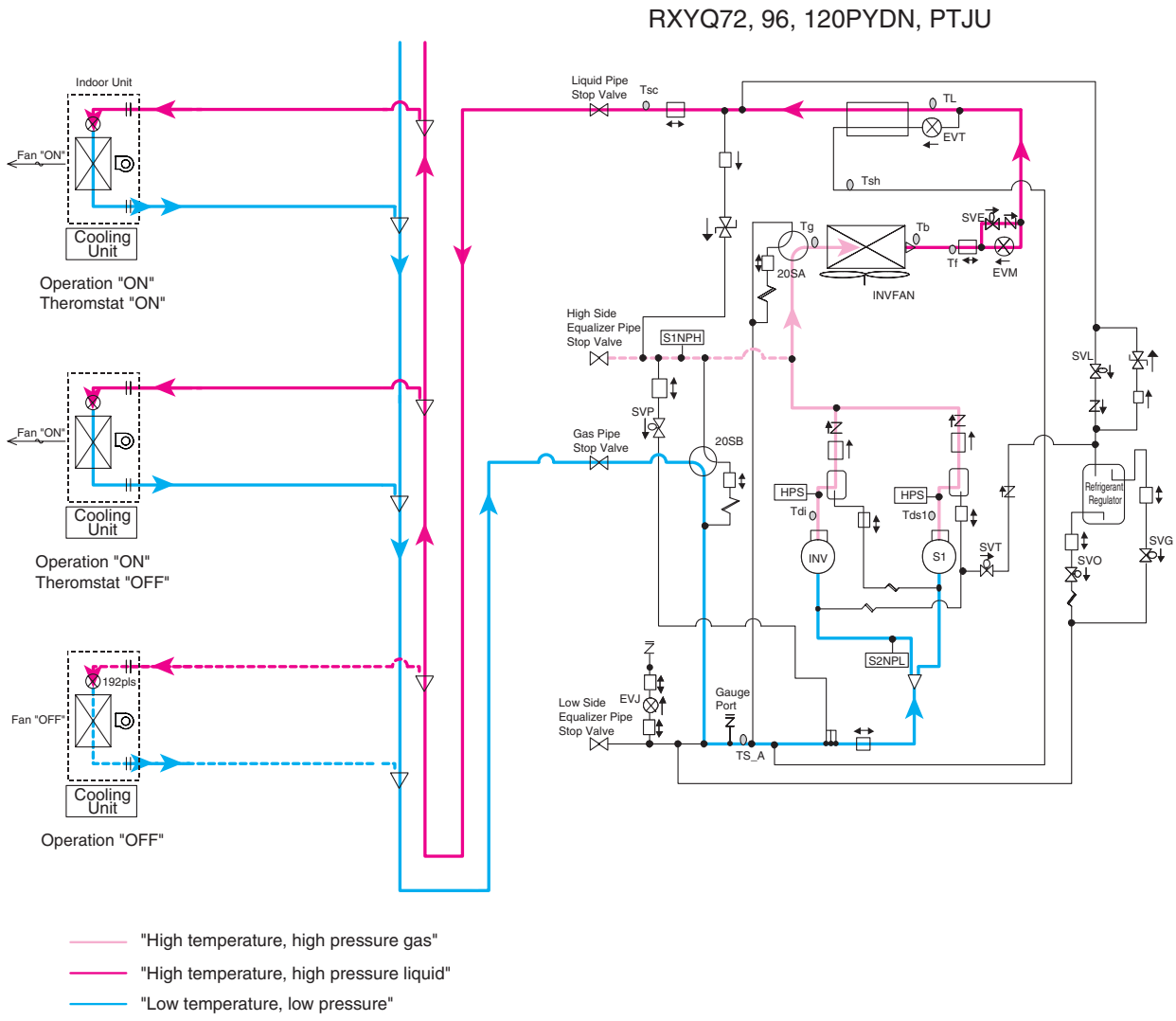
RXYQ72, 96, 120PYDN, PTJU
Cooling Operation



RXYQ72, 96, 120PYDN, PTJU
Heating Operation

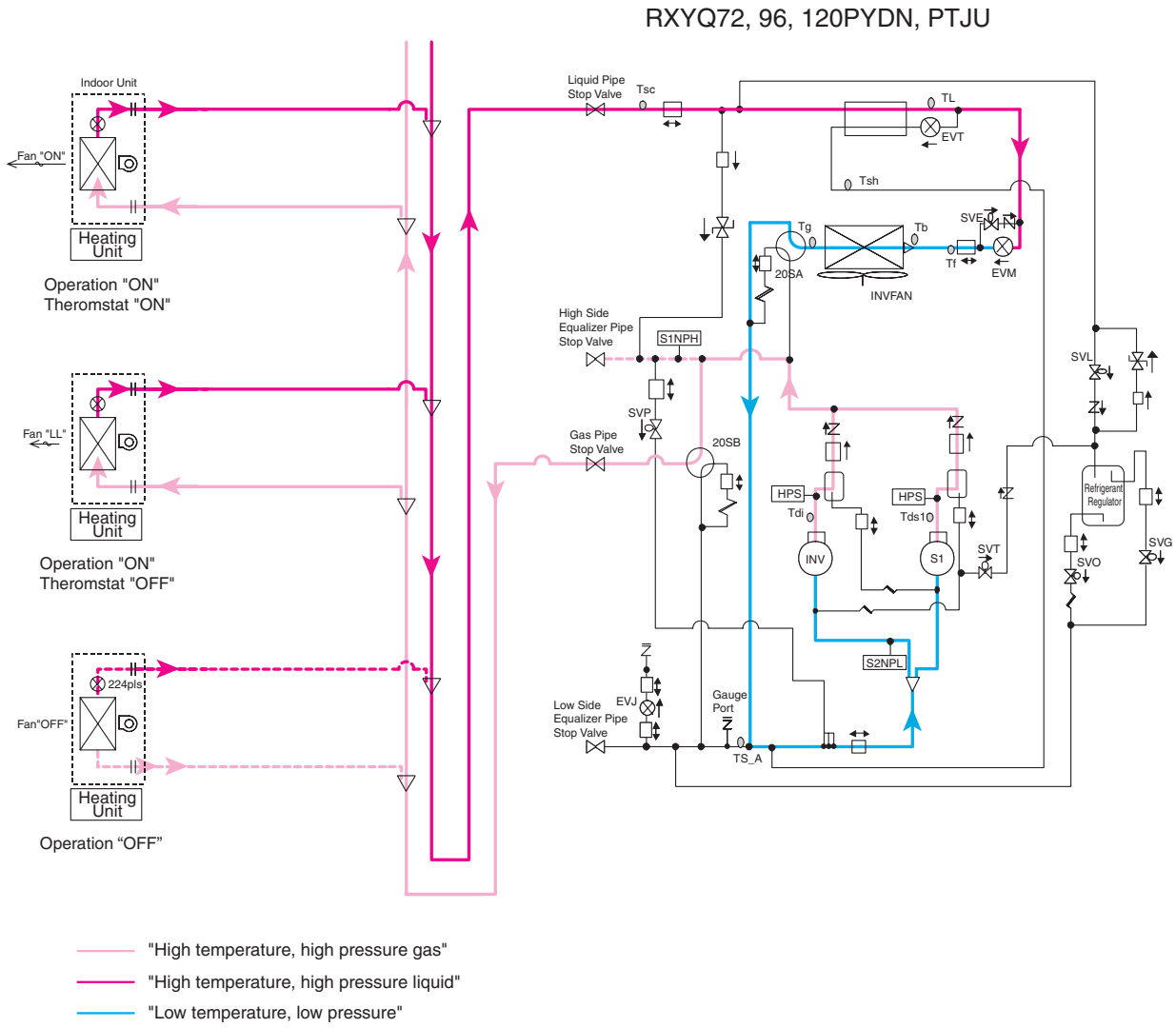


RXYQ72, 96, 120PYDN, PTJU
Cooling Oil Return Operation

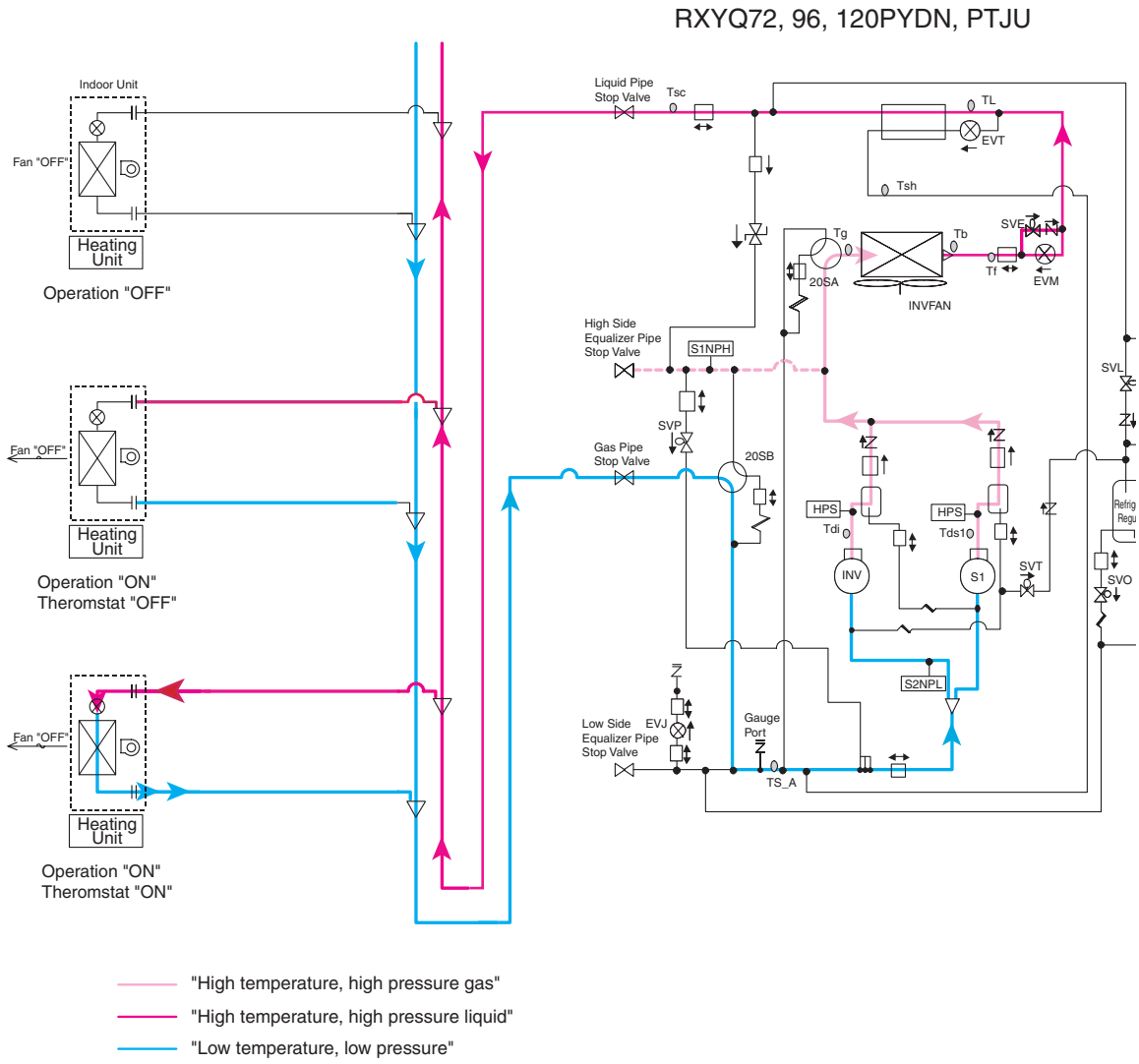


RXYQ72, 96, 120PYDN, PTJU
Heating Oil Return Operation

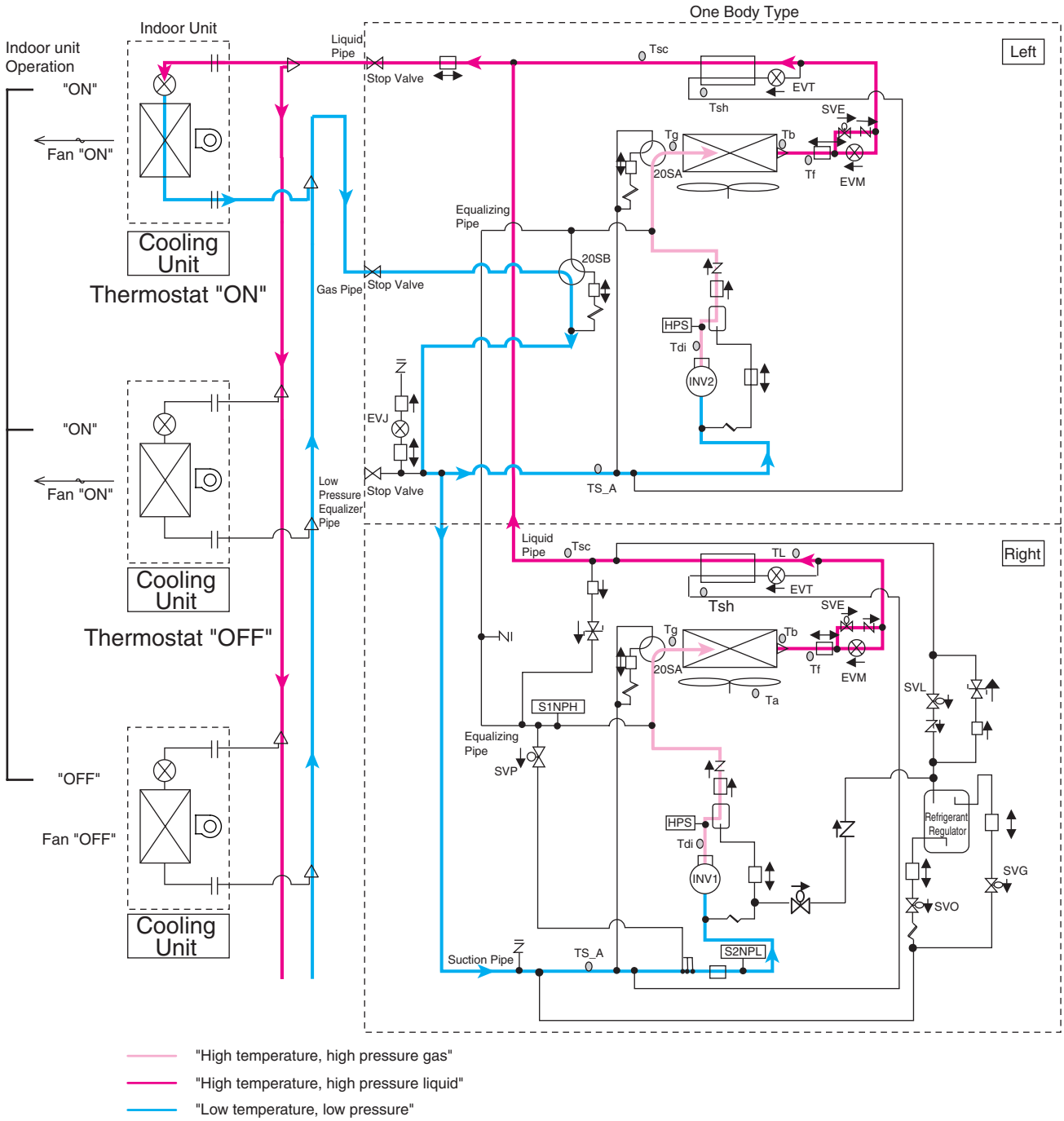
"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



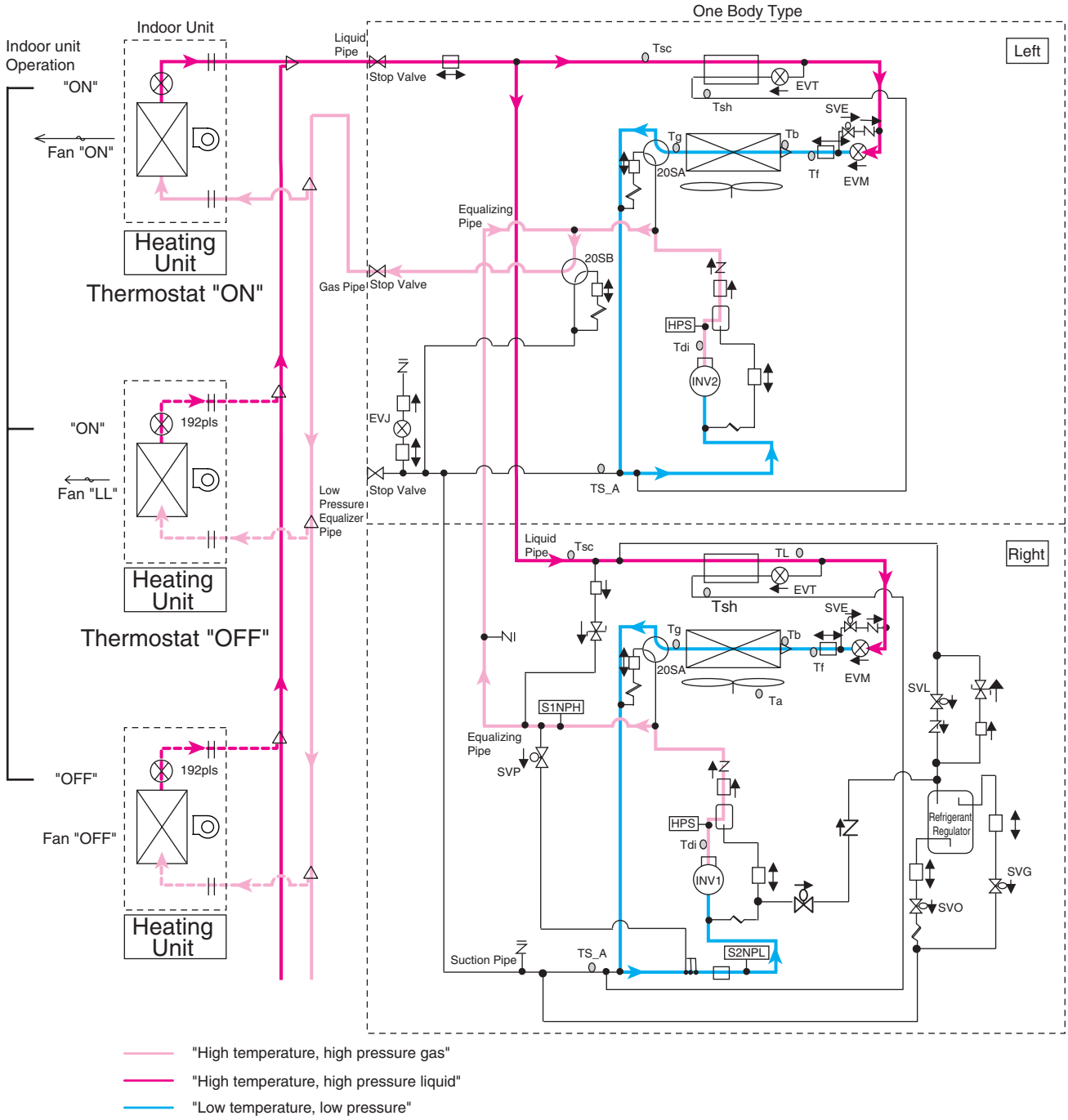
RXYQ72, 96, 120PYDN, PTJU (When a single unit is connected)
Defrost



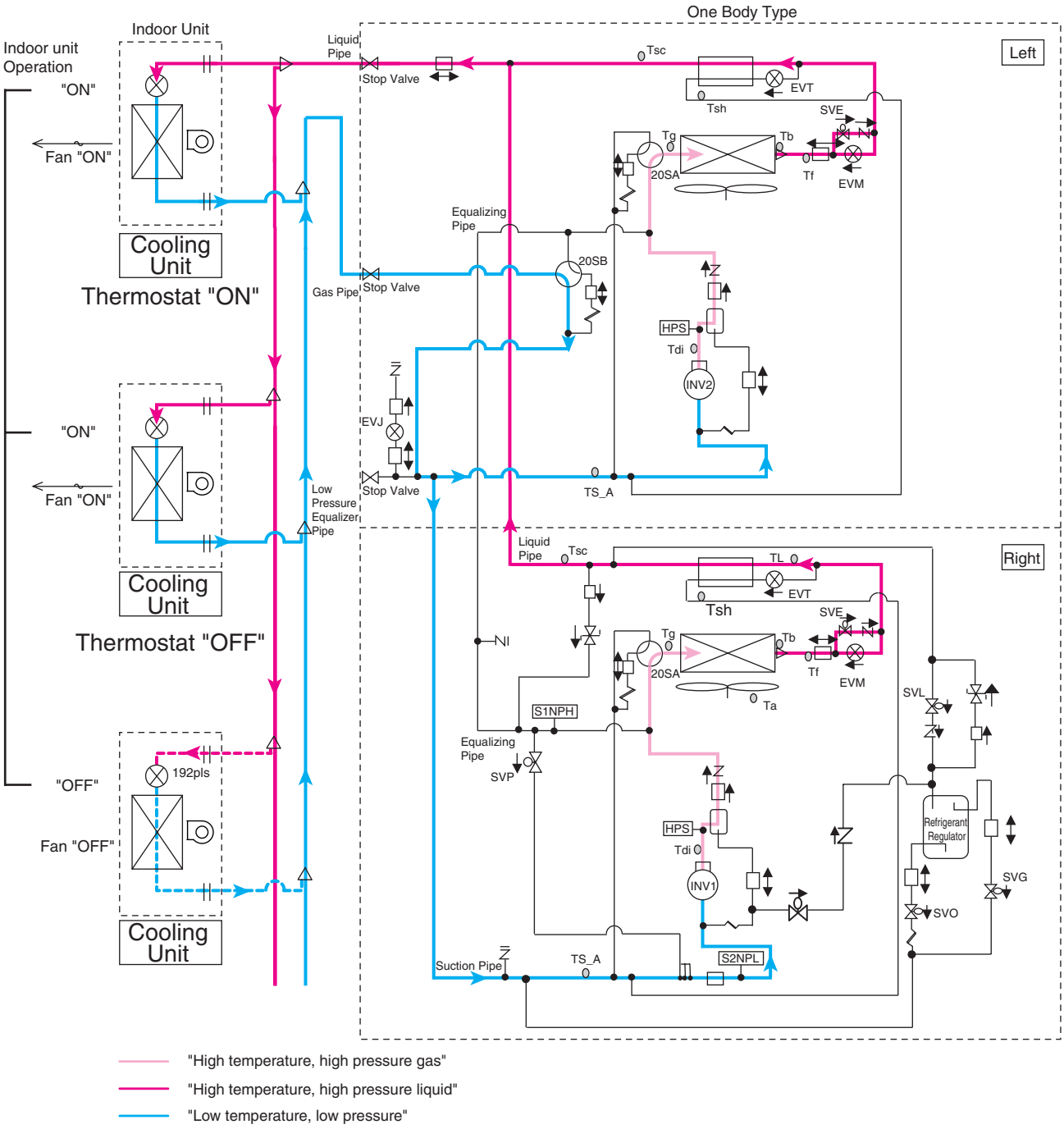
RXYQ144PTJU
Cooling Operation



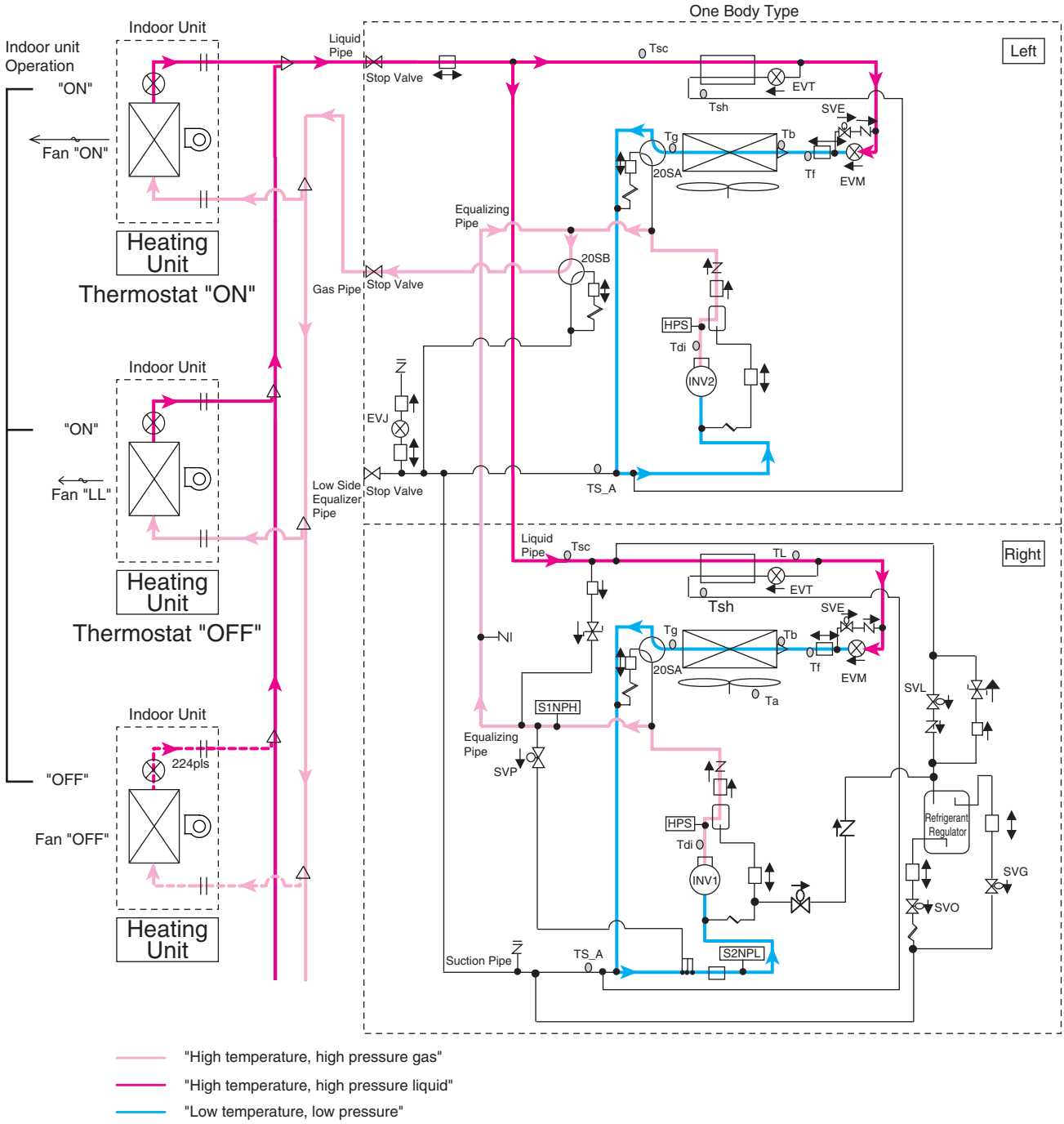
RXYQ144PTJU
Heating Operation



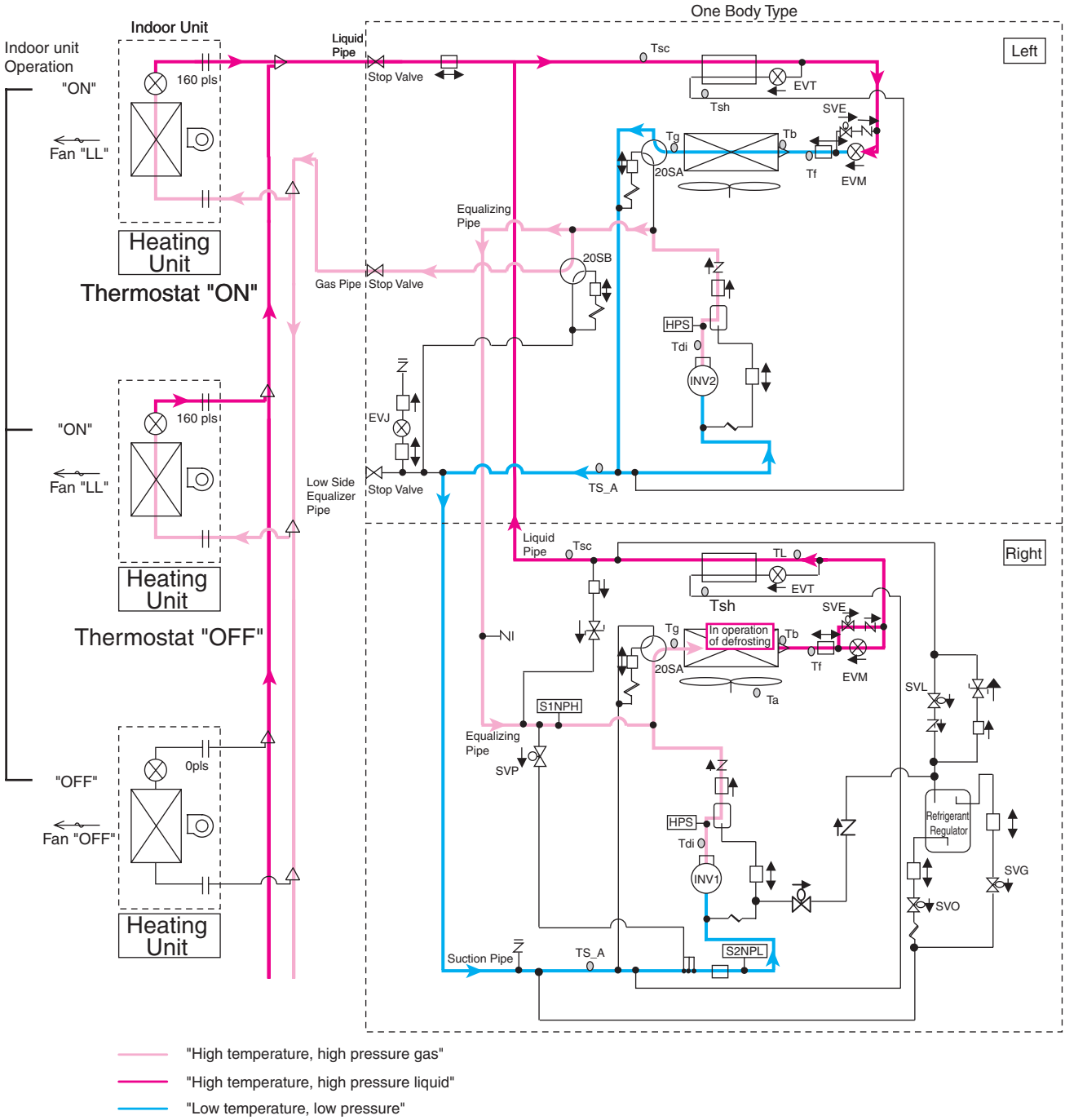
RXYQ144PTJU
Cooling Oil Return Operation



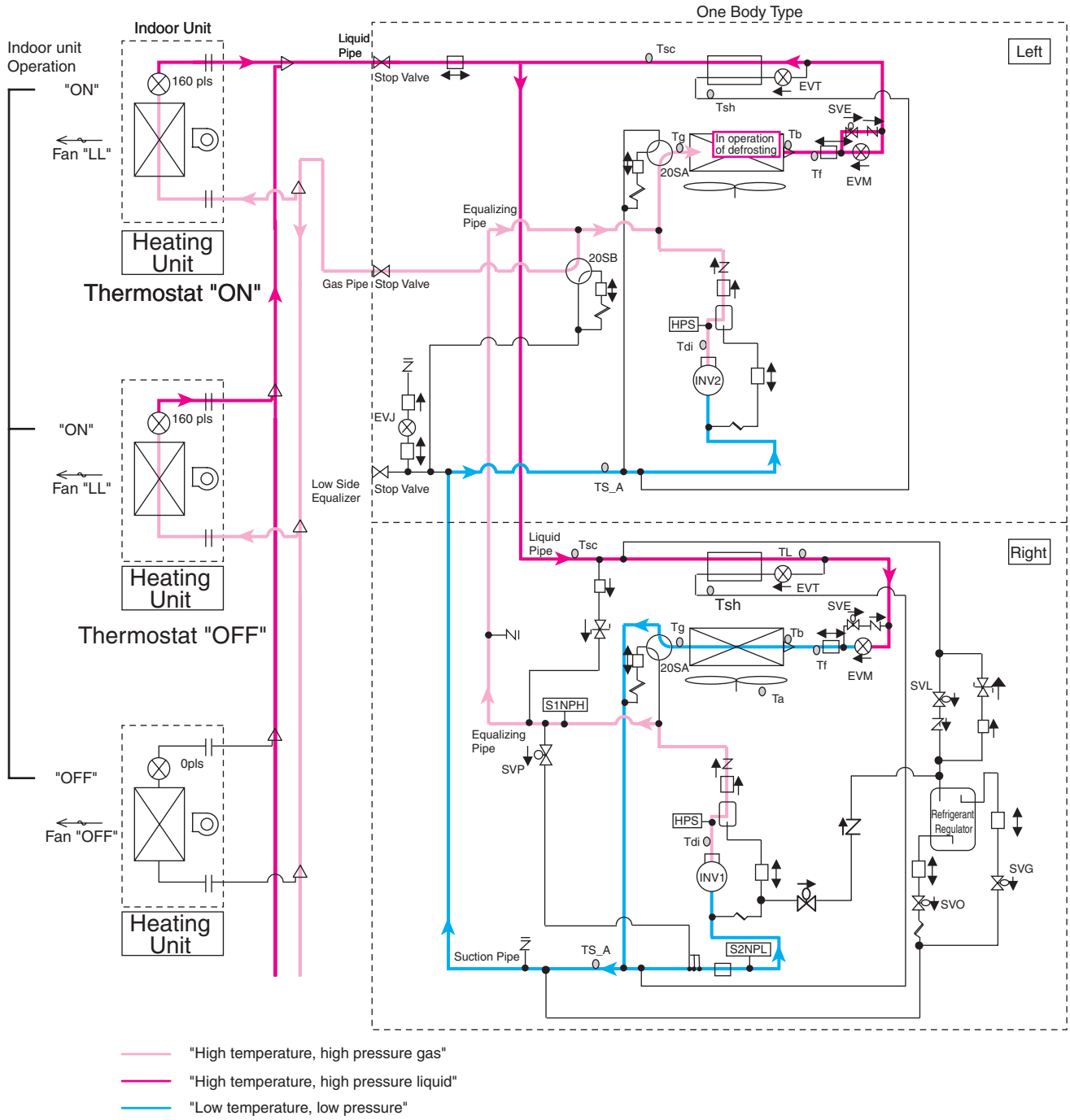
RXYQ144PTJU
Heating Oil Return Operation



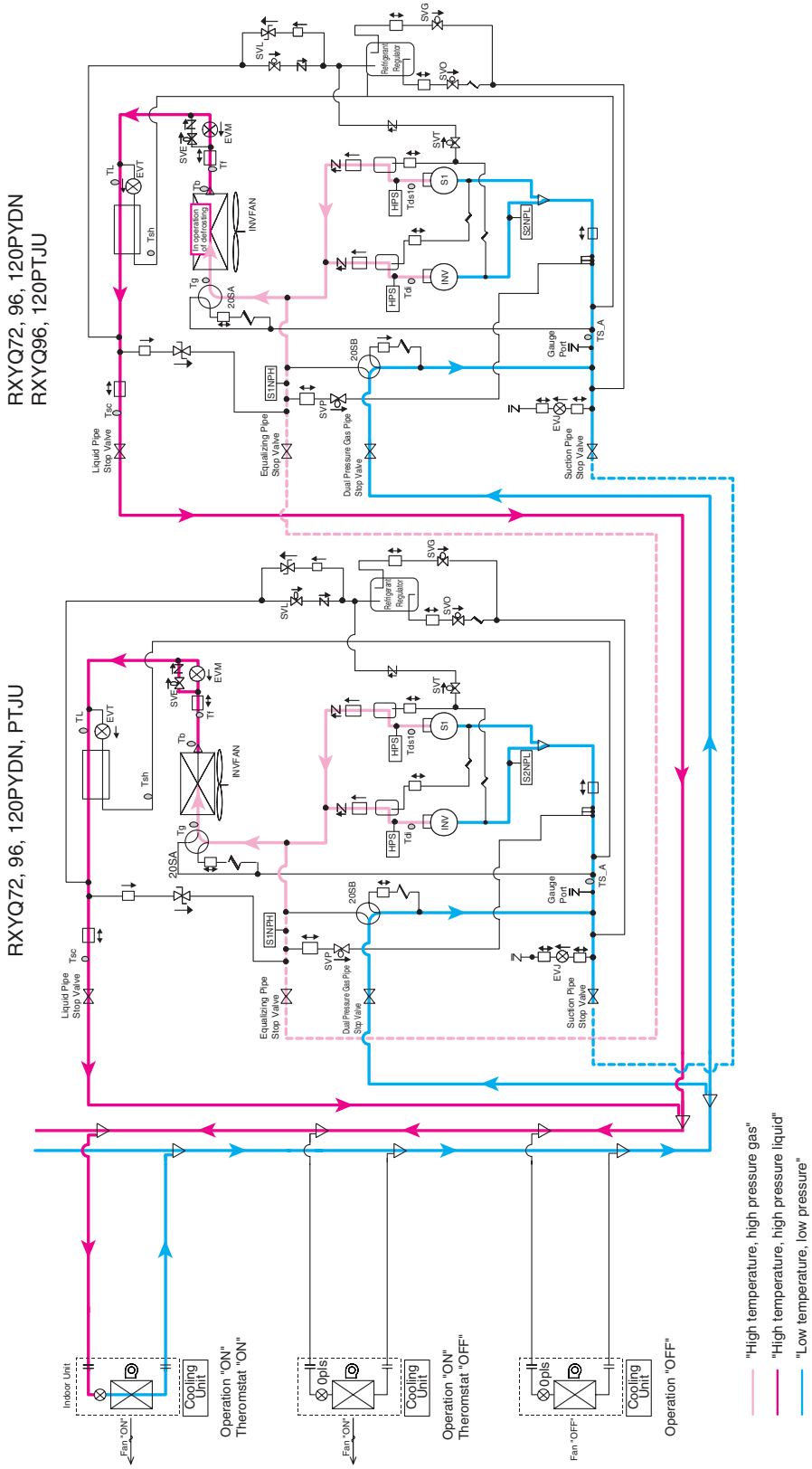
RXYQ144PTJU
Partial Defrosting 1 (Defrosting in the Right Unit)



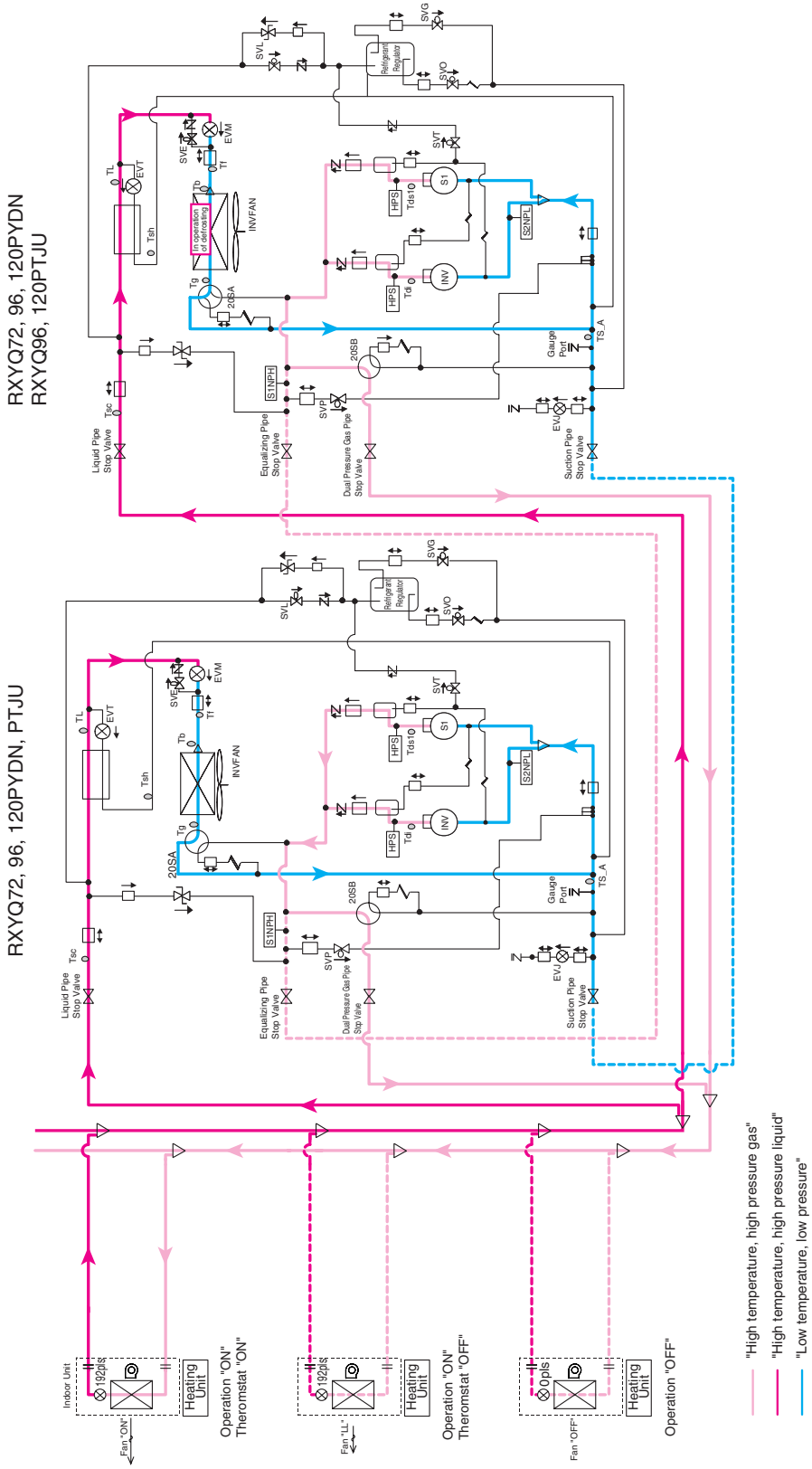
RXYQ144PTJU
Partial Defrosting 2 (Defrosting in the Left Unit)



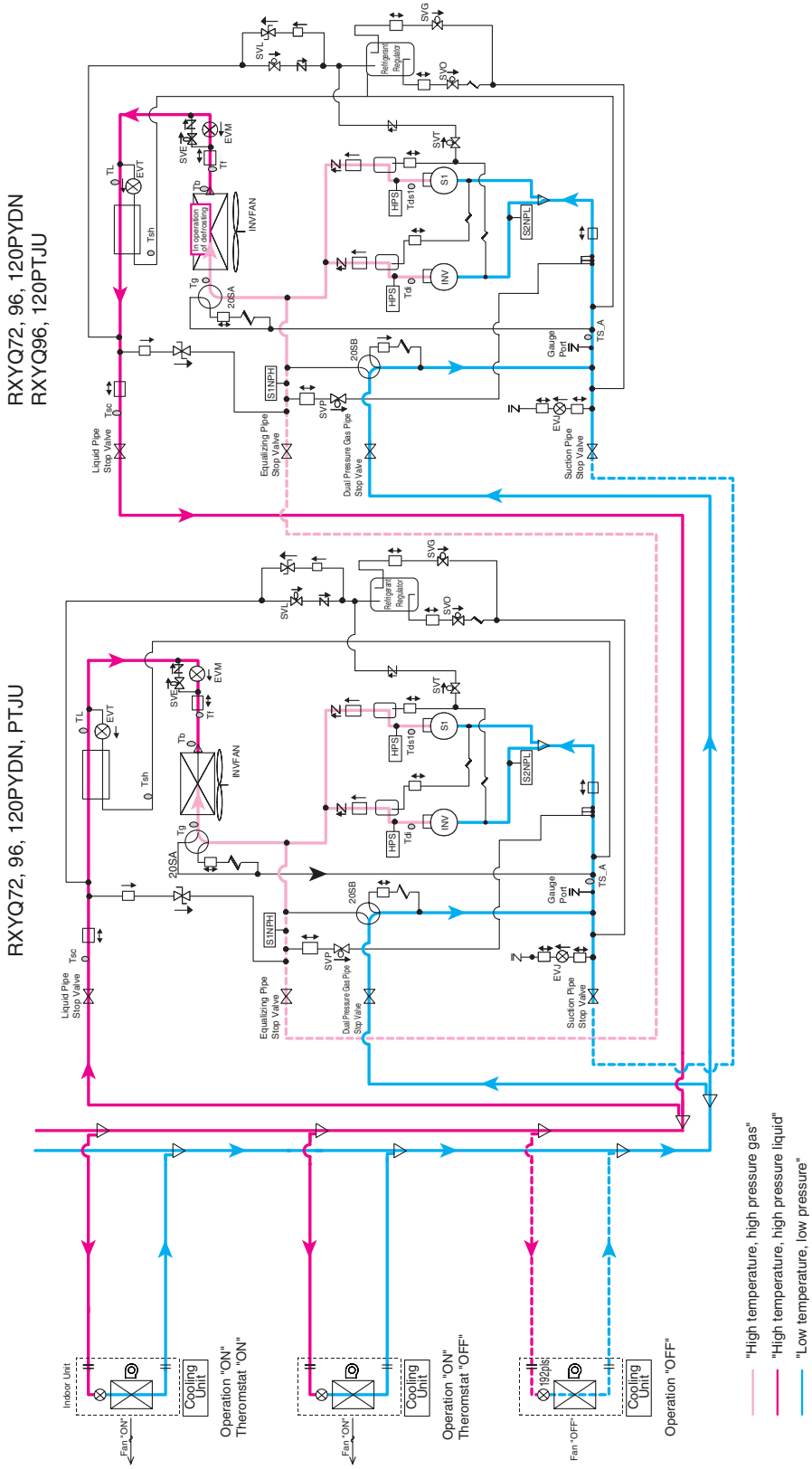
RXYQ144, 168, 192, 216, 240PYDN, RXYQ168, 192, 216, 240PTJU
Cooling Operation (When multiple units are connected)



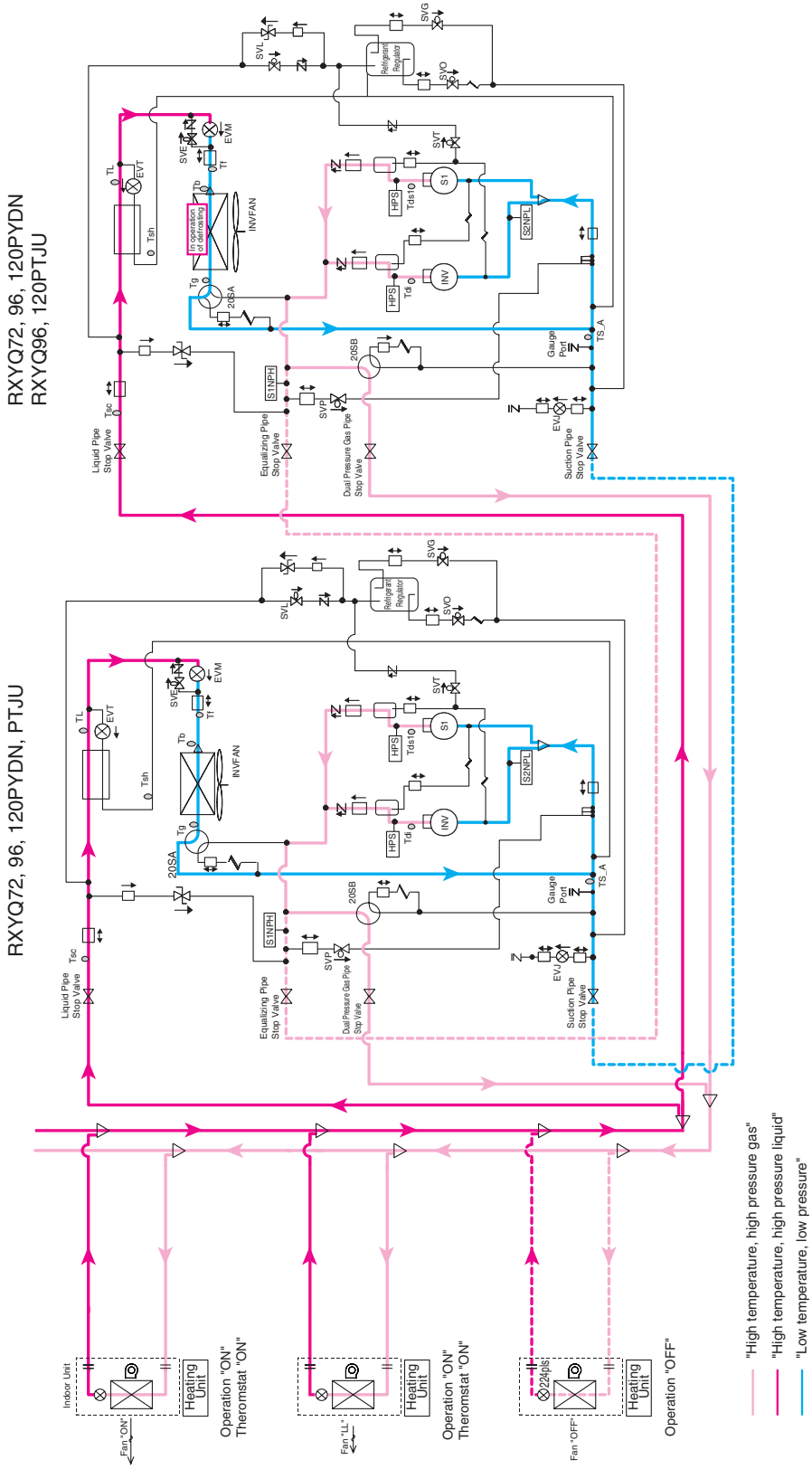
RXYQ144, 168, 192, 216, 240PYDN, RXYQ168, 192, 216, 240PTJU
Heating Operation (When multiple units are connected)



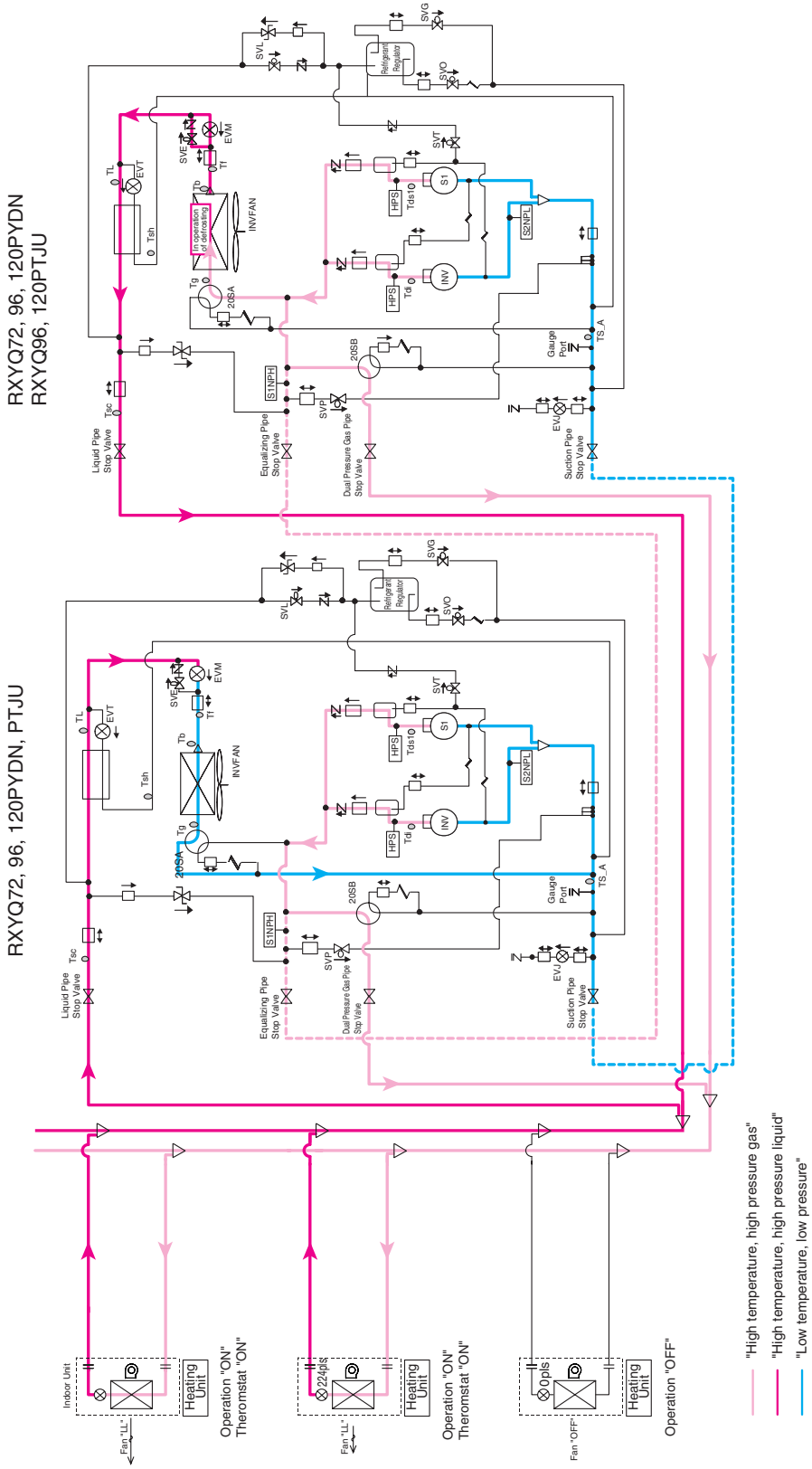
RXYQ144, 168, 192, 216, 240PYDN, RXYQ168, 192, 216, 240PTJU
Cooling Oil Return Operation (When multiple units are connected)



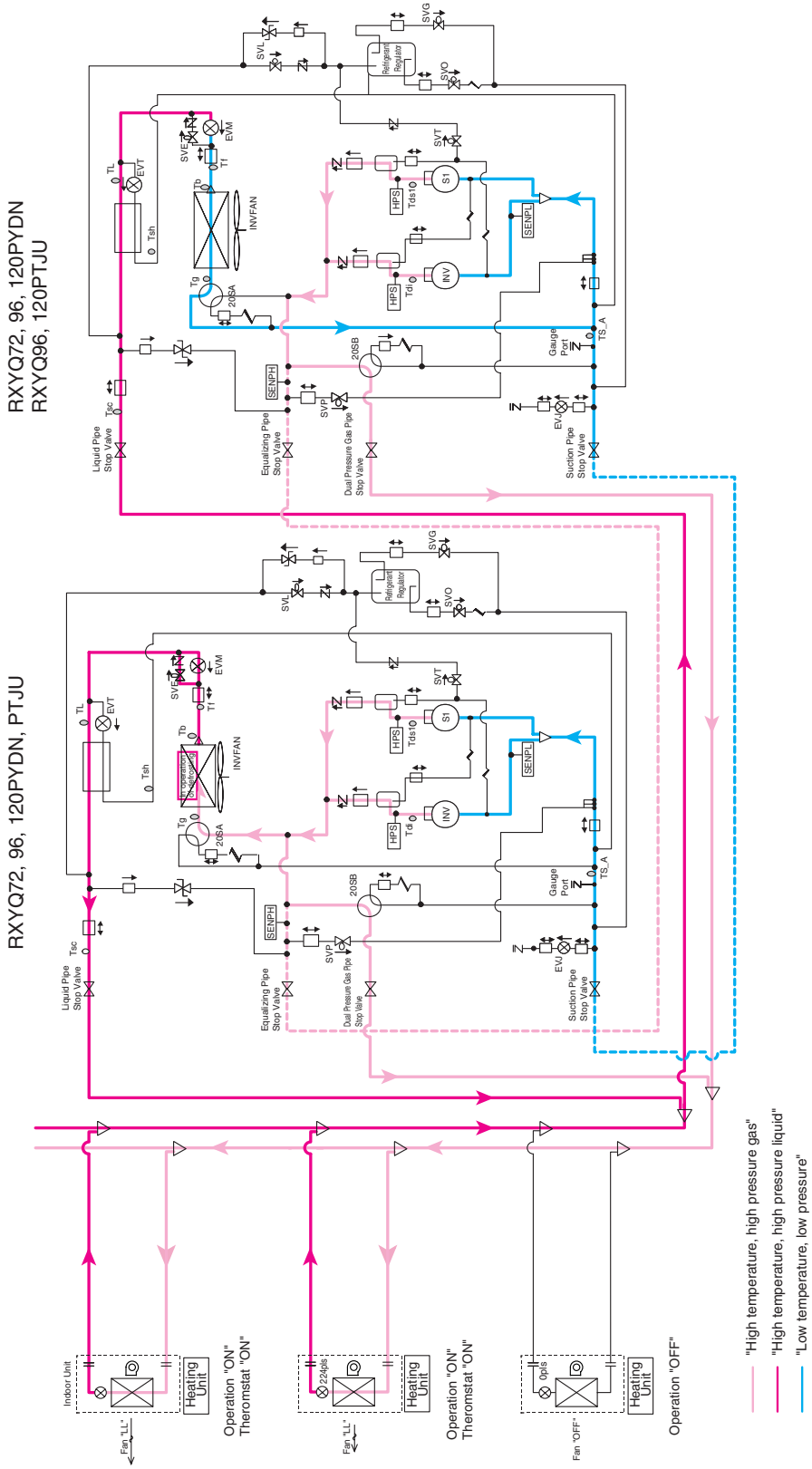
RXYQ144, 168, 192, 216, 240PYDN, RXYQ168, 192, 216, 240PTJU
Heating Oil Return Operation (When multiple units are connected)



RXYQ144, 168, 192, 216, 240PYDN, RXYQ168, 192, 216, 240PTJU
Partial Defrosting 1 (Defrosting in the Right Unit) (When multiple units are connected)

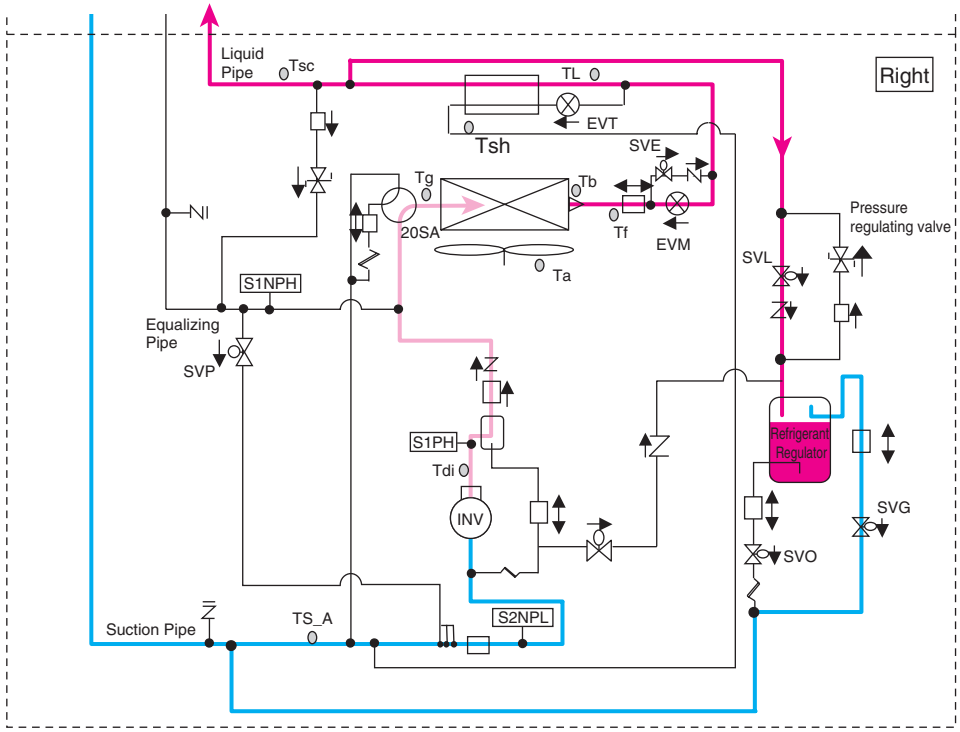


RXYQ144, 168, 192, 216, 240PYDN, RXYQ168, 192, 216, 240PTJU
Partial Defrosting 2 (Defrosting in the Left Unit)

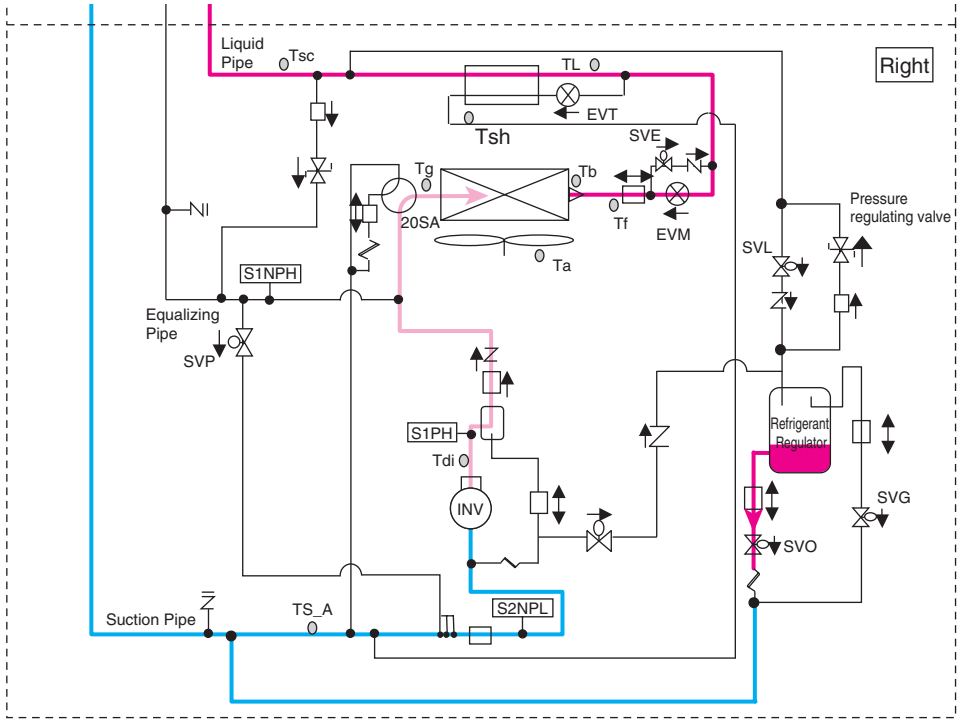


Operation of refrigerant regulator

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**
   Refrigerant is discharge from the 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.

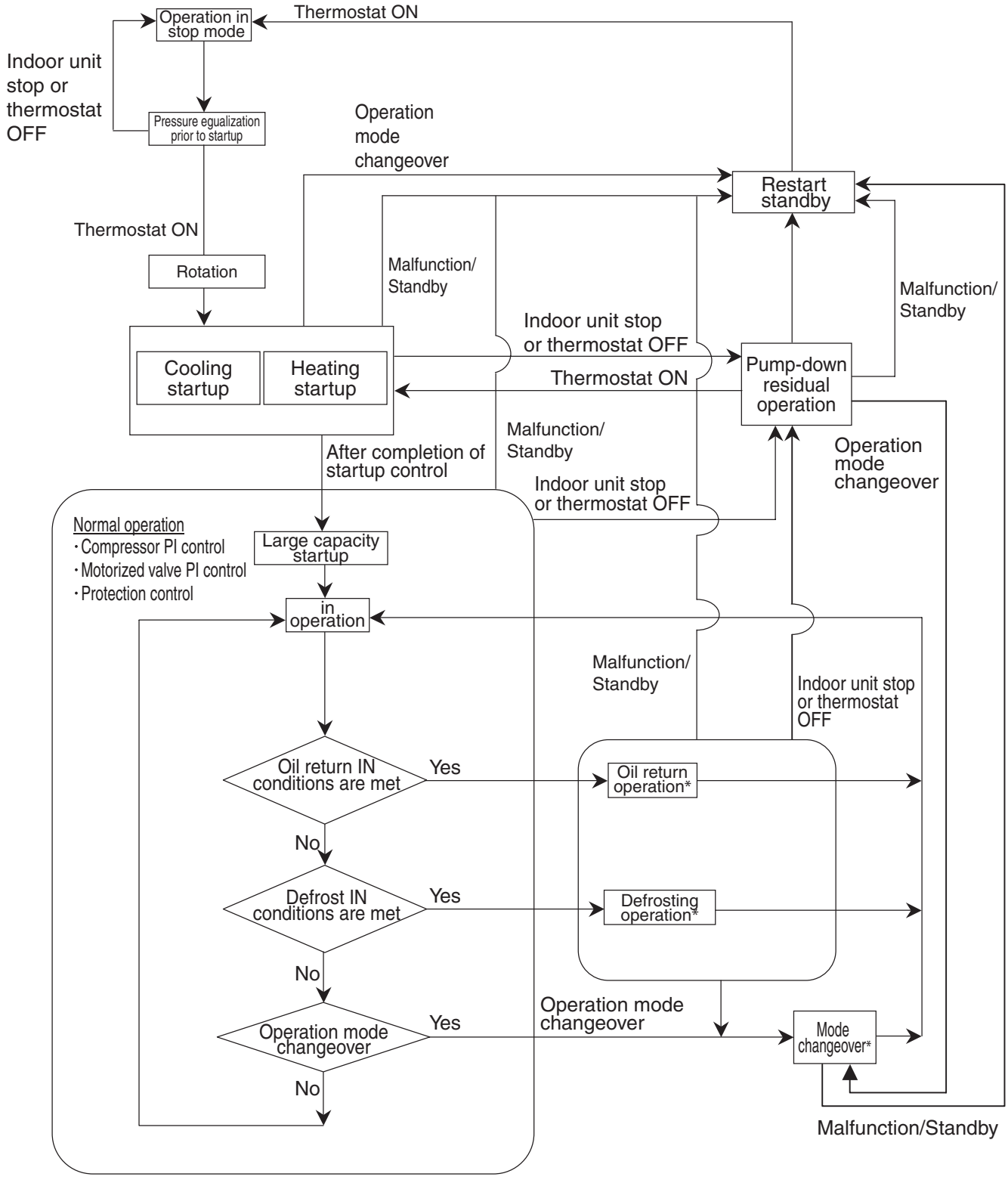
5. Function General

5.1 Symbol

Symbol	Electric symbol	Description or function
20SA	Y3S	Four-way valve (Heat exchanger switch)
20SB	Y2S (Y9S)	Four-way valve (High/low pressure gas pipe switch)
DSH	–	Discharge pipe superheated degree
DSHi	–	Discharge pipe superheat of inverter compressor
DSHs	–	Discharge pipe superheat of standard compressor
EV	–	Opening of electronic expansion valve
EVM	Y1E (Y3E)	Electronic expansion valve for main heat exchanger
EVT	Y3E (Y2E, Y5E)	Electronic expansion valve for subcooling heat exchanger
EVJ	Y2E (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 superheat
SHS	–	Target evaporator outlet superheat
SVE	Y6S (Y5S, Y10S)	Main bypass solenoid valve
SVP	Y5S (Y4S)	Solenoid valve for hot gas
SVL	Y4S (Y3S)	Refrigerant regulator liquid pipe solenoid valve
SVG	Y1S	Refrigerant regulator gas pipe solenoid valve
SVO	Y7S	Refrigerant regulator exhaust pipe solenoid valve
SVT	Y8S (Y6S)	Refrigerant regulator discharge pipe solenoid valve
Ta	R1T (A1P)	Outdoor air temperature
TsA	R8T (R10T)	Suction pipe temperature
Tb	R4T (R12T)	Heat exchanger outlet temperature at cooling
Tg	R2T (R11T)	Heat exchanger gas pipe temperature
Tf	R7T (R15T)	Temperature of liquid pipe between heat exchanger and main electronic expansion valve
Tsh	R5T (R13T)	Temperature detected with the subcooling heat exchanger outlet thermistor
Tl	R6T	Liquid pipe temperature detected with the liquid pipe thermistor
Tsc	R9T (R14T)	Temperature of liquid pipe between liquid shutoff valve and subcooled heat exchanger
Tc	–	High pressure equivalent saturation temperature
TcS	–	Target temperature of Tc
Te	–	Low pressure equivalent saturation temperature
TeS	–	Target temperature of Te
Tfin	R1T (A3P)	Inverter fin temperature
Tp	–	Calculated value of compressor port temperature
Tdi	R31T (R32T)	Discharge pipe temperature of inverter compressor
Tds	R32T, R33T	Discharge pipe temperature of standard compressor

Note: Symbol in ( ) are for RXYQ144PTJU.

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	
			Normal Cooling	Normal Heating
Compressor 1	—	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		
Outdoor unit fan 1	—	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		
Electronic expansion valve (Main)	EVM	Y1E	1375 pls	Outdoor unit heat exchanger: Condenser / Liquid pressure control Outdoor unit heat exchanger: Evaporator / PI control
Electronic expansion valve (Subcooling)	EVT	Y3E	PI control	PI control
Electronic expansion valve (Refrigerant charge)	EVJ	Y2E	80 pls	80 pls
■ Four way valve (Heat exchanger switch)	20SA	Y3S	OFF	Outdoor unit heat exchanger: Condenser / OFF Outdoor unit heat exchanger: Evaporator / ON
Four way valve (High/low pressure gas pipe switch)	20SB	Y2S	ON	OFF
Solenoid valve (Main bypass)	SVE	Y6S	ON	OFF
Solenoid valve (Hot gas)	SVP	Y5S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y4S	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 exhaust pipe)	SVO	Y7S	ON for refrigerant discharge	ON for refrigerant discharge
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y8S	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 Section 6, **Control of Electronic Expansion Valve** on page 293.

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 (F)

L	M (Normal) (factory setting)	H				
37	43	45	46	48	50	52

Te : Low pressure equivalent saturation temperature (°F)

TeS : Target Te value (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 (F)

L	M (Normal) (factory setting)	H
109	114	118

Tc : High pressure equivalent saturation temperature (°F)

TcS : Target Tc value (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.

Rotation of outdoor units

In order to make operating time equal for each compressor of multi connection outdoor units, outdoor units are used in rotation.

[Rotation of outdoor units]

For multiple outdoor units, an operational priority order is assigned to each outdoor unit on the control purpose.

The operational priority orders of each outdoor unit are switched by means of outdoor unit rotation.

[System with two outdoor units]

	Outdoor Unit 1	Outdoor Unit 2
Previous time	Priority 1	Priority 2
This time	Priority 2	Priority 1
Next time	Priority 1	Priority 2

[Timing of outdoor rotation]

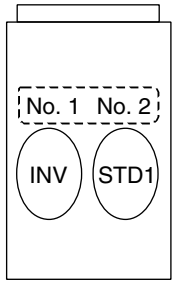
In start of startup control

■ Compressor Operating Priority

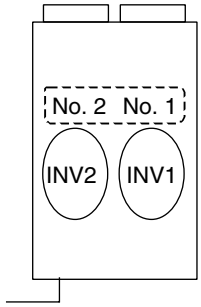
Each compressor operates in the following order of priority.
INV: Inverter compressor
STD1: Standard compressor 1

[ ] Pattern 1

RXYQ72P, 96P, 120P



RXYQ144PTJU



RXYQ72, 96, 120PYDN, PTJU

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

RXYQ144PTJU (12 ton)

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

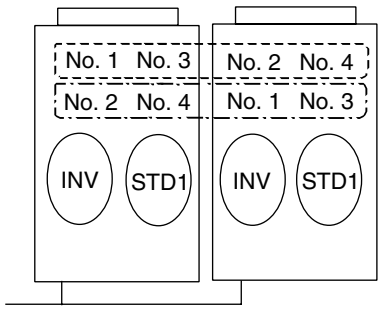
- Compressors are operated in the order of descending priorities.
- Compressors may operate in a pattern other than those listed in above tables subject to the operating conditions.

■ Compressor Operating Priority

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 2 according to the rotation of outdoor units.
INV: Inverter compressor
STD1: Standard compressor 1

Pattern 1 Pattern 2

RXYQ144P, 168P, 192P, 216P, 240P



RXYQ144, 168, 192, 216, 240PYDN
RXYQ168, 192, 216, 240PTJU

(To increase Step No.)

STEP No.	unit 1 INV	unit 2 INV	STD
1	52Hz	52Hz	◄Initial step
2	56Hz	56Hz	
3	62Hz	62Hz	
4	66Hz	66Hz	
5	70Hz	70Hz	
6	74Hz	74Hz	
7	80Hz	80Hz	
8	88Hz	88Hz	
9	92Hz	92Hz	
10	96Hz	96Hz	
11	104Hz	104Hz	
12	110Hz	110Hz	
13	116Hz	116Hz	
14	124Hz	124Hz	
15	132Hz	132Hz	
16	144Hz	144Hz	
17	158Hz	158Hz	
18	166Hz	166Hz	
19	176Hz	176Hz	
20	80Hz	80Hz	ON1
21	88Hz	88Hz	ON1
22	96Hz	96Hz	ON1
23	104Hz	104Hz	ON1
24	116Hz	116Hz	ON1
25	124Hz	124Hz	ON1
26	132Hz	132Hz	ON1
27	88Hz	88Hz	ON2
28	96Hz	96Hz	ON2
29	104Hz	104Hz	ON2
30	124Hz	124Hz	ON2
31	144Hz	144Hz	ON2
32	158Hz	158Hz	ON2
33	166Hz	176Hz	ON2
34	176Hz	158Hz	ON2
35	188Hz	188Hz	ON2
36	202Hz	202Hz	ON2
37	210Hz	210Hz	ON2
38	202Hz	202Hz	ON2
39	210Hz	210Hz	ON2

(To decrease Step No.)

STEP No.	unit 1 INV	unit 2 INV	STD
1	52Hz		
2	56Hz		
3	62Hz		
4	68Hz		
5	74Hz		
6	80Hz		
7	88Hz		
8	96Hz		
9	104Hz		
10	52Hz	52Hz	
11	56Hz	56Hz	
12	62Hz	62Hz	
13	66Hz	66Hz	
14	70Hz	70Hz	
15	74Hz	74Hz	
16	80Hz	80Hz	
17	88Hz	88Hz	
18	92Hz	92Hz	
19	96Hz	96Hz	
20	104Hz	104Hz	
21	110Hz	110Hz	
22	116Hz	116Hz	
23	124Hz	124Hz	
24	132Hz	132Hz	
25	52Hz	52Hz	ON1
26	62Hz	62Hz	ON1
27	68Hz	68Hz	ON1
28	74Hz	74Hz	ON1
29	80Hz	80Hz	ON1
30	88Hz	88Hz	ON1
31	96Hz	96Hz	ON1
32	104Hz	104Hz	ON1
33	52Hz	52Hz	ON2
34	62Hz	62Hz	ON2
35	74Hz	74Hz	ON2
36	88Hz	88Hz	ON2
37	96Hz	96Hz	ON2
38	104Hz	104Hz	ON2
39	124Hz	124Hz	ON2
40	144Hz	144Hz	ON2
41	158Hz	158Hz	ON2
42	166Hz	166Hz	ON2
43	176Hz	176Hz	ON2
44	188Hz	188Hz	ON2
45	202Hz	202Hz	ON2
46	210Hz	210Hz	ON2
47	202Hz	202Hz	ON2
48	210Hz	210Hz	ON2

- Compressors are operated in the order of descending priorities.
- Compressors may operate in a pattern other than those listed in above tables subject to the operating conditions.

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 saturated temperature (°F)

Subcooling electronic expansion valve EVT control

In order to make the maximum use of the subcool 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 subcool heat exchanger outlet thermistor R5T
Te: Low pressure equivalent saturated 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

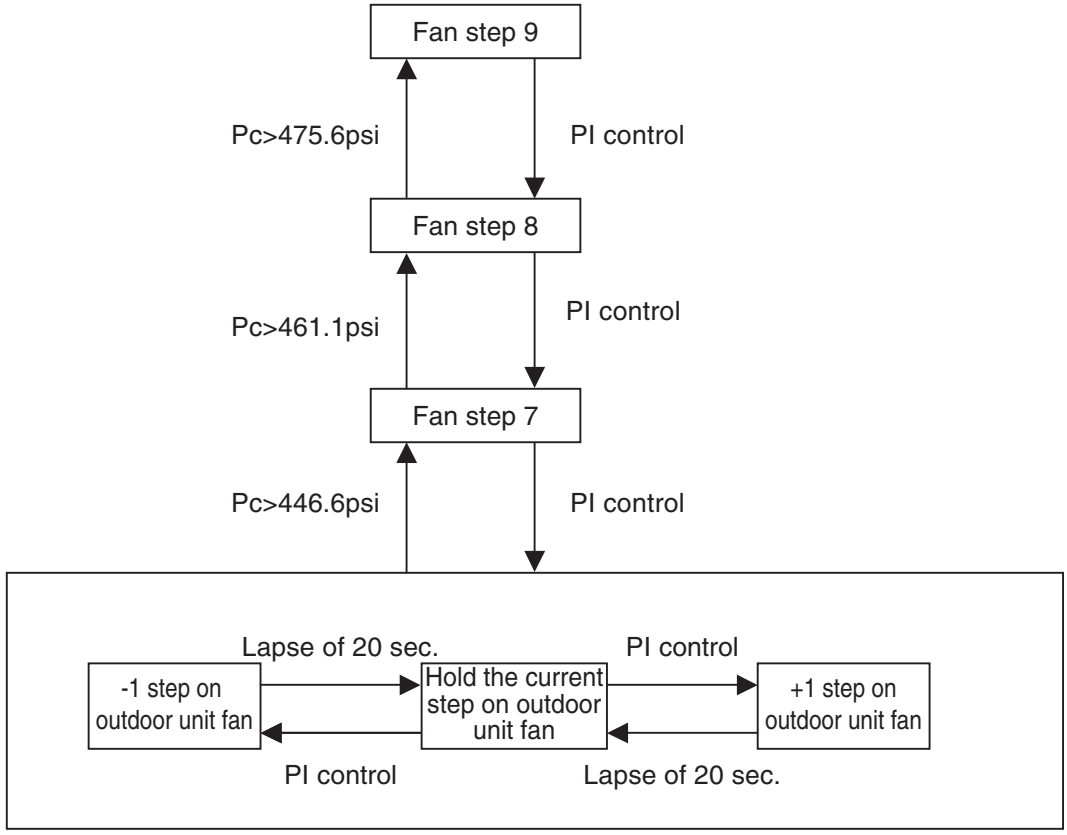
Used to control the revolutions of outdoor unit fans in the steps listed in table below, according to condition changes.

STEP No.	Fan revolutions (rpm)			
	RXYQ72P	RXYQ96P	RXYQ120P	RXYQ144PTJU
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 Operation

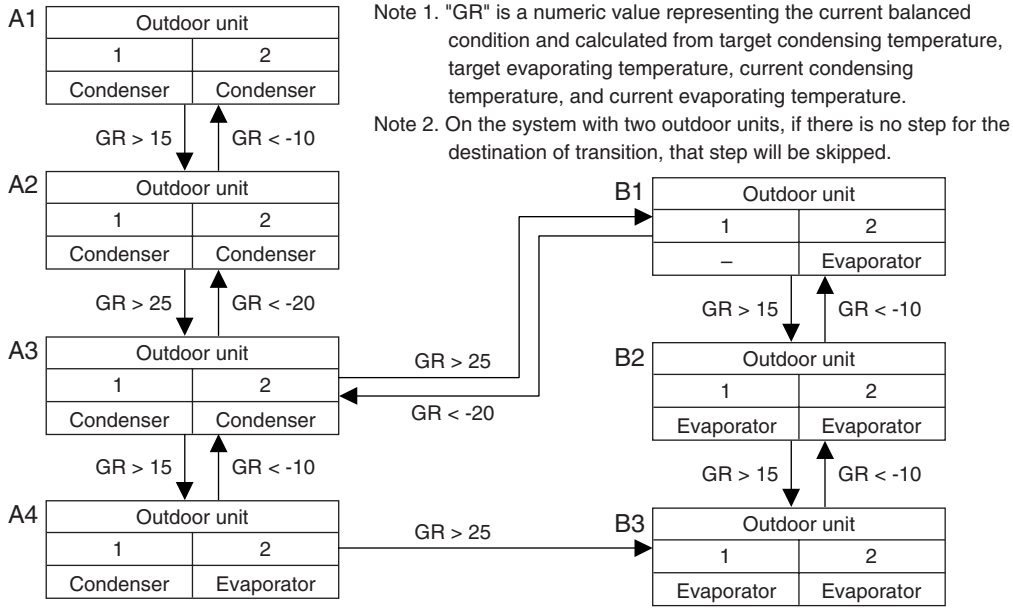
While in cooling operation, if the outdoor temperature is low, this mode provides high-pressure control using the outdoor unit fan to retain appropriate liquid pressure, thus ensuring refrigerant circulation rate to be supplied to indoor units.



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.

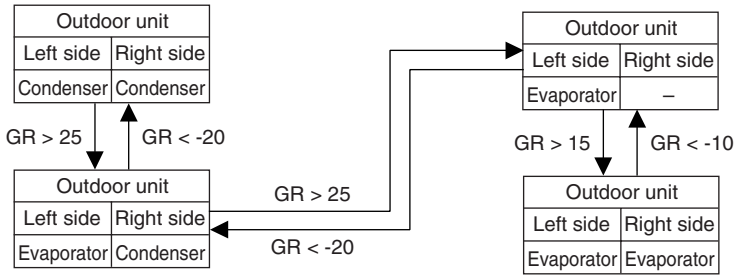
[Multi outdoor unit system]



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.

[RXYQ144PTJU]



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.

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 Operation

Actuator	Symbol	Elect. symbol		Control before startup	Startup control	
		RXYQ 144PTJU	For any model other than that shown on the left		STEP1	STEP2
Compressor 1	—	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	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	—			
Electronic expansion valve (Main)	EVM	Y1E	Y1E	0 pls	1375 pls	1375 pls
		Y3E				
Electronic expansion valve (Subcooling)	EVT	Y2E	Y3E	0 pls	0 pls	0 pls
		Y5E				
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S	Y3S	OFF	OFF	OFF
		Y9S				
Four-wayvalve (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	ON	ON	ON
Solenoid valve (Main bypass)	SVE	Y5S	Y6S	OFF	ON	ON
		Y10S				
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	Y8S	OFF	OFF	OFF
Ending conditions				A lapse of 60 sec.	A lapse of 15 sec.	OR • A lapse of 90 sec. • Pc - Pe>56.55psi

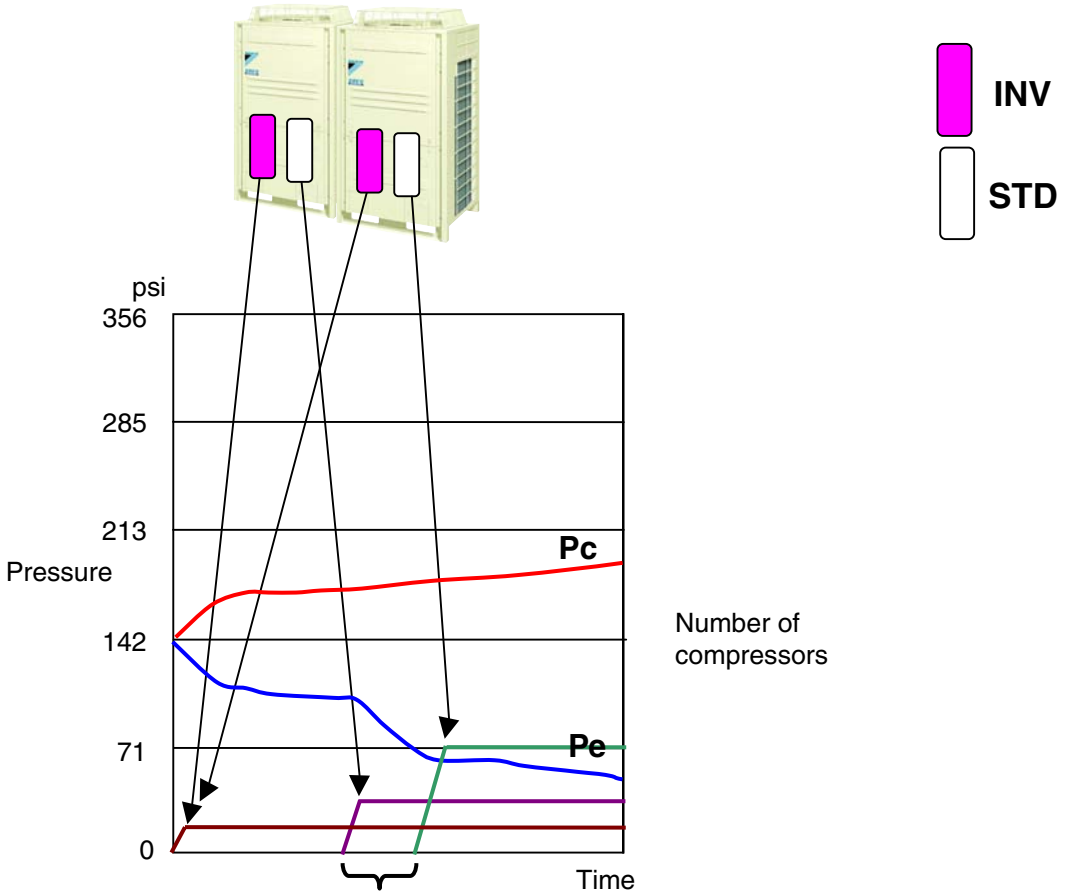
7.1.2 Startup Control in Heating Operation

Actuator	Symbol	Elect. symbol		Control before startup	Startup control	
		RXYQ 144PTJU	For any model other than that shown on the left		STEP1	STEP2
Compressor 1	—	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	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) -1step/15 sec. (When Pc_max<256.65psi)
Outdoor unit fan 2		M2F	—			
Electronic expansion valve (Main)	EVM	Y1E	Y1E	0 pls	20SA=ON: SH Control 20SA=OFF: 1375 pls	20SA=ON: SH Control 20SA=OFF: 1375 pls
		Y3E				
Electronic expansion valve (Subcooling)	EVT	Y2E	Y3E	0 pls	0 pls	0 pls
		Y5E				
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S	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
		Y9S				
Four-way valve (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	OFF	OFF	OFF
Solenoid valve (Main bypass)	SVE	Y5S	Y6S	OFF	OFF	OFF
		Y10S				
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	Y8S	OFF	OFF	OFF
Ending conditions				A lapse of 60 sec.	A lapse of 15 sec.	OR • A lapse of 90 sec. • Pc - Pe>56.55psi

7.2 Large Capacity Start Up 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.



Start up 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

Used to recover refrigerant oil that flows out from the compressor to the system side by conducting the oil-return operation. This prevents the compressor from running out of refrigerant oil.

7.3.1 Cooling Oil Return Operation

[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	Elect. symbol		Oil return operation	Operation after oil return
		RXYP 144PTJU	For any model other than that shown on the left		
Compressor 1	—	M1C	M1C	52Hz+ON (Subsequently, constant low pressure control) Maintain the number of compressors that were used before oil return operation	52Hz+ON (Subsequently, constant low pressure control) Maintain the number of compressors that were used before oil return operation
Compressor 2		M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	Cooling fan control	Cooling fan control
Outdoor unit fan 2		M2F	—		
Four-way valve (for heat exchanger selection)	20SA	Y2S Y9S	Y3S	OFF	OFF
Four-way valve (for high- and low-pressure gas pipe selection)	20SB	Y8S	Y2S	ON	ON
Electronic expansion valve (main)	EVM	Y1E Y3E	Y1E	1375pls	1375pls
Electronic expansion valve (subcooling)	EVT	Y2E Y5E	Y3E	SH control	SH control
Electronic expansion valve (refilling refrigerant)	EVJ	Y4E	Y2E	80pls	80pls
Solenoid valve (main bypass)	SVE	Y5S Y10S	Y6S	ON	ON
Solenoid valve (hot gas)	SVP	Y4S	Y5S	OFF	OFF
Solenoid valve (liquid pipe of refrigerant regulator)	SVL	Y3S	Y4S	0pls	0pls
Solenoid valve (gas discharge pipe of refrigerant regulator)	SVG	Y1S	Y1S	0pls	0pls
Solenoid valve (drain pipe of refrigerant regulator)	SVO	Y7S	Y7S	0pls	0pls
Solenoid valve (discharge pipe of refrigerant regulator)	SVT	Y6S	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>526.35psi • 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	Thermo ON unit	Remote controller setting
	Unit not in operation	OFF
	Thermo OFF unit	Remote controller setting
Motorized valve	Thermo ON unit	Normal opening degree
	Unit not in operation	192pls
	Thermo OFF unit	Normal opening degree for forced thermostat ON

7.3.2 Heating Oil Return 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.

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	Elect. symbol		Oil return operation
		RXYQ 144PTJU	For any model other than that shown on the left	
Compressor 1	—	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	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	—	
Electronic expansion valve (main)	EVM	Y1E Y3E	Y1E	20SA=ON : PI control 20SA=OFF : 418pls
Electronic expansion valve (subcooling)	EVT	Y2E Y5E	Y3E	PI control
Electronic expansion valve (refilling refrigerant)	EVJ	Y4E	Y2E	80pls
Four-way valve (for heat exchanger selection)	20SA	Y2S Y9S	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 high- and low-pressure gas pipe selection)	20SB	Y8S	Y2S	OFF
Solenoid valve (main bypass)	SVE	Y5S Y10S	Y6S	OFF
Solenoid valve (hot gas)	SVP	Y4S	Y5S	0pls
Solenoid valve (liquid pipe of refrigerant regulator)	SVL	Y3S	Y4S	0pls
Solenoid valve (gas discharge pipe of refrigerant regulator)	SVG	Y1S	Y1S	0pls
Solenoid valve (drain pipe of refrigerant regulator)	SVO	Y7S	Y7S	0pls
Solenoid valve (discharge pipe of refrigerant regulator)	SVT	Y6S	Y8S	0pls

End conditions	or • Pe_min<31.9psi • After a lapse of 9 min.

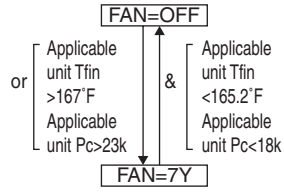
*1: In case of multi outdoor unit system:
Master unit: It conducts the operation listed in the table above.
Slave units: Operating units conduct the operation listed in the table above.
Non-operating units conduct the operation listed in the table above after the ***Oil returning*** process.
(Non-operating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

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

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

7.4 Defrost Operation

7.4.1 Single System

Defrosting outdoor unit actuator	Symbol	Electrical symbol		Defrosting operation	Operation after defrosting
		RXYQ 144PTJU	For any model other than that shown on the left		
Compressor 1	—	M1C	M1C	232Hz+ON	232Hz+ON
Compressor 2		M2C	M2C		
Outdoor unit fan	—	M1F	M1F		Step 8
		M2F	—		
Four-way valve (heat exchanging)	20SA	Y2S Y9S	Y3S	OFF	ON
Four-way valve (switching between high- and low-pressure gas pipes)	20SB	Y8S	Y2S	ON	OFF
Electronic expansion valve (main)	EVM	Y1E Y3E	Y1E	1375pls	0pls→200~400pls
Electronic expansion valve (subcool)	EVT	Y2E Y5E	Y3E	SH control	0pls
Electronic expansion valve (refrigerant charge)	EVJ	Y4E	Y2E	80pls	80pls
Solenoid valve (main)	SVE	Y5S Y10S	Y6S	ON	OFF
Solenoid valve (hot gas)	SVP	Y4S	Y5S	OFF	OFF
Solenoid valve (liquid pipe of refrigerant regulator)	SVL	Y3S	Y4S	0pls	0pls
Solenoid valve (gas purging pipe of refrigerant regulator)	SVG	Y1S	Y1S	0pls	0pls
Solenoid valve (drain pipe of refrigerant regulator)	SVO	Y7S	Y7S	0pls	0pls

Solenoid valve (discharge pipe of refrigerant regulator)	SVT	Y6S	Y8S	0pls	0pls
Ending conditions				or • 10 min. • Tb>51.8°F continues for a period of consecutive 90 sec.	or • 160 sec. • Pc-Pe>58psi continues for a period of consecutive 120 sec.

7.4.2 Multi Outdoor Unit System

[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 conductivity of outdoor unit heat exchanger is calculated by Tc, Te, and compressor loads.

Defrosting outdoor unit actuator	Symbol	Elect. symbol: For any model other than 144PTJU	Defrost operation	Operation after defrost
Compressor 1	—	M1C	210Hz+ON	210Hz+ON
Compressor 2		M2C		
Outdoor unit fan 1	—	M1F	OFF ↓ Pcmax>355.25psi, ↑ Pcmax<342.2psi → FANSTEP4; ↓ Pcmax>440.8psi, ↑ Pcmax<427.75psi → FANSTEP6	OFF ↓ Pcmax>355.25psi, ↑ Pcmax<342.2psi → FANSTEP4; ↓ Pcmax>440.8psi, ↑ Pcmax<427.75psi → FANSTEP6
Four way valve (for heat exchanger selection)	20SA	Y3S	OFF	OFF
Four way valve (for high- and low-pressure gas pipe selection)	20SB	Y2S	Holds	Holds
Electronic expansion valve (main)	EVM	Y1E	1375pls	0pls
Electronic expansion valve (subcooling)	EVT	Y3E	SH control	0pls
Electronic expansion valve (refilling refrigerant)	EVJ	Y2E	80pls	80pls
Solenoid valve (main bypass)	SVE	Y6S	ON	OFF
Solenoid valve (hot gas)	SVP	Y5S	OFF	OFF
Solenoid valve (liquid pipe of refrigerant regulator)	SVL	Y4S	0pls	0pls
Solenoid valve (gas discharge pipe of refrigerant regulator)	SVG	Y1S	0pls	0pls
Solenoid valve (drain pipe of refrigerant regulator)	SVO	Y7S	0pls	0pls
Solenoid valve (discharge pipe of refrigerant regulator)	SVT	Y8S	0pls	0pls
End conditions			RXYQ72~120P (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	Elect. symbol		Defrost operation	Operation after defrost
		RXYQ 144PTJU	For any model other than that shown on the left		
Compressor 1	—	M1C	M1C	210Hz+ON	210Hz+ON
Compressor 2		M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	Fan control	Fan control
		M2F	—		
Four-way valve (for heat exchanger selection)	20SA	Y2S	Y3S	ON	ON
		Y9S			
Four-way valve (for high- and low-pressure gas pipe selection)	20SB	Y8S	Y2S	Holds	Holds
Electronic expansion valve (main)	EVM	Y1E	Y1E	PI control	PI control
		Y3E			
Electronic expansion valve (subcooling)	EVT	Y2E	Y3E	SH control	0pls
		Y5E			
Electronic expansion valve (refilling refrigerant)	EVJ	Y4E	Y2E	80pls	80pls
Solenoid valve (main bypass)	SVE	Y5S	Y6S	OFF	OFF
		Y10S			
Solenoid valve (hot gas)	SVP	Y4S	Y5S	OFF	OFF
Solenoid valve (liquid pipe of refrigerant regulator)	SVL	Y3S	Y4S	0pls	0pls
Solenoid valve (gas discharge pipe of refrigerant regulator)	SVG	Y1S	Y1S	0pls	0pls
Solenoid valve (drain pipe of refrigerant regulator)	SVO	Y7S	Y7S	0pls	0pls
Solenoid valve (discharge pipe of refrigerant regulator)	SVT	Y6S	Y8S	0pls	0pls

Heating indoor unit actuator		Defrost operation		
		RXYQ72 · 96 · 120P	RXYQ144PTJU (230V)	RXYQ144PYDN (460V) RXYQ168 · 192 · 216 · 240P
Fan	Thermo ON unit	OFF	LL	LL
	Unit not in operation	OFF	OFF	OFF
	Thermo OFF unit	OFF	LL	LL
Motorized valve	Thermo ON unit	416pls	160pls	224pls
	Unit not in operation	160pls	0pls	0pls
	Thermo OFF unit	160pls	160pls	224pls

7.5 Pump-down Residual Operation

7.5.1 Pump-down Residual Operation in Cooling Operation

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	Elect. symbol		Master unit operation	Slave unit operation
		RXYQ 144PTJU	For any model other than that shown on the left		
Compressor 1	—	M1C	M1C	124 Hz+OFF	OFF
Compressor 2		M2C	M2C		

Outdoor unit fan 1	—	M1F	M1F	Fan control	Fan control
Outdoor unit fan 2		M2F	—		
Electronic expansion valve (Main)	EVM	Y1E	Y1E	1375 pls	1375 pls
		Y3E			
Electronic expansion valve (Subcooling)	EVT	Y2E	Y3E	0 pls	0 pls
		Y5E			
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S	Y3S	OFF	OFF
		Y9S			
Four-way valve (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	ON	ON
Solenoid valve (Main bypass)	SVE	Y5S	Y6S	ON	ON
		Y10S			
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF	OFF
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	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 Operation

Actuator	Symbol	Elect. symbol		Master unit operation	Slave unit operation
		RXYQ 144PTJU	For any model other than that shown on the left		
Compressor 1	—	M1C	M1C	124 Hz+OFF	OFF
Compressor 2		M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	Fan control	Fan control
Outdoor unit fan 2		M2F	—		
Electronic expansion valve (Main)	EVM	Y1E	Y1E	When 20SA=ON: 0 pls When 20SA=OFF: 1375 pls	When 20SA=ON: 0 pls When 20SA=OFF: 1375 pls
		Y3E			
Electronic expansion valve (Subcooling)	EVT	Y2E	Y3E	0 pls	0 pls
		Y5E			
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S	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
		Y9S			

Four way valve (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	OFF	OFF
Solenoid valve (Main bypass)	SVE	Y5S Y10S	Y6S	OFF	OFF
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF	OFF
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	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

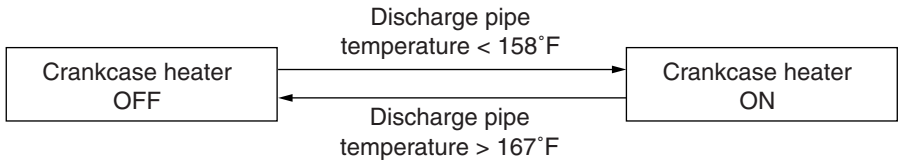
Used to forcedly stop the compressor for a period of 2 minutes, in order to prevent the frequent ON/OFF of the compressor and equalize the pressure within the refrigerant system.

Actuator	Symbol	Elect. symbol		Operation
		RXYQ 144PTJU	For any model other than that shown on the left	
Compressor 1	—	M1C	M1C	OFF
Compressor 2	—	M2C	M2C	OFF
Outdoor unit fan 1	—	M1F	M1F	Ta>86°F: STEP4 Ta≤86°F: OFF
Outdoor unit fan 2		M2F	—	Ta>86°F: STEP4 Ta≤86°F: OFF
Electronic expansion valve (Main)	EVM	Y1E Y3E	Y1E	0 pls
Electronic expansion valve (Subcooling)	EVT	Y2E Y5E	Y3E	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S Y9S	Y3S	Holds
Four-way valve (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	Holds
Solenoid valve (Main bypass)	SVE	Y5S Y10S	Y6S	OFF
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF

Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	Y8S	OFF
Ending conditions	—			2 min.

7.6.2 Crankcase Heater Control

In order to prevent the refrigerant from condensing in the compressor oil when 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	Elect. symbol		Operation
		RXYQ 144PTJU	For any model other than that shown on the left	
Compressor1	—	M1C	M1C	OFF
Compressor2	—	M2C	M2C	OFF
Outdoor unit fan1	—	M1F	M1F	OFF
Outdoor unit fan2		M2F	—	OFF
Electronic expansion valve (Main)	EVM	Y1E Y3E	Y1E	0 pls
Electronic expansion valve (Subcooling)	EVT	Y2E Y5E	Y3E	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S Y9S	Y3S	Holds
Four-way valve (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	Holds
Solenoid valve (Main bypass)	SVE	Y5S Y10S	Y6S	OFF
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	Y8S	OFF
Ending conditions	—			Indoor unit thermostat is turned ON.

7.7.2 Stop due to Malfunction

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

Item	Judgment Criteria	Malfunction 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	16.1A: 260 sec.	L8
6. Abnormal radiator fin temperature level	199.4°F	L4

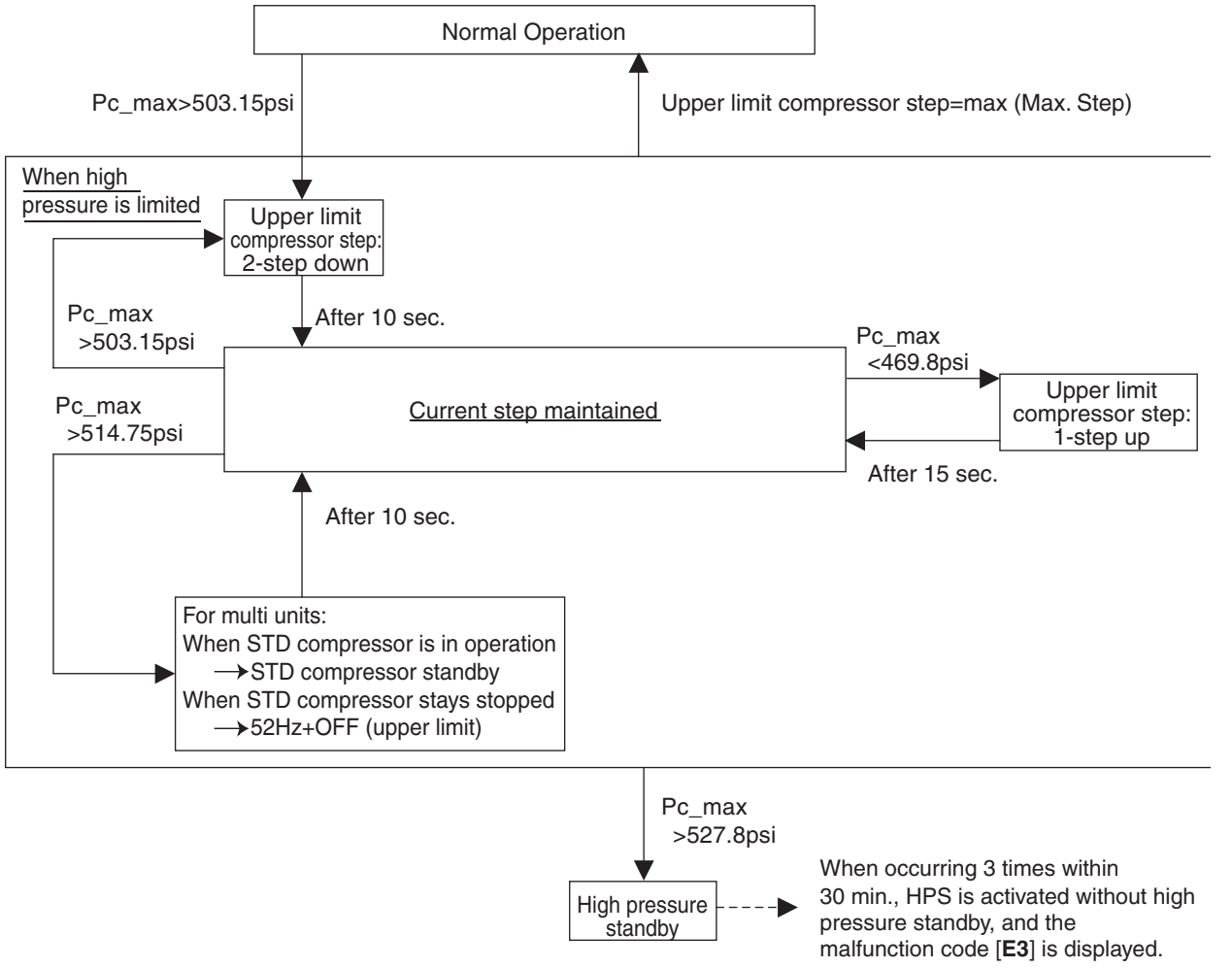
8. Protection Control

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.

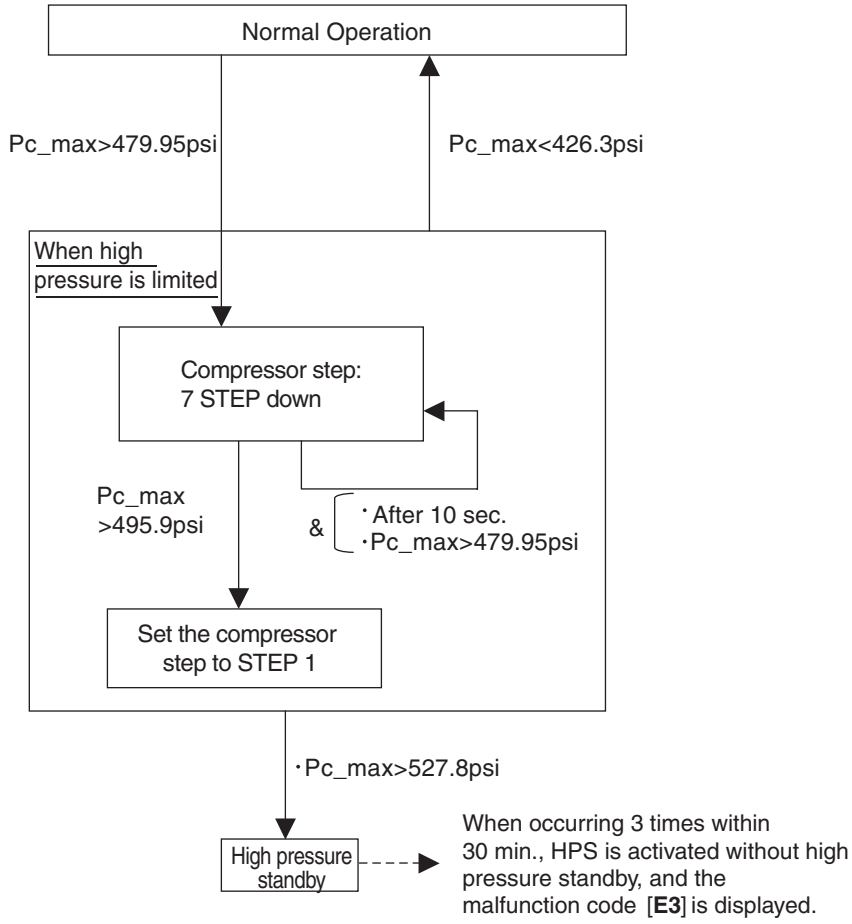
[In cooling operation]

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



[Heating Operation]

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

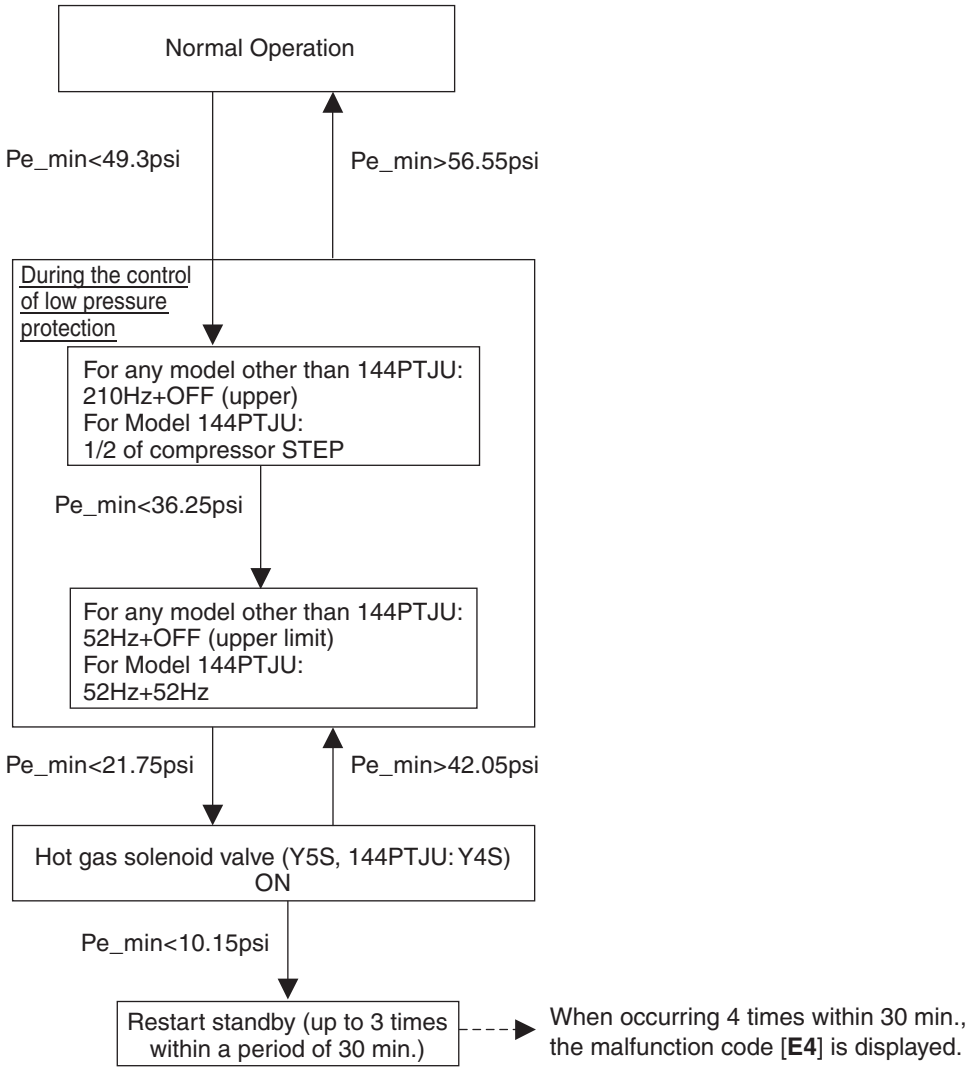


8.2 Low Pressure Protection Control

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

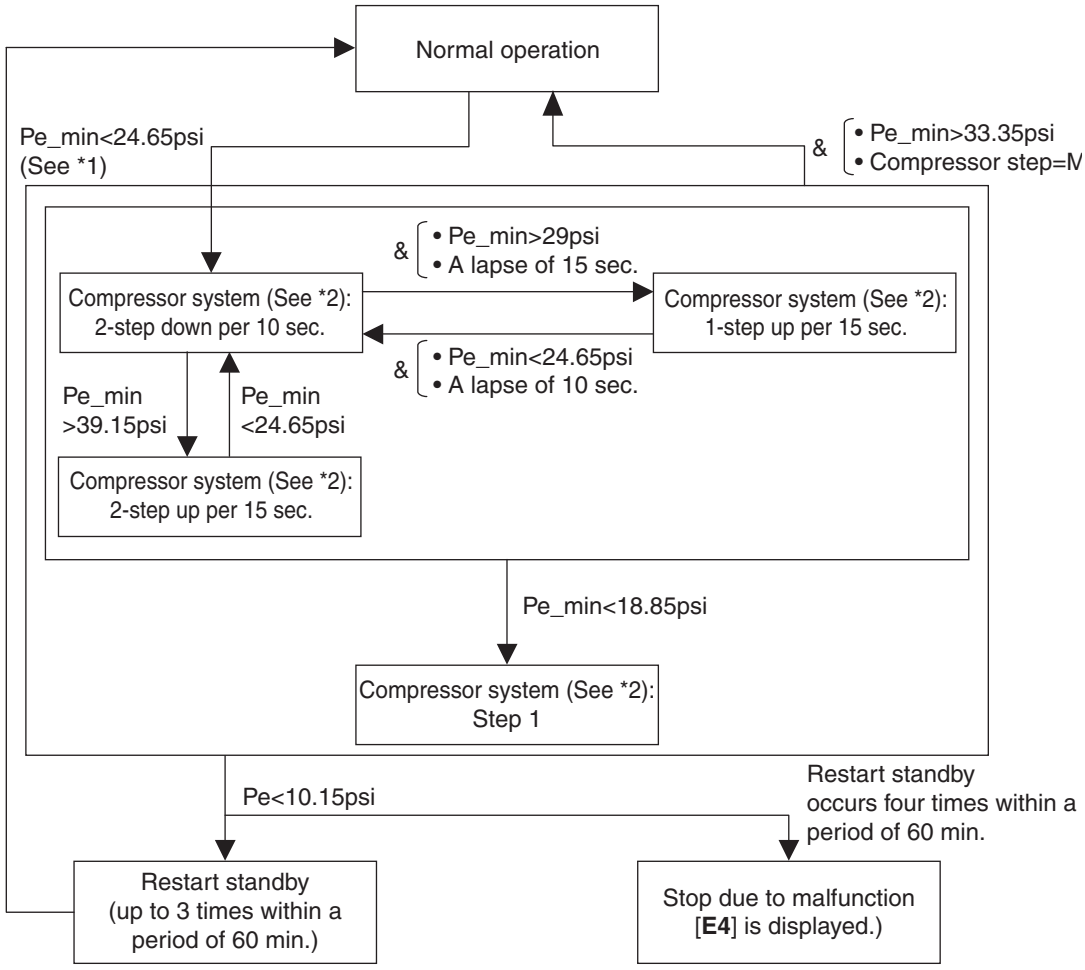
[In cooling operation]

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



[In heating operation]

★ 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 page 45.

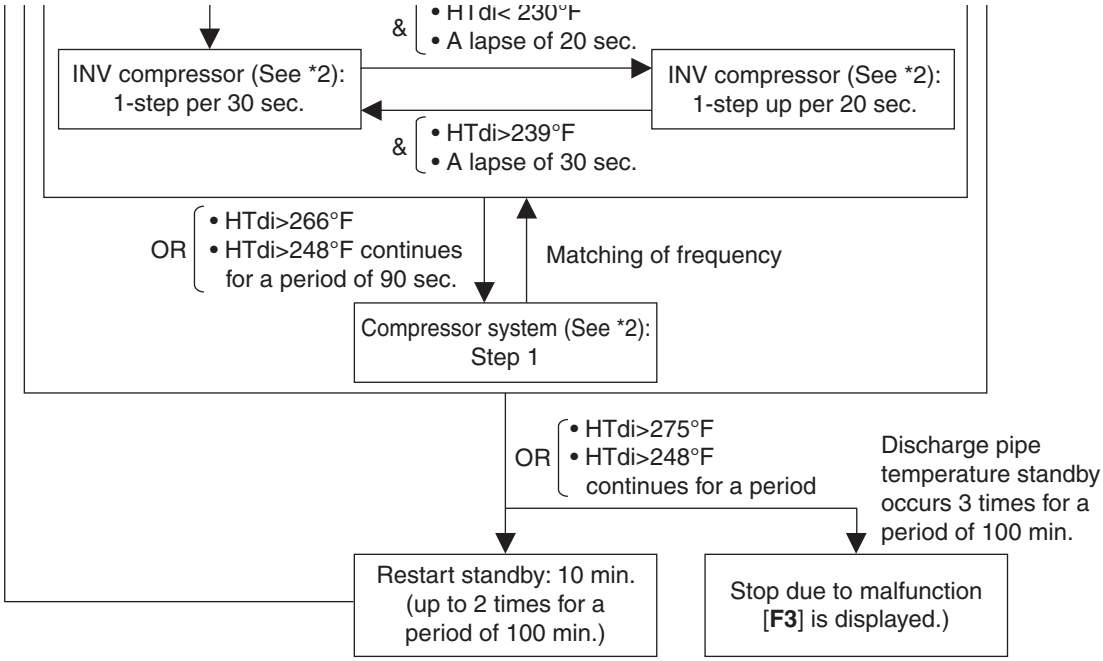
8.3 Discharge Pipe Protection Control

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

[Contents]

★ The following control is performed for each compressor.

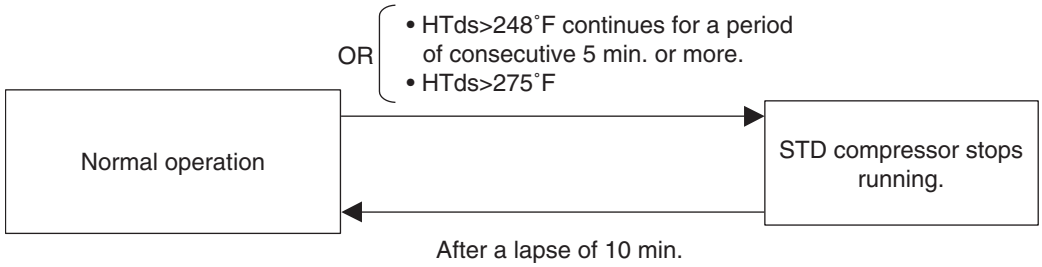
[INV compressor]



*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 page 45.

[STD compressor]



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

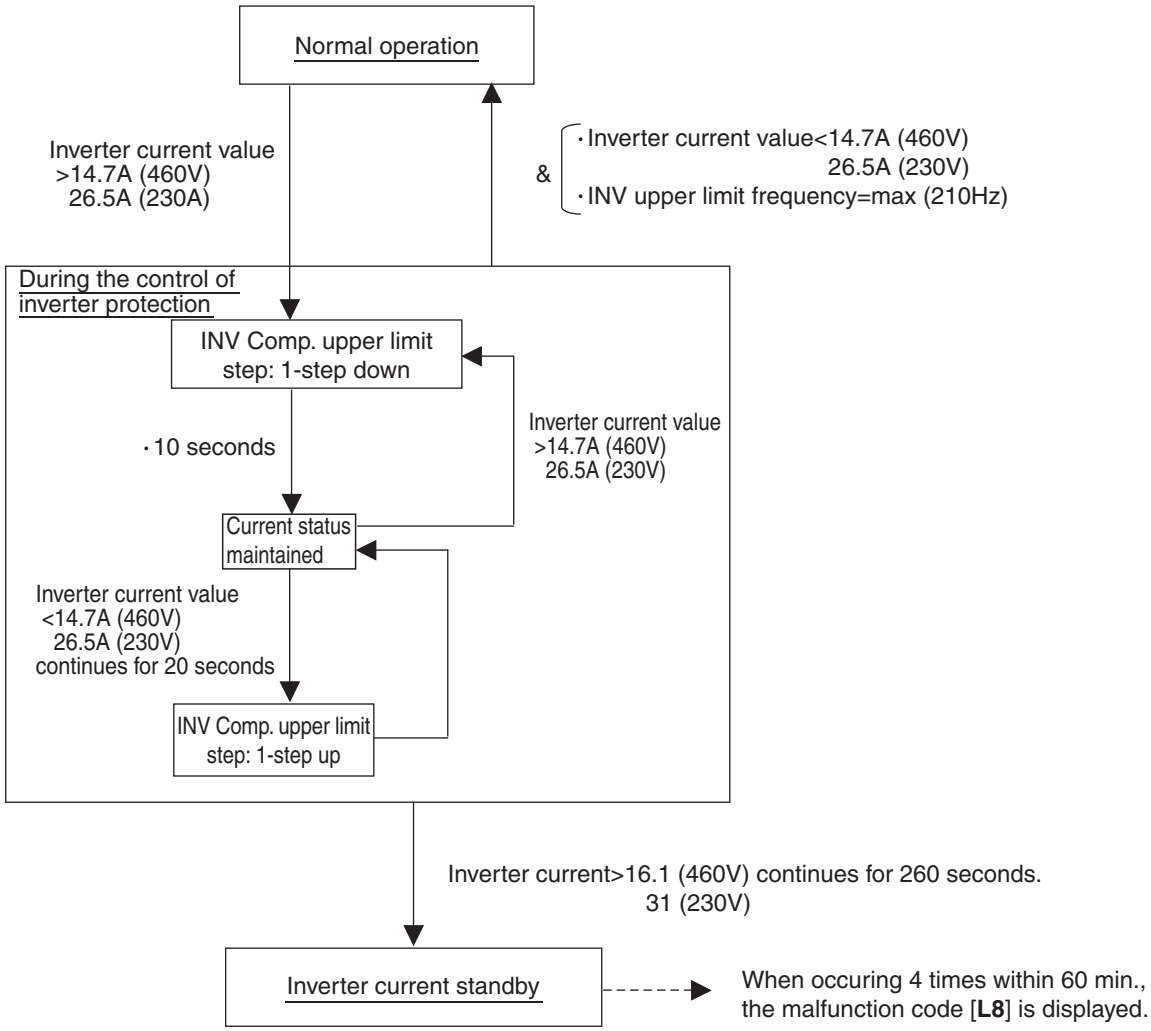
8.4 Inverter Protection Control

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

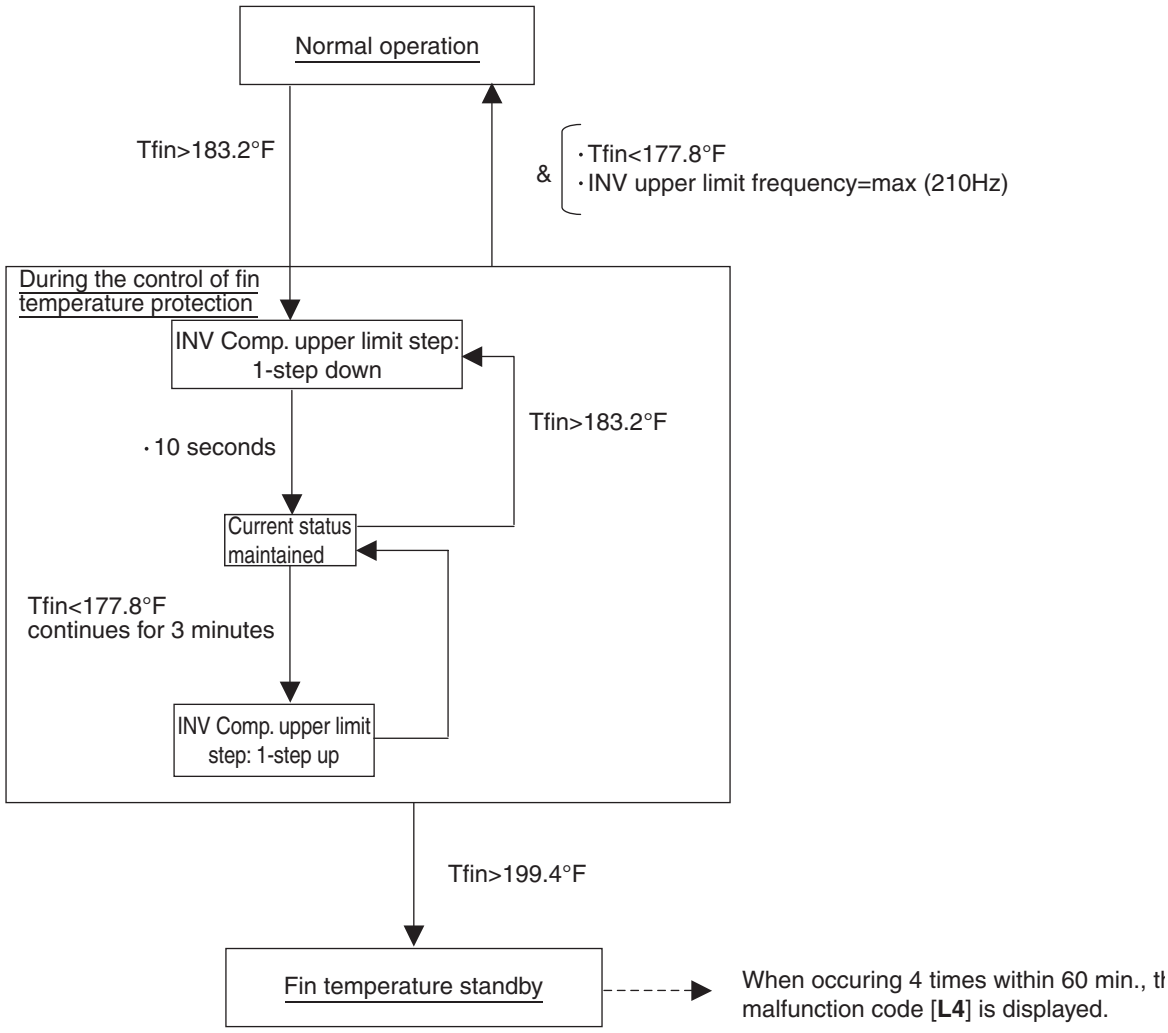
[Inverter overcurrent protection control]

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



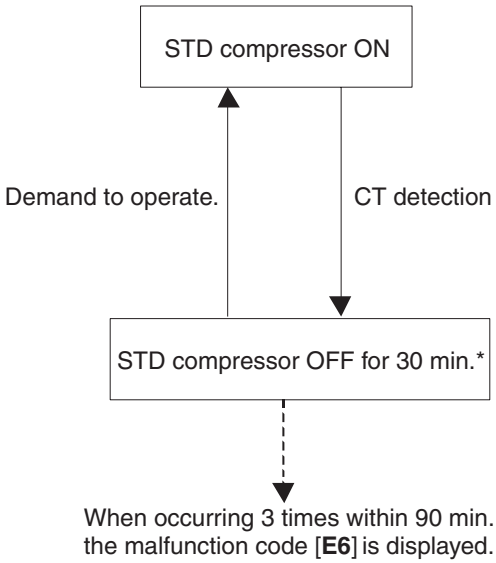
[Inverter fin temperature control]

★ 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 the STD compressor, such as locking.



*If the power supply is reset while in operation prohibition mode, the prohibition timer will continue counting when the power supply is turned ON.

9. Other Control

9.1 Backup Operation

If any of the compressors malfunctions, disable the relevant corresponding compressor or outdoor unit, and then conduct emergency operation only with operational compressors or outdoor units.
Emergency operation with remote controller reset and **Emergency operation with outdoor unit PC board setting** are available.

Operating method / Applicable model	(1) Emergency operation with remote controller reset (Auto backup operation)	(2) Emergency operation with outdoor unit PC board setting (Manual backup operation)
RXYQ72~120PYDN RXYQ72~144PTJU	–	Backup operation by the compressor
RXYQ144~240PYDN RXYQ168~240PTJU	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 [**RUN/STOP**] 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 PC board 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 page 113.[Details of operation]

Disable the compressor with the ***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 adapter is required.

Set item	Condition	Content
Demand 1	Mode 1	The compressor operates at approx. 60% or less of rating.
	Mode 2	The compressor operates at approx. 70% or less of rating.
	Mode 3	The compressor operates at approx. 80% or less of rating.
Demand 2	—	The compressor operates at approx. 40% or less of rating.

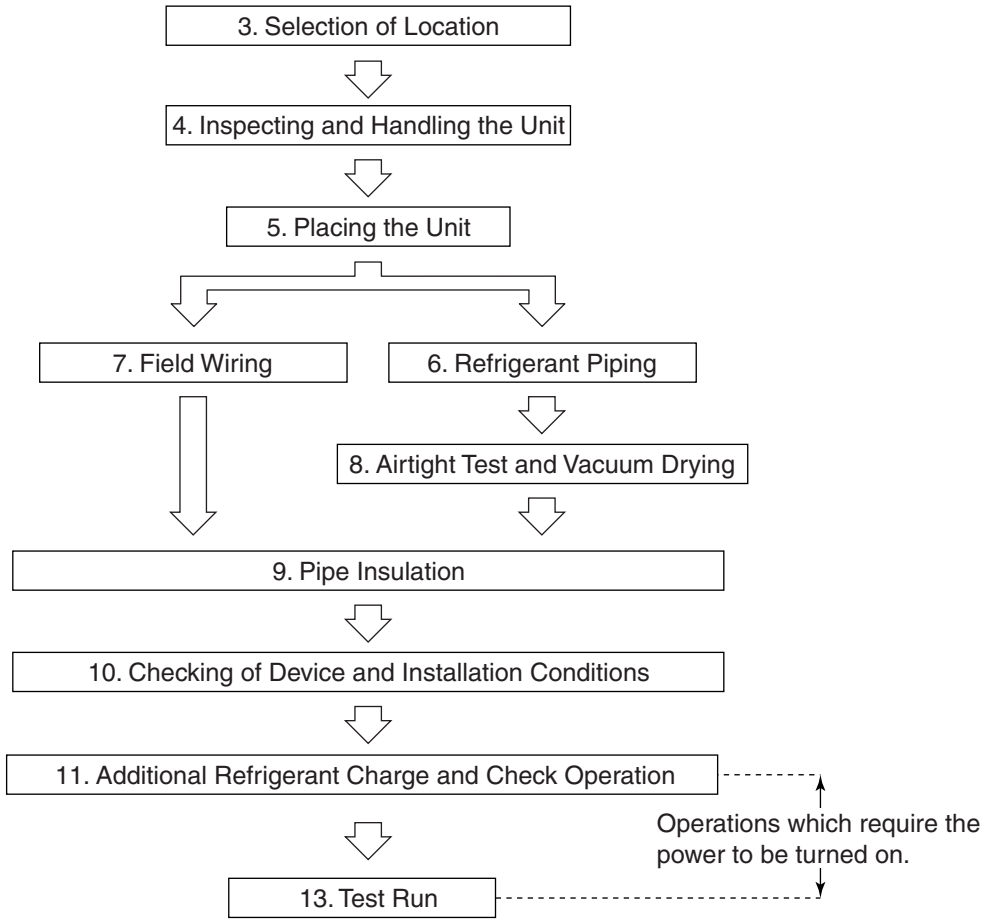
9.3 Heating Operation Prohibition

Heating operation is prohibited above 75.2°F ambient temperature.

10.Test Operation

10.1 Installation Process

The following Figure shows the installation process. Install in the order of the steps shown:



10.2 Procedure and Outline

Use the following procedure to conduct the initial test operation after installation:

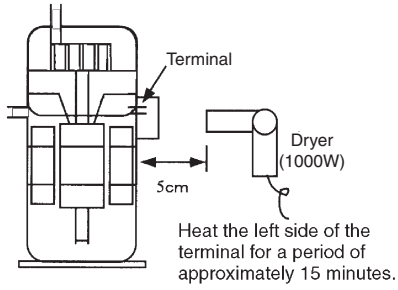
10.2.1 Check Work Prior to Turn Power Supply On

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

⇩

- ○ Is the wiring installed as specified?
- ○ Is designated wiring used?
- ○ Is the wiring screw tight?
- ○ 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:Measures 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 is charged with the stop valve open and the power supply OFF, 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 correct?
- ○ 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 leaks.)

Check airtight test and vacuum drying.

⇩

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

Check on amount of refrigerant charge

○ Is a correct 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 kg)

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

+

HEAT PUMP SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
RXYQ72 ~ 120PYDN RXYQ72 ~ 120PTJU	—
RXYQ144PTJU	7.9 lb
RXYQ144 ~ 192PYDN RXYQ168 ~ 192PTJU	2.2 lb
RXYQ216 ~ 240PYDN RXYQ216 ~ 240PTJU	3.3 lb

+

REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT	
INDOOR CONNECTION CAPACITY	MODEL NAME RXYQ72 ~ 240PYDN RXYQ72 ~ 240PTJU
MORE THAN 100% 120% OR LESS	1.1 lb
MORE THAN 120% 130% OR LESS	1.1 lb

- If there is a refrigerant shortage after completion of vacuum drying, close the liquid and gas stop valves and charge liquid refrigerant through the stop valve service port.
- If the refrigerant charging is still insufficient, **turn ON the power supply** following the information on the page 75 ~.

○ Has the additional refrigerant charging amount been recorded on the **Precautions for Servicing** label?

Check the status of the stop valves

○ Check to be sure the following stop valves are open:

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 power on the crankcase heater. This protects the compressors.

Check the LED display of the outdoor unit PC board.

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

LED display ○ ON ● OFF ◑ Blinking

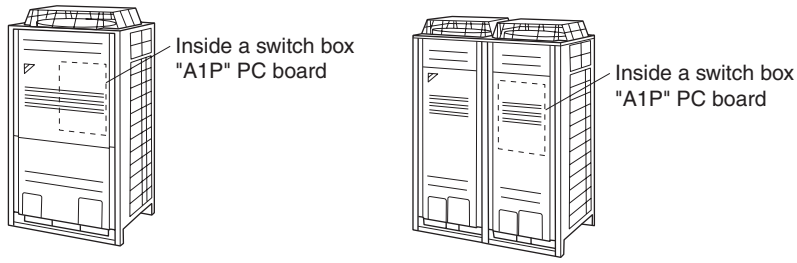
LED display (Default status before delivery)		Micro-computer operation monitor	MODE	TEST	COOL / HEAT select			Low noise	Demand	Multi
					IND	MASTER	SLAVE			
		HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
One outdoor unit installed		◑	●	●	○	●	●	●	●	●
When multiple outdoor unit installed (*)	Master	◑	●	●	○	●	●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

○ Make field settings if needed.
For the setting procedure, refer to information in **12.1 Field Setting from Outdoor Unit** on page 95 onward.
For the outdoor-multi system, make field settings with the master unit.
* Field settings made with the slave unit will be invalid.

<RXYQ144PTJU>



* 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 judgment of piping length

Check for normal operation.

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

10.2.3 Air Tight Test and Vacuum Drying

- After finishing piping work, carry out airtight test and vacuum drying.

Note:

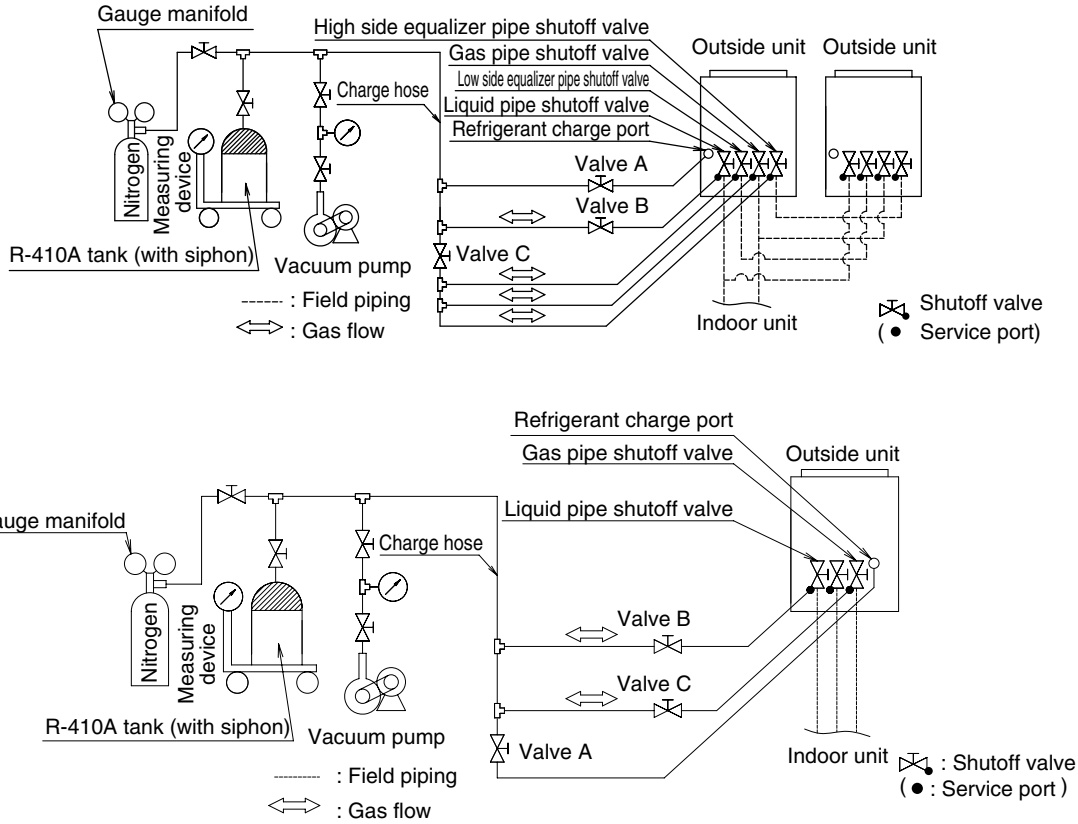
- Always use nitrogen gas for the airtightness test.
- Absolutely do not open the shutoff valve until the main power circuit insulation measurement has been completed. Measuring after the shutoff valve is opened will cause the insulation value to drop.

<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 has a pushing stick for connecting to service port of shutoff 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 flows backward into the refrigerant pipe when the pump stops.

<The system for air tight test and vacuum drying>

- Referring to figure 25, connect a nitrogen tank, refrigerant tank, and a vacuum pump to the outside unit.
  The refrigerant tank and the charge hose connection to refrigerant charge port or valve A in figure 25 are needed in **10.2.5 Additional Refrigerant Charge and Check Operation**.

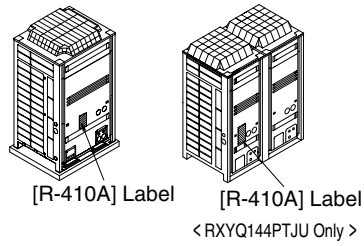


< RXYQ144PTJU Only >

fig. 25

Note:

- The air-tightness test and vacuum drying should be done using the service ports of equalizer pipe, HP/LP gas pipe, suction gas pipe and liquid pipe shutoff valve.
- See the [R-410A] Label attached to the front plate of the outside unit for details on the location of the service port (see figure at right)
- See **[Shutoff valve operation procedure]** in **10.2.5.1 Before working** for details on handling the shutoff 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, HP/LP gas pipe and equalizer pipe from the service ports of each shutoff 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 airtight test again.

<Vacuum drying>

Evacuate the system from the liquid pipe, suction gas pipe, HP/LP gas pipe and equalizer pipe shutoff 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 enters the piping, use the following instructions: (For example, if working in a rainy season takes long enough that condensation may form on the inside of the pipes,rain might enter the pipes during work.)

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.
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 HP/LP gas piping, the gas piping, the equalizer pipe, (between the outside units for the outdoor multi system) and these pipe connections.
  Be sure to insulate the HP/LP gas piping as the suction pipe because the suction gas follows in the HP/LP gas piping when the system is whole cooling mode.
  Be sure to use the 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 following standards:
  - Ambient temperature : 86°F, humidity : 75% to 80% RH : min. thickness : 9/16 inches.
  - If the ambient temperature exceeds 86°F and the humidity 80% RH, then the minimum thickness is 3/4 inches.
    See the Engineering data book for details.

- If there is a possibility that condensation on the shutoff valve might drip down into the indoor unit through gaps in the insulation and piping because the outside unit is located higher than the indoor unit, it can be prevented by caulking the connections. **(Refer to figure 26)**
- The piping lead-out hole lid should be attached after opening a knockout hole. **(Refer to figure 27)**
- If small animals or debris enters 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 30)**

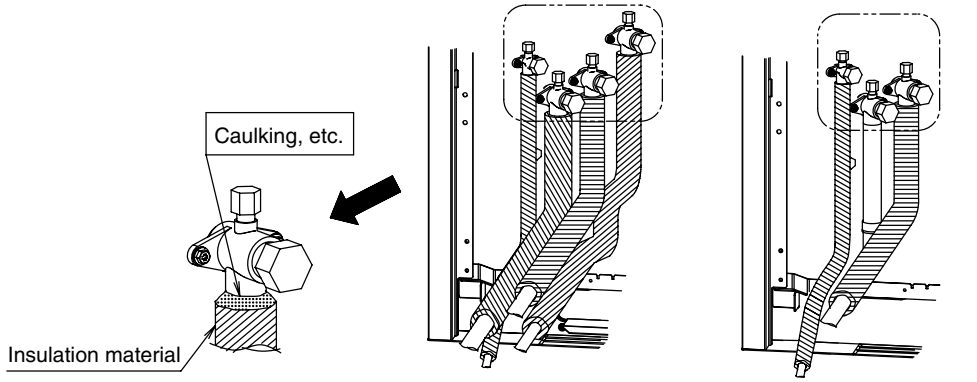


fig. 26

< RXYQ144PTJU Only >

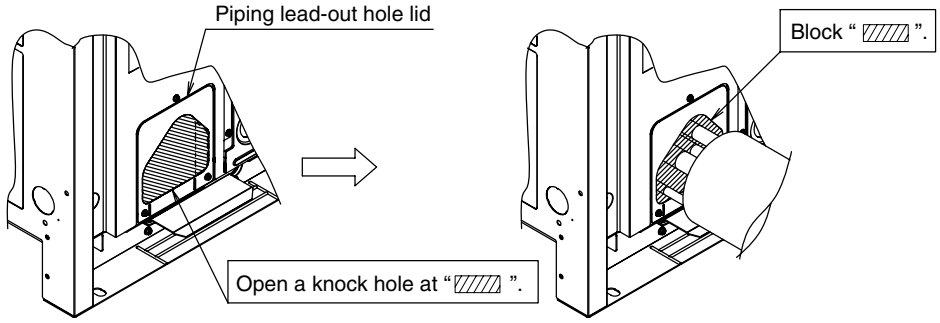


fig. 27

Note:

- After knocking out the holes, we recommend you remove burrs in the knockout holes **(See figure 27)** and paint the edges and areas around the edges using the repair paint.

10.2.5 Additional Refrigerant Charge and Check Operation

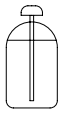
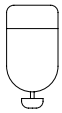
The outside unit is charged with refrigerant when shipped from the factory, but depending on the size and length of the piping when installed, it may require additional charging.
For charging the additional refrigerant, follow the procedures in this chapter and then perform the check operation.

Note:
Total amount of refrigerant should be 220 lbs (100 kg) or less

10.2.5.1Before 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 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.

[Shutoff valve operation procedure]

When operating the shutoff valve, use the following procedure.

Note:

- Do not open the shutoff valve until **10.2.1 Check Work Prior to Turn Power Supply On** is completed. If the shutoff valve is left open without turning on the power, it may cause refrigerant to buildup in the compressor, leading to insulation degradation.
- Be sure to use the correct tools.
  The shutoff valve is not a back-seat type. If forced 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 shutoff valves on each model and the tightening torque for each size are listed in the table below.

<Size of Shutoff Valve>

	72P type	96P type	120P/144P type
Liquid pipe shutoff valve	ϕ3/8 The 120P type / RXYQ144PTJU corresponds to the ϕ1/2 - diameter onsite piping using the accessory pipe.		
(2) Low side equalizer pipe shutoff valve	ϕ3/4		
(3) Gas shutoff valve	ϕ1 The 72P type corresponds to the ϕ3/4 - diameter onsite piping using the accessory pipe. The 96P type corresponds to the ϕ7/8 - diameter onsite piping using the accessory pipe. The 120P/144P type corresponds to the ϕ1-1/8 - diameter onsite piping using the accessory pipe.		
(4) High side equalizer pipe shutoff valve	ϕ3/4		

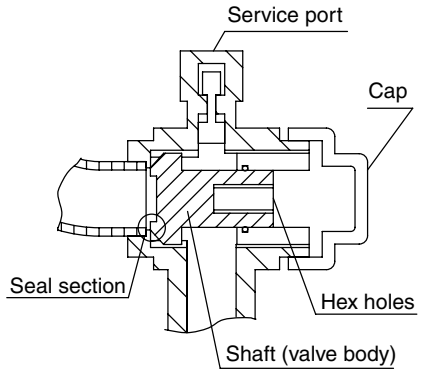


fig. 28

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 table <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 table <Tightening Torque>.

<Tightening torque>

Shutoff 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 outside unit in the system are turned on by operating the push button on the PC-board (A1P) of outside unit (In case of multi system master unit). Follow the procedure below to check how many indoor or outside 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).		●	●	☼	●	●	●	●

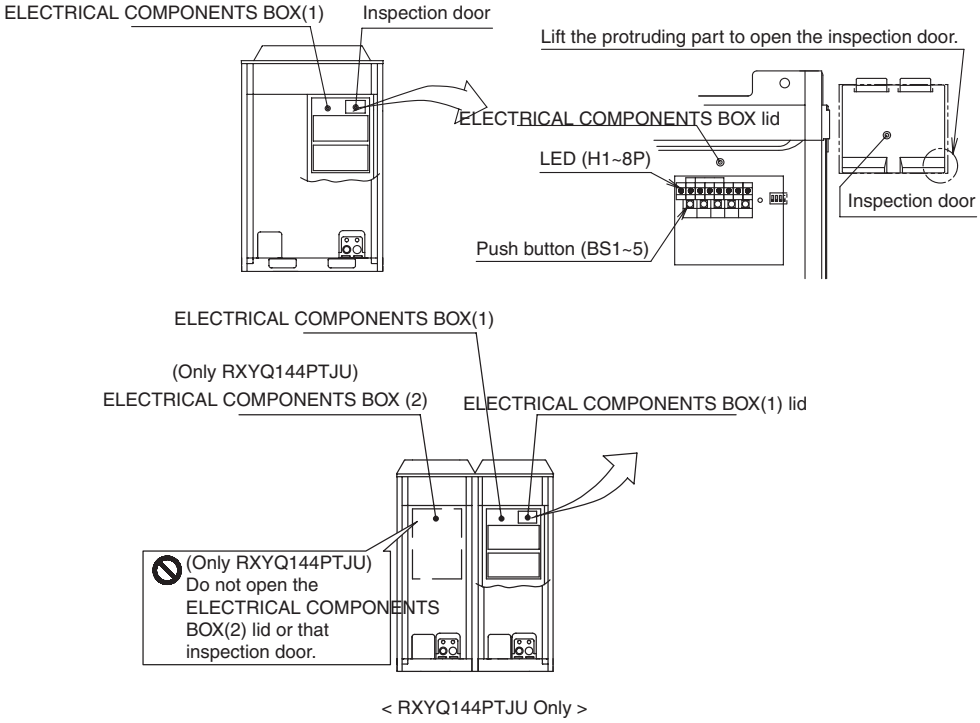
Note:

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

10.2.5.2Procedure 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 PC-board (A1P) of the outside unit and check the LED display after the power is on via the inspection door which is in the Electrical Components Box lid.



< RXYQ144PTJU Only >

fig. 29

- Use an insulated rod to operate the push 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 protection tools (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 while working on the BS and indoor unit.
- When opening the front panel, be cautious of the rotating fan. After the outside unit stops operating, the fan may continue to rotate for a while.

Note:

- If operation is performed within 12 minutes after the BS, indoor and outside 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
●	☼	●	●	●	●	●

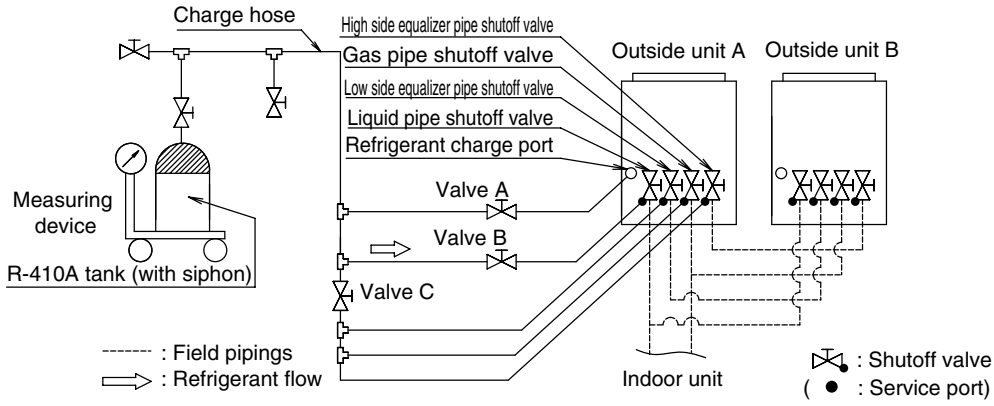
- In order to ensure uniform refrigerant distribution, it may take up to around 10 minutes for the compressor to start up after the unit starts operating. This is not a malfunction.
- The refrigerant charge port is connected to the piping inside the unit.

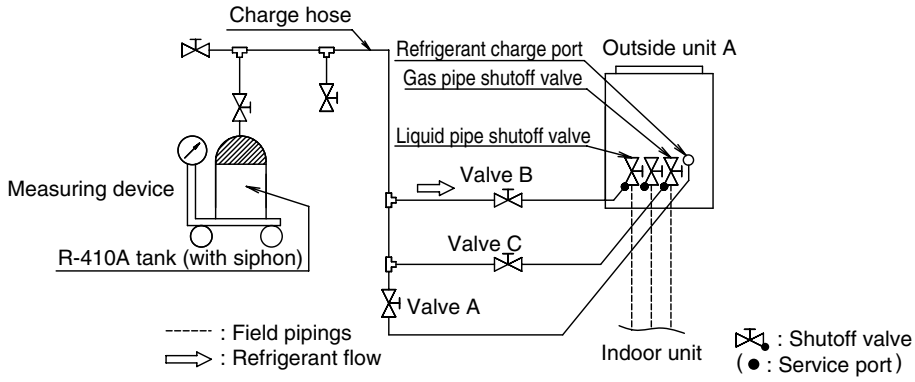
When the unit is shipped from the factory, the unit's internal piping is already charged with refrigerant, so be careful when connecting the charge hose.

- 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 [Shutoff valve operation procedure] in chapter 10.2.5.1 for details on how to handle shutoff valves.
- When finished, or when pausing the refrigerant charging operation, close the valve of the refrigerant tank immediately.
  The refrigerant charge port of this product has an electric 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 properly charged may be off the point.
- Make sure to perform the check operation after installation. Otherwise, the malfunction code [**U3**] will be displayed and normal operation cannot be performed.
  And the failure of [**Check of miswiring**] may also cause abnormal operation. Performance may drop due to the failure of [**Judgment 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.
  Check these problems with a test run after the check operation is completed. Refer to Chaper 13.
- The check operation cannot be performed in recovery or other service modes.

10.2.5.3Procedure of Adding Refrigerant charging

1. Make sure the following works are complete in accordance with the installation manual.
   - Piping work
   - Wiring work
   - Airtight test
   - Vacuum drying
   - Installation work for BS, indoor unit
2. Calculate the ***additional charging amount*** using ***How to calculate the additional refrigerant to be charged*** in **Example of connection** on page 529.
3. Open the valve B (**See the figure 30**. Valves A, and C, and the liquid pipe, suction gas pipe, HP/LP gas pipe, and equalizer pipe shutoff valves must be left closed), and charged with the refrigerant of the ***additional charging amount*** from the liquid side shutout valve service port.





< RXYQ144PTJU Only >

fig. 30

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

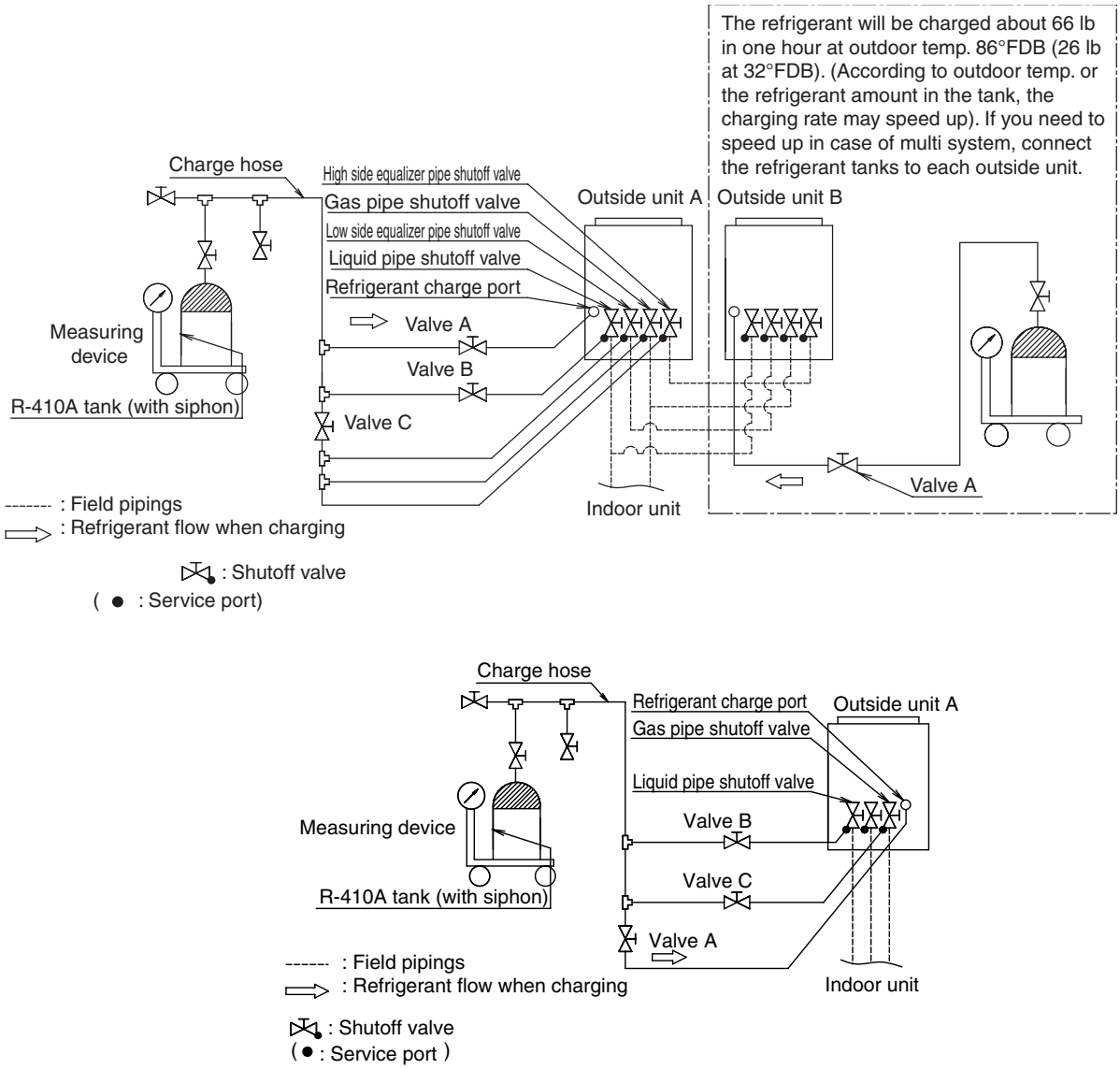
Note:

- For performing the automatic refrigerant charging operation, the push buttons on the PC-board (A1) of outside units are used. (See figure 29.)
  Refrigerant is charged from the refrigerant charge port via valve A. (See figure 31.) For operating the push 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 following temperature condition:

  Outdoor temp. : 32˚F DB ~ 109˚F DB
  Indoor temp. : 50˚F DB ~ 90˚F DB
  ⇒ Cooling mode

  Less than 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 force the operation to stop by pushing MODE button (BS1).



< RXYQ144PTJU Only >

fig. 31

[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 shutoff 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) 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 that H2P is OFF. If H2P is ON, check the malfunction code in the remote controller of indoor unit and correct the malfunction in accordance with [Remote controller display malfunction code] in chapter 11-2-2.

(3) Check the LED. Push the MODE button (BS1) once if the LED display is not as below:

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

(4) Push the TEST button (BS4) once. (The LED displays will change as shown 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 shown below and fan of outside 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) Push the TEST button (BS4) once within 5 minutes after procedure (5) (*4) and close all front panels (*5).
After that, open 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 valve A.
And go to procedure (9).
If the remote controller display shows other code, close valve A immediately and refer to [Remote controller cooling mode malfunction code].

⚠ **Beware of the fan running when opening the front panel.**
The fan may continue rotation after the system stops operating.

(9) When the compressor stops working (the fan may continue rotation), close valve A immediately (*8).
Check that the LED displays are as below and the remote controller display shows [**P9**] code.

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

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

In case of heating mode

(7) Push the TEST button (BS4) once within 5 minutes after procedure (5) (*4) and close all front panels.
After that, open valve A immediately (See figure 31) (*6) and check the charged amount with a measuring device.
During operation, if the remote controller display shows [**P2**] or [**P8**] code, close valve A immediately and refer to [Remote controller heating mode malfunction code].

⚠ **Beware of the fan running when opening the front panel.**
The fan may continue rotation after the system stops operating.

(8) When the required amount of refrigerant is charged, close valve A (See figure 30) (*8) and push the RETURN button (BS3) once. And then go to procedure (9).

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

Notes (*1)~(*9)

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

(*2) • If you perform the refrigerant charging operation within a refrigerant system that has the power off to one or more units, the operation cannot finish properly.
Check the number of outside and indoor units that are 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 to achieve refrigerant stability.
If the additional refrigerant is too small an amount and operation is started before achieving stability, the system cannot precisely judge the charging amount, resulting in overcharging.

(*4) If the TEST button (BS4) is not pushed within 5 minutes, [**P2**] code will be displayed in the remote controller. In this case, refer to [Remote controller cooling (or heating) mode malfunction 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 valve A for 30 minutes or more, the system stops operation and the [**P2**] code is displayed in the remote controller. In this case, refer to [Remote controller cooling (or heating) mode malfunction code].

(*7) Depending on the situation of operation such as a small charging amount, the [**PE**] code may not be displayed and the [**P9**] code may be displayed.

(*8) Always close valve A and take the tank off.
The refrigerant charge port of this unit has an electronic expansion valve and the valve is closed when charging is finished. However, the valve opens when other operations occur. If you leave the tank connected, the refrigerant will overcharge.

[Remote controller cooling mode malfunction 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 valve A.</td></tr>
<tr><td>PA
PH</td><td colspan="2">The refrigerant tank is empty. Close valve A and replace empty tank to the new tank. After changing the tank, open valve A again.
⚠ Be cautious of the fan running.
The outside 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 valve A immediately and check the below items.
• Check if the gas pipe or liquid pipe shutoff valve is opened.
• Check that the refrigerant tank is connected and valve A was opened.
• Check to ensure that 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 valve A immediately. Confirm the malfunction code and correct the abnormality following the [Remote controller displays malfunction code] in chapter 10.2.5.4.</td></tr>
<tr><td>P9</td><td colspan="2">Charging is finished. Close valve A and take the refrigerant tank off.</td></tr>
</table>

[Remote controller heating mode malfunction code]

Code	The work contents
P8	Close valve A immediately and push the TEST button (BS4) once. Restart from ***Procedure (7) In case of heating mode***.
P2	Operation is interrupted. Close valve A immediately and check the below items. • Check if the gas pipe or liquid pipe shutoff valve is opened. • Check the refrigerant tank is connected and valve A was opened. • Check to ensure that 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 INDICATON]** 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.

10.2.5.4Procedure of check operation

- Perform the following Check Operation procedures or malfunction code [U3] will be displayed in the remote controller and normal operation can not be carried out.
  - Check of shutoff valve opening
  - Check of miswiring
  - Judgment 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 a day or time that the outdoor temp. is 23°F or higher.

[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 outside unit and all connected BS, indoor units. Be sure to turn the power on at least 6 hours before operation in order to have power running to the crank case heater.
2. Make the onsite settings as needed using the push button (BS1-BS5) on the outside unit PC-board (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 32. The system operation for about 40~60 minutes and automatically stops the check operation.
   If the malfunction 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 malfunction code is displayed in the remote controller, correct the malfunction displayed as [**Remote controller displays malfunction code**] and perform the check operation again.

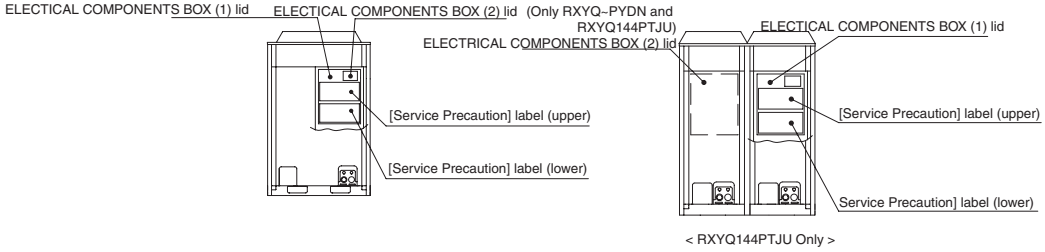


fig. 32

Note:

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

[Remote controller displays malfunction code]

Malfunction code	Installation error	Remedial action
E3, E4 F3, F6 UF	The shutoff valve of the outside unit is left closed.	Open the shutoff valve.
U1	The phases of the power to the outside 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 outside, BS or indoor unit (including phase interruption).	Make sure the power source wire is properly connected to the outside, BS 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 outside unit PC-board (A1P) when the system is one outdoor system.	Remove the line from the **TO MULTI UNIT (Q1, Q2)** terminal.

Note:
If any malfunction 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 sub units are invalid.
The outside unit to which the indoor unit transmission wire is connected is the master unit, and all other units are sub units.

Use the push button switches (BS1 through BS5) on the outside unit PC-board (A1P) to make the necessary onsite settings.
See the [**Service Precautions**] label (upper) on the Electrical Componets Box lid for details on the positions and operating method of the push button switches 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 push buttons via the inspection door of Electrical Componets Box lid.
There is a risk of electric shock if you touch any live parts as 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 BS and indoor units is finished, and that it is safe to operate.

10.2.7.2 Test Run

After all works are completed, operate the unit normally and check the following:

(1) Make sure the indoor and outside units are operating normally.

(2) Operate each indoor unit one by one and make sure the corresponding outside unit is also operating.

(3) Check to see if cold (or hot) air is coming out from the indoor unit.

(4) Push 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 crank case 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 pushed.
- When the system operation is stopped by the remote controller, the outside units may continue operating for further 5 minutes maximum.
- The outside unit fan may rotate at low speeds if the Night-time low noise setting or the External low noise level setting is made, but this is not a malfunction.
- If the check operation was not performed at first installation, the malfunction 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 Componets 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 master power and address (indoor-outdoor address, etc.).

