

# Service Manual

## **SUPER MULTI *PLUS*** **J Series**



### [Applied Models]

- Super Multi Plus : Cooling Only
- Super Multi Plus : Heat Pump

# Super Multi Plus J Series

## ●Heat Pump

### Indoor Unit

FTX25JVEA9	FTXD50JVEA9	CDX25HAVEA	FLX25HVEA	FHYC35KVE9
FTX35JVEA9	FTXD60JVEA	CDX35HAVEA	FLX35HVEA	FHYC50KVE9
FTX25JVEC	FTXD71JVEA	CDX50HAVEA	FLX50JVEA9	FHYC60KVE9
FTX35JVEC	FTX50HVEC	CDX60HAVEA	FLX60JVEA	FHYC71KVE9
FTX25JAVET	FTX60HVEC	CDX25HAVEC	FLX25HVEC	FHYC35KV1C9
FTX35JAVET	FTXD50JVET	CDX35HAVEC	FLX35HVEC	FHYC50KV1C9
FTX25JAV1NB	FTXD60JVET	CDX50HAVEC	FLX50HVEC	FHYC60KV1C9
FTX35JAV1NB	FTXD71JVET	CDX60HAVEC	FLX60HVEC	FHYC71KV1C9
	FTXD50JV1B	CDX25HAV1NB	FLX25HVET	FDYM60FAV1
FTXD25KZV1B	FTXD60JV1B	CDX35HAV1NB	FLX35HVET	FDYM03FAV1
FTXD35KZV1B	FTXD71JV1B	CDX50HAV1NB	FLX50HVET	FDYM60FAV1C
FVX25KZV1B		CDX60HAV1NB	FLX60HVET	FDYM03FAV1C
FVX35KZV1B		CDX25JV1NB	FLX25HV1NB	FDYM60FAVAL
		CDX35JV1NB	FLX35HV1NB	FDYM03FAVAL
		CDX50JV1NB	FLX50JV1B	
		CDX60JV1NB	FLX60JV1B	
		CDX25JVEC		
		CDX35JVEC		

### Outdoor Unit

RMX140JVMC9	RMX140JVMT9	RMX140JVMB	RMX140JZVMB
RMX140JVMC8			

### BP Unit

BPMK928B42	BPMK928B43
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## ●Cooling Only

### Indoor Unit

FTK25JVE9	FTKD50JVE	CDK25HAVE	FLK25HVE	FHYC35KVE9
FTK35JVE9	FTKD60JVE	CDK35HAVE	FLK35HVE	FHYC50KVE9
FTK25JVEA9	FTKD71JVE	CDK50HAVE	FLK50HVE	FHYC60KVE9
FTK35JVEA9	FTKD50JVEA9	CDK60HAVE	FLK60HVE	FHYC71KVE9
FTK25JVEC	FTKD60JVEA	CDK25HAVEA	FLK25HVEA	FHYC35KV1C9
FTK35JVEC	FTKD71JVEA	CDK35HAVEA	FLK35HVEA	FHYC50KV1C9
FTK25JAVET	FTK50HVEC	CDK50HAVEA	FLK50JVEA9	FHYC60KV1C9
FTK35JAVET	FTK60HVEC	CDK60HAVEA	FLK60JVEA	FHYC71KV1C9
	FTKD50JVET	CDK25HAVEC	FLK25HVEC	FDYM60FAV1
	FTKD60JVET	CDK35HAVEC	FLK35HVEC	FDYM03FAV1
	FTKD71JVET	CDK50HAVEC	FLK50HVEC	FDYM60FAV1C
		CDK60HAVEC	FLK60HVEC	FDYM03FAV1C
		CDK25HAVET	FLK25HVET	FDYM60FAVAL
		CDK35HAVET	FLK35HVET	FDYM03FAVAL
		CDK50HAVET	FLK50HVET	
		CDK60HAVET	FLK60HVET	

### Outdoor Unit

RMK140JVMC9	RMK140JVMT9	*RMK140JAVM	RMK140JZVMA
RMK140JVMC8			

### BP Unit

BPMK928B42	BPMK928B43
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\* The RMK140JAVM specifications are special. For details, see the next page.

## NOTICE : Special specifications

Model **RMK140JAVM** has the following different specifications from the others. Take the important notes below. This model is designed for cooling mode only, which means it has no heating functions at all.

★Important points : The model is not equipped with the receiver circuit.

### 1) The heating mode is not available because the following parts are not built in.

PART 5	(5) EVL : Liquid pipe motorized valve	Page 103~105
	(6) EVG : Gas pipe motorized valve	
	(8) Capillary tube for gas purge	
	(9) Check valve	
	(10) Check valve	

### 2) The following control features are not available.

PART 5	3.8	Defrost Operation	Page 122
	3.12	Peak Cut Control	Page 128
	3.23	Warm-Up Function	Page 141
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	3.34	Inter-BP Units Heating Heat Exchanger Isothermal Control	Page 163
	3.37	4-Way Valve Operation	Page 166

### 3) Change the following values for this model.

PART 5	3.11.1 20sec → 10sec	Page 126
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### 4) The model is not provided with the surplus refrigerant control function.

PART 6	See "1.7 Cooling operation (multi-room operation - without surplus refrigerant control function) ".	Page 178
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# 1. Introduction








## 1.1 Safety Cautions

### Cautions and Warnings


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




### 1.1.1 Cautions 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 (R22) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	
When replacing the coin battery in the remote controller, be sure to dispose of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

 <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 MΩ 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

## List of Function

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The RMK140JAVM specifications are special. Refer to <RMK140JAVM's important points> (on page ii) for the changes in contents.

## 1.1 Function List for General

★2 – : for FLK, FLX50/60J

## 1.2 Function List for China

Division		Cooling Only										Heat Pump																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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				Wall Mounted Type		Floor/Ceiling Suspended Dual Type	Ceiling Mounted Cassette Type	Duct Connected Type				Wall Mounted Type		Floor/Ceiling Suspended Dual Type	Ceiling Mounted Cassette Type	Duct Connected Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Inverter (with Inverter Power Control) PAM control (Pulse Amplitude Modulation Control) Horizontal Scroll, Oval Scroll Compressor (DAIKIN SCROLL) Reluctance DC Motor Dual Flaps Power-Airflow Dual Flaps Power-Airflow Diffuser Wide-Angle Louvers Vertical Auto-Swing (Up and Down) Horizontal Auto-Swing (Right and Left) Auto Fan Speed Silent Operation Control (Automatic) Intelligent Eye Automatic Operation Programme Dry Function Fan Only Inverter Powerful Operation Indoor Unit On/Off Switch Air-Purifying Filter with Bacteriostatic, Virustatic & Deodorizing Functions Mold-Proof Air Filter Washable Grille Filter Cleaning Indicator Good-Sleep Cooling Operation 72-Hour On/Off Timer 24-Hour On/Off Timer Night Set Mode Auto-Restart (after Power Failure) Self-Diagnosis Digital Display Self-Diagnosis LED Display Wiring-Error Check Anticorrosion Treatment of Outdoor Heat Exchanger Multi-Split/Split Type Compatible Indoor Unit High-Ceiling Application Chargeless Wireless (FHYC, FDYM: Option) Wired (FHYC, FDYM: Option) Group Control by 1 Remote Controller	RMK 140J	●	●	●	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

# 1.3 Function List for Taiwan

Division	Cooling Only						Heat Pump																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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		Wall Mounted Type	Floor/Ceiling Suspended Dual Type	Ceiling Mounted Cassette Type	Duct Connected Type		Wall Mounted Type	Floor/Ceiling Suspended Dual Type	Ceiling Mounted Cassette Type	Duct Connected Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
Indoor Unit / Outdoor Unit	RMK 140J	FTK25/35J	FTKD 50/60/71J	FLK25/35/50/60H	FHYC 35/50/60/71K	FDYM 60/03FA	RMX 140J	FTX25/35J	FTXD 50/60/71J	FLX25/35/50/60H	FHYC 35/50/60/71K	FDYM 60/03FA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

## 1.4 Function List for Europe

Heat Pump									
Division	Outdoor Unit		Indoor Unit						
			Wall Mounted Type			Floor/Ceiling Suspended Dual Type	Floor Standing Type	Ceiling Mounted Cassette Type	Duct Connected Type
Indoor Unit / Outdoor Unit	RMX 140J	●	●	●	●	●	●	—	●
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★1 ● : for FLX50/60J

★2 – : for FLX50/60J

## 1.5 Function List for Singapore, Malaysia, Indonesia

Division	Indoor Unit / Outdoor Unit	Cooling Only					
		Outdoor Unit		Indoor Unit			
		RMK 140JA		Wall Mounted Type	Floor/Ceiling Suspended Dual Type	Ceiling Mounted Cassette Type	Duct Connected Type
	Inverter (with Inverter Power Control)	●	●	FTK25/35J	FLK25/35/50/60H	FHYC 35/50/60/71K	CDK25/35/50/60HA
	PAM control (Pulse Amplitude Modulation Control)	●	●	FTKD 50/60/71J			FDYM 60/03FA
	Horizontal Scroll, Oval Scroll Compressor (DAIKIN SCROLL)	●	●				
	Reluctance DC Motor	●	●				
	Dual Flaps	●	●				
	Power-Airflow Dual Flaps	●	●				
	Power-Airflow Diffuser	●	●				
	Wide-Angle Louvers	●	●				
	Vertical Auto-Swing (Up and Down)	●	●				
	Horizontal Auto-Swing (Right and Left)	●	●				
	3-D Airflow	●	●				
	Auto Fan Speed	●	●				
	Silent Operation Control (Automatic)	●	●				
	Intelligent Eye	●	●				
	Automatic Operation	●	●				
	Programme Dry Function	●	●				
	Fan Only	●	●				
	Inverter Powerful Operation	●	●				
	Home Leave Operation	●	●				
	Indoor Unit On/Off Switch	●	●				
	Air-Purifying Filter with Bacteriostatic, Virustatic & Deodorizing Functions	●	●				
	Mold-Proof Air Filter	●	●				
	Washable Grille	●	●				
	Filter Cleaning Indicator	●	●				
	Good-Sleep Cooling Operation	●	●				
	72-Hour On/Off Timer	●	●				
	24-Hour On/Off Timer	●	●				
	Night Set Mode	●	●				
	Auto-Restart (after Power Failure)	●	●				
	Self-Diagnosis Digital Display	●	●				
	Self-Diagnosis LED Display	●	●				
	Wiring-Error Check	●	●				
	Anticorrosion Treatment of Outdoor Heat Exchanger	●	●				
	Multi-Split/Split Type Compatible Indoor Unit	●	●				
	High-Ceiling Application	●	●				
	Chargeless	●	●				
	Wireless (FHYC, FHYM: Option)	●	●				
	Wired (FHYC, FHYM: Option)	●	●				
	Group Control by 1 Remote Controller	●	●				

## 1.6 Function List for Australia

Division	Indoor Unit / Outdoor Unit	Cooling Only										Heat Pump									
		Outdoor Unit		Indoor Unit				Indoor Unit				Outdoor Unit		Indoor Unit				Indoor Unit			
		RMK 140J		FTK25/35J	FTKD 50/60/71J	FLK25/35H 50/60J	FHYC 35/50/60/71K	CDK25/35/50/60HA	FDYM 60/03FA			RMX 140J		FTX25/35J	FTXD 50/60/71J	FLX25/35H 50/60J	FHYC 35/50/60/71K	CDX25/35/50/60HA	FDYM 60/03FA		
	Inverter (with Inverter Power Control)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	PAM control (Pulse Amplitude Modulation Control)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Horizontal Scroll, Oval Scroll Compressor (DAIKIN SCROLL)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Reluctance DC Motor	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Dual Flaps	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Power-Airflow Dual Flaps	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Power-Airflow Diffuser	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Wide-Angle Louvers	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Vertical Auto-Swing (Up and Down)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Horizontal Auto-Swing (Right and Left)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	3-D Airflow	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Auto Fan Speed	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Silent Operation Control (Automatic)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Intelligent Eye	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Automatic Operation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Programme Dry Function	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Fan Only	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Inverter Powerful Operation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Home Leave Operation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Indoor Unit On/Off Switch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Air-Purifying Filter with Bacteriostatic, Virustatic & Deodorizing Functions	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Mold-Proof Air Filter	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Washable Grille	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Filter Cleaning Indicator	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Good-Sleep Cooling Operation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	72-Hour On/Off Timer	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	24-Hour On/Off Timer	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Night Set Mode	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Auto-Restart (after Power Failure)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Self-Diagnosis Digital Display	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Self-Diagnosis LED Display	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Wiring-Error Check	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Anticorrosion Treatment of Outdoor Heat Exchanger	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Multi-Split/Type Compatible Indoor Unit	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	High-Ceiling Application	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Chargeless	115	3	●	●	●	●	●	●	●	●	115	m	●	●	●	●	●	●	●	●
	Wireless (FHYC, FHYM: Option)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Wired (FHYC, FHYM: Option)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Group Control by 1 Remote Controller	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

★1 ● : for FLK, FLX50/60J

★2 - : for FLK, FLX50/60J

## 1.7 Function List for Europe

Heat Pump							
Division	Outdoor Unit		RMX 140JZ	Indoor Unit			Indoor Unit / Outdoor Unit
	Wall Mounted Type						
	FTX25/35JA	●	●	●	●	Inverter (with Inverter Power Control)	
		●	●	●	●	PAM control (Pulse Amplitude Modulation Control)	
		●	●	●	●	Horizontal Scroll, Oval Scroll Compressor (DAIKIN SCROLL)	
		●	●	●	●	Reluctance DC Motor	
		●	●	●	●	Dual Flaps	
		●	●	●	●	Power-Airflow Dual Flaps	
		●	●	●	●	Power-Airflow Diffuser	
		●	●	●	●	Wide-Angle Louvers	
		●	●	●	●	Vertical Auto-Swing (Up and Down)	
		●	●	●	●	Horizontal Auto-Swing (Right and Left)	
		●	●	●	●	3-D Airflow	
		●	●	●	●	Auto Fan Speed	
		●	●	●	●	Silent Operation Control (Automatic)	
		●	●	●	●	Intelligent Eye	
		●	●	●	●	Automatic Operation	
		●	●	●	●	Programme Dry Function	
		●	●	●	●	Fan Only	
		●	●	●	●	Inverter Powerful Operation	
		●	●	●	●	Home Leave Operation	
		●	●	●	●	Indoor Unit On/Off Switch	
		●	●	●	●	Air-Purifying Filter with Bacteriostatic, Virustatic & Deodorizing Functions	
		●	●	●	●	Mold-Proof Air Filter	
		●	●	●	●	Washable Grille	
		●	●	●	●	Filter Cleaning Indicator	
		●	●	●	●	Good-Sleep Cooling Operation	
		●	●	●	●	72-Hour On/Off Timer	
		●	●	●	●	24-Hour On/Off Timer	
		●	●	●	●	Night Set Mode	
		●	●	●	●	Auto-Restart (after Power Failure)	
		●	●	●	●	Self-Diagnosis Digital Display	
		●	●	●	●	Self-Diagnosis LED Display	
		●	●	●	●	Wiring-Error Check	
		●	●	●	●	Anticorrosion Treatment of Outdoor Heat Exchanger	
		●	●	●	●	Multi-Split/Split Type Compatible Indoor Unit	
		●	●	●	●	High-Ceiling Application	
		●	●	●	●	Chargeless	
		●	●	●	●	Wireless (FHYC: Option)	
		●	●	●	●	Wired (FHYC, FDYM: Option)	
		●	●	●	●	Group Control by 1 Remote Controller	

★1 ● : for FLX50/60J

★2 – : for FLX50/60J

# Part 2

# Specifications

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The RMK140JAVM specifications are special. Refer to <RMK140JAVM's important points> (on page ii) for the changes in contents.

# 1. Specifications

## 1.1 Outdoor Units

### 1.1.1 Cooling Only

50Hz 220-240V / 60Hz 220-230V

Model			RMK140JVMC9 (8)	
Cooling Capacity (19.0°CWB)	kW		14.5	
	kcal/h		12,470	
Power Consumption ★	W		5,000	
Running Current ★	A		23.2	
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Scroll Type (Oval Discharge)	
	Model		JT100FBVD	
	Motor Output	W	3,300	
Refrigerant Oil	Model		SUNISO 4GSD.I.	
	Charge	kg	1.5	
Refrigerant	Type		R22	
	Charge	kg	9.9	
Air Flow Rate	m³/min	H	114	
		L	104	
	cfm	H	4,024	
		L	3,671	
Fan	Type		Propeller	
	Motor Output	W	(Upper Side) H : 53 L : 38	(Lower Side) H : 41 L : 30
	Running Current	A	(Upper Side) H : 0.50 L : 0.45	(Lower Side) H : 0.47 L : 0.42
	Power Consumption	W	(Upper Side) H : 93.1 L : 78.8	(Lower Side) H : 81.3 L : 68.8
	Power Factor	%	100	
Starting Current	A		29.0	
Dimensions (HxWxD)	mm		1,345x880x320	
Package Dimensions	mm		918x394x1,397	
Weight	kg		134	
Gross Weight	kg		143	
Operation Sound	dBA		53	
Piping Connection	Liquid	mm	φ 9.5 (Flare Connection)	
	Gas	mm	φ 19.1 (Flare Connection)	
	Drain	mm	φ 18	
Heat Insulation			Both Liquid and Gas Pipes	
No. of Wiring Connection			3 for Power Supply, 4 for Interunit Wiring (Including Earth Wiring)	
Max. Interunit Piping Length	m		115 (Total Main Piping and Branch Piping) 55 (Total Main Piping), 60 (Total Branch Piping) 15 (Max. Length for Each Room)	
Amount of Additional Charge	g/m		Chargeless	
Max. Installation Height Difference	m		30 (Between Indoor or BP Unit and Outdoor Unit), 15 (Between Indoor or BP Units)	
Drawing No.			3D030948A	

#### Notes:

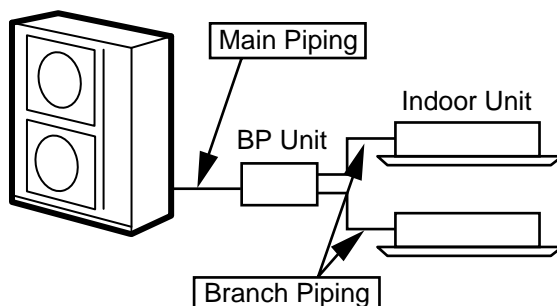
- ★ Refer to Engineering Data Book.
- The data are based on the conditions shown in the table below.

Cooling	Piping Length
Indoor ; 27°CDB / 19.0°CWB Outdoor ; 35°CDB	Main Piping : 5m Branch Piping : 3m (each indoor unit / 71 Class+60 Class)

#### Conversion Formulae

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

Outdoor Unit



(Q0143)

60Hz 220V

Model			RMK140JVMT9	
Cooling Capacity (19.5°CWB)		kW	14.5	
		kcal/h	12,500	
Power Consumption ★		W	4,950	
Running Current ★		A	23.0	
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Scroll Type (Oval Discharge)	
	Model		JT100FBVD	
	Motor Output	W	3,300	
Refrigerant Oil	Model		SUNISO 4GSD.I.	
	Charge	kg	1.5	
Refrigerant	Type		R22	
	Charge	kg	9.9	
Air Flow Rate	m³/min	H	114	
		L	104	
	cfm	H	4,024	
		L	3,671	
Fan	Type		Propeller	
	Motor Output	W	(Upper Side) H : 53 L : 38	(Lower Side) H : 41 L : 30
	Running Current	A	(Upper Side) H : 0.50 L : 0.45	(Lower Side) H : 0.47 L : 0.42
	Power Consumption	W	(Upper Side) H : 93.1 L : 78.8	(Lower Side) H : 81.3 L : 68.8
	Power Factor	%	100	
Starting Current		A	29.0	
Dimensions (H×W×D)		mm	1,345×880×320	
Package Dimensions		mm	918×394×1,397	
Weight		kg	134	
Gross Weight		kg	143	
Operation Sound		dBA	53	
Piping Connection	Liquid	mm	φ 9.5 (Flare Connection)	
	Gas	mm	φ19.1 (Flare Connection)	
	Drain	mm	φ18	
Heat Insulation			Both Liquid and Gas Pipes	
No. of Wiring Connection			3 for Power Supply, 4 for Interunit Wiring (Including Earth Wiring)	
Max. Interunit Piping Length		m	115 (Total Main Piping and Branch Piping) 55 (Total Main Piping), 60 (Total Branch Piping) 15 (Max. Length for Each Room)	
Amount of Additional Charge		g/m	Chargeless	
Max. Installation Height Difference		m	30 (Between Indoor or BP Unit and Outdoor Unit), 15 (Between Indoor or BP Units)	
Drawing No.			3D030949A	

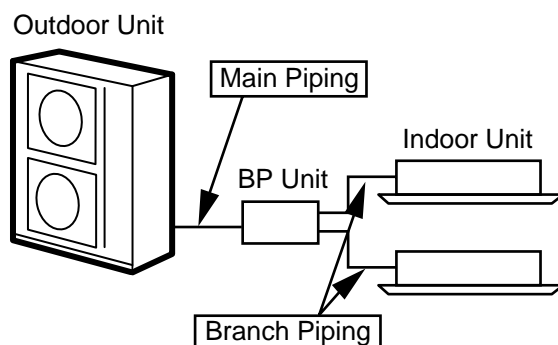
**Notes:**

- ★ Refer to Engineering Data Book.
- The data are based on the conditions shown in the table below.

Cooling	Piping Length
Indoor ; 27°CDB / 19.5°CWB Outdoor ; 35°CDB	Main Piping : 5m Branch Piping : 3m (each indoor unit / 71 Class+60 Class)

## Conversion Formulae

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



(Q0143)

50Hz 220-230-240V / 60Hz 220-230V

Model			RMK140JAVM	
Cooling Capacity (19.0°CWB)		kW	14.5	
		kcal/h	12,470	
Power Consumption ★		W	4,650	
Running Current ★		A	20.4	
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Scroll Type (Oval Discharge)	
	Model		JT100FBVD	
	Motor Output	W	3,300	
Refrigerant Oil	Model		SUNISO 4GSD.I.	
	Charge	kg	1.5	
Refrigerant	Type		R22	
	Charge	kg	4.5	
Air Flow Rate	m³/min	H	114	
		L	104	
	cfm	H	4,024	
		L	3,671	
Fan	Type		Propeller	
	Motor Output	W	(Upper Side) H : 53 L : 38	(Lower Side) H : 41 L : 30
	Running Current	A	(Upper Side) H : 0.50 L : 0.45	(Lower Side) H : 0.47 L : 0.42
	Power Consumption	W	(Upper Side) H : 93.1 L : 78.8	(Lower Side) H : 81.3 L : 68.8
	Power Factor	%	100	
Starting Current		A	29.0	
Dimensions (HxWxD)		mm	1,345x880x320	
Package Dimensions (WxDxH)		mm	918x394x1,397	
Weight		kg	111	
Gross Weight		kg	120	
Operation Sound		dBA	50	
Piping Connection	Liquid	mm	φ9.5 (Flare Connection)	
	Gas	mm	φ19.1 (Flare Connection)	
	Drain	mm	φ18	
Heat Insulation			Both Liquid and Gas Pipes	
No. of Wiring Connection			3 For Power Supply, 4 For Interunit Wiring	
Max. Interunit Piping Length		m	110 (Total Main Piping and Branch Piping) 30 (Total Main Piping), 60 (Total Branch Piping) 20 (Max. Length for Each Room)	
Amount of Additional Charge		g/m	Additional refrigerant to be charge : R (kg) R = (Total length of the liquid pipe-line of φ9.5) ×0.05 + (Total length of the liquid pipe-line of φ6.4) × 0.025 *If the value of "R" is less than 0.5, additional charging of refrigerant is unnecessary.	
Max. Installation Height Difference		m	15 (Between Indoor or BP Unit and Outdoor Unit), 10 (Both between Indoor Units and BP Units)	
Drawing No.			3D033202	

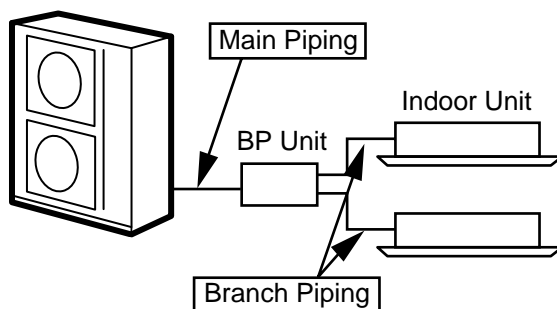
**Notes:**

- ★ Refer to Engineering Data Book.
- The data are based on the conditions shows in the table below.

Cooling	Piping Length
Indoor ; 27°CDB / 19.0°CWB Outdoor ; 35°CDB	Main Piping : 5m Branch Piping : 3m (each indoor unit / 71 Class+60 Class)

**Conversion Formulae**

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

**Outdoor Unit**

(Q0143)

50Hz 220-230-240V / 60Hz 220-230V

Model			RMK140JZVMA	
Cooling Capacity (19.0°CWB)	kW		14.5	
	kcal/h		12,470	
Power Consumption ★	W		5,000	
Running Current ★	A		23.2-22.2-21.3	
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Scroll Type (Oval Discharge)	
	Model		JT100FAVD	
	Motor Output	W	3,300	
Refrigerant Oil	Model		DAPHNE FVC68D	
	Charge	kg	1.5	
Refrigerant	Type		R407C	
	Charge	kg	9.9	
Air Flow Rate	m³/min	H	114	
		L	104	
	cfm	H	4,024	
		L	3,671	
Fan	Type		Propeller	
	Motor Output	W	(Upper Side) H : 53 L : 38	(Lower Side) H : 41 L : 30
	Running Current	A	(Upper Side) H : 0.50 L : 0.45	(Lower Side) H : 0.47 L : 0.42
	Power Consumption	W	(Upper Side) H : 93.1 L : 78.8	(Lower Side) H : 81.3 L : 68.8
	Power Factor	%	100	
Starting Current	A		29.0	
Dimensions (HxWxD)	mm		1,345x880x320	
Package Dimensions (WxDxH)	mm		918x394x1,397	
Weight	kg		134	
Gross Weight	kg		143	
Operation Sound	dBA		53	
Piping Connection	Liquid	mm	φ9.5 (Flare Connection)	
	Gas	mm	φ19.1 (Flare Connection)	
	Drain	mm	φ18	
Heat Insulation			Both Liquid and Gas Pipes	
No. of Wiring Connection			3 For Power Supply, 4 For Interunit Wiring (Included Earth Wiring)	
Max. Interunit Piping Length	m		115 (Total Main Piping and Branch Piping) 55 (Total Main Piping), 60 (Total Branch Piping) 15 (Max. Length for Each Room)	
Amount of Additional Charge	g/m		Chargeless	
Max. Installation Height Difference	m		30 (Between Indoor or BP Unit and Outdoor Unit), 15 (Both between Indoor Units and BP Units)	
Drawing No.			3D031579	

**Notes:**

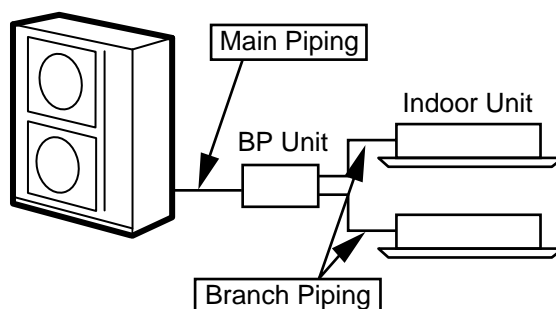
- ★ Refer to Engineering Data Book.
- The data are based on the conditions shows in the table below.

Cooling	Piping Length
Indoor ; 27°CDB / 19.0°CWB Outdoor ; 35°CDB	Main Piping : 5m Branch Piping : 3m (each indoor unit / 71 Class+60 Class)

## Conversion Formulae

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

## Outdoor Unit



(Q0143)

## 1.1.2 Heat Pump

50Hz 220-240V / 60Hz 220-230V

Model			RMX140JVMC9 (8)	
			Cooling	Heating
Cooling Capacity (19.0°CWB)	kW		14.5	16.5
	kcal/h		12,470	14,190
Power Consumption ★	W		5,000	5,780
Running Current ★	A		23.2	26.8
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Scroll Type (Oval Discharge)	
	Model		JT100FBVD	
	Motor Output	W	3,300	
Refrigerant Oil	Model		SUNISO 4GSD.I.	
	Charge	L	1.5	
Refrigerant	Type		R22	
	Charge	kg	9.9	
Air Flow Rate	m³/min	H	114	
		L	104	
	cfm	H	4,024	
		L	3,671	
Fan	Type		Propeller	
	Motor Output	W	(Upper Side) H : 53 L : 38	(Lower Side) H : 41 L : 30
	Running Current	A	(Upper Side) H : 0.50 L : 0.45	(Lower Side) H : 0.47 L : 0.42
	Power Consumption	W	(Upper Side) H : 93.1 L : 78.8	(Lower Side) H : 81.3 L : 68.8
	Power Factor	%	100	
Starting Current	A		29.0	
Dimensions (HxWxD)	mm		1,345x880x320	
Package Dimensions	mm		918x394x1,397	
Weight	kg		136	
Gross Weight	kg		145	
Operation Sound	dBA		53	
Piping Connection	Liquid	mm	φ 9.5 (Flare Connection)	
	Gas	mm	φ 19.1 (Flare Connection)	
	Drain	mm	φ 18	
Heat Insulation			Both Liquid and Gas Pipes	
No. of Wiring Connection			3 for Power Supply, 4 for Interunit Wiring (Including Earth Wiring)	
Max. Interunit Piping Length	m		115 (Total Main Piping and Branch Piping) 55 (Total Main Piping), 60 (Total Branch Piping) 15 (Max. Length for Each Room)	
Amount of Additional Charge	g/m		Chargeless	
Max. Installation Height Difference	m		30 (Between Indoor or BP Unit and Outdoor Unit), 15 (Between Indoor or BP Units)	
Drawing No.			3D030946A	

### Notes:

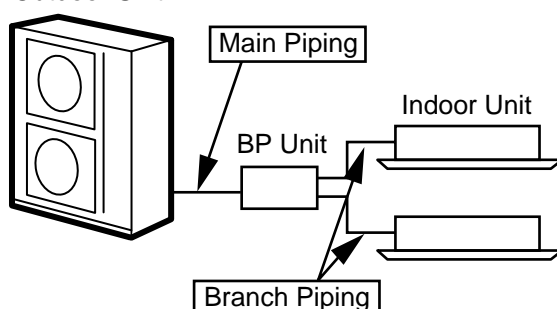
- ★ Refer to Engineering Data Book.
- The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor ; 27°CDB / 19.0°CWB Outdoor ; 35°CDB	Indoor ; 21°CDB Outdoor ; 7°CDB / 6°CWB	Main Piping : 5m Branch Piping : 3m (each indoor unit / 71 Class+60 Class)

### Conversion Formulae

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

Outdoor Unit



(Q0143)

60Hz 220-230V

Model			RMX140JVMT9	
			Cooling	Heating
Cooling Capacity (19.5°CWB)	kW		14.5	16.5
	kcal/h		12,500	14,200
Power Consumption ★	W		4,950	5,870
Running Current ★	A		23.0	27.2
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Scroll Type (Oval Discharge)	
	Model		JT100FBVD	
	Motor Output	W	3,300	
Refrigerant Oil	Model		SUNISO 4GSD.I.	
	Charge	L	1.5	
Refrigerant	Type		R22	
	Charge	kg	9.9	
Air Flow Rate	m³/min	H	114	
		L	104	
	cfm	H	4,024	
		L	3,671	
Fan	Type		Propeller	
	Motor Output	W	(Upper Side) H : 53 L : 38	(Lower Side) H : 41 L : 30
	Running Current	A	(Upper Side) H : 0.50 L : 0.45	(Lower Side) H : 0.47 L : 0.42
	Power Consumption	W	(Upper Side) H : 93.1 L : 78.8	(Lower Side) H : 81.3 L : 68.8
	Power Factor	%	100	
Starting Current	A		29.0	
Dimensions (HxWxD)	mm		1,345x880x320	
Package Dimensions	mm		918x394x1,397	
Weight	kg		136	
Gross Weight	kg		145	
Operation Sound	dBA		53	
Piping Connection	Liquid	mm	φ9.5 (Flare Connection)	
	Gas	mm	φ19.1 (Flare Connection)	
	Drain	mm	φ18	
Heat Insulation			Both Liquid and Gas Pipes	
No. of Wiring Connection			3 for Power Supply, 4 for Interunit Wiring (Including Earth Wiring)	
Max. Interunit Piping Length	m		115 (Total Main Piping and Branch Piping) 55 (Total Main Piping), 60 (Total Branch Piping) 15 (Max. Length for Each Room)	
Amount of Additional Charge	g/m		Chargeless	
Max. Installation Height Difference	m		30 (Between Indoor or BP Unit and Outdoor Unit), 15 (Between Indoor or BP Units)	
Drawing No.			3D030947A	

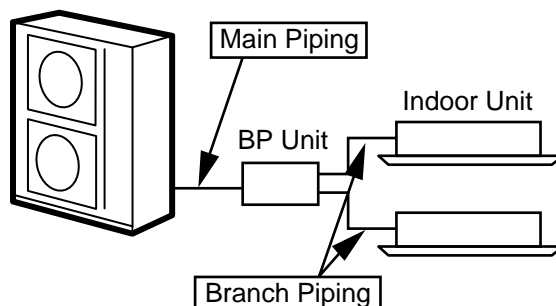
**Notes:**

- ★ Refer to Engineering Data Book.
- The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor ; 27°CDB / 19.5°CWB Outdoor ; 35°CDB	Indoor ; 21°CDB Outdoor ; 7°CDB / 6°CWB	Main Piping : 5m Branch Piping : 3m (each indoor unit / 71 Class+60 Class)

**Conversion Formulae**

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

**Outdoor Unit**

(Q0143)

50Hz 220-240V / 60Hz 220-230V

Model			RMX140JVMB	
			Cooling	Heating
Cooling Capacity (19.0°CWB)	kW		14.5	16.5
	kcal/h		12,470	14,190
Power Consumption ★	W		5,000	5,780
Running Current ★	A		23.2	26.8
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Scroll Type (Oval Discharge)	
	Model		JT100FBVD	
	Motor Output	W	3,300	
Refrigerant Oil	Model		SUNISO 4GSD.I.	
	Charge	L	1.5	
Refrigerant	Type		R22	
	Charge	kg	9.9	
Air Flow Rate	m³/min	H	114	
		L	104	
	cfm	H	4,024	
		L	3,671	
Fan	Type		Propeller	
	Motor Output	W	(Upper Side) H : 53 L : 38	(Lower Side) H : 41 L : 30
	Running Current	A	(Upper Side) H : 0.50 L : 0.45	(Lower Side) H : 0.47 L : 0.42
	Power Consumption	W	(Upper Side) H : 93.1 L : 78.8	(Lower Side) H : 81.3 L : 68.8
	Power Factor	%	100	
Starting Current	A		29.0	
Dimensions (HxWxD)	mm		1,345x880x320	
Package Dimensions (WxDxH)	mm		918x394x1,397	
Weight	kg		136	
Gross Weight	kg		145	
Operation Sound	dBA		53	
Piping Connection	Liquid	mm	φ9.5 (Flare Connection)	
	Gas	mm	φ19.1 (Flare Connection)	
	Drain	mm	φ18	
Heat Insulation			Both Liquid and Gas Pipes	
No. of Wiring Connection			3 For Power Supply, 4 For Interunit Wiring (Included Earth Wiring)	
Max. Interunit Piping Length	m		115 (Total Main Piping and Branch Piping) 55 (Total Main Piping), 60 (Total Branch Piping) 15 (Max. Length for Each Room)	
Amount of Additional Charge	g/m		Chargeless	
Max. Installation Height Difference	m		30 (Between Indoor or BP Unit and Outdoor Unit), 15 (Both between Indoor Units and BP Units)	
Drawing No.			3D030950A	

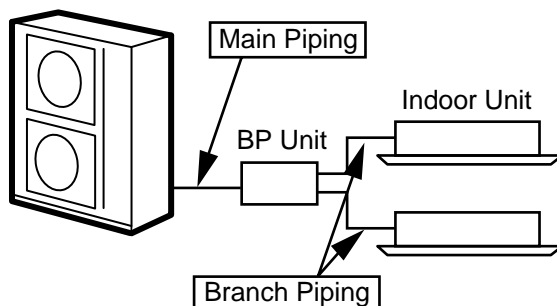
**Notes:**

- ★ Refer to Engineering Data Book.
- The data are based on the conditions shown in the table below.

Cooling	Heating	Piping Length
Indoor ; 27°CDB / 19.0°CWB Outdoor ; 35°CDB	Indoor ; 20°CDB Outdoor ; 7°CDB / 6°CWB	Main Piping : 5m Branch Piping : 3m (each indoor unit / 71 Class+60 Class)

**Conversion Formulae**

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

**Outdoor Unit**

(Q0143)

50Hz 220-230-240V / 60Hz 220-230V

Model			RMX140JZVMB	
			Cooling	Heating
Cooling Capacity (19.0°CWB)	kW		14.5	16.5
	kcal/h		12,470	14,190
Power Consumption ★	W		5,000	6,050
Running Current ★	A		23.2-22.2-21.3	28.1-26.8-25.7
Casing Color			Ivory White	
Compressor	Type		Hermetically Sealed Scroll Type (Oval Discharge)	
	Model		JT100FAVD	
	Motor Output	W	3,300	
Refrigerant Oil	Model		DAPHNE FVC68D	
	Charge	L	1.5	
Refrigerant	Type		R407C	
	Charge	kg	9.9	
Air Flow Rate	m³/min	H	114	
		L	104	
	cfm	H	4,024	
		L	3,671	
Fan	Type		Propeller	
	Motor Output	W	(Upper Side) H : 53 L : 38	(Lower Side) H : 41 L : 30
	Running Current	A	(Upper Side) H : 0.50 L : 0.45	(Lower Side) H : 0.47 L : 0.42
	Power Consumption	W	(Upper Side) H : 93.1 L : 78.8	(Lower Side) H : 81.3 L : 68.8
	Power Factor	%	100	
Starting Current	A		29.0	
Dimensions (HxWxD)	mm		1,345x880x320	
Package Dimensions (WxDxH)	mm		918x394x1,397	
Weight	kg		136	
Gross Weight	kg		145	
Operation Sound	dBA		53	
Piping Connection	Liquid	mm	φ9.5 (Flare Connection)	
	Gas	mm	φ19.1 (Flare Connection)	
	Drain	mm	φ18	
Heat Insulation			Both Liquid and Gas Pipes	
No. of Wiring Connection			3 For Power Supply, 4 For Interunit Wiring (Included Earth Wiring)	
Max. Interunit Piping Length	m		115 (Total Main Piping and Branch Piping) 55 (Total Main Piping), 60 (Total Branch Piping) 15 (Max. Length for Each Room)	
Amount of Additional Charge	g/m		Chargeless	
Max. Installation Height Difference	m		30 (Between Indoor or BP Unit and Outdoor Unit), 15 (Both between Indoor Units and BP Units)	
Drawing No.			3D031578	

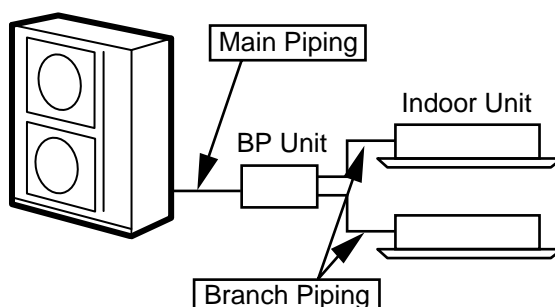
**Notes:**

- ★ Refer to Engineering Data Book.
- The data are based on the conditions shows in the table below.

Cooling	Heating	Piping Length
Indoor ; 27°CDB / 19.0°CWB Outdoor ; 35°CDB	Indoor ; 21°CDB Outdoor ; 7°CDB / 6°CWB	Main Piping : 5m Branch Piping : 3m (each indoor unit / 71 Class+60 Class)

**Conversion Formulae**

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

**Outdoor Unit**

(Q0143)

## 1.2 BP Units

50Hz 220-240V / 60Hz 220-230V

Model			BPMK928B42	BPMK928B43
Connectable Indoor Units			1~2 Units	1~3 Units
Capacity	Cooling	kW	—	—
	Heating	kW	—	—
Casing Color			Paintingless	
Power Consumption		W	10	10
Running Current		A	0.05	0.05
Refrigerant	Type		—	
	Charge	kg	—	
Dimensions	(HxWxD)	mm	223x400x272	
Package Dimensions		mm	651x342x281	
Machine Weight		kg	7	8
Gross Weight		kg	10	11
Number of Wiring Connections			4 for Interunit Wiring	
Piping Connection (Brazeing)	Liquid	mm	Main : $\phi 9.5 \times 1$ / Branch : $\phi 6.4 \times 2$	Main : $\phi 9.5 \times 1$ / Branch : $\phi 6.4 \times 3$
	Gas	mm	Main : $\phi 19.1 \times 1$ / Branch : $\phi 15.9 \times 2$	Main : $\phi 19.1 \times 1$ / Branch : $\phi 15.9 \times 3$
	Drain	mm	Drain Processingless	
Heat Insulation			Both Liquid and Gas Pipes	
Max. Piping Length		m	—	
Amount of Additional Charge		g/m	—	
Max. Height Difference		m	—	
Max. Combination		kW	18.9	18.9
Min. Combination		kW	2.5	2.5
Accessories	Installation Manual	pc.	1	
	L Shape Reducer	pc.	For Main (Gas)	1
			For Branch Gas	3 ( $\phi 15.9 / \phi 12.7 / \phi 9.5$ )
			For Branch Liquid	1 ( $\phi 9.5$ )

### Note:

- BP or Indoor Unit Max. Height - BP or Indoor Unit Min. Height → Max. 15m.  
Set up BP and IU in 15m.
- The piping connection must be cut so as to suit the piping sizes of the indoor unit which will be connected.  
The same sizes should be used for the piping on the outdoor unit.

### Conversion Formulae

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

## 1.3 Indoor Units (for General)

### 1.3.1 Cooling Only

#### ■ Wall Mounted Type

##### ■ 2.5kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FTK25JVE9	FTK25JVEA9
Rating Capacity		kW	2.5	
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	7.5	
		M	6.4	
		L	5.4	
	cfm	H	265	
		M	226	
		L	191	
Fan	Type		Cross Flow Fan	
	Motor Output	W	18	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.17 - 0.18 - 0.18 / 0.21 - 0.21	
Power Consumption ★ (Rated)		W	37 - 40 - 43 / 45 - 48	
Power Factor ★		%	98.9 - 96.6 - 99.5 / 97.4 - 99.4	
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	273x784x185	
Package Dimensions (WxHxD)		mm	834x325x258	
Weight		kg	7.5	
Gross Weight		kg	11	
Operation Sound	dBA	H	37	
		M	34	
		L	30	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ9.5	
	Drain	mm	φ18.0	
Drawing No.			3D029316	3D029314

##### ■ 3.5kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FTK35JVE9	FTK35JVEA9
Rating Capacity		kW	3.5	
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	7.8	
		M	6.7	
		L	5.5	
	cfm	H	275	
		M	237	
		L	194	
Fan	Type		Cross Flow Fan	
	Motor Output	W	18	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.17 - 0.18 - 0.18 / 0.21 - 0.21	
Power Consumption ★ (Rated)		W	37 - 40 - 43 / 45 - 48	
Power Factor ★		%	98.9 - 96.6 - 99.5 / 97.4 - 99.4	
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	273x784x185	
Package Dimensions (WxHxD)		mm	834x325x258	
Weight		kg	7.5	
Gross Weight		kg	11	
Operation Sound	dBA	H	38	
		M	35	
		L	32	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ12.7	
	Drain	mm	φ18.0	
Drawing No.			3D029317	3D029315

★ Refer to Engineering Data Book

## ■ 5.0kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FTKD50JVE	FTKD50JVEA9
Rating Capacity		kW	5.0	
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	12.9	
		M	11.4	
		L	9.9	
	cfm	H	455	
		M	402	
		L	349	
Fan	Type		Cross Flow Fan	
	Motor Output	W	54	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removal / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.19-0.18-0.17 / 0.19-0.18	
Power Consumption ★ (Rated)		W	40	
Power Factor ★		%	95.7-96.7-98.0 / 95.7-96.7	
Temperature Control			Microcomputer Control	
Dimensions (H×W×D)		mm	298×1,050×190	
Package Dimensions (W×D×H)		mm	1,183×367×289	
Weight		kg	12	
Gross Weight		kg	16	
Operation Sound	dBA	H	44	
		M	40	
		L	35	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ12.7	
	Drain	mm	φ18.0	
Drawing No.			3D027863A	3D027860C

## ■ 6.0kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FTKD60JVE	FTKD60JVEA
Rating Capacity		kW	6.0	
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	13.6	
		M	12.0	
		L	10.4	
	cfm	H	480	
		M	424	
		L	367	
Fan	Type		Cross Flow Fan	
	Motor Output	W	54	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removal / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.21-0.20-0.19 / 0.21-0.20	
Power Consumption ★ (Rated)		W	45	
Power Factor ★		%	97.4-97.8 -98.7 / 97.4-97.8	
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	298x1,050x190	
Package Dimensions (WxDxH)		mm	1,183x367x289	
Weight		kg	12	
Gross Weight		kg	16	
Operation Sound	dBA	H	45	
		M	41	
		L	37	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ15.9	
	Drain	mm	φ18.0	
Drawing No.			3D027864	3D027861

★ Refer to Engineering Data Book.

Conversion Formulae

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

## ■ 7.1kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FTKD71JVE		FTKD71JVEA	
Rating Capacity		kW	7.1			
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	14.3			
		M	12.3			
		L	10.4			
	cfm	H	505			
		M	434			
		L	367			
Fan	Type		Cross Flow Fan			
	Motor Output	W	54			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removal / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.23-0.22-0.21 / 0.23-0.22			
Power Consumption ★ (Rated)		W	50			
Power Factor ★		%	98.8-98.8-99.2 / 98.8-98.8			
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	298×1,050×190			
Package Dimensions (W×D×H)		mm	1,183×367×289			
Weight		kg	12			
Gross Weight		kg	16			
Operation Sound	dBA	H	46			
		M	42			
		L	37			
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ9.5			
	Gas	mm	φ15.9			
	Drain	mm	φ18.0			
Drawing No.			3D027865A		3D027862	

★ Refer to Engineering Data Book.

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

## ■ Duct Connected Type

### ■ 2.5kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			CDK25HAVE	CDK25HAVEA
Rating Capacity		kW	2.5	
Front Panel Color			—	
Air Flow Rates	m³/min	H	13.0	
		M	12.0	
		L	11.0	
	cfm	H	459	
		M	424	
		L	388	
Fan	Type		Sirocco Fan	
	Motor Output	W	47	
	Speed	Steps	5 Steps and Auto	
Air Filter			—	
Running Current ★ (Rated)		A	0.40 - 0.40 - 0.40 / 0.43 - 0.43	
Power Consumption ★ (Rated)		W	85 - 85 - 90 / 90 - 90	
Power Factor ★		%	96.6 - 92.4 - 93.8 / 95.1 - 91.0	
Temperature Control			Microcomputer Control	
Dimensions (H×W×D)		mm	260×900×580	
Package Dimensions		mm	1,070×719×354	
Weight		kg	23	
Gross Weight		kg	32	
Operation Sound	dBA	H	39	
		M	37	
		L	36	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ9.5	
	Drain	mm	φ27.2(3/4B)	
Drawing No.			3D024955	3D024967

### ■ 3.5kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			CDK35HAVE	CDK35HAVEA
Rating Capacity		kW	3.5	
Front Panel Color			—	
Air Flow Rates	m³/min	H	13.0	
		M	12.0	
		L	11.0	
	cfm	H	459	
		M	424	
		L	388	
Fan	Type		Sirocco Fan	
	Motor Output	W	47	
	Speed	Steps	5 Steps and Auto	
Air Filter			—	
Running Current ★ (Rated)		A	0.40 - 0.40 - 0.40 / 0.43 - 0.43	
Power Consumption ★ (Rated)		W	85 - 85 - 90 / 90 - 90	
Power Factor ★		%	96.6 - 92.4 - 93.8 / 95.1 - 91.0	
Temperature Control			Microcomputer Control	
Dimensions (H×W×D)		mm	260×900×580	
Package Dimensions		mm	1,070×719×354	
Weight		kg	23	
Gross Weight		kg	32	
Operation Sound	dBA	H	39	
		M	37	
		L	36	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ12.7	
	Drain	mm	φ27.2(3/4B)	
Drawing No.			3D024958	3D024968

★ Refer to Engineering Data Book.

Conversion Formulae	
kcal/h=kWx860	
Btu/h=kWx3414	
cfm=m³/minx35.3	

## ■ 5.0kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			CDK50HAVE	CDK50HAVEA
Rating Capacity		kW	5.0	
Front Panel Color			—	
Air Flow Rates	m³/min	H	13.0	
		M	12.0	
		L	11.0	
	cfm	H	459	
		M	424	
		L	388	
Fan	Type		Sirocco Fan	
	Motor Output	W	47	
	Speed	Steps	5 Steps and Auto	
Air Filter			—	
Running Current ★ (Rated)		A	0.40 - 0.40 - 0.40 / 0.43 - 0.43	
Power Consumption ★ (Rated)		W	85 - 85 - 90 / 90 - 90	
Power Factor ★		%	96.6 - 92.4 - 93.8 / 95.1 - 91.0	
Temperature Control			Microcomputer Control	
Dimensions (H×W×D)		mm	260×900×580	
Package Dimensions		mm	1,070×719×354	
Weight		kg	24	
Gross Weight		kg	33	
Operation Sound	dBA	H	42	
		M	40	
		L	39	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ12.7	
	Drain	mm	φ27.2(3/4B)	
Drawing No.			3D024961	3D024969

## ■ 6.0kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			CDK60HAVE	CDK60HAVEA
Rating Capacity		kW	6.0	
Front Panel Color			—	
Air Flow Rates	m³/min	H	14.5	
		M	13.0	
		L	11.5	
	cfm	H	512	
		M	459	
		L	406	
Fan	Type		Sirocco Fan	
	Motor Output		W	
	Speed		Steps	
Air Filter			—	
Running Current ★ (Rated)		A	0.45 - 0.45 - 0.45 / 0.48 - 0.48	
Power Consumption ★ (Rated)		W	95 - 95 - 100 / 100 - 100	
Power Factor ★		%	96.0 - 91.8 - 92.6 / 94.7 - 90.6	
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	260x900x580	
Package Dimensions		mm	1,070x719x354	
Weight		kg	24	
Gross Weight		kg	33	
Operation Sound	dBA	H	44	
		M	42	
		L	41	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ15.9	
	Drain	mm	φ27.2(3/4B)	
Drawing No.			3D024964	3D024970

★ Refer to Engineering Data Book.

Conversion Formulae	
kcal/h=kWx860	
Btu/h=kWx3414	
cfm=m³/minx35.3	

## ■ Floor/Ceiling Suspended Dual Type

### ■ 2.5kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FLK25HVE	FLK25HVEA
Rating Capacity		kW	2.5	
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	7.6	
		M	6.8	
		L	6.0	
	cfm	H	268	
		M	240	
		L	212	
Fan	Type		Sirocco Fan	
	Motor Output	W	34	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.32 - 0.32 - 0.32 / 0.34 - 0.34	
Power Consumption ★ (Rated)		W	68 - 70 - 72 / 72 - 74	
Power Factor ★		%	96.6 - 95.1 - 93.8 / 95.1 - 94.6	
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	490x1,050x200	
Package Dimensions		mm	1,100x566x284	
Weight		kg	16	
Gross Weight		kg	22	
Operation Sound	dBA	H	37	
		M	34	
		L	31	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ9.5	
	Drain	mm	φ18.0	
Drawing No.			3D024997	3D025009

### ■ 3.5kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FLK35HVE	FLK35HVEA
Rating Capacity		kW	3.5	
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	8.7	
		M	7.7	
		L	6.6	
	cfm	H	307	
		M	270	
		L	233	
Fan	Type		Sirocco Fan	
	Motor Output	W	34	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.36 - 0.36 - 0.36 / 0.39 - 0.39	
Power Consumption ★ (Rated)		W	76 - 78 - 80 / 80 - 84	
Power Factor ★		%	96.0 - 94.2 - 92.6 / 94.0 - 93.6	
Temperature Control			Microcomputer Control	
Dimensions (H×W×D)		mm	490×1,050×200	
Package Dimensions		mm	1,100×566×284	
Weight		kg	16	
Gross Weight		kg	22	
Operation Sound	dBA	H	38	
		M	35	
		L	32	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ12.7	
	Drain	mm	φ18.0	
Drawing No.			3D024998	3D025010

★ Refer to Engineering Data Book.

Conversion Formulae	
kcal/h=kWx860	
Btu/h=kWx3414	
cfm=m³/minx35.3	

## ■ 5.0kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FLK50HVE	FLK50JVEA9
Rating Capacity		kW	5.0	
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	11.4	11.4
		M	10.0	9.9
		L	8.5	8.5
	cfm	H	402	402
		M	351	349
		L	300	300
Fan	Type		Sirocco Fan	
	Motor Output	W	34	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.45 - 0.45 - 0.45 / 0.48 - 0.48	
Power Consumption ★ (Rated)		W	94 - 96 - 98 / 98 - 101	
Power Factor ★		%	94.2 - 92.8 - 90.7 / 92.1 - 91.5	
Temperature Control			Microcomputer Control	
Dimensions (H×W×D)		mm	490×1,050×200	
Package Dimensions		mm	1,100×566×284	
Weight		kg	17	
Gross Weight		kg	24	
Operation Sound	dBA	H	47	
		M	43	
		L	39	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ12.7	
	Drain	mm	φ18.0	
Drawing No.			3D024999	3D027868C

## ■ 6.0kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FLK60HVE	FLK60JVEA
Rating Capacity		kW	5.7	
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	12.0	12.0
		M	10.7	10.6
		L	9.3	9.3
	cfm	H	424	424
		M	376	374
		L	328	328
Fan	Type		Sirocco Fan	
	Motor Output	W	34	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.47 - 0.47 - 0.47 / 0.51 - 0.51	0.47 - 0.47 - 0.47 / 0.51 - 0.51
Power Consumption ★ (Rated)		W	96 - 98 - 100 / 100 - 104	96 - 98 - 100 / 100 - 104
Power Factor ★		%	92.8 - 90.7 - 88.7 / 90.0 - 88.7	92.8 - 90.7 - 88.7 / 89.1 - 88.7
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	490x1,050x200	
Package Dimensions		mm	1,100x566x284	
Weight		kg	17	
Gross Weight		kg	24	
Operation Sound	dBA	H	49	
		M	45	
		L	41	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ15.9	
	Drain	mm	φ18.0	
Drawing No.			3D025000	3D027869

★ Refer to Engineering Data Book.

Conversion Formulae	
kcal/h=kWx860	
Btu/h=kWx3414	
cfm=m³/minx35.3	

## ■ Ceiling Mounted Cassette Type (SkyAir)

### ■ 3.75kW Class · 5.2kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FHYC35KVE9	FHYC50KVE9
Rating Capacity		kW	3.75	5.2
Front Panel Color			White	
Air Flow Rates	m³/min	H	14.0	15.0
		L	10.0	11.0
	cfm	H	494	530
		L	353	388
Fan	Type		Turbo Fan	
	Motor Output	W	45	
	Speed	Steps	2 Steps and Auto	
Air Filter			Resin Net (with Mold Resistant)	
Running Current ★ (Rated)		A	0.8 - 0.8 / 0.9	
Power Consumption ★ (Rated)		W	140 - 140 / 161	
Power Factor ★		%	79.5 - 72.9 / 81.3	
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	230x840x840	
Package Dimensions		mm	305x930x920	
Weight		kg	24	
Gross Weight		kg	29	
Operation Sound	dBA	H	33	
		L	29	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	
	Gas	mm	φ12.7	φ15.9
	Drain	mm	φ25.0	

### ■ 6.15kW Class · 7.7kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FHYC60KVE9		FHYC71KVE9	
Rating Capacity		kW	6.15		7.7	
Front Panel Color			White			
Air Flow Rates	m³/min	H	19.0			
		L	14.0			
	cfm	H	671			
		L	494			
Fan	Type		Turbo Fan			
	Motor Output	W	45			
	Speed	Steps	2 Steps and Auto			
Air Filter			Resin Net (with Mold Resistant)			
Running Current ★ (Rated)		A	0.9 - 0.9 / 1.0			
Power Consumption ★ (Rated)		W	161 - 161 / 181			
Power Factor ★		%	81.3 - 74.5 / 82.3			
Temperature Control			Microcomputer Control			
Dimensions (HxWxD)		mm	230x840x840			
Package Dimensions		mm	305x930x920			
Weight		kg	24			
Gross Weight		kg	29			
Operation Sound	dBA	H	35			
		L	30			
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ6.4		φ9.5	
	Gas	mm	φ15.9			
	Drain	mm	φ25.0			

★ Refer to Engineering Data Book.

Conversion Formulae
kcal/h=kWx860
Btu/h=kWx3414
cfm=m³/minx35.3

## ■ Duct Connected Type (SkyAir)

### ■ 6.15kW Class - 7.7kW Class

50Hz 220-230-240V

Model			FDYM60FAV1	FDYM03FAV1
Rating Capacity		kW	6.15	7.7
Front Panel Color			—	
Air Flow Rates	m³/min	H	20	
		L	—	
	cfm	H	706	
		L	—	
Fan	Type		Sirocco Fan	
	Motor Output	W	125	
	Speed	Steps	2 Step and Auto	
Air Filter			—	
Running Current ★ (Rated)		A	0.9	
Power Consumption ★ (Rated)		W	170	
Power Factor ★		%	85.9	
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	295×1,100×680	
Package Dimensions		mm	349×1,311×864	
Weight		kg	42	
Gross Weight		kg	54	
Operation Sound	dBA	H	39	
		L	—	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	φ9.5
	Gas	mm	φ15.9	
	Drain	mm	3/4B	

### ■ 6.15kW Class - 7.7kW Class

60Hz 220-230V

Model			FDYM60FAVAL	FDYM03FAVAL
Rating Capacity		kW	6.15	7.7
Front Panel Color			—	
Air Flow Rates	m³/min	H	20	22
		L	—	—
	cfm	H	706	777
		L	—	—
Fan	Type		Sirocco Fan	
	Motor Output	W	125	
	Speed	Steps	2 Step and Auto	
Air Filter			—	
Running Current ★ (Rated)		A	—	
Power Consumption ★ (Rated)		W	—	
Power Factor ★		%	—	
Temperature Control			Microcomputer Control	
Dimensions (H×W×D)		mm	295×1,100×680	
Package Dimensions		mm	349×1,311×864	
Weight		kg	42	
Gross Weight		kg	54	
Operation Sound	dBA	H	42	
		L	—	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	φ9.5
	Gas	mm	φ15.9	
	Drain	mm	3/4B	

★ Refer to Engineering Data Book.

Conversion Formulae	
kcal/h=	kWx860
Btu/h=	kWx3414
cfm=	m³/minx35.3

## 1.3.2 Heat Pump

### ■ Wall Mounted Type

#### ■ 2.5kW Class · 3.5kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FTX25JVEA9		FTX35JVEA9	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.4	3.5	4.2
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	7.5	8.8	7.8	8.7
		M	6.4	7.5	6.7	7.4
		L	5.4	6.2	5.5	6.2
	cfm	H	265	311	275	307
		M	226	265	237	261
		L	191	219	194	219
Fan	Type		Cross Flow Fan			
	Motor Output	W	18			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removal / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.17 - 0.18 - 0.18 / 0.21 - 0.21			
Power Consumption ★ (Rated)		W	37 - 40 - 43 / 45 - 48			
Power Factor ★		%	98.9 - 96.6 - 99.5 / 97.4 - 99.4			
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	273×784×185			
Package Dimensions (W×D×H)		mm	834×325×218			
Weight		kg	7.5			
Gross Weight		kg	11			
Operation Sound	dBA	H	37	37	38	38
		M	34	33	35	35
		L	30	30	32	31
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ6.4			
	Gas	mm	φ9.5		φ12.7	
	Drain	mm	φ18.0			
Drawing No.			3D029308		3D029309	

#### ■ 5.0kW Class · 6.0kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FTXD50JVEA9		FTXD60JVEA	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	5.0	6.5	6.0	7.2
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	12.9	15.7	13.6	17.2
		M	11.4	13.4	12.0	14.4
		L	9.9	11.0	10.4	11.7
	cfm	H	455	554	480	607
		M	402	473	424	508
		L	349	388	367	413
Fan	Type	Cross Flow Fan				
	Motor Output	W	54			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removal / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.19-0.18-0.17 / 0.19-0.18	0.16-0.16-0.15 / 0.16-0.16	0.21-0.20-0.19 / 0.21-0.20	0.21-0.20-0.19 / 0.21-0.20
Power Consumption ★ (Rated)		W	40	35	45	45
Power Factor ★		%	95.7-96.7-98.0 / 95.7-96.7	99.4-95.1-97.2 / 99.4-95.1	97.4-97.8-98.7 / 97.4-97.8	97.4-97.8-98.7 / 97.4-97.8
Temperature Control			Microcomputer Control			
Dimensions (HxWxD)		mm	298x1,050x190			
Package Dimensions (WxDxH)		mm	1,183x367x289			
Weight		kg	12			
Gross Weight		kg	16			
Operation Sound	dBA	H	44	42	45	44
		M	40	38	41	39
		L	35	33	37	34
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ6.4			
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ18.0			
Drawing No.			3D027857A		3D027858A	

★ Refer to Engineering Data Book.

## ■ 7.1kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FTXD71JVEA	
			Cooling	Heating
Rating Capacity		kW	7.1	8.5
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	14.3	18.1
		M	12.3	14.9
		L	10.4	11.7
	cfm	H	505	639
		M	434	526
		L	367	413
Fan	Type		Cross Flow Fan	
	Motor Output	W	54	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removal / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.23-0.22-0.21 / 0.23-0.22	0.23-0.22-0.21 / 0.23-0.22
Power Consumption ★ (Rated)		W	50	50
Power Factor ★		%	98.8-98.8-99.2 / 98.8-98.8	98.8-98.8-99.2 / 98.8-98.8
Temperature Control			Microcomputer Control	
Dimensions (H×W×D)		mm	298×1,050×190	
Package Dimensions (W×D×H)		mm	1,183×367×289	
Weight		kg	12	
Gross Weight		kg	16	
Operation Sound	dBA	H	46	46
		M	42	40
		L	37	34
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ9.5	
	Gas	mm	φ15.9	
	Drain	mm	φ18.0	
Drawing No.			3D027859A	

★ Refer to Engineering Data Book.

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

## ■ Duct Connected Type

### ■ 2.5kW Class · 3.5kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			CDX25HAVEA		CDX35HAVEA	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.86	3.5	4.42
Front Panel Color			—			
Air Flow Rates	m³/min	H	13.0			
		M	12.0			
		L	11.0			
	cfm	H	459			
		M	424			
		L	388			
Fan	Type		Sirocco Fan			
	Motor Output	W	47			
	Speed	Steps	5 Steps and Auto			
Air Filter			—			
Running Current ★ (Rated)		A	0.40 - 0.40 - 0.40 / 0.43 - 0.43			
Power Consumption ★ (Rated)		W	85 - 85 - 90 / 90 - 90			
Power Factor ★		%	96.6 - 92.4 - 93.8 / 95.1 - 91.0			
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	260×900×580			
Package Dimensions		mm	1,070×719×354			
Weight		kg	23			
Gross Weight		kg	32			
Operation Sound	dBA	H	39	40	39	40
		M	37	38	37	38
		L	36	36	36	36
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ6.4			
	Gas	mm	φ9.5		φ12.7	
	Drain	mm	φ27.2(3/4B)			
Drawing No.			3D024985		3D024986	

### ■ 5.0kW Class · 6.0kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			CDX50HAVEA		CDX60HAVEA	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	5.0	6.13	6.0	7.32
Front Panel Color			—			
Air Flow Rates	m³/min	H	13.0		14.5	
		M	12.0		13.0	
		L	11.0		11.5	
	cfm	H	459		512	
		M	424		459	
		L	388		406	
Fan	Type		Sirocco Fan			
	Motor Output	W	47			
	Speed	Steps	5 Steps and Auto			
Air Filter			—			
Running Current ★ (Rated)		A	0.40 - 0.40 - 0.40 / 0.43 - 0.43		0.45 - 0.45 - 0.45 / 0.48 - 0.48	
Power Consumption ★ (Rated)		W	85 - 85 - 90 / 90 - 90		95 - 95 - 100 / 100 - 100	
Power Factor ★		%	96.6 - 92.4 - 93.8 / 95.1 - 91.0		96.0 - 91.8 - 92.6 / 94.7 - 90.6	
Temperature Control			Microcomputer Control			
Dimensions (HxWxD)		mm	260x900x580			
Package Dimensions		mm	1,070x719x354			
Weight		kg	24			
Gross Weight		kg	33			
Operation Sound	dBA	H	42	42	44	44
		M	40	40	42	42
		L	39	38	41	40
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ6.4			
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ27.2(3/4B)			
Drawing No.			3D024987		3D024988	

★ Refer to Engineering Data Book.

