

# Panasonic

ideas for life

P-HPM-MX4-06E1

R-410A MX4 Heat Pump Service Manual 50Hz





# MX4 Series R-410A Heat Pump 50Hz

## MX4 Series R-410A Heat Pump 50Hz

1. Introduction .....	vi
1.1 Safety Cautions .....	vi

## Part 1 General Information ..... 1

1. Model Names of Indoor/Outdoor Units.....	2
2. External Appearance.....	3
2.1 Indoor Units .....	3
2.2 Outdoor Units .....	4
3. Combination of Outdoor Units.....	5
4. Model Selection.....	7

## Part 2 Specifications..... 11

1. Specifications .....	12
1.1 Outdoor Units .....	12
1.2 Indoor Units .....	30

## Part 3 Refrigerant Circuit..... 49

1. Refrigerant Circuit .....	50
1.1 U-5MX4XPQ.....	50
1.2 U-8MX4XPQ.....	52
1.3 U-10MX4XPQ, U-12MX4XPQ.....	54
1.4 U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ .....	56
2. Functional Parts Layout .....	58
2.1 U-5MX4XPQ.....	58
2.2 U-8MX4XPQ.....	59
2.3 U-10MX4XPQ, U-12MX4XPQ.....	60
2.4 U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ .....	61
3. Refrigerant Flow for Each Operation Mode.....	62

## Part 4 Function..... 79

1. Function general .....	80
1.1 Symbol.....	80
1.2 Operation Mode.....	81
2. Basic Control.....	82
2.1 Normal Operation .....	82
2.2 Compressor PI Control .....	83
2.3 Electronic Expansion Valve PI Control.....	95
2.4 Step Control of Outdoor Unit Fans .....	95
2.5 Outdoor Unit Fan Control in Cooling Operation.....	96
3. Special Control.....	97
3.1 Startup Control .....	97

3.2	Large capacity start up control (Heating).....	98
3.3	Oil Return Operation.....	99
3.4	Defrosting Operation .....	101
3.5	Pump-down Residual Operation.....	102
3.6	Standby .....	103
3.7	Stopping Operation.....	104
4.	Protection Control .....	106
4.1	High Pressure Protection Control.....	106
4.2	Low Pressure Protection Control.....	107
4.3	Discharge Pipe Protection Control .....	108
4.4	Inverter Protection Control.....	109
4.5	STD Compressor Overload Protection .....	110
4.6	Injection Control (only for U-5MX4XPQ).....	110
5.	Other Control.....	111
5.1	Outdoor Unit Rotation.....	111
5.2	Emergency Operation.....	112
5.3	Demand Operation .....	116
5.4	Heating Operation Prohibition .....	116
6.	Outline of Control (Indoor Unit) .....	117
6.1	Drain Pump Control.....	117
6.2	Louver Control for Preventing Ceiling Dirt.....	119
6.3	Thermostat Sensor in Remote Control.....	120
6.4	Thermostat Control While in Normal Operation.....	122
6.5	Thermostat Control in Dry Operation.....	122
6.6	Electronic expansion Valve Control.....	123
6.7	Hot Start Control (In Heating Operation Only).....	123
6.8	Freeze Prevention .....	124
6.9	Heater Control .....	124
6.10	List of Swing Flap Operations.....	125

## **Part 5 Test Operation.....129**

1.	Test Operation .....	130
1.1	Installation Process .....	130
1.2	Procedure and Outline.....	131
1.3	Operation When Power is Turned On .....	145
2.	Outdoor Unit PC Board Layout .....	146
3.	Field Setting .....	147
3.1	Field Setting from Remote Control .....	147
3.2	Field Setting from Outdoor Unit.....	159

## **Part 6 Troubleshooting .....185**

1.	Symptom-based Troubleshooting .....	187
2.	Troubleshooting by Remote Control .....	190
2.1	The INSPECTION / TEST Button.....	190
2.2	Self-diagnosis by Wired Remote Control.....	191
2.3	Self-diagnosis by Infrared Remote Control.....	192
2.4	Operation of The Remote Control's Inspection / Test Operation Button .....	195
2.5	Remote Control Service Mode .....	196
2.6	Remote Control Self-Diagnosis Function .....	198

3. Troubleshooting by Indication on the Remote Control .....	205
3.1 "R0" Indoor Unit: Error of External Protection Device.....	205
3.2 "R1" Indoor Unit: PC Board Defect.....	206
3.3 "R3" Indoor Unit: Malfunction of Drain Level Control System (S1L) .....	207
3.4 "R6" Indoor Unit: Fan Motor (M1F) Lock, Overload .....	209
3.5 "R7" Indoor Unit: Malfunction of Swing Flap Motor (M1S) .....	210
3.6 "R9" Indoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E).....	212
3.7 "RF" Indoor Unit: Drain Level above Limit.....	214
3.8 "RJ" Indoor Unit: Malfunction of Capacity Determination Device .....	215
3.9 "C4" Indoor Unit: Malfunction of Thermistor (R2T) for Heat Exchanger.....	216
3.10 "C5" Indoor Unit: Malfunction of Thermistor (R3T) for Gas Pipes.....	217
3.11 "C9" Indoor Unit: Malfunction of Thermistor (R1T) for Suction Air .....	218
3.12 "CJ" Indoor Unit: Malfunction of Thermostat Sensor in Remote Control.....	219
3.13 "E1" Outdoor Unit: PC Board Defect .....	220
3.14 "E3" Outdoor Unit: Actuation of High Pressure Switch .....	221
3.15 "E4" Outdoor Unit: Actuation of Low Pressure Sensor .....	223
3.16 "E5" Outdoor Unit: Inverter Compressor Motor Lock .....	225
3.17 "E6" Outdoor Unit: STD Compressor Motor Overcurrent/Lock.....	227
3.18 "E7" Outdoor Unit: Malfunction of Outdoor Unit Fan Motor.....	228
3.19 "E9" Outdoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E, Y2E) .....	231
3.20 "F3" Outdoor Unit: Abnormal Discharge Pipe Temperature .....	233
3.21 "F6" Outdoor Unit: Refrigerant Overcharged .....	234
3.22 "H7" Outdoor Unit: Abnormal Outdoor Fan Motor Signal.....	235
3.23 "H9" Outdoor Unit: Malfunction of Thermistor (R1T) for Outdoor Air ....	236
3.24 "J2" Outdoor Unit: Current Sensor Malfunction.....	237
3.25 "J3" Outdoor Unit: Malfunction of Discharge Pipe Thermistor (R3, R31~33T).....	238
3.26 "J5" Outdoor Unit: Malfunction of Thermistor (R2T), (R7T) for Suction Pipe .....	239
3.27 "J6" Outdoor Unit: Malfunction of Thermistor (R4T) for Outdoor Unit Heat Exchanger .....	240
3.28 "J7" Outdoor Unit: Malfunction of Liquid Pipe Thermistor (R6T) .....	241
3.29 "J9" Outdoor Unit: Malfunction of Subcooling Heat Exchanger Gas Pipe Thermistor (R5T) .....	242
3.30 "JR" Outdoor Unit: Malfunction of High Pressure Sensor.....	243
3.31 "JL" Outdoor Unit: Malfunction of Low Pressure Sensor.....	244
3.32 "L4" Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise.....	245
3.33 "L5" Outdoor Unit: Inverter Compressor Abnormal .....	247
3.34 "L8" Outdoor Unit: Inverter Current Abnormal .....	249
3.35 "L9" Outdoor Unit: Inverter Start up Error .....	251
3.36 "LC" Outdoor Unit: Malfunction of Transmission Between Inverter and Control PC Board .....	253
3.37 "P7" Outdoor Unit: Inverter Over-Ripple Protection .....	256
3.38 "P4" Outdoor Unit: Malfunction o Inverter Radiating Fin Temperature Rise Sensor .....	257
3.39 PJ Outdoor Unit: Faulty Field Setting after Replacing Main PC Board or Faulty Combination of PC Board.....	259

3.40	"U0" Outdoor Unit: Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure .....	260
3.41	"U1" Reverse Phase, Open Phase .....	261
3.42	"U2" Outdoor Unit: Power Supply Insufficient or Instantaneous Failure .....	262
3.43	"U3" Outdoor Unit: Check Operation not executed .....	265
3.44	"U4" Malfunction of Transmission Between Indoor Units .....	266
3.45	"U5" Indoor Unit: Malfunction of Transmission Between Remote Control and Indoor Unit .....	268
3.46	"U7" Indoor Unit: Malfunction of Transmission Between Outdoor Units .....	269
3.47	"U8" Indoor Unit: Malfunction of Transmission Between Main and Sub Remote Controls .....	271
3.48	"U9" Indoor Unit: Malfunction of Transmission Between Indoor and Outdoor Units in the Same System .....	272
3.49	"UR" Improper Combination of Indoor and Outdoor Units, Indoor Units and Remote Control .....	273
3.50	"UL" Address Duplication of Centralized Controller .....	275
3.51	"UE" Malfunction of Transmission Between Centralized Controller and Indoor Unit .....	276
3.52	"UF" System is not Set yet .....	279
3.53	"UH" Malfunction of System, Refrigerant System Address Undefined ..	280
4.	Troubleshooting (OP: Central Remote Control) .....	282
4.1	"M1" PC Board Defect .....	282
4.2	"M8" Malfunction of Transmission Between Optional Controllers for Centralized Control .....	283
4.3	"MR" Improper Combination of Optional Controllers for Centralized Control .....	285
4.4	"ML" Address Duplication, Improper Setting .....	287
5.	Troubleshooting (OP: Unified ON/OFF Controller) .....	290
5.1	Operation Lamp Blinks .....	290
5.2	Display "Under Centralized Control" Blinks (Repeats Single Blink) .....	292
5.3	Display "Under Centralized Control" Blinks (Repeats Double Blink) ...	295

## **Part 7 Appendix.....299**

1.	Piping Diagrams .....	300
1.1	Outdoor Unit .....	300
1.2	Indoor Unit .....	304
2.	Wiring Diagrams for Reference .....	305
2.1	Outdoor Unit .....	305
2.2	Field Wiring .....	309
2.3	Indoor Unit .....	312
3.	List of Electrical and Functional Parts .....	323
3.1	Outdoor Unit .....	323
3.2	Indoor Side .....	326
4.	Piping Installation Point .....	331
4.1	Piping Installation Point .....	331
4.2	The Example of A Wrong Pattern .....	332
5.	Example of connection (R-410A Type) .....	333
6.	Thermistor Resistance / Temperature Characteristics .....	336
7.	Pressure Sensor .....	338

8. Method of Checking The Inverter's Power Transistors and Diode Modules .....	339
---	-----

## **Part 8 Precautions for New Refrigerant (R-410A) .....341**

1. Precautions for New Refrigerant (R-410A) .....	342
1.1 Outline .....	342
1.2 Refrigerant Cylinders.....	344
1.3 Service Tools.....	345








## **Index .....i**

## **Drawings & Flow Charts .....v**







# 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




 <b>Warning</b>	
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.	





 <b>Caution</b>	
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



 <b>Warning</b>	
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.	

 <b>Warning</b>	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-410A) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	
When replacing the coin battery in the remote control, be sure to disposed of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

 <b>Caution</b>	
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





 <b>Warning</b>	
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.	

 <b>Caution</b>	
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, lose 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

1. Model Names of Indoor/Outdoor Units.....	2
2. External Appearance.....	3
2.1 Indoor Units .....	3
2.2 Outdoor Units .....	4
3. Combination of Outdoor Units.....	5
4. Model Selection.....	7

# 1. Model Names of Indoor/Outdoor Units

## Indoor Units

Type	Model Name												Power Supply
Ceiling mounted cassette type (Double flow)	LM3	20	25	32	40	50	63	80	—	125	—	—	H
Ceiling mounted cassette type (Multi flow) 600×600	YM3	20	25	32	40	50	—	—	—	—	—	—	
Ceiling mounted cassette type (Multi flow)	UM3	20	25	32	40	50	63	80	100	125	—	—	
Ceiling mounted cassette corner	DM3	—	25	32	40	—	63	—	—	—	—	—	
Ceiling mounted built-in type	FM3	20	25	32	40	50	63	80	100	125	—	—	
Ceiling mounted duct type	EM3	—	—	—	40	50	63	80	100	125	200	250	
Ceiling suspended type	TM3	—	—	32	—	—	63	—	100	—	—	—	
Wall mounted type	KM3	20	25	32	40	50	63	—	—	—	—	—	
Floor standing type	PM3	20	25	32	40	50	63	—	—	—	—	—	
Concealed Floor standing type	RM3	20	25	32	40	50	63	—	—	—	—	—	

## Outdoor Units

### Normal Series

Series	Model Name										Power Supply
Heat Pump	MX4	5	8	10	12	14	16	18	20	22	X
		24	26	28	30	32	34	36	38	40	
		42	44	46	48	50	52	54			

### High COP Series (Energy Saving Series)

Series	Model Name										Power Supply
Heat Pump	MX4	16	18	24	26	28	30	32	34	36	X
		38	40	42	44	46	48	50			

## 2. External Appearance

### 2.1 Indoor Units

Ceiling mounted cassette type (Double flow)  S-20LM3 S-25LM3 S-32LM3 S-40LM3 S-50LM3 S-63LM3 S-80LM3 S-125LM3 	Ceiling mounted duct type  S-40EM3 S-50EM3 S-63EM3 S-80EM3 S-100EM3 S-125EM3 S-200EM3 S-250EM3  S-40~125EM3   S-200 · 250EM3
Ceiling mounted cassette type (Multi flow) 600×600  S-20YM3 S-25YM3 S-32YM3 S-40YM3 S-50YM3 	Ceiling suspended type  S-32TM3 S-63TM3 S-100TM3 
Ceiling mounted cassette type (Multi flow)  S-20UM3 S-25UM3 S-32UM3 S-40UM3 S-50UM3 S-63UM3 S-80UM3 S-100UM3 S-125UM3 	Wall mounted type  S-20KM3 S-25KM3 S-32KM3 S-40KM3 S-50KM3 S-63KM3 
Ceiling mounted cassette corner type  S-25DM3 S-32DM3 S-40DM3 S-63DM3 	Floor standing type  S-20PM3 S-25PM3 S-32PM3 S-40PM3 S-50PM3 S-63PM3 
Ceiling mounted built-in type  S-20FM3 S-25FM3 S-32FM3 S-40FM3 S-50FM3 S-63FM3 S-80FM3 S-100FM3 S-125FM3 	Concealed floor standing type  S-20RM3 S-25RM3 S-32RM3 S-40RM3 S-50RM3 S-63RM3 

## 2.2 Outdoor Units

U-5MX4XPQ	U-8MX4XPQ, U-10MX4XPQ, U-12MX4XPQ	U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ
 <p>5HP</p>	 <p>8, 10, 12HP</p>	 <p>14, 16, 18HP</p>
U-20MX4XPQ, U-22MX4XPQ, U-24MX4XPQ, U-26MX4XPQ, U-28MX4XPQ		U-30MX4XPQ, U-32MX4XPQ, U-34MX4XPQ, U-36MX4XPQ
 <p>20, 22, 24, 26, 28HP</p>		 <p>30, 32, 34, 36HP</p>
U-38MX4XPQ, U-40MX4XPQ, U-42MX4XPQ, U-44MX4XPQ, U-46MX4XPQ		U-48MX4XPQ, U-50MX4XPQ, U-52MX4XPQ, U-54MX4XPQ
 <p>38, 40, 42, 44, 46HP</p>		 <p>48, 50, 52, 54HP</p>



### 3. Combination of Outdoor Units

#### Normal Series

System Capacity	Number of units	Module							Outdoor Unit Multi Connection Piping Kit (Option)
		5	8	10	12	14	16	18	
5HP	1	●							—
8HP	1		●						
10HP	1			●					
12HP	1				●				
14HP	1					●			
16HP	1						●		
18HP	1							●	
20HP	2		●		●				Heat Pump: CZ-P32PJ4PQ
22HP	2			●	●				
24HP	2		●				●		
26HP	2		●					●	
28HP	2			●				●	
30HP	2				●			●	
32HP	2						●●		
34HP	2						●	●	Heat Pump: CZ-P48PJ4PQ
36HP	2							●●	
38HP	3		●		●			●	
40HP	3		●				●●		
42HP	3		●				●	●	
44HP	3		●					●●	
46HP	3			●				●●	
48HP	3				●			●●	
50HP	3					●		●●	
52HP	3						●	●●	
54HP	3							●●●	



**Note:** For multiple connection of 18HP system or more, an optional Panasonic Outdoor Unit Multi Connection Piping Kit is required.

## High COP Series (Energy Saving Series)

System Capacity	Number of units	Module						Outdoor Unit Multi Connection Piping Kit (Option)
		8	10	12	14	16	18	
16HP	2	●●						Heat Pump: CZ-P32PJ4PQ
18HP	2	●	●					
24HP	3	●●●						
26HP	3	●●	●					
28HP	3	●●		●				
30HP	3	●	●	●				
32HP	3	●		●●				
34HP	3		●	●●				
36HP	3			●●●				
38HP	3			●●	●			Heat Pump: CZ-P48PJ4PQ
40HP	3			●●		●		
42HP	3			●●			●	
44HP	3			●		●●		
46HP	3			●		●	●	
48HP	3					●●●		
50HP	3					●●	●	



**Note:** For multiple connection of 16HP system or more, an optional Panasonic Outdoor Unit Multi Connection Piping Kit is required.

## 4. Model Selection

### MX4 Heat Pump Series

#### Connectable indoor units number and capacity

##### Normal Series

HP	5HP	8HP	10HP	12HP	14HP	16HP	18HP
System name	U-5MX4	U-8MX4	U-10MX4	U-12MX4	U-14MX4	U-16MX4XPQ	U-18MX4XPQ
Outdoor unit 1	U-5MX4	U-8MX4	U-10MX4	U-12MX4	U-14MX4	U-16MX4XPQ	U-18MX4XPQ
Outdoor unit 2	—	—	—	—	—	—	—
Outdoor unit 3	—	—	—	—	—	—	—
Total number of connectable indoor units	8	13	16	19	23	26	29
Total capacity of connectable indoor units (kW)	7.00~18.20	11.20~29.12	14.00~36.40	16.75~43.55	20.00~52.00	22.40~58.24	25.20~65.52

HP	20HP	22HP	24HP	26HP	28HP	30HP	32HP
System name	U-20MX4	U-22MX4	U-24MX4	RU-36MX4	U-28MX4	U-30MX4	U-32MX4
Outdoor unit 1	U-8MX4	U-10MX4	U-8MX4	U-8MX4	U-10MX4	U-12MX4XPQ	U-16MX4XPQ
Outdoor unit 2	U-12MX4	U-12MX4	U-16MX4	U-18MX4	U-18MX4	U-18MX4	U-16MX4
Outdoor unit 3	—	—	—	—	—	—	—
Total number of connectable indoor units	32	35	39	42	45	49	52
Total capacity of connectable indoor units (kW)	27.95~72.67	30.75~79.95	33.60~87.36	36.40~94.64	39.15~101.79	41.95~109.07	44.70~116.22

HP	34HP	36HP	38HP	40HP	42HP	44HP	46HP
System name	U-34MX4	U-36MX4	U-38MX4	U-40MX4	U-42MX4	U-44MX4	U-46MX4
Outdoor unit 1	U-16MX4	U-18MX4	U-8MX4	U-8MX4	U-8MX4	U-8MX4XPQ	U-10MX4XPQ
Outdoor unit 2	U-18MX4	U-18MX4	U-12MX4	U-16MX4	U-16MX4	U-18MX4XPQ	U-18MX4XPQ
Outdoor unit 3	—	—	U-18MX4	U-16MX4	U-18MX4	U-18MX4	U-18MX4
Total number of connectable indoor units	55	58	61	64			
Total capacity of connectable indoor units (kW)	47.50~123.50	50.25~130.65	53.50~139.10	56.00~145.60	58.00~150.80	61.75~160.55	63.75~165.75

HP	48HP	50HP	52HP	54HP
System name	U-48MX4	U-50MX4	U-52MX4	U-54MX4
Outdoor unit 1	U-12MX4	U-14MX4	U-16MX4	U-18MX4
Outdoor unit 2	U-18MX4	U-18MX4	U-18MX4	U-18MX4
Outdoor unit 3	U-18MX4	U-18MX4	U-18MX4	U-18MX4
Total number of connectable indoor units	64			
Total capacity of connectable indoor units (kW)	67.50~175.50	69.50~180.70	71.50~185.90	73.50~191.10

**High COP Series (Energy Saving Series)**

HP	16HP	18HP
System name	U-16MX4	U-18MX4
Outdoor unit 1	U-8MX4	U-8MX4
Outdoor unit 2	U-8MX4	U-10MX4
Outdoor unit 3	—	—
Total number of connectable indoor units	26	29
Total capacity of connectable indoor units (kW)	22.40~58.24	25.20~65.52

HP	24HP	26HP	28HP	30HP	32HP
System name	U-24MX4	U-26MX4	U-28MX4	U-30MX4	U-32MX4
Outdoor unit 1	U-8MX4	U-8MX4	U-8MX4	U-8MX4	U-8MX4
Outdoor unit 2	U-8MX4	U-8MX4	U-8MX4	U-10MX4	U-12MX4
Outdoor unit 3	U-8MX4	U-10MX4	U-12MX4	U-12MX4	U-12MX4
Total number of connectable indoor units	39	42	45	48	52
Total capacity of connectable indoor units (kW)	33.60~87.36	36.40~94.64	39.15~101.79	41.95~109.07	44.70~116.22

HP	34HP	36HP	38HP	40HP	42HP	44HP	46HP
System name	U-34MX4	U-36MX4	U-38MX4	U-40MX4	U-42MX4	U-44MX4	U-46MX4
Outdoor unit 1	U-10MX4	U-12MX4	U-12MX4	U-12MX4	U-12MX4	U-12MX4	U-12MX4
Outdoor unit 2	U-12MX4	U-12MX4	U-12MX4	U-12MX4	U-12MX4	U-16MX4	U-16MX4
Outdoor unit 3	U-12MX4	U-12MX4	U-14MX4	U-16MX4	U-18MX4	U-16MX4	U-18MX4
Total number of connectable indoor units	55	58	61	64			
Total capacity of connectable indoor units (kW)	47.50~123.50	50.25~130.65	53.50~139.10	56.00~145.60	58.00~150.80	61.75~160.55	63.75~165.75

HP	48HP	50HP
System name	U-48MX4	U-50MX4
Outdoor unit 1	U-16MX4	U-16MX4
Outdoor unit 2	U-16MX4	U-16MX4
Outdoor unit 3	U-16MX4	U-18MX4
Total number of connectable indoor units	64	
Total capacity of connectable indoor units (kW)	67.50~175.50	69.50~180.70

### Connectable Indoor Unit

Type		Model Name											Power Supply
Ceiling mounted cassette type (Double flow)	LM3	20	25	32	40	50	63	80	—	125	—	—	H
Ceiling mounted cassette type (Multi flow) 600×600	YM3	20	25	32	40	50	—	—	—	—	—	—	
Ceiling mounted cassette type (Multi flow)	UM3	20	25	32	40	50	63	80	100	125	—	—	
Ceiling mounted cassette corner	DM3	—	25	32	40	—	63	—	—	—	—	—	
Ceiling mounted built-in type	FM3	20	25	32	40	50	63	80	100	125	—	—	
Ceiling mounted duct type	EM3	—	—	—	40	50	63	80	100	125	200	250	
Ceiling suspended type	TM3	—	—	32	—	—	63	—	100	—	—	—	
Wall mounted type	KM3	20	25	32	40	50	63	—	—	—	—	—	
Floor standing type	PM3	20	25	32	40	50	63	—	—	—	—	—	
Concealed Floor standing type	RM3	20	25	32	40	50	63	—	—	—	—	—	

### Indoor unit capacity

New refrigerant model code	20 type	25 type	32 type	40 type	50 type	63 type	80 type	100 type	125 type	200 type	250 type
Selecting model capacity	2.2 kW	2.8 kW	3.5 kW	4.5 kW	5.6 kW	7.0 kW	9.0 kW	11.2 kW	14.0 kW	22.4 kW	28.0 kW
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.

### Differences from Conventional Models

Item	Differences		
	Object	New model (MX4 Model)	Conventional model (MX3 Model)
Compressor	Connection of equalizer oil pipe	● NONE (No particular changes in terms of service)	● YES
Workability	Equalizer oil pipe for multi-outdoor-unit system	● NONE	● YES
	Procedure for calculating refrigerant refilling quantity	● Refilling quantity due to piping length + Adjustment quantity according to models of outdoor units	● Refilling quantity due to piping length - Adjustment quantity according to models of outdoor units
Optional accessories	Branch pipe for outdoor unit connection	● Y branch Type: CZ-32/48PJ4PQ	● T branch Type: CZ-32/48PJ1PQ

# Part 2

# Specifications

- 1. Specifications .....12
  - 1.1 Outdoor Units ..... 12
  - 1.2 Indoor Units ..... 30

# 1. Specifications

## 1.1 Outdoor Units

### Heat Pump 50Hz Standard Series <U-MX4XPQ>

Technical Specifications				U-5MX4XPQ	U-8MX4XPQ	U-10MX4XPQ	U-12MX4XPQ	U-14MX4XPQ	U-16MX4XPQ	U-18MX4XPQ
Capacity	Cooling	kW		14.0	22.4	28.0	33.5	40.0	45.0	49.0
	Heating	kW		16.0	25.0	31.5	37.5	45.0	50.0	56.5
COP	Cooling			3.98	4.03	3.77	3.48	3.23	3.17	3.02
	Heating			4.00	4.27	4.09	3.97	3.98	3.88	3.69
Capacity range		HP		5	8	10	12	14	16	18
Power input (Nominal)	Cooling	kW		3.52	5.56	7.42	9.62	12.4	14.2	16.2
	Heating	kW		4.00	5.86	7.70	9.44	11.30	12.90	15.30
PED category				Category II						
Max n° of indoor units to be connected				8	13	16	19	23	26	29
Indoor index connection	Minimum			62.5	100	125	150	175	200	225
	Maximum			162.5	260	325	390	455	520	585
Casing	Colour			Panasonic White						
	Material			Painted galvanised steel						
Dimensions	Packing	Height	mm	1,855						
		Width	mm	796	1,055	1,055	1,055	1,365	1,365	1,365
		Depth	mm	860	860	860	860	860	860	860
	Unit	Height	mm	1,680						
		Width	mm	635	930	930	930	1,240	1,240	1,240
		Depth	mm	765	765	765	765	765	765	765
Weight	Unit	kg	159	187	240	240	317	317	325	
	Packed Unit	kg	182	217	273	273	357	357	365	
Packing	Material			Carton						
	Weight	kg		3.80	4.02	4.02	4.02	6.35	6.35	6.35
	Material			Wood						
	Weight	kg		19.15	20.85	20.85	20.85	23.55	23.55	23.55
	Material			Plastic						
	Weight	kg		0.215	0.265	0.265	0.265	0.330	0.330	0.33
Heat Exchanger	Dimensions	Length	mm	1,483	1,778	1,778	1,778	2,088	2,088	2,088
		Nr of Rows		54	54	54	54	54	54	54
			mm	2.00	2.00	2.00	2.00	2.00	2.00	2.00
		Nr of Passes		8	18	18	18	21	21	21
		Face Area	m <sup>2</sup>	1.762	2.112	2.112	2.112	2.481	2.481	2.481
		Nr of Stages		2	2	2	2	2	2	2
	Tube type			Hi-XSS (8)						
	Fin	Fin type		Non-symmetric waffle louvre						
		Treatment		Hydrophylic and anti corrosion resistant						
Fan	Type			Propeller						
	Quantity			1	1	1	1	2	2	2
	Air Flow Rate (nominal at 230V)	Cooling	m <sup>3</sup> /min	95	171	185	196	233	233	239
		Heating	m <sup>3</sup> /min	95	171	185	196	233	233	239
	External static pressure		Pa	78 pa in high external static pressure						
	Discharge direction			Vertical						
	Motor	Quantity		1	1	1	1	2	2	2
		Model		Brushless DC						
		Output motor	W	350	750	750	750	2 x 350	2 x 350	2 x 750
Compressor	Quantity			1	1	2	2	3	3	3
	Motor	Quantity		1	1	1	1	1	1	1
		Model		Inverter						
		Type		Hermetically sealed scroll compressor						
		Speed	rpm	6,300	7,980	6,300	6,300	6,300	6,300	7,980
		Motor Output	kW	2.8	3.8	1.2	2.8	0.3	1.4	3.0
		Crankcase Heater	W	33	33	33	33	33	33	33
		Quantity				1	1	2	2	2
		Model				ON - OFF	ON - OFF	ON - OFF	ON - OFF	ON - OFF
		Type				Hermetically sealed scroll compressor				
		Speed	rpm			2,900	2,900	2,900	2,900	2,900
		Motor Output	kW			4.5	4.5	4.5	4.5	4.5
		Crankcase Heater	W			33	33	33	33	33
		Operation Range	Cooling	Min	°CDB	-5.0	-5.0	-5.0	-5.0	-5.0
Max	°CDB			43.0	43.0	43.0	43.0	43.0	43.0	43.0
Heating	Min		°CWB	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
	Max		°CWB	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Sound Level	Cooling	Sound Power	dBA	72	78	78	80	80	80	83
		Sound Pressure	dBA	54	57	58	60	60	60	63
Refrigerant	Name			R-410A						
	Charge	kg		6.2	7.7	8.4	8.6	12.3	12.5	12.7
	Control			Expansion valve (electronic type)						
	Nr of Circuits			1	1	1	1	1	1	1



Technical Specifications				U-5MX4XPQ	U-8MX4XPQ	U-10MX4XPQ	U-12MX4XPQ	U-14MX4XPQ	U-16MX4XPQ	U-18MX4XPQ
Refrigerant Oil	Name			Synthetic (ether) oil						
	Charged Volume		l	1.7	2.1	3.9	3.9	5.7	5.7	5.8
Piping connections	Liquid (OD)	Type		Braze connection						
		Diameter (OD)	mm	9.5	9.5	9.5	12.7	12.7	12.7	15.9
	Gas	Type		Braze connection						
		Diameter (OD)	mm	15.9	19.1	22.2	28.6	28.6	28.6	28.6
	Heat Insulation			Both liquid and gas pipes						
	Max total length			m	1000	1000	1000	1000	1000	1000
Defrost Method				Reversed cycle						
Defrost Control				Sensor for outdoor heat exchanger temperature						
Capacity Control Method				Inverter controlled						
Capacity Control				~ 100						
Safety devices				HPS						
				Fan motor driver overload protector						
				Over current relay						
				Inverter overload protector						
				PC board fuse						
Standard Accessories	Standard Accessories			Installation and operation manual						
	Quantity			1	1	1	1	1	1	1
	Standard Accessories			Connection pipes						
	Quantity			4	4	4	4	4	4	4
Notes				Nominal cooling capacities are based on: indoor temperature: 27°CDB, 19°CWB, outdoor temperature: 35°CDB, equivalent refrigerant piping: 7.5m, level difference: 0m.						
				Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping: 7.5m, level difference: 0m						
				Sound power level is an absolute value that a sound source generates.						
				Sound pressure level is a relative value, depending on the distance and acoustic environment. For more details, please refer to sound level drawings.						
				Sound values are measured in a semi-anechoic room.						
				Indoor index connection: when indoor models S-20UM3HPQ and S-25UM3HPQ are connected, maximum connection ratio is 130%						
				When indoor models S-NM3HPQ, S-FM3HPQ and S-KM3HPR are connected, connection ratio of 200% is possible						

Technical Specifications				U-20MX4XPQ	U-22MX4XPQ	U-24MX4XPQ	U-26MX4XPQ	U-28MX4XPQ	U-30MX4XPQ	U-32MX4XPQ
Capacity	Cooling	kW		55.9	61.5	67.0	71.4	77.0	82.5	89.0
	Heating	kW		62.5	69.0	75.0	81.5	88.0	94.0	102.0
COP	Cooling			3.68	3.62	3.49	3.28	3.26	3.20	3.11
	Heating			4.08	4.04	3.97	3.84	3.83	3.81	3.83
Capacity range		HP		20	22	24	26	28	30	32
Power input (Nominal)	Cooling	kW		15.2	17.0	19.2	21.8	23.6	25.8	28.6
	Heating	kW		15.3	17.1	18.9	21.2	23.0	24.7	26.6
PED category				Category II						
Max n° of indoor units to be connected				32	35	39	42	45	49	52
Indoor index connection	Minimum			250	275	300	325	350	375	400
	Maximum			650	715	780	845	910	975	1.040
Casing	Colour			Panasonic White						
	Material			Painted galvanised steel						
Heat Exchanger	Dimensions	Length	mm	1,778 + 1,778	1,778 + 1,778	1,778 + 1,778	1,778 + 2,088	1,778 + 2,088	1,778 + 2,088	2,088 + 2,088
		Nr of Rows		54 + 54						
		Fin Pitch	mm	2.00	2.00	2.00	2.00	2.00	2.00	2.00
		Nr of Passes		18 + 18	18 + 18	18 + 18	18 + 21	18 + 21	18 + 21	21 + 21
		Face Area	m²	2,112 + 2,112	2,112 + 2,112	2,112 + 2,112	2,112 + 2,481	2,112 + 2,481	2,112 + 2,481	2,481 + 2,481
		Nr of Stages		2 + 2						
	Tube type		Hi-XSS (8)							
	Fin	Fin type		Non-symmetric waffle louvre						
Treatment		Hydrophilic and anti corrosion resistant								
Fan	Type		Propeller							
	Quantity		1 + 1	1 + 1	1 + 1	1 + 2	1 + 2	1 + 2	2 + 2	
	Air Flow Rate (nominal at 230V)	Cooling	m³/min	171 + 196	185 + 196	196 + 196	171 + 239	185 + 239	196 + 239	233 + 239
		Heating	m³/min	171 + 196	185 + 196	196 + 196	171 + 239	185 + 239	196 + 239	233 + 239
	External static pressure		Pa	78 pa in high static pressure						
	Discharge direction		Vertical							
	Motor	Quantity		1 + 1	1 + 1	1 + 1	1 + 2	1 + 2	1 + 2	2 + 2
		Model		Brushless DC						
Output motor		W	750 + 750	750 + 750	750 + 750	750 + 2x750	750 + 2x750	750 + 2x750	2x350 + 2x750	
Compressor	Quantity			1 + 2	2 + 2	2 + 2	1 + 3	2 + 3	2 + 3	3 + 3
	Motor	Quantity		1 + 1						
		Model		Inverter						
		Type		Hermetically sealed scroll compressor						
		Speed	rpm	7,980 + 6,300	6,300 + 6,300	6,300 + 6,300	7,980 + 7,980	6,300 + 7,980	6,300 + 7,980	6,300 + 7,980
		Motor Output	kW	3.8 + 2.8	1.2 + 2.8	2.8 + 2.8	3.8 + 3.0	1.2 + 3.0	2.8 + 3.0	0.3 + 3.0
		Crankcase Heater	W	33	33	33	33	33	33	33
		Quantity		1	2	2	3	3	3	4
		Model		ON-OFF						
		Type		Hermetically sealed scroll compressor						
		Speed	rpm	2,900						
		Motor Output	kW	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		Crankcase Heater	W	33	33	33	33	33	33	33
		Operation Range	Cooling	Min	°CDB	-5.0	-5.0	-5.0	-5.0	-5.0
Max	°CDB			43.0	43.0	43.0	43.0	43.0	43.0	43.0
Heating	Min		°CWB	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
	Max		°CWB	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Refrigerant	Name		R-410A							
	Charge	kg	7.7 + 8.6	8.4 + 8.6	8.6 + 8.6	7.7 + 12.7	8.4 + 12.7	8.6 + 12.7	12.3 + 12.7	
	Control		Expansion valve (electronic type)							
	Nr of Circuits		1	1	1	1	1	1	1	
Maximum total refrigerant charge in the system			kg	Less than 100 (calculated charge less than 95)						
Refrigerant Oil	Name		Synthetic (ether) oil							
	Charged Volume	l	2.1 + 3.9	3.9 + 3.9	3.9 + 3.9	2.1 + 5.8	3.9 + 5.8	3.9 + 5.8	5.7 + 5.8	
Piping connections	Liquid (OD)	Type	Brazed connection							
		Diameter (OD)	mm	15.9	15.9	15.9	19.1	19.1	19.1	19.1
	Gas	Type	Brazed connection							
		Diameter (OD)	mm	28.6	28.6	34.9	34.9	34.9	34.9	34.9
	Heat Insulation		Both liquid and gas pipes							
Max total length		m	1000	1000	1000	1000	1000	1000	1000	
Defrost Method				Reversed cycle						
Defrost Control				Sensor for outdoor heat exchanger temperature						
Capacity Control Method				Inverter controlled						
Capacity Control				~ 100						
Safety devices				HPS						
				Fan motor driver overload protector						
				Over current relay						
				Inverter overload protector						
				PC board fuse						

Technical Specifications		U-20MX4XPQ	U-22MX4XPQ	U-24MX4XPQ	U-26MX4XPQ	U-28MX4XPQ	U-30MX4XPQ	U-32MX4XPQ
Standard Accessories	Standard Accessories	Installation and operation manual						
	Quantity	1	1	1	1	1	1	1
	Standard Accessories	Connection pipes						
	Quantity	4	4	4	4	4	4	4
Notes		Nominal cooling capacities are based on: indoor temperature: 27°CDB, 19°CWB, outdoor temperature: 35°CDB, equivalent refrigerant piping: 7.5m, level difference: 0m.						
		Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping: 7.5m, level difference: 0m						
		Sound level of a multi system is determined by the individual outdoor unit and installation condition						
		Indoor index connection: when indoor models S-20UM3HPQ and S-25UM3HPQ are connected, maximum connection ratio is 130%						
		When indoor models S-NM3HPQ, S-FM3HPQ and S-KM3HPR are connected, connection ratio of 200% is possible						
		The refrigerant charge of the system must be less than 100 kg. This means that in case the calculated refrigerant charge is equal to or more than 95 kg, you must divide your multiple outdoor system into smaller independent systems, each containing less than 95 kg refrigerant charge. For factory charge, refer to the namplate of the unit.						

Technical Specifications				U-34MX4XPQ	U-36MX4XPQ	U-38MX4XPQ	U-40MX4XPQ	U-42MX4XPQ	U-44MX4XPQ	U-46MX4XPQ
Capacity	Cooling	kW		94.0	98.0	105.0	111.0	116.0	120.0	126.0
	Heating	kW		107.0	113.0	119.0	126.0	132.0	138.0	145.0
COP	Cooling			3.09	3.02	3.34	3.34	3.28	3.16	3.17
	Heating			3.79	3.69	3.89	3.89	3.86	3.78	3.79
Capacity range		HP		34	36	38	40	42	44	46
Power input (Nominal)	Cooling	kW		30.4	32.4	31.4	33.2	35.4	38.0	39.8
	Heating	kW		28.2	30.6	30.6	32.4	34.2	36.5	38.3
PED category				Category II						
Max n° of indoor units to be connected				55	58	61	64	64	64	64
Indoor index connection	Minimum			425	450	475	500	525	550	575
	Maximum			1,105	1,170	1,235	1,300	1,365	1,430	1,495
Casing	Colour			Panasonic White						
	Material			Painted galvanised steel						
Heat Exchanger	Dimensions	Length	mm	2,088 + 2,088	2,088 + 2,088	1,778 + 1,778 + 2,088	1,778 + 1,778 + 2,088	1,778 + 1,778 + 2,088	1,778 + 2,088 + 2,088	1,778 + 2,088 + 2,088
				Nr of Rows		54 + 54	54 + 54	54 + 54 + 54	54 + 54 + 54	54 + 54 + 54
		Fin Pitch	mm	2.00	2.00	2.00	2.00	2.00	2.00	2.00
				Nr of Passes		21 + 21	21 + 21	18 + 18 + 21	18 + 18 + 21	18 + 18 + 21
		Face Area	m²	2,481 + 2,481	2,481 + 2,481	2,112 + 2,112 + 2,481	2,112 + 2,112 + 2,481	2,112 + 2,112 + 2,481	2,112 + 2,481 + 2,481	2,112 + 2,481 + 2,481
				Nr of Stages		2 + 2	2 + 2	2	2	2
	Tube type			Hi-XSS (8)						
	Fin	Fin type		Non-symmetric waffle louvre						
		Treatment		Hydrophilic and anti corrosion resistant						
Fan	Type			Propeller						
	Quantity			2 + 2	2 + 2	1 + 1 + 2	1 + 1 + 2	1 + 1 + 2	1 + 2 + 2	1 + 2 + 2
	Air Flow Rate (nominal at 230V)	Cooling	m³/min	233 + 239	239 + 239	171 + 196 + 239	185 + 196 + 239	196 + 196 + 239	171 + 239 + 239	185 + 239 + 239
		Heating	m³/min	233 + 239	239 + 239	171 + 196 + 239	185 + 196 + 239	196 + 196 + 239	171 + 239 + 239	185 + 239 + 239
	External static pressure		Pa	78 pa in high static pressure						
	Discharge direction			Vertical						
	Motor	Quantity		2 + 2	2 + 2	1 + 1 + 2	1 + 1 + 2	1 + 1 + 2	1 + 2 + 2	1 + 2 + 2
		Model		Brushless DC						
		Output motor	W	2x350 + 2x750	2x750 + 2x750	750 + 750 + 2x750	750 + 750 + 2x750	750 + 750 + 2x750	750 + 2x750 + 2x750	750 + 2x750 + 2x750
Compressor	Quantity			3 + 3	3 + 3	6	7	7	7	8
	Motor	Quantity		1 + 1	1 + 1	1 + 1 + 1	1 + 1 + 1	1 + 1 + 1	1 + 1 + 1	1 + 1 + 1
		Model		Inverter						
		Type		Hermetically sealed scroll compressor						
		Speed	rpm	6,300 + 7,980	7,980 + 7,980	7,980 + 6,300 + 7,980	6,300 + 6,300 + 7,980	6,300 + 6,300 + 7,980	7,980 + 7,980 + 7,980	6,300 + 7,980 + 7,980
		Motor Output	kW	1.4 + 3.0	3.0 + 3.0	3.8 + 2.8 + 3.0	1.2 + 2.8 + 3.0	2.8 + 2.8 + 3.0	3.8 + 3.0 + 3.0	1.2 + 3.0 + 3.0
		Crankcase Heater	W	33	33	33	33	33	33	33
		Quantity		4	4	3	4	4	4	5
		Model		ON-OFF						
		Type		Hermetically sealed scroll compressor						
		Speed	rpm	2,900						
		Motor Output	kW	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		Crankcase Heater	W	33	33	33	33	33	33	33
Operation Range	Cooling	Min	°CDB	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
		Max	°CDB	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	Heating	Min	°CWB	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
		Max	°CWB	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Refrigerant	Name			R-410A						
	Charge	kg	12.5 + 12.7	12.7 + 12.7	7.7 + 8.6 + 12.7	8.4 + 8.6 + 12.7	8.6 + 8.6 + 12.7	7.7 + 12.7 + 12.7	8.4 + 12.7 + 12.7	
	Control			Expansion valve (electronic type)						
	Nr of Circuits			1	1	1	1	1	1	1
Maximum total refrigerant charge in the system		kg	Less than 100 (calculated charge less than 95)							
Refrigerant Oil	Name			Synthetic (ether) oil						
	Charged Volume		l	5.7 + 5.8	5.8 + 5.8	2.1 + 3.9 + 5.8	3.9 + 3.9 + 5.8	3.9 + 3.9 + 5.8	2.1 + 5.8 + 5.8	3.9 + 5.8 + 5.8
Piping connections	Liquid (OD)	Type		Braze connection						
		Diameter (OD)	mm	19.1	19.1	19.1	19.1	19.1	19.1	19.1
	Gas	Type		Braze connection						
		Diameter (OD)	mm	34.9	41.3	41.3	41.3	41.3	41.3	41.3
	Heat Insulation		Both liquid and gas pipes							
Max total length		m	1000	1000	1000	1000	1000	1000	1000	
Defrost Method				Reversed cycle						
Defrost Control				Sensor for outdoor heat exchanger temperature						
Capacity Control Method				Inverter controlled						
Capacity Control				~ 100						

Technical Specifications		U-34MX4XPQ	U-36MX4XPQ	U-38MX4XPQ	U-40MX4XPQ	U-42MX4XPQ	U-44MX4XPQ	U-46MX4XPQ
Safety devices		HPS						
		Fan motor driver overload protector						
		Over current relay						
		Inverter overload protector						
		PC board fuse						
Standard Accessories	Standard Accessories	Installation and operation manual						
	Quantity	1	1	1	1	1	1	1
	Standard Accessories	Connection pipes						
	Quantity	4	4	4	4	4	4	4
Notes		Nominal cooling capacities are based on: indoor temperature: 27°CDB, 19°CWB, outdoor temperature: 35°CDB, equivalent refrigerant piping: 7.5m, level difference: 0m.						
		Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping: 7.5m, level difference: 0m						
		Sound level of a multi system is determined by the individual outdoor unit and installation condition						
		Indoor index connection: when indoor models S-20UM3HPQ and S-25UM3HPQ are connected, maximum connection ratio is 130%						
		When indoor models S-NM3HPQ, S-FM3HPQ and S-KM3HPR are connected, connection ratio of 200% is possible						
		The refrigerant charge of the system must be less than 100 kg. This means that in case the calculated refrigerant charge is equal to or more than 95 kg, you must divide your multiple outdoor system into smaller independent systems, each containing less than 95 kg refrigerant charge. For factory charge, refer to the nameplate of the unit.						

Technical Specifications				U-48MX4XPQ	U-50MX4XPQ	U-52MX4XPQ	U-54MX4XPQ		
Capacity	Cooling	kW		132.0	138.0	143.0	147.0		
	Heating	kW		151.0	158.0	163.0	170.0		
COP	Cooling			3.14	3.08	3.07	3.02		
	Heating			3.78	3.77	3.75	3.70		
Capacity range		HP		48	50	52	54		
Power input (Nominal)	Cooling	kW		42.0	44.8	46.6	48.6		
	Heating	kW		40.0	41.9	43.5	45.9		
PED category				Category II					
Max n° of indoor units to be connected				64	64	64	64		
Indoor index connection	Minimum			600	625	650	675		
	Maximum			1,560	1,625	1,690	1,755		
Casing	Colour			Panasonic White					
	Material			Painted galvanised steel					
Heat Exchanger	Dimensions	Length	mm	1,778 + 2,088 + 2,088	2,088 + 2,088 + 2,088	2,088 + 2,088 + 2,088	2,088 + 2,088 + 2,088		
		Nr of Rows		54 + 54 + 54					
		Fin Pitch	mm	2.00	2.00	2.00	2.00		
		Nr of Passes		18 + 21 + 21	21 + 21 + 21	21 + 21 + 21	21 + 21 + 21		
		Face Area	m <sup>2</sup>	2.112 + 2.481 + 2.481	2.481 + 2.481 + 2.481	2.481 + 2.481 + 2.481	2.481 + 2.481 + 2.481		
		Nr of Stages		2	2	2	2		
	Tube type		Hi-XSS (8)						
	Fin	Fin type		Non-symmetric waffle louvre					
		Treatment		Hydrophilic and anti corrosion resistant					
	Fan	Type			Propeller				
Quantity			1 + 2 + 2	2 + 2 + 2	2 + 2 + 2	2 + 2 + 2			
Air Flow Rate (nominal at 230V)		Cooling	m <sup>3</sup> /min	196 + 239 + 239	233 + 239 + 239	233 + 239 + 239	239 + 239 + 239		
		Heating	m <sup>3</sup> /min	196 + 239 + 239	233 + 239 + 239	233 + 239 + 239	239 + 239 + 239		
External static pressure		Pa	78 pa in high static pressure						
Discharge direction			Vertical						
Motor		Quantity		1 + 2 + 2	2 + 2 + 2	2 + 2 + 2	2 + 2 + 2		
		Model		Brushless DC					
	Output motor	W	750 + 2x750 + 2x750	2x350 + 2x350 + 2x750	2x350 + 2x350 + 2x750	2x750 + 2x750 + 2x750			
Compressor	Quantity			8	9	9	9		
	Motor	Quantity		1 + 1 + 1					
		Model		Inverter					
		Type		Hermetically sealed scroll compressor					
		Speed	rpm	6,300 + 7,980 + 7,980	6,300 + 7,980 + 7,980	6,300 + 7,980 + 7,980	7,980 + 7,980 + 7,980		
		Motor Output	kW	2.8 + 3.0 + 3.0	0.3 + 3.0 + 3.0	1.4 + 3.0 + 3.0	3.0 + 3.0 + 3.0		
		Crankcase Heater	W	33	33	33	33		
		Quantity		5	6	6	6		
		Model		ON-OFF					
		Type		Hermetically sealed scroll compressor					
		Speed	rpm	2,900					
		Motor Output	kW	4.5	4.5	4.5	4.5		
		Crankcase Heater	W	33	33	33	33		
		Operation Range	Cooling	Min	°CDB	-5.0	-5.0	-5.0	-5.0
				Max	°CDB	43.0	43.0	43.0	43.0
Heating	Min		°CWB	-20.0	-20.0	-20.0	-20.0		
	Max		°CWB	15.0	15.0	15.0	15.0		
Refrigerant	Name			R-410A					
	Charge		kg	8.6 + 12.7 + 12.7	12.3 + 12.7 + 12.7	12.5 + 12.7 + 12.7	12.7 + 12.7 + 12.7		
	Control			Expansion valve (electronic type)					
	Nr of Circuits			1	1	1	1		
Maximum total refrigerant charge in the system			kg	Less than 100 (calculated charge less than 95)					
Refrigerant Oil	Name			Synthetic (ether) oil					
	Charged Volume		l	3.9 + 5.8 + 5.8	5.7 + 5.8 + 5.8	5.7 + 5.8 + 5.8	5.8 + 5.8 + 5.8		
Piping connections	Liquid (OD)	Type		Braze connection					
		Diameter (OD)	mm	19.1	19.1	19.1	19.1		
	Gas	Type		Braze connection					
		Diameter (OD)	mm	41.3	41.3	41.3	41.3		
	Heat Insulation			Both liquid and gas pipes					
	Max total length		m	1000	1000	1000	1000		
Defrost Method				Reversed cycle					
Defrost Control				Sensor for outdoor heat exchanger temperature					
Capacity Control Method				Inverter controlled					
Capacity Control				~ 100					
Safety devices				HPS					
				Fan motor driver overload protector					
				Over current relay					
				Inverter overload protector					
				PC board fuse					
Standard Accessories	Standard Accessories			Installation and operation manual					
	Quantity			1	1	1	1		
	Standard Accessories			Connection pipes					
	Quantity			4	4	4	4		

Technical Specifications	U-48MX4XPQ	U-50MX4XPQ	U-52MX4XPQ	U-54MX4XPQ
Notes	Nominal cooling capacities are based on: indoor temperature: 27°CDB, 19°CWB, outdoor temperature: 35°CDB, equivalent refrigerant piping: 7.5m, level difference: 0m.			
	Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping: 7.5m, level difference: 0m			
	Sound level of a multi system is determined by the individual outdoor unit and installation condition			
	Indoor index connection: when indoor models S-20UM3HPQ and S-25UM3HPQ are connected, maximum connection ratio is 130%			
	When indoor models S-NM3HPQ, S-FM3HPQ and S-KM3HPR are connected, connection ratio of 200% is possible			
	The refrigerant charge of the system must be less than 100 kg. This means that in case the calculated refrigerant charge is equal to or more than 95 kg, you must divide your multiple outdoor system into smaller independent systems, each containing less than 95 kg refrigerant charge. For factory charge, refer to the namplate of the unit.			

Electrical Specifications				U-5MX4XPQ	U-8MX4XPQ	U-10MX4XPQ	U-12MX4XPQ	U-14MX4XPQ	U-16MX4XPQ	U-18MX4XPQ
Power Supply	Name			XPQ						
	Phase			3N						
	Frequency		Hz	50	50	50	50	50	50	50
	Voltage		V	400	400	400	400	400	400	400
Current	Nominal running current (RLA)	Cooling	A	5.1	7.5	11.3	14.0	18.4	21.3	24.2
		Heating	A	5.8	8.2	11.1	13.8	16.8	19.4	23.0
	Starting current (MSC)		A			74	75	84	85	85
	Minimum circuit amps (MCA)		A	11.9	18.5	21.6	22.7	31.5	31.5	32.5
	Maximum fuse amps (MFA)		A	16.	25	25	25	40	40	40
	Total overcurrent amps (TOCA)		A	15.6	16.5	31.5	31.5	46.4	46.4	48.3
	Full load amps (FLA)		A	0.4	0.7	0.9	0.9	1.2	1.2	1.4
	Voltage range	Minimum		V	360	360	360	360	360	360
Maximum		V	440	440	440	440	440	440	440	
Wiring connections	For Power Supply	Quantity	5			5	5	5	5	5
		Remark	Earth wire included							
	For connection with indoor	Quantity	2			2	2	2	2	2
		Remark	F1 - F2							
Power Supply Intake				Both indoor and outdoor unit						
Notes				MCA/MFA : MCA = 1.25 x maximum RLA + other RLA + EA FLA, MCA <= 2.25 x maximum RLA + other RLA + EA FLA, next lower standard fuse rating minimum 16A						
				MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth leakage circuit breaker)						
				MSC means the maximum current during start up of the compressor						
				Maximum allowable voltage range variation between phases is 2%						
				RLA is based on following conditions : indoor temperature : 27°CDB/19°CWB , outdoor temperature : 35°CDB						
				Select wire size based on the value of MCA or TOCA						
				TOCA means the total value of each OC set						
				Voltage range : units are suitable for use on electrical systems where voltage supplied to unit terminal is not below or above listed range limits						



Electrical Specifications				U-20MX4XPQ	U-22MX4XPQ	U-24MX4XPQ	U-26MX4XPQ	U-28MX4XPQ	U-30MX4XPQ	U-32MX4XPQ
Power Supply	Name			XPQ						
	Phase			3N						
	Frequency	Hz		50	50	50	50	50	50	50
	Voltage	V		400	400	400	400	400	400	400
Current	Nominal running current (RLA)	Cooling	A	21.4	25.3	28.0	31.7	35.6	38.2	42.7
		Heating	A	22.0	24.8	27.5	31.2	34.1	36.8	39.8
	Starting current (MSC)		A	79	88	88	89	98	98	108
	Minimum circuit amps (MCA)		A	41.2	44.3	45.4	51.0	54.1	55.2	64.0
	Maximum fuse amps (MFA)		A	50	50	50	63	63	63	80
	Total overcurrent amps (TOCA)		A	48.0	63.0	63.0	64.8	79.8	79.8	94.7
	Full load amps (FLA)		A	1.6	1.8	1.8	2.1	2.3	2.3	2.6
	Voltage range	Minimum		V	360	360	360	360	360	360
Maximum		V	440	440	440	440	440	440	440	
Wiring connections	For Power Supply	Quantity		5	5	5	5	5	5	5
		Remark		Earth wire included						
	For connection with indoor	Quantity		2	2	2	2	2	2	2
		Remark		F1 - F2						
Power Supply Intake				Both indoor and outdoor unit						
Notes				MCA/MFA : MCA = 1.25 x maximum RLA + other RLA + EA FLA, MCA <= 2.25 x maximum RLA + other RLA + EA FLA, next lower standard fuse rating minimum 16A						
				MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth leakage circuit breaker)						
				MSC means the maximum current during start up of the compressor						
				Maximum allowable voltage range variation between phases is 2%						
				RLA is based on following conditions : indoor temperature : 27°CDB/19°CWB , outdoor temperature : 35°CDB						
				Select wire size based on the value of MCA or TOCA						
				TOCA means the total value of each OC set						
				Voltage range : units are suitable for use on electrical systems where voltage supplied to unit terminal is not below or above listed range limits						

Electrical Specifications				U-34MX4XPQ	U-36MX4XPQ	U-38MX4XPQ	U-40MX4XPQ	U-42MX4XPQ	U-44MX4XPQ	U-46MX4XPQ
Power Supply	Name			XPQ						
	Phase			3N						
	Frequency		Hz	50	50	50	50	50	50	50
	Voltage		V	400	400	400	400	400	400	400
Current	Nominal running current (RLA)	Cooling	A	45.5	48.5	45.7	48.8	52.2	55.9	59.1
		Heating	A	42.4	46.0	45.0	47.8	50.5	54.2	57.1
	Starting current (MSC)		A	109	109	102	111	111	113	122
	Minimum circuit amps (MCA)		A	64.0	65.0	73.7	76.8	77.9	83.5	86.6
	Maximum fuse amps (MFA)		A	80	80	100	100	100	100	100
	Total overcurrent amps (TOCA)		A	94.7	96.6	96.3	111.3	111.3	113.1	128.1
	Full load amps (FLA)		A	2.6	2.8	3.0	3.2	3.2	3.5	3.7
	Voltage range	Minimum		V	360	360	360	360	360	360
Maximum		V	440	440	440	440	440	440	440	
Wiring connections	For Power Supply	Quantity		5	5	5	5	5	5	5
		Remark		Earth wire included						
	For connection with indoor	Quantity		2	2	2	2	2	2	2
		Remark		F1 - F2						
Power Supply Intake				Both indoor and outdoor unit						
Notes				MCA/MFA : MCA = 1.25 x maximum RLA + other RLA + EA FLA, MCA <= 2.25 x maximum RLA + other RLA + EA FLA, next lower standard fuse rating minimum 16A						
				MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth leakage circuit breaker)						
				MSC means the maximum current during start up of the compressor						
				Maximum allowable voltage range variation between phases is 2%						
				RLA is based on following conditions : indoor temperature : 27°CDB/19°CWB , outdoor temperature : 35°CDB						
				Select wire size based on the value of MCA or TOCA						
				TOCA means the total value of each OC set						
				Voltage range : units are suitable for use on electrical systems where voltage supplied to unit terminal is not below or above listed range limits						

Electrical Specifications				U-48MX4XPQ	U-50MX4XPQ	U-52MX4XPQ	U-54MX4XPQ
Power Supply	Name			XPQ			
	Phase			3N			
	Frequency	Hz		50	50	50	50
	Voltage	V		400	400	400	400
Current	Nominal running current (RLA)	Cooling	A	62.5	66.9	69.8	72.7
		Heating	A	59.8	62.8	65.4	69.0
	Starting current (MSC)		A	122	132	134	134
	Minimum circuit amps (MCA)		A	87.7	96.5	96.5	97.5
	Maximum fuse amps (MFA)		A	100	125	125	125
	Total overcurrent amps (TOCA)		A	128.1	143.0	143.0	144.9
	Full load amps (FLA)		A	3.7	3.6	3.6	4.2
	Voltage range	Minimum		V	360	360	360
Maximum		V	440	440	440	440	
Wiring connections	For Power Supply	Quantity		5	5	5	5
		Remark	Earth wire included				
	For connection with indoor	Quantity		2	2	2	2
		Remark	F1 - F2				
Power Supply Intake				Both indoor and outdoor unit			
Notes				MCA/MFA : MCA = 1.25 x maximum RLA + other RLA + EA FLA, MCA <= 2.25 x maximum RLA + other RLA + EA FLA, next lower standard fuse rating minimum 16A			
				MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth leakage circuit breaker)			
				MSC means the maximum current during start up of the compressor			
				Maximum allowable voltage range variation between phases is 2%			
				RLA is based on following conditions : indoor temperature : 27°CDB/19°CWB , outdoor temperature : 35°CDB			
				Select wire size based on the value of MCA or TOCA			
				TOCA means the total value of each OC set			
				Voltage range : units are suitable for use on electrical systems where voltage supplied to unit terminal is not below or above listed range limits			

## Heat Pump 50Hz High COP Series &lt;U-MX4XPQ&gt;

Technical Specifications				U-16MX4XPQ	U-18MX4XPQ	U-20MX4XPQ	U-22MX4XPQ	U-24MX4XPQ	U-26MX4XPQ
Capacity	Cooling	kW		44.8	50.4	56.0	61.5	67.2	72.8
	Heating	kW		50.0	56.5	63.0	69.0	75.0	81.5
COP	Cooling			4.04	3.88	3.78	3.62	4.02	3.94
	Heating			4.27	4.15	4.09	4.04	3.97	4.20
Capacity range		HP		16	18	20	22	24	26
Power input (Nominal)	Cooling	kW		11.1	13.0	14.8	17.0	16.7	18.5
	Heating	kW		11.7	13.6	15.4	17.1	18.9	19.4
PED category				Category II					
Max n° of indoor units to be connected				26	29	32	35	39	42
Indoor index connection	Minimum			200	225	250	275	300	325
	Maximum			520	585	650	715	780	845
Casing	Colour			Panasonic White					
	Material			Painted galvanised steel					
Heat Exchanger	Dimensions	Length	mm	1,778 + 1,778	1,778 + 1,778	1,778 + 1,778	1,778 + 1,778	1,778 + 1,778 + 1,778	1,778 + 1,778 + 1,778
		Nr of Rows		54 + 54	54 + 54	54 + 54	54 + 54	54 + 54 + 54	54 + 54 + 54
		Fin Pitch	mm	2.00	2.00	2.00	2.00	2.00	2.00
		Nr of Passes		18 + 18	18 + 18	18 + 18	18 + 18	18 + 18 + 18	18 + 18 + 18
		Face Area	m <sup>2</sup>	2.112 + 2.112	2.112 + 2.112	2.112 + 2.112	2.112 + 2.112	2.112 + 2.112 + 2.112	2.112 + 2.112 + 2.112
		Nr of Stages		2 + 2	2 + 2	2 + 2	2 + 2	2 + 2 + 2	2 + 2 + 2
	Tube type			Hi-XSS (8)					
Fin	Fin type		Non-symmetric waffle louvre						
	Treatment		Hydrophilic and anti corrosion resistant						
Fan	Type			Propeller					
	Quantity			1 + 1	1 + 1	1 + 1	1 + 1	1 + 1 + 1	1 + 1 + 1
	Air Flow Rate (nominal at 230V)	Cooling	m <sup>3</sup> /min	171 + 171	171 + 185	185 + 185	185 + 185	171 + 171 + 171	171 + 171 + 185
		Heating	m <sup>3</sup> /min	171 + 171	171 + 185	185 + 185	185 + 185	171 + 171 + 171	171 + 171 + 185
	External static pressure		Pa	78 pa in high static pressure					
	Discharge direction			Vertical					
	Motor	Quantity		1 + 1	1 + 1	1 + 1	1 + 1	1 + 1 + 1	1 + 1 + 1
		Model		Brushless DC					
Output motor		W	750 + 750	750 + 750	750 + 750	750 + 750	750 + 750 + 750	750 + 750 + 750	
Compressor	Quantity			1 + 1	1 + 2	2 + 2	2 + 2	3	4
	Motor	Quantity		1 + 1	1 + 1	1 + 1	1 + 1	1 + 1 + 1	1 + 1 + 1
		Model		Inverter					
		Type		Hermetically sealed scroll compressor					
		Speed	rpm	7,980 + 7,980	7,980 + 6,300	6,300 + 6,300	6,300 + 6,300	7,980 + 7,980 + 7,980	7,980 + 7,980 + 6,300
		Motor Output	kW	3.8 + 3.8	3.8 + 1.2	1.2 + 1.2	1.2 + 2.8	3	3
		Crankcase Heater	W	33	33	33	33	33	33
		Quantity			1	2	2		1
		Model			ON - OFF	ON - OFF	ON - OFF		ON-OFF
		Type			Hermetically sealed scroll compressor	Hermetically sealed scroll compressor	Hermetically sealed scroll compressor		Hermetically sealed scroll compressor
		Speed	rpm		2,900	2,900	2,900		2,900
		Motor Output	kW		4.5	4.5	4.5		4.5
		Crankcase Heater	W		33	33	33		33
Operation Range	Cooling	Min	°CDB	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
		Max	°CDB	43.0	43.0	43.0	43.0	43.0	43.0
	Heating	Min	°CWB	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
		Max	°CWB	15.0	15.0	15.0	15.0	15.0	15.0
Refrigerant	Name			R-410A					
	Charge		kg	7.7 + 7.7	7.7 + 8.4	8.4 + 8.4	8.4 + 8.6	7.7 + 7.7 + 7.7	7.7 + 7.7 + 8.4
	Control			Expansion valve (electronic type)					
	Nr of Circuits			1	1	1	1	1	1
Maximum total refrigerant charge in the system			kg	Less than 100 (calculated charge less than 95)					
Refrigerant Oil	Name			Synthetic (ether) oil					
	Charged Volume		l	2.1 + 2.1 + 2.1	2.1 + 2.1 + 3.9	2.1 + 2.1	2.1 + 2.1	3.9 + 3.9	3.9 + 3.9
Piping connections	Liquid (OD)	Type		Brazed connection					
		Diameter (OD)	mm	12.7	15.9	15.9	15.9	15.9	19.1
	Gas	Type		Brazed connection					
		Diameter (OD)	mm	28.6	28.6	28.6	28.6	34.9	34.9
	Heat Insulation			Both liquid and gas pipes					
Max total length			m	1000	1000	1000	1000	1000	
Defrost Method				Reversed cycle					
Defrost Control				Sensor for outdoor heat exchanger temperature					
Capacity Control Method				Inverter controlled					
Capacity Control				~ 100					

Technical Specifications		U-16MX4XPQ	U-18MX4XPQ	U-20MX4XPQ	U-22MX4XPQ	U-24MX4XPQ	U-26MX4XPQ
Safety devices		HPS					
		Fan motor driver overload protector					
		Over current relay					
		Inverter overload protector					
		PC board fuse					
Standard Accessories	Standard Accessories	Installation and operation manual					
	Quantity	1	1	1	1	1	1
	Standard Accessories	Connection pipes					
	Quantity	4	4	4	4	4	4
Notes		Nominal cooling capacities are based on: indoor temperature: 27°CDB, 19°CWB, outdoor temperature: 35°CDB, equivalent refrigerant piping: 7.5m, level difference: 0m.					
		Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping: 7.5m, level difference: 0m					
		Sound level of a multi system is determined by the individual outdoor unit and installation condition					
		Indoor index connection: when indoor models S-20UM3HPQ and S-25UM3HPQ are connected, maximum connection ratio is 130%					
		When indoor models S-NM3HPQ, S-FM3HPQ and S-KM3HPR are connected, connection ratio of 200% is possible					
		The refrigerant charge of the system must be less than 100 kg. This means that in case the calculated refrigerant charge is equal to or more than 95 kg, you must divide your multiple outdoor system into smaller independent systems, each containing less than 95 kg refrigerant charge. For factory charge, refer to the namplate of the unit.					

Technical Specifications				U-28MX4XPQ	U-30MX4XPQ	U-32MX4XPQ	U-34MX4XPQ	U-36MX4XPQ
Capacity	Cooling	kW		78.4	84.0	89.4	95.0	101.0
	Heating	kW		88.0	94.5	100.0	107.0	113.0
COP	Cooling			3.84	3.77	3.60	3.56	3.49
	Heating			4.13	4.09	4.05	4.02	3.99
Capacity range		HP		28	30	32	34	36
Power input (Nominal)	Cooling	kW		20.4	22.3	24.8	26.7	28.9
	Heating	kW		21.3	23.1	24.7	26.6	28.3
PED category				Category II				
Max n° of indoor units to be connected				45	48	52	55	58
Indoor index connection	Minimum			350	375	400	425	450
	Maximum			910	975	1,040	1,105	1,170
Casing	Colour			Panasonic White				
	Material			Painted galvanised steel				
Heat Exchanger	Dimensions	Length	mm	1,778 + 1,778 + 1,778				
		Nr of Rows		54 + 54 + 54				
		Fin Pitch	mm	2.00	2.00	2.00	2.00	2.00
		Nr of Passes		18 + 18 + 18				
		Face Area	m <sup>2</sup>	2.112 + 2.112 + 2.112				
		Nr of Stages		2 + 2 + 2				
	Tube type			Hi-XSS (8)				
	Fin	Fin type		Non-symmetric waffle louvre				
Treatment			Hydrophylic and anti corrosion resistant					
Fan	Type			Propeller				
	Quantity			1 + 1 + 1				
	Air Flow Rate (nominal at 230V)	Cooling	m <sup>3</sup> /min	171 + 185 + 185	185 + 185 + 185	171 + 196 + 196	185 + 196 + 196	196 + 196 + 196
		Heating	m <sup>3</sup> /min	171 + 185 + 185	185 + 185 + 185	171 + 196 + 196	185 + 196 + 196	196 + 196 + 196
	External static pressure		Pa	60	60	60	60	60
	Discharge direction			Vertical				
	Motor	Quantity		1 + 1 + 1				
		Model		Brushless DC				
Output motor		W	750 + 750 + 750					
Compressor	Quantity			5	6	5	6	6
	Motor	Quantity		1 + 1 + 1				
		Model		Inverter				
		Type		Hermetically sealed scroll compressor				
		Speed	rpm	7,980 + 6,300 + 6,300	6,300 + 6,300 + 6,300	7,980 + 6,300 + 6,300	6,300 + 6,300 + 6,300	6,300 + 6,300 + 6,300
		Motor Output	kW	3	3	3	3	3
		Crankcase Heater	W	33	33	33	33	33
		Quantity		2	3	2	3	3
		Model		ON-OFF				
		Type		Hermetically sealed scroll compressor				
		Speed	rpm	2,900				
		Motor Output	kW	4.5	4.5	4.5	4.5	4.5
		Crankcase Heater	W	33	33	33	33	33
		Operation Range	Cooling	Min	°CDB	-5.0	-5.0	-5.0
Max	°CDB			43.0	43.0	43.0	43.0	43.0
Heating	Min		°CWB	-20.0	-20.0	-20.0	-20.0	-20.0
	Max		°CWB	15.0	15.0	15.0	15.0	15.0
Refrigerant	Name			R-410A				
	Charge	kg	7.7 + 8.4 + 8.4	8.6 + 8.6 + 8.6	7.7 + 8.6 + 8.6	8.4 + 8.6 + 8.6	8.6 + 8.6 + 8.6	
	Control			Expansion valve (electronic type)				
	Nr of Circuits			1	1	1	1	1
Maximum total refrigerant charge in the system		kg	Less than 100 (calculated charge less than 95)					
Refrigerant Oil	Name			Synthetic (ether) oil				
	Charged Volume	l	2.1 + 3.9 + 3.9	3.9 + 3.9 + 3.9	2.1 + 3.9 + 3.9	3.9 + 3.9 + 3.9	3.9 + 3.9 + 3.9	
Piping connections	Liquid (OD)	Type	Brazed connection					
		Diameter (OD)	mm	19.1	19.1	19.1	19.1	19.1
	Gas	Type	Brazed connection					
		Diameter (OD)	mm	34.9	34.9	34.9	34.9	41.3
	Heat Insulation			Both liquid and gas pipes				
Max total length		m	1000	1000	1000	1000	1000	
Defrost Method				Reversed cycle				
Defrost Control				Sensor for outdoor heat exchanger temperature				
Capacity Control Method				Inverter controlled				
Capacity Control				~ 100				
Safety devices				HPS				
				Fan motor driver overload protector				
				Over current relay				
				Inverter overload protector				
				PC board fuse				

Technical Specifications		U-28MX4XPQ	U-30MX4XPQ	U-32MX4XPQ	U-34MX4XPQ	U-36MX4XPQ
Standard Accessories	Standard Accessories	Installation and operation manual				
	Quantity	1	1	1	1	1
	Standard Accessories	Connection pipes				
	Quantity	4	4	4	4	4
Notes		Nominal cooling capacities are based on: indoor temperature: 27°CDB, 19°CWB, outdoor temperature: 35°CDB, equivalent refrigerant piping: 7.5m, level difference: 0m.				
		Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping: 7.5m, level difference: 0m				
		Sound level of a multi system is determined by the individual outdoor unit and installation condition				
		Indoor index connection: when indoor models S-20UM3HPQ and S-25UM3HPQ are connected, maximum connection ratio is 130%				
		When indoor models S-NM3HPQ, S-FM3HPQ and S-KM3HPR are connected, connection ratio of 200% is possible				
		The refrigerant charge of the system must be less than 100 kg. This means that in case the calculated refrigerant charge is equal to or more than 95 kg, you must divide your multiple outdoor system into smaller independent systems, each containing less than 95 kg refrigerant charge. For factory charge, refer to the namplate of the unit.				

Electrical Specifications				U-16MX4XPQ	U-18MX4XPQ	U-20MX4XPQ	U-22MX4XPQ	U-24MX4XPQ	U-26MX4XPQ
Power Supply	Name			XPQ					
	Phase			3N					
	Frequency		Hz	50	50	50	50	50	50
	Voltage		V	400	400	400	400	400	400
Current	Nominal running current (RLA)	Cooling	A	14.9	18.8	22.6	25.3	22.4	26.2
		Heating	A	16.4	19.3	22.1	24.8	24.6	27.4
	Starting current (MSC)		A	4	78	87	88	7	82
	Minimum circuit amps (MCA)		A	37.0	40.1	43.2	44.3	55.5	58.6
	Maximum fuse amps (MFA)		A	50	50	50	50	63.0	80.0
	Total overcurrent amps (TOCA)		A	33.0	48.0	63.0	63.0	49.5	64.5
	Full load amps (FLA)		A	1.4	1.6	1.8	1.8	2.1	2.3
	Voltage range	Minimum		V	360	360	360	360	360
Maximum		V	440	440	440	440	440	440	
Wiring connections	For Power Supply	Quantity		5	5	5	5	5	5
		Remark		Earth wire included					
	For connection with indoor	Quantity		2	2	2	2	2	2
		Remark		F1 - F2					
Power Supply Intake				Both indoor and outdoor unit					
Notes				MCA/MFA : MCA = 1.25 x maximum RLA + other RLA + EA FLA, MCA <= 2.25 x maximum RLA + other RLA + EA FLA, next lower standard fuse rating minimum 16A					
				MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth leakage circuit breaker)					
				MSC means the maximum current during start up of the compressor					
				Maximum allowable voltage range variation between phases is 2%					
				RLA is based on following conditions : indoor temperature : 27°CDB/19°CWB , outdoor temperature : 35°CDB					
				Select wire size based on the value of MCA or TOCA					
				TOCA means the total value of each OC set					
				Voltage range : units are suitable for use on electrical systems where voltage supplied to unit terminal is not below or above listed range limits					



Electrical Specifications				U-28MX4XPQ	U-30MX4XPQ	U-32MX4XPQ	U-34MX4XPQ	U-36MX4XPQ
Power Supply	Name			XPQ				
	Phase			3N				
	Frequency	Hz		50	50	50	50	50
	Voltage	V		400	400	400	400	400
Current	Nominal running current (RLA)	Cooling	A	30.1	33.9	35.4	39.3	41.9
		Heating	A	30.3	33.2	35.7	38.6	41.3
	Starting current (MSC)		A	91	100	92	101	101
	Minimum circuit amps (MCA)		A	61.7	64.8	63.9	67.0	68.1
	Maximum fuse amps (MFA)		A	80.0	80.0	80.0	80.0	80.0
	Total overcurrent amps (TOCA)		A	79.5	94.5	79.5	94.5	94.5
	Full load amps (FLA)		A	2.5	2.7	2.7	2.7	2.7
	Voltage range	Minimum		V	360	360	360	360
Maximum		V	440	440	440	440	440	
Wiring connections	For Power Supply	Quantity		5	5	5	5	5
		Remark		Earth wire included				
	For connection with indoor	Quantity		2	2	2	2	2
		Remark		F1 - F2				
Power Supply Intake				Both indoor and outdoor unit				
Notes				MCA/MFA: MCA = 1.25 x maximum RLA + other RLA + EA FLA, MCA <= 2.25 x maximum RLA + other RLA + EA FLA, next lower standard fuse rating minimum 16A				
				MFA is used to select the circuit breaker and the ground fault circuit interrupter (earth leakage circuit breaker)				
				MSC means the maximum current during start up of the compressor				
				Maximum allowable voltage range variation between phases is 2%				
				RLA is based on following conditions: indoor temperature: 27°CDB/19°CWB, outdoor temperature: 35°CDB				
				Select wire size based on the value of MCA or TOCA				
				TOCA means the total value of each OC set				
				Voltage range : units are suitable for use on electrical systems where voltage supplied to unit terminal is not below or above listed range limits				

## 1.2 Indoor Units

### Ceiling Mounted Cassette Type (Double Flow)

Model			S-20LM3HPQ	S-25LM3HPQ	S-32LM3HPQ	S-40LM3HPQ
★1 Cooling Capacity (19.5°CWB)		kcal/h	2,000	2,500	3,150	4,000
		Btu/h	7,900	9,900	12,500	15,900
		kW	2.3	2.9	3.7	4.7
★2 Cooling Capacity (19.0°CWB)		kW	2.2	2.8	3.6	4.5
★3 Heating Capacity		kcal/h	2,200	2,800	3,400	4,300
		Btu/h	8,500	10,900	13,600	17,000
		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)		mm	305×775×600	305×775×600	305×775×600	305×990×600
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 <sup>2</sup>	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	10×1	15×1	15×1	20×1
	Air Flow Rate (H/L)	m <sup>3</sup> /min	7/5	9/6.5	9/6.5	12/9
		cfm	247/177	318/230	318/230	424/318
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	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ12.7 (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 ）
Machine Weight		kg	26	26	26	31
★5 Sound Level (H/L) (220V)		dBA	32/27	34/28	34/28	34/29
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
Connectable outdoor unit			R410A Series	R410A Series	R410A Series	R410A Series
Decoration Panels (Option)	Model		CZ-01KPL11P	CZ-01KPL11P	CZ-01KPL11P	CZ-02KPL11P
	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, Washer for Hanging Brackets, Clamp Metal, Drain Hose, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Washer for Hanging Brackets, Clamp Metal, Drain Hose, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Washer for Hanging Brackets, Clamp Metal, Drain Hose, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Washer for Hanging Brackets, Clamp Metal, Drain Hose, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.
Drawing No.			3D039413			

#### Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

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

## Ceiling Mounted Cassette Type (Double Flow)

Model			S-50LM3HPQ	S-63LM3HPQ	S-80LM3HPQ	S-125LM3HPQ
★1 Cooling Capacity (19.5°CWB)		kcal/h	5,000	6,300	8,000	12,500
		Btu/h	19,900	25,000	31,800	49,600
		kW	5.8	7.3	9.3	14.5
★2 Cooling Capacity (19.0°CWB)		kW	5.6	7.1	9.0	14.0
★3 Heating Capacity		kcal/h	5,400	6,900	8,600	13,800
		Btu/h	21,500	27,300	34,100	54,600
		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)		mm	305×990×600	305×1,175×600	305×1,665×600	305×1,665×600
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 <sup>2</sup>	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	20×1	30×1	50×1	85×1
	Air Flow Rate (H/L)	m <sup>3</sup> /min	12/9	16.5/13	26/21	33/25
		cfm	424/318	582/459	918/741	1,165/883
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	mm	φ6.4 (Flare Connection)	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ15.9 (Flare Connection)	φ15.9 (Flare Connection)	φ15.9 (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 ）
Machine Weight		kg	32	35	47	48
★5 Sound Level (H/L)		dBA	34/29	37/32	39/34	44/38
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
Connectable outdoor unit			R410A Series	R410A Series	R410A Series	R410A Series
Decoration Panels (Option)	Model		CZ-02KPL11P	CZ-03KPL11P	CZ-04KPL11P	CZ-04KPL11P
	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, Washer for Hanging Brackets, Clamp Metal, Drain Hose, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Washer for Hanging Brackets, Clamp Metal, Drain Hose, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Washer for Hanging Brackets, Clamp Metal, Drain Hose, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Washer for Hanging Brackets, Clamp Metal, Drain Hose, Insulation for Fitting, Washer Fixing Plates, Sealing Pads, Clamps, Screws, Washers.
Drawing No.			3D039413			

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

kcal/h=kW×860  
 Btu/h=kW×3414  
 cfm=m<sup>3</sup>/min×35.3

## Ceiling Mounted Cassette Type (Multi Flow) 600×600

Model			S-20YM3HPS	S-25YM3HPS	S-32YM3HPS
★1 Cooling Capacity (19.5℃CWB)	kcal/h		2,000	2,500	3,150
	Btu/h		7,900	9,900	12,500
	kW		2.3	2.9	3.7
★2 Cooling Capacity (19.0℃CWB)	kW		2.2	2.8	3.6
★3 Heating Capacity	kcal/h		2,200	2,800	3,400
	Btu/h		8,500	10,900	13,600
	kW		2.5	3.2	4.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		mm	260 (286)×575×575 ( ): Include Control Box	260 (286)×575×575 ( ): Include Control Box	260 (286)×575×575 ( ): Include Control Box
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×10×1.5	2×10×1.5	2×10×1.5
	Face Area	m <sup>2</sup>	0.269	0.269	0.269
Fan	Model		QTS32C15M	QTS32C15M	QTS32C15M
	Type		Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output × Number of Units	W	55×1	55×1	55×1
	Air Flow Rate (H/L)	m <sup>3</sup> /min	9/7	9/7	9.5/7.5
		cfm	318/247	318/247	335/265
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	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ12.7 (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 )
Machine Weight		kg	18	18	18
★5 Sound Level (H/L) (230V)		dBA	30/25	30/25	32/26
Safety Devices			Fuse	Fuse	Fuse
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R410A Series	R410A Series	R410A Series
Decoration Panels (Option)	Model		CZ-02KPY11P	CZ-02KPY11P	CZ-02KPY11P
	Panel Color		White (Ral 9010)	White (Ral 9010)	White (Ral 9010)
	Dimensions: (H×W×D)	mm	55×700×700	55×700×700	55×700×700
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight		kg	2.7	2.7
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Washer Fixing Plate, Sealing Pads, Clamps, Screws, Washer for Hanging Bracket, Insulation for Fitting.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Washer Fixing Plate, Sealing Pads, Clamps, Screws, Washer for Hanging Bracket, Insulation for Fitting.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Washer Fixing Plate, Sealing Pads, Clamps, Screws, Washer for Hanging Bracket, Insulation for Fitting.
Drawing No.			3D038929A		

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

kcal/h=kW×860  
 Btu/h=kW×3414  
 cfm=m<sup>3</sup>/min×35.3

## Ceiling Mounted Cassette Type (Multi Flow) 600×600

Model			S-40YM3HPS	S-50YM3HPS
★1 Cooling Capacity (19.5°CWB)		kcal/h	4,000	5,000
		Btu/h	15,900	19,900
		kW	4.7	5.8
★2 Cooling Capacity (19.0°CWB)		kW	4.5	5.6
★3 Heating Capacity		kcal/h	4,300	5,400
		Btu/h	17,000	21,500
		kW	5.0	6.3
Casing			Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		mm	260 (286)×575×575 (    ): Include Control Box	260 (286)×575×575 (    ): Include Control Box
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×10×1.5	2×10×1.5
	Face Area	m <sup>2</sup>	0.269	0.269
Fan	Model		QTS32C15M	QTS32C15M
	Type		Turbo Fan	Turbo Fan
	Motor Output × Number of Units	W	55×1	55×1
	Air Flow Rate (H/L)	m <sup>3</sup> /min	11/8	14/10
		cfm	388/282	494/353
Drive		Direct Drive	Direct Drive	
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polystyrene/Foamed Polyethylene	Foamed Polystyrene/Foamed Polyethylene
Piping Connections	Liquid Pipes	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)
	Drain Pipe	mm	VP20 ( External Dia. 26 Internal Dia. 20 )	VP20 ( External Dia. 26 Internal Dia. 20 )
Machine Weight		kg	18	18
★5 Sound Level (H/L) (230V)		dBA	36/28	41/33
Safety Devices			Fuse	Fuse,
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R410A Series	R410A Series
Decoration Panels (Option)	Model		CZ-02KPY11P	CZ-02KPY11P
	Panel Color		White (Ral 9010)	White (Ral 9010)
	Dimensions: (H×W×D)	mm	55×700×700	55×700×700
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	kg	2.7	2.7
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Washer Fixing Plate, Sealing Pads, Clamps, Screws, Washer for Hanging Bracket, Insulation for Fitting.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Washer Fixing Plate, Sealing Pads, Clamps, Screws, Washer for Hanging Bracket, Insulation for Fitting.
Drawing No.			3D038929A	

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

kcal/h=kW×860  
Btu/h=kW×3414  
cfm=m<sup>3</sup>/min×35.3

## Ceiling Mounted Cassette Type (Multi-flow)

Model			S-25UM3HPQ	S-32UM3HPQ	S-40UM3HPQ	S-50UM3HPQ
★1 Cooling Capacity (19.5°CWB)		kcal/h	2,500	3,150	4,000	5,000
		Btu/h	9,900	12,500	15,900	19,900
		kW	2.9	3.7	4.7	5.8
★2 Cooling Capacity (19.0°CWB)		kW	2.8	3.6	4.5	5.6
★3 Heating Capacity		kcal/h	2,800	3,400	4,300	5,400
		Btu/h	10,900	13,600	17,000	21,500
		kW	3.2	4.0	5.0	6.3
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		mm	246×840×840	246×840×840	246×840×840	246×840×840
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×8×1.2	2×8×1.2	2×8×1.2	2×8×1.2
	Face Area	m <sup>2</sup>	0.363	0.363	0.363	0.363
Fan	Model		QTS46D14M	QTS46D14M	QTS46D14M	QTS46D14M
	Type		Turbo Fan	Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output × Number of Units	W	30×1	30×1	30×1	30×1
	Air Flow Rate (H/L)	m <sup>3</sup> /min	13/10	13/10	15/11	16/11
		cfm	459/353	459/353	530/388	565/388
	Drive		Direct Drive	Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Polyurethane Form	Polyurethane Form	Polyurethane Form	Polyurethane Form
Piping Connections	Liquid Pipes	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ12.7 (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 ）
Machine Weight		kg	24	24	24	24
★5 Sound Level (H/L) (220V)		dBA	30/27	30/27	31/27	32/27
Safety Devices			Fuse	Fuse	Fuse	Fuse
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R410A Series	R410A Series	R410A Series	R410A Series
Decoration Panels (Option)	Model		CZ-06KPU11P	CZ-06KPU11P	CZ-06KPU11P	CZ-06KPU11P
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	mm	45×950×950	45×950×950	45×950×950	45×950×950
	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	5.5	5.5
Standard Accessories			Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanging bracket, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanging bracket, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanging bracket, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanging bracket, Insulation for fitting.
Drawing No.			3D038812			

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

kcal/h=kW×860  
 Btu/h=kW×3414  
 cfm=m<sup>3</sup>/min×35.3

## Ceiling Mounted Cassette Type (Multi-flow)

Model			S-63UM3HPQ	S-80UM3HPQ	S-100UM3HPQ	S-125UM3HPQ
★1 Cooling Capacity (19.5°CWB)		kcal/h	6,300	8,000	10,000	12,500
		Btu/h	25,000	31,800	39,700	49,600
		kW	7.3	9.3	11.6	14.5
★2 Cooling Capacity (19.0°CWB)		kW	7.1	9.0	11.2	14.0
★3 Heating Capacity		kcal/h	6,900	8,600	10,800	13,800
		Btu/h	27,300	34,100	42,700	54,600
		kW	8.0	10.0	12.5	16.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		mm	246×840×840	246×840×840	288×840×840	288×840×840
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×10×1.2	2×10×1.2	2×12×1.2	2×12×1.2
	Face Area	m <sup>2</sup>	0.454	0.454	0.544	0.544
Fan	Model		QTS46D14M	QTS46D14M	QTS46C17M	QTS46C17M
	Type		Turbo Fan	Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output × Number of Units	W	30×1	30×1	120×1	120×1
	Air Flow Rate (H/L)	m <sup>3</sup> /min	18.5/14	20/15	26/21	30/24
		cfm	653/494	706/530	918/741	1,059/847
	Drive		Direct Drive	Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Polyurethane Form	Polyurethane Form	Polyurethane Form	Polyurethane Form
Piping Connections	Liquid Pipes	mm	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)
	Gas Pipes	mm	φ15.9 (Flare Connection)	φ15.9 (Flare Connection)	φ15.9 (Flare Connection)	φ15.9 (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 ）
Machine Weight		kg	25	25	29	29
★5 Sound Level (H/L)		dBA	33/28	36/31	39/33	42/36
Safety Devices			Fuse	Fuse	Fuse	Fuse
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R410A Series	R410A Series	R410A Series	R410A Series
Decoration Panels (Option)	Model		CZ-06KPU11P	CZ-06KPU11P	CZ-06KPU11P	CZ-06KPU11P
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	mm	45×950×950	45×950×950	45×950×950	45×950×950
	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	5.5	5.5
Standard Accessories			Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanging bracket, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanging bracket, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanging bracket, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washer fixing plate, Sealing pads, Clamps, Screws, Washer for hanging bracket, Insulation for fitting.
Drawing No.			3D038812			

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

kcal/h=kW×860  
Btu/h=kW×3414  
cfm=m<sup>3</sup>/min×35.3

## Ceiling Mounted Cassette Corner Type

Model			S-25DM3HP3	S-32DM3HP3	S-40DM3HP3	S-63DM3HP3
★1 Cooling Capacity (19.5°CWB)		kcal/h	2,500	3,150	4,000	6,300
		Btu/h	9,900	12,500	15,900	25,000
		kW	2.9	3.7	4.7	7.3
★2 Cooling Capacity (19.0°CWB)		kW	2.8	3.6	4.5	7.1
★3 Heating Capacity		kcal/h	2,800	3,400	4,300	6,900
		Btu/h	10,900	13,600	17,000	27,300
		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	215×1,110×710	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 <sup>2</sup>	0.180	0.180	0.180	0.226
Fan	Model		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 <sup>3</sup> /min	11/9	11/9	13/10	18/15
		cfm	388/318	388/318	459/353	635/530
	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	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ9.5 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ15.9 (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 ）
Machine Weight		kg	31	31	31	34
★5 Sound Level (H/L) (220V)		dBA	38/33	38/33	40/34	42/37
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
Connectable Outdoor Units			R410A Series	R410A Series	R410A Series	R410A Series
Decoration Panels (Option)	Model		CZ-02KPD11P	CZ-02KPD11P	CZ-02KPD11P	CZ-03KPD11P
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	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, Air Outlet Blocking Pad.	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, Air Outlet Blocking Pad.	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, Air Outlet Blocking Pad.	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, Air Outlet Blocking Pad.
Drawing No.			3D038813			

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured at a point 1m in front of the unit and 1m downward. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

kcal/h=kW×860  
 Btu/h=kW×3414  
 cfm=m<sup>3</sup>/min×35.3



## Ceiling Mounted Built-in Type

Model			S-20FM3HPQ	S-25FM3HPQ	S-32FM3HPQ
★1 Cooling Capacity (19.5°CWB)	kcal/h		2,000	2,500	3,150
	Btu/h		7,900	9,900	12,500
	kW		2.3	2.9	3.7
★2 Cooling Capacity (19.0°CWB)	kW		2.2	2.8	3.6
★3 Heating Capacity	kcal/h		2,200	2,800	3,400
	Btu/h		8,500	10,900	13,600
	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
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	3×14×1.75	3×14×1.75	3×14×1.75
	Face Area	m <sup>2</sup>	0.088	0.088	0.088
Fan	Model		D18H3A	D18H3A	D18H3A
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	50×1	50×1	50×1
	Air Flow Rate (H/L)	m <sup>3</sup> /min	9/6.5	9/6.5	9.5/7
	★4 Static external pressure	Pa	88-39-20	88-39-20	64-39-15
	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	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ12.7 (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)
Machine Weight			kg	30	30
★7 Sound Level (H/L) (220V)			dBA	37/32	38/32
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R410A Series	R410A Series	R410A Series
Decoration Panel (Option)	Model		CZ-01HPF11P	CZ-01HPF11P	CZ-01HPF11P
	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.
Drawing No.			3D039431		

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference; 0m. (Heat pump only)
- ★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 Static external pressure is changeable to change over the connectors inside electrical box, this pressure means "High static pressure-Standard".
- 6 Capacities are net, including a deduction for cooling (an additional for heating) for indoor fan motor heat.
- ★7 Anechoic chamber conversion value, measured at a point 1.5m downward from the unit center. These values are normally somewhat higher during actual operation as a result of installation conditions.

## Conversion Formulae

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

## Ceiling Mounted Built-in Type

Model			S-40FM3HPQ	S-50FM3HPQ	S-63FM3HPQ
★1 Cooling Capacity (19.5°CWB)		kcal/h	4,000	5,000	6,300
		Btu/h	15,900	19,900	25,000
		kW	4.7	5.8	7.3
★2 Cooling Capacity (19.0°CWB)		kW	4.5	5.6	7.1
★3 Heating Capacity		kcal/h	4,300	5,400	6,900
		Btu/h	17,000	21,500	27,300
		kW	5.0	6.3	8.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		mm	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		D18H2A	D18H2A	2D18H2A
	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 Static external pressure	Pa	88-49-20	88-59-29	88-49-20
	Drive		Direct Drive	Direct Drive	Direct Drive
	Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber	Glass Fiber	Glass Fiber
Air Filter			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ9.5 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ15.9 (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)
Machine Weight		kg	30	31	41
★7 Sound Level (H/L)		dBA	38/32	41/36	42/35
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R410A Series	R410A Series	R410A Series
Decoration Panel (Option)	Model		CZ-02HPF11P	CZ-02HPF11P	CZ-03HPF11P
	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.
Drawing No.			3D039431		

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- ★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 Static external pressure is changeable to change over the connectors inside electrical box, this pressure means "High static pressure-Standard".
- 6 Capacities are net, including a deduction for cooling (an additional for heating) for indoor fan motor heat.
- ★7 Anechoic chamber conversion value, measured at a point 1.5m downward from the unit center. These values are normally somewhat higher during actual operation as a result of installation conditions.

## Conversion Formulae

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

## Ceiling Mounted Built-in Type

Model			S-80FM3HPQ	S-100FM3HPQ	S-125FM3HPQ
★1 Cooling Capacity (19.5°CWB)		kcal/h	8,000	10,000	12,500
		Btu/h	31,800	39,700	49,600
		kW	9.3	11.6	14.5
★2 Cooling Capacity (19.0°CWB)		kW	9.0	11.2	14.0
★3 Heating Capacity		kcal/h	8,600	10,800	13,800
		Btu/h	34,100	42,700	54,600
		kW	10.0	12.5	16.0
Casing			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		mm	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	m²	0.338	0.338	0.338
Fan	Model		3D18H2A	3D18H2A	3D18H2A
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	225×1	225×1	225×1
	Air Flow Rate (H/L)	m³/min	27/21.5	28/22	38/28
	★5 Static external pressure	Pa	113-82	107-75	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	mm	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)
	Gas Pipes	mm	φ15.9 (Flare Connection)	φ15.9 (Flare Connection)	φ15.9 (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)
Machine Weight		kg	51	51	52
★7 Sound Level (H/L)		dBA	43/37	43/37	46/41
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R410A Series	R410A Series	R410A Series
Decoration Panel (Option)	Model		CZ-06HPF11P	CZ-06HPF11P	CZ-06HPF11P
	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.
Drawing No.			3D039431		

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference; 0m. (Heat pump only)
- ★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 Static external pressure is changeable to change over the connectors inside electrical box, this pressure means "High static pressure-Standard".
- 6 Capacities are net, including a deduction for cooling (an additional for heating) for indoor fan motor heat.
- ★7 Anechoic chamber conversion value, measured at a point 1.5m downward from the unit center. These values are normally somewhat higher during actual operation as a result of installation conditions.

## 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 Duct Type

Model			S-40EM3HPQ	S-50EM3HPQ	S-63EM3HPQ	S-80EM3HPQ
★1 Cooling Capacity (19.5°CWB)	kcal/h		4,000	5,000	6,300	8,000
	Btu/h		15,900	19,900	25,000	31,800
	kW		4.7	5.8	7.3	9.3
★2 Cooling Capacity (19.0°CWB)	kW		4.5	5.6	7.1	9.0
★3 Heating Capacity	kcal/h		4,300	5,400	6,900	8,600
	Btu/h		17,000	21,500	27,300	34,100
	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	390×720×690
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 <sup>2</sup>	0.181	0.181	0.181	0.181
Fan	Model		D11/2D3AB1VE	D11/2D3AB1VE	D11/2D3AB1VE	D11/2D3AA1VE
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	100×1	100×1	100×1	160×1
	Air Flow Rate (H/L)	m <sup>3</sup> /min	14/11.5	14/11.5	14/11.5	19.5/16
		cfm	494/406	494/406	494/406	688/565
	External Static Pressure	Pa	157/157-118/108 ★4	157/157-118/108 ★4	157/157-118/108 ★4	157/160-108/98 ★4
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	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ15.9 (Flare Connection)	φ15.9 (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 )
Machine Weight		kg	44	44	44	45
★7 Sound Level (H/L)		dBA	39/35	39/35	39/35	42/38
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
Connectable outdoor unit			R410A Series	R410A Series	R410A Series	R410A Series
Standard Accessories			Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.	Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.	Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.	Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.
Drawing No.			3D038814			

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length; 7.5m, level difference; 0m. (Heat pump only)
- ★4 Static external pressure is changeable to change over the connectors inside electrical box, this pressure means "High static pressure-Standard".
- ★5 Air filter is not standard accessory, but please mount it in the duct system of the suction side. Select its colorimetric method (gravity method) 50% or more.
- 6 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★7 Anechoic chamber conversion value, measured at a point 1.5m downward from the unit center. These values are normally somewhat higher during actual operation as a result of installation conditions.

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

## Ceiling Mounted Duct Type

Model			S-100EM3HPQ	S-125EM3HPQ	S-200EM3HPQ	S-250EM3HPQ
★1 Cooling Capacity (19.5°CWB)	kcal/h		10,000	12,500	20,000	25,000
	Btu/h		39,700	49,600	79,000	99,000
	kW		11.6	14.5	23.0	28.8
★2 Cooling Capacity (19.0°CWB)	kW		11.2	14.0	22.4	28.0
★3 Heating Capacity	kcal/h		10,800	13,800	21,500	27,000
	Btu/h		42,700	54,600	85,300	107,500
	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
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 <sup>2</sup>	0.319	0.319	0.68	0.68
Fan	Model		2D11/2D3AG1VE	2D11/2D3AF1VE	D13/4G2DA1×2	D13/4G2DA1×2
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	270×1	430×1	380×2	380×2
	Air Flow Rate (H/L)	m <sup>3</sup> /min	29/23	36/29	58/50	72/62
		cfm	1,024/812	1,271/1,024	2,047/1,765	2,542/2,189
	External Static Pressure	Pa	157/172-98/98 ★4	191/245-152/172 ★4	221/270-132 ★4	270/191-147 ★4
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	mm	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)
	Gas Pipes	mm	φ15.9 (Flare Connection)	φ15.9 (Flare Connection)	φ19.1 (Brazing Connection)	φ22.2 (Brazing Connection)
	Drain Pipe	mm	VP25 ( External Dia. 32 ) ( Internal Dia. 25 )	VP25 ( External Dia. 32 ) ( Internal Dia. 25 )	PS1B	PS1B
Machine Weight		kg	63	65	137	137
★7 Sound Level (H/L)		dBA	43/39	45/42	48/45	48/45
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
Connectable outdoor unit			R410A Series	R410A Series	R410A Series	R410A Series
Standard Accessories			Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.	Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.	Operation Manual, Installation Manual, Sealing Pads, Connection Pipes, Screws, Clamps.	Operation Manual, Installation Manual, Sealing Pads, Connection Pipes, Screws, Clamps.
Drawing No.			3D038814			

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference; 0m. (Heat pump only)
- ★4 Static external pressure is changeable to change over the connectors inside electrical box, this pressure means "High static pressure-Standard".
- ★5 Air filter is not standard accessory, but please mount it in the duct system of the suction side. Select its colorimetric method (gravity method) 50% or more.
- 6 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★7 Anechoic chamber conversion value, measured at a point 1.5m downward from the fan center. These values are normally somewhat higher during actual operation as a result of installation conditions.

## Conversion Formulae

kcal/h=kW×860  
 Btu/h=kW×3414  
 cfm=m<sup>3</sup>/min×35.3

## Ceiling Suspended Type

Model			S-32TM3JPR	S-63TM3JPR	S-100TM3JPR
★1 Cooling Capacity (19.5°CWB)		kcal/h	3,150	6,300	10,000
		Btu/h	12,500	25,000	39,700
		kW	3.7	7.3	11.6
★2 Cooling Capacity (19.0°CWB)		kW	3.6	7.1	11.2
★3 Heating Capacity		kcal/h	3,400	6,900	10,800
		Btu/h	13,600	27,300	42,700
		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	195×960×680	195×1,160×680	195×1,400×680
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×12×1.75	3×12×1.75	3×12×1.75
	Face Area	m²	0.182	0.233	0.293
Fan	Model		3D12K1AA1	4D12K1AA1	3D12K2AA1
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output × Number of Units	W	62×1	62×1	130×1
	Air Flow Rate (H/L)	m³/min	12/10	17.5/14	25/19.5
		cfm	424/353	618/494	883/688
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Wool	Glass Wool	Glass Wool
Air Filter			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	mm	φ6.4 (Flare Connection)	φ9.5 (Flare Connection)	φ9.5 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ15.9 (Flare Connection)	φ15.9 (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)
Machine Weight		kg	24	28	33
★5 Sound Level (H/L)		dBA	36/31	39/34	45/37
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R410A Series	R410A Series	R410A Series
Standard Accessories			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.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Clamps, Washers.
Drawing No.			3D035297		

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

kcal/h=kW×860  
Btu/h=kW×3414  
cfm=m<sup>3</sup>/min×35.3

## Wall Mounted Type

Model			S-20KM3HPR	S-25KM3HPR	S-32KM3HPR
★1 Cooling Capacity (19.5°CWB)		kcal/h	2,000	2,500	3,150
		Btu/h	7,900	9,900	12,500
		kW	2.3	2.9	3.7
★2 Cooling Capacity (19.0°CWB)		kW	2.2	2.8	3.6
★3 Heating Capacity		kcal/h	2,200	2,800	3,400
		Btu/h	8,500	10,900	13,600
		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	290×795×230	290×795×230	290×795×230
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×14×1.4	2×14×1.4	2×14×1.4
	Face Area	m²	0.161	0.161	0.161
Fan	Model		—	—	—
	Type		Cross Flow Fan	Cross Flow Fan	Cross Flow Fan
	Motor Output × Number of Units	W	40×1	40×1	40×1
	Air Flow Rate (H/L)	m³/min	7.5/4.5	8/5	9/5.5
		cfm	265/159	282/177	318/194
	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	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)
	Drain Pipe	mm	VP13 (External Dia. 18 Internal Dia. 13)	VP13 (External Dia. 18 Internal Dia. 13)	VP13 (External Dia. 18 Internal Dia. 13)
Machine Weight		kg	11	11	11
★5 Sound Level (H/L)		dBA	35/29	36/29	37/29
Safety Devices			Fuse	Fuse	Fuse
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R410A Series	R410A Series	R410A Series
Standard Accessories			Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tape, Clamps, screws.	Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tape, Clamps, screws.	Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tape, Clamps, screws.
Drawing No.					

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

kcal/h=kW×860  
 Btu/h=kW×3414  
 cfm=m<sup>3</sup>/min×35.3

## Wall Mounted Type

Model			S-40KM3HPR	S-50KM3HPR	S-63KM3HPR
★1 Cooling Capacity (19.5°CWB)		kcal/h	4,000	5,000	6,300
		Btu/h	15,900	19,900	25,000
		kW	4.7	5.8	7.3
★2 Cooling Capacity (19.0°CWB)		kW	4.5	5.6	7.1
★3 Heating Capacity		kcal/h	4,300	5,400	6,900
		Btu/h	17,000	21,500	27,300
		kW	5.0	6.3	8.0
Casing Color			White (B-272)	White (B-272)	White (B-272)
Dimensions: (H×W×D)		mm	290×1,050×230	290×1,050×230	290×1,050×230
Coil (Cross Fin Coil)	Rows×Stages×Fin Pitch	mm	2×14×1.4	2×14×1.4	2×14×1.4
	Face Area	m²	0.161	0.161	0.161
Fan	Model		—	—	—
	Type		Cross Flow Fan	Cross Flow Fan	Cross Flow Fan
	Motor Output × Number of Units	W	43×1	43×1	43×1
	Air Flow Rate (H/L)	m³/min	12/9	15/12	19/14
		cfm	424/318	530/424	671/494
	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	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ9.5 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ15.9 (Flare Connection)
	Drain Pipe	mm	VP13	VP13	VP13
Machine Weight		kg	14	14	14
★5 Sound Level (H/L)		dBA	39/34	42/36	46/39
Safety Devices			Fuse	Fuse	Fuse
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R410A Series	R410A Series	R410A Series
Standard Accessories			Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tape, Clamps, screws.	Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tape, Clamps, screws.	Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tape, Clamps, screws.
Drawing No.					

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp; 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp; 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length; 7.5m, level difference; 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

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



## Floor Standing Type

Model			S-20PM3HPQ	S-25PM3HPQ	S-32PM3HPQ
★1 Cooling Capacity (19.5°CWB)		kcal/h	2,000	2,500	3,150
		Btu/h	7,900	9,900	12,500
		kW	2.3	2.9	3.7
★2 Cooling Capacity (19.0°CWB)		kW	2.2	2.8	3.6
★3 Heating Capacity		kcal/h	2,200	2,800	3,400
		Btu/h	8,500	10,900	13,600
		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	m²	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)	m³/min	7/6	7/6	8/6
		cfm	247/212	247/212	282/212
	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	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)
	Drain Pipe	mm	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)
Machine Weight		kg	25	25	30
★5 Sound Level (H/L)		dBA	35/32	35/32	35/32
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable Outdoor Unit			R410A Series	R410A Series	R410A Series
Standard Accessories			Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.
Drawing No.			3D038816		

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured at a point 1.5 m in front of the unit at a height of 1.5 m. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

kcal/h=kW×860  
Btu/h=kW×3414  
cfm=m<sup>3</sup>/min×35.3

## Floor Standing Type

Model			S-40PM3HPQ	S-50PM3HPQ	S-63PM3HPQ
★1 Cooling Capacity (19.5°CWB)		kcal/h	4,000	5,000	6,300
		Btu/h	15,900	19,900	25,000
		kW	4.7	5.8	7.3
★2 Cooling Capacity (19.0°CWB)		kW	4.5	5.6	7.1
★3 Heating Capacity		kcal/h	4,300	5,400	6,900
		Btu/h	17,000	21,500	27,300
		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
		cfm	388/300	494/388	565/424
	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	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ9.5 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ15.9 (Flare Connection)
	Drain Pipe	mm	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)
Machine Weight		kg	30	36	36
★5 Sound Level (H/L)		dBA	38/33	39/34	40/35
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable Outdoor Unit			R410A Series	R410A Series	R410A Series
Standard Accessories			Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.
Drawing No.			3D038816		

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured at a point 1.5 m in front of the unit at a height of 1.5 m. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

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

## Concealed Floor Standing Type

Model			S-20RM3HPQ	S-25RM3HPQ	S-32RM3HPQ
★1 Cooling Capacity (19.5°CWB)		kcal/h	2,000	2,500	3,150
		Btu/h	7,900	9,900	12,500
		kW	2.3	2.9	3.7
★2 Cooling Capacity (19.0°CWB)		kW	2.2	2.8	3.6
★3 Heating Capacity		kcal/h	2,200	2,800	3,400
		Btu/h	8,500	10,900	13,600
		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	m²	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)	m³/min	7/6	7/6	8/6
		cfm	247/212	247/212	282/212
	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	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)
	Drain Pipe	mm	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)
Machine Weight		kg	19	19	23
★5 Sound Level (H/L)		dBA	35/32	35/32	35/32
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable Outdoor Unit			R410A Series	R410A Series	R410A Series
Standard Accessories			Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.
Drawing No.			3D038817		

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured at a point 1.5 m in front of the unit at a height of 1.5 m. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

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

## Concealed Floor Standing Type

Model			S-40RM3HPQ	S-50RM3HPQ	S-63RM3HPQ
★1 Cooling Capacity (19.5°CWB)		kcal/h	4,000	5,000	6,300
		Btu/h	15,900	19,900	25,000
		kW	4.7	5.8	7.3
★2 Cooling Capacity (19.0°CWB)		kW	4.5	5.6	7.1
★3 Heating Capacity		kcal/h	4,300	5,400	6,900
		Btu/h	17,000	21,500	27,300
		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	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
		cfm	388/300	494/388	565/424
	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	mm	φ6.4 (Flare Connection)	φ6.4 (Flare Connection)	φ9.5 (Flare Connection)
	Gas Pipes	mm	φ12.7 (Flare Connection)	φ12.7 (Flare Connection)	φ15.9 (Flare Connection)
	Drain Pipe	mm	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)	φ21 O.D (Vinyl Chloride)
Machine Weight		kg	23	27	27
★5 Sound Level (H/L)		dBA	38/33	39/34	40/35
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable Outdoor Unit			R410A Series	R410A Series	R410A Series
Standard Accessories			Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.
Drawing No.			3D038817		

## Notes:

- ★1 Indoor temp. : 27°CDB, 19.5°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★2 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp.: 35°CDB / Equivalent piping length: 7.5m, level difference: 0m.
- ★3 Indoor temp. : 20°CDB / outdoor temp.: 7°CDB, 6°CWB / Equivalent piping length: 7.5m, level difference: 0m. (Heat pump only)
- 4 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.
- ★5 Anechoic chamber conversion value, measured at a point 1.5 m in front of the unit at a height of 1.5 m. During actual operation, these values are normally somewhat higher as a result of installation conditions.

## Conversion Formulae

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

# Part 3

## Refrigerant Circuit

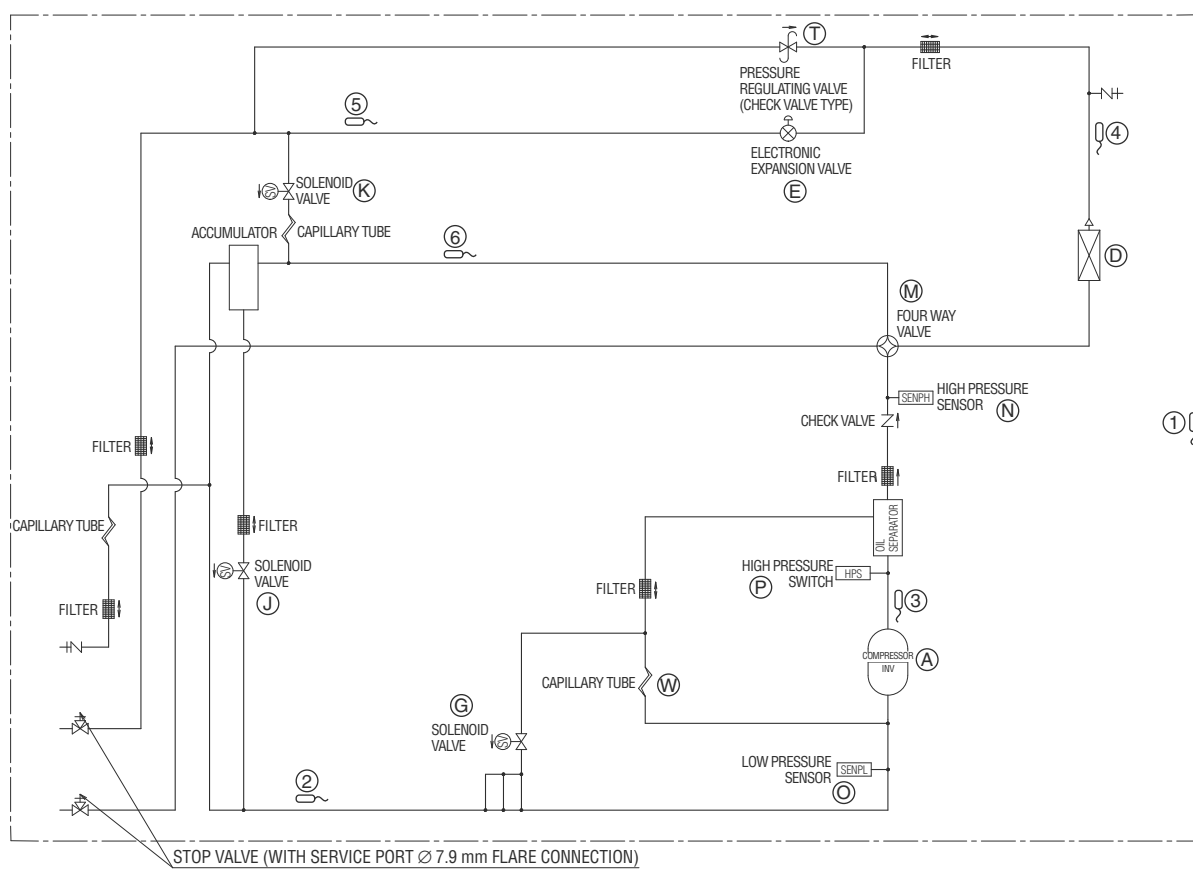
1. Refrigerant Circuit .....	50
1.1 U-5MX4XPQ.....	50
1.2 U-8MX4XPQ.....	52
1.3 U-10MX4XPQ, U-12MX4XPQ .....	54
1.4 U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ .....	56
2. Functional Parts Layout .....	58
2.1 U-5MX4XPQ.....	58
2.2 U-8MX4XPQ.....	59
2.3 U-10MX4XPQ, U-12MX4XPQ .....	60
2.4 U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ .....	61
3. Refrigerant Flow for Each Operation Mode.....	62

# 1. Refrigerant Circuit

## 1.1 U-5MX4XPQ

No. in refrigerant system diagram	Symbol	Name	Major Function
A	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 52Hz and 188Hz by using the inverter. The number of operating steps is as follows when Inverter compressor is operated. U-5MX4XPQ : 18 steps
D	M1F	Inverter fan	Since the system is of air heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
E	Y1E	Electronic expansion valve (Main: EV1)	While in heating operation, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
G	Y1S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
J	Y2S	Solenoid valve (Oil return: SVO)	Used to return oil from the accumulator to the compressor.
K	Y4S	Solenoid valve (Injection) SVT	Used to cool the compressor by injecting refrigerant when the compressor discharge temperature is high.
M	Y3S	4-way valve	Used to switch the operation mode between cooling and heating.
N	S1NPH	High pressure sensor	Used to detect high pressure.
O	S1NPL	Low pressure sensor	Used to detect low pressure.
P	S1PH	HP pressure switch (For INV compressor)	In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 4.0 MPa or more to stop the compressor operation.
T	—	Pressure regulating valve 1	This valve opens at a pressure of 4.0 MPa for prevention of pressure increase, thus resulting in no damage of functional parts due to the increase of pressure in transportation or storage.
W	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the compressor.
1	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor temperature, correct discharge pipe temperature, and others.
2	R2T	Thermistor (Suction pipe: Ts)	Used to detect suction pipe temperature.
3	R3T	Thermistor (INV discharge pipe: Tdi)	Used to detect discharge pipe temperature, make the temperature protection control of compressor, and others.
4	R4T	Thermistor (Heat exchanger deicer: Tb)	Used to detect liquid pipe temperature of air heat exchanger, determine defrosting operation, and others.
5	R6T	Thermistor (Liquid pipe TI)	Used to detect liquid pipe temperature.
6	R7T	Thermistor (Accumulator inlet Ts1)	Used to detect gas pipe temperature at the accumulator inlet. Keep the suction superheated degree constant in heating operation, and others.

## U-5MX4XPQ

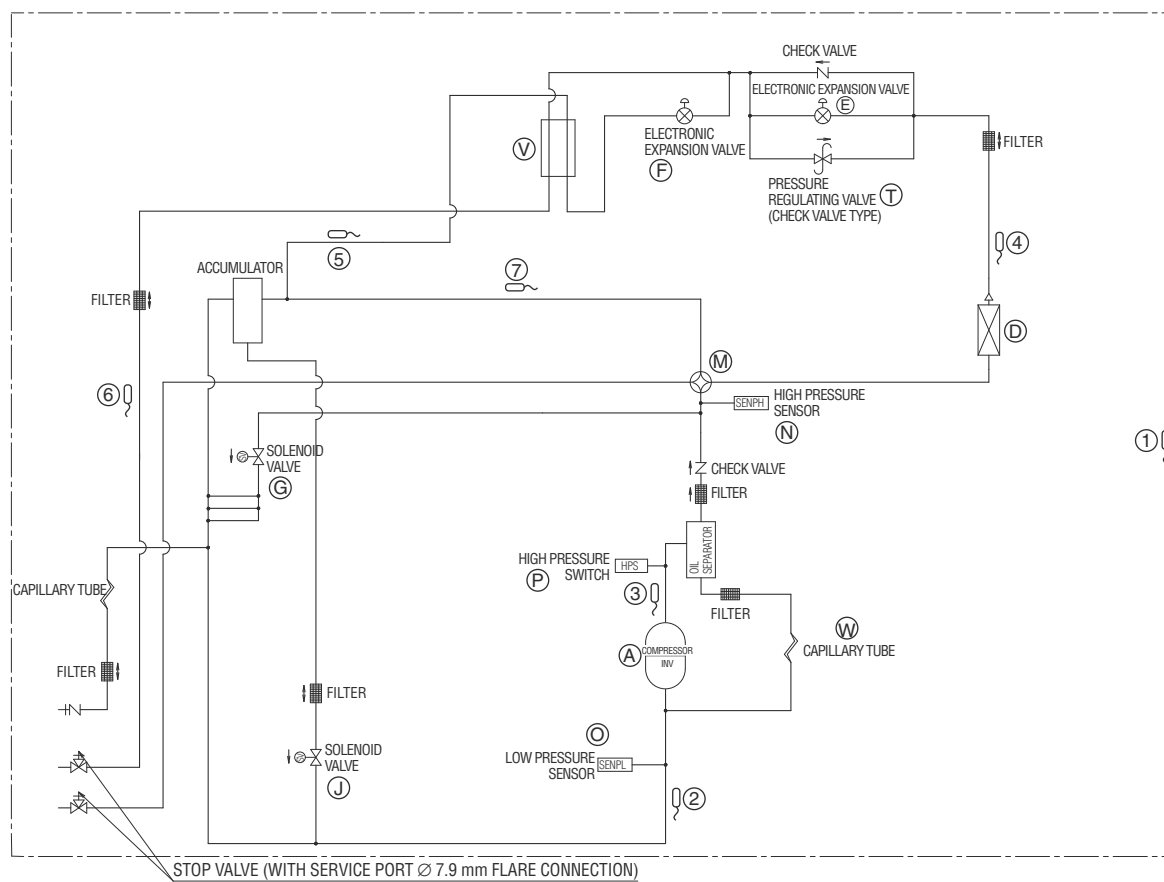


## 1.2 U-8MX4XPQ

No. in refrigerant system diagram	Symbol	Name	Major Function
A	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 52Hz and 266Hz by using the inverter, while Standard compressor is operated with commercial power supply only. The number of operating steps is as follows when Inverter compressor is operated in combination with Standard compressor. U-8MX4XPQ : 24 steps
D	M1F	Inverter fan	Since the system is of air heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
E	Y1E	Electronic expansion valve (Main: EV1)	While in heating operation, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
F	Y2E	Electronic expansion valve (Subcool: EV2)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
G	Y1S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
J	Y2S	Solenoid valve (Oil return: SVO)	Used to return oil from the accumulator to the compressor.
M	Y3S	4-way valve	Used to switch the operation mode between cooling and heating.
N	S1NPH	High pressure sensor	Used to detect high pressure.
O	S1NPL	Low pressure sensor	Used to detect low pressure.
P	S1PH	HP pressure switch (For INV compressor)	In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 4.0 MPa or more to stop the compressor operation.
T	—	Pressure regulating valve (Liquid pipe)	This valve opens at a pressure of 4.0 MPa for prevention of pressure increase, thus resulting in no damage of functional parts due to the increase of pressure in transportation or storage.
V	—	Subcooling heat exchanger	Used to subcool liquid refrigerant from the electronic expansion valve (cooling) or indoor units (heating).
W	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV compressor.
1	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor temperature, correct discharge pipe temperature, and others.
2	R2T	Thermistor (Suction pipe: Ts)	Used to detect suction pipe temperature.
3	R3T	Thermistor (INV discharge pipe: Tdi)	Used to detect discharge pipe temperature, make the temperature protection control of compressor, and others.
4	R4T	Thermistor (Heat exchanger deicer: Tb)	Used to detect liquid pipe temperature of air heat exchanger, determine defrosting operation, and others.
5	R5T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Used to detect gas pipe temperature on the evaporation side of subcooling heat exchanger, keep the superheated degree at the outlet of subcooling heat exchanger constant, and others.
6	R6T	Thermistor (Receiver outlet liquid pipe: TI)	Used to detect receiver outlet liquid pipe temperature.
7	R7T	Thermistor (Accumulator inlet)	Used to detect gas pipe temperature at the accumulator inlet. Keep the suction superheated degree constant in heating operation, and others.