Status

Outdoor unit	Test lamp H2P .... Blinks Can also be set during operation described above.
Indoor unit	If the **ON** button is pushed during operation described above, the [**UH**] malfunction 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 PC board. Operation becomes possible for about 2 minutes. If you do not push the RESET button, the unit cannot be run for up to 10 minutes to automatically set master power.

Status

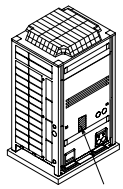
Outdoor unit	Test lamp H2P .... Blinks Can also be set during operation described above.
Indoor unit	If ON button is pushed during operation described above, the operation lamp lights but the compressor does not operate. Returns to normal when automatic setting is complete.

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

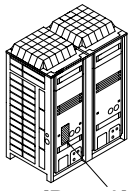
Be sure to push and hold the RESET button for 5 seconds. If not, the addition cannot be recognized. In this case, the unit cannot be run for up to 12 minutes to automatically set the address (indoor-outdoor address, etc.)

Status

Outdoor unit	Test lamp H2P .... **ON** Can also be set during operation described above.
Indoor unit	If the **ON** button is pushed during operation described above, the [**UH**] or [**U4**] malfunction indicator blinks. It returns to normal when the automatic setting is complete.

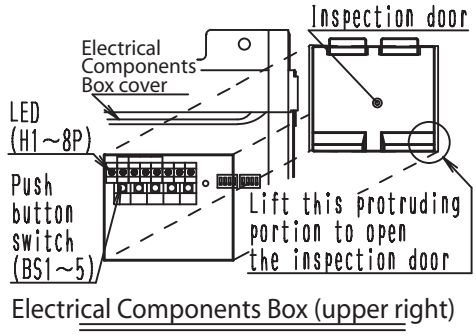


[R-410A] Label



[R-410A] Label

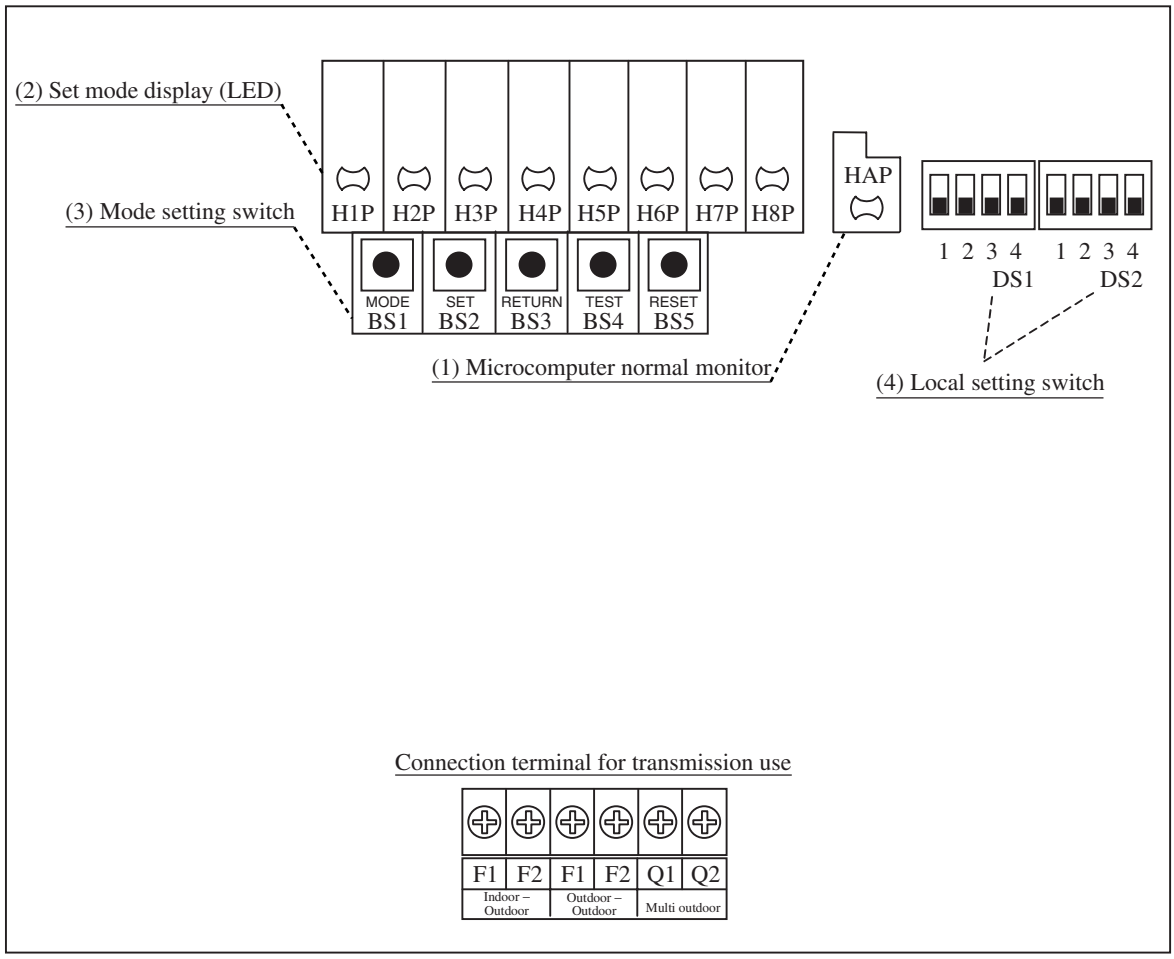
< RXYQ144PTJU Only >



Electrical Components Box (upper right)

11.Outdoor Unit PC Board Layout

Outdoor unit PC board



(V3054)

(1) Microcomputer normal monitor
This monitor blinks while in normal operation, and turns on or off when a malfunction occurs.

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

(3) Mode setting switch
Used to change mode.

(4) Local setting switch
Used to make field settings.

12.Field Settings

12.1 Field Settings on the Outdoor Unit

12.1.1 Field Settings on the 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 page 101 onward.

Setting item			Content and objective of setting	Overview of setting procedure	Reference page
Function setting	2	Setting of low noise operation (*1)	A. Use external input to step down the upper limit of the fan (factory set to Step 8), providing low noise level. (1) Mode 1: Step 5 or lower (2) Mode 2: Step 4 or lower (3) Mode 3: Step 3 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.	106~111
			B. The low noise operation aforementioned is enabled in nighttime automatic low 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.	106~111
	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 adapter": Set the system to [External control adaptor for outdoor unit] with [No. 12 of Setting mode 2] and select the mode with No. 30.	106~111
				■ 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.	106~111
	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] .	101~104
	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.	101~104
	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”)	101~104
	8	Setting of BS Cool-Heat selection control time	■ Make this setting to shorten the BS Cool-Heat selection control time.	■ Set the Setting item No. 42 of [Setting mode 2] to [**ON**].	101~104

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.	101~104
	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.	101~104
	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**].	101~104
	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**].	101~104
	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**].	101~104
	6	Setting of sequential startup	■ Used to start units not in sequence but simultaneously.	■ Set No. 11 of [**Setting mode 2**] to NONE.	101~104
	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.	113~117
	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.	78~89
	9	Refrigerant recovery mode (*1)	■ Used to recover refrigerant on site. With operations of indoor and outdoor units prohibited, open the outdoor/indoor 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.	112
	10	Vacuuming mode (*1)	■ Used to conduct vacuuming on site. Open the outdoor/indoor 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.	112
	11	ENECUT test operation	■ Used to forcedly turn **ON** the ENECUT. (Be noted this mode is not functional with the indoor unit remote controller turned **ON**.)	■ Set No. 24 of [**Setting mode 2**] to ON.	101~104
	12	Power transistor check mode	■ Used for the troubleshooting of DC compressors. Inverter waveform output makes it possible to judge whether a malfunction results from the compressor or the PC board.	■ Set No. 28 of [**Setting mode 2**] to ON.	101~104
	13	Setting of model with spare PC board	■ In order to replace the PC board by a spare one, be sure to make model setting.	■ For this setting, set the DS2-2, -3, and-4 switches on the PC board to the model concerned.	95~97

For setting items of (*1), refer to detailed information provided on page 101 onward.

12.1.2 Setting by Dip Switches

(1) Factory setting of initial PC board.

Do not make any changes in all factory settings of the DIP switches on the control PC board.

Status of DIP switches

■ : Represents the factory setting positions of the switches.

Setting at replacement by spare PC board

Caution

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

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

Initial conditions of dip switches

DIP Switch Detail

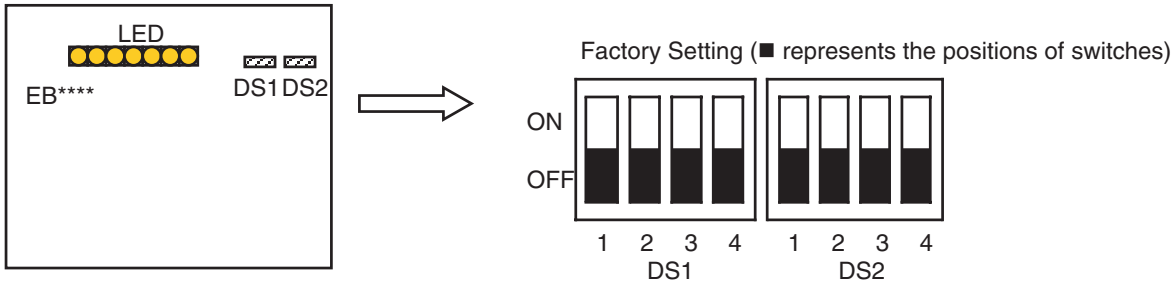
DS No.	Item	Contents	
DS1-2	Power supply specification	ON	200V class (220V)
		OFF (Factory setting of spare PC board)	400V class (380V)
DS1-3 Except Multiple use	Number of fans (Main PC board control)	Make the settings according to models of outdoor units. (All models are set to **OFF** at factory.)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

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

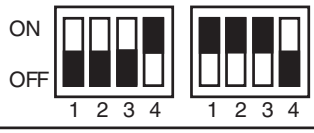
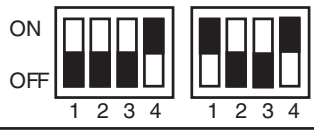
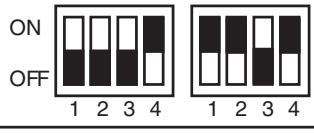
DS2-2 DS2-3 DS2-4	Model setting	Make the settings according to models of outdoor units. (All models are set to **OFF** at factory.) * Refer to following pages for setting detail.

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

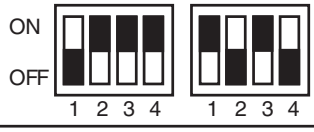
Detail of DS1-1~4, DS2-1~4 setting:



460V

Application model	Setting method (■ represents the positions of switches)	
HEAT PUMP RXYQ72PYDN		Set DS1-4, DS2-1, DS2-2 and DS2-3 to ON.
HEAT PUMP RXYQ96PYDN		Set DS1-4, DS2-1 and DS2-4 to ON.
HEAT PUMP RXYQ120PYDN		Set DS1-4, DS2-1, DS2-2 and DS2-4 to ON.

230V

Application model	Setting method (■ represents the positions of switches)	
HEAT PUMP RXYQ72PTJU		Set DS1-2, DS1-4, DS2-1, DS2-2 and DS2-3 to ON.
HEAT PUMP RXYQ96PTJU		Set DS1-2, DS1-4, DS2-1 and DS2-4 to ON.
HEAT PUMP RXYQ120PTJU		Set DS1-2, DS1-4, DS2-1, DS2-2 and DS2-4 to ON.
HEAT PUMP RXYQ144PTJU		Set DS1-2, DS1-3, DS1-4, DS2-1 and DS2-3 to ON.

12.1.3 Setting by Push Button Switches

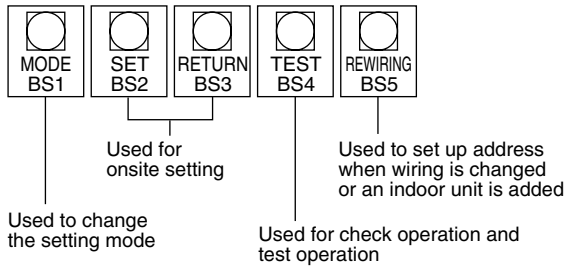
The following settings are made by push button switches on PC board.
In case of multi-outdoor unit system, various items should be set with the master unit.
Setting with the slave unit is disabled.The master unit and slave unit can be discriminated with the LED display as shown below.

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	●	●	●	●	●	●	●	◑

Pushbutton switches



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 on during ***abnormal***, ***low noise control,*** and ***demand control***.

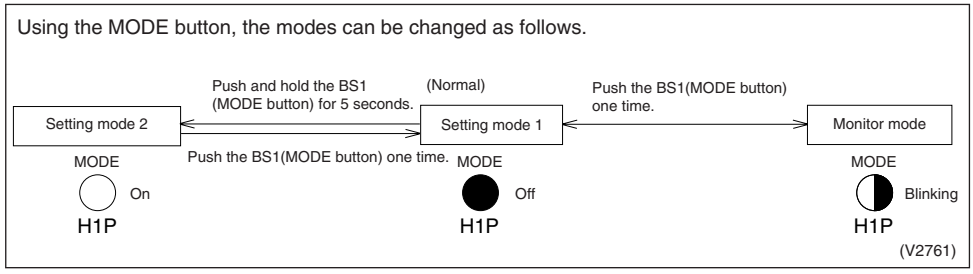
② **Setting mode 2 (H1P on)**

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

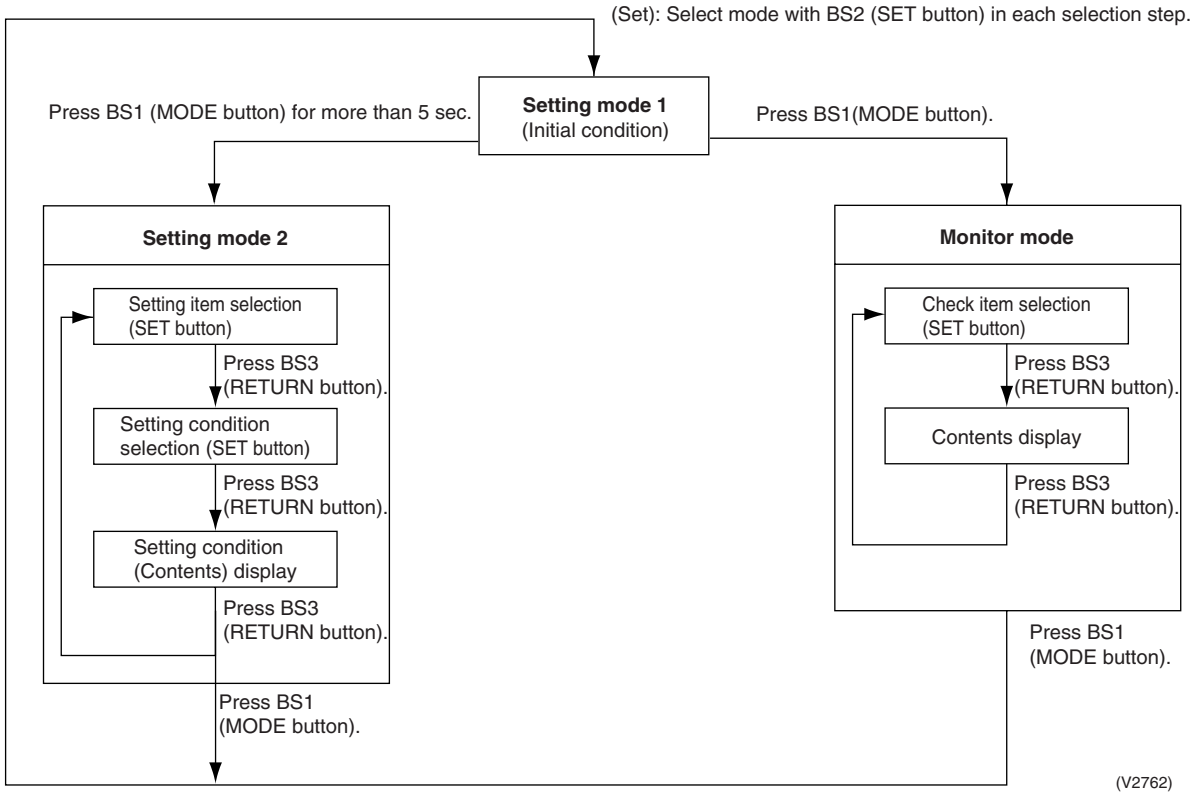
③ **Monitor mode (H1P blinks)**

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.

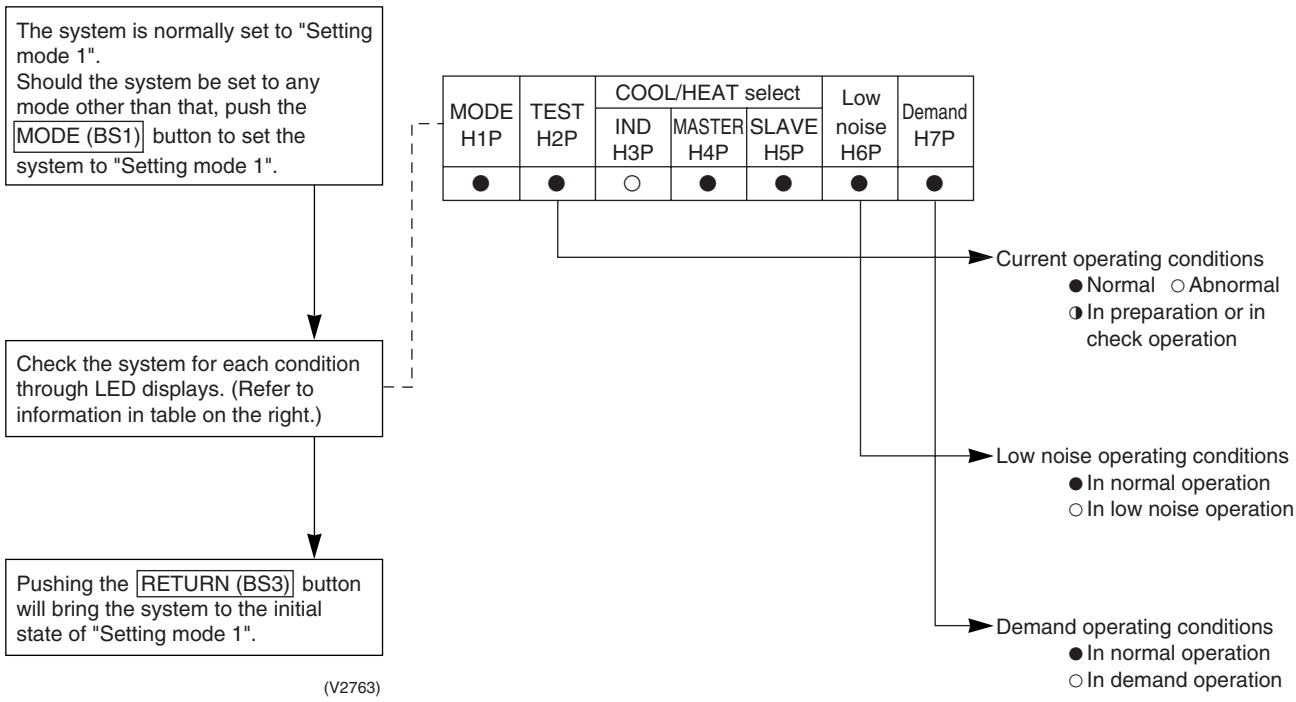
Check items ····· The following items can be checked.

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

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

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

Procedure for checking check items



(V2763)

b. “Setting mode 2”

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

<Selection of setting items>

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

<Selection of setting conditions>

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

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

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

(V2764)

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 PC board 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 evaporation temperature for cooling
9	Tc setting	Target condensation temperature for heating
10	Defrost changeover setting	Changes the temperature condition for defrost and sets to quick defrost or slow defrost.
11	Sequential operation setting	Sets sequential operation (Factory set to ON)
12	External low noise setting / Demand setting	Reception of external low noise or demand signal
13	AIRNET address	Set address for AIRNET.
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	Night-time low noise setting	Sets automatic nighttime low noise operation in a simple way. The operating time is based on ***Starting set*** and ***Ending set***.
25	Setting of external low noise level	Sets low noise level when the low noise signal is input from outside.
26	Night-time low noise operation start setting	Sets starting time of nighttime low noise operation. Night-time low noise setting is also required.
27	Night-time low noise operation end setting	Sets ending time of nighttime low noise operation. Night-time low noise setting is also required.
28	Power transistor check mode *Check after disconnection of compressor wires	Used for trouble diagnosis of DC compressor. Since the waveform of inverter is output without wiring to the compressor, it is convenient to probe whether the trouble comes from the compressor or PC board.
29	Capacity precedence setting	If the capacity control is required, the low noise control is automatically released by this setting during carrying out low noise operation and nighttime low noise operation.
30	Demand setting 1	Changes target value of power consumption when demand control 1 is input.
32	Normal demand setting	Normally enables demand control 1 without external input. Effective to prevent a problem 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 faulty 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 BS Cool-Heat selection control time. However, make the setting, pay careful attention to the following: • If the refrigerant piping between each BS 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 BS unit and indoor unit is long in length, refrigerant passing sounds may become louder at the time of BS Cool-Heat selection. • This setting shortens the Cool-Heat selection time of all BS 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 (REWIRING) 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 set
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	○ ○ ○	● ● ○	● ● ○	● ● ○	● ● ○	● ○ ○	∗
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 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	Setting condition display (∗ Factory set)
22	Night-time low noise setting	○	●	○	●	○	○	●	OFF ○●●●●●●∗ Level 1 (outdoor fan with 6 step or ○●●●●●○ Level 2 (outdoor fan with 5 step or ○●●●●○● Level 3 (outdoor fan with 4 step or ○●●●●○○
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	Night-time low noise operation start setting	○	●	○	○	●	○	●	About 20:00 ○●●●●●○ About 22:00 (factory setting) ○●●●●○●∗ About 24:00 ○●●●○●●
27	Night-time low noise operation end setting	○	●	○	○	●	○	○	About 6:00 ○●●●●●○ About 7:00 ○●●●●○● About 8:00 (factory setting) ○●●●○●●∗
28	Power transistor check mode	○	●	○	○	○	●	●	OFF ○●●●●●○∗ ON ○●●●●○●
29	Capacity 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 unit ○●●●●○○∗
51	Master-slave set-up for multi outdoor units	○	○	○	●	●	○	○	Automatic judgment ○●●●●●●∗ 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, push the MODE (BS1) button when in "Setting mode 1".

<Selection of setting item>

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

<Confirmation on setting contents>

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

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

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

(V2765)

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 malfunction (the latest)	◑	●	●	○	○	○	●	Malfunction code table
15	Contents of malfunction (1 cycle before)	◑	●	●	○	○	○	○	Refer to page 332.
16	Contents of malfunction (2 cycle before)	◑	●	○	●	●	●	●	
20	Contents of retry (the latest)	◑	●	○	●	○	●	●	
21	Contents of retry (1 cycle before)	◑	●	○	●	○	●	○	
22	Contents of retry (2 cycle before)	◑	●	○	●	○	○	●	
25	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.

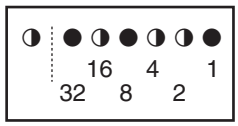
*2: Number of outdoor units
Used to make setting of the number of outdoor units connected to DIII-NET that is one of the communication lines.

*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"

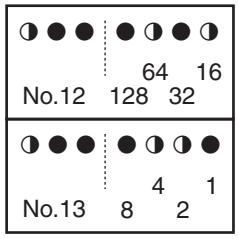
EMG operation / backup operation setting	ON	◑	●	●	○	●	●	●
	OFF	◑	●	●	●	●	●	●
Defrost select setting	Short	◑	●	●	●	○	●	●
	Medium	◑	●	●	●	◑	●	●
	Long	◑	●	●	●	●	●	●
Te setting	L	◑	●	●	●	●	●	●
	M	◑	●	●	●	●	◑	●
	H ①~⑤	◑	●	●	●	●	○	●
Tc setting	L	◑	●	●	●	●	●	●
	M	◑	●	●	●	●	●	◑
	H	◑	●	●	●	●	●	○

★ 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 Setting of Low Noise Operation and Demand Operation

Setting of Low Noise Operation

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

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

A. When the low noise operation is carried out by external instructions (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 low noise operation command will be ignored to put the system into normal operation mode.)

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

1. While in [**Setting mode 2**], select the setting condition (i.e., "Level 1", "Level 2", or "Level 3") for set item No. 22 (Setting of nighttime low noise level).
2. If necessary, while in [**Setting mode 2**], select the setting condition (i.e., "20:00", "22:00", or "24:00") for set item No. 26 (Setting of start time of nighttime low noise operation).
   (Use the start time as a guide since it is estimated according to outdoor temperatures.)
3. If necessary, while in [**Setting mode 2**], select the setting condition (i.e., "06:00", "07:00", or "08:00") for set item No. 27 (Setting of end time of nighttime low noise operation).
   (Use the end time as a guide since it is estimated according to outdoor temperatures.)
4. If necessary, while in [**Setting mode 2**], set the setting condition for set item No. 29 (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 nighttime.)

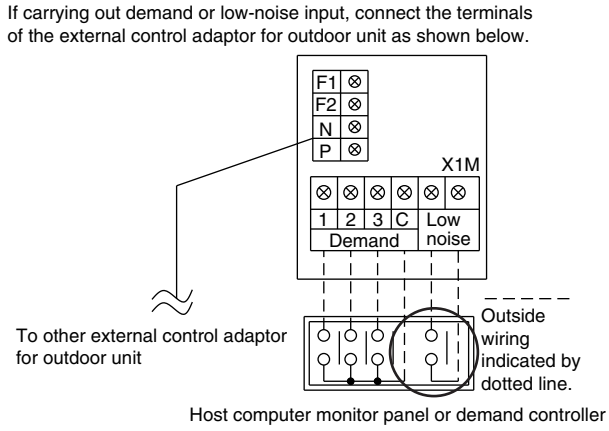
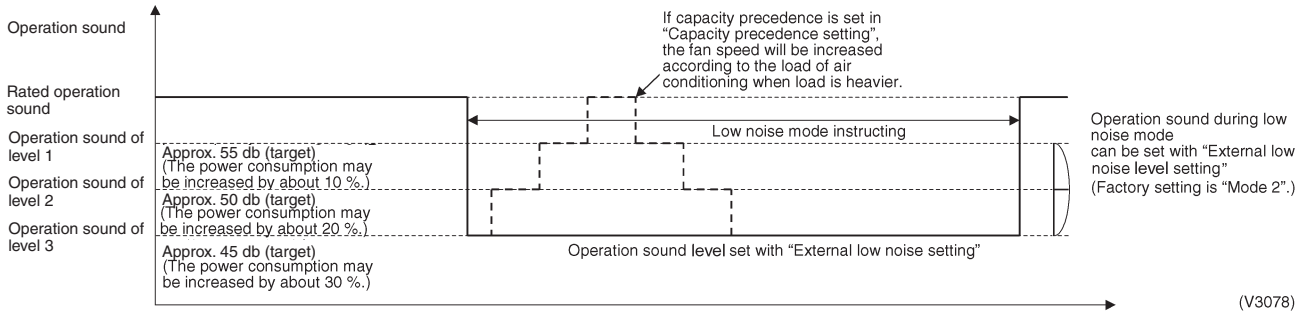


Image of operation in the case of A



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

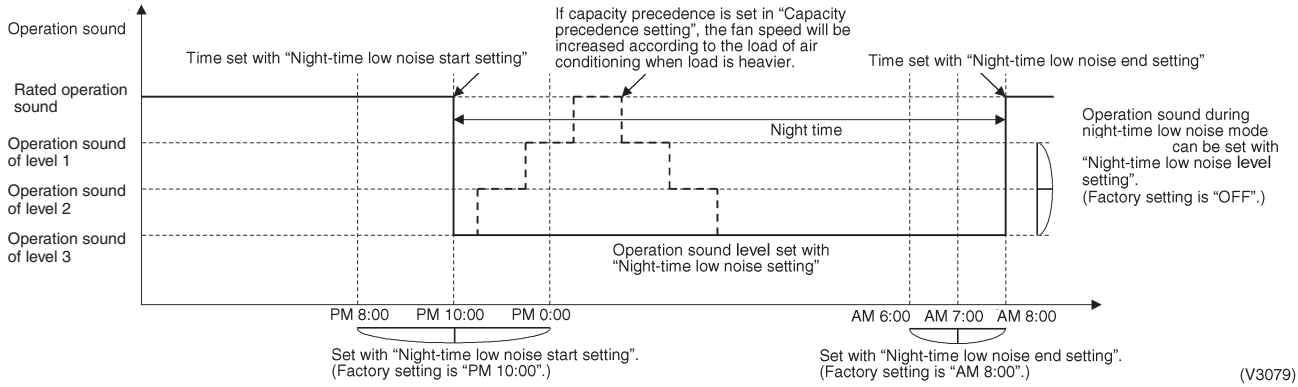
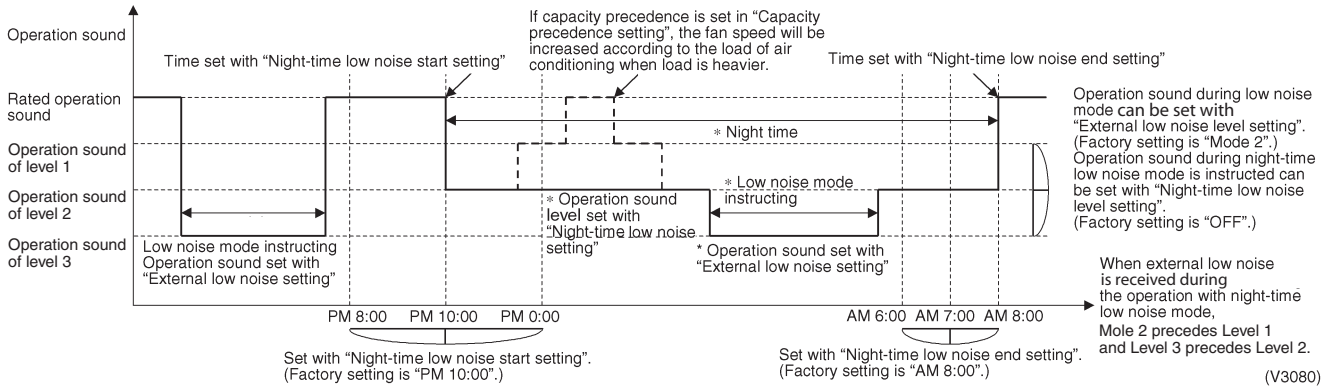


Image of operation in the case of A and B



Setting of Demand Operation

By connecting the external contact input to the demand input of the outdoor unit external control adaptor (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	Outdoor unit PC board
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 instructions (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 adapter for outdoor unit is not required.)

1. While in [**Setting mode 2**], make setting of the set item No. 32 (Setting of constant 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.

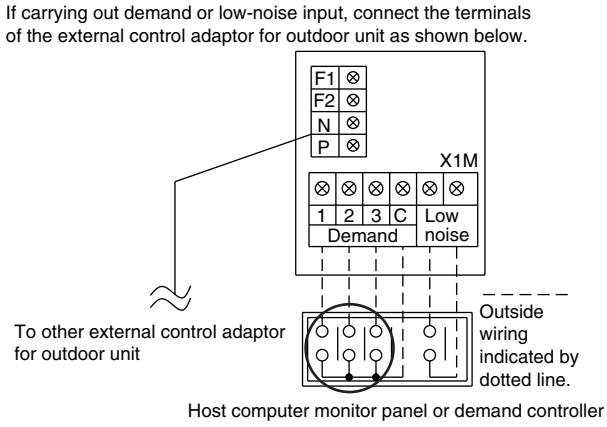


Image of operation in the case of A

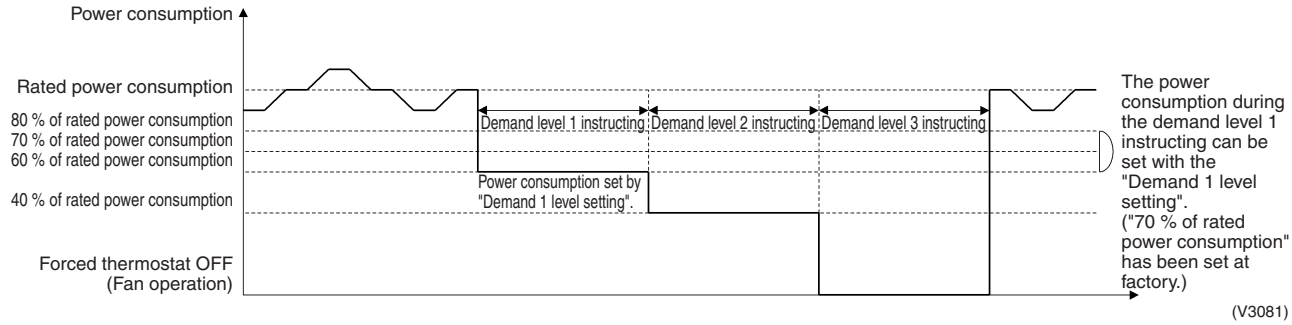


Image of operation in the case of B

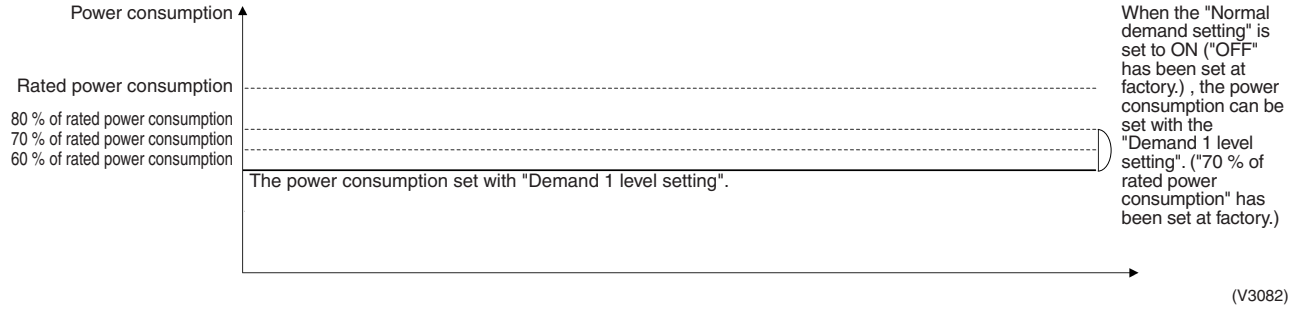
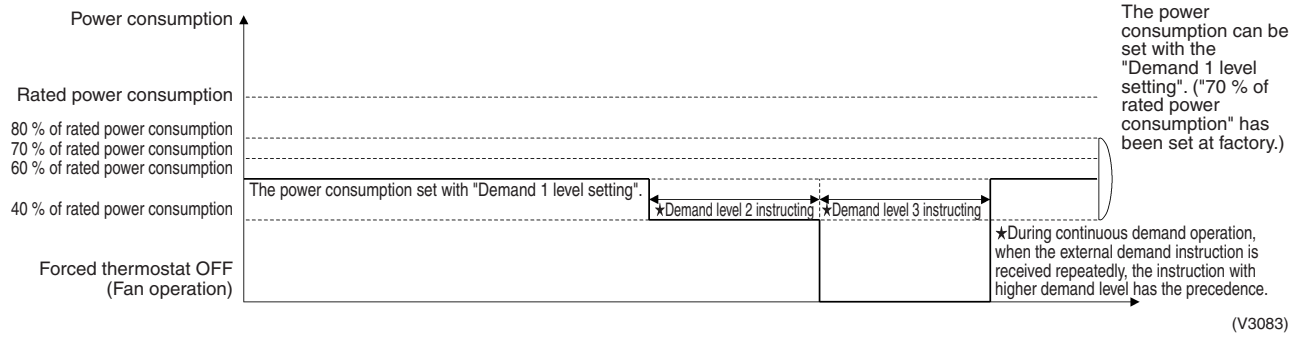


Image of operation in the case of A and B



Detailed Setting Procedure of Low Noise Operation and Demand Control

1. Setting mode 1 (H1P off)

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

2. Setting mode 2 (H1P on)

① In setting 1, push and hold the BS1 (MODE button) for more than 5 seconds. → Setting mode 2 is entered and H1P lights.

② Push the BS2 (SET button) several times and match the LED display with the Setting No. you want.

③ Push the BS3 (RETURN button) one time, and the present setting content is displayed.
→ Push the BS2 (SET button) several times and match the LED display with the setting content (as shown below) you want.

④ Push the BS3 (RETURN button) two times. → Returns to ①.

⑤ Push the BS1 (MODE button) one time. → Returns to the setting mode 1 and turns H1P off.

○: ON ●: OFF ◑: Blink

		①							②							③							
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	Night-time low 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	Night-time low noise start setting								○	●	○	○	●	○	●	PM 8:00	○	●	●	●	●	●	◑
																PM 10:00 (Factory setting)	○	●	●	●	●	◑	●
																PM 0:00	○	●	●	●	◑	●	●
27	Night-time low noise end setting								○	●	○	○	●	○	○	AM 6:00	○	●	●	●	●	●	◑
																AM 7:00	○	●	●	●	●	◑	●
																AM 8:00 (Factory setting)	○	●	●	●	◑	●	●
29	Capacity 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

12.1.5 Setting of Refrigerant Recovery Mode

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

[Operation procedure]

① In **setting mode 2** with units in stop mode, set "**Refrigerant Recovery / Vacuuming mode**" to ON. The respective 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 the all 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 detal.)
③ Press Mode button "BS1" once and reset **Setting Mode 2**.

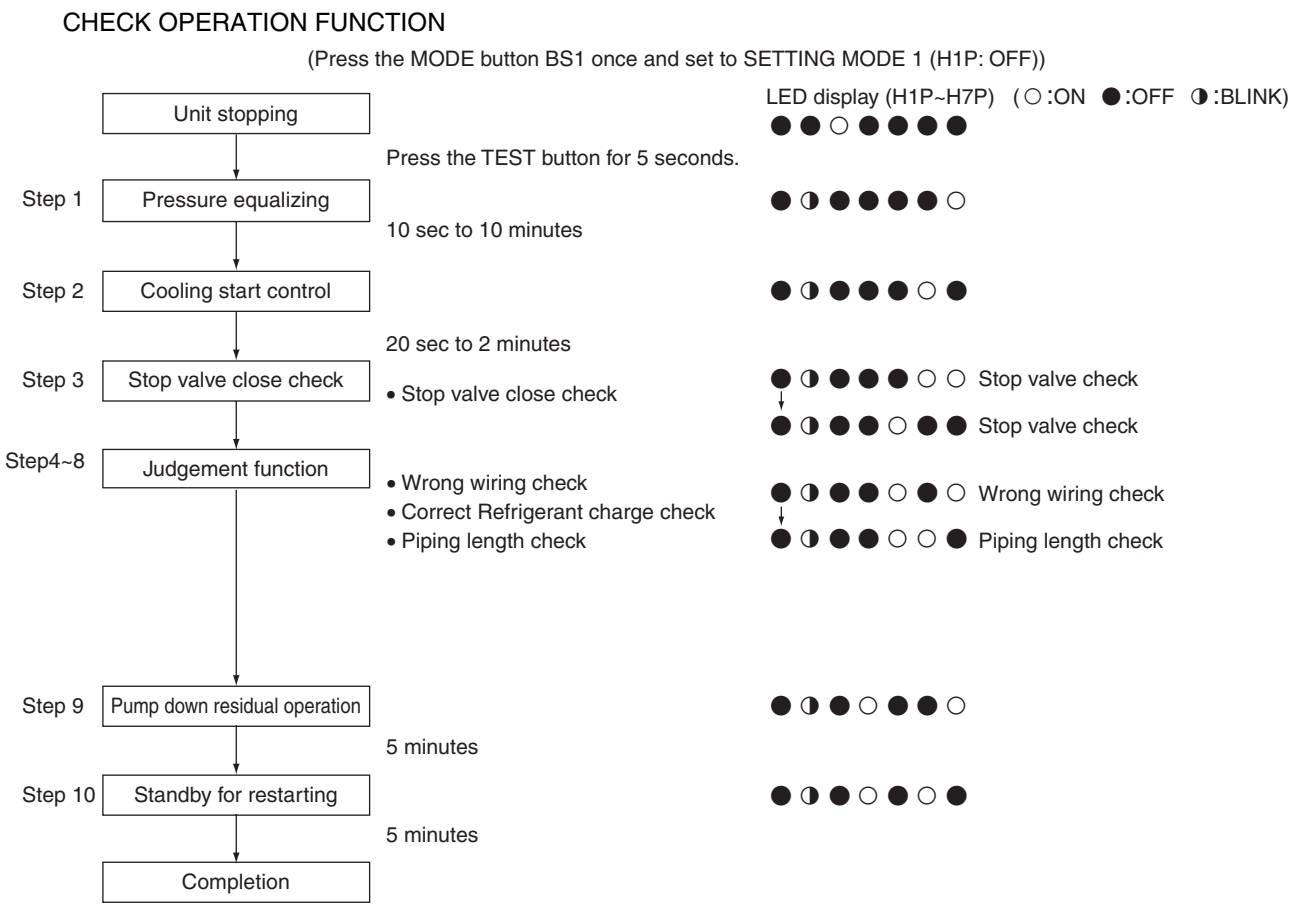
12.1.6 Setting of Vacuuming Mode

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

[Operating procedure]

① With **Setting Mode 2** while the unit stops, set **Refrigerant recovery / Vacuuming mode** to ON. The 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**.

12.1.7 Check Operation Detail



12.1.8 Emergency Operation

If any of the compressors malfunctions, disable the corresponding compressor or outdoor unit, 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 PC board.

Operating method / Applicable model	① Emergency operation with remote controller reset (Auto backup operation)	② Emergency operation with outdoor unit PC board setting (Manual backup operation)
RXYQ72 to 120PYDN, PTJU RXYQ144PTJU	–	Backup operation by the compressor
RXYQ144 to 240PYDN RXYQ168 to 240 PTJU	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 a malfunction (in this case, the system will stop and the corresponding malfunction code will be displayed on the indoor remote controller), disable only the corresponding 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 RUN/STOP button on the remote controller for 4 seconds or more) when the outdoor unit stops because of malfunction state.

[Details of operation]

- Automatically disable the defective outdoor unit from operating, and then operate other outdoor units.
- The following section shows malfunction 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 PC board**
In malfunction 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, 96, 120PYDN, PTJU, RXYQ144PTJU>

○ Disabling the compressor 1 (INV or INV1) 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 **MODE** button (BS1) for 5 sec. or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 38 times.	○ ○ ● ● ○ ○ ●
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ● ◑ (Factory setting)
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ◑ ●
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** button (BS1) once.	● ● ○ ● ● ● ●

○ Disabling the compressor 2 (STD or INV2) 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 **MODE** button (BS1) for 5 seconds or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 39 times.	○ ○ ● ● ○ ○ ○
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ● ◑ (Factory setting)
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ◑ ●
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** button (BS1) once.	● ● ○ ● ● ● ●

<RXYQ144, 168, 192, 216, 240PYDN, RXYQ168, 192, 216, 240PTJU>

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 **MODE** button (BS1) for 5 sec. or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 38 times.	○ ○ ● ● ○ ○ ●
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ● ◑ (Factory setting)
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ◑ ●
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** 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 **MODE** button (BS1) for 5 seconds or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 39 times.	○ ○ ● ● ○ ○ ○
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ● ◑ (Factory setting)
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ◑ ●

(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** button (BS1) once.	● ● ○ ● ● ● ●

[Cancel of Emergency Operation]

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

<RXYQ72, 96, 120PYDN, PTJU, RXYQ144PTJU>

○ Cancel disabling the compressor 1 (INV or INV1) 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 **MODE** button (BS1) for 5 sec. or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 38 times.	○ ○ ● ● ○ ○ ●
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ◑ ●
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ● ◑ (Factory setting)
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** button (BS1) once.	● ● ○ ● ● ● ●

○ Cancel disabling the compressor 2 (STD or INV2) 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 **MODE** button (BS1) for 5 seconds or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 39 times.	○ ○ ● ● ○ ○ ○
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ◑ ●
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ● ◑ (Factory setting)
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** button (BS1) once.	● ● ○ ● ● ● ●

<RXYQ144, 168, 192, 216, 240PYDN, RXYQ168, 192, 216, 240PTJU>

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 **MODE** button (BS1) for 5 sec. or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 38 times.	○ ○ ● ● ○ ○ ●
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ◑ ●
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ● ◑ (Factory setting)
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** 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 **MODE** button (BS1) for 5 seconds or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 39 times.	○ ○ ● ● ○ ○ ○
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ◑ ●
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ● ◑ (Factory setting)
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** button (BS1) once.	● ● ○ ● ● ● ●

Part 3
VRVIII R-410A Heat Recovery 60Hz

1. Specifications

1.1 Outdoor Units

Heat Recovery 60Hz <REYQ-PYDN> 460V

Model Name			REYQ72PYDN	REYQ96PYDN	REYQ120PYDN
Power Supply			3 Phase 60Hz 460V	3 Phase 60Hz 460V	3 Phase 60Hz 460V
★1 Cooling Capacity		Btu / h	72,000	96,000	120,000
★2 Heating Capacity		Btu / h	81,000	108,000	135,000
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 mm)	66-1/8 × 51-3/16 × 30-1/8" (1680 x 1300 x 765 mm)	66-1/8 × 51-3/16 × 30-1/8" (1680 x 1300 x 765 mm)
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
	Piston Displacement	m^3/h	7.88+10.53	13.34+10.53	13.34+10.53
	Number of Revolutions	r.p.m	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
	Air Flow Rate	cfm	6,700	6,700	7,410
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in(mm)	ϕ 3/8" (9.5 mm) C1220T (Brazing Connection)	ϕ 3/8" (9.5 mm) C1220T (Brazing Connection)	ϕ1/2" (12.7 mm) C1220T (Brazing Connection)
	Suction Gas Pipe	in(mm)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ 7/8" (22.2 mm) C1220T (Brazing Connection)	ϕ1-1/8" (28.6 mm C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe	in(mm)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)
Mass		Lbs (kg)	732 lbs (332 kg)	732 lbs (332 kg)	732 lbs (332 kg)
★3 Sound Level (Reference Value)		dBA	58	58	60
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	22.7	23.4	23.8
	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.			4D058602A	4D058603A	4D058604A

Notes:
- ★1 Indoor temp. : 80°FDB or 67°FWB / outdoor temp. : 95°FDB / Equivalent piping length : 25 ft (7.5 m), level difference: 0.
- ★2 Indoor temp. : 70°FDB / outdoor temp. : 47°FDB or 43°FWB / Equivalent piping length : 25 ft (7.5 m), level difference: 0
- ★3 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

Heat Recovery 60Hz <REYQ-PYDN> 460V

Model Name (Combination Unit)			REYQ144PYDN	REYQ168PYDN	REYQ192PYDN
Model Name (Independent Unit)			REMQ72PYDN REMQ72PYDN	REMQ72PYDN REMQ96PYDN	REMQ72PYDN REMQ120PYDN
Power Supply			3 Phase 60Hz 460V	3 Phase 60Hz 460V	3 Phase 60Hz 460V
★1 Cooling Capacity		Btu / h	144,000	168,000	192,000
★2 Heating Capacity		Btu / h	162,000	189,000	216,000
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 930.3 x 765.2 + (1680 x 930.3 x 765.2 mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8" (1680 x 930.3 x 765.2 + (1680 x 930.3 x 765.2 mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8" (1680 x 930.3 x 765.2 + (1680 x 930.3 x 765.2 mm)
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
	Piston Displacement	m^3/h	(16.90) × 2	16.90 + (10.53+13.34)	16.90 + (10.53+13.34)
	Number of Revolutions	r.p.m	(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		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
	Air Flow Rate	cfm	6,350+6,350	6,350+6,530	6,350+7,060
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe ★3	in(mm)	ϕ1/2" (12.7 mm) C1220T (Brazing Connection)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)
	Suction Gas Pipe ★3	in(mm)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe ★3	in	ϕ7/8" (22.2 mm) C1220T (Brazing Connection)	ϕ7/8" (22.2 mm) C1220T (Brazing Connection)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)
	Pressure Equalizer Tube	in	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)
Mass		Lbs (kg)	463+463 lbs (210+210 kg)	463+573 lbs (210+260 kg)	463+573 lbs (210+260 kg)
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	18.1+18.1	18.1+19.8	18.1+20.1
	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.			4D059666A	4D059667A	4D059668A

Notes:

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

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

★3 BHFP26P90U is necessary for the connection.
Concerning about the piping connection for each outdoor unit to the main line as shown above, use REFNET.

Heat Recovery 60Hz <REYQ-PYDN> 460V

Model Name (Combination Unit)			REYQ216PYDN	REYQ240PYDN
Model Name (Independent Unit)			REMQ96PYDN REMQ120PYDN	REMQ120PYDN REMQ120PYDN
Power Supply			3 Phase 60Hz 460V	3 Phase 60Hz 460V
★1 Cooling Capacity		Btu / h	216,000	240,000
★2 Heating Capacity		Btu / h	243,000	270,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8" (1680 x 930.3 x 765.2 + (1680 x 930.3 x 765.2 mm)	66-1/8 × 36-5/8 × 30-1/8 + 66-1/8 × 36-5/8 × 30-1/8" (1680 x 930.3 x 765.2 + (1680 x 930.3 x 765.2 mm)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Piston Displacement	m^3/h	(10.53+13.34) × 2	(10.53+13.34) × 2
	Number of Revolutions	r.p.m	(2900, 6300) × 2	(2900, 6300) × 2
	Motor Output×Number of Units	kW	(2.2+4.5) × 1 + (3.5+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
	Air Flow Rate	cfm	6,530+7,060	7,060+7,060
	Drive		Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe ★3	in	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)
	Suction Gas Pipe ★3	in	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)	ϕ1-3/8" (34.9 mm) C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe ★3	in	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)
	Pressure Equalizer Tube	in	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)
Mass		Lbs (kg)	573+573 lbs (260+260 kg)	573+573 lbs (260+260 kg)
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		%	7~100	6~100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	Lbs	19.8+20.1	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.			4D059669A	4D059670A

Notes:

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

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

★3 BHFP26P90U is necessary for the connection.
Concerning about the piping connection for each outdoor unit to the main line as shown above, use REFNET.

Heat Recovery 60Hz <REYQ-PTJU> 230V

Model Name			REYQ72PTJU	REYQ96PTJU	REYQ120PTJU
Power Supply			3 Phase 60Hz 208V-230V	3 Phase 60Hz 208V-230V	3 Phase 60Hz 208V-230V
★1 Cooling Capacity		Btu / h	72,000	96,000	120,000
★2 Heating Capacity		Btu / h	81,000	108,000	135,000
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 mm)	66-1/8 × 51-3/16 × 30-1/8" (1680 x 1300 x 765 mm)	66-1/8 × 51-3/16 × 30-1/8" (1680 x 1300 x 765 mm)
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
	Piston Displacement	m^3/h	7.88+10.53	13.34+10.53	13.34+10.53
	Number of Revolutions	r.p.m	3720, 2900	6300, 2900	6300, 2900
	Motor Output×Number of Units	kW	(2.4+7.0) × 1	(4.2+7.0) × 1	(6.0+6.8) × 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
	Air Flow Rate	cfm	6,700	6,700	7,410
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in (mm)	ϕ 3/8" (9.5 mm) C1220T (Flare Connection)	ϕ 3/8" (9.5 mm) C1220T (Flare Connection)	ϕ1/2" (12.7 mm) C1220T (Flare Connection)
	Suction Gas Pipe	in (mm)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ 7/8" (22.2 mm) C1220T (Brazing Connection)	ϕ1-1/8" (28.6 mm C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe	in (mm)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)
Mass		Lbs (kg)	730 (331 kg)	730(331 kg)	730(331 kg)
★3 Sound Level (Reference Value)		dBA	58	58	60
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	22.7	23.4	23.8
	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.			4D058609	4D058610	4D058611

Notes:

★1 Indoor temp. : 80°FDB or 67°FWB / outdoor temp. : 95°FDB / Equivalent piping length :25 ft (7.5 m), level difference: 0 ft.
★2 Indoor temp. : 70°FDB / outdoor temp. : 47°FDB or 43°FWB / Equivalent piping length :25 ft (7.5 m), level difference: 0 ft.
★3 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

Heat Recovery 60Hz <REYQ-PTJU> 230V

Model Name (Combination Unit)			REYQ144PTJU	REYQ168PTJU	REYQ192PTJU
Model Name (Independent Unit)			—	REMQ72PTJU REMQ96PTJU	REMQ72PTJU REMQ120PTJU
Power Supply			3 Phase 60Hz 208V-230V	3 Phase 60Hz 208V-230V	3 Phase 60Hz 208V-230V
★1 Cooling Capacity		Btu / h	144,000	168,000	192,000
★2 Heating Capacity		Btu / h	162,000	189,000	216,000
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 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 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 mm)
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
	Piston Displacement	m^3/h	16.90+16.90	16.90 + (10.53+13.34)	16.90 + (10.53+13.34)
	Number of Revolutions	r.p.m	7980, 7980	7980, (2900, 6300)	7980, (2900, 6300)
	Motor Output×Number of Units	kW	3.8+3.8	(7.1) × 1 + (8.4+3.9) × 1	(7.1) × 1 + (8.4+6.1) × 1
	Starting Method		Direct on Line	Soft Start	Soft Start
Fan	Type		Propeller Fan	Propeller Fan	Propeller Fan
	Motor Output	kW	0.75 × 2	(0.75) × 1 + (0.75) × 1	(0.75) × 1 + (0.75) × 1
	Air Flow Rate	cfm	8,299	6,350+6,530	6,350+7,060
	Drive		Direct Drive	Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe	in (mm)	ϕ1/2” (12.7 mm) C1220T (Flare Connection)	ϕ5/8” (15.8 mm) C1220T (Brazing Connection) ★3	ϕ5/8” (15.8 mm) C1220T (Brazing Connection)
	Suction Gas Pipe	in (mm)	ϕ1-1/8” (28.6 mm) C1220T (Brazing Connection)	ϕ1-1/8” (28.6 mm) C1220T (Brazing Connection) ★3	ϕ1-1/8” (28.6 mm) 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) ★3	ϕ1-1/8” (28.6 mm) C1220T (Brazing Connection)
	Pressure Equalizer Tube	in (mm)	—	ϕ3/4” (19.1) C1220T (Brazing Connection)	ϕ3/4” (19.1) C1220T (Brazing Connection)
Mass		Lbs (kg)	747 (338.8 kg)	450+560 (204 + 254 kg)	450+560 (204 + 254 kg)
★4 Sound Level (Reference Value)		dBA	61	—	—
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	7~100
Refrigerant	Refrigerant Name		R-410A	R-410A	R-410A
	Charge	Lbs	24.5	18.1+19.8	18.1+20.1
	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.			4D058612	4D060122	4D060123

Notes:

★1 Indoor temp. : 80°FDB or 67°FWB / outdoor temp. : 95°FDB / Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.
★2 Indoor temp. : 70°FDB / outdoor temp. : 47°FDB or 43°FWB / Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.
★3 BHFP26P90U is necessary for the connection.
Concerning about the piping connection for each outdoor unit to the main line as shown above, use REFNET.
★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation,
these values are normally somewhat higher as a result of ambient conditions.

Heat Recovery 60Hz <REYQ-PTJU> 230V

Model Name (Combination Unit)			REYQ216PTJU	REYQ240PTJU
Model Name (Independent Unit)			REMQ96PTJU REMQ120PTJU	REMQ120PTJU REMQ120PTJU
Power Supply			3 Phase 60Hz 208V-230V	3 Phase 60Hz 208V-230V
★1 Cooling Capacity		Btu / h	216,000	240,000
★2 Heating Capacity		Btu / h	243,000	270,000
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 (1680 x 930 x 765 + (1680 x 930 x 765 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 mm)
Heat Exchanger			Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Piston Displacement	m^3/h	(10.53+13.34) × 2	(10.53+13.34) × 2
	Number of Revolutions	r.p.m	(2900, 6300) × 2	(2900, 6300) × 2
	Motor Output×Number of Units	kW	(8.4+3.9) × 1 + (8.4+6.1) × 1	(8.4+6.1) × 1 + (8.4+6.1) × 1
	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
	Air Flow Rate	cfm	6,530+7,060	7,060+7,060
	Drive		Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe ★3	in (mm)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)
	Suction Gas Pipe ★3	in (mm)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)	ϕ1-3/8" (34.9 mm) C1220T (Brazing Connection)
	High and Low Pressure Gas Pipe ★3	in (mm)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)	ϕ1-1/8" (28.6 mm) C1220T (Brazing Connection)
	Pressure Equalizer Tube	in (mm)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)	ϕ3/4" (19.1 mm) C1220T (Brazing Connection)
Mass		Lbs (kg)	560+560 (254+254 kg)	560+560 (254+254 kg)
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		%	7~100	6~100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	Lbs	19.8+20.1	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.			4D060124	4D060125

Notes:

★1 Indoor temp. : 80°FDB or 67°FWB / outdoor temp. : 95°FDB / Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.
★2 Indoor temp. : 70°FDB / outdoor temp. : 47°FDB or 43°FWB / Equivalent piping length : 25 ft (7.5 m), level difference: 0 ft.
★3 BHFP26P90U is necessary for the connection.
Concerning about the piping connection for each outdoor unit to the main line as shown above, use REFNET.

1.2 BS Units

Model			BSVQ36PVJU	BSVQ60PVJU
Power Supply			1 Phase 60Hz 208~230V	1 Phase 60Hz 208~230V
Total Capacity Index of Connectable Indoor Unit			Less than 36	Less than 60
No. of Connectable Indoor Units			Max. 5	Max. 8
Casing			Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in (mm)	8-1/8 × 15-1/4 × 12-13/16" (206.4 x 387.4 x 325.4 mm)	8-1/8 × 15-1/4 × 12-13/16" (206.4 x 387.4 x 325.4 mm)
Sound Absorbing Thermal Insulation Material			Foamed Polyurethane, Frame Resisting Needle Felt	Foamed Polyurethane, Frame Resisting Needle Felt
Piping Connection	Indoor Unit	Liquid Pipes	ϕ 3/8" (9.5 mm) C1220T(Brazing Connection) ★1	ϕ 3/8" (9.5 mm) C1220T(Brazing Connection)
		Gas Pipes	ϕ5/8" (15.8 mm) C1220T (Brazing Connection) ★1	ϕ5/8" (15.8 mm) C1220T(Brazing Connection) ★2
	Outdoor Unit	Liquid Pipes	ϕ 3/8" (9.5 mm) C1220T(Brazing Connection)	ϕ 3/8" (9.5 mm) C1220T(Brazing Connection)
		Suction Gas Pipes	ϕ5/8" (15.8 mm) C1220T (Brazing Connection)	ϕ5/8" (15.8 mm) C1220T(Brazing Connection) ★2
		Discharge Gas Pipes	ϕ1/2" (12.7 mm) (Brazing Connection)	ϕ1/2" (12.7 mm) (Brazing Connection) ★2

Mass	Lbs (kg)	26 (11.8 kg)	26 (11.8 kg)
Standard Accessories		Installation Manual, Attached Pipe, Insulation Pipe Cover, Clamps	Installation Manual, Attached Pipe, Insulation Pipe Cover, Clamps
Drawing No.		4D058233A	4D058234A

Note:

★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.)

Connection Range for BS Unit

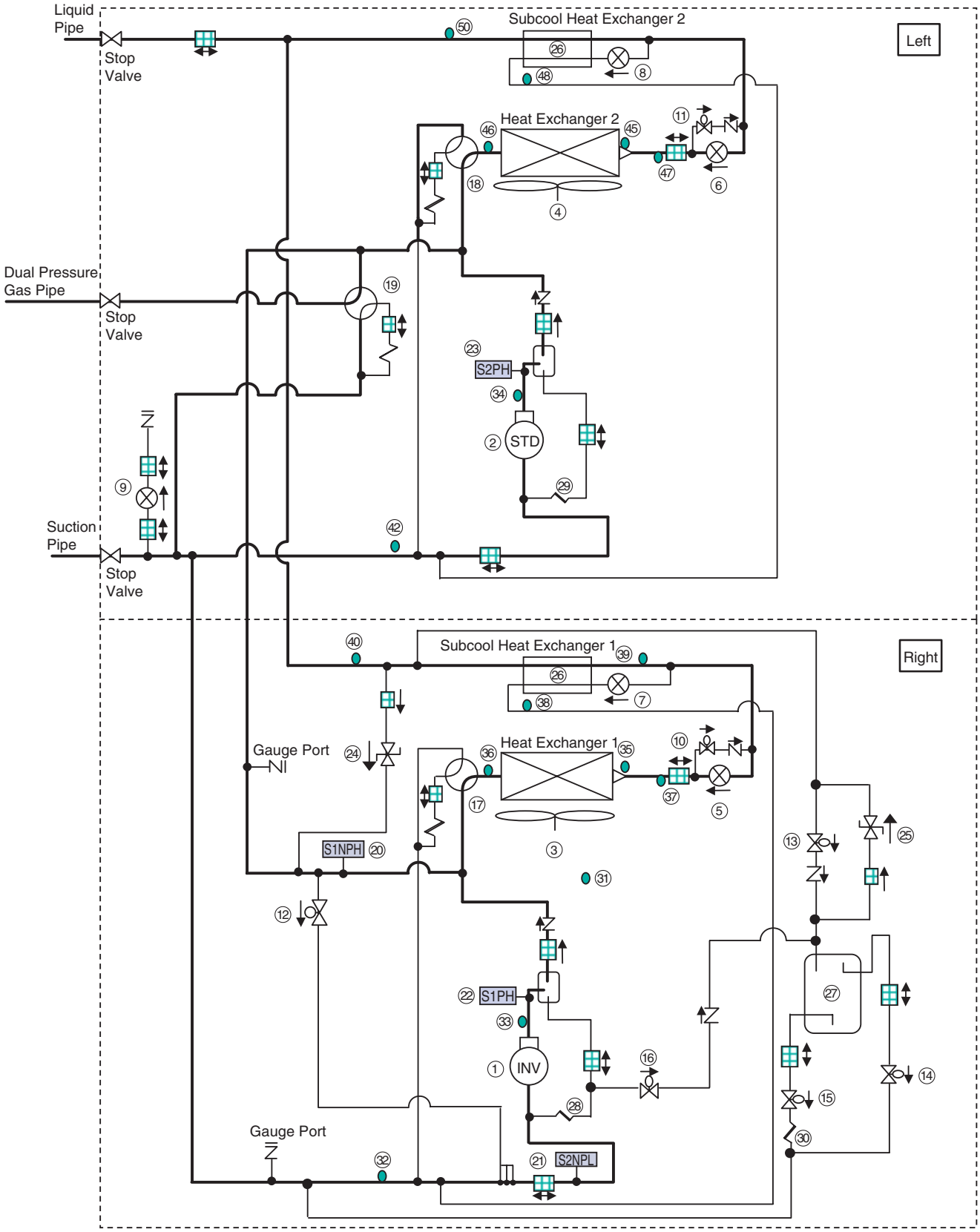
Components	Outdoor unit/BS unit model name	Total capacity of connectable indoor units	Number of connectable indoor units	
Indoor unit total capacity	REYQ72P	36~93.5	12	Same number of BS units
	REYQ96P	48~124.5	16	
	REYQ120P	60~156	20	
	REYQ144P	72~187	25	
	REYQ168P	84~218	29	
	REYQ192P	96~249.5	33	
	REYQ216P	108~280.5	37	
	REYQ240P	120~312	41	

2. Refrigerant Circuit

2.1 REYQ72, 96, 120PYDN, PTJU

No. in refrigerant system diagram	Symbol	Name	Major Function
1	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 52Hz and 210Hz by using the inverter, while Standard compressor is operated with commercial power supply only. The number of operating steps is as follows when Inverter compressor is operated in combination with Standard compressor: REYQ8, 10, 12P : 37 steps
2	M2C	Standard compressor 1 (STD1)	
3	M1F	Inverter fan	Since the system is of the outdoor unit heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
4	M2F	Inverter fan	Since the system is of the outdoor unit heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
5(6)	Y1E (Y3E)	Electronic expansion valve (Main1 (Main2))	While in heating operation, PI control is applied to keep the outlet superheated degree of outdoor unit heat exchanger constant.
7(8)	Y2E (Y5E)	Electronic expansion valve (Subcool1 (Subcool2))	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
9	Y4E	Electronic expansion valve (Refrigerant charge EVJ)	Used to open/close refrigerant charge port.
10(11)	Y5S (Y10S)	Solenoid valve (Main bypass1 (Main bypass2))	Opens in cooling operation.
12	Y4S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from reducing.
13	Y3S	Solenoid valve (Refrigerant regulator liquid pipe SVL)	Used to collect refrigerant to the refrigerant regulator.
14	Y1S	Solenoid valve (Refrigerant regulator gas purging pipe SVG)	Used to collect refrigerant to the refrigerant regulator.
15	Y7S	Solenoid valve (Refrigerant regulator discharge pipe SVO)	Used to discharge refrigerant from the refrigerant regulator.
16	Y6S	Solenoid valve (Discharge pipe of refrigerant regulator)	Bypasses the high pressure gas to the refrigerant regulator.
17(18)	Y2S (Y9S)	4-way valve (Heat exchanger switch 20SA)	Used to switch outdoor heat exchanger to evaporator or condenser.
19	Y8S	4-way valve (Dual pressure gas pipe switch 20SB)	Used to switch dual pressure gas pipe to high pressure or low pressure.
20	S1NPH	High pressure sensor	Detects high pressure.
21	S2NPL	Low pressure sensor	Detects low pressure.
22	S1PH	HP pressure switch (For INV)	Functions when pressure increases to stop operation and avoid high pressure increase in the event of a fault.
23	S2PH	HP pressure switch (For STD)	
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)	Used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
26	—	Subcooling heat exchanger	Apply subcooling to liquid refrigerant.
27	—	Refrigerant regulator	Surplus refrigerant is held according to the operation conditions.
28	—	Capillary tube	Returns the refrigerating oil separated through the oil separator to the INV compressor.
29	—	Capillary tube	Returns the refrigerating oil separated through the oil separator to the STD1 compressor.
30	—	Capillary tube	Discharges refrigerant from the refrigerant regulator.
31	R1T	Thermistor (Outdoor air: Ta)	Detects outdoor temperature, correct discharge pipe temperature, and others.
32(42)	R8T (R10T)	Thermistor (Suction pipe: TsA)	Detects suction pipe temperature.
33	R31T	Thermistor (INV discharge pipe: Tdi)	Detects discharge pipe temperature. Used for compressor temperature protection control.
34	R32T	Thermistor (STD1 discharge pipe: Tds1)	
35(45)	R4T (R12T)	Thermistor (Heat exchanger deicer: Tb)	Detects liquid pipe temperature of the outdoor unit heat exchanger. Used to make judgments on defrosting operation.
36(46)	R2T (R11T)	Thermistor (Heat exchanger gas pipe Tg)	Detects temperature of gas pipe for the outdoor unit heat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
37(47)	R7T (R15T)	Thermistor (Heat exchanger liquid pipe Tf)	Detects temperature of liquid pipe between the the outdoor unit heat exchanger and main electronic expansion valve. Used to make judgments on the recover or discharge refrigerants to the refrigerant regulator.
38(48)	R5T (R13T)	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Detects gas pipe temperature on the evaporation side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooled heat exchanger.
39	R6T	Thermistor (Subcooling heat exchanger liquid pipe Tl)	Detects temperature of liquid pipe between the main expansion valve and subcooling heat exchanger.
40(50)	R9T (R14T)	Thermistor (Liquid pipe Tsc)	Detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.

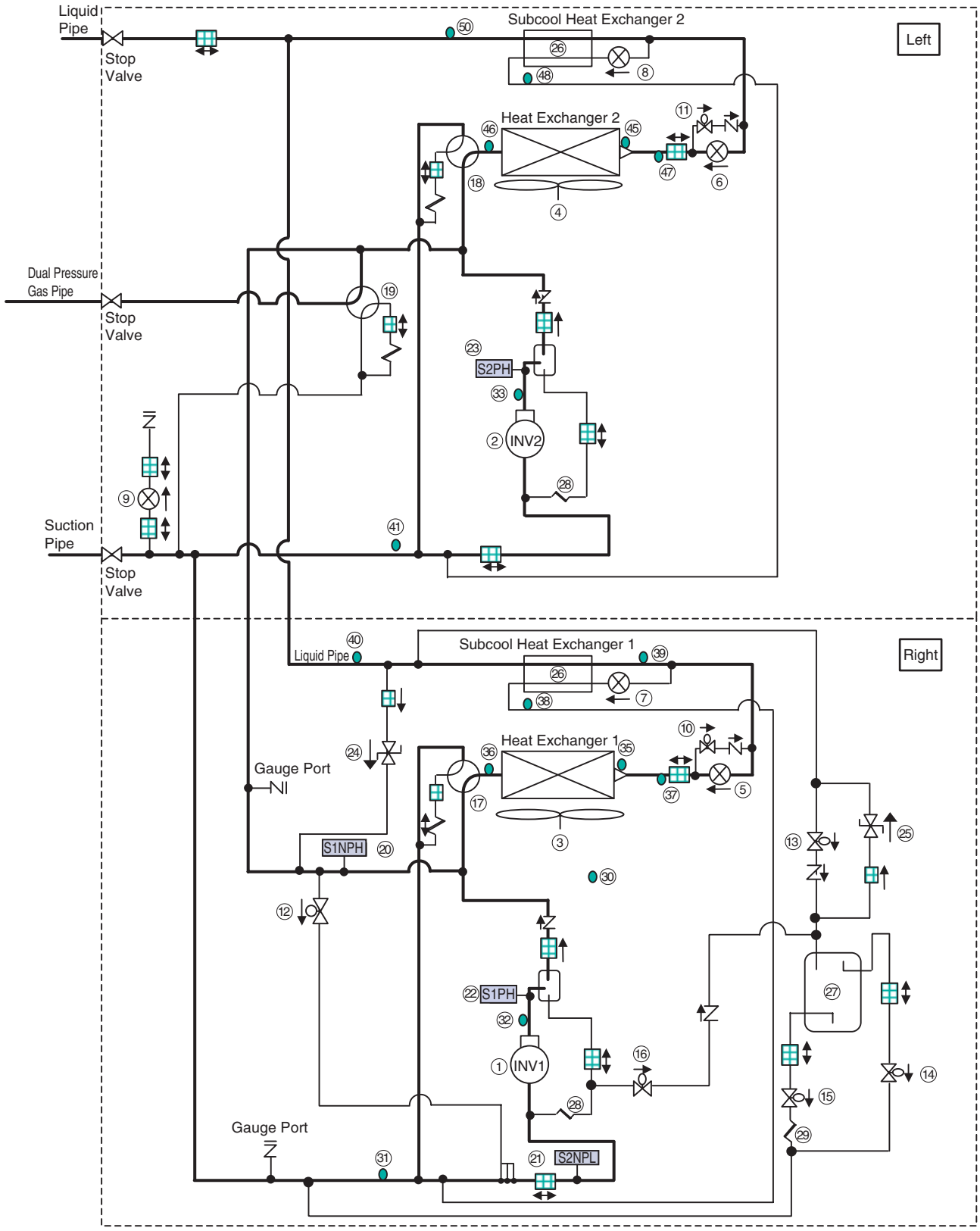
REYQ72, 96, 120PYDN, PTJU
(6ton, 8ton, 10ton Single Type)
(INV Unit + STD Unit)



2.2 REYQ144PTJU

No. in refrigerant system diagram	Symbol	Name	Major Function
1	M1C	Inverter compressor (INV1)	Inverter compressor is operated on frequencies between 52Hz and 266Hz by using the inverter. The number of operating steps is as follows. REYQ14P or 16P : 26 step
2	M2C	Standard compressor 1 (INV2)	
3	M1F	Inverter fan	Since the system is of the outdoor unit heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
4	M2F	Inverter fan	Since the system is of the outdoor unit heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
5(6)	Y1E (Y3E)	Electronic expansion valve (Main1 (Main2))	While in heating operation, PI control is applied to keep the outlet superheated degree of the outdoor unit heat exchanger constant.
7(8)	Y2E (Y5E)	Electronic expansion valve (Subcool1 (Subcool2))	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
9	Y4E	Electronic expansion valve (Refrigerant charge EVJ)	Used to open/close refrigerant charge port.
10(11)	Y5S (Y10S)	Solenoid valve (Main bypass1 (Main bypass2))	Opens in cooling operation.
12	Y4S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from reducing.
13	Y3S	Solenoid valve (Refrigerant regulator liquid pipe SVL)	Used to collect refrigerant to the refrigerant regulator.
14	Y1S	Solenoid valve (Refrigerant regulator gas purging pipe SVG)	Used to collect refrigerant to the refrigerant regulator.
15	Y7S	Solenoid valve (Refrigerant regulator discharge pipe SVO)	Used to discharge refrigerant from the refrigerant regulator.
16	Y6S	Solenoid valve (Discharge pipe of refrigerant regulator)	Bypass the high pressure gas to the refrigerant regulator.
17(18)	Y2S (Y9S)	4 way valve (Heat exchanger switch 20SA)	Used to switch outdoor heat exchanger to evaporator or condenser.
19	Y8S	4 way valve (Dual pressure gas pipe switch 20SB)	Used to switch dual pressure gas pipe to high pressure or low pressure.
20	S1NPH	High pressure sensor	Detects high pressure.
21	S2NPL	Low pressure sensor	Detects low pressure.
22(23)	S1PH (S2PH)	HP pressure switch (For INV compressor)	This functions when pressure increases to stop operation and avoid high pressure increase in the event of a fault.
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)	Used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
26	—	Subcooling heat exchanger	Apply subcooling to liquid refrigerant.
27	—	Refrigerant regulator	Surplus refrigerant is held according to the operation conditions.
28	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV compressor.
29	—	Capillary tube	Used to discharge refrigerant from the refrigerant regulator.
30	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor temperature, correct discharge pipe temperature, and others.
31(41)	R8T (R10T)	Thermistor (Suction pipe: TsA)	Detects suction pipe temperature.
32	R31T	Thermistor (INV1 discharge pipe: Tdi)	Detects discharge pipe temperature. Used for compressor temperature protection control.
33	R32T	Thermistor (INV2 discharge pipe: Tds1)	
35(45)	R4T (R12T)	Thermistor (Heat exchanger deicer: Tb)	Detects liquid pipe temperature of the outdoor unit heat exchanger. Used to make judgments on defrosting operation.
36(46)	R2T (R11T)	Thermistor (Heat exchanger gas pipe Tg)	Detects temperature of gas pipe for the outdoor unitheat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
37(47)	R7T (R15T)	Thermistor (Heat exchanger liquid pipe Tf)	Detects temperature of liquid pipe between the the outdoor unitheat exchanger and main electronic expansion valve. Used to make judgments on the recover or discharge refrigerants to the refrigerant regulator.
38(48)	R5T (R13T)	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Detects temperature of gas pipe on the evaporator side for the subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooled heat exchanger.
39	R6T	Thermistor (Subcooling heat exchanger liquid pipe Tl)	Detects temperature of liquid pipe between the main expansion valve and subcooling heat exchanger.
40(50)	R9T (R14T)	Thermistor (Liquid pipe Tsc)	Detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.

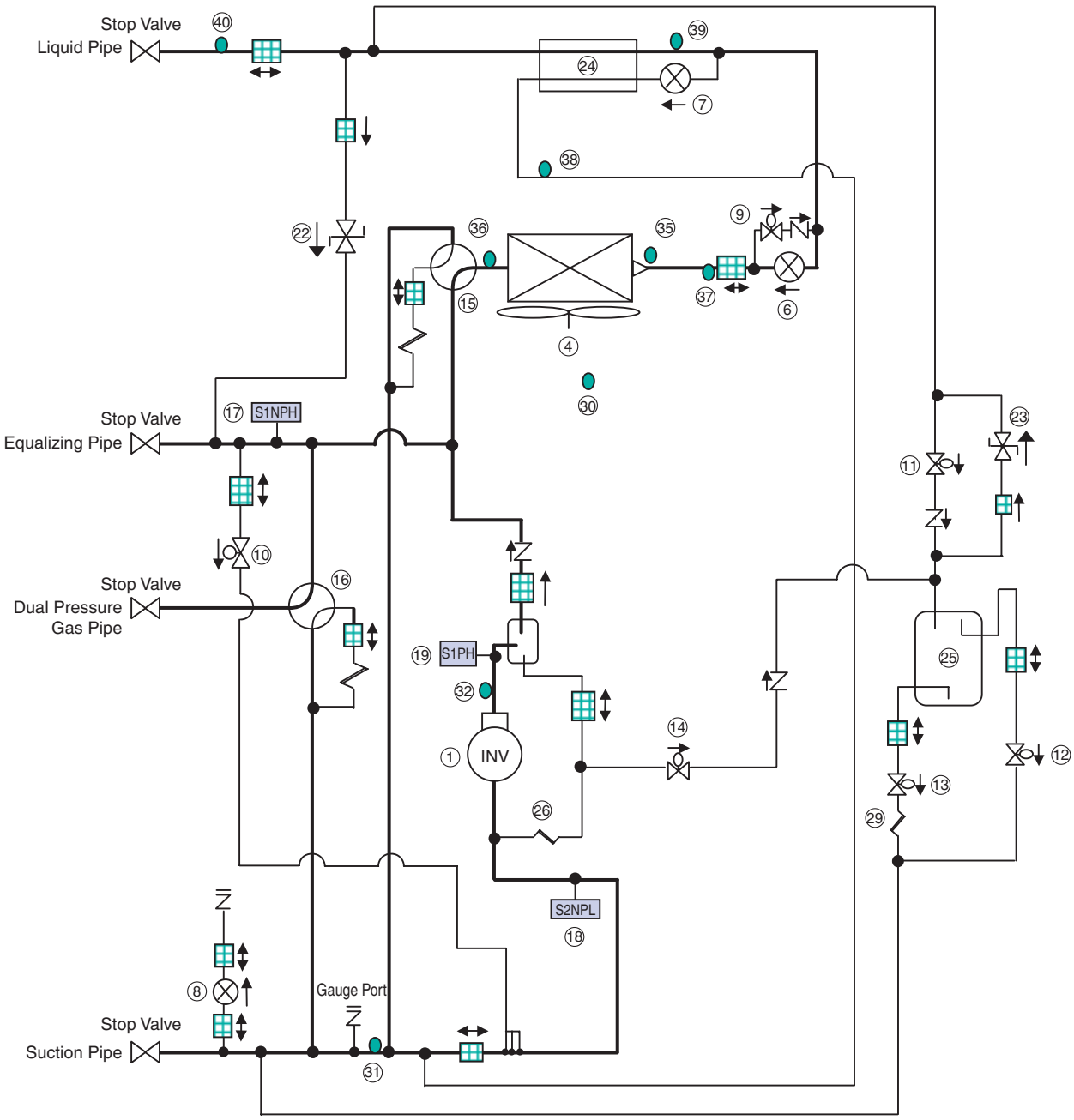
REYQ144PTJU
(12ton Single Type)
(INV Unit × 2)



2.3 REMQ72PYDN, PTJU (Multi 6ton)

No. in refrigerant system diagram	Symbol	Name	Major Function
1	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 52Hz and 210Hz by using the inverter. Compressor operation steps : Refer to page 190.
4	M1F	Inverter fan	Since the system is of the outdoor unit heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
6	Y1E	Electronic expansion valve (Main: EVM)	While in heating operation, PI control is applied to keep the outlet superheated degree of the outdoor unit heat exchanger constant.
7	Y3E	Electronic expansion valve (Subcool: EVT)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
8	Y2E	Electronic expansion valve (Refrigerant charge EVJ)	Used to open/close refrigerant charge port.
9	Y6S	Solenoid valve (Main bypass SVE)	Opens in cooling operation.
10	Y5S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from reducing.
11	Y4S	Solenoid valve (Refrigerant regulator liquid pipe SVL)	Used to collect refrigerant to the refrigerant regulator.
12	Y1S	Solenoid valve (Refrigerant regulator gas purging pipe SVG)	Used to collect refrigerant to the refrigerant regulator.
13	Y7S	Solenoid valve (Refrigerant regulator discharge pipe SVO)	Used to discharge refrigerant from the refrigerant regulator.
14	Y8S	Solenoid valve (Discharge pipe of refrigerant regulator)	Bypasses the high pressure gas to the refrigerant regulator.
15	Y3S	4-way valve (Heat exchanger switch 20SA)	Used to switch outdoor heat exchanger to evaporator or condenser.
16	Y2S	4-way valve (Dual pressure gas pipe switch 20SB)	Used to switch dual pressure gas pipe to high pressure or low pressure.
17	S1NPH	High pressure sensor	Detects high pressure.
18	S2NPL	Low pressure sensor	Detects low pressure.
19	S1PH	HP pressure switch (For INV compressor)	Functions when pressure increases to stop operation and avoid high pressure increase in the event of a fault.
22	—	Pressure regulating valve (Liquid pipe)	Used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
23	—	Pressure regulating valve (Refrigerant regulator)	Used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
24	—	Subcooling heat exchanger	Applies subcooling to liquid refrigerant.
25	—	Refrigerant regulator	Surplus refrigerant is held according to the operation conditions.
26	—	Capillary tube	Returns the refrigerating oil separated through the oil separator to the INV compressor.
29	—	Capillary tube	Used to discharge refrigerant from the refrigerant regulator.
30	R1T	Thermistor (Outdoor air: Ta)	Detects outdoor temperature.
31	R8T	Thermistor (Suction pipe: TsA)	Detects suction pipe temperature.
32	R31T	Thermistor (INV discharge pipe: Tdi)	Detects detect discharge pipe temperature. Used for compressor temperature protection control.
35	R4T	Thermistor (Heat exchanger deicer Tb)	Detects temperature of some of the liquid pipes for the outdoor unit heat exchanger. Used to make judgments on defrosting operation.
36	R2T	Thermistor (Heat exchanger gas pipe Tg)	Detects temperature of gas pipe for the outdoor unit heat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
37	R7T	Thermistor (Heat exchanger liquid pipe Tf)	Detects temperature of liquid pipe between the the outdoor unit heat exchanger and main electronic expansion valve. Used to make judgments on the recover or discharge refrigerants to the refrigerant regulator.
38	R5T	Thermistor (Subcooling heat exchanger gas pipe Tsh)	Detects temperature of gas pipe on the evaporator side for the subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooled heat exchanger.
39	R6T	Thermistor (Subcooling heat exchanger liquid pipe Tl)	Detects temperature of liquid pipe between the main expansion valve and subcooling heat exchanger.
40	R9T	Thermistor (Liquid pipe Tsc)	Detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.

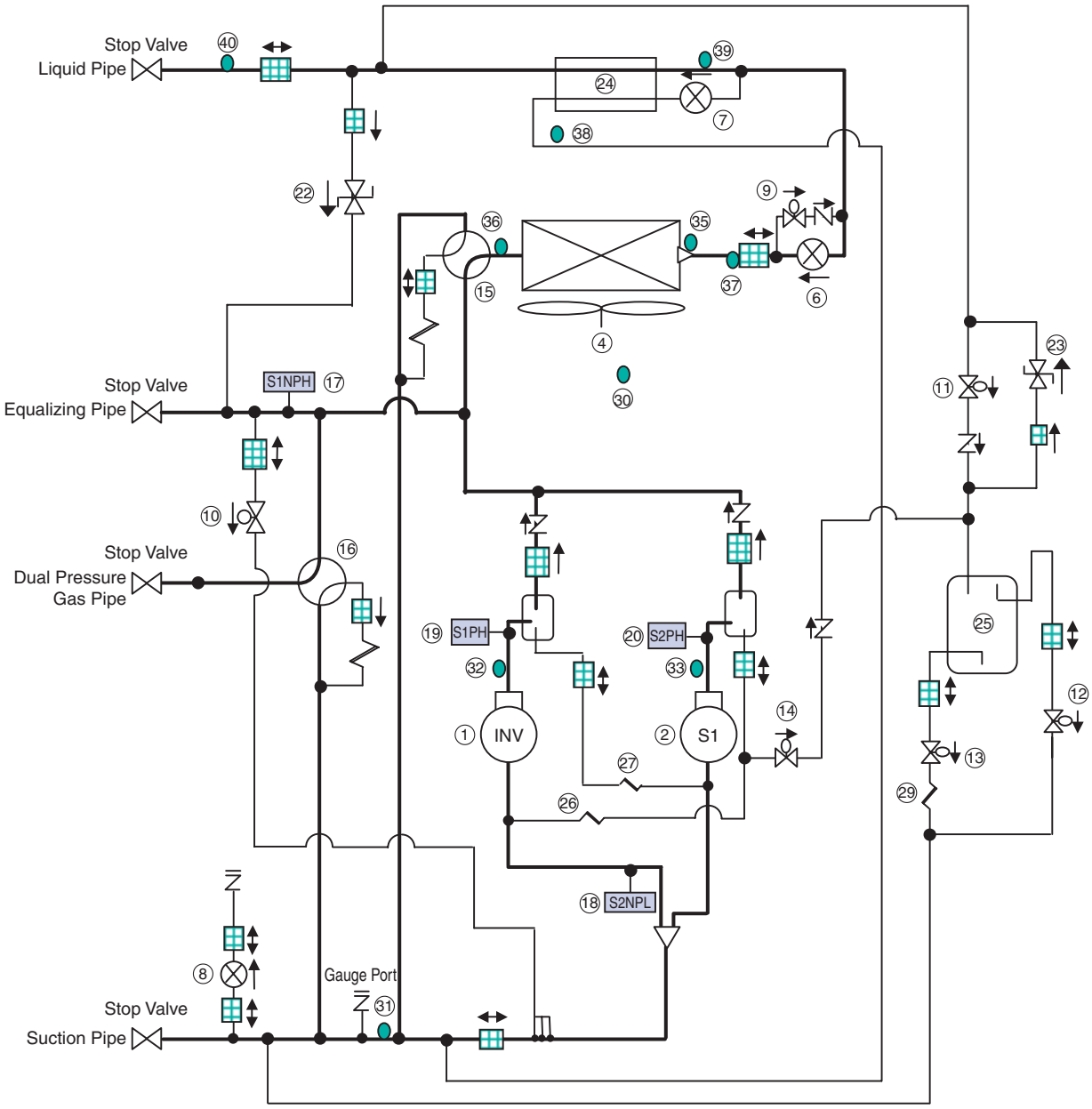
REMQ72PYDN, PTJU



2.4 REMQ96, 120PYDN, PTJU (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 and 210Hz by using the inverter, while Standard compressor is operated with commercial power supply only. The number of operating steps is as follows when Inverter compressor is operated in combination with Standard compressor. Compressor operation steps : Refer to page 190.
2	M2C	Standard compressor 1 (STD1)	
4	M1F	Inverter fan	Since the system is of the outdoor unit heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
6	Y1E	Electronic expansion valve (Main: EVM)	While in heating operation, PI control is applied to keep the outlet superheated degree of the outdoor unit heat exchanger constant.
7	Y3E	Electronic expansion valve (Subcool: EVT)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
8	Y2E	Electronic expansion valve (Refrigerant charge EVJ)	Opens/closes refrigerant charge port.
9	Y6S	Solenoid valve (Main bypass SVE)	Opens in cooling operation.
10	Y5S	Solenoid valve (Hot gas: SVP)	Prevents the low pressure from transient fallingreducing.
11	Y4S	Solenoid valve (Refrigerant regulator liquid pipe SVL)	Collects refrigerant to the refrigerant regulator.
12	Y1S	Solenoid valve (Refrigerant regulator gas purging pipe SVG)	Collects refrigerant to the refrigerant regulator.
13	Y7S	Solenoid valve (Refrigerant regulator discharge pipe SVO)	Discharges refrigerant from the refrigerant regulator.
14	Y8S	Solenoid valve (Discharge pipe of refrigerant regulator)	Bypasses the high pressure gas to the refrigerant regulator.
15	Y3S	4-way valve (Heat exchanger switch 20SA)	Switches outdoor heat exchanger to evaporator or condenser.
16	Y2S	4-way valve (Dual pressure gas pipe switch 20SB)	Switches dual pressure gas pipe to high pressure or low pressure.
17	S1NPH	High pressure sensor	Detects high pressure.
18	S2NPL	Low pressure sensor	Detects low pressure.
19	S1PH	HP pressure switch (For INV compressor)	Functions when pressure increases to stop operation and avoid high pressure increase in the event of a fault.
20	S2PH	HP pressure switch (For STD compressor 1)	
22	—	Pressure regulating valve (Liquid pipe)	Used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
23	—	Pressure regulating valve (Refrigerant regulator)	Used when pressure increases, to prevent any damage on components caused by pressure increase in transport or storage.
24	—	Subcooling heat exchanger	Appies subcooling to liquid refrigerant.
25	—	Refrigerant regulator	Surplus refrigerant is held according to the operation conditions.
26	—	Capillary tube	Returns the refrigerating oil separated through the oil separator to the INV compressor.
27	—	Capillary tube	Returns the refrigerating oil separated through the oil separator to the STD1 compressor.
29	—	Capillary tube	Discharges refrigerant from the refrigerant regulator.
30	R1T	Thermistor (Outdoor air: Ta)	Detects outdoor temperature, correct discharge pipe temperature, and others.
31	R8T	Thermistor (Suction pipe: TsA)	Detects suction pipe temperature.
32	R31T	Thermistor (INV discharge pipe: Tdi)	Detects discharge pipe temperature. Used for compressor temperature protection control.
33	R32T	Thermistor (STD1 discharge pipe: Tds1)	
35	R4T	Thermistor (Heat exchanger deicer: Tb)	Detects liquid pipe temperature of the outdoor unit heat exchanger. Used to make judgments on defrosting operation.
36	R2T	Thermistor (Heat exchanger gas pipe Tg)	Detects temperature of gas pipe for the outdoor unit heat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
37	R7T	Thermistor (Heat exchanger liquid pipe Tf)	Detects temperature of liquid pipe between the the outdoor unit heat exchanger and main electronic expansion valve. Used to make judgments on the recover or discharge refrigerants to the refrigerant regulator.
38	R5T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Detects gas pipe temperature on the evaporation side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooled heat exchanger.
39	R6T	Thermistor (Subcooling heat exchanger liquid pipe Tl)	Detects temperature of liquid pipe between the main expansion valve and subcooling heat exchanger.
40	R9T	Thermistor (Liquid pipe Tsc)	Detects temperature of liquid pipe between the liquid stop valve and subcooling heat exchanger.

REMQ96, 120PYDN, PTJU

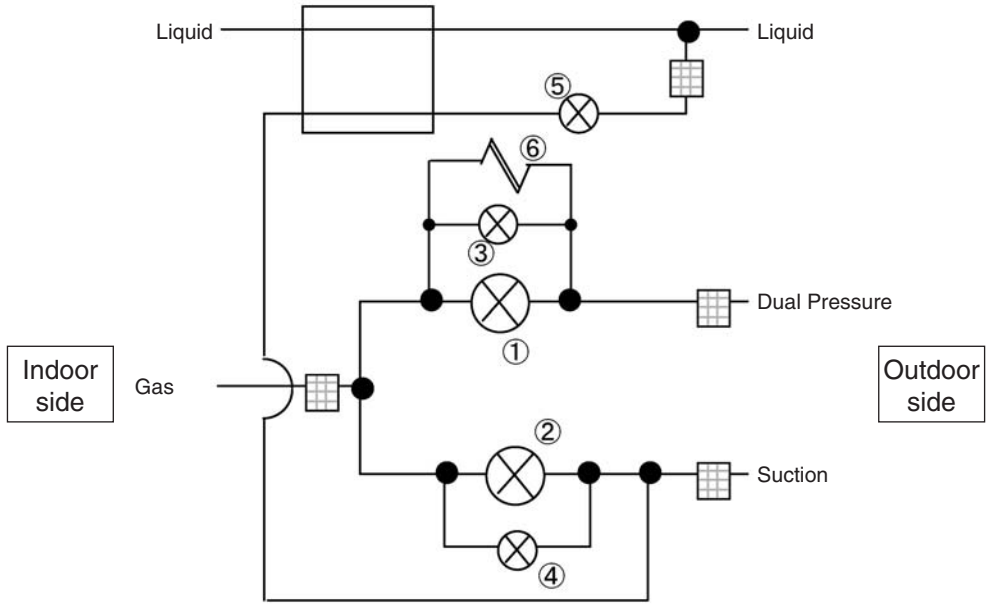


2.5 BS Unit Functional Parts

BSVQ36, 60PVJU

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

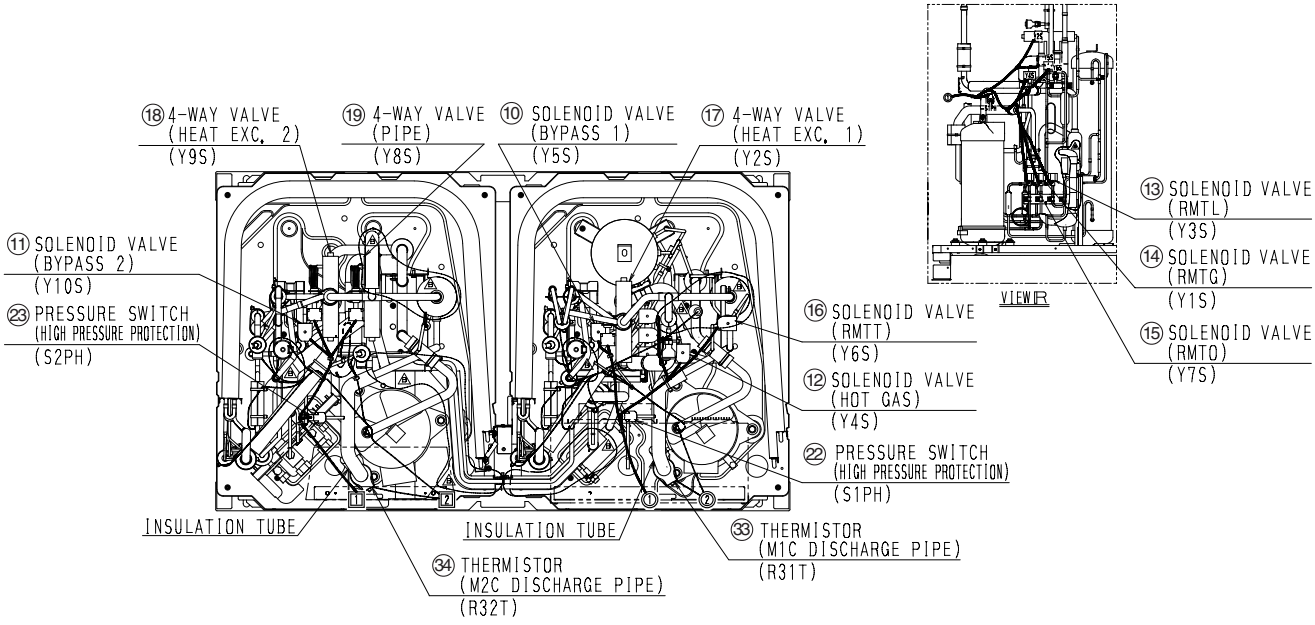
Note : Factory set of all EV opening : 60pls



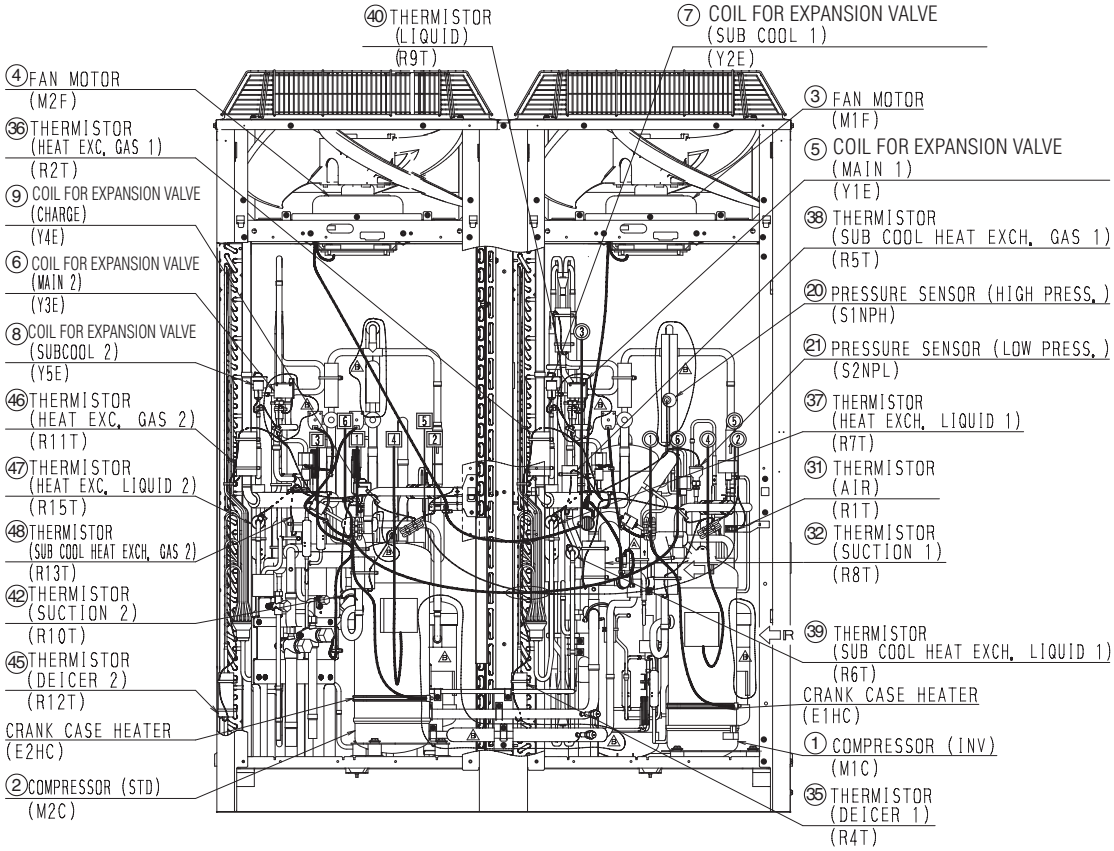
3. Functional Parts Layout

3.1 REYQ72P, 96P, 120P

Plan



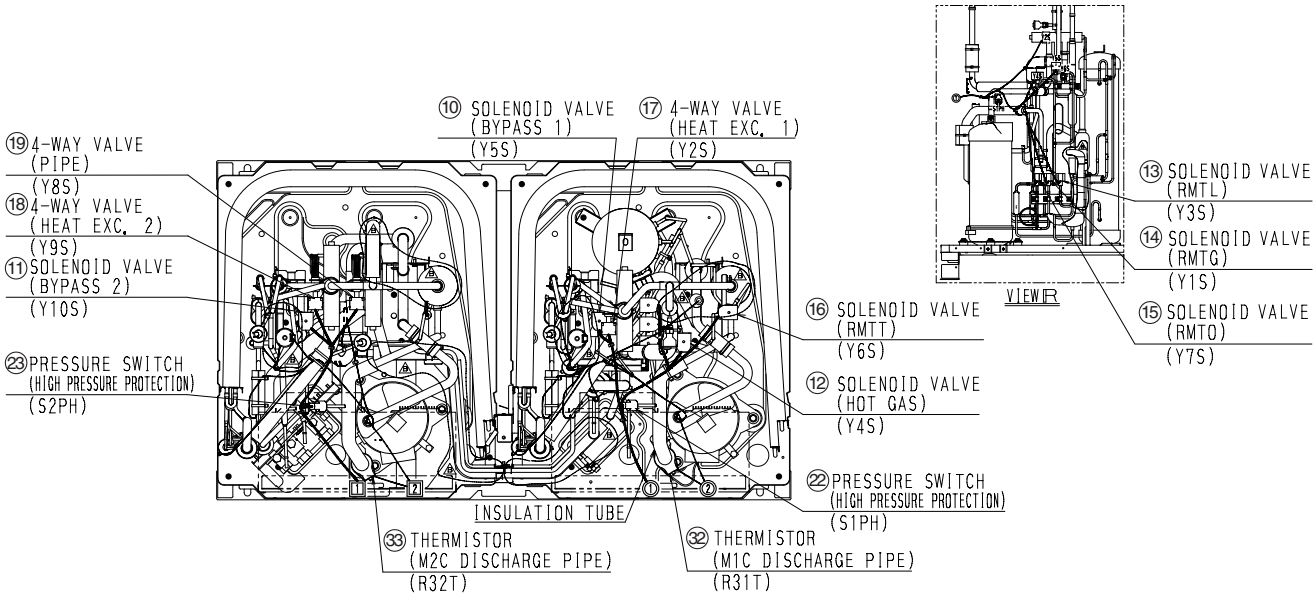
Front View



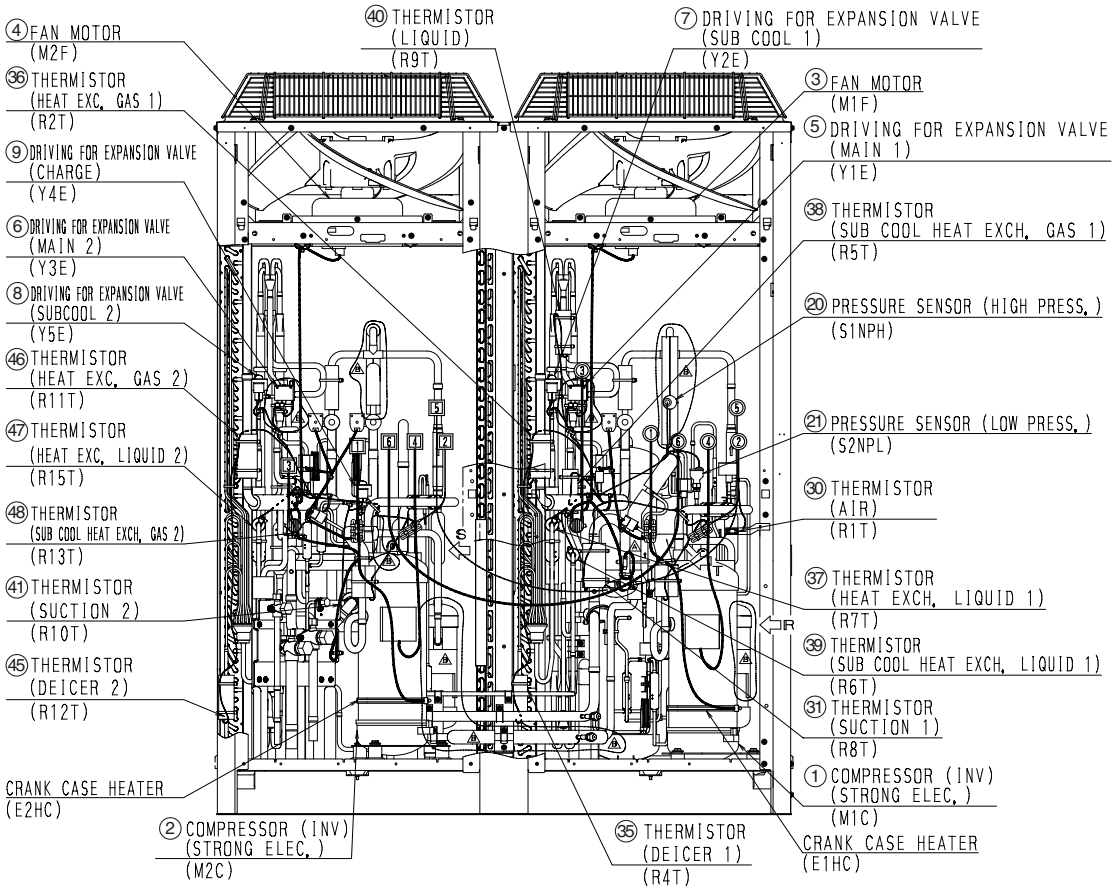
Note: For reference numbers, refer to page 128.

3.2 REYQ144PTJU

Plan



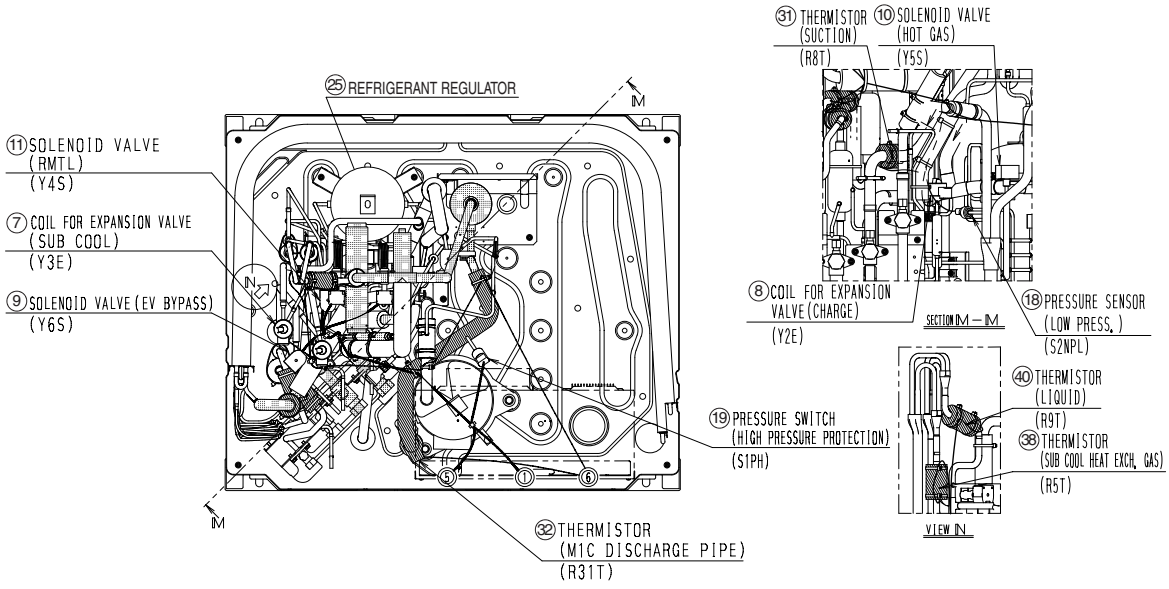
Front View



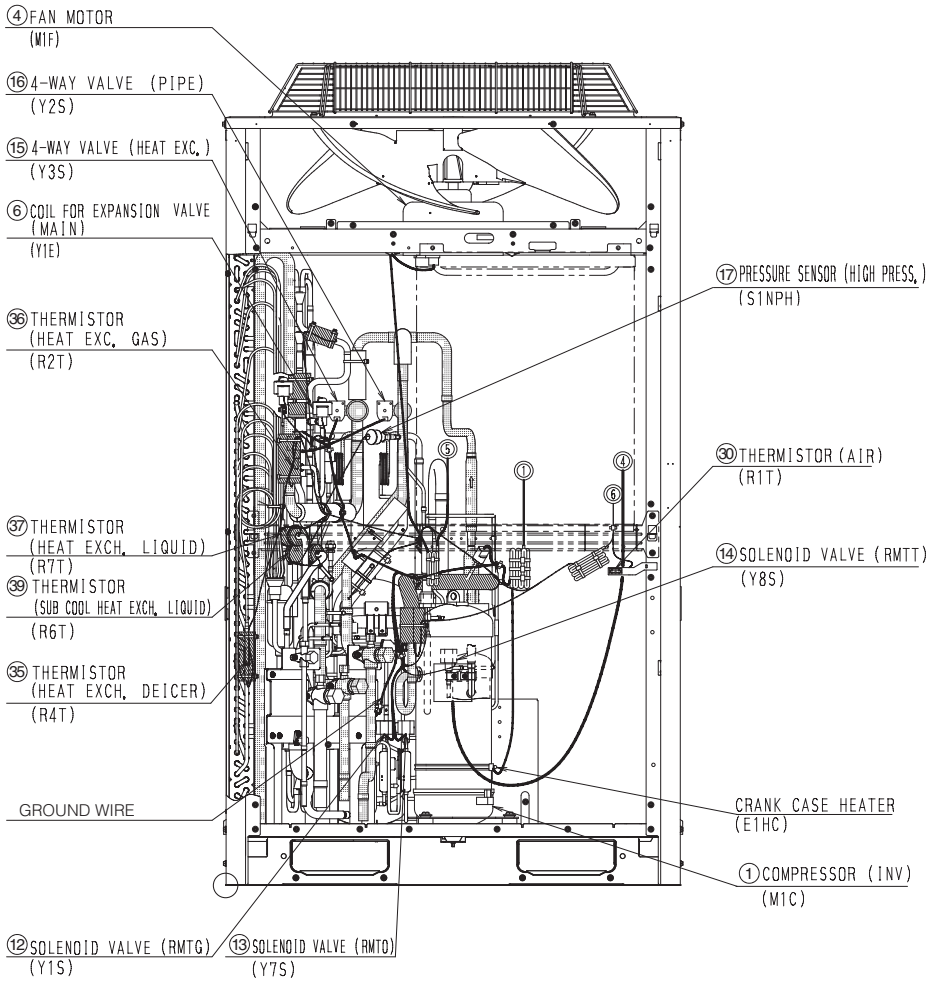
Note: For reference numbers, refer to page 130.

3.3 REMQ72P

Plan



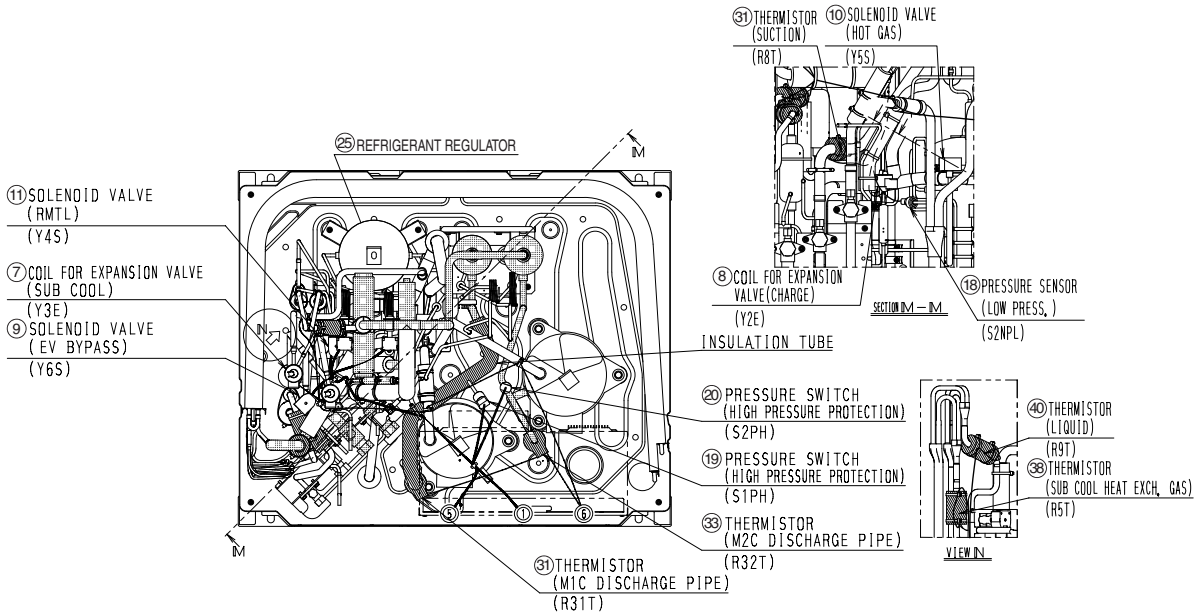
Front View



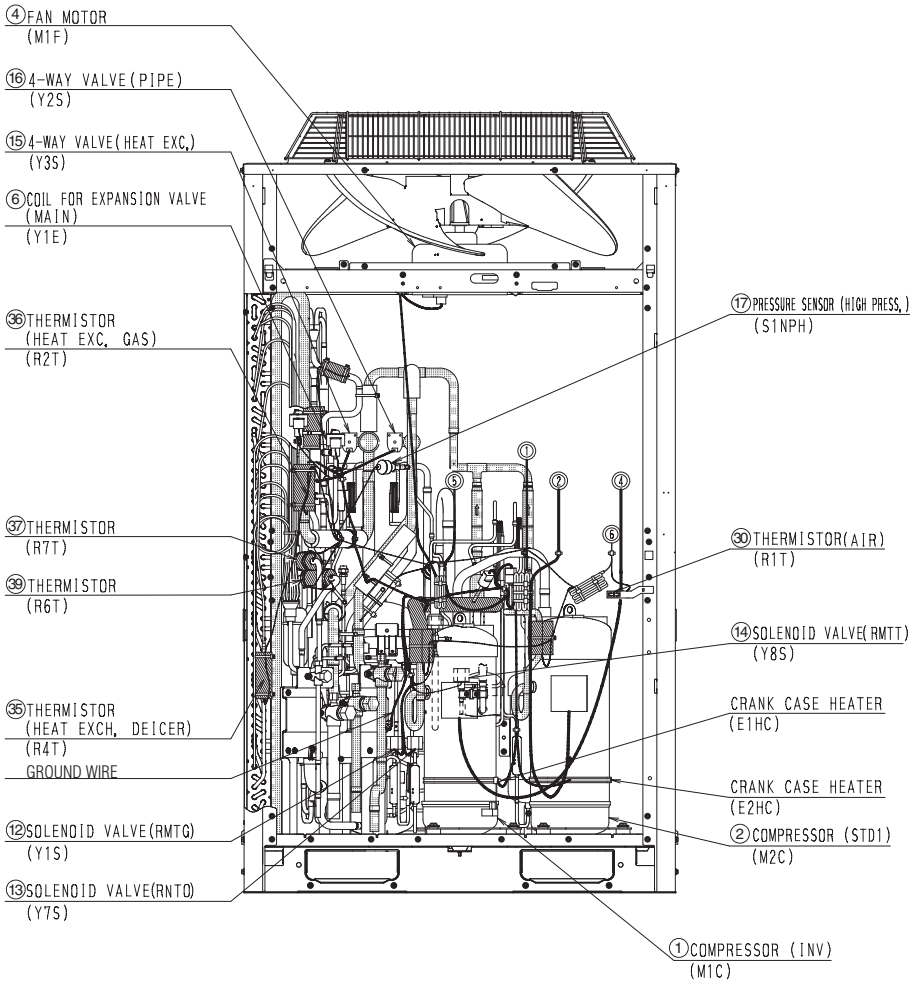
Note: For reference numbers, refer to page 132.

3.4 REMQ96P, 120P

Plan



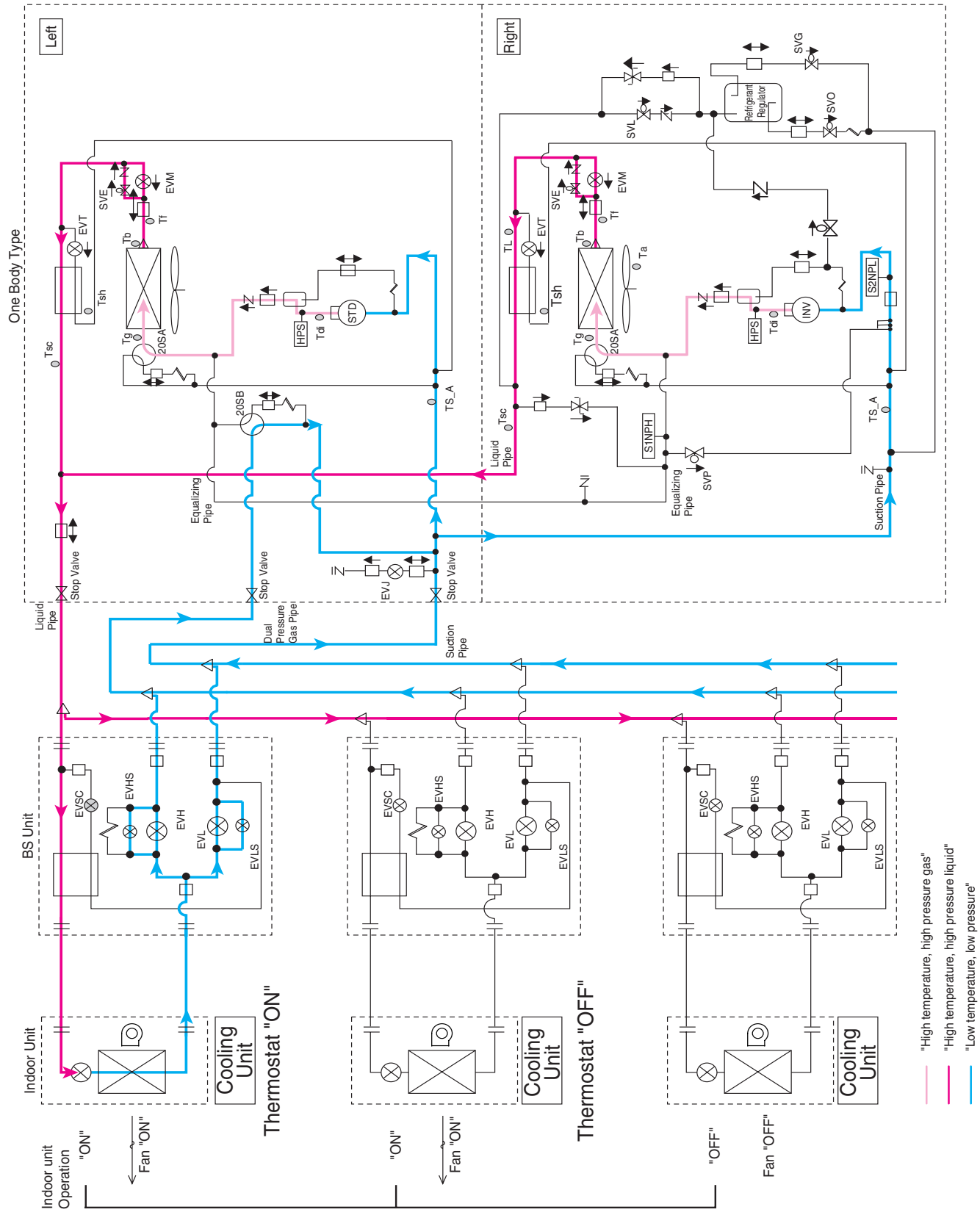
Front View



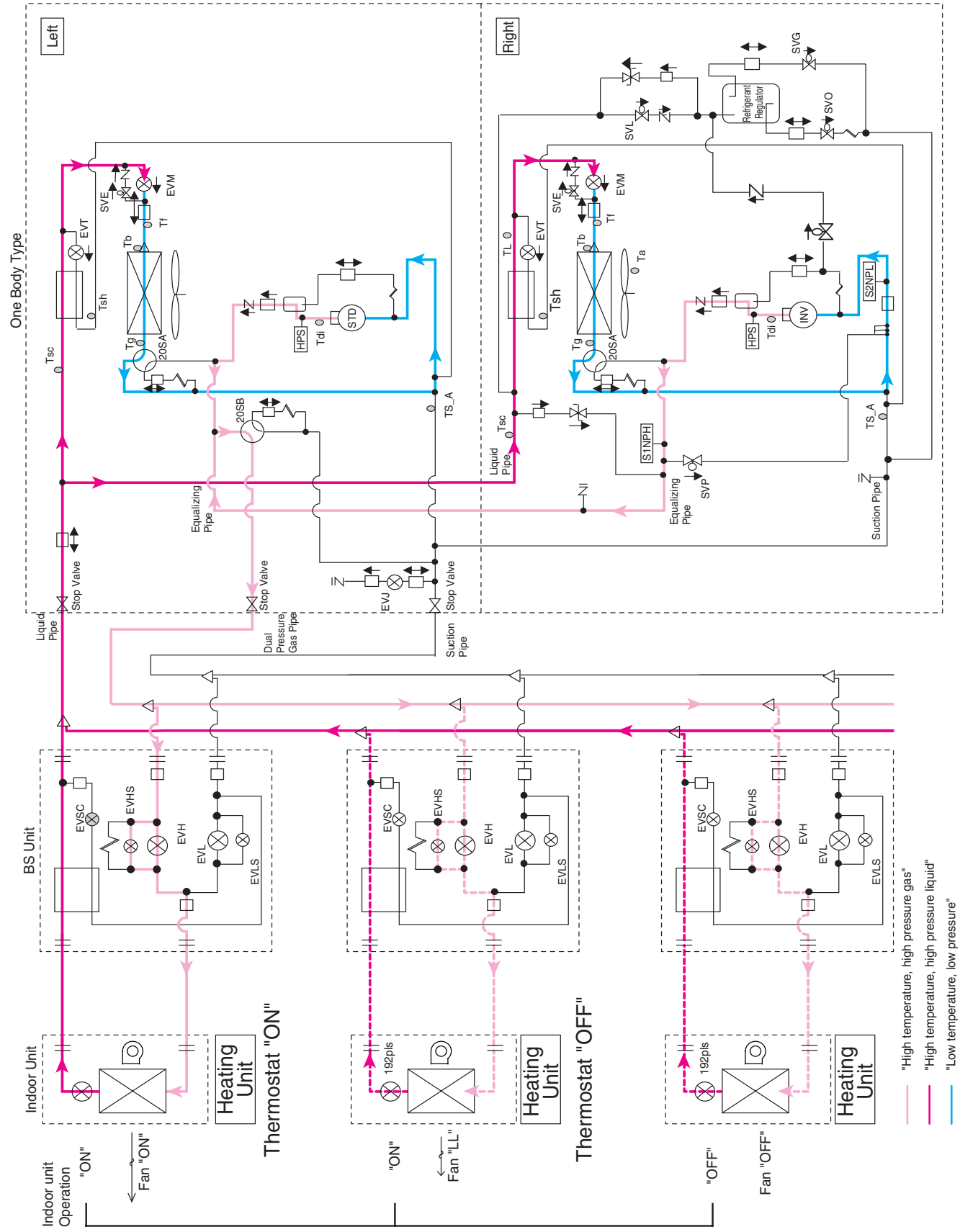
Note: For reference number, refer to page 134.

4. Refrigerant Flow for Each Operation Mode

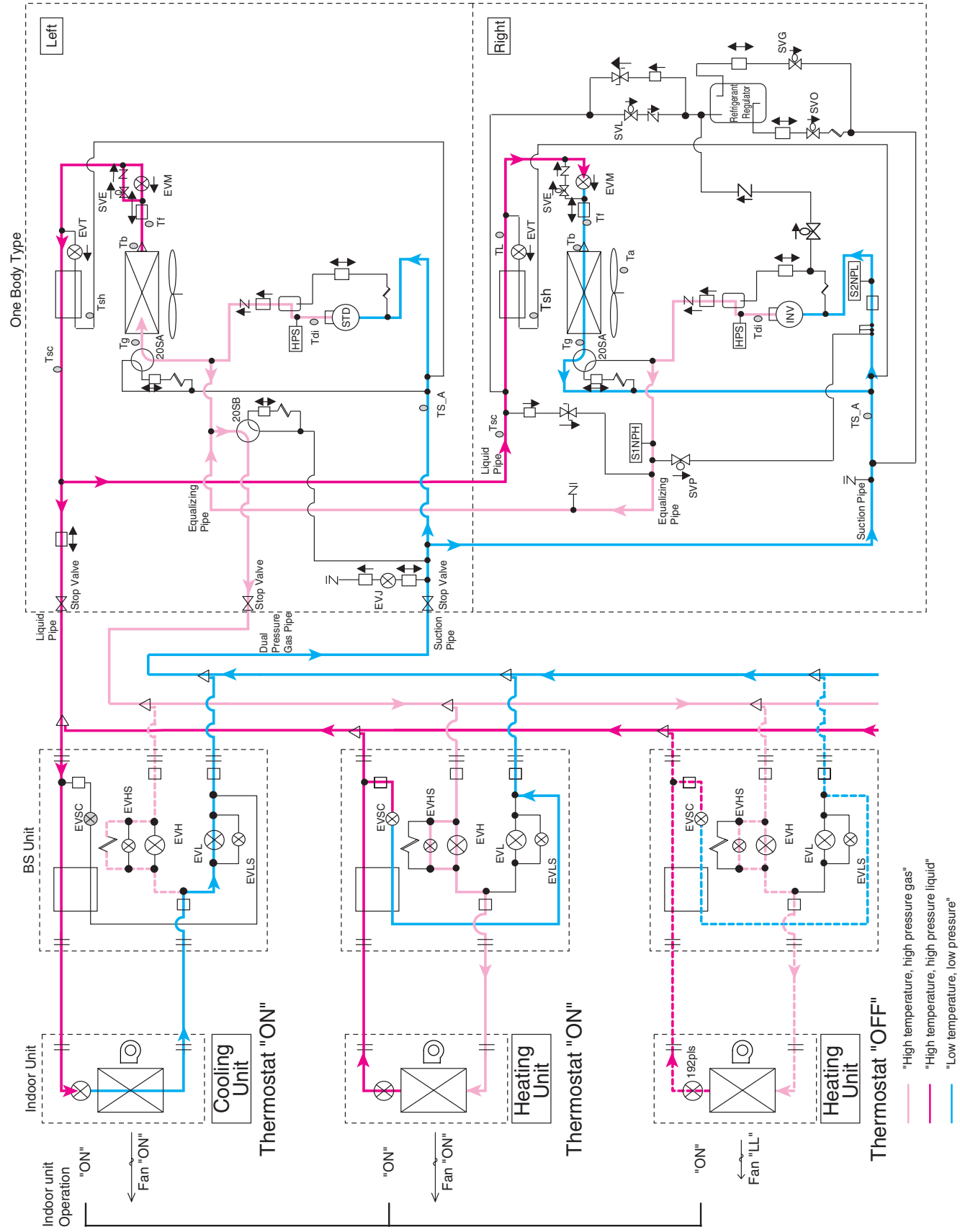
REYQ72P, 96P, 120P
Cooling Operation



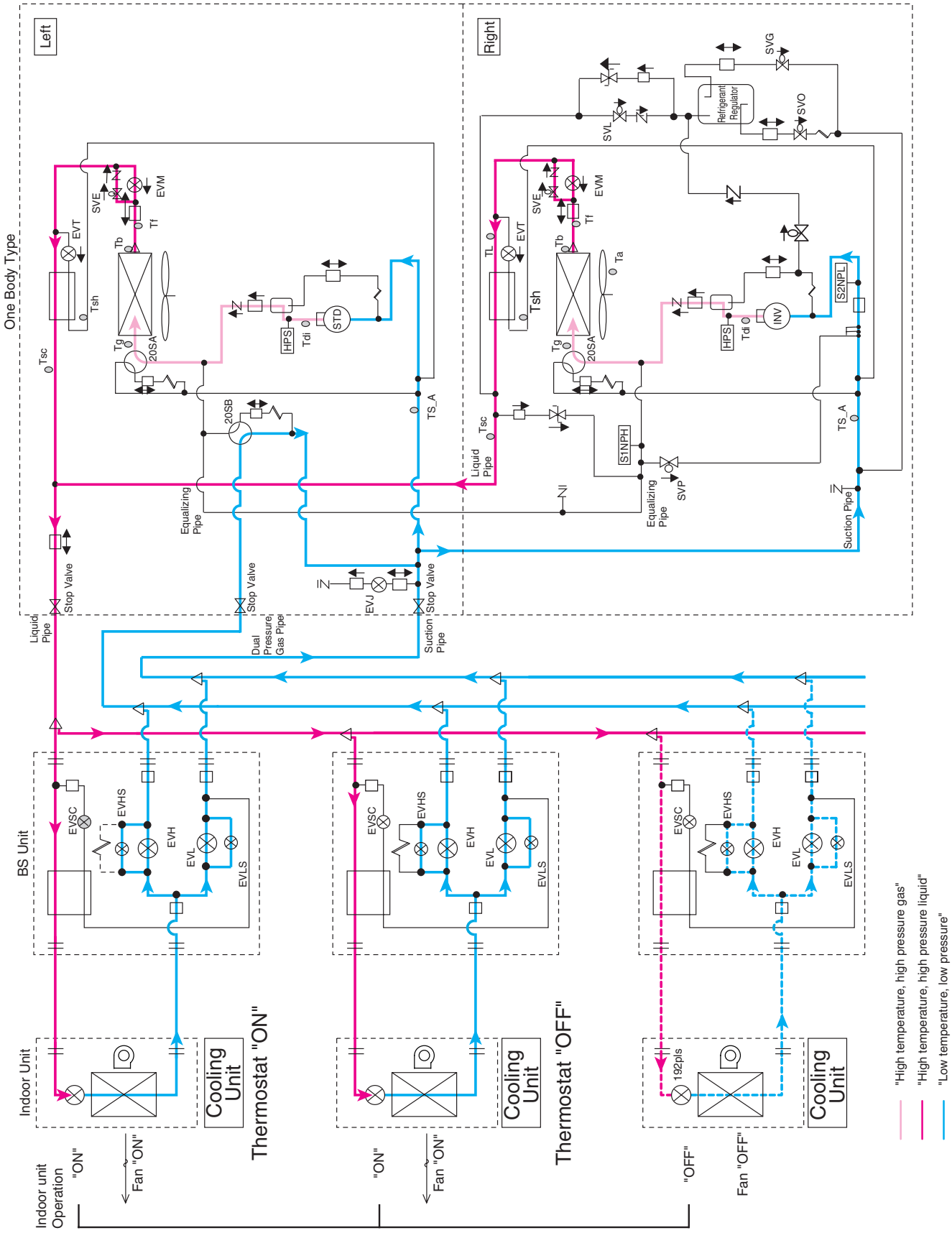
REYQ72P, 96P, 120P
Heating Operation



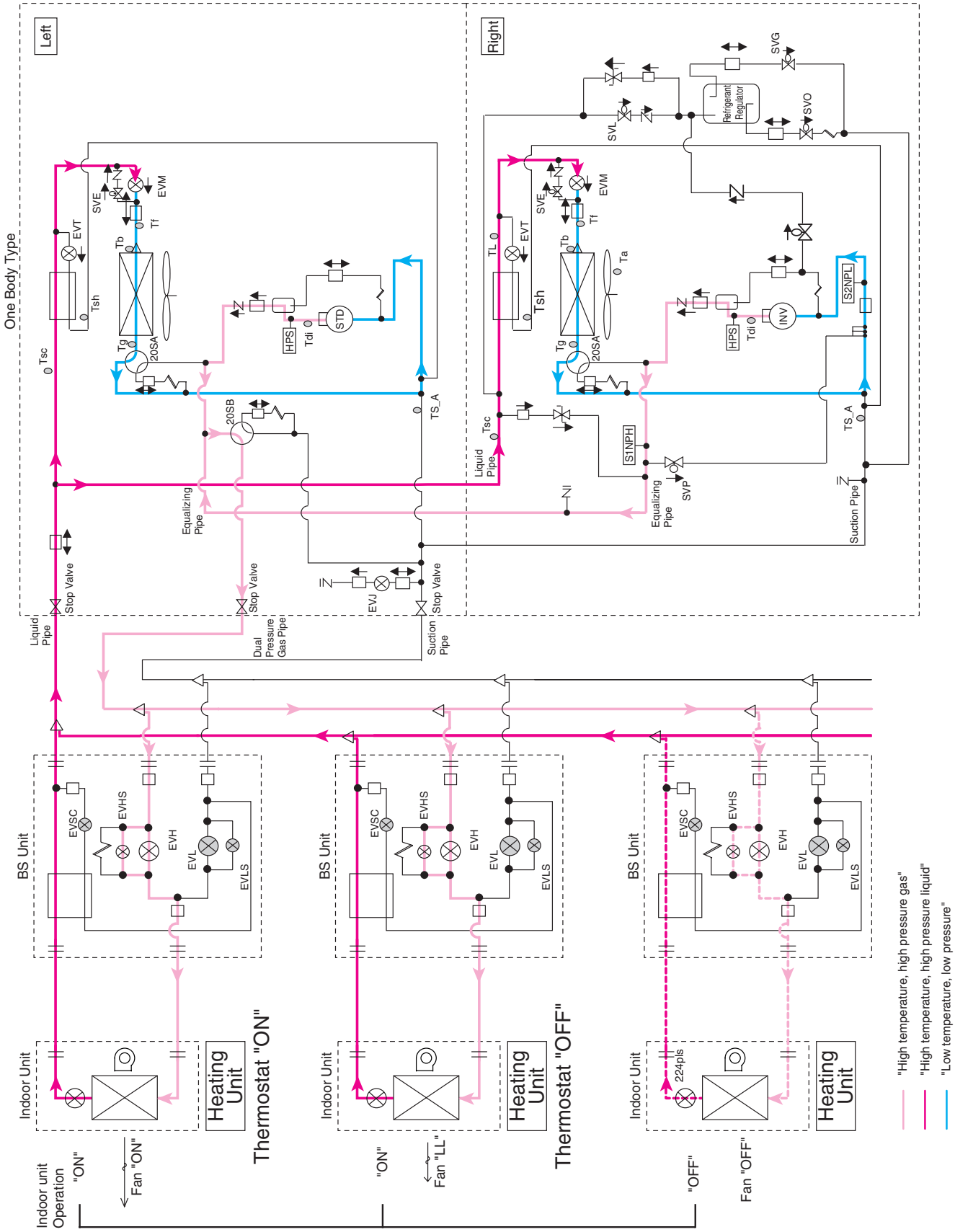
REYQ72P, 96P, 120P
Simultaneous Cooling / Heating Operation



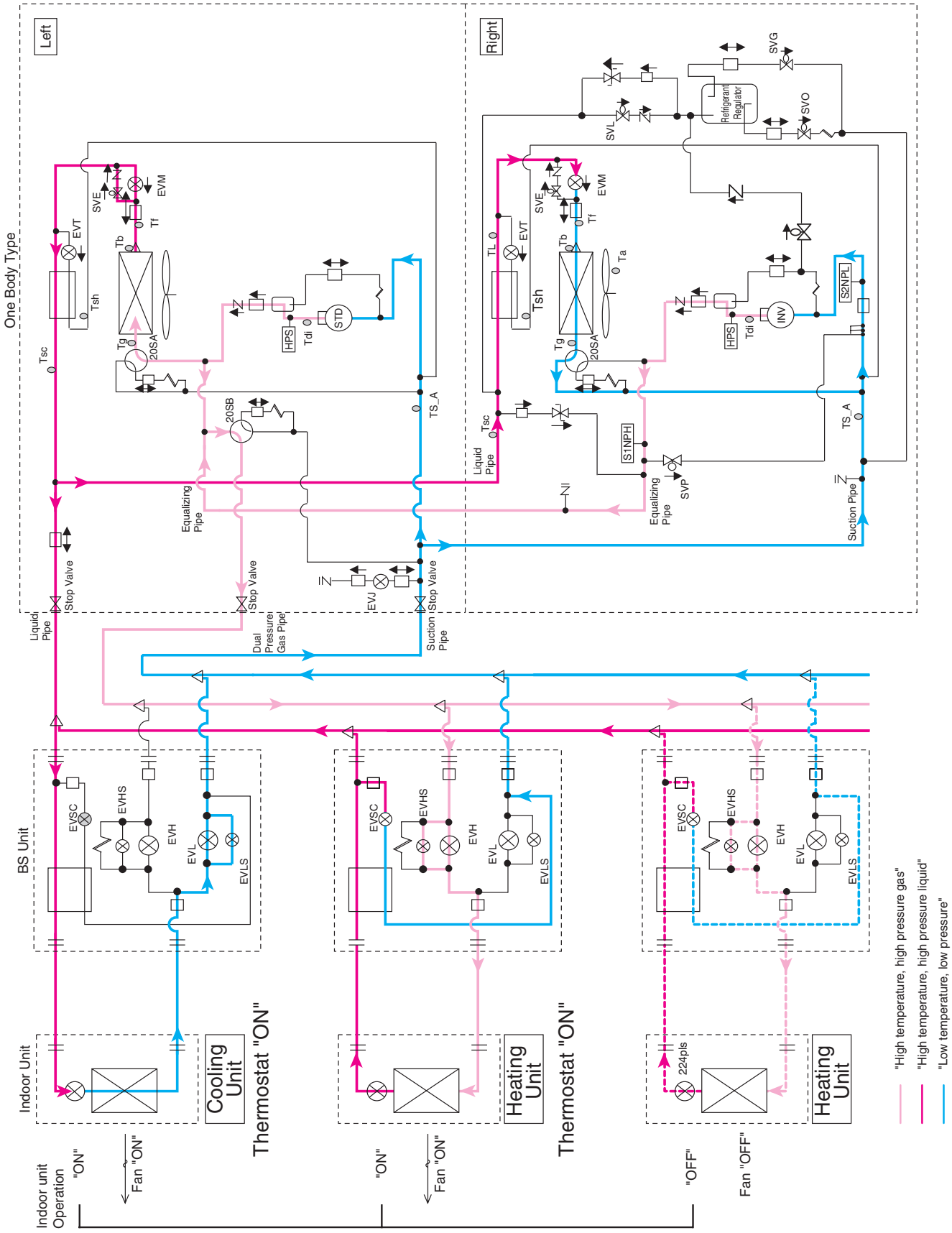
REYQ72P, 96P, 120P
Cooling Oil Return Operation



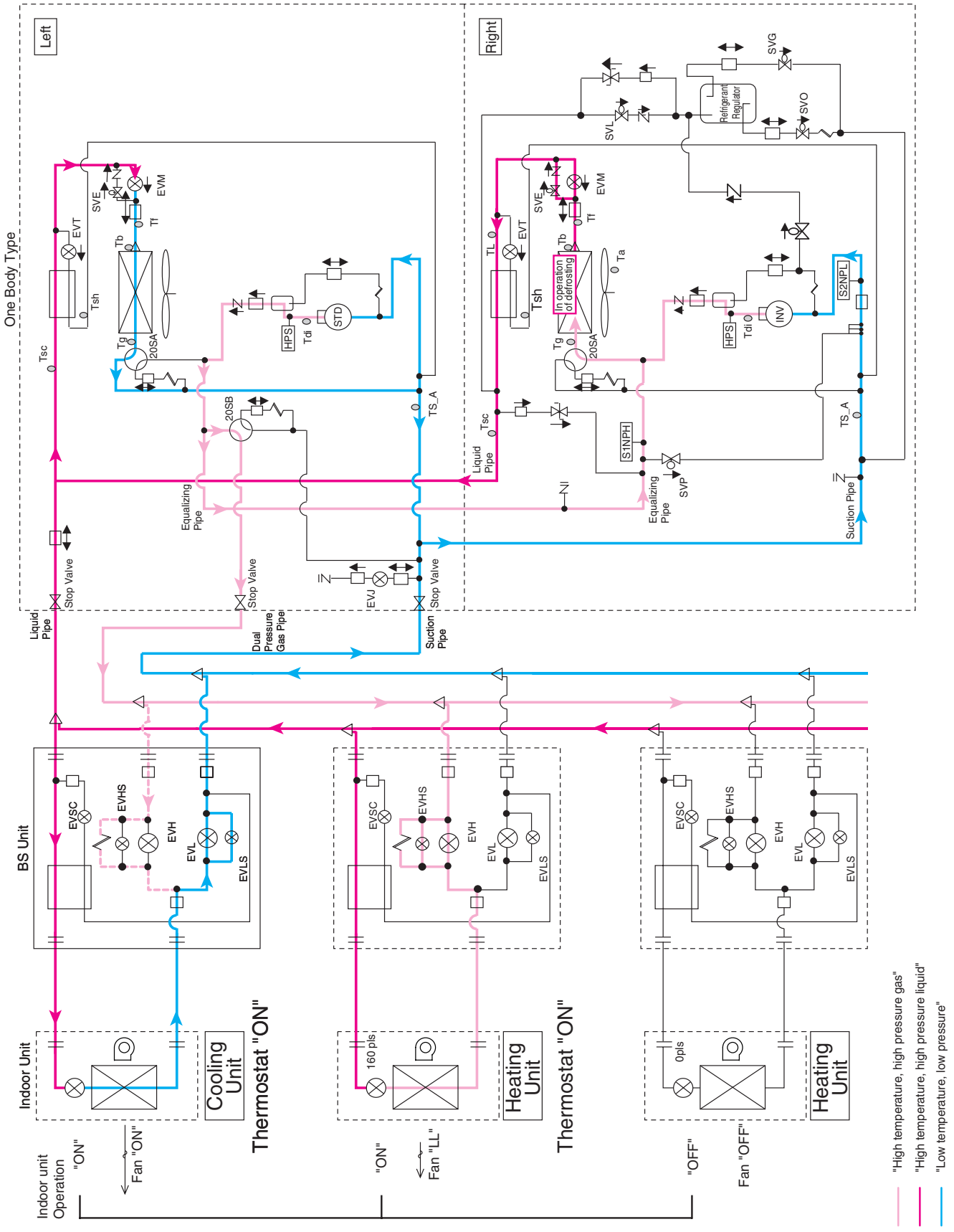
REYQ72P, 96P, 120P
Heating Oil Return Operation



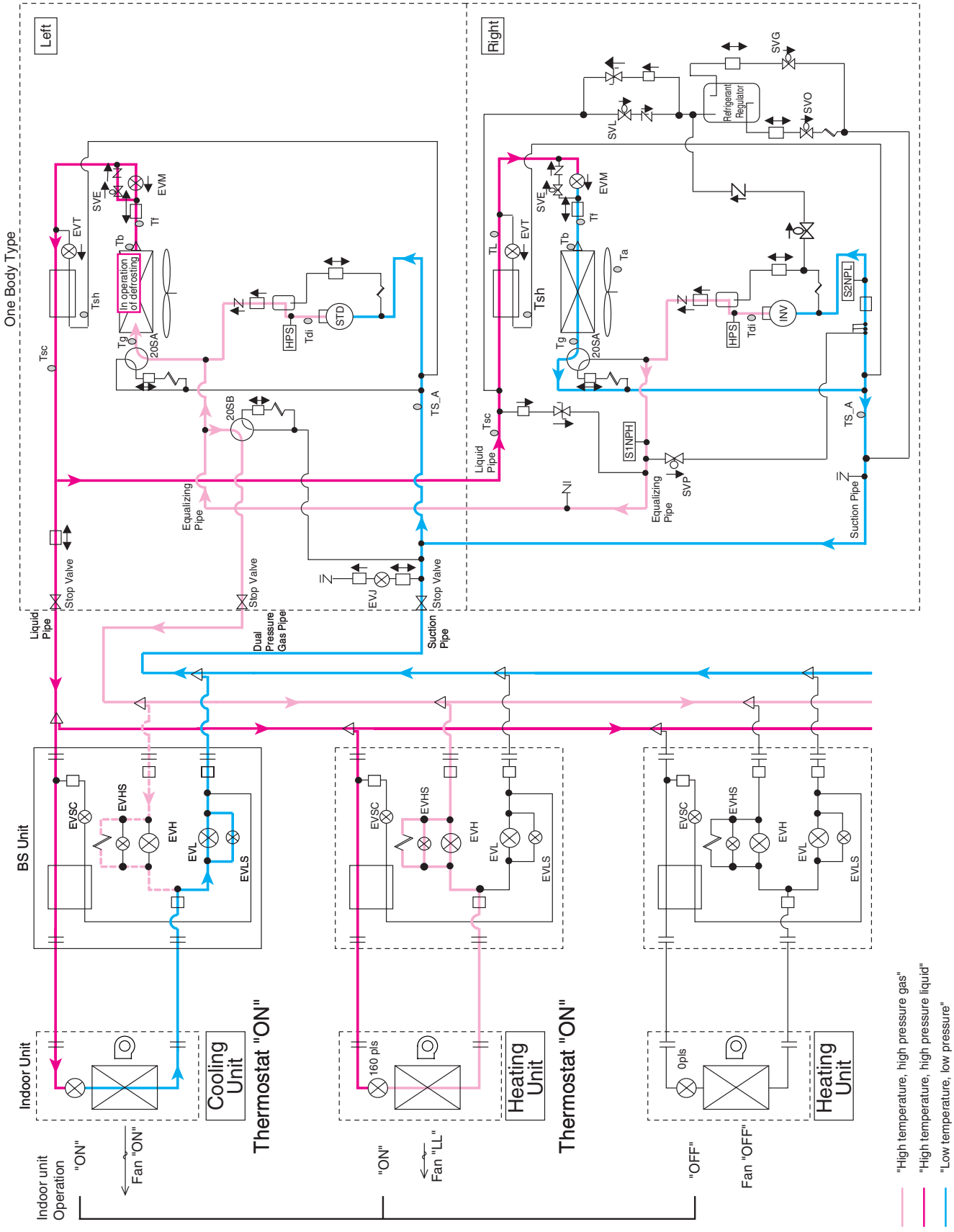
REYQ72P, 96P, 120P
Oil Return Operation at Simultaneous Cooling / Heating Operation



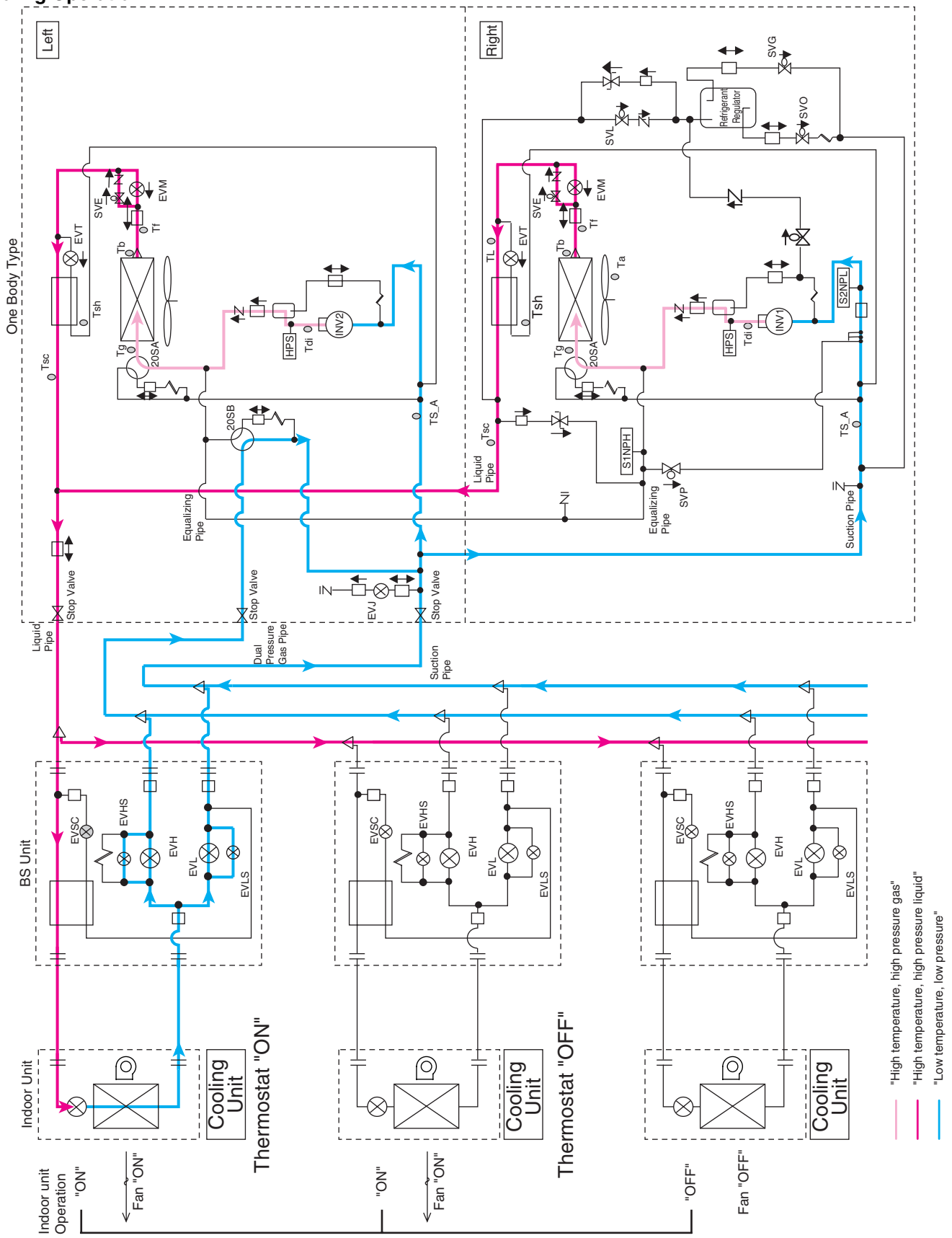
REYQ72P, 96P, 120P
Partial Defrosting 1 (Defrosting in the Right Unit)



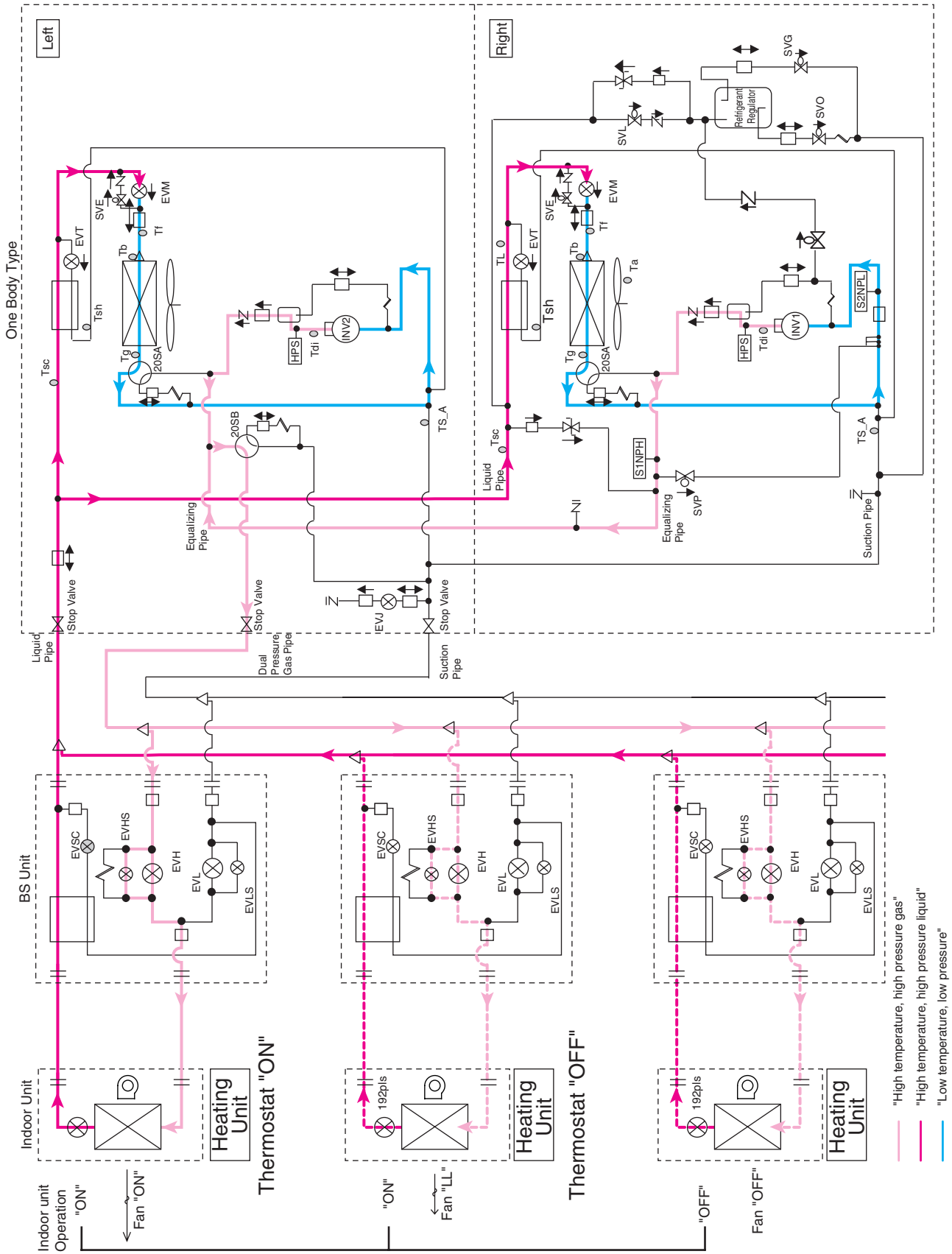
REYQ72P, 96P, 120P
Partial Defrosting 2 (Defrosting in the Left Unit)



REYQ144PTJU
Cooling Operation

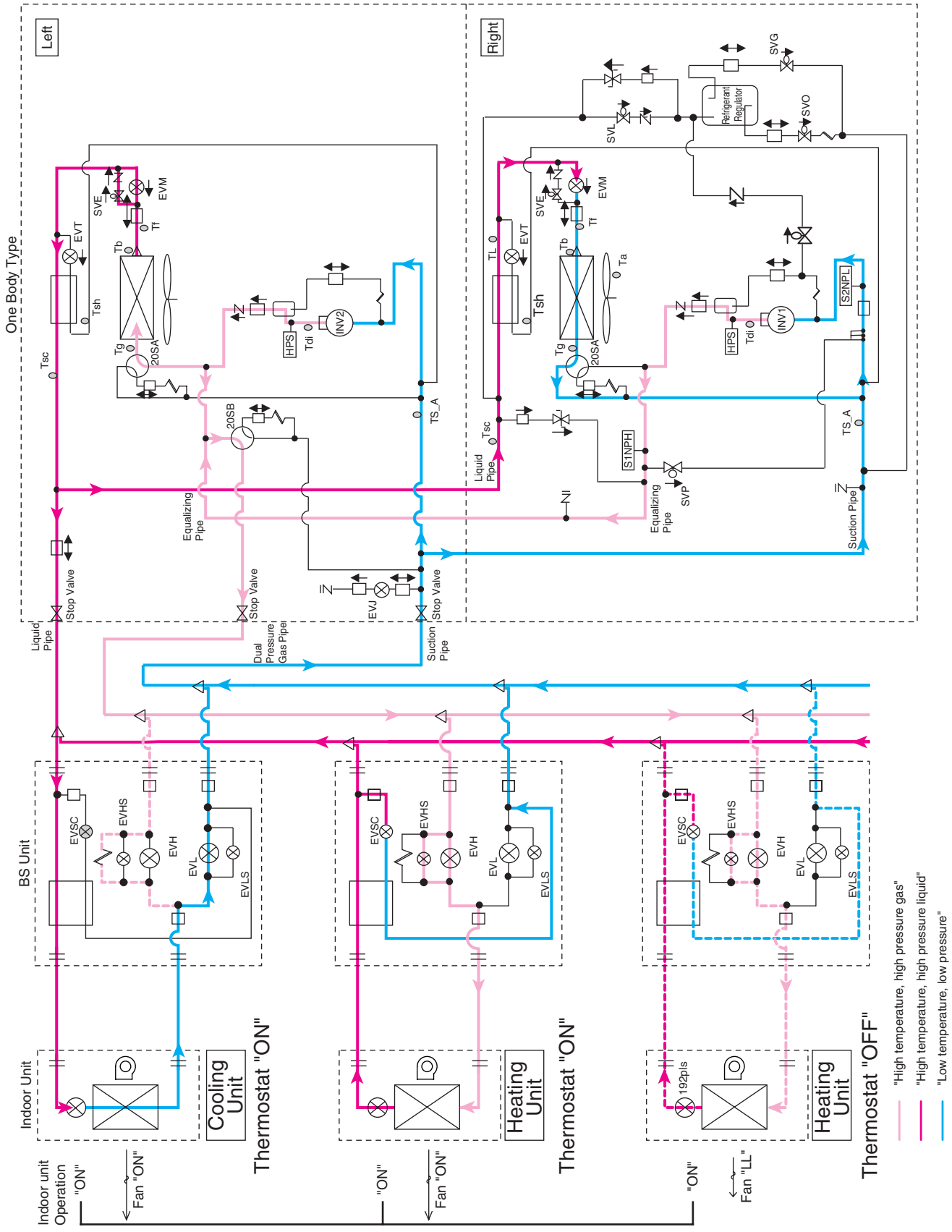


REYQ144PTJU
Heating Operation

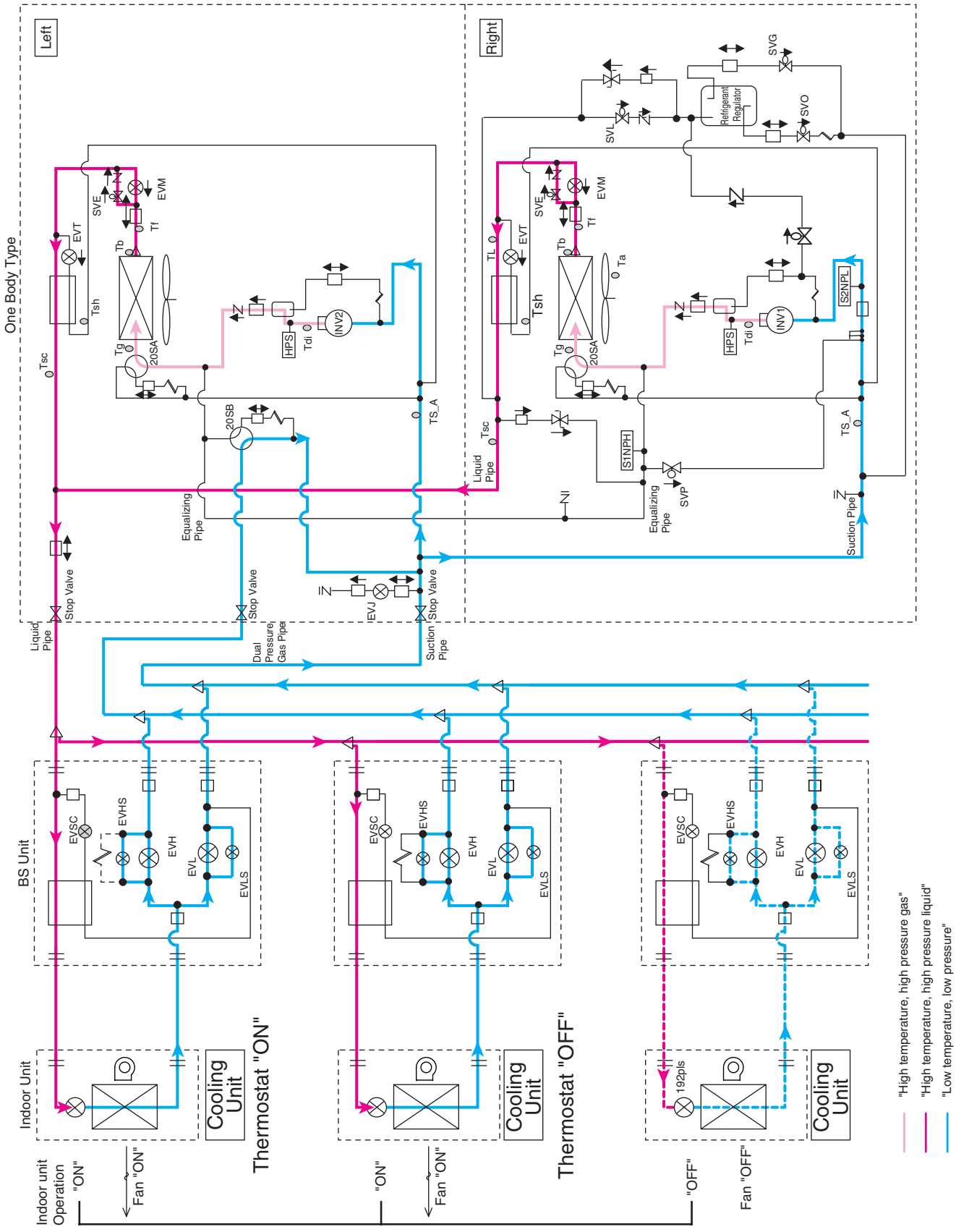


REYQ144PTJU

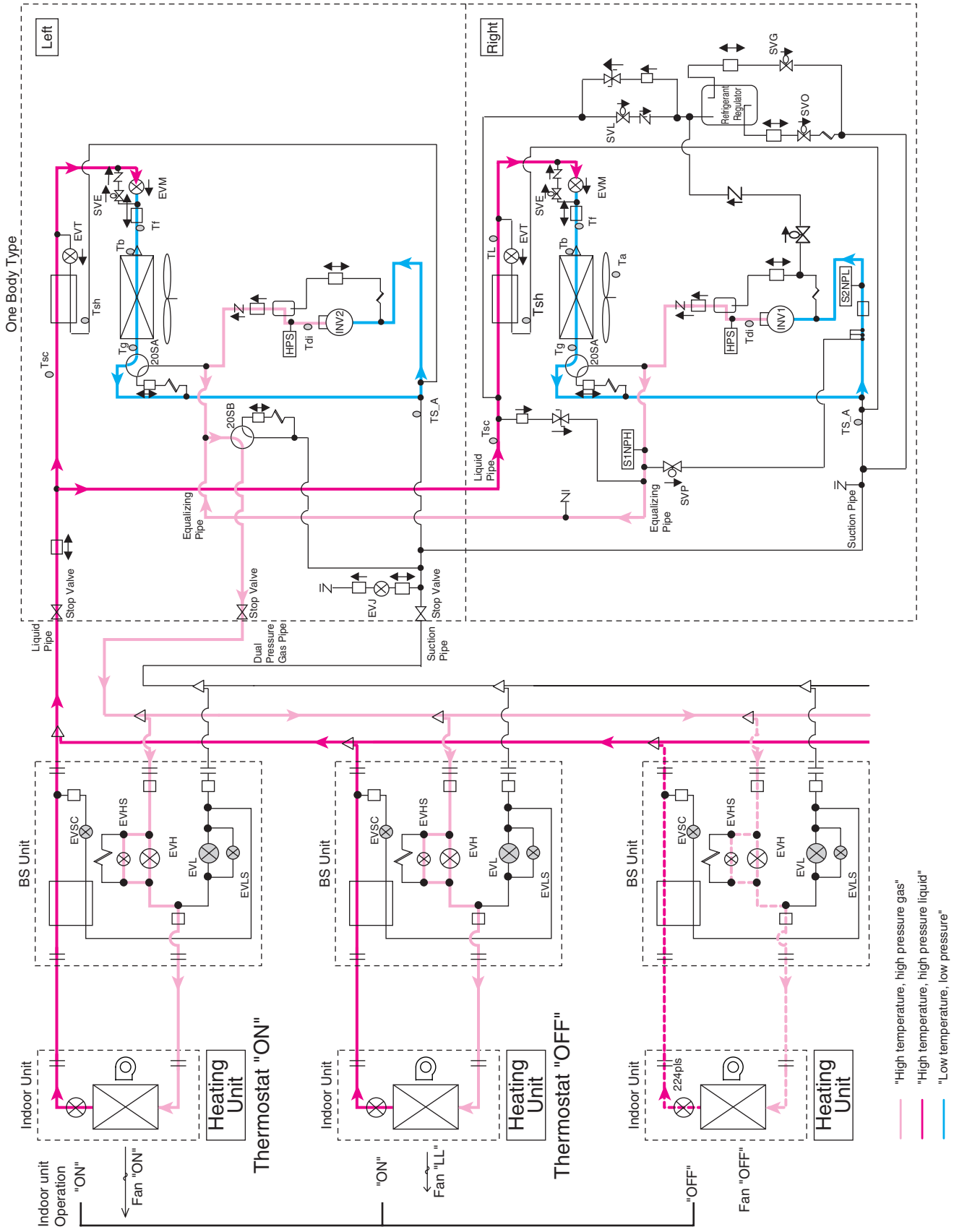
Simultaneous Cooling / Heating Operation