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

## ■ Floor / Ceiling Suspended Dual Type

## ■ 2.5kW Class · 3.5kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FLX25HVEA		FLX35HVEA	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.86	3.5	4.42
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	7.6	9.2	8.7	10.0
		M	6.8	8.3	7.7	9.0
		L	6.0	7.4	6.6	8.0
	cfm	H	268	325	307	353
		M	240	293	270	318
		L	212	261	233	282
Fan	Type		Sirocco Fan			
	Motor Output	W	34			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removable / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.32 - 0.32 - 0.32 / 0.34 - 0.34	0.34 - 0.34 - 0.34 / 0.37 - 0.37	0.36 - 0.36 - 0.36 / 0.39 - 0.39	
Power Consumption ★ (Rated)		W	68 - 70 - 72 / 72 - 74	72 - 74 - 76 / 76 - 79	76 - 78 - 80 / 80 - 84	76 - 78 - 80 / 80 - 83
Power Factor ★		%	96.6 - 95.1 - 93.8 / 95.1 - 94.6	96.3 - 94.6 - 93.1 / 94.5 - 92.8	96.0 - 94.2 - 92.6 / 94.0 - 93.6	96.0 - 94.2 - 92.6 / 94.0 - 92.5
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	490×1,050×200			
Package Dimensions		mm	1,100×566×284			
Weight		kg	16			
Gross Weight		kg	22			
Operation Sound	dBA	H	37	37	38	39
		M	34	34	35	36
		L	31	31	32	33
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ6.4		φ6.4	
	Gas	mm	φ9.5		φ12.7	
	Drain	mm	φ18.0		φ18.0	
Drawing No.			3D025021		3D025022	

## ■ 5.0kW Class · 6.0kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FLX50JVEA9		FLX60JVEA	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	5.0	6.1	5.7	6.7
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	11.4	12.1	12.0	12.8
		M	9.9	9.8	10.6	10.6
		L	8.5	7.5	9.3	8.4
	cfm	H	402	427	424	452
		M	349	346	374	374
		L	300	265	328	297
Fan	Type		Sirocco Fan			
	Motor Output	W	34			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removable / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.45 - 0.45 - 0.45 / 0.48 - 0.48	0.45 - 0.45 - 0.45 / 0.48 - 0.48	0.47 - 0.47 - 0.47 / 0.51 - 0.51	0.45 - 0.45 - 0.45 / 0.48 - 0.48
Power Consumption ★ (Rated)		W	94 - 96 - 98 / 98 - 100	94 - 96 - 98 / 98 - 100	96 - 98 - 100 / 100 - 104	94 - 96 - 98 / 98 - 101
Power Factor ★		%	94.2 - 92.8 - 90.7 / 92.1 - 91.5	94.2 - 92.8 - 90.7 / 92.1 - 91.5	92.8 - 90.7 - 88.7 / 89.1 - 88.7	94.9 - 92.8 - 90.7 / 92.8 - 91.5
Temperature Control			Microcomputer Control			
Dimensions (HxWxD)		mm	490x1,050x200			
Package Dimensions		mm	1,100x566x284			
Weight		kg	17			
Gross Weight		kg	24			
Operation Sound	dBA	H	47	46	48	47
		M	43	41	45	42
		L	39	35	41	37
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ6.4		φ6.4	
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ18.0		φ18.0	
Drawing No.			3D027866B		3D027867A	

★ Refer to Engineering Data Book.

## ■ Ceiling Mounted Cassette Type (SkyAir)

### ■ 3.75kW Class · 5.2kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FHYC35KVE9		FHYC50KVE9	
			Cooling	Heating	Cooling	Heating
Rating Capacity			3.75	4.22	5.2	5.8
Front Panel Color			White			
Air Flow Rates	m³/min	H	14.0		15.0	
		L	10.0		11.0	
	cfm	H	494		530	
		L	353		388	
Fan	Type		Turbo Fan			
	Motor Output		W			
	Speed		Steps			
Air Filter			Resin Net (with Mold Resistant)			
Running Current ★ (Rated)		A	0.8 - 0.8 / 0.9	0.6 - 0.6 / 0.7	0.8 - 0.8 / 0.9	0.6 - 0.6 / 0.7
Power Consumption ★ (Rated)		W	140 - 140 / 161	107 - 107 / 128	140 - 140 / 161	107 - 107 / 128
Power Factor ★		%	79.5 - 72.9 / 81.3	81.1 - 74.3 / 83.1	79.5 - 72.9 / 81.3	81.1 - 74.3 / 83.1
Temperature Control			Microcomputer Control			
Dimensions (HxWxD)		mm	230x840x840			
Package Dimensions		mm	305x930x920			
Weight		kg	24			
Gross Weight		kg	29			
Operation Sound	dBA	H	33			
		L	29			
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ6.4		φ15.9	
	Gas	mm	φ12.7			
	Drain	mm	φ25.0			

### ■ 6.15kW Class · 7.7kW Class

50Hz 220-230-240V / 60Hz 220-230V

Model			FHYC60KVE9		FHYC71KVE9	
			Cooling	Heating	Cooling	Heating
Rating Capacity			6.15	7.0	7.7	7.9
Front Panel Color			White			
Air Flow Rates	m³/min	H	19.0			
		L	14.0			
	cfm	H	671			
		L	494			
Fan	Type		Turbo Fan			
	Motor Output	W	45			
	Speed	Steps	2 Steps and Auto			
Air Filter			Resin Net (with Mold Resistant)			
Running Current ★ (Rated)		A	0.9 - 0.9 / 1.0	0.7 - 0.7 / 0.8	0.9 - 0.9 / 1.0	0.7 - 0.7 / 0.8
Power Consumption ★ (Rated)		W	161 - 161 / 181	128 - 128 / 148	161 - 161 / 181	128 - 128 / 148
Power Factor ★		%	81.3 - 74.5 / 82.3	83.1 - 76.2 / 84.1	81.3 - 74.5 / 82.3	83.1 - 76.2 / 84.1
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	230×840×840			
Package Dimensions		mm	305×930×920			
Weight		kg	24			
Gross Weight		kg	29			
Operation Sound	dBA	H	35			
		L	30			
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ6.4		φ9.5	
	Gas	mm	φ15.9			
	Drain	mm	φ25.0			

★ Refer to Engineering Data Book.

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

## ■ Duct Connected Type (SkyAir)

### ■ 6.0kW Class · 7.7kW Class

50Hz 220-230-240V

Model			FDYM60FAV1		FDYM03FAV1	
			Cooling	Heating	Cooling	Heating
Rating Capacity			6.0	7.0	7.7	7.9
Front Panel Color			—			
Air Flow Rates	m³/min	H	20.0			
		L	—			
	cfm	H	706			
		L	—			
Fan	Type		Sirocco Fan			
	Motor Output	W	125			
	Speed	Steps	2 Step and Auto			
Air Filter			—			
Running Current ★ (Rated)		A	0.9			
Power Consumption ★ (Rated)		W	170			
Power Factor ★		%	85.9			
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	295×1,100×680			
Package Dimensions		mm	349×1,311×864			
Weight		kg	42			
Gross Weight		kg	54			
Operation Sound	dBA	H	39			
		L	—			
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ6.4		φ9.5	
	Gas	mm	φ15.9			
	Drain	mm	3/4B			

60Hz 220-230V

Model			FDYM60FAVAL		FDYM03FAVAL	
			Cooling	Heating	Cooling	Heating
Rating Capacity			6.0	7.0	7.7	7.9
Front Panel Color			—			
Air Flow Rates	m³/min	H	20		22	
		L	—		—	
	cfm	H	706		777	
		L	—		—	
Fan	Type		Sirocco Fan			
	Motor Output		W 125			
	Speed		Steps 2 step and Auto			
Air Filter			—			
Running Current ★ (Rated)		A	—			
Power Consumption ★ (Rated)		W	—			
Power Factor ★		%	—			
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	295×1,100×680			
Package Dimensions		mm	349×1,311×864			
Weight		kg	42			
Gross Weight		kg	54			
Operation Sound	dBA	H	42			
		L	—			
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ6.4		φ9.5	
	Gas	mm	φ15.9			
	Drain	mm	3/4B			

★ Refer to Engineering Data Book.

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

## 1.4 Indoor Units (for China)

### 1.4.1 Cooling Only

#### ■ Wall Mounted Type

50Hz 220V

Model			FTK25JVEC	FTK35JVEC
Rating Capacity		kW	2.5	3.5
Front Panel Color			Almond White	Almond White
Air Flow Rates	m³/min	H	7.5	7.5
		M	6.4	6.5
		L	5.5	5.5
	cfm	H	265	265
		M	226	229
		L	194	194
Fan	Type		Cross Flow Fan	Cross Flow Fan
	Motor Output	W	18	18
	Speed	Steps	5 Steps and Auto	5 Steps and Auto
Air Filter			Removable / Washable / Mildew Proof	Removable / Washable / Mildew Proof
Running Current ★ (Rated)		A	0.17	0.17
Power Consumption ★ (Rated)		W	37	37
Power Factor ★		%	98.9	98.9
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (H×W×D)		mm	273×784×185	273×784×185
Package Dimensions		mm	834×325×258	834×325×258
Weight		kg	7.5	7.5
Gross Weight		kg	11	11
Operation Sound	dBA	H	39	39
		M	35	36
		L	30	32
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Piping Connection	Liquid	mm	φ6.4	φ6.4
	Gas	mm	φ9.5	φ12.7
	Drain	mm	φ18.0	φ18.0
Drawing No.			3D020446A	3D020447A

50Hz 220V

Model			FTK50HVEC	FTK60HVEC
Rating Capacity		kW	5.0	6.0
Front Panel Color			Almond White	Almond White
Air Flow Rates	m³/min	H	12.9	14.0
		M	11.2	12.1
		L	9.4	10.3
	cfm	H	455	494
		M	395	427
		L	332	364
Fan	Type		Cross Flow Fan	Cross Flow Fan
	Motor Output	W	35	35
	Speed	Steps	5 Steps and Auto	5 Steps and Auto
Air Filter			Removable / Washable / Mildew Proof	Removable / Washable / Mildew Proof
Running Current ★ (Rated)		A	0.50	0.60
Power Consumption ★ (Rated)		W	50	60
Power Factor ★		%	—	—
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (HxWxD)		mm	298x1,050x190	298x1,050x190
Package Dimensions		mm	1,183x367x289	1,183x367x289
Weight		kg	12	12
Gross Weight		kg	16	16
Operation Sound	dBA	H	44	46
		M	39	42
		L	35	38
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Piping Connection	Liquid	mm	φ6.4	φ6.4
	Gas	mm	φ12.7	φ15.9
	Drain	mm	φ18.0	φ18.0
Drawing No.			3D013610	3D013614

★ Refer to Engineering Data Book.

## ■ Duct Connected Type

50Hz 220V

Model			CDK25HAVEC	CDK35HAVEC
Rating Capacity		kW	2.5	3.5
Front Panel Color			—	—
Air Flow Rates	m³/min	H	13.0	13.0
		M	12.0	12.0
		L	11.0	11.0
	cfm	H	459	459
		M	424	424
		L	388	388
Fan	Type		Sirocco Fan	Sirocco Fan
	Motor Output	W	47	47
	Speed	Steps	5 Steps and Auto	5 Steps and Auto
Air Filter			—	—
Running Current ★ (Rated)		A	0.40	0.40
Power Consumption ★ (Rated)		W	85	85
Power Factor ★		%	96.6	96.6
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (H×W×D)		mm	260×900×580	260×900×580
Package Dimensions		mm	1,070×719×354	1,070×719×354
Weight		kg	23	23
Gross Weight		kg	33	33
Operation Sound	dBA	H	39	39
		M	37	37
		L	36	36
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Piping Connection	Liquid	mm	φ6.4	φ6.4
	Gas	mm	φ9.5	φ12.7
	Drain	mm	φ27.2 (3/4B)	φ27.2 (3/4B)
Drawing No.			3D024956	3D024959

50Hz 220V

Model			CDK50HAVEC	CDK60HAVEC
Rating Capacity		kW	5.0	6.0
Front Panel Color			—	—
Air Flow Rates	m³/min	H	13.0	14.5
		M	12.0	13.0
		L	11.0	11.5
	cfm	H	459	512
		M	424	459
		L	388	406
Fan	Type		Sirocco Fan	Sirocco Fan
	Motor Output	W	47	47
	Speed	Steps	5 Steps and Auto	5 Steps and Auto
Air Filter			—	—
Running Current ★ (Rated)		A	0.40	0.45
Power Consumption ★ (Rated)		W	85	95
Power Factor ★		%	96.6	96.0
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (H×W×D)		mm	260×900×580	260×900×580
Package Dimensions		mm	1,070×719×354	1,070×719×354
Weight		kg	24	24
Gross Weight		kg	34	34
Operation Sound	dBA	H	42	44
		M	40	42
		L	39	41
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Piping Connection	Liquid	mm	φ6.4	φ6.4
	Gas	mm	φ12.7	φ15.9
	Drain	mm	φ27.2 (3/4B)	φ27.2 (3/4B)
Drawing No.			3D024962	3D024965

★ Refer to Engineering Data Book.

Conversion Formulae	
kcal/h=kWx860	
Btu/h=kWx3414	
cfm=m³/minx35.3	

## ■ Floor / Ceiling Suspended Dual Type

50Hz 220V

Model			FLK25HVEC	FLK35HVEC
Rating Capacity		kW	2.5	3.5
Front Panel Color			Almond White	Almond White
Air Flow Rates	m³/min	H	7.6	8.7
		M	6.8	7.7
		L	6.0	6.6
	cfm	H	268	307
		M	240	270
		L	212	233
Fan	Type		Sirocco Fan	Sirocco Fan
	Motor Output	W	34	34
	Speed	Steps	5 Steps and Auto	5 Steps and Auto
Air Filter			Removable / Washable / Mildew Proof	Removable / Washable / Mildew Proof
Running Current ★ (Rated)		A	0.32	0.36
Power Consumption ★ (Rated)		W	68	76
Power Factor ★		%	96.6	96.0
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (H×W×D)		mm	490×1,050×200	490×1,050×200
Package Dimensions		mm	1,100×566×284	1,100×566×284
Weight		kg	16	16
Gross Weight		kg	23	23
Operation Sound	dBA	H	37	38
		M	34	35
		L	31	32
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Piping Connection	Liquid	mm	φ6.4	φ6.4
	Gas	mm	φ9.5	φ12.7
	Drain	mm	φ18.0	φ18.0
Drawing No.			3D025001	3D025002

50Hz 220V

Model			FLK50HVEC	FLK60HVEC
Rating Capacity		kW	5.0	5.7
Front Panel Color			Almond White	Almond White
Air Flow Rates	m³/min	H	11.4	12.0
		M	10.0	10.7
		L	8.5	9.3
	cfm	H	402	424
		M	351	376
		L	300	328
Fan	Type		Sirocco Fan	Sirocco Fan
	Motor Output	W	34	34
	Speed	Steps	5 Steps and Auto	5 Steps and Auto
Air Filter			Removable / Washable / Mildew Proof	Removable / Washable / Mildew Proof
Running Current ★ (Rated)		A	0.45	0.47
Power Consumption ★ (Rated)		W	94	96
Power Factor ★		%	94.2	92.8
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (HxWxD)		mm	490x1,050x200	490x1,050x200
Package Dimensions		mm	1,100x566x284	1,100x566x284
Weight		kg	17	17
Gross Weight		kg	24	24
Operation Sound	dBA	H	47	49
		M	43	45
		L	39	41
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Piping Connection	Liquid	mm	φ6.4	φ6.4
	Gas	mm	φ12.7	φ15.9
	Drain	mm	φ18.0	φ18.0
Drawing No.			3D025003	3D025004

★ Refer to Engineering Data Book.

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

## ■ Ceiling Mounted Cassette Type (SkyAir)

50Hz 220V

Model			FHYC35KV1C9	FHYC50KV1C9	FHYC60KV1C9	FHYC71KV1C9
Rating Capacity		kW	3.75	5.2	6.15	7.7
Front Panel Color			White		White	
Air Flow Rates	m³/min	H	14.0	15.0	19.0	
		L	10.0	11.0	14.0	
	cfm	H	494	530	671	
		L	353	388	494	
Fan	Type		Turbo Fan		Turbo Fan	
	Motor Output	W	45		45	
	Speed	Steps	2 Steps and Auto		2 Steps and Auto	
Air Filter			Resin Net (with Mold Resistant)		Resin Net (with Mold Resistant)	
Running Current ★ (Rated)		A	0.8	0.8	0.9	0.9
Power Consumption ★ (Rated)		W	140	140	161	161
Power Factor ★		%	79.5	79.5	81.3	81.3
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (HxWxD)		mm	230x840x840		230x840x840	
Package Dimensions		mm	305x930x920		305x930x920	
Weight		kg	24		24	
Gross Weight		kg	29		29	
Operation Sound	dBA	H	33		35	
		L	29		30	
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4		φ6.4	φ9.5
	Gas	mm	φ12.7	φ15.9	φ15.9	
	Drain	mm	φ25.0		φ25.0	

## ■ Duct Connected Type (SkyAir)

50Hz 220V

Model			FDYM60FAV1C	FDYM03FAV1C
Rating Capacity		kW	6.15	7.7
Front Panel Color			—	
Air Flow Rates	m³/min	H	20	
		L	—	
	cfm	H	706	
		L	—	
Fan	Type		Sirocco Fan	
	Motor Output	W	125	
	Speed	Steps	2 Step and Auto	
Air Filter			—	
Running Current ★ (Rated)		A	0.9	
Power Consumption ★ (Rated)		W	170	
Power Factor ★		%	85.9	
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	295x1,100x680	
Package Dimensions		mm	349x1,311x864	
Weight		kg	42	
Gross Weight		kg	54	
Operation Sound	dBA	H	39	
		L	—	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4	φ9.5
	Gas	mm	φ15.9	
	Drain	mm	3/4B	

★ Refer to Engineering Data Book.

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

## 1.4.2 Heat Pump

### ■ Wall Mounted Type

50Hz 220V

Model			FTX25JVEC		FTX35JVEC	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.4	3.5	4.2
Front Panel Color			Almond White		Almond White	
Air Flow Rates	m³/min	H	7.5	8.5	7.5	8.7
		M	6.4	7.3	6.5	7.5
		L	5.4	6.2	5.5	6.2
	cfm	H	265	300	265	307
		M	226	258	229	265
		L	191	219	194	219
Fan	Type		Cross Flow Fan		Cross Flow Fan	
	Motor Output	W	18		18	
	Speed	Steps	5 Steps and Auto		5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.17		0.17	
Power Consumption ★ (Rated)		W	37		37	
Power Factor ★		%	98.9		98.9	
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (H×W×D)		mm	273×784×185		273×784×185	
Package Dimensions		mm	834×325×258		834×325×258	
Weight		kg	7.5		7.5	
Gross Weight		kg	11		11	
Operation Sound	dBA	H	39	37	39	38
		M	35	34	36	35
		L	30	30	32	31
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4		φ6.4	
	Gas	mm	φ9.5		φ12.7	
	Drain	mm	φ18.0		φ18.0	
Drawing No.			3D020444A		3D020445A	

50Hz 220V

Model			FTX50HVEC		FTX60HVEC		
			Cooling	Heating	Cooling	Heating	
Rating Capacity		kW	5.0	6.13	6.0	7.32	
Front Panel Color			Almond White				
Air Flow Rates	m³/min	H	12.9	15.2	14.0	16.3	
		M	11.2	13.1	12.1	14.0	
		L	9.4	11.0	10.3	11.7	
	cfm	H	455	537	494	575	
		M	395	462	427	494	
		L	332	388	364	413	
Fan	Type		Cross Flow Fan		Cross Flow Fan		
	Motor Output	W	35		35		
	Speed	Steps	5 Steps and Auto		5 Steps and Auto		
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof		
Running Current ★ (Rated)		A	0.50		0.60		
Power Consumption ★ (Rated)		W	50		60		
Power Factor ★		%	—		—		
Temperature Control			Microcomputer Control		Microcomputer Control		
Dimensions (H×W×D)		mm	298×1,050×190		298×1,050×190		
Package Dimensions		mm	1,183×367×289		1,183×367×289		
Weight		kg	12		12		
Gross Weight		kg	16		16		
Operation Sound		dBA	H	44	44	46	46
			M	39	38	42	41
			L	35	33	38	34
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes		
Piping Connection	Liquid	mm	φ6.4		φ6.4		
	Gas	mm	φ12.7		φ15.9		
	Drain	mm	φ18.0		φ18.0		
Drawing No.			3D013592		3D013595		

★ Refer to Engineering Data Book.

## ■ Duct Connected Type

50Hz 220V

Model			CDX25HAVEC		CDX35HAVEC	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.86	3.5	4.42
Front Panel Color			—		—	
Air Flow Rates	m³/min	H	13.0	13.0	13.0	13.0
		M	12.0	12.0	12.0	12.0
		L	11.0	11.0	11.0	11.0
	cfm	H	459	459	459	459
		M	424	424	424	424
		L	388	388	388	388
Fan	Type		Sirocco Fan		Sirocco Fan	
	Motor Output	W	47		47	
	Speed	Steps	5 Steps and Auto		5 Steps and Auto	
Air Filter			—		—	
Running Current ★ (Rated)		A	0.40	0.40	0.40	0.40
Power Consumption ★ (Rated)		W	85	85	85	85
Power Factor ★		%	96.6	96.6	96.6	96.6
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (H×W×D)		mm	260×900×580		260×900×580	
Package Dimensions		mm	1,070×719×354		1,070×719×354	
Weight		kg	23		23	
Gross Weight		kg	33		33	
Operation Sound	dBA	H	39	40	39	40
		M	37	38	37	38
		L	36	36	36	36
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4		φ6.4	
	Gas	mm	φ9.5		φ12.7	
	Drain	mm	φ27.2(3/4B)		φ27.2(3/4B)	
Drawing No.			3D024975		3D024977	

50Hz 220V

Model			CDX50HAVEC		CDX60HAVEC	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	5.0	6.13	6.0	7.32
Front Panel Color			—		—	
Air Flow Rates	m³/min	H	13.0	13.0	14.5	14.5
		M	12.0	12.0	13.0	13.0
		L	11.0	11.0	11.5	11.5
	cfm	H	459	459	512	512
		M	424	424	459	459
		L	388	388	406	406
Fan	Type		Sirocco Fan		Sirocco Fan	
	Motor Output	W	47		47	
	Speed	Steps	5 Steps and Auto		5 Steps and Auto	
Air Filter			—		—	
Running Current ★ (Rated)		A	0.40	0.40	0.45	0.45
Power Consumption ★ (Rated)		W	85	85	95	95
Power Factor ★		%	96.6	96.6	96.0	96.0
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (H×W×D)		mm	260×900×580		260×900×580	
Package Dimensions		mm	1,070×719×354		1,070×719×354	
Weight		kg	24		24	
Gross Weight		kg	34		34	
Operation Sound	dBA	H	42	42	44	44
		M	40	40	42	42
		L	39	38	41	40
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ6.4		φ6.4	
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ27.2(3/4B)		φ27.2(3/4B)	
Drawing No.			3D024979		3D024981	

★ Refer to Engineering Data Book.

Conversion Formulae

kcal/h=kWx860  
 Btu/h=kWx3414  
 cfm=m³/minx35.3

## ■ Duct Connected Type

50Hz 220V

Model			CDX25JVEC		CDX35JVEC	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.86	3.5	4.42
Front Panel Color			—		—	
Air Flow Rates	m³/min	H	10.4	10.4	11.0	11.0
		M	9.6	9.6	10.2	10.2
		L	8.7	8.7	9.3	9.3
	cfm	H	367	367	388	388
		M	339	339	360	360
		L	307	307	328	328
Fan	Type		Sirocco Fan		Sirocco Fan	
	Motor Output	W	47		47	
	Speed	Steps	5 Steps and Auto		5 Steps and Auto	
Air Filter			—		—	
Running Current ★ (Rated)		A	0.38	0.38	0.38	0.38
Power Consumption ★ (Rated)		W	80	80	80	80
Power Factor ★		%	95.7	95.7	95.7	95.7
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (H×W×D)		mm	260×900×580		260×900×580	
Package Dimensions		mm	1,070×719×354		1,070×719×354	
Weight		kg	23		23	
Gross Weight		kg	33		33	
Operation Sound	dBA	H	36	37	37	38
		M	34	35	35	36
		L	31	32	32	33
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ 6.4		φ 6.4	
	Gas	mm	φ 9.5		φ 12.7	
	Drain	mm	φ 27.2(3/4B)		φ 27.2(3/4B)	
Drawing No.			3D037541		3D037542	

★ Refer to Engineering Data Book.

Conversion Formulae

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

## ■ Floor / Ceiling Suspended Dual Type

50Hz 220V

Model			FLX25HVEC		FLX35HVEC	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.86	3.5	4.42
Front Panel Color			Almond White		Almond White	
Air Flow Rates	m³/min	H	7.6	9.2	8.7	10.0
		M	6.8	8.3	7.7	9.0
		L	6.0	7.4	6.6	8.0
	cfm	H	268	325	307	353
		M	240	293	270	318
		L	212	261	233	282
Fan	Type		Sirocco Fan		Sirocco Fan	
	Motor Output	W	34		34	
	Speed	Steps	5 Steps and Auto		5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.32	0.34	0.36	0.36
Power Consumption ★ (Rated)		W	68	72	76	76
Power Factor ★		%	96.6	96.3	96.0	96.0
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (HxWxD)		mm	490x1,050x200		490x1,050x200	
Package Dimensions		mm	1,100x566x284		1,100x566x284	
Weight		kg	16		16	
Gross Weight		kg	23		23	
Operation Sound	dBA	H	37		38	39
		M	34		35	36
		L	31		32	33
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ 6.4		φ 6.4	
	Gas	mm	φ 9.5		φ 12.7	
	Drain	mm	φ 18.0		φ 18.0	
Drawing No.			3D025013		3D025014	

50Hz 220V

Model			FLX50HVEC		FLX60HVEC	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	5.0	6.13	5.7	7.32
Front Panel Color			Almond White		Almond White	
Air Flow Rates	m³/min	H	11.4	12.1	12.0	12.8
		M	10.0	9.8	10.7	10.6
		L	8.5	7.5	9.3	8.4
	cfm	H	402	427	424	452
		M	351	346	376	374
		L	300	265	328	297
Fan	Type		Sirocco Fan		Sirocco Fan	
	Motor Output	W	34		34	
	Speed	Steps	5 Steps and Auto		5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.45	0.44	0.47	0.45
Power Consumption ★ (Rated)		W	94	94	96	94
Power Factor ★		%	94.9	91.7	92.8	94.9
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (H×W×D)		mm	490×1,050×200		490×1,050×200	
Package Dimensions		mm	1,100×566×284		1,100×566×284	
Weight		kg	17		17	
Gross Weight		kg	24		24	
Operation Sound	dBA	H	47	46	49	48
		M	43	42	45	44
		L	39	37	41	39
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ 6.4		φ 6.4	
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ18.0		φ18.0	
Drawing No.			3D025015		3D025016	

★ Refer to Engineering Data Book.

Conversion Formulae

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

## ■ Ceiling Mounted Cassette Type (SkyAir)

50Hz 220V

Model			FHYC35KV1C9		FHYC50KV1C9		FHYC60KV1C9		FHYC71KV1C9		
			Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	
Rating Capacity			3.75	4.22	5.2	5.8	6.15	7.0	7.7	7.9	
Front Panel Color			White				White				
Air Flow Rates	m³/min	H	14.0		15.0		19.0				
		L	10.0		11.0		14.0				
	cfm	H	494		530		671				
		L	353		388		494				
Fan	Type		Turbo Fan				Turbo Fan				
	Motor Output		W	45				45			
	Speed		Steps	2 Steps and Auto				2 Steps and Auto			
Air Filter			Resin Net (with Mold Resistant)				Resin Net (with Mold Resistant)				
Running Current ★ (Rated)		A	0.8				0.9				
Power Consumption ★ (Rated)		W	140				161				
Power Factor ★		%	79.5				81.3				
Temperature Control			Microcomputer Control				Microcomputer Control				
Dimensions (H×W×D)		mm	230×840×840				230×840×840				
Package Dimensions		mm	305×930×920				305×930×920				
Weight		kg	24				24				
Gross Weight		kg	29				29				
Operation Sound		dBA	H	33				35			
			L	29				30			
Heat Insulation			Both Liquid and Gas Pipes				Both Liquid and Gas Pipes				
Piping Connection	Liquid	mm	φ 6.4				φ 6.4		φ 9.5		
	Gas	mm	φ12.7		φ15.9		φ15.9				
	Drain	mm	φ 25				φ 25				

## ■ Duct Connected Type (SkyAir)

50Hz 220V

Model			FDYM60FAV1C		FDYM03FAV1C	
			Cooling	Heating	Cooling	Heating
Rating Capacity			6.0	7.0	7.7	7.9
Front Panel Color			—			
Air Flow Rates	m³/min	H	20.0			
		L	—			
	cfm	H	706			
		L	—			
Fan	Type		Sirocco Fan			
	Motor Output		W	125		
	Speed		Steps	2 Step and Auto		
Air Filter			—			
Running Current ★ (Rated)		A	0.9			
Power Consumption ★ (Rated)		W	170			
Power Factor ★		%	85.9			
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	295×1,100×680			
Package Dimensions		mm	349×1,311×864			
Weight		kg	42			
Gross Weight		kg	54			
Operation Sound	dBA	H	39			
		L	—			
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4		φ 9.5	
	Gas	mm	φ15.9			
	Drain	mm	3/4B			

★ Refer to Engineering Data Book.

Conversion Formulae

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

## 1.5 Indoor Units (for Taiwan)

### 1.5.1 Cooling Only

#### ■ Wall Mounted Type

##### ■ 2.5, 3.5kW Class

60Hz 220V

Model			FTK25JAVET	FTK35JAVET
Rating Capacity		kW	2.5	3.5
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	7.5	7.8
		M	6.4	6.7
		L	5.4	5.5
	cfm	H	265	275
		M	226	237
		L	191	194
Fan	Type		Cross Flow Fan	
	Motor Output	W	18	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removal / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.21	
Power Consumption ★ (Rated)		W	45	
Power Factor ★		%	97.4	
Temperature Control			Microcomputer Control	
Dimensions (WxDxH)		mm	273x784x185	
Package Dimensions		mm	834x325x258	
Weight		kg	7.5	
Gross Weight		kg	11	
Operation Sound	dBA	H	37	38
		M	34	35
		L	30	32
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ 6.4	
	Gas	mm	φ 9.5	φ12.7
	Drain	mm	φ18.0	
Drawing No.			3D031683	3D031684

##### ■ 5.0, 6.0kW Class

60Hz 220V

Model			FTKD50JVET	FTKD60JVET
Rating Capacity		kW	5.0	6.0
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	12.9	13.6
		M	11.4	12.0
		L	9.9	10.4
	cfm	H	455	480
		M	402	424
		L	349	367
Fan	Type		Cross Flow Fan	
	Motor Output	W	54	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removal / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.19	0.21
Power Consumption ★ (Rated)		W	40	45
Power Factor ★		%	95.7	97.4
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	298x1,050x190	
Package Dimensions (WxDxH)		mm	1,183x367x289	
Weight		kg	12	
Gross Weight		kg	16	
Operation Sound	dBA	H	44	45
		M	40	41
		L	35	37
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ 6.4	
	Gas	mm	φ12.7	φ15.9
	Drain	mm	φ18.0	
Drawing No.			3D028406A	3D028407

★ Refer to Engineering Data Book.

## ■ 7.1kW Class

60Hz 220V

Model			FTKD71JVET
Rating Capacity		kW	7.1
Front Panel Color			Almond White
Air Flow Rates	m³/min	H	14.3
		M	12.3
		L	10.4
	cfm	H	505
		M	434
		L	367
Fan	Type		Cross Flow Fan
	Motor Output	W	54
	Speed	Steps	5 Steps and Auto
Air Filter			Removal / Washable / Mildew Proof
Running Current ★ (Rated)		A	0.23
Power Consumption ★ (Rated)		W	50
Power Factor ★		%	98.8
Temperature Control			Microcomputer Control
Dimensions (H×W×D)		mm	298×1,050×190
Package Dimensions (W×D×H)		mm	1,183×367×289
Weight		kg	12
Gross Weight		kg	16
Operation Sound	dBA	H	46
		M	42
		L	37
Heat Insulation			Both Liquid and Gas Pipes
Piping Connection	Liquid	mm	φ 9.5
	Gas	mm	φ15.9
	Drain	mm	φ18.0
Drawing No.			3D028408

★ Refer to Engineering Data Book.

Conversion Formulae	
kcal/h=kWx860	
Btu/h=kWx3414	
cfm=m³/minx35.3	

## ■ Duct Connected Type

60Hz 220V

Model			CDK25HAVET	CDK35HAVET
Rating Capacity		kW	2.5	3.5
Front Panel Color			—	—
Air Flow Rates	m³/min	H	13.0	13.0
		M	12.0	12.0
		L	11.0	11.0
	cfm	H	459	459
		M	424	424
		L	388	388
Fan	Type		Sirocco Fan	Sirocco Fan
	Motor Output	W	47	47
	Speed	Steps	5 Steps and Auto	5 Steps and Auto
Air Filter			—	—
Running Current ★ (Rated)		A	0.48	0.48
Power Consumption ★ (Rated)		W	100	100
Power Factor ★		%	94.7	94.7
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (H×W×D)		mm	260×900×580	260×900×580
Package Dimensions		mm	1,070×719×354	1,070×719×354
Weight		kg	23	23
Gross Weight		kg	32	32
Operation Sound	dBA	H	42	42
		M	39	39
		L	36	36
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Piping Connection	Liquid	mm	φ 6.4	φ 6.4
	Gas	mm	φ 9.5	φ 12.7
	Drain	mm	φ 27.2 (3/4B)	φ 27.2 (3/4B)
Drawing No.			3D024957	3D024960

60Hz 220V

Model			CDK50HAVET	CDK60HAVET
Rating Capacity		kW	5.0	6.0
Front Panel Color			—	—
Air Flow Rates	m³/min	H	13.0	14.5
		M	12.0	13.0
		L	11.0	11.5
	cfm	H	459	512
		M	424	459
		L	388	406
Fan	Type		Sirocco Fan	Sirocco Fan
	Motor Output	W	47	47
	Speed	Steps	5 Steps and Auto	5 Steps and Auto
Air Filter			—	—
Running Current ★ (Rated)		A	0.48	0.53
Power Consumption ★ (Rated)		W	100	110
Power Factor ★		%	94.7	94.3
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (H×W×D)		mm	260×900×580	260×900×580
Package Dimensions		mm	1,070×719×354	1,070×719×354
Weight		kg	24	24
Gross Weight		kg	33	33
Operation Sound	dBA	H	45	46
		M	42	44
		L	39	41
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Piping Connection	Liquid	mm	φ 6.4	φ 6.4
	Gas	mm	φ12.7	φ15.9
	Drain	mm	φ 27.2 (3/4B)	φ 27.2 (3/4B)
Drawing No.			3D024963	3D024966

★ Refer to Engineering Data Book.

Conversion Formulae	
kcal/h=kWx860	
Btu/h=kWx3414	
cfm=m³/minx35.3	

## ■ Floor / Ceiling Suspended Dual Type

60Hz 220V

Model			FLK25HVET	FLK35HVET
Rating Capacity		kW	2.5	3.5
Front Panel Color			Almond White	Almond White
Air Flow Rates	m³/min	H	7.6	8.7
		M	6.8	7.7
		L	6.0	6.6
	cfm	H	268	307
		M	240	270
		L	212	233
Fan	Type		Sirocco Fan	Sirocco Fan
	Motor Output	W	34	34
	Speed	Steps	5 Steps and Auto	5 Steps and Auto
Air Filter			Removable / Washable / Mildew Proof	Removable / Washable / Mildew Proof
Running Current ★ (Rated)		A	0.34	0.39
Power Consumption ★ (Rated)		W	72	80
Power Factor ★		%	95.1	94.0
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (HxWxD)		mm	490x1,050x200	490x1,050x200
Package Dimensions		mm	1,100x566x284	1,100x566x284
Weight		kg	16	16
Gross Weight		kg	22	22
Operation Sound	dBA	H	37	38
		M	34	35
		L	31	32
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Piping Connection	Liquid	mm	φ 6.4	φ 6.4
	Gas	mm	φ 9.5	φ12.7
	Drain	mm	φ18.0	φ18.0
Drawing No.			3D025005	3D025006

60Hz 220V

Model			FLK50HVET	FLK60HVET
Rating Capacity		kW	5.0	5.7
Front Panel Color			Almond White	Almond White
Air Flow Rates	m³/min	H	11.4	12.0
		M	10.0	10.7
		L	8.5	9.3
	cfm	H	402	424
		M	351	376
		L	300	328
Fan	Type		Sirocco Fan	Sirocco Fan
	Motor Output	W	34	34
	Speed	Steps	5 Steps and Auto	5 Steps and Auto
Air Filter			Removable / Washable / Mildew Proof	Removable / Washable / Mildew Proof
Running Current ★ (Rated)		A	0.48	0.51
Power Consumption ★ (Rated)		W	98	100
Power Factor ★		%	92.1	90.0
Temperature Control			Microcomputer Control	Microcomputer Control
Dimensions (HxWxD)		mm	490x1,050x200	490x1,050x200
Package Dimensions		mm	1,100x566x284	1,100x566x284
Weight		kg	17	17
Gross Weight		kg	24	24
Operation Sound	dBA	H	47	49
		M	43	45
		L	39	41
Heat Insulation			Both Liquid and Gas Pipes	Both Liquid and Gas Pipes
Piping Connection	Liquid	mm	φ 6.4	φ 6.4
	Gas	mm	φ12.7	φ15.9
	Drain	mm	φ18.0	φ18.0
Drawing No.			3D025007	3D025008

★ Refer to Engineering Data Book.

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

## ■ Ceiling Mounted Cassette Type (SkyAir)

60Hz 220V

Model			FHYC35KVE9	FHYC50KVE9	FHYC60KVE9	FHYC71KVE9
Rating Capacity		kW	3.75	5.2	6.15	7.7
Front Panel Color			White		White	
Air Flow Rates	m³/min	H	14.0	15.0	19.0	
		L	10.0	11.0	14.0	
	cfm	H	494	530	671	
		L	353	388	494	
Fan	Type		Turbo Fan		Turbo Fan	
	Motor Output		W	45	45	
	Speed		Steps	2 Steps and Auto		2 Steps and Auto
Air Filter			Resin Net (with Mold Resistant)		Resin Net (with Mold Resistant)	
Running Current ★ (Rated)		A	0.9	0.9	1.0	1.0
Power Consumption ★ (Rated)		W	161	161	181	181
Power Factor ★		%	81.3	81.3	82.3	82.3
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (HxWxD)		mm	230x840x840		230x840x840	
Package Dimensions		mm	305x930x920		305x930x920	
Weight		kg	24		24	
Gross Weight		kg	29		29	
Operation Sound	dBA	H	33		35	
		L	29		30	
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ 6.4		φ 6.4	φ 9.5
	Gas	mm	φ12.7	φ15.9	φ15.9	
	Drain	mm	φ 25.0		φ 25.0	

## ■ Duct Connected Type (SkyAir)

60Hz 220V

Model			FDYM60FAVAL	FDYM03FAVAL
Rating Capacity		kW	6.15	7.7
Front Panel Color			—	
Air Flow Rates	m³/min	H	20	
		L	—	
	cfm	H	706	
		L	—	
Fan	Type		Sirocco Fan	
	Motor Output	W	125	
	Speed	Steps	2 Step and Auto	
Air Filter			—	
Running Current ★ (Rated)		A	—	
Power Consumption ★ (Rated)		W	—	
Power Factor ★		%	—	
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	295x1,100x680	
Package Dimensions		mm	349x1,311x864	
Weight		kg	42	
Gross Weight		kg	54	
Operation Sound	dBA	H	42	
		L	—	
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ 6.4	φ 9.5
	Gas	mm	φ15.9	
	Drain	mm	3/4B	

★ Refer to Engineering Data Book.

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

## 1.5.2 Heat Pump

### ■ Wall Mounted Type

#### ■ 2.5kW Class · 3.5kW Class

60Hz 220V

Model			FTX25JAVET		FTX35JAVET	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.4	3.5	4.2
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	7.5	8.8	7.8	8.7
		M	6.4	7.5	6.7	7.4
		L	5.4	6.2	5.5	6.2
	cfm	H	265	311	275	307
		M	226	265	237	261
		L	191	219	194	219
Fan	Type		Cross Flow Fan			
	Motor Output	W	18			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removal / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.21			
Power Consumption ★ (Rated)		W	45			
Power Factor ★		%	97.4			
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	273×784×185			
Package Dimensions (W×D×H)		mm	834×325×258			
Weight		kg	7.5			
Gross Weight		kg	11			
Operation Sound	dBA	H	37	37	38	38
		M	34	33	35	35
		L	30	30	32	31
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4			
	Gas	mm	φ 9.5		φ12.7	
	Drain	mm	φ18.0			
Drawing No.			3D031681		3D031682	

#### ■ 5.0kW Class · 6.0kW Class

60Hz 220V

Model			FTXD50JVET		FTXD60JVET	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	5.0	6.5	6.0	7.2
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	12.9	15.7	13.6	17.2
		M	11.4	13.4	12.0	14.4
		L	9.9	11.0	10.4	11.7
	cfm	H	455	554	480	607
		M	402	473	424	508
		L	349	388	367	413
Fan	Type		Cross Flow Fan			
	Motor Output	W	54			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removal / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.19	0.18	0.21	0.21
Power Consumption ★ (Rated)		W	40	35	45	45
Power Factor ★		%	95.7	96.0	97.4	97.4
Temperature Control			Microcomputer Control			
Dimensions (HxWxD)		mm	298x1,050x190			
Package Dimensions (WxDxH)		mm	1,183x367x289			
Weight		kg	12			
Gross Weight		kg	16			
Operation Sound	dBA	H	44	42	45	44
		M	40	38	41	39
		L	35	33	37	34
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4			
	Gas	mm	φ12.7		φ 15.9	
	Drain	mm	φ18.0			
Drawing No.			3D028409A		3D028410	

★ Refer to Engineering Data Book.

## ■ 7.1kW Class

60Hz 220V

Model			FTXD71JVET	
			Cooling	Heating
Rating Capacity		kW	7.1	8.5
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	14.3	18.1
		M	12.3	14.9
		L	10.4	11.7
	cfm	H	505	639
		M	434	526
		L	367	413
Fan	Type		Cross Flow Fan	
	Motor Output	W	54	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removal / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.23	0.23
Power Consumption ★ (Rated)		W	50	50
Power Factor ★		%	98.8	98.8
Temperature Control			Microcomputer Control	
Dimensions (H×W×D)		mm	298×1,050×190	
Package Dimensions (W×D×H)		mm	1,183×367×289	
Weight		kg	12	
Gross Weight		kg	16	
Operation Sound	dBA	H	46	46
		M	42	40
		L	37	34
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ 9.5	
	Gas	mm	φ15.9	
	Drain	mm	φ18.0	
Drawing No.			3D028411	

★ Refer to Engineering Data Book.

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

## ■ Floor / Ceiling Suspended Dual Type

60Hz 220V

Model			FLX25HVET		FLX35HVET	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5 kW Class		3.5 kW Class	
Front Panel Color			Almond White		Almond White	
Air Flow Rates	m³/min	H	7.6	9.2	8.7	10.0
		M	6.8	8.3	7.7	9.0
		L	6.0	7.4	6.6	8.0
	cfm	H	268	325	307	353
		M	240	293	270	318
		L	212	261	233	282
Fan	Type		Sirocco Fan		Sirocco Fan	
	Motor Output	W	34		34	
	Speed	Steps	5 Steps and Auto		5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.34	0.37	0.39	
Power Consumption ★ (Rated)		W	72	76	80	
Power Factor ★		%	95.1	94.5	94.0	
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (HxWxD)		mm	490x1,050x200		490x1,050x200	
Package Dimensions		mm	1,100x566x284		1,100x566x284	
Weight		kg	16		16	
Gross Weight		kg	22		22	
Operation Sound	dBA	H	37		38	39
		M	34		35	36
		L	31		32	33
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ 6.4		φ 6.4	
	Gas	mm	φ 9.5		φ 12.7	
	Drain	mm	φ 18.0		φ 18.0	
Drawing No.			3D025017		3D025018	

60Hz 220V

Model			FLX50HVET		FLX60HVET	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	5.0 kW Class		5.7 kW Class	
Front Panel Color			Almond White		Almond White	
Air Flow Rates	m³/min	H	11.4	12.1	12.0	12.8
		M	10.0	9.8	10.7	10.6
		L	8.5	7.5	9.3	8.4
	cfm	H	402	427	424	452
		M	351	346	376	374
		L	300	265	328	297
Fan	Type		Sirocco Fan		Sirocco Fan	
	Motor Output	W	34		34	
	Speed	Steps	5 Steps and Auto		5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof		Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.48	0.47	0.51	0.48
Power Consumption ★ (Rated)		W	98	98	100	98
Power Factor ★		%	92.1	94.2	90.0	92.1
Temperature Control			Microcomputer Control		Microcomputer Control	
Dimensions (H×W×D)		mm	490×1,050×200		490×1,050×200	
Package Dimensions		mm	1,100×566×284		1,100×566×284	
Weight		kg	17		17	
Gross Weight		kg	24		24	
Operation Sound	dBA	H	47	46	49	48
		M	43	42	45	44
		L	39	37	41	39
Heat Insulation			Both Liquid and Gas Pipes		Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ 6.4		φ 6.4	
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ18.0		φ18.0	
Drawing No.			3D025019		3D025020	

★ Refer to Engineering Data Book.

Conversion Formulae

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

## ■ Ceiling Mounted Cassette Type (SkyAir)

60Hz 220V

Model			FHYC35KVE9		FHYC50KVE9		FHYC60KVE9		FHYC71KVE9		
			Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	
Rating Capacity		kW	3.75	4.22	5.2	5.8	6.15	7.0	7.7	7.9	
Front Panel Color			White				White				
Air Flow Rates	m³/min	H	14.0		15.0		19.0				
		L	10.0		11.0		14.0				
	cfm	H	494		530		671				
		L	353		388		494				
Fan	Type		Turbo Fan				Turbo Fan				
	Motor Output		W	45				45			
	Speed		Steps	2 Steps and Auto				2 Steps and Auto			
Air Filter			Resin Net (with Mold Resistant)				Resin Net (with Mold Resistant)				
Running Current ★ (Rated)		A	0.9	0.7	0.9	0.7	1.0	0.8	1.0	0.8	
Power Consumption ★ (Rated)		W	161	128	161	128	181	148	181	148	
Power Factor ★		%	81.3	83.1	81.3	83.1	82.3	84.1	82.3	84.1	
Temperature Control			Microcomputer Control				Microcomputer Control				
Dimensions (HxWxD)		mm	230x840x840				230x840x840				
Package Dimensions		mm	305x930x920				305x930x920				
Weight		kg	24				24				
Gross Weight		kg	29				29				
Operation Sound		dBA	H				35				
			L				30				
Heat Insulation			Both Liquid and Gas Pipes				Both Liquid and Gas Pipes				
Piping Connection	Liquid	mm	φ 6.4				φ 6.4		φ 9.5		
	Gas	mm	φ12.7		φ15.9		φ15.9				
	Drain	mm	φ 25				φ 25				

## ■ Duct Connected Type (SkyAir)

60Hz 220V

Model			FDYM60FAVAL		FDYM03FAVAL	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	6.0	7.0	7.7	7.9
Front Panel Color			—			
Air Flow Rates	m³/min	H	20.0			
		L	—			
	cfm	H	706			
		L	—			
Fan	Type		Sirocco Fan			
	Motor Output	W	125			
	Speed	Steps	2 Step and Auto			
Air Filter			—			
Running Current ★ (Rated)		A				
Power Consumption ★ (Rated)		W				
Power Factor ★		%				
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	295×1,100×680			
Package Dimensions		mm	349×1,311×864			
Weight		kg	42			
Gross Weight		kg	54			
Operation Sound	dBA	H	42			
		L	—			
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4		φ 9.5	
	Gas	mm	φ15.9			
	Drain	mm	3/4B			

★ Refer to Engineering Data Book.

Conversion Formulae

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

## 1.6 Indoor Units (for Europe)

### 1.6.1 Heat Pump

#### ■ Wall Mounted Type

#### ■ 2.5kW Class · 3.5kW Class

50Hz 230V

Model			FTX25JAV1NB		FTX35JAV1NB	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.4	3.5	4.2
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	7.1	8.4	7.4	8.4
		M	5.9	7.0	6.0	7.1
		L	4.6	5.7	4.7	5.9
	cfm	H	251	297	261	297
		M	208	247	212	251
		L	162	201	166	208
Fan	Type		Cross Flow Fan			
	Motor Output	W	18			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removable / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.18			
Power Consumption ★ (Rated)		W	40			
Power Factor ★		%	96.6			
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	273×784×185			
Package Dimensions (W×D×H)		mm	834×325×258			
Weight		kg	7.5			
Gross Weight		kg	11			
Operation Sound	dBA	H	38	38	39	39
		M	32	32	33	33
		L	26	26	27	27
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4			
	Gas	mm	φ 9.5		φ12.7	
	Drain	mm	φ18.0			
Drawing No.			3D027497B		3D027498B	

50Hz 230V

Model			FTXD25KZV1B		FTXD35KZV1B	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.4	3.5	4.2
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	7.5	8.0	7.9	8.0
		M	5.8	6.4	6.1	6.5
		L	4.0	4.8	4.3	5.0
	cfm	H	265	282	279	282
		M	203	226	215	229
		L	141	169	152	177
Fan	Type		Cross Flow Fan			
	Motor Output	W	18			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removable / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.18			
Power Consumption ★ (Rated)		W	40			
Power Factor ★		%	96.6			
Temperature Control			Microcomputer Control			
Dimensions (HxWxD)		mm	273x784x185			
Package Dimensions (WxDxH)		mm	834x325x258			
Weight		kg	8			
Gross Weight		kg	11			
Operation Sound	dBA	H	38	38	39	39
		M	32	32	33	33
		L	25	25	26	26
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4			
	Gas	mm	φ 9.5		φ12.7	
	Drain	mm	φ18.0			
Drawing No.			3D029436		3D029437	

★ Refer to Engineering Data Book.

## ■ 5.0kW Class · 6.0kW Class

50Hz 230V

Model			FTXD50JV1B		FTXD60JV1B	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	5.0	6.5	6.0	7.2
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	12.3	14.9	13.0	16.5
		M	10.7	12.8	11.5	13.7
		L	9.1	10.5	9.9	11.1
	cfm	H	434	526	459	582
		M	378	452	406	484
		L	321	371	349	392
Fan	Type		Cross Flow Fan			
	Motor Output	W	54			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removable / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.18	0.17	0.20	0.20
Power Consumption ★ (Rated)		W	40	38	45	45
Power Factor ★		%	96.6	97.2	97.8	97.8
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	298×1,050×190			
Package Dimensions (W×D×H)		mm	1,183×367×289			
Weight		kg	12			
Gross Weight		kg	16			
Operation Sound	dBA	H	44	42	45	44
		M	40	37	41	39
		L	35	32	37	34
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4			
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ18.0			
Drawing No.			3D029183		3D029184	

## ■ 7.1kW Class

50Hz 230V

Model			FTXD71JV1B	
			Cooling	Heating
Rating Capacity		kW	7.1	8.5
Front Panel Color			Almond White	
Air Flow Rates	m³/min	H	13.7	17.3
		M	11.8	14.1
		L	9.9	11.1
	cfm	H	484	611
		M	417	498
		L	349	392
Fan	Type		Cross Flow Fan	
	Motor Output	W	54	
	Speed	Steps	5 Steps and Auto	
Air Filter			Removable / Washable / Mildew Proof	
Running Current ★ (Rated)		A	0.22	0.22
Power Consumption ★ (Rated)		W	50	50
Power Factor ★		%	98.8	98.8
Temperature Control			Microcomputer Control	
Dimensions (HxWxD)		mm	298x1,050x190	
Package Dimensions (WxDxH)		mm	1,183x367x289	
Weight		kg	12	
Gross Weight		kg	16	
Operation Sound	dBA	H	46	46
		M	42	40
		L	37	34
Heat Insulation			Both Liquid and Gas Pipes	
Piping Connection	Liquid	mm	φ 9.5	
	Gas	mm	φ15.9	
	Drain	mm	φ18.0	
Drawing No.			3D029185	

★ Refer to Engineering Data Book.

Conversion Formulae

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

## ■ Duct Connected Type

### ■ 2.5kW Class · 3.5kW Class

50Hz 230V

Model			CDX25HAV1NB		CDX35HAV1NB	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.86	3.5	4.42
Front Panel Color			—			
Air Flow Rates	m³/min	H	13.0			
		M	12.0			
		L	11.0			
	cfm	H	459			
		M	424			
		L	388			
Fan	Type		Sirocco Fan			
	Motor Output	W	47			
	Speed	Steps	5 Steps and Auto			
Air Filter			—			
Running Current ★ (Rated)		A	0.40			
Power Consumption ★ (Rated)		W	85			
Power Factor ★		%	92.4			
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	260×900×580			
Package Dimensions (W×D×H)		mm	1,070×719×354			
Weight		kg	23			
Gross Weight		kg	32			
Operation Sound	dBA	H	39	40	39	40
		M	37	38	37	38
		L	36	36	36	36
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4			
	Gas	mm	φ 9.5			
	Drain	mm	φ 27.2(3/4B)			
Drawing No.			3D024989			3D024990

### ■ 5.0kW Class · 6.0kW Class

50Hz 230V

Model			CDX50HAV1NB		CDX60HAV1NB	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	5.0	6.13	6.0	7.32
Front Panel Color			—			
Air Flow Rates	m³/min	H	13.0		14.5	
		M	12.0		13.0	
		L	11.0		11.5	
	cfm	H	459		512	
		M	424		459	
		L	388		406	
Fan	Type		Sirocco Fan			
	Motor Output	W	47			
	Speed	Steps	5 Steps and Auto			
Air Filter			—			
Running Current ★ (Rated)		A	0.40		0.45	
Power Consumption ★ (Rated)		W	85		95	
Power Factor ★		%	92.4		91.8	
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	260×900×580			
Package Dimensions (W×D×H)		mm	1,070×719×354			
Weight		kg	24			
Gross Weight		kg	33			
Operation Sound	dBA	H	42	42	44	44
		M	40	40	42	42
		L	39	38	41	40
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4			
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ 27.2(3/4B)			
Drawing No.			3D024987		3D024988	

★ Refer to Engineering Data Book.

Conversion Formulae

kcal/h=kWx860  
 Btu/h=kWx3414  
 cfm=m³/minx35.3

## ■ 2.5kW Class · 3.5kW Class

50Hz 230V

Model			CDX25JV1NB		CDX35JV1NB	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.86	3.5	4.42
Front Panel Color			—			
Air Flow Rates	m³/min	H	13.0			
		M	12.0			
		L	11.0			
	cfm	H	459			
		M	424			
		L	388			
Fan	Type		Sirocco Fan			
	Motor Output	W	47			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removable / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.40			
Power Consumption ★ (Rated)		W	85			
Power Factor ★		%	92.4			
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	260×900×580			
Package Dimensions (W×D×H)		mm	1,070×719×354			
Weight		kg	23			
Gross Weight		kg	32			
Operation Sound	dBA	H	39	40	39	40
		M	37	38	37	38
		L	36	36	36	36
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4			
	Gas	mm	φ 9.5			
	Drain	mm	φ 27.2(3/4B)			
Drawing No.			3D024989			3D024990

## ■ 5.0kW Class · 6.0kW Class

50Hz 230V

Model			CDX50JV1NB		CDX60JV1NB	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	5.0	6.13	6.0	7.32
Front Panel Color			—			
Air Flow Rates	m³/min	H	13.0		14.5	
		M	12.0		13.0	
		L	11.0		11.5	
	cfm	H	459		512	
		M	424		459	
		L	388		406	
Fan	Type		Sirocco Fan			
	Motor Output	W	47			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removable / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.40		0.45	
Power Consumption ★ (Rated)		W	85		95	
Power Factor ★		%	92.4		91.8	
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	260×900×580			
Package Dimensions (W×D×H)		mm	1,070×719×354			
Weight		kg	24			
Gross Weight		kg	33			
Operation Sound	dBA	H	42	42	44	44
		M	40	40	42	42
		L	39	38	41	40
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4			
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ 27.2(3/4B)			
Drawing No.			3D024987		3D024988	

★ Refer to Engineering Data Book.

Conversion Formulae

kcal/h=kWx860  
 Btu/h=kWx3414  
 cfm=m<sup>3</sup>/minx35.3

## ■ Floor / Ceiling Suspended Dual Type

### ■ 2.5kW Class · 3.5kW Class

50Hz 230V

Model			FLX25HV1NB		FLX35HV1NB	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.86	3.5	4.42
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	7.6	9.2	8.7	10.0
		M	6.8	8.3	7.7	9.0
		L	6.0	7.4	6.6	8.0
	cfm	H	268	325	307	353
		M	240	293	270	318
		L	212	261	233	282
Fan	Type		Sirocco Fan			
	Motor Output	W	34			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removable / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.32	0.34	0.36	
Power Consumption ★ (Rated)		W	70	74	78	78
Power Factor ★		%	95.1	94.6	94.2	94.2
Temperature Control			Microcomputer Control			
Dimensions (HxWxD)		mm	490x1,050x200			
Package Dimensions (WxDxH)		mm	1,100x566x284			
Weight		kg	16			
Gross Weight		kg	22			
Operation Sound	dBA	H	37	37	38	39
		M	34	34	35	36
		L	31	31	32	33
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4		φ 6.4	
	Gas	mm	φ 9.5		φ 12.7	
	Drain	mm	φ 18.0		φ 18.0	

### ■ 5.0kW Class · 6.0kW Class

50Hz 230V

Model			FLX50JV1B		FLX60JV1B	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	5.0	6.1	5.7	6.7
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	11.4	12.1	12.0	12.8
		M	9.9	9.8	10.6	10.6
		L	8.5	7.5	9.3	8.4
	cfm	H	402	427	424	452
		M	349	346	374	374
		L	300	265	328	297
Fan	Type		Sirocco Fan			
	Motor Output	W	34			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removable / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.43	0.42	0.45	0.43
Power Consumption ★ (Rated)		W	96	96	98	96
Power Factor ★		%	97.1	99.4	94.7	97.1
Temperature Control			Microcomputer Control			
Dimensions (HxWxD)		mm	490×1,050×200			
Package Dimensions (WxDxH)		mm	1,100×566×284			
Weight		kg	17			
Gross Weight		kg	24			
Operation Sound	dBA	H	47	46	48	47
		M	43	41	45	42
		L	39	35	41	37
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4		φ 6.4	
	Gas	mm	φ12.7		φ15.9	
	Drain	mm	φ18.0		φ18.0	
Drawing No.			3D029186		3D029187	

★ Refer to Engineering Data Book.

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

### ■ 2.5kW Class · 3.5kW Class

50Hz 230V

Model			FVX25KZV1B		FVX35KZV1B	
			Cooling	Heating	Cooling	Heating
Rating Capacity		kW	2.5	3.4	3.5	4.2
Front Panel Color			Almond White			
Air Flow Rates	m³/min	H	8.1	9.2	8.3	9.2
		M	6.2	7.0	6.3	7.1
		L	4.3	4.8	4.3	5.0
	cfm	H	286	325	293	325
		M	219	247	222	251
		L	152	169	152	177
Fan	Type		Cross Flow Fan			
	Motor Output	W	14			
	Speed	Steps	5 Steps and Auto			
Air Filter			Removable / Washable / Mildew Proof			
Running Current ★ (Rated)		A	0.14		0.15	
Power Consumption ★ (Rated)		W	32		34	
Power Factor ★		%	99.4		98.6	
Temperature Control			Microcomputer Control			
Dimensions (H×W×D)		mm	600×650×195			
Package Dimensions (W×D×H)		mm	764×288×702			
Weight		kg	13			
Gross Weight		kg	18			
Operation Sound	dBA	H	38	38	39	39
		M	32	32	33	33
		L	26	26	26	26
Heat Insulation			Both Liquid and Gas Pipes			
Piping Connection	Liquid	mm	φ 6.4			
	Gas	mm	φ 9.5		φ12.7	
	Drain	mm	φ 20.0			
Drawing No.			3D029440		3D029441	

★ Refer to Engineering Data Book.

## Conversion Formulae

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



# Part 3

## Printed Circuit Board Connector Wiring Diagram and Name

1. Printed Circuit Board Connector Wiring Diagram and Name .....	60
1.1 Branch Provider Unit BPMK928B42, B43 .....	60
1.2 Outdoor Unit RMK (X) 140JVMT (C) 9 (8), RMK140JAVM, RMX140JVMB, RMK (X) 140JZVMA (B) .....	61
1.3 FTK25 / 35J Series, FTX25 / 35J Series, FTXD25 / 35K Series, FVX25 / 35K Series .....	64
1.4 FTK50~60HV Series, FTKD50~71JV Series, FTX50~60HV Series, FTXD50~71JV Series .....	66
1.5 CDX25~60HAV Series, CDK25~60HAV Series .....	68
1.6 FLK25~60HV Series, FLX25~60HV Series, FLK50 / 60JV Series, FLX50 / 60JV Series .....	70
1.7 FHYC35~71KV Series .....	73
1.8 FDYM60FA, FDYM03FA Series .....	75

The RMK140JAVM specifications are special. Refer to <RMK140JAVM's important points> (on page ii) for the changes in contents.