## U-8MX4XPQ

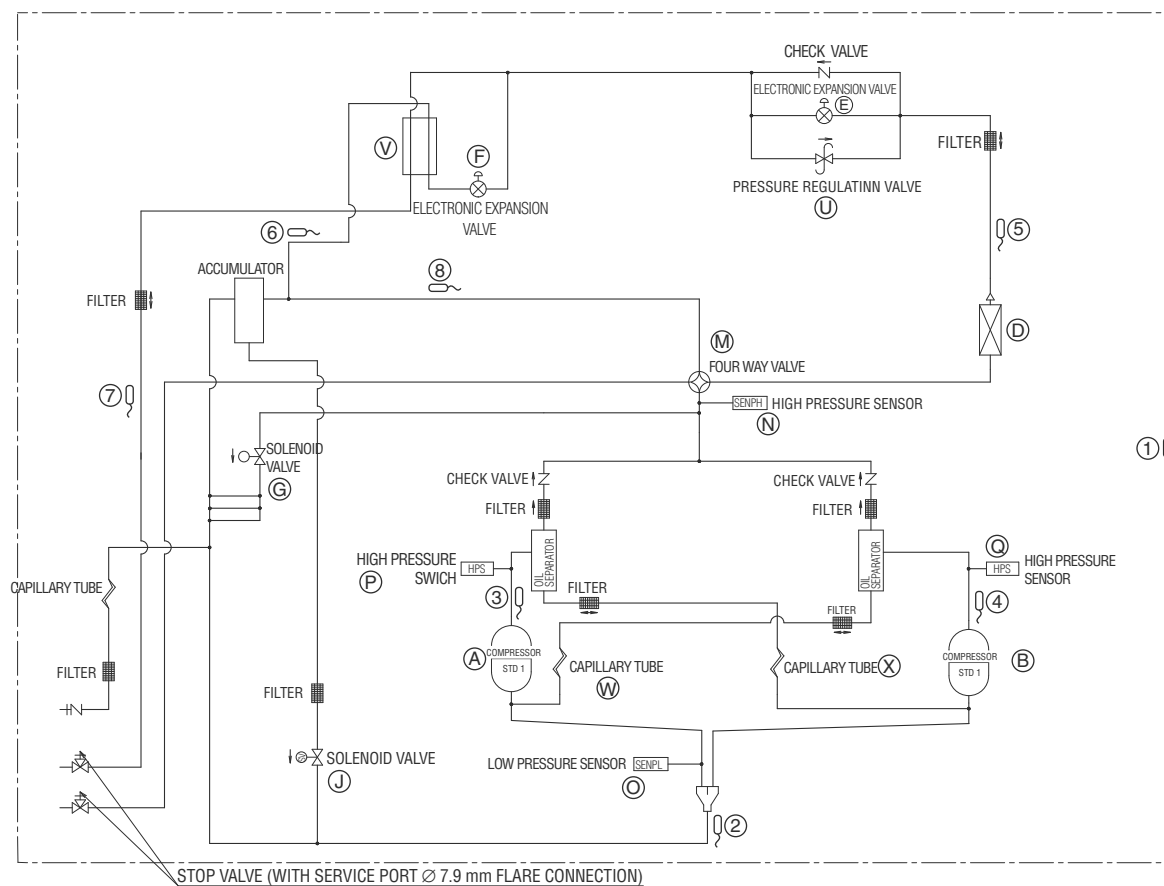


3D050783

## 1.3 U-10MX4XPQ, U-12MX4XPQ

No. in refrigerant system diagram	Symbol	Name	Major Function
A	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 52Hz and 210Hz by using the inverter, while Standard compressor is operated with commercial power supply only. The number of operating steps is as follows when Inverter compressor is operated in combination with Standard compressor. U-10MX4XPQ, U-12MX4XPQ : 37 steps
B	M2C	Standard compressor 1 (STD1)	
D	M1F	Inverter fan	Since the system is of air heat exchanging type, the fan is operated at 9-step rotation speed by using the inverter.
E	Y1E	Electronic expansion valve (Main: EV1)	While in heating operation, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
F	Y2E	Electronic expansion valve (Subcool: EV3)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
G	Y1S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
J	Y2S	Solenoid valve (Oil return: SVO)	Used to return oil from the accumulator to the compressor.
M	Y3S	4-way valve	Used to switch the operation mode between cooling and heating.
N	S1NPH	High pressure sensor	Used to detect high pressure.
O	S1NPL	Low pressure sensor	Used to detect low pressure.
P	S1PH	HP pressure switch (For INV compressor)	In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 4.0 MPa or more to stop the compressor operation.
Q	S2PH	HP pressure switch (For STD compressor 1)	
U	—	Pressure regulating valve (Liquid pipe)	This valve opens at a pressure of 4.0 MPa for prevention of pressure increase, thus resulting in no damage of functional parts due to the increase of pressure in transportation or storage.
V	—	Subcooling heat exchanger	Used to subcool liquid refrigerant from the electronic expansion valve (cooling) or indoor units (heating).
W	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV compressor.
X	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the STD1 compressor.
1	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor temperature, correct discharge pipe temperature, and others.
2	R2T	Thermistor (Suction pipe: Ts)	Used to detect suction pipe temperature.
3	R31T	Thermistor (INV discharge pipe: Tdi)	Used to detect discharge pipe temperature, make the temperature protection control of compressor, and others.
4	R32T	Thermistor (STD1 discharge pipe: Tds1)	
5	R4T	Thermistor (Heat exchanger deicer: Tb)	Used to detect liquid pipe temperature of air heat exchanger, determine defrosting operation, and others.
6	R5T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Used to detect gas pipe temperature on the evaporation side of subcooling heat exchanger, keep the superheated degree at the outlet of subcooling heat exchanger constant, and others.
7	R6T	Thermistor (Liquid pipe: Tl)	Used to detect liquid pipe temperature.
8	R7T	Thermistor (Accumulator inlet)	Used to detect gas pipe temperature at the accumulator inlet. Keep the suction superheated degree constant in heating operation, and others.

## U-10MX4XPQ, U-12MX4XPQ

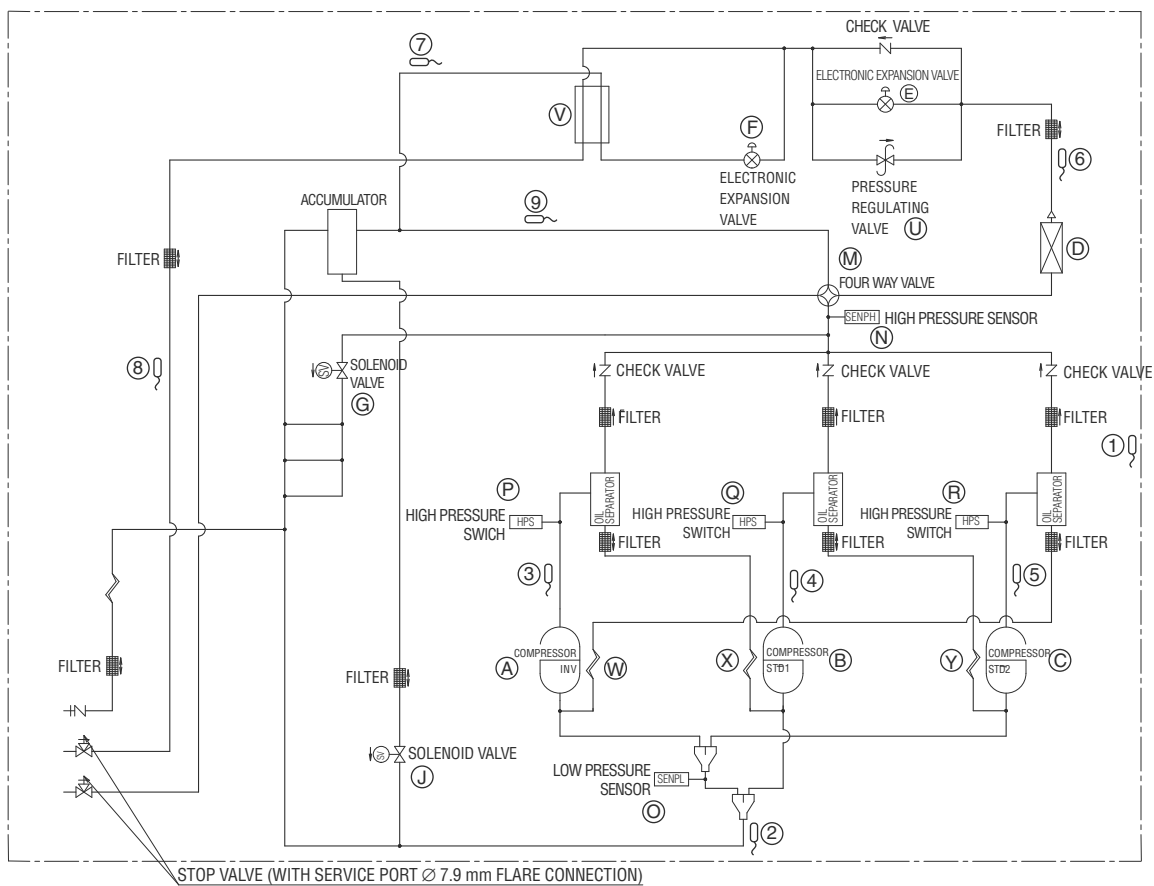


3D050784

## 1.4 U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ

No. in refrigerant system diagram	Symbol	Name	Major Function
A	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 52Hz and 266Hz by using the inverter, while Standard compressor is operated with commercial power supply only. The number of operating steps is as follows when Inverter compressor is operated in combination with Standard compressor. U-14MX4XPQ, U-16MX4XPQ : 51 steps, U-18MX4XPQ : 55 steps
B	M2C	Standard compressor 1 (STD1)	
C	M3C	Standard compressor 1 (STD2)	
D	M1F	Inverter fan	Since the system is of air heat exchanging type, the fan is operated at 8-step rotation speed by using the inverter.
E	Y1E	Electronic expansion valve (Main: EV1)	While in heating operation, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
F	Y2E	Electronic expansion valve (Subcool: EV3)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
G	Y1S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
J	Y2S	Solenoid valve (Oil return: SVO)	Used to return oil from the accumulator to the compressor.
M	Y3S	4-way valve	Used to switch the operation mode between cooling and heating.
N	S1NPH	High pressure sensor	Used to detect high pressure.
O	S1NPL	Low pressure sensor	Used to detect low pressure.
P	S1PH	HP pressure switch (For INV compressor)	In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 4.0 MPa or more to stop the compressor operation.
Q	S2PH	HP pressure switch (For STD compressor 1)	
R	S3PH	HP pressure switch (For STD compressor 2)	
U	—	Pressure regulating valve (Liquid pipe)	This valve opens at a pressure of 4.0 MPa for prevention of pressure increase, thus resulting in no damage of functional parts due to the increase of pressure in transportation or storage.
V	—	Subcooling heat exchanger	Used to subcool liquid refrigerant from the electronic expansion valve (cooling) or indoor units (heating).
W	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV compressor.
X	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the STD1 compressor.
Y	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the STD2 compressor.
1	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor temperature, correct discharge pipe temperature, and others.
2	R2T	Thermistor (Suction pipe: Ts)	Used to detect suction pipe temperature.
3	R31T	Thermistor (INV discharge pipe: Tdi)	Used to detect discharge pipe temperature, make the temperature protection control of compressor, and others.
4	R32T	Thermistor (STD1 discharge pipe: Tds1)	
5	R33T	Thermistor (STD2 discharge pipe: Tds2)	
6	R4T	Thermistor (Heat exchanger deicer: Tb)	Used to detect liquid pipe temperature of air heat exchanger, determine defrosting operation, and others.
7	R5T	Thermistor (Subcooling heat exchanger gas pipe: Tsh)	Used to detect gas pipe temperature on the evaporation side of subcooling heat exchanger, keep the superheated degree at the outlet of subcooling heat exchanger constant, and others.
8	R6T	Thermistor (Liquid pipe: TI)	Used to detect liquid pipe temperature.
9	R7T	Thermistor (Accumulator inlet)	Used to detect gas pipe temperature at the accumulator inlet. Keep the suction superheated degree constant in heating operation, and others.

## U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ

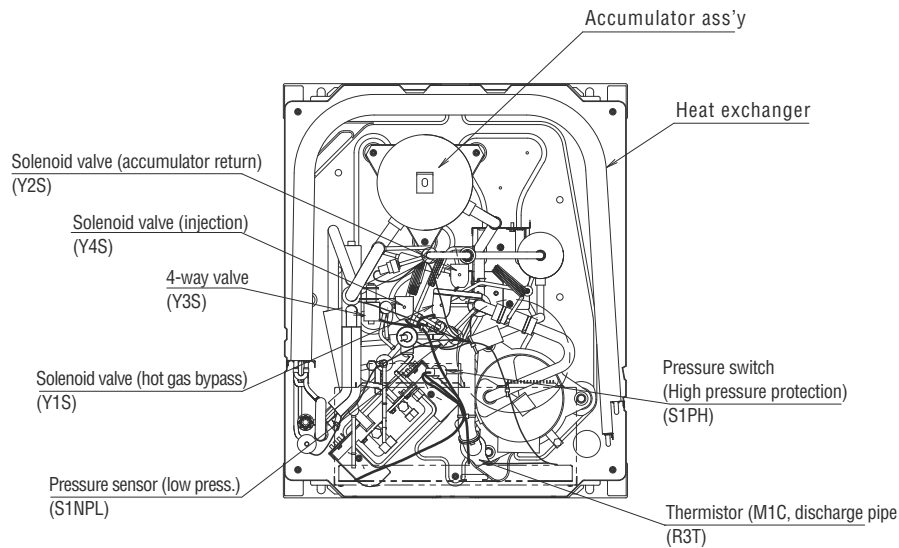


3D050785

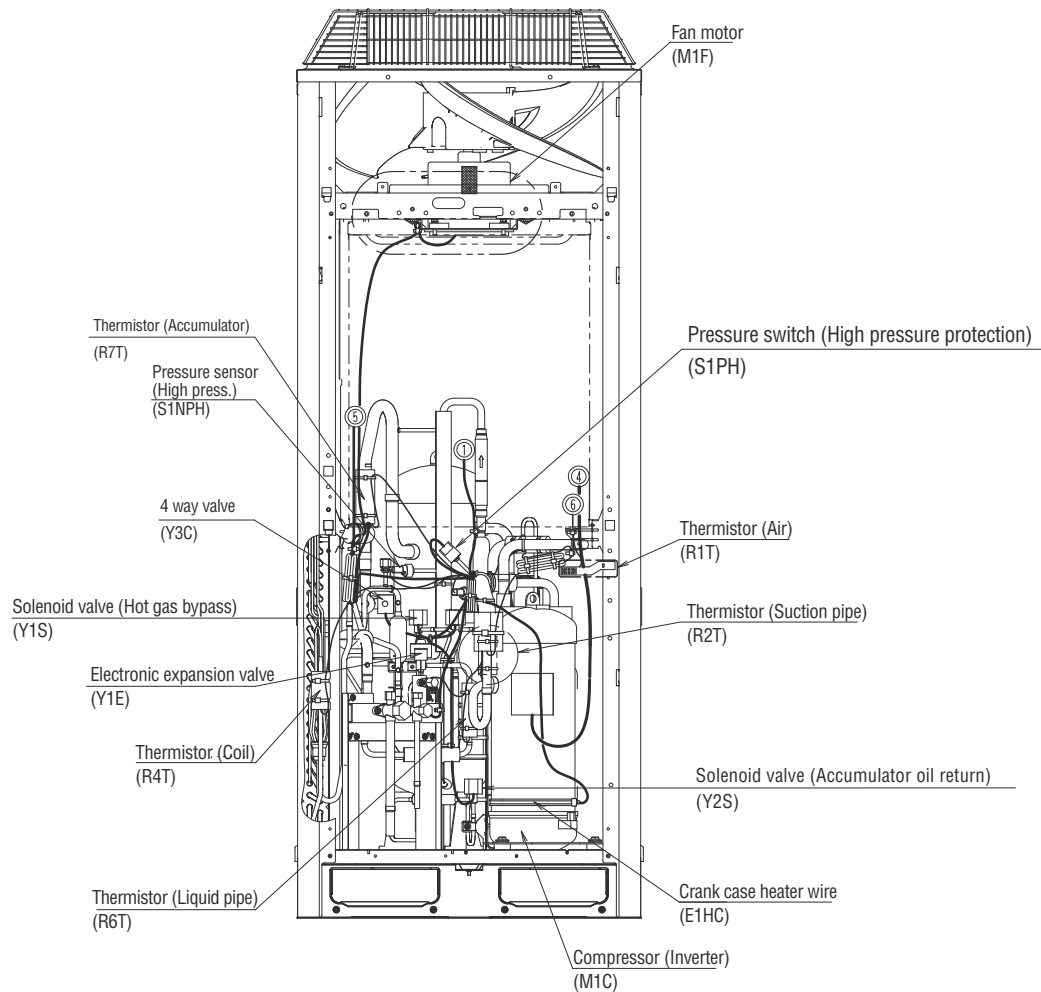
## 2. Functional Parts Layout

### 2.1 U-5MX4XPQ

#### Plan

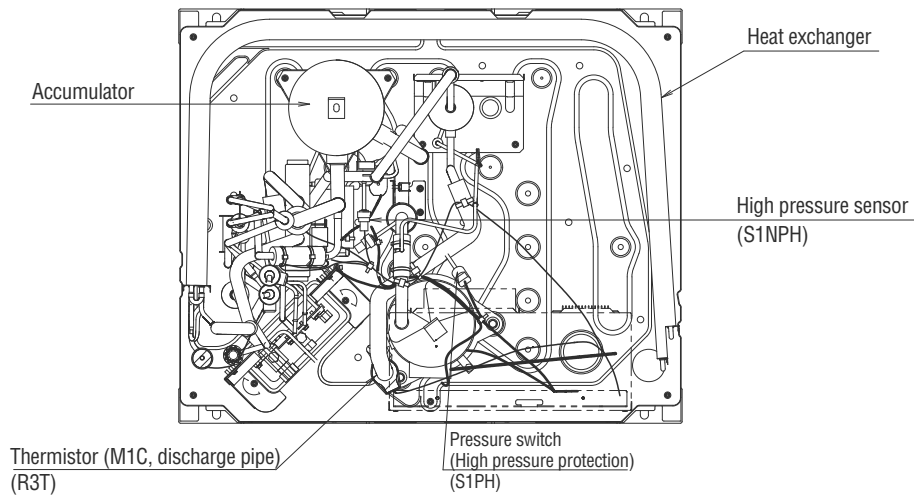


#### Front View

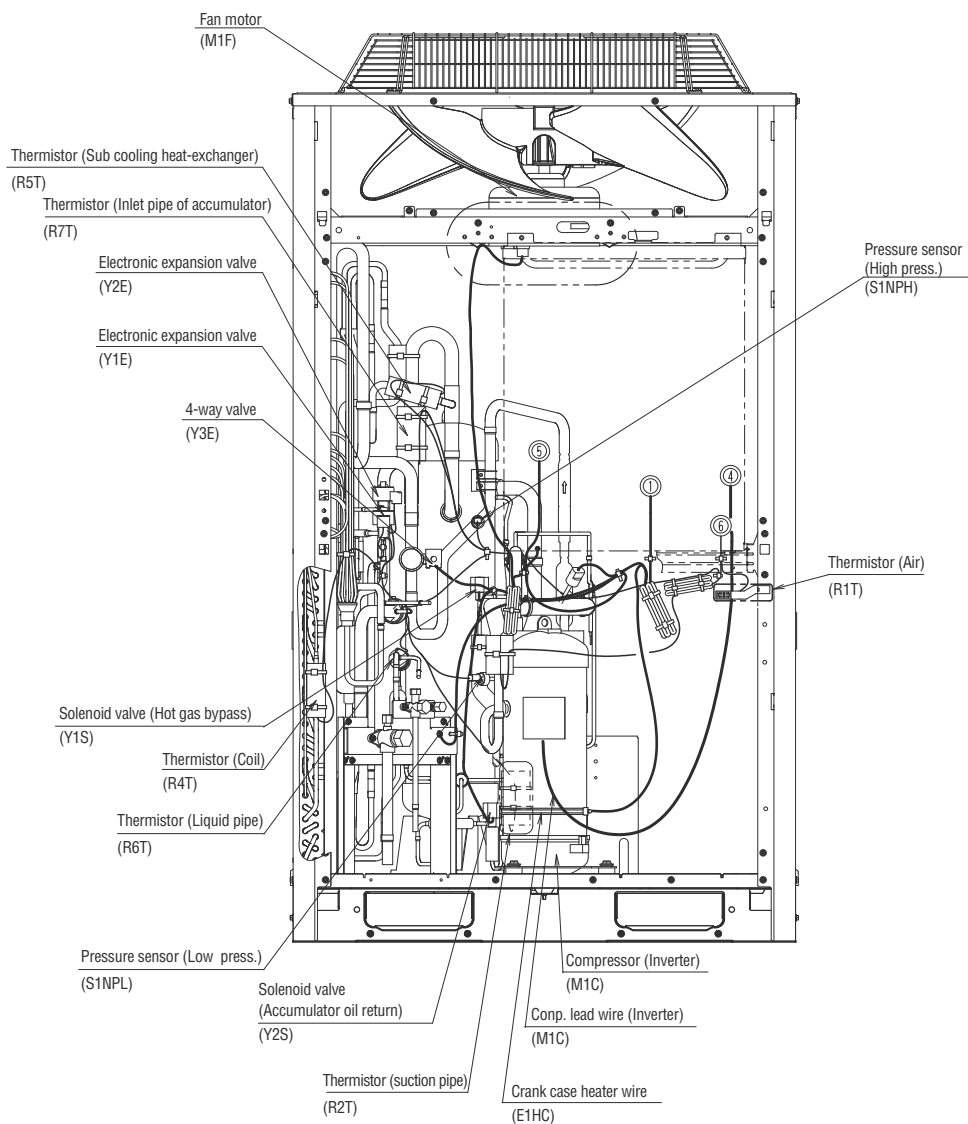


## 2.2 U-8MX4XPQ

### Plan

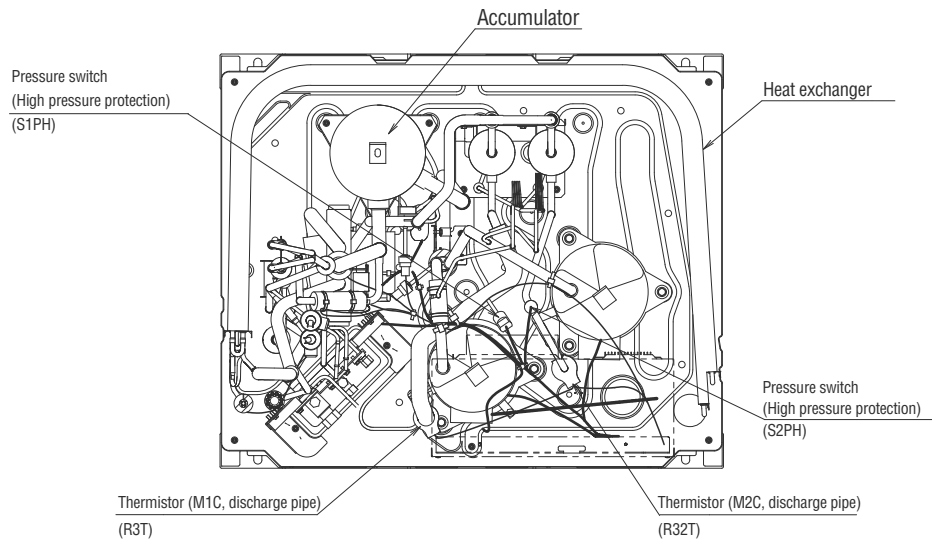


### Front View

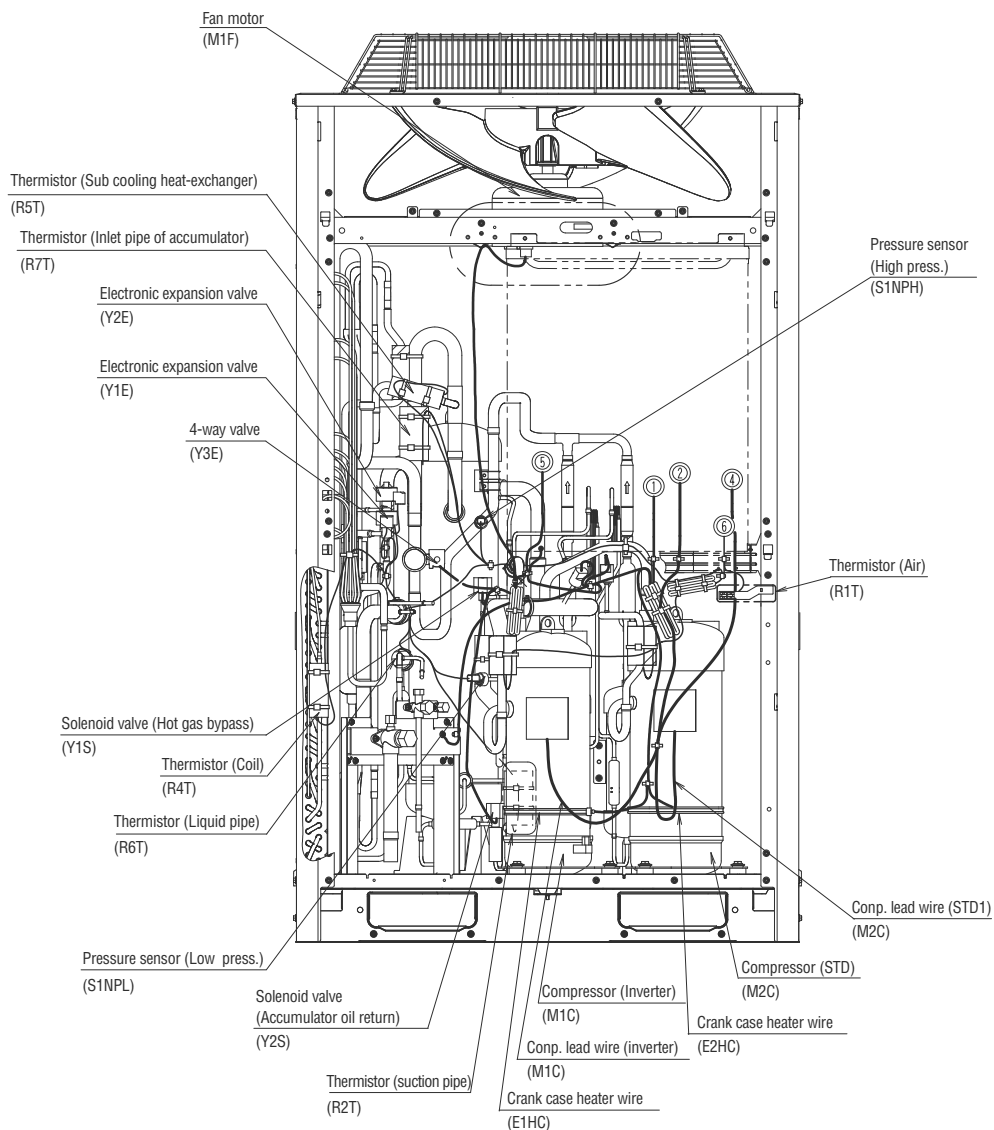


## 2.3 U-10MX4XPQ, U-12MX4XPQ

### Plan



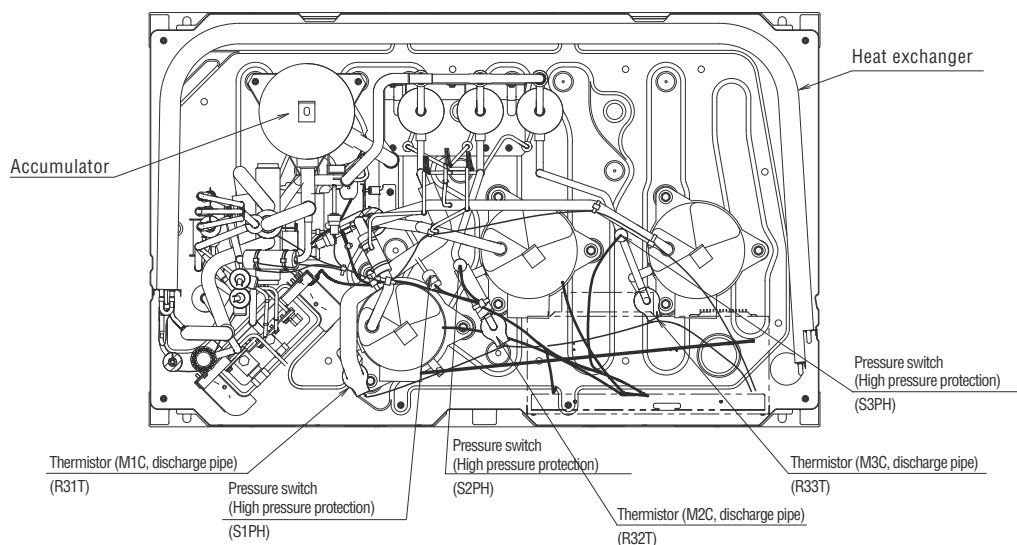
### Front View



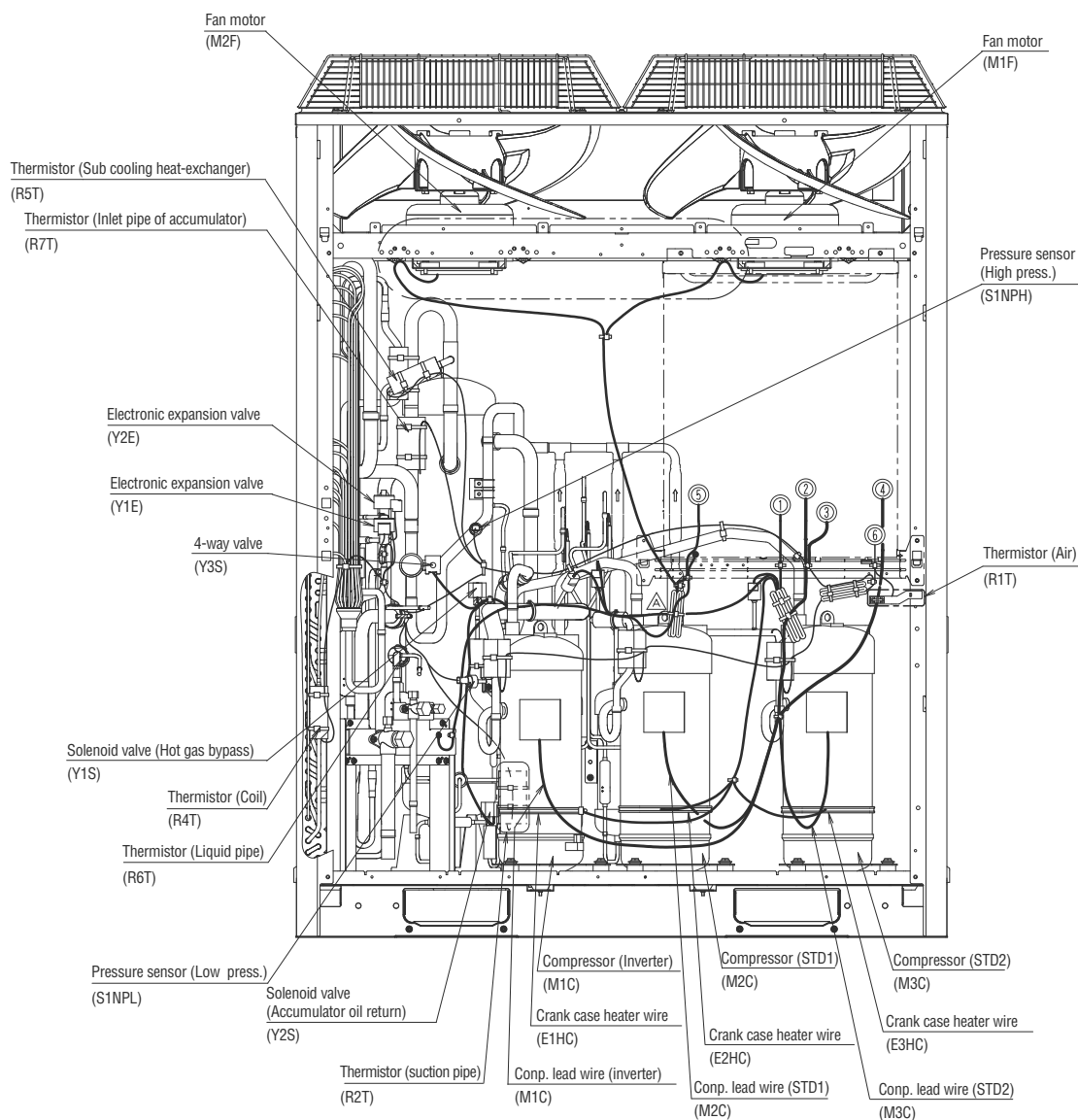


## 2.4 U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ

### Plan



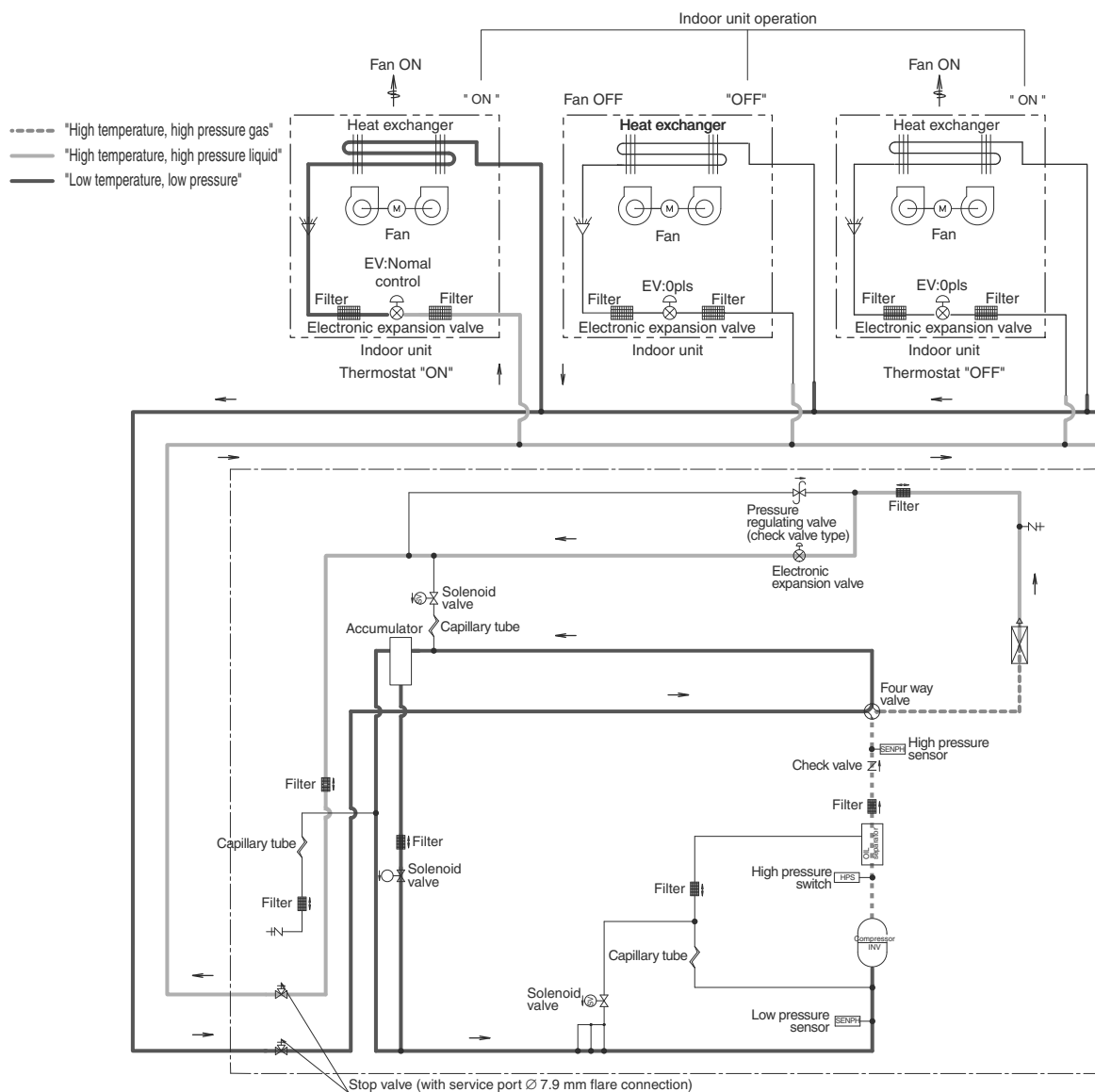
### Front View



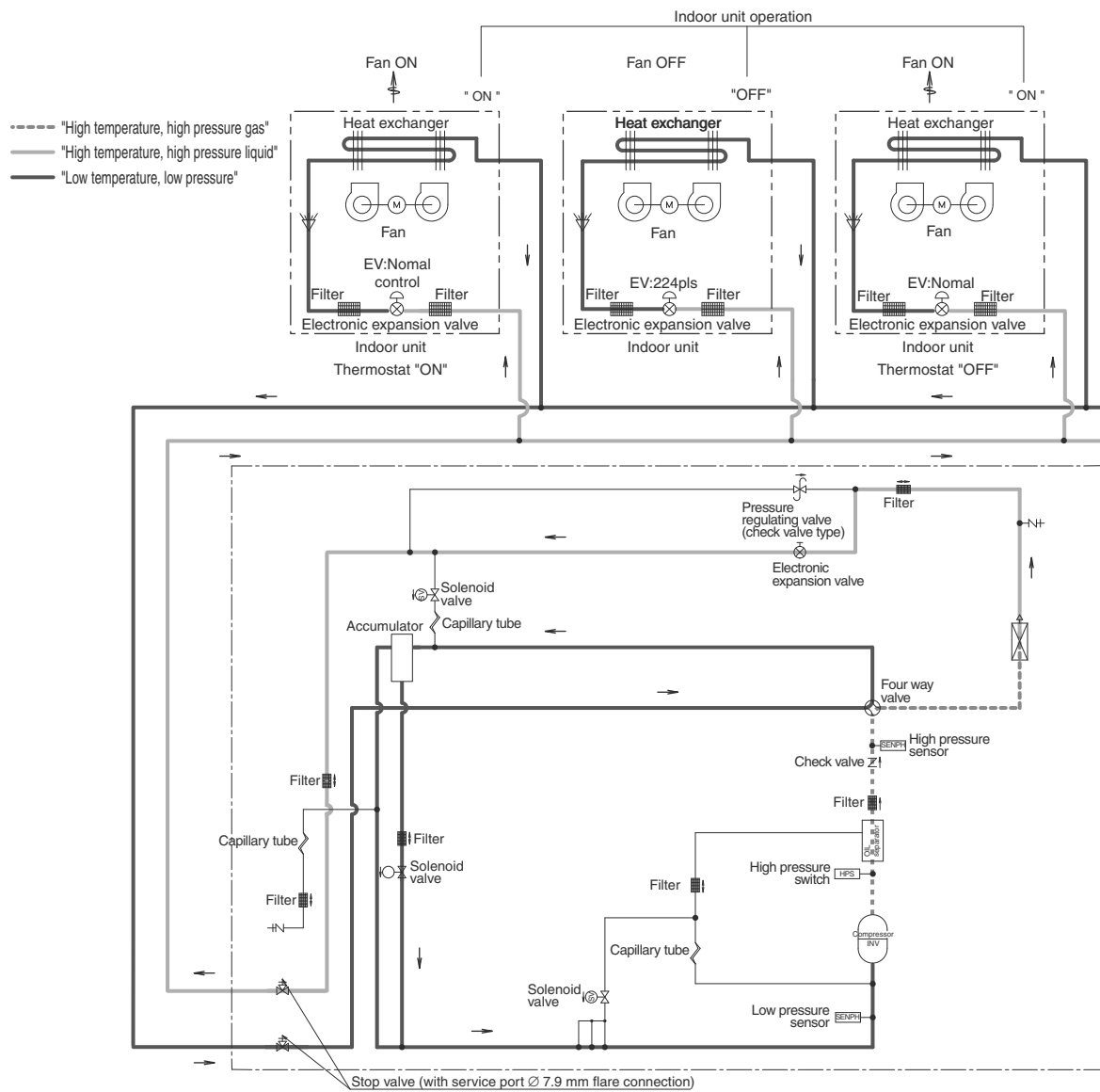
### 3. Refrigerant Flow for Each Operation Mode

U-5MX4XPQ

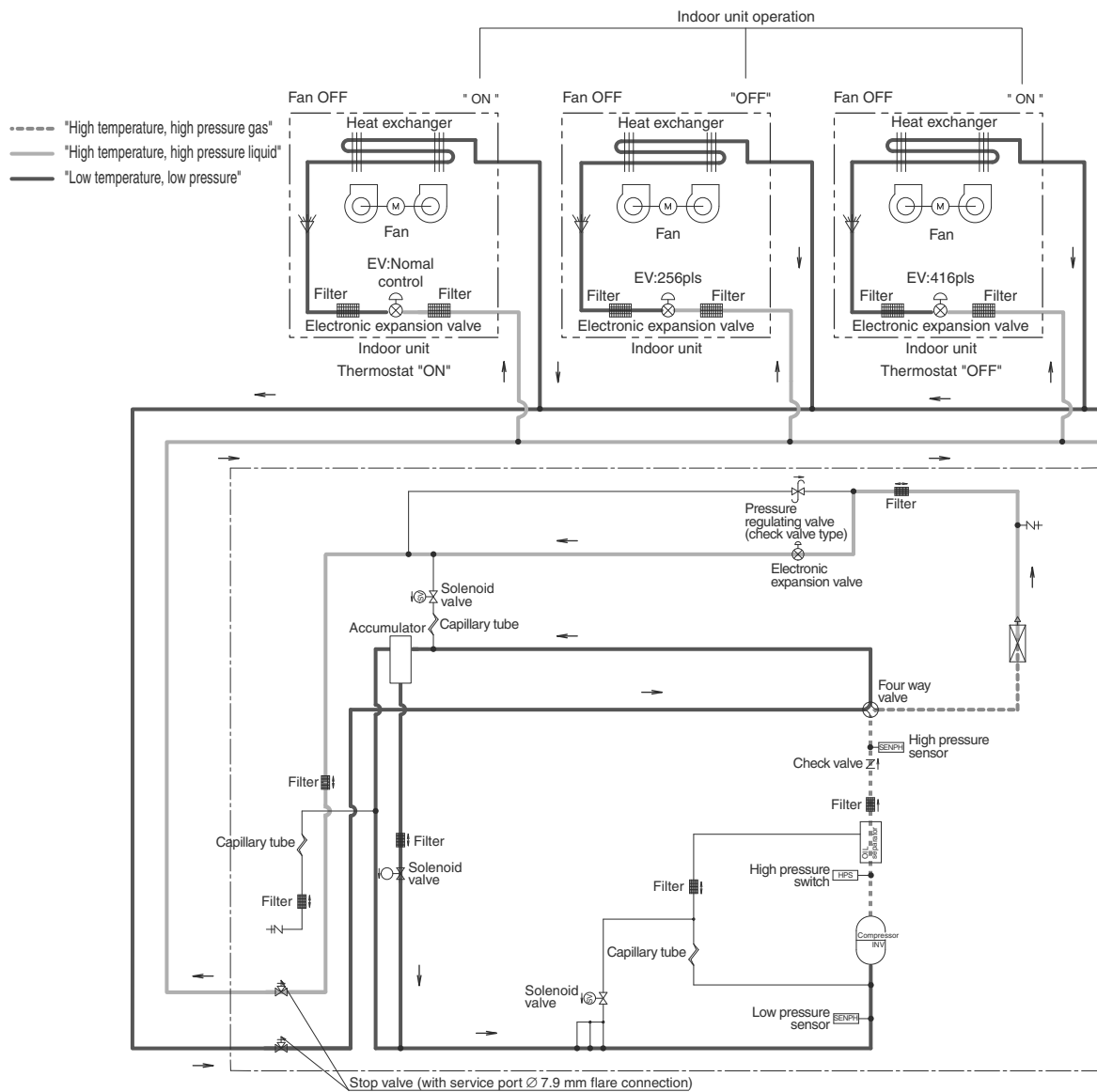
Cooling Operation



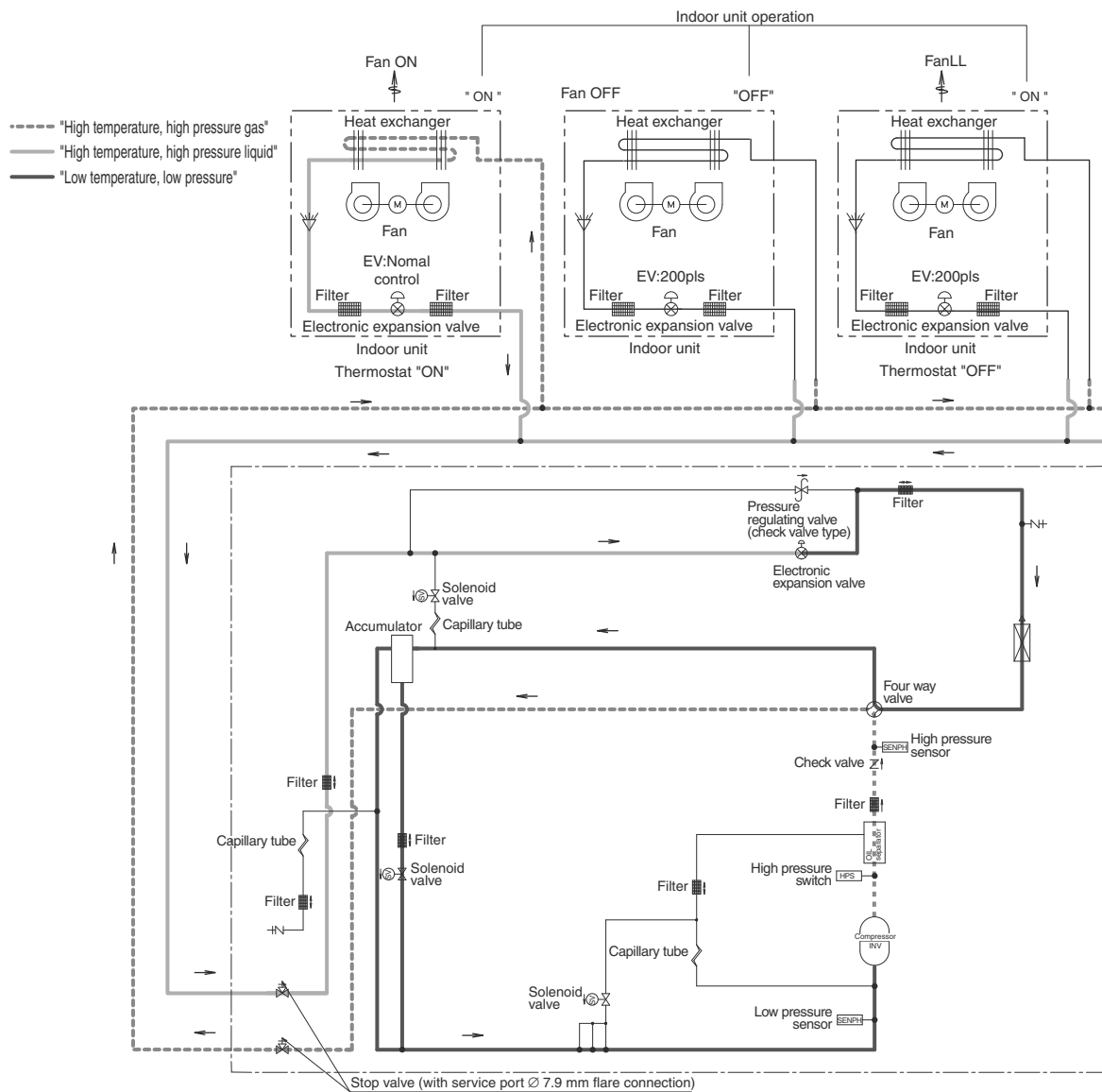
## Cooling Oil Return Operation



## Heating Oil Return &amp; Defrost Operation

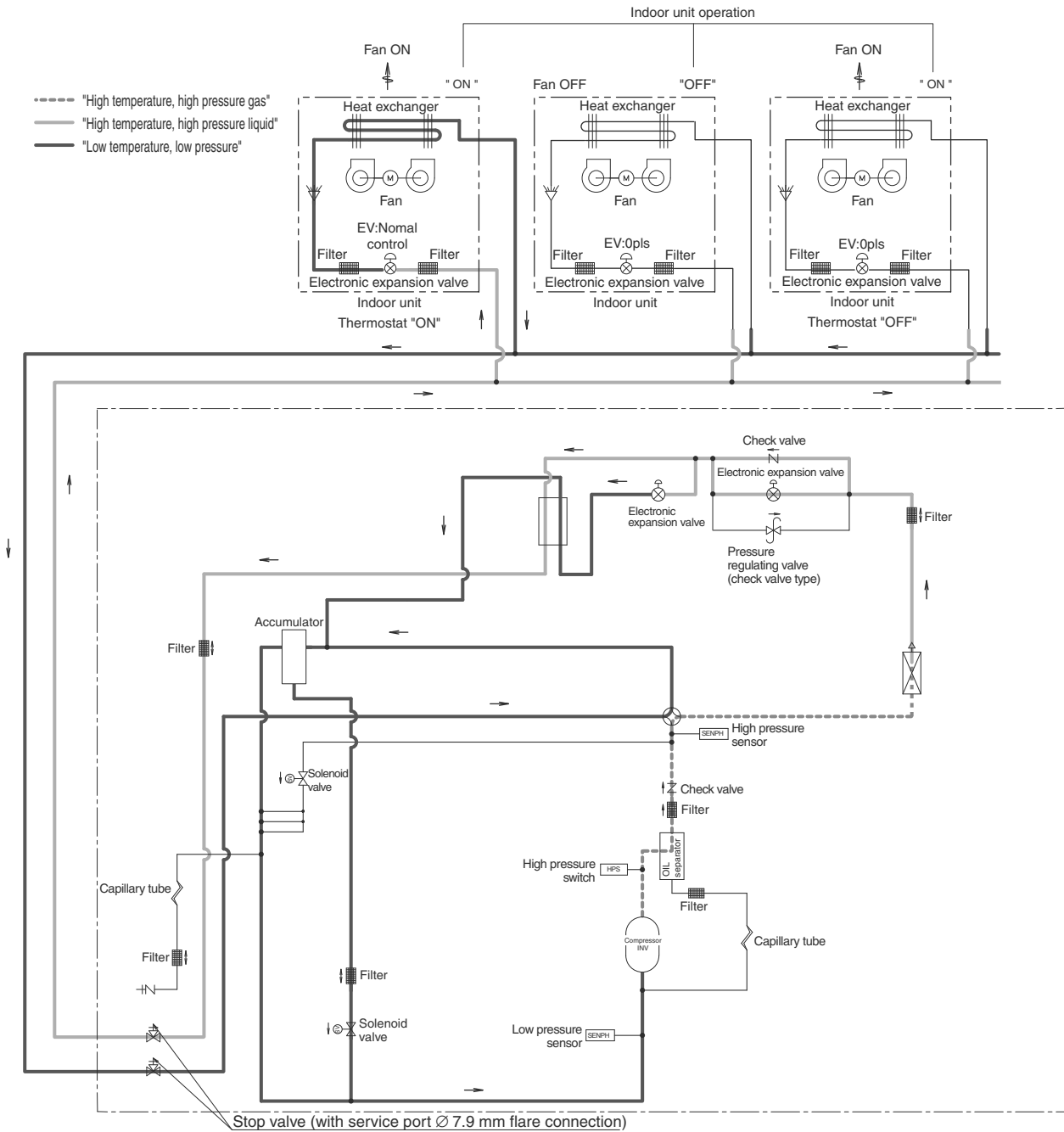


## Heating Operation

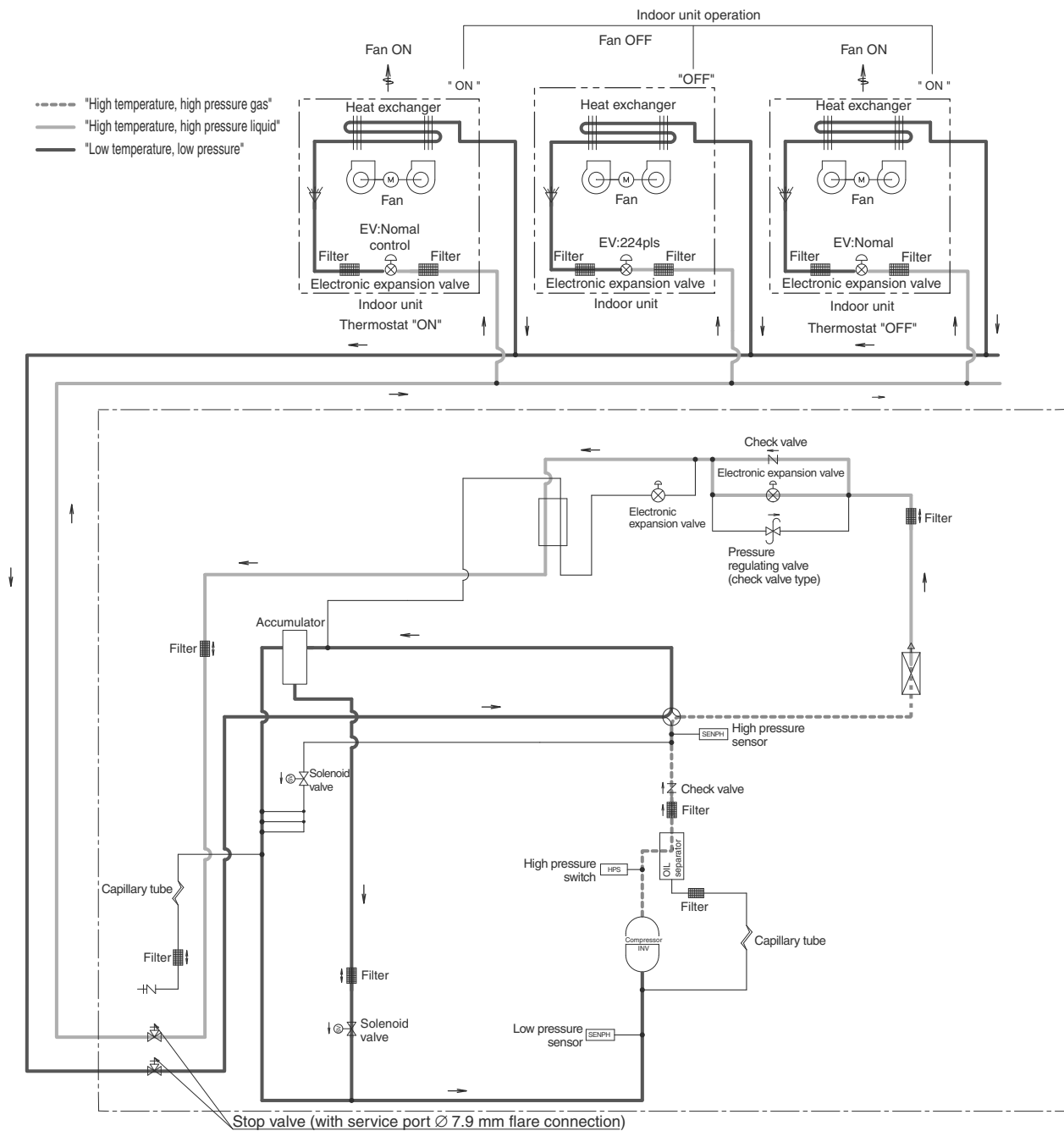


## U-8MX4XPQ

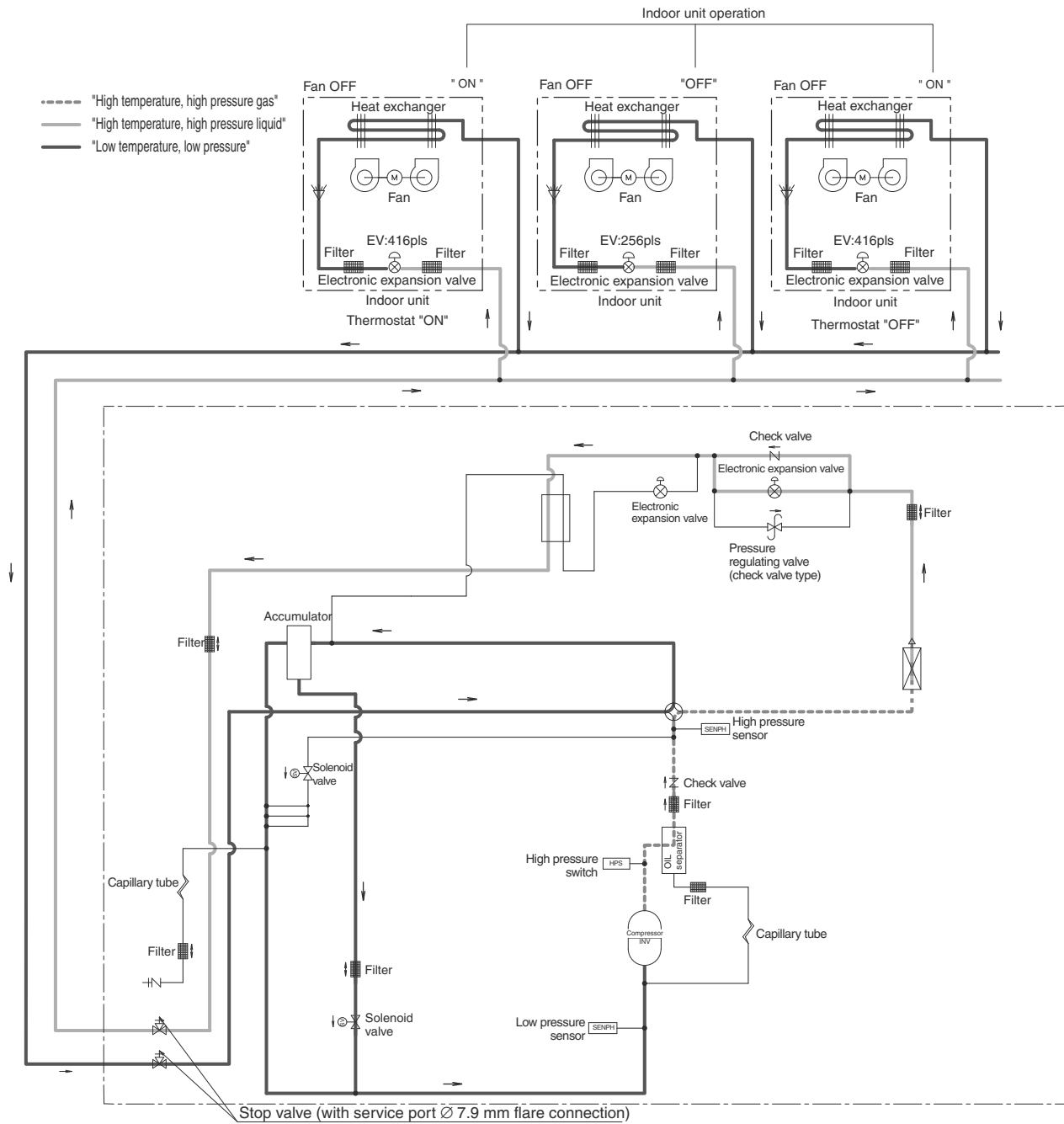
## Cooling Operation



## Cooling Oil Return

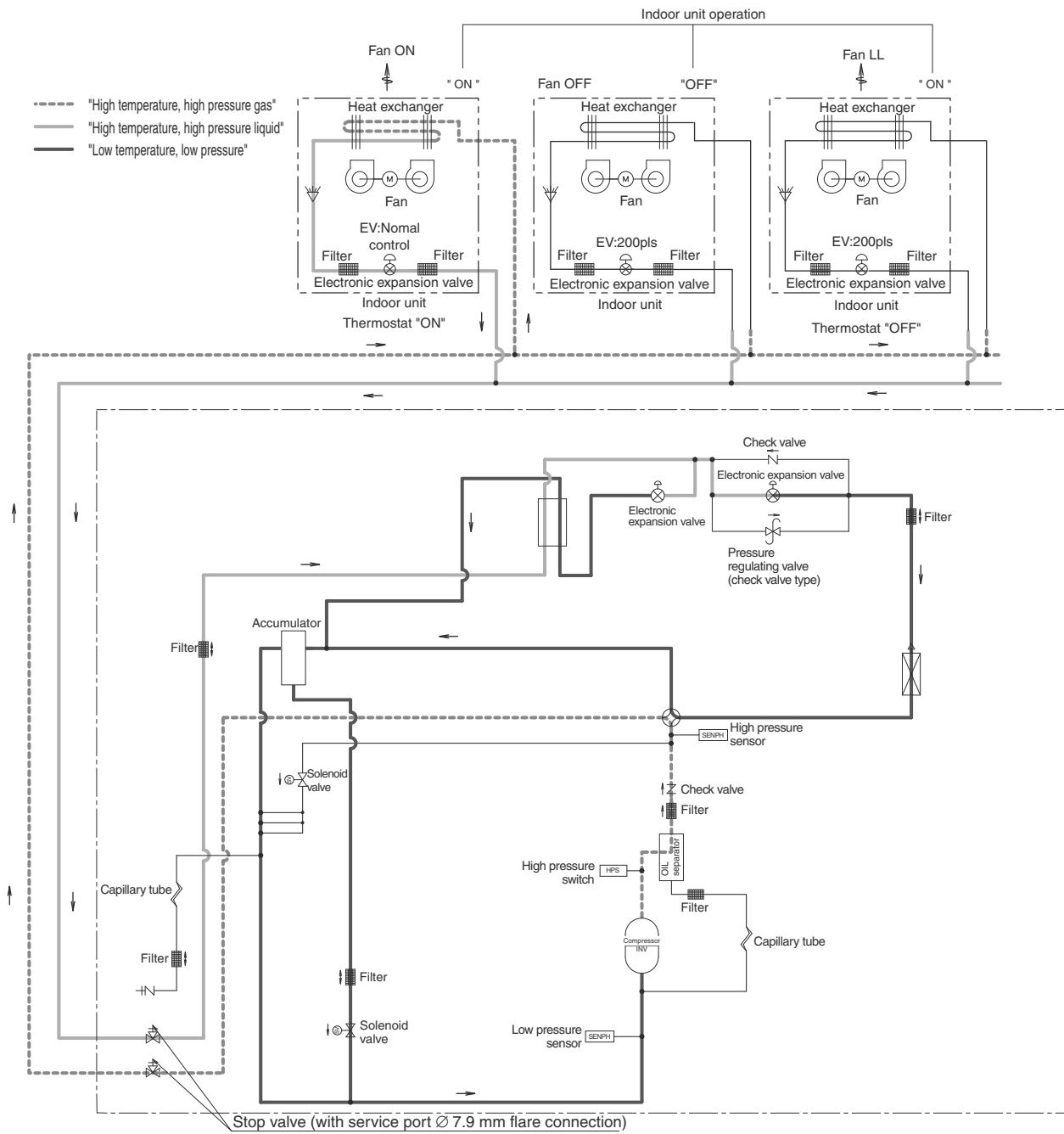


## Heating Oil Return &amp; Defrost



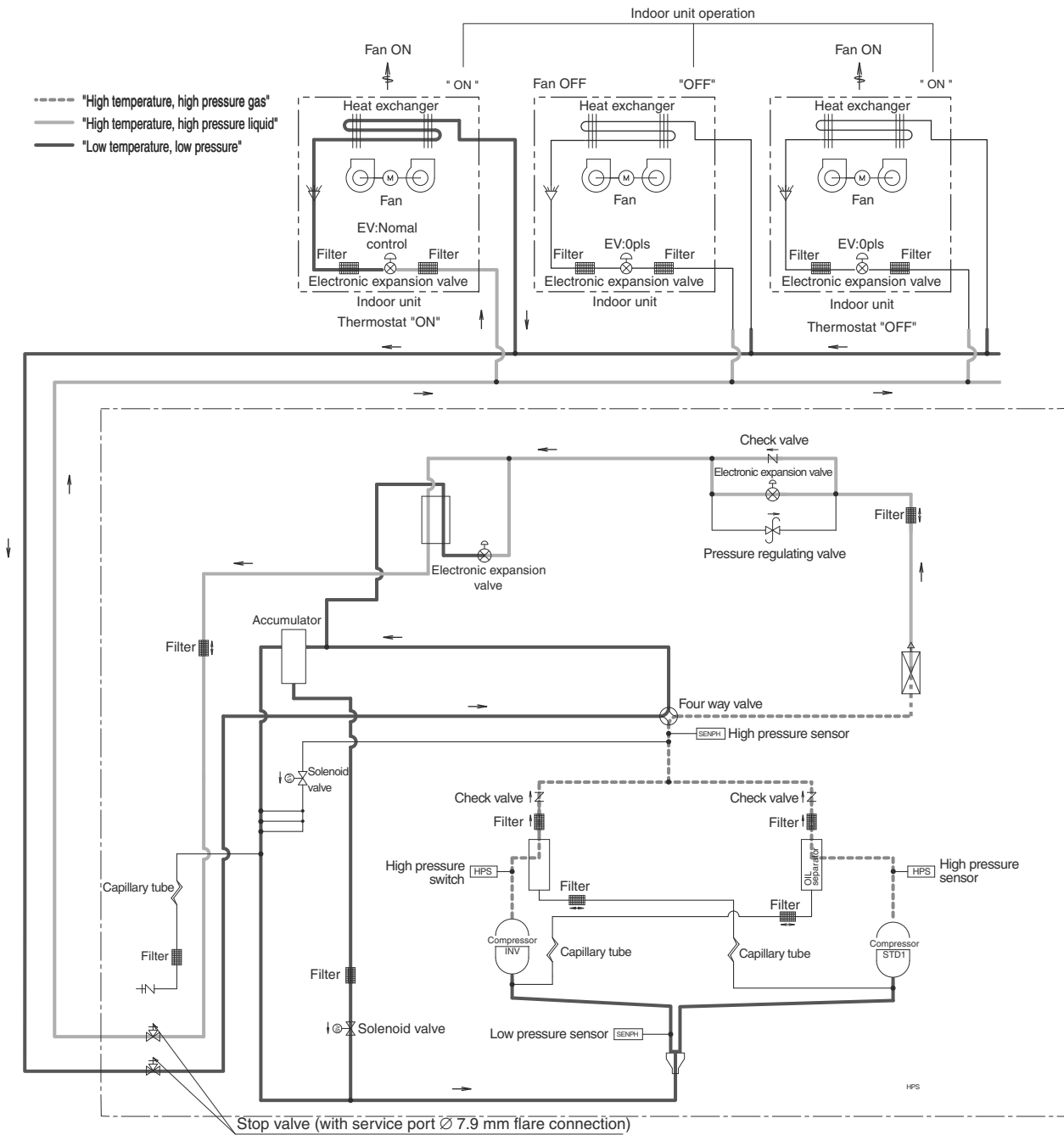


## Heating Operation

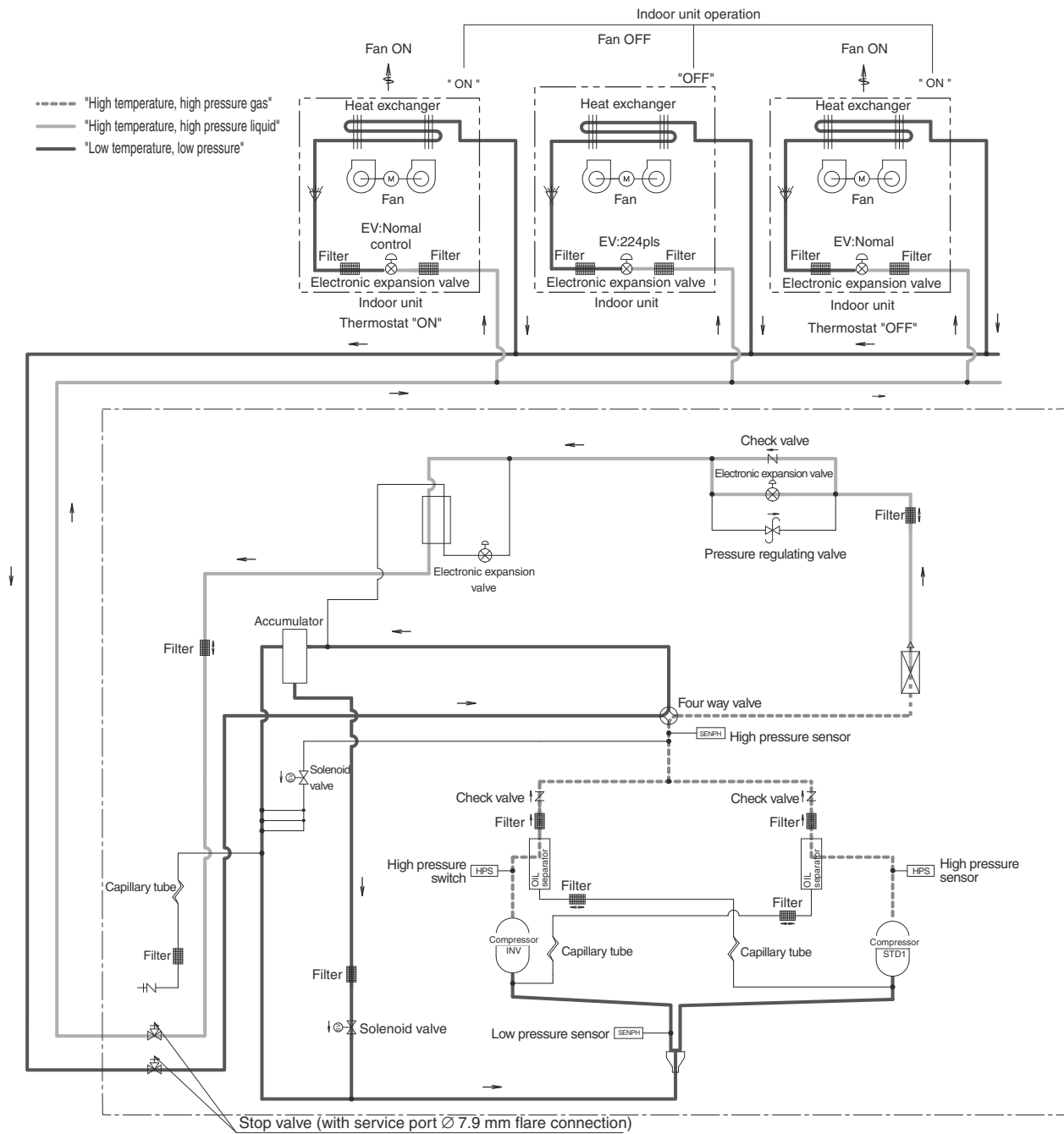


## U-10MX4XPQ, U-12MX4XPQ

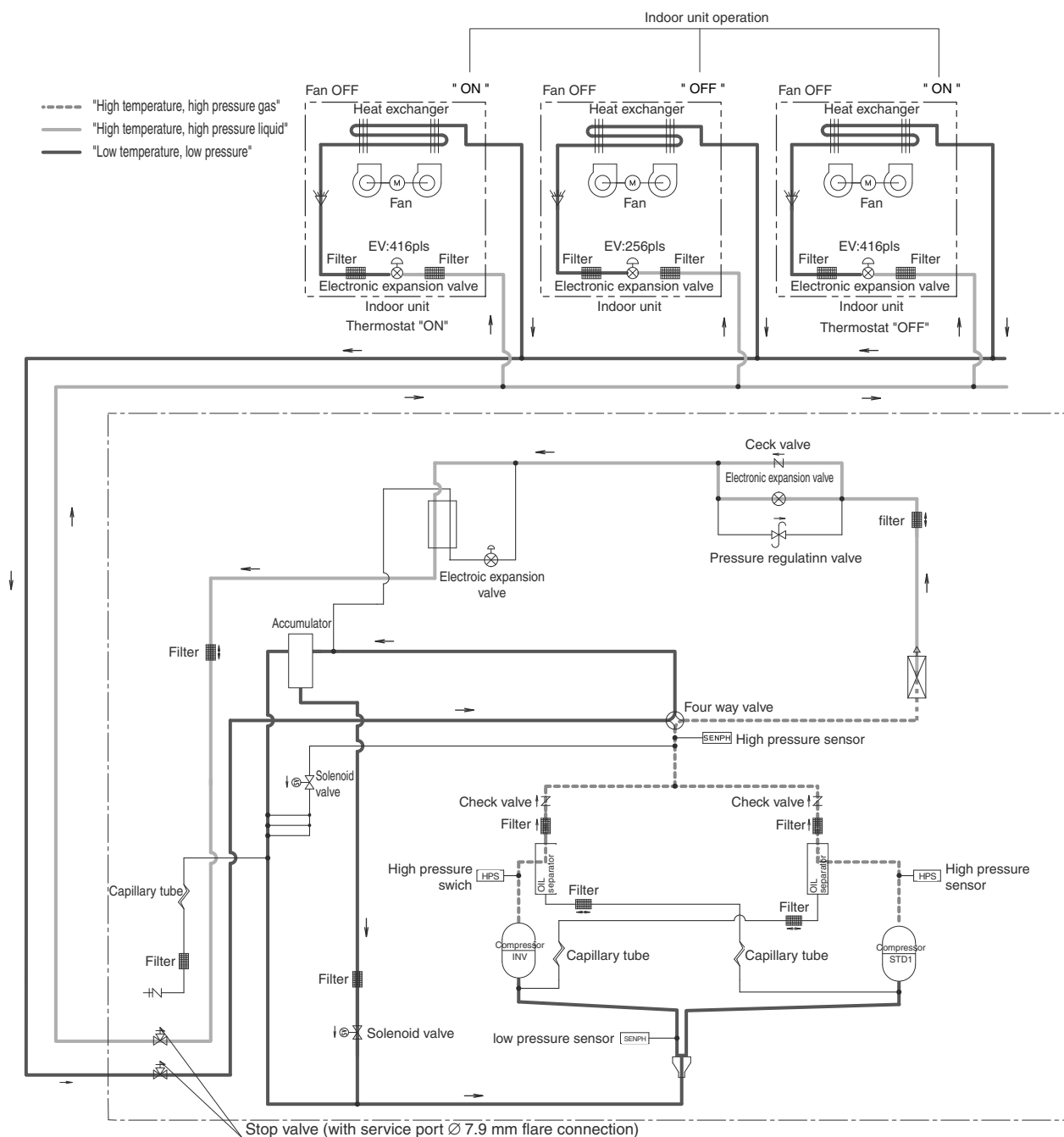
## Cooling Operation



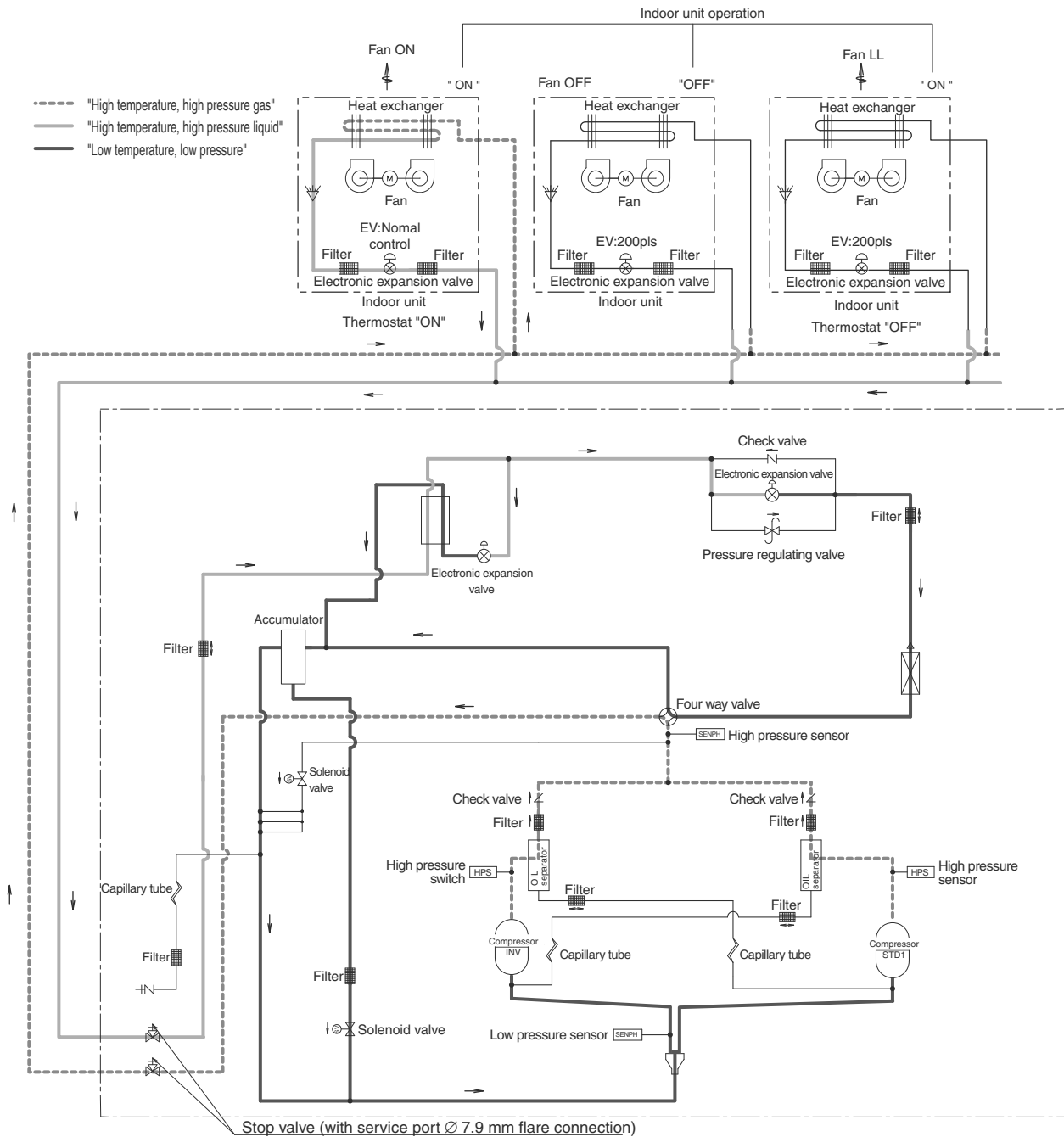
## Cooling Oil Return



## Heating Oil Return &amp; Defrost

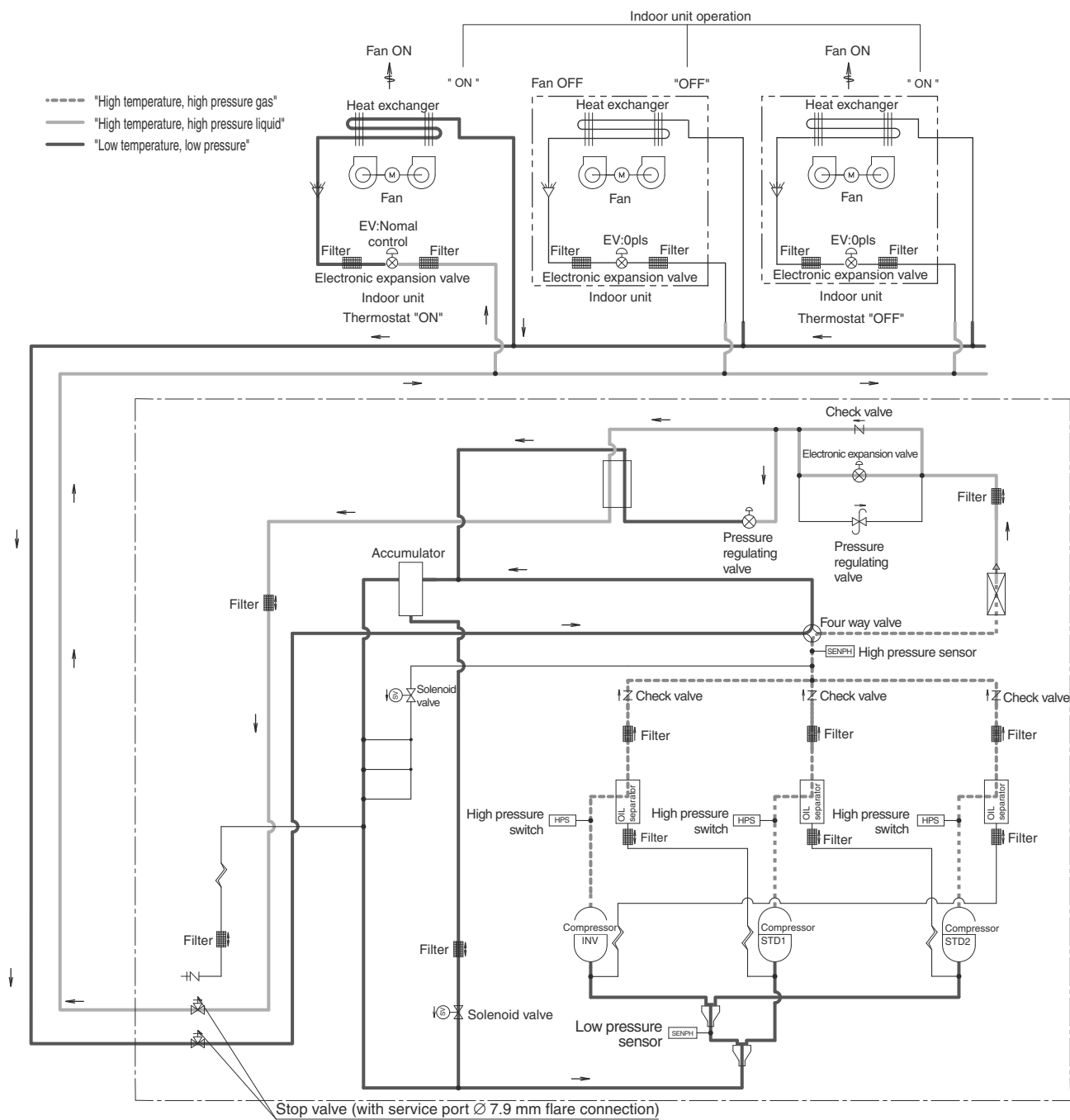


## Heating Operation

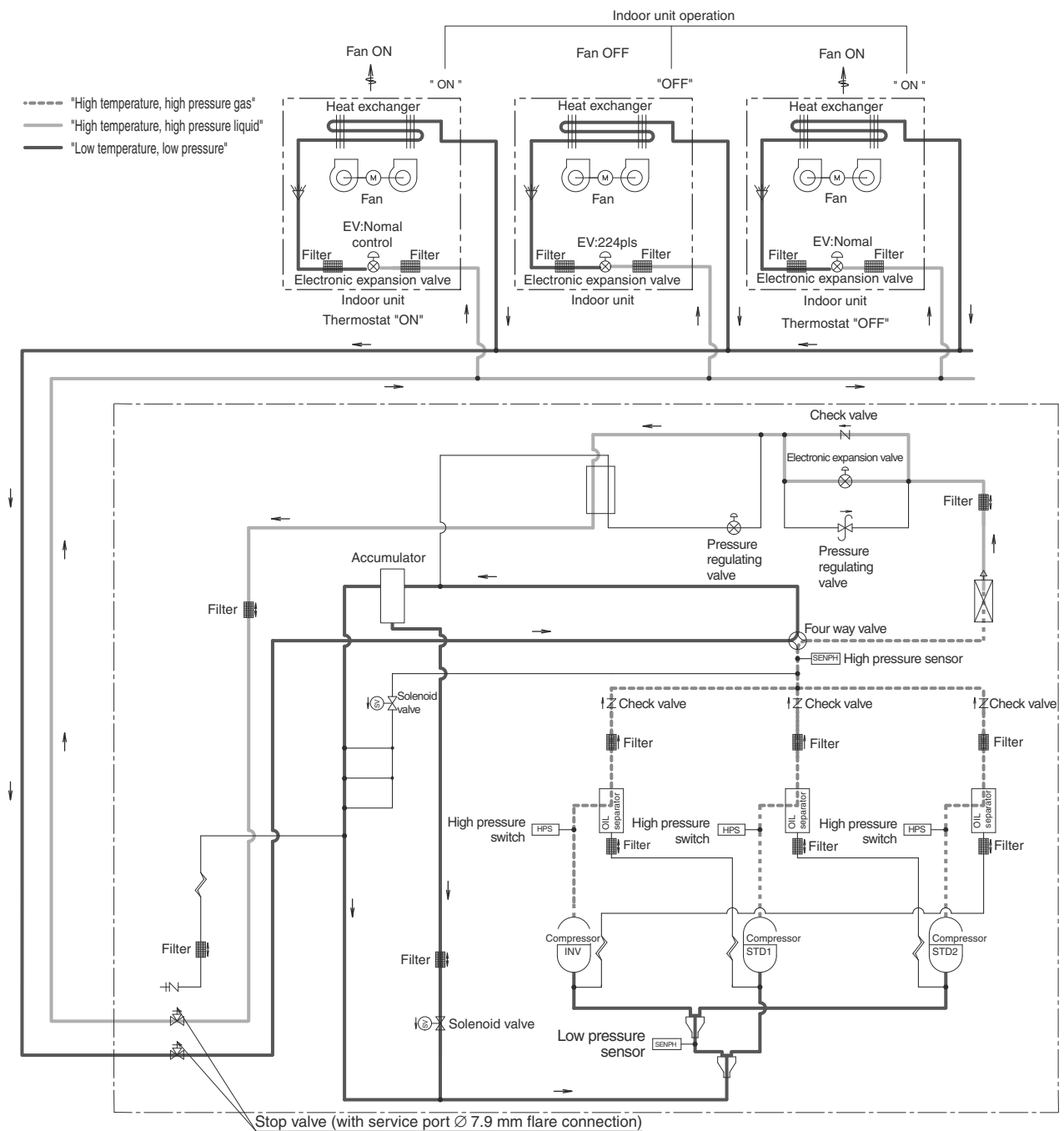


## U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ

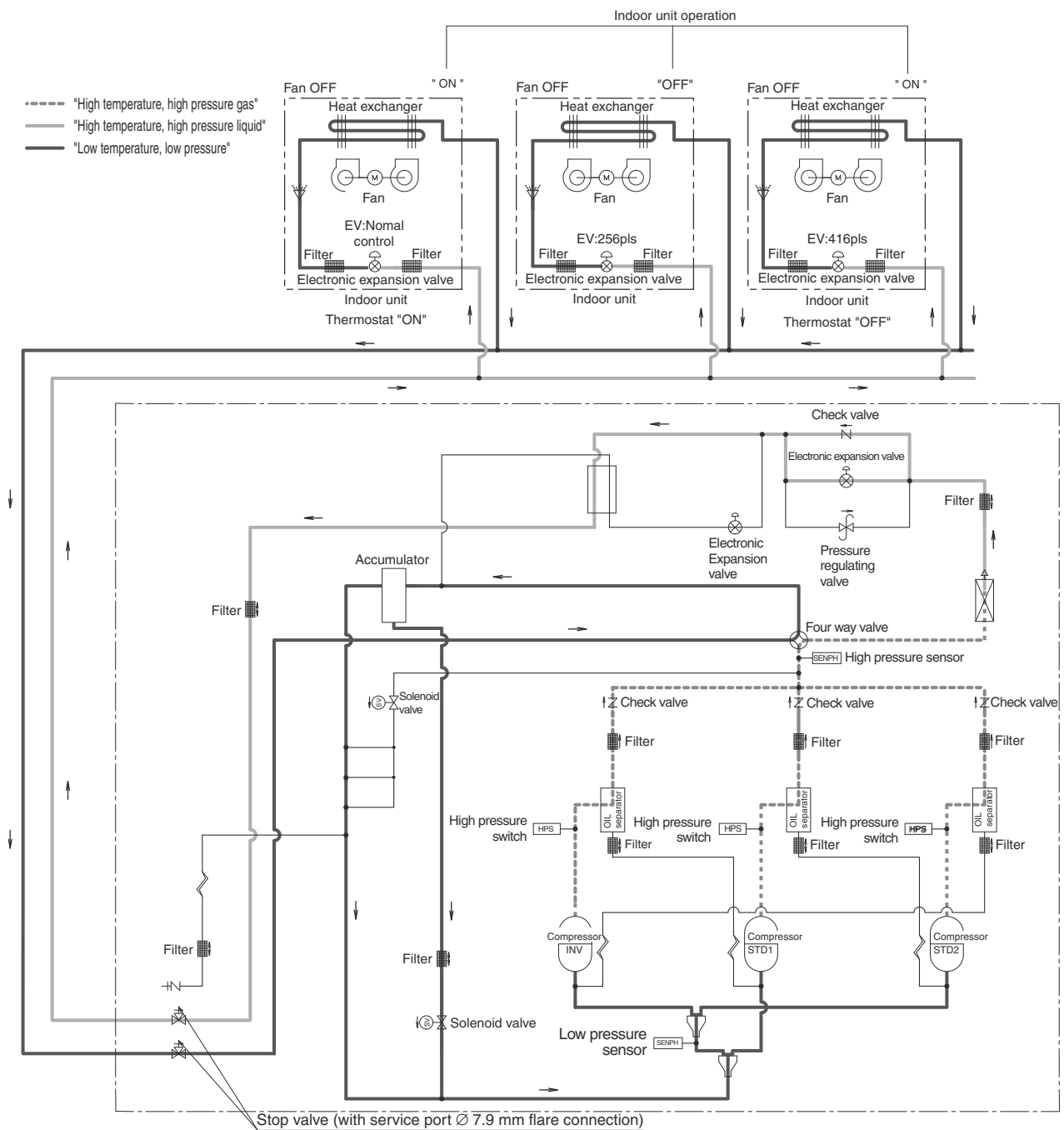
## Cooling Operation



## Cooling Oil Return Operation

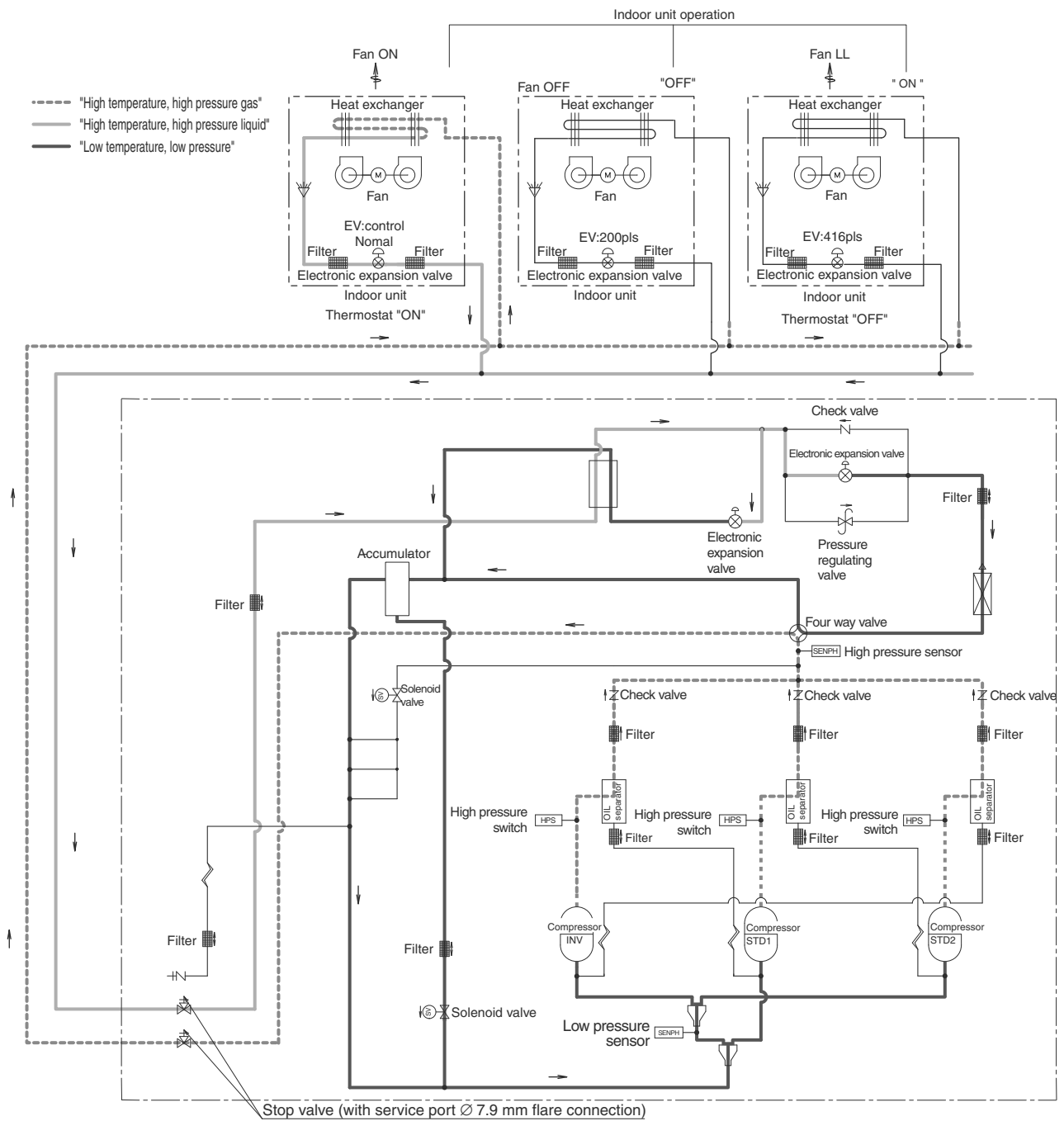


## Heating Oil Return &amp; Defrost Operation





## Heating Operation





# Part 4

## Function

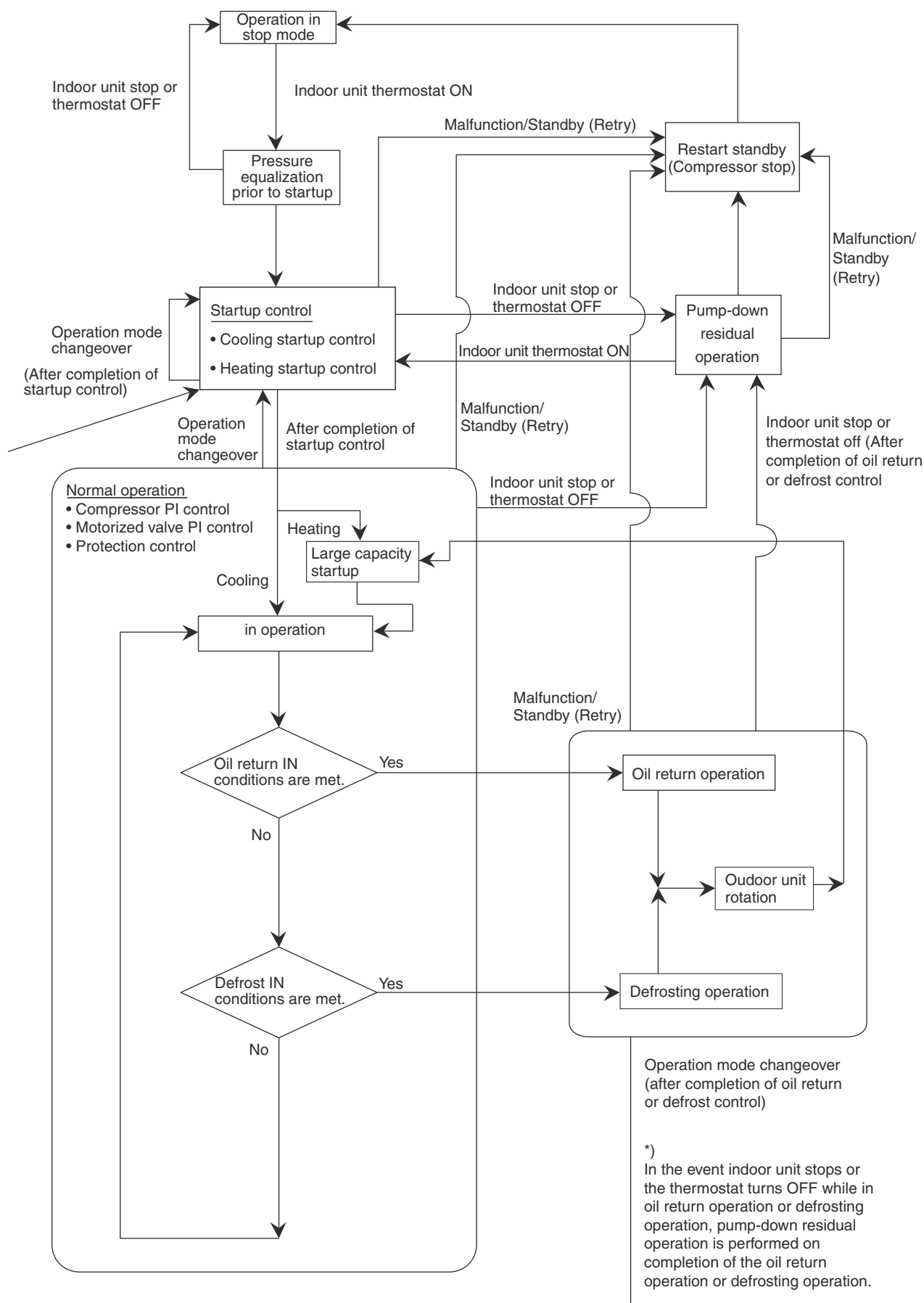
1. Function general .....	80
1.1 Symbol.....	80
1.2 Operation Mode.....	81
2. Basic Control.....	82
2.1 Normal Operation .....	82
2.2 Compressor PI Control .....	83
2.3 Electronic Expansion Valve PI Control.....	95
2.4 Step Control of Outdoor Unit Fans .....	95
2.5 Outdoor Unit Fan Control in Cooling Operation.....	96
3. Special Control.....	97
3.1 Startup Control .....	97
3.2 Large capacity start up control (Heating).....	98
3.3 Oil Return Operation.....	99
3.4 Defrosting Operation .....	101
3.5 Pump-down Residual Operation.....	102
3.6 Standby .....	103
3.7 Stopping Operation.....	104
4. Protection Control .....	106
4.1 High Pressure Protection Control.....	106
4.2 Low Pressure Protection Control.....	107
4.3 Discharge Pipe Protection Control .....	108
4.4 Inverter Protection Control.....	109
4.5 STD Compressor Overload Protection.....	110
4.6 Injection Control (only for U-5MX4XPQ).....	110
5. Other Control.....	111
5.1 Outdoor Unit Rotation.....	111
5.2 Emergency Operation.....	112
5.3 Demand Operation .....	116
5.4 Heating Operation Prohibition .....	116
6. Outline of Control (Indoor Unit) .....	117
6.1 Drain Pump Control.....	117
6.2 Louver Control for Preventing Ceiling Dirt.....	119
6.3 Thermostat Sensor in Remote Control.....	120
6.4 Thermostat Control While in Normal Operation.....	122
6.5 Thermostat Control in Dry Operation.....	122
6.6 Electronic expansion Valve Control.....	123
6.7 ..... Hot Start Control (In Heating Operation Only).....	123
6.8 Freeze Prevention .....	124
6.9 Heater Control .....	124
6.10 List of Swing Flap Operations.....	125

# 1. Function general

## 1.1 Symbol

Symbol	Electric symbol	Description or function
20S1	Y3S	Four way valve (Energize during heating)
DSH	–	Discharge pipe superheated degree
DSHi	–	Discharge pipe superheat of inverter compressor
DSHs	–	Discharge pipe superheat of standard compressor
EV	–	Opening of electronic expansion valve
EV1	Y1E	Electronic expansion valve for main heat exchanger
EV2	Y2E	Electronic expansion valve for sub-cooling heat exchanger
HTDi	–	Value of INV compressor discharge pipe temperature (R31T) compensated with outdoor air temperature
HTDs	–	Value of STD compressor discharge pipe temperature (R32T, R33T) compensated with outdoor air temperature
Pc	S1NPH	Value detected by high pressure sensor
Pe	S1NPL	Value detected by low pressure sensor
SH	–	Evaporator outlet superheat
SHS	–	Target evaporator outlet superheat
SVO	Y2S	Solenoid valve for oil return
SVP	Y1S	Solenoid valve for hot gas bypass
SVT	Y4S	Solenoid valve for injection
Ta	R1T (A1P)	Outdoor air temperature
Tb	R4T	Heat exchanger outlet temperature at cooling
Ts2	R2T	Suction pipe temperature detected with the suction pipe thermistor (R2T)
Tsh	R5T (–)	Temperature detected with the subcooling heat exchanger outlet thermistor (R5T)
Tc	–	High pressure equivalent saturation temperature
TcS	–	Target temperature of Tc
Te	–	Low pressure equivalent saturation temperature
TeS	–	Target temperature of Te
Tfin	R1T	Inverter fin temperature
TI	R6T	Liquid pipe temperature detected with the liquid pipe thermistor (R6T)
Tp	–	Calculated value of compressor port temperature
Ts1	R7T	Suction pipe temperature detected with the accumulator inlet thermistor

## 1.2 Operation Mode



## 2. Basic Control

### 2.1 Normal Operation

#### 2.1.1 List of Functions in Normal Operation

Part Name	Symbol	(Electric Symbol)	Function of Functional Part	
			Normal Cooling	Normal Heating
Compressor	—	(M1C, M2C)	PI control, High pressure protection, Low pressure protection, Td protection, INV protection,	PI control, High pressure protection, Low pressure protection, Td protection, INV protection,
Outdoor unit fan		(M1F)	Cooling fan control	Step 7 or 8
Four way valve	20S1	(Y1R)	OFF	ON
Main motorized valve	EV1	(Y1E)	480 pls	PI control
Subcool heat exchanger electronic expansion valve	EV2	(Y2E)	PI control	PI control
Hot gas bypass valve	SVP	(Y1S)	OFF	Energized when the system is set to low pressure control mode
Accumulator oil return valve	SV0	(Y2S)	ON	ON

Indoor unit actuator		Normal cooling	Normal heating
Fan	Thermostat ON unit	Remote control setting	Remote control setting
	Stopping unit	OFF	OFF
	Thermostat OFF unit	Remote control setting	LL
Electronic expansion valve	Thermostat ON unit	Normal opening *1	Normal opening *2
	Stopping unit	0 pls	200 pls
	Thermostat OFF unit	0 pls	200 pls

\*1. PI control : Evaporator outlet superheated degree (SH) constant.

\*2. PI control : Condenser outlet subcooled degree (SC) constant.

\*1 and 2 : Refer “6.6 Electronic expansion valve control” on page 123.

## 2.2 Compressor PI Control

### Compressor PI Control

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

#### [Cooling operation]

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

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

##### Te setting

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

Te : Low pressure equivalent saturation temperature (°C)

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

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

#### [Heating operation]

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

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

##### Tc setting

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

Tc : High pressure equivalent saturation temperature (°C)

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

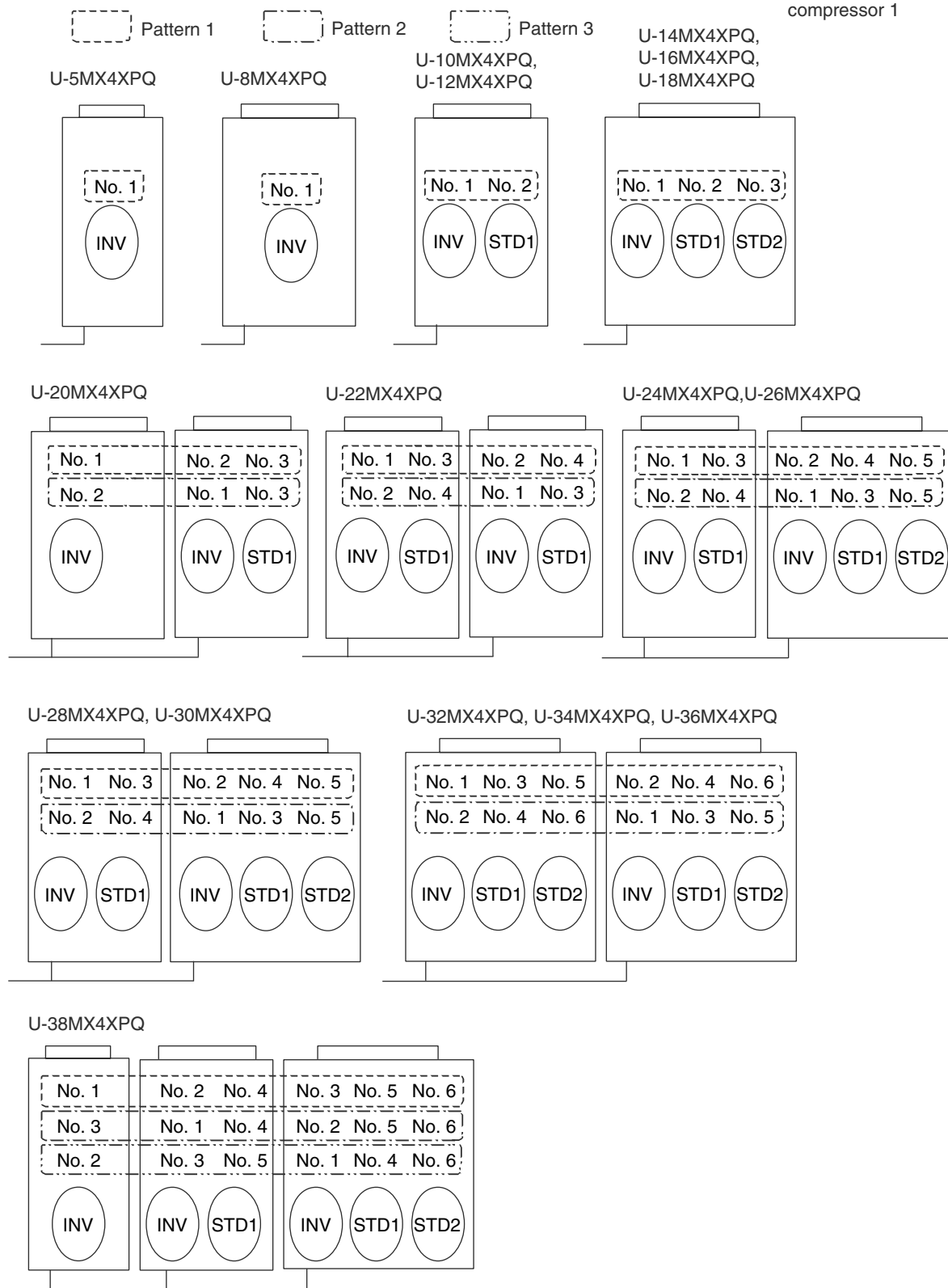
\*On multi-outdoor-unit systems, this control is made according to values of the first-priority unit, which is detected with the pressure sensor.

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

Each compressor operates in the following order of priority.

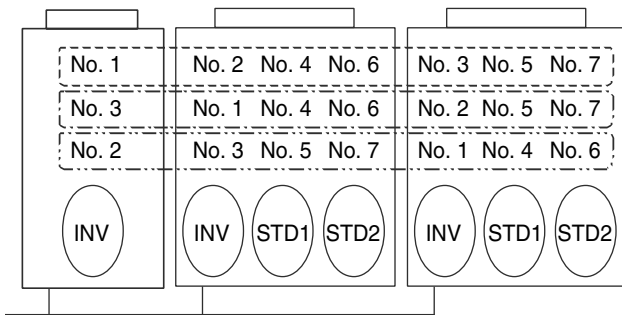
In the case of multi-outdoor-unit system, each compressor operates in any of Pattern 1 through Pattern 3 according to the rotation of outdoor units.

INV: Inverter compressor  
STD1: Standard compressor 1

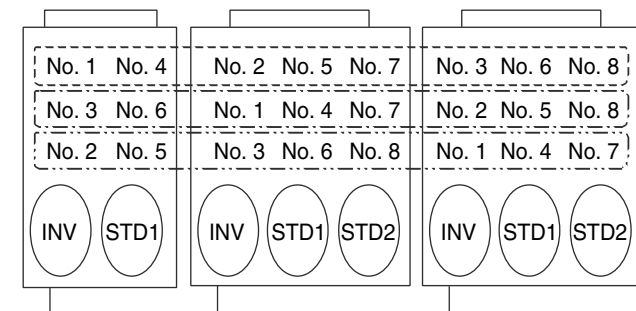




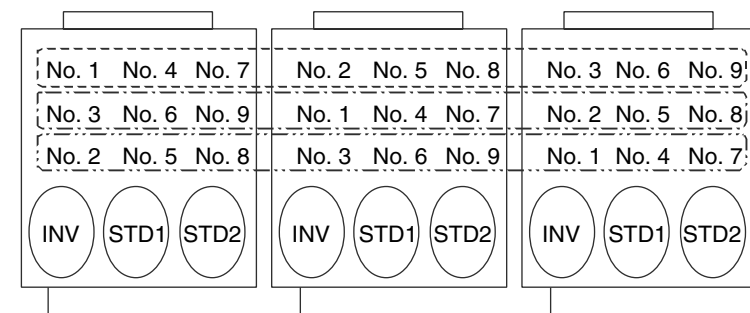
## U-40MX4XPQ, U-42MX4XPQ, U-44MX4XPQ



## U-46MX4XPQ, U-48MX4XPQ



## U-50MX4XPQ, U-52MX4XPQ, U-54MX4XPQ



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

- Compressor Step Control (Multi outdoor unit connection is available on the standard connection system)  
Compressor operations vary with the following steps according to information in "2.2 Compressor PI Control".  
Furthermore, the operating priority of compressors is subject to information in "■ Operating Priority and Rotation of Compressors".

### Stand-alone installation

#### U-5MX4XPQ

STEP No.	INV
1	52 Hz
2	56 Hz
3	62 Hz
4	68 Hz
5	74 Hz
6	80 Hz
7	88 Hz
8	96 Hz
9	104 Hz
10	110 Hz
11	116 Hz
12	124 Hz
13	132 Hz
14	144 Hz
15	158 Hz
16	166 Hz
17	176 Hz
18	188 Hz

#### U-8MX4XPQ

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

#### U-10MX4XPQ, U-12MX4XPQ

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

#### U-14MX4XPQ, U-16MX4XPQ

STEP No.	INV	STD1	STD2
1	52 Hz	OFF	OFF
2	56 Hz	OFF	OFF
3	62 Hz	OFF	OFF
4	68 Hz	OFF	OFF
5	74 Hz	OFF	OFF
6	80 Hz	OFF	OFF
7	88 Hz	OFF	OFF
8	96 Hz	OFF	OFF
9	104 Hz	OFF	OFF
10	110 Hz	OFF	OFF
11	116 Hz	OFF	OFF
12	124 Hz	OFF	OFF
13	132 Hz	OFF	OFF
14	144 Hz	OFF	OFF
15	158 Hz	OFF	OFF
16	166 Hz	OFF	OFF
17	176 Hz	OFF	OFF
18	188 Hz	OFF	OFF
19	202 Hz	OFF	OFF
20	210 Hz	OFF	OFF
21	52 Hz	ON	OFF
22	62 Hz	ON	OFF
23	68 Hz	ON	OFF
24	74 Hz	ON	OFF
25	80 Hz	ON	OFF
26	88 Hz	ON	OFF
27	96 Hz	ON	OFF
28	104 Hz	ON	OFF
29	116 Hz	ON	OFF
30	124 Hz	ON	OFF
31	132 Hz	ON	OFF
32	144 Hz	ON	OFF
33	158 Hz	ON	OFF
34	176 Hz	ON	OFF
35	188 Hz	ON	OFF
36	202 Hz	ON	OFF
37	210 Hz	ON	OFF
38	52 Hz	ON	ON
39	62 Hz	ON	ON
40	74 Hz	ON	ON
41	88 Hz	ON	ON
42	96 Hz	ON	ON
43	104 Hz	ON	ON
44	124 Hz	ON	ON
45	144 Hz	ON	ON
46	158 Hz	ON	ON
47	166 Hz	ON	ON
48	176 Hz	ON	ON
49	188 Hz	ON	ON
50	202 Hz	ON	ON
51	210 Hz	ON	ON

#### U-18MX4XPQ

STEP No.	INV	STD1	STD2
1	52 Hz	OFF	OFF
2	56 Hz	OFF	OFF
3	62 Hz	OFF	OFF
4	68 Hz	OFF	OFF
5	74 Hz	OFF	OFF
6	80 Hz	OFF	OFF
7	88 Hz	OFF	OFF
8	96 Hz	OFF	OFF
9	104 Hz	OFF	OFF
10	110 Hz	OFF	OFF
11	116 Hz	OFF	OFF
12	124 Hz	OFF	OFF
13	132 Hz	OFF	OFF
14	144 Hz	OFF	OFF
15	158 Hz	OFF	OFF
16	166 Hz	OFF	OFF
17	176 Hz	OFF	OFF
18	188 Hz	OFF	OFF
19	202 Hz	OFF	OFF
20	210 Hz	OFF	OFF
21	52 Hz	ON	OFF
22	62 Hz	ON	OFF
23	68 Hz	ON	OFF
24	74 Hz	ON	OFF
25	80 Hz	ON	OFF
26	88 Hz	ON	OFF
27	96 Hz	ON	OFF
28	104 Hz	ON	OFF
29	116 Hz	ON	OFF
30	124 Hz	ON	OFF
31	132 Hz	ON	OFF
32	144 Hz	ON	OFF
33	158 Hz	ON	OFF
34	176 Hz	ON	OFF
35	188 Hz	ON	OFF
36	202 Hz	ON	OFF
37	210 Hz	ON	OFF
38	52 Hz	ON	ON
39	62 Hz	ON	ON
40	74 Hz	ON	ON
41	88 Hz	ON	ON
42	96 Hz	ON	ON
43	104 Hz	ON	ON
44	124 Hz	ON	ON
45	144 Hz	ON	ON
46	158 Hz	ON	ON
47	166 Hz	ON	ON
48	176 Hz	ON	ON
49	188 Hz	ON	ON
50	202 Hz	ON	ON
51	210 Hz	ON	ON
52	218 Hz	ON	ON
53	232 Hz	ON	ON
54	248 Hz	ON	ON
55	266 Hz	ON	ON

### Notes:

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

**Two-unit multi system****U-20MX4XPQ (8+12HP)**

(To increase Step No.)

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

(To decrease Step No.)

STEP No.	Master unit INV	Slave unit INV	STD
1	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	OFF
3	62 Hz	62 Hz	OFF
4	68 Hz	68 Hz	OFF
5	74 Hz	74 Hz	OFF
6	80 Hz	80 Hz	OFF
7	88 Hz	88 Hz	OFF
8	96 Hz	96 Hz	OFF
9	104 Hz	104 Hz	OFF
10	52 Hz	52 Hz	OFF
11	56 Hz	56 Hz	OFF
12	62 Hz	62 Hz	OFF
13	66 Hz	66 Hz	OFF
14	70 Hz	70 Hz	OFF
15	74 Hz	74 Hz	OFF
16	80 Hz	80 Hz	OFF
17	88 Hz	88 Hz	OFF
18	92 Hz	96 Hz	OFF
19	96 Hz	96 Hz	OFF
20	104 Hz	104 Hz	OFF
21	110 Hz	110 Hz	OFF
22	116 Hz	116 Hz	OFF
23	124 Hz	124 Hz	OFF
24	132 Hz	132 Hz	OFF
25	52 Hz	52 Hz	ON
26	62 Hz	62 Hz	ON
27	68 Hz	68 Hz	ON
28	74 Hz	74 Hz	ON
29	80 Hz	80 Hz	ON
30	88 Hz	88 Hz	ON
31	96 Hz	96 Hz	ON
32	104 Hz	104 Hz	ON
33	116 Hz	116 Hz	ON
34	124 Hz	124 Hz	ON
35	132 Hz	132 Hz	ON
36	144 Hz	144 Hz	ON
37	158 Hz	158 Hz	ON
38	176 Hz	176 Hz	ON
39	188 Hz	188 Hz	ON
40	202 Hz	202 Hz	ON
41	210 Hz	210 Hz	ON
42	218 Hz	210 Hz	ON
43	232 Hz	210 Hz	ON
44	248 Hz	210 Hz	ON
45	266 Hz	210 Hz	ON

represents the range in which “Hz” is not stepped up.

**U-22MX4XPQ (10+12HP)**

(To increase Step No.)

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

(To decrease Step No.)

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

**Notes:**

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

■ represents the range in which “Hz” is not stepped up.

## U-24MX4XPQ (8+16HP)

(To increase Step No.)

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

(To decrease Step No.)

STEP No.	Master unit INV	Slave unit INV	STD
1	52 Hz	OFF	OFF
2	56 Hz	OFF	OFF
3	62 Hz	OFF	OFF
4	68 Hz	OFF	OFF
5	74 Hz	OFF	OFF
6	80 Hz	OFF	OFF
7	88 Hz	OFF	OFF
8	96 Hz	OFF	OFF
9	104 Hz	OFF	OFF
10	52 Hz	52 Hz	OFF
11	56 Hz	56 Hz	OFF
12	62 Hz	62 Hz	OFF
13	66 Hz	66 Hz	OFF
14	70 Hz	70 Hz	OFF
15	74 Hz	74 Hz	OFF
16	80 Hz	80 Hz	OFF
17	88 Hz	88 Hz	OFF
18	92 Hz	92 Hz	OFF
19	96 Hz	96 Hz	OFF
20	104 Hz	104 Hz	OFF
21	110 Hz	110 Hz	OFF
22	116 Hz	116 Hz	OFF
23	124 Hz	124 Hz	OFF
24	132 Hz	132 Hz	OFF
25	52 Hz	52 Hz	ON 1
26	62 Hz	62 Hz	ON 1
27	68 Hz	68 Hz	ON 1
28	74 Hz	74 Hz	ON 1
29	80 Hz	80 Hz	ON 1
30	88 Hz	88 Hz	ON 1
31	96 Hz	96 Hz	ON 1
32	104 Hz	104 Hz	ON 1
33	52 Hz	52 Hz	ON 2
34	62 Hz	62 Hz	ON 2
35	74 Hz	74 Hz	ON 2
36	88 Hz	88 Hz	ON 2
37	96 Hz	96 Hz	ON 2
38	104 Hz	104 Hz	ON 2
39	124 Hz	124 Hz	ON 2
40	144 Hz	144 Hz	ON 2
41	158 Hz	158 Hz	ON 2
42	166 Hz	166 Hz	ON 2
43	176 Hz	176 Hz	ON 2
44	188 Hz	188 Hz	ON 2
45	202 Hz	202 Hz	ON 2
46	210 Hz	210 Hz	ON 2
47	218 Hz	210 Hz	ON 2
48	232 Hz	210 Hz	ON 2
49	248 Hz	210 Hz	ON 2
50	266 Hz	210 Hz	ON 2

## U-26MX4XPQ (8+18HP)

(To increase Step No.)

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

(To decrease Step No.)