REYQ144PTJU
Cooling Oil Return Operation

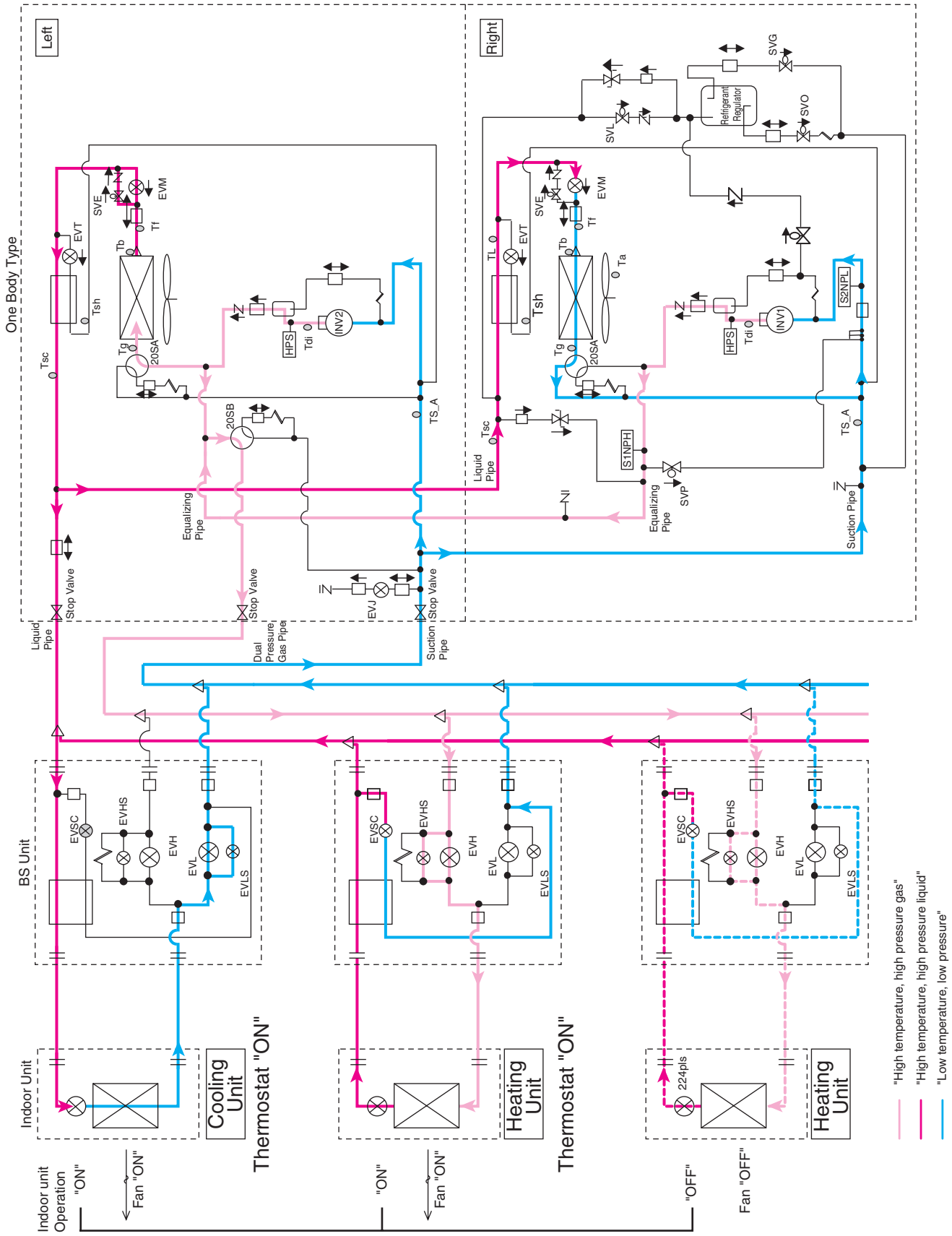


REYQ144PTJU
Heating Oil Return Operation



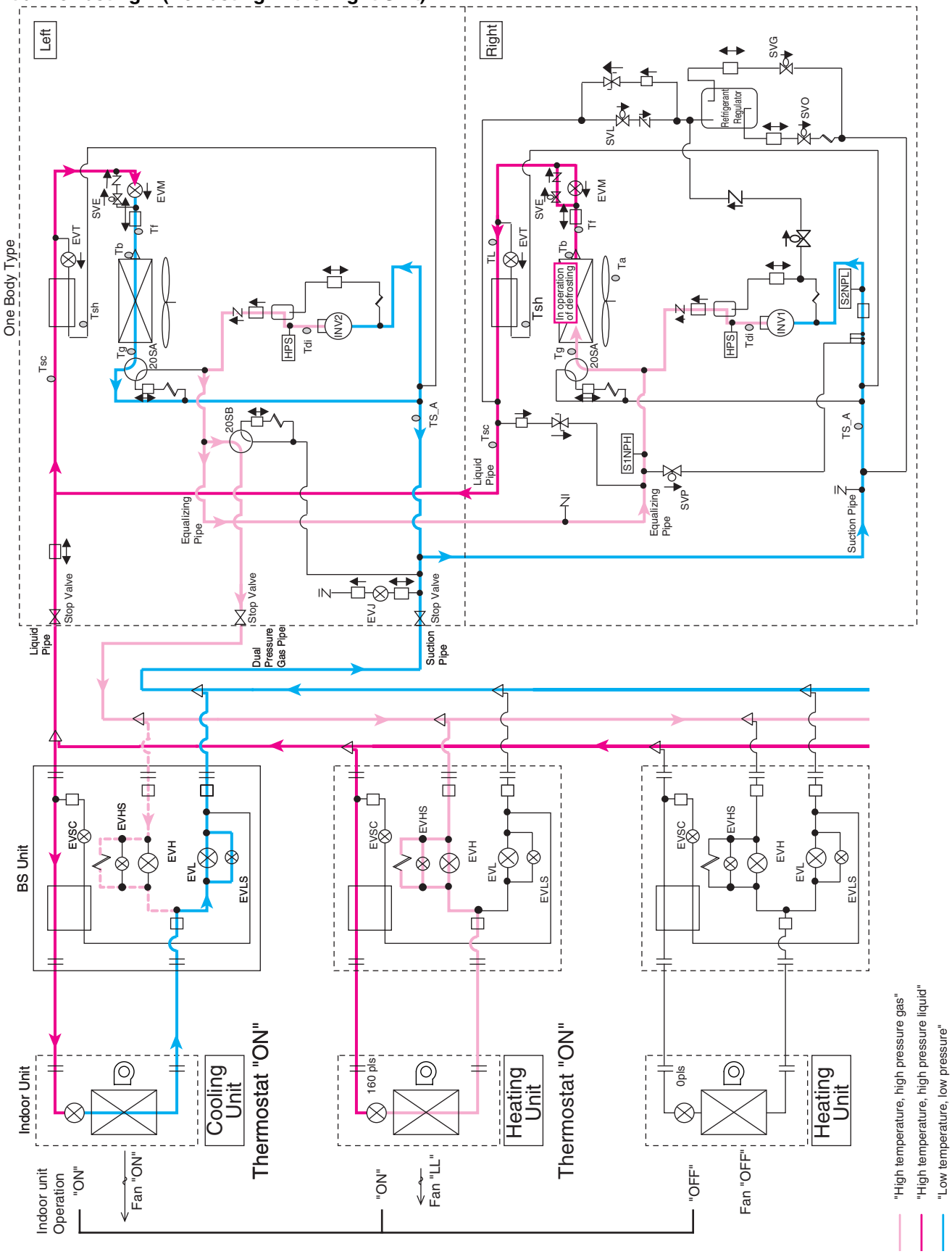
REYQ144PTJU

Oil Return Operation at Simultaneous Cooling / Heating Operation



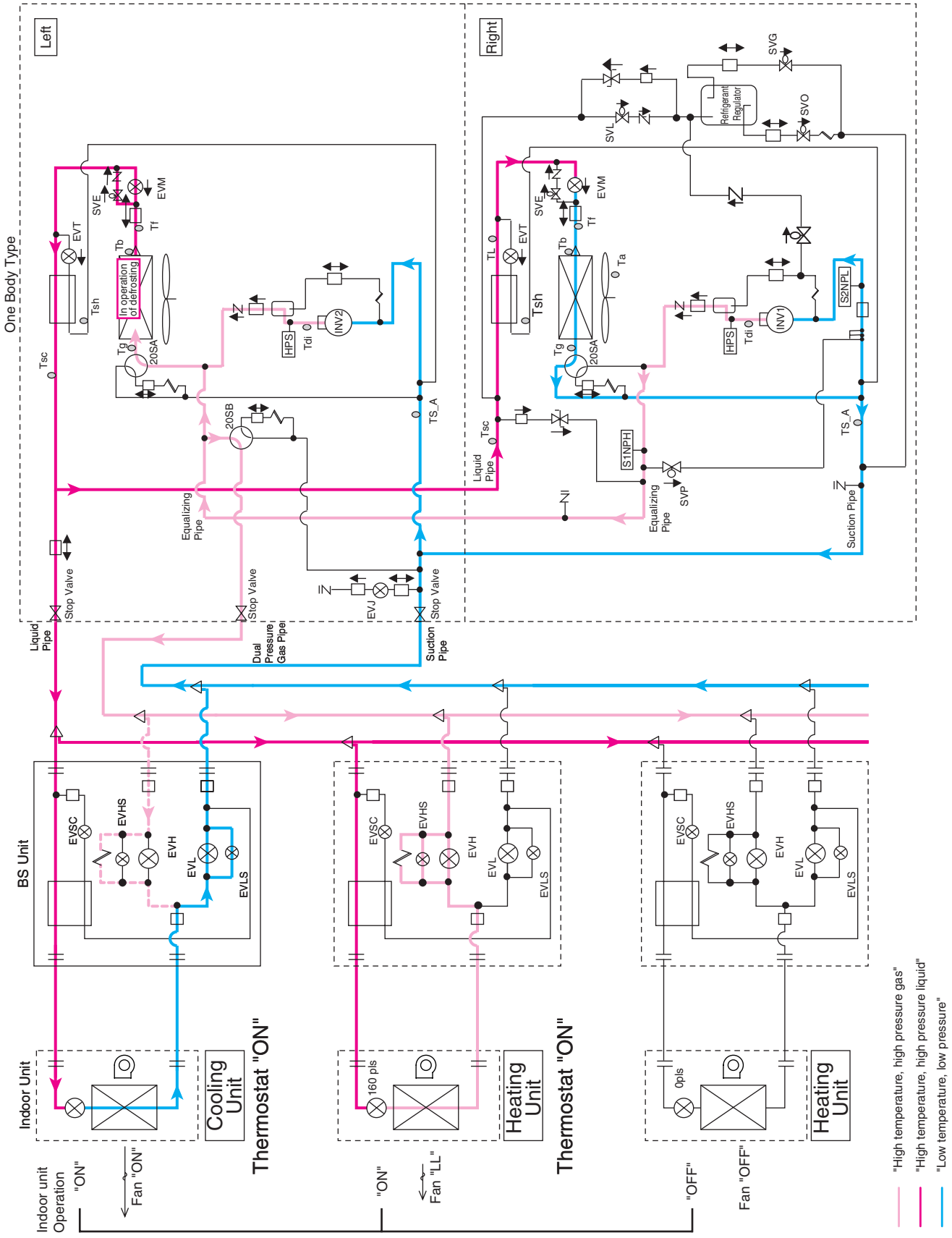
REYQ144PTJU

Partial Defrosting 1 (Defrosting in the Right Unit)

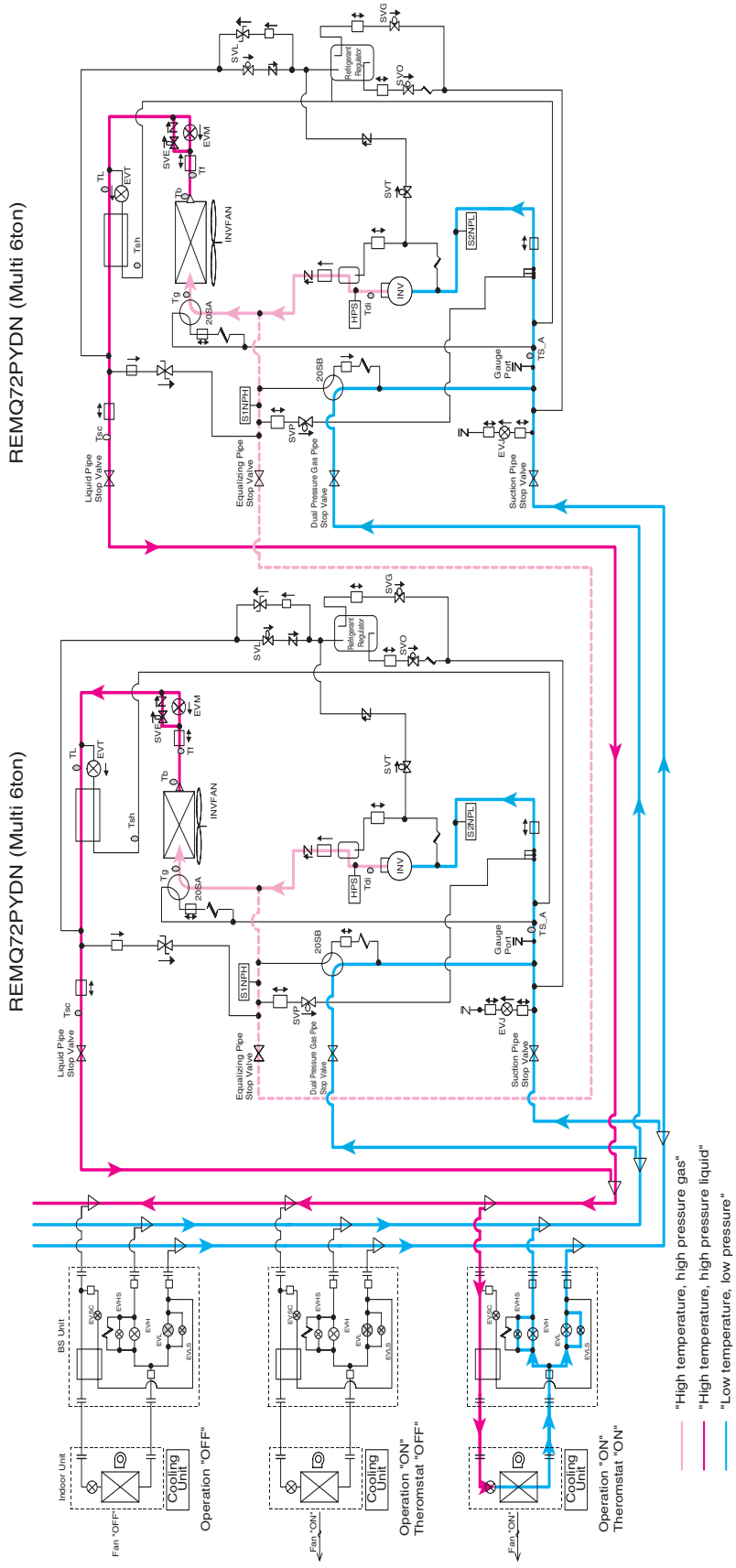


REYQ144PTJU

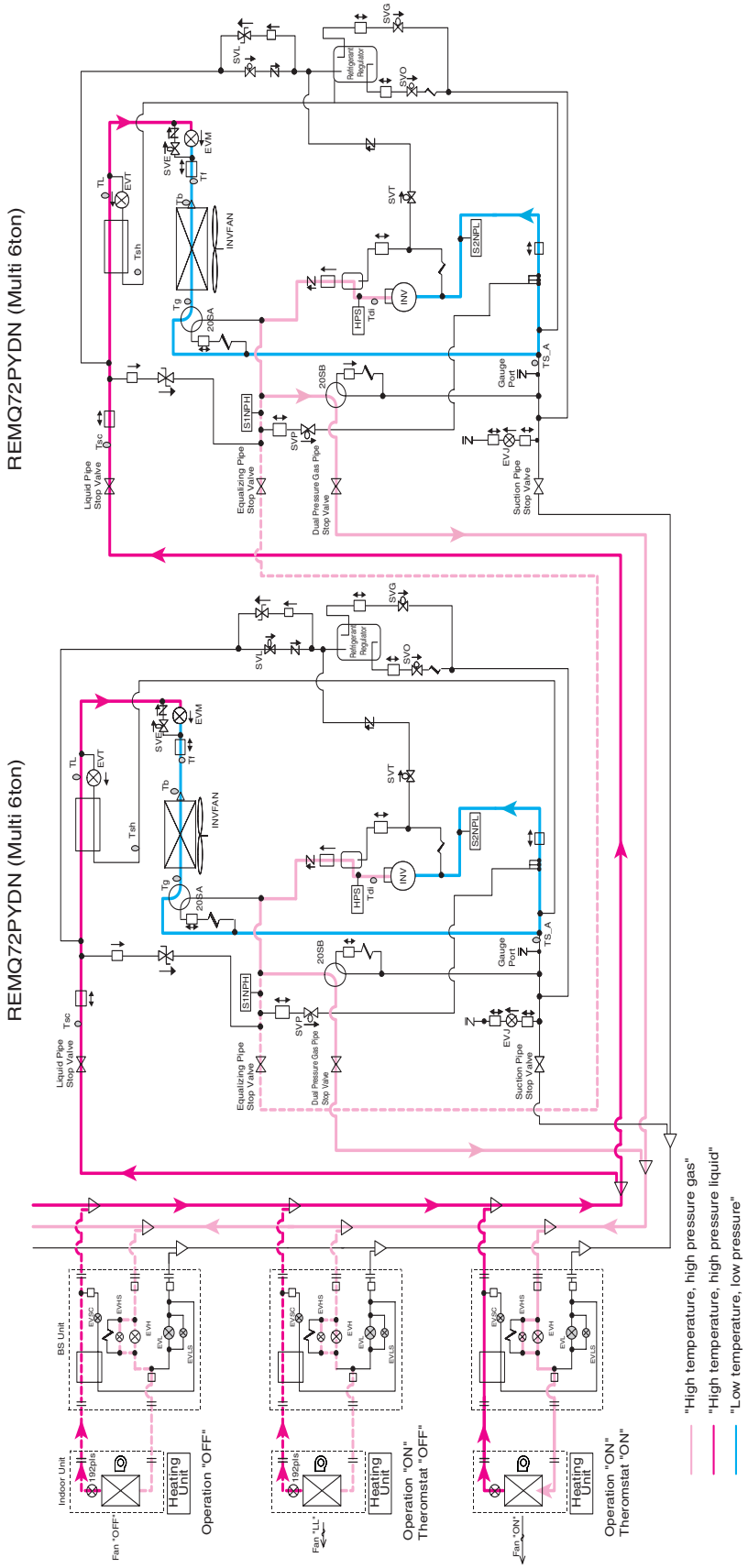
Partial Defrosting 2 (Defrosting in the Left Unit)



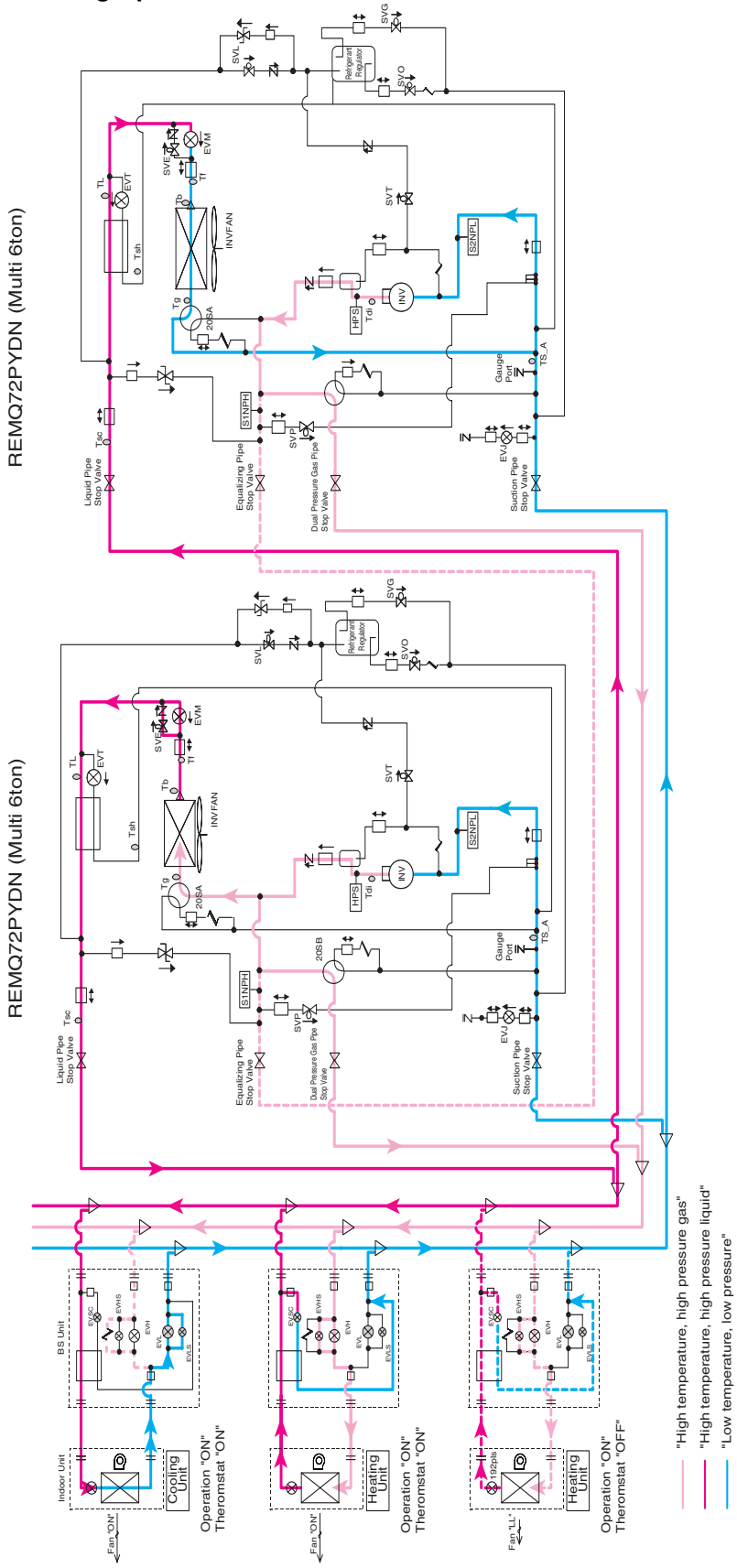
REYQ144PYDN
Cooling Operation



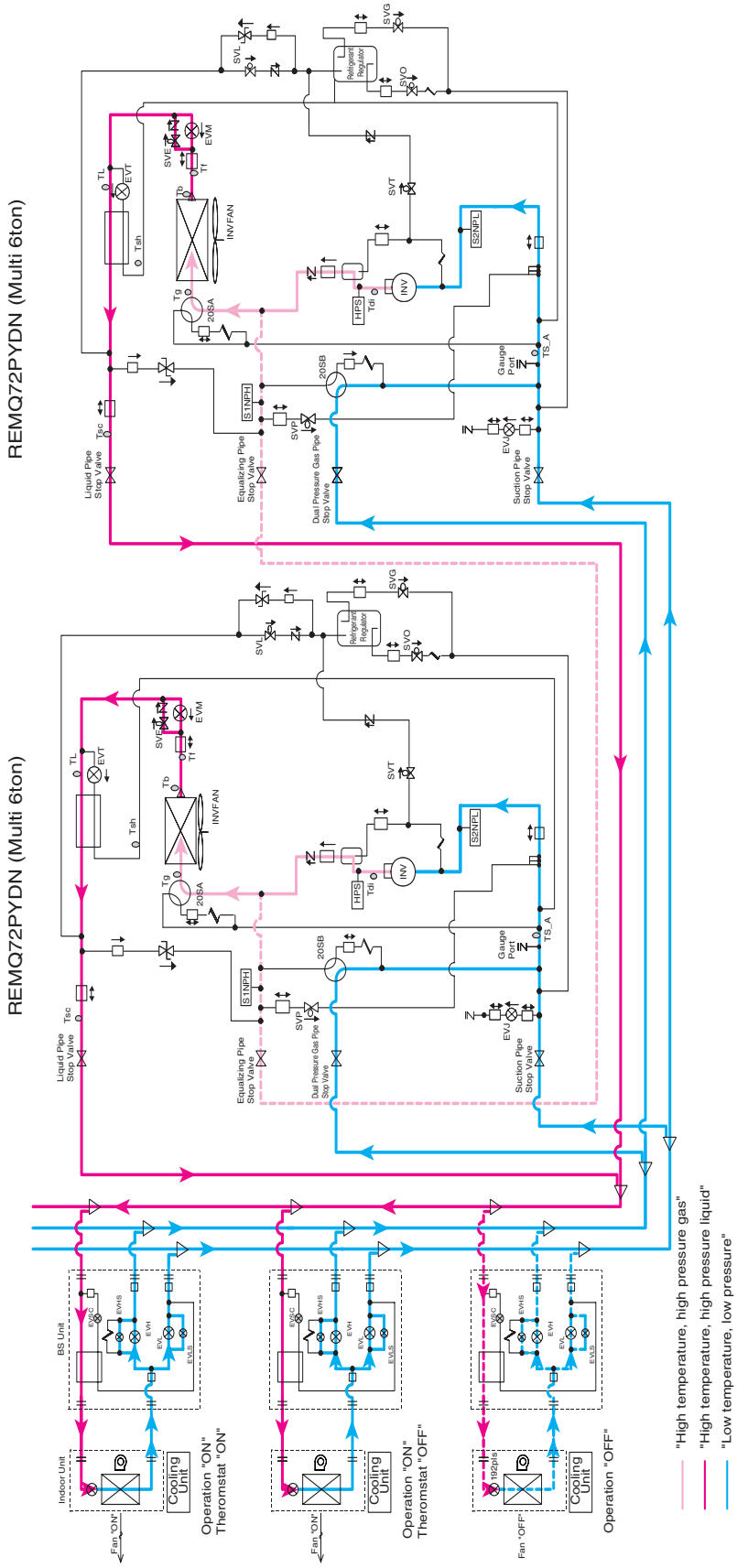
REYQ144PYDN
Heating Operation



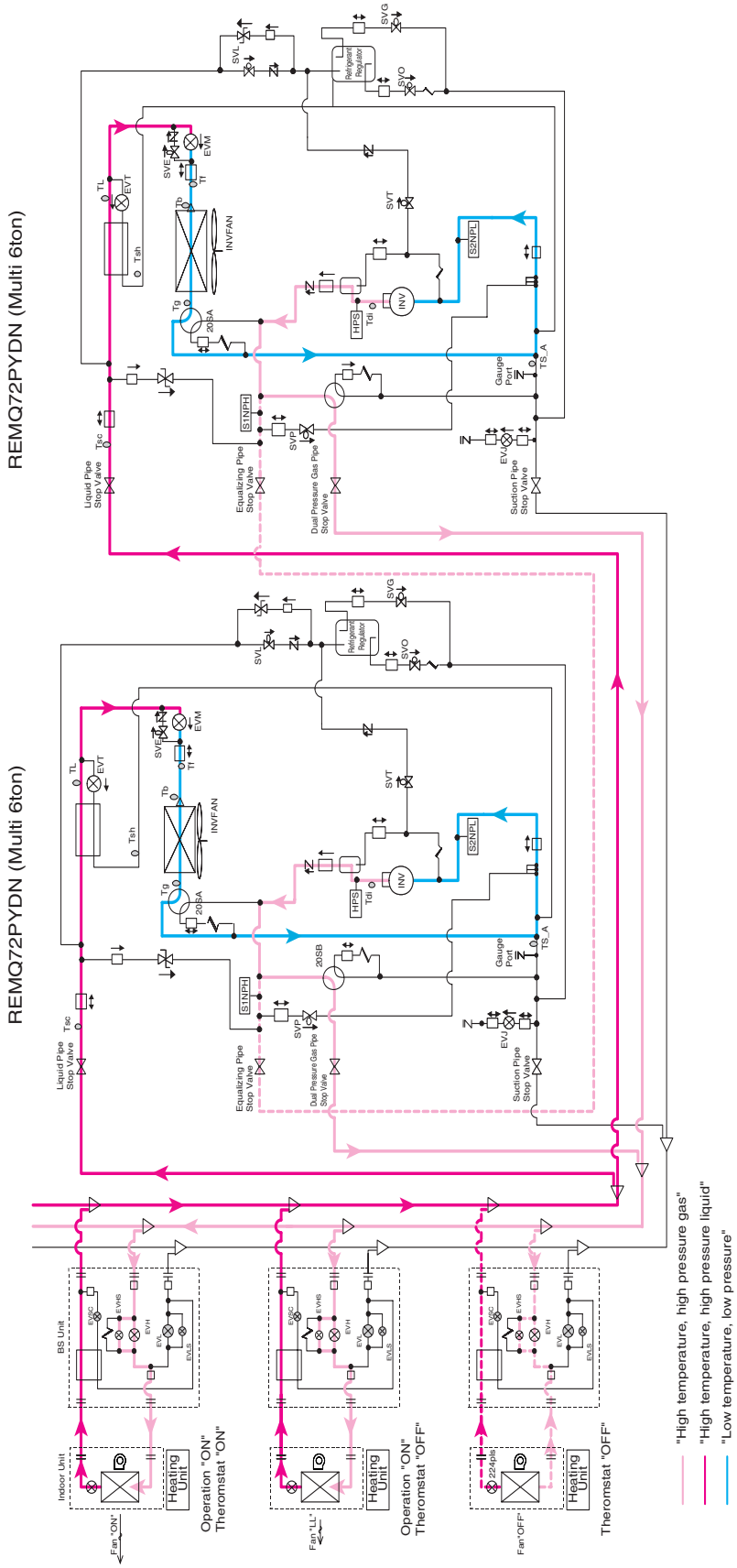
REYQ144PYDN
Simultaneous Cooling / Heating Operation



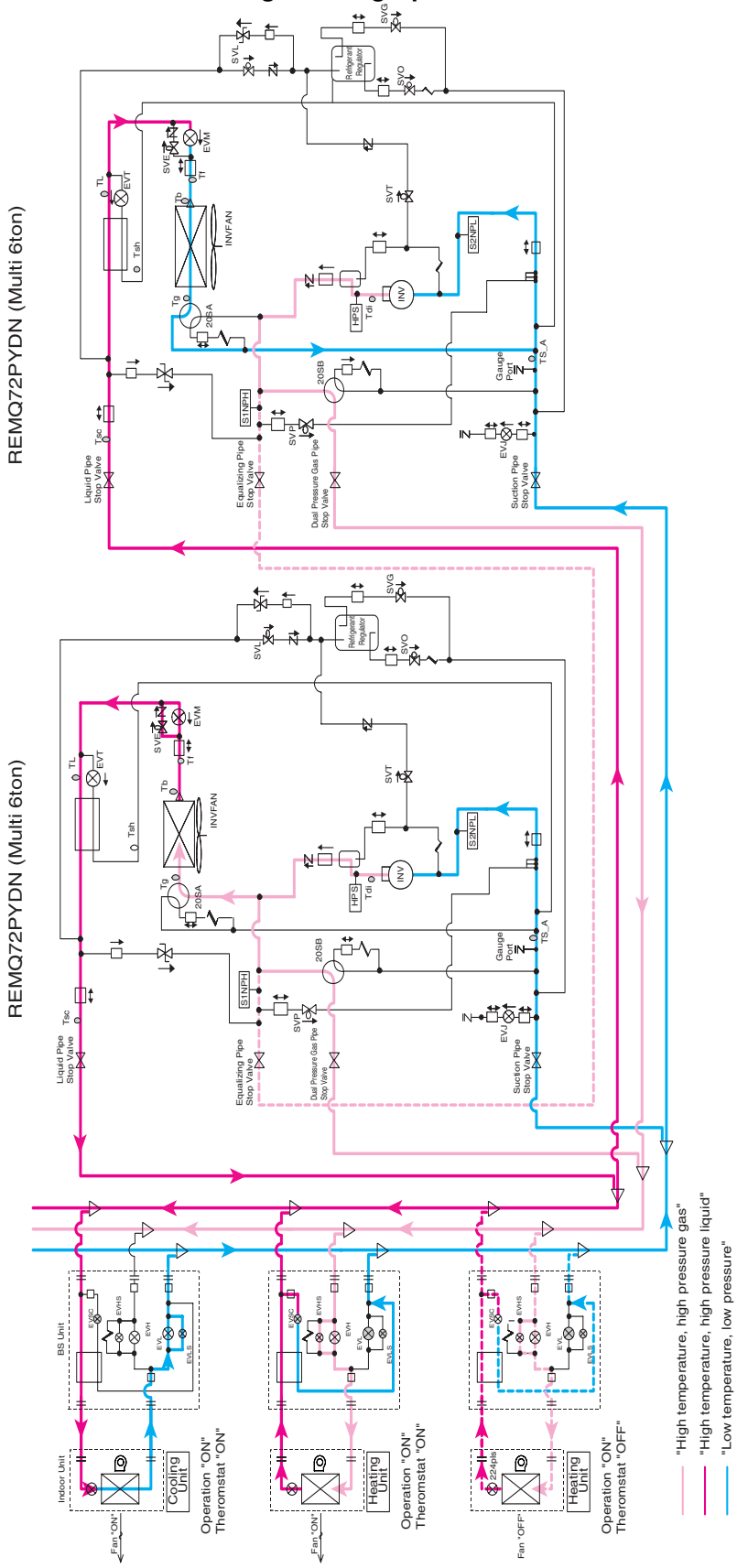
REYQ144PYDN
Cooling Oil Return Operation



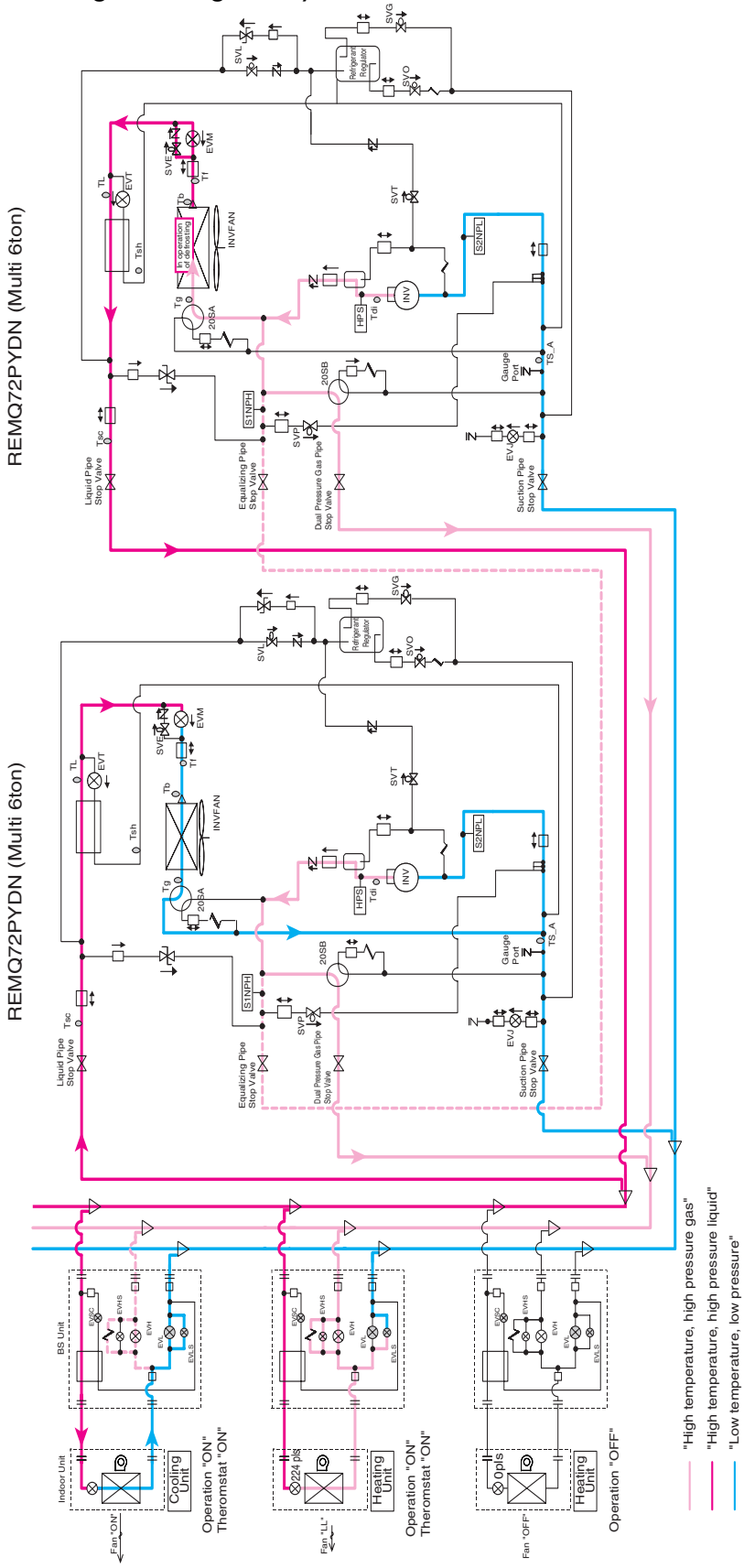
REYQ144PYDN
Heating Oil Return Operation



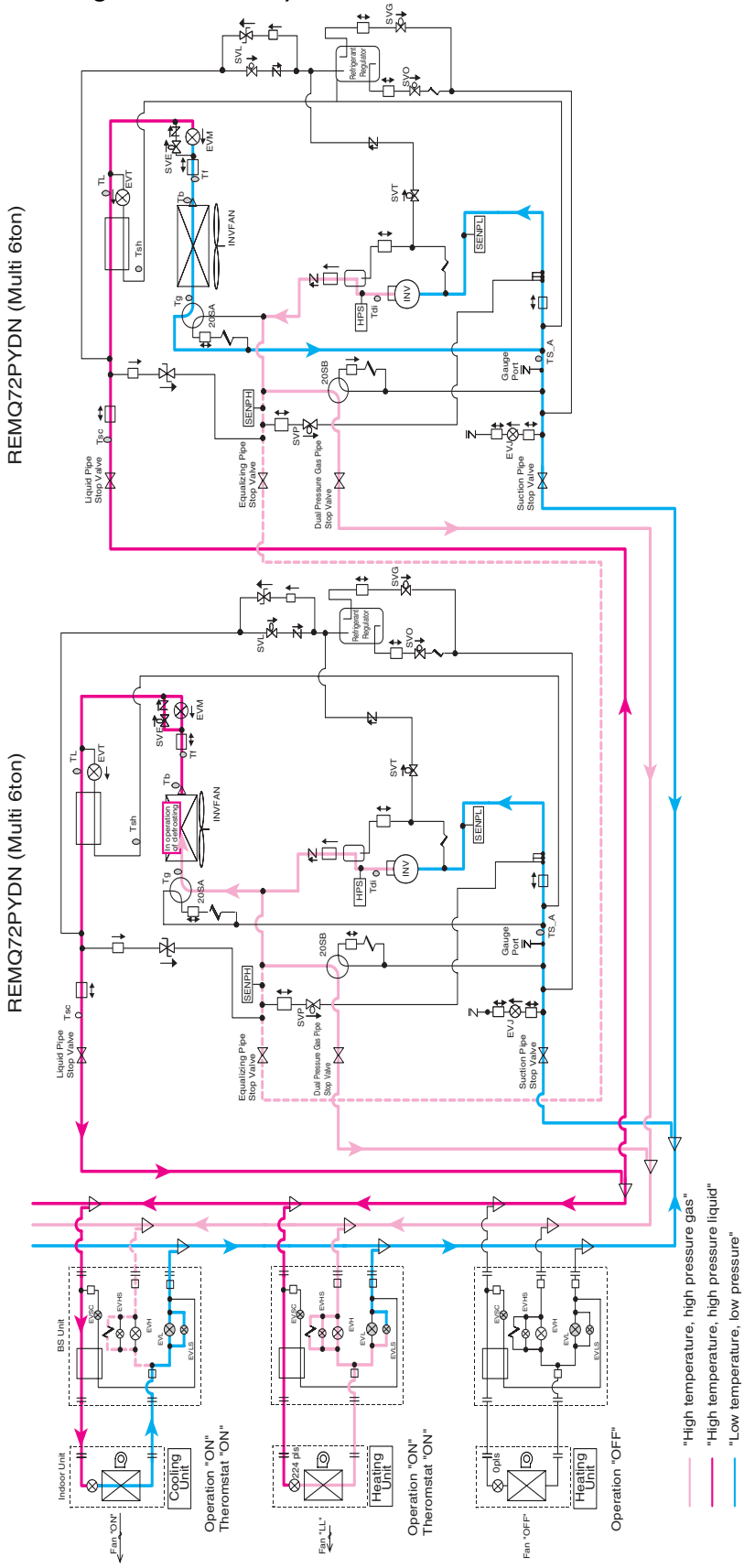
REYQ144PYDN
Oil Return Operation at Simultaneous Cooling / Heating Operation



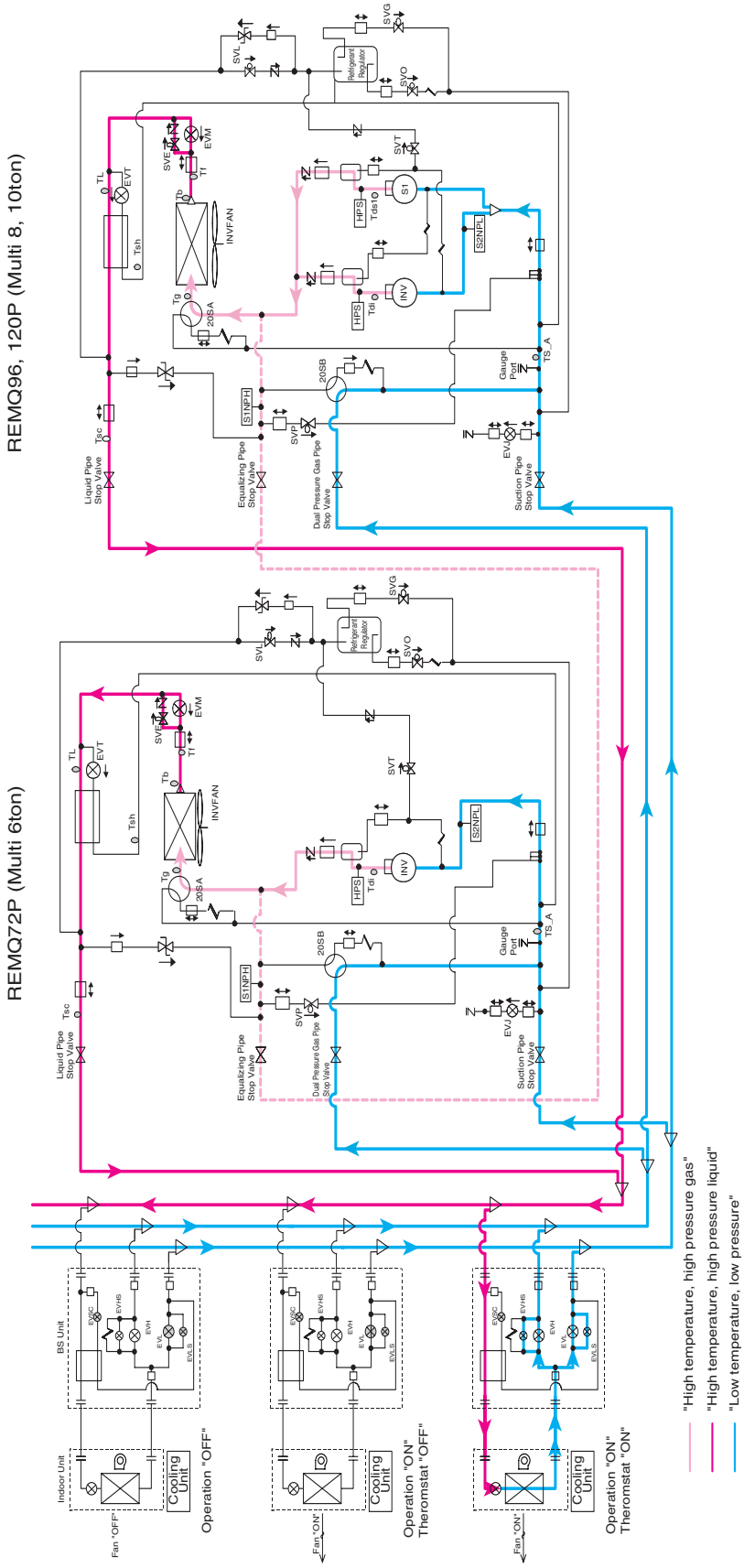
REYQ144PYDN
Partial Defrosting 1 (Defrosting in the Right Unit)



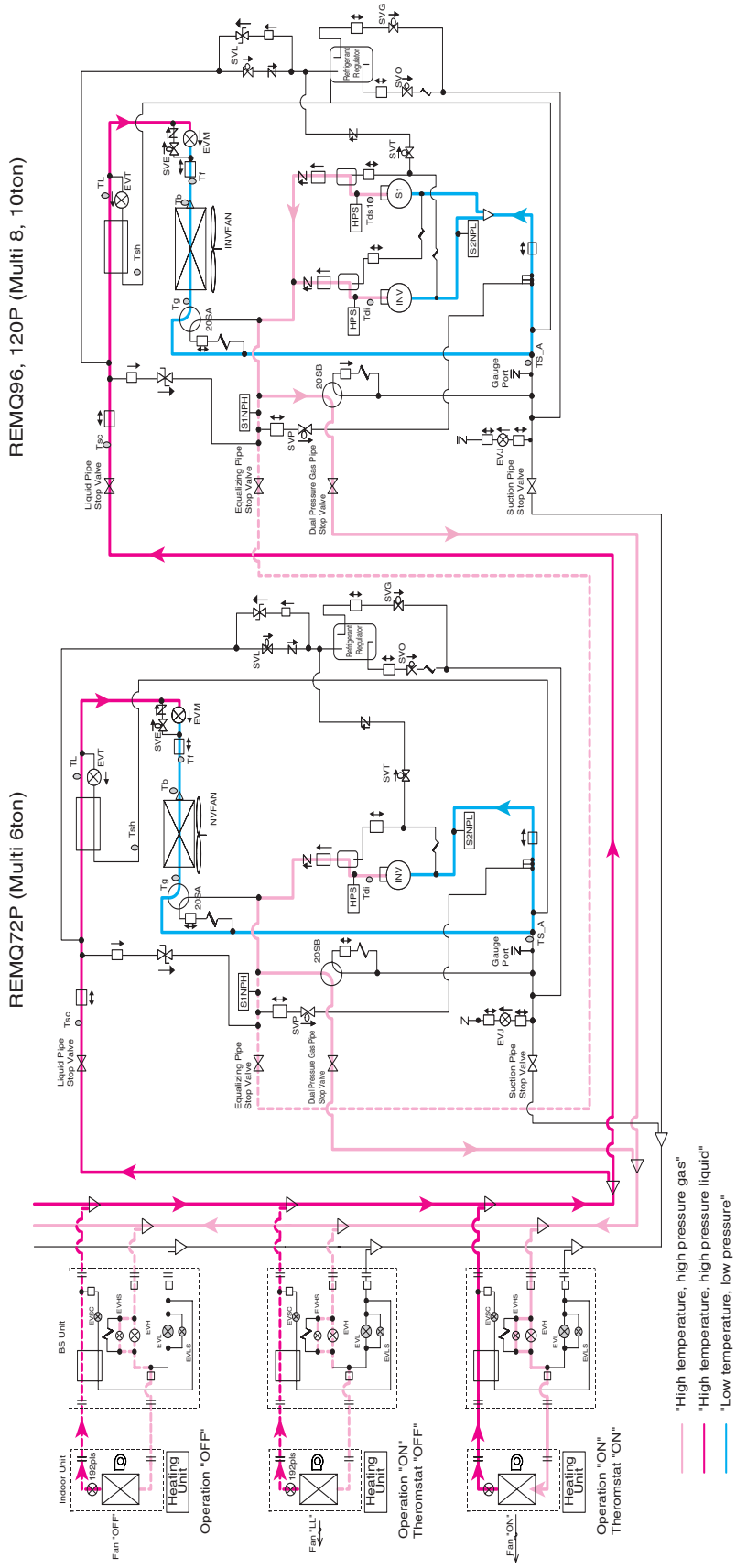
REYQ144PYDN
Partial Defrosting 2 (Defrosting in the Left Unit)



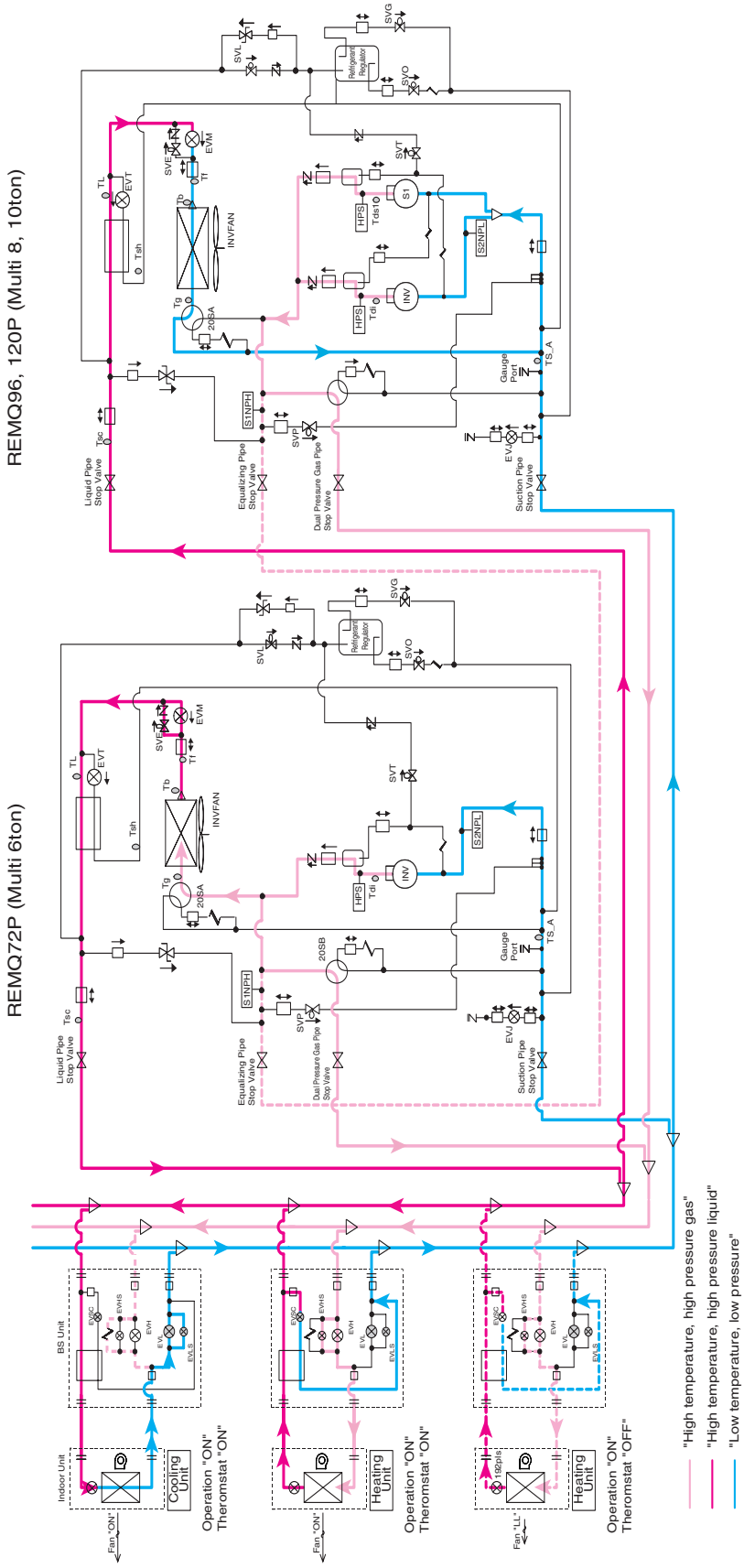
REYQ168P, 192P
Cooling Operation



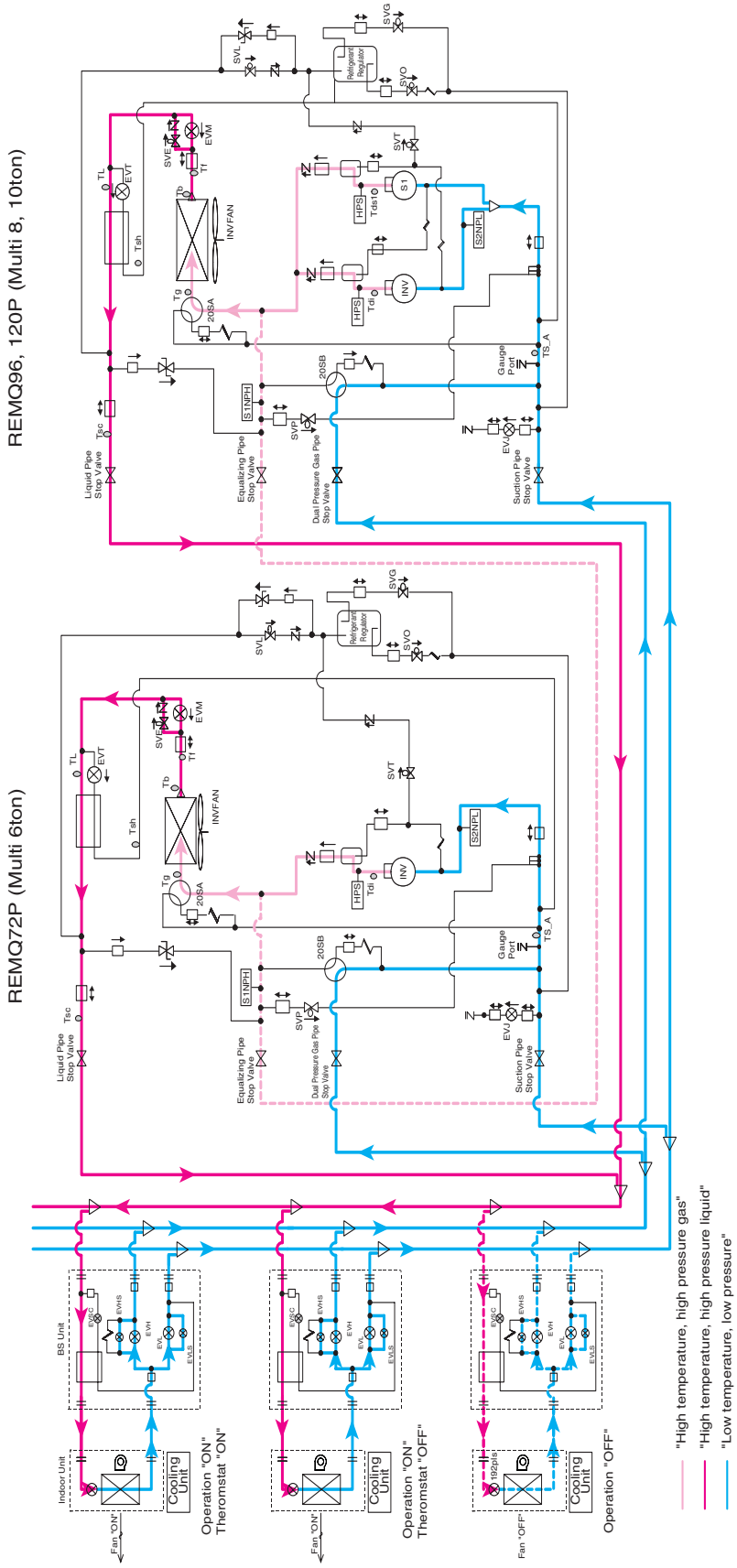
REYQ168P, 192P
Heating Operation



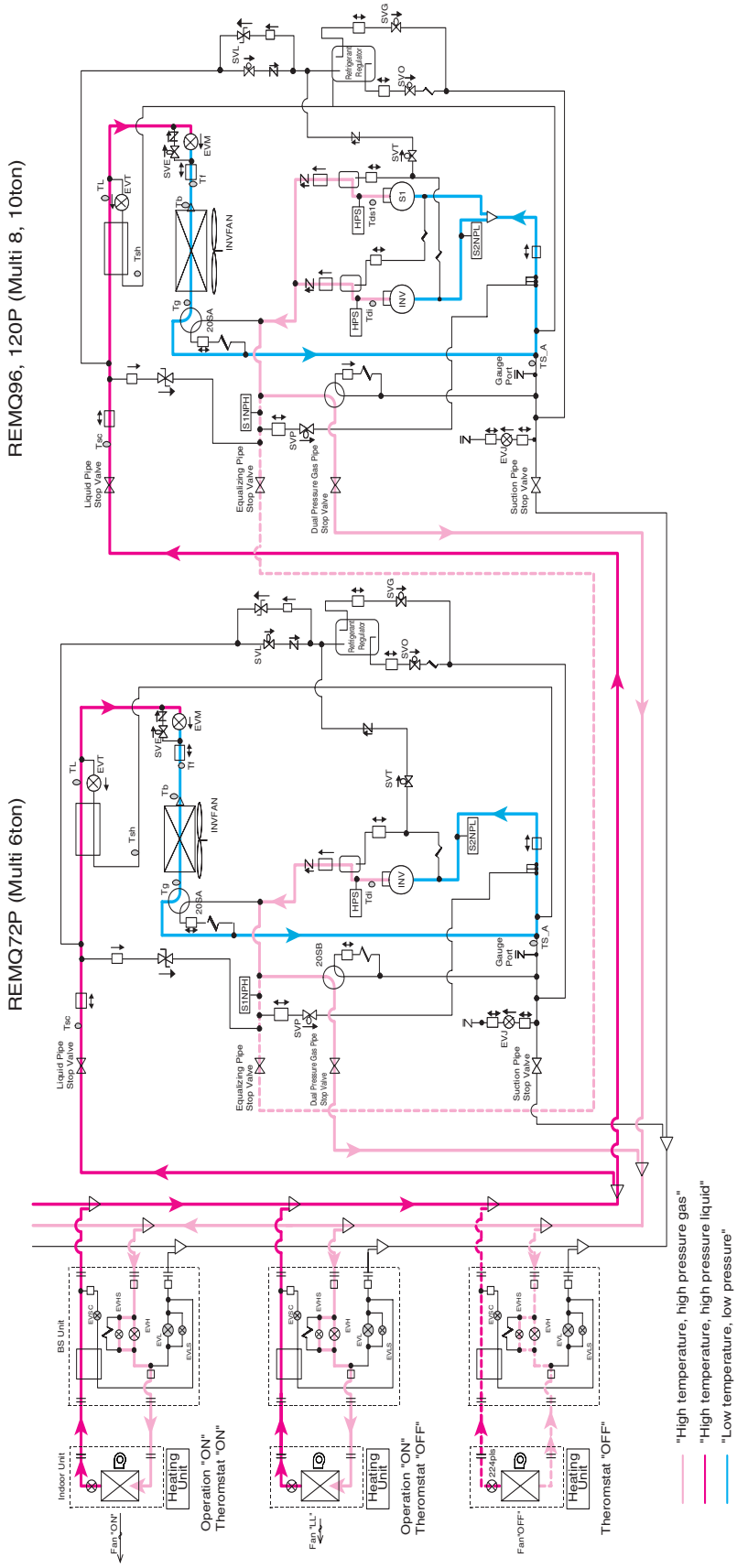
REYQ168P, 192P
Simultaneous Cooling / Heating Operation



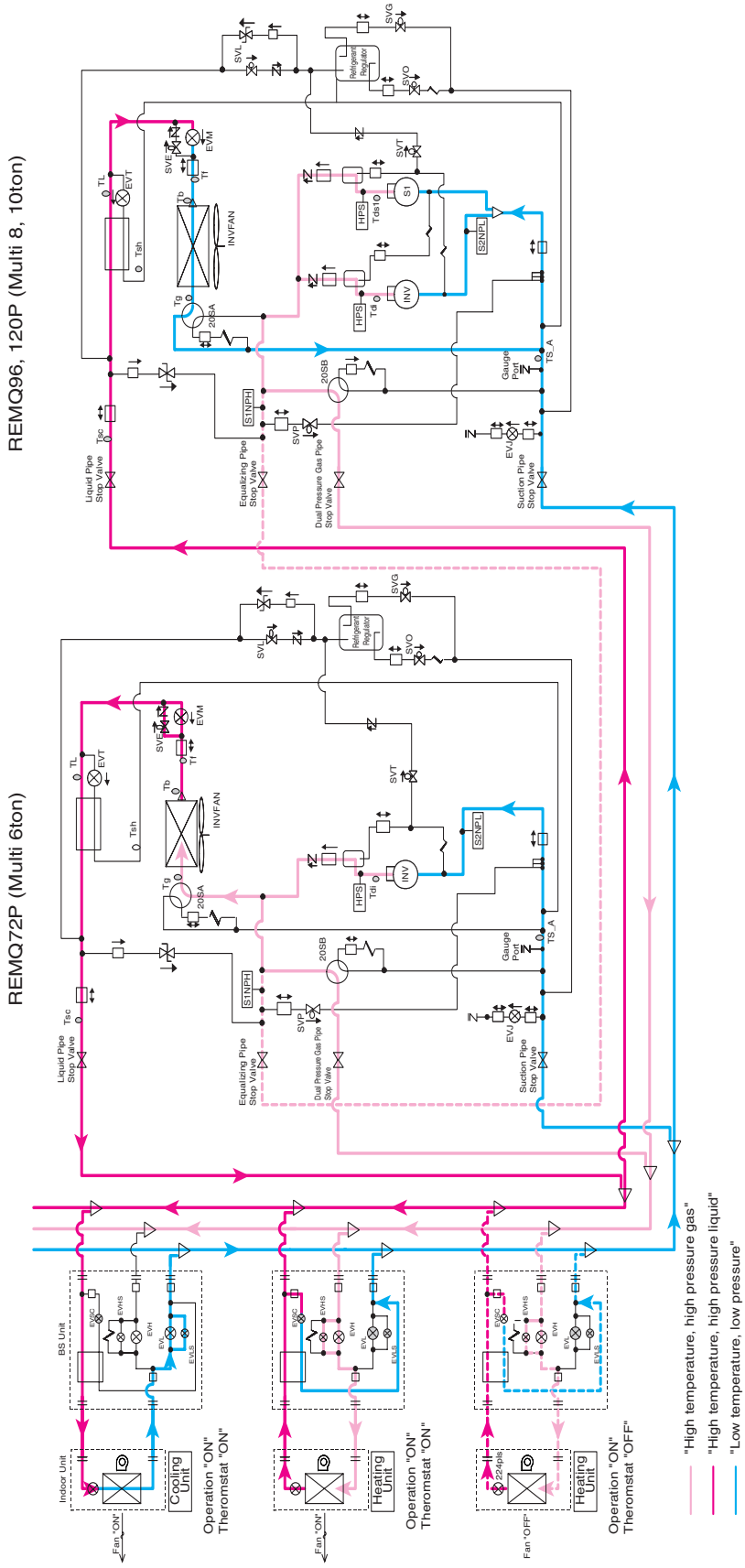
REYQ168P, 192P
Cooling Oil Return Operation



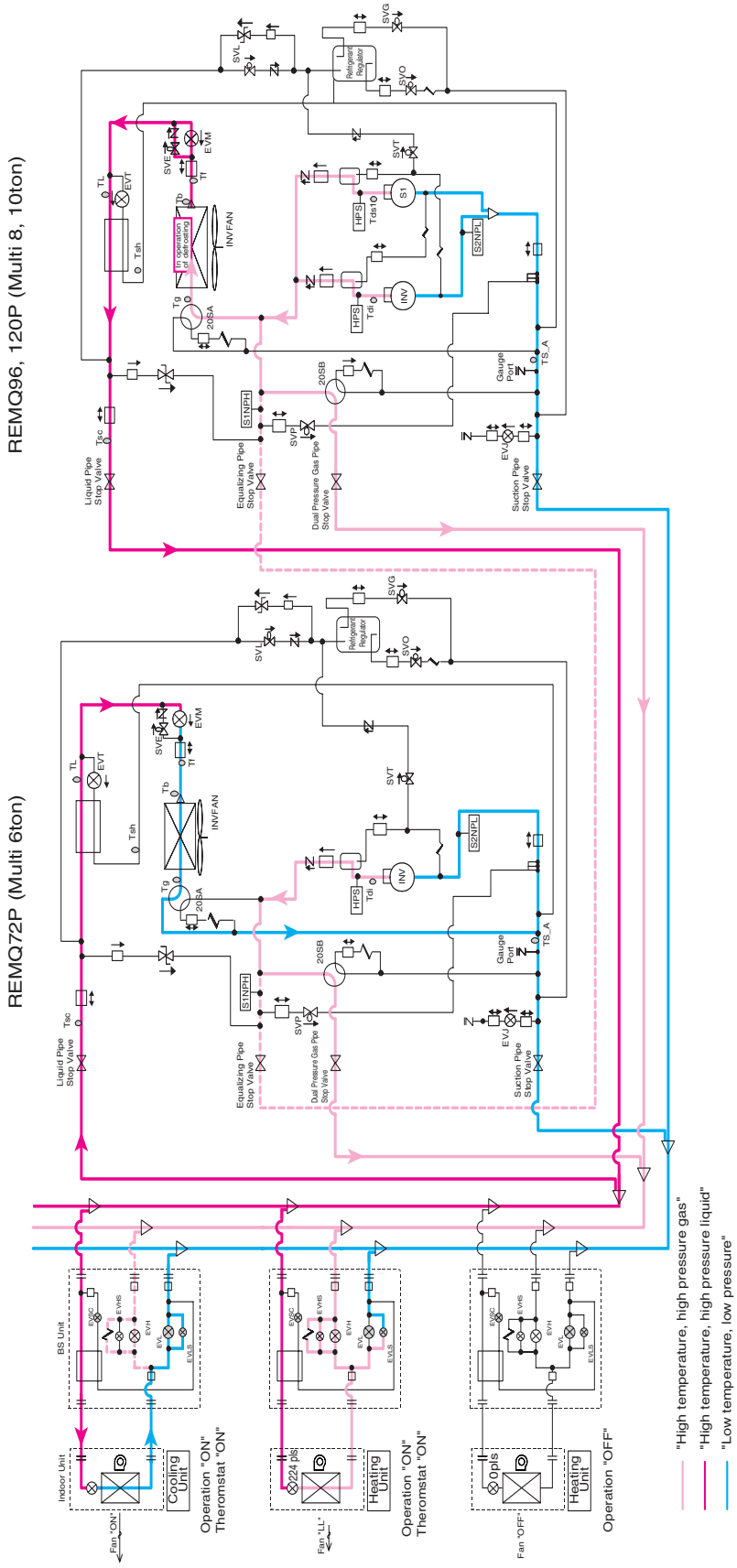
REYQ168P, 192P
Heating Oil Return Operation



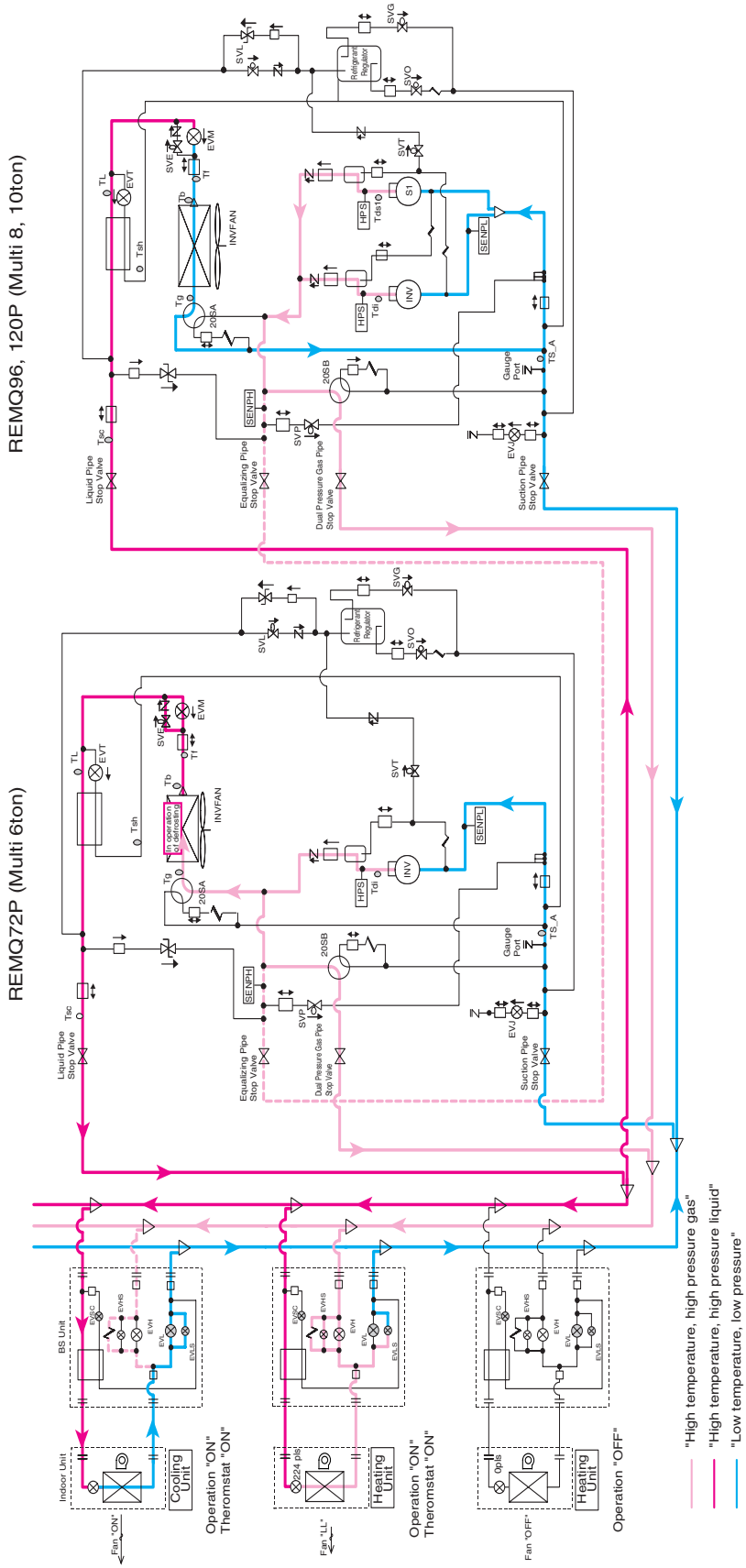
REYQ168P, 192P
Oil Return Operation at Simultaneous Cooling / Heating Operation



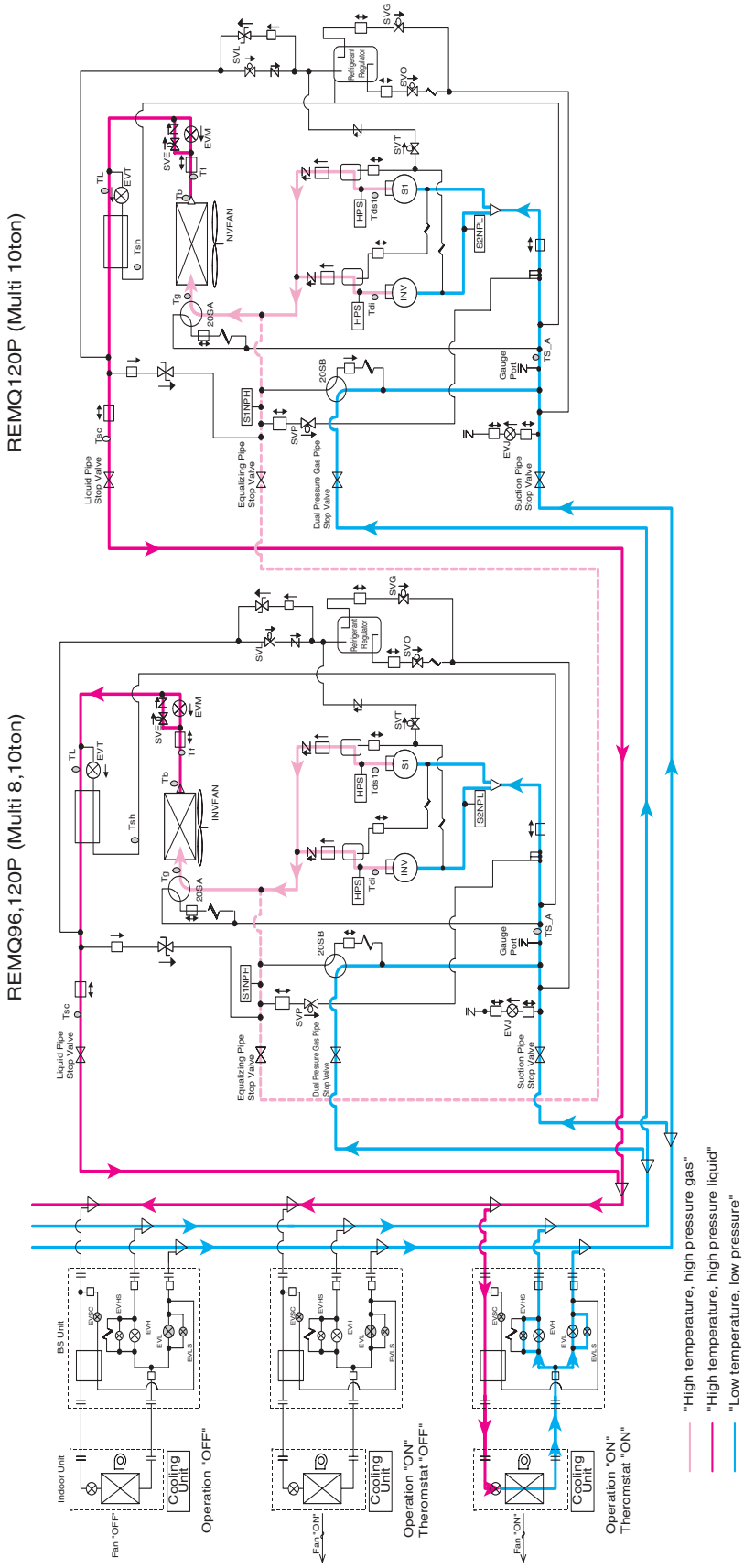
REYQ168P, 192P
Partial Defrosting 1 (Defrosting in the Right Unit)



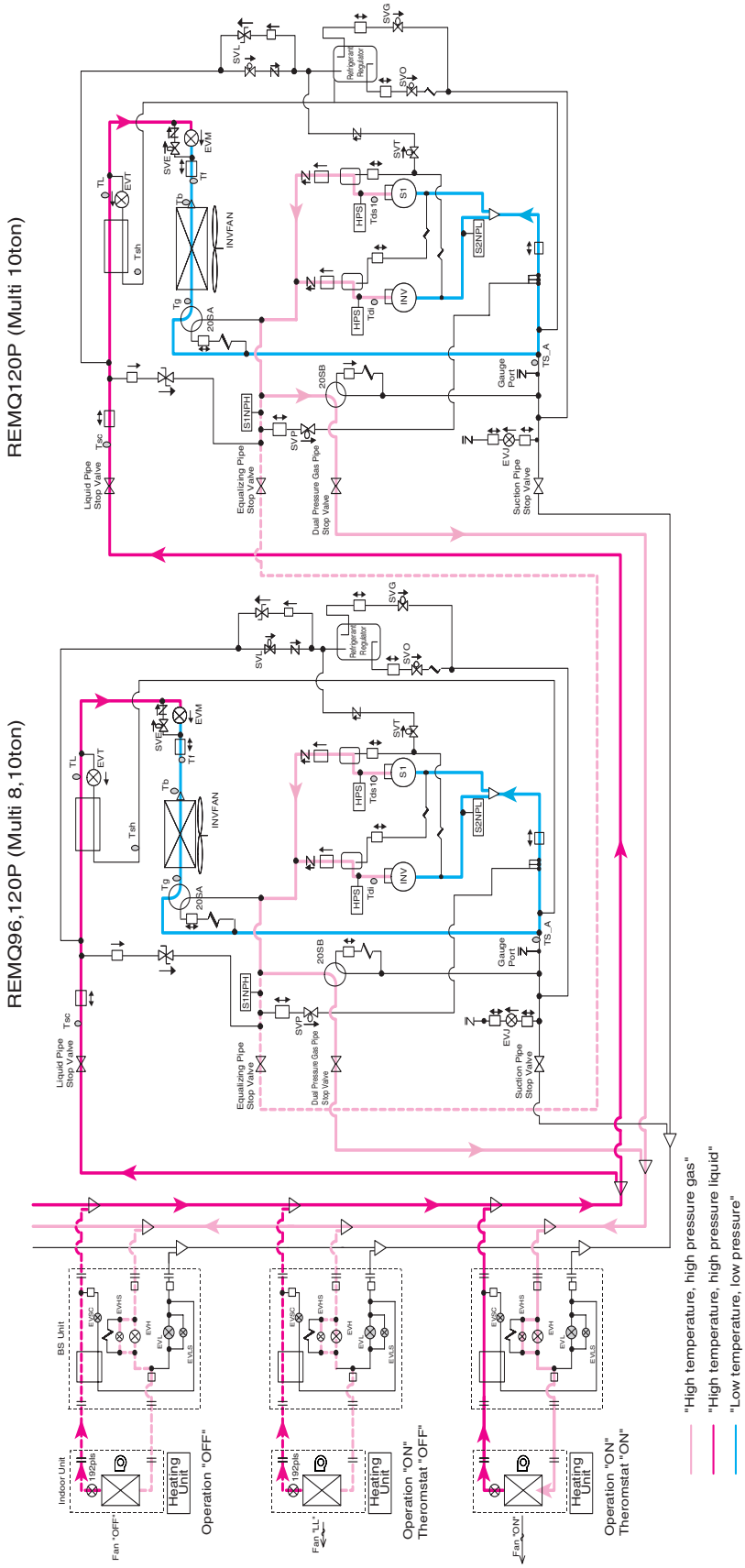
REYQ168P, 192P
Partial Defrosting 2 (Defrosting in the Left Unit)



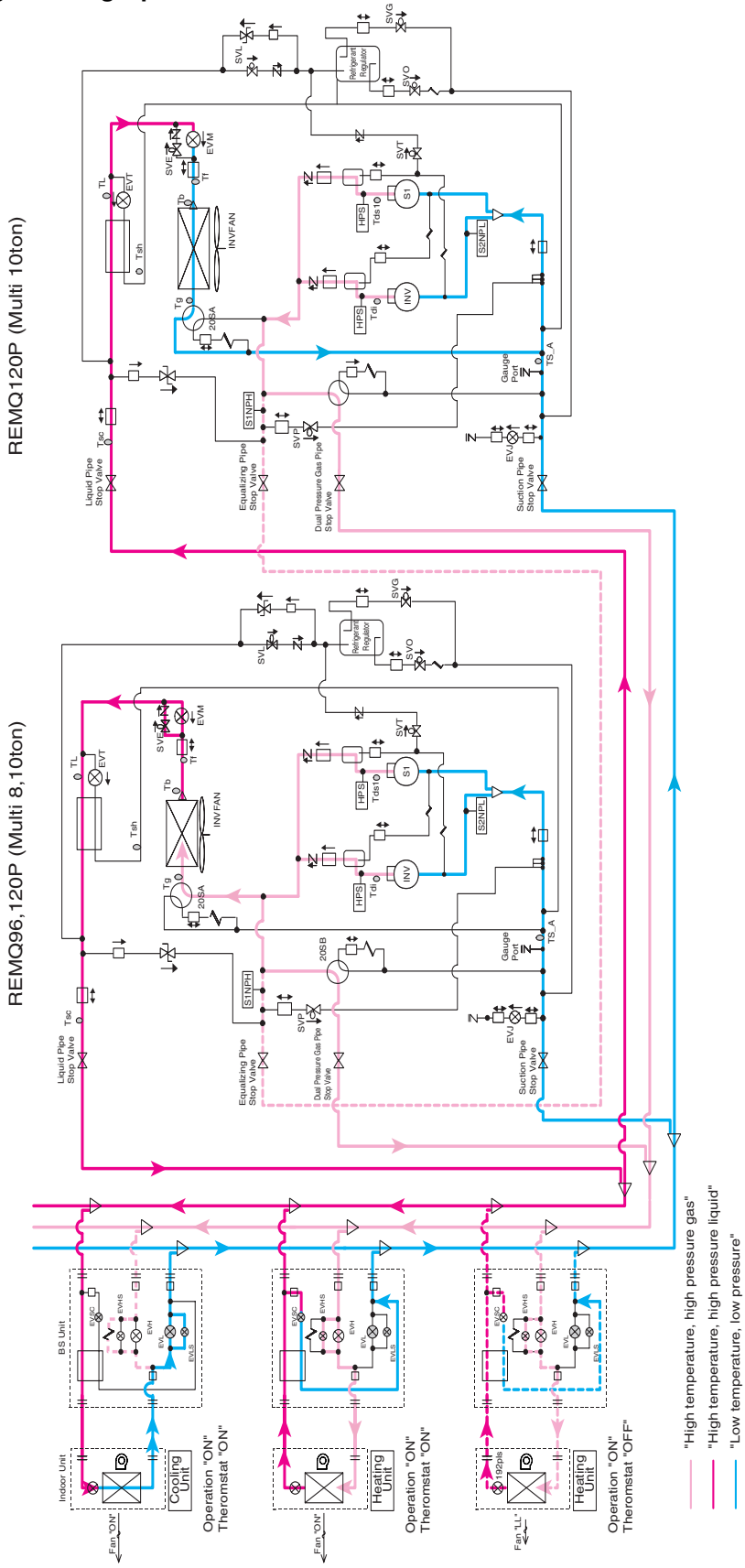
REYQ216P, 240P
Cooling Operation



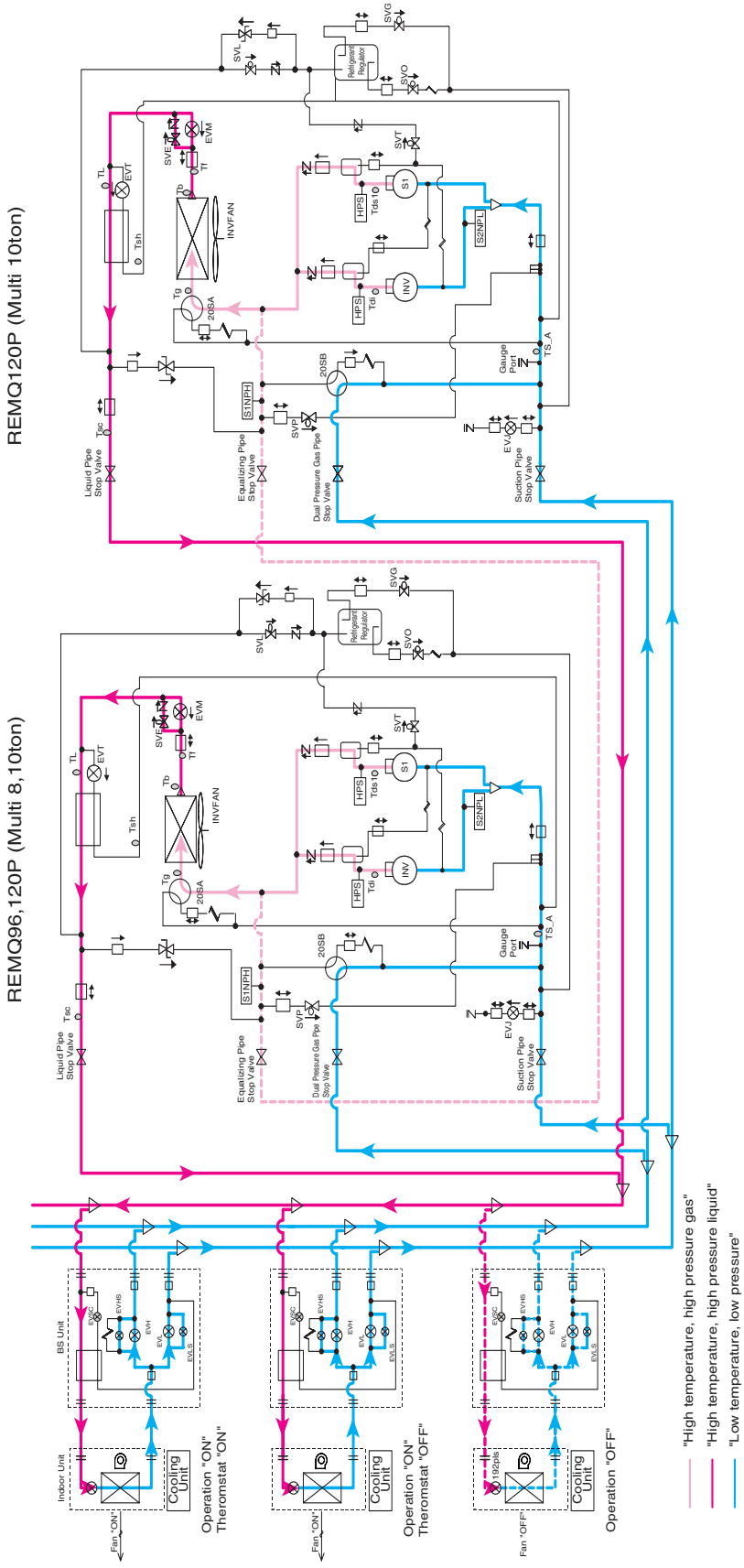
REYQ216P, 240P
Heating Operation



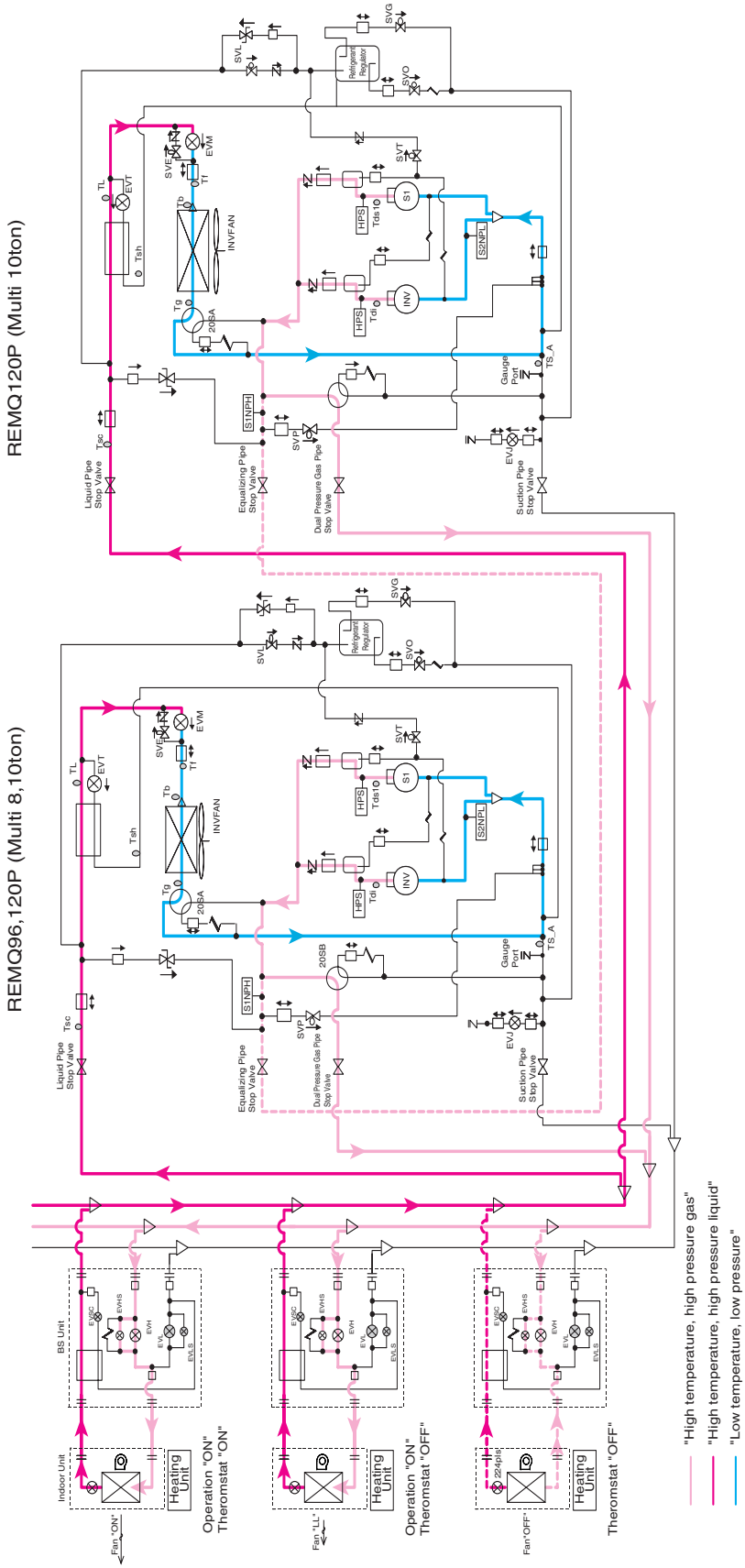
REYQ216P, 240P
Simultaneous Cooling / Heating Operation



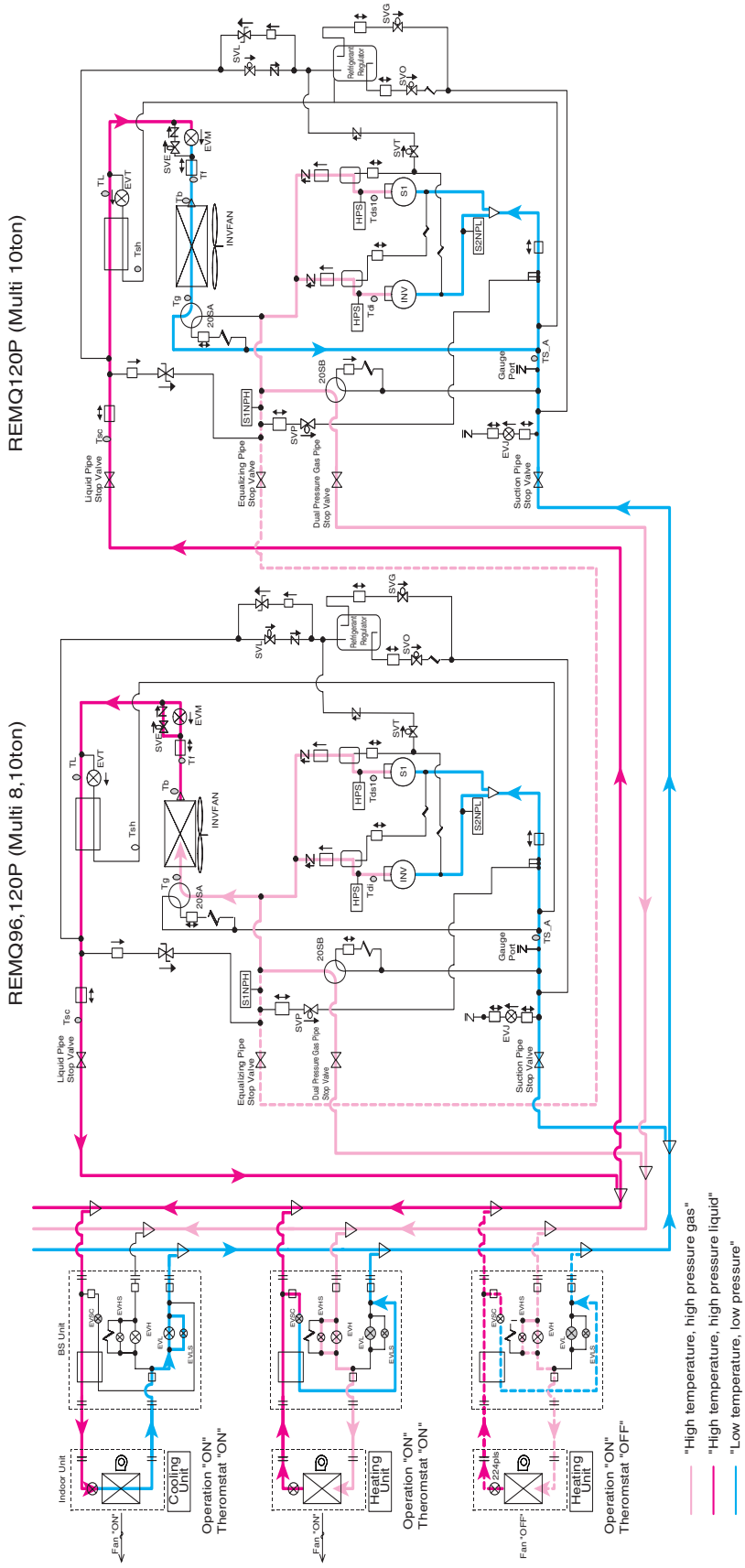
REYQ216P, 240P
Cooling Oil Return Operation



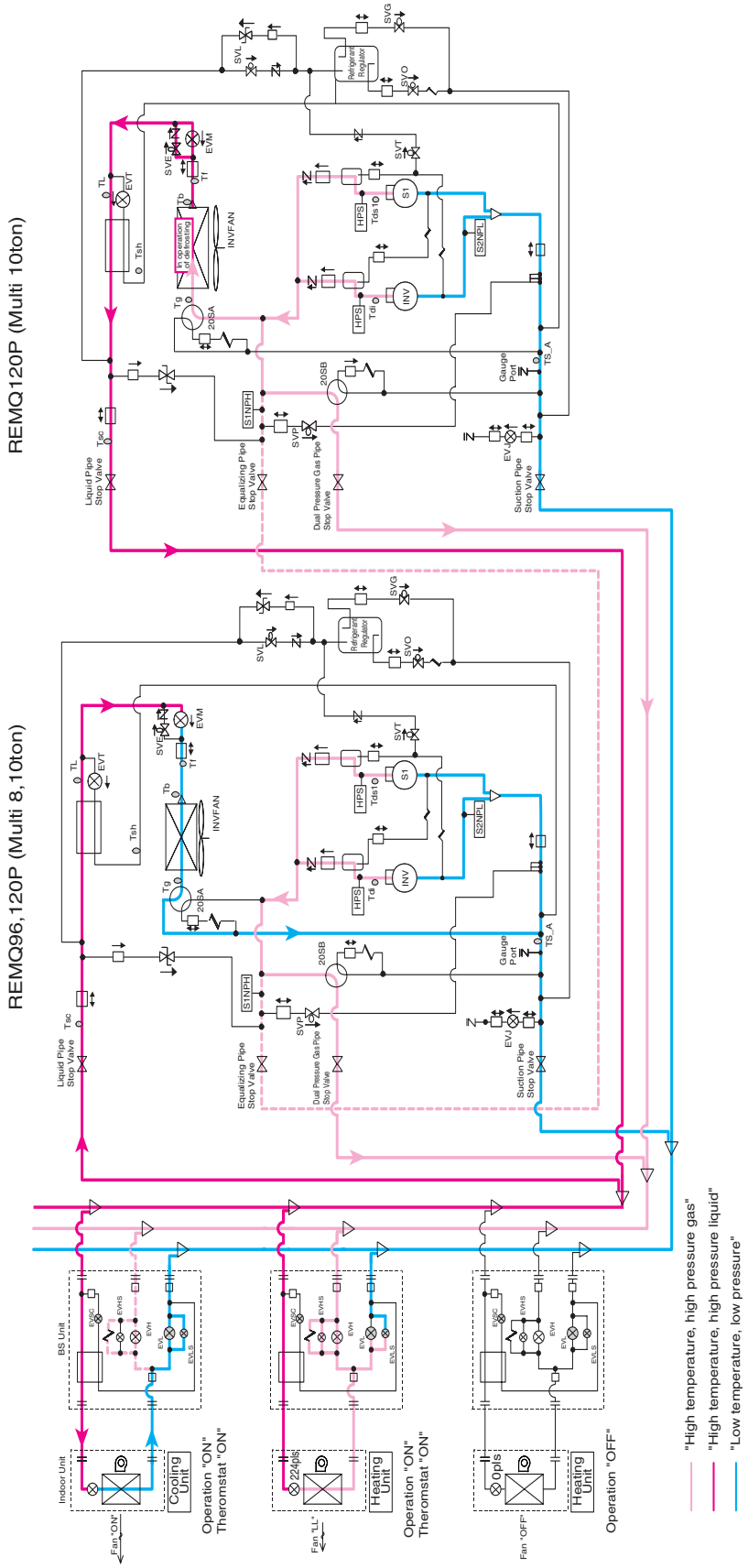
REYQ216P, 240P
Heating Oil Return Operation



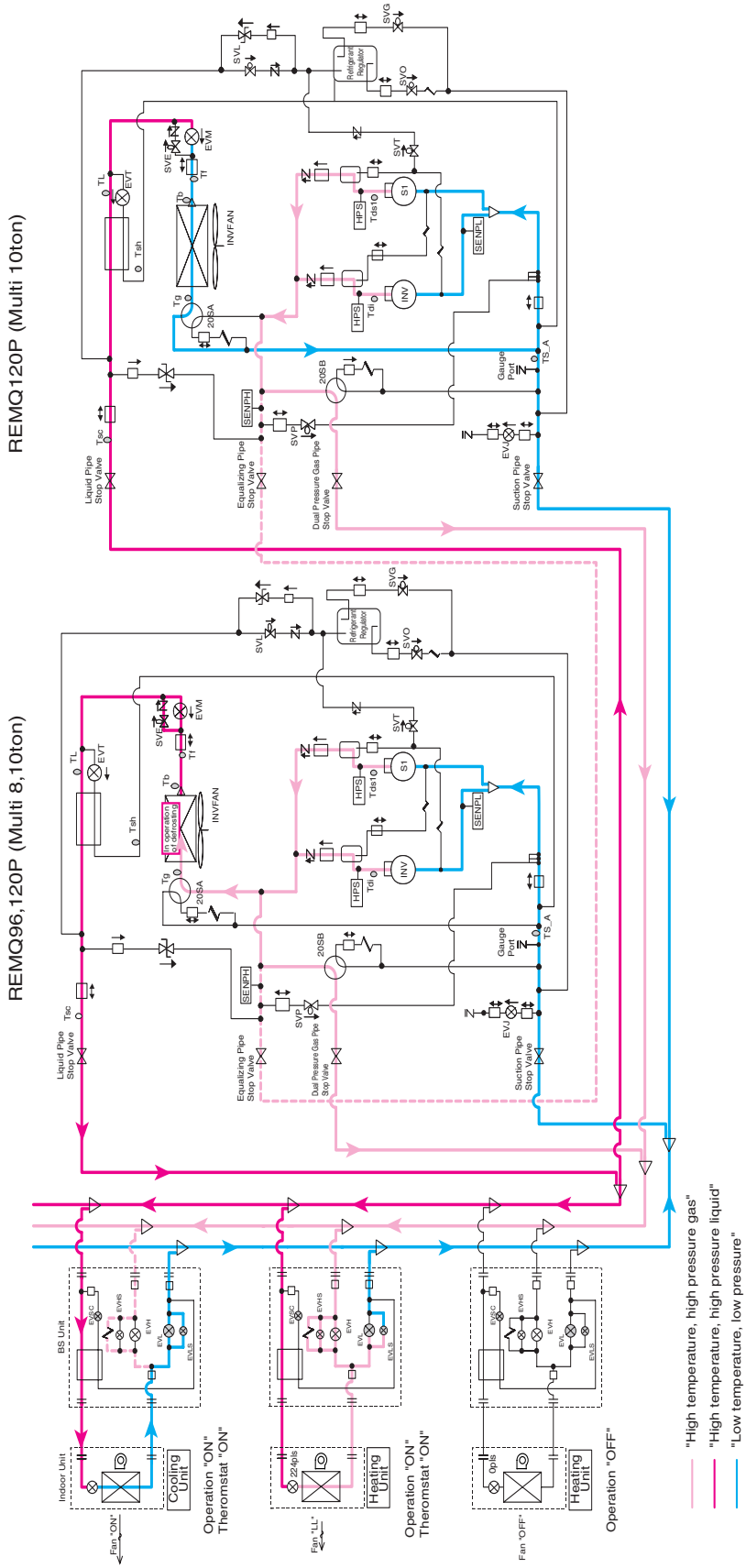
REYQ216P, 240P
Oil Return Operation at Simultaneous Cooling / Heating Operation



REYQ216P, 240P
Partial Defrosting 1 (Defrosting in the Right Unit)



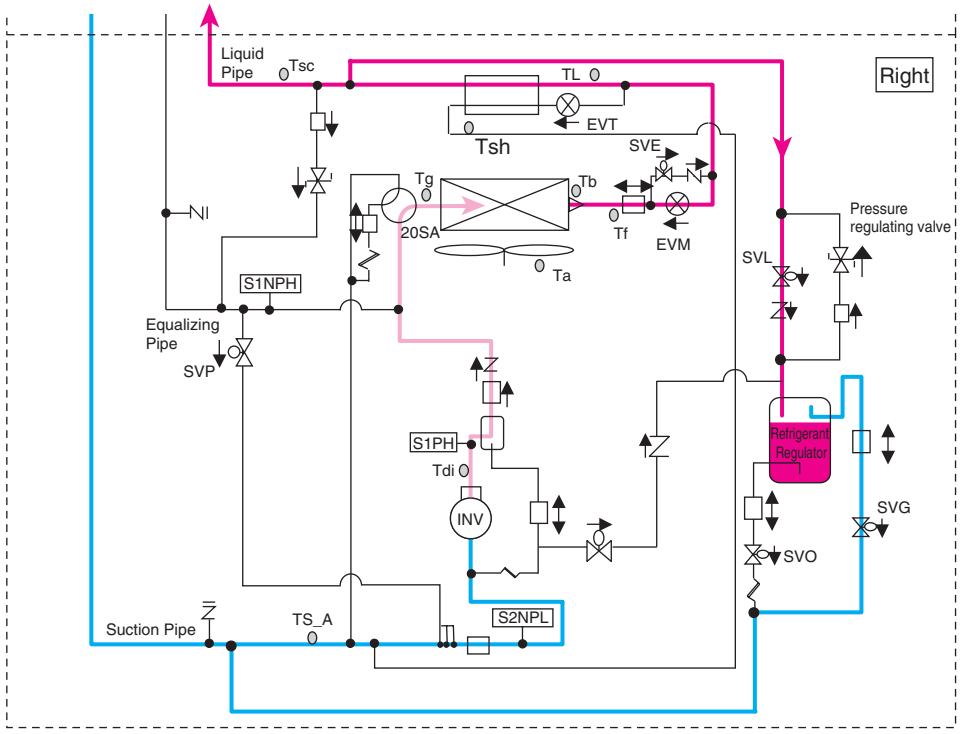
REYQ216P, 240P
Partial Defrosting 2 (Defrosting in the Left Unit)



Operation of refrigerant regulator

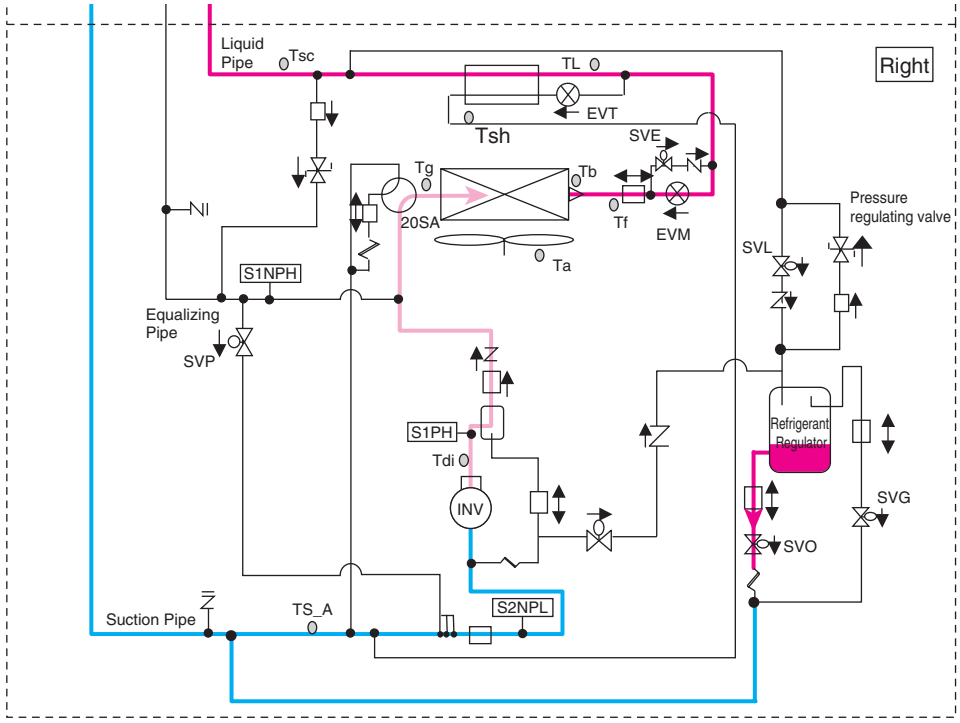
1. **Recovery of refrigerant**

   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.

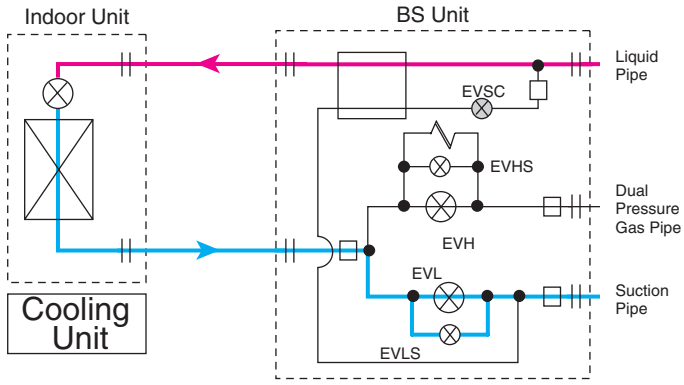


3. **Pressure regulating valve (Refrigerant regulator)**
   The circuit will be closed when SVL, SVO, SVG are all closed. In this case, the increased pressure in the refrigerant regulator will be transferred to the liquid refrigerant pipe side, to regulate the pressure.

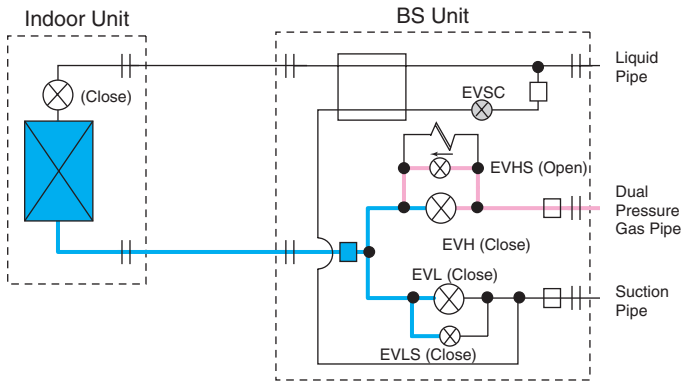
Pressure equalizing when switching operation cooling/ heating

1. **When switching operation from to cooling to heating**
   First, the electric 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 electric expansion valve of the indoor unit is opened to start the operation as a heating circuit.

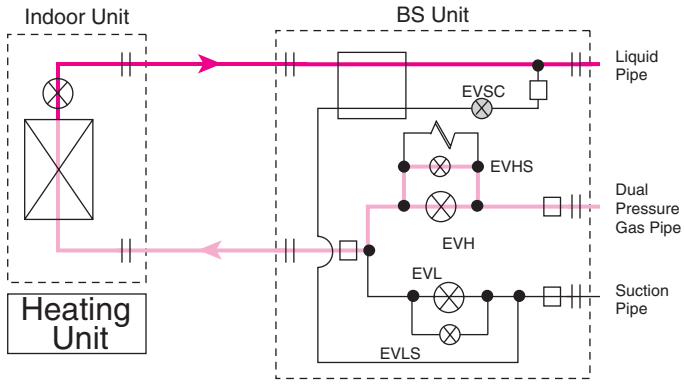
In cooling operation



In equalization



To heating operation



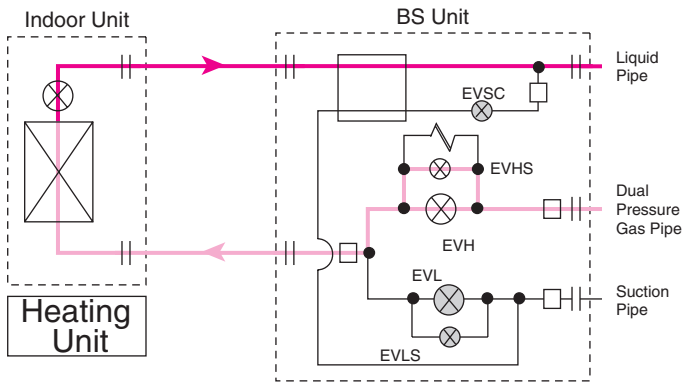
2. When switching operation from heating to cooling

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

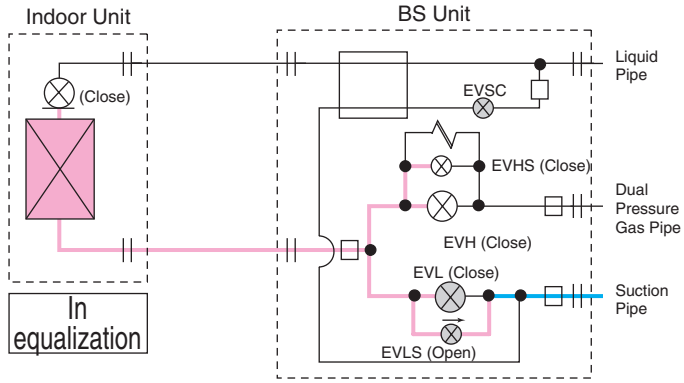
Next, open the EVLS, and it makes to balance the system pressure.

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

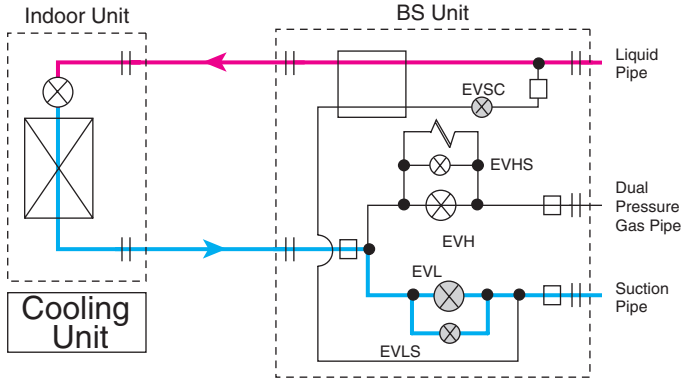
In heating operation



In equalization



To cooling operation



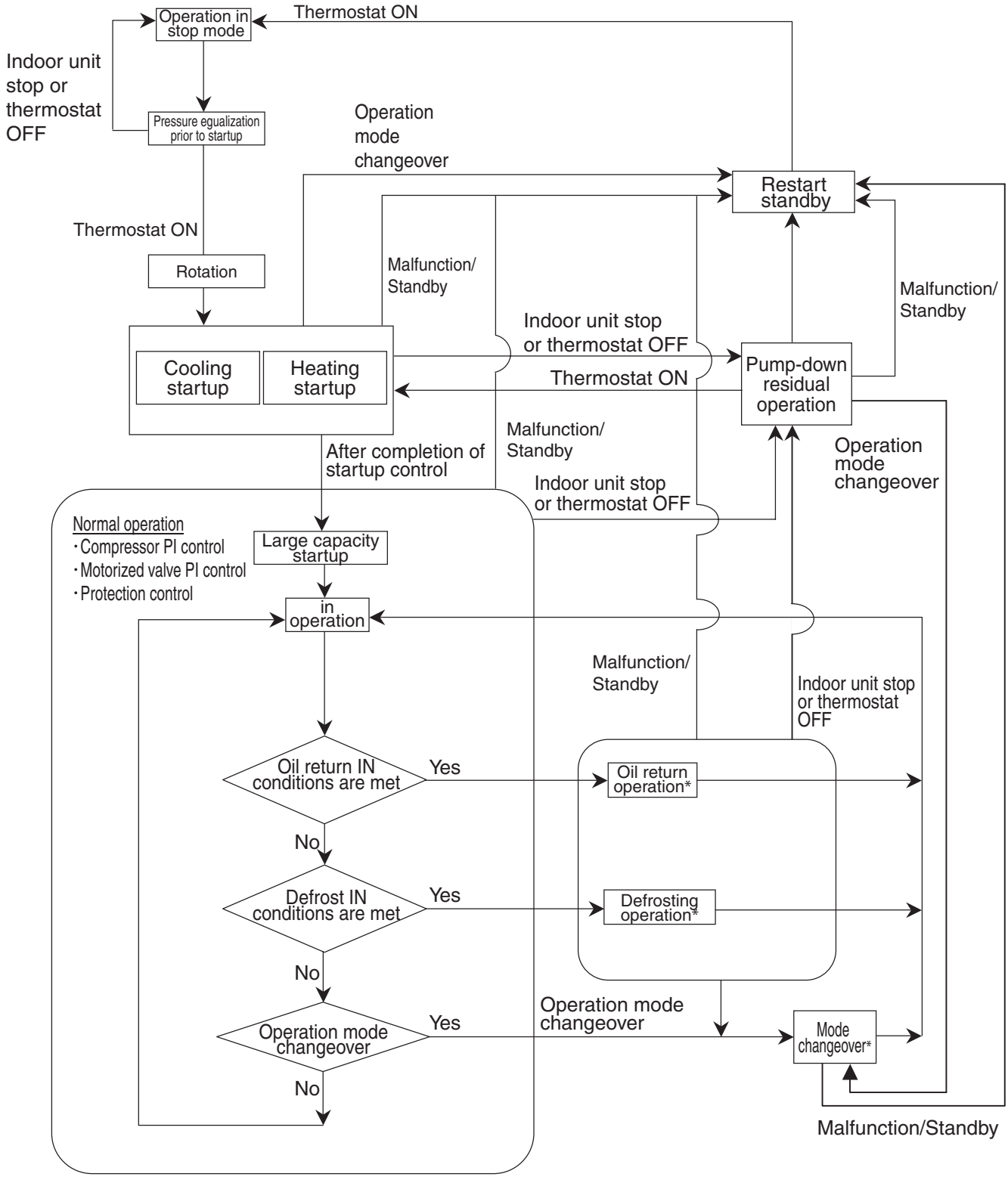
5. Function General

5.1 Symbol

Symbol	Electric symbol		Description or function
	REYQ72, 96, 120P REYQ144PTJU	REMQ72, 96, 120P	
20SA	Y2S (Heat exchanger1) Y9S (Heat exchanger2)	Y3S	Four-way valve (Heat exchanger switch)
20SB	Y8S	Y2S	Four-way valve (High/low pressure gas pipe switch)
DSH	–	–	Discharge pipe superheated degree
DSHi	–	–	Discharge pipe superheat of inverter compressor
DSHs	–	–	Discharge pipe superheat of standard compressor
EV	–	–	Opening of electronic expansion valve
EVM	Y1E (Main1) Y3E (Main2)	Y1E	Electronic expansion valve for main heat exchanger
EVT	Y2E (Subcooling1) Y5E (Subcooling2)	Y3E	Electronic expansion valve for subcooling heat exchanger
EVJ	Y4E	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	S1NPH	Value detected by high pressure sensor
Pe	S2NPL	S2NPL	Value detected by low pressure sensor
SH	–	–	Evaporator outlet superheat
SHS	–	–	Target evaporator outlet superheat
SVE	Y5S (Bypass1) Y10S (Bypass2)	Y6S	Main bypass solenoid valve
SVP	Y4S	Y5S	Solenoid valve for hot gas
SVL	Y3S	Y4S	Refrigerant regulator liquid pipe solenoid valve
SVG	Y1S	Y1S	Refrigerant regulator gas pipe solenoid valve
SVO	Y7S	Y7S	Refrigerant regulator exhaust pipe solenoid valve
SVT	Y6S	Y8S	Refrigerant regulator discharge pipe solenoid valve

Symbol	Electric symbol		Description or function
	REYQ72, 96, 120P REYQ144PTJU	REMQ72, 96, 120P	
Ta	R1T (A1P)	R1T (A1P)	Outdoor air temperature
TsA	R8T (Suction pipe1)	R8T	Suction pipe temperature
	R10T (Suction pipe2)		
Tb	R4T (Deicer1)	R4T	Heat exchanger outlet temperature at cooling
	R12T (Deicer2)		
Tg	R2T (Gas pipe1)	R2T	Heat exchanger gas pipe temperature
	R11T (Gas pipe2)		
Tf	R7T (Liquid pipe1)	R7T	Temperature of liquid pipe between heat exchanger and main electronic expansion valve
	R15T (Liquid pipe2)		
Tsh	R5T (Gas pipe1)	R5T	Temperature detected with the subcooling heat exchanger outlet thermistor
	R13T (Gas pipe2)		
Tl	R6T (Liquid pipe1)	R6T	Liquid pipe temperature detected with the liquid pipe thermistor
	R14T (Liquid pipe2)		
Tsc	R9T	R9T	Temperature of liquid pipe between liquid shutoff valve and subcooled heat exchanger
Tc	–	–	High pressure equivalent saturation temperature
TcS	–	–	Target temperature of Tc
Te	–	–	Low pressure equivalent saturation temperature
TeS	–	–	Target temperature of Te
Tfin	R1T (A4P) (A5P)	R1T (A3P)	Inverter fin temperature
Tp	–	–	Calculated value of compressor port temperature
Tdi	R31T (R32T)	R31T	Discharge pipe temperature of inverter compressor
Tds	R32T	R32T, R33T	Discharge pipe temperature of standard compressor

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		
		REYQ	REMQ	Normal Cooling	Normal Heating	Normal Simultaneous Cooling / Heating
Compressor 1	—	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,	PI control, High pressure protection, Low pressure protection, Td protection, INV protection,
Compressor 2		M2C	M2C			
Outdoor unit fan 1	—	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	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
		Y3E				
Electronic expansion valve (Subcooling)	EVT	Y2E	Y3E	PI control	PI control	PI control
		Y5E				
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls	80 pls	80 pls
Four way valve (Heat exchanger switch)	20SA	Y2S	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
		Y9S				
Four way valve (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	ON	OFF	OFF
Solenoid valve (Main bypass)	SVE	Y5S	Y6S	ON	OFF	OFF
		Y10S				
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	ON for refrigerant recovery	ON for refrigerant recovery	ON for refrigerant recovery
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	ON for refrigerant recovery	ON for refrigerant recovery	ON for refrigerant recovery
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	ON for refrigerant discharge	ON for refrigerant discharge	ON for refrigerant discharge
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	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 **Chapter 6: *Control of Electonic Expansion Valve*** on page 293.

BS 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				
37	43	45	46	48	50	52

Te : Low pressure equivalent saturation temperature (°F)

TeS : Target Te value (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
109	115	118

Tc : High pressure equivalent saturation temperature (°F)

TcS : Target Tc value (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.

Rotation of outdoor units

In order to make operating time equal for each compressor of multi connection outdoor units, outdoor units are used in rotation.
However this is not applicable to single units.

[Rotation of outdoor units]

For multiple outdoor units, an operational priority order is assigned to each outdoor unit on the control purpose.
The operational priority orders of each outdoor unit are switched by means of outdoor unit rotation.

[System with two outdoor units]

	Outdoor Unit 1	Outdoor Unit 2
Previous time	Priority 1	Priority 2
This time	Priority 2	Priority 1
Next time	Priority 1	Priority 2

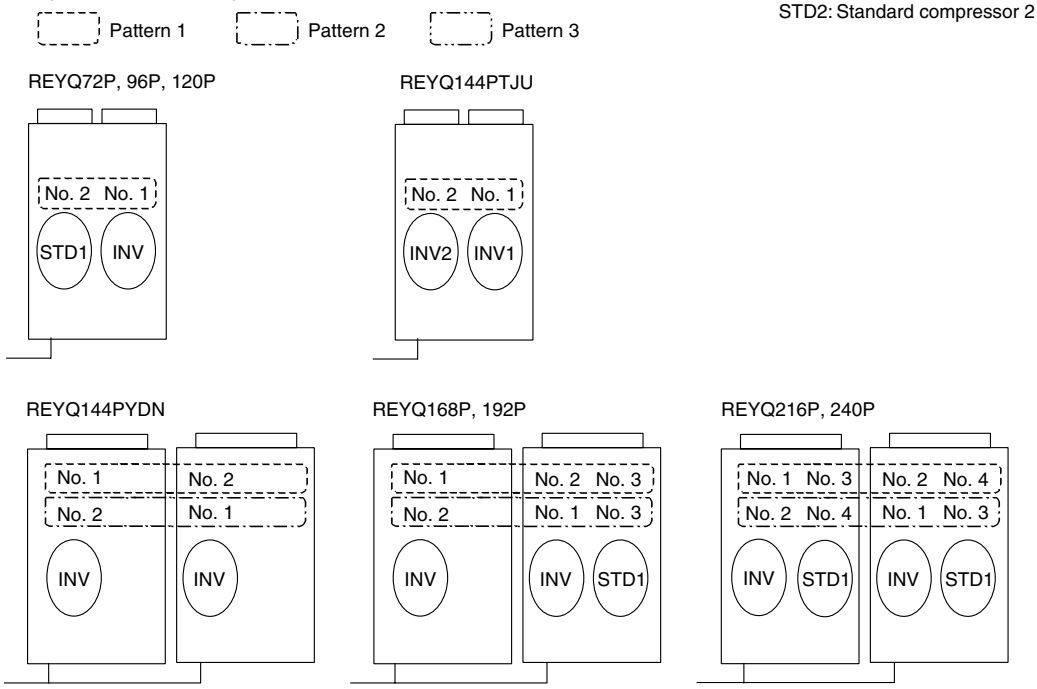
[Timing of outdoor rotation]

In start of startup control

- 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
STD2: Standard compressor 2



- 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 **Section 2.2: *Compressor PI Control***. Furthermore, the operating priority of compressors is subject to information in ***Operating Priority and Rotation of***

Compressors.

Single unit installation

REYQ72, 96, 120PYDN, PTJU

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

REYQ144PTJU (12 ton)

(To increase Step No.)

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

Notes:

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.

Two-unit multi system

REYQ144PYDN (6/6 ton)

(To increase Step No.)

STEP No.	unit 1 INV	unit 2 INV	
1	52Hz	52Hz	← Initial step
2	56Hz	56Hz	
3	62Hz	62Hz	
4	66Hz	66Hz	
5	70Hz	70Hz	
6	74Hz	74Hz	
7	80Hz	80Hz	
8	88Hz	88Hz	
9	92Hz	92Hz	
10	96Hz	96Hz	
11	104Hz	104Hz	
12	110Hz	110Hz	
13	116Hz	116Hz	
14	124Hz	124Hz	
15	132Hz	132Hz	
16	144Hz	144Hz	
17	158Hz	158Hz	
18	166Hz	166Hz	
19	176Hz	176Hz	
20	80Hz	80Hz	
21	88Hz	88Hz	
22	96Hz	96Hz	
23	104Hz	104Hz	
24	116Hz	116Hz	

(To decrease Step No.)

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

REYQ168PYDN, 192PYDN (6+8/10 ton)

(To increase Step No.)

STEP No.	unit 1 INV	unit 2 INV	STD	
1	52Hz	52Hz		← Initial step
2	56Hz	56Hz		
3	62Hz	62Hz		
4	66Hz	66Hz		
5	70Hz	70Hz		
6	74Hz	74Hz		
7	80Hz	80Hz		
8	88Hz	88Hz		
9	92Hz	92Hz		
10	96Hz	96Hz		
11	104Hz	104Hz		
12	110Hz	110Hz		
13	116Hz	116Hz		
14	124Hz	124Hz		
15	132Hz	132Hz		
16	144Hz	144Hz		
17	158Hz	158Hz		
18	166Hz	166Hz		
19	176Hz	176Hz		
20	80Hz	80Hz	ON	
21	88Hz	88Hz	ON	
22	96Hz	96Hz	ON	
23	104Hz	104Hz	ON	
24	116Hz	116Hz	ON	

(To decrease Step No.)

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

Notes:

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.

Two-unit multi system

REYQ216PYDN, 240PYDN (8/10+10 ton)

(To increase Step No.)

STEP No.	unit 1 INV	unit 2 INV	STD
1	52Hz	52Hz	◄Initial step
2	56Hz	56Hz	
3	62Hz	62Hz	
4	66Hz	66Hz	
5	70Hz	70Hz	
6	74Hz	74Hz	
7	80Hz	80Hz	
8	88Hz	88Hz	
9	92Hz	92Hz	
10	96Hz	96Hz	
11	104Hz	104Hz	
12	110Hz	110Hz	
13	116Hz	116Hz	
14	124Hz	124Hz	
15	132Hz	132Hz	
16	144Hz	144Hz	
17	158Hz	158Hz	
18	166Hz	166Hz	
19	176Hz	176Hz	
20	80Hz	80Hz	ON1
21	88Hz	88Hz	ON1
22	96Hz	96Hz	ON1
23	104Hz	104Hz	ON1
24	116Hz	116Hz	ON1
25	124Hz	124Hz	ON1
26	132Hz	132Hz	ON1
27	88Hz	88Hz	ON2
28	96Hz	96Hz	ON2
29	104Hz	104Hz	ON2
30	124Hz	124Hz	ON2
31	144Hz	144Hz	ON2
32	158Hz	158Hz	ON2
33	166Hz	176Hz	ON2

(To decrease Step No.)

STEP No.	unit 1 INV	unit 2 INV	STD
1	52Hz		
2	56Hz		
3	62Hz		
4	68Hz		
5	74Hz		
6	80Hz		
7	88Hz		
8	96Hz		
9	104Hz		
10	52Hz	52Hz	
11	56Hz	56Hz	
12	62Hz	62Hz	
13	66Hz	66Hz	
14	70Hz	70Hz	
15	74Hz	74Hz	
16	80Hz	80Hz	
17	88Hz	88Hz	
18	92Hz	92Hz	
19	96Hz	96Hz	
20	104Hz	104Hz	
21	110Hz	110Hz	
22	116Hz	116Hz	
23	124Hz	124Hz	
24	132Hz	132Hz	
25	52Hz	52Hz	ON1
26	62Hz	62Hz	ON1
27	68Hz	68Hz	ON1
28	74Hz	74Hz	ON1
29	80Hz	80Hz	ON1
30	88Hz	88Hz	ON1
31	96Hz	96Hz	ON1
32	104Hz	104Hz	ON1
33	52Hz	52Hz	ON2

Notes:

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 saturated temperature (°F)

Subcooling electronic expansion valve EVT control

In order to make the maximum use of the subcool 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 subcool heat exchanger outlet thermistor R5T
Te: Low pressure equivalent saturated 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.

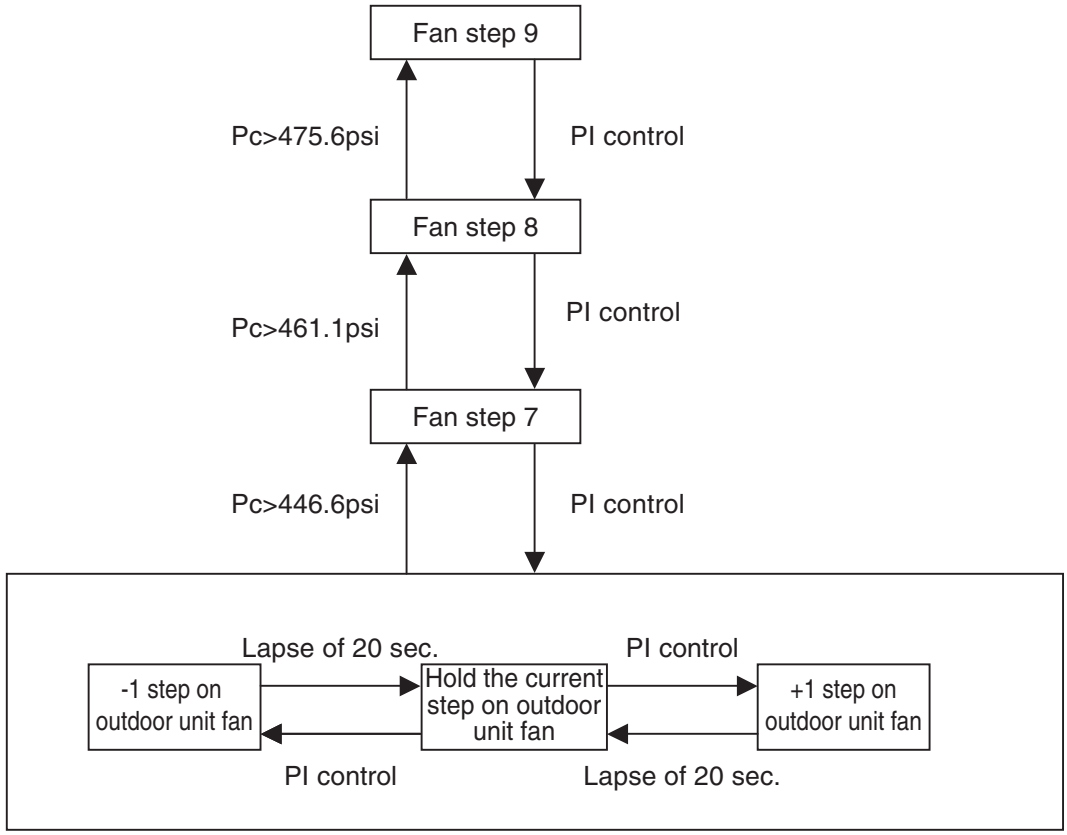
STEP No.	Fan revolutions (rpm)						
	Single type				Multiple type		
	REYQ72P	REYQ96P	REYQ120P	REYQ144PTJU	REMQ72P	REMQ96P	REMQ120P
0	0	0	0	0	0	0	0
1	285/255	285/255	285/255	285/255	350	350	350
2	315/285	315/285	315/285	360/315	370	370	370
3	360/330	360/330	360/330	395/365	400	400	400
4	430/400	430/400	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 Operation

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

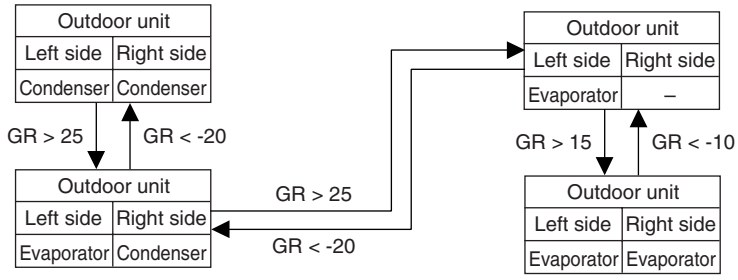
circulation rate to be supplied to indoor units.



6.6 Heat Exchanger Control

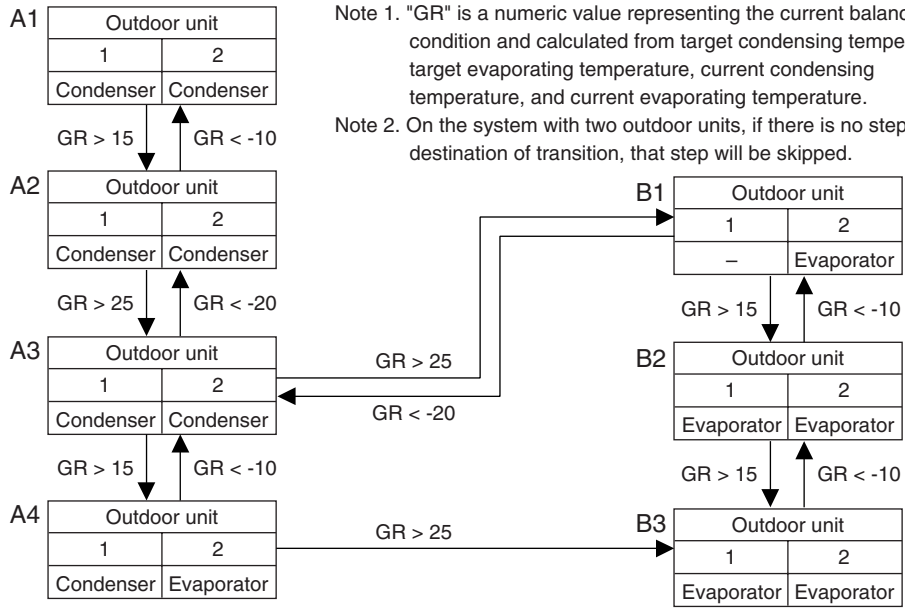
While in heating or cool/heat simultaneous operation, ensure target condensing and evaporating temperature by changing over the air heat exchange of outdoor unit to the evaporator or the condenser in response to loads.

[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 Operation

Actuator	Symbol	Elect. symbol		Control before startup	Startup control	
		REYQ	REMQ		STEP1	STEP2
Compressor 1	—	M1C	M1C	0 Hz	52 Hz+OFF	52Hz+OFF+2STEP / 20 sec. (Until it reaches Pc-Pe>56.55 psi)
Compressor 2		M2C	M2C			
Outdoor unit fan 1	—	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<256.5 psi)
Outdoor unit fan 2		M2F	M2F			
Electronic expansion valve (Main)	EVM	Y1E Y3E	Y1E	0 pls	1375 pls	1375 pls
Electronic expansion valve (Subcooling)	EVT	Y2E Y5E	Y3E	0 pls	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S Y9S	Y3S	OFF	OFF	OFF
Four-way valve (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	ON	ON	ON
Solenoid valve (Main bypass)	SVE	Y5S Y10S	Y6S	OFF	ON	ON
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	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

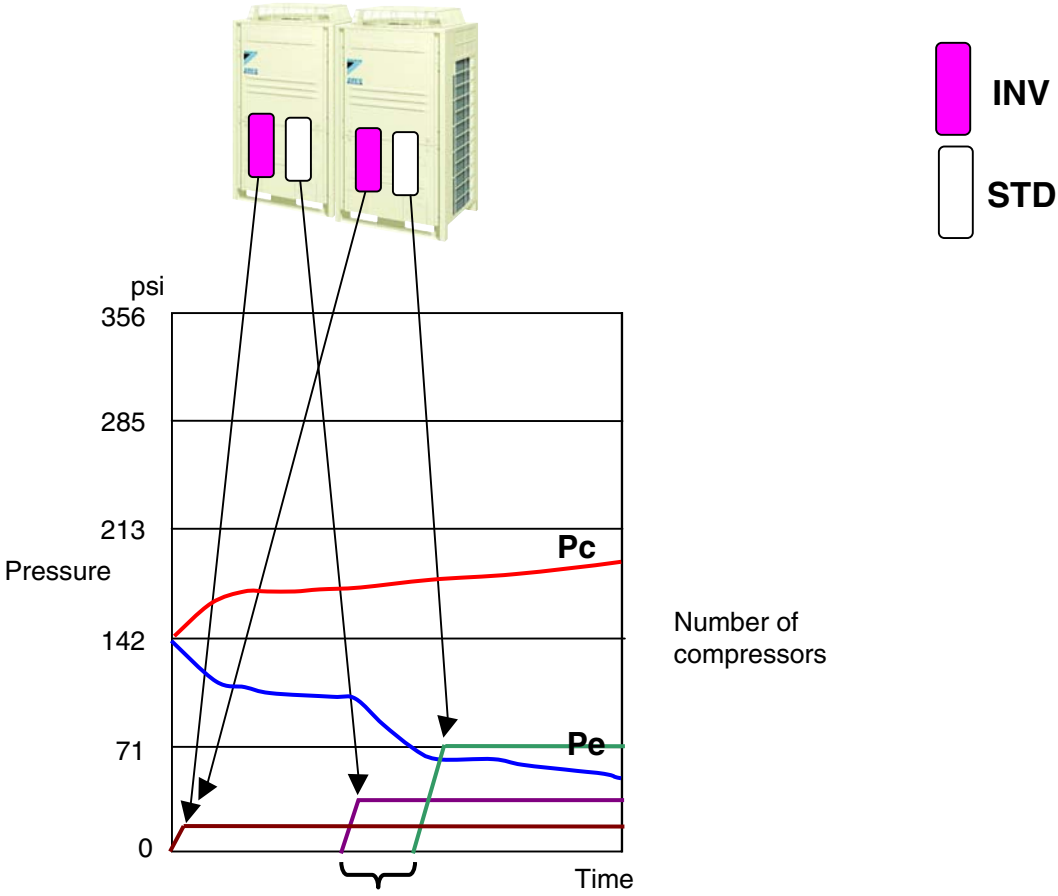
7.1.2 Startup Control in Heating Operation

Actuator	Symbol	Elect. symbol		Control before startup	Startup control	
		REYQ	REMQ		STEP1	STEP2
Compressor 1	—	M1C	M1C	0 Hz	52 Hz+OFF	52Hz+OFF+2STEP / 20 sec. (Until it reaches Pc-Pe>56.55 psi)
Compressor 2		M2C	M2C			
Outdoor unit fan 1	—	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	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	Y3E	0 pls	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S Y9S	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 (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	OFF	OFF	OFF
Solenoid valve (Main bypass)	SVE	Y5S Y10S	Y6S	OFF	OFF	OFF
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	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 Start Up 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.



Start up 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 out of refrigerant oil.

7.3.1 Cooling Oil Return Operation

[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	Elect. symbol		Oil return operation	Operation after oil return
		REYQ	REMQ		
Compressor 1	—	M1C	M1C	52Hz+ON (Subsequently, constant low pressure control) Maintain the number of compressors that were used before oil return operation)	52Hz+ON (Subsequently, constant low pressure control) Maintain the number of compressors that were used before oil return operation)
Compressor 2		M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	Cooling fan control	Cooling fan control
Outdoor unit fan 2		M2F	M2F		
Four-way valve (for heat exchanger selection)	20SA	Y2S Y9S	Y3S	OFF	OFF
Four-way valve (for high- and low-pressure gas pipe selection)	20SB	Y8S	Y2S	ON	ON
Electronic expansion valve (main)	EVM	Y1E Y3E	Y1E	1375pls	1375pls
Electronic expansion valve (subcooling)	EVT	Y2E Y5E	Y3E	SH control	SH control
Electronic expansion valve (refilling refrigerant)	EVJ	Y4E	Y2E	80pls	80pls
Solenoid valve (main bypass)	SVE	Y5S Y10S	Y6S	ON	ON
Solenoid valve (hot gas)	SVP	Y4S	Y5S	OFF	OFF
Solenoid valve (liquid pipe of refrigerant regulator)	SVL	Y3S	Y4S	0pls	0pls
Solenoid valve (gas discharge pipe of refrigerant regulator)	SVG	Y1S	Y1S	0pls	0pls
Solenoid valve (drain pipe of refrigerant regulator)	SVO	Y7S	Y7S	0pls	0pls
Solenoid valve (discharge pipe of refrigerant regulator)	SVT	Y6S	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	Thermo ON unit	Remote controller setting
	Unit not in operation	OFF
	Thermo OFF unit	Remote controller setting
Motorized valve	Thermo ON unit	Normal opening degree
	Unit not in operation	192pls
	Thermo OFF unit	Normal opening degree for forced thermostat ON

Cooling BS unit actuator	Elect. symbol	Oil return operation
Electronic expansion valve (EVH)	Y4E	600pls
Electronic expansion valve (EVL)	Y5E	760pls
Electronic expansion valve (EVHS)	Y2E	480pls
Electronic expansion valve (EVLS)	Y3E	480pls
Electronic expansion valve (EVSC)	Y1E	0pls

7.3.2 Heating Oil Return Operation (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	Elect. symbol		Oil return operation
		REYQ	REMQ	
Compressor 1	—	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	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	20SA=ON : PI control 20SA=OFF : 418pls
Electronic expansion valve (subcooling)	EVT	Y2E Y5E	Y3E	PI control
Electronic expansion valve (refilling refrigerant)	EVJ	Y4E	Y2E	80pls
Four-way valve (for heat changer selection)	20SA	Y2S Y9S	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 high- and low-pressure gas pipe selection)	20SB	Y8S	Y2S	OFF
Solenoid valve (main bypass)	SVE	Y5S Y10S	Y6S	OFF
Solenoid valve (hot gas)	SVP	Y4S	Y5S	0pls
Solenoid valve (liquid pipe of refrigerant regulator)	SVL	Y3S	Y4S	0pls
Solenoid valve (gas discharge pipe of refrigerant regulator)	SVG	Y1S	Y1S	0pls
Solenoid valve (drain pipe of refrigerant regulator)	SVO	Y7S	Y7S	0pls
Solenoid valve (discharge pipe of refrigerant regulator)	SVT	Y6S	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	Thermo ON unit	Remote controller setting
	Unit not in operation	OFF
	Thermo OFF unit	Remote controller setting
Motorized valve	Thermo ON unit	Normal opening degree
	Unit not in operation	192pls
	Thermo OFF unit	Normal opening degree for forced thermostat ON

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

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

Heating BS unit actuator	Elect. 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	0pls (60pls when 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 conductivity of outdoor unit heat exchanger is calculated by Tc, Te, and compressor loads.

Defrosting outdoor unit actuator	Symbol	Elect. symbol		Defrost operation	Operation after defrost
		REYQ	REMQ		
Compressor 1	—	M1C	M1C	REYQ72·96·120·144P: 232Hz+ON REMQ72P: 210Hz REMQ96·120P: 210Hz+ON	REYQ72·96·120·144P: upper limit 124Hz(STD Holds) REMQ72P: 210Hz REMQ96·120P: 210Hz+ON
Compressor 2		M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	OFF Pcmax>355.25psi ↓ ↑ Pcmax<342.2psi FANSTEP4 Pcmax>440.8psi ↓ ↑ Pcmax<427.75psi FANSTEP6	OFF Pcmax>355.25psi ↓ ↑ Pcmax<342.2psi FANSTEP4 Pcmax>440.8psi ↓ ↑ Pcmax<427.75psi FANSTEP6
Outdoor unit fan 2		M2F	M2F		
Four-way valve (for heat changer selection)	20SA	Y2S Y9S	Y3S	OFF	OFF
Four-way valve (for high- and low-pressure gas pipe selection)	20SB	Y8S	Y2S	Holds	Holds
Electronic expansion valve (main)	EVM	Y1E Y3E	Y1E	1375pls	0pls

Electronic expansion valve (subcooling)	EVT	Y2E Y5E	Y3E	SH control	0pls
Electronic expansion valve (refilling refrigerant)	EVJ	Y4E	Y2E	80pls	80pls
Solenoid valve (main bypass)	SVE	Y5S Y10S	Y6S	ON	OFF
Solenoid valve (hot gas)	SVP	Y4S	Y5S	OFF	OFF
Solenoid valve (liquid pipe of refrigerant regulator)	SVL	Y3S	Y4S	0pls	0pls
Solenoid valve (gas discharge pipe of refrigerant regulator)	SVG	Y1S	Y1S	0pls	0pls
Solenoid valve (drain pipe of refrigerant regulator)	SVO	Y7S	Y7S	0pls	0pls
Solenoid valve (discharge pipe of refrigerant regulator)	SVT	Y6S	Y8S	0pls	0pls
End conditions				REYP72 to 120P (by unit) REYP144PTJU or • 6 min. and 30 sec. • Tb > 57.8°F continues for a period of 90 consecutive sec. • Pc_max > 440.8psi REMQ72 to 96P (by unit) or • 5 min. and 30 sec. • Tb > 57.8°F for a period of 10 consecutive sec. • Pc_max > 440.8psi REMQ120P (by unit) or • 5 min. and 30 sec. • Tb > 57.8°F for a period of 30 consecutive sec. • Pc_max > 440.8psi	or • 30 sec. • Pc_max>440.8psi

Evaporating outdoor unit actuator	Symbol	Elect. symbol		Defrost operation	Operation after defrost
		REYQ	REMQ		
Compressor 1	—	M1C	M1C	REYQ72·96·120·144P: 232Hz+ON REMQ72P: 210Hz REMQ96·120P: 210Hz+ON	REYQ72·96·120·144P: Upper limit 124Hz (STD Holds) REMQ72P: 210Hz REMQ96·120P: 210Hz+ON
Compressor 2		M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	Fan control	Fan control
Outdoor unit fan 2		M2F	M2F		
Four way valve (for heat changer selection)	20SA	Y2S Y9S	Y3S	ON	ON
Four way valve (for high- and low-pressure gas pipe selection)	20SB	Y8S	Y2S	Holds	Holds
Electronic expansion valve (main)	EVM	Y1E Y3E	Y1E	PI control	PI control
Electronic expansion valve (subcooling)	EVT	Y2E Y5E	Y3E	SH control	0pls
Electronic expansion valve (refilling refrigerant)	EVJ	Y4E	Y2E	80pls	80pls
Solenoid valve (main bypass)	SVE	Y5S Y10S	Y6S	OFF	OFF
Solenoid valve (hot gas)	SVP	Y4S	Y5S	OFF	OFF
Solenoid valve (liquid pipe of refrigerant regulator)	SVL	Y3S	Y4S	0pls	0pls
Solenoid valve (gas discharge pipe of refrigerant regulator)	SVG	Y1S	Y1S	0pls	0pls
Solenoid valve (drain pipe of refrigerant regulator)	SVO	Y7S	Y7S	0pls	0pls
Solenoid valve (discharge pipe of refrigerant regulator)	SVT	Y6S	Y8S	0pls	0pls

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

Heating indoor unit actuator		Defrost operation	
		REYQ	REMQ
Fan	Thermo ON unit	LL	LL
	Unit not in operation	OFF	OFF
	Thermo OFF unit	LL	LL
Motorized valve	Thermo ON unit	160pls	224pls
	Unit not in operation	0pls	0pls
	Thermo OFF unit	160pls	224pls

Cooling BS unit actuator	Elect. 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 BS unit actuator	Elect. 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 · 120P) 60pls (REMQ72 · 96 · 120P)
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 Operation

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	Elect. symbol		Master unit operation	Slave unit operation
		REYQ	REMQ		
Compressor 1	—	M1C	M1C	124 Hz+OFF	OFF
Compressor 2		M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	Fan control	Fan control
Outdoor unit fan 2		M2F	M2F		
Electronic expansion valve (Main)	EVM	Y1E Y3E	Y1E	1375 pls	1375 pls
Electronic expansion valve (Subcooling)	EVT	Y2E Y5E	Y3E	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S Y9S	Y3S	OFF	OFF
Four-way valve (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	ON	ON
Solenoid valve (Main bypass)	SVE	Y5S Y10S	Y6S	ON	ON
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF	OFF
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	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 Operation and Simultaneous Cooling / Heating Operation

Actuator	Symbol	Elect. symbol		Master unit operation	Slave unit operation
		REYQ	REMQ		
Compressor 1	—	M1C	M1C	124 Hz+OFF	OFF
Compressor 2		M2C	M2C		
Outdoor unit fan 1	—	M1F	M1F	Fan control	Fan control
Outdoor unit fan 2		M2F	M2F		
Electronic expansion valve (Main)	EVM	Y1E Y3E	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	Y3E	0 pls	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S Y9S	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 (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	OFF	OFF
Solenoid valve (Main bypass)	SVE	Y5S Y10S	Y6S	OFF	OFF
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF	OFF
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	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

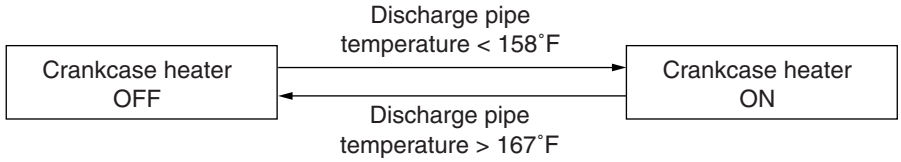
Used to forcedly stop the compressor for a period of 2 minutes, in order to prevent the frequent ON/OFF of the compressor and equalize the pressure within the refrigerant system.

Actuator	Symbol	Elect. symbol		Operation		
		REYQ	REMQ	REYQ72~144P	REMQ72P	REMQ96·120P
Compressor1	—	M1C	M1C	OFF	OFF	OFF
Compressor2	—	M2C	M2C	OFF	—	OFF
Outdoor unit fan1	—	MF1	MF1	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	—	MF2	MF2	Ta>86°F: STEP4 Ta≤86°F: OFF	—	—

Electronic expansion valve (Main)	EVM	Y1E Y3E	Y1E	0 pls
Electronic expansion valve (Subcooling)	EVT	Y2E Y5E	Y3E	0 pls
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls
Four-way valve (Heat exchanger switch)	20SA	Y2S Y9S	Y3S	Holds
Four-way valve (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	Holds
Solenoid valve (Main bypass)	SVE	Y5S Y10S	Y6S	OFF
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	Y8S	OFF
Ending conditions	—			2 min.

7.6.2 Crankcase Heater Control

In order to prevent the refrigerant from condensing 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	Elect. symbol		Operation		
		REYQ	REMQ	REYQ72~144P	REMQ72P	REMQ96·120P
Compressor1	—	M1C	M1C	OFF	OFF	OFF
Compressor2	—	M2C	M2C	OFF	—	OFF
Outdoor unit fan1	—	M1F	M1F	OFF	OFF	OFF
Outdoor unit fan2	—	M2F	M2F	OFF	—	—
Electronic expansion valve (Main)	EVM	Y1E Y3E	Y1E	0 pls		
Electronic expansion valve (Subcooling)	EVT	Y2E Y5E	Y3E	0 pls		
Electronic expansion valve (Refrigerant charge)	EVJ	Y4E	Y2E	80 pls		
Four-way valve (Heat exchanger switch)	20SA	Y2S Y9S	Y3S	Holds		
Four-way valve (High/low pressure gas pipe switch)	20SB	Y8S	Y2S	Holds		

Solenoid valve (Main bypass)	SVE	Y5S Y10S	Y6S	OFF
Solenoid valve (Hot gas)	SVP	Y4S	Y5S	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	SVL	Y3S	Y4S	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	SVG	Y1S	Y1S	OFF
Solenoid valve (Refrigerant regulator exhaust pipe)	SVO	Y7S	Y7S	OFF
Solenoid valve (Refrigerant regulator discharge pipe)	SVT	Y6S	Y8S	OFF
Ending conditions	—			Indoor unit thermostat is turned ON.

7.7.2 Stop due to Malfunction

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 malfunction will be determined according to the number of retry times.

Item	Judgment Criteria	Malfunction 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	16.1A: 260 sec.	L8
6. Abnormal radiator fin temperature level	199.4°F	L4

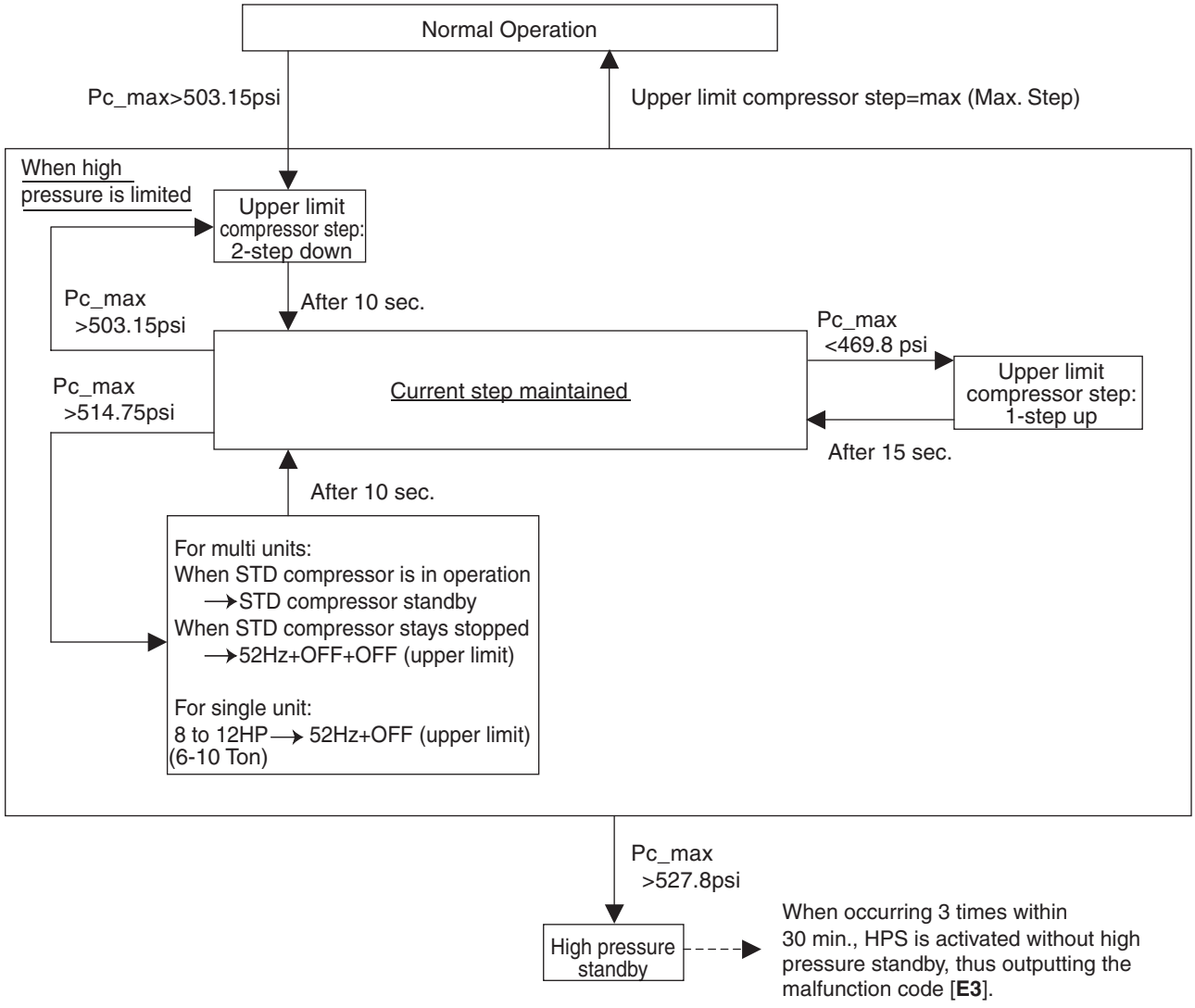
8. Protection Control

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.

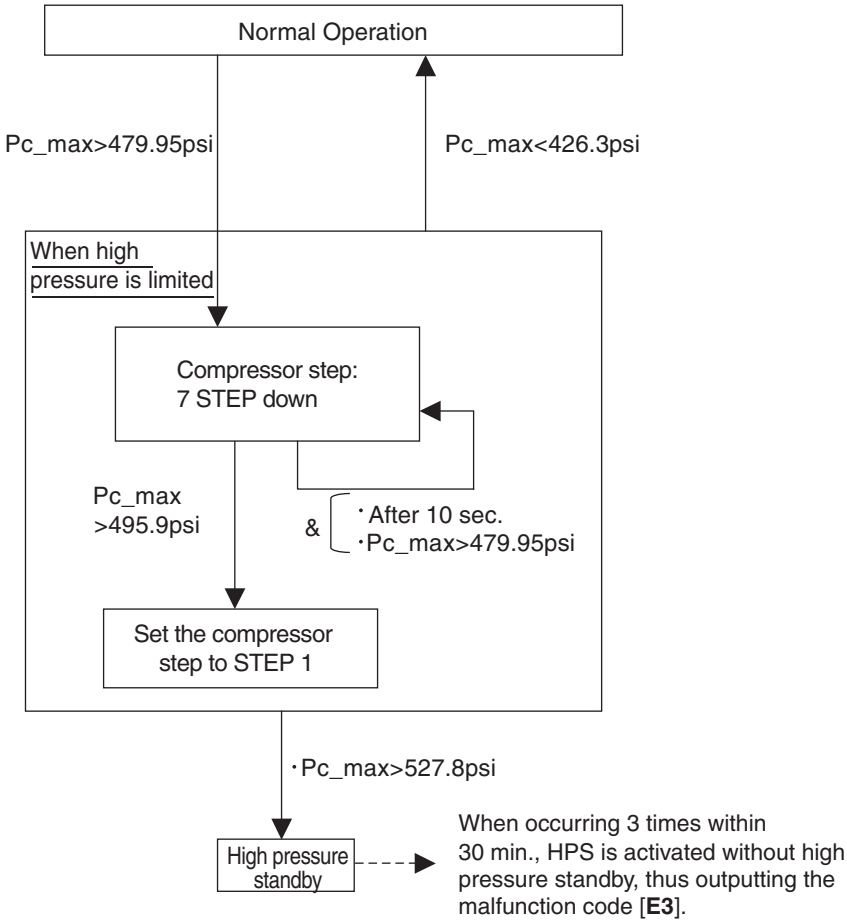
[In cooling operation]

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



[Heating Operation and Simultaneous Cooling / Heating Operation]

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



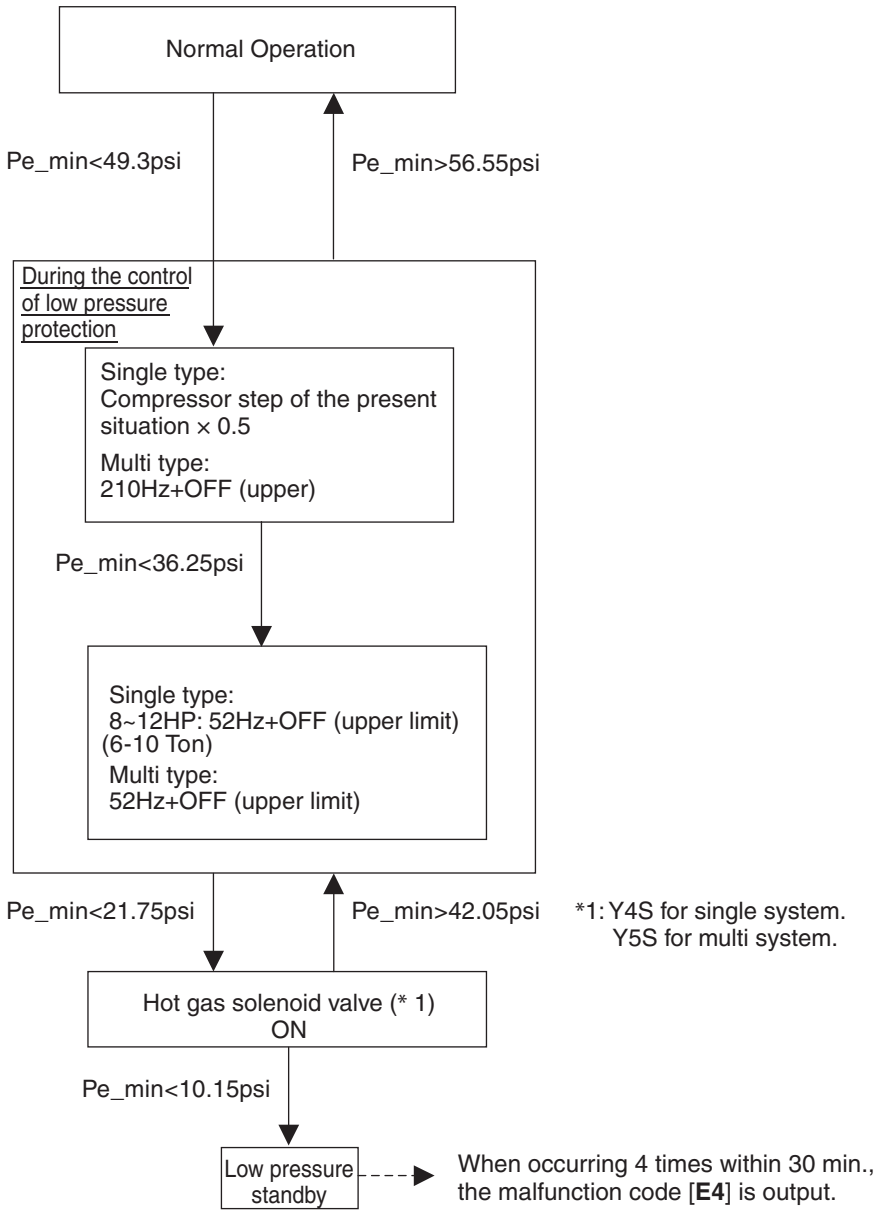
8.2 Low Pressure Protection Control

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

[In cooling operation]

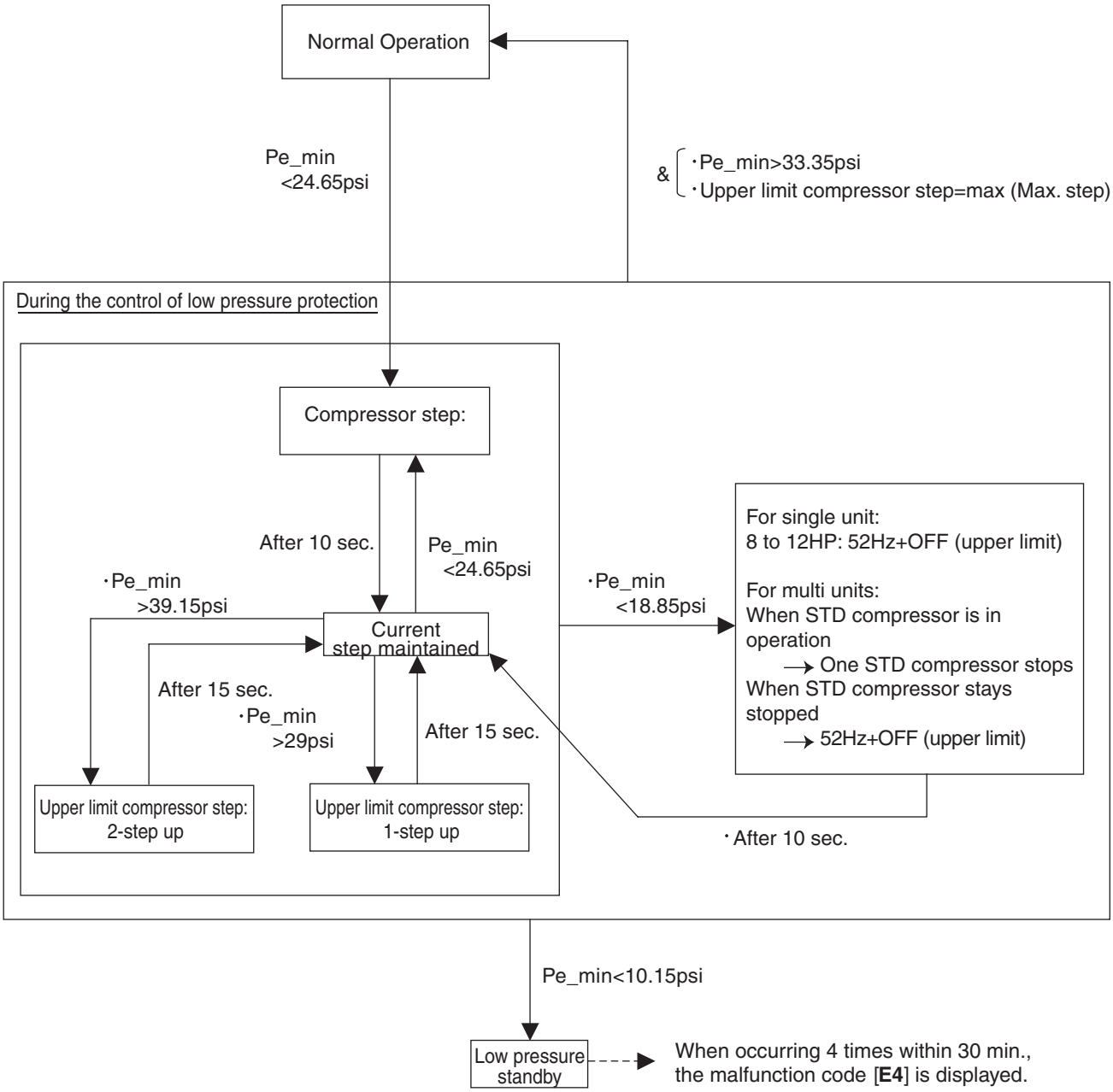
★ Because of common low pressure, the following control is performed in the system.