# 1. Printed Circuit Board Connector Wiring Diagram and Name

## 1.1 Branch Provider Unit BPMK928B42, B43

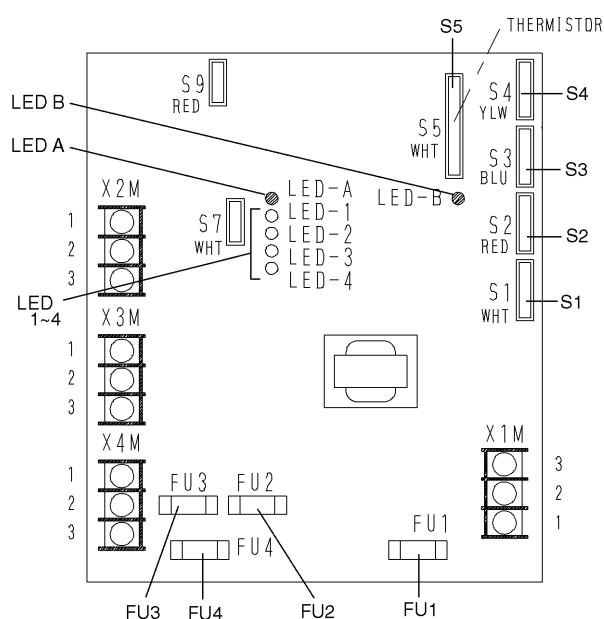
### Name of Connector

- |             |   |
|-------------|---|
| 1) S1       | Connector for Bypass Electronic Expansion Valve             |
| 2) S2 to S4 | Connector for Electronic Expansion Valve to Room A, B and C |
| 3) S5       | Connector for Thermistors                                   |

### Other Designations

- |               |  |
|---------------|--|
| 1) FU1        | Fuse for Transformer                     |
| 2) FU2        | Fuse for Inter Connecting Wire to Room 1 |
| 3) FU3        | Fuse for Inter Connecting Wire to Room 2 |
| 4) FU4        | Fuse for Inter Connecting Wire to Room 3 |
| 5) LED-A      | LED for Service Monitor                  |
| 6) LED-B      | LED for Service Monitor                  |
| 7) LED 1 to 4 | LED for Fault Indication                 |

### Printed Circuit Board



## 1.2 Outdoor Unit RMK (X) 140JVMT (C) 9 (8), RMK140JAVM, RMX140JVMB, RMK (X) 140JZVMA (B)

---

**Cooling Only** RMK140JVMT (C) 9 (8), RMK140JAVM, RMK140JZVMA

---

**Heat Pump** RMX140JVMT (C) 9 (8), RMX140JVMB, RMX140JZVMB

---

**Printed Circuit Board** Printed Circuit Board (1) (Control PCB)  
 Printed Circuit Board (2) (Filter PCB)  
 Printed Circuit Board (3) (Fan Control PCB)  
 Printed Circuit Board (4) (Indicator PCB)

---

### Name of Connector

#### PCB 1

- |          |   |
|----------|---|
| 1) S101  | Connector to PCB 3 (to S501)                      |
| 2) S102  | Connector to PCB 3 (to S502)                      |
| 3) S103  | Connector to PCB 2 (to S903)                      |
| 4) S104  | Connector to PCB 2 (to S904)                      |
| 5) S105  | Connector to SP (Low Pressure Sensor)             |
| 6) S107  | Connector to PCB 2 (to S907)                      |
| 7) S108  | Connector to Y1E EVG (Electronic Expansion Valve) |
| 8) S109  | Connector to Y2E EVL (Electronic Expansion Valve) |
| 9) S110  | Connector to Y3E EVP (Electronic Expansion Valve) |
| 10) S111 | Connector to Y1R (4 Way Valve)                    |
| 11) S114 | Connector to Thermistors                          |
| 12) S131 | Connector to HPS (High Pressure Switch)           |
| 13) S132 | Connector to PCB 2 (to S908)                      |
| 14) S140 | Connector to Active Module                        |
| 15) S151 | Connector to PCB 2 (to S951)                      |

#### PCB 2

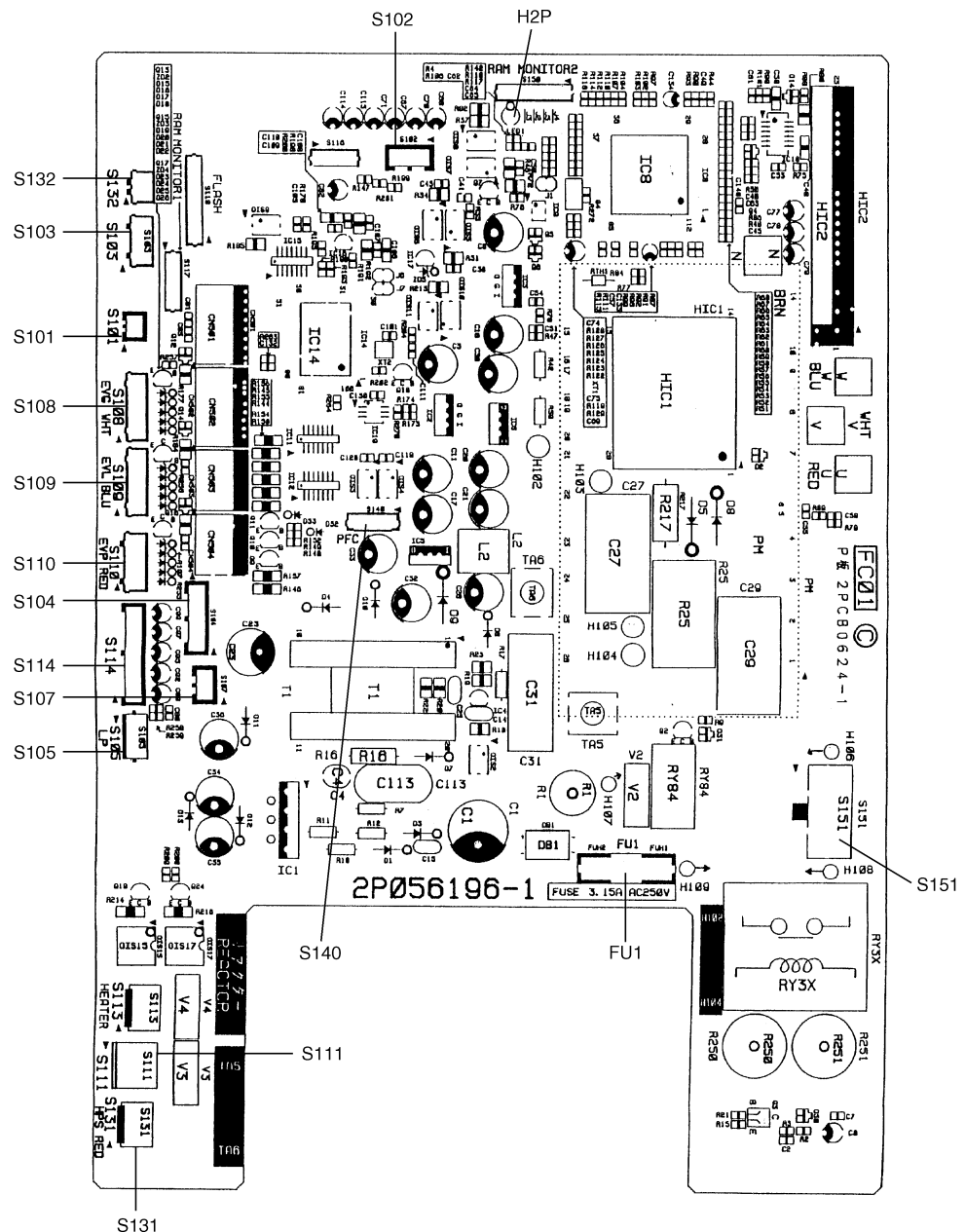
- |         |  |
|---------|--|
| 1) S903 | Connector to PCB 1 (to S103)                         |
| 2) S904 | Connector to PCB 1 (to S104)                         |
| 3) S906 | Connector of Communication Wire to Each Indoor Units |
| 4) S907 | Connector to PCB 1 (to S107)                         |
| 5) S908 | Connector to PCB 1 (to S132)                         |
| 6) S951 | Connector to PCB 1 (to S151)                         |
| 7) S952 | Connector to Power Supply (N, L)                     |

#### PCB 3

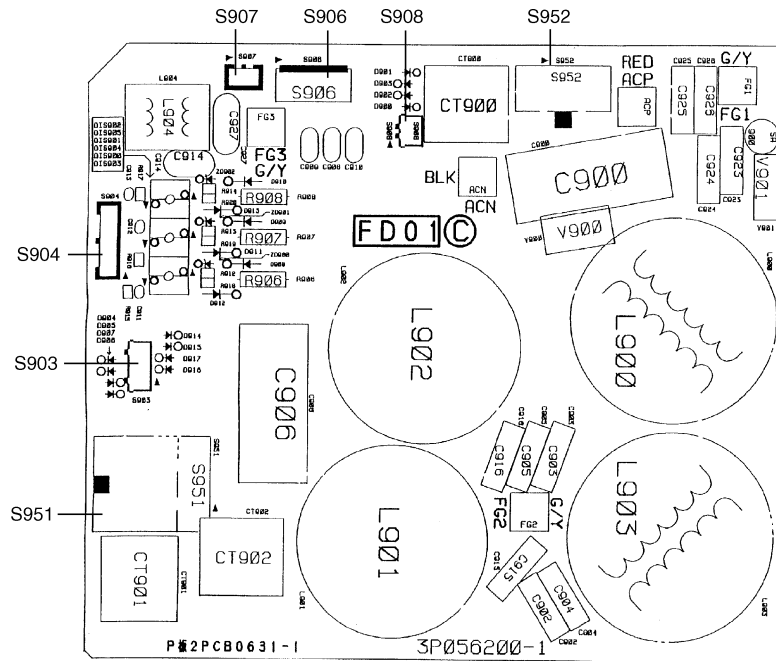
- |         |                              |
|---------|------------------------------|
| 1) S501 | Connector to PCB 1 (to S101) |
| 2) S502 | Connector to PCB 1 (to S102) |
| 3) S504 | Connector to FAN M1F         |
| 4) S506 | Connector to FAN M2F         |
| 5) S514 | Connector to FAN M1F         |
| 6) S516 | Connector to FAN M2F         |
| 7) S517 | Connector to C1R (Capacitor) |

## Other Designations

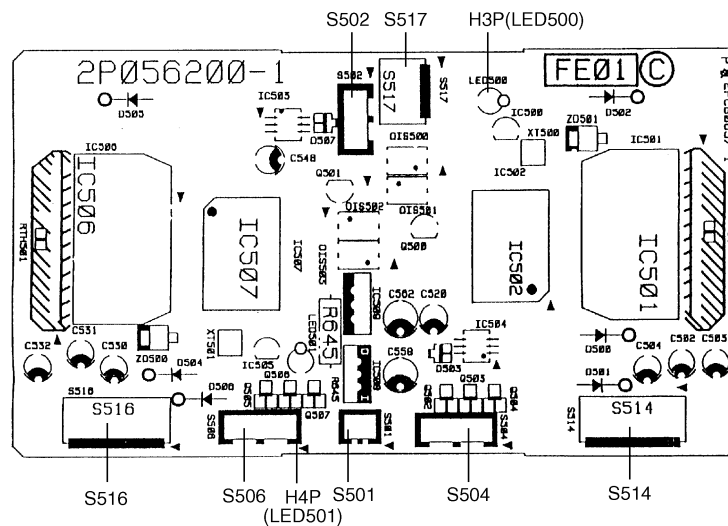
- |                         |  |
|-------------------------|--|
| 1) H1P (LED A on PCB 4) | LED for Outdoor Unit Status-normal                 |
| 2) H2P (PCB 1)          | LED for Outdoor Unit Status-normal                 |
| 3) H3P (PCB 3)          | LED for Outdoor Unit Fan Status-normal             |
| 4) H4P (PCB 3)          | LED for Outdoor Unit Fan Status-normal             |
| 5) LED 2~4 (PCB 4)      | Digital Service Monitor                            |
| 6) SW1, SW2 (PCB 4)     | Address Selection Switches                         |
| 7) SW3 (PCB 4)          | Forced Operation Mode Selection Switch (Cool↔Heat) |
| 8) SW4 (PCB 4)          | Pump Down Switch (Service Mode No. Down Switch)    |
| 9) SW5 (PCB 4)          | Pump Down Switch (Service Mode No. Up Switch)      |
| 10) SW6 (PCB 4)         | Initialize Switch                                  |
| 11) SW7 (PCB 4)         | Test Operation Switch                              |
| 12) FU1 (PCB 1)         | Fuse 3.15Amps                                      |
| 13) JP                  | Silent Select Switch                               |

Printed Circuit Board (1)  
(Control PCB)

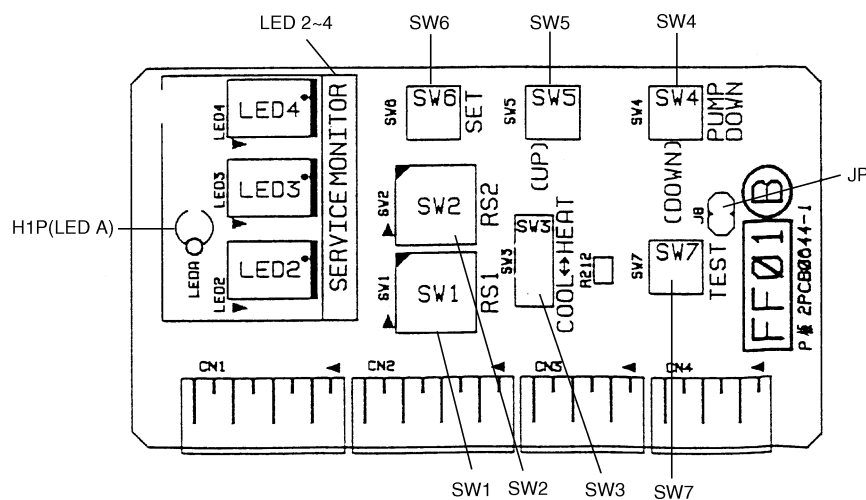
### Printed Circuit Board (2) (Filter PCB)



### Printed Circuit Board (3) (Fan Control)



### Printed Circuit Board (4) (Indicator PCB)



## 1.3 FTK25 / 35J Series, FTX25 / 35J Series, FTXD25 / 35K Series, FVX25 / 35K Series

Cooling Only	FTK25 / 35JVE (A) 9, FTK25 / 35JVEC, FTK25 / 35JAVET
Heat Pump	FTX25 / 35JVEA9, FTX25 / 35JVEC, FTX25 / 35JAVET, FTX25 / 35JAV1NB, FTXD25 / 35KZV1B, FVX25 / 35KZV1B
Printed Circuit Board	Printed Circuit Board (1) (Control PCB) Printed Circuit Board (2) (Signal Receiver PCB) Printed Circuit Board (3) (Intelligent Eye Sensor PCB)

### Name of Connector

- |             |   |
|-------------|---|
| 1) S1       | Connector for Fan Motor                           |
| 2) S6       | Connector for Swing Motor (Horizontal Flap)       |
| 3) S7       | Connector for Fan Motor                           |
| 4) S21      | Connector for Centralized Control to 5 Rooms      |
| 5) S27, S36 | Connector for Control PCB                         |
| 6) S26      | Connector for Signal Receiver PCB                 |
| 7) S32      | Connector for Room Temp/Heat Exchanger Thermistor |
| 8) S35      | Connector for Intelligent Eye Sensor PCB          |

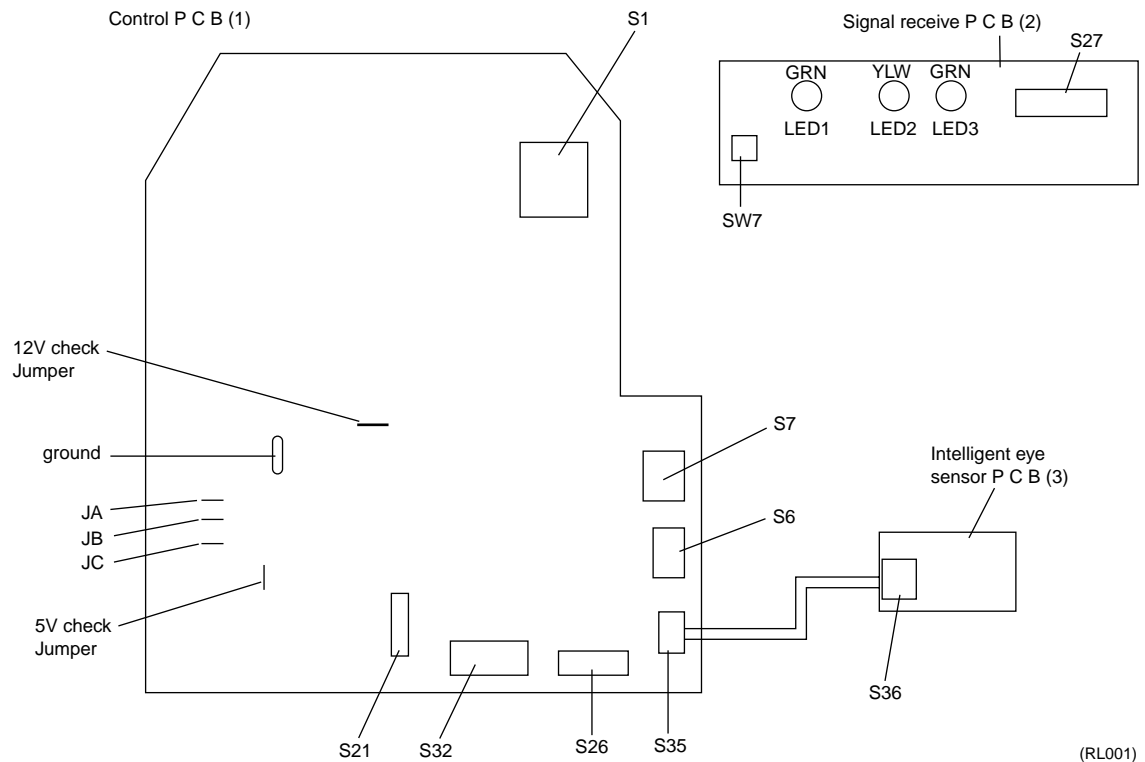


#### Note:

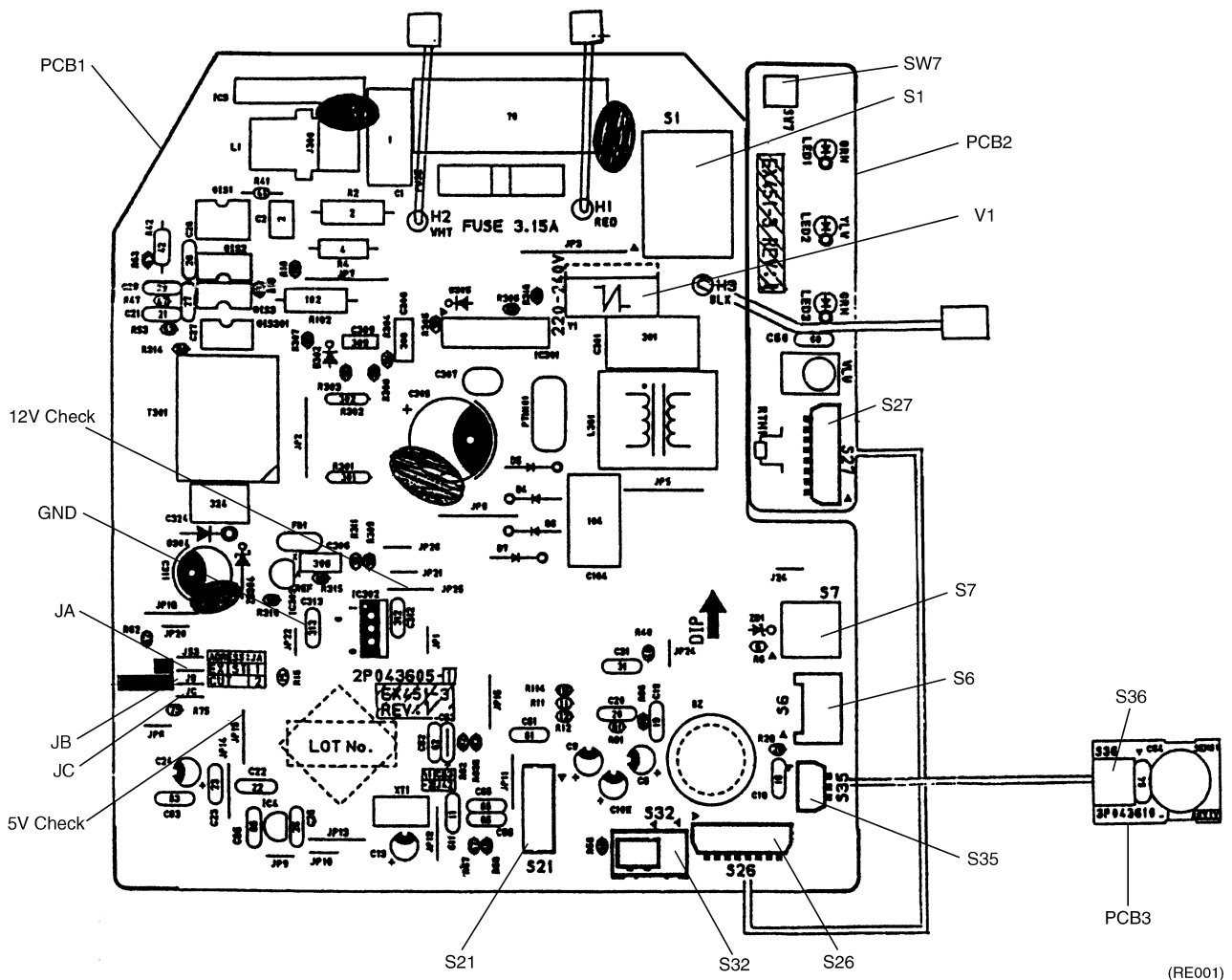
Other designations

- |               |   |
|---------------|---|
| 1) V1         | Varistor  |
| 2) JA         | Address Setting Jumper                                  |
| JB            | Fan Speed Setting when Compressor is OFF on Thermostat. |
| JC            | Power Failure Recovery Function.                        |
| 3) SW7        | Operation Switch  |
| 4) LED1 (GRN) | LED for Operation                                       |
| 5) LED2 (YLW) | LED for Timer   |
| 6) LED3 (GRN) | LED for Intelligent Eye                                 |

## Printed Circuit Board (1)~(3)



## Printed Circuit Board (1)~(3) Detail



## 1.4 FTK50~60HV Series, FTKD50~71JV Series, FTX50~60HV Series, FTXD50~71JV Series

Cooling Only FTK50 / 60HVEC, FTKD50 / 60 / 71JVE (A) (9), FTKD50 / 60 / 71JVET

Heat Pump FTX50 / 60HVEC, FTXD50 / 60 / 74JVEA (9), FTXD50 / 60 / 71JVET, FTXD50 / 60 / 71JV1B

Printed Circuit Board  
 Printed Circuit Board (1) (Control PCB)  
 Printed Circuit Board (2) (Power Supply PCB)  
 Printed Circuit Board (3) (Display PCB)  
 Printed Circuit Board (4) (Signal Receiver PCB)

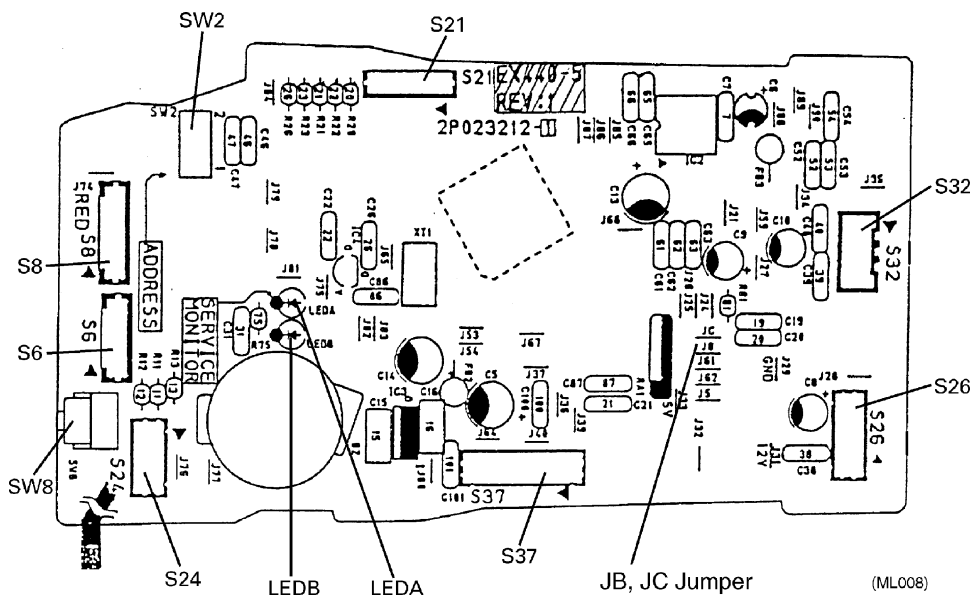
### Name of Connector

- |                  |   |
|------------------|---|
| 1) S1            | Connector for Fan Motor                           |
| 2) S6            | Connector for Swing Motor (Horizontal Flap)       |
| 3) S8            | Connector for Swing Motor (Vertical Flap)         |
| 4) S21           | Connector for Centralized Control to 5 Rooms      |
| 5) S24           | Connector for Display PCB                         |
| 6) S25, S27, S36 | Connector for Control PCB                         |
| 7) S26           | Connector for Signal Receiver PCB                 |
| 8) S31, S32      | Connector for Room Temp/Heat Exchanger Thermistor |
| 9) S37           | Connector for Power Supply PCB                    |

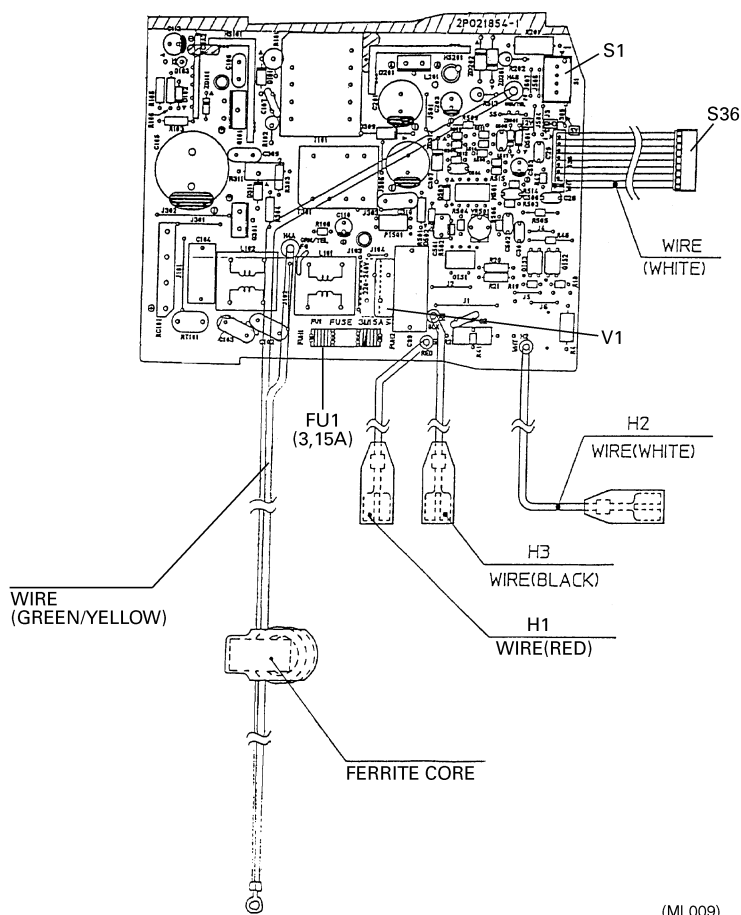
### Other Designations

- |                 |                                 |
|-----------------|---------------------------------|
| 1) V1           | Varistor                        |
| 2) SW7 (S1W)    | Operation Switch                |
| 3) SW2 (S2W)    | Address Switch                  |
| 4) SW8 (S8W)    | Cleaning Indicator Reset Switch |
| 5) LED3 (GRN)   | LED for Operation               |
| 6) LED4 (YLW)   | LED for Timer                   |
| 7) LED5 (RED)   | LED for Cleaning                |
| 8) LED A, LED B | LED for Service Monitor         |

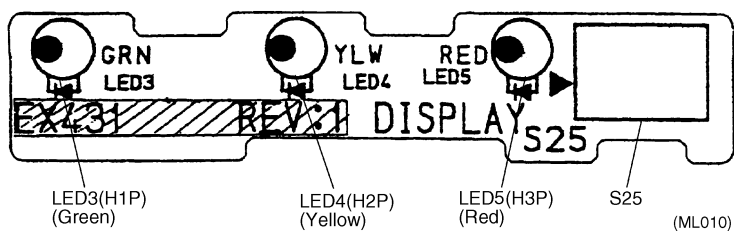
### Printed Circuit Board (1) (Control PCB)



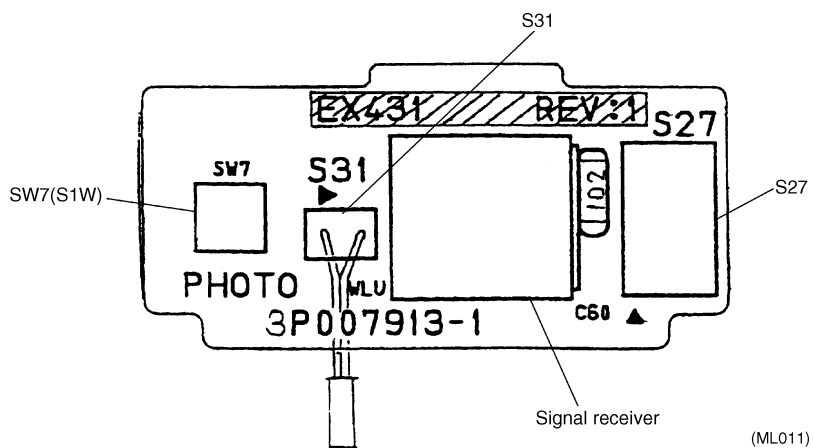
**Printed Circuit  
Board (2)  
(Power Supply  
PCB)**



**Printed Circuit  
Board (3)  
(Display PCB)**



**Printed Circuit  
Board (4)  
(Signal Receiver  
PCB)**



## 1.5 CDX25~60HAV Series, CDK25~60HAV Series

Cooling Only	CDK25 / 35 / 50 / 60HAVE (A) (C) (T)
Heat Pump	CDX25 / 35 / 50 / 60HAVEA (C), CDX25 / 35 / 50 / 60HAV1NB, CDX25 / 35 / 50 / 60JV1NB, CDX25 / 35JVEC
Printed Circuit Board	Printed Circuit Board (1) (Control PCB) Printed Circuit Board (3) (Intelligent Eye Sensor PCB)
Name of Connector	

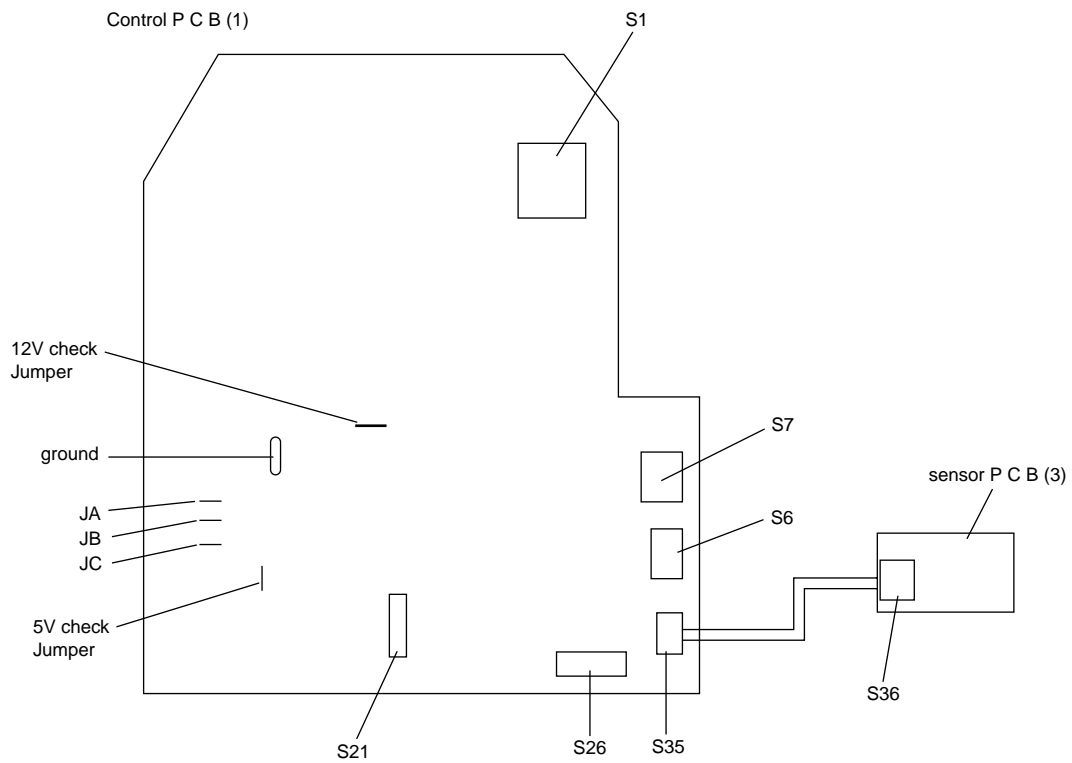
- |        |  |
|--------|--|
| 1) S1  | Connector for Fan Motor                      |
| 2) S6  | Connector for Swing Motor (Horizontal Flap)  |
| 3) S7  | Connector for Fan Motor                      |
| 4) S21 | Connector for Centralized Control to 5 Rooms |
| 5) S36 | Connector for Control PCB                    |
| 6) S26 | Connector for Signal Receiver PCB            |
| 7) S35 | Connector for Intelligent Eye Sensor PCB     |


**Note:**

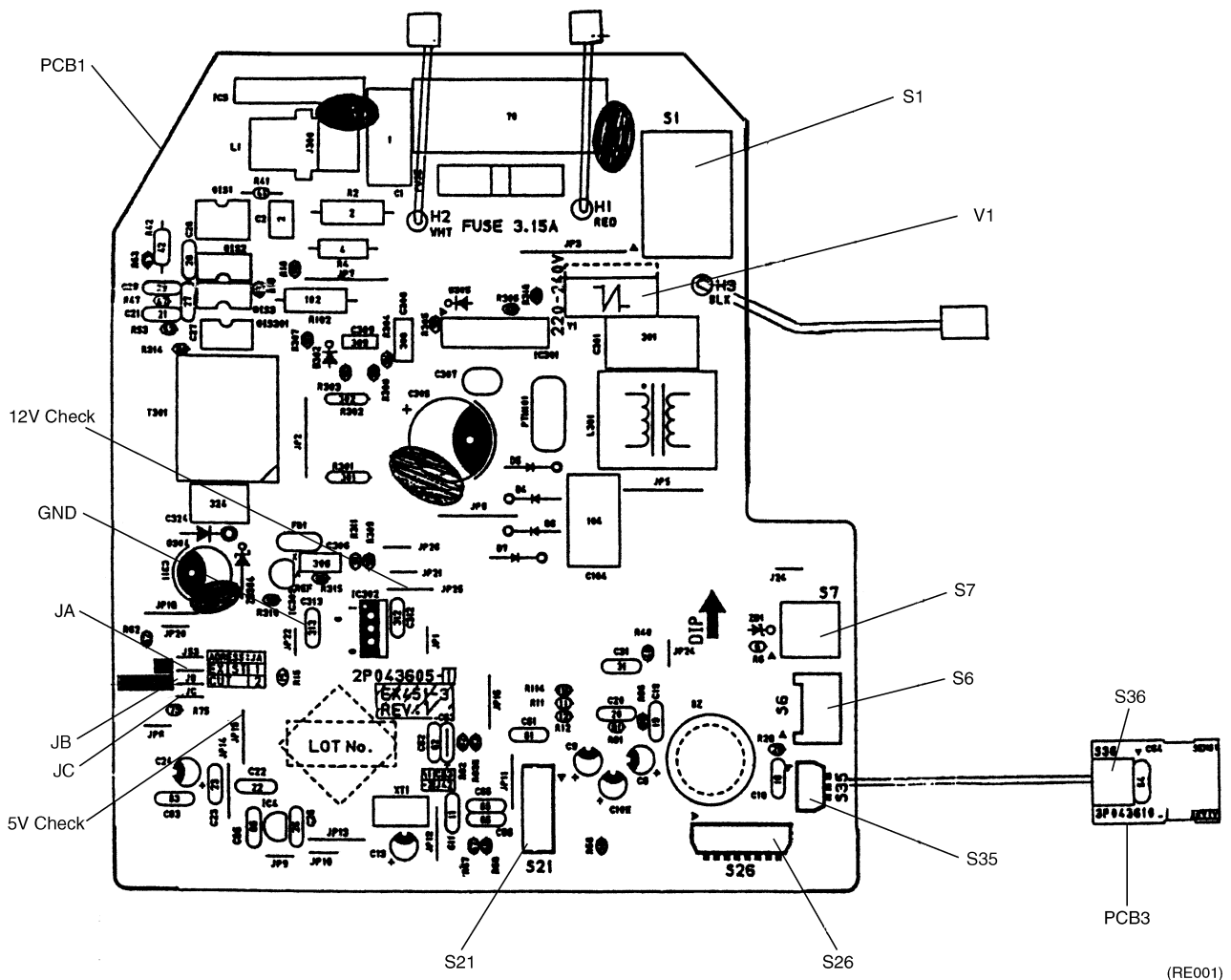
Other designations

- |               |   |
|---------------|---|
| 1) V1         | Varistor  |
| 2) JA         | Address Setting Jumper                                  |
| JB            | Fan Speed Setting when Compressor is OFF on Thermostat. |
| JC            | Power Failure Recovery Function.                        |
| 3) LED1 (GRN) | LED for Operation                                       |
| 4) LED2 (YLW) | LED for Timer   |
| 5) LED3 (GRN) | LED for Intelligent Eye                                 |

## Printed Circuit Board (1)~(3)



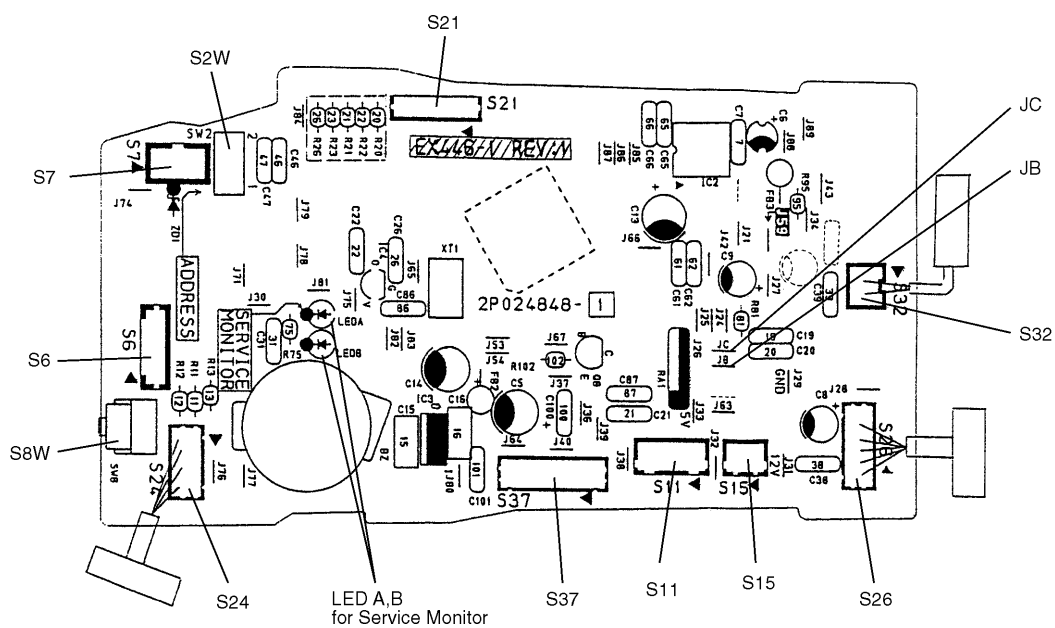
## Printed Circuit Board (1)~(3) Detail



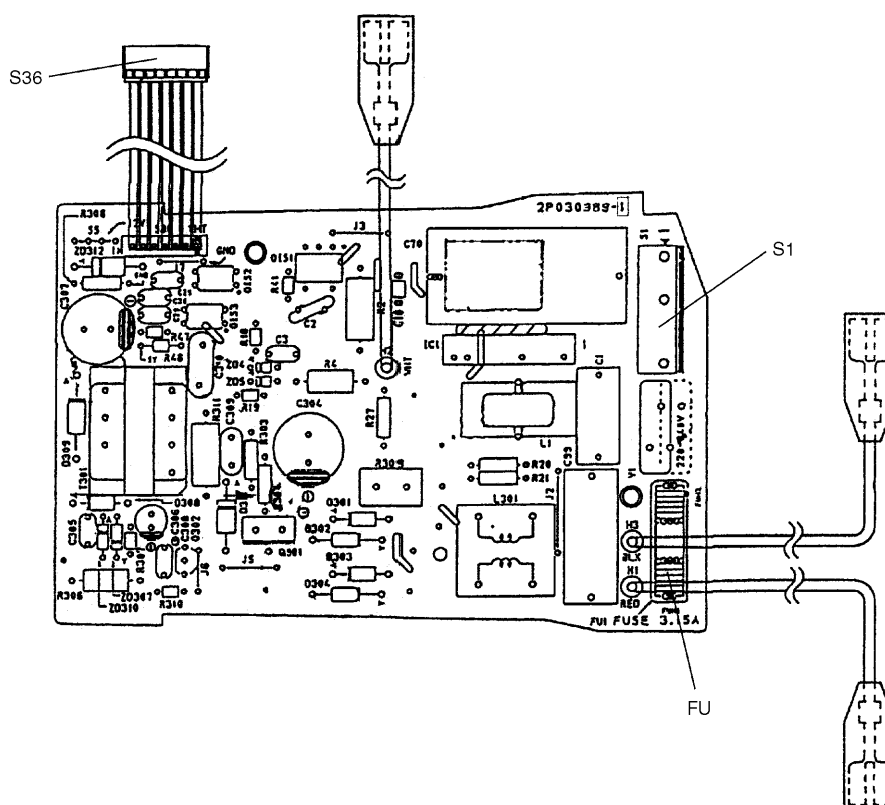
## 1.6 FLK25~60HV Series, FLX25~60HV Series, FLK50 / 60JV Series, FLX50 / 60JV Series

Cooling Only	FLK25 / 35 / 50 / 60HVE (C) (T), FLK25 / 35HVEA, FLK50 / 60JVEA (9)
Heat Pump	FLX25 / 35HVEA, FLX25 / 35HV1NB, FLX25 / 35 / 50 / 60HVEC (T), FLX50 / 60JV1B
Printed Circuit Board	Printed Circuit Board(1) (Control PCB) Printed Circuit Board(2) (Power Supply PCB) Printed Circuit Board(3) (Display PCB) Printed Circuit Board(4) (Signal Receiver PCB)
Name of Connector	<div> <div>1) S1</div> <div>Connector for Fan Motor (Power Supply)</div> </div> <div> <div>2) S6</div> <div>Connector for Swing Motor</div> </div> <div> <div>3) S7</div> <div>Connector for Fan Motor</div> </div> <div> <div>4) S21</div> <div>Connector for Centralized Control</div> </div> <div> <div>5) S24</div> <div>Connector for PCB3 (to S25)</div> </div> <div> <div>6) S25</div> <div>Connector for PCB1 (to S24)</div> </div> <div> <div>7) S26</div> <div>Connector for PCB4 (to S27)</div> </div> <div> <div>8) S27</div> <div>Connector for PCB1 (to S26)</div> </div> <div> <div>9) S31</div> <div>Connector for Thermistor (R1T)</div> </div> <div> <div>10) S32</div> <div>Connector for Thermistor (R2T,R3T)</div> </div> <div> <div>11) S36</div> <div>Connector for PCB1 (to S37)</div> </div> <div> <div>12) S37</div> <div>Connector for PCB2 (to S36)</div> </div>
Other Designation	<div> <div>1) FU</div> <div>Fuse 3.15A</div> </div> <div> <div>2) S2W</div> <div>Address Switch</div> </div> <div> <div>3) S7W</div> <div>Operation Switch</div> </div> <div> <div>4) S8W</div> <div>Cleaning Indicator Reset Switch</div> </div> <div> <div>5) H1P</div> <div>LED for Filter Sign</div> </div> <div> <div>6) H2P</div> <div>LED for Timer</div> </div> <div> <div>7) H3P</div> <div>LED for Operation</div> </div> <div> <div>8) LED A,B</div> <div>LED for Service Monitor</div> </div> <div> <div>9) JB</div> <div>Control Function Change Jumper (When cut → Setting of Fan RPM "0" during Thermostat Off)</div> </div> <div> <div>10) JC</div> <div>Control Function Change Over (When cut → No Auto Restart Function)</div> </div>

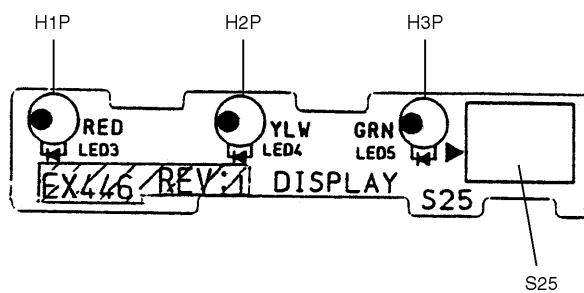
**Printed Circuit Board (1)  
(Control PCB)**



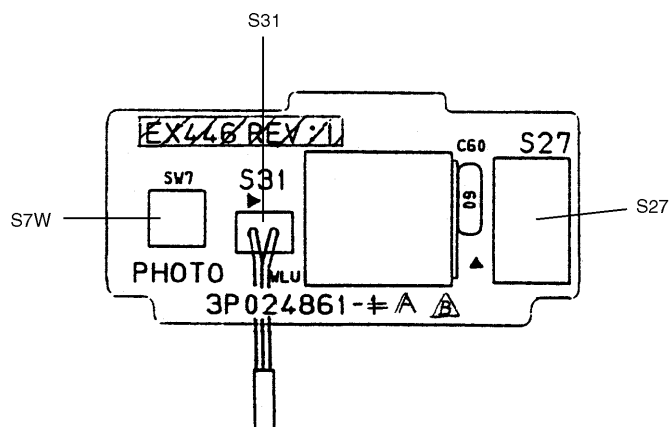
## Printed Circuit Board (2) (Power Supply PCB)



Printed Circuit  
Board (3)  
(Display PCB)



Printed Circuit  
Board (4)  
(Signal Receiver  
PCB)



## 1.7 FHYC35~71KV Series

Cooling Only /  
Heat Pump

FHYC35 / 50 / 60 / 71KVE9, FHYC35 / 50 / 60 / 71KV1C9

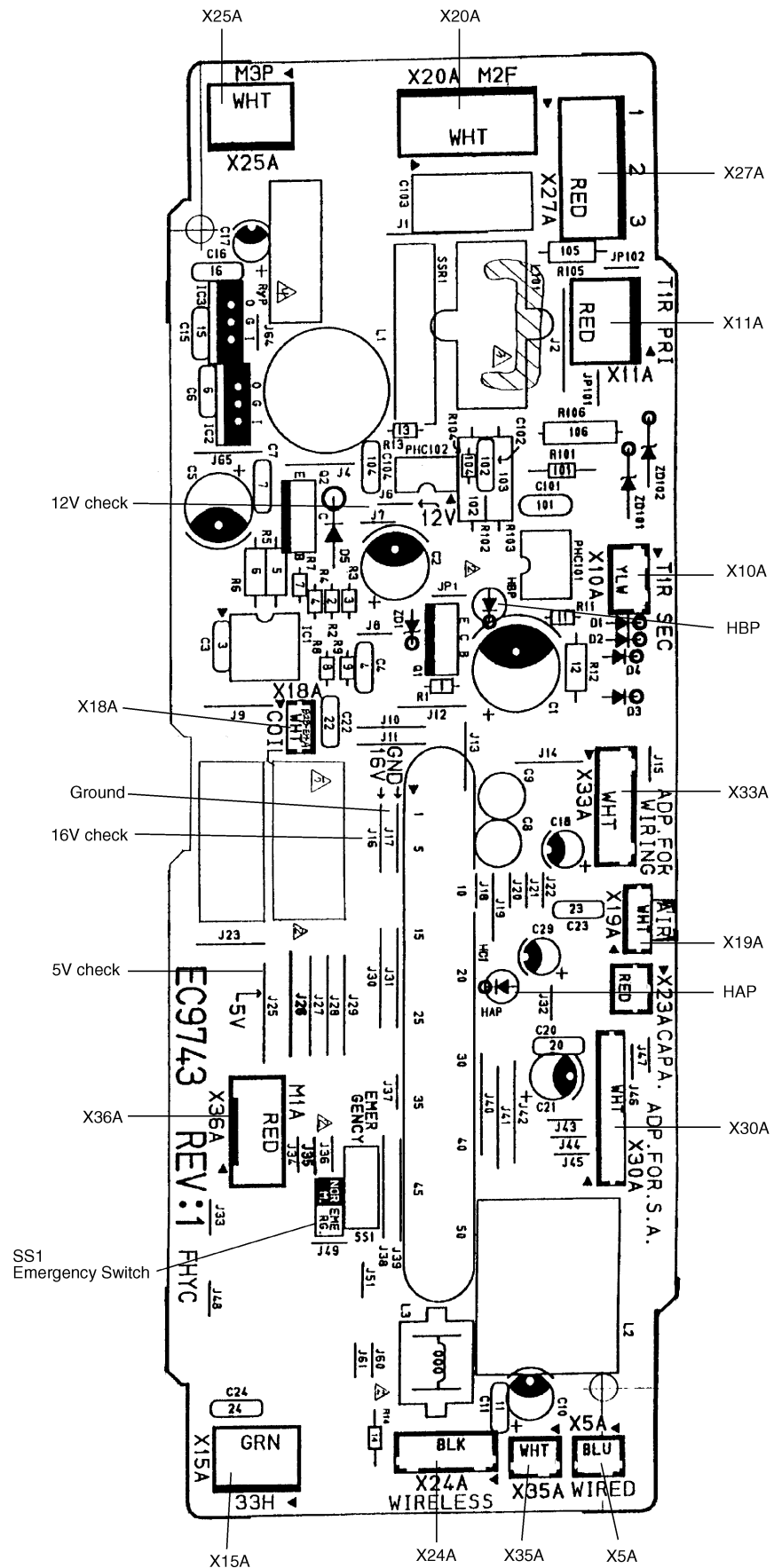
### Name of Connector

- |          |   |
|----------|---|
| 1) X5A   | Connector for Wired Remote Controller             |
| 2) X10A  | Connector for Transformer                         |
| 3) X11A  | Connector for Transformer                         |
| 4) X15A  | Connector for Float Switch                        |
| 5) X18A  | Connector for Thermistor (Coil)                   |
| 6) X19A  | Connector for Thermistor (Air)                    |
| 7) X20A  | Connector for Fan Motor                           |
| 8) X24A  | Connector for Wireless Remote Controller (Option) |
| 9) X25A  | Connector for Drain Pump                          |
| 10) X27A | Connector for Outdoor Unit                        |
| 11) X30A | Connector for Interface Adaptor (Option)          |
| 12) X33A | Connector for Adaptor for Wiring (Option)         |
| 13) X35A | Connector for Group Control Adaptor (Option)      |
| 14) X36A | Connector for Swing Flap Motor                    |

### Other Designation

- |            |                             |
|------------|-----------------------------|
| 1) SS1     | Selector Switch (Emergency) |
| 2) HAP,HBP | Service Monitor LED (Green) |

Printed Circuit Board



2P008254E

## 1.8 FDYM60FA, FDYM03FA Series

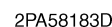
Cooling Only / Heat Pump	FDYM60FAV1, FDYM60FAV1C, FDYM60FAVAL FDYM03FAV1, FDYM03FAV1C, FDYM03FAVAL
-----------------------------	--

### Name of Connector

- |          |  |
|----------|--|
| 1) X5A   | Connector for Wired Remote Controller        |
| 2) X10A  | Connector for Transformer                    |
| 3) X11A  | Connector for Transformer                    |
| 4) X15A  | Jumpered                                     |
| 5) X18A  | Connector for Thermistor (Coil)              |
| 6) X19A  | Connector for Thermistor (Air)               |
| 7) X21A  | Connector for Fan Motor                      |
| 8) X27A  | Connector for Outdoor Unit                   |
| 9) X30A  | Connector for Interface Adaptor (Option)     |
| 10) X33A | Connector for Adaptor for Wiring (Option)    |
| 11) X35A | Connector for Group Control Adaptor (Option) |

### Other Designation

- |            |                             |
|------------|-----------------------------|
| 1) H1P,H2P | Service Monitor LED (Green) |
|------------|-----------------------------|



# Part 4

## Main Functions

### Indoor Unit

1. Main Functions.....	78
1.1 Main Functions in Split Type .....	78
1.2 SkyAir .....	98
1.3 Cautions when SkyAir [Auto] [FAN] are used.....	100

The RMK140JAVM specifications are special. Refer to <RMK140JAVM's important points> (on page ii) for the changes in contents.

# 1. Main Functions

## 1.1 Main Functions in Split Type

### 1.1.1 Power-Airflow Flap & Diffuser

**For FTK, FTX50/  
60 H Series Only**

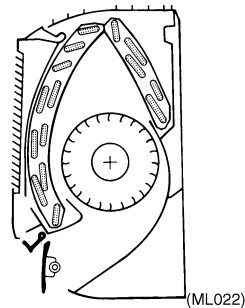
The large flaps send ample volume of warm air downward to heat the feet of people in the room, while the wide-angle diffuser ensures the air reaches every corner of the room.

The upper and lower flaps located at the air outlet provide optimum air flow control in the cooling, heating and dry modes. In a heating operation, the large flaps direct warm air downward to heat the feet area. The wide-angle diffuser presses the air down to lay a “carpet” of warm air above the floor. In a cooling operation, the diffuser is retracted into the air conditioner body to distribute cool air throughout the room.

#### In Heating Operation

Warm air is sent out straight down by the flaps, while the diffuser produces an air stream that presses down the warm air.

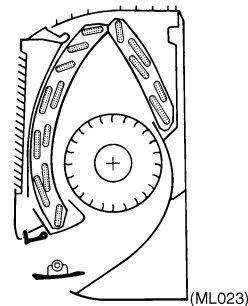
Heating operation



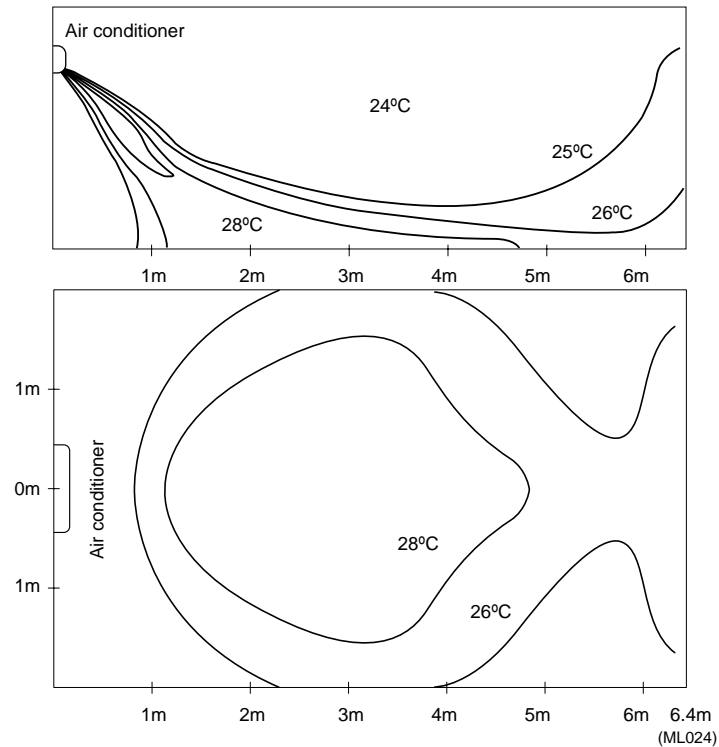
#### In Cooling Operation

The diffuser is stored inside the unit, and the wide-angle flaps send cool air throughout the room.

Cooling operation



### Temperature Distribution



< Conditions >

Outside temperature: 7°CDB, thermostat setting: 23°C, air flow setting: High (H tap), approximately 40 minutes after operation start, height of air outlet: approx. 2 m.

\*Note that temperature distribution varies depending on the heat insulation, furniture arrangement and other factors in the room.

## 1.1.2 Wide-Angle Louvers

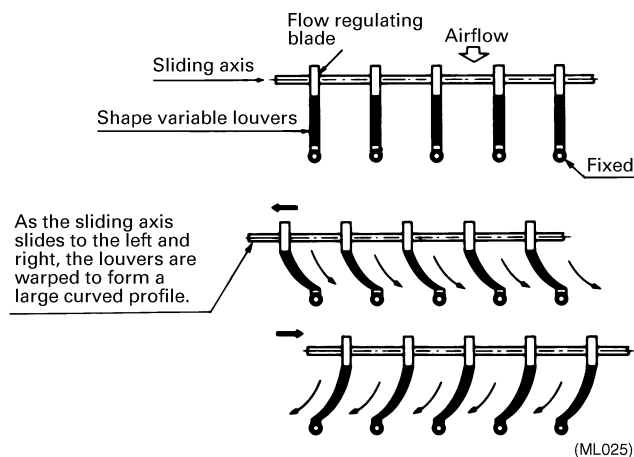
For FTK, FTX50/  
60 H Series Only

**The louvers provide wide-range airflow and minimize uneven temperature distribution that gives an uncomfortable feeling.**

All-round louvers are adopted to create wide-range airflow. They can be easily warped to allow airflow control in a wide angle. They can swing to a maximum of 120° (during heating) as shown below, air can be distributed to every corner of the room.

### All-Round Louvers

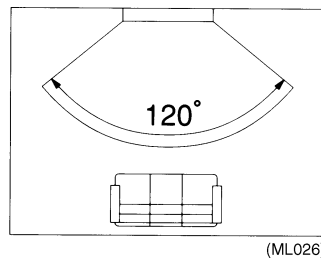
Airflow direction changes depending on the curved blade shape.



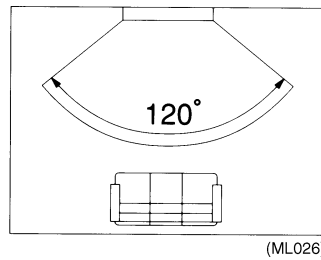
(ML025)

**Flap Angle**

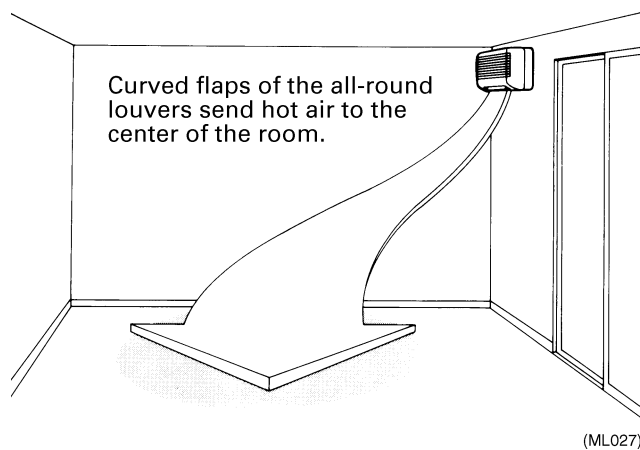
During Heating



During Cooling



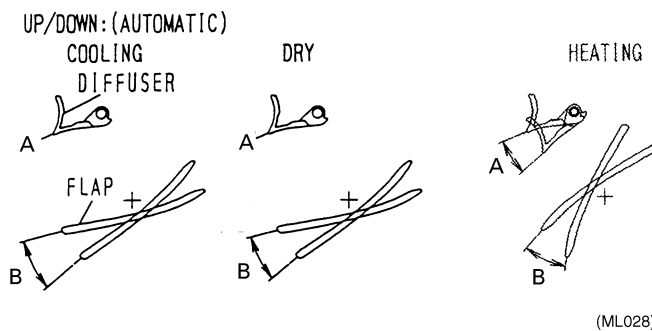
Capable of sending air to the center of a room even if it is installed at a corner of the room.



### 1.1.3 Horizontal Auto-Swing (Up and Down)

For FTK, FTX50/60 H Series Only

Auto-swing angles are about “A” degrees when the fan is ON, and about “B” degrees when the cooling or program dry operation is ON. The up-and-down swing of the flaps widens the direction of wind.

**Blade Angle**

**Cooling, Dry,  
Operation (For  
Cooling Only  
Model)**

		Cooling	Dry
FTK50/60H Series	A	20°	20°
	B	15° ↔ 40°	15° ↔ 40°

**Cooling, Dry,  
Heating  
Operation (For  
Heat Pump  
Model)**

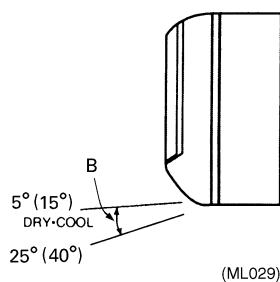
		Cooling	Dry	Heating
FTK50/60H Series	A	20°	20°	20° ↔ 40°
	B	15° ↔ 40°	15° ↔ 40°	30° ↔ 60°



**Note:**

Notes on flap angles

The diffuser is kept open in DRY, COOL or FAN mode.



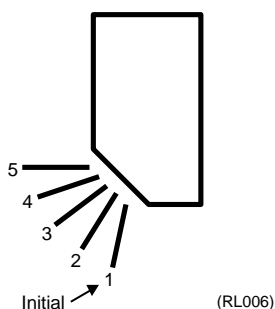
**Note:**

Unless [SWING] is selected, you should set the flap at a near-horizontal angle in COOL or DRY mode to obtain the best performance.

### 1.1.4 Wide Angle Flaps, Louvers and Auto-Swing

#### For FTK(X)25/35J Series Only Outline of the Action

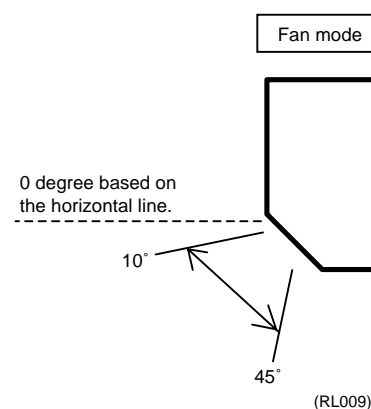
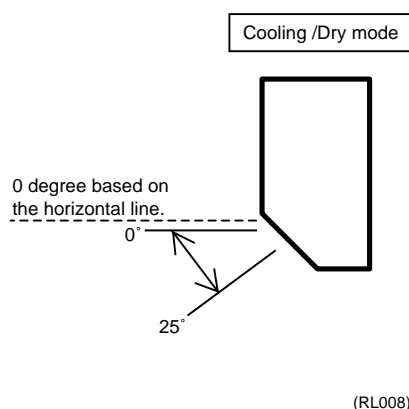
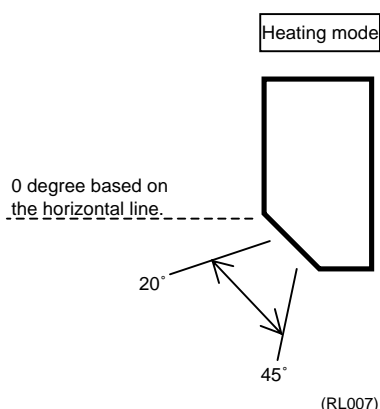
It can be commanded for J type by means of a user setting to select either any one desired position among the five-step directions of air flow adjusted on a remote controller, or Auto-swing.



Although the liquid crystal display of the five-step directions of the air flow is common for the modes of Cooling-Dry/Heating as illustrated above, in fact the range of the swing angle is slightly different in every operation mode.

The position a user sets will be selected among the five positions calculated preliminarily and evenly divided into four partitions which were taken from the upper and lower flap angle's range limits of each mode.

When Auto-swing is chosen, the flap swings in the swing range which meets the operation mode selected.



\* Fan mode is available for the models of cooling-only.

#### Others

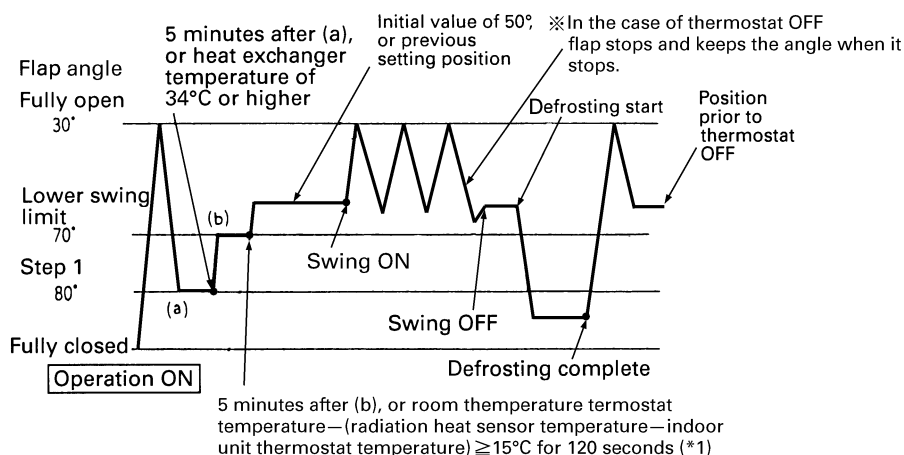
- The vertical louver can be adjusted manually. The movable range is 60 degrees for left or right, and total 120 degrees.
- A diffuser is not available for J type.

### 1.1.5 3 Step Flow

#### For FTX50/60 H Series Only (Heat Pump Only)

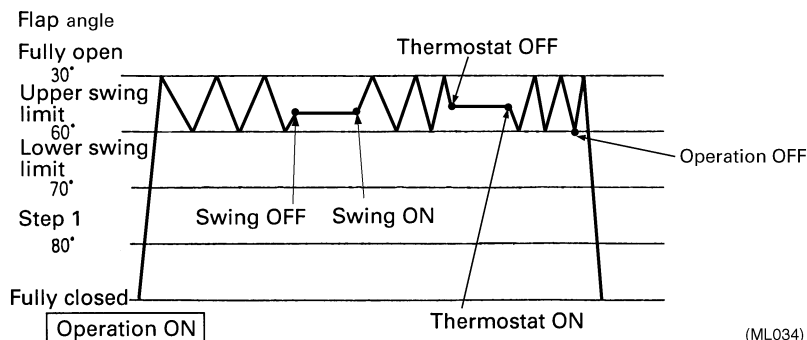
In the beginning of a heating operation, the unit sends warm air towards the wall behind the unit to prevent the air from directly blowing on people in the room. After a while, it blows air downward to warm up the area close to the floor. After the walls and floor become warm, the unit sends out air according to the set angle and fan speed. (Air flow angle and fan speed set from remote controller)

### Heating (In The Case of Swing-OFF Start)



(ML033)

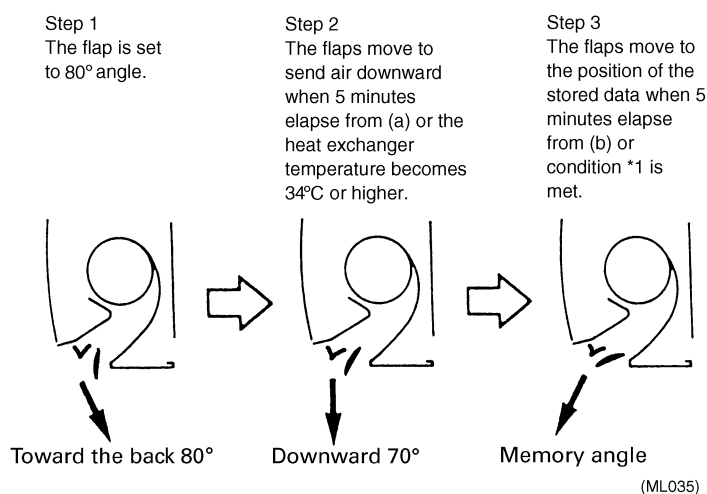
### Heating (In The Case of Swing-ON Start)



(ML034)



**Note:** The flaps remain in the preset position for about 10 seconds before they return to the full-open processing.



(ML035)

## 1.1.6 Fan Speed Control for Indoor Units

For FTK(X)25/35J,  
FTK(X)50/60 H  
Series  
Control Mode





The airflow rate can be automatically controlled depending on the difference between the set temperature and the room temperature. This is done through phase control and Hall IC control.