STEP No.	Master unit INV	Slave unit INV	STD
1	52 Hz	OFF	OFF
2	56 Hz	OFF	OFF
3	62 Hz	OFF	OFF
4	68 Hz	OFF	OFF
5	74 Hz	OFF	OFF
6	80 Hz	OFF	OFF
7	88 Hz	OFF	OFF
8	96 Hz	OFF	OFF
9	104 Hz	OFF	OFF
10	52 Hz	52 Hz	OFF
11	56 Hz	56 Hz	OFF
12	62 Hz	62 Hz	OFF
13	66 Hz	66 Hz	OFF
14	70 Hz	70 Hz	OFF
15	74 Hz	74 Hz	OFF
16	80 Hz	80 Hz	OFF
17	88 Hz	88 Hz	OFF
18	92 Hz	92 Hz	OFF
19	96 Hz	96 Hz	OFF
20	104 Hz	104 Hz	OFF
21	110 Hz	110 Hz	OFF
22	116 Hz	116 Hz	OFF
23	124 Hz	124 Hz	OFF
24	132 Hz	132 Hz	OFF
25	52 Hz	52 Hz	ON 1
26	62 Hz	62 Hz	ON 1
27	68 Hz	68 Hz	ON 1
28	74 Hz	74 Hz	ON 1
29	80 Hz	80 Hz	ON 1
30	88 Hz	88 Hz	ON 1
31	96 Hz	96 Hz	ON 1
32	104 Hz	104 Hz	ON 1
33	52 Hz	52 Hz	ON 2
34	62 Hz	62 Hz	ON 2
35	74 Hz	74 Hz	ON 2
36	88 Hz	88 Hz	ON 2
37	96 Hz	96 Hz	ON 2
38	104 Hz	104 Hz	ON 2
39	124 Hz	124 Hz	ON 2
40	144 Hz	144 Hz	ON 2
41	158 Hz	158 Hz	ON 2
42	166 Hz	166 Hz	ON 2
43	176 Hz	176 Hz	ON 2
44	188 Hz	188 Hz	ON 2
45	202 Hz	202 Hz	ON 2
46	210 Hz	210 Hz	ON 2
47	218 Hz	218 Hz	ON 2
48	232 Hz	232 Hz	ON 2
49	248 Hz	248 Hz	ON 2
50	266 Hz	266 Hz	ON 2

## Notes:

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

■ represents the range in which “Hz” is not stepped up.

## U-28MX4XPQ, U-30MX4XPQ (10/12+18HP)

## U-32MX4XPQ (16+16HP)

(To increase Step No.)				(To decrease Step No.)				(To increase Step No.)				(To decrease Step No.)			
STEP No.	Master unit INV	Slave unit INV	STD	STEP No.	Master unit INV	Slave unit INV	STD	STEP No.	Master unit INV	Slave unit INV	STD	STEP No.	Master unit INV	Slave unit INV	STD
1	52 Hz	52 Hz	OFF	1	52 Hz	OFF	OFF	1	52 Hz	52 Hz	OFF	1	52 Hz	OFF	OFF
2	56 Hz	56 Hz	OFF	2	56 Hz	OFF	OFF	2	56 Hz	56 Hz	OFF	2	56 Hz	OFF	OFF
3	62 Hz	62 Hz	OFF	3	62 Hz	OFF	OFF	3	62 Hz	62 Hz	OFF	3	62 Hz	OFF	OFF
4	66 Hz	66 Hz	OFF	4	68 Hz	OFF	OFF	4	66 Hz	66 Hz	OFF	4	68 Hz	OFF	OFF
5	70 Hz	70 Hz	OFF	5	74 Hz	OFF	OFF	5	70 Hz	70 Hz	OFF	5	74 Hz	OFF	OFF
6	74 Hz	74 Hz	OFF	6	80 Hz	OFF	OFF	6	74 Hz	74 Hz	OFF	6	80 Hz	OFF	OFF
7	80 Hz	80 Hz	OFF	7	88 Hz	OFF	OFF	7	80 Hz	80 Hz	OFF	7	88 Hz	OFF	OFF
8	88 Hz	88 Hz	OFF	8	96 Hz	OFF	OFF	8	88 Hz	88 Hz	OFF	8	96 Hz	OFF	OFF
9	96 Hz	96 Hz	OFF	9	104 Hz	OFF	OFF	9	96 Hz	96 Hz	OFF	9	104 Hz	OFF	OFF
10	104 Hz	104 Hz	OFF	10	52 Hz	52 Hz	OFF	10	104 Hz	104 Hz	OFF	10	52 Hz	52 Hz	OFF
11	110 Hz	110 Hz	OFF	11	56 Hz	56 Hz	OFF	11	110 Hz	110 Hz	OFF	11	56 Hz	56 Hz	OFF
12	116 Hz	116 Hz	OFF	12	62 Hz	62 Hz	OFF	12	116 Hz	116 Hz	OFF	12	62 Hz	62 Hz	OFF
13	124 Hz	124 Hz	OFF	13	66 Hz	66 Hz	OFF	13	124 Hz	124 Hz	OFF	13	66 Hz	66 Hz	OFF
14	132 Hz	132 Hz	OFF	14	70 Hz	70 Hz	OFF	14	132 Hz	132 Hz	OFF	14	70 Hz	70 Hz	OFF
15	144 Hz	144 Hz	OFF	15	74 Hz	74 Hz	OFF	15	144 Hz	144 Hz	OFF	15	74 Hz	74 Hz	OFF
16	158 Hz	158 Hz	OFF	16	80 Hz	80 Hz	OFF	16	158 Hz	158 Hz	OFF	16	80 Hz	80 Hz	OFF
17	166 Hz	166 Hz	OFF	17	88 Hz	88 Hz	OFF	17	166 Hz	166 Hz	OFF	17	88 Hz	88 Hz	OFF
18	176 Hz	176 Hz	OFF	18	92 Hz	92 Hz	OFF	18	176 Hz	176 Hz	OFF	18	92 Hz	92 Hz	OFF
19	80 Hz	80 Hz	ON 1	19	96 Hz	96 Hz	OFF	19	80 Hz	80 Hz	ON 1	19	96 Hz	96 Hz	OFF
20	88 Hz	88 Hz	ON 1	20	104 Hz	104 Hz	OFF	20	88 Hz	88 Hz	ON 1	20	104 Hz	104 Hz	OFF
21	96 Hz	96 Hz	ON 1	21	110 Hz	110 Hz	OFF	21	96 Hz	96 Hz	ON 1	21	110 Hz	110 Hz	OFF
22	104 Hz	104 Hz	ON 1	22	116 Hz	116 Hz	OFF	22	104 Hz	104 Hz	ON 1	22	116 Hz	116 Hz	OFF
23	116 Hz	116 Hz	ON 1	23	124 Hz	124 Hz	OFF	23	116 Hz	116 Hz	ON 1	23	124 Hz	124 Hz	OFF
24	124 Hz	124 Hz	ON 1	24	132 Hz	132 Hz	OFF	24	124 Hz	124 Hz	ON 1	24	132 Hz	132 Hz	OFF
25	132 Hz	132 Hz	ON 1	25	52 Hz	52 Hz	ON 1	25	132 Hz	132 Hz	ON 1	25	52 Hz	52 Hz	ON 1
26	88 Hz	88 Hz	ON 2	26	62 Hz	62 Hz	ON 1	26	88 Hz	88 Hz	ON 2	26	62 Hz	62 Hz	ON 1
27	96 Hz	96 Hz	ON 2	27	68 Hz	68 Hz	ON 1	27	96 Hz	96 Hz	ON 2	27	68 Hz	68 Hz	ON 1
28	104 Hz	104 Hz	ON 2	28	74 Hz	74 Hz	ON 1	28	104 Hz	104 Hz	ON 2	28	74 Hz	74 Hz	ON 1
29	124 Hz	124 Hz	ON 2	29	80 Hz	80 Hz	ON 1	29	124 Hz	124 Hz	ON 2	29	80 Hz	80 Hz	ON 1
30	144 Hz	144 Hz	ON 2	30	88 Hz	88 Hz	ON 1	30	144 Hz	144 Hz	ON 2	30	88 Hz	88 Hz	ON 1
31	92 Hz	92 Hz	ON 3	31	96 Hz	96 Hz	ON 1	31	92 Hz	96 Hz	ON 3	31	96 Hz	96 Hz	ON 1
32	104 Hz	104 Hz	ON 3	32	104 Hz	104 Hz	ON 1	32	104 Hz	104 Hz	ON 3	32	104 Hz	104 Hz	ON 1
33	116 Hz	116 Hz	ON 3	33	52 Hz	52 Hz	ON 2	33	116 Hz	116 Hz	ON 3	33	52 Hz	52 Hz	ON 2
34	124 Hz	124 Hz	ON 3	34	62 Hz	62 Hz	ON 2	34	124 Hz	124 Hz	ON 3	34	62 Hz	62 Hz	ON 2
35	144 Hz	144 Hz	ON 3	35	74 Hz	74 Hz	ON 2	35	144 Hz	144 Hz	ON 3	35	74 Hz	74 Hz	ON 2
36	158 Hz	158 Hz	ON 3	36	88 Hz	88 Hz	ON 2	36	158 Hz	158 Hz	ON 3	36	88 Hz	88 Hz	ON 2
37	166 Hz	166 Hz	ON 3	37	96 Hz	96 Hz	ON 2	37	166 Hz	166 Hz	ON 3	37	96 Hz	96 Hz	ON 2
38	176 Hz	176 Hz	ON 3	38	52 Hz	52 Hz	ON 3	38	176 Hz	176 Hz	ON 3	38	52 Hz	52 Hz	ON 3
39	188 Hz	188 Hz	ON 3	39	62 Hz	62 Hz	ON 3	39	188 Hz	188 Hz	ON 3	39	62 Hz	62 Hz	ON 3
40	202 Hz	202 Hz	ON 3	40	74 Hz	74 Hz	ON 3	40	202 Hz	202 Hz	ON 3	40	74 Hz	74 Hz	ON 3
41	210 Hz	210 Hz	ON 3	41	92 Hz	92 Hz	ON 3	41	210 Hz	210 Hz	ON 3	41	92 Hz	92 Hz	ON 3
42	210 Hz	218 Hz	ON 3	42	104 Hz	104 Hz	ON 3	42	210 Hz	218 Hz	ON 3	42	104 Hz	104 Hz	ON 3
43	210 Hz	232 Hz	ON 3	43	116 Hz	116 Hz	ON 3	43	210 Hz	232 Hz	ON 3	43	52 Hz	52 Hz	ON 4
44	210 Hz	248 Hz	ON 3	44	124 Hz	124 Hz	ON 3	44	210 Hz	248 Hz	ON 3	44	62 Hz	62 Hz	ON 4
45	210 Hz	266 Hz	ON 3	45	144 Hz	144 Hz	ON 3	45	210 Hz	266 Hz	ON 3	45	74 Hz	74 Hz	ON 4
				46	158 Hz	158 Hz	ON 3	46				46	96 Hz	96 Hz	ON 4
				47	166 Hz	166 Hz	ON 3					47	104 Hz	104 Hz	ON 4
				48	176 Hz	176 Hz	ON 3					48	116 Hz	116 Hz	ON 4
				49	188 Hz	188 Hz	ON 3					49	124 Hz	124 Hz	ON 4
				50	202 Hz	202 Hz	ON 3					50	144 Hz	144 Hz	ON 4
				51	210 Hz	210 Hz	ON 3					51	158 Hz	158 Hz	ON 4
				52	210 Hz	218 Hz	ON 3					52	166 Hz	166 Hz	ON 4
				53	210 Hz	232 Hz	ON 3					53	176 Hz	176 Hz	ON 4
				54	210 Hz	248 Hz	ON 3					54	188 Hz	188 Hz	ON 4
				55	210 Hz	266 Hz	ON 3					55	202 Hz	202 Hz	ON 4
												56	210 Hz	210 Hz	ON 4

**Notes:**

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

■ represents the range in which “Hz” is not stepped up.

## U-34MX4XPQ (16+18HP)

(To increase Step No.)

STEP No.	Master unit INV	Slave unit INV	STD
1	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	OFF
3	62 Hz	62 Hz	OFF
4	66 Hz	66 Hz	OFF
5	70 Hz	70 Hz	OFF
6	74 Hz	74 Hz	OFF
7	80 Hz	80 Hz	OFF
8	88 Hz	88 Hz	OFF
9	96 Hz	96 Hz	OFF
10	104 Hz	104 Hz	OFF
11	110 Hz	110 Hz	OFF
12	116 Hz	116 Hz	OFF
13	124 Hz	124 Hz	OFF
14	132 Hz	132 Hz	OFF
15	144 Hz	144 Hz	OFF
16	158 Hz	158 Hz	OFF
17	166 Hz	166 Hz	OFF
18	176 Hz	176 Hz	OFF
19	80 Hz	80 Hz	ON 1
20	88 Hz	88 Hz	ON 1
21	96 Hz	96 Hz	ON 1
22	104 Hz	104 Hz	ON 1
23	116 Hz	116 Hz	ON 1
24	124 Hz	124 Hz	ON 1
25	132 Hz	132 Hz	ON 1
26	88 Hz	88 Hz	ON 2
27	96 Hz	96 Hz	ON 2
28	104 Hz	104 Hz	ON 2
29	124 Hz	124 Hz	ON 2
30	144 Hz	144 Hz	ON 2
31	92 Hz	96 Hz	ON 3
32	104 Hz	104 Hz	ON 3
33	116 Hz	116 Hz	ON 3
34	124 Hz	124 Hz	ON 3
35	144 Hz	144 Hz	ON 3
36	96 Hz	96 Hz	ON 4
37	104 Hz	104 Hz	ON 4
38	116 Hz	116 Hz	ON 4
39	124 Hz	124 Hz	ON 4
40	144 Hz	144 Hz	ON 4
41	158 Hz	158 Hz	ON 4
42	166 Hz	166 Hz	ON 4
43	176 Hz	176 Hz	ON 4
44	188 Hz	188 Hz	ON 4
45	202 Hz	202 Hz	ON 4
46	210 Hz	210 Hz	ON 4
47	210 Hz	218 Hz	ON 4
48	210 Hz	232 Hz	ON 4
49	210 Hz	248 Hz	ON 4
50	210 Hz	266 Hz	ON 4

(To decrease Step No.)

STEP No.	Master unit INV	Slave unit INV	STD
1	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	OFF
3	62 Hz	62 Hz	OFF
4	68 Hz	68 Hz	OFF
5	74 Hz	74 Hz	OFF
6	80 Hz	80 Hz	OFF
7	88 Hz	88 Hz	OFF
8	96 Hz	96 Hz	OFF
9	104 Hz	104 Hz	OFF
10	52 Hz	52 Hz	OFF
11	56 Hz	56 Hz	OFF
12	62 Hz	62 Hz	OFF
13	66 Hz	66 Hz	OFF
14	70 Hz	70 Hz	OFF
15	74 Hz	74 Hz	OFF
16	80 Hz	80 Hz	OFF
17	88 Hz	88 Hz	OFF
18	92 Hz	92 Hz	OFF
19	96 Hz	96 Hz	OFF
20	104 Hz	104 Hz	OFF
21	110 Hz	110 Hz	OFF
22	116 Hz	116 Hz	OFF
23	124 Hz	124 Hz	OFF
24	132 Hz	132 Hz	OFF
25	52 Hz	52 Hz	ON 1
26	62 Hz	62 Hz	ON 1
27	68 Hz	68 Hz	ON 1
28	74 Hz	74 Hz	ON 1
29	80 Hz	80 Hz	ON 1
30	88 Hz	88 Hz	ON 1
31	96 Hz	96 Hz	ON 1
32	104 Hz	104 Hz	ON 1
33	52 Hz	52 Hz	ON 2
34	62 Hz	62 Hz	ON 2
35	74 Hz	74 Hz	ON 2
36	88 Hz	88 Hz	ON 2
37	96 Hz	96 Hz	ON 2
38	52 Hz	52 Hz	ON 3
39	62 Hz	62 Hz	ON 3
40	74 Hz	74 Hz	ON 3
41	92 Hz	92 Hz	ON 3
42	104 Hz	104 Hz	ON 3
43	52 Hz	52 Hz	ON 4
44	62 Hz	62 Hz	ON 4
45	74 Hz	74 Hz	ON 4
46	96 Hz	96 Hz	ON 4
47	104 Hz	104 Hz	ON 4
48	116 Hz	116 Hz	ON 4
49	124 Hz	124 Hz	ON 4
50	144 Hz	144 Hz	ON 4
51	158 Hz	158 Hz	ON 4
52	166 Hz	166 Hz	ON 4
53	176 Hz	176 Hz	ON 4
54	188 Hz	188 Hz	ON 4
55	202 Hz	202 Hz	ON 4
56	210 Hz	210 Hz	ON 4
57	210 Hz	218 Hz	ON 4
58	210 Hz	232 Hz	ON 4
59	210 Hz	248 Hz	ON 4
60	210 Hz	266 Hz	ON 4

## U-36MX4XPQ (18+18HP)

(To increase Step No.)

STEP No.	Master unit INV	Slave unit INV	STD
1	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	OFF
3	62 Hz	62 Hz	OFF
4	66 Hz	66 Hz	OFF
5	70 Hz	70 Hz	OFF
6	74 Hz	74 Hz	OFF
7	80 Hz	80 Hz	OFF
8	88 Hz	88 Hz	OFF
9	96 Hz	96 Hz	OFF
10	104 Hz	104 Hz	OFF
11	110 Hz	110 Hz	OFF
12	116 Hz	116 Hz	OFF
13	124 Hz	124 Hz	OFF
14	132 Hz	132 Hz	OFF
15	144 Hz	144 Hz	OFF
16	158 Hz	158 Hz	OFF
17	166 Hz	166 Hz	OFF
18	176 Hz	176 Hz	OFF
19	80 Hz	80 Hz	ON 1
20	88 Hz	88 Hz	ON 1
21	96 Hz	96 Hz	ON 1
22	104 Hz	104 Hz	ON 1
23	116 Hz	116 Hz	ON 1
24	124 Hz	124 Hz	ON 1
25	132 Hz	132 Hz	ON 1
26	88 Hz	88 Hz	ON 2
27	96 Hz	96 Hz	ON 2
28	104 Hz	104 Hz	ON 2
29	124 Hz	124 Hz	ON 2
30	144 Hz	144 Hz	ON 2
31	92 Hz	96 Hz	ON 3
32	104 Hz	104 Hz	ON 3
33	116 Hz	116 Hz	ON 3
34	124 Hz	124 Hz	ON 3
35	144 Hz	144 Hz	ON 3
36	96 Hz	96 Hz	ON 4
37	104 Hz	104 Hz	ON 4
38	116 Hz	116 Hz	ON 4
39	124 Hz	124 Hz	ON 4
40	144 Hz	144 Hz	ON 4
41	158 Hz	158 Hz	ON 4
42	166 Hz	166 Hz	ON 4
43	176 Hz	176 Hz	ON 4
44	188 Hz	188 Hz	ON 4
45	202 Hz	202 Hz	ON 4
46	210 Hz	210 Hz	ON 4
47	218 Hz	218 Hz	ON 4
48	232 Hz	232 Hz	ON 4
49	248 Hz	248 Hz	ON 4
50	266 Hz	266 Hz	ON 4

(To decrease Step No.)

STEP No.	Master unit INV	Slave unit INV	STD
1	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	OFF
3	62 Hz	62 Hz	OFF
4	68 Hz	68 Hz	OFF
5	74 Hz	74 Hz	OFF
6	80 Hz	80 Hz	OFF
7	88 Hz	88 Hz	OFF
8	96 Hz	96 Hz	OFF
9	104 Hz	104 Hz	OFF
10	52 Hz	52 Hz	OFF
11	56 Hz	56 Hz	OFF
12	62 Hz	62 Hz	OFF
13	66 Hz	66 Hz	OFF
14	70 Hz	70 Hz	OFF
15	74 Hz	74 Hz	OFF
16	80 Hz	80 Hz	OFF
17	88 Hz	88 Hz	OFF
18	92 Hz	92 Hz	OFF
19	96 Hz	96 Hz	OFF
20	104 Hz	104 Hz	OFF
21	110 Hz	110 Hz	OFF
22	116 Hz	116 Hz	OFF
23	124 Hz	124 Hz	OFF
24	132 Hz	132 Hz	OFF
25	52 Hz	52 Hz	ON 1
26	62 Hz	62 Hz	ON 1
27	68 Hz	68 Hz	ON 1
28	74 Hz	74 Hz	ON 1
29	80 Hz	80 Hz	ON 1
30	88 Hz	88 Hz	ON 1
31	96 Hz	96 Hz	ON 1
32	104 Hz	104 Hz	ON 1
33	52 Hz	52 Hz	ON 2
34	62 Hz	62 Hz	ON 2
35	74 Hz	74 Hz	ON 2
36	88 Hz	88 Hz	ON 2
37	96 Hz	96 Hz	ON 2
38	52 Hz	52 Hz	ON 3
39	62 Hz	62 Hz	ON 3
40	74 Hz	74 Hz	ON 3
41	92 Hz	92 Hz	ON 3
42	104 Hz	104 Hz	ON 3
43	52 Hz	52 Hz	ON 4
44	62 Hz	62 Hz	ON 4
45	74 Hz	74 Hz	ON 4
46	96 Hz	96 Hz	ON 4
47	104 Hz	104 Hz	ON 4
48	116 Hz	116 Hz	ON 4
49	124 Hz	124 Hz	ON 4
50	144 Hz	144 Hz	ON 4
51	158 Hz	158 Hz	ON 4
52	166 Hz	166 Hz	ON 4
53	176 Hz	176 Hz	ON 4
54	188 Hz	188 Hz	ON 4
55	202 Hz	202 Hz	ON 4
56	210 Hz	210 Hz	ON 4
57	218 Hz	218 Hz	ON 4
58	232 Hz	232 Hz	ON 4
59	248 Hz	248 Hz	ON 4
60	266 Hz	266 Hz	ON 4

**Notes:**

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

## Three-unit multi system

## U-38MX4XPQ (8+12+18HP)

(To increase Step No.)				
STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD
1	52 Hz	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	56 Hz	OFF
3	62 Hz	62 Hz	62 Hz	OFF
4	66 Hz	66 Hz	66 Hz	OFF
5	68 Hz	68 Hz	68 Hz	OFF
6	70 Hz	70 Hz	70 Hz	OFF
7	74 Hz	74 Hz	74 Hz	OFF
8	80 Hz	80 Hz	80 Hz	OFF
9	88 Hz	88 Hz	88 Hz	OFF
10	96 Hz	96 Hz	96 Hz	OFF
11	104 Hz	104 Hz	104 Hz	OFF
12	110 Hz	110 Hz	110 Hz	OFF
13	116 Hz	116 Hz	116 Hz	OFF
14	124 Hz	124 Hz	124 Hz	OFF
15	80 Hz	80 Hz	80 Hz	ON 1
16	88 Hz	88 Hz	88 Hz	ON 1
17	96 Hz	96 Hz	96 Hz	ON 1
18	104 Hz	104 Hz	104 Hz	ON 1
19	116 Hz	116 Hz	116 Hz	ON 1
20	124 Hz	124 Hz	124 Hz	ON 1
21	132 Hz	132 Hz	132 Hz	ON 1
22	88 Hz	88 Hz	88 Hz	ON 2
23	96 Hz	96 Hz	96 Hz	ON 2
24	104 Hz	104 Hz	104 Hz	ON 2
25	124 Hz	124 Hz	124 Hz	ON 2
26	144 Hz	144 Hz	144 Hz	ON 2
27	92 Hz	92 Hz	92 Hz	ON 3
28	104 Hz	104 Hz	104 Hz	ON 3
29	116 Hz	116 Hz	116 Hz	ON 3
30	124 Hz	124 Hz	124 Hz	ON 3
31	144 Hz	144 Hz	144 Hz	ON 3
32	158 Hz	158 Hz	158 Hz	ON 3
33	166 Hz	166 Hz	166 Hz	ON 3
34	176 Hz	176 Hz	176 Hz	ON 3
35	188 Hz	188 Hz	188 Hz	ON 3
36	202 Hz	202 Hz	202 Hz	ON 3
37	210 Hz	210 Hz	210 Hz	ON 3
38	218 Hz	210 Hz	218 Hz	ON 3
39	232 Hz	210 Hz	232 Hz	ON 3
40	248 Hz	210 Hz	248 Hz	ON 3
41	266 Hz	210 Hz	266 Hz	ON 3

(To decrease Step No.)				
STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD
1	52 Hz	OFF	OFF	OFF
2	56 Hz	OFF	OFF	OFF
3	62 Hz	OFF	OFF	OFF
4	68 Hz	OFF	OFF	OFF
5	74 Hz	OFF	OFF	OFF
6	80 Hz	OFF	OFF	OFF
7	88 Hz	OFF	OFF	OFF
8	96 Hz	OFF	OFF	OFF
9	104 Hz	OFF	OFF	OFF
10	52 Hz	52 Hz	OFF	OFF
11	56 Hz	56 Hz	OFF	OFF
12	62 Hz	62 Hz	OFF	OFF
13	66 Hz	66 Hz	OFF	OFF
14	70 Hz	70 Hz	OFF	OFF
15	74 Hz	74 Hz	OFF	OFF
16	52 Hz	52 Hz	52 Hz	OFF
17	56 Hz	56 Hz	56 Hz	OFF
18	62 Hz	62 Hz	62 Hz	OFF
19	66 Hz	66 Hz	66 Hz	OFF
20	68 Hz	68 Hz	68 Hz	OFF
21	70 Hz	70 Hz	70 Hz	OFF
22	74 Hz	74 Hz	74 Hz	OFF
23	80 Hz	80 Hz	80 Hz	OFF
24	88 Hz	88 Hz	88 Hz	OFF
25	96 Hz	96 Hz	96 Hz	OFF
26	52 Hz	52 Hz	52 Hz	ON 1
27	62 Hz	62 Hz	62 Hz	ON 1
28	68 Hz	68 Hz	68 Hz	ON 1
29	74 Hz	74 Hz	74 Hz	ON 1
30	80 Hz	80 Hz	80 Hz	ON 1
31	88 Hz	88 Hz	88 Hz	ON 1
32	96 Hz	96 Hz	96 Hz	ON 1
33	104 Hz	104 Hz	104 Hz	ON 1
34	52 Hz	52 Hz	52 Hz	ON 2
35	62 Hz	62 Hz	62 Hz	ON 2
36	74 Hz	74 Hz	74 Hz	ON 2
37	88 Hz	88 Hz	88 Hz	ON 2
38	96 Hz	96 Hz	96 Hz	ON 2
39	52 Hz	52 Hz	52 Hz	ON 3
40	62 Hz	62 Hz	62 Hz	ON 3
41	74 Hz	74 Hz	74 Hz	ON 3
42	92 Hz	92 Hz	92 Hz	ON 3
43	104 Hz	104 Hz	104 Hz	ON 3
44	116 Hz	116 Hz	116 Hz	ON 3
45	124 Hz	124 Hz	124 Hz	ON 3
46	144 Hz	144 Hz	144 Hz	ON 3
47	158 Hz	158 Hz	158 Hz	ON 3
48	166 Hz	166 Hz	166 Hz	ON 3
49	176 Hz	176 Hz	176 Hz	ON 3
50	188 Hz	188 Hz	188 Hz	ON 3
51	202 Hz	202 Hz	202 Hz	ON 3
52	210 Hz	210 Hz	210 Hz	ON 3
53	218 Hz	210 Hz	218 Hz	ON 3
54	232 Hz	210 Hz	232 Hz	ON 3
55	248 Hz	210 Hz	248 Hz	ON 3
56	266 Hz	210 Hz	266 Hz	ON 3

represents the range in which “Hz” is not stepped up.

## U-40MX4XPQ (8+16+16HP)

(To increase Step No.)				
STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD
1	52 Hz	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	56 Hz	OFF
3	62 Hz	62 Hz	62 Hz	OFF
4	66 Hz	66 Hz	66 Hz	OFF
5	68 Hz	68 Hz	68 Hz	OFF
6	70 Hz	70 Hz	70 Hz	OFF
7	74 Hz	74 Hz	74 Hz	OFF
8	80 Hz	80 Hz	80 Hz	OFF
9	88 Hz	88 Hz	88 Hz	OFF
10	96 Hz	96 Hz	96 Hz	OFF
11	104 Hz	104 Hz	104 Hz	OFF
12	110 Hz	110 Hz	110 Hz	OFF
13	116 Hz	116 Hz	116 Hz	OFF
14	124 Hz	124 Hz	124 Hz	OFF
15	80 Hz	80 Hz	80 Hz	ON 1
16	88 Hz	88 Hz	88 Hz	ON 1
17	96 Hz	96 Hz	96 Hz	ON 1
18	104 Hz	104 Hz	104 Hz	ON 1
19	116 Hz	116 Hz	116 Hz	ON 1
20	124 Hz	124 Hz	124 Hz	ON 1
21	132 Hz	132 Hz	132 Hz	ON 1
22	88 Hz	88 Hz	88 Hz	ON 2
23	96 Hz	96 Hz	96 Hz	ON 2
24	104 Hz	104 Hz	104 Hz	ON 2
25	124 Hz	124 Hz	124 Hz	ON 2
26	144 Hz	144 Hz	144 Hz	ON 2
27	92 Hz	92 Hz	92 Hz	ON 3
28	104 Hz	104 Hz	104 Hz	ON 3
29	116 Hz	116 Hz	116 Hz	ON 3
30	124 Hz	124 Hz	124 Hz	ON 3
31	144 Hz	144 Hz	144 Hz	ON 3
32	96 Hz	96 Hz	96 Hz	ON 4
33	104 Hz	104 Hz	104 Hz	ON 4
34	116 Hz	116 Hz	116 Hz	ON 4
35	124 Hz	124 Hz	124 Hz	ON 4
36	144 Hz	144 Hz	144 Hz	ON 4
37	158 Hz	158 Hz	158 Hz	ON 4
38	166 Hz	166 Hz	166 Hz	ON 4
39	176 Hz	176 Hz	176 Hz	ON 4
40	188 Hz	188 Hz	188 Hz	ON 4
41	202 Hz	202 Hz	202 Hz	ON 4
42	210 Hz	210 Hz	210 Hz	ON 4
43	218 Hz	210 Hz	218 Hz	ON 4
44	232 Hz	210 Hz	232 Hz	ON 4
45	248 Hz	210 Hz	248 Hz	ON 4
46	266 Hz	210 Hz	266 Hz	ON 4

(To decrease Step No.)				
STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD
1	52 Hz	OFF	OFF	OFF
2	56 Hz	OFF	OFF	OFF
3	62 Hz	OFF	OFF	OFF
4	68 Hz	OFF	OFF	OFF
5	74 Hz	OFF	OFF	OFF
6	80 Hz	OFF	OFF	OFF
7	88 Hz	OFF	OFF	OFF
8	96 Hz	OFF	OFF	OFF
9	104 Hz	OFF	OFF	OFF
10	52 Hz	52 Hz	OFF	OFF
11	56 Hz	56 Hz	OFF	OFF
12	62 Hz	62 Hz	OFF	OFF
13	66 Hz	66 Hz	OFF	OFF
14	70 Hz	70 Hz	OFF	OFF
15	74 Hz	74 Hz	OFF	OFF
16	52 Hz	52 Hz	52 Hz	OFF
17	56 Hz	56 Hz	56 Hz	OFF
18	62 Hz	62 Hz	62 Hz	OFF
19	66 Hz	66 Hz	66 Hz	OFF
20	68 Hz	68 Hz	68 Hz	OFF
21	70 Hz	70 Hz	70 Hz	OFF
22	74 Hz	74 Hz	74 Hz	OFF
23	80 Hz	80 Hz	80 Hz	OFF
24	88 Hz	88 Hz	88 Hz	OFF
25	96 Hz	96 Hz	96 Hz	OFF
26	52 Hz	52 Hz	52 Hz	ON 1
27	62 Hz	62 Hz	62 Hz	ON 1
28	68 Hz	68 Hz	68 Hz	ON 1
29	74 Hz	74 Hz	74 Hz	ON 1
30	80 Hz	80 Hz	80 Hz	ON 1
31	88 Hz	88 Hz	88 Hz	ON 1
32	96 Hz	96 Hz	96 Hz	ON 1
33	104 Hz	104 Hz	104 Hz	ON 1
34	52 Hz	52 Hz	52 Hz	ON 2
35	62 Hz	62 Hz	62 Hz	ON 2
36	74 Hz	74 Hz	74 Hz	ON 2
37	88 Hz	88 Hz	88 Hz	ON 2
38	96 Hz	96 Hz	96 Hz	ON 2
39	52 Hz	52 Hz	52 Hz	ON 3
40	62 Hz	62 Hz	62 Hz	ON 3
41	74 Hz	74 Hz	74 Hz	ON 3
42	92 Hz	92 Hz	92 Hz	ON 3
43	104 Hz	104 Hz	104 Hz	ON 3
44	52 Hz	52 Hz	52 Hz	ON 4
45	62 Hz	62 Hz	62 Hz	ON 4
46	74 Hz	74 Hz	74 Hz	ON 4
47	96 Hz	96 Hz	96 Hz	ON 4
48	104 Hz	104 Hz	104 Hz	ON 4
49	116 Hz	116 Hz	116 Hz	ON 4
50	124 Hz	124 Hz	124 Hz	ON 4
51	144 Hz	144 Hz	144 Hz	ON 4
52	158 Hz	158 Hz	158 Hz	ON 4
53	166 Hz	166 Hz	166 Hz	ON 4
54	176 Hz	176 Hz	176 Hz	ON 4
55	188 Hz	188 Hz	188 Hz	ON 4
56	202 Hz	202 Hz	202 Hz	ON 4
57	210 Hz	210 Hz	210 Hz	ON 4
58	218 Hz	210 Hz	218 Hz	ON 4
59	232 Hz	210 Hz	232 Hz	ON 4
60	248 Hz	210 Hz	248 Hz	ON 4
61	266 Hz	210 Hz	266 Hz	ON 4

## Notes:

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

■ represents the range in which “Hz” is not stepped up.

## U-42MX4XPQ (8+16+18HP)

(To increase Step No.)

STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD
1	52 Hz	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	56 Hz	OFF
3	62 Hz	62 Hz	62 Hz	OFF
4	66 Hz	66 Hz	66 Hz	OFF
5	68 Hz	68 Hz	68 Hz	OFF
6	70 Hz	70 Hz	70 Hz	OFF
7	74 Hz	74 Hz	74 Hz	OFF
8	80 Hz	80 Hz	80 Hz	OFF
9	88 Hz	88 Hz	88 Hz	OFF
10	96 Hz	96 Hz	96 Hz	OFF
11	104 Hz	104 Hz	104 Hz	OFF
12	110 Hz	110 Hz	110 Hz	OFF
13	116 Hz	116 Hz	116 Hz	OFF
14	124 Hz	124 Hz	124 Hz	OFF
15	80 Hz	80 Hz	80 Hz	ON 1
16	88 Hz	88 Hz	88 Hz	ON 1
17	96 Hz	96 Hz	96 Hz	ON 1
18	104 Hz	104 Hz	104 Hz	ON 1
19	116 Hz	116 Hz	116 Hz	ON 1
20	124 Hz	124 Hz	124 Hz	ON 1
21	132 Hz	132 Hz	132 Hz	ON 1
22	88 Hz	88 Hz	88 Hz	ON 2
23	96 Hz	96 Hz	96 Hz	ON 2
24	104 Hz	104 Hz	104 Hz	ON 2
25	124 Hz	124 Hz	124 Hz	ON 2
26	144 Hz	144 Hz	144 Hz	ON 2
27	92 Hz	92 Hz	92 Hz	ON 3
28	104 Hz	104 Hz	104 Hz	ON 3
29	116 Hz	116 Hz	116 Hz	ON 3
30	124 Hz	124 Hz	124 Hz	ON 3
31	144 Hz	144 Hz	144 Hz	ON 3
32	96 Hz	96 Hz	96 Hz	ON 4
33	104 Hz	104 Hz	104 Hz	ON 4
34	116 Hz	116 Hz	116 Hz	ON 4
35	124 Hz	124 Hz	124 Hz	ON 4
36	144 Hz	144 Hz	144 Hz	ON 4
37	158 Hz	158 Hz	158 Hz	ON 4
38	166 Hz	166 Hz	166 Hz	ON 4
39	176 Hz	176 Hz	176 Hz	ON 4
40	188 Hz	188 Hz	188 Hz	ON 4
41	202 Hz	202 Hz	202 Hz	ON 4
42	210 Hz	210 Hz	210 Hz	ON 4
43	218 Hz	210 Hz	218 Hz	ON 4
44	232 Hz	210 Hz	232 Hz	ON 4
45	248 Hz	210 Hz	248 Hz	ON 4
46	266 Hz	210 Hz	266 Hz	ON 4

(To decrease Step No.)

STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD
1	52 Hz	OFF	OFF	OFF
2	56 Hz	OFF	OFF	OFF
3	62 Hz	OFF	OFF	OFF
4	68 Hz	OFF	OFF	OFF
5	74 Hz	OFF	OFF	OFF
6	80 Hz	OFF	OFF	OFF
7	88 Hz	OFF	OFF	OFF
8	96 Hz	OFF	OFF	OFF
9	104 Hz	OFF	OFF	OFF
10	52 Hz	52 Hz	OFF	OFF
11	56 Hz	56 Hz	OFF	OFF
12	62 Hz	62 Hz	OFF	OFF
13	66 Hz	66 Hz	OFF	OFF
14	70 Hz	70 Hz	OFF	OFF
15	74 Hz	74 Hz	OFF	OFF
16	52 Hz	52 Hz	52 Hz	OFF
17	56 Hz	56 Hz	56 Hz	OFF
18	62 Hz	62 Hz	62 Hz	OFF
19	66 Hz	66 Hz	66 Hz	OFF
20	68 Hz	68 Hz	68 Hz	OFF
21	70 Hz	70 Hz	70 Hz	OFF
22	74 Hz	74 Hz	74 Hz	OFF
23	80 Hz	80 Hz	80 Hz	OFF
24	88 Hz	88 Hz	88 Hz	OFF
25	96 Hz	96 Hz	96 Hz	OFF
26	52 Hz	52 Hz	52 Hz	ON 1
27	62 Hz	62 Hz	62 Hz	ON 1
28	68 Hz	68 Hz	68 Hz	ON 1
29	74 Hz	74 Hz	74 Hz	ON 1
30	80 Hz	80 Hz	80 Hz	ON 1
31	88 Hz	88 Hz	88 Hz	ON 1
32	96 Hz	96 Hz	96 Hz	ON 1
33	104 Hz	104 Hz	104 Hz	ON 1
34	52 Hz	52 Hz	52 Hz	ON 2
35	62 Hz	62 Hz	62 Hz	ON 2
36	74 Hz	74 Hz	74 Hz	ON 2
37	88 Hz	88 Hz	88 Hz	ON 2
38	96 Hz	96 Hz	96 Hz	ON 2
39	52 Hz	52 Hz	52 Hz	ON 3
40	62 Hz	62 Hz	62 Hz	ON 3
41	74 Hz	74 Hz	74 Hz	ON 3
42	92 Hz	92 Hz	92 Hz	ON 3
43	104 Hz	104 Hz	104 Hz	ON 3
44	52 Hz	52 Hz	52 Hz	ON 4
45	62 Hz	62 Hz	62 Hz	ON 4
46	74 Hz	74 Hz	74 Hz	ON 4
47	96 Hz	96 Hz	96 Hz	ON 4
48	104 Hz	104 Hz	104 Hz	ON 4
49	116 Hz	116 Hz	116 Hz	ON 4
50	124 Hz	124 Hz	124 Hz	ON 4
51	144 Hz	144 Hz	144 Hz	ON 4
52	158 Hz	158 Hz	158 Hz	ON 4
53	166 Hz	166 Hz	166 Hz	ON 4
54	176 Hz	176 Hz	176 Hz	ON 4
55	188 Hz	188 Hz	188 Hz	ON 4
56	202 Hz	202 Hz	202 Hz	ON 4
57	210 Hz	210 Hz	210 Hz	ON 4
58	218 Hz	210 Hz	218 Hz	ON 4
59	232 Hz	210 Hz	232 Hz	ON 4
60	248 Hz	210 Hz	248 Hz	ON 4
61	266 Hz	210 Hz	266 Hz	ON 4

## U-44MX4XPQ (8+18+18HP)

(To increase Step No.)

STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD
1	52 Hz	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	56 Hz	OFF
3	62 Hz	62 Hz	62 Hz	OFF
4	66 Hz	66 Hz	66 Hz	OFF
5	68 Hz	68 Hz	68 Hz	OFF
6	70 Hz	70 Hz	70 Hz	OFF
7	74 Hz	74 Hz	74 Hz	OFF
8	80 Hz	80 Hz	80 Hz	OFF
9	88 Hz	88 Hz	88 Hz	OFF
10	96 Hz	96 Hz	96 Hz	OFF
11	104 Hz	104 Hz	104 Hz	OFF
12	110 Hz	110 Hz	110 Hz	OFF
13	116 Hz	116 Hz	116 Hz	OFF
14	124 Hz	124 Hz	124 Hz	OFF
15	80 Hz	80 Hz	80 Hz	ON 1
16	88 Hz	88 Hz	88 Hz	ON 1
17	96 Hz	96 Hz	96 Hz	ON 1
18	104 Hz	104 Hz	104 Hz	ON 1
19	116 Hz	116 Hz	116 Hz	ON 1
20	124 Hz	124 Hz	124 Hz	ON 1
21	132 Hz	132 Hz	132 Hz	ON 1
22	88 Hz	88 Hz	88 Hz	ON 2
23	96 Hz	96 Hz	96 Hz	ON 2
24	104 Hz	104 Hz	104 Hz	ON 2
25	124 Hz	124 Hz	124 Hz	ON 2
26	144 Hz	144 Hz	144 Hz	ON 2
27	92 Hz	92 Hz	92 Hz	ON 3
28	104 Hz	104 Hz	104 Hz	ON 3
29	116 Hz	116 Hz	116 Hz	ON 3
30	124 Hz	124 Hz	124 Hz	ON 3
31	144 Hz	144 Hz	144 Hz	ON 3
32	96 Hz	96 Hz	96 Hz	ON 4
33	104 Hz	104 Hz	104 Hz	ON 4
34	116 Hz	116 Hz	116 Hz	ON 4
35	124 Hz	124 Hz	124 Hz	ON 4
36	144 Hz	144 Hz	144 Hz	ON 4
37	158 Hz	158 Hz	158 Hz	ON 4
38	166 Hz	166 Hz	166 Hz	ON 4
39	176 Hz	176 Hz	176 Hz	ON 4
40	188 Hz	188 Hz	188 Hz	ON 4
41	202 Hz	202 Hz	202 Hz	ON 4
42	210 Hz	210 Hz	210 Hz	ON 4
43	218 Hz	218 Hz	218 Hz	ON 4
44	232 Hz	232 Hz	232 Hz	ON 4
45	248 Hz	248 Hz	248 Hz	ON 4
46	266 Hz	266 Hz	266 Hz	ON 4

(To decrease Step No.)

STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD
1	52 Hz	OFF	OFF	OFF
2	56 Hz	OFF	OFF	OFF
3	62 Hz	OFF	OFF	OFF
4	68 Hz	OFF	OFF	OFF
5	74 Hz	OFF	OFF	OFF
6	80 Hz	OFF	OFF	OFF
7	88 Hz	OFF	OFF	OFF
8	96 Hz	OFF	OFF	OFF
9	104 Hz	OFF	OFF	OFF
10	52 Hz	52 Hz	OFF	OFF
11	56 Hz	56 Hz	OFF	OFF
12	62 Hz	62 Hz	OFF	OFF
13	66 Hz	66 Hz	OFF	OFF
14	70 Hz	70 Hz	OFF	OFF
15	74 Hz	74 Hz	OFF	OFF
16	52 Hz	52 Hz	52 Hz	OFF
17	56 Hz	56 Hz	56 Hz	OFF
18	62 Hz	62 Hz	62 Hz	OFF
19	66 Hz	66 Hz	66 Hz	OFF
20	68 Hz	68 Hz	68 Hz	OFF
21	70 Hz	70 Hz	70 Hz	OFF
22	74 Hz	74 Hz	74 Hz	OFF
23	80 Hz	80 Hz	80 Hz	OFF
24	88 Hz	88 Hz	88 Hz	OFF
25	96 Hz	96 Hz	96 Hz	OFF
26	52 Hz	52 Hz	52 Hz	ON 1
27	62 Hz	62 Hz	62 Hz	ON 1
28	68 Hz	68 Hz	68 Hz	ON 1
29	74 Hz	74 Hz	74 Hz	ON 1
30	80 Hz	80 Hz	80 Hz	ON 1
31	88 Hz	88 Hz	88 Hz	ON 1
32	96 Hz	96 Hz	96 Hz	ON 1
33	104 Hz	104 Hz	104 Hz	ON 1
34	52 Hz	52 Hz	52 Hz	ON 2
35	62 Hz	62 Hz	62 Hz	ON 2
36	74 Hz	74 Hz	74 Hz	ON 2
37	88 Hz	88 Hz	88 Hz	ON 2
38	96 Hz	96 Hz	96 Hz	ON 2
39	52 Hz	52 Hz	52 Hz	ON 3
40	62 Hz	62 Hz	62 Hz	ON 3
41	74 Hz	74 Hz	74 Hz	ON 3
42	92 Hz	92 Hz	92 Hz	ON 3
43	104 Hz	104 Hz	104 Hz	ON 3
44	52 Hz	52 Hz	52 Hz	ON 4
45	62 Hz	62 Hz	62 Hz	ON 4
46	74 Hz	74 Hz	74 Hz	ON 4
47	96 Hz	96 Hz	96 Hz	ON 4
48	104 Hz	104 Hz	104 Hz	ON 4
49	116 Hz	116 Hz	116 Hz	ON 4
50	124 Hz	124 Hz	124 Hz	ON 4
51	144 Hz	144 Hz	144 Hz	ON 4
52	158 Hz	158 Hz	158 Hz	ON 4
53	166 Hz	166 Hz	166 Hz	ON 4
54	176 Hz	176 Hz	176 Hz	ON 4
55	188 Hz	188 Hz	188 Hz	ON 4
56	202 Hz	202 Hz	202 Hz	ON 4
57	210 Hz	210 Hz	210 Hz	ON 4
58	218 Hz	218 Hz	218 Hz	ON 4
59	232 Hz	232 Hz	232 Hz	ON 4
60	248 Hz	248 Hz	248 Hz	ON 4
61	266 Hz	266 Hz	266 Hz	ON 4

## Notes:

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



represents the range in which “Hz” is not stepped up.

## U-46MX4XPQ, U-48MX4XPQ (10/12+18+18HP)

## U-50MX4XPQ, U-52MX4XPQ (14/16+18+18HP)

(To increase Step No.)					(To decrease Step No.)					(To increase Step No.)					(To decrease Step No.)				
STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD	STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD	STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD	STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD
1	52 Hz	52 Hz	52 Hz	OFF	1	52 Hz	OFF	OFF	OFF	1	52 Hz	52 Hz	52 Hz	OFF	1	52 Hz	52 Hz	52 Hz	OFF
2	56 Hz	56 Hz	56 Hz	OFF	2	56 Hz	OFF	OFF	OFF	2	56 Hz	56 Hz	56 Hz	OFF	2	56 Hz	OFF	OFF	OFF
3	62 Hz	62 Hz	62 Hz	OFF	3	62 Hz	OFF	OFF	OFF	3	62 Hz	62 Hz	62 Hz	OFF	3	62 Hz	OFF	OFF	OFF
4	66 Hz	66 Hz	66 Hz	OFF	4	68 Hz	OFF	OFF	OFF	4	66 Hz	66 Hz	66 Hz	OFF	4	68 Hz	OFF	OFF	OFF
5	68 Hz	68 Hz	68 Hz	OFF	5	74 Hz	OFF	OFF	OFF	5	68 Hz	68 Hz	68 Hz	OFF	5	74 Hz	OFF	OFF	OFF
6	70 Hz	70 Hz	70 Hz	OFF	6	80 Hz	OFF	OFF	OFF	6	70 Hz	70 Hz	70 Hz	OFF	6	80 Hz	OFF	OFF	OFF
7	74 Hz	74 Hz	74 Hz	OFF	7	88 Hz	OFF	OFF	OFF	7	74 Hz	74 Hz	74 Hz	OFF	7	88 Hz	OFF	OFF	OFF
8	80 Hz	80 Hz	80 Hz	OFF	8	96 Hz	OFF	OFF	OFF	8	80 Hz	80 Hz	80 Hz	OFF	8	96 Hz	OFF	OFF	OFF
9	88 Hz	88 Hz	88 Hz	OFF	9	104 Hz	OFF	OFF	OFF	9	88 Hz	88 Hz	88 Hz	OFF	9	104 Hz	OFF	OFF	OFF
10	96 Hz	96 Hz	96 Hz	OFF	10	52 Hz	52 Hz	OFF	OFF	10	96 Hz	96 Hz	96 Hz	OFF	10	52 Hz	52 Hz	OFF	OFF
11	104 Hz	104 Hz	104 Hz	OFF	11	56 Hz	56 Hz	OFF	OFF	11	104 Hz	104 Hz	104 Hz	OFF	11	56 Hz	56 Hz	OFF	OFF
12	110 Hz	110 Hz	110 Hz	OFF	12	62 Hz	62 Hz	OFF	OFF	12	110 Hz	110 Hz	110 Hz	OFF	12	62 Hz	62 Hz	OFF	OFF
13	116 Hz	116 Hz	116 Hz	OFF	13	66 Hz	66 Hz	OFF	OFF	13	116 Hz	116 Hz	116 Hz	OFF	13	66 Hz	66 Hz	OFF	OFF
14	124 Hz	124 Hz	124 Hz	OFF	14	70 Hz	70 Hz	OFF	OFF	14	124 Hz	124 Hz	124 Hz	OFF	14	70 Hz	70 Hz	OFF	OFF
15	80 Hz	80 Hz	80 Hz	ON 1	15	74 Hz	74 Hz	OFF	OFF	15	80 Hz	80 Hz	80 Hz	ON 1	15	74 Hz	74 Hz	OFF	OFF
16	88 Hz	88 Hz	88 Hz	ON 1	16	52 Hz	52 Hz	52 Hz	OFF	16	88 Hz	88 Hz	88 Hz	ON 1	16	52 Hz	52 Hz	52 Hz	OFF
17	96 Hz	96 Hz	96 Hz	ON 1	17	56 Hz	56 Hz	56 Hz	OFF	17	96 Hz	96 Hz	96 Hz	ON 1	17	56 Hz	56 Hz	56 Hz	OFF
18	104 Hz	104 Hz	104 Hz	ON 1	18	62 Hz	62 Hz	62 Hz	OFF	18	104 Hz	104 Hz	104 Hz	ON 1	18	62 Hz	62 Hz	62 Hz	OFF
19	116 Hz	116 Hz	116 Hz	ON 1	19	66 Hz	66 Hz	66 Hz	OFF	19	116 Hz	116 Hz	116 Hz	ON 1	19	66 Hz	66 Hz	66 Hz	OFF
20	124 Hz	124 Hz	124 Hz	ON 1	20	68 Hz	68 Hz	68 Hz	OFF	20	124 Hz	124 Hz	124 Hz	ON 1	20	68 Hz	68 Hz	68 Hz	OFF
21	132 Hz	132 Hz	132 Hz	ON 1	21	70 Hz	70 Hz	70 Hz	OFF	21	132 Hz	132 Hz	132 Hz	ON 1	21	70 Hz	70 Hz	70 Hz	OFF
22	88 Hz	88 Hz	88 Hz	ON 2	22	74 Hz	74 Hz	74 Hz	OFF	22	88 Hz	88 Hz	88 Hz	ON 2	22	74 Hz	74 Hz	74 Hz	OFF
23	96 Hz	96 Hz	96 Hz	ON 2	23	80 Hz	80 Hz	80 Hz	OFF	23	96 Hz	96 Hz	96 Hz	ON 2	23	80 Hz	80 Hz	80 Hz	OFF
24	104 Hz	104 Hz	104 Hz	ON 2	24	88 Hz	88 Hz	88 Hz	OFF	24	104 Hz	104 Hz	104 Hz	ON 2	24	88 Hz	88 Hz	88 Hz	OFF
25	124 Hz	124 Hz	124 Hz	ON 2	25	96 Hz	96 Hz	96 Hz	OFF	25	124 Hz	124 Hz	124 Hz	ON 2	25	96 Hz	96 Hz	96 Hz	OFF
26	144 Hz	144 Hz	144 Hz	ON 2	26	52 Hz	52 Hz	52 Hz	ON 1	26	144 Hz	144 Hz	144 Hz	ON 2	26	52 Hz	52 Hz	52 Hz	ON 1
27	92 Hz	92 Hz	92 Hz	ON 3	27	62 Hz	62 Hz	62 Hz	ON 1	27	92 Hz	92 Hz	92 Hz	ON 3	27	62 Hz	62 Hz	62 Hz	ON 1
28	104 Hz	104 Hz	104 Hz	ON 3	28	68 Hz	68 Hz	68 Hz	ON 1	28	104 Hz	104 Hz	104 Hz	ON 3	28	68 Hz	68 Hz	68 Hz	ON 1
29	116 Hz	116 Hz	116 Hz	ON 3	29	74 Hz	74 Hz	74 Hz	ON 1	29	116 Hz	116 Hz	116 Hz	ON 3	29	74 Hz	74 Hz	74 Hz	ON 1
30	124 Hz	124 Hz	124 Hz	ON 3	30	80 Hz	80 Hz	80 Hz	ON 1	30	124 Hz	124 Hz	124 Hz	ON 3	30	80 Hz	80 Hz	80 Hz	ON 1
31	144 Hz	144 Hz	144 Hz	ON 3	31	88 Hz	88 Hz	88 Hz	ON 1	31	144 Hz	144 Hz	144 Hz	ON 3	31	88 Hz	88 Hz	88 Hz	ON 1
32	96 Hz	96 Hz	96 Hz	ON 4	32	96 Hz	96 Hz	96 Hz	ON 1	32	96 Hz	96 Hz	96 Hz	ON 4	32	96 Hz	96 Hz	96 Hz	ON 1
33	104 Hz	104 Hz	104 Hz	ON 4	33	104 Hz	104 Hz	104 Hz	ON 1	33	104 Hz	104 Hz	104 Hz	ON 4	33	104 Hz	104 Hz	104 Hz	ON 1
34	116 Hz	116 Hz	116 Hz	ON 4	34	52 Hz	52 Hz	52 Hz	ON 2	34	116 Hz	116 Hz	116 Hz	ON 4	34	52 Hz	52 Hz	52 Hz	ON 2
35	124 Hz	124 Hz	124 Hz	ON 4	35	62 Hz	62 Hz	62 Hz	ON 2	35	124 Hz	124 Hz	124 Hz	ON 4	35	62 Hz	62 Hz	62 Hz	ON 2
36	144 Hz	144 Hz	144 Hz	ON 4	36	74 Hz	74 Hz	74 Hz	ON 2	36	144 Hz	144 Hz	144 Hz	ON 4	36	74 Hz	74 Hz	74 Hz	ON 2
37	96 Hz	96 Hz	96 Hz	ON 5	37	88 Hz	88 Hz	88 Hz	ON 2	37	96 Hz	96 Hz	96 Hz	ON 5	37	88 Hz	88 Hz	88 Hz	ON 2
38	104 Hz	104 Hz	104 Hz	ON 5	38	96 Hz	96 Hz	96 Hz	ON 2	38	104 Hz	104 Hz	104 Hz	ON 5	38	96 Hz	96 Hz	96 Hz	ON 2
39	116 Hz	116 Hz	116 Hz	ON 5	39	52 Hz	52 Hz	52 Hz	ON 3	39	116 Hz	116 Hz	116 Hz	ON 5	39	52 Hz	52 Hz	52 Hz	ON 3
40	124 Hz	124 Hz	124 Hz	ON 5	40	62 Hz	62 Hz	62 Hz	ON 3	40	124 Hz	124 Hz	124 Hz	ON 5	40	62 Hz	62 Hz	62 Hz	ON 3
41	144 Hz	144 Hz	144 Hz	ON 5	41	74 Hz	74 Hz	74 Hz	ON 3	41	144 Hz	144 Hz	144 Hz	ON 5	41	74 Hz	74 Hz	74 Hz	ON 3
42	158 Hz	158 Hz	158 Hz	ON 5	42	92 Hz	92 Hz	92 Hz	ON 3	42	96 Hz	96 Hz	96 Hz	ON 6	42	92 Hz	92 Hz	92 Hz	ON 3
43	166 Hz	166 Hz	166 Hz	ON 5	43	104 Hz	104 Hz	104 Hz	ON 3	43	104 Hz	104 Hz	104 Hz	ON 6	43	104 Hz	104 Hz	104 Hz	ON 3
44	176 Hz	176 Hz	176 Hz	ON 5	44	52 Hz	52 Hz	52 Hz	ON 4	44	116 Hz	116 Hz	116 Hz	ON 6	44	52 Hz	52 Hz	52 Hz	ON 4
45	188 Hz	188 Hz	188 Hz	ON 5	45	62 Hz	62 Hz	62 Hz	ON 4	45	124 Hz	124 Hz	124 Hz	ON 6	45	62 Hz	62 Hz	62 Hz	ON 4
46	202 Hz	202 Hz	202 Hz	ON 5	46	74 Hz	74 Hz	74 Hz	ON 4	46	144 Hz	144 Hz	144 Hz	ON 6	46	74 Hz	74 Hz	74 Hz	ON 4
47	210 Hz	210 Hz	210 Hz	ON 5	47	96 Hz	96 Hz	96 Hz	ON 4	47	158 Hz	158 Hz	158 Hz	ON 6	47	96 Hz	96 Hz	96 Hz	ON 4
48	210 Hz	218 Hz	218 Hz	ON 5	48	104 Hz	104 Hz	104 Hz	ON 4	48	166 Hz	166 Hz	166 Hz	ON 6	48	104 Hz	104 Hz	104 Hz	ON 4
49	210 Hz	232 Hz	232 Hz	ON 5	49	52 Hz	52 Hz	52 Hz	ON 5	49	176 Hz	176 Hz	176 Hz	ON 6	49	52 Hz	52 Hz	52 Hz	ON 5
50	210 Hz	248 Hz	248 Hz	ON 5	50	68 Hz	68 Hz	68 Hz	ON 5	50	188 Hz	188 Hz	188 Hz	ON 6	50	68 Hz	68 Hz	68 Hz	ON 5
51	80 Hz	80 Hz	80 Hz	ON 5	51	80 Hz	80 Hz	80 Hz	ON 5	51	202 Hz	202 Hz	202 Hz	ON 6	51	80 Hz	80 Hz	80 Hz	ON 5
52	96 Hz	96 Hz	96 Hz	ON 5	52	96 Hz	96 Hz	96 Hz	ON 5	52	210 Hz	210 Hz	210 Hz	ON 6	52	96 Hz	96 Hz	96 Hz	ON 5
53	104 Hz	104 Hz	104 Hz	ON 5	53	104 Hz	104 Hz	104 Hz	ON 5	53	210 Hz	218 Hz	218 Hz	ON 6	53	104 Hz	104 Hz	104 Hz	ON 5
54	116 Hz	116 Hz	116 Hz	ON 5	54	116 Hz	116 Hz	116 Hz	ON 5	54	210 Hz	232 Hz	232 Hz	ON 6	54	52 Hz	52 Hz	52 Hz	ON 6
55	124 Hz	124 Hz	124 Hz	ON 5	55	124 Hz	124 Hz	124 Hz	ON 5	55	210 Hz	248 Hz	248 Hz	ON 6	55	68 Hz	68 Hz	68 Hz	ON 6
56	144 Hz	144 Hz	144 Hz	ON 5	56	144 Hz	144 Hz	144 Hz	ON 5	56	210 Hz	266 Hz	266 Hz	ON 6	56	80 Hz	80 Hz	80 Hz	ON 6
57	158 Hz	158 Hz	158 Hz	ON 5	57	158 Hz	158 Hz	158 Hz	ON 5	57	96 Hz	96 Hz	96 Hz	ON 6	57	96 Hz	96 Hz	96 Hz	ON 6
58	166 Hz	166 Hz	166 Hz	ON 5	58	166 Hz	166 Hz	166 Hz	ON 5	58	104 Hz	104 Hz	104 Hz	ON 6	58	104 Hz	104 Hz	104 Hz	ON 6
59	176 Hz	176 Hz	176 Hz	ON 5	59	176 Hz	176 Hz	176 Hz	ON 5	59	116 Hz	116 Hz	116 Hz	ON 6	59	116 Hz	116 Hz	116 Hz	ON 6
60	188 Hz	188 Hz	188 Hz	ON 5	60	188 Hz	188 Hz	188 Hz	ON 5	60	124 Hz	124 Hz	124 Hz	ON 6	60	124 Hz	124 Hz	124 Hz	ON 6
61	202 Hz	202 Hz	202 Hz	ON 5	61	202 Hz	202 Hz	202 Hz	ON 5	61	144 Hz	144 Hz	144 Hz	ON 6	61	144 Hz	144 Hz	144 Hz	ON 6
62	210 Hz	210 Hz	210 Hz	ON 5	62	210 Hz	210 Hz	210 Hz	ON 5	62	158 Hz	158 Hz	158 Hz	ON 6	62	158 Hz	158 Hz	158 Hz	ON 6
63	210 Hz	218 Hz	218 Hz	ON 5	63	210 Hz	218 Hz	218 Hz	ON 5	63	166 Hz	166 Hz	166 Hz	ON 6	63	166 Hz	166 Hz	166 Hz	ON 6
64	210 Hz	232 Hz	232 Hz	ON 5	64	210 Hz	232 Hz	232 Hz	ON 5	64	176 Hz	176 Hz	176 Hz	ON 6	64	176 Hz	176 Hz	176 Hz	ON 6
65	210 Hz	248 Hz	248 Hz	ON 5	65	210 Hz	248 Hz	248 Hz	ON 5	65	188 Hz	188 Hz	188 Hz	ON 6	65	188 Hz	188 Hz	188 Hz	ON 6
66	210 Hz	266 Hz	266 Hz	ON 5	66	210 Hz	266 Hz	266 Hz	ON 5	66	202 Hz	202 Hz	202 Hz	ON 6	66	202 Hz	202 Hz	202 Hz	ON 6
															67	210 Hz	210 Hz	210 Hz	ON 6
															68	210 Hz	218 Hz	218 Hz	ON 6
															69	210 Hz	232 Hz	232 Hz	ON 6
															70	210 Hz	248 Hz	248 Hz	ON 6
															71	210 Hz	266 Hz	266 Hz	ON 6

## Notes:

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

## U-54MX4XPQ (18+18+18HP)

(To increase Step No.)

(To decrease Step No.)

STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD	STEP No.	Master unit INV	Slave unit1 INV	Slave unit2 INV	STD
1	52 Hz	52 Hz	52 Hz	OFF	1	52 Hz	OFF	OFF	OFF
2	56 Hz	56 Hz	56 Hz	OFF	2	56 Hz	OFF	OFF	OFF
3	62 Hz	62 Hz	62 Hz	OFF	3	62 Hz	OFF	OFF	OFF
4	66 Hz	66 Hz	66 Hz	OFF	4	68 Hz	OFF	OFF	OFF
5	68 Hz	68 Hz	68 Hz	OFF	5	74 Hz	OFF	OFF	OFF
6	70 Hz	70 Hz	70 Hz	OFF	6	80 Hz	OFF	OFF	OFF
7	74 Hz	74 Hz	74 Hz	OFF	7	88 Hz	OFF	OFF	OFF
8	80 Hz	80 Hz	80 Hz	OFF	8	96 Hz	OFF	OFF	OFF
9	88 Hz	88 Hz	88 Hz	OFF	9	104 Hz	OFF	OFF	OFF
10	96 Hz	96 Hz	96 Hz	OFF	10	52 Hz	52 Hz	OFF	OFF
11	104 Hz	104 Hz	104 Hz	OFF	11	56 Hz	56 Hz	OFF	OFF
12	110 Hz	110 Hz	110 Hz	OFF	12	62 Hz	62 Hz	OFF	OFF
13	116 Hz	116 Hz	116 Hz	OFF	13	66 Hz	66 Hz	OFF	OFF
14	124 Hz	124 Hz	124 Hz	OFF	14	70 Hz	70 Hz	OFF	OFF
15	80 Hz	80 Hz	80 Hz	ON 1	15	74 Hz	74 Hz	OFF	OFF
16	88 Hz	88 Hz	88 Hz	ON 1	16	52 Hz	52 Hz	52 Hz	OFF
17	96 Hz	96 Hz	96 Hz	ON 1	17	56 Hz	56 Hz	56 Hz	OFF
18	104 Hz	104 Hz	104 Hz	ON 1	18	62 Hz	62 Hz	62 Hz	OFF
19	116 Hz	116 Hz	116 Hz	ON 1	19	66 Hz	66 Hz	66 Hz	OFF
20	124 Hz	124 Hz	124 Hz	ON 1	20	68 Hz	68 Hz	68 Hz	OFF
21	132 Hz	132 Hz	132 Hz	ON 1	21	70 Hz	70 Hz	70 Hz	OFF
22	88 Hz	88 Hz	88 Hz	ON 2	22	74 Hz	74 Hz	74 Hz	OFF
23	96 Hz	96 Hz	96 Hz	ON 2	23	80 Hz	80 Hz	80 Hz	OFF
24	104 Hz	104 Hz	104 Hz	ON 2	24	88 Hz	88 Hz	88 Hz	OFF
25	124 Hz	124 Hz	124 Hz	ON 2	25	96 Hz	96 Hz	96 Hz	OFF
26	144 Hz	144 Hz	144 Hz	ON 2	26	52 Hz	52 Hz	52 Hz	ON 1
27	92 Hz	92 Hz	92 Hz	ON 3	27	62 Hz	62 Hz	62 Hz	ON 1
28	104 Hz	104 Hz	104 Hz	ON 3	28	68 Hz	68 Hz	68 Hz	ON 1
29	116 Hz	116 Hz	116 Hz	ON 3	29	74 Hz	74 Hz	74 Hz	ON 1
30	124 Hz	124 Hz	124 Hz	ON 3	30	80 Hz	80 Hz	80 Hz	ON 1
31	144 Hz	144 Hz	144 Hz	ON 3	31	88 Hz	88 Hz	88 Hz	ON 1
32	96 Hz	96 Hz	96 Hz	ON 4	32	96 Hz	96 Hz	96 Hz	ON 1
33	104 Hz	104 Hz	104 Hz	ON 4	33	104 Hz	104 Hz	104 Hz	ON 1
34	116 Hz	116 Hz	116 Hz	ON 4	34	52 Hz	52 Hz	52 Hz	ON 2
35	124 Hz	124 Hz	124 Hz	ON 4	35	62 Hz	62 Hz	62 Hz	ON 2
36	144 Hz	144 Hz	144 Hz	ON 4	36	74 Hz	74 Hz	74 Hz	ON 2
37	96 Hz	96 Hz	96 Hz	ON 5	37	88 Hz	88 Hz	88 Hz	ON 2
38	104 Hz	104 Hz	104 Hz	ON 5	38	96 Hz	96 Hz	96 Hz	ON 2
39	116 Hz	116 Hz	116 Hz	ON 5	39	52 Hz	52 Hz	52 Hz	ON 3
40	124 Hz	124 Hz	124 Hz	ON 5	40	62 Hz	62 Hz	62 Hz	ON 3
41	144 Hz	144 Hz	144 Hz	ON 5	41	74 Hz	74 Hz	74 Hz	ON 3
42	96 Hz	96 Hz	96 Hz	ON 6	42	92 Hz	92 Hz	92 Hz	ON 3
43	104 Hz	104 Hz	104 Hz	ON 6	43	104 Hz	104 Hz	104 Hz	ON 3
44	116 Hz	116 Hz	116 Hz	ON 6	44	52 Hz	52 Hz	52 Hz	ON 4
45	124 Hz	124 Hz	124 Hz	ON 6	45	62 Hz	62 Hz	62 Hz	ON 4
46	144 Hz	144 Hz	144 Hz	ON 6	46	74 Hz	74 Hz	74 Hz	ON 4
47	158 Hz	158 Hz	158 Hz	ON 6	47	96 Hz	96 Hz	96 Hz	ON 4
48	166 Hz	166 Hz	166 Hz	ON 6	48	104 Hz	104 Hz	104 Hz	ON 4
49	176 Hz	176 Hz	176 Hz	ON 6	49	52 Hz	52 Hz	52 Hz	ON 5
50	188 Hz	188 Hz	188 Hz	ON 6	50	68 Hz	68 Hz	68 Hz	ON 5
51	202 Hz	202 Hz	202 Hz	ON 6	51	80 Hz	80 Hz	80 Hz	ON 5
52	210 Hz	210 Hz	210 Hz	ON 6	52	96 Hz	96 Hz	96 Hz	ON 5
53	218 Hz	218 Hz	218 Hz	ON 6	53	104 Hz	104 Hz	104 Hz	ON 5
54	232 Hz	232 Hz	232 Hz	ON 6	54	52 Hz	52 Hz	52 Hz	ON 6
55	248 Hz	248 Hz	248 Hz	ON 6	55	68 Hz	68 Hz	68 Hz	ON 6
56	266 Hz	266 Hz	266 Hz	ON 6	56	80 Hz	80 Hz	80 Hz	ON 6
					57	96 Hz	96 Hz	96 Hz	ON 6
					58	104 Hz	104 Hz	104 Hz	ON 6
					59	116 Hz	116 Hz	116 Hz	ON 6
					60	124 Hz	124 Hz	124 Hz	ON 6
					61	144 Hz	144 Hz	144 Hz	ON 6
					62	158 Hz	158 Hz	158 Hz	ON 6
					63	166 Hz	166 Hz	166 Hz	ON 6
					64	176 Hz	176 Hz	176 Hz	ON 6
					65	188 Hz	188 Hz	188 Hz	ON 6
					66	202 Hz	202 Hz	202 Hz	ON 6
					67	210 Hz	210 Hz	210 Hz	ON 6
					68	218 Hz	218 Hz	218 Hz	ON 6
					69	232 Hz	232 Hz	232 Hz	ON 6
					70	248 Hz	248 Hz	248 Hz	ON 6
					71	266 Hz	266 Hz	266 Hz	ON 6

**Notes:**

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

## 2.3 Electronic Expansion Valve PI Control

### Main Motorized Valve EV1 Control

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

$$SH = Ts1 - Te$$

SH : Evaporator outlet superheated degree (°C)

Ts1 : Suction pipe temperature detected by thermistor R6T (R7T) (°C)

Te : Low pressure equivalent saturation temperature (°C)

The optimum initial value of the evaporator outlet superheated degree is 5°C, but varies depending on the discharge pipe superheated degree of inverter compressor.

### Subcooling Motorized Valve EV2 Control

Makes PI control of the motorized valve (Y2E) to keep the superheated degree of the outlet gas pipe on the evaporator side for the full use of the subcooling heat exchanger.

$$SH = Tsh - Te$$

SH : Outlet superheated degree of evaporator (°C)

Tsh : Suction pipe temperature detected with the thermistor R5T (°C)

Te : Low pressure equivalent saturation temperature (°C)

## 2.4 Step Control of Outdoor Unit Fans

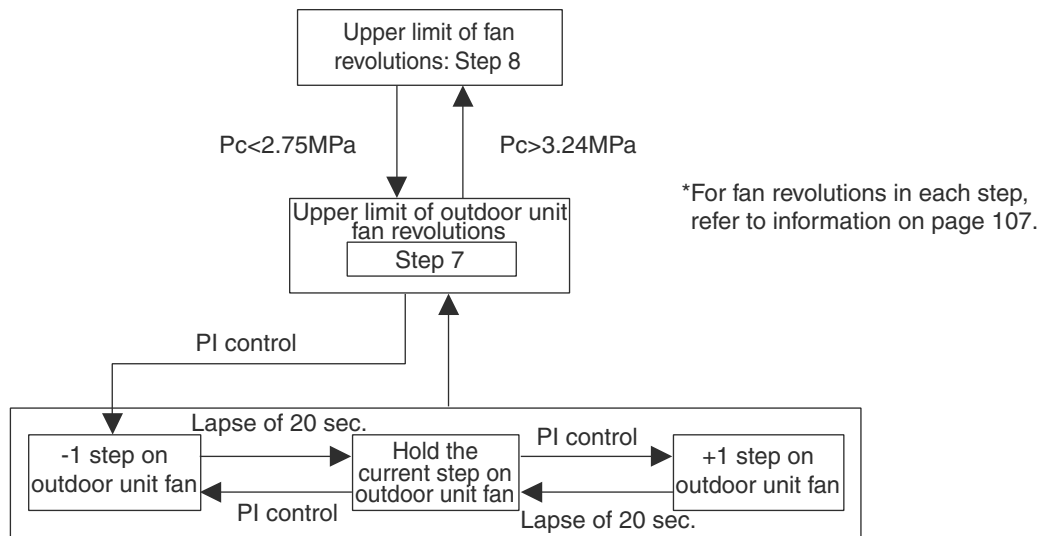
Used to control the revolutions of outdoor unit fans in the steps listed in table below, according to condition changes.

STEP No.	Fan revolutions (rpm)									
	U-5MX4XPQ	U-8MX4XPQ	U-10MX4XPQ	U-12MX4XPQ (Europe)	U-14MX4XPQ FAN1	U-14MX4XPQ FAN2	U-16MX4XPQ FAN1	U-16MX4XPQ FAN2	U-18MX4XPQ FAN1	U-18MX4XPQ FAN2
0	0	0	0	0	0	0	0	0	0	0
1	285	350	350	350	230	0	230	0	395	0
2	315	370	370	370	380	0	380	0	460	0
3	360	400	400	400	290	260	290	260	570	0
4	450	450	460	460	375	345	375	345	385	355
5	570	540	560	560	570	540	570	540	550	520
6	710	670	680	680	720	690	720	690	800	770
7	Cooling: 951 Heating: 941	760	Cooling: 821 Heating: 800	870	1091	1061	1091	1061	1136	1106
8	Cooling: 951 Heating: 941	Cooling: 796 Heating: 780	Cooling: 821 Heating: 800	870	1136	1106	1136	1106	1166	1136

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

## 2.5 Outdoor Unit Fan Control in Cooling Operation

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



## 3. Special Control

### 3.1 Startup Control

This control is used to equalize the pressure in the front and back of the compressor prior to the startup of the compressor, thus reducing startup loads. Furthermore, the inverter is turned ON to charge the capacitor.

In addition, to avoid stresses to the compressor due to oil return or else after the startup, the following control is made and the position of the four way valve is also determined. To position the four way valve, the master and slave units simultaneously start up.

#### 3.1.1 Startup Control in Cooling Operation

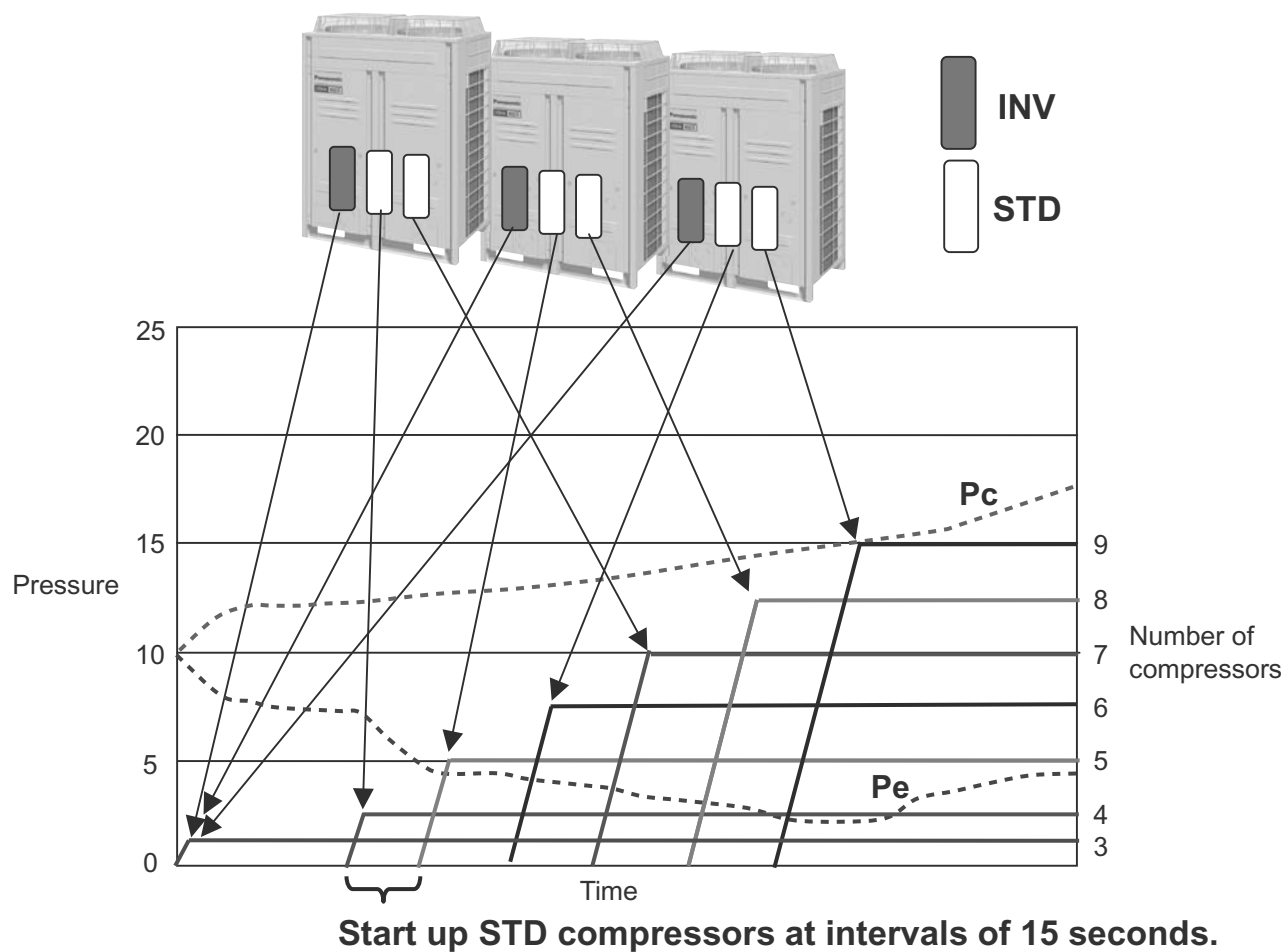
	Pressure equalization control prior to startup	Startup control	
		STEP1	STEP2
Compressor	0 Hz	52 Hz + OFF + OFF	124 Hz + OFF + OFF +2 steps/20 sec. (until $P_c - P_e > 0.39\text{MPa}$ is achieved)
Outdoor unit fan	STEP4	$T_a < 20^\circ\text{C}$ : OFF $T_a \geq 20^\circ\text{C}$ : STEP4	+1 step/15 sec. (when $P_c > 2.16\text{MPa}$ ) -1 step/15 sec. (when $P_c < 1.77\text{MPa}$ )
Four way valve (20S1)	Holds	OFF	OFF
Main motorized valve (EV1)	0 pls	480 pls	480 pls
Subcooling motorized valve (EV2) (U-8MX4~)	0 pls	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Accumulator oil return valve (SVO)	OFF	OFF	OFF
Injection (SVT) (U-5MX4XPQ model)	OFF	OFF	OFF
Ending conditions	A lapse of one minute	A lapse of 10 sec.	OR <ul style="list-style-type: none"> <li>• A lapse of 130 sec.</li> <li>• <math>P_c - P_e &gt; 0.39\text{MPa}</math></li> </ul>

#### 3.1.2 Startup Control in Heating Operation

	Pressure equalization control prior to startup	Startup control	
		STEP1	STEP2
Compressor	0 Hz	52 Hz + OFF + OFF	124 Hz + OFF + OFF +2 steps/20 sec. (until $P_c - P_e > 0.39\text{MPa}$ is achieved)
Outdoor unit fan	STEP4	STEP8	STEP8
Four way valve	Holds	ON	ON
Main motorized valve (EV1)	0 pls	0 pls	0 pls
Subcooling motorized valve (EV2) (U-8MX4XPQ)	0 pls	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Accumulator oil return valve (SVO)	OFF	OFF	OFF
Injection (SVT) (U-5MX4XPQ model)	OFF	OFF	OFF
Ending conditions	A lapse of one minute	A lapse of 10 sec.	OR <ul style="list-style-type: none"> <li>• A lapse of 130 sec.</li> <li>• <math>P_c &gt; 2.70\text{MPa}</math></li> <li>• <math>P_c - P_e &gt; 0.39\text{MPa}</math></li> </ul>

## 3.2 Large capacity start up control (Heating)

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



### 3.3 Oil Return Operation

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

#### 3.3.1 Oil Return Operation in Cooling Operation

##### [Start conditions]

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

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

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

Outdoor unit actuator	Oil return preparation operation	Oil return operation	Post-oil-return operation
Compressor	Take the current step as the upper limit.	5 HP: 52 Hz (→ Low pressure constant control) Other model: 52 Hz + ON + ON (→ Low pressure constant control) ↓ Maintain number of compressors in oil return preparation operation ON	Same as the “oil return operation” mode.
Outdoor unit fan	Fan control (Normal cooling)	Fan control (Normal cooling)	Fan control (Normal cooling)
Four way valve	OFF	OFF	OFF
Main motorized valve (EV1)	480 pls	480 pls	480 pls
Subcooling motorized valve (EV2)	SH control	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Accumulator oil return valve (SVO)	ON	ON	ON
Ending conditions	20 sec.	or <div style="display: inline-block; vertical-align: middle;"> <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px;"> <ul style="list-style-type: none"> <li>• 3 min.</li> <li>• <math>T_s - T_e &lt; 5^{\circ}\text{C}</math></li> </ul> </div> </div>	or <div style="display: inline-block; vertical-align: middle;"> <div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 5px;"> <ul style="list-style-type: none"> <li>• 3 min.</li> <li>• <math>P_e &lt; 0.6\text{MPa}</math></li> <li>• <math>HT_{di} &gt; 110^{\circ}\text{C}</math></li> </ul> </div> </div>

\* In the case of multi-outdoor-unit system,

Master unit: Performs the operations listed in the table above.

Slave units: Operating units perform the operations listed in the table above.

Non-operating units perform the operations listed in the table above from the oil return operation.

(Non-operating unit stops during “oil return preparation operation”.)

\* Actuators are based on U-14,16,18MX4XPQ.

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

### 3.3.2 Oil Return Operation in Heating Operation

Outdoor Unit Actuator	Oil return preparation operation	Oil return operation	Post-oil-return operation
Compressor	Upper limit control	176 Hz + ON + ON	124 Hz + OFF + OFF 2-steps increase/20sec. till $P_c - P_e > 0.4 \text{ MPa}$
Outdoor unit fan	STEP7 or STEP8	OFF	STEP8
Four way valve	ON	OFF	ON
Main motorized valve (EV1)	SH control → 480 pls	480 pls	55 pls
Subcooling motorized valve (EV2)	SH control	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Accumulator oil return valve (SVO)	ON	ON	ON
Injection (SVT) (U-5MX4XPQ model only)	OFF	OFF	OFF
Ending conditions	170 sec.	or $\left[ \begin{array}{l} \bullet 4 \text{ min.} \\ \bullet T_s - T_e < 5^\circ\text{C} \end{array} \right.$	or $\left[ \begin{array}{l} \bullet 10 \text{ sec.} \\ \bullet P_c - P_e > 0.4 \text{ MPa} \end{array} \right.$

\* In the case of multi-outdoor-unit system,

Master unit: Performs the operations listed in the table above.

Slave units: Operating units perform the operations listed in the table above.

Non-operating units perform the operations listed in the table above from the oil return operation.

(Non-operating unit stops during "oil return preparation operation".)

\* Actuators are based on U-MX4XPQ14~18P.

Indoor unit actuator		Heating oil return operation
Fan	Thermostat ON unit	OFF
	Stopping unit	OFF
	Thermostat OFF unit	OFF
Electronic expansion valve	Thermostat ON unit	Oil return EV opening degree
	Stopping unit	256 pls
	Thermostat OFF unit	Oil return EV opening degree



### 3.4 Defrosting Operation

To defrost the outdoor unit heat exchanger while in Evaporator, the defrost operation is conducted to recover the heating capacity.

[Start conditions]

Referring to the set conditions for the following items, start the defrosting operation.

- Heat transfer coefficient of the outdoor unit heat exchanger
- Heat exchange temperature (Tb)
- Timer (Set to two hours at minimum.)

Furthermore, the heat transfer coefficient of the outdoor unit Evaporator is computed from Tc, Te, and compressor loads.

Outdoor unit actuator	Defrost preparation operation	Defrost operation	Post Defrost operation
Compressor	Upper limit control	176 Hz + ON + ON	124 Hz + OFF + OFF 2-steps increase/20sec. till Pc - Pe>0.4 MPa
Outdoor unit fan	STEP7 or STEP8	OFF	STEP8
Four way valve	ON	OFF	ON
Main motorized valve (EV1)	SH control → 480 pls	480 pls	55 pls
Subcooling motorized valve (EV2)	0 pls	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF	OFF
Accumulator oil return valve (SVO)	ON	ON	ON
Injection (SVT) (U-5MX4XPQ model only)	OFF	OFF	OFF
Ending conditions	170 sec.	or [ <ul style="list-style-type: none"> <li>• 10 min.</li> <li>• Tb&gt;11°C</li> </ul>	or [ <ul style="list-style-type: none"> <li>• 10 sec.</li> <li>• Pc - Pe&gt;0.4MPa</li> </ul>

\* In the case of multi-outdoor-unit system,

Master unit: Performs the operations listed in the table above.

Slave units: Operating units perform the operations listed in the table above.

Non-operating units perform the operations listed in the table above from the Defrost operation.

(Non-operating unit stops during "Defrost preparation operation".)

\* Actuators are based on U-14,16,18MX4XPQ.

Indoor unit actuator		During defrost
Fan	Thermostat ON unit	OFF
	Stopping unit	OFF
	Thermostat OFF unit	OFF
Electronic expansion valve	Thermostat ON unit	Defrost EV opening degree
	Stopping unit	256 pls
	Thermostat OFF unit	Defrost EV opening degree

## 3.5 Pump-down Residual Operation

### 3.5.1 Pump-down Residual Operation in Cooling Operation

If the liquid refrigerant stays in the Evaporator at the startup of a compressor, this liquid refrigerant enters the compressor, thus resulting in diluted oil in the compressor and then degraded lubrication performance.

Consequently, in order to recover the refrigerant in the Evaporator while the compressor stops, the pump-down residual operation is conducted.

Actuator	Master unit operation	Slave unit operation
Compressor	124 Hz + OFF + OFF	OFF
Outdoor unit fan	Fan control	OFF
Four way valve	OFF	OFF
Main motorized valve (EV1)	480 pls	0 pls
Subcooling motorized valve (EV2)	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF
Accumulator oil return valve (SVO)	ON	ON
Ending conditions	or <ul style="list-style-type: none"> <li>• 5 min.</li> <li>• Master Unit <math>P_e &lt; 0.49 \text{ MPa}</math></li> <li>• Master Unit <math>T_d &gt; 110^\circ\text{C}</math></li> <li>• Master Unit <math>P_c &gt; 2.94 \text{ MPa}</math></li> </ul>	

\* Actuators are based on U-14,16,18MX4XPQ.

### 3.5.2 Pump-down Residual Operation in Heating Operation

Actuator	Master unit operation	Slave unit operation
Compressor	124 Hz + OFF + OFF	OFF
Outdoor unit fan	STEP7	STEP4
Four way valve	ON	ON
Main motorized valve (EV1)	0 pls	0 pls
Subcooling motorized valve (EV2)	0 pls	0 pls
Hot gas bypass valve (SVP)	OFF	OFF
Accumulator oil return valve (SVO)	ON	ON
Ending conditions	or <ul style="list-style-type: none"> <li>• 3 min.</li> <li>• Master Unit <math>P_e &lt; 0.25 \text{ MPa}</math></li> <li>• Master Unit <math>T_d &gt; 110^\circ\text{C}</math></li> <li>• Master Unit <math>P_c &gt; 2.94 \text{ MPa}</math></li> </ul>	

\* Actuators are based on U-14,16,18MX4XPQ.

## 3.6 Standby

### 3.6.1 Restart Standby

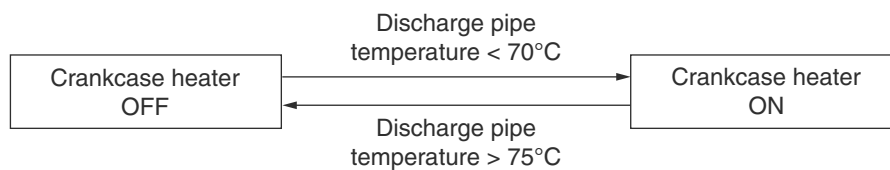
Used to forcibly stop the compressor for a period of 3 minutes, in order to prevent the frequent ON/OFF of the compressor and equalize the pressure within the refrigerant system.

Actuator	Operation
Compressor	OFF
Outdoor unit fan	Ta>30°C: STEP4 Ta≤30°C: OFF
Four way valve	Holds
Main motorized valve (EV1)	0 pls
Subcooling motorized (EV2)	0 pls
Hot gas bypass valve (SVP)	OFF
Accumulator oil return valve (SVO)	OFF
Injection (SVT) (U-5MX4XPQ model)	OFF
Ending conditions	3 min.

\* Actuators are based on U-14,16,18MX4XPQ.

### 3.6.2 Crankcase Heater Control

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



## 3.7 Stopping Operation

### 3.7.1 When System is in Stop Mode (Normal operation stop)

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

Actuator	Operation
Compressor	OFF
Outdoor unit fan	OFF
Four way valve	Holds
Main motorized valve (EV1)	0 pls
Subcooling motorized valve (EV2)	0 pls
Hot gas bypass valve (SVP)	OFF
Accumulator oil return valve (SVO)	OFF
Injection (SVT) (U-5MX4XPQ model only)	OFF
Ending conditions	Indoor unit thermostat is turned ON.

\* Actuators are based on U-14,16,18MX4XPQ.

### 3.7.2 Stop due to Malfunction

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

Item	Judgment Criteria	Malfunction Code
1. Abnormal low pressure level	0.07MPa	E4
2. Abnormal high pressure level	4.0MPa	E3
3. Abnormal discharge pipe temperature level	135°C	F3
4. Abnormal power supply voltage	Reverse-phase power supply	U1
5. Abnormal inverter current level	16.1A: 260 sec.	L8
6. Abnormal radiator fin temperature level	93°C	L4

### 3.7.3 Stopping Operation of Slave Units During Master Unit is in Operation with Multi-Outdoor-Unit System

While the master unit is in operation, this mode is used to set the refrigerant flow rate to a required level using a slave unit in the stopped mode.

In cooling operation: Same as that of normal operation stop.

In heating operation: The system operates with following mode.

Actuator	Operation
Compressor	OFF
Outdoor unit fan	OFF
Four way valve	ON
Main motorized valve (EV1)	0 pls
Subcooling motorized valve (EV2)	0 pls
Hot gas bypass valve (SVP)	OFF
Accumulator oil return valve (SVO)	OFF
Injection valve (SVT 5HP only)	OFF
Ending conditions	Slave units are required to operate.

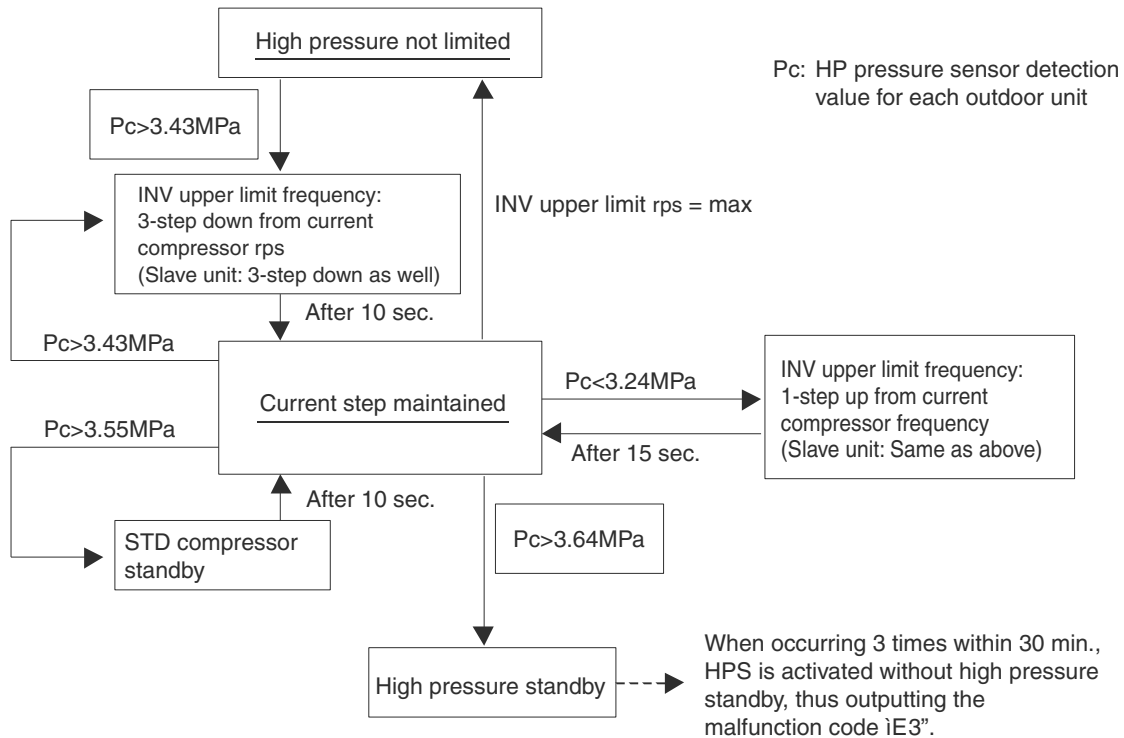
## 4. Protection Control

#### 4.1 High Pressure Protection Control

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

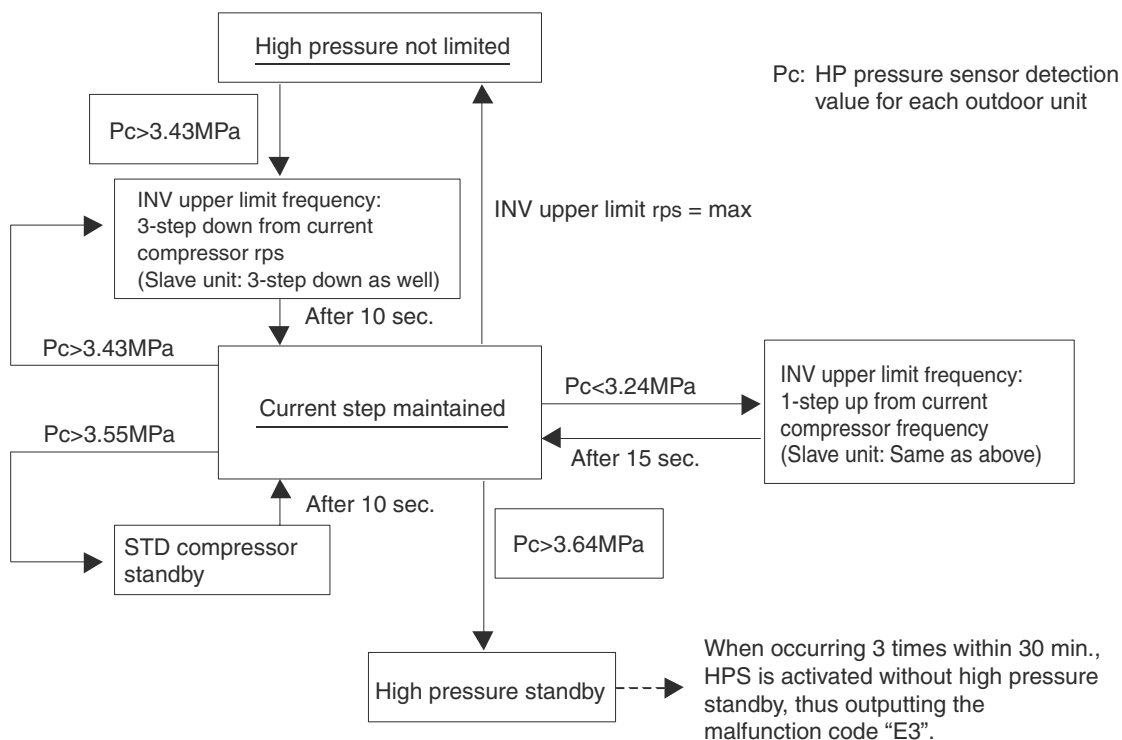
**[In cooling operation]**

- ★ In the case of multi-outdoor-unit system, each outdoor unit performs this control individually in the following sequence.



**[In heating operation]**

- ★ In the case of multi-outdoor-unit system, the entire system performs this control in the following sequence.

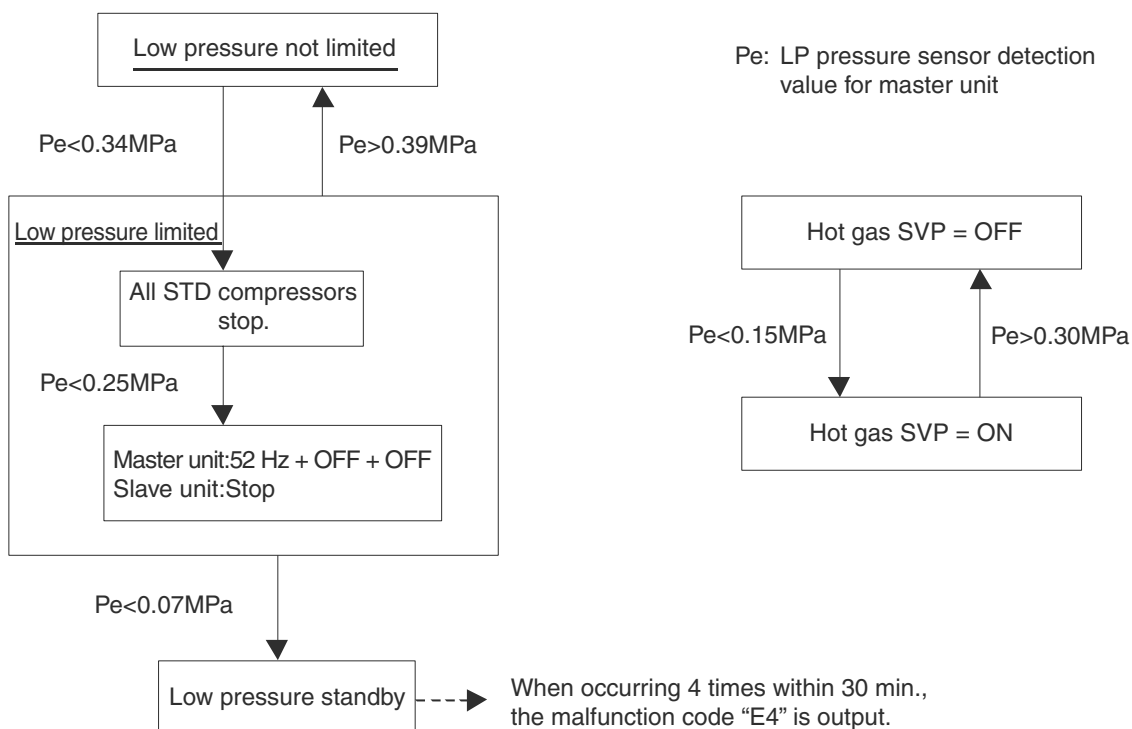


## 4.2 Low Pressure Protection Control

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

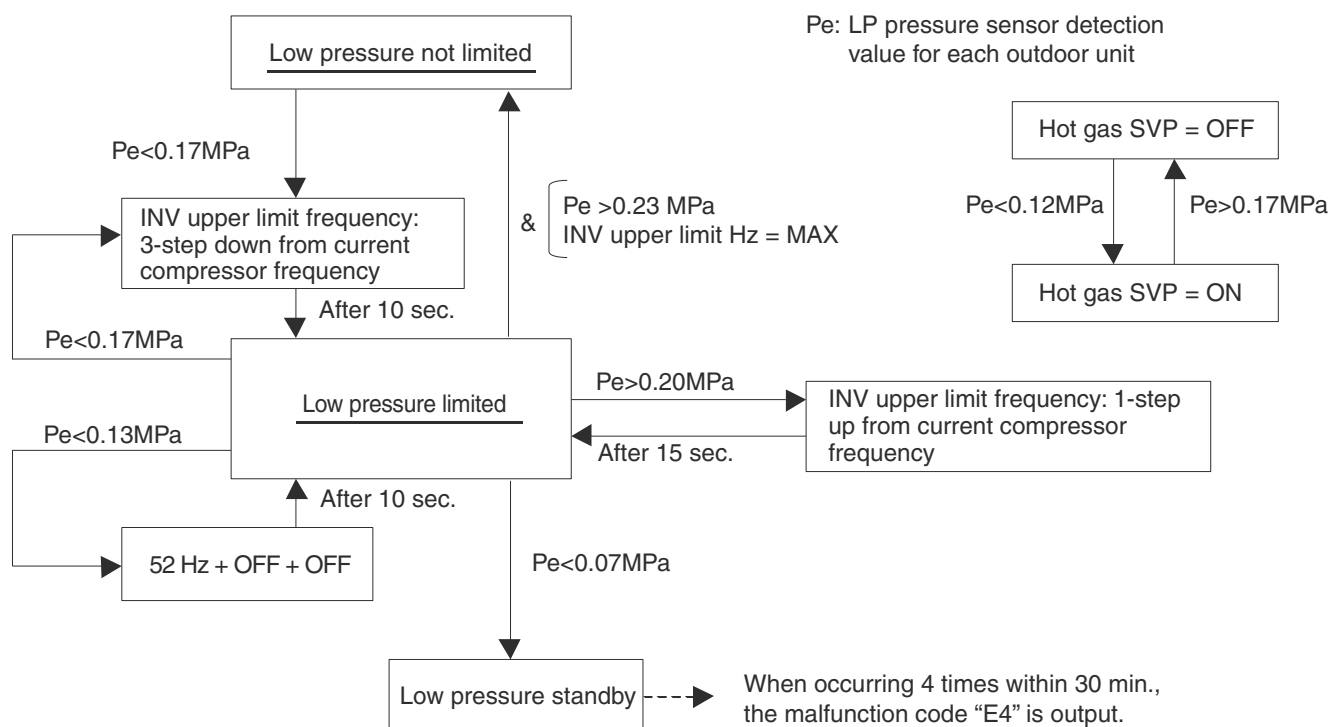
### [In cooling operation]

- ★ In the case of multi-outdoor-unit system, the entire system performs this control in the following sequence.



### [In heating operation]

- ★ In the case of multi-outdoor-unit system, each outdoor unit performs this control individually in the following sequence.

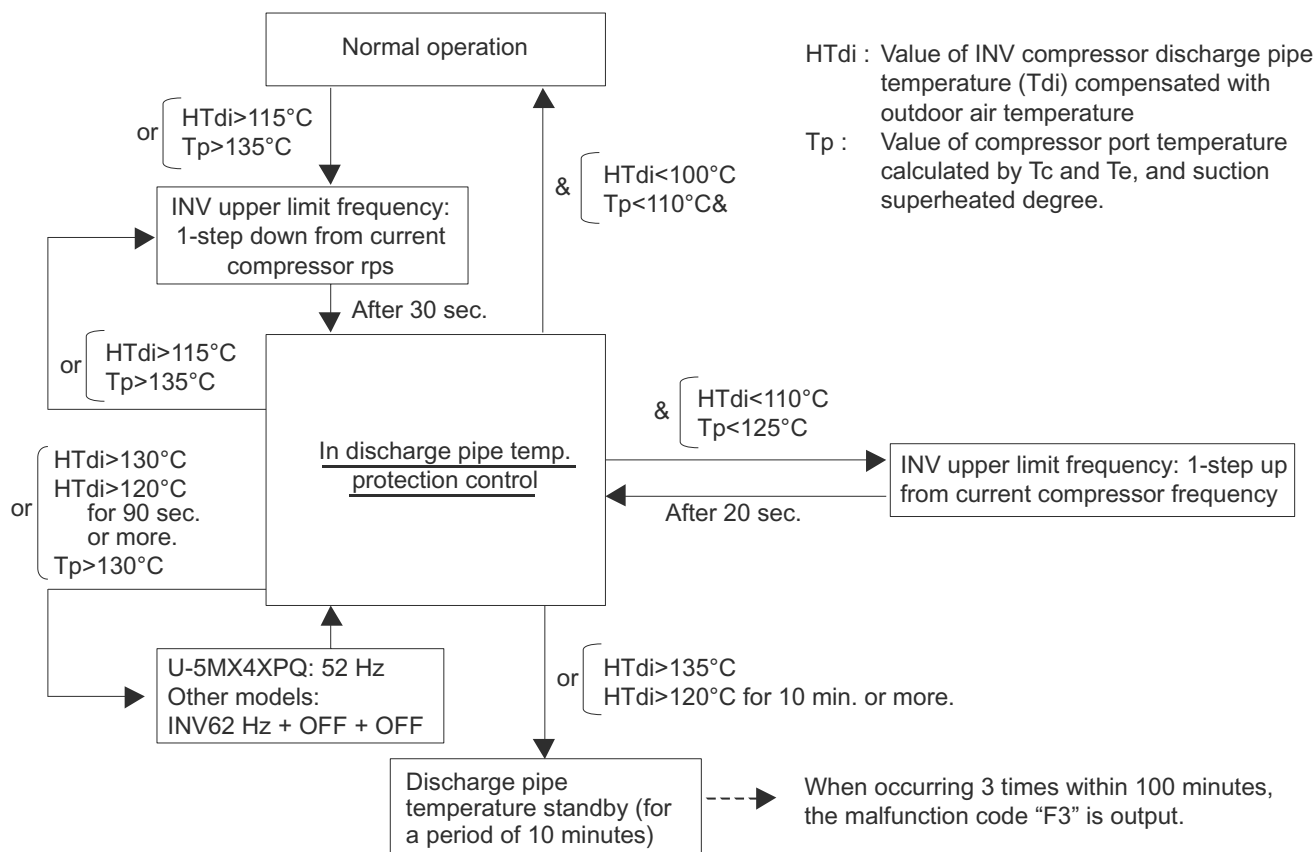


## 4.3 Discharge Pipe Protection Control

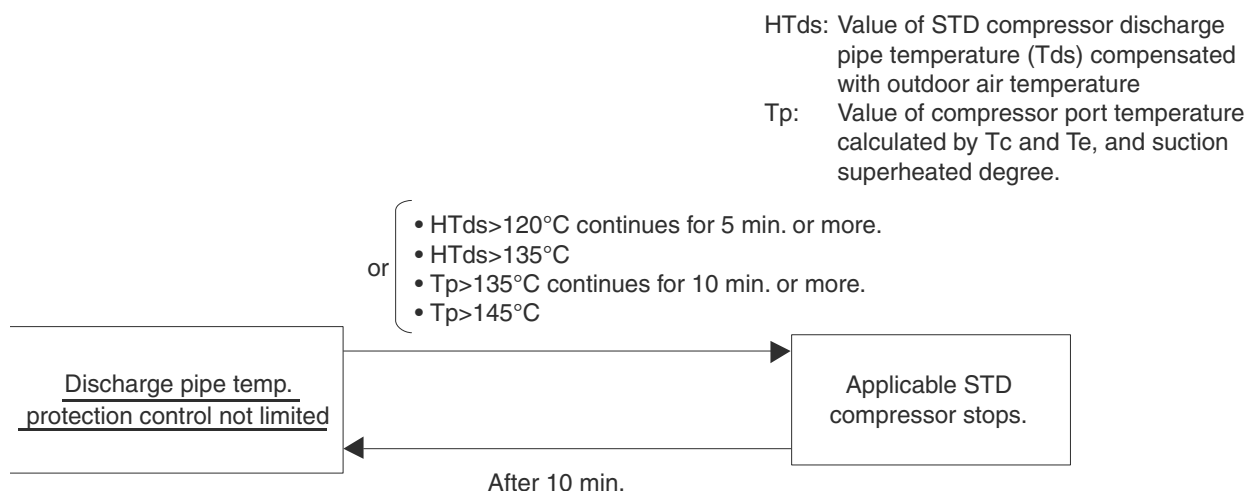
This discharge pipe protection control is used to protect the compressor internal temperature against a malfunction or transient increase of discharge pipe temperature.

- ★ Each compressor performs the discharge pipe temperature protection control individually in the following sequence.

### [INV compressor]



### [STD compressor]



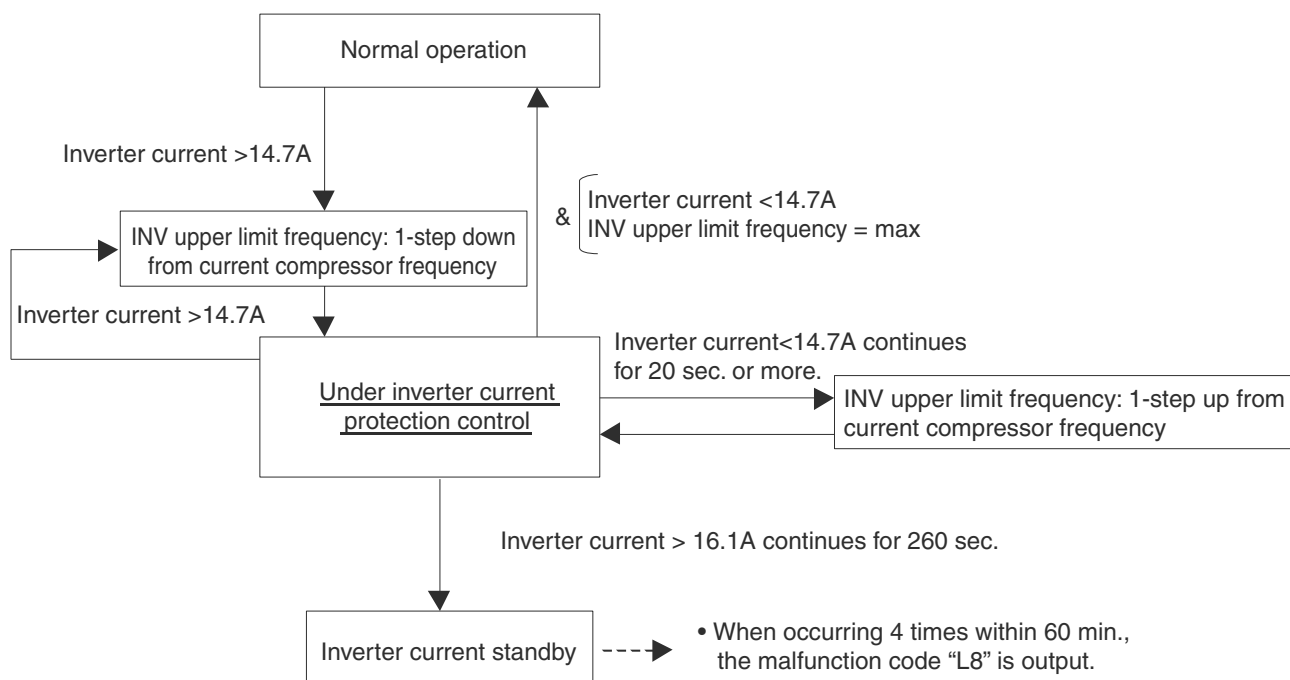


## 4.4 Inverter Protection Control

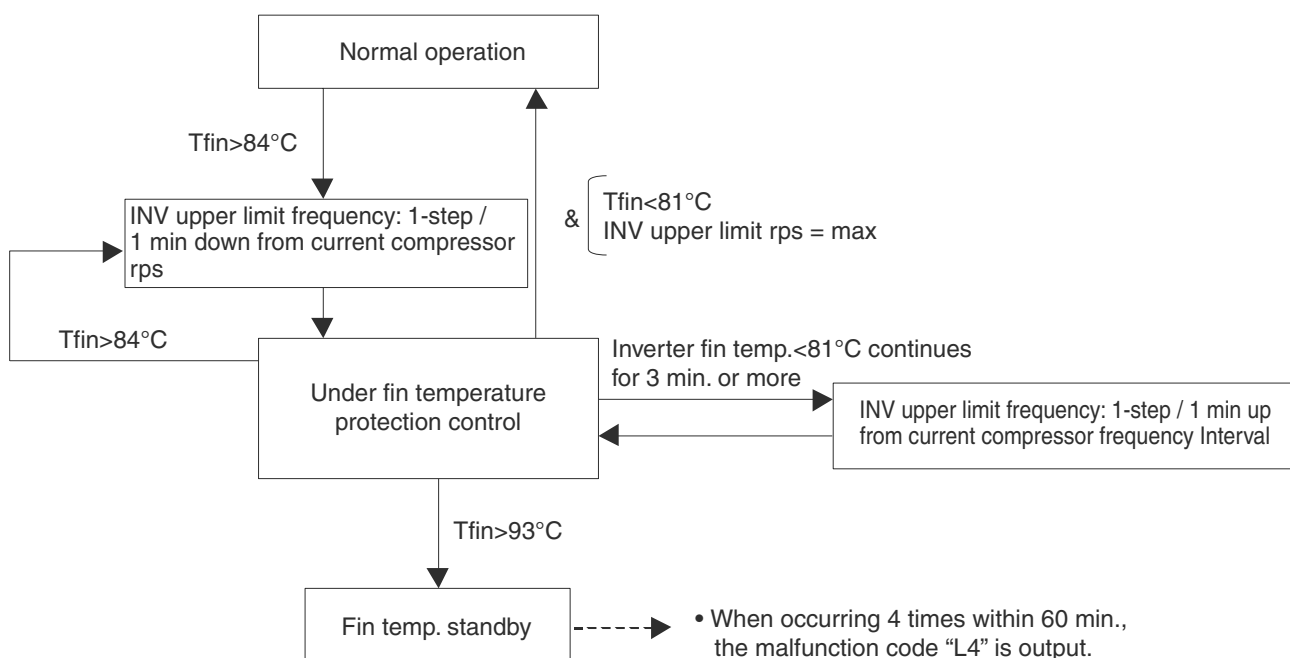
Inverter current protection control and inverter fin temperature control are performed to prevent tripping due to a malfunction, or transient inverter overcurrent, and fin temperature increase.

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

### [Inverter overcurrent protection control]

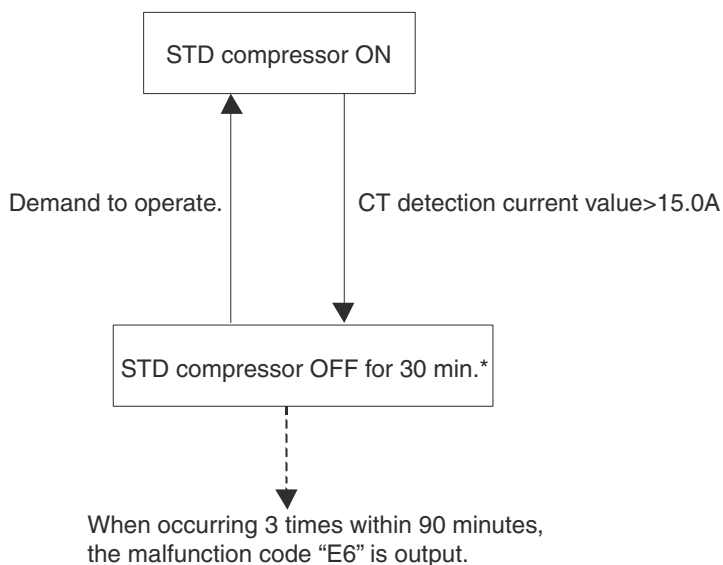


### [Inverter fin temperature control]



## 4.5 STD Compressor Overload Protection

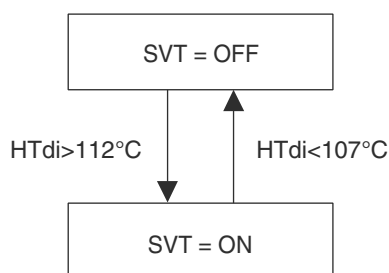
This control is used to prevent abnormal heating due to overcurrent to the compressor resulting from failures of STD compressor such as locking.



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

## 4.6 Injection Control (only for U-5MX4XPQ)

For transitional rise in discharge pipe temperature, have the liquid refrigerant flow into the suction side to reduce the discharge pipe temperature for the compressor protection.



HTdi: Correction value of the discharge pipe temperature on the INV compressor.

## 5. Other Control

### 5.1 Outdoor Unit Rotation

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

#### [Details of outdoor unit rotation]

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

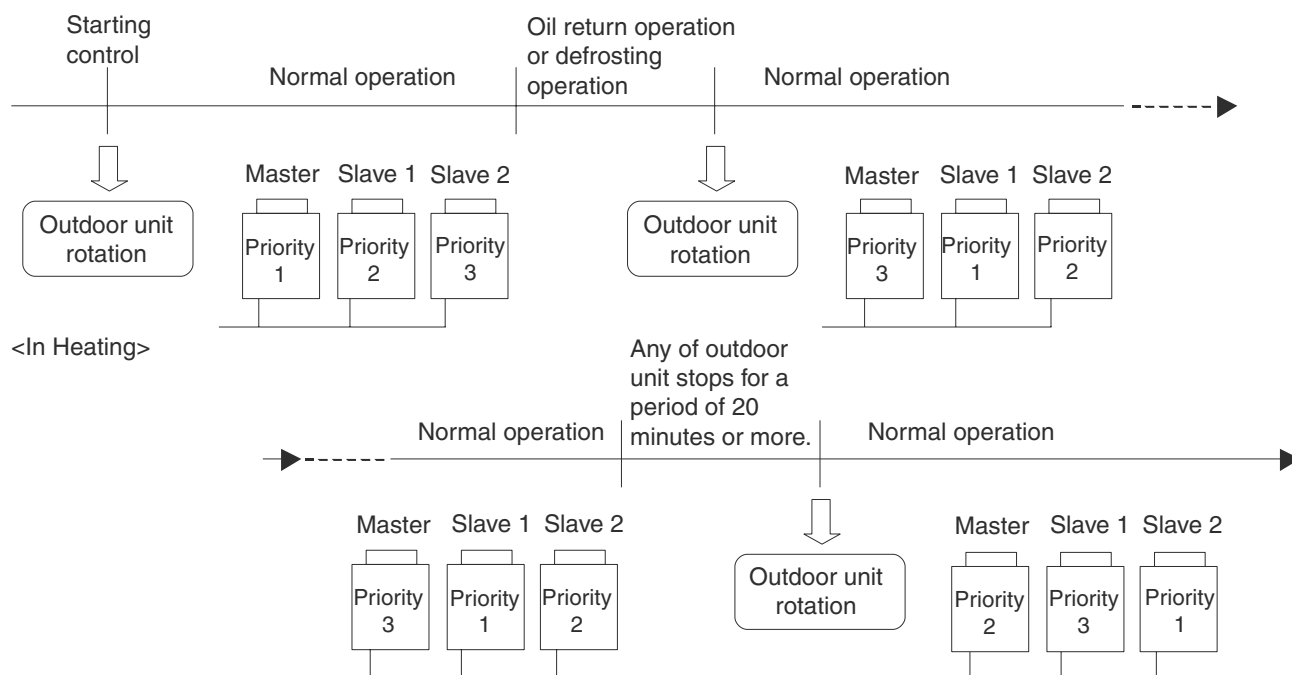
Outdoor unit rotation makes it possible to change the operating priority of outdoor units.

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

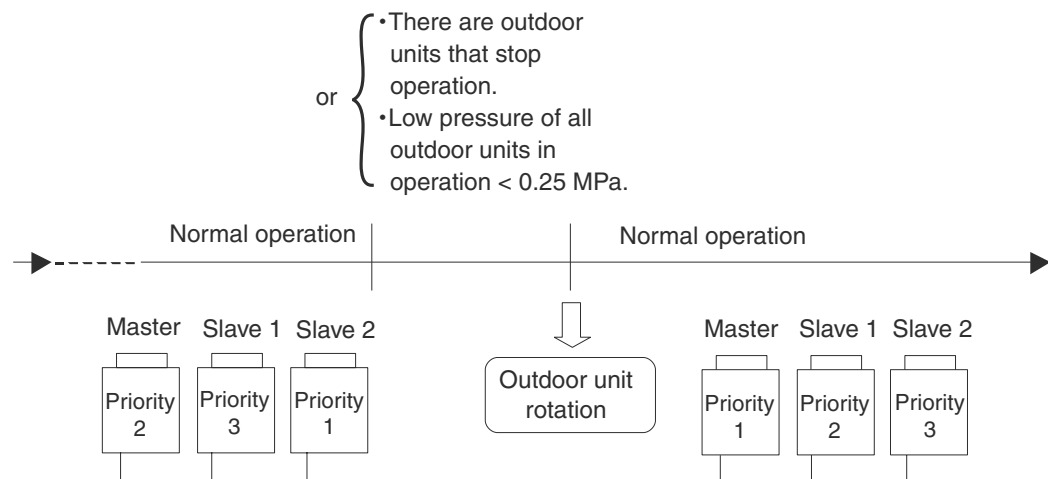
#### [Timing of outdoor unit rotation]

- or
- After oil return operation
  - After defrosting operation
  - At the beginning of the starting control
  - When any of outdoor unit stops for a period of 20 minutes or more (in heating)
  - There are outdoor units that stop operation (in cooling).
  - Low pressure of all outdoor units in operation is less than 0.25 MPa (in cooling).