Pe_min indicates the minimum value within the system.



[In heating operation and Simultaneous Cooling / Heating Operation]

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



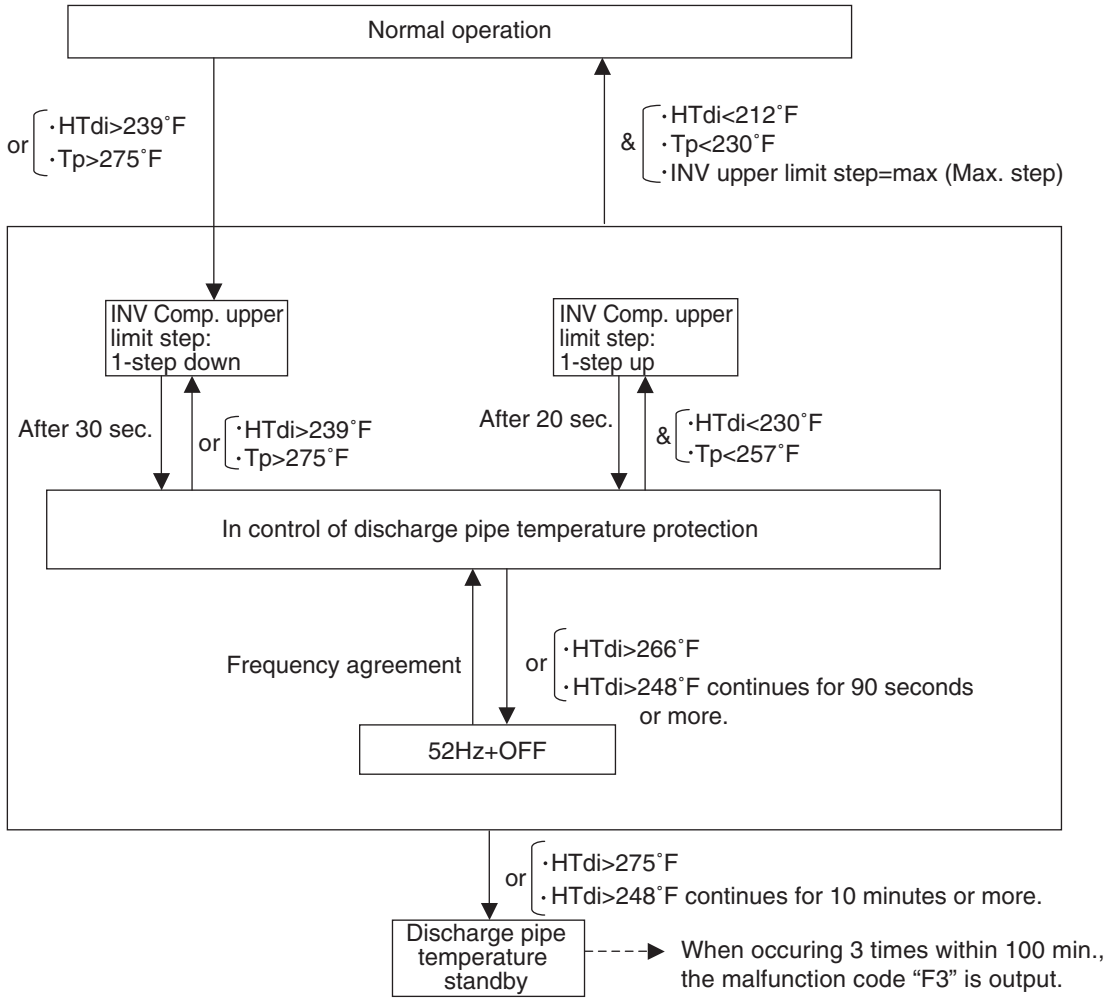
8.3 Discharge Pipe Protection Control

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

[Contents]

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

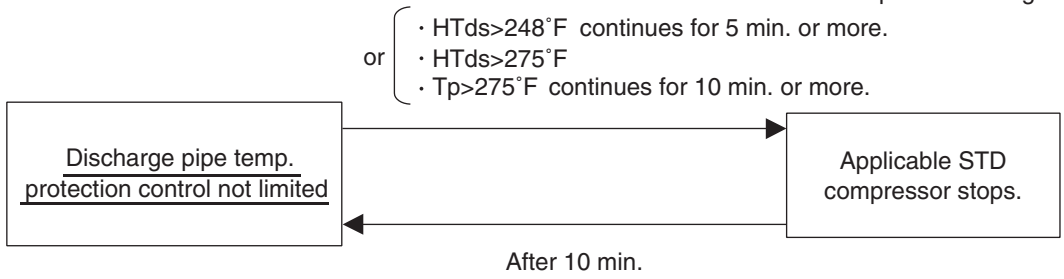
[INV compressor]



[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.



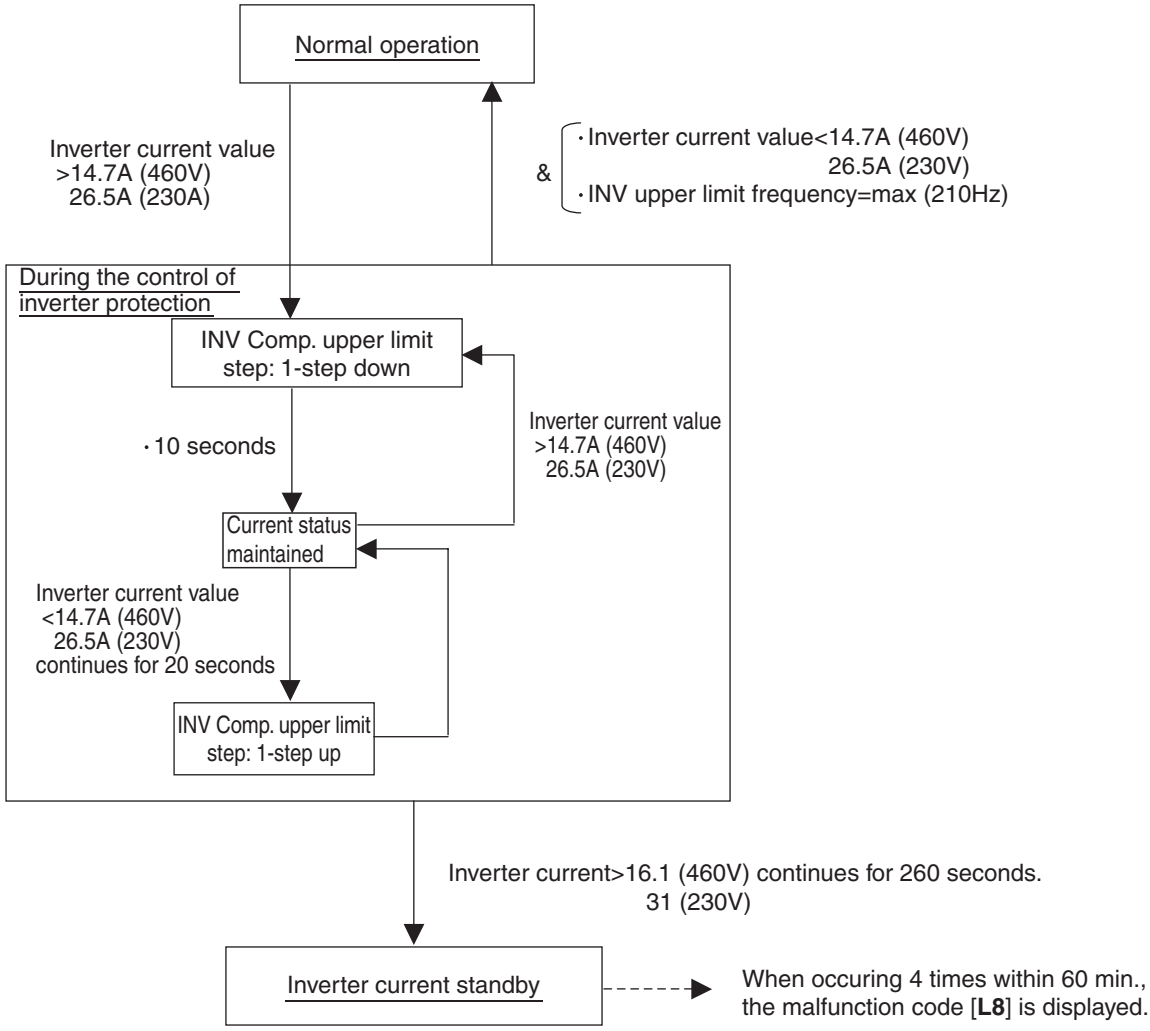
8.4 Inverter Protection Control

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

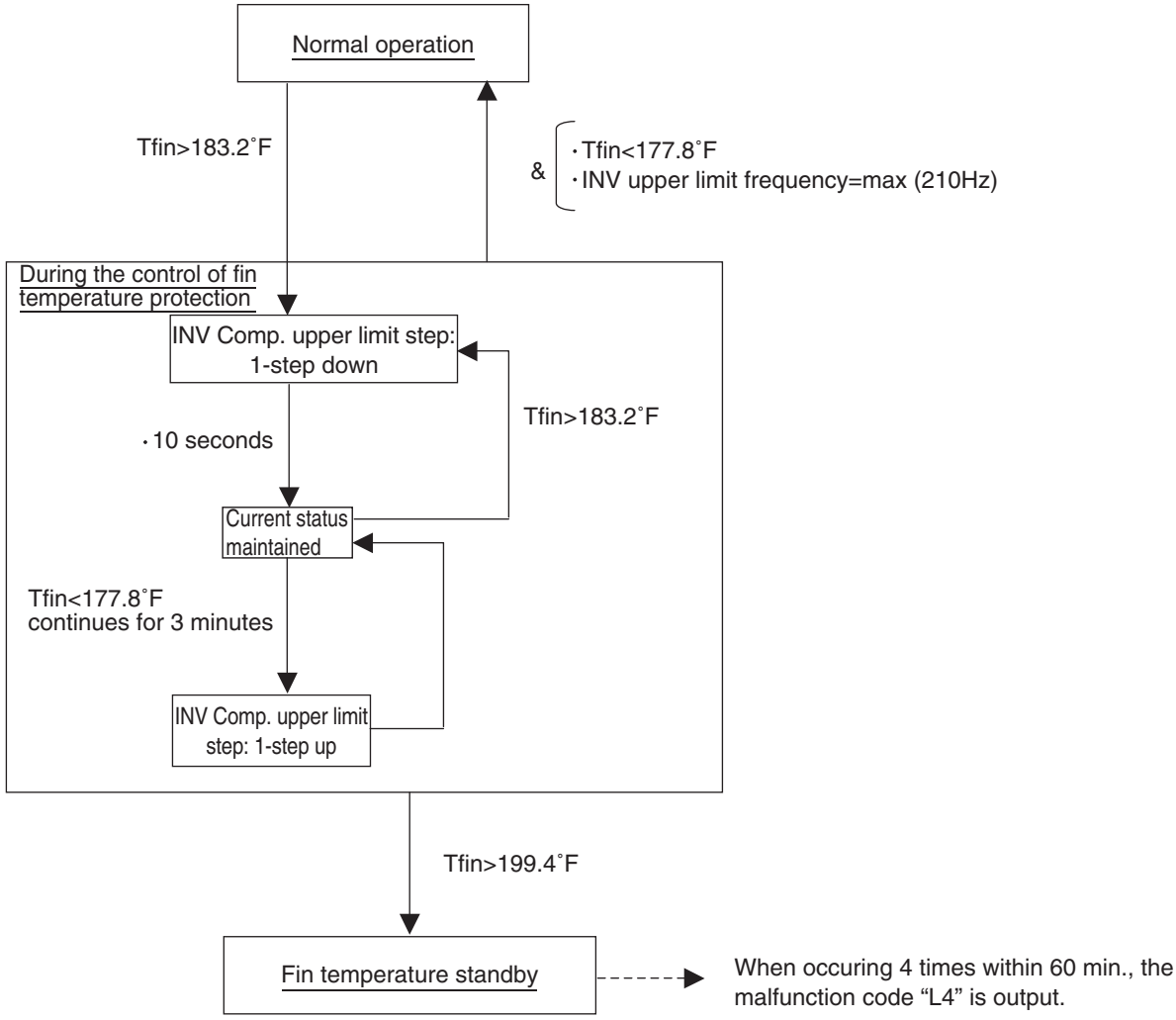
[Inverter overcurrent protection control]

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



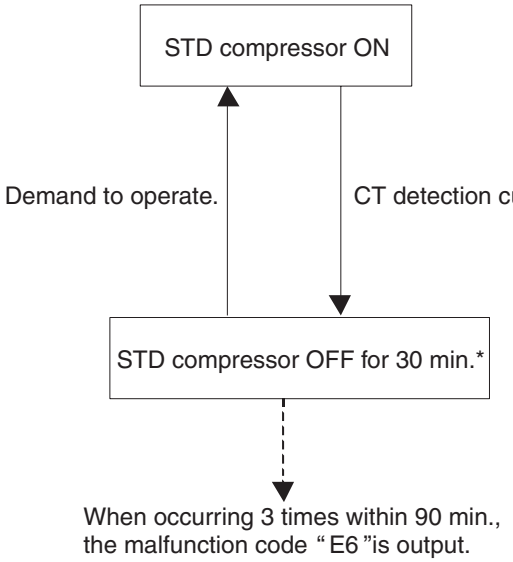
[Inverter fin temperature control]

★ 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.



*If the power supply is reset while in operation prohibition mode, the prohibition timer will continue counting when the power supply is turned ON.

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 PC board*** settings are available.

Operating method / Applicable model	(1) Emergency operation with remote controller reset (Auto backup operation)	(2) Emergency operation with outdoor unit PC board setting (Manual backup operation)
REYQ72 ~ 120PYDN REYQ72~144PTJU	–	Backup operation by the compressor
REYQ144 ~ 240PYDN REYQ168~240PTJU	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 RUN/STOP 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 PC board setting

[Setting method]

Change the setting of the compressor to the emergency operation setting as explained in Section 12, Field Setting on Page 95 in Section 2.

For details of the setting method, refer to page 264.[Details of operation]

Disable the compressor with the ***operation disable*** setting 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 adapter is required.

Set item	Condition	Content
Demand 1	Mode 1	The compressor operates at approx. 60% or less of rating.
	Mode 2	The compressor operates at approx. 70% or less of rating.
	Mode 3	The compressor operates at approx. 80% or less of rating.
Demand 2	—	The compressor operates at approx. 40% or less of rating.

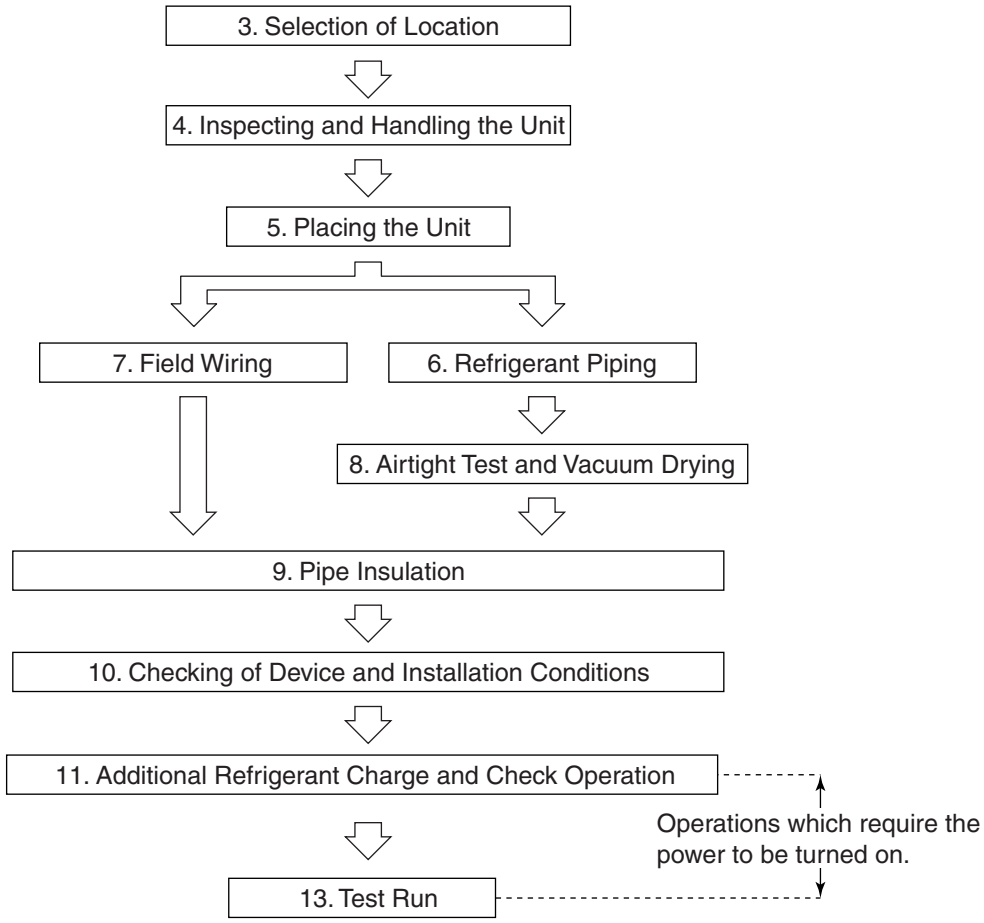
9.3 Heating Operation Prohibition

Heating operation is prohibited above 75.2°F ambient 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

Use the following procedure to conduct the initial test operation after installation:

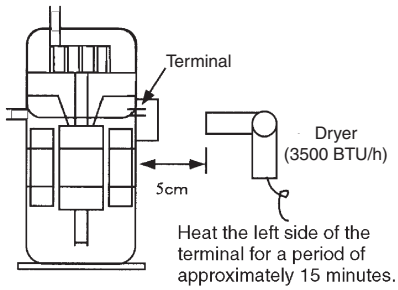
10.2.1 Check Work Prior to Turn Power Supply On

Check the below items.
- Power wiring
- Control transmission wiring between units
- Ground 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 200-240 circuits.

*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 correct?
- ○ 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 pipes need to be insulated. (Otherwise causes water leak.)

Check airtight test and vacuum drying.

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

Check on amount of refrigerant charge

○ Is the correct 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 ~ 120PYDN	7.9 lb
REYQ72 ~ 144PTJU	
REYQ144 ~ 192PYDN	2.2 lb
REYQ168 ~ 192PTJU	
REYQ216 ~ 240PYDN	3.3 lb
REYQ216 ~ 240PTJU	

Correction amount with a total capacity of indoor units

REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT	
INDOOR CONNECTION CAPACITY	MODEL NAME
	REYQ72 ~ 240PYDN REYQ72 ~ 240PTJU
MORE THAN 100% 120% OR LESS	1.1 lb
MORE THAN 120% 130% OR LESS	1.1 lb

- If there is a refrigerant shortage after the completion of vacuum drying, charge liquid refrigerant through the stop valve service port with the liquid and gas stop valves closed. .
- If the refrigerant charging is still insufficient, ***turn ON the power supply*** following the information on the page 222.

○ 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 PC board.

○ 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

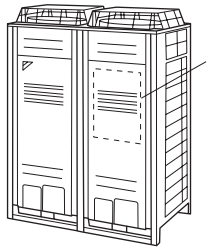
LED display (Default status before delivery)		Micro-computer operation monitor	MODE	TEST	COOL / HEAT select			Low noise	Demand	Multi
					IND	MASTER	SLAVE			
		HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
One outdoor unit installed		◑	●	●	○ ○	●	●	●	●	●
When multiple outdoor unit installed (*)	Master	◑	●	●	●	●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

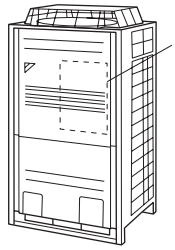
Make field settings with outdoor unit PC board.

○ Make field settings if needed.
For the setting procedure, refer to information in ***12.1 Field Setting from Outdoor Unit*** on page 242 onward.
For the outdoor-multi system, make field settings with the master unit.
Field settings made with the slave unit will be invalid.

⟨REYQ72~120PYDN
REYQ72~144PTJU⟩



⟨REMQ72~120PYDN
REMQ72~120PTJU⟩



* 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 judgment of piping length

Check for normal operation.

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

10.2.3 Air Tight Test and Vacuum Drying

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

Note:

- Always use nitrogen gas for the air-tightness test.
- Absolutely do not open the shutoff valve until the main power circuit insulation measurement has been completed. If you measure after the shutoff valve is opened, it will cause the insulation value to drop.

<Needed tools>

Gauge manifold Charge hose valve	• To prevent entry of any impurities and to ensure sufficient pressure resistance, always use the special tools dedicated for R-410A. • Use a charge hose that has a pushing stick for connecting to the service ports of shutoff 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 flows backward into the refrigerant pipe during the pump stops.

<The system for air tight test and vacuum drying>

- Referring to figure 25, connect a nitrogen tank, refrigerant tank, and a vacuum pump to the outside unit.
  The refrigerant tank and the charge hose connection to refrigerant charge port or the valve A in figure 25 are needed in **10.2.6 Additional Refrigerant Charge and Check Operation**.

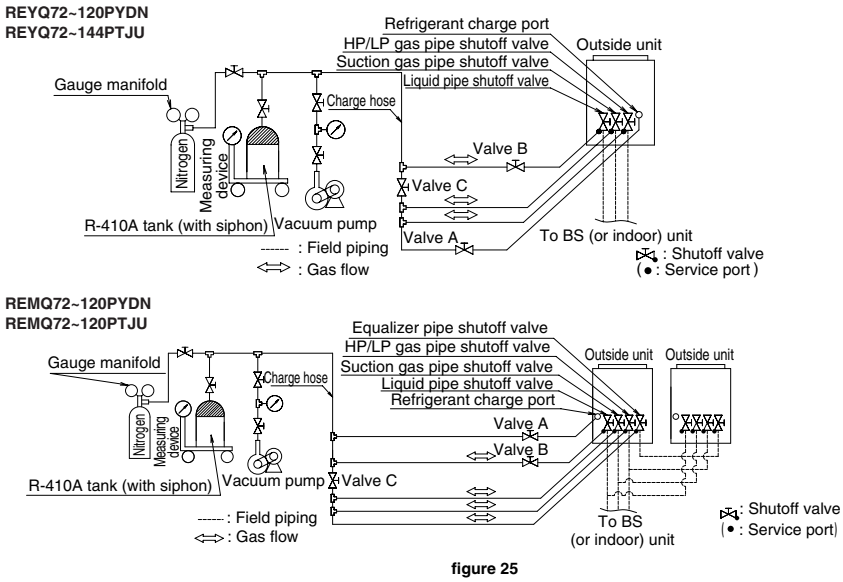


figure 25

Note:

- The air-tightness test and vacuum drying should be done using the service ports of equalizer pipe, HP/LP gas pipe, suction gas pipe and liquid pipe shutoff valve.
  See the [R-410A] Label attached to the front plate of the outside unit for details on the location of the service port (see figure in page 238)
- See **[Shutoff valve operation procedure]** in **10.2.6.1 Before working** for details on handling the shutoff 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, HP/LP gas pipe and equalizer pipe from the service ports of each shutoff 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 airtight test again.

<Vacuum drying>

Evacuate the system from the liquid pipe, suction gas pipe, HP/LP gas pipe and equalizer pipe shutoff 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 working while it is raining, condensation may form on the inside of the pipes.
If any moisture enters the piping, use the following precautions:

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 the steps described in Section **10.2.3 Air Tight Test And Vacuum Drying**.
- Always insulate the liquid piping, the HP/LP gas piping, the gas piping, the equalizer pipe (between the outside units for the outdoor multi system) and these pipe connections.
  Failing to insulate the pipes may cause leaking or burns.
- **IMPORTANT:**
  BE SURE to insulate the HP/LP gas piping as the suction pipe because the suction gas follows in the HP/LP gas piping when the system is entirely in cooling mode.
  BE SURE to use the 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.
  ■Ambient temperature : 86°F, humidity : 75% to 80% RH : min. thickness : 9/16 inches.
  ■If the ambient temperature exceeds 86°F and the humidity 80% RH, then the minimum thickness is 3/4 inches.
  See the Engineering data book for detail.
- If there is a possibility that condensation on the shutoff valve might drip down into the indoor unit through gaps in the insulation and piping because the outside unit is located higher than the indoor unit. This must be prevented by caulking the connections. **(Refer to figure 26)**
- The piping lead-out hole lid should be attached after opening a knock hole. **(Refer to figure 27)**
- If small animals or foreign materials 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 30)**

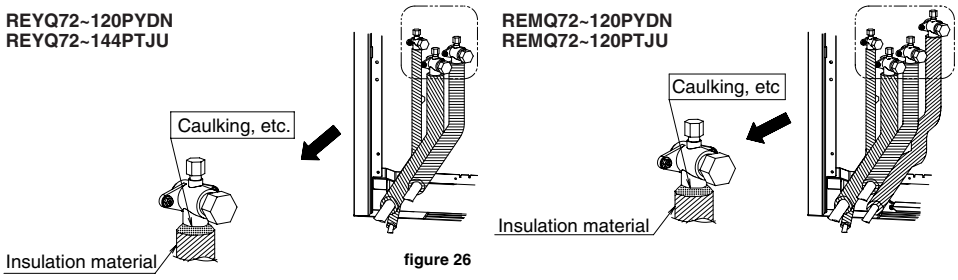


figure 26

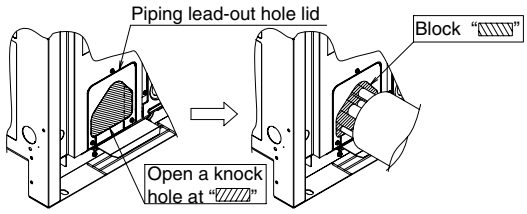


figure 27

NOTE:

- After knocking out the holes, we recommend you remove burrs in the knock holes **(See figure 27)** 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 following:

For those doing electrical work

1. Make sure there is no faulty transmission wiring or loosening of a nut.
2. Make sure there is no faulty power wiring or loosening of a nut.
3. Has the insulation of the main power circuit deteriorated?
   Measure the insulation and check to ensure that the insulation is above the 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 faulty refrigerant piping.

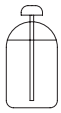
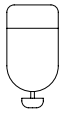
10.2.6 Additional Refrigerant Charge and Check Operation

The outside 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 to be put upside-down to charge in liquid form.)
Other tanks
 Stand the tank upside-down and charge.

NOTE:

- Always use the proper refrigerant (R-410A). If charged with 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.

[Shutoff valve operation procedure]

When operating the shutoff valve, use the following procedures:

NOTE:

- Do not open the shutoff valve until the steps in Section **10.2.5 Checking of Device and Installation Conditions** are completed. If the shutoff valve is left open without turning on the power, it may cause refrigerant to build up in the compressor, leading to insulation degradation.
- Be sure to use the correct tools.
  The shutoff valve is not a back-seat type. If forced 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 shutoff valves on each model and the tightening torque for each size are listed in the table below.

<Size of Shutoff Valve>

	72P type	96P type	120P/144P type
Liquid pipe shutoff valve	ϕ3/8 The 120P type / RXYQ144PTJU corresponds to the ϕ1/2 - diameter onsite piping using the accessory pipe.		
(2) Low side equalizer pipe shutoff valve	ϕ3/4		
(3) Gas shutoff valve	ϕ1 The 72P type corresponds to the ϕ3/4 - diameter onsite piping using the accessory pipe. The 96P type corresponds to the ϕ7/8 - diameter onsite piping using the accessory pipe. The 120P/144P type corresponds to the ϕ1-1/8 - diameter onsite piping using the accessory pipe.		
(4) High side equalizer pipe shutoff valve	ϕ3/4		

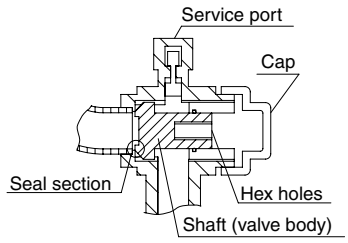


figure 28

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 table <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 table <Tightening Torque>.

<Tightening torque>

Shutoff 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 outside units in the system are turned on by operating the push button on the PC-board (A1P) of outside unit (In case of multi system master unit).
Follow the procedure below to check how many indoor or outside 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. $32 \times \mathbf{0} + 16 \times \mathbf{1} + 8 \times \mathbf{0} + 4 \times \mathbf{1} + 2 \times \mathbf{1} + 1 \times \mathbf{0} = 22$ units Note: "000000" indicates 64 units.		◑	●	◑	●	◑	◑	●
(4) Press the MODE button (BS1) once. This returns to **Setting Mode 1** (H1P : OFF, default).		●	●	☼	●	●	●	●

NOTE:

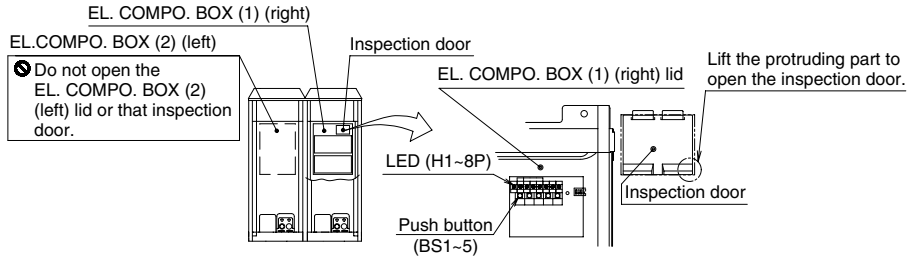
Press the MODE button (BS1) if you get confused while operating.
This returns to **Setting Mode 1** (H1P : OFF, default).

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 PC-board (A1P) of the outside unit and check the LED display after the power is on via the inspection door which is in the Electrical Components Box lid.

REYQ72~120PYDN
REYQ72~144PTJU



REMQ72~120PYDN
REMQ72~120PTJU

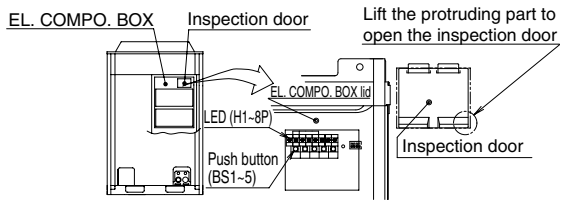


figure 29

- Use an insulated rod to operate the push buttons via the Electrical Components Box 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 gloves 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 while working on the BS and indoor unit.
- When opening the front panel, make sure to be careful of the fan rotation while working. After the outside unit stops operating, the fan may continue rotating for a while.
- **NOTE:** If operation is performed within 12 minutes after the BS, indoor and outside 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, allow up to 10 minutes after initially starting operation for the compressor to startup. . This is not a malfunction.
- 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 cap of the refrigerant charging port.
  The tightening torque for the lid is 8.48 to 10.3 ft · lbf.
- See [Shutoff valve operation procedure] in chapter 10.2.6.1 for details on how to handle shutoff 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 has an electric 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 incorrect.
- Make sure to perform the check operation after installation. Otherwise, the malfunction code **[U3]** will be displayed and normal operation cannot be performed.
  Failure to check for miswiring may also cause abnormal operation. Performance may drop due to the failure of proper judgment 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.
  Perform a test run after the check operation is completed. (See Section 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 BS, indoor unit
2. Calculate the ***additional charging amount*** using ***How to calculate the additional refrigerant to be charged*** in **Part 6. Example of connection**.

3. Open the valve B (**See the figure 30**. The valve A,C and the liquid pipe, suction gas pipe, HP/LP gas pipe, equalizer pipe shutoff valves must be left closed), and charge the refrigerant of the ***additional charging amount*** from the liquid side shutout valve service port.

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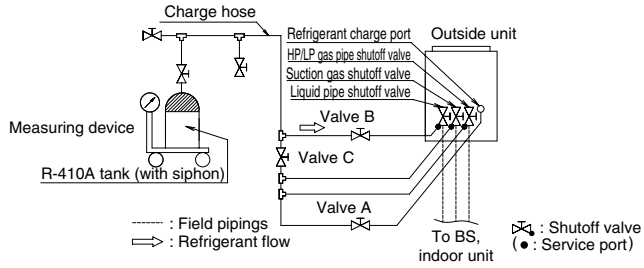
REYQ72~144PTJU



REMQ72~120PYDN
REMQ72~120PTJU

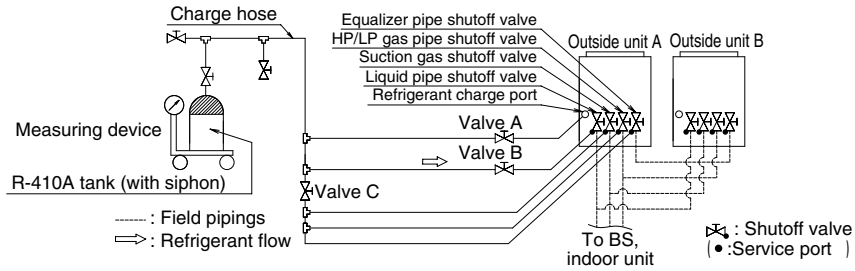


figure 30

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. Charge the remaining refrigerant of the ***additional charging amount***.

NOTE:

- For performing the automatic refrigerant charging operation, the push button on the PC-board (A1) of outside unit is used. (See figure 29.)
  The refrigerant is charged from the refrigerant charge port via the valve A. (See figure 31.) For operating the push 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
  Less than 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 forcibly by pushing

MODE button (BS1).

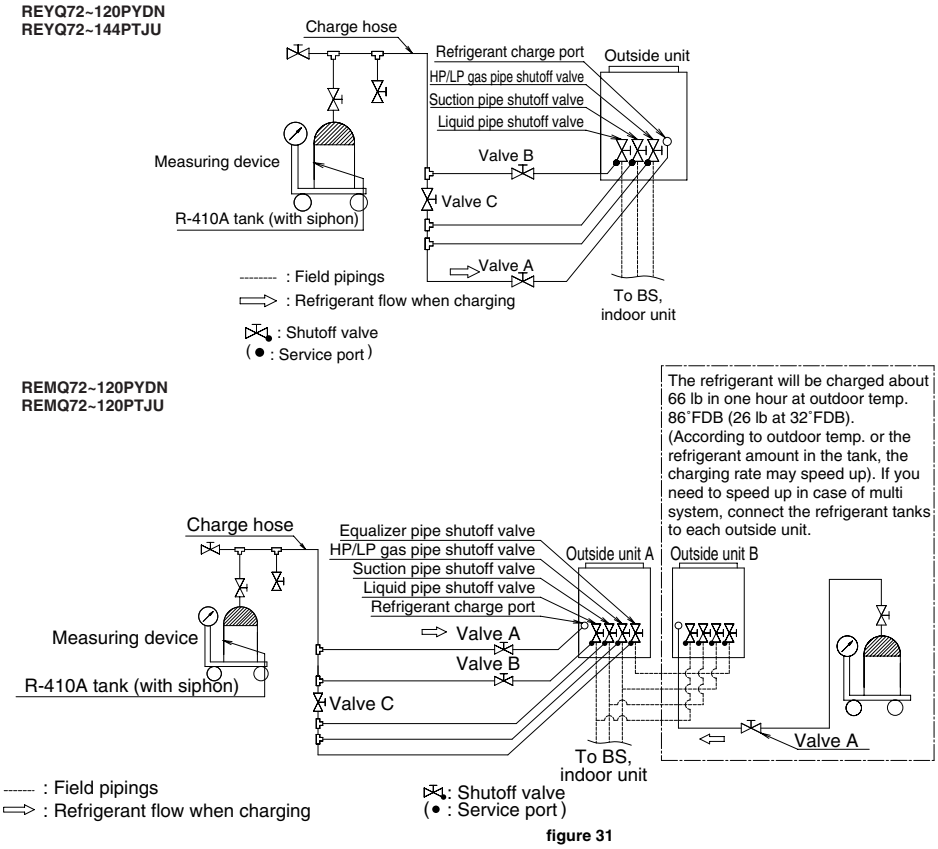


figure 31

[Automatic refrigerant charging operation procedure]

NOTE:

- The LED signals represent the following:
  ● : OFF ☼ : ON ◑ : Blinking ∗ : OFF, ON or Blinking

(1) Open the liquid pipe, suction gas pipe and HP/LP gas pipe shutoff valves. (The valve A~C must be closed. See figure 31.)

(2) • Close the Electrical Componets Box (1) lid and all front panels except on the Electrical Componets Box (1) side. (*1) Turn on the power to the outdoor unit and all connected BS, indoor units. (*2)

• After H2P stops blinking (about 12 minutes after turning on the power), check that H2P is OFF. If H2P is ON, check the malfunction code in the remote controller of indoor unit and correct the malfunction in accordance with [***Remote controller display malfunction code***] in chapter 11-2-2.

(3) Check the LED. And push the MODE button (BS1) once if the LED displays is not as shown in the following diagram:

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

(4) Push 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 outside unit will start rotation.)

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

(6) When the compressor starts working and the LED displays change any state in the diagram 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) Push the TEST button (BS4) once within 5 minutes after procedure (5) (*4) and close all front panels (*5).
After that, open 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), be ready to close Valve A.
And go to procedure (9).
If the remote controller display shows another code, close Valve A immediately and refer to [Remote controller cooling mode malfunction code]

⚠ **Beware of the fan running when opening the front panel.**
The fan may continue rotation after the system stops operation.

(9) When the compressor stops working (the fan may continue rotation.), close Valve A immediately (*8).
And check that the LED displays are as below and that the remote controller display shows [**P9**] code.

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

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

In case of heating mode

(7) Push the TEST button (BS4) once within 5 minutes after procedure (5) (*4) and close all front panels.
After that, open valve A immediately (See figure 31) (*6) and check the charged amount by a measuring device.
During operation, if the remote controller display shows [**P2**] or [**P8**] code, close Valve A immediately and refer to [**Remote controller heating mode malfunction code**].

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

(8) When the required amount of refrigerant is charged, close Valve A (See figure 31) (*8) and push the **RETURN** button (BS3) once.

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

Notes (*1)~(*9)

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

(*2) • If you perform the refrigerant charging operation with a refrigerant system that has the power off, the operation cannot finish properly. Check the number of outside and indoor

units 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 the power for 6 hours before starting operation.

(*3) It takes about 2~10 minutes to achieve refrigerant stability.
If too little refrigerant is added and operation is started before stability is achieved, the system cannot precisely judge the amount charged and overcharging will result.

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

(*5) If the front panel is opened during 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 stops operation and the [**P2**] code is displayed on the remote controller.
In this case, refer to [**Remote controller cooling (or heating) mode malfunction code**].

(*7) Depending on the situation of operation, such as not enough refrigerant charge, the [**PE**] code may not be displayed and the [**P9**] code may be displayed.

(*8) Always close Valve A and take the tank off.
The refrigerant charge port of this unit has an electric expansion valve and the valve is closed when charging is finished. However, the valve will open if other operations take place. (Check operation, normal operation, etc.) If you leave the tank connected, the refrigerant will over charge.

[Remote controller cooling mode malfunction code]

<table>
<tr><th>Code</th><th colspan="2">Meaning / Action</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 Valve A and replace empty tank to the new tank. After changing the tank, open Valve A again.
⚠ Beware of the fan running. The outside 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 Valve A immediately and check the below items.
●Check if the HP/LP gas pipe, suction gas pipe or liquid pipe shutoff valve is opened.
●Check if the refrigerant tank is connected and if Valve A was opened.
●Check that 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 Valve A immediately. Confirm the malfunction code and correct the abnormality following the [Remote controller displays malfunction code] in chapter 10.2.6.2.</td></tr>
<tr><td>P9</td><td colspan="2">Charging is finished. Close Valve A and take the refrigerant tank off.</td></tr>
</table>

[Remote controller heating mode malfunction code]

Code	Meaning/ Action
P8	Close Valve A immediately and push the TEST button (BS4) once. Restart from procedure (7) ***In case of heating mode***.
P2	Operation is interrupted. Close Valve A immediately and check the below items. ●Check if the HP/LP gas pipe, suction gas pipe or liquid pipe shutoff valve is opened. ●Check if the refrigerant tank is connected and if 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 INDICATON** label (Installation records) and adhere it to the back side of the front panel. Record the factory charged refrigerant amount, additional refrigerant amount in the field, and total refrigerant amount of the system to the ADDITIONAL REF. CHARGE label and adhere it in the proximity of the refrigerant charge port.

10.2.6.2.2 Procedure of check operation

Conduct the following check operations or malfunction code [U3] will be displayed in the remote controller and normal operation cannot be carried out:

- Check shutoff valve opening
- Check for miswiring
- Judgment of piping length
- Check refrigerant overcharge

Note:

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

[Check Operation Procedure]

(1) Close the Electrical Components Box lid and all front panels except the side, and turn on the power to the outside unit and all connected BS, indoor units. Be sure to turn the power on at least 6 hours before operation in order to have power running to the crank case heater.

(2) Make the onsite settings as needed using the push button (BS1-BS5) on the outside unit PC-board (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 32) The system operates for about 40~60 minutes and then automatically stops the check operation. If the malfunction code is not displayed in the remote controller after the system stops, check operation is completed. Normal operation will be possible after 5 minutes. If the malfunction code is displayed in the remote controller, correct the malfunction following [Remote controller displays malfunction code] and perform the check operation again.

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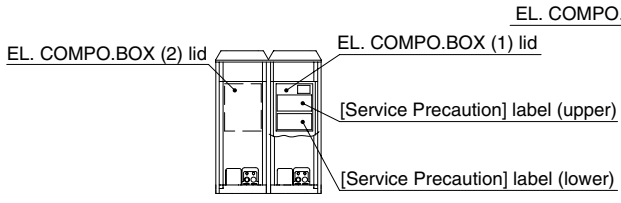
REYQ72~144PTJU



REMQ72~120PYDN
REMQ72~120PTJU

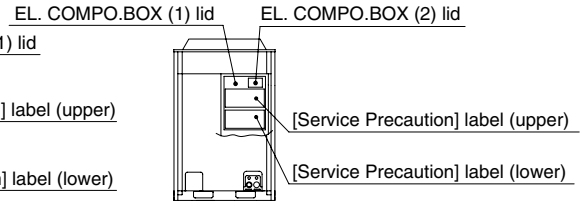


figure 32

Note:

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

[Remote controller displays malfunction code]

Malfunction code	Installation error	Remedial action
E3, E4 F3, F6 UF	The shutoff valve of the outside unit is left closed.	Open the shutoff valve.
U1	The phases of the power to the outside 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 outside, BS or indoor unit (including phase interruption).	Make sure the power source wire is properly connected to the outside, BS 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 refrigerant amount 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 outside unit PC-board (A1P) when the system is one outdoor system.	Remove the line from the **TO MULTI UNIT (Q1,Q2)** terminal.

Note: If any malfunction codes other than the above are displayed, check the service manual for proper procedure.

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 subunits are invalid.

The outside unit to which the indoor unit transmission wires are connected is the master unit, and all other units are subunits.

Use the push button switches (BS1 through BS5) on the outside unit PC board (A1P) to make the necessary onsite settings.

See the [**Service Precautions]** label (upper) on the Electrical Components Boxlid for details on the positions and operating method of the push button switches 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 push buttons via the inspection door of the Electrical Components Box lid.

Avoid touching any live parts as this operation takes place 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 BS and indoor unit is finished and that there is 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 outside units are operating normally.
(2) Operate each indoor unit one by one and make sure the corresponding outside unit is also operating.
(3) Check to see if cold (or hot) air is coming out from the indoor unit.
(4) Push 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 crank case heater for a sufficient length of time before restarting the operation.
- Once stopped, the compressor will not restart for 5 minutes even if the On/Off button of the remote controller is pushed.
- When the system operation is stopped by the remote controller, the outside units may continue operating for up to 5 additional minutes.
- The outside unit fan may rotate at low speeds if the Night-time low noise setting or the External low noise level setting is made, but this is not a malfunction.
- If the check operation was not performed at first installation, the malfunction 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 the 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.
  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.

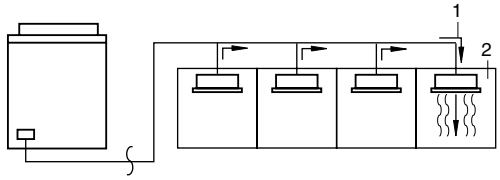
The VRV System, like other air conditioning systems, uses R-410A. R-410A itself is an entirely safe non-toxic, non-combustible refrigerant. Nevertheless, care must be taken to ensure that air-conditioning facilities are installed in a large enough room. to comply with local applicable regulations and standards. This precaution ensures that the maximum concentration level of refrigerant is not exceeded in the unlikely even of a major leak in the system..

Maximum concentration level

The maximum charge of refrigerant and the calculation of the maximum concentration of refrigerant is directly related to the human-occupied space into 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 a special attention to the place, such as a basement, 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 to 4 below and take whatever action is necessary to comply.

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

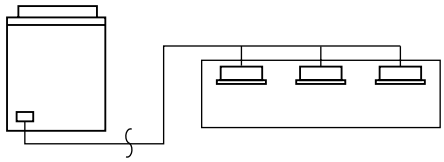
amount of refrigerant in a single unit system (amount of refrigerant with which the system is charged before leaving the factory)	+	additional charging amount (amount of refrigerant added locally in accordance with the length or diameter of the refrigerant piping)	=	total amount of refrigerant (lb) in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

Note:

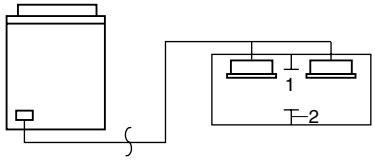
- Where a single refrigerant facility is divided into 2 entirely independent refrigerant systems, use the amount of refrigerant with which each separate system is charged.

2. Calculate the smallest room volume (ft^3)
   For the following cases, calculate the volume of (A), (B) as a single room or as the smallest room.

A.Where there are no smaller room divisions



B.Where there is a room division but there is an opening between the rooms sufficiently large to permit a free flow of air back and forth.



1.opening between rooms

2.partition

Where there is an opening without a door or where there are openings above and below the door that are each equivalent in size to 0.15% or more of the floor area.

NOTE:

3. 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.

4. Follow local code requirements (ASHRAI-15 2007 & ASHRAI-34 2007).

10.3 Operation when Power is Turned On

10.3.1 When Turning On Power for the First Time

The unit cannot be run for up to 12 minutes to allow for automatic setting of the master power and its indoor-outdoor addresses.

Status

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

10.3.2 When Turning On Power the Second Time and Subsequent

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

Status

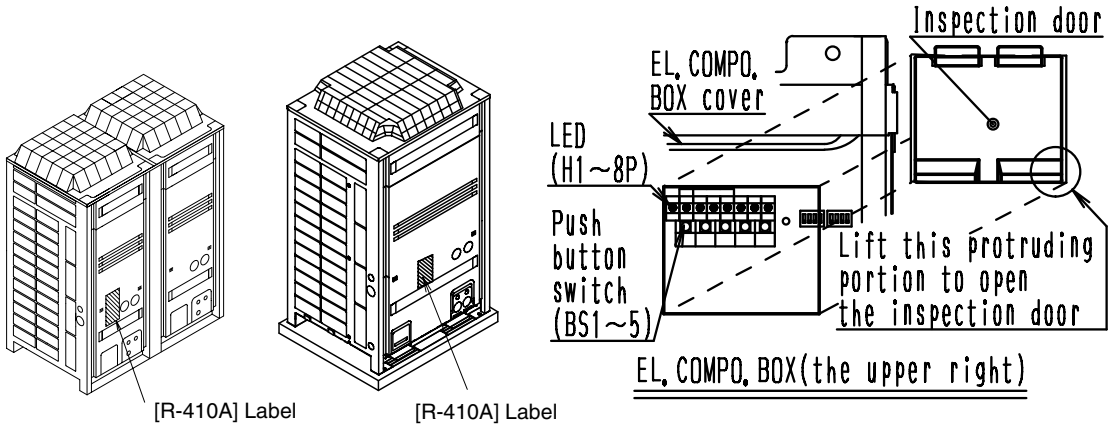
Outdoor unit	Test lamp H2P .... Blinks Can also be set during operation described above.
Indoor unit	If **ON** button is pushed during operation described above, the operation lamp lights but the compressor does not operate. (Returns to normal when automatic setting is complete.)

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

Be sure to push and hold the **RESET** button for 5 seconds. If not, the addition cannot be recognized. In this case, the unit cannot be run for up to 12 minutes to to allow for automatic setting of the indoor-outdoor addresses.

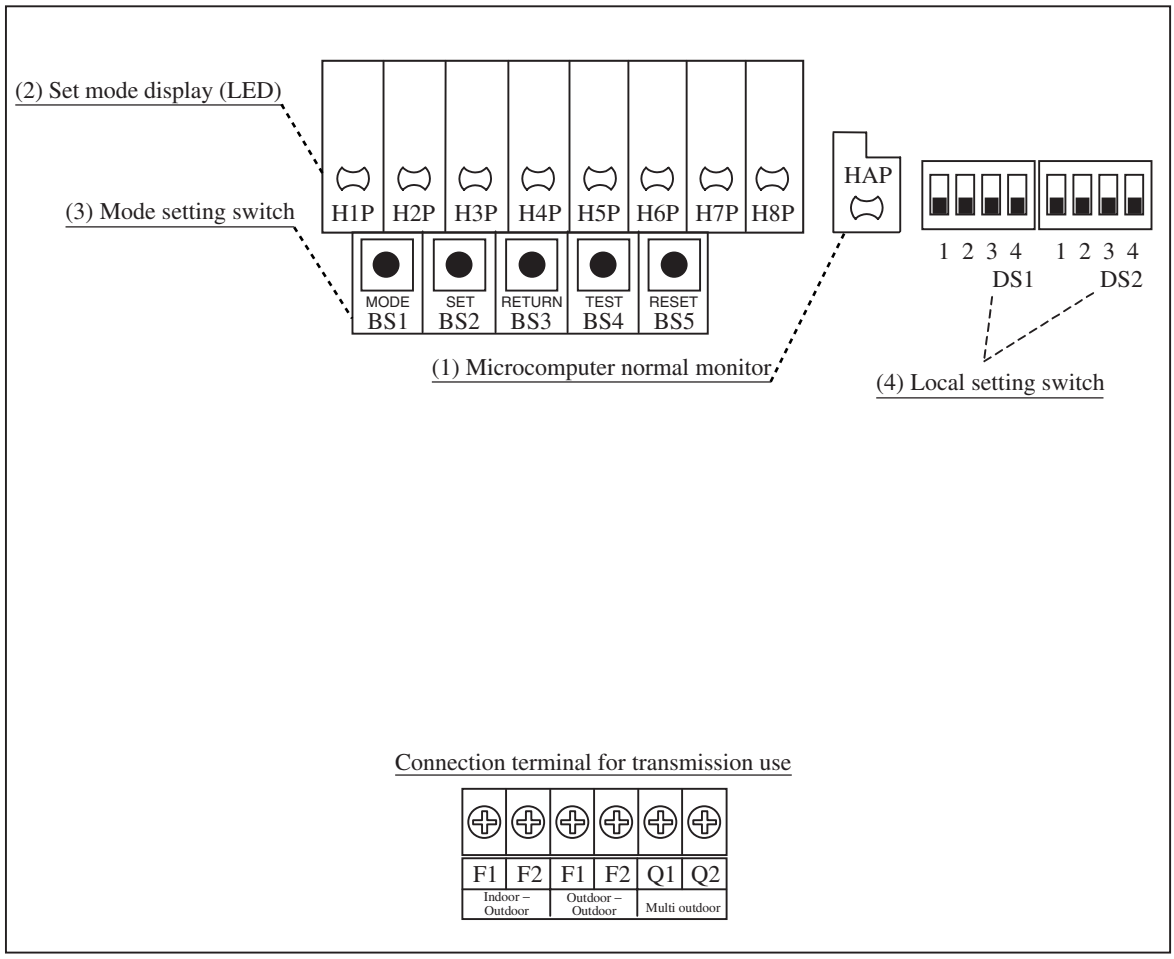
Status

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


[R-410A] Label
[R-410A] Label
Inspection door
EL. COMPO.
BOX cover
LED
(H1~8P)
Push
button
switch
(BS1~5)
Lift this protruding
portion to open
the inspection door
EL. COMPO. BOX(the upper right)

11.Outdoor Unit PC Board Layout

Outdoor unit PC board



(V3054)

(1) Microcomputer normal monitor
This monitor blinks while in normal operation, and turns on or off when a malfunction occurs.

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

(3) Mode setting switch
Used to change mode.

(4) Local setting 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 page 249 onward.

Setting item			Content and objective of setting	Overview of setting procedure	Reference page
Function setting	2	Setting of low noise operation (*1)	A. Use external input to step down the upper limit of the fan (factory set to Step 8), providing low noise level. (1) Mode 1: Step 5 or lower (2) Mode 2: Step 4 or lower (3) Mode 3: Step 3 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.	256~261
			B. The low noise operation aforementioned is enabled in nighttime automatic low 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.	256~261
	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 an **External Control Adapter**: Set the system to **External control adaptor for outdoor unit** with No. 12 of **Setting mode 2** and select the mode with No. 30.	256~261
				■ 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.	256~261
	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**.	249~252
	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.	249~252
	7	Prevention of bleed heating operation by heating thermostat OFF unit or non-heating-operation unit	■ Make this setting to prevent a rise in room temperature due to bleed 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**)	249~252
	8	Setting of BS Cool-Heat selection control time	■ Make this setting to shorten the BS Cool-Heat selection control time.	■ Set the Setting item No. 42 of **Setting mode 2** to **ON**.	249~252

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.	249~252
	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.	249~252
	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**.	249~252
	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**.	249~252
	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**.	249~252
	6	Setting of sequential startup	■ Used to start units not in sequence but simultaneously.	■ Set No. 11 of **Setting mode 2** to NONE.	249~252
	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.	264~267
	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.	226~235
	9	Refrigerant recovery mode (*1)	■ Used to recover refrigerant on site. With operations of indoor and outdoor units prohibited, open the outdoor/indoor 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.	262
	10	Vacuuming mode (*1)	■ Used to conduct vacuuming on site. Open the outdoor/indoor 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.	262
	11	ENECUT test operation	■ Used to forcedly turn ON the ENECUT. Note that this mode is not functional with the indoor unit remote controller turned ON.	■ Set No. 24 of **Setting mode 2** to ON.	249~252
	12	Power transistor check mode	■ Used for the troubleshooting of DC compressors. Inverter waveform output makes it possible to judge whether a malfunction results from the compressor or the PC board.	■ Set No. 28 of **Setting mode 2** to ON.	249~252
	13	Setting of model with spare PC board	■ In order to replace the PC board with a spare one, be sure to make model setting.	■ For this setting, set the DS2-2, -3, and-4 switches on the PC board to the model concerned.	243~246

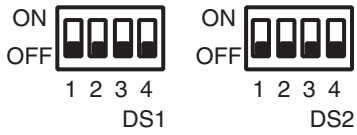
For setting items of (*1), refer to detailed information provided on page 249 onward.

12.1.2 Setting by Dip Switches

(1) Factory setting of initial PC board.

Do not make any changes to the factory settings of the DIP switches on the control PC board.

Status of DIP switches



■ : Represents the factory setting positions of the switches.

Setting at replacement by spare PC board

Caution

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

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

Initial conditions of dip switches

DIP Switch Detail

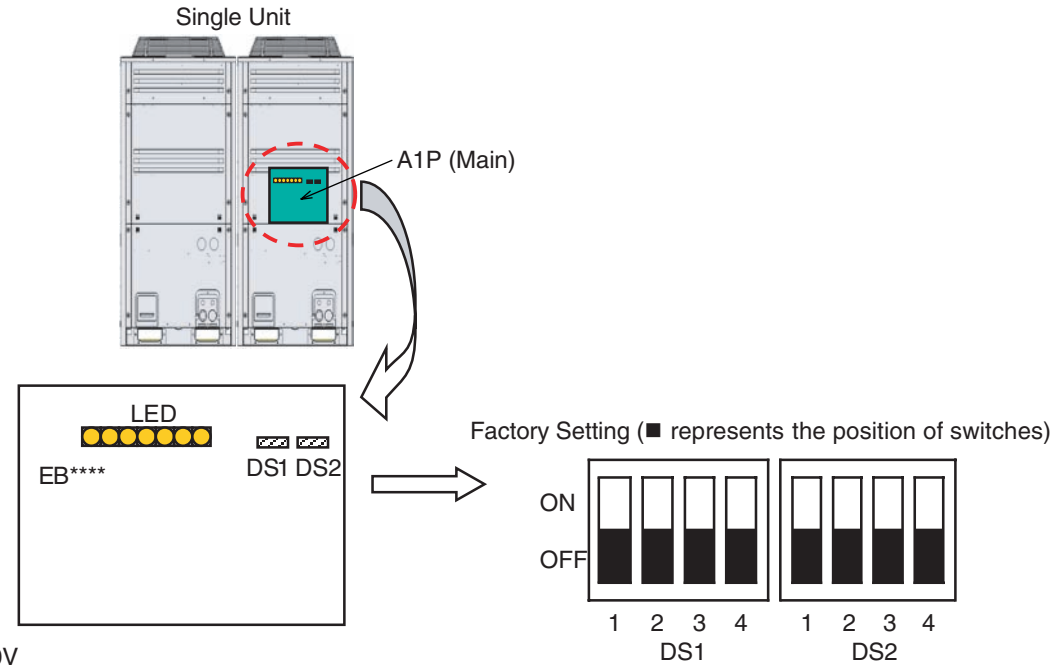
DS No.	Item	Contents	
DS1-2	Power supply specification	ON	200V class (220V)
		OFF (Factory setting of spare PC board)	400V class (380V)
DS1-3 Except Multiple use	Cooling only/Heat-pump setting	ON	Cooling only setting
		OFF (Factory setting of spare PC board)	Heat pump setting
DS1-4	Unit allocation setting	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 PC board)	

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

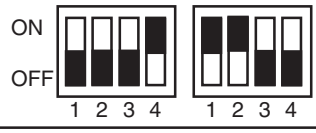
DS2-2	Model setting	Make the settings according to models of outdoor units. (All models are set to OFF at factory.) * Refer to following pages for setting detail.
DS2-3		
DS2-4		

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

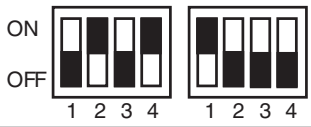
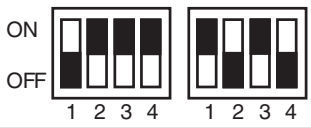
"Detail of DS1-1~4, DS2-1~4 setting"

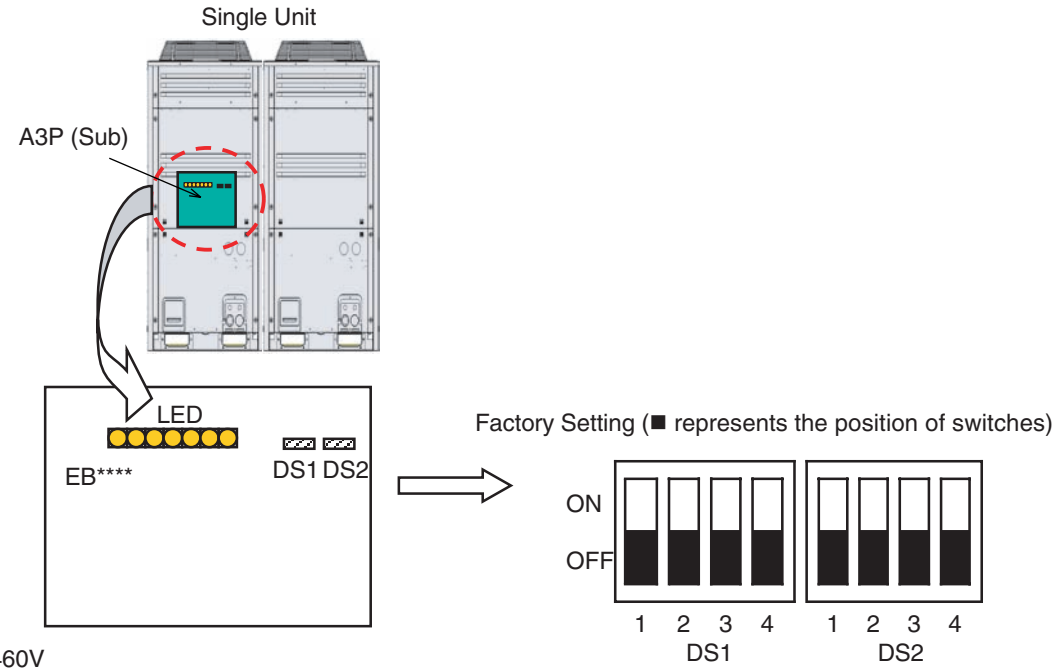


460V

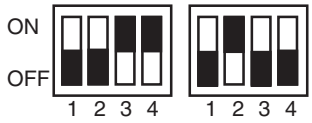
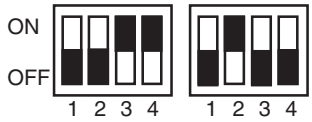
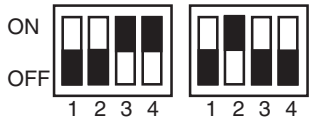
Application model	Setting method (■ represents the position of switches)	
HEAT RECOVERY(6ton) REYQ72PYDN		Set DS1-4, DS2-1 and DS2-3 to ON.
HEAT RECOVERY(8ton) REYQ96PYDN		Set DS1-4 and DS2-1 to ON.
HEAT RECOVERY(10ton) REYQ120PYDN		Set DS1-4, DS2-1 and DS2-2. to ON.

230V

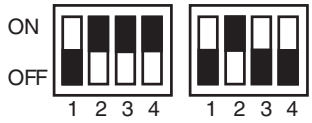
Application model	Setting method (■ represents the position of switches)	
HEAT RECOVERY (6ton) REYQ72PTJU		Set DS1-2, DS1-4, DS2-1 and DS2-3 to ON.
HEAT RECOVERY (8ton) REYQ96PTJU		Set DS1-2, DS1-4 and DS2-1 to ON.
HEAT RECOVERY (10ton) REYQ120PTJU		Set DS1-2, DS1-4, DS2-1 and DS2-2 to ON.
HEAT RECOVERY (12ton) REYQ144PTJU		Set DS1-2, DS1-3, DS1-4, DS2-1 and DS2-3 to ON.



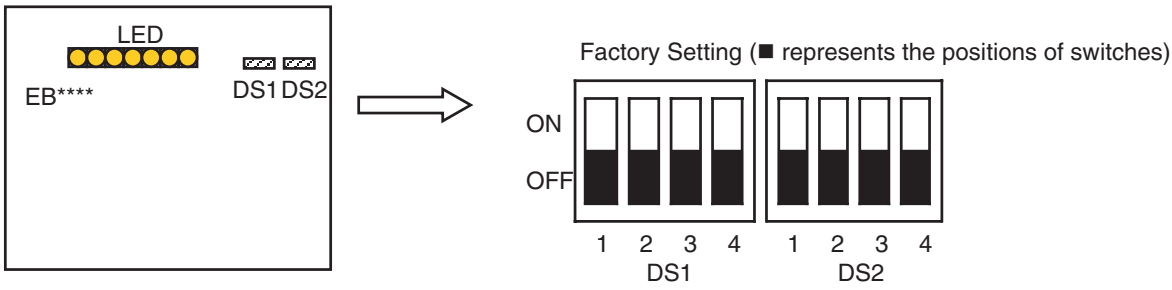
460V

Application model	Setting method (■ represents the position of switches)	
HEAT RECOVERY(6ton) REYQ72PYDN		Set DS1-3, DS1-4 and DS2-2 to ON.
HEAT RECOVERY(8ton) REYQ96PYDN		Set DS1-3, DS1-4 and DS2-2 to ON.
HEAT RECOVERY(10ton) REYQ120PYDN		Set DS1-3, DS1-4 and DS2-2 to ON.

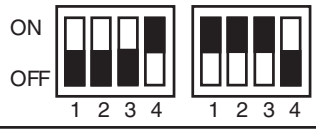
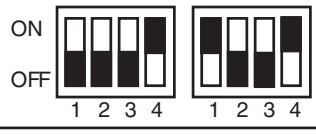
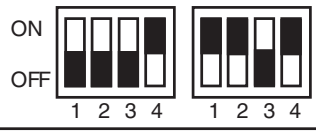
230V

Application model	Setting method (■ represents the position of switches)	
HEAT RECOVERY (6ton) REYQ72PTJU		Set DS1-2, DS1-3, DS1-4 and DS2-2 to ON.
HEAT RECOVERY (8ton) REYQ96PTJU		Set DS1-2, DS1-3, DS1-4 and DS2-2 to ON.
HEAT RECOVERY (10ton) REYQ120PTJU		Set DS1-2, DS1-3, DS1-4 and DS2-2 to ON.
HEAT RECOVERY (12ton) REYQ144PTJU		Set DS1-2, DS1-3, DS1-4, DS2-1 and DS2-3 to ON.

Detail of DS1-1~4, DS2-1~4 settingMulti-unit



460V

Application model	Setting method (■ represents the positions of switches)	
HEAT RECOVERY REMQ72PYDN		Set DS1-4, DS2-1, DS2-2 and DS2-3 to ON.
HEAT RECOVERY REMQ96PYDN		Set DS1-4, DS2-1 and DS2-4 to ON.
HEAT RECOVERY REMQ120PYDN		Set DS1-4, DS2-1, DS2-2 and DS2-4 to ON.

230V

Application model	Setting method (■ represents the positions of switches)	
HEAT RECOVERY (6ton) REMQ72PTJU		Set DS1-2, DS1-4, DS2-1, DS2-2 and DS2-3 to ON.
HEAT RECOVERY (8ton) REMQ96PTJU		Set DS1-2, DS1-4, DS2-1 and DS2-4 to ON.
HEAT RECOVERY (10ton) REMQ120PTJU		Set DS1-2, DS1-4, DS2-1, DS2-2 and DS2-4 to ON.

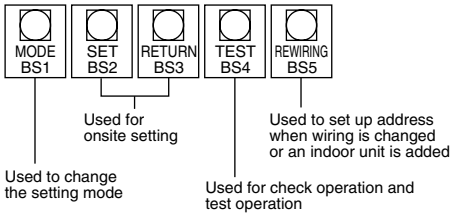
12.1.3 Setting by Push Button Switches

The following settings are made by push button switches on PC board.
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 are indicated with the LED display as displayed below:

LED display

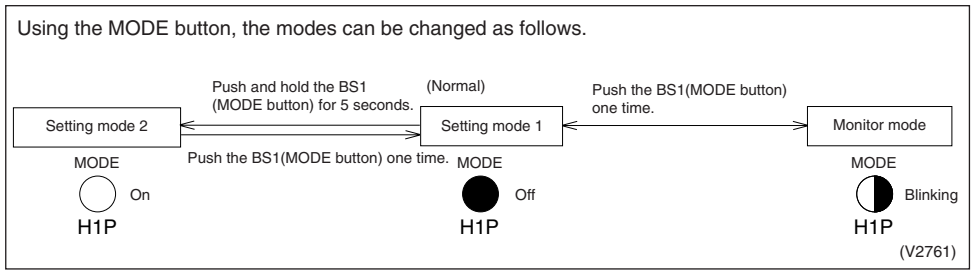
		MODE H1P	TEST H2P	COOL/HEAT select			Low noise H6P	Demand H7P	Multi; H8P
				IND H3P	MASTER H4P	SLAVE H5P			
Single-outdoor-unit system		●	●	○	●	●	●	●	●
Outdoor-multi system	Master	●	●	○	●	●	●	●	○
	Slave 1	●	●	●	●	●	●	●	◑

Pushbutton switches



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. 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**



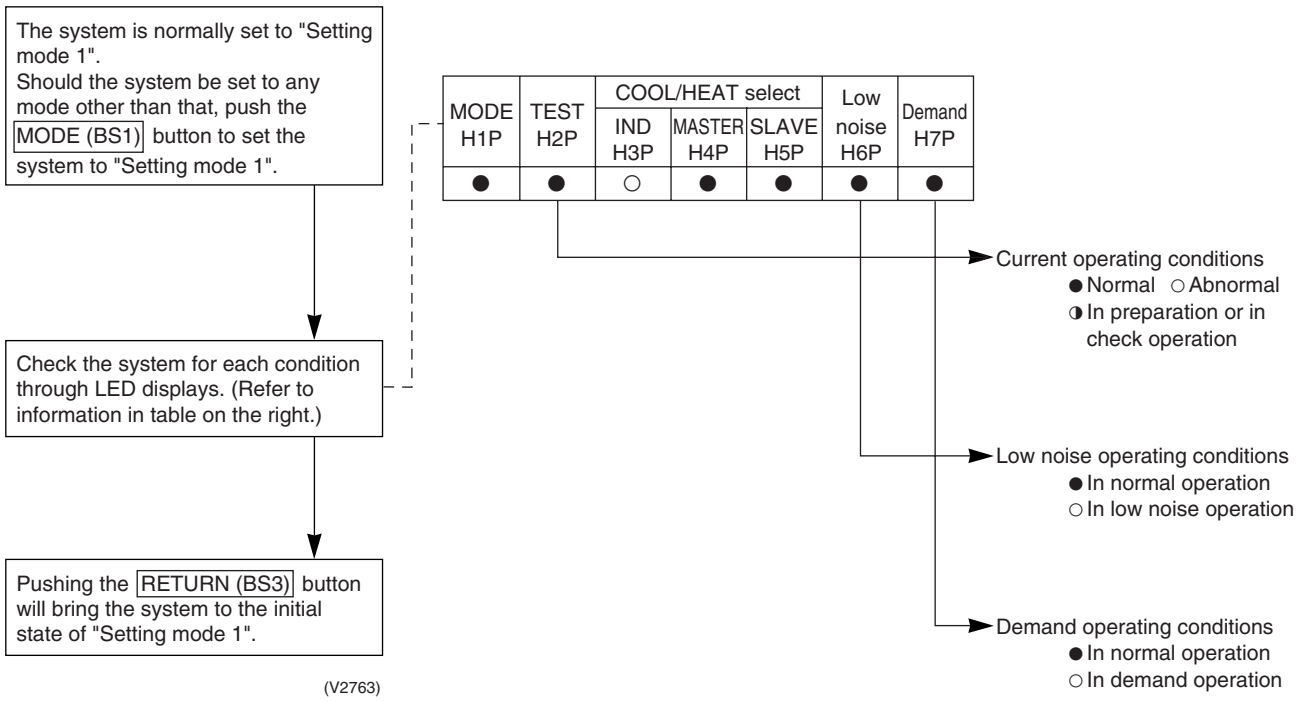
■ **Mode changing procedure 2**

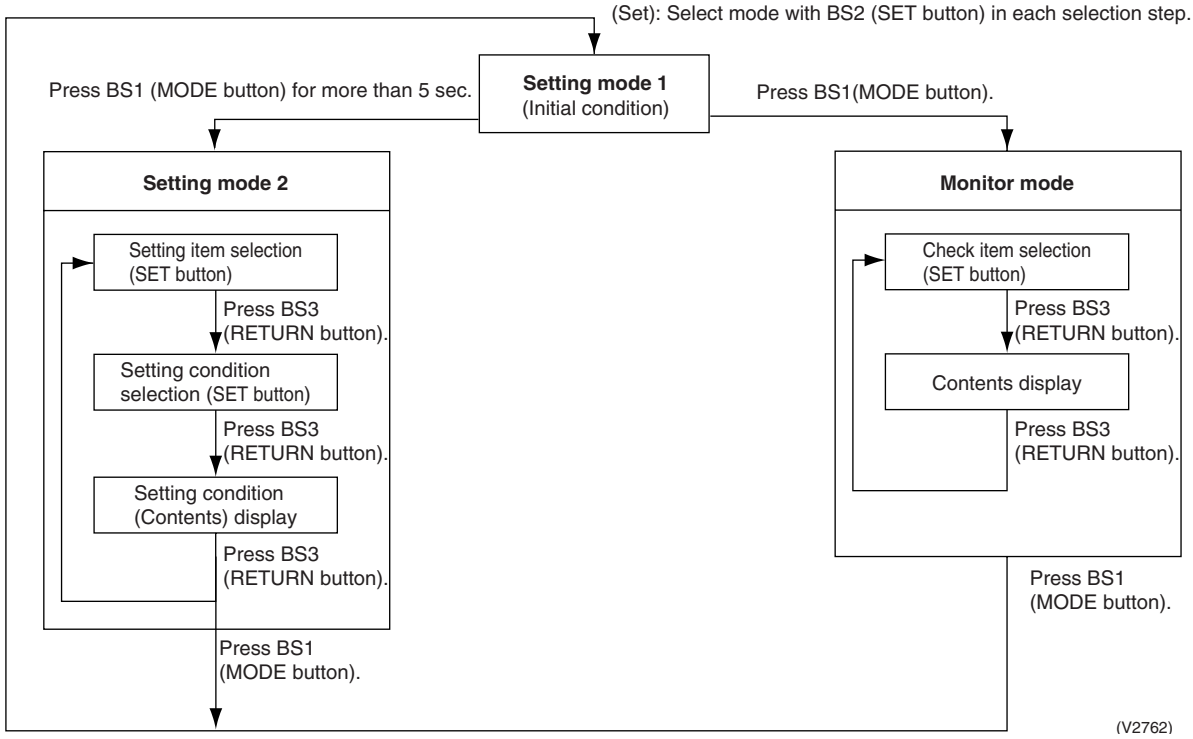
a. Setting mode 1

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

(1) Current operating conditions (Normal / Abnormal / In check operation)
(2) Low noise operating conditions (In normal operation / In low noise operation)
(3) Demand operating conditions (In normal operation / In demand operation)

Procedure for checking check items





b. Setting mode 2

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

<Selection of setting items>

Push the SET (BS2) button and set the LED display to a setting item shown in the table on the right.

Push the RETURN (BS3) button and decide the item. (The present setting condition is blinked.)

<Selection of setting conditions>

Push the SET (BS2) button and set to the setting condition you want.

Push the RETURN (BS3) button and decide the condition.

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

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

(V2764)

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 PC board 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 evaporation temperature for cooling
9	Tc setting	Target condensation temperature for heating
10	Defrost changeover setting	Changes the temperature condition for defrost and sets to quick defrost or slow defrost.
11	Sequential operation setting	Sets sequential operation (Factory set to ON)
12	External low noise setting / Demand setting	Reception of external low noise or demand signal
13	AIRNET address	Set address for AIRNET.
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	Night-time low noise setting	Sets automatic nighttime low noise operation in a simple way. The operating time is based on “Starting set” and “Ending set”.
24	ENECUT test operation	Used to forcibly turn ON the ENECUT. (Be noted that the ENECUT is only functional with outdoor unit in the stopped state - Japanese domestic model only.)
25	Setting of external low noise level	Sets low noise level when the low noise signal is input from outside.
26	Night-time low noise operation start setting	Sets starting time of nighttime low noise operation. (Night-time low noise setting is also required.)
27	Night-time low noise operation end setting	Sets ending time of nighttime low noise operation. (Night-time low noise setting is also required.)
28	Power transistor check mode *Check after disconnection of compressor wires	Used for trouble diagnosis of DC compressor. Since the waveform of inverter is output without wiring to the compressor, it is convenient to probe whether the trouble comes from the compressor or PC board.
29	Capacity precedence setting	If the capacity control is required, the low noise control is automatically released by this setting during carrying out low noise operation and nighttime low noise operation.
30	Demand setting 1	Changes target value of power consumption when demand control 1 is input.
32	Normal demand setting	Normally enables demand control 1 without external input. (Effective to prevent a problem caused by a circuit breaker of small capacity shutting 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 faulty part in the 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 bleed heating operation by heating thermostat OFF unit or non-heating-operation unit	Make this setting to prevent a rise in room temperature due to bleed heating capacity generated by heating thermostat OFF unit or non-heating-operation unit while in heating operation. • Used to prevent bleed heating operation by setting the BS unit to COOL while in heating thermostat OFF or non-heating-operation mode. • With the BS unit set to default, enabling bleed heating prevention setting of outdoor unit will enable the bleed heating prevention setting of all BS units connected to the outdoor unit. (BS unit default setting) • To make this setting by BS unit, make a change to bleed heating prevention setting of the BS unit. (In this case, enable the outdoor unit setting.)
42	Setting of BS Cool-Heat selection control time	Make this setting to shorten the BS Cool-Heat selection control time. If making the setting, pay careful attention to the following: • If the refrigerant piping between each BS unit connected to outdoor unit and indoor unit is not more than 32 ft. (10 meters) in length, this setting will be enabled. • If the refrigerant piping between BS unit and indoor unit is long in length, refrigerant passing sounds may become louder at the time of BS Cool-Heat selection. • This setting shortens the Cool-Heat selection time of all BS 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 (REWIRING) 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 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	Setting condition display (✻ Factory set)
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 ○●●●●○○; High② ○●●●○●●; High③ (Level H) ○●●●○●○; 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 ○○○○○○○
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: ○●●●●●○; Refrigerant recovery / vacuuming: ○●●●●○●

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 set
22	Night-time low noise setting	○	●	○	●	○	○	●	OFF	○ ● ● ● ● ● ●
									Level 1 (outdoor fan with 6 step or	○ ● ● ● ● ● ○
									Level 2 (outdoor fan with 5 step or	○ ● ● ● ● ○ ●
									Level 3 (outdoor fan with 4 step or	○ ● ● ● ● ○ ○
24	ENECUT test operation (Domestic Japan	○	●	○	○	●	●	●	ENECUT output OFF	○ ● ● ● ● ● ○
									ENECUT output forced ON	○ ● ● ● ● ○ ●
25	Low noise setting	○	●	○	○	●	●	○	Level 1 (outdoor fan with 6 step or	○ ● ● ● ● ● ○
									Level 2 (outdoor fan with 5 step or	○ ● ● ● ● ○ ●
									Level 3 (outdoor fan with 4 step or	○ ● ● ● ○ ● ●
26	Night-time low noise operation start setting	○	●	○	○	●	○	●	About 20:00	○ ● ● ● ● ● ○
									About 22:00 (factory setting)	○ ● ● ● ● ○ ●
									About 24:00	○ ● ● ● ○ ● ●
27	Night-time low noise operation end setting	○	●	○	○	●	○	○	About 6:00	○ ● ● ● ● ● ○
									About 7:00	○ ● ● ● ● ○ ●
									About 8:00 (factory setting)	○ ● ● ● ○ ● ●
28	Power transistor check mode	○	●	○	○	○	●	●	OFF	○ ● ● ● ● ● ○
									ON	○ ● ● ● ● ○ ●
29	Capacity 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 BS Cool-Heat selection control time	○	○	●	○	●	○	●	6 min.	○ ● ● ● ● ● ●
									4 min.	○ ● ● ● ● ● ○
51	Master-slave set-up for multi outdoor units	○	○	○	●	●	○	○	Automatic judgment	○ ● ● ● ● ● ●
									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, push the MODE (BS1) button when in **Setting mode 1**.

<Selection of setting item>

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

<Confirmation on setting contents>

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

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

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

(V2765)

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 BS units *2	◑	●	●	●	○	○	●	
7	Number of connected zone units (Fixed to "0")	◑	●	●	●	○	○	○	
8	Number of outdoor units *3	◑	●	●	○	●	●	●	
9	Number of BS units *4	◑	●	●	○	●	●	○	Lower 4 digits: upper
10	Number of BS 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 malfunction (the latest)	◑	●	●	○	○	○	●	Malfunction code table
15	Contents of malfunction (1 cycle before)	◑	●	●	○	○	○	○	Refer to page 332.
16	Contents of malfunction (2 cycle before)	◑	●	○	●	●	●	●	
20	Contents of retry (the latest)	◑	●	○	●	○	●	●	
21	Contents of retry (1 cycle before)	◑	●	○	●	○	●	○	
22	Contents of retry (2 cycle before)	◑	●	○	●	○	○	●	
25	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 BS units
Used to make setting of the number of BS 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.

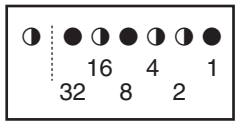
*4: Number of BS units
Used to make setting of the number of BS units connected to DIII-NET that is one of the communication lines.

*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 displays the contents of *various settings*

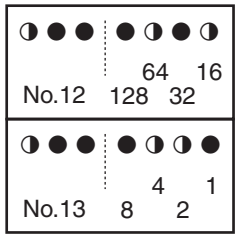
EMG operation / backup operation setting	ON	◑	●	●	○	●	●	●
	OFF	◑	●	●	●	●	●	●
Defrost select setting	Short	◑	●	●	●	○	●	●
	Medium	◑	●	●	●	◑	●	●
	Long	◑	●	●	●	●	●	●
Te setting	L	◑	●	●	●	●	●	●
	M	◑	●	●	●	●	◑	●
	H ①~⑤	◑	●	●	●	●	○	●
Tc setting	L	◑	●	●	●	●	●	●
	M	◑	●	●	●	●	●	◑
	H	◑	●	●	●	●	●	○

★ Data such as addresses and number of unitsare 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, for No. 0 - 25.

12.1.4 Cool / Heat Mode Switching

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

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

- When using COOL/HEAT selector, turn this switch to the BS 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 terminal block of the electric parts box.

EXAMPLE OF TRANSMISSION LINE CONNECTION

- Example of connecting transmission wiring.
  Connect the transmission wirings as shown in the Fig. 1.

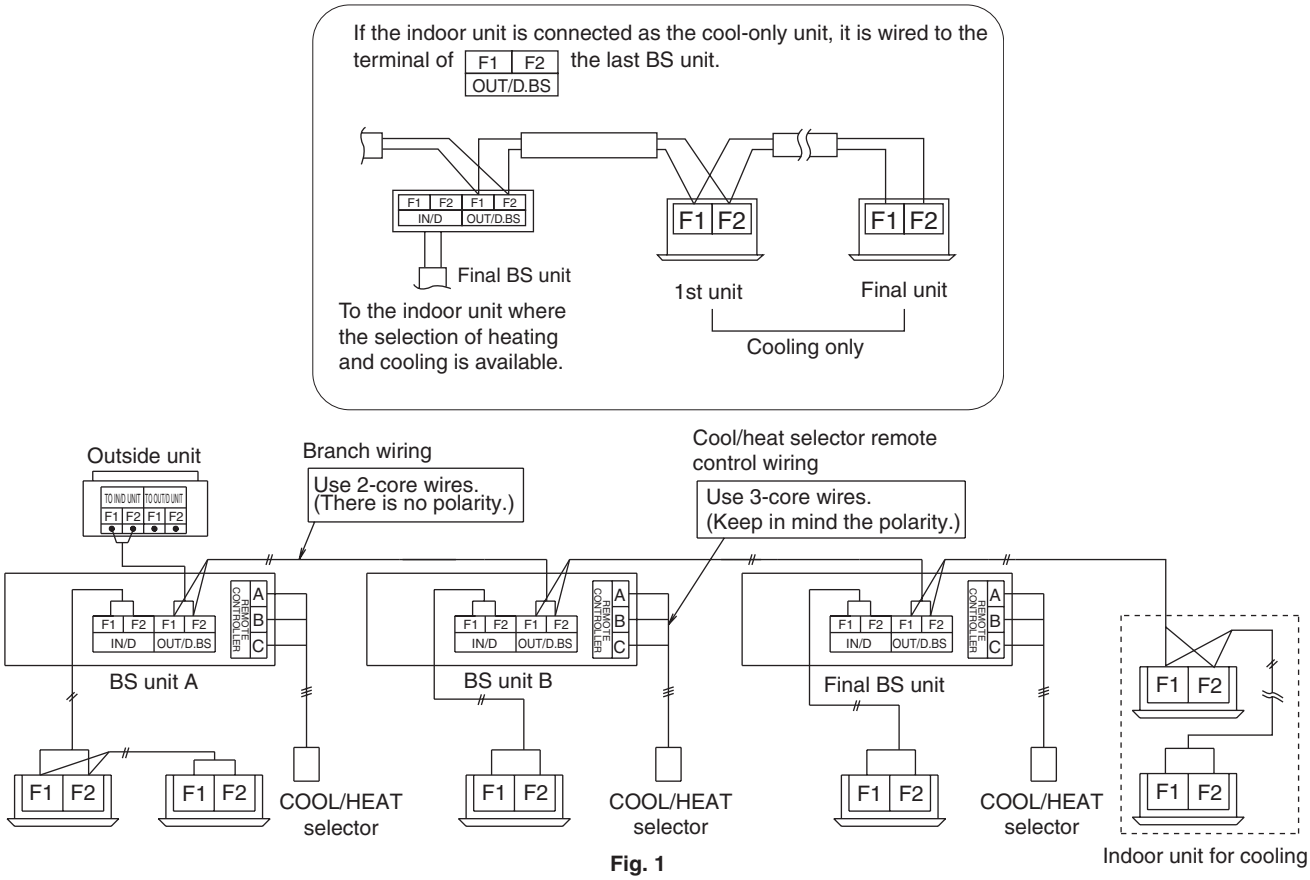


Fig. 1

12.1.5 Setting of Low Noise Operation and Demand Operation

Setting of Low Noise Operation

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

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

A. When the low noise operation is carried out by external instructions (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 low noise operation command will be ignored to put the system into normal operation mode.)

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

1. While in **Setting mode 2**, select the setting condition (i.e., **Level 1**, **Level 2**, or **Level 3**) for set item No. 22 (Setting of nighttime low noise level).
2. If necessary, while in **Setting mode 2**, select the setting condition (i.e., [**20:00**], [**22:00**], or [**24:00**]) for set item No. 26 (Setting of start time of nighttime low noise operation).
   (Use the start time as a guide since it is estimated according to outdoor temperatures.)
3. If necessary, while in **Setting mode 2**, select the setting condition (i.e., "06:00", "07:00", or "08:00") for set item No. 27 (Setting of end time of nighttime low noise operation).
   (Use the end time as a guide since it is estimated according to outdoor temperatures.)
4. If necessary, while in **Setting mode 2**, set the setting condition for set item No. 29 (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 nighttime.)

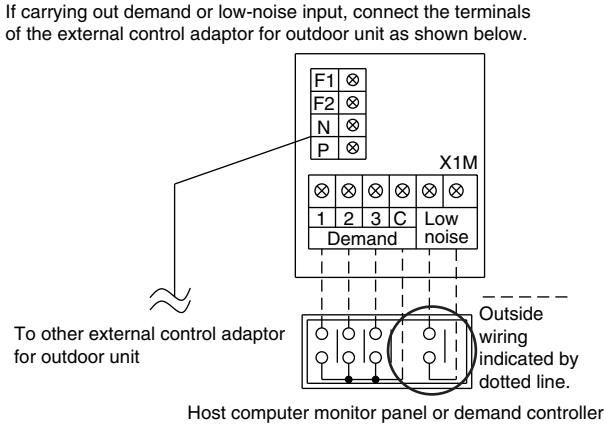
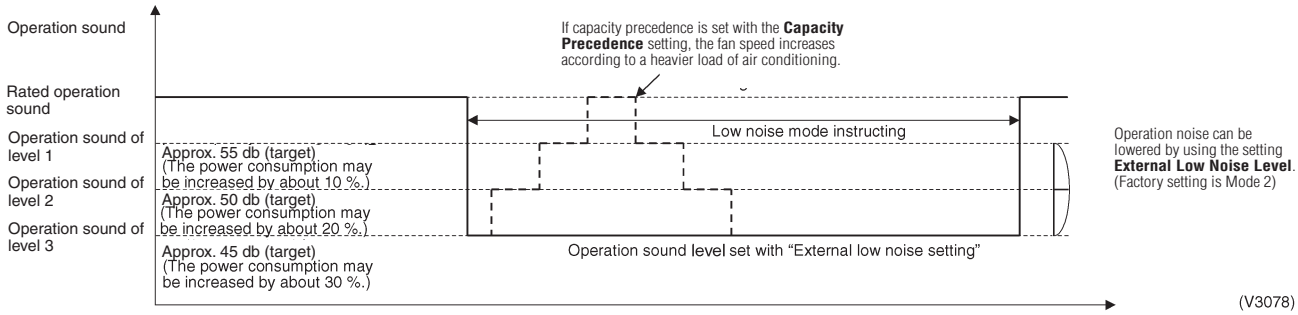


Image of operation in the case of A



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

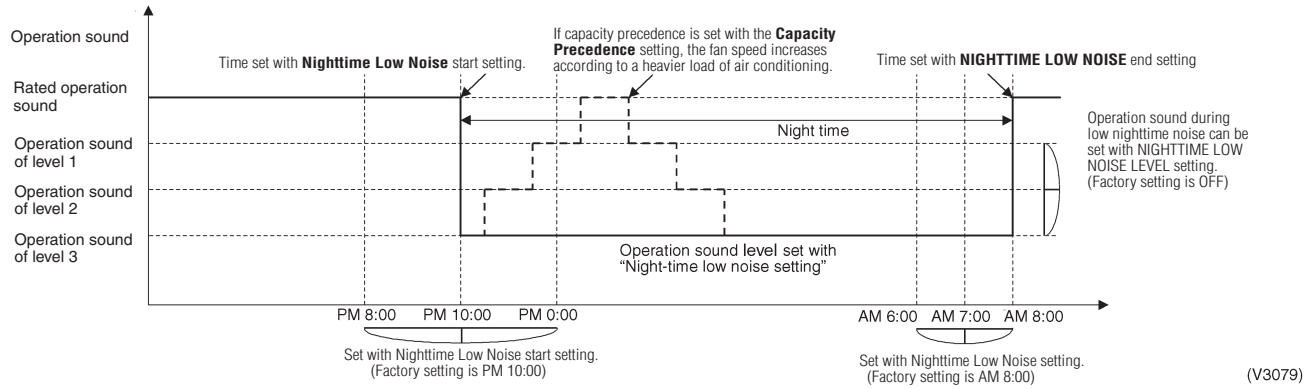
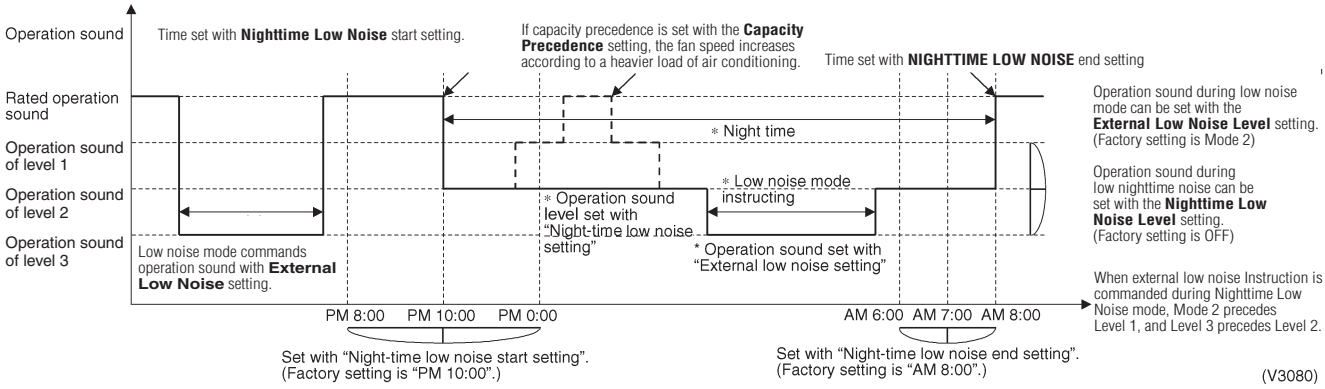


Image of operation in the case of A and B



Setting of Demand Operation

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

Description of setting			Setting procedure	
Setting item	Condition	Description	External control adaptor	Outdoor unit PC board
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 **Demand 1** 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 instructions (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 adapter for outdoor unit is not required.)

1. While in ***Setting mode 2***, make setting of the set item No. 32 (Setting of constant 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.

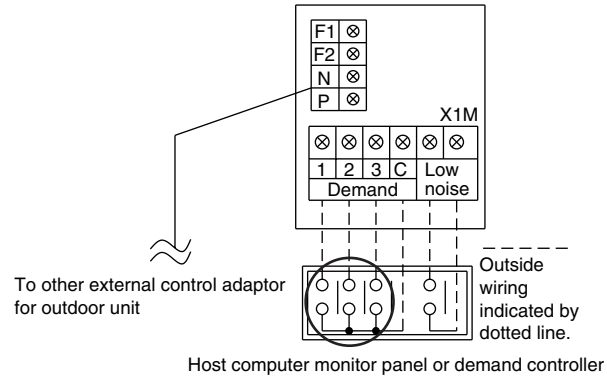


Image of operation in the case of A

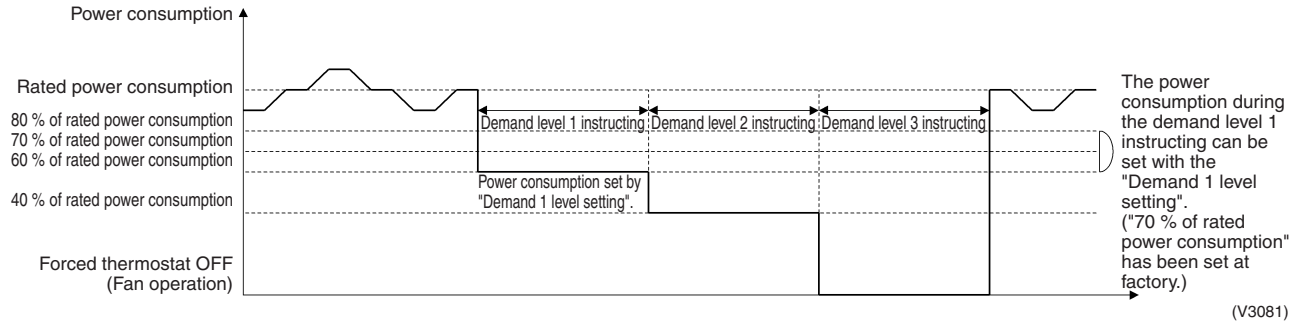


Image of operation in the case of B

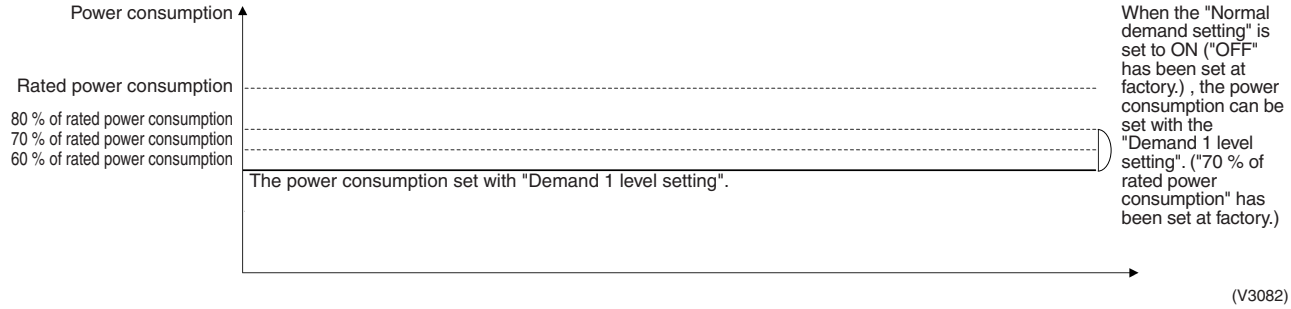
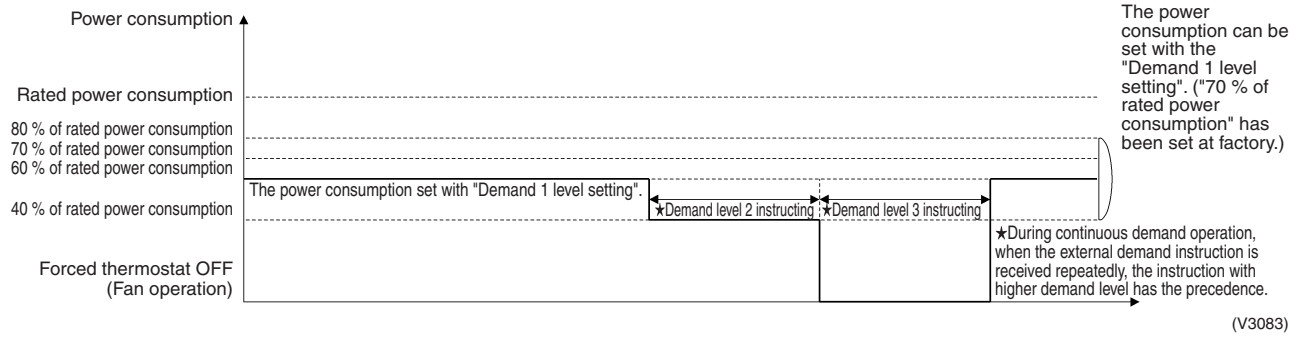


Image of operation in the case of A and B



Detailed Setting Procedure of Low Noise Operation and Demand Control

1. Setting mode 1 (H1P off)

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

2. Setting mode 2 (H1P on)

① In setting 1, push and hold the BS1 (MODE button) for more than 5 seconds. → Setting mode 2 is entered and H1P lights.

② Push the BS2 (SET button) several times and match the LED display with the Setting No. you want.

③ Push the BS3 (RETURN button) one time, and the present setting content is displayed.
→ Push the BS2 (SET button) several times and match the LED display with the setting content (as shown below) you want.

④ Push the BS3 (RETURN button) two times. → Returns to ①.

⑤ Push the BS1 (MODE button) one time. → Returns to the setting mode 1 and turns H1P off.

○: ON ●: OFF ◑: Blink

Setting No.	Setting contents	① Setting No. indication							② Setting No. indication							Setting contents	③ Setting contents indication (Initial setting)						
		H1 P	H2 P	H3 P	H4 P	H5 P	H6 P	H7 P	H1 P	H2 P	H3 P	H4 P	H5 P	H6 P	H7 P		H1 P	H2 P	H3 P	H4 P	H5 P	H6 P	H7 P
12	External low noise / Demand setting	○	●	●	●	●	●	●	○	●	●	○	○	●	●	NO (Factory setting)	○	●	●	●	●	●	◑
																YES	○	●	●	●	●	◑	●
22	Night-time low 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	Night-time low noise start setting								○	●	○	○	●	○	●	PM 8:00	○	●	●	●	●	●	◑
																PM 10:00 (Factory setting)	○	●	●	●	●	◑	●
																PM 0:00	○	●	●	●	◑	●	●
27	Night-time low noise end setting								○	●	○	○	●	○	○	AM 6:00	○	●	●	●	●	●	◑
																AM 7:00	○	●	●	●	●	◑	●
																AM 8:00 (Factory setting)	○	●	●	●	◑	●	●
29	Capacity 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 expansion valve of indoor and outdoor units.
All indoor and outdoor unit operations are prohibited.

[Operation procedure]

① In ***Setting Mode 2*** with units in stop mode, set ***Refrigerant Recovery / Vacuuming mode*** to ON. The respective 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 the all 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 detal.)
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 expansion valves of indoor and outdoor units and turn on some solenoid valves.

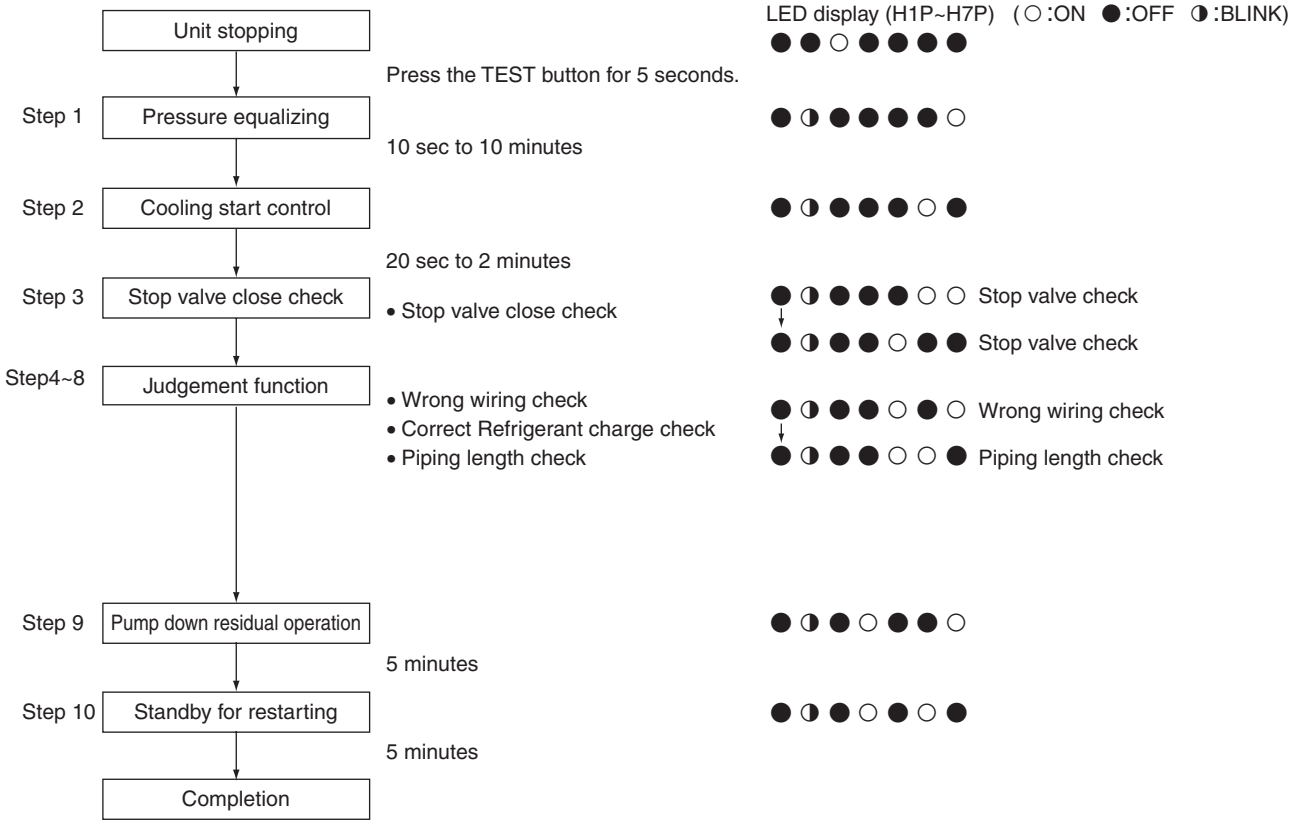
[Operating procedure]

① With **Setting Mode 2** while the unit stops, set **Refrigerant recovery / Vacuuming mode** to **ON**. The 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 PC board.

Operating method / Applicable model	① Emergency operation with remote controller reset (Auto backup operation)	② Emergency operation with outdoor unit PC board setting (Manual backup operation)
REYQ72 to 120PYDN REYQ72 to 144PTJU	–	Backup operation by the compressor
REYQ144 to 240PYDN REYQ168 to 240PTJU	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 a malfunction (in this case, the system will stop and the relevant malfunction 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 (press the RUN/STOP button on the remote controller for 4 seconds or more) when the outdoor unit stops because of malfunction state.

[Details of operation]

- Automatically disable the defective outdoor unit from operating, and then operate other outdoor units.
- The following section shows malfunction 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 **Outdoor Unit Setting Procedure to Enable Emergency Operation**
When a defective compressor forces an outdoor unit to enter a malfunction stop state, emergency operation mode can partially restore operation of the systems by disabling the affected compressor or outdoor unit module.

<REYQ72 to 120PYDN, REYQ72 to 144PTJU>

○ 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 **MODE** button (BS1) for 5 sec. or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 38 times.	○ ○ ● ● ○ ○ ●
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ● ◑ (Factory setting)
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ◑ ●
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** 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 **MODE** button (BS1) for 5 seconds or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 39 times.	○ ○ ● ● ○ ○ ○
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ● ◑ (Factory setting)
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ◑ ●
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** button (BS1) once.	● ● ○ ● ● ● ●

<REYQ144 to 240PYDN, REYQ168 to 240PTJU>

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-1operation***.

(Step)	LED display (○: ON, ●: OFF, ◑: Blink) H1P----------H7P
(1) Press and hold the **MODE** button (BS1) for 5 sec. or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 38 times.	○ ○ ● ● ○ ○ ●
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ● ◑ (Factory setting)
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ◑ ●
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** 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 **MODE** button (BS1) for 5 seconds or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 39 times.	○ ○ ● ● ○ ○ ○
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ● ◑ (Factory setting)
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ◑ ●
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●

(6) Press the **MODE** button (BS1) once. ● ● ○ ● ● ● ●

[Cancel of Emergency Operation]

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

<REYQ72 to 120PYDN, REYQ72 to144PTJU>

○ 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 **MODE** button (BS1) for 5 sec. or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 38 times.	○ ○ ● ● ○ ○ ●
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ◑ ●
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ● ◑ (Factory setting)
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** 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 **MODE** button (BS1) for 5 seconds or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 39 times.	○ ○ ● ● ○ ○ ○
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ◑ ●
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ● ◑ (Factory setting)
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** button (BS1) once.	● ● ○ ● ● ● ●

<REYQ144 to 240PYDN, REYQ168 to 240PTJU>

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.)

* You can determine the outdoor units 1 and 2 according to the LED displays shown in the following diagram:

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 sec. or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 38 times.	○ ○ ● ● ○ ○ ●
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ◑ ●
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ● ◑ (Factory setting)
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** 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 **MODE** button (BS1) for 5 seconds or more.	○ ● ● ● ● ● ●
(2) Press the **SET** button (BS2) 39 times.	○ ○ ● ● ○ ○ ○
(3) Press the **RETURN** button (BS3) once.	○ ● ● ● ● ◑ ●
(4) Press the **SET** button (BS2) once.	○ ● ● ● ● ● ◑ (Factory setting)
(5) Press the **RETURN** button (BS3) twice.	○ ● ● ● ● ● ●
(6) Press the **MODE** button (BS1) once.	● ● ○ ● ● ● ●

12.1.10Prevention of Small Heating in Non-operating Unit

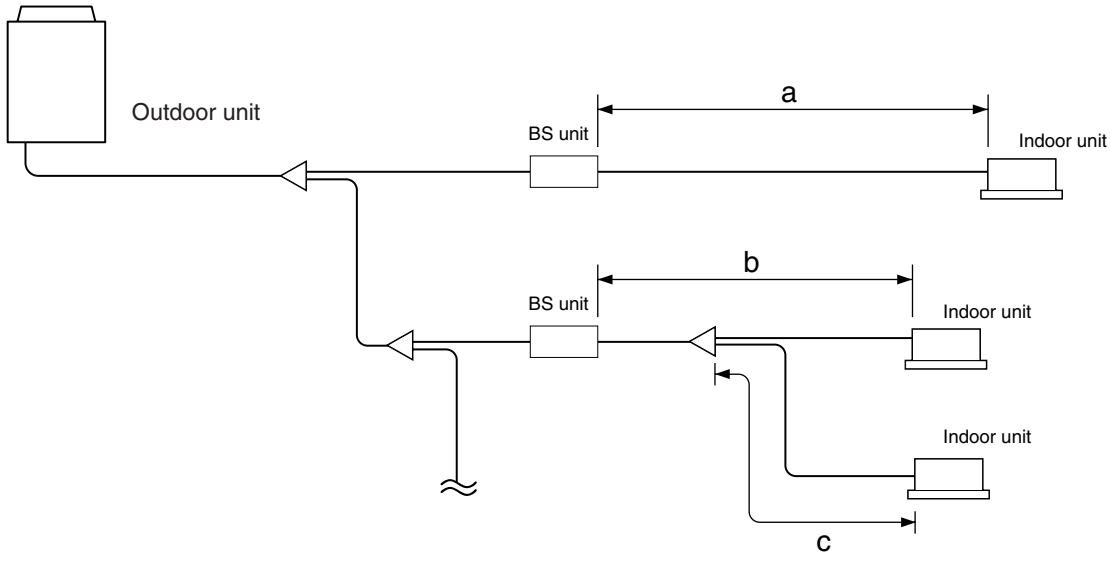
In heating operation, this setting is made to prevent room temperature from rising due to bleed heating capacity generated in the unit with its heating thermostat OFF or in the unit with its heating operation stopped.

- By switching the BS units to cooling when the system turns OFF the heating thermostat or stops heating operation, bleed heating is prevented.
- By enabling the bleed heating prevention setting of the outdoor unit, prevention of bleed heating of all BS units connected to the outdoor unit is enabled. (Default setting of BS unit)
- Setting by BS unit is enabled by changing the bleed heating prevention setting of every BS unit. (In this case, enable the outdoor unit setting.)

12.1.11Reduction of Cooling/Heating Selection Time of BS Units

Make this setting to reduce selection time between cooling and heating of the BS units, with careful attention paid to the following points.

- This setting is only enabled in case the refrigerant piping length between every BS 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, etc.)
- In case the refrigerant piping length between the BS units and the indoor units is long, refrigerant passing sounds may become louder when the BS unit selects operation mode between cooling and heating.
- This setting reduces the operation mode selection time in all the BS units within the same refrigerant circuit.



Part 4
Indoor Unit

1. Specifications

Ceiling Mounted Cassette Type (Multi-flow)

Model			FXFQ12MVJU	FXFQ18MVJU	FXFQ24MVJU
★1 Cooling Capacity		Btu/h	12,000	18,000	24,000
★2 Heating Capacity		Btu/h	13,500	20,000	27,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		inch (mm)	9-1/8×33-1/8×33-1/8" (231.8 x 841.4 x 841.4 mm)	9-1/8×33-1/8×33-1/8" (231.8 x 841.4 x 841.4 mm)	9-1/8×33-1/8×33-1/8" (231.8 x 841.4 x 841.4 mm)
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×8×17	2×8×17	2×8×17
	Face Area	ft²	3.56	3.56	3.56
Fan	Model		QTS45B14M	QTS45B14M	QTS45B14M
	Type		Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output	kW	0.04	0.04	0.04
	Air Flow Rate (H/L)	cfm	460/350	570/390	670/490
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene
Piping Connections	Liquid Pipes	inch (mm)	ϕ1/4" (6.4 mm) (Flare Connection)	ϕ1/4" (6.4 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)
	Gas Pipes	inch (mm)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ5/8" (15.8 mm)(Flare Connection)
	Drain Pipe	inch (mm)	VP25 (External Dia. 1-1/4 Internal Dia. 1)	VP25 (External Dia. 1-1/4 Internal Dia. 1)	VP25 (External Dia. 1-1/4 Internal Dia. 1)
Machine Weight (Mass)		Lbs (kg)	55 lbs (24.9 kg)	55 lbs (24.9 kg)	55
★4 Sound Level (H/L)		dBA	31/28	33/28	34/29
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Decoration Panels (Option)	Model		BYC125K-W1	BYC125K-W1	BYC125K-W1
	Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	inch (mm)	1-5/8×37-3/8×37-3/8" (41.2 x 949.3 x 949.3 mm)	1-5/8×37-3/8×37-3/8" (41.2 x 949.3 x 949.3 mm)	1-5/8×37-3/8×37-3/8" (41.2 x 949.3 x 949.3 mm)
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	Lbs (kg)	11 lbs (5 kg)	11 lbs (5 kg)	11
Standard Accessories			Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.
Drawing No.			C:3D042686		

Notes:

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

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

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

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

Ceiling Mounted Cassette Type (Multi-flow)

Model			FXFQ30MVJU	FXFQ36MVJU
★1 Cooling Capacity		Btu/h	30,000	36,000
★2 Heating Capacity		Btu/h	34,000	40,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		inch (mm)	11-3/8×33-1/8×33-1/8" (288.9 x 841.4 x 841.4 mm	11-3/8×33-1/8×33-1/8" (288.9 x 841.4 x 841.4 mm
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×12×17	2×12×17
	Face Area	ft²	5.35	5.35
Fan	Model		QTS45A17M	QTS45A17M
	Type		Turbo Fan	Turbo Fan
	Motor Output	kW	0.09	0.09
	Air Flow Rate (H/L)	cfm	990/710	990/740
	Drive		Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene
Piping Connections	Liquid Pipes	inch (mm)	ϕ3/8" (9.5 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)
	Gas Pipes	inch (mm)	ϕ5/8" (15.8 mm) (Flare Connection)	ϕ5/8" (15.8 mm) (Flare Connection)
	Drain Pipe	inch (mm)	VP25 (External Dia. 1-1/4 (31.75 mm) Internal Dia. 1 (25.4 mm))	VP25 (External Dia. 1-1/4 (31.75 mm) Internal Dia. 1 (25.4 mm))
Machine Weight (Mass)		Lbs (kg)	66 lbs (29.9 kg)	66 lbs (29.9 kg)
★4 Sound Level (H/L)		dBA	38/32	40/33
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series
Decoration Panels (Option)	Model		BYC125K-W1	BYC125K-W1
	Color		White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	inch (mm)	1-5/8×37-3/8×37-3/8" (41.2 x 949.3 x 949.3 mm)	1-5/8×37-3/8×37-3/8" (41.2 x 949.3 x 949.3 mm)
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	Lbs (kg)	11 lbs (5 kg)	11 lbs (5 kg)
Standard Accessories			Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.
Drawing No.			C:3D042686	

Notes:

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

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25 ft (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.

Available in April 2008

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

Model			FXZQ07M7VJU	FXZQ09M7VJU	FXZQ12M7VJU
★1 Cooling Capacity		Btu/h	7,500	9,500	12,000
★2 Heating Capacity		Btu/h	8,700	11,100	14,000
Casing / Color			Galvanized Steel / Non Painted	Galvanized Steel / Non Painted	Galvanized Steel / Non Painted
Dimensions: (H×W×D)		in(mm)	10-14 (11-1/4) x 22-5/8 x 22-5/8" (260 x (286) x 575 x 575 mm) ( ): includes Electical Componets Box	10-14 (11-1/4) x 22-5/8 x 22-5/8" (260 x (286) x 575 x 575 mm) ( ): includes Electical Componets Box	10-14 (11-1/4) x 22-5/8 x 22-5/8" (260 x (286) x 575 x 575 mm) ( ): includes Electical Componets Box
Coil (Cross Fin Coil)	Rows×Stages×FPI		2×10×0.06	2×10×0.06	2×10×0.06
	Face Area	ft²	2.9	2.9	2.9
Fan	Model		QST32C15M	QST32C15M	QST32C15M
	Type		Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output (High)	W	55	55	55
	Air Flow Rate (H/L)	cfm	320/247	335/265	495/353
	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
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 mmm) (Flare Connection)	ϕ1/4" (6.4 mmm) (Flare Connection)	ϕ1/4" (6.4 mmm) (Flare Connection)
	Gas Pipes	in (mm)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ1/2" (12.7 mm) (Flare Connection)
	Drain Pipe	in (mm)	VP20 (External Dia. 1.02 Internal Dia. 0.79)	VP20 (External Dia. 1.02 Internal Dia. 0.79)	VP20 (External Dia. 1.02 Internal Dia. 0.79)
Machine Weight (Mass)		Lbs (kg)	42 lbs (19 kg)	42 lbs (19 kg	42 lbs (19 kg
★4 Sound Level (H/L)		dBA	31/29	33/29	41/34
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
Decoration Panels (Option)	Model		BYFQ60BU	BYFQ60BU	BYFQ60BU
	Color		White (RAL 9010)	White (RAL 9010)	White (RAL 9010)
	Dimensions: (H×W×D)	in (mm)	2-3/16 x 27-9/16 x 27-9/16" (55 x 700 x 700 mm)	2-3/16 x 27-9/16 x 27-9/16" (55 x 700 x 700 mm)	2-3/16 x 27-9/16 x 27-9/16" (55 x 700 x 700 mm)
	Weight	Lbs (kg)	6 lbs (2.7 kg)	6 lbs (2.7 kg)	6 lbs (2.7 kg)
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.
Drawing No.			C:3TW30721-1		

Notes:

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

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

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

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

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

Model			FXZQ18M7VJU
★1 Cooling Capacity		Btu/h	18,000
★2 Heating Capacity		Btu/h	21,000
Casing / Color			Galvanized Steel / Non Painted
Dimensions: (H×W×D)		in	10-1/4 (11-1/4) x 22-5/8 x 22- 5/8" (260 (286) x 575 x 575 mm)
Coil (Cross Fin Coil)	Rows×Stages×FPI		2 × 10 × 0.06
	Face Area	ft²	2.9
Fan	Model		QST32C15M
	Type		Turbo Fan
	Motor Output (High)	W	55
	Air Flow Rate (H/L)	cfm	320/247
	Drive		Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating
Air Filter			Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	in (mm)	ϕ1/4" (6.4 mm) (Flare Connection)
	Gas Pipes	in (mm)	ϕ1/2" (12.7 mm) (Flare Connection)
	Drain Pipe	in	VP20 (External Dia. 1.02) (26 mm) (Internal Dia. 0.79) (20 mm)
Machine Weight (Mass)		Lbs (kg)	42 lbs (19.05 kg)
★4 Sound Level (H/L)		dBA	41/34
Safety Devices			Fuse
Refrigerant Control			Electronic Expansion Valve
Connectable outdoor unit			R-410A Series
Decoration Panels (Option)	Model		BYFQ60BU
	Color		White (RAL 9010)
	Dimensions: (H×W×D)	in (mm)	2-3/16 x 27-9/16 x 27-9/16" (55 x 700 x 700 mm)
	Weight	Lbs (kg)	6
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.
Drawing No.			C:3TW30721-1

Notes:

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

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25 ft (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 620.7 mm)	7-7/8 × 27-9/16 × 24-7/16" (200 x 700 x 620.7 mm)	7-7/8 × 27-9/16 × 24-7/16" (200 x 700 x 620.7 mm)
Coil (Cross Fin Coil)	Rows × Stages × FPI		2 × 12× 17	2 × 12× 17	3 × 12× 17
	Face Area	ft²	1.36	1.36	1.36
Fan	Model		—	—	—
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	kW	0.06	0.06	0.06
	Air Flow Rate (H/L)	cfm	280/226 (H/L)	280/226 (H/L)	280/226 (H/L)
	External Static Pressure ★4	"wg	0.12 - 0.04	0.12 - 0.04	0.12 - 0.04
	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 mm) (Flare Connection)	ϕ1/4" (6.4 mm) (Flare Connection)	ϕ1/4" (6.4 mm) (Flare Connection)
	Gas Pipes	in (mm)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ1/2" (12.7 mm) (Flare Connection)
	Drain Pipe	in (mm)	VP20 (External Dia. 1-1/32" (26.2 mm) Internal Dia. 25/32) (20 mm)	VP20 (External Dia. 1-1/32" (26.2 mm) Internal Dia. 25/32) (20 mm)	VP20 (External Dia. 1-1/32" (26.2 mm) Internal Dia. 25/32) (20 mm)
Machine Weight (Mass)		Lbs (kg)	51 lbs (23.1 kg)	51 lbs (23.1 kg)	51 lbs (23.1 kg)
★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
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25 ft (7.5 m) (Horizontal)

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

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

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

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

Slim Ceiling Mounted Duct Type

Model			FXDQ18MVJU	FXDQ24MVJU
★1 Cooling Capacity		Btu/h	18,000	24,000
★2 Heating Capacity		Btu/h	20,000	27,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in (mm)	7-7/8 × 35-7/16 × 24-7/16" (200 x 900 x 620.7 mm)	7-7/8 × 43-5/16 × 24-7/16" (200 x 1100 x 620.7 mm)
Coil (Cross Fin Coil)	Rows × Stages × FPI		3 × 12 × 17	3 × 12 × 17
	Face Area	ft²	1.89	2.44
Fan	Model		—	—
	Type		Sirocco Fan	Sirocco Fan
	Motor Output	kW	0.13	0.13
	Air Flow Rate (H/L)	cfm	440/350 (H/L)	580/460 (H/L)
	External Static Pressure ★4	"wg	0.16 - 0.06	0.16 - 0.06
	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 mm) ((Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)
	Gas Pipes	in (mm)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ5/8" (15.8 mm) (Flare Connection)
	Drain Pipe	in (mm)	VP20 External Dia. 1-1/32" (26.2 mm) Internal Dia. 25/32" (19.8 mm)	VP20 External Dia. 1-1/32" (26.2 mm) Internal Dia. 25/32" (19.8 mm)
Machine Weight (Mass)		Lbs (kg)	63 lbs (28.6 kg)	71 lbs (32.2 kg)
★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
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25 ft (7.5 m) (Horizontal)

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

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

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

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

Ceiling Mounted Built-in Type

Model			FXSQ12MVJU	FXSQ18MVJU	FXSQ24MVJU
★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)	11-7/8 × 21-5/8 × 31-1/2" (301.6 x 549.3 x 800 mm)	11-7/8 × 27-1/2 × 31-1/2" (301.6 x 698.5 x 800 mm)	11-7/8 × 39-3/8 × 31-1/2" (301.6 x 1000 x 800 mm)
Coil (Cross Fin Coil)	Rows × Stages × FPI		3 × 14 × 14	3 × 14 × 14	3 × 14 × 14
	Face Area	ft²	0.95	1.42	2.38
Fan	Model		D18H3A	D18H2A	2D18H2A
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	kW	0.05	0.08	1.13
	Air Flow Rate (H/L)	cfm	340/230	530/390	740/490
	External Static Pressure ★4	in. Aq	0.37-0.19-0.06	0.38-0.19-0.06	0.51-0.29-0.06
	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			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 mm) (Flare Connection)	ϕ1/4" (6.4 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)
	Gas Pipes	in (mm)	ϕ1/2" (12.7 mm (Flare Connection)	ϕ1/2" (12.7 mm (Flare Connection)	ϕ5/8" (15.8 mm) (Flare Connection)
	Drain Pipe	in (mm)	VP25 (External Dia. 1-1/4 (31.7 mm) Internal Dia. 1) (25.4 mm)	VP25 (External Dia. 1-1/4 (31.7 mm) Internal Dia. 1) (25.4 mm)	VP25 (External Dia. 1-1/4 (31.7 mm) Internal Dia. 1) (25.4 mm)
Machine Weight (Mass)		Lbs (kg)	69 lbs (31.3 kg)	73 lbs (33.1 kg)	95 lbs (43.1 kg)
★5 Sound Level (H/L)		dBA	41/35	44/38	44/38
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Decoration Panel (Option)	Model		BYBS32DJW1	BYBS45DJW1	BYBS71DJW1
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	in (mm)	2-1/8 × 25-5/8 × 19-5/8" (54 x 650.8 x 498.4 mm)	2-1/8 × 31-1/2 × 19-5/8" (54 x 800 x 498.4 mm)	2-1/8 × 43-1/4 × 19-5/8" (54 x 1098.5 x 498.4 mm)
	Weight	Lbs (kg)	6.6 lbs (3 kg)	7.7lbs (3.5 kg)	9.9 lbs (4.5 kg)
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.
Drawing No.			C:3D042684		

Notes:

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

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

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

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

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

Ceiling Mounted Built-in Type

Model			FXSQ30MVJU	FXSQ36MVJU	FXSQ48MVJU
★1 Cooling Capacity		Btu/h	30,000	36,000	48,000
★2 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)	11-7/8 × 55-1/8 × 31-1/2" (301.6 x 1400 x 800 mm)	11-7/8 × 55-1/8 × 31-1/2" (301.6 x 1400 x 800 mm)	11-7/8 × 55-1/8 × 31-1/2" (301.6 x 1400 x 800 mm)
Coil (Cross Fin Coil)	Rows × Stages × FPI		3 × 14 × 14	3 × 14 × 14	3 × 14 × 14
	Face Area	ft²	3.64	3.64	3.64
Fan	Model		3D18H2A	3D18H2A	3D18H2A
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	kW	0.22	0.22	0.22
	Air Flow Rate (H/L)	cfm	950/720	990/740	1,300/950
	External Static Pressure ★4	in. Aq	0.57-0.39	0.57-0.35	0.34-0.10
	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			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	in (mm)	ϕ3/8" (9.5 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)
	Gas Pipes	in (mm)	ϕ5/8" (15.8 mm) (Flare Connection)	ϕ5/8" (15.8 mm) (Flare Connection)	ϕ5/8" (15.8 mm) (Flare Connection)
	Drain Pipe	in (mm)	VP25 (External Dia. 1-1/4 (31.7 mm) Internal Dia. 1) (25.4 mm)	VP25 (External Dia. 1-1/4 (31.7 mm) Internal Dia. 1) (25.4 mm)	VP25 (External Dia. 1-1/4 (31.7 mm) Internal Dia. 1) (25.4 mm)
Machine Weight (Mass)		Lbs (kg)	119 lbs (54 kg)	119 lbs (54 kg)	122 lbs (55.3 kg)
★5 Sound Level (H/L)		dBA	45/39	45/39	48/43
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Decoration Panel (Option)	Model		BYBS125DJW1	BYBS125DJW1	BYBS125DJW1
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	in (mm)	2-1/8 × 59 × 19-5/8" (54 x 1499 x 498.4 mm)	2-1/8 × 59 × 19-5/8" (54 x 1499 x 498.4 mm)	2-1/8 × 59 × 19-5/8" (54 x 1499 x 498.4 mm)
	Weight	Lbs (kg)	14 lbs (6.3 kg)	14 lbs (6.3 kg)	14 lbs (6.3 kg)
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.
Drawing No.			C:3D042684		

Notes:

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

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

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

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

★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			FXMQ30MVJU	FXMQ36MVJU	FXMQ48MVJU
★1 Cooling Capacity		Btu/h	30,000	36,000	48,000
★2 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)		inch (mm)	15-3/8 × 28-3/8 × 27-1/8" (390 x 720.7 x 689 mm)	15-3/8 × 43-3/4 × 27-1/8" (390 x 1111 x 689 mm)	15-3/8 × 43-3/4 × 27-1/8" (390 x 1111 x 689 mm)
Coil (Cross Fin Coil)	Rows × Stages × FPI		3×16×13	3×16×13	3×16×13
	Face Area	ft²	1.95	3.43	3.43
Fan	Model		D11/2D3AA1VE	2D11/2D3AG1VE	2D11/2D3AF1VE
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	kW	0.15	0.27	0.43
	Air Flow Rate (H/L)	cfm	690/565	1,020/810	1,270/1,020
	External Static Pressure ★4	in. Aq	0.66-0.43	0.71-0.43	1.0-0.72
	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	inch (mm)	ϕ3/8" (9.5 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)
	Gas Pipes	inch (mm)	ϕ5/8" (15.8 mm)(Flare Connection)	ϕ5/8" (15.8 mm) (Flare Connection)	ϕ5/8" (15.8 mm) (Flare Connection)
	Drain Pipe	inch (mm)	VP25 External Dia. 1-1/4(31.75 mm) Internal Dia. 1 (25.4 mm)	VP25 External Dia. 1-1/4(31.75 mm) Internal Dia. 1 (25.4 mm)	VP25 External Dia. 1-1/4(31.75 mm) Internal Dia. 1 (25.4 mm)
Machine Weight (Mass)		Lbs (kg)	99 lbs (44.9 kg)	139 lbs (63. kg)	144 lbs (65.3 kg)
★6 Sound Level (H/L)		dBA	45/41	45/41	48/45
Safety Devices			Fuse, Thermal Fuse for Fan Motor	Fuse, Thermal Fuse for Fan Motor	Fuse, Thermal Fuse 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, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.	Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.	Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.
Drawing No.			C:3D042685		

Notes:

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

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

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

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

★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.

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

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" (195.3 x 960.4 x 679.4 mm)	7-11/16×55-1/8×26-3/4" (195.3 x 1400 x 679.4 mm)	7-11/16×62-5/8×26-3/4" (195.3 x1590.7 x 679.4 mm)
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×12×15	3×12×15	2×12×15+2×10×15
	Face Area	ft²	1.96	3.15	3.66+2.95
Fan	Model		3D12K1AA1	3D12K2AA1	—
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	W	62	130	130
	Air Flow 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 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)
	Gas Pipes	in (mm)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ5/8" (15.8 mm) (Flare Connection)	ϕ5/8" (15.8 mm)(Flare Connection)
	Drain Pipes	in (mm)	VP20 External Dia. 1 (25.4 mm) Internal Dia. 3/4 (19.1 mm)	VP20 External Dia. 1 (25.4 mm) Internal Dia. 3/4 (19.1 mm)	VP20 External Dia. 1 (25.4 mm) Internal Dia. 3/4 (19.1 mm)
Machine Weight (Mass)		Lbs (kg)	55 lbs (25 kg)	80 lbs (36.3 kg)	90 lbs (40.8kg)
★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
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25 ft (7.5 m) (Horizontal)

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

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

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

Wall Mounted Type

Model			FXAQ07MVJU	FXAQ09MVJU	FXAQ12MVJU
★1 Cooling Capacity		Btu/h	7,500	9,500	12,000
★2 Heating Capacity		Btu/h	8,500	10,500	13,500
Casing Color			White (3.0Y8.5/0.5)	White (3.0Y8.5/0.5)	White (3.0Y8.5/0.5)
Dimensions: (H×W×D)		in (mm)	11–3/8 × 31–1/4 ×9" (289 x 794 x 229 mm)	11–3/8 × 31–1/4 ×9" (289 x 794 x 229 mm)	11–3/8 × 31–1/4 ×9" (289 x 794 x 229 mm)
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×14×17	2×14×17	2×14×17
	Face Area	ft²	1.73	1.73	1.73
Fan	Model		QCL9661M	QCL9661M	QCL9661M
	Type		Cross Flow Fan	Cross Flow Fan	Cross Flow Fan
	Motor Output	kW	0.04	0.04	0.04
	Air Flow 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 mm) (Flare Connection)	ϕ1/4" (6.4 mm) (Flare Connection)	ϕ1/4" (6.4 mm) (Flare Connection)
	Gas Pipes	in (mm)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ1/2" (12.7 mm) (Flare Connection)
	Drain Pipe	in (mm)	VP13 External Dia. 11/16" (17.5 mm) Internal Dia. 1/2" (12.7 mm)	VP13 External Dia. 11/16" (17.5 mm) Internal Dia. 1/2" (12.7 mm)	VP13 External Dia. 11/16" (17.5 mm) Internal Dia. 1/2" (12.7 mm)
Machine Weight (Mass)		Lbs (kg)	25 lbs (11.3 kg)	25 lbs (11.3 kg)	25 lbs (11.3 kg)
★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
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25 ft (7.5 m) (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
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			FXAQ18MVJU	FXAQ24MVJU
★1 Cooling Capacity		Btu/h	18,000	24,000
★2 Heating Capacity		Btu/h	20,000	27,000
Casing Color			White (3.0Y8.5/0.5)	White (3.0Y8.5/0.5)
Dimensions: (H×W×D)		in (mm)	11–3/8 × 41-3/8 ×9" (289 x1051 x 229 mm)	11–3/8 × 41-3/8 ×9" (289 x1051 x 229 mm)
Coil (Cross Fin Coil)	Rows × Stages × FPI		2×14×17	2×14×17
	Face Area	ft²	2.29	2.29
Fan	Model		QCL9686	QCL9686
	Type		Cross Flow Fan	Cross Flow Fan
	Motor Output	kW	0.04	0.04
	Air Flow 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 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)
	Gas Pipes	in (mm)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ5/8" (15.8 mm) (Flare Connection)
	Drain Pipe	in (mm)	VP13 External Dia. 11/16" (17.5 mm) Internal Dia. 1/2" (12.7 mm)	VP13 External Dia. 11/16" (17.5 mm) Internal Dia. 1/2" (12.7 mm)
Machine Weight (Mass)		Lbs (kg)	31 lbs (14.1 kg)	31 lbs (14.1 kg)
★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
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25 ft (7.5 m) (Horizontal)

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

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

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

Floor Standing Type

Model			FXLQ12MVJU	FXLQ18MVJU	FXLQ24MVJU
★1 Cooling Capacity		Btu/h	12,000	18,000	24,000
★2 Heating Capacity		Btu/h	13,500	20,000	27,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in (mm)	23–5/8 ×44–7/8 ×8–3/4" (600 x 1140 x 222.3 mm)	23–5/8 ×55–7/8 ×8–3/4" (600 x 1419 x 222.3 mm)	23–5/8 ×55–7/8 ×8–3/4" (600 x 1419 x 222.3 mm)
Coil (Cross Fin Coil)	Rows × Stages × FPI		3×14×17	3×14×17	3×14×17
	Face Area	ft²	2.15	3.04	3.04
Fan	Model		2D14B13	2D14B20	2D14B20
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	kW	0.03	0.04	0.04
	Air Flow 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 mm) (Flare Connection)	ϕ1/4" (6.4 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)
	Gas Pipes	in (mm)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ5/8" (15.8 mm) (Flare Connection)
	Drain Pipe	in (mm)	ϕ27/32 O.D (Vinyl Chloride) (21.43 mm)	ϕ27/32 O.D (Vinyl Chloride) (21.43 mm)	ϕ27/32 O.D (Vinyl Chloride) (21.43 mm)
Machine Weight (Mass)		Lbs (kg)	66 lbs (30 kg)	80 lbs (36.3 kg)	80 lbs (36.3 kg)
★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
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25 ft (7.5 m)(Horizontal)

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

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

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

Concealed Floor Standing Type

Model			FXNQ12MVJU	FXNQ18MVJU	FXNQ24MVJU
★1 Cooling Capacity		Btu/h	12,000	18,000	24,000
★2 Heating Capacity		Btu/h	13,500	20,000	27,000
Casing Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in (mm)	24 × 42–1/8 ×8–5/8" (609.6 x 1070 x 219.1 mm)	24 × 53-1/8 ×8–5/8" (609.6 x 1349 x 219.1 mm)	24 × 53-1/8 ×8–5/8" (609.6 x 1349 x 219.1 mm)
Coil (Cross Fin Coil)	Rows × Stages × FPI		3×14×17	3×14×17	3×14×17
	Face Area	ft²	2.15	3.04	3.04
Fan	Model		2D14B13	2D14B20	2D14B20
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	kW	0.03	0.04	0.04
	Air Flow 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 mm) (Flare Connection)	ϕ1/4" (6.4 mm) (Flare Connection)	ϕ3/8" (9.5 mm) (Flare Connection)
	Gas Pipes	in (mm)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ1/2" (12.7 mm) (Flare Connection)	ϕ5/8" (15.8 mm) (Flare Connection)
	Drain Pipe	in (mm)	ϕ27/32 O.D (Vinyl Chloride) (21.43 mm)	ϕ27/32 O.D (Vinyl Chloride) (21.43 mm)	ϕ27/32 O.D (Vinyl Chloride) (21.43 mm)
Machine Weight (Mass)		Lbs(kg)	66 lbs (29.9 kg)	80 lbs (26.3 kg)	80 lbs (26.3 kg)
★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
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25 ft (7.5 m) (Horizontal)

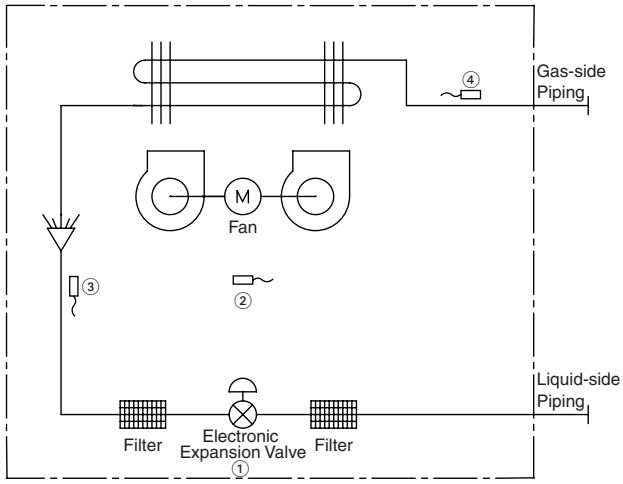
★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25 ft (7.5 m) (Horizontal)

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.

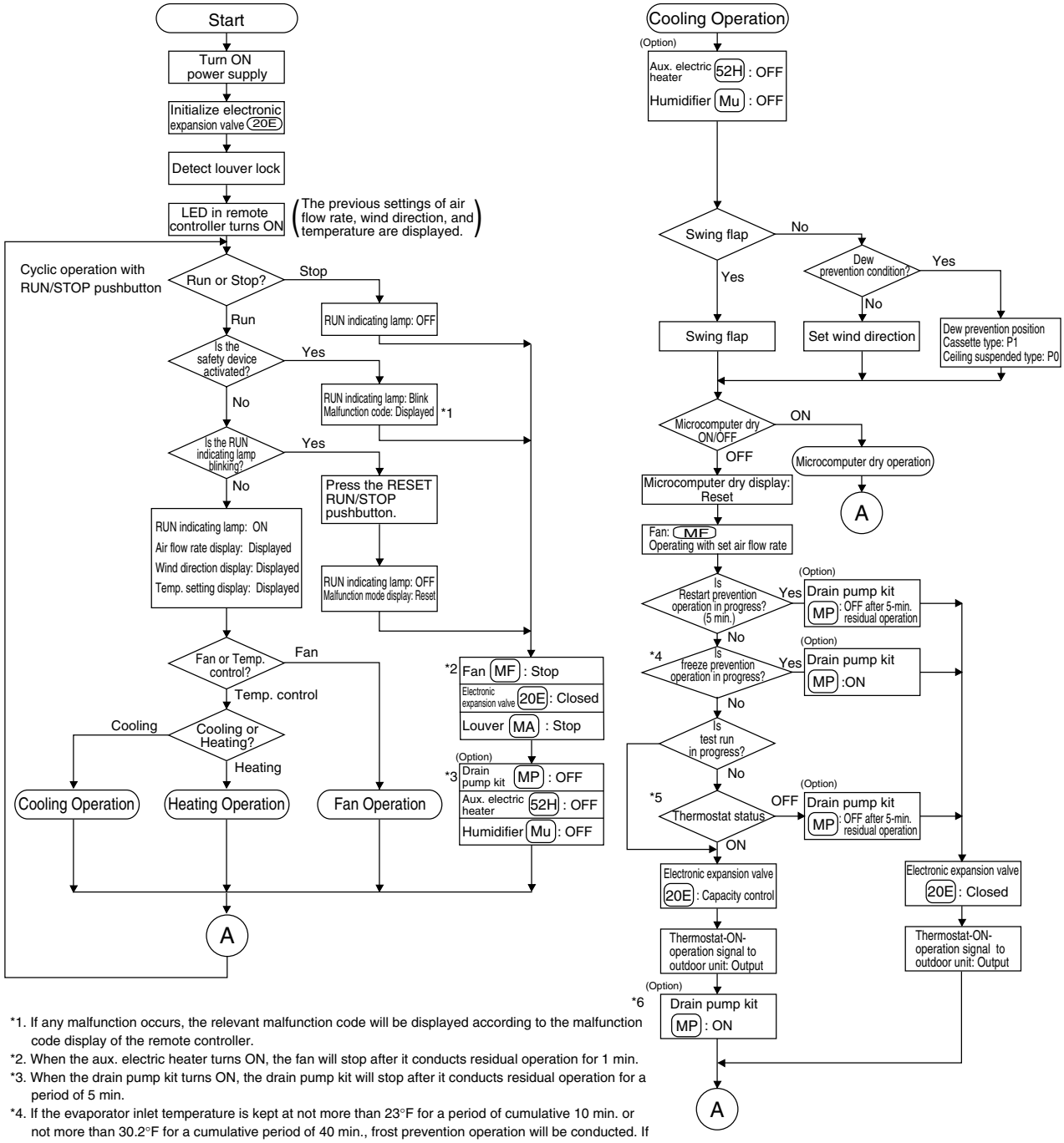
2. Refrigerant Circuit

FXFQ, FXZQ, FXDQ, FXSQ, 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.

3. Operation Flow Chart



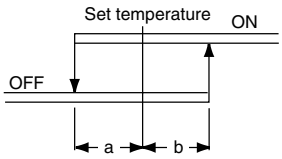
*1. If any malfunction occurs, the relevant malfunction code will be displayed according to the malfunction code display of the remote controller.

*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.

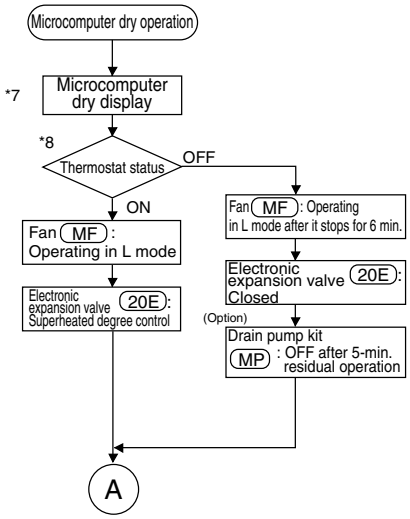
*4. If the evaporator inlet temperature is kept at not more than 23°F for a period of cumulative 10 min. or not more than 30.2°F for a cumulative period of 40 min., frost prevention operation will be conducted. If the evaporator inlet temperature is kept at not less than 44.6°F for a consecutive period of 10 min., the frost prevention operation will be reset.

*5. Thermostat status



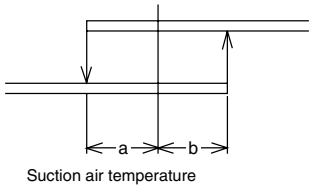
Suction air temperature
a=b=1
(a=b=0.5 is only available for the FXCQ, FXFQ, FXHQ, and FXKQ series.)

*6. The FXCQ, FXFQ, FXKQ, and FXSQ series have the drain pump as standard equipment.

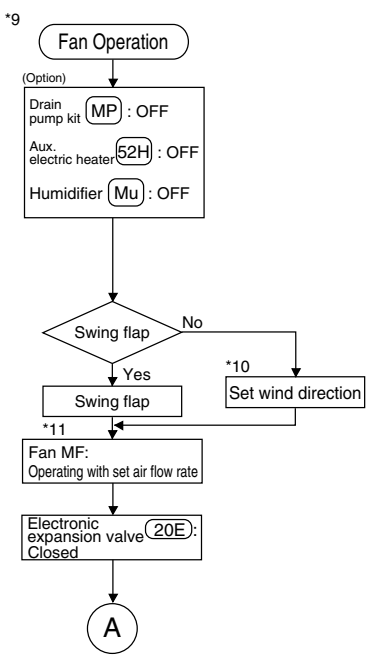


*7. Microcomputer dry display
No set temperature and air flow rate of the remote controller are displayed.

*8. Thermostat status
Set temperature when operating the microcomputer dry mechanism.



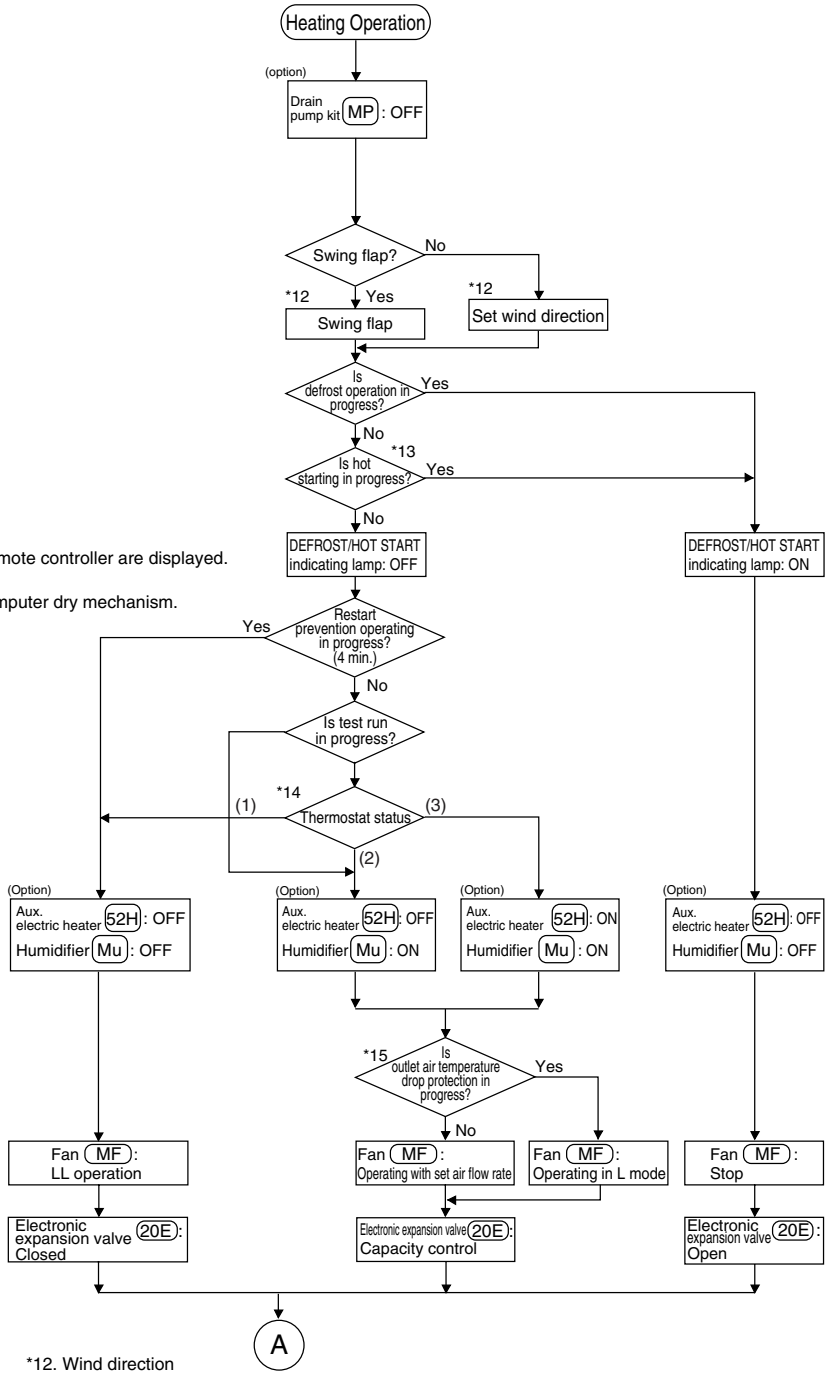
Suction air temperature



*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.

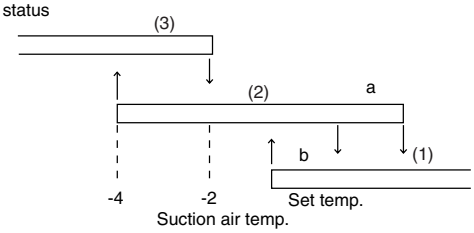
*11. Fan
According to fan speed instruction from the remote controller, the fan is put into operation in LL mode while in heating operation.



*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.

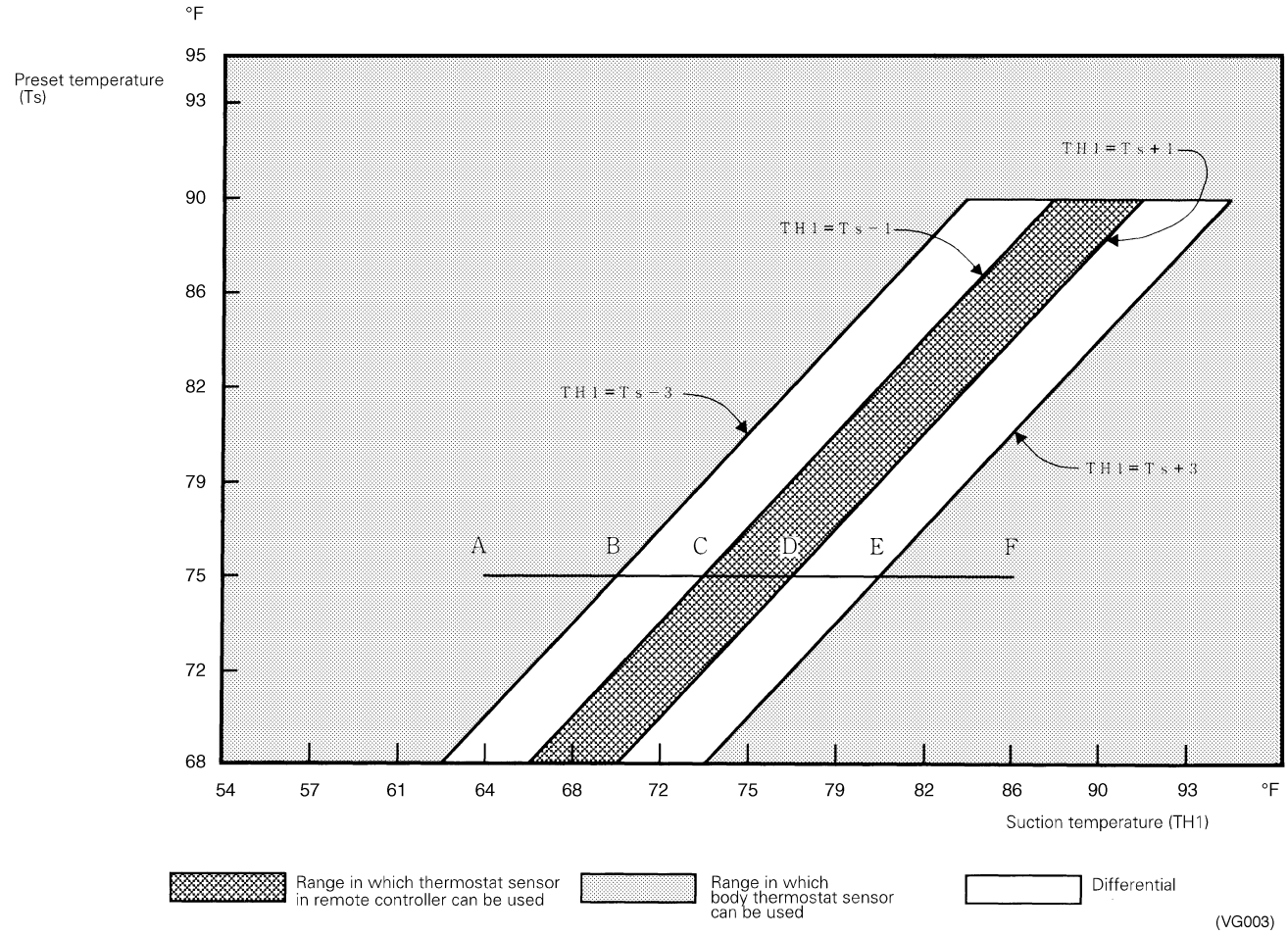
*15. Outlet air temperature drop protection
When the set temperature is below 75.2°F or the electronic expansion valve opening is small, the protection will be activated.

4. Thermostat Sensor in Remote Controller

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

Cooling

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



■ **Ex: When cooling**

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

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

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

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

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

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

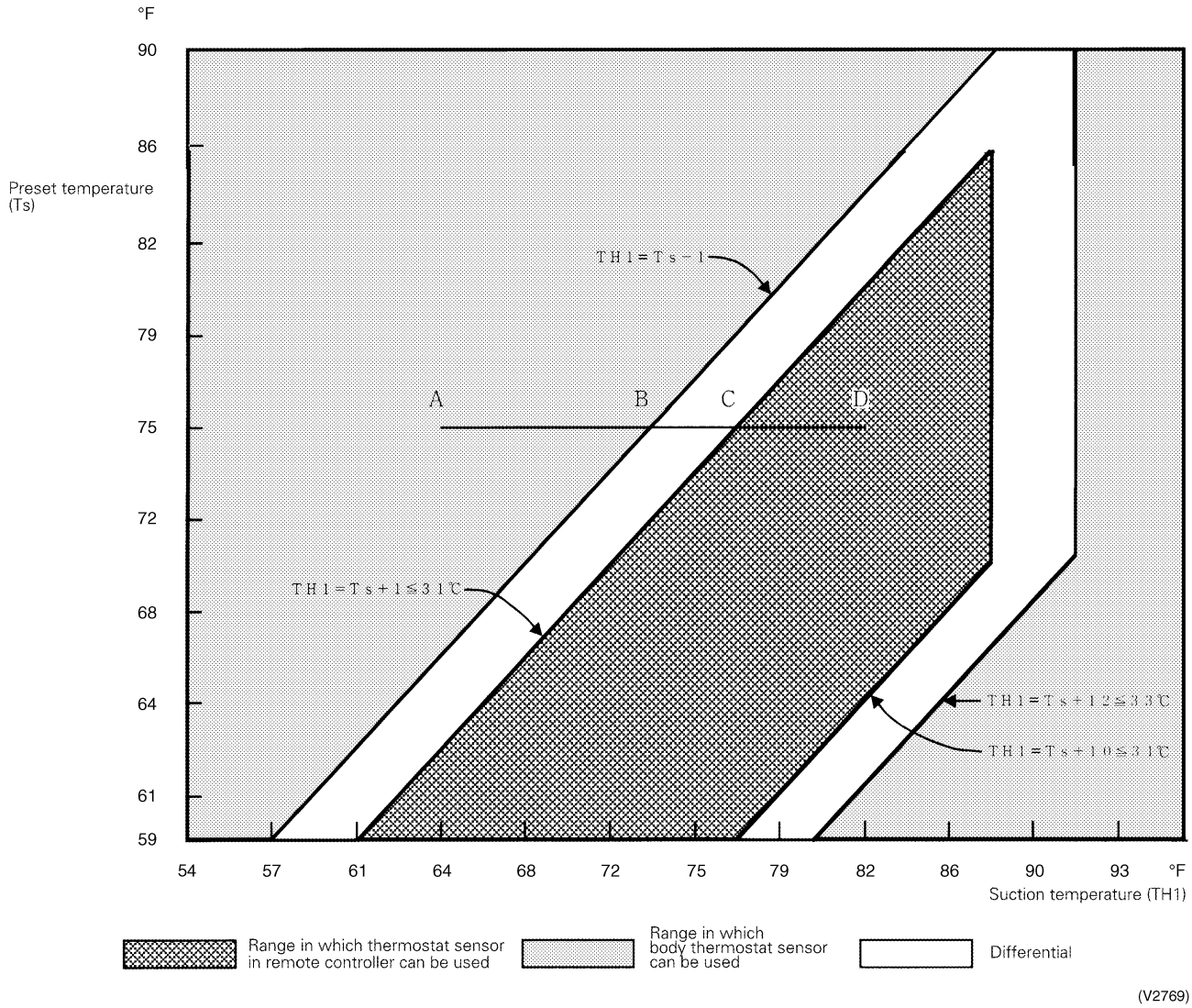
Body thermostat sensor is used for temperatures from 86°F to 77°F (F → D).

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

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

Heating

When heating, the hot air rises to the top of the room, resulting in a lower temperature near the floor where the occupants are. When controlling by return air sensor only, the unit may cycle off before the lower part of the room reaches the preset temperature. The temperature can be controlled so that the lower part of the room, where the occupants are, does not get cold. This can be accomplished by widening the thermostat sensor's range in the remote controller so that the return air temperature is higher than the preset temperature.



■ **Ex: When heating**

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

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

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

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

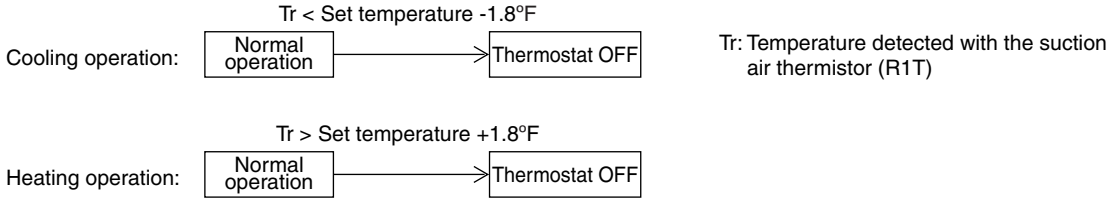
And, assuming return air temperature has changed from 82°F to 64°F (D → A):

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

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

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 set 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.

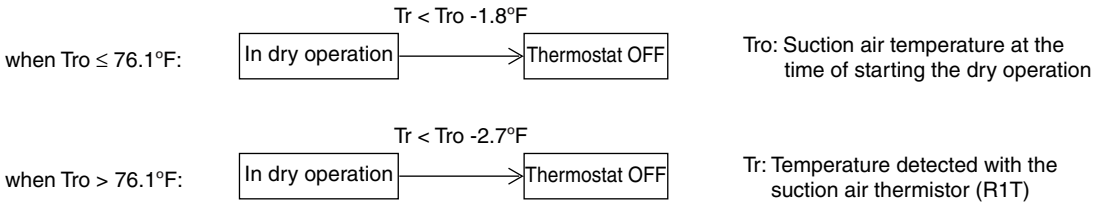


While in a single remote controller group control, the return air sensor is only used from this control. While in heating operation, cassette-mounted indoor units conduct the thermostat control by a value compensated by -3.6°F for the value detected with the body thermostat. Through field settings, the thermostat differential setting can be changed from 1.8°F to 0.9°F.

