

Service Manual

R-407C *VRV*TM *PLUS* Series Heat Recovery System



RSEYP16KJY1
RSEYP18KJY1
RSEYP20KJY1
RSEYP24KJY1
RSEYP26KJY1
RSEYP28KJY1
RSEYP30KJY1

R-407C *VRVTM PLUS* Inverter K Series Heat Recovery System

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1. Introduction








1.1 Safety Cautions

Cautions and Warnings


- Be sure to read the following safety cautions before conducting repair work.
- The caution items are classified into “ **Warning**” and “ **Caution**”. The “ **Warning**” items are especially important since they can lead to death or serious injury if they are not followed closely. The “ **Caution**” items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.
- About the pictograms
 -  This symbol indicates an item for which caution must be exercised.
The pictogram shows the item to which attention must be paid.
 -  This symbol indicates a prohibited action.
The prohibited item or action is shown inside or near the symbol.
 -  This symbol indicates an action that must be taken, or an instruction.
The instruction is shown inside or near the symbol.
- After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer




1.1.1 Caution in Repair.



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

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





1.1.2 Cautions Regarding Products after Repair



 Warning	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only
Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.	

 Warning	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-407C) 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 deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock, excessive heat generation or fire.	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it can cause an electrical shock, excessive heat generation or fire.	

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

1.1.4 Using Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

1.1.5 Using Icons List

Icon	Type of Information	Description
 Note:	Note	A “note” provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
 Caution	Caution	A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.
 Warning	Warning	A “warning” is used when there is danger of personal injury.
	Reference	A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

Part 1

General Information

R-407C *VRV*TM PLUS Series

Heat Recovery System

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1. Product Outline

1.1 Year 2001 Models Using New Refrigerant

Outdoor Unit Series

● New model

Series name	Equivalent horsepower (HP)	16	18	20	24	26	28	30
R-407C VRV PLUS series Heat Recovery System		●	●	●	●	●	●	●

Indoor Unit Series

● New model ◎ Model change ○ Continued model

		Type P20	Type P25	Type P32	Type P40	Type P50	Type P63	Type P80	Type P100	Type P125	Type P200	Type P250
Ceiling mounted cassette type	Multi-flow type	—	—	○	○	○	○	○	○	○	—	—
	Double-flow type	○	○	○	○	○	○	○	—	○	—	—
	Corner type	—	○	○	○	—	○	—	—	—	—	—
Ceiling mounted built-in type		○	○	○	○	○	○	○	○	○	—	—
Ceiling mounted duct type		—	—	—	○	○	○	○	○	○	○	○
Ceiling suspended type		—	—	○	—	—	○	—	○	—	—	—
Wall mounted type		○	○	○	○	○	○	—	—	—	—	—
Floor standing type		○	○	○	○	○	○	—	—	—	—	—
Concealed floor standing type		○	○	○	○	○	○	—	—	—	—	—

BS unit

	Type P100	Type P160	Type P250
R-407C Heat Recovery	○	○	●

System Layout

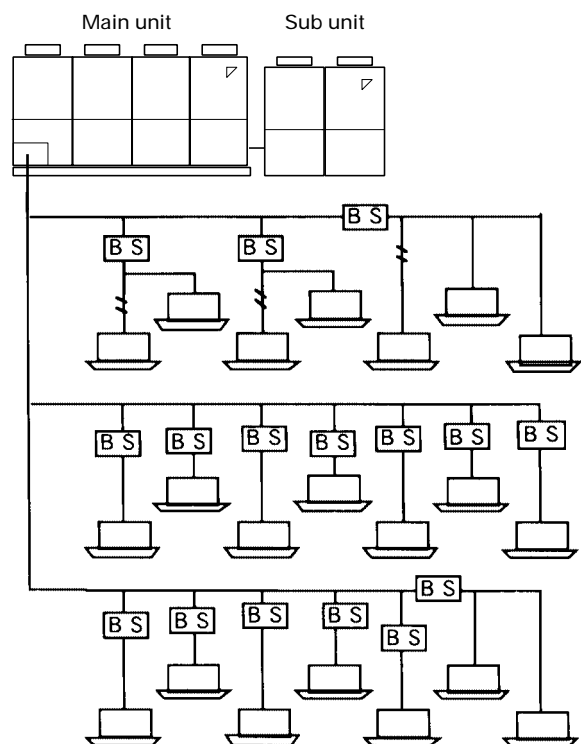
RSEYP-K

Main unit REYP-KJ
Sub unit RXEP-KJ

Connectable indoor unit capacity
20type

Indoor unit connection capacity
50 - 130% of outdoor unit total capacity

No. of connectable indoor units
RSEYP16 ~ 20K Max. 20 units
RSEYP24 ~ 30K Max. 32 units

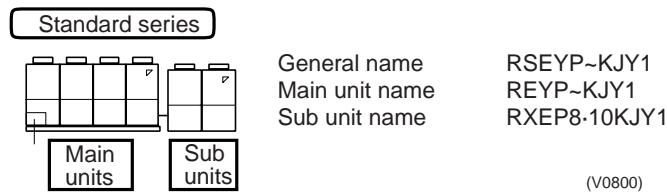


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1.2 Outline of New Series Products

In addition to the use of a new refrigerant (R-407C), the new series products incorporate a function-unit-less structure for significantly improved flexibility and ease of installation.

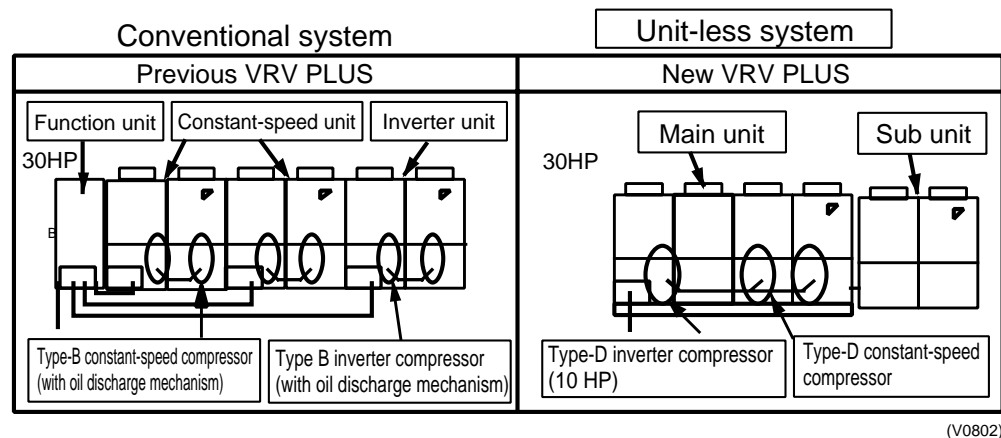
System outline



- No function unit
All models combine master units and slave units or master units, slave units and Plus units.
- All models use a new refrigerant with low ozone destruction potential and global warming potential to minimize environmental loads.

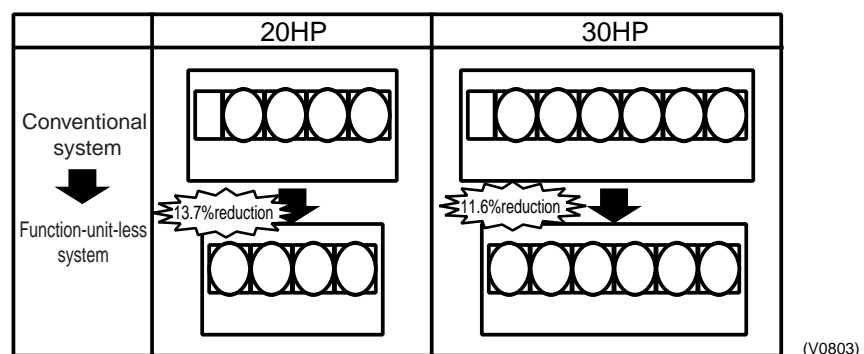
Feature (1)

- Dramatically improved flexibility and ease of field installation by function-unit-less structure
 - Simpler piping work at installation sites
 - Reduced unit installation area (13.7%: 20HP, 11.6%: 30HP)



Feature (2)

- Reduction of installation area

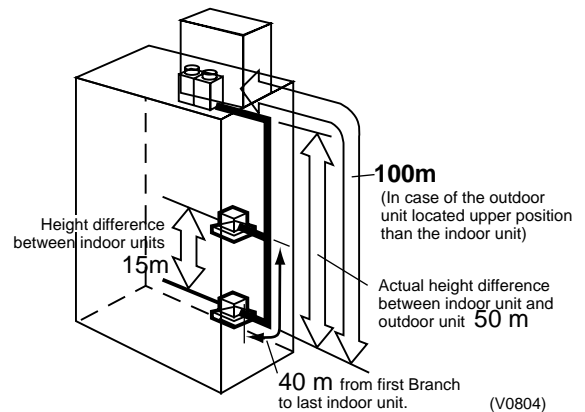


- Simpler piping work at installation sites

	20HP	30HP
Pipe connecting locations	15 joints → 7 joints	21 joints → 7 joints

Other versatile functions are provided

- Long refrigerant piping : equivalent length of 125, actual length of 100 m and height difference of 50 m.
- Connection of indoor unit of varying capacities and types totaling 130% (max.) of outdoor unit by capacity.



- Individual control of up to 20 indoor units with one 20HP class outdoor unit and 32 indoor units with one 30HP outdoor unit.
- For VRV PLUS

Outdoor unit name	No. of indoor units connectable
RSEYP16~20K	20 units
RSEYP24~30K	32 units

- **Others**
- Refrigerant volume will be reduced by simplify the refrigerant circuit (4kg~9kg)
- COP: Power Input decreased 5% for cooling, although 5% increase for heating because of R-407C
- Cooling operation with outdoor air temperature as low as -5°C
- Heating operation with outdoor air temperature as low as -15°C
- Simple REFNET piping system
- Super wiring system
- Automatic address setting function
- Built-in wiring error check function
- Equipped with sequential start function
- Nighttime low-noise mode for reduced operating sound

1.3 Model Configuration and Combination

1.3.1 Number of units and capacity of connectable indoor units

Standard series	Equivalent output		16HP	18HP	20HP	24HP
	R-407C VRV PLUS series system model		RSEYP16KJ	RSEYP18KJ	RSEYP20KJ	RSEYP24KJ
	Outdoor unit combination	Main unit	REYP8KJ	REYP10KJ	REYP10KJ	REYP16KJ
		Sub unit	RXEP8KJ	RXEP8KJ	RXEP10KJ	RXEP8KJ
	Total number of connectable indoor units		Up to 20 units			Up to 32 units
	Total capacity of connectable indoor units		200~520	225~585	250~650	300~780

Standard series	Equivalent output		26HP	28HP	30HP
	R-407C VRV PLUS series system model		RSEYP26KJ	RSEYP28KJ	RSEYP30KJ
	Outdoor unit combination	Main unit	REYP16KJ	REYP20KJ	REYP20KJ
		Sub unit	RXEP10KJ	RXEP8KJ	RXEP10KJ
	Total number of connectable indoor units		Up to 32 units		
	Total capacity of connectable indoor units		325~845	350~910	375~975

1.3.2 Connectable indoor unit

Indoor unit		Model name
Ceiling mounted cassette type	Multi-flow type	FXYFP32KVE·40KVE·50KVE·63KVE·80KVE·100KVE·125KVE
	Double flow type	FXYCP20KV1·25KV1·32KV1·40KV1·50KV1·63KV1·80KV1·125KV1
	Corner type	FXYKP25KV1·32KV1·40KV1·63KV1
Ceiling mounted built-in type		FXYSP20KV1·25KV1·32KV1·40KV1·50KV1·63KV1·80KV1·100KV1·125KV1
Ceiling mounted duct type		FXYMP40KV1·50KV1·63KV1·80KV1·100KV1·125KV1·200KV1·250KV1
Ceiling suspended type		FXYHP32KV1·63KV1·100KV1
Wall mounted type		FXYAP20KV1·25KV1·32KV1·40KV1·50KV1·63KV1
Floor standing type		FXYLP20KV1·25KV1·32KV1·40KV1·50KV1·63KV1
Concealed floor standing type		FXYLMP20KV1·25KV1·32KV1·40KV1·50KV1·63KV1

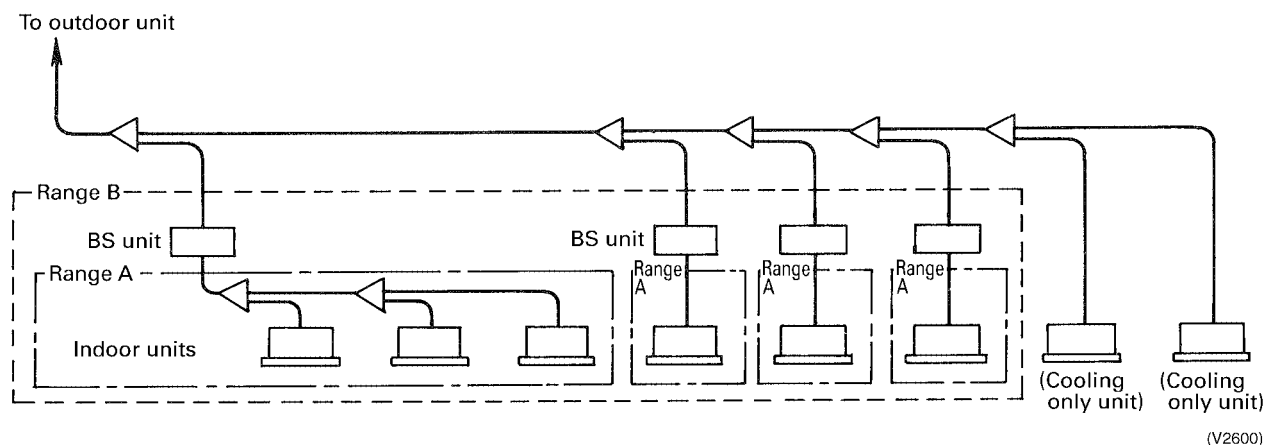
Indoor unit capacity

New refrigerant model code	P20 type	P25 type	P32 type	P40 type	P50 type	P63 type	P80 type	P100 type	P125 type	P200 type	P250 type
Selecting model capacity	2.2kW	2.8kW	3.5kW	4.5kW	5.6kW	7.0kW	9.0kW	11.2kW	14.0kW	22.4kW	28.0kW
Equivalent output	0.8HP	1HP	1.25HP	1.6HP	2.0HP	2.5HP	3.2HP	4HP	5HP	8HP	10HP

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 (kW).

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

1.3.3 BS unit connection range and total indoor unit capacity allowed for simultaneous cooling/heating operations



		Model	Total capacity of connectable indoor units	Maximum number of connectable indoor units
Range A	Total indoor unit capacity allowed for connection to BS unit	BSVP100KJV1	Less than 11.2kW	3 units or less
		BSVP160KJV1	11.2kW or more and less than 18.0kW	6 units or less
		BSVP250KJV1	From 18.0kW to 28.0kW	8 units or less
Range B	Total indoor unit capacity allowed for simultaneous cooling/heating operations	RSEYP16KJY1	22.4kW or more	20 units or less
		RSEYP18KJY1	25.2kW or more	
		RSEYP20KJY1	28.0kW or more	
		RSEYP24KJY1	33.6kW or more	
		RSEYP26KJY1	36.4kW or more	32 units or less
		RSEYP28KJY1	39.2kW or more	
		RSEYP30KJY1	42.0kW or more	

Part 2

Specifications

R-407C *VRV*TM PLUS Series

Heat Recovery System

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1. Specifications

1.1 Outdoor Unit

Model			RSEYP16KJY1	RSEYP18KJY1
Constituent Model (Main Unit + Sub Unit)			REYP8KJY1+RXEP8KJY1	REYP10KJY1+RXEP8KJY1
Power Supply			3 phase 50Hz 380-415V	3 phase 50Hz 380-415V
★1 Cooling Capacity	kW		43.8	49.3
★2 Heating Capacity	kW		43.8	49.3
Casing Color			Ivory white (5Y7.5/1)	Ivory white (5Y7.5/1)
Dimensions : (H×W×D)		mm	(1,440×1,280×690)+(1,220×1,280×690)	(1,440×1,280×690)+(1,220×1,280×690)
Heat Exchanger			Cross fin coil	Cross fin coil
Compressor	Model		JT236DCVTYE @2+JT265DATYE @2	JT236DCVTYE @2+JT265DATYE @2
	Type		Hermetically sealed scroll type	Hermetically sealed scroll type
	Piston Displacement	m³/h	(43.3+25.2)	(43.3+25.2)
	Number of Revolutions	rpm	(5,510, 2,900)	(5,510, 2,900)
	Motor Output × Number of Units	kW	5.5+7.5	5.5+7.5
	Starting Method		Direct on line	Direct on line
Fan	Model		P52H11S	P52H11S
	Type		Propellor fan	Propellor fan
	Motor Output × Number of Units	kW	(0.14+0.23)+(0.14+0.23)	(0.14+0.23)+(0.14+0.23)
	Air Flow Rate	m³/min	320	320
	Drive		Direct drive	Direct drive
Connecting Pipes	Outdoor Unit	Liquid pipe	φ15.9 C1220T (Flare connection)	φ19.1 C1220T (Flare connection)
		Gas pipe	φ34.9 C1220T (Brazing connection)	φ34.9 C1220T (Brazing connection)
		Discharge Pipe	φ28.6 C1220T (Brazing connection)	φ28.6 C1220T (Brazing connection)
	Main Unit ~ Sub Unit	Liquid pipe	φ12.7 C1220T (Flare-Brazing connection)	φ12.7 C1220T (Flare-Brazing connection)
		Gas pipe	φ28.6 C1220T (Brazing-Brazing connection)	φ28.6 C1220t (Brazing-Brazing connection)
Weight		kg	375+95	375+95
Safety Devices			High pressure switch, fan motor safety thermostat, inverter overload protector, overcurrent relay, fusible plugs	High pressure switch, fan motor safety thermostat, inverter overload protector, overcurrent relay, fusible plugs
Defrost Method			Deicer	Deicer
Capacity Control		%	11~100	11~100
Refrigerant	Refrigerant Name		R-407C	R-407C
	Charge	kg	19.8	19.8
	Control		Electronic expansion valve	Electronic expansion valve
Refrigerator Oil	Refrigerant Oil		DAPHNE FVC68D	DAPHNE FVC68D
	Charge Volume	L	4.0+4.0	4.0+4.0
Standard Accessories			Accessories pipe (Gas, liquid and Discharge pipe), Connection pipes (Gas pipe), Installation manual, Operation manual, Jumper wire (Low, High voltage), Clamps	Accessories pipe (Gas, liquid and Discharge pipe), Connection pipes (Gas pipe), Installation manual, Operation manual, Jumper wire (Low, High voltage), Clamps

- Notes:**
- ★1 Indoor temp. : 27°C DB or 19°C WB / outdoor temp. : 35°C DB / Equivalent piping length : 7.5m, level difference : 0m.
 - ★2 Indoor temp. : 20°C DB or 12°C WB / outdoor temp. : 7°C DB or 6°C WB / equivalent piping length : 7.5m, level difference : 0m.

Model			RSEYP20KJY1	RSEYP24KJY1
Constituent Model (Main Unit + Sub Unit)			REYP10KJY1+RXEP10KJY1	REYP16KJY1+RXEP8KJY1
Power Supply			3 phase 50Hz 380-415V	3 phase 50Hz 380-415V
★1 Cooling Capacity	kW		54.7	65.7
★2 Heating Capacity	kW		54.7	65.7
Casing Color			Ivory white (5Y7.5/1)	Ivory white (5Y7.5/1)
Dimensions : (H×W×D)		mm	(1,440×1,280×690)+(1,440×1,280×690)	(1,460×2,580×690)+(1,220×1,280×690)
Heat Exchanger			Cross fin coil	Cross fin coil
Compressor	Model		JT236DCVTYPE @2+JT265DATYE @2	JT236DCVTYPE @2+JT300DATYE @2×2
	Type		Hermetically sealed scroll type	Hermetically sealed scroll type
	Piston Displacement	m³/h	(43.3+25.2)	(43.3+28.4+28.4)
	Number of Revolutions	rpm	(5,510, 2,900)	(5,510, 2,900, 2,900)
	Motor Output × Number of Units	kW	5.5+7.5	5.5+7.5+7.5
	Starting Method		Direct on line	Direct on line
Fan	Model		P52H11S	P52H11S
	Type		Propellor fan	Propellor fan
	Motor Output × Number of Units	kW	(0.14+0.23)+(0.14+0.23)	(0.14+0.23)×2+(0.14+0.23)
	Air Flow Rate	m³/min	340	490
	Drive		Direct drive	Direct drive
Connecting Pipes	Outdoor Unit	Liquid pipe	φ19.1 C1220T (Flare connection)	φ19.1 C1220T (Flare connection)
		Gas pipe	φ34.9 C1220T (Brazing connection)	φ41.3 C1220T (Brazing connection)
		Discharge Pipe	φ28.6 C1220T (Brazing connection)	φ28.6 C1220T (Brazing connection)
	Main Unit ~ Sub Unit	Liquid pipe	φ12.7 C1220T (Flare-Brazing connection)	φ12.7 C1220T (Flare-Brazing connection)
		Gas pipe	φ28.6 C1220T (Brazing-Brazing connection)	φ28.6 C1220T (Brazing-Brazing connection)
Weight		kg	375+105	640+95
Safety Devices			High pressure switch, fan motor safety thermostat, inverter overload protector, overcurrent relay, fusible plugs	High pressure switch, fan motor safety thermostat, inverter overload protector, overcurrent relay, fusible plugs
Defrost Method			Deicer	Deicer
Capacity Control		%	11 ~ 100	11 ~ 100
Refrigerant	Refrigerant Name		R-407C	R-407C
	Charge	kg	19.8	29.5
	Control		Electronic expansion valve	Electronic expansion valve
Refrigerator Oil	Refrigerant Oil		DAPHNE FVC68D	DAPHNE FVC68D
	Charge Volume	L	4.0+4.0	4.0+4.0+4.0
Standard Accessories			Accessories pipe (Gas, liquid and Discharge pipe), Connection pipes (Gas pipe), Installation manual, Operation manual, Jumper wire (Low, High voltage), Clamps	Accessories pipe (Gas, liquid and Discharge pipe), Connection pipes (Gas pipe), Installation manual, Operation manual, Jumper wire (Low, High voltage), Clamps

- Notes:**
- ★1 Indoor temp. : 27°C DB or 19°C WB / outdoor temp. : 35°C DB / Equivalent piping length : 7.5m, level difference : 0m.
 - ★2 Indoor temp. : 20°C DB / outdoor temp. : 7°C DB or 6°C WB / equivalent piping length : 7.5m, level difference : 0m.

Model			RSEYP26KJY1	RSEYP28KJY1
Constituent Model (Main Unit + Sub Unit)			REYP16KJY1+RXEP10KJY1	REYP20KJY1+RXEP8KJY1
Power Supply			3 phase 50Hz 380-415V	3 phase 50Hz 380-415V
★1 Cooling Capacity	kW		71.2	76.6
★2 Heating Capacity	kW		71.2	76.6
Casing Color			Ivory white (5Y7.5/1)	Ivory white (5Y7.5/1)
Dimensions : (H×W×D)			(1,460×2,580×690)+(1,440×1,280×690)	(1,460×2,580×690)+(1,220×1,280×690)
Heat Exchanger			Cross fin coil	Cross fin coil
Compressor	Model		JT236DCVTYPE @2+JT300DATYE @2×2	JT236DCVTYPE @2+JT300DATYE @2×2
	Type		Hermetically sealed scroll type	Hermetically sealed scroll type
	Piston Displacement	m³/h	(43.3+28.4+28.4)	(43.3+28.4+28.4)
	Number of Revolutions	rpm	(5,510, 2,900, 2,900)	(5,510, 2,900, 2,900)
	Motor Output × Number of Units	kW	5.5+7.5+7.5	5.5+7.5+7.5
	Starting Method		Direct on line	Direct on line
Fan	Model		P52H11S	P52H11S
	Type		Propellor fan	Propellor fan
	Motor Output × Number of Units	kW	(0.14+0.23)×2+(0.14+0.23)	(0.14+0.23)×2+(0.14+0.23)
	Air Flow Rate	m³/min	510	490
	Drive		Direct drive	Direct drive
Connecting Pipes	Outdoor Unit	Liquid pipe	φ22.2 C1220T (Brazing connection)	φ22.2 C1220T (Brazing connection)
		Gas pipe	φ41.3 C1220T (Brazing connection)	φ41.3 C1220T (Brazing connection)
		Discharge pipe	φ28.6 C1220T (Brazing connection)	φ34.9 C1220T (Brazing connection)
	Main Unit ~ Sub Unit	Liquid pipe	φ12.7 C1220T (Flare-Brazing connection)	φ12.7 C1220T (Flare-Brazing connection)
		Gas pipe	φ28.6 C1220T (Brazing-Brazing connection)	φ28.6 C1220T (Brazing-Brazing connection)
Weight		kg	640+105	640+95
Safety Devices			High pressure switch, fan motor safety thermostat, inverter overload protector, overcurrent relay, fusible plugs	High pressure switch, fan motor safety thermostat, inverter overload protector, overcurrent relay, fusible plugs
Defrost Method			Deicer	Deicer
Capacity Control		%	11 ~ 100	11 ~ 100
Refrigerant	Refrigerant Name		R-407C	R-407C
	Charge	kg	29.5	29.5
	Control		Electronic expansion valve	Electronic expansion valve
Refrigerator Oil	Refrigerant Oil		DAPHNE FVC68D	DAPHNE FVC68D
	Charge Volume	L	4.0+4.0+4.0	4.0+4.0+4.0
Standard Accessories			Accessories pipe (Gas, liquid and Discharge pipe), Connection pipes (Gas pipe), Installation manual, Operation manual, Jumper wire (Low, High voltage), Clamps	Accessories pipe (Gas, liquid and Discharge pipe), Connection pipes (Gas pipe), Installation manual, Operation manual, Jumper wire (Low, High voltage), Clamps

- Notes:**
- ★1 Indoor temp. : 27°C DB or 19°C WB / outdoor temp. : 35°C DB / Equivalent piping length : 7.5m, level difference : 0m.
 - ★2 Indoor temp. : 20°C DB / outdoor temp. : 7°C DB or 6°C WB / equivalent piping length : 7.5m, level difference : 0m.

Model			RSEYP30KJY1
Constituent Model (Main Unit + Sub Unit)			REYP20KJY1+RXEP10KJY1
Power Supply			3 phase 50Hz 380-415V
★1 Cooling Capacity	kW		82.1
★2 Heating Capacity	kW		82.1
Casing Color			Ivory white (5Y7.5/1)
Dimensions : (H×W×D)	mm		(1,460×2,580×690)+(1,440×1,280×690)
Heat Exchanger			Cross fin coil
Compressor	Model		JT236DCVTYE@2+JT300DATYE@2×2
	Type		Hermetically sealed scroll type
	Piston Displacement	m³/h	(43.3+28.4+28.4)
	Number of Revolutions	rpm	(5,510, 2,900, 2,900)
	Motor Output × Number of Units	kW	5.5+7.5+7.5
Starting Method			Direct on line
Fan	Model		P52H11S
	Type		Propellor fan
	Motor Output × Number of Units	kW	(0.14+0.23)×2+(0.14+0.23)
	Air Flow Rate	m³/min	510
	Drive		Direct drive
Connecting Pipes	Outdoor Unit	Liquid pipe	φ22.2 C1220T (Brazing connection)
		Gas pipe	φ41.3 C1220T (Brazing connection)
		Discharge pipe	φ34.9 C1220T (Brazing connection)
	Main Unit – Sub Unit	Liquid pipe	φ12.7 C1220T (Flare-Brazing connection)
		Gas pipe	φ28.6 C1220T (Brazing-Brazing connection)
Weight	kg		640+105
Safety Devices			High pressure switch, fan motor safety thermostat, inverter overload protector, overcurrent relay, fusible plugs
Defrost Method			Deicer
Capacity Control	%		11 ~ 100
Refrigerant	Refrigerant Name		R-407C
	Charge	kg	29.5
	Control		Electronic expansion valve
Refrigerator Oil	Refrigerant Oil		DAPHNE FVC68D
	Charge Volume	L	4.0+4.0+4.0
Standard Accessories			Accessories pipe (Gas, liquid and Discharge pipe), Connection pipes (Gas pipe), Installation manual, Operation manual, Jumper wire (Low, High voltage), Clamps

- Notes:**
- ★1 Indoor temp. : 27°C DB or 19°C WB / outdoor temp. : 35°C DB / Equivalent piping length : 7.5m, level difference : 0m.
 - ★2 Indoor temp. : 20°C DB / outdoor temp. : 7°C DB or 6°C WB / equivalent piping length : 7.5m, level difference : 0m.

1.2 BS unit

Model			BSVP100KJV1	BSVP160KJV1	BSVP250KJV1
Power Supply			1 Phase 50Hz 220~240V	1 Phase 50Hz 220~240V	1 Phase 50Hz 220~240V
Casing			Galvanized steel plate	Galvanized steel plate	Galvanized steel plate
Dimensions:		(H×W×D) mm	185×310×280	185×310×280	185×590×435
Sound absorbing thermal insulation material			Flame and heat resistant foamed polyethylene	Flame and heat resistant foamed polyethylene	Flame and heat resistant foamed polyethylene
Connecting pipes	Indoor unit	Liquid pipes	9.5mm C1220T (flare connection) ★1	9.5mm C1220T (flare connection)	12.7mm C1220T (flare connection)
		Gas pipes	15.9mm C1220T (flare connection) ★1	19.1mm C1220T (flare connection)	25.4mm C1220T (flare connection) ★2
	Outdoor unit	Liquid pipes	9.5mm C1220T (flare connection) ★1	9.5mm C1220T (flare connection)	12.7mm C1220T (flare connection)
		Suction gas pipes	15.9mm C1220T (flare connection) ★1	19.1mm C1220T (flare connection)	25.4mm C1220T (flare connection) ★2
		Discharge gas pipes	12.7mm C1220T (flare connection) ★1	15.9mm C1220T (flare connection)	19.1mm C1220T (flare connection)
Weight		kg	9	11	25
Standard Accessories			Installation manual, Attached pipe Insulation for fitting, Clamps	Installation manual, Insulation for fitting, Clamps	Installation manual, Attached pipe Clamps

- Notes:**
- ★1 If the total capacity of all indoor units connected to the system is less than 5.6kW, connect the attached pipe to the field pipe.
(Braze the connection between the attached pipe and field pipe.)
 - ★2 Use the field flanged pipe.
Also, with a 250 class indoor unit, connect the attached reducer to the field pipe.
(Braze the connection between the attached pipe and field pipe.)

1.3 Indoor Unit

Ceiling Mounted Cassette Type (Multi-flow)

Model			FXYP32KVE	FXYP40KVE	FXYP50KVE	FXYP63KVE
Power Supply			1 phase 50/60Hz 220~240V/220V	1 phase 50/60Hz 220~240V/220V	1 phase 50/60Hz 220~240V/220V	1 phase 50/60Hz 220~240V/220V
★1 Cooling Capacity	kW		3.6	4.5	5.6	7.1
★2 Heating Capacity	kW		4.0	5.0	6.3	8.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)			mm	230×840×840	230×840×840	230×840×840
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×8×1.5	2×8×1.5	2×8×1.5	2×8×1.5
	Face Area	m ²	0.331	0.331	0.331	0.331
Fan	Model		QTS46B14M	QTS46B14M	QTS46B14M	QTS46B14M
	Type		Turbo Fan	Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output × Number of Units	W	45	45	45	45
	Air Flow Rate (H/L)	m ³ /min	13/10	14/10	16/11	18/14
Drive			Direct Drive	Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed polystyrene/ Foamed polyethylene	Foamed polystyrene/ Foamed polyethylene	Foamed polystyrene/ Foamed polyethylene	Foamed polystyrene/ Foamed polyethylene
Piping Connections	Liquid Pipes		6.4mm (Flare Connection)	6.4mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	12.7mm (Flare Connection)	15.9mm (Flare Connection)	15.9mm (Flare Connection)
	Drain Pipe	(mm)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)
Weight	kg		24	24	24	24
Safety Devices			Fuse Thermal protector for Fan Motor	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	Electronic Expansion Valve
Decoration Panels	Mode		BYC125KJW1	BYC125KJW1	BYC125KJW1	BYC125KJW1
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	mm	40×950×950	40×950×950	40×950×950	40×950×950
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Weight	kg		5	5	5	5
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.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae

$\text{kcal/h} = \text{kW} \times 860$
 $\text{Btu/h} = \text{kW} \times 3414$
 $\text{cfm} = \text{m}^3/\text{min} \times 35.3$

Ceiling Mounted Cassette Type (Multi-flow)

Model			FXYFP80KVE	FXYFP100KVE	FXYFP125KVE
Power Supply			1 phase 50/60Hz 220~240V/220V	1 phase 50/60Hz 220~240V/220V	1 phase 50/60Hz 220~240V/220V
★1 Cooling Capacity		kW	9.0	11.2	14.0
★2 Heating Capacity		kW	10.0	12.5	16.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)			mm	288×840×840	288×840×840
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×12×1.5	2×12×1.5	2×12×1.5
	Face Area	m²	0.497	0.497	0.497
Fan	Model		QTS46B17M	QTS46B17M	QTS46B17M
	Type		Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output × Number of Units	W	90	90	90
	Air Flow Rate (H/L)	m³/min	28/20	28/21	33/24
	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		9.5mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)
	Gas Pipes		15.9mm (Flare Connection)	15.9mm (Flare Connection)	19.1mm (Flare Connection)
	Drain Pipe	(mm)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)
Weight		kg	28	28	28
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
Decoration Panels	Mode		BYC125KJW1	BYC125KJW1	BYC125KJW1
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	mm	40×950×950	40×950×950	40×950×950
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	kg	5	5	5
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.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m ³ /min×35.3

Ceiling Mounted Cassette Type (Double-flow)

Model			FXYCP20KV1	FXYCP25KV1	FXYCP32KV1	FXYCP40KV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity	kW		2.2	2.8	3.6	4.5
★2 Heating Capacity	kW		2.5	3.2	4.0	5.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)			305×780×600	305×780×600	305×780×600	305×995×600
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×10×1.5	2×10×1.5	2×10×1.5	2×10×1.5
	Face Area	m ²	2×0.100	2×0.100	2×0.100	2×0.145
Fan	Model		D17K2AA1	D17K2AB1	D17K2AB1	2D17K1AA1
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	10	15	15	20
	Air Flow Rate (H/L)	m ³ /min	7/5	9/6.5	9/6.5	12/9
	Drive		Direct Drive	Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Wool/Urethane Foam	Glass Wool/Urethane Foam	Glass Wool/Urethane Foam	Glass Wool/Urethane Foam
Piping Connections	Liquid Pipes		6.4mm (Flare Connection)	6.4mm (Flare Connection)	6.4mm (Flare Connection)	6.4mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	12.7mm (Flare Connection)	12.7mm (Flare Connection)	12.7mm (Flare Connection)
	Drain Pipe	(mm)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)
Weight		kg	26	26	26	31
Safety Devices			Fuse Thermal Fuse for Fan Motor	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	Electronic Expansion Valve
Decoration Panels	Model		BYBC32GJW1	BYBC32GJW1	BYBC32GJW1	BYBC50GJW1
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	mm	53×1,030×680	53×1,030×680	53×1,030×680	53×1,245×680
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	kg	8	8	8	8.5
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Washer for Heating Brackets, Clamp Metal, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Washer for Heating Brackets, Clamp Metal, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Washer for Heating Brackets, Clamp Metal, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Washer for Heating Brackets, Clamp Metal, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae

$\text{kcal/h} = \text{kW} \times 860$
 $\text{Btu/h} = \text{kW} \times 3414$
 $\text{cfm} = \text{m}^3/\text{min} \times 35.3$

Ceiling Mounted Cassette Type (Double-flow)

Model			FXYP50KV1	FXYP63KV1	FXYP80KV1	FXYP125KV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity	kW		5.6	7.1	9.0	14.0
★2 Heating Capacity	kW		6.3	8.0	10.0	16.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)			305×995×600	305×1,180×600	305×1,670×600	305×1,670×600
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×10×1.5	2×10×1.5	2×10×1.5	2×10×1.5
	Face Area	m ²	2×0.145	2×0.184	2×0.287	2×0.287
Fan	Model		2D17K1AA1	2D17K2AA1VE	3D17K2AA1	3D17K2AB1
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	20	30	50	85
	Air Flow Rate (H/L)	m ³ /min	12/9	16.5/13	26/21	33/25
	Drive		Direct Drive	Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Wool/Urethane Foam	Glass Wool/Urethane Foam	Glass Wool/Urethane Foam	Glass Wool/Urethane Foam
Piping Connections	Liquid Pipes		9.5mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)
	Gas Pipes		15.9mm (Flare Connection)	15.9mm (Flare Connection)	15.9mm (Flare Connection)	19.1mm (Flare Connection)
	Drain Pipe	(mm)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)
Weight		kg	32	35	47	48
Safety Devices			Fuse Thermal Fuse for Fan Motor	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	Electronic Expansion Valve
Decoration Panels	Model		BYBC50GJW1	BYBC63GJW1	BYBC125GJW1	BYBC125GJW1
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	mm	53×1,245×680	53×1,430×680	53×1,920×680	53×1,920×680
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	kg	8.5	9.5	12	12
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Washer for Heating Brackets, Clamp Metal, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Washer for Heating Brackets, Clamp Metal, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Washer for Heating Brackets, Clamp Metal, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Washer for Heating Brackets, Clamp Metal, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae

$\text{kcal/h} = \text{kW} \times 860$
 $\text{Btu/h} = \text{kW} \times 3414$
 $\text{cfm} = \text{m}^3/\text{min} \times 35.3$

Ceiling Mounted Cassette Corner Type

Model			FXYKP25KV1	FXYKP32KV1	FXYKP40KV1	FXYKP63KV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity	kW		2.8	3.6	4.5	7.1
★2 Heating Capacity	kW		3.2	4.0	5.0	8.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)			mm	215×1,110×710	215×1,110×710	215×1,310×710
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×11×1.75	2×11×1.75	2×11×1.75	3×11×1.75
	Face Area	m ²	0.180	0.180	0.180	0.226
Fan	Model	V1	3D12H1AN1V1	3D12H1AN1V1	3D12H1AP1V1	4D12H1AJ1V1
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	15×1	15×1	20×1	45×1
	Air Flow Rate (H/L)	m ³ /min	11/9	11/9	13/10	18/15
	Drive		Direct Drive	Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Polyethylene Foam	Polyethylene Foam	Polyethylene Foam	Polyethylene Foam
Piping Connections	Liquid Pipes		6.4mm (Flare Connection)	6.4mm (Flare Connection)	6.4mm (Flare Connection)	9.5mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	12.7mm (Flare Connection)	12.7mm (Flare Connection)	15.9mm (Flare Connection)
	Drain Pipe	(mm)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)
Weight	kg		31	31	31	34
Safety Devices			Fuse Thermal Fuse for Fan Motor	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	Electronic Expansion Valve
Decoration Panels	Model		BYK45FJW1	BYK45FJW1	BYK45FJW1	BYK71FJW1
	Panel Color		White	White	White	White
	Dimensions: (H×W×D)	mm	70×1,240×800	70×1,240×800	70×1,240×800	70×1,440×800
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	kg	8.5	8.5	8.5	9.5
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Positioning Jig for Installation, Insulation for Hanger Bracket, Drain Pipe Insulation, Air Outlet Blocking Pad, Drain Raising Pipe.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Positioning Jig for Installation, Insulation for Hanger Bracket, Drain Pipe Insulation, Air Outlet Blocking Pad, Drain Raising Pipe.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Positioning Jig for Installation, Insulation for Hanger Bracket, Drain Pipe Insulation, Air Outlet Blocking Pad, Drain Raising Pipe.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Positioning Jig for Installation, Insulation for Hanger Bracket, Drain Pipe Insulation, Air Outlet Blocking Pad, Drain Raising Pipe.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae

$\text{kcal/h} = \text{kW} \times 860$
 $\text{Btu/h} = \text{kW} \times 3414$
 $\text{cfm} = \text{m}^3/\text{min} \times 35.3$

Ceiling Mounted Built-in Type

Model			FXYSP20KV1	FXYSP25KV1	FXYSP32KV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity		kW	2.2	2.8	3.6
★2 Heating Capacity		kW	2.5	3.2	4.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		mm	300×550×800	300×550×800	300×550×800
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	3×14×1.75	3×14×1.75	3×14×1.75
	Face Area	m ²	0.088	0.088	0.088
Fan	Model	V1	D18H3AA1V1	D18H3AA1V1	D18H3AA1V1
		VAL	D18H3AA1	D18H3AA1	D18H3AA1
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	50×1	50×1	50×1
	Air Flow Rate (H/L)	m³/min	9/6.5	9/6.5	9.5/7
	★4 External Static Pressure (50/60Hz)	Pa	88-39-20	88-39-20	88-39-20
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Regulator			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		6.4mm (Flare Connection)	6.4mm (Flare Connection)	6.4mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	12.7mm (Flare Connection)	12.7mm (Flare Connection)
	Drain Pipe	(mm)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)
Weight		kg	30	30	30
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
Suction Half Panel	Model		BYBS32DJW1	BYBS32DJW1	BYBS32DJW1
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	mm	55×650×500	55×650×500	55×650×500
	Weight	kg	3	3	3
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.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★4 Static external pressure is changeable to change over the connectors inside electrical box, this pressure means "High static pressure-Standard-Low static pressure".

Conversion Formulae

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

Ceiling Mounted Built-in Type

Model			FXYSP40KV1	FXYSP50KV1	FXYSP63KV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity		kW	4.5	5.6	7.1
★2 Heating Capacity		kW	5.0	6.3	8.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)			300×700×800	300×700×800	300×1,000×800
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	3×14×1.75	3×14×1.75	3×14×1.75
	Face Area	m²	0.132	0.132	0.221
Fan	Model	V1	D18H2AC1V1	D18H2AB1V1	2D18H2AB1V1
		VAL	D18H2AC1	D18H2AB1	2D18H2AB1
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	65×1	85×1	125×1
	Air Flow Rate (H/L)	m³/min	11.5/9	15/11	21/15.5
	★4 External Static Pressure	Pa	88-49-20	88-59-29 ★4	88-49-20 ★4
	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		6.4mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	15.9mm (Flare Connection)	15.9mm (Flare Connection)
	Drain Pipe	(mm)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)
Weight		kg	30	31	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
Suction Half Panel	Model		BYBS45DJW1	BYBS45DJW1	BYBS71DJW1
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	mm	55×800×500	55×800×500	55×1,100×500
	Weight	kg	3.5	3.5	4.5
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.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★4 Static external pressure is changeable to change over the connectors inside electrical box, this pressure means "High static pressure-Standard-Low static pressure".

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m ³ /min×35.3

Ceiling Mounted Built-in Type

Model			FXYS80KV1	FXYS100KV1	FXYS125KV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity		kW	9.0	11.2	14.0
★2 Heating Capacity		kW	10.0	12.5	16.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)			300×1,400×800	300×1,400×800	300×1,400×800
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	3×14×1.75	3×14×1.75	3×14×1.75
	Face Area	m ²	0.338	0.338	0.338
Fan	Model	V1	3D18H2AH1V1	3D18H2AH1V1	3D18H2AG1V1
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	135×1	135×1	225×1
	Air Flow Rate (H/L)	m ³ /min	27/20	28/20.5	38/28
	★4 External Static Pressure	Pa	88-49	98-69	78-39
	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		9.5mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)
	Gas Pipes		15.9mm (Flare Connection)	19.1mm (Flare Connection)	19.1mm (Flare Connection)
	Drain Pipe	(mm)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)
Weight		kg	51	51	52
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
Decoration Panels	Model		BYBS125DJW1	BYBS125DJW1	BYBS125DJW1
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	mm	55×1,500×500	55×1,500×500	55×1,500×500
	Weight	kg	6.5	6.5	6.5
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.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★4 Static external pressure is changeable to change over the connectors inside electrical box, this pressure means "High static pressure-Standard".

Conversion Formulae

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

Ceiling Mounted Duct Type

Model			FXYP40KV1	FXYP50KV1	FXYP63KV1	FXYP80KV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity	kW		4.5	5.6	7.1	9.0
★2 Heating Capacity	kW		5.0	6.3	8.0	10.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		mm	390×720×690	390×720×690	390×720×690	390×1,110×690
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	3×16×2.0	3×16×2.0	3×16×2.0	3×16×2.0
	Face Area	m ²	0.181	0.181	0.181	0.319
Fan	Model		D11/2D3AB1VE	D11/2D3AB1VE	D11/2D3AA1VE	2D11/2D3AG1VE
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	100	100	160	270
	Air Flow Rate (H/L)	m³/min	14/11.5	14/11.5	19.5/16	29/23
	★4 External Static Pressure	Pa	157-118	157-118	157/108	157/98
	Drive		Direct Drive	Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber	Glass Fiber	Glass Fiber	Glass Fiber
Air Filter			★5	★5	★5	★5
Piping Connections	Liquid Pipes		6.4mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	15.9mm (Flare Connection)	15.9mm (Flare Connection)	15.9mm (Flare Connection)
	Drain Pipe	(mm)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)
Weight		kg	44	44	45	62
Safety Devices			Fuse Thermal Fuse for Fan Motor	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	Electronic Expansion Valve
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.	Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★4 Static external pressure is changeable to change over the connectors inside electrical box, this pressure means "High Static pressure-Standard-Low static pressure".
- ★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.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3414 cfm=m ³ /min×35.3

Ceiling Mounted Duct Type

Model			FXYP100KV1	FXYP125KV1	FXYP200KV1	FXYP250KV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity	kW		11.2	14.0	22.4	28.0
★2 Heating Capacity	kW		12.5	16.0	25.0	31.5
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		mm	390×1,110×690	390×1,110×690	470×1,380×1,100	470×1,380×1,100
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	3×16×2.0	3×16×2.0	3×26×2.0	3×26×2.0
	Face Area	m ²	0.319	0.319	0.68	0.68
Fan	Model		2D11/2D3AG1VE	2D11/2D3AF1VE	D13/4G2AD1×2	D13/4G2AD1×2
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	270	430	380×2	380×2
	Air Flow Rate (H/L)	m ³ /min	29/23	36/29	58/50	72/62
	External Static Pressure	Pa	157/98 ★4	191/152 ★4	221-132 ★5	270-191 ★5
	Drive		Direct Drive	Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber	Glass Fiber	Glass Fiber	Glass Fiber
Air Filter			★5	★5	★5	★5
Piping Connections	Liquid Pipes		9.5mm (Flare Connection)	9.5mm (Flare Connection)	12.7mm (Flare Connection)	12.7mm (Flare Connection)
	Gas Pipes		19.1mm (Flare Connection)	19.1mm (Flare Connection)	25.4mm (Brazing Connection)	28.6mm (Brazing Connection)
	Drain Pipe	(mm)	VP25 (External Dia. 32 Internal Dia. 25)	VP25 (External Dia. 32 Internal Dia. 25)	PS1B	PS1B
Weight		kg	63	65	137	137
Safety Devices			Fuse Thermal Fuse for Fan Motor	Fuse Thermal Fuse 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	Electronic Expansion Valve
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, Sealing Pads, Connection Pipes, Screws, Clamps.	Operation Manual, Installation Manual, Sealing Pads, Connection Pipes, Screws, Clamps.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★4 Static external pressure is changeable to change over the connectors inside electrical box, this pressure means "High Static pressure-Standard-Low static pressure".
- ★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.

Conversion Formulae

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

Ceiling Suspended Type

Model			FXYP32KV1	FXYP63KV1	FXYP100KV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity		kW	3.6	7.1	11.2
★2 Heating Capacity		kW	4.0	8.0	12.5
Casing Color			White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
Dimensions: (H×W×D)			mm	188×1,100×600	238×1,300×695
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×10×1.75	3×10×1.75	3×12×1.75
	Face Area	m ²	0.181	0.223	0.268
Fan	Model	V1	3D12J1AA1VE	4D12J1AA1VE	3D15J1AA1VE
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	57	57	130
	Air Flow Rate (H/L)	m ³ /min	13/10	19/15	27/21
	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			Flame and Heat Resistant Foamed Polyethylene	Flame and Heat Resistant Foamed Polyethylene	Flame and Heat Resistant Foamed Polyethylene
Air Filter			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes		6.4mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	15.9mm (Flare Connection)	19.1mm (Flare Connection)
	Drain Pipe	(mm)	VP20 (External Dia. 26 Internal Dia. 20)	VP20 (External Dia. 26 Internal Dia. 20)	VP20 (External Dia. 26 Internal Dia. 20)
Weight			kg	27	31
Safety Devices			Fuse Thermal Fuse for Fan Motor	Fuse Thermal Fuse for Fan Motor	Fuse Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Clamps, Washers, Flare Nut.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Clamps, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Clamps, Washers.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae

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

Wall Mounted Type

Model			FXYP20KV1	FXYP25KV1	FXYP32KV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity		kW	2.2	2.8	3.6
★2 Heating Capacity		kW	2.5	3.2	4.0
Casing Color			White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
Dimensions: (H×W×D)		mm	360×1,050×200	360×1,050×200	360×1,050×200
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×12×1.4	2×12×1.4	2×12×1.4
	Face Area	m²	0.169	0.169	0.169
Fan	Model		QCL1165M	QCL1165M	QCL1165M
	Type		Cross Flow Fan	Cross Flow Fan	Cross Flow Fan
	Motor Output × Number of Units	W	23	23	23
	Air Flow Rate (H/L)	m³/min	8/6.5	8/6.5	9/7
	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		6.4mm (Flare Connection)	6.4mm (Flare Connection)	6.4mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	12.7mm (Flare Connection)	12.7mm (Flare Connection)
	Drain Pipe	(mm)	VP20 (External Dia. 26 Internal Dia. 20)	VP20 (External Dia. 26 Internal Dia. 20)	VP20 (External Dia. 26 Internal Dia. 20)
Weight		kg	21	21	21
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
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Insulation for Fitting, Screws, Clamps, Insulation Tape, Installation Panel Fixed Parts.	Operation Manual, Installation Manual, Paper Pattern for Installation, Insulation for Fitting, Screws, Clamps, Insulation Tape, Installation Panel Fixed Parts.	Operation Manual, Installation Manual, Paper Pattern for Installation, Insulation for Fitting, Screws, Clamps, Insulation Tape, Installation Panel Fixed Parts.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae

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

Wall Mounted Type

Model			FXYP40KV1	FXYP50KV1	FXYP63KV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity		kW	4.5	5.6	7.1
★2 Heating Capacity		kW	5.0	6.3	8.0
Casing Color			White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
Dimensions: (H×W×D)		mm	360×1,050×200	360×1,250×200	360×1,250×200
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×12×1.4	2×12×1.4	2×12×1.4
	Face Area	m ²	0.169	0.219	
Fan	Model		QCL1165M	QCL1185M	QCL1185M
	Type		Cross Flow Fan	Cross Flow Fan	Cross Flow Fan
	Motor Output × Number of Units	W	23	37	37
	Air Flow Rate (H/L)	m ³ /min	11/9	13/11	15/12
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			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		6.4mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	15.9mm (Flare Connection)	15.9mm (Flare Connection)
	Drain Pipe	(mm)	VP20 (External Dia. 26 Internal Dia. 20)	VP20 (External Dia. 26 Internal Dia. 20)	VP20 (External Dia. 26 Internal Dia. 20)
Weight		kg	21	24	24
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
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Insulation for Fitting, Screws, Clamps, Insulation Tape, Installation Panel Fixed Parts.	Operation Manual, Installation Manual, Paper Pattern for Installation, Insulation for Fitting, Screws, Washers, Insulation Tape, Installation Panel Fixed Parts.	Operation Manual, Installation Manual, Paper Pattern for Installation, Insulation for Fitting, Screws, Washers, Insulation Tape, Installation Panel Fixed Parts.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae

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

Floor Standing Type

Model			FXYP20KJV1	FXYP25KJV1	FXYP32KJV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity	kW		2.2	2.8	3.6
★2 Heating Capacity	kW		2.5	3.2	4.0
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		mm	600×1,000×222	600×1,000×222	600×1,140×222
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	3×14×1.5	3×14×1.5	3×14×1.5
	Face Area	m ²	0.159	0.159	0.200
Fan	Model		D14B20	D14B20	2D14B13
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	15×1	15×1	25×1
	Air Flow Rate (H/L)	m ³ /min	7/6	7/6	8/6
	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		6.4mm (Flare Connection)	6.4mm (Flare Connection)	6.4mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	12.7mm (Flare Connection)	12.7mm (Flare Connection)
	Drain Pipe	(mm)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)
Weight		kg	25	25	30
Safety Devices			Fuse Thermal Protector for Fan Motor	Fuse Thermal Protector for Fan Motor	Fuse Thermal Fuse for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
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.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae

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

Floor Standing Type

Model			FXYP40KJV1	FXYP50KJV1	FXYP63KJV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity	kW		4.5	5.6	7.1
★2 Heating Capacity	kW		5.0	6.3	8.0
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		mm	600×1,140×222	600×1,420×222	600×1,420×222
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	3×14×1.5	3×14×1.5	3×14×1.5
	Face Area	m²	0.200	0.282	0.282
Fan	Model		2D14B13	2D14B20	2D14B20
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	25×1	35×1	35×1
	Air Flow Rate (H/L)	m³/min	11/8.5	14/11	16/12
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber/ 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		6.4mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	15.9mm (Flare Connection)	15.9mm (Flare Connection)
	Drain Pipe	(mm)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)
Weight		kg	30	36	36
Safety Devices			Fuse Thermal Protector for Fan Motor	Fuse Thermal Fuse for Fan Motor	Fuse Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
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.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae

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

Concealed Floor Standing Type

Model			FXYLMP20KJV1	FXYLMP25KJV1	FXYLMP32KJV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity	kW		2.2	2.8	3.6
★2 Heating Capacity	kW		2.5	3.2	4.0
Casing Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		mm	610×930×220	610×930×220	610×1,070×220
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	3×14×1.5	3×14×1.5	3×14×1.5
	Face Area	m ²	0.159	0.159	0.200
Fan	Model		D14B20	D14B20	2D14B13
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	15×1	15×1	25×1
	Air Flow Rate (H/L)	m ³ /min	7/6	7/6	8/6
	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		6.4mm (Flare Connection)	6.4mm (Flare Connection)	6.4mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	12.7mm (Flare Connection)	12.7mm (Flare Connection)
	Drain Pipe	(mm)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)
Weight		kg	19	19	23
Safety Devices			Fuse Thermal Protector for Fan Motor	Fuse Thermal Protector for Fan Motor	Fuse Thermal Fuse for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
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.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae

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

Concealed Floor Standing Type

Model			FXYLMP40KJV1	FXYLMP50KJV1	FXYLMP63KJV1
Power Supply			1 phase 50Hz 220-240V	1 phase 50Hz 220-240V	1 phase 50Hz 220-240V
★1 Cooling Capacity	kW		4.5	5.6	7.1
★2 Heating Capacity	kW		5.0	6.3	8.0
Casing Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		mm	610×1,070×220	610×1,350×220	610×1,350×220
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	3×14×1.5	3×14×1.5	3×14×1.5
	Face Area	m ²	0.200	0.282	0.282
Fan	Model		2D14B13	2D14B20	2D14B20
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	25×1	35×1	35×1
	Air Flow Rate (H/L)	m³/min	11/8.5	14/11	16/12
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber/ 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		6.4mm (Flare Connection)	9.5mm (Flare Connection)	9.5mm (Flare Connection)
	Gas Pipes		12.7mm (Flare Connection)	15.9mm (Flare Connection)	15.9mm (Flare Connection)
	Drain Pipe	(mm)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)
Weight		kg	23	27	27
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
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.

Notes:

- ★1 Nominal cooling capacities are based on the following conditions:
Return air temperature : 27°C DB, 19°C WB, Outdoor temperature : 35°C DB
Equivalent ref. piping : 5m (Horizontal)
- ★2 Nominal heating capacities are based on the following conditions:
Return air temperature : 20°C DB, Outdoor temperature : 7°C DB, 6°C WB
Equivalent ref. piping : 5m (Horizontal)
- ★3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

Conversion Formulae

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

Part 3

Function

R-407C *VRV*TM PLUS Series

Heat Recovery System

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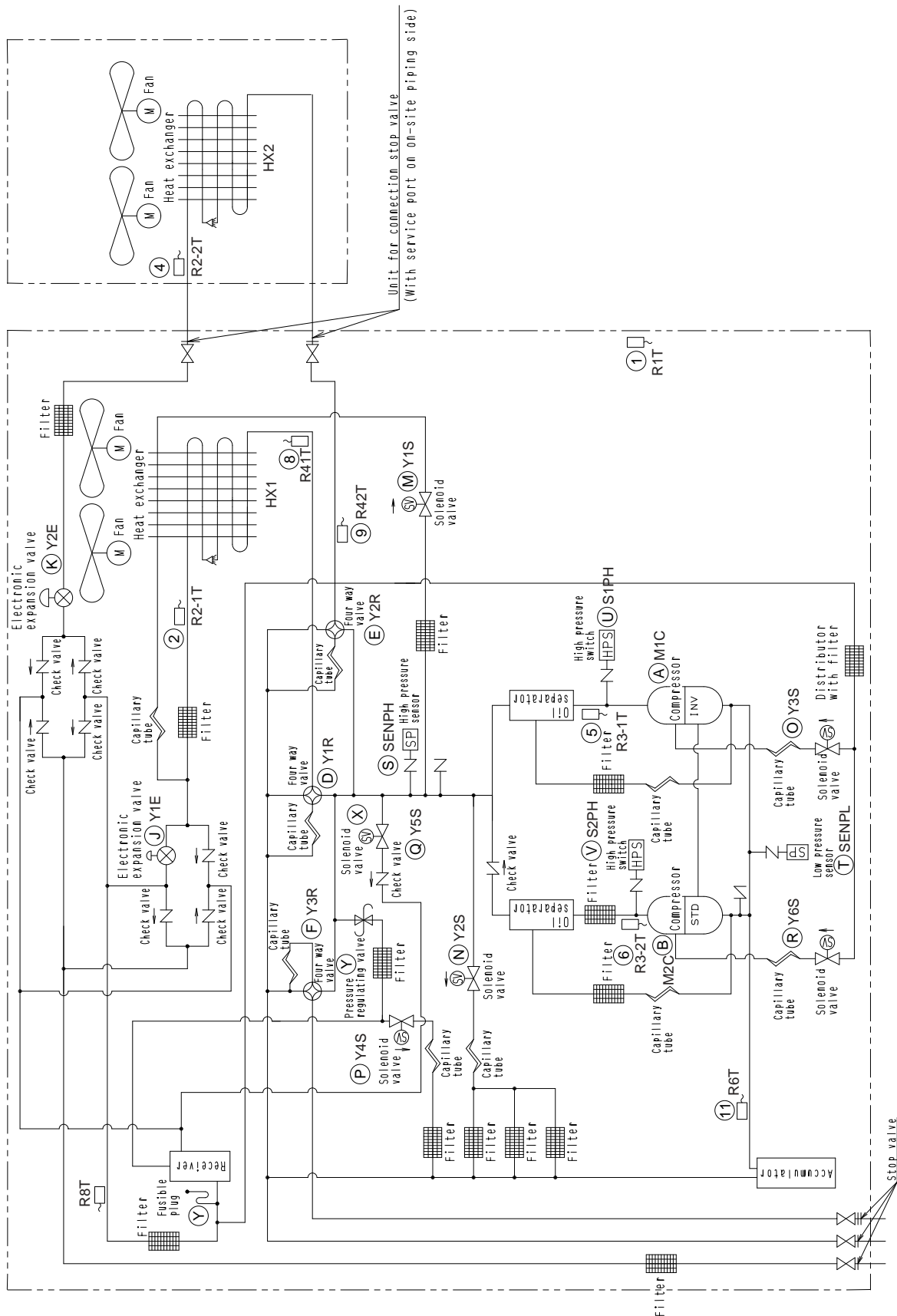
1. Refrigerant System Diagram

1.1 Outdoor Unit Refrigerant System Diagram

RSEYP16~20KJY1

No.	Name	Code	Function
A	Inverter compressor	M1C	Combination of a compressor (inverter compressor) capable of operating at 29-95Hz (79 Hz for RSEYP16KJ) with inverter drive and compressors (constant-speed compressors) operable only on commercial power supply achieves multi step control.
B	Constant-speed compressor 1	M2C	
D	4 way valve	Y1R	Change the refrigerant flow to the main unit heat exchanger 1, to switch the condenser↔evaporator.
E	4 way valve	Y2R	Change the refrigerant flow to the sub-unit heat exchanger to switch the condenser↔evaporator.
F	4 way valve	Y3R	Change the refrigerant flow to the outdoor main unit discharge line to switch the high temperature high pressure gas↔low temperature & low pressure gas.
J	Electronic expansion valve	Y1E	(For main unit heat exchangers) Provides PI control during evaporator to maintain constant superheated degree (SH).
K	Electronic expansion valve	Y2E	(For sub unit heat exchangers) Provides PI control during evaporator to maintain constant superheated degree (SH).
M	Solenoid valve	Y1S	(For auxiliary condensers) Use for heat exchanger capacity control during simultaneous cooling / heating operation.
N	Solenoid valve	Y2S	(For hot gas bypass and pressure equalization) Bypasses hot gas during transitional operation such as defrosting operation to prevent sudden decrease of low pressure. Also equalizes pressure to reduce startup load.
O	Solenoid valve	Y3S	(For inverter unit liquid injection) Provides liquid injection to prevent overheating operation.
P	Solenoid valve	Y4S	(For receivers) Use for pump-down refrigerant to receiver.
Q	Solenoid valve	Y5S	(For liquid pressure control) Use for maintaining liquid pressure during heat exchanger capacity control.
R	Solenoid valve	Y6S	(For constant-speed unit liquid injection) Provides liquid injection to prevent overheating operation.
S	High pressure sensor	SENP	Heating operation: Provides PI control for compressors and heat exchanger by detecting high pressure. Cooling operation: Controls compressors to ensure sufficient high pressure when outside temperature is low.
T	Low pressure sensor	SENP	Cooling operation: Provides PI control for compressors and heat exchanger by detecting low pressure. Heating operation: Controls motorized valves to maintain constant evaporator superheated degree.
U	High pressure switch	Q1PH	Opens at set pressure of 2.94 MPa to stop operation.
V	High pressure switch	Q2PH	
X	Pressure regulating valve		Pressure relief valve to protect liquid sealing in receiver piping during transportation or storing. It opens at 2.65 MPa.
Y	Fusible plug		Plug head melt at 70~75°C around receiver and high pressure and high temperature refrigerant is relived.
1	Outside air thermistor	R1T	Detects outside temperature and uses it as a function in determining defrost IN conditions during heating operation.
2	Heat exchanger thermistor 1	R21T	Uses inlet temperature of each heat exchanger as a function (together with outside temperature data) in determining defrost IN conditions during heating operation.
4	Heat exchanger thermistor 3	R22T	
5	Discharge pipe thermistor 1	R31T	Detects discharge pipe temperature of inverter compressor and use it for compressor discharge pipe temperature protection.
6	Discharge pipe thermistor 2	R32T	Detects discharge pipe temperature of constant-speed compressor 1 and use it for compressor discharge pipe temperature protection.
8	Header thermistor 1	R41T	Detects outlet temperatures of heat exchangers and uses it in constant superheated degree (SH) control (electronic expansion valve control)
9	Header thermistor 2	R42T	
11	Suction pipe thermistor	R6T	Detect accumulator outlet temperature and protect compressor.
12	Liquid pipe thermistor	R8T	Detect liquid receiver outlet temperature and judge the Y5S open/close under liquid pressure control.

RSEYP16, 18, 20KJY1



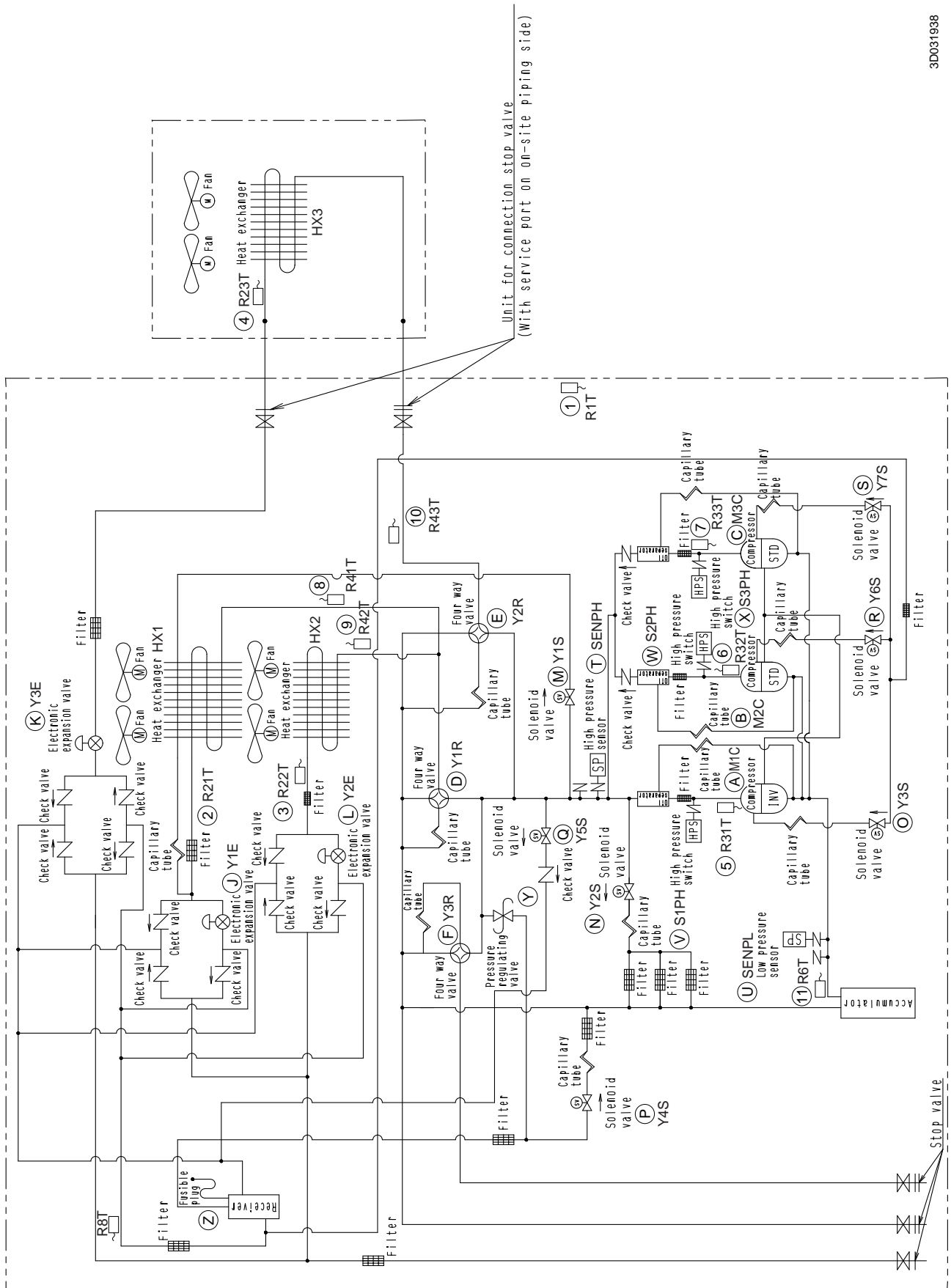
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RSEYP24~30KJY1

No.	Name	Code	Function	Remarks
A	Inverter compressor	M1C	Combination of a compressor (inverter compressor) capable of operating at 29-95 Hz with inverter drive and compressors (constant-speed compressors) operable only on commercial power supply achieves multi step control.	
B	Constant-speed compressor 1	M2C		
C	Constant-speed compressor 2	M3C		
D	4 way valve	Y1R	Change the refrigerant flow to the main unit heat exchanger 1 and 2, to switch the condenser↔evaporator.	
E	4 way valve	Y2R	Change the refrigerant flow to the sub-unit heat exchanger to switch the condenser↔evaporator.	
F	4 way valve	Y3R	Change the refrigerant flow to the outdoor main unit discharge line to switch the high temperature high pressure gas↔low temperature & low pressure gas.	
J	Electronic expansion valve	Y1E	(For main unit heat exchangers 1) Provides PI control during evaporator to maintain constant superheated degree (SH).	Main unit's left side exchanger
K	Electronic expansion valve	Y2E	(For main unit heat exchangers 2) Provides PI control during evaporator to maintain constant superheated degree (SH).	Main unit's right side heat exchanger
L	Electronic expansion valve	Y3E	(For sub unit's heat exchanger) Provides PI control during heating operation to maintain constant superheated degree (SH).	
M	Solenoid valve	Y1S	(For auxiliary condensers) Use for heat exchanger capacity control during simultaneous cooling / heating operation.	
N	Solenoid valve	Y2S	(For hot gas bypass and pressure equalization) Bypasses hot gas during transitional operation such as defrosting operation to prevent sudden decrease of low pressure. Also equalizes pressure to reduce startup load.	
O	Solenoid valve	Y3S	(For inverter unit liquid injection) Provides liquid injection to prevent overheating operation.	
P	Solenoid valve	Y4S	(For receivers) Use for pump-down refrigerant to receiver.	
Q	Solenoid valve	Y5S	(For liquid pressure control) Use for maintaining liquid pressure during heat exchanger capacity control.	
R	Solenoid valve	Y6S	(For constant-speed comp. 1 liquid injection) Provides liquid injection to prevent overheating operation.	
S	Solenoid valve	Y7S	(For constant-speed comp. 2 liquid injection) Provides liquid injection to prevent overheating operation.	
T	High pressure sensor	SENP	Heating operation: Provides PI control for compressors and heat exchanger by detecting high pressure. Cooling operation: Controls compressors to ensure sufficient high pressure when outside temperature is low.	
U	Low pressure sensor	SENPL	Cooling operation: Provides PI control for compressors and heat exchanger by detecting low pressure. Heating operation: Controls motorized valves to maintain constant evaporator superheated degree.	
V	High pressure switch	Q1PH	Opens at set pressure of 2.94 MPa to stop operation.	
W	High pressure switch	Q2PH		
X	High pressure switch	Q3PH		
Y	Pressure regulating valve		Pressure relief valve to protect liquid sealing in receiver piping during transportation or storing. It opens at 2.65 MPa.	
Z	Fusible plug		Plug head melt at 70~75°C around receiver and high pressure and high temperature refrigerant is relieved.	

No.	Name	Code	Function	Remarks
1	Outside air thermistor	R1T	Detects outside temperature and uses it as a function in determining defrost IN conditions during heating operation.	
2	Heat exchanger thermistor 1	R21T	Uses inlet temperature of each heat exchanger as a function (together with outside temperature data) in determining defrost IN conditions during heating operation.	
3	Heat exchanger thermistor 2	R22T		
4	Heat exchanger thermistor 3	R23T		
5	Discharge pipe thermistor 1	R31T	Detects discharge pipe temperature of inverter compressor and use it for compressor discharge pipe temperature protection.	
6	Discharge pipe thermistor 2	R32T	Detects discharge pipe temperature of constant-speed compressor 1 and use it for compressor discharge pipe temperature protection.	
7	Discharge pipe thermistor 3	R33T	Detects discharge pipe temperature of constant-speed compressor 2 and use it for compressor discharge pipe temperature protection.	
8	Suction thermistor 1 (Hx. 1)	R41T	Detects outlet temperatures of heat exchangers and uses it in constant superheated degree (SH) control (electronic expansion valve control)	
9	Suction thermistor 2 (Hx. 2)	R42T		
10	Suction thermistor 3 (Hx. 3)	R43T		
11	Suction pipe thermistor	R6T	Detect accumulator outlet temperature and protect compressor.	
12	Liquid pipe thermistor	R8T	Detect liquid receiver outlet temperature and judge the Y5S open/close under liquid pressure control.	

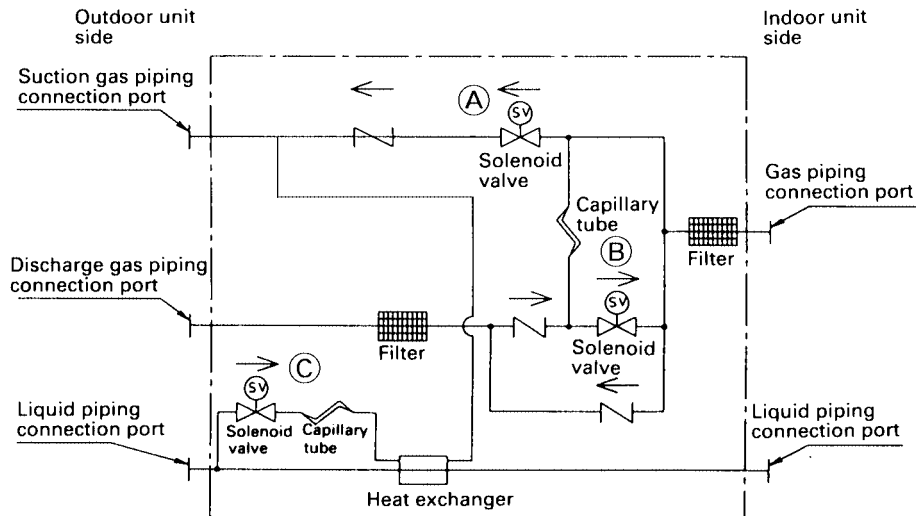
RSEYP24, 26, 28, 30KJY1



3D031938

1.2 BS unit Refrigerant System Diagram

BSVP100KJV1



Model	Outdoor unit			Indoor unit	
	Liquid	Suction gas	Discharge gas	Liquid	Gas
BSVP100KJV1	φ 9.5	φ 15.9	φ 12.7	φ 9.5	φ 15.9
BSVP160KJV1	φ 9.5	φ 19.1	φ 15.9	φ 9.5	φ 19.1
BSVP250KJV1	φ 12.7	φ 25.4	φ 19.1	φ 12.7	φ 25.4

A.Solenoid valve (suction side) Y2S

Turns ON during normal cooling operation. (Connects indoor unit gas pipe and outdoor unit suction pipe)

B.Solenoid valve (discharge side) Y3S

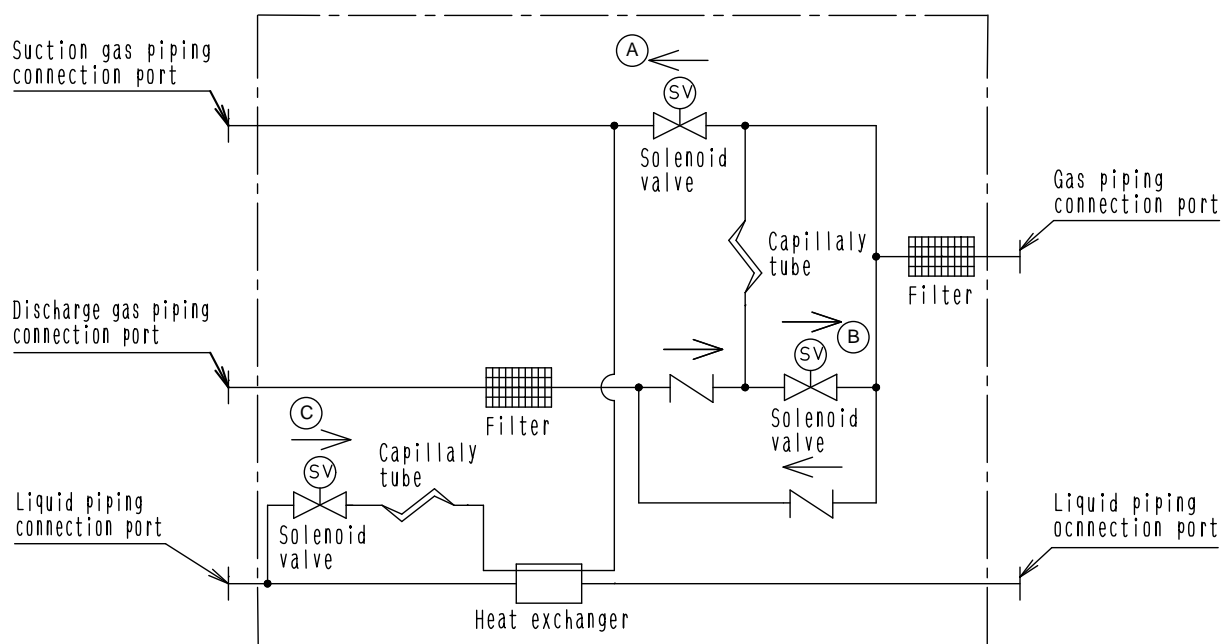
Turns ON when the indoor unit is set to the heating mode. (Connects indoor unit gas pipe and outdoor unit discharge pipe)

C.Solenoid valve (for drift-prevention injection) Y1S

Turns ON only the BS unit of the indoor unit in heating operation when the system is used for simultaneous cooling/heating operations.