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



&lt;In Cooling&gt;



- \* “Master unit”, “slave unit 1” and “slave unit 2” in this section are the names for installation. They are determined in installation work, and not changed thereafter. (These names are different from “master unit” and “slave unit” for control.)
- The outdoor unit connected the control wires (F1 and F2) for the indoor unit should be designated as main unit.
- Consequently, The LED display on the main PC board for “master unit”, “slave unit 1” and “slave unit 2” do not change. (Refer to the page 115.)

## 5.2 Emergency Operation

If the compressor cannot operate, this control inhibits any applicable compressor or outdoor unit from operating to perform emergency operation only with the operative compressor or outdoor unit.



### Caution

**In order to disable the compressor operation due to a failure or else, be sure to do so in emergency operation mode.**

**NEVER attempt to disconnect power supply wires from magnetic contactors or else. (Doing so will operate compressors in combination that disables oil equalization between the compressors, thus resulting in malfunctions of other normal compressors.)**

### 5.2.1 Restrictions for Emergency Operation

- In the case of system with 1 outdoor unit installed, only when thermostats of indoor units having a capacity of 50% or more of the outdoor unit capacity turn ON, the emergency operation is functional. (If the total capacity of indoor units with thermostat ON is small, the outdoor unit cannot operate.)
- If the emergency operation is set while the outdoor unit is in operation, the outdoor unit stops once after pump-down residual operation (a maximum of 5 minutes elapsed).

## 5.2.2 In the Case of 1-Outdoor-Unit System (U-8MX4XPQ to U-18MX4XPQ)

### [Set the system to operation prohibition mode by compressor]

- In order to set an INV compressor to operation prohibition mode, set No. 42 of Setting mode 2 to "EMERGENCY OPERATION".

LED display (●:ON ●:OFF ○:Blink)  
H1P — — — — H7P

(Procedure)

- (1) Press and hold the MODE button (BS1) for a period of 5 seconds or more.
- (2) Press the SET button (BS2) 42 times.
- (3) Press the RETURN button (BS3) once.
- (4) Press the SET button (BS2) once.
- (5) Press the RETURN button (BS3) twice.
- (6) Press the MODE button (BS1) once.

○ ● ● ● ● ● ● ●

○ ○ ● ○ ● ○ ● ● (Factory set)

○ ● ● ● ● ● ● ●

○ ● ● ● ● ● ● ●

○ ● ● ● ● ● ● ●

● ● ○ ● ● ● ● ●

- In order to set STD1 and STD2 compressors to operation prohibition mode, set No. 19 of Setting mode 2 to "STD1, 2 OPERATION PROHIBITION". (U-10MX4 to 18MX4)

LED display (●:ON ●:OFF ○:Blink)  
H1P — — — — H7P

(Procedure)

- (1) Press and hold the MODE button (BS1) for a period of 5 seconds or more.
- (2) Press the SET button (BS2) 19 times.
- (3) Press the RETURN button (BS3) once.
- (4) Press the SET button (BS2) once.
- (5) Press the RETURN button (BS3) twice.
- (6) Press the MODE button (BS1) once.

○ ● ● ● ● ● ● ●

○ ● ○ ● ● ○ ○ ○

○ ● ● ● ● ● ● ● (Factory set)

○ ● ● ● ● ● ● ●

○ ● ● ● ● ● ● ●

○ ● ● ● ● ● ● ●

● ● ○ ● ● ● ● ●

- In order to set the STD 2 compressor to operation prohibition mode, set No. 19 of Setting mode 2 to "STD2 OPERATION PROHIBITION". (U-14MX4XPQ, 16P, 18P)

LED display (●:ON ●:OFF ○:Blink)  
H1P — — — — H7P

(Procedure)

- (1) Press and hold the MODE button (BS1) for a period of 5 seconds or more.
- (2) Press the SET button (BS2) 19 times.
- (3) Press the RETURN button (BS3) once.
- (4) Press the SET button (BS2) twice.
- (5) Press the RETURN button (BS3) twice.
- (6) Press the MODE button (BS1) once.

○ ● ● ● ● ● ● ●

○ ● ○ ● ● ○ ○ ○

○ ● ● ● ● ● ● ● (Factory set)

○ ● ● ● ● ● ● ●

○ ● ● ● ● ● ● ●

○ ● ● ● ● ● ● ●

● ● ○ ● ● ● ● ●

- For U-14, 16 and 18MX4, if the INV compressor is set to operation prohibition mode, only a single STD compressor will operate for the convenience of oil equalization.
- For U-14, 16 and 18MX4, only the STD1 compressor cannot be put into operation prohibition mode for the convenience of oil equalization.
- For the system with a single outdoor unit (U-8MX4 to 18MX4), automatic backup operation is not functional.

## 5.2.3 In The Case of Multi-Outdoor-Unit System (U-20MX4XPQ to U-54MX4XPQ)

### [Automatic backup operation]

With multi-outdoor-unit system, if a certain outdoor unit system malfunctions (i.e., the system stops and indoor unit remote control displays the malfunction), by resetting the system with the indoor unit remote control, the applicable outdoor unit is inhibited from operating for 8 hours, thus making it possible to perform emergency operation automatically.

However, in the event any of the following malfunctions occurs, automatic backup operation can be performed.

Malfunctions under which automatic backup operation can be performed:

- E3, E4, E5, E7
- F3
- H7, H9
- J2, J3, J5, J6, J7, J9, JA, JC
- L3, L4, L5, L8, L9, LC
- U2, UJ



**Note :** In order to forcibly clear the automatic backup operation, reset the power supply with the outdoor unit in the stopped state.

### [Emergency operation with settings in service mode]

\* "Inhibition of operation" is set with each outdoor unit.

Make the following settings with the master unit. (Setting with the slave unit becomes disabled.)

\* Discriminate the operating status of the master unit / slave units through the following LED display.

LED display (●:ON ●:OFF ○:Blink)  
H1P — — — H7P H8P

Master: ●●○●●●●○  
Slave 1: ●●●●●●●○  
Slave 2: ●●●●●●●●  
(Factory set)

- In order to set the master unit to operation prohibition mode, set No. 38 of Setting mode 2 to "MASTER OPERATION PROHIBITION".

(Procedure)

- (1) Press and hold the MODE button (BS1) for a period of 5 seconds or more.
- (2) Press the SET button (BS2) 38 times.
- (3) Press the RETURN button (BS3) once.
- (4) Press the SET button (BS2) once.
- (5) Press the RETURN button (BS3) twice.
- (6) Press the MODE button (BS1) once.

LED display (●:ON ●:OFF ○:Blink)  
H1P — — — H7P

○●●●●●●●  
○●●●●●●●  
○●●●●●●● (Factory set)  
○●●●●●●●  
○●●●●●●●  
●●○●●●●●

- In order to set the slave unit 1 to operation prohibition mode, set No. 39 of Setting mode 2 to "SLAVE 1 OPERATION PROHIBITION".

(Procedure)

- (1) Press and hold the MODE button (BS1) for a period of 5 seconds or more.
- (2) Press the SET button (BS2) 39 times.
- (3) Press the RETURN button (BS3) once.
- (4) Press the SET button (BS2) once.
- (5) Press the RETURN button (BS3) twice.
- (6) Press the MODE button (BS1) once.

LED display (●:ON ●:OFF ○:Blink)  
H1P — — — H7P

○●●●●●●●  
○●●●●●●●  
○●●●●●●● (Factory set)  
○●●●●●●●  
○●●●●●●●  
●●○●●●●●

- In order to set the slave unit 2 to operation prohibition mode, set No. 40 of Setting mode 2 to "SLAVE 2 OPERATION PROHIBITION".

(Procedure)

- (1) Press and hold the MODE button (BS1) for a period of 5 seconds or more.
- (2) Press the SET button (BS2) 40 times.
- (3) Press the RETURN button (BS3) once.
- (4) Press the SET button (BS2) once.
- (5) Press the RETURN button (BS3) twice.
- (6) Press the MODE button (BS1) once.

LED display (●:ON ●:OFF ○:Blink)  
H1P — — — H7P

○●●●●●●●  
○●●●●●●●  
○●●●●●●● (Factory set)  
○●●●●●●●  
○●●●●●●●  
●●○●●●●●

\*

- In the case of multi-outdoor-unit system, "Inhibition of operation" is not set with each compressor individually.
- In the case of multi-outdoor-unit system, when the above "Inhibition of operation" is set, outdoor unit rotation is not functional.



Note :

**Reset the power supply during the outdoor unit is stopping to cancel the automatic backup operation forcibly.**

## 5.3 Demand Operation

In order to save the power consumption, the capacity of outdoor unit is saved with control forcibly by using “Demand 1 Setting” or “Demand 2 Setting”.

To operate the unit with this mode, additional setting of “Continuous Demand Setting” or external input by external control adapter is required.

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

## 5.4 Heating Operation Prohibition

Heating operation is prohibited above 24°C ambient temperature.

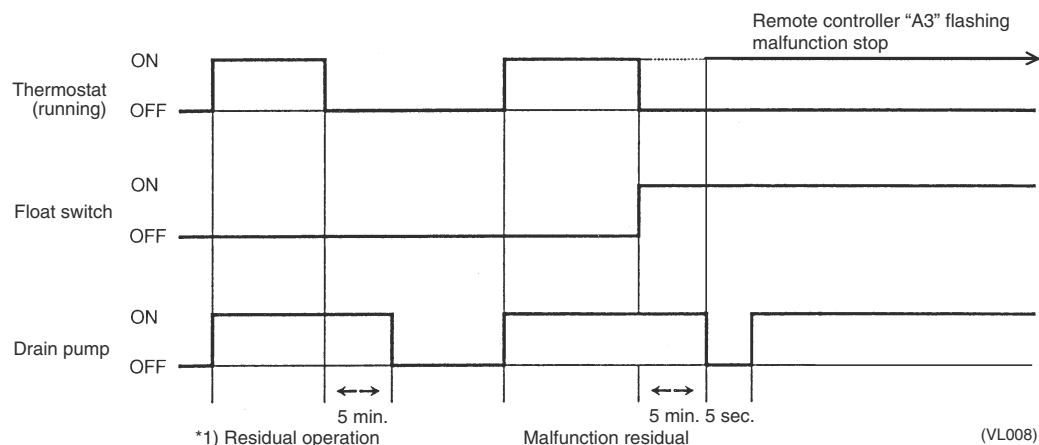


## 6. Outline of Control (Indoor Unit)

### 6.1 Drain Pump Control

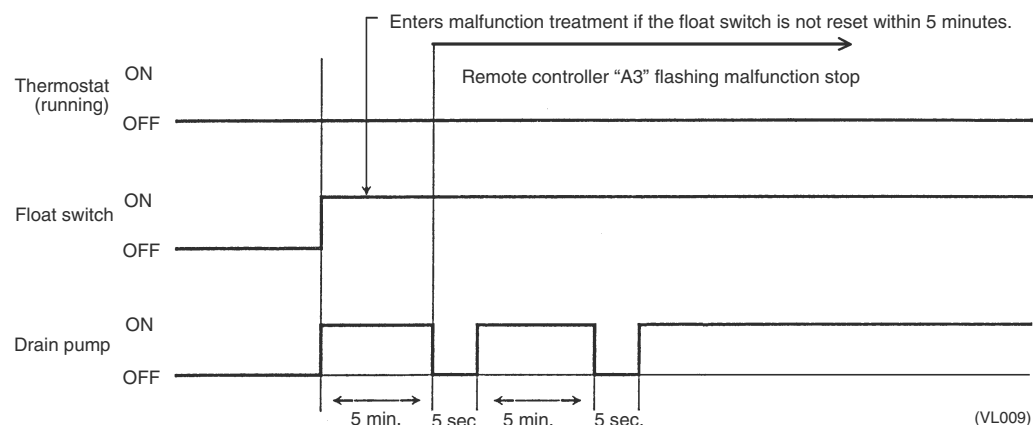
- The drain pump is controlled by the ON/OFF buttons (4 button (1) - (4) given in the figure below).

#### 6.1.1 When the Float Switch is Tripped While the Cooling Thermostat is ON:

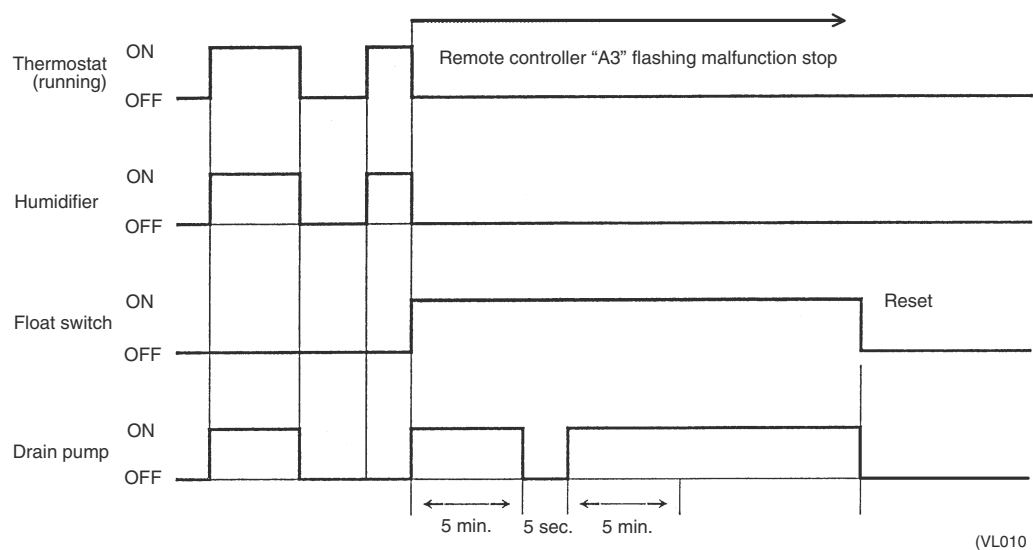


\* 1. The objective of residual operation is to completely drain any moisture adhering to the fin of the indoor unit heat exchanger when the thermostat goes off during cooling operation.

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

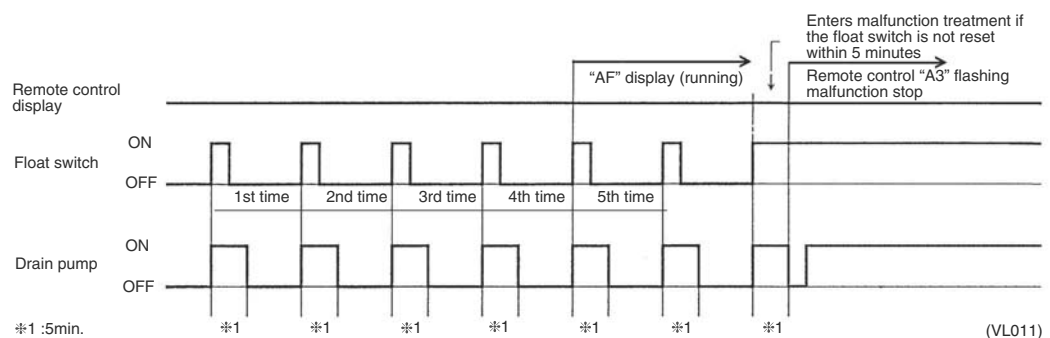


### 6.1.3 When the Float Switch is Tripped During Heating Operation:



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

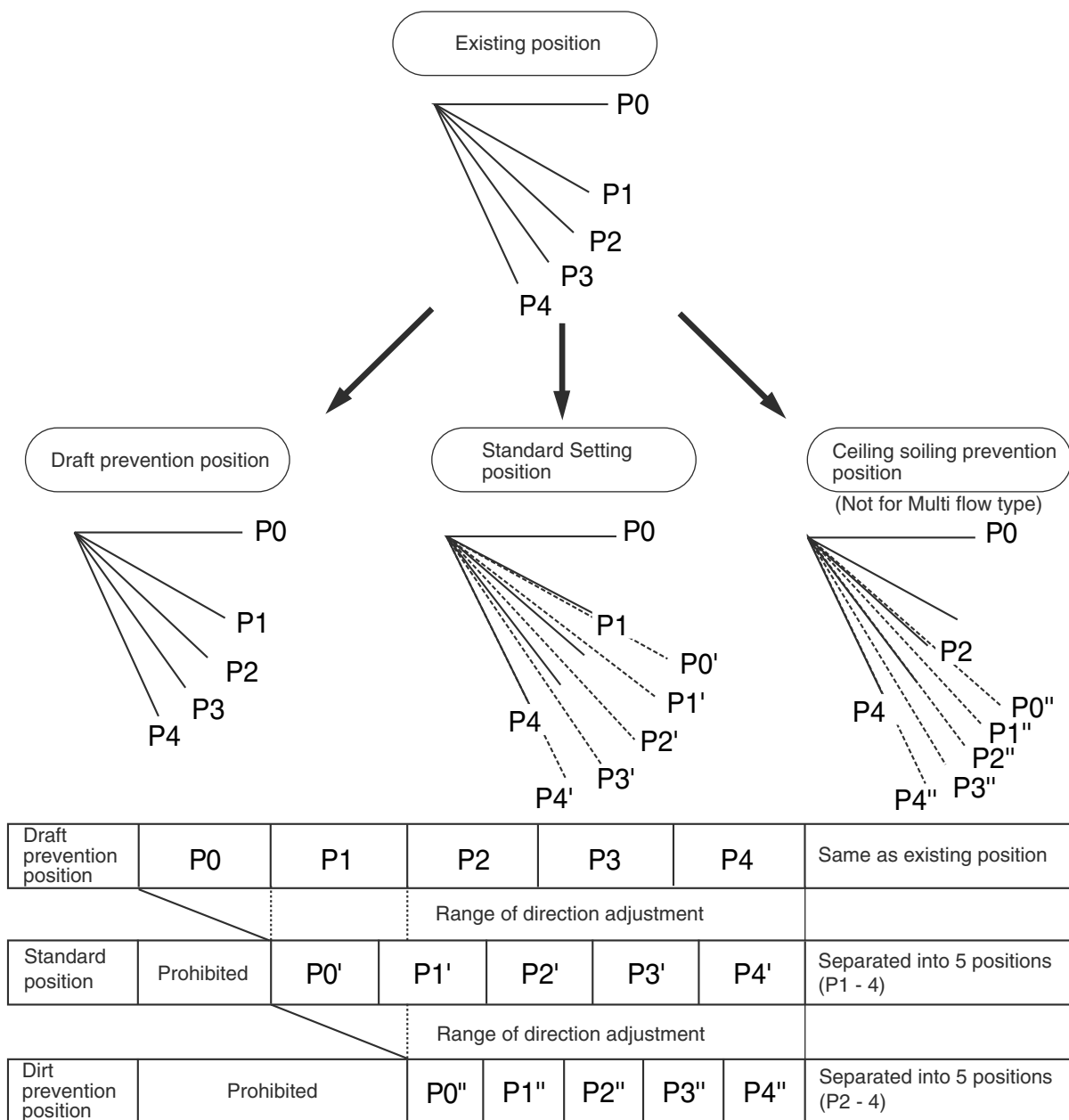
### 6.1.4 When the Float Switch is Tripped and "AF" is Displayed on the Remote Control:



**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.

## 6.2 Louver Control for Preventing Ceiling Dirt

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



The factory set position is standard position.

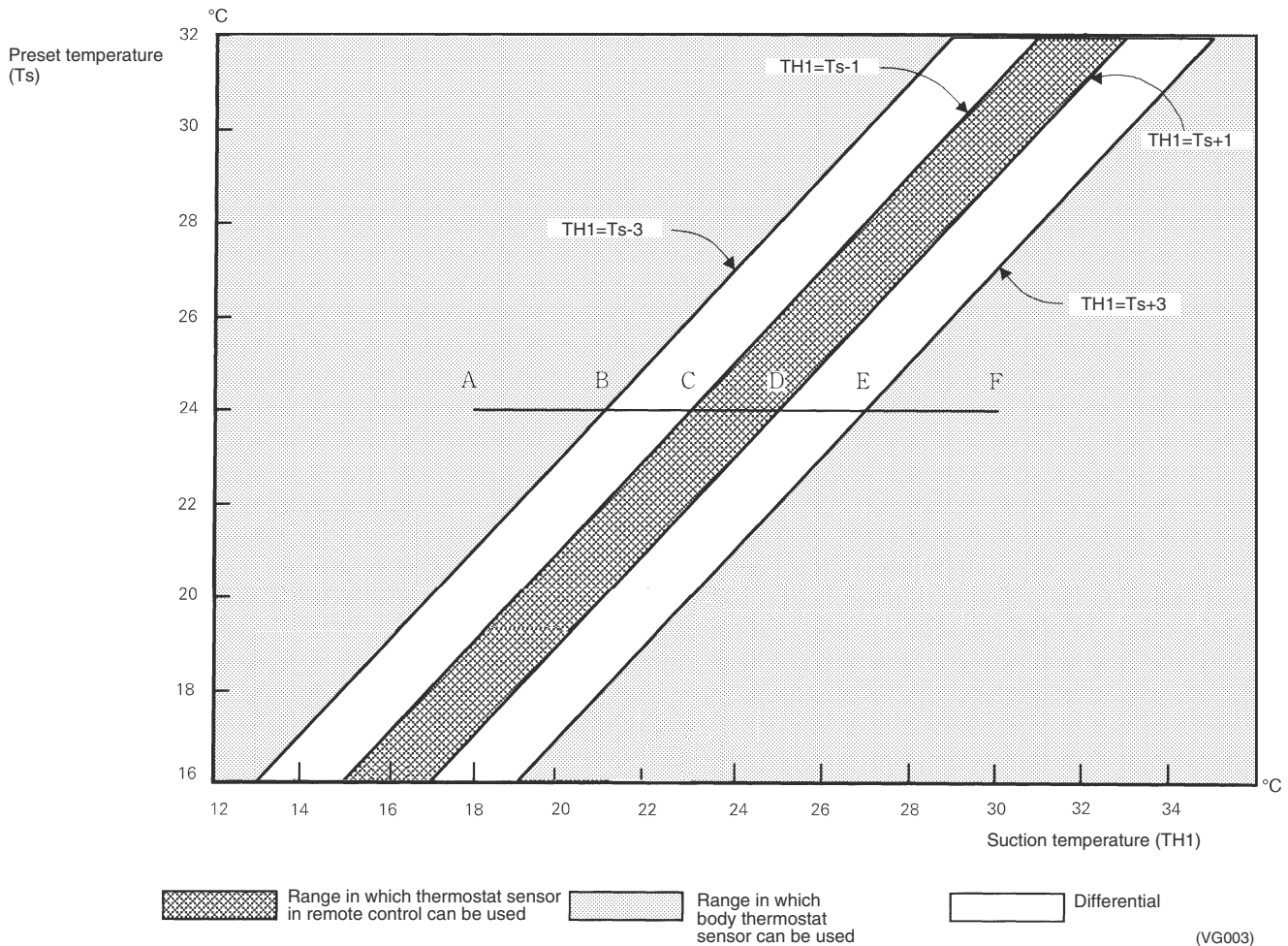
(VL012)

## 6.3 Thermostat Sensor in Remote Control

Temperature is controlled by both the thermostat sensor in remote control and air suction thermostat in the indoor unit. (This is however limited to when the field setting for the thermostat sensor in remote control 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 control 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 control 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):**

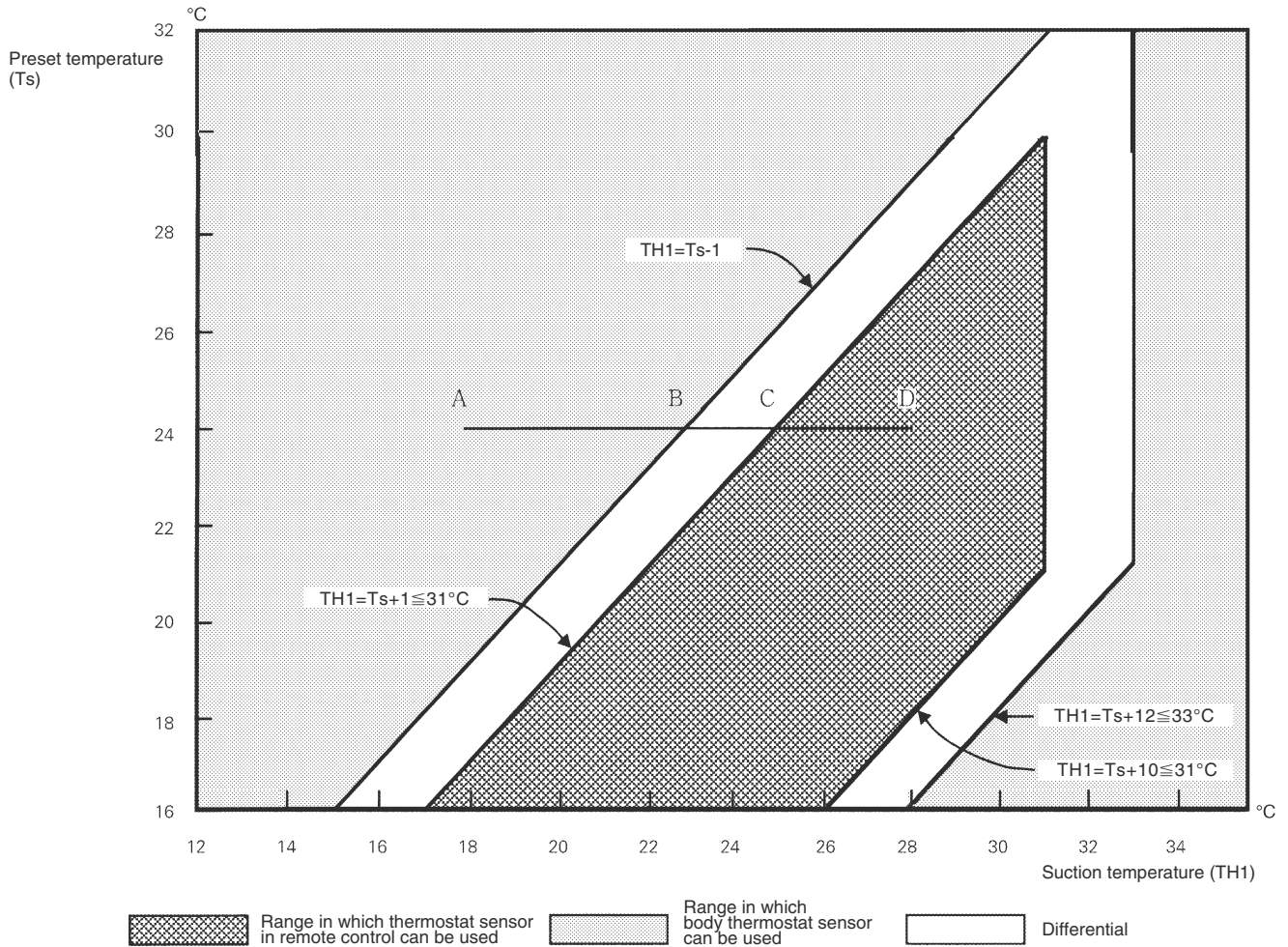
Body thermostat sensor is used for temperatures from 30°C to 25°C (F → D).

Remote control 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 control can be used so that suction temperature is higher than the preset temperature.



(V2769)

■ **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 → D):**

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

Body thermostat sensor is used for temperatures from 18°C to 25°C (A → C).

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

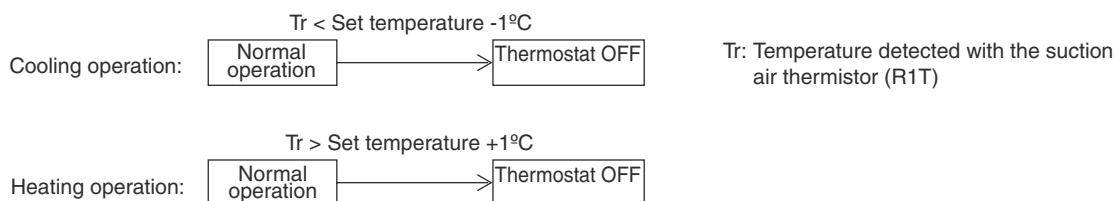
**And, assuming suction temperature has changed from 28°C to 18°C (D → A):**

Remote control 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).

## 6.4 Thermostat Control While in Normal Operation

VRF multi systems are set at factory to thermostat control mode using the remote control. While in normal thermostat differential control mode (i.e., factory set mode), the thermostat turns OFF when the system reaches a temperature of  $-1^{\circ}\text{C}$  from the set temperature while in cooling operation or of  $+1^{\circ}\text{C}$  from that while in heating operation.

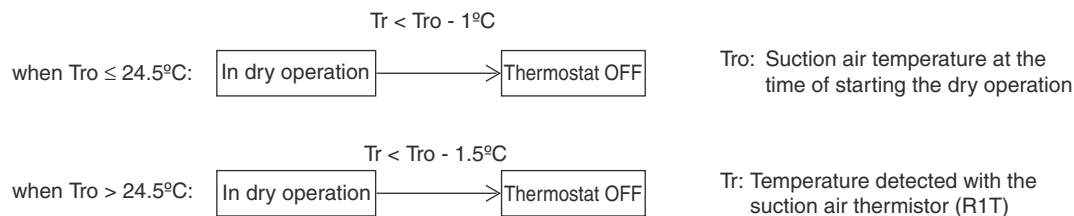


While in a single remote control group control, the body thermostat is only used for this control. Furthermore, while in heating operation, cassette-mounted indoor units conduct the thermostat control by a value compensated by  $-2^{\circ}\text{C}$  for the value detected with the body thermostat. (Through field settings, the thermostat differential setting can be changed from  $1^{\circ}\text{C}$  to  $0.5^{\circ}\text{C}$ . For details on the changing procedure, refer to information on page onward.)

## 6.5 Thermostat Control in Dry Operation

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

Assuming that the suction air temperature at the time of starting the dry operation is  $T_{ro}$  and the suction air temperature in operation is  $T_r$ ,



Furthermore, while in dry operation mode, fans operate at L flow rate, stops for a period of six minutes while the thermostat is OFF, and then return to operation at L flow rate. (This control is used to prevent a rise in indoor temperature while in thermostat OFF mode.)

## 6.6 Electronic expansion Valve Control

### • Electronic expansion Valve Control

In cooling, to maximize the capacity of indoor unit heat exchanger (evaporator), operate the electronic expansion valve under PI control so that the evaporator outlet superheated degree (SH) will become constant.

In heating, to maximize the capacity of indoor unit heat exchanger (condenser), operate the electronic expansion valve under PI control so that the evaporator outlet superheated degree (Condenser outlet subcooled degree) will become constant.

Cooling  $SH = TH_2 - TH_1$   
(Heating  $SC = TC - TH_1$ )

SH : Evaporator outlet superheated degree  
TH<sub>1</sub>: Temperature (°C) detected with the liquid thermistor  
TH<sub>2</sub>: Temperature (°C) detected with the gas thermistor  
SC : Condenser outlet subcooled degree  
TC : High pressure equivalent saturated temperature

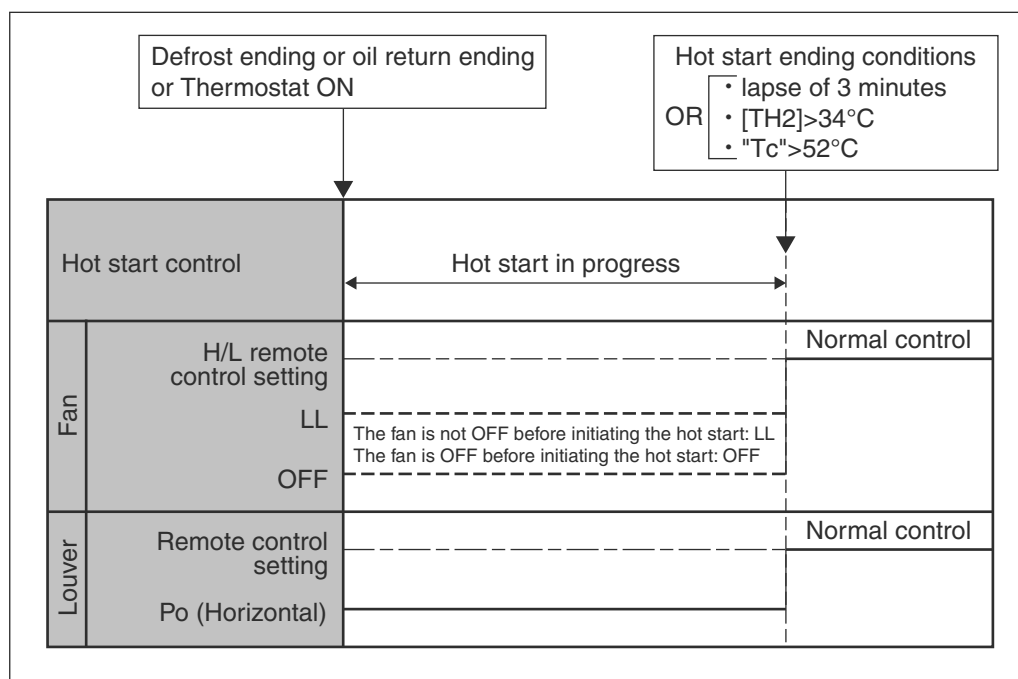
Furthermore, the default value of the optimal evaporator outlet superheated degree (condenser outlet subcooled degree) is 5 deg. However, this default value varies with the operating performance.

## 6.7 Hot Start Control (In Heating Operation Only)

At startup with thermostat ON or after the completion of defrosting in heating operation, the indoor unit fan is controlled to prevent cold air from blasting out and ensure startup capacity.

### [Detail of operation]

When either the **start condition 1** or the **start condition 2** is established, the operations shown below will be conducted.



TH<sub>2</sub>: Temperature (°C) detected with the gas thermistor

TC : High pressure equivalent saturated temperature

## 6.8 Freeze Prevention

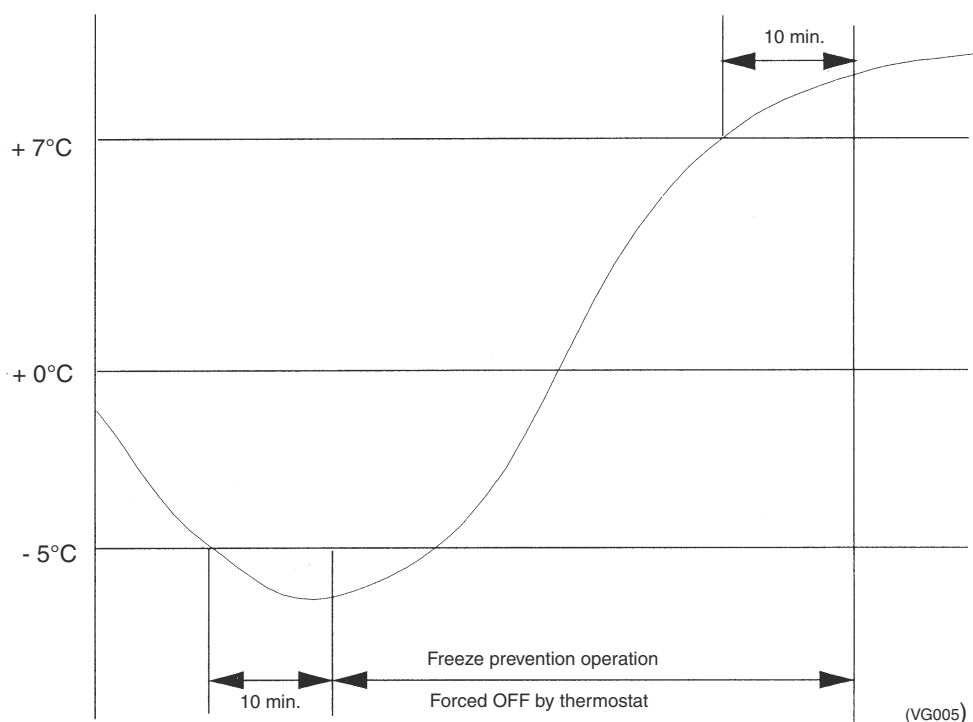
### Freeze Prevention by Off Cycle (Indoor Unit)

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  $-1^{\circ}\text{C}$  or less for total of 40 min., or temperature is  $-5^{\circ}\text{C}$  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  $-5^{\circ}\text{C}$  or less for total of 10 min.

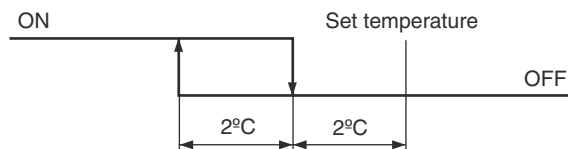


## 6.9 Heater Control

The heater control is conducted in the following manner.

### [Normal control]

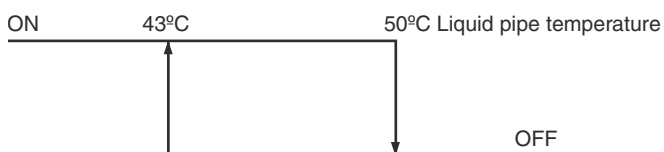
While in heating operation, the heater control (ON/OFF) is conducted as shown on the right.



### [Overload control]

When the system is overloaded in heating operation, the heater will be turned OFF in the following two manners.

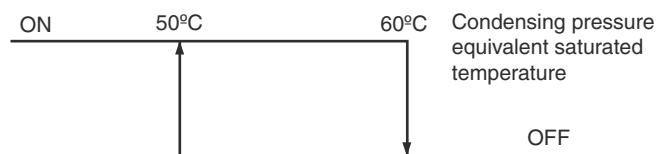
(1) The heater control (ON/OFF) is conducted through the liquid pipe temperature (R2T) of the indoor unit.





(2) The heater control (ON/OFF)

is conducted by converting the heater temperature into the condensing pressure equivalent saturated temperature (Tc) according to the temperature detection through the high pressure sensor (SINPH) of the outdoor unit.



#### [Fan residual operation]

While the heater turns OFF, in order to prevent the activation of the thermal protector, the fan conducts residual operation for a given period of time after the heater turns OFF. (This operation is conducted regardless of with or without heater equipped.)

Residual operation time = 100 seconds on ceiling suspended type or 60 seconds on other types

## 6.10 List of Swing Flap Operations

Swing flaps operate as shown in table below.

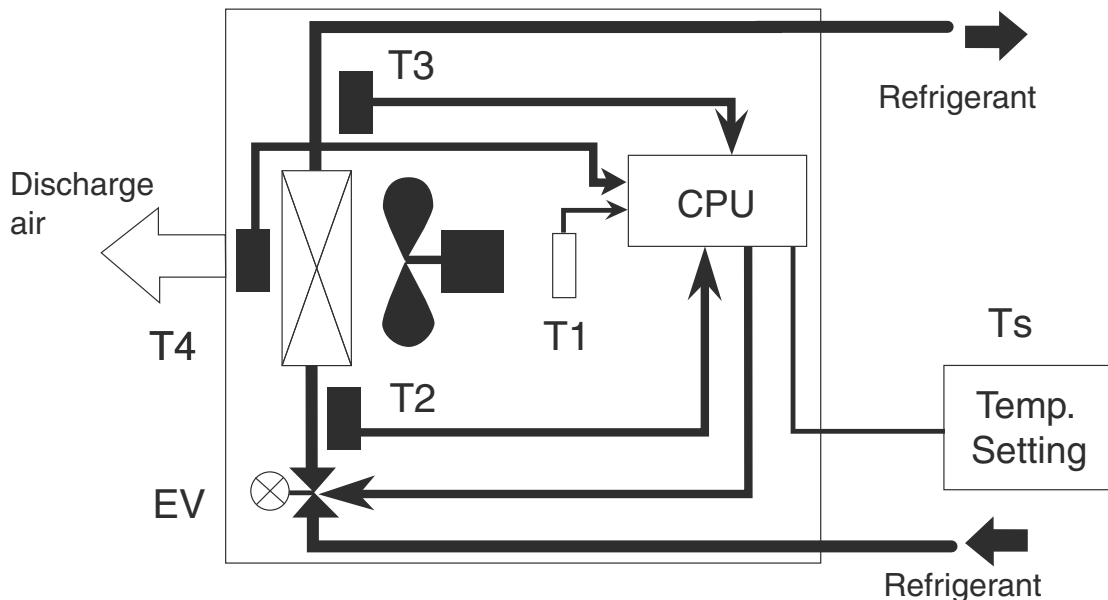
			Fan	Flap		
				YM3	LM3 TM3 DM3	KM3
Heating	Hot start from defrosting operation	Swing	OFF	Horizontal	Horizontal	Horizontal
		Wind direction set	OFF	Horizontal	Horizontal	Horizontal
	Defrosting operation	Swing	OFF	Horizontal	Horizontal	Horizontal
		Wind direction set	OFF	Horizontal	Horizontal	Horizontal
	Thermostat OFF	Swing	LL	Horizontal	Horizontal	Horizontal
		Wind direction set	LL	Horizontal	Horizontal	Horizontal
	Hot start from thermostat OFF mode (for prevention of cold air)	Swing	LL	Horizontal	Horizontal	Horizontal
		Wind direction set	LL	Horizontal	Horizontal	Horizontal
Cooling	Thermostat ON in dry operation using micro computer	Swing	L* <sup>1</sup>	Swing	Swing	Swing
		Wind direction set	L* <sup>1</sup>	Set	Set	Set
	Thermostat OFF in dry operation using micro computer	Swing	OFF or L	Swing	Swing	Swing
		Wind direction set	OFF or L	Set	Set	Set
	Thermostat OFF in cooling	Swing	Set	Swing	Swing	Swing
		Wind direction set	Set	Set	Set	Set
	Stop	Swing	OFF	Horizontal	Horizontal	Totally closed
		Wind direction set	OFF	Set	Horizontal	Totally closed
	Micro computer control (including cooling operation)	Swing	L	Swing	Swing	Swing
		Wind direction set	L	Set	Set	Set

\*1. L or LL only on LM3 models

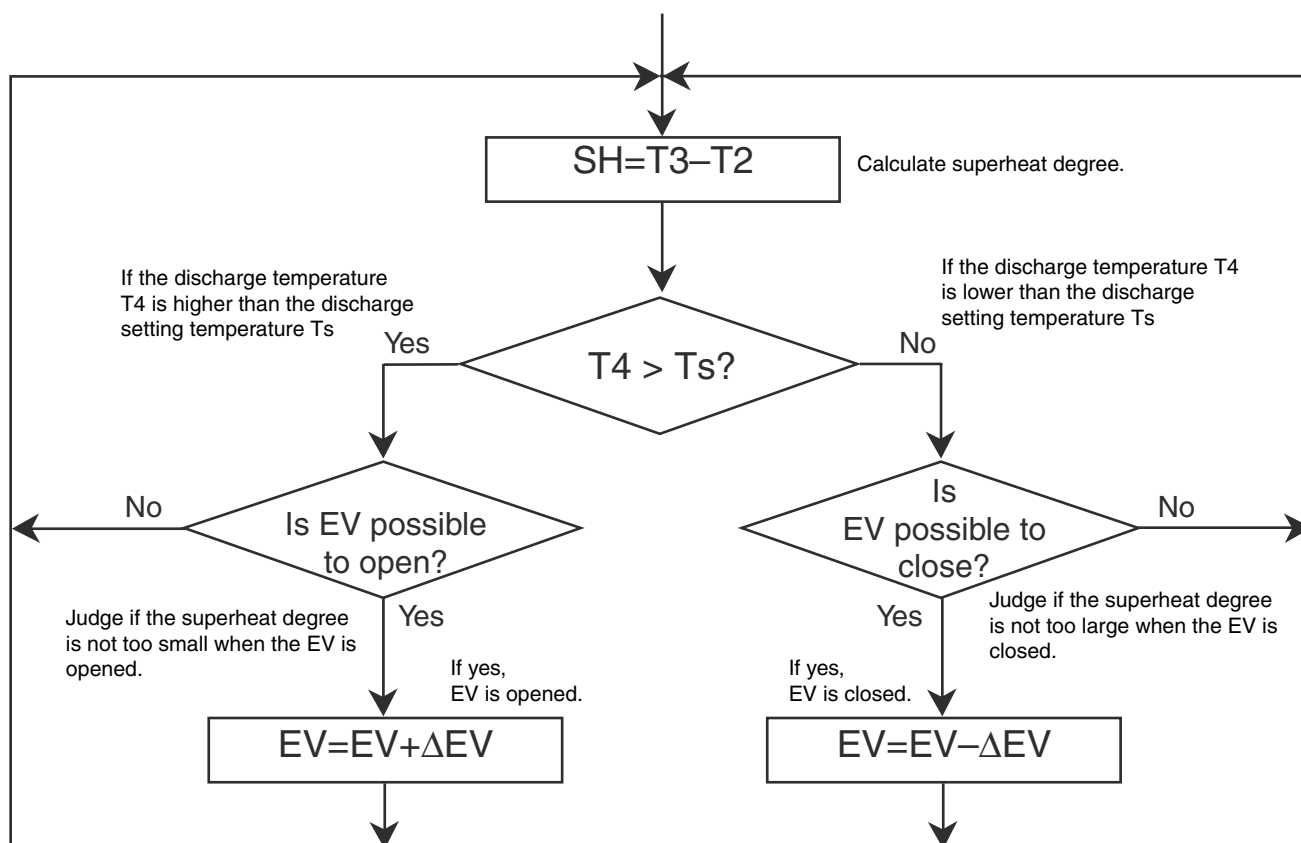
## 6.10.1 Discharge Air Temperature Control

Used to control the EV (electronic expansion valve) opening and thermostat ON/OFF so as to keep the discharge air temperature at the set temperature.

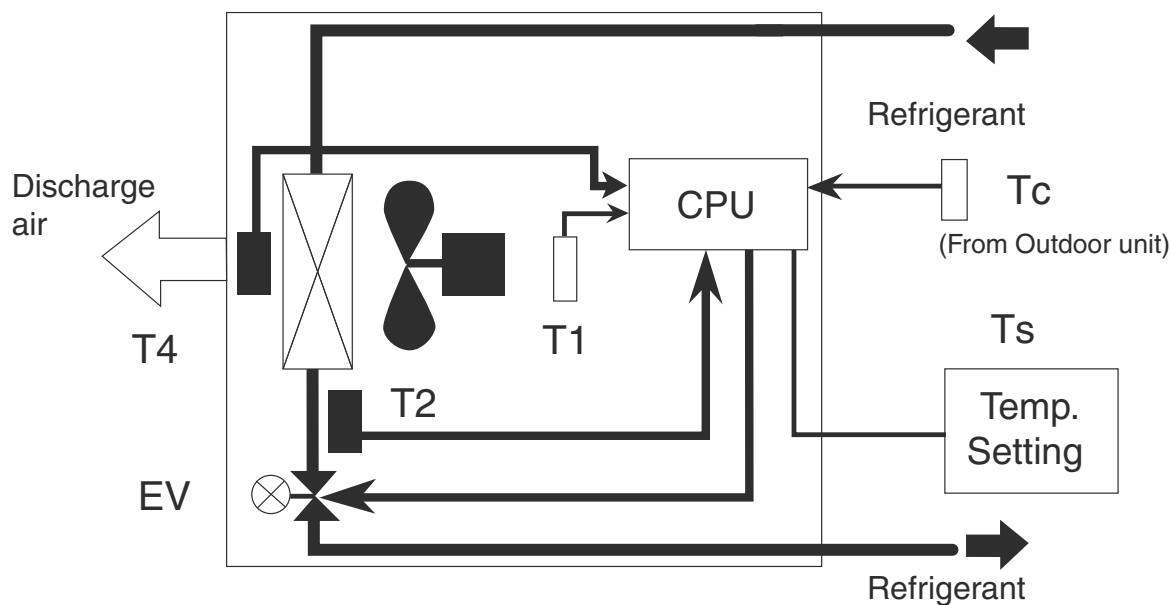
### (1) Cooling operations



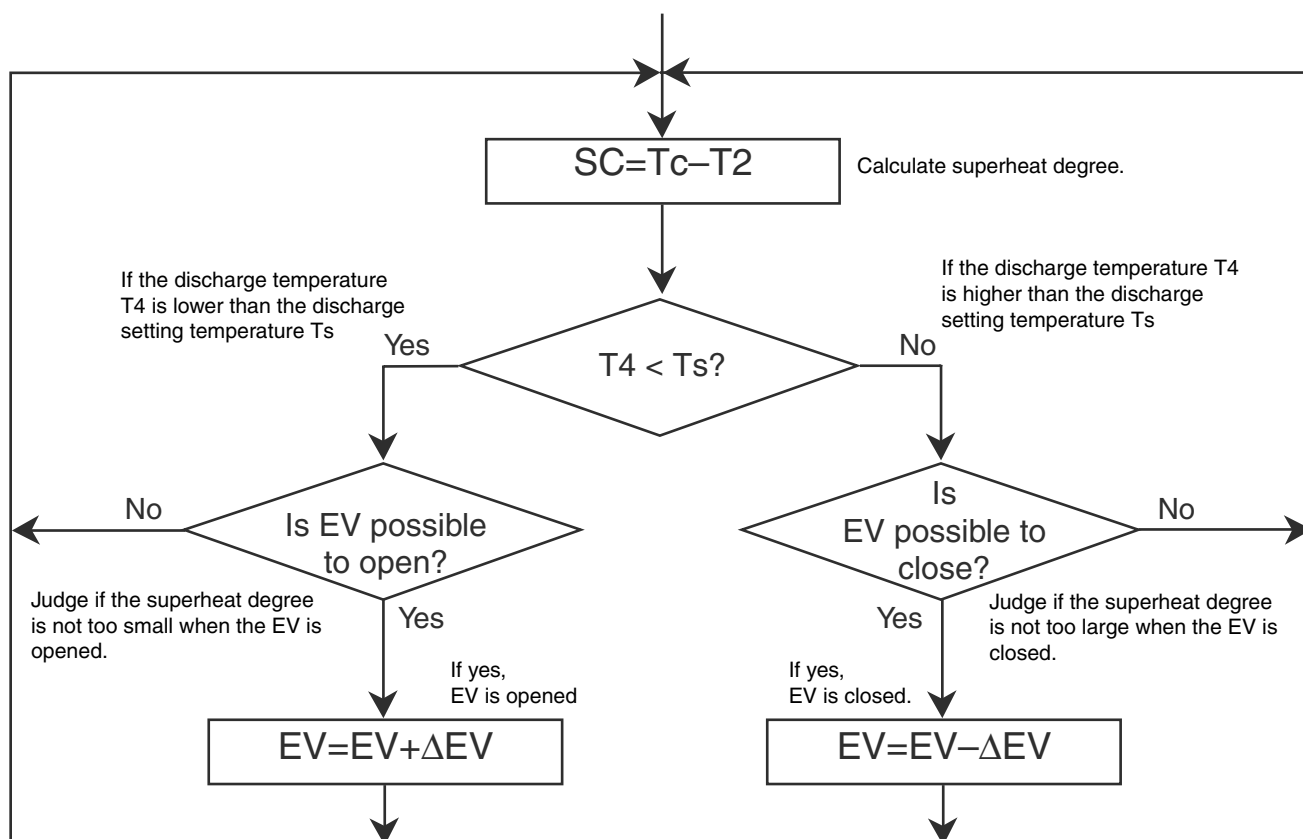
T1: Temperature detected by suction air thermistor Th1  
 T2: Temperature detected by liquid pipe temp. thermistor Th2  
 T3: Temperature detected by gas pipe temp. thermistor Th3  
 T4: Temperature detected by discharge air thermistor Th4  
 EV: Electronic expansion valve opening



## (2) Heating operations



T1: Temperature detected by suction air thermistor Th1  
T2: Temperature detected by liquid pipe temp. thermistor Th2  
T3: Temperature detected by gas pipe temp. thermistor Th3  
T4: Temperature detected by discharge air thermistor Th4  
Tc : Outdoor unit condensing temperature  
EV: Electronic expansion valve opening



**(3) Thermostat OFF by discharge air temperature****<Cooling>**

Target discharge air temp.  $T_s$  – Discharge air temp.  $T_4$

>5 degree continue for 5 minutes.

→Thermostat stops for 1 minute. →Thermostat ON

**<Heating>**

& { Discharge air temp.  $T_4$  – Target discharge air temp.  $T_s$  >5 degree } continue for 5  
 { EV opening is low limit } minutes

→Thermostat stops for 1 minute. →Thermostat ON

**6.10.2 Low Outdoor Air Temperature Protection Control****Objective**

In cooling (or fan operation) or heating, if outdoor air is low in temperature, stop the fan forcibly.

**Details****[Cooling and fan operation]**

Turn OFF the fan for a period of 60 minutes at a suction temperature of 5°C or lower.

In order to monitor the outdoor air temperature, however, turn ON the fan for a period of one minute and turn OFF the fan again at a temperature of 5°C or lower after the said timer completes the operative period.

Reset the 60-minute timer when the fan stops running.

**[Heating]**

Turn OFF the fan for a period of 60 minutes at a suction temperature of –5°C or lower.

In order to monitor the outdoor air temperature, however, turn ON the fan for a period of one minute and turn OFF the fan again at a temperature of –5°C or lower after the said timer completes the operative period.

Reset the 60-minute timer when the fan stops running.

\* The thermostat will not turn ON in one minute due to the temperature while the fan stops.

- This control shall be disabled at test run both in cooling and heating. (The test run shall be conducted first.)

# Part 5

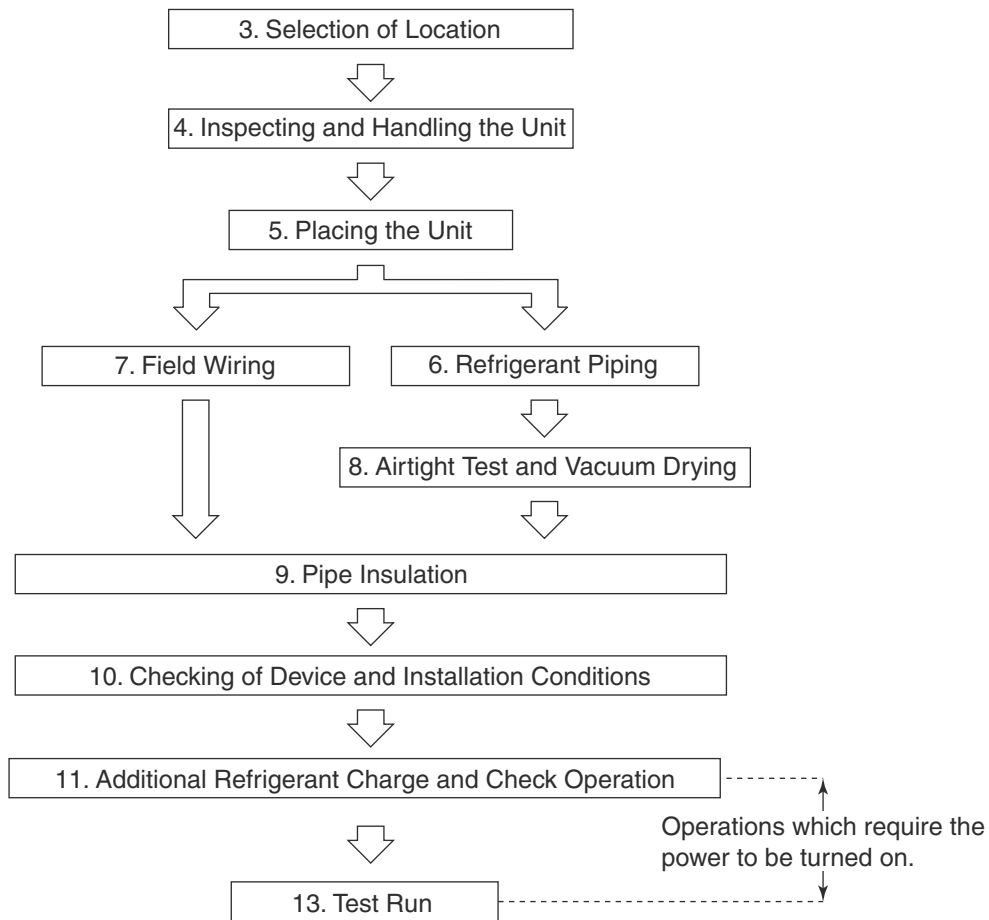
## Test Operation

1. Test Operation .....	130
1.1 Installation Process .....	130
1.2 Procedure and Outline.....	131
1.3 Operation When Power is Turned On .....	145
2. Outdoor Unit PC Board Layout .....	146
3. Field Setting .....	147
3.1 Field Setting from Remote Control .....	147
3.2 Field Setting from Outdoor Unit.....	159

# 1. Test Operation

## 1.1 Installation Process

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



## 1.2 Procedure and Outline

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

### 1.2.1 Check work prior to turn power supply on

Check the below items.

- Power wiring
- Control transmission wiring between units
- Earth wire

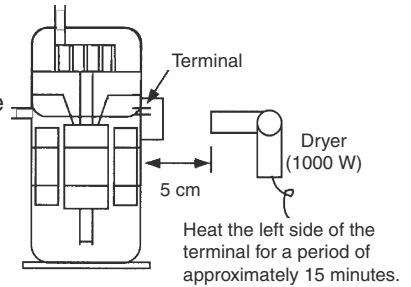


- Is the wiring performed as specified?
- Is the designated wire used?
- Is the wiring screw of wiring not loose?
- Is the grounding work completed?
- Is the insulation of the main power supply circuit deteriorated?  
Use a 500V megger tester to measure the insulation. (\*1)
  - Do not use a megger tester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

\*1: Measure to be taken against decreased insulation resistance in the compressor

If the compressor is left to stand for an extended period of time after the refrigerant charge with the stop valve open and the power supply OFF, the refrigerant may be mixed in the compressor, thus decreasing the insulation resistance.

Heat the compressor as shown on the right and then recheck the insulation.



Check on refrigerant piping / insulation materials



Check airtight test and vacuum drying.



Check on amount of refrigerant charge



- Is the pipe size proper?
- Is the pipe insulation material installed securely?  
Liquid and gas pipes need to be insulated. (Otherwise causes water leak.)
- Have the airtight test and the vacuum drying been conducted according to the procedure in the Installation Manual?
- Is a proper quantity of refrigerant refilled?  
The following two methods are available for refilling of the refrigerant.
  - (1) Use the automatic refrigerant refilling function.
  - (2) Calculate a refrigerant refilling quantity.

Check the stop valves for conditions.

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

Liquid-side stop valve	Gas-side stop valve
Open	Open

## 1.2.2 Turn power on

Turn outdoor unit and indoor unit power on.



Check the LED display of the outdoor unit PC board.



Make field settings with outdoor unit PC board.



Conduct check operations.



Check for normal operation.

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

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

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

- (\*) The master unit is the outdoor unit to which the transmission wiring for the indoor units is connected.

The other outdoor units are slave units.

- Make field settings if needed.  
(For the setting procedure, refer to information in "3.2. Field Setting from Outdoor Unit" on page 174 onward.)  
For the outdoor-multi system, make field settings with the master unit. (Field settings made with the slave unit will be all invalid.)

The check operations shown below will be automatically initiated.

- Check for erroneous wirings
- Check for failure to open stop valves
- Check for excessive refrigerant refilling
- Automatic judgment of piping length

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



## 1.2.3 Air Tight Test and Vacuum Drying

### Note:

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

### 1.2.3.1 Preparations

#### <Needed tools>

Gauge manifold Charge hose valve	<ul style="list-style-type: none"> <li>• To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R-410A.</li> <li>• Use charge hose that have pushing stick for connecting to service port of shutoff valves or refrigerant charge port.</li> </ul>
Vacuum pump	<ul style="list-style-type: none"> <li>• The vacuum pump for vacuum drying should be able to lower the pressure to <math>-100.7\text{kPa}</math> (5 Torr <math>-755\text{mm Hg}</math>).</li> <li>• Take care the pump oil never flow backward into the refrigerant pipe during the pump stops.</li> </ul>

#### <The system for air tight test and vacuum drying>

- Referring to figure 28, connect an nitrogen tank, refrigerant tank, and a vacuum pump to the outdoor unit.
- The shutoff valve and valve A~C in figure 28 should be open or closed as shown in the table below.

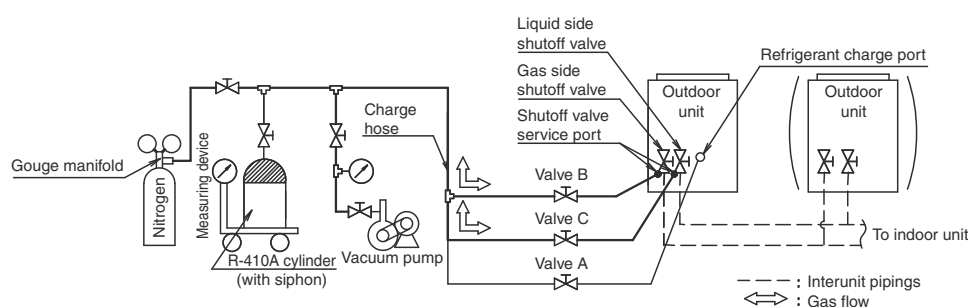
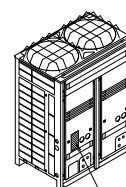


fig. 28

of valve A, B and C and shutoff valves	Valve			shutoff valve	
	A	B	C	Liquid side	Gas side
Air tight test, Vacuum drying (Close valve A and shutoff valves certainly. Otherwise the refrigerant in the unit are released.)	Close	Open	Open	Close	Close

### Note:

- The airtightness test and vacuum drying should be done using the liquid side and gas side shutoff valve service ports.  
See the [R-410A] Label attached to the front plate of the outdoor unit for details on the location of the service port (see figure at right).
- See [Shutoff valve operation procedure] for details on handling the shutoff valve. (Refer page 135)
- The refrigerant charge port is connected to unit pipe.  
When shipped, the unit contains refrigerant, so use caution when attaching the charge hose.



[Caution] Label

### 1.2.3.2 Air Tight Test and Vacuum Drying Method

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

#### <Air tight test>

Pressurize the liquid and gas pipes to 4.0MPa (40bar) (do not pressurize more than 4.0MPa (40bar)). If the pressure does not drop within 24 hours, the system passes the test.

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

#### <Vacuum drying>

Evacuate the system from the liquid and gas pipes by using a vacuum pump for more than 2 hours and bring the system to  $-100.7\text{kPa}$  or less. After keeping the system under that condition for more than 1 hour, check if the vacuum gauge rises or not. If it rises, the system may either contain moisture inside or have leaks.

#### Note:

##### ■ If moisture might enter the piping, follow belows.

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

1. After performing the vacuum drying for two hours, pressurize to 0.05 MPa (i.e., vacuum breakdown) with nitrogen gas, then depressurize down to  $-100.7\text{ kPa}$  for an hour using the vacuum pump (vacuum drying).
2. If the pressure does not reach  $-100.7\text{ kPa}$  even after depressurizing for at least two hours, repeat the vacuum breakdown - vacuum drying process.

After vacuum drying, maintain the vacuum for an hour and make sure the pressure does not rise by monitoring with a vacuum gauge.

### 1.2.4 Additional Refrigerant Charge and Check Operation

The outdoor unit is charged with refrigerant when shipped from the factory, but depending on the size and length of the piping when installed, it may require additional charging.

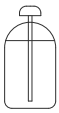
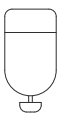
For charging the additional refrigerant, follow the procedure in this chapter.

And then carry out the check operation.

#### 1.2.4.1 Before Working

##### [About the refrigerant cylinder]

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

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



#### Caution

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

## [Shutoff Valve Operation Procedure]

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

### Note:

- Do not open the shutoff valve until “1.2.1 Check work prior to turn power supply on” in page 131 are completed. If the shutoff valve is left open without turning on the power, it may cause refrigerant to buildup in the compressor, leading insulation degradation.
- Be sure to use the correct tools.
- The shutoff valve is not a back-seat type. If forced it to open, it might break the valve body.
- When using a service port, use the charge hose.
- After tightening the cap, make sure no refrigerant gas is leaking.

### [Tightening torque]

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

<Size of Shutoff Valve>

	5HP type	8HP type	10HP type	12HP type	14HP type	16HP type	18HP type
Liquid side shutoff valve	φ 9.5 The 12HP type corresponds to the 12.7-diameter onsite piping using the included piping.				φ 12.7 The 18HP type corresponds to the 15.9-diameter onsite piping using the accessory pipe.		
Gas side shutoff valve	φ 15.9	φ 19.1	φ 25.4 The 10HP type corresponds to the 22.2-diameter onsite piping using the accessory pipe. The 12 ~ 18HP type corresponds to the 28.6-diameter onsite piping using the accessory pipe.				

<Tightening torque>

Shutoff valve size	Tightening torque N·m (Turn clockwise to close)			
	Shaft (valve body)		Cap (valve lid)	Service port
ϕ 9.5	5.4 - 6.6	Hexagonal wrench 4 mm	13.5 - 16.5	11.5 - 13.9
ϕ 12.7	8.1 - 9.9		18.0 - 22.0	
ϕ 15.9	13.5 - 16.5	Hexagonal wrench 6 mm	22.5 - 27.5	
ϕ 19.1	27.0 - 33.0	Hexagonal wrench 8 mm		
ϕ 25.4				

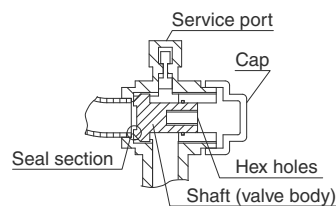


fig 34

### [To open]

1. Remove the cap and turn the shaft counterclockwise with the hexagon wrench (JISB4648).
2. Turn it until the shaft stops.
3. Make sure to tighten the cap securely.  
(For the tightening torque, refer to the item <Tightening Torque>.)

### [To close]

1. Remove the cap and turn the shaft clockwise with the hexagon wrench (JISB4648).
2. Securely tighten the valve until the shaft contacts the main body seal.
3. Make sure to tighten the cap securely.  
(For the tightening torque, refer to the item <Tightening Torque>.)

### [How to Check How Many Units are Connected]

It is possible to find out how many indoor or outdoor unit in the system are turned on by operating the push button on the PC-board (A1P) of outdoor unit (In case of multi system master unit).

Follow the procedure below to check how many indoor or outdoor units are turned on.

(LED display: ● ...OFF ☀ ...ON ⚡ ...Blinking * ...Uncertain)		LED display						
		H 1 P	H 2 P	H 3 P	H 4 P	H 5 P	H 6 P	H 7 P
1. Press the MODE button (BS1) once, and set the MONITOR MODE (H1P: Blinking).		⚡	●	●	●	●	●	●
2. Press the SET button (BS2) the number of times until the LED display matches that at right.	For checking the number of outdoor units: eight times	⚡	●	●	☀	●	●	●
	For checking the number of indoor units: five times	⚡	●	●	●	☀	●	☀
3. Press the RETURN button (BS3) and read the number of units from the display of H2P through H7P. [Reading Method] The display of H2P through H7P should be read as a binary number, with ⚡ standing for "1" and ● standing for "0".		⚡	*	*	*	*	*	*
<p>Ex: For the LED display at right, this would be "0 1 0 1 1 0", which would mean 22 units are connected.</p> $32 \times 0 + 16 \times 1 + 8 \times 0 + 4 \times 1 + 2 \times 1 + 1 \times 0 = 22 \text{ units}$ <p>Note: "000000" indicates 64 units.</p>		⚡	●	⚡	●	⚡	⚡	●
4. Press the MODE button (BS1) once. This returns to <b>Setting Mode 1</b> (default).		●	●	☀	●	●	●	●

#### Note:

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

### 1.2.4.2 Procedure of Adding Refrigerant Charging and Check Operation



#### Warning



#### Electric Shock Warning

- Make sure to close the EL. COMPO. BOX lid before turning on the power when performing the refrigerant charging operation.
- Perform the setting on the PC-board (A1P) of the outdoor unit and check the LED display after the power is on via the inspection door which is in the EL. COMPO. BOX lid.
- Use an insulated rod to operate the push buttons via the EL. COMPO. BOX's inspection door.  
There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.



#### Caution

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

#### Note:

- If operation is performed within 12 minutes after the indoor and outdoor units are turned on, H2P will be lit on and the compressor will not operate.
- In order to ensure uniform refrigerant distribution, it may take up to around 10 minutes for the compressor to start up after the unit starting operating. This is not a malfunction.

#### <About refrigerant charging>

- The refrigerant charge port is connected to the piping inside the unit.  
When the unit is shipped from the factory, the unit's internal piping is already charged with refrigerant, so be careful when connecting the charge hose.
- After adding the refrigerant, make sure to close the lid of the refrigerant charging port.  
The tightening torque for the lid is 11.5 to 13.9 Nm.
- See [Shutoff valve operation procedure] in 1.2.4.1 for details on how to handle shutoff valves.
- When done or when pausing the refrigerant charging operation, close the valve of the refrigerant tank immediately. If the tank is left with the valve open, the amount of refrigerant which is properly charged may be off the point. More refrigerant may be charged by any remaining pressure after the machine is stopped.

#### <About check operation>

- Make sure to perform the check operation after installation. Otherwise, the malfunction code "U3" will be displayed and normal operation cannot be performed.  
And the failure of "Check of miswiring" may also cause abnormal operation. Performance may drop due to the failure of "Judgment of piping length".
  - Check operation must be performed for each refrigerant piping system.  
Checking is impossible if plural systems are being done at once.
  - The individual problems of indoor units can not be checked.  
About these problems check by test run after the check operation is completed. (See page 144)
  - The check operation cannot be performed in recovery or other service modes.
1. Make sure the following works are complete in accordance with the installation manual.
    - Piping work
    - Wiring work
    - Air tight test
    - Vacuum drying
    - Installation work for indoor unit
  2. Calculate the "additional charging amount" using "How to calculate the additional refrigerant to be charged" in "6 Example of connection" on Part7. Appendix in page 333.

3. Open the valve C (See the figure 31. The valve A, B and the liquid and gas side shutout valve must be left closed), and charge the refrigerant of the “additional charging amount” from the liquid side shutout valve service port.  
If the “additional charging amount” was charged fully, close the valve C and go to step 5.  
If the “additional charging amount” was not charged fully, go to step 4.

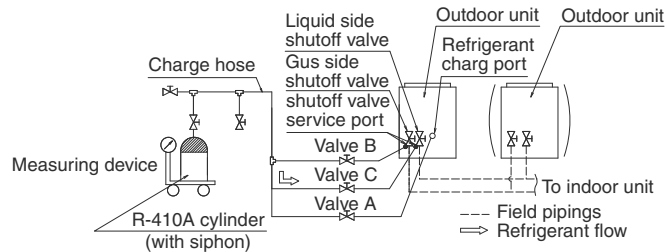


fig 31

4. Perform the refrigerant charging operation following [Refrigerant charging operation procedure] as shown in page 139, and charge the remaining refrigerant of the “additional charging amount”. For performing the refrigerant charging operation the push button on the PC-board (A1P) of outdoor unit (In case of multi system master unit) are use. (See the figure 32) In addition, the refrigerant are charged from the refrigerant charge port via the valve A. (See the figure 33)  
For operating the push button and opening and closing the valve, follow the work procedure.

#### Note:

The refrigerant will be charged about 22kg in one hour at outdoor temp. 30°C DB (6kg at 0°C DB).

If you need to speedup in case of multi system, connect the refrigerant cylinders to each outdoor unit as shown in the figure 33.

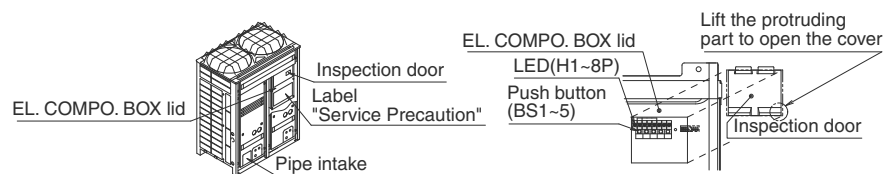


fig 32

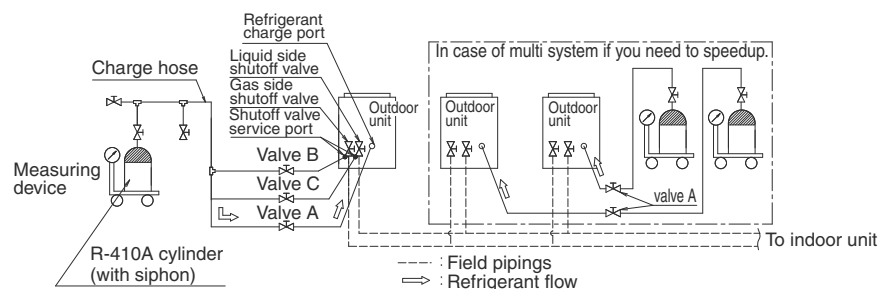


fig 33

## [Refrigerant Charging Operation Procedure]

**STEP1** Open the liquid and gas side shutoff valves (The valve A~C must be closed. The valve A~C means the valves in the figure 33.)

### [Display of normal system]

LED display (Default status of shipped)		SERV. MONI- TOR	MODE	TEST/ HWL	C/H SELECTOR			L.N.O.P	DEMA- ND	MULTI
					IND	MASTE R	SLAVE			
Single system		●	●	●	☀	●	●	●	●	●
Multi system (*)	Master unit	●	●	●	☀	●	●	●	●	☀
	Sub unit 1	●	●	●	●	●	●	●	●	●
	Sub unit 2	●	●	●	●	●	●	●	●	●

LED display: ●...OFF, ☀...ON, ●...Blinking

(\*)How to distinguish the master unit, sub unit 1, and sub unit 2 in the multi system.

Method 1: By the H8P (MULTI) LED display

☀ (ON): Master unit	● (Blinking): Sub unit 1	● (OFF): Sub unit 2
---------------------	--------------------------	---------------------

Method 2: By the transmission wiring to indoor unit

Transmission wiring is connected: Master unit
Transmission wiring is not connected : Sub unit 1 or Sub unit 2

**STEP2** If necessary, set the field setting by using the dip switch on the outdoor unit PC-board(A1P).

(For how to set, see “1.2.5.1 Onsite Settings With the Power Off”)

**STEP3** • Close the EL. COMPO. BOX lid and all front panel except on the side of the EL. COMPO. BOX (\*1) and turn the power to the outdoor unit and all connected indoor units. (\*2)

• After H2P stop blinking (about 12 minutes after turning on the power), check LED displays as shown in the table [Display of normal system] and the system is normal state.

If H2P is blinking, check the malfunction code in the remote control, and correct the malfunction in accordance with [Remote control display malfunction code] in page 141.

(\*1) Lead the refrigerant charge hose etc from the pipe intake. All front panels must be closed at the procedure (9).

(\*2) • If you perform the refrigerant charging operation within the refrigerant system that have

the power off unit, the operation cannot finish properly.

For confirming the number of the outdoor and indoor units with the power on, see [How to check how many units are connected] in chapter 1.2.4.1. In case of a multi system, turn on the power to all outdoor units in the refrigerant system.

• To energize the crankcase heater, make sure to turn on for 6 hours before starting operation.

**STEP4** Start the additional refrigerant charge operation.

(About the system settings for additional refrigerant charge operation, refer to the [Service Precaution] label attached on the EL. COMPO. BOX lid in the outdoor unit.)

Open valve A immediately after starting the compressor.

**STEP5** Close the valve A if the “additional charging amount” of refrigerant was charged, and push the RETURN button (BS3) once.

**STEP6** Record the charging amount on the accessory “REQUEST FOR THE INDICATION” label and attach it to the back side of the front panel.

5. After completing the additional refrigerant charging perform the check operation following below

**NOTE:**

- For check operation, the following work will be performed.
  - Check of shutoff valve opening
  - Check of miswiring
  - Judgment of piping length
  - Check of refrigerant overcharge
- It takes about 40 minutes to complete the check operation.

**[Check Operation Procedure]**

**STEP1** Make the onsite setting as needed using the dip switches on the outdoor unit PC-board (A1P) with the power off (See “1.2.5.1 Onsite Settings With the Power Off”)

**STEP2** Close the EL. COMPO. BOX lid and all front panels except as the side of the EL. COMPO. BOX and turn on the power to the outdoor unit and all connected indoor units. (Be sure to turn the power on at least 6 hours before operation in order to have power running to the crank case heater.)

**STEP3** Check the LED display on the outdoor unit PC-board (A1P) is as shown in the table below and transmission is normal.

LED display (Default status of shipped)		SERV. MONI- TOR	MODE	TEST/ HWL	C/H SELECTOR			L.N.O.P	DEMA- ND	MULTI
					IND	MASTE R	SLAVE			
					H3P	H4P	H5P	H6P	H7P	H8P
Single system		●	●	●	☼	●	●	●	●	●
Multi system (*)	Master unit	●	●	●	☼	●	●	●	●	☼
	Sub unit 1	●	●	●	●	●	●	●	●	●
	Sub unit 2	●	●	●	●	●	●	●	●	●

LED display: ●...OFF, ☼...ON, ●...Blinking

(\*)How to distinguish the master unit, sub unit 1, and sub unit 2 in the multi system.

Method 1: By the H8P (MULTI) LED display

☼ (ON): Master unit	● (Blinking): Sub unit 1	● (OFF): Sub unit 2
---------------------	--------------------------	---------------------

Method 2: By the transmission wiring to indoor unit

Transmission wiring is connected: Master unit
Transmission wiring is not connected : Sub unit 1 or Sub unit 2

**STEP4** Make the onsite settings as needed using the push button (BS1-BS5) on the outdoor unit PC-board (A1P) with the power on. (See “1.2.5.2 Onsite Settings With the Power On”)

**STEP5** Perform the check operation following the Check Operation Method of the [Service Precautions] label on the EL. COMPO. BOX lid. The system operation for about 40 minutes and automatically stops the check operation.

If the malfunction code is not displayed in the remote control after the system stop, check operation is completed. Normal operation will be possible after 5 minutes. If the malfunction code is displayed in the remote control, correct the malfunction following [Remote control displays malfunction code] and perform the check operation again.



**[Remote control displays malfunction code]**

Malfunction code	Installation error	Remedial action
E3, E4 F3, F6 UF	The shutoff valve of the outdoor unit is left closed.	Open the shutoff valve.
U1	The phases of the power to the outdoor unit is reversed.	Exchange two of the three phases (L1, L2, L3) to make a proper connection.
U1 U4 LC	No power is supplied to an outdoor or indoor unit (including phase interruption).	Make sure the power source wire is properly connected to the outdoor unit and revise if necessary.
UF	There is conflict on the connection of transmission wiring in the system.	Check if the refrigerant piping line and the transmission wiring are consistent with each other.
E3 F6 UF	Refrigerant overcharge.	Recalculate the additional amount refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
E4 F3	Insufficient refrigerant.	<ul style="list-style-type: none"> <li>• Check if the additional refrigerant charge has been finished correctly.</li> <li>• Recalculate the additional amount refrigerant from the piping length and add the adequate amount.</li> </ul>
U7, U4 UF, UH	If the outdoor unit terminal is connected when there is one outdoor unit installed.	Remove the line from the outdoor multi terminals (Q1 and Q2).

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

## 1.2.5 Onsite Settings

### NOTE:

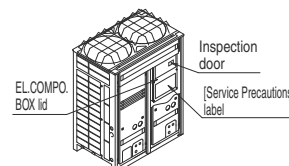
In the case of a multi system, all onsite settings should be made on the master unit. Settings made on sub units are invalid.

The outdoor unit to which the indoor unit transmission wire are connected is the master unit, and all other units are sub units.

### 1.2.5.1 Onsite Settings with the Power Off

If the COOL/HEAT selector was connected to the outdoor unit, set the dip switch (DS1) on the outdoor unit PC-board (A1P) to "ON" (it is set to "OFF" when shipped from the factory).

For the position of the dip switch (DS1), see the "Service Precautions" label (see at right) which is attached to the EL. COMPO. BOX lid.



**Warning**



**Electric Shock Warning**

Never perform with the power on.

There is a serious risk of electric shock if any live part is touched.

### 1.2.5.2 Onsite Settings with the Power On

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

See the "Service Precautions" label on the EL. CONPO. BOX lid for details on the positions and operating method of the push button switches and on the onsite setting.

Make sure to record the setting on the accessory "REQUEST FOR THE INDICATION" label.



**Warning**



**Electric Shock Warning**

Use an insulated rod to operate the push buttons via the inspection door of EL. COMPO. BOX lid.

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

## 1.2.6 Test Run

### 1.2.6.1 Before Test Run

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

### 1.2.6.2 Test Run

After check operation is completed, operate the unit normally and check the following.

- (1) Make sure the indoor and outdoor units are operating normally.
- (2) Operate each indoor unit one by one and make sure the corresponding outdoor unit is also operating.
- (3) Check to see if cold (or hot) air is coming out from the indoor unit.
- (4) Push the fan direction and strength buttons on the remote control to see if they operate properly.

**NOTE:**

- Heating is not possible if the outdoor temperature is 24°C or higher. Refer to the Operation manual.
- If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the crank case heater for a sufficient length of time before restarting the operation.
- Once stopping, the compressor will not restart in about 5 minutes even if the On/Off button of the remote control is pushed.
- When the system operation is stopped by the remote control, the outdoor units may continue operating for further 5 minutes at maximum.
- The outdoor unit fan may rotate at low speeds if the Night-time low noise setting or the External low noise level setting is made, but this is not a malfunction.

### 1.2.6.3 Checks after Test Run

**Perform the following checks after the test run is complete.**

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

**NOTE:**

After the test run, when handing the unit over to the customer, make sure the EL.COMPO.BOX lid, the inspection door, and the unit casing are all attached.

## 1.3 Operation When Power is Turned On

### 1.3.1 When Turning On Power First Time

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

#### Status

Outdoor unit

Test lamp H2P .... Blinks

Can also be set during operation described above.

Indoor unit

If ON button is pushed during operation described above, the "UH" malfunction indicator blinks.  
(Returns to normal when automatic setting is complete.)

### 1.3.2 When Turning On Power The Second Time and Subsequent

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

#### Status

Outdoor unit

Test lamp H2P .... Blinks

Can also be set during operation described above.

Indoor unit

If ON button is pushed during operation described above, the operation lamp lights but the compressor does not operate. (Returns to normal when automatic setting is complete.)

### 1.3.3 When an Indoor Unit or Outdoor unit Has Been Added, or Indoor or Outdoor Unit PC Board Has Been Changed

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

#### Status

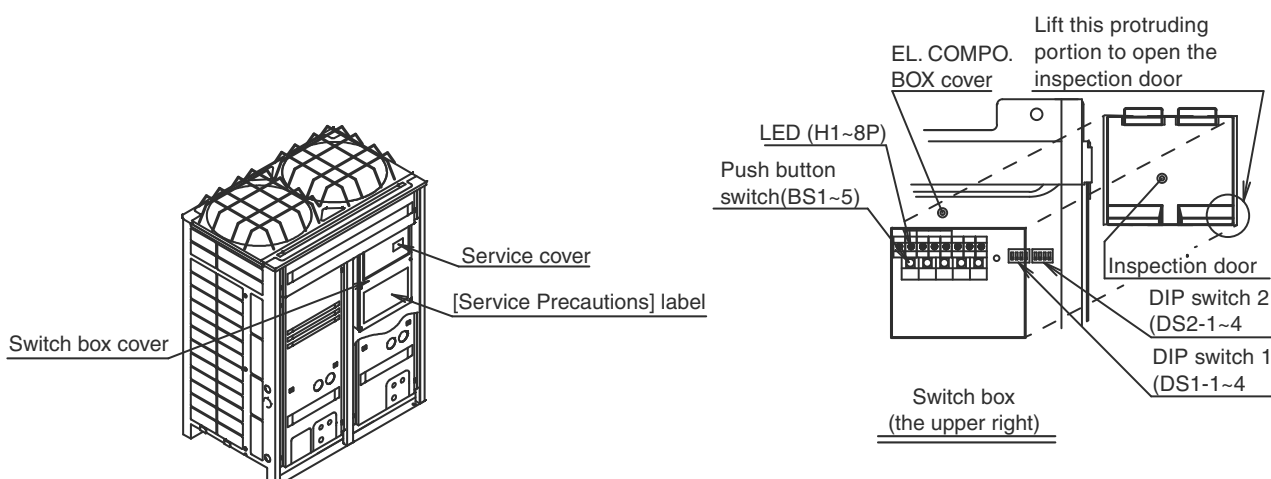
Outdoor unit

Test lamp H2P .... ON

Can also be set during operation described above.

Indoor unit

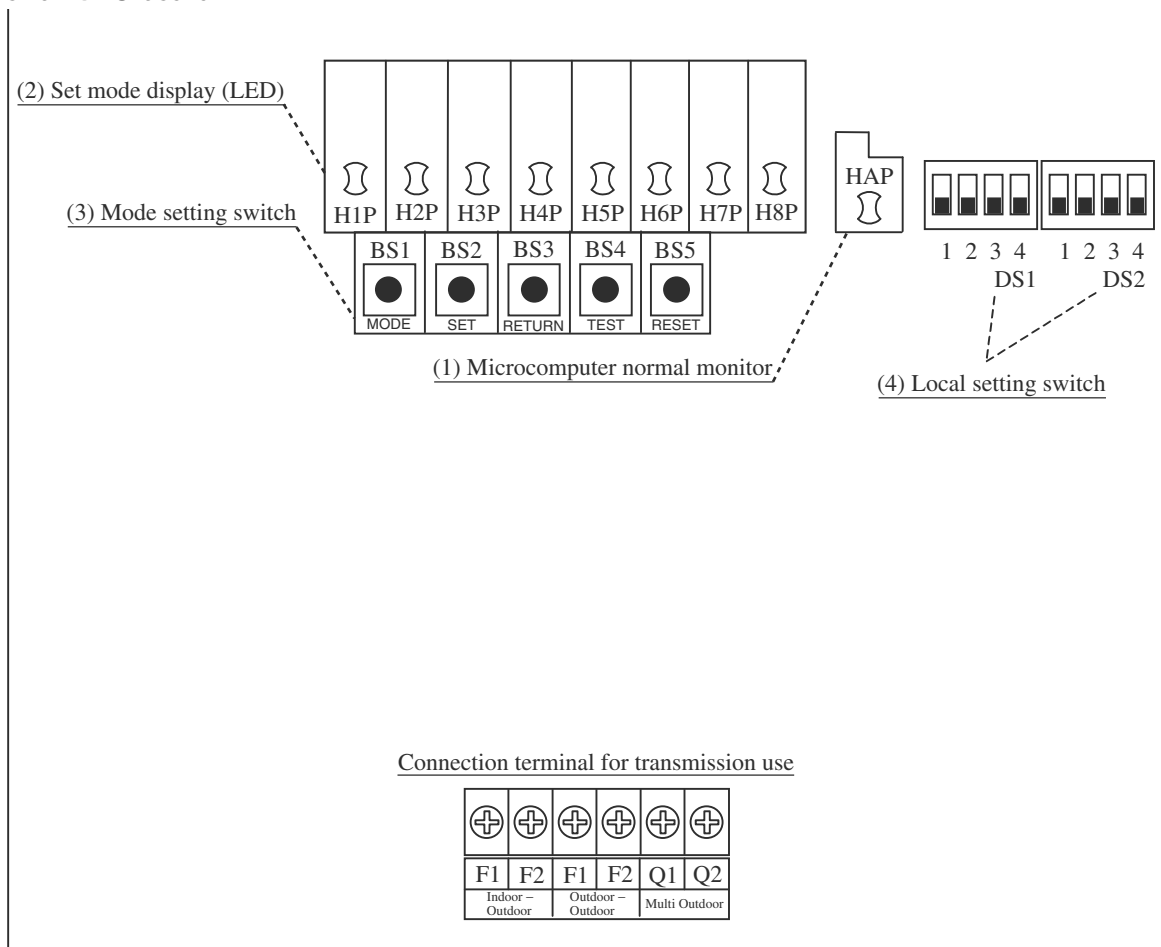
If ON button is pushed during operation described above, the "UH" or "U4" malfunction indicator blinks. (Returns to normal when automatic setting is complete.)



**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.

## 2. Outdoor Unit PC Board Layout

### Outdoor unit PC board



(V3054)

- (1) Microcomputer normal monitor  
This monitor blinks while in normal operation, and turns on or off when a malfunction occurs.
- (2) Set mode display (LED)  
LEDs display mode according to the setting.
- (3) Mode setting switch  
Used to change mode.
- (4) Local setting switch  
Used to make field settings.

## 3. Field Setting

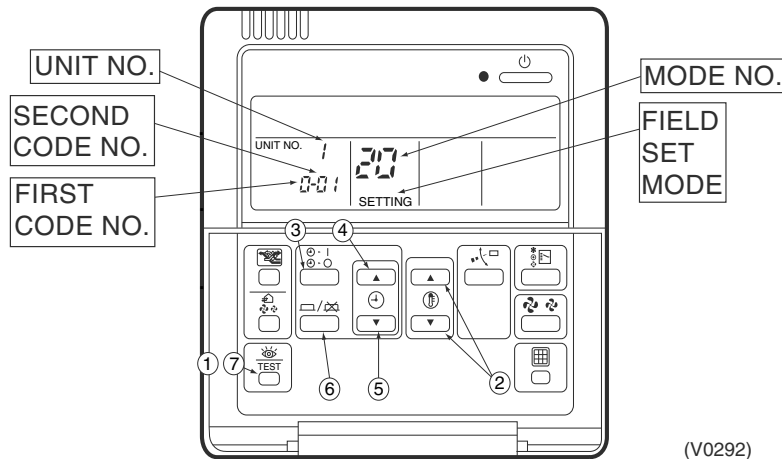
### 3.1 Field Setting from Remote Control

Individual function of indoor unit can be changed from the remote control. At the time of installation or after service inspection / repair, make the local setting in accordance with the following description.








Wrong setting may cause malfunction.

(When optional accessory is mounted on the indoor unit, setting for the indoor unit may be required to change. Refer to information in the option handbook.)

#### 3.1.1 Wired Remote Control <CZ-02RT Type>



(V0292)

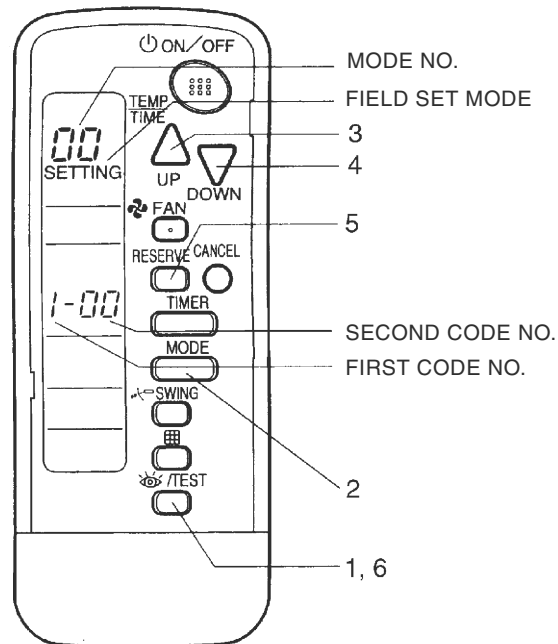
1. When in the normal mode, press the “” button for a minimum of four seconds, and the FIELD SET MODE is entered.
2. Select the desired MODE NO. with the “” button (②).
3. During group control, when setting by each indoor unit (mode No. 20, 22 and 23 have been selected), push the “” button (③) and select the INDOOR UNIT NO to be set. (This operation is unnecessary when setting by group.)
4. Push the “” upper button (④) and select FIRST CODE NO.
5. Push the “” lower button (⑤) and select the SECOND CODE NO.
6. Push the “” button (⑥) once and the present settings are SET.
7. Push the “” button (⑦) to return to the NORMAL MODE.

(Example)







If during group setting and the time to clean air filter is set to FILTER CONTAMINATION, HEAVY, SET MODE NO. to “10” FIRST CODE NO. to “0”, and SECOND CODE NO. to “02”.

### 3.1.2 Infrared Remote Control - Indoor Unit

CZ-01/02RW Type



(V2770)

1. When in the normal mode, push the “ /TEST” button for 4 seconds or more, and operation then enters the “field set mode.”
2. Select the desired “mode No.” with the “ ” 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 “ /TEST” button to return to the normal mode.

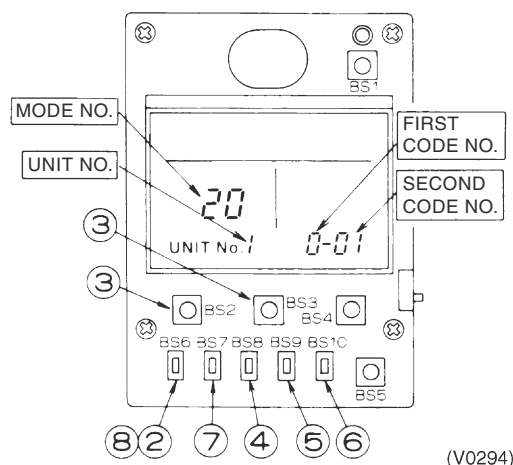
(Example)

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



### 3.1.3 Simplified Remote Control

CZ-02RE Type



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

### 3.1.4 Setting Contents and Code No. – VRF Indoor unit

VRF 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			Long life filter		Super long life filter		—		—	
	2	Thermostat sensor in remote control			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 adapter for wiring)			Indoor unit turned ON by thermostat				Operationoutput		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 input		—
		2	Thermostat differential changeover (Set when remote sensor is to be used.)			1°C		0.5°C		—		—
		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	04:3	05:4	06:5	07:6	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.)			N		H		S		—	
	1	Selection of air flow direction (Set when a blocking pad kit has been installed.)			F (4 directions)		T (3 directions)		W (2 directions)		—	
	3	Air flow direction adjustment (Set at installation of decoration panel.)			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		—		—	
	2	Direct duct connection (when the indoor unit and heat reclaim ventilation unit are connected by duct directly.) *Note 6			Not equipped		Equipped		—		—	
	3	Drain pump humidifier interlock selection			Not equipped		Equipped		—		—	
	5	Field set selection for individual ventilation setting by remote control			Not equipped		Equipped		—		—	
	6	Field set selection for individual ventilation setting by remote control			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 infrared remote controls, so they cannot be set individually. Setting changes also cannot be checked.
  - Marked   are factory set.
  - 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 control is resetting when returning to the normal mode.
  - If the setting mode to "Equipped", heat reclaim ventilation fan conducts the fan residual operation by linking to indoor unit.

### 3.1.5 Applicable range of Field setting

	Ceiling mounted cassette type			Ceiling mounted built-in type	Ceiling mounted duct type	Ceiling suspended type	Wall mounted type	Floor standing type	Concealed Floor standing type
	Multi flow	Double flow	Corner type						
	UM3	LM3	DM3						
Filter sign	○	○	○	○	○	○	○	○	○
Ultra long life filter sign	○	○	—	—	—	—	—	—	—
Remote controller thermostat sensor	○	○	○	○	○	○	○	○	○
Set fan speed when thermostat OFF	○	○	○	○	○	○	○	○	○
Air flow adjustment Ceiling height	○	—	—	—	—	○	—	—	—
Air flow direction	○	—	—	—	—	—	—	—	—
Air flow direction adjustment (Down flow operation)	—	—	○	—	—	—	—	—	—
Air flow direction adjustment range	○	○	○	—	—	—	—	—	—
Field set fan speed selection	○	—	—	—	—	○	—	—	—

\*1 Static pressure selection

### 3.1.6 Detailed Explanation of Setting Modes

#### Filter Sign Setting

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

##### Set Time

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

#### Ultra-Long-Life Filter Sign Setting

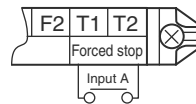
When a Ultra-long-life filter is installed, the filter sign timer setting must be changed.

##### Setting Table

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

#### External ON/OFF input

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



##### Setting Table

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

#### Fan Speed Changeover When Thermostat is OFF

By setting to "Set Fan Speed," you can switch the fan speed to the set fan speed when the heating thermostat is OFF.

\* Since there is concern about draft if using "fan speed up when thermostat is OFF," you should take the setup location into consideration.

##### Setting Table

Mode No.	First Code No.	Second Code No.	Setting
12(22)	3	01	LL Fan Speed
		02	Set Fan Speed

### Auto Restart after Power Failure Reset

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

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



- Caution**
- 1. The air conditioner starts operation suddenly after power failure reset or the main power supply turned on again. Consequently, the user might be surprised (with question for the reason why).**
  - 2. In the service work, for example, turning off the main power switch during the unit is in operation, and turning on the switch again after the work is completed start the unit operation (the fan rotates).**

### Air Flow Adjustment - Ceiling height

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

#### ■ In the Case of KM3 or TM3

Mode No.	Setting Switch No.	Setting Position No.	Setting
13(23)	0	01	Wall-mounted type: Standard
		02	Wall-mounted type: Slight increase
		03	Wall-mounted type: Normal increase

#### ■ In the Case of UM3, 25~80

Mode No.	First code No.	Second code No.	Setting	Ceiling height		
				4-way Outlets	3-way Outlets	2-way Outlets
13 (23)	0	01	Standard (N)	Lower than 2.7 m	Lower than 3.0 m	Lower than 3.5 m
		02	High Ceiling (H)	Lower than 3.0 m	Lower than 3.3 m	Lower than 3.8 m
		03	Higher Ceiling (S)	Lower than 3.5 m	Lower than 3.5 m	—

#### ■ In the Case of UM3, 100~125

Mode No.	First code No.	Second code No.	Setting	Ceiling height		
				4-way Outlets	3-way Outlets	2-way Outlets
13 (23)	0	01	Standard (N)	Lower than 3.2 m	Lower than 3.6 m	Lower than 4.2 m
		02	High Ceiling (H)	Lower than 3.6 m	Lower than 4.0 m	Lower than 4.2 m
		03	Higher Ceiling (S)	Lower than 4.2 m	Lower than 4.2 m	—

### Air Flow Direction Setting

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

**Setting Table**

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

### Setting of Air Flow Direction Adjustment

Only the model DM3 has the function.

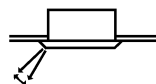
When only the front-flow is used, sets yes/no of the swing flap operation of down-flow.

**Setting Table**

Setting	Mode No.	First Code No.	Second Code No.
Down-flow operation: Yes	13 (23)	3	01
Down-flow operation: No			02

### Setting of Air Flow Direction Adjustment Range

Make the following air flow direction setting according to the respective purpose.



(S2537)

**Setting Table**

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

### Air flow rate switching at discharge grille for field air flow rate switching

When the optional parts (high performance filter, etc.) is installed, sets to change fan speed for securing air flow rate.






Follow the instruction manual for the optional parts to enter the setting numbers.

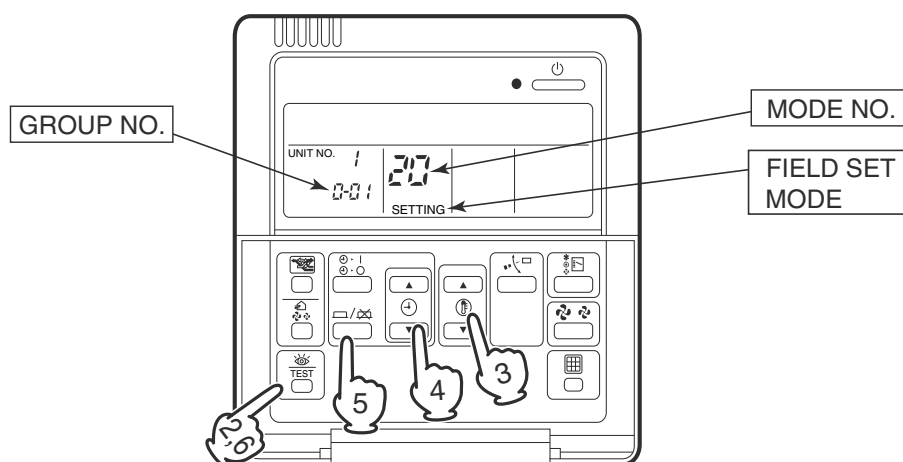
### 3.1.7 Centralized Control Group No. Setting

#### CZ-02RT Type

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

Make Group No. settings for central remote control using the operating remote control.

1. While in normal mode, press and hold the  switch for a period of four seconds or more to set the system to "Field Setting Mode".
2. Select the MODE No. "00" with the " " button.
3. Use the " " button to select the group No. for each group.  
(Group numbers increase in the order of 1-00, 1-01, ... 1-15, 2-00, ... 4-15.)
4. Press " " to set the selected group No.
5. Press " " to return to the NORMAL MODE.



**Note:**







- For infrared remote control, see the following.

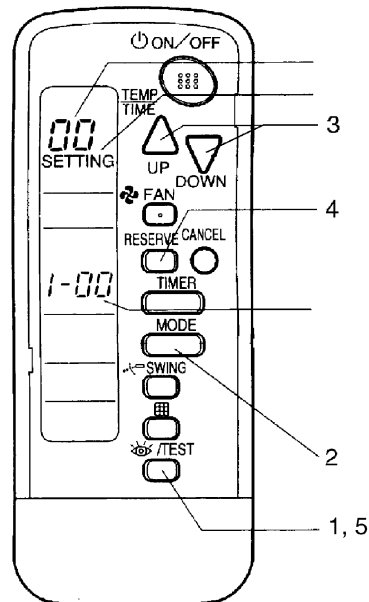
**NOTICE**

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

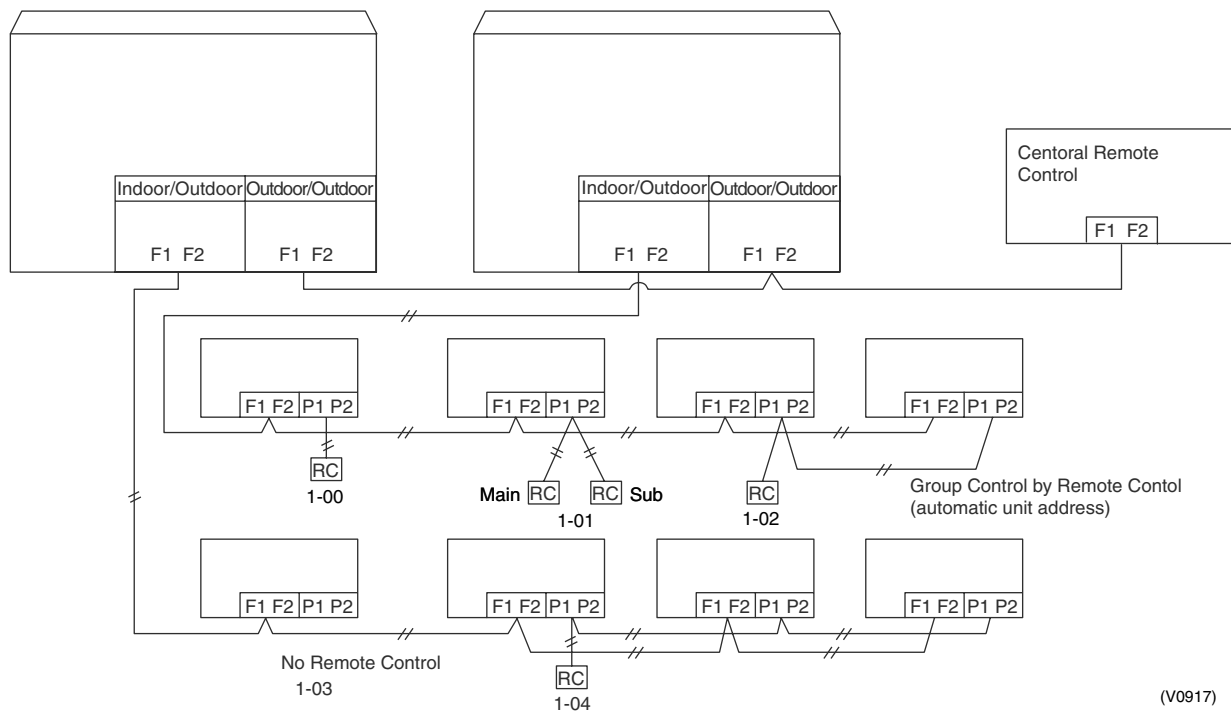
**CZ-01/02RW Type**

## ■ Group No. setting by infrared remote control for centralized control

1. When in the normal mode, push “/TEST” button for 4 seconds or more, and operation then enters the “field set mode.”
2. Set mode No. “00” with “” 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.



(V0916)

**Group No. Setting Example**

(V0917)

**Caution**

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



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

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

Central remote control is normally available for operations. (Except when centralized monitor is connected)

### 3.1.9 Contents of Control Modes

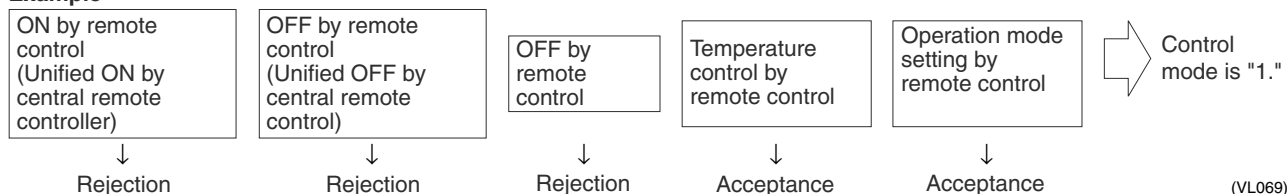
Twenty modes consisting of combinations of the following five operation modes with temperature and operation mode setting by remote control can be set and displayed by operation modes 0 through 19.

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

## How to Select Operation Mode

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

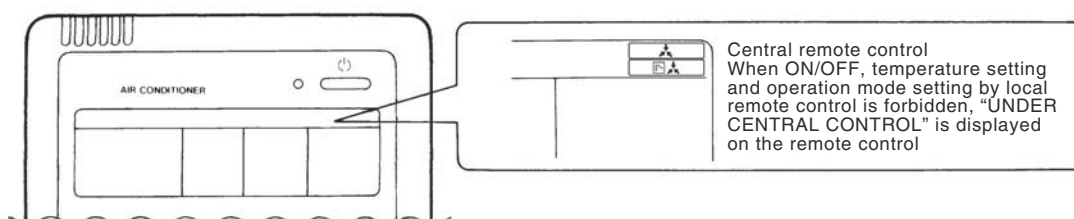
### Example



Control mode	Control by remote control					Control mode		
	Operation		OFF	Temperature control	Operation mode setting			
	Unified operation, individual operation by central remote control, or operation controlled by timer	Unified OFF, individual stop by central remote control, or timer stop						
ON/OFF control impossible by remote control	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 control	Acceptance	Rejection (Example)	Acceptance	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	Acceptance	Rejection	Acceptance	6		
					Rejection	16		
				Acceptance	Acceptance	7 *1		
					Rejection	17		
Timer operation possible by remote control	Acceptance (During timer at ON position only)	Acceptance (During timer at ON position only)	Acceptance	Rejection	Acceptance	8		
					Rejection	18		
				Acceptance	Acceptance	9		
					Rejection	19		

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

\*1. Factory setting



## 3.2 Field Setting from Outdoor Unit

### 3.2.1 Field Setting from Outdoor Unit

#### ■ List of Field Setting Items

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

For setting items of (\*1), refer to detailed information provided on page 133 onward.

Setting item		Content and objective of setting	Overview of setting procedure
Function setting	1	Setting of COOL/HEAT selection (*1)	<ul style="list-style-type: none"> <li>COOL/HEAT selection methods are possible to select from the following               <ol style="list-style-type: none"> <li>Control by each outdoor unit using the indoor unit remote control</li> <li>Control by each outdoor unit using the COOL/HEAT selection remote control</li> <li>Batch control by outdoor unit group using the indoor unit remote control</li> <li>Batch control by outdoor unit group using the COOL/HEAT selection remote control</li> </ol> </li> <li>In order to use the COOL/HEAT selection remote control, set the DS1-1 on the outdoor unit PC board to OUT.</li> <li>For outdoor unit group control, set the system to "BATCH MASTER" or "SLAVE" while in "Setting mode 1". Then, make setting of COOL/HEAT batch address.</li> </ul>
	2	Setting of low noise operation (*1)	<ul style="list-style-type: none"> <li>A. Use external input to step down the upper limit of the fan (factory set to Step 8), providing low noise level.               <ol style="list-style-type: none"> <li>Mode 1: Step 6 or lower</li> <li>Mode 2: Step 5 or lower</li> <li>Mode 3: Step 4 or lower</li> </ol> </li> <li>B. The low noise operation aforementioned is enabled in nighttime automatic low noise operation mode.               <p>Start time: Possible to select in the range of 20:00 to 24:00 hours.</p> <p>End time: Possible to select in the range of 06:00 to 08:00 hours.</p> <p>(Use the said time as a guide since the start time and the end time are estimated according to outdoor temperatures.)</p> </li> <li>Use the "External control adapter for outdoor unit". Set to "External control adapter for outdoor unit" with No. 12 of "Setting mode 2" and select the mode with No. 25. If necessary, set the "Capacity priority setting" to ON with No. 29.</li> <li>Make this setting while in "Setting mode 2". Select a mode with No. 22 of "Setting mode 2". Select the start time with No. 26 and the end time with No. 27. If necessary, set the "Capacity priority setting" to ON with No. 29.</li> </ul>
		Setting of demand operation (*1)	<ul style="list-style-type: none"> <li>Used to place limits on the compressor operating frequency to control the upper limit of power consumption.               <ol style="list-style-type: none"> <li>Mode 1 of Demand 1: 60% or less of rating</li> <li>Mode 2 of Demand 1: 70% or less of rating</li> <li>Mode 3 of Demand 1: 80% or less of rating</li> <li>Demand 2: 40% or less of rating</li> </ol> </li> <li>For setting with the use of "external control adapter": Set the system to "External control adapter for outdoor unit" with No. 12 of Setting mode 2" and select the mode with No. 30.</li> <li>For setting only in "Setting mode 2": Set the system to Normal demand mode with No. 32 of "Setting mode 2" and select the mode with No. 30.</li> </ul>
	4	Setting of AirNet address	<ul style="list-style-type: none"> <li>Used to make address setting with AirNet connected.</li> <li>Set the AirNet to an intended address using binary numbers with No. 13 of "Setting mode 2".</li> </ul>
	5	Setting of hot water heater	<ul style="list-style-type: none"> <li>Make this setting to conduct heating operation using the hot water heater.</li> <li>Set No. 16 of "Setting mode 2" to ON.</li> </ul>
	6	Setting of high static pressure	<ul style="list-style-type: none"> <li>Make this setting to operate a system with diffuser duct while in high static pressure mode. (Use this setting mode when shields are installed on upper floors or balconies.)</li> <li>* In order to mount the diffuser duct, remove the cover from the outdoor unit fan.</li> <li>Set No. 18 of "Setting mode 2" to ON.</li> </ul>

Setting item		Content and objective of setting	Overview of setting procedure
Service setting	1	Indoor unit fan forced H operation ■ Used to operate the indoor unit in the stopped state in forced H operation mode.	■ Set No. 5 of "Setting mode 2" to indoor unit forced fan H.
	2	Indoor unit forced operation ■ Used to operate the indoor unit in forced operation mode.	■ Set No. 6 of "Setting mode 2" to indoor unit forced operation mode.
	3	Change of targeted evaporating temperature (in cooling) ■ In cooling operation, used to change the targeted evaporating temperature for compressor capacity control.	■ Select high side or low side with No. 8 of "Setting mode 2".
	4	Change of targeted condensing temperature (in heating) ■ In heating operation, used to change the targeted condensing temperature for compressor capacity control.	■ Select high side or low side with No. 9 of "Setting mode 2".
	5	Setting of defrost selection ■ Used to change a temperature at which the defrost operation is initiated, thus making the initiation easy or hard.	■ Select fast side or slow side with No. 10 of "Setting mode 2".
	6	Setting of sequential startup ■ Used to start units not in sequence but simultaneously.	■ Set No. 11 of "Setting mode 2" to NONE.
	7	Emergency operation (*1) ■ If the compressor has a failure, used to prohibit the operation of compressor(s) concerned or outdoor unit(s) concerned and to conduct emergency operation of the system only with operable compressor(s) or outdoor unit(s).	■ Make this setting while in "Setting mode 2". For system with a single outdoor unit: Set with No. 19 or 42. For system with multiple outdoor units: Set with No. 38, 39, or 40.
	8	Additional refrigerant charging (*1) ■ If a necessary amount of refrigerant cannot be charged due to the stop of outdoor unit, operate the outdoor unit and then refill refrigerant.	■ Set No. 20 of "Setting mode 2" to ON and then charge refrigerant.
	9	Refrigerant recovery mode (*1) ■ Used to recover refrigerant on site. With operations of indoor and outdoor units prohibited, fully open the expansion valve of the indoor and outdoor units.	■ Set No. 21 of "Setting mode 2" to ON.
	10	Vacuumping mode (*1) ■ Used to conduct vacuuming on site. Fully open the expansion valves of the indoor and outdoor units, and energize part of solenoid valves. Use a vacuum pump to conduct vacuuming.	■ Set No. 21 of "Setting mode 2" to ON.
	11	ENECUT test operation ■ Used to forcibly turn ON the ENECUT. (Be noted this mode is not functional with the indoor unit remote control turned ON.)	■ Set No. 24 of "Setting mode 2" to ON.
	12	Power transistor check mode ■ Used for the troubleshooting of DC compressors. Inverter waveform output makes it possible to judge whether a malfunction results from the compressor or the PC board.	■ Set No. 28 of "Setting mode 2" to ON.
	13	Setting of model with spare PC board ■ In order to replace the PC board by a spare one, be sure to make model setting.	■ For this setting, set the DS2-2, -3, and-4 switches on the PC board to the model concerned.

For setting items of (\*1), refer to detailed information provided on page 159 onward.

### ■ Setting by dip switches

Using dip switches on the PC board enables field setting shown below. However, make no changes of factory settings except for DS1-1.

Dipswitch		Setting item	Description
No.	Setting		
DS1-1	ON	Cool / Heat select	Used to set cool / heat select by Cool/Heat selector equipped with outdoor unit.
	OFF (Factory set)		
DS1-2 ~DS1-4	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		
DS2-1 ~4	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		

Setting at replacement by spare PC board



### Caution

#### **DIP switch Setting after changing the main P.C.Board(A1P) to spare parts P.C.B.**

After the replacement by the spare PC board, be sure to make settings shown below.

When you change the main P.C.Board(A1P) to spare parts P.C.B., please carry out the following setting.

Initial conditions of dip switches



#### **DIP Switch Detail**

DS No.	Item	Contents																																						
DS1-1	Cool/Heat change over setting	ON	COOL/HEAT setting is made with the use of a Cool/Heat selector mounted to the outdoor unit.																																					
		OFF (Factory setting of spare PC board)	COOL/HEAT setting is not made with the use of a Cool/Heat selector mounted to the outdoor unit.																																					
DS1-2	Power supply specification	ON	200V class (220V)																																					
		OFF (Factory setting of spare PC board)	400V class (380V)																																					
DS1-3	Cooling only/Heat-pump setting	ON	Cooling only setting																																					
		OFF (Factory setting of spare PC board)	Heat pump setting																																					
DS1-4	Unit allocation setting	ON	Make the following settings according to allocation of unit. (All models are set to OFF at factory.)																																					
<table><tr><td></td><td>Domestic Japan</td><td>Overseas General</td><td>Europe</td></tr><tr><td>DS1-4</td><td>OFF</td><td>OFF</td><td>ON</td></tr><tr><td>DS2-1</td><td>OFF</td><td>ON</td><td>OFF</td></tr></table>								Domestic Japan	Overseas General	Europe	DS1-4	OFF	OFF	ON	DS2-1	OFF	ON	OFF																						
		Domestic Japan	Overseas General	Europe																																				
DS1-4	OFF	OFF	ON																																					
DS2-1	OFF	ON	OFF																																					
DS2-1	OFF (Factory setting of spare PC board)																																							
DS2-2	Model setting	Make the following settings according to models of outdoor units. (All models are set to OFF at factory.)																																						
DS2-3		<table><tr><td></td><td>U-5MX4XPQ</td><td>U-8MX4XPQ</td><td>U-10MX4XPQ</td><td>U-12MX4XPQ</td><td>U-14MX4XPQ</td><td>U-16MX4XPQ</td><td>U-18MX4XPQ</td></tr><tr><td>DS2-2</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr><tr><td>DS2-3</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>DS2-4</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td></tr></table>								U-5MX4XPQ	U-8MX4XPQ	U-10MX4XPQ	U-12MX4XPQ	U-14MX4XPQ	U-16MX4XPQ	U-18MX4XPQ	DS2-2	OFF	OFF	ON	OFF	ON	OFF	ON	DS2-3	OFF	ON	ON	OFF	OFF	ON	ON	DS2-4	OFF	OFF	OFF	ON	ON	ON	ON
	U-5MX4XPQ	U-8MX4XPQ	U-10MX4XPQ	U-12MX4XPQ	U-14MX4XPQ	U-16MX4XPQ	U-18MX4XPQ																																	
DS2-2	OFF	OFF	ON	OFF	ON	OFF	ON																																	
DS2-3	OFF	ON	ON	OFF	OFF	ON	ON																																	
DS2-4	OFF	OFF	OFF	ON	ON	ON	ON																																	
DS2-4																																								

\* If the DS1-1~1-4, DS2-2~2-4 setting has not been carried out, error code "UA" are displayed and unit can not be operated.



Refer "DS1-1~4, DS2-1~4 setting detail" on next page.

“Detail of DS1-1~4, DS2-1~4 setting” (for Overseas general)

Unit	Setting method ( ■ represents the position of switches)	
HEAT PUMP(5HP) U-5MX4XPQ	<div> DS1  ON OFF    1 2 3 4 </div> <div> DS2  ON OFF    1 2 3 4 </div>	Set DS2-1 to ON.
HEAT PUMP(8HP) U-8MX4XPQ	<div> DS1  ON OFF    1 2 3 4 </div> <div> DS2  ON OFF    1 2 3 4 </div>	Set DS2-1 and DS2-3 to ON.
HEAT PUMP(10HP) U-10MX4XPQ	<div> DS1  ON OFF    1 2 3 4 </div> <div> DS2  ON OFF    1 2 3 4 </div>	Set DS2-1, DS2-2 and DS2-3 to ON.
HEAT PUMP(12HP) U-12MX4XPQ	<div> DS1  ON OFF    1 2 3 4 </div> <div> DS2  ON OFF    1 2 3 4 </div>	Set DS2-1 and DS2-4 to ON.
HEAT PUMP(14HP) U-14MX4XPQ	<div> DS1  ON OFF    1 2 3 4 </div> <div> DS2  ON OFF    1 2 3 4 </div>	Set DS2-1, DS2-2 and DS2-4 to ON.
HEAT PUMP(16HP) U-16MX4XPQ	<div> DS1  ON OFF    1 2 3 4 </div> <div> DS2  ON OFF    1 2 3 4 </div>	Set DS2-1, DS2-3 and DS2-4 to ON.
HEAT PUMP(18HP) U-18MX4XPQ	<div> DS1  ON OFF    1 2 3 4 </div> <div> DS2  ON OFF    1 2 3 4 </div>	Set DS2-1, DS2-2, DS2-3, and DS2-4 to ON.

### ■ Setting by pushbutton switches

The following settings are made by pushbutton switches on PC board.

In case of multi-outdoor unit system, various items should be set with the master unit.

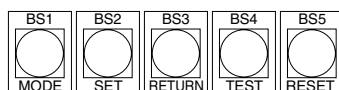
(Setting with the slave unit is disabled.)

The master unit and slave unit can be discriminated with the LED display as shown below.