4.2 Thermostat Control in Dry Operation

While in dry operation, the thermostat control is conducted according to a return air temperature at the time of starting the dry operation.

Assuming that the return air temperature at the time of starting the dry operation is Tro and the return air temperature in operation is Tr:



While in dry operation mode, fans operate at L flow rate, stops for a period of six 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.

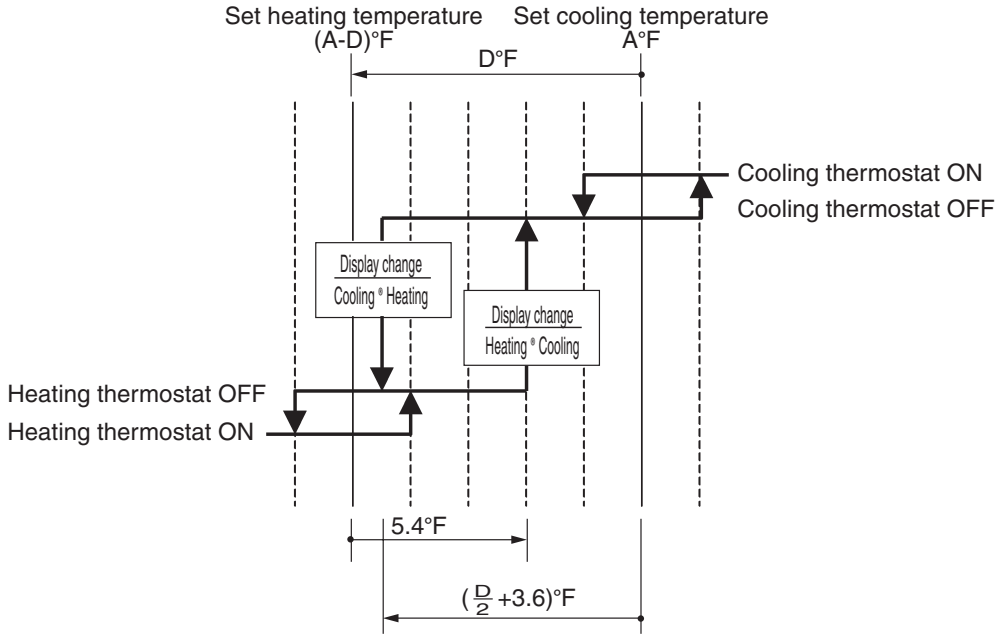
4.3 Thermostat Control with Operation Mode Set to AUTO

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 with remote controller*** (beginning page302) section.

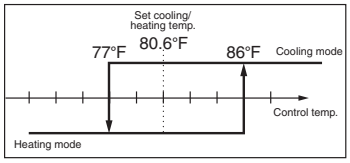
Mode No.	Setting switch No.	Contents of setting	Setting position No.							
			01	02	03	04	05	06	07	08
12	4	Differential value while in **AUTO** operation mode	0°F	1.8°F	3.6°F	5.4°F	7.2°F	9.0°F	10.8°F	12.6°F

: Factory setting

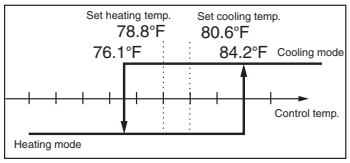


(Ex.) When automatic cooling temperature is set to 80.6°F:

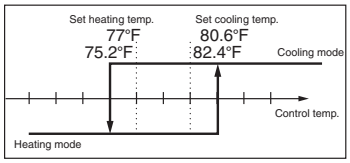
Differential value :0°F



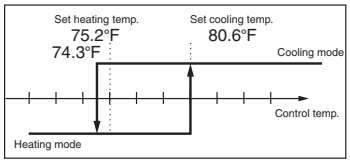
Differential value set to 1.8°F



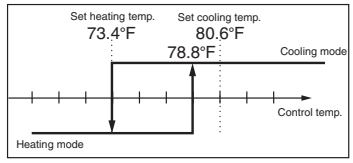
Differential value set to 3.6°F



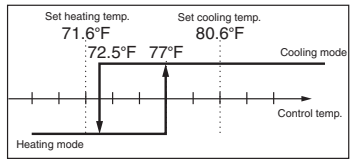
Differential value set to 5.4°F



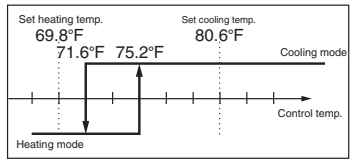
Differential value set to 7.2°F



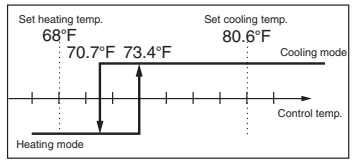
Differential value set to 9°F



Differential value set to 10.8°F



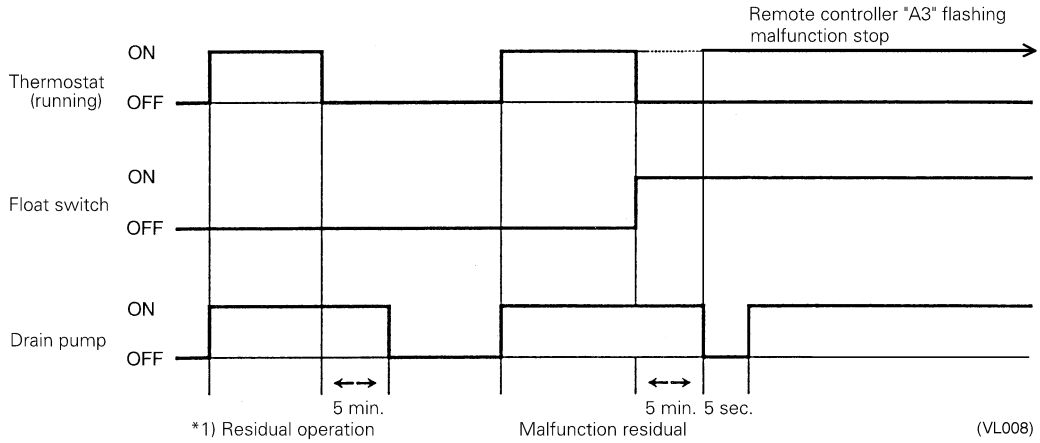
Differential value set to 12.6°F



5. Drain Pump Control

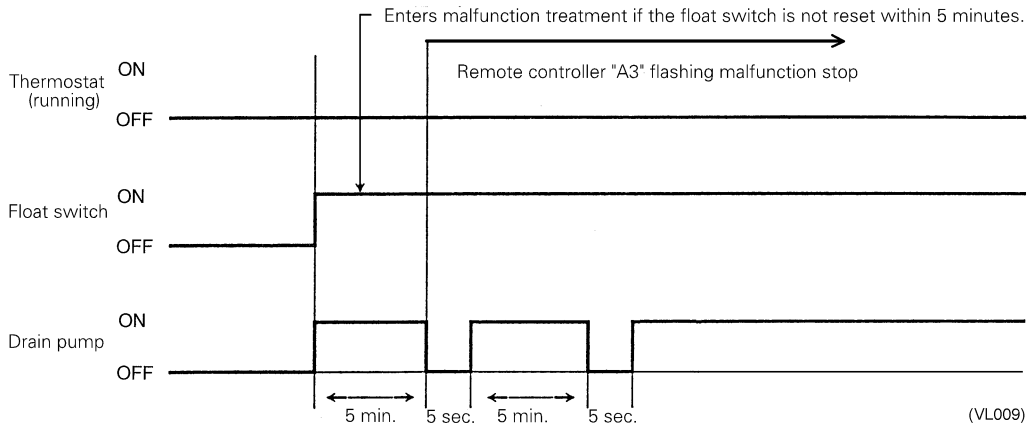
1. The drain pump is controlled by the ON/OFF buttons as shown in the following 4 figures:

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

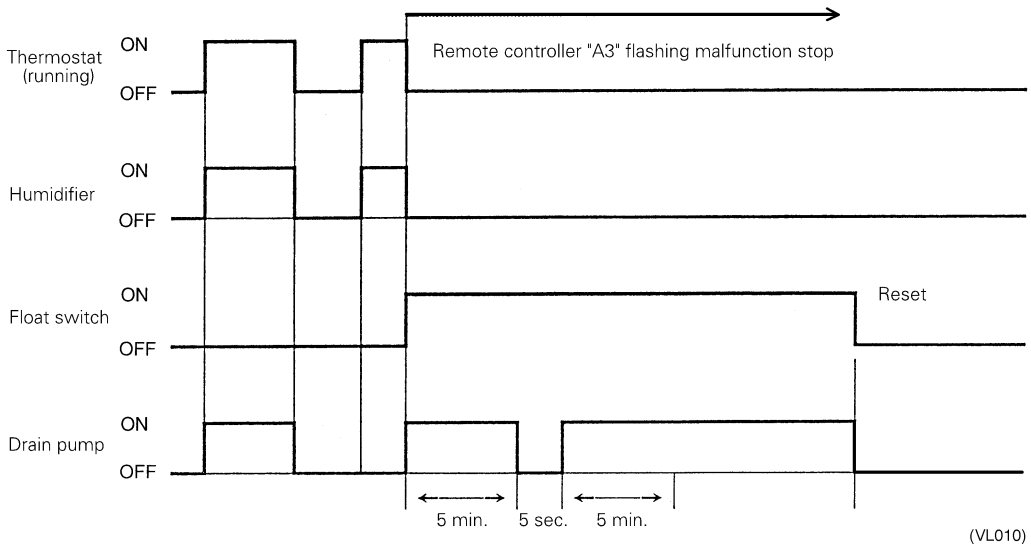


∗ 1. The objective of residual operation is to completely drain any moisture adhering to the fin of the indoor unit heat exchanger when the thermostat goes off during cooling operation.

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

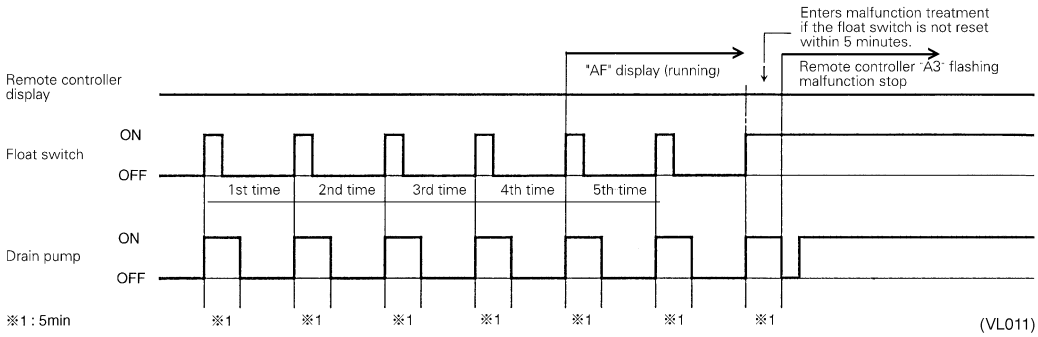


5.3 When the Float Switch is Tripped During Heating Operation:



During heating operation, if the float switch is not reset after 5 minutes of operation, it stops for 5 seconds, then for 5 minutes the operation cycle ends, then operation resumes 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 malfunction is determined to have occurred and [**AF**] is then displayed as operation continues.

6. Control of Electronic Expansion Valve

Electronic expansion valves in indoor units conduct superheated degree control in cooling operation and subcooled degree control in heating operation. 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 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 41°F.
- As ΔT (Remote controller set temp. - return air temp.) becomes larger, SHS becomes lower.
- As ΔT (Remote controller set temp. - return 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)

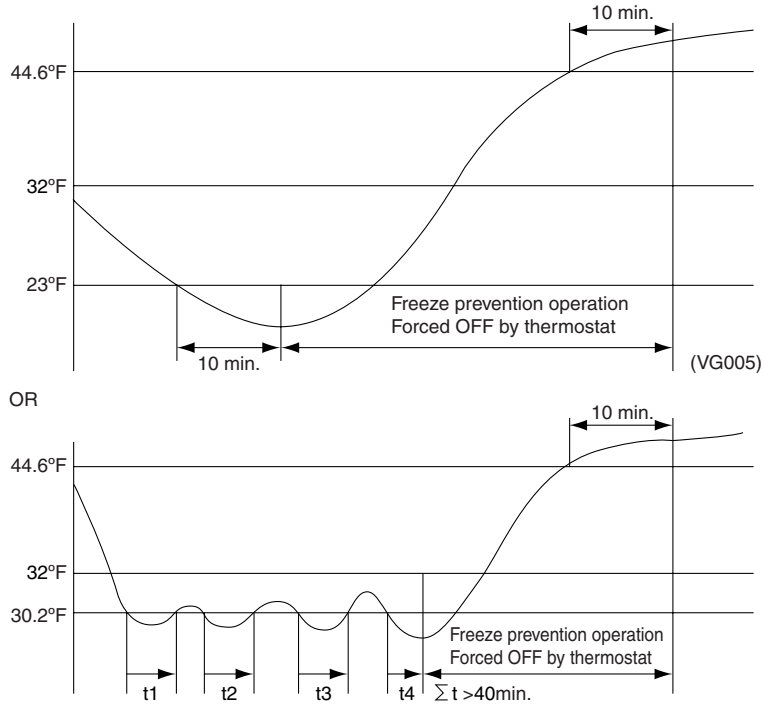
SCS (Target SC value)
SCS: Target subcooled degree

- Normally 41°F.
- As ΔT (Remote controller set temp. - return temp.) becomes larger, SCS becomes lower.
- As ΔT (Remote controller set temp. - return temp.) becomes lower, SCS becomes larger.

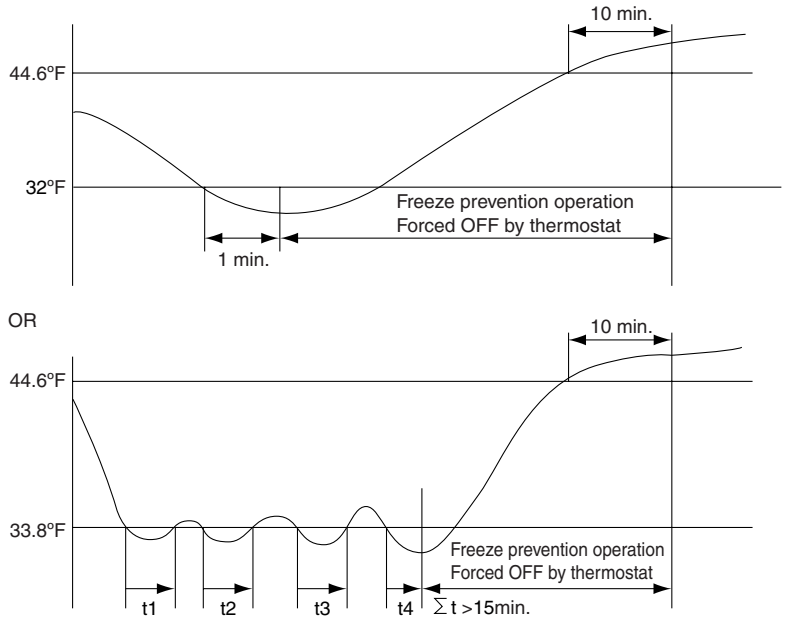
7. Freeze Prevention

Freeze Prevention by Off Cycle (Indoor Unit)

When the temperature detected by liquid pipe temperature thermistor (R2T) of the indoor unit heat exchanger drops too low, the unit enters freeze prevention operation in accordance with the following conditions, and is also set in accordance with the conditions given below.
When freeze prevention is activated, the electronic expansion valve is closed, the drain pump turns ON and the fan tap is fixed to L air flow. When the following conditions for stopping are satisfied, it returns.
Conditions for starting freeze 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 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 33.8ºF or less for a total of 15 minutes or 32ºF or less for 1 minute continuously.

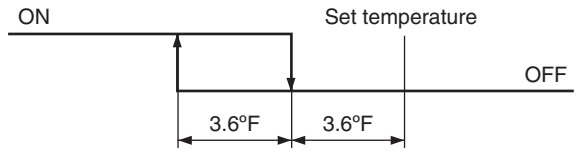


8. Heater Control (Optional PC Board KRP1B ... is required.)

The heater control is conducted in the following manner.

[Normal control]

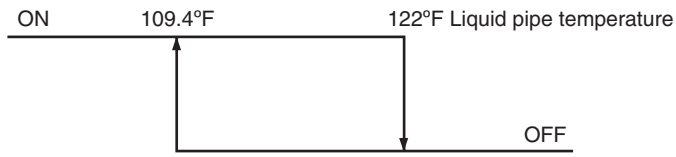
While in heating operation, the heater control (ON/OFF) is conducted as shown on the right.



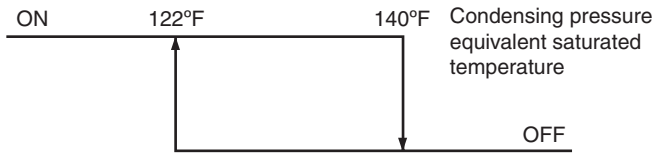
[Overload control]

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 (SINPH) of the outside 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

9. List of Louver Operations

Louvers operate as shown in table below.

			Fan	Louver		
				FXFQ	FXHQ FXKQ	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

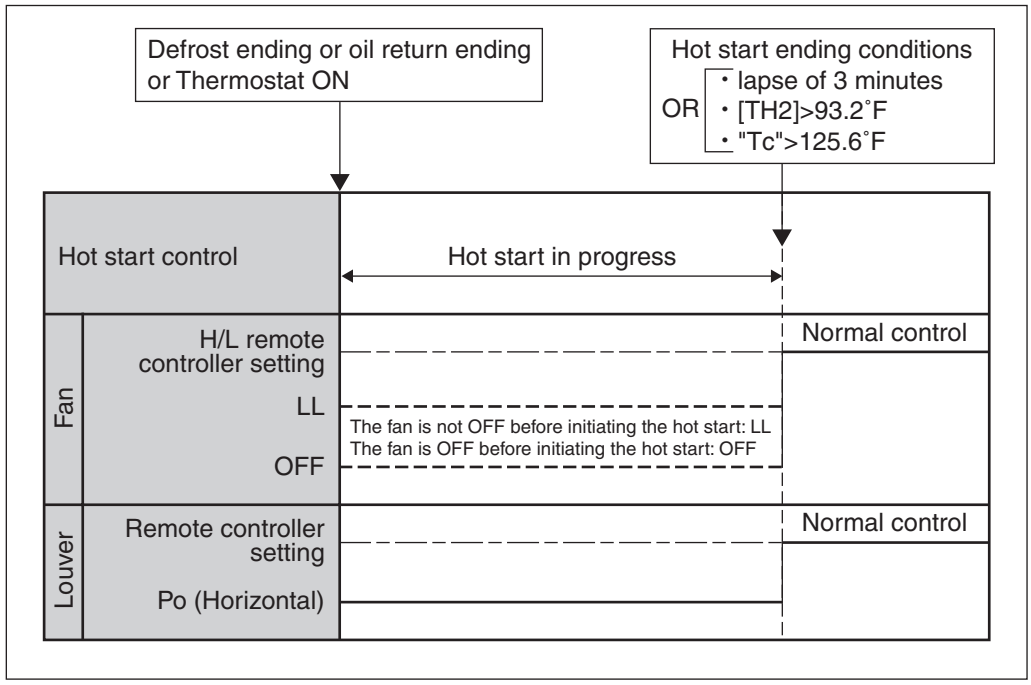
*1. L or LL only on FXFQ models

10.Hot Start Control (In Heating Operation 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.

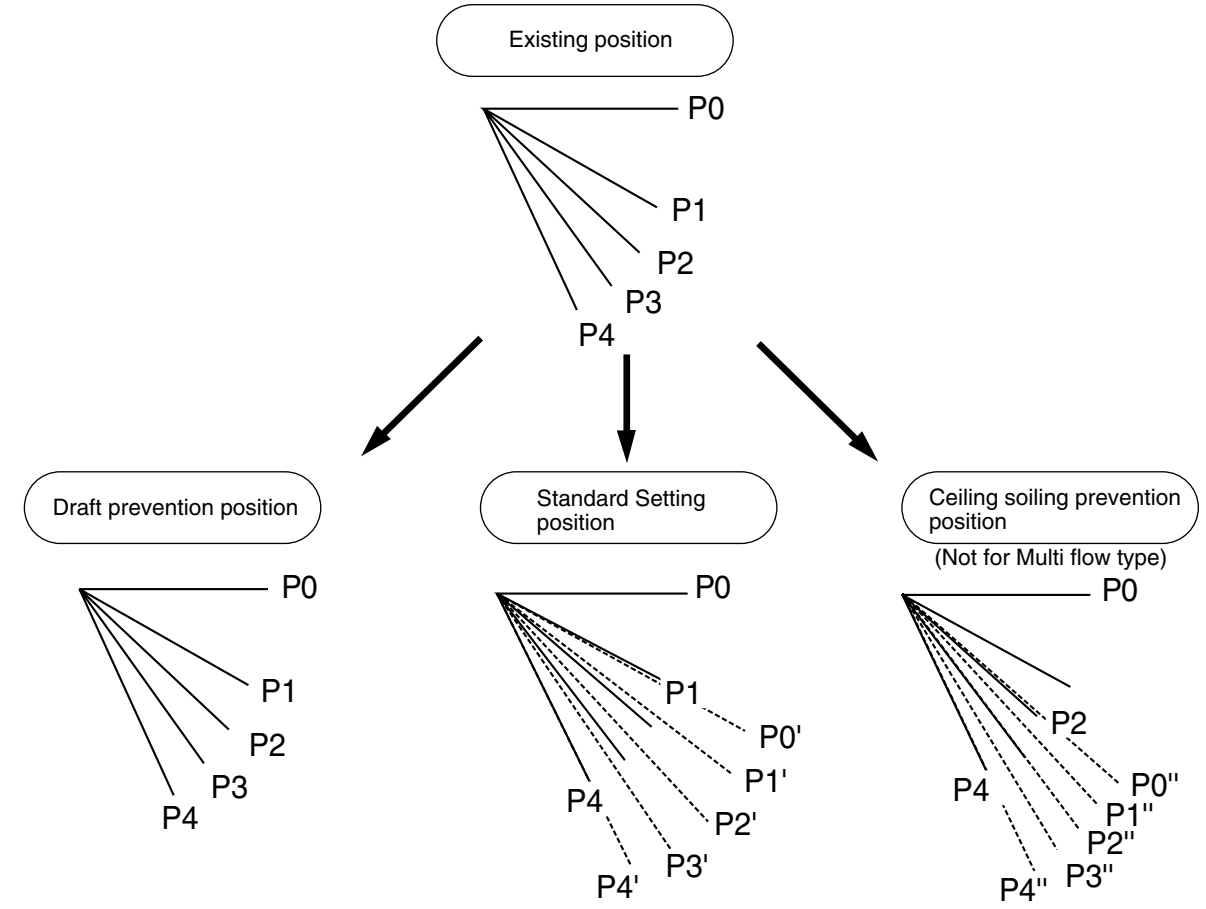


TH_2: Temperature (°F) detected with the gas thermistor

TC : High pressure equivalent saturated temperature

11.Louver Control for Preventing Ceiling Dirt

We have added a control feature that allows you to select the range of adjustable airflow direction 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 set position is standard position.

(VL012)

12.Field Setting

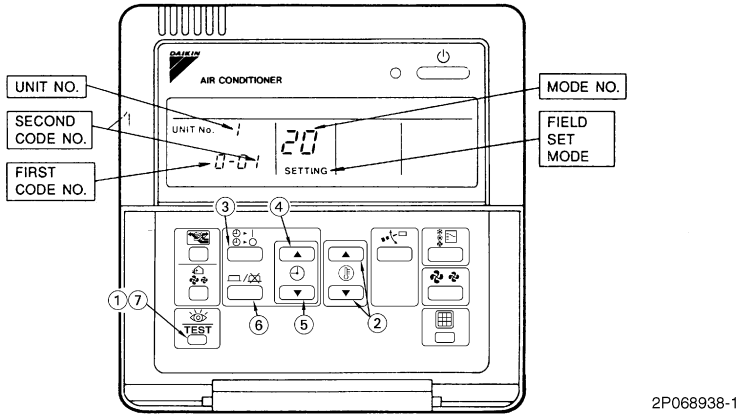
12.1 Field Setting from Remote Controller

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.

Incorrect settings may result in malfunction.

When an optional accessory is mounted on the indoor unit, the setting for the indoor unit may need to be changed. Refer to information in the **Option Handbook**.

12.1.1 Wired Remote Controller <BRC1D71>



2P068938-1

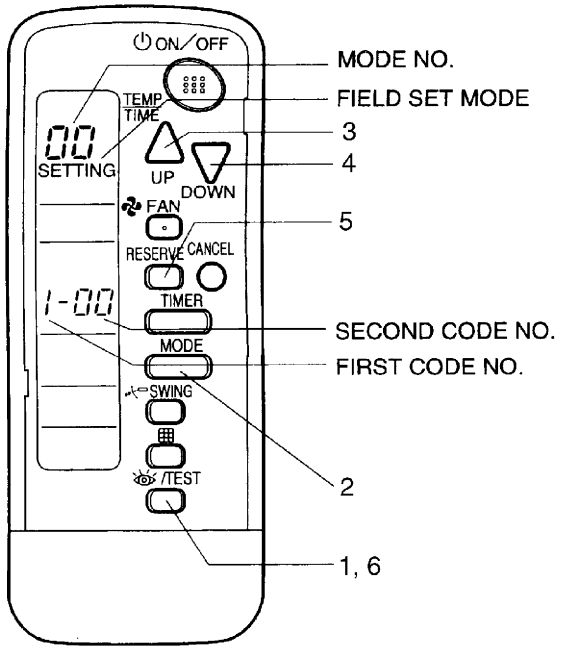
1. When in the normal mode, push the TEST button for 4 seconds or more, and operation then enters the [**FIELD SET MODE**]. Select the desired [**MODE NO.**] with the button.
2. During group control and you want to set by each individual indoor unit (when mode No. 20, 21, 22, 23, 25 has been selected), push the time mode button and select the “indoor unit No.” to be set.
   Note: This operation is not required when setting as a group.
3. Push the button and select the first code No.
4. Push the button and select the second code No.
5. Push the timer button one time and “define” the currently set contents.
6. Push the TEST button to return to the normal mode.

(Example)

When setting the filter sign time to [Filter Dirtiness-High] in all group unit setting, set the Mode No. to [**10**], Mode setting No. to [**0**] and setting position No. to [**02**].

12.1.2 Wireless Remote Controller - Indoor Unit

BRC7C812
BRC4C82
BRC7E818
BRC7E83



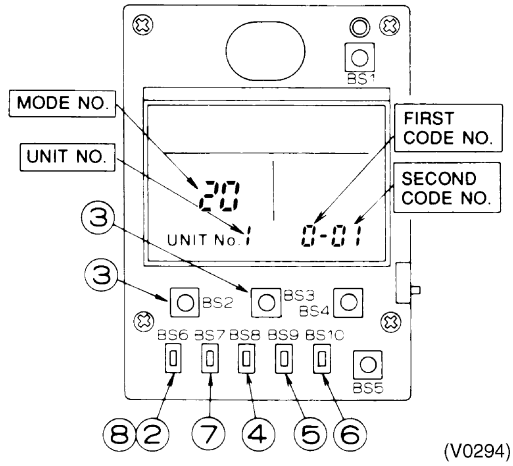
(V2770)

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

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

12.1.3 Simplified Remote Controller

BRC2A71



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

12.1.4 Setting Contents and Code No. – VRV Indoor unit

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

Notes :

1. Settings are made simultaneously for the entire group, however, if you select the mode No. inside parentheses, you can also set by each individual unit. Setting changes 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. Marked ▭ are factory set.
4. Do not make settings other than those described above. Nothing is displayed for functions the indoor unit is not equipped with.
5. [88] may be displayed to indicate the remote controller is resetting when returning to the normal mode.
6. If the setting mode to [Equipped] the heat reclaim ventilation fan conducts the fan residual operation by linking to indoor unit.

12.1.5 Applicable range of Field setting

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

*1 Static pressure selection

12.1.6 Detailed Explanation of Setting Modes

(1) Filter Sign Setting

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

Set Time

Filter Specs. / Setting	Standard	Long Life	Ultra Long Life Filter
Contamination Light	200 hrs.	2,500 hrs.	10,000 hrs.
Contamination Heavy	100 hrs.	1,250 hrs.	5,000 hrs.

(2) Ultra-Long-Life Filter Sign Setting

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

Setting Table

Mode No.	Setting Switch No.	Setting Position No.	Setting
10 (20)	1	01	Long-Life Filter
		02	Ultra-Long-Life Filter (1)
		03	—

(3) Selection of Thermistor

Select the thermistor to control room temperature.

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

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

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

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

(4) [Filter Cleaning] Displayed or Not Displayed

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

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

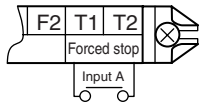
(5) Optional Output Switching

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

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

(6) External ON/OFF input

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



Setting Table

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

(7) Thermostat Switching

Differential value during thermostat ON/OFF control can be changed. For details, refer to **4.1 Thermostat Control while in Normal Operation** on page 289.

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

(8) Air Flow Setting When Heating Thermostat is OFF

This setting is used to set air flow when heating thermostat is OFF.

* When thermostat OFF air flow volume up mode is used, careful consideration is required before deciding installation location. During heating operation, this setting takes precedence over (7) **Fan Stop When Thermostat is OFF**.

Mode No.	First Code No.	Second Code No.	Contents
12 (22)	3	01	LL air flow
		02	Preset air flow

(9) Setting of operation mode to [AUTO]

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

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

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

(10) Auto Restart after Power Failure Reset

For the air conditioners with no setting for the ***Auto Restart after Power Failure Reset*** 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 if the main power supply is turned off and then on again. For air conditioners that do have this setting, the units may start automatically after power failure reset or if the main power supply is turned on again, and return to prior normal operation.
When the unit is set to enable [**Auto restart function after power failure reset**], use the following cautions:

Caution 1. The air conditioner starts operation suddenly after power failure reset or the main power supply turned on again. 2. During service work, turning off the main power switch while the unit is in operation, and turning on the switch again after the work is completed starts operation (the fan rotates).

(11) Air Flow When Cooling Thermostat is OFF

Sets airflow to [**LL air flow**] when cooling thermostat is OFF.

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

(12) Setting of Normal Air Flow

Make the following setting according to the ceiling height. The setting position No. is set to [**01**] at the factory.

■ **In the Case of FXAQ, FXHQ**

Mode No.	Setting Switch No.	Setting Position No.	Setting
13(23)	0	01	Wall-mounted type: Standard
		02	Wall-mounted type: Slight increase
		03	Wall-mounted type: 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 9 ft	Lower than 10 ft	Lower than 12 ft
		02	High Ceiling (H)	Lower than 10 ft	Lower than 11 ft	Lower than 13 ft
		03	Higher Ceiling (S)	Lower than 12 ft	Lower than 12 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 12 ft	Lower than 12 ft	Lower than 14 ft
		02	High Ceiling (H)	Lower than 12 ft	Lower than 13 ft	Lower than 14 ft
		03	Higher Ceiling (S)	Lower than 14 ft	Lower than 14 ft	—

(13) Air Flow Direction Setting

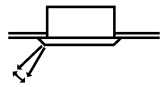
Set the airflow direction of indoor units as given in the following table . (Set when optional air outlet blocking pad has been installed.) The second code No. is factory set to [01].

Setting Table

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

(14) Setting of Air Flow Direction Adjustment Range

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



(S2537)

Setting Table

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

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

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

Model No.	First Code No.	Second Code No.	External static pressure
13 (23)	5	01	Standard (0.06"Wg)
		02	High static pressure (0.17"Wg)

(16) Humidification When Heating Thermostat is OFF

Setting to **Humidification Setting** turns ON the humidifier if suction temperature is 20ºC or above and turns OFF the humidifier if suction temperature is 18ºC or below when the heating thermostat is OFF.

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

(17) Setting of Direct Duct Connection

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 to prevent air filter dust from scattering.

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

(18) Interlocked Operation between Humidifier and Drain Pump

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

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

(19) Individual Setting of Ventilation

Set to perform individual operation of heat-reclaim ventilation using the remote controller/central unit if the option is available.

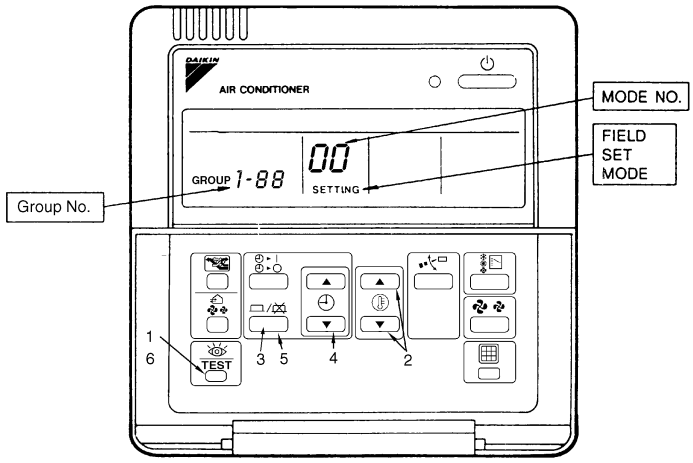
Mode No.	First Code No.	Second Code No.	Contents
15 (25)	5	01	—
		02	Individual operation of ventilation

12.1.7 Centralized Control Group No. Setting

BRC1D Type

- If carrying out centralized control by central remote controller or unified ON/OFF controller, group No. must be set for each group individually by remote controller.
- Group No. setting by remote controller for centralized control

1. When in the normal mode, push the TEST button for 4 seconds or more, and operation then enters the **field setting mode**.
2. Set mode No. [**00**] with the button. *
3. Push the button to inspect the group No. display.
4. Set the group No. for each group with the button. The group No. increases in the manner of 1-00, 1-01, ...,1-15, 2-00,...4-15. However, the unified ON/OFF controller displays only the group No. within the range selected by the switch for setting each address.
5. Push the timer button to define the selected group No.
6. Push the TEST button to return to the normal mode.



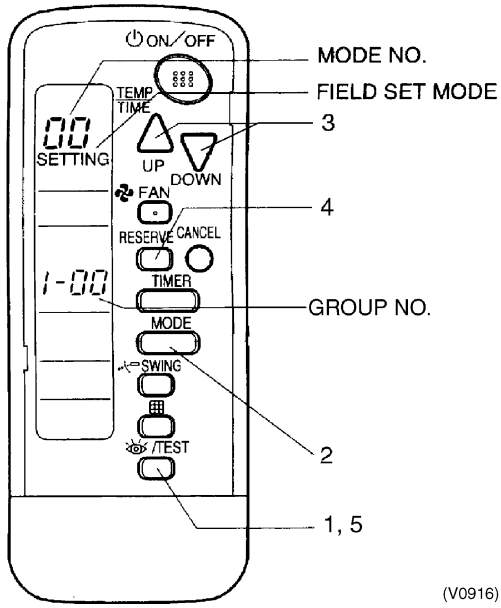
(S1095)

- Even if not using a remote controller, connect the remote controller when setting the group No., set the group No. for centralized control, and disconnect after making the settings.
- Set the group No. after turning on the power supply for the central remote controller, unified ON/OFF controller, and indoor unit.

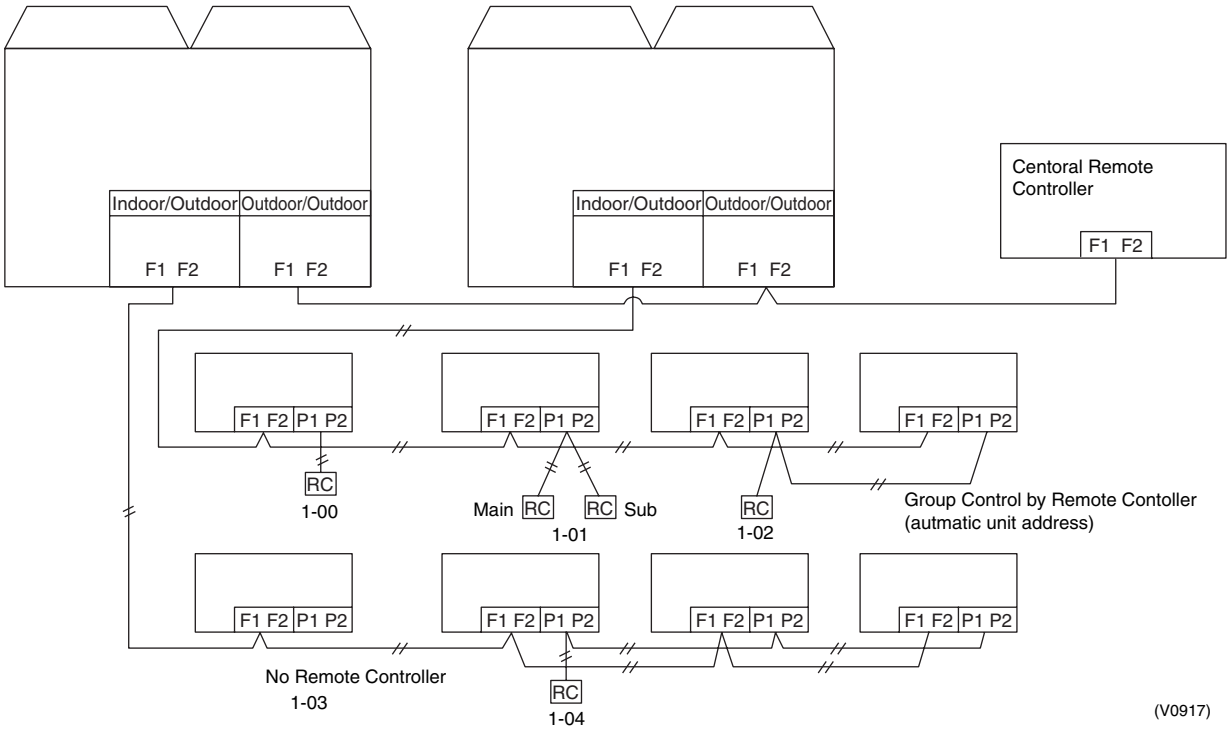
BRC7C Type
BRC4C Type
BRC7E Type

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

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

12.1.8 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 table below.)

The centralized controller is normally available for operations except when the centralized monitor is connected.

12.1.9 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.

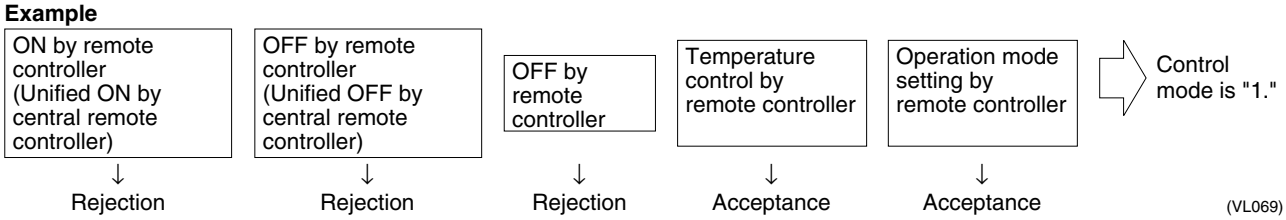
- ON/OFF control cannot be performed with the remote controller
  Used when you want to turn on/off by central remote controller only.

- OFF control only possible by remote controller
  Used when you want to turn on by central remote controller only, and off by remote controller only.
- Centralized
  Used when you want to turn on by central 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 central 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 central remote controller when time of system start is programmed.

How to Select Operation Mode

If operation by remote controller is available or not for turning on/off, controlling temperature, or setting operation, the mode is designated by the operation mode in the right hand column of the following table:

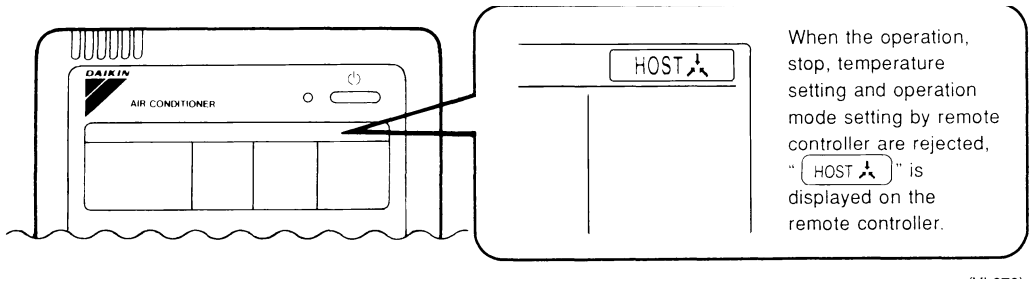
Example



Control mode	Control by remote controller					Control mode
	Operation		OFF	Temperature control	Operation mode setting	
	Unified operation, individual operation by central remote controller, or operation controlled by timer	Unified OFF, individual stop by central 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

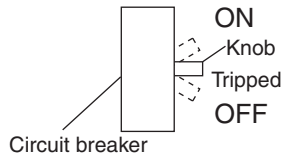
Do not select ***timer operation possible by remote controller*** if not using a remote controller as it will not be functional.

∗1. Factory setting



Part 5
Troubleshooting

1. Symptom-based Troubleshooting

	Symptom		Probable Cause	Countermeasure
1	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	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	System does not cool or heat air well.		Blocked air inlet or outlet of indoor or outdoor unit	Remove obstacle(s).
			Clogged air filter(s)	Clean the air filter(s).
			Enclosed outdoor unit(s)	Remove the enclosure.
			Improper set temperature	Set the temperature to a proper degree.
			Airflow rate set to **LOW**	Set it to a proper airflow rate.
			Improper direction of air diffusion	Set it to a proper direction.
			Open window(s) or door(s)	Shut it tightly.
		[In cooling]	Direct sunlight received	Hang curtains or shades on windows.
		[In cooling]	Too many persons staying in a room	
		[In cooling]	Too many heat sources (e.g. OA equipment) located in a room	
4	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	System makes intermittent stops.	The remote controller displays malfunction codes [**U4**] and [**U5**], and the system stops but restarts after a lapse of several minutes.	The system stops due to an interruption in communication between units caused by electrical noises coming from equipment other than air conditioners.	Remove causes of electrical noises. If these causes are removed, the system will automatically restart operation.

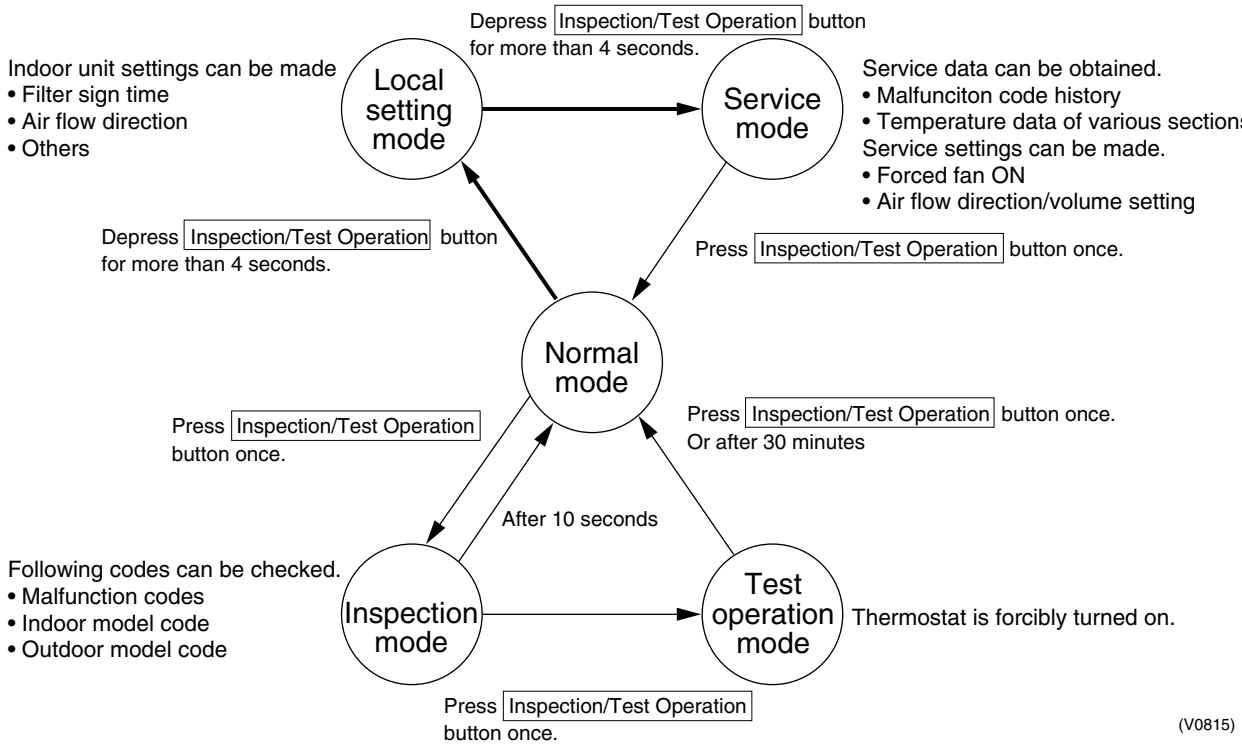
	Symptom		Probable Cause	Countermeasure
6	COOL-HEAT selection is disabled.	The remote controller displays **UNDER CENTRALIZED CONTROL**.	This remote controller has no option to select cooling operation.	Use a remote controller with option to select cooling operation.
		The remote controller displays **UNDER 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	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	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 setpoint temperature, the outdoor unit will stop while the indoor unit is brought to fan LL operation so that cold air is prevented.If fan operation mode is selected when other indoor unit is in heating operation, the system reverts to fan LL operation. The fan LL operation is also enabled while in oil return mode in cooling operation.	Normal operation.
9	Airflow direction is not reproduced according to the setting.	The airflow direction is not corresponding to that displayed on the remote controller. The louver does not swing.	Automatic control	Normal operation.
10	A white mist emits from the system.	<Indoor unit> In cooling operation, the ambient humidity is high. (Indoor unit is installed in a place with a lot of 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 stops, the ambient temperature and humidity are low.	Hot gas (refrigerant) flown in the indoor unit results to be vapor from the unit.	Normal operation.
		<Indoor and outdoor units> After the completion of defrosting operation, the system is switched to heating operation.	Defrosted moisture turns to be vapor and comes out from the units.	Normal operation.
11	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 flow.	Normal operation.

	Symptom		Probable Cause	Countermeasure
		<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" are produced from indoor units in the stopped state.	With VRV systems, these sounds are produced when other indoor units are 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 emits from the system.	Dust comes out from the system when it restarts after the stop for an extended period of time.	Accumulated dust deposits are emitted from the system.	Normal operation.
13	Odors emit from the system.	In operation	Odors in a room are absorbed into indoor unit and then blown out.	The inside of the indoor unit should be cleaned.
14	Outdoor unit fan does not rotate.	In operation	Fan revolutions are controlled for optimum performance.	Normal operation.
15	LCD display [**88**] appears on the remote controller.	Immediately after turning ON the power supply	System is checking if remote controller is normal.	Normal operation. This code is displayed for one minute maximum.
16	The outdoor unit compressor or the outdoor unit fan does not stop.	After stopping operation	It continues to prevent oil or refrigerant from accumulating.	Normal operation. It stops after a lapse of approximately 5 to 10 minutes.
17	The outdoor unit 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 emits from the system even though it stops.	Hot air is felt while the system stops.	With VRV systems, a 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.	Dry operation does not reduce room temperature.	Change the system to cooling operation.

2. Troubleshooting by Remote Controller

2.1 The INSPECTION / TEST Button

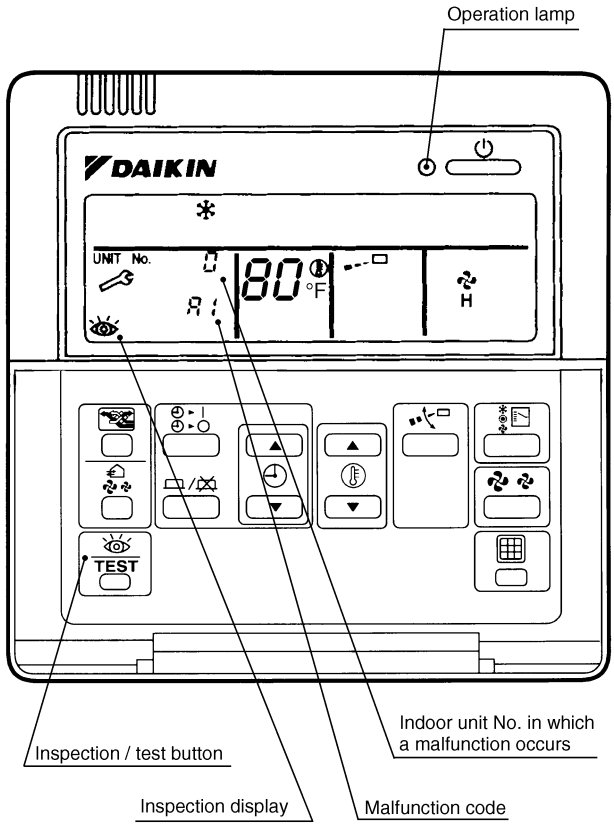
The following modes can be selected by using the [Inspection/Test Operation] button on the remote control.



2.2 Self-diagnosis by Wired Remote Controller

Explanation

If operation stops due to malfunction, the remote controller's operation LED blinks, and the malfunction code is displayed. Even if stop operation is carried out, malfunction contents are displayed when the inspection mode is entered. The malfunction code enables you to tell what kind of malfunction caused operation to stop. See page 115 for malfunction codes and the corresponding problem.



(S1155)

Note:

1. Pressing the INSPECTION/TEST button will blink to indicate checking mode.
2. While in check mode, pressing and holding the ON/OFF button for a period of five seconds or more will clear the failure history indication shown above. In this case, on the codes display, the malfunction code will blink twice and then change to [**00**] (=Normal), the Unit No. will change to [**0**], and the operation mode will automatically switch from check mode to normal mode, displaying the set temperature.

2.3 Self-diagnosis by Wireless Remote Controller

In the Case of BRC7C Type BRC7E Type BRC4C Type

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

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

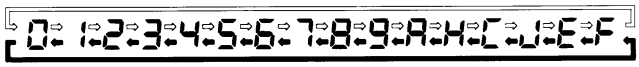
■ The upper digit of the code changes as shown below when the UP and DOWN buttons are pressed.

(SE006)

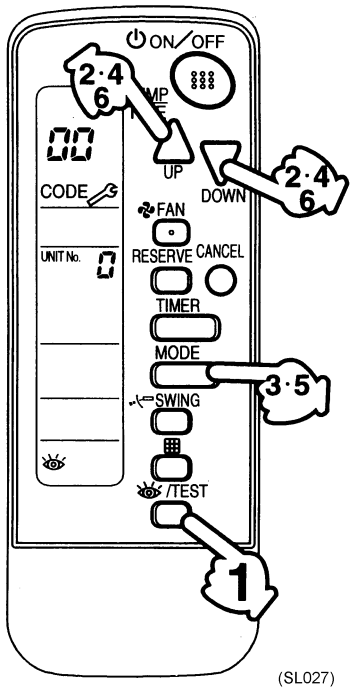
*2 Number of beeps
Continuous beep : Both upper and lower digits matched. (Malfunction code confirmed)
2 short beeps : Upper digit matched.
1 short beep : Lower digit matched.

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

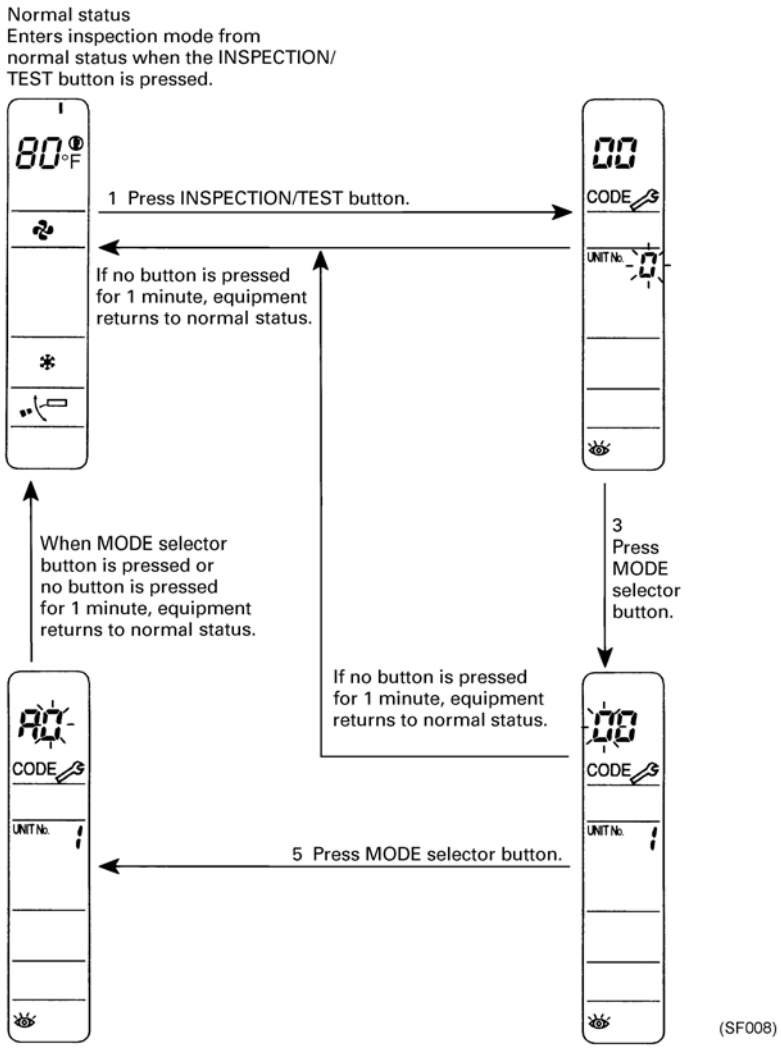
■ The lower digit of the code changes as shown below when the UP and DOWN buttons are pressed.



⇨ "Advance" button ⇦ "Backward" button (SE007)

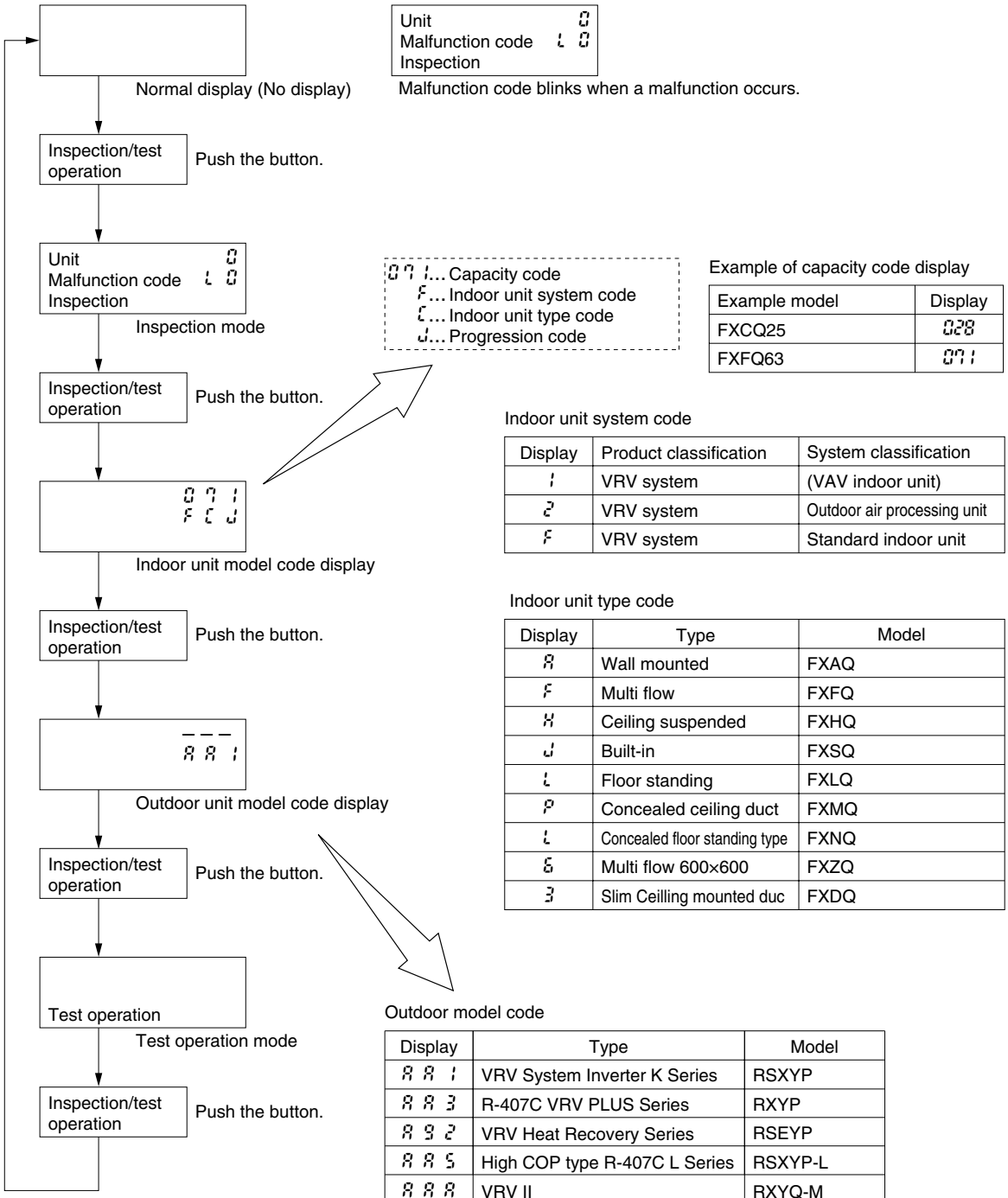


(SL027)


Normal status
Enters inspection mode from normal status when the INSPECTION/ TEST button is pressed.
80 °F
00
CODE
UNIT No.
0
1 Press INSPECTION/TEST button.
If no button is pressed for 1 minute, equipment returns to normal status.
3 Press MODE selector button.
When MODE selector button is pressed or no button is pressed for 1 minute, equipment returns to normal status.
If no button is pressed for 1 minute, equipment returns to normal status.
A0
CODE
UNIT No.
1
00
CODE
UNIT No.
1
5 Press MODE selector button.
(SF008)

2.4 Inspection Mode

Operating the INSPECTION/TEST button on the remote controller allows you to check the malfunction codes, indoor unit model codes, and outdoor unit model codes while in inspection mode.



Example of capacity code display

Example model	Display
FXCQ25	028
FXFQ63	071

Indoor unit system code

Display	Product classification	System classification
1	VRV system	(VAV indoor unit)
2	VRV system	Outdoor air processing unit
F	VRV system	Standard indoor unit

Indoor unit type code

Display	Type	Model
A	Wall mounted	FXAQ
F	Multi flow	FXFQ
H	Ceiling suspended	FXHQ
J	Built-in	FXSQ
L	Floor standing	FXLQ
P	Concealed ceiling duct	FXMQ
L	Concealed floor standing type	FXNQ
6	Multi flow 600×600	FXZQ
3	Slim Ceilling mounted duc	FXDQ

Outdoor model code

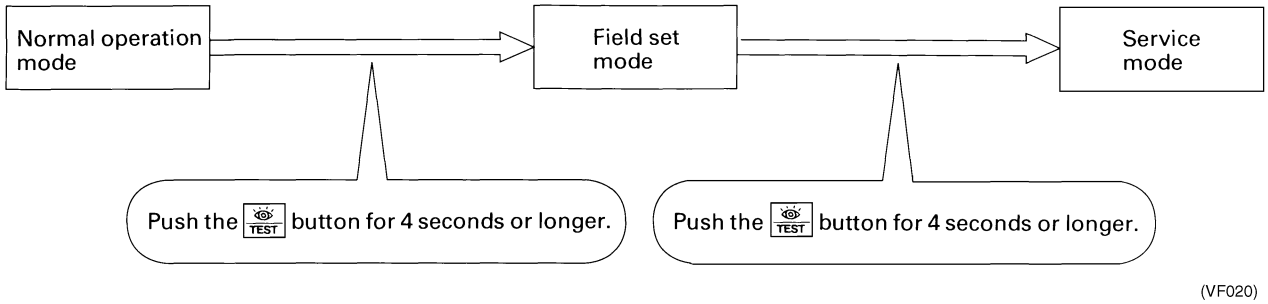
Display	Type	Model
AA1	VRV System Inverter K Series	RSXYP
AA3	R-407C VRV PLUS Series	RXYP
A92	VRV Heat Recovery Series	RSEYP
AA5	High COP type R-407C L Series	RSXYP-L
AAA	VRV II	RXYQ-M
A96	VRV II Heat Recovery	REYQM
A9F	VRV III Series	RXYQ-PYDN RXYQ-PTJU REYQ-PYDN REYQ-PTJU

(V2775)

2.5 Remote Controller Service Mode

Operating the CHECK/TEST button on the remote controller will make it possible to obtain service data and change service setting while in service mode.

How to Enter the Service Mode



(VF020)

Service Mode Operation Method

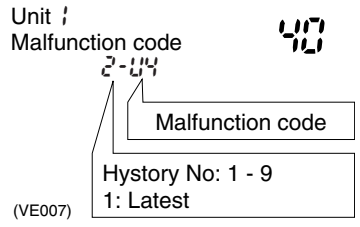
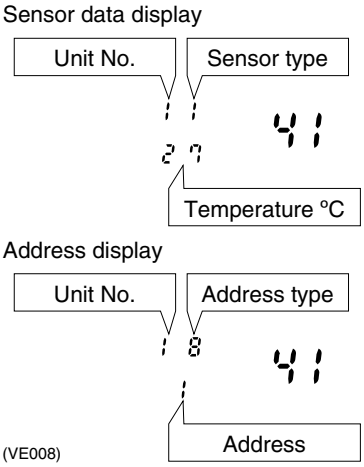
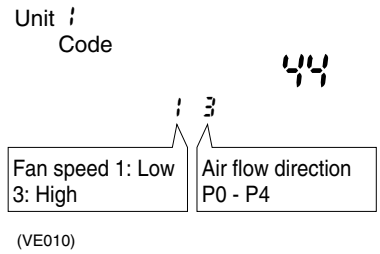
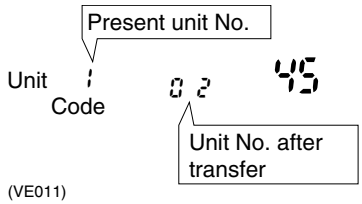
1. Select the mode No.
Set the desired mode No. with the button.
For wireless remote controller, Mode 43 only can be set.

2. Select the unit No. (For group control only)
Select the indoor unit No. to be set with the time mode . For wireless remote controller, button.

3. Make the settings required for each mode. (Modes 41, 44, 45)
In case of Mode 44, 45, push button to be able to change setting before setting work. (LCD code blinks.)
For details, refer to the table in next page.

4. Define the setting contents. (Modes 44, 45)
Define by pushing the timer button.
After defining, LCD code changes blinking to ON.

5. Return to the normal operation mode.
Push the button one time.

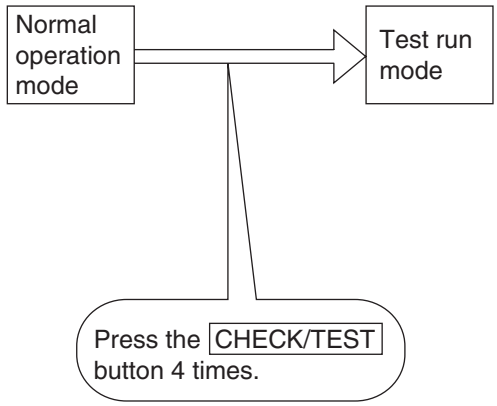
Mode No	Function	Contents and operation method	Remote controller display example
40	Malfunction hysteresis display	Display malfunction hysteresis. The history No. can be changed with the button.	
41	Display of sensor and address data	Display various types of data. Select the data to be displayed with the button. Sensor data 0: Thermostat sensor in remote controller. 1: Suction 2: Liquid pipe 3: Gas pipe Address data 4: Indoor unit address 5: Outdoor unit address 6: BS unit address 7: Zone control address 8: Cool/heat group address 9: Demand / low noise address	
43	Forced fan ON	Manually turn the fan ON by each unit. (When you want to search for the unit No.) By selecting the unit No. with the button, you can turn the fan of each indoor unit on (forced ON) individually.	
44	Individual setting	Set the fan speed and air flow direction by each unit Select the unit No. with the time mode button. Set the fan speed with the button. Set the air flow direction with the button.	
45	Unit No. transfer	Transfer unit No. Select the unit No. with the button. Set the unit No. after transfer with the button.	
46 47	This function is not used by VRV III R-410A.		

2.6 Test Run Mode

Selecting the INSPECTION/TEST button on the remote controller enables **Test Run Mode**.

(1) Test run mode setting

Use the following steps to initiate **Test Run Mode**:

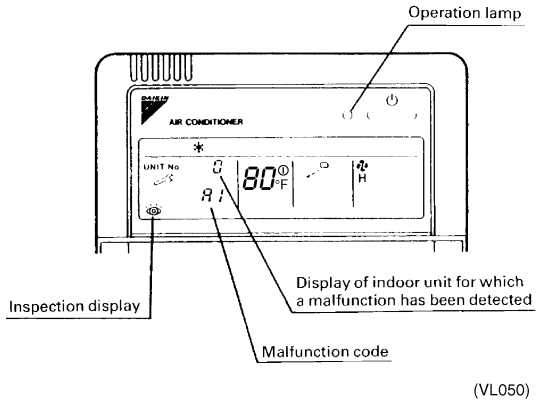


Press the RUN/STOP button after the completion of test run mode setting, and a test run starts. The remote controller display [**TEST RUN**] .

2.7 Remote Controller Self-Diagnosis Function

The remote controller switches are equipped with a self diagnosis function to ensure appropriate maintenance. If a malfunction occurs during operation, the operation lamp, malfunction code, location, and unit number are displayed

When there is a stop due to malfunction, the contents of the malfunction given below can be diagnosed by a combination of operation lamp, INSPECTION display of the liquid crystal display and display of malfunction code. It also displays the unit number during group control.



○: ON ●: OFF ◑: Blink

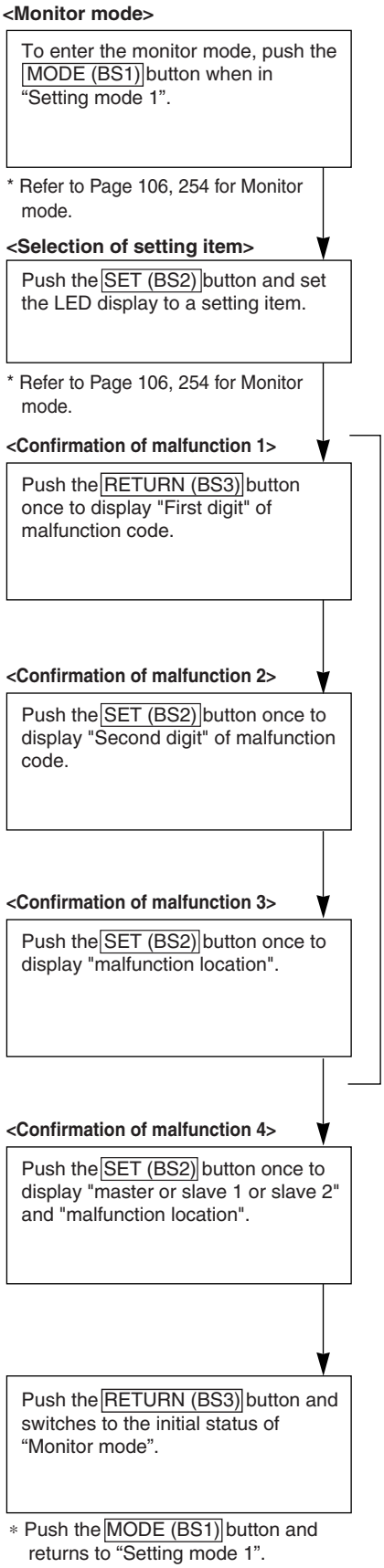
	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	Page
Indoor Unit	A0	◑	◑	◑	Error of external protection device	338
	A1	◑	◑	◑	PC board defect, E^2 PROM defect	337
	A3	◑	◑	◑	Malfunction of drain level control system (S1L)	338
	A6	◑	◑	◑	Fan motor (M1F) lock, overload	342 344 345
	A7	○	●	◑	Malfunction of swing flap motor (M1S)	344
	A9	◑	◑	◑	Malfunction of moving part of electronic expansion valve / Dust clogging	346 350
	AF	○	●	◑	Drain level about limit	350
	AH	○	●	◑	Malfunction of air filter maintenance	—
	AJ	◑	◑	◑	Malfunction of capacity setting	351
	C4	◑	◑	◑	Malfunction of thermistor (R2T) for heat exchange (loose connection, disconnection, short circuit, failure)	352
	C5	◑	◑	◑	Malfunction of thermistor (R3T) for gas pipes (loose connection, disconnection, short circuit, failure)	354
	C9	◑	◑	◑	Malfunction of thermistor (R1T) for air inlet (loose connection, disconnection, short circuit, failure)	354
	CJ	○	○	○	Malfunction of thermostat sensor in remote controller	355
Outdoor Unit	E1	◑	◑	◑	PC board defect	356
	E2	◑	◑	◑	Detection of ground leakage by leak detection PC board assembly	358
	E3	◑	◑	◑	Actuation of high pressure switch	360
	E4	◑	◑	◑	Actuation of low pressure sensor	361
	E5	◑	◑	◑	Compressor motor lock	364
	E6	◑	◑	◑	Standard compressor lock or over current	365
	E7	◑	◑	◑	Malfunction of outdoor unit fan motor	367
	E9	◑	◑	◑	Malfunction of moving part of electronic expansion valve (Y1E, Y2E, Y3E)	370
	F3	◑	◑	◑	Abnormal discharge pipe temperature	372
	F6	◑	◑	◑	Refrigerant overcharged	374
	F9	◑	◑	◑	Malfunction of BS unit electronic expansion valve	—
	H7	◑	◑	◑	Abnormal outdoor fan motor signal	374
	H9	◑	◑	◑	Malfunction of thermistor (R1T) for outdoor air (loose connection, disconnection, short circuit, failure)	377
	J2	◑	◑	◑	Current sensor malfunction	378
	J3	◑	◑	◑	Malfunction of discharge pipe thermistor (R31, 32T, 33T) (loose connection, disconnection, short circuit, failure)	384
	J4	◑	◑	◑	Malfunction of temperature sensor for heat exchanger gas (R2T)	385
	J5	◑	◑	◑	Malfunction of thermistor (R8T) for suction pipe (loose connection, disconnection, short circuit, failure)	382
	J6	◑	◑	◑	Malfunction of thermistor (R4T) for heat exchanger (loose connection, disconnection, short circuit, failure)	383
	J7	◑	◑	◑	Malfunction of receiver outlet liquid pipe thermistor (R6T), (9T)	384
	J8	◑	◑	◑	Malfunction of liquid pipe thermistor 2 (R7T)	385
	J9	◑	◑	◑	Malfunction of subcooling heat exchanger gas pipe thermistor (R5T)	386
	JA	◑	◑	◑	Malfunction of high pressure sensor	387
	JC	◑	◑	◑	Malfunction of low pressure sensor	389

○: ON ●: OFF ◑: Blink

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	Page
Outdoor Unit	L1	◑	◑	◑	Malfunction of inverter PC board	391
	L4	◑	◑	◑	Malfunction of inverter radiating fin temperature rise	393
	L5	◑	◑	◑	DC output overcurrent of inverter compressor	396
	L8	◑	◑	◑	Inverter current abnormal	398
	L9	◑	◑	◑	Inverter start up error	400
	LA	◑	◑	◑	Malfunction of power unit	—
	LC	◑	◑	◑	Malfunction of transmission between inverter and control PC board	403
	P1	◑	◑	◑	Inverter over-ripple protection	406
	P4	◑	◑	◑	Malfunction of inverter radiating fin temperature rise sensor	408
	PJ	◑	◑	◑	Faulty field setting after replacing main PC board or faulty combination of PC board	410
System	U0	○	●	◑	Gas shortage alert	412
	U1	◑	◑	◑	Reverse phase / open phase	414
	U2	◑	◑	◑	Power supply insufficient or instantaneous failure	415
	U3	◑	◑	◑	Check operation is not completed.	418
	U4	◑	◑	◑	Malfunction of transmission between indoor and outdoor units	419
	U5	◑	◑	◑	Malfunction of transmission between remote controller and indoor unit	424
	U5	●	○	●	Failure of remote controller PC board or setting during control by remote controller	424
	U7	◑	◑	◑	Malfunction of transmission between outdoor units	421
	U8	◑	◑	●	Malfunction of transmission between main and sub remote controllers (malfunction of sub remote controller)	431
	U9	◑	◑	◑	Malfunction of transmission between indoor unit and outdoor unit in the same system	432
	UA	◑	◑	◑	Improper combination of indoor and outdoor units, indoor units and remote controller	433
	UC	○	○	○	Address duplication of central remote controller	439
	UE	◑	◑	◑	Malfunction of transmission between central remote controller and indoor unit	440
	UF	◑	◑	◑	Refrigerant system not set, incompatible wiring / piping	443
	UH	◑	◑	◑	Malfunction of system, refrigerant system address undefined	444
Central Remote Controller and Schedule Timer	M1	○ or ●	◑	◑	Central remote controller PC board defect Schedule timer PC board defect	446
	M8	○ or ●	◑	◑	Malfunction of transmission between optional controllers for centralized control	447
	MA	○ or ●	◑	◑	Improper combination of optional controllers for centralized control	453
	MC	○ or ●	◑	◑	Address duplication, improper setting	451
Heat Reclaim Ventilation	64	○	●	◑	Indoor unit's air thermistor error	—
	65	○	●	◑	Outside air thermistor error	—
	6A	○	●	◑	Damper system alarm	—
	6A	◑	◑	◑	Damper system + thermistor error	—
	6F	○	●	◑	Malfunction of simple remote controller	—
	6H	○	●	◑	Malfunction of door switch or connector	—
	94	◑	◑	◑	Internal transmission error	—

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

Malfunction code



Detail description on next page.

Malfunctions		Malfunction code
Description of malfunction	Description of malfunction (PGF)	Remote controller
PC board malfunction	PC board malfunction	E1
	Faulty PC board	
Leak detection PC board	Indicate electric leakage detected by the leak detection PC board	E2
Abnormal discharge pressure	HPS activated	E3
Abnormal suction pressure	Pe malfunction	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 malfunction	EVM	E9
	EV2	
	EVT	
Positioning signal malfunction of outdoor unit fan motor	DC fan motor positioning signal malfunction for fan 1	H7
	DC fan motor positioning signal malfunction for fan 2	
Abnormal outdoor temperature	Ta sensor malfunction (short-circuited)	H9
	Ta sensor malfunction (open)	
Abnormal discharge pipe temperature	Td malfunction	F3
Abnormal heat exchanger temperature	Refrigerant overcharged	F6
Current sensor malfunction	CT1 sensor malfunction	J2
	CT2 sensor malfunction	
Discharge pipe temperature sensor malfunction	Tdi sensor malfunction (short-circuited)	J3
	Tds1 sensor malfunction (short-circuited)	
	Tds2 sensor malfunction (short-circuited)	
	Tdi sensor malfunction (open)	
	Tds1 sensor malfunction (open)	
	Tds2 sensor malfunction (open)	
Heat exchanger gas temperature sensor malfunction	Tg sensor malfunction (short-circuited)	J4
	Tg sensor malfunction (open)	
Suction pipe temperature sensor malfunction	TsA sensor malfunction (short-circuited)	J5
	TsA sensor malfunction (open)	
Heat exchanger temperature sensor malfunction	Tb sensor malfunction (short-circuited)	J6
	Tb sensor malfunction (open)	
Liquid pipe temperature sensor malfunction 1	Tsc sensor malfunction (short-circuited)	J7
	Tsc sensor malfunction (open)	
	TL sensor malfunction (short-circuited)	
	TL sensor malfunction (open)	
Liquid pipe temperature sensor malfunction 2	Tf sensor malfunction (short-circuited)	J8
	Tf sensor malfunction (open)	
Subcool heat exchanger temperature sensor malfunction	Tsh sensor malfunction (short-circuited)	J9
	Tsh sensor malfunction (open)	
Discharge pressure sensor malfunction	Pc sensor malfunction (short-circuited)	JA
	Pc sensor malfunction (open)	
Suction pressure sensor malfunction	Pe sensor malfunction (short-circuited)	JC
	Pe sensor malfunction (open)	

○ : ON
◑ : Blink
● : OFF

○: ON ●: OFF ◑:Blink

Malfunction code	Confirmation of malfunction 1 (Check 1)							Confirmation of malfunction 2 (Check 2)							Confirmation of malfunction 3 (Check 3)							Confirmation of malfunction 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 malfunction (first digit)

Display of contents of malfunction (second digit)

Display 1 of malfunction in detail

Display 2 of malfunction in detail

*1: Faulty 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, push the MODE (BS1) button when in "Setting mode 1".

* Refer to Page 106, 254 for Monitor mode.

<Selection of setting item>

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

* Refer to Page 106, 254 for Monitor mode.

<Confirmation of malfunction 1>

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

<Confirmation of malfunction 2>

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

Detail description on next page.

<Confirmation of malfunction 3>

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

<Confirmation of malfunction 4>

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

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

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

Malfunctions		Malfunction code
Description of malfunction	Description of malfunction (PGF)	Remote controller
INV PC board malfunction	Faulty IPM	L1
	Current sensor failure confirmation 1	
	IGBT malfunction	
	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 malfunction	INV transmission malfunction	LC
Open phase and unbalanced power supply	Unbalanced INV power supply voltage	P1
Switch box inside temperature sensor malfunction	INV-box temperature thermistor malfunction	P3
INV radiation fin temperature sensor malfunction	INV fin thermistor malfunction	P4
Faulty combination of INV and fan driver	Faulty combination of INV	PJ
	Faulty combination of fan driver 1	
	Faulty combination of fan driver 2	
Out of gas	Out-of-gas alarm	U0
Reversed phase	Reversed phase malfunction	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 malfunction	U4
	System malfunction	
Faulty transmission between outdoor units	Sequential start ADP alarm	U7
	Sequential start ADP malfunction	
	Multi transmission malfunction (Multi 1)	
	Multi transmission malfunction (Multi 2)	
	Faulty multi horsepower setting	
	Erroneous multi address	
	Excess multi connection	
	Multi system malfunction	
Faulty transmission with other systems	Other system or other unit in the same system	U9
Faulty field setting	System transmission malfunction	UA
	Excess indoor units connected	
	Faulty field setting	
	Erroneous refrigerant	
	Multi ID malfunction	
	TSS field setting alarm	
	CT address alarm	
	Faulty connection of BS 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 malfunction	UJ
	Multi level converter alarm	
Unmatched wiring/piping, no system settings	Unmatched wiring/piping	UF

○ : ON
◑ : Blink
● : OFF

○: ON ●: OFF ◑: Blink

Malfunction code	Confirmation of malfunction 1 (Check 1)							Confirmation of malfunction 2 (Check 2)							Confirmation of malfunction 3 (Check 3)							Confirmation of malfunction 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								◑			◑	●	◑	●	◑			●	●	●	●	◑			●	●	◑	◑
															◑			●	●	●	●	◑			●	◑	◑	◑
															◑			●	●	●	●	◑			◑	●	◑	◑
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															◑			●	●	●	◑	◑			●	◑	◑	◑
															◑			●	●	●	◑	◑			◑	●	◑	◑
															◑			●	●	●	◑	◑			◑	◑	◑	◑
															◑			●	◑	●	●	◑			●	●	◑	◑
															◑			●	◑	●	●	◑			●	◑	◑	◑
UH								◑			◑	●	◑	◑	◑			●	●	●	●	◑			●	●	◑	◑
UJ								◑			◑	◑	●	◑	◑			●	●	●	●	◑			●	●	*1	
															◑			●	●	●	●	◑			●	◑		
UF								◑			◑	◑	◑	◑	◑			●	●	●	●	◑			●	●	◑	◑

Display of contents of malfunction (first digit)

Display of contents of malfunction (second digit)

Display 1 of malfunction in detail

Display 2 of malfunction in detail

*1: Faulty 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 A0 Indoor Unit: Error of External Protection Device

Remote Controller Display

A0

Applicable Models

All indoor unit models

Method of Malfunction Detection

Detect open or short circuit between external input terminals in indoor unit.

Malfunction Decision Conditions

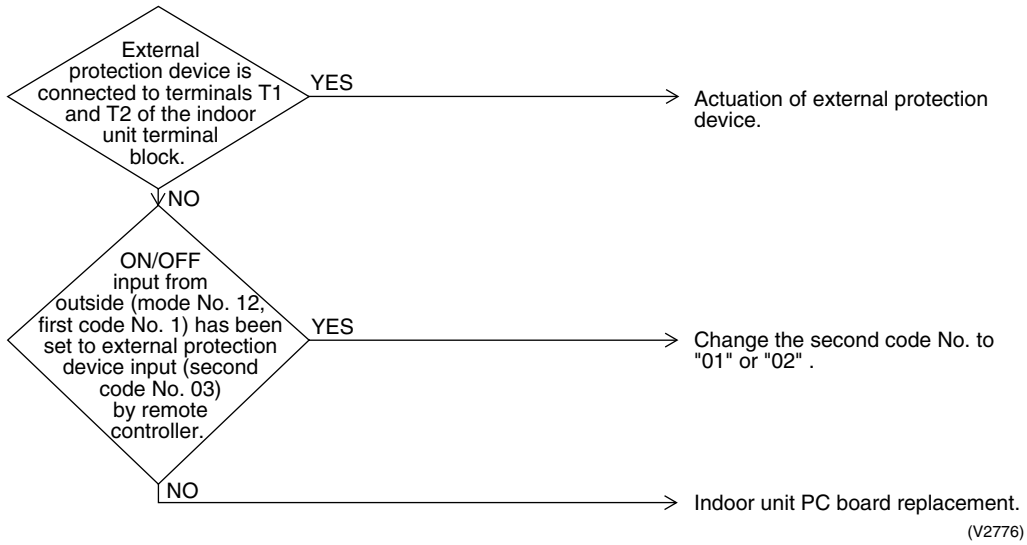
When an open circuit occurs between external input terminals with the remote controller set to ***external ON/OFF terminal***.

Supposed Causes

- Actuation of external protection device
- Improper field set
- Defect of indoor unit PC board

Troubleshooting

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



3.2 A1 Indoor Unit: PC Board Defect

Remote Controller Display

A1

Applicable Models

All indoor unit models

Method of Malfunction Detection

Check data from E²PROM.

Malfunction Decision Conditions

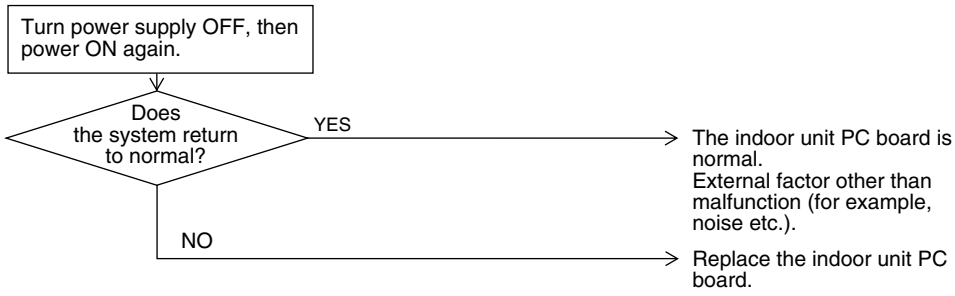
When data could not be correctly received from the E²PROM
E²PROM : Type of nonvolatile memory. Maintains memory contents even when the power supply is turned off.

Supposed Causes

- Defect of indoor unit PC board

Troubleshooting

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



(V2777)

3.3 A3 Indoor Unit: Malfunction of Drain Level Control System (S1L)

Remote Controller Display

A3

Applicable Models

FXFQ, FXSQ, FXDQ, FXMQ, FXHQ (Option), FXAQ (Option)

Method of Malfunction Detection

By float switch OFF detection

Malfunction Decision Conditions

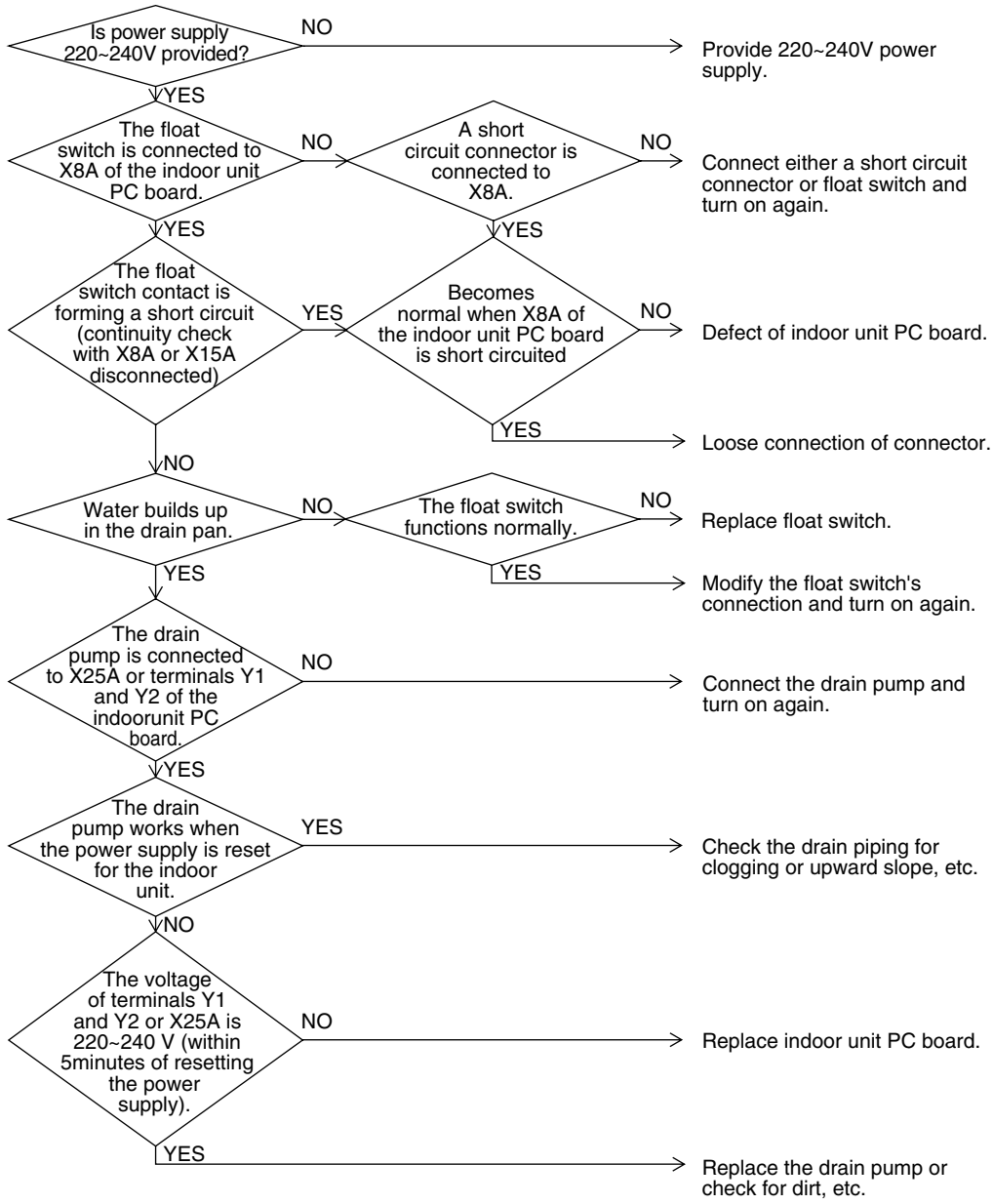
When rise of water level is not a condition and the float switch goes OFF.

Supposed Causes

- 220~240V power supply is not provided
- Defect of float switch or short circuit connector
- Defect of drain pump
- Drain clogging, upward slope, etc.
- Defect of indoor unit PC board
- Loose connection of connector

Troubleshooting

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



(V2778)

3.4 A6 Indoor Unit: Fan Motor (M1F) Lock, Overload

Remote Controller Display

A6

Applicable Models

FXAQ, FXFQ

Method of Malfunction Detection

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

Malfunction Decision Conditions

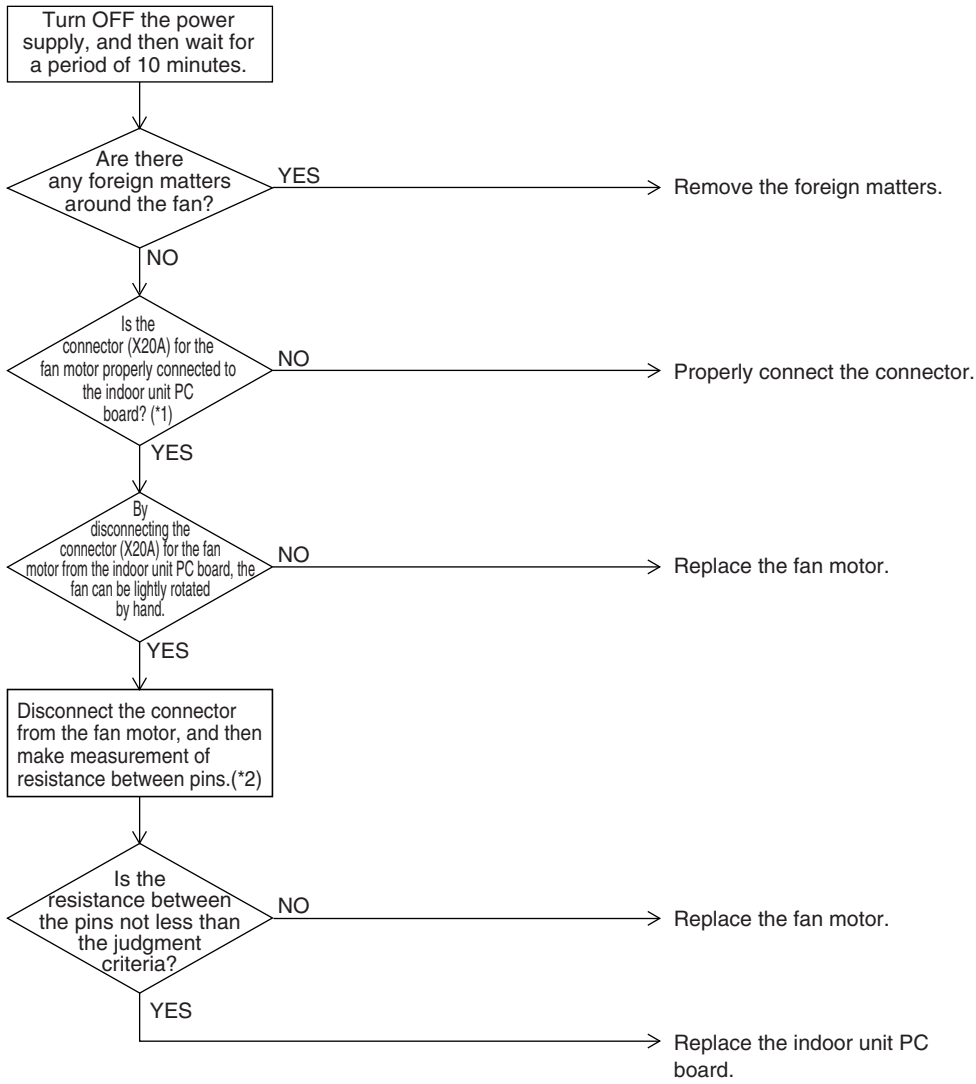
When the fan revolutions do not increase

Supposed Causes

- Broken wires in, short circuit of, or disconnection of connectors from the fan motor harness
- Faulty fan motor
  (Broken wires or faulty insulation)
- Abnormal signal output from the fan motor (Faulty circuit)
- Faulty PC board
- 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 PC board (A1P) and the low-power PC board (A2P).

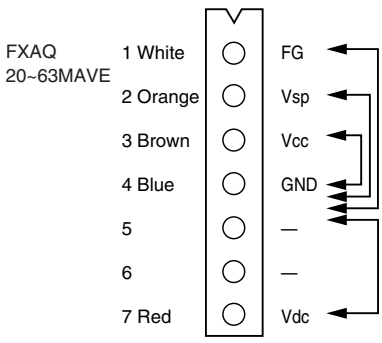
Troubleshooting

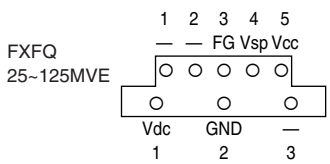
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



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

*2. All resistance measuring points and judgment criteria





Judgment Criteria

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

A6 Indoor Unit: Malfunction of Indoor Unit Fan Motor

Remote Controller Display

A6

Applicable Models

FXHQ, FXDQ

Method of Malfunction Detection

Detected by no fan motor revolutions.

Malfunction Decision Conditions

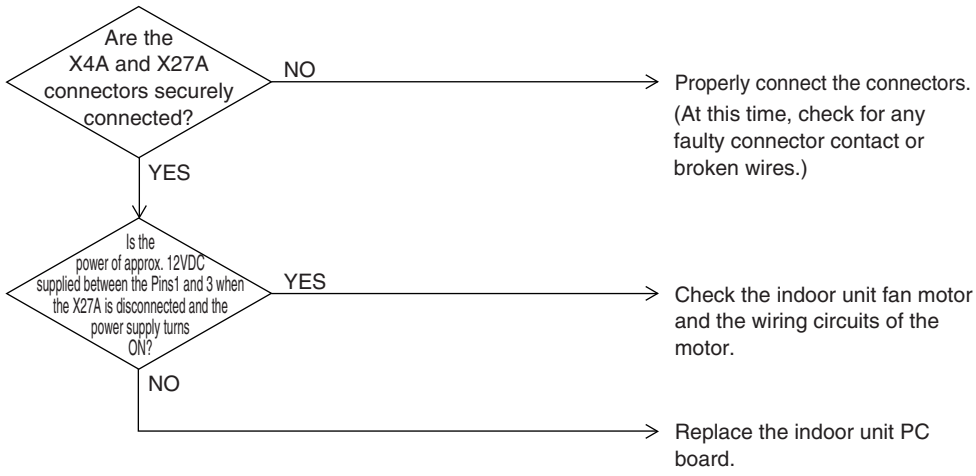
No fan revolutions detected even at maximum voltage.

Supposed Causes

- Faulty indoor fan motor
- Broken wires
- Faulty contact

Troubleshooting

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



A6 Indoor Unit: Overload / Overcurrent / Lock of Indoor Unit Fan Motor

Remote Controller Display

A6

Applicable Models

FXMQ

Method of Malfunction Detection

Individual power supply for the fan turns OFF.

Malfunction Decision Conditions

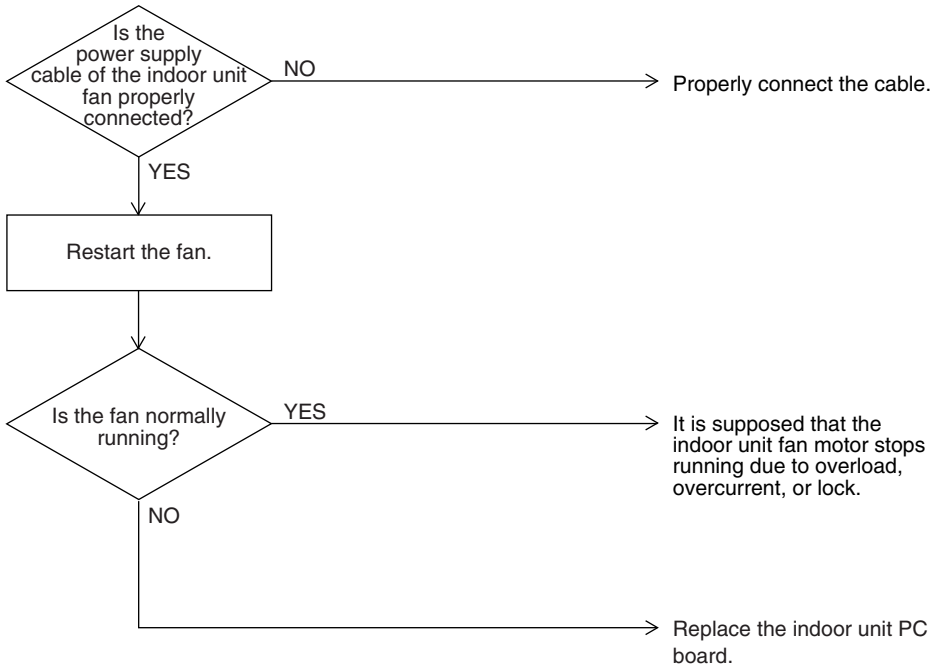
Individual power supply for the indoor unit fan does not turn ON while in operation.

Supposed Causes

- Faulty power supply for the indoor unit fan motor
- Clogged drain piping
- Actuation of the indoor unit safety device
- Faulty contact in the fan wiring circuit

Troubleshooting

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

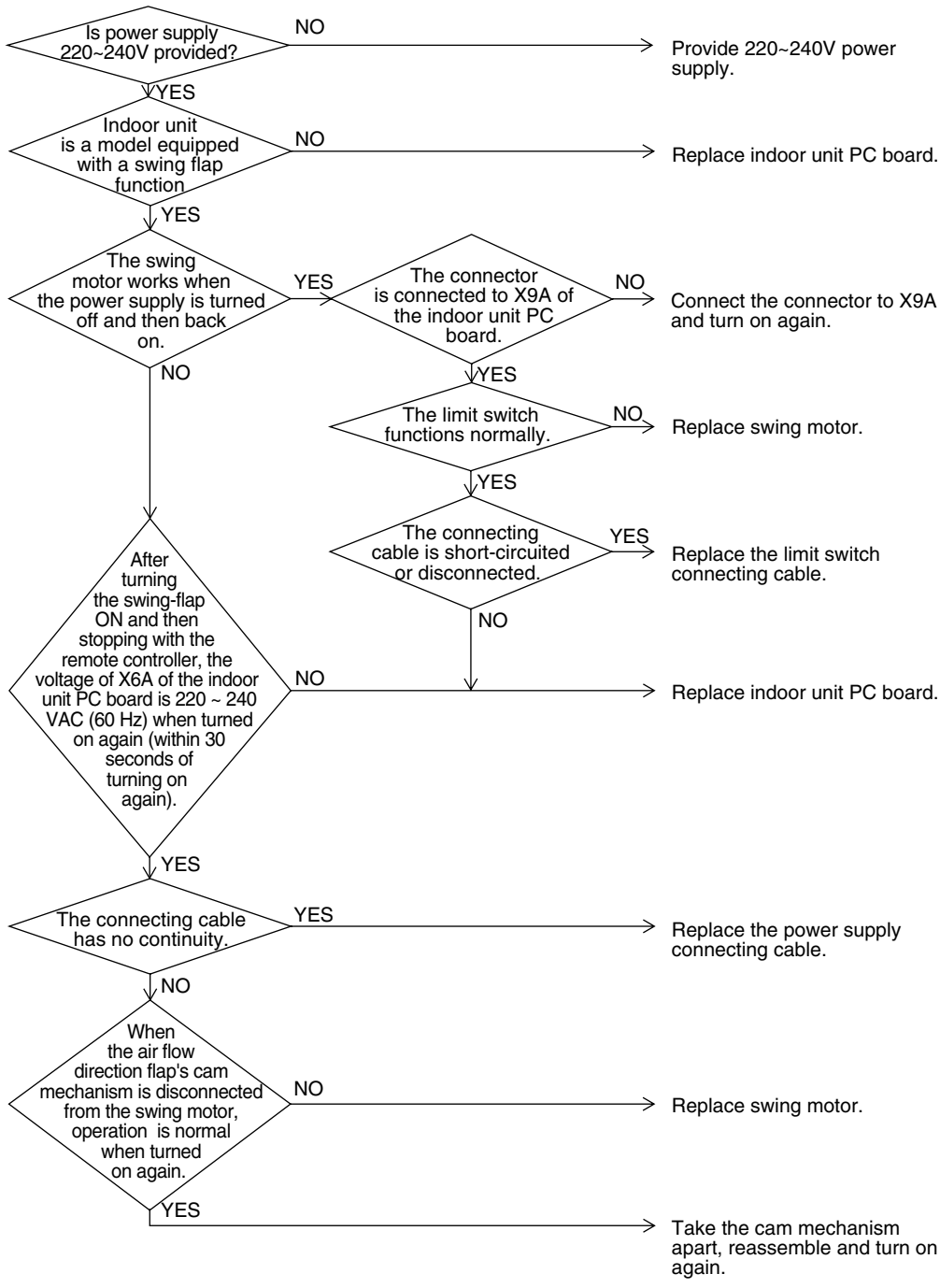


3.5 A7 Indoor Unit: Malfunction of Louver Motor (M1S)

Remote Controller Display	A7
Applicable Models	FXHQ
Method of Malfunction Detection	Utilizes ON/OFF of the limit switch when the motor turns.
Malfunction Decision Conditions	When ON/OFF of the microswitch for positioning cannot be reversed even though the louver motor is energized for a specified amount of time (about 30 seconds). ★ Error code is displayed but the system operates continuously.
Supposed Causes	■ Defect of swing motor ■ Defect of connection cable (power supply and limit switch) ■ Defect of airflow direction adjusting louver ■ Defect of indoor unit PC board

Troubleshooting

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



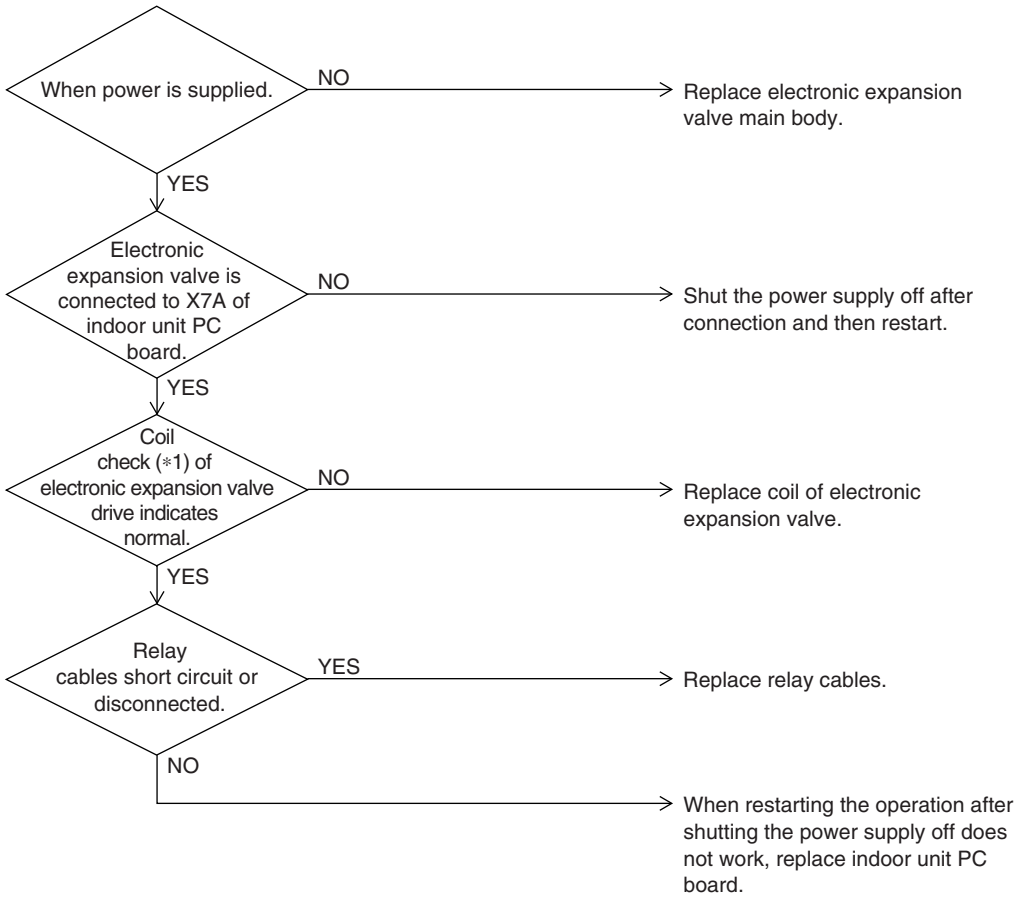
(V2780)

3.6 A9 Indoor Unit: Electronic Expansion Valve Malfunction / Dust Clogging

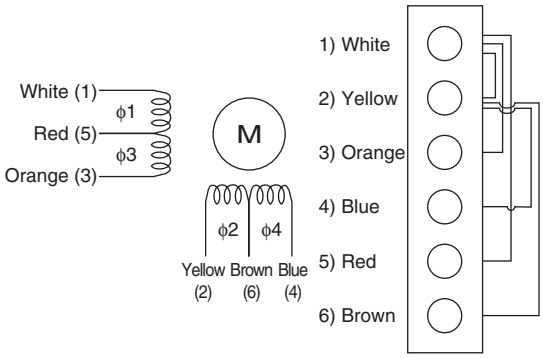
Remote Controller Display	A9
Applicable Models	FXFQ
Method of Malfunction Detection	Check coil condition of electronic expansion valve by using microcomputer. Check dust clogging condition of electronic expansion valve main body by using microcomputer.
Malfunction Decision Conditions	Pin input for electronic expansion valve coil is abnormal when initializing microcomputer. 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 drive of electronic expansion valve ■ Defective PC board of indoor unit ■ Defective relay cables

Troubleshooting

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



*1: How to check the coil of electronic expansion valve drive
Remove the connector for electronic expansion valve (X7A) from PC board. Measure the resistance value between pins and check the continuity to judge the condition.



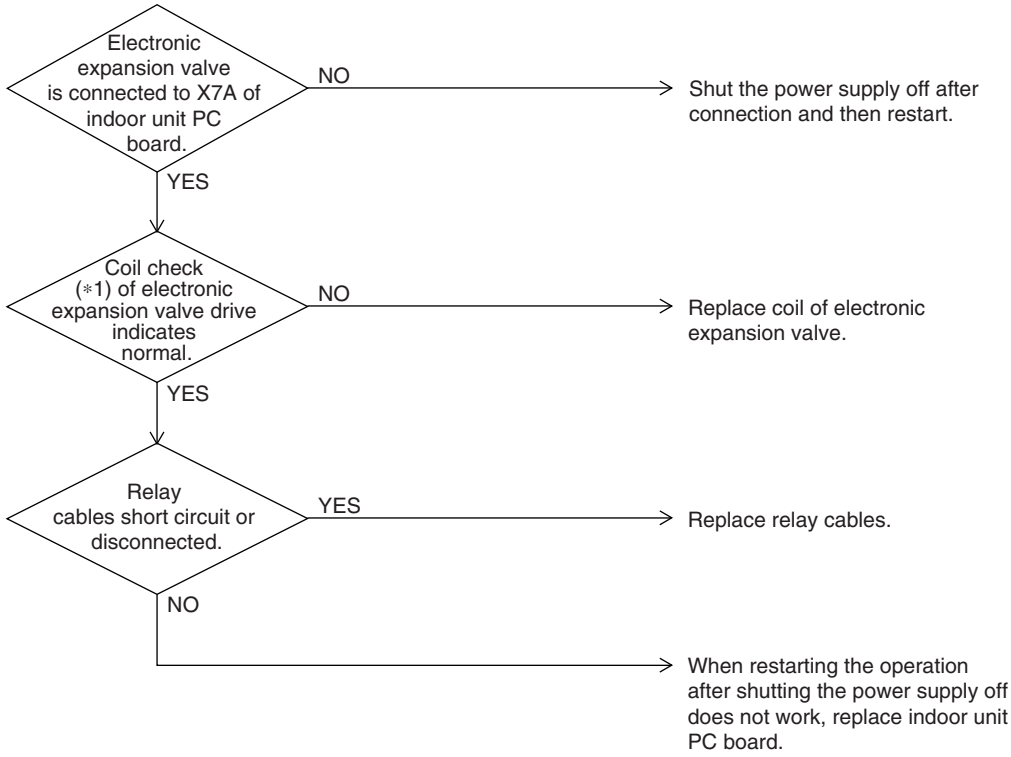
The normal products will show the following conditions:
① No continuity between (1) and (2)
② Resistance value between (1) and (3) is approx. 300 Ω
③ Resistance value between (1) and (5) is approx. 150 Ω
④ Resistance value between (2) and (4) is approx. 300 Ω
⑤ Resistance value between (2) and (6) is approx. 150 Ω

A9 Indoor Unit: Malfunction of Electronic Expansion Valve Coil

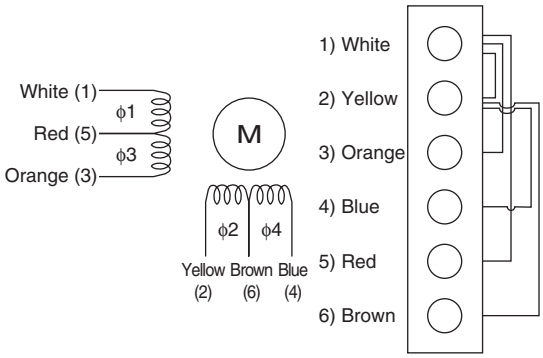
Remote Controller Display	A9
Applicable Models	Indoor units except FXFQ models
Method of Malfunction Detection	Check coil condition of electronic expansion valve by using microcomputer.
Malfunction Decision Conditions	Pin input for electronic expansion valve coil is abnormal when initializing microcomputer.
Supposed Causes	■ Defective drive of electronic expansion valve ■ Defective PC board of indoor unit ■ Defective relay cables

Troubleshooting

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



*1: How to check the coil of electronic expansion valve
Remove the connector for electronic expansion valve (X7A) from PC board. 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

3.7 AF Indoor Unit: Drain Level above Limit

Remote Controller Display

AF

Applicable Models

FXFQ, FXSQ, FXMQ, FXDQ

Method of Malfunction Detection

Water leakage is detected based on float switch ON/OFF operation while the compressor is in non-operation.

Malfunction Decision Conditions

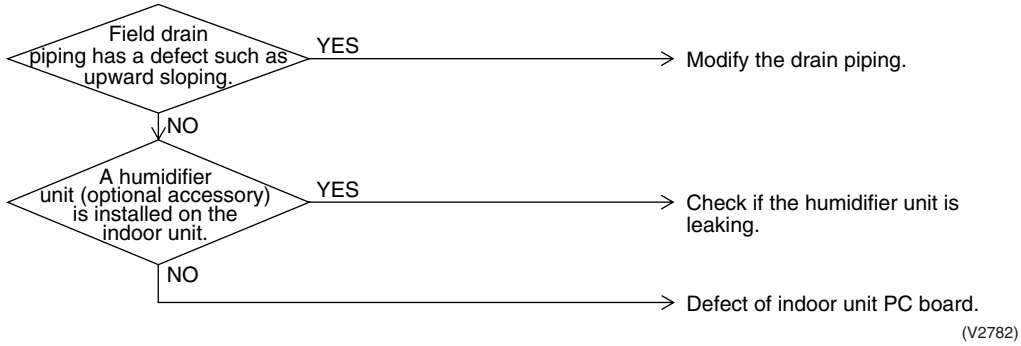
When the float switch changes from ON to OFF while the compressor is in non-operation.
★ Error code is displayed but the system operates continuously.

Supposed Causes

- Humidifier unit (optional accessory) leaking
- Defect of drain pipe (upward slope, etc.)
- Defect of indoor unit PC board

Troubleshooting

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



3.8 Indoor Unit: Malfunction of Capacity Determination Device

Remote controller display

Applicable Models

All indoor unit models

Method of Malfunction Detection

Capacity is determined according to resistance of the capacity setting adaptor and the memory inside the IC memory on the indoor unit PC board, and whether the value is normal or abnormal .

Malfunction Decision Conditions

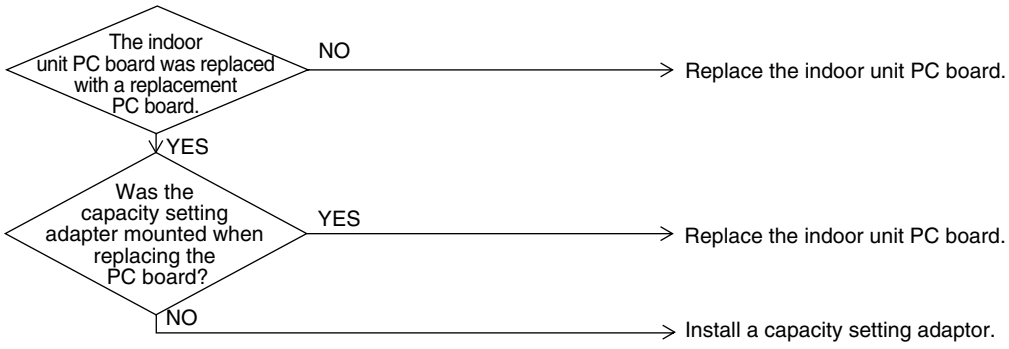
When the capacity code is not contained in the PC board's memory, and the capacity setting adaptor is not connected.

Supposed Causes

- The capacity setting adaptor was not installed.
- Defect of indoor unit PC board

Troubleshooting

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



(V2783)

3.9 C4 Indoor Unit: Malfunction of Thermistor (R2T) for Heat Exchanger

Remote Controller Display

C4

Applicable Models

All indoor unit models

Method of Malfunction Detection

M
Temperature of the heat exchanger thermistor.

Malfunction Decision Conditions

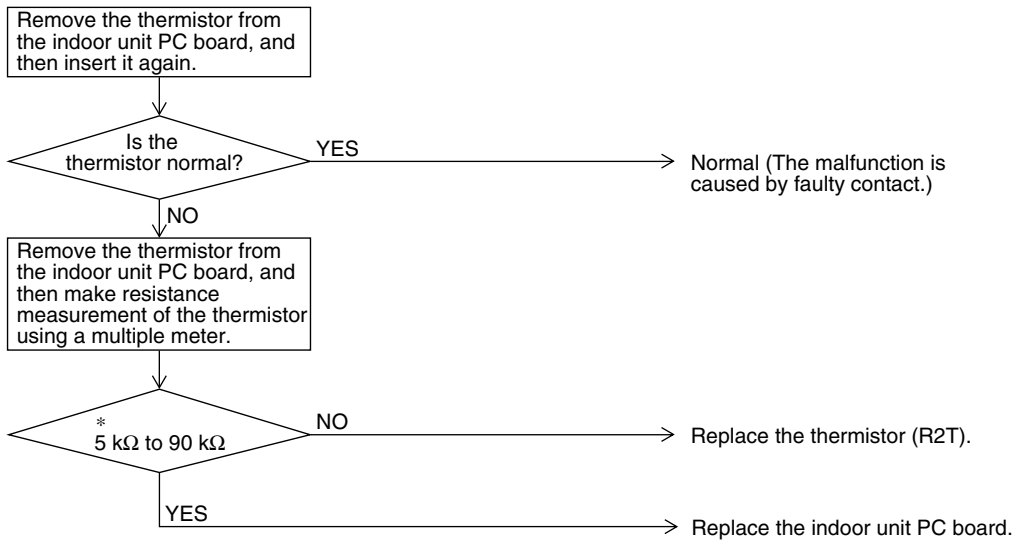
When the heat exchanger thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defect of thermistor (R2T) for liquid pipe
- Defect of indoor unit PC board

Troubleshooting

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



* Refer to the ***Thermistor Resistance / Temperature Characteristics*** table on Page 523.

3.10 C5 Indoor Unit: Malfunction of Thermistor (R3T) for Gas Pipes

Remote Controller Display

C5

Applicable Models

All indoor unit models

Method of Malfunction Detection

.
Temperature of the gas pipe thermistor.

Malfunction Decision Conditions

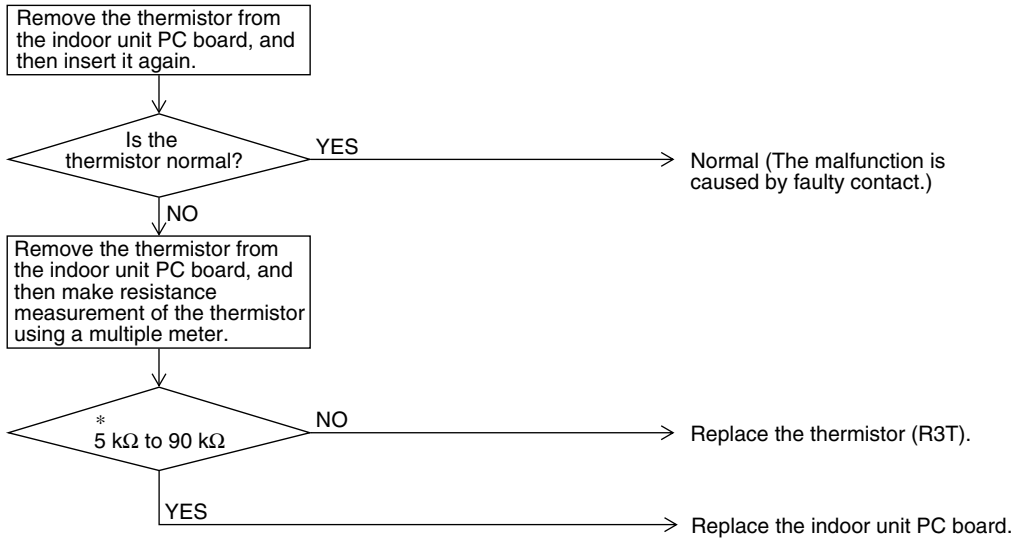
When the gas pipe thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defect of indoor unit thermistor (R3T) for gas pipe
- Defect of indoor unit PC board

Troubleshooting

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



* Refer to the ***Thermistor Resistance / Temperature Characteristics*** table on Page 529.

3.11 C9 Indoor Unit: Malfunction of Thermistor (R1T) for Suction Air

Remote Controller Display

C9

Applicable Models

All indoor unit models

Method of Malfunction Detection

Malfunction detection is carried out by temperature detected by suction air temperature thermistor.
Temperature detected by the suction air temperature thermistor..

Malfunction Decision Conditions

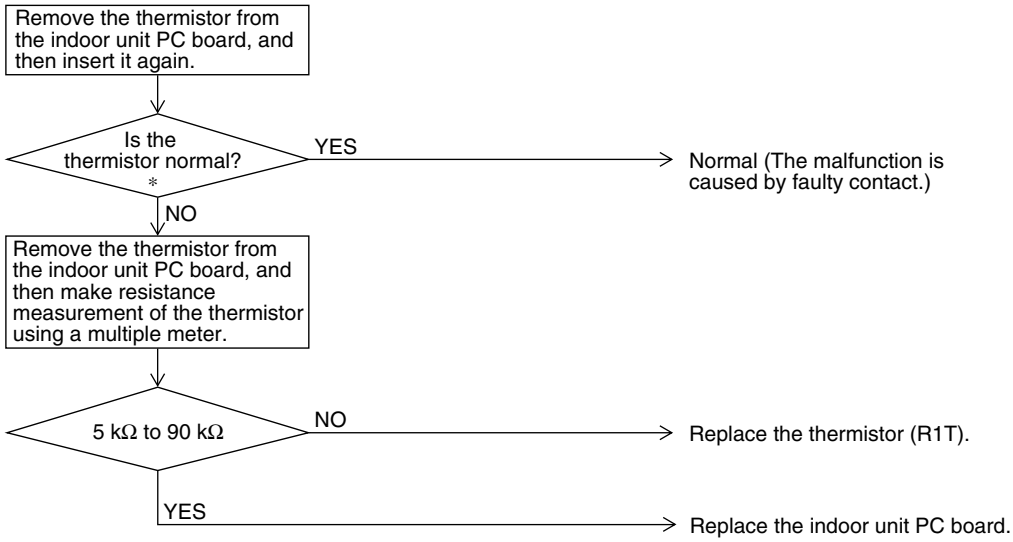
When the suction air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defect of indoor unit thermistor (R1T) for air inlet
- Defect of indoor unit PC board

Troubleshooting

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



* Refer to the ***Thermistor Resistance / Temperature Characteristics*** table on Page 529.

3.12 C4 Indoor Unit: Malfunction of Thermostat Sensor in Remote Controller

Remote Controller Display

C4

Applicable Models

All indoor unit models

Method of Malfunction Detection

Temperature detected by remote controller air temperature thermistor.

Malfunction Decision Conditions

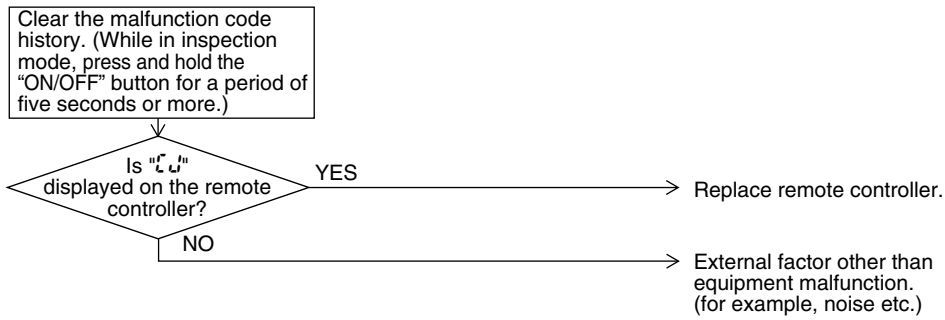
When the remote controller air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defect of remote controller thermistor
- Defect of remote controller PC board

Troubleshooting

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



(V2787)

Note: ∗1: How to delete ***the record of malfunction codes***.
Press the [**Operate/ Stop**] button for 4 seconds or more while the malfunction code is displayed in the inspection mode.

∗ Refer to the ***Thermistor Resistance / Temperature Characteristics*** table on Page 529.

3.13 E1 Outdoor Unit: PC Board Defect

Remote Controller Display

E1

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Abnormality is detected in the hardware section communication between the indoor unit and outdoor unit.

Malfunction Decision Conditions

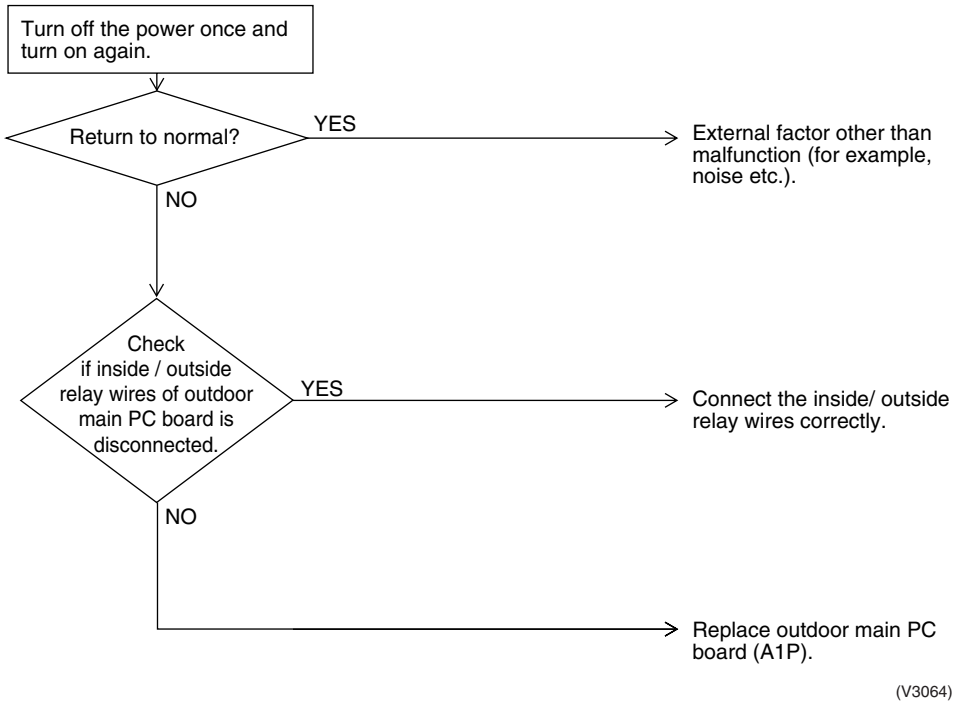
When the communication conditions in the hardware section between the indoor unit and the outdoor unit are not normal.

Supposed Causes

- Defect of outdoor unit PC board (A1P)
- Defective connection of inside/ outside relay wires

Troubleshooting

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

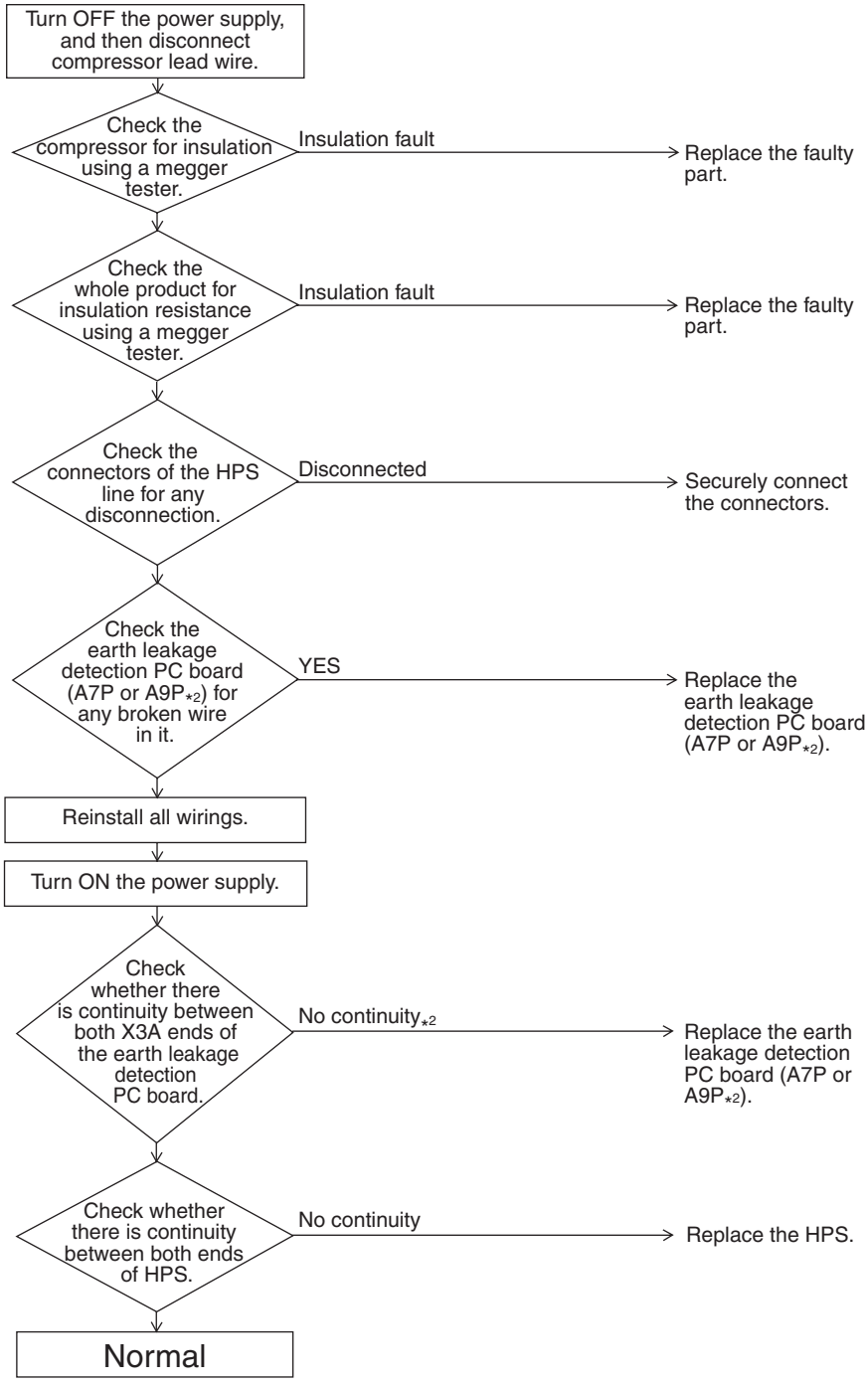


3.14 E2 Outdoor Unit: Detection of ground leakage by leak detection PC board ass'y

Remote Controller Display	E2
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Failure is to be detected by using leak detection PC board assembly. .
Malfunction Decision Conditions	Leakage is detected under the conditions outside of the scope of HPS operation.
Supposed Causes	■ Defect of compressor

Troubleshooting

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



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.

*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: A7P: RXYQ72, 96, 120PYDN, PTJU
REMQ72, 96, 120PYDN, PTJU
A9P: REYQ72, 96, 120PYDN, PTJU
RXYQ144PTJU, REYQ144PTJU

3.15 E3 Outdoor Unit: Actuation of High Pressure Switch

Remote Controller Display	E3
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Abnormality is detected when the contact of the high pressure protection switch opens.
Malfunction Decision Conditions	Error is generated when the HPS activation count reaches the number specific to the operation mode. (Reference) Operating pressure of high pressure switch Operating pressure: 580psi Reset pressure: 413.25psi
Supposed Causes	■ Actuation of outdoor unit high pressure switch ■ Defect of High pressure switch ■ Defect of outdoor unit main PC board (A1P) ■ Instantaneous power failure ■ Faulty high pressure sensor

Troubleshooting

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

Check for the points shown below.
① Is the stop valve open?
② Is the HPS connector properly connected to the main PC board?
③ Does the high pressure switch have continuity?

Are the three points above OK?
NO → Rectify 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 malfunction (E3) recur?
YES → Is the HPS operating value normal (i.e., 580psi)?
NO → Replace the HPS.
YES
NO

Are the characteristics of the high pressure sensor normal? (See ∗1.)
NO → Replace the high pressure sensor.
YES

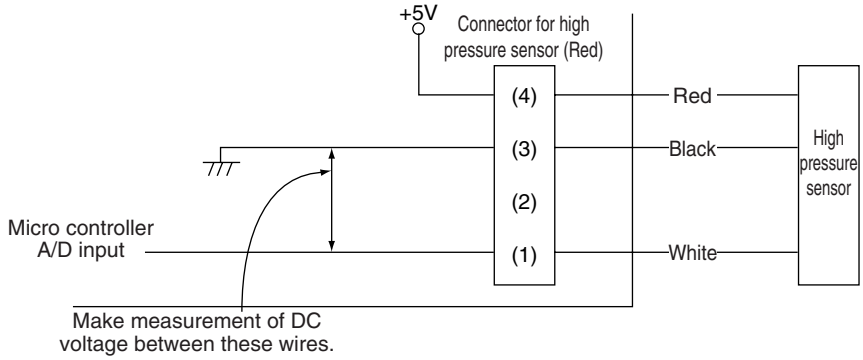
Service Checker
Connect the service checker to compare the “high pressure” value and the actual measurement value by pressure sensor (Refer to ∗1) by using the service checker.

Check if the “high pressure” value and the actual measurement value by pressure sensor are the same.
NO → Replace main PC board (A1P).
YES

· The high pressure sensor is normal, and the pressure detected with the PC board is also normal.
· The high pressure has really become high.

CHECK 5 Referring to information on P464, remove the causes by which the high pressure has become high.

∗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 P533.)
∗2: Make measurement of voltage of the pressure sensor.

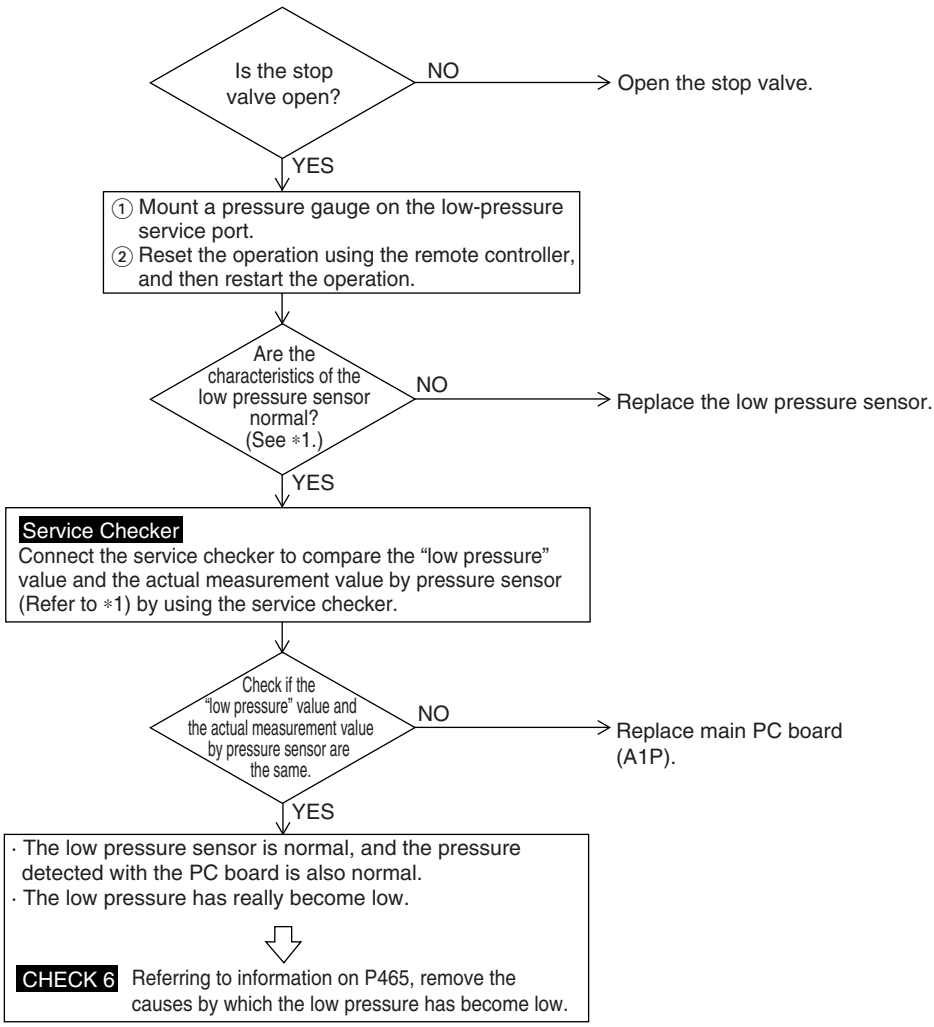


3.16 E4 Outdoor Unit: Actuation of Low Pressure Sensor

Remote Controller Display	E4
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Abnormality is detected by the pressure value with the low pressure sensor.
Malfunction Decision Conditions	Error is generated when the low pressure is dropped under compressor operation. Operating pressure:10.15psi
Supposed Causes	■ Abnormal drop of low pressure (Lower than 10.15psi) ■ Defect of low pressure sensor ■ Defect of outdoor unit PC board ■ Stop valve is not opened.

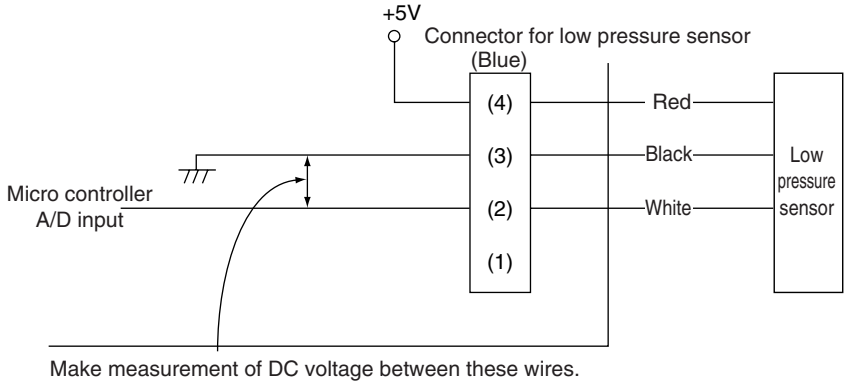
Troubleshooting

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



∗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 P533.)

∗2: Make measurement of voltage of the pressure sensor.



3.17 E5 Outdoor Unit: Inverter Compressor Motor Lock

Remote Controller Display

E5

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

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

Malfunction Decision Conditions

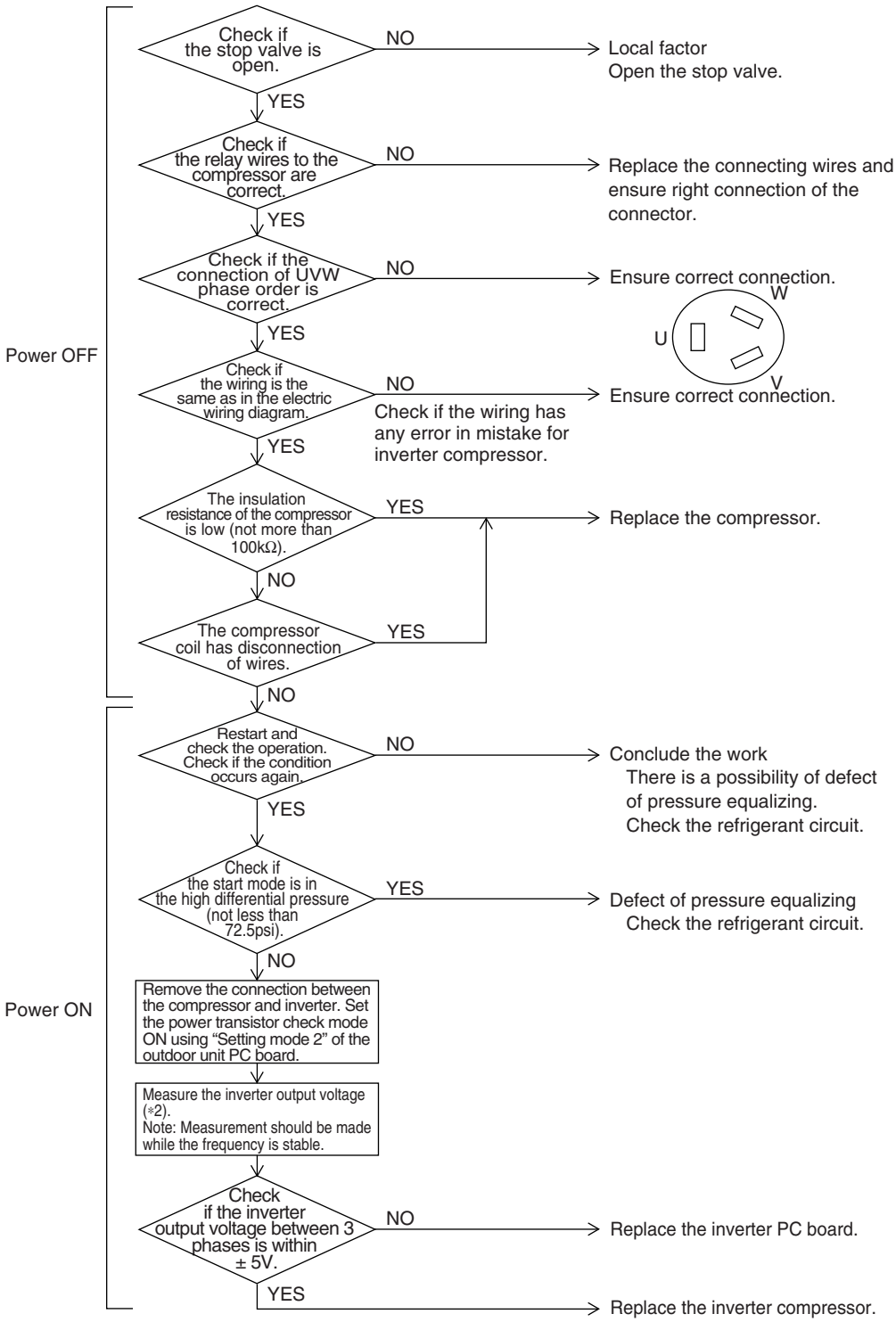
This malfunction will be output when the inverter compressor motor does not start up even in forced startup mode.

Supposed Causes

- Inverter compressor lock
- High differential pressure (72.5psi or more)
- Incorrect UVW wiring
- Faulty inverter PC board
- Stop valve is left in closed.

Troubleshooting

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



*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 (P463).

3.18 E6 Outdoor Unit: STD Compressor Motor Overcurrent/ Lock

Remote Controller Display

E6

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Detects the overcurrent with current sensor (CT).

Malfunction Decision Conditions

Malfunction is decided when the detected current value exceeds the following value for 2 seconds:

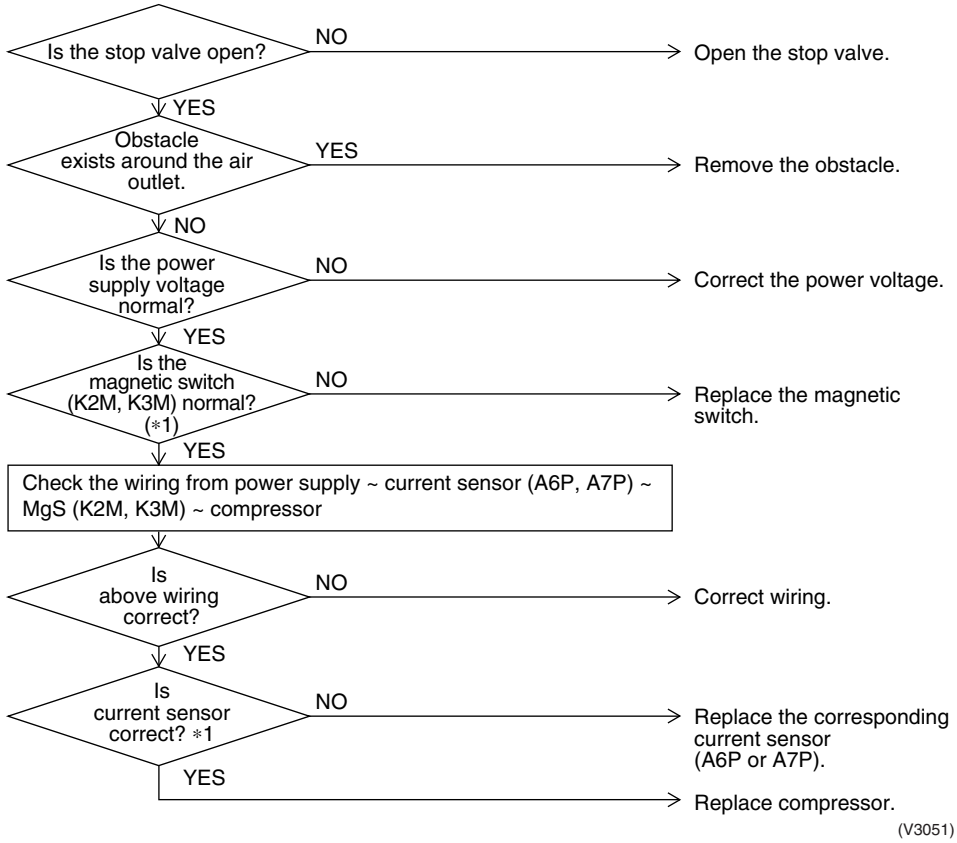
- 400 V unit : 15.0 A

Supposed Causes

- Closed stop value
- Obstacles at the air outlet
- Improper power voltage
- Faulty magnetic switch
- Faulty compressor
- Faulty current sensor (A6P, A7P)

Troubleshooting

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



(V3051)

Note: ∗1 One of the possible factors may be chattering due to rough MgS contact.
∗2 Abnormal case
- The current sensor value is 0 during STD compressor operation.
- The current sensor value is more than 15.0A during STD compressor stop.

3.19 E7 Outdoor Unit: Malfunction of Outdoor Unit Fan Motor

Remote Controller Display	E7
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Detect a malfunction based on the current value in the INVERTER PC board (as for motor 2, current value in the fan PC board). Detect a malfunction for the fan motor circuit based on the number of rotation detected by hole IC during the fan motor operation.
Malfunction Decision Conditions	■ Overcurrent is detected for INVERTER PC board (A2P) or fan INVERTER PC board (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 ■ Defective or connection error of the connectors/ harness between the fan motor and PC board ■ The fan cannot 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 connect or disconnect connector, or parts damage may be occurred.

Check in the monitor mode
REYQ72~120PYDN models have 2 fans.
Check electric motor (electric motor 1 or 2) corresponding to malfunction code "Ɛ7" in the monitor mode of outdoor unit PC board. (Refer to P.334 - P.335 for how to check)

↓

Cut the power supply OFF and wait for 10 minutes.

↓

Check if any foreign substances around the fan. — YES → Remove the foreign substances.

NO ↓

Check the connection status of the connectors
- Fan motor 1: relay connector or X1A, X2A (X501A, X502A) of compressor inverter PC board.
- Fan motor 2: relay connector or X1A, X2A (X501A, X502A) of fan inverter PC board.

↓

Check if any connector is disconnected. — YES → Insert the connector.

NO ↓

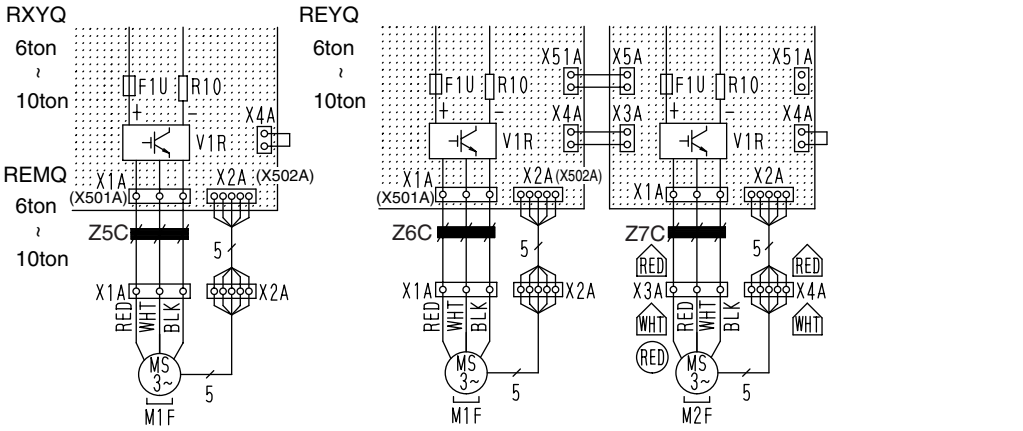
Check the color of relay connectors
- Fan motor 1: Both power supply wire and signal wire are all white.
- Fan motor 2: Both power supply wire and signal wire are red in the PC board side and white in the motor side.

↓

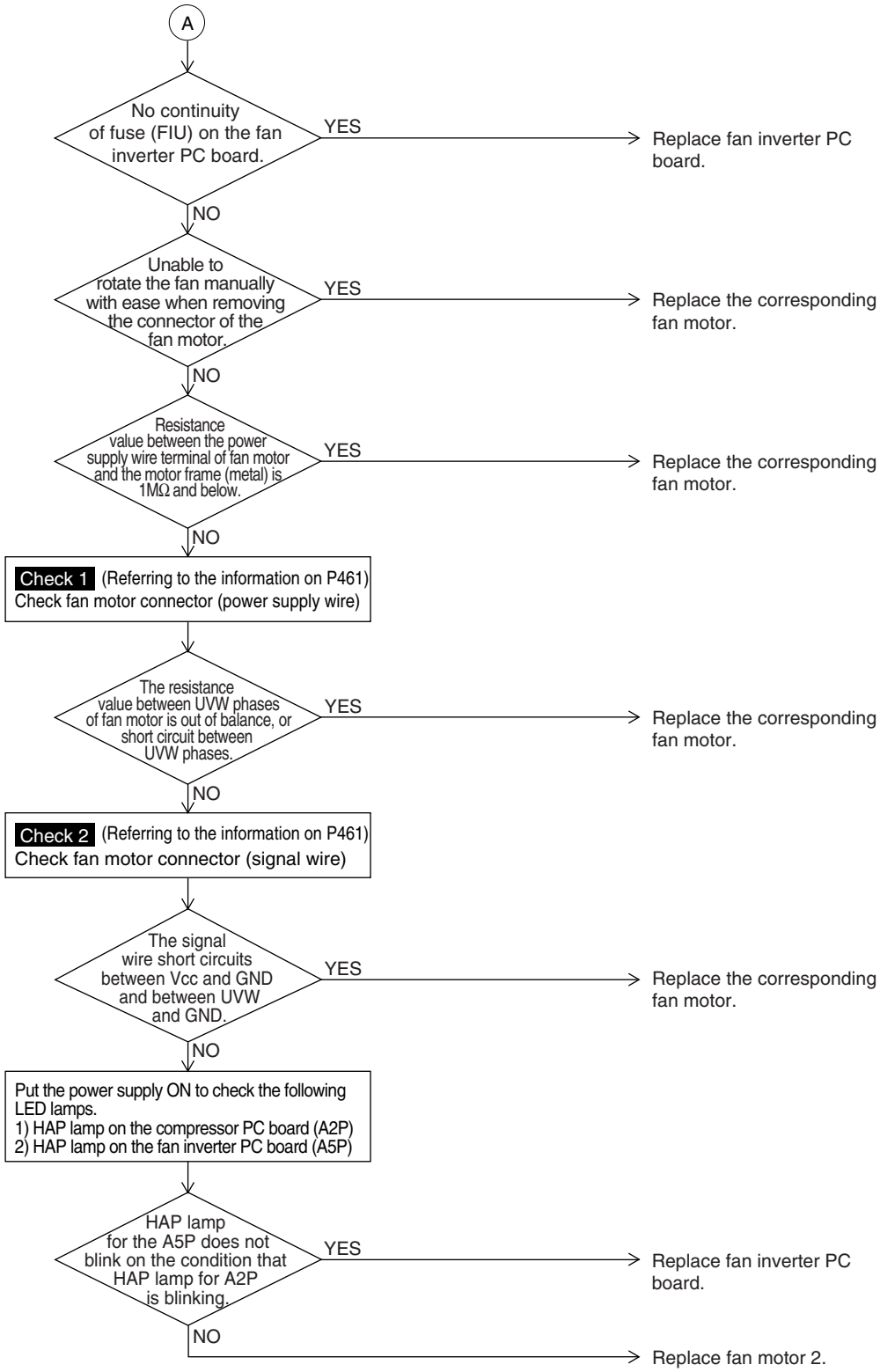
Relay connectors have any connection error. — YES → Correct the connection of the relay connectors.

NO ↓

A



Troubleshooting



3.20 E9 Outdoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E~Y5E)

Remote Controller Display

E9

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Check disconnection of connector
To be detected based on continuity of of electronic expansion valve coil

Malfunction Decision Conditions

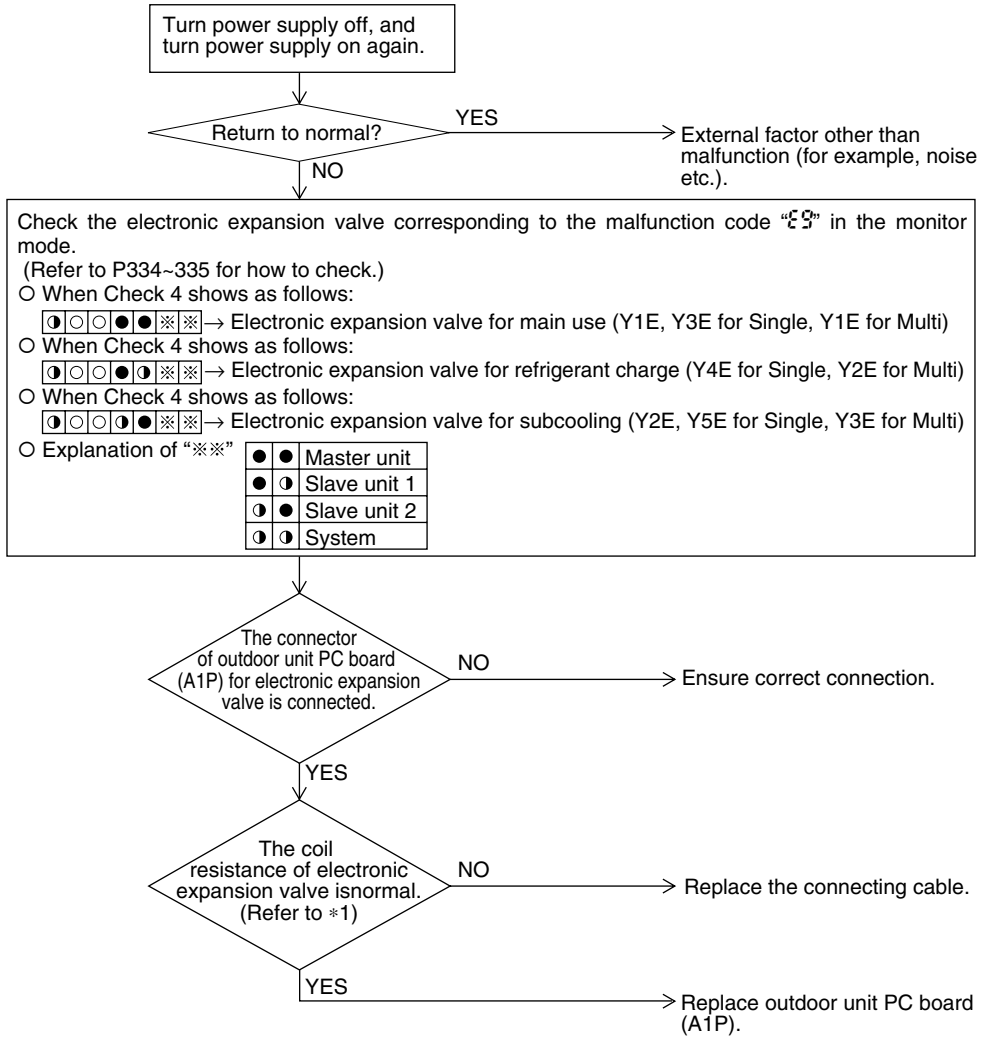
No current is detected in the common (COM [+]) when power supply is ON.

Supposed Causes

- Disconnection of connectors for electronic expansion valve (Y1E)
- Defect of moving part of electronic expansion valve
- Defect of outdoor unit main PC board (A1P)

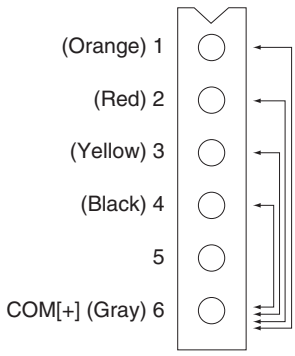
Troubleshooting

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



(V3067)

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



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

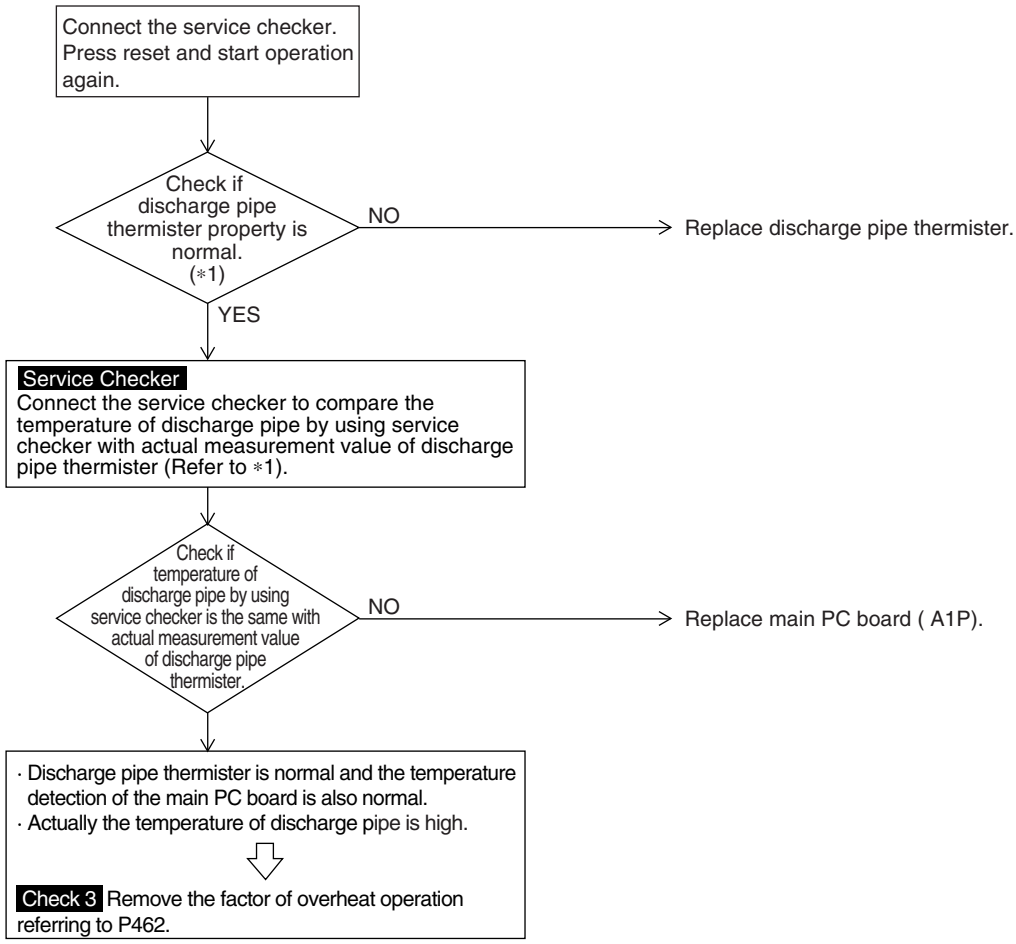
(V3067)

3.21 F3 Outdoor Unit: Abnormal Discharge Pipe Temperature

Remote Controller Display	F3
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Temperature detected by the discharge pipe temperature sensor.
Malfunction Decision Conditions	When the discharge pipe temperature rises to an abnormally high level (275 °F and above) When the discharge pipe temperature rises suddenly (248 °F and above for10 successive minutes)
Supposed Causes	■ Faulty discharge pipe temperature sensor ■ Faulty connection of discharge pipe temperature sensor ■ Faulty outdoor unit PC board

Troubleshooting

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



∗1: Compare the resistance value of discharge pipe thermister and the value based on the surface thermometer.
(Refer to P532 for the temperature of thermister and the resistance property)

∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P529.

3.22 F6 Outdoor Unit: Refrigerant Overcharged

Remote Controller Display

F6

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

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

Malfunction Decision Conditions

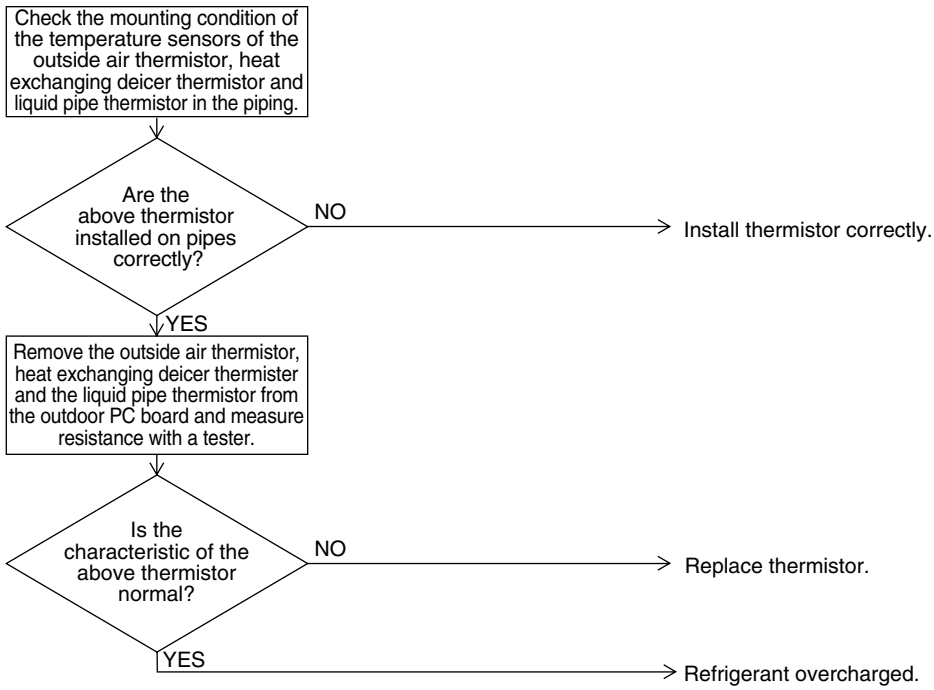
When the amount of refrigerant, calculated by outside temperature, exceeds the standard heat-exchange deicer and liquid pipe tempertures during a check run.

Supposed Causes

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

Troubleshooting

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



(V2797)

∗ Refer to the ***Thermistor Resistance / Temperature Characteristics*** table on Page 523.

3.23 H7 Outdoor Unit: Abnormal Outdoor Fan Motor Signal

Remote Controller Display	H7
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Abnormal signal from fan motor.
Malfunction Decision Conditions	In case of detection of abnormal signal at starting fan motor.
Supposed Causes	■ Abnormal fan motor signal (circuit malfunction) ■ Broken, short or disconnection connector of fan motor connection cable ■ Fan Inverter PC board malfunction (A2P)

Troubleshooting

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

Check the fan motor corresponding to the malfunction code "H7" in the monitor mode.
(Refer to P334~335 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

Cut the power supply off.