For more information about Hall IC, refer to 'Hall IC check (A6)' on page 309.

### Phase Steps

Phase control and fan speed control contains 8 steps: LLL, LL, L, ML, M, HM, H and HH.

Step	Cooling	Heating	Dry mode
LLL (Heating thermostat OFF)	         (RL010)	         (RL010)	H type : 500 - 860 rpm (During powerful operation : 850 - 910 rpm)
LL (Cooling thermostat OFF)			J type : 800 - 980 rpm (During powerful operation : 1050 rpm)
L			
ML			
M			
MH			
H			
HH (Powerful)			

= Within this range the airflow rate is automatically controlled when the AIRFLOW ADJUSTING button is set to AUTOMATIC

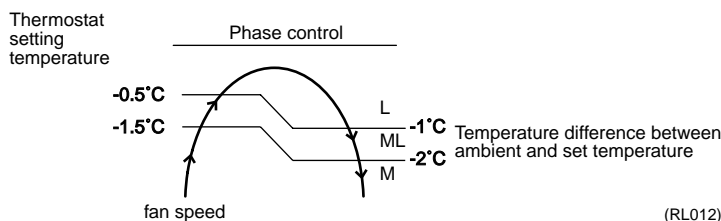


**Note:**

1. During powerful operation, fan operate H tap + 50 - 70 rpm.
2. Fan stops during defrost operation.

### Automatic Air Flow Control for Heating

The following drawing explains the principle for fan speed control for heating:

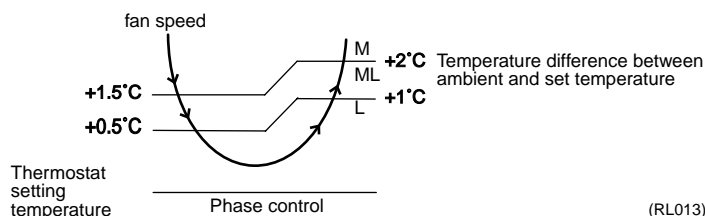


**Note:**

When there is no operation and the night set mode turns on, the step is low. Refer to "Night set mode" on page 89.

### Automatic Air Flow Control for Cooling

The following drawing explains the principle of fan speed control for cooling:

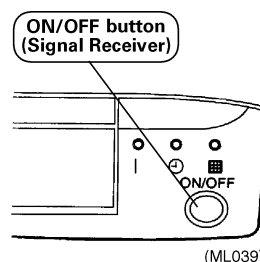


### 1.1.7 ON/OFF Button on Indoor Unit

For FTK, FTX50/  
60 H Series Only

An ON/OFF switch is provided on the front panel of the unit. Use this switch when the remote controller is missing or if its battery has run out.

Every press of the switch changes from Operation to Stop or from Stop to Operation



- Push this button once to start operation. Push once again to stop it.
- This button is useful when the remote controller is missing.
- The operation mode refers to the following table.

	Mode	Temperature setting	Air flow rate
FTK	COOL	22°C	AUTO
FTX	AUTO	25°C	AUTO

- In the case of multi system operation, there are times when the unit does not activate with this button.

### 1.1.8 Signal Receiving Sign

When the indoor unit receives a signal from the remote controller, the unit emits a signal receiving sound.

### 1.1.9 Air Purifying Filter

For FTK(X)25/35 J,  
FTK(X)50/60 H  
Series

The air purifying filter (electrostatic filter) catches pollen or smoke of cigarette as small as 0.01 micron through electro static charging. An activated carbon deodorizing filter in a net shape is also mounted to absorb and minimize fine odor particles.

### 1.1.10 Washable Grille

Washable grille is for FTK(X)25/35 J, FTK(X)50/60 H Series only

In the Case of FTK,  
FTX50/60 H Series

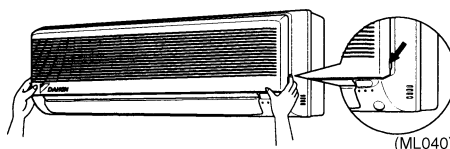


**Note:**

Refer to P97 in Si12-001 for FTK25/35 J Series "Cleaning the air filters."

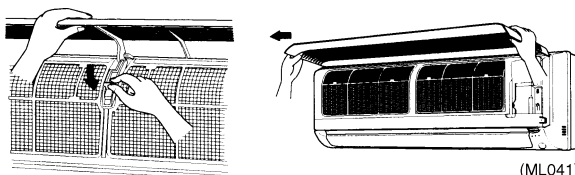
**Open the Front  
Grille.**

- Hold the grille by the tabs on the two sides and lift it until it stops with a click.



**Remove the Front  
Grille.**

- Supporting the front grille with one hand, release the lock by sliding down the knob with the other hand.
- To remove the front grille, pull it toward yourself with both hands.

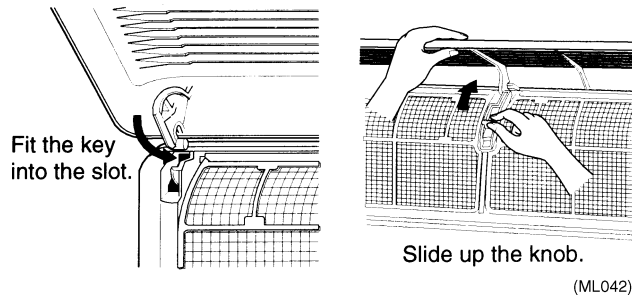


### Clean the Front Grille.

- You may wipe it with a soft cloth soaked in water.
- Only neutral detergent may be used.
- You may wash the grille with water. After washing, dry it with cloth, then dry it up in the shade.

### Attach the Front Grille.

- Set the 3 keys of the front grille into the slots and push them in all the way.
- Supporting the front grille with one hand, fit the lock by sliding up the knob with the other hand.
- Close the front grille slowly in this state. (Push the grille at the 3 points, two at both sides and in the middle).



#### Caution

- When removing or attaching the front grille, use a robust and stable stool and watch your steps carefully.
- When removing or attaching the front grille, support the grille securely with a hand to prevent it from falling.
- For cleaning, do not use water hotter than 40°C, benzine, gasoline, thinner, nor other volatile oils, polishing compound, scrubbing brushes nor other hard stuff.
- After cleaning, make sure that the front grille is securely fixed.

## 1.1.11 Filter Cleaning Indicator

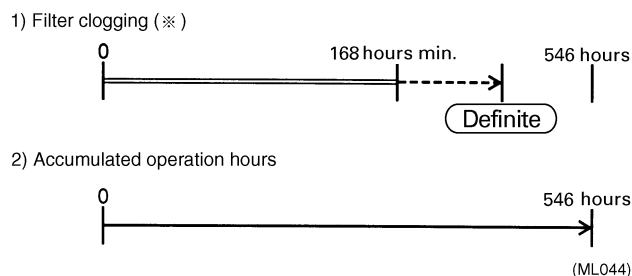
### For FTK, FTX50/60 H Series Only

- **The filter check indicator located at the center of the unit will indicate the time for cleaning the air filters.**

The indicator will indicate an appropriate cleaning time depending on the environment (dusty place or not). This will prevent you from forgetting filter cleaning and also prevent performance drop that might be caused by using clogged filters and wasteful use of electricity by approximately 8%.

### Contents of Indication

- **Sensed by the operation hours and the fan motor voltage**



Indicates the earlier one of the above 1) or 2).

\*This indicator utilizes the characteristic that the fan motor voltage drops as the crossflow fan gets clogged; it does not detect the amount of filter clogging.



#### Note:

- When the power supply is reset, the accumulated operation hour is also reset.
- After cleaning and mounting the filters, press the reset button located inside the panel of the unit.

### 1.1.12 Mold Proof Air Filter

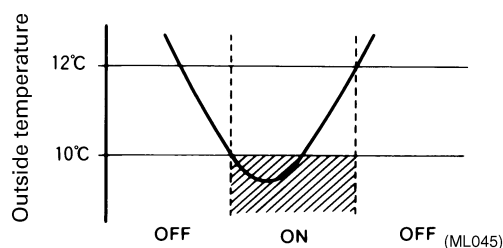
For FTK(X)25/35 J,  
FTK(X)50/60 H  
Series

The filter net is treated with mold resisting agent TBZ (harmless, colorless, and odorless). Due to this treatment, the amount of mold growth is much smaller than that of normal filters.

### 1.1.13 Pre-Heat Operation (Heat Pump Only)

For FTK(X)25/35  
J,  
FTK(X)50/60 H  
Series

1. When the equipment has been stopped, the compressor is warmed up by passing a small single-phasing current through the compressor motor so that the start up is speeded up.
2. The power consumption during warming up is about 15 to 35W.
3. This function operates only when the outside temperature is low (less than about 10°C) so that power saving is achieved.



### 1.1.14 Hot Start Function (Heat Pump Only)

In order to prevent the cold air blast that normally comes when heating is started, the temperature of the heat exchanger of the indoor unit is detected, and either the air flow is stopped or is made very weak thereby carrying out comfortable heating of the room.

\*The cold air blast is also prevented using a similar control when the defrosting operation is started or when the thermostat gets turned ON.

During defrosting or when the thermostat is on in heating mode, the indoor heat exchanger temperature  $\geq 29^{\circ}\text{C}$  to fan starts to avoid cold draft.

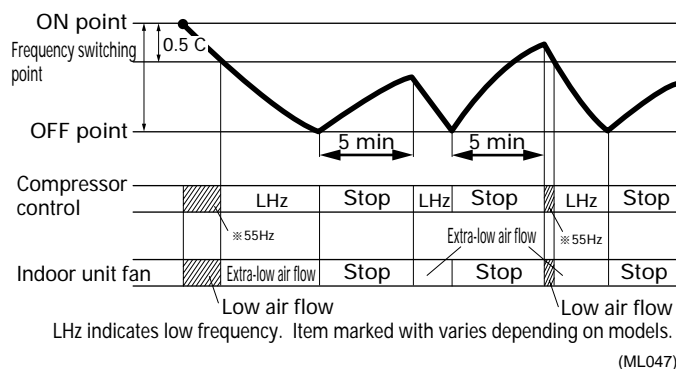
### 1.1.15 Program Dry Function

Program dry function removes humidity while preventing the room temperature from lowering. Since the microcomputer controls both the temperature and air flow volume, the temperature adjustment and fan adjustment buttons are inoperable in this mode.

In the Case of  
Inverter Units

The microcomputer automatically sets the temperature and fan settings. The difference between the room temperature at startup and the temperature set by the microcomputer is divided into two zones. Then, the unit operates in the dry mode with an appropriate capacity for each zone to maintain the temperature and humidity at a comfortable level.

Room temperature at startup	Temperature (ON point) at which operation starts	Frequency switching point	Temperature difference for operation stop
24°C	Room temperature at startup	0.5°C	1.5°C
18°C	18°C		1.0°C
17°C		—	



### 1.1.16 Automatic Operation (Heat Pump Only)

#### Automatic Cooling/Heating Function

When the AUTO mode is selected with the remote controller, the microcomputer automatically determines the operation mode from cooling and heating according to the room temperature and setting temperature at the time of the operation startup, and automatically operates in that mode.

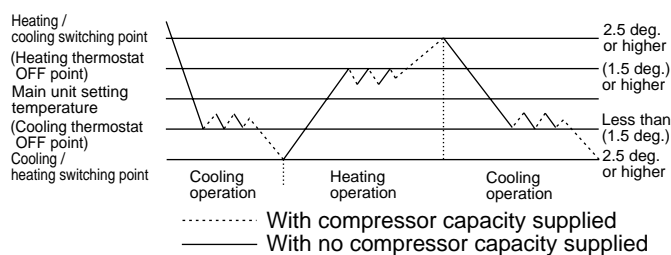
The unit automatically switches the operation mode to cooling or heating to maintain the room temperature at the main unit setting temperature.

#### Detailed explanation of the function

- Remote controller setting temperature is set as automatic cooling / heating setting temperature (18 to 30°C).
- Main unit setting temperature equals remote controller setting temperature plus correction value (correction value / cooling: 0 deg, heating: 2 deg.).
- Operation ON / OFF point and mode switching point are as follows.
  - ① Heating → Cooling switching point: Room temperature  $\geq$  Main unit setting temperature +2.5 deg.
  - ② Cooling → Heating switching point: Room temperature  $<$  Main unit setting temperature – 2.5 deg.
  - ③ Thermostat ON / OFF point is the same as the ON / OFF point of cooling or heating operation.
- During initial operation
 

Room temperature  $\geq$  Remote controller setting temperature: Cooling operation

Room temperature  $<$  Remote controller setting temperature: Heating operation



However, in the automatic Powerful cooling/heating mode, the guard timer is set as follows to prevent hunting in cooling / heating mode.

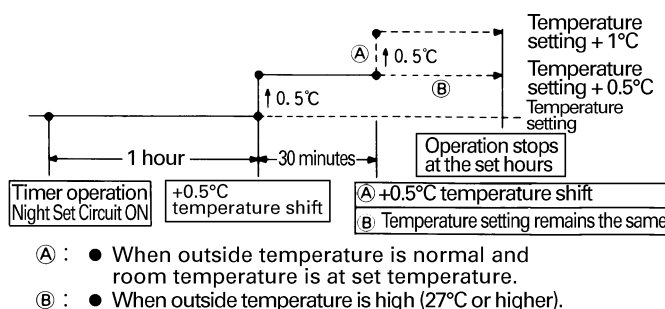
### 1.1.17 Night Set Mode

When the OFF Timer is set, the New Night Set Circuit automatically activates. The Night Set Circuit automatically switches the fan speed to a low setting to minimize operating noise. On the other hand, the New Night Set Circuit maintains the airflow setting made by users. (Some models are equipped with an Night Set Circuit ON switch.)

#### The Night Set Circuit

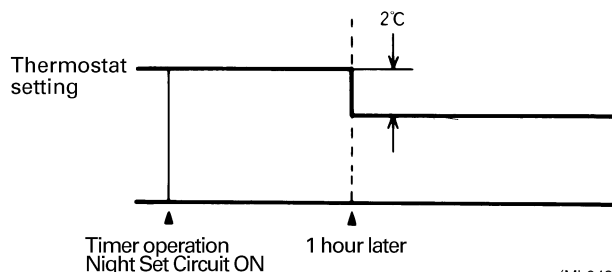
The Night Set Circuit continues heating or cooling the room at the set temperature for the first one hour, then automatically lowers the temperature setting slightly in the case of cooling, or raises it slightly in the case of heating, for economical operations. This prevents excessive heating in winter and excessive cooling in summer to ensure comfortable sleeping conditions, and also conserves electricity.

#### Cooling Operation



(ML048)

#### Heating Operation



(ML049)

### 1.1.18 Self-Diagnosis Digital Display

The microcomputer continuously monitors main operating conditions of the indoor unit, outdoor unit and the entire system. Should an abnormality occur, the LCD remote controller displays information and the indicators on the indoor and outdoor units light. These indications allow prompt maintenance operations.

### 1.1.19 Self-Diagnosis LED Display

The lighting patterns of the indoor unit LEDs (Operation, Timer and Dry/Hot Start indicators) and the LEDs on the outdoor unit's printed circuit board allow diagnosis of problem areas and faulty conditions of the interconnecting wire.



**Note:** Self-Diagnosis LED display is not equipped for FTK(X)25/35 J series.

### 1.1.20 Auto-Restart Function

Even if a power failure (including one for just a moment) occurs during the operation, the operation restarts in the condition before power failure automatically when power is restored. (Note) It takes 3 minutes to restart the operation because the 3-minute standby function is activated.

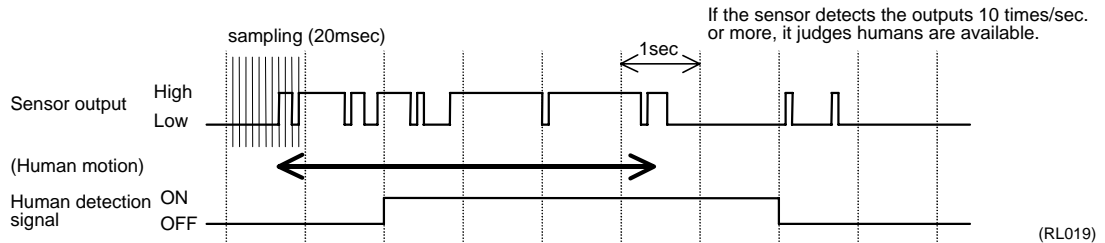
## 1.1.21 Intelligent Eye

For FTK(X)25/35 J  
Series Only  
Outline

The function that detects existence of humans in the air-conditioned room and reduces the capacity when no humans are available in the room in order to save electricity by means of a human motion sensor.

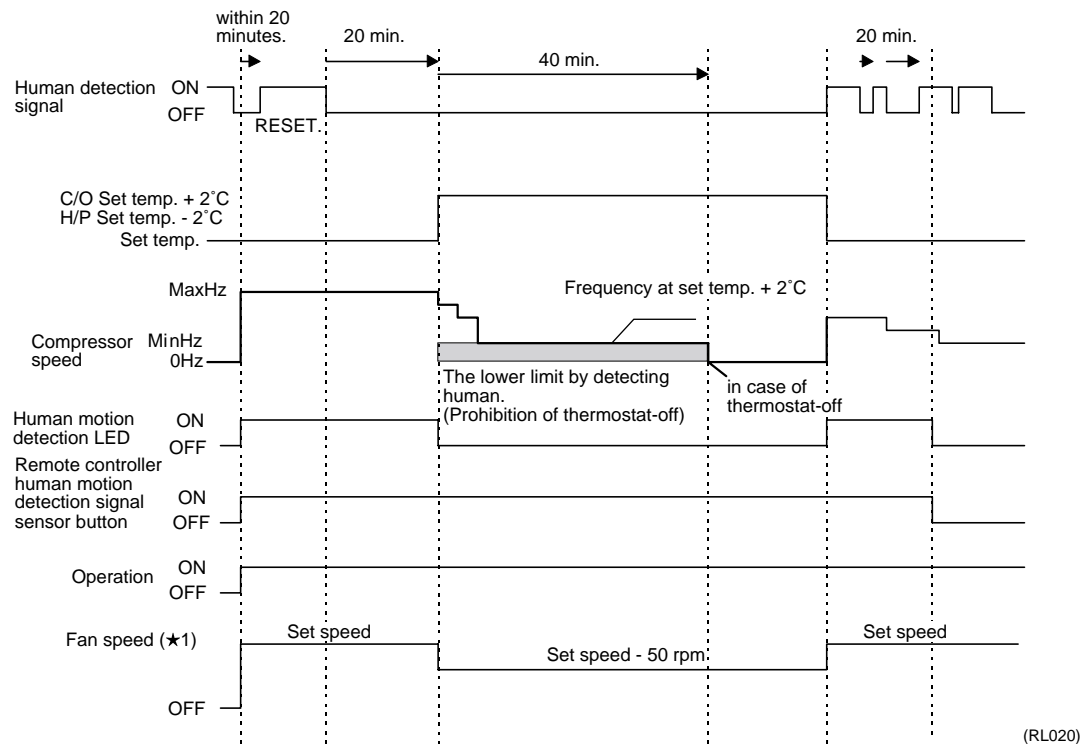
### Processing

#### 1. Detection method by human motion sensor



- This sensor detects human motion by receiving infrared rays and displays the pulse wave output.
- A micro computer in an indoor unit carries out a sampling every 20 msec. and if it detects 10 cycles of the wave in one second in total (corresponding to  $20\text{msec.} \times 10 = 100\text{msec.}$ ), it judges human is in the room as the motion signal is ON.

#### 2. The motions (for example: in cooling)



- When a micro computer doesn't have a signal from the sensor in 20 minutes, it judges that no body is in the room and turns off the human detection LED, operating the unit in temperature sifted 2°C from the set temperature. (Cooling : 2°C higher, Dry: 1°C higher and Auto : according to the operation mode at that time.)

★1 In case of Fan mode, the fan speed reduces by 50 rpm.

- Since the set temperature is shifted by 2°C higher for 40 minutes, compressor speed becomes low and can realize energy saving operation. But as thermostat is prone to be off by the fact that the set temperature has been shifted, the thermostat-off action is prohibited in 40 minutes so as to prevent this phenomena.  
After this 40 minutes, the prohibition of the thermostat-off is cancelled and it can realize the conditions to conduct thermostat-off depending on the room temperature. In or after this forty minutes, if the sensor detects human motion detection signal, it turns on “Human detection LED” and let the set temperature and the fan speed return to the original set point, keeping a normal operation.

#### Others

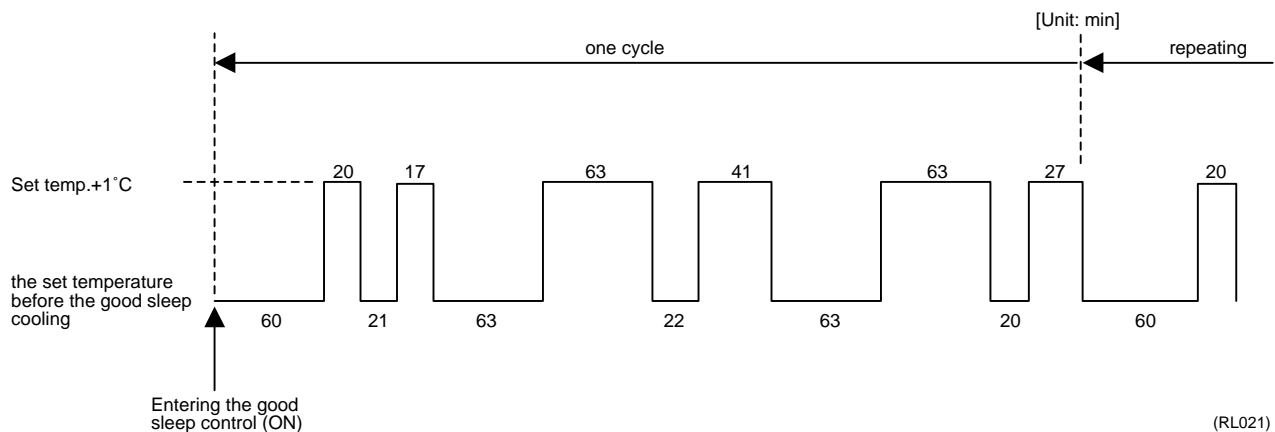
- The dry operation can't command the setting temperature with a remote controller, but internally the set temperature is shifted by 1°C.

### 1.1.22 Good Sleep Cooling Control

#### For FTK(X)25/35 J Series Only Outline

The function to create deep sleeping and to offer good sleep by altering the set temperatures in certain intervals to give temperature variation to a living space based on “1/f temperature fluctuation” principle, in case of going to bed while air conditioner keeps operating in cooling mode.

#### Processing



#### Notes:

1. Each timer's counting/stop is not related to a thermostat ON/OFF.
2. When the sleeping control works by the OFF timer, the shift from the set temperature should be just 1°C with this control function.  
(The temperature shift of the normal OFF-timer will not be carried out. However, the passed time should be remembered since the OFF-timer was set.)
3. While operation with the good sleep cooling control and off-timer setting, if the signal of the good sleep cooling OFF signal comes, the level of the set temperature shift should be set corresponding to the same with an existing value in accordance with the passed time since the OFF-timer was set.
4. When the good sleep cooling control is on while a normal operation with a OFF-timer is going on, once returning to the original criterion which doesn't shift the timer's set temperature, and the shift alteration at every sequence by 1°C is carried out in accordance with the value above mentioned.
5. Fan speed will change by the alteration of the set temperature by 1°C at the automatic fan speed operation mode, and it causes an alteration of fan noise. So, the fan tap should be fixed at L tap position during the good sleep cooling even at the auto fan speed operation.
6. The function of the good sleep cooling is cancelled, when the good sleep cooling operation is off or operation OFF command is received or also the operation mode changes to the mode except cooling.
7. The priority order for each function is ; 'Powerful', 'Intelligent eye', 'Good sleep', and 'Night set mode'.

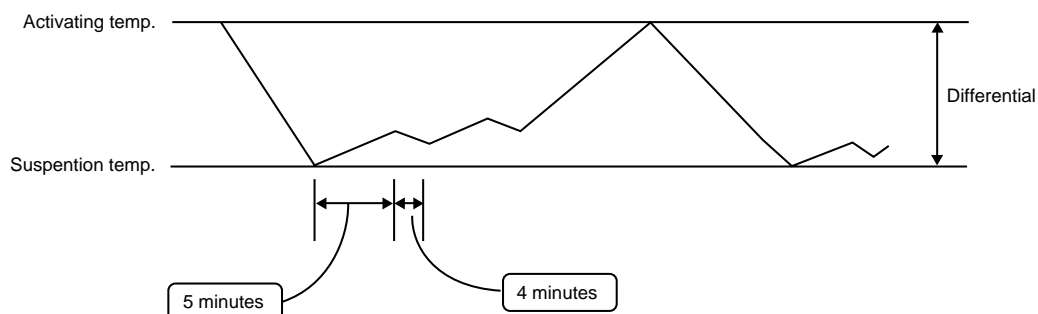
### 1.1.23 Program Dry Operation

By the function of the microcomputer, program dry operation reduces the humidity keeping the temperature in a minimum drop. Room temperature and air volume can not be controlled by room temperature adjusting button and air volume adjusting button because they are controlled automatically. When the program dry function starts, dry operation is provided, and then it repeats 5 minute suspension and 4-minute dry operation alternately. When the room temperature rises, it repeats the above process from the beginning.

Room temperature at starting of program dry operation	Program dry activating temperature ★1	Differential ★2
Above 24°C	Room temperature at starting of program dry operation	1.5 deg
18°C~24°C	Room temperature at starting of program dry operation	1.0 deg
Below 18°C	18°C	1.0 deg

★1 Dry operation activating (compressor on) temperature

★2 Room temperature difference between activation and suspension of dry operation



(RL001)



**Note:**

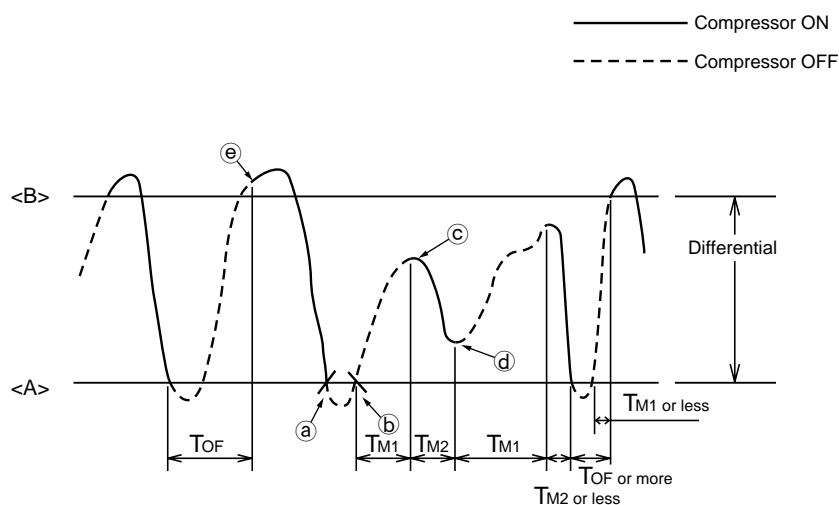
1. The program dry function is not operated when the room temperature is at 18°C or less.
2. In monitoring operation, fan rotates 5 seconds after the compressor starts its operation.

Compressor	Suspension	Operation
Indoor fan	Suspension	L tap

(RL002)

### 1.1.24 Cooling Monitoring Function

Monitoring function is activated while cooling and program dry operation are suspended.



(RL003)

TOF: Compressor recycling guard timer (3-minute timer)

TM1: 5-minute timer

TM2: 4-minute timer

<A> At cooling: Temperature set by wireless remote controller

At program dry operation: Temperature at suspension

<B> Temperature set by wireless remote controller + 1 deg. (Cooling operation)

Temperature set (Program dry operation)

Even if the suction temperature remains in the differential range, a compressor is cycled ON and OFF.

DETAIL: When the suction temperature rises again to <A> (point b) after the suction temperature is dropped to <A> and the compressor turns OFF (point a) the 5-minute timer starts.

After that, when the suction temperature is within the differential range, even after a lapse of 5 minutes, the compressor is forced to turn ON (point c).

When the suction temperature is still in the differential range, after another 4 minutes of compressor ON, the compressor is forced to turn OFF (point d).

The 5 and 4-minute timers are effective only within the differential temperature range, and when the air suction temperature is reached to <B> or <A> while the timers are counting, timers are reset and the compressor is turned ON or OFF.

(Note, however, that function of placing the compressor in a 3-minute compressor recycling guard timer is provided at point e.)

While the compressor is OFF, the indoor fan operation is controlled by tap A during cooling mode.

In the program dry mode, the indoor fan starts operating five seconds after the compression starts, and it stops operating when the compressor shuts down.

	A
FLE18HV1LS, FL35/50HV1	Remote controller setting

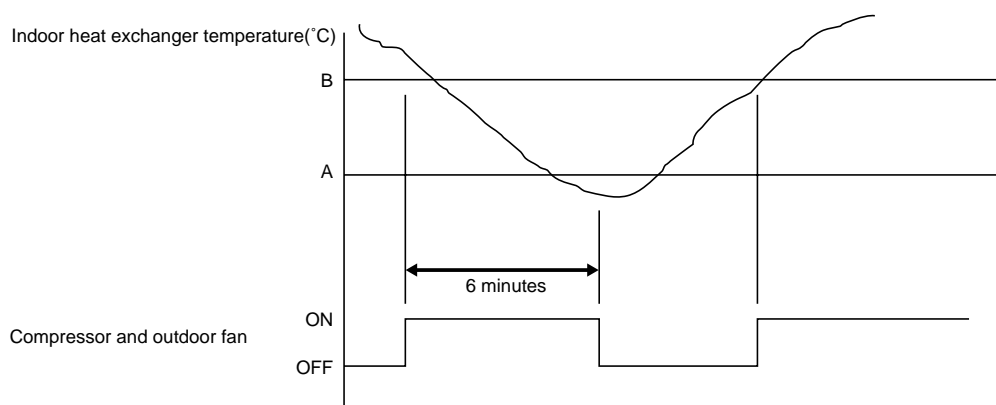
### 1.1.25 Freeze Protection Function

When the indoor heat exchanger temperature falls below “A”°C in cooling or program dry operation,

- the compressor and the outdoor fan are forced to turn OFF, and
  - the indoor fan rotates at the L tap (in cooling operation) or W2 tap (in program dry operation).
- Note that this function is not activated for 6 minutes after compressor turns ON.

When the indoor heat exchanger reaches “B”°C, the compressor and the outdoor fan restart the operations. However, because the compressor recycling guard timer (3-minute timer) takes priority, the compressor and the outdoor fan don't restart the operation during this timer is ON.

	A	B	W2
FLE18HV1LS, FL35/50HV1	3	13	LL



(RG001)

### 1.1.26 Auto-Restart Function

Even if a power failure (including one for just a moment) occurs during the operation, the operation restarts in the condition before power failure automatically when power is restored. (Note) It takes 3 minutes to restart the operation because the 3-minute standby function is activated.

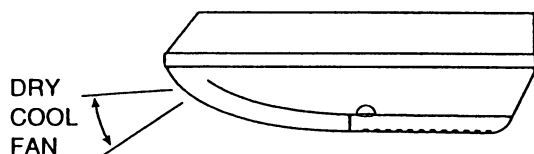
### 1.1.27 3-Minutes Standby Function

When the compressor turns OFF, it doesn't turn ON for 3 minutes

### 1.1.28 Auto-Swing of Flap(s)

Auto-swing angles are about “A” degrees when the fan is ON, and about “B” degrees when the cooling or program dry operation is ON. The up-and-down swing of the flaps widens the direction of wind.

- When [SWING] is selected, the flap swinging range depends on the operation mode. (See the figure.)



#### NOTE

- Unless [SWING] is selected, you should set the flap at a near- horizontal angle in COOL or DRY mode to obtain the best performance.
- In DRY mode, if the flap is fixed at a upward position, the flap automatically moves in about 60 minutes to prevent condensation on it.

#### ATTENTION

- Always use a remote controller to adjust the flap angle. If you attempt to move it forcibly with a hand when it is swinging, the mechanism may be broken.

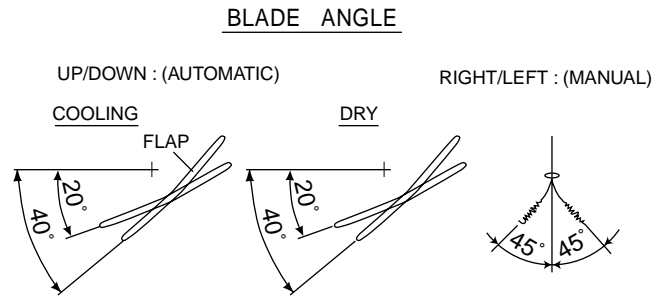
(RL004)



**Note:** Notes on flap angles

### 1.1.29 Air Flow Automatic (Auto Fan Speed)

In cooling operation, if automatic airflow has been selected, the wind flow is determined according to the room temperature and the temperature setting.

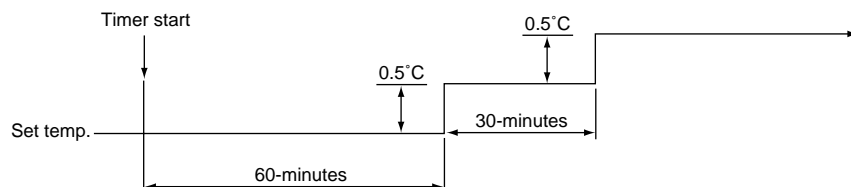


(RL005)

### 1.1.30 Night Set Mode Function

This mode automatically keeps temperature slightly higher than the temperature setting. In this way, there is no need to worry about overcooling while sleeping, and it also saves on electricity.

- Set the OFF timer.
- The unit will cool the room at the set temperature for 1 hour from when the timer starts counting.
- After that, the unit will raise temperature 0.5°C higher than the set temperature and cool for 30 minutes.
- After that, the unit will raise temperature another 0.5°C and continue cooling at that temperature.
- Setting the OFF timer forcibly changes the airflow adjustment to the tap-L setting.
- It is possible to change the airflow setting while the OFF timer is in operation. However, changing the airflow setting cancels the shift-up of the set temperature.



(M1101)



**Note:** No higher temperature setting on program Dry or Auto operation.

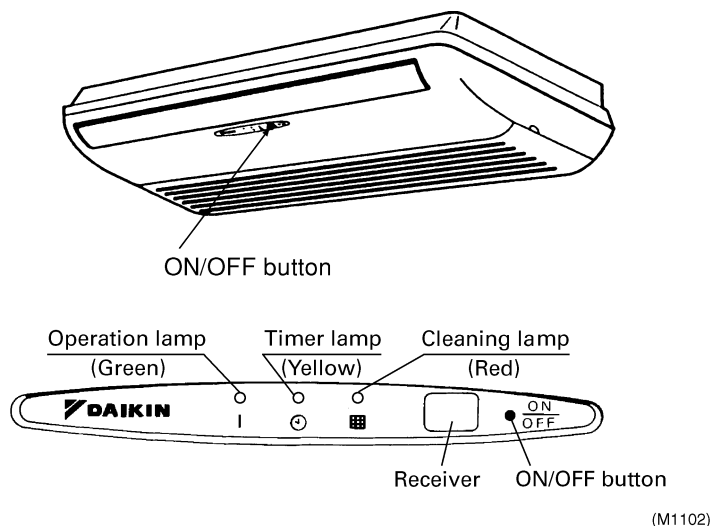
### 1.1.31 Emergency Operation Function (ON/OFF Switch)

The unit can be turned ON only by pressing ON/OFF operation switch. This is convenient when the remote controller cannot be found or if the batteries are dead.

The operation condition is as follows:

Operation mode	Cool
Fan speed	Auto
Set temperature	22°C

Pressing the switch again will turn the unit OFF.



### 1.1.32 Powerful Operation

During cool and program dry operation, when the POWERFUL button on the remote controller is pressed, the thermistor setting is changed to the lowest setting of the remote controller and the fan runs at the maximum rpm (Note). During fan operation, air is blown at the maximum fan rpm.



**Note:** Max. fan rpm = H tap set by remote controller + 50 rpm

#### Notes on POWERFUL Operation

- In COOL mode  
To maximize the cooling effect, the temperature setting is fixed to 18°C and the air flow rate is fixed to the maximum setting. (H tap + 50 r.p.m)  
The temperature and air flow settings are not variable.
- In DRY mode  
The temperature setting is lowered by 3°C and the air flow rate is slightly increased. You can repeat POWERFUL operation if you need even more dehumidification.

### 1.1.33 Filter Check Indicator

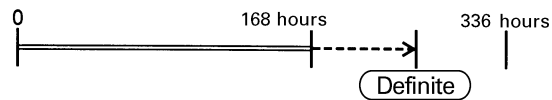
- The filter check indicator located at the center of the unit will indicate the time for cleaning the air filters.

The indicator will indicate an appropriate cleaning time depending on the environment (dusty place or not). This will prevent you from forgetting filter cleaning and also prevent performance drop that might be caused by using clogged filters and wasteful use of electricity by approximately 8%.

#### <Contents of indication>

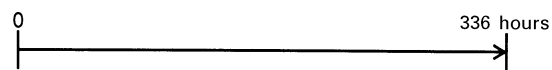
- Sensed by the operation hours and the fan motor voltage

#### 1. Filter clogging (★)



(M1103)

#### 2. Accumulated operation hours



(M1104)

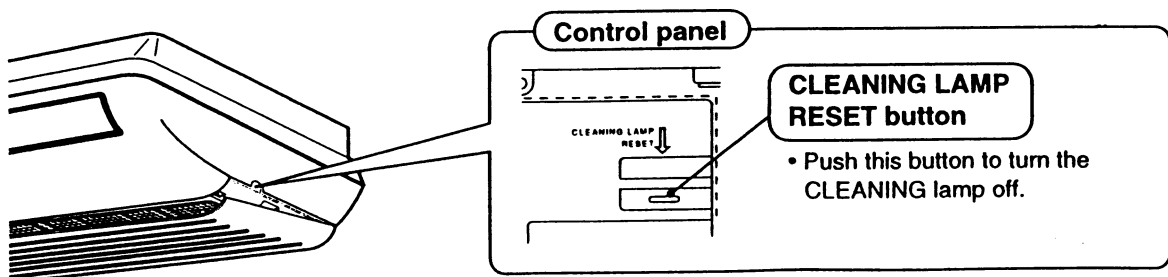
Indicates the earlier one of the above 1 or 2.

- ★ This indicator utilizes the characteristic that the fan motor voltage drops as the crossflow fan gets clogged; it does not detect the amount of filter clogging.



#### Note:

- When the power supply is reset, the accumulated operation hour is not reset.
- After cleaning and mounting the filters, press the reset button located inside the panel of the unit.

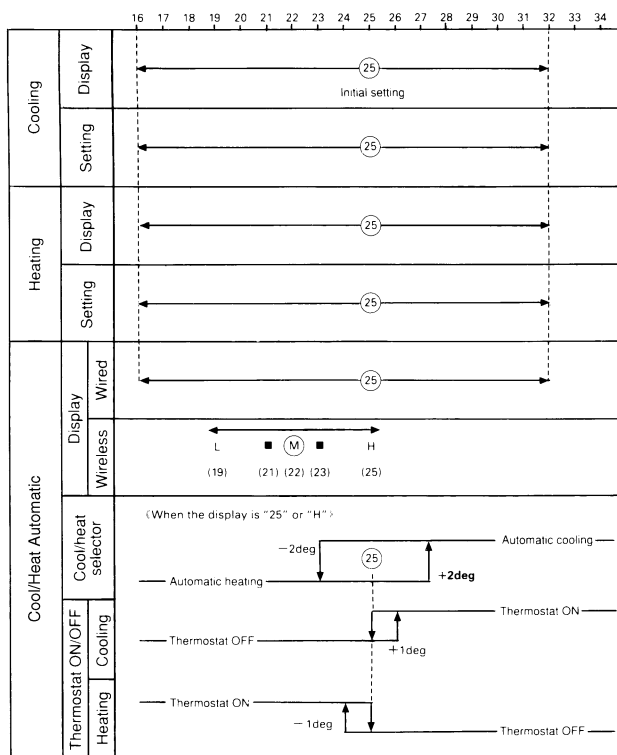


(M1105)

## 1.2 SkyAir

### Thermostat Control

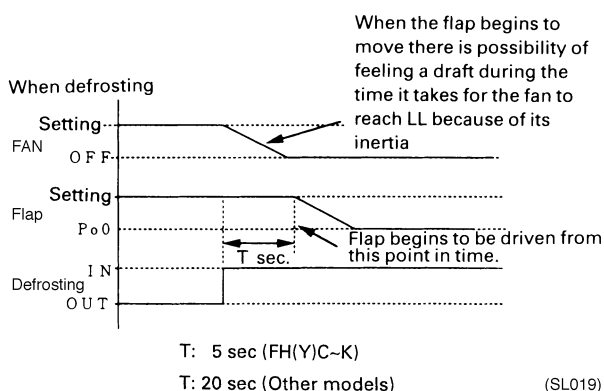
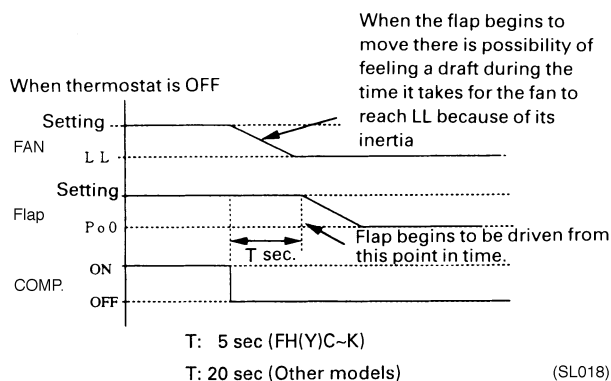
Existing cooling/heating preset temperature range has been changed.



(SL017)

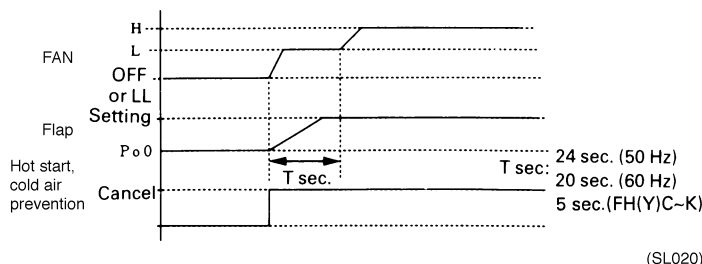
### Draft Avoidance Control 1

Draft is circumvented by delaying transfer of the flap to the Po0 (horizontal) position for a certain amount of time when defrosting and in the heating mode with the thermostat OFF.



### Draft Avoidance Control 2

When hot start is cancelled or when cold air prevention control is finished, if the fan speed is set to "H," the fan turns at L speed for a certain amount of time, thus avoiding draft while the flap is moving.



### Air Flow Volume Shift Control

The air flow volume of an indoor unit is varied to prevent shutdown due to a rise in the high pressure level.

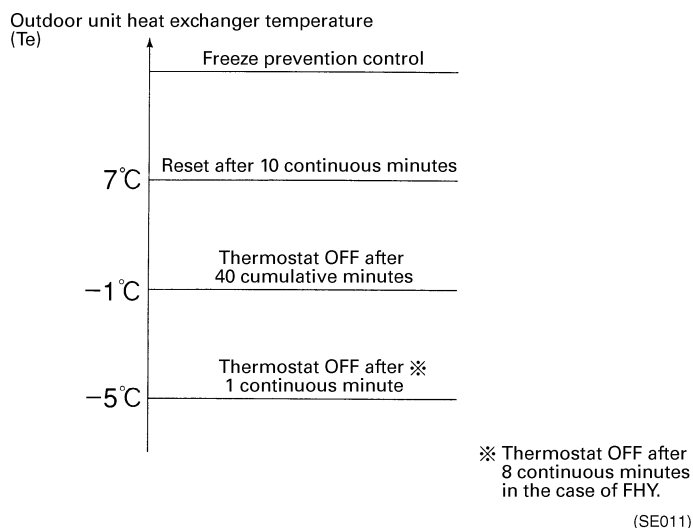
(Air volume up at heating operation)

- When indoor unit suction air temperature is 25°C or higher  
 ON condition  $T_c \geq 60^\circ\text{C}$   
 Reset condition  $T_c < 50^\circ\text{C}$   
 Note that the air flow volume is varied for a preset time when the thermostat is ON.
- When indoor unit suction air temperature is lower than 25°C  
 ON condition  $T_c \geq 60^\circ\text{C}$   
 Reset condition  $T_c < 59^\circ\text{C}$

### Freeze Prevention Control

The thermostat turns OFF under the following temperature conditions to prevent freezing of the indoor unit heat exchanger.

- The motorized valve is controlled to maintain the indoor unit heat exchanger temperature ( $T_e$ ) above 0°C.
- The outdoor unit fan speed is reduced to prevent freeze prevention control from activating during cooling operation under low outside air temperature. (For details, see the section on cooling operation under low outside air temperature.)



### Auto-Restart Function

If there is a power cut when the unit is operating, it will automatically resume the same operating mode when the power is restored.



#### Caution

When performing maintenance and the power supply is to be shut off, be sure to turn the remote controller's ON/OFF switch OFF first.

Shutting the power supply switch off while the ON/OFF switch is still ON is dangerous because the "power failure automatic reset function" will cause the indoor fan to start turning immediately, or the outdoor unit fan to automatically start turning three minutes after the power supply is turned back on.

## 1.3 Cautions when SkyAir [Auto] [FAN] are used

### 1.3.1 Heat Pump Model

---

#### The Corresponding Models


FHYC35 / 50 / 60 / 71K

FDYM60 / 03 F (A)

★Excludes the case connecting the cooling only models.

---

#### Cautions

1. In case of plural and simultaneous operation including the corresponding models stated above, the mode change (Cooling → Heating, or Heating → Cooling) will not be carried out automatically, even if [Auto] is selected.  
Accordingly, when operation mode change is required, once stop the operation of the corresponding model and then choose a mode after starting the model again.
2. SkyAir [FAN Only] mode can't be operated.  
If [FAN Only] mode is chosen, [  ] is displayed once but disappears after a few seconds.  
(The indoor unit's fan once starts but soon will stop).

# Part 5

## Main Functions

### Outdoor Unit / BP Unit

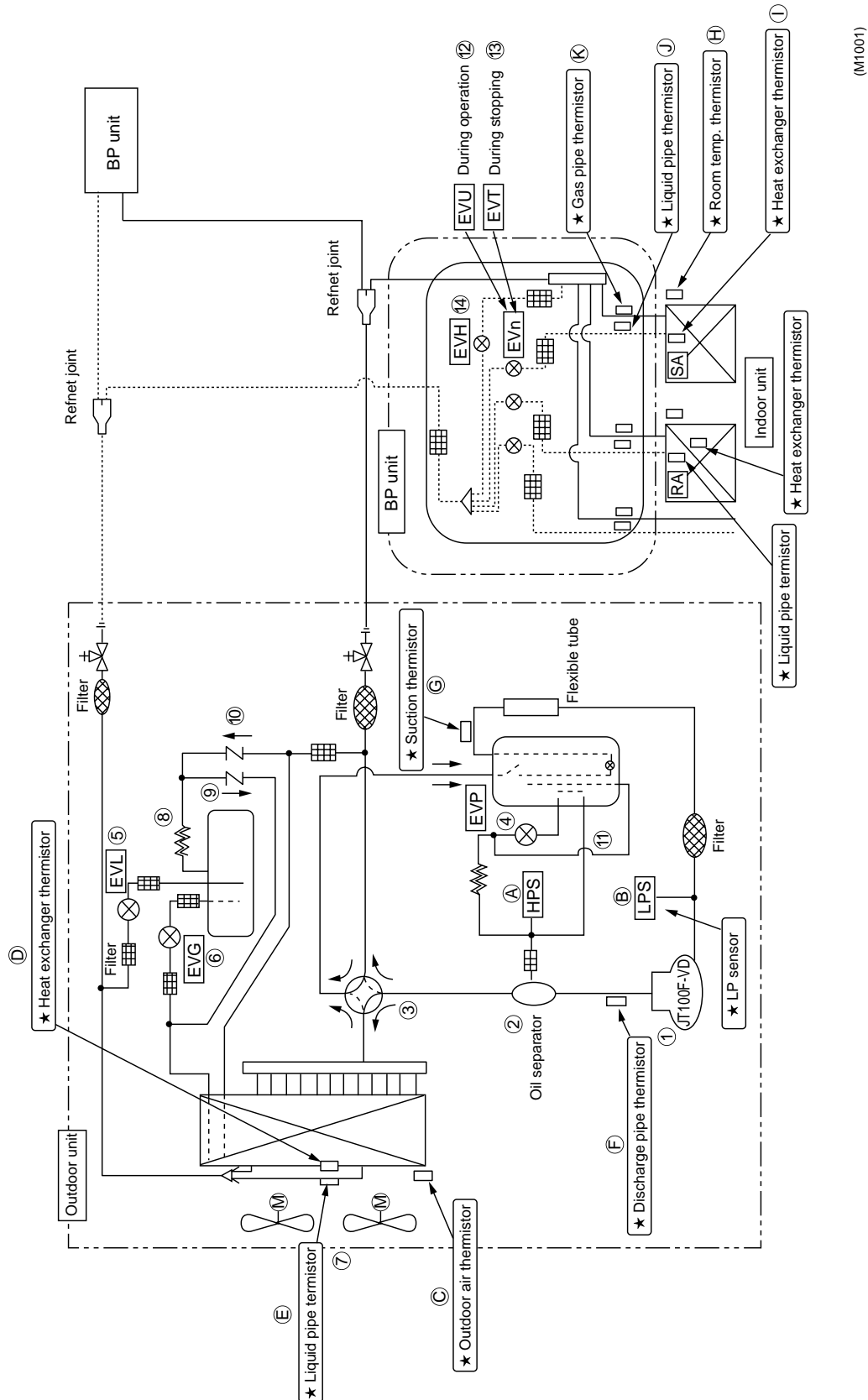
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The RMK140JAVM specifications are special. Refer to <RMK140JAVM's important points> (on page ii) for the changes in contents.

# 1. Refrigerant System and Function of Functional Parts of Outdoor Unit

## 1.1 Refrigerant System and Function of Functional Parts of Outdoor Unit



## 1.2 Major Functional Parts

### ① Compressor : JT100F-VD

The application of Inverter drive enables the capacity control for 1 Hz/step at 25 to 98Hz in cooling operation or at 30 to 105Hz in heating operation.

### ② Oil separator

Collects oil discharged from the compressor. The oil discharged passes through filter, capillary tube and accumulator to return to the compressor.

### ③ 4-way valve

Carries out switching of the cooling/heating operations.

### ④ EVP : Discharge to Suction bypass motorized valve

Motorized valve for capacity control.

[When small-capacity indoor unit is operating, opens to activate the high pressure rising protection function (in heating operation) or the freeze protection function (in cooling operation)]

### ⑤ EVL : Liquid pipe motorized valve

In cooling operation, it judges based on outdoor unit's SC control whether there is surplus refrigerant or not, and EVL opens or closes to adjust the surplus refrigerant amount in the receiver.

In heating operation, if EVG is opened, when the surplus refrigerant is in receiver the entire system control is provided.

### ⑥ EVG : Gas pipe motorized valve

In cooling operation, if EVL is opened, when the surplus refrigerant is in receiver the entire system control is provided. In heating operation, if surplus refrigerant treatment is required (the opening of EVT is minimum), feed the surplus refrigerant in the receiver with reverse discharge pipe temperature control. If small-capacity indoor unit is connected and the high pressure rises, open the EVG to increase auxiliary heat exchanger capacity and decrease the high pressure.

### ⑦ Outdoor unit fan

The upper limit of the fan speed is provided to secure the differential pressure in low-temperature cooling operation. The fan runs with H-tap in overloaded cooling and low-temperature heating. For other cases the fan runs with L-tap.

### ⑧ Capillary tube for gas purge

When the unit is operated in pump down mode, this tube serves as gas purging capillary tube.

### ⑨ Check valve

When the liquid refrigerant in the receiver overflows, flows the liquid refrigerant to accelerate the evaporation in cooling operation, or prevent the liquid refrigerant from intrusion into the receiver in heating operation.

### ⑩ Check valve

When the liquid refrigerant in the receiver overflows, prevents the liquid refrigerant from flowing into the suction pipe in cooling operation, or prevent the liquid refrigerant from EVL from flowing into the discharge side when heating.

### ⑪ Cooling piping

When EVP is open, cools the discharged gas once and protects the EVP from abnormal high temperature.

### ⑫ EVU : Motorized valve in operating room BP unit

When EVL opens in cooling operation, activates SH control to carry out self-determination of the refrigerant control in BP unit. When EVL is closed, carries out the entire system control and distribution control (gas pipe isothermal control). In heating operation, carries out the controls equal to Super-multi unit control (entire system control and SC control).

⑬ **EVT : Motorized valve in non-operating room BP unit**

In cooling operation, fully closed.

In heating operation, carries out the control equal to Super-multi unit control (entire system control).

⑭ **EVH : Bypass motorized valve in BP unit**

Opens at specified opening degree when oil collecting operation is conducted in heating mode.

The EVH opens as well when oil collecting and defrosting operation is conducted in cooling mode.

## 1.3 Protective Devices, Thermistors, Sensors

### A HPS

When the high pressure rose abnormally, HPS is actuated to stop the compressor.

### B Low pressure sensor

Carries out controls such as low pressure protection (compressor protection), and ending pump down operation, and judgement of gas shortage.

### C Outdoor air thermistor

Carries out controls such as fan tap control (H/L switching), determination of initial frequency, and compressor protection control.

### D Outdoor unit heat exchanger thermistor

Carries out the target discharge pipe temperature control and the judgement of defrosting start.

### E Outdoor unit liquid pipe thermistor

In cooling operation, carries out the outdoor unit SC control (subcooling control) and the judgement on defrost resetting.

### F Discharge pipe thermistor

Carries out the compressor internal temperature protection control (operation halts due to the discharge pipe abnormal high temperature, gas shortage, etc.)

Carries out the judgement of open-phase operation and the system control.

### G Suction pipe thermistor

Carries out the pump down operation.

### H Indoor unit room temperature thermistor

Instructs the capacity supply to BP unit using the room temperature.

### I Indoor unit heat exchanger thermistor

Carries out various protection functions and controls of capacity (peak cut, freeze protection, heat exchanger isothermal control in heating operation, target discharge pipe temperature control, SH control in cooling operation, SC control in heating operation).

### J BP unit liquid pipe thermistor

In heating operation, carries out the indoor unit SC control.

### K BP unit gas pipe temperature thermistor

In cooling operation, carries out the indoor unit SH control and the cooling gas pipe isothermal control.

## 2. Protection Device

### 2.1 Outdoor Unit

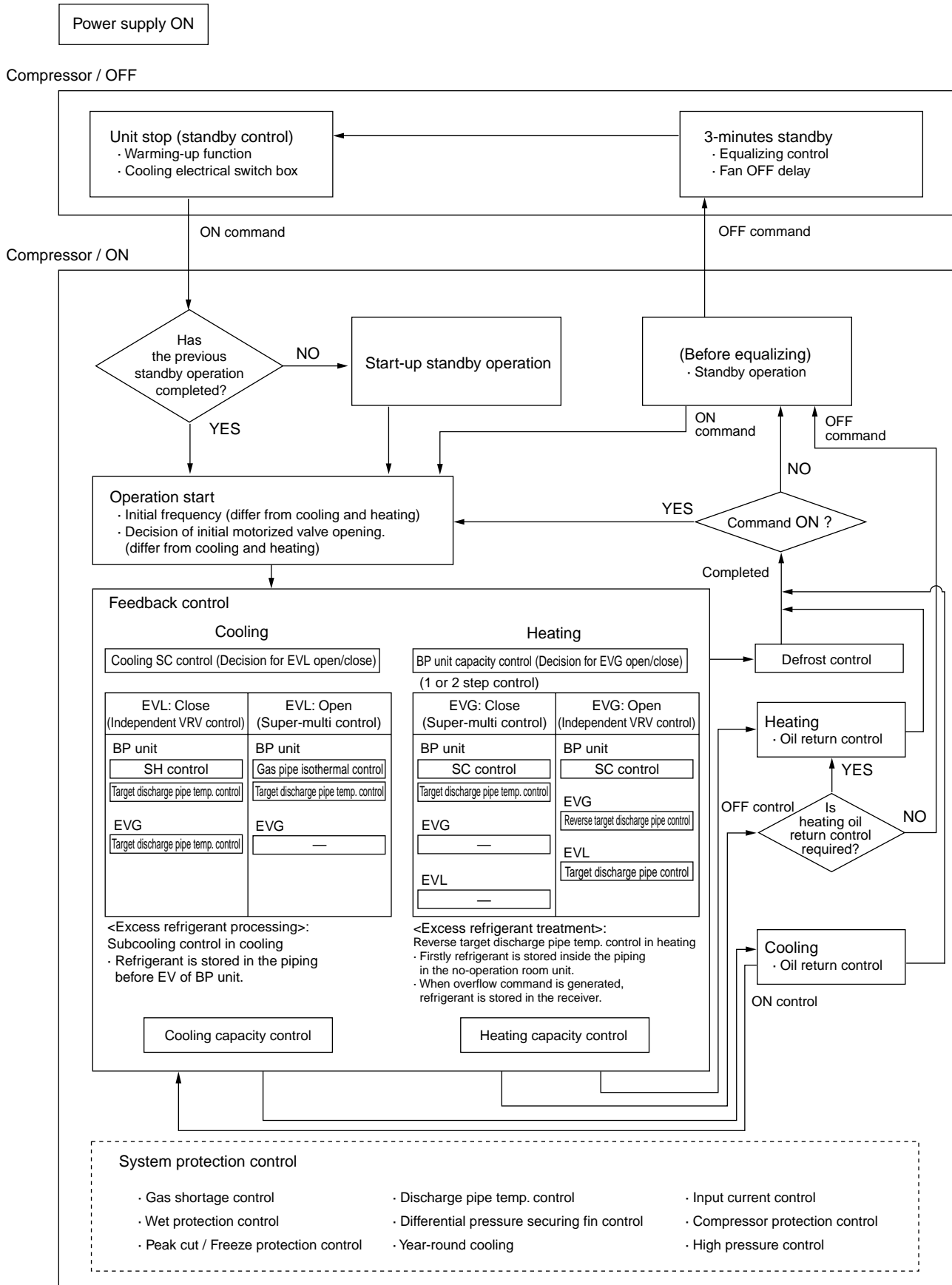
		RMX140JVM	
M1C	Compressor	JT100F-VD	3.3kW × 1 Scroll
J1HC	Crankcase Heater	—	
HPS	High Pressure Protection	(3SA45022-1) OFF: 2.94MPa ON: 2.16MPa	
SP	Low Pressure Sensor	(3SA48112-1) PS8040A 0~0.98MPa	
Y1E (EV <sub>G</sub> )	Electronic Expansion Valve	Main Body (2SB45422-1) Coil (3SB45348-8)	LAM-B30YHDM-1
Y2E (EV <sub>L</sub> )	Electronic Expansion Valve	Main Body (2SB45422-1) Coil (3SB45348-1)	LAM-B30YHDM-1
Y3E (EV <sub>P</sub> )	Electronic Expansion Valve	Main Body (3SA52028-1) Coil (3P002169-1)	EKV-30D36
Y1R	4-Way Valve	Main Body (3SA52023-1) V40100B Coil (3SA52037-5-KU)	V40100B H/p Only
M1F	Fan Motor (Lower)	(3SB40509-1) H41, L30-W × 1 8P Propeller	
M2F	Fan Motor (Upper)	(3SB40509-1) H53, L38-W × 1 8P Propeller	
C1R	Capacitor for Fan Motor	(3EB60099-1) 2,500μF	
L1R	Direct Current Reactor	(3EB75084-1)	
L2R	Direct Current Reactor	(3EB75084-1)	
F1U	FUSE	(3EB82010-1) (250)V (3.15)A	
R1T	Thermistor (Condenser)	(3EB70006-19) R25 = 20kΩ B = 3,950	
R2T	Thermistor (Liquid)	(3EB70006-29) R25 = 20kΩ B = 3,950	
R3T	Thermistor (Outdoor)	(3EB70001-9) R25 = 20kΩ B = 3,950	
R4T	Thermistor (Suction)	(3EB70006-19) R25 = 20kΩ B = 3,950	
R5T	Thermistor (Discharge)	(3EB70006-19) R25 = 20kΩ B = 3,950	

## 2.2 BP Unit

		BPMK928B42, BPMK928B43	
FU1 ~ 4	FUSE	(3EB82010-1) 250V 3.15A	
Y1E (EV <sub>H</sub> )	Electronic Expansion Valve	Main Body (2SB45422-1) Coil (3SB45348-10)	LAM-B30YHDM-1
Y2E	Electronic Expansion Valve	Main Body (2SB45422-1) Coil (3SB45348-10)	
Y3E	Electronic Expansion Valve	Main Body (2SB45422-1) Coil (3SB45348-10)	
Y4E	Electronic Expansion Valve	Main Body (2SB45422-1) Coil (3SB45348-10)	

## 3. System control

### 3.1 Outline of System Control



(M1003)

## 3.2 Mode Configuration

### Air Conditioner Control Mode

#### Air conditioner control mode

Standby Mode	Standby Control at Power ON
	Cooling Standby Operation
	Heating Standby Operation
	Pressure-Equalizing Control
Installation/Servicing Operation Mode	Pump-Down Operation
	Cooling Test Operation
	Heating Test Operation
Normal Operation Mode	Cooling Mode
	Heating Mode
	Stop Mode
Malfunction Processing	

### Determination of Normal Operation Mode

The operation mode signal sent from each BP unit is analysed in the following procedure, and this signal is used to determine the operation mode of the outdoor unit.

The operation mode is determined based on the first button pressed.

The following shows operation mode instructions sent from two BP units.

Operation mode command HA is issued from BP 1, and HB is sent from BP2.

1. When HA = HB: Indoor unit command is used.
2. When HA = Stop and HB = Operation (cooling, dry, heating), or HA = Operation (cooling, dry, heating) and HB = Stop: Control room command is used.
3. When HA = Operation, HB = Operation and HA ≠ HB: Due to mode batting, the following operation mode is used.

The first operation mode entered takes precedence. (operation based on first button pressed)



#### Note

The dry mode is treated as cooling mode, and the two entered modes do not result in mode batting.

4. The current operation mode (of outdoor unit) is sent to all BP units.

### 3.3 Standby Control at Power ON

#### Purpose of the Function

To initialize the motorized valve at power ON, to determine the valve opening degree and promote pressure equalization, and to conduct a standby operation.

The reason for promoting pressure equalization at power ON is to prevent the compressor from locking due to insufficient pressure equalization that could result if units are restarted immediately after reset during operation (due to momentary power outage and others). The standby operation collects refrigerant in the receiver to ensure sufficient oil level and dilution in the compressor immediately after startup.



\*

The standby operation and pressure equalization are described in the next section.

#### Explanation of The Function

[Detail]

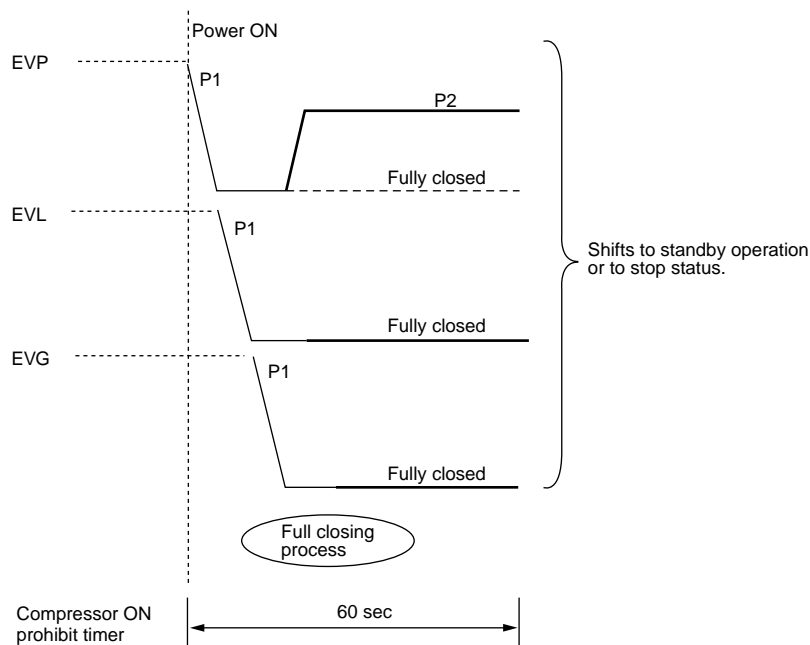
1. Compressor ON prohibit timer (60 seconds) starts when power is turned on.  
P1 pulses is closed, and the current opening degree is set to 0 pulse (full closing process)
2. Compressor ON prohibit timer reaches the set time, a standby operation is activated.