LED display

		MODE H1P	TEST H2P	COOL/HEAT select			Low noise H6P	Demand H7P	Multi; H8P
				IND H3P	MASTER H4P	SLAVE H5P			
Single-outdoor-unit system		●	●	○	●	●	●	●	●
Outdoor- multi system	Master	●	●	○	●	●	●	●	○
	Slave 1	●	●	●	●	●	●	●	◐
	Slave 2	●	●	●	●	●	●	●	●

(Factory setting)



(V2760)

There are the following three setting modes.

#### ① Setting mode 1 (H1P off)

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

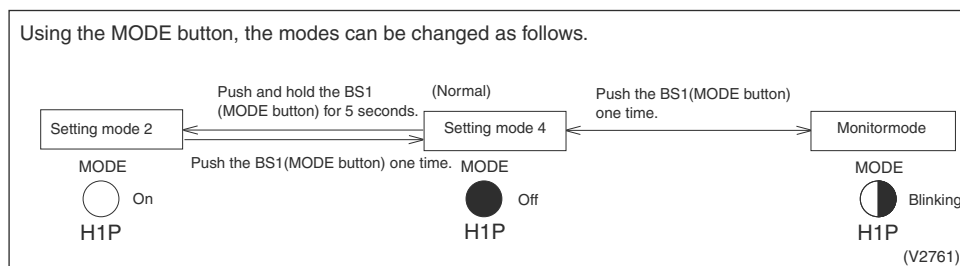
#### ② Setting mode 2 (H1P on)

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

#### ③ Monitor mode (H1P blinks)

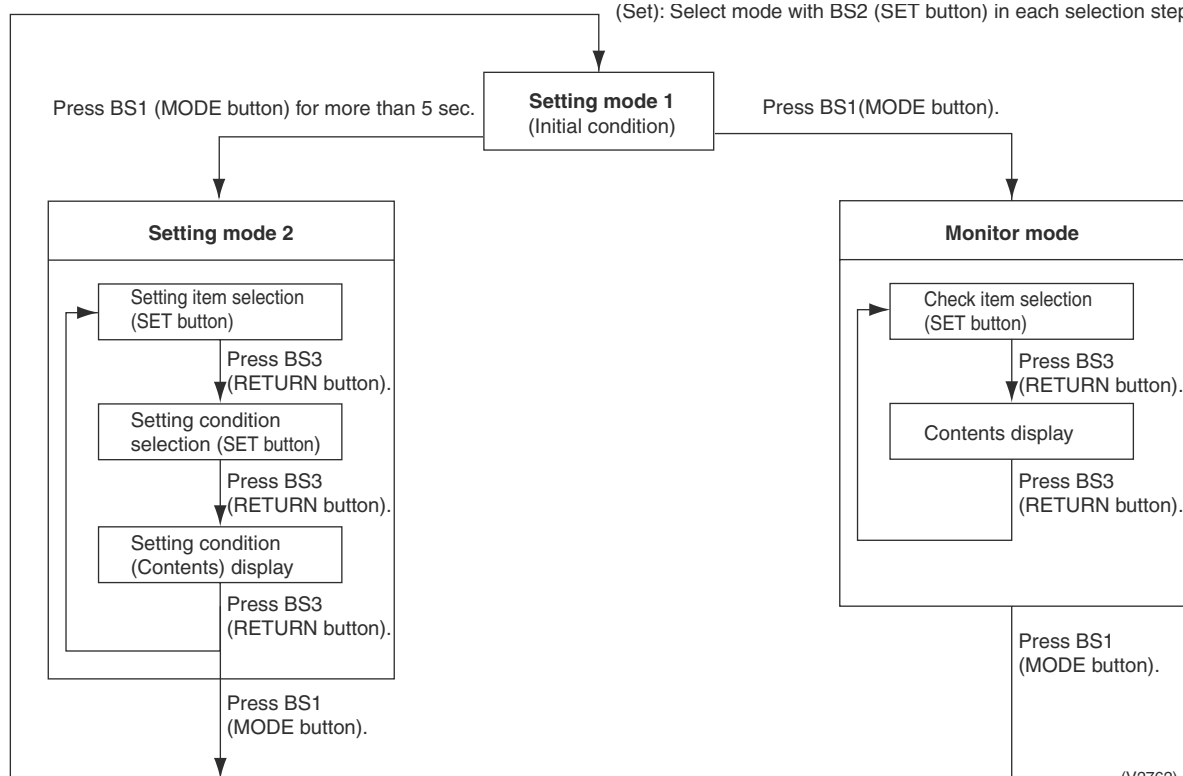
Used to check the program made in Setting mode 2.

### ■ Mode changing procedure 1



### ■ Mode changing procedure 2

(Set): Select mode with BS2 (SET button) in each selection step.

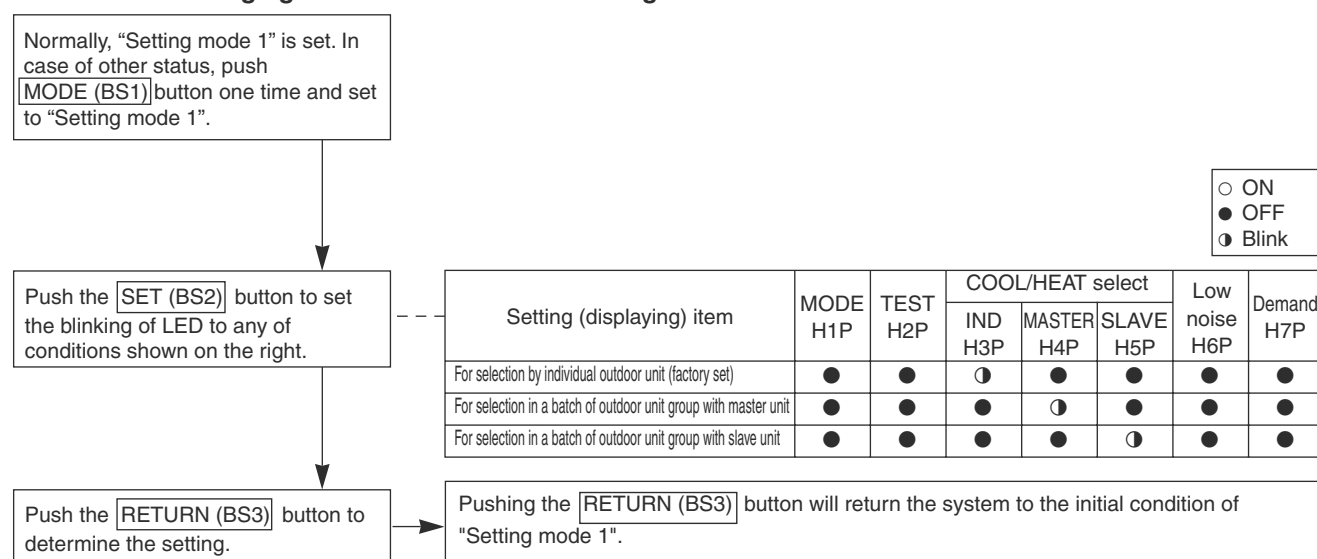


## a. "Setting mode 1"

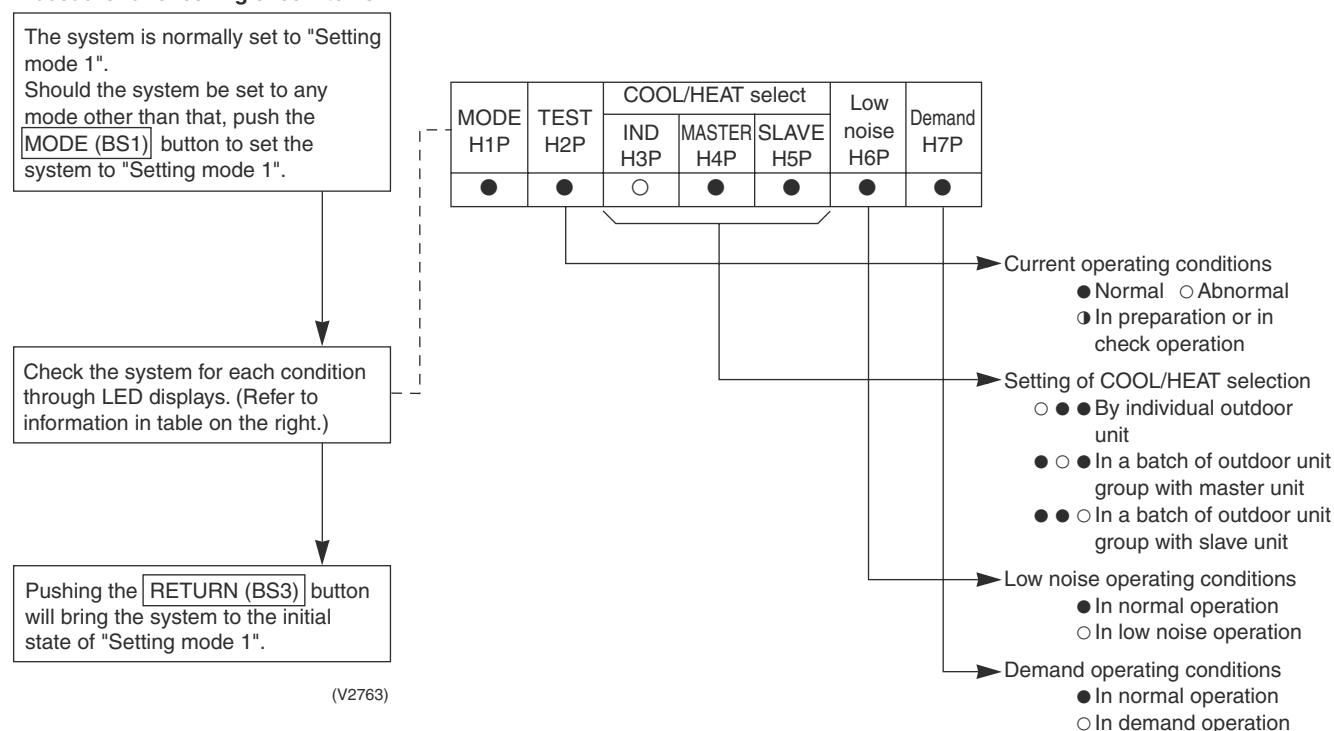
This mode is used to set and check the following items.

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

### Procedure for changing COOL/HEAT selection setting



### Procedure for checking check items





## b. Setting mode 2

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

### <Selection of setting items>

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

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

### <Selection of setting conditions>

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

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

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

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

(V2764)

No.	Setting item	Description
0	Digital pressure gauge kit display	Used to make setting of contents to display on the digital pressure gauges (e.g. pressure sensors and temperature sensors)
1	Cool/heat unified address	Sets address for cool/heat unified operation.
2	Low noise/demand address	Address for low noise/demand operation
3	Test operation settings	Used to conduct test operation without making changes to the PCB and replacing the refrigerant, after the completion of maintenance.
5	Indoor unit forced fan H	Allows forced operation of indoor unit fan while unit is stopped. (H tap)
6	Indoor unit forced operation	Allows forced operation of indoor unit.
8	Te setting	Target evaporation temperature for cooling
9	Tc setting	Target condensation temperature for heating
10	Defrost changeover setting	Changes the temperature condition for defrost and sets to quick defrost or slow defrost.
11	Sequential operation setting	Sets sequential operation (Factory set to ON)
12	External low noise setting / Demand setting	Reception of external low noise or demand signal
13	AIRNET address	Set address for AIRNET.
16	Setting of hot water	Make this setting to conduct heating operation with hot water heater.
18	High static pressure setting	Make this setting in the case of operating in high static pressure mode with diffuser duct mounted. (In order to mount the diffuser duct, remove the cover from the outdoor unit fan.)
19	Emergency operation (STD compressor operation prohibited)	Used to operate system only with inverter compressor when STD compressor malfunctions. This is a temporary operation extremely impairing comfortable environment. Therefore, prompt replacement of the compressor is required. (This operation, however, is not set with U-5,8MX4XPQ.)
20	Additional refrigerant charge operation setting	Carries out additional refrigerant charge operation.
21	Refrigerant recovery/ vacuuming mode setting	Sets to refrigerant recovery or vacuuming mode.
22	Night-time low noise setting	Sets automatic nighttime low noise operation in a simple way. The operating time is based on "Starting set" and "Ending set".
24	ENECUT test operation	Used to forcibly turn ON the ENECUT. (Be noted that the ENECUT is only functional with outdoor unit in the stopped state - Japanese domestic model only.)
25	Setting of external low noise level	Sets low noise level when the low noise signal is input from outside.
26	Night-time low noise operation start setting	Sets starting time of nighttime low noise operation. (Night-time low noise setting is also required.)
27	Night-time low noise operation end setting	Sets ending time of nighttime low noise operation. (Night-time low noise setting is also required.)
28	Power transistor check mode *Check after disconnection of compressor wires	Used for trouble diagnosis of DC compressor. Since the waveform of inverter is output without wiring to the compressor, it is convenient to probe whether the trouble comes from the compressor or PC board.
29	Capacity precedence setting	If the capacity control is required, the low noise control is automatically released by this setting during carrying out low noise operation and nighttime low noise operation.
30	Demand setting 1	Changes target value of power consumption when demand control 1 is input.
32	Normal demand setting	Normally enables demand control 1 without external input. (Effective to prevent a problem that circuit breaker of small capacity is shut down due to large load.)

No.	Setting item	Description
35	Setting of difference in elevation for the outdoor unit	Make the setting when the outdoor unit is installed 40 m or more below the indoor unit.
38	Emergency operation (Setting for the master unit operation prohibition in multi-outdoor-unit system)	Used to temporarily prohibit the applicable outdoor unit from operating should there be any faulty part in multi-outdoor-unit system. Since the comfortable environment is extremely impaired, prompt replacement of the part is required.
39	Emergency operation (Setting for the slave unit 1 operation prohibition in multi-outdoor-unit system)	
40	Emergency operation (Setting for the slave unit 2 operation prohibition in multi-outdoor-unit system)	
42	Emergency operation (prohibition of INV compressor operation)	If the INV compressor has a failure, used to run the system only with STD compressor(s). This is a temporary running of the system until the compressor is replaced, thus making comfort extremely worse. Therefore, it is recommended to replace the compressor as soon as possible. (Be noted this setting is not available on model U-5,8MX4XPQ.)

No.	Setting item display								Setting condition display	
	Setting item	MODE H1P	TEST H2P	C/H selection			Low noise H6P	Demand H7P		
				IND H3P	Master H4P	Slave H5P			* Factory set	
0	Digital pressure gauge kit display	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Address	0 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
									Binary number	1 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
									(4 digits)	~
										15 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
1	Cool / Heat Unified address	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Address	0 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									Binary number	1 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
									(6 digits)	~
										31 <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
2	Low noise/demand address	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Address	0 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									Binary number	1 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
									(6 digits)	~
										31 <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
3	Test operation (Refer to the description on page 180)	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Test operation: ON	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
									Test operation: OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> *
5	Indoor forced fan H	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Normal operation	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> *
									Indoor forced fan H	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
6	Indoor forced operation	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Normal operation	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> *
									Indoor forced operation	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
8	Te setting	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	High	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
									Normal (factory setting)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> *
									Low	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
9	Tc setting	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	High	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
									Normal (factory setting)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> *
									Low	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
10	Defrost changeover setting	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Quick defrost	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
									Normal (factory setting)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> *
									Slow defrost	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
11	Sequential operation setting	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
									ON	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> *
12	External low noise/demand setting	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	External low noise/demand: NO	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> *
									External low noise/demand: YES	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
13	Airnet address	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Address	0 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									Binary number	1 <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
									(6 digits)	~
										63 <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
16	Setting of hot water heater	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> *
									ON	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
18	High static pressure setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	High static pressure setting: OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> *
									High static pressure setting: ON	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
19	Emergency operation (STD compressor is inhibited to operate.)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									STD 1, 2 operation: Inhibited	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
									STD 2 operation: Inhibited	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
20	Additional refrigerant charging operation setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	Refrigerant charging: OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> *
									Refrigerant charging: ON	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
21	Refrigerant recovery/vacuuuming mode setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Refrigerant recovery / vacuuming: OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> *
									Refrigerant recovery / vacuuming: ON	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
22	Night-time low noise setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	OFF	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> *
									Level 1 (outdoor fan with 6 step or lower)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/>
									Level 2 (outdoor fan with 5 step or lower)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/>
									Level 3 (outdoor fan with 4 step or lower)	<input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>

No.	Setting item display								Setting condition display
	Setting item	MODE H1P	TEST H2P	C/H selection			Low noise H6P	Demand H7P	
				IND H3P	Master H4P	Slave H5P			* Factory set
24	ENECUT test operation (Domestic Japan only)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	ENECUT output OFF <input type="radio"/> ● ● ● ● ● ● ● ● ● ● ENECUT output forced ON <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
25	Low noise setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Level 1 (outdoor fan with 6 step or lower) <input type="radio"/> ● ● ● ● ● ● ● ● ● ● Level 2 (outdoor fan with 5 step or lower) <input type="radio"/> ● ● ● ● ● ● ● ● ● ● Level 3 (outdoor fan with 4 step or lower) <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
26	Night-time low noise operation start setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	About 20:00 <input type="radio"/> ● ● ● ● ● ● ● ● ● ● About 22:00 (factory setting) <input type="radio"/> ● ● ● ● ● ● ● ● ● ● About 24:00 <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
27	Night-time low noise operation end setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	About 6:00 <input type="radio"/> ● ● ● ● ● ● ● ● ● ● About 7:00 <input type="radio"/> ● ● ● ● ● ● ● ● ● ● About 8:00 (factory setting) <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
28	Power transistor check mode	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	OFF <input type="radio"/> ● ● ● ● ● ● ● ● ● ● ON <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
29	Capacity precedence setting	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	OFF <input type="radio"/> ● ● ● ● ● ● ● ● ● ● ON <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
30	Demand setting 1	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	60 % demand <input type="radio"/> ● ● ● ● ● ● ● ● ● ● 70 % demand <input type="radio"/> ● ● ● ● ● ● ● ● ● ● 80 % demand <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
32	Normal demand setting	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	OFF <input type="radio"/> ● ● ● ● ● ● ● ● ● ● ON <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
35	Setting of difference in elevation for the outdoor unit	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Normal <input type="radio"/> ● ● ● ● ● ● ● ● ● ● 65 m or less <input type="radio"/> ● ● ● ● ● ● ● ● ● ● 90 m or less <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
38	Emergency operation (Master unit with multi-outdoor-unit system is inhibited to operate.)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	OFF <input type="radio"/> ● ● ● ● ● ● ● ● ● ● Master unit operation: Inhibited <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
39	Emergency operation (Slave unit 1 with multi-outdoor-unit system is inhibited to operate.)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	OFF <input type="radio"/> ● ● ● ● ● ● ● ● ● ● Slave unit 1 operation: Inhibited <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
40	Emergency operation (Slave unit 2 with multi-outdoor-unit system is inhibited to operate.)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	OFF <input type="radio"/> ● ● ● ● ● ● ● ● ● ● Slave unit 2 operation: Inhibited <input type="radio"/> ● ● ● ● ● ● ● ● ● ●
42	Emergency operation (prohibition of INV compressor operation)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	Normal operation <input type="radio"/> ● ● ● ● ● ● ● ● ● ● Emergency operation (prohibition of INV compressor operation) <input type="radio"/> ● ● ● ● ● ● ● ● ● ●

### c. Monitor mode

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

#### <Selection of setting item>

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

#### <Confirmation on setting contents>

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

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

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

(V2765)

No.	Setting item	LED display							Data display
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	
0	Various settings	●	●	●	●	●	●	●	Lower 4 digits
1	C/H unified address	●	●	●	●	●	●	○	Lower 6 digits
2	Low noise/demand address	●	●	●	●	●	○	●	
3	Not used	●	●	●	●	●	○	○	
4	Airnet address	●	●	●	●	○	●	●	
5	Number of connected indoor units	●	●	●	●	○	●	○	
6	Number of connected HR Boxes	●	●	●	●	○	○	●	
7	Number of connected zone units (excluding outdoor and HR Box)	●	●	●	●	○	○	○	Lower 4 digits: upper
8	Number of outdoor units	●	●	●	○	●	●	●	
9	Number of connected HR Boxes	●	●	●	○	●	●	○	Lower 4 digits: lower
10	Number of connected HR Boxes	●	●	●	○	●	○	●	Lower 6 digits
11	Number of zone units (excluding outdoor and HR Boxes)	●	●	●	○	●	○	○	Lower 4 digits: upper
12	Number of terminal blocks	●	●	●	○	○	●	●	Lower 4 digits: lower
13	Number of terminal blocks	●	●	●	○	○	●	○	Malfunction code table Refer page 201.
14	Contents of malfunction (the latest)	●	●	●	○	○	○	●	
15	Contents of malfunction (1 cycle before)	●	●	●	○	○	○	○	
16	Contents of malfunction (2 cycle before)	●	●	○	●	●	●	●	
20	Contents of retry (the latest)	●	●	○	●	○	●	●	
21	Contents of retry (1 cycle before)	●	●	○	●	○	●	○	
22	Contents of retry (2 cycle before)	●	●	○	●	○	○	●	Lower 6 digits
25	Number of multi connection outdoor units	●	●	○	○	●	●	○	

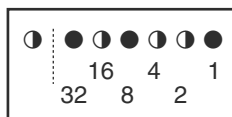
The numbers in the "No." column represent the number of times to press the SET (BS2) button.

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

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

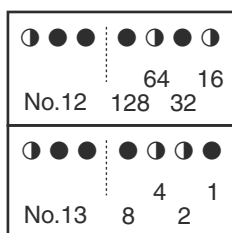
Push the SET button and match with the LEDs No. 1 - 15, push the RETURN button, and confirm the data for each setting.

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



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

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



The number of terminal blocks for No. 12 and 13 is expressed as an 8-digit binary number, which is the combination of four upper, and four lower digits for No. 12 and 13 respectively. (0 - 128)

In ② the address for No. 12 is 0101, the address for No. 13 is 0110, and the combination of the two is 01010110 (binary number), which translates to  $64 + 16 + 4 + 2 = 86$  (base 10 number). In other words, the number of terminal block is 86.

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

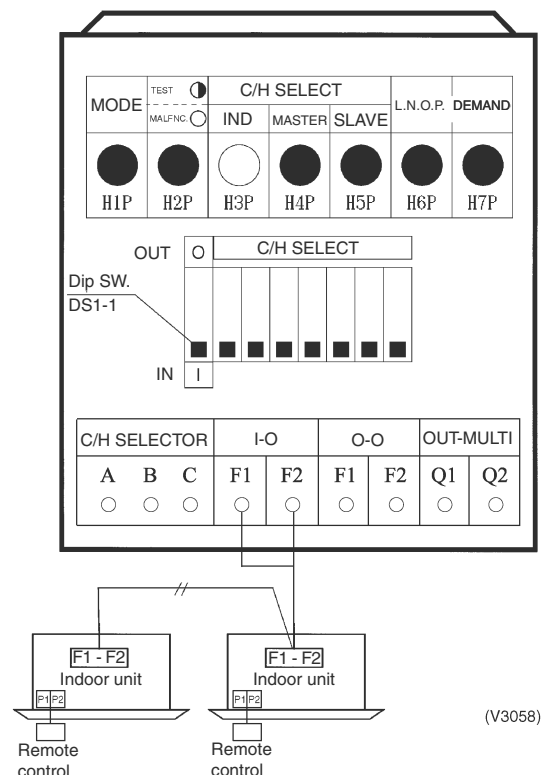
### 3.2.2 Cool / Heat Mode Switching

There are the following 4 cool/heat switching modes.

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

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

- ◆ It does not matter whether or not there is outdoor - outdoor unit wiring.
- ◆ Set outdoor unit PC board DS1-1 to IN (factory set).
- ◆ Set cool/heat switching to IND (individual) for "Setting mode 1" (factory set).
- ◆ Set the master unit (= indoor unit having the right to select the cooling/heating operation mode).



(V3058)

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

#### In the case of wired remote controls

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

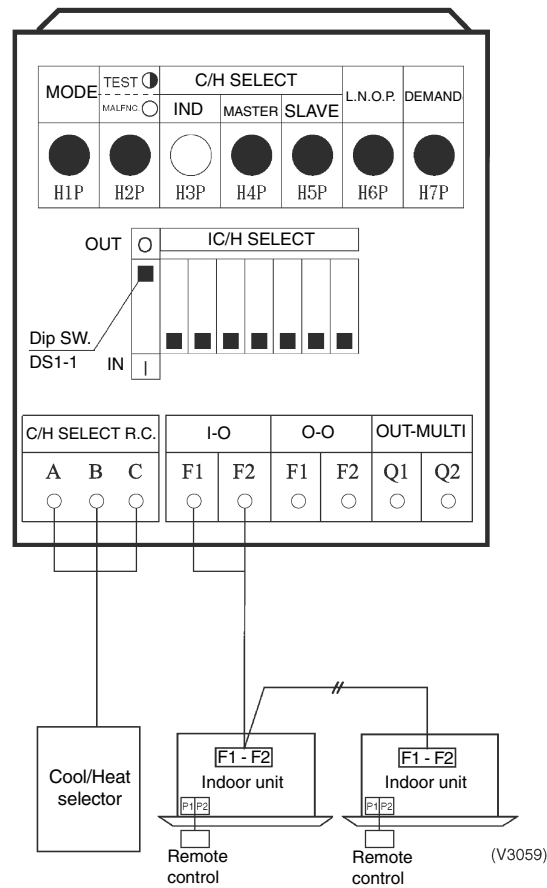
For the details, refer to the installation manual supplied together with the indoor unit.

#### In the case of infrared remote controls

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

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

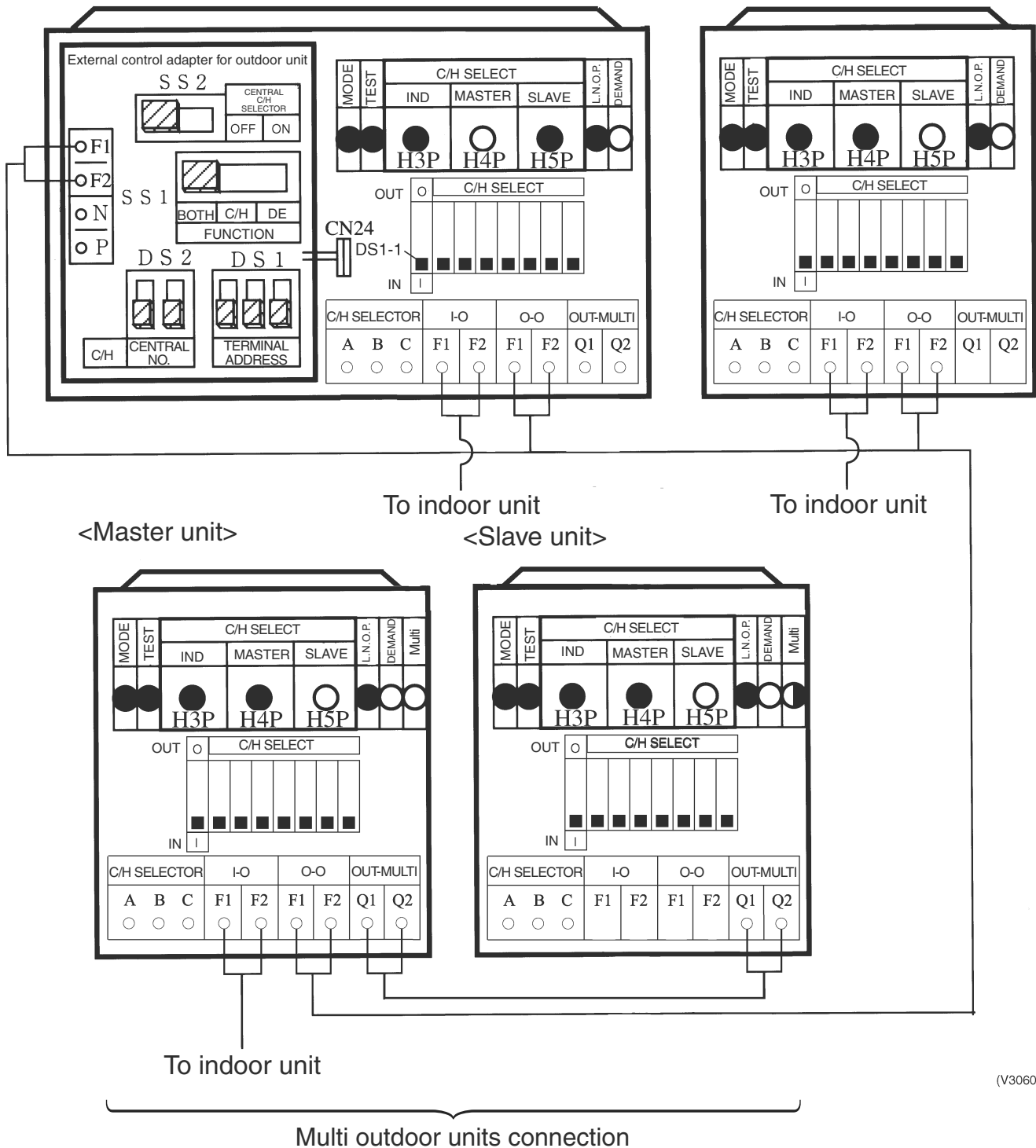
- ◆ It does not matter whether or not there is outdoor - outdoor unit wiring.
- ◆ Set outdoor unit PC board DS1-1 to OUT (factory set).
- ◆ Set cool/heat switching to IND (individual) for “Setting mode 1” (factory set).





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

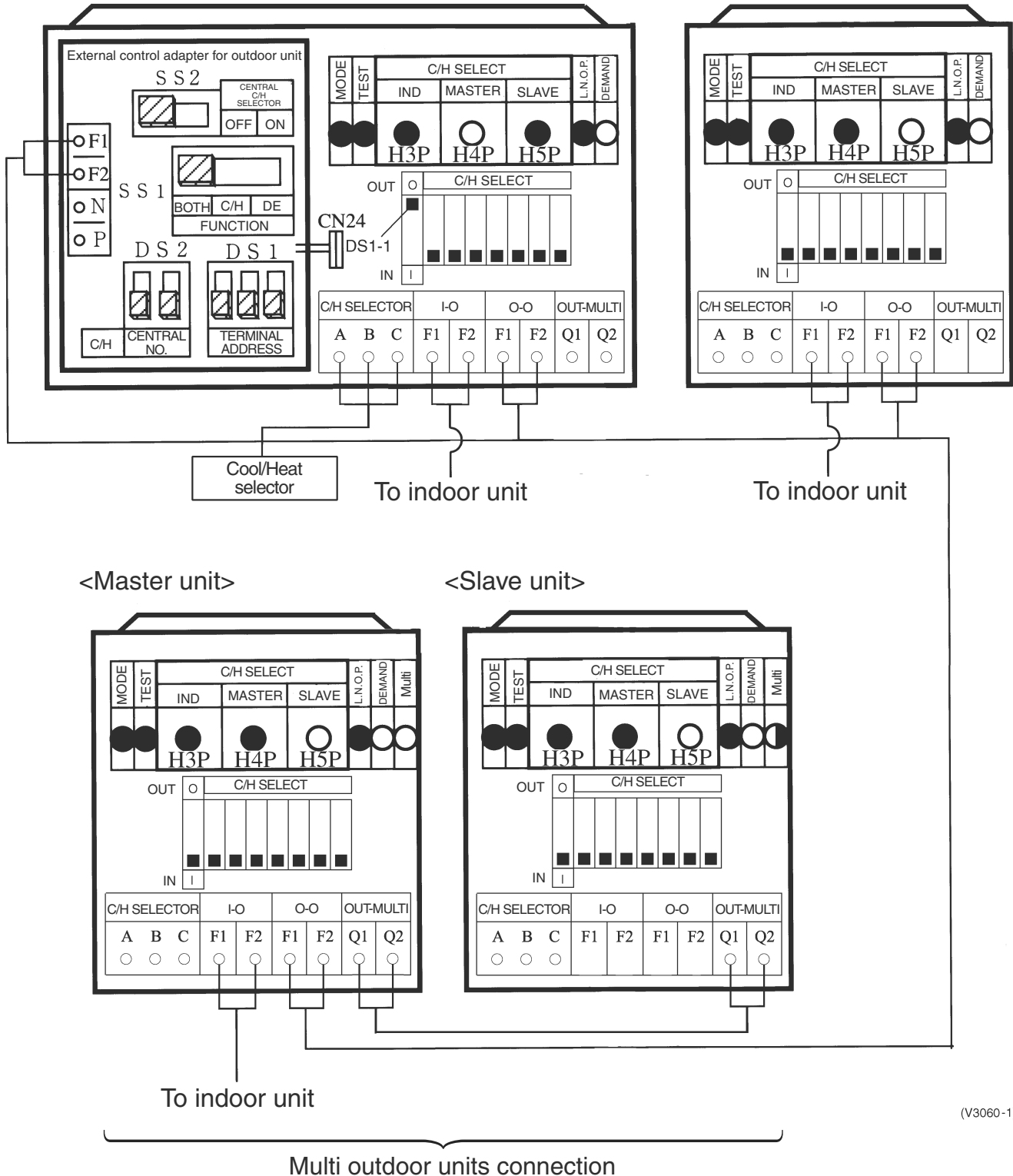
- ◆ Install the external control adapter for outdoor unit on either the outdoor-outdoor, indoor-outdoor transmission line.
- ◆ Set outdoor unit PC board DS1-1 to IN (factory set).
- ◆ In setting mode 1, set the outdoor unit you want to give cool/heat selection permission to as the group master, and set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



(V3060)

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

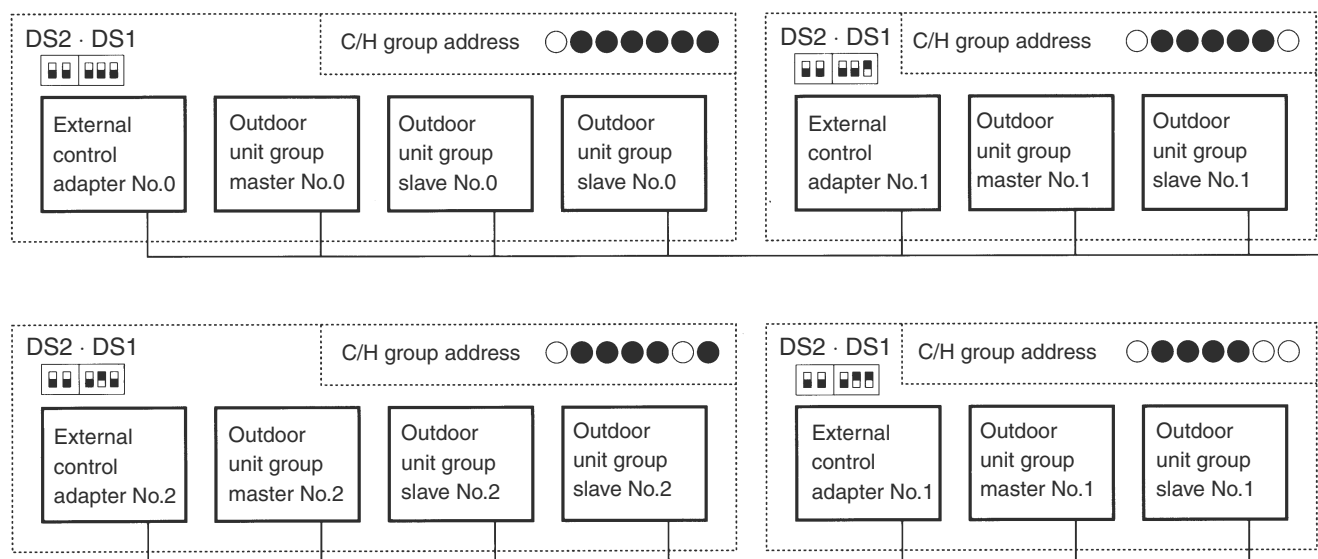
- ◆ Install the external control adapter for outdoor unit on either the outdoor-outdoor, indoor-outdoor transmission line.
- ◆ Mount the COOL/HEAT selector to the master outdoor unit for the unified control.
- ◆ Set the DS1-1 on the PC board of master outdoor unit to OUT.
- ◆ In setting mode 1, set the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



(V3060-1)

**Supplementation on ③ and ④.**

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



(V2723)

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

Address No.	Outdoor unit PC board LED Set with setting mode 2	External control adapter for outdoor unit DS2 DS1
No 0	<div> <div>○ ●</div> <div>● ● ● ● ●</div> <div>0</div> </div>	<div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div>0</div> </div>
No 1	<div> <div>○ ●</div> <div>● ● ● ● ○</div> <div>1</div> </div>	<div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div>1</div> </div>
No 2	<div> <div>○ ●</div> <div>● ● ● ○ ●</div> <div>2</div> </div>	<div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div>2</div> </div>
No 3	<div> <div>○ ●</div> <div>● ● ● ○ ○</div> <div>3</div> </div>	<div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div>3</div> </div>
No 4	<div> <div>○ ●</div> <div>● ● ○ ● ●</div> <div>4</div> </div>	<div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div>4</div> </div>
}	}	}
No 30	<div> <div>○ ●</div> <div>○ ○ ○ ○ ●</div> <div>30</div> </div>	<div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div>30</div> </div>
No 31	<div> <div>○ ●</div> <div>○ ○ ○ ○ ○</div> <div>31</div> </div>	<div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div> <div>Upper position (ON)</div> <div>Lower position (OFF)</div> </div> <div>31</div> </div>

○ ON

● OFF



Upper position (ON)



Lower position (OFF)

(The shaded part shows knob)

(V2724)

### 3.2.3 Setting of Low Noise Operation and Demand Operation

#### Setting of Low Noise Operation

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

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

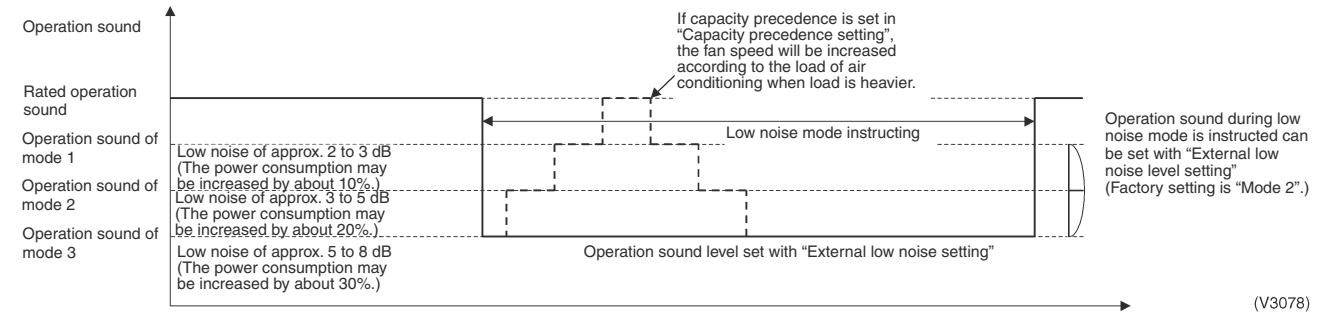
#### A. When the low noise operation is carried out by external instructions (with the use of the external control adapter for outdoor unit)

1. While in "Setting mode 2", set the setting condition for set item No. 12 (Setting of external low noise/demand operation) to "YES".
2. If necessary, while in "Setting mode 2", select the setting condition (i.e., "Mode 1", "Mode 2", or "Mode 3") for set item No. 25 (Setting of external low noise level).
3. If necessary, while in "Setting mode 2", set the setting condition for the set item No. 29 (Setting of capacity precedence) to "ON".  
(If the condition is set to "ON", when the air-conditioning load reaches a high level, the low noise operation command will be ignored to put the system into normal operation mode.)

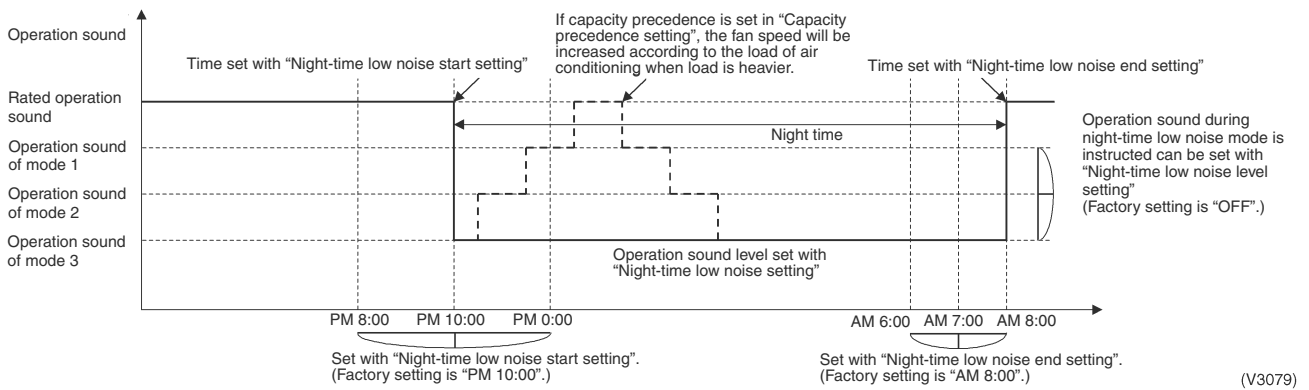
#### B. When the low noise operation is carried out automatically at night (The external control adapter for outdoor unit is not required)

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

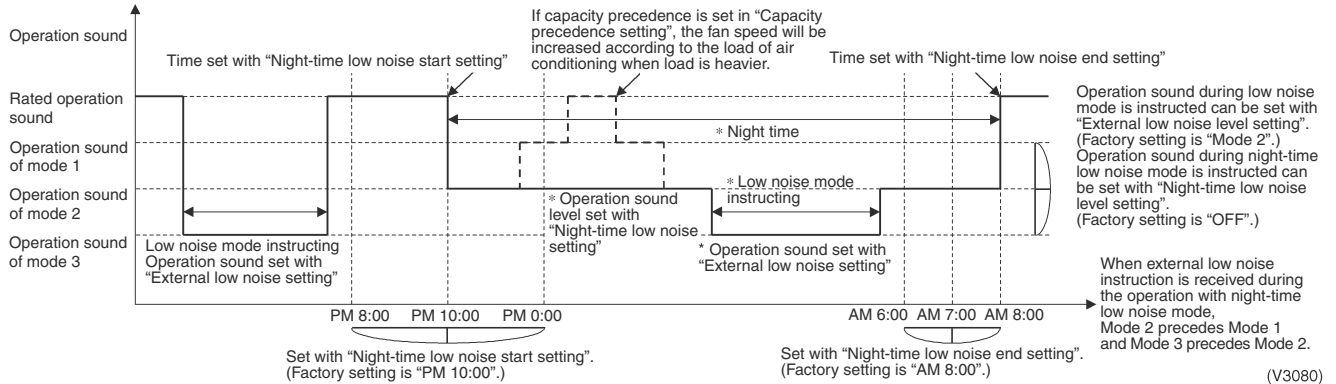
## Image of operation in the case of A



## Image of operation in the case of B



## Image of operation in the case of A and B



## Setting of Demand Operation

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

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

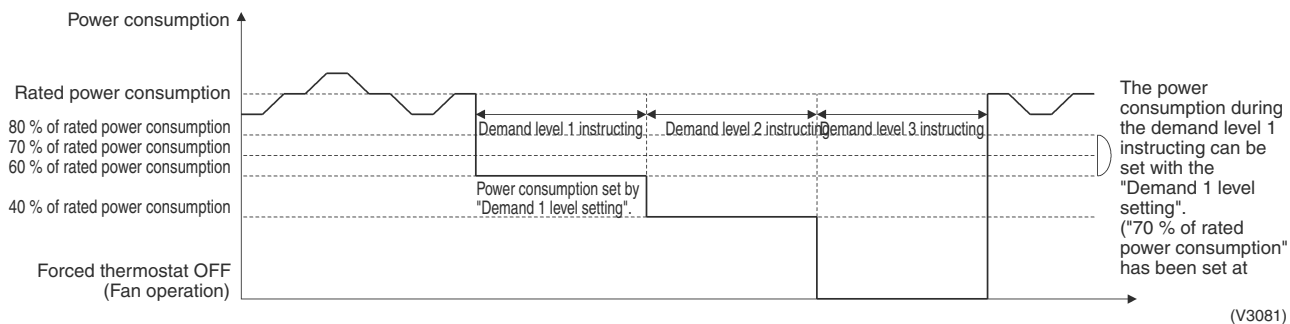
### A. When the demand operation is carried out by external instructions (with the use of the external control adapter for outdoor unit).

1. While in "Setting mode 2", set the setting condition for set item No. 12 (Setting of external low noise/demand operation) to "YES".
2. If necessary, while in "Setting mode 2", select the set item No. 30 (Setting of Demand 1 level) and then set the setting condition to targeted mode.

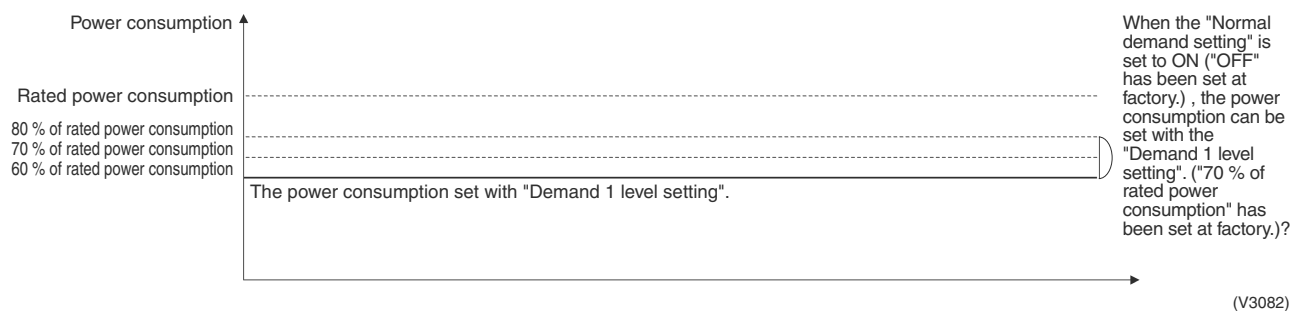
### B. When the Normal demand operation is carried out. (Use of the external control adapter for outdoor unit is not required.)

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

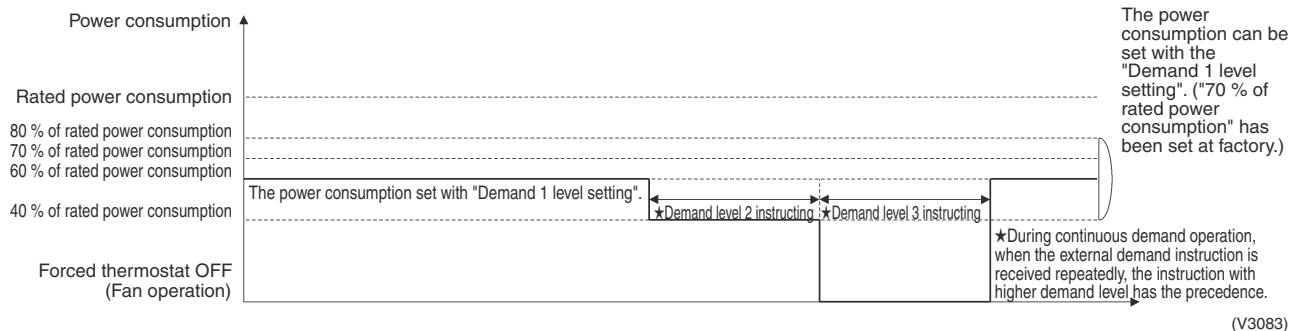
## Image of operation in the case of A



## Image of operation in the case of B



## Image of operation in the case of A and B



---

## Detailed Setting Procedure of Low Noise Operation and Demand Control

### 1. Setting mode 1 (H1P off)

- ① In setting mode 2, push the BS1 (MODE button) one time. → Setting mode 2 is entered and H1P lights.

During the setting mode 1 is displayed, “In low noise operation” and “In demand control” are displayed.

### 2. Setting mode 2 (H1P on)

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



○: ON ●: OFF ◐: Blink

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

Setting mode indication section

Setting No. indication section

Set contents indication section

### 3.2.4 Setting of Refrigerant Recovery Mode

When carrying out the refrigerant collection on site, fully open the respective expansion valve of indoor and outdoor units.

All indoor and outdoor unit's operation are prohibited.

**[Operation procedure]**

- ① In **setting mode 2** with units in stop mode, set "Refrigerant Recovery / Vacuuming mode" to ON. The respective expansion valve of indoor and outdoor units are fully opened. (H2P turns to display "TEST OPERATION" (blinks), "TEST OPERATION" and "UNDER CENTRALIZED CONTROL" are displayed on the remote control, and the all indoor / outdoor unit operation is prohibited.  
After setting, do not cancel "Setting Mode 2" until completion of refrigerant recovery operation.
- ② Collect the refrigerant using a refrigerant recovery unit. (See the instruction attached to the refrigerant recovery unit for more detail.)
- ③ Press Mode button "BS1" once and reset "Setting Mode 2".

### 3.2.5 Setting of Vacuuming Mode

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

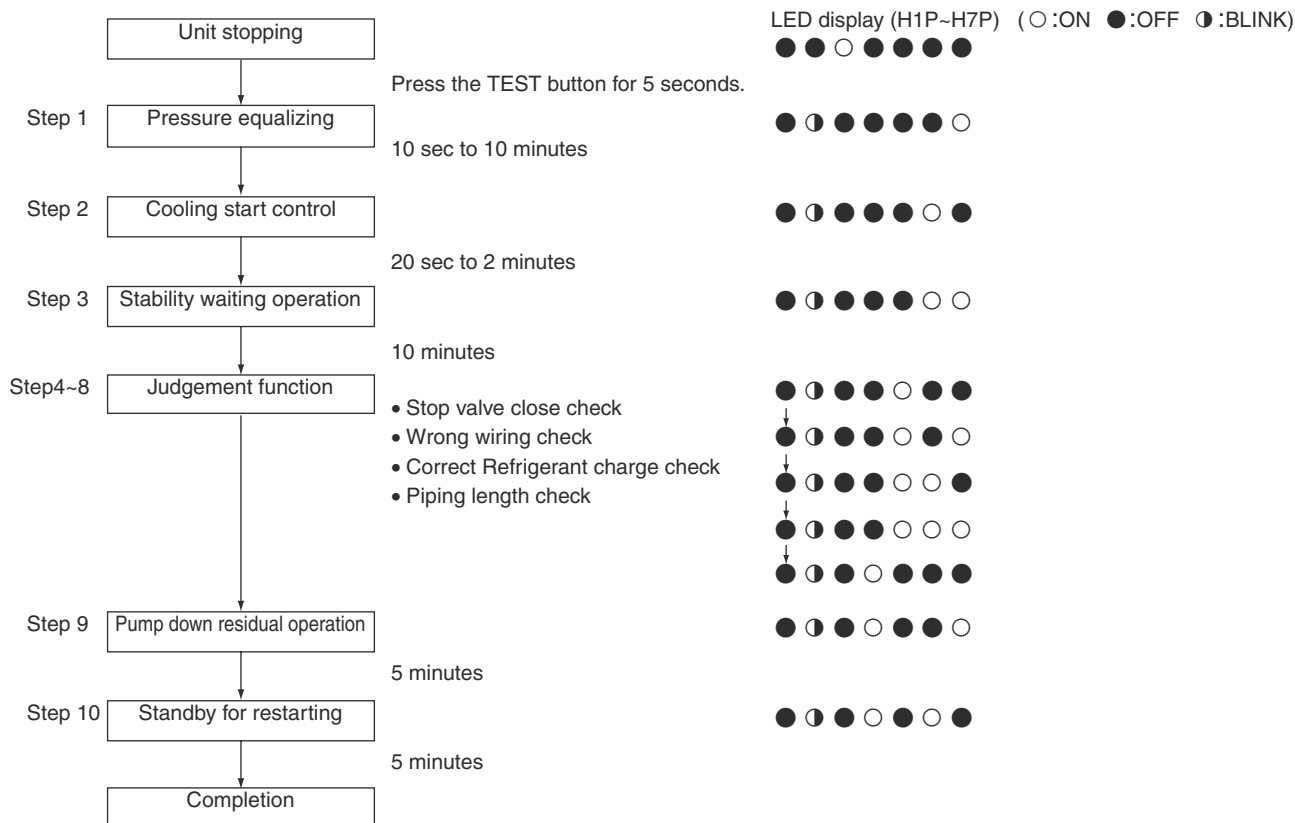
### [Operating procedure]

- ① With **Setting Mode 2** while the unit stops, set “Refrigerant recovery / Vacuuming mode” to ON. The expansion valves of indoor and outdoor units fully open and some of solenoid valves open.  
(H2P blinks to indicate the test operation, and the remote control displays "Test Operation" and "Under centralized control", thus prohibiting operation.)  
After setting, do not cancel “Setting Mode 2” until completion of Vacuuming operation.
- ② Use the vacuum pump to perform vacuuming operation.
- ③ Press Mode button “BS1” once and reset “Setting Mode 2”.

### 3.2.6 Check Operation Detail

## CHECK OPERATION FUNCTION

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





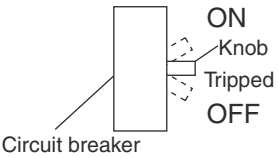
# Part 6

## Troubleshooting

1. Symptom-based Troubleshooting .....	187
2. Troubleshooting by Remote Control .....	190
2.1 The INSPECTION / TEST Button.....	190
2.2 Self-diagnosis by Wired Remote Control.....	191
2.3 Self-diagnosis by Infrared Remote Control.....	192
2.4 Operation of The Remote Control's Inspection / Test Operation Button ...	195
2.5 Remote Control Service Mode .....	196
2.6 Remote Control Self-Diagnosis Function .....	198
3. Troubleshooting by Indication on the Remote Control .....	205
3.1 "R0" Indoor Unit: Error of External Protection Device.....	205
3.2 "R1" Indoor Unit: PC Board Defect.....	206
3.3 "R3" Indoor Unit: Malfunction of Drain Level Control System (S1L) .....	207
3.4 "R6" Indoor Unit: Fan Motor (M1F) Lock, Overload.....	209
3.5 "R7" Indoor Unit: Malfunction of Swing Flap Motor (M1S) .....	210
3.6 "R9" Indoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E)212	
3.7 "RF" Indoor Unit: Drain Level above Limit.....	214
3.8 "RJ" Indoor Unit: Malfunction of Capacity Determination Device .....	215
3.9 "C4" Indoor Unit: Malfunction of Thermistor (R2T) for Heat Exchanger.....	216
3.10 "C5" Indoor Unit: Malfunction of Thermistor (R3T) for Gas Pipes.....	217
3.11 "C9" Indoor Unit: Malfunction of Thermistor (R1T) for Suction Air.....	218
3.12 "CJ" Indoor Unit: Malfunction of Thermostat Sensor in Remote Control .....	219
3.13 "E1" Outdoor Unit: PC Board Defect .....	220
3.14 "E3" Outdoor Unit: Actuation of High Pressure Switch .....	221
3.15 "E4" Outdoor Unit: Actuation of Low Pressure Sensor .....	223
3.16 "E5" Outdoor Unit: Inverter Compressor Motor Lock.....	225
3.17 "E6" Outdoor Unit: STD Compressor Motor Overcurrent/Lock.....	227
3.18 "E7" Outdoor Unit: Malfunction of Outdoor Unit Fan Motor.....	228
3.19 "E9" Outdoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E, Y2E).....	231
3.20 "F3" Outdoor Unit: Abnormal Discharge Pipe Temperature .....	233
3.21 "F6" Outdoor Unit: Refrigerant Overcharged .....	234
3.22 "H7" Outdoor Unit: Abnormal Outdoor Fan Motor Signal.....	235
3.23 "H9" Outdoor Unit: Malfunction of Thermistor (R1T) for Outdoor Air....	236
3.24 "J2" Outdoor Unit: Current Sensor Malfunction.....	237
3.25 "J3" Outdoor Unit: Malfunction of Discharge Pipe Thermistor (R3, R31~33T).....	238
3.26 "J5" Outdoor Unit: Malfunction of Thermistor (R2T), (R7T) for Suction Pipe .....	239
3.27 "J6" Outdoor Unit: Malfunction of Thermistor (R4T) for Outdoor Unit Heat Exchanger .....	240
3.28 "J7" Outdoor Unit: Malfunction of Liquid Pipe Thermistor (R6T) .....	241

3.29	“J9” Outdoor Unit: Malfunction of Subcooling Heat Exchanger Gas Pipe Thermistor (R5T) .....	242
3.30	“JR” Outdoor Unit: Malfunction of High Pressure Sensor.....	243
3.31	“JC” Outdoor Unit: Malfunction of Low Pressure Sensor.....	244
3.32	“L4” Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise .....	245
3.33	“L5” Outdoor Unit: Inverter Compressor Abnormal .....	247
3.34	“L8” Outdoor Unit: Inverter Current Abnormal .....	249
3.35	“L9” Outdoor Unit: Inverter Start up Error .....	251
3.36	“LC” Outdoor Unit: Malfunction of Transmission Between Inverter and Control PC Board .....	253
3.37	“P1” Outdoor Unit: Inverter Over-Ripple Protection .....	256
3.38	“P4” Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise Sensor .....	257
3.39	“PJ” Outdoor Unit: Faulty Field Setting after Replacing Main PC Board or Faulty Combination of PC Board.....	259
3.40	“UD” Outdoor Unit: Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure.....	260
3.41	“U1” Reverse Phase, Open Phase.....	261
3.42	“U2” Outdoor Unit: Power Supply Insufficient or Instantaneous Failure .....	262
3.43	“U3” Outdoor Unit: Check Operation not executed.....	265
3.44	“U4” Malfunction of Transmission Between Indoor Units .....	266
3.45	“U5” Indoor Unit: Malfunction of Transmission Between Remote Control and Indoor Unit.....	268
3.46	“U7” Indoor Unit: Malfunction of Transmission Between Outdoor Units .....	269
3.47	“U8” Indoor Unit: Malfunction of Transmission Between Main and Sub Remote Controls .....	271
3.48	“U9” Indoor Unit: Malfunction of Transmission Between Indoor and Outdoor Units in the Same System .....	272
3.49	“UR” Improper Combination of Indoor and Outdoor Units, Indoor Units and Remote Control.....	273
3.50	“UC” Address Duplication of Centralized Controller .....	275
3.51	“UE” Malfunction of Transmission Between Centralized Controller and Indoor Unit.....	276
3.52	“UF” System is not Set yet .....	279
3.53	“UH” Malfunction of System, Refrigerant System Address Undefined..	280
4.	Troubleshooting (OP: Central Remote Control) .....	282
4.1	“77” PC Board Defect .....	282
4.2	“78” Malfunction of Transmission Between Optional Controllers for Centralized Control.....	283
4.3	“7R” Improper Combination of Optional Controllers for Centralized Control.....	285
4.4	“7C” Address Duplication, Improper Setting .....	287
5.	Troubleshooting (OP: Unified ON/OFF Controller) .....	290
5.1	Operation Lamp Blinks .....	290
5.2	Display “Under Centralized Control” Blinks (Repeats Single Blink)....	292
5.3	Display “Under Centralized Control” Blinks (Repeats Double Blink) ...	295

# 1. Symptom-based Troubleshooting

	Symptom	Supposed Cause	Countermeasure
1	The system does not start operation at all.	Blowout of fuse(s)	Turn Off the power supply and then replace the fuse(s).
		Cutout of breaker(s)	<ul style="list-style-type: none"> <li>If the knob of any breaker is in its OFF position, turn ON the power supply.</li> <li>If the knob of any circuit breaker is in its tripped position, do not turn ON the power supply.</li> </ul> 
		Power failure	After the power failure is reset, restart the system.
2	The system starts operation but makes an immediate stop.	Blocked air inlet or outlet of indoor or outdoor unit	Remove obstacle(s).
		Clogged air filter(s)	Clean the air filter(s).
3	The system does not cool or heat air well.	Blocked air inlet or outlet of indoor or outdoor unit	Remove obstacle(s).
		Clogged air filter(s)	Clean the air filter(s).
		Enclosed outdoor unit(s)	Remove the enclosure.
		Improper set temperature	Set the temperature to a proper degree.
		Airflow rate set to "LOW"	Set it to a proper airflow rate.
		Improper direction of air diffusion	Set it to a proper direction.
		Open window(s) or door(s)	Shut it tightly.
		[In cooling] Direct sunlight received	Hang curtains or shades on windows.
		[In cooling] Too many persons staying in a room	
		[In cooling] Too many heat sources (e.g. OA equipment) located in a room	
4	The system does not operate.	The system stops and immediately restarts operation.	Normal operation. The system will automatically start operation after a lapse of five minutes.
		Pressing the TEMP ADJUST button immediately resets the system.	
		The remote control displays "UNDER CENTRALIZED CONTROL", which blinks for a period of several seconds when the OPERATION button is depressed.	Operate the system using the COOL/HEAT centralized remote control.
		The system stops immediately after turning ON the power supply.	Wait for a period of approximately one minute.
5	The system makes intermittent stops.	The remote control displays malfunction codes "U4" and "U5", and the system stops but restarts after a lapse of several minutes.	The system stops due to an interruption in communication between units caused by electrical noises coming from equipment other than air conditioners.
6	COOL-HEAT selection is disabled.	The remote control displays "UNDER CENTRALIZED CONTROL".	Remove causes of electrical noises. If these causes are removed, the system will automatically restart operation.
		The remote control displays "UNDER CENTRALIZED CONTROL", and the COOL-HEAT selection remote control is provided.	This remote control has no option to select cooling operation.
		COOL-HEAT selection is made using the COOL-HEAT selection remote control.	Use a remote control with option to select cooling operation.
			Use the COOL-HEAT selection remote control to select cool or heat.

	Symptom		Supposed Cause	Countermeasure
7	The system conducts fan operation but not cooling or heating operation.	This symptom occurs immediately after turning ON the power supply.	The system is in preparation mode of operation.	Wait for a period of approximately 10 minutes.
8	The airflow rate is not reproduced according to the setting.	Even pressing the AIRFLOW RATE SET button makes no changes in the airflow rate.	In heating operation, when the room temperature reaches the set degree, the outdoor unit will stop while the indoor unit is brought to fan LL operation so that no one gets cold air. Furthermore, if fan operation mode is selected when other indoor unit is in heating operation, the system will be brought to fan LL operation. (The fan LL operation is also enabled while in oil return mode in cooling operation.)	Normal operation.
9	The airflow direction is not reproduced according to the setting.	The airflow direction is not corresponding to that displayed on the remote control. The flap does not swing.	Automatic control	Normal operation.
10	A white mist comes out from the system.	<Indoor unit> In cooling operation, the ambient humidity is high. (This indoor unit is installed in a place with much oil or dust.)	Uneven temperature distribution due to heavy stain of the inside of the indoor unit	Clean the inside of the indoor unit.
		<Indoor unit> Immediately after cooling operation stopping, the ambient temperature and humidity are low.	Hot gas (refrigerant) flown in the indoor unit results to be vapor from the unit.	Normal operation.
		<Indoor and outdoor units> After the completion of defrosting operation, the system is switched to heating operation.	Defrosted moisture turns to be vapor and comes out from the units.	Normal operation.
11	The system produces sounds.	<Indoor unit> Immediately after turning ON the power supply, indoor unit produces "ringing" sounds.	These are operating sounds of the electronic expansion valve of the indoor unit.	Normal operation. This sound becomes low after a lapse of approximately one minute.
		<Indoor and outdoor units> "Hissing" sounds are continuously produced while in cooling or defrosting operation.	These sounds are produced from gas (refrigerant) flowing respectively through the indoor and outdoor units.	Normal operation.
		<Indoor and outdoor units> "Hissing" sounds are produced immediately after the startup or stop of the system, or the startup or stop of defrosting operation.	These sounds are produced when the gas (refrigerant) stops or changes flowing.	Normal operation.
		<Indoor unit> Faint sounds are continuously produced while in cooling operation or after stopping the operation.	These sounds are produced from the drain discharge device in operation.	Normal operation.
		<Indoor unit> "Creaking" sounds are produced while in heating operation or after stopping the operation.	These sounds are produced from resin parts expanding and contracting with temperature changes.	Normal operation.
		<Indoor unit> Sounds like "trickling" or the like are produced from indoor units in the stopped state.	On VRF systems, these sounds are produced when other indoor units in operation. The reason is that the system runs in order to prevent oil or refrigerant from dwelling.	Normal operation.
		<Outdoor unit> Pitch of operating sounds changes.	The reason is that the compressor changes the operating frequency.	Normal operation.

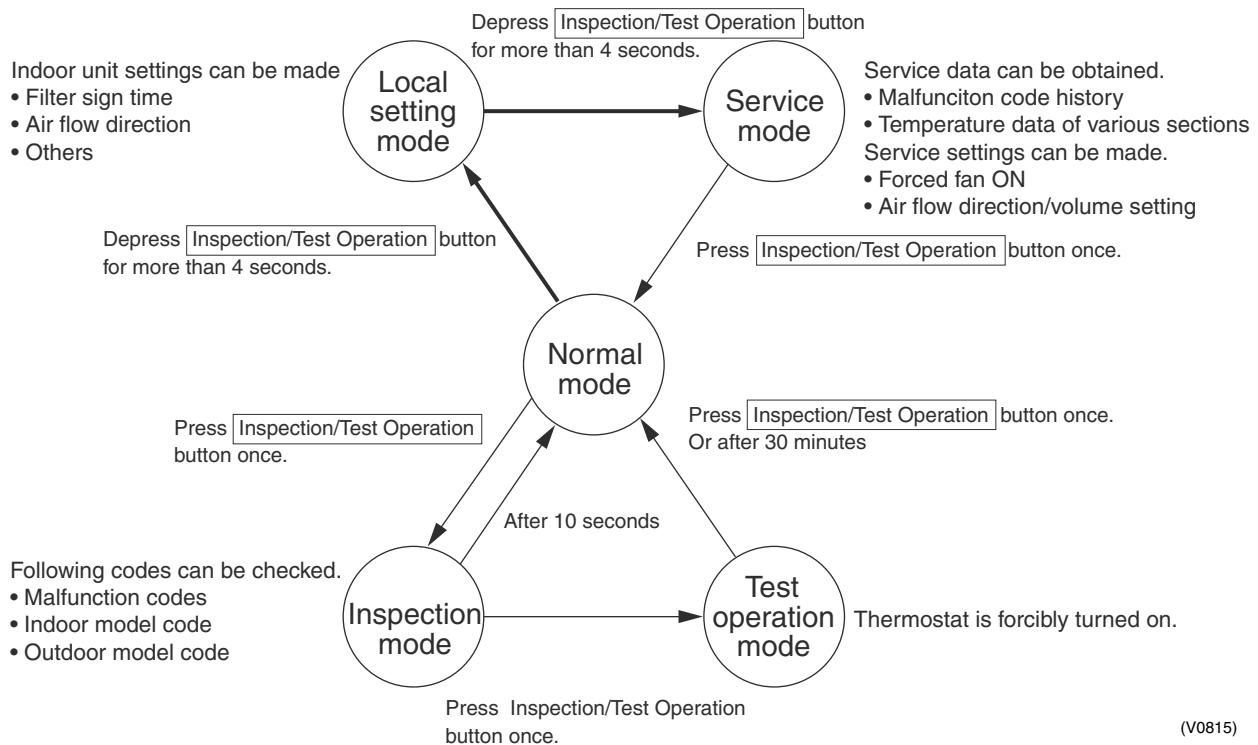


	Symptom		Supposed Cause	Countermeasure
12	Dust comes out from the system.	Dust comes out from the system when it restarts after the stop for an extended period of time.	Dust, which has deposited on the inside of indoor unit, is blown out from the system.	Normal operation.
13	Odors come out from the system.	In operation	Odors of room, cigarettes or else adsorbed to the inside of indoor unit are blown out.	The inside of the indoor unit should be cleaned.
14	Outdoor unit fan does not rotate.	In operation	The reason is that fan revolutions are controlled to put the operation to the optimum state.	Normal operation.
15	LCD display "88" appears on the remote control.	Immediately after turning ON the power supply	The reason is that the system is checking to be sure the remote control is normal.	Normal operation. This code is displayed for a period of approximately one minute at maximum.
16	The outdoor unit compressor or the outdoor unit fan does not stop.	After stopping operation	It stops in order to prevent oil or refrigerant from dwelling.	Normal operation. It stops after a lapse of approximately 5 to 10 minutes.
17	The outdoor gets hot.	While stopping operation	The reason is that the compressor is warmed up to provide smooth startup of the system.	Normal operation.
18	Hot air comes out from the system even though it stops.	Hot air is felt while the system stops.	On VRF systems, small quantity of refrigerant is fed to indoor units in the stopped state when other indoor units are in operation.	Normal operation.
19	The system does not cool air well.	The system is in dry operation.	The reason is that the dry operation serves not to reduce the room temperature where possible.	Change the system to cooling operation.

## 2. Troubleshooting by Remote Control

### 2.1 The INSPECTION / TEST Button

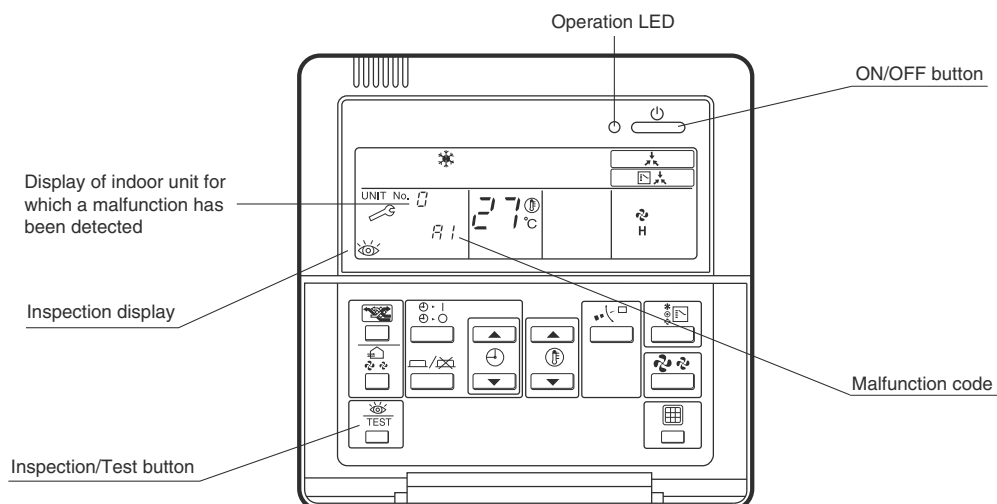
The following modes can be selected by using the [Inspection/Test Operation] button on the remote control.



## 2.2 Self-diagnosis by Wired Remote Control

### Explanation

If operation stops due to malfunction, the remote control'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 199 for malfunction code and malfunction contents.



### Note:

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

## 2.3 Self-diagnosis by Infrared Remote Control

### In the Case of CZ-01/02RW 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

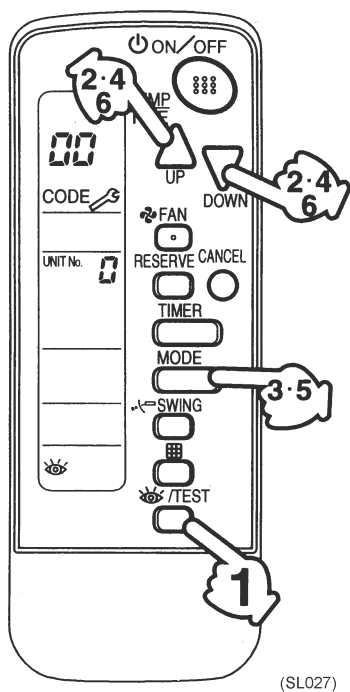
**Continuous beep** : Both upper and lower digits matched. (Malfunction code confirmed)

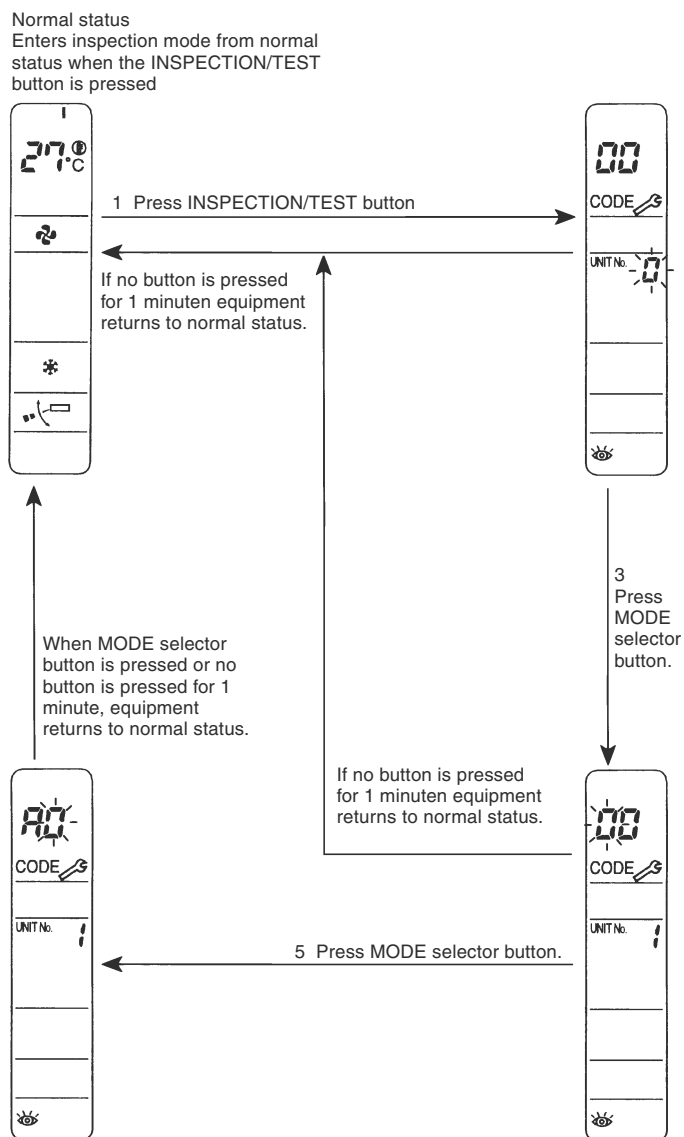
**2 short beeps** : Upper digit matched.

**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.

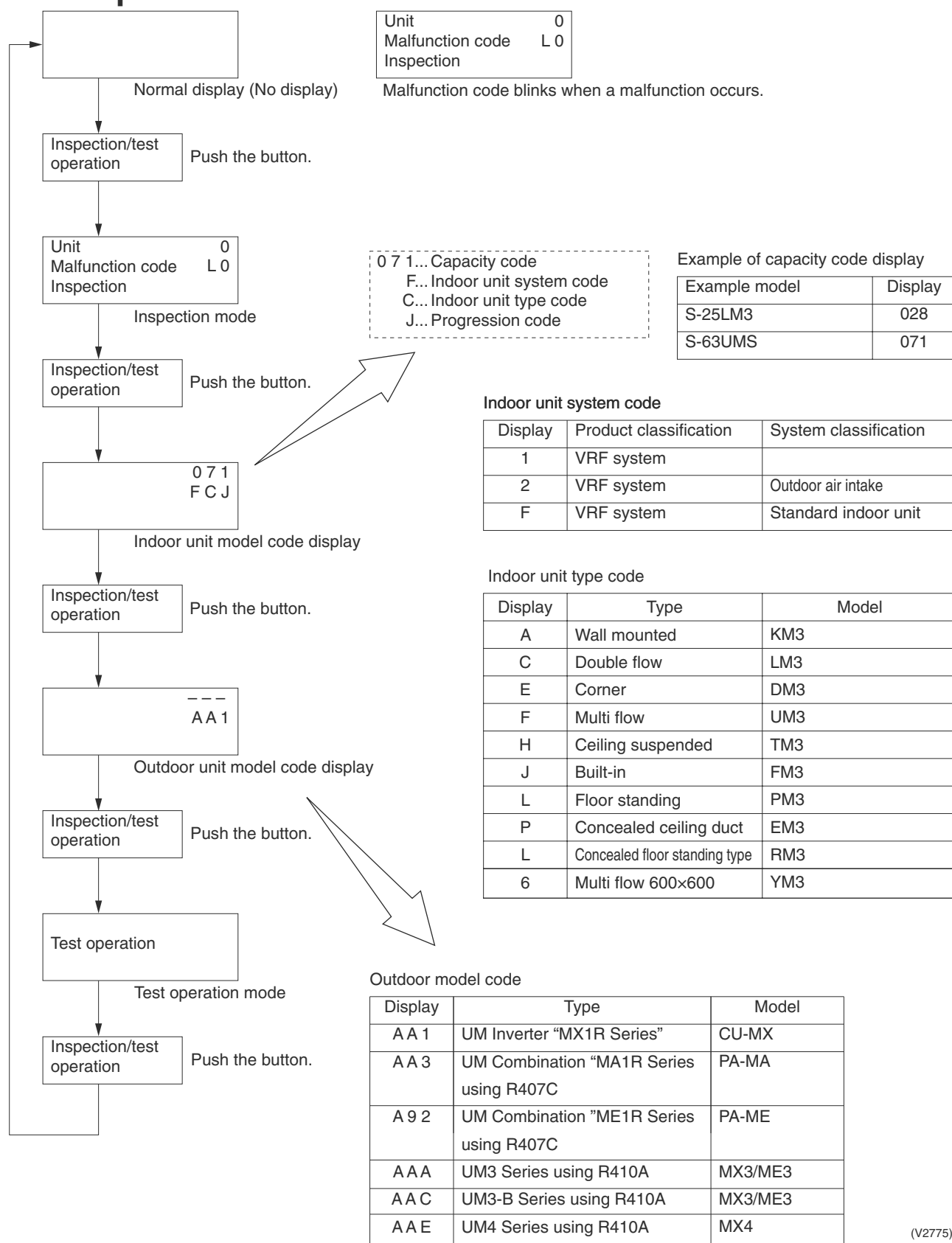
- The lower digit of the code changes as shown below when the UP and DOWN buttons are pressed.





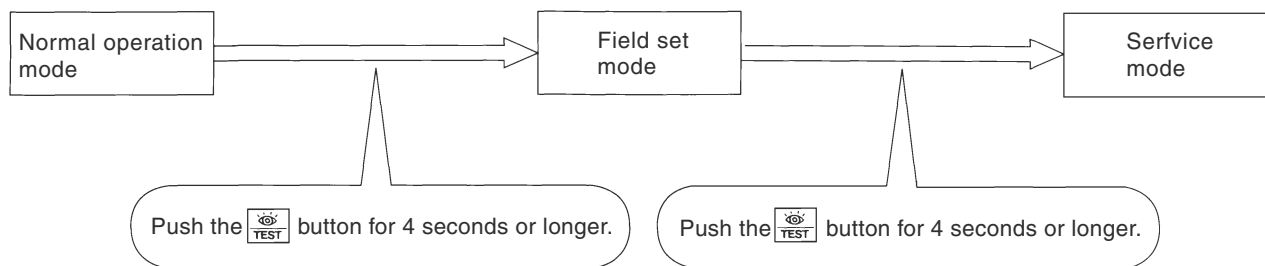
(SF008)

## 2.4 Operation of The Remote Control's Inspection / Test Operation Button



## 2.5 Remote Control Service Mode


### How to Enter the Service Mode




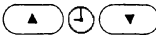
(VF020)

### Service Mode Operation Method


#### 1. Select the mode No.

Set the desired mode No. with the  button.  
(For infrared remote control, 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 infrared remote control,  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.

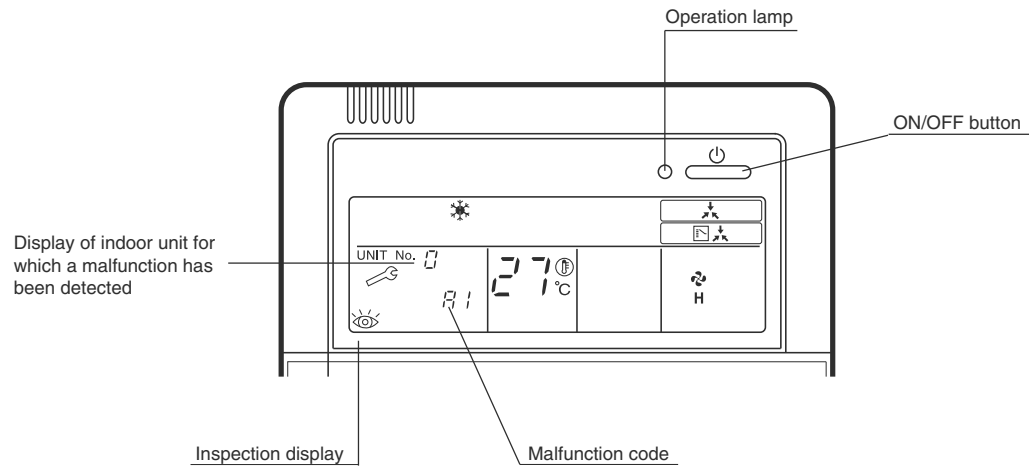


Mode No	Function	Contents and operation method	Remote control display example
40	Malfunction hysteresis display	<p>Display malfunction hysteresis.</p> <p>The history No. can be changed with the  button.</p>	<p>Unit 1</p> <p>Malfunction code <b>40</b></p> <p>2-U4</p> <p>Malfunction code</p> <p>Hystory No: 1 - 9</p> <p>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. Sensor data</p> <p>0: Thermostat sensor in remote control.</p> <p>1: Suction</p> <p>2: Liquid pipe</p> <p>3: Gas pipe</p> <p>Address data</p> <p>4: Indoor unit address</p> <p>5: Outdoor unit address</p> <p>6: BS unit address</p> <p>7: Zone control address</p> <p>8: Cool/heat group address</p> <p>9: Demand / low noise address</p>	<p>Sensor data display</p> <p>Unit No. Sensor type</p> <p>1 1</p> <p>2 7</p> <p>Temperature °C</p> <p>Address display</p> <p>Unit No. Address type</p> <p>1 8</p> <p>1</p> <p>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</p> <p><b>43</b></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.  Set the fan speed with the  button.</p> <p>Set the air flow direction with the  button.</p>	<p>Unit 1</p> <p>Code <b>44</b></p> <p>1 3</p> <p>Fan speed 1: Low 3: High</p> <p>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.</p> <p>Set the unit No. after transfer with the  button.</p>	<p>Unit 1</p> <p>Code <b>44</b></p> <p>1 3</p> <p>Fan speed 1: Low 3: High</p> <p>Air flow direction P0 - P4</p> <p>(VE010)</p>
46	This function is not used by MX3 Series R-410A Heat Pump 50Hz.		
47			

## 2.6 Remote Control Self-Diagnosis Function

The remote control 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)

○ : ON ● : OFF ◐ : Blink

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	Page Referred
Indoor Unit	A0	◐	◐	◐	Error of external protection device	205
	A1	◐	◐	◐	PC board defect, E <sup>2</sup> PROM defect	206
	A3	◐	◐	◐	Malfunction of drain level control system (S1L)	207
	A6	◐	◐	◐	Fan motor (M1F) lock, overload	209
	A7	○	●	◐	Malfunction of swing flap motor (MA)	210
	A9	◐	◐	◐	Malfunction of moving part of electronic expansion valve (20E)	212
	AF	○	●	◐	Drain level about limit	214
	AH	○	●	◐	Malfunction of air filter maintenance	—
	AJ	◐	◐	◐	Malfunction of capacity setting	215
	C4	◐	◐	◐	Malfunction of thermistor (R2T) for heat exchange (loose connection, disconnection, short circuit, failure)	216
	C5	◐	◐	◐	Malfunction of thermistor (R3T) for gas pipes (loose connection, disconnection, short circuit, failure)	217
	C9	◐	◐	◐	Malfunction of thermistor (R1T) for air inlet (loose connection, disconnection, short circuit, failure)	218
	CJ	○	○	○	Malfunction of thermostat sensor in remote control	219
Outdoor Unit	E1	◐	◐	◐	PC board defect	220
	E3	◐	◐	◐	Actuation of high pressure switch	221
	E4	◐	◐	◐	Actuation of low pressure sensor	223
	E5	◐	◐	◐	Compressor motor lock	225
	E6	◐	◐	◐	Standard compressor lock or over current	227
	E7	◐	◐	◐	Malfunction of outdoor unit fan motor	228
	E9	◐	◐	◐	Malfunction of moving part of electronic expansion valve (Y1E, Y2E)	231
	F3	◐	◐	◐	Abnormal discharge pipe temperature	233
	F6	◐	◐	◐	Refrigerant overcharged	234
	H7	◐	◐	◐	Abnormal outdoor fan motor signal	235
	H9	◐	◐	◐	Malfunction of thermistor (R1T) for outdoor air (loose connection, disconnection, short circuit, failure)	236
	J2	◐	◐	◐	Current sensor malfunction	237
	J3	◐	◐	◐	Malfunction of discharge pipe thermistor (R31~33T) (loose connection, disconnection, short circuit, failure)	238
	J5	◐	◐	◐	Malfunction of thermistor (R2T) for suction pipe (loose connection, disconnection, short circuit, failure)	239
	J6	◐	◐	◐	Malfunction of thermistor (R4T) for heat exchanger (loose connection, disconnection, short circuit, failure)	240
	J7	◐	◐	◐	Malfunction of receiver outlet liquid pipe thermistor (R6T)	241
	J9	◐	◐	◐	Malfunction of subcooling heat exchanger gas pipe thermistor (R5T)	242
	JA	◐	◐	◐	Malfunction of discharge pipe pressure sensor	243
	JC	◐	◐	◐	Malfunction of suction pipe pressure sensor	244
	L0	◐	◐	◐	Inverter system error	—
	L4	◐	◐	◐	Malfunction of inverter radiating fin temperature rise	245
	L5	◐	◐	◐	DC output overcurrent of inverter compressor	247
	L8	◐	◐	◐	Inverter current abnormal	249
	L9	◐	◐	◐	Inverter start up error	251

○ : ON ● : OFF ◐ : Blink

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	Page Referred
Outdoor Unit	LA	◐	◐	◐	Malfunction of power unit	—
	LC	◐	◐	◐	Malfunction of transmission between inverter and control PC board	253
	P1	◐	◐	◐	Inverter over-ripple protection	256
	P4	◐	◐	◐	Malfunction of inverter radiating fin temperature rise sensor	257
	PJ	◐	◐	◐	Faulty field setting after replacing main PC board or faulty combination of PC board	274
System	U0	○	●	◐	Low pressure drop due to refrigerant shortage or electronic expansion valve failure	260
	U1	◐	◐	◐	Reverse phase / open phase	261
	U2	◐	◐	◐	Power supply insufficient or instantaneous failure	262
	U3	◐	◐	◐	Check operation is not completed.	265
	U3	○	●	◐	Check operation is not completed.	265
	U4	◐	◐	◐	Malfunction of transmission between indoor and outdoor units	266
	U5	◐	◐	◐	Malfunction of transmission between remote control and indoor unit	268
	U5	●	○	●	Failure of remote control PC board or setting during control by remote control	268
	U7	◐	◐	◐	Malfunction of transmission between outdoor units	269
	U8	◐	◐	●	Malfunction of transmission between main and sub remote controls (malfunction of sub remote control)	271
	U9	◐	◐	◐	Malfunction of transmission between indoor unit and outdoor unit in the same system	272
	UA	◐	◐	◐	Improper combination of indoor and outdoor units, indoor units and remote control	273
	UC	○	○	○	Address duplication of central remote control	275
	UE	◐	◐	◐	Malfunction of transmission between central remote control and indoor unit	276 265
	UF	◐	◐	◐	Refrigerant system not set, incompatible wiring / piping	279
	UH	◐	◐	◐	Malfunction of system, refrigerant system address undefined	280
Central Remote Control and Schedule Timer	M1	○ or ●	◐	◐	Central remote control PC board defect Schedule timer PC board defect	282
	M8	○ or ●	◐	◐	Malfunction of transmission between optional controllers for centralized control	283
	MA	○ or ●	◐	◐	Improper combination of optional controllers for centralized control	285
	MC	○ or ●	◐	◐	Address duplication, improper setting	287
Heat Reclaim Ventilation	64	○	●	◐	Indoor unit's air thermistor error	—
	65	○	●	◐	Outside air thermistor error	—
	6A	○	●	◐	Damper system alarm	—
	6A	◐	◐	◐	Damper system + thermistor error	—
	6F	○	●	◐	Malfunction of simple remote control	—
	6H	○	●	◐	Malfunction of door switch or connector	—
	94	◐	◐	◐	Internal transmission error	—

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

## Malfunction code indication by outdoor unit PC board

### <Monitor mode>

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

\* Refer      for Monitor mode.

### <Selection of setting item>

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

\* Refer      for Monitor mode.

### <Confirmation of malfunction 1>

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

### <Confirmation of malfunction 2>

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

### <Confirmation of malfunction 3>

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

### <Confirmation of malfunction 4>

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

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

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

Detail description on next page.

Contents of malfunction		Malfunction code
Abnormal discharge pressure	HPS activated	E3
Abnormal suction pressure	Abnormal Pe	E4
Compressor lock	Detection of INV compressor lock	E5
Activation of OC	Detection of STD1 compressor lock	E6
	Detection of STD2 compressor lock	
Over load, over current, abnormal lock of outdoor unit fan motor	Instantaneous over current of DC fan 1 motor	E7
	Detection of DC fan 1 motor lock	
	Instantaneous over current of DC fan 2 motor	
	Detection of DC fan 2 motor lock	
Malfunction of electronic expansion valve	EV1	E9
	EV2	
	EV3	
Abnormal position signal of outdoor unit fan motor	Abnormal position signal of DC fan 1 motor	H7
	Abnormal position signal of DC fan 2 motor	
Faulty sensor of outdoor air temperature	Faulty Ta sensor (short)	H9
	Faulty Ta sensor (open)	
Abnormal discharge pipe temperature	Abnormal Td	F3
Abnormal heat exchanger temperature	Refrigerant over charge	F6
Faulty current sensor	Faulty CT1 sensor	J2
	Faulty CT2 sensor	
Faulty sensor of discharge pipe temperature	Faulty Tdi sensor (short)	J3
	Faulty Tds1 sensor (short)	
	Faulty Tds2 sensor (short)	
	Faulty Tdi sensor (open)	
	Faulty Tds1 sensor (open)	
	Faulty Tds2 sensor (open)	
Faulty sensor of suction pipe temperature	Faulty Ts1 sensor (short)	J5
	Faulty Ts1 sensor (open)	
	Faulty Ts2 sensor (short)	
	Faulty Ts2 sensor (open)	
Faulty sensor of heat exchanger temperature	Faulty Tb sensor (short)	J6
	Faulty Tb sensor (open)	
Malfunction of the liquid pipe temperature sensor	Faulty TI sensor (short)	J7
	Faulty TI sensor (open)	
Faulty sensor of subcool heat exchanger temperature	Faulty Tsh sensor (short)	J9
	Faulty Tsh sensor (open)	
Faulty sensor of discharge pressure	Faulty Pc sensor (short)	JA
	Faulty Pc sensor (open)	
Faulty sensor of suction pressure	Faulty Pe sensor (short)	JC
	Faulty Pe sensor (open)	
Instantaneous power failure	*NO display on remote control (Judge during compressor operation)	(L2)
Inverter radiation fin temperature rising	Over heating of inverter radiation fin temperature	L4
DC output over current	Inverter instantaneous over current	L5
	IGBT malfunction	L5
Electronic thermal	Electronic thermal switch 1	L8
	Electronic thermal switch 2	
	Out-of-step	
	Speed down after startup	
	Lightening detection	
Stall prevention (Limit time)	Stall prevention (Current increasing)	L9
	Stall prevention (Faulty start up)	
	Abnormal wave form in startup	
	Out-of-step	
Transmission error between inverter and outdoor unit	Inverter transmission error	LC

○: ON ●: OFF ◐: Blink

Malfunction code	Confirmation of malfunction 1							Confirmation of malfunction 2							Confirmation of malfunction 3							Confirmation of malfunction 4						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P
E3	●			●	●	●	●	●			●	●	●	●	●			●	●	●	●	●			●	●	*1	
E4								●			●	●	●	●	●			●	●	●	●	●			●	●		
E5								●			●	●	●	●	●			●	●	●	●	●			●	●		
E6								●			●	●	●	●	●			●	●	●	●	●			●	●		
E7								●			●	●	●	●	●			●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
E9								●			●	●	●	●	●			●	●	●	●	●			●	●	*1	
H7	●			●	●	●	●	●			●	●	●	●	●			●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
H9								●			●	●	●	●	●			●	●	●	●	●			●	●	*1	
F3	●			●	●	●	●	●			●	●	●	●	●			●	●	●	●	●			●	●		
								●			●	●	●	●	●			●	●	●	●	●			●	●		
J2	●			●	●	●	●	●			●	●	●	●	●			●	●	●	●	●			●	●	*1	
J3								●			●	●	●	●	●			●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
J5								●			●	●	●	●	●			●	●	●	●	●			●	●		
J6																		●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
J7								●			●	●	●	●	●			●	●	●	●	●			●	●		
J9								●			●	●	●	●	●			●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
JA								●			●	●	●	●	●			●	●	●	●	●			●	●		
JC								●			●	●	●	●	●			●	●	●	●	●			●	●		
(L2)	●			●	●	●	●	●			●	●	●	●	●			●	●	●	●	●			●	●	*1	
L4								●			●	●	●	●	●			●	●	●	●	●			●	●		
L5								●			●	●	●	●	●			●	●	●	●	●			●	●		
L5																		●	●	●	●	●			●	●		
L8								●			●	●	●	●	●			●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
																		●	●	●	●	●			●	●		
L9								●			●	●	●	●	●			●	●	●	●	●			●	●		
LC								●			●	●	●	●	●			●	●	●	●	●			●	●		

Display of contents of malfunction (first digit)

Display of contents of malfunction (second digit)

Display 1 of malfunction in detail

Display 2 of malfunction in detail

\*1

●	●	Master
●	○	Slave1
○	●	Slave2
○	○	System

**<Monitor mode>**

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

\* Refer [P.10](#) for Monitor mode.

**<Selection of setting item>**

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

\* Refer [P.10](#) for Monitor mode.

**<Confirmation of malfunction 1>**

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

**<Confirmation of malfunction 2>**

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

**<Confirmation of malfunction 3>**

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

**<Confirmation of malfunction 4>**

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

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

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

Detail description on next page.

Contents of malfunction		Malfunction code
Open phase/Power supply imbalance	Imbalance of inverter power supply voltage	P1
Faulty temperature sensor inside switch box	Faulty thermistor of inverter box	P3
Faulty temperature sensor of inverter radiation fin	Faulty thermistor of inverter fin	P4
Incorrect combination of Inverter and fan driver	Incorrect combination of inverter	PJ
	Incorrect combination of fan driver 1	
	Incorrect combination of fan driver 2	
Gas shortage	Gas shortage alarm	U0
Reverse phase	Reverse phase error	U1
Abnormal power supply voltage	Insufficient Inverter voltage	U2
	Inverter open phase (phase T)	
	Charging error of capacitor in inverter main circuit	
No implementation of test-run		U3
Transmission error between indoor and outdoor unit	I/O transmission error	U4
	I/O transmission error	
Transmission error between outdoor units, transmission error between thermal storage units, duplication of IC address	Sequential startup ADP alarm	U7
	Sequential startup ADP malfunction	U7
	Malfunction of transmission between multi units (Multi 1)	
	Malfunction of transmission between multi units (Multi 2)	
	Abnormal multi horsepower setting	
	Abnormal multi address setting	
	Excessive multi connections	
	Multi system malfunction	
Transmission error of other system	Indoor unit system abnormal in other system or other indoor unit system abnormal in own system	U9
Erroneous field setting	System transmission malfunction	UA
	Overconnection malfunction of indoor units	
	Malfunction of field setting	
	Refrigerant abnormal	
	Multi-ID abnormal	
	Alarm of TSS field setting	UA
	Alarm of CT address setting	
Faulty system malfunction	Wiring error (Auto-address error)	UH
Transmission error in accessory devices	Malfunction of multi-level connection	UJ
	Alarm of multi-level connection	UJ
Conflict in wiring and piping, no setting for system	Conflict in wiring and piping	UF

○: ON ●: OFF ◐: Blink

Malfunction code	Confirmation of malfunction 1							Confirmation of malfunction 2							Confirmation of malfunction 3							Confirmation of malfunction 4							
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	
P1	●			●	●	●	●	●			●	●	●	●	●			●	●	●	●	●			●	●	※1		
P3								●			●	●	●	●	●			●	●	●	●	●			●	●			
P4								●			●	●	●	●	●			●	●	●	●	●			●	●			
PJ								●			●	●	●	●	●	●			●	●	●	●	●			●			●
U0	●			●	●	●	●	●			●	●	●	●	●			●	●	●	●	●			●	●	●	●	
U1								●			●	●	●	●	●			●	●	●	●	●			●	●			
U2								●			●	●	●	●	●			●	●	●	●	●			●	●			
															●			●	●	●	●	●			●	●			
U3								●			●	●	●	●	●	●			●	●	●	●	●			●	●	●	●
U4								●			●	●	●	●	●	●			●	●	●	●	●			●	●	●	●
U7								●			●	●	●	●	●	●			●	●	●	●	●			●	●	●	●
U7															●			●	●	●	●	●	●			●	●	●	●
															●			●	●	●	●	●	●			●	●	●	●
															●			●	●	●	●	●	●			●	●	●	●
															●			●	●	●	●	●	●			●	●	●	●
															●			●	●	●	●	●	●			●	●	●	●
U9								●			●	●	●	●	●			●	●	●	●	●			●	●	●	●	●
UA								●			●	●	●	●	●	●			●	●	●	●	●			●	●	●	●
															●			●	●	●	●	●	●			●	●	●	●
															●			●	●	●	●	●	●			●	●	●	●
															●			●	●	●	●	●	●			●	●	●	●
UA															●			●	●	●	●	●	●			●	●	●	●
															●			●	●	●	●	●	●			●	●	●	●
UH								●			●	●	●	●	●			●	●	●	●	●	●			●	●	●	●
UJ								●			●	●	●	●	●			●	●	●	●	●	●			●	●	※1	
UJ								●			●	●	●	●	●			●	●	●	●	●	●			●	●		
UF								●			●	●	●	●	●			●	●	●	●	●	●			●	●	●	●

Display of contents of malfunction (first digit)

Display of contents of malfunction (second digit)

Display 1 of malfunction in detail

Display 2 of malfunction in detail

*1	●	●	Master
	●	◐	Slave1
	◐	●	Slave2
	◐	◐	System



## 3. Troubleshooting by Indication on the Remote Control

### 3.1 “RD” Indoor Unit: Error of External Protection Device

Remote Control Display *RD*

Applicable Models All indoor unit models

Method of Malfunction Detection Detect open or short circuit between external input terminals in indoor unit.

Malfunction Decision Conditions When an open circuit occurs between external input terminals with the remote control set to "external ON/OFF terminal".

Supposed Causes

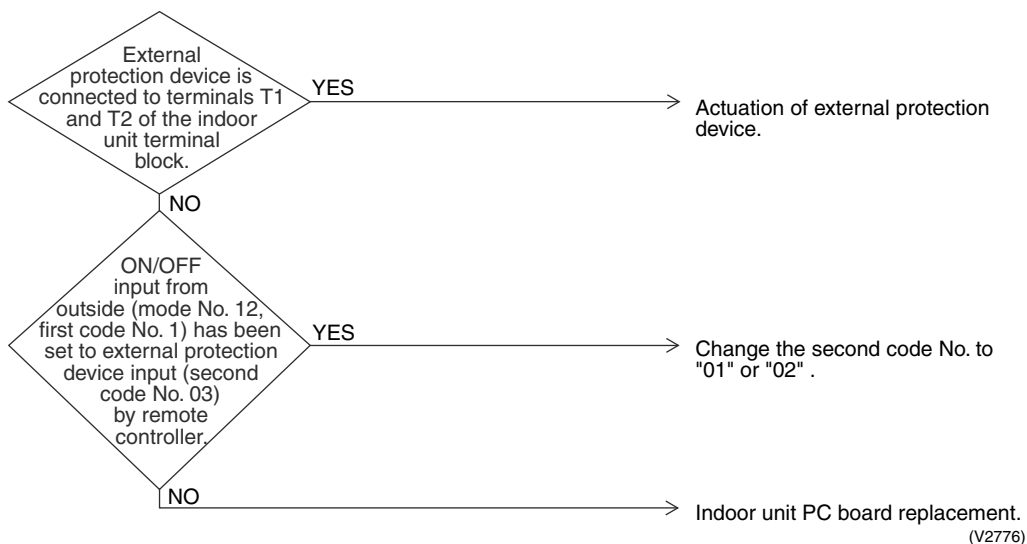
- Actuation of external protection device
- Improper field set
- Defect of indoor unit PC board

#### Troubleshooting



#### Caution

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



## 3.2 “A1” Indoor Unit: PC Board Defect

Remote Control  
Display

A1

Applicable  
Models

All indoor unit models

Method of  
Malfunction  
Detection

Check data from EΣPROM.

Malfunction  
Decision  
Conditions

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

Supposed  
Causes

- Defect of indoor unit PC board

Troubleshooting



**Caution**

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

Turn power supply OFF, then  
power ON again.

Does  
the system return  
to normal?

YES

NO

The indoor unit PC board is  
normal.  
External factor other than  
malfunction (for example,  
noise etc.).

Replace the indoor unit PC  
board.

(V2777)

### 3.3 “R3” Indoor Unit: Malfunction of Drain Level Control System (S1L)

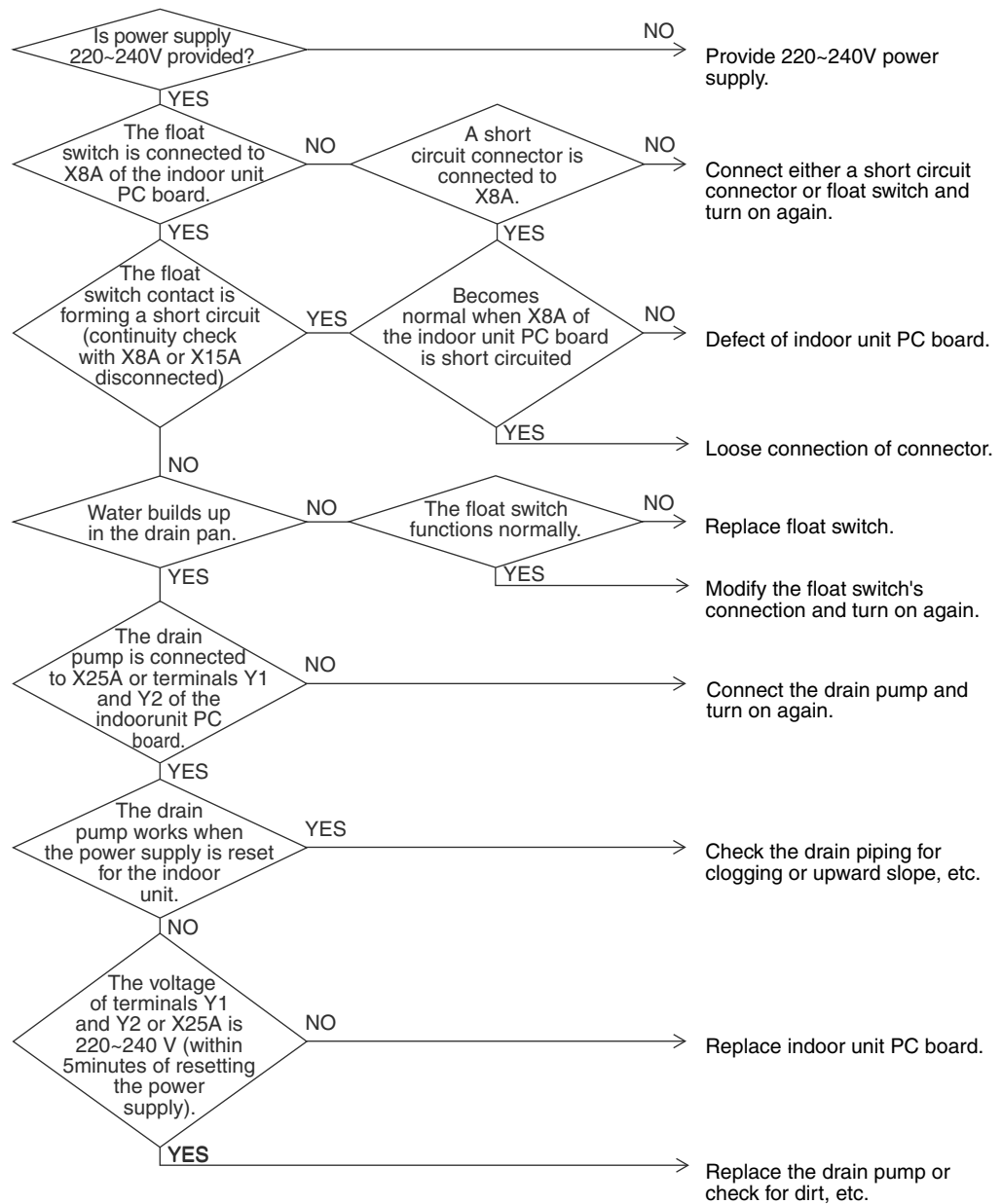
Remote Control Display	<i>R3</i>
Applicable Models	LM3, YM3, UM3, KM3 (Option), EM3 (Option)
Method of Malfunction Detection	By float switch OFF detection
Malfunction Decision Conditions	When rise of water level is not a condition and the float switch goes OFF.
Supposed Causes	<ul style="list-style-type: none"><li>■ 220~240V power supply is not provided</li><li>■ Defect of float switch or short circuit connector</li><li>■ Defect of drain pump</li><li>■ Drain clogging, upward slope, etc.</li><li>■ Defect of indoor unit PC board</li><li>■ Loose connection of connector</li></ul>

# Troubleshooting



## Caution

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



(V2778)

### 3.4 “R6” Indoor Unit: Fan Motor (M1F) Lock, Overload

Remote Control  
Display

**R6**

Applicable  
Models

All indoor units

Method of  
Malfunction  
Detection

Detection by failure of signal for detecting number of turns to come from the fan motor

Malfunction  
Decision  
Conditions

When number of turns can't be detected even when output voltage to the fan is maximum

Supposed  
Causes

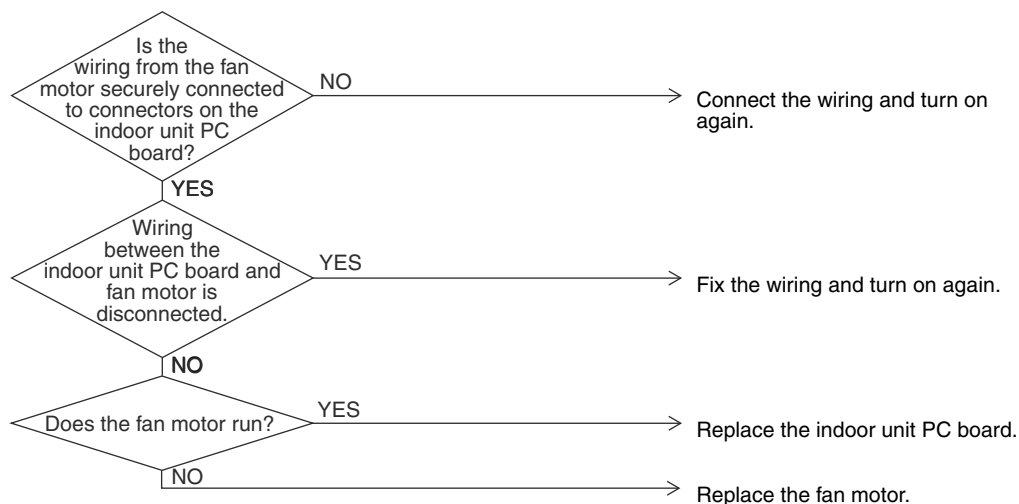
- Fan motor lock
- Disconnected or faulty wiring between fan motor and PC board

Troubleshooting



**Caution**

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



(V2779)

### 3.5 “A7” Indoor Unit: Malfunction of Swing Flap Motor (M1S)

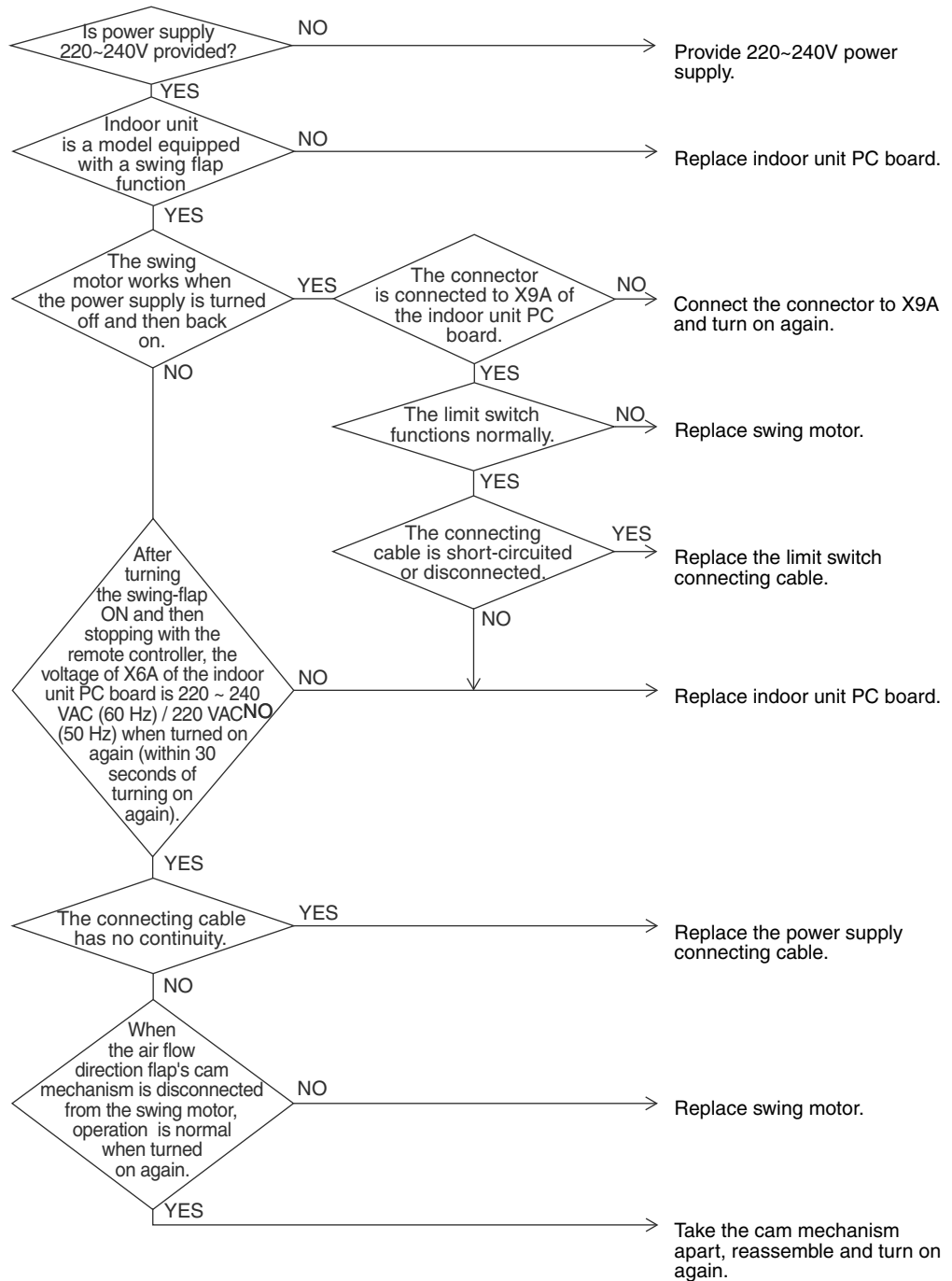
<b>Remote Control Display</b>	<i>A7</i>
<b>Applicable Models</b>	LM3, YM3, UM3, KM3, TM3
<b>Method of Malfunction Detection</b>	Utilizes ON/OFF of the limit switch when the motor turns.
<b>Malfunction Decision Conditions</b>	When ON/OFF of the microswitch for positioning cannot be reversed even though the swing flap motor is energized for a specified amount of time (about 30 seconds).
<b>Supposed Causes</b>	<ul style="list-style-type: none"><li>■ Defect of swing motor</li><li>■ Defect of connection cable (power supply and limit switch)</li><li>■ Defect of air flow direction adjusting flap-cam</li><li>■ Defect of indoor unit PC board</li></ul>

## Troubleshooting



### Caution

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



(V2780)

### 3.6 “R9” Indoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E)

Remote Control Display **R9**

Applicable Models All indoor unit models

Method of Malfunction Detection Use a microcomputer to check the electronic expansion valve for coil conditions.

Malfunction Decision Conditions When the pin input of the electronic expansion valve is not normal while in the initialization of the microcomputer.

Supposed Causes

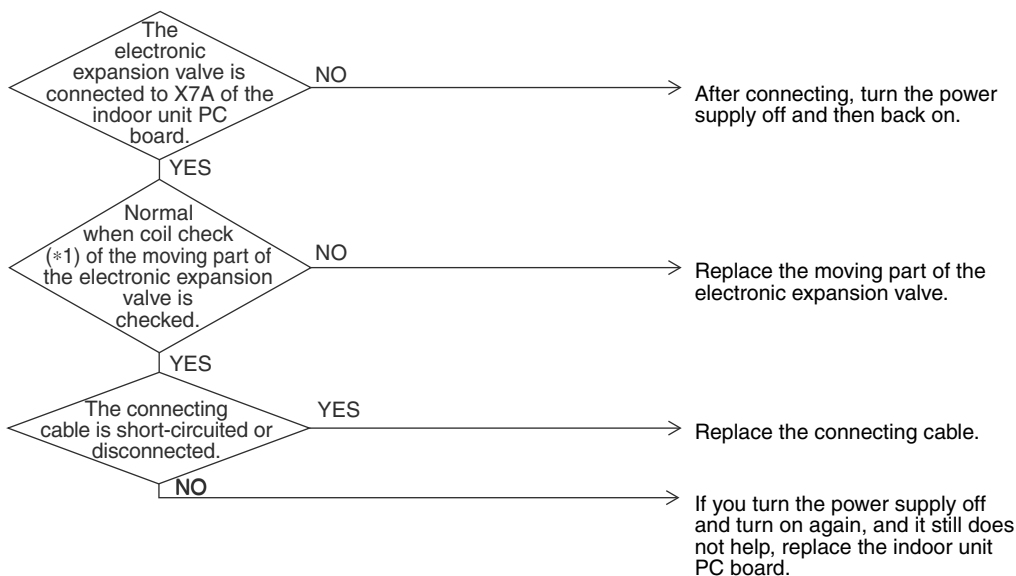
- Malfunction of moving part of electronic expansion valve
- Defect of indoor unit PC board
- Defect of connecting cable

#### Troubleshooting



#### Caution

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



(V2781)



\*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		$\infty$	○ Approx. 300Ω	$\infty$	○ Approx. 150Ω	$\infty$
2. Yellow			$\infty$	○ Approx. 300Ω	$\infty$	○ Approx. 150Ω
3. Orange				$\infty$	○ Approx. 150Ω	$\infty$
4. Blue					$\infty$	○ Approx. 150Ω
5. Red						$\infty$
6. Brown						

○: Continuity

$\infty$ : No continuity

### 3.7 “RF” Indoor Unit: Drain Level above Limit

Remote Control  
Display

*RF*

Applicable  
Models

LM3, YM3, UM3, DM3, FM3, EM3

Method of  
Malfunction  
Detection

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

Malfunction  
Decision  
Conditions

When the float switch changes from ON to OFF while the compressor is in non-operation.

Supposed  
Causes

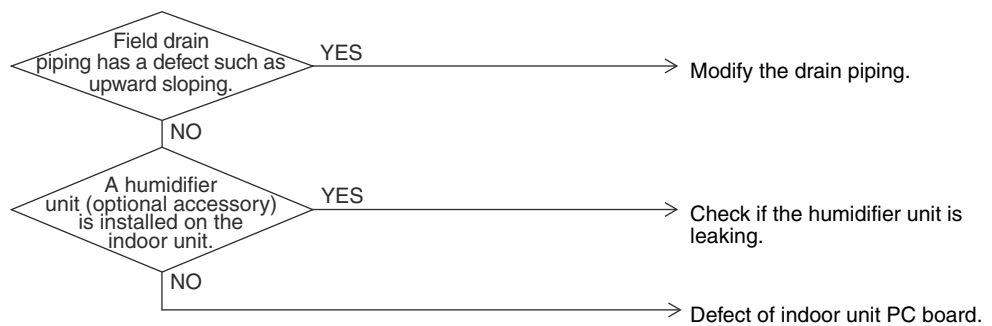
- Humidifier unit (optional accessory) leaking
- Defect of drain pipe (upward slope, etc.)
- Defect of indoor unit PC board

Troubleshooting



**Caution**

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



(V2782)

### 3.8 “RU” Indoor Unit: Malfunction of Capacity Determination Device

Remote control display

*RU*

Applicable Models

All indoor unit models

Method of Malfunction Detection

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

Malfunction Decision Conditions

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

Supposed Causes

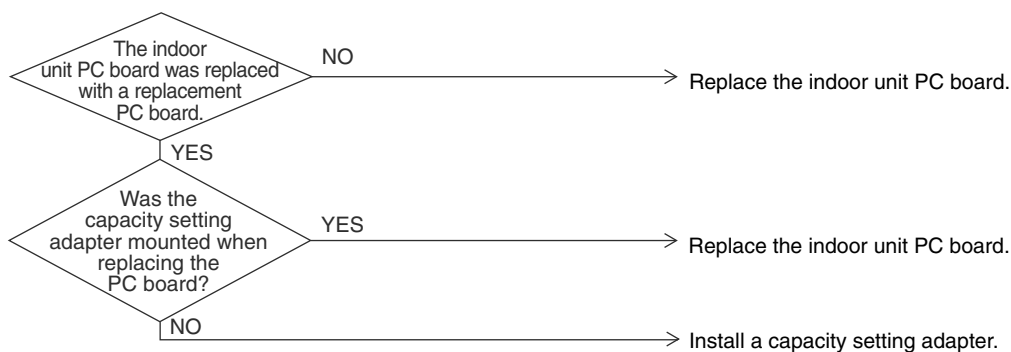
- You have forgotten to install the capacity setting adapter.
- Defect of indoor unit PC board

Troubleshooting



**Caution**

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



(V2783)

## 3.9 “E4” Indoor Unit: Malfunction of Thermistor (R2T) for Heat Exchanger

**Remote Control Display** E4

**Applicable Models** All indoor unit models

**Method of Malfunction Detection** Malfunction detection is carried out by temperature detected by heat exchanger thermistor.

**Malfunction Decision Conditions** When the heat exchanger thermistor becomes disconnected or shorted while the unit is running.

**Supposed Causes**

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

### Troubleshooting



**Caution**

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

Remove the thermistor from the indoor unit PC board, and then insert it again.

Is the thermistor normal?

YES → Normal (The malfunction is caused by faulty contact.)

NO →

Remove the thermistor from the indoor unit PC board, and then make resistance measurement of the thermistor using a multiple meter.

\* 5 kΩ to 90 kΩ

NO → Replace the thermistor (R2T).

YES →

Replace the indoor unit PC board.



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

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

Remote Control  
Display

C5

Applicable  
Models

All indoor unit models

Method of  
Malfunction  
Detection

Malfunction detection is carried out by temperature detected by gas pipe thermistor.