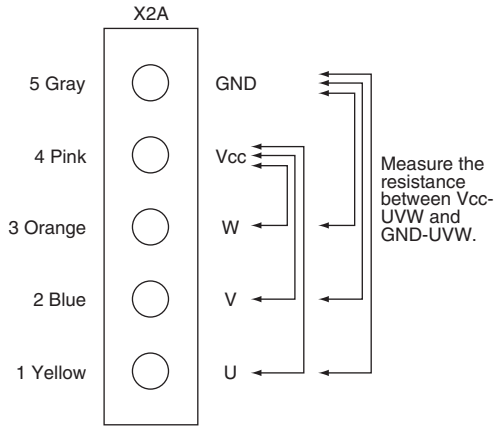
Check if signal wire connector for the corresponding fan motor is normal.
NO → Ensure correct connection.
YES

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 fan motor.
YES → Replace inverter PC board.
- For fan motor 1: replace inverter PC board (A2P)
- For fan motor 2: replace fan inverter PC board (A5P)

∗1. Check procedure for fan motor connector
(1) Power OFF the fan motor.
(2) Remove the connector (X2A or X4A) on the PC board to measure the following resistance value.
Judgment criteria: resistance value between each phase is within ±20%

Connector for signal wires (X2A or X4A)



3.24 H9 Outdoor Unit: Malfunction of Thermistor (R1T) for Outdoor Air

Remote Controller Display

H9

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Temperature detected by the outdoor air thermistor.

Malfunction Decision Conditions

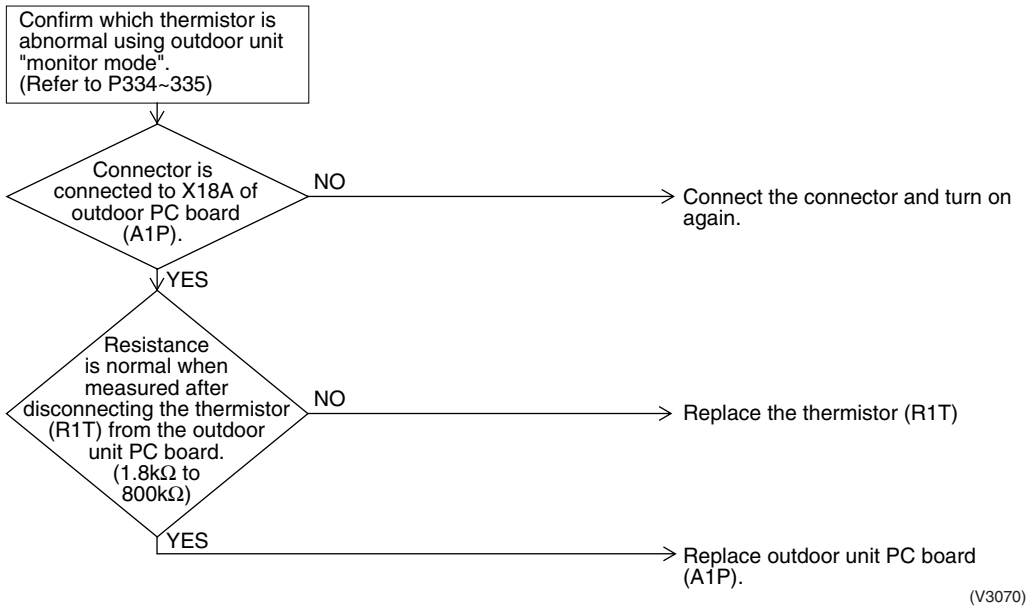
When the outside air temperature thermistor has short circuit or open circuit.

Supposed Causes

- Defective thermistor connection
- Defect of thermistor (R1T) for outdoor air
- Defect of outdoor unit PC board (A1P)

Troubleshooting

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



∗ Refer to the ***Thermistor Resistance / Temperature Characteristics*** table on Page 523.

3.25 J2 Outdoor Unit: Current Sensor Malfunction

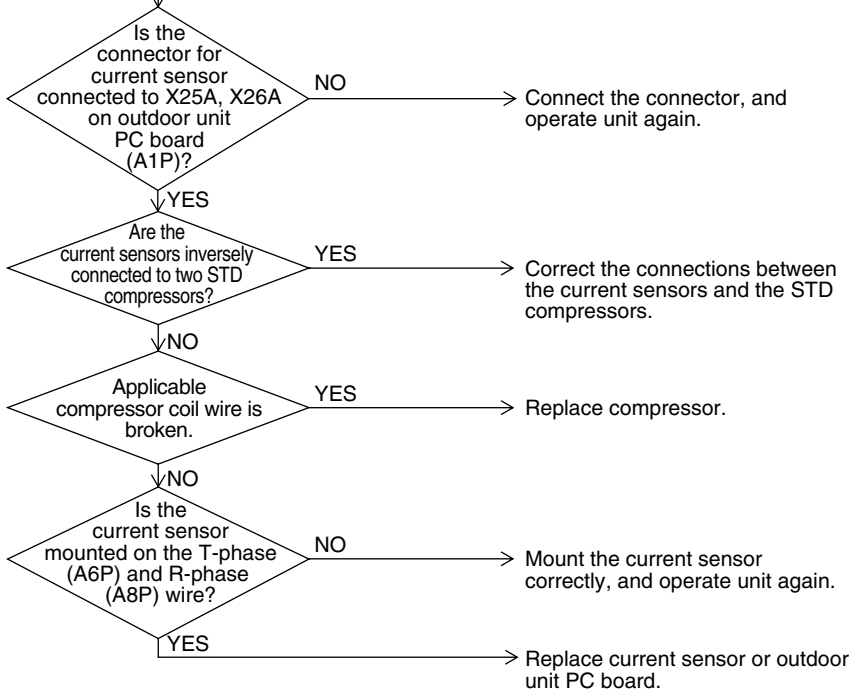
Remote Controller Display	J2
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Current value detected by current sensor.
Malfunction Decision Conditions	When the current value detected by current sensor becomes 5A or lower, or 40A or more during standard compressor operation.
Supposed Causes	■ Faulty current sensor (A6P, A8P) ■ Faulty outdoor unit PC board ■ Defective compressor

Troubleshooting

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

Check the current sensor corresponding to the malfunction code "UC" in the monitor mode.
(Refer to P334~335 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



(V3071)

3.26 J3 Outdoor Unit: Malfunction of Discharge Pipe Thermistor (R31, 32T)

Remote Controller Display

J3

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Temperature detected by discharge pipe temperature thermistor.

Malfunction Decision Conditions

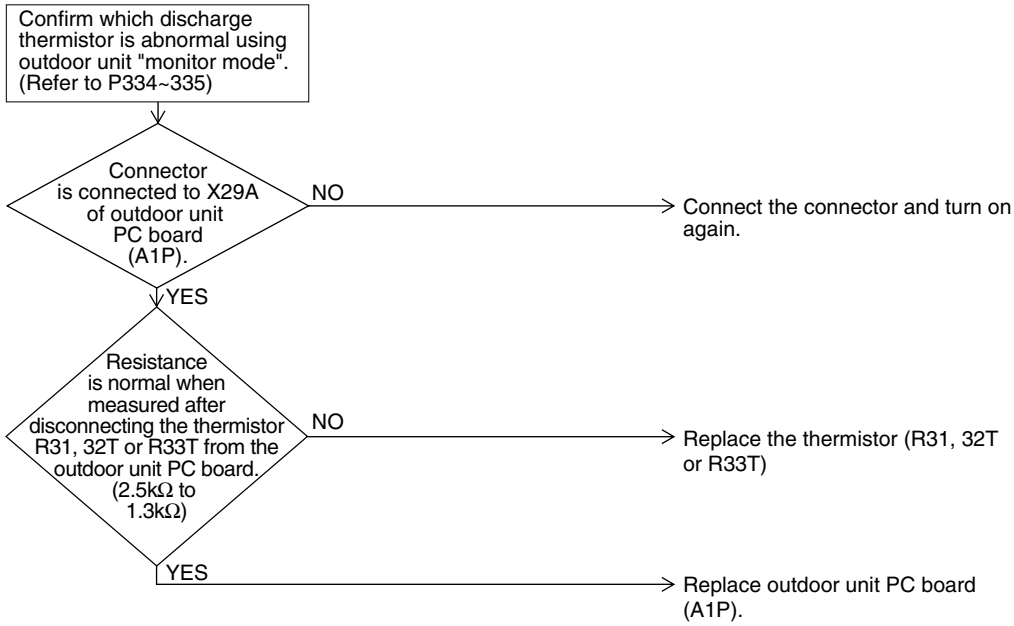
When a short circuit or an open circuit in the discharge pipe temperature thermistor is detected.

Supposed Causes

- Defect of thermistor (R31T, R32T) for outdoor unit discharge pipe
- Defect of outdoor unit PC board (A1P)
- Defect of thermistor connection

Troubleshooting

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



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

∗ Refer to the ***Thermistor Resistance / Temperature Characteristics*** table on Page 523.

3.27 J4 Outdoor Unit: Malfunction of Temperature Sensor for Heat Exchanger Gas (R2T or R11T)

Remote Controller Display

J4

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Temperature detected by each thermistor.

Malfunction Decision Conditions

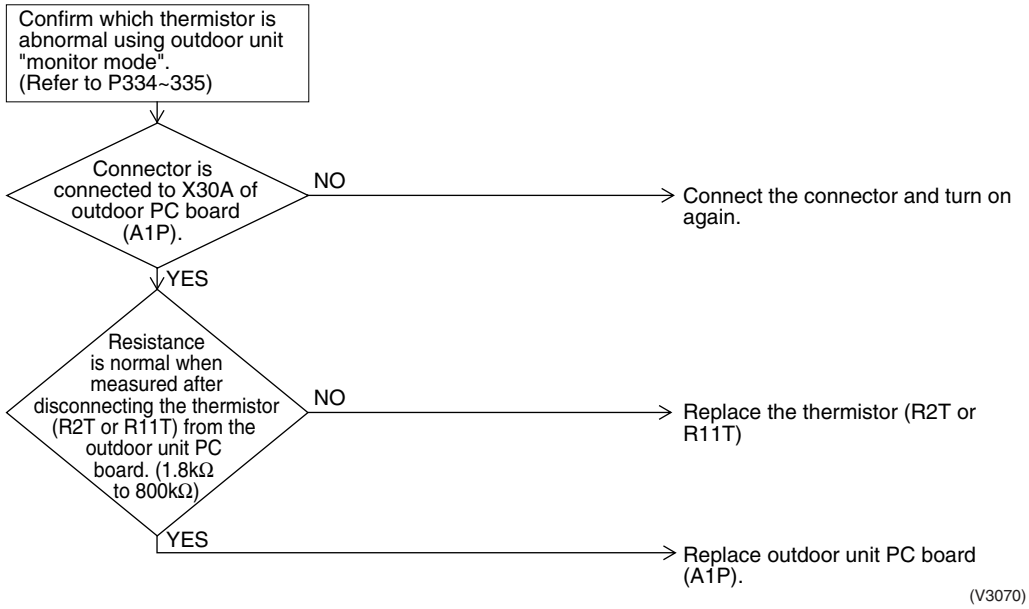
In operation, when a thermistor is disconnected or short circuits.

Supposed Causes

- Defective connection of thermistor
- Defective thermistor
- Defective outdoor unit PC board

Troubleshooting

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



∗ Refer to the ***Thermistor Resistance / Temperature Characteristics*** table on Page 523.

3.28 J5 Outdoor Unit: Malfunction of Thermistor (R8T or R10T) for Suction Pipe

Remote Controller Display

J5

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Temperature detected by the suction pipe temperature thermistor.

Malfunction Decision Conditions

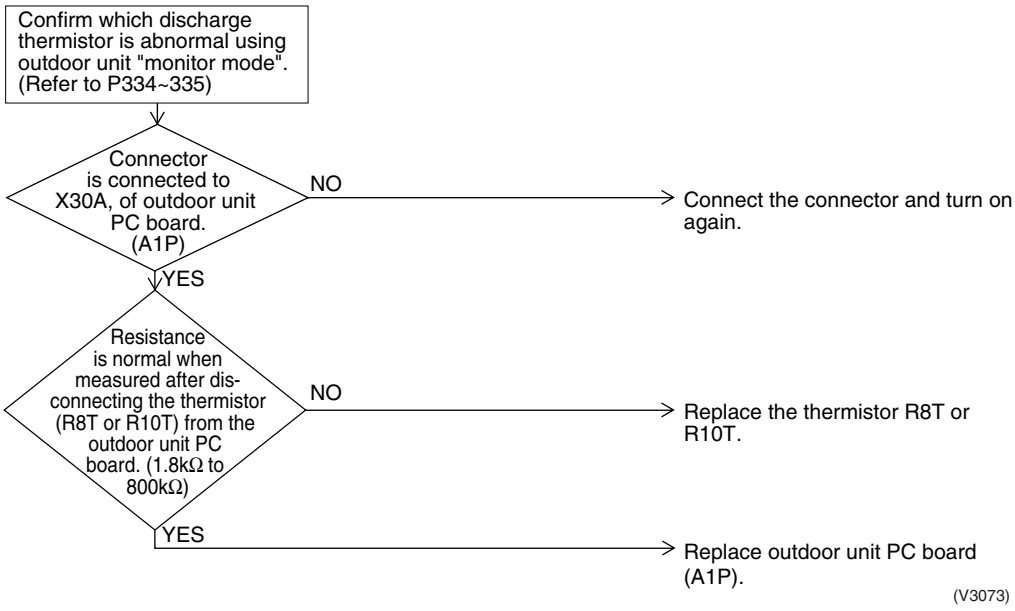
When a short circuit or an open circuit in the suction pipe temperature thermistor is detected.

Supposed Causes

- Defect of thermistor (R8T or R10T) for outdoor unit suction pipe
- Defect of outdoor unit PC board (A1P)
- Defect of thermistor connection

Troubleshooting

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



∗ Refer to the ***Thermistor Resistance / Temperature Characteristics*** table on Page 523.

3.29 J6 Outdoor Unit: Malfunction of Thermistor (R4T or R12T) for Outdoor Unit Heat Exchanger

Remote Controller Display

J6

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Temperature detected by the heat exchanger thermistor.

Malfunction Decision Conditions

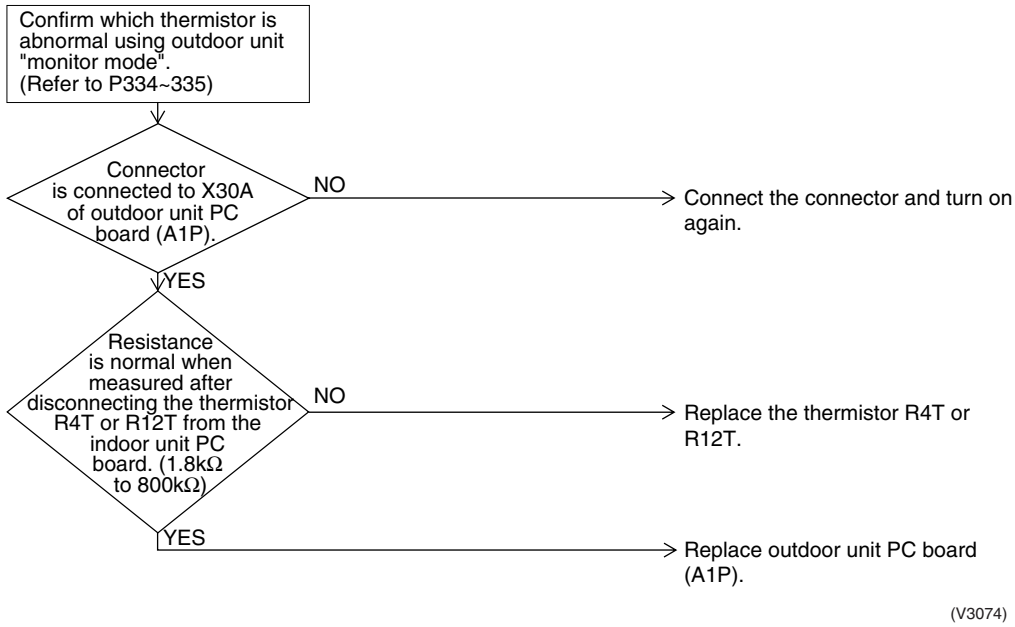
When a short circuit or an open circuit in the heat exchange thermistor is detected.

Supposed Causes

- Defect of thermistor (R4T or R12T) for outdoor unit coil
- Defect of outdoor unit PC board (A1P)
- Defect of thermistor connection

Troubleshooting

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



∗ Refer to the ***Thermistor Resistance / Temperature Characteristics*** table on Page 523.

3.30 J7 Outdoor Unit: Malfunction of Liquid Pipe Thermistor 1 (R6T), (R9T) or (R14T)

Remote Controller Display

J7

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Malfunction is detected according to the temperature detected by liquid pipe thermistor.

Malfunction Decision Conditions

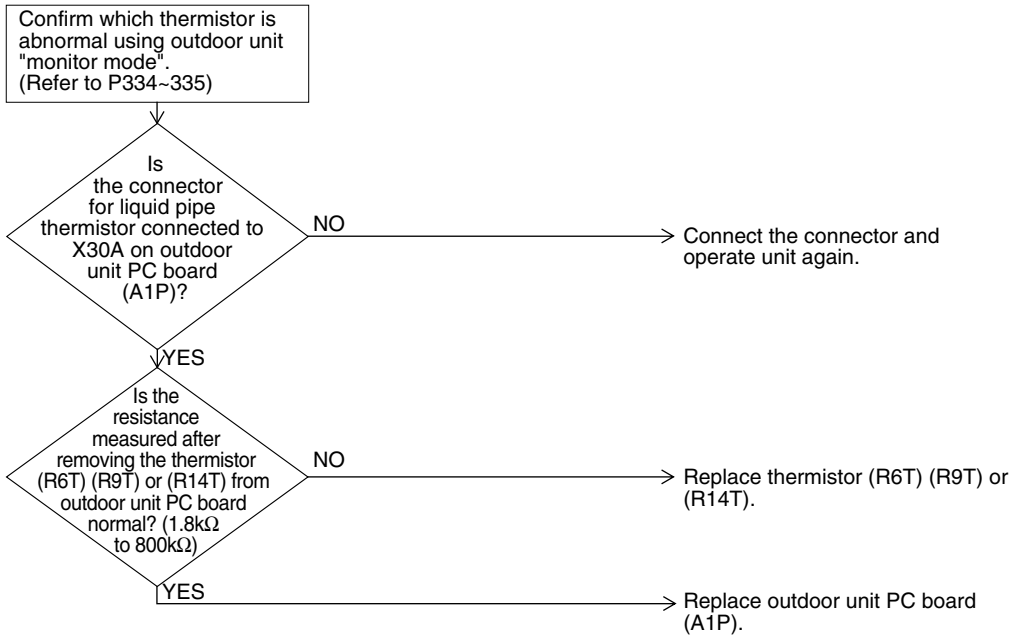
When the liquid pipe thermistor is short circuited or open.

Supposed Causes

- Faulty liquid pipe thermistor 1 (R6T), (R9T) or (R14T)
- Faulty outdoor unit PC board
- Defect of thermistor connection

Troubleshooting

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



(V3075)

∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P523.

3.31 J8 Outdoor Unit: Malfunction of Liquid Pipe Thermistor 2 (R7T or R15T)

Remote Controller Display

J8

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Malfunction is detected according to the temperature detected by liquid pipe thermistor.

Malfunction Decision Conditions

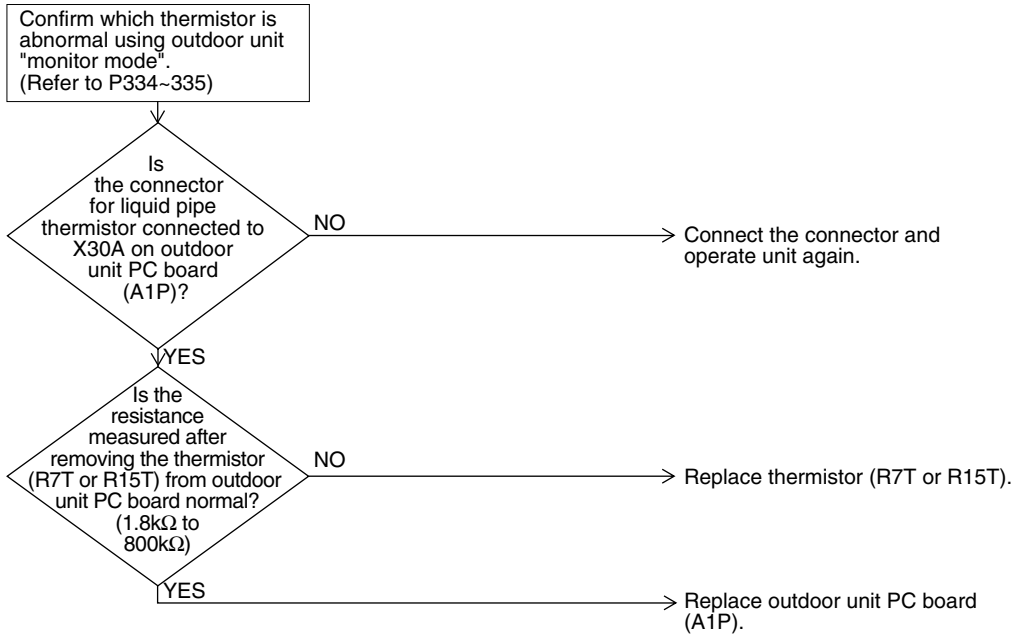
When the liquid pipe thermistor is short circuited or open.

Supposed Causes

- Faulty liquid pipe thermistor 2 (R7T or R15T)
- Faulty outdoor unit PC board
- Defect of thermistor connection

Troubleshooting

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



(V3075)

∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P523.

3.32 J9 Outdoor Unit: Malfunction of Subcooling Heat Exchanger Gas Pipe Thermistor (R5T or R13T)

Remote Controller Display

J9

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Malfunction is detected according to the temperature detected by subcooling heat exchanger gas pipe thermistor.

Malfunction Decision Conditions

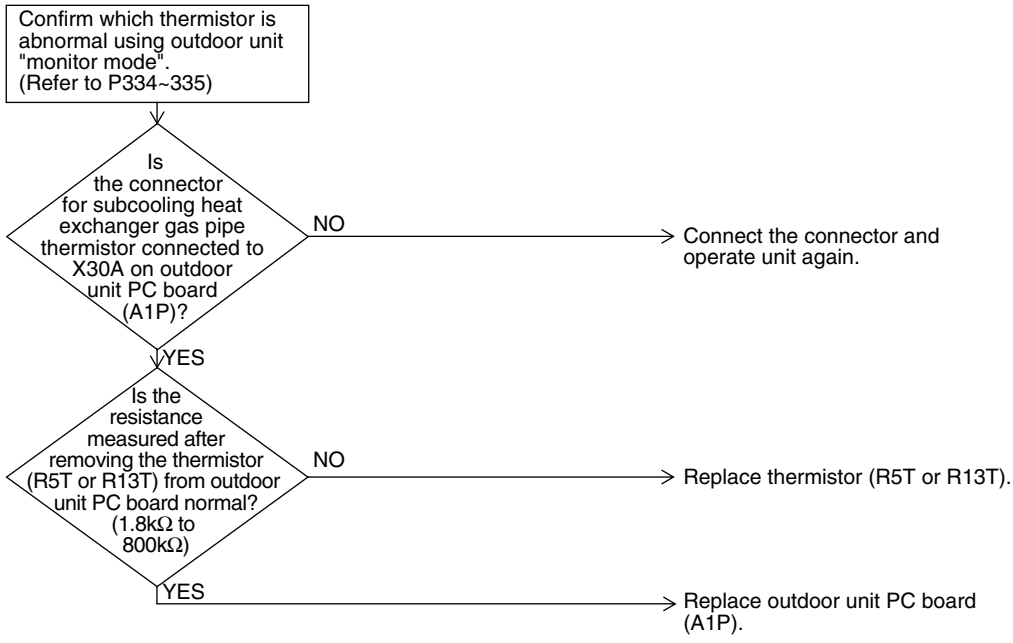
When the subcooling heat exchanger gas pipe thermistor is short circuited or open.

Supposed Causes

- Faulty subcooling heat exchanger gas pipe thermistor (R5T or R13T)
- Faulty outdoor unit PC board

Troubleshooting

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



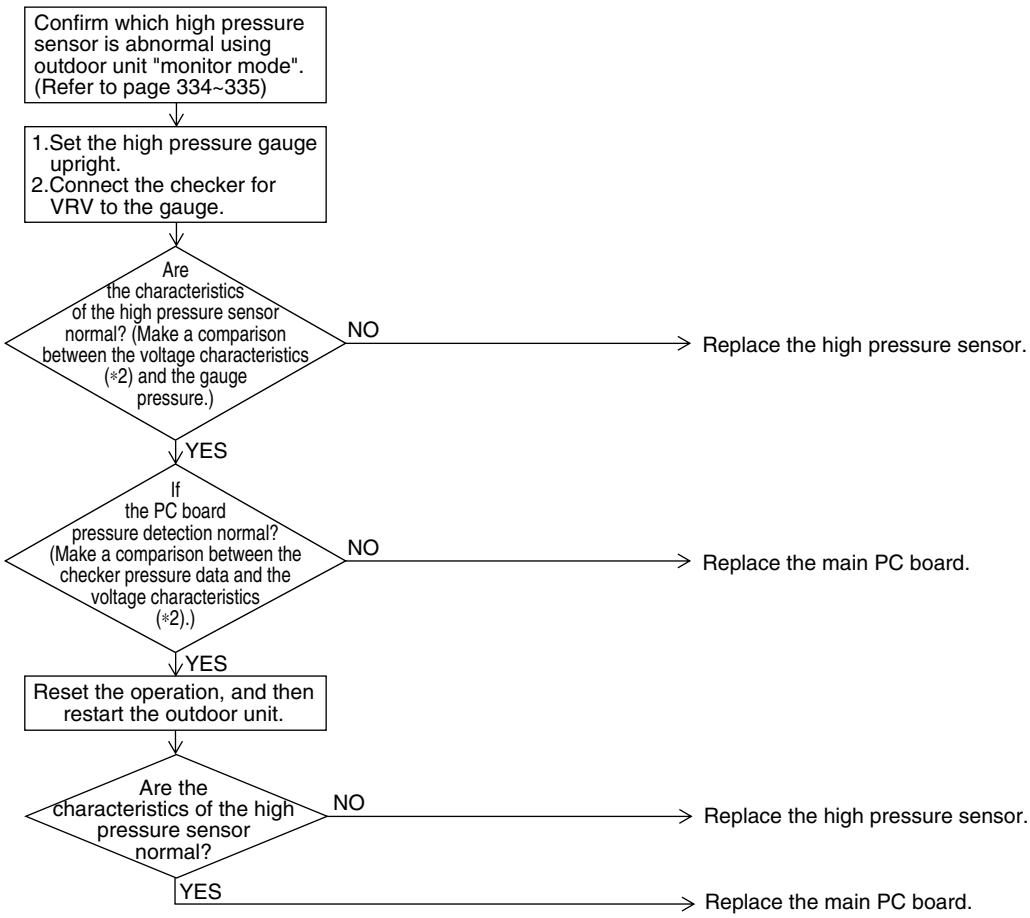
∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P523.

3.33 JA Outdoor Unit: Malfunction of High Pressure Sensor

Remote Controller Display	JA
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Malfunction is detected from the pressure detected by the high pressure sensor.
Malfunction Decision Conditions	When the high pressure sensor is short circuit or open circuit. (Not less than 611.9psi, or 1.45psi and below)
Supposed Causes	■ Defect of high pressure sensor system ■ Connection of low pressure sensor with wrong connection. ■ Defect of outdoor unit PC board. ■ Defective connection of high pressure sensor

Troubleshooting

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

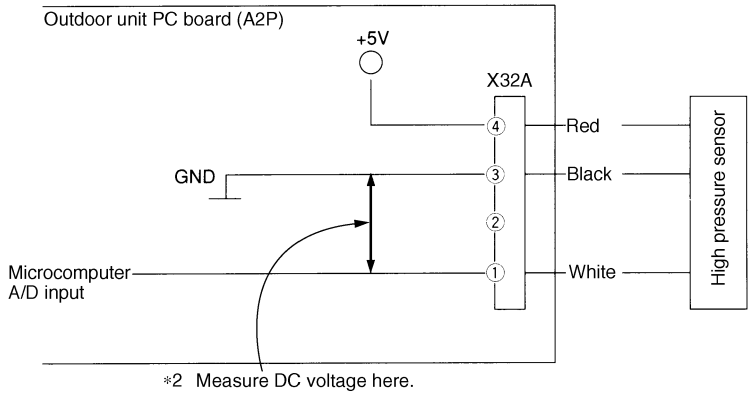


*1: Pressure sensor subject to malfunction code

Malfunction code	Pressure sensor subject to malfunction code	Electric symbol
JA	High pressure sensor	S1NPH

(V2806)

*2: Voltage measurement point



(V2807)

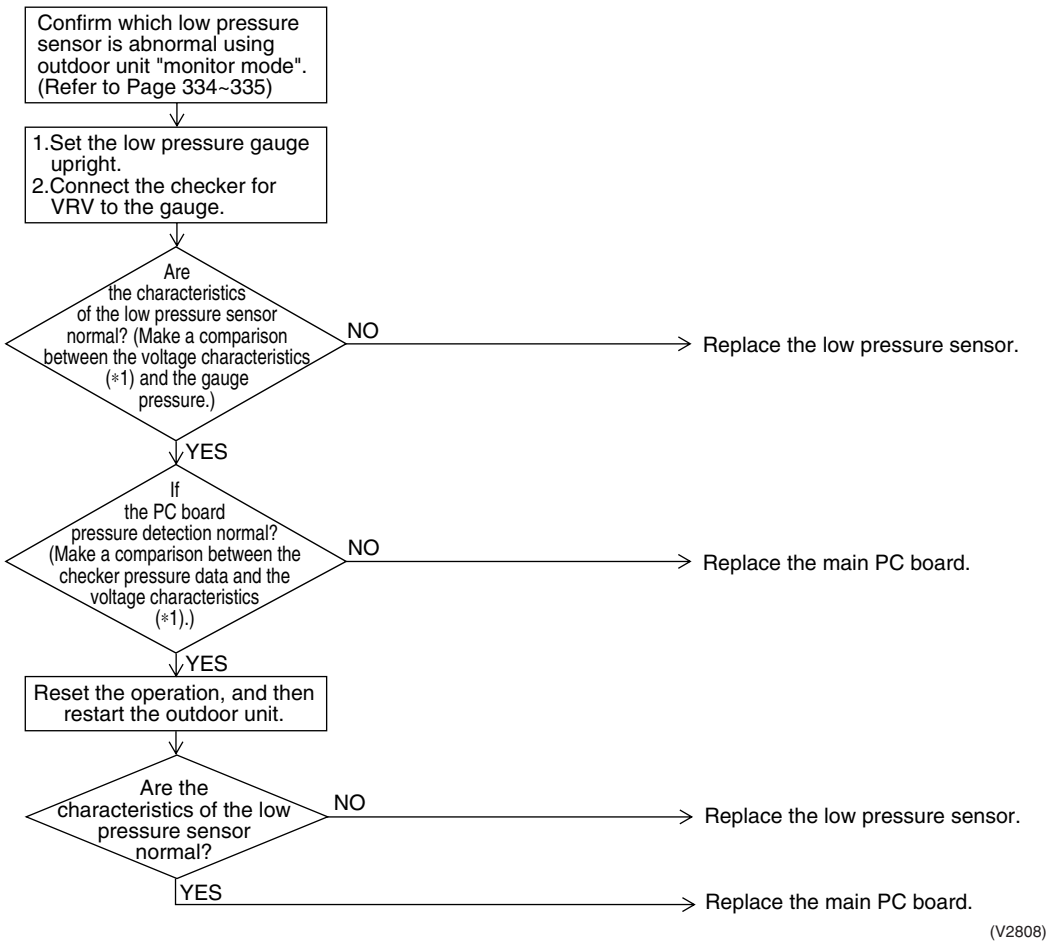
*2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on P525.

3.34 UE Outdoor Unit: Malfunction of Low Pressure Sensor

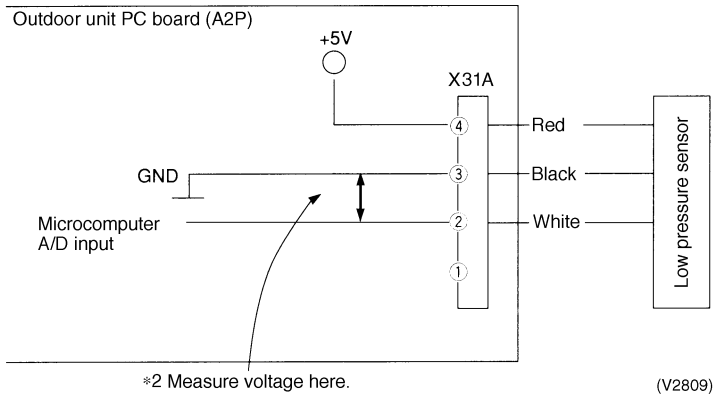
Remote Controller Display	UE
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Malfunction is detected from pressure detected by low pressure sensor.
Malfunction Decision Conditions	When the low pressure sensor is short circuit or open circuit. (Not less than 256.65psi, or -1.45psi and below)
Supposed Causes	■ Defect of low pressure sensor system ■ Connection of high pressure sensor with wrong connection. ■ Defect of outdoor unit PC board. ■ Defective connection of low pressure sensor

Troubleshooting

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



∗1: Voltage measurement point



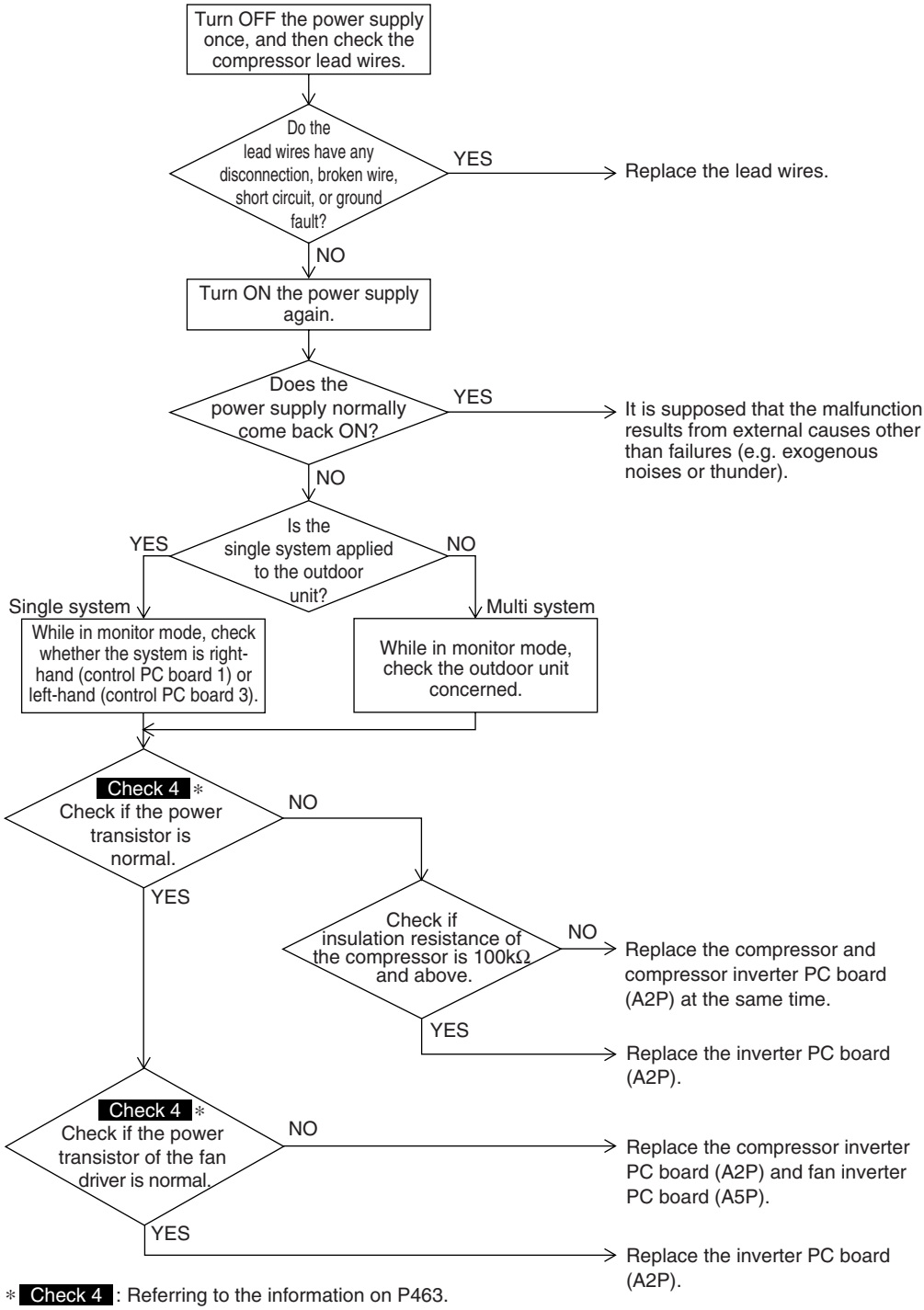
∗2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on P525.

3.35 L1 Outdoor Unit: Defective Inverter PC Board

Remote Controller Display	L1
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Malfunction is detected based on the current value during waveform output before starting compressor. Malfunction is detected based on the value from current sensor during synchronous operation when starting the unit.
Malfunction Decision Conditions	Overcurrent (OCP) flows during waveform output. Malfunction of current sensor during synchronous operation. IPM failure.
Supposed Causes	■ Inverter PC board (A2P) ● IPM failure ● Current sensor failure ● Drive circuit failure

Troubleshooting

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



＊ Check 4 : Referring to the information on P463.

*1. List of Inverter PC boards

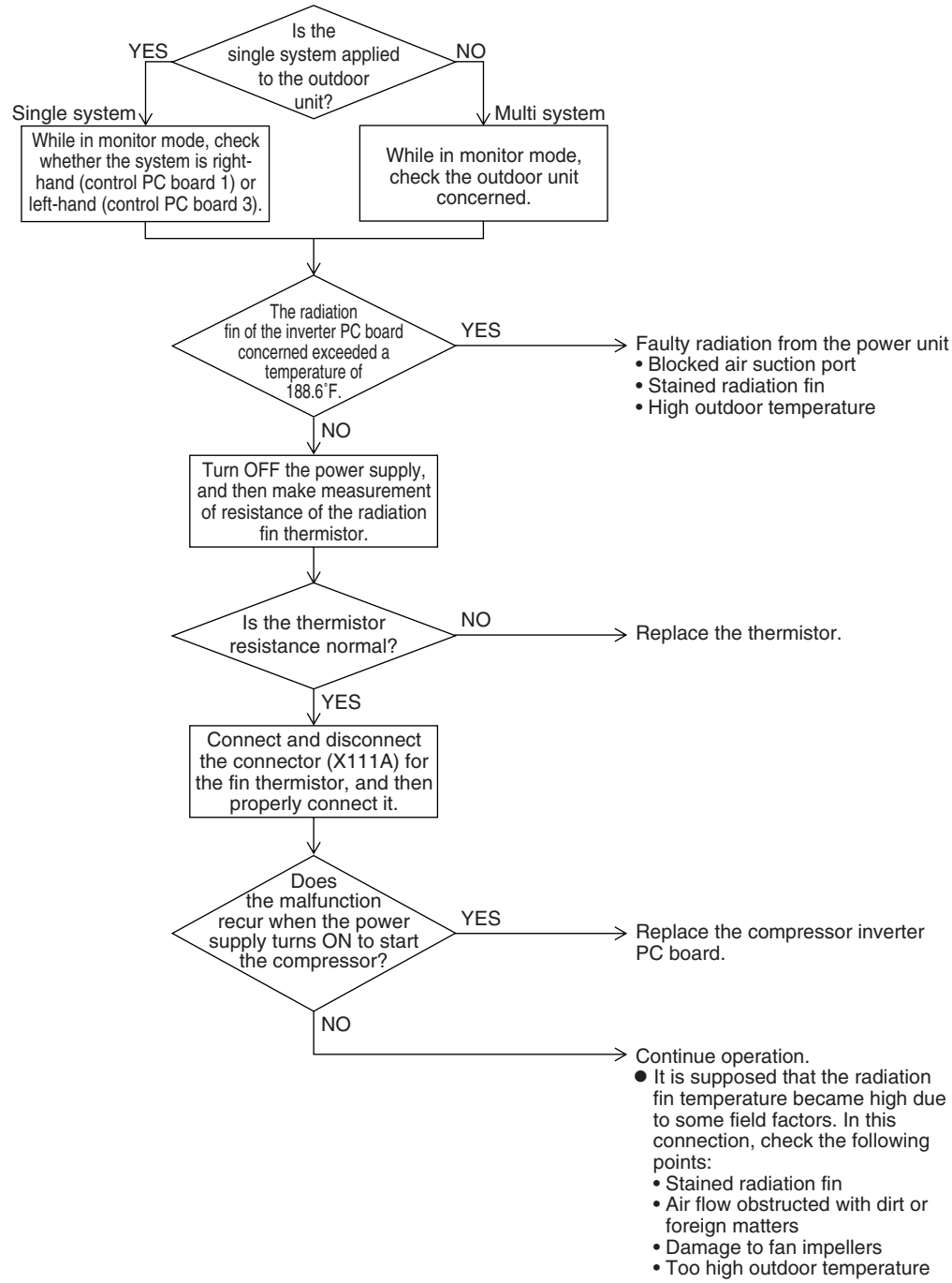
Model	Name	Electric symbol
RXYQ72, 96, 120PYDN, PTJU REMQ72, 96, 120PYDN, PTJU	Compressor inverter PC board	A4P
	Fan inverter PC board	A5P
REYQ72, 96, 120PYDN REYQ72, 96, 120PTJU	Compressor inverter PC board	A5P
	Fan inverter PC board	A6P, A7P
REYQ144PTJU	Compressor inverter PC board	A4P
RXYQ144PTJU	Fan inverter PC board	A5P

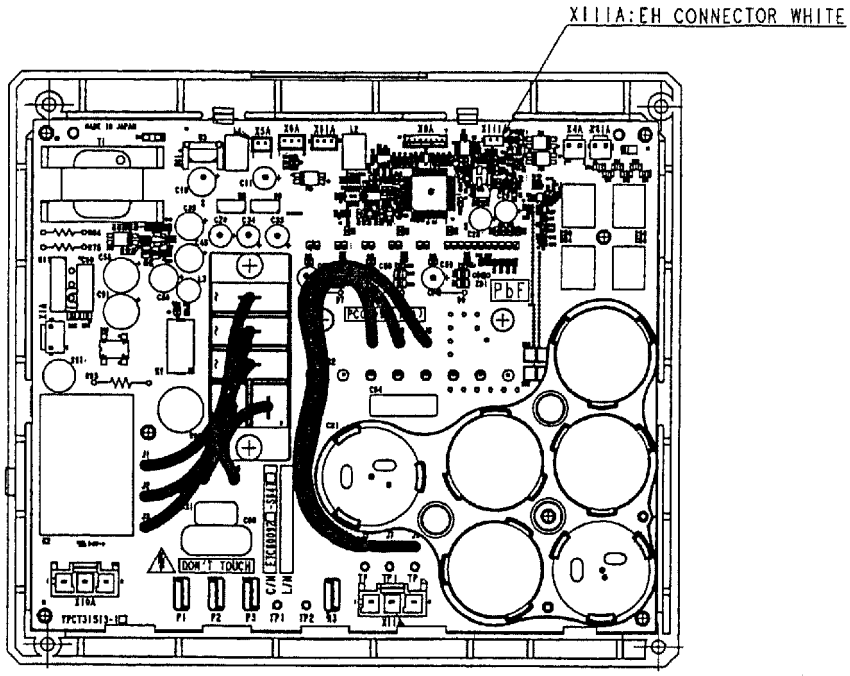
3.36 L4 Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise

Remote Controller Display	L4
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Fin temperature is detected by the thermistor of the radiation fin.
Malfunction Decision Conditions	When the temperature of the inverter radiation fin increases above 188.6°F.
Supposed Causes	■ Actuation of fin thermal (Actuates above 188.6°F) ■ Defect of inverter PC board ■ Defect of fin thermistor

Troubleshooting

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





Inverter PC board for compressor

∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P523.

3.37 L5 Outdoor Unit: Momentary Overcurrent of Inverter Compressor

Remote Controller Display

L5

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Malfunction is detected from current flowing in the power transistor.

Malfunction Decision Conditions

When an excessive current flows in the power transistor.
(Instantaneous overcurrent also causes activation.)

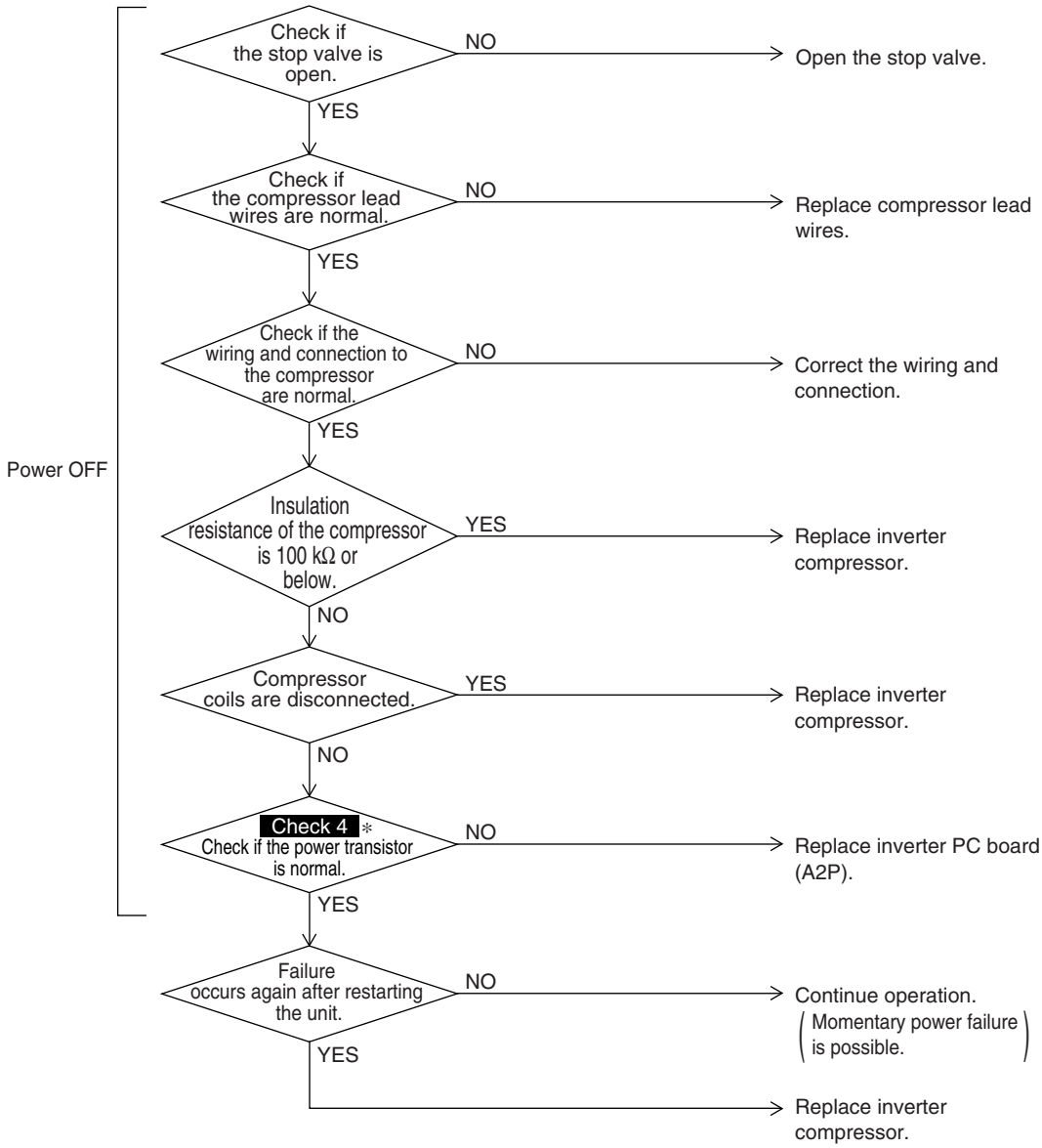
Supposed Causes

- Defect of compressor coil (disconnected, defective insulation)
- Compressor start-up malfunction (mechanical lock)
- Defect of inverter PC board

Troubleshooting

Compressor inspection

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



* Check 4 : Referring to the information on P463.

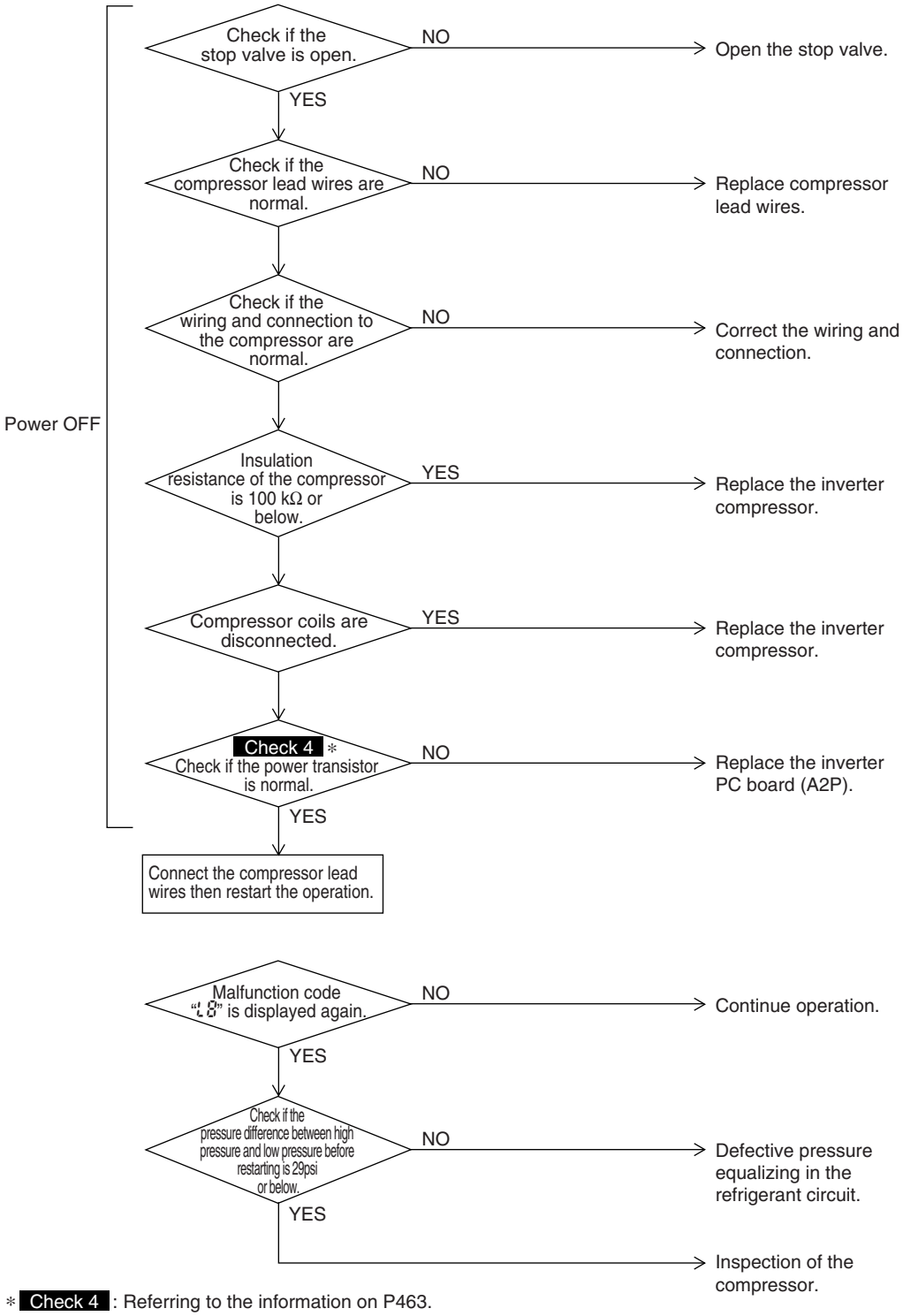
3.38 L8 Outdoor Unit: Momentary Overcurrent of Inverter Compressor

Remote Controller Display	L8
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Malfunction is detected by current flowing in the power transistor.
Malfunction Decision Conditions	When overload in the compressor is detected. (Inverter secondary current 16.1A) 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 ■ Defect of inverter PC board ■ Faulty compressor

Troubleshooting

Output current check

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



* Check 4 : Referring to the information on P463.

3.39 L9 Outdoor Unit: Inverter Compressor Starting Failure

Remote Controller Display

L9

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

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

Malfunction Decision Conditions

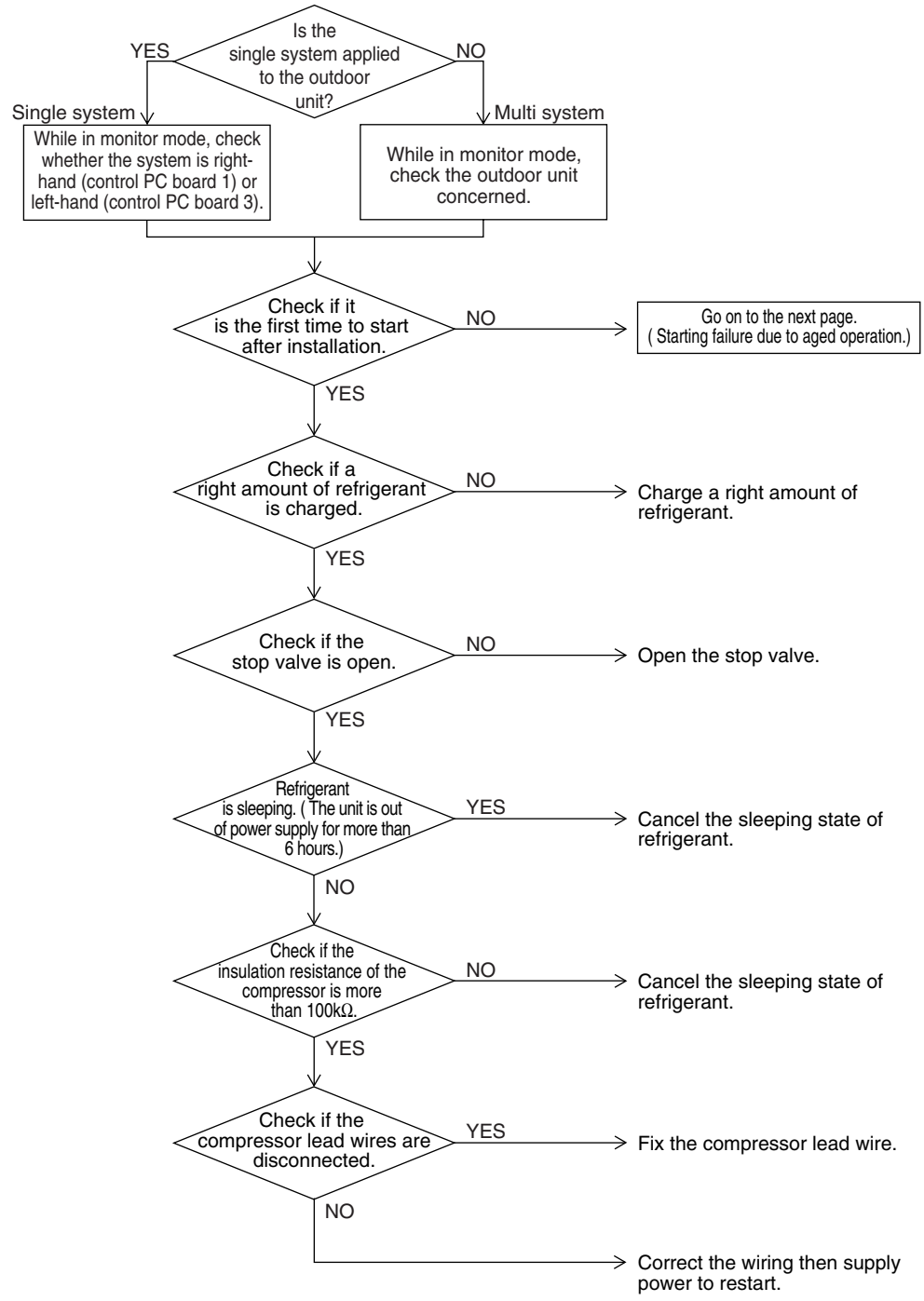
Starting the compressor does not complete.

Supposed Causes

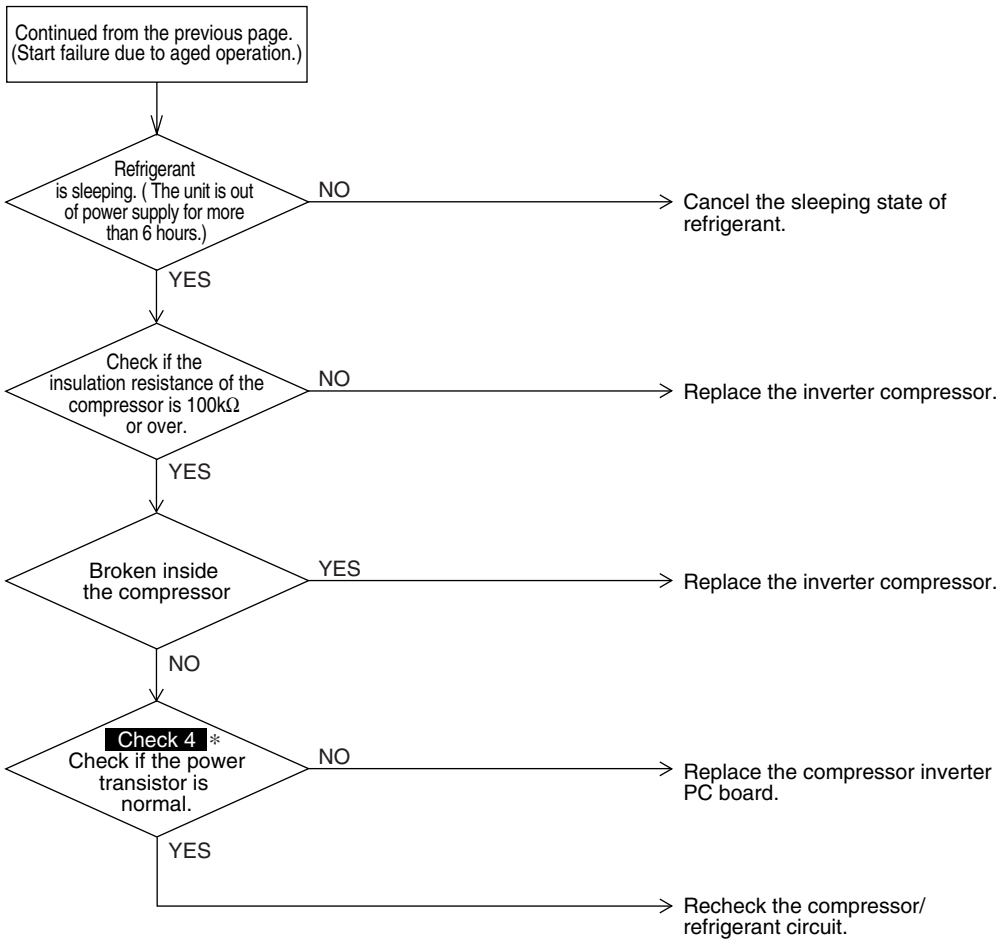
- Failure to open the stop valve
- Defective compressor
- Wiring connection error to the compressor
- Large pressure difference before starting the compressor
- Defective inverter PC board

Troubleshooting

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



Troubleshooting



* Check 4 : Referring to the information on P463.

3.40 LC Outdoor Unit: Malfunction of Transmission between Inverter and Control PC Board

Remote Controller Display

LC

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Check the communication state between inverter PC board and control PC board by micro-computer.

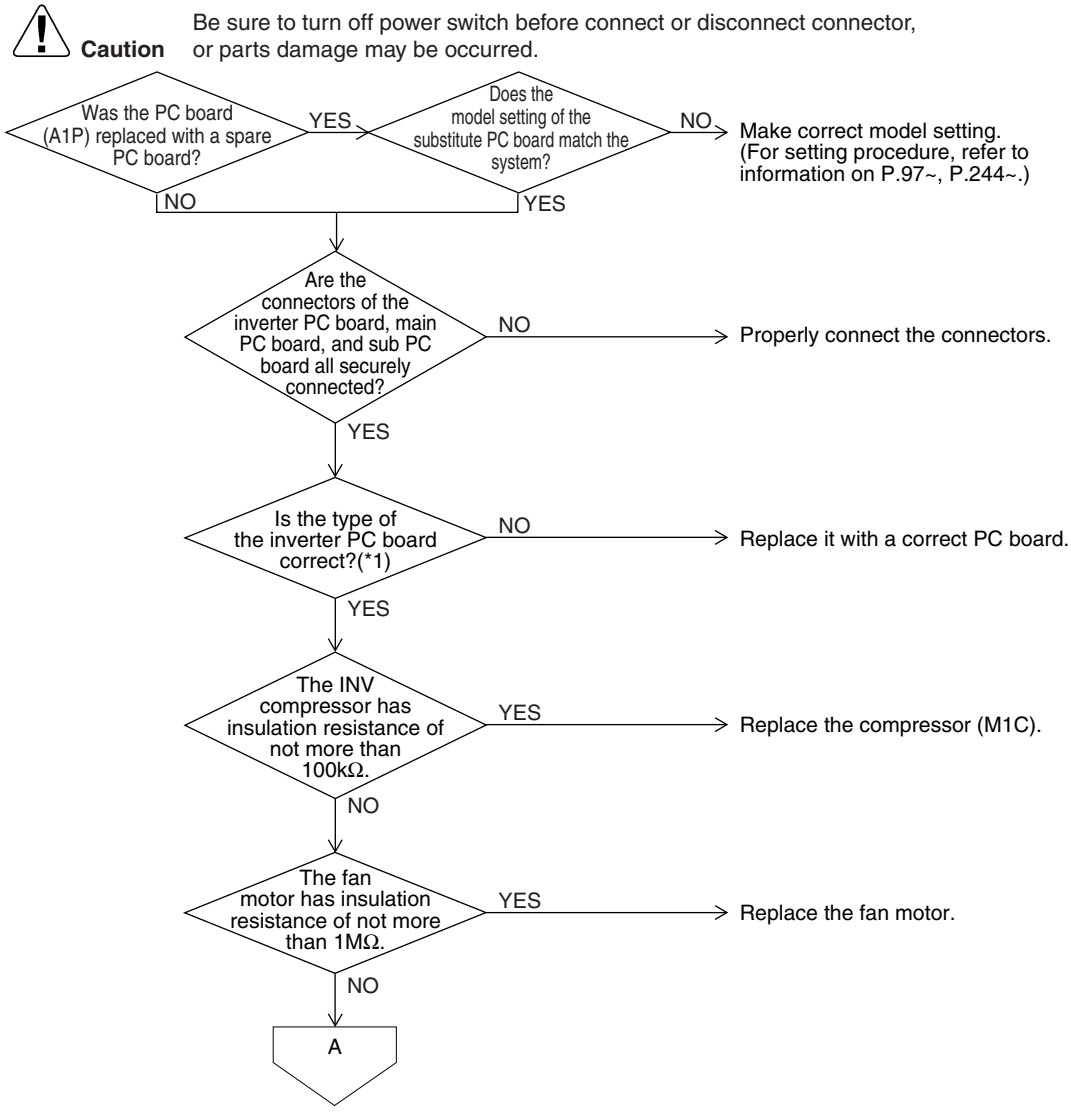
Malfunction Decision Conditions

When the correct communication is not conducted in certain period.

Supposed Causes

- Malfunction of connection between the inverter PC board and outdoor main PC board
- Defect of outdoor main PC board (transmission section)
- Defect of inverter PC board
- Defect of noise filter
- Faulty fan inverter
- Incorrect type of inverter PC board
- Faulty inverter compressor
- Faulty fan motor
- External factor (noise etc.)

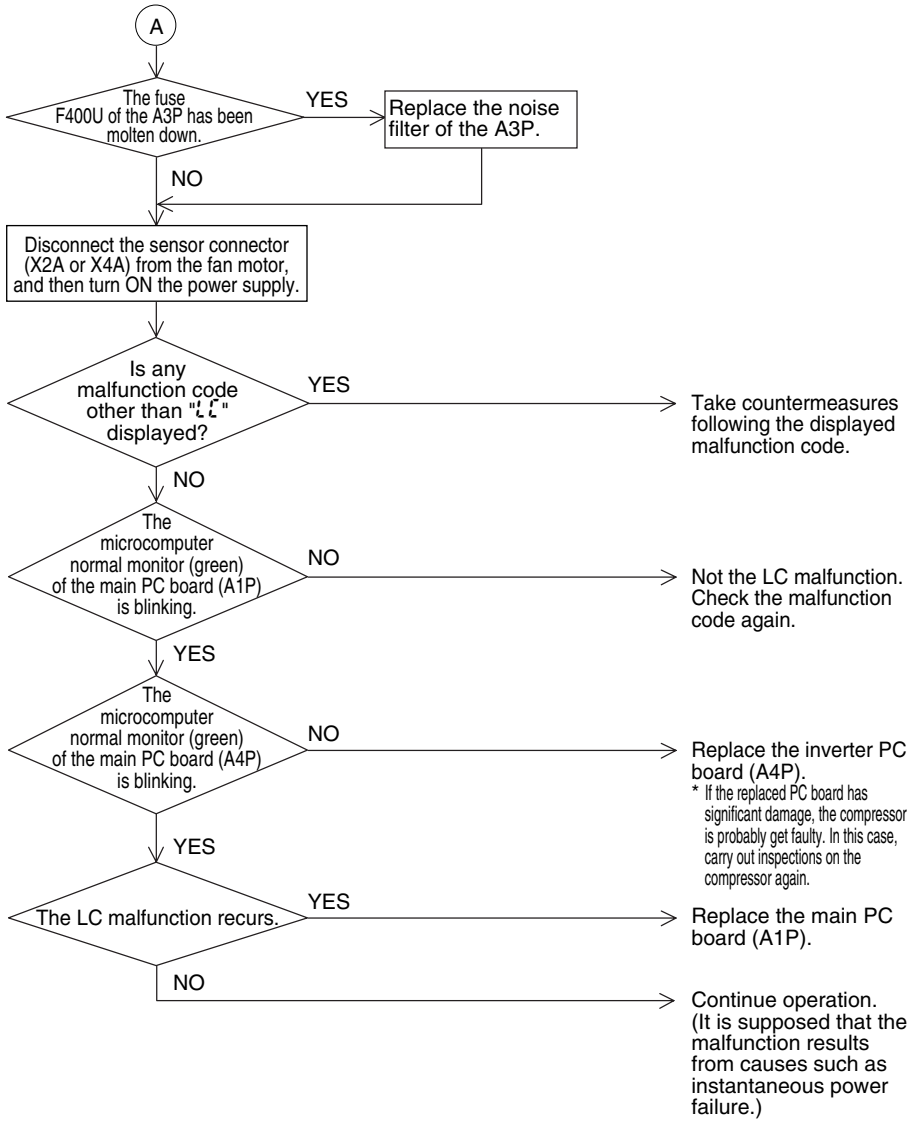
Troubleshooting

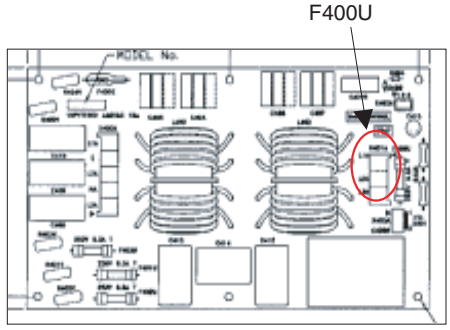


*1. List of Inverter PC boards

PC0702	REMQ72, 96, 120PYDN RXYQ72, 96, 120PYDN REYQ72, 96, 120PYDN
PC0615-1	REMQ96, 120PTJU RXYQ72, 96, 120PTJU REYQ144PTJU
PC0615-2	REMQ72PTJU REYQ72, 96, 120PTJU

Troubleshooting





3.41 P1 Outdoor Unit: Inverter Over-Ripple Protection

Remote Controller Display

P1

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Imbalance in supply voltage is detected in PC board.
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.

Malfunction Decision Conditions

When the resistance value of thermistor becomes a value equivalent to open or short circuited status.

★ Malfunction is not decided while the unit operation is continued.
"P1" will be displayed by pressing the inspection button.

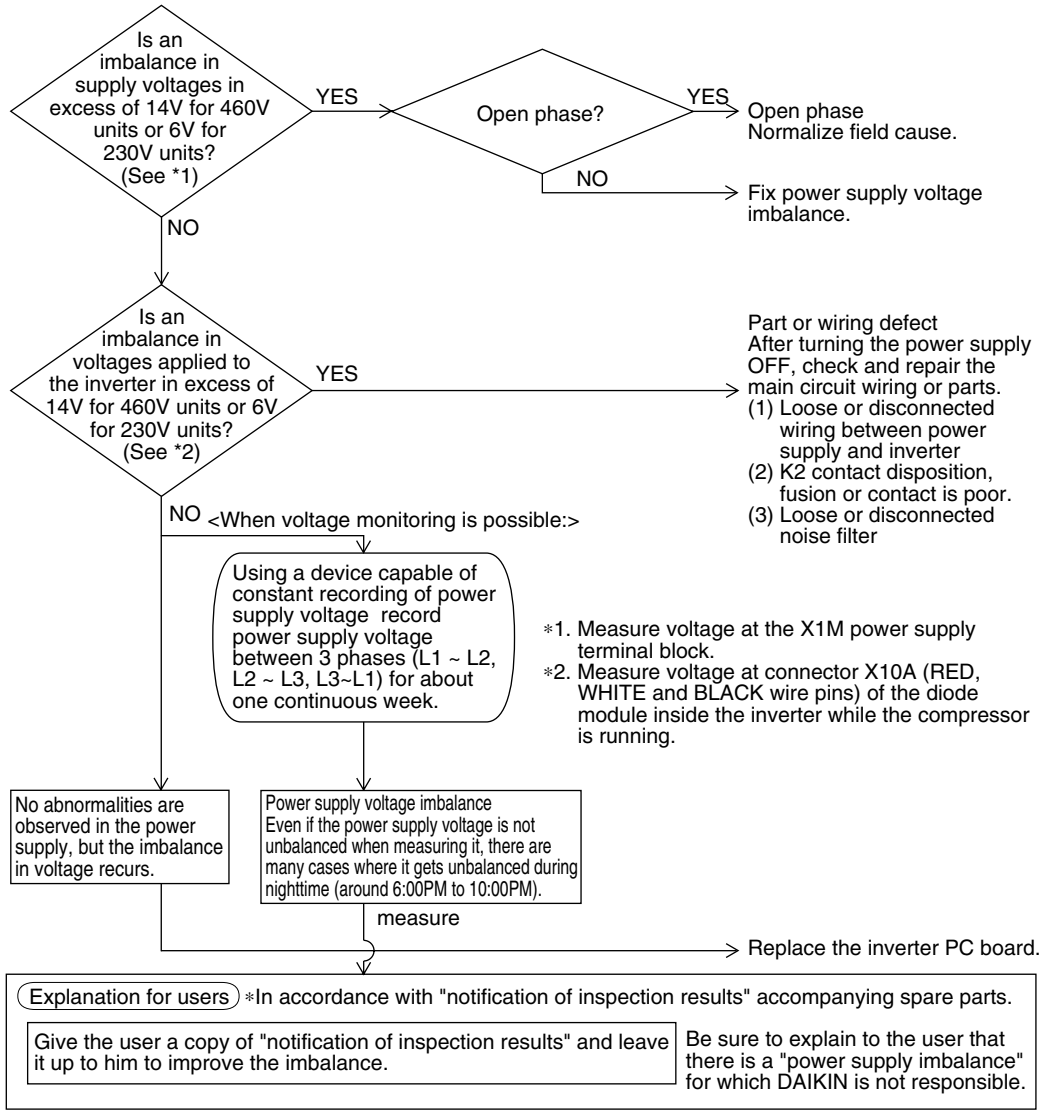
When the amplitude of the ripple exceeding a certain value is detected for consecutive 4 minutes.

Supposed Causes

- Open phase
- Voltage imbalance between phases
- Defect of main circuit capacitor
- Defect of inverter PC board
- Defect of K2 relay in inverter PC board
- Improper main circuit wiring

Troubleshooting

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



(V2816)

3.42 P4 Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise Sensor

Remote Controller Display

P4

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Resistance of radiation fin thermistor is detected when the compressor is not operating.

Malfunction Decision Conditions

When the resistance value of thermistor becomes a value equivalent to open or short circuited status.

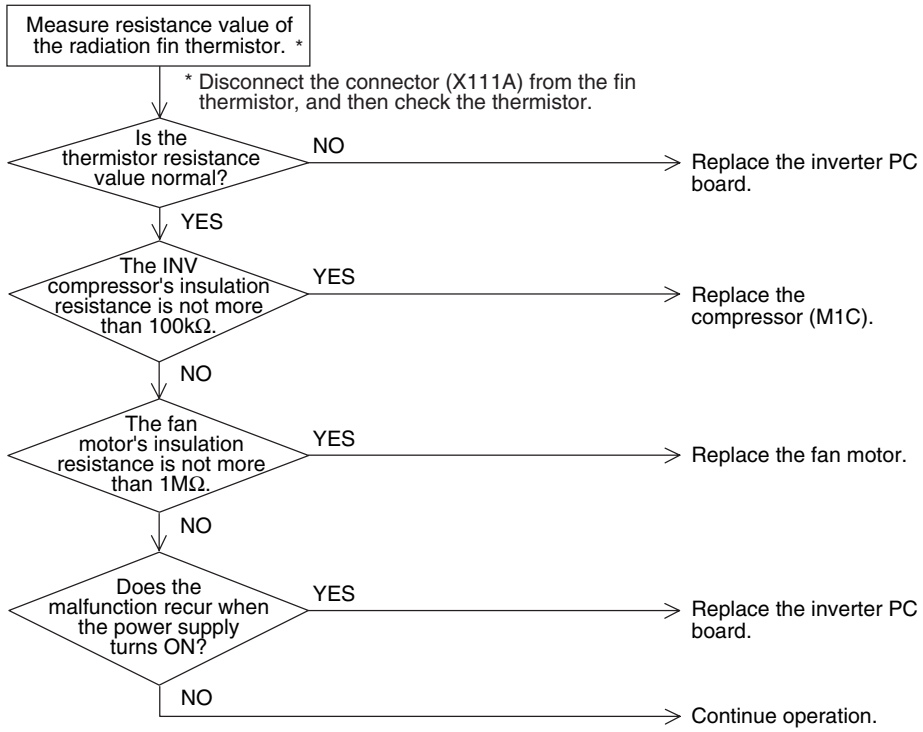
★ Malfunction is not decided while the unit operation is continued.
"P4" will be displayed by pressing the inspection button.

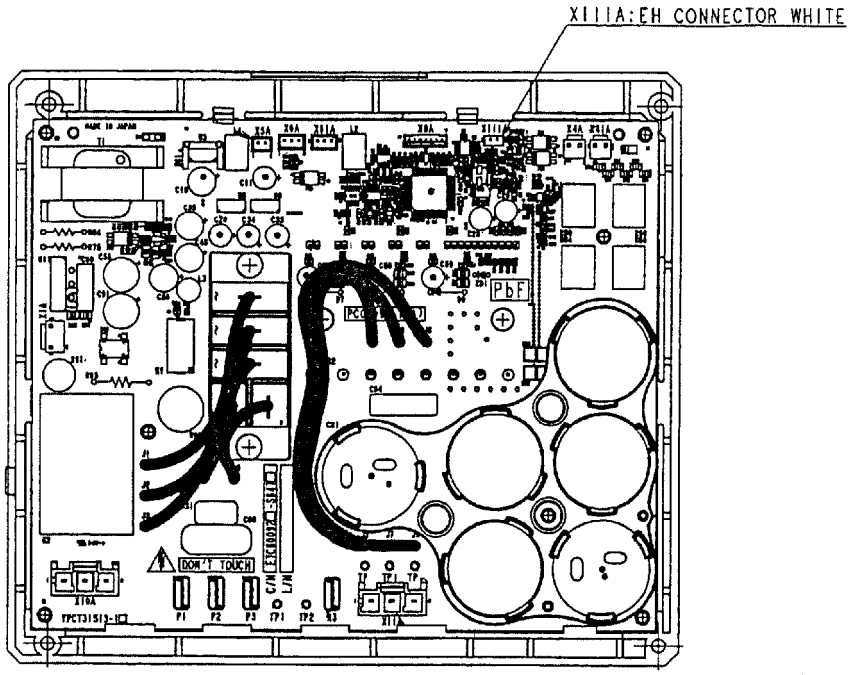
Supposed Causes

- Defect of radiator fin temperature sensor
- Defect of inverter PC board
- Faulty inverter compressor
- Faulty fan motor

Troubleshooting

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





Inverter PC board for compressor

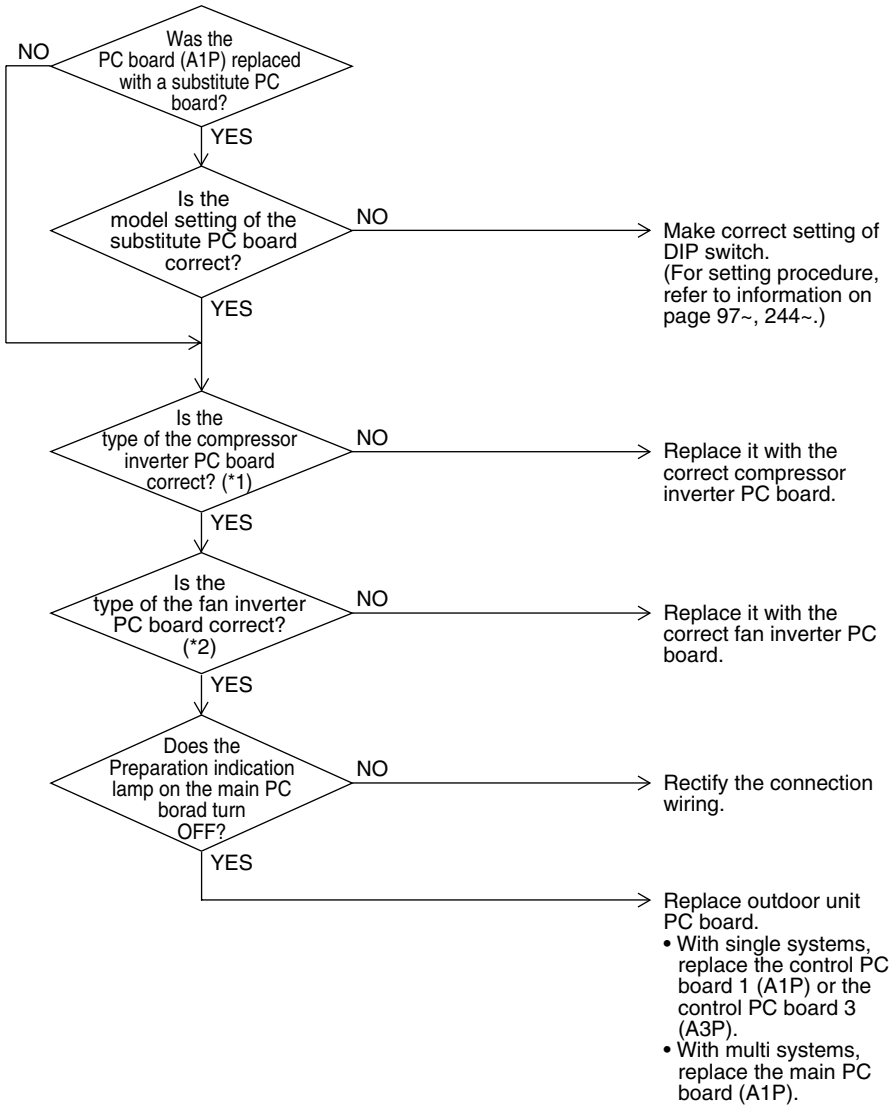
∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P523.

3.43 PJ Outdoor Unit: Faulty Field Setting after Replacing Main PC Board or Faulty Combination of PC Board

Remote Controller Display	PJ
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	This malfunction is detected according to communications with the inverter.
Malfunction Decision Conditions	Make judgment according to communication data on whether or not the type of the inverter PC board is correct.
Supposed Causes	■ Faulty (or no) field setting after replacing main PC board ■ Mismatching of type of PC board

Troubleshooting

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



*1. List of Inverter PC boards

PC0702	REMQ72, 96, 120PYDN RXYQ72, 96, 120PYDN REYQ72, 96, 120PYDN
PC0615-1	REMQ96, 120PTJU RXYQ72, 96, 120PTJU REYQ144PTJU
PC0615-2	REMQ72PTJU REYQ72, 96, 120PTJU

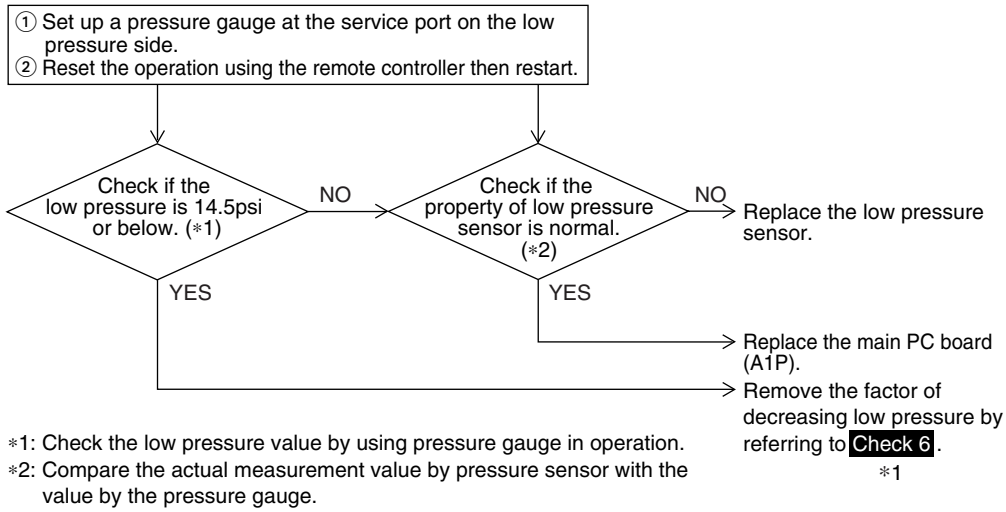
3.44 U0 Outdoor Unit: Gas Shortage Alert

Remote Controller Display	U0
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Detect gas shortage based on the temperature difference between low pressure or suction pipe and heat exchanger.
Malfunction Decision Conditions	[In cooling mode] Low pressure becomes 14.5psi or below. [In heating mode] The degree of superheat of suction gas becomes 36 degrees and over. SH= Ts1 –Te Ts1: Suction pipe temperature detected by thermistor Te : Saturated temperature corresponding to low pressure ★Malfunction is not determined. The unit continues operation.
Supposed Causes	■ Gas shortage or refrigerant clogging (piping error) ■ Defective thermistor (R4T, R7T, R12T, R15T) ■ Defective low pressure sensor ■ Defective outdoor unit PC board (A1P)

Troubleshooting

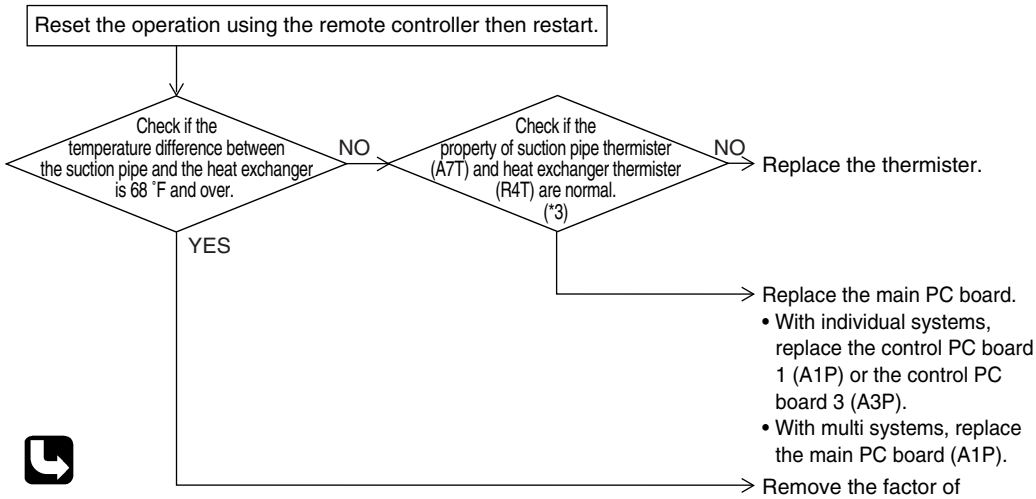
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

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 P533.)

In heating mode



∗3: Compare the thermister resistance value with the value on the surface thermometer.

∗1 Check 6 : Referring to the information on P465.

∗2 Check 3 : Referring to the information on P462.

3.45 U1 Reverse Phase, Open Phase

Remote Controller Display

U1

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

The phase of each phase are detected by reverse phase detection circuit and right phase or reverse phase are judged.

Malfunction Decision Conditions

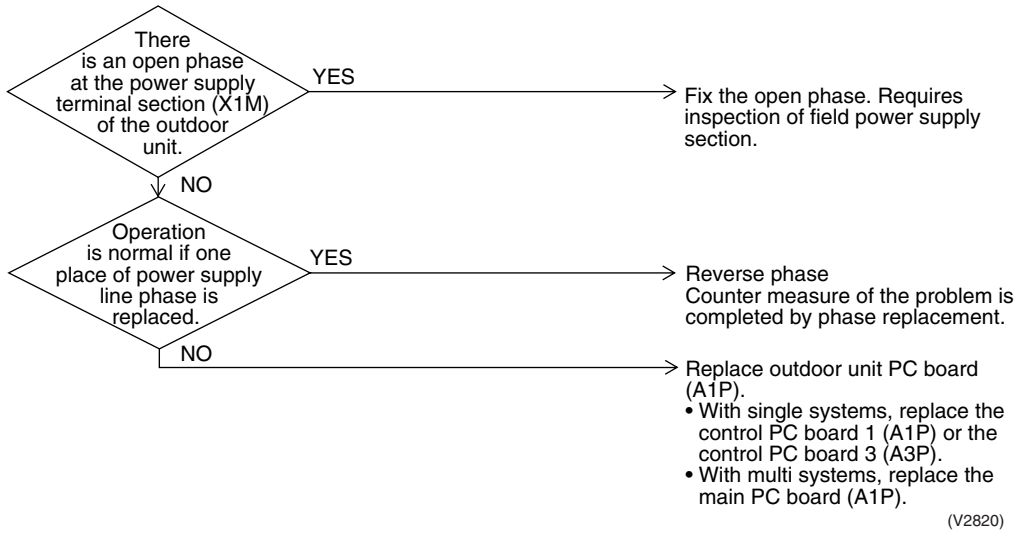
When a significant phase difference is made between phases.

Supposed Causes

- Power supply reverse phase
- Power supply open phase
- Defect of outdoor PC board (A1P)

Troubleshooting

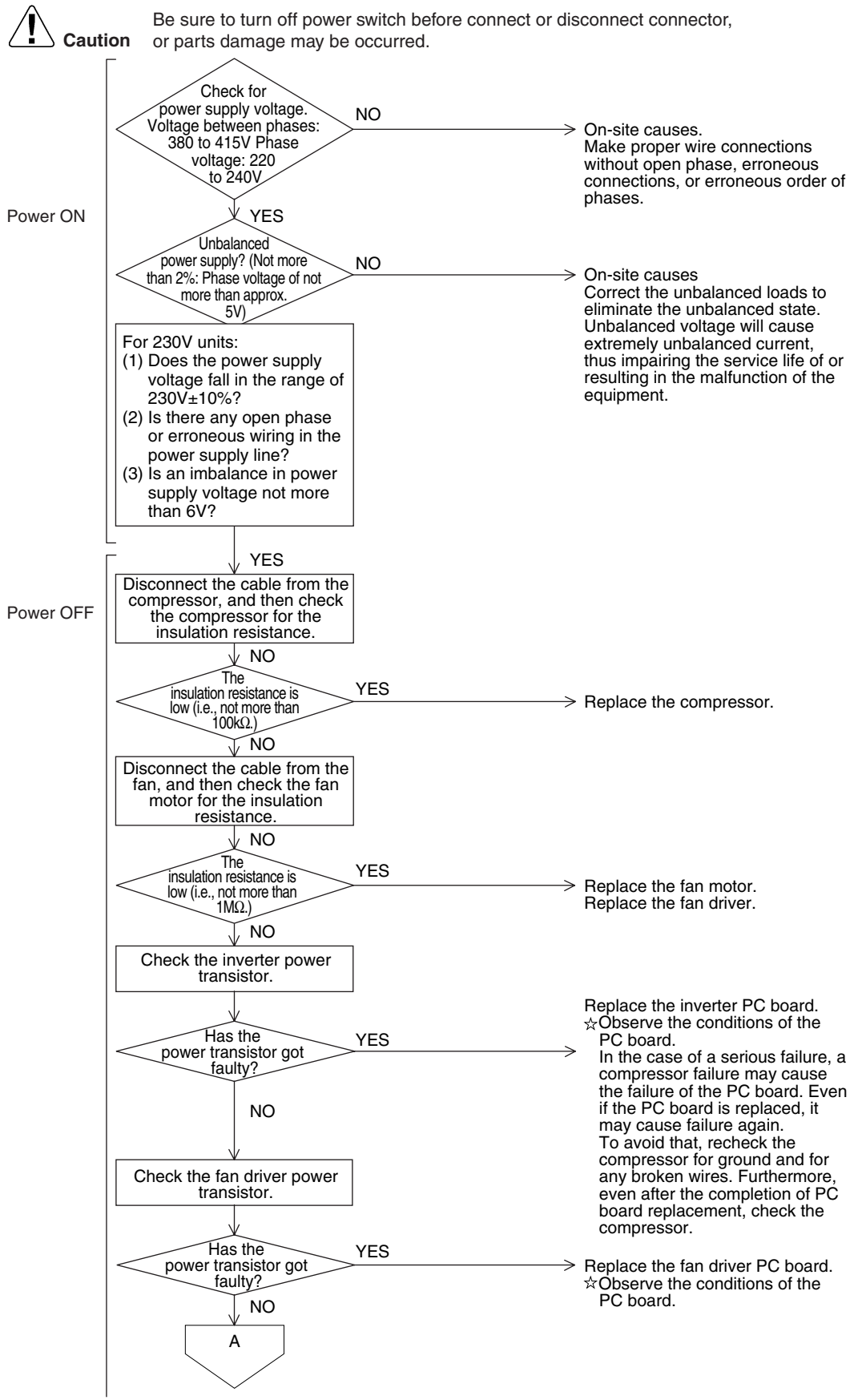
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



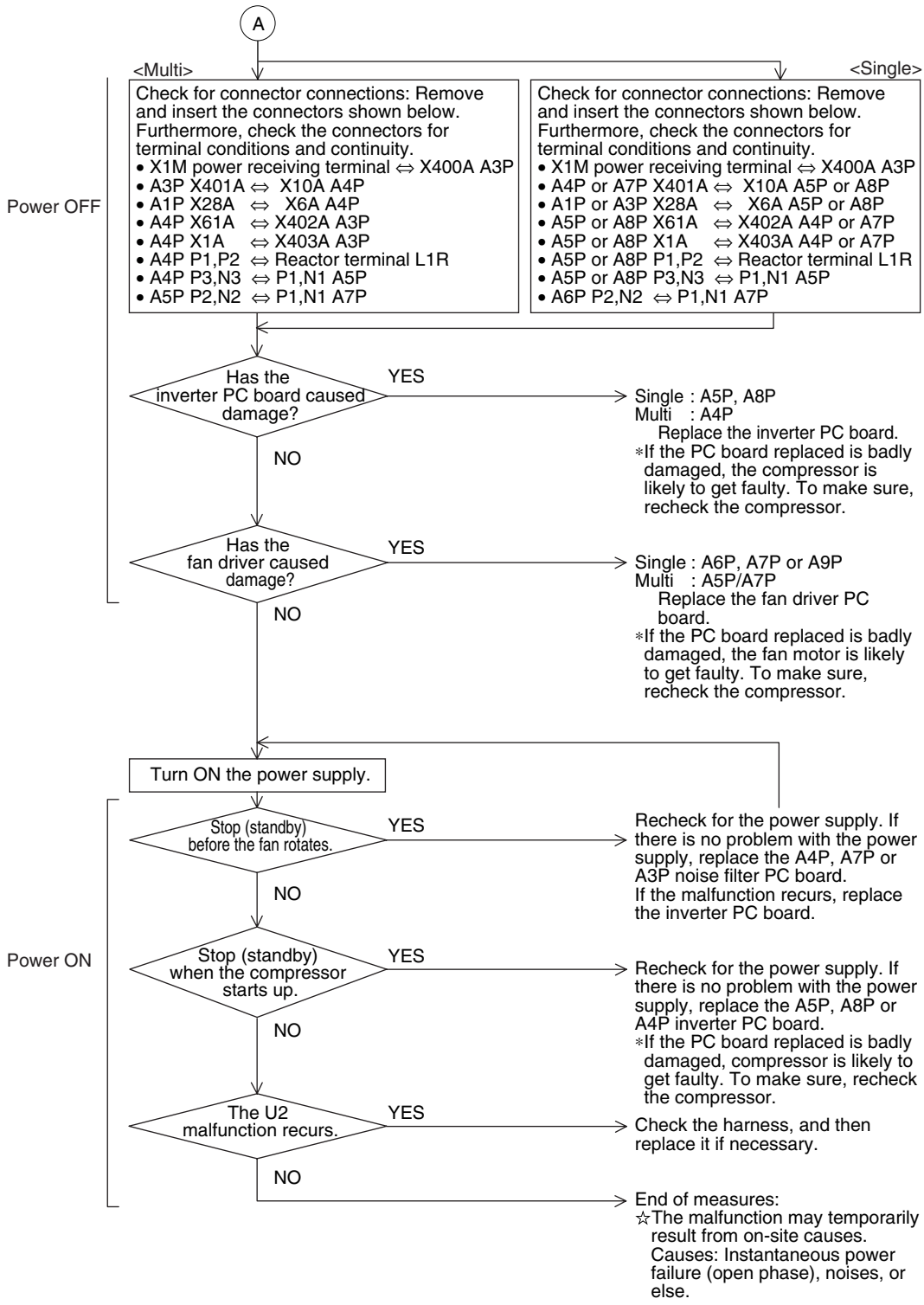
3.46 U2 Outdoor Unit: Power Supply Insufficient or Instantaneous Failure

Remote Controller Display	U2
Applicable Models	RXYQ72P~240PYDN, PTJU REYQ72P~240PYDN, PTJU
Method of Malfunction Detection	Detection of voltage of main circuit capacitor built in the inverter and power supply voltage.
Malfunction Decision Conditions	When the voltage aforementioned is not less than 780V or not more than 320V, or when the current-limiting voltage does not reach 200V or more or exceeds 740V. For 230V units: When the voltage aforementioned is not more than 190V.
Supposed Causes	■ Power supply insufficient ■ Instantaneous power failure ■ Open phase ■ Defect of inverter PC board ■ Defect of outdoor control PC board ■ Main circuit wiring defect ■ Faulty compressor ■ Faulty fan motor ■ Faulty connection of signal cable

Troubleshooting



Troubleshooting



3.47 U3 Outdoor Unit: Check Operation not Executed

Remote Controller Display

U3

Applicable Models

RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Check operation is executed or not

Malfunction Decision Conditions

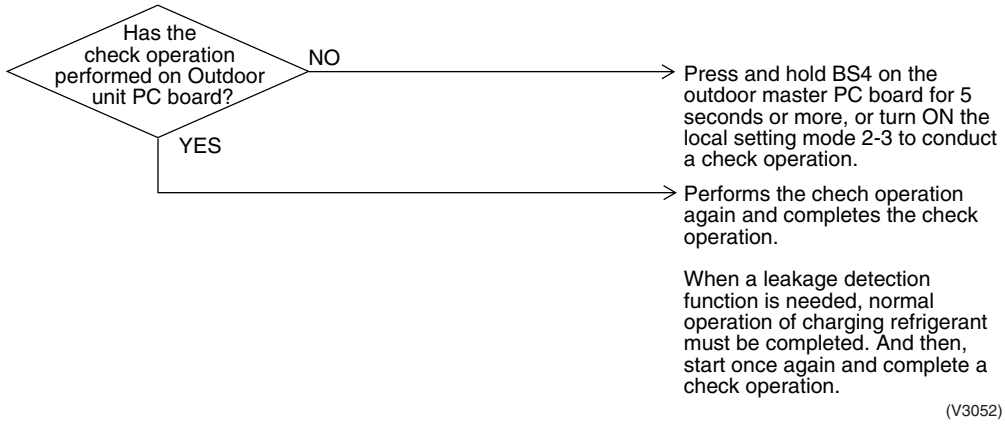
Malfunction is decided when the unit starts operation without check operation.

Supposed Causes

- Check operation is not executed.

Troubleshooting

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



3.48 U4 Malfunction of Transmission between Indoor Units

Remote Controller Display

U4

Applicable Models

All models of indoor unit
RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Microcomputer checks if transmission between indoor and outdoor units is normal.

Malfunction Decision Conditions

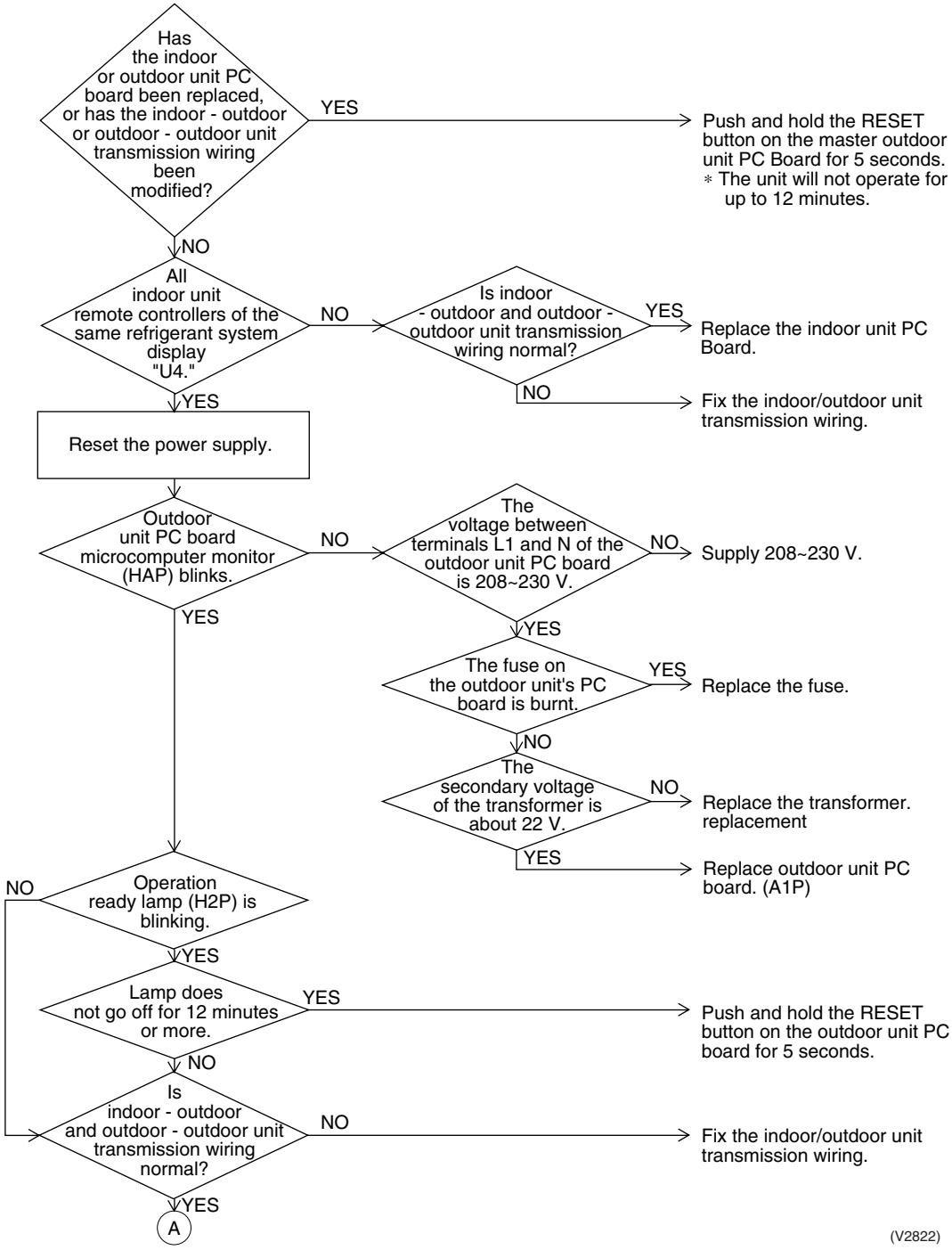
When transmission is not carried out normally for a certain amount of time

Supposed Causes

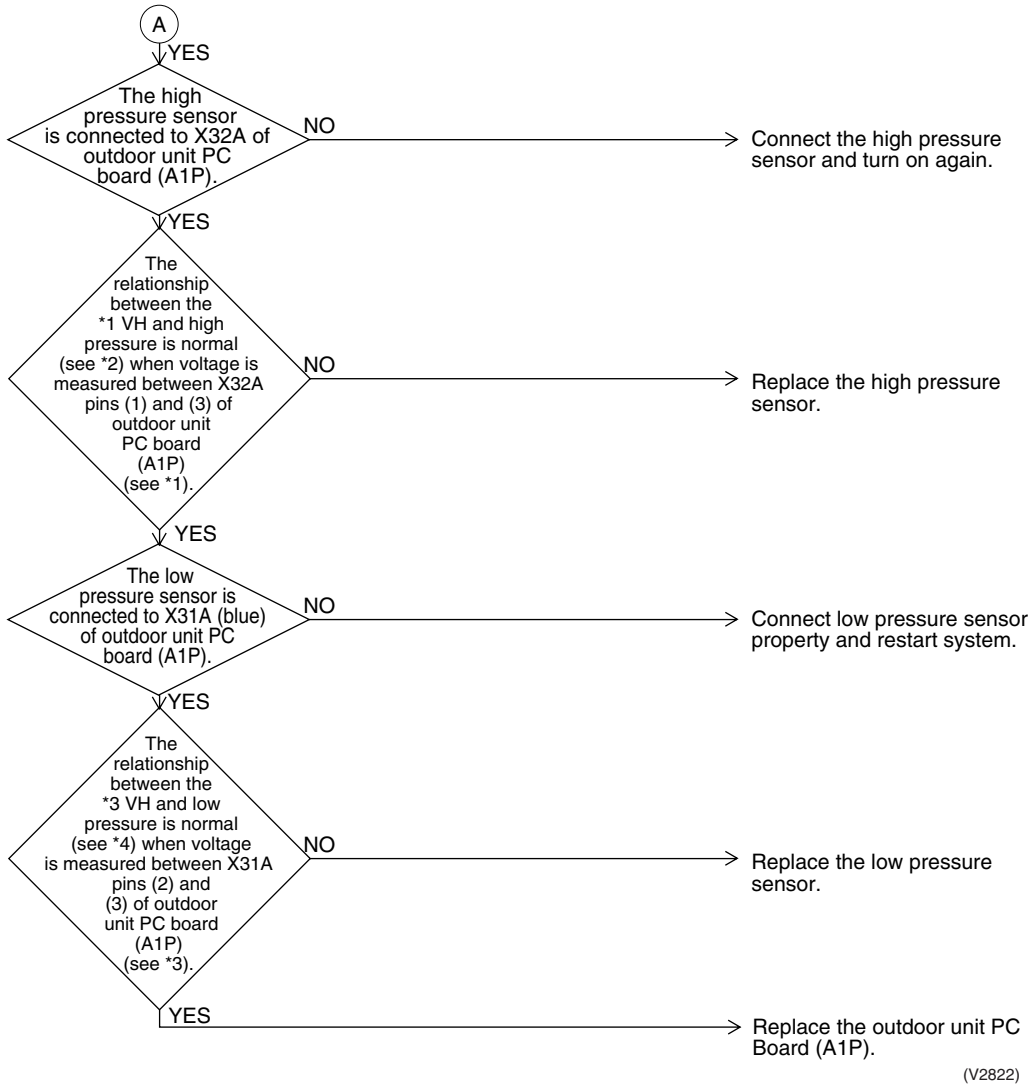
- Indoor to outdoor, outdoor to outdoor transmission wiring F1, F2 disconnection, short circuit or wrong wiring
- Outdoor unit power supply is OFF
- System address doesn't match
- Defect of indoor unit PC board
- Defect of outdoor unit PC board
- Defect of high pressure sensor system
- Defect of low pressure sensor system
- Incorrect connection of pressure sensor(s)

Troubleshooting

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



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

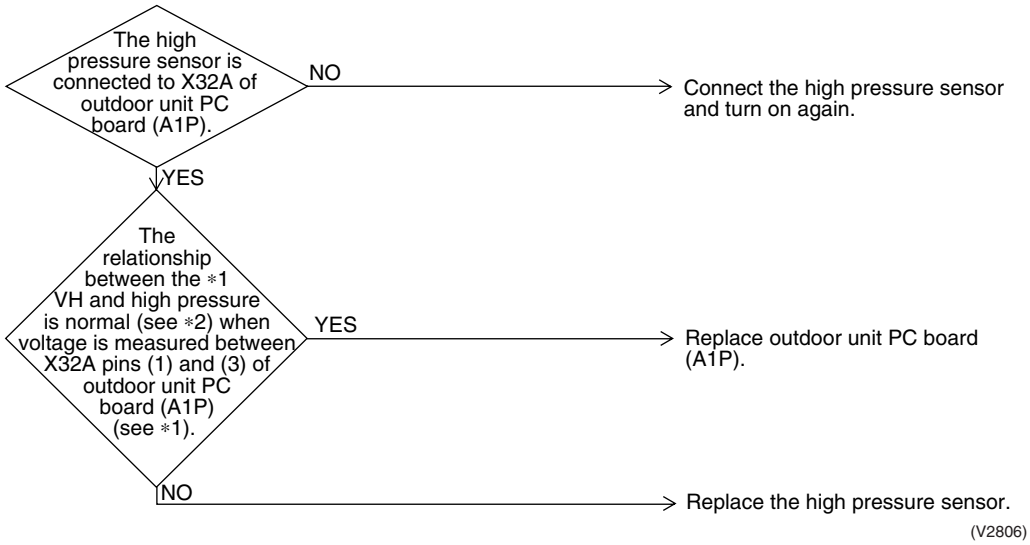


*1, *2; See the chart and footnote on P422

*3, *4; See the chart and footnote on P423

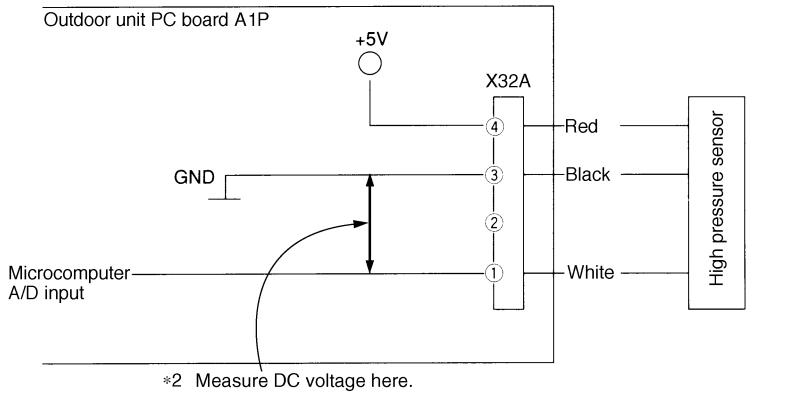
a

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



(V2806)

∗1: Voltage measurement point

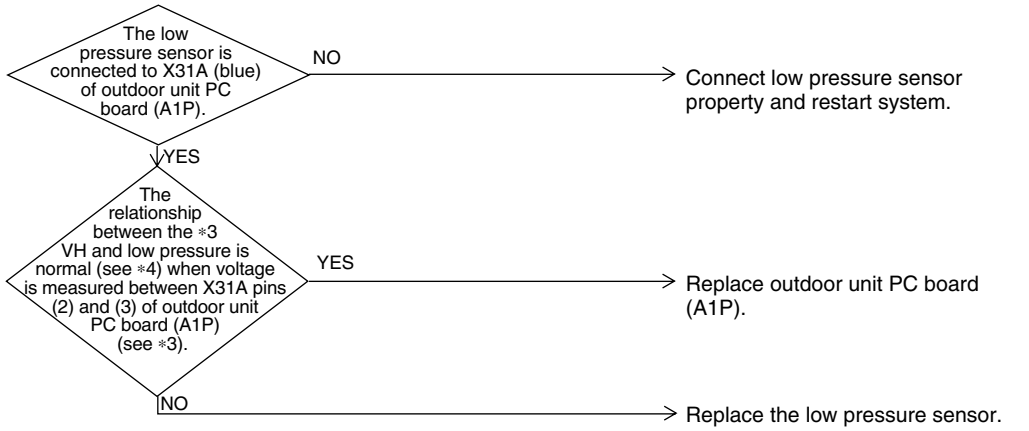


(V2807)

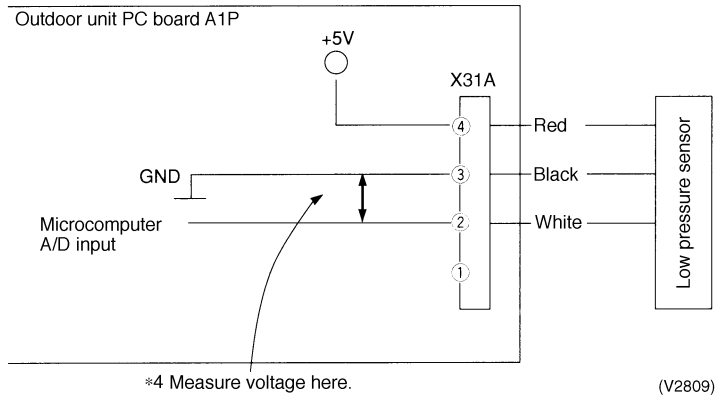
∗2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on P525.

a

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



∗3: Voltage measurement point



∗4: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on P525.

3.49 U5 Indoor Unit: Malfunction of Transmission between Remote Controller and Indoor Unit

Remote Controller Display

U5

Applicable Models

All models of indoor units

Method of Malfunction Detection

In case of controlling with 2-remote controller, check the system using microcomputer is signal transmission between indoor unit and remote controller (main and sub) is normal.

Malfunction Decision Conditions

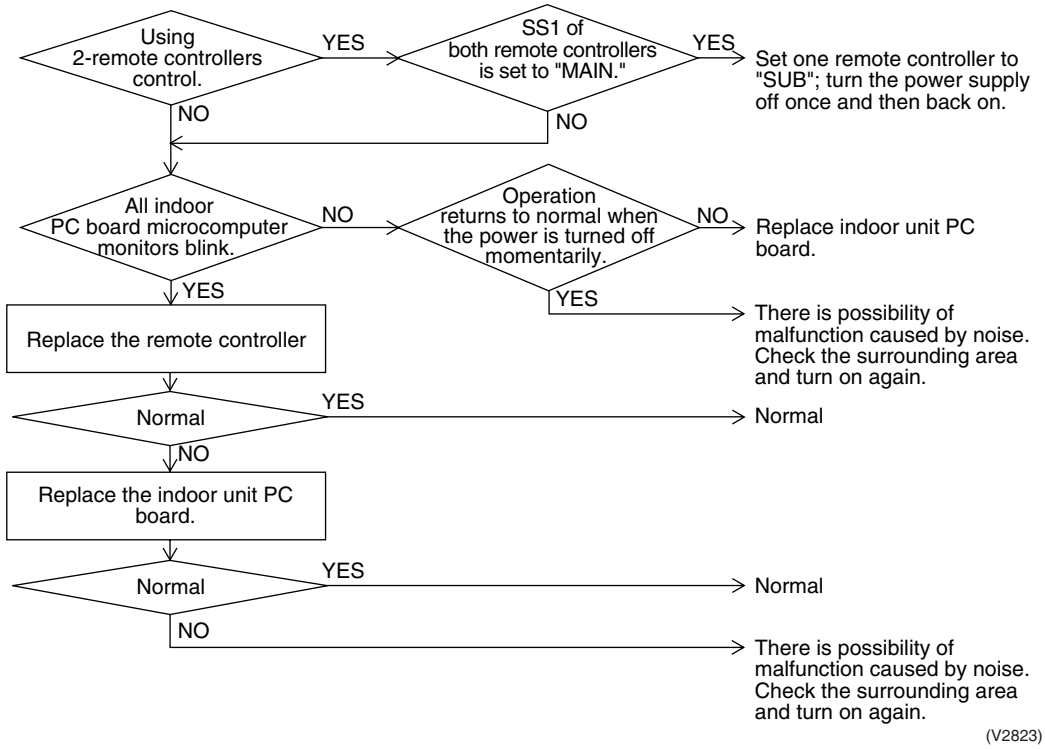
Normal transmission does not continue for specified period.

Supposed Causes

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

Troubleshooting

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



(V2823)

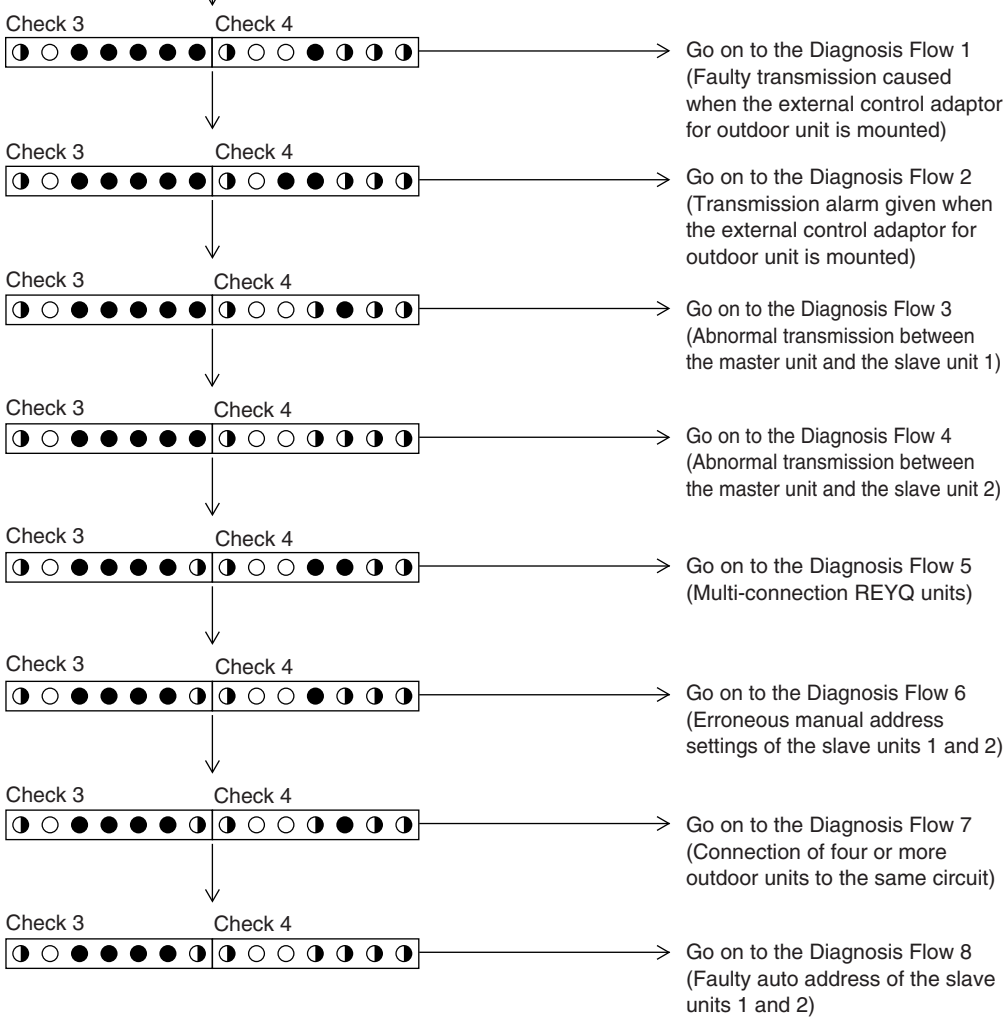
3.50 U7 Outdoor Unit: Transmission Failure (Across Outdoor Units)

Remote Controller Display	U7
Applicable Models	All models of outdoor units
Method of Malfunction Detection	Microcomputer checks if transmission between outdoor units.
Malfunction 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 outdoor unit outside control adapter ■ Connection error in connecting wires across outdoor units ■ Setting error in switching cooling/ heating ■ Integrated address setting error for cooling/ heating (function unit, outdoor unit outside control adapter) ■ Defective outdoor unit PC board (A1P or A3P) ■ Defective outdoor unit outside control adapter

Troubleshooting

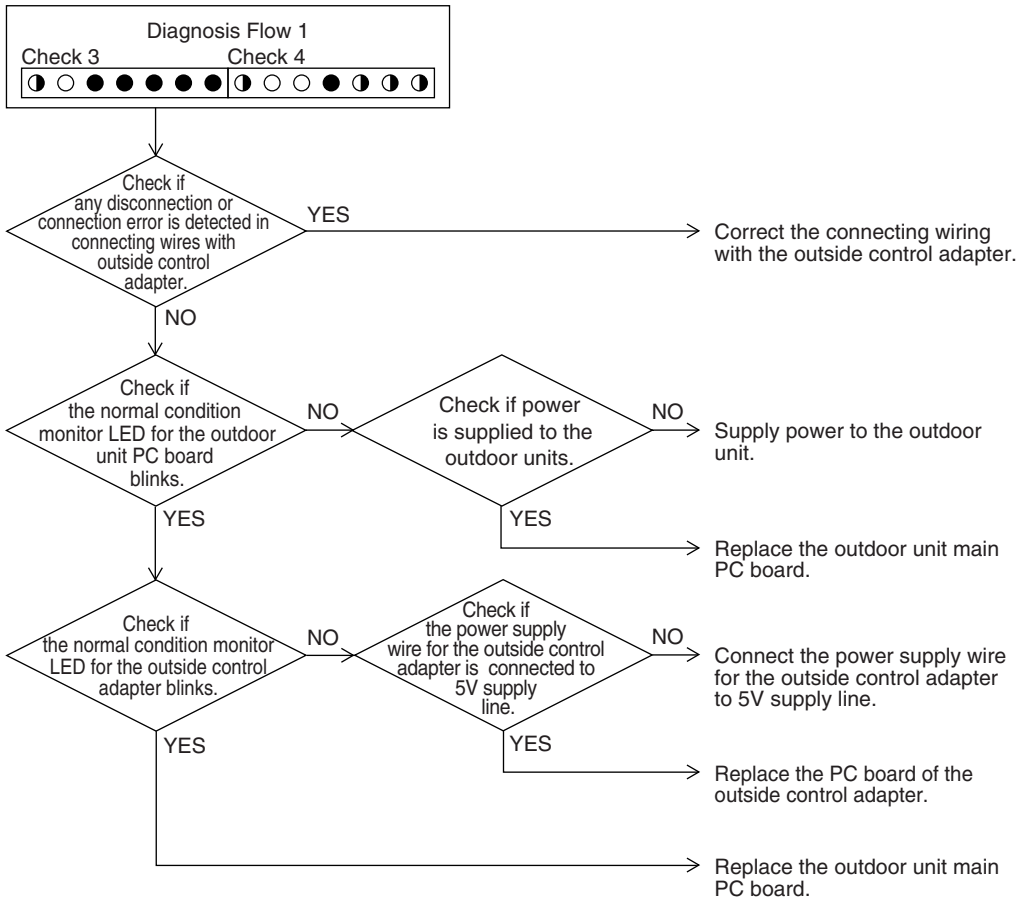
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Check the LED lamps for "Check 3" corresponding to the malfunction code "UY" and for Check 4 in the monitor mode. (Refer to P336~337 for how to check)



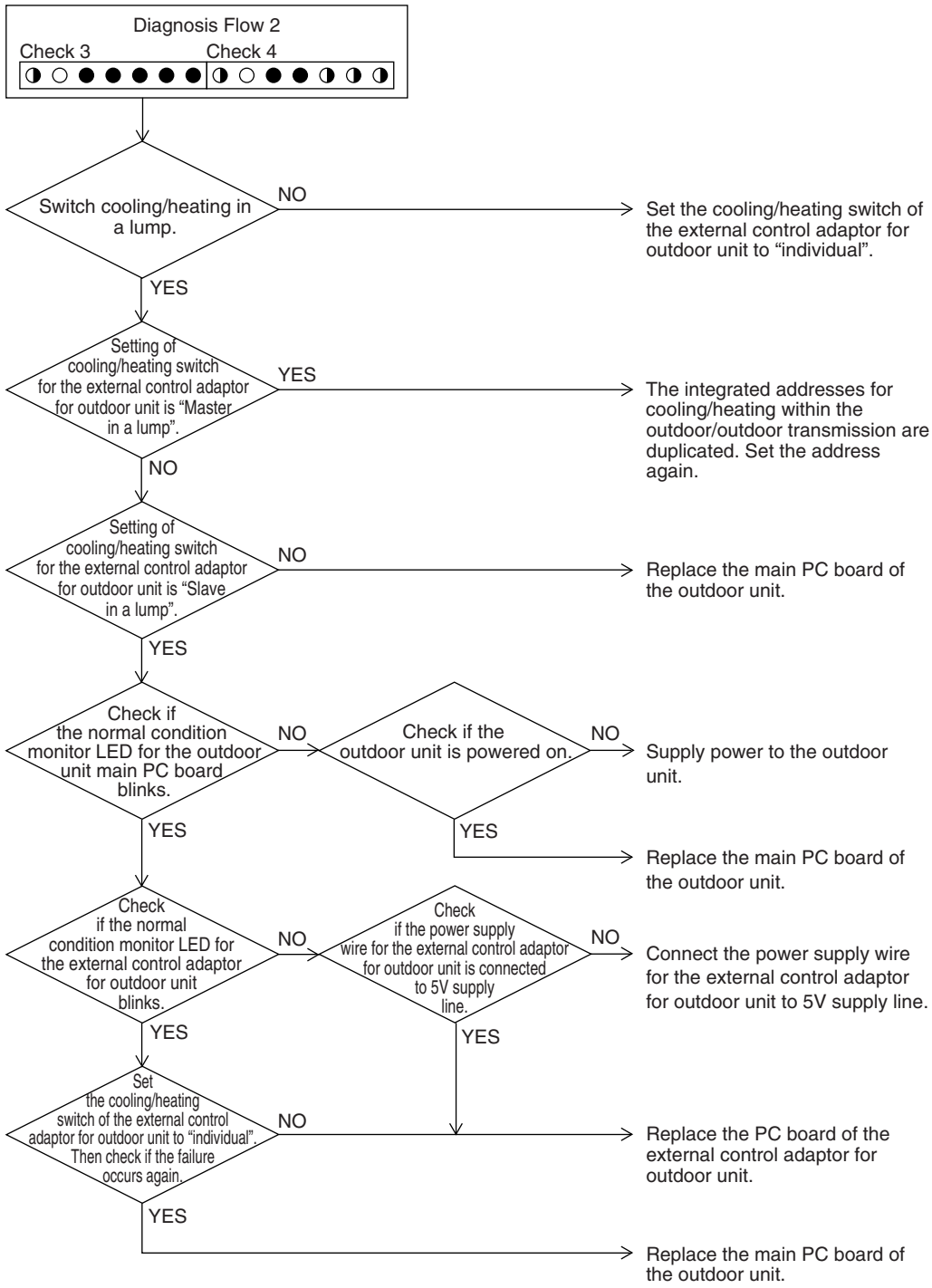
Troubleshooting

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



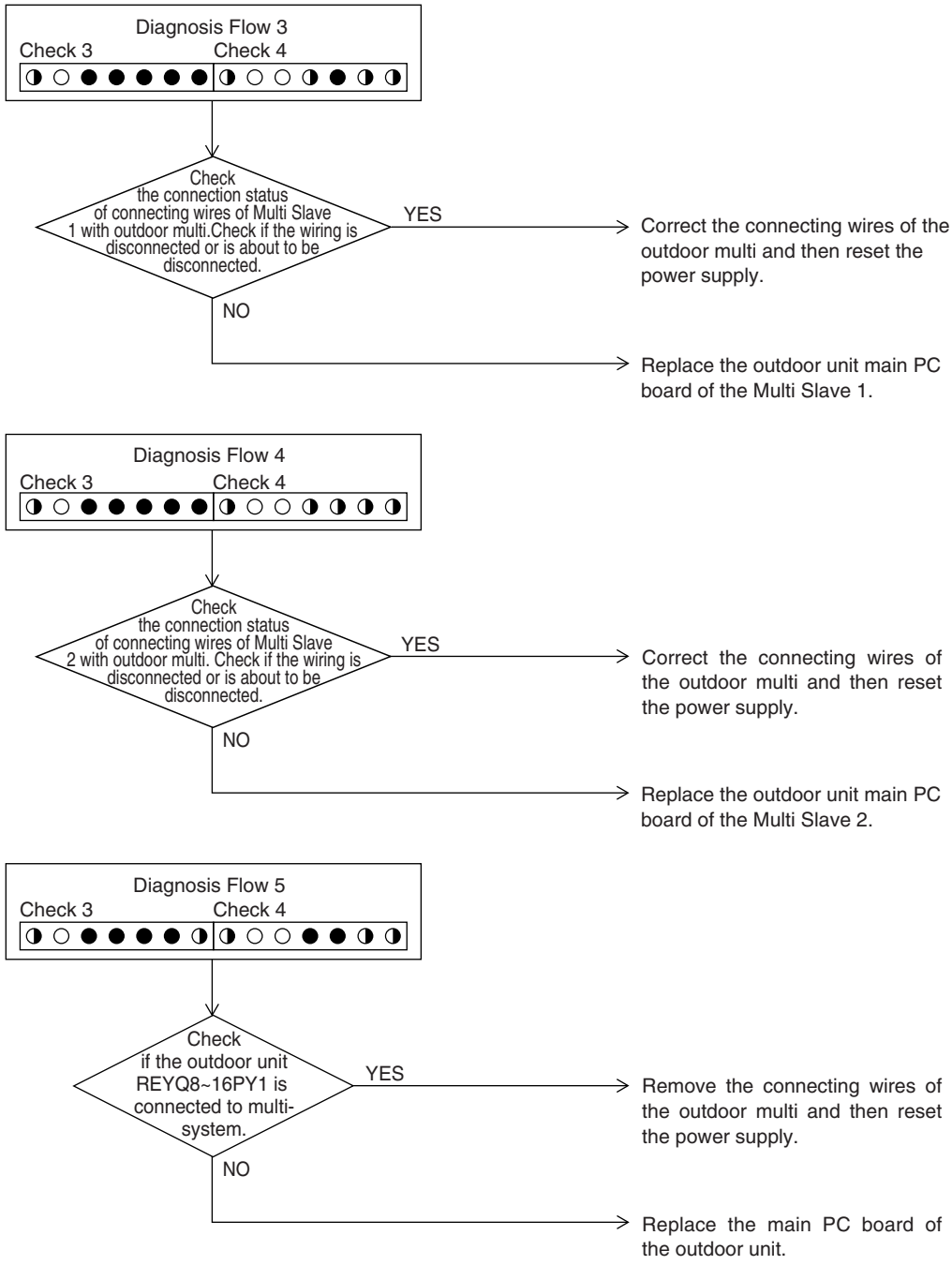
Troubleshooting

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



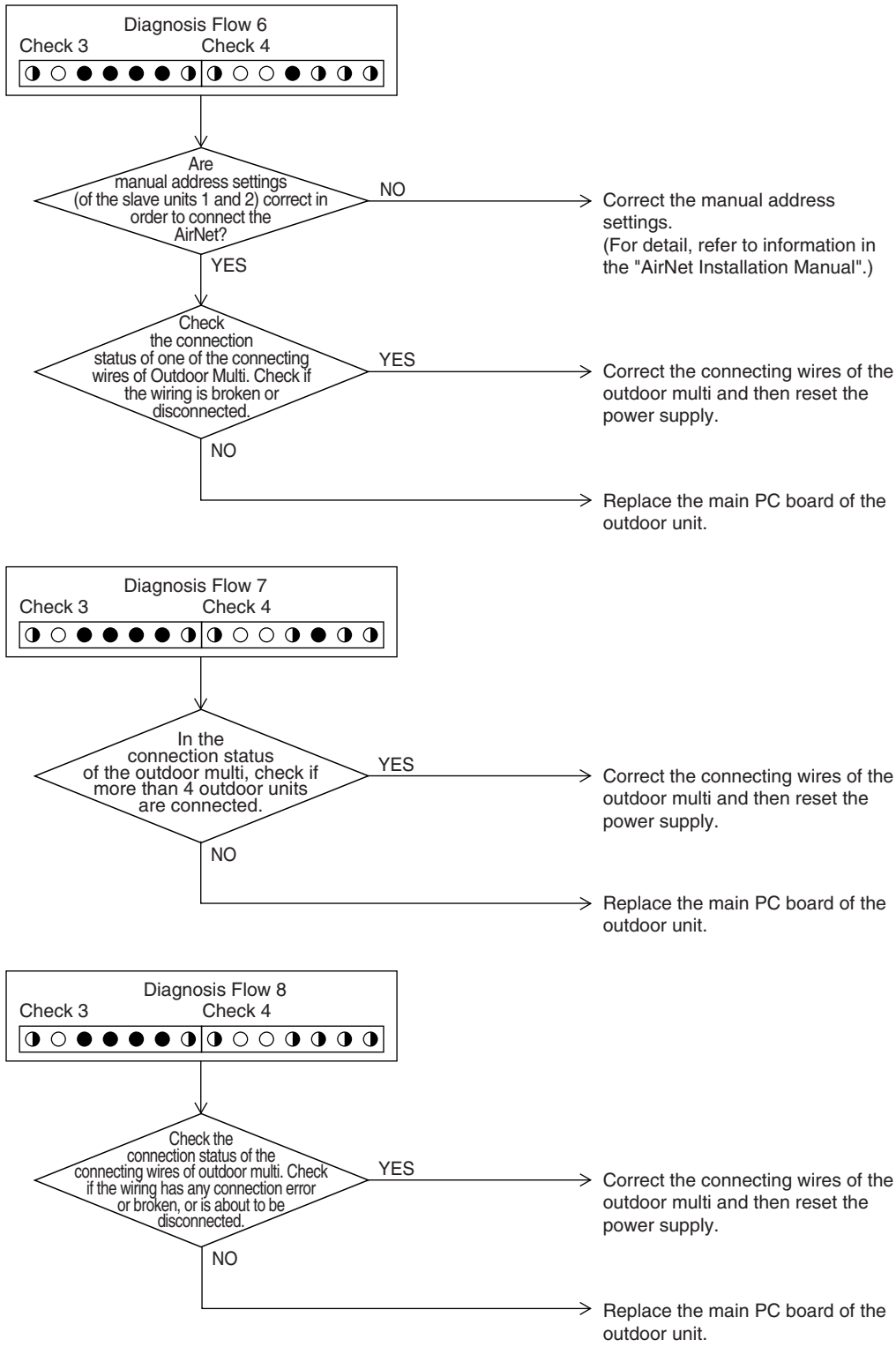
Troubleshooting

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



Troubleshooting

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



3.51 U8 Indoor Unit: Malfunction of Transmission between Main and Sub Remote Controllers

Remote Controller Display

U8

Applicable Models

All models of indoor units

Method of Malfunction Detection

In case of controlling with 2-remote controller, check the system using microcomputer if signal transmission between indoor unit and remote controller (main and sub) is normal.

Malfunction Decision Conditions

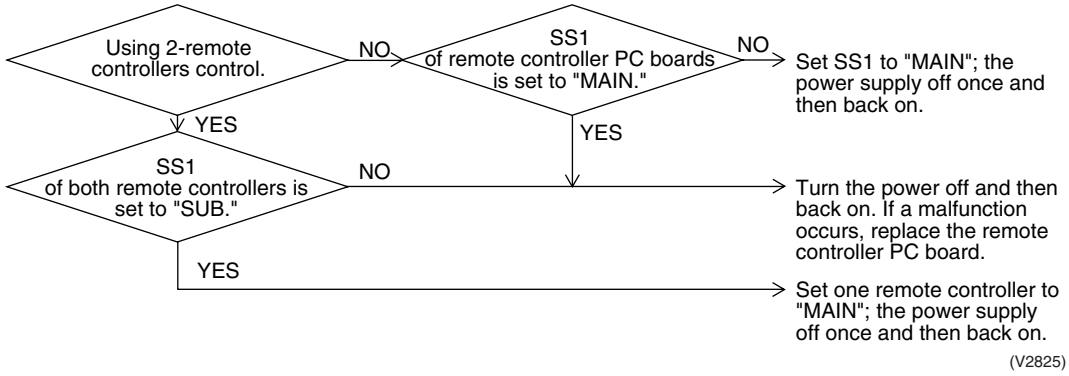
Normal transmission does not continue for specified period.

Supposed Causes

- Malfunction of transmission between main and sub remote controller
- Connection between sub remote controllers
- Defect of remote controller PC board

Troubleshooting

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



(V2825)

3.52 U9 Indoor Unit: Malfunction of Transmission between Indoor and Outdoor Units in the Same System

Remote Controller Display

U9

Applicable Models

All models of indoor units
RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Detection of a malfunction signal for the other indoor units within the circuit by outdoor unit PC board.

Malfunction Decision Conditions

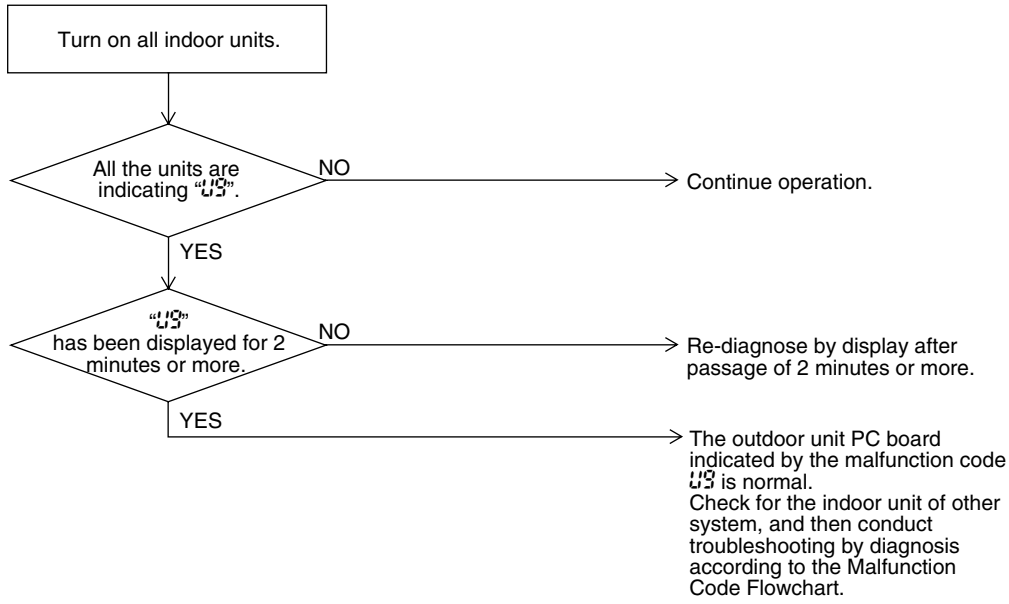
Malfunction is determined by the malfunction signal.

Supposed Causes

- Malfunction of transmission within or outside of other system
- Malfunction of electronic expansion valve in indoor unit of other system
- Defect of PC board 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 connect or disconnect connector, or parts damage may be occurred.



3.53 UA Improper Combination of Indoor and Outdoor Units, Indoor Units and Remote Controller

Remote Controller Display

UA

Applicable Models

All models of indoor unit
RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

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

Malfunction Decision Conditions

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

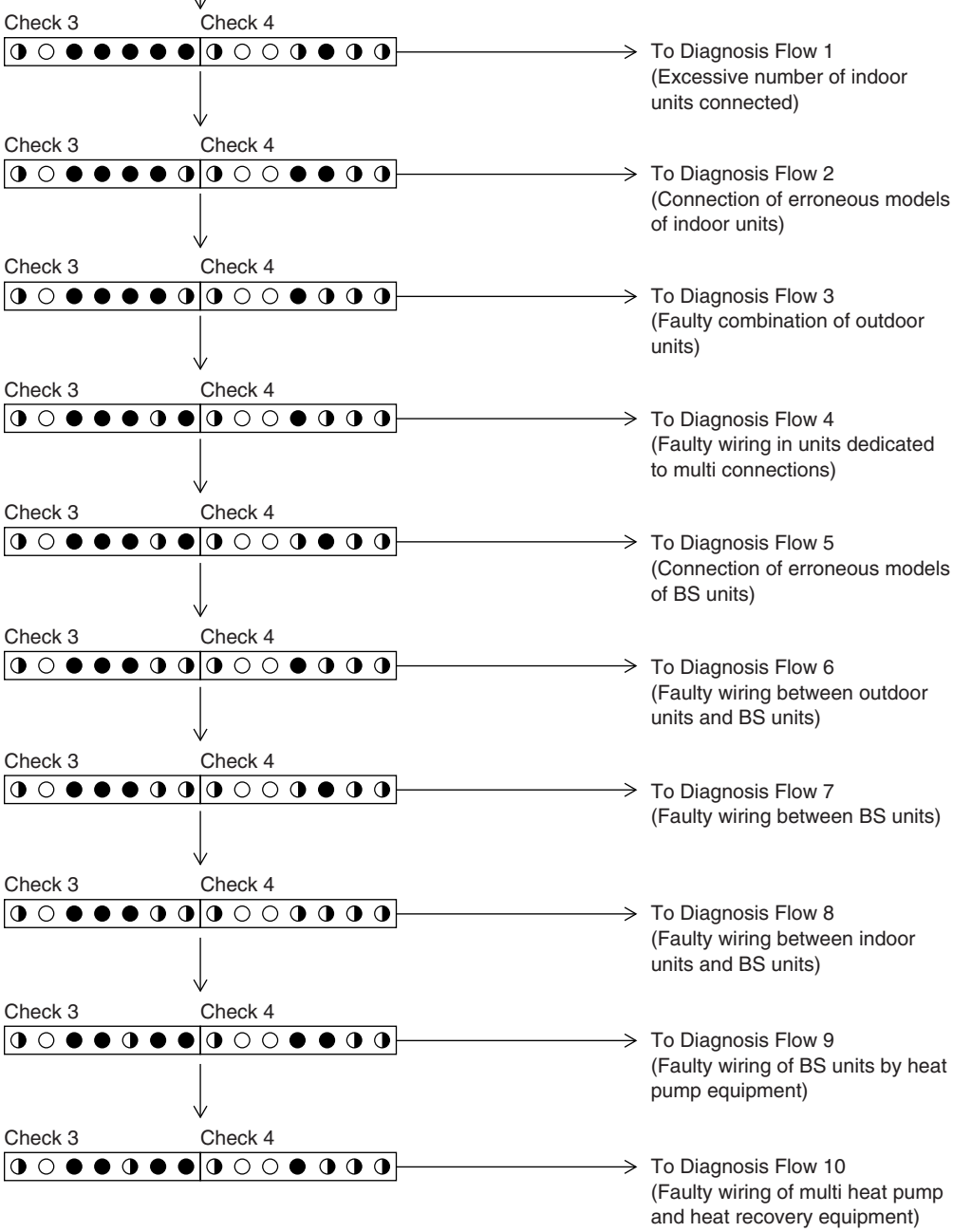
Supposed Causes

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

Troubleshooting

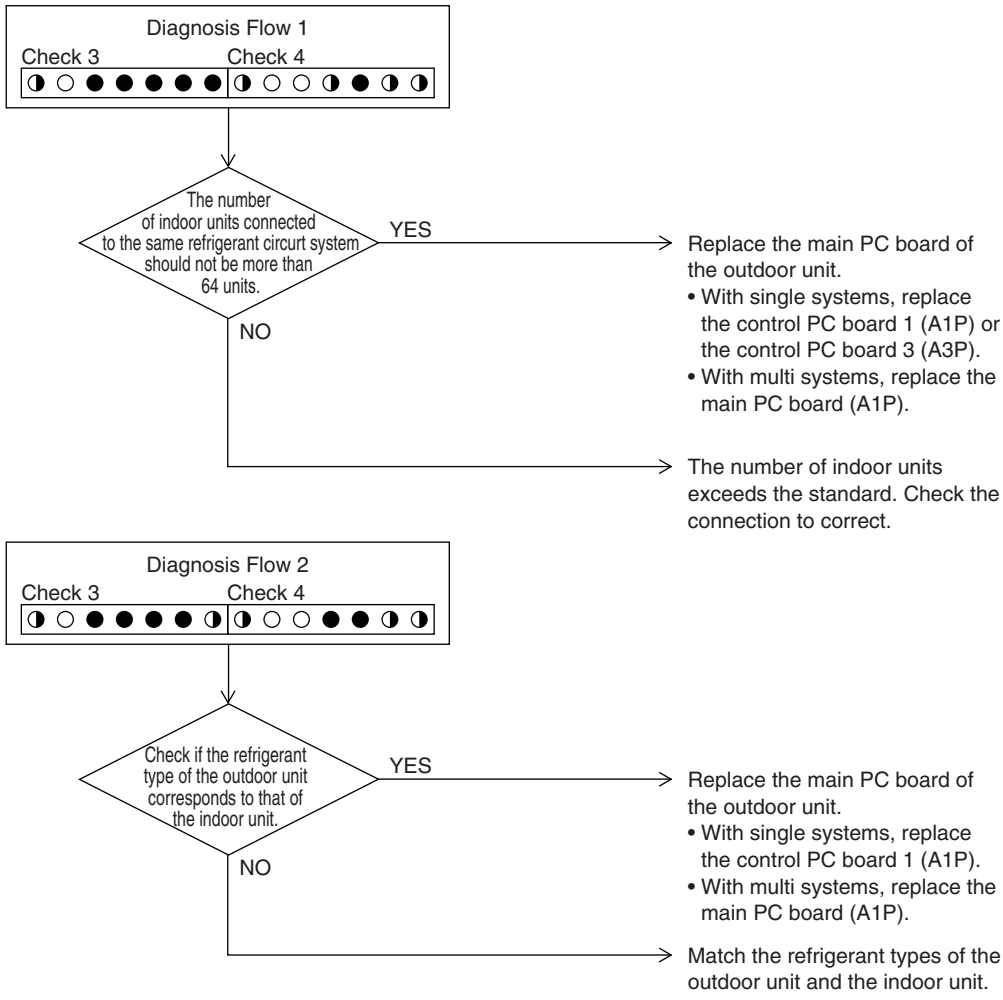
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Check the LED lamps for "Check 3" corresponding to the malfunction code "UH" and for Check 4 in the monitor mode. (Refer to P336~337 for how to check.)



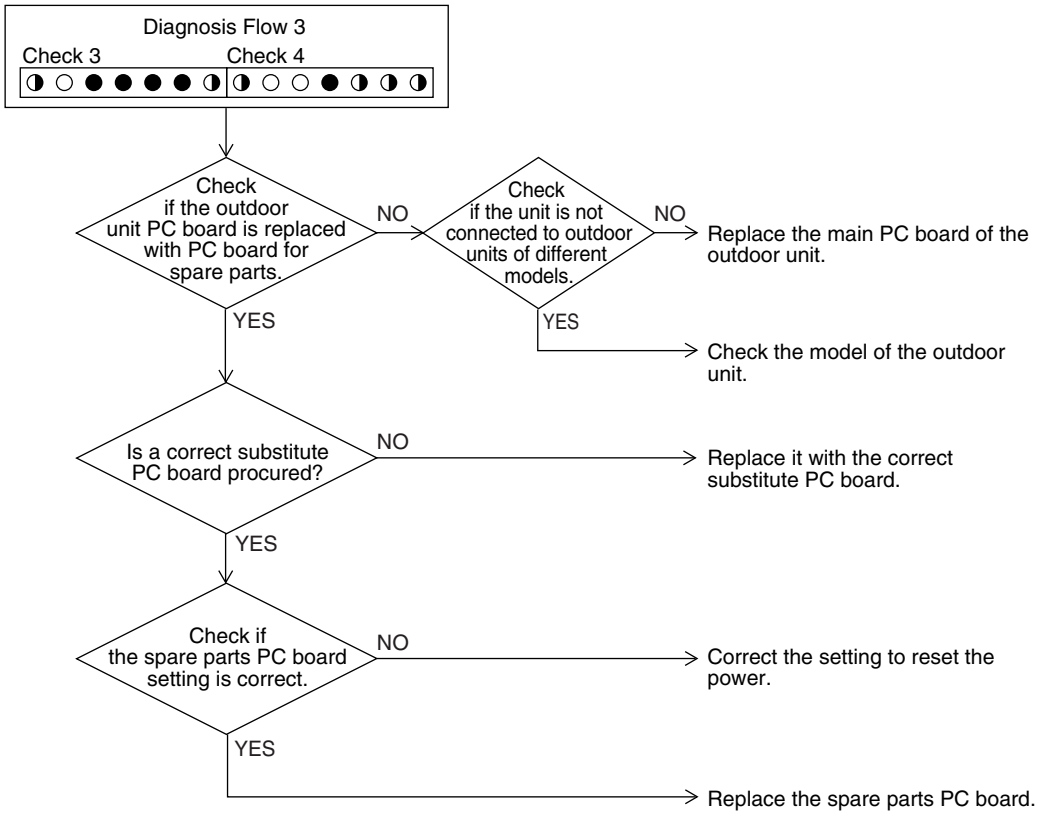
Troubleshooting

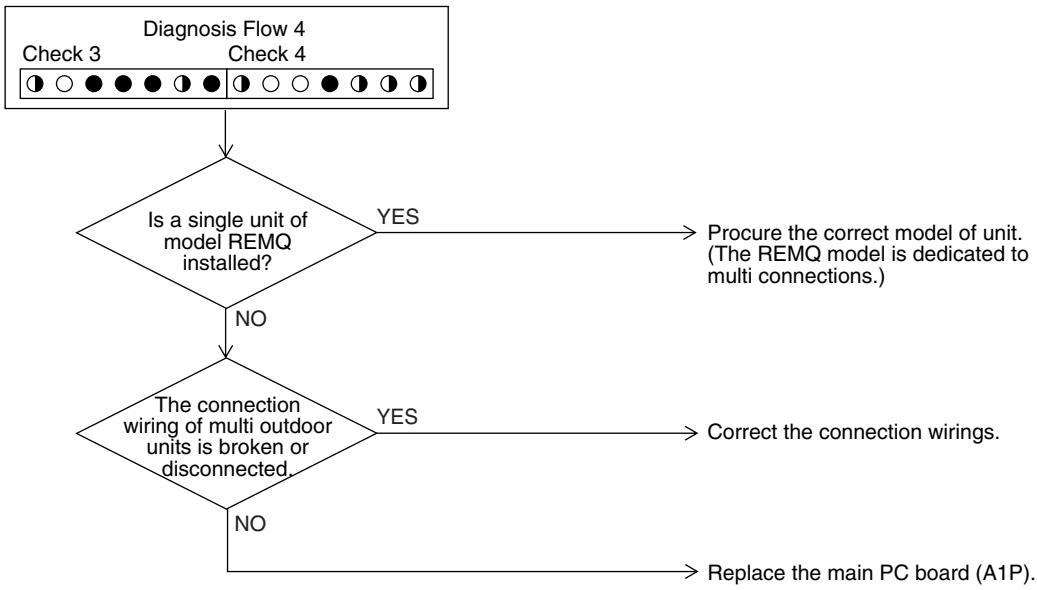
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



Troubleshooting

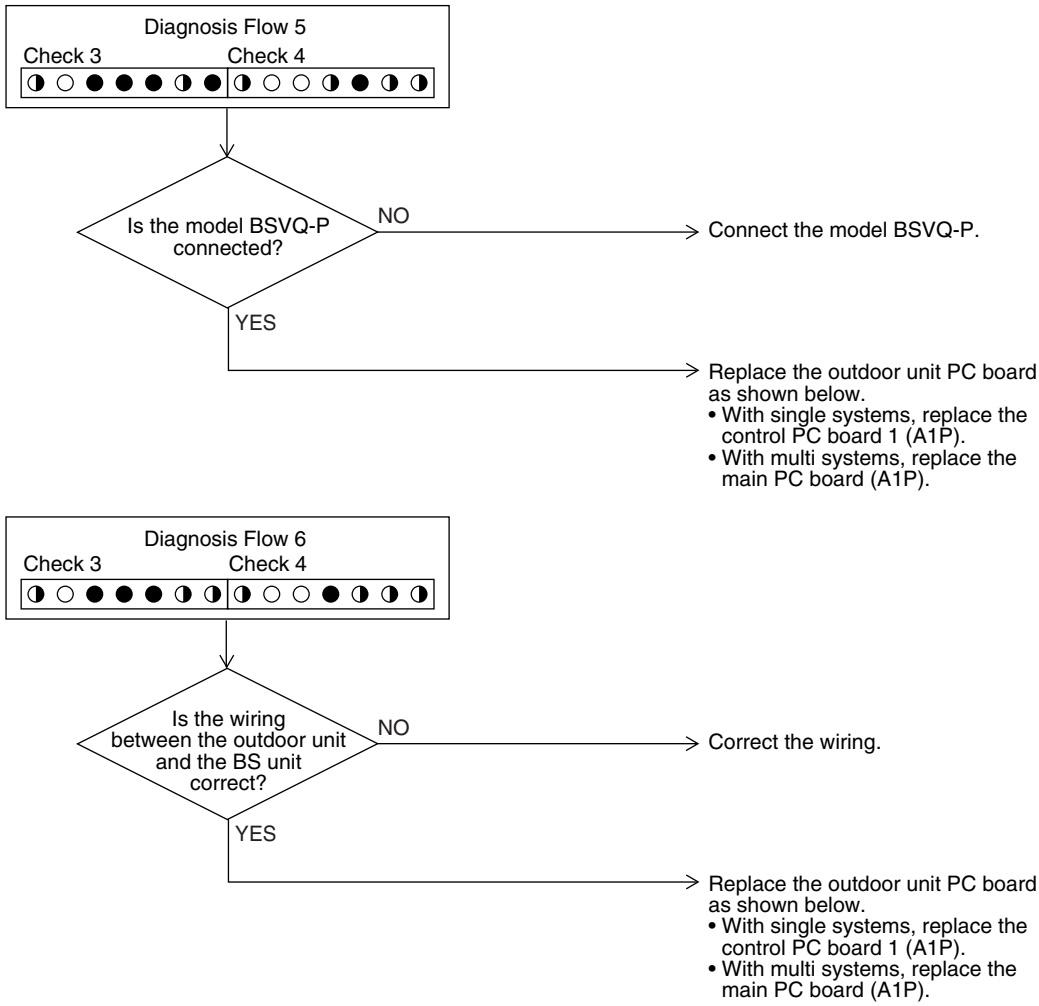
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.





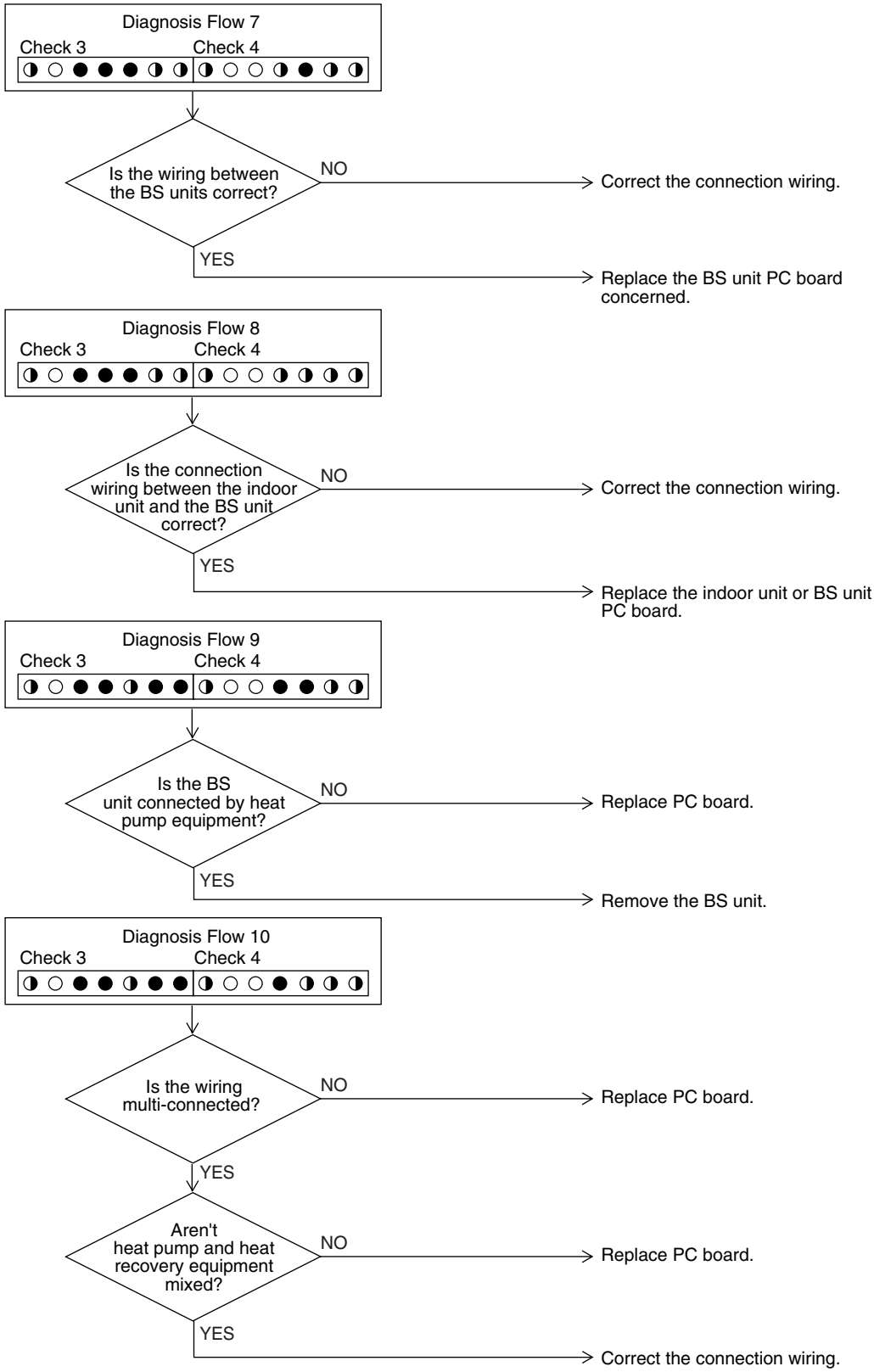
Troubleshooting

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



Troubleshooting

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



3.54 UC Address Duplication of Centralized Controller

Remote Controller Display

UC

Applicable Models

All models of indoor unit
Centralized controller

Method of Malfunction Detection

The principal indoor unit detects the same address as that of its own on any other indoor unit.

Malfunction Decision Conditions

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

Supposed Causes

- Address duplication of centralized controller

Troubleshooting

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

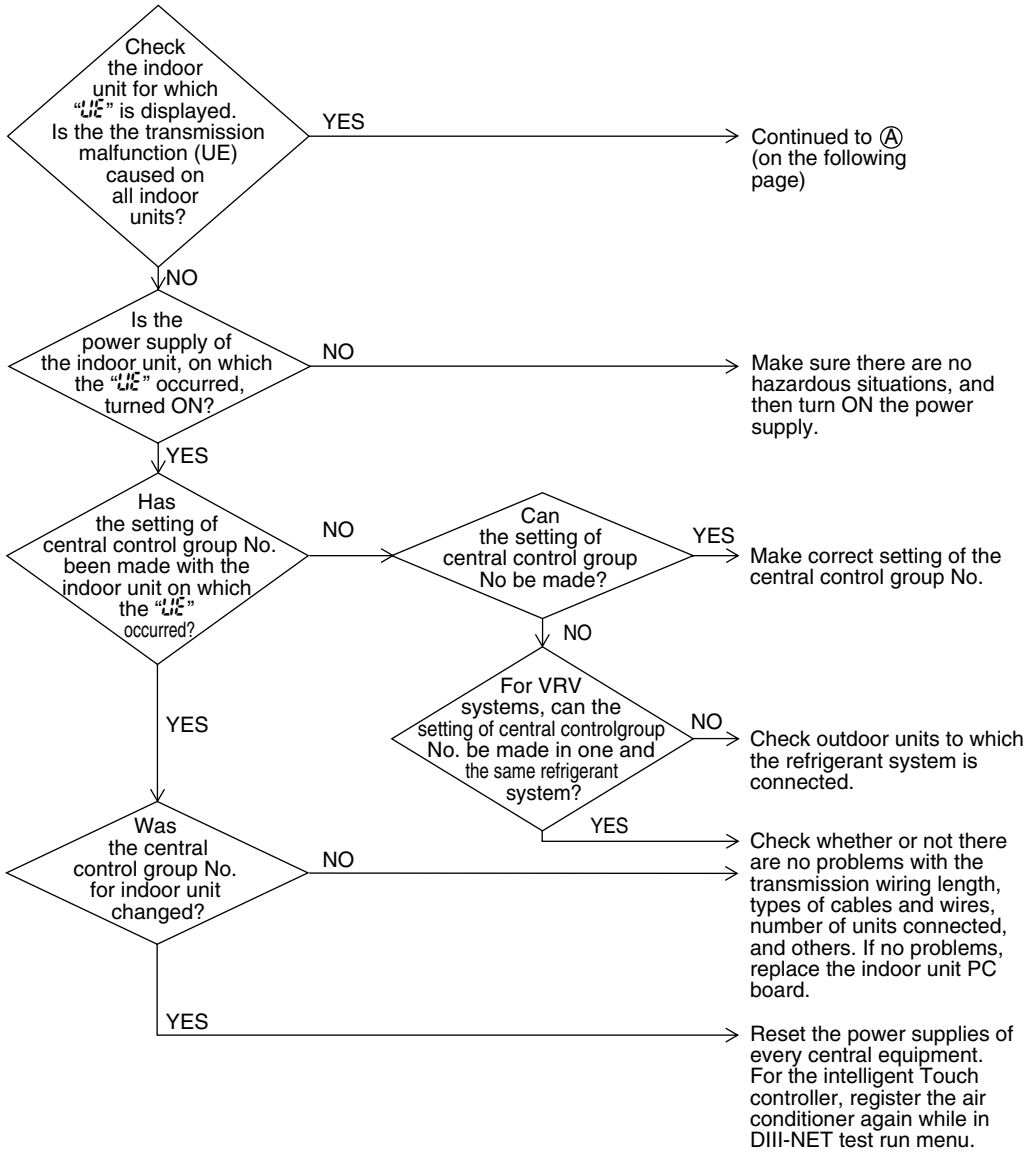
The centralized address is duplicated. → Make setting change so that the centralized address will not be duplicated.