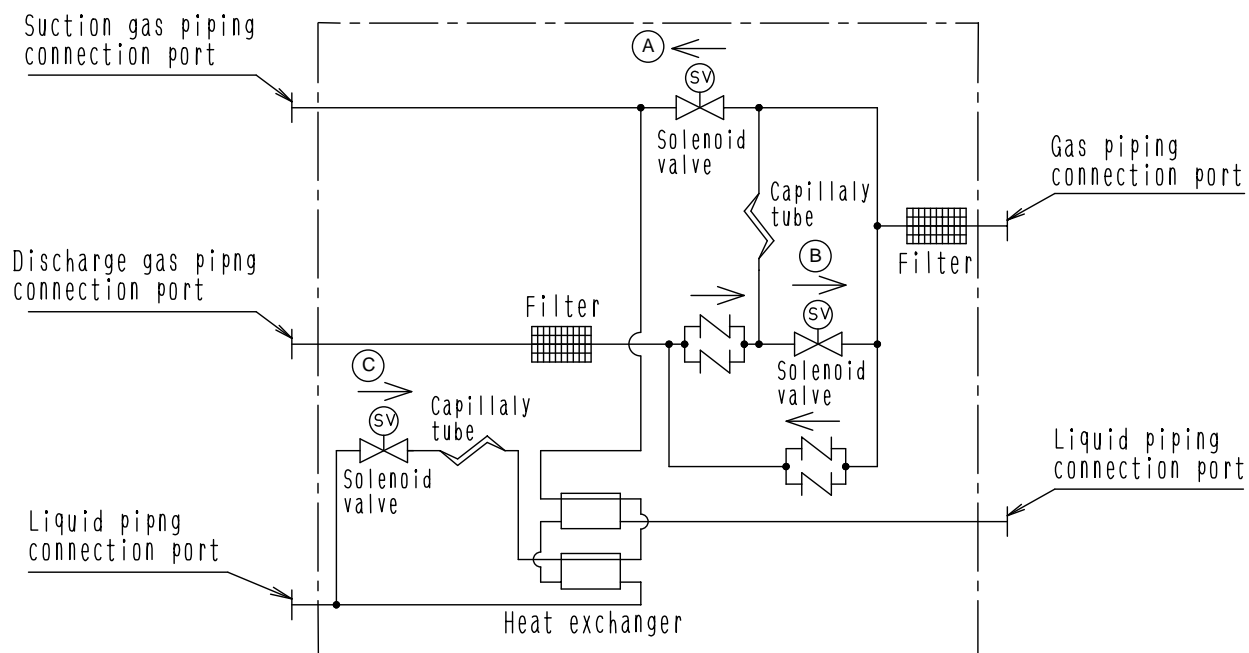
* Do not replace the valve body

BSVP160KJV1



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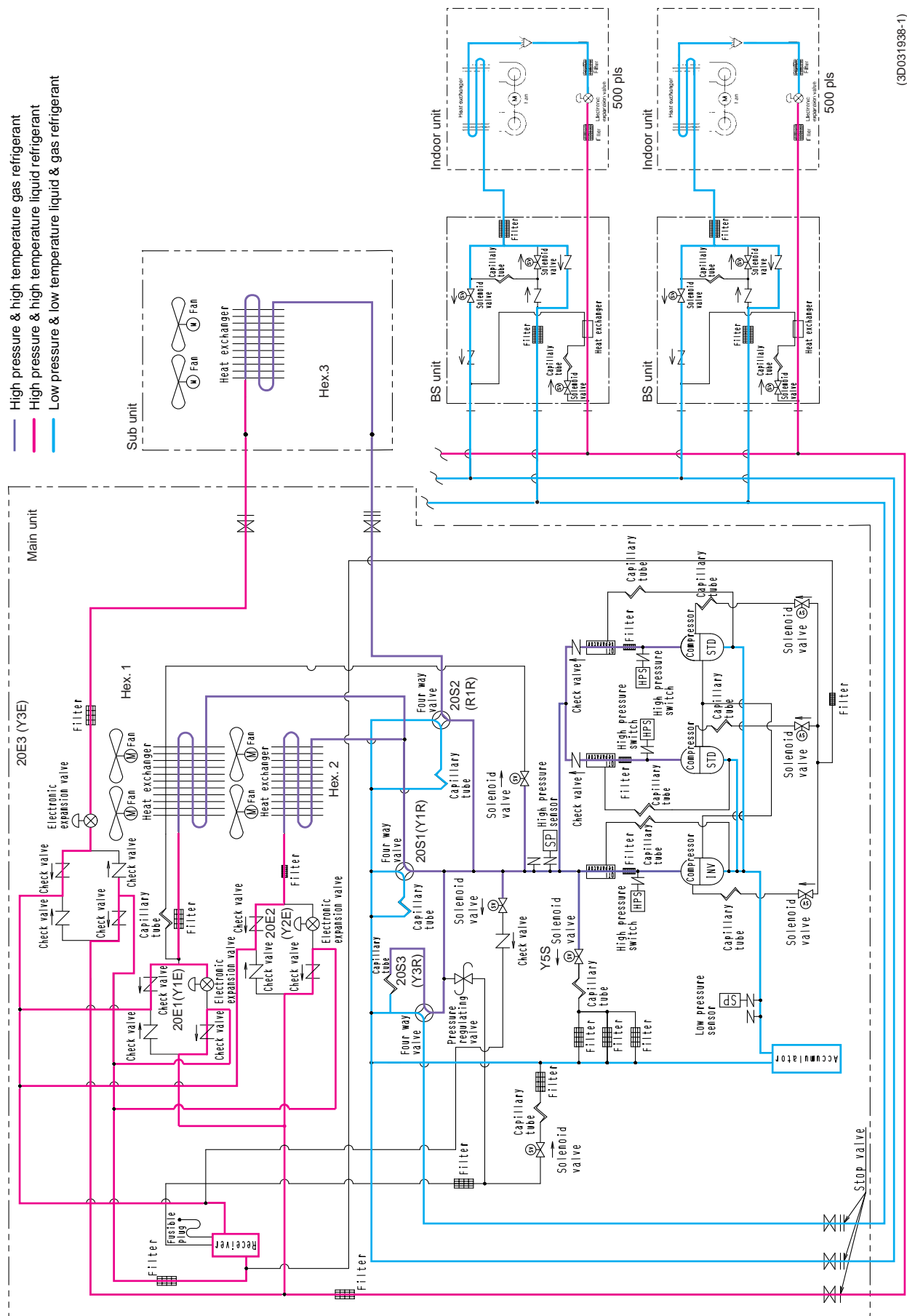
BSVP250KJV1



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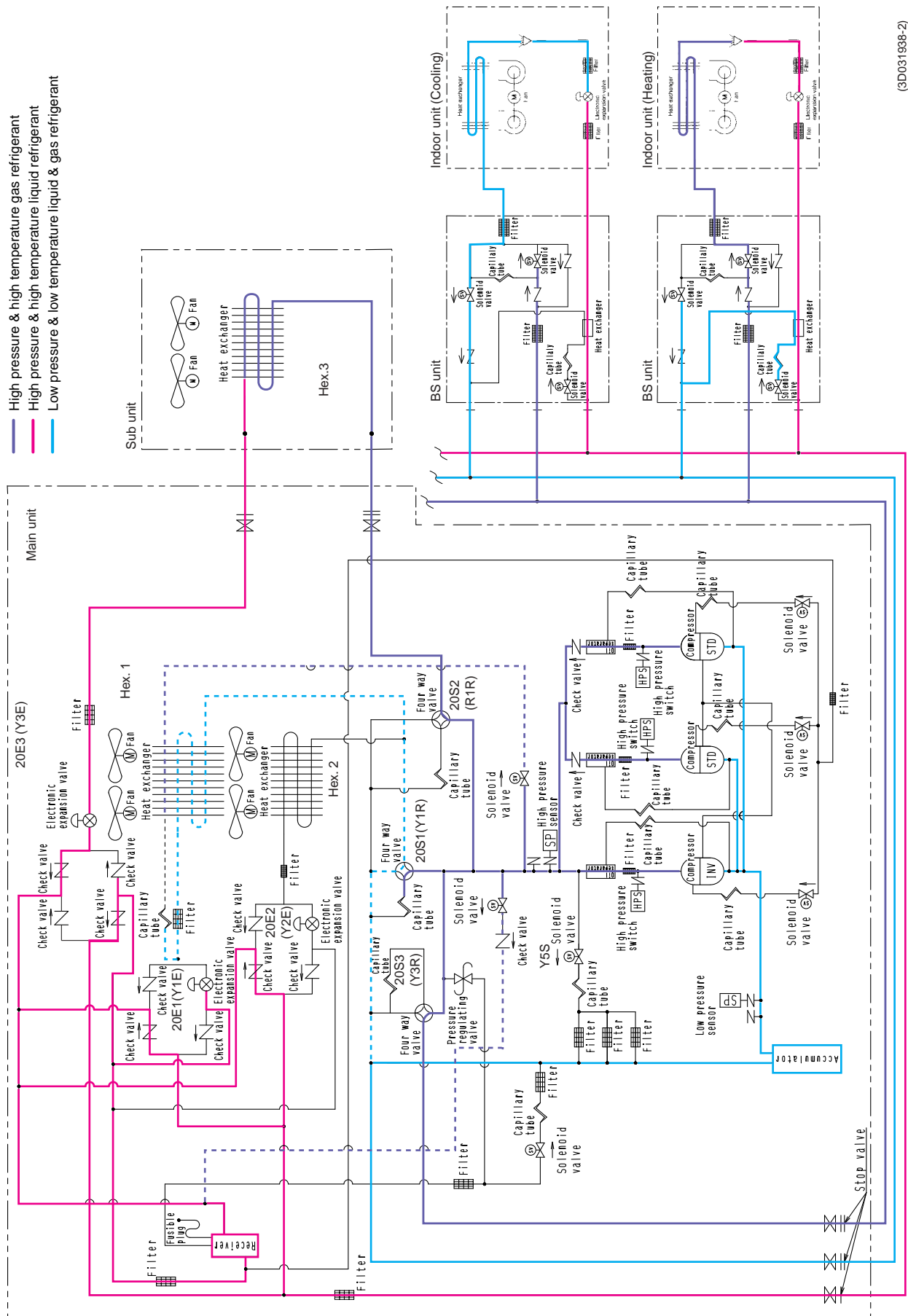
1.3 Flow of Refrigerant in Each Operating Mode

1.3.1 Cooling Operation



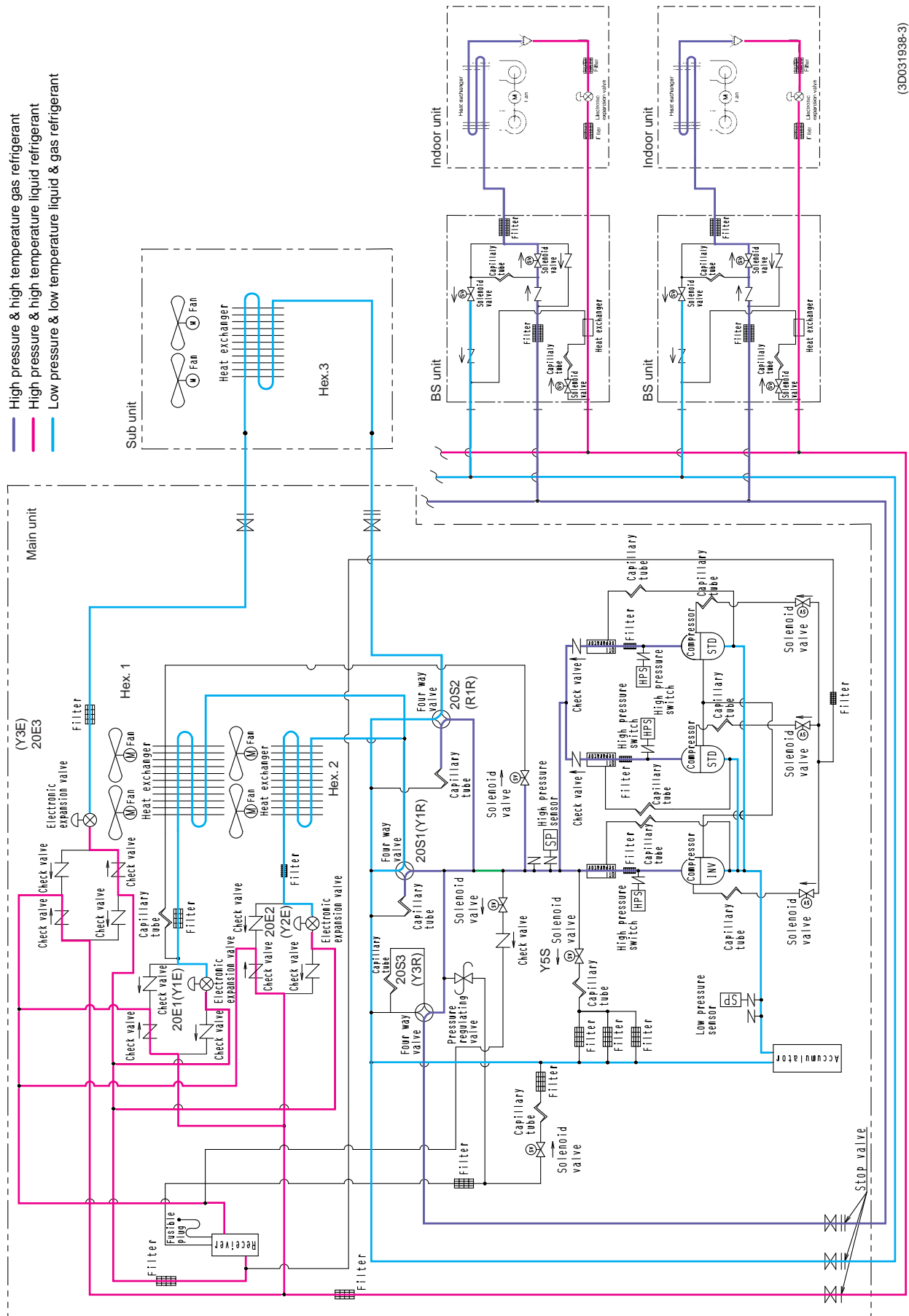
(3D031938-1)

1.3.2 Simultaneous Cooling / Heating Operation



(3D031938-2)

1.3.3 Heating Operation

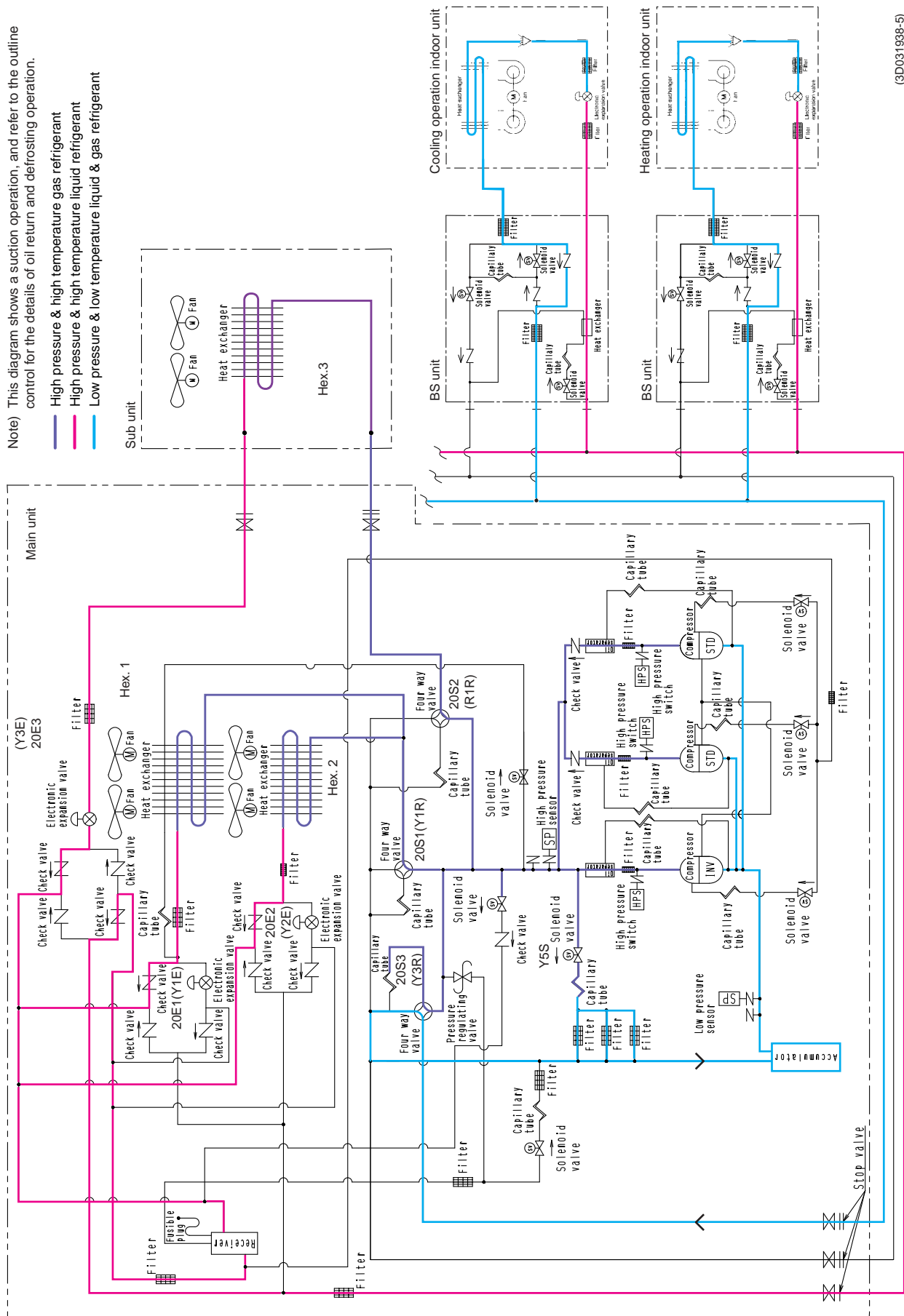


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1.3.4 Oil Return Operation-Discharge (at Heating and Simultaneous Cooling / Heating Operation or Defrost Operation)

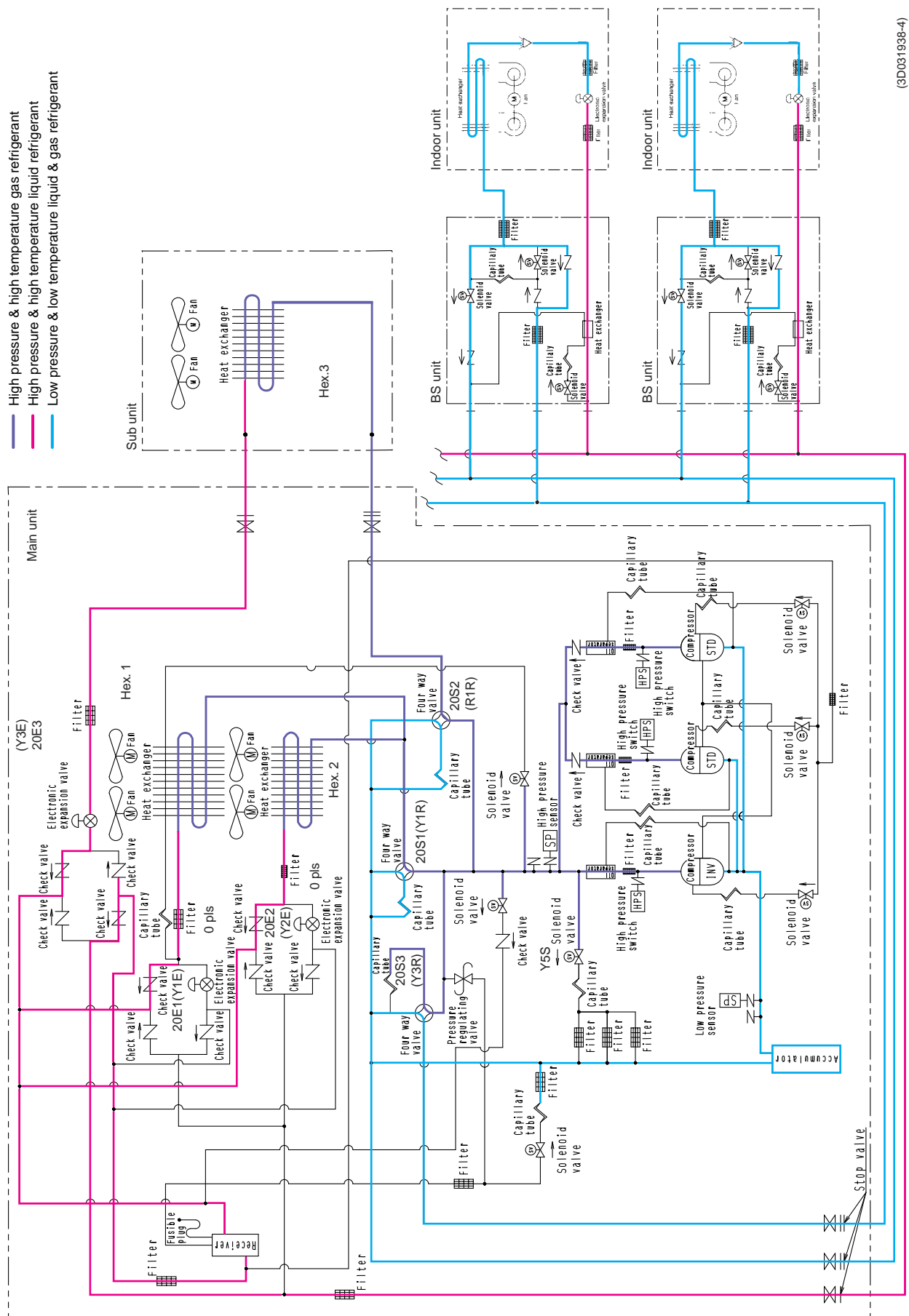
Note) This diagram shows a suction operation, and refer to the outline control for the details of oil return and defrosting operation.

- High pressure & high temperature gas refrigerant
- High pressure & high temperature liquid refrigerant
- Low pressure & low temperature liquid & gas refrigerant



(3D031938-5)

1.3.5 Oil Return Operation-Suction (at Cooling and Heating and Simultaneous Cooling / Heating Operation or Defrost Operation)



(3D031938-4)

2. List of Safety Device and Function Parts Setting Value

2.1 Outdoor Unit

Item	Name	Symbol	Model						
			RSEYP 16KJY1	RSEYP 18KJY1	RSEYP 20KJY1	RSEYP 24KJY1	RSEYP 26KJY1	RSEYP 28KJY1	RSEYP 30KJY1
Compressor	Inverter Compressor	M1C	JT236DCVTYPE @2						
	STD Compressor 1	M2C	JT265DATYE @2			JT300DATYE @2			
	STD Compressor 2	M3C	—	—	—	JT300DATYE @2			
	Magnetic Relay (Inverter)	K1M	CLK-35J-P6						
	(STD)	K2M	HOE-35F-TRA1B 20A			HOE-35F-TRA1D 22A			
	(STD)	K3M	—	—	—	HOE-35F-TRA1D 22A			
	Crankcase Heater	E1~3HC	50W×2	50W×2	50W×2	50W×3	50W×3	50W×3	50W×3
Fan Motor	Fan Motor (Setting temperature of temperature switch)	M1F	140W 135±5℃						
		M2F	230W 135±5℃						
		M3F	140W 135±5℃						
		M4F	230W 135±5℃						
		M11F	—	—	—	140W 135±5℃			
		M12F	—	—	—	230W 135±5℃			
		M21F	—	—	—	140W 135±5℃			
		M22F	—	—	—	230W 135±5℃			
Functional Parts	Electronic Expansion Valve	Y1E	Body : EDM-BA0YPDM-1 Coil : EBM-DM						
		Y2E	Body : EDM-BA0YPDM-1 Coil : EBM-DM			Body : EDM-BA0YPDM-1 Coil : EBM-DM			
		Y3E	—			Body : EDM-BA0YPDM-1 Coil : EBM-DM			
	Solenoid Valve	Y1S	(for Auxiliary condenser) NEV603DXF						
		Y2S	(for Hot gas) NEV603DXF						
		Y3S	(for Injection M1C) NEV202DXF						
		Y4S	(for receiver) NEV603DXF						
		Y5S	(for liquid pressure control) NEV202DXF						
		Y6S	(for Injection M2C) NEV202DXF						
		Y7S	—	—	—	(for Injection M3C) NEV202DXF			
4 Way Valve	Y1~3R	VH60100							
Pressure	Pressure Sensor	SENP	PS8040A (0~3.33MPa)						
		SENPL	PS8040A (0~0.96MPa)						
	Pressure Switch	Q1-2PH	20PS688-10 OFF : 2.94 ⁺⁰ _{-0.1} MPa ON : 2.16±0.1MPa						
		Q3PH	—	—	—	20PS688-10 OFF : 2.94 ⁺⁰ _{-0.1} MPa ON : 2.16±0.1MPa			
	Pressure Regulating Valve		LRV(B)-3 MIN OPERATING PRESSURE 1.5~2.0 MPa						
Thermistors	Thermistor (Ambient temp.)	R1T	3.5~360kΩ (20kΩ at 25℃)						
	Thermistor (Coil)	R2T	3.5~360kΩ (20kΩ at 25℃)						
	Thermistor (Discharge)	R3T	3.5~400kΩ (20kΩ at 25℃)						
	Thermistor (header)	R4T	3.5~360kΩ (20kΩ at 25℃)						
	Thermistor (Suction pipe)	R6T	3.5~360kΩ (20kΩ at 25℃)						
	Thermistor (Liquid pipe)	R8T	3.5~360kΩ (20kΩ at 25℃)						
Fuses	Fuse (A1P)	F1U-2U	AC250V, 10A						
	Fuse (A3P)	F1U	AC250V, 10A						
	Fuse (A4P)	F1U	—	—	—	AC250V, 10A			
	Fuse (Z1F)	F1U-2U	AC250V, 5A						
	Fusible Plug		Plug head melt at 70~75℃						

2.2 Indoor Side

2.2.1 Indoor Unit

Parts Name		Symbol	Model							Remark
			FXYFP 32KV1(VE)	FXYFP 40KV1(VE)	FXYFP 50KV1(VE)	FXYFP 63KV1(VE)	FXYFP 80KV1(VE)	FXYFP 100KV1(VE)	FXYFP 125KV1(VE)	
Remote Controller	Wired Remote Controller		BRC1A51							Option
	Wireless Remote Controller		BRC7C512W-513W							Option
Motors	Fan Motor	M1F	AC 220~240V 45W 6P					AC 230V 90W 6P		
			Thermal protector 130°C : OFF 80°C : ON							
	Motor for Drain Pump	M1P	AC220-240V (50Hz) AC220V (60Hz) Thermal Fuse 145°C							
	Swing Motor	M1S	MP35HCA[3P007482-1] Stepping Motor DC16V							
Thermistors	Thermistor (Suction Air)	R1T	ST8601-1 φ4 L250 20kΩ (25°C)							
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-4 φ8 L800 20kΩ (25°C)							
	Thermistor (Heat Exchanger)	R2T	ST8602-4 φ6 L800 20kΩ (25°C)							
Others	Float Switch	33H	FS-0211							
	Fuse	F1U	250V 5A φ5.2							
	Thermal Fuse	TFu	109°C 10A							
	Transformer	T1R	TR22M21R8							

Parts Name		Symbol	Model								Remark
			FXYCP 20KV1	FXYCP 25KV1	FXYCP 32KV1	FXYCP 40KV1	FXYCP 50KV1	FXYCP 63KV1	FXYCP 80KV1	FXYCP 125KV1	
Remote Controller	Wired Remote Controller		BRC1A51								Option
	Wireless Remote Controller		BRC7C62-67								Option
Motors	Fan Motor	M1F	AC 220~240V 50Hz								
			1φ10W	1φ15W	1φ20W		1φ30W	1φ50W	1φ85W		
			Thermal Fuse 152°C			—		Thermal protector 135°C : OFF 87°C : ON			
	Motor for Drain Pump	M1P	AC220-240V (50Hz) Thermal Fuse 169°C								
	Swing Motor	M1S	MT8-L[3PA07509-1] AC200~240V								
Thermistors	Thermistor (Suction Air)	R1T	ST8601-16 φ4 L1250 20kΩ (25°C)								
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-6 φ8 L1250 20kΩ (25°C)								
	Thermistor (Heat Exchanger)	R2T	ST8602-5 φ6 L1000 20kΩ (25°C)								
Others	Float Switch	33H	FS-0211								
	Fuse	F1U	250V 5A φ5.2								
	Transformer	T1R	TR22M21R8								

Parts Name		Symbol	Model				Remark
			FXYKP 25KV1	FXYKP 32KV1	FXYKP 40KV1	FXYKP 63KV1	
Remote Controller	Wired Remote Controller		BRC1A51				Option
Motors	Fan Motor	M1F	AC 220~240V 50Hz				
			1φ15W 4P		1φ20W 4P	1φ45W 4P	
			Thermal Fuse 146°C		Thermal protector 120°C : OFF 105°C : ON		
	Motor for Drain Pump	M1P	AC 220-240V (50Hz) Thermal Fuse 145°C				
	Swing Motor	M1S	MT8-L[3PA07312-1] AC200~240V				
Thermistors	Thermistor (Suction Air)	R1T	ST8601-13 φ4 L630 20kΩ (25°C)				
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-7 φ8 L1600 20kΩ (25°C)				
	Thermistor (Heat Exchanger)	R2T	ST8602A-7 φ6 L1600 20kΩ (25°C)				
Others	Float Switch	33H	FS-0211				
	Fuse	F1U	250V 5A φ5.2				
	Transformer	T1R	TR22M21R8				

Parts Name		Symbol	Model									Remark
			FXYSP 20KV1	FXYSP 25KV1	FXYSP 32KV1	FXYSP 40KV1	FXYSP 50KV1	FXYSP 63KV1	FXYSP 80KV1	FXYSP 100KV1	FXYSP 125KV1	
Remote Controller	Wired Remote Controller		BRC1A52									Option
Motors	Fan Motor	M1F	AC 220~240V 50Hz									
			1φ50W		1φ65W	1φ85W	1φ125 W	1φ135W		1φ225 W		
			Thermal Fuse 152°C					Thermal protector 135°C : OFF 87°C : ON				
	Motor for Drain Pump	M1P	AC220-240V (50Hz) Thermal Fuse 169°C									
Thermistors	Thermistor (Suction Air)	R1T	ST8601-4 φ4 L800 20kΩ (25°C)									
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-7 φ8 L1600 20kΩ (25°C)									
	Thermistor (Heat Exchanger)	R2T	ST8602-6 φ6 L1250 20kΩ (25°C)									
Others	Float Switch	33H	FS-0211									
	Fuse	F1U	250V 10A φ5.2									
	Thermal Fuse	TFu	109°C 10A									
	Transformer	T1R	TR22M21R8									

Parts Name		Symbol	Model								Remark
			FXYMP 40KV1	FXYMP 50KV1	FXYMP 63KV1	FXYMP 80KV1	FXYMP 100KV1	FXYMP 125KV1	FXYMP 200KV1	FXYMP 250KV1	
Remote Controller	Wired Remote Controller		BRC1A52								Option
Motors	Fan Motor	M1F	AC 220~240V 50Hz								
			1φ100W		1φ160W	1φ270W		1φ430W	1φ380W×2		
			Thermal protector 135°C : OFF 87°C : ON								
	Capacitor for Fan Motor	C1R	6μ F-400V		10μ F-400V				10μ F-400V	12μ F-400V	
Thermistors	Thermistor (Suction Air)	R1T	ST8601-5 φ4 L1000 20kΩ (25°C)						ST8601-13 φ4 L630		
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-5 φ8 L1000 20kΩ (25°C)						ST8605-5 φ8 L1000		
	Thermistor (Heat Exchanger)	R2T	ST8602-5 φ6 L1000 20kΩ (25°C)						ST8602A-6 φ6 L1250		
Others	Fuse	F1U	250V 10A φ5.2						250V 10A		
	Transformer	T1R	TR22M21R8						TR22M21R8		

Parts Name		Symbol	Model			Remark
			FXYHP 32KV1	FXYHP 63KV1	FXYHP 100KV1	
Remote Controller	Wired Remote Controller		BRC1A51			Option
	Wireless Controller		BRC7C63W-68W			
Motors	Fan Motor	M1F	AC 220~240V 50Hz			
			1φ57W		1φ130W	
			Thermal protector 130°C : OFF 80°C : ON			
	Capacitor for Fan Motor	C1R	4μF-400V		6μF-400V	
Thermistors	Swing Motor	M1S	MT8-L[3PA07530-1] AC200~240V			
	Thermistor (Suction Air)	R1T	ST8601-11 φ4 L250 20kΩ (25°C)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-7 φ8 L1600 20kΩ (25°C)		ST8605-8 φ8 L2000 20kΩ (25°C)	
Others	Thermistor (Heat Exchanger)	R2T	ST8602A-7 φ6 L1600 20kΩ (25°C)		ST8602-8 φ6 L2000 20kΩ (25°C)	
	Fuse	F1U	250V 5A φ5.2			
Others	Transformer	T1R	TR22M21R8			

Parts Name		Symbol	Model						Remark
			FXYAP 20KV1	FXYAP 25KV1	FXYAP 32KV1	FXYAP 40KV1	FXYAP 50KV1	FXYAP 63KV1	
Remote Controller	Wired Remote Controller		BRC1A51						Option
	Wireless Remote Controller		BRC7C510W-511W						Option
Motors	Fan Motor	M1F	AC 220~240V 50Hz						
			1φ23W				1φ37W		
			Thermal protector 130℃ : OFF 80℃ : ON						
	Capacitor for Fan Motor	C1R	1.5μF-400V				2μF-400V		
	Swing Motor	M1S	MT8-L[3SB40350-2] AC200~240V						
Thermistors	Thermistor (Suction Air)	R1T	ST8601-4 φ4 L800 20kΩ (25℃)						
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-4 φ8 L800 20kΩ (25℃)						
	Thermistor (for Heat Exchanger)	R2T	ST8602-4 φ6 L800 20kΩ (25℃)						
Others	Float Switch	33H	FS-0211						
	Fuse	F1U	250V 10A φ5.2						
	Transformer	T1R	TR22M21R8						

Parts Name		Symbol	Model						Remark
			FXYLP20KV1	FXYLP25KV1	FXYLP32KV1	FXYLP40KV1	FXYLP50KV1	FXYLP63KV1	
Remote Controller	Wired Remote Controller		BRC1A52						Option
Motors	Fan Motor	M1F	AC 220~240V 50Hz						
			1φ15W		1φ25W		1φ45W		
			Thermal protector 135°C : OFF 120°C : ON						
	Capacitor for Fan Motor	C1R	1.2μF-400V		0.5μF-400V	1.2μF-400V	2μF-400V	2.5μF-400V	
Thermistors	Thermistor (Suction Air)	R1T	ST8601-6 φ4 L1250 20kΩ (25°C)						
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-9 φ8 L2500 20kΩ (25°C)						
	Thermistor (for Heat Exchanger)	R2T	ST8602-9 φ6 L2500 20kΩ (25°C)						
Others	Fuse	F1U							
	Transformer	T1R	TR22M21R8						

Parts Name		Symbol	Model						Remark
			FXYLMP 20KV1	FXYLMP 25KV1	FXYLMP 32KV1	FXYLMP 40KV1	FXYLMP 50KV1	FXYLMP 63KV1	
Remote Controller	Wired Remote Controller		BRC1A52						Option
Motors	Fan Motor	M1F	AC 220~240V 50Hz						
			1φ15W		1φ25W		1φ45W		
			Thermal protector 135℃ : OFF 120℃ : ON						
	Capacitor for Fan Motor	C1R	1.2μF-400V		0.5μF-400V	1.2μF-400V	2μF-400V	2.5μF-400V	
Thermistors	Thermistor (Suction Air)	R1T	ST8601-6 φ4 L1250 20kΩ (25℃)						
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-9 φ8 L2500 20kΩ (25℃)						
	Thermistor (for Heat Exchanger)	R2T	ST8602-9 φ6 L2500 20kΩ (25℃)						
Others	Fuse	F1U							
	Transformer	T1R	TR22M21R8						

2.2.2 BS unit

MODEL		Safety devices
		PC board fuse
BSVP100KJV1	BSVP160KJV1	250V 5A
BSVP250KJV1		250V 5A

3. Outline of Control (Outdoor Unit)

< Symbols using in this manual >

Apparatus No.	Symbol	Description
Y3S	20RH	Discharge solenoid valve of BS unit
Y2S	20RL	Suction solenoid valve of BS unit
Y1S	20RT	Bypass solenoid valve of BS unit (liquid)
Y1R	20S1	4 way valve 1
Y2R	20S2	4 way valve 2
Y3R	20S3	4 way valve 3
	52Ci	Magnetic switch for INV compressor
	DSH	Discharge superheat
	DSHi	Discharge superheat of INV compressor
	EV	Electronic expansion valve
Y1E	EV1	Electronic expansion valve of Heat EX.1
Y2E	EV2	Electronic expansion valve of Heat EX.2
Y3E	EV3	Electronic expansion valve of sub unit heat EX.
	HDSHi	Adjusted discharge superheat of INV compressor
	HDSHs1	Adjusted discharge superheat of STD1 compressor
	HDSHs2	Adjusted discharge superheat of STD2 compressor
SENP	Hp	High pressure
	HTdi	Adjusted discharge pipe temperature of INV compressor
	HTds1	Adjusted discharge pipe temperature of STD1 compressor
	HTds2	Adjusted discharge pipe temperature of STD2 compressor
SENP	Lp	Low pressure
SENP	Pc	Condensing pressure
SENP	Pe	Evaporating pressure
	SH	Superheat
	SHS	Target evaporator outlet superheat
Y2S	SVP	Bypass solenoid valve
Y1S	SVS	Solenoid valve for auxiliary condensor
Y3S	SVTi	Solenoid valve for INV comp. liquid injection
Y4S	SVRVG	Solenoid valve for liquid receiver
Y5S	—	Solenoid valve for liquid pressure control
Y6S	SVTs1	Solenoid valve for STD1 comp. liquid injection
Y7S	SVTs2	Solenoid valve for STD2 comp. liquid injection
R1T	Ta	Ambient temperature
R21T	Tb1	Heat exchanger 1 distributor temperature
R22T	Tb2	Heat exchanger 2 distributor temperature
R23T	Tb3	Heat exchanger 3 distributor temperature
	Tc	High pressure equivalent saturation temperature
	Tcg	High pressure equivalent saturation temperature (gas side)
	Tcl	High pressure equivalent saturation temperature (liquid side)
	Tcs	Target Tc value
	Td	Discharge pipe temperature
R31T	Tdi	Discharge temperature of INV compressor
R32T	Tds1	Discharge temperature of STD1 compressor
R33T	Tds2	Discharge temperature of STD2 compressor
	Te	Low pressure equivalent saturation temperature
	TeS	Target Te value
	T fin	Inverter unit fin temperature
R1T	Th1	Ambient temperature
R21, 22, 23T	Th2	Heat exchange distributor temperature
R31T	Th3-11	Discharge pipe temperature for INV compressor
R32, R33T	Th3-12, 13	Discharge pipe temperature for STD1, 2 compressor
R41, 42, 43T	Th4-11, 12, 13	Heat exchanger suction pipe temperature
R6T	Th7	Accumulator outlet temperature
R8T	Th8	Receiver outlet temperature
R6T	Trac	Accumulator outlet temperature
R8T	Trev	Receiver outlet temperature (liquid)
R41T	Ts1	Heat exchanger 1 suction pipe temperature
R42T	Ts2	Heat exchanger 2 suction pipe temperature
R43T	Ts3	Heat exchanger 3 suction pipe temperature

3.1 Malfunction Stop

3.1.1 Judgement of Sensor Malfunction

- Stops operation when temperature or pressure sensor detects an abnormal value.

Contents

- When each sensor detects that a value exceeds upper or lower limit shown in the following table. (Malfunction stop which can be reset automatically)

Symbol	Apparatus No.	Symbol in wiring diagram	Item to detect	Upper limit	Lower limit
Pc	SENPB	SENPB	Discharge pressure	3.38MPa	0.01MPa
Pe	SENPL	SENPL	Suction pressure	1.17MPa	-0.01MPa
Ta	Th1	R1T	Outdoor temperature	90°C ★1	-43.6°C
Tb1, 2, 3	Th2	R21T, R22T, R23T	Distribution pipe temperature	90°C ★2	-43.6°C
Tdi	Th3-11	R31T	Discharge pipe temperature (Inverter compressor)	196°C	-10.1°C
Tds1, 2	Th3-12,13	R32T, R33T	Discharge pipe temperature (Constant-speed compressor)	196°C	-10.1°C
Ts1, 2, 3	Th4-11, 12, 13	R41T, R42T, R43T	Suction pipe temperature	90°C	-43.6°C
Trac	Th7	R6T	Accumulator outlet temperature	90°C	-43.6°C
Trev	Th8	R8T	Receiver outlet temperature	90°C	-43.6°C

- In oil return (cooling/heating) and defrosting operation and for 10 minutes after those operations, both of temperature and pressure sensors are not judged as malfunction even when the value exceeds the upper or lower limit shown in the above table.
- In addition to the above, Pe is not judged as malfunction in compressor stop or 3 minutes after startup, oil return operation in heating, "Drooping control by Pc", and "Inverter current/temperature drooping". The pressure sensor is judged as malfunction when the pressure value exceeds that shown in the above table for 1 minute continuously.
- Regarding the lower limit of discharge pipe temperature, Tdi is not judged as malfunction in inverter compressor stop and for 10 minutes after startup, and Tds1 and 2 are not judged as malfunction in each commercial power supply compressor stop and for 10 minutes after startup. **Regarding the upper limit of discharge pipe temperature, the malfunction judgement is conducted after 10 minutes upon completion of oil return and defrosting, and in each compressor stop. (Same as for other thermistors)**
- Since Ts1, 2 and 3 become discharge side in cooling cycle, they do not detect malfunction.

3.1.2 Malfunction Stop by Pe

- Unit is conducted malfunction stop (manual reset) when Pe becomes low to prevent compressor from seizing.

Contents

■ Malfunction judgement conditions

Condition①

- ☆ &
{
 - In compressor operation
 - $Pe < 0 \text{ MPa}$ (-37.0°C)
 - Not in defrosting and oil return operation
 - Elapsed time of 10 minutes or more after defrosting and oil return operation completion}
 → •Stops operation when low pressure error (E4) is detected.

- ★ • $Pe \geq 0.06 \text{ MPa}$ (-26.7°C) → •Resets malfunction.

(V2554)

Condition②

- ☆ &
{
 - In compressor operation
 - $Th7 - Te > 45^{\circ}\text{C}$ and $Pe < 0.15 \text{ MPa}$ (-16.5°C) continues for 3 minutes
 - Injection on inverter side = ON
 - After turning on power supply, within 20 minutes after the initial startup of compressor}
 → •Stops operation when low pressure error (E4) is detected.

- ★ • Compressor stop → •Resets malfunction.

(V2555)

3.1.3 Malfunction Stop by Td

- Unit is conducted malfunction stop (manual reset) when Td becomes high to prevent compressor from seizing.

Contents

■ Malfunction judgement conditions

- ☆ &
{
 - In compressor operation
 - OR
{
 - $HTdi \geq 130^{\circ}\text{C}$
 - $HTds1 \geq 130^{\circ}\text{C}$
 - $HTds2 \geq 130^{\circ}\text{C}$}}
 → •Stops operation when discharge pipe temperature error (F3) is

- ★
{
 - $HTdi < 115^{\circ}\text{C}$
 - $HTs1 < 115^{\circ}\text{C}$
 - $HTs2 < 115^{\circ}\text{C}$}
 → •Resets malfunction.

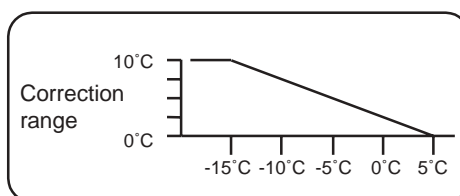
(V2556)

3.1.4 Correction of Td with Outdoor Temperature

- When the outdoor temperature is low, the following correction is conducted to cope with temperature drop at the temperature sensor (due to cooling by outdoor temperature) or expanding difference between discharge port temperature inside the compressor and detected discharge temperature.

Contents

- When outdoor temperature (T_a) $\leq 5^\circ\text{C}$, the following correction is conducted.
 $\text{HTdi, HTds1,2} = \text{Value detected Tdi, Tds1,2} + 0.5 \times (5.0 - T_a)$
 The correction factor must be a minimum of 0 deg. and a maximum of 10 deg.



(V2557)

- Specify HDSHi and HDSHs1,2 for the discharge superheat degree to calculate using the corrected discharge pipe temperature as shown above.
 $\text{HDSHi} = \text{HTdi} - T_{cg}$
 $\text{HDSHs1} = \text{HTds1} - T_{cg}$
 $\text{HDSHs2} = \text{HTds2} - T_{cg}$

3.1.5 Malfunction Stop by Reverse Phase

- When the power supply is connected in reverse phase, detects the reverse phase and stops operation to prevent a damage of scroll compressor due to turning reverse.

Contents

- Detects reverse phase → Stops operation by reverse phase (U1)

Remarks

- Detects reverse phase to protect commercial power supply compressor

3.2 Standby

3.2.1 Restart Standby

Purpose

- Once compressor stops operation, stands by for compressor restart for a certain period of time to prevent compressor from frequent ON-OFF operation.

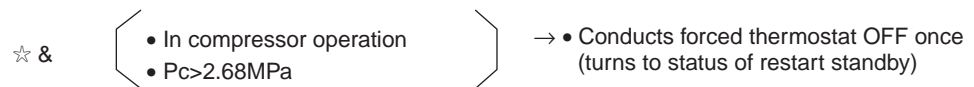
Contents

- Stops compressor operation with forced thermostat OFF for 5 minutes after the compressor stops.
(When all compressors including inverter compressor (INV) and commercial power supply compressor (STD1,2) stop operation)

3.2.2 Standby due to Pc

- Forcibly stops compressor operation just before detecting malfunction to prevent malfunction stop due to transitional increase of Pc. (Constrained automatic reset)

Contents



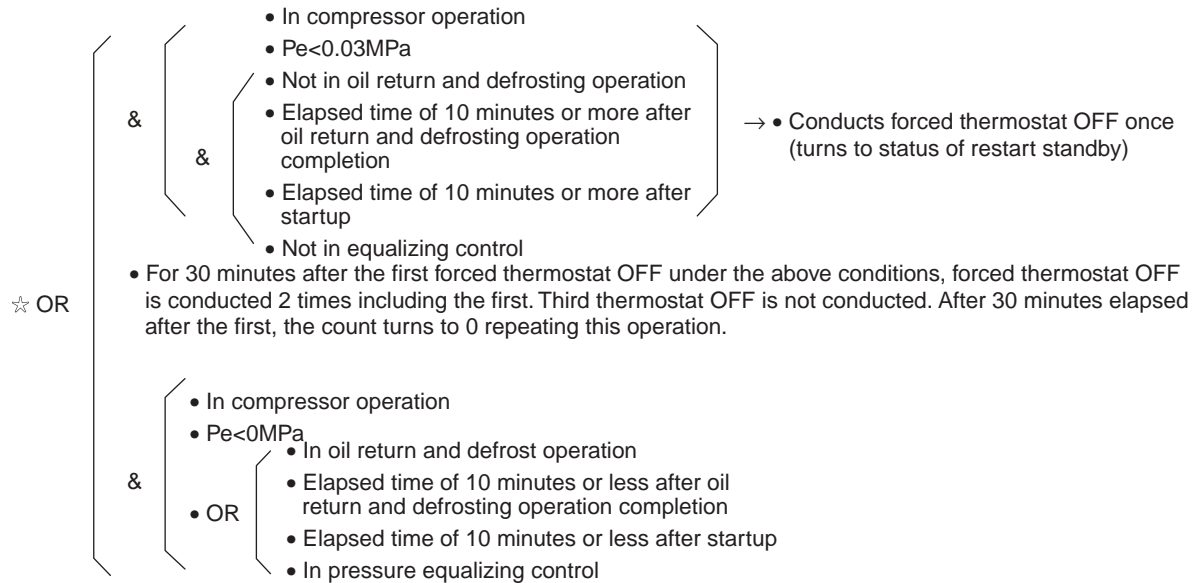
(V2558)

- For 30 minutes after the first forced thermostat OFF under the above conditions, forced thermostat OFF is conducted 2 times including the first. Third thermostat OFF is not conducted. After 30 minutes elapsed after the first thermostat OFF, the count turns to 0 repeating this operation.

3.2.3 Standby due to Pe

- Forcibly stops compressor operation just before detecting malfunction to prevent stopping operation due to transitional drop of Pe. (Constrained automatic reset)

Contents

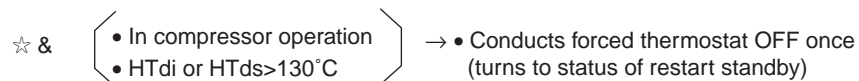


(V2560)

3.2.4 Standby due to Td

- Forcibly stops compressor operation just before detecting malfunction to prevent stopping operation due to transitional increase of Td. (Constrained automatic reset)

Contents



(V2561)

- For 100 minutes after the first forced thermostat OFF under the above conditions, forced thermostat OFF is conducted 2 times including the first. Third thermostat OFF is not conducted. After 100 minutes elapsed after the first, the count turns to 0 repeating this operation.

3.2.5 Heating Restriction according to Outdoor Temperature

Purpose

- When outdoor temperature exceeds the working range in heating or simultaneous cooling/heating operation, forcibly stops compressor operation to prevent the activation of protection devices and sensor malfunction.

Contents

- When $T_a(\text{outdoor temperature}) > 23^{\circ}\text{C}$, the unit in heating operation is stopped with forcible thermostat OFF, and resets when $T_a < 21^{\circ}\text{C}$.

3.3 Startup Control

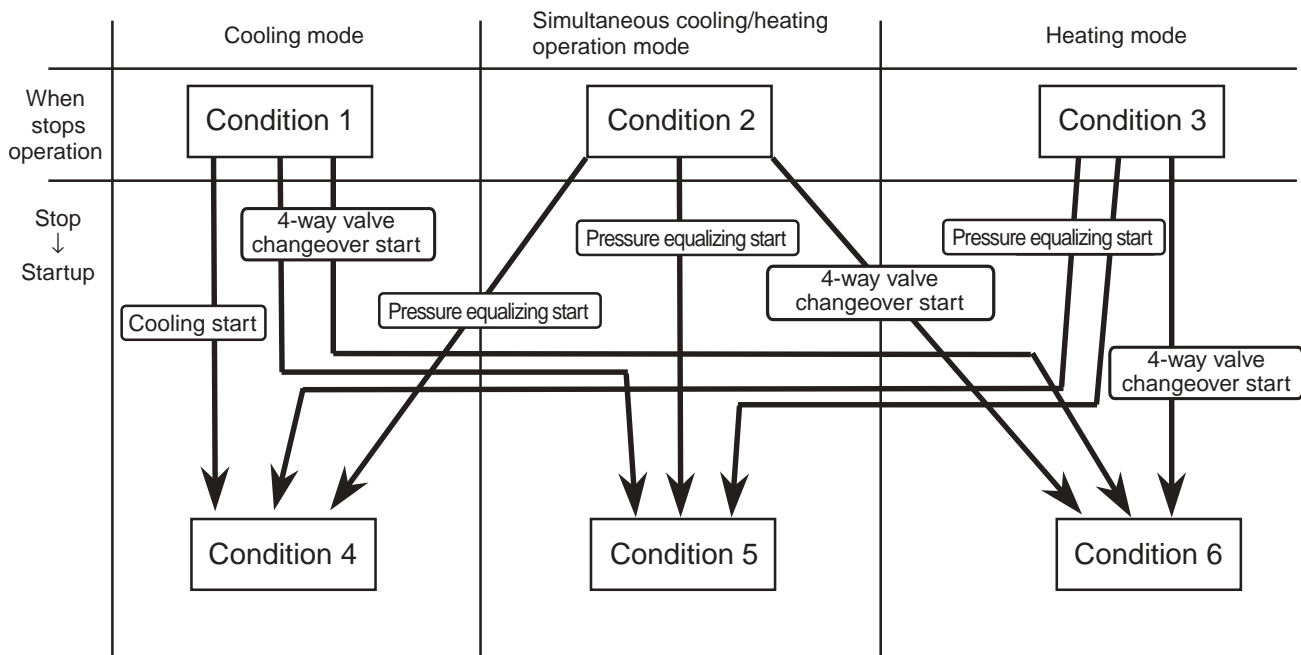
3.3.1 Startup Mode

Purpose

- Selects startup method depending on operating mode during compressor stop and startup to changeover BS unit solenoid valve and three 4-way valves.

Contents

- Decides the startup mode depending on the operating status during compressor stop.



(V2563)

- Mode judgement
 - In case of all the temperature adjusting modes of indoor unit in thermostat ON are cooling: Cooling mode.
 - In case of all the temperature adjusting modes of indoor unit in thermostat ON are heating: Heating mode.
 - In case of the temperature adjusting modes of indoor unit in thermostat ON include cooling and heating: Simultaneous cooling/heating operation mode.

★ As for mode judgement, modes of the unit in thermostat OFF, stop or fan are ignored. (The judgement should be based on only those of thermostat ON unit.)

- The condition when power supply turning ON is designated as Condition 1.

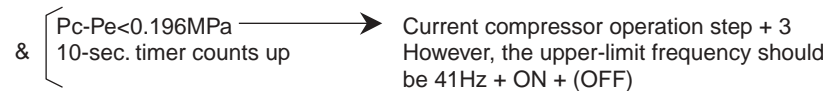
3.3.2 4-Way Valve Changeover Ensuring Control

Purpose

- To ensure the changeover 4-way valve, when difference in high and low pressure does not generate due to mid-stop of the 4-way valve in each startup mode, increases the circulation amount of compressor and forcibly generates the differential pressure with pressure loss in the 4-way valve.

Contents

- Varies the compressor loads under the following conditions in all startup control, 4-way valve changeover control, and equalizing control.
Computes $P_c - P_e$ every 10 seconds when 20 seconds elapsed after the control turns on, and varies the compressor operation steps depending on the computed value.



(V2564)

When the following condition is met, conducts step down.



(V2565)

When stepping down, the lower-limit frequency is to be as follows.

- ① At the normal startup of cooling and heating operation
Within 1 minute after startup : 41Hz + OFF + (OFF)
Elapsed time of 1 minute after startup : 52Hz+OFF+(OFF)
- ② At the startup of 4-way valve changeover
41Hz + OFF + (OFF)
- ③ At the (startup of) pressure equalizing
41Hz + OFF + (OFF)

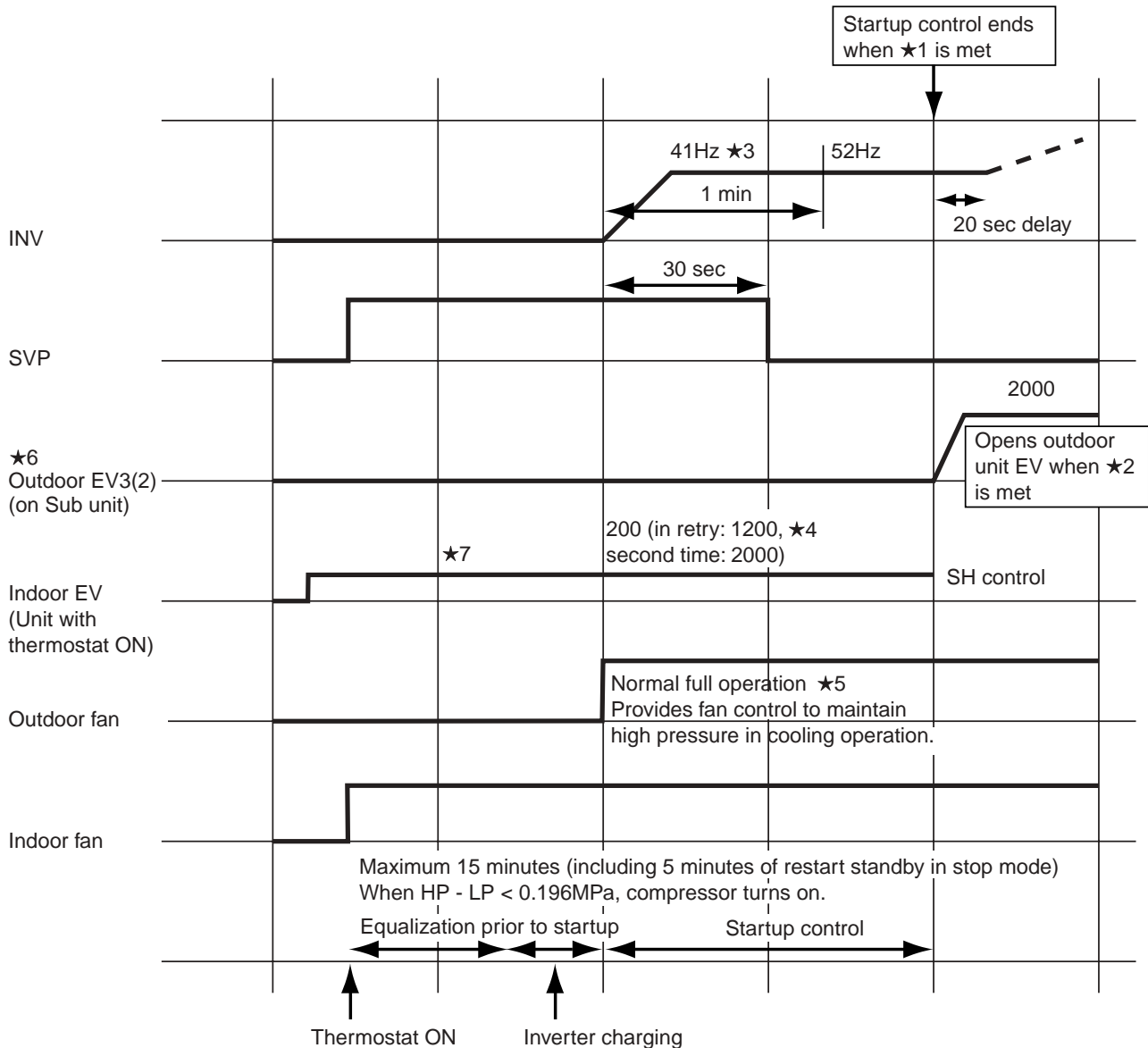
In any cases, fix the frequency in the initial compressor operation step at 41Hz + OFF + (OFF).

3.3.3 Startup Control

Cooling Startup Control

Fixes the frequency at a low level for a certain period of time during compressor startup to prevent liquid return.

[Startup control in cooling operation]



★1
Startup control ending conditions

OR {
DSHi>30
Th7 - Te>10
Elapsed time of 15 minutes
LP<0.098MPa

★2
Outdoor unit EV full-open conditions

& {
OR {
Tc>Ta+10
Elapsed time of 10 minutes
Tcg>55deg
When condition ★1 is met

★3
Operates at 52 Hz after operating at 41 Hz for 1 minute.
(until PI control is activated in ★1)

(V0808)

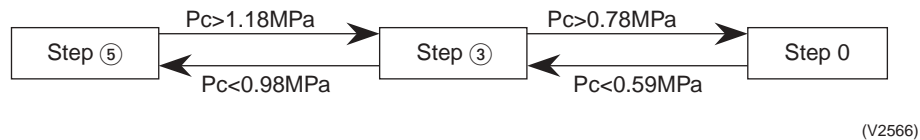
★4

When LP retry is conducted at 200pls in operation, maintain 200pls during standby.
Conduct the next startup at 1200pls for 3 minutes (The control is not switched to SH control even when ★1 condition is met.)

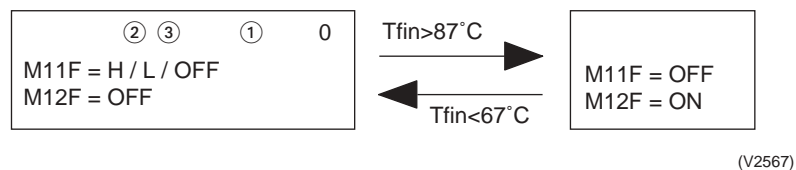
When further LP retry is conducted, maintains 1200pls during standby to conduct the next startup at 2000pls for 3 minutes. (The control is not switched to SH control even when ★1 condition is met.)

★5

Outdoor fan control



Regarding 24 to 34HP model, the fan (M12F) on the inverter box side stops if operating at fan tap ③ or lower. Therefore, Tfin switches M12F to M11F.



Start the control from Step 0.

★6

Outdoor EV control

In cooling operation, fix the EV=0pls on the master unit side and EV=2000pls on the slave unit side.

16HP to 20HP : EV1=0pls, EV2=2000pls

24HP or larger : EV1, Ev2=0pls, EV3=2000pls

★7

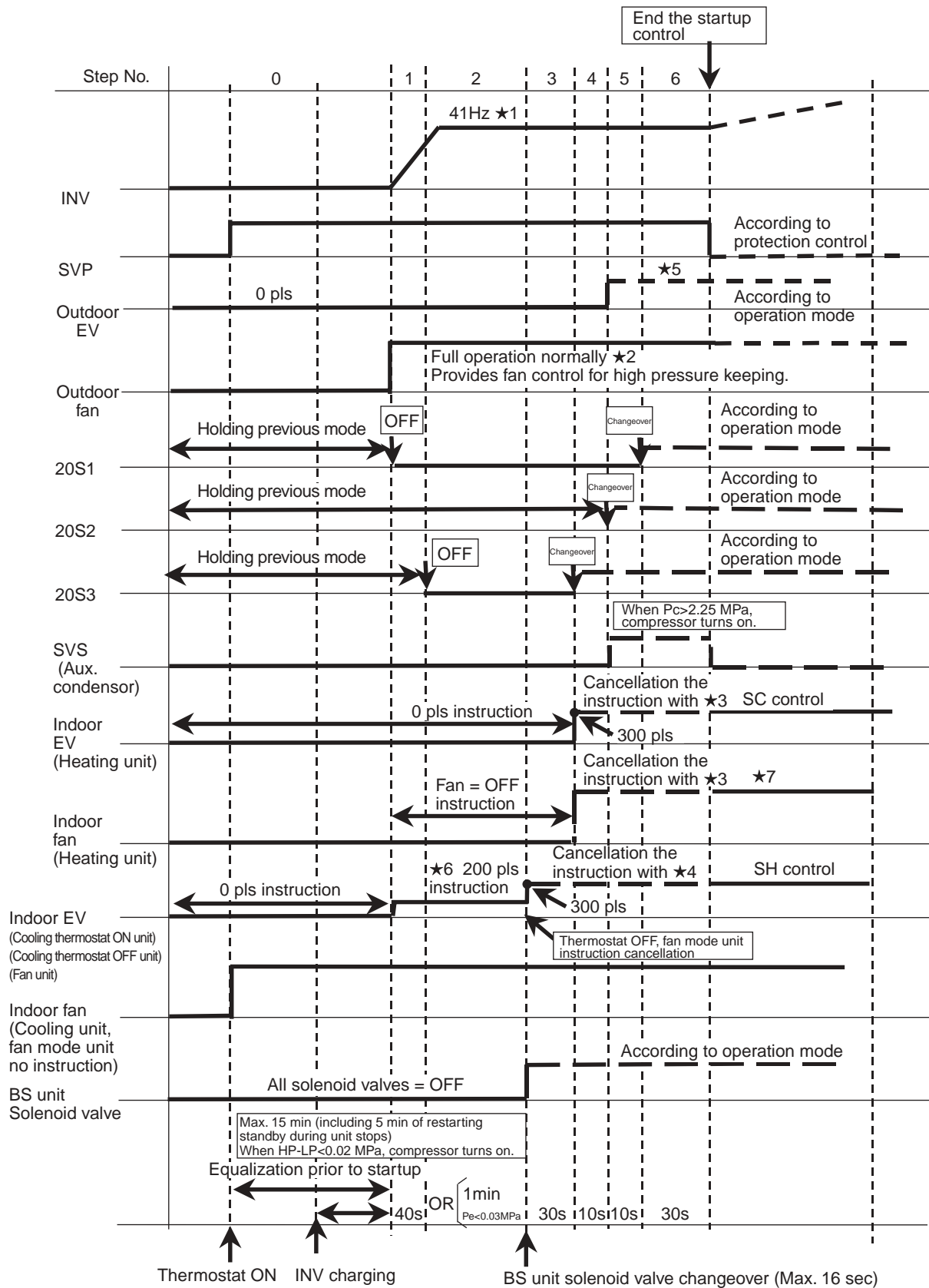
Indoor EV control

Conducts 200pls instruction to all indoor units EV from 10 seconds before SVP=ON.



Note: Refer "Fan Tap Table" Page 96 for fan step detail.

Equalizing Startup Control



(V2568)

★1

Compressor frequency

Fix the frequency at 41Hz + OFF + (OFF) for the basic operation.

However, increase the compressor operation step with 4-way valve operation ensuring control to ensure the operation of the 4-way valve.

★2

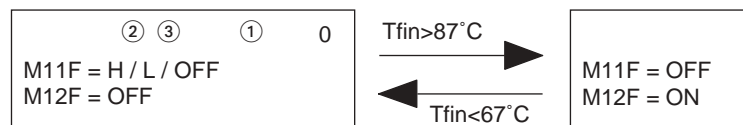
Outdoor fan control



Note : Initial step is Step 0.

(V2569)

Regarding 24 to 34HP model, the fan (M12F) on the inverter box side stops if operating at fan tap ③ or lower. Therefore, Tfin switches M12F to M11F.



(V2570)

★3

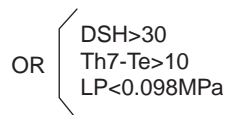
Indoor unit instruction cancellation conditions



(V2571)

★4

Indoor unit instruction cancellation conditions



(V2572)

★5

Opening degree of Ev (in 3 compressor system: EV3) on sub unit side

20S2=ON→0 pls

20S2=OFF→500 pls

★6

EV instruction to indoor unit

Instructed opening degree is shifted under the following conditions only on indoor unit with cooling thermostat ON.

Th7-Te>40°C→1000 pls

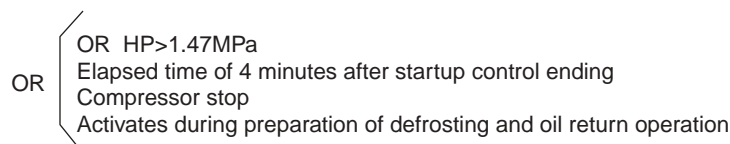
Th7-Te<15°C→200 pls

★ Initial status: 200 pls

★7

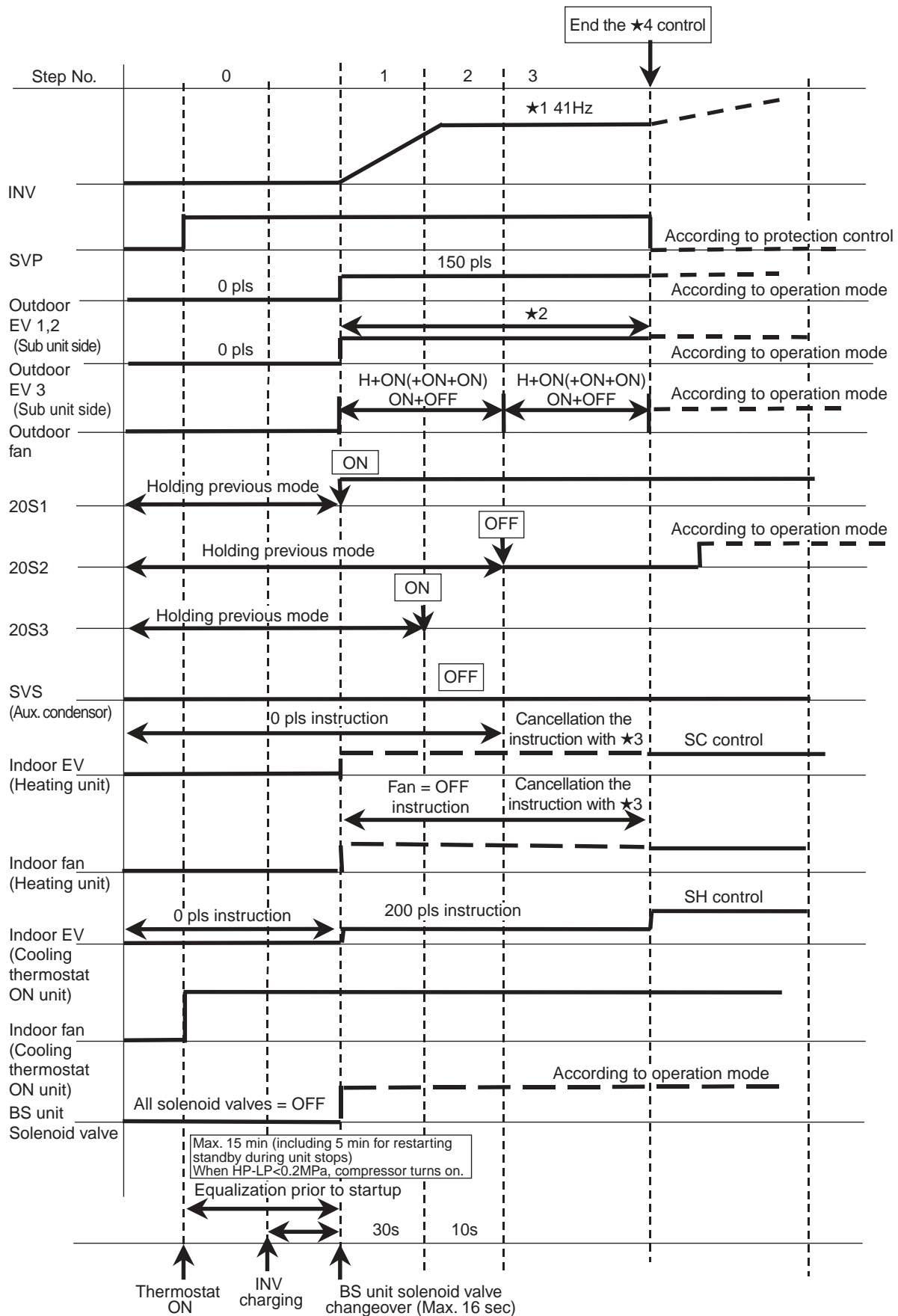
Fan instruction to indoor unit

LL tap instruction is conducted after the startup control ending until the following conditions are met.



(V2573)

4-way valve changeover control (starting control)



(V2574)

★1

Compressor frequency

Fix the frequency at 41Hz + OFF + (OFF) for the basic operation.

However, increase the compressor operation step with four way valve function assuring control to ensure the operation of the 4-way valve.

★2

Opening degree of EV (in 3 compressor system: EV3) on sub unit side

20S2=ON→0 pls

20S2=OFF→500 pls

★3

Indoor unit instruction cancellation conditions

OR $\left\{ \begin{array}{l} \text{HP} > 1.47\text{MPa} \\ \text{Startup control ending} \end{array} \right.$

(V2575)

Then, fix at 500 pls to return to the normal control in the following conditions.

or $\left\{ \begin{array}{l} \text{Pc} > 1.96\text{MPa} \\ \text{Elapsed time of 1 minute after 500pls instruction startup} \end{array} \right.$

(V2576)

★4

Control ending conditions

OR $\left\{ \begin{array}{l} \& \left\{ \begin{array}{l} \text{Elapsed time of 1 minute} \\ \text{OR} \left\{ \begin{array}{l} \text{DSH} > 30 \\ \text{Th7-Te} > 10 \\ \text{LP} < 1.0\text{k} \end{array} \right. \end{array} \right. \\ \text{Elapsed time of 15 minutes (local setting of 10 minutes) (30 minutes in power ON)} \\ \& \left\{ \begin{array}{l} \bullet \text{ Indoor unit thermostat ON capacity of 8.0kW (3HP) or less} \\ \bullet \text{ OR} \left\{ \begin{array}{l} \bullet \text{ Ta} \geq 30^{\circ}\text{C} \\ \bullet \& \left\{ \begin{array}{l} \bullet \text{ Ta} < 30^{\circ}\text{C} \\ \bullet \text{ Pc} \geq 23\text{k (56.7}^{\circ}\text{C)} \end{array} \right. \end{array} \right. \end{array} \right. \end{array} \right.$

When ending the control in these conditions, maintain the upper-limit frequency at 29Hz + OFF(+OFF) for 2 minutes.

(V2577)

3.3.4 Compressor ON/OFF Conditions

Purpose

- Defines the compressor ON/OFF conditions.

Contents

1. Compressor restarting conditions in stop mode

- ☆&
- Either of connected indoor units in thermostat ON operation (excluding fan operation)
 - Not in 3.2.1 "Restart Standby"
 - Not in 3.2.7 "Standby due to outdoor temperature"
 - No standby command from inverter
 - Not in malfunction stop mode
 - Not in Demand 3

(V2578)

2. Compressor stopping conditions in operation mode

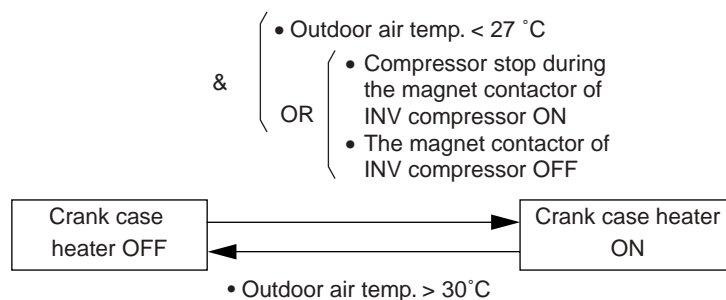
- ★&
- All connected indoor units not in thermostat ON operation (including fan operation)
 - 3.2.2 "Standby due to detection of Pc error" activated
 - 3.2.3 "Standby due to detection of Pe error" activated
 - 3.2.4 "Standby due to detection of Td error" activated
 - 3.2.5 "Standby due to switching of cooling and heating operation" activated
 - 3.2.7 "Standby due to outdoor temperature" activated
 - Standby command provided from inverter
 - In malfunction stop
 - In Demand 3

(V2579)

3. Magnetic contactor (52Ci) used in inverter compressor turns on when the above condition 1 is met, and turns off only when all connected indoor units stop operation.
(In other words, the 52Ci remains ON and inverter frequency becomes 0Hz when either of indoor units is in thermostat OFF operation and the compressor stopping conditions are met.)

3.3.5 Crankcase Heater Control

Controls the crankcase heater to prevent refrigerant from remaining in the inverter compressor.



(V0833)



Note: STD compressor crankcase heater is controlled previous way. (ON/OFF by magnetic switch)

3.4 Capacity control

3.4.1 Compressor PI Control

Compressor PI Control

Controls the compressor to maintain Te at constant during cooling operation and Te at constant during heating operation to ensure stable compressor performance.

[Cooling operation]

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

Te setting

L	M (factory setting)	H
4.5	7.5	10.5

Te: Low pressure equivalent saturation temperature (°C)

TeS: Target Te value

(Varies depending on Te setting, operating frequency, etc.)

[Heating operation]

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

Tc setting

L	M (factory setting)	H
45	48	51

Tc: High pressure equivalent saturation temperature (°C)

TcS: Target Tc value

(Varies depending on Tc setting, operating frequency, etc.)

Compressor Operation Steps

The operating frequency changes in the following steps.

■ RSEYP16K~20K

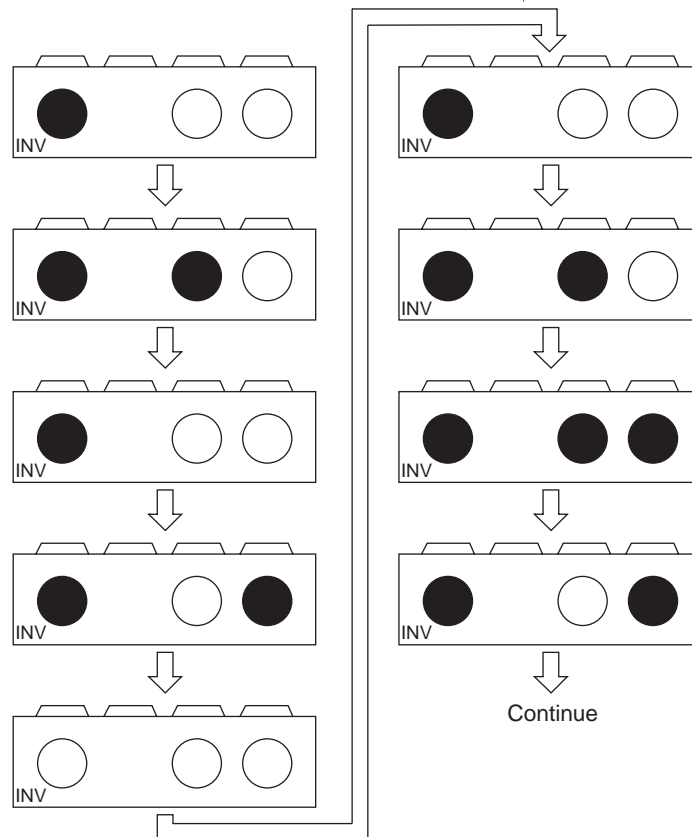
NO.	Frequency		
	INV	STD	
1	29Hz	OFF	
2	31Hz	OFF	
3	33Hz	OFF	
4	35Hz	OFF	
5	37Hz	OFF	
6	39Hz	OFF	
7	41Hz	OFF	
8	43Hz	OFF	
9	46Hz	OFF	
10	48Hz	OFF	
11	52Hz	OFF	
12	55Hz	OFF	
13	58Hz	OFF	
14	62Hz	OFF	
15	64Hz	OFF	
16	67Hz	OFF	
17	71Hz	OFF	
18	75Hz	OFF	
19	37Hz	ON	
20	41Hz	ON	
21	46Hz	ON	
22	52Hz	ON	
23	58Hz	ON	
24	64Hz	ON	
25	71Hz	ON	
26	79Hz	ON	16 HP upper limit
27	87Hz	ON	
28	95Hz	ON	18, 20 HP upper limit

■ RSEYP24K~30K

NO.	Frequency			
	INV	STD1	STD2	
1	29Hz	OFF	OFF	
2	31Hz	OFF	OFF	
3	33Hz	OFF	OFF	
4	35Hz	OFF	OFF	
5	37Hz	OFF	OFF	
6	39Hz	OFF	OFF	
7	41Hz	OFF	OFF	
8	43Hz	OFF	OFF	
9	46Hz	OFF	OFF	
10	48Hz	OFF	OFF	
11	52Hz	OFF	OFF	
12	55Hz	OFF	OFF	
13	58Hz	OFF	OFF	
14	62Hz	OFF	OFF	
15	64Hz	OFF	OFF	
16	67Hz	OFF	OFF	
17	71Hz	OFF	OFF	
18	75Hz	OFF	OFF	
19	37Hz	ON	OFF	
20	41Hz	ON	OFF	
21	46Hz	ON	OFF	
22	52Hz	ON	OFF	
23	58Hz	ON	OFF	
24	64Hz	ON	OFF	
25	71Hz	ON	OFF	
26	41Hz	ON	ON	
27	52Hz	ON	ON	
28	64Hz	ON	ON	
29	79Hz	ON	ON	24, 26 HP upper limit
30	87Hz	ON	ON	
31	95Hz	ON	ON	28, 30 HP upper limit

Compressor Sequence Operation

Regarding operation of STD compressors in 3 compressor system, STD1 and STD2 are switched under following condition.



(V0914)

STD Compressor Operation

Since ON/OFF switching of STD compressors causes a sudden change in the capacity, therefore the following operation is conducted.

[When STD compressor is turned on]

- When a STD compressor changes from OFF to ON due to the compressor PI control or others, 41 Hz + ON (+ON) is fixed for 30 seconds.
- Regarding the above operation timing, the inverter compressor is set to the above frequency (41 Hz) first, then the STD compressor is started.
(Operation starts when frequency matching signal from inverter is received.)
- The STD compressor does not start for 3 seconds if the STD compressor of another outdoor units starts.

[When STD compressor is turned off]

- The frequency of the inverter compressor changes after the STD compressor stops operation.

3.4.2 Motorized Valve PI Control (Heating)

Controls the motorized valves (EV1, EV2, EV3) to maintain the outlet superheated degree (SH) of the outdoor heat exchanger (evaporator) at constant during heating operation.

$$SH = Th7 - Te$$

Te: Low pressure equivalent saturation temperature (°C)

Th7: Accumulator outlet temperature (°C)

Superheated degree target value (SHS)

■ Initial value at the start of motorized valve control: SHS = 5 °C

■ When $Th7 - Te < 5$: SHS (new) = SHS (current) + 1

However, when $Th7 - Te < 5$ and $DSHi < 30$: SHS = 7 °C (fixed)

■ When $Th7 - Te > 10$: SHS (new) = SHS (current) - 1

DSHi: Inverter discharge pipe superheat

3.4.3 Heat Exchanger PI Control (Heating & Simultaneous Cooling/Heating Operation Mode)

In heating and simultaneous cooling/heating operation, conducts heat exchanger PI control, switches the operation mode through 3 of 4-way valves, and adjusts the capacity by controlling 3 off electronic expansion valves, outdoor fan, auxiliary heat exchanger, and pressurizing valve.