Malfunction  
Decision  
Conditions

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

Supposed  
Causes

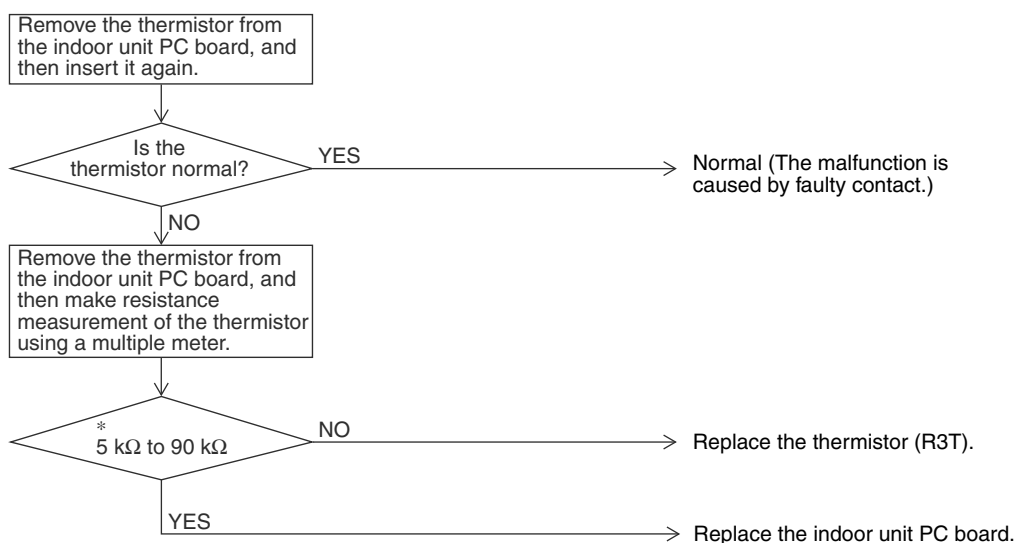
- Defect of indoor unit thermistor (R3T) for gas pipe
- Defect of indoor unit PC board

Troubleshooting



**Caution**

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



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

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

Remote Control Display

C9

Applicable Models

All indoor unit models

Method of Malfunction Detection

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

Malfunction Decision Conditions

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

Supposed Causes

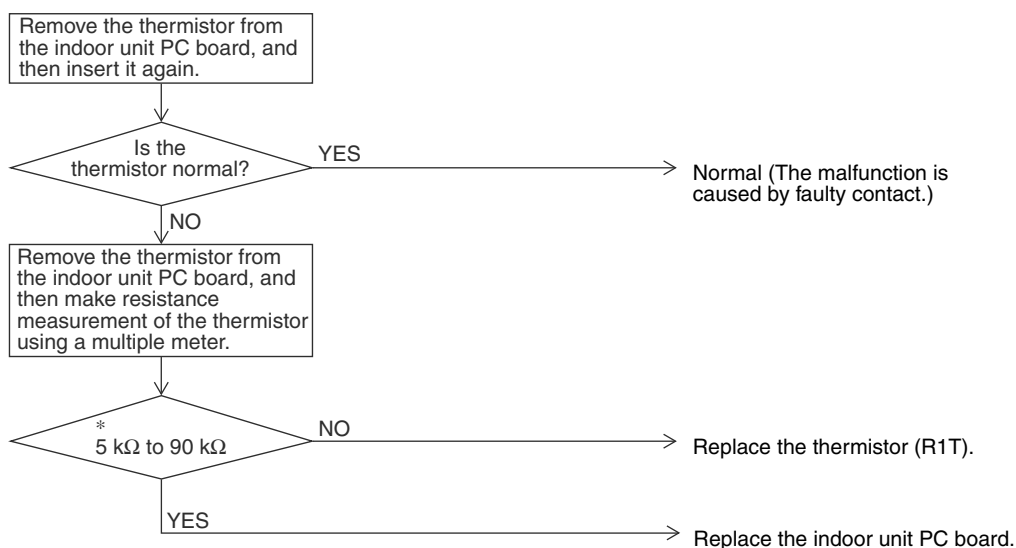
- Defect of indoor unit thermistor (R1T) for air inlet
- Defect of indoor unit PC board

Troubleshooting



**Caution**

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



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

## 3.12 “CJ” Indoor Unit: Malfunction of Thermostat Sensor in Remote Control

Remote Control  
Display

CJ

Applicable  
Models

All indoor unit models

Method of  
Malfunction  
Detection

Malfunction detection is carried out by temperature detected by remote control air temperature thermistor. (Note:)

Malfunction  
Decision  
Conditions

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

Supposed  
Causes

- Defect of remote control thermistor
- Defect of remote control PC board

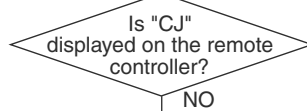
Troubleshooting



**Caution**

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

Clear the malfunction code history. (While in inspection mode, press and hold the “ON/OFF” button for a period of five seconds or more.)



YES

Replace remote control.

NO

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

(V2787)



**Note:**

In case of remote control thermistor malfunction, unit is still operable by suction air thermistor on indoor unit.



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

### 3.13 “E1” Outdoor Unit: PC Board Defect

Remote Control Display	E1
Applicable Models	U-5MX4XPQ ~ U-54MX4XPQ
Method of Malfunction Detection	Check data from E <sup>2</sup> PROM
Malfunction Decision Conditions	When data could not be correctly received from the E <sup>2</sup> PROM E <sup>2</sup> PROM : Type of nonvolatile memory. Maintains memory contents even when the power supply is turned off.
Supposed Causes	<ul style="list-style-type: none"> <li>Defect of outdoor unit PC board (A1P)</li> </ul>
Troubleshooting	



**Caution**

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



(V3064)



### 3.14 “E3” Outdoor Unit: Actuation of High Pressure Switch

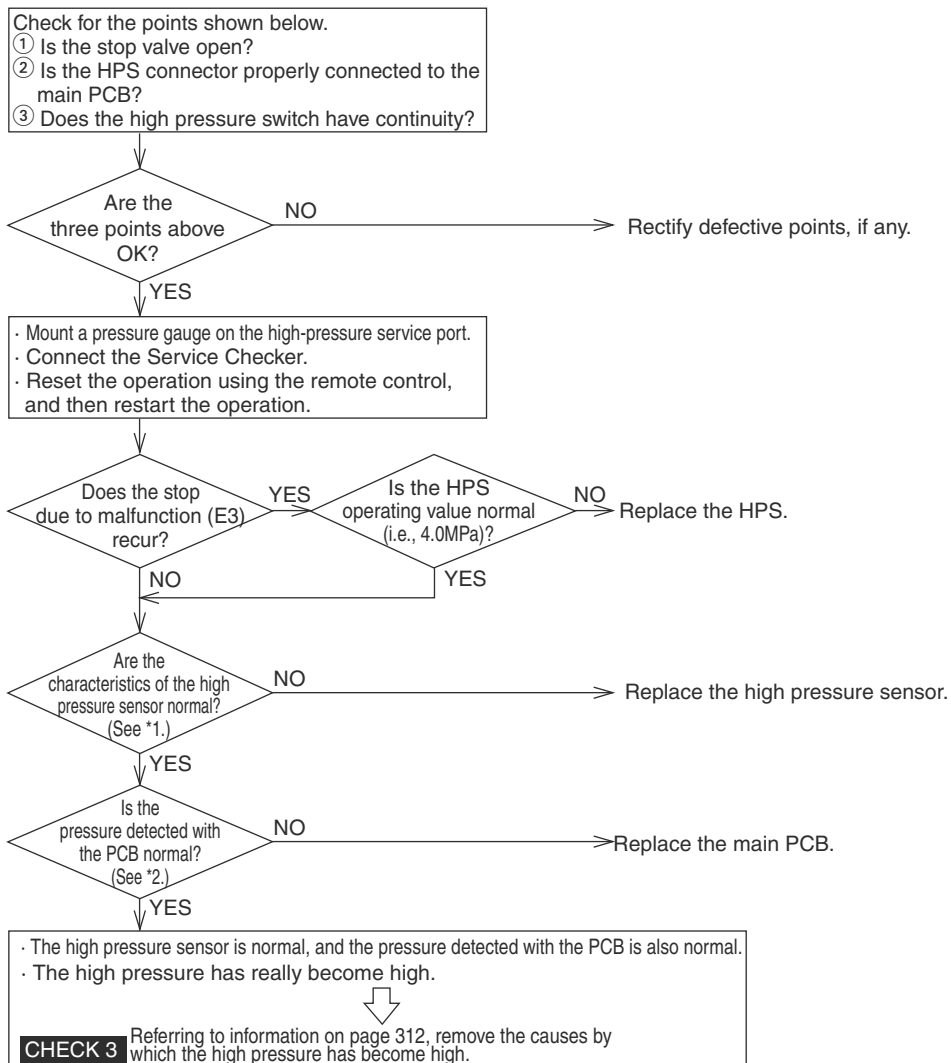
<b>Remote Control Display</b>	E3
<b>Applicable Models</b>	U-5MX4XPQ ~ U-54MX4XPQ
<b>Method of Malfunction Detection</b>	Abnormality is detected when the contact of the high pressure protection switch opens.
<b>Malfunction Decision Conditions</b>	<p>Error is generated when the HPS activation count reaches the number specific to the operation mode.</p> <p>(Reference) Operating pressure of high pressure switch            Operating pressure: 4.0MPa            Reset pressure: 2.85MPa</p>
<b>Supposed Causes</b>	<ul style="list-style-type: none"> <li>■ Actuation of outdoor unit high pressure switch</li> <li>■ Defect of High pressure switch</li> <li>■ Defect of outdoor unit PC board</li> <li>■ Instantaneous power failure</li> <li>■ Faulty high pressure sensor</li> </ul>

# Troubleshooting

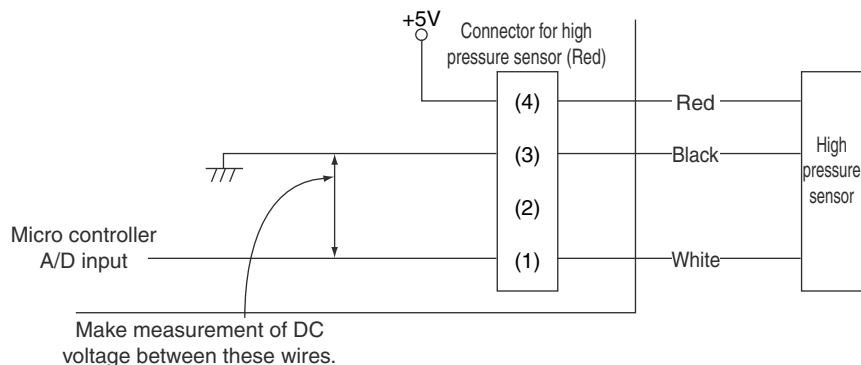


## Caution

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



- \*1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge.  
(As to the voltage of the pressure sensor, make measurement of voltage at the connector, and then convert it to pressure according to information on page 367.)
- \*2: Make a comparison between the high pressure value checked with the Service Checker and the voltage of the pressure sensor (see \*1).
- \*3: Make measurement of voltage of the pressure sensor.



### 3.15 “E4” Outdoor Unit: Actuation of Low Pressure Sensor

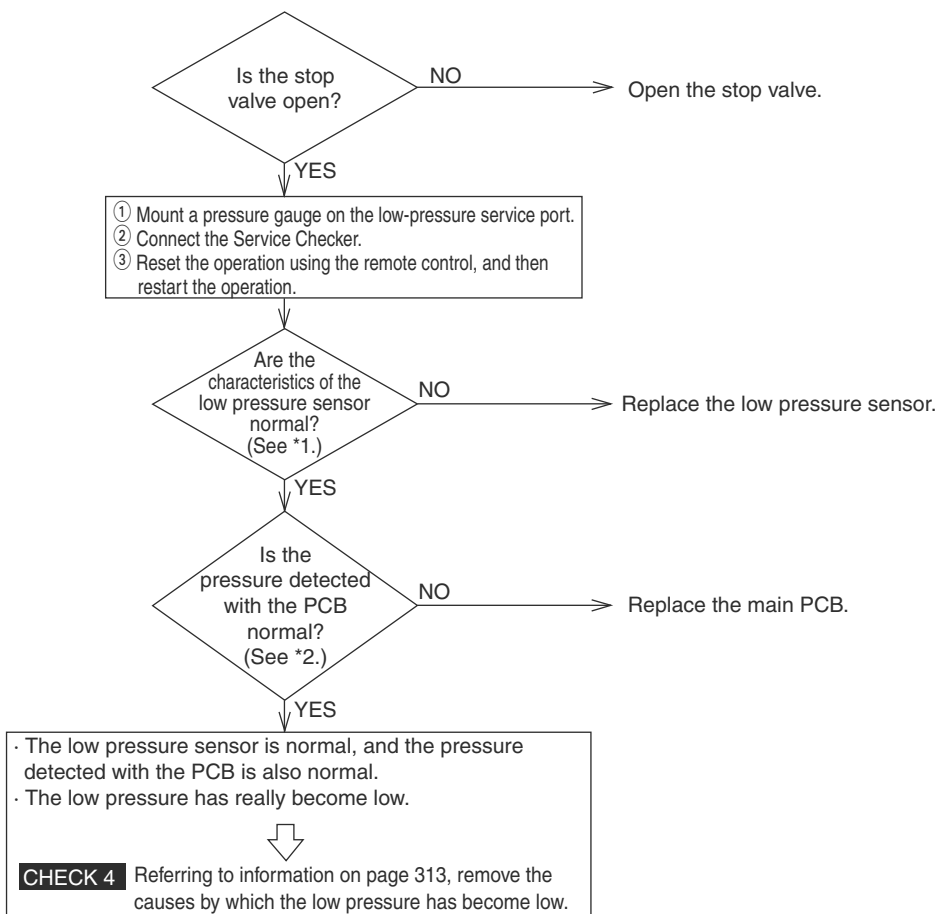
Remote Control Display	E4
Applicable Models	U-5MX4XPQ ~ U-54MX4XPQ
Method of Malfunction Detection	Abnormality is detected by the pressure value with the low pressure sensor.
Malfunction Decision Conditions	Error is generated when the low pressure is dropped under specific pressure. Operating pressure:0.07MPa
Supposed Causes	<ul style="list-style-type: none"><li>■ Abnormal drop of low pressure (Lower than 0.07MPa)</li><li>■ Defect of low pressure sensor</li><li>■ Defect of outdoor unit PC board</li><li>■ Stop valve is not opened.</li></ul>

# Troubleshooting



## Caution

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

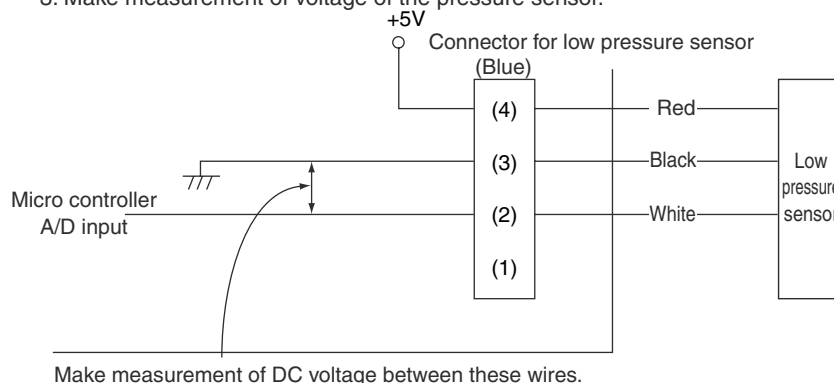


\*1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge.

(As to the voltage of the pressure sensor, make measurement of voltage at the connector, and then convert it to pressure according to information on page 367.)

\*2: Make a comparison between the low pressure value checked with the Service Checker and the voltage of the pressure sensor (see \*1).

\*3: Make measurement of voltage of the pressure sensor.



## 3.16 “E5” Outdoor Unit: Inverter Compressor Motor Lock

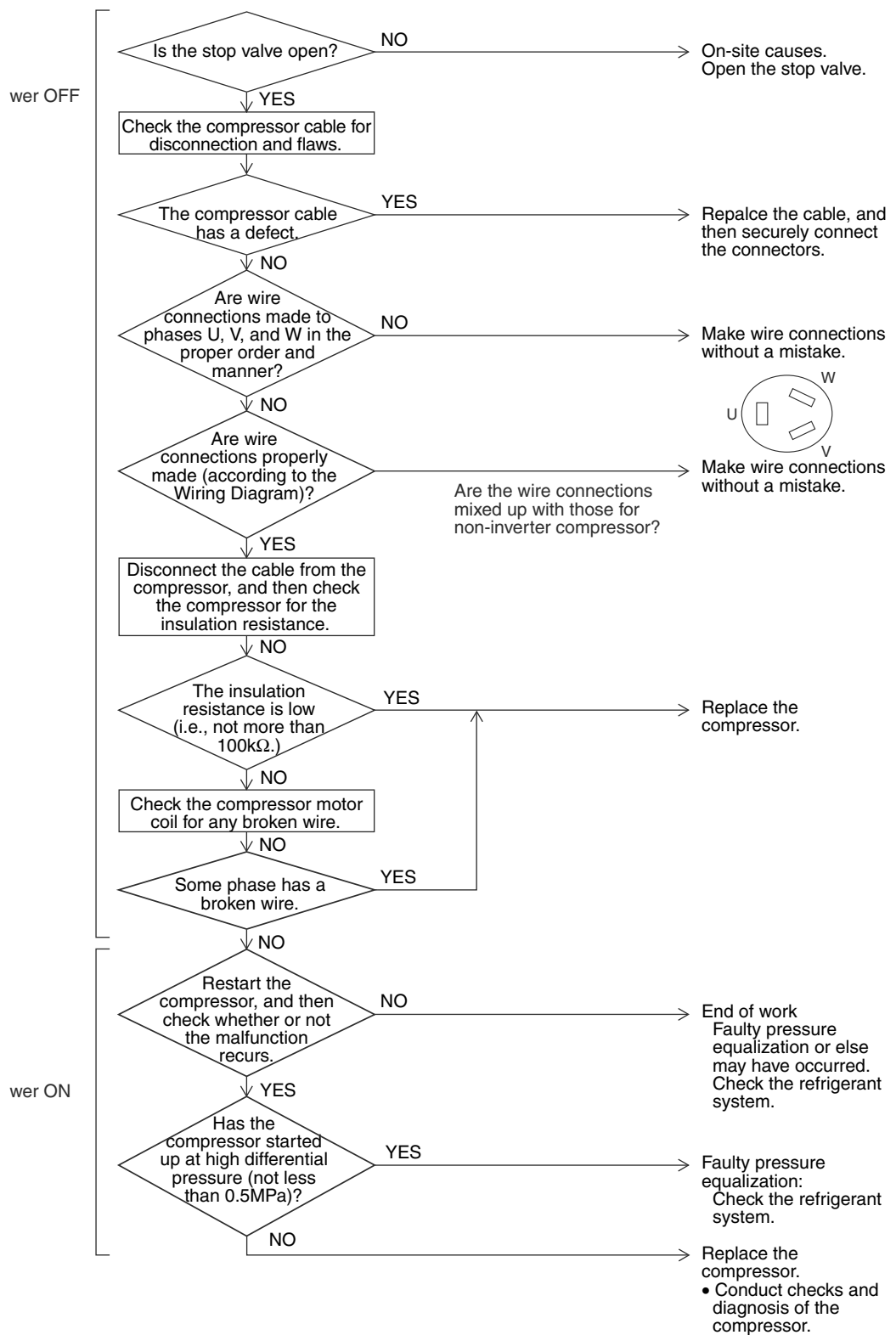
Remote Control Display	E5
Applicable Models	U-5MX4XPQ ~ U-54MX4XPQ
Method of Malfunction Detection	Inverter PC board takes the position signal from UVW line connected between the inverter and compressor, and the malfunction is detected when any abnormality is observed in the phase-current waveform.
Malfunction Decision Conditions	This malfunction will be output when the inverter compressor motor does not start up even in forced startup mode.
Supposed Causes	<ul style="list-style-type: none"><li>■ Inverter compressor lock</li><li>■ High differential pressure (0.5MPa or more)</li><li>■ Incorrect UVW wiring</li><li>■ Faulty inverter PC board</li><li>■ Stop valve is left in closed.</li></ul>

# Troubleshooting



## Caution

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



## 3.17 “E6” Outdoor Unit: STD Compressor Motor Overcurrent/Lock

Remote Control  
Display

E6

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Detects the overcurrent with current sensor (CT).

Malfunction  
Decision  
Conditions

Malfunction is decided when the detected current value exceeds the below mentioned value for 2 seconds.

■ 400 V unit : 15.0 A

Supposed  
Causes

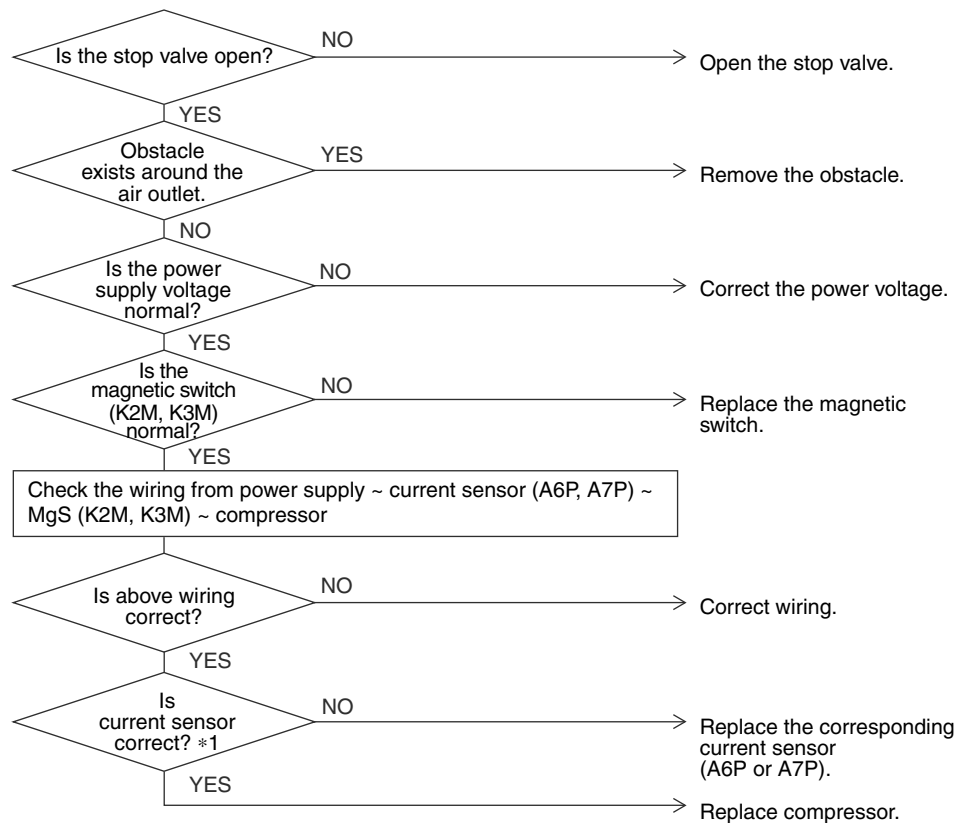
- Closed stop valve
- Obstacles at the air outlet
- Improper power voltage
- Faulty magnetic switch
- Faulty compressor
- Faulty current sensor (A6P, A7P)

### Troubleshooting



#### Caution

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



(V3051)



#### Note:

\*1 Abnormal case

- The current sensor value is 0 during STD compressor operation.
- The current sensor value is more than 15.0A during STD compressor stop.

### 3.18 “E7” Outdoor Unit: Malfunction of Outdoor Unit Fan Motor

<b>Remote Control Display</b>	<b>E7</b>
<b>Applicable Models</b>	U-5MX4XPQ ~ U-54MX4XPQ
<b>Method of Malfunction Detection</b>	Malfunction of fan motor system is detected according to the fan speed detected by hall IC when the fan motor runs.
<b>Malfunction Decision Conditions</b>	<ul style="list-style-type: none"> <li>■ When the fan runs with speed less than a specified one for 6 seconds or more when the fan motor running conditions are met</li> <li>■ When connector detecting fan speed is disconnected</li> <li>■ When malfunction is generated 4 times, the system shuts down.</li> </ul>
<b>Supposed Causes</b>	<ul style="list-style-type: none"> <li>■ Malfunction of fan motor</li> <li>■ The harness connector between fan motor and PC board is left in disconnected, or faulty connector</li> <li>■ Fan does not run due to foreign matters tangled</li> <li>■ Clearing condition: Operate for 5 minutes (normal)</li> </ul>

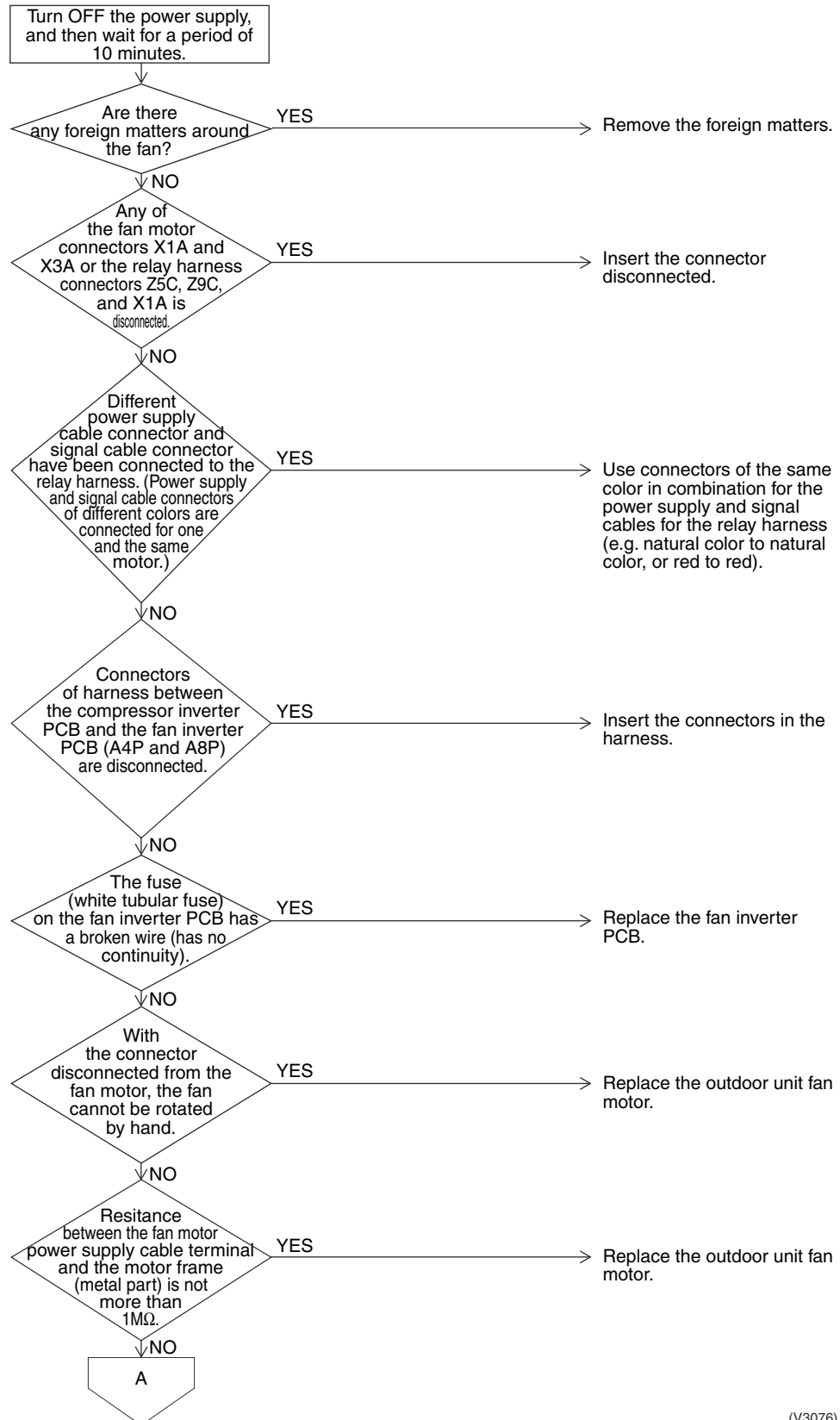


## Troubleshooting



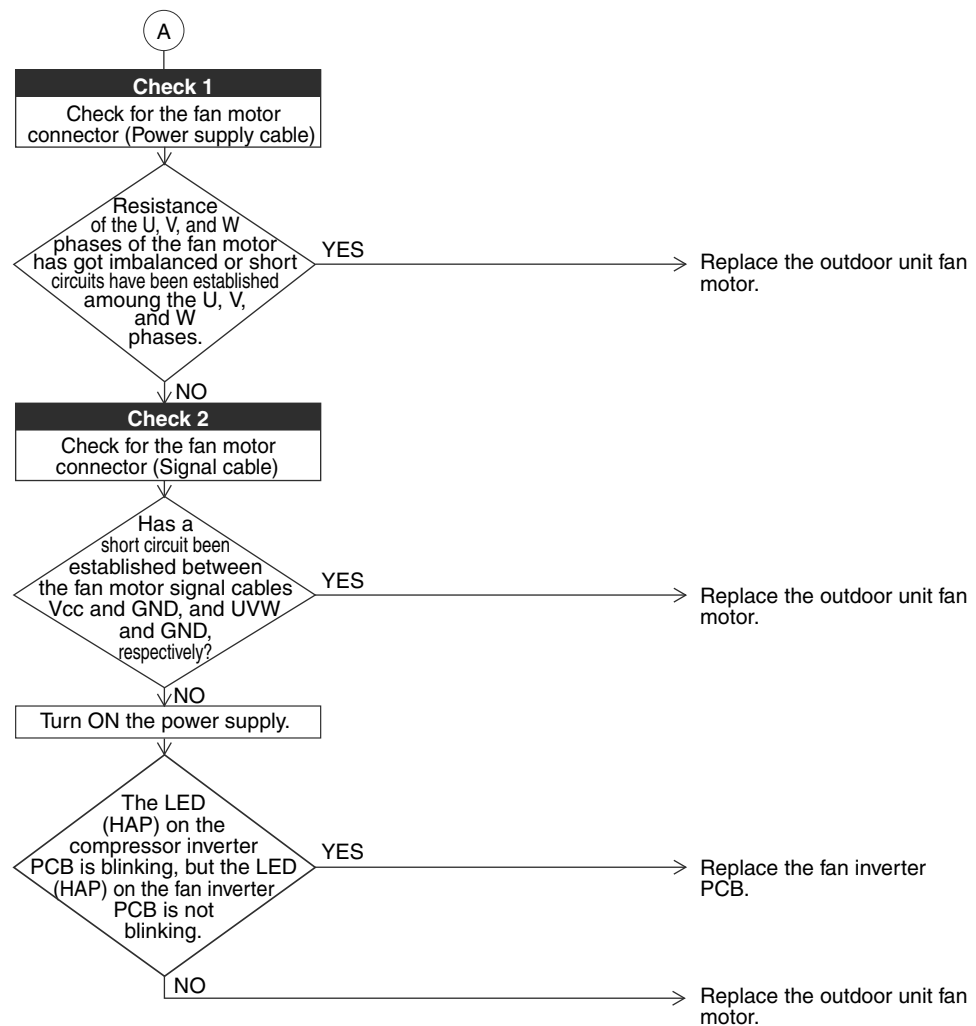
### Caution

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



(V3076)

# Troubleshooting



(V3077)

**i** **Note:** Refer check 1 and 2 to P.296.

### 3.19 “E9” Outdoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E, Y2E)

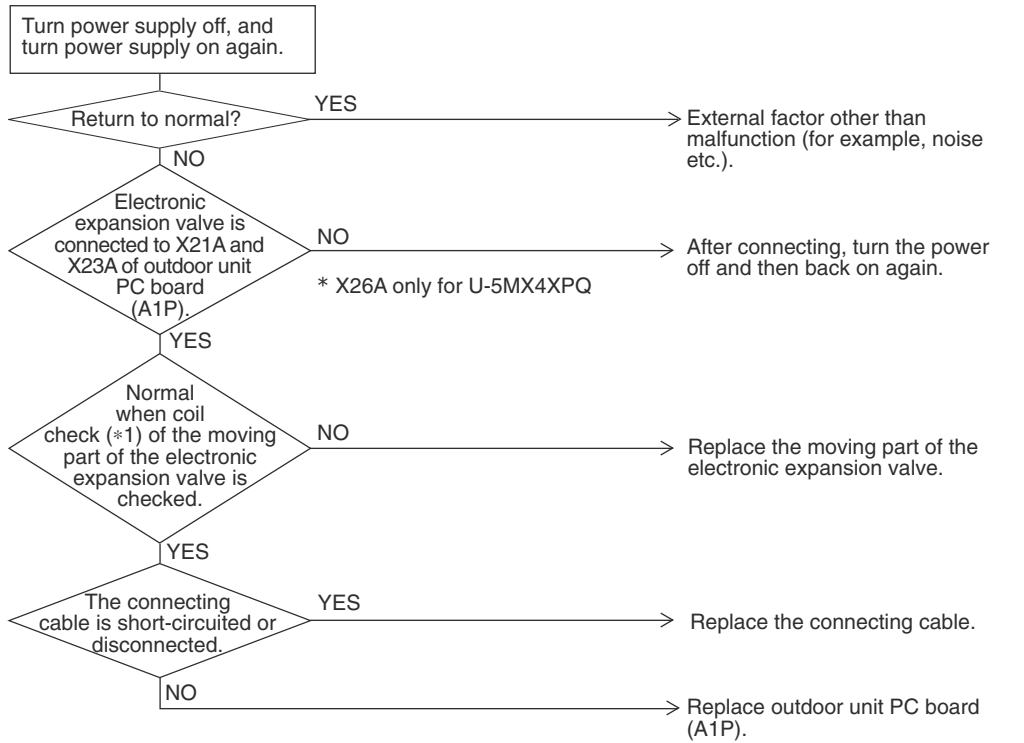
Remote Control Display	E9
Applicable Models	U-5MX4XPQ ~ U-54MX4XPQ
Method of Malfunction Detection	Check disconnection of connector Check continuity of expansion valve coil
Malfunction Decision Conditions	Error is generated under no common power supply when the power is on.
Supposed Causes	<ul style="list-style-type: none"><li>■ Defect of moving part of electronic expansion valve</li><li>■ Defect of outdoor unit PC board (A1P)</li><li>■ Defect of connecting cable</li></ul>

# Troubleshooting



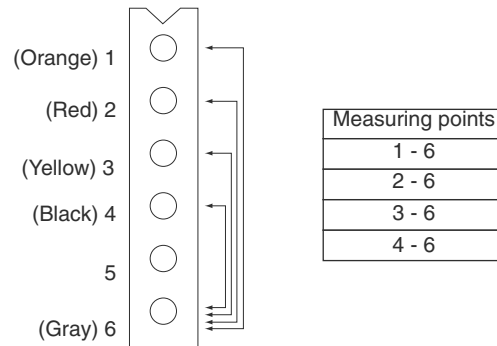
## Caution

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



(V3067)

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



(V3067)

## 3.20 “F3” Outdoor Unit: Abnormal Discharge Pipe Temperature

Remote Control  
Display

F3

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Abnormality is detected according to the temperature detected by the discharge pipe temperature sensor.

Malfunction  
Decision  
Conditions

When the discharge pipe temperature rises to an abnormally high level  
When the discharge pipe temperature rises suddenly

Supposed  
Causes

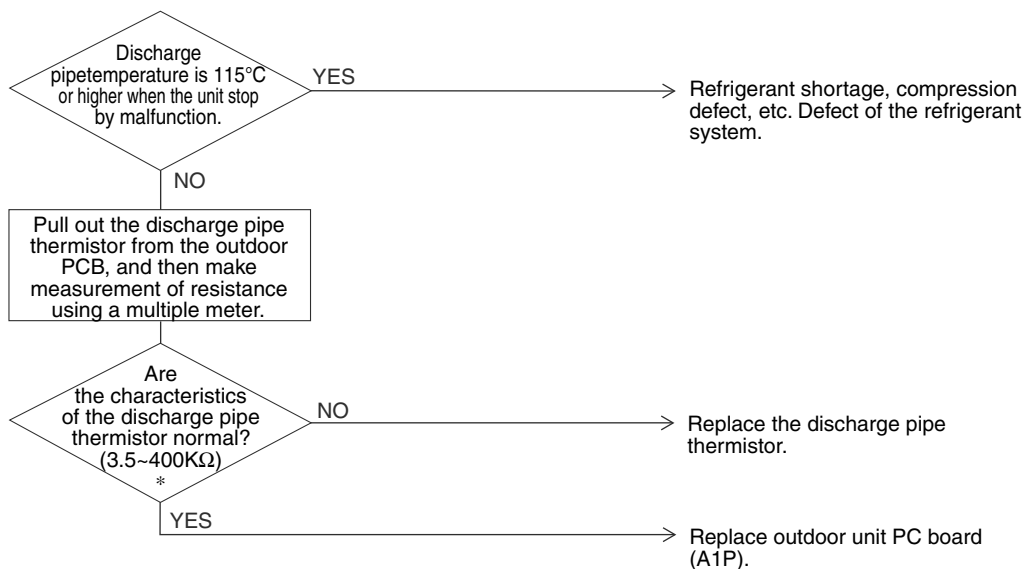
- Faulty discharge pipe temperature sensor
- Faulty connection of discharge pipe temperature sensor
- Faulty outdoor unit PC board

### Troubleshooting



#### Caution

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



(V3068)



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

## 3.21 “F6” Outdoor Unit: Refrigerant Overcharged

Remote Control  
Display

**F6**

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

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

Malfunction  
Decision  
Conditions

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

Supposed  
Causes

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

### Troubleshooting



**Caution**

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

Check the mounting condition of the temperature sensors of the outside air thermistor, heat exchanging deicer thermistor and liquid pipe thermistor in the piping.

Are the above thermistor installed on pipes correctly?

NO

→ Install thermistor correctly.

YES

Remove the outside air thermistor, heat exchanging deicer thermistor and the liquid pipe thermistor from the outdoor PCB and measure resistance with a tester.

Is the characteristic of the above thermistor normal?

NO

→ Replace thermistor.

YES

→ Refrigerant overcharged.

(V2797)



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

## 3.22 “H7” Outdoor Unit: Abnormal Outdoor Fan Motor Signal

Remote Control  
Display

H7

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Detection of abnormal signal from fan motor.

Malfunction  
Decision  
Conditions

In case of detection of abnormal signal at starting fan motor.

Supposed  
Causes

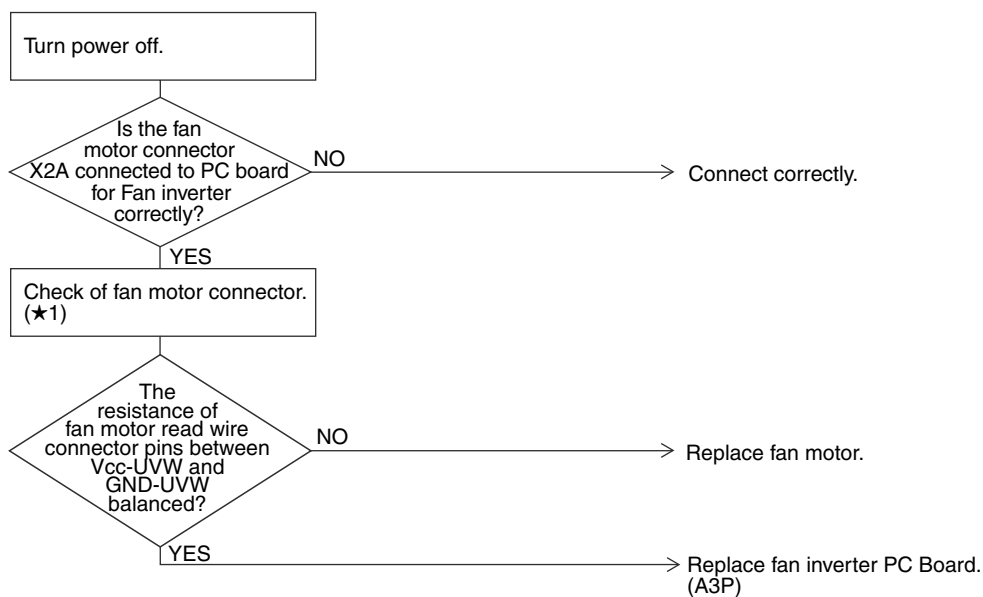
- Abnormal fan motor signal (circuit malfunction)
- Broken, short or disconnection connector of fan motor connection cable
- Fan Inverter PC board malfunction

### Troubleshooting



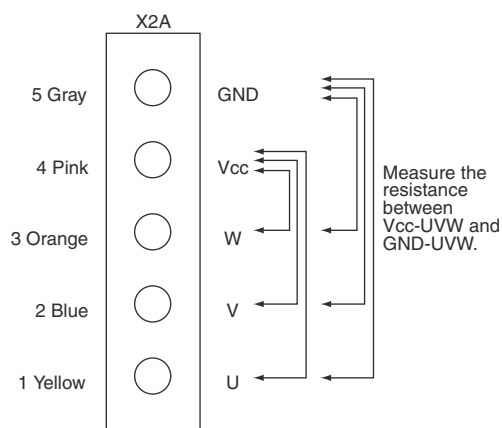
#### Caution

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



(V3069)

★1: Disconnect connector (X2A) and measure the following resistance.



(V2799)

### 3.23 “H9” Outdoor Unit: Malfunction of Thermistor (R1T) for Outdoor Air

Remote Control Display *H9*

Applicable Models U-5MX4XPQ ~ U-54MX4XPQ

Method of Malfunction Detection Malfunction is detected from the temperature detected by the outdoor air thermistor.

Malfunction Decision Conditions When the outside air temperature thermistor has short circuit or open circuit.

Supposed Causes

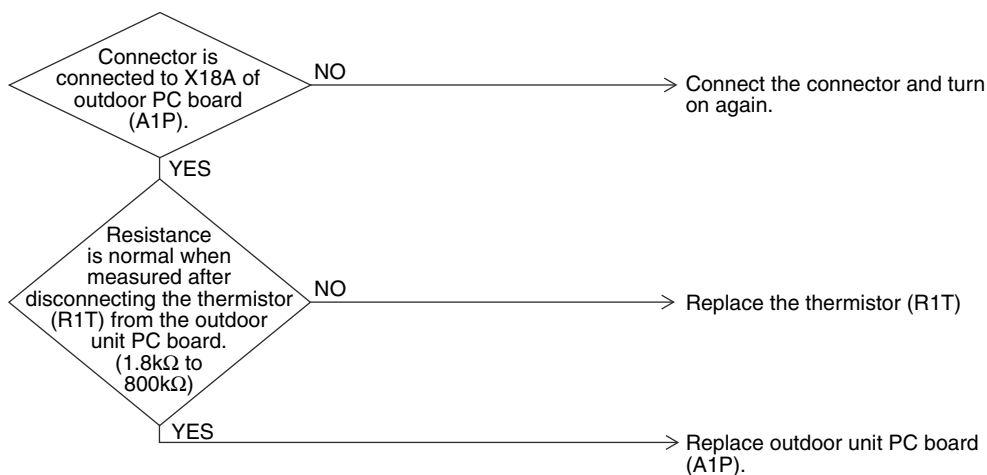
- Defect of thermistor (R1T) for outdoor air
- Defect of outdoor unit PC board (A1P)

#### Troubleshooting



#### Caution

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



(V3070)



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.



## 3.24 “J2” Outdoor Unit: Current Sensor Malfunction

Remote Control  
Display



Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Malfunction is detected according to the current value detected by current sensor.

Malfunction  
Decision  
Conditions

When the current value detected by current sensor becomes 5A or lower, or 40A or more during standard compressor operation.

Supposed  
Causes

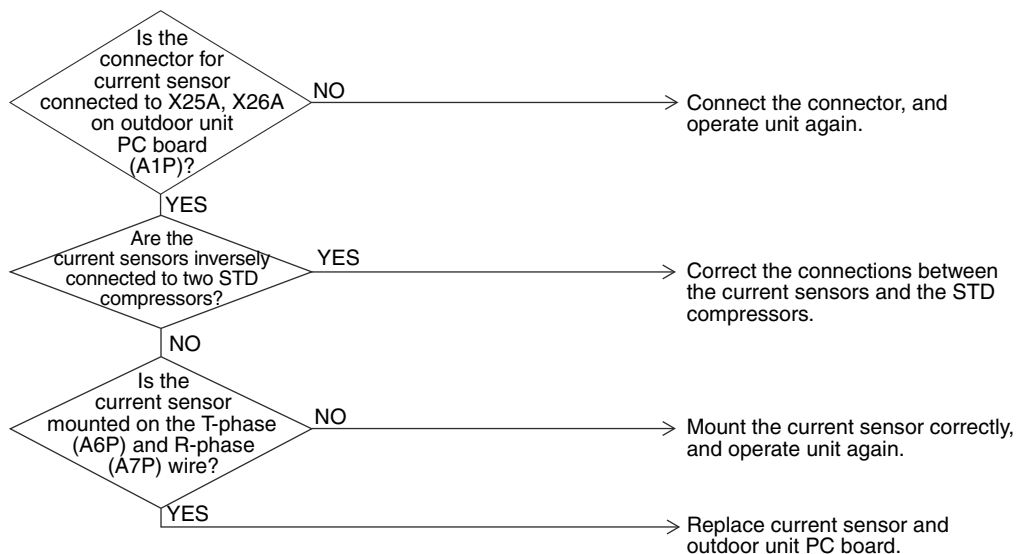
- Faulty current sensor (A6P, A7P)
- Faulty outdoor unit PC board

Troubleshooting



**Caution**

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



(V3071)

## 3.25 “J3” Outdoor Unit: Malfunction of Discharge Pipe Thermistor (R3, R31~33T)

Remote Control  
Display

J3

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Malfunction is detected from the temperature detected by discharge pipe temperature thermistor.

Malfunction  
Decision  
Conditions

When a short circuit or an open circuit in the discharge pipe temperature thermistor is detected.

Supposed  
Causes

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

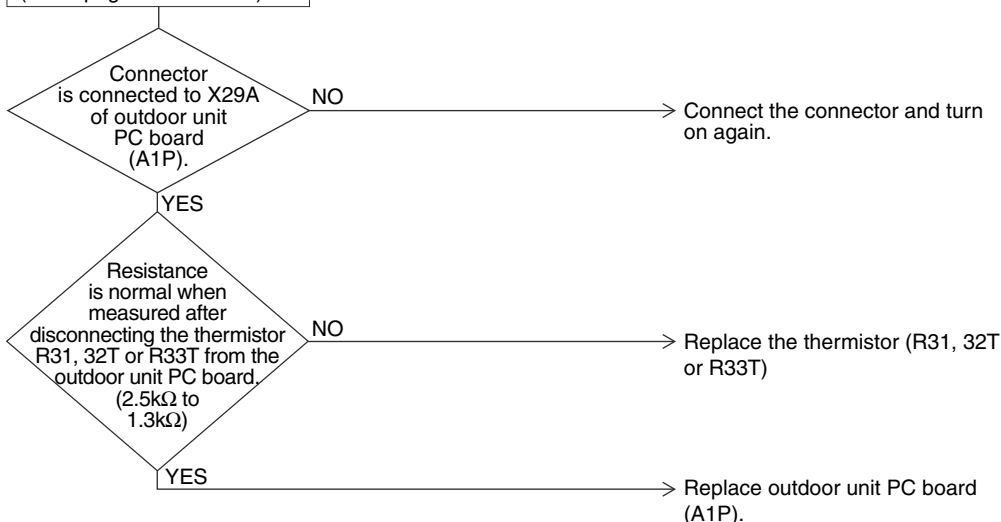
### Troubleshooting



**Caution**

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

Confirm which discharge thermistor is abnormal using outdoor unit "monitor mode". (Refer page 216 and 217)



(V3072)

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



**Note:**

5 HP class ... R3T  
8~12 HP class ... R31T, R32T  
14, 16Hp class ... R31T, R32T and R33T



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

## 3.26 “J5” Outdoor Unit: Malfunction of Thermistor (R2T), (R7T) for Suction Pipe

Remote Control  
Display

J5

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Malfunction is detected from the temperature detected by the suction pipe temperature thermistor.

Malfunction  
Decision  
Conditions

When a short circuit or an open circuit in the suction pipe temperature thermistor is detected.

Supposed  
Causes

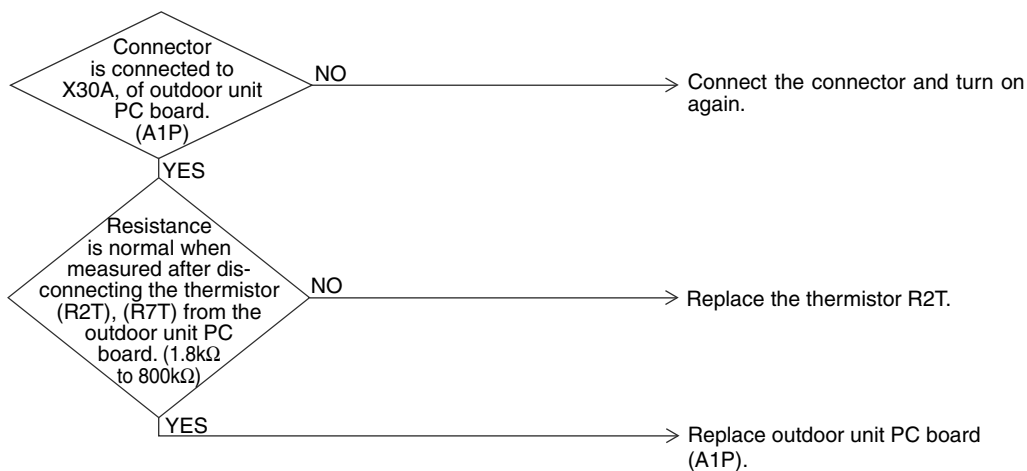
- Defect of thermistor (R2T), (R7T) for outdoor unit suction pipe
- Defect of outdoor unit PC board (A1P)
- Defect of thermistor connection

Troubleshooting



**Caution**

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



(V3073)



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

## 3.27 “J6” Outdoor Unit: Malfunction of Thermistor (R4T) for Outdoor Unit Heat Exchanger

Remote Control  
Display

J6

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Malfunction is detected from the temperature detected by the heat exchanger thermistor.

Malfunction  
Decision  
Conditions

When a short circuit or an open circuit in the heat exchange thermistor is detected.

Supposed  
Causes

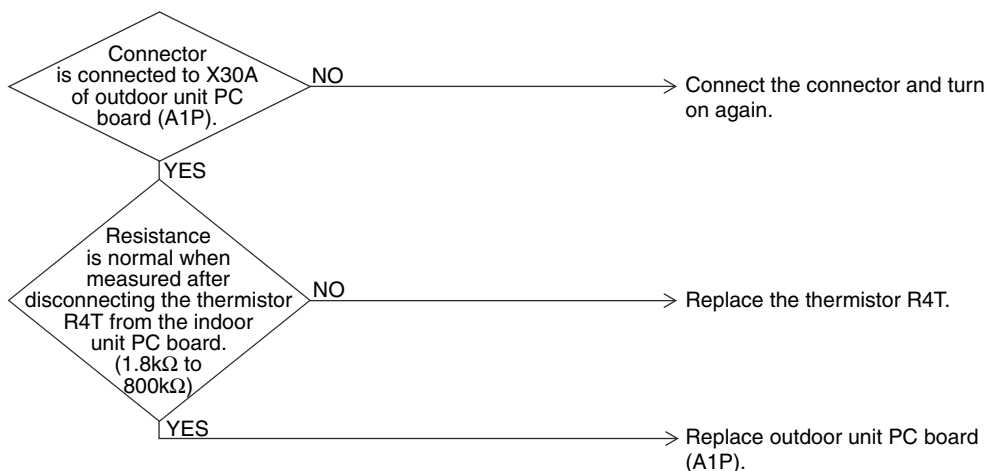
- Defect of thermistor (R4T) for outdoor unit coil
- Defect of outdoor unit PC board (A1P)
- Defect of thermistor connection

Troubleshooting



**Caution**

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



(V3074)



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

## 3.28 “J7” Outdoor Unit: Malfunction of Liquid Pipe Thermistor (R6T)

Remote Control  
Display

J7

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Malfunction is detected according to the temperature detected by liquid pipe thermistor.

Malfunction  
Decision  
Conditions

When the liquid pipe thermistor is short circuited or open.

Supposed  
Causes

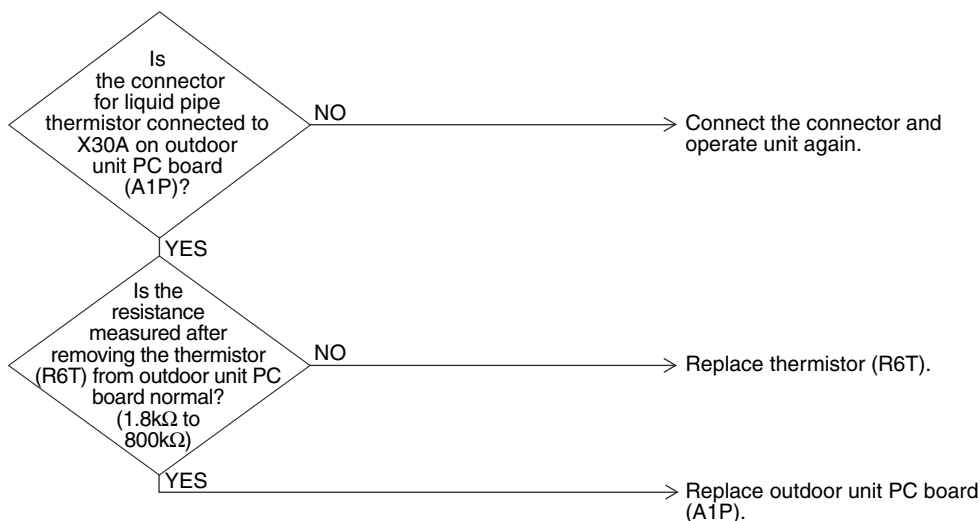
- Faulty liquid pipe thermistor (R6T)
- Faulty outdoor unit PC board
- Defect of thermistor connection

Troubleshooting



**Caution**

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



(V3075)



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

### 3.29 “J9” Outdoor Unit: Malfunction of Subcooling Heat Exchanger Gas Pipe Thermistor (R5T)

Remote Control Display **J9**

Applicable Models U-5MX4XPQ ~ U-54MX4XPQ

Method of Malfunction Detection Malfunction is detected according to the temperature detected by subcooling heat exchanger gas pipe thermistor.

Malfunction Decision Conditions When the subcooling heat exchanger gas pipe thermistor is short circuited or open.

Supposed Causes

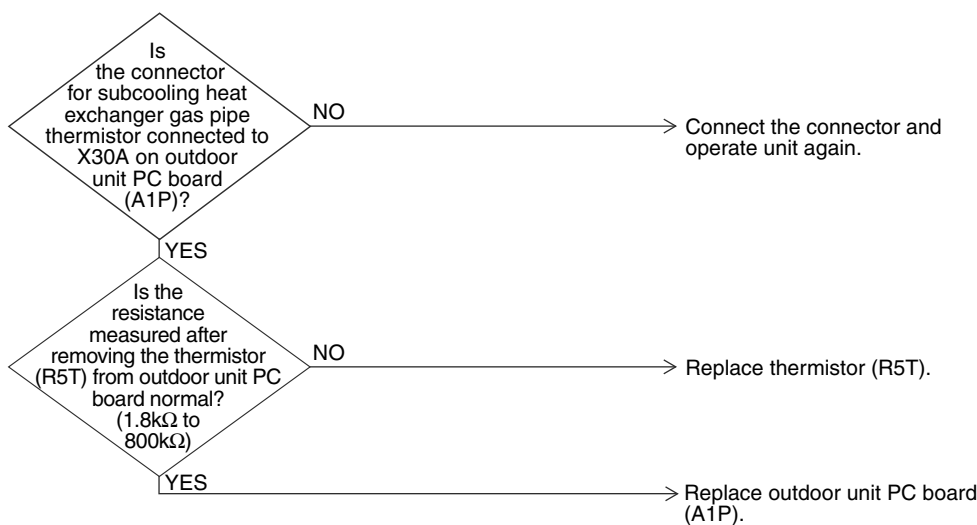
- Faulty subcooling heat exchanger gas pipe thermistor (R5T)
- Faulty outdoor unit PC board

#### Troubleshooting



#### Caution

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



(V3075)



\* Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

### 3.30 “JA” Outdoor Unit: Malfunction of High Pressure Sensor

Remote Control  
Display

JA

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Malfunction is detected from the pressure detected by the high pressure sensor.

Malfunction  
Decision  
Conditions

When the high pressure sensor is short circuit or open circuit.

Supposed  
Causes

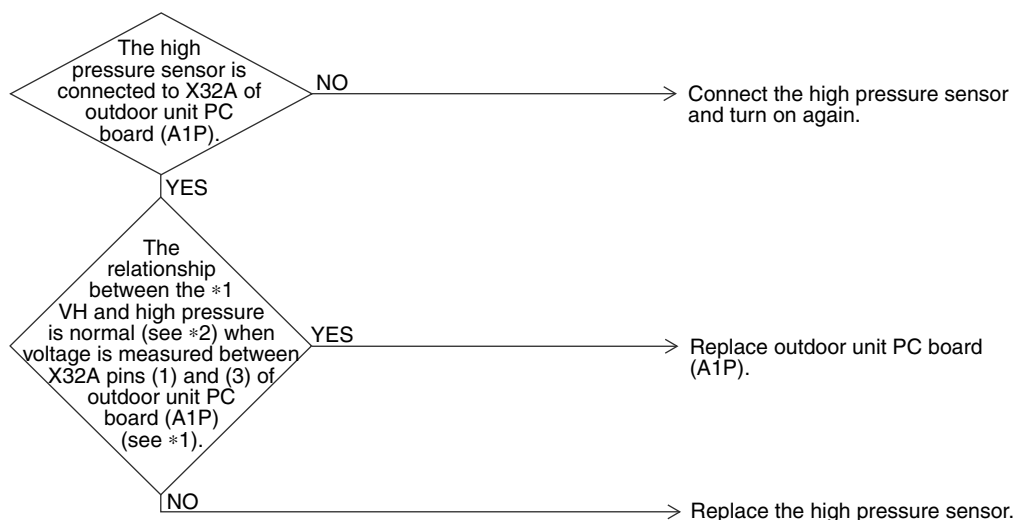
- Defect of high pressure sensor system
- Connection of low pressure sensor with wrong connection.
- Defect of outdoor unit PC board.

#### Troubleshooting



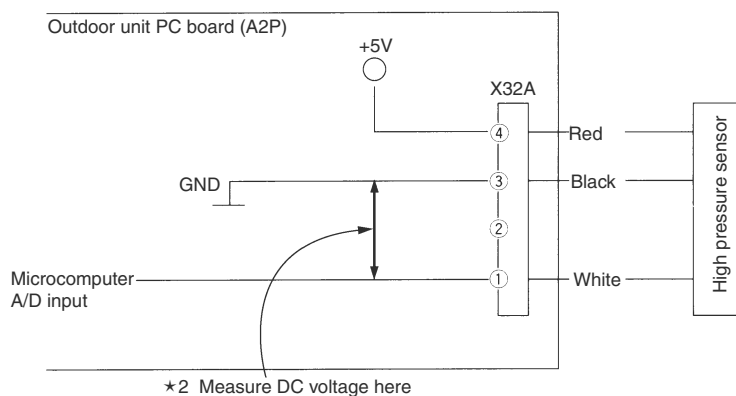
#### Caution

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



(V2806)

\*1: Voltage measurement point



(V2807)



\*2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on P338.

### 3.31 “JL” Outdoor Unit: Malfunction of Low Pressure Sensor

Remote Control  
Display



Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Malfunction is detected from pressure detected by low pressure sensor.

Malfunction  
Decision  
Conditions

When the low pressure sensor is short circuit or open circuit.

Supposed  
Causes

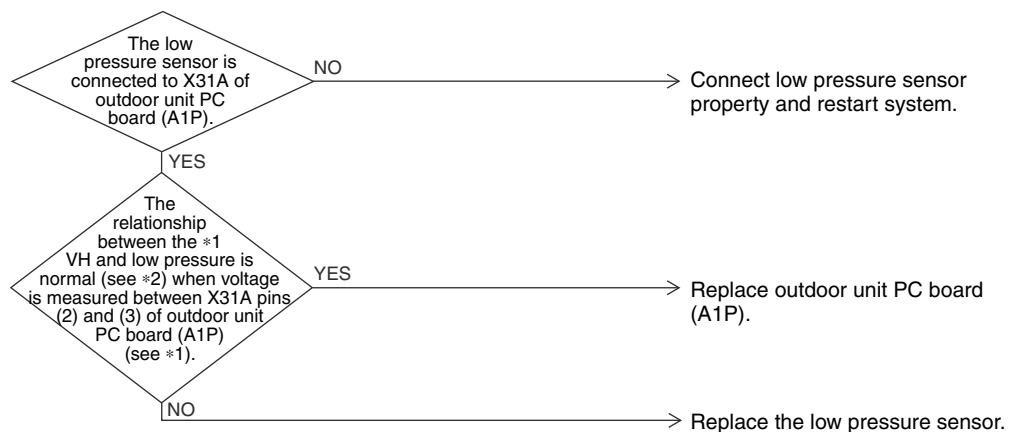
- Defect of low pressure sensor system
- Connection of high pressure sensor with wrong connection.
- Defect of outdoor unit PC board.

Troubleshooting



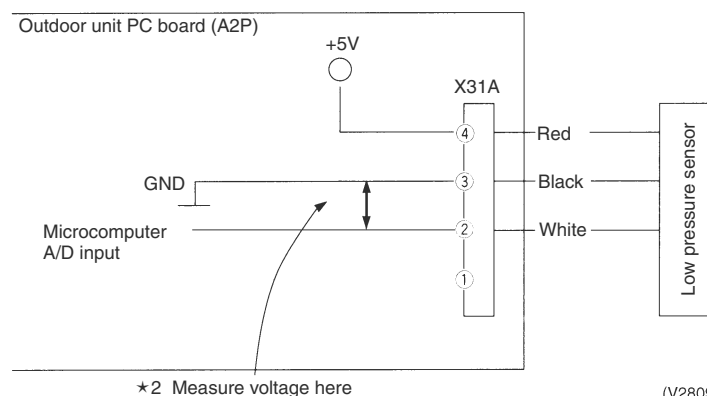
**Caution**

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



(V2808)

\*1: Voltage measurement point



(V2809)



\*2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on P338.



### 3.32 “L4” Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise

Remote Control  
Display

L4

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Fin temperature is detected by the thermistor of the radiation fin.

Malfunction  
Decision  
Conditions

When the temperature of the inverter radiation fin increases above 93°C.

Supposed  
Causes

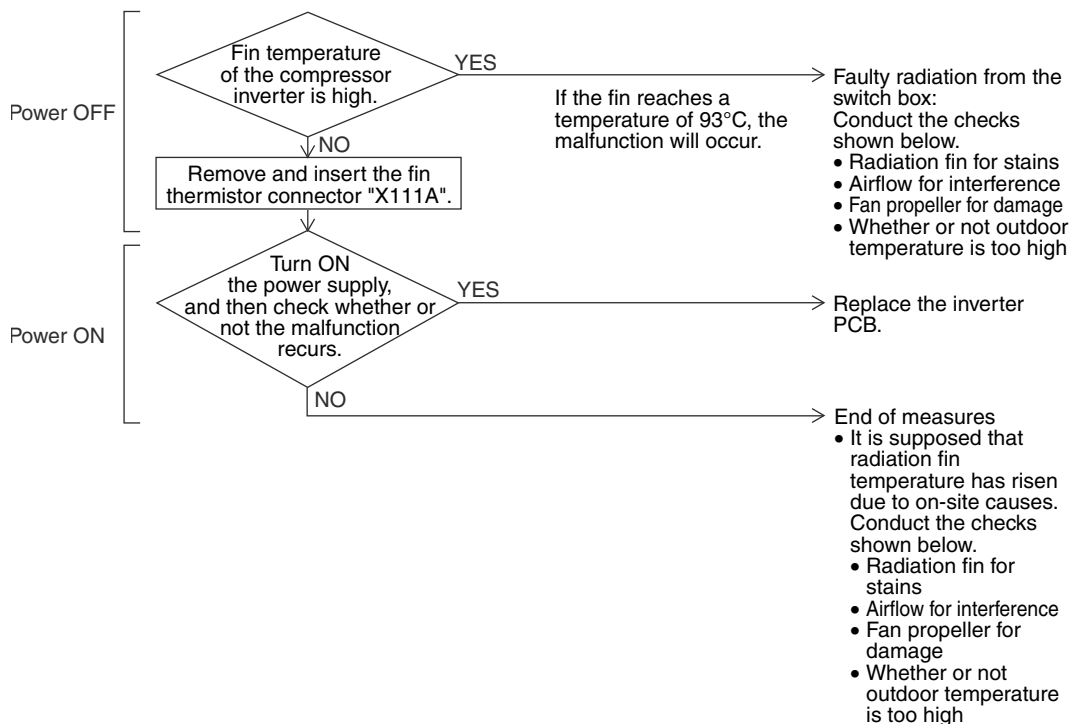
- Actuation of fin thermal (Actuates above 93°C)
- Defect of inverter PC board
- Defect of fin thermistor

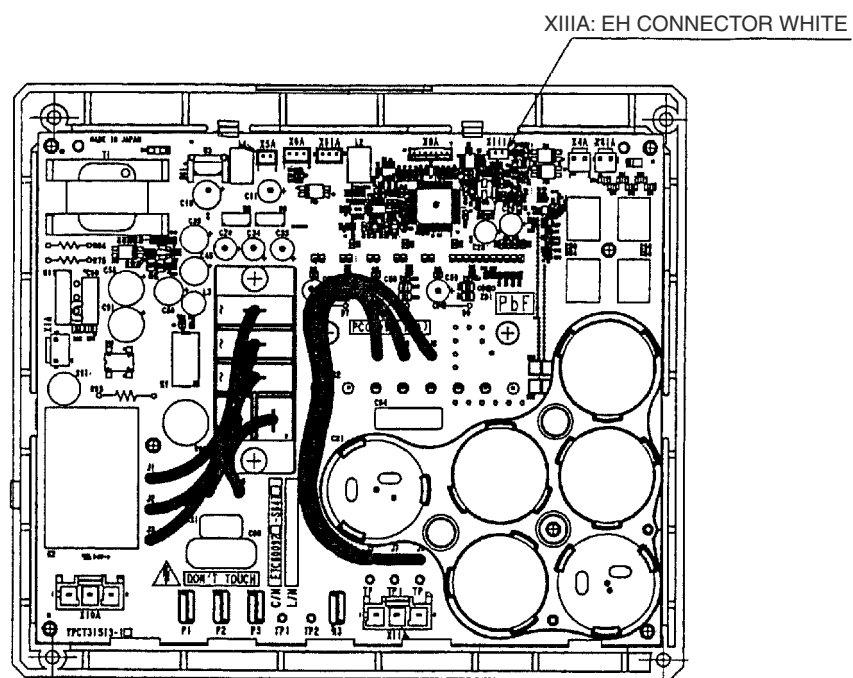
Troubleshooting



**Caution**

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





Inverter PCB for compressor



\* Refer to "Thermistor Resistance / Temperature Characteristics" table on P336.

### 3.33 “L5” Outdoor Unit: Inverter Compressor Abnormal

Remote Control  
Display

L5

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Malfunction is detected from current flowing in the power transistor.

Malfunction  
Decision  
Conditions

When an excessive current flows in the power transistor.  
(Instantaneous overcurrent also causes activation.)

Supposed  
Causes

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

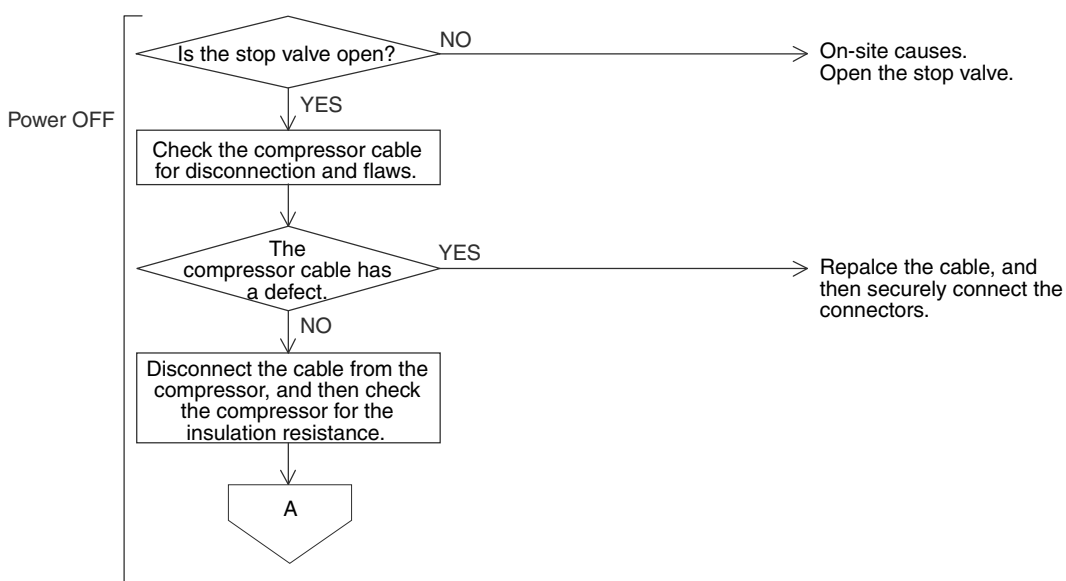
Troubleshooting

Compressor inspection

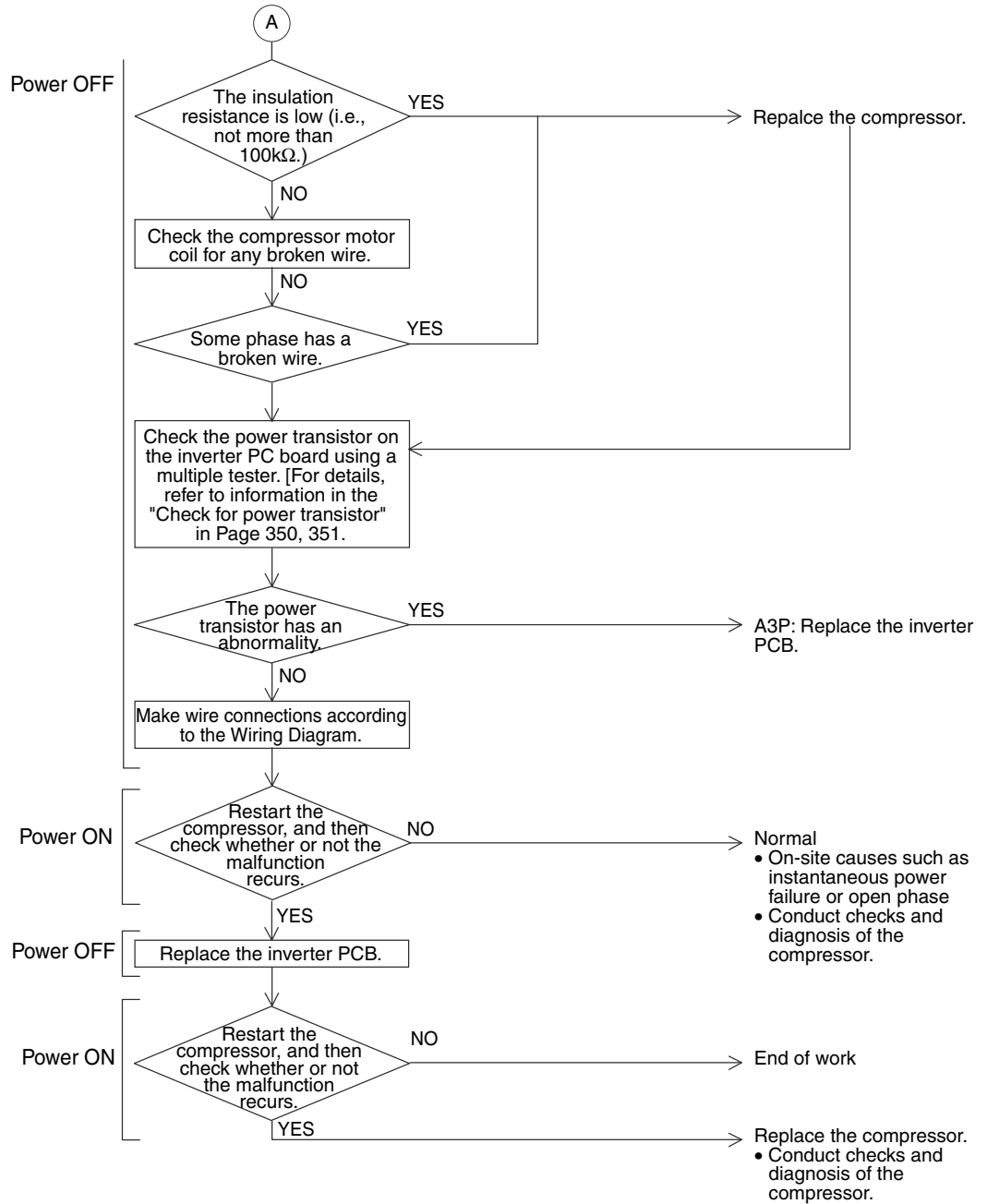


**Caution**

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



# Troubleshooting



### 3.34 “L8” Outdoor Unit: Inverter Current Abnormal

Remote Control Display **L8**

Applicable Models U-5MX4XPQ ~ U-54MX4XPQ

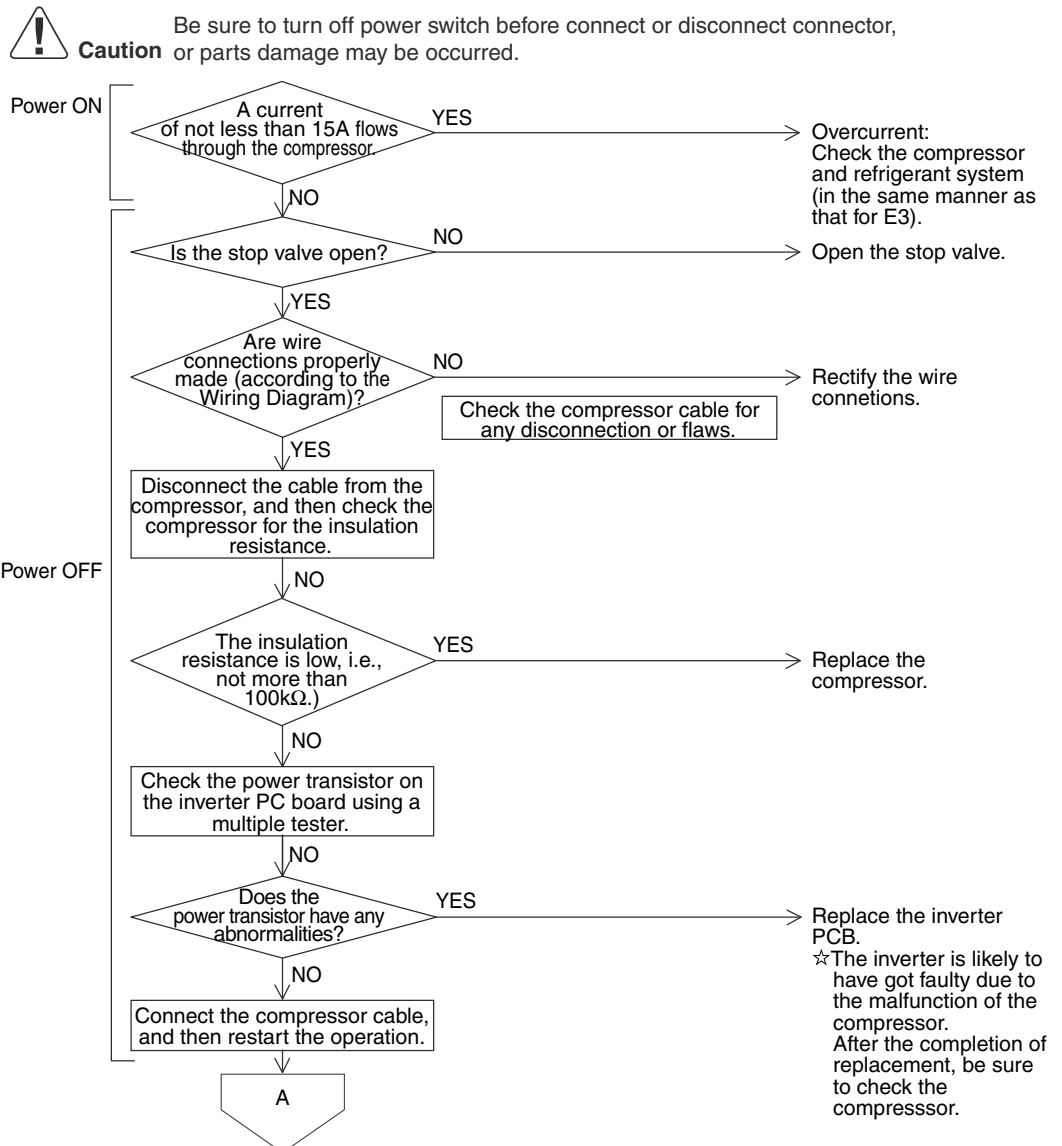
Method of Malfunction Detection Malfunction is detected by current flowing in the power transistor.

Malfunction Decision Conditions When overload in the compressor is detected. (Inverter secondary current 16.1A)

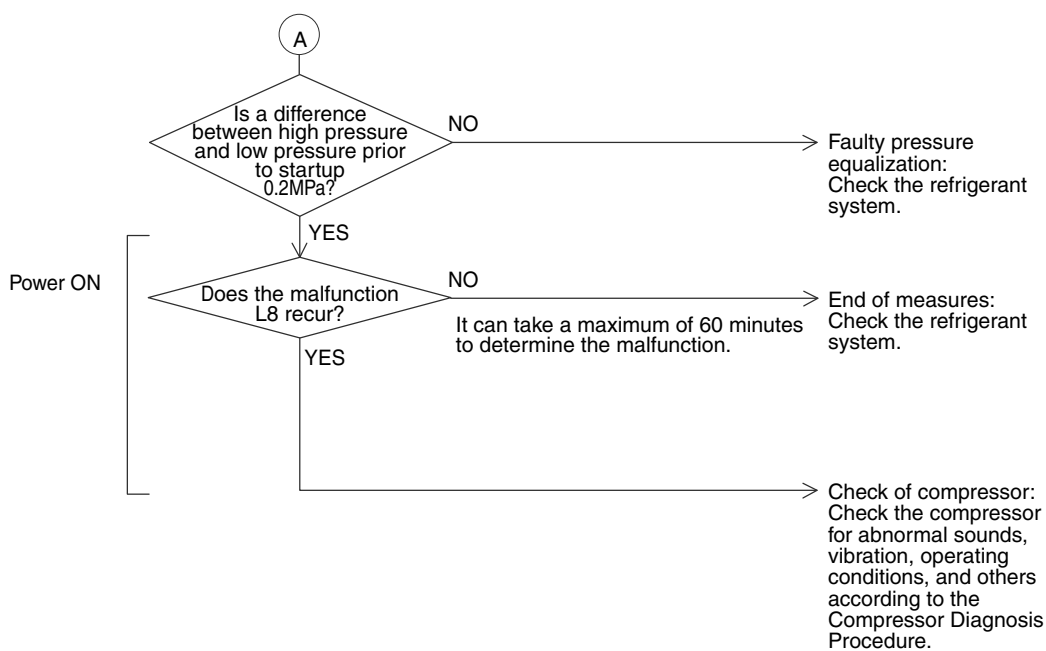
Supposed Causes

- Compressor overload
- Compressor coil disconnected
- Defect of inverter PC board
- Faulty compressor

Troubleshooting Output current check



## Troubleshooting



### 3.35 “L9” Outdoor Unit: Inverter Start up Error

Remote Control Display **L9**

Applicable Models U-5MX4XPQ ~ U-54MX4XPQ

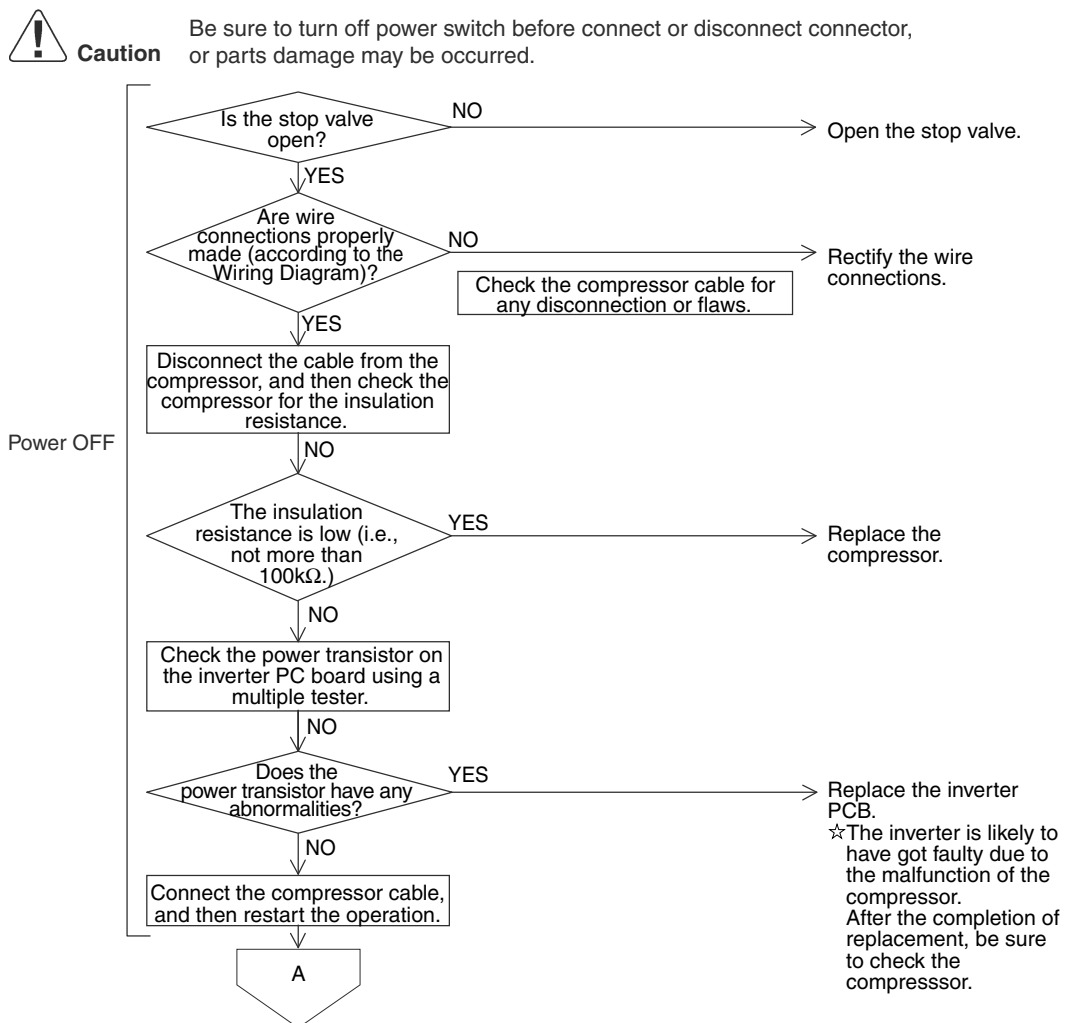
Method of Malfunction Detection This malfunction code will be output if overcurrent occurs at the time of startup.

Malfunction Decision Conditions When the startup control is failed.  
When an overcurrent is passed to the inverter due to the malfunction of a compressor or electrical system.

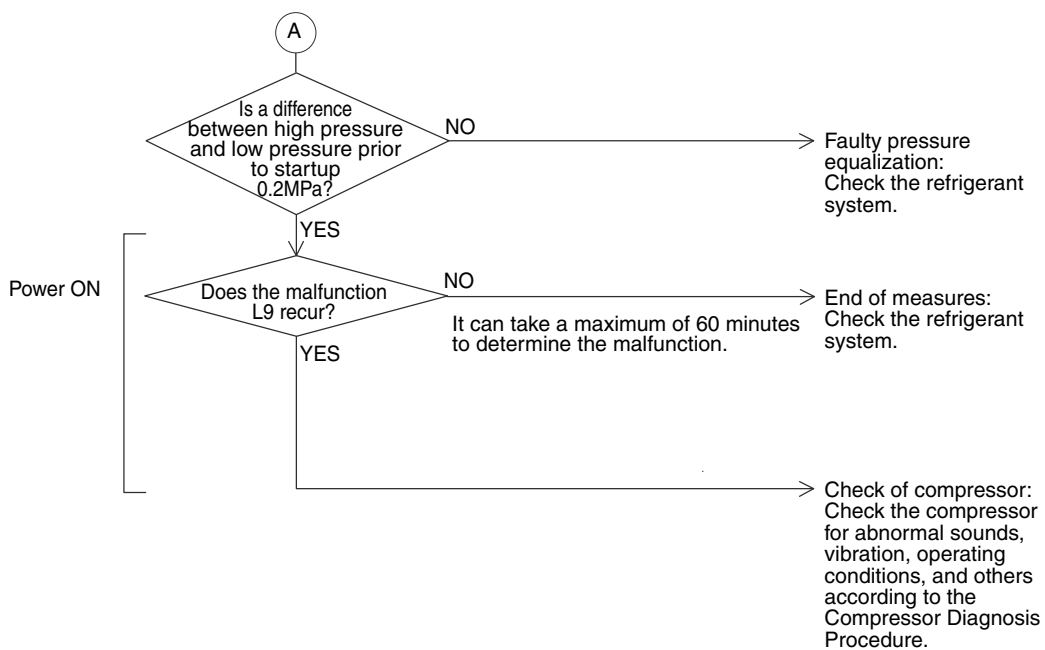
Supposed Causes

- Defect of compressor
- Pressure differential start
- Defect of inverter PC board
- Failure to open the stop valve
- Faulty compressor connection

#### Troubleshooting



## Troubleshooting





### 3.36 “*LC*” Outdoor Unit: Malfunction of Transmission Between Inverter and Control PC Board

Remote Control  
Display

*LC*

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Check the communication state between inverter PC board and control PC board by micro-computer.

Malfunction  
Decision  
Conditions

When the correct communication is not conducted in certain period.

Supposed  
Causes

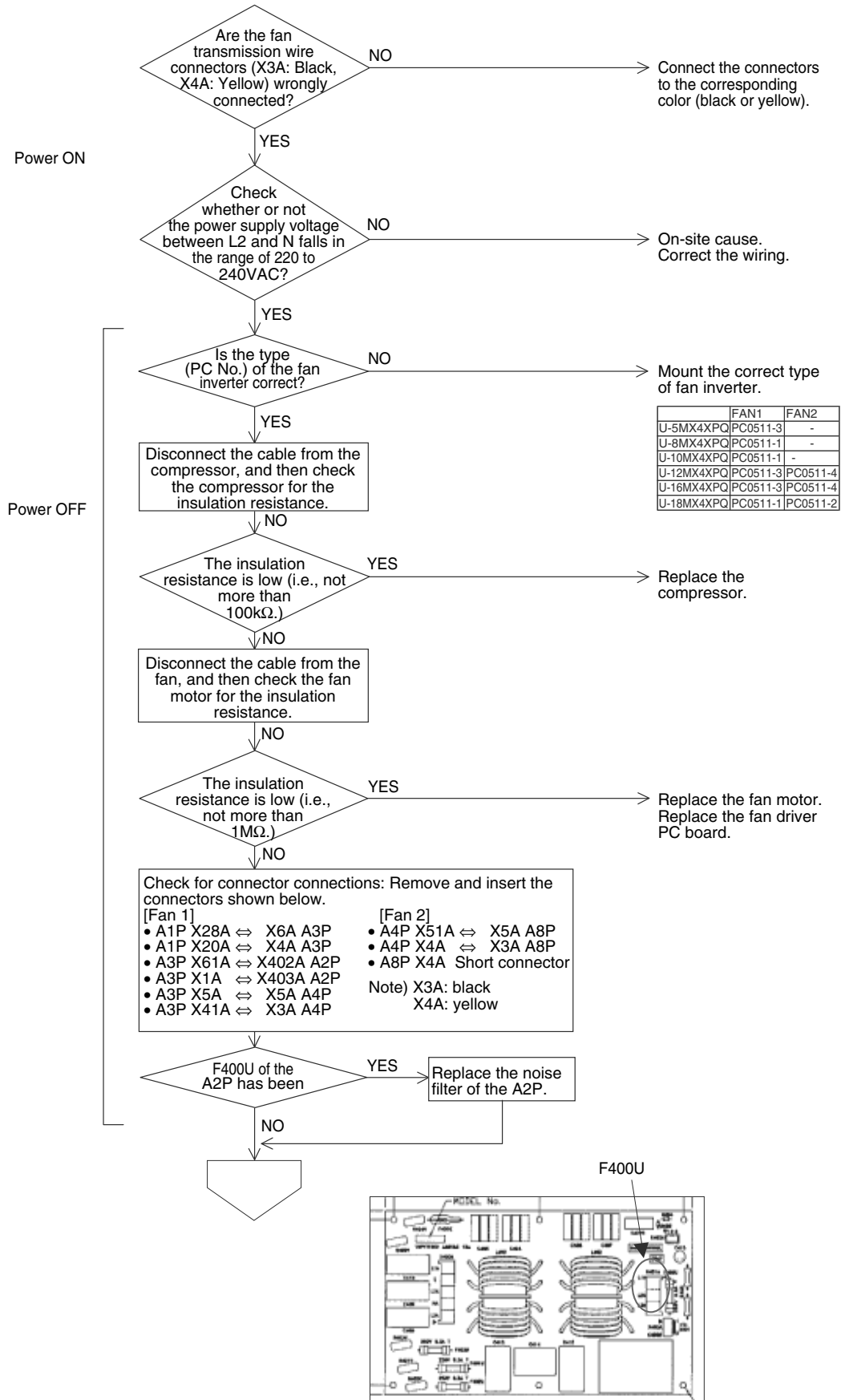
- Malfunction of connection between the inverter PC board and outdoor control PC board
- Defect of outdoor control PC board (transmission section)
- Defect of inverter PC board
- Defect of noise filter
- Faulty fan inverter
- Incorrect type of fan inverter
- Faulty compressor
- Faulty fan motor

# Troubleshooting

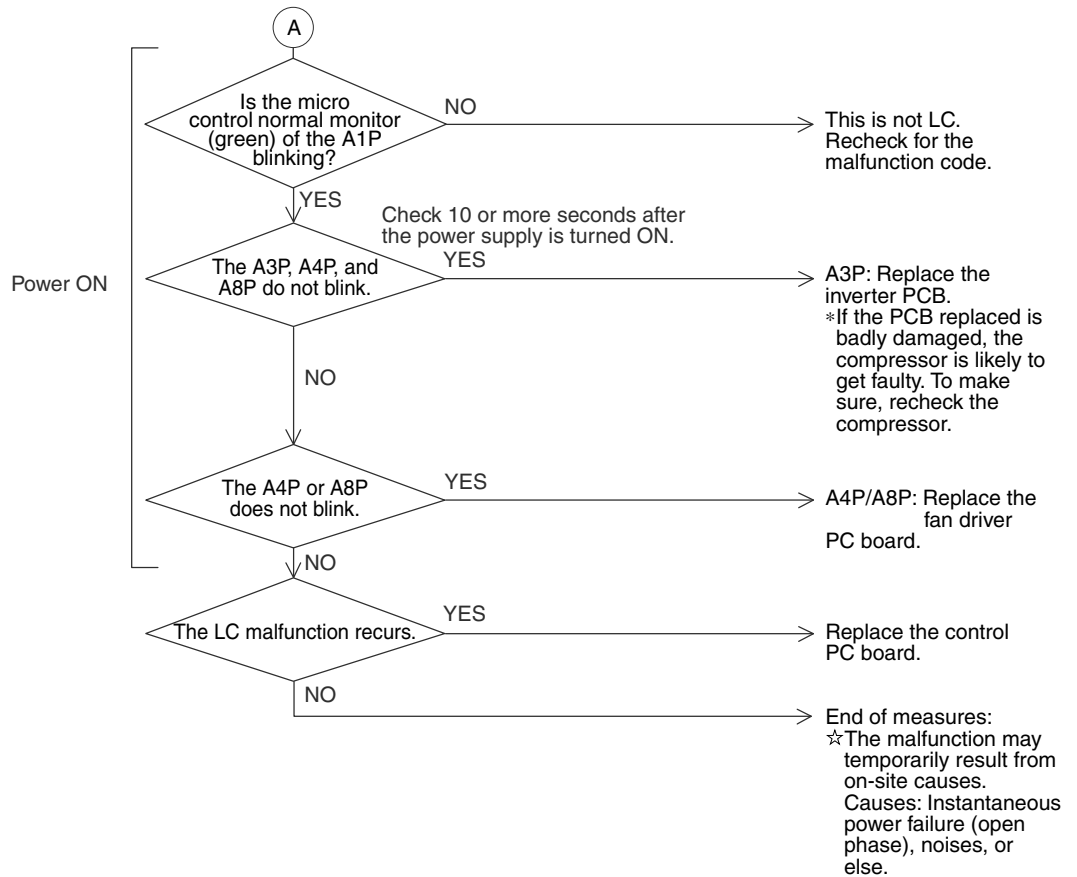


## Caution

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



## Troubleshooting



### 3.37 "P1" Outdoor Unit: Inverter Over-Ripple Protection

Remote Control  
Display

P1

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Imbalance in supply voltage is detected in PC board.

Imbalance in the power supply voltage causes increased ripple of voltage of the main circuit capacitor in the inverter. Consequently, the increased ripple is detected.

Malfunction  
Decision  
Conditions

When the resistance value of thermistor becomes a value equivalent to open or short circuited status.

★ Malfunction is not decided while the unit operation is continued.

"P1" will be displayed by pressing the inspection button.

When the amplitude of the ripple exceeding a certain value is detected for consecutive 4 minutes.

Supposed  
Causes

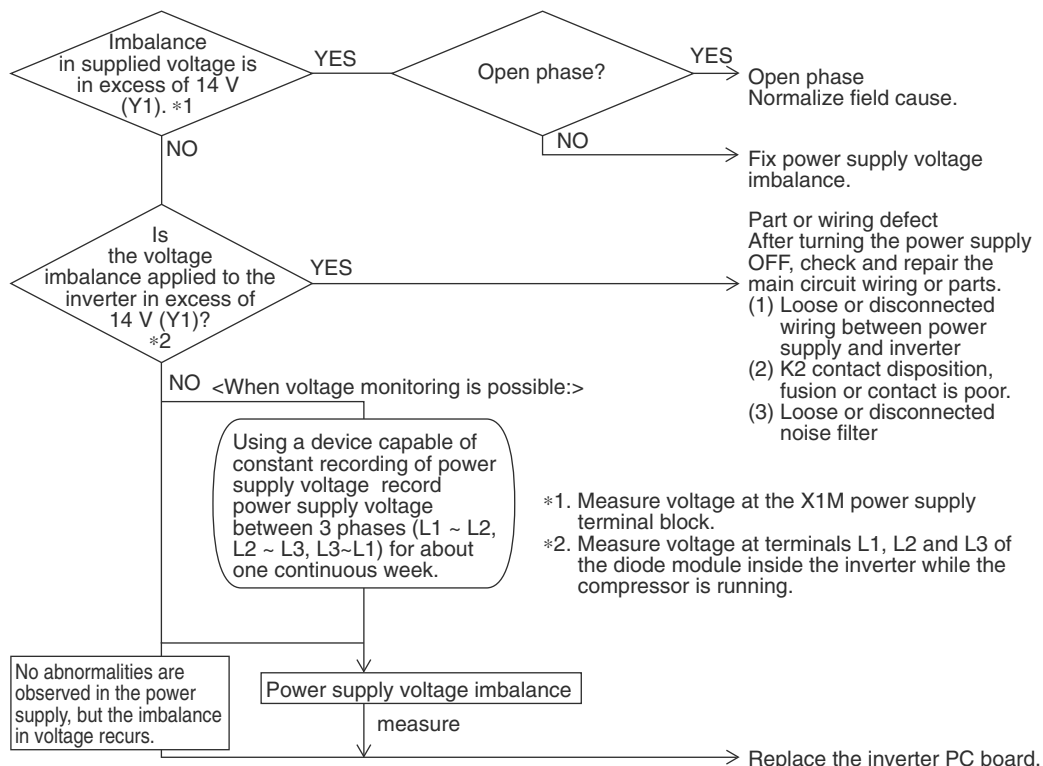
- Open phase
- Voltage imbalance between phases
- Defect of main circuit capacitor
- Defect of inverter PC board
- Defect of K2 relay in inverter PC board
- Improper main circuit wiring

#### Troubleshooting



#### Caution

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



#### Explanation for users

\*In accordance with "notification of inspection results" accompanying spare parts.

Give the user a copy of "notification of inspection results" and leave it up to him to improve the imbalance.

Be sure to explain to the user that there is a "power supply imbalance" for which Panasonic is not responsible.

(V2816)

### 3.38 “P4” Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise Sensor

Remote Control  
Display

P4

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

Resistance of radiation fin thermistor is detected when the compressor is not operating.

Malfunction  
Decision  
Conditions

When the resistance value of thermistor becomes a value equivalent to open or short circuited status.

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

Supposed  
Causes

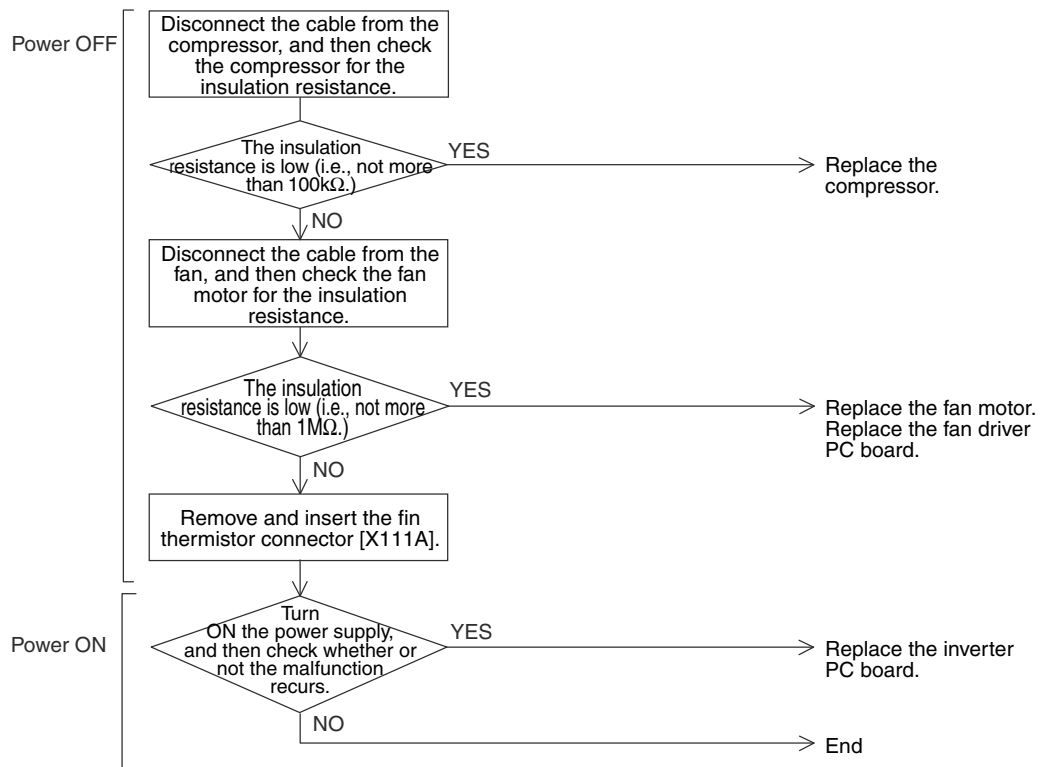
- Defect of radiator fin temperature sensor
- Defect of inverter PC board

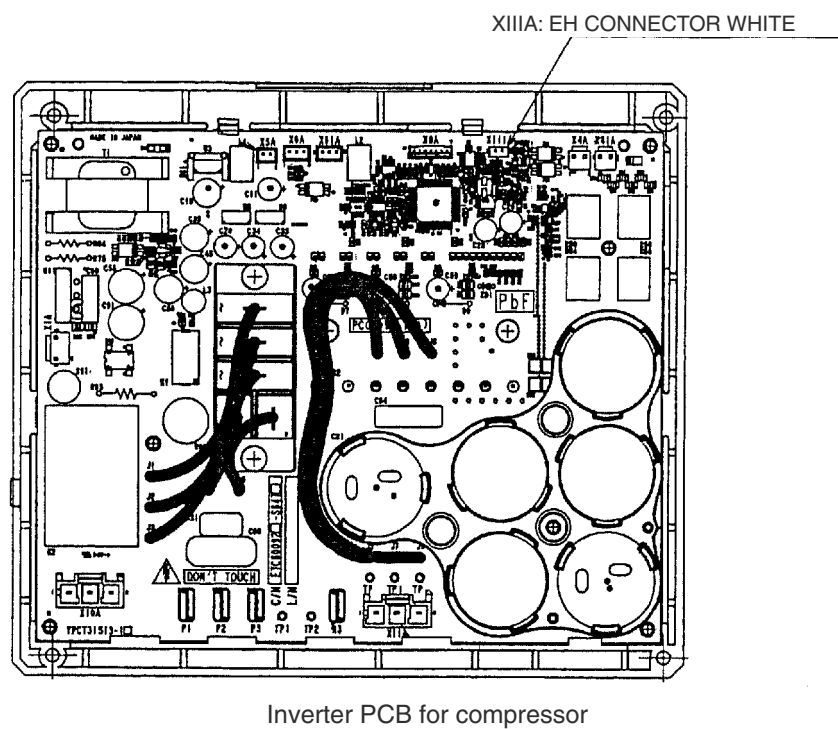
Troubleshooting



**Caution**

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





\* Refer to "Thermistor Resistance / Temperature Characteristics" table on P336.

### 3.39 PU Outdoor Unit: Faulty Field Setting after Replacing Main PC Board or Faulty Combination of PC Board

Remote Control  
Display

PU

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

The faulty (or no) field setting after replacing main PC board or faulty PC board combination is detected through communications with the inverter.

Malfunction  
Decision  
Conditions

Whether or not the field setting or the type of the PC board is correct through the communication date is judged.

Supposed  
Causes

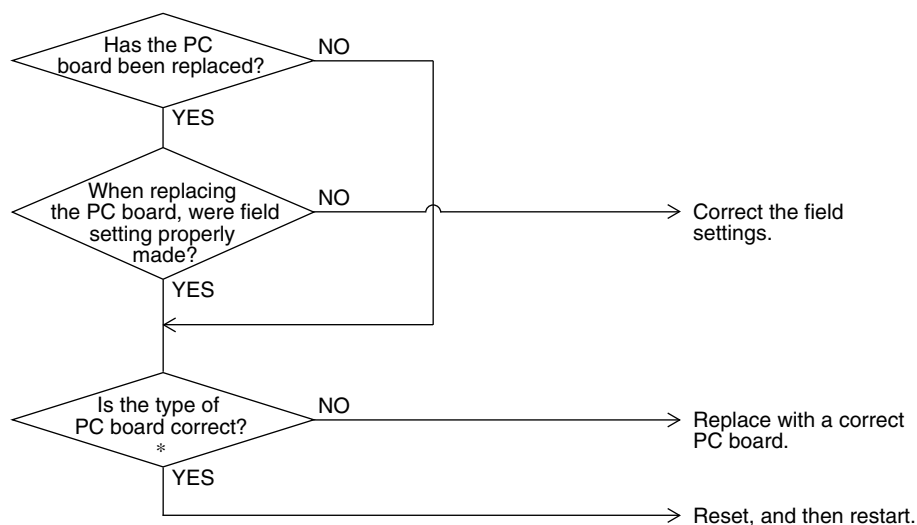
- Faulty (or no) field setting after replacing main PC board
- Mismatching of type of PC board

Troubleshooting



**Caution**

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



\*Note) Type of PC board mismatching includes;  
Main PC board  
Inverter PC board (for compressor)  
Fan driver PC board

### 3.40 “U0” Outdoor Unit: Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure

Remote Control Display **U0**

Applicable Models U-5MX4XPQ ~ U-54MX4XPQ

Method of Malfunction Detection Short of gas malfunction is detected by discharge pipe temperature thermistor.

Malfunction Decision Conditions  
Microcomputer judge and detect if the system is short of refrigerant.  
★Malfunction is not decided while the unit operation is continued.

Supposed Causes

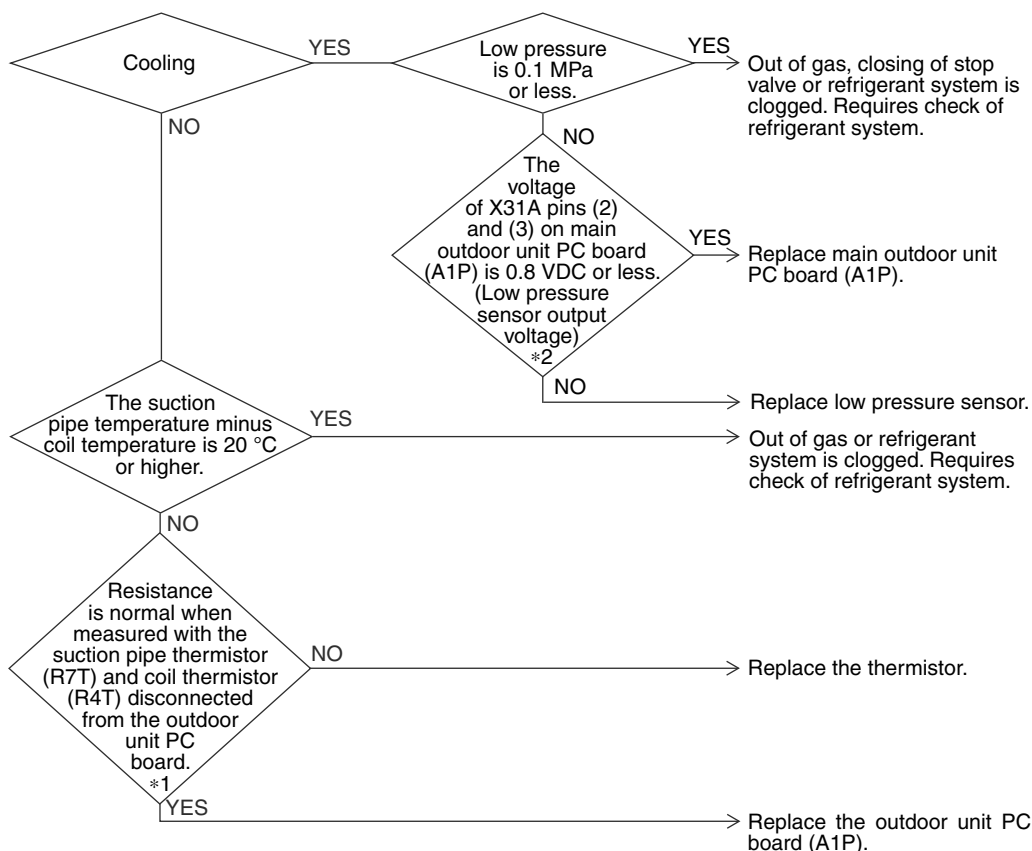
- Out of gas or refrigerant system clogging (incorrect piping)
- Defect of pressure sensor
- Defect of outdoor unit PC board (A1P)
- Defect of thermistor R7T or R4T

#### Troubleshooting



#### Caution

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



(V2819)



\*1: Refer to “Thermistor Resistance / Temperature Characteristics” table on P336.

\*2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on P338.



### 3.41 “U1” Reverse Phase, Open Phase

Remote Control  
Display

U1

Applicable  
Models

U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

The phase of each phase are detected by reverse phase detection circuit and right phase or reverse phase are judged.

Malfunction  
Decision  
Conditions

When a significant phase difference is made between phases.

Supposed  
Causes

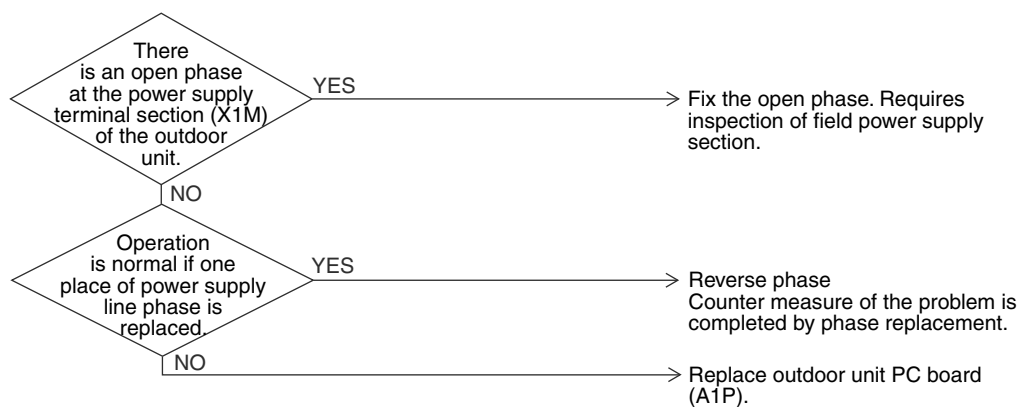
- Power supply reverse phase
- Power supply open phase
- Defect of outdoor PC board (A1P)

Troubleshooting



**Caution**

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

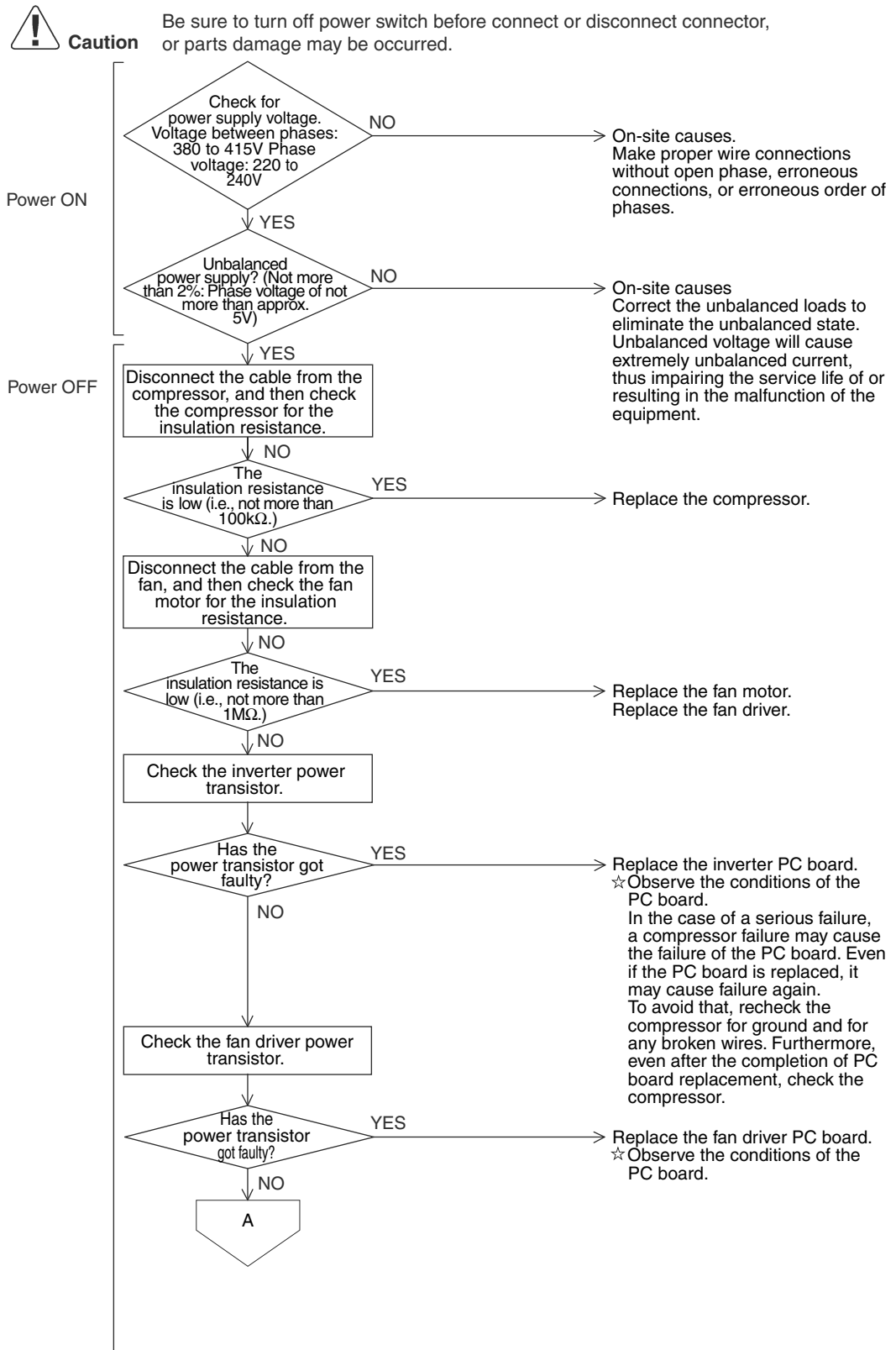


(V2820)

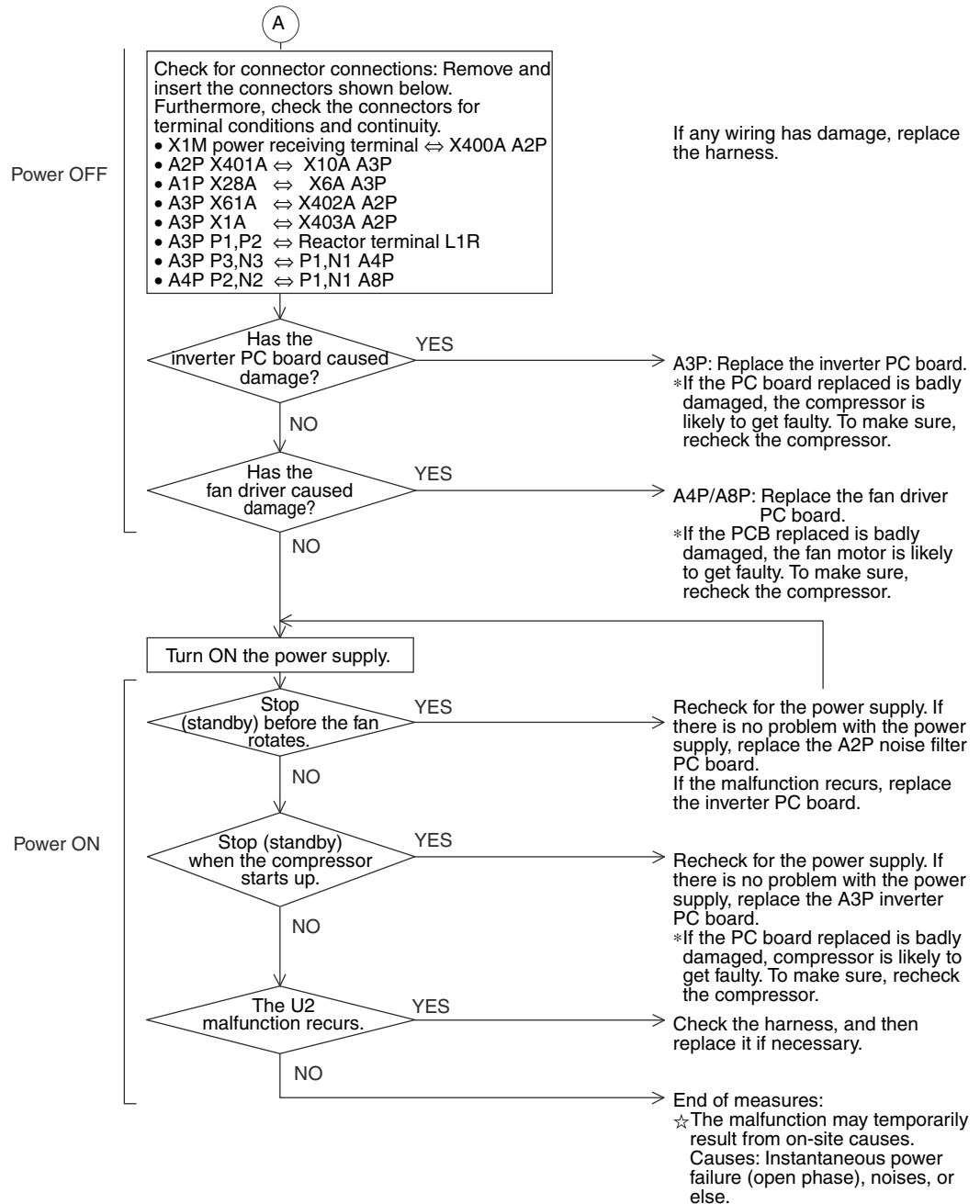
### 3.42 “U2” Outdoor Unit: Power Supply Insufficient or Instantaneous Failure

<b>Remote Control Display</b>	U2
<b>Applicable Models</b>	U-5MX4XPQ ~ U-54MX4XPQ
<b>Method of Malfunction Detection</b>	Detection of voltage of main circuit capacitor built in the inverter and power supply voltage.
<b>Malfunction Decision Conditions</b>	When the voltage aforementioned is not less than 780V or not more than 320V, or when the current-limiting voltage does not reach 200V or more or exceeds 740V.
<b>Supposed Causes</b>	<ul style="list-style-type: none"> <li>■ Power supply insufficient</li> <li>■ Instantaneous power failure</li> <li>■ Open phase</li> <li>■ Defect of inverter PC board</li> <li>■ Defect of outdoor control PC board</li> <li>■ Main circuit wiring defect</li> <li>■ Faulty compressor</li> <li>■ Faulty fan motor</li> <li>■ Faulty connection of signal cable</li> </ul>

## Troubleshooting



# Troubleshooting



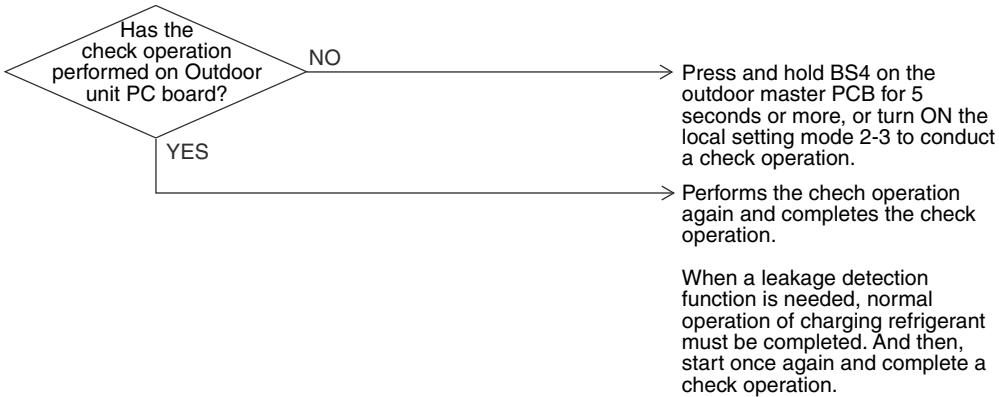
### 3.43 “U3” Outdoor Unit: Check Operation not executed

Remote Control Display	U3
Applicable Models	U-5MX4XPQ ~ U-54MX4XPQ
Method of Malfunction Detection	Check operation is executed or not
Malfunction Decision Conditions	Malfunction is decided when the unit starts operation without check operation.
Supposed Causes	<div><div></div> Check operation is not executed.</div>
Troubleshooting	



**Caution**

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



(V3052)

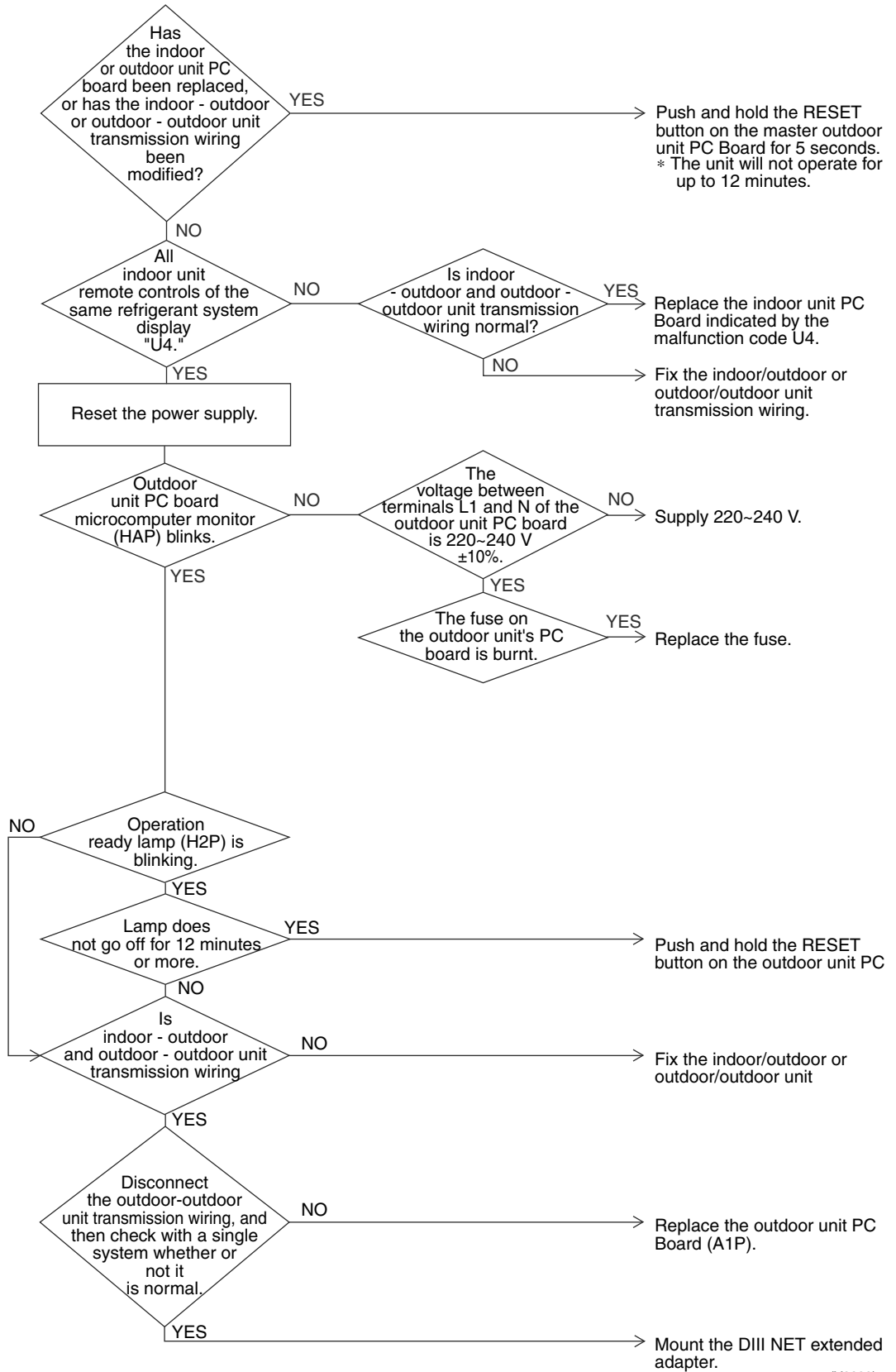
### 3.44 “U4” Malfunction of Transmission Between Indoor Units

<b>Remote Control Display</b>	U4
<b>Applicable Models</b>	All model of indoor unit U-5MX4XPQ ~ U-54MX4XPQ
<b>Method of Malfunction Detection</b>	Microcomputer checks if transmission between indoor and outdoor units is normal.
<b>Malfunction Decision Conditions</b>	When transmission is not carried out normally for a certain amount of time
<b>Supposed Causes</b>	<ul style="list-style-type: none"><li>■ Indoor to outdoor, outdoor to outdoor transmission wiring F1, F2 disconnection, short circuit or wrong wiring</li><li>■ Outdoor unit power supply is OFF</li><li>■ System address doesn't match</li><li>■ Defect of indoor unit PC board</li><li>■ Defect of outdoor unit PC board</li></ul>

## Troubleshooting

**Caution**

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



(V2822)

## 3.45 “U5” Indoor Unit: Malfunction of Transmission Between Remote Control and Indoor Unit

Remote Control  
Display

U5

Applicable  
Models

All models of indoor units

Method of  
Malfunction  
Detection

In case of controlling with 2-remote control, check the system using microcomputer is signal transmission between indoor unit and remote control (main and sub) is normal.