3.55 UE Malfunction of Transmission between Centralized Controller and Indoor Unit

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

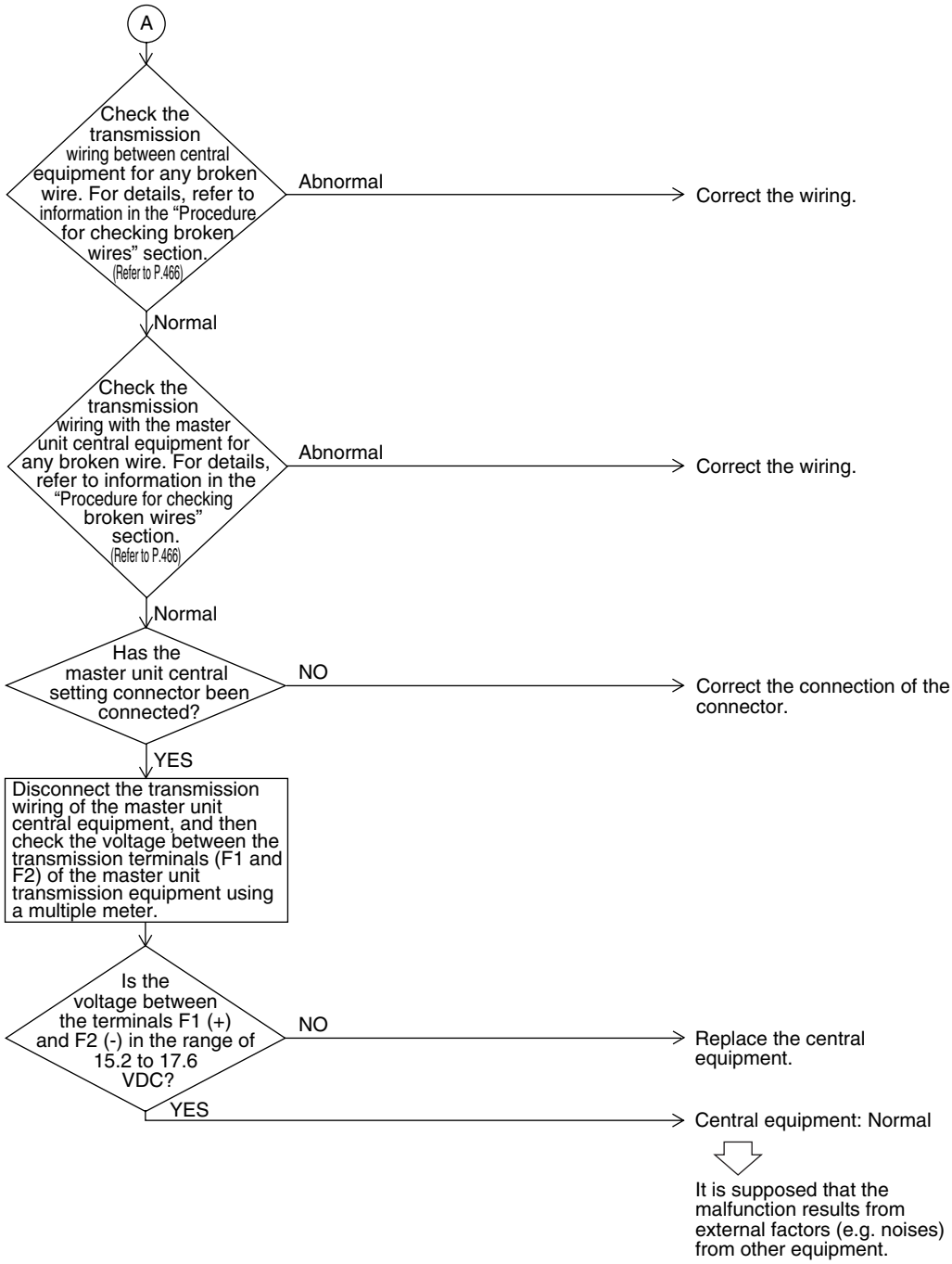
Troubleshooting

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



(V2822)

Troubleshooting



3.56 UF System is not Set yet

Remote Controller Display

UF

Applicable Models

All models of indoor units
RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

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

Malfunction Decision Conditions

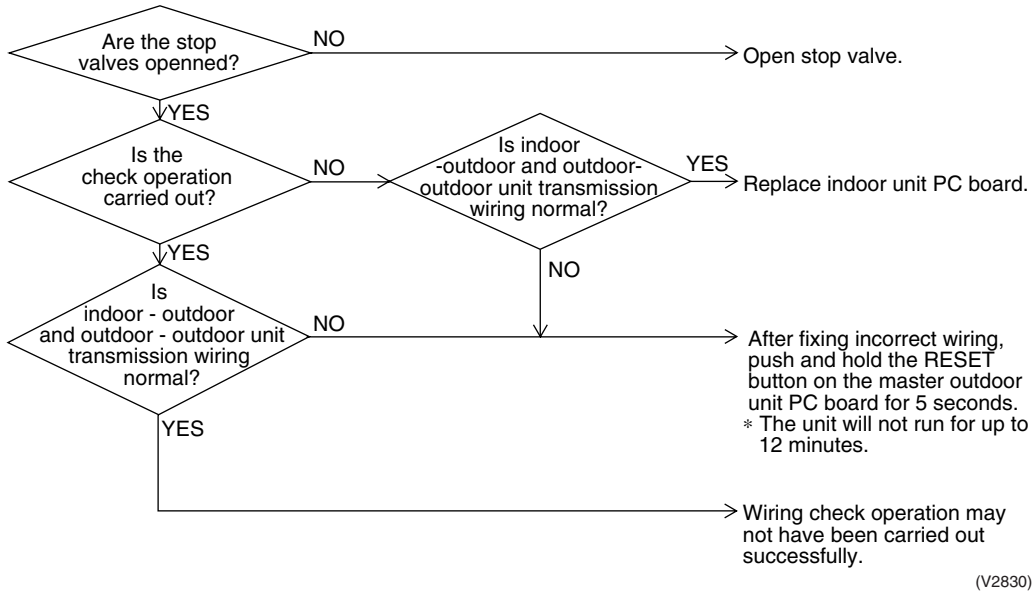
The malfunction is determined as soon as the abnormality aforementioned is detected through checking the system for any erroneous connection of units on the check operation.

Supposed Causes

- Improper connection of transmission wiring between indoor-outdoor units and outdoor-outdoor units
- Failure to execute check operation
- Defect of indoor unit PC board
- Stop valve is left in closed

Troubleshooting

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



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.

3.57 UH Malfunction of System, Refrigerant System Address Undefined

Remote Controller Display

UH

Applicable Models

All models of indoor units
RXYQ72P~240PYDN, PTJU
REYQ72P~240PYDN, PTJU

Method of Malfunction Detection

Detect an indoor unit with no address setting.

Malfunction Decision Conditions

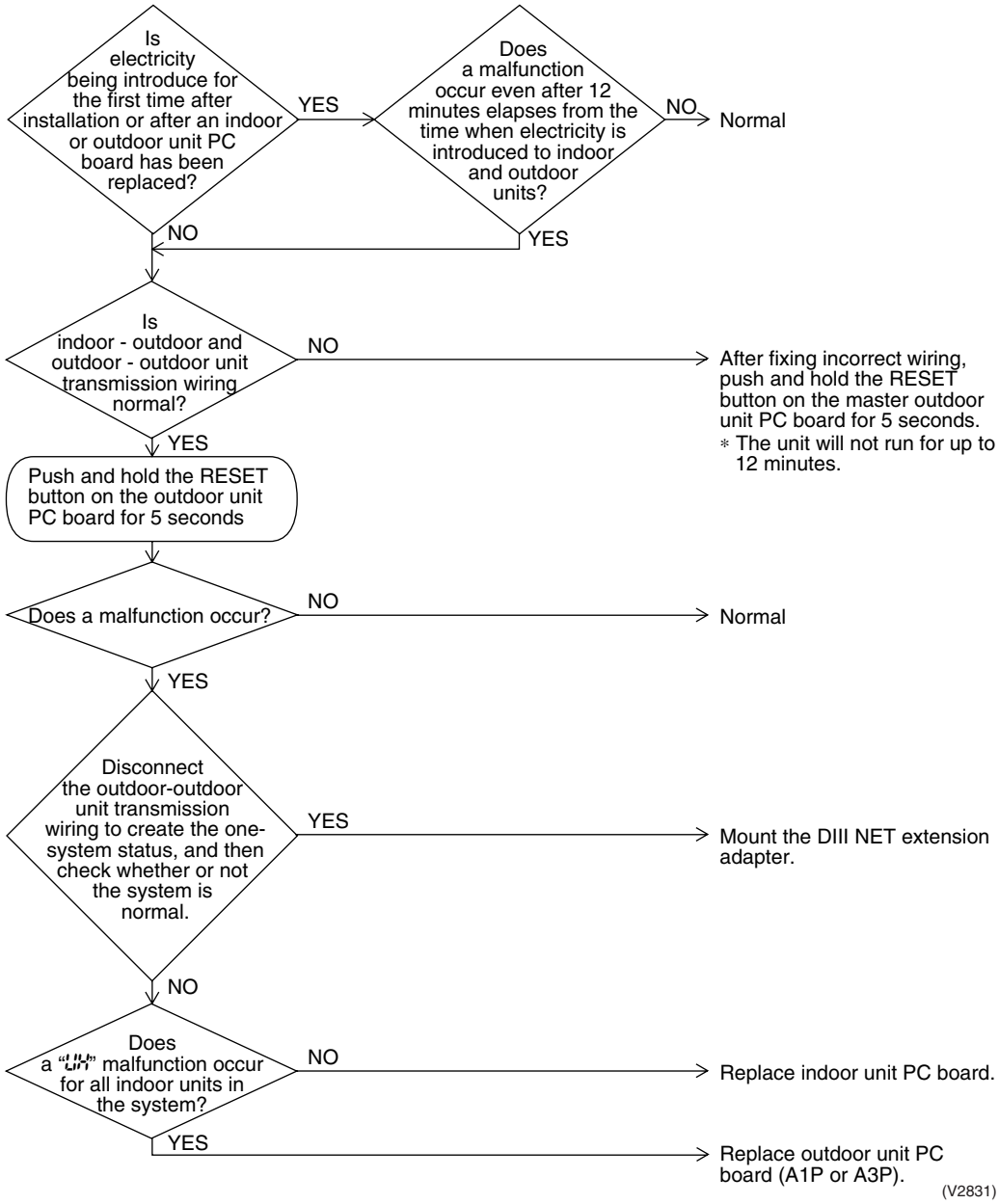
The malfunction decision is made as soon as the abnormality aforementioned is detected.

Supposed Causes

- Improper connection of transmission wiring between indoor-outdoor units and outdoor-outdoor units
- Defect of indoor unit PC board
- Defect of outdoor unit main PC board (A1P or A3P)

Troubleshooting

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



∗1: Check the correct wiring "indoor-outdoor" and "outdoor-outdoor" by Installation Instruction.

∗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 rewiring button for more than 4 seconds).

4. Troubleshooting (OP: Central Remote Controller)

4.1 M1 PC Board Defect

Remote Controller Display

M1

Applicable Models

Central remote controller Intelligent Touch Controller
Schedule timer

Method of Malfunction Detection

Detect an abnormality in the DIII-NET polarity circuit.

Malfunction Decision Conditions

When + polarity and - polarity are detected at the same time.

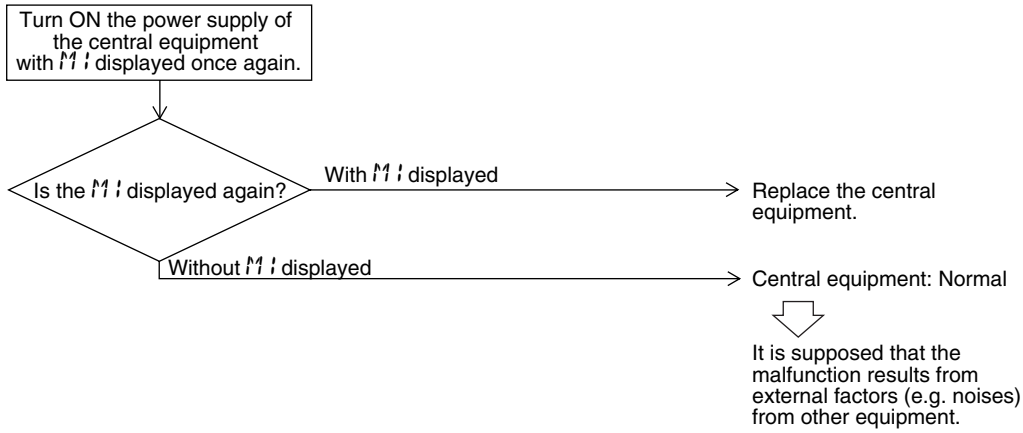
Supposed Causes

- Defect of central remote controller PC board
- Defect of Intelligent Touch Controller PC board
- Defect of Schedule timer PC board

Troubleshooting

Replace the central remote controller.

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

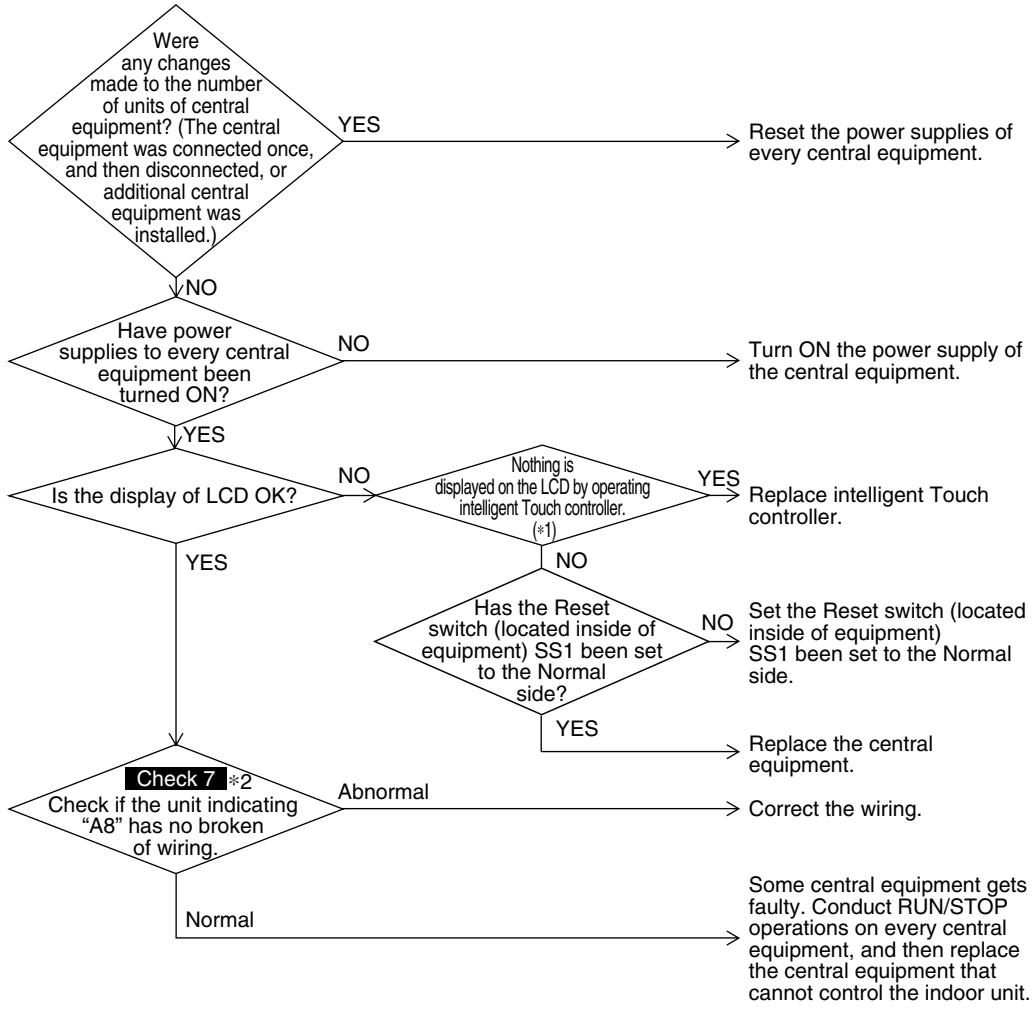


4.2 M18 Malfunction of Transmission between Optional Controllers for Centralized Control

Remote Controller Display	M18
Applicable Models	Central remote controller Intelligent Touch Controller Schedule timer
Method of Malfunction Detection	DIII-NET transmission data (The system will be automatically reset.)
Malfunction Decision Conditions	When no master controller is present at the time of the startup of slave controller. When the connected centralized controller shows no response.
Supposed Causes	■ Malfunction of transmission between optional controllers for centralized control ■ Defect of PC board of optional controllers for centralized control

Troubleshooting

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



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

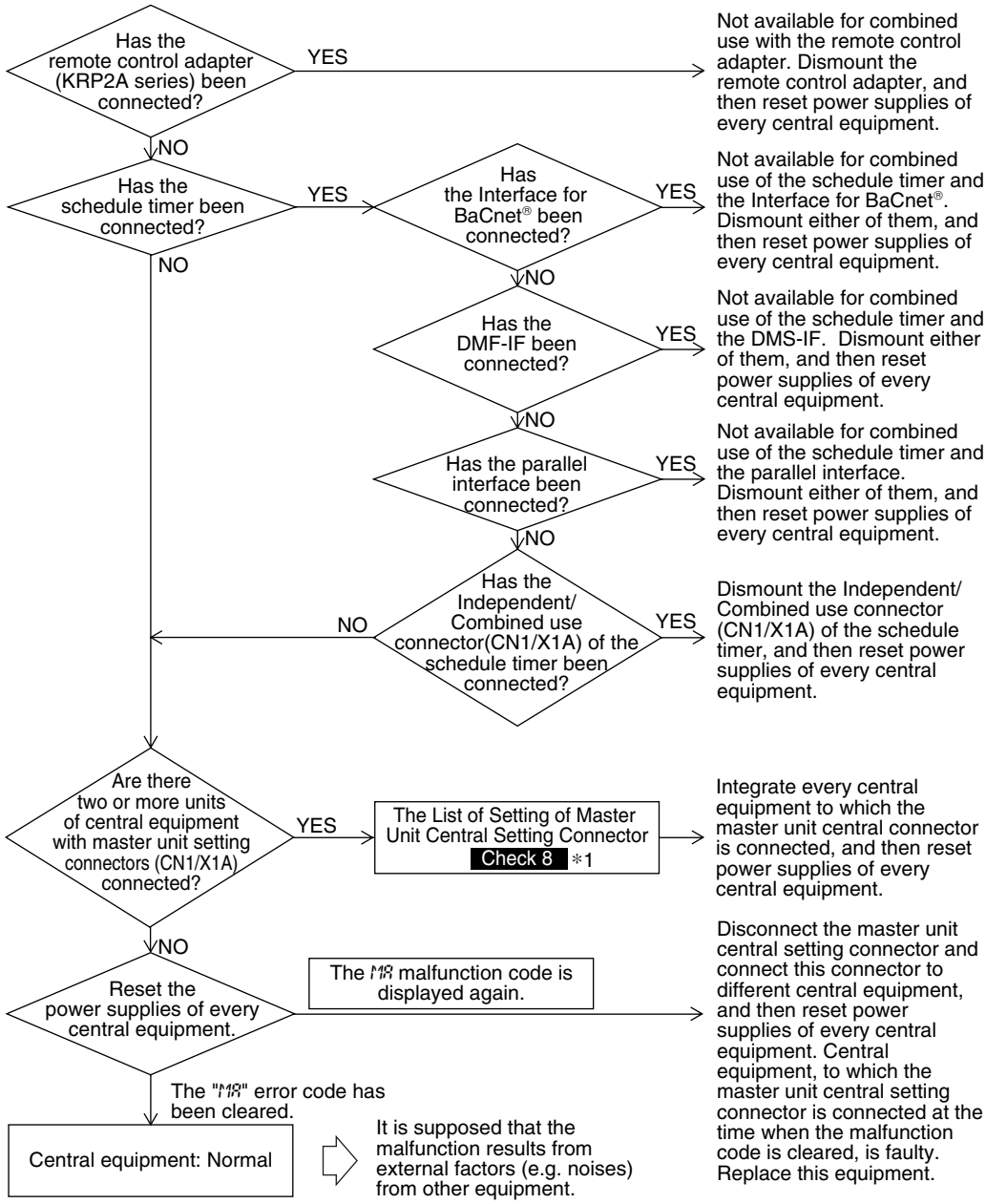
*2 Check 7 : Referring to the information on P466.

4.3 MA Improper Combination of Optional Controllers for Centralized Control

Remote Controller Display	MA
Applicable Models	Central remote controller Intelligent touch controller Schedule timer
Method of Malfunction Detection	
DIII-NET transmission data**Malfunction Decision Conditions**	When the schedule timer is set to individual use mode, but other central components are present. When multiple master controllers are present. When the remote control adapter is present.
Supposed Causes	■ Improper combination of optional controllers for centralized control ■ More than one master controller is connected ■ Defect of PC board of optional controller for centralized control

Troubleshooting

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



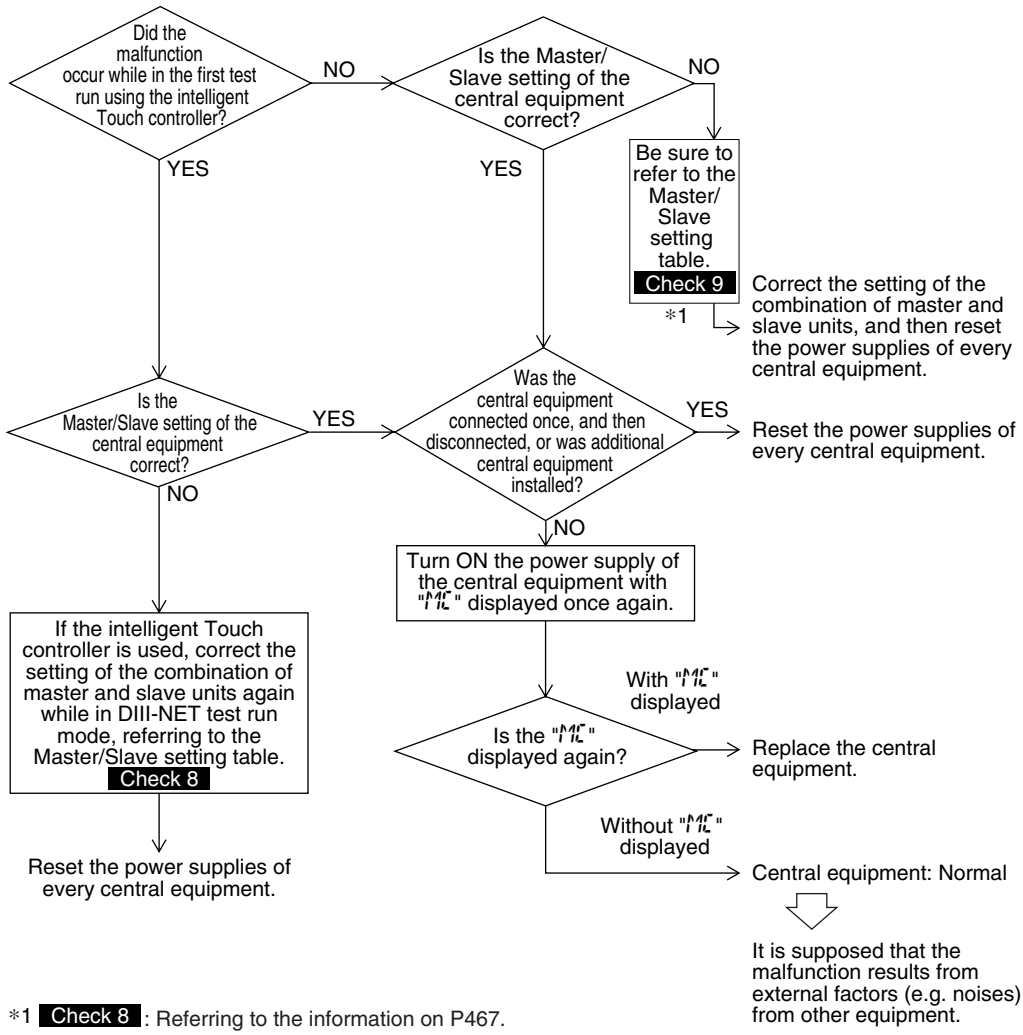
*1 Check 8 : Referring to the information on P467.

4.4 ME Address Duplication, Improper Setting

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

Troubleshooting

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



*1 Check 8 : Referring to the information on P467.
Check 9 : Referring to the information on P468.

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

5.1 Operation Lamp Blinks

Remote Controller Display

Operation lamp blinks

Applicable Models

All model of indoor units
Unified ON/OFF controller

Method of Malfunction Detection

DIII-NET transmission data**Malfunction Decision Conditions**

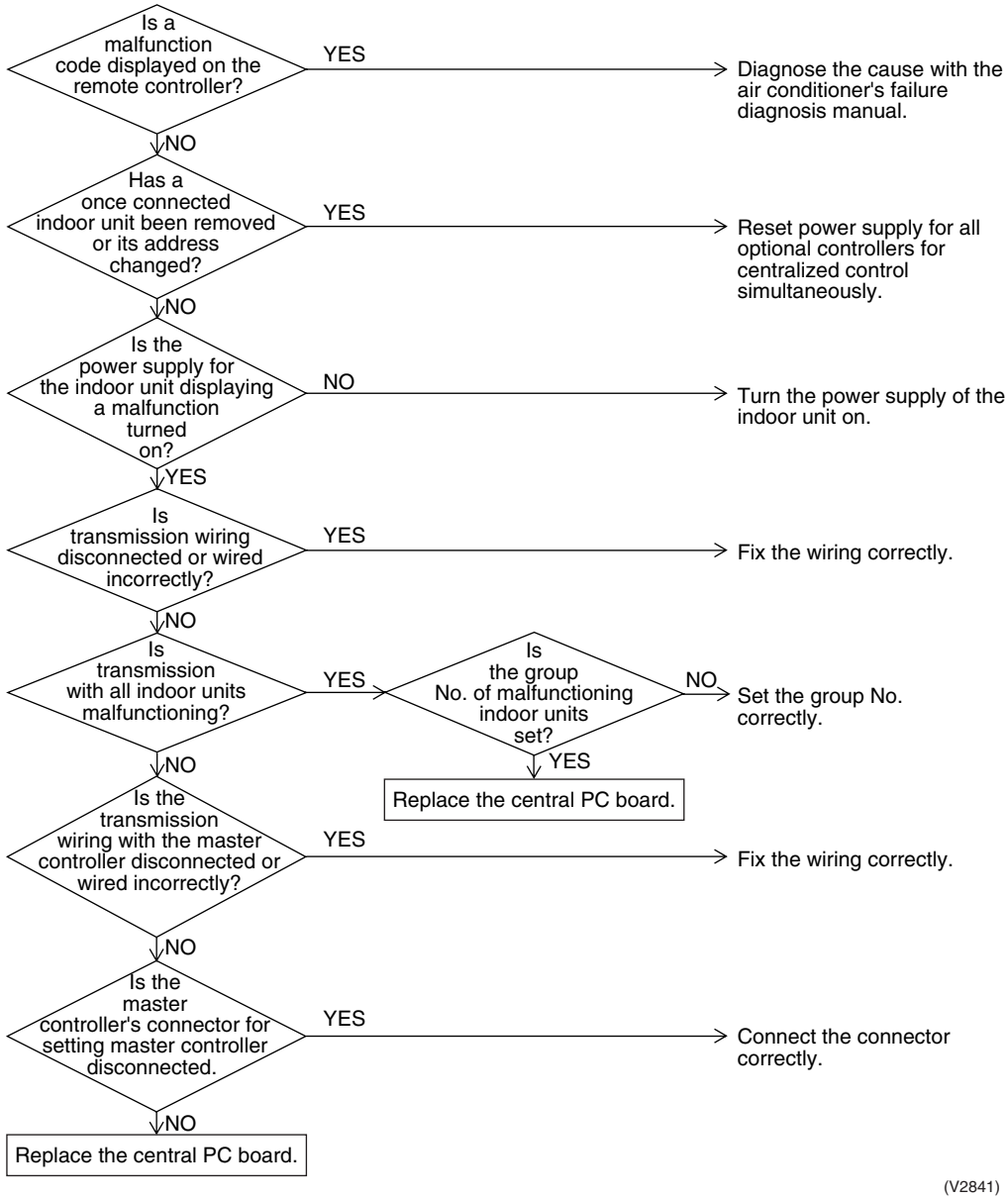
- Malfunction of transmission between optional central controller and indoor unit

Supposed Causes

- Connector for setting master controller is disconnected
- Defect of unified ON/OFF controller PC board
- Defect of indoor unit PC board
- Malfunction of air conditioner

Troubleshooting

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



(V2841)

5.2 Display [Under Centralized Control] Blinks (Repeats Single Blink)

Remote Controller Display

"under centralized control" (Repeats single blink)

Applicable Models

Unified ON/OFF controller
Central remote controller, Schedule timer

Method of Malfunction Detection

Detect the malfunction according to DIII-NET transmission data.

Malfunction Decision Conditions

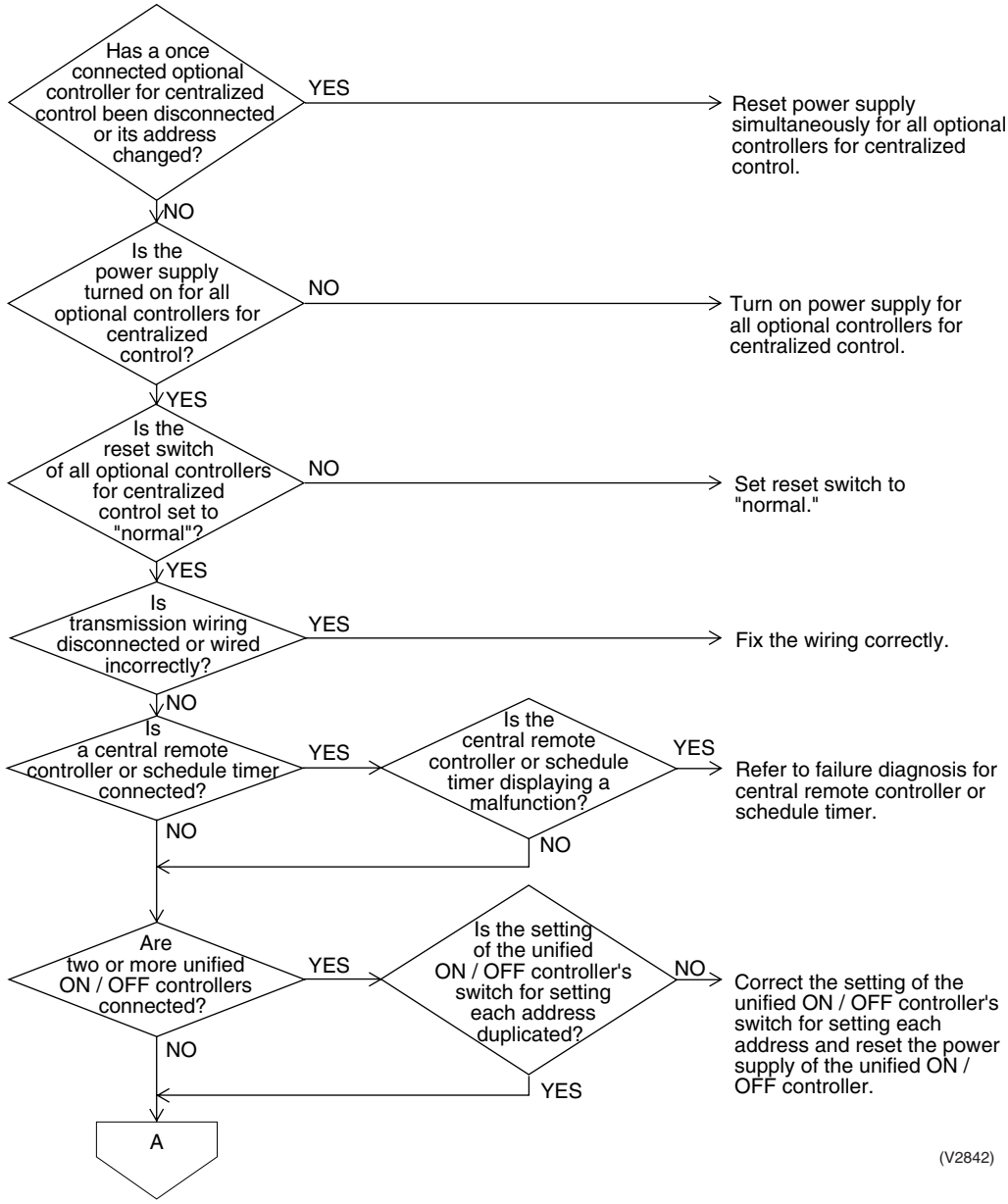
When the centralized controller, which was connected once, shows no response.
The control ranges are overlapped.
When multiple master central controller are present.
When the schedule timer is set to individual use mode, other central controller is present.
When the wiring adaptor for electrical appendices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

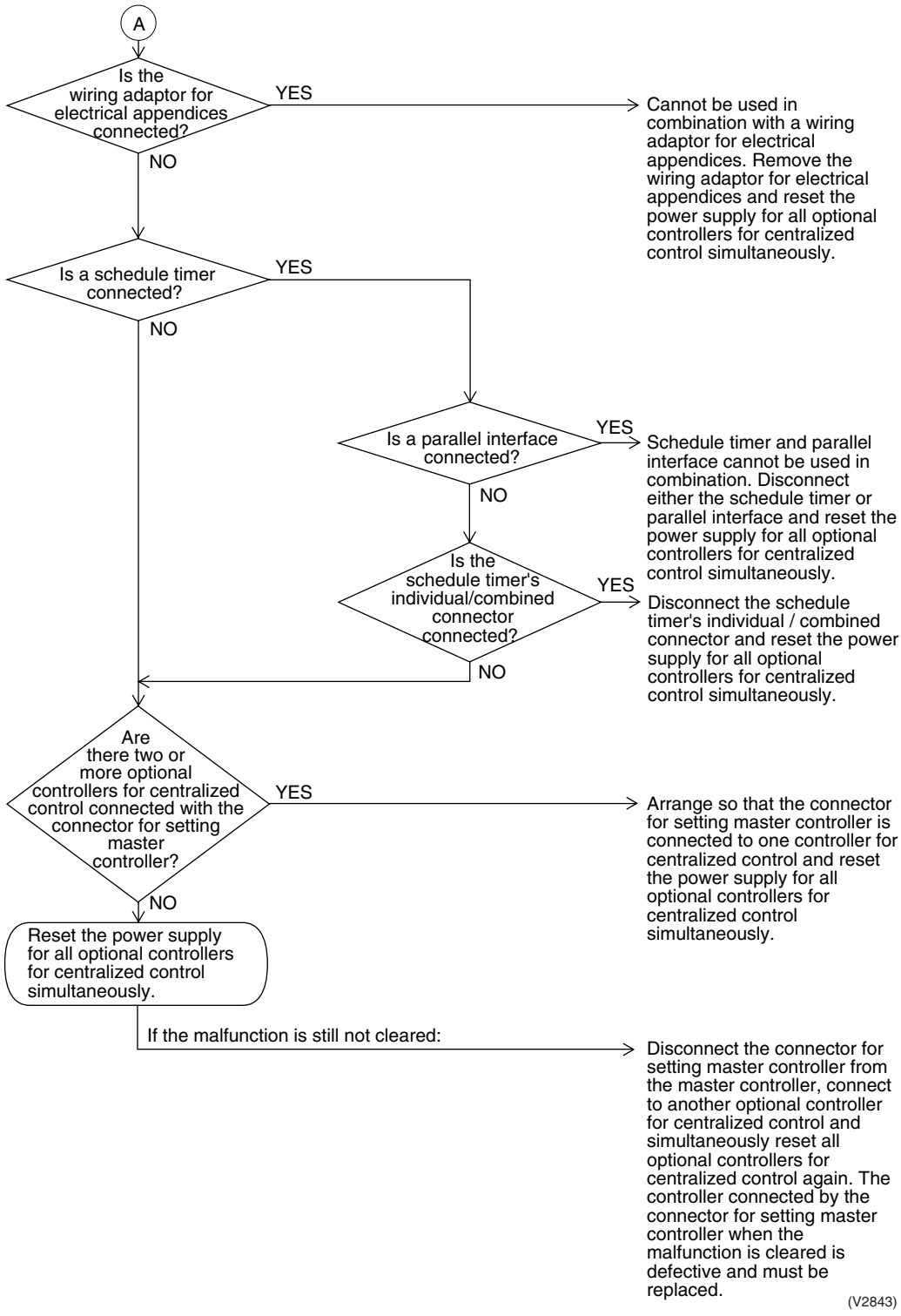
Supposed Causes

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

Troubleshooting

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




A
Is the wiring adaptor for electrical appendices connected?
YES
Cannot be used in combination with a wiring adaptor for electrical appendices. Remove the wiring adaptor for electrical appendices and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Is a schedule timer connected?
YES
NO
Is a parallel interface connected?
YES
Schedule timer and parallel interface cannot be used in combination. Disconnect either the schedule timer or parallel interface and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Is the schedule timer's individual/combined connector connected?
YES
Disconnect the schedule timer's individual / combined connector and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Are there two or more optional controllers for centralized control connected with the connector for setting master controller?
YES
Arrange so that the connector for setting master controller is connected to one controller for centralized control and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Reset the power supply for all optional controllers for centralized control simultaneously.
If the malfunction is still not cleared:
Disconnect the connector for setting master controller from the master controller, connect to another optional controller for centralized control and simultaneously reset all optional controllers for centralized control again. The controller connected by the connector for setting master controller when the malfunction is cleared is defective and must be replaced.
(V2843)

5.3 Display [Under Centralized Control] Blinks (Repeats Double Blink)

Remote Controller Display

"under centralized control" (Repeats double blink)

Applicable Models

Unified ON/OFF controller

Method of Malfunction Detection

Detect the malfunction according to DIII-NET transmission data.

Malfunction Decision Conditions

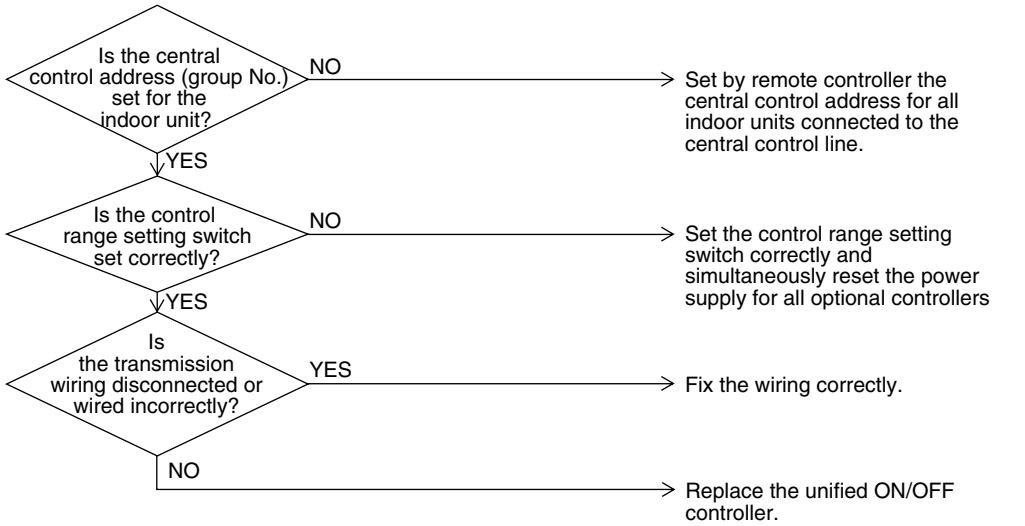
When no central control addresses are set to indoor units.
When no indoor units are connected within the control range.

Supposed Causes

- Central control address (group No.) is not set for indoor unit.
- Improper control range setting switch
- Improper wiring of transmission wiring

Troubleshooting

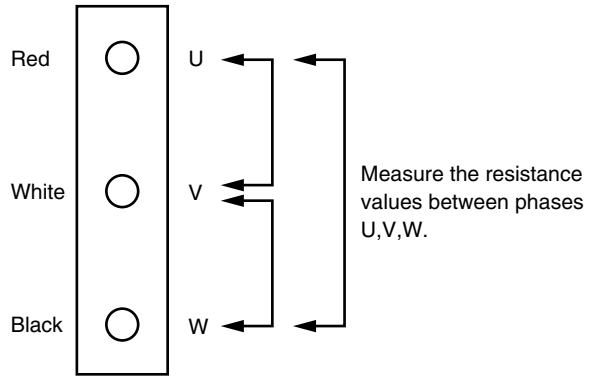
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



[CHECK 1]

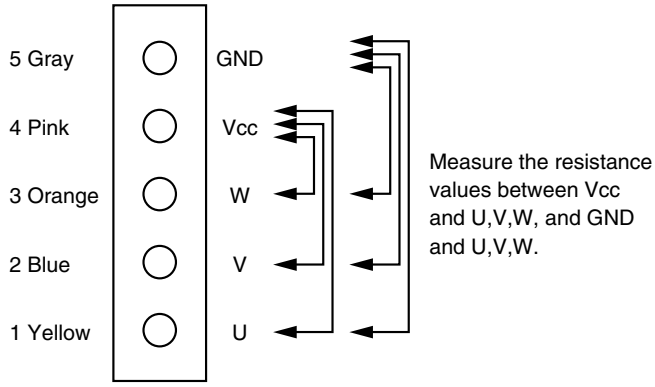
Check on connector of fan motor (Power supply cable)

(1) Turn off the power supply.
While disconnected, measure the resistance between phases U,V,W at the motor side connectors (3-conductor wire) to check that the values are balanced and that there is no short circuiting.



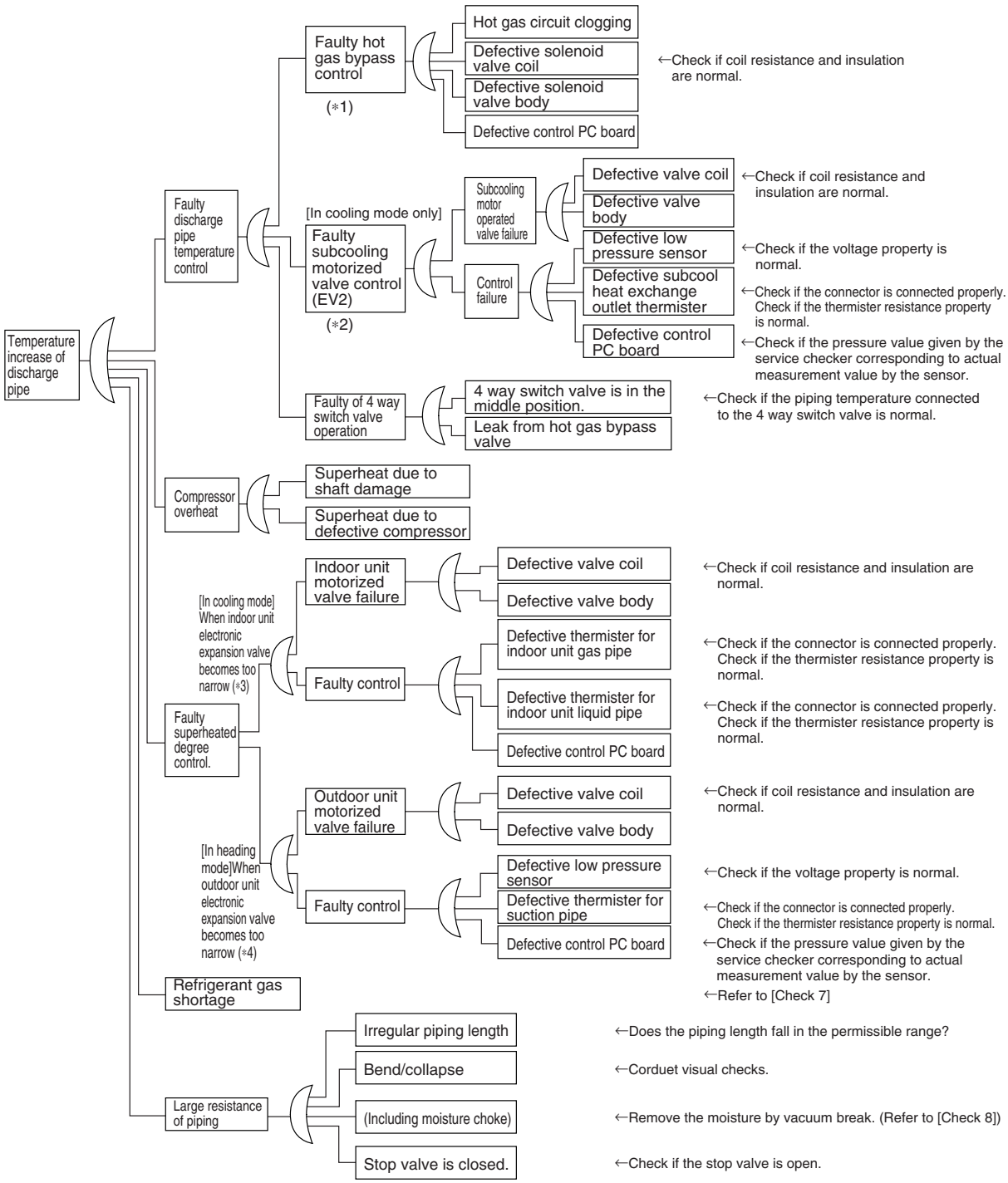
[CHECK 2]

(1) Turn off the power supply.
(2) While disconnected, 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 %.
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” (P66, 213) for hot gas bypass control.
∗2: Refer to P47, 195 for 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). (Refer to P47, 195).
∗5: Judgment 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

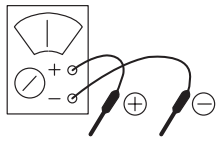
Perform the following procedures prior to check.

(1) Power Off.

(2) Remove all the wiring connected to the PC board 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 Judgment Criteria]

· Measure the resistance value using a tester at each point of measurement below, 10 minutes later after power OFF.

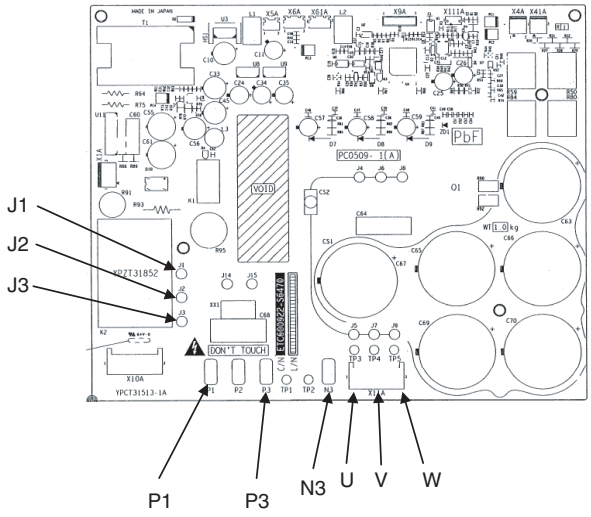
To use analog tester:
Measurement in the resistance value mode in the range of multiplying 1kΩ.

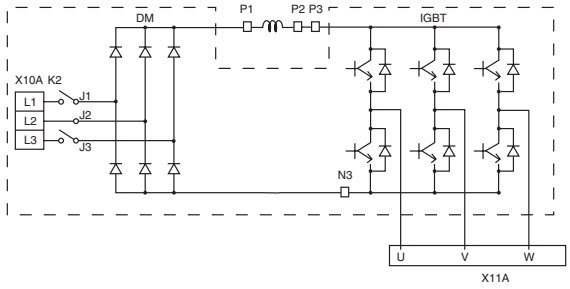
No.	Point of Measurement		Judgment Criteria	Remarks
	+	–		
1	P2	U	2 ~ 15kΩ	
2	P2	V		
3	P2	W		
4	U	P2	15kΩ and above (including ∞)	Due to condenser charge and so on, resistance measurement may require some time.
5	V	P2		
6	W	P2		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	2 ~ 15kΩ	
11	V	N3		
12	W	N3		

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

No.	Point of Measurement		Judgment 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		

[PC board and Circuit Diagram]

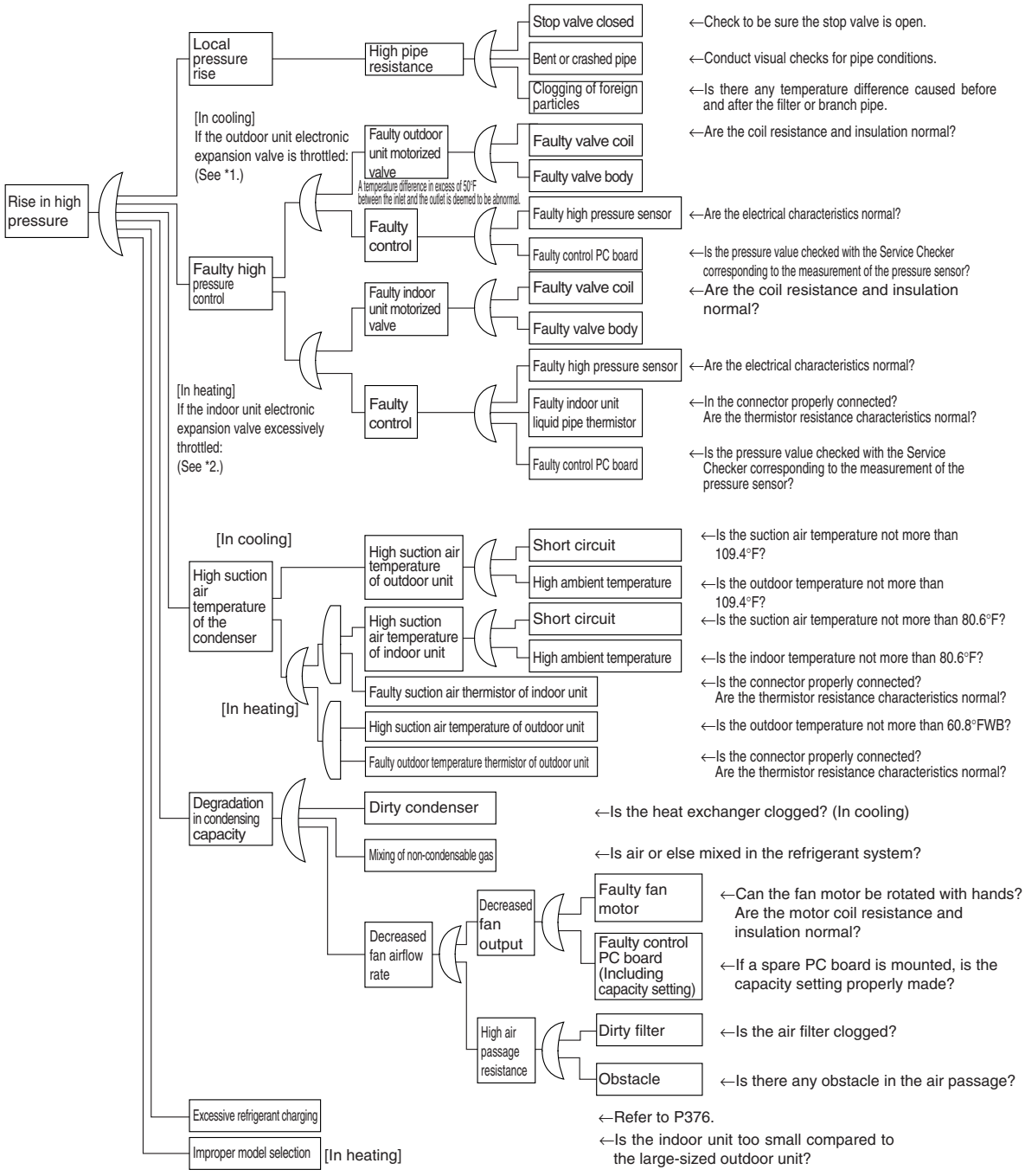




(V2895)

[CHECK 5] Check for causes of rise in high pressure

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

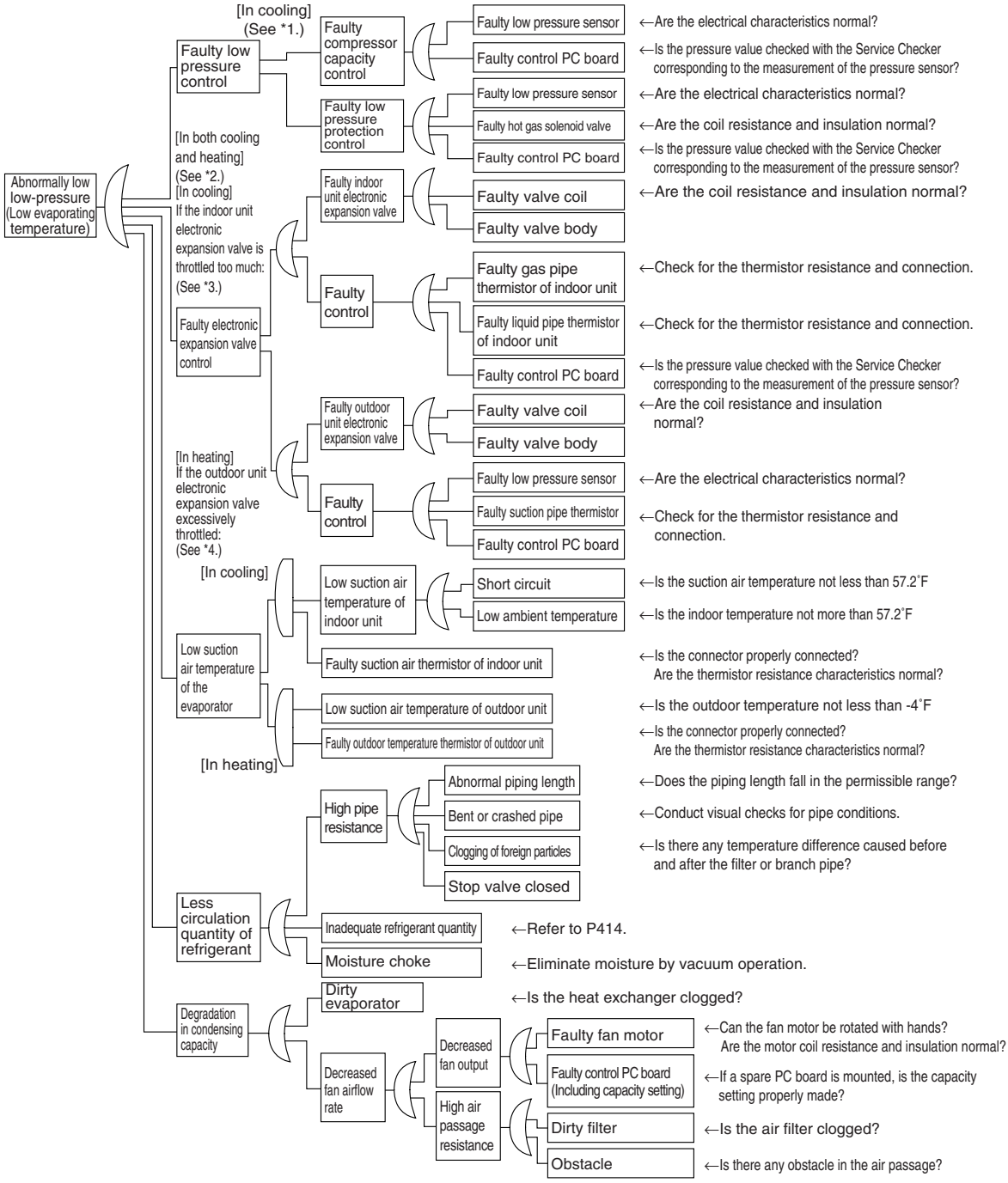


*1: In cooling, it is normal if the outdoor unit electronic expansion valve (EVM) is fully open.
*2: In heating, the indoor unit electronic expansion valve is used for “subcooled degree control”.

SDK04009

[CHECK 6] Check for causes of drop in low pressure

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

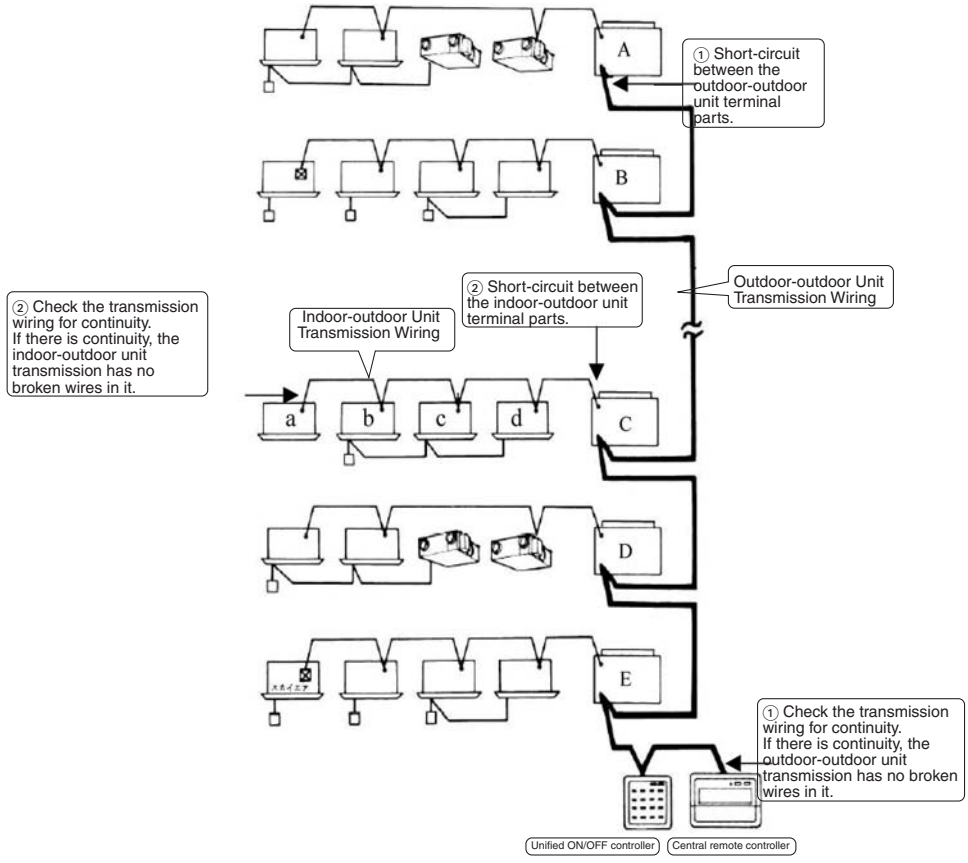


*1: The "low pressure protection control" includes low pressure protection control and hot gas bypass control. For details, refer to P66, 213.
*2: In cooling, the indoor unit electronic expansion valve is used for "superheated degree control".
*3: In heating, the outdoor unit electronic expansion valve (EVM) is used for "superheated degree control of outdoor unit heat exchanger". (For details, refer to P47, 195.)

SDK04009

[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 central remote controller, and then conduct continuity checks between the transmission wiring terminal blocks F1 and F2 of the central 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 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 central remote controller, do not dismount the master unit central setting connector (i.e., use the connector with the factory setting unchanged).
- To independently use the schedule timer, insert an independent-use setting connector.
  No independent-use setting connector has been mounted at the factory. Insert the connector, which is attached to the casing of the main unit, into the PC board (CN1/X1A).
  (Independent-use connector=Master unit central setting connector)
- To use two or more central equipment in combination, make settings according to the table shown below.

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

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

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

[CHECK 9] Master-Slave Unit Setting Table

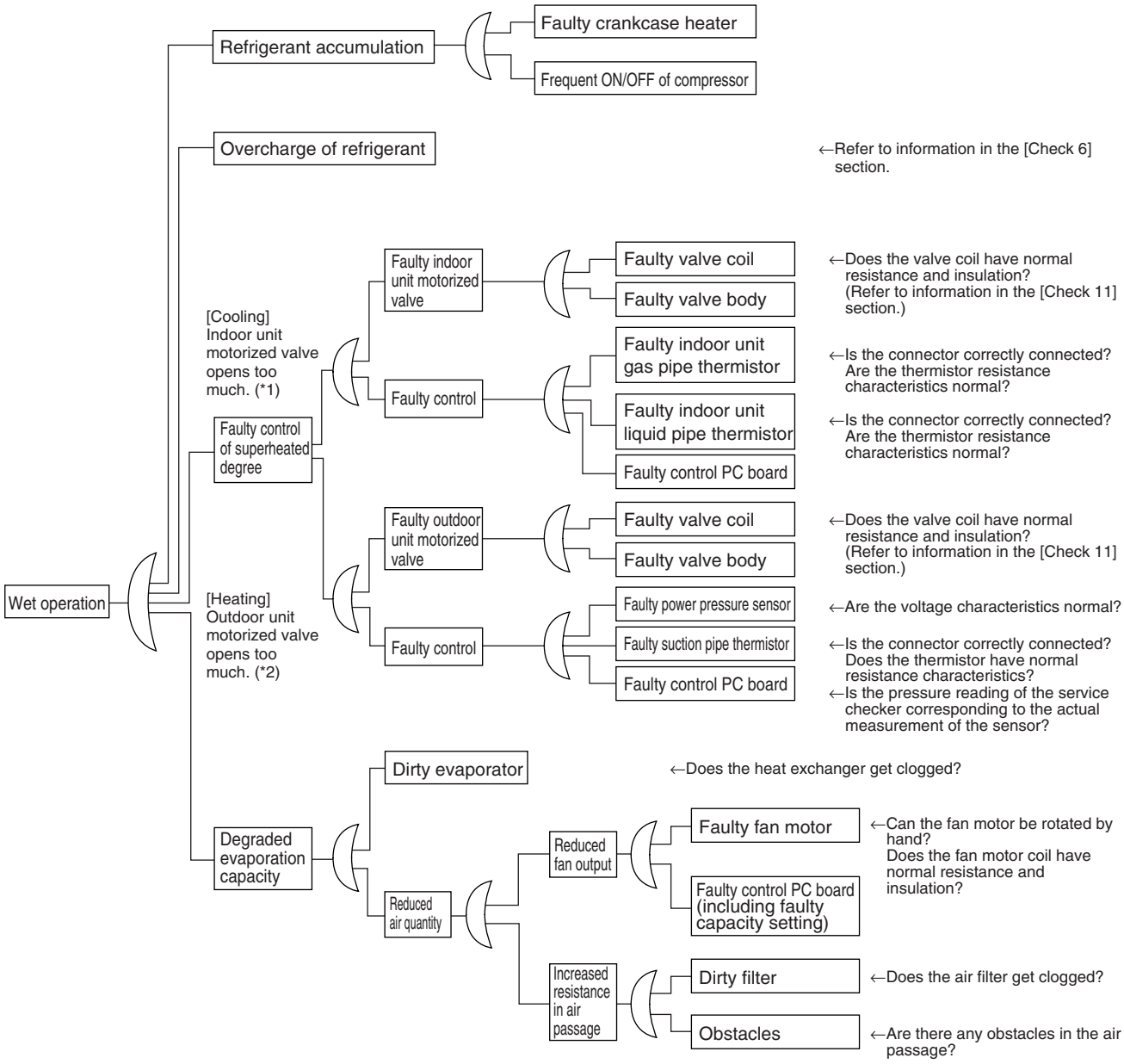
Combination of Intelligent Touch Controller and Central Remote Controller

*	#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: Central 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 faulty points.



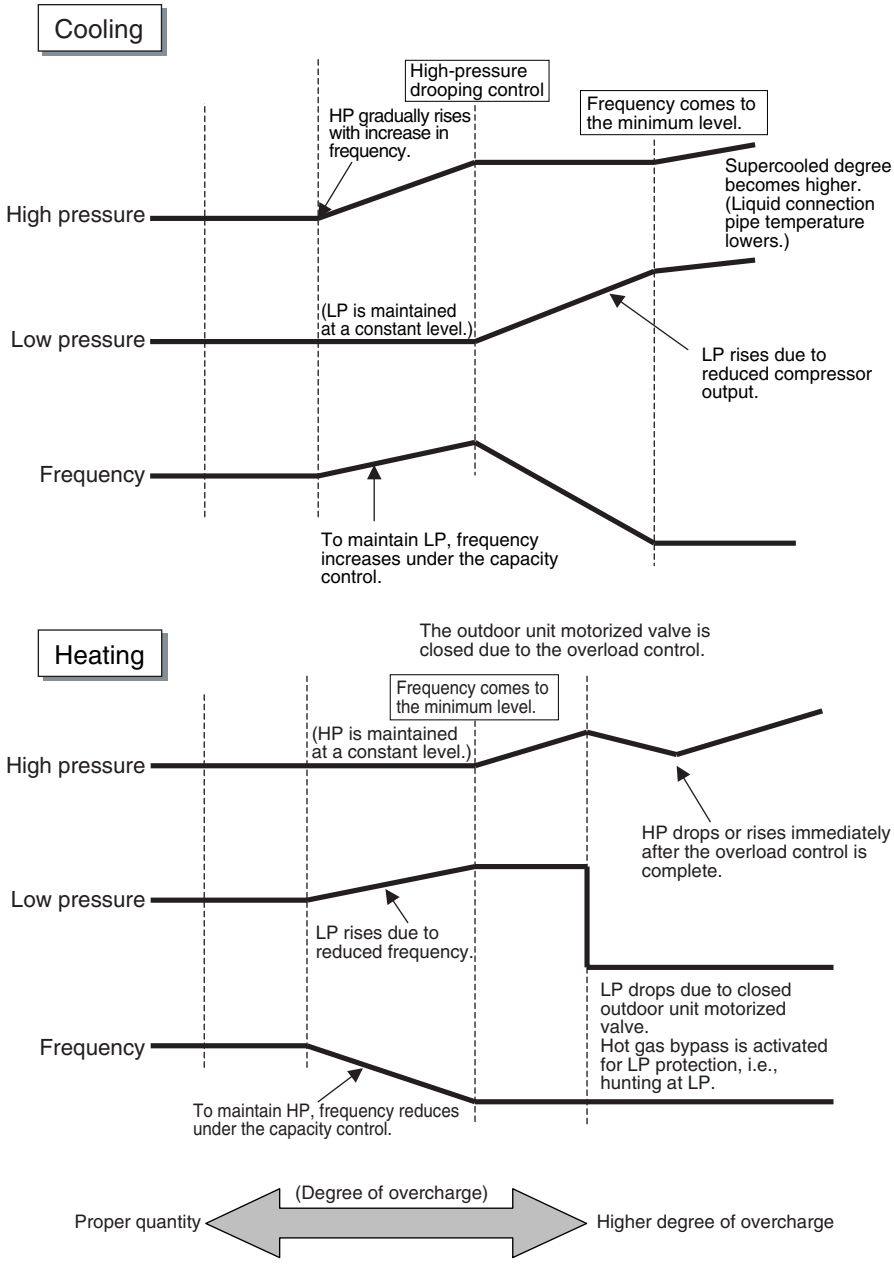
*1: "Superheated degree control" in cooling operation is exercised with the indoor unit motorized valve.
*2: "Superheated degree control" in heating operation is exercised with the outdoor unit motorized valve (EV1). (Refer to information on P47, 195.)
*3: Guideline of superheated degree to judge as wet operation
①Suction gas superheated degree: Not more than 5.4°F; ②Discharge gas superheated degree: Not more than 27°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 judgment, 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.

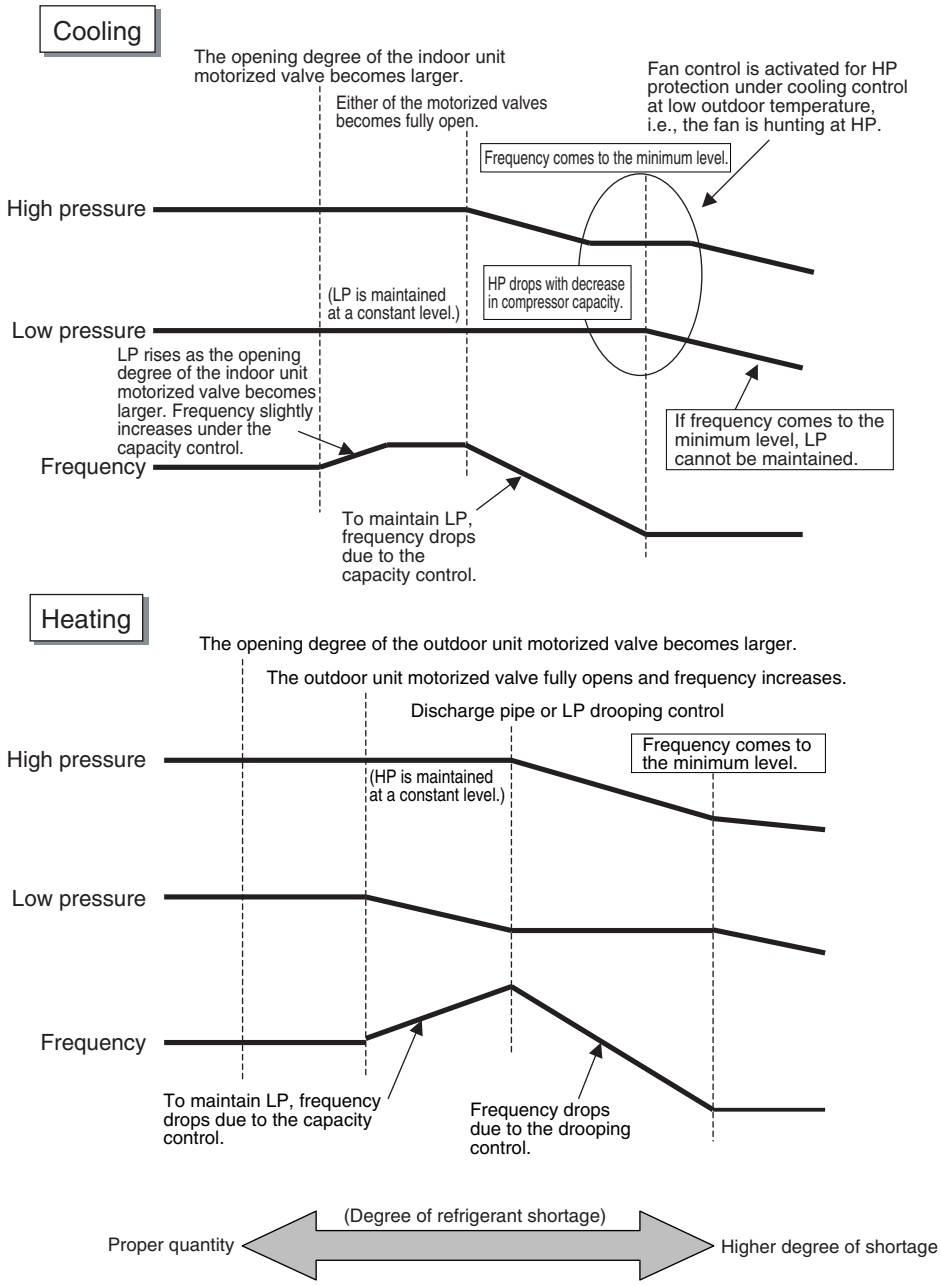


[Check 12] Check for shortage of refrigerant.

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 judgment, 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 opens.
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.
If moisture gets 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 there may be refrigerant leakage.

③ Refrigerant charge
- Purge air from the manifold gauge connection hoses, and then charge the appropriate quantity of refrigerant.

<Special vacuuming and dehydration> - In case moisture gets enters 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.

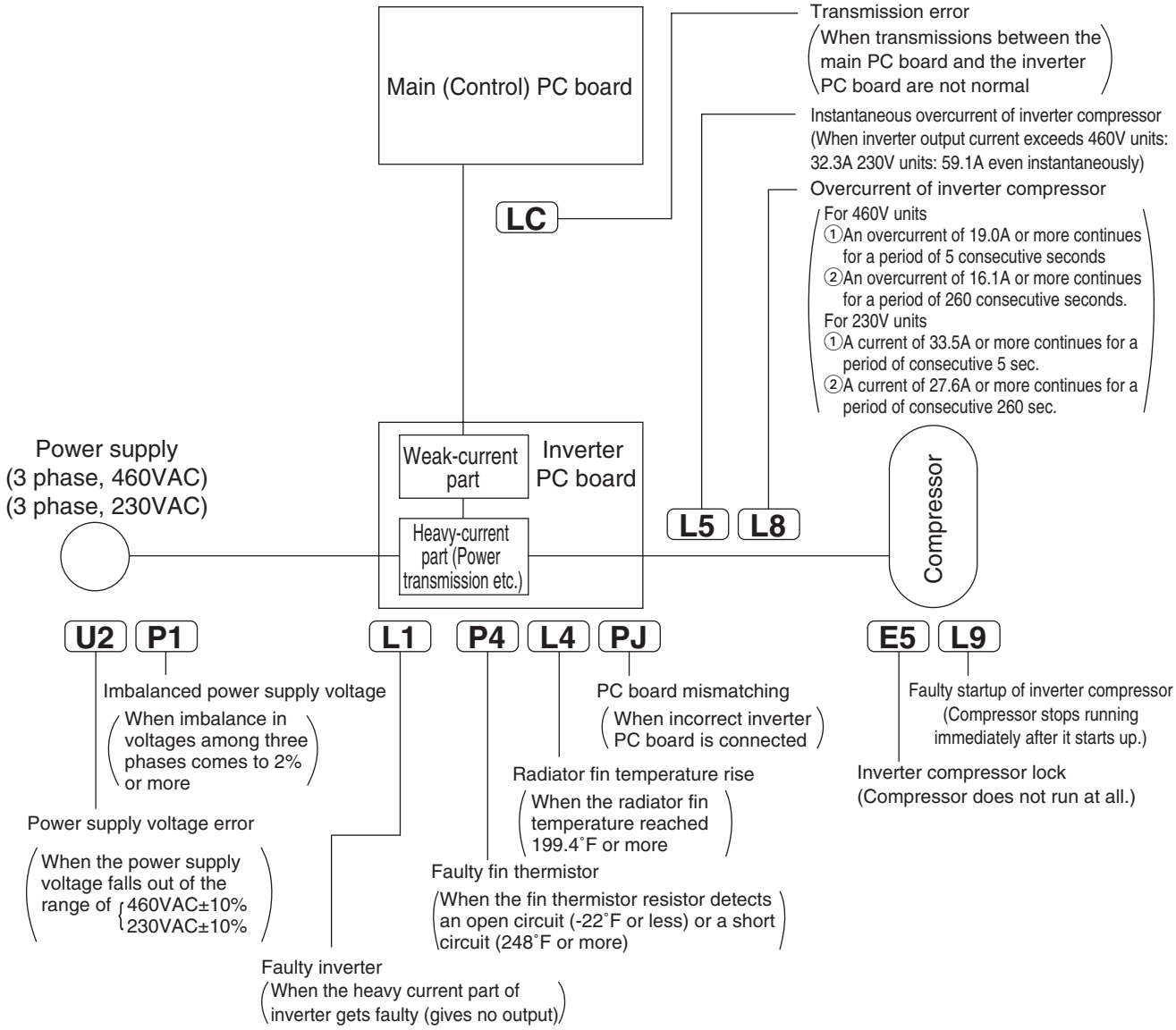
⑤ Refrigerant charge
- Purge air from the manifold gauge connection hoses, and then charge the appropriate quantity of refrigerant.

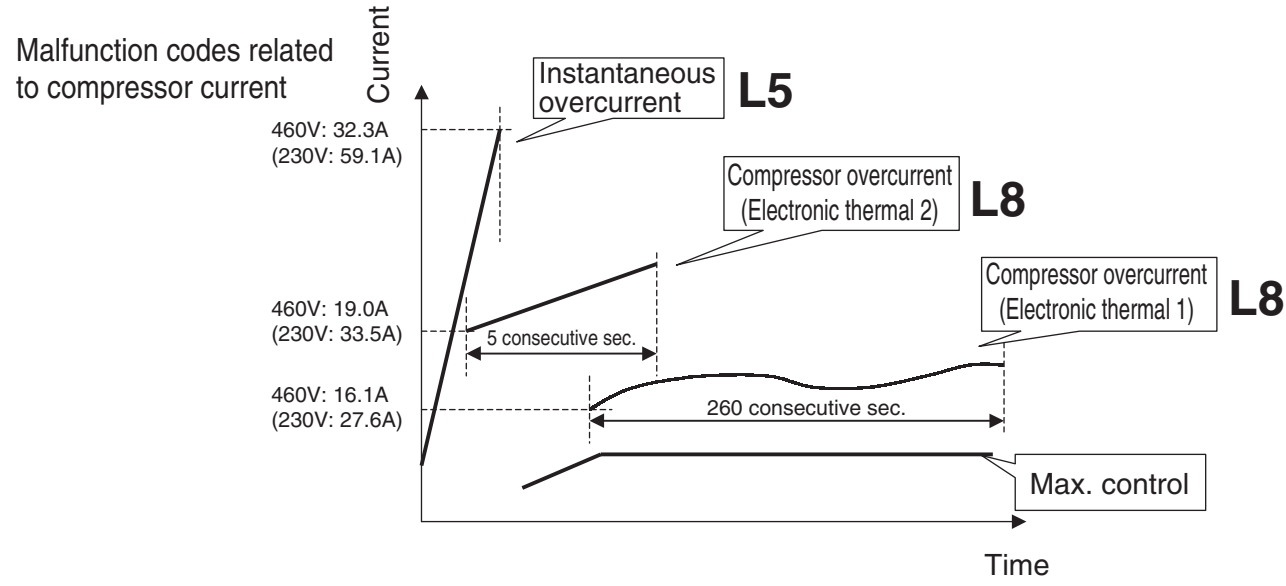
* If extended construction takes place during a rainy season and rainwater or dew condensation builds in the piping

[Check 14] List of inverter-related malfunction codes

	Code	Name	Condition for determining malfunction	Major cause
Compressor current	L5	Instantaneous overcurrent of inverter compressor	• Inverter output current exceeds 32.3A even instantaneously.	• Liquid sealing • Faulty compressor • Faulty inverter PC board
	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 • Faulty inverter PC board
Protection device and others	L1	Faulty inverter PC board	• No output is given.	• Faulty heavy current part of compressor
	L9	Faulty startup of inverter compressor	• The compressor motor fails to start up.	• Liquid sealing or faulty compressor • Excessive oil or refrigerant • Faulty inverter PC board
	E5	Inverter compressor lock	• The compressor is in the locked status (does not rotate).	• Faulty compressor
	L4	Radiator fin temperature rise	• The radiator fin temperature reaches 188.6°F or more (while in operation).	• Malfunction of fan • Running in overload for an extended period of time • Faulty inverter PC board
	U2	Power supply voltage error	• The inverter power supply voltage is high or low.	• Power supply error • Faulty inverter PC board
	P1	Imbalanced power supply	• Power supply voltages get significantly imbalanced among three phases.	• Power supply error (imbalanced voltages of 2% or more) • Faulty inverter PC board • Dead inverter PC board
	LC	Transmission error (between inverter PC board and control PC board)	• With the outdoor unit PC board, no communications are carried out across control PC board - inverter PC board - fan PC board.	• Broken wire in communication line • Faulty control PC board • Faulty inverter PC board • Faulty fan PC board
	PJ	PC board mismatching	• Any PC board of specification different from that of the product is connected.	• PC board of different specification mounted
	P4	Faulty fin thermistor	• The fin thermistor gets short-circuited or open.	• Faulty fin thermistor

[Check 15] Concept of inverter-related malfunction codes





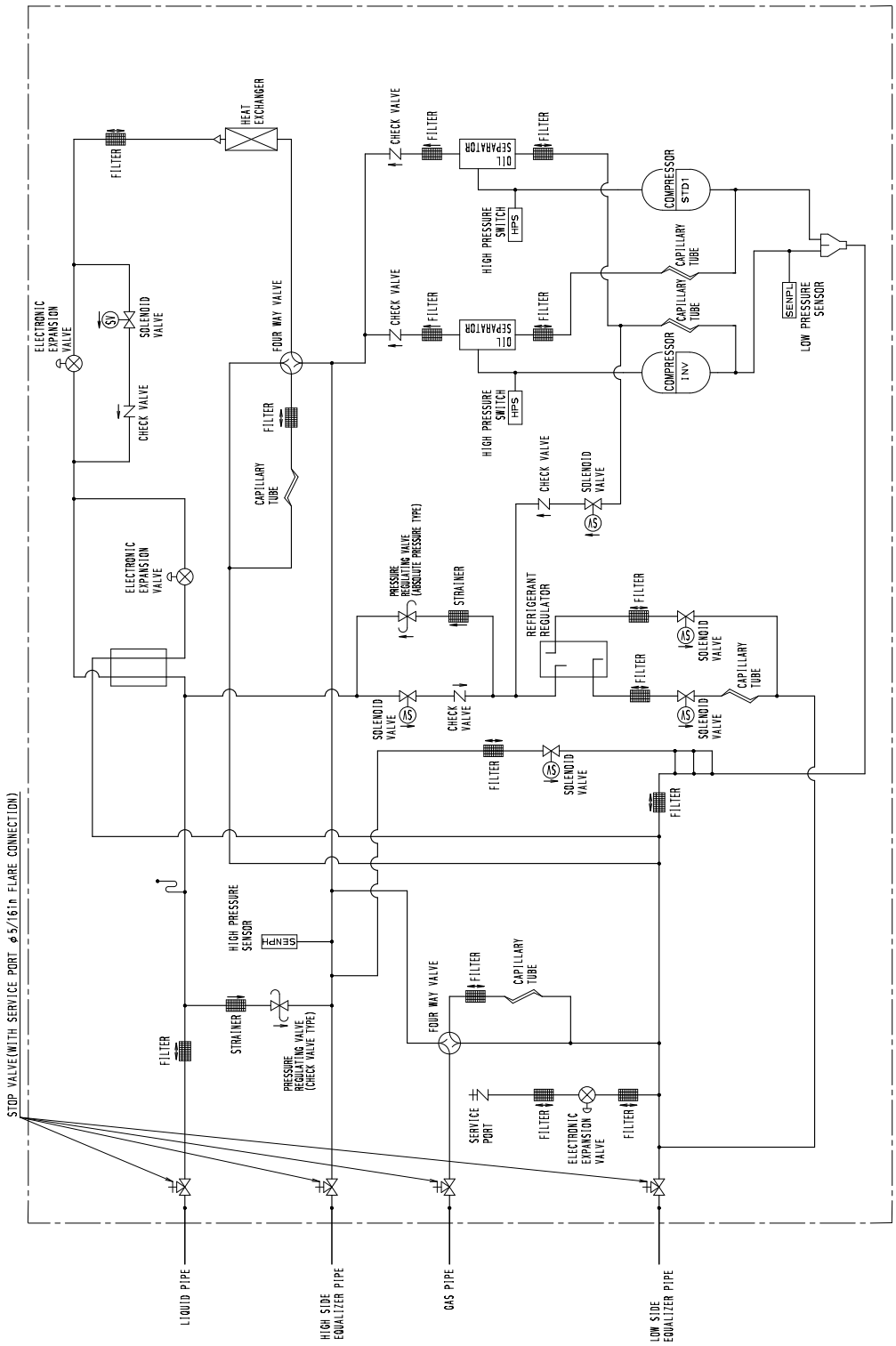
Part 6
Appendix

1. Piping Diagrams

1.1 Outdoor Unit

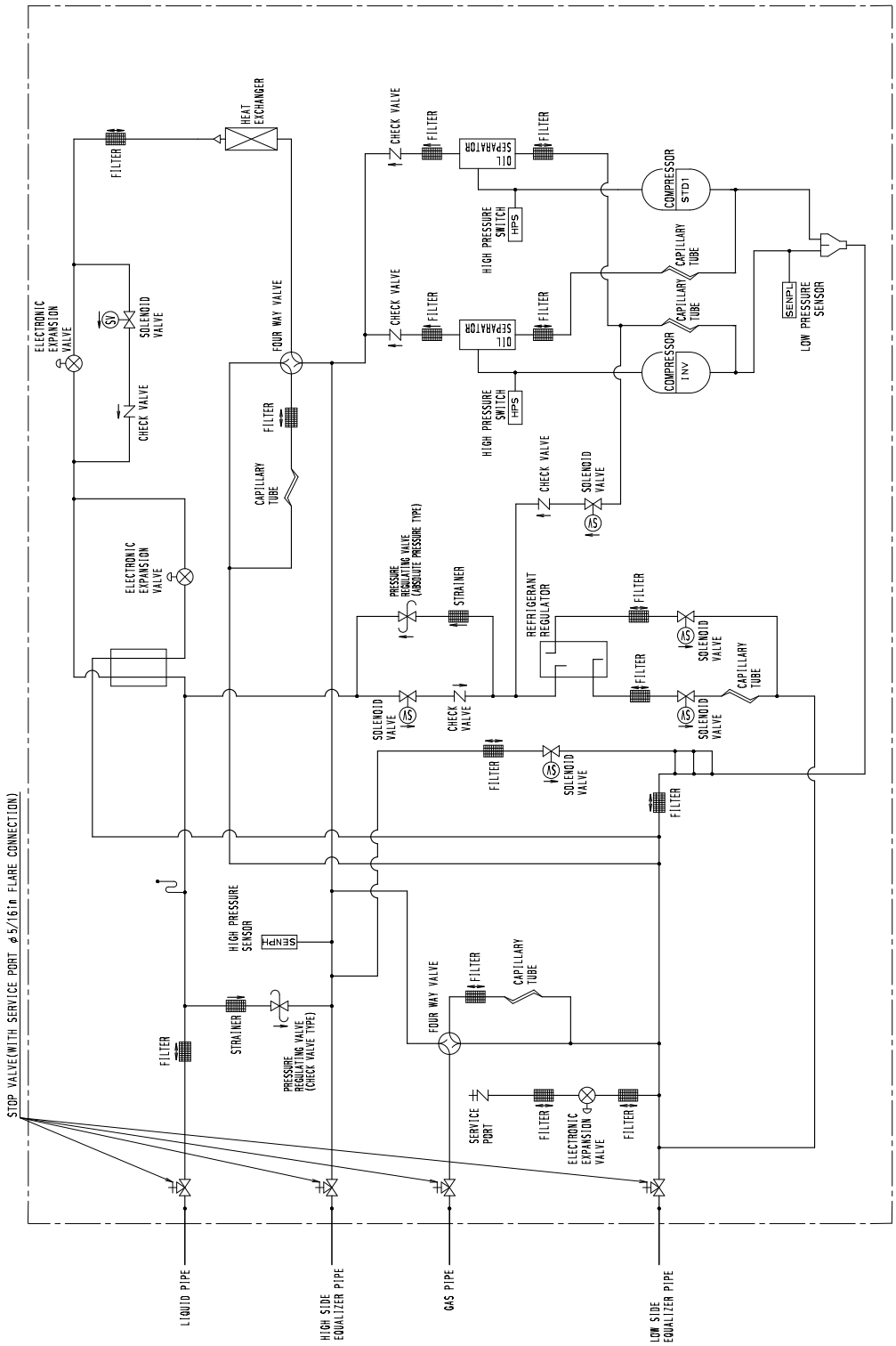
Heat Pump 460V
RXYQ72, 96, 120PYDN

3D058636A



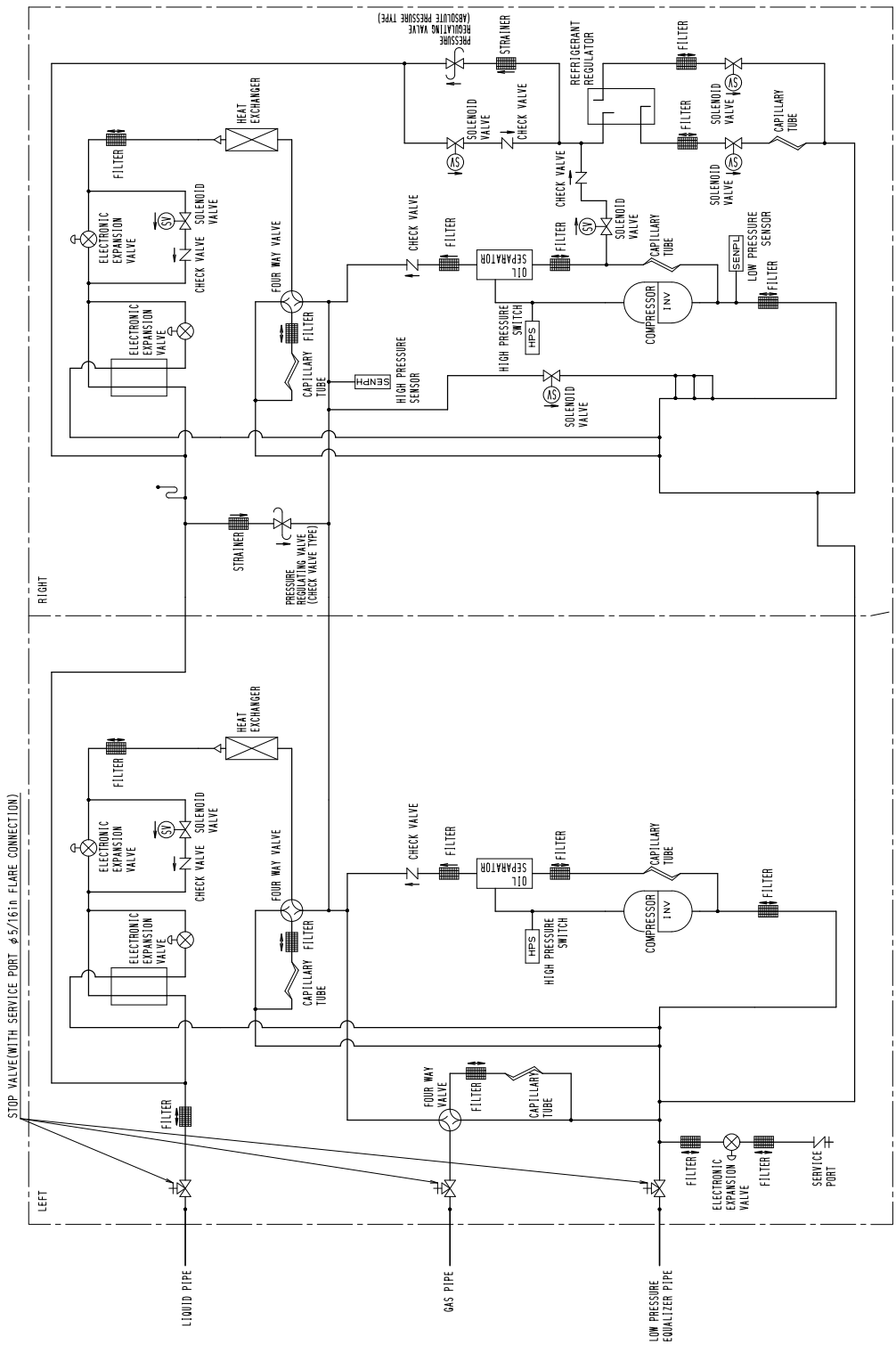
Heat Pump 230V
RXYQ72, 96, 120PTJU

3D058636A

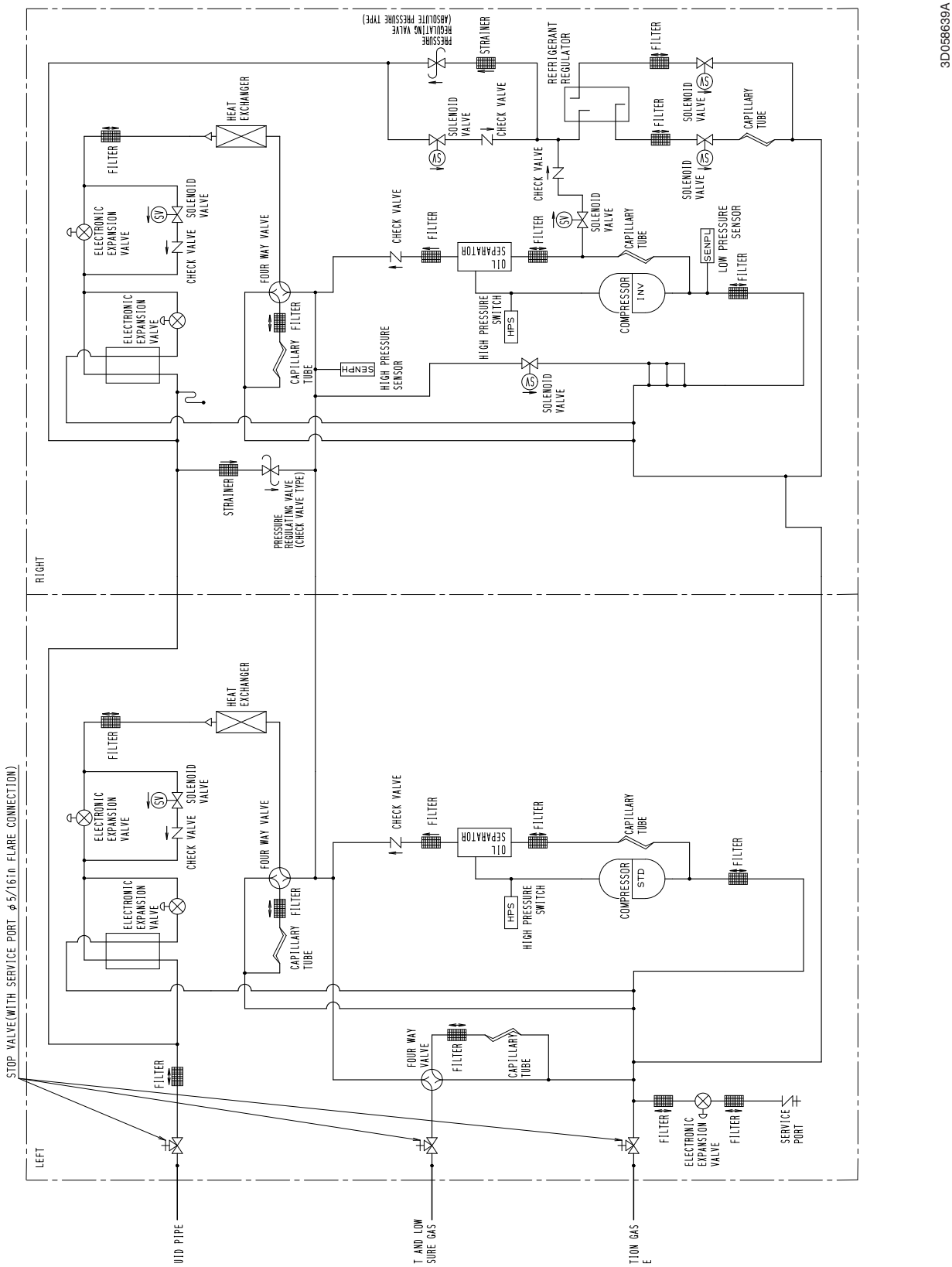


Heat Pump 230V
RXYQ144PTJU

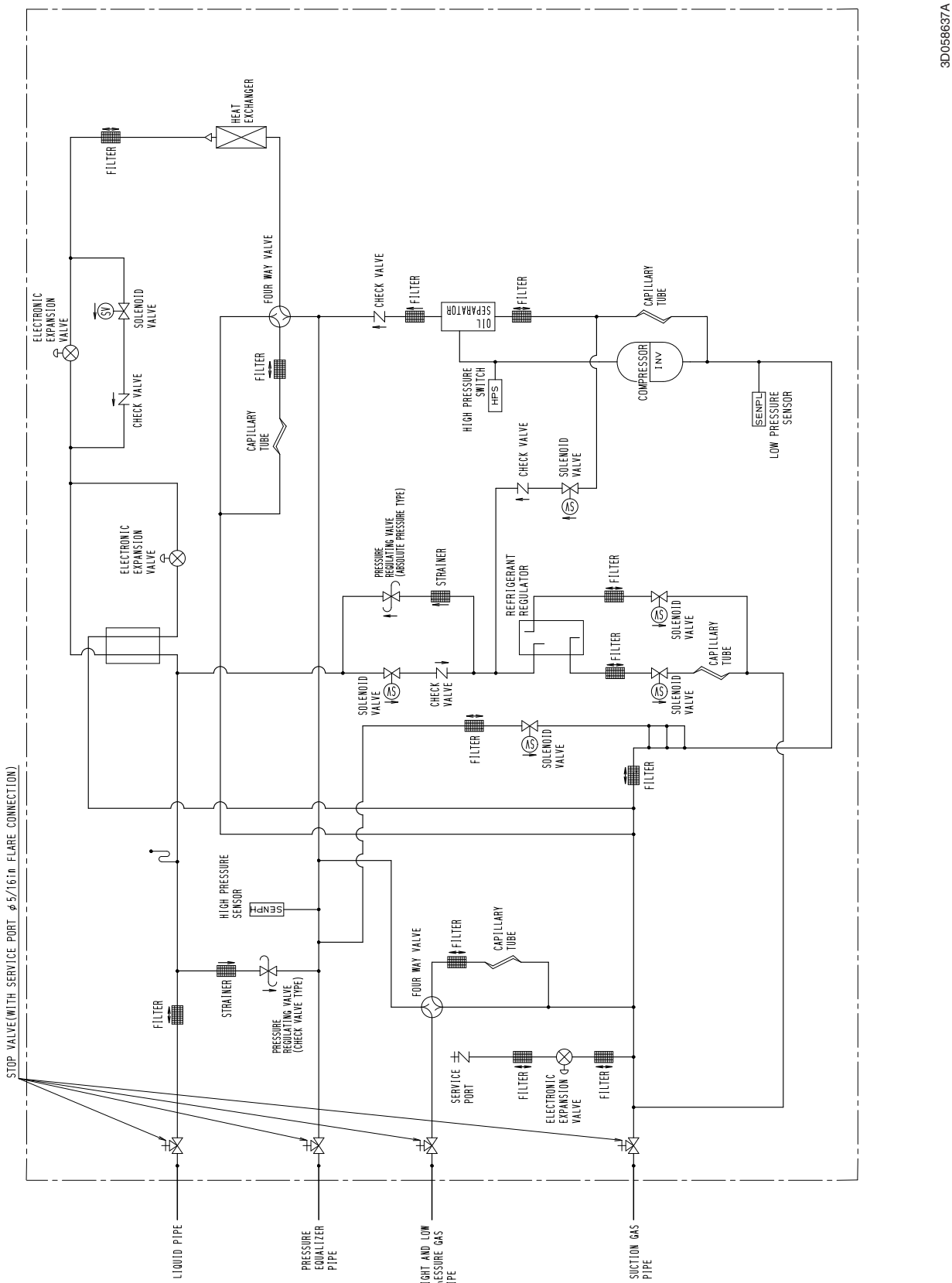
3D058640



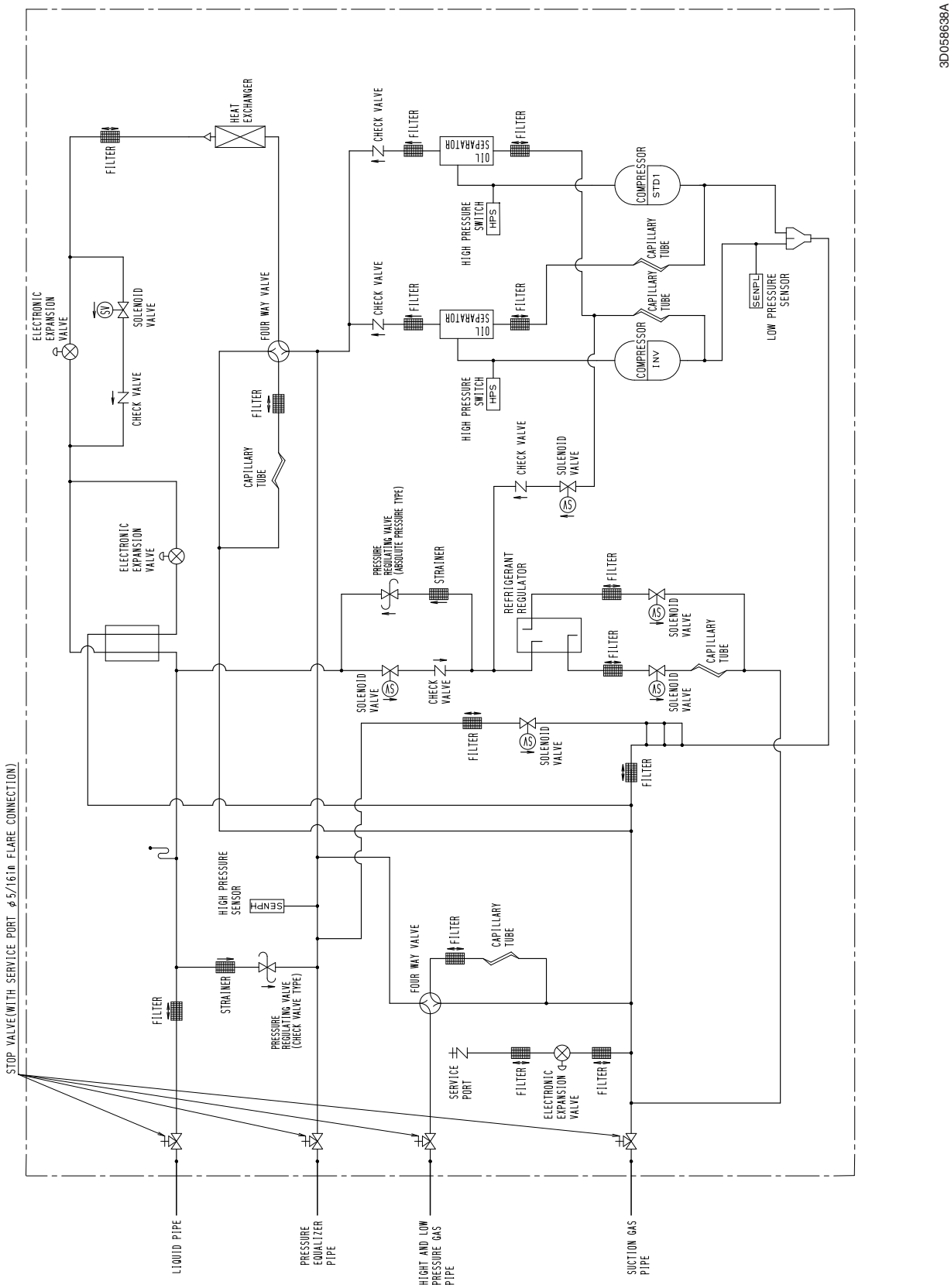
Heat Recovery 460V
REYQ72, 96, 120PYDN



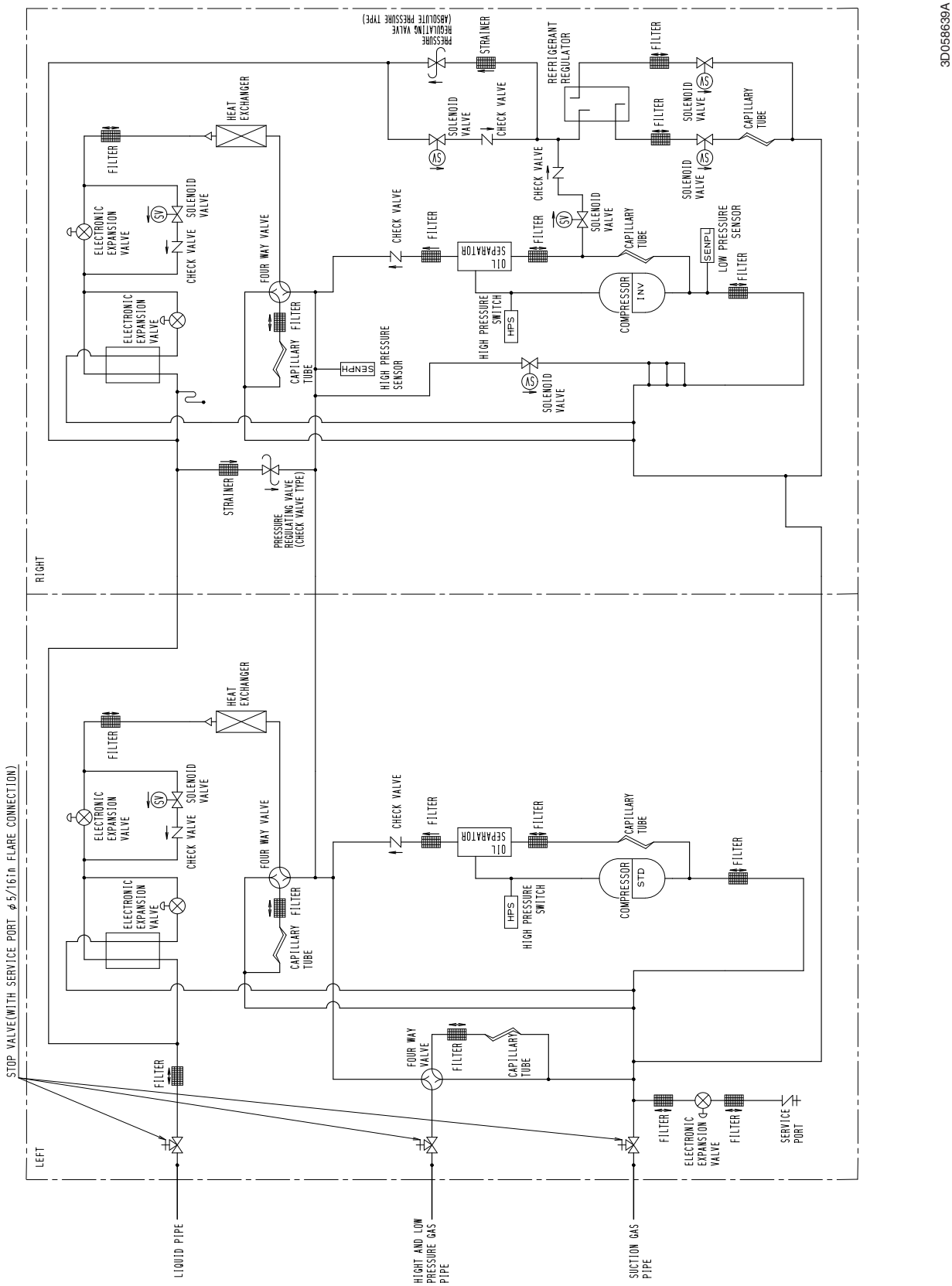
Heat Recovery 460V
REMQ72PYDN



Heat Recovery 460V
REMQ96, 120PYDN

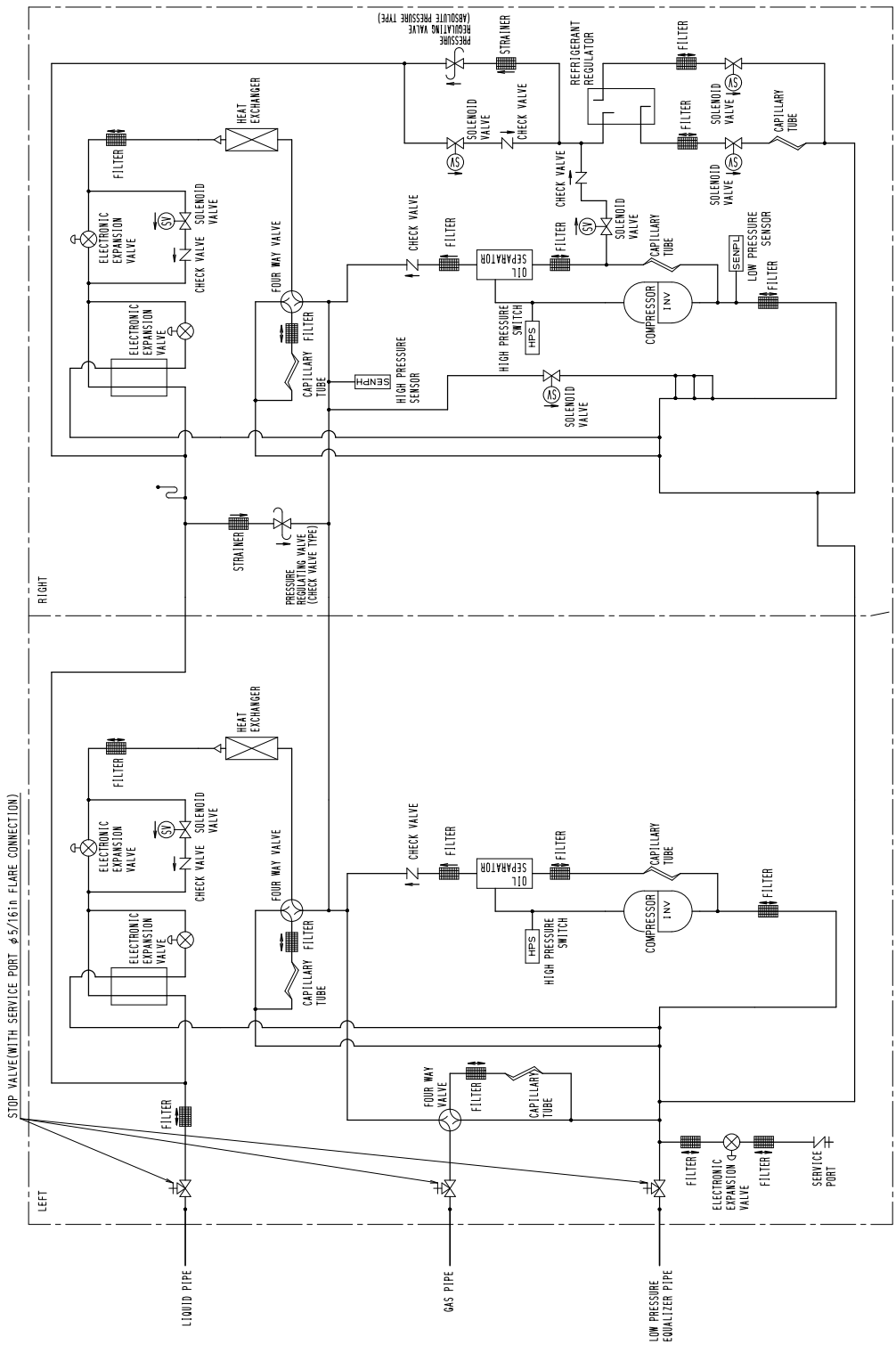


Heat Recovery 230V
REYQ72, 96, 120PTJU

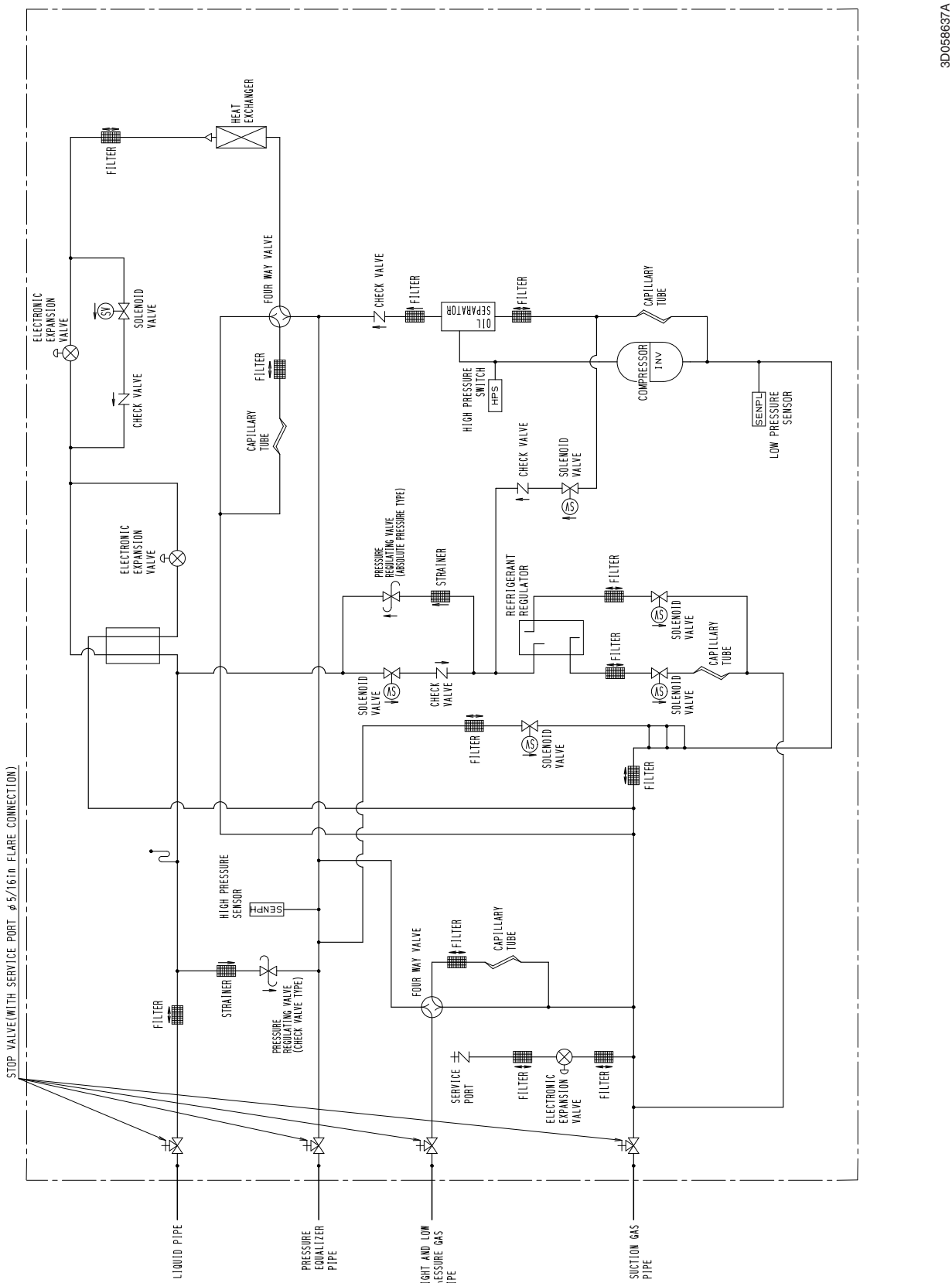


Heat Recovery 230V
REYQ144PTJU

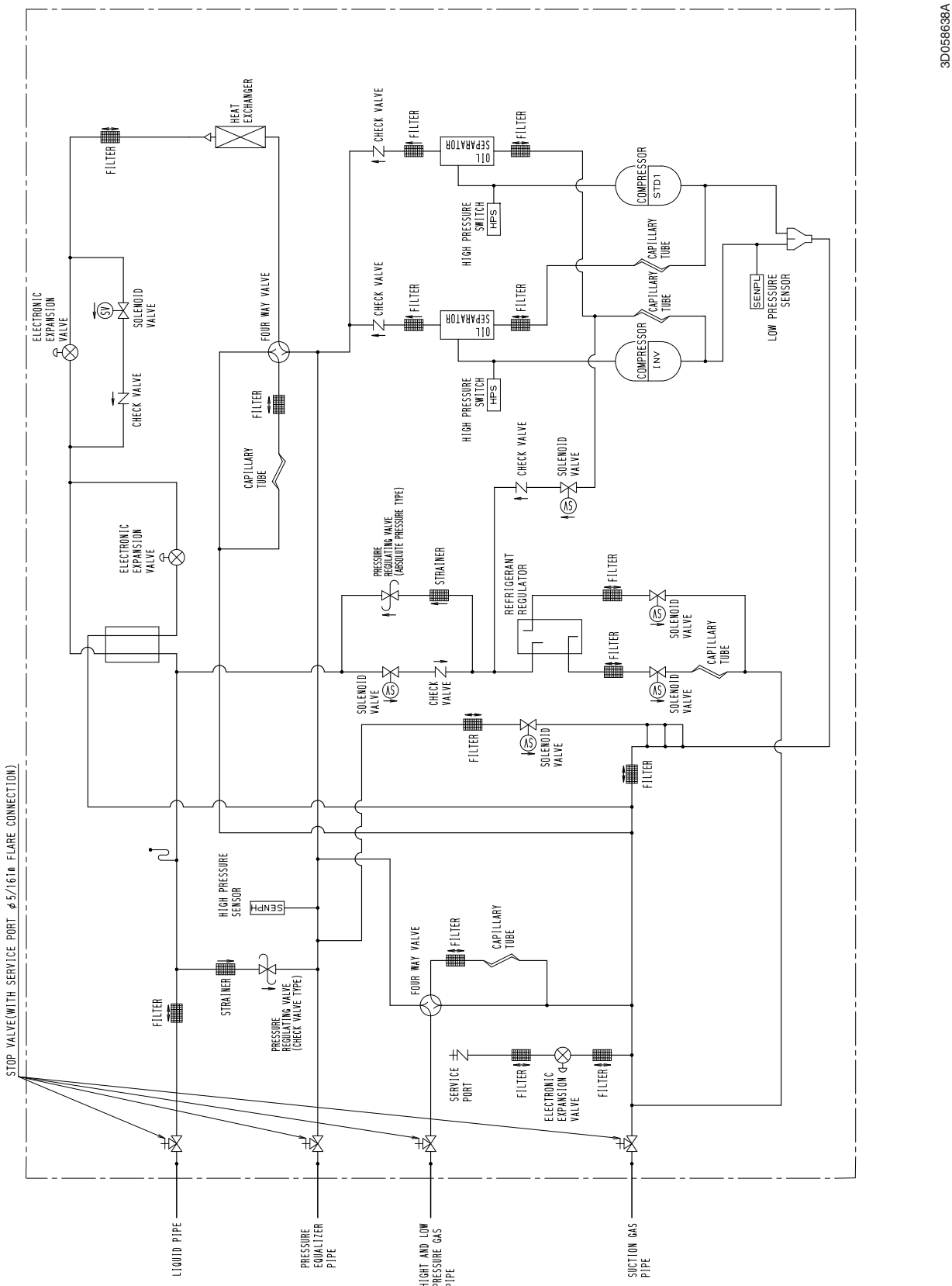
3D058640



Heat Recovery 230V
REMQ72PTJU

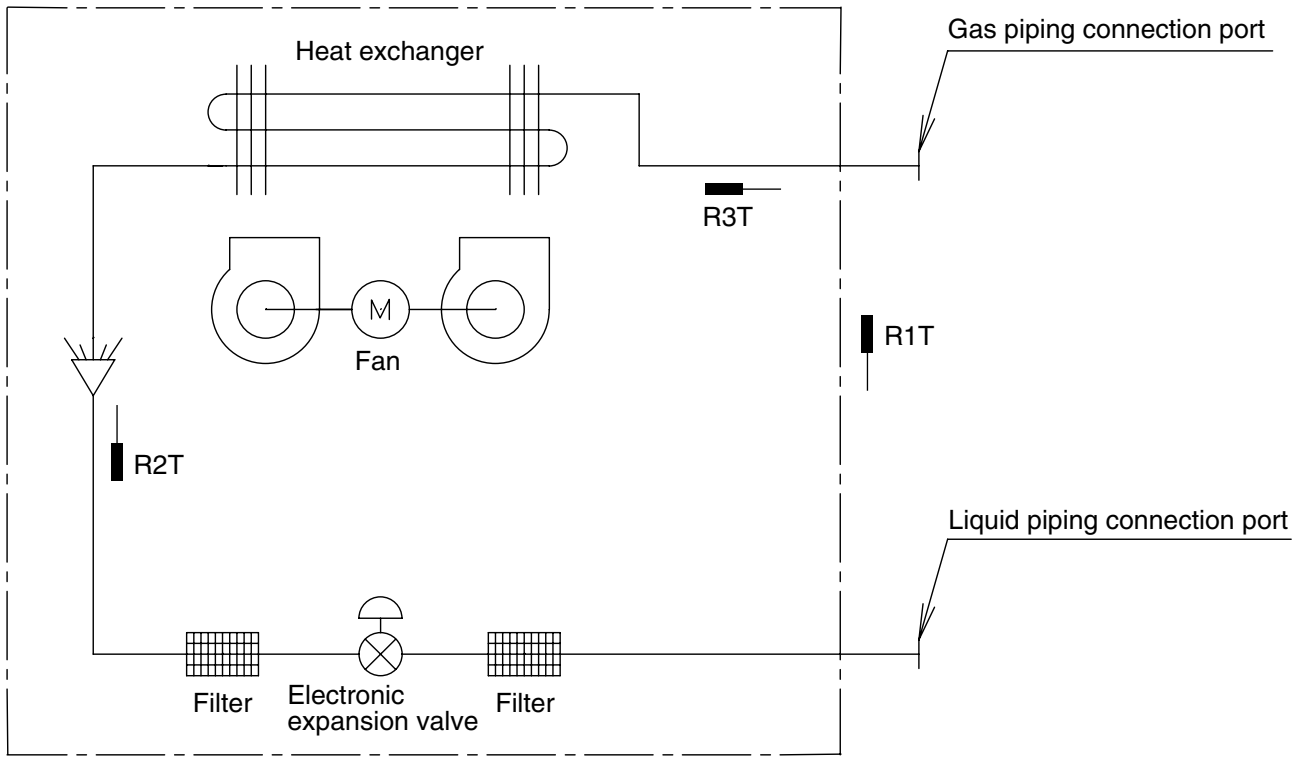


Heat Recovery 230V
REMQ96, 120PTJU



1.2 Indoor Unit

FXFQ 12M / 18M / 24M / 30M / 36MVJU
FXZQ 07M / 09M / 12M / 18M7VJU
FXSQ 12M / 18M / 24M / 30M / 36M / 48MVJU
FXMQ 30M / 36M / 48MVJU
FXHQ 12M / 24M / 36MVJU
FXAQ 07M / 09M / 12M / 18M / 24MVJU
FXLQ 12M / 18M / 24MVJU
FXNQ 12M / 18M / 24MVJU

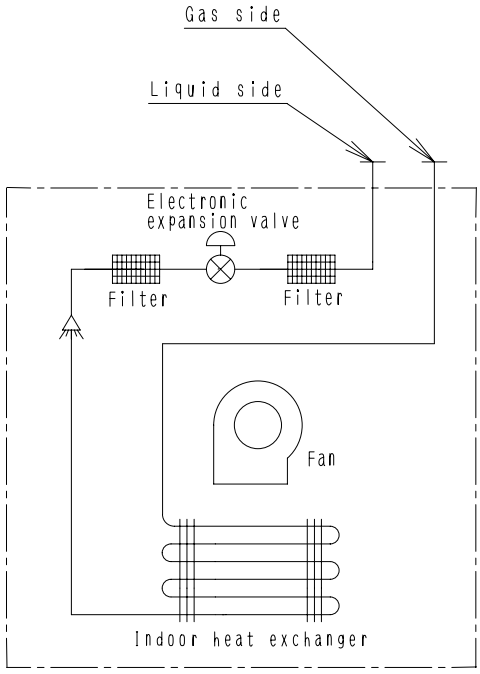


J:DU220-602J

R1T : Thermistor for return air temperature
R2T : Thermistor for liquid line temperature
R3T : Thermistor for gas line temperature

Capacity	GAS	Liquid
07/09/12/18M	ϕ1/2	ϕ1/4
24/30/36/48M	ϕ5/8	ϕ3/8

FXDQ

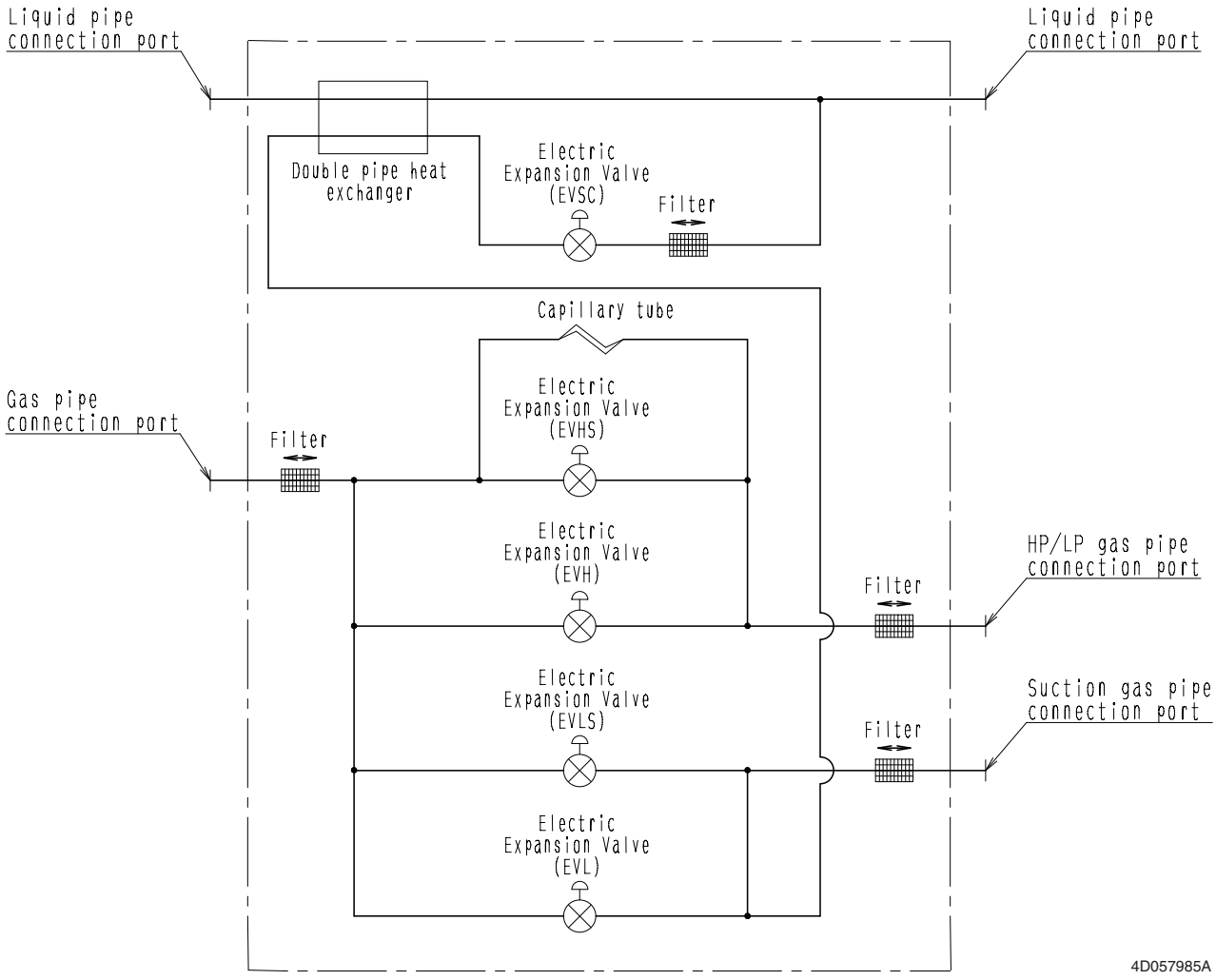


4D043864J

■ Refrigerant pipe connection port diameters

Model	Gas	Liquid
FXDQ07M / 09M / 12M / 18MVJU	ϕ1/2	ϕ1/4
FXDQ24MVJU	ϕ5/8	ϕ3/8

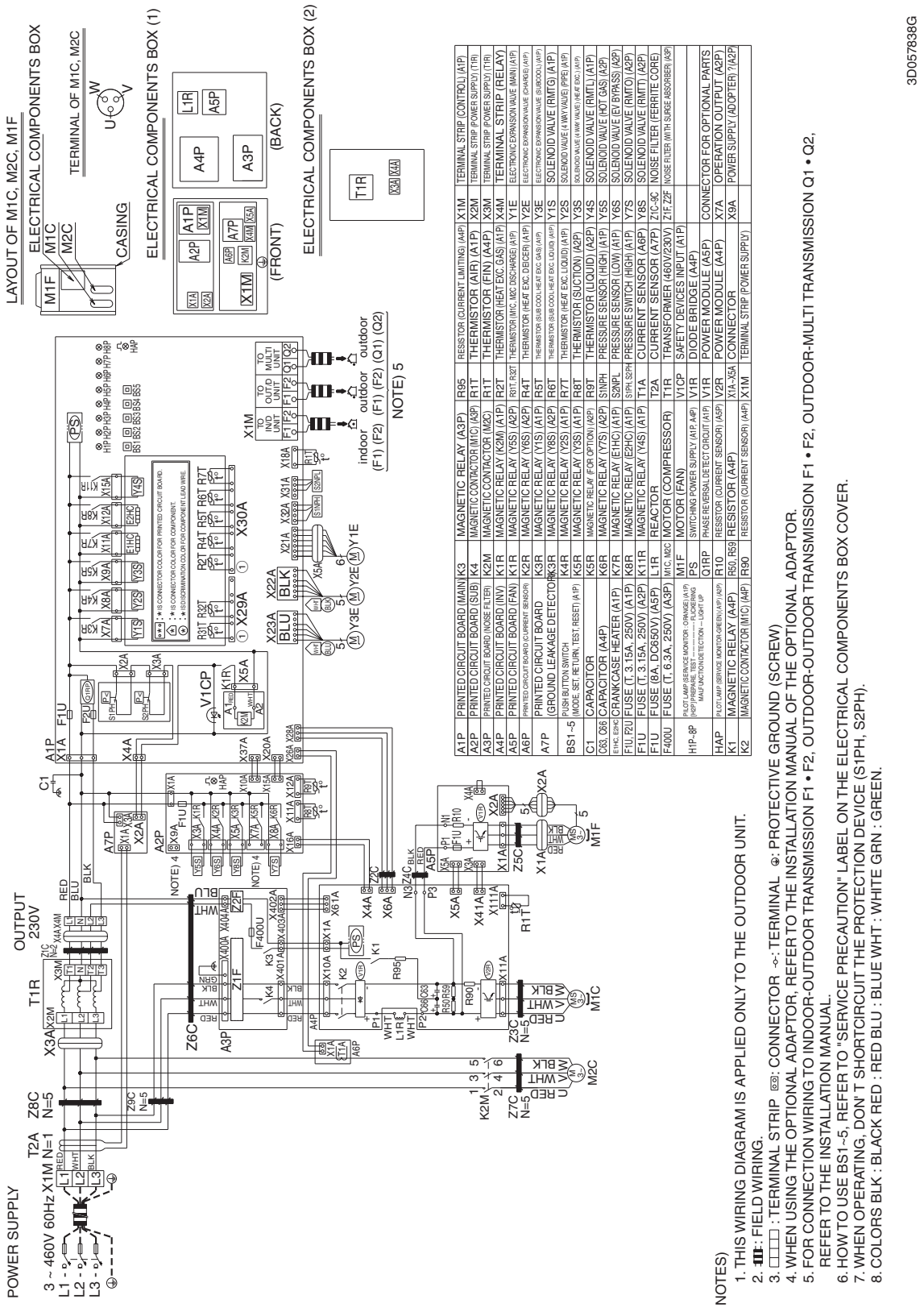
1.3 BS Unit


Liquid pipe connection port
Liquid pipe connection port
Double pipe heat exchanger
Electric Expansion Valve (EVSC)
Filter
Capillary tube
Electric Expansion Valve (EVHS)
Gas pipe connection port
Filter
Electric Expansion Valve (EVH)
HP/LP gas pipe connection port
Filter
Electric Expansion Valve (EVLS)
Suction gas pipe connection port
Filter
Electric Expansion Valve (EVL)
4D057985A

2. Wiring Diagrams for Reference

2.1 Outdoor Unit

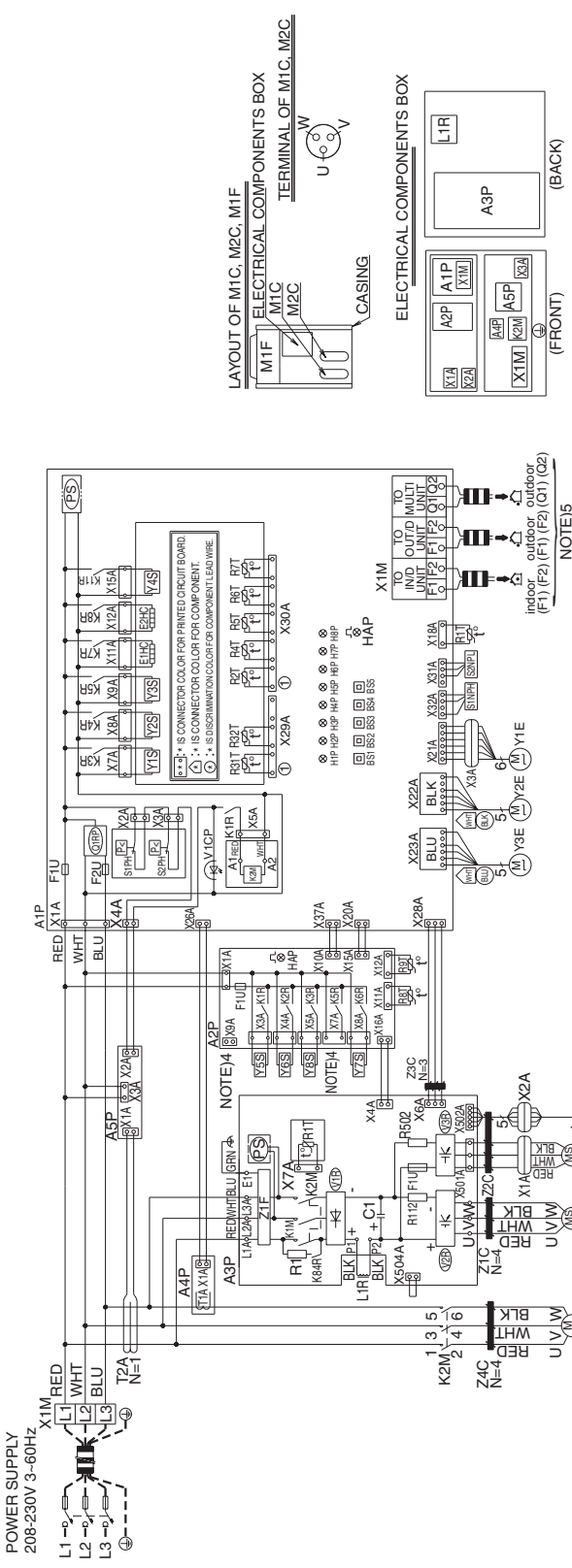
Heat Pump 460V, RXYQ72, 96, 120PYDN



A1P	PRINTED CIRCUIT BOARD (MAIN)	K3	MAGNETIC RELAY (A3P)	R95	RESISTOR (CURRENT LIMITING) (A4P)
A2P	PRINTED CIRCUIT BOARD (SUB)	K4	MAGNETIC CONTACTOR (M1C) (A3P)	R1T	THERMISTOR (AIR) (A1P)
A3P	PRINTED CIRCUIT BOARD (NOISE FILTER)	K2M	MAGNETIC CONTACTOR (M2C)	R1T	THERMISTOR (FIN) (A4P)
A4P	PRINTED CIRCUIT BOARD (INV)	K1R	MAGNETIC RELAY (K2M) (A1P)	R2T	THERMISTOR (HEAT EXC. GAS) (A1P)
A5P	PRINTED CIRCUIT BOARD (FAN)	K1R	MAGNETIC RELAY (Y5S) (A2P)	R3T, R32T	THERMISTOR (M1C, M2C DISCHARGE) (A1P)
A6P	PRINTED CIRCUIT BOARD (CURRENT SENSOR)	K2R	MAGNETIC RELAY (Y6S) (A2P)	R4T	THERMISTOR (HEAT EXC. DEICER) (A1P)
A7P	PRINTED CIRCUIT BOARD (GROUND LEAKAGE DETECTOR)	K3R	MAGNETIC RELAY (Y1S) (A1P)	R5T	THERMISTOR (SUB-COOL HEAT EXC. GAS) (A1P)
		K3R	MAGNETIC RELAY (Y8S) (A2P)	R6T	THERMISTOR (SUB-COOL HEAT EXC. LIQUID) (A1P)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET) (A1P)	K4R	MAGNETIC RELAY (Y2S) (A1P)	R7T	THERMISTOR (HEAT EXC. LIQUID) (A1P)
		K5R	MAGNETIC RELAY (Y3S) (A1P)	R8T	THERMISTOR (SUCTION) (A2P)
C1	CAPACITOR	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R9T	THERMISTOR (LIQUID) (A2P)
C83, C66	CAPACITOR (A4P)	K6R	MAGNETIC RELAY (Y7S) (A2P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)
E1HC, E2HC	CRANKCASE HEATER (A1P)	K7R	MAGNETIC RELAY (E1HC) (A1P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P)	K8R	MAGNETIC RELAY (E2HC) (A1P)	S3PH, S2PH	PRESSURE SWITCH (HIGH) (A1P)
F1U	FUSE (T, 3.15A, 250V) (A2P)	K11R	MAGNETIC RELAY (Y4S) (A1P)	T1A	CURRENT SENSOR (A6P)
F1U	FUSE (8A, DC650V) (A5P)	L1R	REACTOR	T2A	CURRENT SENSOR (A7P)
F400U	FUSE (T, 6.3A, 250V) (A3P)	M1C, M2C	MOTOR (COMPRESSOR)	T1R	TRANSFORMER (460V/230V)
		M1F	MOTOR (FAN)	V1CP	SAFETY DEVICES INPUT (A1P)
H1P~8P	PILOT LAMP (SERVICE MONITOR : ORANGE) (A1P) (R2P) PREPARE TEST ---------- FLICKERING MALFUNCTION DETECTION -- LIGHT UP	PS	SWITCHING POWER SUPPLY (A1P, A4P)	V1R	DIODE BRIDGE (A4P)
		Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P)	V1R	POWER MODULE (A5P)
HAP	PILOT LAMP (SERVICE MONITOR (GREEN) LAMP) (A1P)	R10	RESISTOR (CURRENT SENSOR) (A5P)	V2R	POWER MODULE (A4P)
K1	MAGNETIC RELAY (A4P)	R60, R59	RESISTOR (A4P)	X1A~X5A	CONNECTOR
K2	MAGNETIC CONTACTOR (M1C) (A4P)	R90	RESISTOR (CURRENT SENSOR) (A4P)	X1M	TERMINAL STRIP (POWER SUPPLY)
				X1M	TERMINAL STRIP (CONTROL) (A1P)
				X2M	TERMINAL STRIP (POWER SUPPLY) (T1R)
				X3M	TERMINAL STRIP (POWER SUPPLY) (T1R)
				X4M	TERMINAL STRIP (RELAY)
				Y1E	ELECTRONIC EXPANSION VALVE (MAIN) (A1P)
				Y2E	ELECTRONIC EXPANSION VALVE (CHARGE) (A1P)
				Y3E	ELECTRONIC EXPANSION VALVE (SUBCOOL) (A1P)
				Y1S	SOLENOID VALVE (RMTG) (A1P)
				Y2S	SOLENOID VALVE (4 WAY VALVE) (PIPE) (A1P)
				Y3S	SOLENOID VALVE (4 WAY VALVE) (HEAT EXC.) (A1P)
				Y4S	SOLENOID VALVE (RMTL) (A1P)
				Y5S	SOLENOID VALVE (HOT GAS) (A2P)
				Y6S	SOLENOID VALVE (EI) BYPASS) (A2P)
				Y7S	SOLENOID VALVE (RMTO) (A2P)
				Y8S	SOLENOID VALVE (RMTT) (A2P)
				Z1C~3C	NOISE FILTER (FERRITE CORE)
				Z1F, Z2F	NOISE FILTER (WITH SURGE ABSORBER) (A3P)
				V1CP	
					CONNECTOR FOR OPTIONAL PARTS
				X7A	OPERATION OUTPUT (A2P)
				X9A	POWER SUPPLY (ADAPTER) ?(A2P)

NOTES)
1. THIS WIRING DIAGRAM IS APPLIED ONLY TO THE OUTDOOR UNIT.
2. ■■: FIELD WIRING.
3. □□□ : TERMINAL STRIP (▭): CONNECTOR ⏚: TERMINAL ⏚: PROTECTIVE GROUND (SCREW)
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 THE ELECTRICAL COMPONENTS BOX COVER.
7. WHEN OPERATING, DON'T SHORTCIRCUIT THE PROTECTION DEVICE (S1PH, S2PH).
8. COLORS BLK : BLACK RED : RED BLU : BLUE WHT : WHITE GRN : GREEN.

Heat Pump 230, VRXYQ72, 96, 120PTJU



A1P	PRINTED CIRCUIT BOARD (MAIN)	K2R	MAGNETIC RELAY (Y6S) (A2P)	R2T	THERMISTOR (HEAT EXC. GAS) (A1P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN) (A1P)
A2P	PRINTED CIRCUIT BOARD (SUB)	K3R	MAGNETIC RELAY (Y1S) (A1P)	R31T, R32T	THERMISTOR (M1C, M2C DISCHARGE) (A1P)	Y2E	ELECTRONIC EXPANSION VALVE(CHARGE) (A1P)
A3P	PRINTED CIRCUIT BOARD (INV, FAN)	K3R	MAGNETIC RELAY (Y8S) (A2P)	R4T	THERMISTOR (HEAT EXC.DEICER) (A1P)	Y3E	ELECTRONIC EXPANSION VALVE (SUBCOOL) (A1P)
A4P	PRINTED CIRCUIT BOARD (CURRENT SENSOR)	K4R	MAGNETIC RELAY (Y2S) (A1P)	R5T	THERMISTOR (SUB COOL HEAT EXC. GAS) (A1P)	Y1S	SOLENOID VALVE (RMTG) (A1P)
A5P	PRINTED CIRCUIT BOARD (ELB)	K5R	MAGNETIC RELAY (Y3S) (A1P)	R6T	THERMISTOR (SUB COOL HEAT EXC. LIQUID) (A1P)	Y2S	SOLENOID VALVE (4 WAY VALVE) (PIPE) (A1P)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET) (A1P)	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R7T	THERMISTOR (HEAT EXC. LIQUID) (A1P)	Y3S	SOLENOID VALVE (4 WAY VALVE) (HEAT EXC.) (A1P)
		K6R	MAGNETIC RELAY (Y7S) (A2P)	R8T	THERMISTOR (SUCTION) (A2P)	Y4S	SOLENOID VALVE (RMTL) (A1P)
C1	CAPACITOR	K7R	MAGNETIC RELAY (E1HC) (A1P)	R9T	THERMISTOR (LIQUID) (A2P)	Y5S	SOLENOID VALVE (HOT GAS) (A2P)
E1HC, E2HC	CRANKCASE HEATER (A1P)	K8R	MAGNETIC RELAY (E2HC) (A1P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)	Y6S	SOLENOID VALVE (EV BYPASS) (A2P)
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P)	K11R	MAGNETIC RELAY (Y4S) (A1P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)	Y7S	SOLENOID VALVE (RMTO) (A2P)
F1U	FUSE (T, 3.15A, 250V) (A2P)	K84R	MAGNETIC RELAY (CURRENT LIMITING) (A3P)	S1PH, S2PH	PRESSURE SWITCH (HIGH) (A1P)	Y8S	SOLENOID VALVE (RMTT) (A2P)
F1U	FUSE (16A, DC450V) (A3P)	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, A3P)	V1R	DIODE BRIDGE (A3P)		
HAP	PILOT LAMP (SERVICE MONITOR:GREEN) (A1P) (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)		
K2M	MAGNETIC CONTACTOR (M2C)	R112, R502	RESISTOR (CURRENT SENSOR) (A3P)	X3A	CONNECTOR (Y1E)		CONNECTOR FOR OPTIONAL PARTS
K1R	MAGNETIC RELAY (K2M) (A1P)	R1T	THERMISTOR (AIR) (A1P)	X1M	TERMINAL STRIP (POWER SUPPLY)	X7A	OPERATION OUTPUT(A2P)
K1R	MAGNETIC RELAY (Y5S) (A2P)	R1T	THERMISTOR (FIN) (A3P)	X1M	TERMINAL STRIP (CONTROL) (A1P)	X9A	POWER SUPPLY(ADOPTER)(A2P)

NOTES)
1. THIS WIRING DIAGRAM IS APPLIED ONLY TO THE OUTDOOR UNIT.
2. : FIELD WIRING.
3. : TERMINAL STRIP : CONNECTOR : TERMINAL
4. : PROTECTIVE GROUND (SCREW)
5. WHEN USING THE OPTIONAL ADAPTOR, REFER TO THE INSTALLATION MANUAL OF THE OPTIONAL ADAPTOR.
6. FOR CONNECTION WIRING TO INDOOR-OUTDOOR TRANSMISSION F1-F2, OUTDOOR-OUTDOOR TRANSMISSION F1-F2, OUTDOOR-MULTI TRANSMISSION Q1-Q2, REFER TO THE INSTALLATION MANUAL.
7. HOW TO USE BS1~5, REFER TO "SERVICE PRECAUTION" LABEL ON ELECTRICAL COMPONENTS BOX COVER.
8. WHEN OPERATING, DON'T SHORTCIRCUIT THE PROTECTION DEVICE (S1PH, S2PH).
9. COLORS BLK : BLACK RED : RED BLU : BLUE WHT : WHITE GRN : GREEN.

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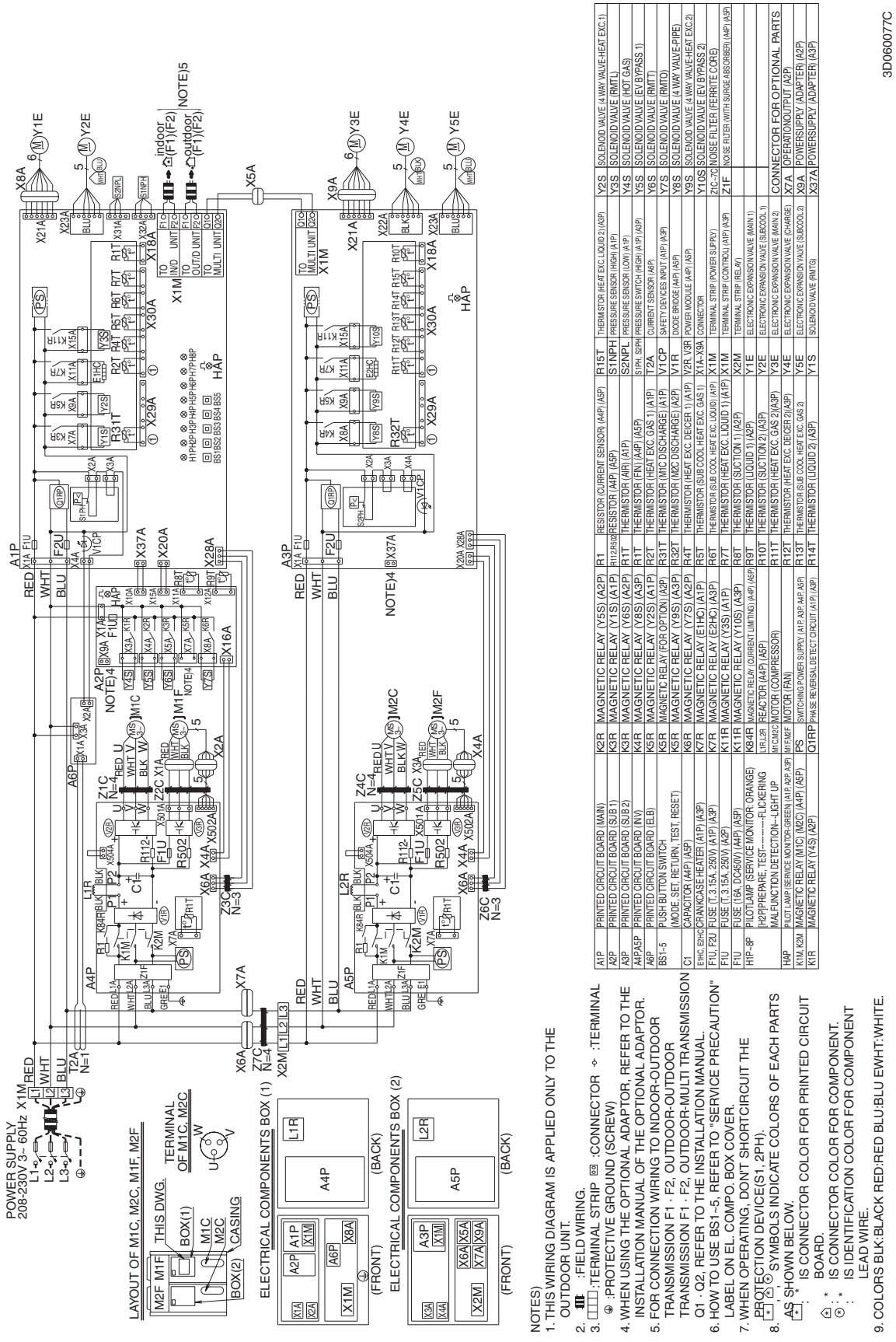
Heat Pump 230V, RXYQ144PTJU



A1P	PRINTED CIRCUIT BOARD (MAIN)	K2R	MAGNETIC RELAY (Y5S) (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)	R112,502	RESISTOR (A4P) (A5P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)	Y3S	SOLENOID VALVE (RMTL)
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)	R1T	THERMISTOR (FIN) (A4P) (A5P)	S3PH, S2PH	PRESSURE SWITCH (HIGH) (A1P) (A3P)	Y5S	SOLENOID VALVE (EV BYPASS 1)
A6P	PRINTED CIRCUIT BOARD (ELB)	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R2T	THERMISTOR (HEAT EXC. GAS 1) (A1P)	T2A	CURRENT SENSOR (A6P)	Y6S	SOLENOID VALVE (RMTT)
BS1-5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)	K5R	MAGNETIC RELAY (Y9S) (A3P)	R31T	THERMISTOR (MTC DISCHARGE) (A1P)	V1CP	SAFETY DEVICES INPUT (A1P) (A3P)	Y7S	SOLENOID VALVE (RMTO)
C1	CAPACITOR (A4P) (A5P)	K5R	MAGNETIC RELAY (Y7S) (A2P)	R32T	THERMISTOR (M2C DISCHARGE) (A2P)	V1R	DIODE BRIDGE (A4P) (A5P)	Y8S	SOLENOID VALVE (4 WAY VALVE-P.PIPE)
E1HC, E2HC	CRANKCASE HEATER (A1P) (A3P)	K6R	MAGNETIC RELAY (E1HC) (A1P)	R4T	THERMISTOR (HEAT EXC. DEICER 1) (A1P)	V2R, V3R	POWER MODULE (A4P) (A5P)	Y9S	SOLENOID VALVE (4 WAY VALVE-HEAT EXC.2)
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P) (A3P)	K7R	MAGNETIC RELAY (E2HC) (A3P)	R5T	THERMISTOR (SUB COOL HEAT EXC. GAS 1)	X1A-X9A	CONNECTOR	Y10S	SOLENOID VALVE (EV BYPASS 2)
F1U	FUSE (T, 3.15A, 250V) (A2P)	K11R	MAGNETIC RELAY (Y5S) (A1P)	R6T	THERMISTOR (SUB COOL HEAT EXC. LIQUID) (A1P)	X1M	TERMINAL STRIP (POWER SUPPLY)	Z1C -Z7C	NOISE FILTER (FERRITE CORE)
F1U	FUSE (T, 3.15A, 250V) (A3P)	K11R	MAGNETIC RELAY (Y10S) (A3P)	R7T	THERMISTOR (HEAT EXC. LIQUID 1) (A1P)	X1M	TERMINAL STRIP (CONTROL) (A1P) (A3P)	Z1F	NOISE FILTER (WITH SURGE ABSORBER) (A4P) (A5P)
F1U	FUSE (10A, DC450V) (A4P) (A5P)	K11R	MAGNETIC RELAY (Y10S) (A3P)	R8T	THERMISTOR (SUCTION 1) (A2P)	X2M	TERMINAL STRIP (RELAY)		
H1P-8P	PILOT LAMP (SERVICE MONITOR: ORANGE) (H2P,H3P:REPAIRE, 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
HAP	PILOT LAMP (SERVICE MONITOR-GREEN) (A1P, A2P, A3P)	M1F,M2F	MOTOR (FAN)	R12T	THERMISTOR (HEAT EXC. DEICER 2) (A3P)	Y4E	ELECTRONIC EXPANSION VALVE (CHARGE)	X7A	OPERATIONOUTPUT (A2P)
K1M, K2M	MAGNETIC RELAY (M1C), (M2C) (A4P) (A5P)	PS	SWITCHING POWER SUPPLY (A1P, A2P, A4P, A5P)	R13T	THERMISTOR (SUB COOL HEAT EXC. GAS 2)	Y5E	ELECTRONIC EXPANSION VALVE (SUBCOOL 2)	X9A	POWERSUPPLY (ADAPTER) (A2P)
K1R	MAGNETIC RELAY (Y4S) (A2P)	Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P) (A3P)	R14T	THERMISTOR (LIQUID 2) (A3P)	Y1S	SOLENOID VALVE (RMTG)	X37A	POWERSUPPLY (ADAPTER) (A3P)

NOTES)
1. THIS WIRING DIAGRAM IS APPLIED ONLY TO THE OUTDOOR UNIT.
2. : FIELD WIRING.
3. : TERMINAL STRIP : CONNECTOR : TERMINAL : PROTECTIVE GROUND (SCREW)
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 EL. COMPO. BOX COVER.
7. WHEN OPERATING, DONT SHORTCIRCUIT THE PROTECTION DEVICE(S1, 2PH).
8. : SYMBOLS INDICATE COLORS OF EACH PARTS AS SHOWN BELOW.
   : IS CONNECTOR COLOR FOR PRINTED CIRCUIT BOARD.
   : IS CONNECTOR COLOR FOR COMPONENT.
   : IS IDENTIFICATION COLOR FOR COMPONENT LEAD WIRE.
9. COLORS BLK:BLACK RED:RED BLU:BLU EWHT:WHITE.