#### Note

When the compressor ON prohibit timer is in counting operation, operation of the compressor is prohibited.

During standby operation, operation command from BP units are ignored.



(M1004)



#### Note

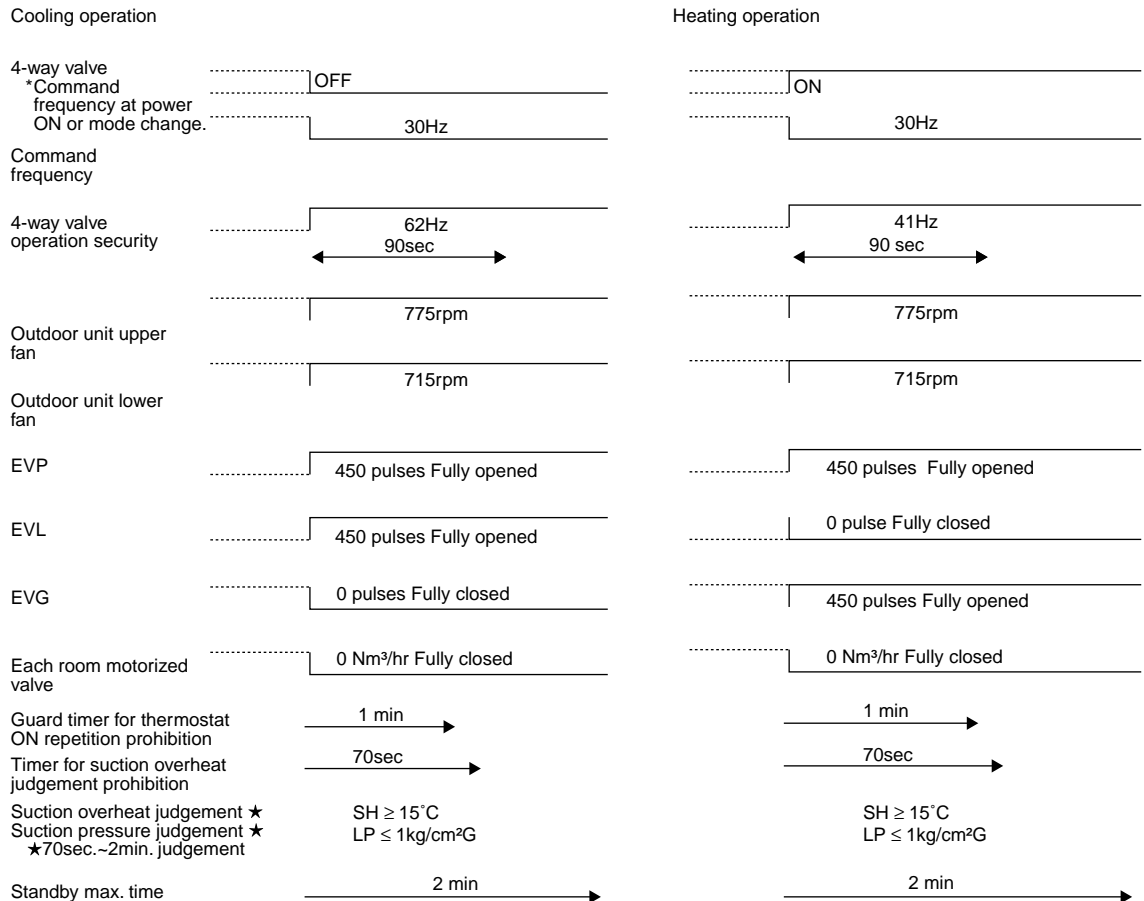
Regarding initialization of BP motorized valves at power ON, refer to the section on BP motorized valve full closing on page 153.

### 3.4 Cooling / Heating Standby Operation at Startup

#### Purpose of the Function

To prepare for the next startup after operation shutdown and to collect refrigerant into the receiver in order to prevent liquid refrigerant from returning to the accumulator and compressor at startup.

#### Standby Operation



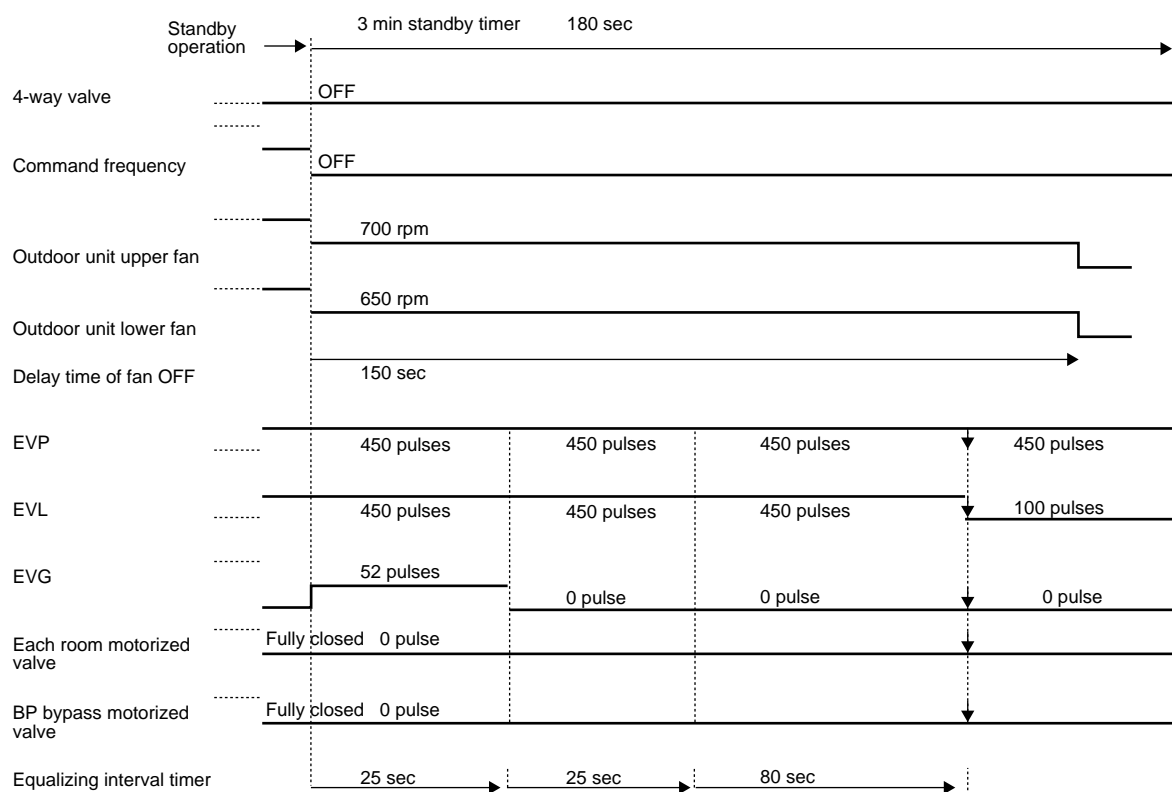
(M1005)

## 3.5 Equalizing Control

### Purpose of the Function

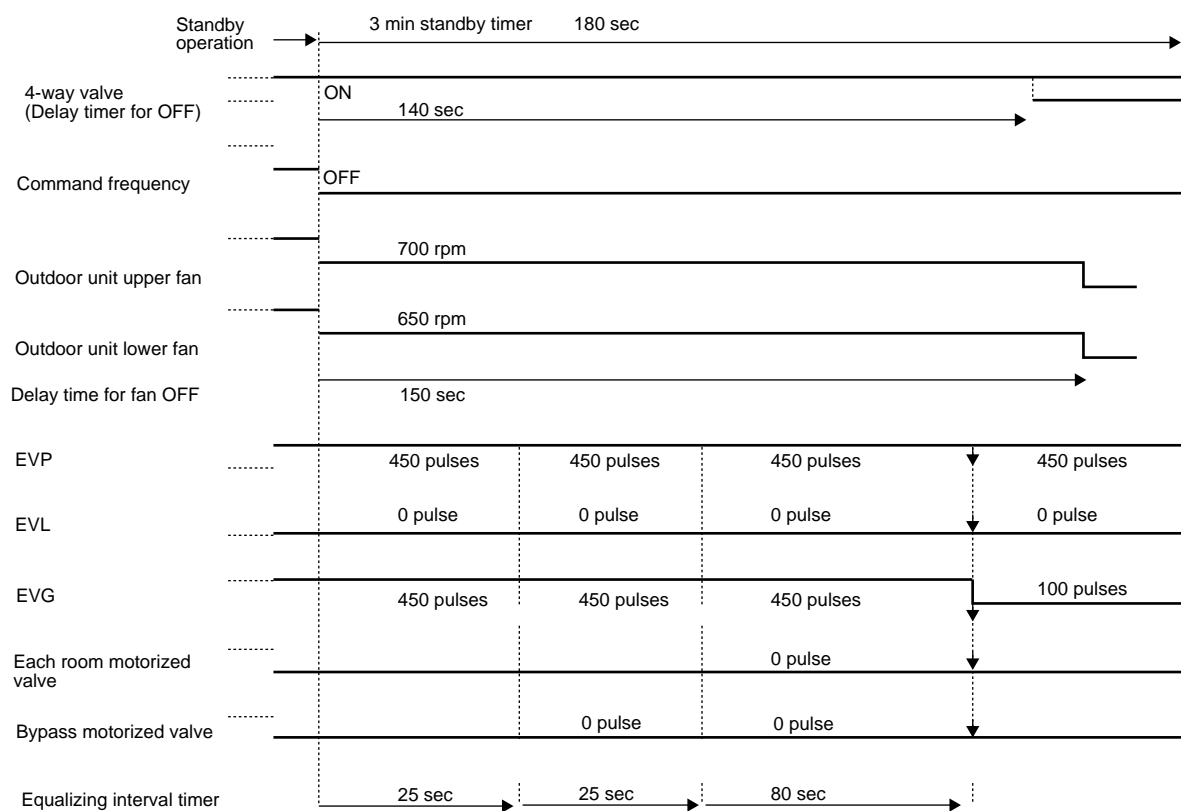
To provide equalizing control after a standby operation in order to prevent the compressor from locking due to insufficient equalizing and to ensure smooth compressor startup.

### Equalizing Control in Cooling



(M1006)

## Equalizing Control in Heating



(M1007)

## 3.6 Determination of Initial Frequency

### 3.6.1 Determination of Operation Frequency

**Purpose of the Function**

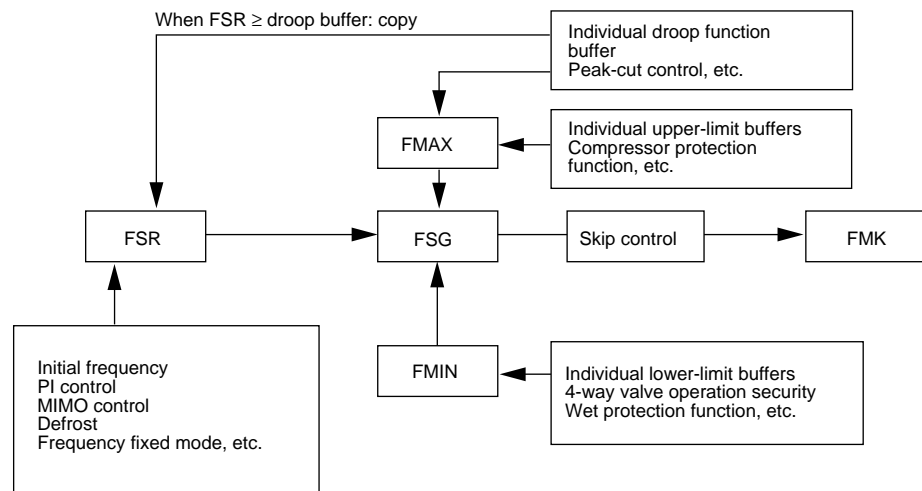
To control the operating frequency in order to ensure compressor reliability and optimise the operating condition.

**Outline**

$\Delta D$  signals (difference between room temperature and temperature setting) from BP units are used to determine the frequency corresponding to the capacities of the indoor units connected to the BP units.

This function is also described in the following section.

**Method of determining frequency**



(M1008)

**Method of determining frequency**

The compressor operating frequency is determined in the following steps.

1. Selection of command frequency FSR
2. Selection of upper-limit frequency FMAX
3. Selection of lower-limit frequency FMIN
4. Selection of restriction frequency FSG
5. Execution of prohibit frequency skip control
6. Selection of target frequency FMK

### 3.6.2 BP Unit Command Conversion

1.  $\Delta D$  (room temperature – temperature setting) signals from BP units are converted to  $\alpha$  values.

$\Delta D$  signals from BP units are used as the  $\alpha$  value in frequency commands (excludes when Powerful function is in operation).

$\Delta D$ Signal	$\alpha$ Value	Temperature Difference
0	0	0
1	0	0.5
2	1	1.0
3	2	1.5
4	3	2.0
5	4	2.5
6	5	3.0
7	6	3.5
8	7	4.0
9	8	4.5
A	9	5.0
B	A	5.5
C	B	6.0
D	C	6.5
E	D	7.0
F	E	7.5

←Thermostat OFF

←Regarding thermostat OFF  
Temperature difference between BP thermostat OFF point and room temperature

#### 2. Processing during Powerful operation mode

- (1) When Powerful command is received from indoor units (one or more units)
- (2) Thermostats are not OFF in room units from which Powerful commands are issued

When the above conditions are met, the Powerful operation mode is activated, and the following processes are conducted.

- (3) Based on the  $\alpha$  value determined by  $\Delta D$  signal from indoor unit, the following calculation is performed.

$$\alpha \text{ value} = \alpha \text{ value} + \alpha \text{ PWR}$$

#### 3. Determination of S value

There are two types of indoor unit capacities from individual BP units. One is the  $\Sigma S$  value of the connected indoor unit, and the other is the  $\Sigma S$  value of the indoor unit which receives an operation demand for the same mode as that of the outdoor unit. They are called H/U connection  $\Sigma S$  value and BP operation  $\Sigma S$  value, respectively. The sums of those S values of BP units are called outdoor unit connection  $\Sigma S$  value and outdoor unit operation  $\Sigma S$  value. In this manual, outdoor unit connection  $\Sigma S$  value is referred to as  $\Sigma S$  value, and outdoor unit operation  $\Sigma S$  value is referred to as  $\Sigma S$  value.

### 3.6.3 Determination of Initial Frequency

Initial frequency setting (determination of initial operating frequency based on S value and  $\Delta D$  signal ( $\alpha$  value))

#### Outline

When the compressor starts and when a change occurs in the conditions such as change of room unit operations, the sum of the maximum  $\alpha$  value ( $MAX\alpha$ ) of each H/U unit, the total of S values of operating indoor units ( $\Sigma SU$ ) and the total of S values of non-operating room units ( $\Sigma ST$ ) is used for the frequency initialization.

(Addition of non-operating room unit correction to S value classification)

Non-operating room unit refers to an indoor unit with thermostat OFF.

To ensure appropriate capacity supply in accordance with outside temperature, correction is provided based on the outside temperature.

Furthermore, for improved startup in heating cold start, frequency correction is provided based on the detection of cold start or hot start (change in the number of rooms) using the discharge pipe temperature.

#### Description

##### Determination of S value classification

The sum of S values sent from each BP unit of operating rooms ( $\Sigma Su$ ) and non-operating rooms ( $\Sigma ST$ ) are used to determine the S value of outdoor unit (system).

For cooling:  $\Sigma S = \Sigma Su$

For heating:  $\Sigma S = \Sigma Su + 0.25 \sim \Sigma ST$

When S value changes in above case, the initial frequency is determined according to the following matrix and set as FINI 1.



#### Note

No change is made in  $\Sigma S$  during defrost control ( $FD = 1$ ).

The frequency obtained by substituting FINI 1, outside air temperature and discharge pipe temperature in the following equation is set as command frequency FSR.

Whereas,

Discharge pipe temperature  $DO \geq 45^\circ\text{C}$ :  $KFIDO = 1$

Discharge pipe temperature  $DO < 45^\circ\text{C}$ :  $KFIDO = 1.4$

S value : Frequency constant

$\Sigma S$  : Total of S value

### Determination of initial frequency for cooling

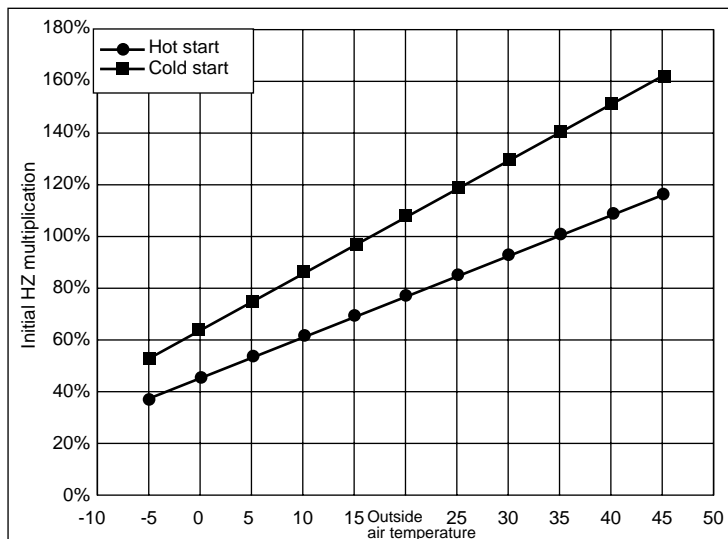
Initial frequency FSR is determined based on the correction of outside air temperature (DOA) and discharge pipe temperature (DO) in accordance with the above matrix.

$$FSR = KFIDO \times (2/128 \times (DOA - 35^{\circ}\text{C}) \times FINI1 + FINI1)$$

KFIDO varies depending on discharge pipe temperature DO

When  $DO \geq DOFINI$  ( $45^{\circ}\text{C}$ ):  $KFIDO = KFIDOH$  (128/128) --- Hot start

When  $DO < DOFINI$  ( $45^{\circ}\text{C}$ ):  $KFIDO = KFIDOL$  (179/128) --- Cold start



(M1009)

Reference Outside Air Temperature	Hot Start	Cold Start
35°C	128/128	179/128

Outside Air Temperature	Hot Start	Cold Start
-5	37.5%	52.4%
0	45.3%	63.4%
5	53.1%	74.3%
10	60.9%	85.2%
15	68.8%	96.1%
20	76.6%	107.1%
25	84.4%	118.0%
30	92.2%	128.9%
35	100.0%	139.8%
40	107.8%	150.8%
45	115.6%	161.7%

### Determination of initial frequency for heating

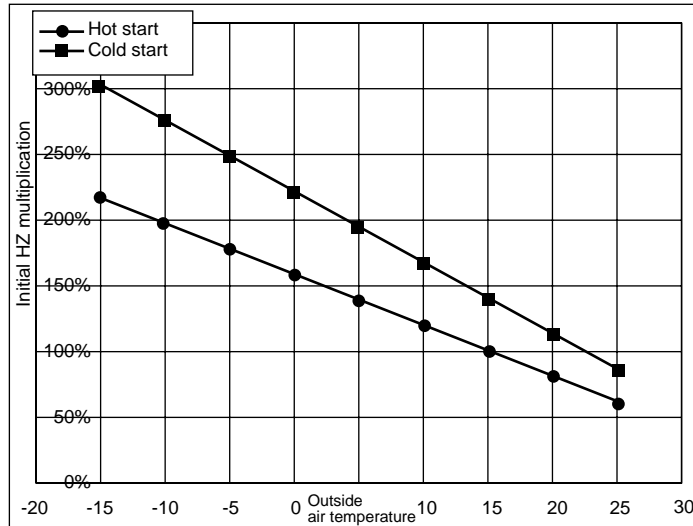
Initial frequency FSR is determined based on the correction of outside air temperature (DOA) and discharge pipe temperature (DO) in accordance with the above matrix.

$$FSR = KFIDO \times (-5/128 \times (DOA - 15^{\circ}\text{C}) \times FINI1 + FINI1)$$

3/ KFIDO varies depending on discharge pipe temperature DO

When  $DO \geq DOFINI$  ( $45^{\circ}\text{C}$ ):  $KFIDO = KFIDOH$  (128/128) --- Hot start

When  $DO < DOFINI$  ( $45^{\circ}\text{C}$ ):  $KFIDO = KFIDOL$  (179/128) --- Cold start



(M1010)

Reference Outside Air Temperature	Hot Start	Cold Start
15°C	128/128	179/128

Outside Air Temperature	Hot Start	Cold Start
-15	217.2%	303.7%
-10	197.7%	276.4%
-5	178.1%	249.1%
0	158.6%	221.8%
5	139.1%	194.5%
10	119.5%	167.2%
15	100.0%	139.8%
20	80.5%	112.5%
25	60.9%	85.2%

## 3.7 Oil Return Operation

### Purpose of the Function

To collect refrigerating machine oil that adheres on the internal connection pipe wall during regular operation and send it to the compressor.

### Outline

The oil recovery operation is conducted in the cooling cycle in both heating and cooling modes. The oil recovery operation collects oil dissolved in liquid refrigerant from High Hz and Low Hz (two types in both cooling and heating) and the section between Refnet joint and branch unit if there is a non-operating branch unit during cooling operation.

#### Oil recovery function in cooling operation

	Integral Timer		Oil Recovery Time	
Oil recovery from non-operating branch unit	TRAC1	1.5 hours	TRBC1	2 minutes
Oil recovery during High Hz appearing	TRAC2	5 hours	TRBC2	2 minutes
Oil recovery during Low Hz operation	TRAC3	8 hours	TRBC3	2 minutes

The opening of bypass motorized valve in branch unit shall be 450 pulses during oil recovery operation.

#### Oil recovery function in heating operation

Similar to the reverse cycle defrost, oil is collected by the cooling cycle.

The opening of bypass motorized valve in branch unit shall be 100 pulses during oil recovery operation.

The oil recovery interval setting timer is set to 3 hours.

### Details

#### Oil recovery operation in cooling mode

In cooling operation, two types of oil recovery operations are conducted. One type of operation collects refrigerating machine oil adhered on the main pipe wall and sends it to the compressor. The other type, called non-operating BP oil recovery operation, collects refrigerating machine oil seeping into non-cooling room units.

The intervals of operations to recover oil from the main pipe become shorter when the operating frequency exceeds the specified frequency.

#### Main pipe oil recovery operation

When the operating frequency exceeds 75 Hz even once after an oil recovery operation, the oil recovery operation interval becomes 5 hours. When the operating frequency does not exceed 75 Hz, the operation interval is 8 hours.

The minimum time of main pipe oil recovery operation time is 2 minutes. The maximum time is 5 minutes when High Hz appears. Under normal Hz, the operation time is 5 minutes.

During a main pipe oil recovery operation, the opening of the EVHs of BP units are set to 450 pulses when High Hz appears, but under normal Hz the opening are set to 450 pulses.

#### Non-operating BP oil recovery operation

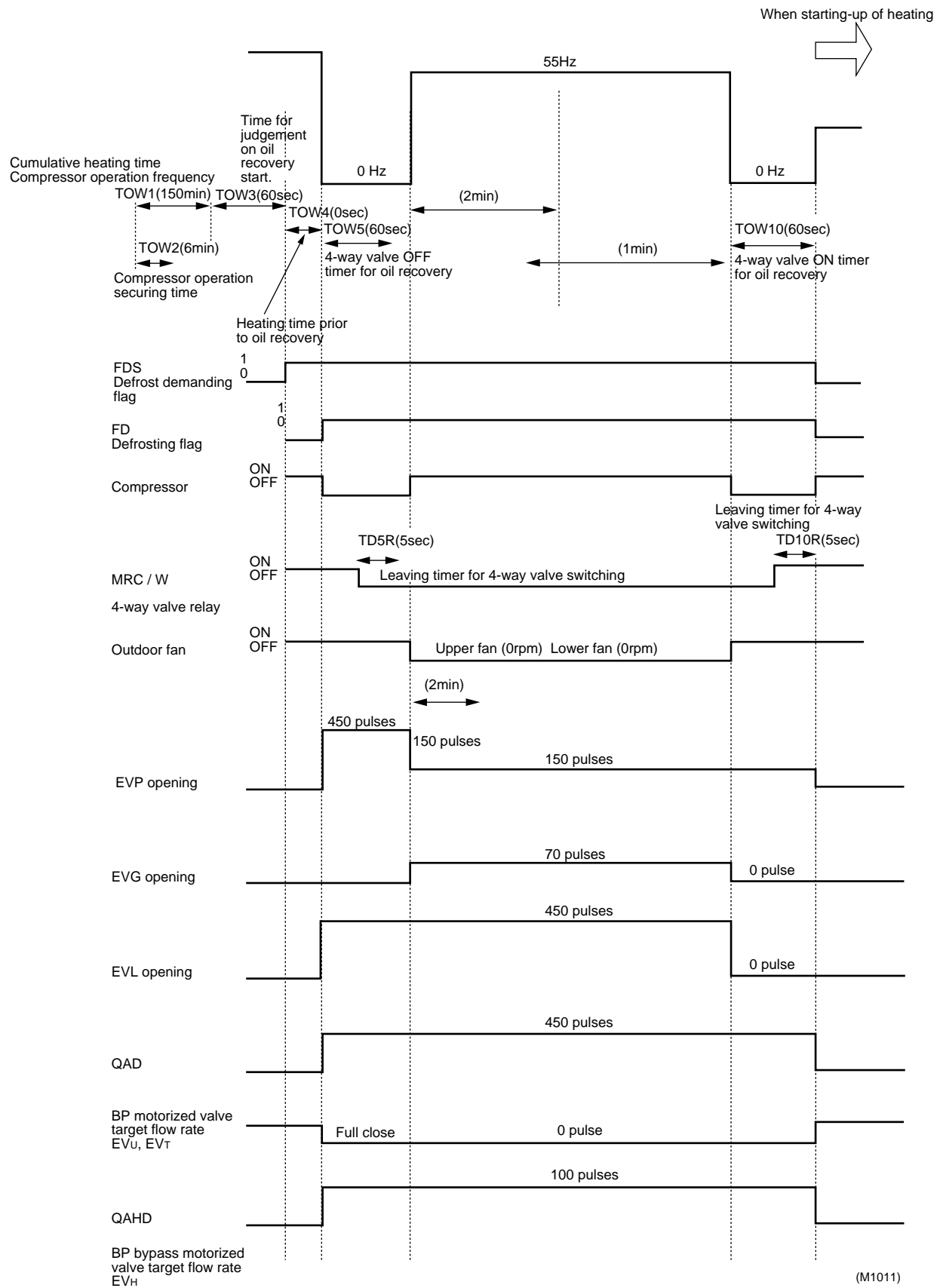
When a BP unit with non-operating room units remain in that condition for 90 minutes while room units of other BP units are operating, an oil recovery operation is activated to collect oil from non-operating room units.

The opening of the EVHs of BPs for which the non-operating BP oil recovery operation is conducted are set to 450 pulses.

The opening of the EVHs of BPs for which the non-operating room unit oil recovery operation is conducted are set to 450 pulses.

The minimum and maximum times of non-operating BP oil recovery operation are 2 minutes and 5 minutes, respectively.

## Oil recovery operation in heating mode

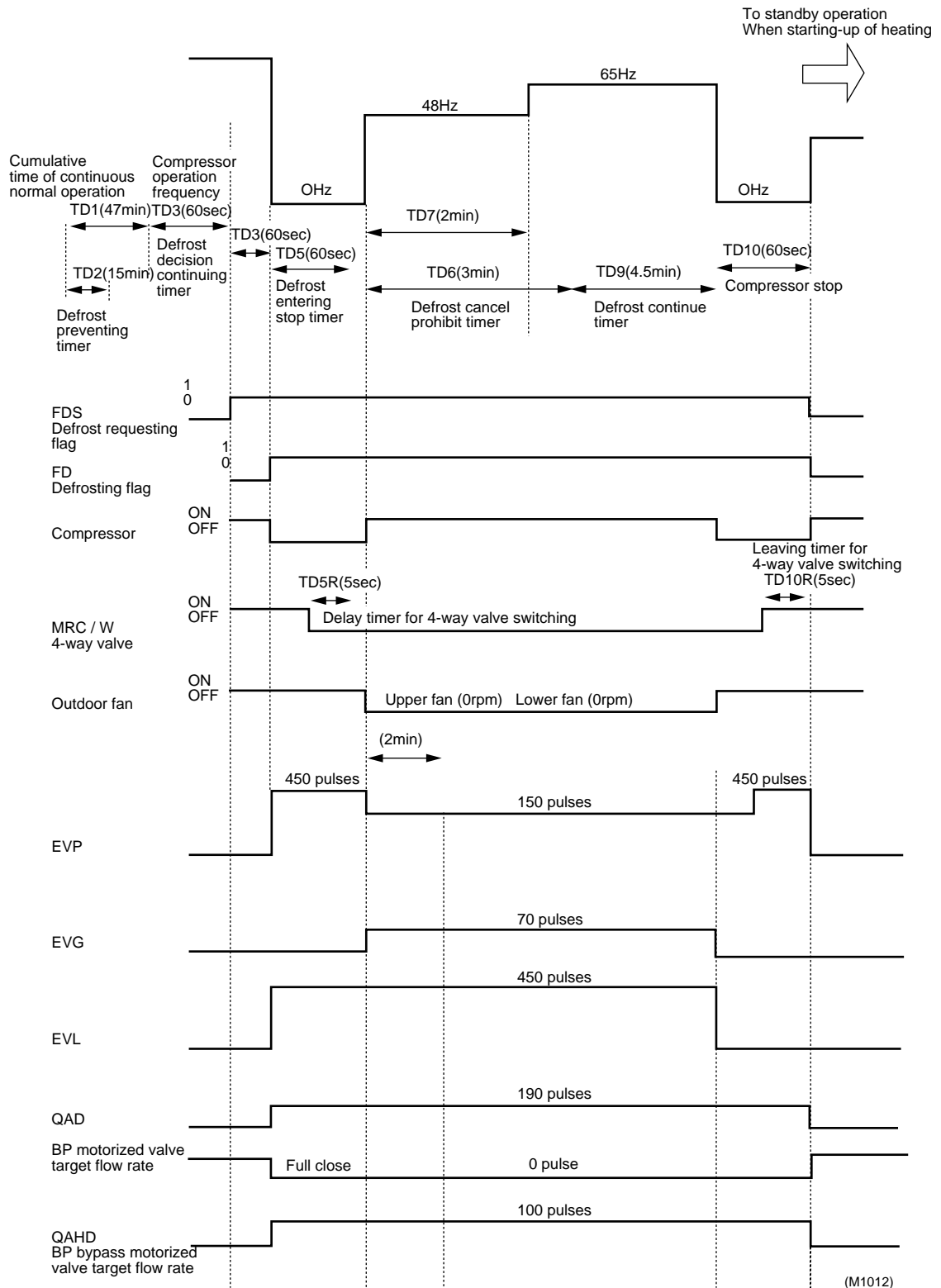


## 3.8 Defrost Operation

### Outline

During heating operation, the outdoor heat exchanger intermediate temperature of a frosted unit is estimated based on the outdoor temperature and compressor output frequency. If the outdoor heat exchanger intermediate temperature is lower than the estimated defrosting temperature, the unit is considered to be frosted; therefore, the compressor is stopped and the cooling cycle is activated for a defrosting operation (reverse cycle defrost). The defrosting operation stops when a certain time elapse or when the outdoor heat exchanger liquid pipe temperature reaches the preset temperature level.

### Details



## 3.9 Pre-Equalization Standby Operation

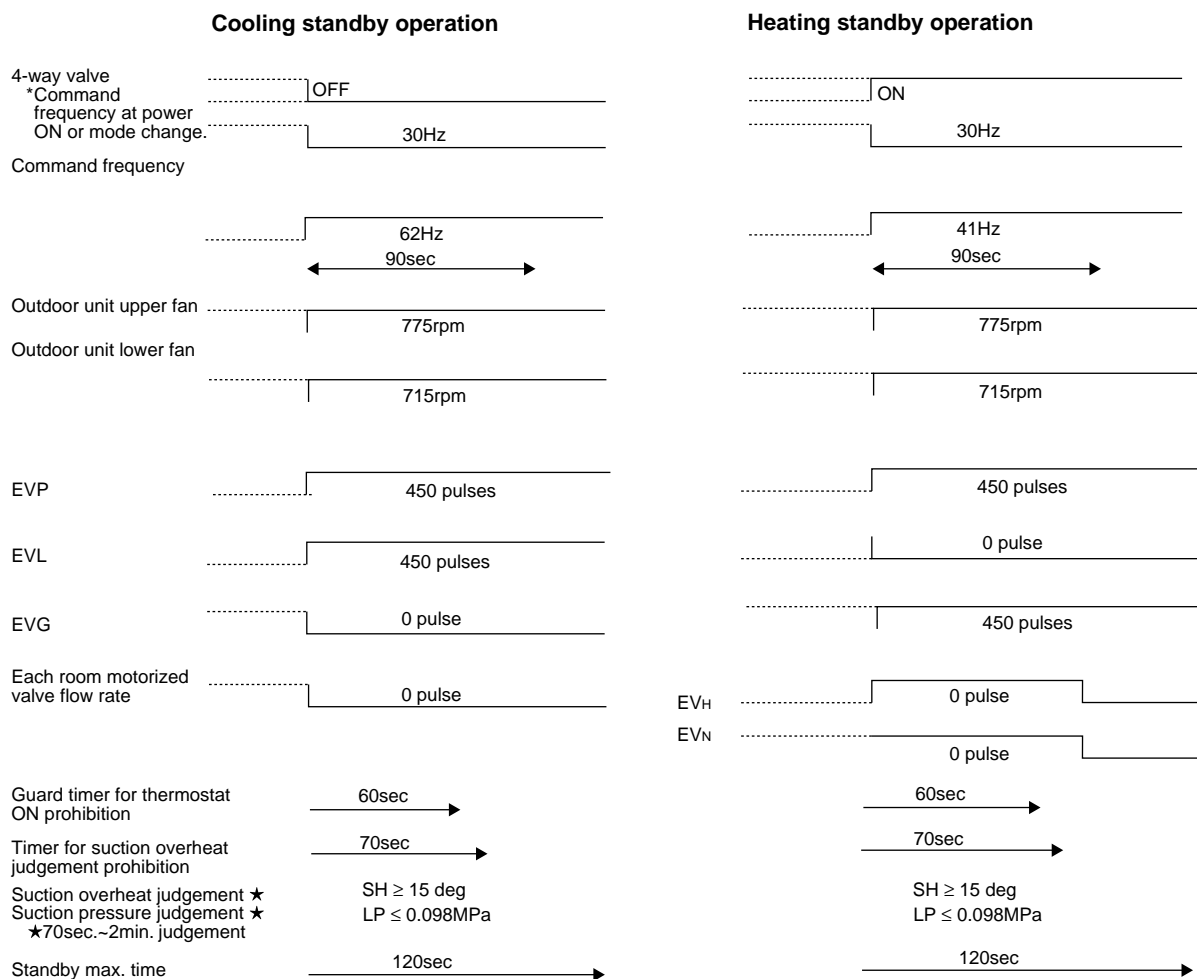
### Outline

In local air conditioner control mode and frequency fix mode, this function collects surplus refrigerant in the receiver before the operation mode is changed from cooling to the compressor stops due to thermostat OFF.

This ensures proper oil level and dilution for the next startup operation.

This function is also activated before cooling operation starts in units that have not completed the standby operation.

### Details



(M1013)

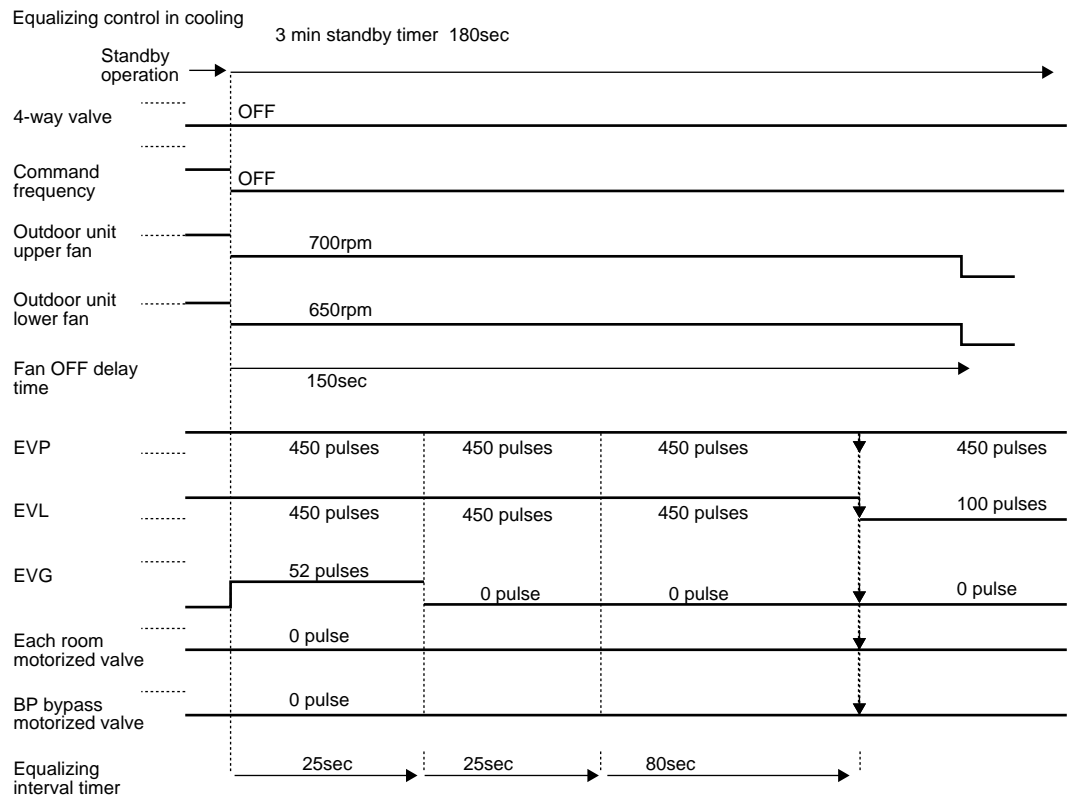
## 3.10 Equalizing Control

### Outline

This function provides equalizing control after a standby operation in order to prevent the compressor from locking due to insufficient equalization and to ensure smooth compressor startup.

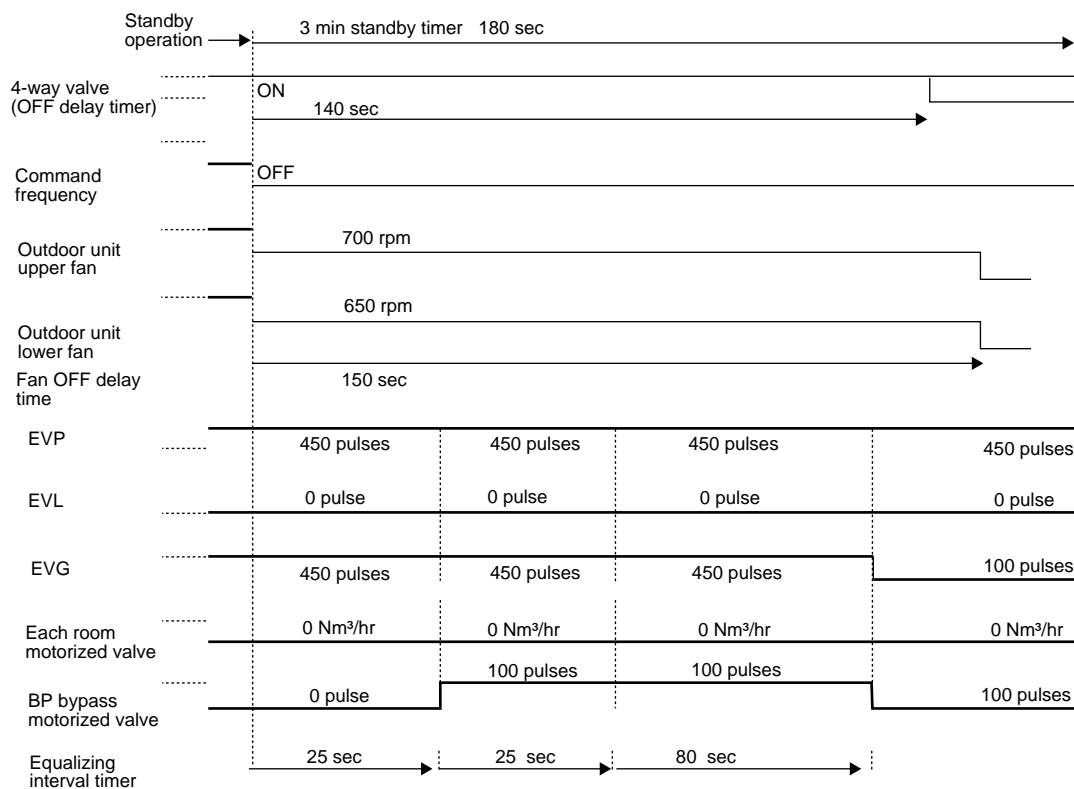
### Details

#### Equalizing control in cooling



(M1014)

### Equalizing control in heating



(M1015)

## 3.11 Capacity Control

### 3.11.1 Outdoor Unit Motorized Valve Low Pressure (Cooling Capacity) Control

#### Outline

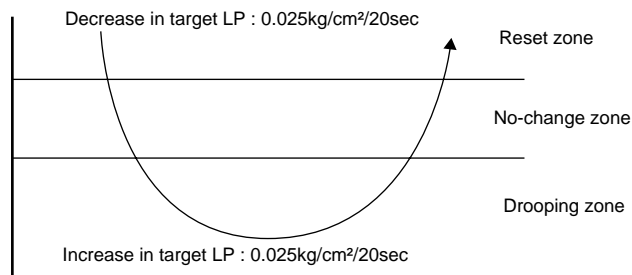
This function forms a discharge-suction bypass circuit to prevent the suction pressure from dropping (freezing of indoor unit) during cooling due to excessively low indoor heat exchange capacity even when operating at the minimum frequency.

The freeze prevention status from the indoor unit is used to calculate target suction pressure LPMK, and the discharge bypass motorized valve is controlled to achieve the target suction pressure.

#### Details

Zones are produced based on the freeze prevention status sent from the BP unit (indoor unit), and the freeze prevention control provides cooling capacity control when the operating frequency reaches the minimum frequency.

The cooling capacity control adjusts the EVP to vary the target low temperature based on the freeze prevention status so the target low pressure is attained.



(M1016)

EVP (discharge bypass motorized valve) operating amount

The suction pressure is detected during each sampling operation (20 sec). The difference target LP is used to determine the amount of valve operation.

In case of Target LP < Current LP, EVP: close

In case of Target LP > Current LP, EVP: open

The capacity control ends when 60 seconds elapse from the time the EVP closes fully.

### 3.11.2 Outdoor Unit Motorized Valve High Pressure (Heating Capacity) Control

#### Outline

This function opens the gas pipe motorized valve then forms a discharge-suction bypass circuit to prevent high pressure rise during cooling due to excessively low indoor heat exchange capacity even when operating at the minimum frequency.

The peak-cut control, low Hz high pressure control and high pressure control lower the operating frequency to the minimum level. If the high pressure is high, target high pressure saturation temperature TDSET is calculated, and the gas pipe motorized valve and discharge bypass motorized valve are controlled to attain the target high pressure saturation temperature.

#### Details

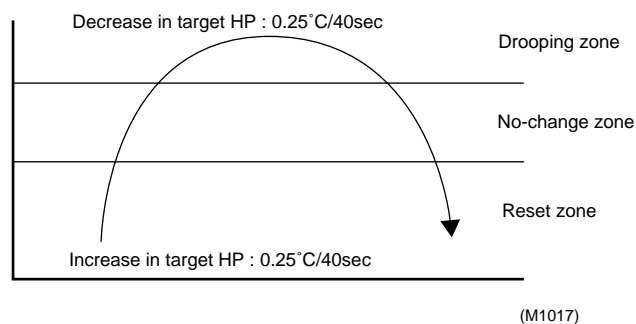
When the operating frequency lowers to the minimum frequency due to the peak-cut control and high pressure control, the heating capacity control is activated.

The heating capacity control provides 2-step control.

1st step: Opens the EVG to increase the condensing capacity of the auxiliary heat exchanger located under the outdoor heat exchanger in order to decrease the high pressure.

2nd step: Opens the EVG fully. If the high pressure is high, the discharge bypass is used for the capacity control.

The heating capacity control adjusts the EVG and EVP to vary the target high pressure equivalent saturation temperature based on the peak-cut and high pressure control zones so the target high pressure equivalent saturation temperature is attained.



The upper-limit and lower-limit values of target high pressure equivalent saturation temperature shall be

between 48°C and 66°C respectively.

The target high pressure equivalent saturation temperature at start is 56°C.

#### Determination of motorized valve operating amount

The target high pressure equivalent saturation temperature is detected during each sampling operation. The difference from the target high pressure equivalent saturation temperatures is used to determine the amount of valve operation.

In case of high pressure equivalent saturation temperature > Target high pressure equivalent saturation temperature, EVG or EVP: To be opened

In case of high pressure equivalent saturation temperature < Target high pressure equivalent saturation temperature, EVG or EVP: To be closed

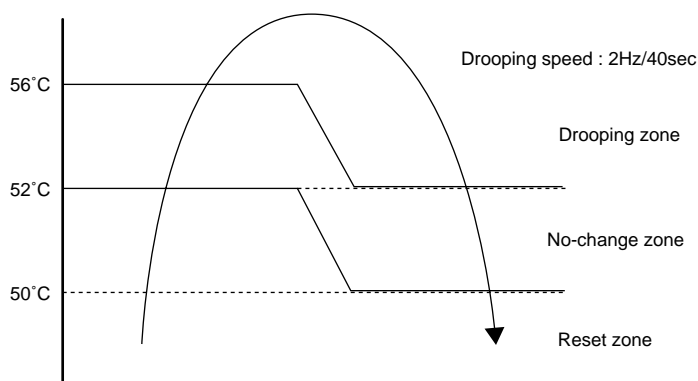
## 3.12 Peak Cut Control

### Outline

Based on the indoor heat exchanger intermediate temperature signal sent from the indoor unit, the compressor output frequency is regulated to lower the compressor capacity in order to prevent an abnormal increase of the high pressure.

### Details

Zones are produced based on the heat exchanger temperature signal sent from the BP unit (indoor unit), and the peak-cut control prevents an abnormal rise of the high pressure.



(M1018)

A change of 2 Hz is made when each zone fluctuates.

The reset zone is set for 30 seconds when the operation mode is changed, for 30 seconds when the number of operating room units increase, and for 20 seconds when the number of operating room units decrease.

With each operation of the HPS operation counter, the above zone judgment temperature is decreased by 2°C.

With each operation of the peak-cut abnormal operation counter, the above drooping speed is increased by 1 Hz.

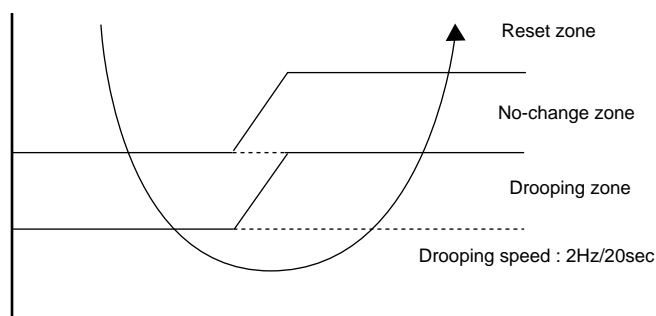
### 3.13 Freeze-Up Prevention

#### Outline

According to the freeze prevention status sent from the BP unit, the compressor output frequency is regulated to decrease the compressor capacity in order to prevent the indoor heat exchanger from freezing.

#### Details

Zones are produced based on the freeze prevention status signal sent from the BP unit (indoor unit), and the freeze prevention control prevents freezing of the indoor unit.



(M1019)

A change of 2 Hz is made when each zone fluctuates.

The reset zone is set for 6 minutes when the operation mode is changed, for 30 seconds when the number of operating room units increase, and for 30 seconds when the number of operating room units decrease.

With each operation of the freeze prevention operation counter, the drooping speed is increased by 1 Hz.

## 3.14 Gas Shortage Malfunction

### Outline

A gas shortage malfunction is detected by using electric current and by judging the discharge pipe temperature and motorized valve opening degree.

### Details

#### Gas shortage detection based on current

The current-based gas shortage detection is conducted when the operating frequency exceeds 55 Hz. When the following condition is met, a gas shortage malfunction is determined.

$$\text{Input current} \leq (23/256) \times \text{Operating frequency} + (-3.5) \text{ A}$$

#### Gas shortage detection based on discharge pipe temperature and motorized valve opening degree

This gas shortage detection method uses either the opening of the motorized valve of the BP or outdoor unit.

##### 1. Gas shortage detection based on BP motorized valve opening and discharge pipe temperature

Gas shortage malfunction is determined when the following condition is met during discharge pipe temperature control.

When discharge pipe temperature (DO) > 1 × target discharge pipe temperature (DOSET) + 20°C, motorized valve MAX flow rate signal from operating BP is continuously received for 80 seconds.

##### 2. Gas shortage detection based on outdoor unit motorized valve opening and discharge pipe temperature

Gas shortage malfunction is determined when the following condition is met during cooling mode discharge pipe temperature control.

When discharge pipe temperature (DO) > 1 × target discharge pipe temperature (DOSET) + 20°C, condition (EVL ≥ 450 pulses) remains for 80 seconds.

Shortage of refrigerant charge is judged when the following condition are satisfied during discharge temperature control in heating operation.

At Discharge pipe temp. (DO) > Target discharge temperature +20°C and when the condition of

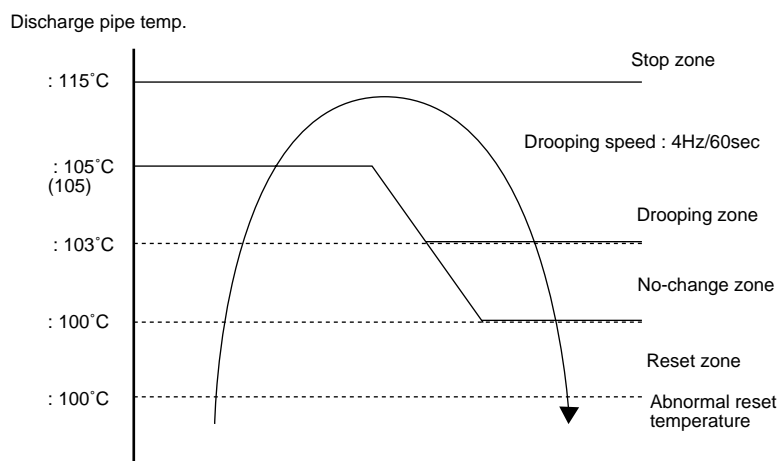
EVL > 450 pulse continue 80 seconds.

## 3.15 Discharge Pipe Control

### Outline

With the internal compressor temperature used as a substitute of the discharge pipe temperature, when the discharge pipe temperature exceeds the specified level, the discharge pipe control regulates the upper limit of the output frequency to prevent the internal pressure from rising. (This function serves the same purpose as the discharge pipe high temperature control that regulates the motorized valve.)

### Details



(M1020)

With each operation of the discharge pipe temperature malfunction operation counter, the above zone judgment temperature is decreased by 2.5°C.

## 3.16 Input Current Control

### 3.16.1 Input Current Control I

---

#### Outline

The input current is detected by CT during compressor operation, and the input current value is used to control the upper limit of the frequency.

As shown in the diagram below, the constraint frequency is varied differently in the stop, drooping, no-change and reset zones.

When the constraint frequency remains in the stop zone for the specified period time, the compressor is stopped.

The lower-limit current (input current droop value) in the drooping zone; I3 varies according to the JIS mode or outside temperature (to stay within the system use area).

The input current control I is a higher-level constraint function that takes precedence over the lower-limit control for 4-way valve operation guarantee.

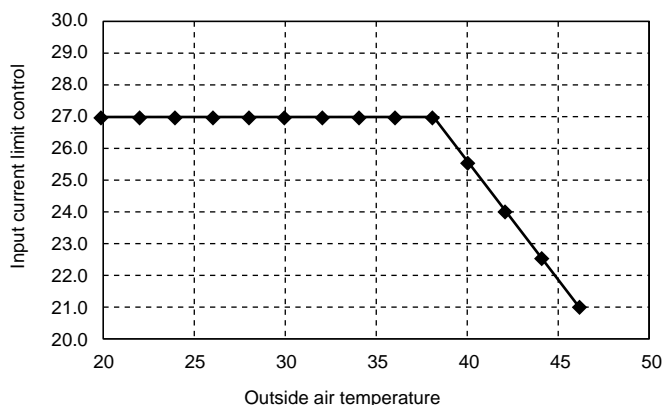
**Note**

Only 4-way valve operation guarantee has precedence, but not other lower-limit control.

## Details

The input current is used to control the upper limit of the operating frequency in order to maintain the temperature around the electric parts under a certain level during cooling overload condition.

When the outside temperature (DOA) is higher than 38°C, input current upper-limit value I3CH (27) A is decreased at a rate of (96/128) A/°C.

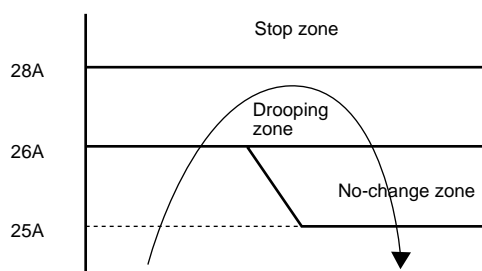


(M1021)

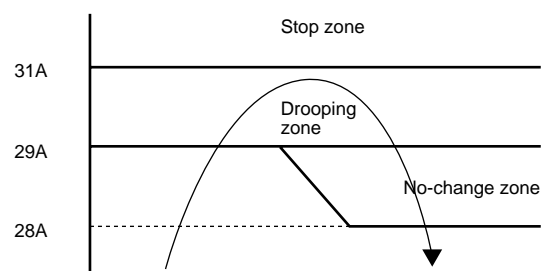
Outside Air Temperature	I3CH
20	27.0
22	27.0
24	27.0
26	27.0
28	27.0
30	27.0
32	27.0
34	27.0
36	27.0
38	27.0
40	25.5
42	24.0
44	22.5
46	21.0

Similarly, the input current value is controlled in inverter microcomputers to protect the inverter parts.

Inverter current limit control



General input current limit control



(M1022)

### 3.16.2 Input Current Control II (High Pressure Control)

#### Outline

Based on the input current and input voltage, the compressor output frequency is regulated to decrease the compressor capacity in order to prevent abnormal rising of the high pressure.



#### Note

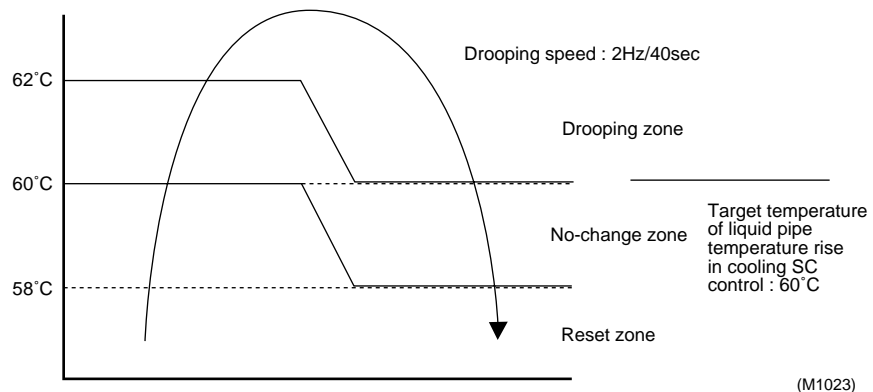
The peak-cut control is similar to this function, but it cannot effectively detect high pressure during transitional condition due to the thermistor's tracing performance; therefore, the high pressure can increase abnormally in some cases. This function droops the compressor when a transitional condition occurs or the high pressure rises suddenly in order to prevent abnormal rising of the high pressure. Therefore, the function start area is set higher than the high pressure setting of the peak-cut control.

The high pressure saturation temperature is estimated from the power consumption (input voltage, input current), output frequency and suction pressure, and three zones (reset, no-change and drooping zones). When the high pressure saturation temperature is in one of the zone, the output frequency limit is varied depending on the type of the zone.

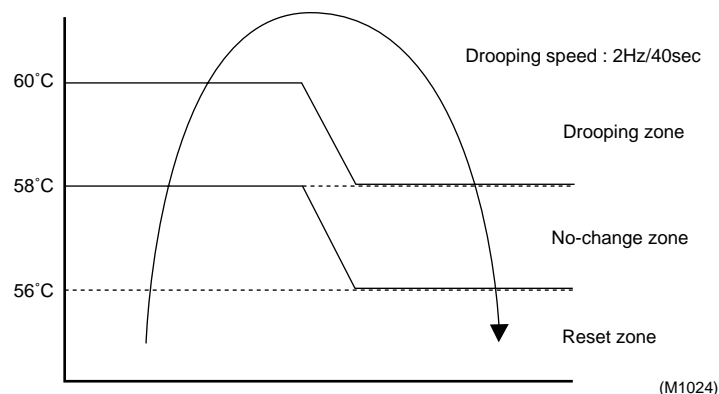
#### Details

The high pressure is estimated based on the high pressure estimation function (operating frequency, input current, suction pressure), and the estimated high pressure is used to obtain the saturation temperature. When the heat exchanger intermediate temperature enters the overcooling zone, if the peak-cut control does not function, this function prevents abnormal rising of the high pressure.

#### Cooling



#### Heating



A change of 2 Hz is made when each zone fluctuates.

The reset zone is set for 30 sec when compressor operation is started, for 30 sec when the number of operating room units increase, and for 2 sec when the number of operating room units decrease.

With each operation of the HPS operation counter, the zone judgement temperature is decreased by 2°C.

## 3.17 Wet Protection Control I

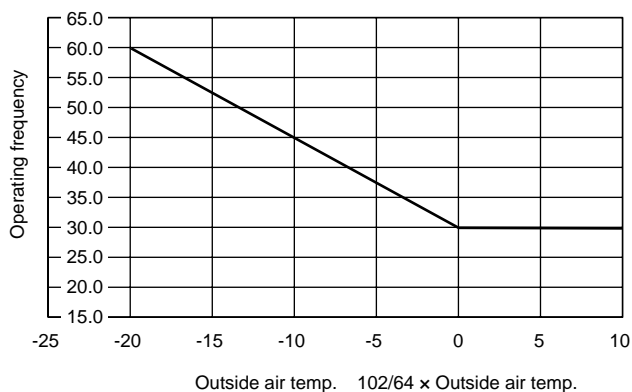
### Outline

When the outside air temperature is low, the lower limit of operating frequency is restricted to ensure the compressor suction air humidity.

### Details

The lower limit of operating frequency (FCG) is set according to following formula and diagram when the outside air temperature (DOA) is 6.5°C or lower during heating operation.

$$\text{FCG} = \text{KCG1W} \times \text{outside air temp. (DOA)} + \text{FCG7W} = 102/64 \times (\text{DOA}) + 28$$



(M1025)

Outside Air Temp.	Lower Limit of Frequency
6	30
4	30
2	30
0	30
-2	32
-4	35
-6	38
-8	41
-10	44
-12	48
-14	51
-16	54
-18	57
-20	60

### 3.18 Electric Parts Cooling and Electric Parts / Fin Temperature Control

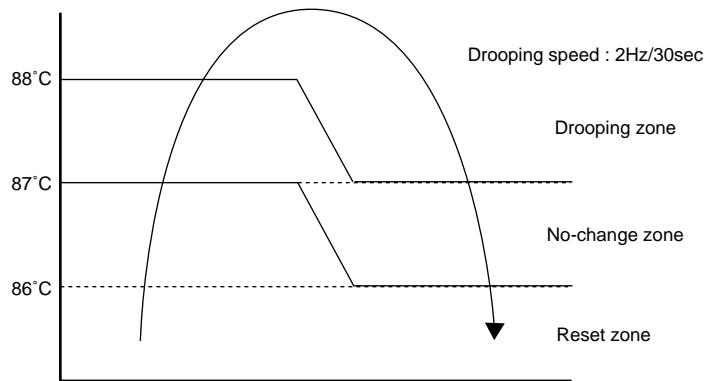
#### Outline

This function cools the electric parts (outside fan ON control) and turns off the inverter to prevent excessive heating that can cause malfunctions of the electric parts and reduces their service life.

#### Details

##### Fin temperature Hz drooping function

Based on the fin temperature detected by the inverter microcomputer, this function prevents generation of inverter stop processing when the fin temperature rises.



(M1026)

A change of 2 Hz is made when each zone fluctuates.

With each operation of the fin temperature abnormal operation counter, the zone judgement temperature is decreased by 2°C.

##### Fan control during electric parts cooling

With the compressor turned off (not in pressure equalization control), when box (electrical box) temperature DTR  $\geq 75^{\circ}\text{C}$ , the top fan rotation is set to 775 rpm and the bottom fan to 715 rpm for the cooling of the electric parts.

When box (electrical box) temperature DTR  $< 70^{\circ}\text{C}$ , the outside fans are turned off.

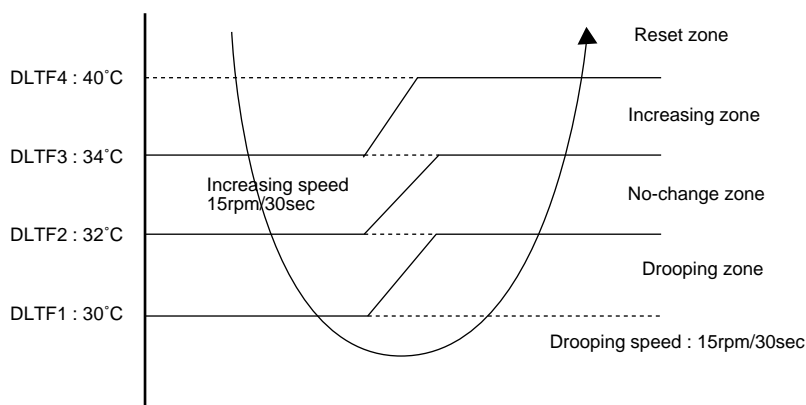
## 3.19 Differential Pressure Control

### Outline

This function sets an upper limit for the fan rotation speed according to the outside temperature and outdoor heat exchanger temperature during cooling operation with low outside temperature. By limiting the fan rotation, the function ensures sufficient differential pressure.

### Details

In cooling operation (outside temperature DOA  $\leq 30^{\circ}\text{C}$ ) or in heating mode oil recovery operation, this function provides an upper-limit control of the fan rotation according to the temperature zone of the high pressure equivalent saturation temperature, as shown below.



(M1027)

A change of 2 Hz is made when each zone fluctuates.

The mask time is 30 seconds at the time of heating mode oil recovery operation start, and the reset zone is set for 30 seconds when the number of operating room units changes.

When 330 rpm operation remains for 10 continuous minutes during normal cooling operation, the thermostat is turned off.

When 330 rpm operation remains for 10 continuous minutes during heating mode oil recovery operation, the fans are turned off.

## 3.20 Year-Round Cooling-Only Function

### Outline

This function turns off the compressor based on the conditions of the outside temperature and high pressure equivalent saturation temperature to ensure compressor reliability.

### Details

The year-round cooling-only function provides two types of shutdown function. One is based on the outside temperature and high pressure equivalent saturation temperature, and the other is based only on the outside temperature.

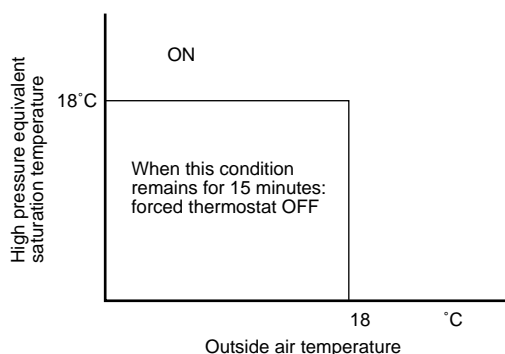
The shutdown function based on the outside temperature and high pressure equivalent saturation temperature stops the operation when sufficient differential pressure cannot be ensured in the compressor.

The shutdown function based on the outside temperature prevent compressor operation when the temperature is outside of the operation area.

■ Shutdown based on outside temperature and high pressure equivalent saturation temperature

■ Shutdown based on outside temperature only

When outside temperature is -5°C or lower:  
forced thermostat OFF



(M1028)

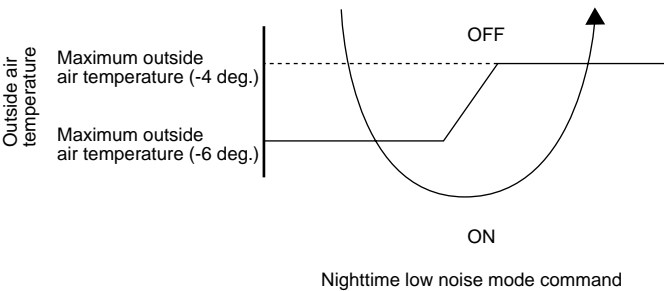
### 3.21 Nighttime Low Noise Control

**Purpose of the Function** This function lowers the operating sound when the noise causes problems during the night.

**Outline** The function turns the nighttime low-noise instruction ON and OFF according to the outside temperature condition.