16 to 20 HP

step No.	Heat exchanger 1					Heat exchanger 2				Pressurizing valve Y5S
	20S1	Heat exchanger mode	20E1	Aux. condensor	Fan (MF11+MF12)	20S2	Heat exchanger mode	20E2	Fan (MF3+MF4)	
b	OFF	cond	0pls	OFF	H+OFF	OFF	cond	2000pls	ON+ON	OFF
a	OFF	cond	0pls	OFF	L+OFF	OFF	cond	2000pls	ON+ON	OFF
0	ON	evp	0pls	ON	H+ON	OFF	cond	2000pls	ON+ON	OFF
1	ON	evp	0pls	OFF	H+ON	OFF	cond	2000pls	ON+ON	OFF
2	ON	evp	0pls	OFF	H+ON	OFF	cond	1000pls	ON+ON	OFF
3	ON	evp	0pls	OFF	H+ON	OFF	cond	700pls	ON+ON	ON
4	ON	evp	0pls	OFF	H+ON	OFF	cond	500pls(PI)	ON+ON	ON
5	ON	evp	0pls	ON	H+ON	OFF	cond	2000pls	ON+OFF	OFF
6	ON	evp	0pls	ON	H+ON	OFF	cond	1000pls	ON+OFF	OFF
7	ON	evp	0pls	ON	H+ON	OFF	cond	700pls	ON+OFF	ON
8	ON	evp	0pls	ON	H+ON	OFF	cond	500pls(PI)	ON+OFF	ON
9	ON	evp	0pls	OFF	H+ON	OFF	cond	2000pls	ON+OFF	OFF
10	ON	evp	0pls	OFF	H+ON	OFF	cond	1000pls	ON+OFF	OFF
11	ON	evp	0pls	OFF	H+ON	OFF	cond	700pls	ON+OFF	ON
12	ON	evp	0pls	OFF	H+ON	OFF	cond	500pls(PI)	ON+OFF	ON
13	ON	evp	GR/SH control	OFF	H+ON	OFF	cond	2000pls	ON+OFF	OFF
14	ON	evp	GR/SH control	OFF	H+ON	OFF	cond	1000pls	ON+OFF	OFF
15	ON	evp	GR/SH control	OFF	H+ON	OFF	cond	700pls	ON+OFF	ON
16	ON	evp	GR/SH control	OFF	H+ON	OFF	cond	500pls(PI)	ON+OFF	ON
23	ON	evp	GR/SH control	OFF	H+ON	OFF	cond	1000pls	OFF+OFF	OFF
24	ON	evp	GR/SH control	OFF	H+ON	ON	evp	0pls	ON+ON	OFF
25	ON	evp	GR/SH control	OFF	H+ON	ON	evp	SH control	ON+ON	OFF



Note: GR/SH control: Imaginary refrigerant circulation amount/Super heat degree control

500pls(PI) : Pc control

24 to 30 HP

step No.	Heat exchanger 1					Heat exchanger 2				Heat exchanger 3				Pressurizing valve Y5S
	20S1	Heat exchanger mode	20E1	Aux. condensor	Fan (MF11+MF12)	20S1	Heat exchanger mode	20E2	Fan (MF21+MF22)	20S2	Heat exchanger mode	20E3	Fan (MF3+MF4)	
c	OFF	cond	0pls	OFF	H+OFF	OFF	cond	0pls	ON+OFF	OFF	cond	2000pls	ON+ON	OFF
b	OFF	cond	0pls	OFF	H+OFF	OFF	cond	0pls	OFF+OFF	OFF	cond	2000pls	ON+ON	OFF
a	OFF	cond	0pls	OFF	L+OFF	OFF	cond	0pls	OFF+OFF	OFF	cond	2000pls	ON+ON	OFF
0	ON	evp	0pls	ON	H+ON	ON	evp	0pls	ON+ON	OFF	cond	2000pls	ON+ON	OFF
1	ON	evp	0pls	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	2000pls	ON+ON	OFF
2	ON	evp	0pls	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	1000pls	ON+ON	OFF
3	ON	evp	0pls	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	700pls	ON+ON	ON
4	ON	evp	0pls	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	500pls(P)	ON+ON	ON
5	ON	evp	0pls	ON	H+ON	ON	evp	0pls	ON+ON	OFF	cond	2000pls	ON+OFF	OFF
6	ON	evp	0pls	ON	H+ON	ON	evp	0pls	ON+ON	OFF	cond	1000pls	ON+OFF	OFF
7	ON	evp	0pls	ON	H+ON	ON	evp	0pls	ON+ON	OFF	cond	700pls	ON+OFF	ON
8	ON	evp	0pls	ON	H+ON	ON	evp	0pls	ON+ON	OFF	cond	500pls(P)	ON+OFF	ON
9	ON	evp	0pls	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	2000pls	ON+OFF	OFF
10	ON	evp	0pls	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	1000pls	ON+OFF	OFF
11	ON	evp	0pls	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	700pls	ON+OFF	ON
12	ON	evp	0pls	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	500pls(P)	ON+OFF	ON
13	ON	evp	GR/SH control	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	2000pls	ON+OFF	OFF
14	ON	evp	GR/SH control	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	1000pls	ON+OFF	OFF
15	ON	evp	GR/SH control	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	700pls	ON+OFF	ON
16	ON	evp	GR/SH control	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	500pls(P)	ON+OFF	ON
23	ON	evp	GR/SH control	OFF	H+ON	ON	evp	0pls	ON+ON	OFF	cond	1000pls	OFF+OFF	OFF
24	ON	evp	GR/SH control	OFF	H+ON	ON	evp	0pls	ON+ON	ON	evp	0pls	ON+ON	OFF
25	ON	evp	GR/SH control	OFF	H+ON	ON	evp	0pls	ON+ON	ON	evp	SH control	ON+ON	OFF
26	ON	evp	GR/SH control	OFF	H+ON	ON	evp	SH control	ON+ON	ON	evp	SH control	ON+ON	OFF



Note: GR/SH control: Imaginary refrigerant circulation amount/Super heat degree control
500pls(P) : Pc control

3.4.4 BS Unit Basic Operation

Contents

Instructs ON/OFF operation of BS unit solenoid valve from outdoor unit depending on the operating state of indoor unit. However, regarding non-ordinary operation of startup control, defrosting, oil return, and equalizing control, BS unit solenoid valve is switched under the individual control. This section describes only the basic operation by indoor unit operation mode.

1. During compressor operation

Indoor unit temperature control mode	Indoor unit operating condition	Suction solenoid valve (20RL)	Discharge solenoid valve (20RH)	Bypass solenoid valve (20RT)
Cooling	Thermostat ON	ON	OFF	OFF
	Thermostat OFF	OFF		
	Stop			
Heating	Thermostat ON	OFF	ON	★1
	Thermostat OFF			OFF
	Stop			
Fan		OFF	OFF	OFF

★1. The solenoid valve is turned ON only when in simultaneous cooling/heating mode

★2. Remote controller setting judgement is not conducted when operation button is in OFF.
(Returns to operation of stopping unit in the previous mode)

2. During compressor stop

Regardless of the indoor unit temperature control and operating state, turns off all solenoid valves.

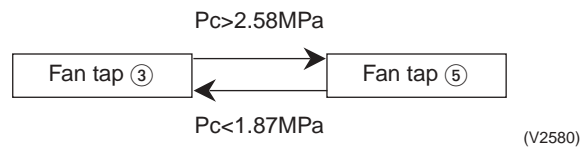
3.5 Protection Control, etc.

3.5.1 Low Noise Control

- Should the noise from outdoor unit cause a problem in the night-time, etc., operates the outdoor fan and compressor at low speed based on an external contact input (low noise input) to reduce the operating sound.

Contents

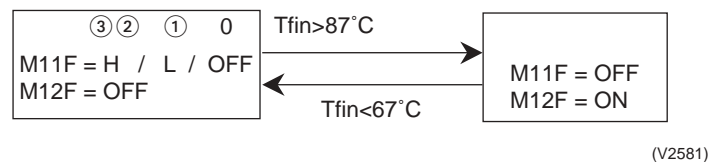
- During compressor operation excluding oil return and defrosting operation, conducts the following operation if low noise input is provided (short circuit of contact points).
 - In heating operation and simultaneous cooling/heating mode
 $Th1 < 0^{\circ}\text{C} \rightarrow$ Low noise input is invalid
 $Th1 > 2^{\circ}\text{C} \rightarrow$ Low noise input is valid
1. Outdoor fan : In cooling operation, take the value shown in the following table as the upper limit. In heating and simultaneous cooling/heating mode, see separate table (on next page).



2. Compressor : Take the value shown in the following table as the upper limit.

	16-18-20HP	24-26-28-30HP
Fan tap ③	H+OFF / ON+OFF	H+OFF+ON+OFF / ON+OFF
Fan tap ⑤	H+ON / ON+ON	H+ON+ON+ON / ON+ON
Compressor upper limit frequency	16HP 58Hz+OFF 18HP 75Hz+OFF 20HP 75Hz+OFF	24HP 41Hz+ON+OFF 26HP 41Hz+ON+OFF 28HP 41Hz+ON+OFF 30HP 41Hz+ON+OFF

- Regarding 24 to 34HP compressors, since the fan (M12F) on the inverter box side stops during operation in fan tap ③ or lower, change the fan to M11F by Tfin.



3. When receiving "Fin temperature drooping signal" from inverter, neglects the low noise input.

When low noise mode input (16 to 20 HP)

step No.	Heat exchanger 1					Heat exchanger 2				Pressurizing valve Y5S
	20S1	Heat exchanger mode	20E1	Aux. condensor	Fan (MF11+MF12)	20S2	Heat exchanger mode	20E2	Fan (MF3+MF4)	
b	OFF	cond	0pls	OFF	H+OFF	OFF	cond	2000pls	ON+ON	OFF
a	OFF	cond	0pls	OFF	L+OFF	OFF	cond	2000pls	ON+ON	OFF
0	ON	evp	0pls	ON	H+OFF	OFF	cond	2000pls	ON+ON	OFF
1	ON	evp	0pls	OFF	H+OFF	OFF	cond	2000pls	ON+ON	OFF
2	ON	evp	0pls	OFF	H+OFF	OFF	cond	1000pls	ON+ON	OFF
3	ON	evp	0pls	OFF	H+OFF	OFF	cond	700pls	ON+ON	ON
4	ON	evp	0pls	OFF	H+OFF	OFF	cond	500pls(PI)	ON+ON	ON
5	ON	evp	0pls	ON	H+OFF	OFF	cond	2000pls	ON+OFF	OFF
6	ON	evp	0pls	ON	H+OFF	OFF	cond	1000pls	ON+OFF	OFF
7	ON	evp	0pls	ON	H+OFF	OFF	cond	700pls	ON+OFF	ON
8	ON	evp	0pls	ON	H+OFF	OFF	cond	500pls(PI)	ON+OFF	ON
9	ON	evp	0pls	OFF	H+OFF	OFF	cond	2000pls	ON+OFF	OFF
10	ON	evp	0pls	OFF	H+OFF	OFF	cond	1000pls	ON+OFF	OFF
11	ON	evp	0pls	OFF	H+OFF	OFF	cond	700pls	ON+OFF	ON
12	ON	evp	0pls	OFF	H+OFF	OFF	cond	500pls(PI)	ON+OFF	ON
13	ON	evp	GR/SH control	OFF	H+OFF	OFF	cond	2000pls	ON+OFF	OFF
14	ON	evp	GR/SH control	OFF	H+OFF	OFF	cond	1000pls	ON+OFF	OFF
15	ON	evp	GR/SH control	OFF	H+OFF	OFF	cond	700pls	ON+OFF	ON
16	ON	evp	GR/SH control	OFF	H+OFF	OFF	cond	500pls(PI)	ON+OFF	ON
23	ON	evp	GR/SH control	OFF	H+OFF	OFF	cond	1000pls	OFF+OFF	OFF
24	ON	evp	GR/SH control	OFF	H+OFF	ON	evp	0pls	OFF+OFF	OFF
25	ON	evp	GR/SH control	OFF	H+OFF	ON	evp	SH control	ON+OFF	OFF



Note: GR/SH control: Imaginary refrigerant circulation amount/Super heat degree control

500pls(PI) : Pc control

When low noise mode input (24 to 30 HP)

step No.	Heat exchanger 1					Heat exchanger 2				Heat exchanger 3				Pressurizing valve Y5S
	20S1	Heat exchanger mode	20E1	Aux. condensor	Fan (MF11+MF12)	20S1	Heat exchanger mode	20E2	Fan (MF21+MF22)	20S2	Heat exchanger mode	20E3	Fan (MF3+MF4)	
c	OFF	cond	0pls	OFF	H+OFF	OFF	cond	0pls	ON+OFF	OFF	cond	2000pls	ON+ON	OFF
b	OFF	cond	0pls	OFF	H+OFF	OFF	cond	0pls	OFF+OFF	OFF	cond	2000pls	ON+ON	OFF
a	OFF	cond	0pls	OFF	L+OFF	OFF	cond	0pls	OFF+OFF	OFF	cond	2000pls	ON+ON	OFF
0	ON	evp	0pls	ON	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	2000pls	ON+ON	OFF
1	ON	evp	0pls	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	2000pls	ON+ON	OFF
2	ON	evp	0pls	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	1000pls	ON+ON	OFF
3	ON	evp	0pls	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	700pls	ON+ON	ON
4	ON	evp	0pls	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	500pls(P)	ON+ON	ON
5	ON	evp	0pls	ON	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	2000pls	ON+OFF	OFF
6	ON	evp	0pls	ON	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	1000pls	ON+OFF	OFF
7	ON	evp	0pls	ON	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	700pls	ON+OFF	ON
8	ON	evp	0pls	ON	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	500pls(P)	ON+OFF	ON
9	ON	evp	0pls	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	2000pls	ON+OFF	OFF
10	ON	evp	0pls	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	1000pls	ON+OFF	OFF
11	ON	evp	0pls	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	700pls	ON+OFF	ON
12	ON	evp	0pls	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	500pls(P)	ON+OFF	ON
13	ON	evp	GR/SH control	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	2000pls	ON+OFF	OFF
14	ON	evp	GR/SH control	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	1000pls	ON+OFF	OFF
15	ON	evp	GR/SH control	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	700pls	ON+OFF	ON
16	ON	evp	GR/SH control	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	500pls(P)	ON+OFF	ON
23	ON	evp	GR/SH control	OFF	H+OFF	ON	evp	0pls	ON+OFF	OFF	cond	1000pls	OFF+OFF	OFF
24	ON	evp	GR/SH control	OFF	H+OFF	ON	evp	0pls	ON+OFF	ON	evp	0pls	OFF+OFF	OFF
25	ON	evp	GR/SH control	OFF	H+OFF	ON	evp	0pls	ON+OFF	ON	evp	SH control	ON+OFF	OFF
26	ON	evp	GR/SH control	OFF	H+OFF	ON	evp	SH control	ON+OFF	ON	evp	SH control	ON+OFF	OFF

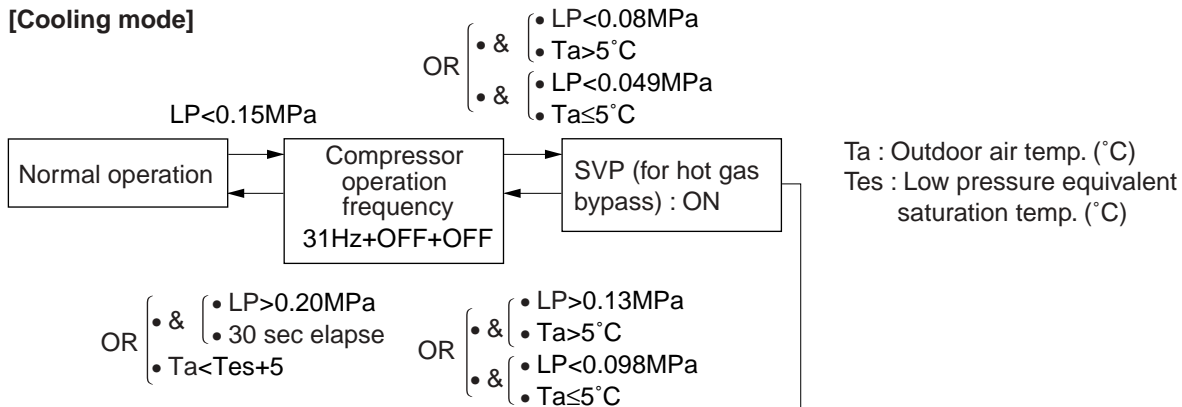


Note: GR/SH control: Imaginary refrigerant circulation amount/Super heat degree control
500pls(P) : Pc control

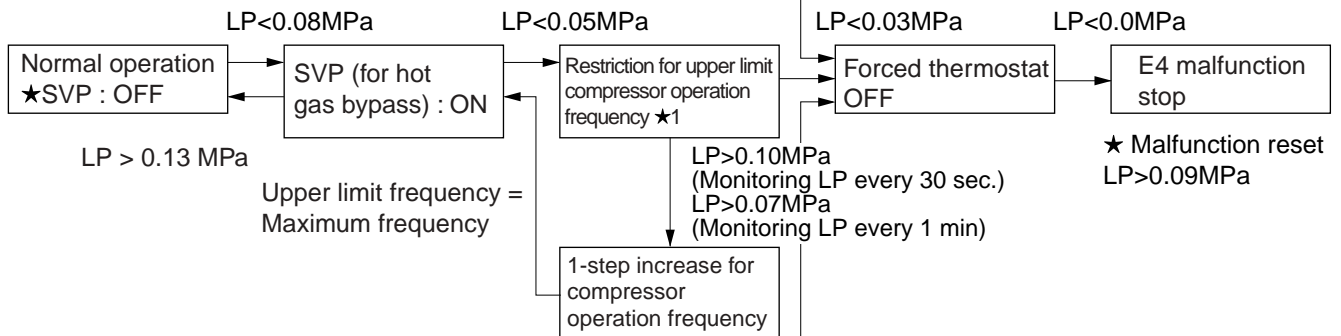
3.5.2 Low Pressure Protection Control

The following control is provided to protect the compressors from abnormal decrease of low pressure (LP).

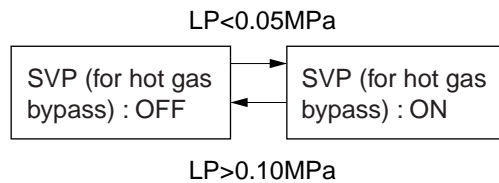
[Cooling mode]



[Heating mode]



[Oil return mode (common for cooling / heating)]



(V0822)

★1.Upper limit compressor operation : According to “Drooping step Table”. See next page.

Drooping step table

NO.	Compressor STEP	Compressor frequency			16HP						24-26HP					
					[3.5.4] Inverter drooping		[3.5.5] Pc drooping		[3.5.2] Pe drooping (Heating)		[3.5.4] Inverter drooping		[3.5.5] Pc drooping		[3.5.2] Pe drooping (Heating)	
		INV	STD1	STD2	DOWN	UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN	UP
1	3	29Hz	OFF	OFF	4	10	4	4	1	4	4	10	4	4	1	4
2	4	31Hz	OFF	OFF	4	11	4	5	2	5	4	11	4	5	2	5
3	5	33Hz	OFF	OFF	4	12	4	6	3	6	4	12	4	6	3	6
4	6	35Hz	OFF	OFF	4	12	4	7	4	7	4	12	4	7	4	7
5	7	37Hz	OFF	OFF	4	13	5	8	5	8	4	13	5	8	5	8
6	8	39Hz	OFF	OFF	4	14	6	9	6	9	4	14	6	9	6	9
7	9	41Hz	OFF	OFF	4	14	7	10	7	10	4	14	7	10	7	10
8	10	43Hz	OFF	OFF	4	15	8	11	8	11	4	15	8	11	8	11
9	11	46Hz	OFF	OFF	4	16	9	12	9	12	4	16	9	12	9	12
10	12	48Hz	OFF	OFF	4	17	10	13	10	13	4	17	10	13	10	13
11	13	52Hz	OFF	OFF	5	18	11	14	11	14	5	18	11	14	11	14
12	14	55Hz	OFF	OFF	6	18	12	15	12	15	6	18	12	15	12	15
13	15	58Hz	OFF	OFF	8	19	13	16	12	16	8	19	13	16	13	16
14	16	62Hz	OFF	OFF	10	20	14	17	12	17	10	20	14	17	14	17
15	17	64Hz	OFF	OFF	11	41	15	18	12	18	11	21	15	18	14	18
16	18	67Hz	OFF	OFF	12	41	16	19	12	19	12	22	16	19	14	19
17	19	71Hz	OFF	OFF	13	41	17	20	12	20	13	23	17	20	14	20
18	20	75Hz	OFF	OFF	14	42	18	21	12	21	14	24	18	21	14	21
19	34	37Hz	ON	OFF	33	37	32	35	12	35	33	37	32	35	14	35
20	35	41Hz	ON	OFF	33	37	33	36	12	36	33	37	33	36	14	36
21	36	46Hz	ON	OFF	33	38	34	37	12	37	33	38	34	37	14	37
22	37	52Hz	ON	OFF	33	39	35	38	12	38	33	39	35	38	14	38
23	38	58Hz	ON	OFF	35	40	36	39	12	39	35	40	36	39	14	39
24	39	64Hz	ON	OFF	36	41	37	40	12	40	36	41	37	40	14	40
25	40	71Hz	ON	OFF	37	42	38	41	12	41	37	41	38	41	14	41
26	41	79Hz	ON	OFF	39	43	39	42	12	42						
27	42	87Hz	ON	OFF												
28	43	95Hz	ON	OFF												
29	51	25Hz	ON	ON							33	53	40	52	14	52
30	52	33Hz	ON	ON							33	53	41	53	14	53
31	53	41Hz	ON	ON							52	54	51	54	14	54
32	54	52Hz	ON	ON							52	55	52	55	14	55
33	55	64Hz	ON	ON							54	56	54	56	14	56
34	56	79Hz	ON	ON							55	57	55	57	14	57
35	57	87Hz	ON	ON												
36	58	95Hz	ON	ON												

NO.	Compressor STEP	Compressor frequency			18-20HP						28-30HP					
					[3.5.4] Inverter drooping		[3.5.5] Pc drooping		[3.5.2] Pe drooping (Heating)		[3.5.4] Inverter drooping		[3.5.5] Pc drooping (Cooling)		[3.5.2] Pe drooping (Heating)	
		INV	STD1	STD2	DOWN	UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN	UP
1	3	29Hz	OFF	OFF	4	10	4	4	1	4	4	10	4	4	1	4
2	4	31Hz	OFF	OFF	4	11	4	5	2	5	4	11	4	5	2	5
3	5	33Hz	OFF	OFF	4	12	4	6	3	6	4	12	4	6	3	6
4	6	35Hz	OFF	OFF	4	12	4	7	4	7	4	12	4	7	4	7
5	7	37Hz	OFF	OFF	4	13	5	8	5	8	4	13	5	8	5	8
6	8	39Hz	OFF	OFF	4	14	6	9	6	9	4	14	6	9	6	9
7	9	41Hz	OFF	OFF	4	14	7	10	7	10	4	14	7	10	7	10
8	10	43Hz	OFF	OFF	4	15	8	11	8	11	4	15	8	11	8	11
9	11	46Hz	OFF	OFF	4	16	9	12	9	12	4	16	9	12	9	12
10	12	48Hz	OFF	OFF	4	17	10	13	10	13	4	17	10	13	10	13
11	13	52Hz	OFF	OFF	5	18	11	14	11	14	5	18	11	14	11	14
12	14	55Hz	OFF	OFF	6	18	12	15	12	15	6	18	12	15	12	15
13	15	58Hz	OFF	OFF	8	19	13	16	13	16	8	19	13	16	13	16
14	16	62Hz	OFF	OFF	10	20	14	17	14	17	10	20	14	17	14	17
15	17	64Hz	OFF	OFF	11	21	15	18	14	18	11	21	15	18	14	18
16	18	67Hz	OFF	OFF	12	22	16	19	14	19	12	22	16	19	14	19
17	19	71Hz	OFF	OFF	13	23	17	20	14	20	13	23	17	20	14	20
18	20	75Hz	OFF	OFF	14	24	18	21	14	21	14	24	18	21	14	21
19	34	37Hz	ON	OFF	33	37	32	35	14	35	33	37	32	35	14	35
20	35	41Hz	ON	OFF	33	37	33	36	14	36	33	37	33	36	14	36
21	36	46Hz	ON	OFF	33	38	34	37	14	37	33	38	34	37	14	37
22	37	52Hz	ON	OFF	33	39	35	38	14	38	33	39	35	38	14	38
23	38	58Hz	ON	OFF	35	40	36	39	14	39	35	40	36	39	14	39
24	39	64Hz	ON	OFF	36	41	37	40	14	40	36	41	37	40	14	40
25	40	71Hz	ON	OFF	37	41	38	41	14	41	37	41	38	41	14	41
26	41	79Hz	ON	OFF	39	57	39	42	14	42						
27	42	87Hz	ON	OFF	40	57	40	43	14	43						
28	43	95Hz	ON	OFF	41	57	41	52	14	52						
29	51	25Hz	ON	ON							33	53	42	52	14	52
30	52	33Hz	ON	ON							33	53	43	53	14	53
31	53	41Hz	ON	ON							52	54	51	54	14	54
32	54	52Hz	ON	ON							52	55	52	55	14	55
33	55	64Hz	ON	ON							54	56	54	56	14	56
34	56	79Hz	ON	ON							55	57	55	57	14	57
35	57	87Hz	ON	ON							56	58	56	58	14	58
36	58	95Hz	ON	ON							56	-	56	-	14	-

Remarks

- When the inverter drooping is lowering, the frequency change rate should be 20Hz/10sec within the range in which the inverter acceleration rate of 2Hz/1sec can catch up.
- When the inverter drooping is rising, it should be 16Hz/3min, and the restriction should be cancelled when INV frequency \geq 79Hz.
- When the drooping of cooling Pc and heating Pe are lowering, the frequency can be decreased with 2 steps.
- When the drooping of cooling Pc and heating Pe are rising, the upper limit should be raised every 30 min.

3.5.3 Discharge Pipe Temperature Control

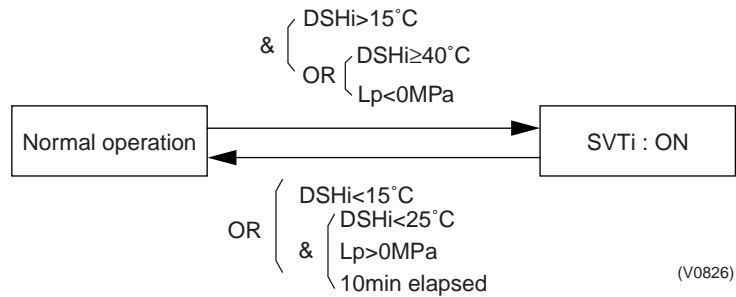
Controls the liquid injection and operating frequency to prevent abnormal increase of discharge pipe temperature and compressor internal temperature.

Liquid Injection Control

Inverter compressor

- Opens SVTi (Y3S) (solenoid valve for inverter compressor liquid injection) for 3 minutes after software startup.

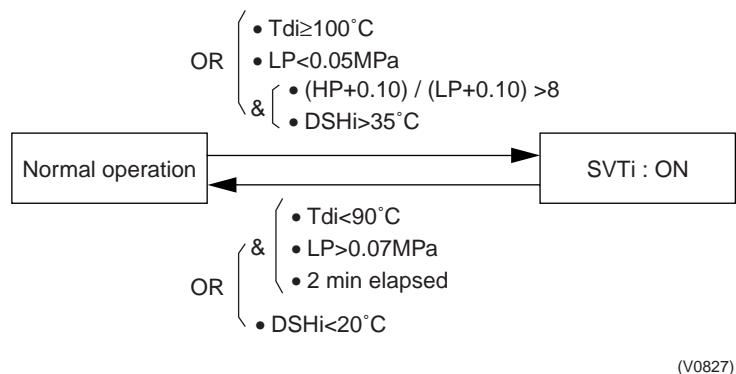
[Cooling and Simultaneous cooling / heating operation]



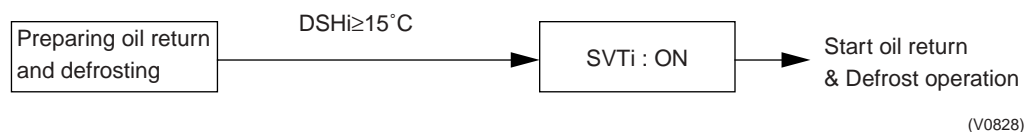
DSHi: Inverter compressor discharge pipe superheated degree
 $= T_{di} (Th3-1) - (HP \text{ equivalent saturation temperature})$

Tdi: Inverter compressor discharge pipe temperature (Th3-1)

[Heating]



[Preparing Oil return and defrosting operation (1 min before operation start)]



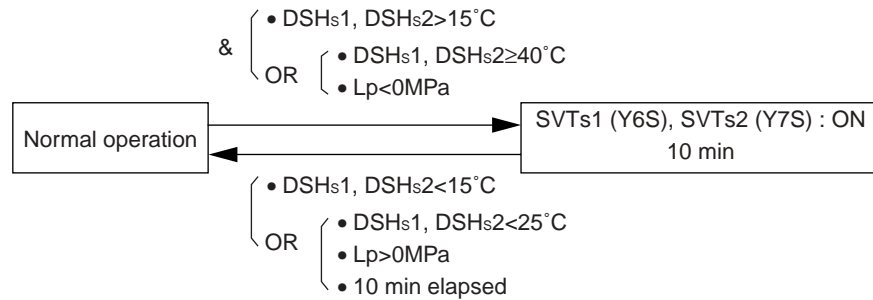
★SVTi is ON during oil return and defrost operation.

[Oil return operation/defrosting operation]

- SVTi (Y3S) is OFF at any case when inverter compressor stops.

STD compressor

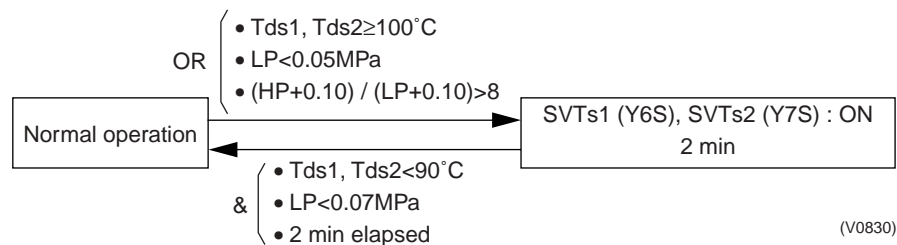
[In cooling and simultaneous cooling / heating operation]



(V0829)

DSHs: STD compressor discharge pipe superheated degree
 = Tds1, 2 (Th3-2) – (HP equivalent saturation temperature)
 Tds1, 2 : STD compressor discharge pipe temperature (Th3-2)

[In heating operation]



(V0830)

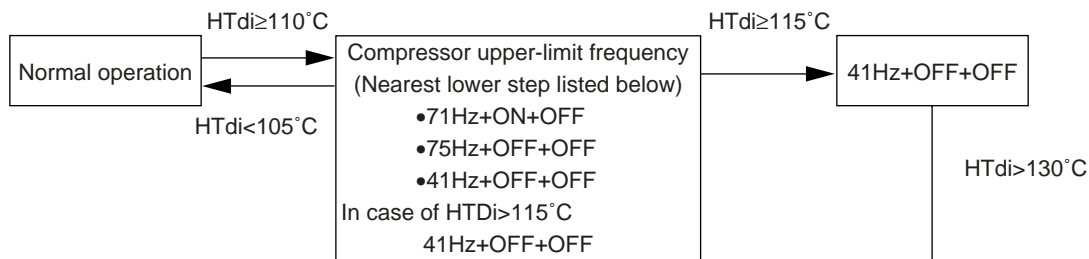
[Defrosting and oil return mode]

SVTs turns ON continuously

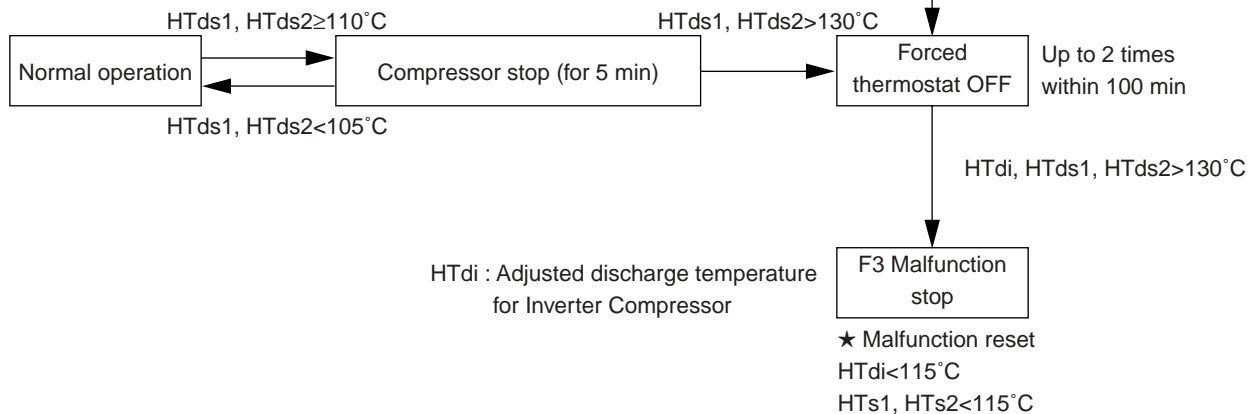
■ SVTs is OFF at any case when STD compressor stops.

Operating Frequency Control

[INV Compressor]



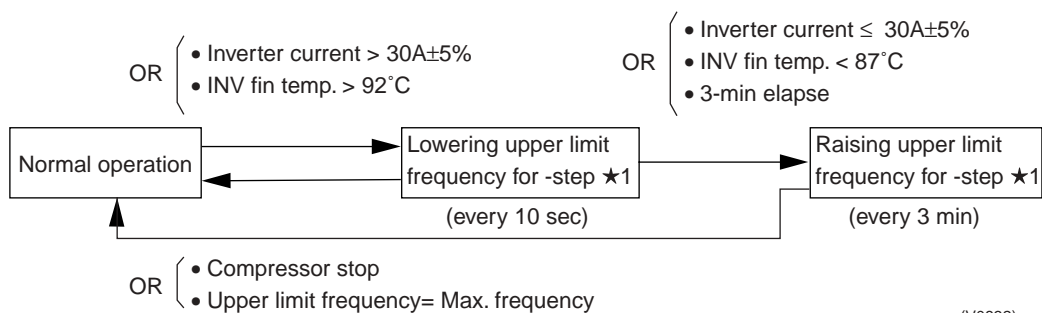
[STD Compressor]



(V0831)

3.5.4 Inverter Protection Control

Controls the compressor upper-limit frequency to prevent tripping by inverter overcurrent and fin temperature increase.



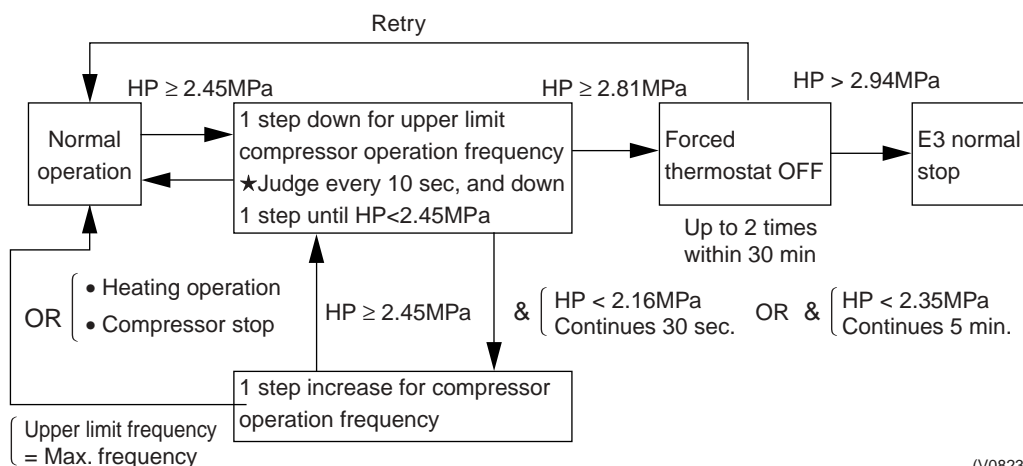
(V0832)

★1: Upper limit frequency according to “step down control”.

3.5.5 High Pressure Protection Control

The following control is provided for the compressor operating frequency and others to prevent protection devices from malfunctioning due to abnormal increase of high pressure (HP) and to protect the compressors.

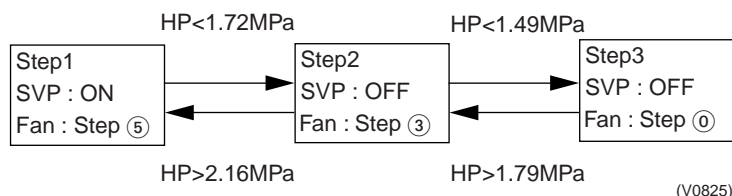
[Cooling and simultaneous cooling / heating operation mode]



(V0823)

[Oil return mode (common for cooling / heating)]

Outdoor unit fan and hot gas bypass solenoid valve (SVP) under oil return operation are controlled not to actuate high pressure protection. Also outdoor fan is controlled to protect short refrigerant circulation due to low high pressure during low ambient temperature. (Oil returning is hard at short refrigerant circulation)



(V0825)

★ Movement

Step	SVP	Fan
①	★ ON	Step ⑤
②	OFF	Step ③
③	OFF	Step ①

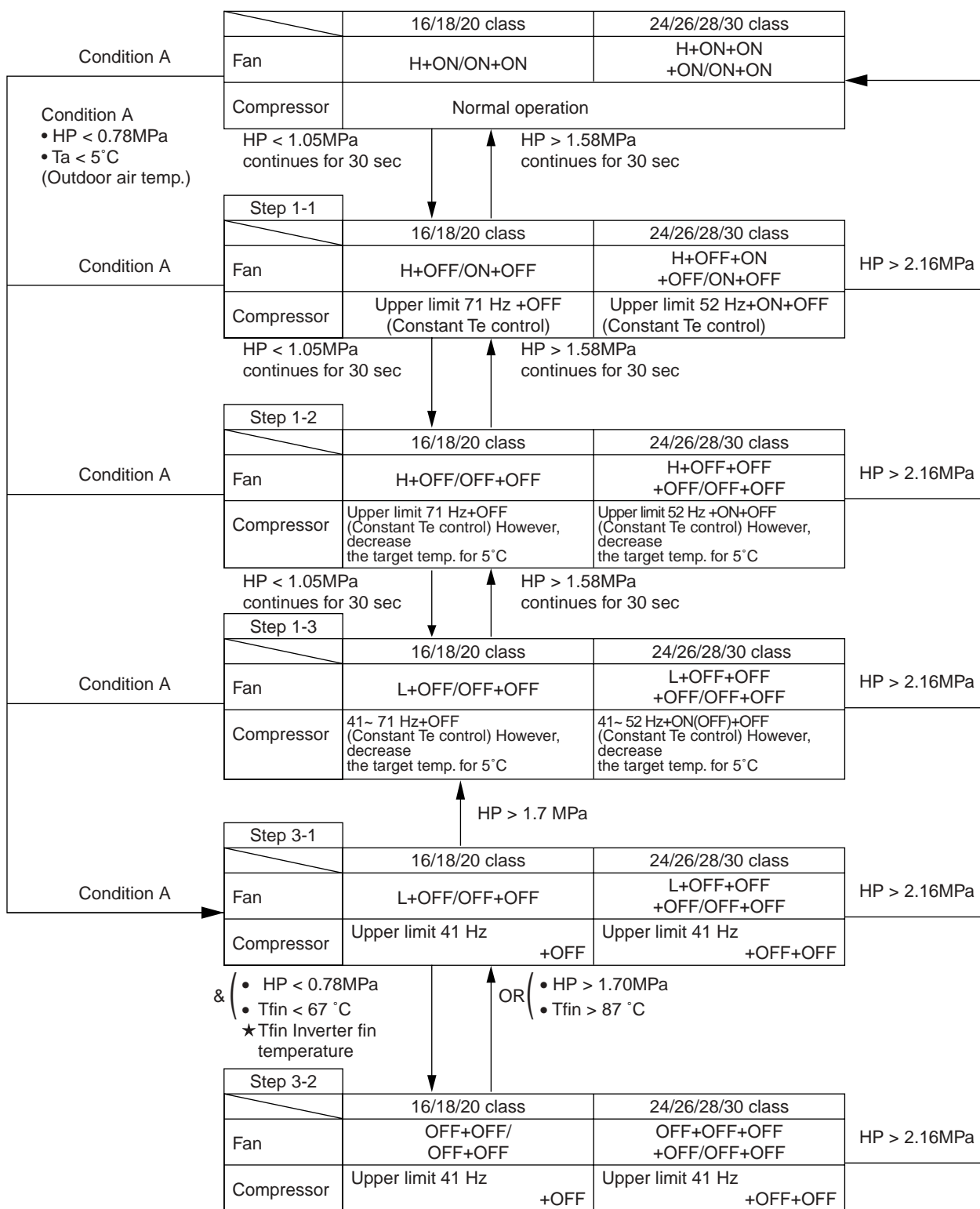
★ SVP of turns ON only when heating mode.

★ The step 1, 2 and 3 will be cancelled when the oil return operation is completed.

★ Refer p.96 for Fan step table.

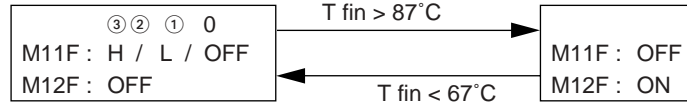
3.5.6 Low Outside Temperature Cooling Control

Controls the outdoor unit fans and compressors to prevent refrigerant circulation from decreasing due to lowering of high pressure and to maintain high pressure when the outside temperature is low during cooling operation.



- When the outdoor temperature is 5°C or lower and Pc<8.0k (Tc<20.0 °C) during cooling operation, starts low outdoor temperature cooling control from Step 3-1 (Fan tap : Step ①). (Does not pass through low outdoor temperature cooling step ①-1)

- When condition ($Th6 - Te < 3$ & $DSHi < 20^{\circ}C$) remains for 3 continuous minutes in steps higher than step 1-1, EVs of all indoor units in thermostat-ON status are set to 200 pls and SVP=ON. This is canceled when $Th6 - Te > 10$ and $DSHi > 30^{\circ}C$. (for prevention of wet operation in cooling operation when outside temperature is low)
 $Th6 - Te$: Suction pipe temperature – Evaporation temperature
- From 24 HP model or higher, the fan (M12F) on the inverter box side stops if operating at fan tap (3) or lower. Therefore, T_{fin} switches M11F OFF and M12F ON.



(V0820)

- In this control, the compressor load increase based on PI calculation is conducted once every 2 minutes. The load decrease operation is conducted once every 20 minutes.
- ★ T_{fin} : Inverter fin temperature.

3.5.7 Oil Equalization Operation

Conducts oil equalization operation at certain time intervals to prevent insufficient oil supply due to uneven oil distribution when two or three compressors are connected in parallel.

[For 16~20HP model units]

- The following oil equalization operation is conducted after two STD compressors operates for 2 continuous hours.

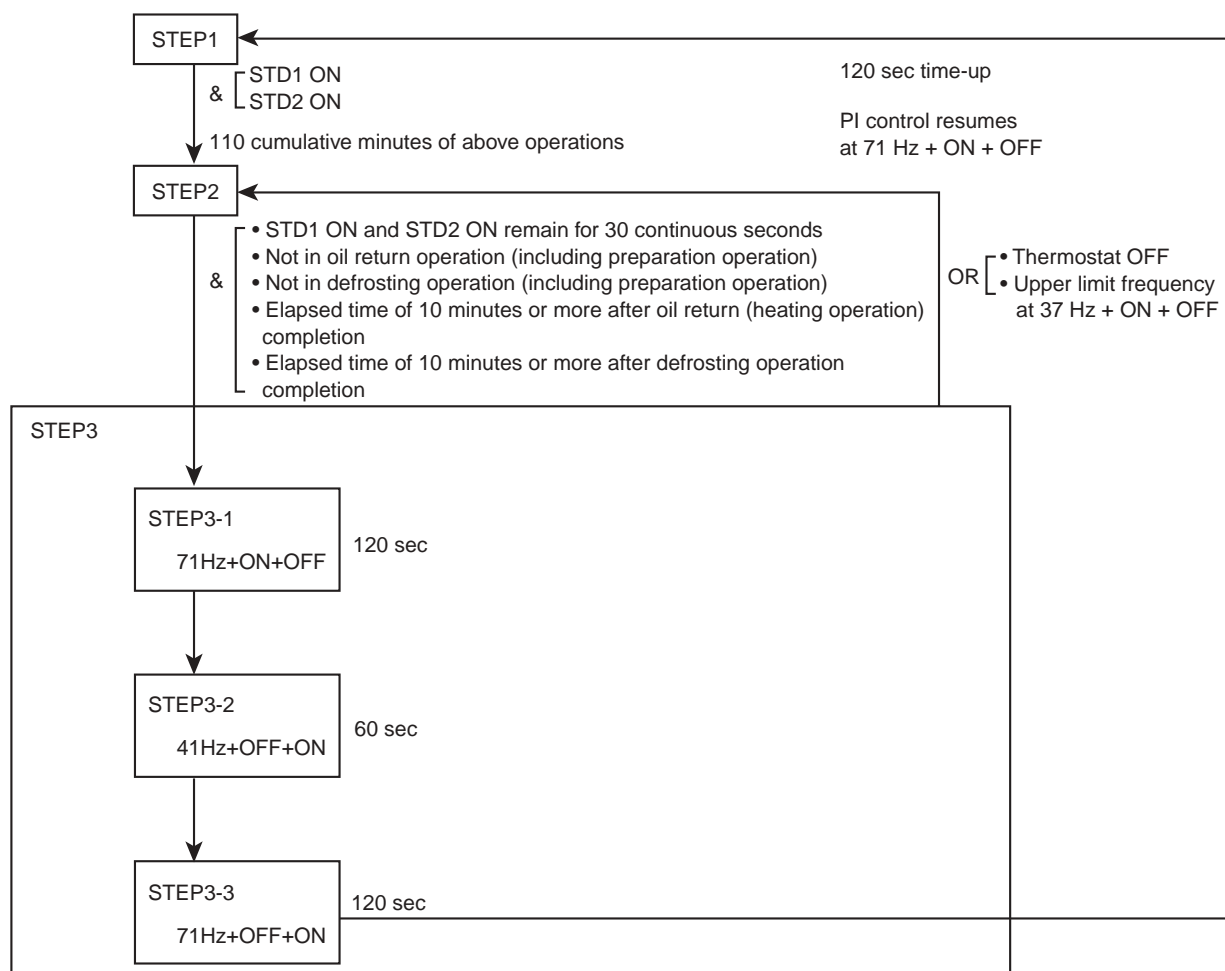
- Oil equalization operation --- Upper-limit frequency is controlled to the following value.

	2 min	2 min
16~20HP model	62Hz+OFF	37Hz+ON

- ★ The oil equalization operation is not activated during soft start, oil return operation and defrosting operation (including defrosting operation preparation) and for 10 minutes after the completion of defrosting operation and oil return (heating operation).

[For 24~30 HP class units]

The oil equalization operation is conducted in the following steps.



(V0821)

Remarks

- The oil equalization operation is not activated during soft start, oil return operation and defrosting operation (including defrosting operation preparation), and for 10 minutes after the completion of defrosting operation and oil return (heating operation).

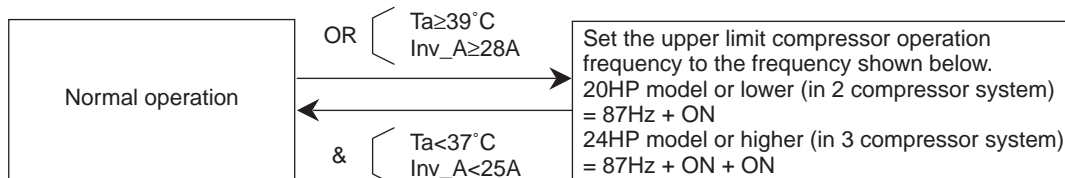
3.5.8 Drooping due to Outdoor Temperature

Purpose

- When the outdoor temperature is high, the temperature inside inverter box does not reach to the reference value. Therefore, conducts forced drooling.

Contents

- Provide upper limit compressor operation frequency based on the following conditions.



Note) Inv_A : Current sent from inverter

(V2583)

3.5.9 Demand Control

Forcibly reduces the outdoor unit capacity based on an external contact input (demand input) to decrease power consumption. The following three types of demand control are provided.

	Compressor upper-limit frequency	Capacity reduction guideline
Demand control 1	A	Reduces power consumption to approx. 70%
Demand control 2	B	Reduces power consumption to approx. 40%
Demand control 3	All compressors in stop mode	Forced thermostat OFF

Model	Upper-limit frequency (A)		
	INV	STD1	STD2
RSXYP16KJ	46Hz	+ON	—
RSXYP18KJ	52Hz	+ON	—
RSXYP20KJ	52Hz	+ON	—
RSXYP24KJ	87Hz	+ON	+OFF
RSXYP26KJ	87Hz	+ON	+OFF
RSXYP28KJ	33Hz	+ON	+ON
RSXYP30KJ	33Hz	+ON	+ON

Model	Upper-limit frequency(B)		
	INV	STD1	STD2
RSXYP16KJ	52Hz	+OFF	—
RSXYP18KJ	62Hz	+OFF	—
RSXYP20KJ	62Hz	+OFF	—
RSXYP24KJ	79Hz	+OFF	+OFF
RSXYP26KJ	79Hz	+OFF	+OFF
RSXYP28KJ	33Hz	+ON	+OFF
RSXYP30KJ	33Hz	+ON	+OFF

- Other protection control functions have precedence over the above operations.

★ Optional PCB is required for this control. (DTA104A61, 62)

3.6 Oil Return/Defrost Operation

3.6.1 Oil Return Operation

Activates the oil return operation to collect refrigerant oil from the field pipes when the following conditions are met.

[Start conditions]

1. When cumulative compressor operating time from power ON exceeds 2 hours
2. When cumulative compressor operating time from completion of previous return operation exceeds 8 hours.
However, when the upper-limit frequency is limited to less than "A" Hz during the previous oil return operation, the above time period of 8 hours is changed to 4 hours.
The oil return operation is activated every 1 hour during 3.6.5 "Cooling overload control".
- ★1) When defrost control operation for more than 4 minutes with inverter compressor frequency of "A" Hz or higher, oil return time reset to 8 hours.
- 2) When condition 1. or 2. is satisfied during heating operation, the electric heaters of indoor units are turned off 2 minutes prior in order to prepare for the oil return operation.
- 3) The oil return operation is not activated for 28 minutes after the completion of the previous defrosting operation.
- 4) When $Th7 - Te < 10$ (30 seconds or more) during defrosting operation, oil return timer is reset.
- 5) The oil return operation is not activated during $DSHi < 20$ and for 10 minutes after going out of $DSHi < 20$. (The oil return operation is activated after the cancellation of this condition.)
- 6) When the compressor operation sequence comes to the oil return operation during startup control, the oil return operation is activated from the preparation after the completion of startup control.

[Oil return operation]

- The oil return operation is shown on following pages.

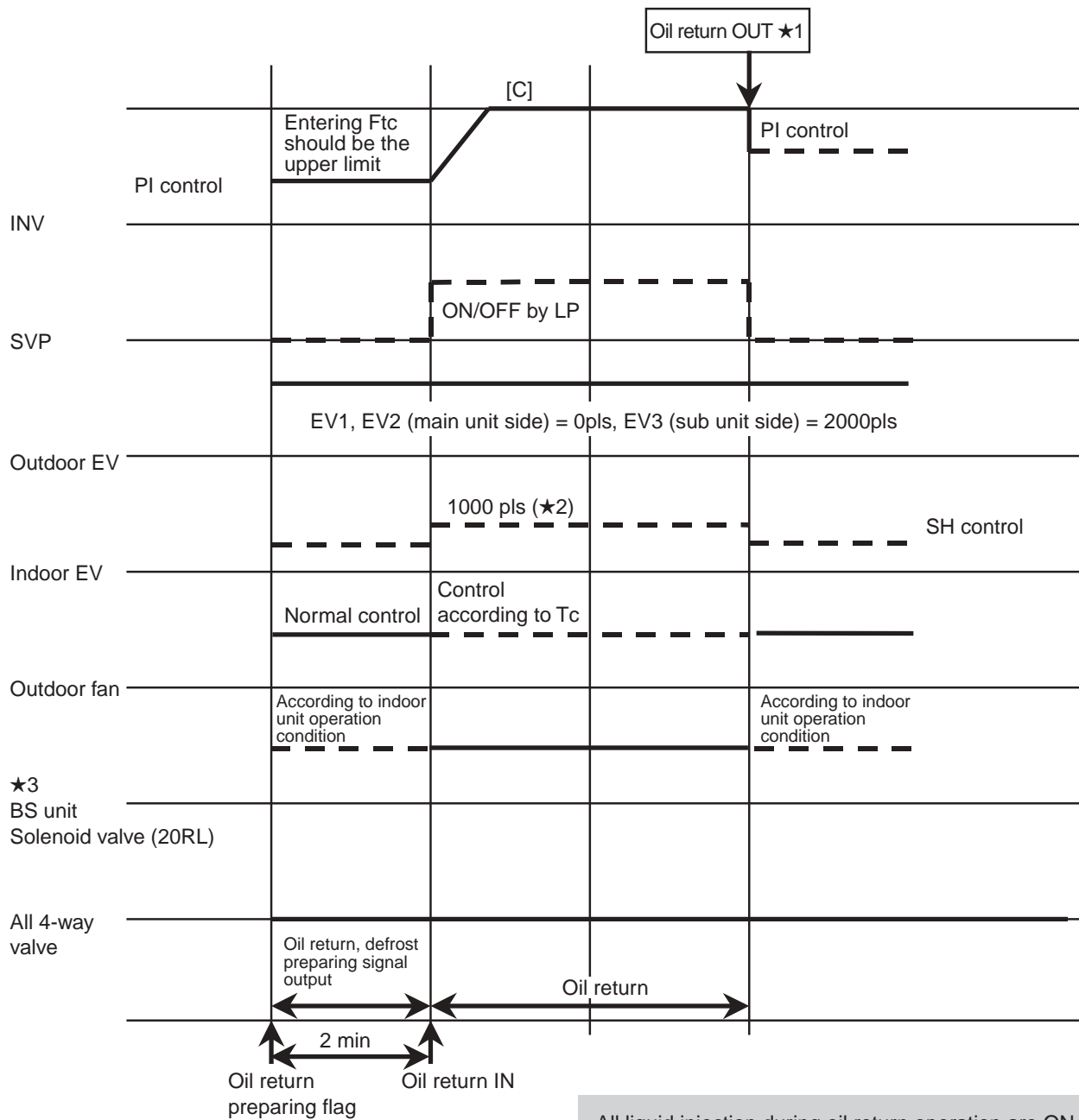
[Ending conditions]

- The oil return operation ends after 4 minutes of operation. However, when the compressor stop conditions are met during an oil return operation, the compressor stops after the completion of the oil return operation.
When the compressor stops during an oil return preparation operation, the oil return operation is activated at the next startup.

[Compressor frequency during oil return operation]

HP	Oil return operation												
	A			B			C			D	E		
	INV	STD1	STD2	INV	STD1	STD2	INV	STD1	STD2	INV	INV	STD1	
16HP	71Hz	OFF	—	52Hz	OFF	—	52Hz	ON	—	64Hz	41Hz	ON	—
18HP	71Hz	OFF	—	52Hz	OFF	—	71Hz	ON	—	64Hz	64Hz	ON	—
20HP	71Hz	OFF	—	52Hz	OFF	—	71Hz	ON	—	64Hz	64Hz	ON	—
24HP	52Hz	ON	OFF	41Hz	ON	OFF	52Hz	ON	ON	64Hz	41Hz	ON	ON
26HP	52Hz	ON	OFF	41Hz	ON	OFF	52Hz	ON	ON	64Hz	41Hz	ON	ON
28HP	52Hz	ON	OFF	41Hz	ON	OFF	52Hz	ON	ON	64Hz	41Hz	ON	ON
30HP	52Hz	ON	OFF	41Hz	ON	OFF	52Hz	ON	ON	64Hz	41Hz	ON	ON

Oil return control (cooling) to prevent liquid back flow



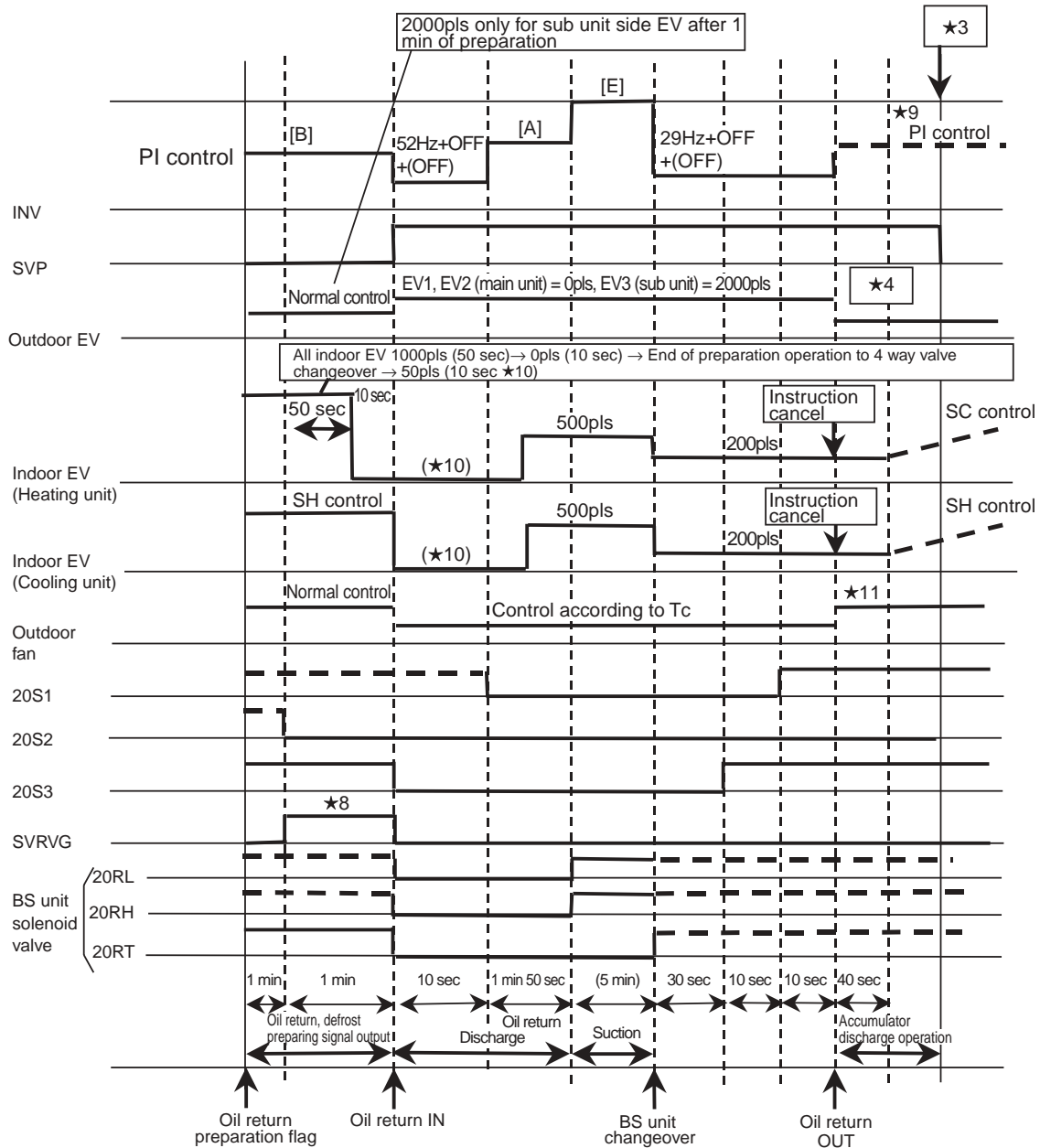
· All liquid injection during oil return operation are ON if compressors are operating

- ★1
Oil return operation ending conditions
- OR { 8 minutes elapsed
- OR { DSHi < 20°C
- OR { 10 continuous seconds
- OR { Th7 – Te < 15°C
- OR { 10 continuous seconds
- OR { 1 minute elapsed
- OR { Th7 – Te < 2
- (V0810-1)

- ★2
Oil return signal only is sent from Outdoor unit.

- ★3
20RH, 20RT are OFF.
- (V0810)

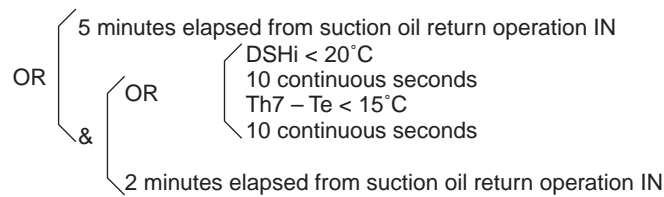
Oil return control (heating, simultaneous cooling/heating operation) to prevent liquid back flow



(V0811)

★2

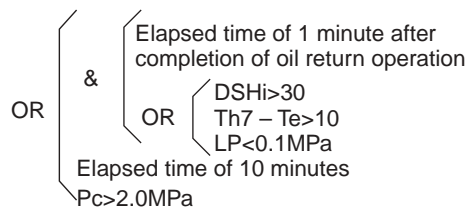
Oil return operation ending conditions



(V0811-1)

★3

Accumulator discharge operation ending conditions



(V0811-2)

★4

Main outdoor unit side (EV1, EV2) : Outdoor unit EV control during accumulator discharge operation.

PI control activated when SHS = 10

(initial opening degree: 200 pls

In the case of an LP retry, the next PI control is provided at SHS = 5.

When condition ★3 is met, the next startup condition is reset to SHS = 10.)

Sub outdoor unit side(EV3)

500 pls fixed

★5

When returning to normal outdoor EV control, the PI control is provided at that opening degree.

★8

Opens receiver solenoid valve for 60 seconds 1 minute after the preparation mode is activated. However, the valve is closed when $Th7 - Te < 0$.

★9

The upper limit frequency is restricted to 67Hz+OFF(+OFF) during accumulator discharge operation.

★10

50pls after 10 sec elapsed until $LP < 0.3MPa$, thereafter, operate with 500 pls.

★11

For 20 sec: H+ON(+ON+ON)/ON+ON

→H+ON(+ON+ON)/ON+OFF

3.6.2 Variation of Temperature Control Mode during Pressure Equalizing Control and Compressor Operation

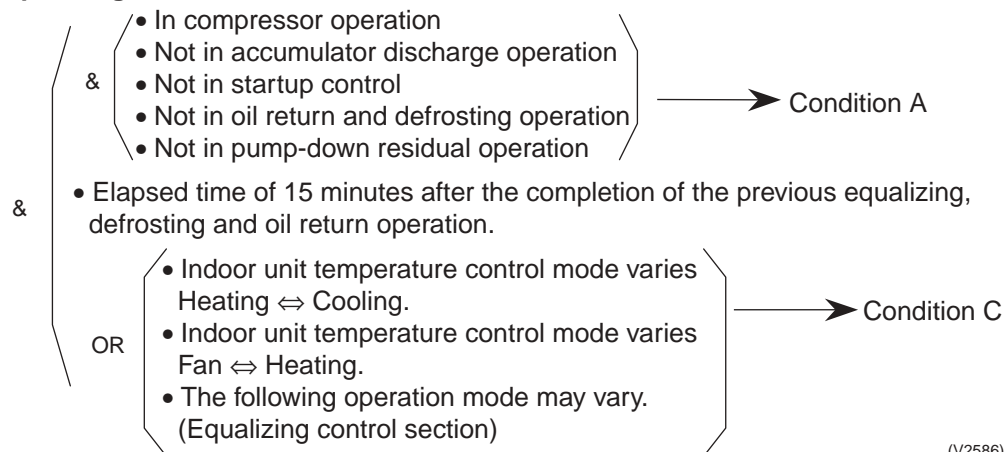
Purpose

- Conducts pressure equalizing operation on outdoor unit to prevent equalizing sound from generating in BS unit.

Contents

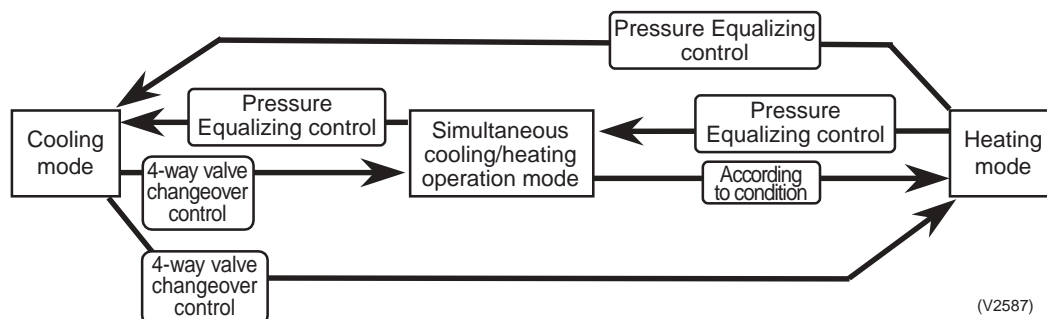
- Conducts pressure equalizing operation depending on the operating state of indoor unit. If any of the following equalizing conditions is met, the equalization is conducted.

Equalizing demand 1



(V2586)

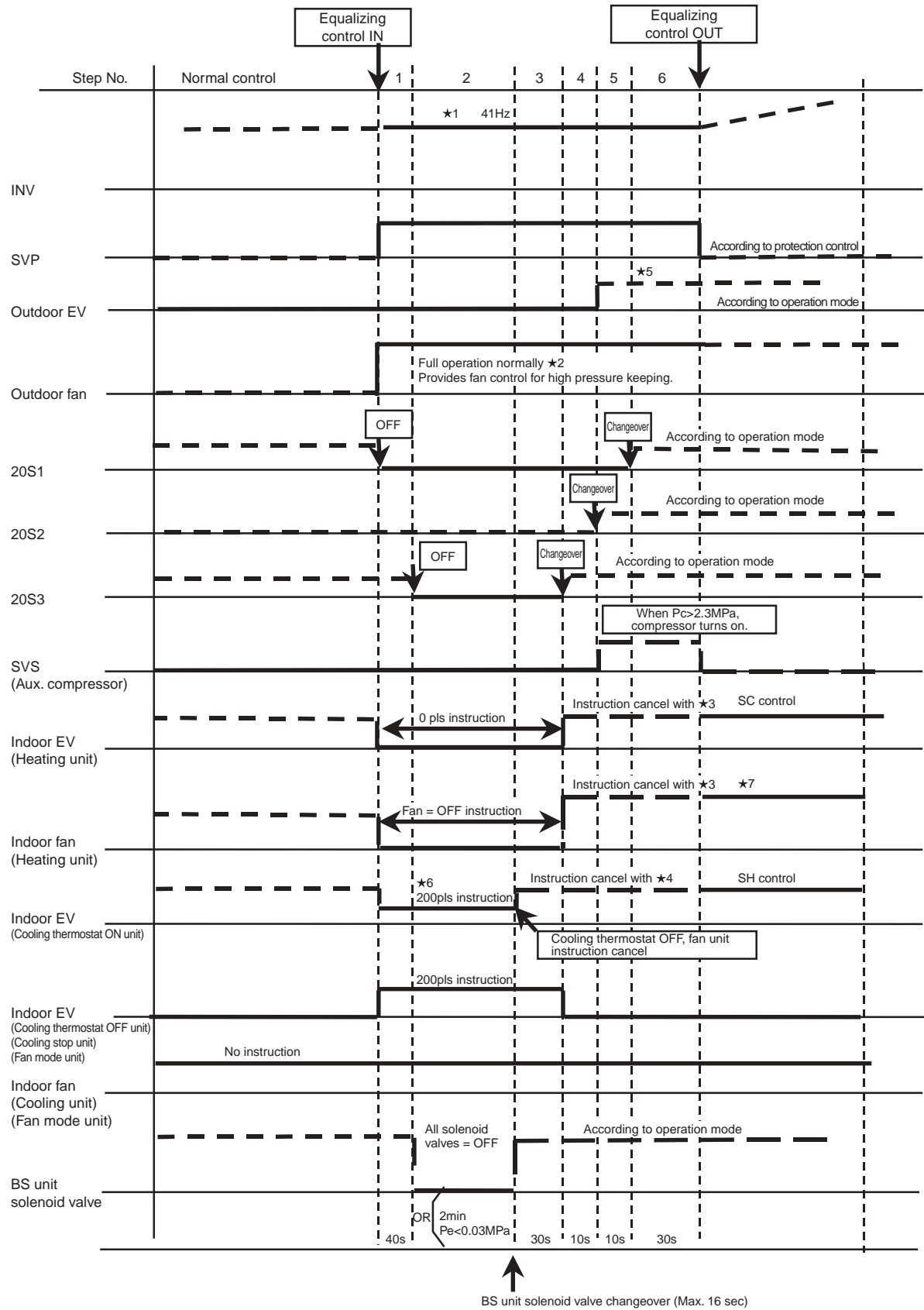
- Mode variation during compressor operation (Operation mode judgement is same as 3-1 "Startup mode judgement".) If the operation button is in OFF position, the variation of temperature control mode on the remote controller is not recognized as the variation of temperature control mode.



(V2587)

When the condition varies to Condition C before the above conditions are met, the indoor unit in varied temperature control mode turns to thermostat OFF status by the operation before the variation. (Switching of BS solenoid valve and indoor unit actuator is not conducted.)

Regarding four way valve switching control, see "Four way valve switching (startup) control". And see the next page for the equalizing control.



(V2589)

★1

Compressor frequency

Fix the frequency at 41Hz + OFF + (OFF) for the basic operation.

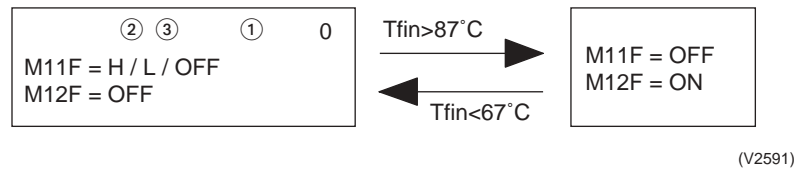
However, increase the compressor operation step with 4-way valve function assuring control to ensure the function of the 4-way valve.

★2

Outdoor fan control

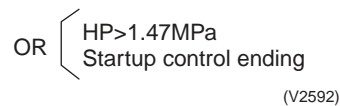


Regarding 24 to 34HP model, the fan (M12F) on the inverter box side stops if operating at fan tap ③ or lower. Therefore, Tfin switches M12F to M11F.



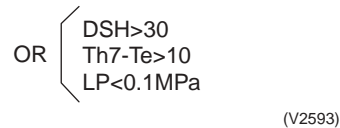
★3

Indoor unit instruction cancellation conditions



★4

Indoor unit instruction cancellation conditions



★5

Opening degree of Ev (in 3 compressor system: EV3) on sub unit side

20S2=ON → 0pls

20S2=OFF → 500pls

★6

Indoor unit EV instruction

Instructed opening degree is shifted under the following conditions only on indoor unit with cooling thermostat ON.

Th7-Te>40°C → 1000pls

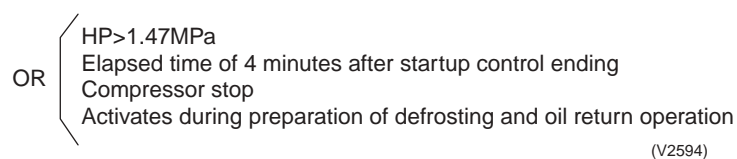
Th7-Te<15°C → 200pls

* Initial status: 200pls

★7

Indoor unit fan instruction

LL tap instruction is conducted after the startup control ending until the following conditions are met.



3.6.3 Defrost Control

Activates the defrosting operation to melt frost accumulated on the outdoor heat exchanger during heating operation.

[Defrost start conditions]

When the following conditions are met during heating operation, the defrosting operation is activated.

OR	&	When cumulative compressor operating time from power On or completion of previous defrosting operation exceeds 30 minutes
		Note.1
		When condition ($T_b \leq X \times T_a - A$) remains for 5 minutes ($-25 \leq T_b \leq -10$) (Value of A based on the following table. When $T_a \geq 7$, $T_a = 7^\circ\text{C}$ is used in calculation)
		When forced defrost setting (local setting) is turned on and $T_b < 12.5^\circ\text{C}$

T_b : Distributor pipe temperature ($^\circ\text{C}$) at heat exchanger outlet (in cooling operation)

T_a : Outside temperature ($^\circ\text{C}$)

Defrost setting	Defrost change setting			X
	L	M	H	
No-setting (Factory set)	A=12	A=14	A=16	Outside air $T_a > 0^\circ\text{C}$
				Outside air $T_a \leq 0^\circ\text{C}$

When the above conditions are met, the following “defrosting operation preparation” operation is conducted for 2 minutes, then the defrosting operation is activated.

1. Outputs “oil return, defrost preparation” signal to indoor units.
2. Turns on the liquid injection solenoid valve (SVT) based on T_d or DSH.

T_d : Discharge pipe temperature

DSH : Discharge super heat temp.

★Liquid injection : Refer to page 77.



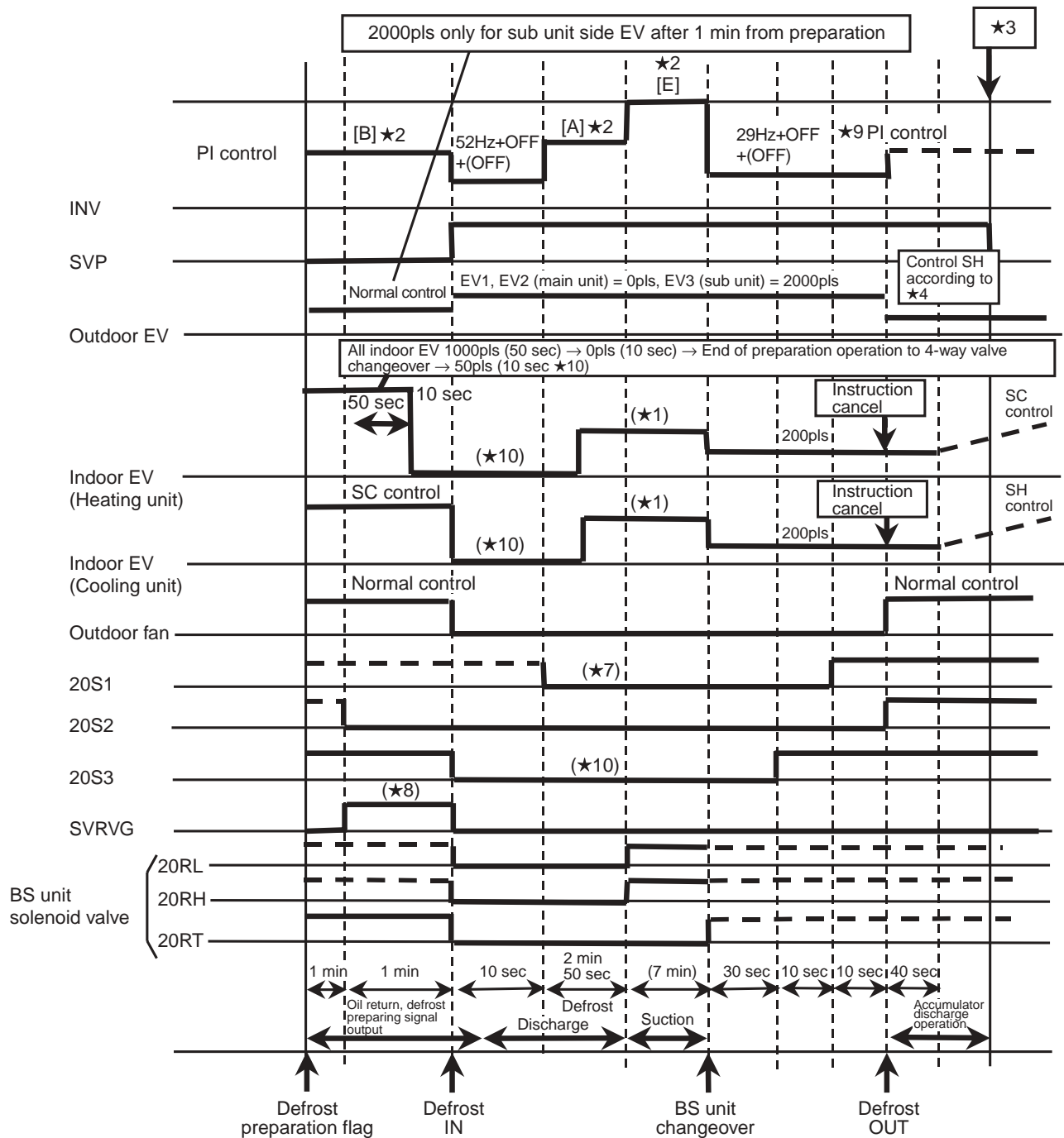
Note:

Note.1

When compressor stops operation at outdoor temperature $> 1^\circ\text{C}$, reset cumulating timer.

Defrosting operation

The defrosting operation provides the following control functions



(V0807)

★1

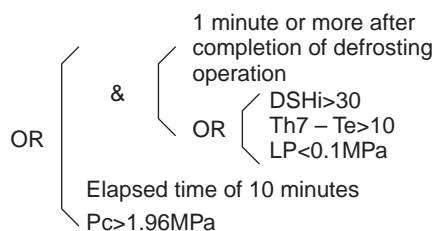
Opening degree of indoor unit EV during defrosting operation

- Initial value: 500
- Next indoor unit EV opening degree (200 – 2000) is determined based on $(Th7 - T_e < 15)$ appearing time in previous defrosting operation
 - 0 minute → +100
 - Less than 3 minutes → +0
 - 3 minutes or more → -100

★2 Refer to p.84 .

★3

Accumulator discharge operation ending conditions



(V0807-1)

★4

LPSH control by outdoor unit EV

PI control activated when SHS = 10

(initial opening degree: 200 pls)

In the case of an LP retry, the next PI control is provided at SHS = 5.

When condition ★3 is met, the next startup condition is reset to SHS = 10.)

★5

When returning to normal outdoor EV control, the PI control is provided at that opening degree.

★7

When $P_c > 1.86\text{MPa}$ during defrosting operation, repeat the following functions in the elapsed time of 1 minute and 30 seconds after the last STD compressor turns on until HP defrost-out condition is met.

$HP > 1.47\text{MPa} \rightarrow$ Outdoor fan step 5

$HP < 1.18\text{MPa} \rightarrow$ Outdoor fan step 0

(Thereafter, follow the normal defrost-out condition in outdoor fan step 0)

★8

Opens receiver solenoid valve SVRVG for 60 seconds at 1 minute after the preparation mode is activated.

However, the valve is closed when $Th7 - Te < 0$.

★9

The upper limit frequency is restricted to 67Hz+OFF(+OFF) during accumulator discharge operation.

★10

Operates with 50pls after 10 seconds elapsed until $LP < 0.3\text{MPa}$, thereafter, operate with the opening according to ★6. (However, also cancelled with defrost ending.)