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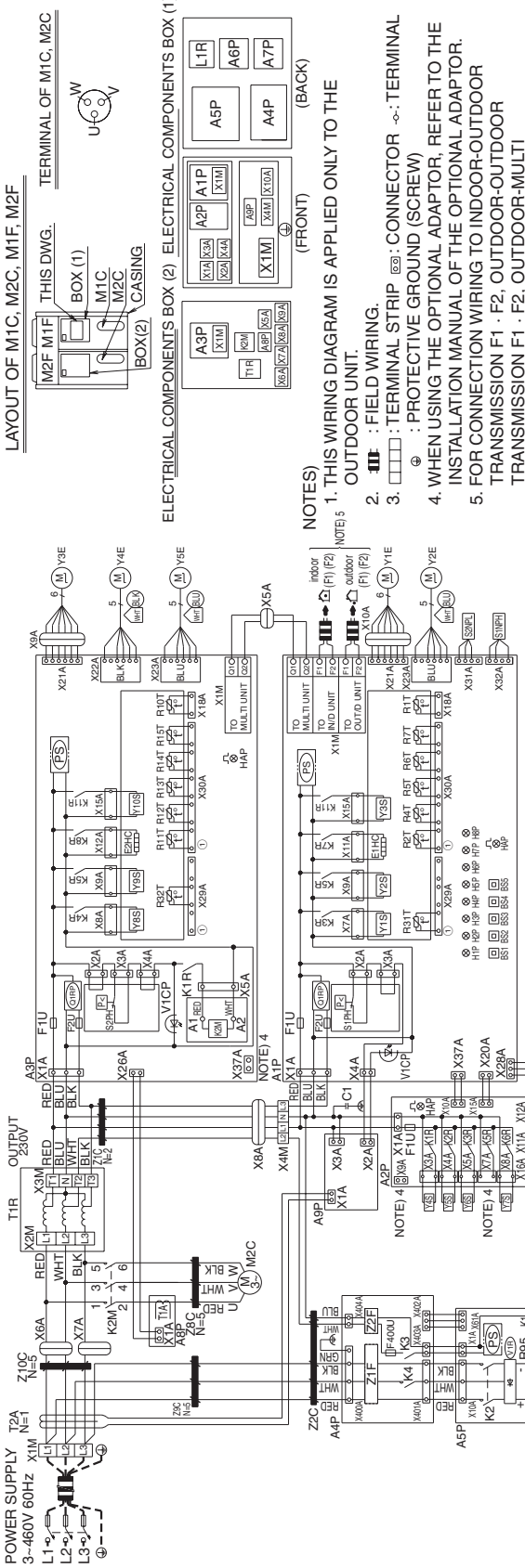
Heat Recovery 460V, REYQ72, 96, 120PYDN



A1P	PRINTED CIRCUIT BOARD (MAIN)	K3	MAGNETIC RELAY (A4P)	M1C, M2C	MOTOR (COMPRESSOR)	R13T	THERMISTOR (SUB COOL HEAT EXC. GAS 2) (A3P)	Y3E	ELECTRONIC EXPANSION VALVE (MAIN 2) (A3P)
A2P	PRINTED CIRCUIT BOARD (SUB)	K4	MAGNETIC CONTACTOR (M1C) (A4P)	M1F, M2F	MOTOR (FAN)	R14T	THERMISTOR (LIQUID 2) (A3P)	Y4E	ELECTRONIC EXPANSION VALVE (CHARGE) (A3P)
A3P	PRINTED CIRCUIT BOARD (SUB2)	K2M	MAGNETIC RELAY (M2C)	PS	SWITCHING POWER SUPPLY (A1P, A9P, A5P)	R15T	THERMISTOR (HEAT EXC. LIQUID 2) (A3P)	Y5E	ELECTRONIC EXPANSION VALVE (SUBCOOL 2) (A3P)
A4P	PRINTED CIRCUIT BOARD (NOISE FILTER)	H1P~8P	PILOT LAMP (SERVICE MONITOR - ORANGE) (A1P)	Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P) (A3P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)	Y1S	SOLENOID VALVE (RMTG) (A1P)
A5P	PRINTED CIRCUIT BOARD (INV)		PILOT LAMP (SERVICE MONITOR - GREEN) (A1P) (A2P) (A3P)	R10	RESISTOR (CURRENT SENSOR) (A6P) (A7P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)	Y2S	SOLENOID VALVE (4WAY VALVE) (HEAT EXC. 1) (A1P)
A6P	PRINTED CIRCUIT BOARD (FAN)		[H2P] PREPARE TEST ---------- FLICKERING MALFUNCTION DETECTION -- LIGHT UP	R50, R59	RESISTOR (A5P)	S1PH	PRESSURE SWITCH (HIGH) (A1P)	Y3S	SOLENOID VALVE (RMTL) (A1P)
A7P	PRINTED CIRCUIT BOARD (FAN)	HAP		R90	RESISTOR (CURRENT SENSOR) (A5P)	S2PH	PRESSURE SWITCH (HIGH) (A3P)	Y4S	SOLENOID VALVE (HOT GAS) (A2P)
A8P	PRINTED CIRCUIT BOARD (CURRENT SENSOR)	K1R	MAGNETIC RELAY (Y4S) (A2P)	R95	RESISTOR (CURRENT LIMITING) (A5P)	T1A	CURRENT SENSOR (A8P)	Y5S	SOLENOID VALVE (EV BYPASS 1) (A2P)
A9P	PRINTED CIRCUIT BOARD (GROUND LEAKAGE DETECTOR)	K1R	MAGNETIC RELAY (K2M) (A3P)	R1T	THERMISTOR (AIR) (A1P)	T2A	CURRENT SENSOR (A9P)	Y6S	SOLENOID VALVE (RMTT) (A2P)
		K2R	MAGNETIC RELAY (Y5S) (A2P)	R1T	THERMISTOR (FIN) (A5P)	T1R	TRANSFORMER (460V/230V)	Y7S	SOLENOID VALVE (RMTO) (A2P)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)	K3R	MAGNETIC RELAY (Y1S) (A1P)	R2T	THERMISTOR (HEAT EXC. GAS 1) (A1P)	V1CP	SAFETY DEVICES INPUT (A1P) (A3P)	Y8S	SOLENOID VALVE (4 WAY VALVE) (PIPE) (A3P)
		K3R	MAGNETIC RELAY (Y6S) (A2P)	R31T	THERMISTOR (M1C DISCHARGE) (A1P)	V1R	DIODE BRIDGE (A5P)	Y9S	SOLENOID VALVE (4WAY VALVE) (HEAT EXC. 2) (A2P)
C1	CAPACITOR	K4R	MAGNETIC RELAY (Y8S) (A3P)	R32T	THERMISTOR (M2C DISCHARGE) (A3P)	V1R	POWER MODULE (A6P) (A7P)	Y10S	SOLENOID VALVE (EV BYPASS 2) (A3P)
C63, C66	CAPACITOR	K5R	MAGNETIC RELAY (Y2S) (A1P)	R4T	THERMISTOR (HEAT EXC. DEICER 1) (A1P)	V2R	POWER MODULE (A5P)	Z1C~10C	NOISE FILTER (FERRITE CORE)
E1HC	CRANKCASE HEATER (A1P)	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 SURGE ABSORBER) (A4P)
E2HC	CRANKCASE HEATER (A3P)	K5R	MAGNETIC RELAY (Y9S) (A3P)	R6T	THERMISTOR (SUB COOL HEAT EXC. LIQUID 1) (A1P)	X1M	TERMINAL STRIP (CONTROL) (A1P) (A3P)		
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P) (A3P)	K6R	MAGNETIC RELAY (Y7S) (A2P)	R7T	THERMISTOR (HEAT EXC. LIQUID 1) (A1P)	X2M	TERMINAL STRIP (POWER SUPPLY) (T1R)		
F1U	FUSE (T, 3.15A, 250V) (A2P)	K7R	MAGNETIC RELAY (E1HC) (A1P)	R8T	THERMISTOR (SUCTION 1) (A2P)	X3M	TERMINAL STRIP (POWER SUPPLY) (T1R)		
F1U	FUSE (6A, DC650V) (A6P) (A7P)	K8R	MAGNETIC RELAY (E2HC) (A3P)	R9T	THERMISTOR (LIQUID 1) (A2P)	X4M	TERMINAL STRIP (RELAY)		CONNECTOR FOR OPTIONAL PARTS
F400U	FUSE (T, 6.3A, 250V) (A4P)	K11R	MAGNETIC RELAY (Y3S) (A1P)	R10T	THERMISTOR (SUCTION 2) (A3P)	X1A~X10A	CONNECTOR	X7A	OPERATION OUTPUT (A2P)
K1	MAGNETIC RELAY (A5P)	K11R	MAGNETIC RELAY (Y10S) (A3P)	R11T	THERMISTOR (HEAT EXC. GAS 2) (A3P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN 1) (A1P)	X9A	POWER SUPPLY (ADAPTER) (A2P)
K2	MAGNETIC CONTACTOR (M1C) (A5P)	L1R	REACTOR	R12T	THERMISTOR (HEAT EXC. DEICER 2) (A3P)	Y2E	ELECTRONIC EXPANSION VALVE (SUBCOOL 1) (A1P)	X37A	POWER SUPPLY (ADAPTER) (A3P)

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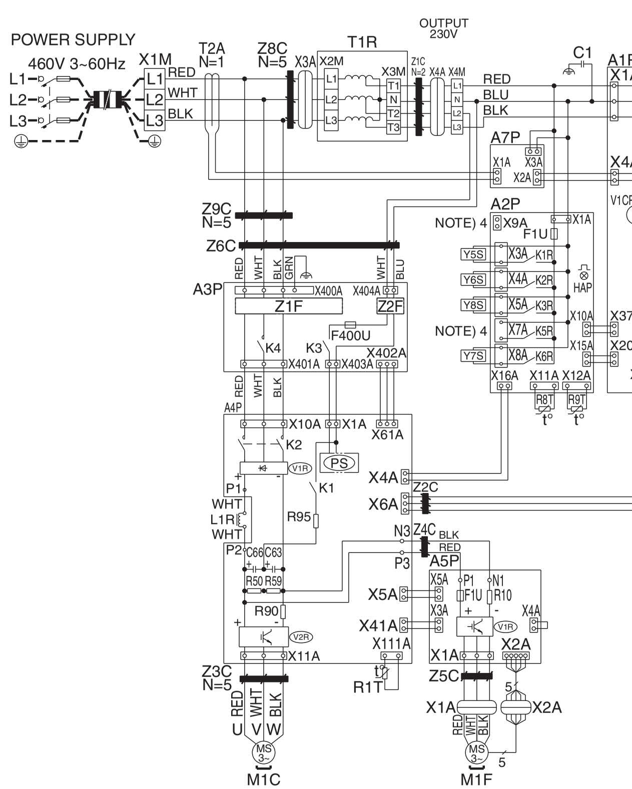
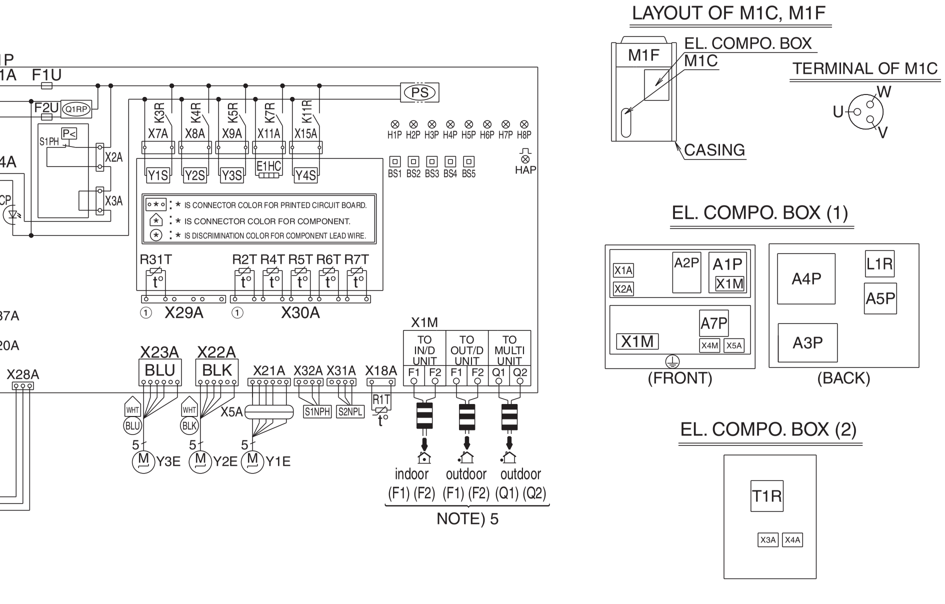
Heat Recovery 460V, REMQ72PYDN





A1P	PRINTED CIRCUIT BOARD (MAIN)	K3	MAGNETIC RELAY (A3P)	R1T	THERMISTOR (FIN) (A4P)	X1M	TERMINAL STRIP (POWER SUPPLY)
A2P	PRINTED CIRCUIT BOARD (SUB)	K4	MAGNETIC CONTACTOR (M1C) (A3P)	R2T	THERMISTOR (HEAT EXC. GAS) (A1P)	X1M	TERMINAL STRIP (CONTROL) (A1P)
A3P	PRINTED CIRCUIT BOARD (NOISE FILTER)	K1R	MAGNETIC RELAY (Y5S) (A2P)	R31T	THERMISTOR (M1C DISCHARGE) (A1P)	X2M	TERMINAL STRIP (POWER SUPPLY) (T1R)
A4P	PRINTED CIRCUIT BOARD (INV)	K2R	MAGNETIC RELAY (Y6S) (A2P)	R4T	THERMISTOR (HEAT EXC. DEICER) (A1P)	X3M	TERMINAL STRIP (POWER SUPPLY) (T1R)
A5P	PRINTED CIRCUIT BOARD (FAN)	K3R	MAGNETIC RELAY (Y1S) (A1P)	R5T	THERMISTOR (SUB COOL HEAT EXC. GAS) (A1P)	X4M	TERMINAL STRIP
A7P	PRINTED CIRCUIT BOARD	K3R	MAGNETIC RELAY (Y8S) (A2P)	R6T	THERMISTOR (SUB COOL HEAT EXC. LIQUID) (A1P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN) (A1P)
	(GROUND LEAKAGE DETECTOR)	K4R	MAGNETIC RELAY (Y2S) (A1P)	R7T	THERMISTOR (HEAT EXC. LIQUID) (A1P)	Y2E	ELECTRONIC EXPANSION VALVE (CHARGE) (A1P)
BS1~5	PUSH BUTTON SWITCH	K5R	MAGNETIC RELAY (Y3S) (A1P)	R8T	THERMISTOR (SUCTION) (A2P)	Y3E	ELECTRONIC EXPANSION VALVE (SUBCOOL) (A1P)
	(MODE, SET, RETURN, TEST, RESET) (A1P)	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R9T	THERMISTOR (LIQUID) (A2P)	Y1S	SOLENOID VALVE (RMTG) (A1P)
C1	CAPACITOR	K6R	MAGNETIC RELAY (Y7S) (A2P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)	Y2S	SOLENOID VALVE (4 WAY VALVE) (PIPE) (A1P)
C63, C66	CAPACITOR (A4P)	K7R	MAGNETIC RELAY (E1HC) (A1P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)	Y3S	SOLENOID VALVE (4 WAY VALVE) (HEAT EXC.) (A1P)
E1HC	CRANKCASE HEATER (A1P)	K11R	MAGNETIC RELAY (Y4S) (A1P)	S1PH	PRESSURE SWITCH (HIGH) (A1P)	Y4S	SOLENOID VALVE (RMTL) (A1P)
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P)	L1R	REACTOR (A4P)	T1R	TRANSFORMER (460V/230V)	Y5S	SOLENOID VALVE (HOT GAS) (A2P)
F1U	FUSE (T, 3.15A, 250V) (A2P)	M1C	MOTOR (COMPRESSOR)	T2A	CURRENT SENSOR (A7P)	Y6S	SOLENOID VALVE (EV BYPASS) (A2P)
F1U	FUSE (8A, DC650V) (A5P)	M1F	MOTOR (FAN)	V1CP	SAFETY DEVICES INPUT (A1P)	Y7S	SOLENOID VALVE (RMTO) (A2P)
F400U	FUSE (T, 6.3A, 250V) (A3P)	PS	SWITCHING POWER SUPPLY (A1P, A4P)	V1R	DIODE BRIDGE (A4P)	Y8S	SOLENOID VALVE (RMTT) (A2P)
H1P~8P	PILOT LAMP (SERVICE MONITOR : ORANGE) (A1P)	Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P)	V1R	POWER MODULE (A5P)	Z1C~9C	NOISE FILTER (FERRITE CORE)
	[H2P] PREPARE, TEST ------------------ FLICKERING	R10	RESISTOR (CURRENT SENSOR) (A5P)	V2R	POWER MODULE (A4P)	Z1F, Z2F	NOISE FILTER (WITH SURGE ABSORBER) (A3P)
	MALFUNCTION DETECTION --- LIGHT UP	R50, R59	RESISTOR (A4P)	X1A, X2A	CONNECTOR (M1F)		
HAP	PILOT LAMP (SERVICE MONITOR-GREEN) (A1P) (A2P)	R90	RESISTOR (CURRENT SENSOR) (A4P)	X3A	CONNECTOR	CONNECTOR FOR OPTIONAL PARTS	
K1	MAGNETIC RELAY (A4P)	R95	RESISTOR (CURRENT LIMITING) (A4P)	X4A	CONNECTOR	X7A	OPERATION OUTPUT (A2P)
K2	MAGNETIC CONTACTOR (M1C) (A4P)	R1T	THERMISTOR (AIR) (A1P)	X5A	CONNECTOR	X9A	POWER SUPPLY (ADOPTER) ?(A2P)

NOTES)

1. THIS WIRING DIAGRAM IS APPLIED ONLY TO THE OUTDOOR UNIT.
2. ▬▮▬ : FIELD WIRING.
3. □□□□ : TERMINAL STRIP ▭ : CONNECTOR -○-: TERMINAL
   ⏚ : PROTECTIVE GROUND (SCREW)
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 COVER.
7. WHEN OPERATING, DON' T SHORTCIRCUIT THE PROTECTION DEVICE (S1PH, S2PH).
8. COLORS BLK : BLACK RED : RED BLU : BLUE WHT : WHITE GRN : GREEN.

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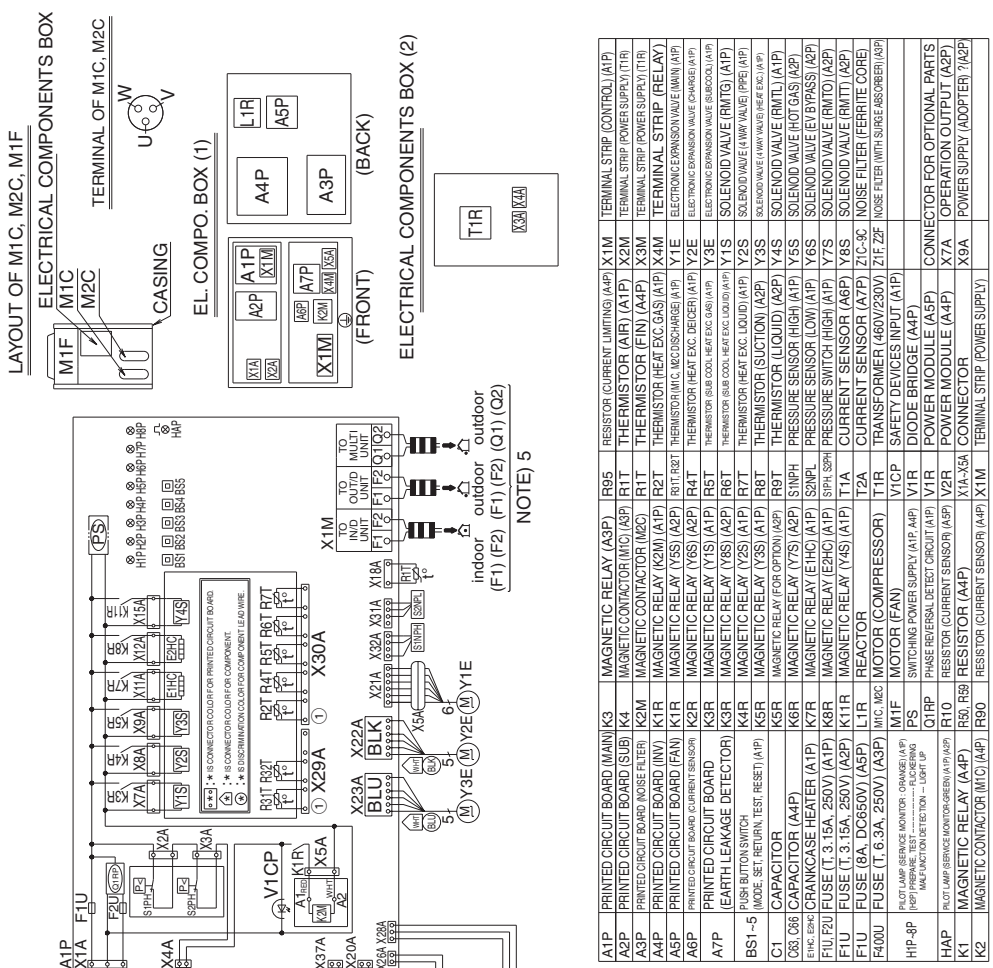
Heat Recovery 460V
REMQ96, 120PYDN



A1P	PRINTED CIRCUIT BOARD (MAIN)	K3	MAGNETIC RELAY (A3P)	R95	RESISTOR (CURRENT LIMITING) (A4P)	X1M	TERMINAL STRIP (CONTROL) (A1P)
A2P	PRINTED CIRCUIT BOARD (SUB)	K4	MAGNETIC CONTACTOR (M1C) (A3P)	R1T	THERMISTOR (AIR) (A1P)	X2M	TERMINAL STRIP (POWER SUPPLY) (T1R)
A3P	PRINTED CIRCUIT BOARD (NOISE FILTER)	K2M	MAGNETIC CONTACTOR (M2C)	R1T	THERMISTOR (FIN) (A4P)	X3M	TERMINAL STRIP (POWER SUPPLY) (T1R)
A4P	PRINTED CIRCUIT BOARD (INV)	K1R	MAGNETIC RELAY (K2M) (A1P)	R2T	THERMISTOR (HEAT EXC.GAS) (A1P)	X4M	TERMINAL STRIP (RELAY)
A5P	PRINTED CIRCUIT BOARD (FAN)	K1R	MAGNETIC RELAY (Y5S) (A2P)	R3T R2T	THERMISTOR (M1C, M2C)(DISCHARGE) (A1P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN) (A1P)
A6P	PRINTED CIRCUIT BOARD (CURRENT SENSOR)	K2R	MAGNETIC RELAY (Y6S) (A2P)	R4T	THERMISTOR (HEAT EXC. DEICER) (A1P)	Y2E	ELECTRONIC EXPANSION VALVE (CHARGE) (A1P)
A7P	PRINTED CIRCUIT BOARD (EARTH LEAKAGE DETECTOR)	K3R	MAGNETIC RELAY (Y1S) (A1P)	R5T	THERMISTOR (SUB COOL HEAT EXC. GAS) (A1P)	Y3E	ELECTRONIC EXPANSION VALVE (SUBCOOL) (A1P)
		K3R	MAGNETIC RELAY (Y8S) (A2P)	R6T	THERMISTOR (SUB COOL HEAT EXC. LIQUID) (A1P)	Y1S	SOLENOID VALVE (RMTG) (A1P)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET) (A1P)	K4R	MAGNETIC RELAY (Y2S) (A1P)	R7T	THERMISTOR (HEAT EXC. LIQUID) (A1P)	Y2S	SOLENOID VALVE (4 WAY VALVE) (PIPE) (A1P)
		K5R	MAGNETIC RELAY (Y3S) (A1P)	R8T	THERMISTOR (SUCTION) (A2P)	Y3S	SOLENOID VALVE (4 WAY VALVE) (HEAT EXC.) (A1P)
C1	CAPACITOR	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R9T	THERMISTOR (LIQUID) (A2P)	Y4S	SOLENOID VALVE (RMTL) (A1P)
C63, C66	CAPACITOR (A4P)	K6R	MAGNETIC RELAY (Y7S) (A2P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)	Y5S	SOLENOID VALVE (HOT GAS) (A2P)
E1HC, E2HC	CRANKCASE HEATER (A1P)	K7R	MAGNETIC RELAY (E1HC) (A1P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)	Y6S	SOLENOID VALVE (EV BYPASS) (A2P)
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P)	K8R	MAGNETIC RELAY (E2HC) (A1P)	S1PH, S2PH	PRESSURE SWITCH (HIGH) (A1P)	Y7S	SOLENOID VALVE (RMTO) (A2P)
F1U	FUSE (T, 3.15A, 250V) (A2P)	K11R	MAGNETIC RELAY (Y4S) (A1P)	T1A	CURRENT SENSOR (A6P)	Y8S	SOLENOID VALVE (RMTT) (A2P)
F1U	FUSE (8A, DC650V) (A5P)	L1R	REACTOR	T2A	CURRENT SENSOR (A7P)	Z1C-3C	NOISE FILTER (FERRITE CORE)
F400U	FUSE (T, 6.3A, 250V) (A3P)	M1C, M2C	MOTOR (COMPRESSOR)	T1R	TRANSFORMER (460V/230V)	Z1F, Z2F	NOISE FILTER (WITH SURGE ABSORBER) (A3P)
H1P~8P	PILOT LAMP (SERVICE MONITOR : ORANGE) (A1P) (H2P) PREPARE TEST ---------- FLICKERING MALFUNCTION DETECTION -- LIGHT UP	M1F	MOTOR (FAN)	V1CP	SAFETY DEVICES INPUT (A1P)		
		PS	SWITCHING POWER SUPPLY (A1P, A4P)	V1R	DIODE BRIDGE (A4P)		
		Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P)	V1R	POWER MODULE (A5P)		CONNECTOR FOR OPTIONAL PARTS
HAP	PILOT LAMP (SERVICE MONITOR-GREEN) (A1P) (A5P)	R10	RESISTOR (CURRENT SENSOR) (A5P)	V2R	POWER MODULE (A4P)	X7A	OPERATION OUTPUT (A2P)
K1	MAGNETIC RELAY (A4P)	R90, R95	RESISTOR (A4P)	X1A~X5A	CONNECTOR	X9A	POWER SUPPLY (ADOPTER) *(A2P)
K2	MAGNETIC CONTACTOR (M1C) (A4P)	R90	RESISTOR (CURRENT SENSOR) (A4P)	X1M	TERMINAL STRIP (POWER SUPPLY)		

NOTES)
1. THIS WIRING DIAGRAM IS APPLIED ONLY TO THE OUTDOOR UNIT.
2. : FIELD WIRING.
3. □□□□ : TERMINAL STRIP , : CONNECTOR , : TERMINAL , : PROTECTIVE GROUND (SCREW)
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 Q1 • Q2, REFER TO THE INSTALLATION MANUAL.
6. HOW TO USE BS1~5, REFER TO "SERVICE PRECAUTION" LABEL ON ELECTRICAL COMPONENTS BOX COVER.
7. WHEN OPERATING, DON' T SHORTCIRCUIT THE PROTECTION DEVICE (S1PH, S2PH).
8. COLORS BLK : BLACK RED : RED BLU : BLUE WHT : WHITE GRN : GREEN.

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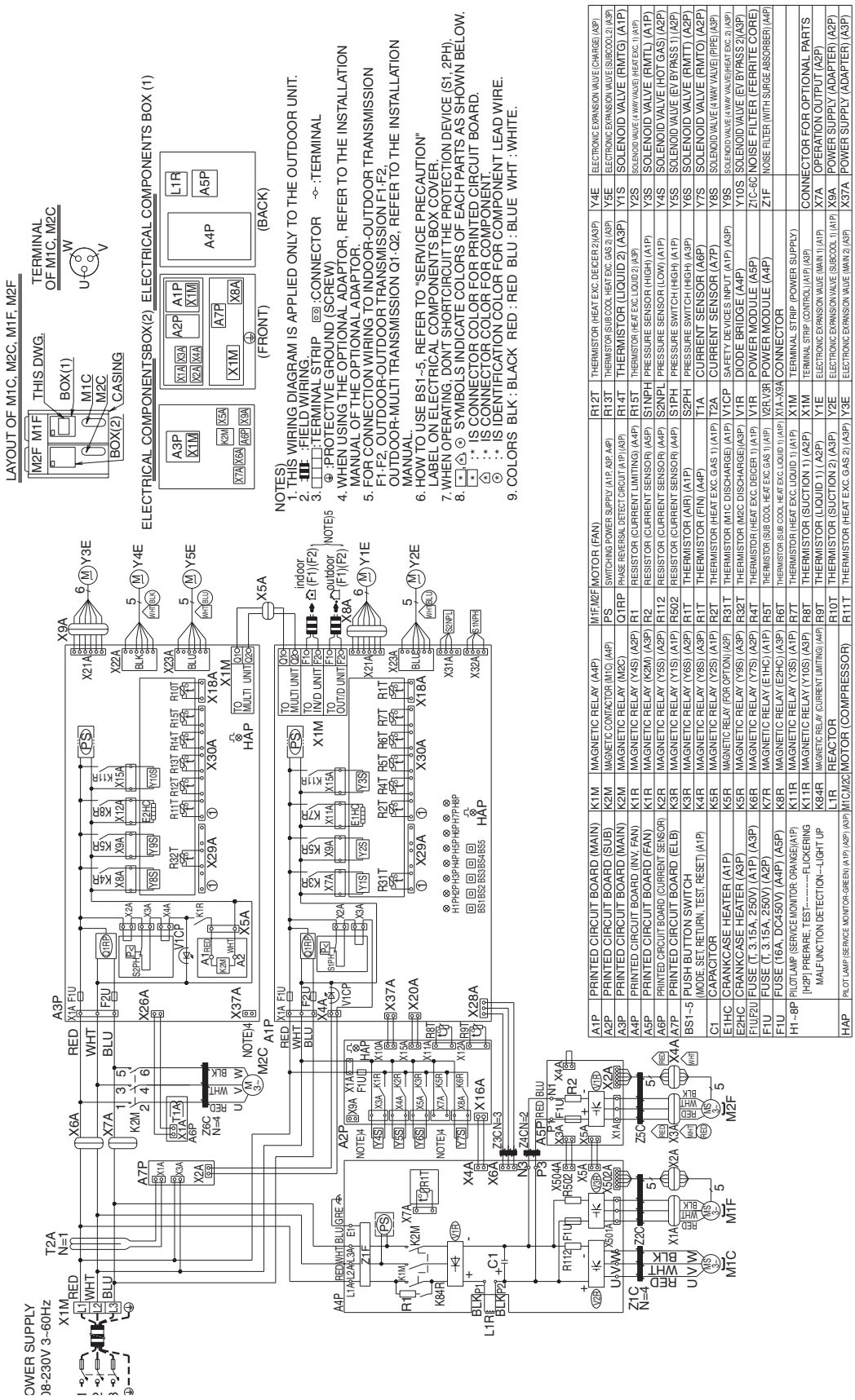
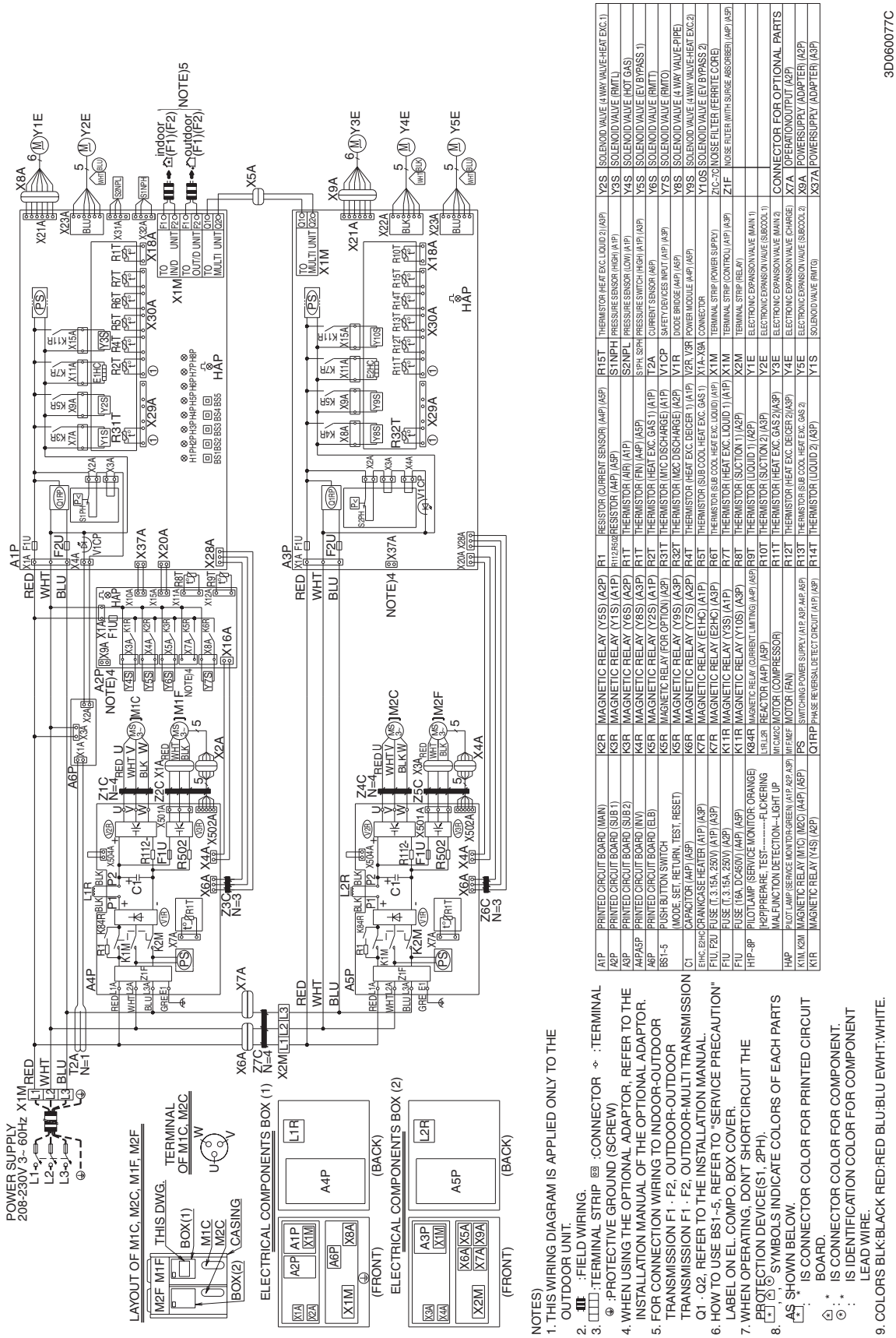
Heat Recovery 230V
REYQ72, 96, 120PTJU



A1P	PRINTED CIRCUIT BOARD (MAIN)	K1M	MAGNETIC RELAY (A4P)	M1F,M2F	MOTOR (FAN)	R12T	THERMISTOR (HEAT EXC. DEICER 2) (A3P)	Y4E	ELECTRONIC EXPANSION VALVE (CHARGE) (A3P)
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) (A3P)	Y5E	ELECTRONIC EXPANSION VALVE (SUBCOOL 2) (A3P)
A3P	PRINTED CIRCUIT BOARD (MAIN)	K2M	MAGNETIC RELAY (M2C)	Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P) (A3P)	R14T	THERMISTOR (LIQUID 2) (A3P)	Y1S	SOLENOID VALVE (RMTG) (A1P)
A4P	PRINTED CIRCUIT BOARD (INV. FAN)	K1R	MAGNETIC RELAY (Y4S) (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 (RMTL) (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 (ELB)	K3R	MAGNETIC RELAY (Y1S) (A1P)	R502	RESISTOR (CURRENT SENSOR) (A4P)	S1PH	PRESSURE SWITCH (HIGH) (A1P)	Y5S	SOLENOID VALVE (EV 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 (RMTT) (A2P)
C1	CAPACITOR	K4R	MAGNETIC RELAY (Y8S) (A3P)	R1T	THERMISTOR (FIN) (A4P)	T1A	CURRENT SENSOR (A6P)	Y7S	SOLENOID VALVE (RMTO) (A2P)
E1HC	CRANKCASE HEATER (A1P)	K5R	MAGNETIC RELAY (Y2S) (A1P)	R2T	THERMISTOR (HEAT EXC. GAS 1) (A1P)	T2A	CURRENT SENSOR (A7P)	Y8S	SOLENOID VALVE (4 WAY VALVE) (PIPE) (A3P)
E2HC	CRANKCASE HEATER (A3P)	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R31T	THERMISTOR (M1C DISCHARGE) (A1P)	V1CP	SAFETY DEVICES INPUT (A1P) (A3P)	Y9S	SOLENOID VALVE (4 WAY VALVE)(HEAT EXC. 2) (A3P)
F1U,F2U	FUSE (T, 3.15A, 250V) (A1P) (A3P)	K5R	MAGNETIC RELAY (Y9S) (A3P)	R32T	THERMISTOR (M2C DISCHARGE) (A3P)	Y1R	DIODE BRIDGE (A4P)	Y10S	SOLENOID VALVE (EV BYPASS 2) (A3P)
F1U	FUSE (T, 3.15A, 250V) (A2P)	K6R	MAGNETIC RELAY (Y7S) (A2P)	R4T	THERMISTOR (HEAT EXC. DEICER 1) (A1P)	Y1R	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 SURGE 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		
H1~8P	PILOT LAMP (SERVICE MONITOR: ORANGE) (A1P)	K11R	MAGNETIC RELAY (Y3S) (A1P)	R7T	THERMISTOR (HEAT EXC. LIQUID 1) (A1P)	X1M	TERMINAL STRIP (POWER SUPPLY)		
	[H2P] PREPARE, TEST----------FLICKERING	K11R	MAGNETIC RELAY (Y10S) (A3P)	R8T	THERMISTOR (SUCTION 1) (A2P)	X1M	TERMINAL STRIP (CONTROL) (A1P) (A3P)	CONNECTOR FOR OPTIONAL PARTS	
	MALFUNCTION DETECTION---LIGHT UP	K84R	MAGNETIC RELAY (CURRENT LIMITING) (A4P)	R9T	THERMISTOR (LIQUID 1) (A2P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN 1) (A1P)	X7A	OPERATION OUTPUT (A2P)
		L1R	REACTOR	R10T	THERMISTOR (SUCTION 2) (A3P)	Y2E	ELECTRONIC EXPANSION VALVE (SUBCOOL 1) (A1P)	X9A	POWER SUPPLY (ADAPTER) (A2P)
HAP	PILOT LAMP (SERVICE MONITOR: GREEN) (A1P) (A3P)	M1C,M2C	MOTOR (COMPRESSOR)	R11T	THERMISTOR (HEAT EXC. GAS 2) (A3P)	Y3E	ELECTRONIC EXPANSION VALVE (MAIN 2) (A3P)	X37A	POWER SUPPLY (ADAPTER) (A3P)

Heat Recovery 230V, REYQ144PTJU



A1P	PRINTED CIRCUIT BOARD (MAIN)	K2R	MAGNETIC RELAY (Y5S) (A2P)	R1	RESISTOR (CURRENT SENSOR) (A4P) (A5P)	R15T	THERMISTOR (HEAT EXC. LIQUID 2) (A3P)
A2P	PRINTED CIRCUIT BOARD (SUB 1)	K3R	MAGNETIC RELAY (Y1S) (A1P)	H112R502	RESISTOR (A4P) (A5P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)
A3P	PRINTED CIRCUIT BOARD (SUB 2)	K3R	MAGNETIC RELAY (Y6S) (A2P)	R1T	THERMISTOR (AIR) (A1P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)
A4P,A5P	PRINTED CIRCUIT BOARD (INV)	K4R	MAGNETIC RELAY (Y8S) (A3P)	R1T	THERMISTOR (FIN) (A4P) (A5P)	S3PH, S2PH	PRESSURE SWITCH (HIGH) (A1P) (A3P)
A6P	PRINTED CIRCUIT BOARD (ELB)	K5R	MAGNETIC RELAY (Y2S) (A1P)	R2T	THERMISTOR (HEAT EXC. GAS 1) (A1P)	T2A	CURRENT SENSOR (A6P)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET)	K5R	MAGNETIC RELAY (Y9S) (A3P)	R31T	THERMISTOR (M1C DISCHARGE) (A1P)	V1CP	SAFETY DEVICES INPUT (A1P) (A3P)
C1	CAPACITOR (A4P) (A5P)	K6R	MAGNETIC RELAY (Y7S) (A2P)	R32T	THERMISTOR (M2C DISCHARGE) (A2P)	V1R	DIODE BRIDGE (A4P) (A5P)
E1HC, E2HC	CRANKCASE HEATER (A1P) (A3P)	K7R	MAGNETIC RELAY (E1HC) (A1P)	R4T	THERMISTOR (HEAT EXC. DEICER 1) (A1P)	V2R, V3R	POWER MODULE (A4P) (A5P)
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P) (A3P)	K7R	MAGNETIC RELAY (E2HC) (A3P)	R5T	THERMISTOR (SUB COOL HEAT EXC. GAS 1)	X1A~X9A	CONNECTOR
F1U	FUSE (T, 3.15A, 250V) (A2P)	K11R	MAGNETIC RELAY (Y3S) (A1P)	R6T	THERMISTOR (SUB COOL HEAT EXC. LIQUID) (A1P)	X1M	TERMINAL STRIP (POWER SUPPLY)
F1U	FUSE (16A, DC450V) (A4P) (A5P)	K11R	MAGNETIC RELAY (Y10S) (A3P)	R7T	THERMISTOR (HEAT EXC. LIQUID 1) (A1P)	X1M	TERMINAL STRIP (CONTROL) (A1P) (A3P)
H1P~8P	PILOTLAMP (SERVICE MONITOR: ORANGE) (H2P)PREPARE, TEST------FLICKERING MALFUNCTION DETECTION---LIGHT UP	K84R	MAGNETIC RELAY (CURRENT LIMITING) (A4P) (A5P)	R8T	THERMISTOR (SUCTION 1) (A2P)	X2M	TERMINAL STRIP (REL.A#)
		L1R,L2R	REACTOR (A4P) (A5P)	R9T	THERMISTOR (LIQUID 1) (A2P)	Y1E	ELECTRONIC EXPANSION VALVE (MAIN 1)
		M1C,M2C	MOTOR (COMPRESSOR)	R10T	THERMISTOR (SUCTION 2) (A3P)	Y2E	ELECTRONIC EXPANSION VALVE (SUBCOOL 1)
		M1F,M2F	MOTOR (FAN)	R11T	THERMISTOR (HEAT EXC. GAS 2) (A3P)	Y3E	ELECTRONIC EXPANSION VALVE (MAIN 2)
HAP	PILOT LAMP (SERVICE MONITOR-GREEN) (A1P, A2P, A3P)	PS	SWITCHING POWER SUPPLY (A1P, A2P, A4P, A5P)	R12T	THERMISTOR (HEAT EXC. DEICER 2) (A3P)	Y4E	ELECTRONIC EXPANSION VALVE (CHARGE)
K1M, K2M	MAGNETIC RELAY (M1C, M2C) (A4P) (A5P)	R13T	THERMISTOR (SUB COOL HEAT EXC. GAS 2)	Y5E	ELECTRONIC EXPANSION VALVE (SUBCOOL 2)		
K1R	MAGNETIC RELAY (Y4S) (A2P)	Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P) (A3P)	R14T	THERMISTOR (LIQUID 2) (A3P)	Y1S	SOLENOID VALVE (RMTG)

Y2S	SOLENOID VALVE (4 WAY VALVE-HEAT EXC.1)		
Y3S	SOLENOID VALVE (RMTL)		
Y4S	SOLENOID VALVE (HOT GAS)		
Y5S	SOLENOID VALVE (EV BYPASS 1)		
Y6S	SOLENOID VALVE (RMTT)		
Y7S	SOLENOID VALVE (RMTO)		
Y8S	SOLENOID VALVE (4 WAY VALVE-PIPE)		
Y9S	SOLENOID VALVE (4 WAY VALVE-HEAT EXC.2)		
Y10S	SOLENOID VALVE (EV BYPASS 2)		
Z1C~7C	NOISE FILTER (FERRITE CORE)		
Z1F	NOISE FILTER (WITH SURGE ABSORBER) (A4P) (A5P)		
	CONNECTOR FOR OPTIONAL PARTS		
X7A	OPERATIONOUTPUT (A2P)		
X9A	POWERSUPPLY (ADAPTER) (A2P)		
X37A	POWERSUPPLY (ADAPTER) (A3P)		

NOTES)
1. THIS WIRING DIAGRAM IS APPLIED ONLY TO THE OUTDOOR UNIT.
2. : FIELD WIRING.
3. : TERMINAL STRIP : CONNECTOR : TERMINAL : PROTECTIVE GROUND (SCREW)
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 EL. COMPO. BOX COVER.
7. WHEN OPERATING, DON'T SHORTCIRCUIT THE PROTECTION DEVICE(S1, 2PH).
8. : SYMBOLS INDICATE COLORS OF EACH PARTS AS SHOWN BELOW.
   : IS CONNECTOR COLOR FOR PRINTED CIRCUIT BOARD.
   : IS CONNECTOR COLOR FOR COMPONENT.
   : IS IDENTIFICATION COLOR FOR COMPONENT LEAD WIRE.
9. COLORS BLK:BLACK RED:RED BLU:BLU EWHT:WHITE.

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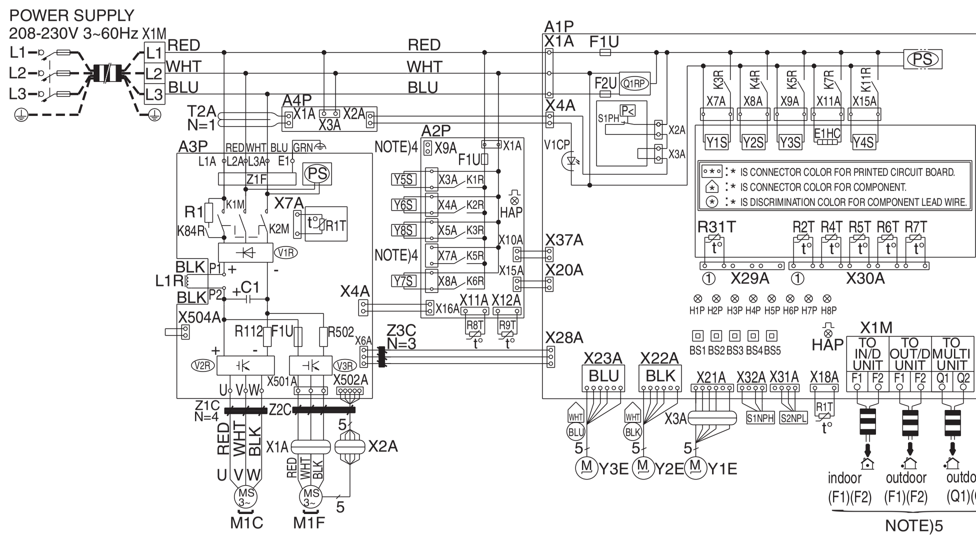
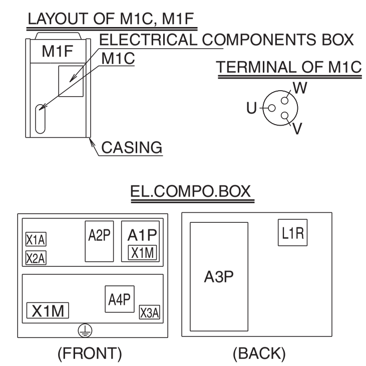
Heat Recovery 230V
REMQ72PTJU





NOTES)
1. THIS WIRING DIAGRAM IS APPLIED ONLY TO THE OUTDOOR UNIT.
2. :FIELD WIRING.
3. :TERMINAL STRIP :CONNECTOR :TERMINAL
:PROTECTIVE GROUND (SCREW)
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 COVER.
7. WHEN OPERATING, DON'T SHORTCIRCUIT THE PROTECTION DEVICE (S1PH, S2PH).
8. COLORS BLK:BLACK RED:RED BLU:BLUE WHT:WHITE GRN:GREEN.

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 (Y8S) (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. DEICER) (A1P)	Y2E	ELECTRONIC EXPANSION VALVE (CHARGE) (A1P)
A4P	PRINTED CIRCUIT BOARD (ELB)	K5R	MAGNETIC RELAY (Y3S) (A1P)	R5T	THERMISTOR (SUB COOL HEAT EXC. GAS) (A1P)	Y3E	ELECTRONIC EXPANSION VALVE (SUBCOOL) (A1P)
BS1~5	PUSH BUTTON SWITCH	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R6T	THERMISTOR (SUB COOL HEAT EXC. LIQUID) (A1P)	Y1S	SOLENOID VALVE (RMTG) (A1P)
	(MODE, SET, RETURN, TEST, RESET) (A1P)	K6R	MAGNETIC RELAY (Y7S) (A2P)	R7T	THERMISTOR (HEAT EXC. LIQUID) (A1P)	Y2S	SOLENOID VALVE (4 WAY VALVE) (PIPE) (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 (RMTL) (A1P)
F1U,F2U	FUSE (T, 3.15A ,250V) (A1P)	K84R	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 (EV BYPASS) (A2P)
F1U	FUSE (16A, DC450V) (A3P)	M1C	MOTOR (COMPRESSOR)	S1PH	PRESSURE SWITCH (HIGH) (A1P)	Y7S	SOLENOID VALVE (RMTO) (A2P)
H1P~8P	PILOT LAMP (SERVICE MONITOR: ORANGE) (A1P)	M1F	MOTOR (FAN)	T2A	CURRENT SENSOR (A4P)	Y8S	SOLENOID VALVE (RMTT)(A2P)
	[H2P] PREPARE, TEST-----------FLICKERING	PS	SWITCHING POWER SUPPLY (A1P, A3P)	V1CP	SAFETY DEVICES INPUT (A1P)	Z1C~3C	NOISE FILTER (FERRITE CORE)
	MALFUNCTION DETECTION---LIGHT UP	Q1RP	PHASE REVERSAL DETECT CIRCUIT (A1P)	V1R	POWER MODULE (A3P)	Z1F	NOISE FILTER (WITH SURGE ABSORBER) (A3P)
HAP	PILOT LAMP (SERVICE MONITOR-GREEN)(A1P) (A2P)	R1	RESISTOR (CURRENT SENSOR) (A3P)	V2R, V3R	POWER MODULE (A3P)		
K1M,K2M	MAGNETIC RELAY (M1C) (A3P)	R112,R502	RESISTOR (A3P)	X1A, X2A	CONNECTOR (M1F)	CONNECTOR FOR OPTIONAL PARTS	
K1R	MAGNETIC RELAY (Y5S) (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 (ADOPTER) (A2P)

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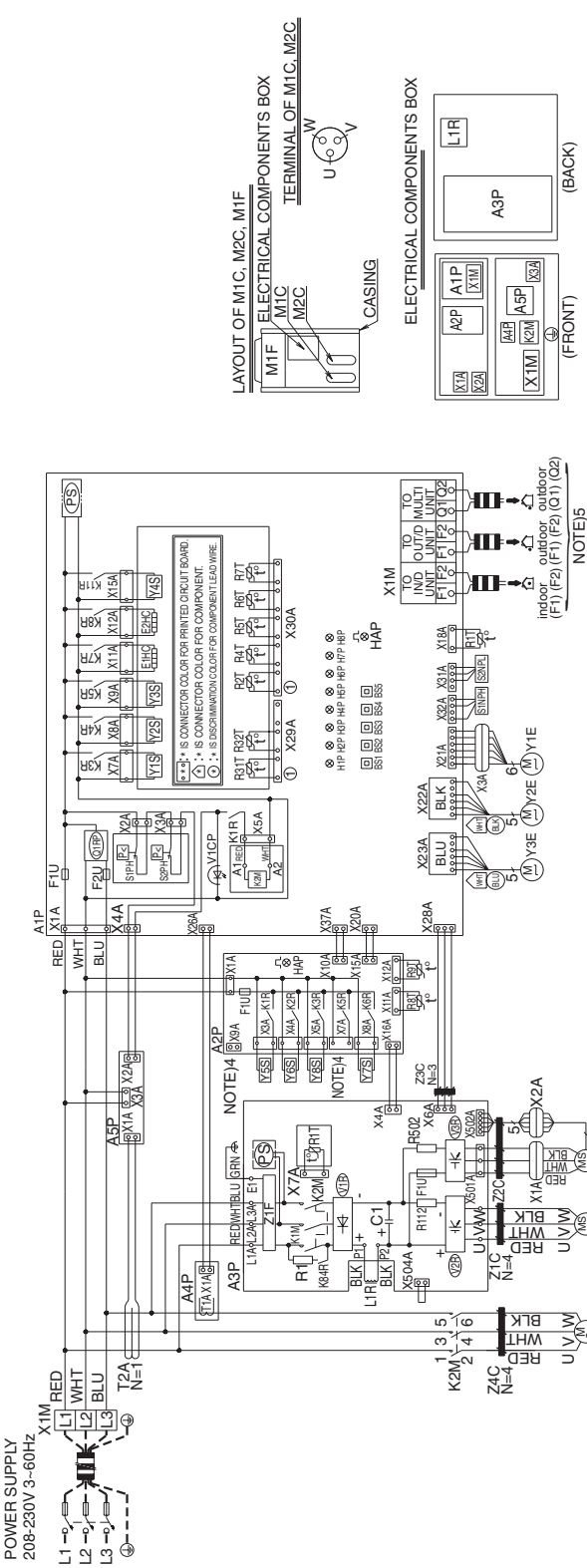
Heat Recovery 230V
REMQ96, 120PTJU



A1P	PRINTED CIRCUIT BOARD (MAIN)	K2R	MAGNETIC RELAY (Y6S) (A2P)	R2T	THERMISTOR (HEAT EXC. GAS) (A1P)
A2P	PRINTED CIRCUIT BOARD (SUB)	K3R	MAGNETIC RELAY (Y1S) (A1P)	R31T, R32T	THERMISTOR (M1C, M2C DISCHARGE) (A1P)
A3P	PRINTED CIRCUIT BOARD (INV, FAN)	K3R	MAGNETIC RELAY (Y8S) (A2P)	R4T	THERMISTOR (HEAT EXC.DEICER) (A1P)
A4P	PRINTED CIRCUIT BOARD (CURRENT SENSOR)	K4R	MAGNETIC RELAY (Y2S) (A1P)	R5T	THERMISTOR (SUB COOL HEAT EXC. GAS) (A1P)
A5P	PRINTED CIRCUIT BOARD (ELB)	K5R	MAGNETIC RELAY (Y3S) (A1P)	R6T	THERMISTOR (SUB COOL HEAT EXC. LIQUID) (A1P)
BS1~5	PUSH BUTTON SWITCH (MODE, SET, RETURN, TEST, RESET) (A1P)	K5R	MAGNETIC RELAY (FOR OPTION) (A2P)	R7T	THERMISTOR (HEAT EXC. LIQUID) (A1P)
		K6R	MAGNETIC RELAY (Y7S) (A2P)	R8T	THERMISTOR (SUCTION) (A2P)
C1	CAPACITOR	K7R	MAGNETIC RELAY (E1HC) (A1P)	R9T	THERMISTOR (LIQUID) (A2P)
E1HC, E2HC	CRANKCASE HEATER (A1P)	K8R	MAGNETIC RELAY (E2HC) (A1P)	S1NPH	PRESSURE SENSOR (HIGH) (A1P)
F1U, F2U	FUSE (T, 3.15A, 250V) (A1P)	K11R	MAGNETIC RELAY (Y4S) (A1P)	S2NPL	PRESSURE SENSOR (LOW) (A1P)
F1U	FUSE (T, 3.15A, 250V) (A2P)	K84R	MAGNETIC RELAY (CURRENT LIMITING) (A3P)	S1PH, S2PH	PRESSURE SWITCH (HIGH) (A1P)
F1U	FUSE (16A, DC450V) (A3P)	L1R	REACTOR (A3P)	T1A	CURRENT SENSOR (A4P)
H1P~8P	PILOT LAMP (SERVICE MONITOR : ORANGE) (A1P)	M1C, M2C	MOTOR (COMPRESSOR)	T2A	CURRENT SENSOR (A5P)
	[H2P] PREPARE, TEST------- FLICKERING	M1F	MOTOR (FAN)	V1CP	SAFETY DEVICES INPUT (A1P)
	MALFUNCTION DETECTION---LIGHT UP	PS	SWITCHING POWER SUPPLY (A1P, A3P)	V1R	DIODE BRIDGE (A3P)
HAP	PILOT LAMP (SERVICE MONITOR-GREEN) (A1P) (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)
K2M	MAGNETIC CONTACTOR (M2C)	R112, R502	RESISTOR (CURRENT SENSOR) (A3P)	X3A	CONNECTOR (Y1E)
K1R	MAGNETIC RELAY (K2M) (A1P)	R1T	THERMISTOR (AIR) (A1P)	X1M	TERMINAL STRIP (POWER SUPPLY)
K1R	MAGNETIC RELAY (Y5S) (A2P)	R1T	THERMISTOR (FIN) (A3P)	X1M	TERMINAL STRIP (CONTROL) (A1P)

Y1E	ELECTRONIC EXPANSION VALVE (MAIN) (A1P)
Y2E	ELECTRONIC EXPANSION VALVE(CHARGE) (A1P)
Y3E	ELECTRONIC EXPANSION VALVE (SUBCOOL) (A1P)
Y1S	SOLENOID VALVE (RMTG) (A1P)
Y2S	SOLENOID VALVE (4 WAY VALVE) (PIPE) (A1P)
Y3S	SOLENOID VALVE (4 WAY VALVE) (HEAT EXC.) (A1P)
Y4S	SOLENOID VALVE (RMTL) (A1P)
Y5S	SOLENOID VALVE (HOT GAS) (A2P)
Y6S	SOLENOID VALVE (EV BYPASS) (A2P)
Y7S	SOLENOID VALVE (RMTO) (A2P)
Y8S	SOLENOID VALVE (RMTT) (A2P)
Z1C~4C	NOISE FILTER (FERRITE CORE)
Z1F	NOISE FILTER (WITH SURGE ABSORBER) (A3P)
	CONNECTOR FOR OPTIONAL PARTS
X7A	OPERATION OUTPUT(A2P)
X9A	POWER SUPPLY(ADOPTER)(A2P)

NOTES)
1. THIS WIRING DIAGRAM IS APPLIED ONLY TO THE OUTDOOR UNIT.
2. ▮▮▮ : FIELD WIRING.
3. □□□ : TERMINAL STRIP ⊂⊃ : CONNECTOR ⊸ : TERMINAL
   ⏚ : PROTECTIVE GROUND (SCREW)
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 Q1-Q2, REFER TO THE INSTALLATION MANUAL.
6. HOW TO USE BS1~5, REFER TO "SERVICE PRECAUTION" LABEL ON ELECTRICAL COMPONENTS BOX COVER.
7. WHEN OPERATING, DON'T SHORTCIRCUIT THE PROTECTION DEVICE (S1PH, S2PH).
8. COLORS BLK : BLACK RED : RED BLU : BLUE WHT : WHITE GRN : GREEN.

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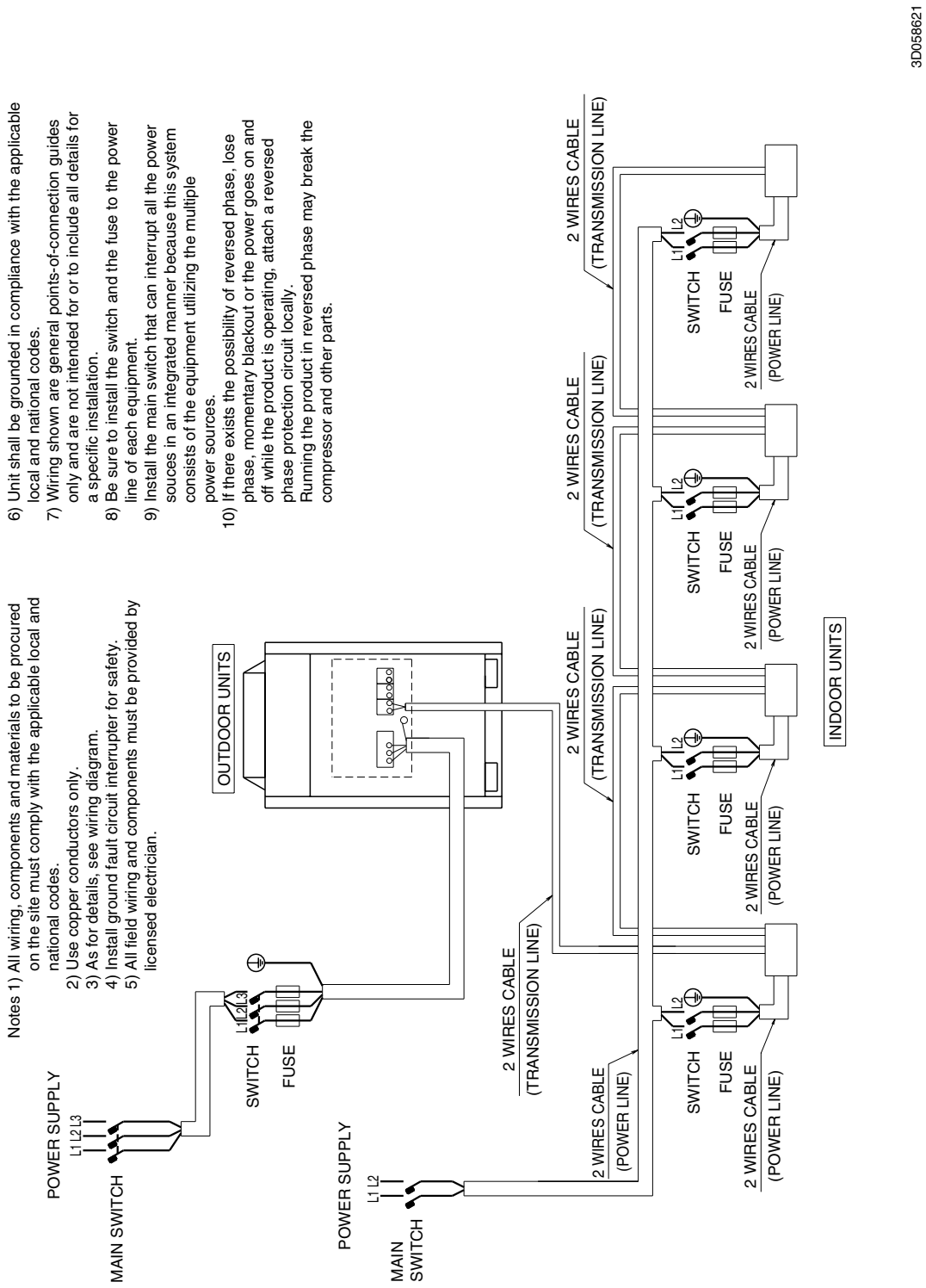
2.2 Field Wiring

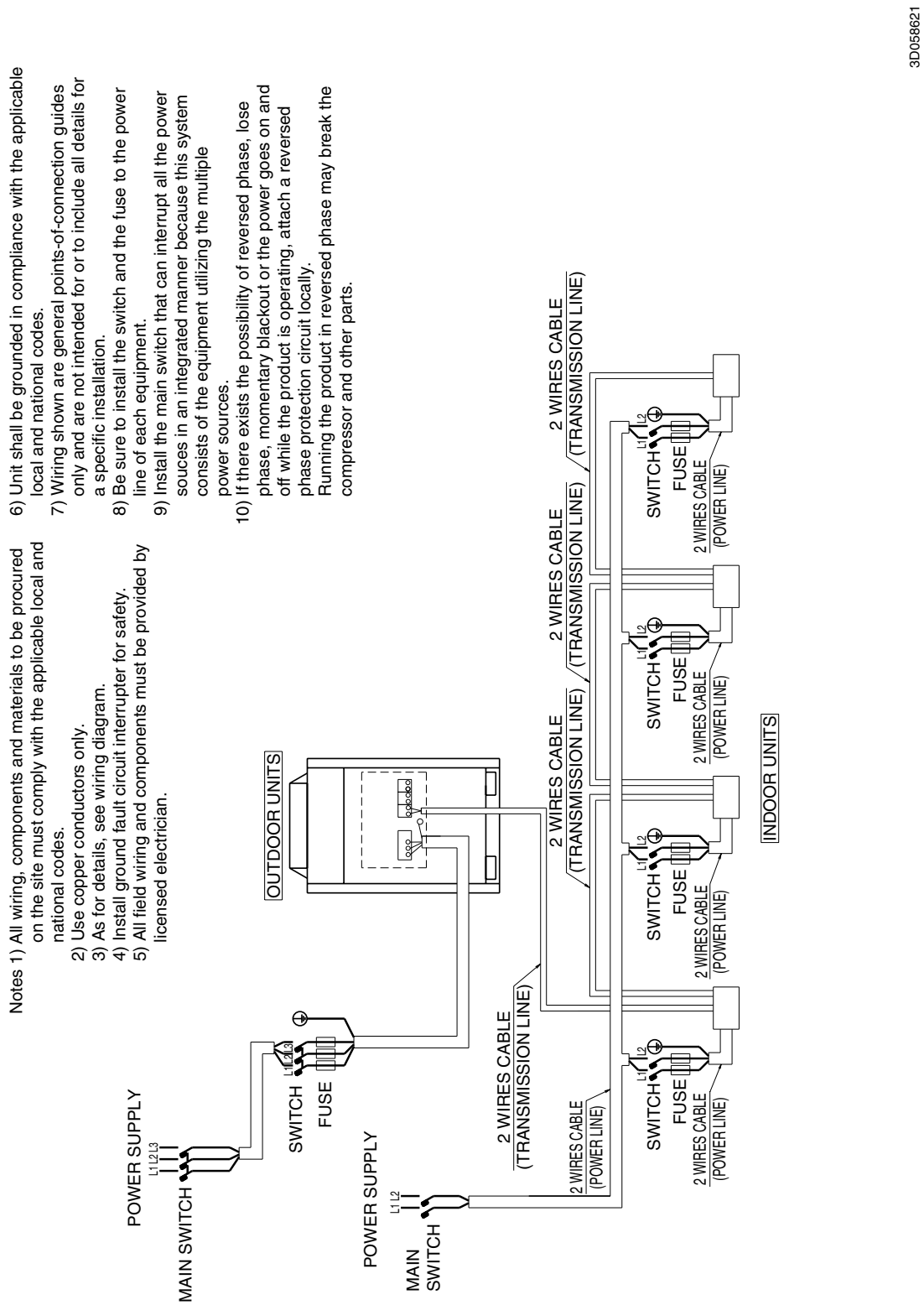
Heat Pump 460V
RXYQ72, 96, 120PYDN



Heat Pump 460V
RXYQ144, 168, 192, 216, 240PYDN

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) As for details, see wiring diagram.
4) Install ground fault circuit interrupter for safety.
5) All field wiring and components must be provided by licensed electrician.
6) Unit shall be grounded in compliance with the applicable local and national codes.
7) Wiring shown are general points-of-connection guides only and are not intended for or to include all details for a specific installation.
8) Be sure to install the switch and the fuse to the power line of each equipment.
9) Install the main switch that can interrupt all the power souces in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
10) The capacity of UNIT1 must be larger than UNIT2 when the power source is connected in series between the units.
11) If there exists the possibility of reversed phase, lose 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 Pump 230V
RXYQ72, 96, 120, 144PTJU

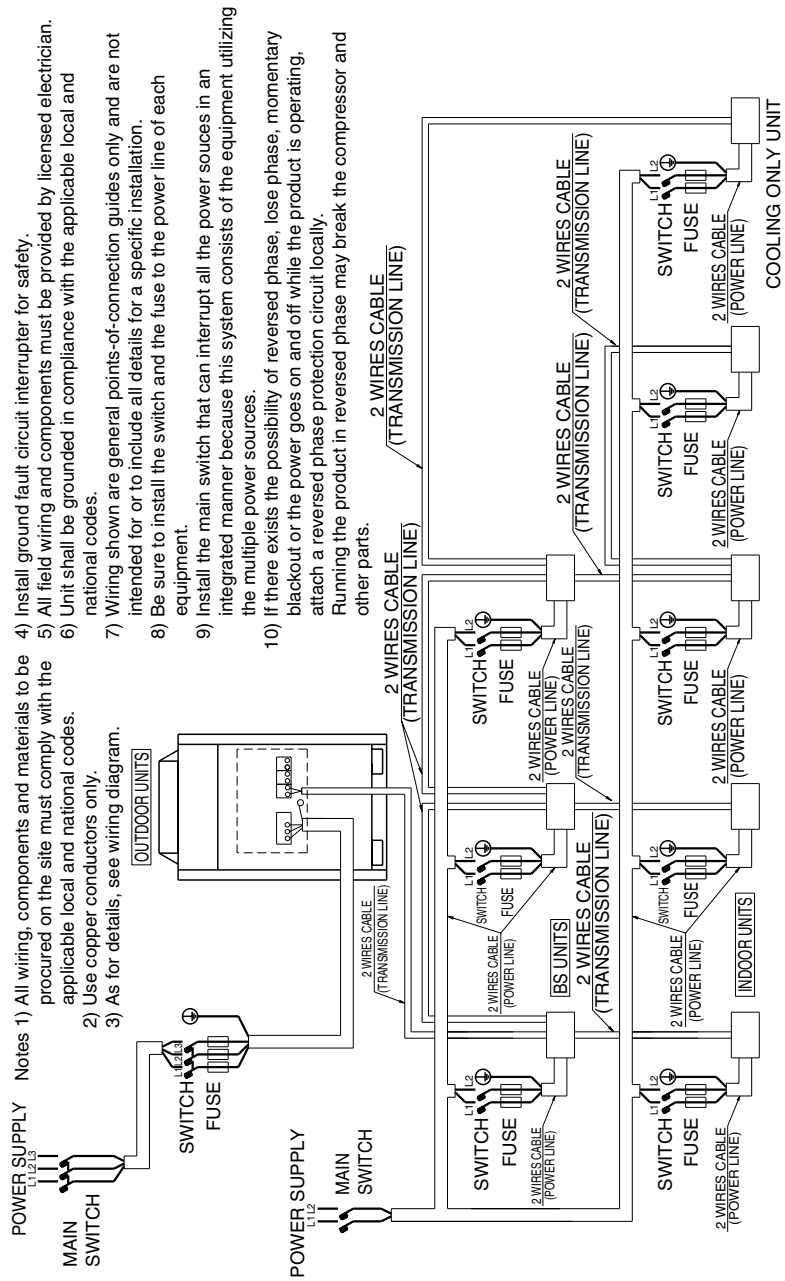


Heat Pump 230V
RXYQ168, 192, 216, 240PTJU

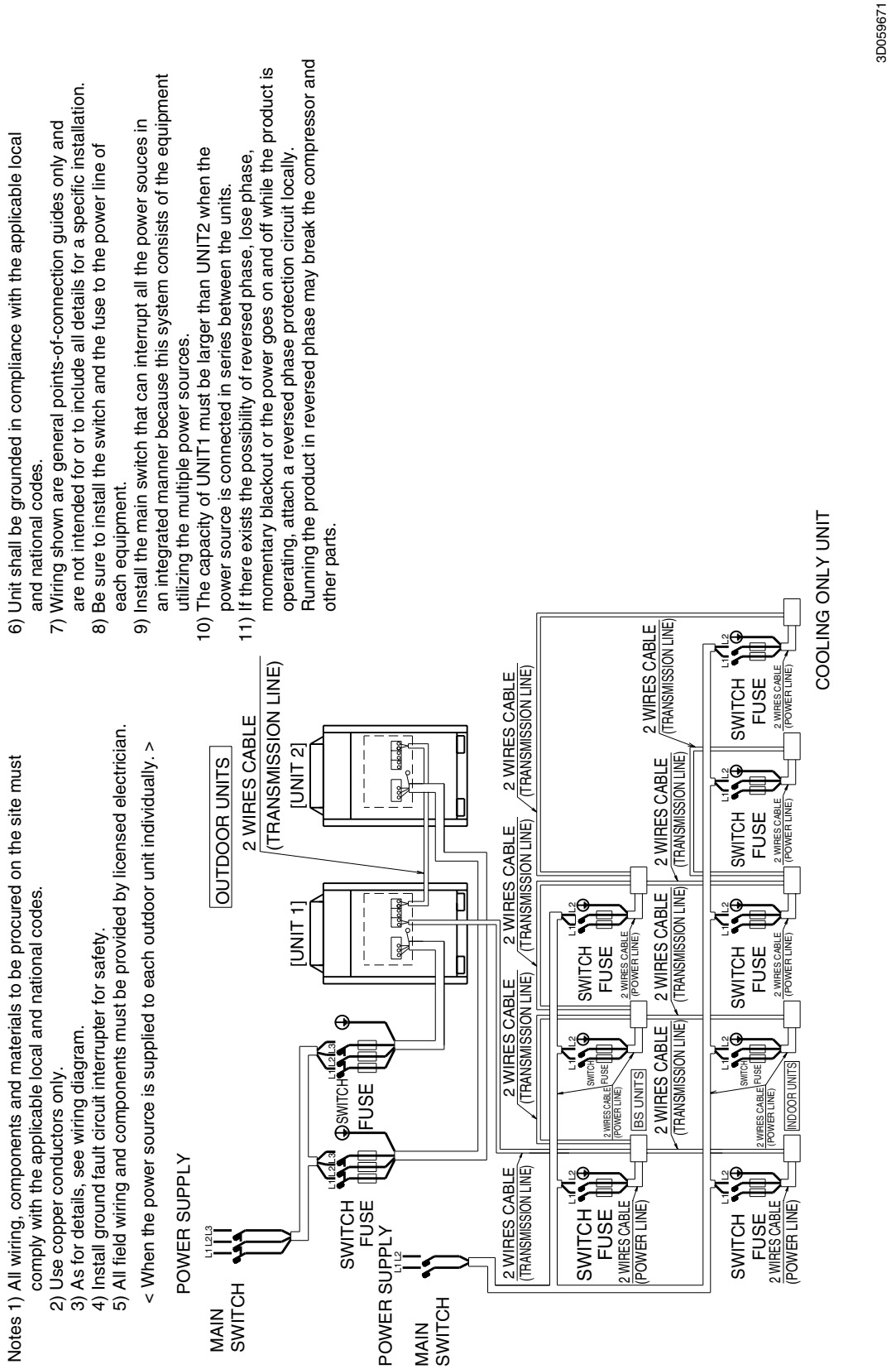
Notes 1) All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
2) Use copper conductors only.
3) As for details, see wiring diagram.
4) Install ground fault circuit interrupter for safety.
5) All field wiring and components must be provided by licensed electrician.
6) Unit shall be grounded in compliance with the applicable local and national codes.
7) Wiring shown are general points-of-connection guides only and are not intended for or to include all details for a specific installation.
8) Be sure to install the switch and the fuse to the power line of each equipment.
9) Install the main switch that can interrupt all the power souces in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
10) The capacity of UNIT1 must be larger than UNIT2 when the power source is connected in series between the units.
11) If there exists the possibility of reversed phase, lose 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, 120PYDN

3D058622

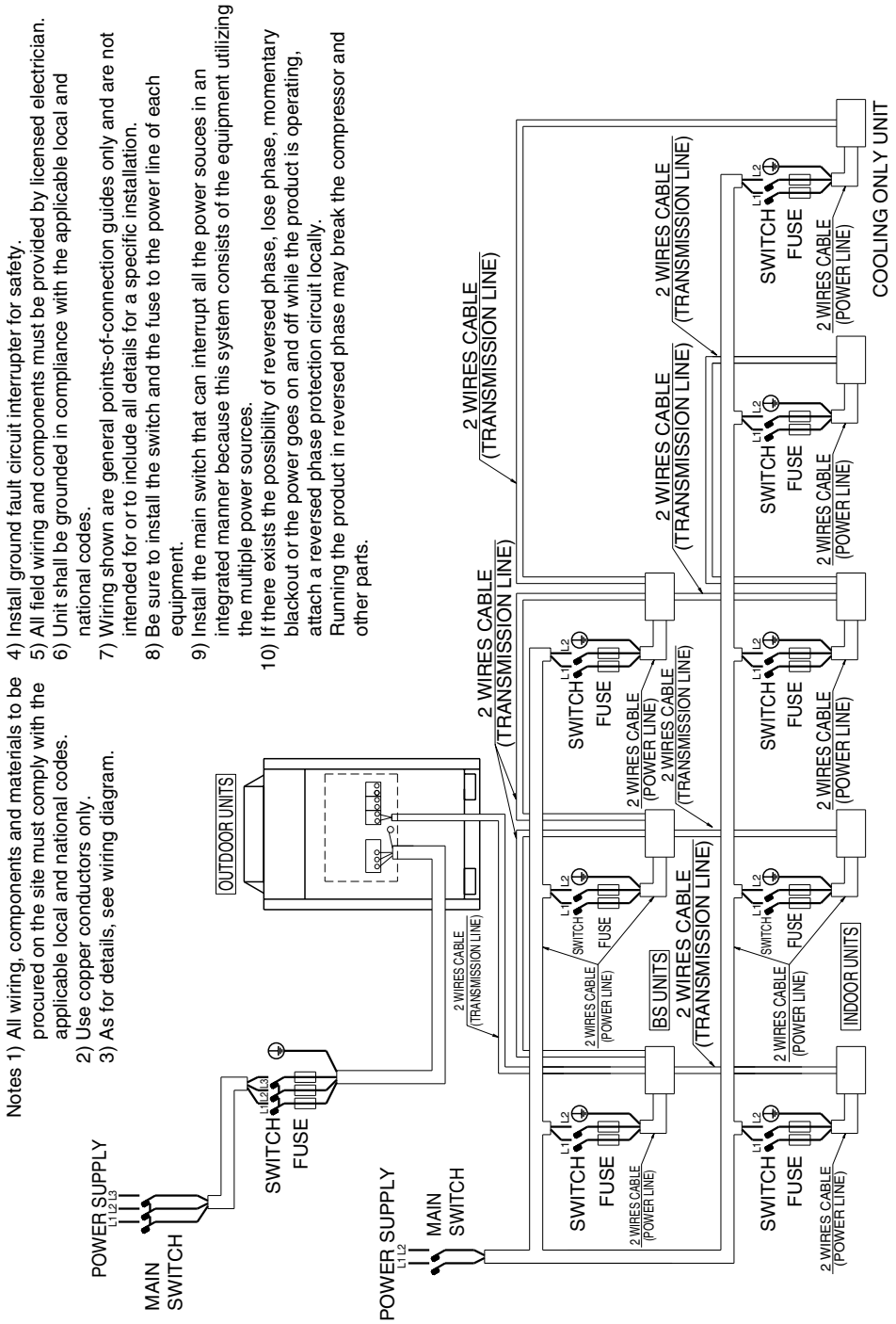


Heat Recovery 460V
REYQ144, 168, 192, 216, 240PYDN

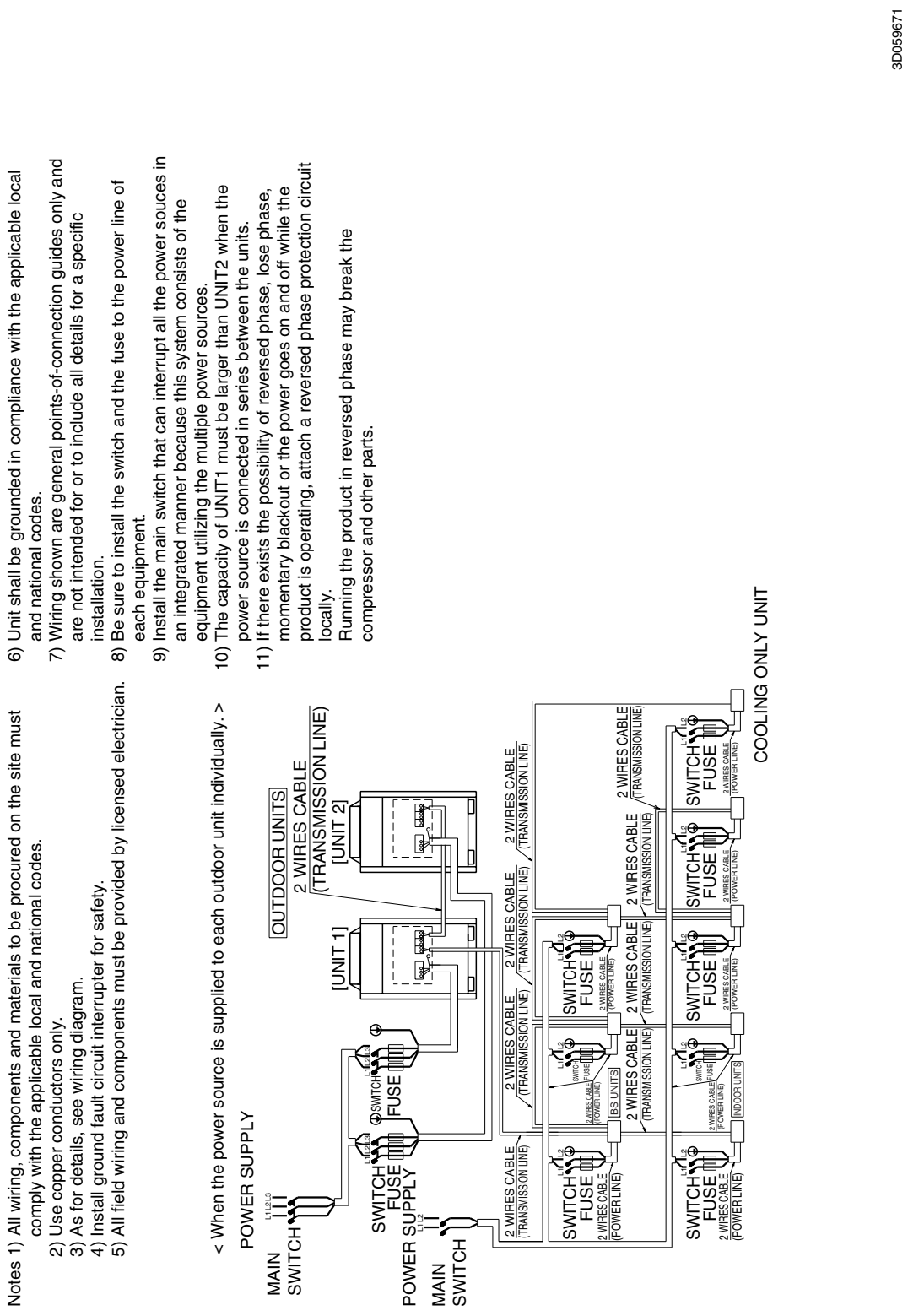


Heat Recovery 230V
REYQ72, 96, 120, 144PTJU

3D058622



Heat Recovery 230V
REYQ168, 192, 216, 240PTJU

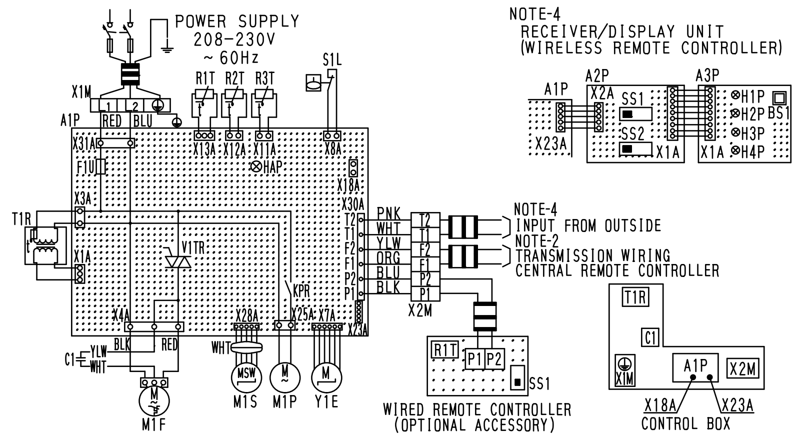


2.3 Indoor Unit

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

INDOOR UNIT	
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)
Q1F	THERMO SWITCH(M1F EMBEDDED)
R1T	THERMISTOR(AIR)
R2T·3T	THERMISTOR(COIL)
S1L	FLOAT SWITCH
T1R	TRANSFOMER(208-230V/22V)
V1TR	TRIAC
X1M	TERMINAL STRIP(POWER)
X2M	TERMINAL STRIP(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 ELECTORICAL APPENDICES)
X23A	CONNECTOR(WIRELESS REMOTE CONTROLLER)

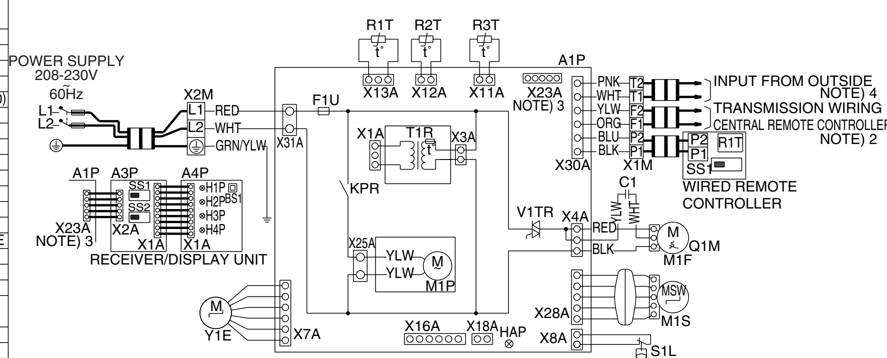


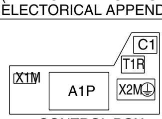
NOTES)
1. : TERMINAL
   , : CONNECTOR
   : FIELD WIRING
2. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTION MANUAL.
3. X23A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS BEING USED.
4. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED 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.

3D042620B

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)





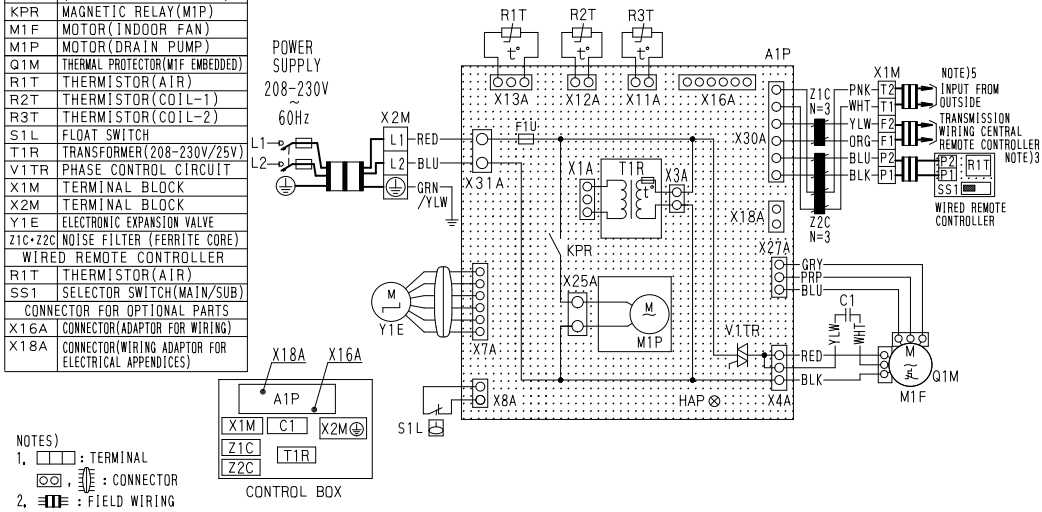
CONTROL BOX

NOTES)
1. : TERMINAL
   , : CONNECTOR
   : FIELD WIRING
2. IN CASE USING CENTRAL 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

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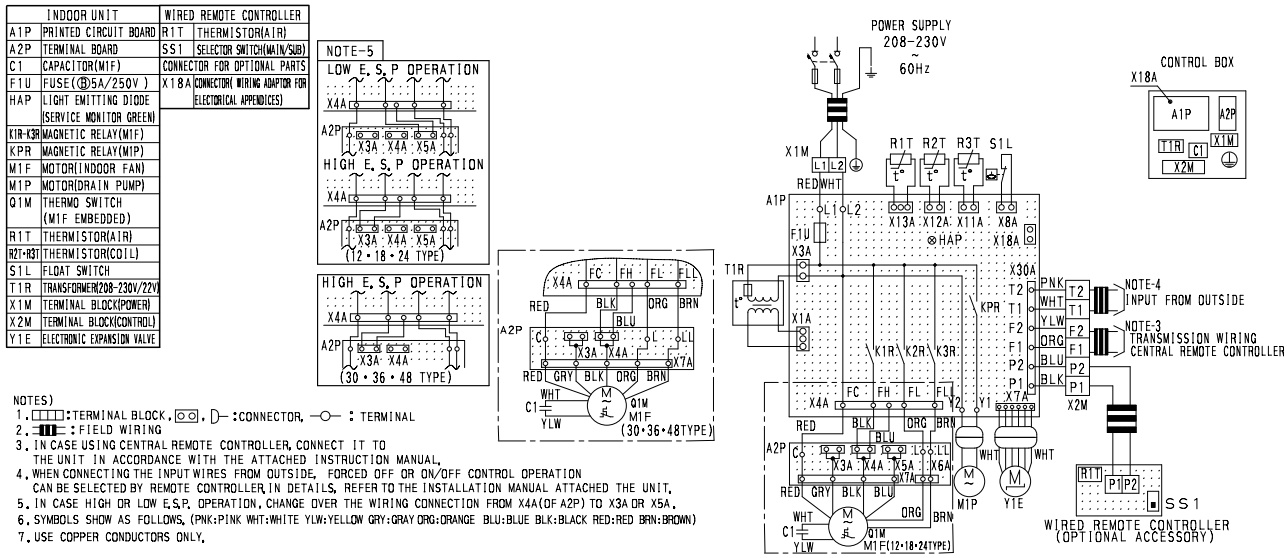
FXSQ12M/18M/24M/30M/36M/48MVJU

INDOOR UNIT		WIRED REMOTE CONTROLLER	
A1P	PRINTED CIRCUIT BOARD	R1T	THERMISTOR(AIR)
A2P	TERMINAL BOARD	SS1	SELECTOR SWITCH(MAIN/SUB)
C1	CAPACITOR(M1F)	CONNECTOR FOR OPTIONAL PARTS	
F1U	FUSE(Ⓣ5A/250V)	X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTRICAL APPENDICES)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)		
K1R-K3R	MAGNETIC RELAY(M1F)		
KPR	MAGNETIC RELAY(M1P)		
M1F	MOTOR(INDOOR FAN)		
M1P	MOTOR(DRAIN PUMP)		
Q1M	THERMO SWITCH (M1F EMBEDDED)		
R1T	THERMISTOR(AIR)		
R2T·R3T	THERMISTOR(COIL)		
S1L	FLOAT SWITCH		
T1R	TRANSFORMER(208-230V/22V)		
X1M	TERMINAL BLOCK(POWER)		
X2M	TERMINAL BLOCK(CONTROL)		
Y1E	ELECTRONIC EXPANSION VALVE		



NOTES)
1. □□□:TERMINAL BLOCK, ⊙⊙, ⊃ :CONNECTOR, —○— : TERMINAL
2. ⫼ : FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO 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 TO THE UNIT.
5. IN CASE HIGH OR LOW E.S.P. OPERATION, CHANGE OVER THE WIRING CONNECTION FROM X4A(OF A2P) TO X3A OR X5A.
6. SYMBOLS SHOW AS FOLLOWS. (PNK:PINK WHT:WHITE YLW:YELLOW GRY:GRAY ORG:ORANGE BLU:BLUE BLK:BLACK RED:RED BRN:BROWN)
7. USE COPPER CONDUCTORS ONLY.

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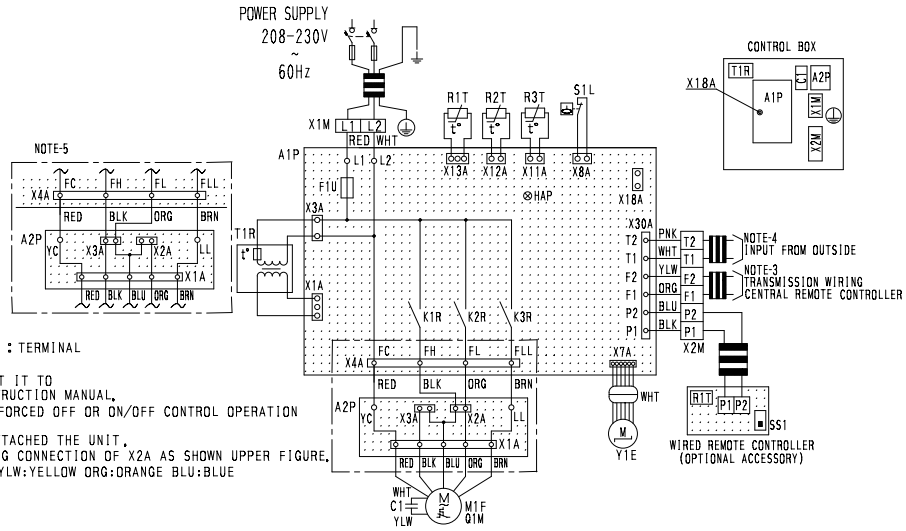
FXMQ30M/36M/48MVJU

	INDOOR UNIT	R2T・R3T	THERMISTOR(COIL)
A1P	PRINTED CIRCUIT BOARD	S1L	FLOAT SWITCH
A2P	TERMINAL BOARD	T1R	TRANSFORMER(208-230V/22V)
C1	CAPACITOR(M1F)	X1M	TERMINAL BLOCK(POWER)
F1U	FUSE(Ⓑ5A/250V)	X2M	TERMINAL BLOCK(CONTROL)
	30TYPE	Y1E	ELECTRONIC EXPANSION VALVE
F1U	FUSE(Ⓑ10A/250V)		
	36・48TYPE	WIRED REMOTE CONTROLLER	
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)	SS1	SELECTOR SWITCH (MAIN/SUB)
K1R~K3R	MAGNETIC RELAY(M1F)	R1T	THERMISTOR(AIR)
M1F	MOTOR(INDOOR FAN)	CONNECTOR FOR OPTIONAL PARTS	
Q1M	THERMO SWITCH (M1F EMBEDDED)	X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTORICAL APPENDICES)
R1T	THERMISTOR(AIR)		



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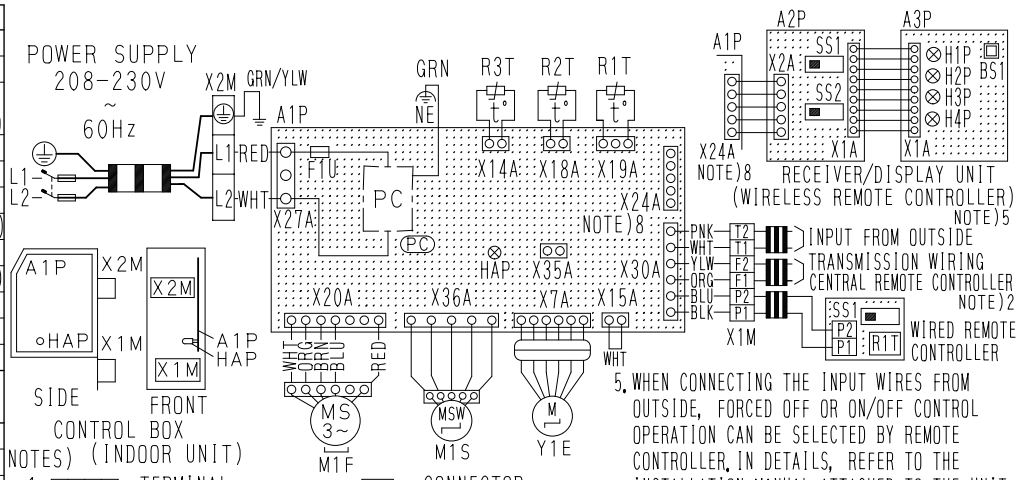
FXAQ07M/09M/12M/18M/24MVJU

	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
(PC)	POWER CIRCUIT
	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)
SS2	SELECTOR SWITCH (WIRELESS ADDRESS SET)

WIRED REMOTE CONTROLLER			CONNECTOR FOR OPTIONAL PARTS	
R1T	THERMISTOR(AIR)		X15A	CONNECTOR(FLOAT SWITCH)
SS1	SELECTOR SWITCH(MAIN/SUB)		X35A	CONNECTOR(GROUP CONTROL ADAPTOR)



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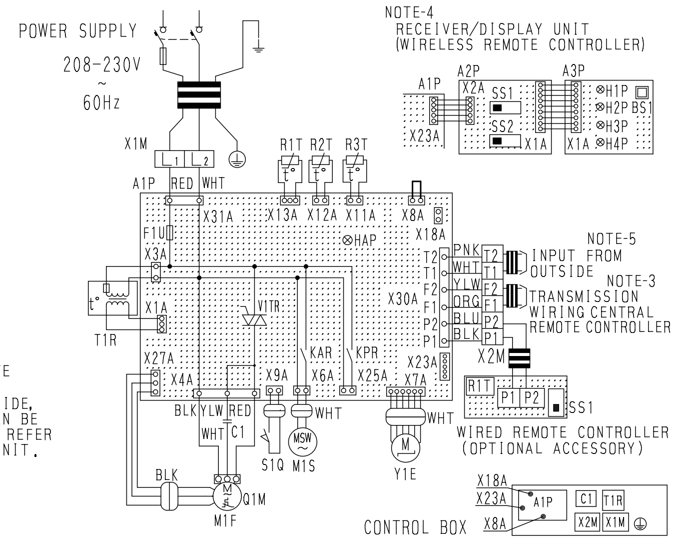
FXHQ12M/24M/36M

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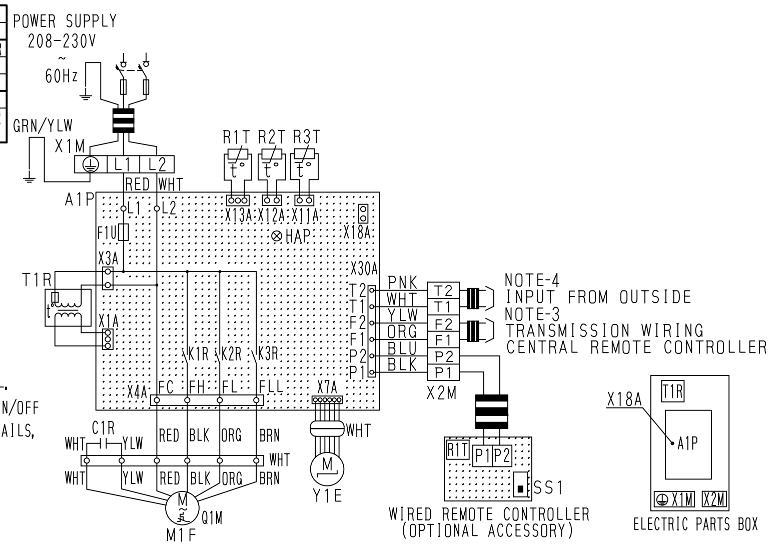
FXLQ12M/18M/24MVJU
FXNQ12M/18M/24MVJU

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, :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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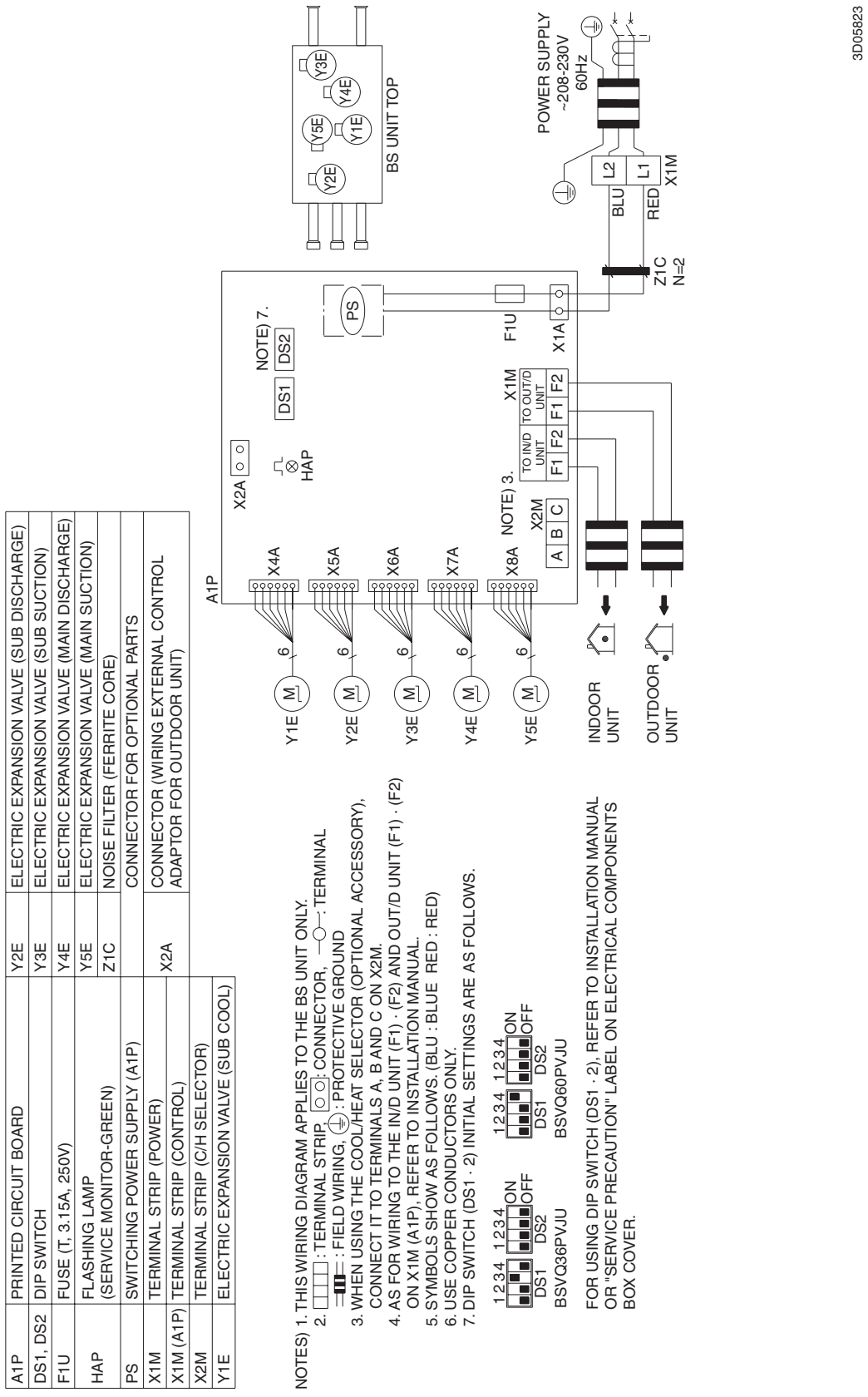
2.4 BS Unit BSVQ36P/60PVJU



3. List of Electrical and Functional Parts

3.1 Outdoor Unit

3.1.1 RXYQ72P, 96P, 120PYDN

Item	Name		Symbol	Model	
Compressor	Inverter	Type	M1C	JT1GCVDKYR@SA	
		OC protection device		14.7A	
	STD 1	Type	M2C	JT170G-KYE@T	
		OC protection device		15.0A	
Fan motor		OC protection device	M1F	3.0A	
Electronic expansion valve (Main)			Y1E	Fully closed : 0pls	Fully open : 480pls
Electronic expansion valve (Refrigerant charge)			Y2E	Fully closed : 0pls	Fully open : 480pls
Electronic expansion valve (Subcool)			Y3E	Fully closed : 0pls	Fully open : 480pls
Pressure protection	High pressure switch	For M1C	S1PH	OFF : $580\,^{+0}_{-17.40}$ psi	ON : 435±21.75psi
		For M2C	S2PH	OFF : $580\,^{+0}_{-17.40}$ psi	ON : 435±21.75psi
	Low pressure sensor		SENPL	OFF : 10.15psi	
Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF : 275°F	
	Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF : 199.4°F	
Others	Fuse	For main PC board	F1U	Time-lag 3.15A AC 250V / 250V AC 10A Class B	
			F2U	Time-lag 3.15A AC 250V / 250V AC 10A Class B	
		For Noise filter PC board	F1U	250V AC 5A Class B	

3.1.2 REYQ72PYDN~120PYDN

Item	Name		Symbol	Model		
				REYQ72PYDN	REYQ96PYDN	REYQ120PYDN
Compressor	Inverter	Type	M1C	JT1GCVDKYR@SA		
		OC protection device		14.7A		
	STD 1	Type	M2C	JT170G-KYE@T		
		OC protection device		15.0A		
Fan motor		OC protection device	M1F	3.0A		3.0A (for General overseas : 1.14A)
Electronic expansion valve (Main)			Y1E	Fully closed: 0pls Fully open: 1375pls		
Electronic expansion valve (Subcool)			Y2E	Fully closed: 0pls Fully open: 480pls		
Electronic expansion valve (Refrigerant charge)			EV	0~480pls		
Pressure protection	High pressure switch	For M1C	S1PH	OFF: $580^{+0}_{-17.40}$ psi ON: 435±21.75psi		
		For M2C	S2PH	OFF: $580^{+0}_{-17.40}$ psi ON: 435±21.75psi		
	Low pressure sensor		SENPL	OFF: 10.15psi		
Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF: 275°F		
	Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF: 199.4°F		
Others	Fuse	For main PC board	F1U	250V AC 10A Class B Time-lag 3.15A AC 250V		
			F2U	250V AC 10A Class B Time-lag 3.15A AC 250V		
		For Noise filter PC board	F1U	250V AC 5A Class B		

3.1.3 REMQ72PYDN

Item	Name		Symbol	Model	
				REMQ72PYDN	
Compressor	Inverter	Type	M1C	JT1GCVDKYR@SA	
		OC protection device		14.7A	
	STD 1	Type	M2C	—	
		OC protection device		—	
Fan motor		OC protection device	M1F	3.0A	
Electronic expansion valve (Main)			Y1E	Fully closed : 0pls	Fully open : 480pls
Electronic expansion valve (Refrigerant charge)			Y2E	Fully closed : 0pls	Fully open : 480pls
Electronic expansion valve (Subcool)			Y3E	Fully closed : 0pls	Fully open : 480pls
Pressure protection	High pressure switch	For M1C	S1PH	OFF : $580\ ^{+0}_{-17.40}$ psi	ON : 435±21.75psi
		For M2C	S2PH	—	
	Low pressure sensor		SENPL	OFF : 10.15psi	
Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF : 275°F	
	Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF : 199.4°F	
Others	Fuse	For main PC board	F1U	Time-lag 3.15A AC 250V / 250V AC 10A Class B	
			F2U	Time-lag 3.15A AC 250V / 250V AC 10A Class B	
		For Noise filter PC board	F1U	250V AC 5A Class B	

3.1.4 REMQ96PYDN~120PYDN

Item	Name		Symbol	Model	
				REMQ96PYDN	REMQ120PYDN
Compressor	Inverter	Type	M1C	JT1GCVDKYR@SA	
		OC protection device		14.7A	
	STD 1	Type	M2C	JT170G-KYE@T	
		OC protection device		15.0A	
Fan motor		OC protection device	M1F	3.0A	
Electronic expansion valve (Main)			Y1E	Fully closed : 0pls	Fully open : 480pls
Electronic expansion valve (Refrigerant charge)			Y2E	Fully closed : 0pls	Fully open : 480pls
Electronic expansion valve (Subcool)			Y3E	Fully closed : 0pls	Fully open : 480pls
Pressure protection	High pressure switch	For M1C	S1PH	OFF : $580^{+0}_{-17.40}$ psi	ON : 435±21.75psi
		For M2C	S2PH	OFF : $580^{+0}_{-17.40}$ psi	ON : 435±21.75psi
	Low pressure sensor		SENPL	OFF : 10.15psi	
Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF :275°F	
	Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF : 199.4°F	
Others	Fuse	For main PC board	F1U	Time-lag 3.15A AC 250V / 250V AC 10A Class B	
			F2U	Time-lag 3.15A AC 250V / 250V AC 10A Class B	
		For Noise filter PC board	F1U	250V AC 5A Class B	

3.2 Indoor Side

3.2.1 Indoor Units

Parts Name		Symbol	Model					Remark
			FXFQ 12MVJU	FXFQ 18MVJU	FXFQ 24MVJU	FXFQ 30MVJU	FXFQ 36MVJU	
Remote Controller	Wired Remote Controller		BRC1D71					Option
	Wireless Remote Controller		BRC7C812					
Motors	Fan Motor	M1F	1ϕ45W 6P			1ϕ90W 6P		
			Thermal Protector 266°F : OFF 176°F : ON					
	Capacitor, fan motor	C1	3.5μF 450VAC			5.0μF 450VAC		
	Drain Pump	M1P	PLD-12230DM Thermal Fuse 293°F					
	Swing Motor	M1S	MP35HCA [3P007482-1]					
Thermistors	Thermistor (Return Air)	R1T	ST8601A-1 ϕ4 L250 20kΩ (77°F)					
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-3 ϕ8 L630 20kΩ (77°F)					
	Thermistor (Heat Exchanger)	R2T	ST8602A-3 ϕ6 L630 20kΩ (77°F)					
Others	Float Switch	S1L	FS-0211					
	Fuse	F1U	250V 5A ϕ5.2					
	Transformer	T1R	TR25H25R0					

Parts Name		Symbol	Model				Remark
			FXZQ 07M7VJU	FXZQ 09M7VJU	FXZQ 12M7VJU	FXZQ 18M7VJU	
Remote Controller	Wired Remote Controller		BRC1D71				Option
	Wireless Remote Controller		BRC7E530W				
Motors	Fan Motor	M1F	1ϕ55W 4P				
			Thermal Protector 266±41°F:OFF 181±68°F:ON				
	Capacitor, fan motor	C1	4.0μ F 400VAC				
	Drain Pump	M1P	PLD-12230DM Thermal Fuse 293°F				
	Swing Motor	M1S	MP35HCA [3P080801-1]				
Thermistors	Thermistor (Return Air)	R1T	ST8601A-1 ϕ4 L250 20kΩ (77°F)				
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-3 ϕ8 L630 20kΩ (77°F)				
	Thermistor (Heat Exchanger)	R2T	ST8602A-3 ϕ6 L630 20kΩ (77°F)				
Others	Float Switch	S1L	FS-0211				
	Fuse	F1U	250V 5A ϕ5.2				
	Transformer	T1R	TR22H21R8				

Parts Name		Symbol	Model					Remark
			FXDQ 07MVJU	FXDQ 09MVJU	FXDQ 12MVJU	FXDQ 18MVJU	FXDQ 24MVJU	
Remote Controller	Wired Remote Controller		BRC1D71					Option
	Wireless Remote Controller		BRC4C82					
Motors	Fan Motor	M1F	1ϕ62W 4P			1ϕ13W 4P		
			Thermal Protector 266±9°F : OFF 181±27°F : ON					
	Capacitor, fan motor	C1	4.0μF 450VAC			7.0μF 450VAC		
Thermistors	Thermistor (Return Air)	R1T	ST8601A-1 ϕ4 L250 20kΩ (77°F)					
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-4 ϕ8 L800 20kΩ (77°F)					
	Thermistor (Heat Exchanger)	R2T	ST8602A-4 ϕ6 L800 20kΩ (77°F)					
Others	Float Switch	S1L	FS-0211					
	Fuse	F1U	250V 5A ϕ5.2					
	Transformer	T1R	TR25H25R0					

Parts Name		Symbol	Model						Remark
			FXSQ 12MVJU	FXSQ 18MVJU	FXSQ 24MVJU	FXSQ 30MVJU	FXSQ 36MVJU	FXSQ 48MVJU	
Remote Controller	Wired Remote Controller		BRC1D71						Option
	Wireless Remote Controller		BRC4C82						
Motors	Fan Motor	M1F	1ϕ50W 4P	1ϕ85W 4P	1ϕ125W 4P	1ϕ225W 4P			
			Thermal Fuse 305.6°F			Thermal protector 275°F : OFF 188.6°F : ON			
	Drain Pump	M1P	PLD-12230DM Thermal Fuse 336.2°F						
Thermistors	Thermistor (Return Air)	R1T	ST8601-13 ϕ4 L630 20kΩ (77°F)						
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-7 ϕ8 L1600 20kΩ (77°F)						
	Thermistor (Heat Exchanger)	R2T	ST8602A-7 ϕ6 L1600 20kΩ (77°F)						
Others	Float Switch	S1L	FS-0211						
	Fuse	F1U	250V 5A ϕ5.2						
	Transformer	T1R	TR25H25R0						

Parts Name		Symbol	Model			Remark
			FXMQ 30MVJU	FXMQ 36MVJU	FXMQ 48MVJU	
Remote Controller	Wired Remote Controller		BRC1D71			Option
	Wireless Remote Controller		BRC4C82			
Motors	Fan Motor	M1F	1ϕ160W	1ϕ270W	1ϕ430W	
			Thermal protector 275°F : OFF 188.6°F : ON			
	Capacitor for Fan Motor	C1R	6μF 450V	9μF 450V	8μF 450V	
Thermistors	Thermistor (Return Air)	R1T	ST8601A-5 ϕ4 L1000 20kΩ (77°F)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605A-4 ϕ8 L800 20kΩ (77°F)			
	Thermistor (Heat Exchanger)	R2T	ST8602A-4 ϕ6 L800 20kΩ (77°F)			
Others	Float switch	S1L	FS-0211			
	Fuse	F1U	250V 5A ϕ5.2	250V 10A ϕ5.2		
	Transformer	T1R	TR25H25R0			

Parts Name		Symbol	Model			Remark
			FXHQ 12MVJU	FXHQ 24MVJU	FXHQ 36MVJU	
Remote Controller	Wired Remote Controller		BRC1D71			Option
	Wireless Controller		BRC7E83			
Motors	Fan Motor	M1F	1ϕ63W	1ϕ130W		
			Thermal protector 266°F : OFF 176°F : ON			
	Capacitor for Fan Motor	C1R	3.0μF-450V	9.0μF-450V		
	Swing Motor	M1S	MT8-L[3P058751-1] AC200~240V			
Thermistors	Thermistor (Return Air)	R1T	ST8601A-1 ϕ4 L250 20kΩ (77°F)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-6 ϕ8 L = 1250 20kΩ (77°F)		ST8605-6 ϕ8 L = 1250 20kΩ (77°F)	
	Thermistor (Heat Exchanger)	R2T	ST8602A-6 ϕ6 L = 1250 20kΩ (77°F)		ST8602A-6 ϕ6 L = 1250 20kΩ (77°F)	
Others	Fuse	F1U	250V 5A			
	Transformer	T1R	TR25H25R0			

Parts Name		Symbol	Model					Remark
			FXAQ 07MVJU	FXAQ 09MVJU	FXAQ 12MVJU	FXAQ 18MVJU	FXAQ 24MVJU	
Remote Controller	Wired Remote Controller		BRC1C71					Option
	Wireless Remote Controller		BRC7E818					Option
Motors	Fan Motor	M1F	1ϕ40W			1ϕ43W		
			Thermal protector 266°F : OFF 176°F : ON					
	Swing Motor	M1S	MP24[3SB40333-1] AC200~240V			MSFBC20C21 [3SB40550-1] AC200~240V		
Thermistors	Thermistor (Return Air)	R1T	ST8601-2 ϕ4 L400 20kΩ (77°F)					
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-2 ϕ8 L400 20kΩ (77°F)					
	Thermistor (for Heat Exchanger)	R2T	ST8602-2 ϕ6 L400 20kΩ (77°F)					
Others	Float Switch	S1L	OPTION					
	Fuse	F1U	250V 3.15A					

Parts Name		Symbol	Model			Remark
			FXLQ 12MVJU	FXLQ 18MVJU	FXLQ 24MVJU	
Remote Controller	Wired Remote Controller		BRD1C71			Option
	Wireless Remote Controller		—			
Motors	Fan Motor	M1F	1ϕ25W	1ϕ35W		
			Thermal protector 275°F : OFF 248°F : ON			
	Capacitor for Fan Motor	C1R	0.5μF-450V	1.5μF-450V	2.0μF-450V	
Thermistors	Thermistor (Return Air)	R1T	ST8601-6 ϕ4 L1250 20kΩ (77°F)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-9 ϕ8 L2500 20kΩ (77°F)			
	Thermistor (for Heat Exchanger)	R2T	ST8602A-9 ϕ6 L2500 20kΩ (77°F)			
Others	Fuse	F1U	AC250V 5A			
	Transformer	T1R	TR25H25R0			

Parts Name		Symbol	Model			Remark
			FXNQ 12MVJU	FXNQ 18MVJU	FXNQ 24MVJU	
Remote Controller	Wired Remote Controller		BRC1D71			Option
	Wireless Remote Controller		—			
Motors	Fan Motor	M1F	1ϕ25W	1ϕ35W		
			Thermal protector 275°F : OFF 248°F : ON			
	Capacitor for Fan Motor	C1R	0.5μF-450V	1.5μF-450V	2.0μF-450V	
Thermistors	Thermistor (Return Air)	R1T	ST8601-6 ϕ4 L1250 20kΩ (77°F)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-9 ϕ8 L2500 20kΩ (77°F)			
	Thermistor (for Heat Exchanger)	R2T	ST8602A-9 ϕ6 L2500 20kΩ (77°F)			
Others	Fuse	F1U	AC250V 5A			
	Transformer	T1R	TR25H25R0			

4. Option List

4.1 Option List of Controllers

Optional Accessories of Operation Control System

No.	Item	Type	FXFQ~M7VJU	FXZQ-MVJU	FXSQ~MVJU	FXMQ~MVJU	FXAQ~MVJU	FXLQ~MVJU FXNQ~MVJU	FXHQ~MVJU	FXDQ~MVJU
1	Remote controller	Wireless	BRC7C812	—	BRC4C82		BRC7E818	—	BRC7E83	BRC4C82
		Wired	BRC1C71							
			BRC1D71							
2	Set back time clock		BRC15A71							
3	Remote sensor		KRCS01-1							
4	Installation box for adaptor PCB		KRP1B98	KRP1BA101	—				KRP1C93	KRP1B101
5	Central remote controller		DCS302C71							
5-1	Electrical box		KJB311A							
6	Unified on/off controller		DCS301C71							
6-1	Electrical box		KJB212A							
7	Schedule timer		DST301B61							
8	External control adaptor for outdoor unit		★DTA104A62		DTA104A61		—	DTA104A61	★DTA104A62	★DTA104A53
9	D3-NET Expander adaptor		DTA109A51							
10	Simplified remote controller		—		BRC2A71		—	BRC2A71	—	BRC2A71
11	Adaptor for wiring		★KRP1B72	KRP1B57	KRP1B71				★KRP1B73	—
12	Wiring adaptor for electrical appendices (2)		★KRP4A73	KRP4A53	KRP4A71				★KRP4A72	★KRP4A74

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Notes:

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

Building management system

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

Notes:

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

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

4.2 Option Lists (Outdoor Unit)

RXYQ72~240PYDN

Series			VRV III								
Models / Optional accessories			RXYQ72PYDN RXYQ72PTJU	RXYQ96PYDN RXYQ96PTJU	RXYQ120PYDN RXYQ120PTJU	RXYQ144PTJU	RXYQ144PYDN	RXYQ168PYDN RXYQ168PTJU	RXYQ192PYDN RXYQ192PTJU	RXYQ216PYDN RXYQ216PTJU	RXYQ240PYDN RXYQ240PTJU
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)		
	Refnet joint	Model	KHRP26M22T KHRP26M33T		KHRP26M22T KHRP26M33T KHRP26M72TU				KHRP26M22T KHRP26M33T KHRP26M72TU KHRP26M73TU		
Outdoor unit multi connection piping kit		Model	—				BHFP22P100U				

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REYQ72~240PYDN

Series			VRV III			
Models / Optional accessories			REYQ72PYDN	REYQ96PYDN REYQ120PYDN	REYQ144PYDN REYQ168PYDN	REYQ192PYDN REYQ216PYDN REYQ240PYDN
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)
	Refnet joint	Model	KHRP25M22T KHRP25M33T	KHRP25M22T KHRP25M33T KHRP25M72TU		KHRP25M22T KHRP25M33T KHRP25M72TU KHRP25M73TU
Outdoor unit multi connection piping kit		Model	—		BHFP26P90U	

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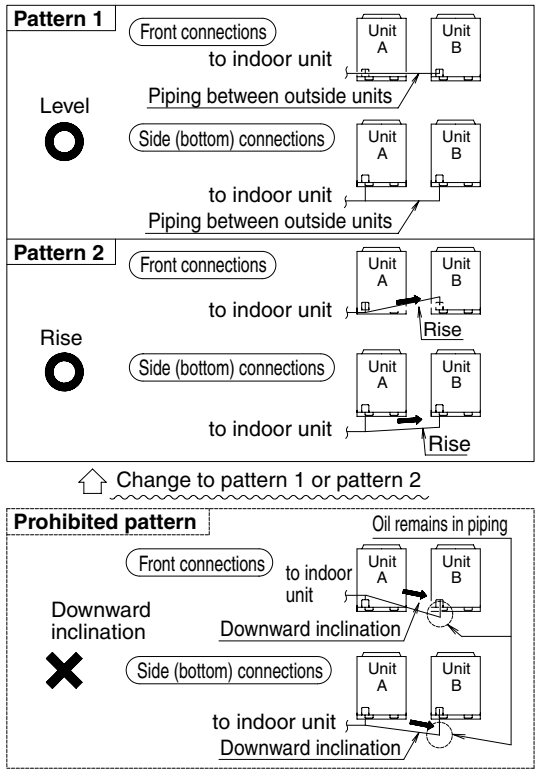
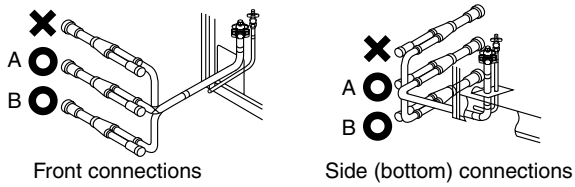
5. Piping Installation Point

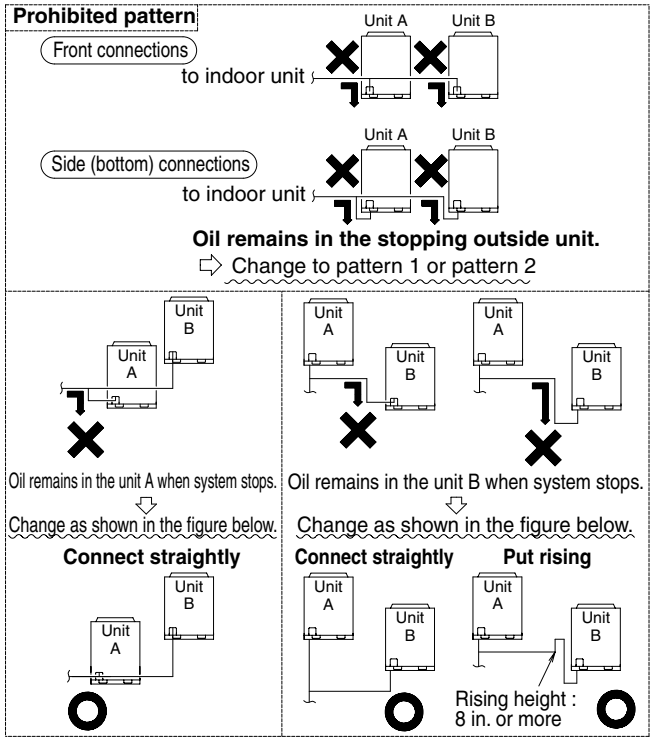
5.1 Piping between Outside Units

(1) The piping between outside units must be installed level (Pattern 1) or with a rise (Pattern 2). Otherwise oil may pool in the pipes.

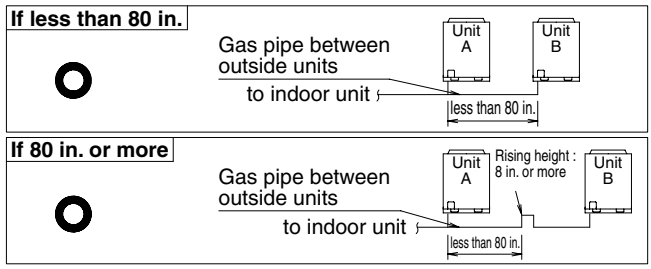


(2) To avoid the risk of oil detention in the stopping unit, always connect the shutoff valve and the piping between outside units as shown A or B in the figure below.





(3) If the piping length between the outside units exceeds 80 inches, create a rise of 80 inches, or more in the gas piping under a length of 80 inches, from the outside unit multi connection piping kit.



6. Thermistor Resistance / Temperature Characteristics

Indoor unit	For air suction	R1T
	For liquid pipe	R2T
	For gas pipe	R3T
Outdoor unit	For outdoor air	R1T
	For heat exchanger gas	R2T, R11T
	For heat exchanger deicer	R4T, R12T
	For sub cooling heat exchanger gas	R5T, R13T
	For sub cool heat exchanger liquid	R6T
	For heat exchanger liquid	R7T, R15T
	For suction	R8T, R10T
	For liquid	R9T, R14T

Outdoor unit 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 (R3T, 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

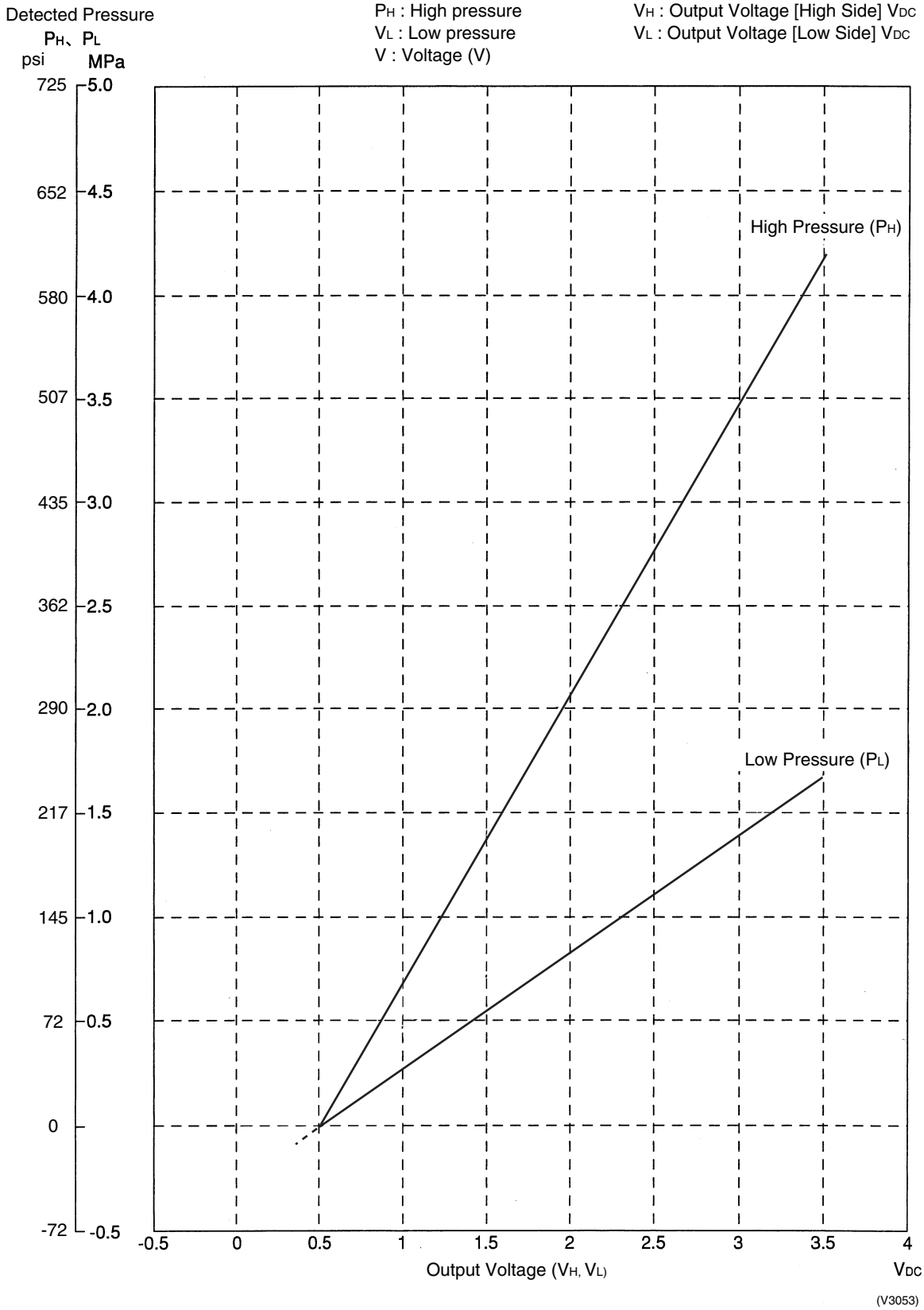
T°F	T°C	kΩ
122.0	50	72.32
123.8	51	69.64
125.6	52	67.06
127.4	53	64.60
129.2	54	62.24
131.0	55	59.97
132.8	56	57.80
134.6	57	55.72
136.4	58	53.72
138.2	59	51.98
140.0	60	49.96
141.8	61	48.19
143.6	62	46.49
145.4	63	44.86
147.2	64	43.30
149.0	65	41.79
150.8	66	40.35
152.6	67	38.96
154.4	68	37.63
156.2	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

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

P_H : Detected Pressure [High Side]
P_L : Detected Pressure [Low Side]
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

Checking failures in power semiconductors mounted on inverter PC board

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

<Items to be prepared>

- Multiple tester : Prepare the analog of multiple tester.
  For the digital multiple tester, check the diode function .

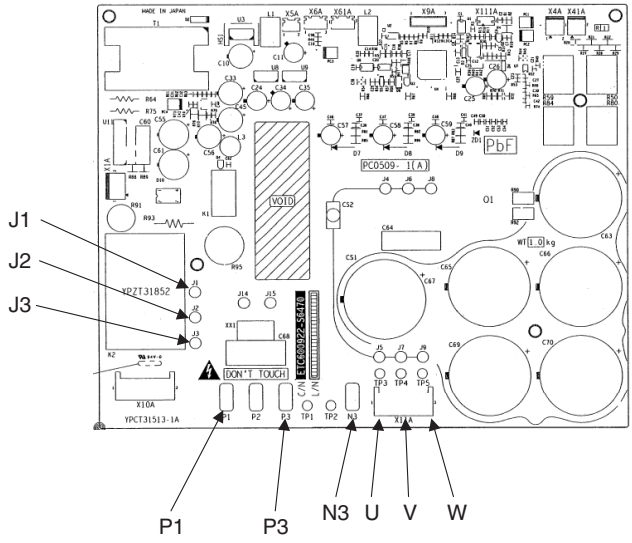
<Test points>

- Turn OFF the power supply. Then, after a lapse of 10 minutes or more, make measurement of resistance.

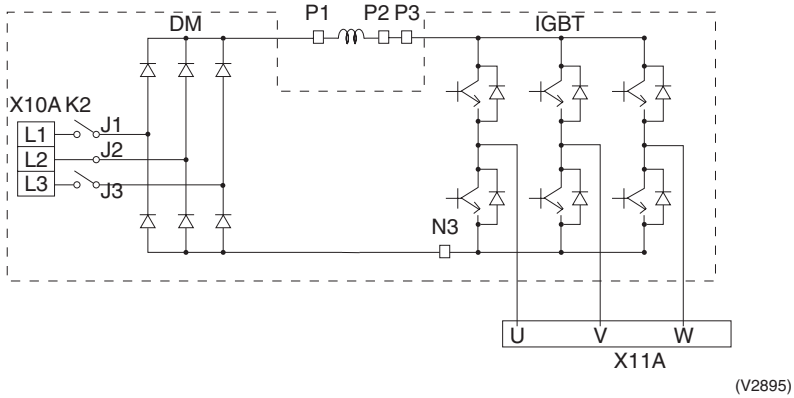
<Preparation>

- To make measurement, disconnect all connectors and terminals.

Inverter PC board



Electronic circuit



(V2895)

■ According to the tests made, it is you can determine if the malfunction is the result of a faulty inverter.The following section describes spossible causes of the faulty inverter:

- Faulty compressor (ground leakage)
- Faulty fan motor (ground leakage)
- Entry of conductive foreign particles

1. ●Abnormal voltage: e.g., over-voltage, electrical surge, or unbalanced voltage**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.

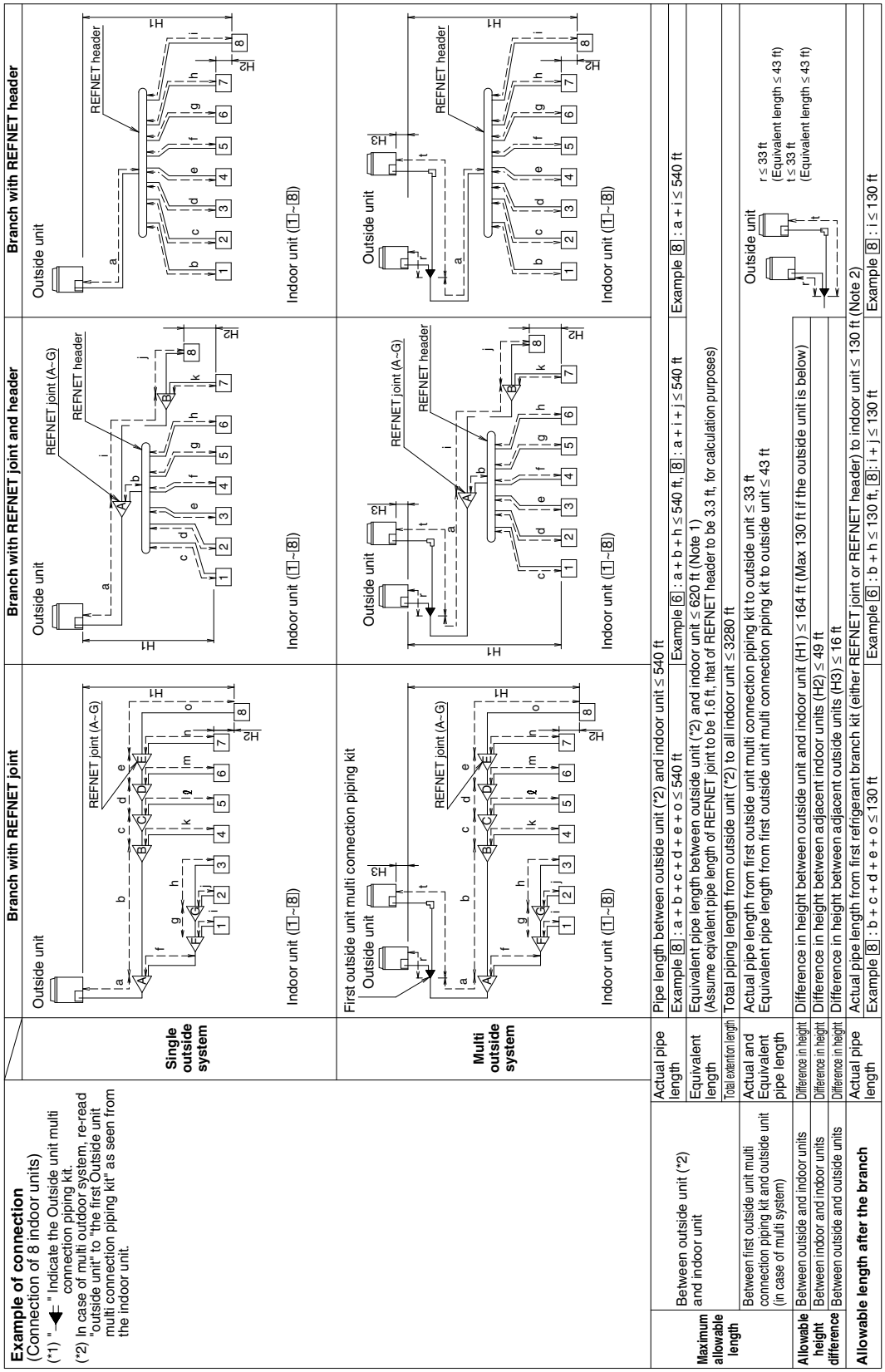
No.	Measuring point		Criterion	Remark
	+	-		
1	P1	J1	2 to 15kΩ	
2	P1	J2		
3	P1	J3		
4	J1	P1	Not less than 15kΩ (including)	It may take time to determine the resistance due to capacitor charge.
5	J2	P1		
6	J3	P1		
7	N3	J1		
8	N3	J2		
9	N3	J3		
10	J1	N3	2 to 15kΩ	
11	J2	N3		
12	J3	N3		

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		

9. Example of Connection

Heat Pump



Outside 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 Outside unit multi connection piping kit. (BHFP22P100U).
  (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 supplyed).

How to select the REFNET joint

- When using REFNET joint at the first branch counted from the outside unit side, choose from the following table in accordance with the outside unit capacity type. (Example :REFNET jointA)

Outside unit capacity type	Refrigerant branch kit name
RXYQ72 · 96P type	KHRP26M33T
RXYQ120 ~ 216P type	KHRP26M72TU
RXYQ240P type	KHRP26M73TU

- 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	KHRP26M72TU

How to select the REFNET header

- Choose form the following table in accordance with the total capacity index of all the indoor units conncted below the REFNET header.

Indoor unit total capacity index	Refrigerant branch kit name
x < 72	KHRP26M22H or KHRP26M33H
72 ≤ x < 111	KHRP26M33H
111 ≤ x	KHRP26M72H

How to select the outside unit multi connection piping kit (This is required when the system is multi outside unit system.)

- Choose from the following table in accordance with the number of outside units.

Number of outside unit	Connecting piping kit name
2 units	BHFP22P100U

Example for indoor units connected downstream

Example REFNET joint C : Indoor units 5+6+7+8

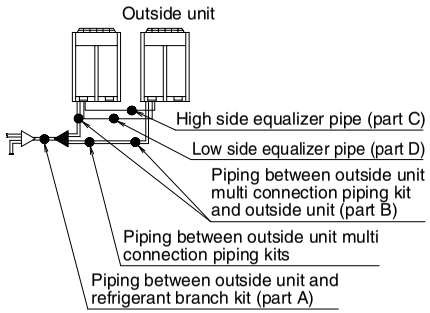
Example REFNET joint B : Indoor units 7+8
Example REFNET header : Indoor units 1+2+3+4+5+6

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 outside unit installation, make the settings in accordance with the following figure.



Piping between outside unit(*2) and refrigerant branch kit (partA)

- Choose from the following table in accordance with the outside units system capacity type. (unit : in.)

Outside 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	

Piping between outside unit multi connection piping kit and outside unit (part B)

- Choose from the following table in accordance with the capacity type of the outside unit connected. (unit : in.)

Outside unit capacity type	Piping size (O. D.)	
	Gas pipe	Liquid pipe
RXYQ72P type	ϕ3/4	ϕ3/4
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 outside 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		ϕ5/8

Piping between refrigerant branch kit and indoor unit.

- Match to the size of the connection pipng 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	ϕ5/8	ϕ3/8

High side Equalizer pipe (part C)(outside multi system only) (unit : in.)

Piping size (O. D.)	ϕ3/4

Low side Equalizer pipe (part D)(outside multi system only) (unit : in.)

Piping size (O. D.)	ϕ3/4

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.)

$$R = \left(\begin{array}{l} (\text{Total length (ft) of liquid piping size at } \phi 7/8) \times 0.249 + (\text{Total length (ft) of liquid piping size at } \phi 3/4) \times 0.175 \\ + (\text{Total length (ft) of liquid piping size at } \phi 5/8) \times 0.121 + (\text{Total length (ft) of liquid piping size at } \phi 1/2) \times 0.081 \\ + (\text{Total length (ft) of liquid piping size at } \phi 3/8) \times 0.040 + (\text{Total length (ft) of liquid piping size at } \phi 1/4) \times 0.015 \end{array} \right) + \text{(HEAT PUMP SYSTEM)} + \text{(REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT)}$$

HEAT PUMP SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
RXYQ72 ~ 120PYDN RXYQ72 ~ 120PTJU	—
RXYQ144PTJU	7.9 lb
RXYQ144 ~ 192PYDN RXYQ168 ~ 192PTJU	2.2 lb
RXYQ216 ~ 240PYDN RXYQ216 ~ 240PTJU	3.3 lb

REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT	
INDOOR CONNECTION CAPACITY	MODEL NAME RXYQ72 ~ 240PYDN RXYQ72 ~ 240PTJU
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 heder for systems and each pipe length as shown below.

Outside system : RXYQ240PYDN
Total capacity of indoor unit : 116%

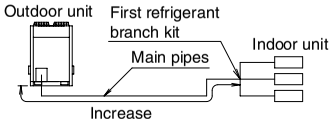
a : ϕ3/4 × 15ft.	e : ϕ3/8 × 5ft.	i : ϕ3/8 × 5ft.	t : ϕ3/8 × 1ft.
b : ϕ3/4 × 10ft.	f : ϕ3/8 × 5ft.	j : ϕ3/8 × 5ft.	
c : ϕ3/8 × 5ft.	g : ϕ3/8 × 5ft.	k : ϕ3/8 × 10ft.	
d : ϕ3/8 × 5ft.	h : ϕ3/8 × 5ft.	r : ϕ1/2 × 1ft.	

$R = (\boxed{25 \times 0.175} + \boxed{1 \times 0.081} + \boxed{51 \times 0.040}) + \boxed{3.3} + \boxed{1.1}$
(a, b; r; c~k, t; RXYQ240PYDN; 116%)

$= 10.896 \Longrightarrow \boxed{10.8\ \text{lb}}$

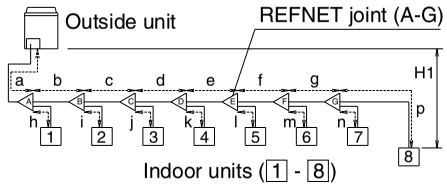
Round off in units of 0.1 lb.

Note 1.
When the equivalent pipe length between outside 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.



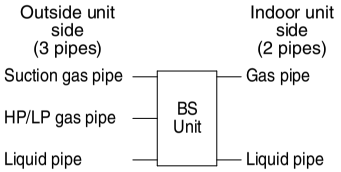
System	Gas pipe	Liquid pipe
RXYQ72P type	ϕ3/4 → ϕ7/8	ϕ3/8 → ϕ1/2
RXYQ96P type	ϕ7/8 → ϕ1	ϕ3/8 → ϕ1/2
RXYQ120P type	Not Increased	ϕ1/2 → ϕ5/8
RXYQ144P type	ϕ1-1/8 → ϕ1-1/4	ϕ1/2 → ϕ5/8
RXYQ168P type	ϕ1-1/8 → ϕ1-1/4	ϕ5/8 → ϕ3/4
RXYQ192P type	ϕ1-1/8 → ϕ1-1/4	ϕ5/8 → ϕ3/4
RXYQ216P type	ϕ1-1/8 → ϕ1-1/4	ϕ5/8 → ϕ3/4
RXYQ240P type	Not Increased	ϕ5/8 → ϕ3/4

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 necessay to increase the pipe size between the first branch kit and the final branch kit. (Reducers must be procured on site) However, the pipes that are same pipe size with main pipe must not be increased	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 [Outside unit to the farthest indoor unit] and [Outside 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.	

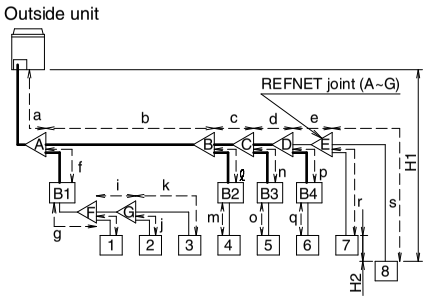
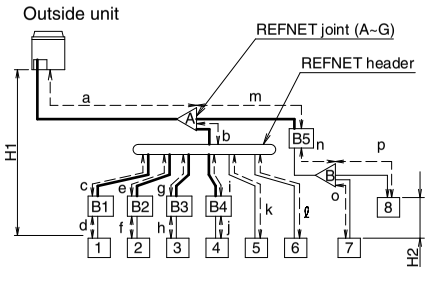
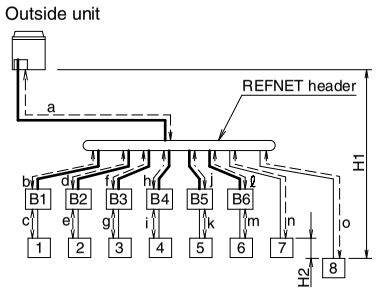
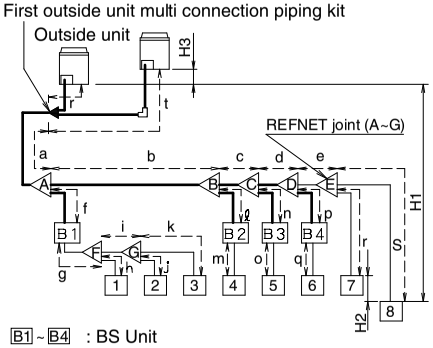
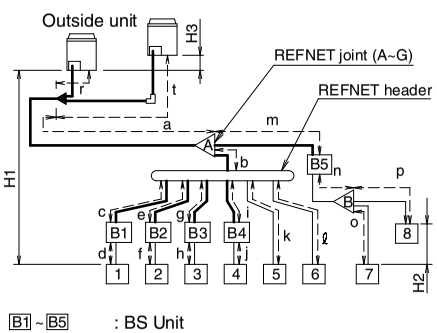
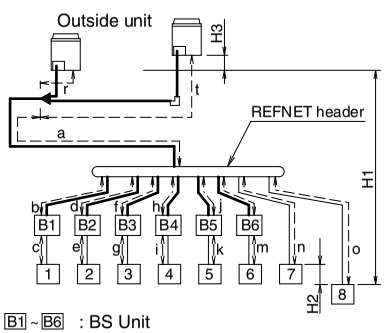
*If available on the site, use this size. Otherwise it can not be increased.

Example of connection
(Connection of 8 indoor units)

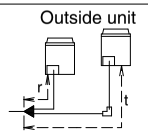


- Piping from outside unit to BS unit
  - (Bold) : 3 pipes { Suction gas pipe / HP/LP gas pipe / Liquid pipe
- Piping from BS unit to indoor unit or Piping from Refrigerant branch kit to indoor unit used as cooling only
  - (Thin) : 2 pipes { (Suction) gas pipe / Liquid pipe

(*1) "◄" Indicate the Outside unit multi connection piping kit.
(*2) In case of multi outdoor system, re-read "outside unit" to "the first Outside unit multi connection piping kit" as seen from the indoor unit.

	Branch with REFNET joint	Branch with REFNET joint and header	Branch with REFNET header
Single outside system REYQ 72~120 PYDN REYQ 72~144 PTJU	 B1~B4 : BS Unit 1~6 : Indoor unit (Cool/Heat selection possible) 7, 8 : Indoor unit (Cooling only)	 B1~B5 : BS Unit 1~4, 7, 8 : Indoor unit (Cool/Heat selection possible) 5, 6 : Indoor unit (Cooling only)	 B1~B6 : BS Unit 1~6 : Indoor unit (Cool/Heat selection possible) 7, 8 : Indoor unit (Cooling only)
Multi outside system REYQ 144~240 PYDN REYQ 168~240 PTJU	 B1~B4 : BS Unit 1~6 : Indoor unit (Cool/Heat selection possible) 7, 8 : Indoor unit (Cooling only)	 B1~B5 : BS Unit 1~4, 7, 8 : Indoor unit (Cool/Heat selection possible) 5, 6 : Indoor unit (Cooling only)	 B1~B6 : BS Unit 1~6 : Indoor unit (Cool/Heat selection possible) 7, 8 : Indoor unit (Cooling only)

Maximum allowable length	Between outside unit (*2) and indoor unit	Actual pipe length	Pipe length between outside 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 outside unit (*2) and indoor unit ≤ 620 ft (Note 1) (Assume eqivalent pipe length of REFNET joint to be 1.6 ft, that of REFNET header to be 3.3 ft, that of BSVQ36 · 60 to be 13 ft, for calculation purposes)		
		Total extention length	Total piping length from outside unit (*2) to all indoor unit ≤ 3280 ft		
	Between first outside unit multi connection piping kit and outside unit (in case of multi system)	Actual and Equivalent pipe length	Actual pipe length from first outside unit multi connection piping kit to outside unit ≤ 33 ft Equivalent pipe length from first outside unit multi connection piping kit to outside unit ≤ 43 ft		
Allowable height difference	Between outside and indoor units	Difference in height	Difference in height between outside unit and indoor unit (H1) ≤ 164 ft (Max 130 ft if the outside unit is below)		
	Between indoor and indoor units	Difference in height	Difference in height between adjacent indoor units (H2) ≤ 49 ft		
	Between outside and outside units	Difference in height	Difference in height between adjacent outside 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



r ≤ 33 ft
(Equivalent length ≤ 43 ft)
t ≤ 33 ft
(Equivalent length ≤ 43 ft)

Outside unit multi connection piping kit and Refrigerant branch kit selection

- Refrigerant branch kits can only be used with R-410A.
- When multi outdoor system are installed, be sure to use the special separately sold Outside 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 supplyed).

How to select the REFNET joint

- When using REFNET joint at the first branch counted from the outside unit side, choose from the following table in accordance with the outside unit capacity type.
  (Example : REFNET joint A)

Outside unit capacity type	Refrigerant branch kit name
REYQ72 · 96P type	KHRP25M33T
REYQ120~216P type	KHRP25M72TU
REYQ240P type ~	KHRP25M73TU

- 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
× < 72	KHRP25M22T	KHRP26M22T
72 ≤ × < 111	KHRP25M33T	KHRP26M33T
111 ≤ ×	KHRP25M72TU	KHRP26M72TU

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
× < 72	KHRP25M33H	KHRP26M22H or KHRP26M33H
72 ≤ × < 111		KHRP26M33H
111 ≤	KHRP25M72H	KHRP26M72H

How to select the outside unit multi connection piping kit (This is required when the system is multi outside unit system.)

- Choose from the following table in accordance with the number of outside units.

Number of outside unit	Connecting piping kit name
2 units	BHFP26P90U

Example for indoor units connected downstream

Example REFNET joint C : Indoor units 5 + 6 + 7 + 8

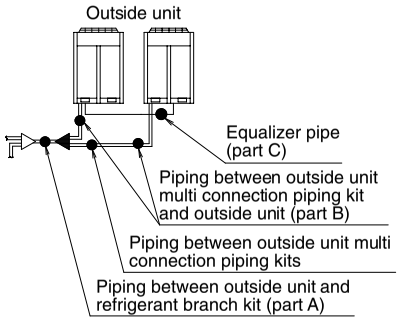
Example REFNET joint B : Indoor units 7 + 8
Example REFNET header : Indoor units 1 + 2 + 3 + 4 + 5 + 6

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 outside unit installation, make the settings in accordance with the following figure.



Piping between outside unit(*2 and refrigerant branch kit (partA)

- Choose from the following table in accordance with the outdoor units system capacity type.

(unit : in.)

Outside 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	
REYQ168P type			ϕ5/8
REYQ192 · 216P type		ϕ1-1/8	
REYQ240P type	ϕ1-3/8		

Piping between outside unit multi connection piping kit and outside unit (part B)

- Choose from the following table in accordance with the capacity type of the outside unit connected.

(unit : in.)

Outside 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 outside 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
× < 54	ϕ5/8	ϕ1/2	ϕ3/8
54 ≤ × < 72	ϕ3/4	ϕ5/8	
72 ≤ × < 111	ϕ7/8	ϕ3/4	
111 ≤ × < 162	ϕ1-1/8		ϕ1/2
162 ≤ ×		ϕ1-1/8	ϕ5/8

Piping between refrigerant branch kit, BS unit and indoor unit.

- Match to the size of the connection pipng 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	ϕ5/8	ϕ3/8

Equalizer pipe (part C) (outside multi system only)

(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 RECOVER SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
REYQ72 ~ 120PYDN REYQ72 ~ 144PTJU	7.9 lb
REYQ144 ~ 192PYDN REYQ168~ 192PTJU	2.2 lb
REYQ216 ~ 240PYDN REYQ216 ~ 240PTJU	3.3 lb

+

REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT	
INDOOR CONNECTION CAPACITY	MODEL NAME REYQ72 ~ 240PYDN REYQ72 ~ 240PTJU
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 heder for systems and each pipe length as shown below.

Outside system : REYQ240PYDN
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.

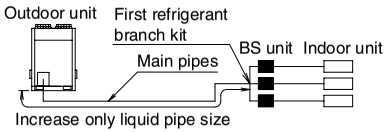
$$R = (\boxed{25 \times 0.175}_{a,\,b} + \boxed{1 \times 0.121}_{u} + \boxed{1 \times 0.081}_{r} + \boxed{75 \times 0.040}_{c\sim n,\,s,\,t} + \boxed{10 \times 0.015}_{o,\,p}) \times 1.02 + \boxed{3.3}_{\text{REYQ240PYDN}} + \boxed{1.1}_{116\%}$$

$$= 12.282 \Longrightarrow \boxed{12.3\text{lb}}$$

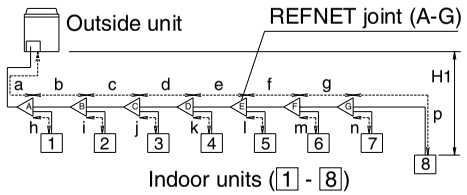
Round off in units of 0.1 lb.

Note 1.
When the equivalent pipe length between outside 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 inxrease 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



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 necessay to increase the pipe size between the first branch kit and the final branch kit. (Reducers must be procured on site) However, the pipes that are same pipe size with main pipe must not be increased	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 [Outside unit to the farthest indoor unit] and [Outside 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.

Part 7
Precautions for New Refrigerant (R-410A)

7. 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:
   Good composition control, since it is a Quasi-azeotropic mixture refrigerant.

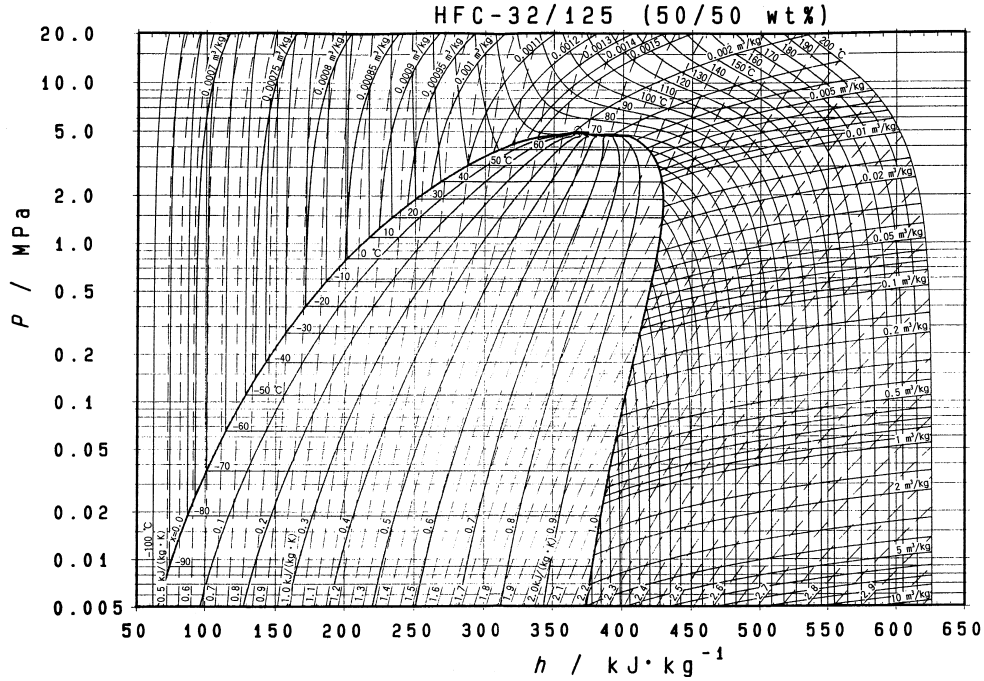
	HFC units (Units using new refrigerants)		HCFC units
Refrigerant name	R-407C	R-410A	R-22
Composing substances	Non-azeotropic mixture of HFC32, HFC125 and HFC134a (*1)	Quasi-azeotropic mixture of HFC32 and JFC125 (*1)	Single-component refrigerant
Design pressure	3.2 MPa (gauge pressure) = 32.6 kgf/cm^2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

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

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

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

(Reference) 1 MPa≒ 10.19716 kgf / cm^2
1 MPa≒ 145 psi



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

■ Thermodynamic characteristic of R-410A

DAIREP ver2.0

Temperature (℃)	Steam pressure (kPa)		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
-70	36.13	36.11	1410.7	1.582	1.372	0.695	100.8	390.6	0.649	2.074
-68	40.83	40.80	1404.7	1.774	1.374	0.700	103.6	391.8	0.663	2.066
-66	46.02	45.98	1398.6	1.984	1.375	0.705	106.3	393.0	0.676	2.058
-64	51.73	51.68	1392.5	2.213	1.377	0.710	109.1	394.1	0.689	2.051
-62	58.00	57.94	1386.4	2.463	1.378	0.715	111.9	395.3	0.702	2.044
-60	64.87	64.80	1380.2	2.734	1.379	0.720	114.6	396.4	0.715	2.037
-58	72.38	72.29	1374.0	3.030	1.380	0.726	117.4	397.6	0.728	2.030
-56	80.57	80.46	1367.8	3.350	1.382	0.732	120.1	398.7	0.741	2.023
-54	89.49	89.36	1361.6	3.696	1.384	0.737	122.9	399.8	0.754	2.017
-52	99.18	99.03	1355.3	4.071	1.386	0.744	125.7	400.9	0.766	2.010
-51.58	101.32	101.17	1354.0	4.153	1.386	0.745	126.3	401.1	0.769	2.009
-50	109.69	109.51	1349.0	4.474	1.388	0.750	128.5	402.0	0.779	2.004
-48	121.07	120.85	1342.7	4.909	1.391	0.756	131.2	403.1	0.791	1.998
-46	133.36	133.11	1336.3	5.377	1.394	0.763	134.0	404.1	0.803	1.992
-44	146.61	146.32	1330.0	5.880	1.397	0.770	136.8	405.2	0.816	1.987
-42	160.89	160.55	1323.5	6.419	1.401	0.777	139.6	406.2	0.828	1.981
-40	176.24	175.85	1317.0	6.996	1.405	0.785	142.4	407.3	0.840	1.976
-38	192.71	192.27	1310.5	7.614	1.409	0.792	145.3	408.3	0.852	1.970
-36	210.37	209.86	1304.0	8.275	1.414	0.800	148.1	409.3	0.864	1.965
-34	229.26	228.69	1297.3	8.980	1.419	0.809	150.9	410.2	0.875	1.960
-32	249.46	248.81	1290.6	9.732	1.424	0.817	153.8	411.2	0.887	1.955
-30	271.01	270.28	1283.9	10.53	1.430	0.826	156.6	412.1	0.899	1.950
-28	293.99	293.16	1277.1	11.39	1.436	0.835	159.5	413.1	0.911	1.946
-26	318.44	317.52	1270.2	12.29	1.442	0.844	162.4	414.0	0.922	1.941
-24	344.44	343.41	1263.3	13.26	1.448	0.854	165.3	414.9	0.934	1.936
-22	372.05	370.90	1256.3	14.28	1.455	0.864	168.2	415.7	0.945	1.932
-20	401.34	400.06	1249.2	15.37	1.461	0.875	171.1	416.6	0.957	1.927
-18	432.36	430.95	1242.0	16.52	1.468	0.886	174.1	417.4	0.968	1.923
-16	465.20	463.64	1234.8	17.74	1.476	0.897	177.0	418.2	0.980	1.919
-14	499.91	498.20	1227.5	19.04	1.483	0.909	180.0	419.0	0.991	1.914
-12	536.58	534.69	1220.0	20.41	1.491	0.921	182.9	419.8	1.003	1.910
-10	575.26	573.20	1212.5	21.86	1.499	0.933	185.9	420.5	1.014	1.906
-8	616.03	613.78	1204.9	23.39	1.507	0.947	189.0	421.2	1.025	1.902
-6	658.97	656.52	1197.2	25.01	1.516	0.960	192.0	421.9	1.036	1.898
-4	704.15	701.49	1189.4	26.72	1.524	0.975	195.0	422.6	1.048	1.894
-2	751.64	748.76	1181.4	28.53	1.533	0.990	198.1	423.2	1.059	1.890
0	801.52	798.41	1173.4	30.44	1.543	1.005	201.2	423.8	1.070	1.886
2	853.87	850.52	1165.3	32.46	1.552	1.022	204.3	424.4	1.081	1.882
4	908.77	905.16	1157.0	34.59	1.563	1.039	207.4	424.9	1.092	1.878
6	966.29	962.42	1148.6	36.83	1.573	1.057	210.5	425.5	1.103	1.874
8	1026.5	1022.4	1140.0	39.21	1.584	1.076	213.7	425.9	1.114	1.870
10	1089.5	1085.1	1131.3	41.71	1.596	1.096	216.8	426.4	1.125	1.866
12	1155.4	1150.7	1122.5	44.35	1.608	1.117	220.0	426.8	1.136	1.862
14	1224.3	1219.2	1113.5	47.14	1.621	1.139	223.2	427.2	1.147	1.859
16	1296.2	1290.8	1104.4	50.09	1.635	1.163	226.5	427.5	1.158	1.855
18	1371.2	1365.5	1095.1	53.20	1.650	1.188	229.7	427.8	1.169	1.851
20	1449.4	1443.4	1085.6	56.48	1.666	1.215	233.0	428.1	1.180	1.847
22	1530.9	1524.6	1075.9	59.96	1.683	1.243	236.4	428.3	1.191	1.843
24	1615.8	1609.2	1066.0	63.63	1.701	1.273	239.7	428.4	1.202	1.839
26	1704.2	1697.2	1055.9	67.51	1.721	1.306	243.1	428.6	1.214	1.834
28	1796.2	1788.9	1045.5	71.62	1.743	1.341	246.5	428.6	1.225	1.830
30	1891.9	1884.2	1034.9	75.97	1.767	1.379	249.9	428.6	1.236	1.826
32	1991.3	1983.2	1024.1	80.58	1.793	1.420	253.4	428.6	1.247	1.822
34	2094.5	2086.2	1012.9	85.48	1.822	1.465	256.9	428.4	1.258	1.817
36	2201.7	2193.1	1001.4	90.68	1.855	1.514	260.5	428.3	1.269	1.813
38	2313.0	2304.0	989.5	96.22	1.891	1.569	264.1	428.0	1.281	1.808
40	2428.4	2419.2	977.3	102.1	1.932	1.629	267.8	427.7	1.292	1.803
42	2548.1	2538.6	964.6	108.4	1.979	1.696	271.5	427.2	1.303	1.798
44	2672.2	2662.4	951.4	115.2	2.033	1.771	275.3	426.7	1.315	1.793
46	2800.7	2790.7	937.7	122.4	2.095	1.857	279.2	426.1	1.327	1.788
48	2933.7	2923.6	923.3	130.2	2.168	1.955	283.2	425.4	1.339	1.782
50	3071.5	3061.2	908.2	138.6	2.256	2.069	287.3	424.5	1.351	1.776
52	3214.0	3203.6	892.2	147.7	2.362	2.203	291.5	423.5	1.363	1.770
54	3361.4	3351.0	875.1	157.6	2.493	2.363	295.8	422.4	1.376	1.764
56	3513.8	3503.5	856.8	168.4	2.661	2.557	300.3	421.0	1.389	1.757
58	3671.3	3661.2	836.9	180.4	2.883	2.799	305.0	419.4	1.403	1.749
60	3834.1	3824.2	814.9	193.7	3.191	3.106	310.0	417.6	1.417	1.741
62	4002.1	3992.7	790.1	208.6	3.650	3.511	315.3	415.5	1.433	1.732
64	4175.7	4166.8	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). The refrigerating machine oil has been changed from Suniso oil to Ether oil, and if oil mixing occurs, sludge builds in the refrigerants and causes other problems. Therefore, gauge manifolds and charge hoses with a previous refrigerant (R-22,R-407C) cannot be used for products with 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.
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	○			
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".

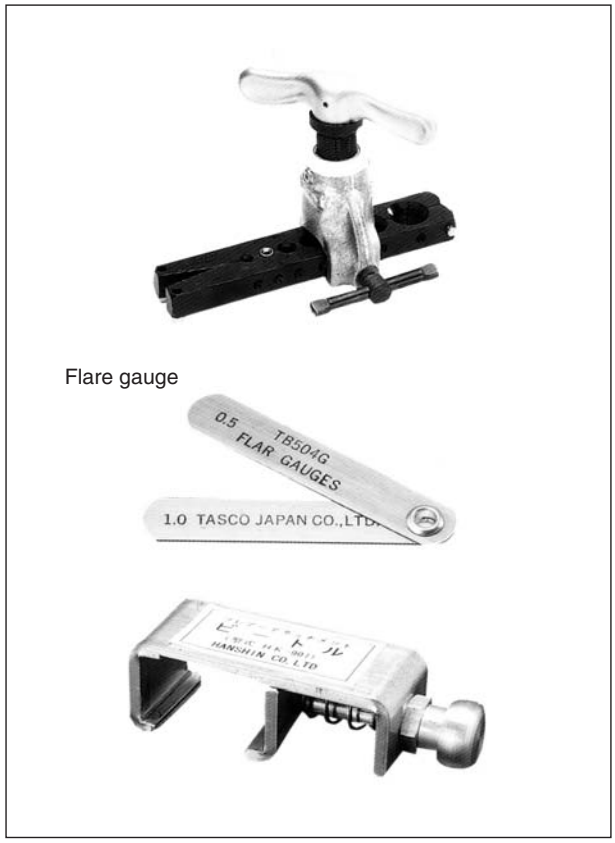
For the charge mouthpiece and packing, 1/2UNF20 is necessary for mouthpiece size of charge hose.

■ Copper tube material and thickness

Pipe size [in]	R-407C		R-410A	
	Material	Thickness [in]	Material	Thickness [in]
ϕ1/4”	O	0.8/32	O	0.8/32
ϕ3/8”	O	0.8/32	O	0.8/32
ϕ1/2”	O	0.8/32	O	0.8/32
ϕ5/8“	O	1.0/32	O	1.0/32
ϕ3/4”	O	1.0/32	1/2H	1.0/32
ϕ7/8”	1/2H	1.0/32	1/2H	1.0/32
ϕ1.0”	1/2H	1.0/32	1/2H	1.0/32
ϕ1-1/8”	1/2H	1.0/32	1/2H	1.0/32
ϕ1-5/16”	1/2H	1.2/32	1/2H	1.1/32
ϕ1-1/2”	1/2H	1.4/32	1/2H	1.4/32
ϕ1-3/4”	1/2H	1.6/32	1/2H	1.6/32

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

1. Flaring tool



■ Specifications

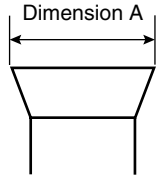
• Dimension A

Unit:mm

Nominal size	Tube O.D.	A $^{+0}_{-0.4}$	
	Do	Class-2 (R-410A)	Class-1 (Conventional)
1/4	6.35	9.1/32	9.0/32
3/8	9.52	13.2/32	13.0/32
1/2	12.70	16.6/32	16.2/32
5/8	15.88	19.7/32	19.4/32
3/4	19.05	3/4	23.3/32

■ 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. Previously, a pipe extension margin of 0 to 0.5/32mm was provided for flaring. For R-410A air conditioners, perform pipe flaring with a pipe extension margin of 1/32 to 1.5/32mm.

l For clutch types only, a conventional tool with pipe extension margin adjustment can be used.

2. Torque wrench

■ Specifications

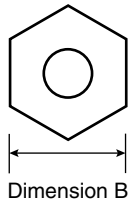
• Dimension B Unit:in

Nominal size	Class-1	Class-2	Previous
1/2	3/4	13/16	3/4
5/8	27/32	29/32	27/32

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

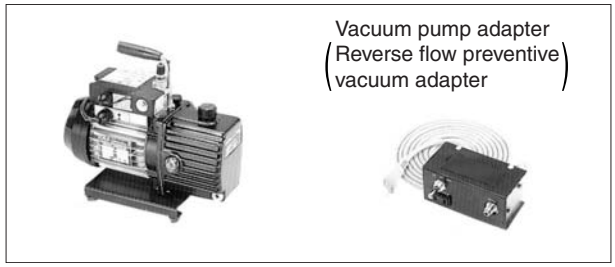
■ Differences

• 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 adapter

● 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 or 5000 micron or – 755 mmHg).

■ Differences

• Designed to prevent reverse oil flow.
• Previous vacuum pump can be used by installing an adapter.

4. Leak tester

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

■ Differences
- Previous testers detected chlorine. Since HFCs do not contain chlorine, the 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.

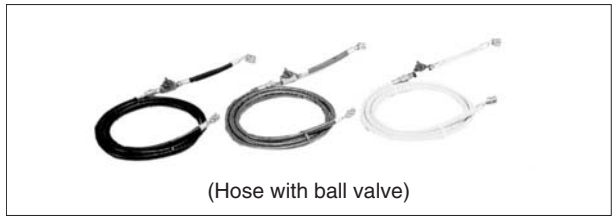
6. Gauge manifold for R-410A

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

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

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

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Drawings & Flow Charts

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- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
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- 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 and/or retailer.

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About ISO9001

ISO 9001 is a plant certification system defined by the International Organization for Standardization (ISO) relating to quality assurance. ISO 9001 certification covers quality assurance aspects related to the "design, development, manufacture, installation, and supplementary service" of products manufactured at the plant.

EC99J2044

JQA-E-90108

About ISO 14001

ISO 14001 is the standard defined by the International Organization for Standardization (ISO) relating to environmental management systems. Our group has been acknowledged by an internationally accredited compliance organisation as having an appropriate programme of environmental protection procedures and activities to meet the requirements of ISO 14001.

Dealer

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