Malfunction  
Decision  
Conditions

Normal transmission does not continue for specified period.

Supposed  
Causes

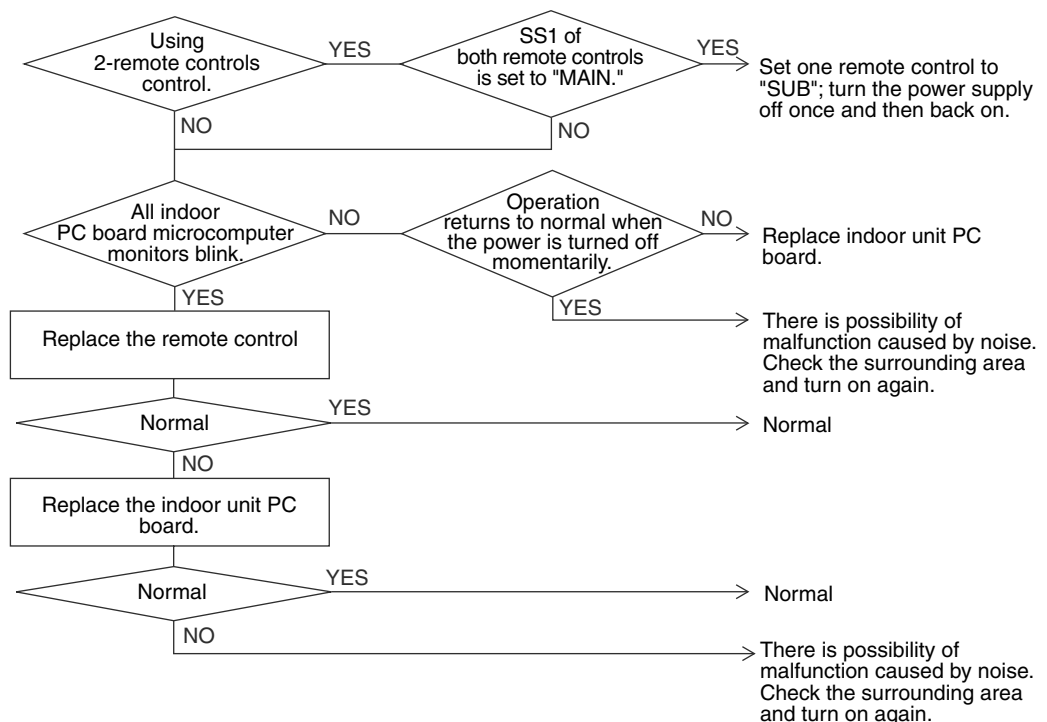
- Malfunction of indoor unit remote control transmission
- Connection of two main remote controls (when using 2 remote controls)
- Defect of indoor unit PC board
- Defect of remote control PC board
- Malfunction of transmission caused by noise

### Troubleshooting



**Caution**

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



(V2823)



### 3.46 “U7” Indoor Unit: Malfunction of Transmission Between Outdoor Units

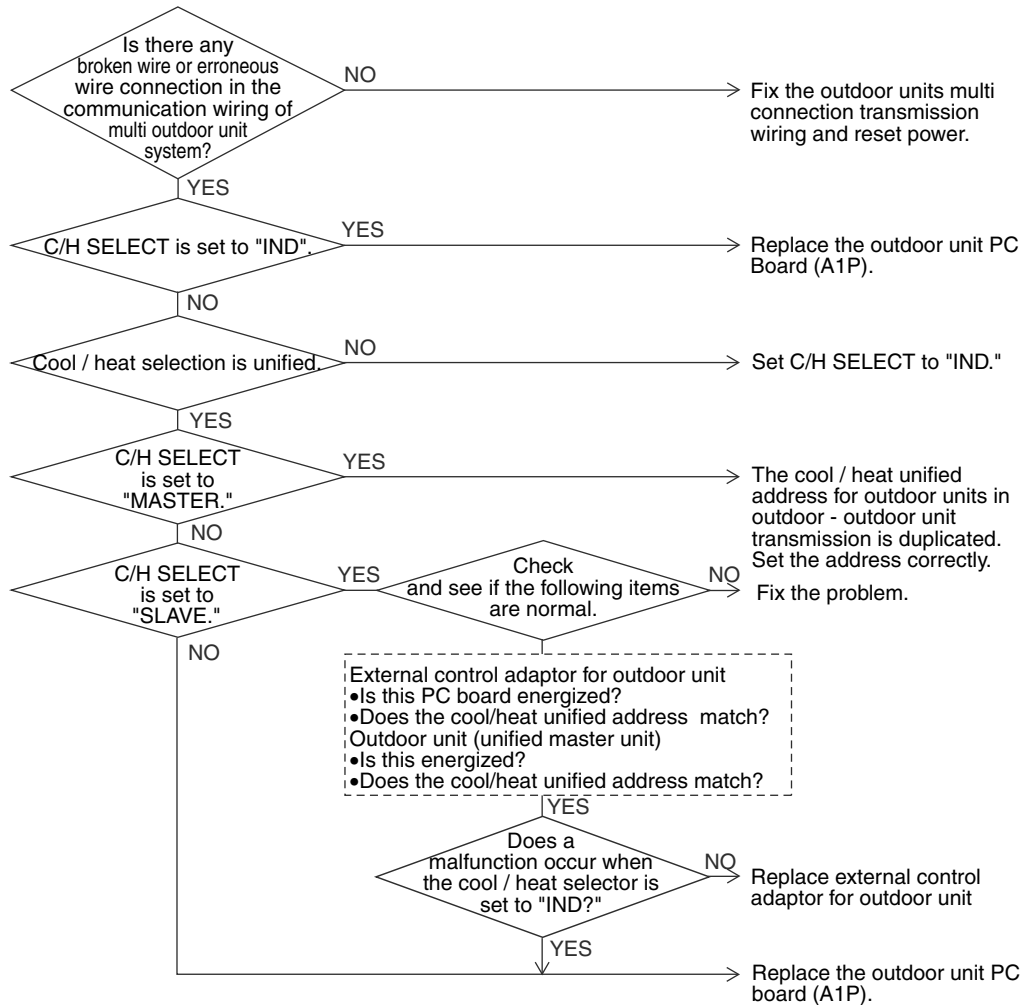
<b>Remote Control Display</b>	U7
<b>Applicable Models</b>	All models of indoor units
<b>Method of Malfunction Detection</b>	Microcomputer checks if transmission between outdoor units.
<b>Malfunction Decision Conditions</b>	When transmission is not carried out normally for a certain amount of time
<b>Supposed Causes</b>	<ul style="list-style-type: none"> <li>■ Improper connection of transmission wiring between outdoor unit and external control adapter for outdoor unit</li> <li>■ Improper connection of transmission wiring between outdoor units.</li> <li>■ Improper cool/heat selection</li> <li>■ Improper cool/heat unified address (outdoor unit, external control adapter for outdoor unit)</li> <li>■ Defect of outdoor unit PC board (A1P)</li> <li>■ Defect of external control adapter for outdoor unit</li> </ul>

# Troubleshooting



## Caution

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



(V2824)

### 3.47 “U8” Indoor Unit: Malfunction of Transmission Between Main and Sub Remote Controls

Remote Control  
Display

U8

Applicable  
Models

All models of indoor units

Method of  
Malfunction  
Detection

In case of controlling with 2-remote control, check the system using microcomputer if signal transmission between indoor unit and remote control (main and sub) is normal.

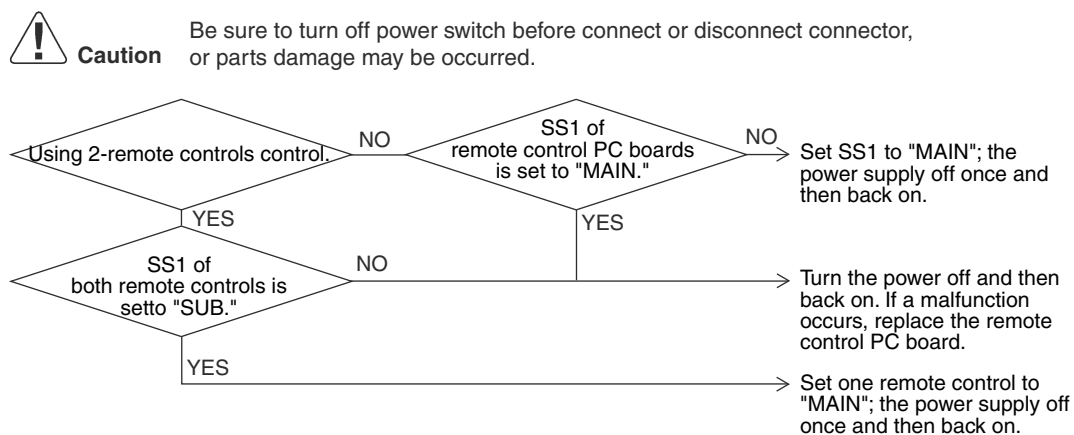
Malfunction  
Decision  
Conditions

Normal transmission does not continue for specified period.

Supposed  
Causes

- Malfunction of transmission between main and sub remote control
- Connection between sub remote controls
- Defect of remote control PC board

Troubleshooting



(V2825)

### 3.48 “U9” Indoor Unit: Malfunction of Transmission Between Indoor and Outdoor Units in the Same System

Remote Control Display *U9*

Applicable Models All models of indoor units

Method of Malfunction Detection Detect the malfunction signal of any other indoor unit within the system concerned.

Malfunction Decision Conditions When the malfunction decision is made on any other indoor unit within the system concerned.

Supposed Causes

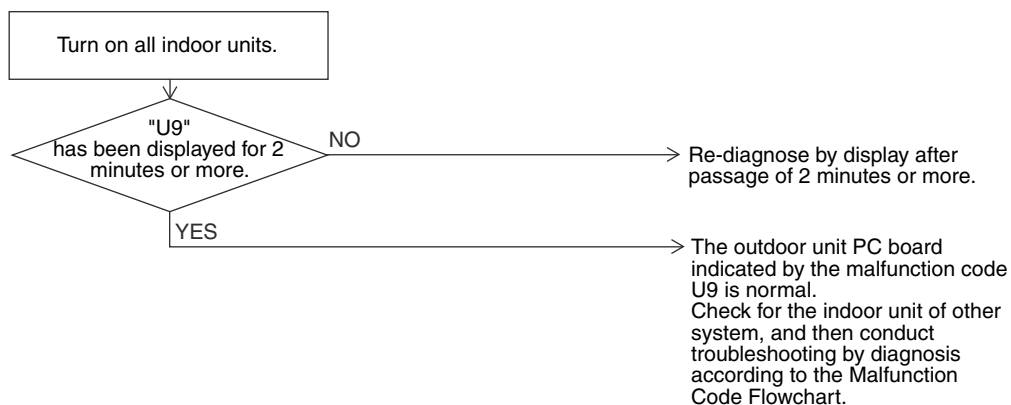
- Malfunction of transmission within or outside of other system
- Malfunction of electronic expansion valve in indoor unit of other system
- Defect of PC board of indoor unit in other system
- Improper connection of transmission wiring between indoor and outdoor unit

#### Troubleshooting



#### Caution

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



### 3.49 “UR” Improper Combination of Indoor and Outdoor Units, Indoor Units and Remote Control

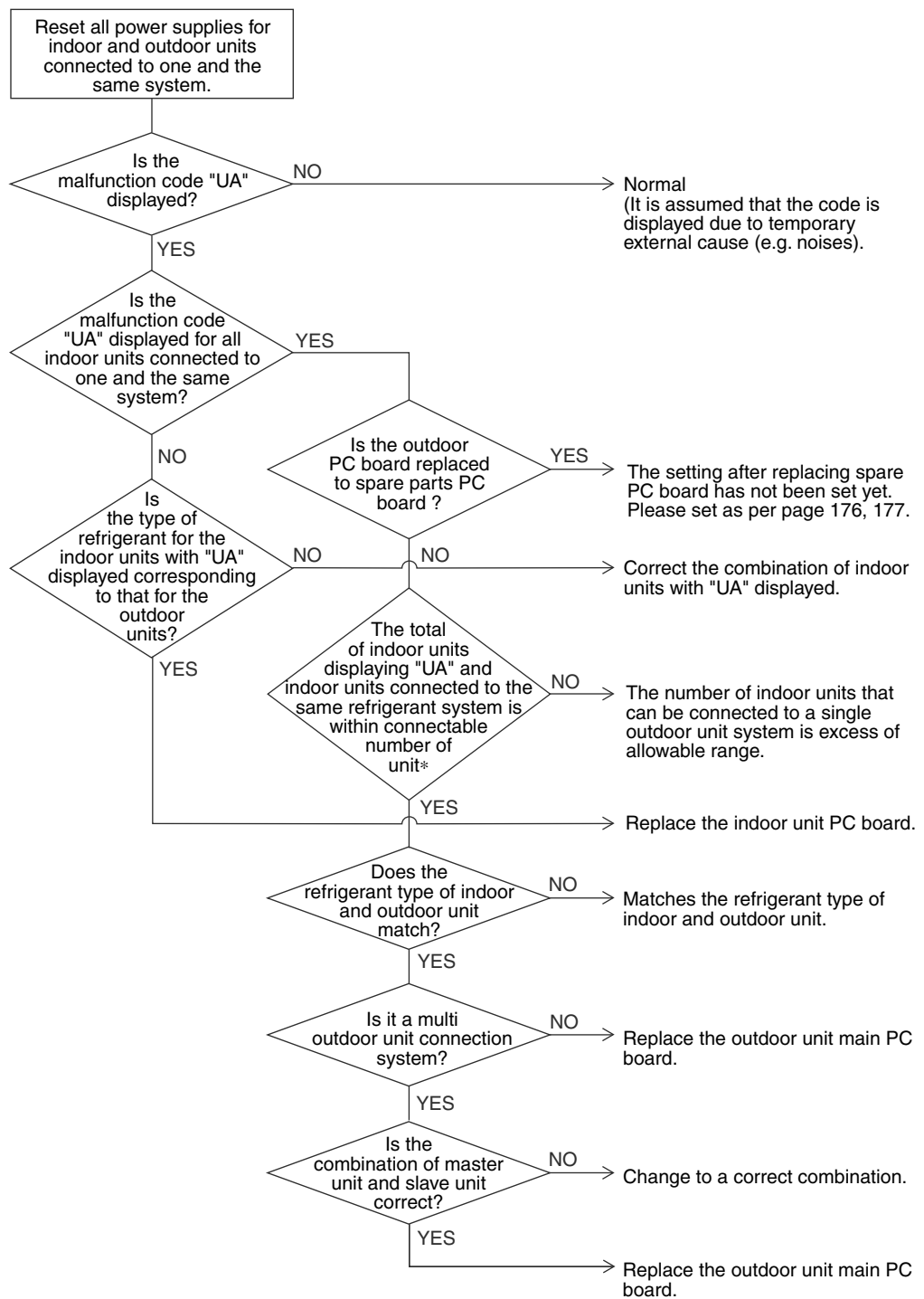
<b>Remote Control Display</b>	<i>UR</i>
<b>Applicable Models</b>	All models of indoor unit U-5MX4XPQ ~ U-54MX4XPQ
<b>Method of Malfunction Detection</b>	A difference occurs in data by the type of refrigerant between indoor and outdoor units. The number of indoor units is out of the allowable range.
<b>Malfunction Decision Conditions</b>	The malfunction decision is made as soon as either of the abnormalities aforementioned is detected.
<b>Supposed Causes</b>	<ul style="list-style-type: none"> <li>■ Excess of connected indoor units</li> <li>■ Defect of outdoor unit PC board (A1P)</li> <li>■ Mismatching of the refrigerant type of indoor and outdoor unit.</li> <li>■ Setting of outdoor PC board was not conducted after replacing to spare parts PC board.</li> </ul>

# Troubleshooting



## Caution


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



(V2827)

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

### 3.50 “UC” Address Duplication of Centralized Controller

Remote Control Display	UC
Applicable Models	All models of indoor unit Centralized controller
Method of Malfunction Detection	The principal indoor unit detects the same address as that of its own on any other indoor unit.
Malfunction Decision Conditions	The malfunction decision is made as soon as the abnormality aforementioned is detected.
Supposed Causes	<div>■ Address duplication of centralized controller</div>
Troubleshooting	<div><div><div> <b>Caution</b></div><div>Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.</div></div><div><div>The centralized address is duplicated.</div><div>→ Make setting change so that the centralized address will not be duplicated.</div></div></div>

### 3.51 “UE” Malfunction of Transmission Between Centralized Controller and Indoor Unit

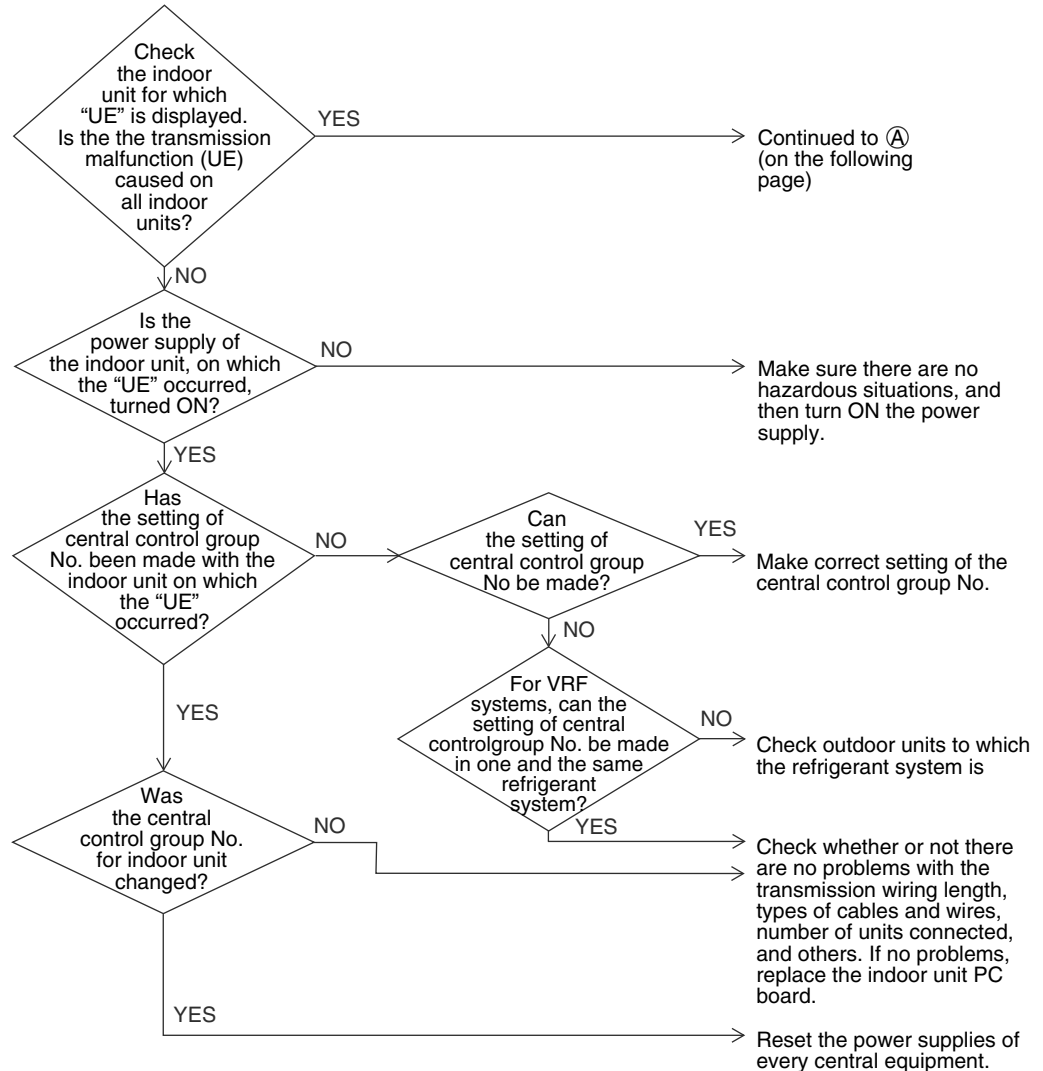
<b>Remote Control Display</b>	<i>UE</i>
<b>Applicable Models</b>	All models of indoor units Centralized controller Schedule timer
<b>Method of Malfunction Detection</b>	Microcomputer checks if transmission between indoor unit and centralized controller is normal.
<b>Malfunction Decision Conditions</b>	When transmission is not carried out normally for a certain amount of time
<b>Supposed Causes</b>	<ul style="list-style-type: none"> <li>■ Malfunction of transmission between optional controllers for centralized control and indoor unit</li> <li>■ Connector for setting master controller is disconnected. (or disconnection of connector for independent / combined use changeover switch.)</li> <li>■ Failure of PC board for central remote control</li> <li>■ Defect of indoor unit PC board</li> </ul>



## Troubleshooting

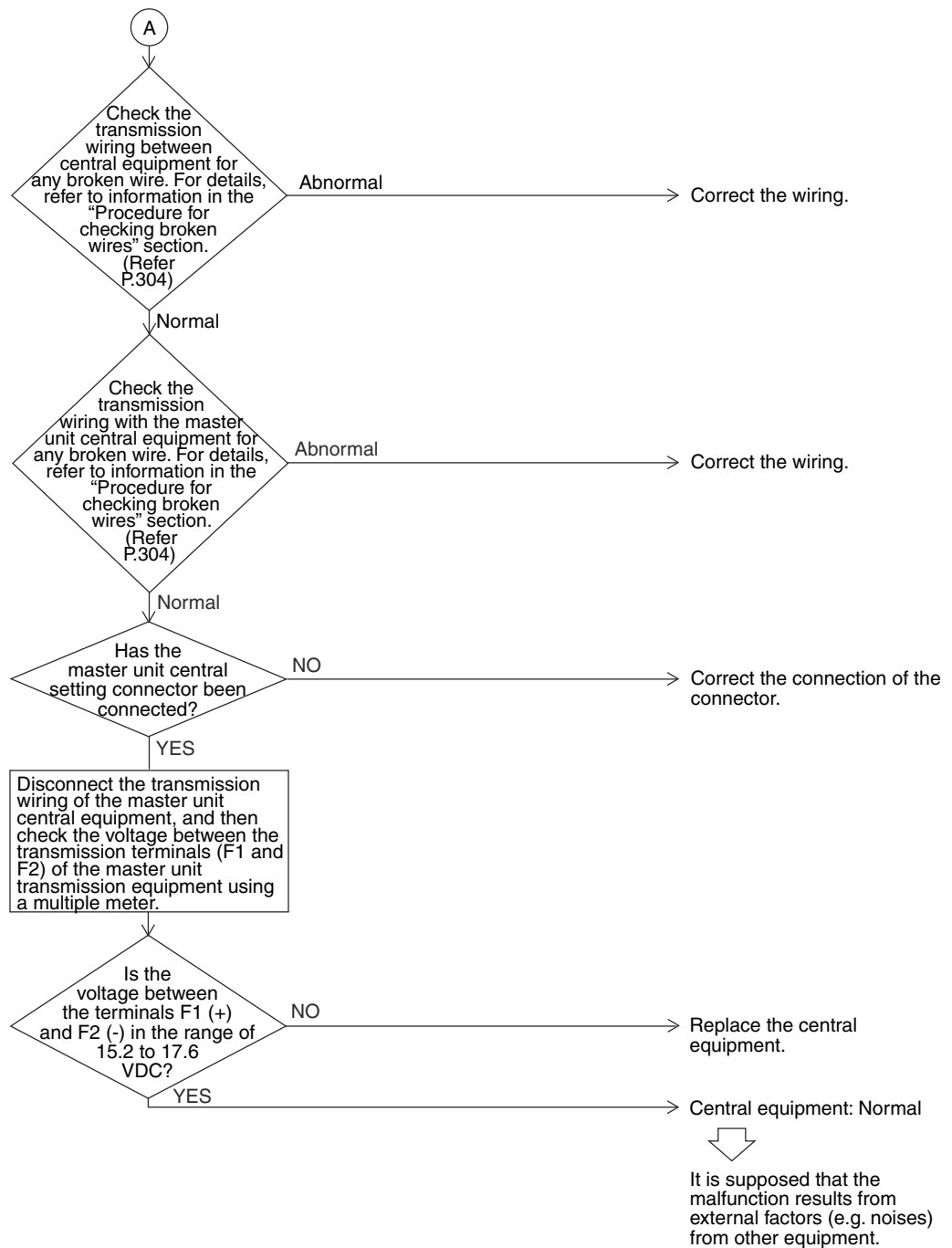

**Caution**

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



(V2822)

# Troubleshooting



## 3.52 “UF” System is not Set yet

Remote Control  
Display

UF

Applicable  
Models

All models of indoor units  
U-5MX4XPQ ~ U-54MX4XPQ

Method of  
Malfunction  
Detection

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

Malfunction  
Decision  
Conditions

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

Supposed  
Causes

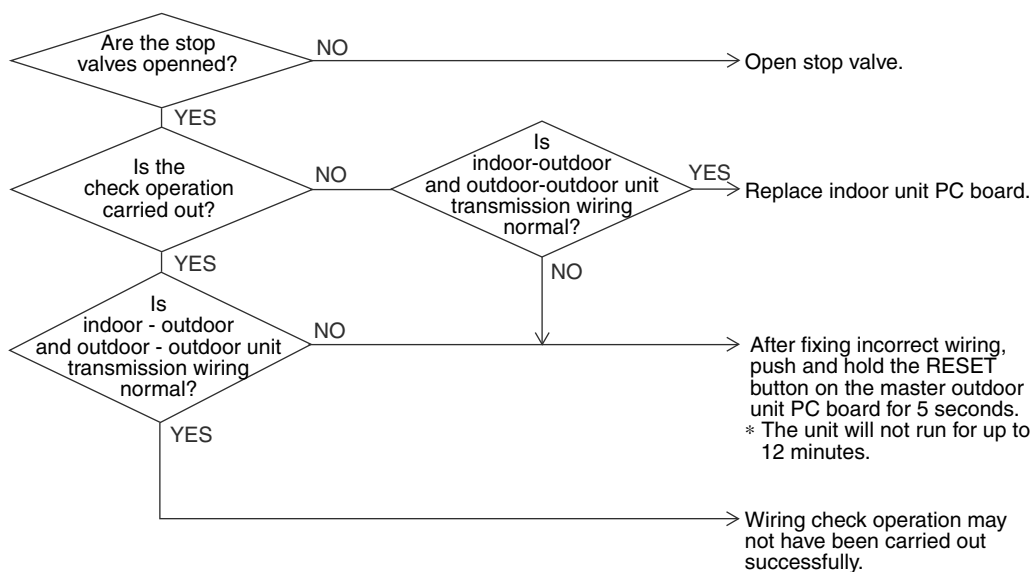
- Improper connection of transmission wiring between indoor-outdoor units and outdoor-outdoor units
- Failure to execute check operation
- Defect of indoor unit PC board
- Stop valve is left in closed

### Troubleshooting



**Caution**

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



(V2830)



**Note:**

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

### 3.53 “UH” Malfunction of System, Refrigerant System Address Undefined

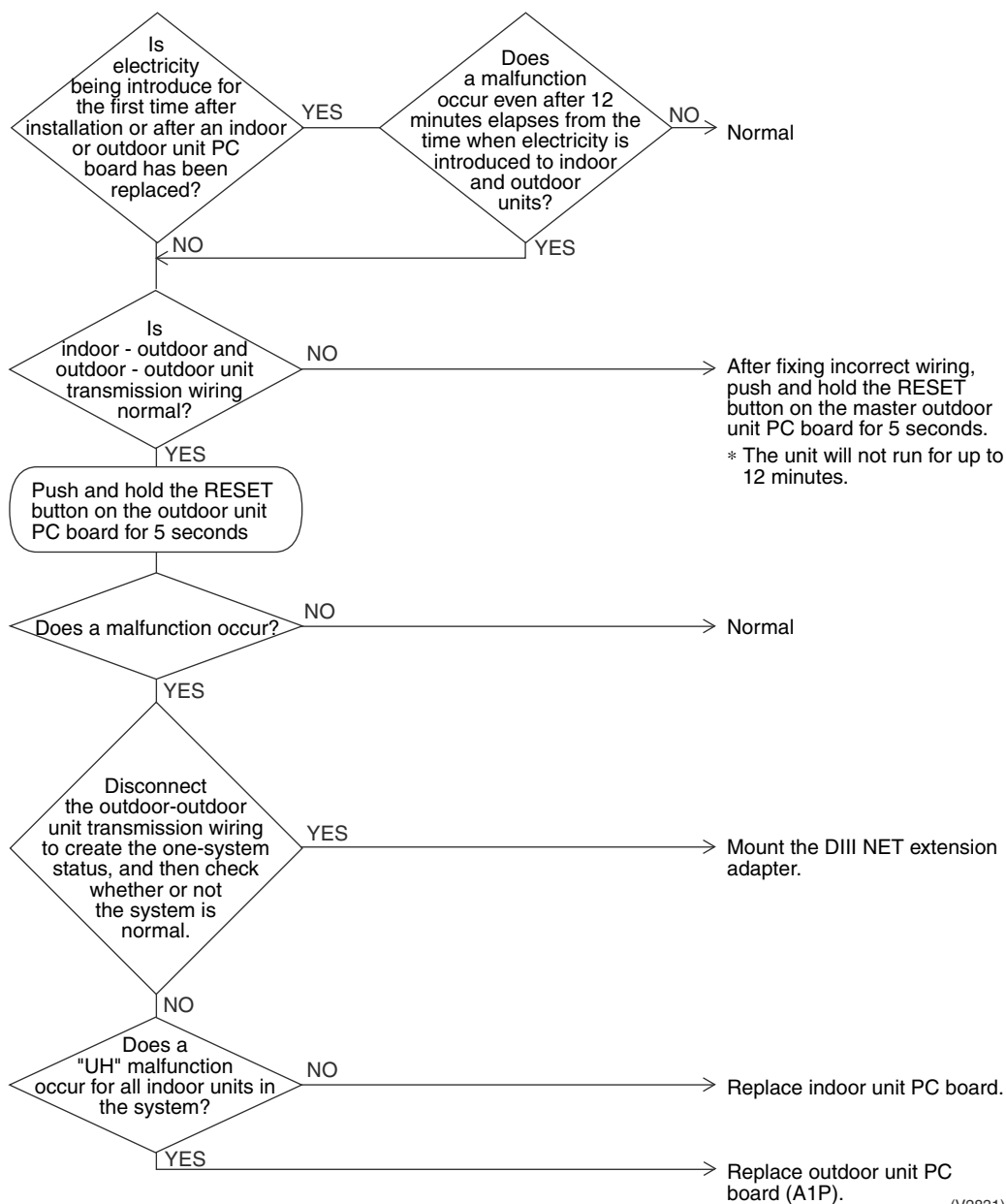
<b>Remote Control Display</b>	UH
<b>Applicable Models</b>	All models of indoor units U-5MX4XPQ ~ U-54MX4XPQ
<b>Method of Malfunction Detection</b>	Detect an indoor unit with no address setting.
<b>Malfunction Decision Conditions</b>	The malfunction decision is made as soon as the abnormality aforementioned is detected.
<b>Supposed Causes</b>	<ul style="list-style-type: none"><li>■ Improper connection of transmission wiring between indoor-outdoor units and outdoor-outdoor units</li><li>■ Defect of indoor unit PC board</li><li>■ Defect of outdoor unit PC board (A1P)</li></ul>

## Troubleshooting



### Caution

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



(V2831)

## 4. Troubleshooting (OP: Central Remote Control)

### 4.1 “M1” PC Board Defect

Remote Control  
Display



Applicable  
Models

Central remote control  
Schedule timer

Method of  
Malfunction  
Detection

Detect an abnormality in the DIII-NET polarity circuit.

Malfunction  
Decision  
Conditions

When + polarity and - polarity are detected at the same time.

Supposed  
Causes

- Defect of central remote control PC board
- Defect of Schedule timer PC board

Troubleshooting

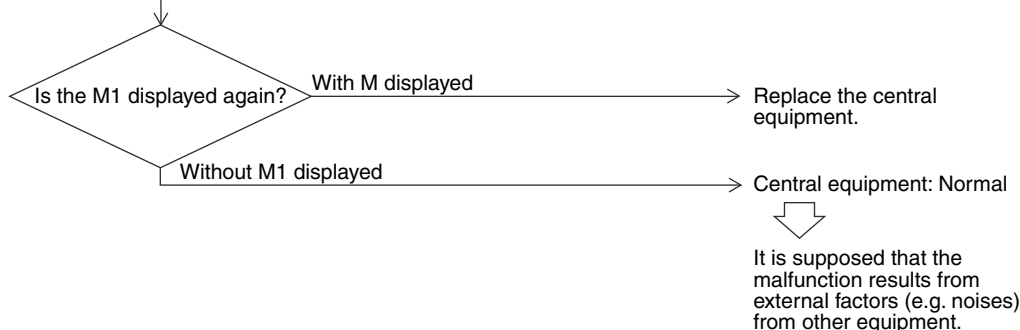
Replace the central remote control.



**Caution**

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

Turn ON the power supply of the central equipment with M1 displayed once again.



## 4.2 “M8” Malfunction of Transmission Between Optional Controllers for Centralized Control

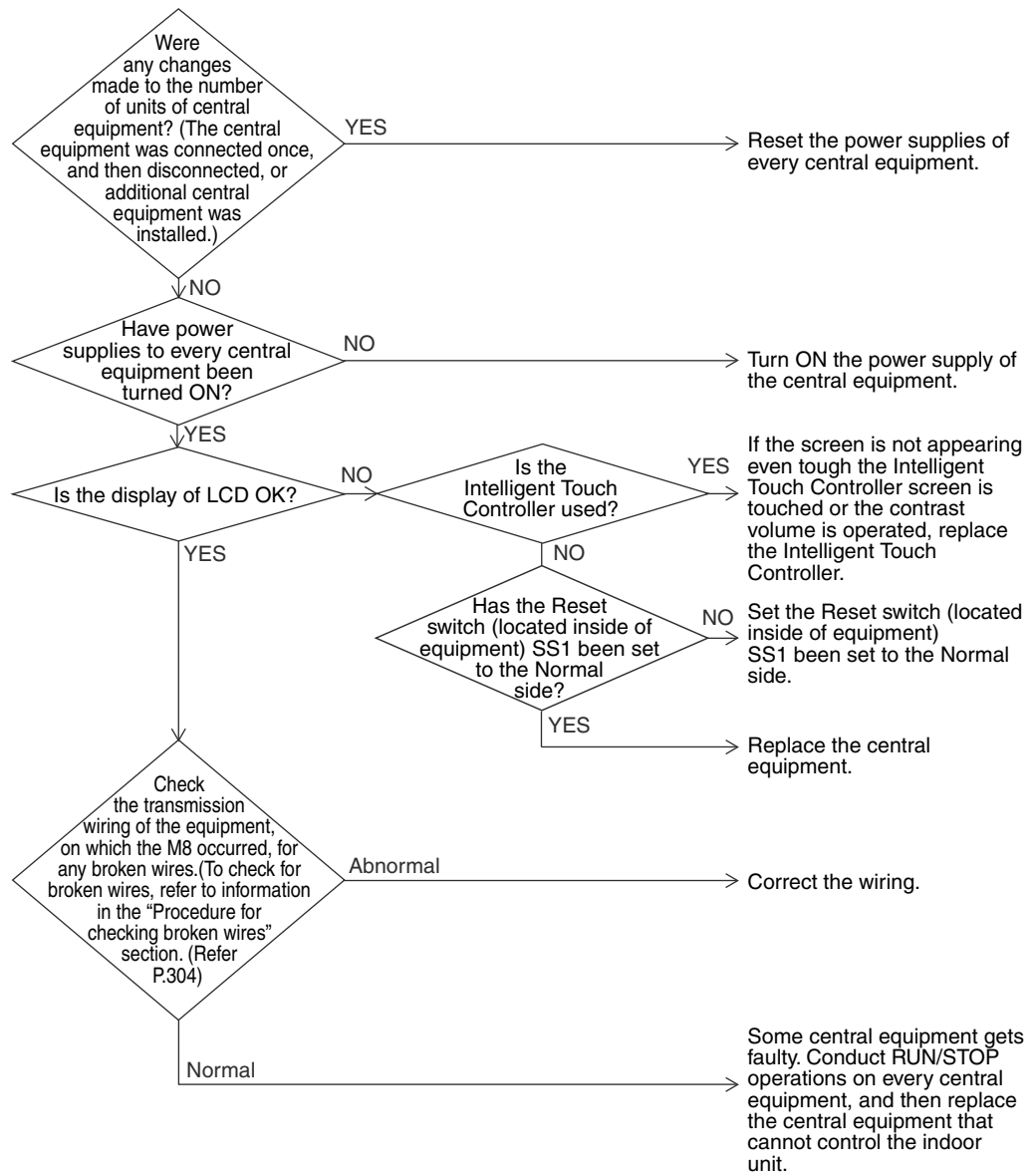
<b>Remote Control Display</b>	M8
<b>Applicable Models</b>	Central remote control Schedule timer
<b>Method of Malfunction Detection</b>	Detect the malfunction according to DIII-NET transmission data. (The system will be automatically reset.)
<b>Malfunction Decision Conditions</b>	When no master controller is present at the time of the startup of slave controller. When the centralized controller, which was connected once, shows no response.
<b>Supposed Causes</b>	<ul style="list-style-type: none"><li>■ Malfunction of transmission between optional controllers for centralized control</li><li>■ Defect of PC board of optional controllers for centralized control</li></ul>

# Troubleshooting



## Caution

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





## 4.3 “*MR*” Improper Combination of Optional Controllers for Centralized Control

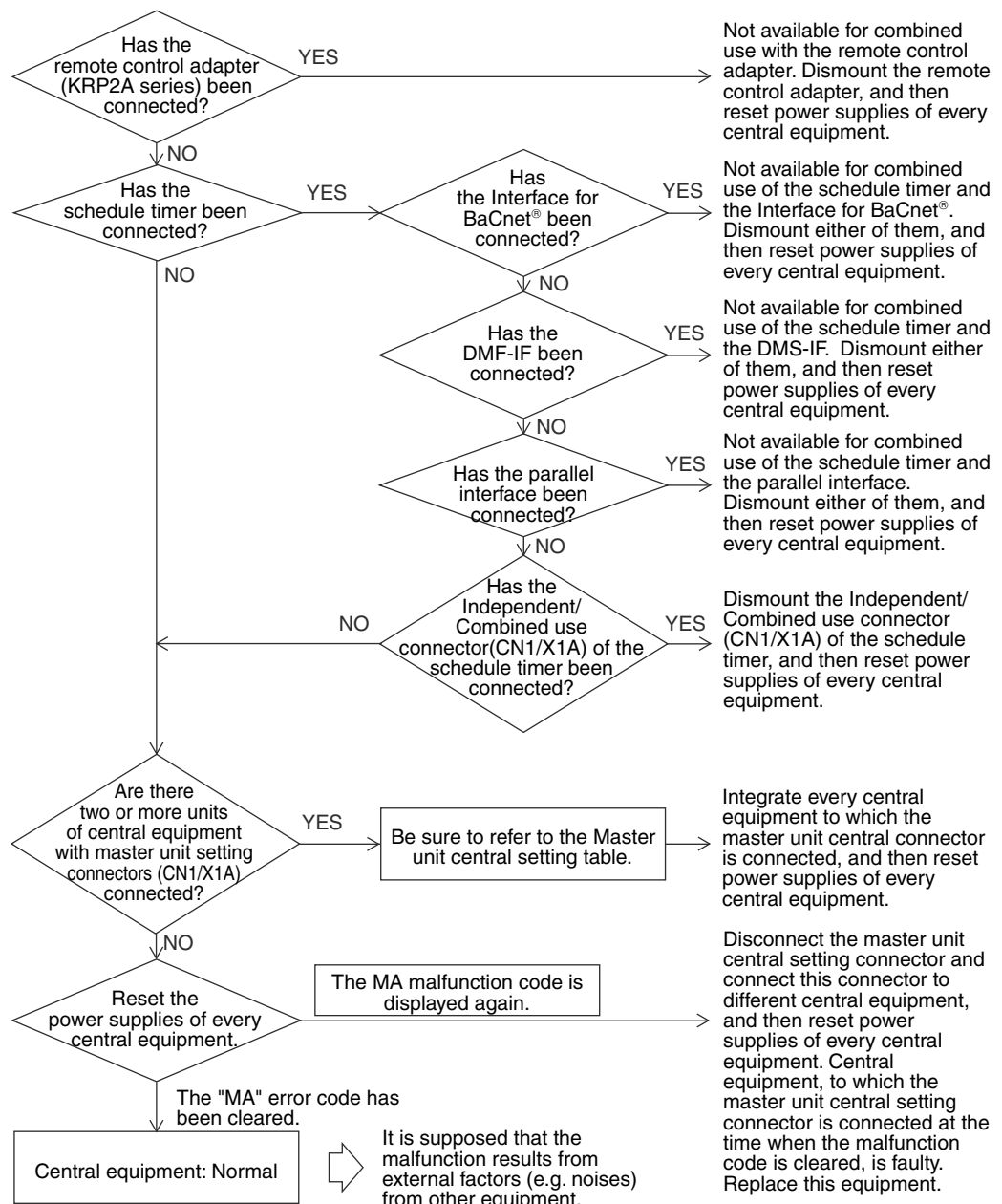
<b>Remote Control Display</b>	<i>MR</i>
<b>Applicable Models</b>	Central remote control Schedule timer
<b>Method of Malfunction Detection</b>	Detect the malfunction according to DIII-NET transmission data.
<b>Malfunction Decision Conditions</b>	When the schedule timer is set to individual use mode, other central component is present. When multiple master controller are present. When the remote control adapter is present.
<b>Supposed Causes</b>	<ul style="list-style-type: none"> <li>■ Improper combination of optional controllers for centralized control</li> <li>■ More than one master controller is connected</li> <li>■ Defect of PC board of optional controller for centralized control</li> </ul>

# Troubleshooting



## Caution

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



## 4.4 “MC” Address Duplication, Improper Setting

Remote Control  
Display



Applicable  
Models

Central remote control  
Schedule timer

Method of  
Malfunction  
Detection

Detect the malfunction according to DIII-NET transmission data.

Malfunction  
Decision  
Conditions

- Two or more units of central remote controls and Intelligent Touch Controllers are connected, and all of them are set to master unit central setting or slave unit central setting.
- Two units of schedule timers are connected.

Supposed  
Causes

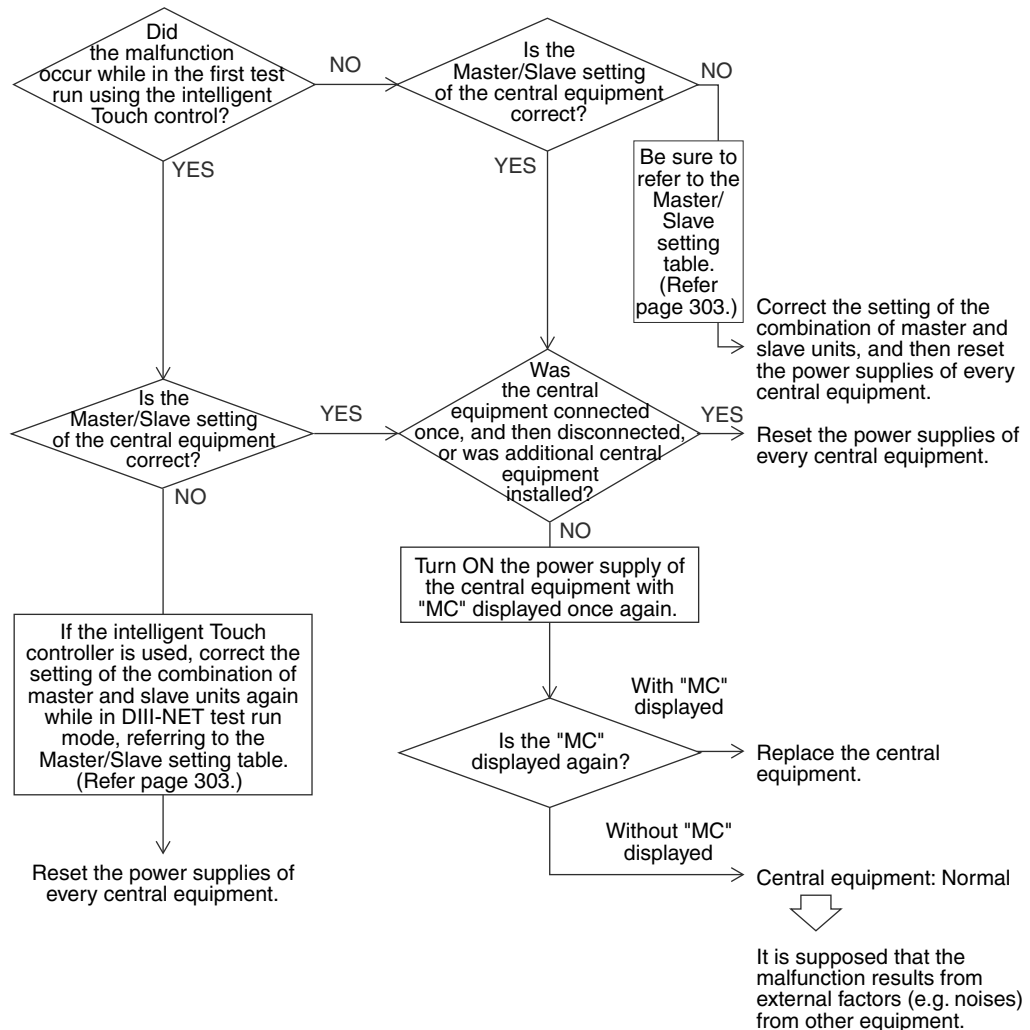
- Address duplication of centralized controller

Troubleshooting



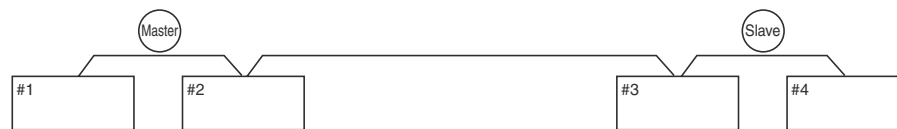
**Caution**

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



## Master-Slave Unit Setting Table

### Combination of Intelligent Touch Controller and Central Remote Control



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

CRC: Central remote control <DCS302C1>

Intelligent Touch controller: <DCS601C51>

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

## Master Unit Central Connector Setting Table

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

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

Pattern	Central equipment connection pattern				Setting of master unit central setting connector(*2)				
	Intelligent Touch control	Central remote control	Unified ON/OFF control	Schedule timer	Intelligent Touch control	Central remote control	Unified ON/OFF control	Schedule timer	
①	1 to 2 units			× (*1)	Only a single unit: "Provided", Others: "Not provided"				
②	1 unit	1 unit		× (*1)	Provided	Not provided			
③				× (*1)					
④	1 to 2 units		1 to 8 units	× (*1)	Only a single unit: "Provided", Others: "Not provided"		All "Not provided"		
⑤		1 to 4 units				Only a single unit: "Provided", Others: "Not provided"			
⑥			1 to 16 units	1 unit				All "Not provided"	Not provided
⑦									
⑧					1 unit				
⑨							Only a single unit: "Provided", Others: "Not provided"		
⑩			1 to 16 units	1 unit				Not provided	
⑪				1 unit				Provided	

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

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

## Procedures for Detecting Broken Wires in Transmission Wiring for Control

1. Procedure for checking outdoor-outdoor unit transmission wiring for broken wires

On the system shown below, turn OFF the power supply to all equipment, short-circuit between the outdoor-outdoor unit terminal parts F1 and F2 in the "Outdoor Unit A" that is farthest from the central remote control, and then conduct continuity checks between the transmission wiring terminal blocks F1 and F2 of the central remote control using a multiple meter. If there is continuity between the said terminal blocks, the outdoor-outdoor unit transmission wiring has no broken wires in it.

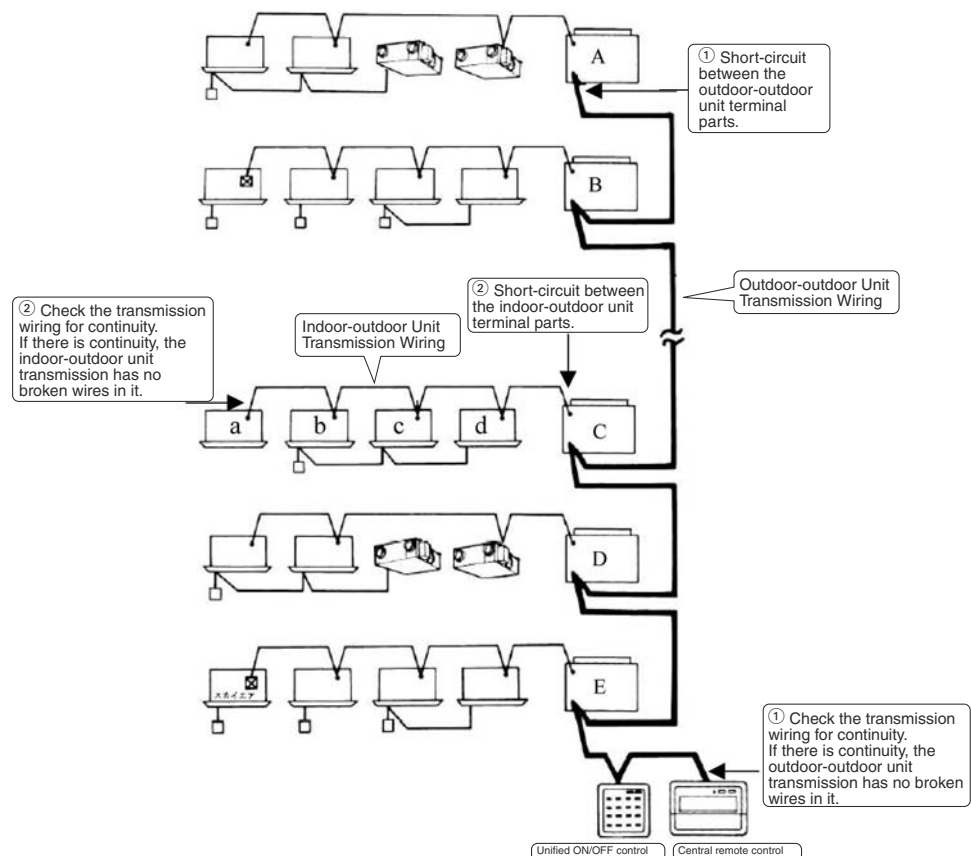
If there is no continuity, the transmission wiring may have broken wires. With the outdoor-outdoor unit terminal parts of the "Outdoor Unit A" short-circuited, conduct continuity checks between the transmission wiring terminal blocks F1 and F2 of the unified ON/OFF controller. If there is no continuity as well, conduct continuity checks between the outdoor-outdoor unit terminal parts of the "Outdoor Unit E", between the outdoor-outdoor unit terminal parts of the "Outdoor Unit D", between the outdoor-outdoor unit terminal parts of the "Outdoor Unit C", ... in the order described, thus identifying the place with continuity.

If the place with continuity can be identified, there may be broken wires in places before the said place with continuity.
2. Procedure for checking indoor-outdoor unit transmission wiring for broken wires (for checking the indoor-outdoor unit transmission wiring of the "Outdoor Unit C" for broken wires)

Turn OFF the power supply to all equipment, short-circuit between the indoor-outdoor unit terminal parts F1 and F2 in the "Outdoor Unit C", and then conduct continuity checks between the transmission wirings F1 and F2 of the "Indoor Unit a" that is farthest from the "Outdoor Unit C" using a multiple meter. If there is continuity between the said transmission wirings, the indoor-outdoor unit transmission wiring has no broken wires in it.

If there is no continuity, the transmission wiring may have broken wires. With the indoor-outdoor unit terminal parts of the "Outdoor Unit C" short-circuited, identify the place with continuity in the transmission wiring of the "Indoor Unit b", transmission wiring of the "Indoor Unit c", and transmission wiring of the "Indoor Unit d" in the order described.

If the place with continuity can be identified, there may be broken wires in places before the said place with continuity.



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

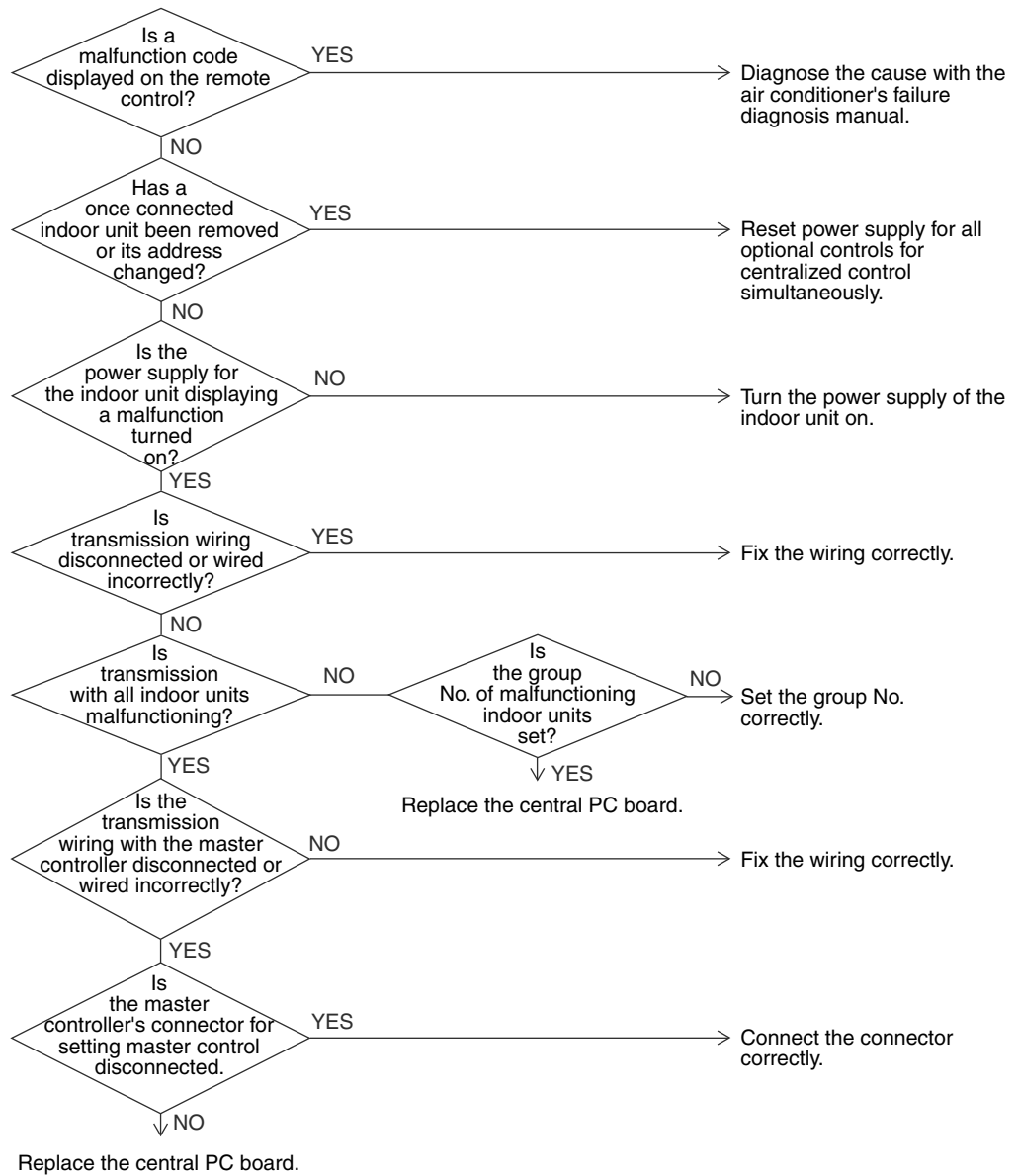
### 5.1 Operation Lamp Blinks

<b>Remote Control Display</b>	Operation lamp blinks
<b>Applicable Models</b>	All model of indoor units Unified ON/OFF controller
<b>Method of Malfunction Detection</b>	Detect the malfunction according to DIII-NET transmission data.
<b>Malfunction Decision Conditions</b>	
<b>Supposed Causes</b>	<ul style="list-style-type: none"><li>■ Malfunction of transmission between optional central controller and indoor unit</li><li>■ Connector for setting master controller is disconnected</li><li>■ Defect of unified ON/OFF controller PC board</li><li>■ Defect of indoor unit PC board</li><li>■ Malfunction of air conditioner</li></ul>

## Troubleshooting



**Caution**

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



(V2841)

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

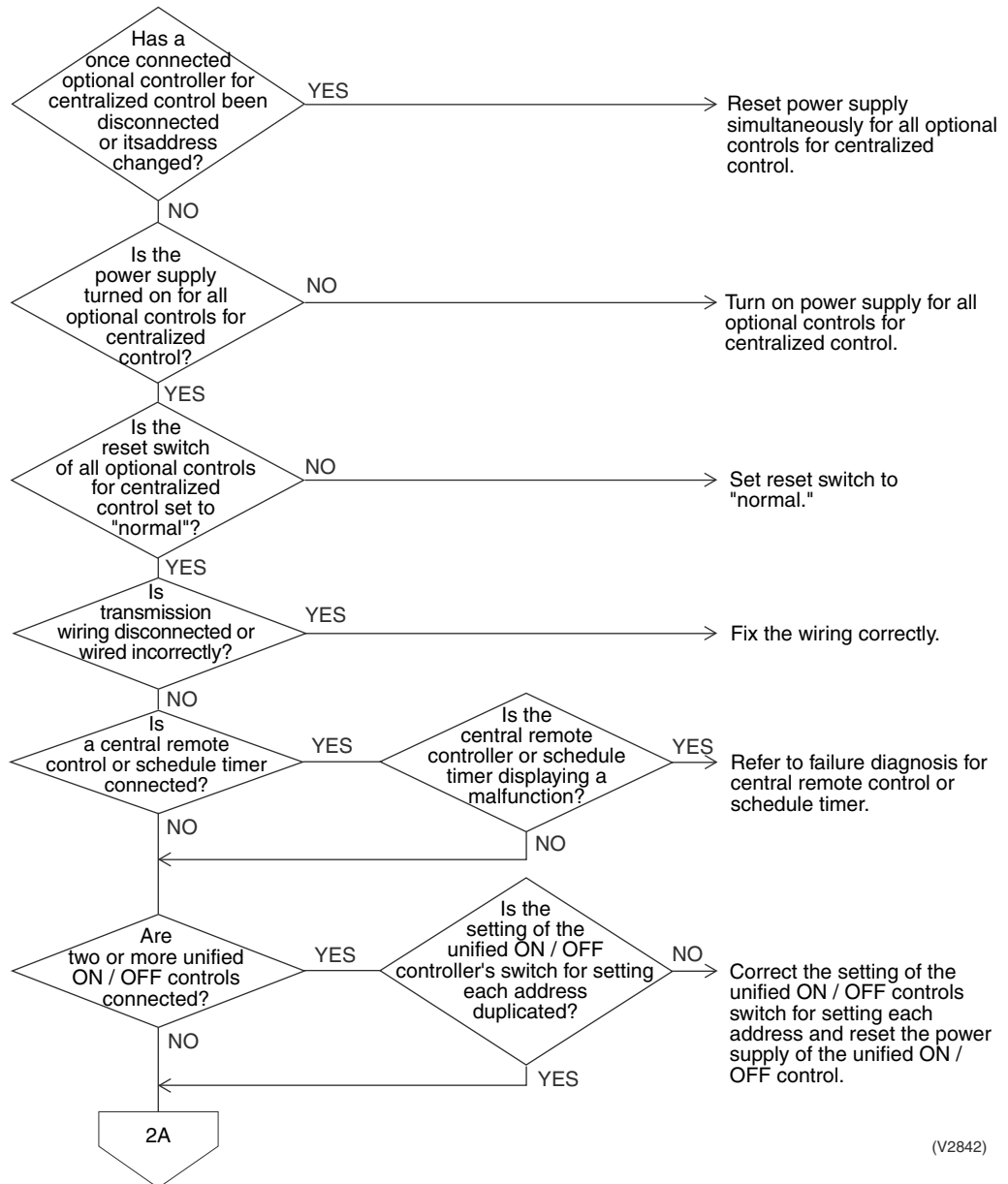
<b>Remote Control Display</b>	 “under centralized control” (Repeats single blink)
<b>Applicable Models</b>	Unified ON/OFF controller Central remote control, Schedule timer
<b>Method of Malfunction Detection</b>	Detect the malfunction according to DIII-NET transmission data.
<b>Malfunction Decision Conditions</b>	When the centralized controller, which was connected once, shows no response. The control ranges are overlapped. When multiple master central controller are present. When the schedule timer is set to individual use mode, other central controller is present. When the wiring adapter for electrical appendices is present.
<b>Supposed Causes</b>	<ul style="list-style-type: none"> <li>■ Address duplication of optional controllers for centralized control</li> <li>■ Improper combination of optional controllers for centralized control</li> <li>■ Connection of more than one master controller</li> <li>■ Malfunction of transmission between optional controllers for centralized control</li> <li>■ Defect of PC board of optional controllers for centralized control</li> </ul>



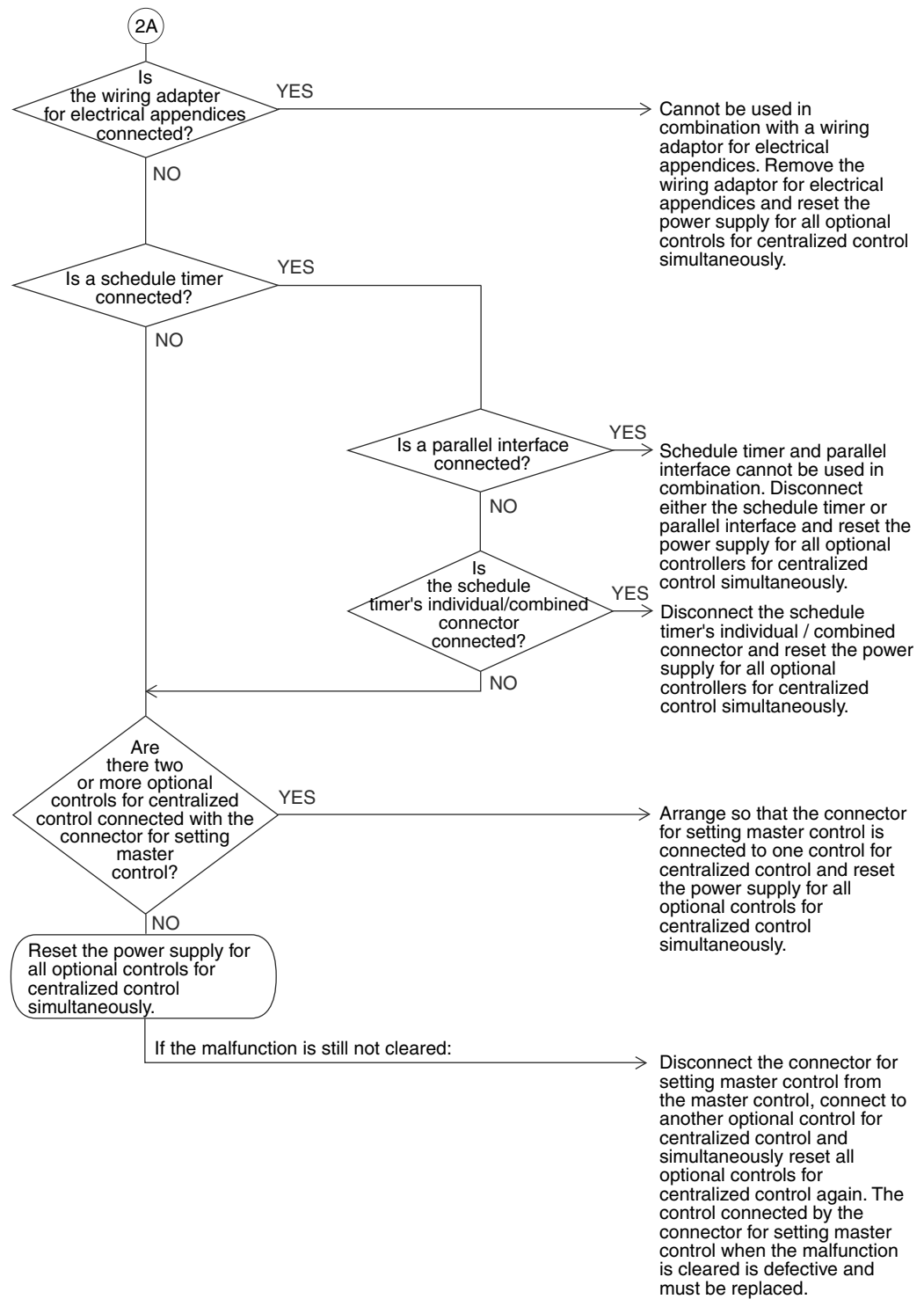
## Troubleshooting


**Caution**

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



(V2842)



(V2843)

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

### Remote Control Display

 “under centralized control” (Repeats double blink)

### Applicable Models

Unified ON/OFF controller

### Method of Malfunction Detection

Detect the malfunction according to DIII-NET transmission data.

### Malfunction Decision Conditions

When no central control addresses are set to indoor units.  
When no indoor units are connected within the control range.

### Supposed Causes

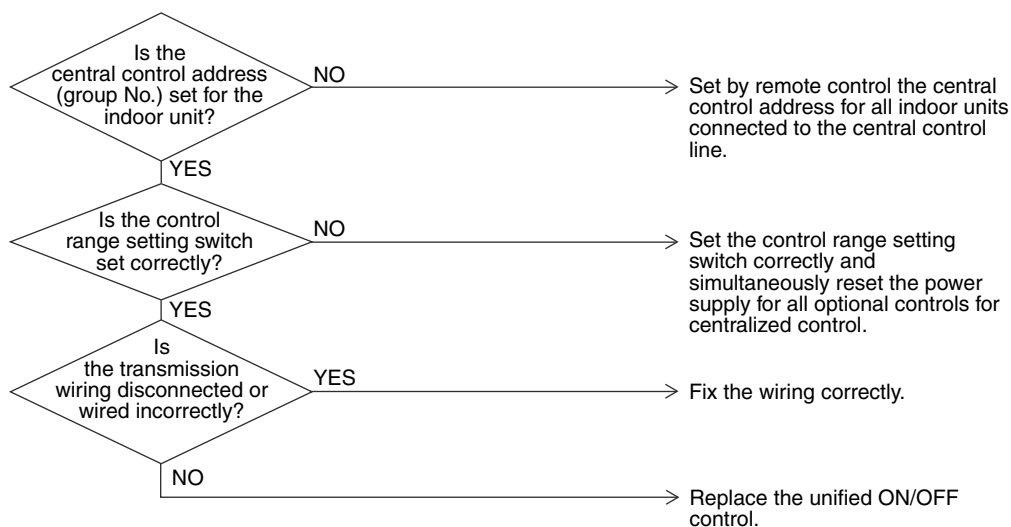
- Central control address (group No.) is not set for indoor unit.
- Improper control range setting switch
- Improper wiring of transmission wiring

### Troubleshooting



#### Caution

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



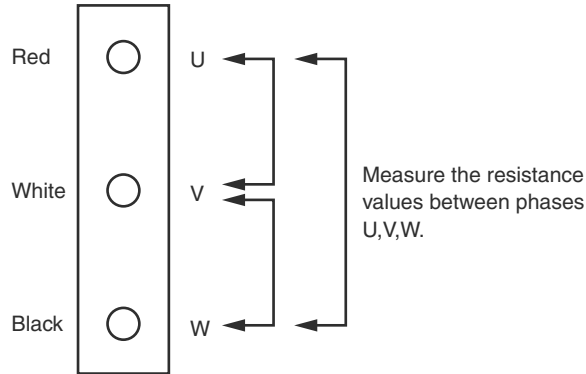
(V2844)

### Check No. 1

#### Check on connector of fan motor (Power supply cable)

(1) Turn off the power supply.

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

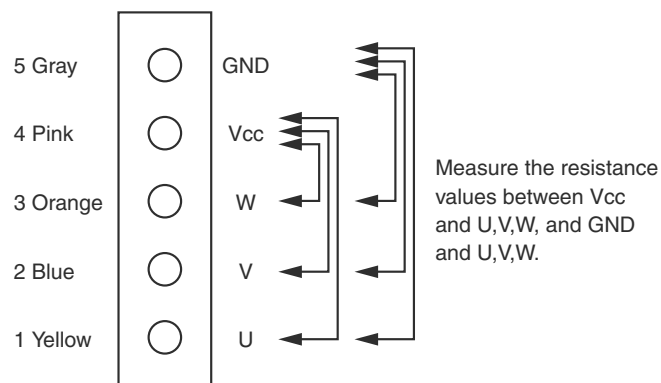


### Check No. 2

(1) Turn off the power supply.

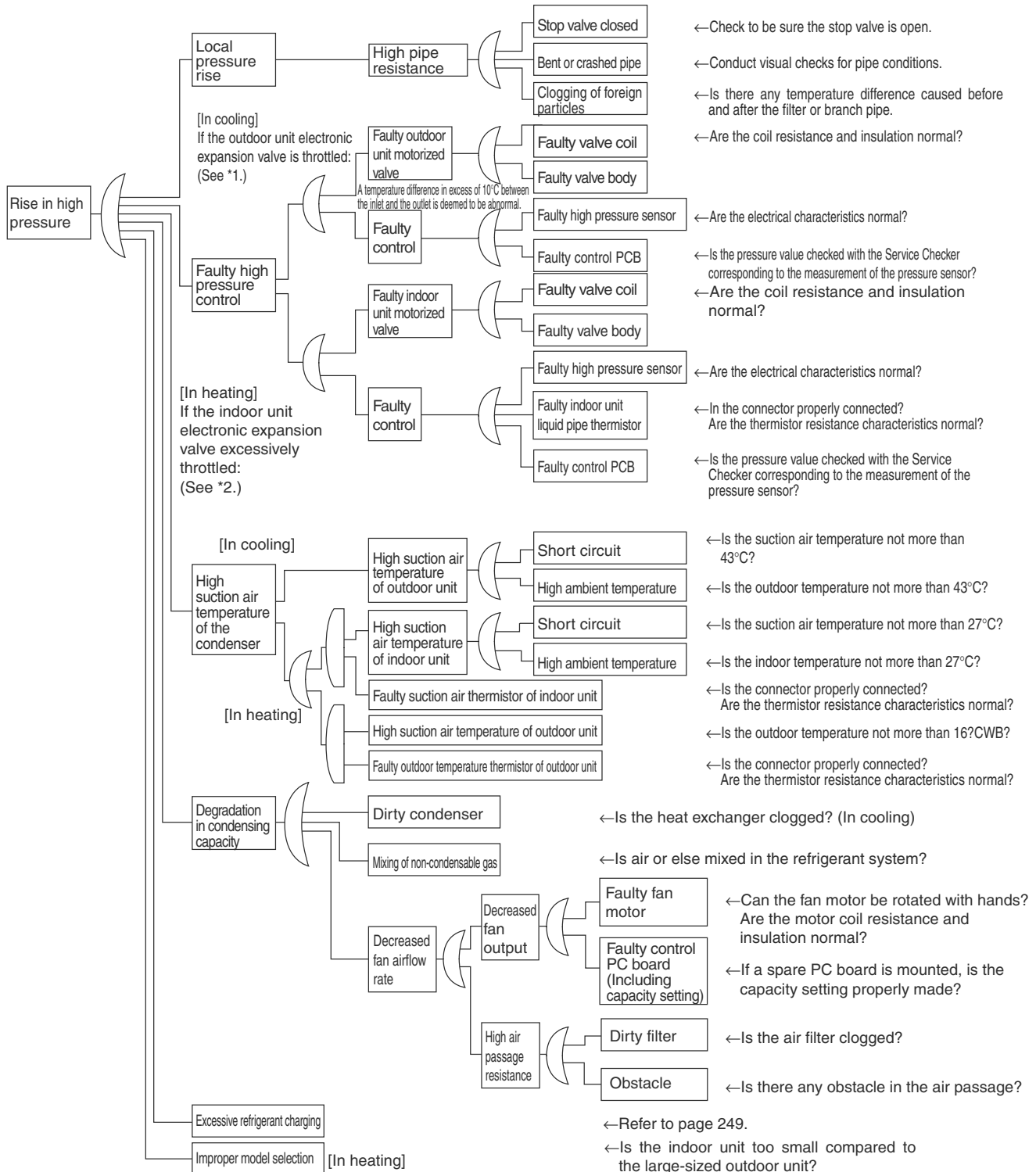
(2) Measure the resistance between Vcc and each phase of U,V,W, and GND and each phase at the motor side connectors (five-core wire) to check that the values are balanced within the range of  $\pm 20\%$ , while connector or relay connector is disconnected.

Furthermore, to use a multiple meter for measurement, connect the probe of negative pole to Vcc and that of positive pole to GND.



**[CHECK 3] Check for causes of rise in high pressure**

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



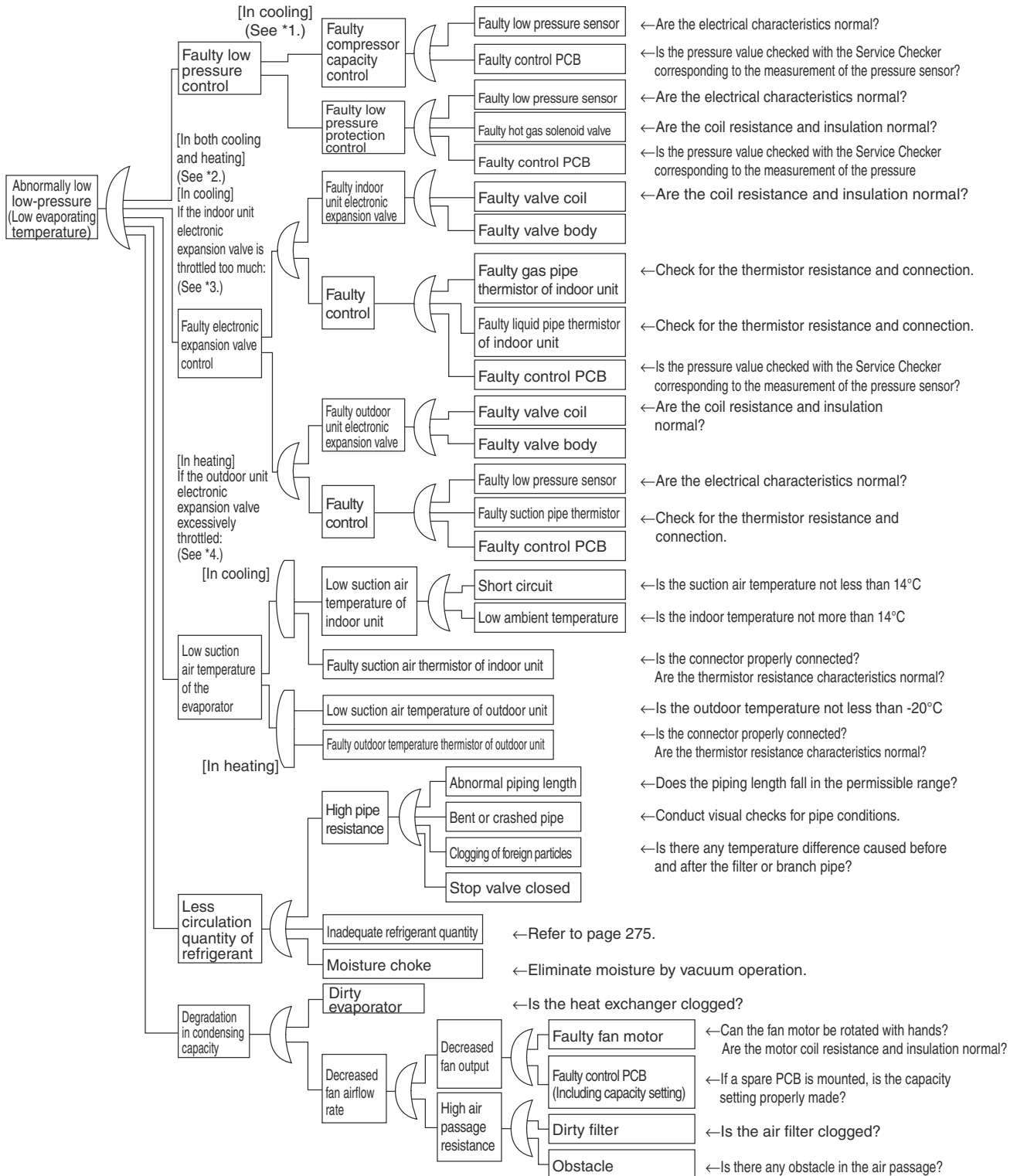
\*1: In cooling, it is normal if the outdoor unit electronic expansion valve (EV1) is fully open.

\*2: In heating, the indoor unit electronic expansion valve is used for "subcooled degree control".  
(For details, refer to "Electronic Expansion Valve Control" on page 135.)

SDK04009

# [CHECK 4] Check for causes of drop in low pressure

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



\*1: For details of the compressor capacity control while in cooling, refer to "Compressor PI Control" on page 95.

\*2: The "low pressure protection control" includes low pressure protection control and hot gas bypass control. For details, refer to page 119.

\*3: In cooling, the indoor unit electronic expansion valve is used for "superheated degree control". (For details, refer to page 135.)

\*4: In heating, the outdoor unit electronic expansion valve (EV1) is used for "superheated degree control of outdoor unit heat exchanger". (For details, refer to page 107.)

# Part 7

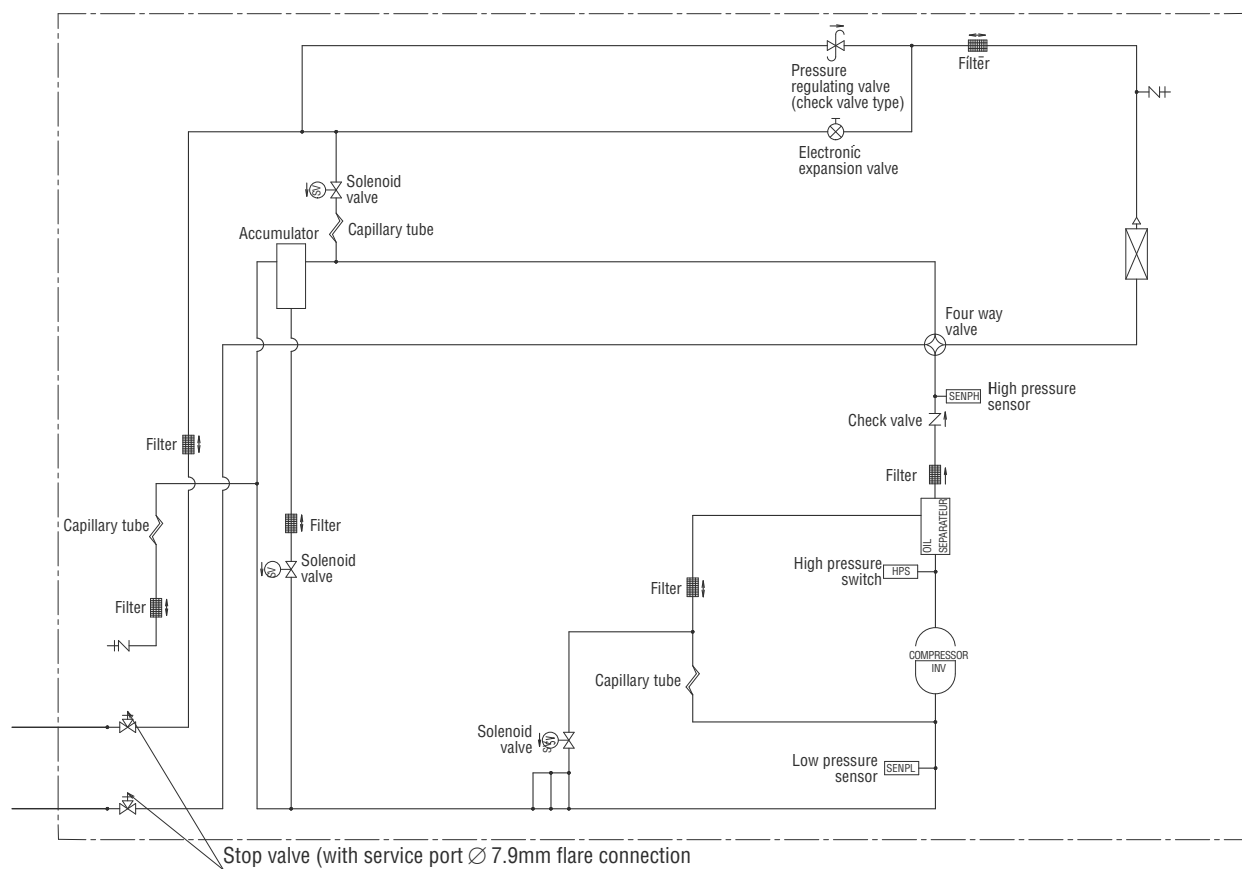
## Appendix

1. Piping Diagrams.....	300
1.1 Outdoor Unit .....	300
1.2 Indoor Unit.....	304
2. Wiring Diagrams for Reference.....	305
2.1 Outdoor Unit .....	305
2.2 Field Wiring.....	309
2.3 Indoor Unit.....	312
3. List of Electrical and Functional Parts .....	323
3.1 Outdoor Unit .....	323
3.2 Indoor Side .....	326
4. Piping Installation Point.....	331
4.1 Piping Installation Point .....	331
4.2 The Example of A Wrong Pattern.....	332
5. Example of connection (R-410A Type) .....	333
6. Thermistor Resistance / Temperature Characteristics.....	336
7. Pressure Sensor .....	338
8. Method of Checking The Inverter's Power Transistors and Diode Modules .....	339

# 1. Piping Diagrams

## 1.1 Outdoor Unit

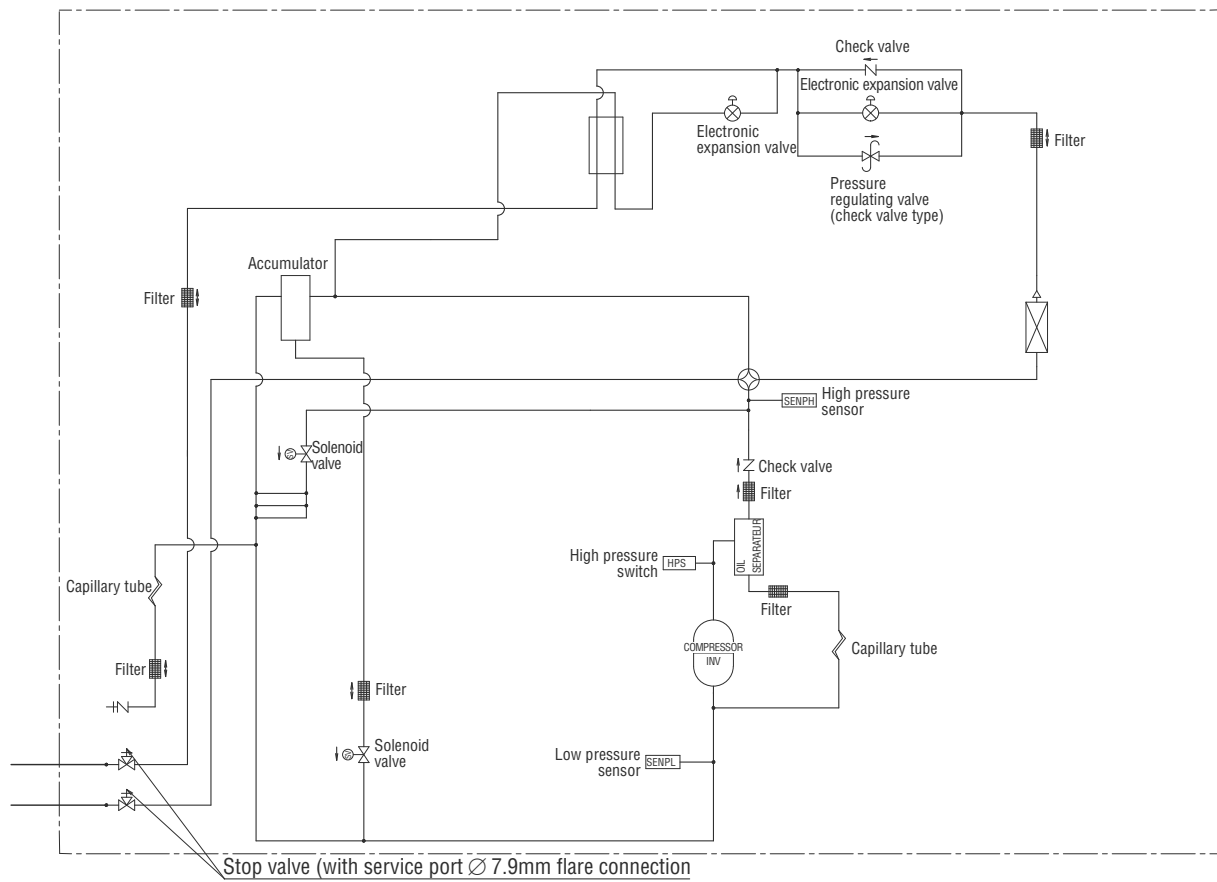
### U-5MX4XPQ



3D050782

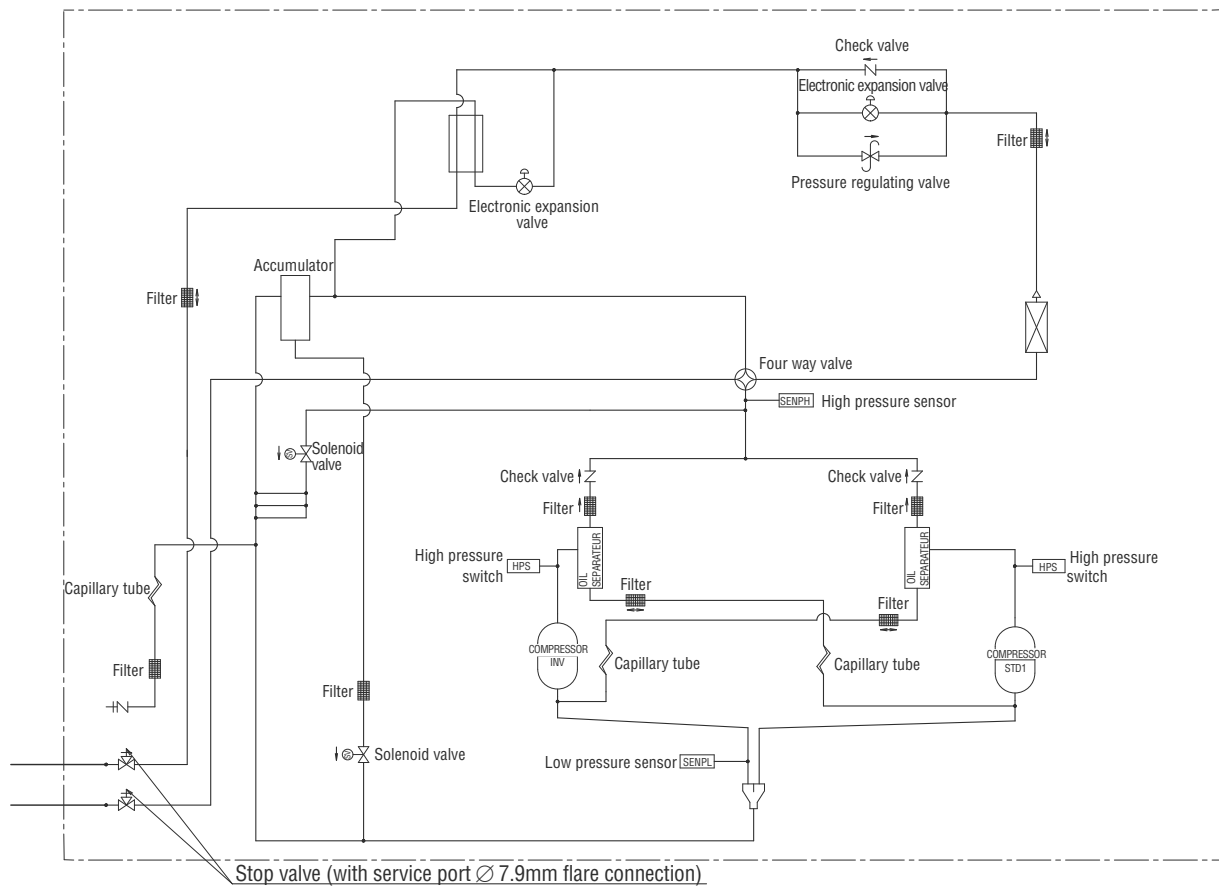


## U-8MX4XPQ



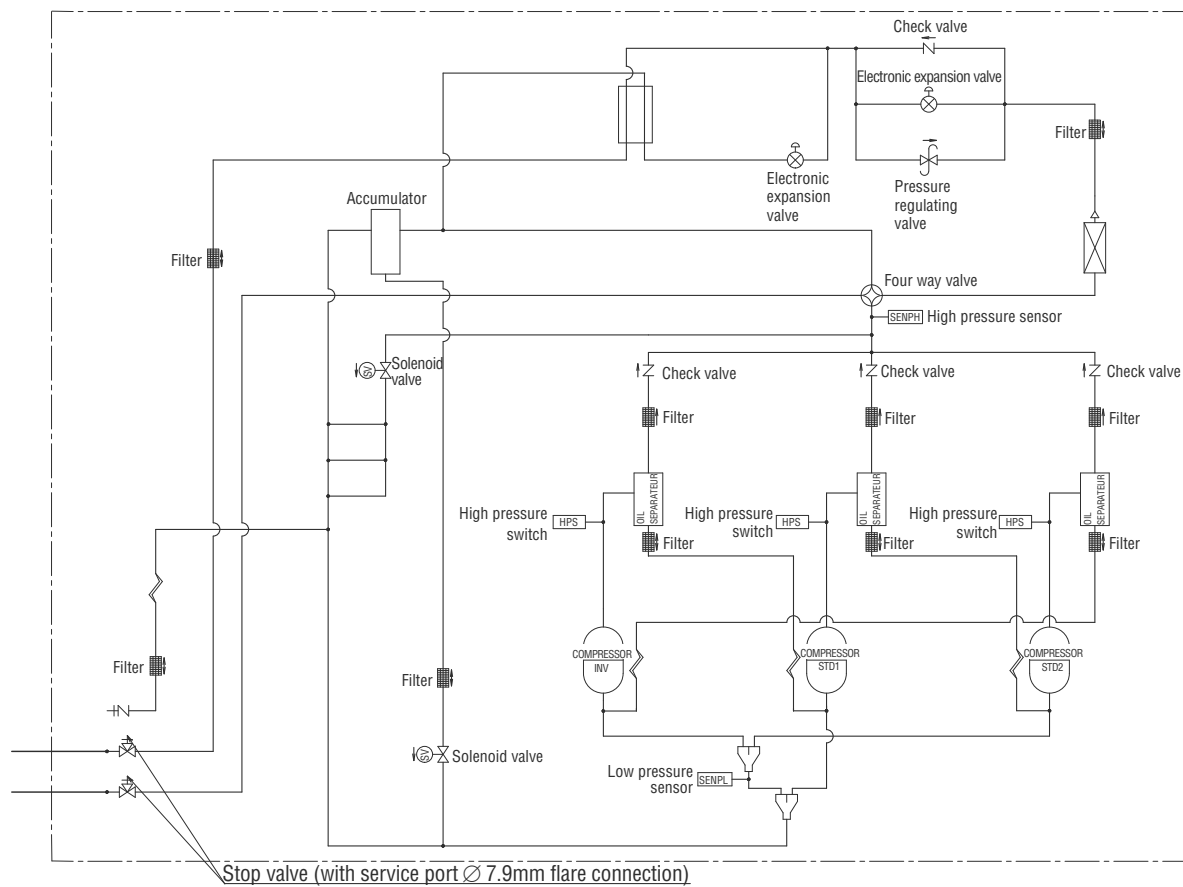
3D050783

## U-10MX4XPQ, U-12MX4XPQ



3D050784

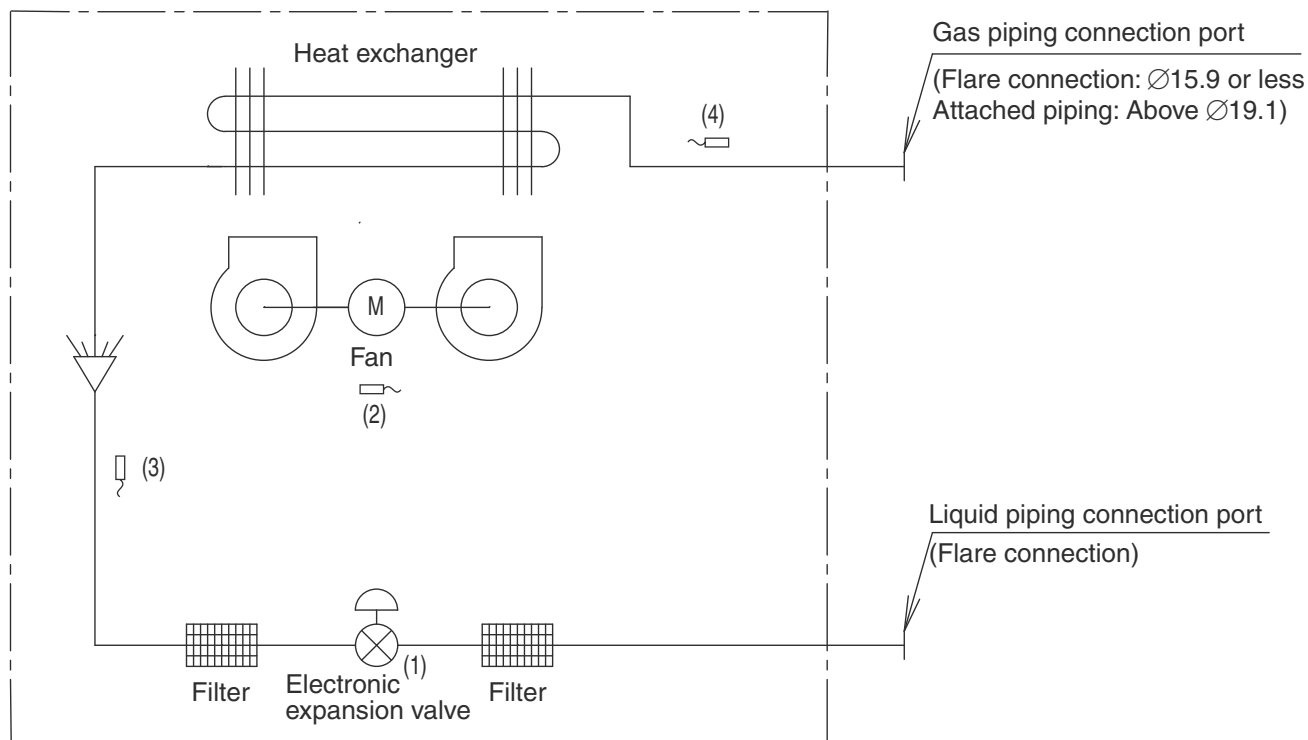
## U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ



3D050785

## 1.2 Indoor Unit

LM3, YM3, UM3, DM3, FM3, EM3, TM3, KM3, RM3



DU220-602J

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

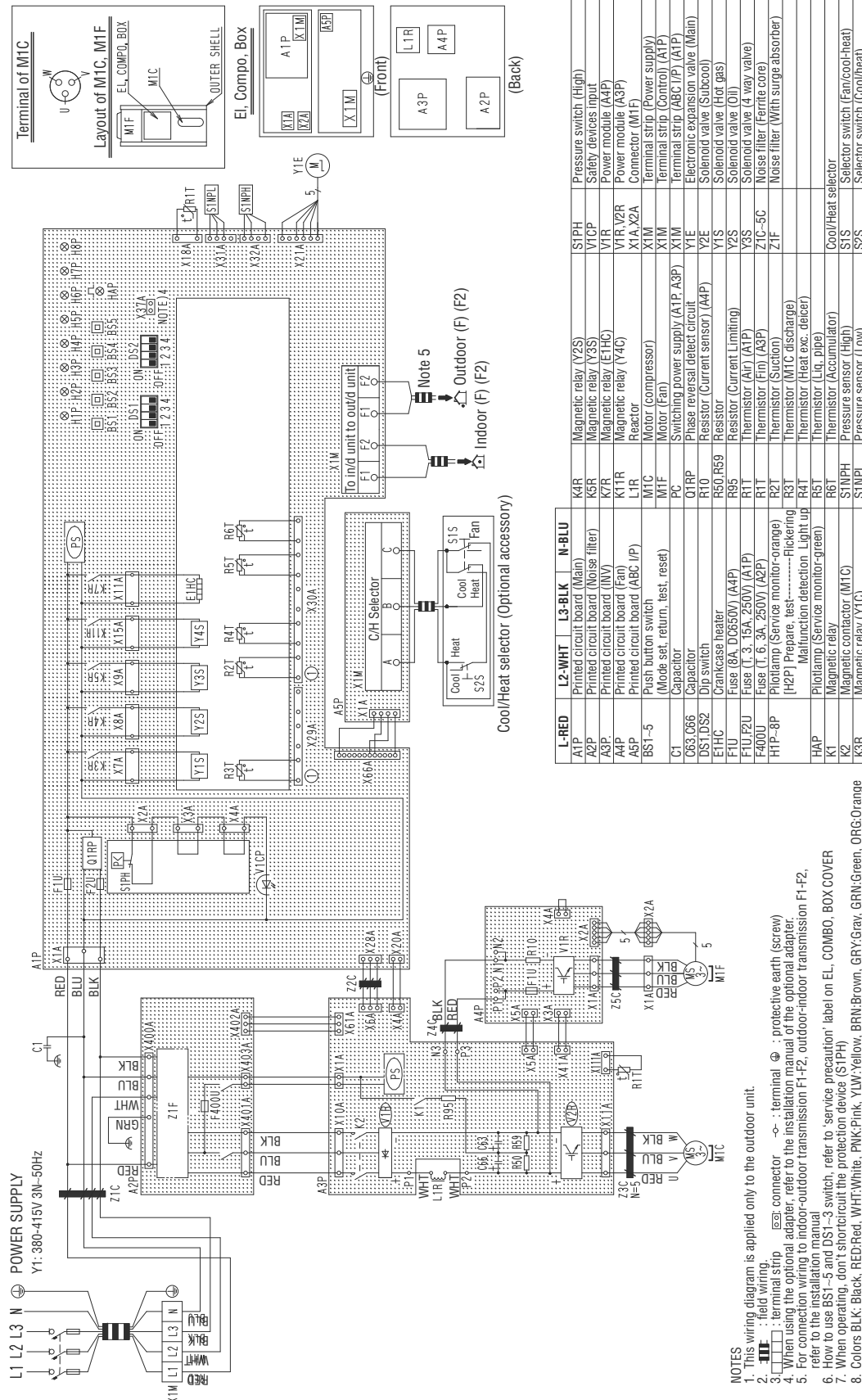
(mm)

Capacity	GAS	Liquid
20 / 25 / 32 / 40 / 50	φ12.7	φ6.4
63 / 80 / 100 / 125	φ15.9	φ9.5
200	φ19.1	φ9.5
250	φ22.2	φ9.5

## 2. Wiring Diagrams for Reference

### 2.1 Outdoor Unit

#### U-5MX4XPQ

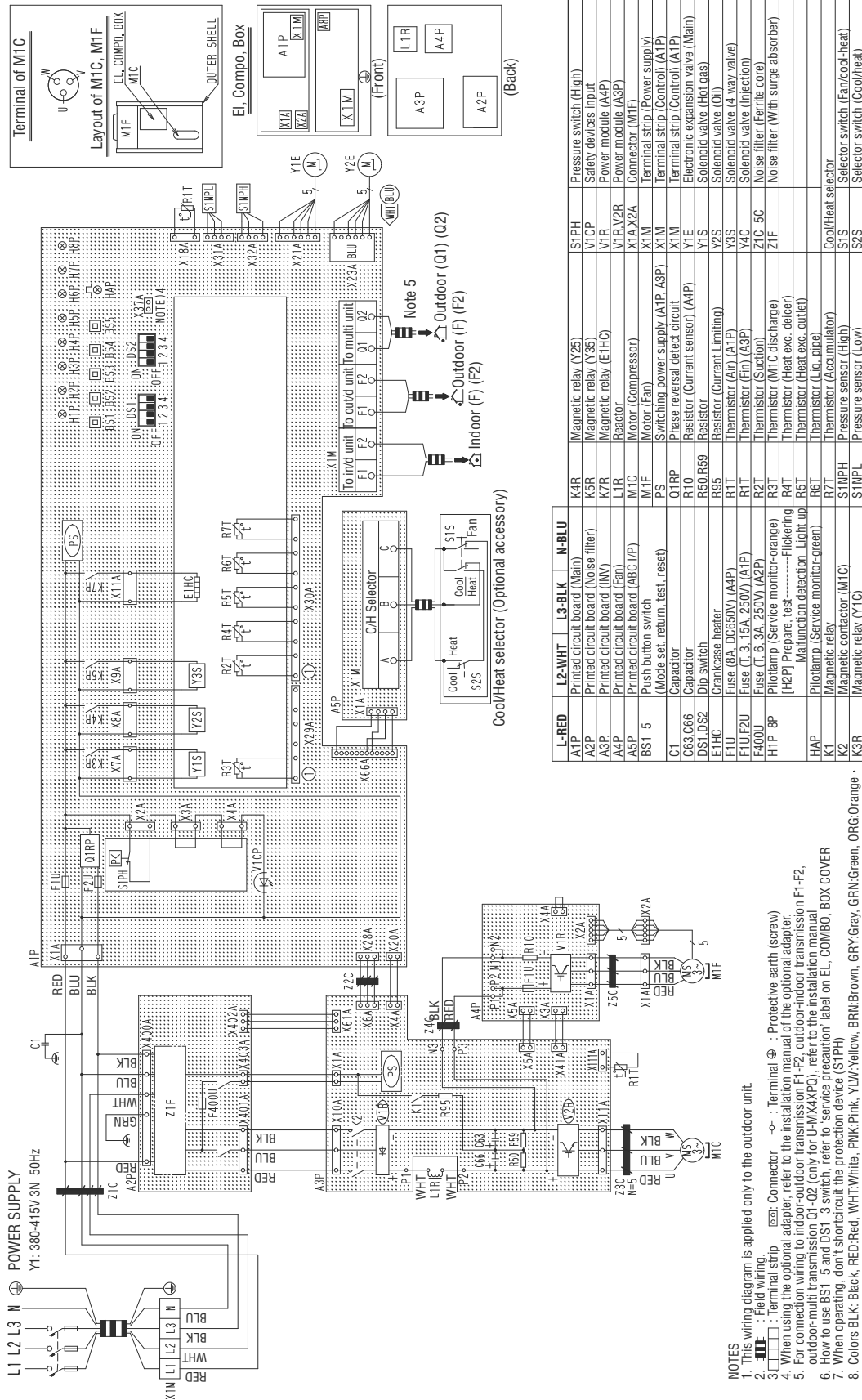


NOTES

1. This wiring diagram is applied only to the outdoor unit.
2. : terminal
3. : field wiring
4. When using the optional adapter, refer to the installation manual of the optional adapter.
5. For connection wiring to indoor-outdoor transmission F1-F2, outdoor-outdoor transmission F1-F2, refer to the installation manual.
6. How to use BS1-5 and DS1-3 switch, refer to 'service precaution' label on EL, COMBO, BOX COVER
7. When operating, don't shortcircuit the protection device (S1PH)
8. Colors BLK: Black, RED:Red, WHT:White, PNK:Pink, YLW:Yellow, BRN:Brown, GRY:Gray, GRN:Green, ORG:Orange

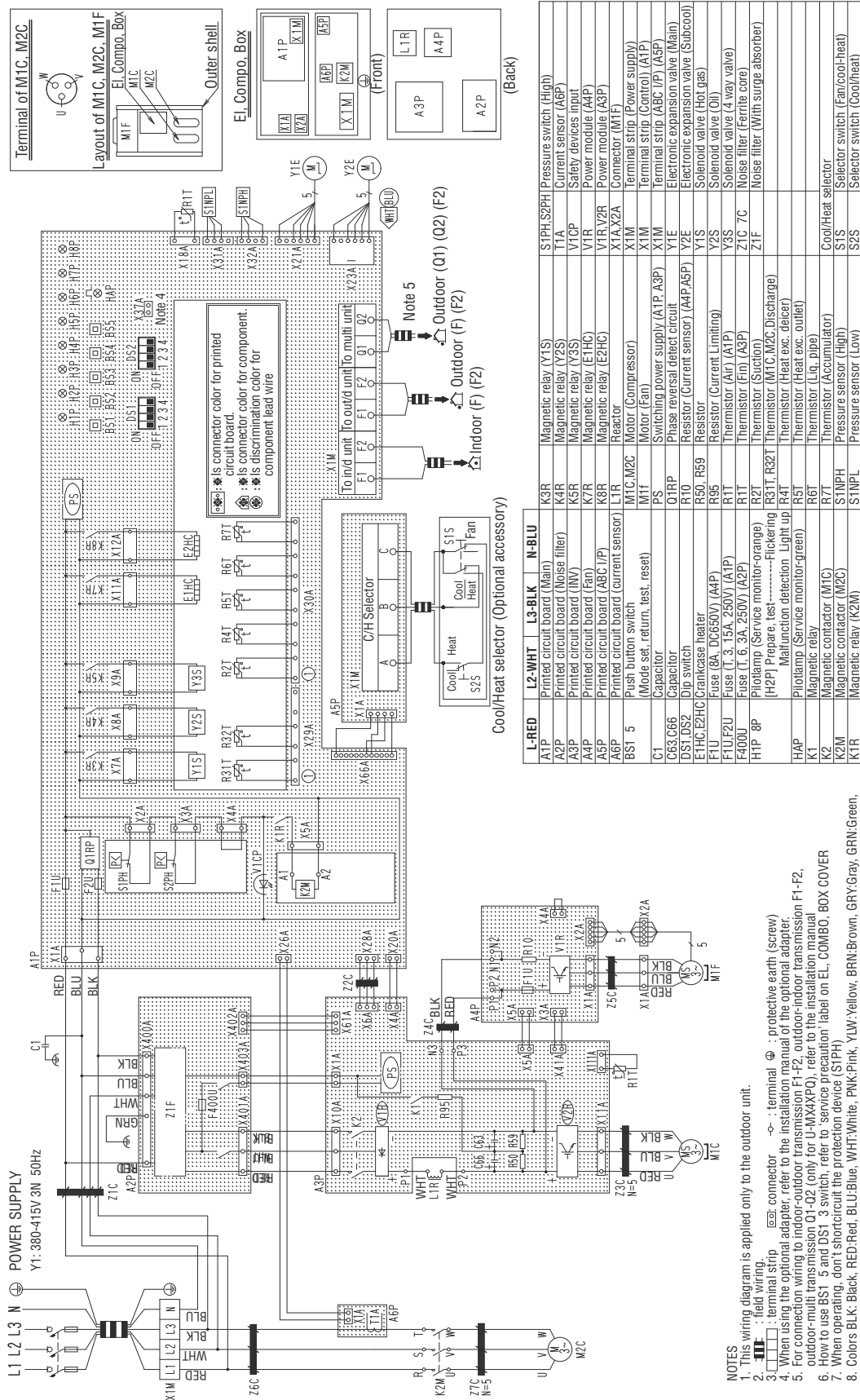
3D050453C

## U-8MX4XPO



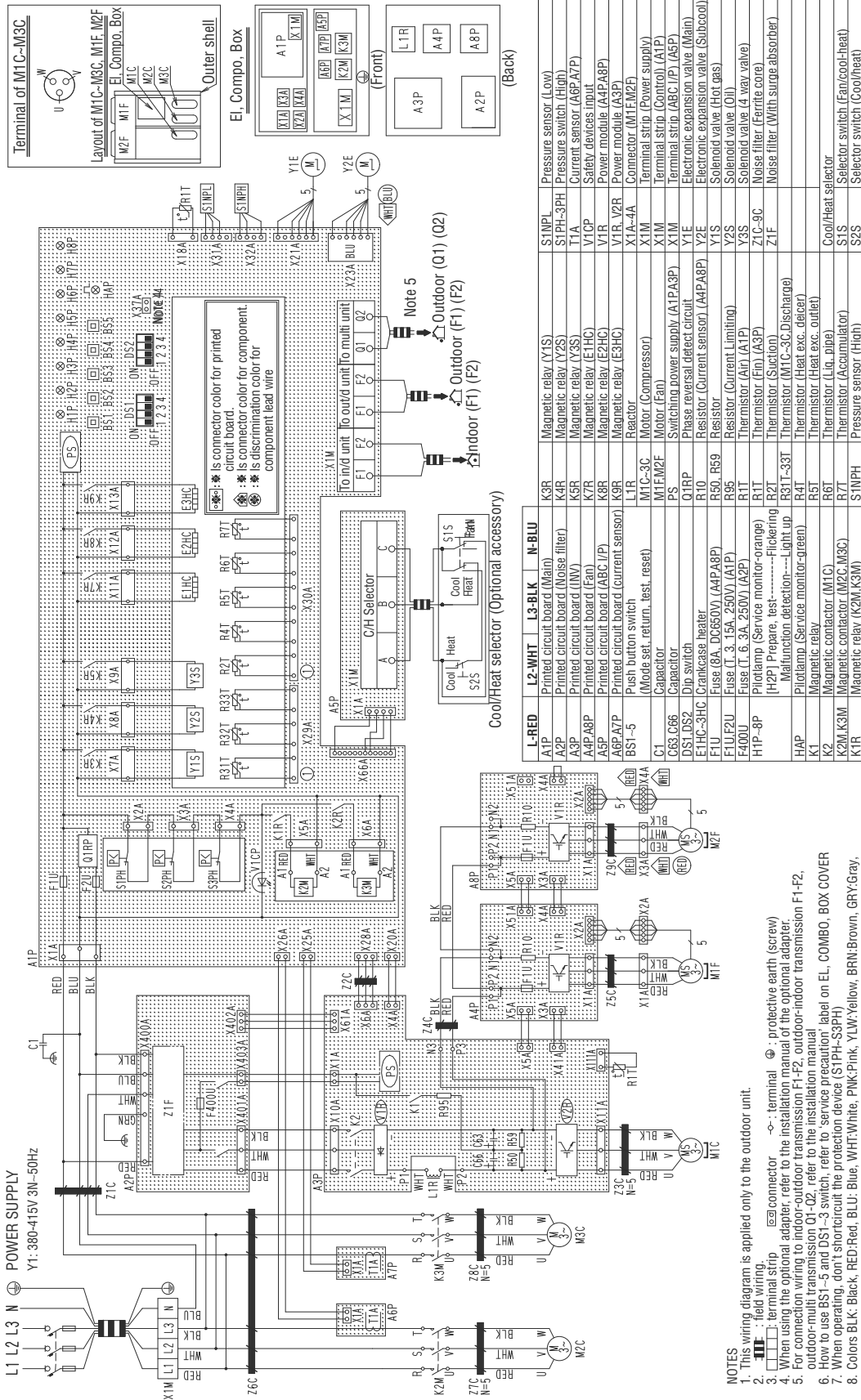
3D050454D

## U-10MX4XPQ &amp; U-12MX4XPQ



3D050455D

## U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ



3D050456D



## 2.2 Field Wiring

U-5-8-10-12-14-16-18MX4XPQ

- Notes

1) All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.

2) Use copper conductors only.

3) As for details, see wiring diagram.

4) Install circuit breaker for safety.

5) All field wiring and components must be provided by licensed electrician.
- 6) Unit shall be grounded in compliance with the applicable local and national codes.

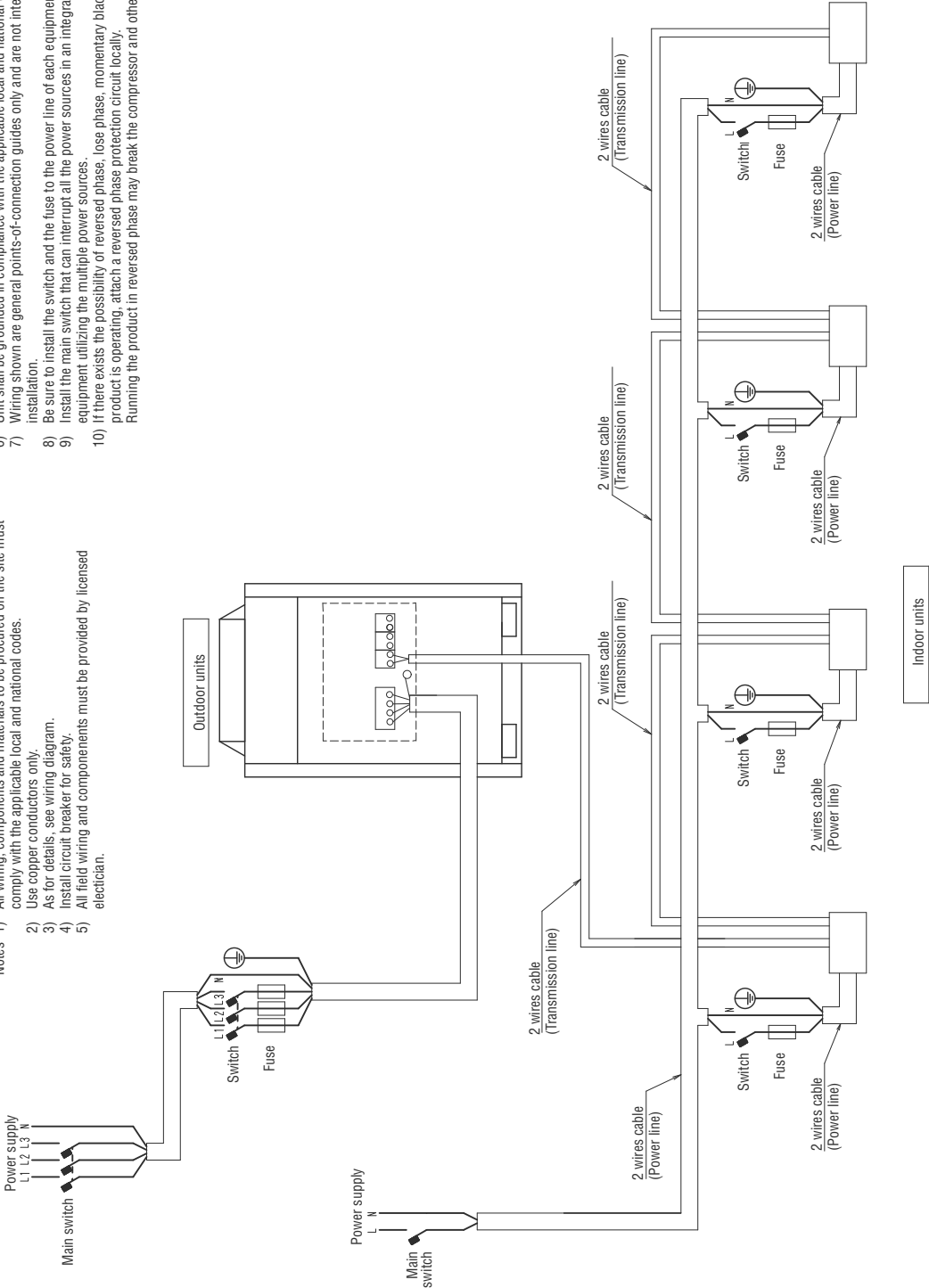
7) Wiring shown are general points-of-connection guides only and are not intended for or to include all details for a specific installation.

8) Be sure to install the switch and the fuse to the power line of each equipment.

9) Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.

10) If there exists the possibility of reversed phase, lose phase, momentary blackout or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally.

Running the product in reversed phase may break the compressor and other parts.