**i** \* Function start condition  
When the nighttime low-noise permit is set (jumper setting), the following control is activated.

**Details** During normal cooling operation, outside temperature DOA is detected every 90 minutes. The maximum value of 16 outside temperature measurements is compared with the outside temperature, and the nighttime low noise is determined based on the following condition.



(M1029)

## 3.22 PI Control

<b>Outline</b>	Based on the $\Delta D$ signal, $MAX\alpha$ of the command frequency is monitored every 20 seconds, and PI control is provided accordingly. (Coefficient of PI control varies for each S value.)
<b>P Control</b>	<p>At every sampling time TFSMP, the maximum value (<math>MAX\alpha</math>) of <math>\alpha</math> value is calculated, and if the result differs from the previous value, the frequency is changed according to the amount of fluctuation.</p> <p>When the previous <math>MAX\alpha</math> is <math>MAX\alpha1</math> and the newest <math>MAX\alpha</math> is <math>MAX\alpha0</math>, the upper-limit value of <math>MAX\alpha</math> is <math>MAX\_ALFA\_MX(9)</math>.</p> <p>Operating frequency operating amount <math>\Delta F</math>: <math>\Delta F = KP \times (MAX\alpha0 - MAX\alpha1)</math></p> <p>P control is prohibited under the following conditions (Equation (A))</p> <p><math>MAX\_ALFA\_P1(3) \leq MAX\alpha0 \leq MAX\_ALFA\_P2(5)</math>  <math>MAX\_ALFA\_P1(3) \leq MAX\alpha1 \leq MAX\_ALFA\_P2(5)</math></p> <p>P control is prohibited under left condition.</p>
<b>I Control</b>	<p>When the <math>\Delta D</math> signal does not change for the specified time, the frequency is increased or decreased according to the <math>MAX\alpha</math> value to set the <math>MAX\alpha</math> value to the specified level.</p> <p>When <math>MAX\alpha</math> value is small <math>\rightarrow</math> Frequency is decreased  When <math>MAX\alpha</math> value is large <math>\rightarrow</math> Frequency is increased</p> <p>When <math>MAX\alpha</math> at TFSMP(20) timer time-over is <math>MAX\alpha0</math>:  If <math>MAX\alpha0 \geq MAX\_ALFA\_12(6)</math>  When frequency does not change for TFSMP <math>\times</math> M(120 sec)  Operating frequency operating amount <math>\Delta F</math> is set to <math>\Delta F = KI \times (MAX\alpha0 - MAX\_ALFA\_MK(3))</math>  If <math>MAX\alpha0 \leq MAX\_ALFA\_11(2)</math>  Operating frequency is decreased at every TFSMP(20 sec)  Operating frequency operating amount <math>\Delta F</math> is set to <math>\Delta F = -KI \times BI(1)</math>  I control is prohibited when <math>MAX\_ALFA\_11(2) &lt; MAX\alpha0 &lt; MAX\_ALFA\_12(6)</math></p>

## 3.23 Warm-Up Function

### Outline

This function operates the inverter in a open-phase mode to warm up the compressor when it receives a warm-up command under certain outdoor air temperature and discharge pipe temperature conditions.

### Details

#### 1. Preheat conditions

When the stop mode remains for 63 minutes or more and when the capacitor is not discharging

(1) When preheat permit command is issued (EEPROM constant)

① Outside temperature DOA < DOAY1

② Discharge temperature DO < DOY1

(2) When no preheat permit command is issued (EEPROM constant)

① Outside temperature DOA < DOAYS1

② Discharge temperature DO < DOYS1

When conditions ① and ② in (1) are met or when conditions ① and ② in (2) are met

(3) Relay MRM1 turns on

(4) Inverter starts operation in open-phase mode

#### 2. Cancellation conditions

(1) When preheat permit command is issued (EEPROM constant)

① Outside temperature DOA > DOAY2 + DOAY1

② Discharge temperature DO > DOY2 + DOY1

(2) When no preheat permit command is issued (EEPROM constant)

① Outside temperature DOA > DOAYS2 + DOAYS1

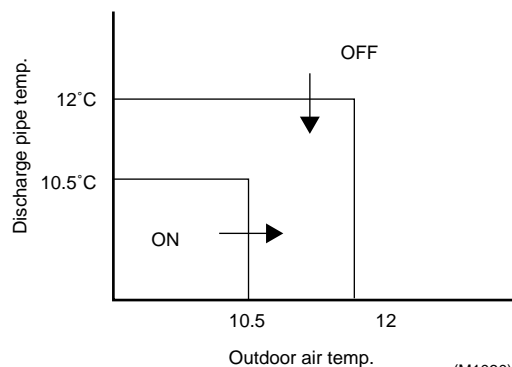
② Discharge temperature DO > DOYS2 + DOYS2

When condition ① or ② in (1) is met or when condition ① or ② in (2) is met

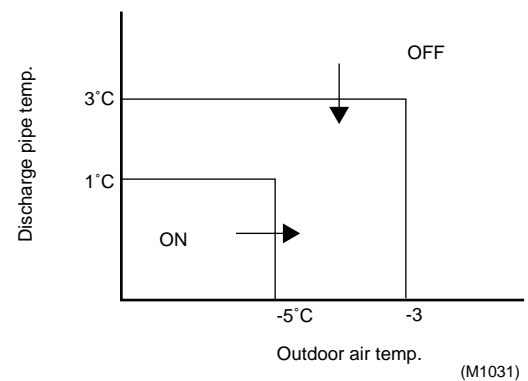
(3) Relay MRM1 turns off

(4) Inverter stops operating in open-phase mode

Preheat permission : Yes



Preheat permission : No



## 3.24 Compressor Protection Control

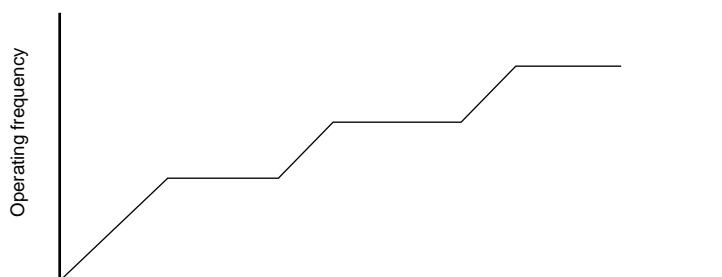
### Purpose of the Function

This function ensures appropriate compressor oil level and dilution at startup.

### Outline

The following upper-limit frequency control is provided at the compressor OFF→ON edge.  
(This function is inactive during defrost control.)

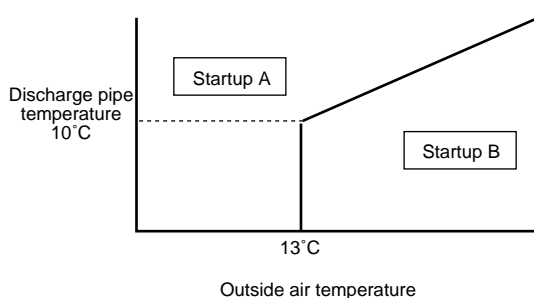
### Details



(M1032)

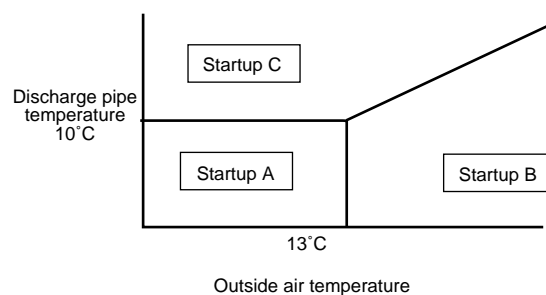
	1st stage		2nd stage		3rd stage		Remarks
Startup A	55	Hz	70	Hz	85	Hz	See the diagram below.
	180	sec	120	sec	150	sec	
Startup B	55	Hz	70	Hz	85	Hz	See the diagram below.
	180	sec	120	sec	150	sec	
Startup C	70	Hz	70	Hz	85	Hz	See the diagram below.
	180	sec	120	sec	150	sec	
Startup D	70	Hz	70	Hz	85	Hz	Standby operation not completed 2 hours after completion of standby operation
	180	sec	120	sec	150	sec	
Startup E	70	Hz	70	Hz	85	Hz	Startup pattern in defrost reset and in heating oil recovery reset
	180	sec	120	sec	150	sec	

More than 2 hours after power reset



(M1033)

When 2 minutes elapsed after power supply resetting.



(M1034)

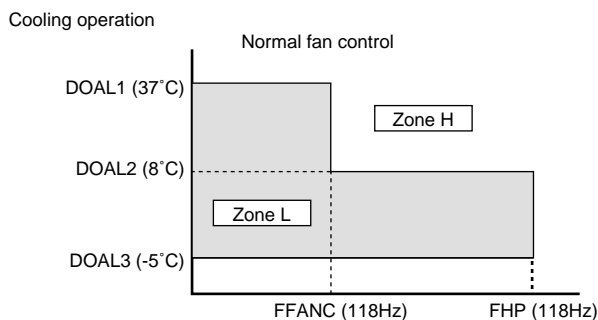
## 3.25 Fan Control

<b>Purpose of the Function</b>	This function changes the fan rotation speed or stop the fan operation according to the operating condition in order to prevent abnormal system operation (overload operation) and ensure compressor reliability.
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### 3.25.1 Fan Control under Normal Condition

<b>Outline</b>	<p>The following fan control functions are provided in normal operation.</p> <ol style="list-style-type: none"> <li>1. Stop mode fan control.</li> <li>2. Fan OFF function when the number of heating room units decreases.</li> <li>3. Low-noise fan control when nighttime low-noise command is issued.</li> <li>4. Fan control in Powerful operation mode.</li> <li>5. Fan control in low-noise mode.</li> <li>6. Fan control in normal cooling mode.</li> <li>7. Fan control in normal heating mode.</li> </ol> <p>The fan control functions are listed in the priority order. (The priority order is for the above functions only, and there are fan control functions that take precedence over these.)</p> <p>→ Refer to the section regarding fan relay control.</p>
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<b>Details</b>	<p><b>Cooling stop/heating stop/stop fan control</b></p> <p>The outdoor fans are turned off when the outdoor unit operating mode is in the stop, cooling stop and heating stop modes.</p> <p><b>Fan OFF function when the number of heating room units decreases</b></p> <p>The outdoor unit fans are turned off for 30 seconds if outside temperature DOA is 10°C or higher when the number of heating room units decreases (includes change of operating room units that results in the same number of operating room units). (When the number of operating room units decreases again during the operation of the 30-second counter, the timer is reset and restarted.)</p> <p><b>Fan control in Powerful operation mode</b></p> <ol style="list-style-type: none"> <li>1. Control start conditions             <ol style="list-style-type: none"> <li>① Powerful command received from BP unit (even by one room unit).</li> <li>② Room unit receiving Powerful command is not in thermostat OFF status.</li> <li>③ No nighttime low-noise command.</li> </ol> </li> </ol> <p>When conditions ①, ② and ③ are met, the Powerful operation mode is activated, and the fan rotation speed is increased 50 rpm from the rotation speed in normal operation.</p> <p><b>Fan control in low-noise mode</b></p> <p>Refer to the section regarding low-noise fan control on page 139.</p> <p><b>Fan control in normal cooling mode</b></p> <p>Due to outside air temperature DOA and output frequency FOUT, conditions ① and ② or conditions ③ and ④ listed below are met, the silent mode is activated and sets the fan rotation speed to FANLC.</p> <ol style="list-style-type: none"> <li>① DOA &lt; 37°C</li> <li>② FOUT &lt; FFAN</li> <li>③ DOA &lt; 8°C</li> <li>④ FFAN ≤ FOUT ≤ FHP</li> </ol>
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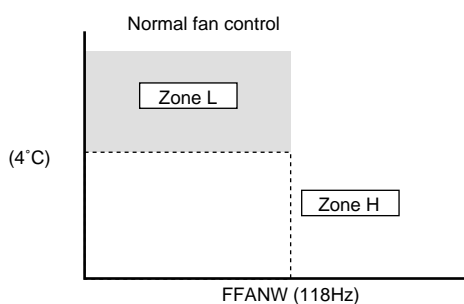


(M1035)

### Fan control in normal heating mode

Due to outside air temperature DOA and output frequency FOUT, conditions ① and ② listed below are met, the silent mode is activated and sets the fan rotation speed to FANLW.

- ① DOA > 4°C
- ② FOUT < FFANW



(M1036)

## 3.25.2 Fan OFF Delay Control

### Outline

This function delays the OFF timing of the fan relay for a period of TFOF during compressor ON → OFF operation.

(This function is not activated after pump-down operation.)

- For the purpose of giving priority to capacitor discharge function after pump-down operation.



### Note

- Fan rotation speed shall be FANOF rpm.
- In the case of HPS activation, insufficient power supply voltage and momentary overcurrent abnormality, the fan OFF delay control does not activate because the main relay turns off.

### Details

During compressor ON → OFF operation, the function set the upper fan rotation speed to FANOF1 (700) rpm and the lower fan rotation speed to FANOF2 (650) rpm in order to delay the OFF operation of the relay for a period of TFOF(150) sec.

## 3.26 Motorized Valve Control of Outdoor Unit

### 3.26.1 Outline of Motorized Valve Control

#### Outline

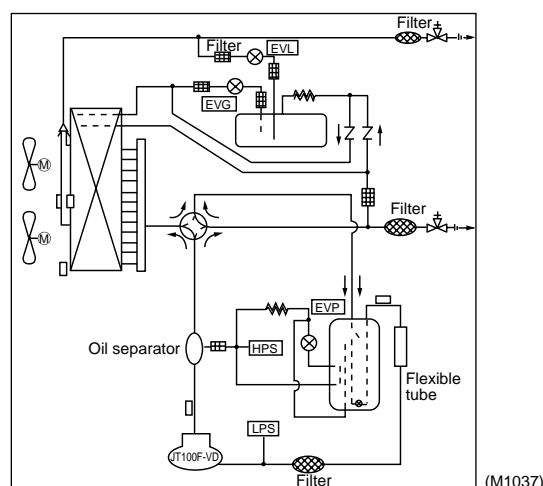
The EVL and EVG valve opening operations switch the with/without-receiver selection.

#### Cooling mode

- When EVL is fully closed (without receiver), the BP motorized valve provides the system control and distribution control.  
 EVU ... Target discharge pipe temperature control, gas pipe isothermal control  
 EVT ... Fully closed  
 EVG ... Target discharge pipe temperature control
- When EVL is not fully closed (with receiver), EVG provides the system control.  
 H/U's motorized valve provides individual control. (SH control)  
 EVU ... SH control  
 EVG ... Target discharge pipe temperature control
- Common  
 EVL ... Outdoor unit SC control  
 EVP ... Capacity control (low pressure control)

#### Heating mode

- When EVG is fully closed (without receiver), the BP motorized valve provides the system control and distribution control.  
 EVU ... Target discharge pipe temperature control, SC control  
 EVT ... Target discharge pipe temperature control  
 \* Surplus refrigerant processing is conducted in non-operating room units.  
 \* When motorized valves of non-operating room units are at minimum opening:  
 The receiver function ON is set (EVG opens).  
 EVL ... Target discharge pipe temperature control
- When EVG is not fully closed (with receiver)  
 Not in capacity control  
 EVU ... Target discharge pipe temperature control, SC control  
 EVT ... Target discharge pipe temperature control  
 EVL ... Target discharge pipe temperature control  
 EVG ... Target discharge pipe temperature control + Capacity control (high pressure control)  
 EVP ... Capacity control (high pressure control)
- ◆ System control ... Provides SH control of refrigerant system, particularly suction control  
 Examples: SH control, target discharge pipe temperature control
- ◆ Distribution control ... Distributes refrigerant volume to individual indoor units according to loads. (This function does not control the absolute volume.)  
 Examples: Gas pipe isothermal control, liquid pipe isothermal control
- ◆ Individual control ... Controls refrigerant amounts of refrigerant supplied to individual room units based on the absolute volume.  
 Examples: SH control (determined by individual indoor units), SC control



EVL: Liquid pipe motorized valve  
 EVG: Gas pipe motorized valve  
 EVP: Discharge bypass motorized valve

### 3.26.2 Outdoor Unit Motorized Valve Opening Restriction

#### Outline

This function restricts the opening degree of the outdoor unit motorized valves (discharge bypass motorized valve, gas pipe motorized valve and liquid pipe motorized valve) in order to quickly stabilize and control the system.

#### 1. EVP opening restriction

There are two types of EVP control: complete closing and completely closing with retightening. EVP's max. opening is set to EVPMAX.

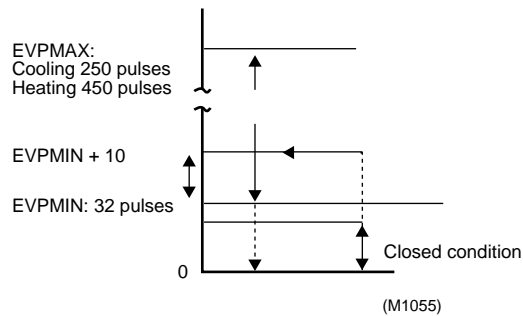
EVP's min. opening is set to EVPMIN.

The motorized valve operates as follows when it is fully closed and at min. opening.

- ① When EVP closes from open condition ("EVP open condition"), EVPMIN is set as the lower limit. When it closes from EVPMIN, the next motorized valve opening degree is set to 0 pulse ("fully closed condition").
- ② EVP is in the "fully closed condition" from 0 pulse to EVPDP pulses, and the opening degree increments. In the fully closed condition, EVPDP pulses is set as the upper limit. When it opens from the EVPDP condition, the next valve opening degree is set to EVPMIN+EVPDP to achieve "EVP open condition."

Outdoor unit valve opening restriction

EVP (discharge bypass motorized valve)



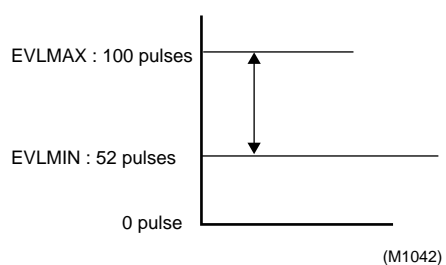
#### 2. EVG (gas pipe motorized valve) opening restriction

<p>■ Not in capacity control during normal heating operation</p> <p>EVGMAX: 70 pulses</p> <p>EVGMIN + (10)</p> <p>EVGMIN: 12 pulses</p> <p>0 pulse</p> <p>Closed condition</p> <p>(M1038)</p>	<p>■ ELV fully closed during normal cooling operation (after TEVGARD elapsed 30 sec or more)</p> <p>EVGMAX: 100 pulses</p> <p>EVGMIN: 12 pulses</p> <p>0 pulse</p> <p>(M1039)</p>
<p>■ In capacity control during normal heating operation</p> <p>EVGMAX: 150 pulses</p> <p>EVGMIN + GDP10</p> <p>EVGMIN: 12 pulses</p> <p>Closed condition</p> <p>(M1040)</p>	<p>■ EVL not fully closed during normal cooling operation</p> <p>EVGMAXC: 450 pulses</p> <p>EVGMIN + GDP10</p> <p>EVGMIN: 12 pulses</p> <p>Closed condition</p> <p>(M1041)</p>

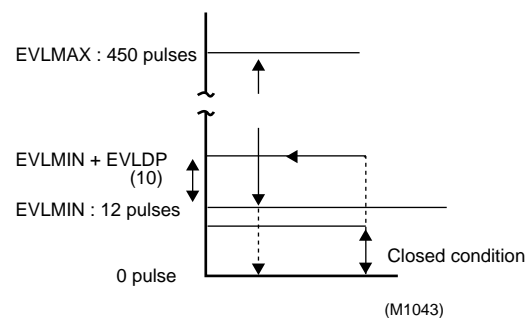
### 3. EVL (liquid pipe motorized valve) opening restriction

EVL (liquid pipe motorized valve)

- ELV fully closed during normal heating operation (after elapsed 30 sec or more)



- Other than the condition mentioned left



### 3.26.3 Outdoor Unit Motorized Valve Control in Startup and During the Number of Operating Room Units Change

#### Outline

- ① This function improves the convergibility of refrigerating cycle during startup (operation startup, when the number of operating room unit changes, in thermostat reset).
- ② It also ensures sufficient oil level for compressor startup (low-temperature heating operation start).

The adverse effects caused by the motorized valve opening to the operation control in startup are as follows.

When the motorized valve opening is more than the appropriate degree;

Poor control of refrigerant flowing noise (due to lack of subcooling, the convergibility is insufficient)

(HP does not increase, LP does not decrease → no warm/cool air).

Prolonged wet operation (presently no standard set for wet operation).

When the motorized valve opening is less than the appropriate degree;

Prolonged pull-down (increase of compressor internal temperature).

Reduced oil return (low oil level).

Rotor due condensation during cooling.

#### Details

Initial opening of outdoor unit motorized valve.

Initial opening of outdoor unit motorized valve during cooling operation is according to the followings:

$KBP = FPIMN / \text{initial frequency}$

- In case of  $FPIMN / \text{initial frequency} < 1.2$

When initial frequency is larger than  $FPIMN/1.2 = 0.83$

$EVL = 0$

$EVG = 50$

$EVP = 0$

- In case of  $1.2 \leq FPIMN / \text{initial frequency}$

When initial frequency is equal or smaller than  $FPIMN/1.2 = 0.83$

$EVL = 52$

$EVG = 90$

$EVP = 330 \times KBP - 346$

Initial opening of outdoor unit motorized valve during heating operation is according to the followings:

$KBP = FPIMN / \text{initial frequency}$

- In case of  $FPIMN / \text{initial frequency} < 1$

When initial frequency is larger than  $FPIMN$ ,

$EVL = 52$

$EVG = 60$

$EVP = 0$

- In case of  $1 \leq FPIMN / \text{initial frequency} < 1.5$

When initial frequency is between  $0.67 (= FPIMN/1.5)$  and  $1$ ,

$EVL = 52$

$EVG = 260 \times KBP + 60$

$EVP = 0$

- In case of KBPIW  $1.5 \leq \text{FPIMN} / \text{initial frequency}$   
 When initial frequency is equal or smaller than  $\text{FPIMN} / 1.5 = 0.67$ ,  
 $\text{EVL} = 52$   
 $\text{EVG} = 450$   
 $\text{EVP} = 267 \times \text{KBP} - 349$

The ending condition for startup control and the control when the number of operating room unit changes,

Cooling mode

$\text{DO} > \text{DE} > 36^\circ\text{C}$

Heating mode

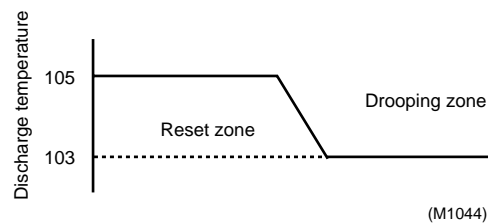
$\text{DO} > \text{DGMNT} - 5 > \text{DCMXT} > 29^\circ\text{C}$

### 3.26.4 Outdoor Unit Motorized Valve Control During High Discharge Pipe Temperature

#### Outline

When the discharge pipe temperature exceeds a certain level during compressor operation, this function opens the motorized valve to return the refrigerant to a low pressure side in order to cool the compressor with refrigerant and lower the discharge temperature.

#### Details



Motorized valve operation in drooping zone

Motorized valve is operated every 20 seconds.

Outdoor motorized valves

Receiver function ON or EVN in fully open condition

- ◆ Normal cooling operation

$\text{EVG} = \text{EVG} + 5 \text{ pulses}$

$\text{EVL} = \text{EVL} + 5 \text{ pulses}$

- ◆ Normal heating operation

$\text{EVG} = \text{EVG} - 5 \text{ pulses}$

$\text{EVL} = \text{EVL} + 5 \text{ pulses}$

BP motorized valve

Regardless of receiver function ON/OFF

- ◆ Normal cooling operation

Open the motorized valve in operating room unit for 5 to 30 pulses.

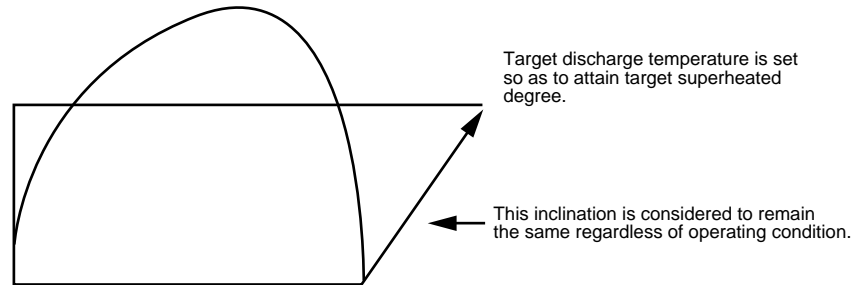
- ◆ Normal heating operation

Open the motorized valve in connecting room unit for 5 to 30 pulses.

### 3.26.5 Outdoor Units Motorized Valve Control by Target Discharge Pipe Temperature

#### Outline

This function adjusts the motorized valve opening in order to set the actual discharge pipe temperature close to the target discharge pipe temperature obtained from the indoor heat exchanger temperature and outdoor heat exchanger temperature.



(M1045)

$$\text{Target discharge temperature} = \alpha \times \text{Condensation temperature} - \beta \times \text{evaporating temp.} + \gamma$$

The correction value for the motorized valve is determined based on the table (fuzzy table) of deviation of the target discharge temperature and actual discharge temperature and per-unit-time change amount of discharge temperature, and used for the operation of the motorized valve.

## 3.27 Cooling Outdoor Unit SC Control

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### Outline

This function controls the subcooling of the outdoor heat exchanger in order to ensure maximum use of the outdoor heat exchanger capacity.

- Normal cooling operation ... Controls the difference between the high pressure and outside temperature to the temperature difference most suitable for the heat exchanger capacity.
- Cooling operation under low outside temperature ... Since the fan control alone cannot maintain appropriate compressor differential pressure, the control function sends surplus refrigerant to the outdoor heat exchanger in order to reduce the heat exchanger performance and maintain the high pressure.

When excessive liquid refrigerant is collected in outdoor heat exchanger;

→ Reduction of outdoor heat exchanger performance → Increase of high pressure

→ High pressure saturation temperature rises higher than target high pressure saturation temperature

→ EVL is opened to send surplus refrigerant (subcooled liquid) to receiver

## 3.28 BP Unit Motorized Valve Control

### Purpose of the Function

This function provides instructions regarding the absolute flow rate, relative flow rate and fully closing from the outdoor unit to the BP unit in order to ensure outdoor unit compressor safety and optimum refrigerating cycle of the system.

When the specification of the BP unit or outdoor unit is changed, the air flow rate is used as the transmission data to maintain compatibility.

With the transmission a permit/prohibit flag for each distribution control in the BP unit, the distribution control startup timing is controlled by the outdoor unit.

### 3.28.1 BP Unit Motorized Valve Control at Startup and During The Number of Operating Room Units Change

#### Outline

Heating operation startup under low outside air temperature

- ① To ensure sufficient oil level.
- ② To prevent refrigerant flowing noise in indoor units.
- ③ To improve heating operation startup performance.

The motorized valve is moved slightly in the closing direction.

In cooling operation

- ① The valve opens slightly more than at the stable position to prevent rotor dew condensation.

### 3.28.2 BP Unit Motorized Valve Control During Frequency Change

This function improves the convergibility and stability of refrigerating cycle when the frequency varies significantly.

#### Outline

When the target frequency (FMK) fluctuates as much as the specified frequency range for a certain time duration (10 sec) during discharge pipe temperature control, the discharge pipe temperature control is stopped and the target motorized valve opening is adjusted according to the amount of frequency change.

### 3.28.3 Motorized Valve Flow Rate Restriction

This function prevents the deviation from the motorized valve specification range by restricting the motorized valve flow rates of the operating and non-operating room units during compressor operation. It also prevents the generation of abnormal noise such as refrigerant flowing sound by restricting the circulation of refrigerant according to the operating conditions (unit ON/OFF) of room units.

#### Outline

Restriction of motorized valve opening degrees of operating room units;  
 ... Restriction of maximum and minimum flow rates based on constant  
 Restriction of motorized valve opening degrees of non-heating room units;  
 ... Restriction of minimum flow rate based on constant  
 ... Maximum flow rate determined based on flow rates of operating room units

### 3.28.4 Full Closing of Motorized Valves

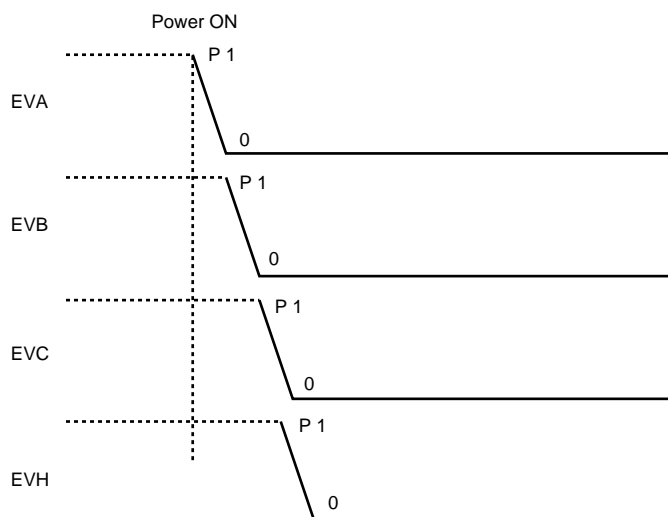
#### Purpose of the Function

The motorized valves are initialized when the power is turned on.

#### Details

The following processes are conducted.

1. Conducts P1 pulses close when power is turned on, and sets current opening to 0 pulse (fully closing process).
2. Sends motorized valve initialization signal to outdoor unit.
3. Closes the motorized valve of each chamber (sets the motorized-valve pulse to 0).
4. Stops transmission of motorized valve initialization signal when EVH retightening is completed.



(M1047)

### 3.28.5 Control Based on Absolute Flow Rate Instruction

#### Purpose of the Function

This function operates the motorized valve based on the absolute flow rate instruction sent from the outdoor unit.

#### Outline

The motorized valve flow rate operation based on the absolute flow rate instruction provides the following functions.

- 1) Flow rate distribution for motorized valves of individual room units.
- 2) Retightening based on retightening instruction from outdoor unit.
- 3) Operation of motorized valves during oil recovery operation.

### 3.28.6 Control Based on Relative Flow Rate Instruction

#### Purpose of the Function

This function operates the motorized valve based on the relative flow rate instruction sent from the outdoor unit.

#### Outline

This function distributes the relative flow rate instruction sent from the outdoor unit to each room unit in connection, and obtain the amount of change in the target motorized valve flow rate.

- Base on absolute flow rate QR sent from the outdoor unit, the corrected flow rate value for each room unit is obtained with the following equation.  

$$QRDA = QR \times KSQA / (\Sigma KSQRU + \beta R \times \Sigma KSQRT)$$
  
 QRDB and QRDC are obtained in the same way.  

$$QRDA = QR \times (\beta R \times KSQRA) / (\Sigma KSQRU + \beta R \times \Sigma KSQRT)$$
  
 In case of the room A unit does not operate, QRDA can be obtained with the following equation.  
 QRDB and QRDC are also obtained in the same way.
- The target flow rate of motorized value (QAMK) is corrected using this function.  

$$\Sigma QRA = \Sigma QRA + QRDA$$
  

$$\Sigma QRB = \Sigma QRB + QRDA$$
  

$$\Sigma QRC = \Sigma QRC + QRDA$$

## 3.29 Gas Pipe Isothermal Control in Cooling Operation

### Purpose of the Function

This function ensures appropriate refrigerant distribution when many room units are operating in the cooling mode.

### Outline

The gas pipe temperatures of operating room units are detected by the gas pipe thermistors, and the motorized valves' flow rates are corrected so as to equalize the temperatures of the gas pipes.

When gas pipe temperature is higher than average → Opens the valve of that room unit

When gas pipe temperature is lower than average → Closes the valve of that room unit

However, the closing operation is restricted to prevent the valve operation that results in a flow rate that exceeds a certain level at one time.

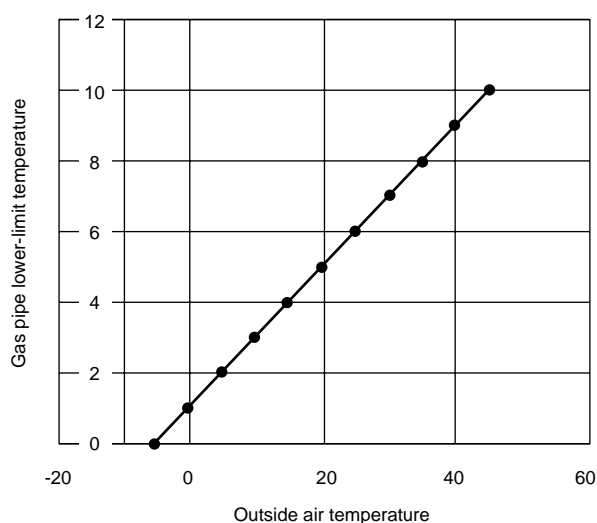
(Protection function to prevent rotor frosting)

### Details

The gas pipe temperature is detected at every sampling (40 SEC) operation of the gas pipe isothermal control, and average value DGAV of each gas pipe temperature is obtained.

In order to prevent dew condensation in the connection pipe, when  $DGAV < \text{Gas pipe lower limit temp.}$ ,  $DGAV = \text{Gas pipe lower limit temp.}$

Gas pipe lower limit temp. =  $0.2 \times DOA + 1$



(M1048)

Outside Air Temperature	Gas Pipe Lower-Limit Temperature
-5	0
0	1
5	2
10	3
15	4
20	5
25	6
30	7
35	8
40	9
45	10

The motorized valve operating amount is determined based on deviation EGA between each room unit's gas pipe temperature and of DGAV after GFTUYU correction and previous deviation EGAZ.

(Example) The following example is based on room A.

$$EGA = DGA - DGAV$$

When the operating flow rate of EVA is QRG

$$QRG = KPCB (0.05) \times ((EGA - EGAZ) + KIB (0.32) \times (EGA + EGAZ)) \\ = 0.05 \times (EGA - EGAZ) + 0.016 \times (EGA + EGAZ)$$

When  $QRG \leq QHENC(-0.12)$ , the following condition is set:  $QRG \leq QHENC (-0.12 \text{ Nm}^3/\text{hr})$ .

### 3.30 SH Control in Cooling Operation

#### Purpose of the Function

This function ensures appropriate refrigerant distribution when many room units are operating in the cooling mode.

#### Outline

The heat exchanger temperatures and gas pipe temperatures of operating room units are detected by the gas pipe thermistors, and the motorized valves' flow rates are corrected so as to adjust each room unit's heat exchanger temperature and gas pipe temperature (hereafter referred to as SH) close to the target values.

When SH is higher than average → Opens the valve of that room unit

When SH is lower than average → Closes the valve of that room unit

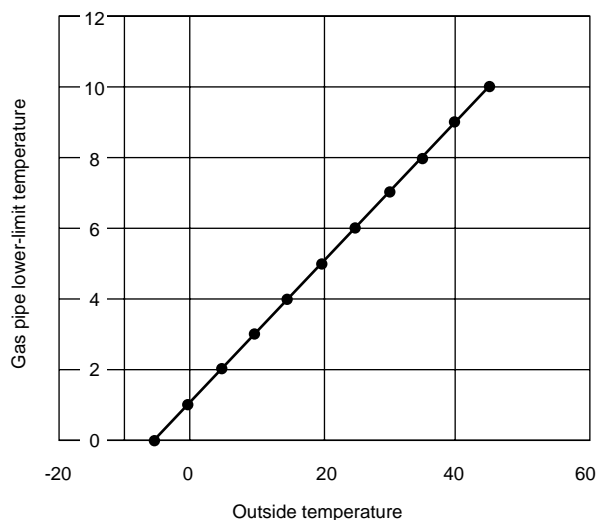
However, the closing operation is restricted to prevent the valve operation that results in a flow rate that exceeds a certain level at one time. When the liquid pipe temperature is higher than the heat exchanger temperature, the motorized valve is opened without providing the above control. (Protection function to prevent rotor dew condensation)

#### Details

The gas pipe temperature and indoor heat exchanger temperature are detected at the time of every sampling time of 40 sec for the cooling SH control.

In order to prevent dew condensation in connection pipe, gas pipe lower-limit temperature is set as follows.

Gas pipe lower-limit temperature =  $0.2 \times \text{DOA} + 1$



(M1049)

Outside Temperature	Gas Pipe Lower-Limit Temperature
-5	0
0	1
5	2
10	3
15	4
20	5
25	6
30	7
35	8
40	9
45	10

Regarding target superheated degree SH

(Example) The following example is based on room A.

When the sum of heat exchanger temperature (DCA) and target superheated degree is smaller than gas pipe lower limit temperature, the following condition is set: DSH = Gas pipe lower-limit temperature – DCA.

When  $DLA < DCA$  (when liquid pipe temperature is exceeded due to heat exchanger intermediate superheating), the motorized valve is opened based on the fixed value determined by  $QRSHA = (0.12 \text{ Nm}^3/\text{hr})$ , with QRSHA being the flow rate operating amount (relative value) provided by the SH control.

In normal condition ( $DLA \geq DCA$ ), when  $SHA = (DGA - DCA) - DSH$  and the previous value is SHAZ  $QRSHA = 0.05 \times ((SHA - SHAZ) + 0.32 \times (SHA + SHAZ))$   
 $= 0.05 \times (SHA - SHAZ) + 0.016 \times (SHA + SHAZ)$   
 Where  $QRSHA \leq QHENCs$ ,  $QRSHA = QHENCs1$



**Notes:**

1. In Sky Air models, the indoor units are equipped with distribution capillary tubes ; therefore, the heat exchangers may superheat even when the condition is met.
2. In Sky Air models, the heat exchanger intermediate position is provided on the liquid connection pipe side; as a result, superheated condition is difficult to detect.

### 3.31 SC Control in Heating Operation

#### Purpose of the Function

This function ensures appropriate refrigerant distribution when room units are operating in the heating mode.

#### Outline

The function serves the following two main purposes.

- 1) Appropriate refrigerant distribution to each room unit  
In the case of heating SC control 2, the motorized valves of only operating room units are regulated. In the case of heating SC control 1, the motorized valves of all room units including non-operating units are operated.
  - 2) Determination of the location (accumulator, receiver, non-operating room units, operating room units) to collect refrigerant in accordance with the connection pattern (extended piping, single-room connection).
- To ensure appropriate refrigerant distribution to each room unit, each room unit's liquid pipe temperature and heat exchanger intermediate temperature are detected, and the motorized valve opening degrees are corrected so SC reaches the target SC (determined based on the supply capacity and the temperature difference between the discharge pipe temperature and target discharge pipe temperature).

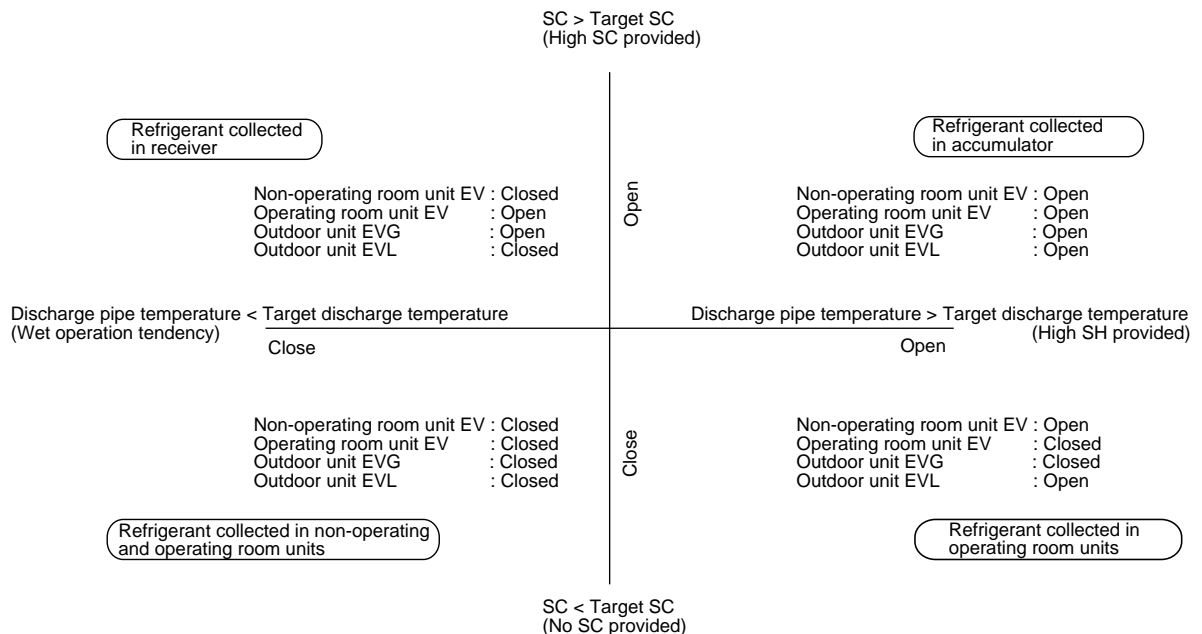
When SH is higher than target SC → Opens the valve of that room unit

When SH is lower than target SC → Closes the valve of that room unit

However, the valve operating amount is restricted to prevent a flow rate that exceeds a certain level at one time.

(For improvement of stability and convergibility performance)

- The determination of the location (accumulator, receiver, non-operating room units, operating room units) to collect refrigerant is determined in accordance with the connection pattern (extended piping, single-room connection).

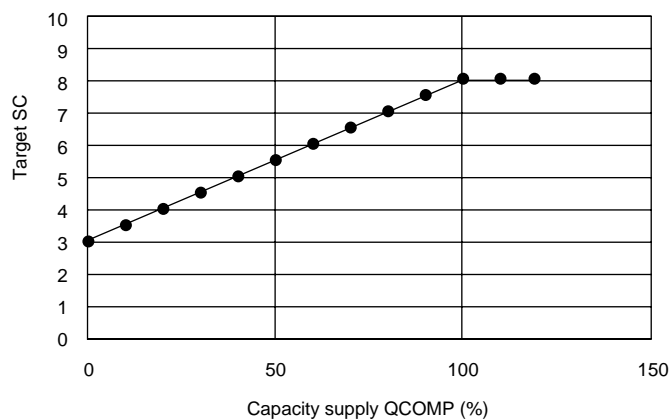


(M1056)

**Details**

The heat exchanger intermediate temperature and liquid pipe temperature are detected at every sampling time of 60 sec of the heating SC control.

The range of target SC :  $3^{\circ}\text{C} \leq \text{SC1} \leq 8^{\circ}\text{C}$



(M1050)

The motorized valve of operating room unit is operated to obtain the target SC.

Target SC > Current SC : Evr closed

Target SC < Current SC : Evr opened

### 3.32 Heat Exchanger Isothermal Control in Heating Operation

<b>Purpose of the Function</b>	<p>This function ensures appropriate refrigerant distribution when room units are operating in the heating mode.</p> <p>It prevents abnormal increase of the high pressure and operation with gas shortage due to uneven refrigerant distribution (Protection function).</p>
<b>Outline</b>	<p>The indoor unit heat exchanger thermistors (of all connected room units including non-operating room units) in heating operation are detected. Then, the highest heat exchanger temperature DCMXT is compared with the heat exchanger temperature of each room unit. If the temperature difference exceeds the predetermined value, it is judged that that indoor unit heat exchanger thermistor position in subcooled zone, and the motorized valves of room units with the temperature difference exceeding the predetermined level is opened to return to the saturation zone.</p> <p>Since this is a protection function, it is effective for all connected room units in heating operation excluding those in defrosting operation. This function is inactive in room units with transmission problems.</p>
<b>Details</b>	<p>The heat exchanger temperature is detected at every sampling time of 20 sec of the heat exchanger isothermal control, and maximum value DCMXT of each heat exchanger temperature is obtained.</p> <p>If the temperature difference between the heat exchanger temperature and maximum heat exchanger temperature value exceeds 10°C, it is judged that the heat exchanger intermediate is in the subcooled zone, and the motorized valve is opened.</p>

### 3.33 BP Unit Motorized Valve Control in High Discharge Pipe Temperature

When the discharge pipe temperature exceeds a certain level during compressor operation, this function opens the motorized valve to return the refrigerant to a low pressure level in order to cool the compressor with refrigerant and lower the discharge temperature.

### 3.34 Inter-BP Units Heating Heat Exchanger Isothermal Control

<b>Purpose of the Function</b>	This function ensures appropriate refrigerant distribution to each BP unit in heating operation. It prevents abnormal increase of the high pressure and operation with gas shortage due to uneven refrigerant distribution (Protection function).
<b>Outline</b>	The indoor unit heat exchanger thermistors (of all connected room units including non-operating room units) in heating operation are detected. Then, the highest heat exchanger temperature DCMXT is compared with the heat exchanger temperature of each room unit. If the temperature difference exceeds the predetermined value, it is judged that that indoor unit heat exchanger thermistor position in subcooled zone, and the motorized valves of room units with the temperature difference exceeding the predetermined level is opened to return to the saturation zone.
<b>Details</b>	The maximum value of DCMXT of BP units is compared with DCMXT of each room. If the temperature difference exceeds DCABC (10°C), open the motorized valve of that BP unit.

### 3.35 Inter-BP Units Gas Pipe Isothermal Control

<b>Purpose of the Function</b>	This function ensures appropriate refrigerant distribution to each BP unit when many room units are operating in the cooling mode.
<b>Outline</b>	<p>The gas pipe temperatures of operating room units are detected by the gas pipe thermistors, and the opening degrees of the motorized valves are corrected so as to equalize the gas pipe temperatures of the room units.</p> <p>When gas pipe temperature is higher than average gas pipe temperature → Opens the valve of that room unit</p> <p>When liquid pipe temperature is lower than average gas pipe temperature → Closes the valve of that room unit</p> <p>In this control, the following conditions are also effective.</p> <p>When the difference between the gas pipe temperature of each room unit and the average value is small, no correction is provided.</p> <p>→ Judged as stable. (Set as PI control prohibit zone to prevent hunting)</p> <p>The motorized valve opening degree correction of this function is restricted to prevent the valve closing past a certain level.</p> <p>→ For improvement of stability and convergibility performance</p>
<b>Details</b>	The temperature difference $\Delta DCG1$ between the min. value of the heat exchanger temperatures of BP units and the min. gas pipe temperature is calculated. If it is lower than the average value of total temperature difference ( $-5^{\circ}\text{C}$ ), open the motorized valve of the applicable BP unit.

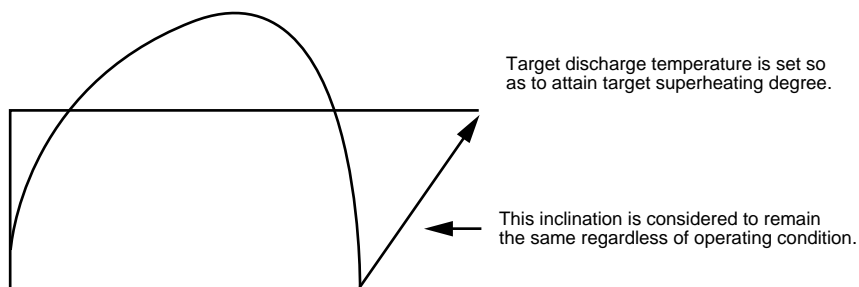
### 3.36 BP Unit Motorized Valve Control by Target Discharge Pipe Temperature

#### Purpose of the Function

This function uses the discharge pipe temperature to provide indirect SH control. It also enables the management of the discharge temperature and wet operation (control in wet zone).

#### Outline

The target discharge pipe temperature is obtained based on the indoor heat exchanger temperature and outdoor heat exchanger temperature, the motorized valves' flow rates are regulated so as to adjust the actual discharge pipe temperature close to the calculated value.



(M1051)

$$\text{Target discharge temp.} = \alpha \times \text{condensing temp.} - \beta \times \text{evaporating temp.} + \gamma$$

The correction value for the motorized valve is determined based on the table (fuzzy table) of deviation of the target discharge temperature and actual discharge temperature and per-unit-time fluctuation of discharge temperature, and used for the operation of the motorized valve.

## 3.37 4-Way Valve Operation

### 3.37.1 4-Way Valve Operation Security

#### Purpose of the Function

This function ensures proper operation of the 4-way valve. (Because the pilot-system drive method is used, the current from the coil cannot provide fail-proof 4-way valve operation. Therefore, the difference of pressure before and after the valve is used to ensure proper valve operation.)

#### Outline

Because the pilot-system drive method is used, the current from the coil cannot provide fail-proof 4-way valve operation. Therefore, the use of the difference of pressure before and after the valve is required. At the time of operation when the 4-way valve switches, the operating frequency exceeding a specified frequency is output for a predetermined time duration to ensure differential pressure necessary for the 4-way valve operation.

#### Details

	Cooling	Heating
Continuing time of 4-way valve operation	90sec	90sec
Frequency of 4-way valve operation	62Hz	41Hz

### 3.37.2 4-Way Valve Switching

#### Outline

When the outdoor heat exchanger is used as a condenser (in cooling and defrosting), the 4-way valve is not supplied with current. When the indoor heat exchanger is used as a condenser, it is supplied with current. To reduce the switching noise when heating operation stops (ON → OFF), the 4-way valve switching after heating operation shutdown is delayed.

#### Details

The 4-way valve switching delay is 140 seconds for OFF delay.  
To reduce power consumption during current flow, a OFF process is conducted when the heating thermostat OFF time exceeds 60 minutes.

### 3.38 JIS Mode

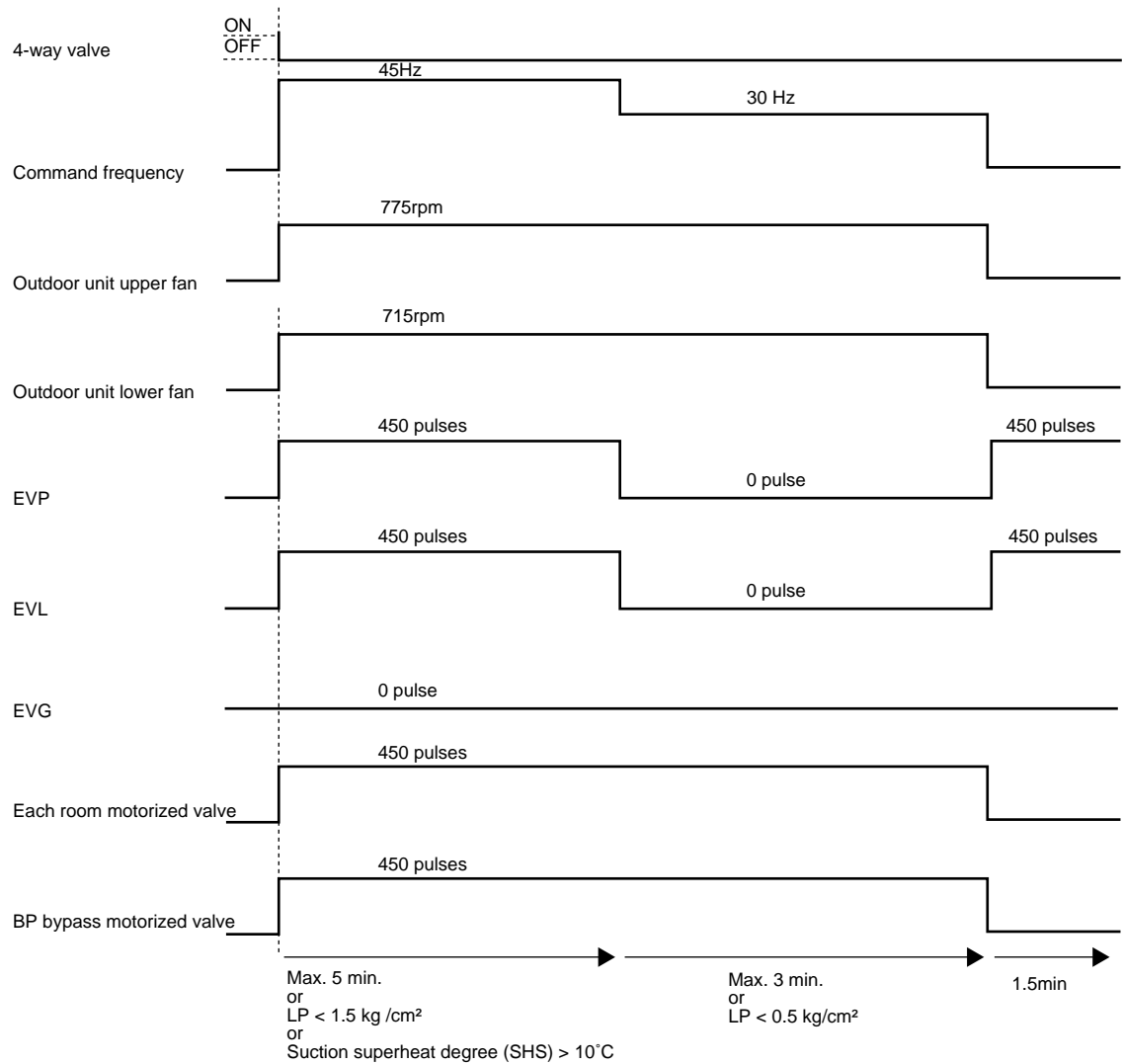
<b>Purpose of the Function</b>	This aims to minimize capacity deviations at the time the JIS mode is determined.
<b>Outline</b>	When the JIS mode is determined, the function fixes the operating frequency (command frequency), target discharge temperature and target SC.
<b>Details</b>	<p>Instruction frequency FSR is set as follows: <math>FSR = FJIS</math>. Cooling operation: 90 Hz Heating operation: 98 Hz</p> <p>Target discharge pipe temperature DOSET is set as follows: <math>DOSET = DOSTJS</math>.</p> <p>Cooling operation: 85°C</p> <p>Heating operation: 75°C</p> <p>Outdoor fan tap is set to FANJIS.</p> <p>Cooling ... Upper fan: 775 rpm Lower fan: 715 rpm</p> <p>Heating ... Upper fan: 775 rpm Lower fan: 715 rpm</p> <p>Heating heat exchanger isothermal control is prohibited.</p>

### 3.39 Pump Down Operation

#### Outline

When the Pump-down button is pressed, the following control is provided to collect refrigerant in the receiver.

#### Details



(M1052)

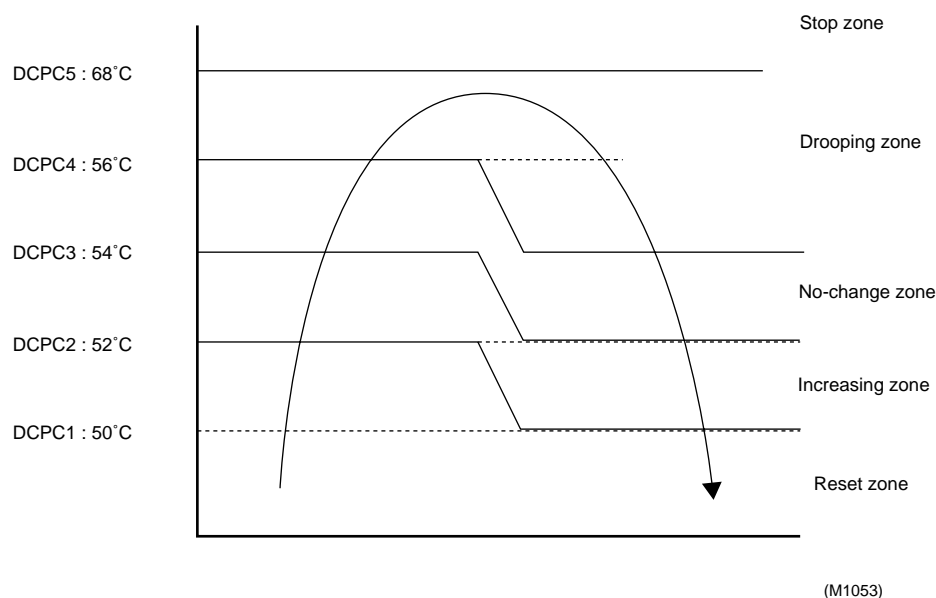
## 3.40 Protection Control of SkyAir Indoor Units

### SkyAir Indoor Unit Peak-Cut Zone

The zones for SkyAir indoor unit peak-cut control is produced in the BP unit.

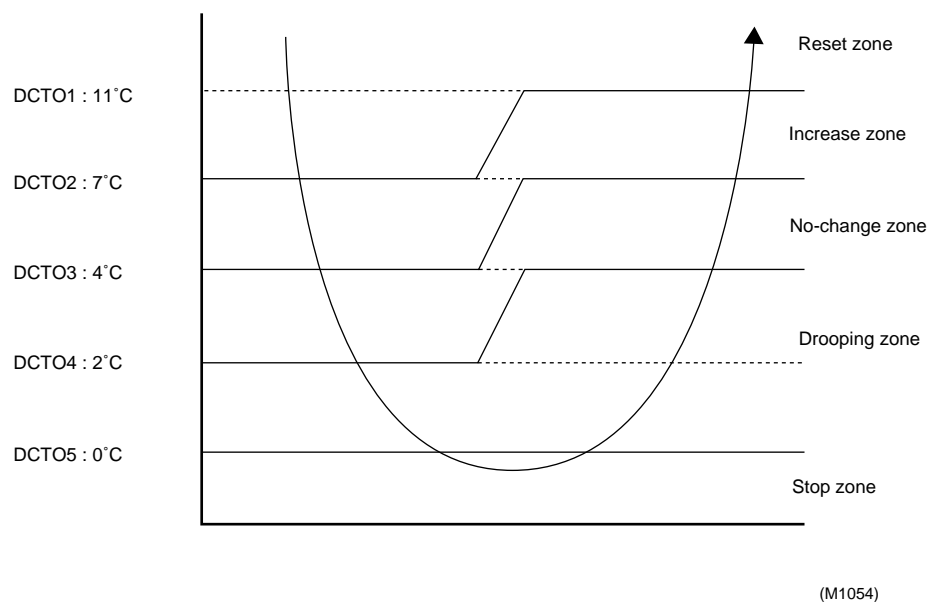
#### Peak-cut control

Based on the heat exchanger temperature information sent from the indoor unit, the zones are produced to prevent abnormal rise of the high pressure.



#### Freeze-up prevention control

Based on the freeze-up prevention status information sent from the BP unit (indoor unit), the zones are produced to prevent freezing-up of the indoor heat exchanger.



Even if the stop zone is reached, the zone remains as the drooping zone for 540 sec.

---

**Monitoring  
Function During  
SkyAir Indoor  
Unit Heating  
Thermostat OFF**

In the case of SkyAir indoor units, the fan operates at the L tap during heating thermostat OFF. Therefore, the refrigerant continues to flow into the indoor heat exchanger. This can cause condensation, causing liquid trap.

To prevent this, the BP unit sends a defrost signal (FD+FDS) to turn off the fan.

However, since the room temperature thermistor of the SA indoor unit is installed inside the equipment, there is a possibility that the thermostat may not reset due to the continuous flow of refrigerant during heating operation.

To solve this problem, the fan ON/OFF control is provided at predetermined intervals (ON time: 300 sec, OFF time: 90 sec) for indoor unit thermostat monitoring.

---

**Abnormality  
Processing**

Icing prevention function for non-operating room units

When 10 minutes pass from the time a room unit stops operating while the compressor is in operation, room temperature DAT and heat exchanger temperature DCT of the non-operating room unit are detected.

①  $DAT - DCT \geq 10 \text{ deg}$

②  $DCT \leq 1^{\circ}\text{C}$

When conditions ① and ② remain for (5 minutes), an icing abnormality of the non-operating room unit is determined.

The motorized valve of the abnormal room unit is opened to 2.3 Nm<sup>3</sup>/hr from the time an icing abnormality is determined to the time the compressor stops.

# Part 6

## Flow of Refrigerant

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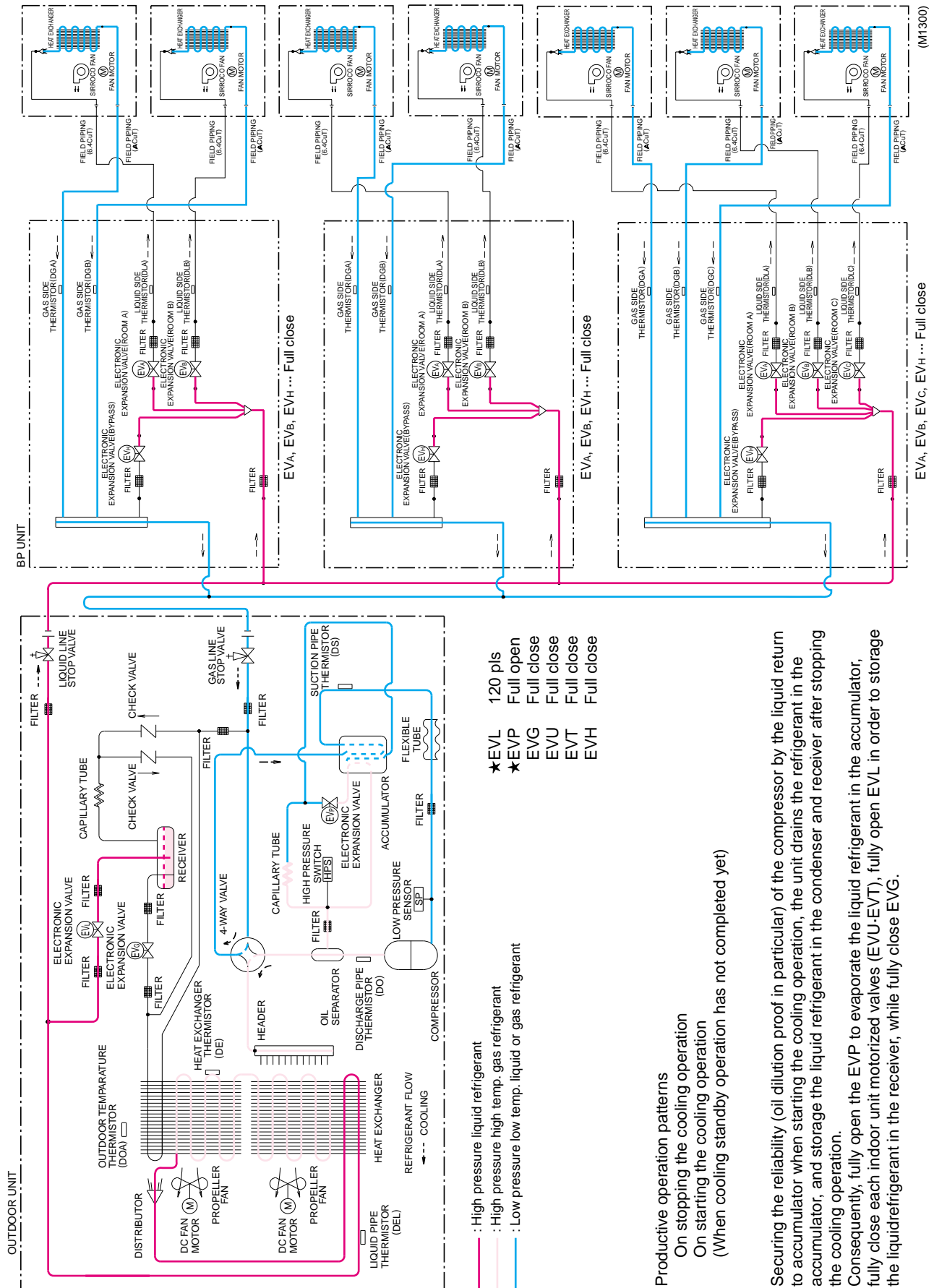
The RMK140JAVM specifications are special. Refer to <RMK140JAVM's important points> (on page ii) for the changes in contents.