[Defrosting operation ending conditions]

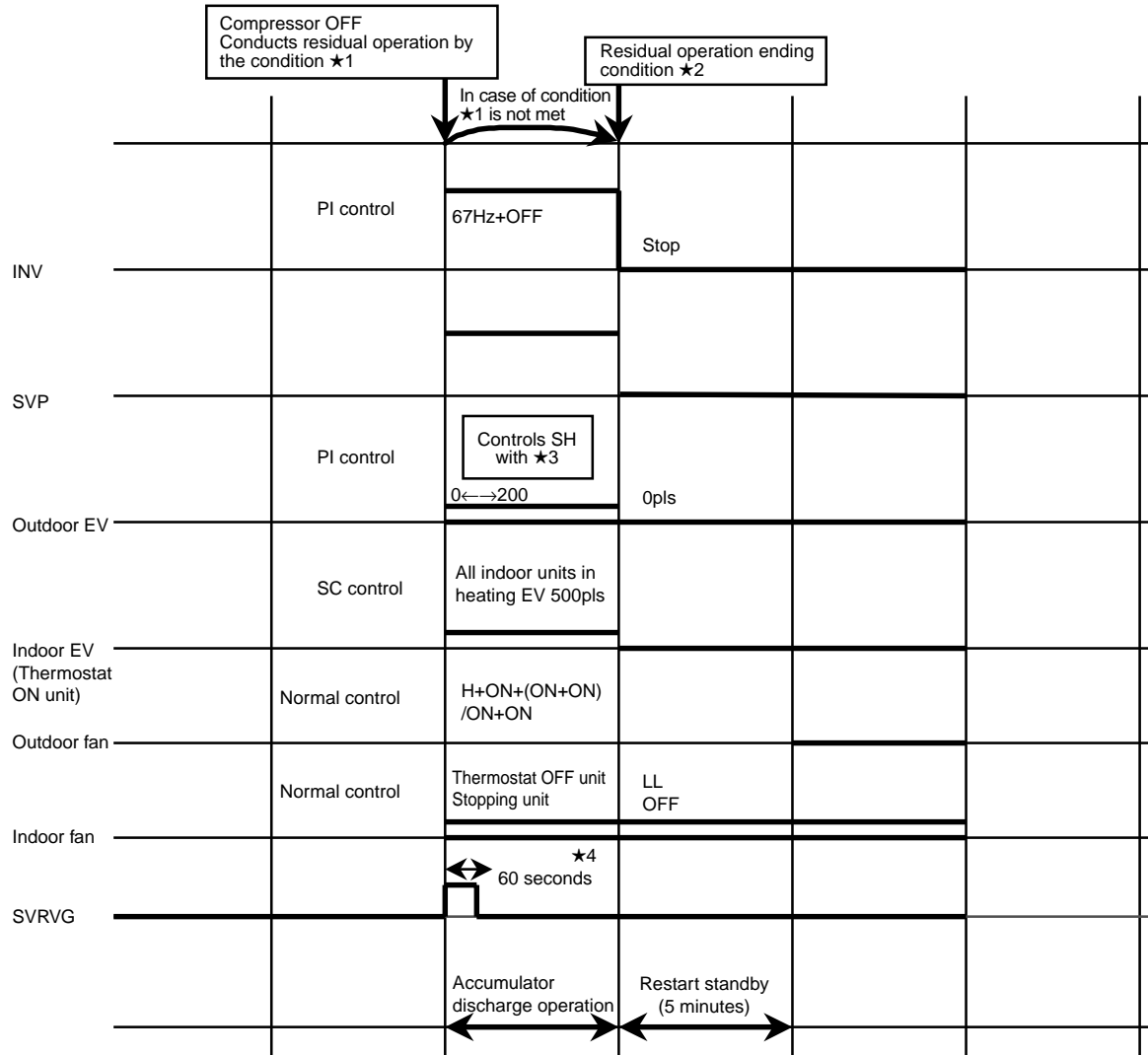
When the following conditions are met, the defrosting operation ends.

&	OR	When distributor pipe temperatures at all heat exchanger outlets (during cooling operation) are as follows: $T_b > 12.5^\circ\text{C}$
		$P_c > 2.16\text{MPa}$
		When defrost operation is conducted for 10 minutes.
	All compressor are ON	

However, when the compressor stops during a defrosting operation, if condition ($T_b > 12.5^\circ\text{C}$) is not met at the next compressor startup, the defrosting operation starts and a 10-minute counter is activated when the soft startup is completed.

3.6.4 Heating Pump-Down Residual Operation (Heating & Simultaneous Cooling / Heating Operation)

Conduct an operation during stop mode to discharge refrigerant from the low pressure side, since liquid refrigerant remaining in the accumulator can be sucked into the compressor during startup and dilutes the refrigerating machine oil in the compressor and lowers the lubricating performance.



(V2595)

★1

Pump down residual operation starting condition

Compressor ON → OFF

& { Compressor ON → OFF
OR { DSHi < 20°C
Th7 - Te < 10

(V2597)

★2

Pump down residual operation ending condition

OR { DSHi > 90
Th7 - Te > 10
LP < 0.07MPa
Tc > 48.6°C
Retry-fault
10 minutes

(V2598)

★3

SH control with outdoor EV
PI control at SHS=10
(initial opening: 200pls)

★4

Receiver gas relief solenoid valve is opened to feed liquid refrigerant to liquid line for 60 seconds after entering pump down residual operation.
However, the valve closes when $Th7 - Te < 0$.

Note that if a thermostat ON signal is received during residual operation, the residual operation is not conducted and returns to normal operation when the total time of previous operation, residual operation and current operation is 10 minutes or longer.

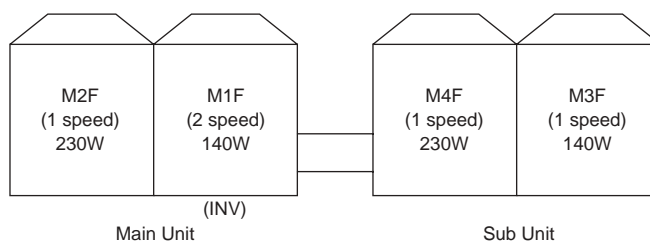
Remarks

- Residual operation is not conducted if stop signal received during defrosting and cooling oil return operation.
- Forcible thermostat OFF is conducted if defrosting or oil return signal is received during residual operation.
- Normal soft start is conducted if thermostat ON is received during residual operation.

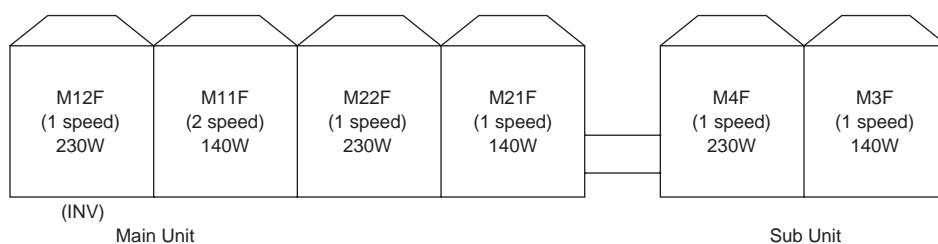
3.6.5 Fan Location and Fan Tap

Fan Location

(16~20HP)



(24~30HP)



(V0846)

Fan Tap Table

tap (Step)	16~20HP				24~30HP					
	M1F	M2F	M3F	M4F	M11F	M12F	M21F	M22F	M3F	M4F
0	OFF	+OFF	OFF	+OFF	OFF	+OFF	+OFF	+OFF	OFF	+OFF
1	L	+OFF	OFF	+OFF	L	+OFF	+OFF	+OFF	OFF	+OFF
2	H	+OFF	OFF	+OFF	H	+OFF	+OFF	+OFF	OFF	+OFF
3	H	+OFF	+ON	+OFF	H	+OFF	+ON	+OFF	+ON	+OFF
4	H	+ON	+ON	+OFF	H	+ON	+ON	+OFF	+ON	+OFF
5	H	+ON	+ON	+ON	H	+ON	+ON	+ON	+ON	+ON

Tfin > 87°C ↓ ↑ Tfin < 67°C

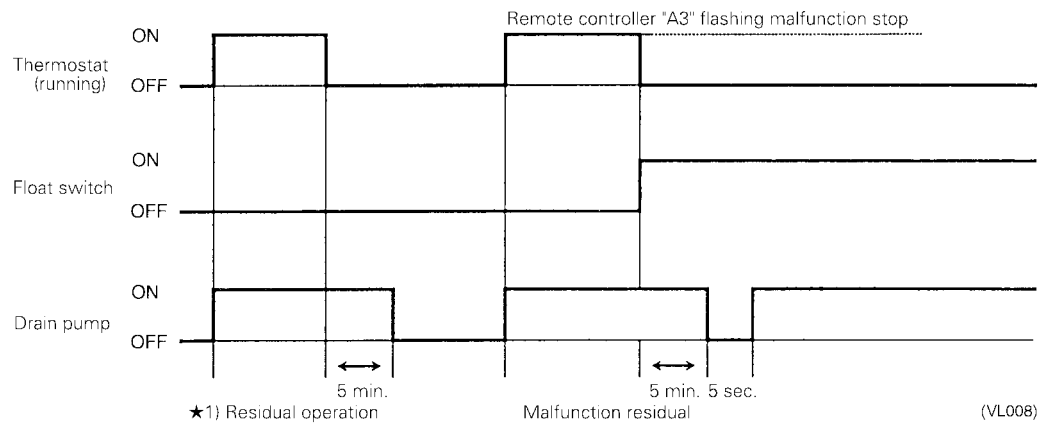
tap	24~30HP					
	M11F	M12F	M21F	M22F	M3F	M4F
0'	OFF	+ON	+OFF	+OFF	OFF	+OFF
1'	OFF	+ON	+OFF	+OFF	OFF	+OFF
2'	OFF	+ON	+OFF	+OFF	OFF	+OFF
3'	OFF	+ON	+ON	+OFF	+ON	+OFF
4'	H	+ON	+ON	+OFF	+ON	+OFF
5'	H	+ON	+ON	+ON	+ON	+ON

4. Outline of Control (Indoor Unit)

4.1 Drain Pump Control

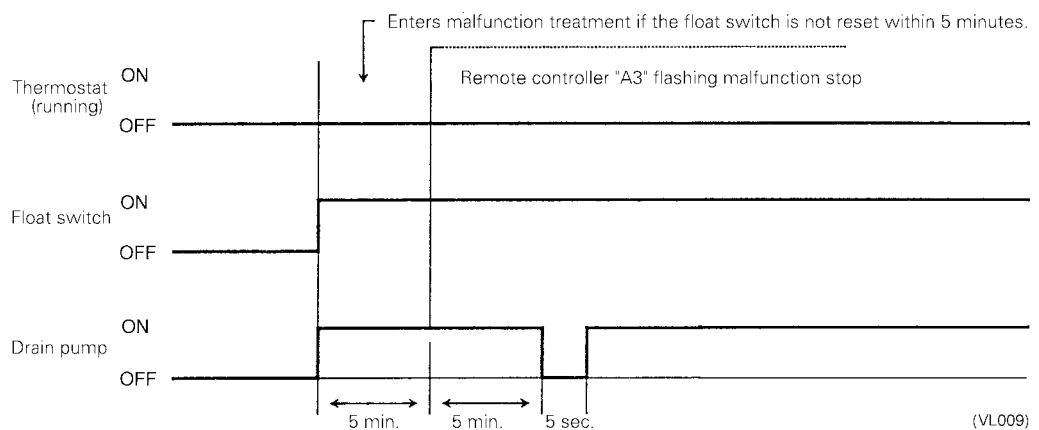
- The drain pump is controlled by the ON/OFF buttons (4 button (1) - (4) given in the figure below).

4.1.1 When the Float Switch is Tripped While the Cooling Thermostat is ON:

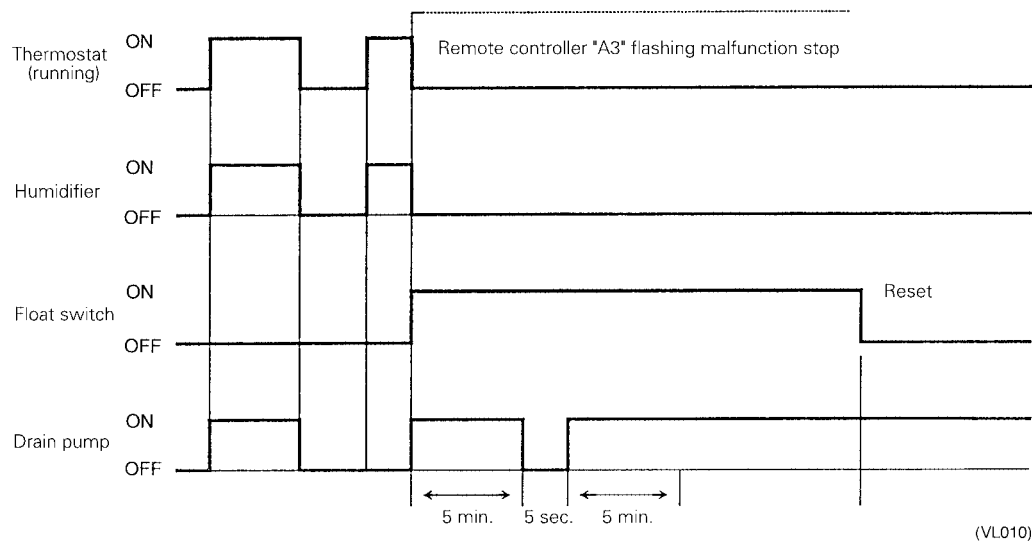


- ★1. The objective of residual operation is to completely drain any moisture adhering to the fin of the indoor unit heat exchanger when the thermostat goes off during cooling operation.

4.1.2 When the Float Switch is Tripped During Cooling OFF by Thermostat:

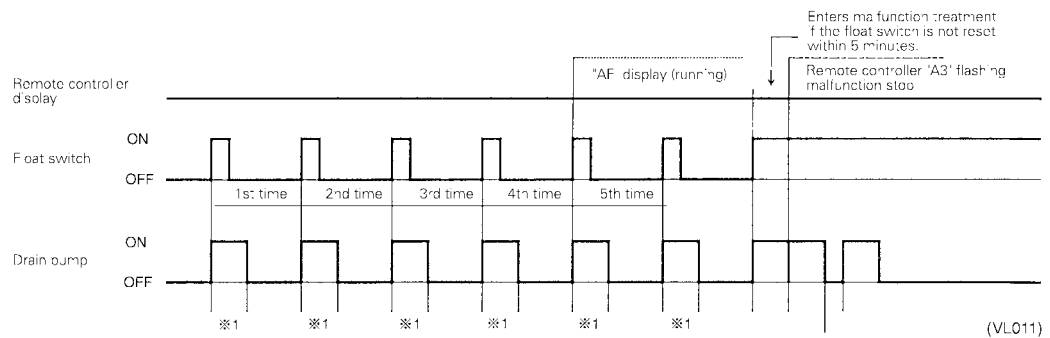


4.1.3 When the Float Switch is Tripped During Heating Operation:



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

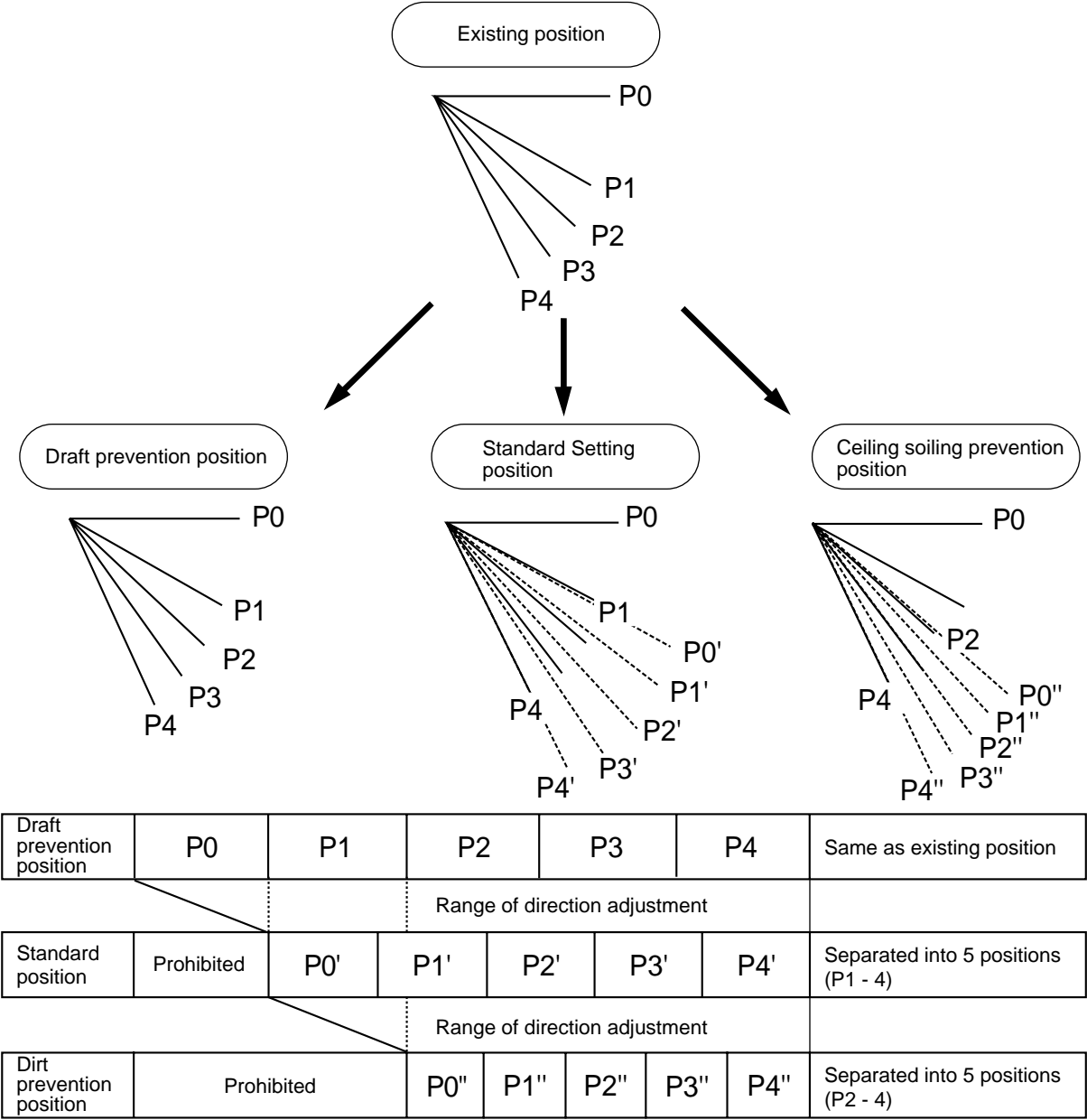
4.1.4 When the Float Switch is Tripped and “AF” is Displayed on the Remote Controller:



Note: If the float switch is tripped five times in succession, a drain malfunction is determined to have occurred. “AF” is then displayed as operation continues.

4.2 Louver Control for Preventing Ceiling Dirt

We have added a control feature that allows you to select the range of in which air direction can be adjusted in order to prevent the ceiling surrounding the air discharge outlet of ceiling mounted cassette type units from being soiled. (This feature is available on double flow, multiflow and corner types.)



The factory set position is standard position.

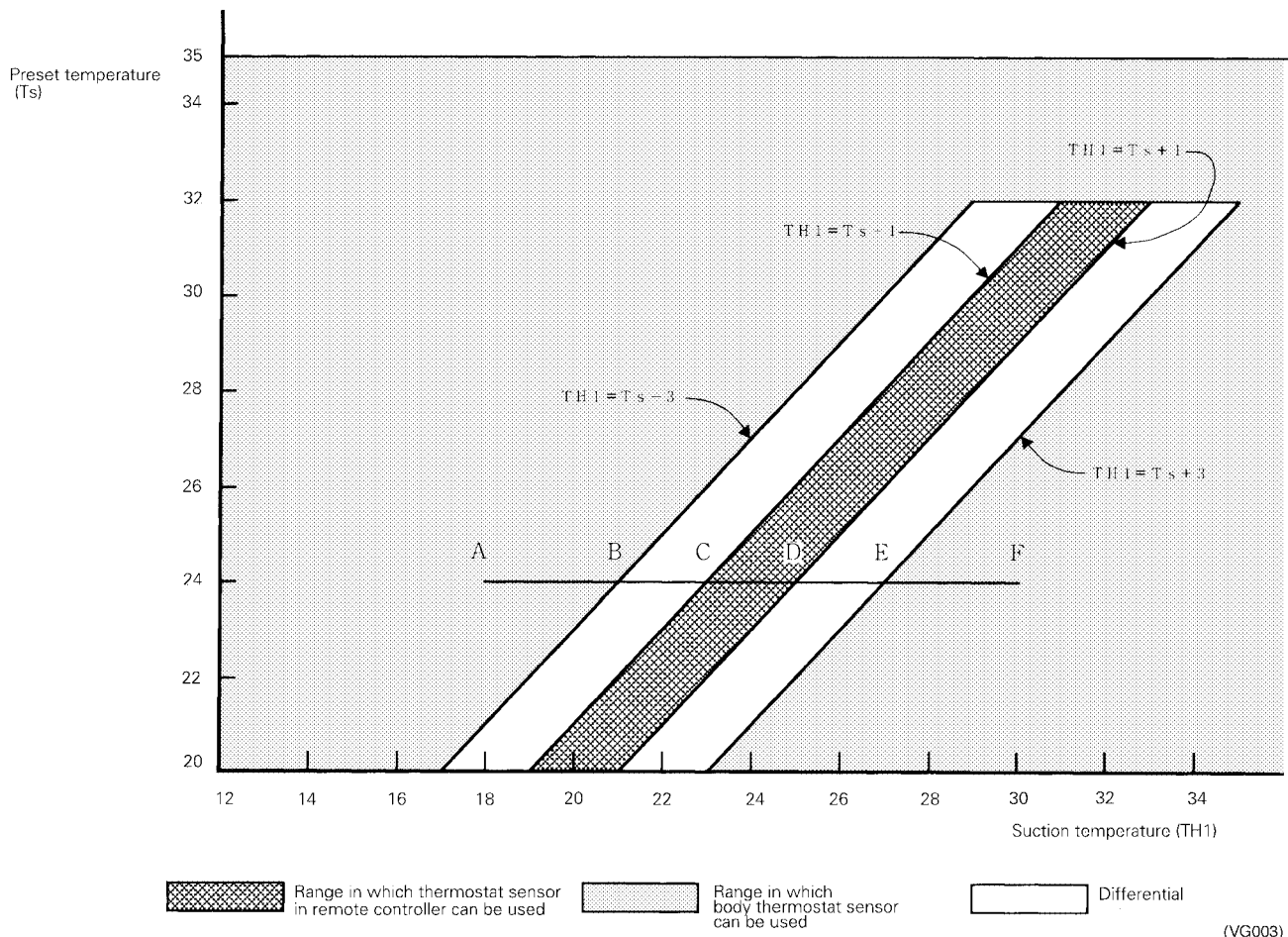
(VL012)

4.3 Thermostat Sensor in Remote Controller

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

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 24°C, and the suction temperature has changed from 18°C to 30°C (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 18°C to 23°C (A → C).

Remote controller thermostat sensor is used for temperatures from 23°C to 27°C (C → E).

Body thermostat sensor is used for temperatures from 27°C to 30°C (E → F).

And, assuming suction temperature has changed from 30°C to 18°C (F → A):

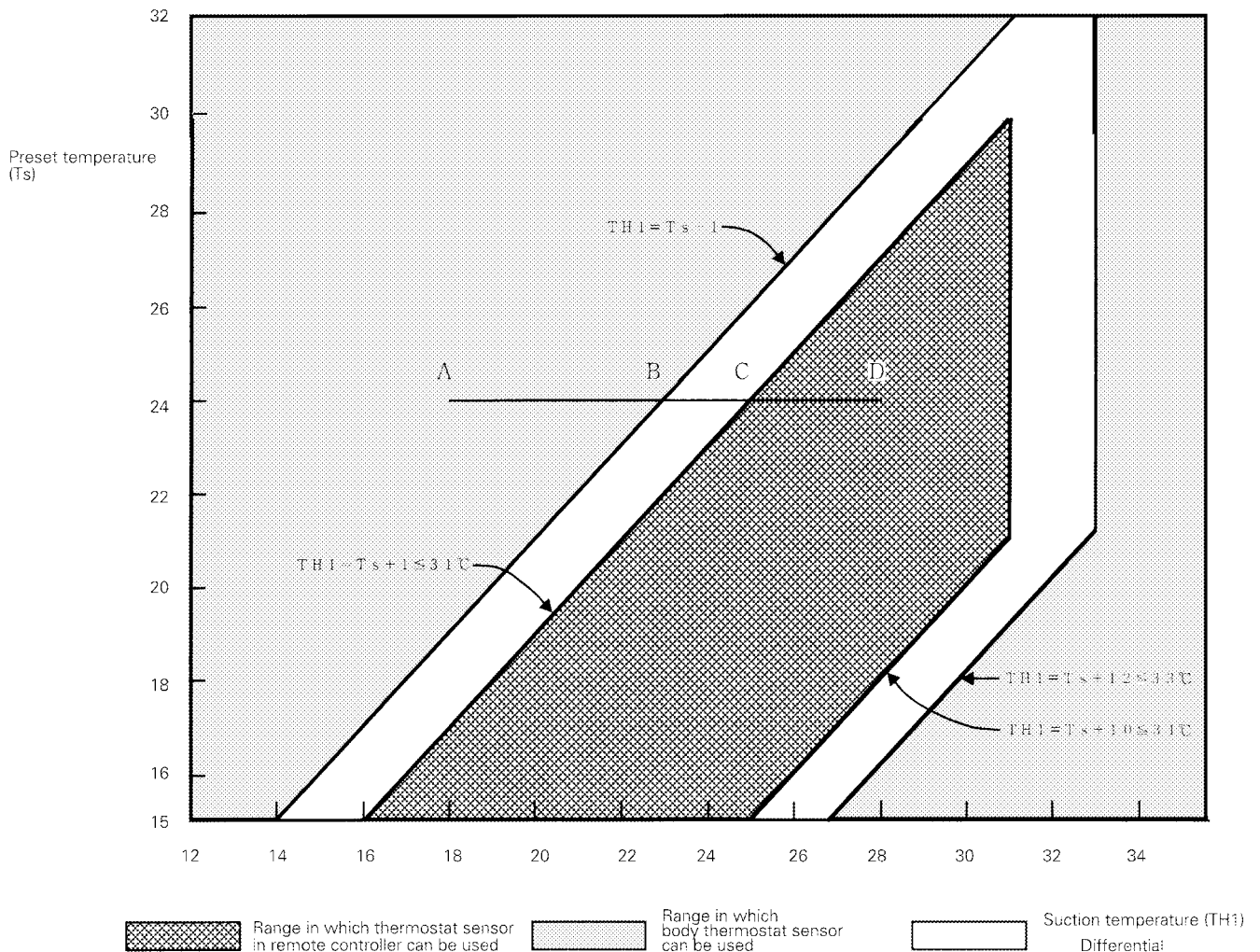
Body thermostat sensor is used for temperatures from 30°C to 25°C (F → D).

Remote controller thermostat sensor is used for temperatures from 25°C to 21°C (D → B).

Body thermostat sensor is used for temperatures from 21°C to 18°C (B → A).

Heating

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



(VG004)

■ Ex: When heating

Assuming the preset temperature in the figure above is 24°C, and the suction temperature has changed from 18°C to 28°C (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 18°C to 25°C (A → C).

Remote controller thermostat sensor is used for temperatures from 25°C to 28°C (C → E).

And, assuming suction temperature has changed from 28°C to 18°C (D → A):

Remote controller thermostat sensor is used for temperatures from 28°C to 23°C (D → B).

Body thermostat sensor is used for temperatures from 23°C to 18°C (B → A).

4.4 Freeze Prevention

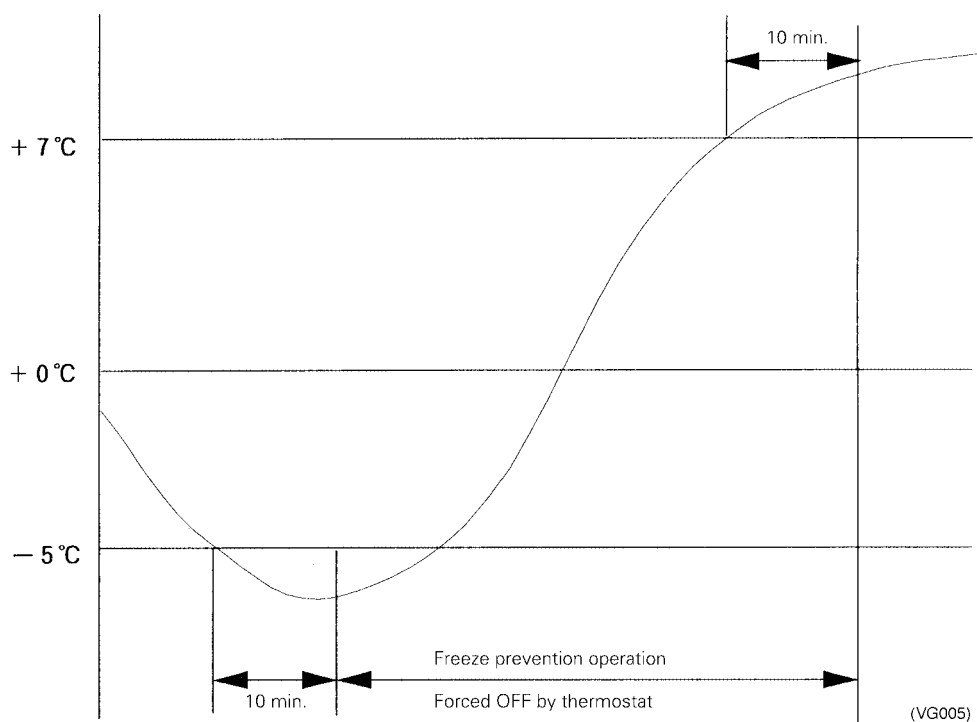
Freeze Prevention by Off Cycle (Indoor Unit)

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

Conditions for starting freeze prevention: Temperature is -1°C or less for total of 40 min., or temperature is -5°C or less for total of 10 min.

Conditions for stopping freeze prevention: Temperature is $+7^{\circ}\text{C}$ or more for 10 min. continuously

Ex: Case where temperature is -5°C or less for total of 10 min.



Part 4

Test Operation

R-407C *VRV*TM PLUS Series

Heat Recovery System

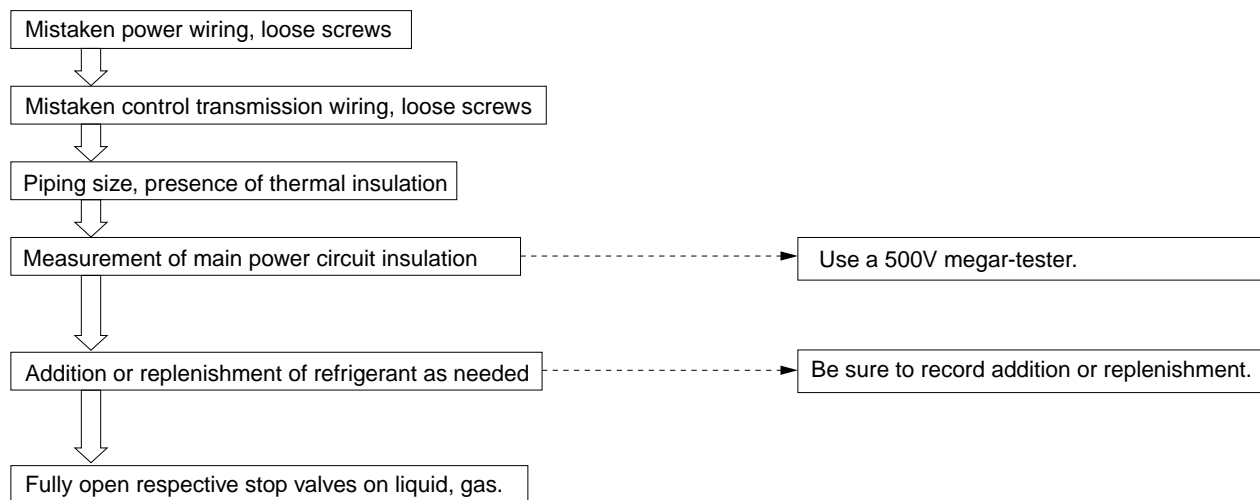
1. Test Operation	104
1.1 Procedure and Outline.....	104
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1.3 Outdoor Unit PC Board Ass'y	107
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1.5 Sequential Start	118
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1.12 Indoor Field Setting	126
1.13 Centralized Control Group No. Setting	132
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1. Test Operation

1.1 Procedure and Outline

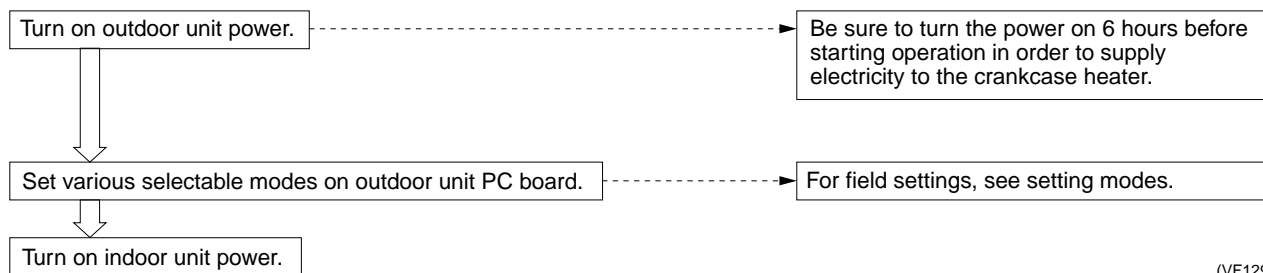
The operation sequence is the most important thing for test operation. Follow the following outline.

1.1.1 Check The Following Before Turning Power On.



(VF128)

1.1.2 Turn Power On.

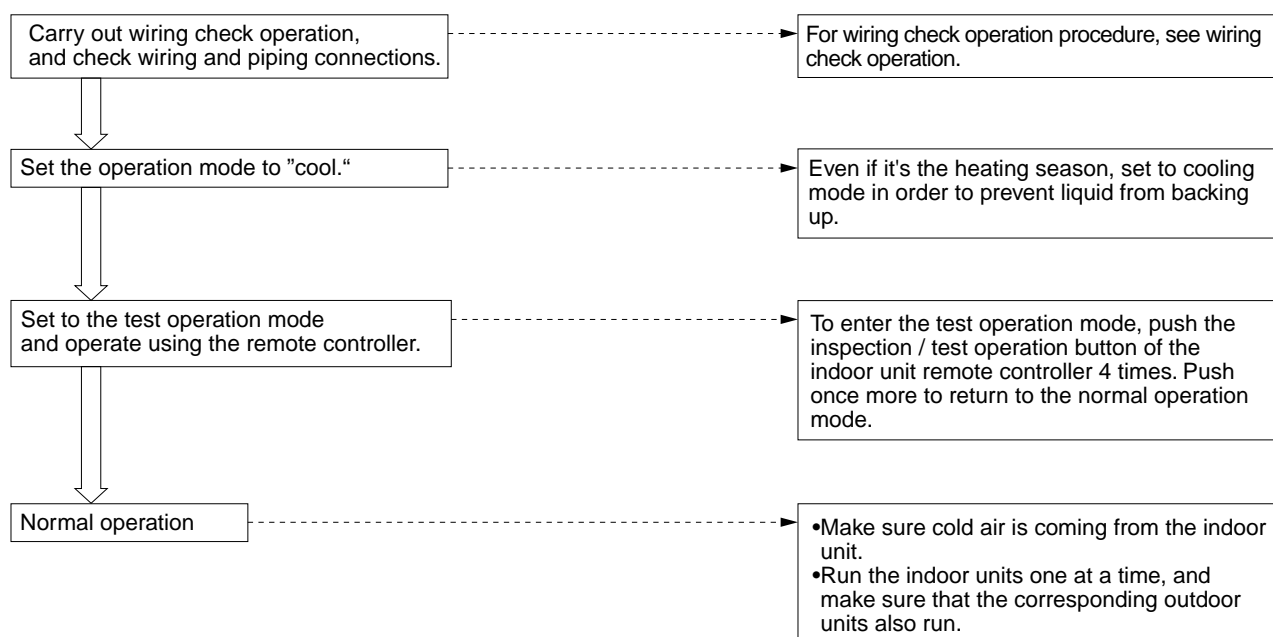


(VF129)



Refer to Setting Modes on P109

1.1.3 Check Operation.



(VF130)



Refer to Wiring Check Operation on P121



Caution

When the 400 volt power supply is applied to "N" phase by mistake, replace Inverter P.C.B (A2P) and control transformer (T1R, T2R) in switch box together.

(V0847)

1.2 Operation When Power is Turned On

1.2.1 When Turning On Power for First Time

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

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

1.2.2 When Turning On Power The Second Time and Subsequent

Tap the RESET button (BS5) on the outdoor unit PC board. Operation becomes possible after setting up 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.

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

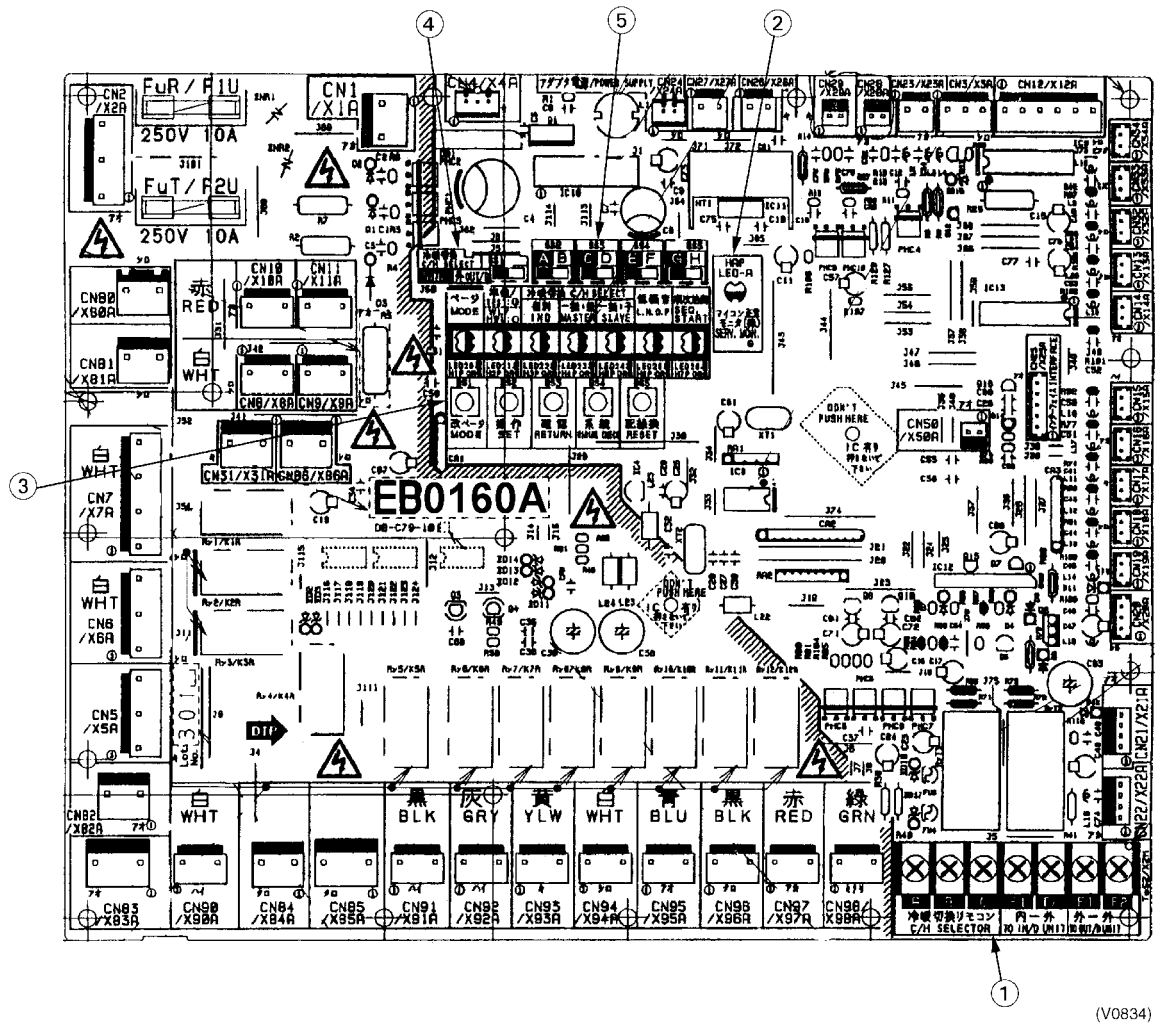
1.2.3 When an Outdoor Unit or Indoor Unit Has Been Added, or Indoor / Outdoor Units PC Board Has Been Changed

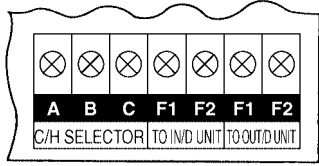
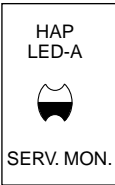
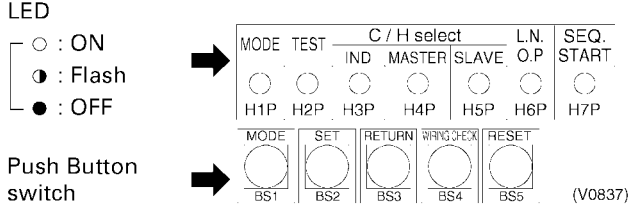
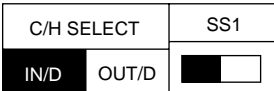
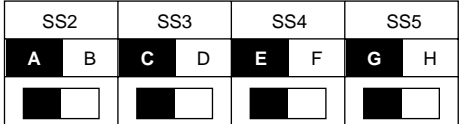
Be sure to push and hold the wiring change button for 5 seconds or longer. If not, the addition cannot be recognized. In this case, the unit cannot be run for up to 12 minutes to automatically set the address (indoor-outdoor address, etc.).

- ◆ Outdoor unit ... Warning lamp (H2P) lights
Test lamp (H2P) goes off
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.)

1.3 Outdoor Unit PC Board Ass'y

Outdoor Unit



1	Transmission terminal Indoor unit, Cool/Heat selector Outdoor - Outdoor	
2	Service monitor LED (Green)	
3	Function setting mode switch and LED	<p>LED</p> <ul style="list-style-type: none"> ○ : ON ◐ : Flash ● : OFF <p>Push Button switch</p> 
4	Function of setting between cooling and heating	
5	Outdoor unit Capacity setting switch	<p>Switches for capacity setting when the outdoor unit PC board is replaced to spare parts PC board.</p>  <p>Refer table below.</p>

	SS2		SS3		SS4		SS5	
	A	B	C	D	E	F	G	H
RSEYP16KJ		■		■	■			■
RSEYP18KJ		■	■			■		■
RSEYP20KJ		■	■			■		■
RSEYP24KJ		■	■		■		■	
RSEYP26KJ		■	■		■		■	
RSEYP28KJ	■			■		■	■	
RSEYP30KJ	■			■		■	■	

Capacity setting table



Note: Resetting of power supply switch is necessary after capacity setting.

1.4 Setting Modes

There are the following three setting modes.

◆ **Setting mode 1 (H1P off)**

Used to select the cool/heat setting, low-noise run and sequential start.

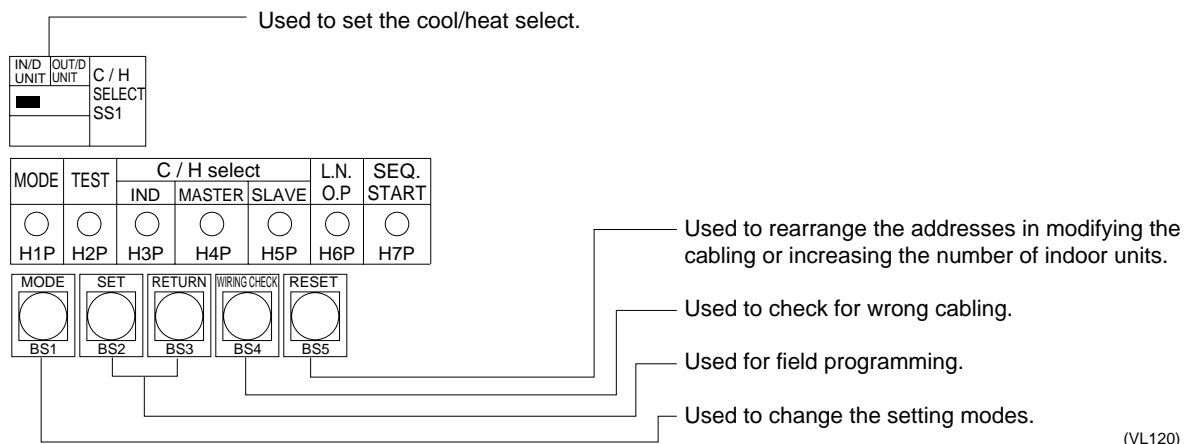
◆ **Setting mode 2 (H1P on)**

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

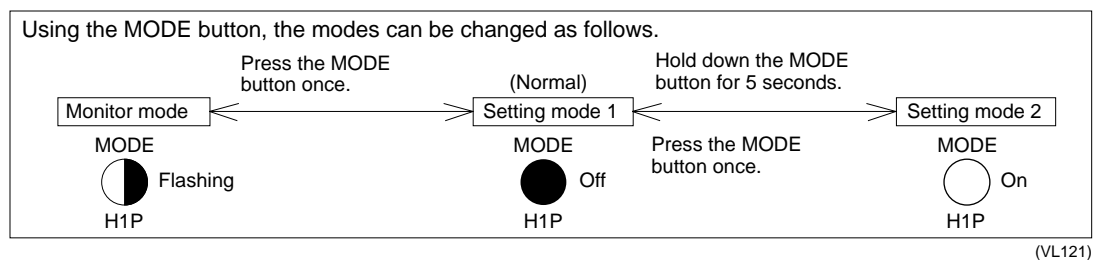
◆ **Monitor mode (H1P flashing)**

Used to check the programs made in the setting mode 2, the number of units being connected, and other entries.

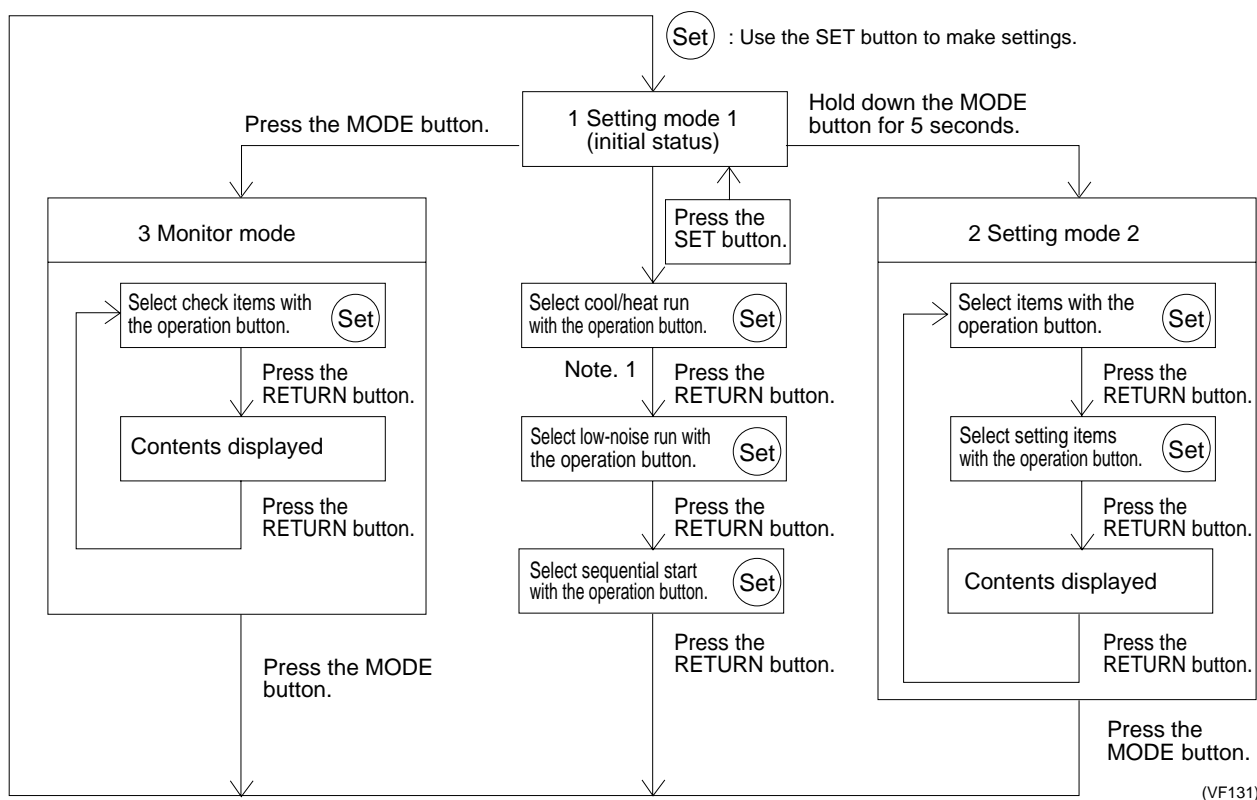
Functions of Pushbutton Switches



Mode Change



Mode Changing Procedure



- Note:**
1. If you become unsure of how to proceed, push the MODE button (BS1) and return to setting mode 1.
 2. Power reset is not necessary after setting of setting mode 1 (including C/H select SS1) and setting mode 2.

1.4.1 Setting Mode 1

Cool/heat selection setting
(SS1)

Do not set

IND UNIT	OUT/D UNIT	C/H SELECT
■		SS1

(Factory set)

MODE	TEST	C/H SELECT			L.N.O.P.	SEQ. START
		IND	MASTER	SLAVE		
● H1P	● H2P	○ H3P	● H4P	● H5P	● H6P	○ H7P



The factory settings are:

Individual (C/H SELECT), OFF (L.N.O.P.), ON (SEQ. START)

You can change the cool/heat selection permission, low noise and sequential start settings by pushing the SET switch.

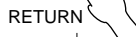
To skip settings you don't want to change, push the RETURN switch and go to the next setting.

Set cool/heat selection to IND.

MODE	TEST	C/H SELECT			L.N.O.P.	SEQ. START
		IND	MASTER	SLAVE		
● H1P	● H2P	○ H3P	● H4P	● H5P	● H6P	○ H7P

Change low noise operation to "ON".

External control adaptor for outdoor unit is required if low noise operation is set to "ON".



MODE	TEST	C/H SELECT			L.N.O.P.	SEQ. START
		IND	MASTER	SLAVE		
● H1P	● H2P	○ H3P	○ H4P	● H5P	● H6P	○ H7P



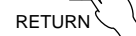
MODE	TEST	C/H SELECT			L.N.O.P.	SEQ. START
		IND	MASTER	SLAVE		
● H1P	● H2P	○ H3P	○ H4P	● H5P	○ H6P	○ H7P

Change sequential start to "OFF".

MODE	TEST	C/H SELECT			L.N.O.P.	SEQ. START
		IND	MASTER	SLAVE		
● H1P	● H2P	○ H3P	○ H4P	○ H5P	● H6P	○ H7P

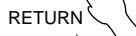


MODE	TEST	C/H SELECT			L.N.O.P.	SEQ. START
		IND	MASTER	SLAVE		
● H1P	● H2P	○ H3P	○ H4P	○ H5P	○ H6P	● H7P

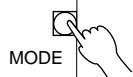


Setting complete

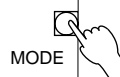
GROUP MASTER (cool/heat selection),
ON (low noise), OFF (sequential start)



MODE	TEST	C/H SELECT			L.N.O.P.	SEQ. START
		IND	MASTER	SLAVE		
● H1P	● H2P	○ H3P	○ H4P	○ H5P	○ H6P	● H7P



Monitor mode



Push and hold for 5 sec.

Setting mode 2

(VF133)

1.4.2 Setting Mode 2

To switch from setting mode 1 (normal) to setting mode 2, you must push and hold the next page button (BS1) for 5 seconds. (You cannot enter setting mode 2 while setting mode 1 is set.)

Setting Procedure

1. Push the SET button and match with the setting item (LED display). (All 10 settings)
↓
2. Push the RETURN button (BS3) and the present settings flicker (LED display).
↓
3. Push the SET button (BS2) and match with each setting (LED flicker display).
↓
4. Push the RETURN button (BS3) and enter the settings.
↓
5. Push the RETURN button (BS3) and return to the initial status.



Note:

1. If you become unsure of how to proceed, push the MODE button (BS1) and return to setting mode 1.
2. The initial status of setting mode 2 is the status of setting item No. 1 in mode 2.

Setting Items

No	Setting item	Description	LED display H1P H2P H3P H4P H5P H6P H7P	LED display H1P H2P H3P H4P H5P H6P H7P
0	EMG (Emergency operation 1)	Emergency operation when inverter type outdoor unit malfunctions.	○ ● ● ● ● ● ●	Emergency operation ○ ● ● ● ● ● ● (Operates by constant speed outdoor unit only.) Normal operation ○ ● ● ● ● ● ●
1	Cool/heat unified address Do not set.	Address for cool/heat unified operation.	○ ● ● ● ● ● ○	Address 0 ○ ● ● ● ● ● ● Binary number 1 ○ ● ● ● ● ● ○ (5 digits) 2 ○ ● ● ● ● ○ ● 31 ○ ● ○ ○ ○ ○ ○
2	Low noise / demand address	Address for low noise / demand operation.	○ ● ● ● ● ○ ●	Address 0 ○ ● ● ● ● ● ● Binary number 1 ○ ● ● ● ● ● ○ (5 digits) 2 ○ ● ● ● ● ○ ● 31 ○ ● ○ ○ ○ ○ ○
3	Sequential start system address	Address for sequential start system.	○ ● ● ● ● ○ ○	Address 0 ○ ● ● ● ● ● ● Binary number 1 ○ ● ● ● ● ● ○ (5 digits) 2 ○ ● ● ● ● ○ ● 31 ○ ● ○ ○ ○ ○ ○
4	Number of unit for sequential start	Outdoor unit for sequential start.	○ ● ● ● ○ ● ●	3 units ○ ● ● ● ○ ● ● 2 units ○ ● ● ● ● ○ ● 1 unit ○ ● ● ● ● ● ○
5	Forced fan switch	Indoor unit fan turns while unit is stopped.	○ ● ● ● ○ ● ○	Forced fan operation (H tap) ○ ● ● ● ● ○ ● Normal operation ○ ● ● ● ● ● ○
6	Indoor unit forced operation	Allows operation of indoor unit from outdoor unit.	○ ● ● ● ○ ○ ●	Indoor unit forced operation ○ ● ● ● ● ○ ● Normal operation ○ ● ● ● ● ● ○
8	TE setting	Low pressure setting for cooling.	○ ● ● ○ ● ● ●	High ○ ● ● ● ○ ● ●
9	TC setting Note 1	High pressure setting for heating.	○ ● ● ○ ● ● ○	Normal (factory set) ○ ● ● ● ● ○ ● Low ○ ● ● ● ● ● ○
10	Defrost setting Note 1	Temperature setting for defrost.	○ ● ● ○ ● ○ ●	Quick defrost ○ ● ● ● ○ ● ● Normal (factory set) ○ ● ● ● ● ○ ● Slow defrost ○ ● ● ● ● ● ○

(V0840)

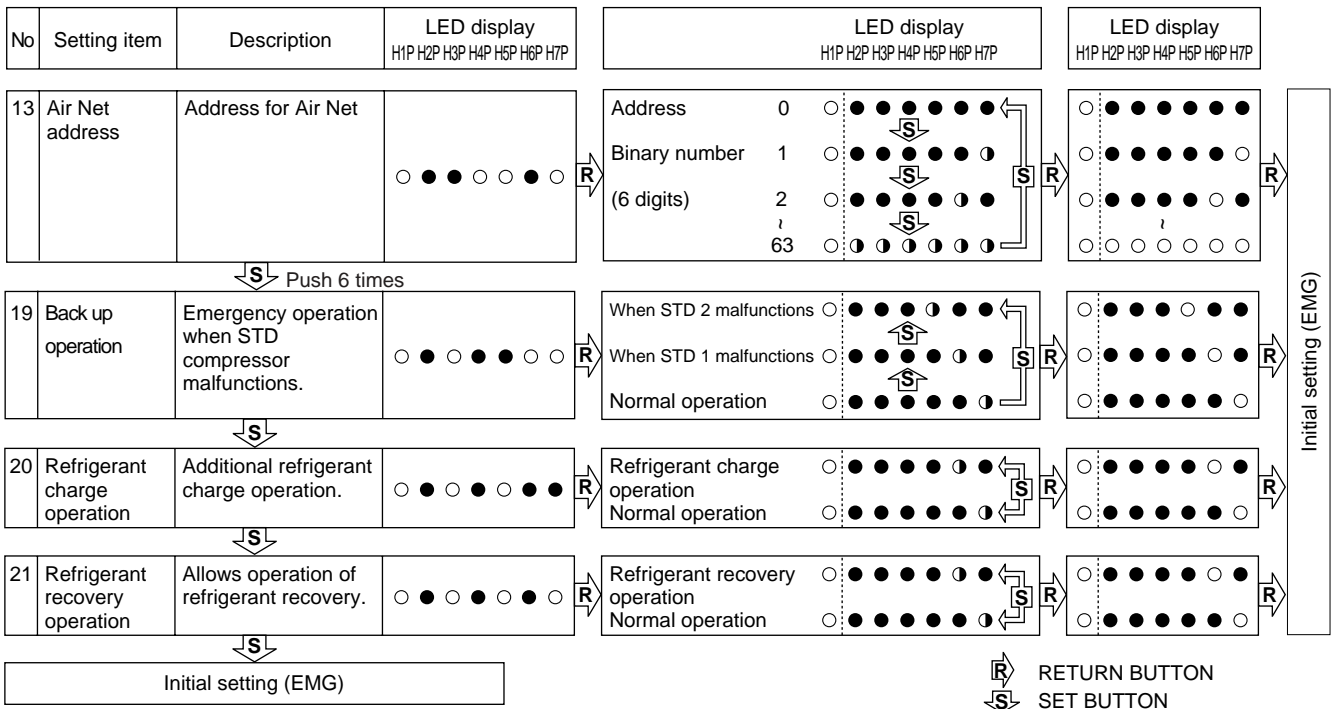
No	Setting item	Description	LED display	LED display
			H1P H2P H3P H4P H5P H6P H7P	H1P H2P H3P H4P H5P H6P H7P
13	Air Net address	Address for Air NET.		Address 0
				Binary number 1
				2
				i
				63
19	Back up operation	Emergency operation when STD compressor malfunctions.		When STD 2 malfunctions
				When STD 1 malfunctions
				Normal operation
20	Refrigerant charge operation	Additional refrigerant charge operation.		Refrigerant charge operation
				Normal operation
21	Refrigerant recovery	Allows operation of refrigerant recovery.		Refrigerant recovery operation
				Normal operation

(V0840-2)

No	Setting item	Description	LED display H1P H2P H3P H4P H5P H6P H7P	LED display H1P H2P H3P H4P H5P H6P H7P	LED display H1P H2P H3P H4P H5P H6P H7P
0	EMG (Emergency operation 1)	Emergency operation when inverter type outdoor unit malfunctions.		Emergency operation Normal operation	
1	Cool/heat unified address Do not set !!	Address for cool/heat unified operation.		Address 0 Binary number 1 (5 digits) 2 31	
2	Low noise / demand address	Address for low noise / demand operation.		Address 0 Binary number 1 (5 digits) 2 31	
3	Sequential start system	Address for sequential start system.		Address 0 Binary number 1 (5 digits) 2 31	
4	Number of unit for sequential start Note 1	Outdoor unit for sequential start.		3 units 2 units 1 unit	
5	Forced fan switch	Indoor unit fan turns while unit is stopped.		Forced fan operation (H tap) Normal operation	
6	Indoor unit forced operation	Allows operation of indoor unit from outdoor unit.		Forced fan operation (H tap) Normal operation	
8	TE setting	Low pressure setting for cooling.		High Normal (factory set) Low	
9	TC setting Note 1	High pressure setting for heating.			
10	Defrost setting Note 1	Temperature setting for defrost.		Quick defrost Normal (factory set) Slow defrost	








Initial setting (EMG)

(V0840-1)

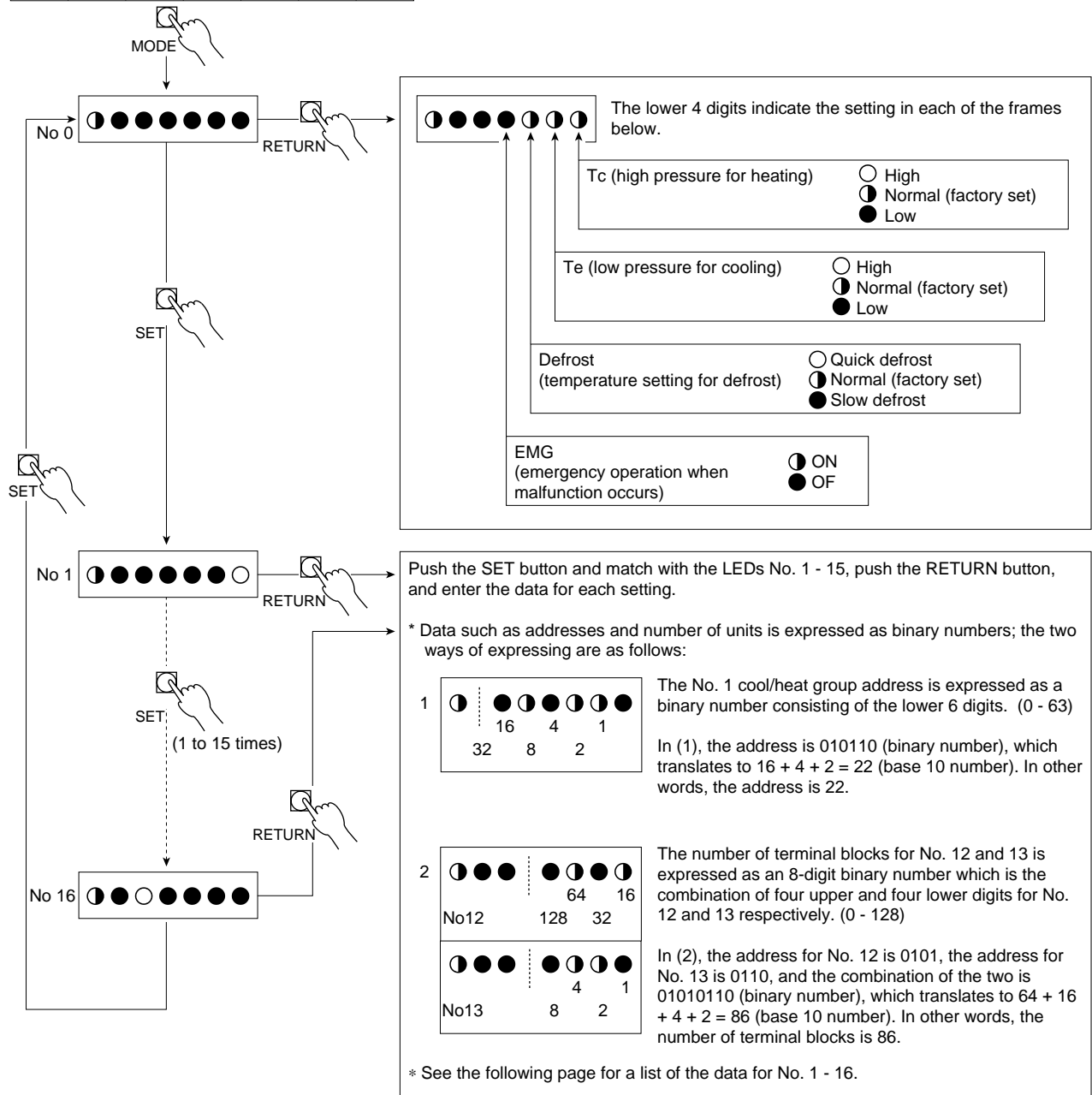


(V0840-3)

1.4.3 Monitor Mode

MODE	TEST	C/H SELECT			L.N.O.P.	SEQ. START
		IND	MASTER	SLAVE		
 H1P	 H2P	 H3P	 H4P	 H5P	 H6P	 H7P

To enter the monitor mode, push the MODE button when in setting mode 1.



(VF135)

- After making sure the data is correct, push the RETURN button and return to No. 0, or push the MODE button and return to setting mode 1.

Monitor Mode Data

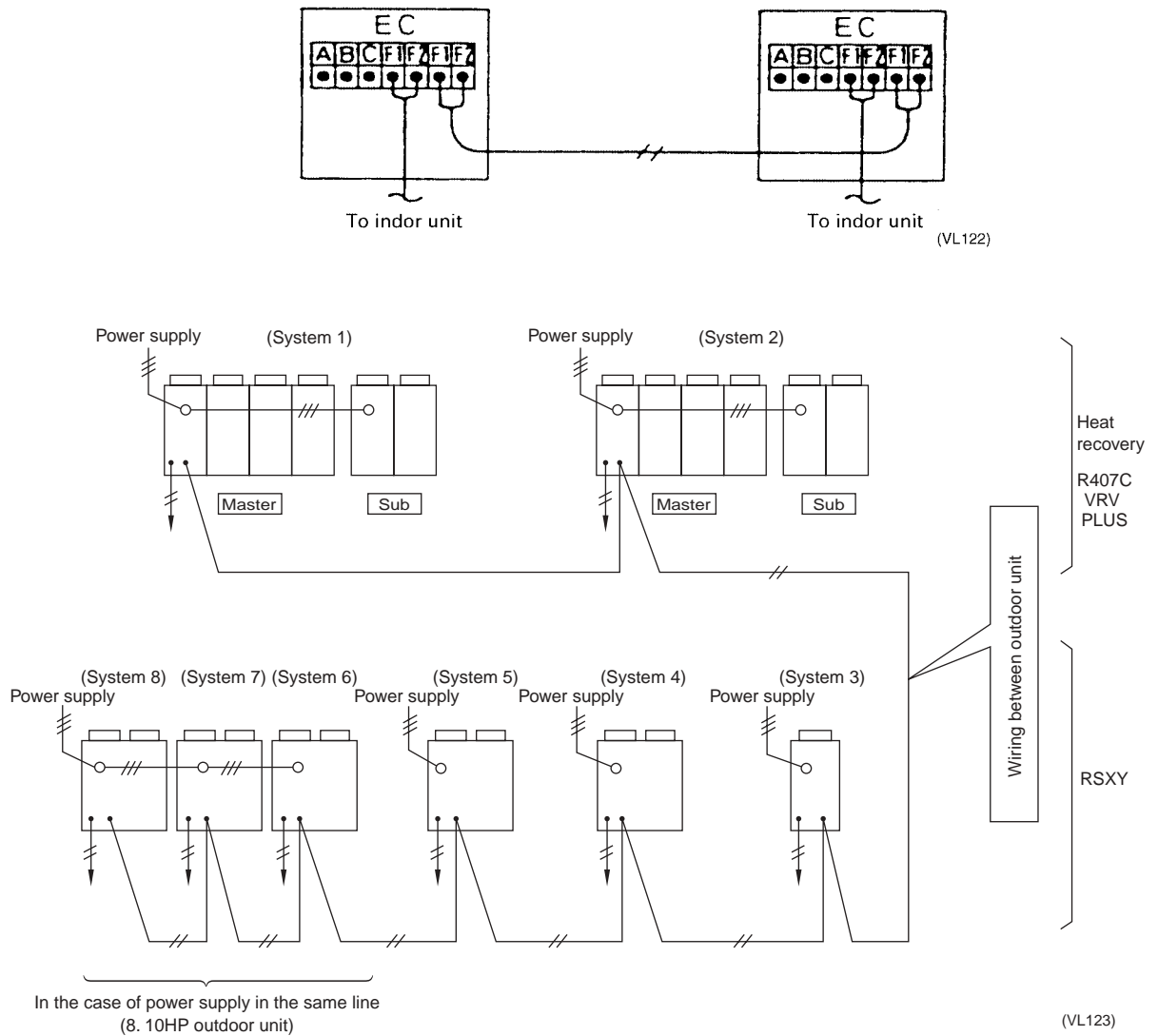
Mode No.	LED	Data	Display method	Size (binary number)
No 1	○ ● ● ● ● ● ○	Cool/heat group address	0 ~ 31	Lower 6 digits
No 2	○ ● ● ● ● ○ ●	Low noise / demand address	0 ~ 31	Lower 6 digits
No 3	○ ● ● ● ● ○ ○	Not used		
No 4	○ ● ● ● ○ ● ●	Not used	0 ~ 63	Lower 6 digits
No 5	○ ● ● ● ○ ● ○	Number of connected indoor units	0 ~ 63 units	Lower 6 digits
No 6	○ ● ● ● ○ ○ ●	Number of connected BS units	0 ~ 63 units	Lower 6 digits
No 7	○ ● ● ● ○ ○ ○	Number of connected zone units (excluding outdoor and BS units)	0 ~ 63 units	Lower 6 digits
No 8	○ ● ● ○ ● ● ●	Number of outdoor units	0 ~ 63 units	Lower 6 digits
No 9	○ ● ● ○ ● ● ○	Number of BS units	0 ~ 128 units	Lower 4 digits, upper
No 10	○ ● ● ○ ● ○ ●	Number of BS units	0 ~ 128 units	Lower 4 digits, lower
No 11	○ ● ● ○ ● ○ ○	Number of zone units (excluding outdoor and BS units)	0 ~ 63 units	Lower 6 digits
No 12	○ ● ● ○ ○ ● ●	Number of terminal blocks	0 ~ 128 units	Lower 4 digits, upper
No 13	○ ● ● ○ ○ ● ○	Number of terminal blocks	0 ~ 128 units	Lower 4 digits, lower
No 14	○ ● ● ○ ○ ○ ●	Not used		
No 15	○ ● ● ○ ○ ○ ○	Not used		
No 16	○ ● ○ ● ● ● ●	Not used		

1.5 Sequential Start

- Separates path timing of commercial power supply compressors by 3 seconds each in order to prevent overcurrent when more than 1 compressor are to be started at the same time.
- Improved wiring system enables sequential start of up to 10 outdoor units.

If you want to carry out sequential start, connect outdoor unit - outdoor unit transmission wiring as shown below.

The outdoor unit PC board (EC) is factory set to "sequential start ON."



1.6 Low Noise Operation

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

Instructions for Demand Control Operation

1. Outdoor unit field setting

- ◆ Setting mode 1: Set low noise operation to "ON."
- ◆ Setting mode 2: Match low noise operation and demand control address with address of outdoor unit external control adaptor.

2. Outdoor unit external control adaptor setting

- ◆ Function switch (SS1)

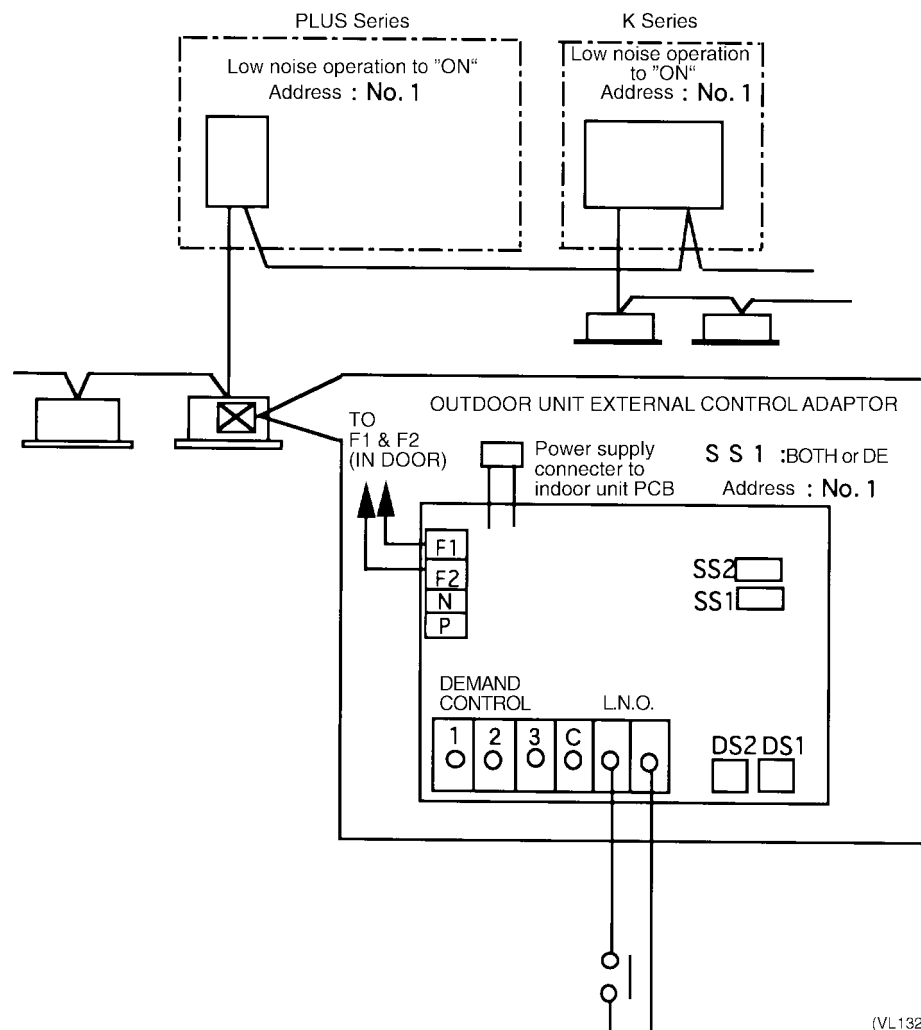
Set to "BOTH" or "DE."

- ◆ Address setting switches (DS1, DS2)

Match with outdoor unit low noise operation and demand control address.

3. Short-circuit the low noise input of outdoor unit external control adaptor for outdoor unit.

Low Noise Control System Example



(VL132)

1.7 Demand Control

By connecting the external contact input to the demand input of the outdoor unit external control adaptor (option), the compressor operating conditions can be controlled for reduced power consumption.

- Demand 1 Approximately 70% level
- Demand 2 Approximately 40% level
- Demand 3 Forced thermostat OFF

Instructions for Demand Control Operation

1. Outdoor unit field setting

- ◆ Setting mode 1: Set low noise operation to "ON."
- ◆ Setting mode 2: Match low noise operation and demand control address with address of outdoor unit external control adaptor.

2. Outdoor unit external control adaptor setting

- ◆ Function switch (SS1)

Set to "BOTH" or "DE."

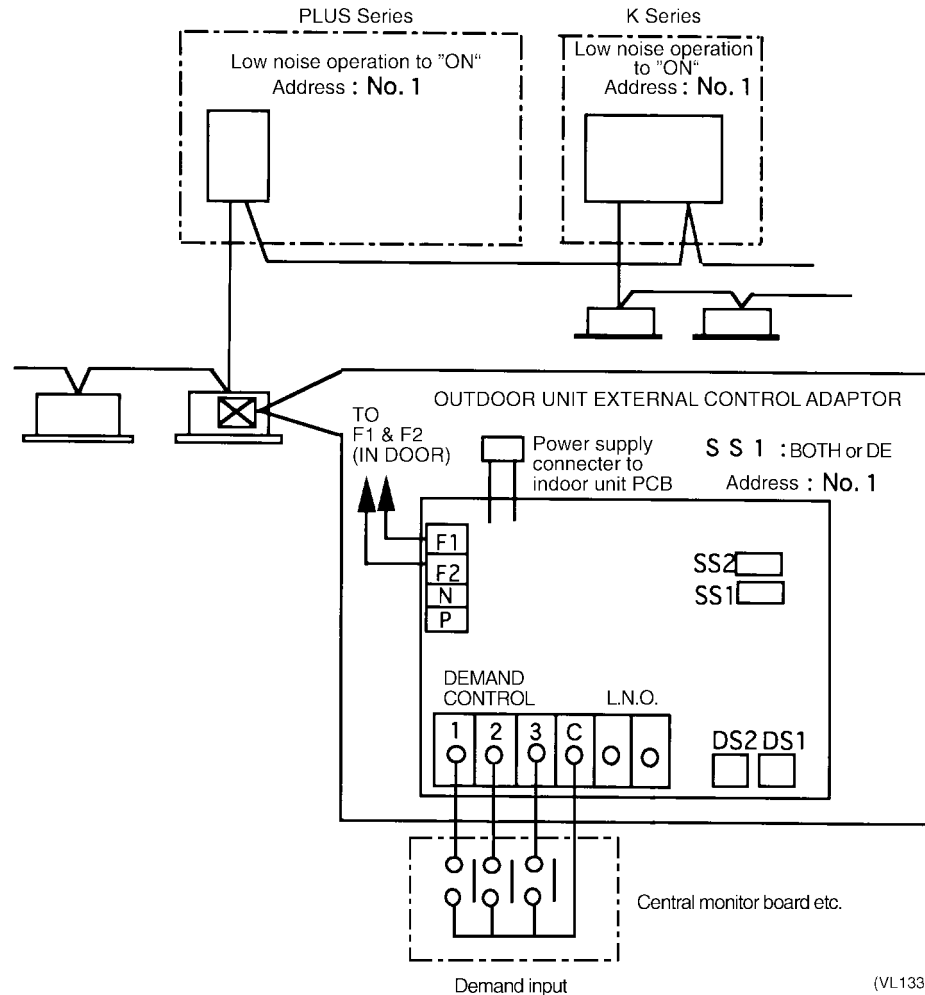
- ◆ Address setting switches (DS1, DS2)

Match with outdoor unit low noise operation and demand control address.

3. Select one from demand input terminals 1 through 3 on the outdoor unit external control adaptor, and short the corresponding terminals.

- Demand 1 Short 1-C.
- Demand 2 Short 2-C.
- Demand 3 Short 3-C.

Demand Control System Example



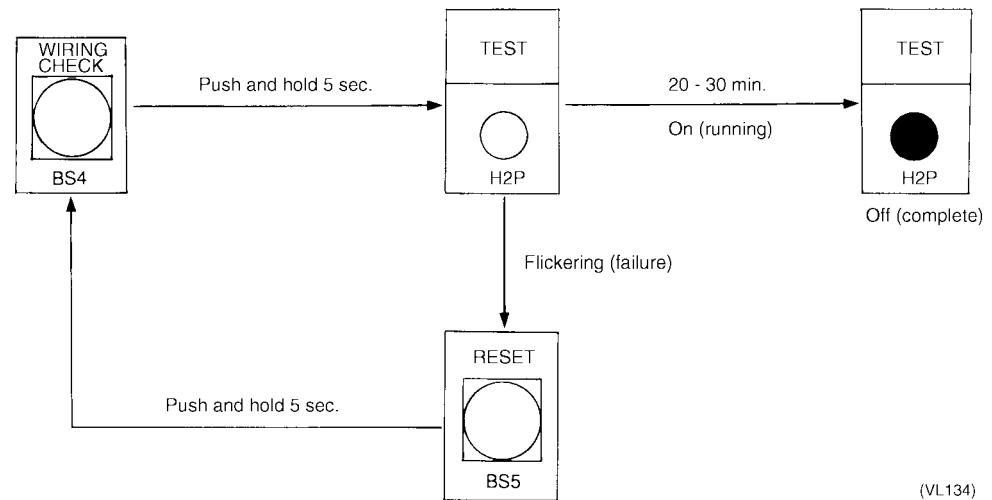
(VL133)

1.8 Wiring Check Operation

If within 12 hours of stopping cooling or heating, be sure to run all indoor units in the system you want to check in the fan mode for about 60 minutes in order to prevent mis-detection.

Operation Method

1. In the monitor mode, check the number of connected indoor units. (See monitor mode.)
2. Push and hold the WIRING CHECK button (BS4) for 5 seconds to perform wiring check operation. While running, TEST (H2P) lights and goes off when finished.
If TEST (H2P) flickers (wiring check operation failure), push and hold the RESET button (BS5) for 5 seconds, and then repeat the procedure from the beginning.
3. About 1 minute after you finish running the system, once again check the number of connected indoor units in the monitor mode and make sure the number agrees with the first time you checked. If not, it indicates that there is a wiring mistake. Fix the wiring of the indoor unit whose remote controller displays "UF" when its ON/OFF switch is turned ON.



Note: Other settings are not accepted during wiring check operation.