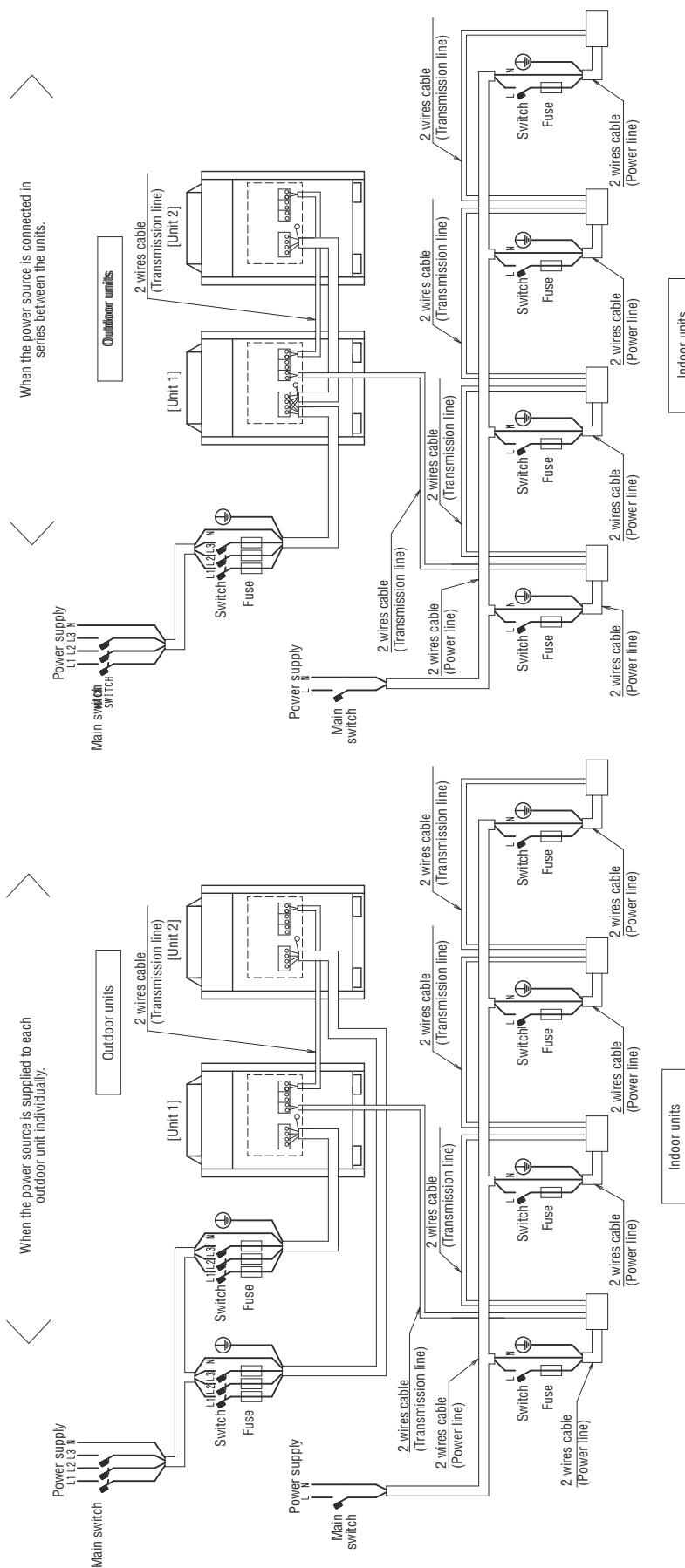


3D051452

## U-20-22-24-26-28-30-32MX4XPQ

- Notes
- 1) All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
  - 2) Use copper conductors only.
  - 3) As for details, see wiring diagram.
  - 4) Install circuit breaker for safety.
  - 5) All field wiring and components must be provided by licensed electrician.

- 6) Unit shall be grounded in compliance with the applicable local and national codes.
  - 7) Wiring shown are general points-of-connection guides only and are not intended for or to include all details for a specific installation.
  - 8) Be sure to install the switch and the fuse to the power line of each equipment.
  - 9) Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
  - 10) The capacity of UNIT1 must be larger than UNIT2 when the power source is connected in series between the units.
  - 11) If there exists the possibility of reversed phase, lose phase, momentary blackout or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally.
- Running the product in reversed phase may break the compressor and other parts.

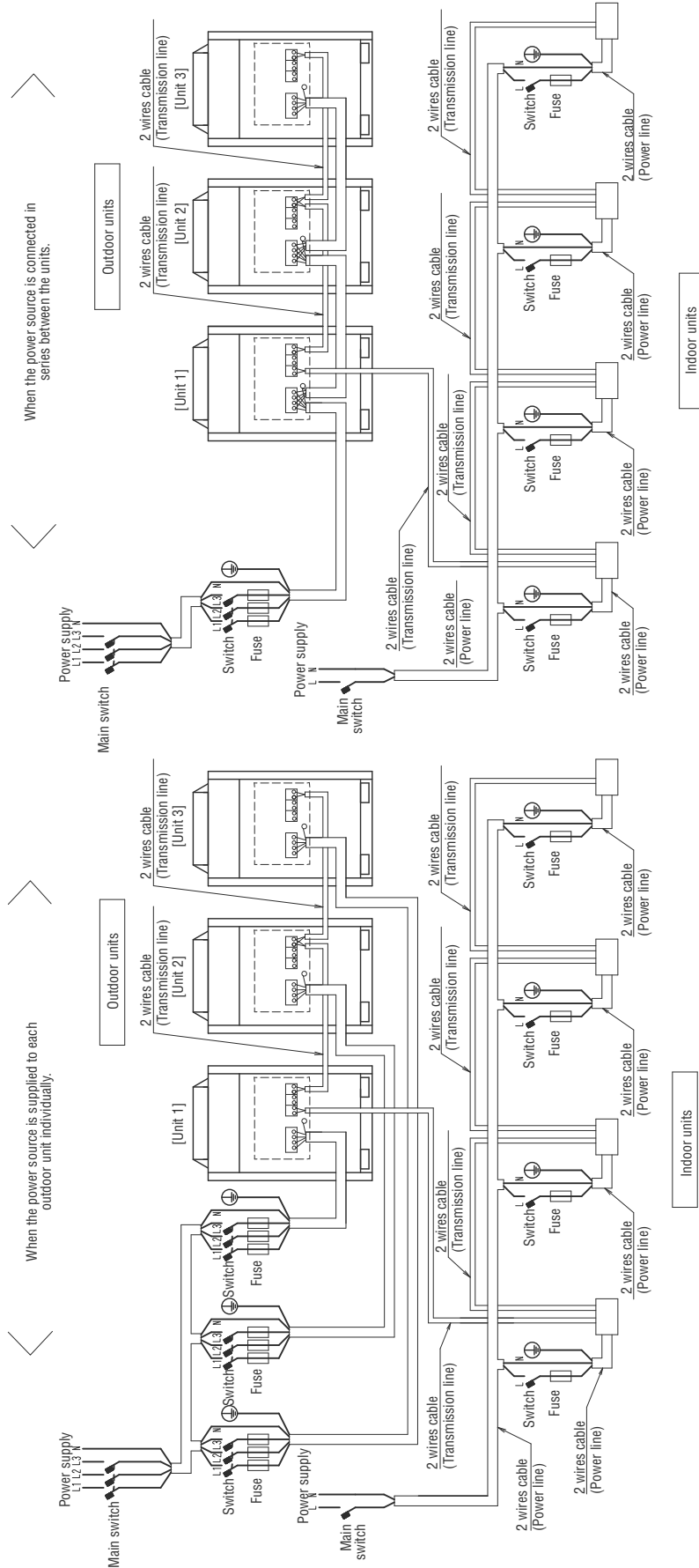


3D052261

## U-34-36-38-40-42-44-46-48-50-52-54MX4XPQ

- Notes
- 1) All wiring, components and materials to be procured on the site must comply with the applicable local and national codes.
  - 2) Use copper conductors only.
  - 3) As for details, see wiring diagram.
  - 4) Install circuit breaker for safety.
  - 5) All field wiring and components must be provided by licensed electrician.

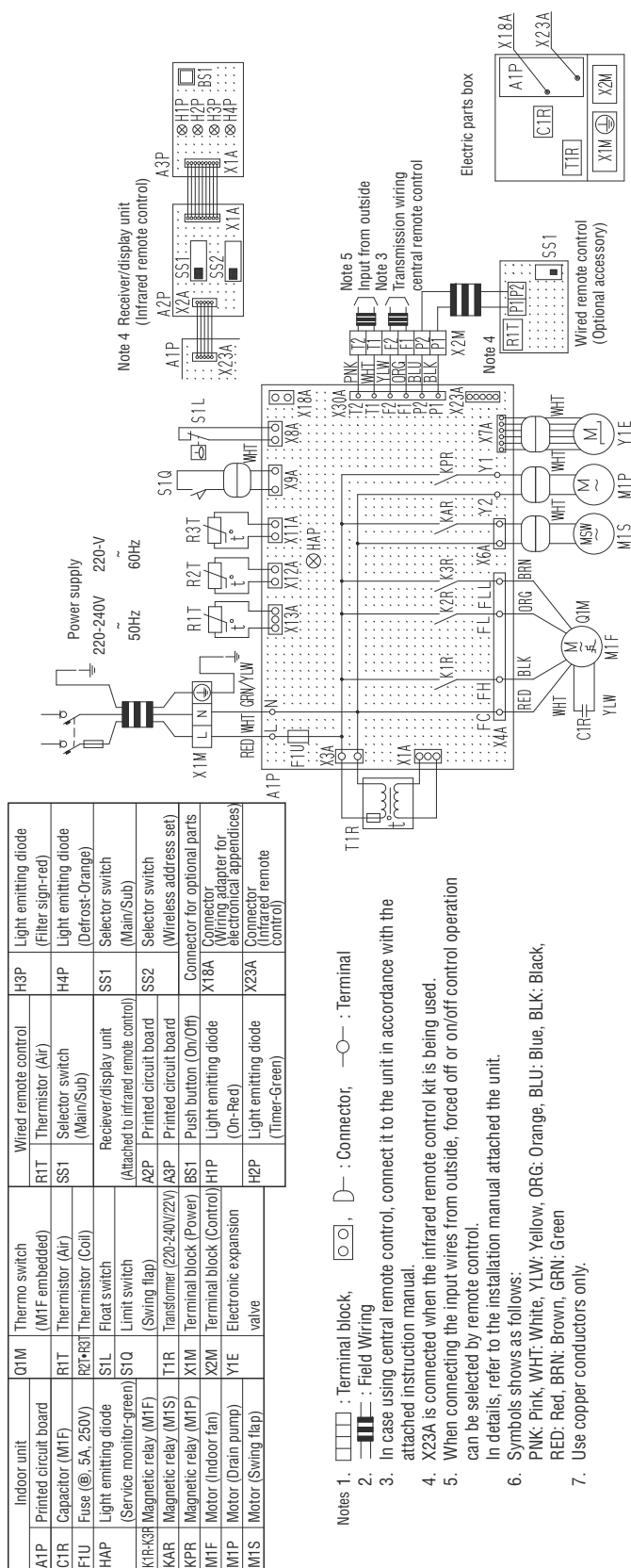
- 6) Unit shall be grounded in compliance with the applicable local and national codes.
  - 7) Wiring shown are general points-of-connection guides only and are not intended for or to include all details for a specific installation.
  - 8) Be sure to install the switch and the fuse to the power line of each equipment.
  - 9) Install the main switch that can interrupt all the power sources in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
  - 10) The capacity of UNIT1 must be larger than UNIT2 when the power source is connected in series between the units.
  - 11) If there exists the possibility of reversed phase, use phase, momentary blackout or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally.
- Running the product in reversed phase may break the compressor and other parts.



C: 3D052262

## 2.3 Indoor Unit

S-20, 25, 32, 63LM3

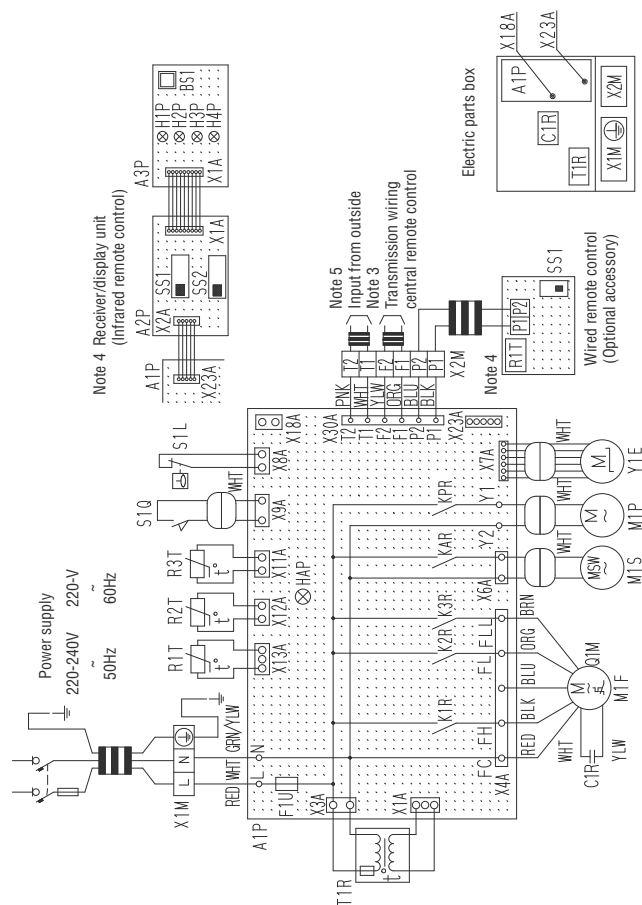


3D039556A

## S-40, 50, 80, 125LM3

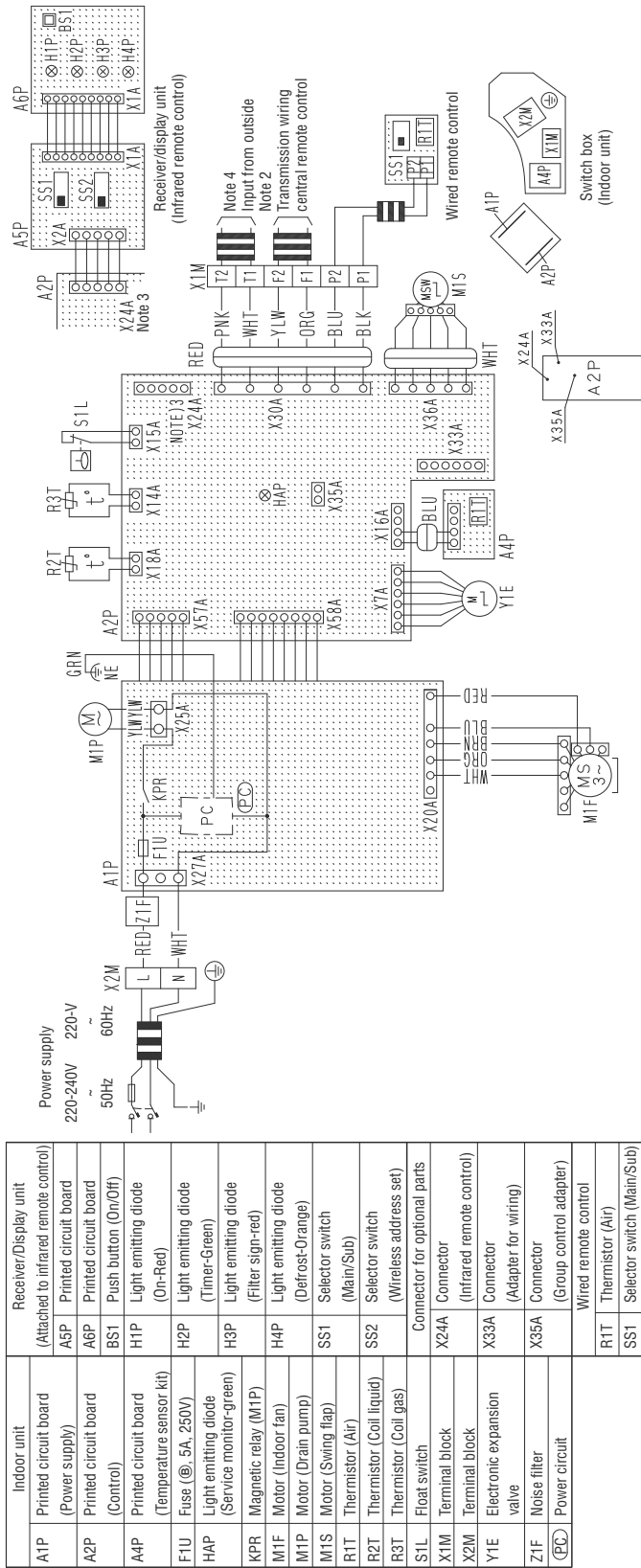
Indoor unit		S1L	Float switch	H1P	Light emitting diode (On-Red)
A1P	Printed circuit board	S1Q	Limit switch (Swing flap)	H2P	Light emitting diode (Timer-Green)
C1R	Capacitor (M1F)	T1R	Transformer (220-240V/22V)	H3P	Light emitting diode (Filter sign-red)
F1U	Fuse (⑤, 5A, 250V)	X1M	Terminal block (Power)	H4P	Light emitting diode (Defrost-Orange)
HAP	Light emitting diode (Service monitor-green)	X2M	Terminal block (Control)		
K1R-K3R	Magnetic relay (M1F)	Y1E	Electronic expansion valve		
KAR	Magnetic relay (M1S)		Wired remote control	SS1	Selector switch (Main/Sub)
KPR	Magnetic relay (M1P)	R1T	Thermistor (Air)	SS2	Selector switch (Wireless address set)
M1P	Motor (Indoor fan)	SS1	Selector switch (Main/Sub)		
M1S	Motor (Drain pump)		Receiver/display unit (Attached to infrared remote control)		
M1S	Motor (Swing flap)		Connector for optional parts		
Q1M	Thermo switch (M1F embedded)	A2P	Printed circuit board	X18A	Connector (Wiring adapter for electronic appendices)
R1T	Thermistor (Air)	A3P	Printed circuit board	X23A	Connector (Infrared remote control)
R2T-R3T	Thermistor (Coil)	BS1	Push button (On/Off)		

- Notes 1. □ : Terminal block, □ : Field Wiring, □ : Connector, —○— : Terminal
2. In case using central remote control, connect it to the unit in accordance with the attached instruction manual.
3. X23A is connected when the infrared remote control kit is being used.
4. When connecting the input wires from outside, forced off or on/off control operation can be selected by remote control.
5. In details, refer to the installation manual attached the unit.
6. Symbols shows as follows:  
 PINK: Pink, WHT: White, YLW: Yellow, ORG: Orange, BLU: Blue, BLK: Black,  
 RED: Red, BRN: Brown, GRN: Green
7. Use copper conductors only.



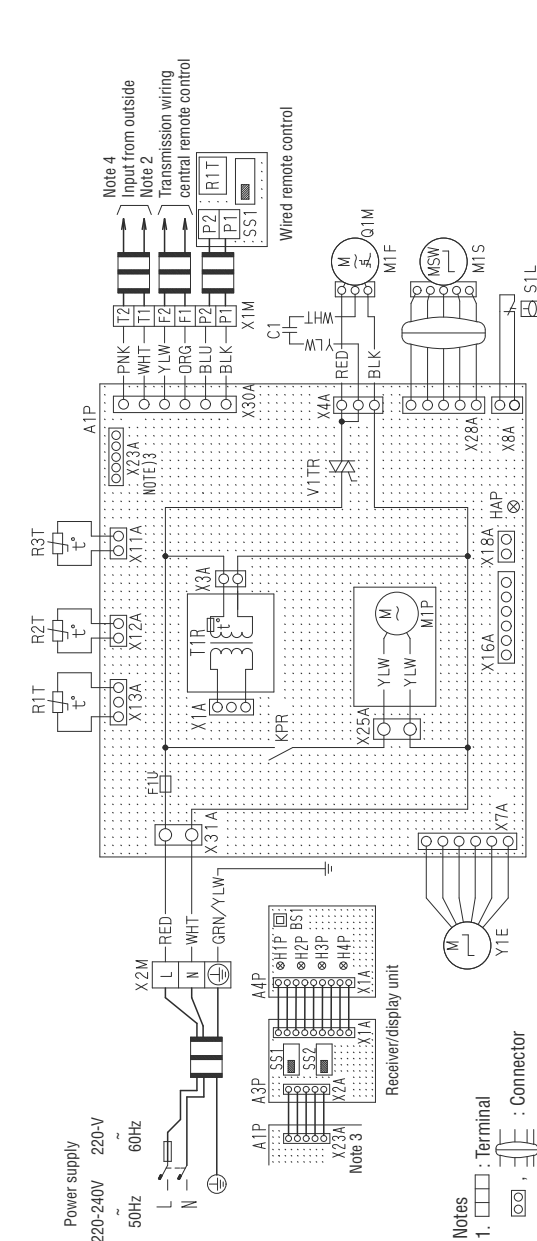
S-20, 25, 32, 40, 50, 63, 80, 100, 125UM3

3D039600A

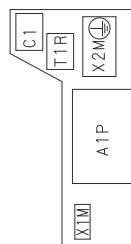


- Notes
1. : Terminal block, : Field Wiring
  2. In case using central remote control, connect it to the unit in accordance with the attached installation manual.
  3. X23A is connected when the infrared remote control kit is being used.
  4. When connecting the input wires from outside, forced off or on/off control operation can be selected by remote control.
- In details, refer to the installation manual attached the unit.
5. Remote control model varies according to the combination system, confirm engineering data and catalogs, etc. before connecting.
6. Confirm the method of setting the selector switch (SS1, SS2) of wired remote control and infrared remote control by installation manual and engineering data, etc.
7. Symbols shows as follows:  
RED: Red, BLK: Black, WHT: White, YLW: Yellow, GRN: Green, ORG: Orange,  
BRN: Brown, PNK: Pink, GRY: Gray, BLU: Blue

## S-20, 25, 32, 40, 50YM3



3D038359

[illegible]

- Notes
1.    

2. In case using central remote control, connect it to the unit in accordance with the attached installation manual.

3. X23A is connected when the infrared remote control kit is being used.

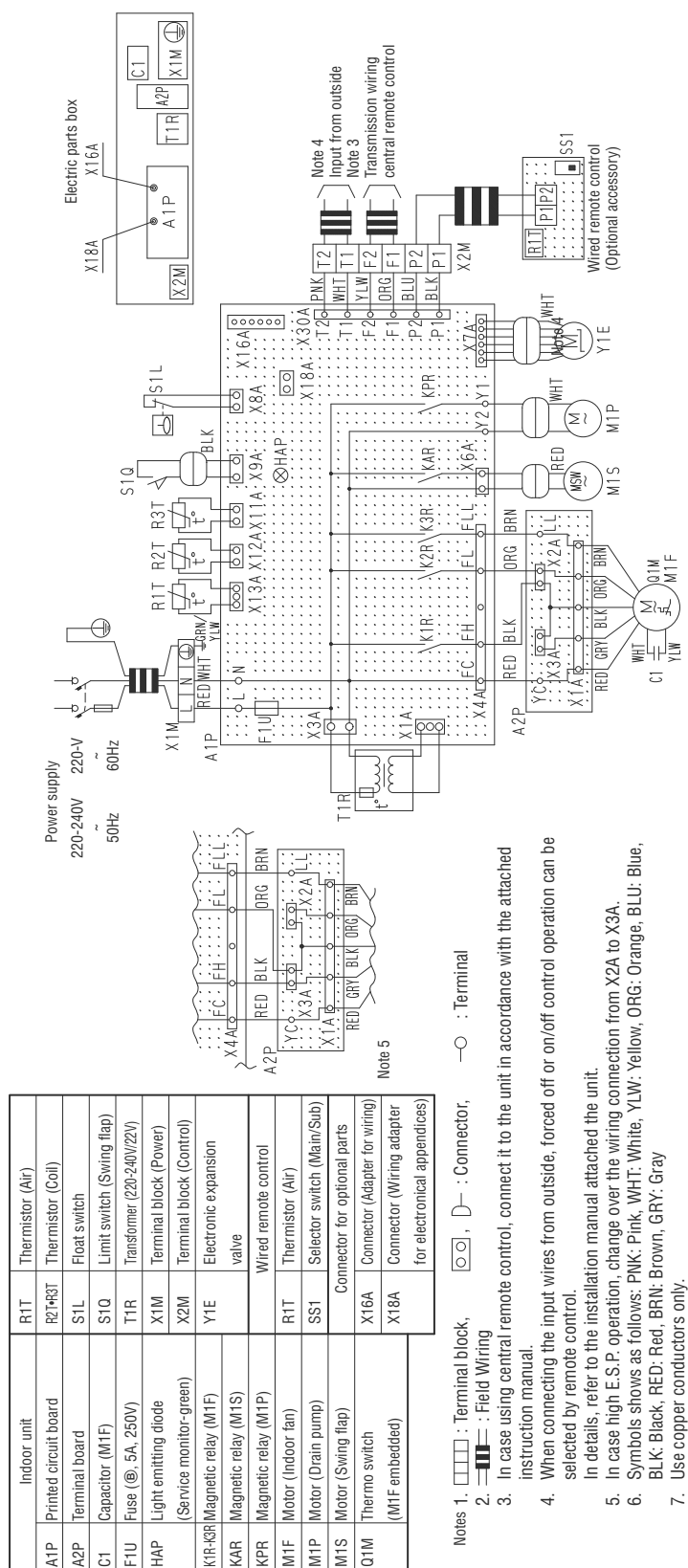
4. When connecting the input wires from outside, forced off or on/off control operation can be selected by remote control.

In details, refer to the installation manual attached the unit.

5. Remote control model varies according to the combination system, confirm engineering material and catalogs, etc. before connecting.

6. Symbols shows as follows: RED: Red, BLK: Black, WHT: White, YLW: Yellow, PNK: Pink, ORG: Orange, GRN: Green, BLU: Blue

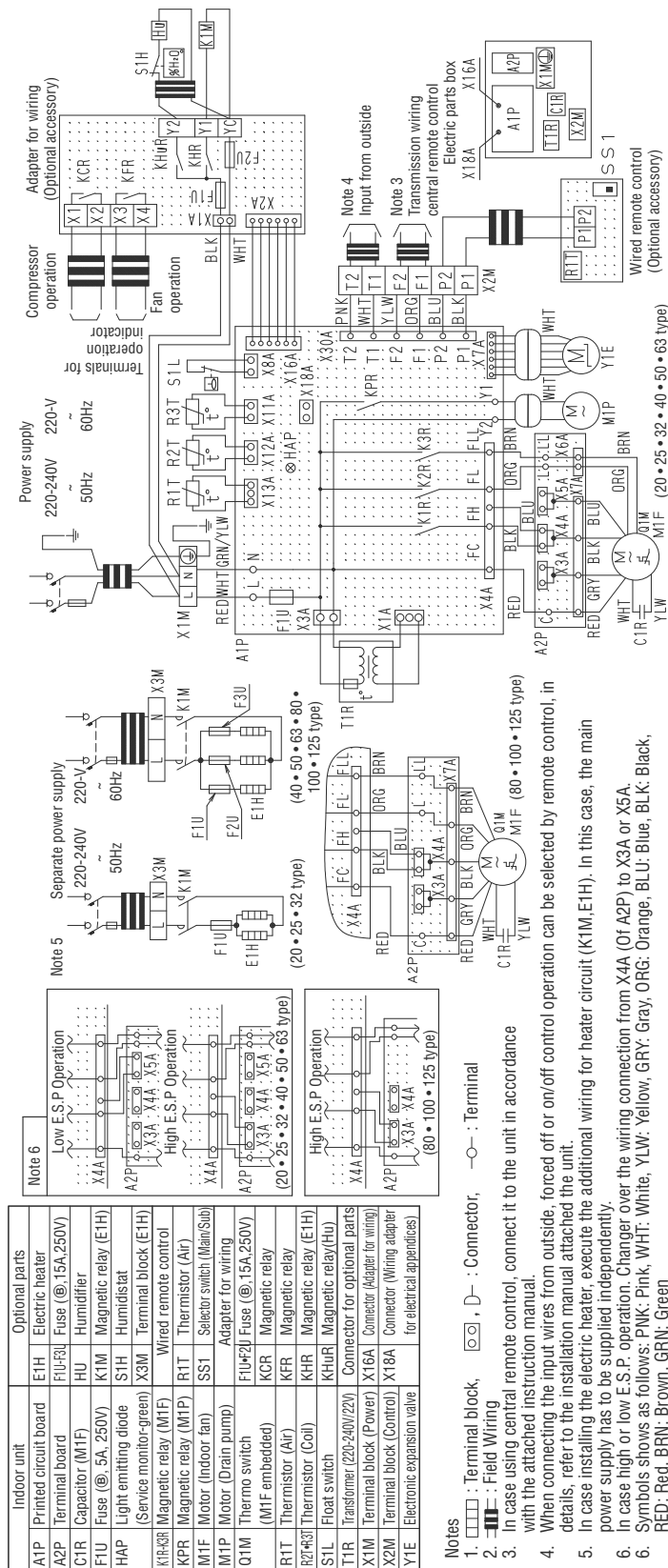
## S-25, 32, 40, 63KM3



3D039564C



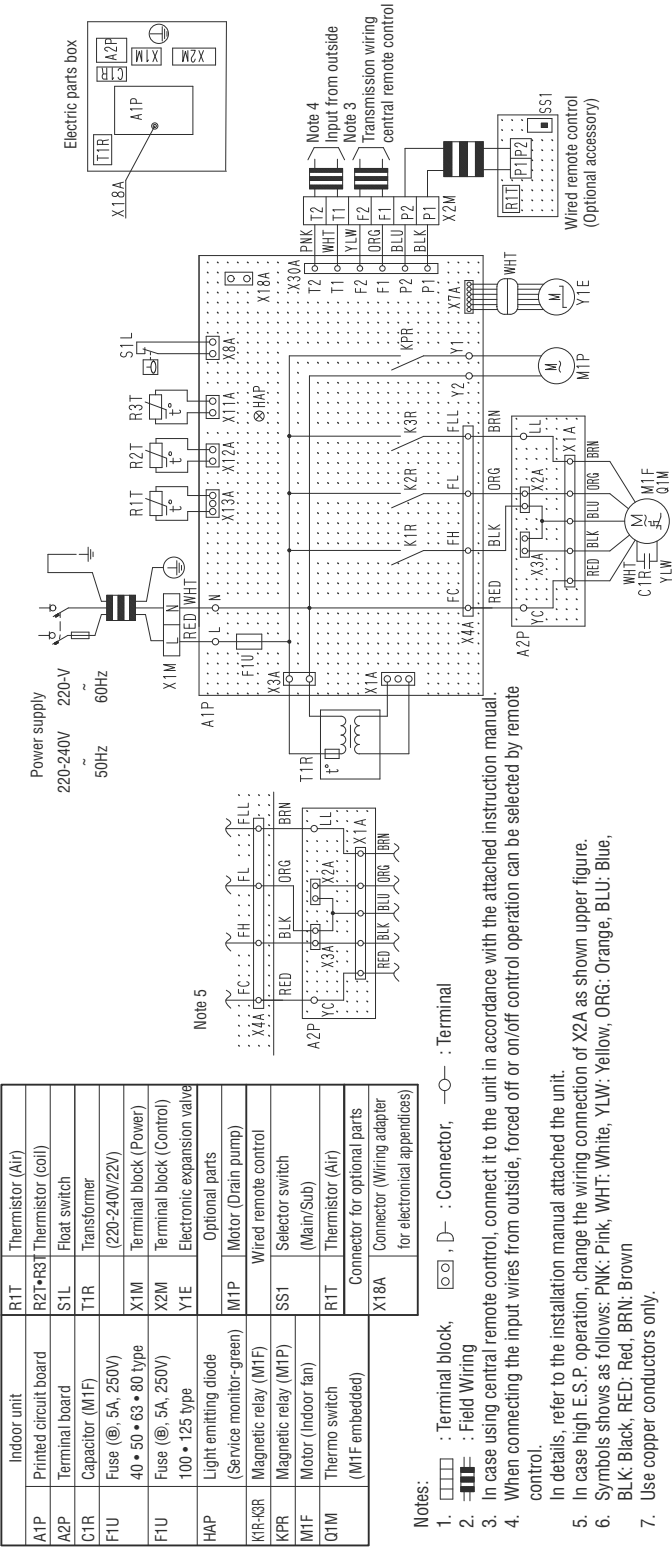
## S-20, 25, 32, 40, 50, 63, 80, 100, 125FM3



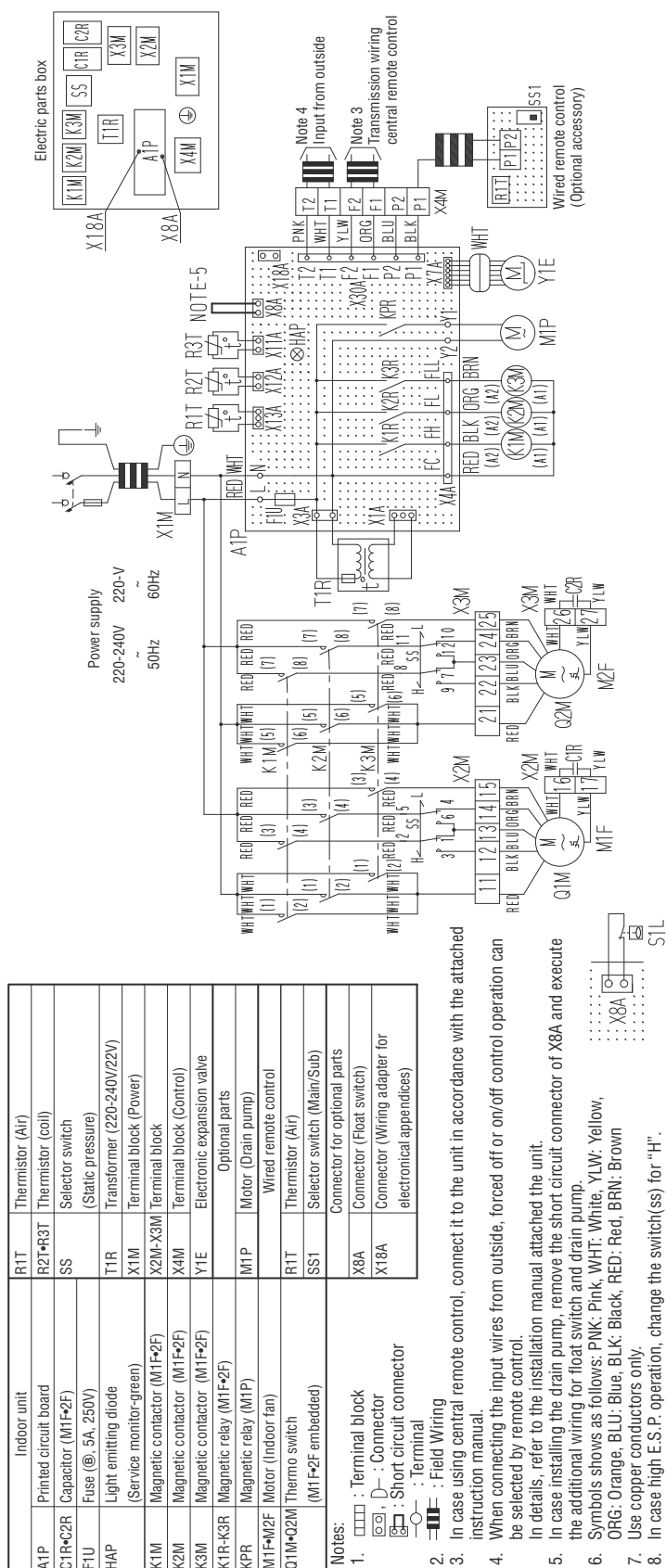
3D039561A

S-40, 50, 63, 80, 100, 125EM3

3D039620B

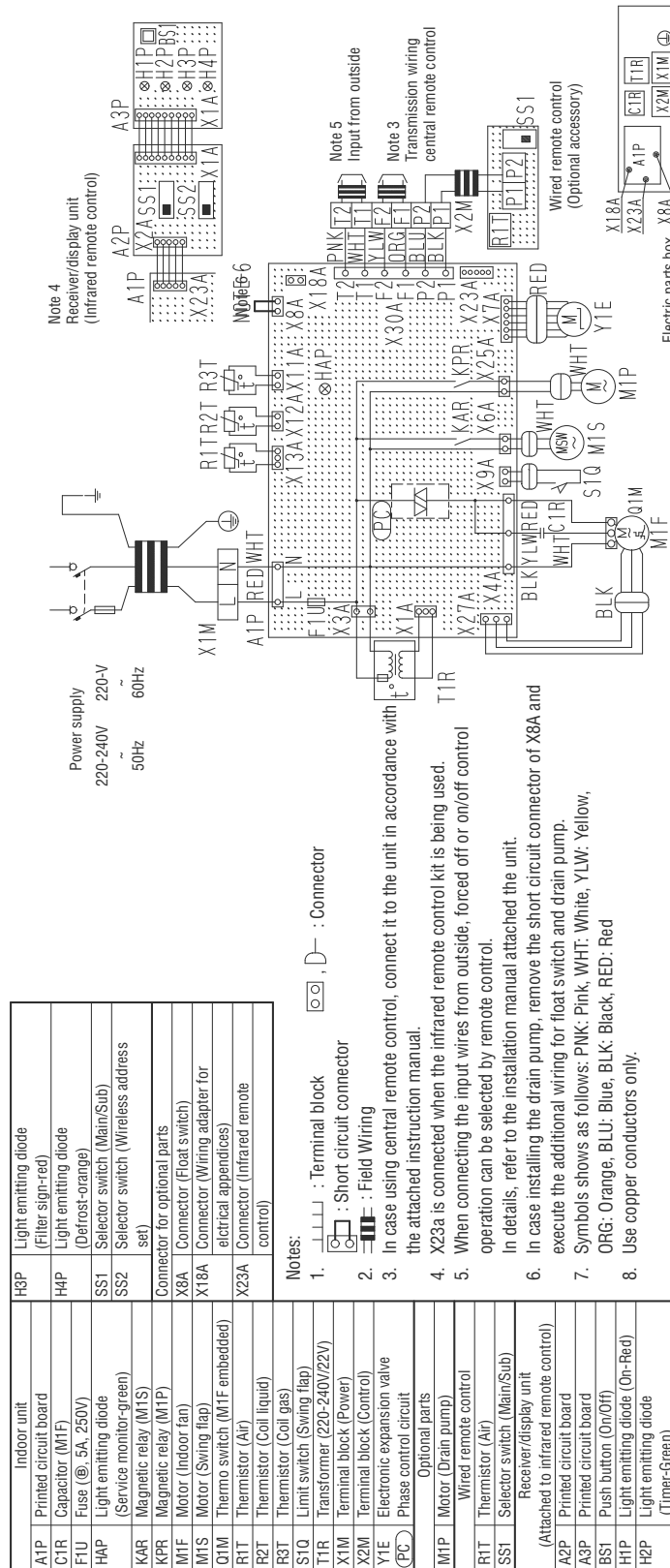


## S-200, 250EM3



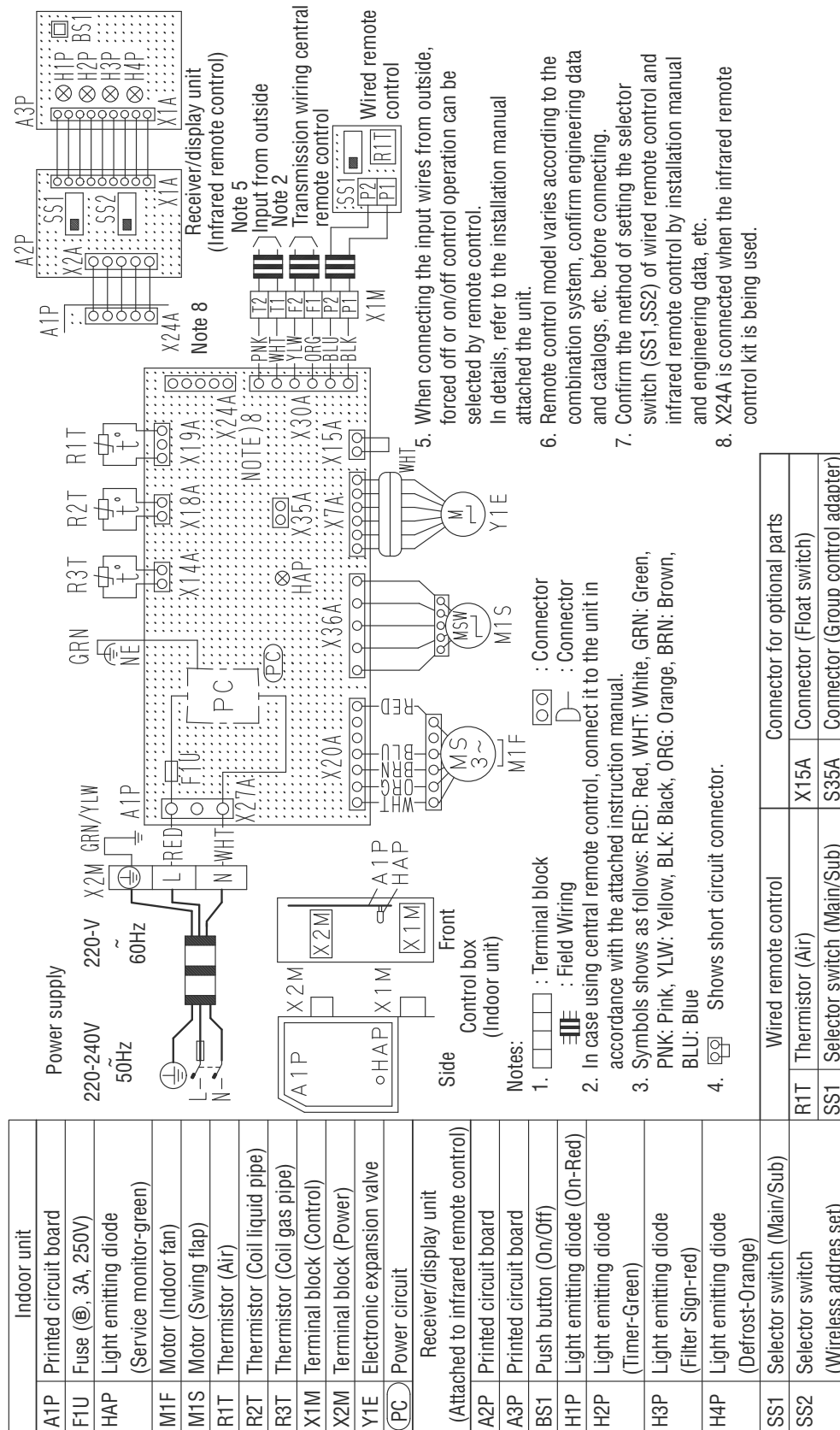
3D039621B

## S-32, 63, 100KM3



3D039801D

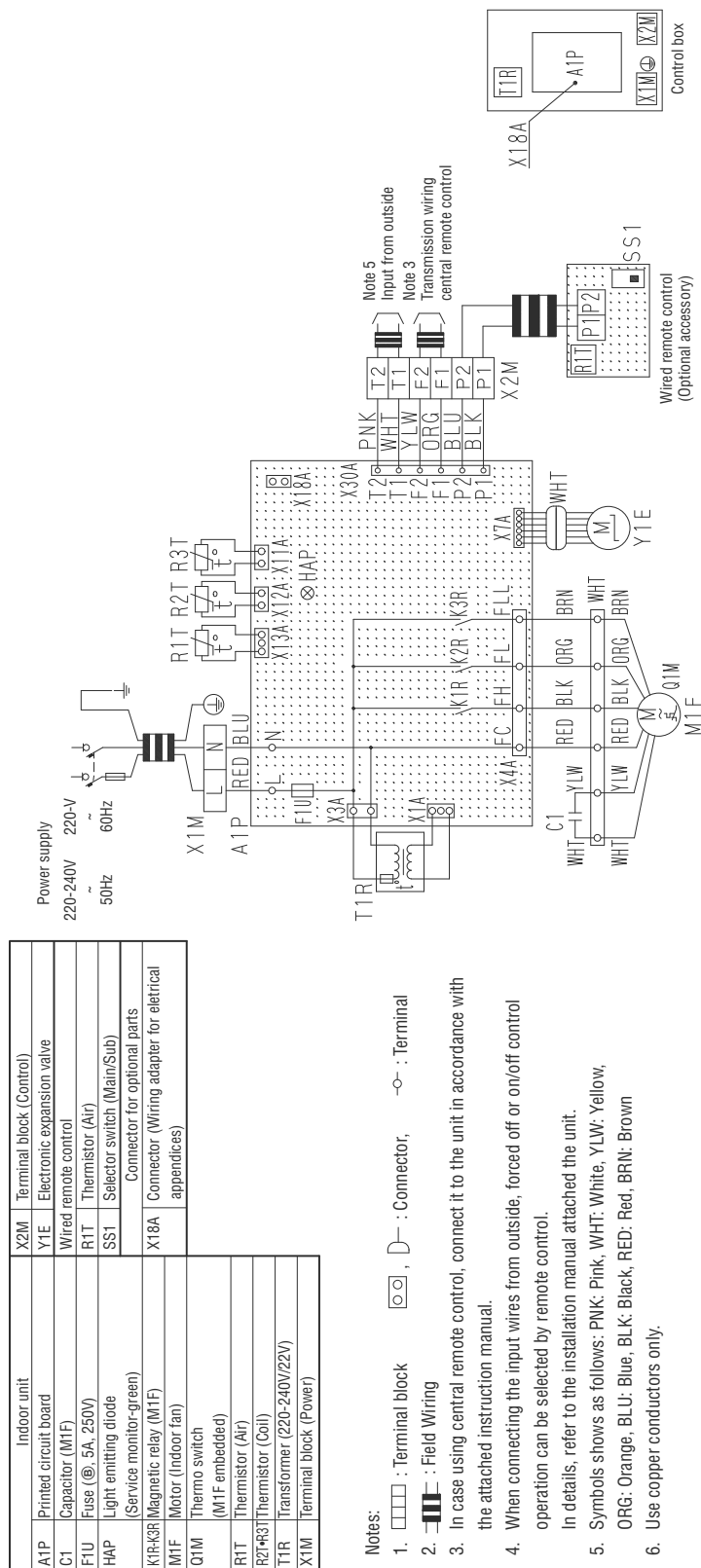
## S-20, 25, 32, 40, 50, 63KM3



**S-20, 25, 32, 40, 50, 63PM3**

**S-20, 25, 32, 40, 50, 63RM3**

3D039826D



### 3. List of Electrical and Functional Parts

#### 3.1 Outdoor Unit

##### 3.1.1 U-5MX4XPQ~U-8MX4XPQ

Item	Name		Symbol	Model	
				U-5MX4XPQ	U-8MX4XPQ
Compressor	Inverter	Type	M1C	JT1GCVDKYR@S	
		OC protection device		14.7A	
	STD 1	Type	M2C	—	
		OC protection device			
	STD 2	Type	M3C	—	
		OC protection device			
Fan motor		OC protection device	M1F	1.15A	3A
Electronic expansion valve (Main)			Y1E	Fully closed: 0pls	Fully open: 480pls
Electronic expansion valve (Subcool)			Y2E	—	Fully closed: 0pls Fully open: 480pls
Pressure protection	High pressure switch	For M1C	S1PH	OFF: 4.0 <sup>+0</sup> <sub>-0.12</sub> MPa    ON: 3.0±0.15MPa	
		For M2C	S2PH	—	
		For M3C	S3PH	—	
	Low pressure sensor		SLNPL	OFF: 0.07MPa	
	Fusible plug		—	Open: 70~75°C	
	Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF: 135°C
Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF: 93°C		
Others	Fuse	For main PC board	F1U	250V AC 10A Class B Time-lag 3.15A AC 250V	
			F2U	250V AC 10A Class B Time-lag 3.15A AC 250V	
		For Noise filter PC board	F1U	250V AC 5A Class B	

## 3.1.2 U-10MX4XPQ~U-12MX4XPQ

Item	Name		Symbol	Model	
				U-10MX4XPQ	U-12MX4XPQ
Compressor	Inverter	Type	M1C	JT1GCVDKYR@S	
		OC protection device		14.7A	
	STD 1	Type	M2C	JT170G-KYE@T	
		OC protection device		15.0A	
	STD 2	Type	M3C	—	
		OC protection device			
Fan motor		OC protection device	M1F	3A	3A (for General overseas : 1.14A)
Electronic expansion valve (Main)			Y1E	Fully closed: 0pls	Fully open: 480pls
Electronic expansion valve (Subcool)			Y2E	Fully closed: 0pls	Fully open: 480pls
Pressure protection	High pressure switch	For M1C	S1PH	OFF: 4.0 <sup>+0</sup> <sub>-0.12</sub> MPa    ON: 3.0±0.15MPa	
		For M2C	S2PH	OFF: 4.0 <sup>+0</sup> <sub>-0.12</sub> MPa    ON: 3.0±0.15MPa	
		For M3C	S3PH	—	
	Low pressure sensor		SLNPL	OFF: 0.07MPa	
	Fusible plug		—	Open: 70~75℃	
Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF: 135℃	
	Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF: 93℃	
Others	Fuse	For main PC board	F1U	250V AC 10A Class B Time-lag 3.15A AC 250V	
			F2U	250V AC 10A Class B Time-lag 3.15A AC 250V	
		For Noise filter PC board	F1U	250V AC 5A Class B	



Item	Name		Symbol	Model		
				U-14MX4XPQ	U-16MX4XPQ	U-18MX4XPQ
Compressor	Inverter	Type	M1C	JT1GCVDKYR@S		
		OC protection device		14.7A		
	STD 1	Type	M2C	JT170G-KYE@T		
		OC protection device		15.0A		
	STD 2	Type	M3C	JT170G-KYE@T		
		OC protection device		15.0A		
Fan motor		OC protection device	M1F	1.14A		3A
Electronic expansion valve (Main)			Y1E	Fully closed: 0pls		Fully open: 480pls
Electronic expansion valve (Subcool)			Y2E	Fully closed: 0pls		Fully open: 480pls
Pressure protection	High pressure switch	For M1C	S1PH	OFF: 4.0 <sup>+0</sup> <sub>-0.12</sub> MPa    ON: 3.0±0.15MPa		
		For M2C	S2PH	OFF: 4.0 <sup>+0</sup> <sub>-0.12</sub> MPa    ON: 3.0±0.15MPa		
		For M3C	S3PH	OFF: 4.0 <sup>+0</sup> <sub>-0.12</sub> MPa ON: 3.0±0.15MPa		
	Low pressure sensor		SLNPL	OFF: 0.07MPa		
Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF: 135°C		
	Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF: 93°C		
Others	Fuse	For main PC board	F1U	250V AC 10A Class B Time-lag 3.15A AC 250V		
			F2U	250V AC 10A Class B Time-lag 3.15A AC 250V		
		For Noise filter PC board	F1U	250V AC 5A Class B		

## 3.2 Indoor Side

### 3.2.1 Indoor Unit

Parts Name		Symbol	Model								Remark
			S-25 UM3	S-32 UM3	S-40 UM3	S-50 UM3	S-63 UM3	S-80 UM3	S-100 UM3	S-125 UM3	
Remote Controller	Wired Remote Controller		CZ-02RT11P								Option
	Wireless Remote Controller		CZ-01RWU12P								Option
Motors	Fan Motor	M1F	DC380V 30W 8P						DC 380V 120W 8P		
	Drain Pump	M1P	AC220-240V (50Hz) AC220V (60Hz) PLD-12230DM Thermal Fuse 145°C								
	Swing Motor	M1S	MP35HCA[3P007482-1] Stepping Motor DC16V								
Thermistors	Thermistor (Suction Air)	R1T	In PCB A4P or wired remote controller								
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-5 φ8 L1000 20kΩ (25°C)								
	Thermistor (Heat Exchanger)	R2T	ST8602A-5 φ6 L1000 20kΩ (25°C)								
Others	Float Switch	S1L	FS-0211B								
	Fuse	F1U	250V 5A φ5.2								
	Thermal Fuse	TFu	—								
	Transformer	T1R	—								

Parts Name		Symbol	Model								Remark
			S-20 LM3	S-25 LM3	S-32 LM3	S-40 LM3	S-50 LM3	S-63 LM3	S-80 LM3	S-125 LM3	
Remote Controller	Wired Remote Controller		CZ-02RT11P								Option
	Wireless Remote Controller		CZ-01RWL12P								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			
	Drain Pump	M1P	AC220-240V (50Hz) AC220V (60Hz) PLD-12230DM Thermal Fuse 145°C								
	Swing Motor	M1S	MT8-L[3PA07509-1] AC200~240V								
Thermistors	Thermistor (Suction Air)	R1T	ST8601-6 φ4 L1250 20kΩ (25°C)								
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-6 φ8 L1250 20kΩ (25°C)								
	Thermistor (Heat Exchanger)	R2T	ST8602A-5 φ6 L1000 20kΩ (25°C)								
Others	Float Switch	S1L	FS-0211B								
	Fuse	F1U	250V 5A φ5.2								
	Transformer	T1R	TR22H21R8								

Parts Name		Symbol	Model				Remark
			S-25DM3	S-32DM3	S-40DM3	S-63DM3	
Remote Controller	Wired Remote Controller		CZ-02RT11P				Option
	Wireless Remote Controller		CZ-01RWD12P				
Motors	Fan Motor	M1F	AC 220~240V 50Hz				
			1φ15W 4P		1φ20W 4P	1φ45W 4P	
			Thermal Fuse 146℃		Thermal protector 120℃ : OFF 105℃ : ON		
	Drain Pump	M1P	AC 220-240V (50Hz) PLD-12200DM Thermal Fuse 145℃				
	Swing Motor	M1S	MP35HCA [3P080801-1] AC200~240V				
Thermistors	Thermistor (Suction Air)	R1T	ST8601-13 φ4 L630 20kΩ (25℃)				
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-7 φ8 L1600 20kΩ (25℃)				
	Thermistor (Heat Exchanger)	R2T	ST8602A-7 φ6 L1600 20kΩ (25℃)				
Others	Float Switch	S1L	FS-0211B				
	Fuse	F1U	250V 5A φ5.2				
	Transformer	T1R	TR22H21R8				

Parts Name		Symbol	Model									Remark
			S-20 FM3	S-25 FM3	S-32 FM3	S-40 FM3	S-50 FM3	S-63 FM3	S-80 FM3	S-100 FM3	S-125 FM3	
Remote Controller	Wired Remote Controller		CZ-02RT11P									Option
	Wireless Remote Controller		CZ-01RWF12P									
Motors	Fan Motor	M1F	AC 220~240V 50Hz									
			1φ50W			1φ65W	1φ85W	1φ125 W	1φ225W			
			Thermal Fuse 152°C						Thermal protector 135°C : OFF    87°C : ON			
	Drain Pump	M1P	AC220-240V (50Hz) PLD-12230DM Thermal Fuse 145°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	ST8602A-6 φ6 L1250 20kΩ (25°C)									
Others	Float Switch	S1L	FS-0211B									
	Fuse	F1U	250V 5A φ5.2									
	Transformer	T1R	TR22H21R8									

Parts Name		Symbol	Model								Remark
			S-40 EM3	S-50 EM3	S-63 EM3	S-80 EM3	S-100 EM3	S-125 EM3	S-200 EM3	S-250 EM3	
Remote Controller	Wired Remote Controller		CZ-02RT11P								Option
	Wireless Remote Controller		CZ-01RWF12P								
Motors	Fan Motor	M1F	AC 220~240V 50Hz								
			1φ100W		1φ160W	1φ270W	1φ430W	1φ380Wx2			
			Thermal protector 135°C : OFF    87°C : ON								
	Capacitor for Fan Motor	C1R	5μ F-400V		7μ F 400V	10μ F 400V	8μ F 400V	10μ F 400V	12μ F 400V		
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-5 φ4 L1000 20kΩ (25°C)						ST8601A-13 φ4 L630		
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605A-4 φ8 L800 20kΩ (25°C)						ST8605A-5 φ8 L1000		
	Thermistor (Heat Exchanger)	R2T	ST8602A-4 φ6 L800 20kΩ (25°C)						ST8602A-6 φ6 L1250		
Others	Float switch	S1L	FS-0211								
	Fuse	F1U	250V 5A φ5.2		250V 10A φ5.2			250V 10A			
	Transformer	T1R	TR22H21R8								

Parts Name		Symbol	Model			Remark
			S-32TM3	S-63TM3	S-100TM3	
Remote Controller	Wired Remote Controller		CZ-02RT11P			Option
	Wireless Controller		CZ-01RWT12P			
Motors	Fan Motor	M1F	AC 220~240V/220V 50Hz/60Hz			
			1φ63W		1φ130W	
			Thermal protector 130°C : OFF 80°C : ON			
	Capacitor for Fan Motor	C1R	3.0μF-400V		9.0μF-400V	
	Swing Motor	M1S	MT8-L[3P058751-1] AC200~240V			
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-1 φ4 L250 20kΩ (25°C)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-6 φ8 L = 1250 20kΩ (25°C)		ST8605-6 φ8 L = 1250 20kΩ (25°C)	
	Thermistor (Heat Exchanger)	R2T	ST8602A-6 φ6 L = 1250 20kΩ (25°C)		ST8602A-6 φ6 L = 1250 20kΩ (25°C)	
Others	Fuse	F1U	250V 5A φ5.2			
	Transformer	T1R	TR22H21R8			

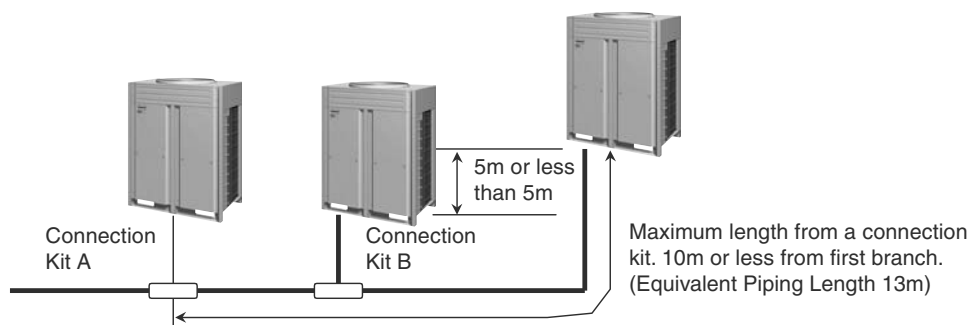
Parts Name		Symbol	Model						Remark
			S-20KM3	S-25KM3	S-32KM3	S-40KM3	S-50KM3	S-63KM3	
Remote Controller	Wired Remote Controller		CZ-02RT11P						Option
	Wireless Remote Controller		CZ-01RWK22P						Option
Motors	Fan Motor	M1F	AC 220~240V 50Hz						
			1φ40W			1φ43W			
			Thermal protector 130℃ : OFF    80℃ : ON						
	Swing Motor	M1S	MP24[3SB40333-1] AC200~240V			MSFBC20C21 [3SB40550-1] AC200~240V			
Thermistors	Thermistor (Suction Air)	R1T	ST8601-2 φ4 L400 20kΩ (25℃)						
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-2 φ8 L400 20kΩ (25℃)						
	Thermistor (for Heat Exchanger)	R2T	ST8602-2 φ6 L400 20kΩ (25℃)						
Others	Float Switch	S1L	OPTION						
	Fuse	F1U	250V 5A φ5.2						

Parts Name		Symbol	Model						Remark
			S-20PM3	S-25PM3	S-32PM3	S-40PM3	S-50PM3	S-63PM3	
Remote Controller	Wired Remote Controller		CZ-02RT11P						Option
	Wireless Remote Controller		CZ-01RWF12P						
Motors	Fan Motor	M1F	AC 220~240V 50Hz						
			1φ15W		1φ25W		1φ35W		
			Thermal protector 135℃ : OFF    120℃ : ON						
	Capacitor for Fan Motor	C1R	1.0μF-400V		0.5μF-400V	1.0μF-400V	1.5μF-400V	2.0μF-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	ST8602A-9 φ6 L2500 20kΩ (25℃)						
Others	Fuse	F1U	AC250V 5A						
	Transformer	T1R	TR22H21R8						

Parts Name		Symbol	Model						Remark
			S-20RM3	S-25RM3	S-32RM3	S-40RM3	S-50RM3	S-63RM3	
Remote Controller	Wired Remote Controller		CZ-02RT11P						Option
	Wireless Remote Controller		CZ-01RWF12P						
Motors	Fan Motor	M1F	AC 220~240V 50Hz						
			1φ15W		1φ25W		1φ35W		
			Thermal protector 135℃ : OFF    120℃ : ON						
	Capacitor for Fan Motor	C1R	1.0μF-400V		0.5μF-400V	1.0μF-400V	1.5μF-400V	2.0μF-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	ST8602A-9 φ6 L2500 20kΩ (25℃)						
Others	Fuse	F1U	AC250V 5A						
	Transformer	T1R	TR22H21R8						

## 4. Piping Installation Point

### 4.1 Piping Installation Point



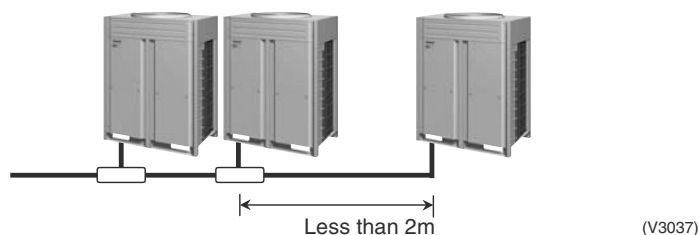
Since there is a possibility that oil may be collected on a stop machine side, install piping between outdoor units to go to level or go up to an outdoor unit, and to make a slope.

(V3036)

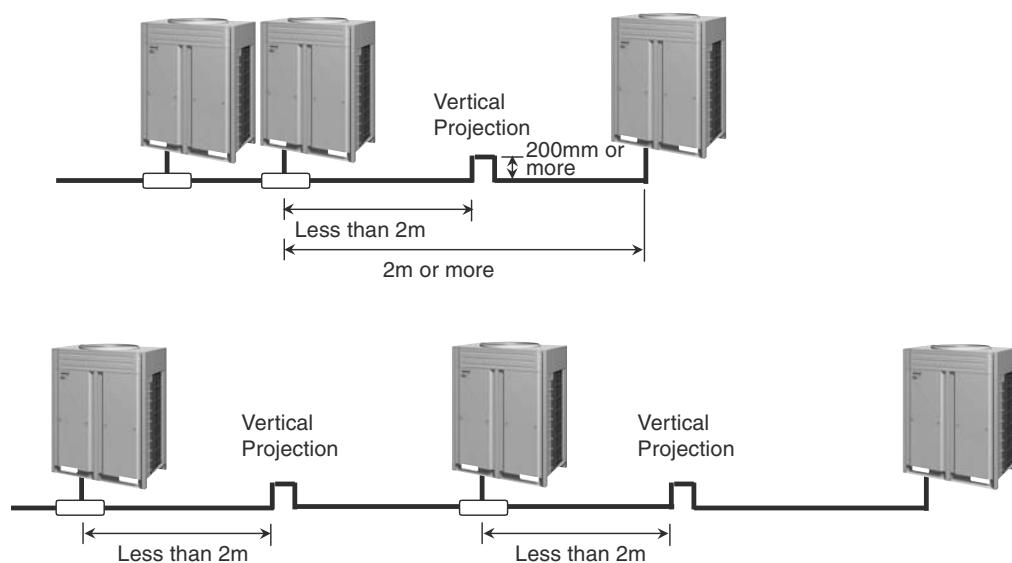
The projection part between multi connection piping kits

When the piping length between the multi connection kits or between multi connection kit and outdoor unit is 2m or more, prepare a vertical projection part (200mm or more as shown below) only on the gas pipe line location less than 2m from multi connection kit.

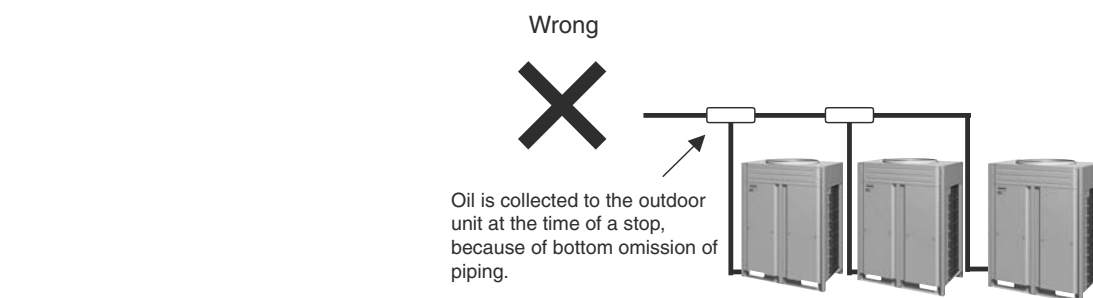
In the case of 2m or less



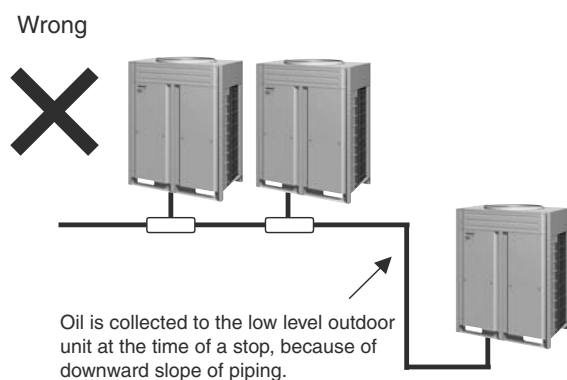
In the case of 2m or more



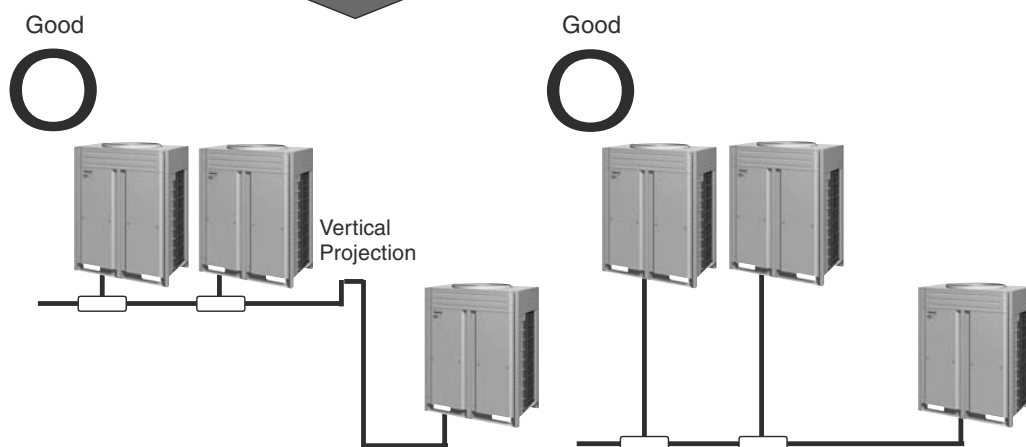
## 4.2 The Example of A Wrong Pattern



(V3039)



The example of installation on which oil is not collected.



(V3040)

Max.allowable Piping Length	Outdoor Unit - Multi Connection Piping Kit	Actual piping length 10m or less, equivalent length 13m or less
	Multi Connection Piping Kit - Indoor Unit	Actual piping length 165m or less, equivalent length 190m or less, the total extension 1000m or less
	BRANCH Joint - Indoor Unit	Actual piping length 40m or less (Refer to Page 363, 364 Note 2 in case of up to 90m)
Allowable Level Difference	Outdoor Unit - Outdoor Unit	5m or less
	Outdoor Unit - Indoor Unit	50m or less ★90m or less (when an outdoor unit is lower than indoor units: 40m or less in case of U-5MX4XPQ)
	Indoor Unit - Indoor Unit	15m or less





## Appendix

## \*Note 1

When the equivalent pipe length between outdoor and indoor units is 90m or more, the size of main pipes (both gas-side and liquid-side) must be increased. Depending on the length of the piping, the capacity may drop, but even in such case it is able to increase the size of main pipes.

## (Refer to figure 9)

1. Outdoor unit
2. Main pipes
3. Increase
4. The first refrigerant branch kit
5. Indoor unit

## ■ Diameter of above case

Model	Gas	Liquid	Model	Gas	Liquid	Model	Gas	Liquid	Model	Gas	Liquid
U-5MX4XPQ Type	φ19.1	Not Increased	U-20MX4XPQ Type	φ31.8*	φ19.1	U-34MX4XPQ Type	φ38.1*	φ22.2	U-48MX4XPQ Type	Not Increased	φ22.2
U-8MX4XPQ Type	φ22.2	φ12.7	U-22MX4XPQ Type	φ31.8*	φ19.1	U-36MX4XPQ Type	Not Increased	φ22.2	U-50MX4XPQ Type	Not Increased	φ22.2
U-10MX4XPQ Type	φ25.4*	φ12.7	U-24MX4XPQ Type	Not Increased	φ19.1	U-38MX4XPQ Type	Not Increased	φ22.2	U-52MX4XPQ Type	Not Increased	φ22.2
U-12MX4XPQ Type	Not Increased	φ15.9	U-26MX4XPQ Type	φ38.1*	φ22.2	U-40MX4XPQ Type	Not Increased	φ22.2	U-54MX4XPQ Type	Not Increased	φ22.2
U-14MX4XPQ Type	Not Increased	φ15.9	U-28MX4XPQ Type	φ38.1*	φ22.2	U-42MX4XPQ Type	Not Increased	φ22.2	*If available on the site, use this size. Otherwise, it can not be increased.		
U-16MX4XPQ Type	φ31.8*	φ15.9	U-30MX4XPQ Type	φ38.1*	φ22.2	U-44MX4XPQ Type	Not Increased	φ22.2			
U-18MX4XPQ Type	φ31.8*	φ19.1	U-32MX4XPQ Type	φ38.1*	φ22.2	U-46MX4XPQ Type	Not Increased	φ22.2			

## \*Note 2

Allowable length after the first refrigerant branch kit to indoor units is 40 m or less, however it can be extended up to 90 m if all the following conditions are satisfied. (In case of "Branch with BRANCH joint")

Required Conditions	Example Drawings
1. It is necessary to increase the pipe size between the first branch kit and the final branch kit. (Reducers must be procured on site) However, the pipes that are same pipe size with main pipe must not be increased.	<p>8 <math>b + c + d + e + f + g + p \leq 90 \text{ m}</math></p> <p>increase the pipe size as follows</p> <p>increase the pipe size of b, c, d, e, f, g</p> <p>φ 9.5 → φ12.7    φ15.9 → φ19.1    φ22.2 → φ25.4*    φ34.9 → φ38.1*</p> <p>φ12.7 → φ15.9    φ19.1 → φ22.2    φ28.6 → φ31.8*</p>
2. For calculation of Total extension length, the actual length of above pipes must be doubled. (except main pipe and the pipes that are not increased)	<p><math>a + b \times 2 + c \times 2 + d \times 2 + e \times 2 + f \times 2 + g \times 2</math></p> <p><math>+ h + i + j + k + l + m + n + p \leq 1000 \text{ m}</math></p> <p>Outdoor unit      BRANCH joint (A-G)</p>
3. Indoor unit to the nearest branch kit $\leq 40 \text{ m4}$ . The difference between [Outdoor unit to the farthest indoor unit] and [Outdoor unit to the nearest indoor unit]	<p>h, i, j, ..... <math>p \leq 40 \text{ m}</math></p> <p>The farthest indoor unit 8</p> <p>The nearest indoor unit 1</p> <p><math>(a + b + c + d + e + f + g + p) - (a + h) \leq 40 \text{ m}</math></p> <p>Indoor units (1 - 8)</p>

\*If available on the site, use this size. Otherwise it can not be increased.

## 6. Thermistor Resistance / Temperature Characteristics

Indoor unit	For air suction	R1T
	For liquid pipe	R2T
	For gas pipe	R3T

Outdoor unit for fin thermistor R1T

Outdoor unit	For outdoor air	R1T
	For coil	R2T
	For suction pipe	R4T
	For Receiver gas pipe	R5T
	For Receiver outlet liquid pipe	R6T

(kΩ)

T°C	0.0
-10	-
-8	-
-6	88.0
-4	79.1
-2	71.1
0	64.1
2	57.8
4	52.3
6	47.3
8	42.9
10	38.9
12	35.3
14	32.1
16	29.2
18	26.6
20	24.3
22	22.2
24	20.3
26	18.5
28	17.0
30	15.6
32	14.2
34	13.1
36	12.0
38	11.1
40	10.3
42	9.5
44	8.8
46	8.2
48	7.6
50	7.0
52	6.7
54	6.0
56	5.5
58	5.2
60	4.79
62	4.46
64	4.15
66	3.87
68	3.61
70	3.37
72	3.15
74	2.94
76	2.75
78	2.51
80	2.41
82	2.26
84	2.12
86	1.99
88	1.87
90	1.76
92	1.65
94	1.55
96	1.46
98	1.38

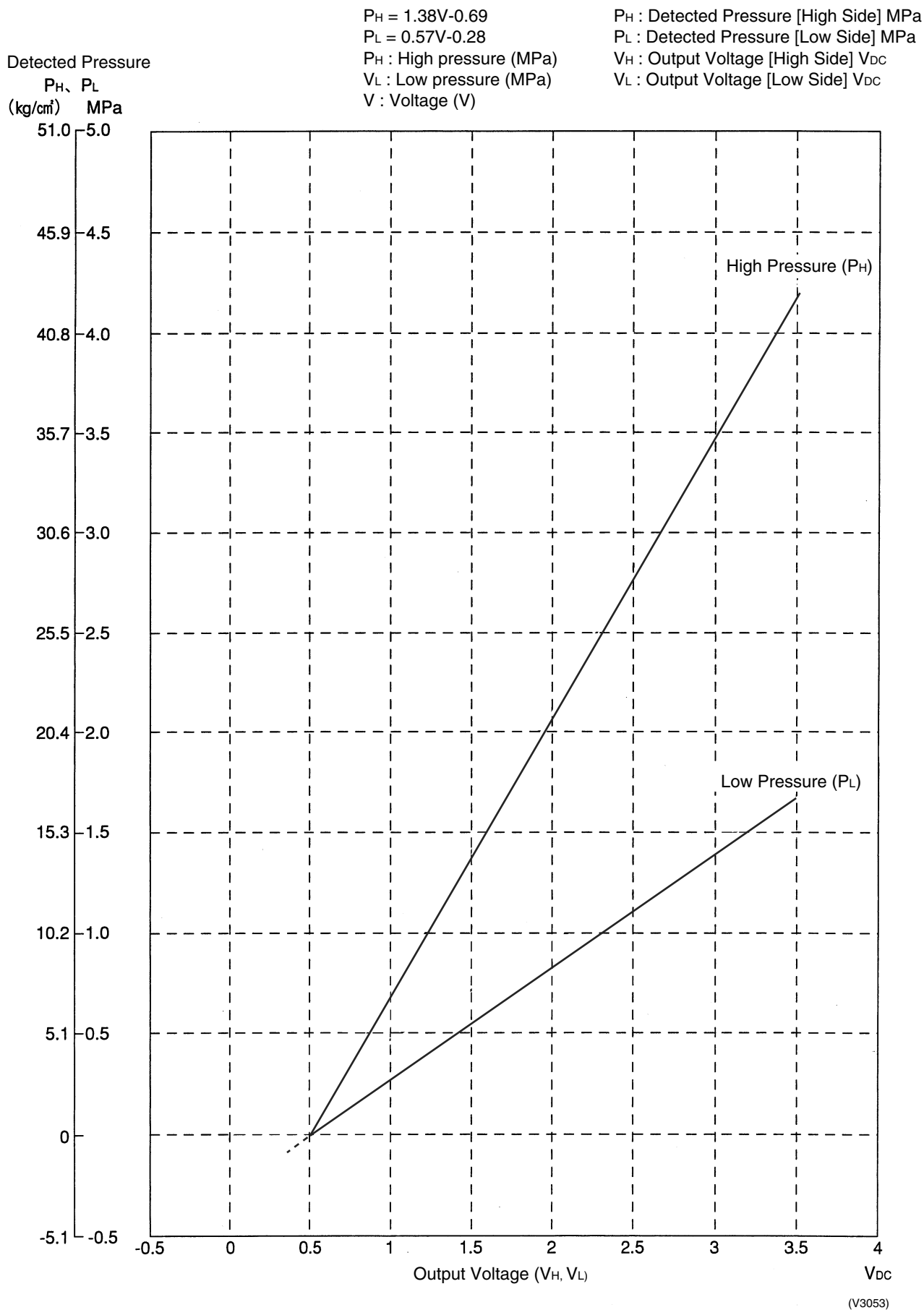
T°C	0.0	0.5
-20	197.81	192.08
-19	186.53	181.16
-18	175.97	170.94
-17	166.07	161.36
-16	156.80	152.38
-15	148.10	143.96
-14	139.94	136.05
-13	132.28	128.63
-12	125.09	121.66
-11	118.34	115.12
-10	111.99	108.96
-9	106.03	103.18
-8	100.41	97.73
-7	95.14	92.61
-6	90.17	87.79
-5	85.49	83.25
-4	81.08	78.97
-3	76.93	74.94
-2	73.01	71.14
-1	69.32	67.56
0	65.84	64.17
1	62.54	60.96
2	59.43	57.94
3	56.49	55.08
4	53.71	52.38
5	51.09	49.83
6	48.61	47.42
7	46.26	45.14
8	44.05	42.98
9	41.95	40.94
10	39.96	39.01
11	38.08	37.18
12	36.30	35.45
13	34.62	33.81
14	33.02	32.25
15	31.50	30.77
16	30.06	29.37
17	28.70	28.05
18	27.41	26.78
19	26.18	25.59
20	25.01	24.45
21	23.91	23.37
22	22.85	22.35
23	21.85	21.37
24	20.90	20.45
25	20.00	19.56
26	19.14	18.73
27	18.32	17.93
28	17.54	17.17
29	16.80	16.45
30	16.10	15.76

T°C	0.0	0.5
30	16.10	15.76
31	15.43	15.10
32	14.79	14.48
33	14.18	13.88
34	13.59	13.31
35	13.04	12.77
36	12.51	12.25
37	12.01	11.76
38	11.52	11.29
39	11.06	10.84
40	10.63	10.41
41	10.21	10.00
42	9.81	9.61
43	9.42	9.24
44	9.06	8.88
45	8.71	8.54
46	8.37	8.21
47	8.05	7.90
48	7.75	7.60
49	7.46	7.31
50	7.18	7.04
51	6.91	6.78
52	6.65	6.53
53	6.41	6.53
54	6.65	6.53
55	6.41	6.53
56	6.18	6.06
57	5.95	5.84
58	5.74	5.43
59	5.14	5.05
60	4.96	4.87
61	4.79	4.70
62	4.62	4.54
63	4.46	4.38
64	4.30	4.23
65	4.16	4.08
66	4.01	3.94
67	3.88	3.81
68	3.75	3.68
69	3.62	3.56
70	3.50	3.44
71	3.38	3.32
72	3.27	3.21
73	3.16	3.11
74	3.06	3.01
75	2.96	2.91
76	2.86	2.82
77	2.77	2.72
78	2.68	2.64
79	2.60	2.55
80	2.51	2.47

Outdoor Unit  
Thermistors for  
Discharge Pipe  
(R3T, R31~33T)

						(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

## 7. Pressure Sensor



## 8. Method of Checking The Inverter's Power Transistors and Diode Modules

### 8.1 Method of Checking The Inverter's Power Transistors and Diode Modules

#### Checking failures in power semiconductors mounted on inverter PC board

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

#### <Items to be prepared>

- Multiple tester : Prepare the analog type of multiple tester.  
For the digital type of multiple tester, those with diode check function are available for the checking.

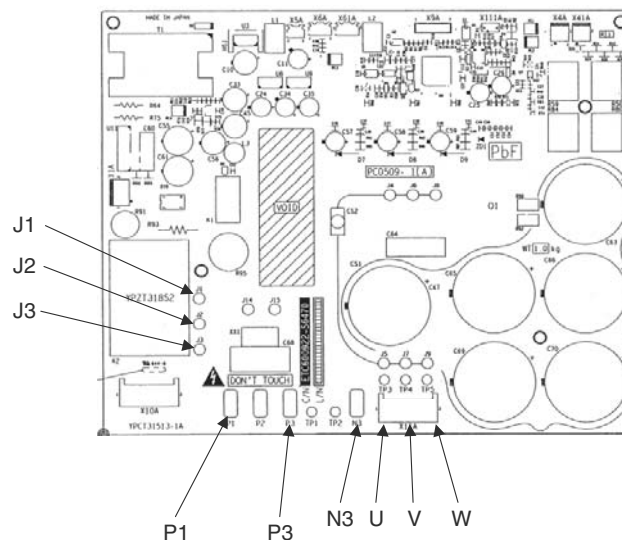
#### <Test points>

- Turn OFF the power supply. Then, after a lapse of 10 minutes or more, make measurement of resistance.

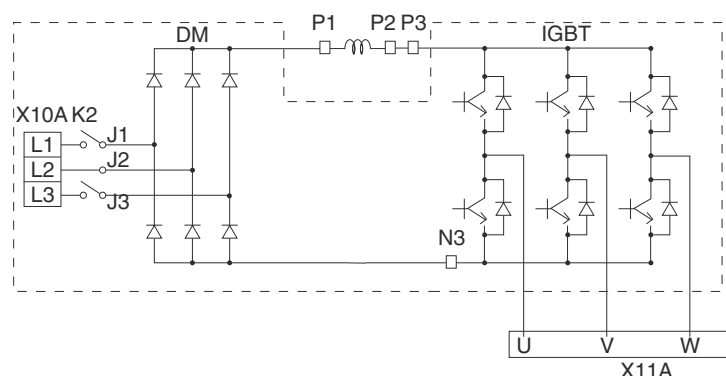
#### <Preparation>

- To make measurement, disconnect all connectors and terminals.

#### Inverter PC board



#### Electronic circuit



(V2895)

- According to the checking aforementioned, it is probed that the malfunction results from the faulty inverter. The following section describes supposed causes of the faulty inverter.
    - Faulty compressor (ground leakage)
    - Faulty fan motor (ground leakage)
    - Entry of conductive foreign particles
    - Abnormal voltage (e.g. overvoltage, surge (thunder), or unbalanced voltage)
- In order to replace the faulty inverter, be sure to check for the points aforementioned.

**1. Power module checking**

When using the analog type of multiple tester, make measurement in resistance measurement mode in the x1kΩ range.

No.	Measuring point		Criterion	Remark
	+	-		
1	P3	U	2 to 15kΩ	
2	P3	V		
3	P3	W		
4	U	P3	Not less than 15kΩ (including)	It may take time to determine the resistance due to capacitor charge or else.
5	V	P3		
6	W	P3		
7	N3	U		
8	N3	V		
9	N3	W	2 to 15kΩ	
10	U	N3		
11	V	N3		
12	W	N3		

When using the digital type of multiple tester, make measurement in diode check mode (  $\rightarrow|$  ).

No.	Measuring point		Criterion	Remark
	+	-		
1	P3	U	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
2	P3	V		
3	P3	W		
4	U	P3	0.3 to 0.7V	
5	V	P3		
6	W	P3		
7	N3	U		
8	N3	V		
9	N3	W	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
10	U	N3		
11	V	N3		
12	W	N3		

**2. Diode module checking**

When using the analog type of multiple tester, make measurement in resistance measurement mode in the x1kΩ range.

No.	Measuring point		Criterion	Remark
	+	-		
1	P1	J1	2 to 15kΩ	
2	P1	J2		
3	P1	J3		
4	J1	P1	Not less than 15kΩ (including)	It may take time to determine the resistance due to capacitor charge or else.
5	J2	P1		
6	J3	P1		
7	N3	J1		
8	N3	J2		
9	N3	J3	2 to 15kΩ	
10	J1	N3		
11	J2	N3		
12	J3	N3		

When using the digital type of multiple tester, make measurement in diode check mode (  $\rightarrow|$  ).

No.	Measuring point		Criterion	Remark
	+	-		
1	P1	J1	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
2	P1	J2		
3	P1	J3		
4	J1	P1	0.3 to 0.7V	
5	J2	P1		
6	J3	P1		
7	N3	J1		
8	N3	J2		
9	N3	J3	Not less than 1.2V (including)	It may take time to determine the voltage due to capacitor charge or else.
10	J1	N3		
11	J2	N3		
12	J3	N3		



# Part 8

## Precautions for New Refrigerant (R-410A)

1. Precautions for New Refrigerant (R-410A) .....	342
1.1 Outline .....	342
1.2 Refrigerant Cylinders.....	344
1.3 Service Tools.....	345

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

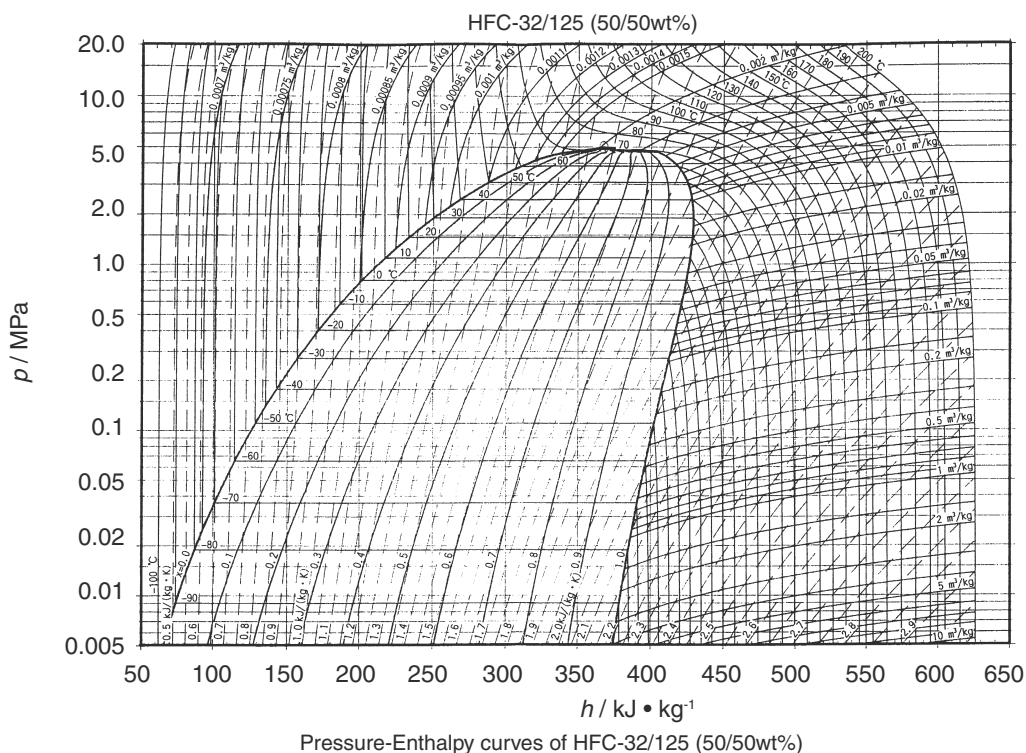
## 1.1 Outline

### 1.1.1 About Refrigerant R-410A

- Characteristics of new refrigerant, R-410A
  1. Performance  
Almost the same performance as R-22 and R-407C
  2. Pressure  
Working pressure is approx. 1.4 times more than R-22 and R-407C.
  3. Refrigerant composition  
Few problems in composition control, since it is a Quasi-azeotropic mixture refrigerant.

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

- ★1. Non-azeotropic mixture refrigerant: mixture of two or more refrigerants having different boiling points.
- ★2. Quasi-azeotropic mixture refrigerant: mixture of two or more refrigerants having similar boiling points.
- ★3. The design pressure is different at each product. Please refer to the installation manual for each product.  
(Reference) 1 MPa  $\doteq$  10.19716 kgf / cm<sup>2</sup>



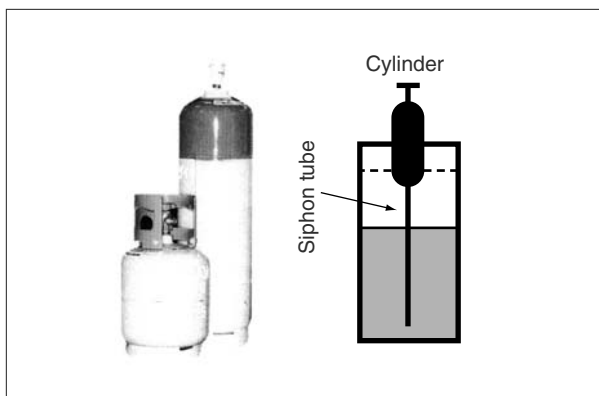
■ Thermodynamic characteristic of R-410A

DAIREP ver2.0

Temperature (°C)	Steam pressure (kPa)		Density (kg/m <sup>3</sup> )		Specific heat at constant pressure (kJ/kgK)		Specific enthalpy (kJ/kg)		Specific entropy (kJ/KgK)	
	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor
-70	36.13	36.11	1410.7	1.582	1.372	0.695	100.8	390.6	0.649	2.074
-68	40.83	40.80	1404.7	1.774	1.374	0.700	103.6	391.8	0.663	2.066
-66	46.02	45.98	1398.6	1.984	1.375	0.705	106.3	393.0	0.676	2.058
-64	51.73	51.68	1392.5	2.213	1.377	0.710	109.1	394.1	0.689	2.051
-62	58.00	57.94	1386.4	2.463	1.378	0.715	111.9	395.3	0.702	2.044
-60	64.87	64.80	1380.2	2.734	1.379	0.720	114.6	396.4	0.715	2.037
-58	72.38	72.29	1374.0	3.030	1.380	0.726	117.4	397.6	0.728	2.030
-56	80.57	80.46	1367.8	3.350	1.382	0.732	120.1	398.7	0.741	2.023
-54	89.49	89.36	1361.6	3.696	1.384	0.737	122.9	399.8	0.754	2.017
-52	99.18	99.03	1355.3	4.071	1.386	0.744	125.7	400.9	0.766	2.010
-51.58	101.32	101.17	1354.0	4.153	1.386	0.745	126.3	401.1	0.769	2.009
-50	109.69	109.51	1349.0	4.474	1.388	0.750	128.5	402.0	0.779	2.004
-48	121.07	120.85	1342.7	4.909	1.391	0.756	131.2	403.1	0.791	1.998
-46	133.36	133.11	1336.3	5.377	1.394	0.763	134.0	404.1	0.803	1.992
-44	146.61	146.32	1330.0	5.880	1.397	0.770	136.8	405.2	0.816	1.987
-42	160.89	160.55	1323.5	6.419	1.401	0.777	139.6	406.2	0.828	1.981
-40	176.24	175.85	1317.0	6.996	1.405	0.785	142.4	407.3	0.840	1.976
-38	192.71	192.27	1310.5	7.614	1.409	0.792	145.3	408.3	0.852	1.970
-36	210.37	209.86	1304.0	8.275	1.414	0.800	148.1	409.3	0.864	1.965
-34	229.26	228.69	1297.3	8.980	1.419	0.809	150.9	410.2	0.875	1.960
-32	249.46	248.81	1290.6	9.732	1.424	0.817	153.8	411.2	0.887	1.955
-30	271.01	270.28	1283.9	10.53	1.430	0.826	156.6	412.1	0.899	1.950
-28	293.99	293.16	1277.1	11.39	1.436	0.835	159.5	413.1	0.911	1.946
-26	318.44	317.52	1270.2	12.29	1.442	0.844	162.4	414.0	0.922	1.941
-24	344.44	343.41	1263.3	13.26	1.448	0.854	165.3	414.9	0.934	1.936
-22	372.05	370.90	1256.3	14.28	1.455	0.864	168.2	415.7	0.945	1.932
-20	401.34	400.06	1249.2	15.37	1.461	0.875	171.1	416.6	0.957	1.927
-18	432.36	430.95	1242.0	16.52	1.468	0.886	174.1	417.4	0.968	1.923
-16	465.20	463.64	1234.8	17.74	1.476	0.897	177.0	418.2	0.980	1.919
-14	499.91	498.20	1227.5	19.04	1.483	0.909	180.0	419.0	0.991	1.914
-12	536.58	534.69	1220.0	20.41	1.491	0.921	182.9	419.8	1.003	1.910
-10	575.26	573.20	1212.5	21.86	1.499	0.933	185.9	420.5	1.014	1.906
-8	616.03	613.78	1204.9	23.39	1.507	0.947	189.0	421.2	1.025	1.902
-6	658.97	656.52	1197.2	25.01	1.516	0.960	192.0	421.9	1.036	1.898
-4	704.15	701.49	1189.4	26.72	1.524	0.975	195.0	422.6	1.048	1.894
-2	751.64	748.76	1181.4	28.53	1.533	0.990	198.1	423.2	1.059	1.890
0	801.52	798.41	1173.4	30.44	1.543	1.005	201.2	423.8	1.070	1.886
2	853.87	850.52	1165.3	32.46	1.552	1.022	204.3	424.4	1.081	1.882
4	908.77	905.16	1157.0	34.59	1.563	1.039	207.4	424.9	1.092	1.878
6	966.29	962.42	1148.6	36.83	1.573	1.057	210.5	425.5	1.103	1.874
8	1026.5	1022.4	1140.0	39.21	1.584	1.076	213.7	425.9	1.114	1.870
10	1089.5	1085.1	1131.3	41.71	1.596	1.096	216.8	426.4	1.125	1.866
12	1155.4	1150.7	1122.5	44.35	1.608	1.117	220.0	426.8	1.136	1.862
14	1224.3	1219.2	1113.5	47.14	1.621	1.139	223.2	427.2	1.147	1.859
16	1296.2	1290.8	1104.4	50.09	1.635	1.163	226.5	427.5	1.158	1.855
18	1371.2	1365.5	1095.1	53.20	1.650	1.188	229.7	427.8	1.169	1.851
20	1449.4	1443.4	1085.6	56.48	1.666	1.215	233.0	428.1	1.180	1.847
22	1530.9	1524.6	1075.9	59.96	1.683	1.243	236.4	428.3	1.191	1.843
24	1615.8	1609.2	1066.0	63.63	1.701	1.273	239.7	428.4	1.202	1.839
26	1704.2	1697.2	1055.9	67.51	1.721	1.306	243.1	428.6	1.214	1.834
28	1796.2	1788.9	1045.5	71.62	1.743	1.341	246.5	428.6	1.225	1.830
30	1891.9	1884.2	1034.9	75.97	1.767	1.379	249.9	428.6	1.236	1.826
32	1991.3	1983.2	1024.1	80.58	1.793	1.420	253.4	428.6	1.247	1.822
34	2094.5	2086.2	1012.9	85.48	1.822	1.465	256.9	428.4	1.258	1.817
36	2201.7	2193.1	1001.4	90.68	1.855	1.514	260.5	428.3	1.269	1.813
38	2313.0	2304.0	989.5	96.22	1.891	1.569	264.1	428.0	1.281	1.808
40	2428.4	2419.2	977.3	102.1	1.932	1.629	267.8	427.7	1.292	1.803
42	2548.1	2538.6	964.6	108.4	1.979	1.696	271.5	427.2	1.303	1.798
44	2672.2	2662.4	951.4	115.2	2.033	1.771	275.3	426.7	1.315	1.793
46	2800.7	2790.7	937.7	122.4	2.095	1.857	279.2	426.1	1.327	1.788
48	2933.7	2923.6	923.3	130.2	2.168	1.955	283.2	425.4	1.339	1.782
50	3071.5	3061.2	908.2	138.6	2.256	2.069	287.3	424.5	1.351	1.776
52	3214.0	3203.6	892.2	147.7	2.362	2.203	291.5	423.5	1.363	1.770
54	3361.4	3351.0	875.1	157.6	2.493	2.363	295.8	422.4	1.376	1.764
56	3513.8	3503.5	856.8	168.4	2.661	2.557	300.3	421.0	1.389	1.757
58	3671.3	3661.2	836.9	180.4	2.883	2.799	305.0	419.4	1.403	1.749
60	3834.1	3824.2	814.9	193.7	3.191	3.106	310.0	417.6	1.417	1.741
62	4002.1	3992.7	790.1	208.6	3.650	3.511	315.3	415.5	1.433	1.732
64	4175.7	4166.8	761.0	225.6	4.415	4.064	321.2	413.0	1.450	1.722

## 1.2 Refrigerant Cylinders

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



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

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

- Handling of cylinders

- (1) Laws and regulations

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

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

- (2) Handling of vessels

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

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

- (3) Storage

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

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

## 1.3 Service Tools

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

Be sure to use dedicated tools and devices.

### ■ Tool compatibility

Tool	Compatibility			Reasons for change
	HFC		HCFC	
	R-410A	R-407C	R-22	
Gauge manifold Charge hose	×			<ul style="list-style-type: none"> <li>Do not use the same tools for R-22 and R-410A.</li> <li>Thread specification differs for R-410A and R-407C.</li> </ul>
Charging cylinder	×		○	<ul style="list-style-type: none"> <li>Weighting instrument used for HFCs.</li> </ul>
Gas detector	○		×	<ul style="list-style-type: none"> <li>The same tool can be used for HFCs.</li> </ul>
Vacuum pump (pump with reverse flow preventive function)	○			<ul style="list-style-type: none"> <li>To use existing pump for HFCs, vacuum pump adapter must be installed.</li> </ul>
Weighting instrument	○			
Charge mouthpiece	×			<ul style="list-style-type: none"> <li>Seal material is different between R-22 and HFCs.</li> <li>Thread specification is different between R-410A and others.</li> </ul>
Flaring tool (Clutch type)	○			<ul style="list-style-type: none"> <li>For R-410A, flare gauge is necessary.</li> </ul>
Torque wrench	○			<ul style="list-style-type: none"> <li>Torque-up for 1/2 and 5/8</li> </ul>
Pipe cutter	○			
Pipe expander	○			
Pipe bender	○			
Pipe assembling oil	×			<ul style="list-style-type: none"> <li>Due to refrigerating machine oil change. (No Suniso oil can be used.)</li> </ul>
Refrigerant recovery device	Check your recovery device.			
Refrigerant piping	See the chart below.			<ul style="list-style-type: none"> <li>Only φ19.1 is changed to 1/2H material while the previous material is "O".</li> </ul>

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

### ■ Copper tube material and thickness

Pipe size	Ve-up		Ve-upII	
	R-407C		R-410A	
	Material	Thickness t (mm)	Material	Thickness t (mm)
φ6.4	O	0.8	O	0.8
φ9.5	O	0.8	O	0.8
φ12.7	O	0.8	O	0.8
φ15.9	O	1.0	O	1.0
φ19.1	O	1.0	1/2H	1.0
φ22.2	1/2H	1.0	1/2H	1.0
φ25.4	1/2H	1.0	1/2H	1.0
φ28.6	1/2H	1.0	1/2H	1.0
φ31.8	1/2H	1.2	1/2H	1.1
φ38.1	1/2H	1.4	1/2H	1.4
φ44.5	1/2H	1.6	1/2H	1.6

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

## 1. Flaring tool



### ■ Specifications

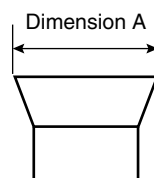
- Dimension A

Unit:mm

Nominal size	Tube O.D.	A <sup>+0</sup> <sub>-0.4</sub>	
		Class-2 (R-410A)	Class-1 (Conventional)
1/4	6.35	9.1	9.0
3/8	9.52	13.2	13.0
1/2	12.70	16.6	16.2
5/8	15.88	19.7	19.4
3/4	19.05	24.0	23.3

### ■ Differences

- Change of dimension A



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

Conventional flaring tools can be used when the work process is changed.

(change of work process)

Previously, a pipe extension margin of 0 to 0.5mm was provided for flaring. For R-410A air conditioners, perform pipe flaring with a pipe extension margin of 1.0 to 1.5mm.

(For clutch type only)

Conventional tool with pipe extension margin adjustment can be used.

## 2. Torque wrench



### ■ Specifications

#### • Dimension B

Unit:mm

Nominal size	Class-1	Class-2	Previous
1/2	24	26	24
5/8	27	29	27

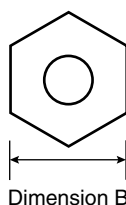
No change in tightening torque

No change in pipes of other sizes

### ■ Differences

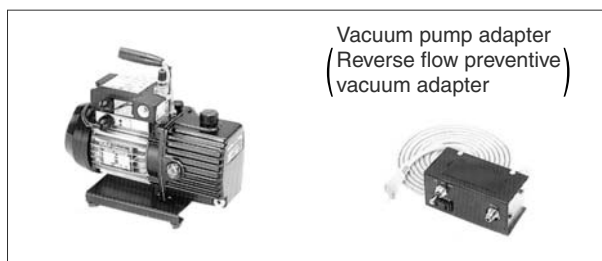
#### • Change of dimension B

Only 1/2", 5/8" are extended



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

## 3. Vacuum pump with check valve



Vacuum pump adapter  
(Reverse flow preventive)  
vacuum adapter

### ■ Specifications

- Discharge speed  
50 l/min (50Hz)  
60 l/min (60Hz)
- Suction port UNF7/16-20(1/4 Flare)  
UNF1/2-20(5/16 Flare) with adapter

#### ● Maximum degree of vacuum

Select a vacuum pump which is able to keep the vacuum degree of the system in excess of -100.7 kPa (5 torr - 755 mmHg).

### ■ Differences

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

#### 4. Leak tester



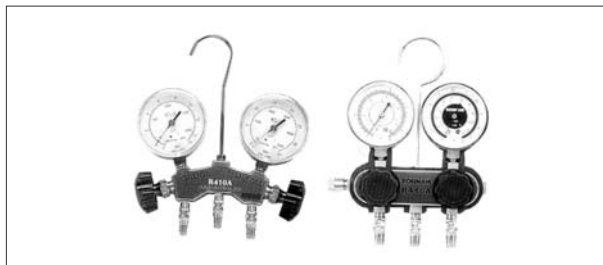
- Specifications
  - Hydrogen detecting type, etc.
  - Applicable refrigerants  
R-410A, R-407C, R-404A, R-507A, R-134a, etc.
- Differences
  - Previous testers detected chlorine. Since HFCs do not contain chlorine, new tester detects hydrogen.

#### 5. Refrigerant oil (Air compal)



- Specifications
  - Contains synthetic oil, therefore it can be used for piping work of every refrigerant cycle.
  - Offers high rust resistance and stability over long period of time.
- Differences
  - Can be used for R-410A and R-22 units.

#### 6. Gauge manifold for R-410A



- Specifications
  - High pressure gauge
    - 0.1 to 5.3 MPa (-76 cmHg to 53 kg/cm<sup>2</sup>)
  - Low pressure gauge
    - 0.1 to 3.8 MPa (-76 cmHg to 38 kg/cm<sup>2</sup>)
  - 1/4" → 5/16" (2min → 2.5min)
  - No oil is used in pressure test of gauges.
    - For prevention of contamination



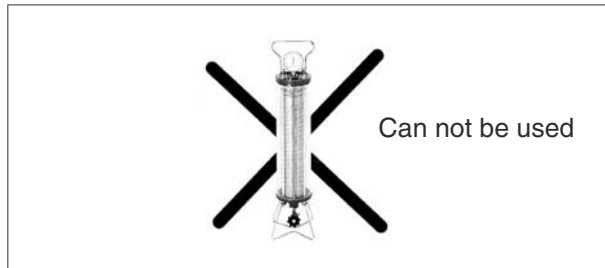
- Temperature scale indicates the relationship between pressure and temperature in gas saturated state.
- Differences
  - Change in pressure
  - Change in service port diameter

## 7. Charge hose for R-410A



- Specifications
  - Working pressure 5.08 MPa (51.8 kg/cm<sup>2</sup>)
  - Rupture pressure 25.4 MPa (259 kg/cm<sup>2</sup>)
  - Available with and without hand-operate valve that prevents refrigerant from outflow.
- Differences
  - Pressure proof hose
  - Change in service port diameter
  - Use of nylon coated material for HFC resistance

## 8. Charging cylinder



- Specifications
  - Use weigher for refrigerant charge listed below to charge directly from refrigerant cylinder.
- Differences
  - The cylinder can not be used for mixed refrigerant since mixing ratio is changed during charging.

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

### 9. Weigher for refrigerant charge



- Specifications
  - High accuracy
    - TA101A (for 10-kg cylinder) =  $\pm 2\text{g}$
    - TA101B (for 20-kg cylinder) =  $\pm 5\text{g}$
  - Equipped with pressure-resistant sight glass to check liquid refrigerant charging.
  - A manifold with separate ports for HFCs and previous refrigerants is equipped as standard accessories.
- Differences
  - Measurement is based on weight to prevent change of mixing ratio during charging.

### 10. Charge mouthpiece



- Specifications
  - For R-410A, 1/4"  $\rightarrow$  5/16" (2min  $\rightarrow$  2.5min)
  - Material is changed from CR to H-NBR.
- Differences
  - Change of thread specification on hose connection side (For the R-410A use)
  - Change of sealer material for the HFCs use.

# Index

<b>A</b>		
A0 .....	205	
A1 .....	206	
A3 .....	207	
A6 .....	209	
A7 .....	210	
A9 .....	212	
Abnormal Discharge Pipe Temperature .....	233	
Abnormal Outdoor Fan Motor Signal .....	235	
About Refrigerant R-410A .....	342	
Actuation of High Pressure Switch .....	221	
Actuation of Low Pressure Sensor .....	223	
Address Duplication of Centralized Controller .....	275	
Address Duplication, Improper Setting .....	287	
AF .....	214	
AJ .....	215	
Applicable range of Field setting .....	151	
Auto Restart after Power Failure Reset .....	153	
<b>B</b>		
Basic Control .....	82	
<b>C</b>		
C4 .....	216	
C5 .....	217	
C9 .....	218	
Centralized Control Group No. Setting .....	155	
Check No. 2 .....	296	
Check Operation not executed .....	265	
CJ .....	219	
Compressor Motor Overcurrent/Lock .....	227	
Compressor PI Control .....	83	
Contents of Control Modes .....	157	
Cool / Heat Mode Switching .....	171	
Current Sensor Malfunction .....	237	
<b>D</b>		
Defrosting Operation .....	101	
Demand Operation .....	116	
Detailed Explanation of Setting Modes .....	152	
Discharge Pipe Protection Control .....	108	
Display "Under Centralized Control" Blinks (Repeats Double Blink) .....	295	
Display "Under Centralized Control" Blinks (Repeats Single Blink) .....	292	
Drain Level above Limit .....	214	
Drain Pump Control .....	117	
<b>E</b>		
E1 .....	220	
E3 .....	221	
E4 .....	223	
E5 .....	225	
E6 .....	227	
E7 .....	228	
E9 .....	231	
Electronic Expansion Valve PI Control .....	95	
Emergency Operation .....	112	
Error of External Protection Device .....	205	
<b>F</b>		
F3 .....	233	
F6 .....	234	
Fan Motor (M1F) Lock, Overload .....	209	
Faulty Field Setting after Replacing Main PC Board or Faulty Combination of PC Board .....	259	
Field Setting .....	147	
Field Setting from Outdoor Unit .....	159	
List of Field Setting Items .....	159	
Setting by pushbutton switches .....	163	
Field Setting from Remote Controller .....	147	
Filter Sign Setting .....	152	
Freeze Prevention .....	124	
Functional Parts Layout .....	58	
U-10MX4XPQ, U-12MX4XPQ .....	60	
U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ .....	61	
U-5MX4XPQ .....	58	
U-8MX4XPQ .....	59	
<b>H</b>		
H7 .....	235	
H9 .....	236	
Heating Operation Prohibition .....	116	
High Pressure Protection Control .....	106	
<b>I</b>		
Improper Combination of Indoor and Outdoor Units, Indoor Units and Remote Controller .....	273	
Improper Combination of Optional Controllers for Centralized Control .....	285	
Injection Control (only for U-5MX4XPQ) .....	110	
Inverter Compressor Abnormal .....	247	
Inverter Compressor Motor Lock .....	225	
Inverter Current Abnormal .....	249	
Inverter Over-Ripple Protection .....	256	
Inverter Protection Control .....	109	
Inverter Start up Error .....	251	
<b>J</b>		
J2 .....	237	
J3 .....	238	
J5 .....	239	
J6 .....	240	
J7 .....	241	
J9 .....	242	
JA .....	243	
JC .....	244	
<b>L</b>		
L4 .....	245	

L5 .....	247
L8 .....	249
L9 .....	251
LC .....	253
List of Electrical and Functional Parts .....	323
Indoor Unit .....	326
Outdoor Unit .....	323
Louver Control for Preventing Ceiling Dirt .....	119
Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure .....	260
Low Pressure Protection Control .....	107

## M

M1 .....	282
M8 .....	283
MA .....	285
Malfunction code indication by outdoor unit PC board .....	201
Malfunction of Capacity Determination Device .....	215
Malfunction of Discharge Pipe Thermistor (R3, R31~33T) .....	238
Malfunction of Drain Level Control System (S1L) .....	207
Malfunction of High Pressure Sensor .....	243
Malfunction of Inverter Radiating Fin Temperature Rise .....	245
Malfunction of Inverter Radiating Fin Temperature Rise Sensor .....	257
Malfunction of Liquid Pipe Thermistor (R6T) .....	241
Malfunction of Low Pressure Sensor .....	244
Malfunction of Moving Part of Electronic Expansion Valve (Y1E) .....	212
Malfunction of Moving Part of Electronic Expansion Valve (Y1E, Y2E) .....	231
Malfunction of Outdoor Unit Fan Motor .....	228
Malfunction of Subcooling Heat Exchanger Gas Pipe Thermistor (R5T) .....	242
Malfunction of Swing Flap Motor (M1S) .....	210
Malfunction of System, Refrigerant System Address Undefined .....	280
Malfunction of Thermistor (R1T) for Suction Air .....	218
Malfunction of Thermistor (R2T) for Heat Exchanger .....	216
Malfunction of Thermistor (R2T), (R7T) for Suction Pipe .....	239
Malfunction of Thermistor (R3T) for Gas Pipes .....	217
Malfunction of Thermistor (R4T) for Outdoor Unit Heat Exchanger .....	240
Malfunction of Thermostat Sensor in Remote Controller .....	219
Malfunction of Transmission Between Centralized Controller and Indoor Unit .....	276
Malfunction of Transmission Between Indoor and Outdoor Units in the Same System .....	272
Malfunction of Transmission Between Indoor Units .....	266
Malfunction of Transmission Between Inverter and Control PC Board .....	253
Malfunction of Transmission Between Main and Sub Remote Controllers .....	271

Malfunction of Transmission Between Optional Controllers for Centralized Control .....	283
Malfunction of Transmission Between Outdoor Units .....	269
Malfunction of Transmission Between Remote Controller and Indoor Unit .....	268
MC .....	287
Method of Checking The Inverter's Power Transistors and Diode Modules .....	339

## O

Oil Return Operation .....	99
Operation Lamp Blinks .....	290
Operation Mode .....	81
Operation When Power is Turned On .....	145
Other Control .....	111
Outdoor Unit Fan Control in Cooling Operation .....	96
Outdoor Unit PC Board Layout .....	146
Outdoor Unit Rotation .....	111
Outdoor Unit Thermistors for Discharge Pipe .....	337

## P

P1 .....	256
P4 .....	257
PC Board Defect .....	206, 220, 282
Piping Installation Point .....	331
The Example of A Wrong Pattern .....	332
PJ .....	259
Power Supply Insufficient or Instantaneous Failure .....	262
Precautions for New Refrigerant (R-410A) .....	342
Pressure Sensor .....	338
Procedure and Outline .....	131
Protection Control .....	106
Pump-down Residual Operation .....	102

## R

Refrigerant Circuit .....	50
U-10MX4XPQ, U-12MX4XPQ .....	54
U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ .....	56
U-5MX4XPQ .....	50
U-8MX4XPQ .....	52
Refrigerant Cylinders .....	344
Refrigerant Flow for Each Operation Mode .....	62
U-10MX4XPQ, U-12MX4XPQ .....	70
U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ .....	74
U-5MX4XPQ .....	62
U-8MX4XPQ .....	66
Refrigerant Overcharged .....	234
Restart Standby .....	103
Reverse Phase, Open Phase .....	261

## S

Selection of Pipe Size, Joints and Header .....	332
Service Tools .....	345
Setting by pushbutton switches .....	163
Setting Contents and Code No. .....	150
Setting of Low Noise Operation and Demand Operation .....	176
Special Control .....	97

Specifications .....	12
Indoor Units .....	30
Outdoor Units .....	12
Standby .....	103
Startup Control .....	97
STD Compressor Overload Protection .....	110
Step Control of Outdoor Unit Fans .....	95
Stopping Operation .....	104
Symptom-based Troubleshooting .....	187
System is not Set yet .....	279

## T

Test Operation .....	130
Procedure and Outline .....	131
The Example of A Wrong Pattern .....	332
Thermistor Resistance /	
Temperature Characteristics .....	336
Thermostat Sensor in Remote Controller .....	120
Troubleshooting	
(OP: Central Remote Controller) .....	282
Troubleshooting	
(OP: Unified ON/OFF Controller) .....	290

## U

U0 .....	260
U1 .....	261
U2 .....	262
U3 .....	265
U4 .....	266
U5 .....	268
U7 .....	269
U8 .....	271
U9 .....	272
UA .....	273
UC .....	275
UE .....	276
UF .....	279
UH .....	280



# Drawings & Flow Charts

## A

Abnormal Discharge Pipe Temperature .....	233
Abnormal Outdoor Fan Motor Signal .....	235
Actuation of High Pressure Switch .....	221
Actuation of Low Pressure Sensor .....	223
Address Duplication of Centralized Controller .....	275
Address Duplication, Improper Setting .....	287

## C

Centralized Control Group No. Setting .....	155
CZ-01/02RW Type .....	156
CZ-02 RT Type .....	155
Group No. Setting Example .....	156
Check No. 1 .....	296
Check No. 2 .....	296
Check Operation not executed .....	265
Compressor Motor Overcurrent/Lock .....	227
Contents of Control Modes .....	157
How to Select Operation Mode .....	158
Control of Outdoor Air Processing Unit (Unique Control for Outdoor Air Processing Unit)	
Discharge Air Temperature Control .....	126
Current Sensor Malfunction .....	237

## D

Display "Under Centralized Control" Blinks (Repeats Double Blink) .....	295
Display "Under Centralized Control" Blinks (Repeats Single Blink) .....	292
Display of sensor and address data .....	197
Drain Level above Limit .....	214
Drain Pump Control .....	117
When the Float Switch is Tripped and "AF" is Displayed on the Remote Controller .....	118
When the Float Switch is Tripped During Heating Operation .....	118
When the Float Switch is Tripped while the Cooling Thermostat is OFF 117	
When the Float Switch is Tripped While the Cooling Thermostat is ON .....	117

## E

Error of External Protection Device .....	205
Example of connection (R-410A Type) .....	333

## F

Fan Motor (M1F) Lock, Overload .....	209
Faulty Field Setting after Replacing Main PC Board or Faulty Combination of PC Board .....	259
Field Setting from Outdoor Unit .....	159
Mode changing procedure .....	163
Setting by dip switches .....	161
Freeze Prevention .....	124

Functional Parts Layout .....	58
-------------------------------	----

## I

Improper Combination of Indoor and Outdoor Units, Indoor Units and Remote Controller .....	273
Improper Combination of Optional Controllers for Centralized Control .....	285
Inverter Compressor Abnormal .....	247
Inverter Compressor Motor Lock .....	225
Inverter Current Abnormal .....	249
Inverter Over-Ripple Protection .....	256
Inverter Start up Error .....	251

## L

Louver Control for Preventing Ceiling Dirt .....	119
Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure .....	260

## M

Malfunction of Capacity Determination Device ...	215
Malfunction of Discharge Pipe Thermistor (R3, R31~33T) .....	238
Malfunction of Drain Level Control System (S1L) .....	207
Malfunction of High Pressure Sensor .....	243
Malfunction of Inverter Radiating Fin Temperature Rise .....	245
Malfunction of Inverter Radiating Fin Temperature Rise Sensor .....	257
Malfunction of Liquid Pipe Thermistor (R6T) .....	241
Malfunction of Low Pressure Sensor .....	244
Malfunction of Moving Part of Electronic Expansion Valve (Y1E) .....	212
Malfunction of Moving Part of Electronic Expansion Valve (Y1E, Y2E) .....	231
Malfunction of Outdoor Unit Fan Motor .....	228
Malfunction of Subcooling Heat Exchanger Gas Pipe Thermistor (R5T) .....	242
Malfunction of Swing Flap Motor (M1S) .....	210
Malfunction of System, Refrigerant System Address Undefined .....	280
Malfunction of Thermistor (R1T) for Outdoor Air .....	236
Malfunction of Thermistor (R1T) for Suction Air .....	218
Malfunction of Thermistor (R2T) for Heat Exchanger .....	216
Malfunction of Thermistor (R2T), (R7T) for Suction Pipe .....	239
Malfunction of Thermistor (R3T) for Gas Pipes .....	217
Malfunction of Thermistor (R4T) for Outdoor Unit Heat Exchanger .....	240
Malfunction of Thermostat Sensor in Remote Controller .....	219

Malfunction of Transmission Between Centralized Controller and Indoor Unit .....	276	Torque wrench .....	347
Malfunction of Transmission Between Indoor and Outdoor Units in the Same System .....	272	Troubleshooting (OP: Central Remote Controller) .....	282
Malfunction of Transmission Between Indoor Units .....	266	Troubleshooting (OP: Unified ON/OFF Controller) .....	290
Malfunction of Transmission Between Inverter and Control PC Board .....	253	Troubleshooting by Remote Controller .....	190
Malfunction of Transmission Between Main and Sub Remote Controllers .....	271	<b>U</b>	
Malfunction of Transmission Between Optional Controllers for Centralized Control .....	283	U-10MX4XPQ, U-12MX4XPQ .....	60
Malfunction of Transmission Between Outdoor Units .....	269	U-14MX4XPQ, U-16MX4XPQ, U-18MX4XPQ .....	61
Malfunction of Transmission Between Remote Controller and Indoor Unit .....	268	U-5MX4XPQ .....	58
Method of Checking The Inverter's Power Transistors and Diode Modules .....	339	U-8MX4XPQ .....	59
<b>O</b>		<b>W</b>	
Operation Lamp Blinks .....	290	Weigher for refrigerant charge .....	350
Operation of The Remote Controller's Inspection / Test Operation Button .....	195	Wired Remote Controller .....	147
Outdoor Unit PC Board Layout .....	146	Wireless Remote Controller - Indoor Unit .....	148
<b>P</b>		CZ-01/02RW type .....	148
PC Board Defect .....	206, 220, 282	Wiring Diagrams for Reference .....	305
Piping Diagrams .....	300	Field Wiring .....	309
Indoor Unit .....	304	Indoor Unit .....	312
Outdoor Unit .....	300	Outdoor Unit .....	305
Piping Installation Point .....	331		
The Example of A Wrong Pattern .....	332		
Power Supply Insufficient or Instantaneous Failure .....	262		
Pressure Sensor .....	338		
<b>R</b>			
Refrigerant Flow for Each Operation Mode .....	62		
Refrigerant Overcharged .....	234		
Remote Controller Self-Diagnosis Function .....	198		
Remote Controller Service Mode .....	196		
Reverse Phase, Open Phase .....	261		
<b>S</b>			
Self-diagnosis by Wired Remote Controller .....	191		
Self-diagnosis by Wireless Remote Controller .....	192		
Setting of Low Noise Operation and Demand Operation .....	176		
Image of operation in the case of A .....	177, 179		
Image of operation in the case of A and B .....	177, 179		
Image of operation in the case of B .....	177, 179		
Simplified Remote Controller .....	149		
CZ-02RE Type .....	149		
System is not Set yet .....	279		
<b>T</b>			
Test Operation .....	130		
Thermostat Sensor in Remote Controller .....	120		
Cooling .....	120		
Heating .....	121		



- For further improvement, specifications or designs are subject to change without prior notice

**Contact Details:**

E mail: [aircon.info@panasonic.co.uk](mailto:aircon.info@panasonic.co.uk)  
Telephone: 01344 476599  
[www.panasonic.co.uk](http://www.panasonic.co.uk)

**Address:**

Panasonic Air Conditioning  
Panasonic House  
Willoughby Road, Bracknell  
Berks, RG12 8FP