# 1. Flow of Refrigerant

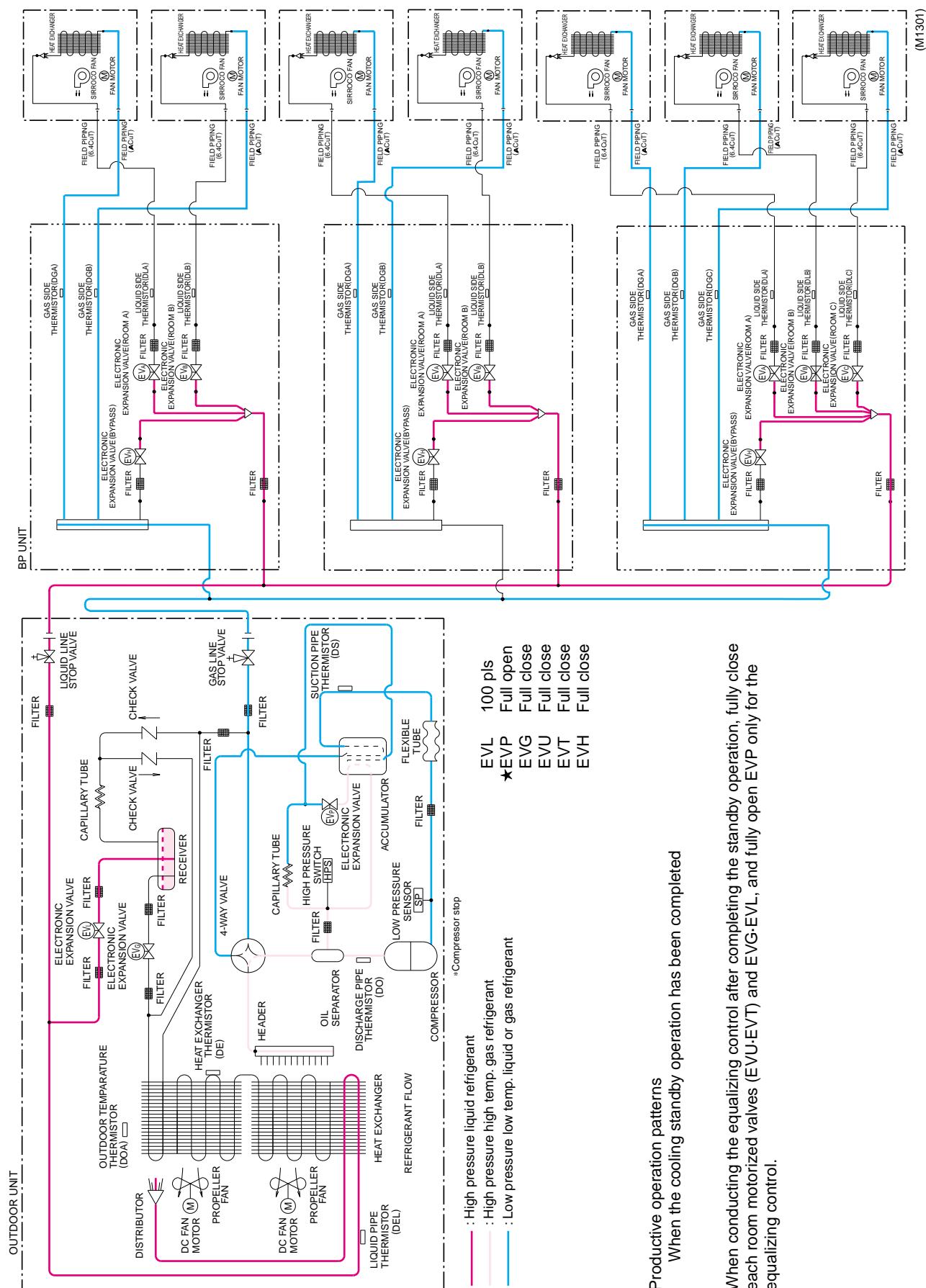
## 1.1 Flow of Refrigerant

Operation Mode	No.	Operating Status ○: Fixed opening (step) ⊙: Variable opening ●: Fully closed status The figures in ( ) are for applicable range.	Excess refrigerant	4-way valve	EVP Discharge Bypass Motorized Valve	EVG Outdoor Unit Gas Pipe Motorized Valve	EVL Outdoor Unit Liquid Pipe Motorized Valve	EVA,B,C- Operating Room Unit BP Unit each Room Motorized Valve	EVA,B,C- Non- Operating Room Unit BP Unit each Room Motorized Valve	EVH BP Unit Bypass Motorized Valve	
				■ Cooling/ Heating changeover ■ Defrost control ■ Oil collection in heating	■ Capacity linear control ■ Equalizing control ■ Freeze protection control ■ Peak cut control ■ At starting	<Cooling> ■ Surplus refrigerant amount adjustment ■ Target discharge pipe temperature control <Heating> ■ Reverse target discharge pipe temperature control ■ Capacity linear control (1-step)	<Cooling> ■ Subcooling control <Heating> ■ Target discharge pipe temperature control	■ Main reducing valve ■ Refrigerant distribution control <Cooling> ■ Gas pipe isothermal control ■ SH control <Heating> ■ Subcooling control	<Cooling> ■ Refrigerant distribution OFF <Heating> ■ Target discharge pipe temperature control	■ Main pipe liquid stagnation prevention control at starting ■ Oil return control ■ Defrost control	
Cooling	1.2	Standby Operation	—	OFF	○ 450 pls	● 0 pls	○ 120 pls	● 0 pls	● 0 pls	● 0 pls	
	1.3	Equalizing Control	—	OFF	○ 450 pls	○ 52 → 0 pls	○ 450 → 100 pls	● 0 pls	● 0 pls	● 0 pls	
	1.4	Oil Return Operation	Main Gas Pipe Oil Return	—	OFF	⊙ 0~200	⊙ 60~100 or 450	⊙ 100~450	⊙ 52~450 pls	● 0 pls	○ 450 pls
	1.5	Low Outside Air Temperature Cooling	2.5kW 1-Room Operation	NO	OFF	⊙ 0~200	⊙ 0~100 (EVL=0)	● 0 pls	⊙ 52~450 pls	● 0 pls	● 0 pls
	1.6	All-Room Operation		NO	OFF	● 0 pls	⊙ 0~100 (EVL=0)	● 0 pls	⊙ 52~450 pls	● 0 pls	● 0 pls
	1.7	Multi-Room Operation		NO	OFF	● 0 pls	⊙ 0~100 (EVL=0)	● 0 pls	⊙ 52~450 pls	● 0 pls	● 0 pls
	1.8		(Partial Loading)	YES	OFF	● 0 pls	⊙ 0~450 (EVL≠0)	⊙ 12~450	⊙ 52~450 pls	● 0 pls	● 0 pls
	1.9	1-Room Operation	Indoor Unit Large Capacity	YES	OFF	● 0 pls	⊙ 0~450 (EVL≠0)	⊙ 12~450	⊙ 52~450 pls	● 0 pls	● 0 pls
	1.10		Indoor Unit Small Capacity (2.5 kW)	YES	OFF	⊙ 0~200	⊙ 0~450 (EVL≠0)	⊙ 12~450	⊙ 52~450 pls	● 0 pls	● 0 pls
Heating	1.11	Standby Operation	—	ON	○ 450 pls	○ 450 pls	● 0 pls	● 0 pls	● 0 pls	● 0 pls	
	1.12	Equalizing Control	—	ON	○ 450 pls	○ 450 → 100 pls	● 0 pls	● 0 pls	● 0 pls	○ 0 → 100 → 0 pls	
	1.13	Oil return Operation	—	OFF	○ 450 → 0 → 150 → 450 pls	● 0 pls	● 0 pls	○ 190 pls	● 0 pls	○ 0 → 232 → 0 pls	
	1.14	Defrost	—	OFF	○ 450 → 150 → 450 pls	○ 0 → 70 → 0 pls	○ 450 → 0 pls	○ 190 pls	● 0 pls	○ 100 pls	
	1.15	All-Room Operation		NO	ON	● 0 pls	● 0 pls	⊙ 0~100 (EVG=0)	⊙ 52~450 pls	⊙ 52~420 pls	● 0 pls
	1.16	Multi-Room Operation		NO	ON	● 0 pls	● 0 pls	⊙ 0~100 (EVG=0)	⊙ 52~450 pls	⊙ 52~420 pls	● 0 pls
	1.17		(Partial Loading)	YES	ON	● 0 pls	⊙ 0~70	⊙ 0~450 (EVG≠0)	⊙ 52~450 pls	⊙ 52~420 pls	● 0 pls
	1.18	1-Room Operation	Indoor Unit Large Capacity	YES	ON	● 0 pls	⊙ 0~70	⊙ 0~450 (EVG≠0)	⊙ 52~450 pls	⊙ 52~420 pls	● 0 pls
	1.19		Indoor Unit Small Capacity (2.5kW)	YES	ON	⊙ 0~450	⊙ 0~150	⊙ 0~450 (EVG≠0)	⊙ 52~450 pls	⊙ 52~420 pls	● 0 pls
—	—	Pump Down Operation	—	OFF	○ 0~450	● 0 pls	○	○	○	○	

## 1.2 Standby Operation (Cooling)



### 1.3 Equalizing Control (Cooling)

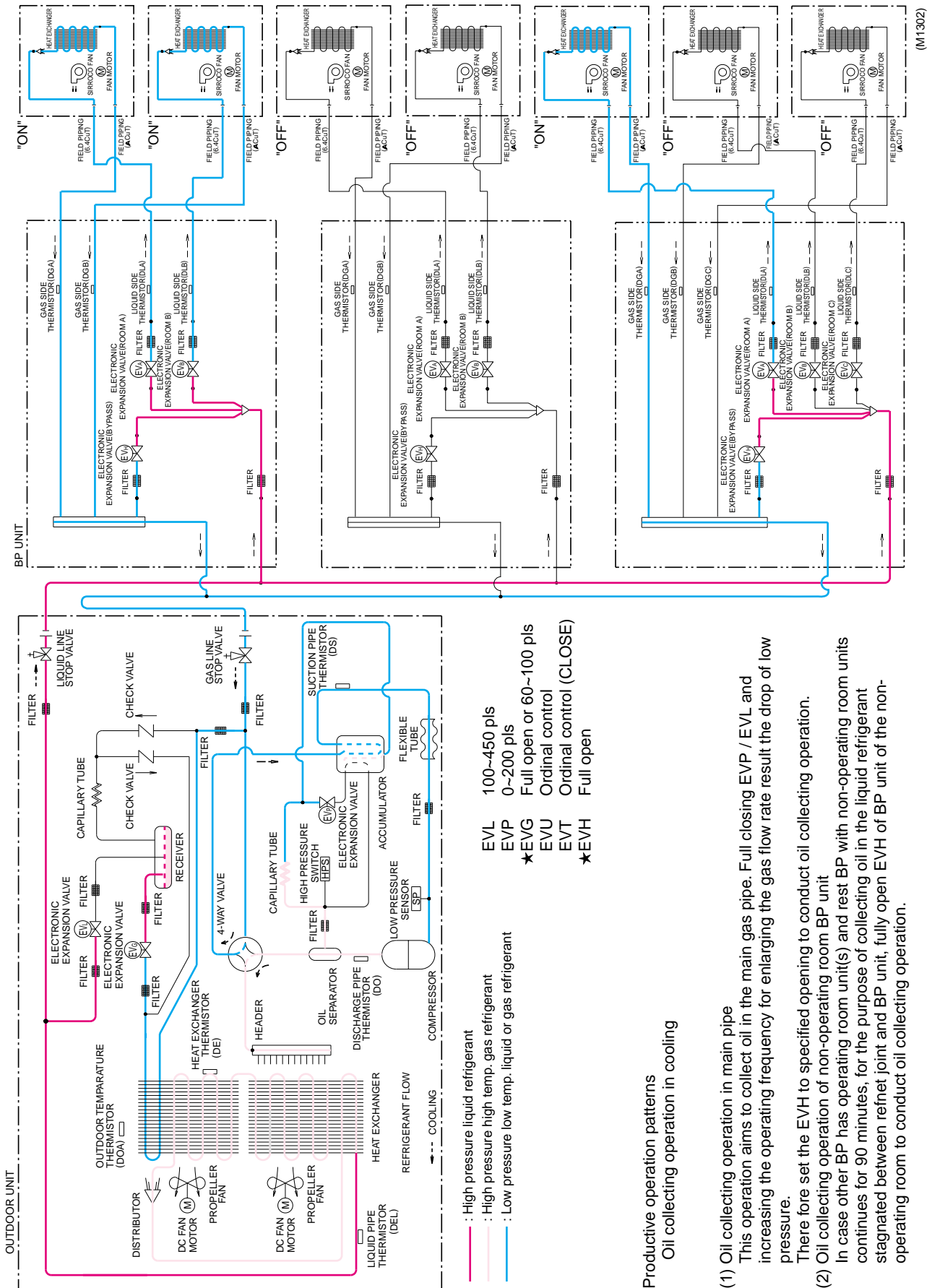


## Productive operation patterns

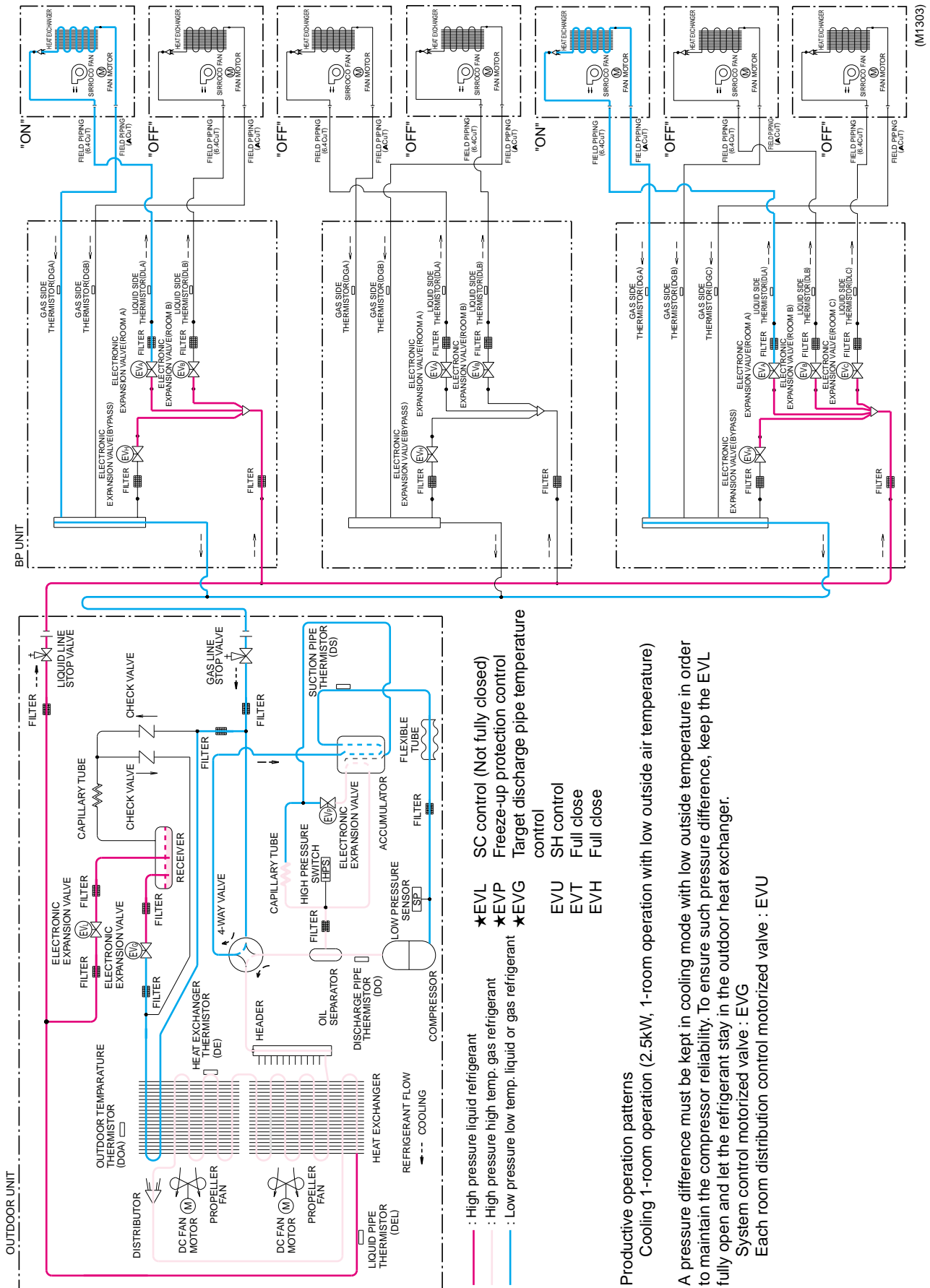
When the cooling standby operation has been completed

When conducting the equalizing control after completing the standby operation, fully close each room motorized valves (EVU-EVT) and EVG-EVL, and fully open EVP only for the equalizing control.

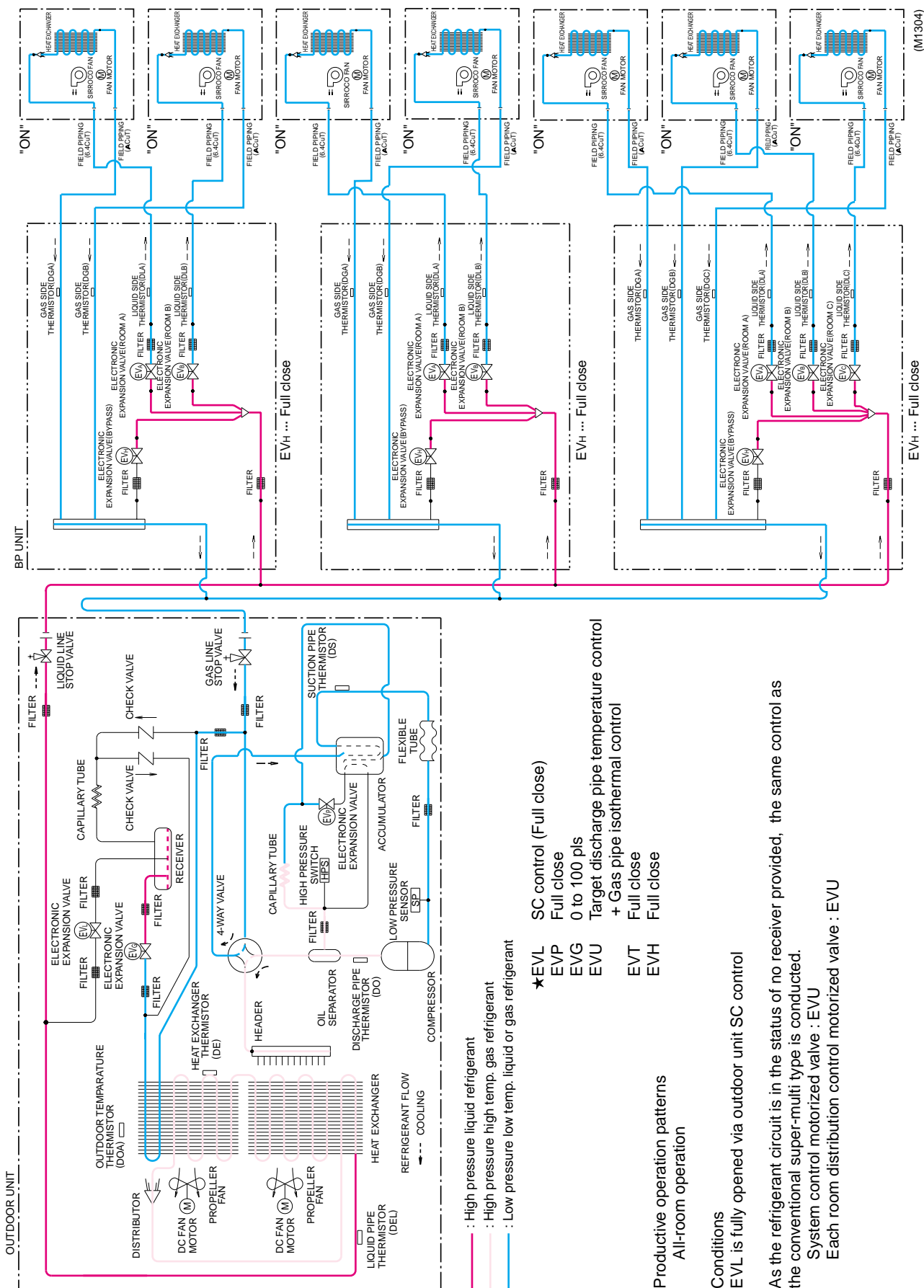
## 1.4 Oil Return Operation (Cooling)



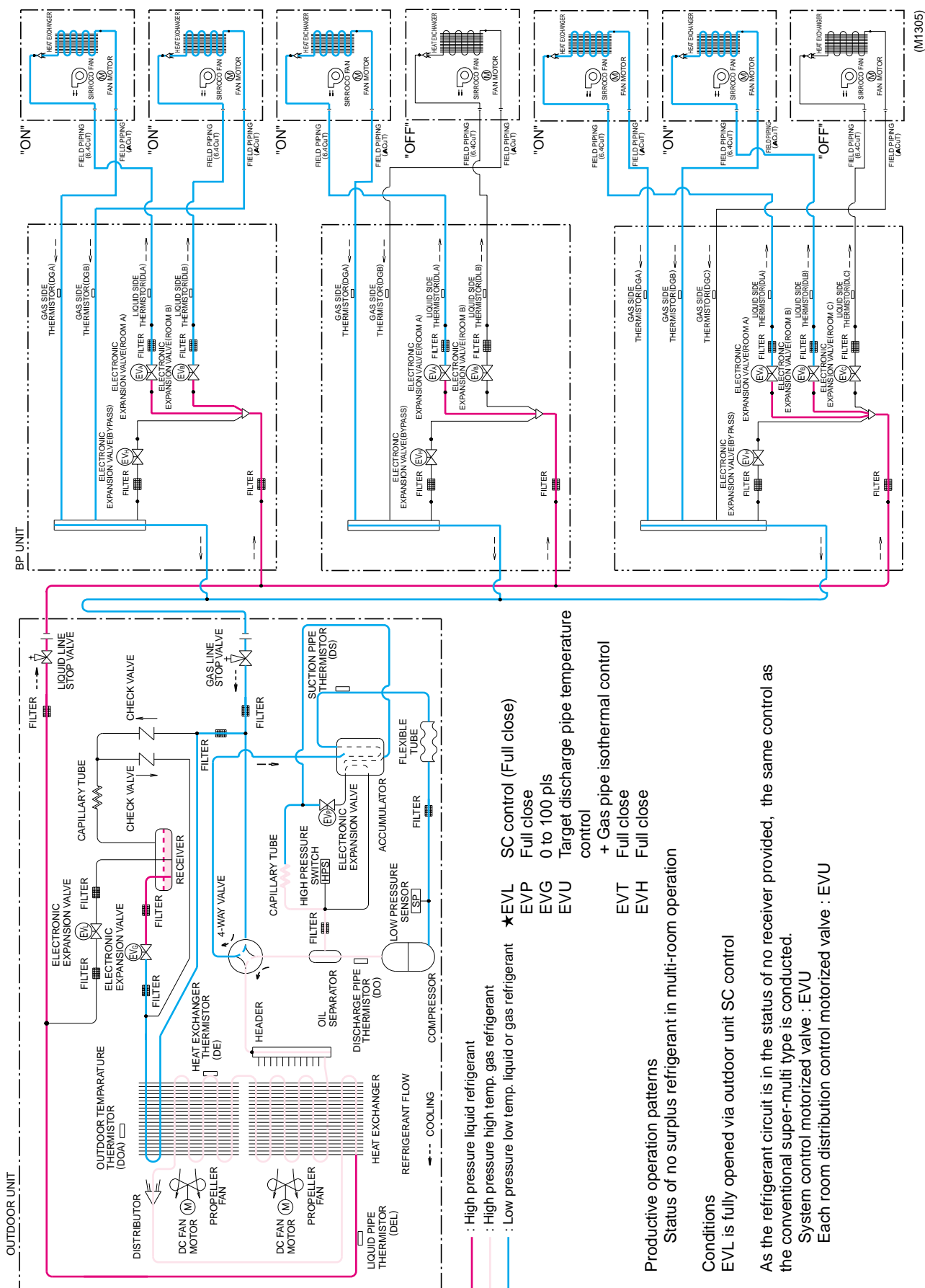
## 1.5 Low Outside Air Temperature Cooling



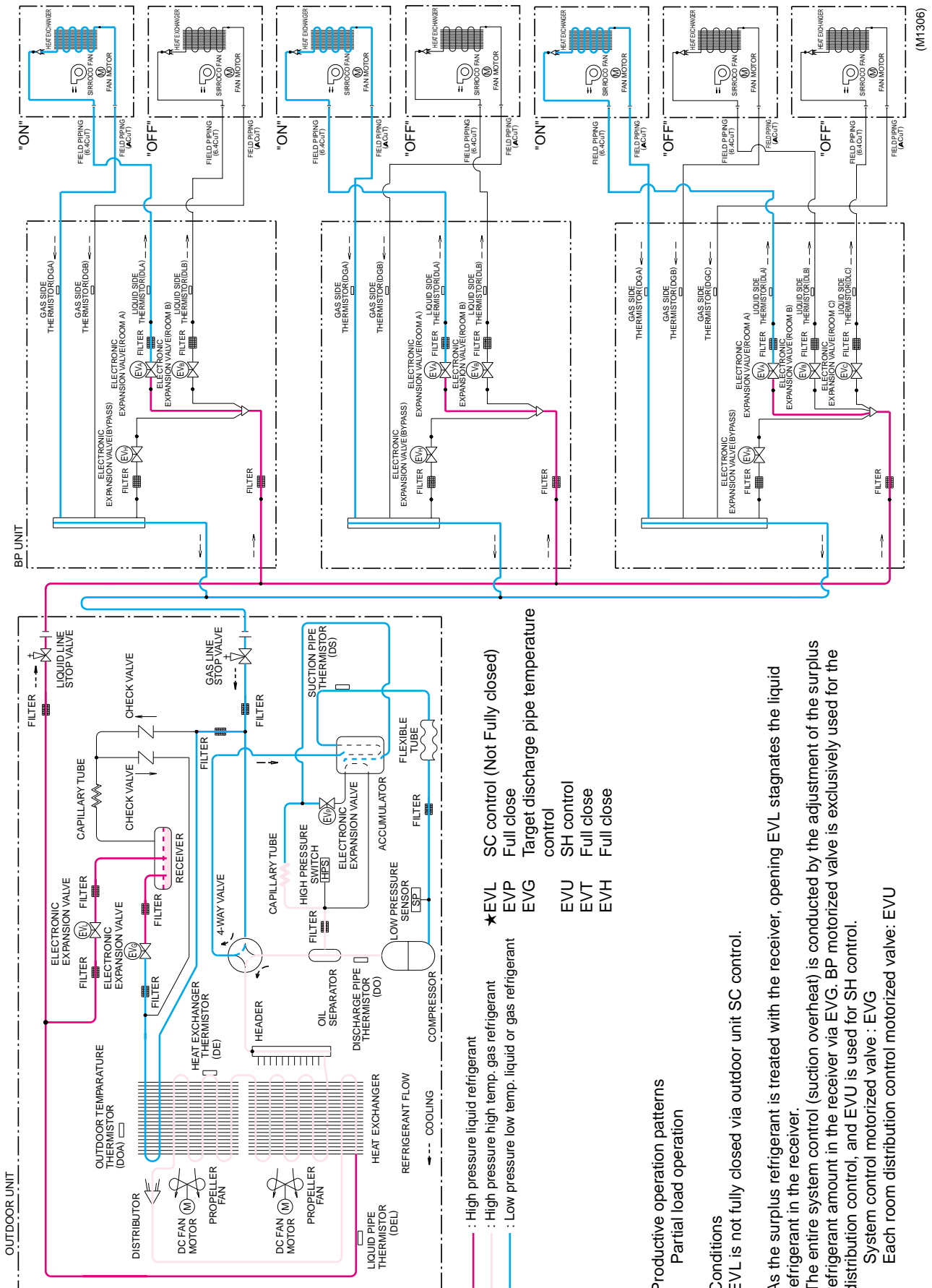
## 1.6 All-Room Operation (Cooling)



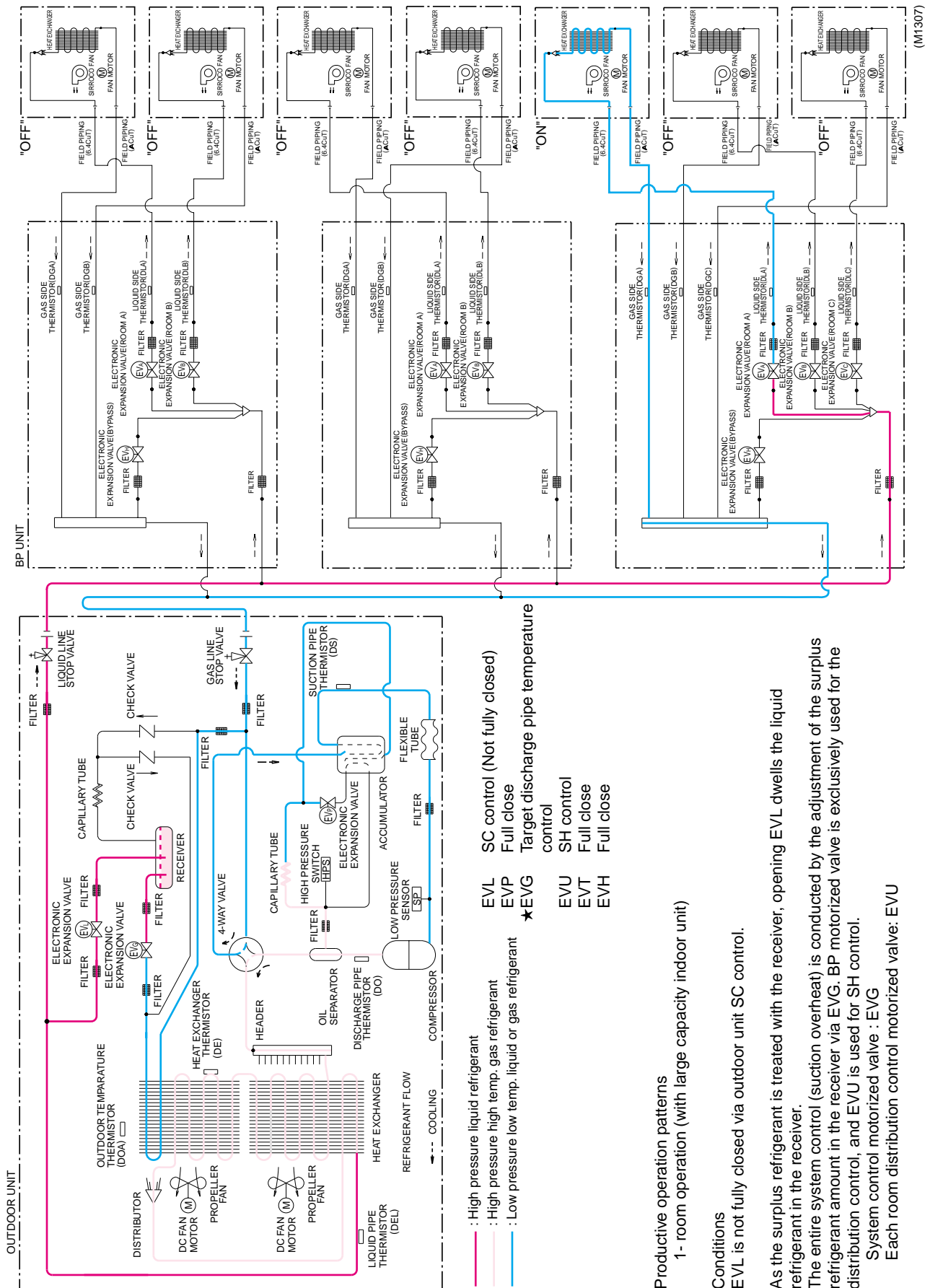
### 1.7 Multi-Room Operation (No Surplus Refrigerant) (Cooling)



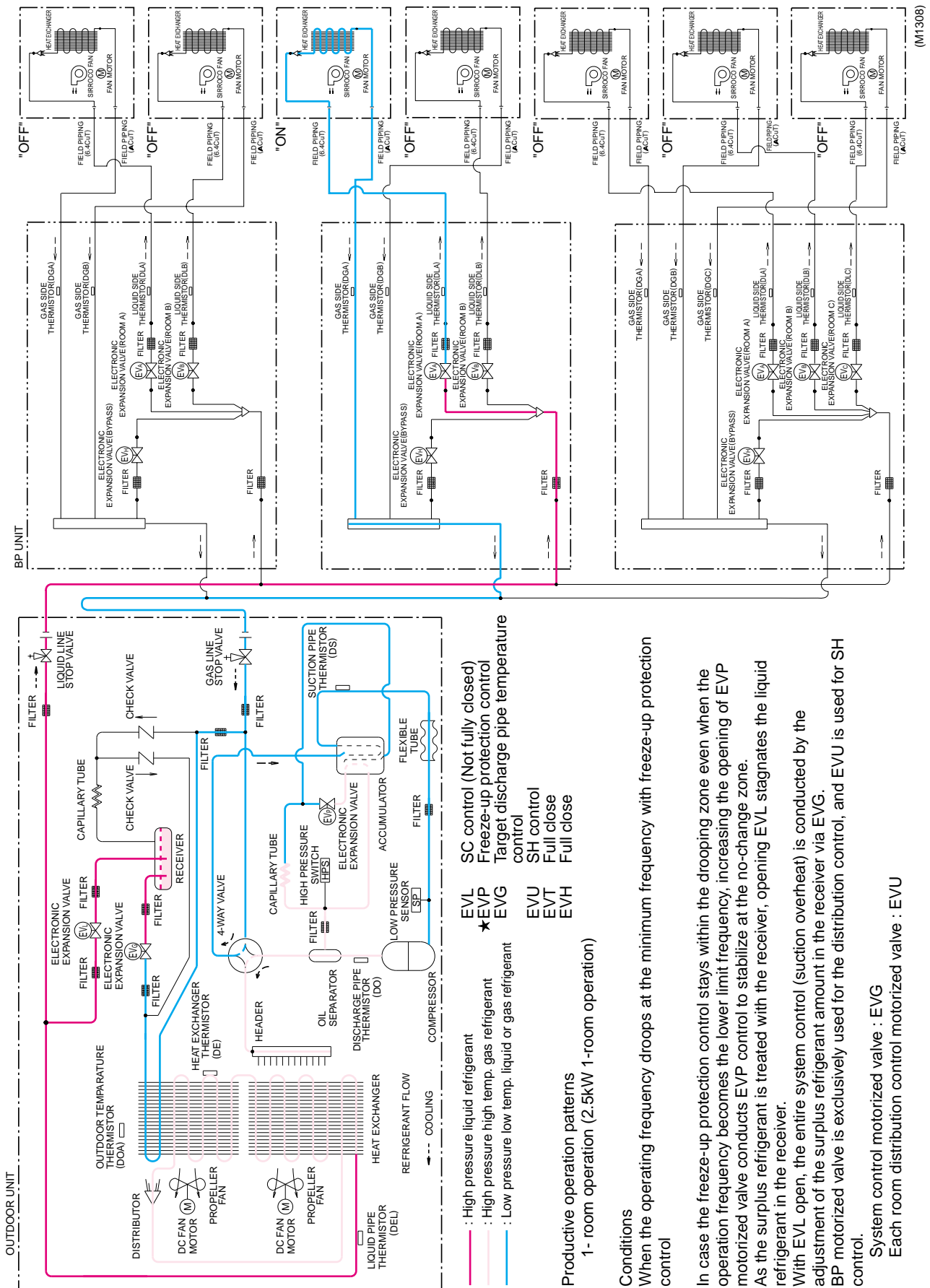
## 1.8 Multi-Room Operation (Cooling) (with Surplus Refrigerant)



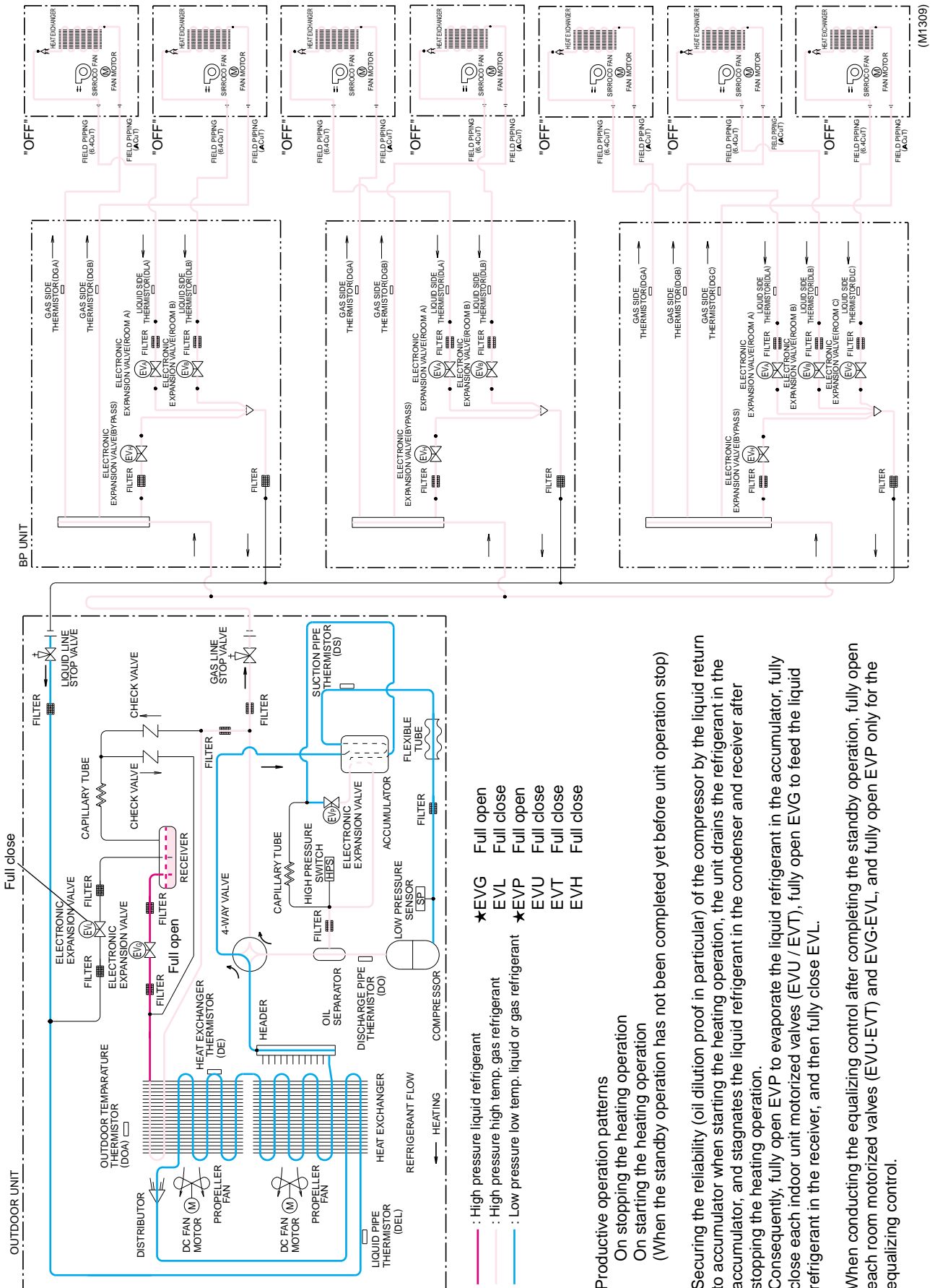
## 1.9 1-Room Operation — Indoor Unit with Large Capacity (Cooling)



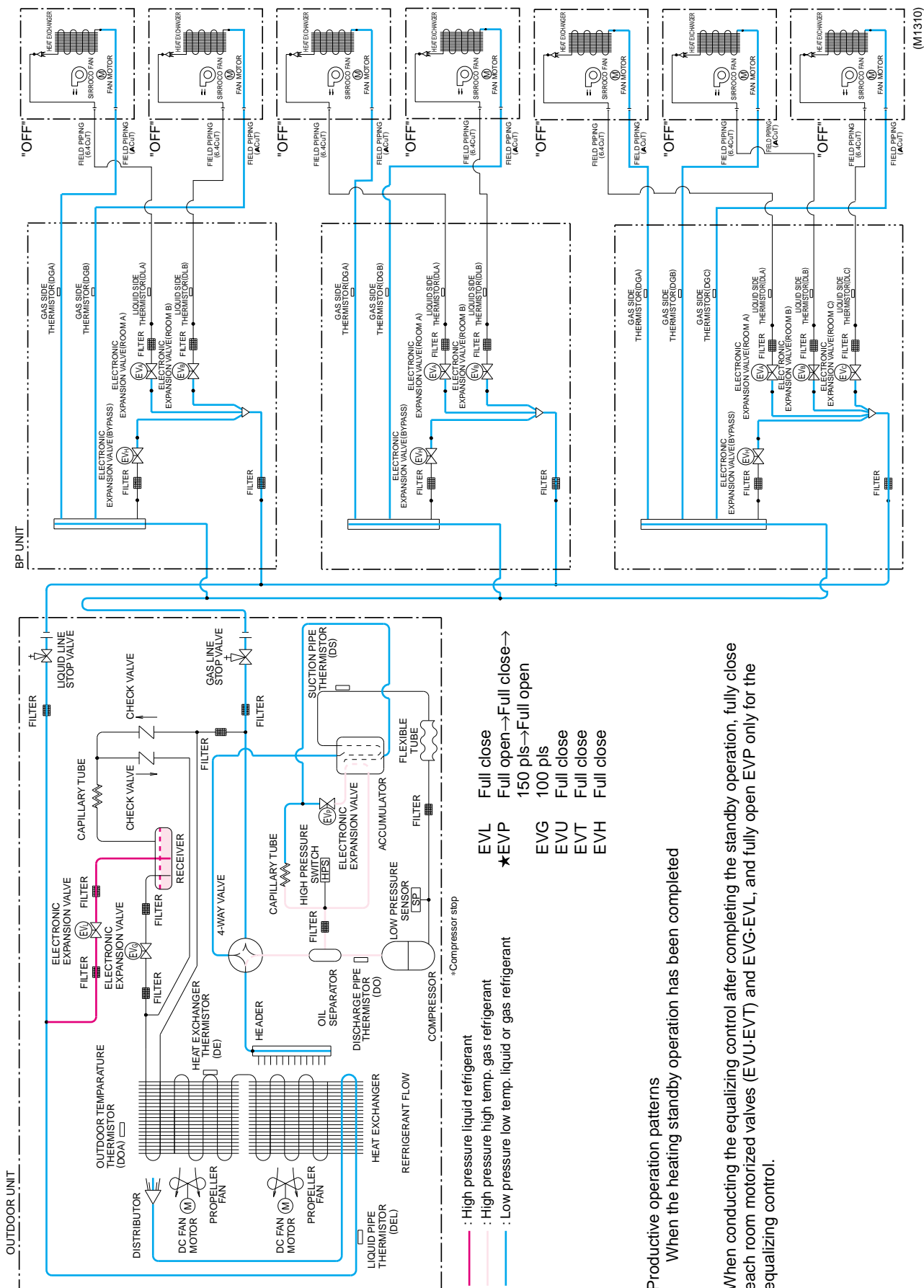
## 1.10 1-Room Operation — Indoor Unit with Small Capacity (2.5 kW) (Cooling)



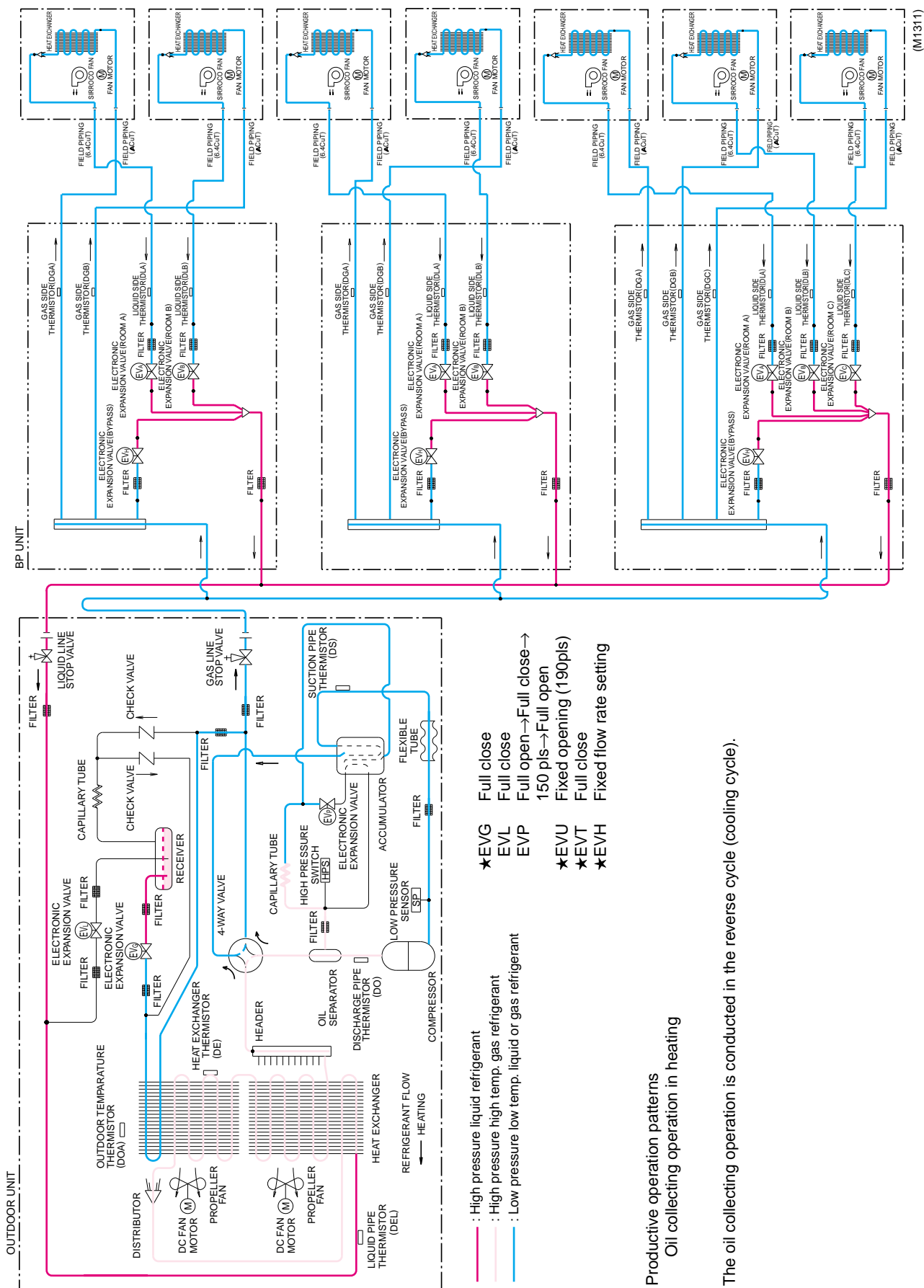
## 1.11 Standby Operation (Heating)



## 1.12 Equalizing Control (Heating)



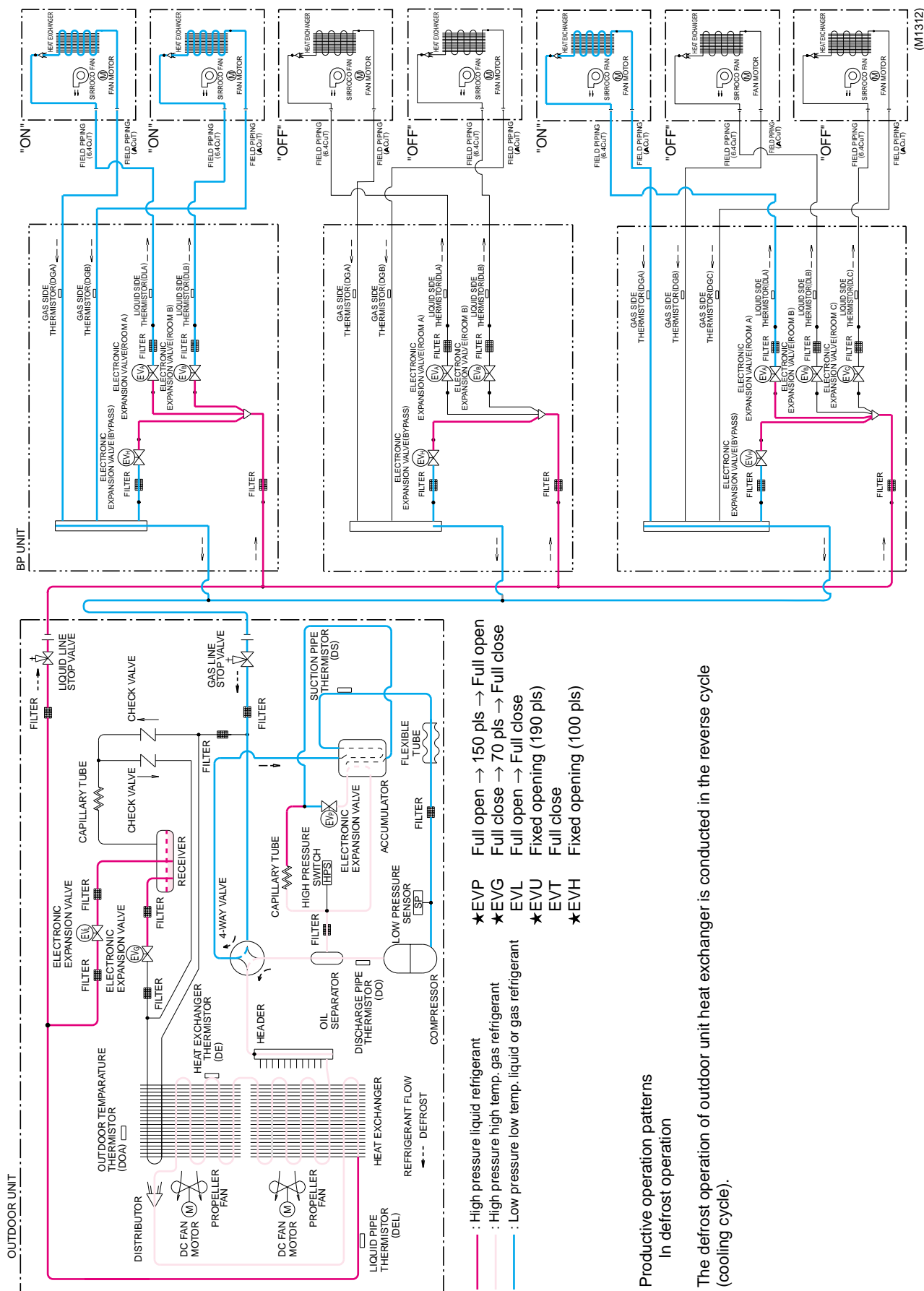
### 1.13 Oil Return Operation (Heating)



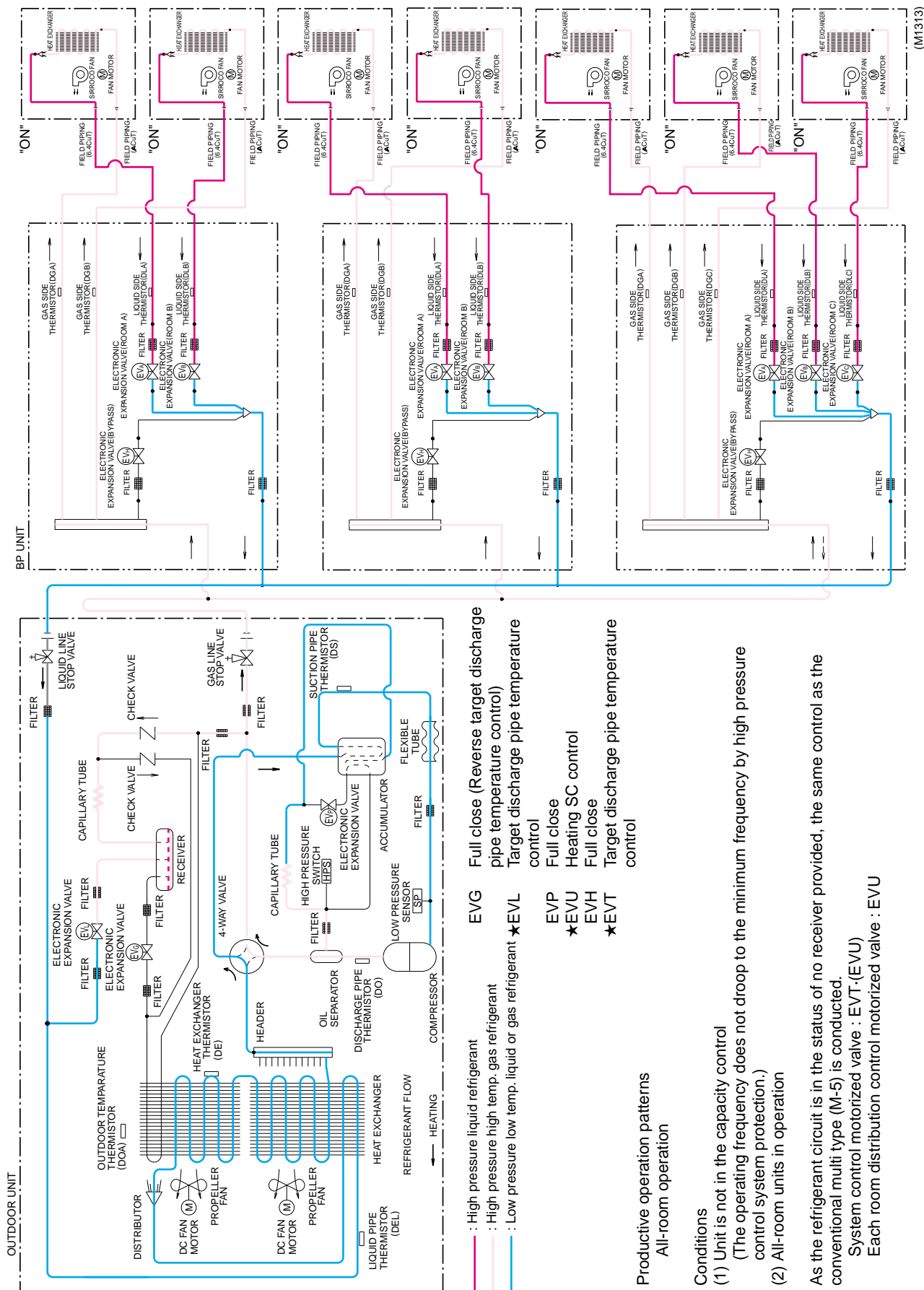
Productive operation patterns  
Oil collecting operation in heating

The oil collecting operation is conducted in the reverse cycle (cooling cycle).

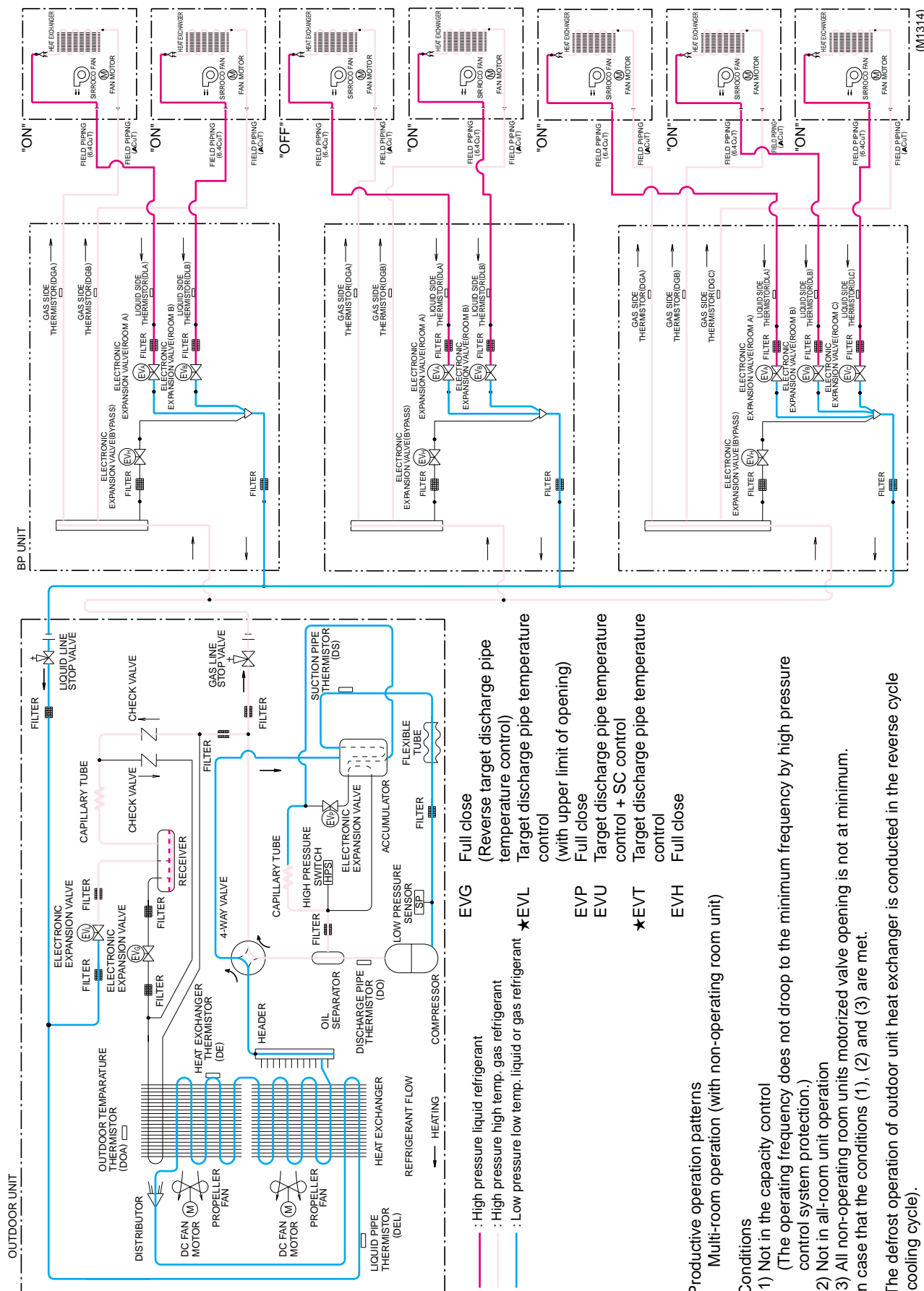
## 1.14 Defrost Operation



### 1.15 All-Room Operation (Heating)

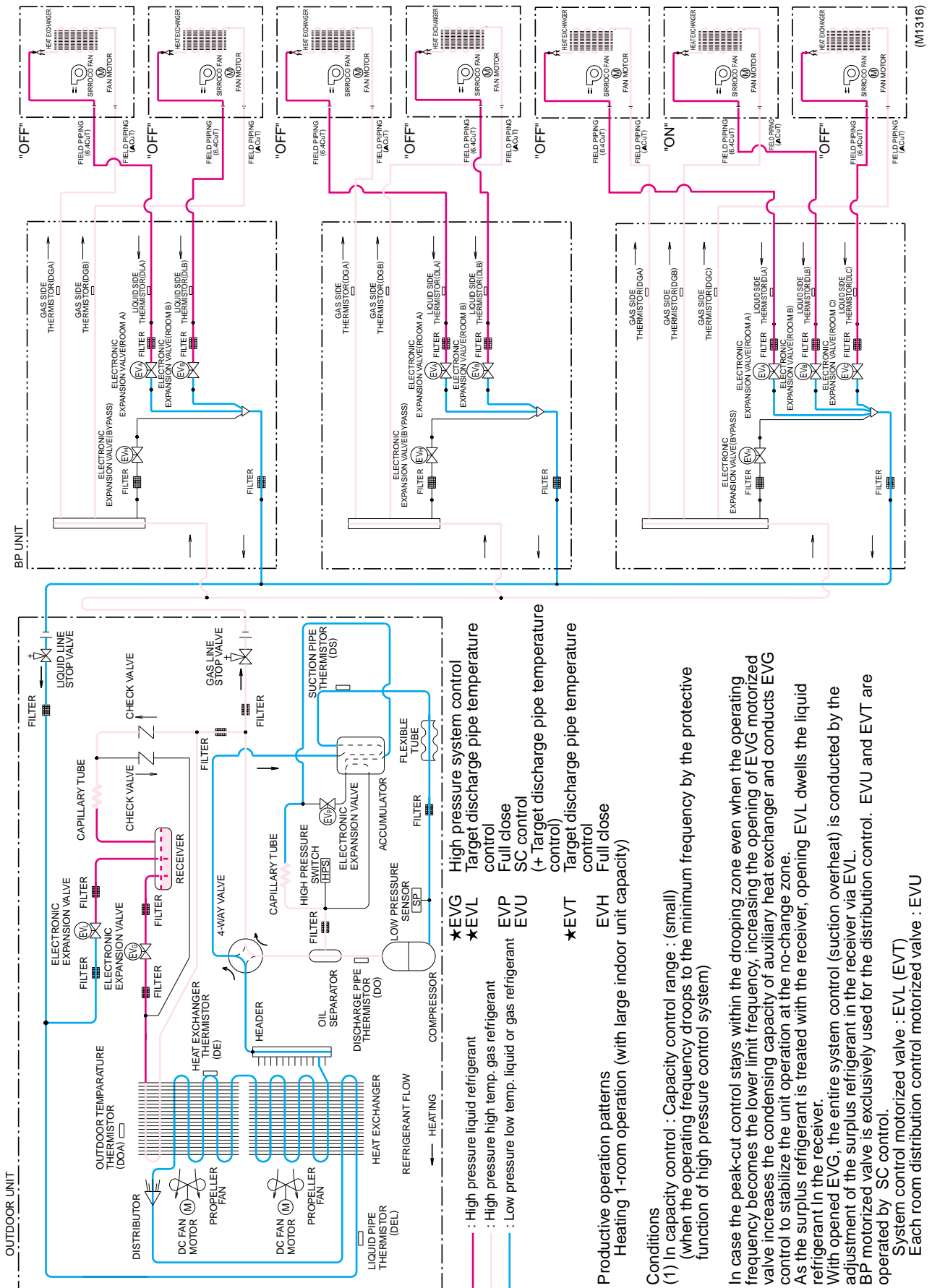


### 1.16 Multi-Room Operation (with non-Operating Room Unit) (Heating)

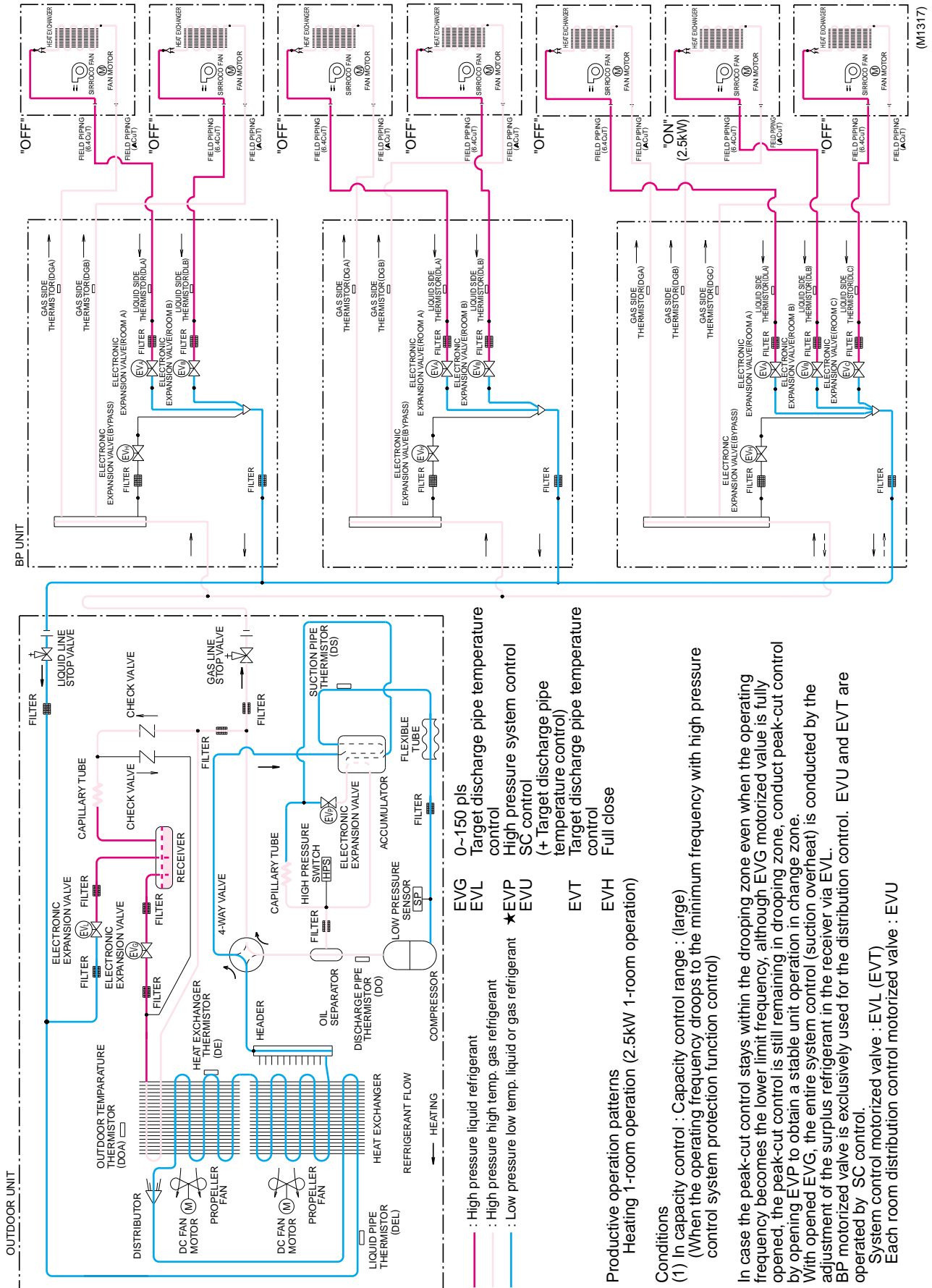




### 1.18 1-Room Operation — Indoor Unit with Large Capacity (Heating)



## 1.19 1-Room Operation — Indoor Unit with Small Capacity (2.5 kW) (Heating)



# Part 7

## Operations

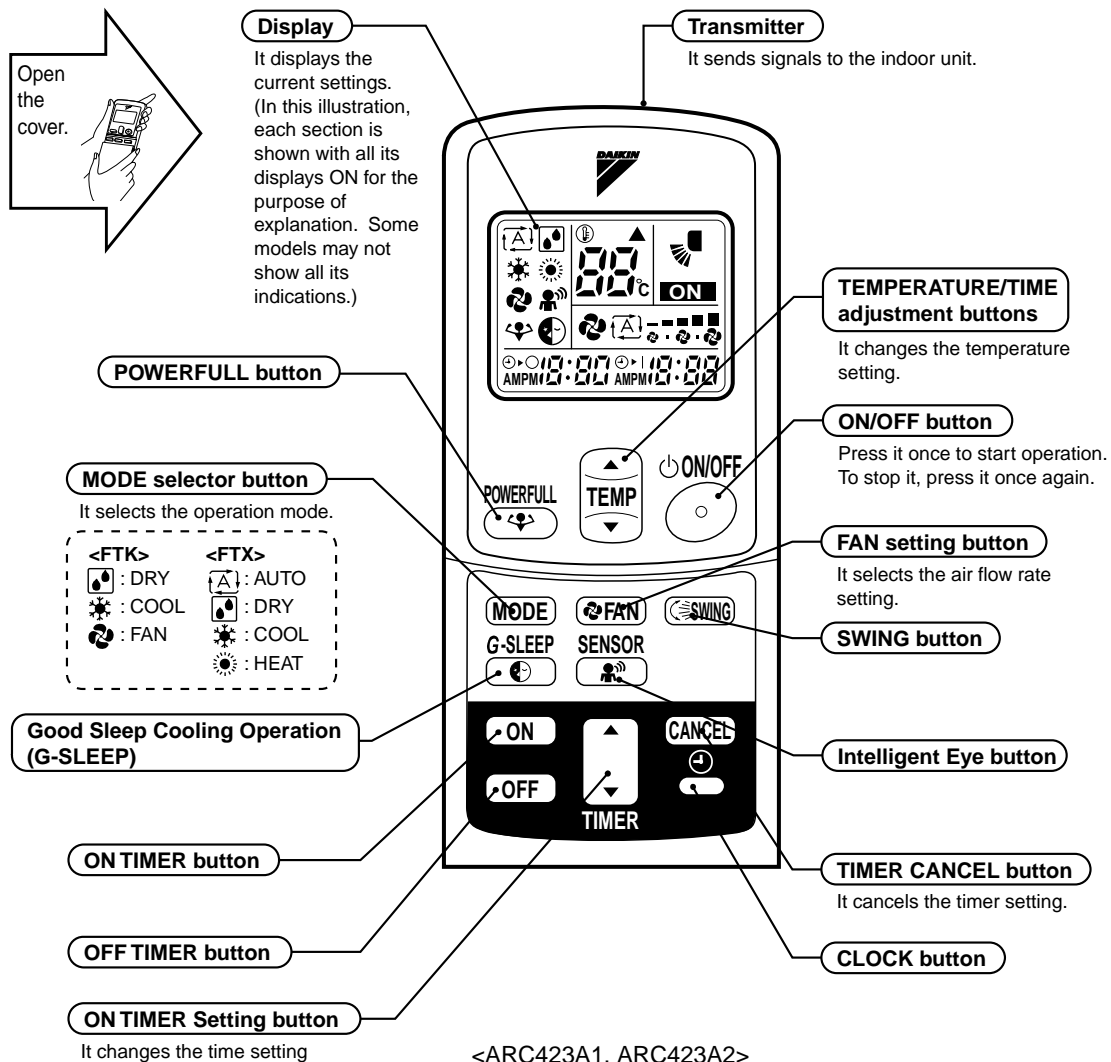
1. Remote Controller .....	192
1.1 Wireless Remote Controller .....	192
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The RMK140JAVM specifications are special. Refer to <RMK140JAVM's important points> (on page ii) for the changes in contents.