1.9 Additional Refrigerant Charge Operation

[Work procedure]

1. Conduct ordinary refrigerant charge.
With the outdoor unit in non-operating condition, charge refrigerant from the liquid-side stop valve service port.
(Keep the stop valves on both liquid and gas sides closed.)
- **Conduct the following operation only when the entire amount of refrigerant could not be charged with the compressor in non-operating condition (otherwise equipment damage can result).**
2. Turn on the power switches of the indoor and outdoor units, and fully open the gas-side stop valve.
(Keep the liquid-side stop valve closed.)

3. Set the service mode.

In service mode 1, press the "MODE" button for 5 seconds to enter service mode 2.		○ ● ● ● ● ● ●
Press the "SET" button to set the LED indicators to the "additional refrigerant charge operation" indication.		○ ● ○ ● ○ ● ●
Press the "RETURN" button.		○ ● ● ● ● ● ①
Press the "SET" button to set the LED indicators as shown at right.		○ ● ● ● ● ① ●
Press the "RETURN" button to end the setting operation.		○ ● ● ● ● ○ ●
Press the "RETURN" button again to start operation.		① ① ● ● ● ● ●
Low pressure level is indicated during operation.	Higher than 3.5k	○ ○ ○ ○ ○ ○ ○
	3.5k or less	○ ○ ● ● ○ ○ ○
	2.5k or less	○ ○ ● ● ● ○ ○
	1.5k or less	○ ○ ● ● ● ● ○
Operation ends (after 30 minutes). (Pressure level immediately before is indicated by flashing LEDs.)		○ ○ ● ● ● ① ① This LED indication shows that the operation stopped with pressure level at [2.5 k or lower].
Push "Mode" button once to complete additional refrigerant charge.		○ ● ● ● ● ○ ●

4. The refrigerant charge is completed when the specified amount of refrigerant is added. If the refrigerant charge operation is not completed in 30 minutes, make the settings again and restart the operation for another 30 minutes.
(When the Confirmation button is pressed during additional refrigerant charge operation, the operation stops.)
5. Disconnect the refrigerant charge hose, then fully open the liquid-side stop valve.

1.10 Refrigerant Recovery Mode

- The electronic expansion valves in the indoor and outdoor units are fixed in the fully open position for refrigerant recovery.

[Work procedure]

1. Stop equipment operation.

2. Set the service mode.

In service mode 1, press the "MODE" button for 5 seconds to enter service mode 2.	○ ● ● ● ● ● ●
Press the "SET" button to set the LED indicators to the "refrigerant recovery mode" indication.	○ ● ○ ● ○ ● ○
Press the "RETURN" button.	○ ● ● ● ● ● ①
Press the "SET" button to set the LED indicators as shown at right.	○ ● ● ● ● ① ●
Press the "RETURN" button to end the setting operation.	○ ● ● ● ● ○ ●

3. Turn off the power switches of the indoor and outdoor units.

(Turn off the power switch for one of indoor or outdoor unit, then turn off the power switch of the other unit within 10 minutes.)

4. Conduct refrigerant recovery.

5.

Press the "RETURN" button again to return to initial status.	○ ● ● ● ● ● ●
--	---------------

- Cancel the setting in the setting mode or cancel the mode by conducting power reset of the outdoor unit.

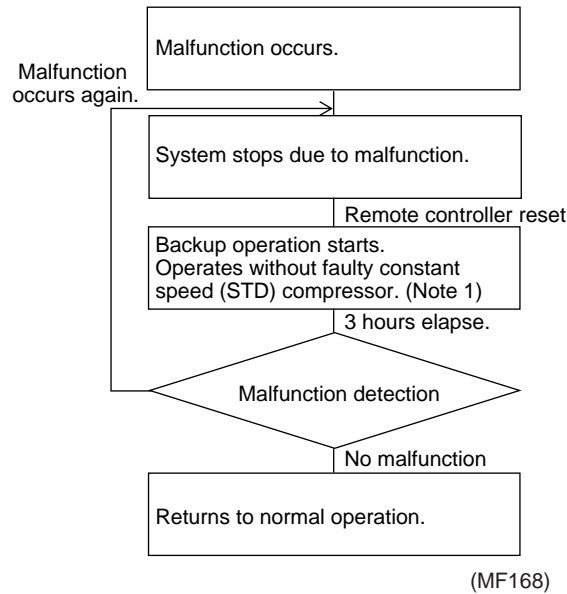
1.11 Backup and Emergency Operation

1.11.1 Backup Operation:

When a constant speed type compressor malfunctions due to OC actuation, if you restart operation by remote controller after the unit stops, you can continue to operate the system without the faulty constant speed type compressor.

The system can run by backup operation for up to 3 hours of total indoor unit operating time. When 3 hours is exceeded and the malfunction still remains, the system once again stops due to malfunction. If the malfunction returns to normal, the system continues to operate as is.

Backup Operation Control Flow



After the system briefly stops due to malfunction in order to call attention to the problem, backup operation is started by remote controller.

For the reason described above, after about 3 hours of backup operation, the system again carries out malfunction detection, and the system once again stops due to malfunction if an error is detected.



Note:

1. < For 2-compressor system >

- When the STD compressor OC operates, the operation continues using only the inverter compressor based on remote control reset. (for 3 hours only)

< For 3-compressor system >

- When OC operates again immediately after a backup operation (within 5 minutes after STD compressor startup), STD1 and STD2 are switched and operation is retried.
- If OC activates again, only the inverter compressor is used for the operation.
- (In any case, the backup operation ends after 3 hours.)
- The compressor in which OC is activated is prohibited to operate until power reset is conducted for a restart.

1.11.2 Emergency Operation:

Set in setting mode 2. Operates the system when an outdoor unit malfunctions.

1. When an inverter type outdoor unit malfunctions

When an inverter type compressor malfunctions, you can continue operation using constant speed type compressors only.

Emergency Operation Method

1. Set to "EMG" in setting mode 2.
and
2. All indoor units connected to this outdoor unit are turned on by thermostat.

Emergency operation stops at the following conditions.

1. Emergency operation mode is reset on outdoor unit PC board.
or
2. One or more indoor units connected to this outdoor unit are turned off by thermostat.

Setting of Emergency Mode

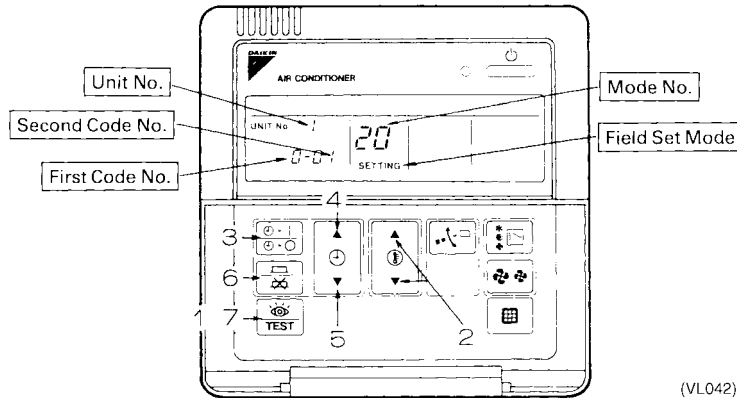
Setting Method	LED Display						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P
Hold down the Mode button for 5 seconds to change to setting Mode 2.	○	●	●	●	●	●	●
Push SET button and select LED display to "Emergency Mode".	○	●	●	●	●	●	●
Push the RETURN button.	○	●	●	●	●	●	⦿
Push SET button and select LED display as shown right.	○	●	●	●	●	⦿	●
Push the RETURN button to enter "Emergency Mode". All indoor units must be thermostat ON.	○	●	●	●	●	○	●

1.12 Indoor Field Setting

Making a field setting

Field settings must be made by remote controller if optional accessories have been installed on the indoor unit, or if the indoor unit or HRV unit's individual functions have been modified.

1.12.1 Wired Remote Controller <BRC1A51>



(VL042)

1. When in the normal mode, push the button for 4 seconds or more, and operation then enters the "field set mode."
2. Select the desired "mode No." with the button.
3. 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.

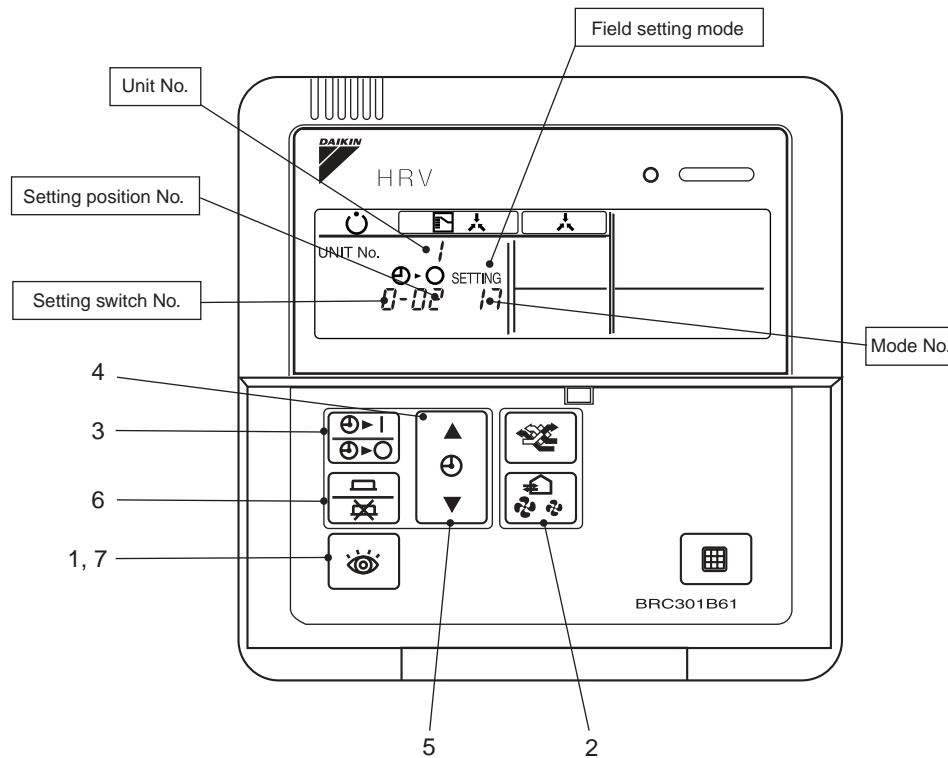
Note: This operation is not required when setting as a group.

4. Push the button and select the first code No.
5. Push the button and select the second code No.
6. Push the timer button one time and "define" the currently set contents.
7. Push the 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".

1.12.2 Wired Remote Controller – Heat Reclaim Ventilation <BRC301B61>



(HL039)

Setting procedure

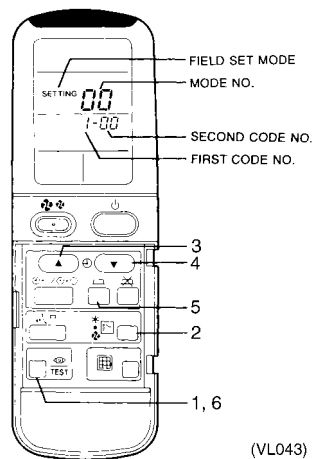
1. In the Normal Mode, press the button for more than 4 seconds to enter the Local Setting mode.
2. Using the (Mode No. UP) and [Ventilation Volume] (Mode No. DOWN) buttons to select a desired Mode No.
3. To set individual Heat Reclaim Ventilation units in group control (select Mode Nos. 27 and 28 (Heat Reclaim Ventilation)), press the button and choose the Unit No. to set. (This step is not necessary in all group unit setting.)
4. Press the UP button to select a Setting Switch No.
5. Press the DOWN button to select a Setting Position No.
6. Press the button once to enter the settings.
7. Depress the button for about 1 second 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 "17," Mode Setting No. to "0" and Setting Position No. to "02."

1.12.3 Wireless Remote Controller — Indoor Unit

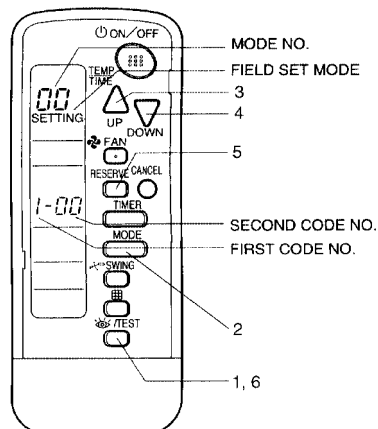
BRC7A type









(VL043)

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

BRC7C type



(V0915)

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

1.12.4 Setting Contents and Code No. – VRV Unit

VRV system indoor unit settings	Mode No. Note 2	Setting Switch No.	Setting Contents		Second Code No.(Note 3)								
					01		02		03		04		
	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.	—	—			
				Long life filter		Approx. 2,500 hrs.		Approx 1,250 hrs.					
				Standard filter		Approx. 200 hrs.		Approx. 100 hrs.					
		1	Long life filter type (FXYC only, 01 indicates long life)			Long life filter		Super long life filter		—		Soot filter	
		2	Thermostat sensor in remote controller			Use		No use		—			
		3	Display time to clean air filter calculation (Set when filter sign is not to be displayed.)			Display		No display		—			
	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	
		1	ON/OFF input from outside (Set when ON/OFF is to be controlled from outside.)			Forced OFF		ON/OFF control		External protection device		—	
		2	Thermostat differential changeover (Set when remote sensor is to be used.) FXYCP, FXYFP, FXYHP only			1℃		0.5℃		—		—	
		3	OFF by thermostat fan speed			LL		Set fan speed		—		—	
		4	Automatic mode differential (automatic temperature differential setting for VRV system heat recovery series cool/heat)			01:0	02:1	03:2	4:03	05:4	6:05	7:06	08:7
		5	Power failure automatic reset			Not equipped		Equipped		—		—	
	13(23)	0	High air outlet velocity (Set when installed in place with ceiling higher than 2.7 m.) FXYF only			N		H		—		—	
		1	Selection of air flow direction (Set when a blocking pad kit has been installed.) FXYF only			F (4 directions)		T (3 directions)		W (2 directions)		—	
		2	Horizontal air discharge			Equipped		Not equipped				—	
3		Air flow direction adjustment (Set at installation of decoration panel.) FXYK only			Equipped		Not equipped				—		
4		Field set air flow position setting			Draft prevention		Standard		Ceiling Soiling prevention		—		
5		Field set fan speed selection (fan speed control by air discharge outlet for phase control)			Standard		Optional accessory 1		Optional accessory 2		—		
15(25)	1	Thermostat OFF excess humidity			Not equipped		Equipped		—		—		
	3	Drain pump humidifier interlock selection			Not equipped		Equipped		—		—		
	4	Sets whether filter sign is to be output by time or by input.			Time addition		Input		—		—		
	5	Field set selection for individual ventilation setting by remote controller			Not equipped		Equipped		—		—		
	6	Field set selection for individual ventilation setting by remote controller			Not equipped		Equipped		—		—		



Notes:

- Settings are made simultaneously for the entire group, however, if you select the mode No. inside parentheses, you can also set by each individual unit. Setting changes however cannot be checked except in the individual mode for those in parentheses.
- The mode numbers inside parentheses cannot be used by wireless remote controllers, so they cannot be set individually. Setting changes also cannot be checked.
- Mode numbers 17 (27) and 19 (29) are HRV functions that can be set from a VRV system remote controller.
- The second code No. is factory set to "01." The field set air flow position setting is however factory set to "02".
- Do not make settings other than those described above. Nothing is displayed for functions the indoor unit is not equipped with.
- "88" may be displayed to indicate the remote controller is resetting when returning to the normal mode.

1.12.5 Field Setting, Service Mode – Heat Reclaim Ventilation (HRV)

1. Field setting
Used for initial setting of heat reclaim ventilation unit.
2. Service mode
Used for confirmation of unit Nos. in the group and reallocation of unit Nos.

List of Field Setting and Service Mode

Heat Reclaim Ventilation (HRV)	Mode No.	Setting switch No.	Setting contents	Setting position					
				01	02	03	04	05	06
	17(27)	0	Filter cleaning time setting	Approx. 2500 hr.	Approx. 1250 hr.	No counting	—	—	—
		2	Pre-cool/pre-heat On/Off setting	Off	On	—	—	—	—
		3	Pre-cool/pre-heat time (min.) setting	30 min.	45 min.	60 min.		—	—
		4	Fan speed initial setting	Normal	Ultra-High	—	—	—	—
		5	Yes / No setting for direct duct Connection with VRV system	No duct (Air flow setting)	With duct (fan off)	—	—	—	—
						Setting for cold areas (Fan operation selection for heater thermostat OFF)	—	—	No duct
					Fan off	Fan L	Fan off	Fan L	
		7	Centralized / individual setting	Centralized	Individual	—	—	—	—
		8	Centralized zone interlock setting	No	Yes	Priority on Operation	—	—	—
	9	Pre-heat time extension setting	0	30 min.	60 min.	90 min.	—	—	
	18(28)	0	External signal setting JC / J2	Last command	Priority on external input	—	—	—	—
		1	Setting for direct power-on	Off	On	—	—	—	—
		2	Auto restart setting	Off	On	—	—	—	—
		4	Indication of ventilation mode / Not indication	Indication	No Indication	—	—	—	—
		7	Fresh up air supply / exhaust setting	No Indication	No Indication	Indication	Indication	—	—
				Supply	Exhaust	Supply	Exhaust	—	—
		8	External input terminal function selection (between J1 and JC)	Fresh up	Overall alarm	Overall malfunction	Forced off	Fan forced off	Air flow increase
		9	KRP50-2 output switching selection (between 1 and 3)	Humidify	Abnormal	Fan on / off	—	—	—
		19(29)	0	Air flow setting	Low	Low	Low	Low	High
	2		Ventilation mode setting	Automatic	Total heat exchange	Normal	—	—	—
	3		Fresh up operation	OFF	ON	—	—	—	—
	8		Electric heater setting	No delay	No delay	ON / OFF Delay	ON / OFF Delay	—	—

**Note:**







1. All the setting can be made by the remote controller for VRV and HRV unit.
The setting of mode No. 19 (29) and 40 can be made only by the remote controller for VRV unit. The mode No. 30 is used for the individual setting such as the calculation of power bill, etc.
2. The mode No. in () is used for making individual setting of each unit.
3. **Group number setting for centralized controller**
 1. Mode no. 00: Group controller
 2. Mode no. 30: Individual controller
 - * Regarding the setting procedure, refer to the section “Group number setting for centralized control” in the operating manual of either the on / off controller or the central controller.

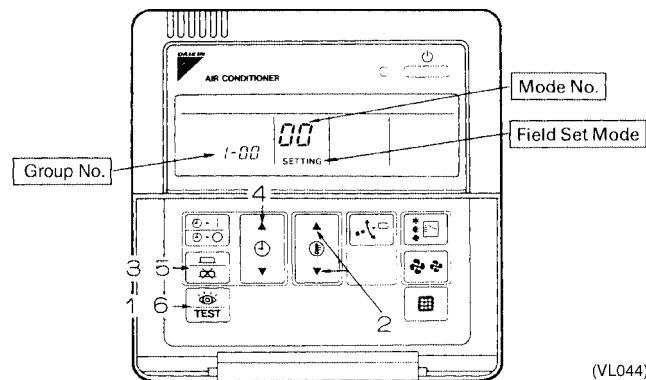
**Caution**

1. The setting positions are set at “01” at the factory.
The ventilation air flow, however, is set at “05” (medium) in the HRV unit. When lower or higher setting is desired, change the setting after installation.

1.13 Centralized Control Group No. Setting



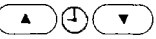


BRC1A51-52

- 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  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  button to return to the normal mode.

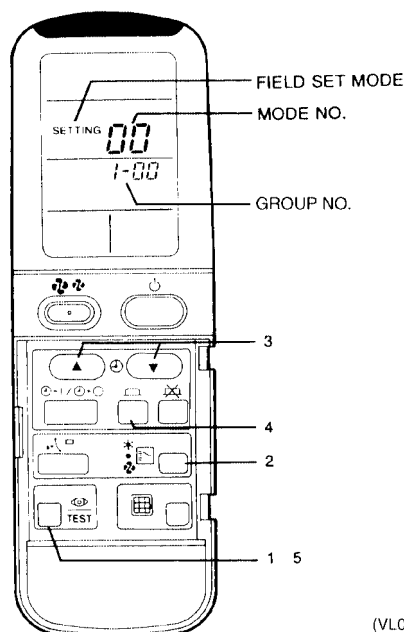


- Even if not using a remote controller, connect the remote controller when setting the group No., set the group No. for centralized control, and disconnect after making the setting.
- Set the group No. after turning on the power supply for the central remote controller, unified ON/OFF controller, and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

BRC7A Type







- Group No. setting by wireless remote controller for centralized control
1. When in the normal mode, push  button for 4 seconds or more, and operation then enters the "field set mode."
 2. Set mode No. "00" with  button.
 3. Set the group No. for each group with  button (advance/backward).
 4. Enter the selected group numbers by pushing  button.
 5. Push  button and return to the normal mode.

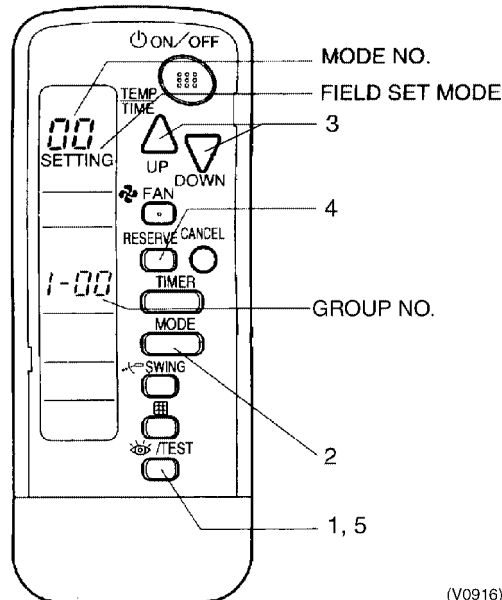
BRC7A Type



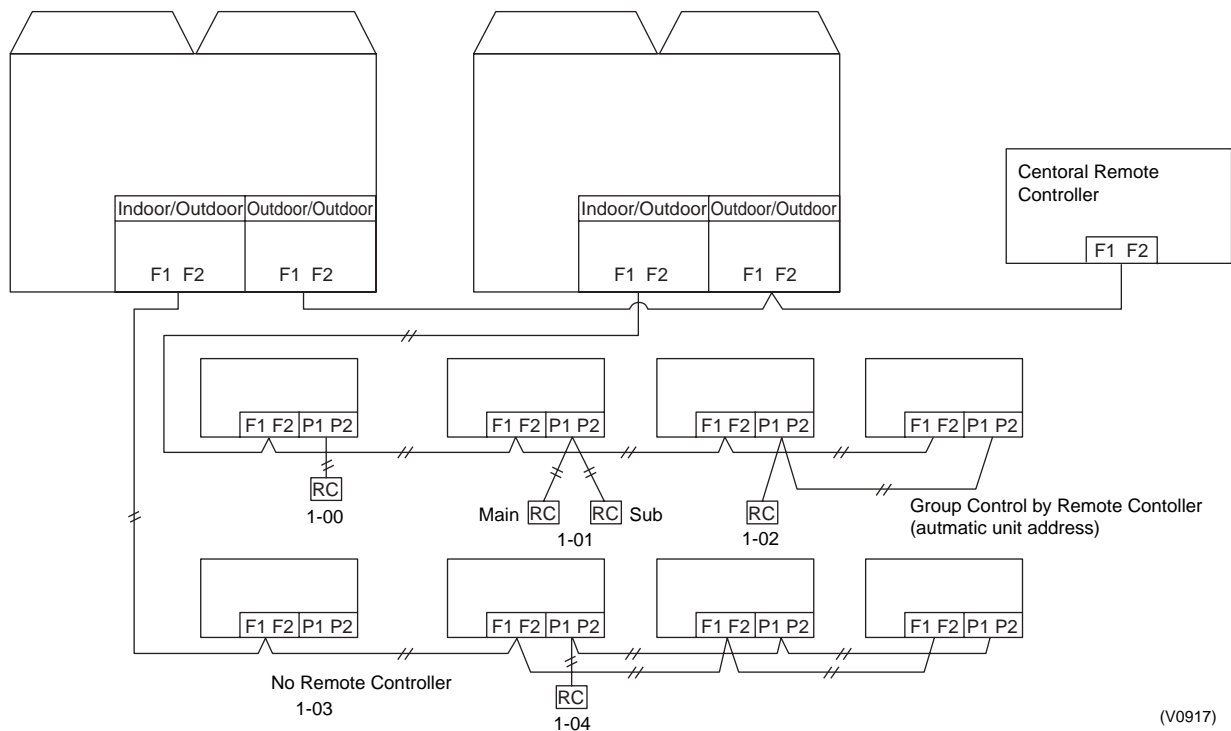
BRC7C Type

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

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

BRC7C Type

(V0916)

Group No. Setting Example

(V0917)

**Caution**

- If you have to set the address for each unit for calculating cost, etc., set the mode No. to "30."

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

This is not an operative fault.

1.14 Contents of Control Modes

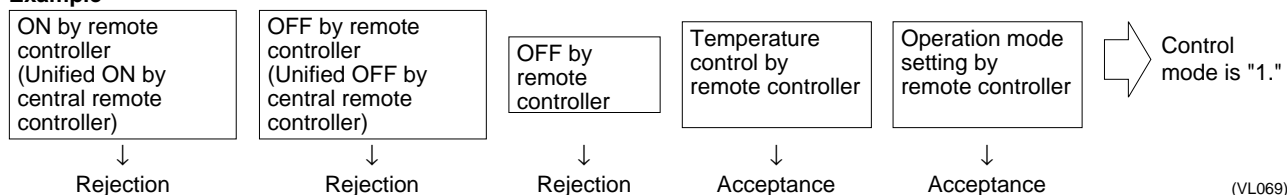
Twenty modes consisting of combinations of the following five operation modes with temperature and operation mode setting by remote controller can be set and displayed by operation modes 0 through 19.

- ◆ ON/OFF control impossible by remote controller
Used when you want to turn on/off by central remote controller only.
(Cannot be turned on/off by remote controller.)
- ◆ OFF control only possible by remote controller
Used when you want to turn on by 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

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

Example

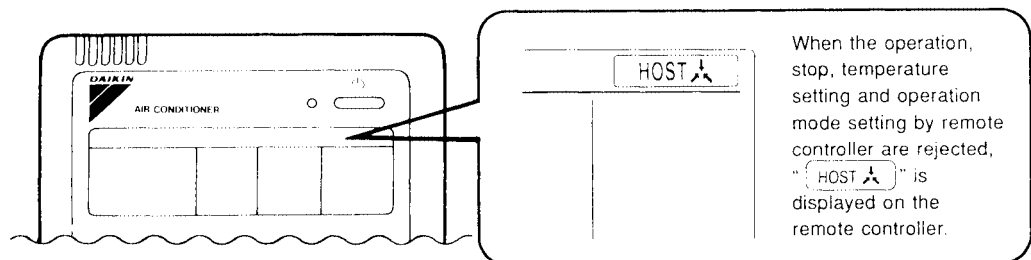


(VL069)

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	Rejection	Acceptance	2
						Rejection	12
					Acceptance	Acceptance	3
						Rejection	13
Centralized	Acceptance	Acceptance			Rejection	Acceptance	4
						Rejection	14
					Acceptance	Acceptance	5
						Rejection	15
Individual			Acceptance	Acceptance	Rejection	Acceptance	6
						Rejection	16
					Acceptance	Acceptance	7 ★1
						Rejection	17
Timer operation possible by remote controller	Acceptance (During timer at ON position only)	Acceptance (During timer at ON position only)			Rejection	Acceptance	8
						Rejection	18
					Acceptance	Acceptance	9
						Rejection	19

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

★1. Factory setting



(VL070)

Part 5

Troubleshooting

R-407C *VRV*TM PLUS Series

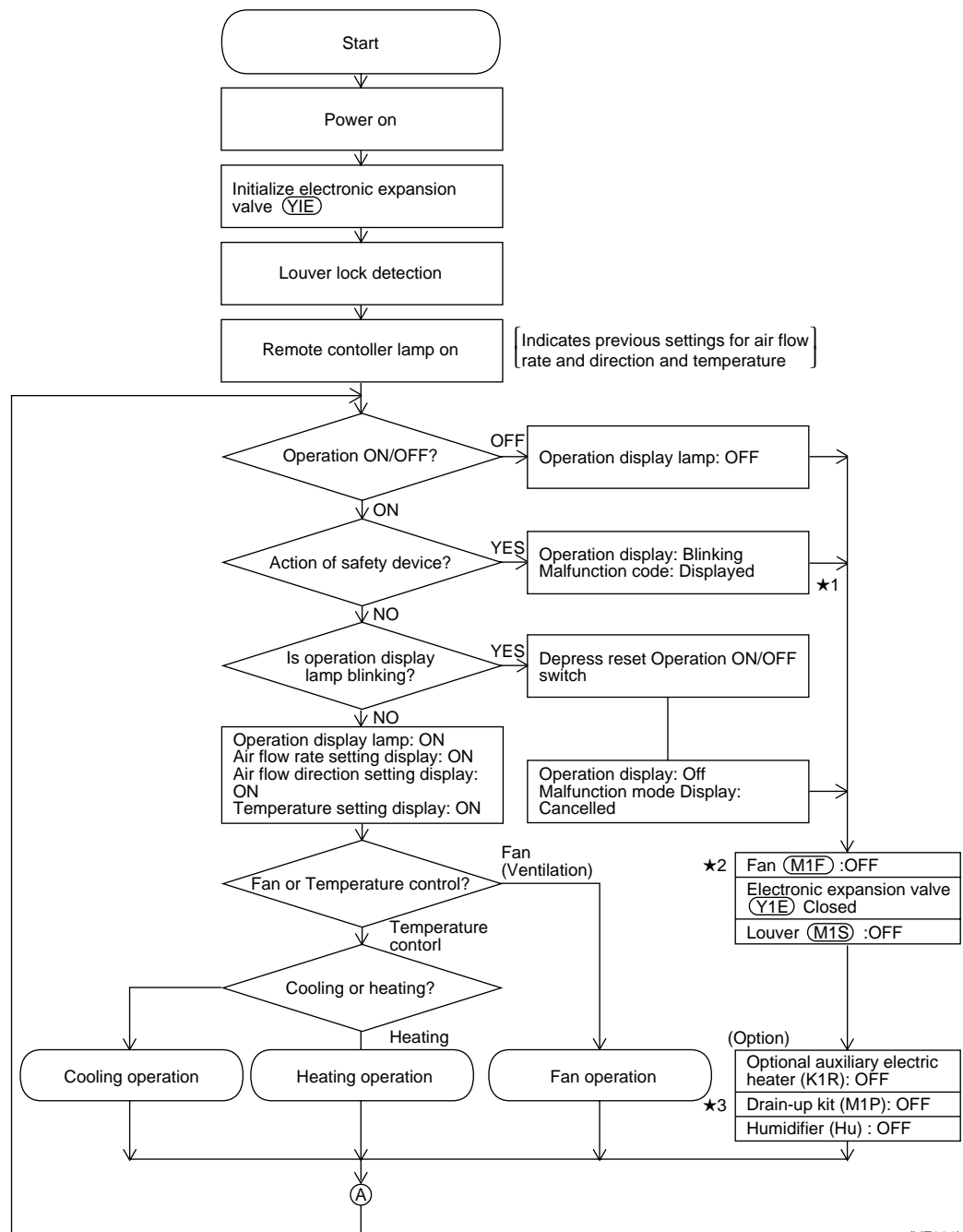
Heat Recovery System

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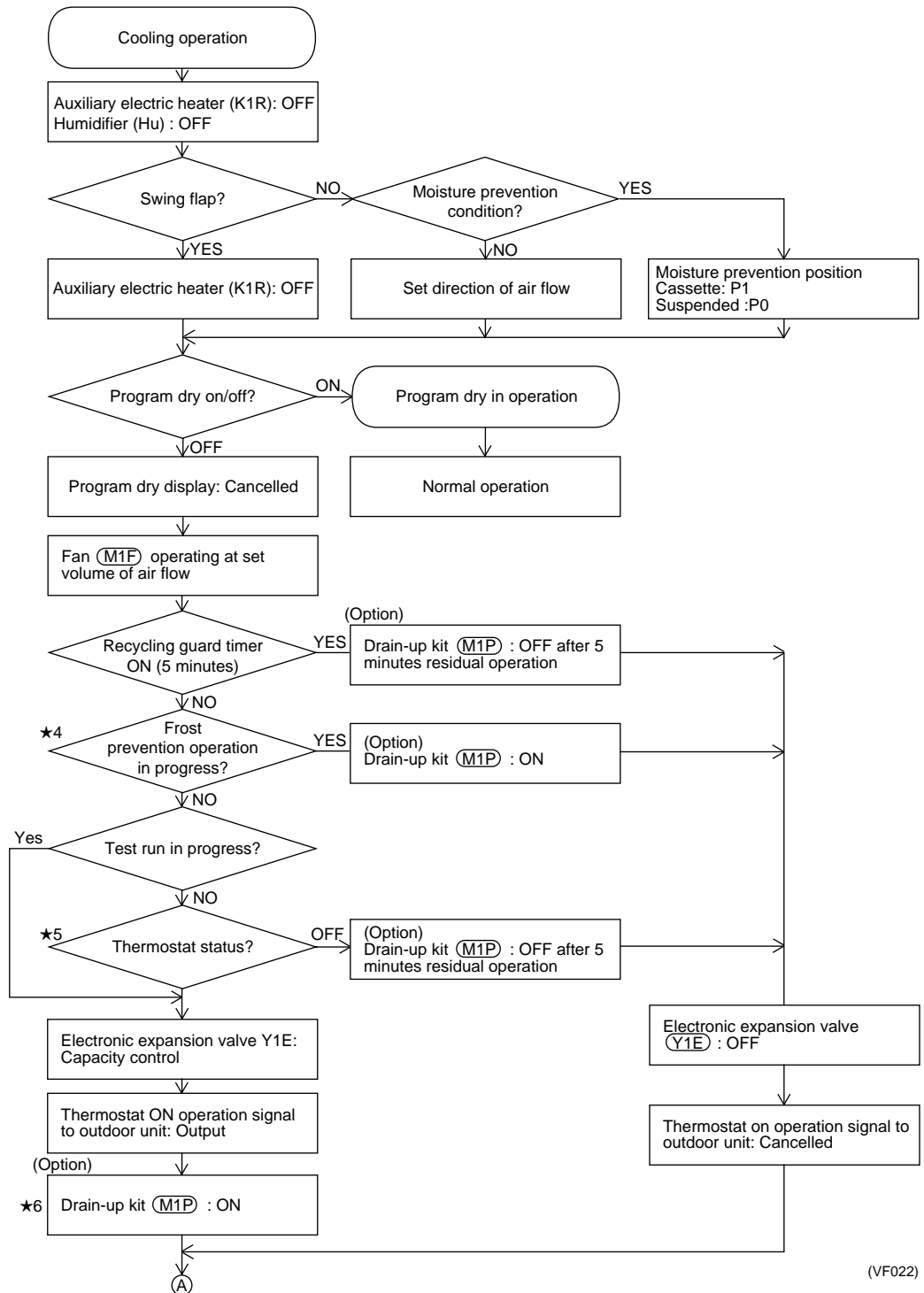
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1. Operation Flowcharts

1.1 Indoor Unit Operation Flowchart

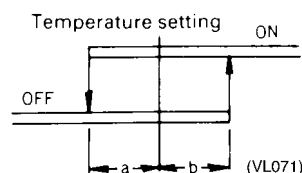


- ★1 In the event of a malfunction, the malfunction code is displayed in the remote controller's malfunction code display.
- ★2 When the auxiliary electric heater is on, the fan stops after one minute residual operation.
- ★3 When the drain-up kit is ON, it stops after five minutes residual operation.



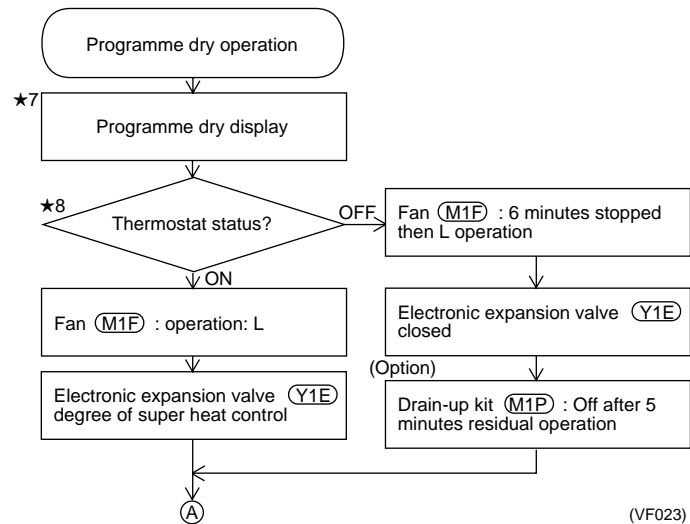
- ★4 If the evaporator inlet temperature is -5°C or lower for a total of 10 minutes, or is -1°C or lower for a total of 40 minutes, frost prevention operation is initiated. Normal operation resumes when the temperature is $+7^{\circ}\text{C}$ or higher for 10 consecutive minutes.
- ★5 Thermostat status
- ★6 The drain-up kit is standard equipment for models FXYCP, FXYFP, FXYKP and FXYSP.

Preset temperature

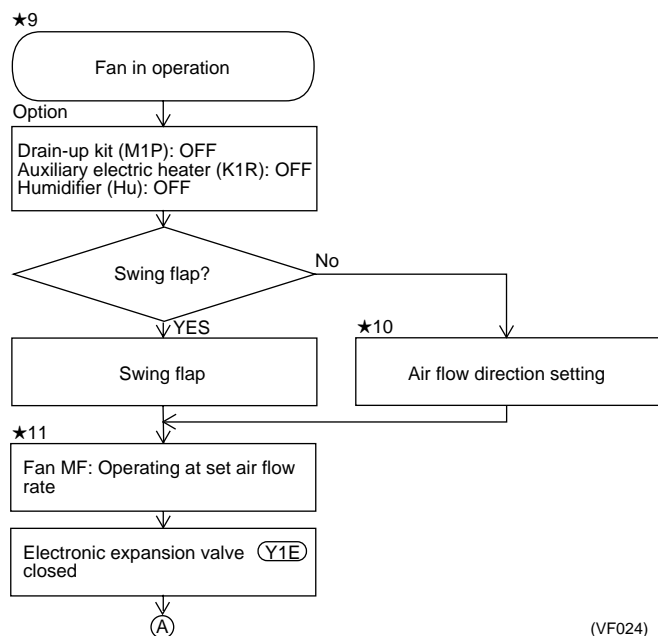
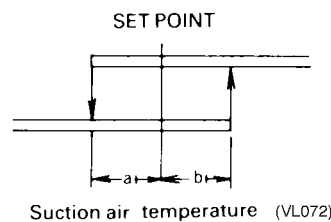


Intake air temperature

$a = b = 1$ ($a = b = 0.5$ possible for FXYCP, FXYFP, FXYHP, FXYKP only.)



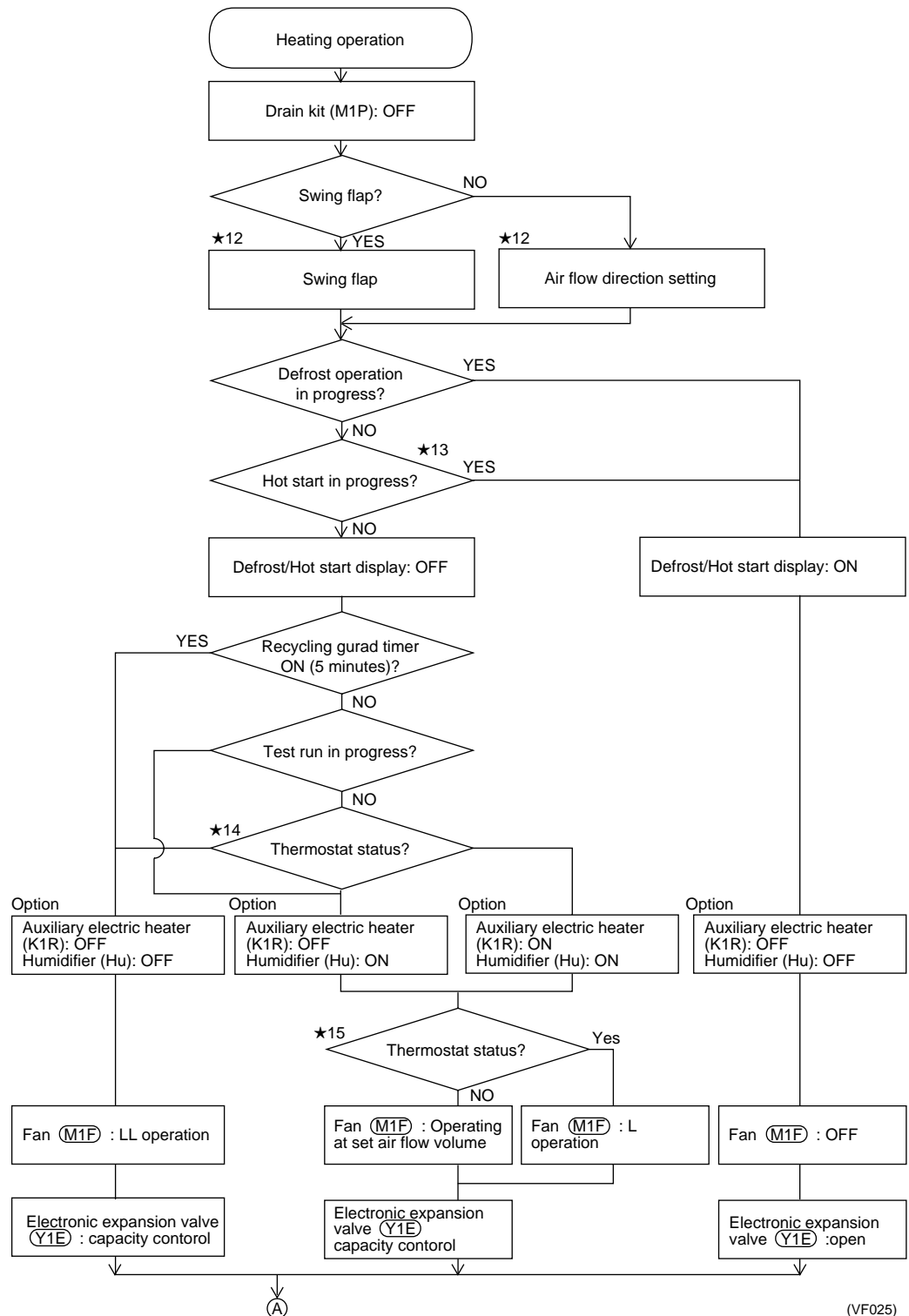
- ★7 Programme dry display
Does not display preset temperature and air flow settings of the controller.
- ★8 Thermostat status
Preset temperature during programme dry operation



- ★9 Fan operation
When fan operation has been selected using the remote controller, operation is turned OFF by thermostat when temperature control operation has been selected.
- ★10 Air flow direction setting
If fan operation is selected with the remote controller, air discharge is 100% horizontal during heating.

★11 Fan

If fan operation is selected with the remote controller, LL speed operation is carried out during heating.



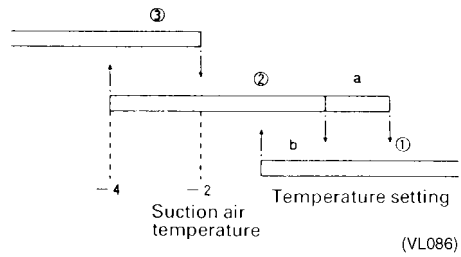
★12 Air flow direction

Air discharge is 100% horizontal when heating operation is turned off by thermostat.

★13 Hot start

Hot start is carried out when operation starts or defrosting is complete, and condenser inlet temperature exceeds 34°C, or 3 minutes elapses, or when Tc > 52°C.

★14. Thermostat status



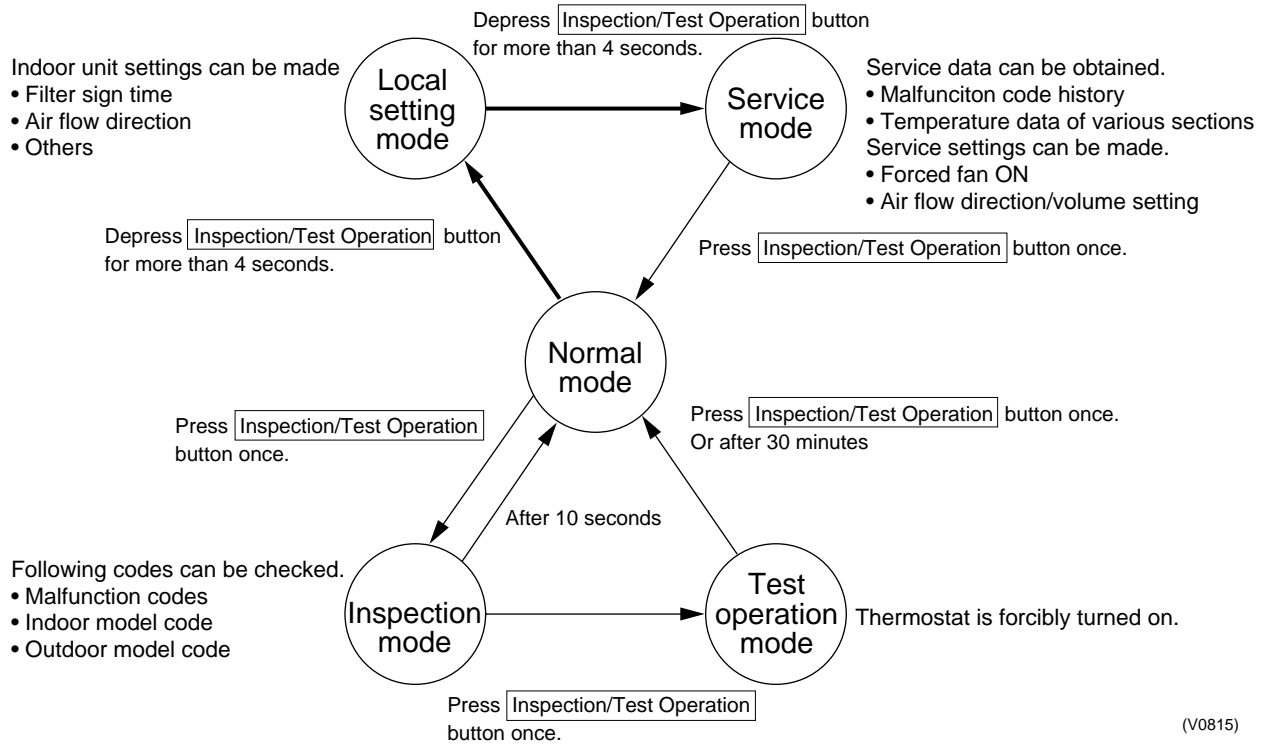
★15 Low discharge air temperature protection

Protection is effected when the preset temperature is 24°C or lower and the opening of the electronic expansion valve is slight.

2. Troubleshooting by Remote Controller

2.1 The INSPECTION / TEST Button

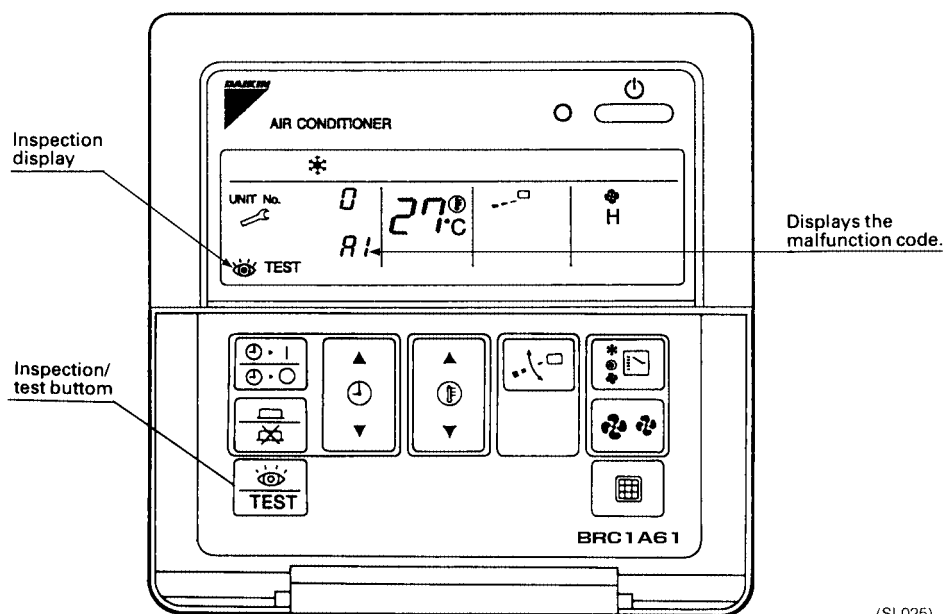
The following modes can be selected by using the [Inspection/Test Operation] button on the remote control.



2.2 Self-diagnosis by Wired Remote Controller

Explanation

If operation stops due to malfunction, the remote controller's operation LED blinks, and 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 153 for malfunction code and malfunction contents.



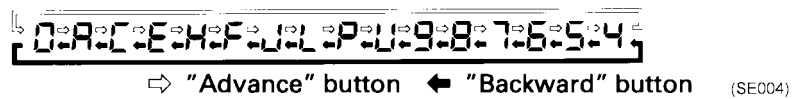
(SL025)

2.3 Self-diagnosis by Wireless Remote Controller

In Case of BRC7A~ Type

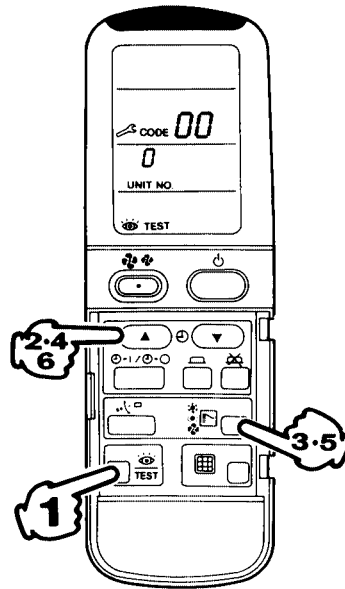
If operation stops due to malfunction, the light reception section operation LED blinks. The malfunction code can be decided by the following procedure. (If operation stops due to malfunction, you can find out the cause by checking the malfunction code, or you can find out what the most recent malfunction code is during normal operation.)

1. Push INSPECTION/TEST, and select "inspection."
Operation then enters the inspection mode. "UNIT" lights and unit No. display "0" blinks.
2. Unit No. setting
Change the unit No. by pushing the "advance" or "backward" button, and continue pushing until the buzzer (★1) sounds from the indoor unit.
★1 Buzzer sound times
3 times : Carry out all of the following operations.
1 time : Carry out operations 3 and 4. Carry out operation 4 until the buzzer sounds continuously. When the buzzer sounds continuously. The malfunction code is set.
Continuous : There is no malfunction.
- The upper digit of the code changes as shown below by pushing the "advance" or "backward" button.



3. Push the operation mode selector button. The "0" (upper digit) on the left side of the malfunction code blinks.
4. Malfunction code upper digit diagnosis Push the "advance" or "backward" button until the malfunction code matching buzzer (★2) sounds and select the malfunction code upper digit.
★2 Buzzer sound times
Continuous : Both upper and lower digit agree. (Malfunction code set)
2 times : Upper digit agrees
1 time : Lower digit agrees
5. Push the operation mode selector button.
The "0" (upper digit) on the right side of the malfunction code blinks.
6. Malfunction code lower digit diagnosis Push the "advance" or "backward" button until the malfunction code matching buzzer sounds continuously, and select the malfunction code lower digit.
- The lower digit of the code changes as shown below by pushing the "advance" or "backward" button.

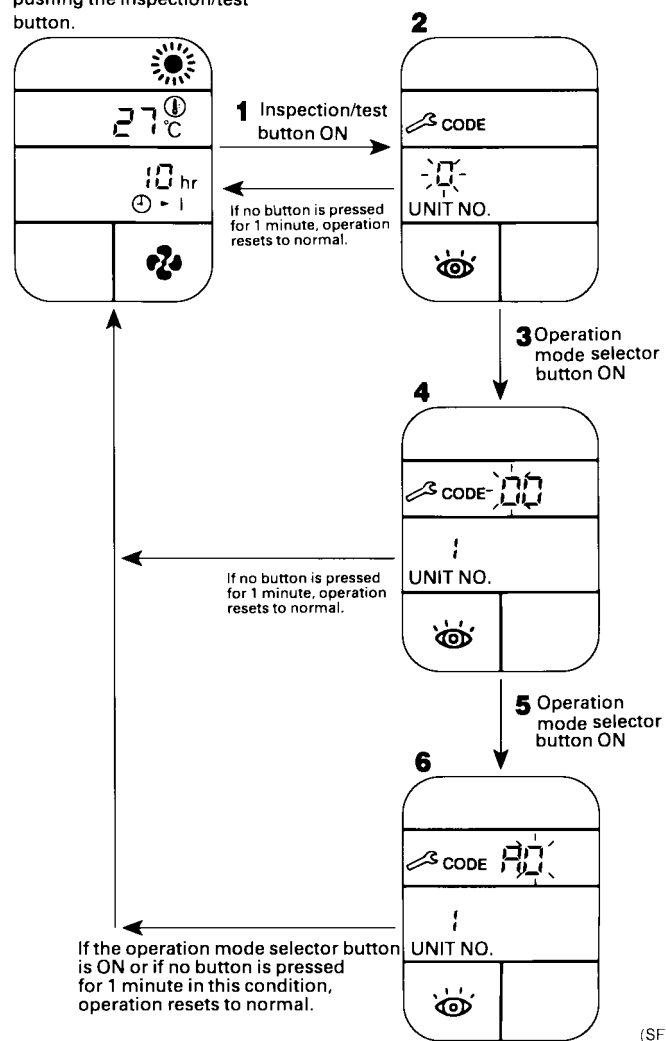




(SL026)

Normal status

You can enter the inspection mode from normal status by pushing the inspection/test button.



(SF007)

In the Case of BRC7C ~ Type

If equipment stops due to a malfunction, the operation indicating LED on the light reception section flashes.

The malfunction code can be determined by following the procedure described below. (The malfunction code is displayed when an operation error has occurred. In normal condition, the malfunction code of the last problem is displayed.)

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



★2 Number of beeps

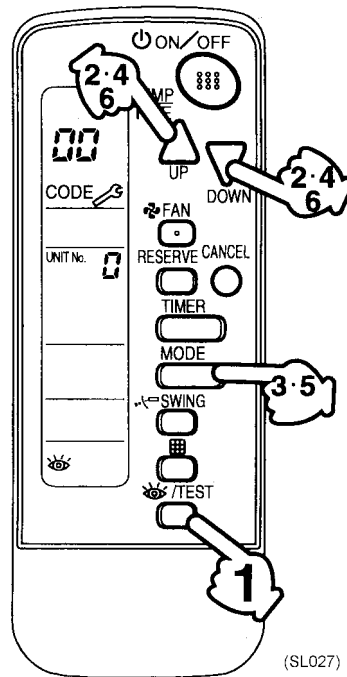
Continuous beep : Both upper and lower digits matched. (Malfunction code confirmed)

2 short beeps : Upper digit matched.

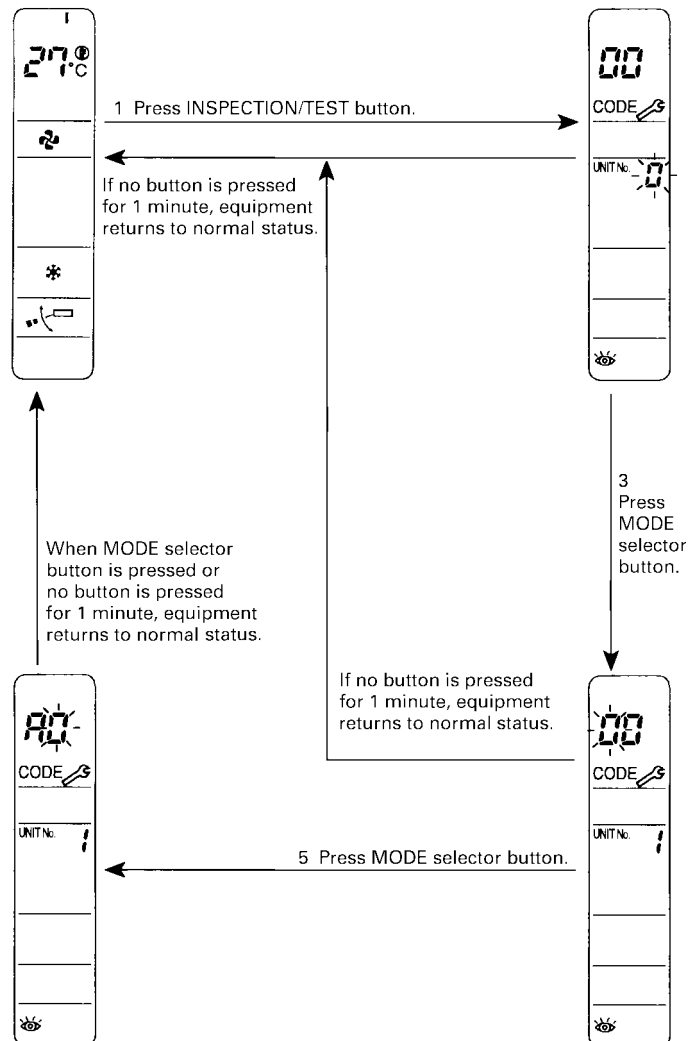
1 short beep : Lower digit matched.

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.

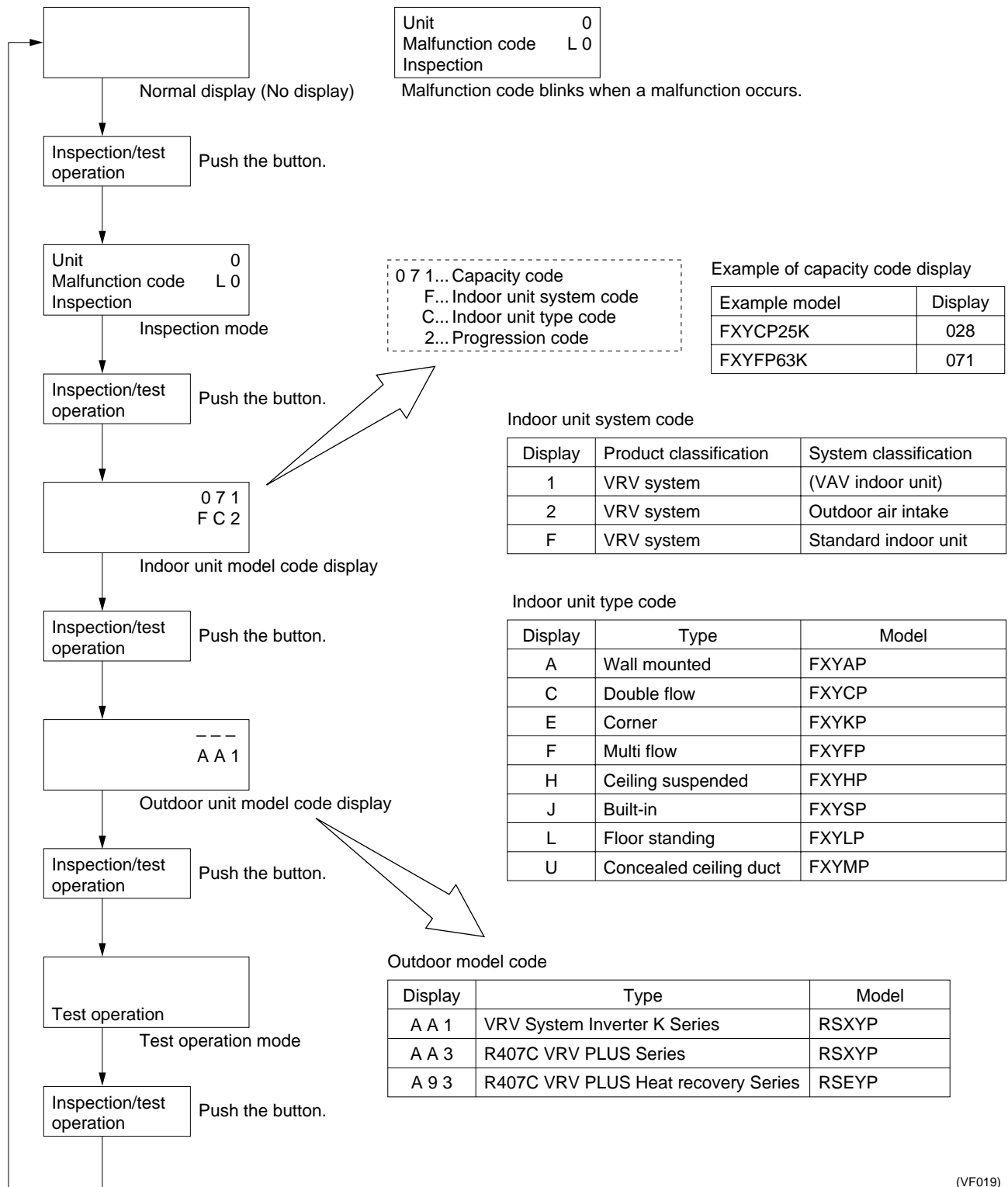




Normal status
 Enters inspection mode from normal status when the INSPECTION/TEST button is pressed.

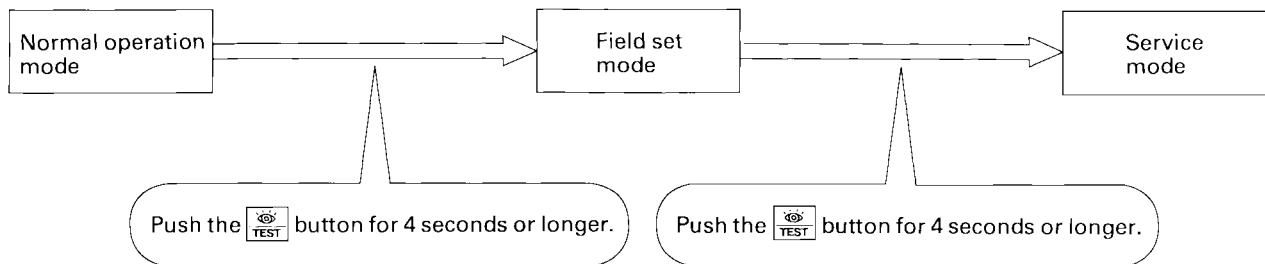


2.4 Operation of The Remote Controller's Inspection / Test Operation Button



2.5 Remote Controller 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.

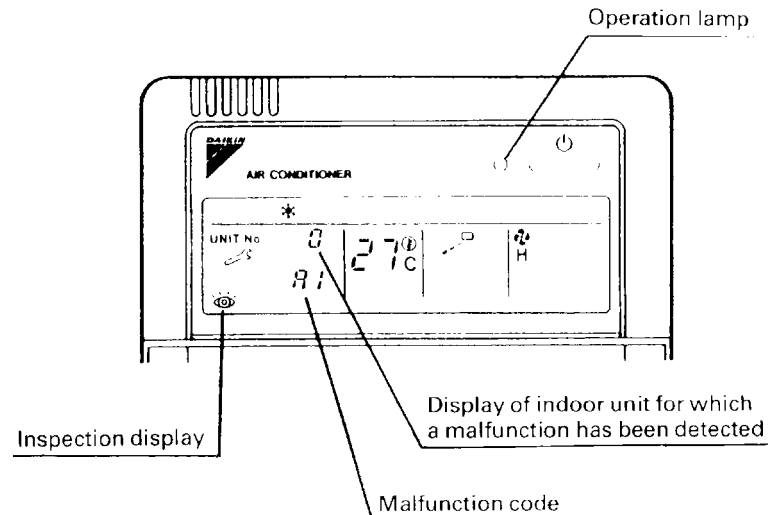
Push the button one time.

Mode No	Function	Contents and operation method	Remote controller display example
40	Malfunction hysteresis display	<p>Display malfunction hysteresis.</p> <p>The hysteresis No. can be changed with the  button.</p>	<p>Unit 1 Malfunction code 40</p> <p>2-U4 Malfunction code Hysteresis No: 1 - 9 1: Latest</p> <p>(VE007)</p>
41	Display of sensor and address data	<p>Display various types of data.</p> <p>Select the data to be displayed with the  button.</p> <p>Sensor data 0: Thermostat sensor in remote controller. 1: Suction 2: Liquid pipe 3: Gas pipe</p> <p>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</p>	<p>Sensor data display</p> <p>Unit No. Sensor type 1 1 2 7 41 Temperature °C</p> <p>Address display</p> <p>Unit No. Address type 1 8 1 41 Address</p> <p>(VE008)</p>
43	Forced fan ON	<p>Manually turn the fan ON by each unit. (When you want to search for the unit No.)</p> <p>By selecting the unit No. with the  button, you can turn the fan of each indoor unit on (forced ON) individually.</p>	<p>Unit 1 43</p> <p>(VE009)</p>
44	Individual setting	<p>Set the fan speed and air flow direction by each unit</p> <p>Select the unit No. with the time mode  button.</p> <p>Set the fan speed with the  button</p> <p>Set the air flow direction with the  button.</p>	<p>Unit 1 Code 44</p> <p>1 3 Fan speed 1: Low 3: High Air flow direction P0 - P4</p> <p>(VE010)</p>
45	Unit No. transfer	<p>Transfer unit No.</p> <p>Select the unit No. with the  button. Set the unit No. after transfer with the  button.</p>	<p>Present unit No.</p> <p>Unit 1 Code 45 0 2 Unit No. after transfer</p> <p>(VE011)</p>
46	This function is not used by VRV System Inverter K Series.		
47			

2.6 Remote Controller Self-Diagnosis Function

The remote controller switches are equipped with a self diagnosis function so that more appropriate maintenance can be carried out. If a malfunction occurs during operation, the operation lamp, malfunction code and display of malfunctioning unit No. let you know the contents and location of the malfunction.


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 lets you know the unit No. during group control.



(VL050)

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	Page Referred
Indoor Unit	A0	●	●	●	Error of external protection device	157
	A1	●	●	●	PC board defect	158
	A1	○	●	●	PC board defect	158
	A3	●	●	●	Malfunction of drain level control system (33H)	159
	A6	●	●	●	Fan motor lock	160
	A7	○	●	●	Malfunction of swing flap motor (M1S)	161
	A9	●	●	●	Malfunction of moving part of electronic expansion valve (Y1E)	162
	AF	○	●	●	Drain level above limit	163
	AH	●	●	●	Malfunction of air filter maintenance	—
	AJ	●	●	●	Malfunction of capacity determination device	164
	C4	●	●	●	Malfunction of thermistor (R2T) for liquid pipe (loose connection, disconnection, short circuit, failure)	165
	C5	●	●	●	Malfunction of thermistor (R3T) for gas pipes (loose connection, disconnection, short circuit, failure)	166
	C9	●	●	●	Malfunction of thermistor (R1T) for air inlet (loose connection, disconnection, short circuit, failure)	167
	CJ	○	○	○	Malfunction of thermostat sensor in remote controller	168
Outdoor Unit	E0	●	●	●	Actuation of safety device	169
	E1	●	●	●	PC board defect	170
	E1	○	●	●	PC board defect	170
	E3	●	●	●	Actuation of high pressure switch	171
	E4	●	●	●	Actuation of low pressure sensor	172
	E9	●	●	●	Malfunction of moving part of electronic expansion valve (Y1E)	173
	F3	●	●	●	Abnormal discharge pipe temperature	174
	H3	○	●	●	High pressure switch failure	—
	H4	●	●	●	Actuation of low pressure switch	—
	H9	●	●	●	Malfunction of thermistor (R1T) for outdoor air (loose connection, disconnection, short circuit, failure)	175
	H9	○	●	●	Malfunction of thermistor (R1T) for outdoor air (loose connection, disconnection, short circuit, failure)	175
	J1	●	●	●	Malfunction of pressure sensor	—
	J3	●	●	●	Malfunction of discharge pipe thermistor (R3T) (loose connection, disconnection, short circuit, failure)	176
	J3	○	●	●	Malfunction of discharge pipe thermistor (R3T) (loose connection, disconnection, short circuit, failure)	176
	J5	●	●	●	Malfunction of thermistor (R4T) for suction pipe (loose connection, disconnection, short circuit, failure)	177

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	Page Referred
Outdoor Unit	J6	●	●	●	Malfunction of thermistor (R2T) for heat exchanger (loose connection, disconnection, short circuit, failure)	178
	J6	○	●	●	Malfunction of thermistor (R2T) for heat exchanger (loose connection, disconnection, short circuit, failure)	178
	JA	●	●	●	Malfunction of discharge pipe pressure sensor	179
	JC	●	●	●	Malfunction of suction pipe pressure sensor	180
	JH	○	●	●	Malfunction of oil temperature sensor	—
	L0	●	●	●	Failure of inverter system	—
	L4	●	●	●	Malfunction of inverter radiating fin temperature rise	195
	L5	●	●	●	Inverter instantaneous over-current	196
	L6	●	●	●	Compressor motor insulation defect, short circuit	—
	L8	●	●	●	Inverter thermostat sensor, Compressor overload	197
	L9	●	●	●	Inverter stall prevention, Compressor lock	198
	LA	●	●	●	Malfunction of power unit	—
	LC	●	●	●	Malfunction of transmission between inverter and control PC board	199
System	P0	●	●	●	Gas depletion (heat build up)	—
	P1	●	●	●	Inverter over-ripple protection	202
	P4	●	●	●	Malfunction of inverter radiating fin temperature sensor	203
	U0	○	●	●	Low pressure drop due to refrigerant shortage or electronic expansion valve failure	181
	U1	●	●	●	Negative phase / open phase	182
	U2	●	●	●	Power supply insufficient or instantaneous failure	201
	U4	●	●	●	Malfunction of transmission between indoor unit	183
	U5	●	●	●	Malfunction of transmission between remote controller and indoor unit	184
	U5	●	○	●	Failure of remote controller PC board or setting during control by remote controller	—
	U7	●	●	●	Malfunction of transmission between indoor units Malfunction of transmission between outdoor units, malfunction of transmission between outdoor unit and ice build-up heat unit	—
	U7	○	●	●	Malfunction of transmission between outdoor units (cool/heat unified, low noise)	185
	U8	●	●	●	Malfunction of transmission between master and slave remote controllers (malfunction of slave remote controller)	186
	U9	●	●	●	Malfunction of transmission between indoor unit and outdoor unit in same system	187
	UA	●	●	●	Excessive number of indoor units	188
	UC	○	○	○	Address duplication of central remote controller	190
	UE	●	●	●	Malfunction of transmission between indoor unit and central remote controller	204
	UF	●	●	●	Refrigerant system not set, incompatible wiring / piping	191
	UH	●	●	●	Malfunction of system, refrigerant system address undefined	192

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

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	Page Referred
Centralized Control and Schedule Timer	UE	●	●	●	Malfunction of transmission between central remote controller and indoor unit	204 209
	M1	○ or ●	●	●	PC board defect	205 210
	M8	○ or ●	●	●	Malfunction of transmission between optional controllers for centralized control	206 211
	MA	○ or ●	●	●	Improper combination of optional controllers for centralized control	207 212
	MC	○ or ●	●	●	Address duplication, improper setting	208 213
Heat Reclaim Ventilation	60	○	●	●	Overall alarm	—
		●	●	●	Overall malfunction	—
	64	○	●	●	Inside air thermistor error	—
	65	○	●	●	Outside air thermistor error	—
	6A	○	●	●	Damper system alarm	—
	6A	●	●	●	Damper system + thermistor error	—
	U5	●	●	●	Data transmission error between LCD remote controller and main unit	—
	U5	●	●	●	LCD remote controller connection error	—
	U8	●	●	●	Data transmission error between master-slave LCD remote controllers	—
	UA	●	●	●	LCD remote controller connection error (no remote controller for air conditioner in air conditioner group)	—
	UC	○	○	○	Overlapping central control address	—
	UE	●	●	●	Transmission error between the unit and centralized controller	—

In case of the malfunction with the shaded error code, the unit still operates. However, be sure to have it inspected and repaired and as soon as possible.



Note: Refer service manual Si71-001 for more detail of heat reclaim ventilation troubleshooting.

3. Troubleshooting

3.1 Indoor Unit: Error of External Protection Device

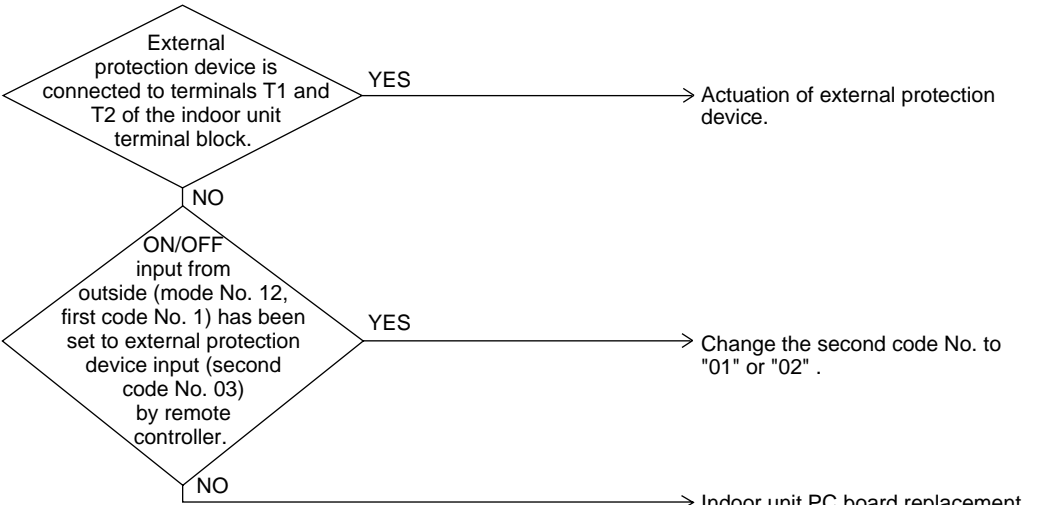
Remote Controller Display	<i>RD</i>
Supposed Causes	<div><div></div>■ Actuation of external protection device</div> <div><div></div>■ Improper field set</div> <div><div></div>■ Defect of indoor unit PC board</div>

Troubleshooting



Caution

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



(VF029)

3.2 Indoor Unit: PC Board Defect

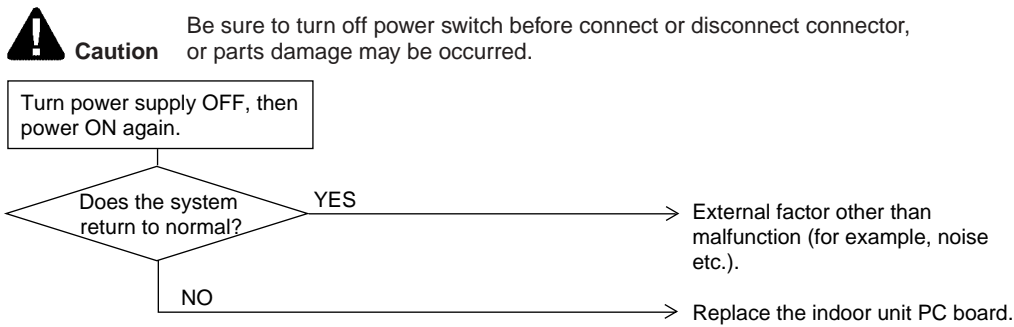
Remote
Controller
Display

A1

Supposed
Causes

- Defect of indoor unit PC board

Troubleshooting



(V0816)

3.3 Indoor Unit: Malfunction of Drain Level Control System (33H)

Remote
Controller
Display

R3

Supposed
Causes

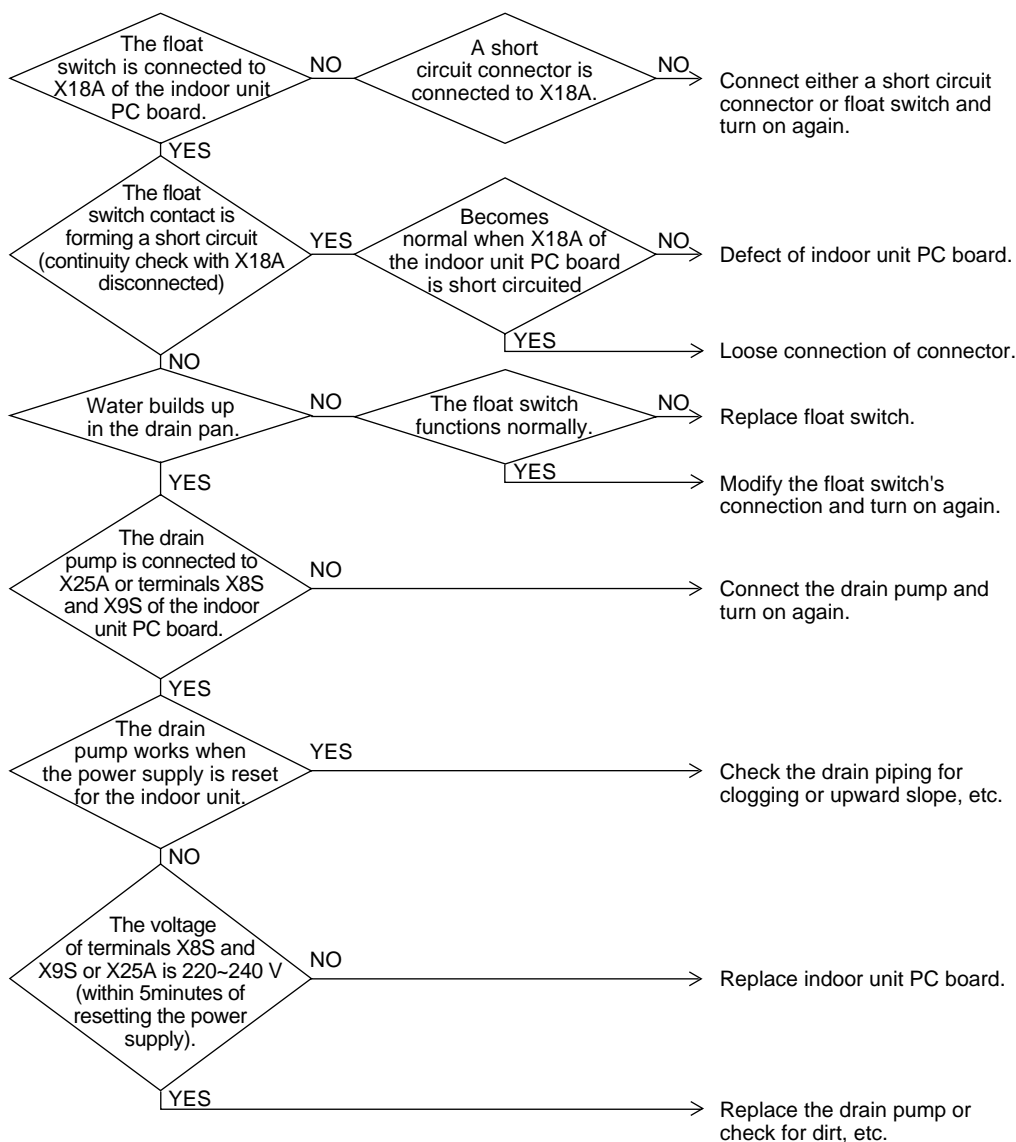
- Defect of float switch or short circuit connector
- Defect of drain pump
- Drain clogging, upward slope, etc.
- Defect of indoor unit PC board
- Loose connection of connector

Troubleshooting



Caution

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



(VF030)

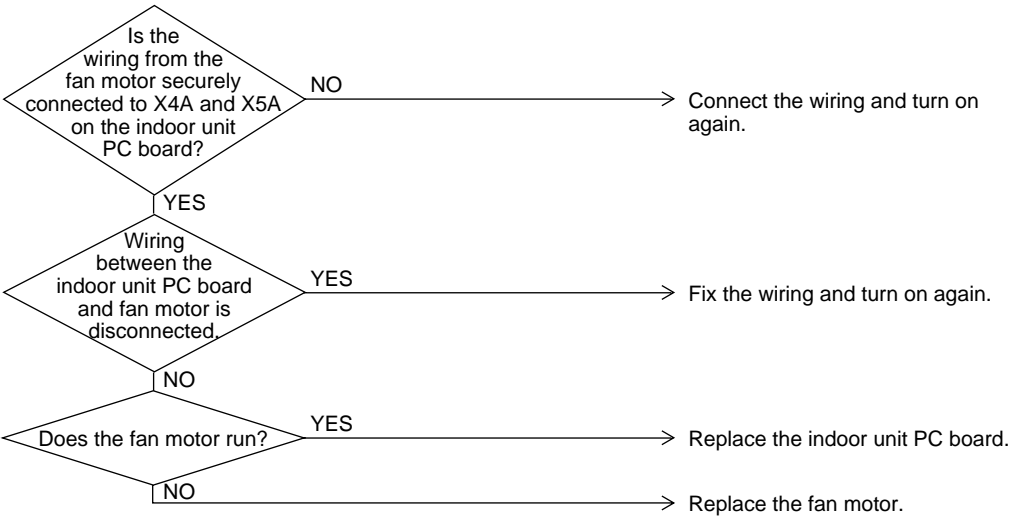
3.4 Indoor Unit: Fan Motor (M1F) Lock, Overload

Remote Controller Display	<i>AB</i>
Supposed Causes	<div><div></div> Fan motor lock</div> <div><div></div> Disconnected or faulty wiring between fan motor and PC board</div>
Troubleshooting	



Caution

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



(VF031)

3.5 Indoor Unit: Malfunction of Swing Flap Motor (M1S)

Remote
Controller
Display

A7

Supposed
Causes

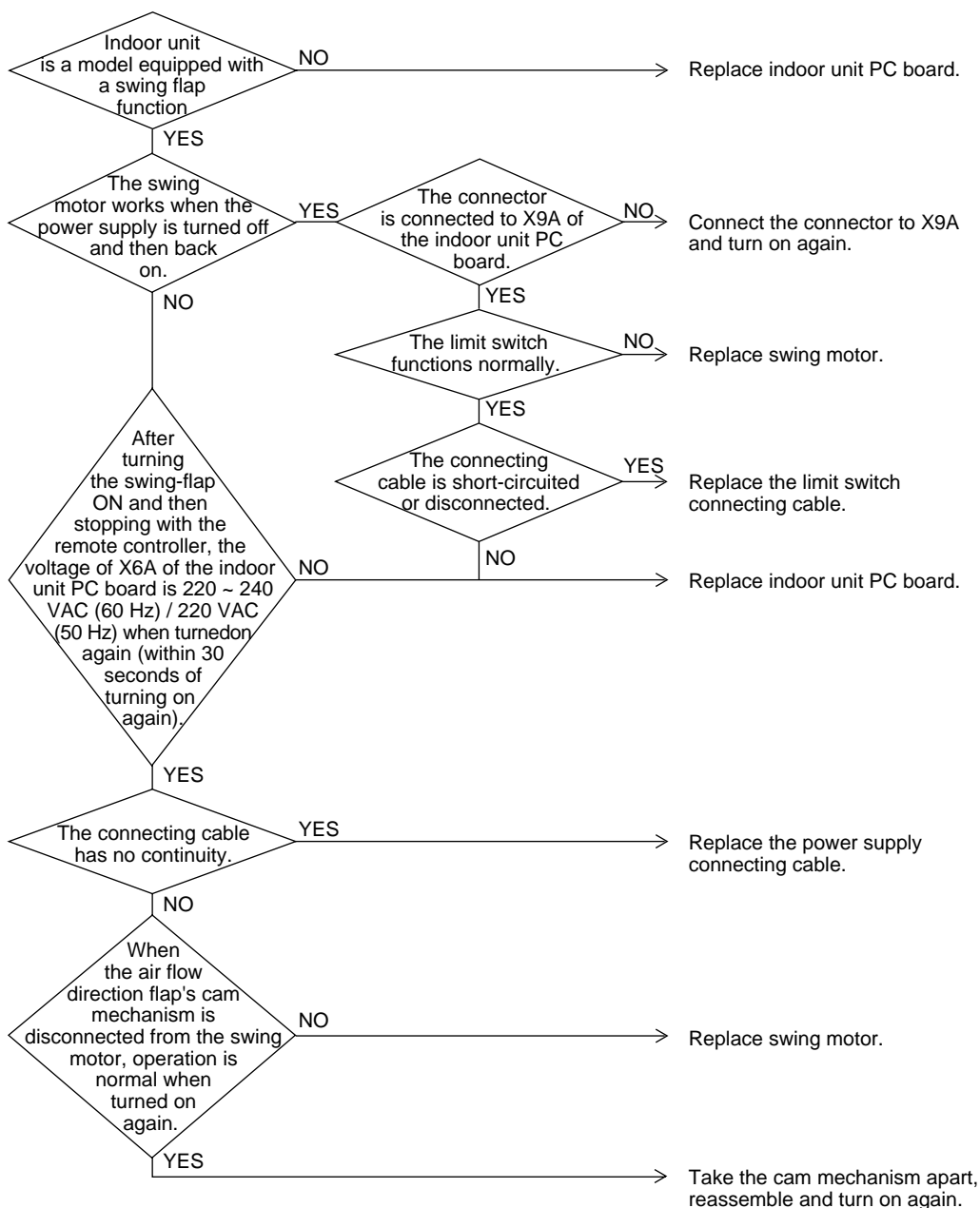
- Defect of swing motor
- Defect of connection cable (power supply and limit switch)
- Defect of air flow direction adjusting flap-cam
- Defect of indoor unit PC board

Troubleshooting



Caution

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



(VF032)

3.6 Indoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E)

Remote
Controller
Display

R9

Supposed
Causes

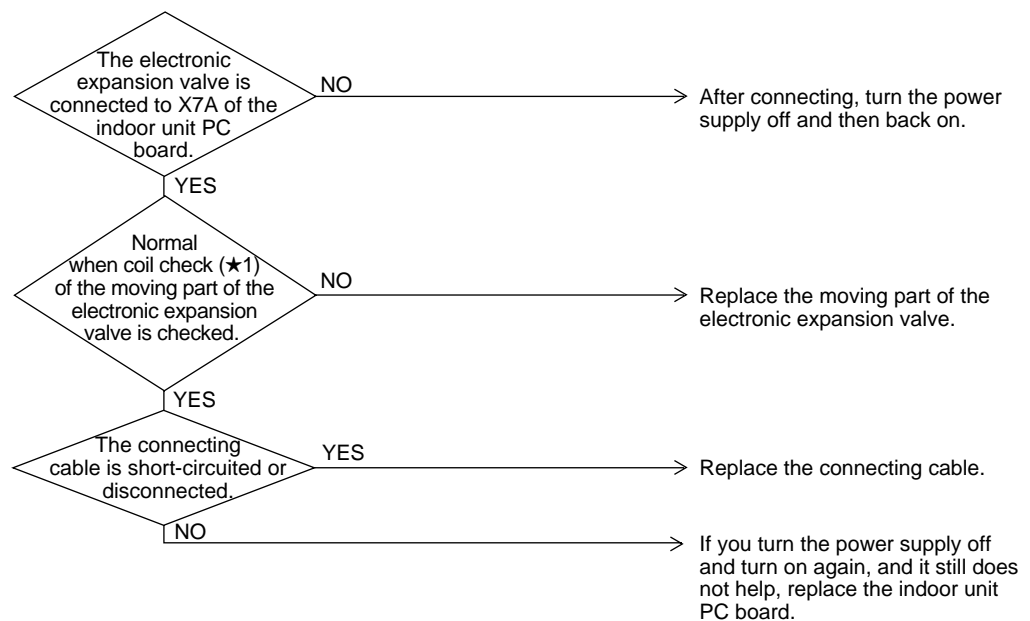
- Malfunction of moving part of electronic expansion valve
- Defect of indoor unit PC board
- Defect of connecting cable

Troubleshooting



Caution

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



(VF033)

★1: Coil check method for the moving part of the electronic expansion valve

Discount the electronic expansion valve from the PC board and check the continuity between the connector pins.

(Normal)

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

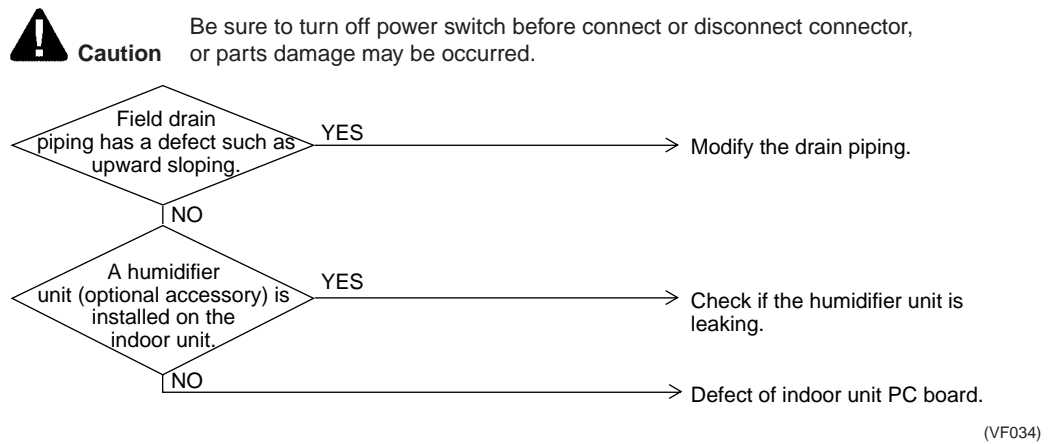
○: Continuity

×: No continuity

3.7 Indoor Unit: Drain Level above Limit

Remote Controller Display	RF
Supposed Causes	<div><div></div> Humidifier unit (optional accessory) leaking</div> <div><div></div> Defect of drain pipe (upward slope, etc.)</div> <div><div></div> Defect of indoor unit PC board</div>

Troubleshooting



3.8 Indoor Unit: Malfunction of Capacity Determination Device

Remote
controller display

RU

Supposed
Causes

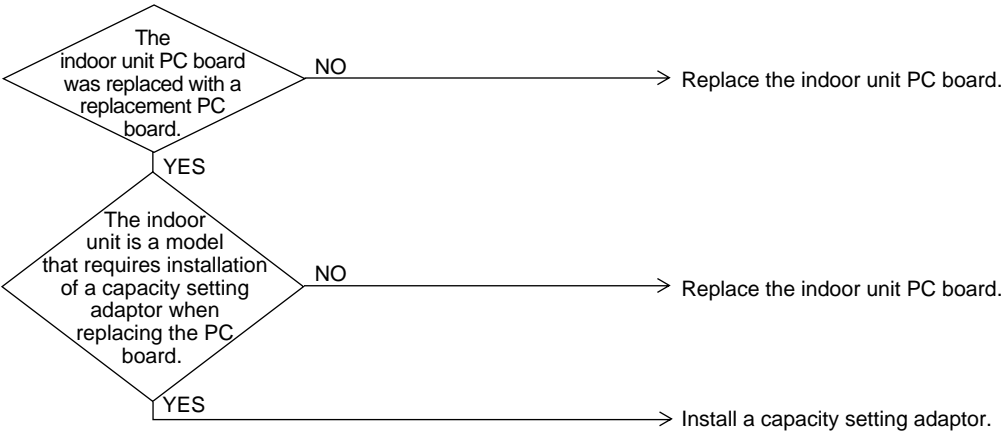
- You have forgotten to install the capacity setting adaptor.
- Defect of indoor unit PC board

Troubleshooting



Caution

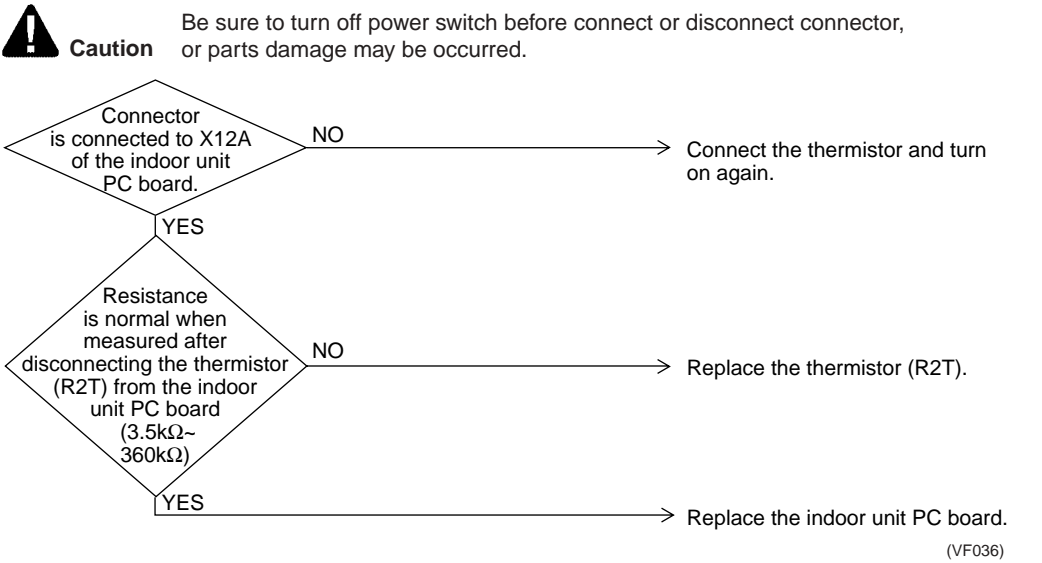
Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(VF035)

3.9 Indoor Unit: Malfunction of Thermistor (R2T) for Liquid Pipe

Remote Controller Display	⌚
Supposed Causes	<div><div></div> Defect of thermistor (R2T) for liquid pipe</div> <div><div></div> Defect of indoor unit PC board</div>
Troubleshooting	



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

Remote
Controller
Display

CS

Supposed
Causes

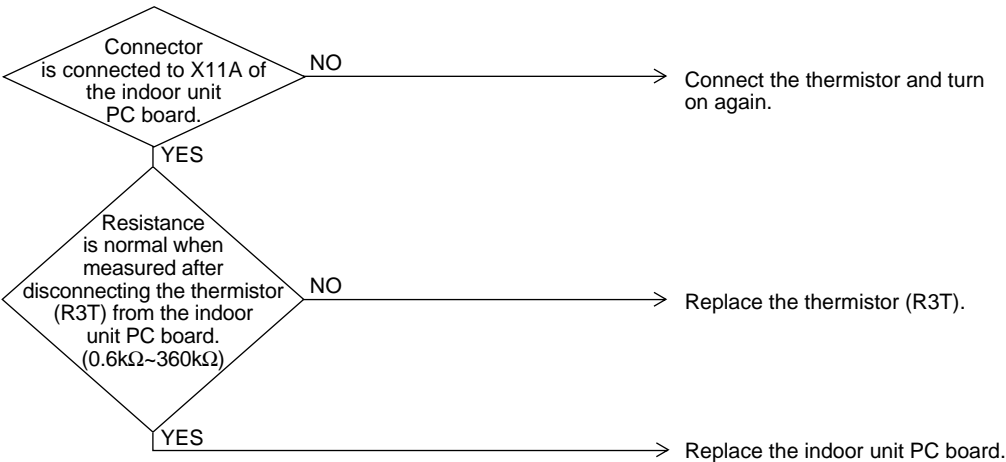
- Defect of indoor unit thermistor (R3T) for gas pipe
- Defect of indoor unit PC board

Troubleshooting



Caution

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



(VF037)

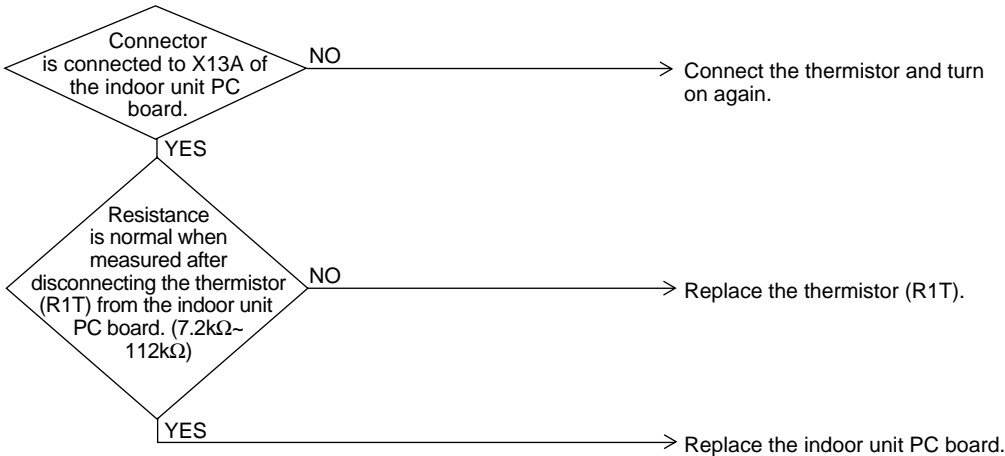
3.11 Indoor Unit: Malfunction of Thermistor (R1T) for Air Inlet

Remote Controller Display	C9
Supposed Causes	<div><div></div> Defect of indoor unit thermistor (R1T) for air inlet</div> <div><div></div> Defect of indoor unit PC board</div>
Troubleshooting	



Caution

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



(VF038)

3.12 Indoor Unit: Malfunction of Thermostat Sensor in Remote Controller

Remote
Controller
Display

CJ

Supposed
Causes

- Defect of remote controller thermistor
- Defect of remote controller PC board

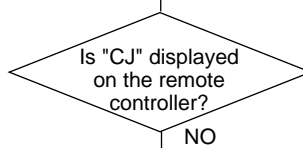
Troubleshooting



Caution

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

Turn power supply OFF, then
power ON again.



YES

→ Replace remote controller.

NO

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

(VF039)

3.13 Outdoor Unit: Actuation of Safety Device

Remote
Controller
Display

EO

Supposed
Causes

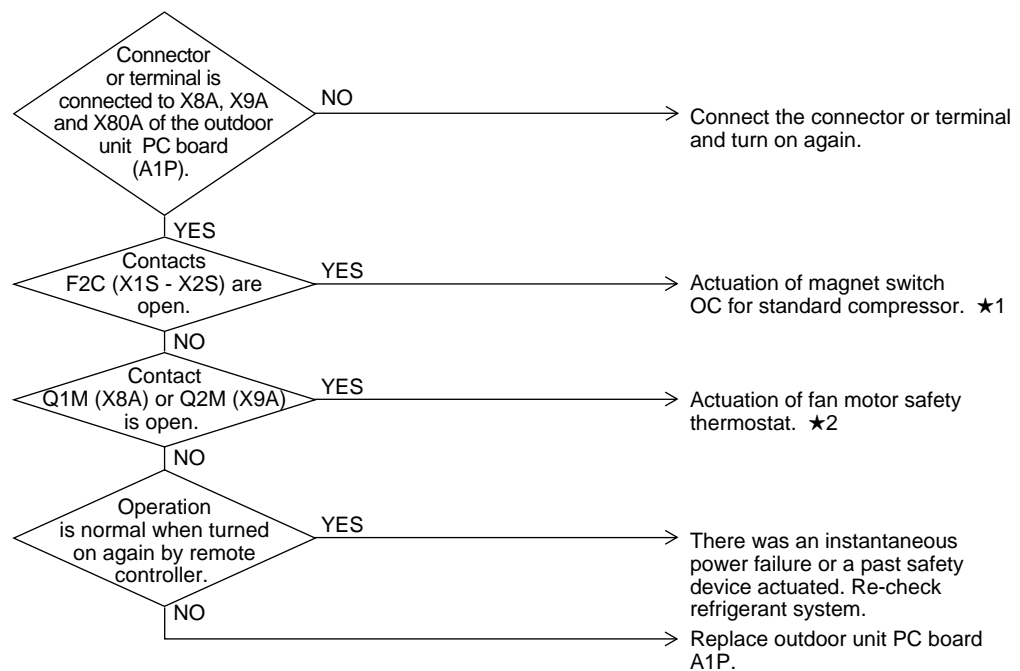
- Actuation of outdoor unit safety device
- Defect of outdoor unit PC board
- Instantaneous power failure

Troubleshooting



Caution

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



(VF040)

★1: Actuation of magnet switch OC

Defect of compressor
Power supply insufficient
Defect of magnet switch, etc.

★2: Actuation of fan motor safety thermostat

Defect of fan motor
Defect of capacitor, etc.

3.14 Outdoor Unit: PC Board Defect

Remote
Controller
Display

E1

Supposed
Causes

- Defect of outdoor unit PC board (A1P)

Troubleshooting

Replace outdoor unit PC board A1P.

3.15 Outdoor Unit: Actuation of High Pressure Switch

Remote
Controller
Display

E3

Supposed
Causes

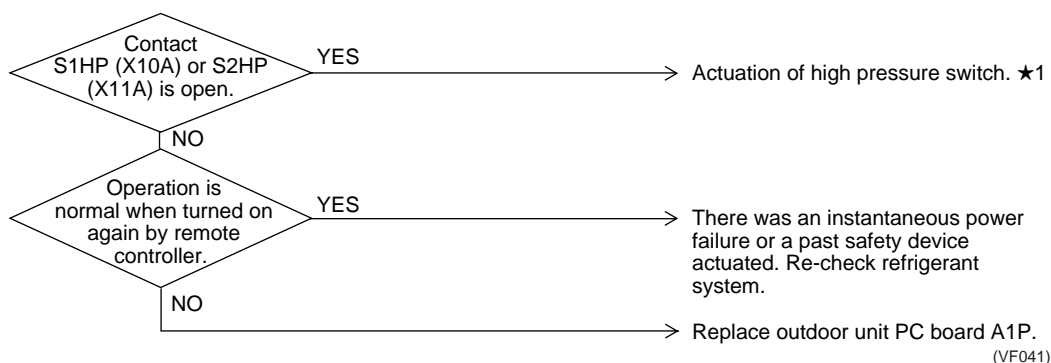
- Actuation of outdoor unit high pressure switch
- Defect of outdoor unit PC board (A1P)
- Instantaneous power failure
- Stop valve closes

Troubleshooting



Caution

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



★1: Actuation of high pressure switch (HPS)

The outdoor unit PC board's connector is disconnected.

Is the outdoor unit heat exchanger dirty?

Defect of outdoor fan

Is the refrigerant over-charged?

Is the stop valve closed?

3.16 Outdoor Unit: Actuation of Low Pressure Sensor

Remote
Controller
Display

E4

Supposed
Causes

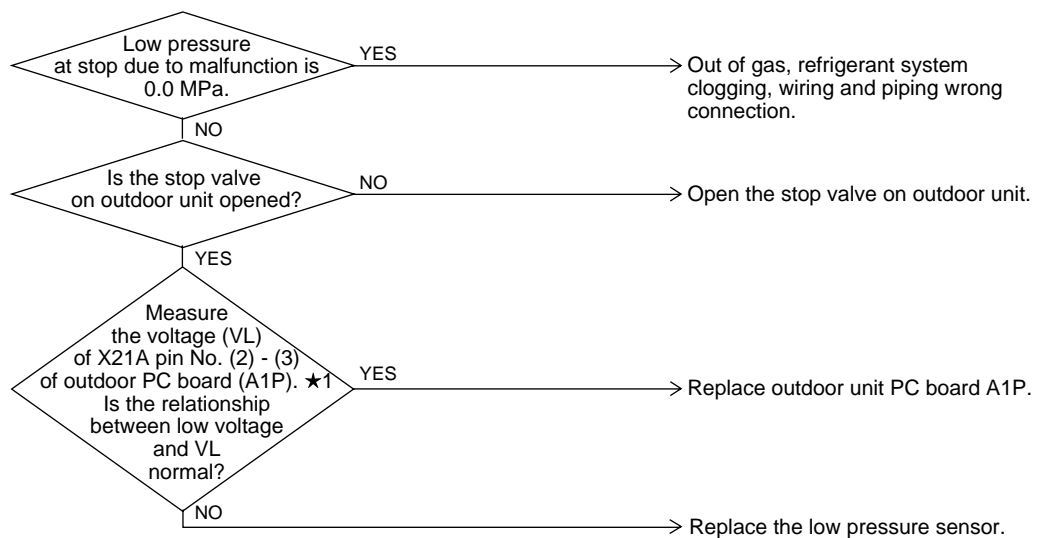
- Abnormal drop of low pressure (0 kg/cm² [0 MPa])
- Defect of low pressure sensor
- Defect of outdoor unit PC board
- Stop valve closes

Troubleshooting



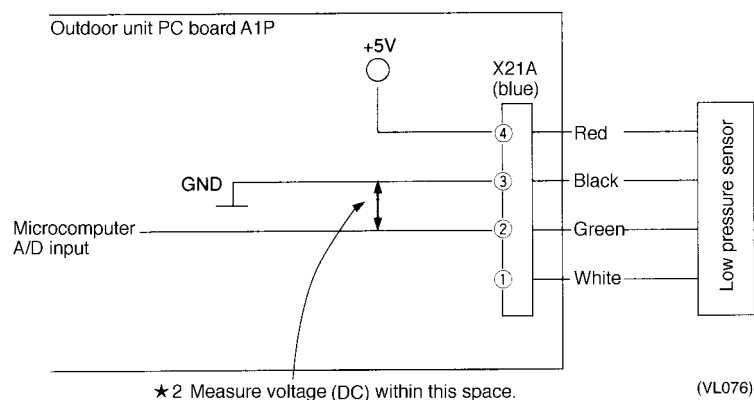
Caution

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



(V2735)

★1: Voltage measurement point



★2: Refer to pressure sensor, pressure / voltage characteristics table on P243.

3.17 Outdoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E)

Remote
Controller
Display

E9

Supposed
Causes

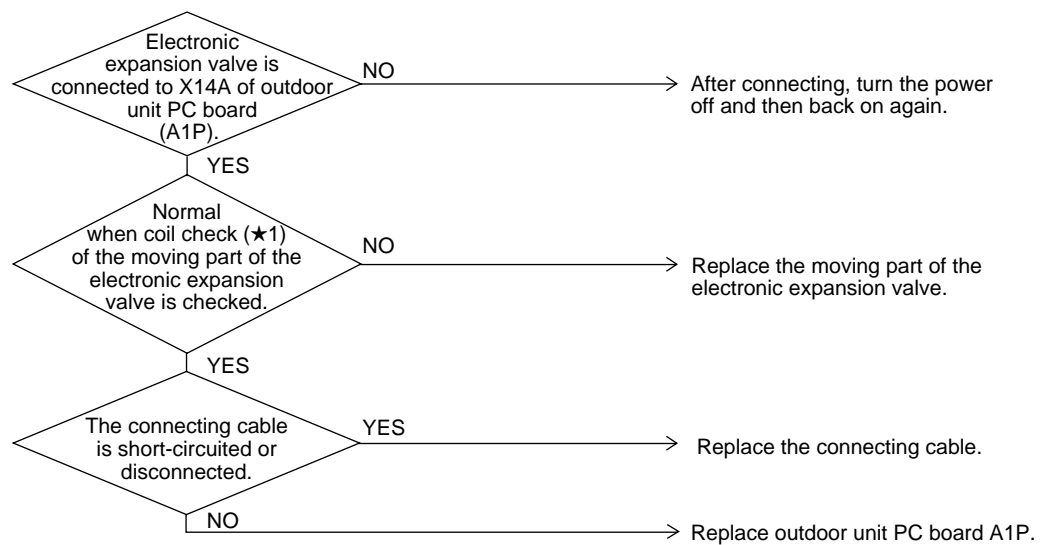
- Defect of moving part of electronic expansion valve
- Defect of outdoor unit PC board (A1P)
- Defect of connecting cable

Troubleshooting



Caution

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



(VF043)

★1 Coil check method for the moving part of the electronic expansion valve

Disconnect the electronic expansion valve from the PC board and check the continuity between the connector pins.

(Normal)

Pin No.	1. White	2. Yellow	3. Orange	4. Blue	5. Red	6. Brown
1. White		×	⊙	×	○	×
2. Yellow			×	⊙	×	○
3. Orange				×	○	×
4. Blue					×	○
5. Red						×
6. Brown						

⊙: Continuity Approx. 300Ω

○: Continuity Approx. 150Ω

×: No continuity

3.18 Outdoor Unit: Abnormal Discharge Pipe Temperature

Remote
Controller
Display

F3

Supposed
Causes

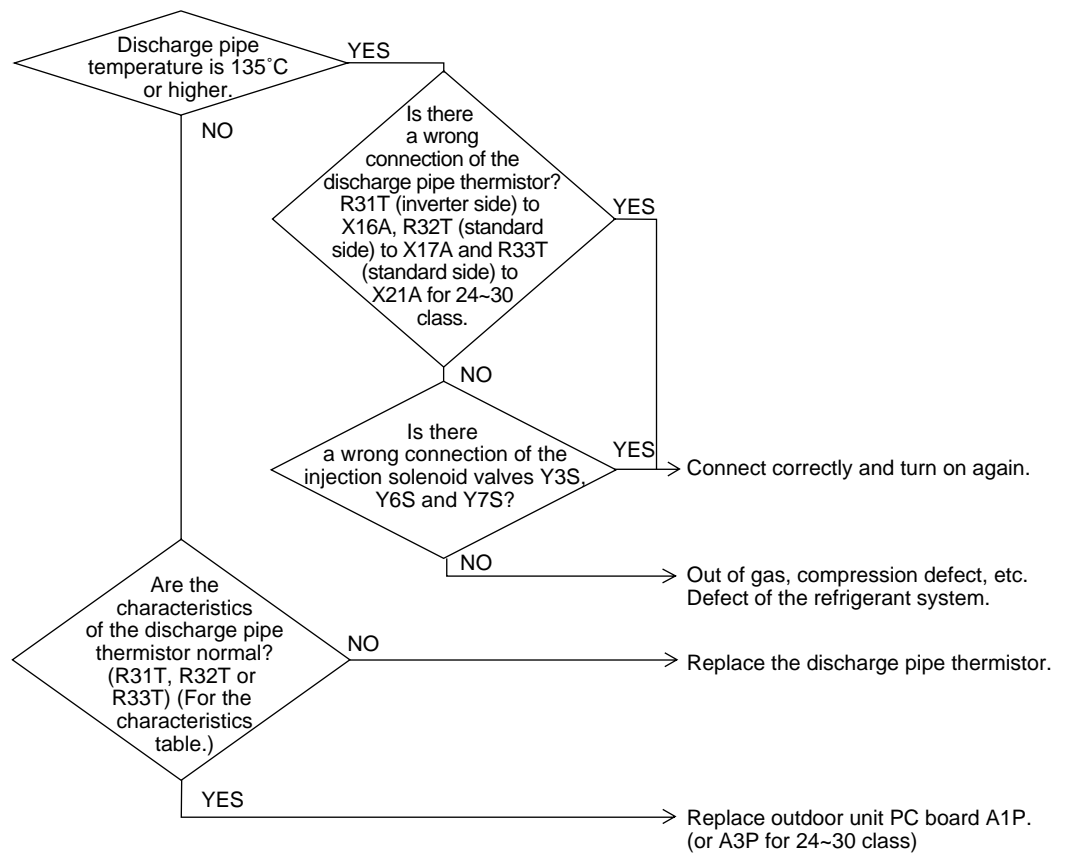
- Abnormal discharge pipe temperature
- Defect of discharge pipe thermistor (R31T, R32T or R33T)
- Defect of outdoor unit PC board
- Discharge pipe thermistor wrong connection
- Liquid injection solenoid valve wrong connection

Troubleshooting



Caution

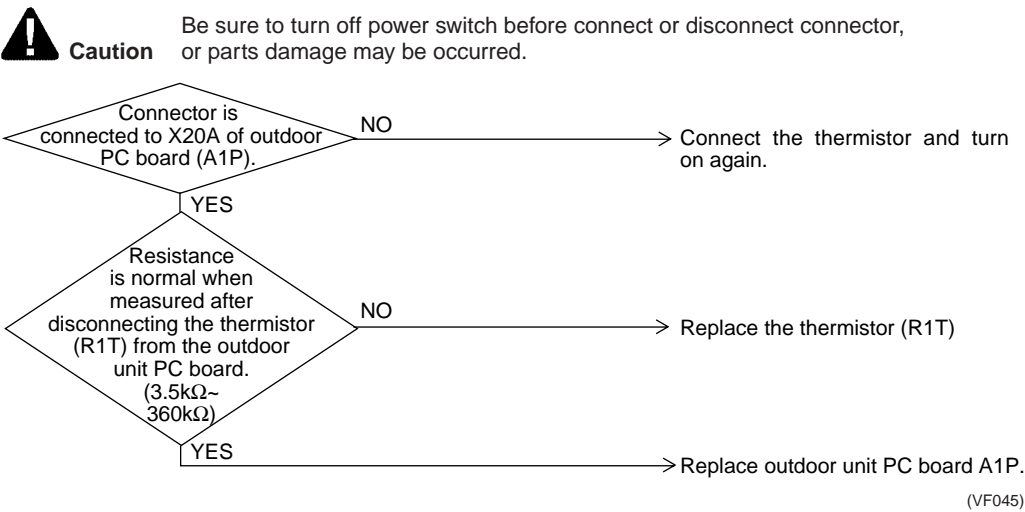
Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(VF044)

3.19 Outdoor Unit: Malfunction of Thermistor for Outdoor Air (R1T)

Remote Controller Display	H9
Supposed Causes	<div><div></div> Defect of thermistor (R1T) for outdoor air</div> <div><div></div> Defect of outdoor unit PC board (A1P)</div>
Troubleshooting	



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

3.20 Outdoor Unit: Malfunction of Discharge Pipe Thermistor (R3T)

Remote
Controller
Display

J3

Supposed
Causes

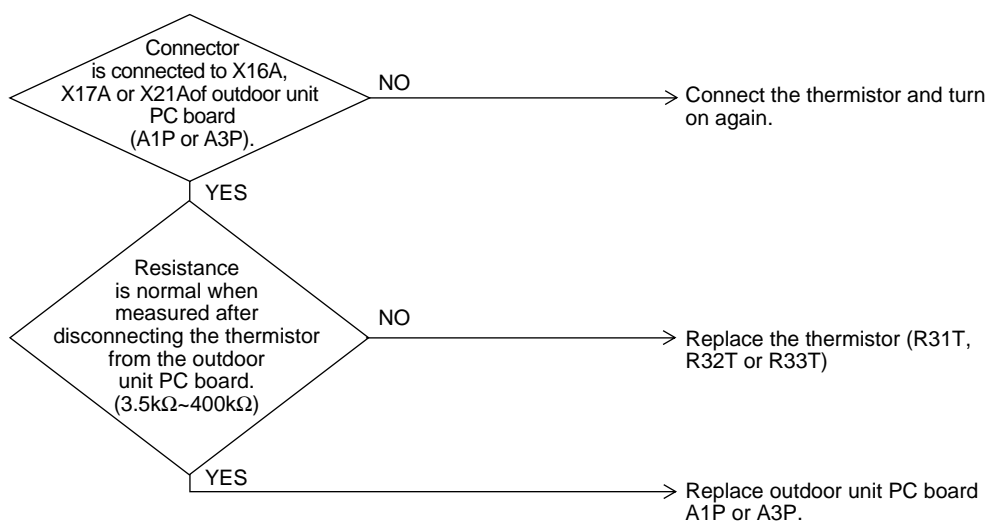
- Defect of thermistor (R31T, R32T or R33T) for outdoor unit discharge pipe
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

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



(VF046)

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



Note:

16~20 HP class ... R31T, R32T (A1P)
24~30 HP class ... R31T, R32T (A1P), R33T (A3P)

3.21 Outdoor Unit: Malfunction of Thermistor (R6T) for Suction Pipe

Remote
Controller
Display

J5

Supposed
Causes

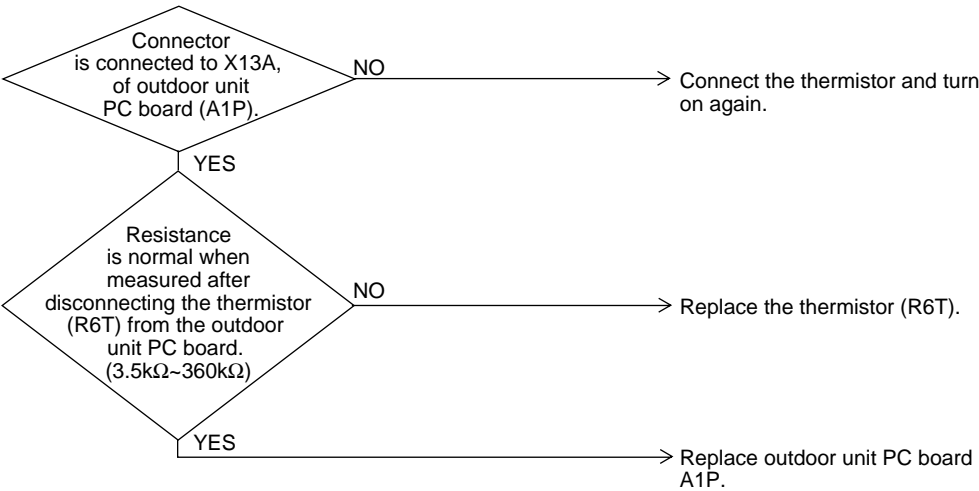
- Defect of thermistor (R6T) for outdoor unit suction pipe
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

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



(VF047)

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

3.22 Outdoor Unit: Malfunction of Thermistor (R2T) for Heat Exchanger

Remote
Controller
Display

J6

Supposed
Causes

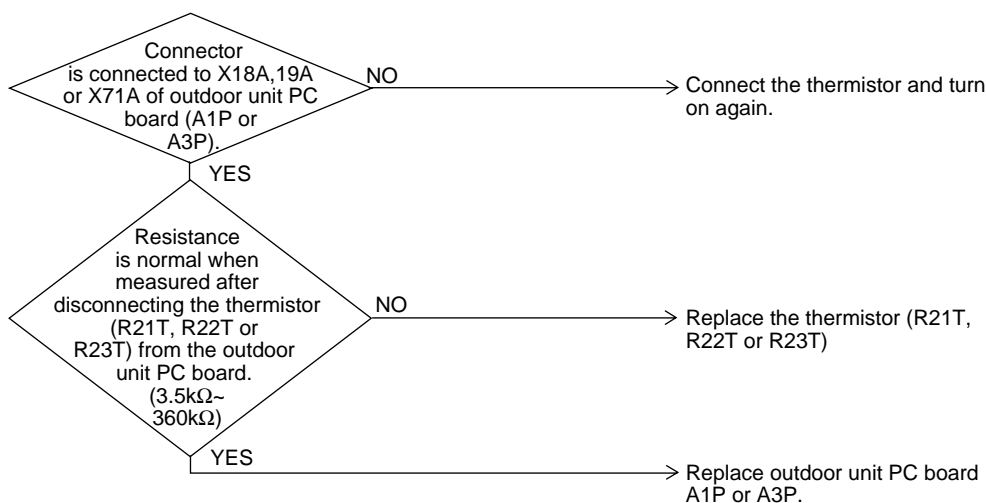
- Defect of thermistor (R21T, R22T or R23T) for outdoor unit coil
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

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



(VF048)

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



Note:

16~20HP class ... R21T, R22T (A1P)
24~30HP class ... R21T, R22T (A1P), R23T (A3P)

3.23 Outdoor Unit: Malfunction of Discharge Pipe Pressure Sensor

Remote
Controller
Display

JA

Supposed
Causes

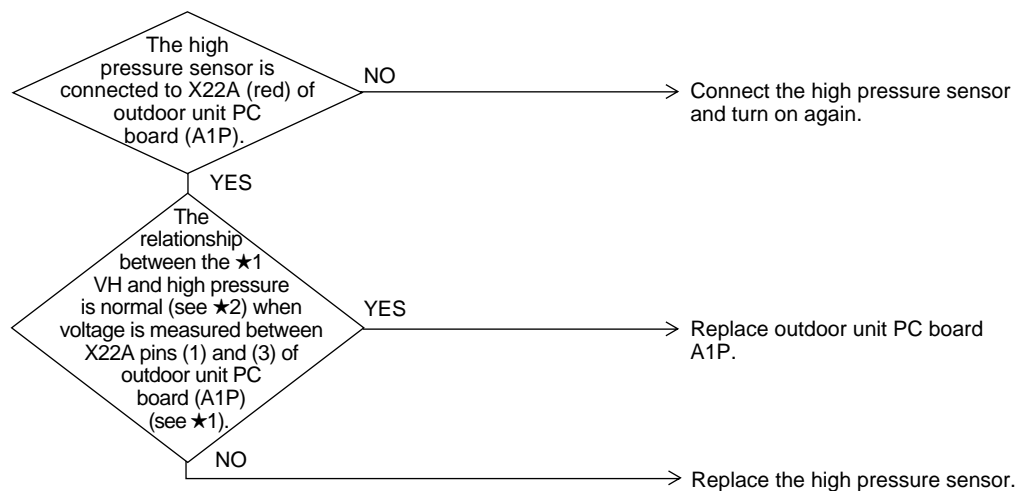
- Defect of high pressure sensor system
- Connection of low pressure sensor with wrong connection.
- Defect of outdoor unit PC board.

Troubleshooting



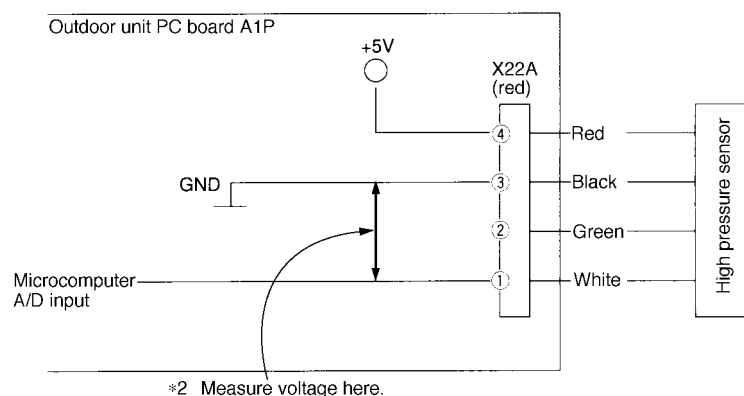
Caution

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



(VF049)

★1: Voltage measurement point



(VL077)



★2: Refer to pressure sensor, pressure / voltage characteristics table on P243.

3.24 Outdoor Unit: Malfunction of Low Pressure Sensor

Remote
Controller
Display



Supposed
Causes

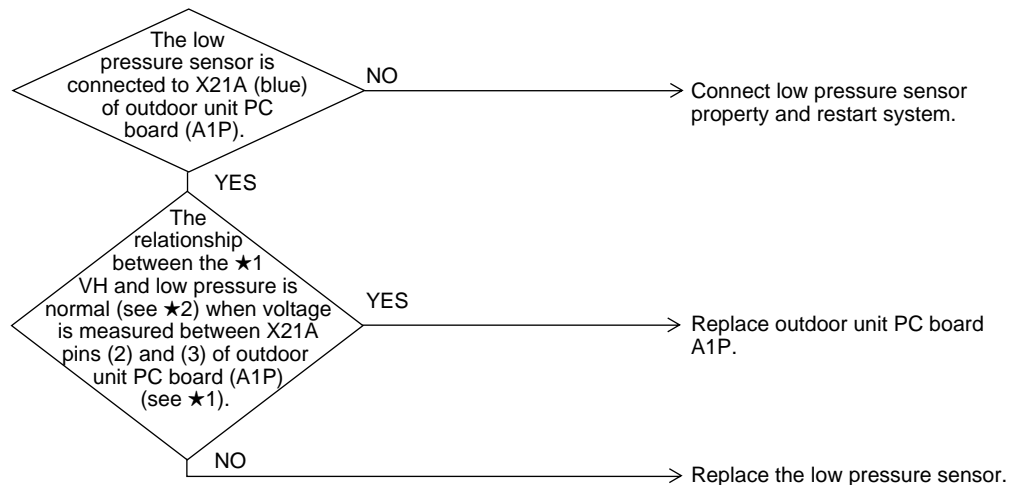
- Defect of low pressure sensor system
- Connection of high pressure sensor with wrong connection.
- Defect of outdoor unit PC board.

Troubleshooting



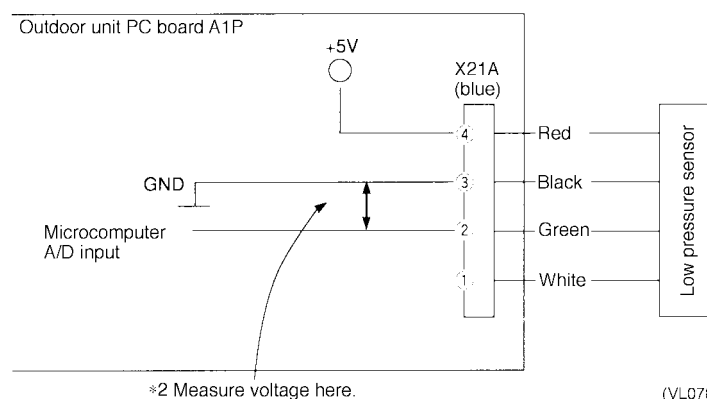
Caution

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



(VF050)

★1: Voltage measurement point



(VL078)



★2: Refer to pressure sensor, pressure/voltage characteristics table on P243.

3.25 Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure

Remote
Controller
Display

U0

Supposed
Causes

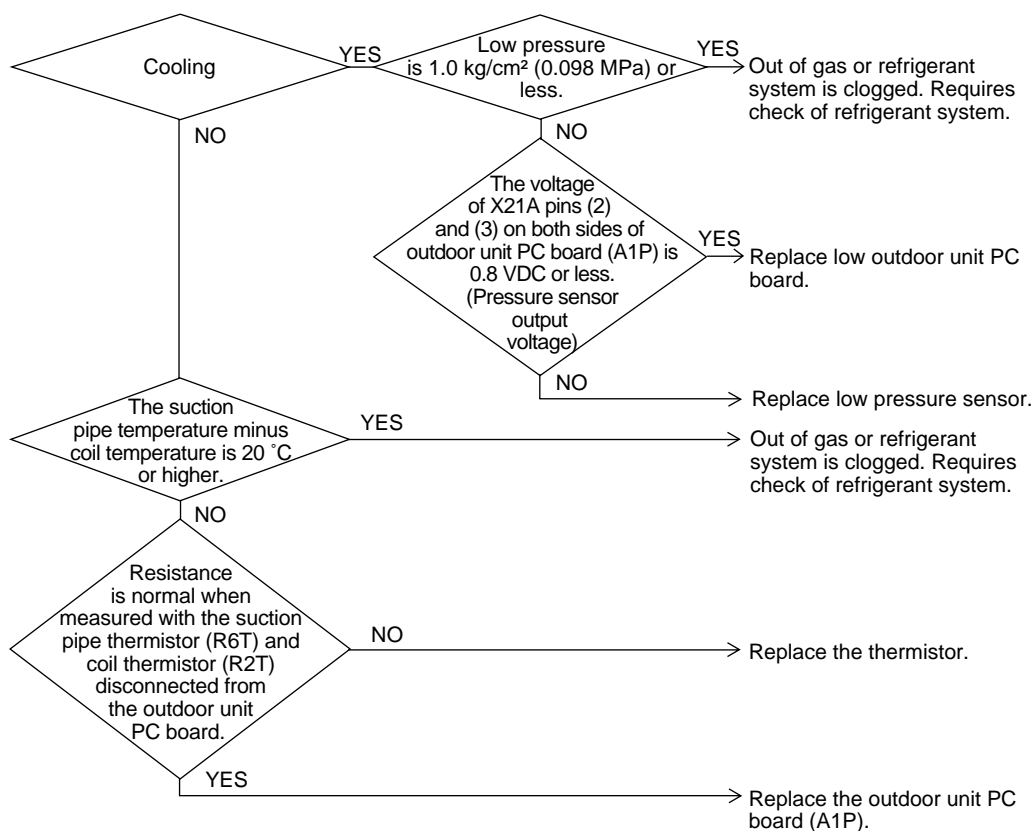
- Out of gas or refrigerant system clogging (incorrect piping)
- Defect of pressure sensor
- Defect of outdoor unit PC board

Troubleshooting



Caution

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



(VF052)

3.26 Reverse Phase, Open Phase

Remote
Controller
Display

U1

Supposed
Causes

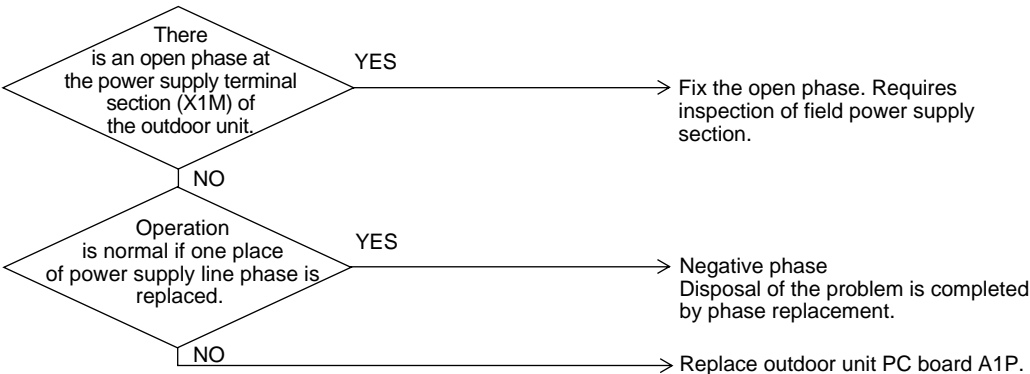
- Power supply reverse phase
- Power supply open phase
- Defect of outdoor PC board A1P

Troubleshooting



Caution

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



(VF053)

3.27 Malfunction of Transmission Between Indoor Units

Remote
Controller
Display

U4

Supposed
Causes

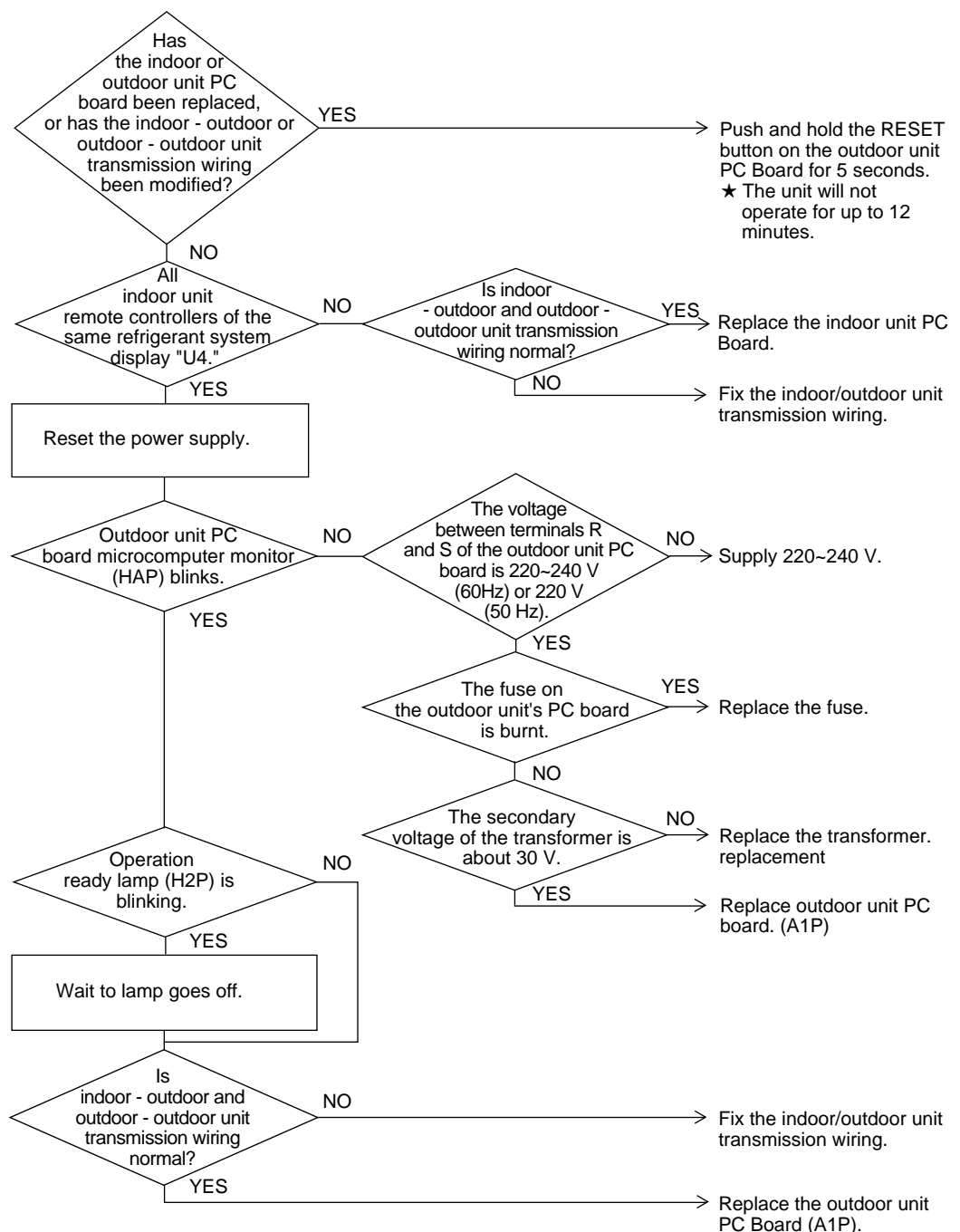
- Indoor to outdoor, outdoor to outdoor crossover wiring disconnection, short circuit or wrong check
- Outdoor unit power supply is OFF
- System address doesn't match
- Defect of indoor unit PC board
- Defect of outdoor unit PC board

Troubleshooting



Caution

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



(VF054)

3.28 Malfunction of Transmission Between Remote Controller and Indoor Unit

Remote
Controller
Display

U5

Supposed
Causes

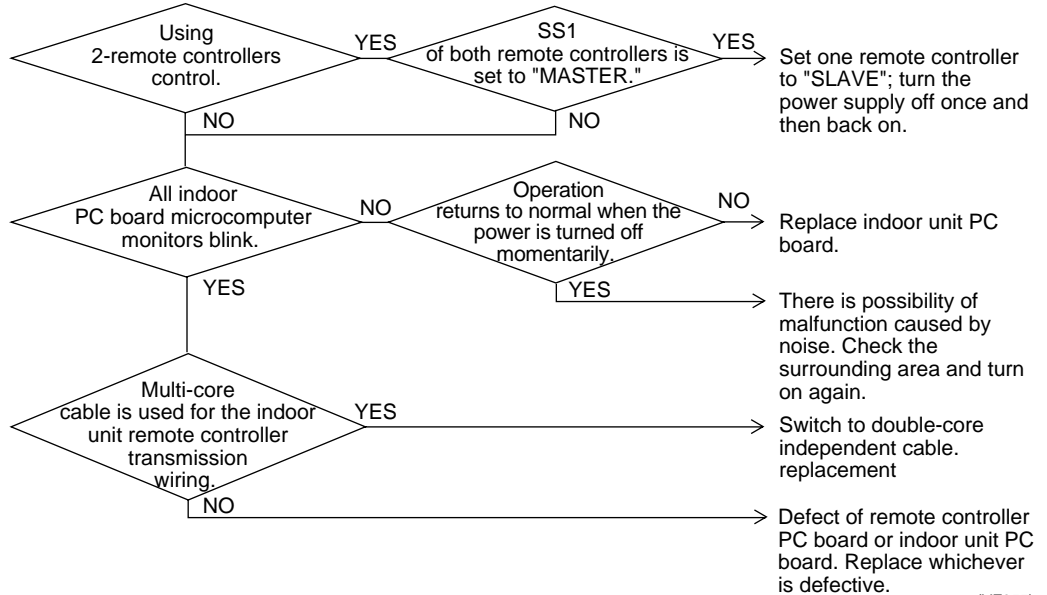
- Malfunction of indoor unit remote controller transmission
- Connection of two main remote controllers (when using 2 remote controllers)
- Defect of indoor unit PC board
- Defect of remote controller PC board
- Malfunction of transmission caused by noise

Troubleshooting



Caution

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



(VF055)

3.29 Malfunction of Transmission Between Outdoor Units

Remote
Controller
Display

U7

Supposed
Causes

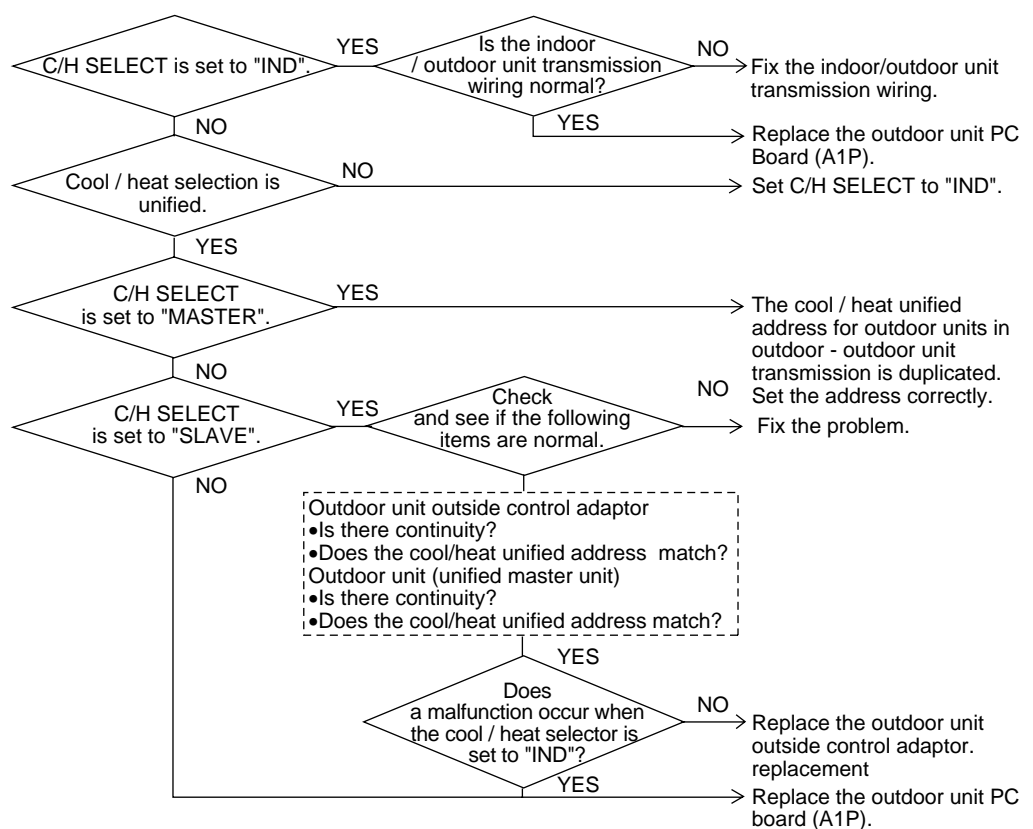
- Improper connection of transmission wiring between outdoor unit and outdoor unit outside control adaptor
- Improper cool/heat selection
- Improper cool/heat unified address (outdoor unit, external control adaptor for outdoor unit)
- Defect of outdoor unit PC board (A1P)
- Defect of outdoor unit outside control adaptor

Troubleshooting



Caution

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



(VF056)

3.30 Malfunction of Transmission Between Master and Slave Remote Controllers

Remote
Controller
Display

U8

Supposed
Causes

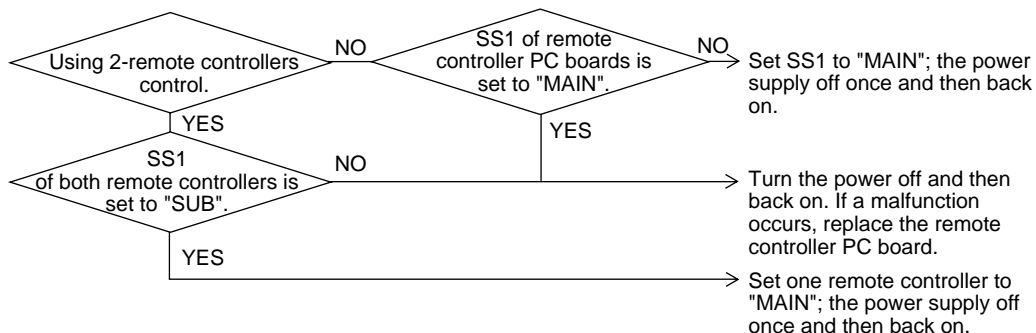
- Malfunction of transmission between main and sub remote controller
- Connection between sub remote controllers
- Defect of remote controller PC board

Troubleshooting



Caution

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



(VF057)

3.31 Malfunction of Transmission Between Indoor and Outdoor Units in the Same System

Remote
Controller
Display

U9

Supposed
Causes

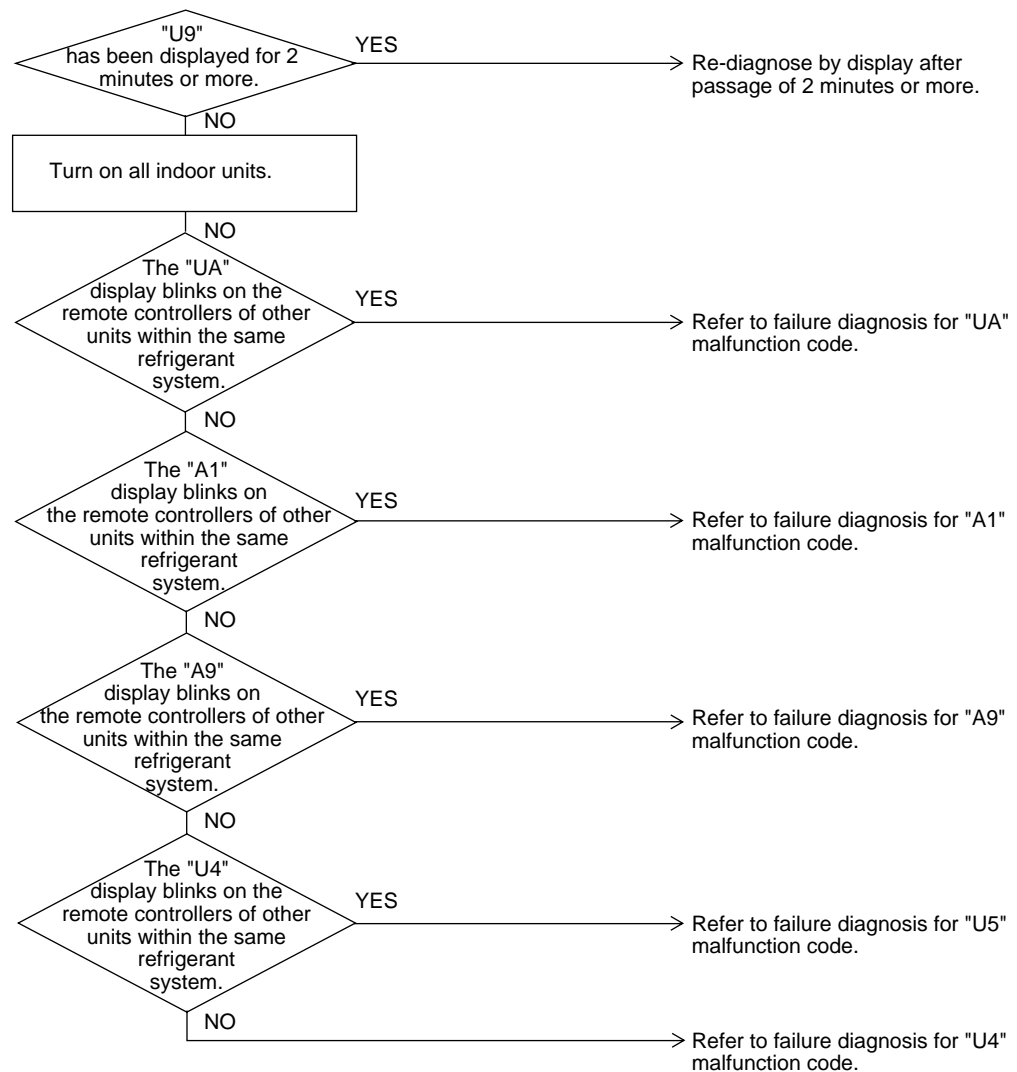
- Malfunction of transmission within or outside of other system
- Malfunction of electronic expansion valve in indoor unit of other system
- Defect of PC board of indoor unit in other system
- Improper connection of transmission wiring between indoor and outdoor unit

Troubleshooting



Caution

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



(VF058)

3.32 Excessive Number of Indoor Units

Remote
Controller
Display

UA

Supposed
Causes

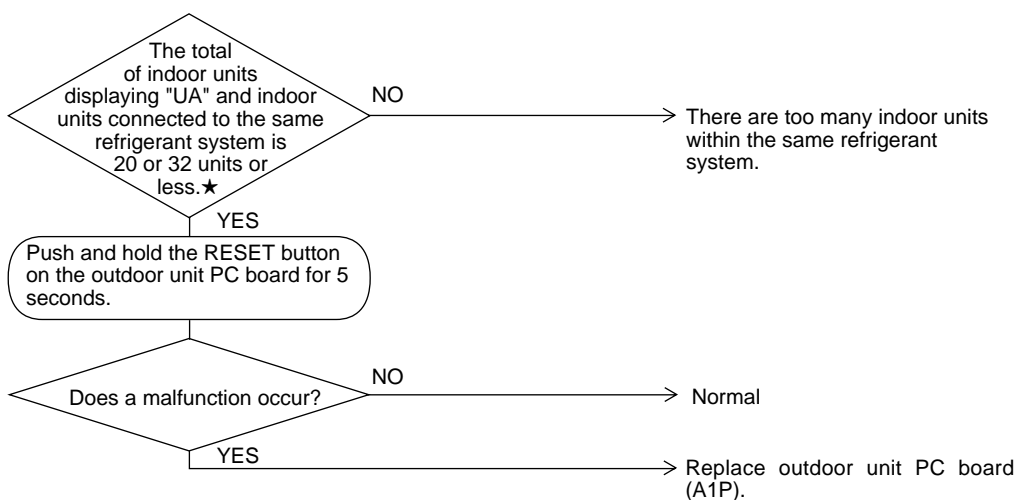
- Excess of connected indoor units
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

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



(VF059)

The number of indoor units that can be connected to a single outdoor unit system depends on the type of outdoor unit.

- ★ RSEYP16~20KJY1 ... 20 units
- RSEYP24~30KJY1 ... 32 units

3.33 R-22 & R-407C Indoor Unit - mixed Connection

Remote
Controller
Display

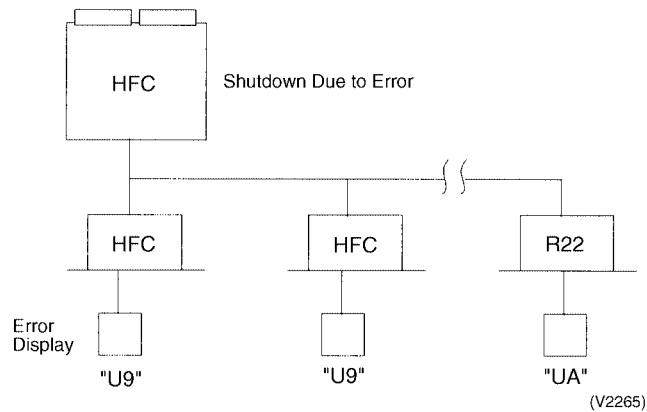
UA & U9

Supposed
Causes

R-22 model connection abnormalities

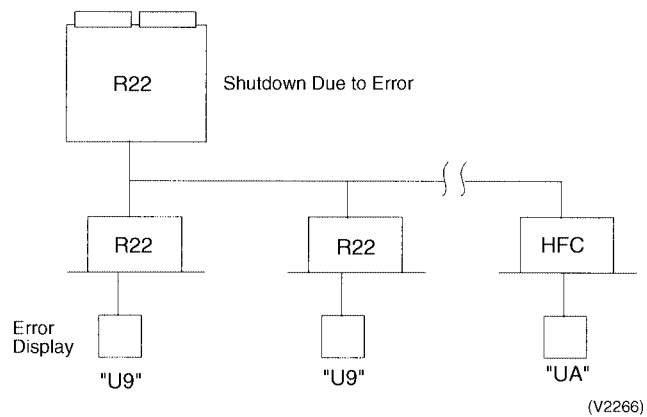
Troubleshooting

1. When R-22 indoor unit is connected to HFC (R-407C) system



Reason : Operation disallowed due to insufficient pressure proof in R-22 indoor unit.

2. When HFC indoor unit is connected to R-22 system



Reason : Operation disallowed to prevent contamination of another system by HFC indoor unit operated previously with R-22 system. If HFC indoor unit that was operated with R-22 system is removed and connected to another HFC system, it can contaminate (SUNISO oil etc.) the newly connected HFC system.

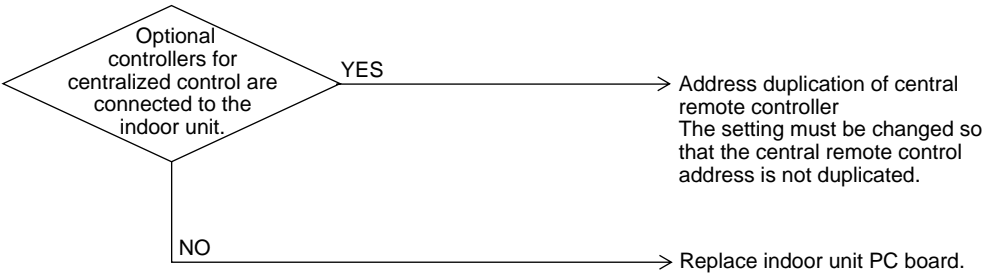
3.34 Address Duplication of Central Remote Controller

Remote Controller Display	UC
Supposed Causes	<div><div></div>Address duplication of central remote controller</div> <div><div></div>Defect of indoor unit PC board</div>
Troubleshooting	



Caution

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



(VF060)

3.35 Refrigerant System not Set, Incompatible Wiring/Piping

Remote
Controller
Display

UF

Supposed
Causes

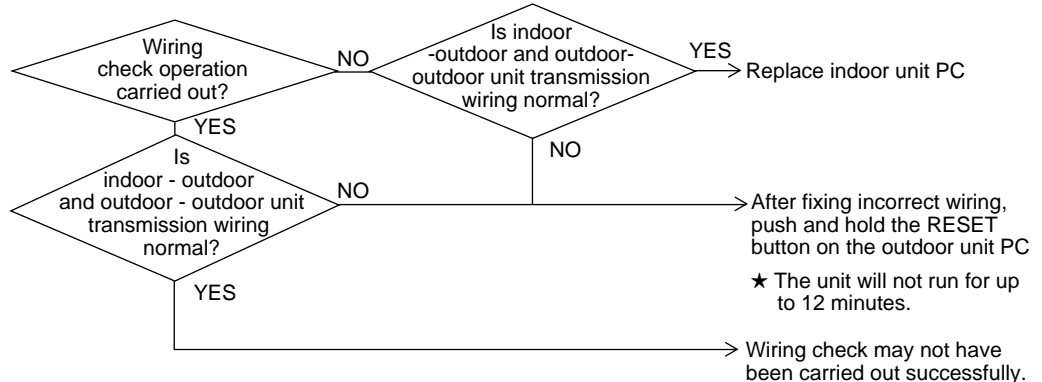
- Improper connection of transmission wiring between outdoor unit and outdoor unit outside control adaptor
- Failure to execute wiring check operation
- Defect of indoor unit PC board

Troubleshooting



Caution

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



(VF061)

Wiring check 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.

3.36 Malfunction of System, Refrigerant System Address Undefined

Remote
Controller
Display

UH

Supposed
Causes

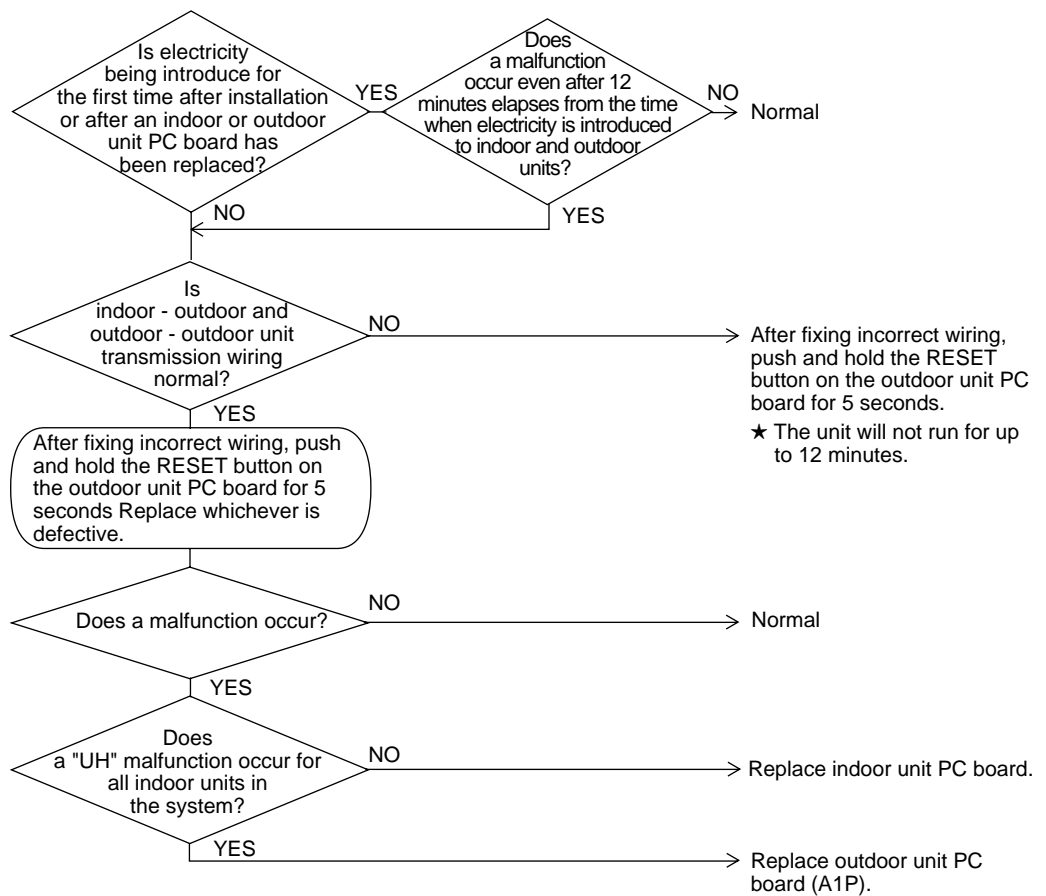
- Improper connection of transmission wiring between outdoor unit and outdoor unit outside control adaptor
- Defect of indoor unit PC board
- Defect of outdoor unit PC board (A1P)

Troubleshooting



Caution

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



(VF062)

4. Failure Diagnosis for Inverter System

4.1 Points of Diagnosis

The main causes for each malfunction code are given in the table below. (For details refer to the next page and those following.)

⊙ : Failure is probable

○ : Failure is possible

□ : Failure is improbable

— : Failure is impossible

Malfunction code	Contents of malfunction	Location of failure							Point of diagnosis
		Inverter		Compressor	Refrigerant system	Outdoor unit PC board	Other	Field cause	
		PC board power unit	Other						
L4	Radiator fin temperature rise	□	⊙	—	—	—	—	□	Is the intake port of the radiator fin clogged?
L5	Instantaneous over-current	○	—	⊙	□	—	—	—	Inspect the compressor.
L8	Electronic thermostat	□	—	⊙	○	—	—	—	Inspect the compressor and refrigerant system.
L9	Stall prevention	□	—	○	⊙	—	—	—	Inspect the compressor and refrigerant system.
LC	Malfunction of transmission between inverter PC board and outdoor unit PC board	○	⊙	—	—	□	—	—	Inspect the connection between the inverter PC board and outdoor unit PC board. Next, inspect the inverter PC board.
U2	Abnormal current/voltage	○	○	—	—	—	□	⊙	• Inspect the fuse on the inverter PC board. • Check the DC voltage.
P1	Over-ripple protection	○	○	—	—	—	—	○	• Open phase • Current/voltage imbalance • Defect of main circuit wiring
P4	Defect of radiator fin temperature sensor	○	□	—	—	—	—	—	Inspect the radiator fin thermistor.

4.2 How to Use The Monitor Switch on The Inverter PC Board

The monitor lets you know the contents of the latest stop due to malfunction by LED display on the inverter PC Board. The inverter is equipped with a retry function that retries operation each time stop due to malfunction occurs, and malfunction is therefore not ascertained by merely entering the five minutes standby while retry is attempted the prescribed number of times. If the number of retry times is exceeded within 60 minutes, malfunction is ascertained, and the corresponding malfunction code is displayed on the indoor unit remote controller.

LED	A	1	2	3	4	Malfunction contents	Retry times
	●	●	●	●	●	Normal	
	●	●	●	●	○	Malfunction of fin thermistor	3
	●	○	○	●	●	Sensor malfunction	0
	●	○	●	●	○	Insufficient voltage	3
	●	●	●	○	●	Instantaneous over-current	3
	●	●	○	○	○	Electronic thermistor	3
	●	○	○	○	○	Stall prevention	3
	●	●	○	●	●	Open phase detection	3
	●	●	●	●	●	Malfunction of microcomputer	Unlimited

● : Blink

○ : On

● : Off

5. Troubleshooting (Inverter)

5.1 Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise

Remote
Controller
Display

L4

Supposed
Causes

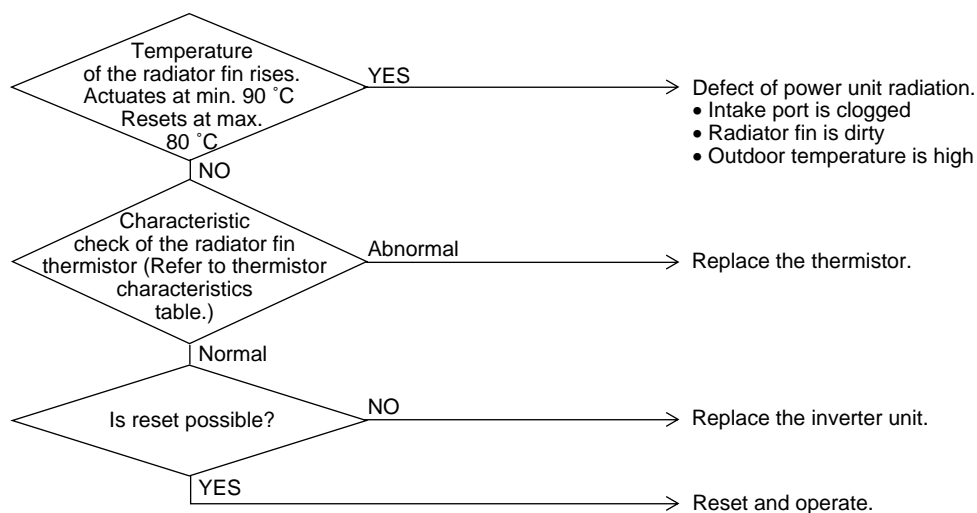
- Actuation of fin thermal (Actuates at min. 90°C and resets at max. 80°C)
- Defect of inverter PC board
- Defect of fin thermistor

Troubleshooting



Caution

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



(VF063)

5.2 Outdoor Unit: Inverter Instantaneous Over-Current

Remote
Controller
Display

L5

Supposed
Causes

- Defect of compressor coil (disconnected, defective insulation)
- Compressor start-up malfunction (mechanical lock)
- Defect of inverter unit

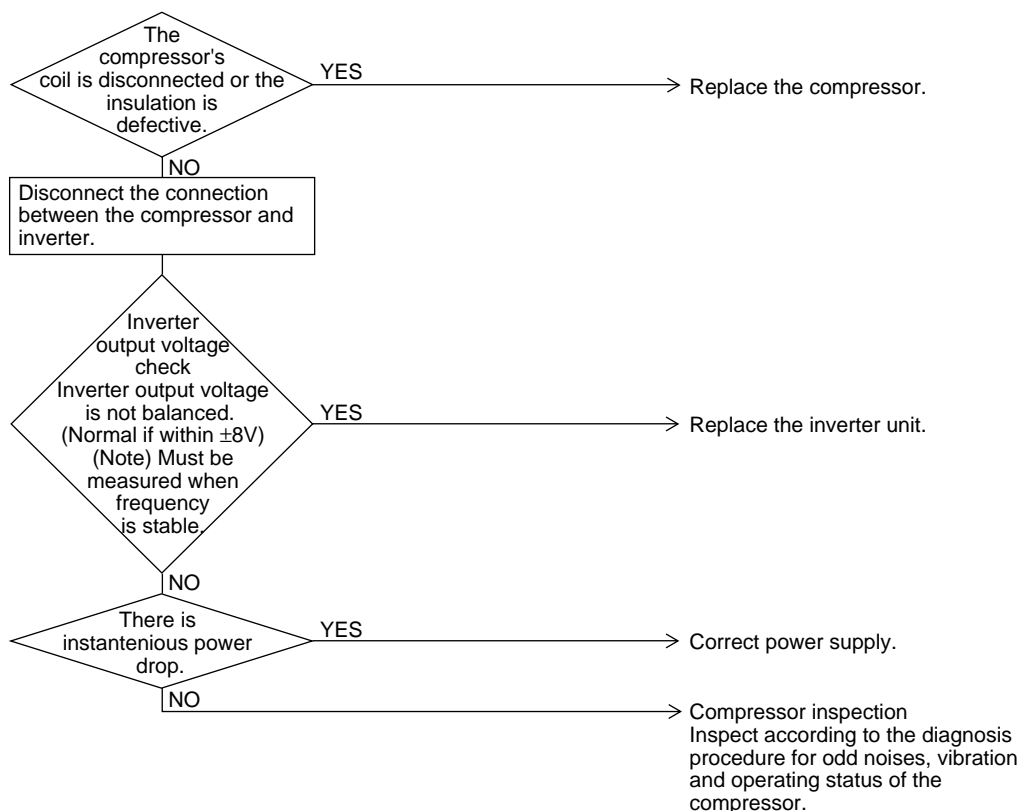
Troubleshooting

Compressor inspection



Caution

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



(VF064)

5.3 Outdoor Unit: Inverter Thermostat Sensor, Compressor Overload

Remote
Controller
Display

L8

Supposed
Causes

- Compressor overload
- Compressor coil disconnected
- Defect of inverter unit

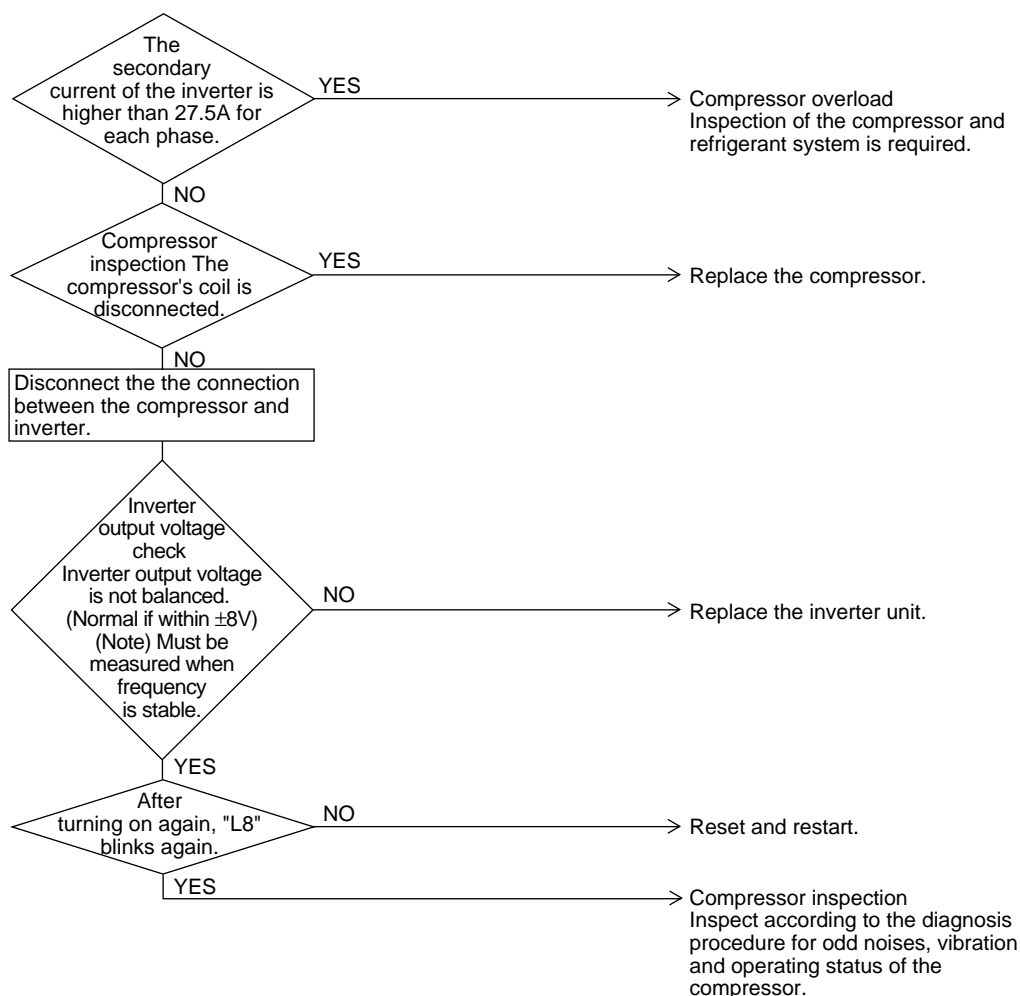
Troubleshooting

Output current check



Caution

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



(VF065)

5.4 Outdoor Unit: Inverter Stall Prevention, Compressor Lock

Remote
Controller
Display

L9

Supposed
Causes

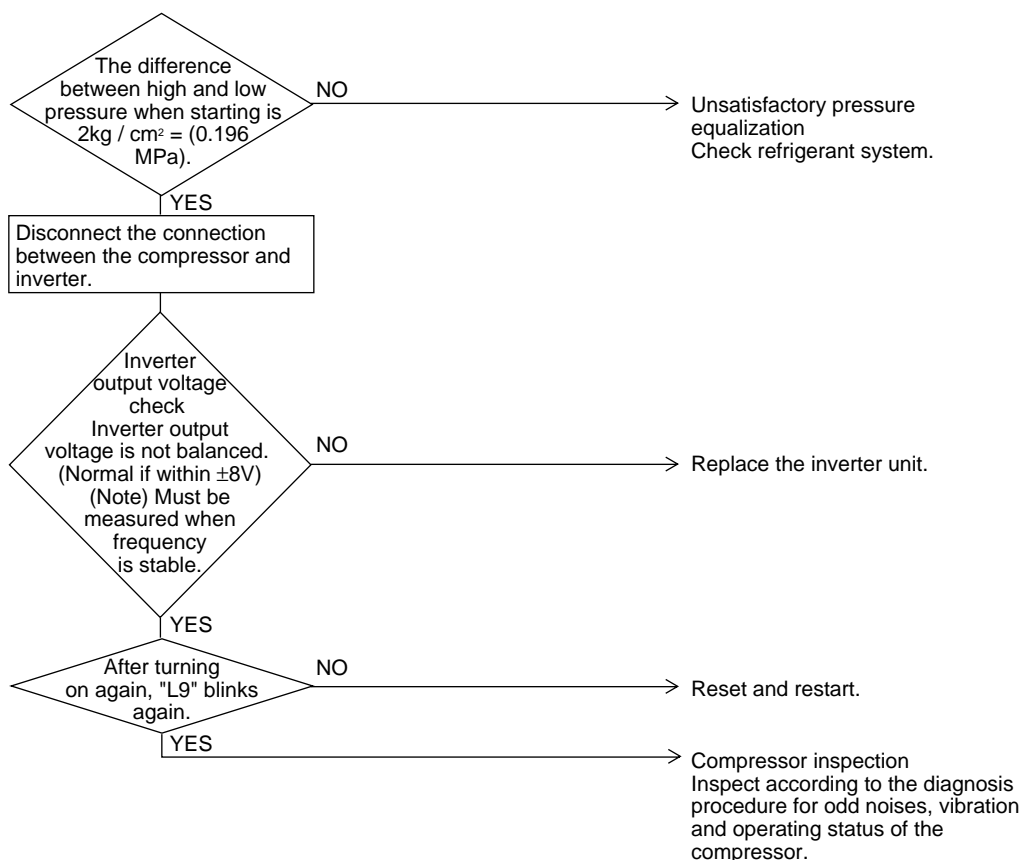
- Defect of compressor
- Pressure differential start
- Defect of inverter unit

Troubleshooting



Caution

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



(VF066)

5.5 Outdoor Unit: Malfunction of Transmission Between Inverter and Control PC Board

Remote
Controller
Display

LC

**Supposed
Causes**

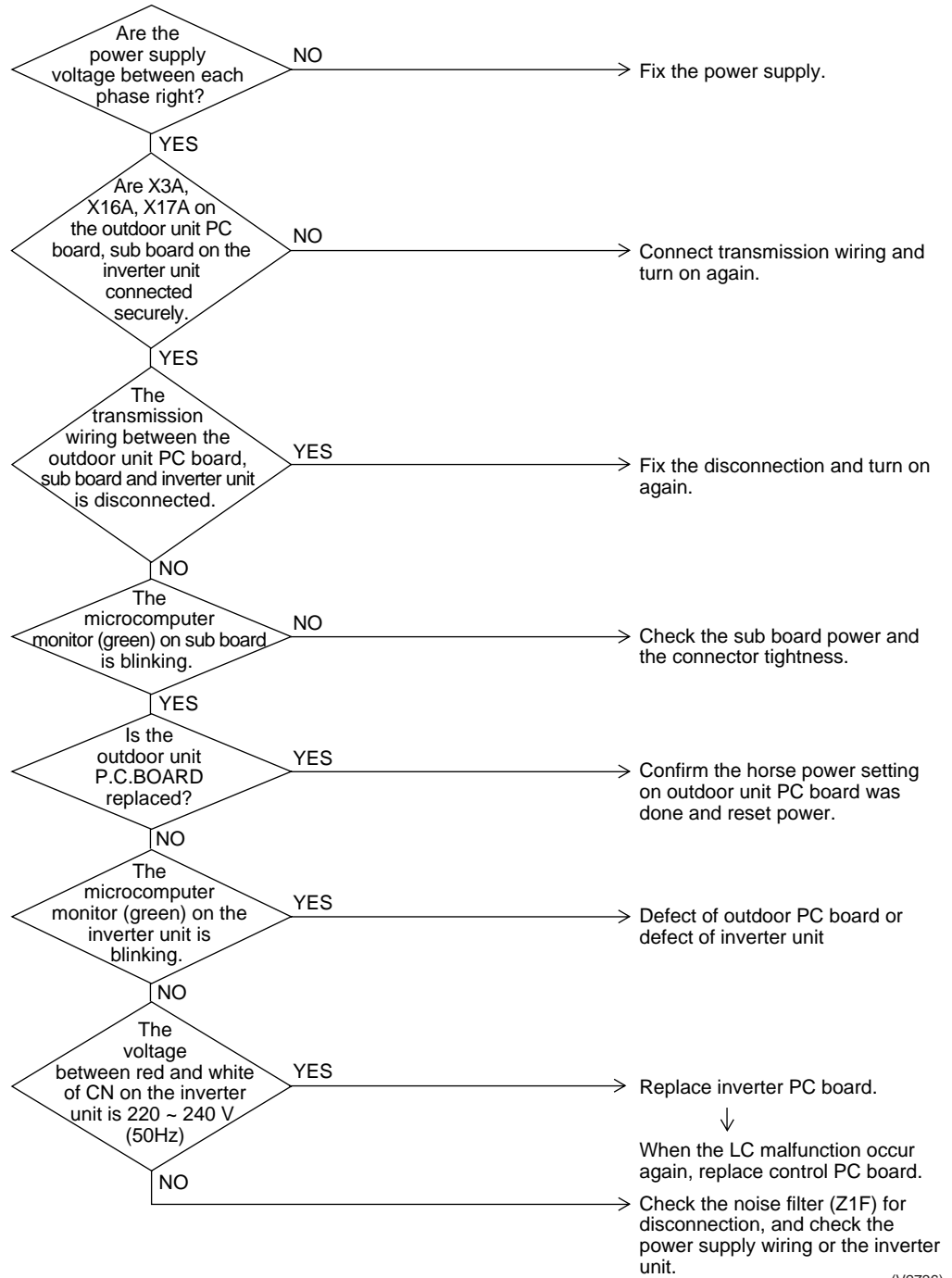
- Malfunction of connection between the inverter unit and outdoor unit PC board
- Defect of outdoor unit PC board (transmission section)
- Defect of inverter unit
- Defect of noise filter (NF1)
- Lack of phase on power supply during outdoor unit operation
- External factor (Noise etc.)
- Horse power setting error on outdoor unit PC board

Troubleshooting



Caution

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



(V2736)

5.6 Power Supply Insufficient or Instantaneous Failure

Remote
Controller
Display

U2

Supposed
Causes

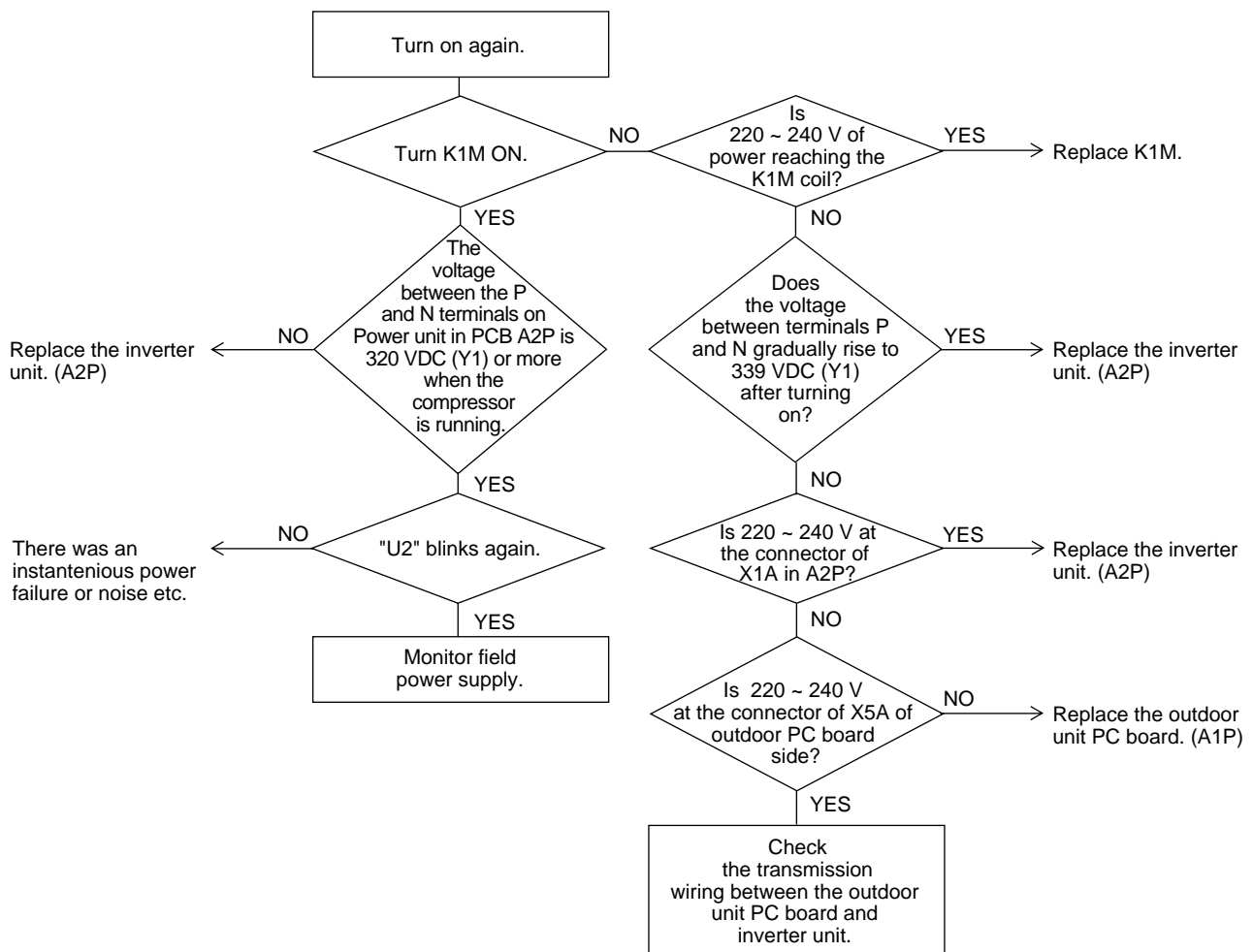
- Power supply insufficient
- Instantaneous failure
- Open phase
- Defect of inverter unit
- Defect of outdoor PC board
- Defect of K1M.
- Main circuit wiring defect

Troubleshooting



Caution

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



(VF068)

5.7 Outdoor Unit: Inverter Over-Ripple Protection

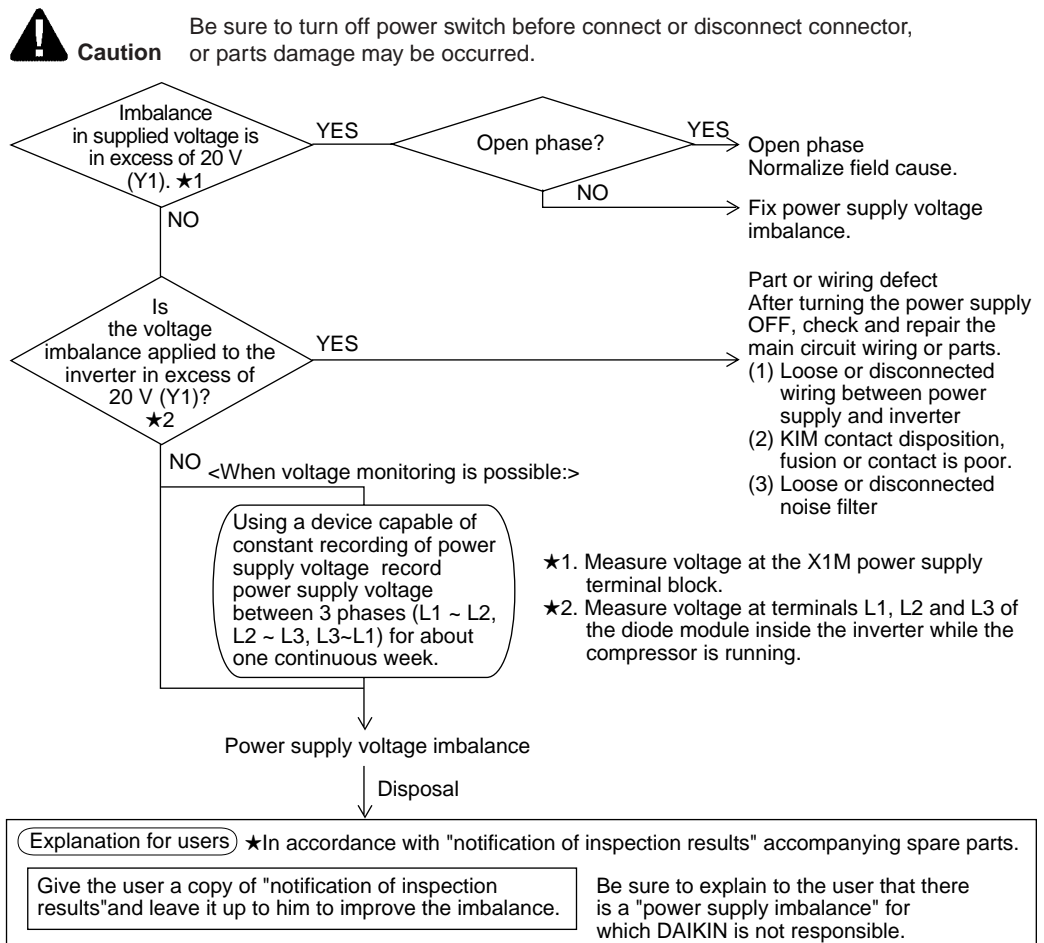
Remote
Controller
Display

P1

Supposed
Causes

- Open phase
- Voltage imbalance between phases
- Defect of main circuit capacitor
- Defect of inverter unit
- Defect of K1M
- Improper main circuit wiring

Troubleshooting



(VF069)

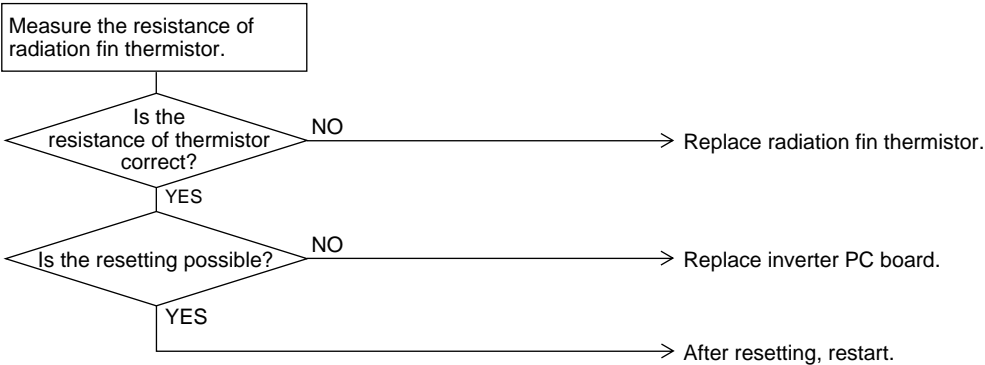
5.8 Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise Sensor

Remote Controller Display	P4
Supposed Causes	<div><div></div> Defect of radiator fin temperature sensor</div> <div><div></div> Defect of inverter unit</div>
Troubleshooting	



Caution

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



(VF070)

6. Troubleshooting (OP: Central Remote Controller)

6.1 Malfunction of Transmission Between Central Remote Controller and Indoor Unit

Remote
Controller
Display

UE

Supposed
Causes

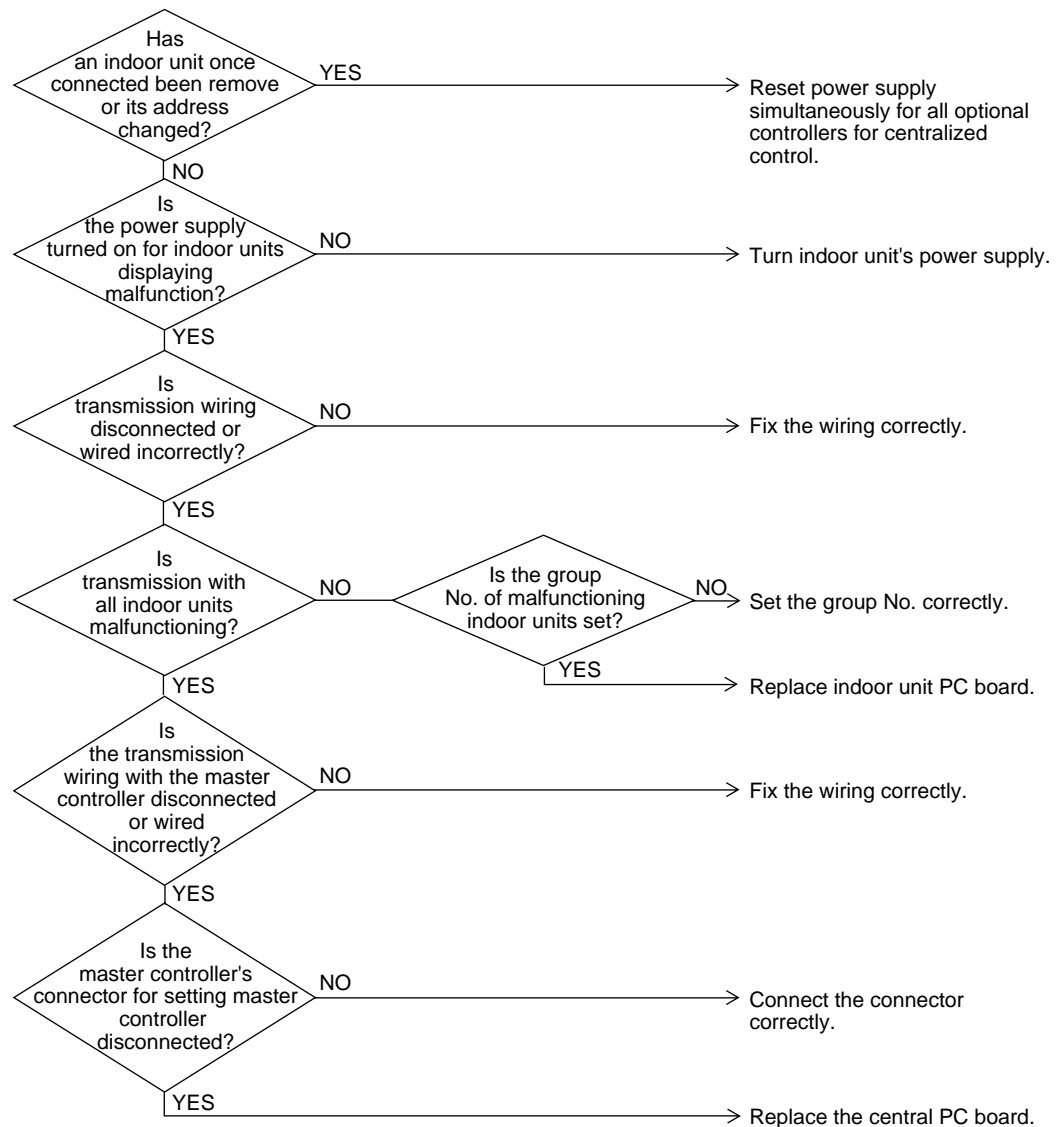
- Malfunction of transmission between optional controllers for centralized control and indoor unit
- Connector for setting master controller is disconnected.
- Failure of PC board for central remote controller
- Defect of indoor unit PC board

Troubleshooting




Caution

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



(VF071)

6.2 PC Board Defect

Remote Controller Display	
Supposed Causes	<ul style="list-style-type: none">■ Defect of central remote controller PC board
Troubleshooting	Replace the central remote controller PC board.

6.3 Malfunction of Transmission Between Optional Controllers for Centralized Control

Remote
Controller
Display

78

Supposed
Causes

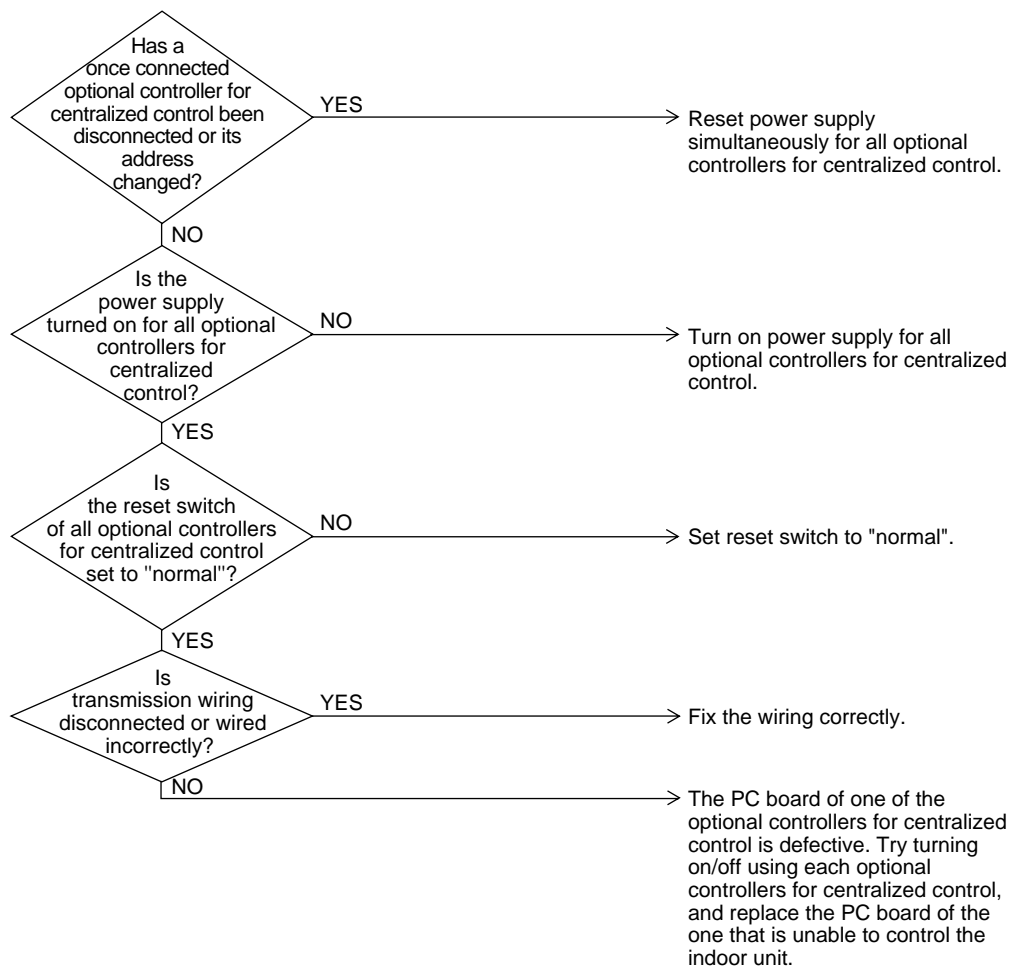
- Malfunction of transmission between optional controllers for centralized control
- Defect of PC board of optional controllers for centralized control

Troubleshooting



Caution

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



(VF072)

6.4 Improper Combination of Optional Controllers for Centralized Control

Remote
Controller
Display

MR

Supposed
Causes

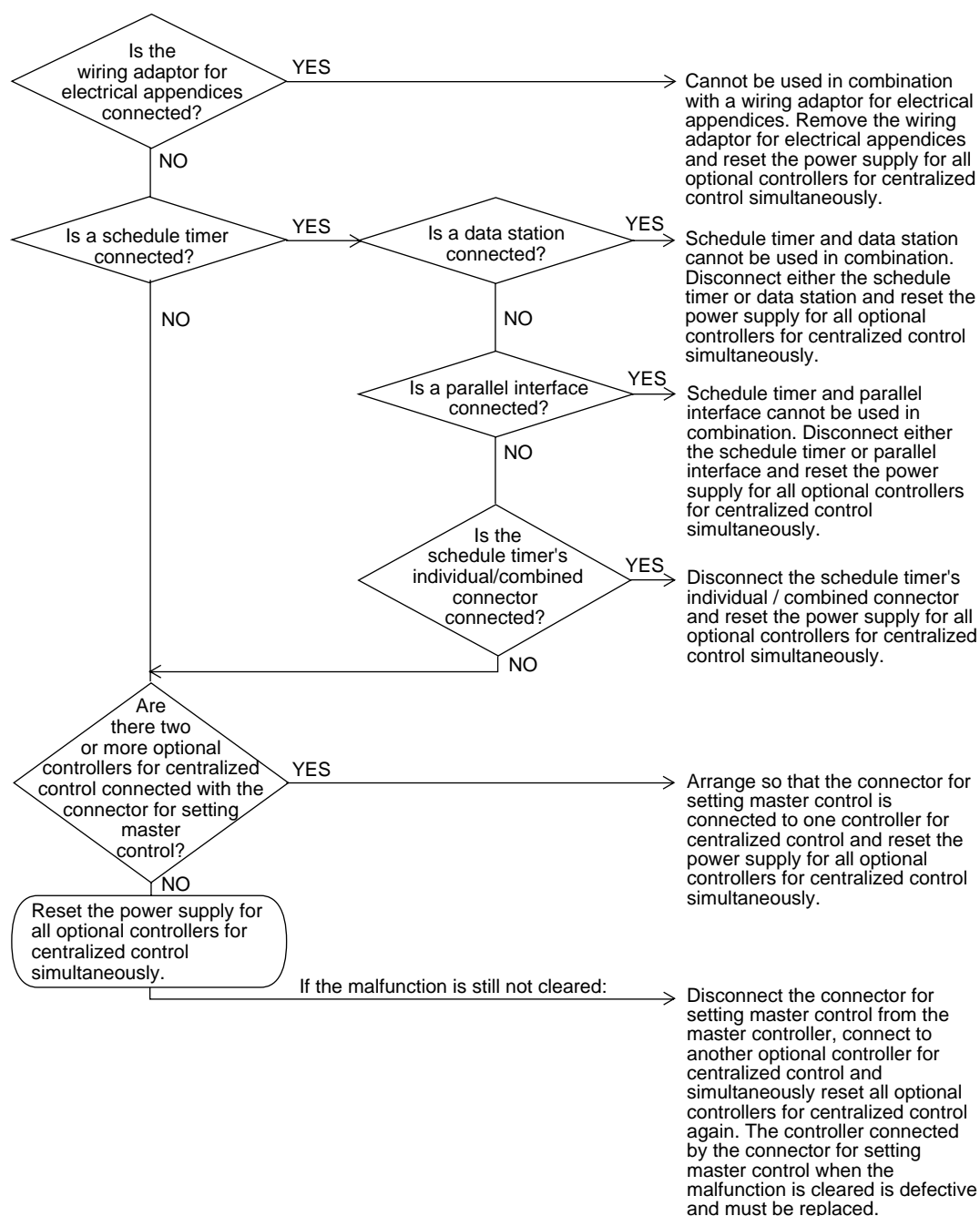
- Improper combination of optional controllers for centralized control
- More than one master controller is connected
- Defect of PC board of optional controller for centralized control

Troubleshooting




Caution

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



(VF073)

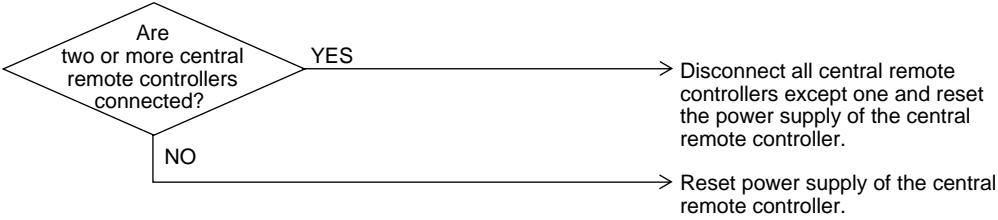
6.5 Address Duplication, Improper Setting

Remote Controller Display	
Supposed Causes	■ Address duplication of central remote controller
Troubleshooting	



Caution

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



(VF074)

7. Troubleshooting (OP: Schedule Timer)

7.1 Malfunction of Transmission Between Central Remote Controller and Indoor Unit

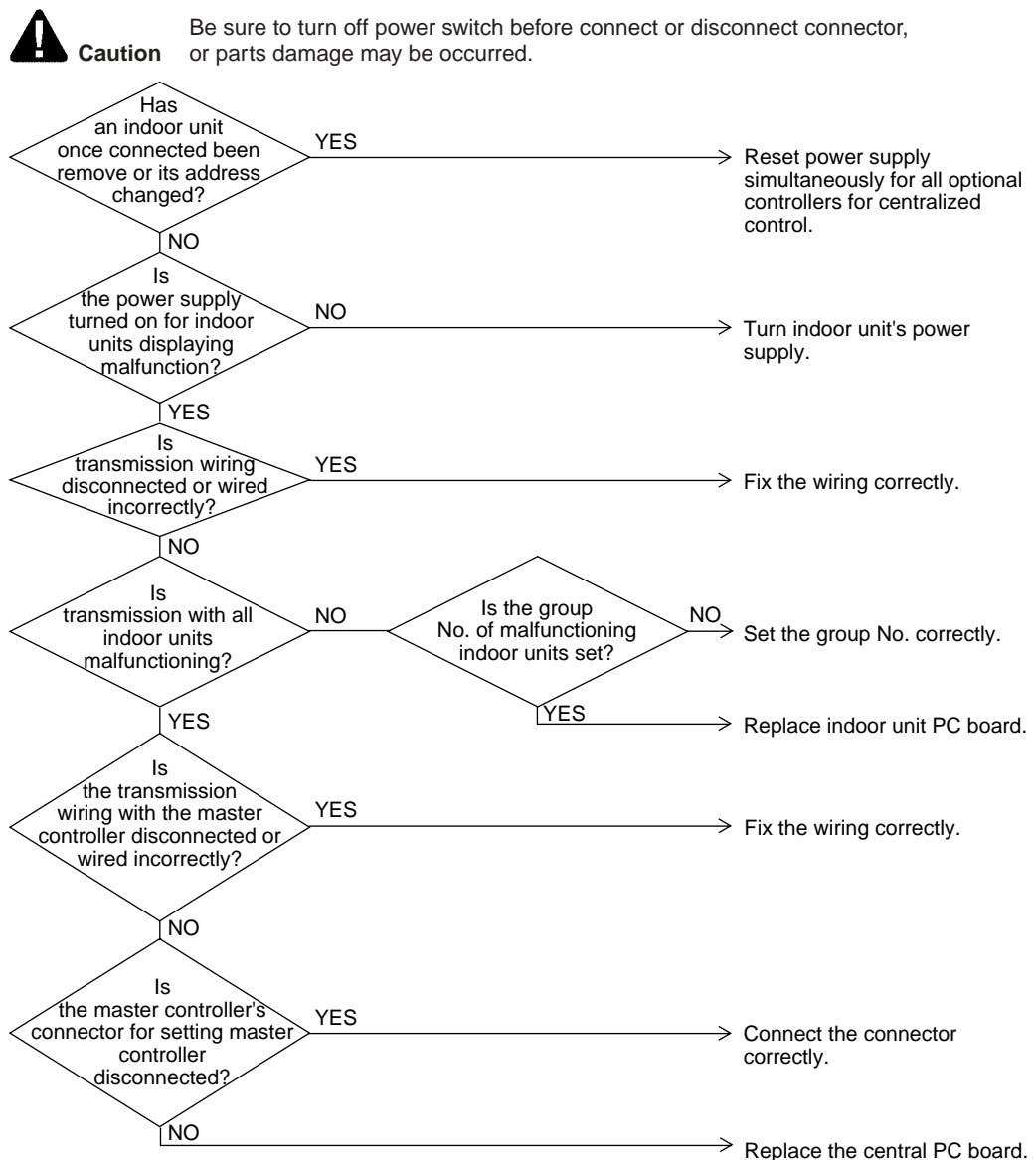
Remote
Controller
Display

UE

Supposed
Causes


- Malfunction of transmission between central remote controller and indoor unit
- Disconnection of connector for setting master controller (or individual/combined switching connector)
- Defect of schedule timer PC board
- Defect of indoor unit PC board

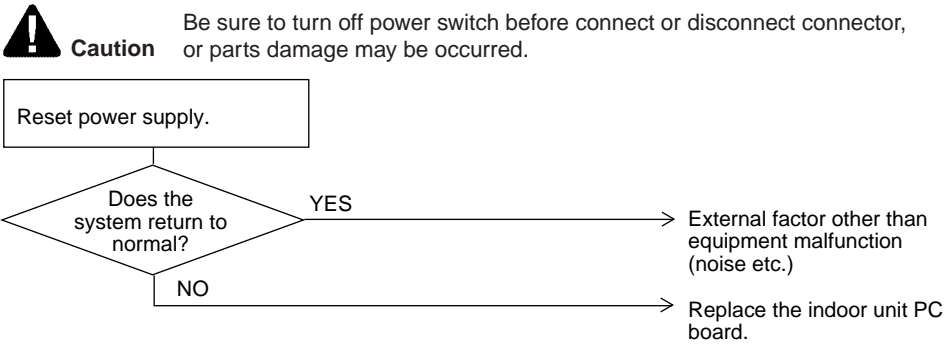
Troubleshooting



(VF075)

7.2 PC Board Defect

Remote Controller Display	
Supposed Causes	■ Defect of schedule timer PC board
Troubleshooting	



(V0843)

7.3 Malfunction of Transmission Between Optional Controllers for Centralized Control

Remote
Controller
Display

78

Supposed
Causes

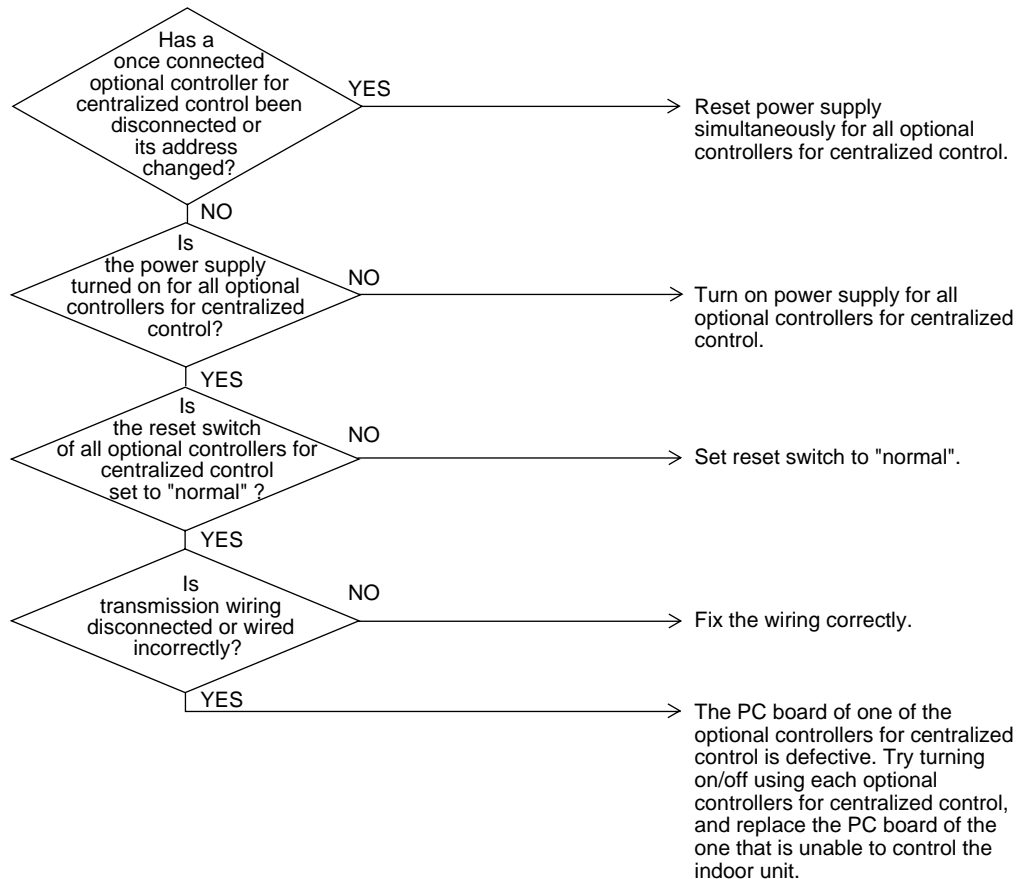
- Malfunction of transmission between optional controllers for centralized control
- Defect of PC board of optional controllers for centralized control

Troubleshooting



Caution

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



(VF076)

7.4 Improper Combination of Optional Controllers for Centralized Control

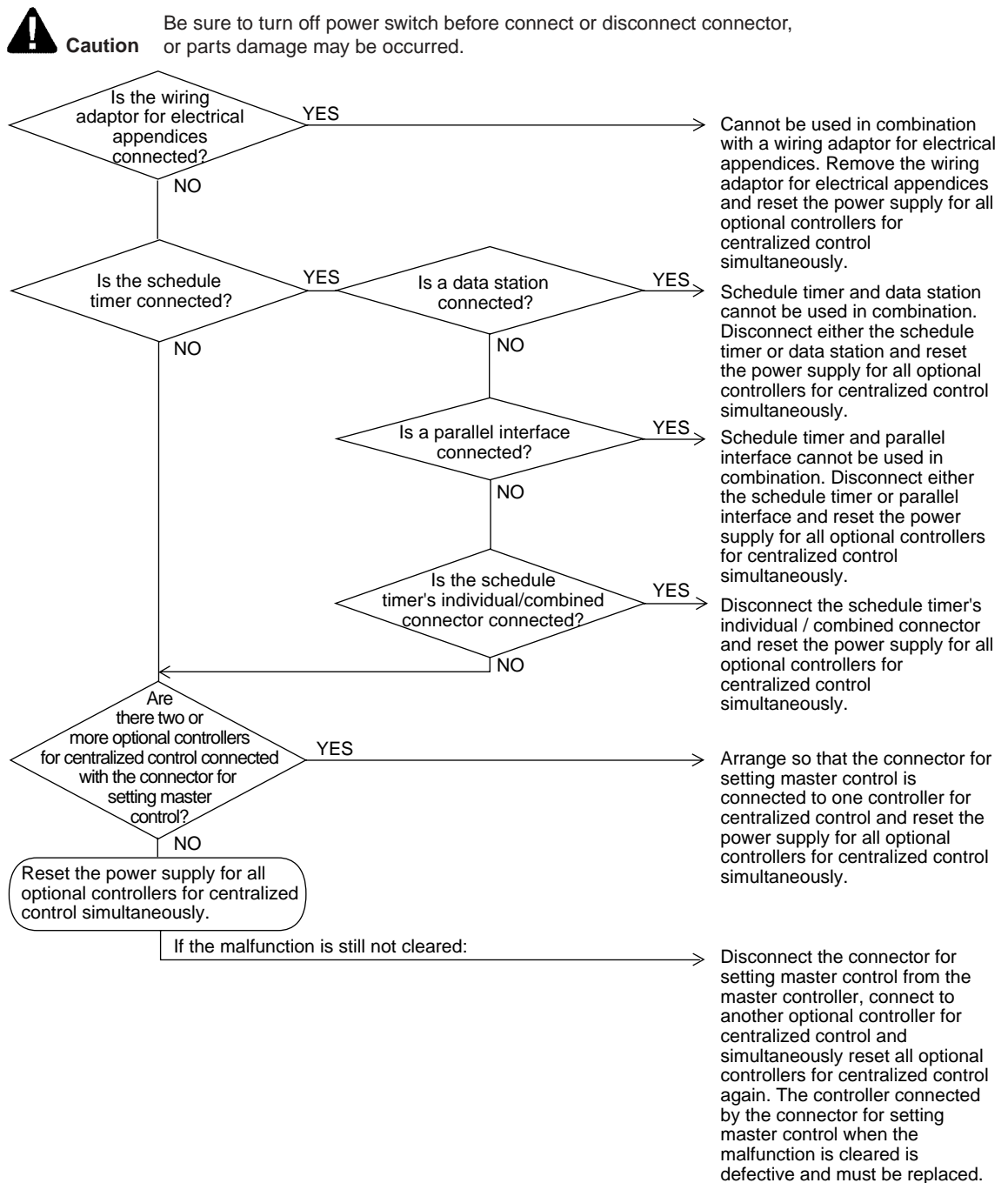
Remote
Controller
Display

MR

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

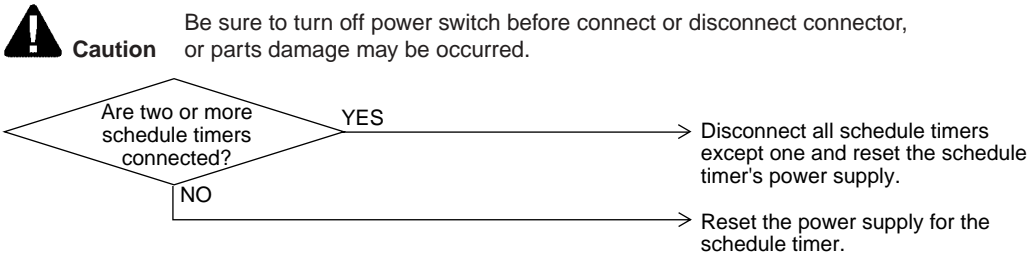
Troubleshooting



(VF077)

7.5 Address Duplication, Improper Setting

Remote Controller Display	
Supposed Causes	■ Address duplication of optional controller for centralized control
Troubleshooting	



(VF078)

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

8.1 Operation Lamp Blinks

Remote
Controller
Display

Operation lamp blinks

Supposed
Causes

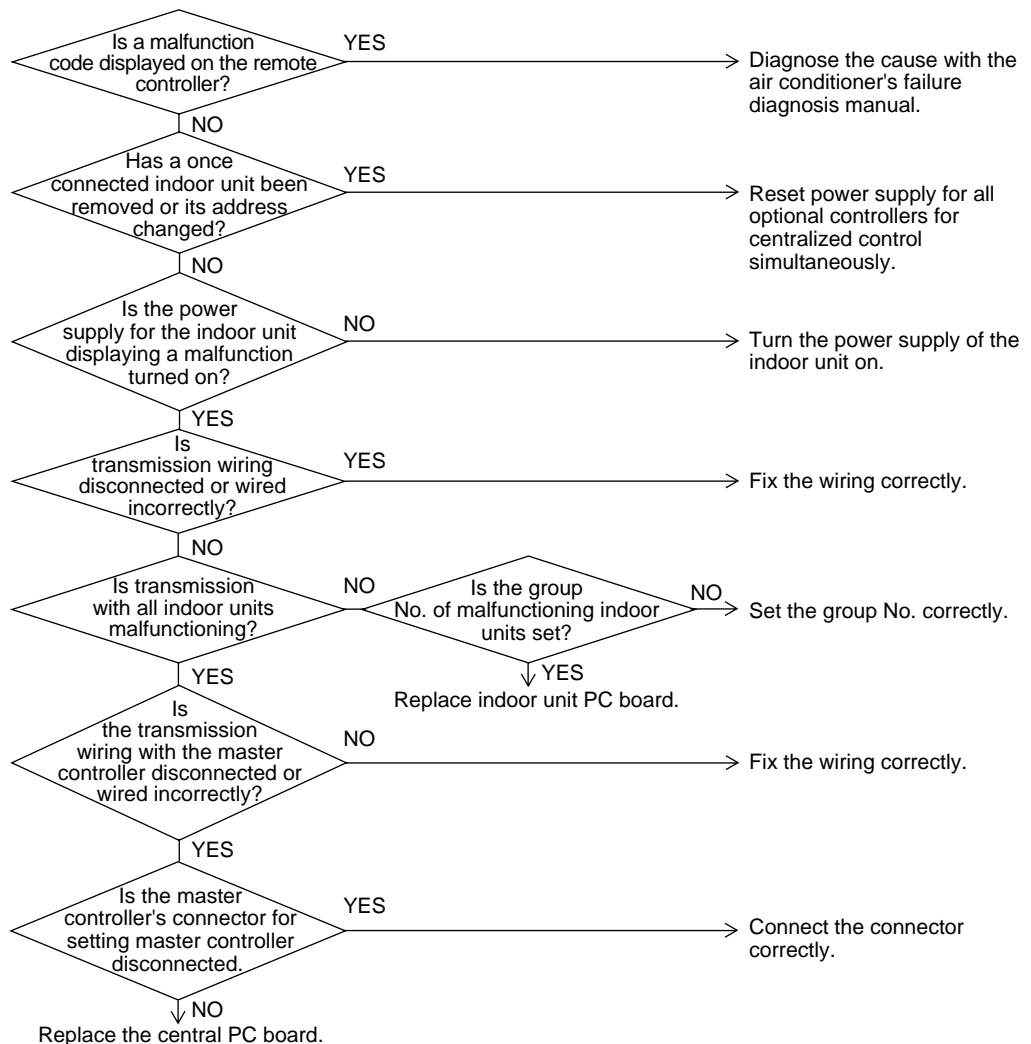
- Malfunction of transmission between optional controller and indoor unit
- Connector for setting master controller is disconnected
- Defect of unified ON/OFF controller
- Defect of indoor unit PC board
- Malfunction of air conditioner

Troubleshooting



Caution

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



(VF079)

8.2 Display “Under Host Computer Integrate Control” Blinks (Repeats Single Blink)

**Remote
Controller
Display**

“under host computer integrated control” (Repeats single blink)

**Supposed
Causes**

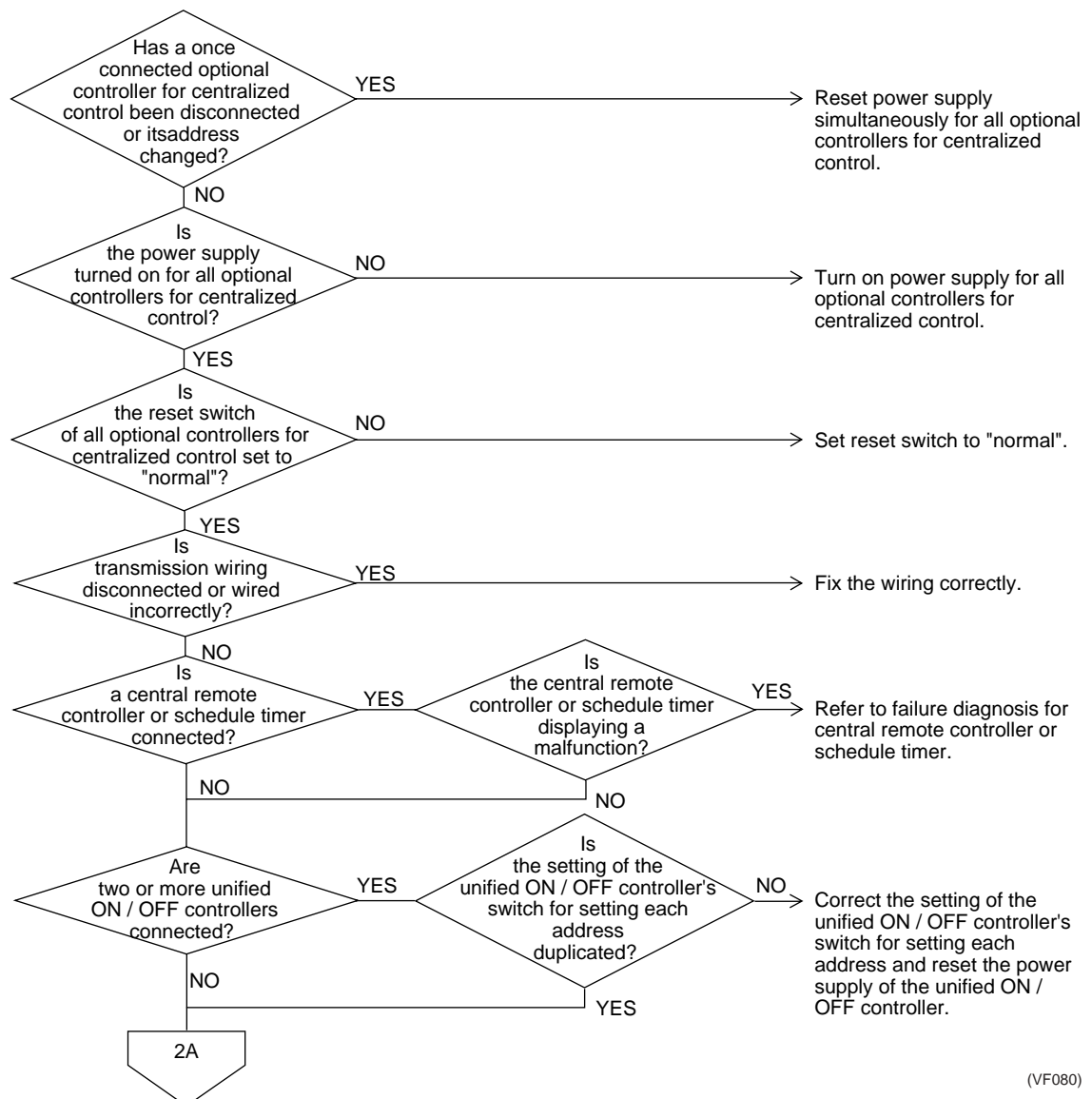
- Address duplication of central remote controller
- Improper combination of optional controllers for centralized control
- Connection of more than one master controller
- Malfunction of transmission between optional controllers for centralized control
- Defect of PC board of optional controllers for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

Troubleshooting

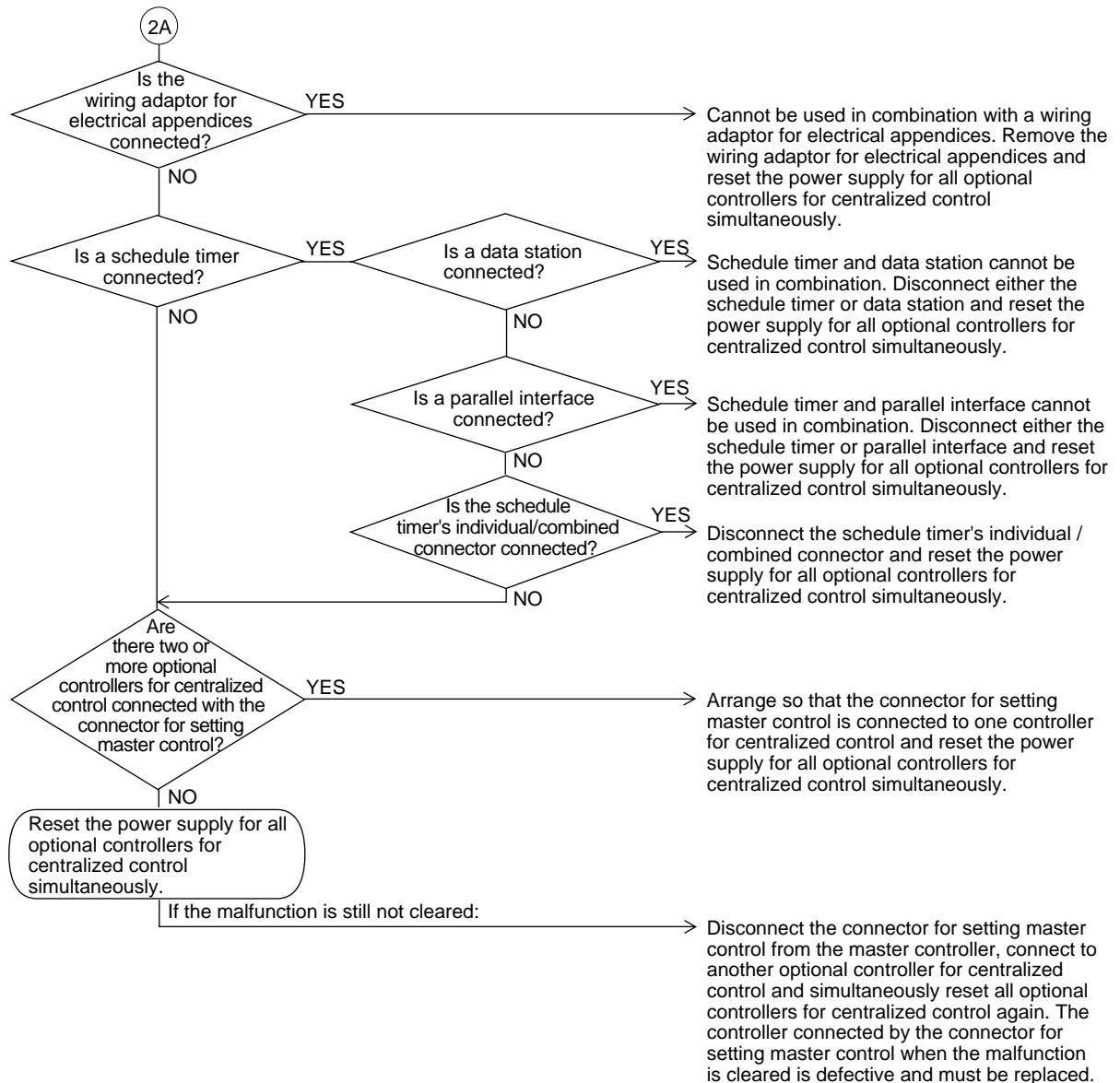


Caution

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



(VF080)



(VF081)

8.3 Display “Under Host Computer Integrate Control” Blinks (Repeats Double Blink)

Remote Controller Display

“under host computer integrated control” (Repeats double blink)

Supposed Causes

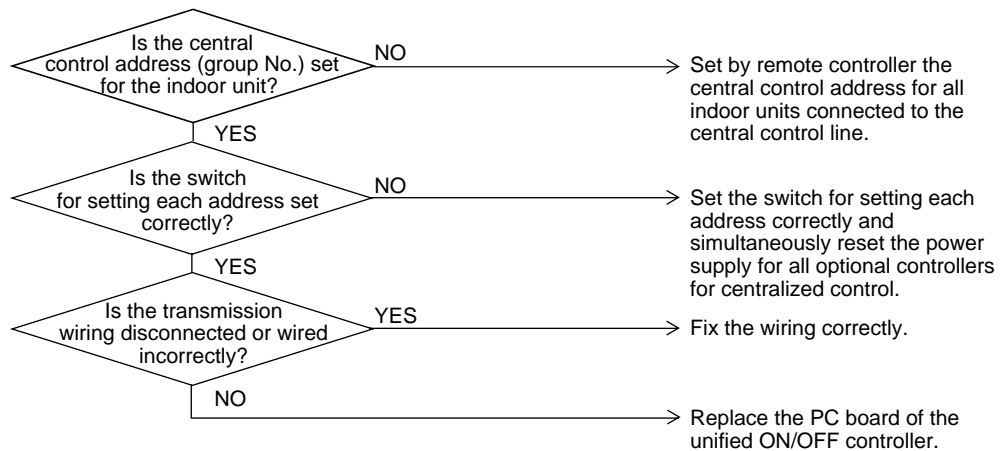
- Central control address (group No.) is not set for indoor unit.
- Improper address setting
- Improper wiring of transmission wiring

Troubleshooting



Caution

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



(VF082)

Part 6

Appendix

R-407C *VRV*TM PLUS Series

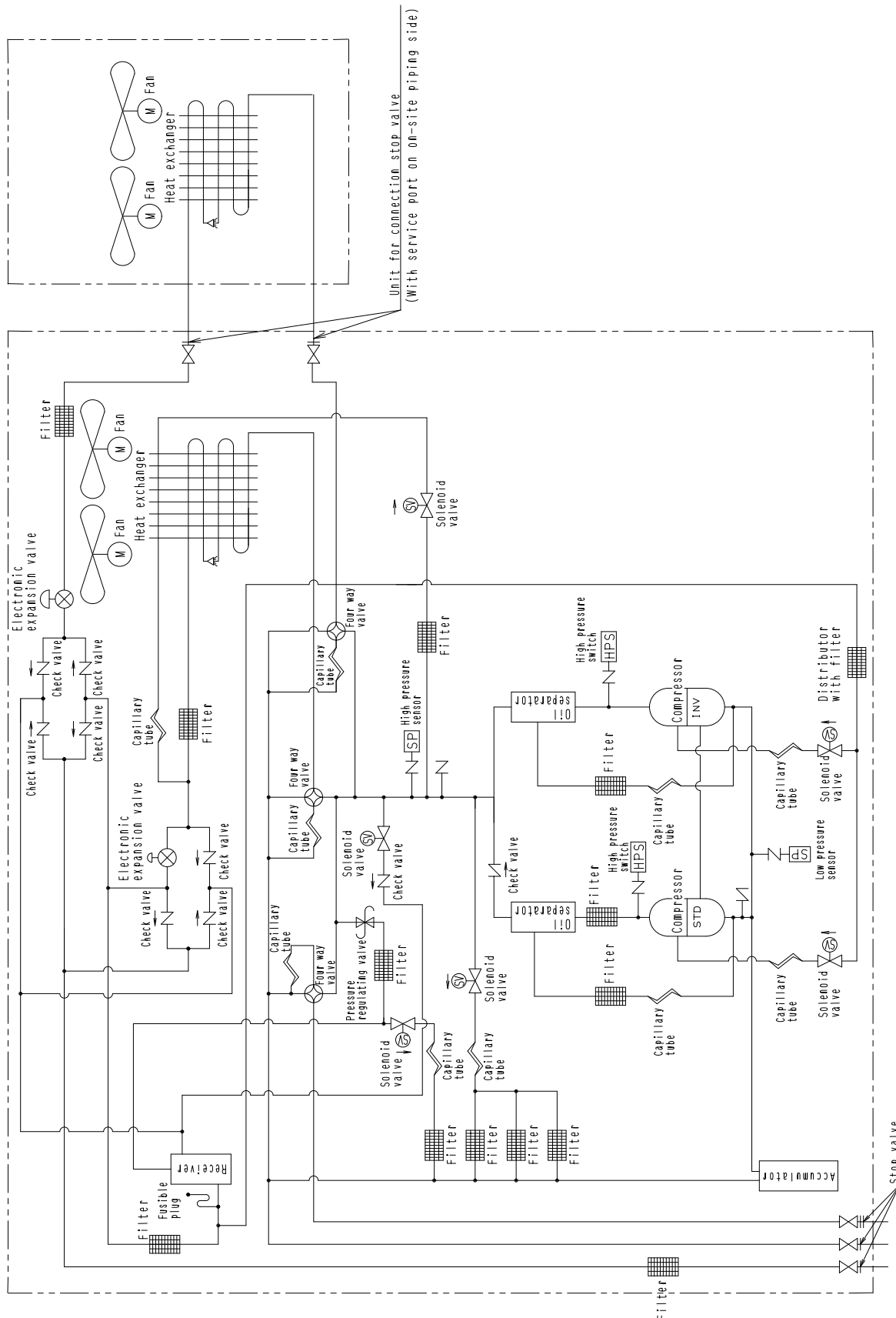
Heat Recovery System

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1. Piping Diagram

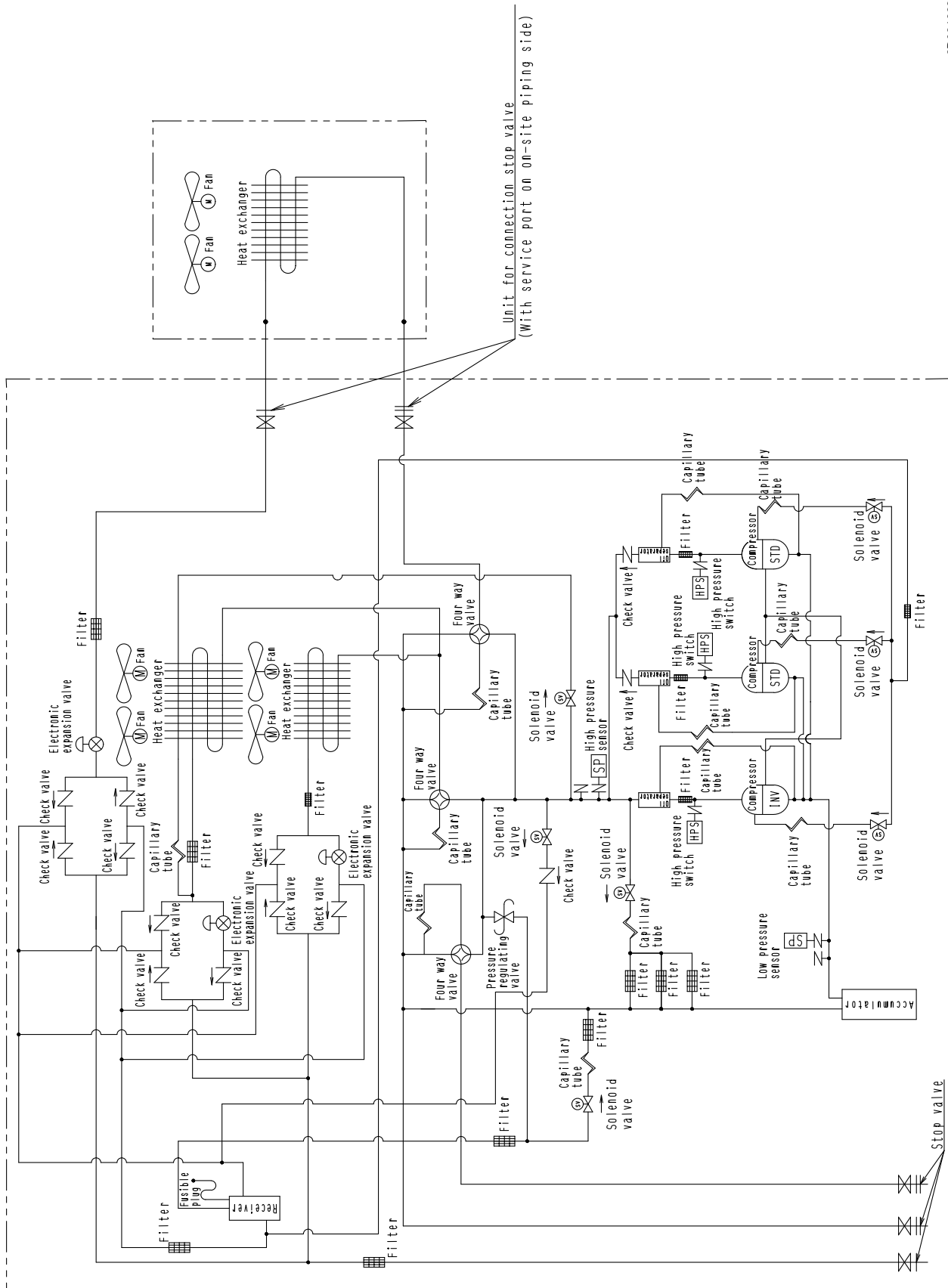
1.1 Outdoor Unit

RSEYP16-18-20KJY1



3D031937

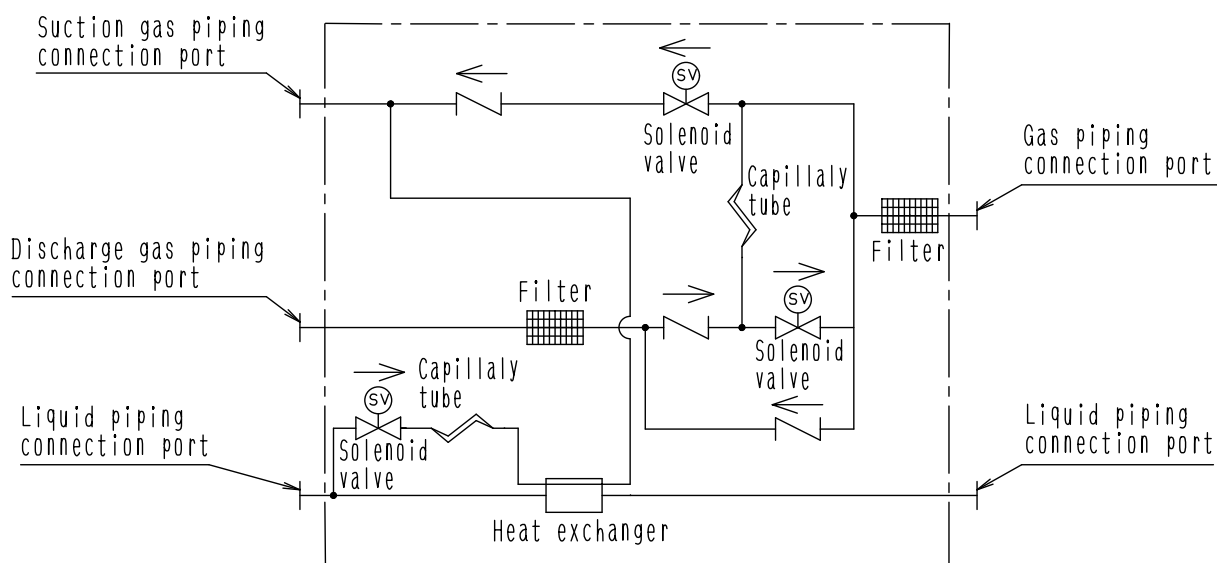
RSEYP24-26-28-30KJY1



3D031938

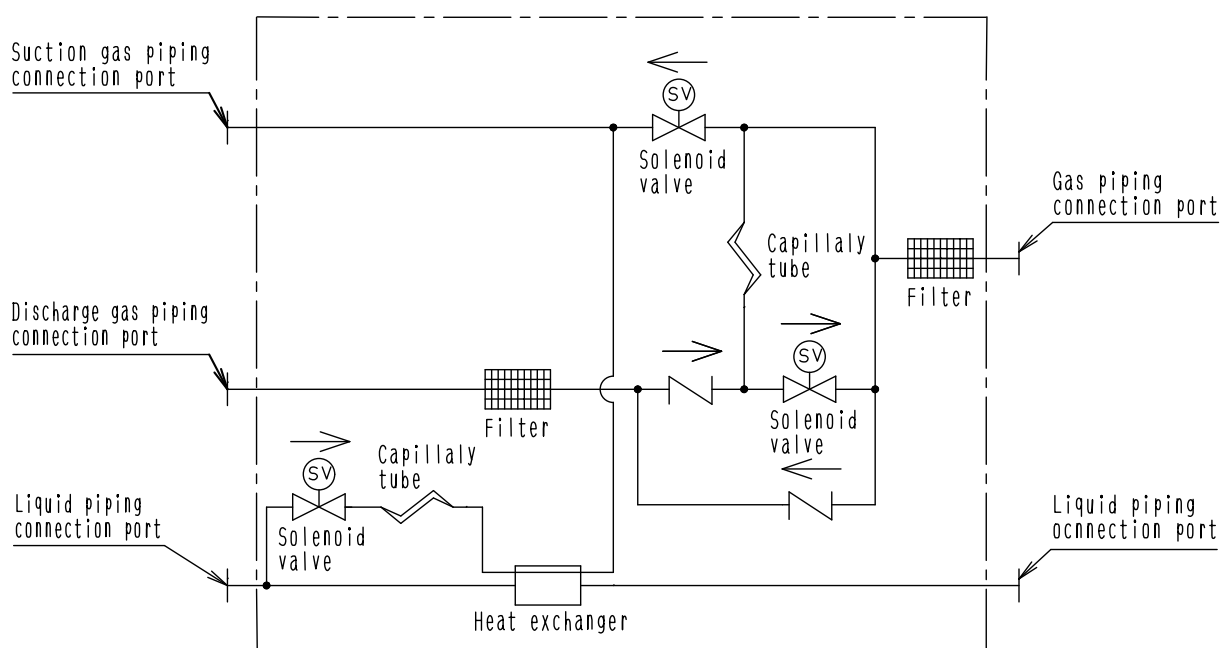
1.2 BS Unit

BSVP100KJV1



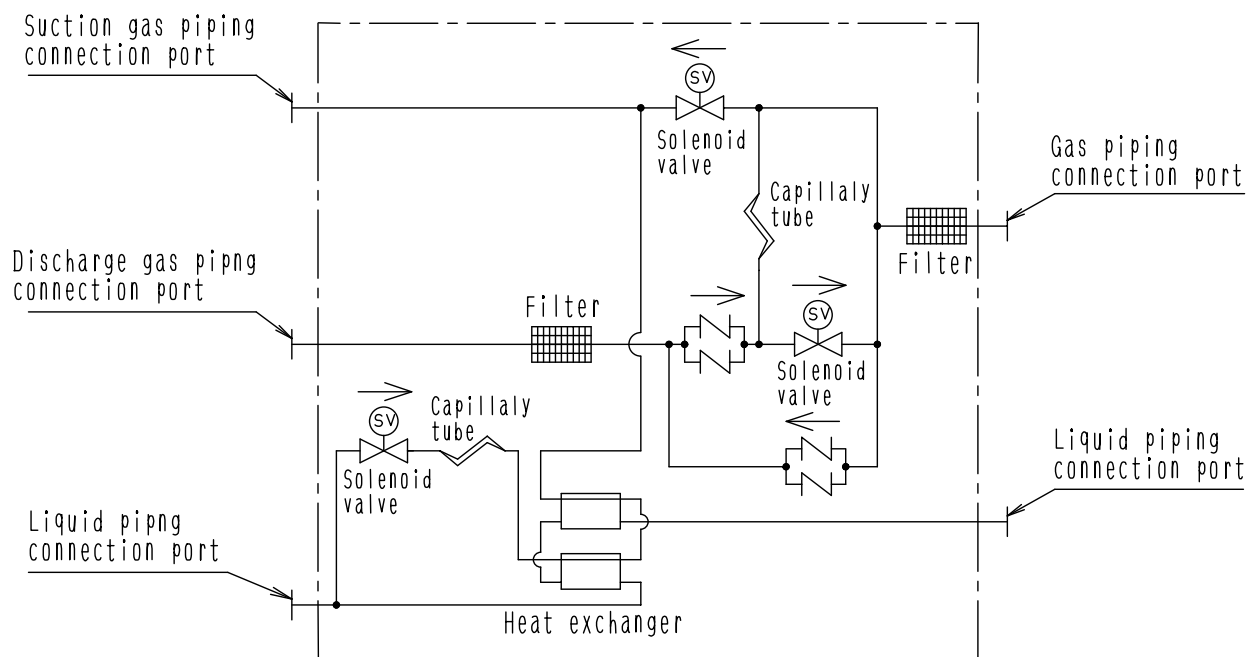
4D014497A

BSVP160KJV1



4D014498A

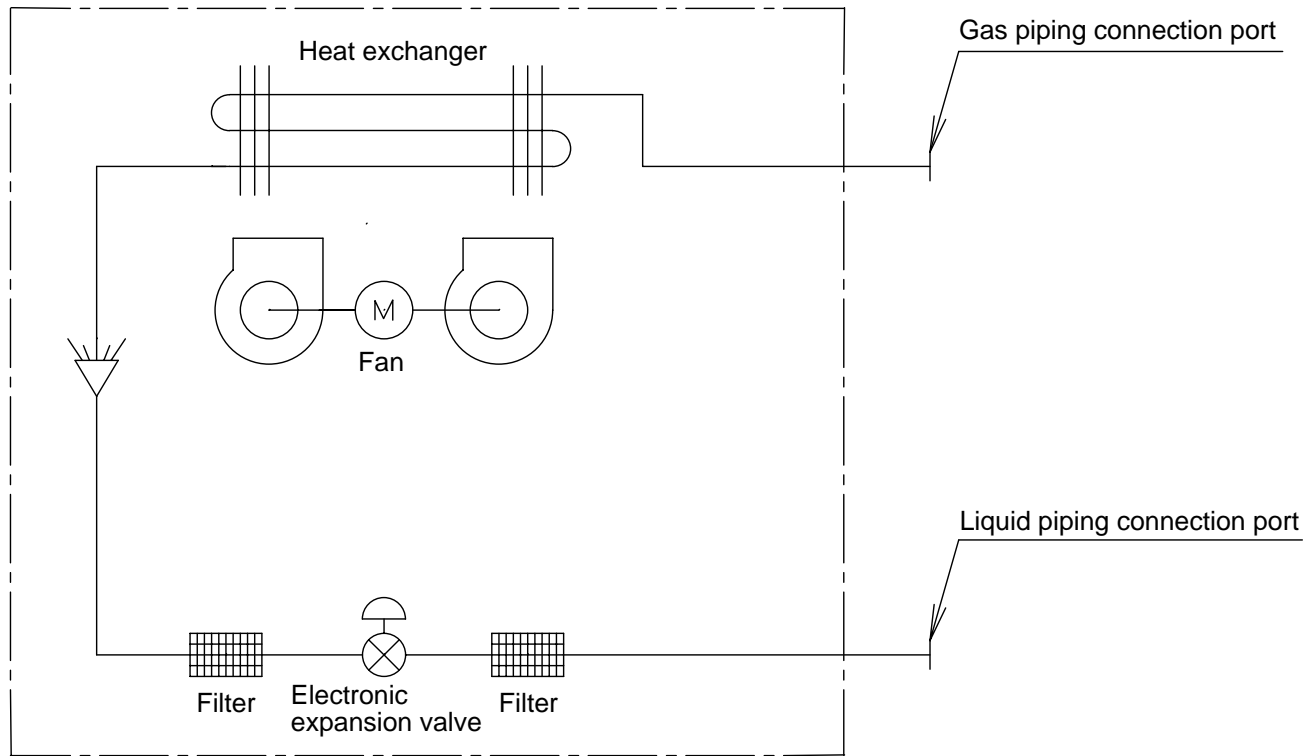
BSVP250KJV1



4D014499A

1.3 Indoor Unit

FXYFP, FXYCP, FXYKP, FXYSP, FXYMP, FXYHP, FXYAP, FXYLP, FXYLMP

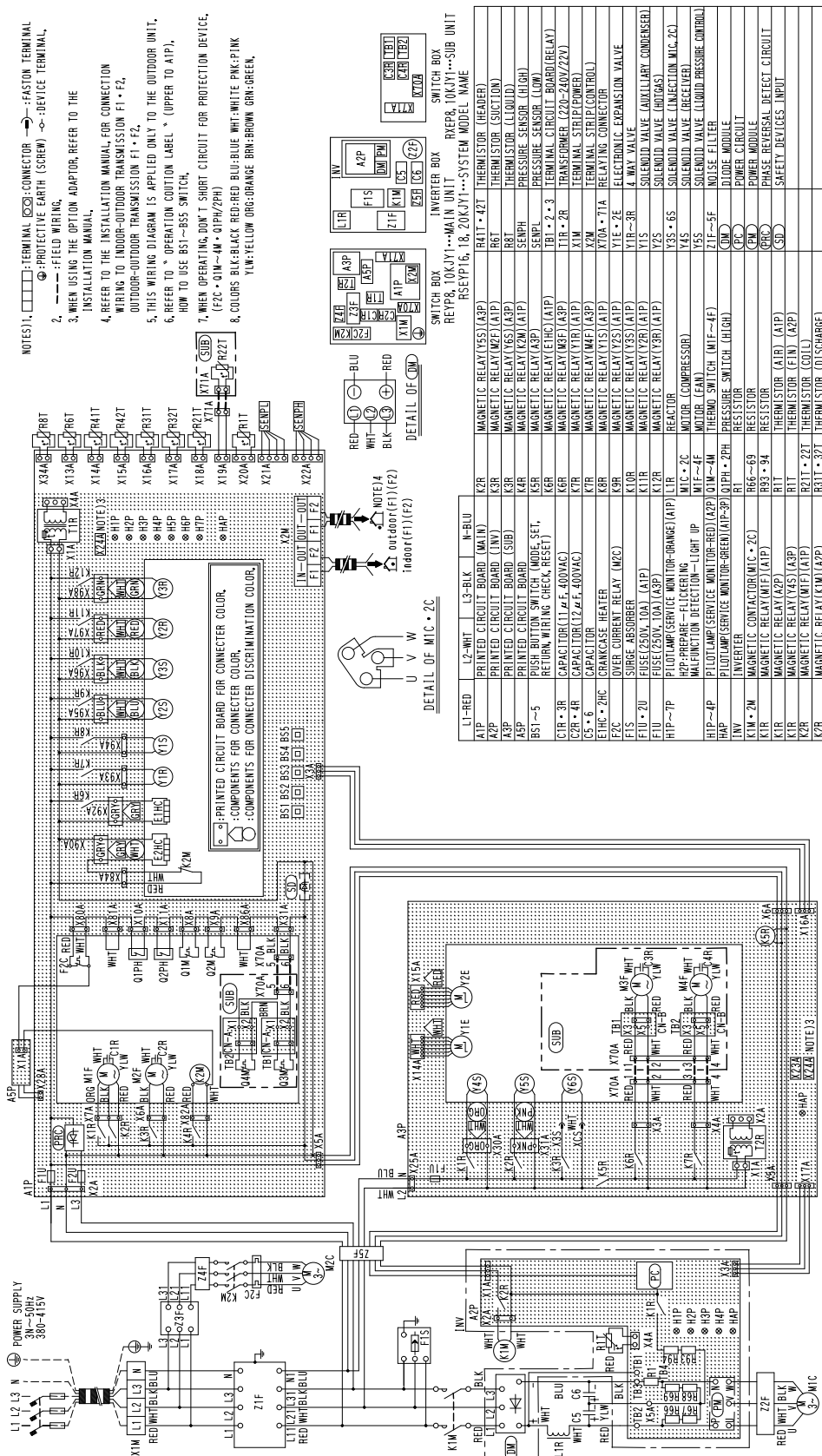


DU220-602D

2. Wiring Diagram

2.1 Outdoor Unit

RSEYP16-18-20KJY1

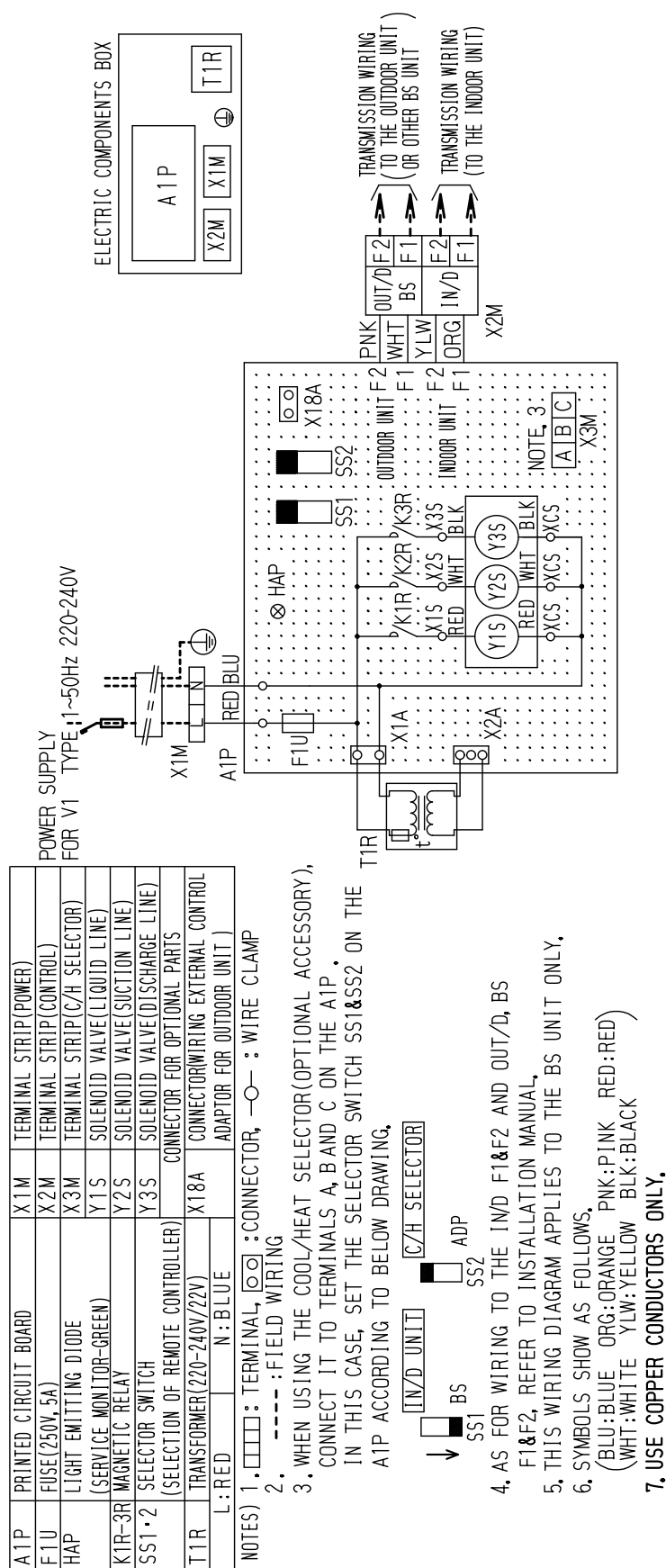


3D031466

226

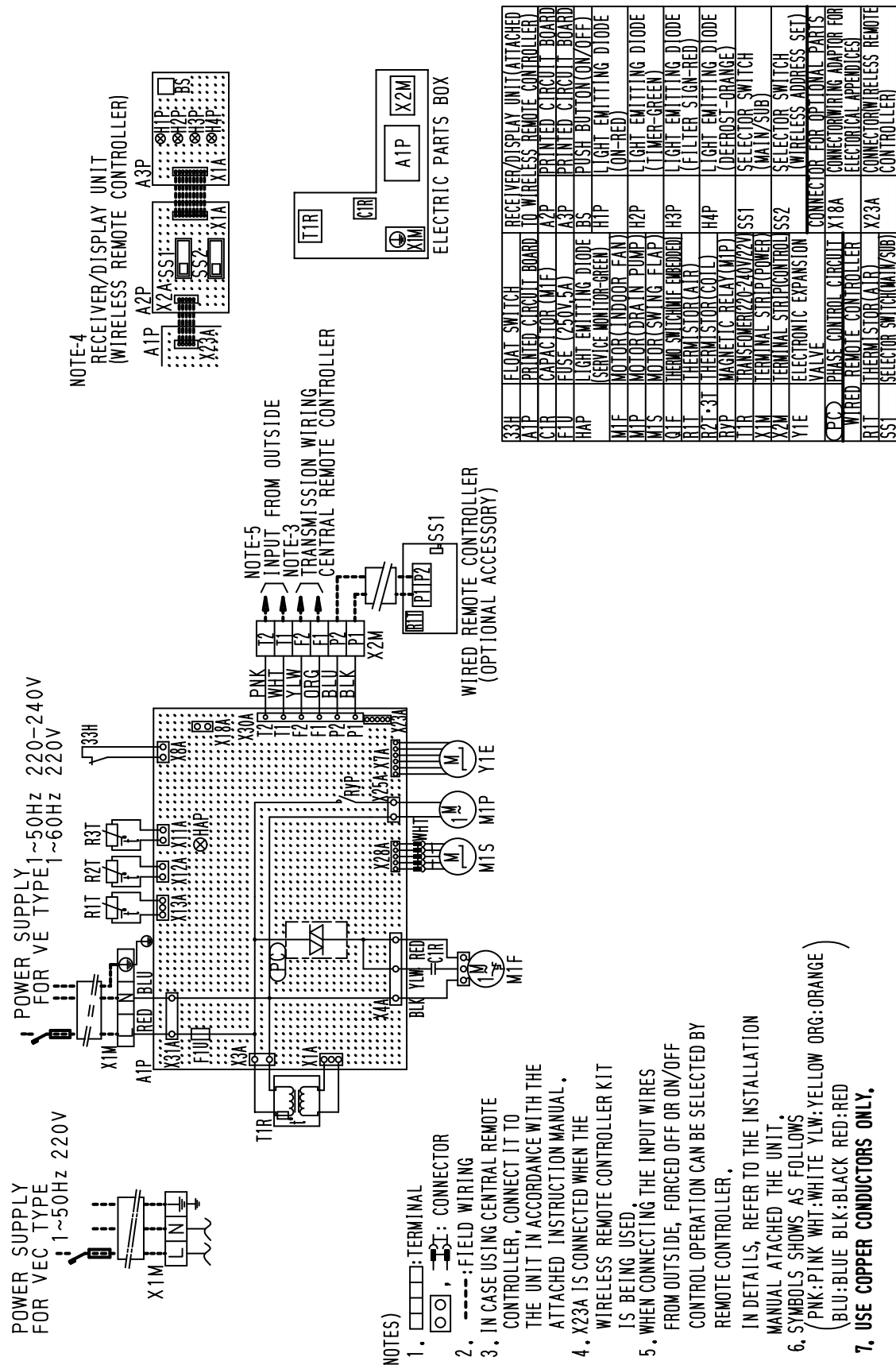


2.2 BS Unit



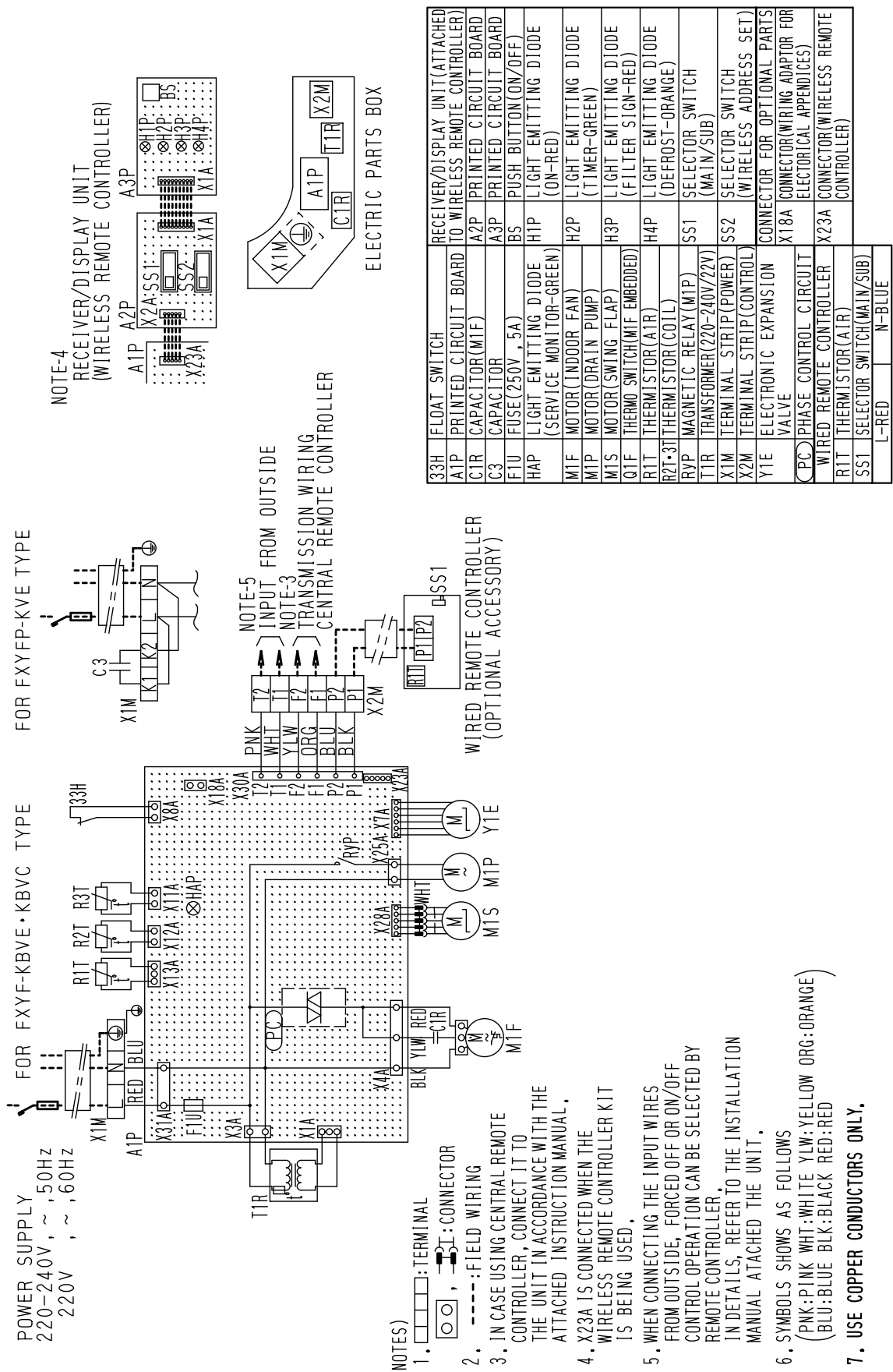
2.3 Indoor Unit

FXYFP32-40-50-63-80-125KV1



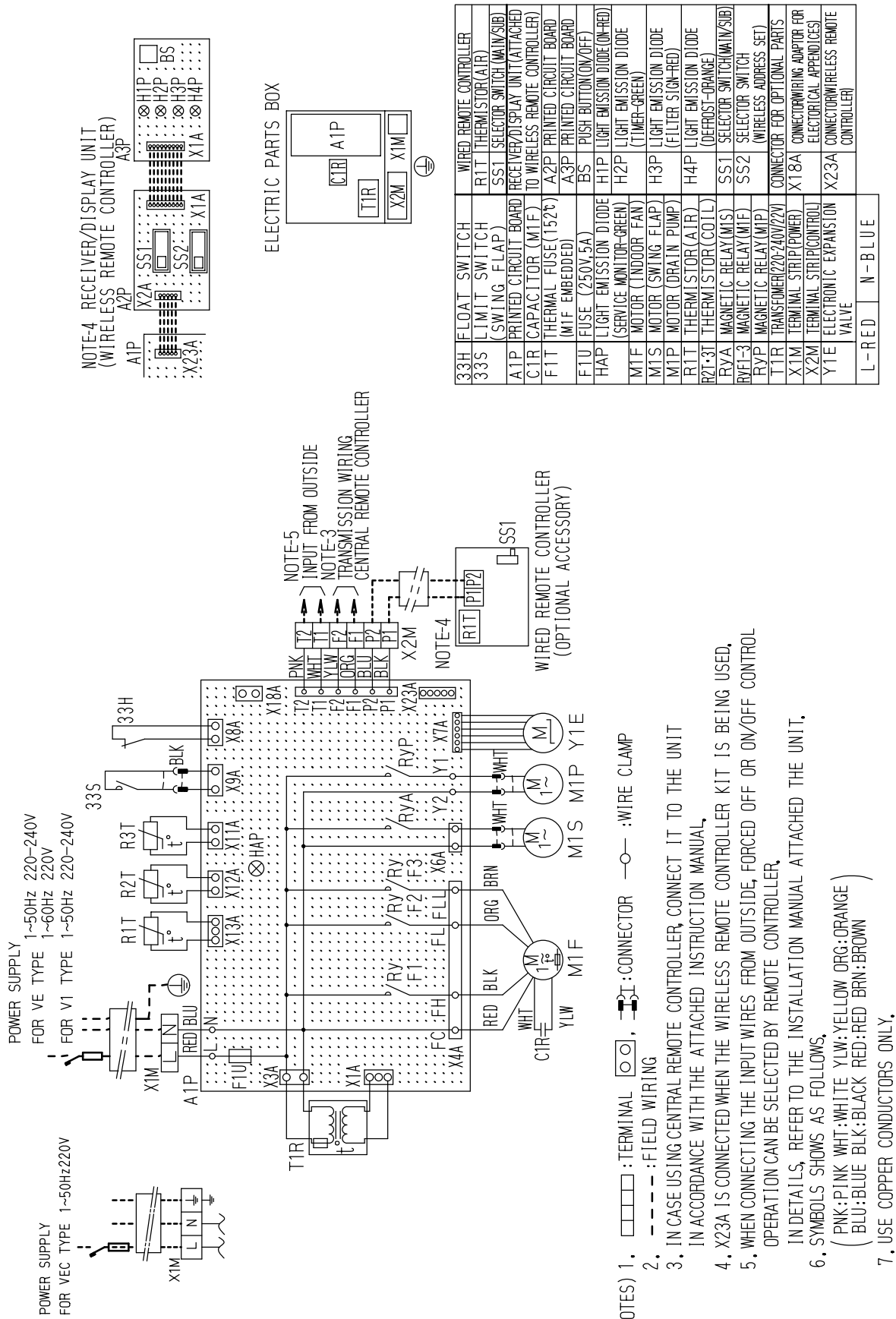
3D005759B

FXYP32-40-50-63-80-100-125KVE



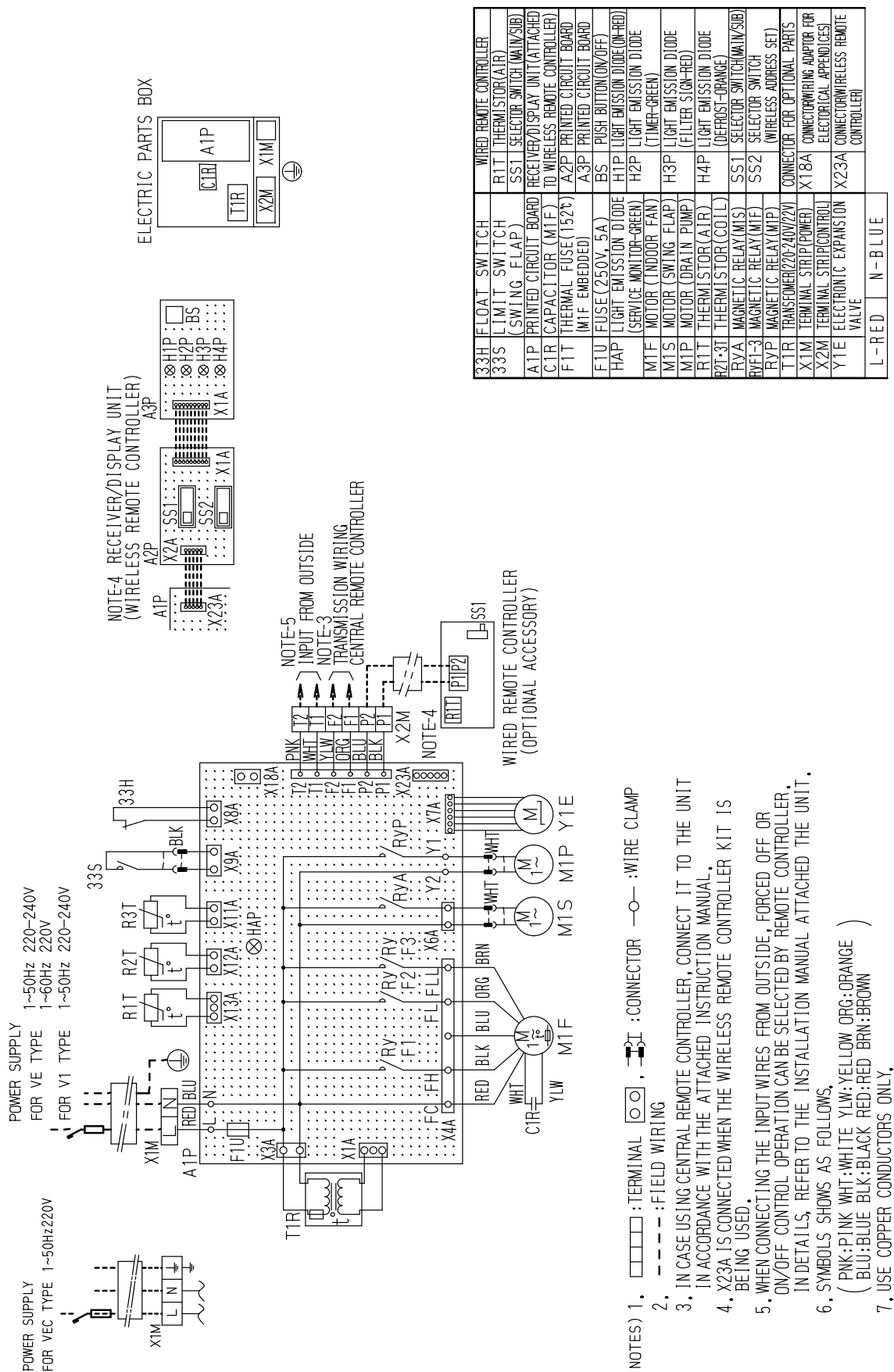
3D020238B

FXYCP20-25-32-63KV1



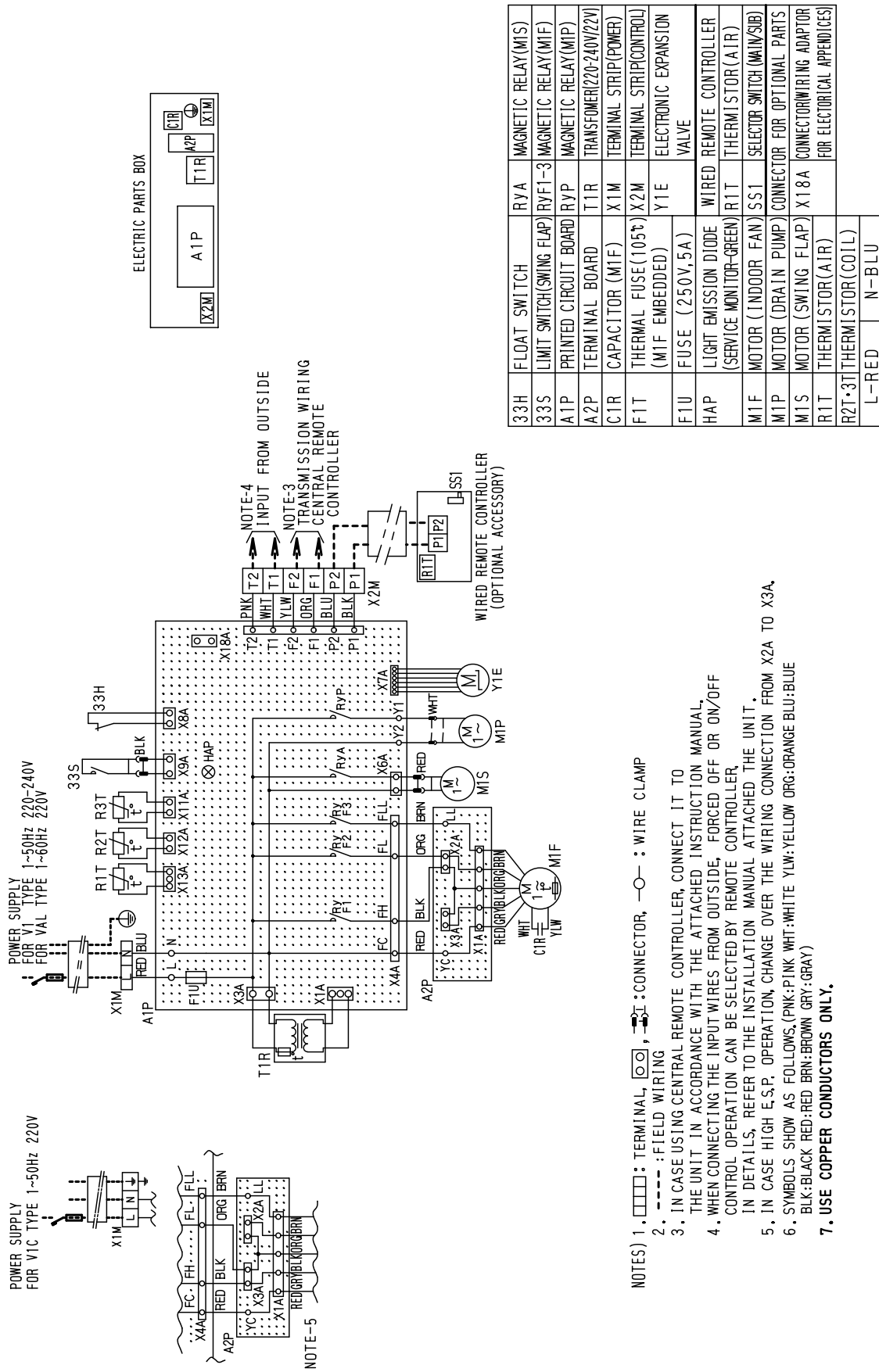
DU225-5139C

FXYCP40-50-80-125KV1



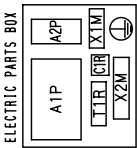
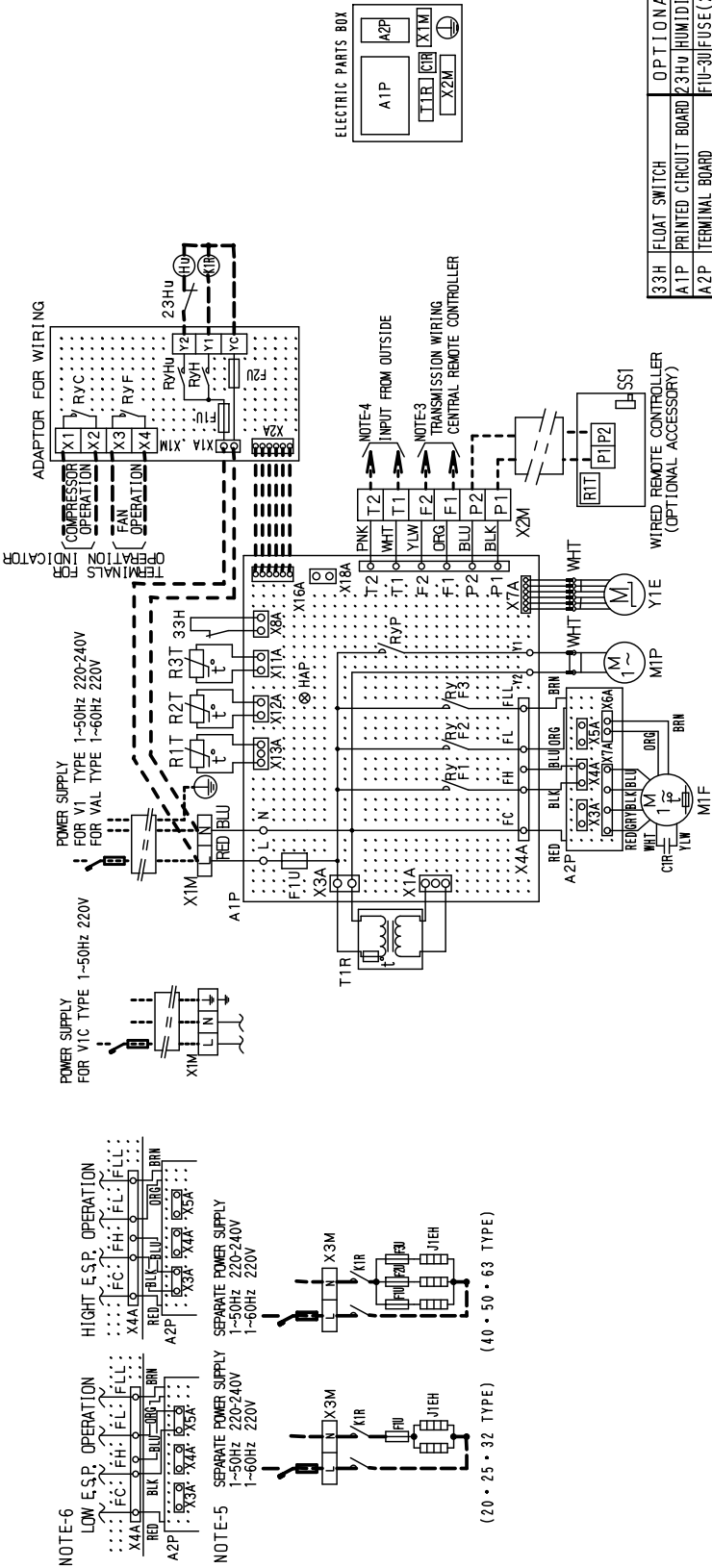
DU230-522C

FXYKP25-32-40-63KV1



DU227-544C

FXYSP20-25-32-40-50-63KV1

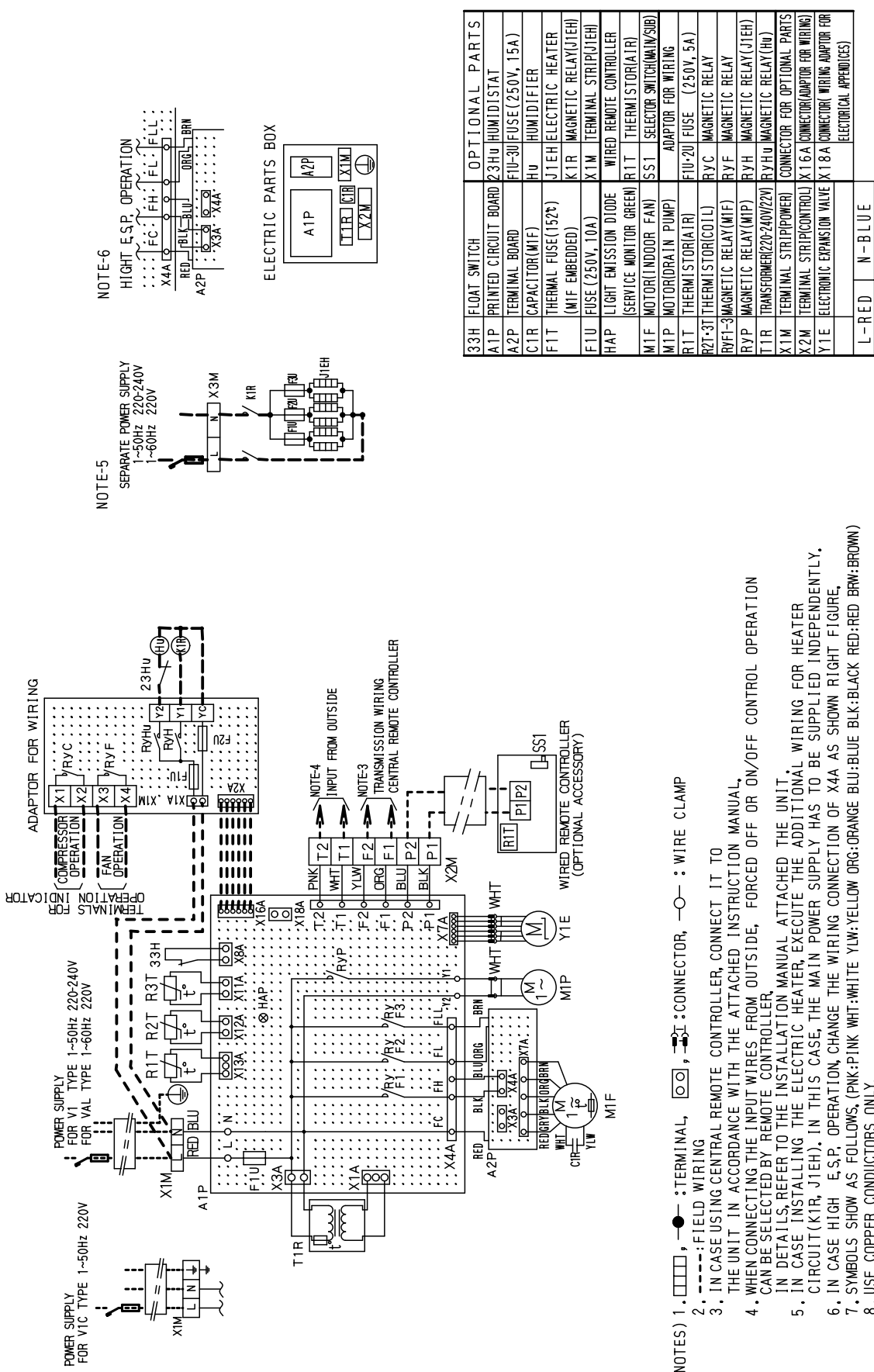


- NOTES) 1. [Symbol]: TERMINAL, [Symbol]: FIELD WIRING, [Symbol]: CONNECTOR, [Symbol]: WIRE CLAMP
2. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTION MANUAL.
3. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
4. IN CASE INSTALLING THE ELECTRIC HEATER, EXECUTE THE ADDITIONAL WIRING FOR HEATER CIRCUIT(K1R, J1EH). IN THIS CASE, THE MAIN POWER SUPPLY HAS TO BE SUPPLIED INDEPENDENTLY.
5. IN CASE HIGH OR LOW E.S.P. OPERATION, CHANGE THE WIRING CONNECTION OF X4A AS SHOWN RIGHT FIGURE.
6. SYMBOLS SHOW AS FOLLOWS, (PNK:PINK WHT:WHITE YLW:YELLOW ORG:ORANGE BLU:BLUE BK:BLACK RED:RED BRW:BROWN)
7. USE COPPER CONDUCTORS ONLY.

33H	FLOAT SWITCH	OPTIONAL PARTS
A1P	PRINTED CIRCUIT BOARD	23Hu HUMIDISTAT
A2P	TERMINAL BOARD	FU-30 FUSE(250V, 15A)
C1R	CAPACITOR(MF)	Hu HUMIDIFIER
F1T	THERMAL FUSE(152t)	J1EH ELECTRIC HEATER
F1U	(MIF EMBEDDED)	K1R MAGNETIC RELAY(J1EH)
F1U	FUSE(250V, 10A)	X1M TERMINAL STRIP(JEH)
HAP	LIGHT EMISSION DIODE	WIRED REMOTE CONTROLLER
M1F	(SERVICE MONITOR GREEN)	R1T THERMISTOR(AIR)
M1P	MOTOR(INDOOR FAN)	SS1 SELECTOR SWITCH(MAIN/SUB)
M1P	MOTOR(DRAIN PUMP)	ADAPTOR FOR WIRING
R1T	THERMISTOR(AIR)	FU-20 FUSE (250V, 5A)
R2T-3T	THERMISTOR(COIL)	RVC MAGNETIC RELAY
RYF1-3	MAGNETIC RELAY(MF)	RVF MAGNETIC RELAY
RYP	MAGNETIC RELAY(MP)	RYH MAGNETIC RELAY(J1EH)
T1R	TRANSFORMER(220V/240V/220V)	RYH MAGNETIC RELAY(Hu)
X1M	TERMINAL STRIP(POWER)	CONNECTOR FOR OPTIONAL PARTS
X2M	TERMINAL STRIP(CONTROL)	X16A CONNECTOR(ADAPTOR FOR WIRING)
Y1E	ELECTRONIC EXPANSION VALVE	X18A CONNECTOR(ADAPTOR FOR ELECTRICAL APPENDICES)
L-RED	N-BLUE	

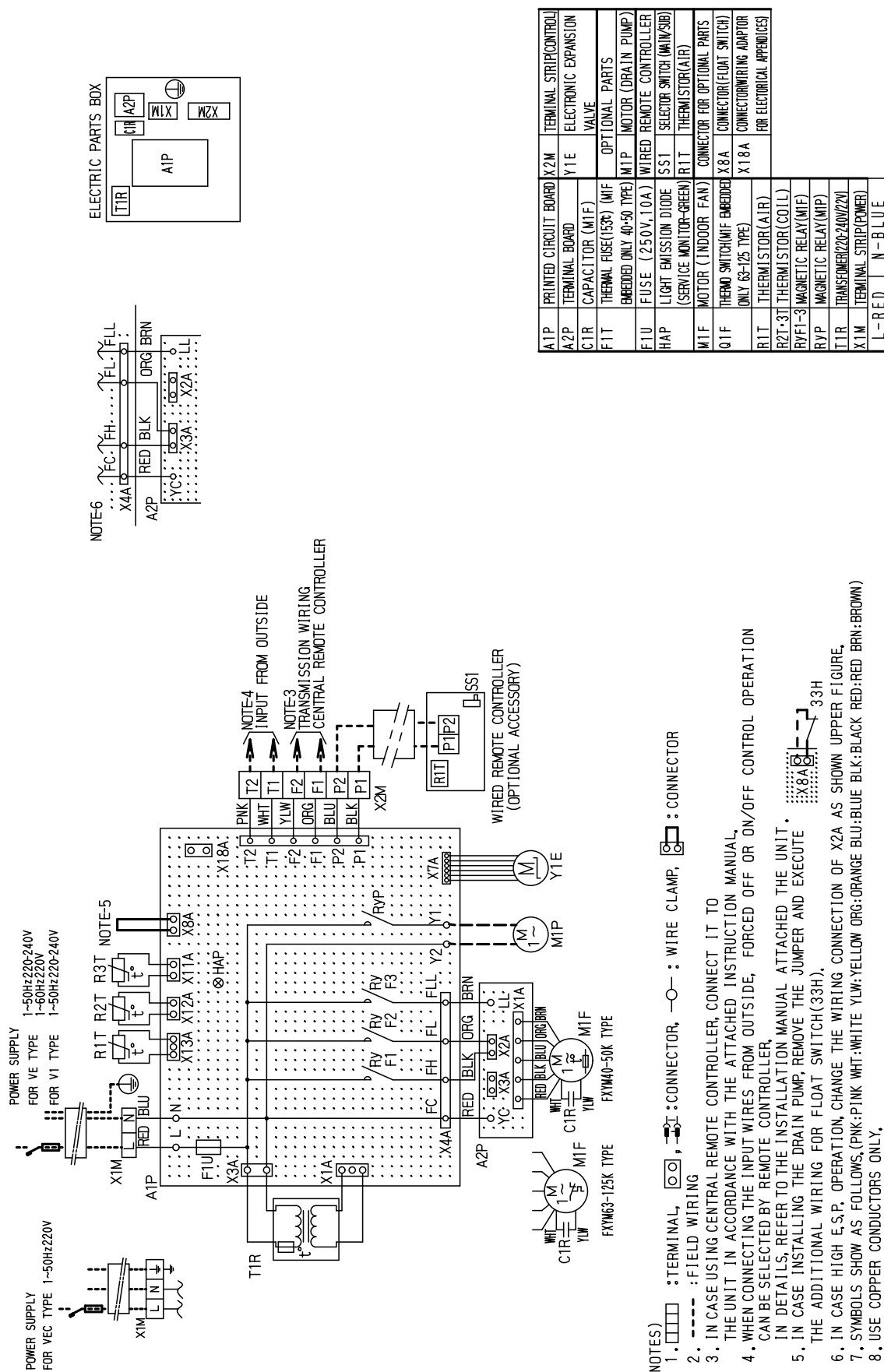
DU227-545E

FXYSP80-100-125KV1



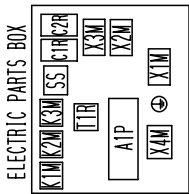
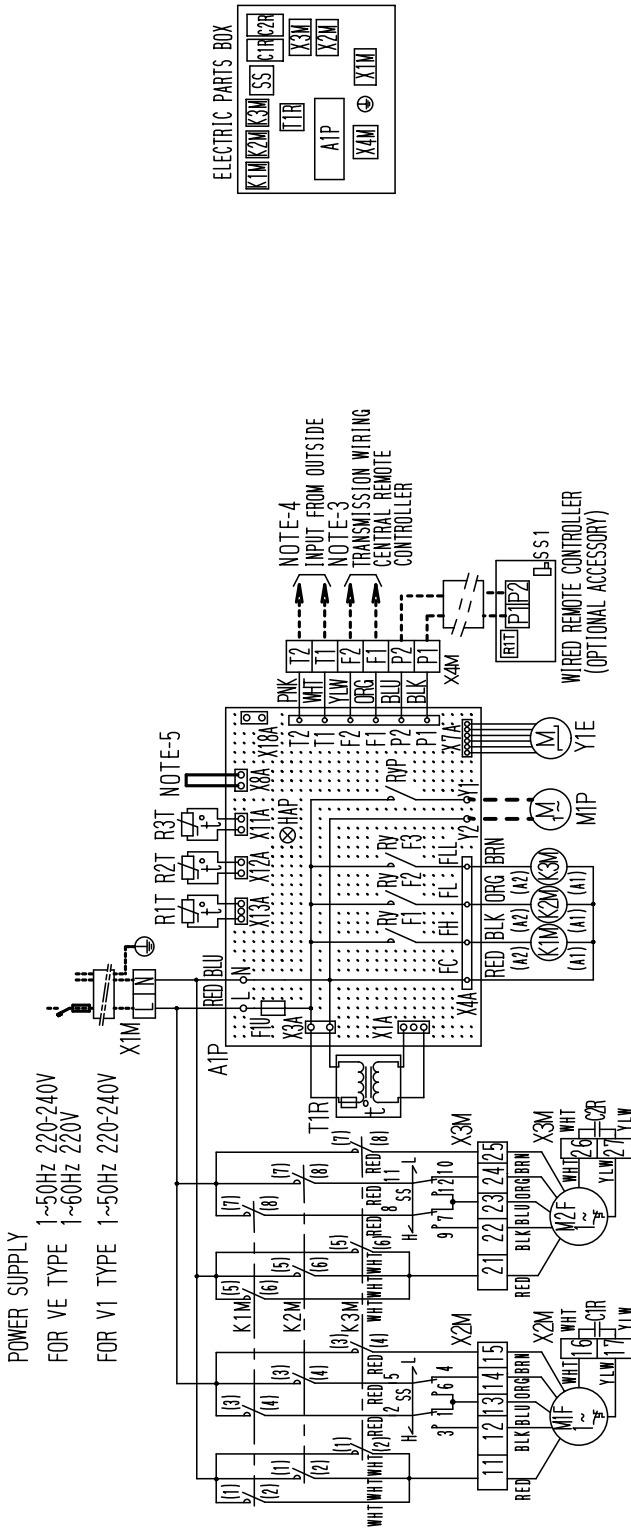
DU230-519D

FXYP40-50-63-80-100-125KV1



DU229-5140C

FXYMP200-250KV1

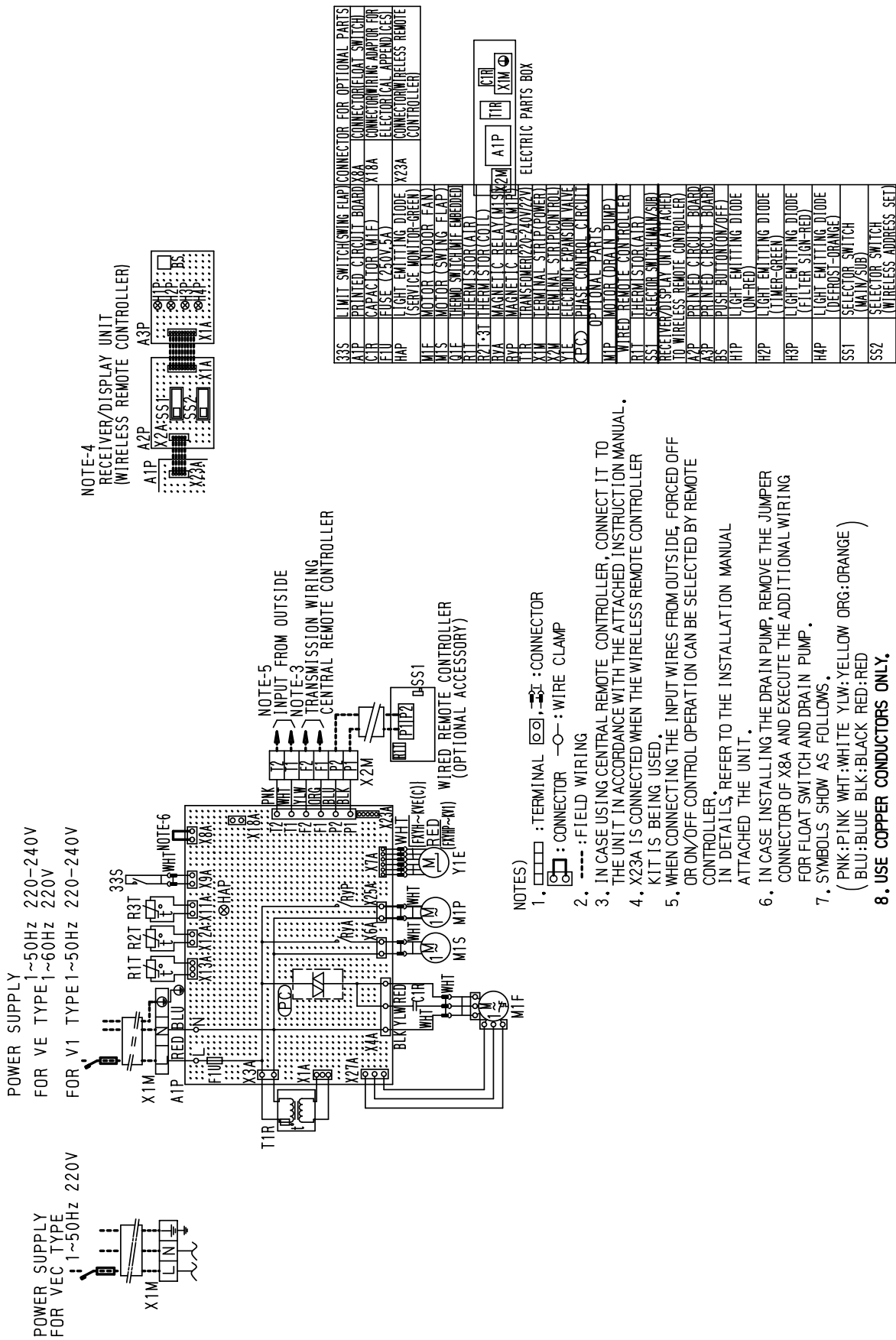


- NOTES)
1. : TERMINAL : WIRE CLAMP : JUMPER CONNECTOR
 2. : FIELD WIRING
 3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTION MANUAL.
 4. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
 5. IN CASE INSTALLING THE DRAIN PUMP, REMOVE THE JUMPER AND EXECUTE THE ADDITIONAL WIRING FOR FLOAT SWITCH(33H).
 6. SYMBOLS SHOW AS FOLLOWS, (PNK:PINK WHT:WHITE YLW:YELLOW ORG:ORANGE BLU:BLUE BLK:BLACK RED:RED BRN:BROWN)
 7. USE COPPER CONDUCTORS ONLY.
 8. IN CASE HIGH E, S, P. OPERATION, CHANGE THE SWITCH(SS) FOR "H".

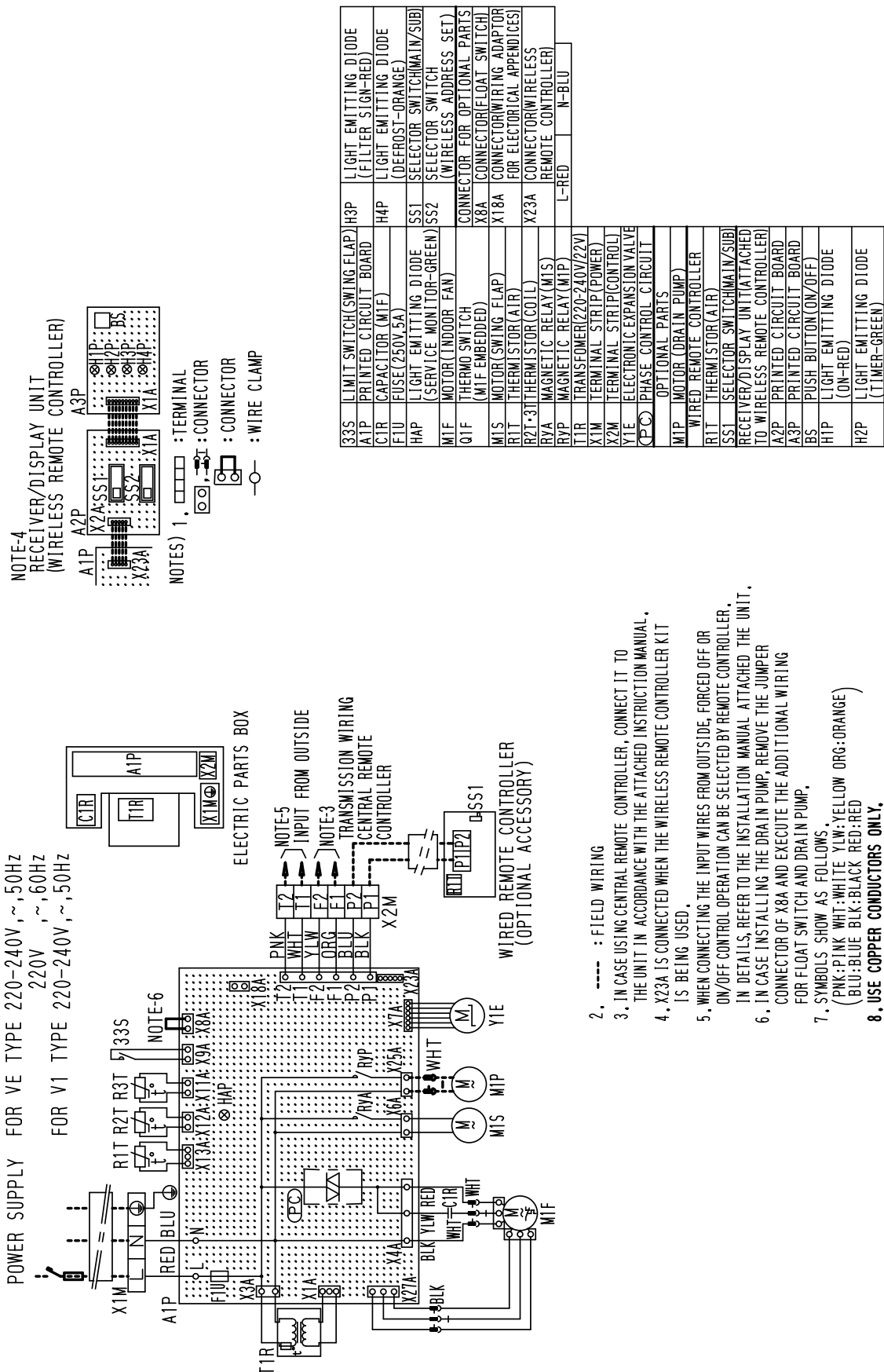
A1P	PRINTED CIRCUIT BOARD	SS	SELECTOR SWITCH
C1R	2R(CAPACITOR (MIF•2F)		(STATIC PRESSURE)
F1U	FUSE (250V,10A)	T1R	TRANSFORMER(220-240V/22V)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)	X1M	TERMINAL STRIP(POWER)
K1M	MAGNETIC CONTACTOR(MIF•2F)	X2M-4M	TERMINAL STRIP(CONTROL)
K2M	MAGNETIC CONTACTOR(MIF•2F)	Y1E	ELECTRONIC EXPANSION VALVE
K3M	MAGNETIC CONTACTOR(MIF•2F)		OPTIONAL PARTS
M1F•2F	MOTOR (INDOOR FAN)	M1P	MOTOR (DRAIN PUMP)
Q1F	THERMO SWITCH (MIF•2F EMBEDDED)		WIRED REMOTE CONTROLLER
R1T	THERMISTOR(AIR)	R1T	THERMISTOR(AIR)
R2T•3T	THERMISTOR(COIL)	SS1	SELECTOR SWITCH (MAIN/SUB)
RVF1-F3	MAGNETIC RELAY(MIF•2F)	X8A	CONNECTOR (FLOAT SWITCH)
RVP	MAGNETIC RELAY(MIP)	X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTRICAL APPENDICES)
L-RED		N-BLUE	

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FXYHP32-63-100KV1

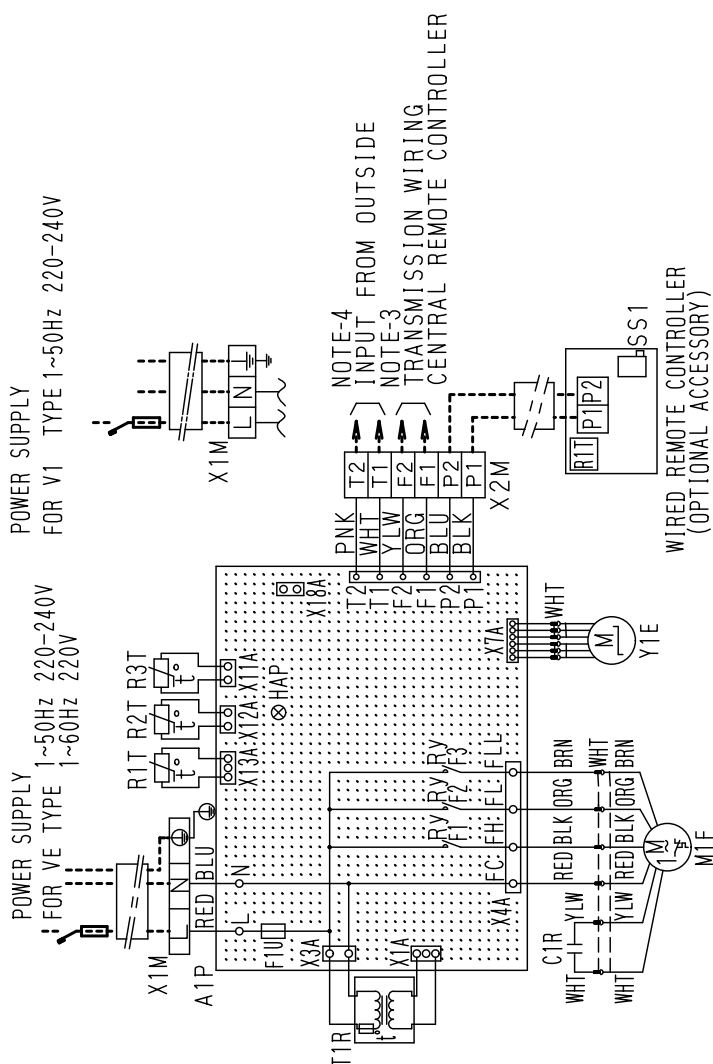


FXYAP20-25-32-40-50-63KV1



DU221-561F




FXYP20-25-32-40-50-63KV1
FXYP20-25-32-40-50-63KV1



A1P	PRINTED CIRCUIT BOARD	WIRED REMOTE CONTROLLER
C1R	CAPACITOR (M1F)	R1T THERMISTOR(AIR)
F1U	FUSE (250V,10A)	S51 SELECTOR SWITCH(MAIN/SUB)
HAP	LIGHT-EMITTING DIODE (SERVICE MONITOR-GREEN)	CONNECTOR FOR OPTIONAL PARTS
M1F	MOTOR (INDOOR FAN)	X18A CONNECTOR(WIRING ADAPTOR FOR ELECTORICAL APPENDICES)
Q1F	THERMO SWITCH (M1F EMBEDDED)	
R1T	THERMISTOR(AIR)	
R2T•3T	THERMISTOR(COIL)	
RYF1-3	MAGNETIC RELAY(M1F)	
T1R	TRANSFORMER(220-240V/22V)	
X1M	TERMINAL STRIP(POWER)	
X2M	TERMINAL STRIP(CONTROL)	
Y1E	ELECTRONIC EXPANSION VALVE	
	LED	N-BLUE

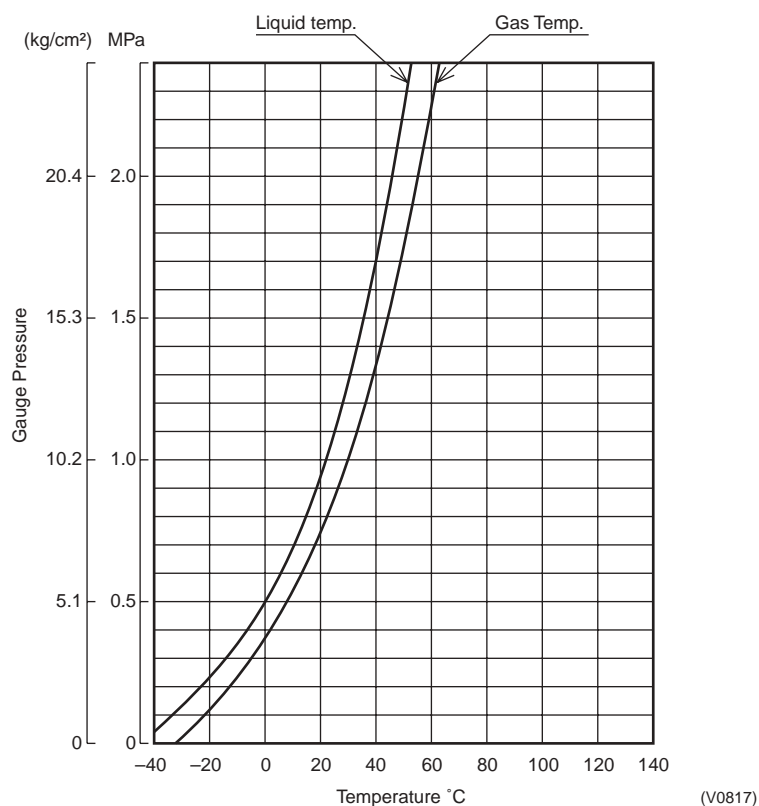
3D003923E

NOTES)

1. : TERMINAL, : CONNECTOR, : WIRE CLAMP
2. -----: FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTIONAL 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, (PK: PINK WHT: WHITE YLW: YELLOW ORG: ORANGE BLU: BLUE BLK: BLACK RED: RED BRN: BROWN)
6. USE COPPER CONDUCTORS ONLY.

3. Characteristics

3.1 R-407C Characteristics



Pressure MPa	Temperature		Pressure MPa	Temperature		Pressure MPa	Temperature	
	Liquid Side °C	Gas Side °C		Liquid Side °C	Gas Side °C		Liquid Side °C	Gas Side °C
0.00	—	-37.0	1.00	21.7	27.5	2.00	46.9	51.9
0.05	—	-28.9	1.05	23.2	29.0	2.05	47.9	52.8
0.10	—	-21.4	1.10	24.7	30.5	2.10	48.9	53.7
0.15	—	-16.3	1.15	26.3	32.0	2.15	49.8	54.6
0.20	—	-11.5	1.20	27.8	33.5	2.20	50.8	55.6
0.25	—	-7.6	1.25	29.3	34.9	2.25	51.8	56.5
0.30	—	-3.7	1.30	30.9	36.4	2.30	52.7	57.4
0.35	—	-0.6	1.35	32.0	37.6	2.35	53.7	58.3
0.40	—	2.5	1.40	33.2	38.7	2.40	54.7	59.2
0.45	-1.1	5.4	1.45	34.4	39.9	2.45	55.6	60.2
0.50	1.4	7.9	1.50	35.6	41.1	2.50	56.6	61.1
0.55	3.9	10.3	1.55	36.8	42.2	2.60	58.4	62.8
0.60	6.4	12.7	1.60	38.1	43.4	2.70	60.0	64.3
0.65	8.7	14.9	1.65	39.3	44.6	2.80	61.6	65.9
0.70	10.6	16.8	1.70	40.5	45.7	2.90	63.2	67.4
0.75	12.6	18.7	1.75	41.7	46.9	3.00	64.9	68.9
0.80	14.5	20.6	1.80	42.9	48.1	3.10	66.5	70.5
0.85	16.5	22.5	1.85	44.1	49.2	3.20	68.1	72.0
0.90	18.4	24.4	1.90	45.0	50.0	3.30	69.8	73.5
0.95	20.2	26.1	1.95	46.0	50.9	3.40	71.4	75.1

3.2 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 coil R2T
 For suction pipe R4T
 For oil R5T
 For header R6T

			(kΩ)		
T°C	0.0	0.05	T°C	0.0	0.05
-20	197.81	192.08	30	16.10	15.76
-19	186.53	181.16	31	15.43	15.10
-18	175.97	170.94	32	14.79	14.48
-17	166.07	161.36	33	14.18	13.88
-16	156.80	152.38	34	13.59	13.31
-15	148.10	143.96	35	13.04	12.77
-14	139.94	136.05	36	12.51	12.25
-13	132.28	128.63	37	12.01	11.76
-12	125.09	121.66	38	11.52	11.29
-11	118.34	115.12	39	11.06	10.84
-10	111.99	108.96	40	10.63	10.41
-9	106.03	103.18	41	10.21	10.00
-8	100.41	97.73	42	9.81	9.61
-7	95.14	92.61	43	9.42	9.24
-6	90.17	87.79	44	9.06	8.88
-5	85.49	83.25	45	8.71	8.54
-4	81.08	78.97	46	8.37	8.21
-3	76.93	74.94	47	8.05	7.90
-2	73.01	71.14	48	7.75	7.60
-1	69.32	67.56	49	7.46	7.31
0	65.84	64.17	50	7.18	7.04
1	62.54	60.96	51	6.91	6.78
2	59.43	57.94	52	6.65	6.53
3	56.49	55.08	53	6.41	6.33
4	53.71	52.38	54	6.65	6.53
5	51.09	49.83	55	6.41	6.33
6	48.61	47.42	56	6.18	6.06
7	46.26	45.14	57	5.95	5.84
8	44.05	42.98	58	5.74	5.43
9	41.95	40.94	59	5.14	5.05
10	39.96	39.01	60	4.96	4.87
11	38.08	37.18	61	4.79	4.70
12	36.30	35.45	62	4.62	4.54
13	34.62	33.81	63	4.46	4.38
14	33.02	32.25	64	4.30	4.23
15	31.50	30.77	65	4.16	4.08
16	30.06	29.37	66	4.01	3.94
17	28.70	28.05	67	3.88	3.81
18	27.41	26.78	68	3.75	3.68
19	26.18	25.59	69	3.62	3.56
20	25.01	24.45	70	3.50	3.44
21	23.91	23.37	71	3.38	3.32
22	22.85	22.35	72	3.27	3.21
23	21.85	21.37	73	3.16	3.11
24	20.90	20.45	74	3.06	3.01
25	20.00	19.56	75	2.96	2.91
26	19.14	18.73	76	2.86	2.82
27	18.32	17.93	77	2.77	2.72
28	17.54	17.17	78	2.68	2.64
29	16.80	16.45	79	2.60	2.55
30	16.10	15.76	80	2.51	2.47

**Outdoor Unit
Thermistors for
Discharge Pipe
(R3T)**

						(kΩ)		
T°C	0.0	0.5	T°C	0.0	0.5	T°C	0.0	0.5
0	640.44	624.65	50	72.32	70.96	100	13.35	13.15
1	609.31	594.43	51	69.64	68.34	101	12.95	12.76
2	579.96	565.78	52	67.06	65.82	102	12.57	12.38
3	552.00	538.63	53	64.60	63.41	103	12.20	12.01
4	525.63	512.97	54	62.24	61.09	104	11.84	11.66
5	500.66	488.67	55	59.97	58.87	105	11.49	11.32
6	477.01	465.65	56	57.80	56.75	106	11.15	10.99
7	454.60	443.84	57	55.72	54.70	107	10.83	10.67
8	433.37	423.17	58	53.72	52.84	108	10.52	10.36
9	413.24	403.57	59	51.98	50.96	109	10.21	10.06
10	394.16	384.98	60	49.96	49.06	110	9.92	9.78
11	376.05	367.35	61	48.19	47.33	111	9.64	9.50
12	358.88	350.62	62	46.49	45.67	112	9.36	9.23
13	342.58	334.74	63	44.86	44.07	113	9.10	8.97
14	327.10	319.66	64	43.30	42.54	114	8.84	8.71
15	312.41	305.33	65	41.79	41.06	115	8.59	8.47
16	298.45	291.73	66	40.35	39.65	116	8.35	8.23
17	285.18	278.80	67	38.96	38.29	117	8.12	8.01
18	272.58	266.51	68	37.63	36.98	118	7.89	7.78
19	260.60	254.72	69	36.34	35.72	119	7.68	7.57
20	249.00	243.61	70	35.11	34.51	120	7.47	7.36
21	238.36	233.14	71	33.92	33.35	121	7.26	7.16
22	228.05	223.08	72	32.78	32.23	122	7.06	6.97
23	218.24	213.51	73	31.69	31.15	123	6.87	6.78
24	208.90	204.39	74	30.63	30.12	124	6.69	6.59
25	200.00	195.71	75	29.61	29.12	125	6.51	6.42
26	191.53	187.44	76	28.64	28.16	126	6.33	6.25
27	183.46	179.57	77	27.69	27.24	127	6.16	6.08
28	175.77	172.06	78	26.79	26.35	128	6.00	5.92
29	168.44	164.90	79	25.91	25.49	129	5.84	5.76
30	161.45	158.08	80	25.07	24.66	130	5.69	5.61
31	154.79	151.57	81	24.26	23.87	131	5.54	5.46
32	148.43	145.37	82	23.48	23.10	132	5.39	5.32
33	142.37	139.44	83	22.73	22.36	133	5.25	5.18
34	136.59	133.79	84	22.01	21.65	134	5.12	5.05
35	131.06	128.39	85	21.31	20.97	135	4.98	4.92
36	125.79	123.24	86	20.63	20.31	136	4.86	4.79
37	120.76	118.32	87	19.98	19.67	137	4.73	4.67
38	115.95	113.62	88	19.36	19.05	138	4.61	4.55
39	111.35	109.13	89	18.75	18.46	139	4.49	4.44
40	106.96	104.84	90	18.17	17.89	140	4.38	4.32
41	102.76	100.73	91	17.61	17.34	141	4.27	4.22
42	98.75	96.81	92	17.07	16.80	142	4.16	4.11
43	94.92	93.06	93	16.54	16.29	143	4.06	4.01
44	91.25	89.47	94	16.04	15.79	144	3.96	3.91
45	87.74	86.04	95	15.55	15.31	145	3.86	3.81
46	84.38	82.75	96	15.08	14.85	146	3.76	3.72
47	81.16	79.61	97	14.62	14.40	147	3.67	3.62
48	78.09	76.60	98	14.18	13.97	148	3.58	3.54
49	75.14	73.71	99	13.76	13.55	149	3.49	3.45
50	72.32	70.96	100	13.35	13.15	150	3.41	3.37

3.3 Pressure Sensor

High Pressure $P_H = (V_H - 0.5) \times 0.98$

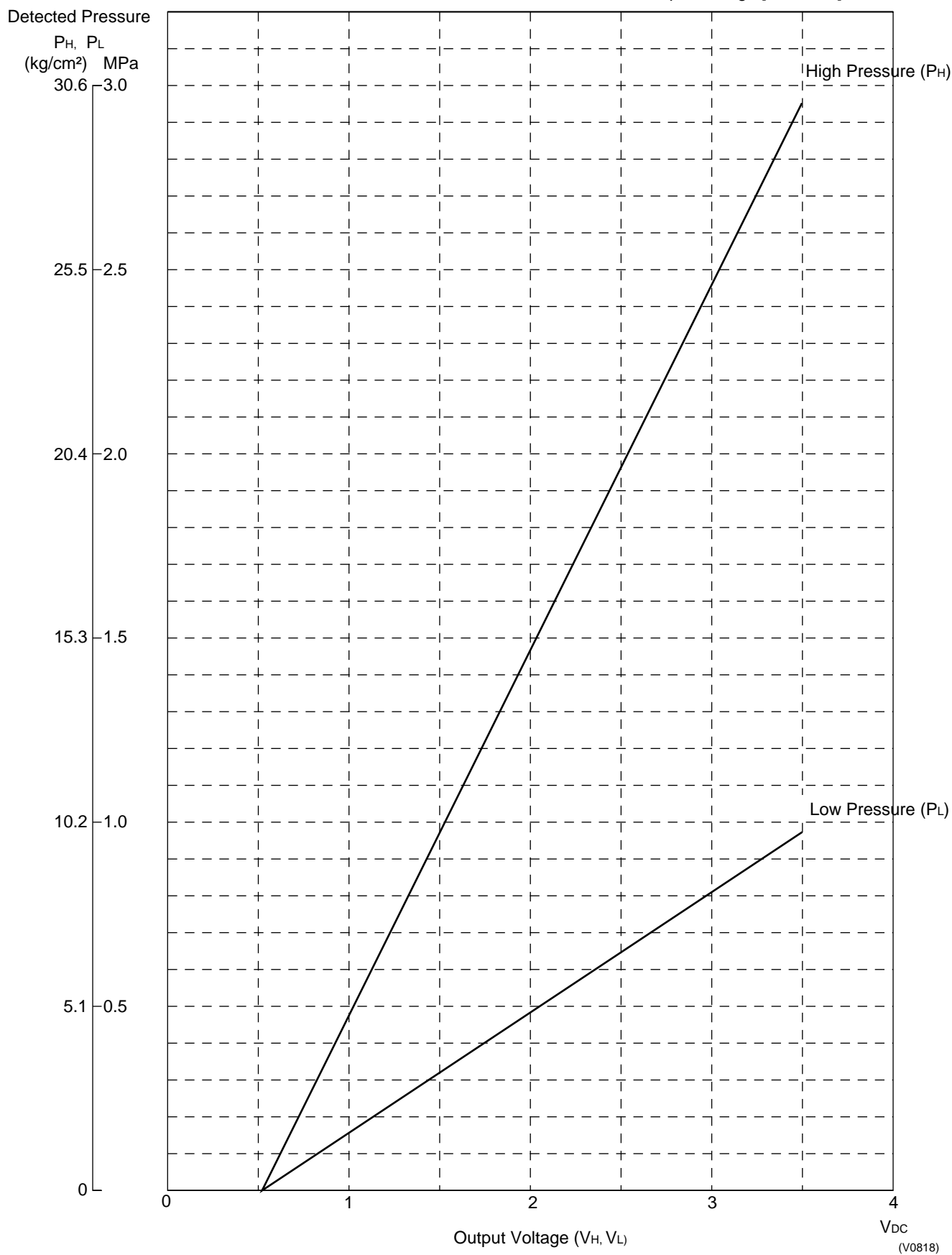
Low Pressure $P_L = (V_L - 0.5) \times \frac{0.98}{3}$

P_H : Detected Pressure [High Side] MPa

P_L : Detected Pressure [Low Side] MPa

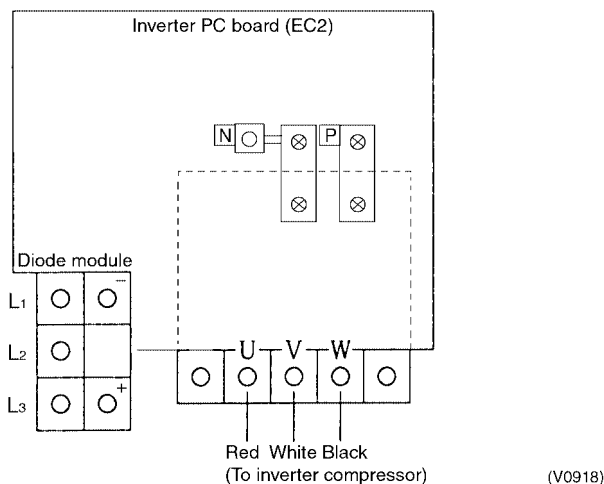
V_H : Output Voltage [High Side] V_{DC}

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



3.4 Method of Replacing The Inverter's Power Transistors and Diode Modules

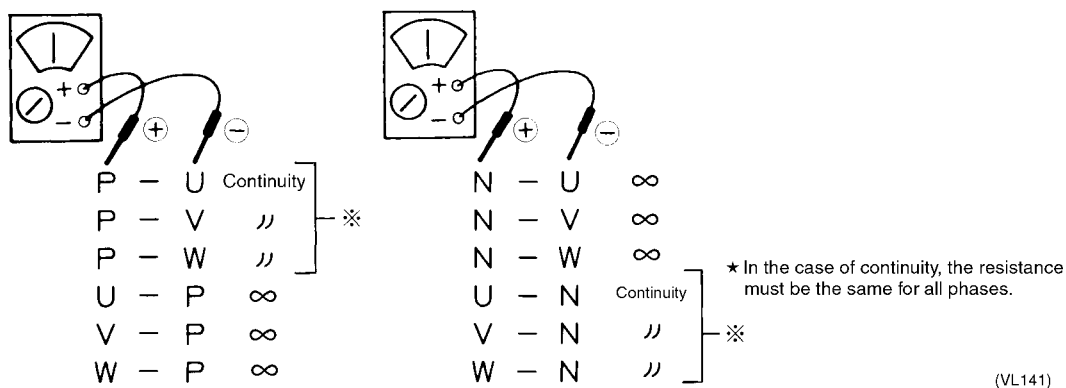
3.4.1 Method of Replacing The Inverter's Power Transistors and Diode Modules



[Decision according to continuity check by analog tester]

- Before checking, disconnect the electric wiring connected to the power transistor and diode module.

Power Transistor (On Inverter PC Board)



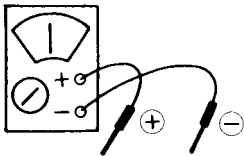
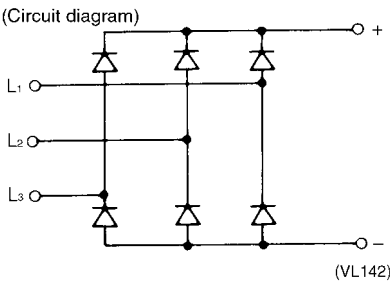
(Decision)

If other than given above, the power unit is defective and must be replaced.

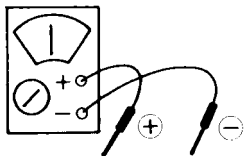


Note: If using a digital tester, ∞ and continuity may be reversed.

Diode Module



+	-	L ₁	Continuity
+	-	L ₂	∞
+	-	L ₃	∞
L ₁	-	+	∞
L ₂	-	+	∞
L ₃	-	+	∞



-	-	L ₁	∞
-	-	L ₂	∞
-	-	L ₃	∞
L ₁	-	-	Continuity
L ₂	-	-	∞
L ₃	-	-	∞

(VL143)

(Decision)

If other than given above, the diode module is defective and must be replaced.



Note: If using a digital tester, ∞ and continuity may be reversed.

4. Precautions in Servicing The Models with New-type Refrigerant

Compared to the conventional refrigerant R-22, the brand-new refrigerant R-407C is higher in pressure. The refrigerant oil is also different in type. With this in mind, note that the piping work procedures as well as the related tools and piping materials are partially different than ever before.

Refrigerant	Conventional type	New type
	R-22 (single)	R-407C (mixed)
Refrigerant oil	Mineral oil (Suniso)	Synthetic oil (ether)
Condensation pressure	1.84MPa	2.01MPa

4.1 Tools Required

Some specific tools are required for servicing the refrigerant line of the new-type refrigerant models. Select the right tools referring to the table below.

Typical tools and materials for piping works and their interchangeability

Name	Work process and application		Interchangeability with conventional tools and materials
Pipe cutter	Refrigerant piping work	Cutting pipes	Interchangeable.
Flaring tool		Flaring pipes	
Refrigerant oil		Applying on flared spots	Specified ether oil, ester oil, alkyl benzene oil or their mixture to be used.
Torque wrench		Connecting flare nut	Interchangeable.
Pipe expander		Expanding pipes at connections	
Pipe bender		Bending pipes	
Nitrogen	Air-tightness test	Inhibiting oxidation in pipes	
Welder		Brazing pipes	
Gauge manifold	Air-tightness test thru refrigerant recharging	Vacuum refrigerant charging and running test	Specific tools required for boosting the pressure and preventing impurities from coming in.
Charging hose			
Vacuum pump	Vacuum drying		Interchangeable. (Adapter to be connected to keep the oil from flowing back to the unit during pump shut-down. Pump with anti-backflow function also available.)
Charging cylinder	Refrigerant recharging		Conventional cylinder not allowed because of different refrigerant properties. (Need to weigh with the scale.)
Refrigerant charging scale			Interchangeable.
Gas leak detector		Gas leak test	Specific detector needed. (R134a-compatible detector allowed.)

4.2 Notes for Work Procedures

Brazing connections

- With the new type of refrigerant, much more care must be paid to keep impurities from coming in. In brazing the pipes, be sure to blow the pipe using nitrogen gas.
- In any other connecting works, much stricter process control is needed to prevent impurities from coming into the pipes. For this purpose, take appropriate measures such as covering the pipes and do the vacuum drying.

Flaring work

- Chamfer (file) the pipe ends as specified. Be very careful not to allow cuttings to come into the pipes.
- To avoid leak, apply a proper amount of refrigerant oil over the inner and outer surfaces of each flared section. As the refrigerant oil, be sure to use synthetic oil (ether oil, ester oil, alkyl benzene oil or their mixture).

Charging refrigerant

- Be sure to charge the new-type refrigerant in liquid phase via the service port of the liquid-side stop valve (outdoor unit). At this time, give vacuum drying with a vacuum pump. Never try the air purging.

Air-tightness test

- Be sure to conduct air-tightness test.



Caution

For servicing the models with the new-type refrigerant, strictly follow the above instructions and precautions. Otherwise the system may get in trouble. For details on handling the new-type refrigerant and the related work procedures and tools, refer to the Installation/Test Run Manual published by Daikin.

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