# 1. Remote Controller

## 1.1 Wireless Remote Controller

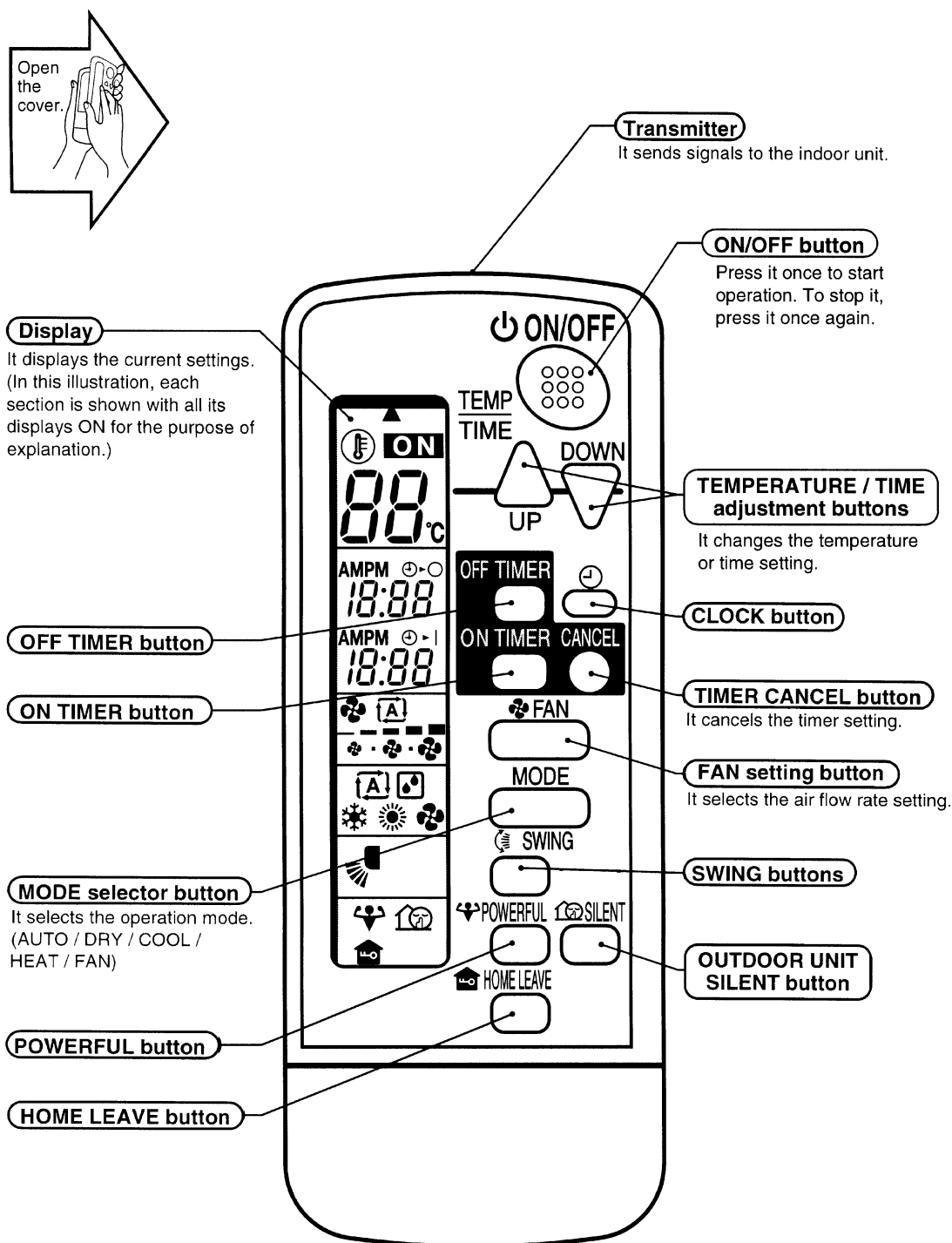
### 1.1.1 FTK, FTX25 / 35J



<ARC423A1, ARC423A2>

\*ARC423A3, ARC423A2 for FTK25 / 35JVEC, FTX25 / 35JVEC.

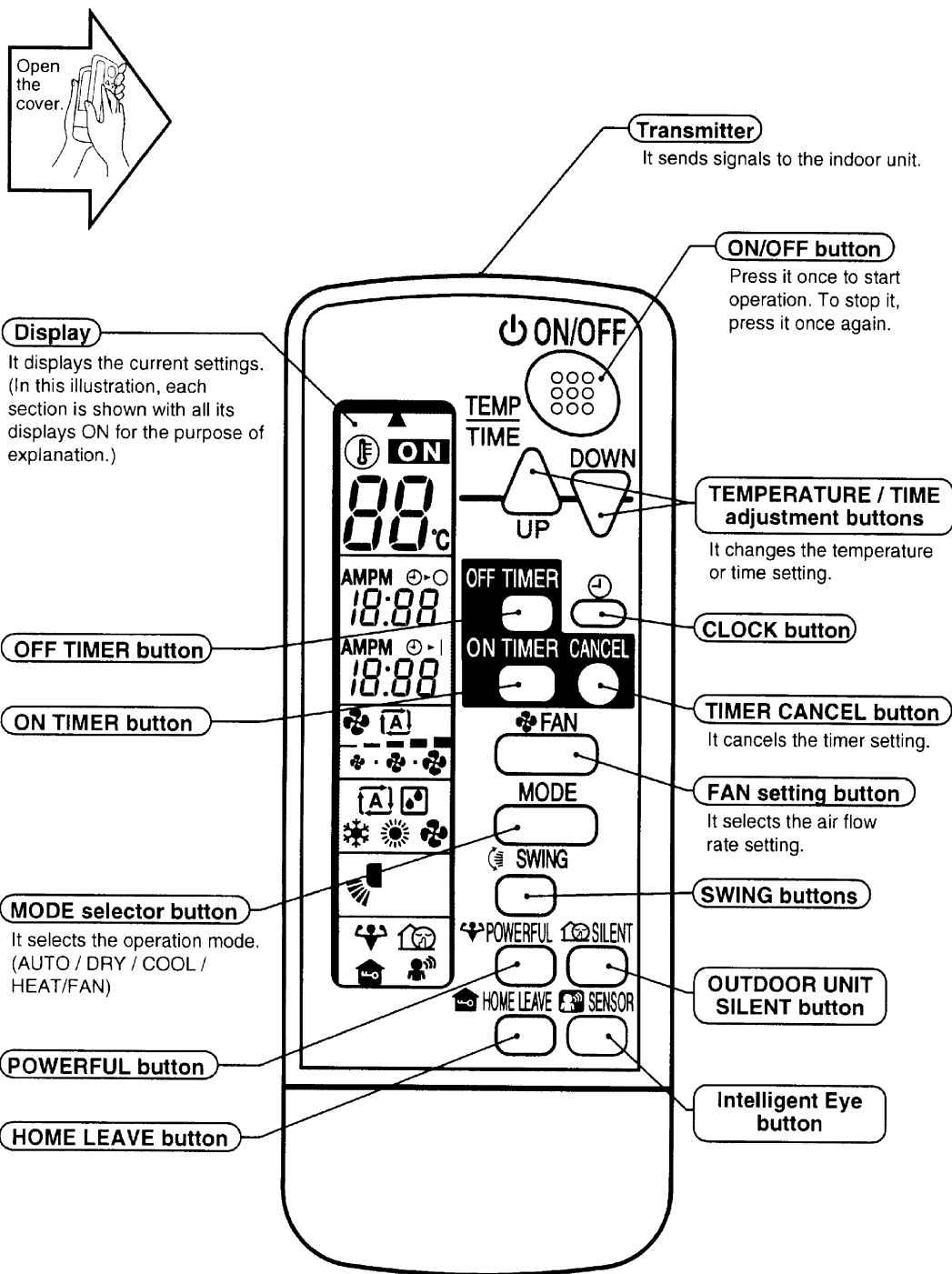
## 1.1.2 FVX25 / 35KZ



<ARC417A16, ARC417A17>

(Q0331)

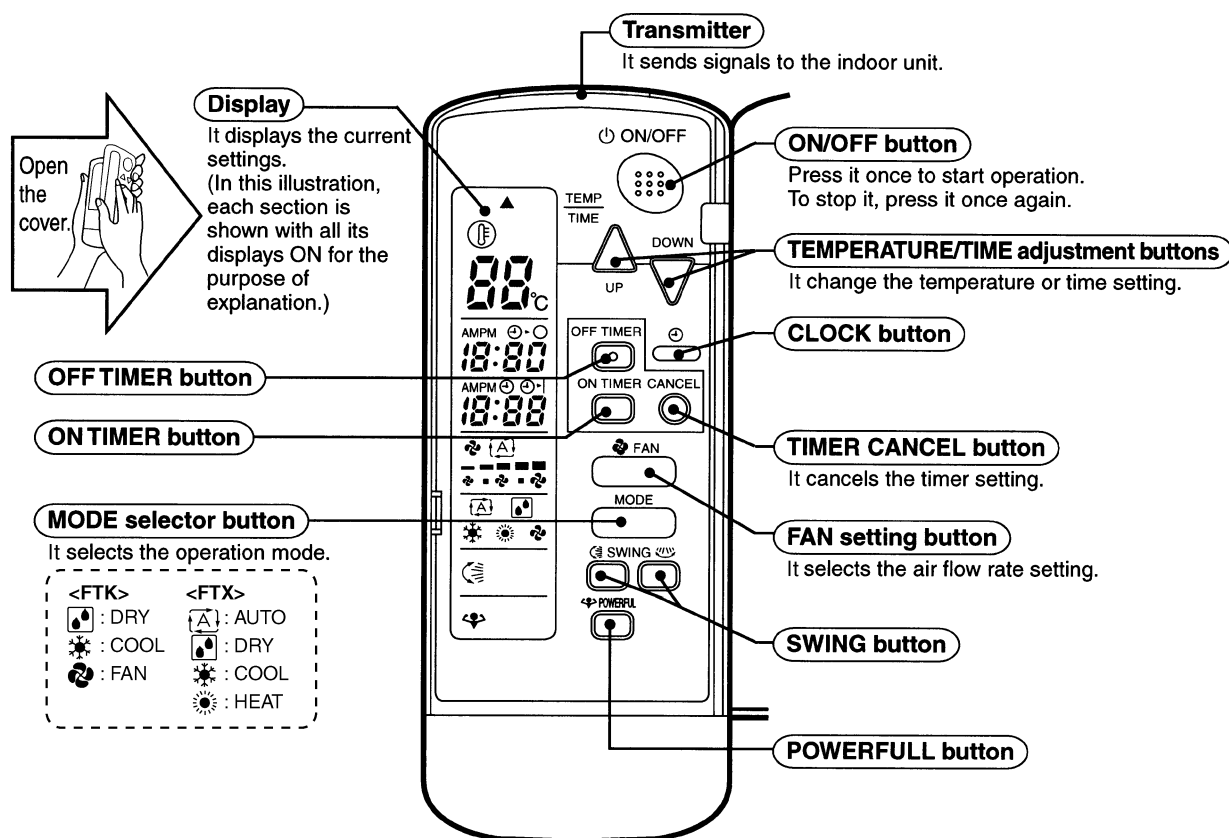
### 1.1.3 FTXD25 / 35KZ



<ARC417A18,ARC417A19>

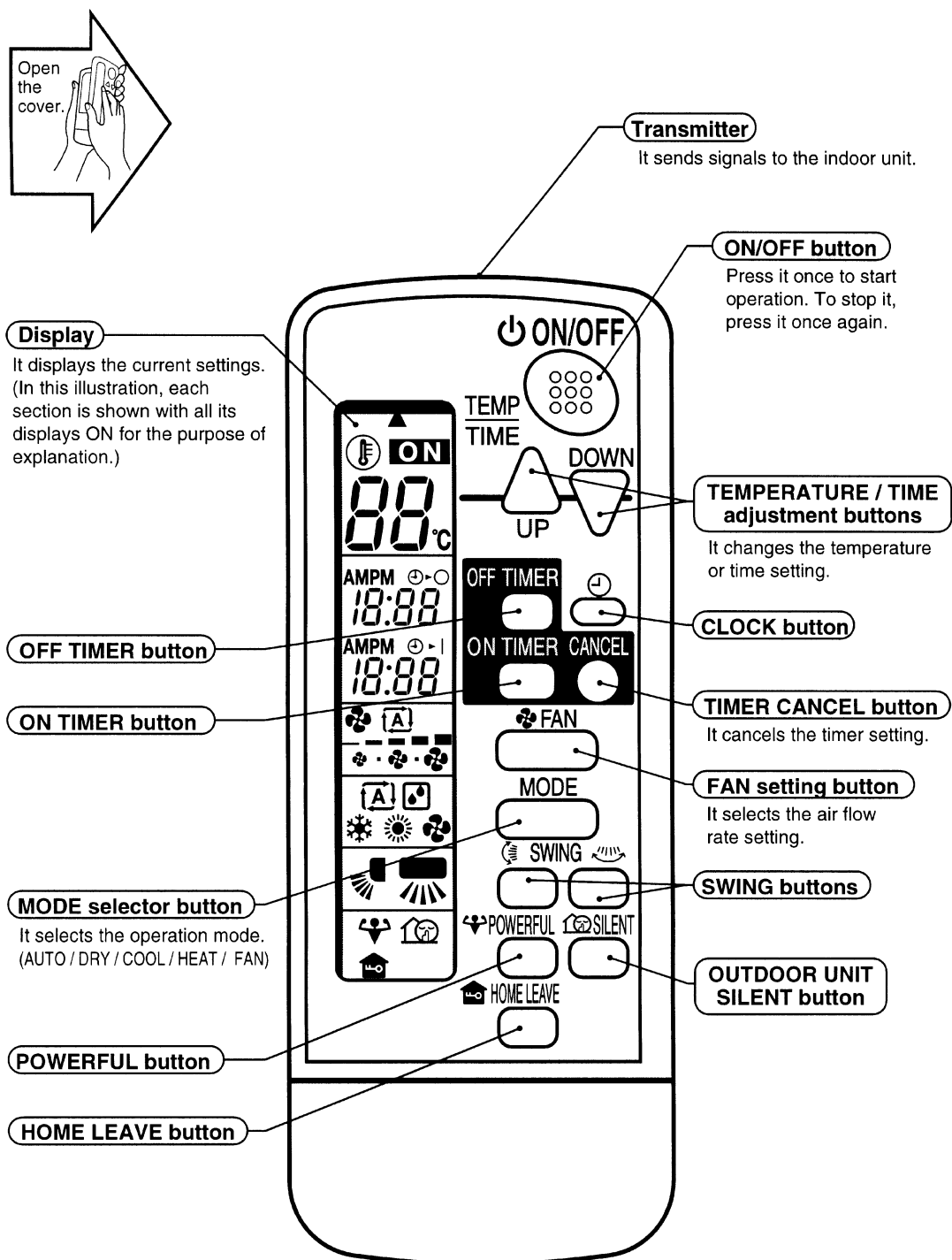
(Q0330)

### 1.1.4 FTK, FTX50 / 60H



<ARC417A4>

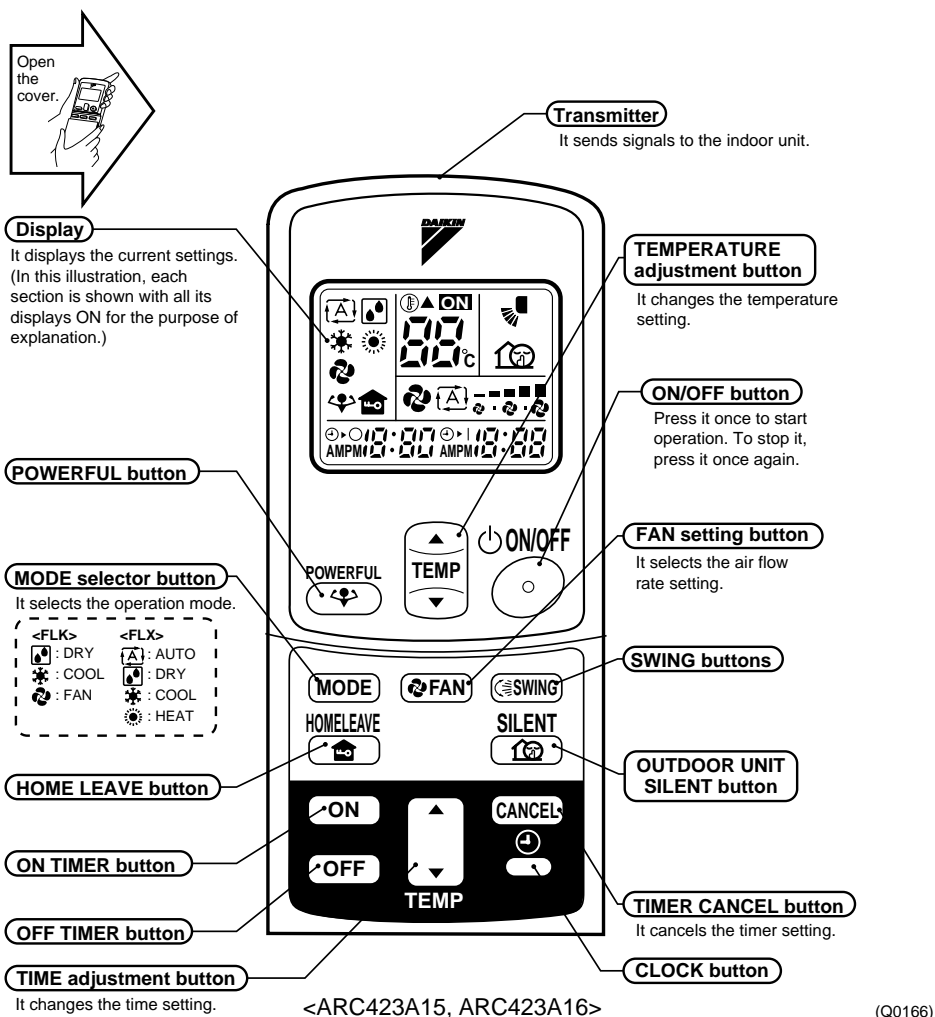
## 1.1.5 FTKD, FTXD50 / 60 / 71J



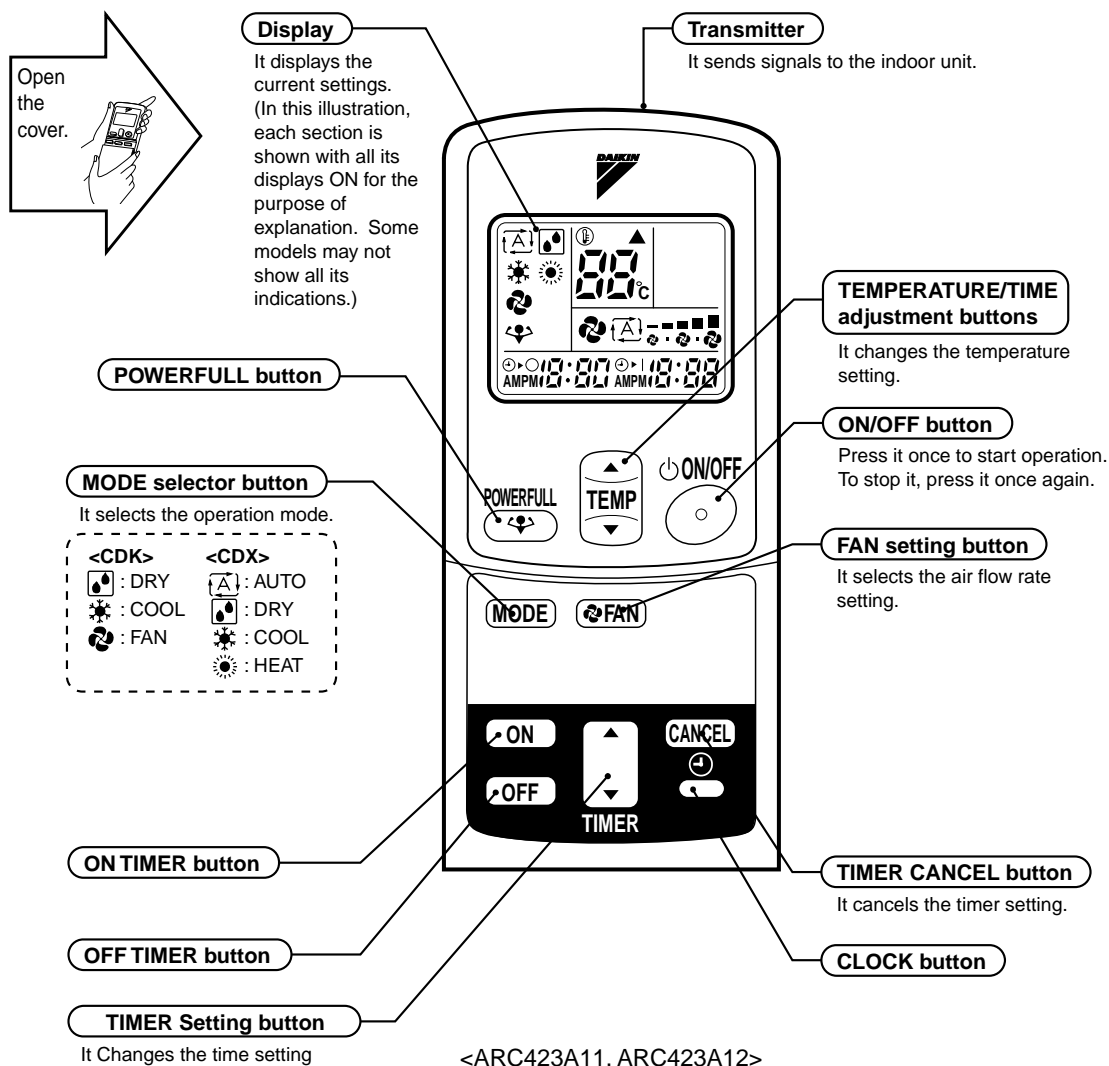
&lt;ARC417 A15 &gt;

(Q0163)

## 1.1.6 FLK, FLX50 / 60J

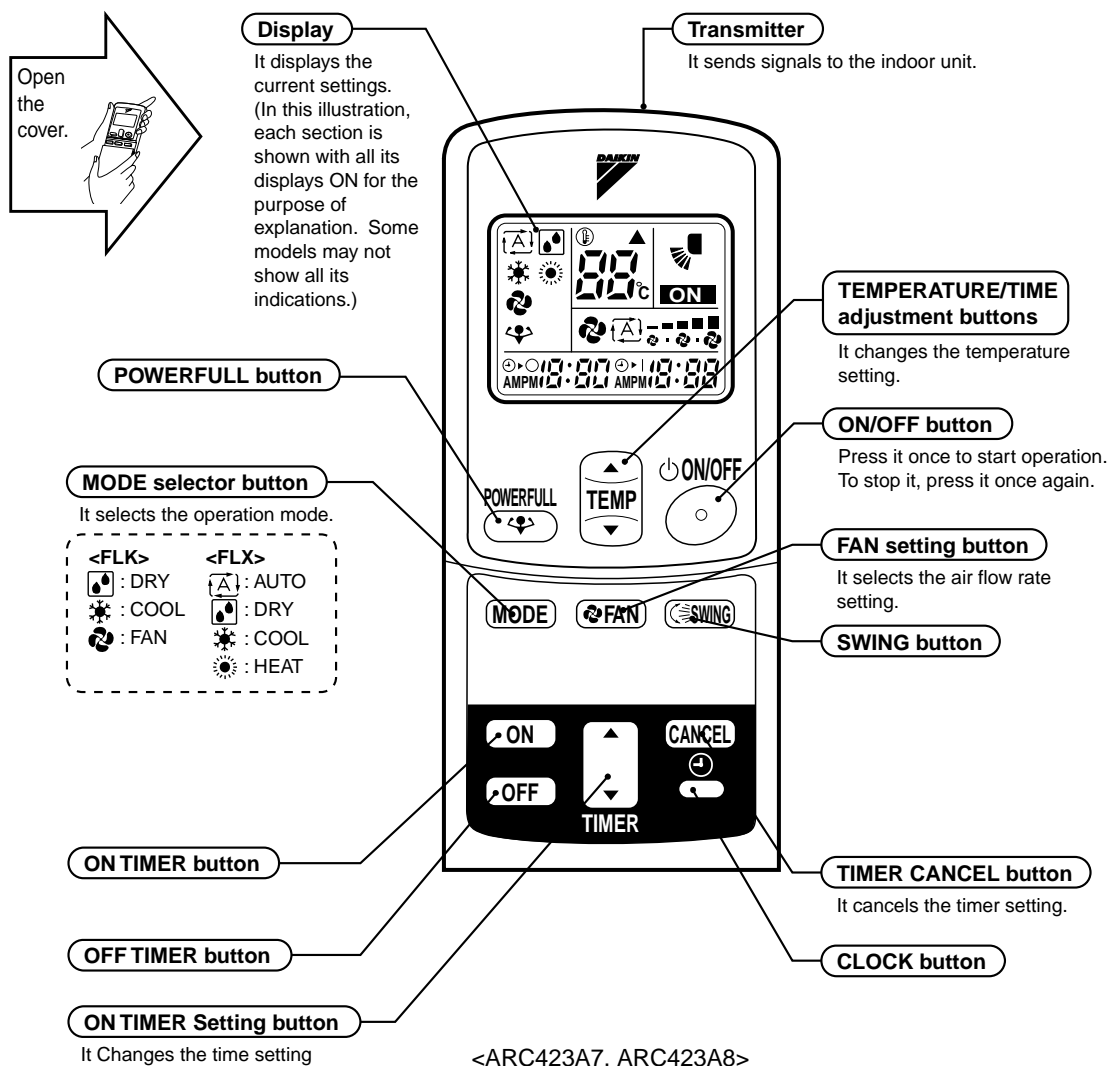


### 1.1.7 CDK25 / 35 / 50 / 60HA, CDX25 / 35 / 50 / 60J



\*ARC423A13, ARC423A14 for CDK25 / 35 / 50 / 60HAVEC, CDX25 / 35 / 50 / 60HAVEC

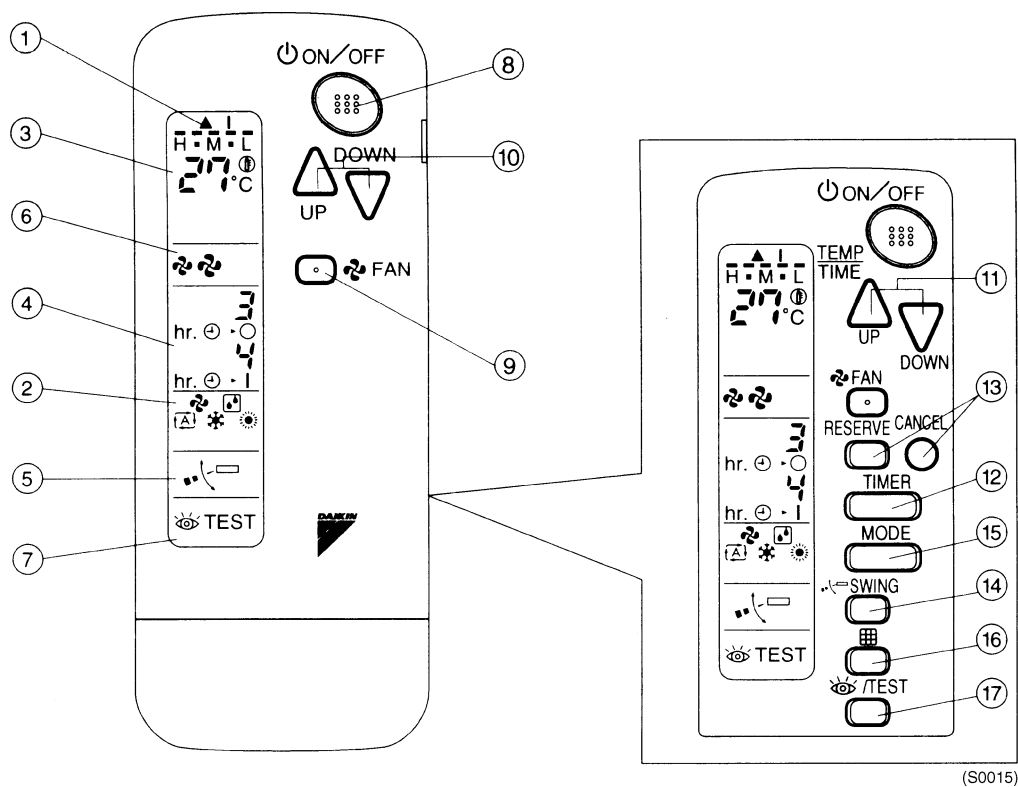
## 1.1.8 FLK, FLX25 / 35 / 50 / 60H



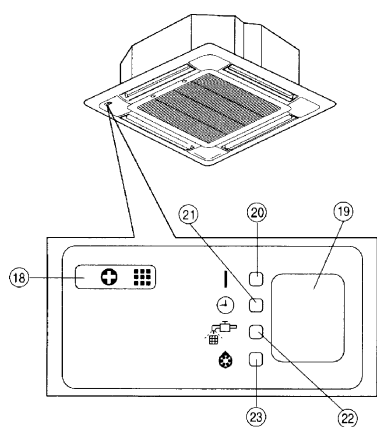
\*ARC423A9, ARC423A10 for FLK25 / 35 / 50 / 60HVEC, FLX25 / 35 / 50 / 60HVEC

## 1.1.9 FHYC35 / 50 / 60 / 71K (Optional Accessory)

BRC7C612WC

















(S0015)



(S0016)

## NAMES AND FUNCTIONS OF THE OPERATING SECTION

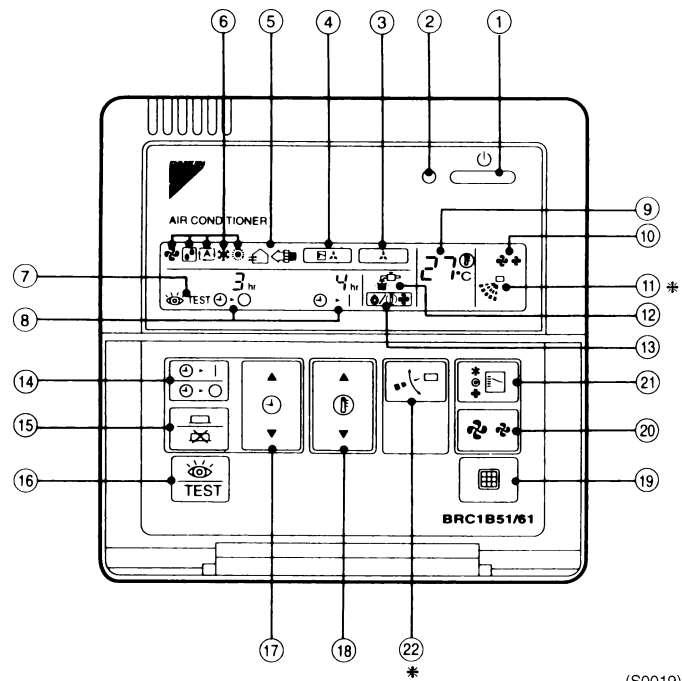
①	<b>DISPLAY “▲” (SIGNAL TRANSMISSION)</b> This lights up when a signal is being transmitted.	⑭	<b>AIR FLOW DIRECTION ADJUST BUTTON</b>
②	<b>DISPLAY “ “ “ “ “” (OPERATION MODE)</b> This display shows the current OPERATION MODE. For straight cooling type, “  ” (Auto) and “  ” (Heating) are not installed.	⑮	<b>OPERATION MODE SELECTOR BUTTON</b> Press this button to select OPERATION MODE.
③	<b>DISPLAY “” (SET TEMPERATURE)</b> This display shows the set temperature.	⑯	<b>FILTER SIGN RESET BUTTON</b> Refer to the section of MAINTENANCE in the operation manual attached to the indoor unit.
④	<b>DISPLAY “ ” (PROGRAMMED TIME)</b> This display shows PROGRAMMED TIME of the system start or stop.	⑰	<b>INSPECTION/TEST OPERATION BUTTON</b> This button is used only by qualified service persons for maintenance purposes.
⑤	<b>DISPLAY “” (AIR FLOW FLAP)</b>	⑱	<b>EMERGENCY OPERATION SWITCH</b> This switch is readily used if the remote controller does not work.
⑥	<b>DISPLAY “ “” (FAN SPEED)</b> The display shows the set fan speed.	㉑	<b>RECEIVER</b> This receives the signals from the remote controller.
⑦	<b>DISPLAY “ TEST” (INSPECTION/TEST OPERATION)</b> When the INSPECTION/TEST OPERATION BUTTON is pressed, the display shows the system mode is in.	㉒	<b>OPERATING INDICATOR LAMP (Red)</b> This lamp stays lit while the air conditioner runs. It flashes when the unit is in trouble.
⑧	<b>ON/OFF BUTTON</b> Press the button and the system will start. Press the button again and the system will stop.	㉓	<b>TIMER INDICATOR LAMP (Green)</b> This lamp stays lit while the timer is set.
⑨	<b>FAN SPEED CONTROL BUTTON</b> Press this button to select the fan speed, HIGH or LOW, of your choice.	㉔	<b>AIR FILTER CLEANING TIME INDICATOR LAMP (Red)</b> Lights up when it is time to clean the air filter.
⑩	<b>TEMPERATURE SETTING BUTTON</b> Use this button for SETTING TEMPERATURE (Operates with the front cover of the remote controller closed.)	㉕	<b>DEFROST LAMP (Orange)</b> Lights up when the defrosting operation has started. (For straight cooling type this lamp does not turn on.)
⑪	<b>PROGRAMMING TIMER BUTTON</b> Use this button for programming “START and/or STOP” time. (Operates with the front cover of the remote controller opened.)	(NOTE) ● For the sake of explanation, all indications are shown on the display in Figure contrary to actual running situations. ● If the air filter cleaning time indicator lamp lights up, clean the air filter as explained in the operation manual provided with the indoor unit. After cleaning and reinstalling the air filter, press the filter sign reset button on the remote controller. The air filter cleaning time indicator lamp on the receiver will go out.	
⑫	<b>TIMER MODE START/STOP BUTTON</b>		
⑬	<b>TIMER RESERVE/CANCEL BUTTON</b>		

## 1.2 Wired Remote Controller

### 1.2.1 FHYC35 / 50 / 60 / 71K (Optional Accessory)

BRC1B61

REMOTE CONTROLLER

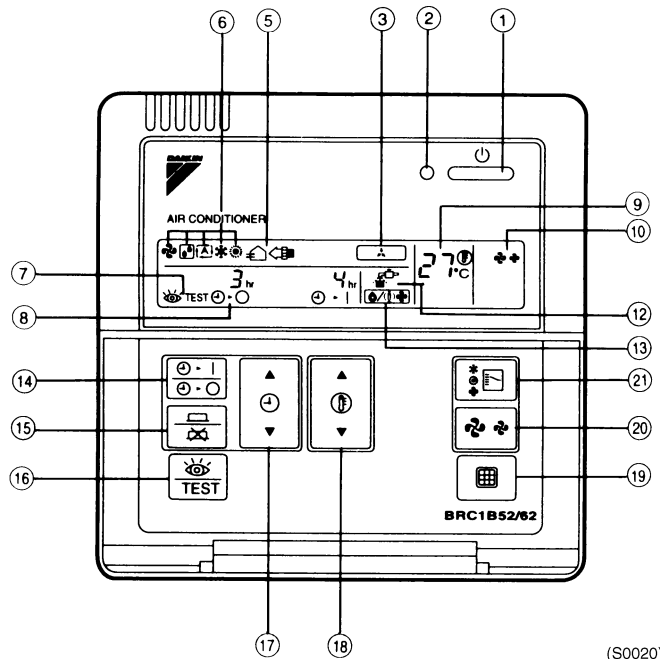


(S0019)

### 1.2.2 FDYM60 / 03F (Standard Accessory)





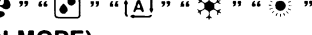









BRC1B62

REMOTE CONTROLLER



(S0020)

## NAME AND FUNCTION OF EACH SWITCH AND DISPLAY ON THE REMOTE CONTROLLER

①	<b>ON/OFF BUTTON</b> Press the button and the system will start. Press the button again and the system will stop.	⑬	<b>DISPLAY “” (DEFROST)</b>
②	<b>OPERATION LAMP (RED)</b> The lamp lights up during operation.	⑭	<b>TIMER MODE START/STOP BUTTON</b>
③	<b>DISPLAY “” (UNDER CENTRALIZED CONTROL)</b> When this display shows, the system is UNDER CENTRALIZED CONTROL. (This is not a standard specification.)	⑮	<b>TIMER ON/OFF BUTTON</b>
④	<b>DISPLAY “” (CHANGEOVER UNDER CONTROL)</b> This display shows when the outdoor unit is individual operation system.	⑯	<b>INSPECTION/TEST OPERATION BUTTON</b> This button is used only by qualified service persons for maintenance purposes.
⑤	<b>DISPLAY “” (VENTILATION/AIR CLEANING)</b> This display shows that the total heat exchange and the air cleaning unit are in operation. (These are optional accessories).	⑰	<b>PROGRAMMING TIME BUTTON</b> Use this button for programming “START and/or STOP” time.
⑥	<b>DISPLAY “” (OPERATION MODE)</b> This display shows the current OPERATION MODE. For straight cooling type, “  ” (Auto) and “  ” (Heating) are not installed.	⑱	<b>TEMPERATURE SETTING BUTTON</b> Use this button for SETTING TEMPERATURE.
⑦	<b>DISPLAY “ TEST ” (INSPECTION/TEST OPERATION)</b> When the INSPECTION/TEST OPERATION BUTTON is pressed, the display shows the system mode is in.	⑲	<b>FILTER SIGN RESET BUTTON</b>
⑧	<b>DISPLAY “ hr  hr ” (PROGRAMMED TIME)</b> This display shows PROGRAMMED TIME of the system start or stop.	⑳	<b>FAN SPEED CONTROL BUTTON</b> Press this button to select the fan speed, HIGH or LOW, of your choice.
⑨	<b>DISPLAY “ °C ” (SET TEMPERATURE)</b> This display shows the set temperature.	㉑	<b>OPERATION MODE SELECTOR BUTTON</b> Press this button to select OPERATION MODE.
⑩	<b>DISPLAY “ ” (FAN SPEED).</b> This display shows the set fan speed.	㉒	<b>AIR FLOW DIRECTION ADJUST BUTTON</b>
⑪	<b>DISPLAY “ ” (AIR FLOW FLAP)</b>	<b>(NOTE)</b> ● For the sake of explanation, all indications are shown on the display in Figure contrary to actual running situations.	
⑫	<b>DISPLAY “ ” (TIME TO CLEAN AIR FILTER)</b>		

(S0021)



# Part 8

## Operating Test

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The RMK140JAVM specifications are special. Refer to <RMK140JAVM's important points> (on page ii) for the changes in contents.

# 1. Operating Test

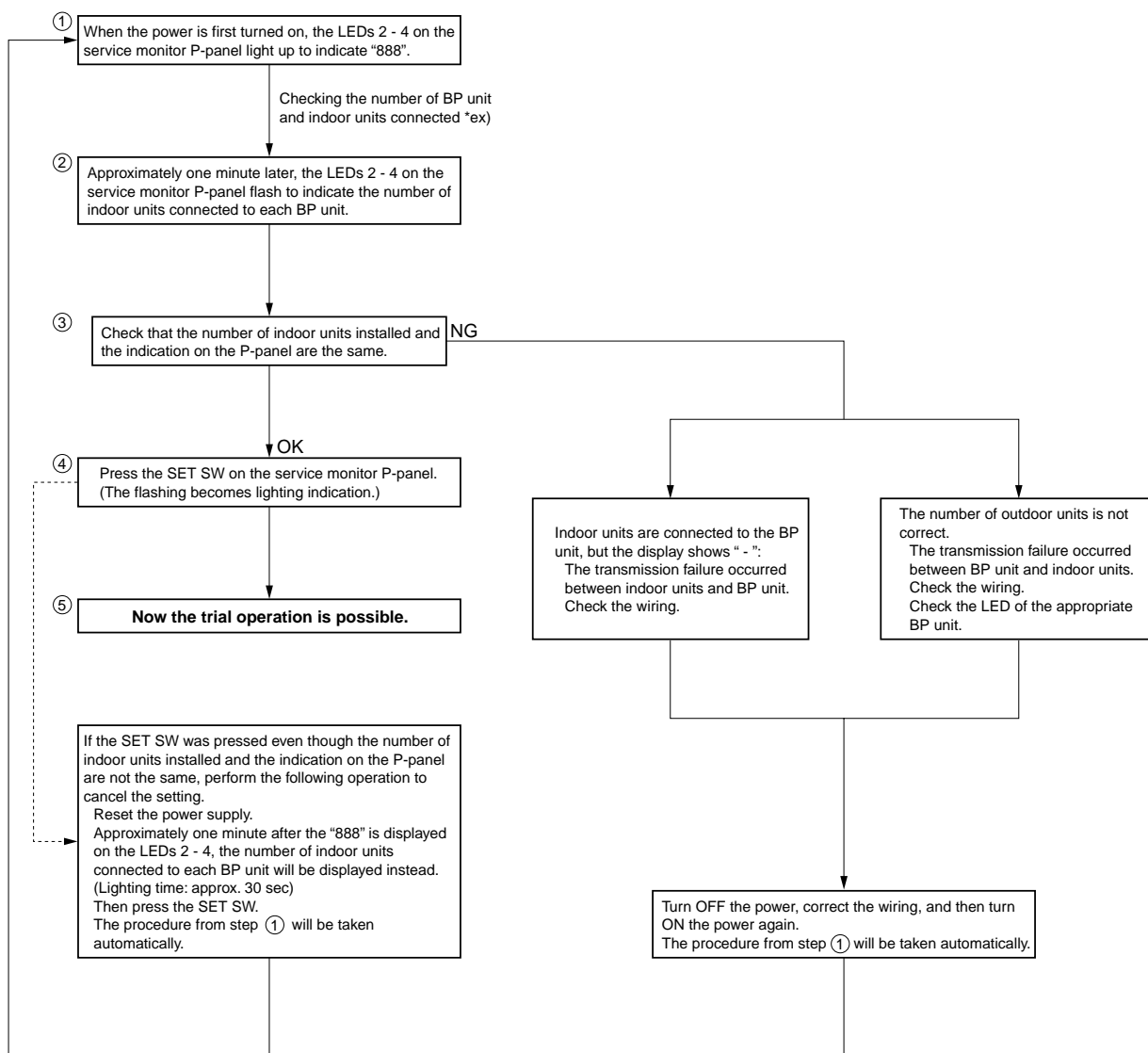
## 1.1 Operating Test

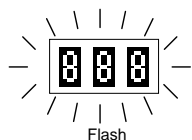
### 1 OPERATING TEST

#### Before performing a trial operation

\*Check the connection status.  
Be sure to carry out initial settings.

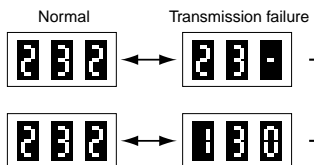
#### Check Flow





" " : BP unit unconnected, or transmission failure between outdoor units and BP unit  
 "Numeral value" : The number of indoor units connected to each BP unit

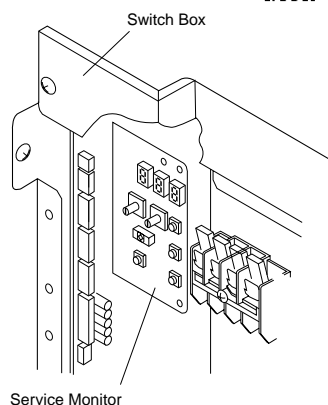
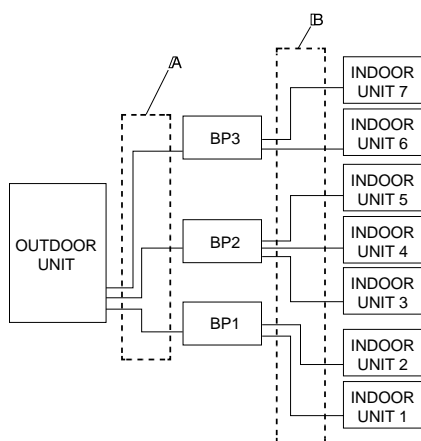
\*ex.) : Connect indoor units (2 rooms) to BP1.  
 Connect indoor units (3 rooms) to BP2.  
 Connect indoor units (2 rooms) to BP3.



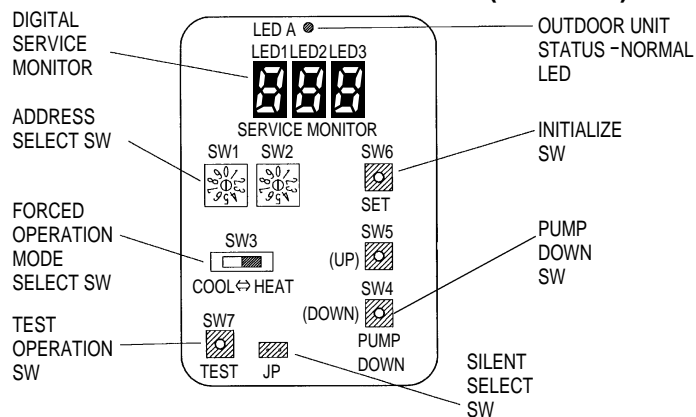
The indoor units for 2 rooms are connected to BP3, but the display indicates "BP unit unconnected." There is a transmission failure between outdoor units and BP unit.  
 Check the connecting wiring in part A in the diagram below.

The numbers of indoor units connected to BP1 and BP3 do not agree with the indication. There is transmission failures between BP units and indoor units.  
 Check the connecting wiring in part B in the diagram below.

\* When checking the connecting wiring, make sure the wire numbering is correct and that there are no numbers missing.



## SERVICE MONITOR RAYOUT (ON PCB)



1. Record the installation location of each BP unit in the centralized name plate attached to the front panel (2) of the indoor unit.  
↓
2. Open the liquid/gas closing valves.  
↓
3. Check for improper wiring and piping.  
With a remote controller, start the cooling operation in one single room only.  
(Operating condition: indoor/outdoor temperature of  $-5^{\circ}\text{C}$  or higher)  
Set the temperature to  $18^{\circ}\text{C}$ .  
After operating for 5 minutes, check that the temperature difference between inlet and outlet of the indoor unit is  $8^{\circ}\text{C}$  or higher.  
Likewise, perform the above step with all indoor units.  
If some improper wiring or piping is found, correct them, and then check again.  
\* Before the operation check is completed on one unit, start the operation of the next indoor unit to be checked so that some trial operation time can be saved. (If the trial operation is performed on every indoor unit one by one, since the compressor is stopped after each operation, it will take some time to restart for the next operation.)  
↓
4. After checking for improper piping and wiring, record the installation locations of indoor units connected to the BP unit in the wiring name plate attached to the BP main body.  
↓
5. After checking that all the piping and wiring is done properly, start the trial operation in heating mode.  
With a remote controller, perform the heating operation for all rooms. (Set the temperature to  $32^{\circ}\text{C}$ .)  
After operating for 60 minutes, check that the temperature difference between inlet and outlet is  $15^{\circ}\text{C}$  or higher.  
↓
6. Upon completion of the trial operation, stop the operation for all rooms with the remote controller.

Note: 1. When performing a trial operation, check that the indoor/outdoor temperatures satisfy the following conditions:  
Cooling:  $-5^{\circ}\text{C}$  or higher  
Heating:  $25^{\circ}\text{C}$  or lower  
2. For the pump down procedure, refer to the trouble diagnostic name plate attached to the front panel (2).

1P058917A
1P058918A

## INITIALIZE SETTING

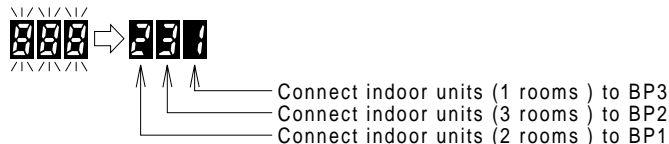
Check the number of indoor units connected to the BP unit before test operation. Press INITIALIZE SW[SW6] to make the setting.  
( "888" : Blinking → Number of connected units appears → Setting )

### <CAUTION>

The setting must be made in order to operate the unit. Cannot be operated unless BP1 is connected first. (Connect BP unit in order starting from BP1)

### [SETTING OPERATION]

After power is turned ON, "888" blinks in the digital display.  
After **1 minute**, the digital display will show the following information.



If the unit correctly displays the number of connected rooms, press SW6 to make the setting.

### <CAUTION>

#### 1) Transmission error display

**-** : BP unconnected, or transmission failure between outdoor unit and BP unit.

#### 2) Set in spite of transmission error (Cancel setting)

- ① Reset the power supply.
- ② Approximately 1 minute after the "888" is displayed on the LEDs 2-4, number of indoor units connected to each BP unit will be displayed instead. (Lighting time : Approx. 30 sec)
- ③ Then press the SET SW[SW6].

## 1.2 Test Operation Switch

### TEST OPERATION SWITCH [SW7]

Press the FORCED OPERATION SWITCH [SW7]

After selecting the COOL/HEAT SWITCH [SW3]

<CAUTIONS>

- 1) Test operation stops automatically in about **60 minutes**.
- 2) Cooling test operation cannot be performed if the outside air temperature is **-5°C or lower**
- 3) Operate SkyAir indoor unit in the same mode.

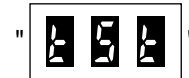
[TO CONTINUE TEST OPERATION]

Press the TEST SW [SW7] again.

[TO RESET TEST OPERATION]

Press the TEST SW [SW7], wait at least 3 seconds and press the TEST SW again.

Digital display:



Blinking

(Q0001)

## 1.3 Pump Down Operation Switch


1. Close the liquid side stop valve of outdoor unit.
2. Pump down

### PUMP DOWN OPERATION SWITCH [SW4]

Press the PUMP DOWN OPERATION SWITCH [SW4]

PUMP DOWN OPERATION STOPS when LP (Low Pressure) COMES TO **0.5kg/cm<sup>2</sup>**, or automatically in about **8 minutes**.

<CAUTIONS>

- 1) If the LP is **1kg/cm<sup>2</sup>** or less, the LP display blinks.
- 2) If the LP fails to drop below the specified level within the specified time during pump down operation,  appears in the display. (This means that the outside air is low and the pipes are long and cold.) Repeat the pump down operation.

Digital display:



After "Pd\_" Blinks in the digital display, the LP (Low Pressure) indicator activates.

<CAUTIONS>

After all indoor units have stopped, PUMP DOWN is performed for the next operation.

[Approx. **5 minutes**]

(Q0002)

3. Close the gas side stop valve of outdoor unit after completion of pump down procedure.
4. After completion of repair works for site piping, BP units or indoor units, make sure to open gas and liquid side stop valves.

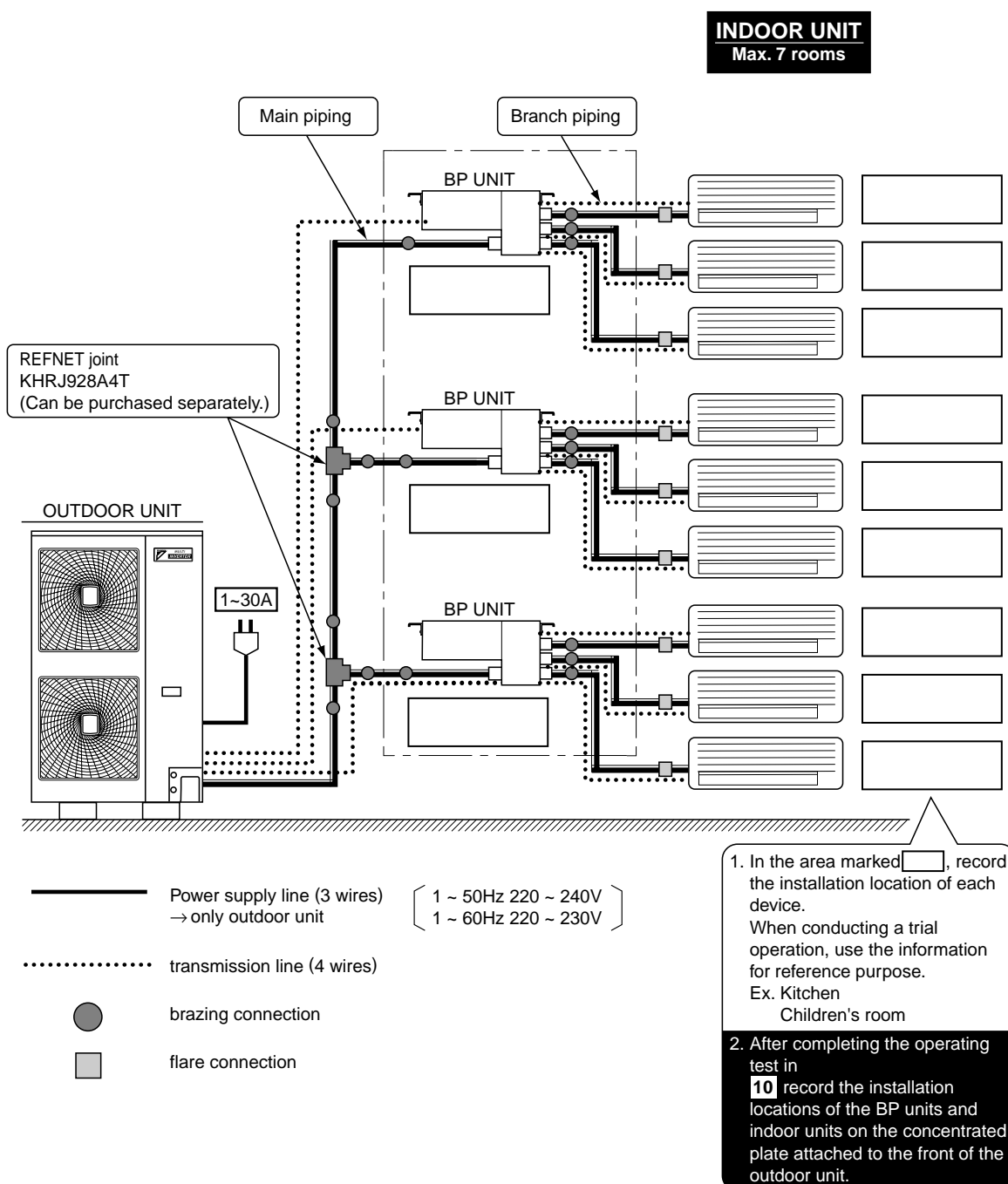
## 1.4 Record of the Installation Position

Be sure to enter the system unit installation position.

### 1 SYSTEM LAYOUT

BP unit model  
FOR 3 rooms : BPMK928A43  
FOR 2 rooms : BPMK928A42

Do not connect more than 7 indoor units together. Choose the BP unit type (2 rooms or 3 rooms) according to the installation pattern.



## 2. Method of Field Set

### 2.1 Field Setting

#### Wired Remote Controller

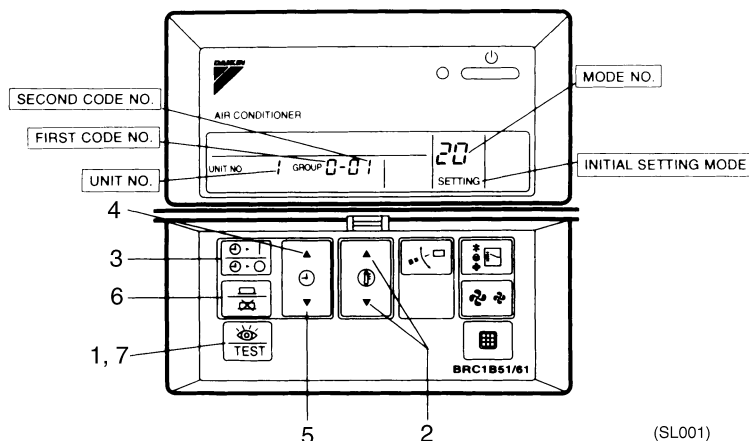

**Notes:**

(Field setting must be made from the remote controller in accordance with the installation conditions.)

- Setting can be made by changing the “Mode number”, “FIRST CODE NO.”, and “SECOND CODE NO.”.
- Refer to the following procedures for Field setting.

**Procedure**

1. Press the “ TEST” button for 4 seconds or more on normal mode to change to “FIELD SETTING MODE”
2. Press the “ ” button and choose the desired “MODE NO.”.
3. If the unit is under group control, it is unified set (factory set). However, if setting on each indoor unit bases or confirming after the setting, use the MODE NO. in the ( ) for the setting. Under group control, press the “ ” button and select the indoor unit no. that you are setting to set on each indoor unit bases.  
(Unnecessary at unified setting of group control and the UNIT NO. is not displayed)
4. Press the “ ” upper part of the button and select the “FIRST CODE NO.”.
5. Press the “ ” lower part of the button and select the “SECOND CODE NO.”.
6. Press the “ ” button once to FIX the change of the setting.
7. Press the “ TEST” button for about one second and return to the “NORMAL MODE”



(SL001)

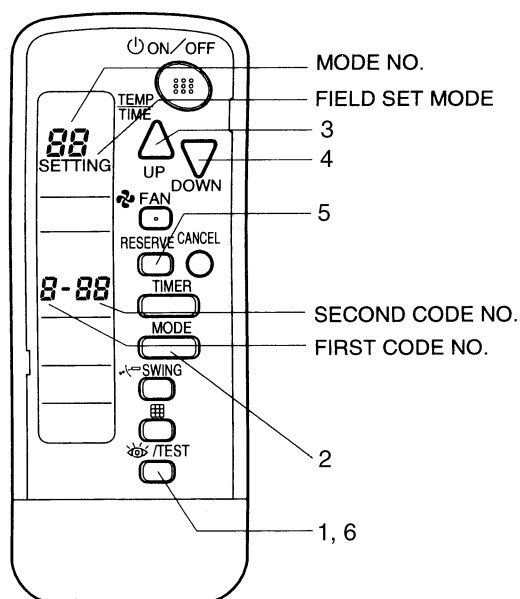
## Wireless Remote Controller



**Note:** If optional accessories are mounted on the indoor unit, the indoor unit setting may have to be changed. Refer to the instruction manual (optional hand book) for each optional accessory.

### Procedure

1. When in the normal mode, push the “ /TEST ” button for a minimum of four seconds, and the FIELD SET MODE is entered.
2. Select the desired MODE NO. with the “ ” button.
3. Push the “ ” button and select the FIRST CODE NO.
4. Push the “ ” button and select the SECOND CODE NO.
5. Push the “ ” button and the present settings are SET.
6. Push the “ /TEST ” button to return to the NORMAL MODE.



(SL002)

### 2.1.1 Initial Setting Contents

Setting Contents		Filter Sign	Filter Sign Estimation of Accumulated Operating Hours	High Air Outlet Velocity (for Application to Ceiling Higher than 2.7m)	Selection of Air Flow Direction	Air Flow Direction Adjust	Air Flow Direction Adjust Range Setting	Twin System No. of Connected Indoor Units	Twin System Individual Set	External Static Pressure	Long Life Filter Type	Fan Speed Up
Indoor Models												
Ceiling Mounted Cassette Type	(H/P) FHYC 35~140	○	○	○	○		○	○	○		○	
Ceiling Mounted Built-in Type	(H/P) FDYM 60~03	○	○							○	○	



**Note:** A heat pump type indoor unit is used for cooling only twin system in case of using ceiling mounted cassette and ceiling suspended types.

## 2.1.2 Local Setting Mode No.

### Example

To set the filter sign time to “filter contamination - heavy” for all units in a group:  
Set mode No. to “10,” setting switch No. to “0,” and setting position No. to “02.”

**Table**

Mode No. Note 1	Setting Switch No.	Setting Description		Setting Position No. *Note 2				
				01		02		03
10(20)	0	Filter contamination - heavy / light (Setting of operating hours for filter sign indication) (Change setting when reducing filter sign indication time to half due to quick soiling of filter)	Ultra-Long-Life Type	Light	Approx. 10,000 hours	Heavy	Approx. 5,000 hours	—
			Long-Life Type		Approx. 2,500 hours		Approx. 1,250 hours	
			Standard Type		Approx. 200 hours		Approx. 100 hours	
	1	Long-life filter type (Setting of filter sign indication time) (Change setting when Ultra-long-life filter is installed)		Long-Life Filter		Ultra-Long-Life Filter (1)		Setting Description Ultra-Long-Life Filter (2)
	3	Estimation of filter operating hour (Change setting when filter sign indication is not used)		ON		OFF		—
11(21)	0	No. of Sky Air indoor units connected for simultaneous ON-OFF multi system (Change setting when simultaneous operation multi system is used) *Note 3		Pair		Twin		Triple
	1	Simultaneous operation multi-unit individual setting		Unified		Individual		—
	2	Indoor unit fan OFF when cooling/heating is OFF		—		Fan OFF		—
12(22)	3	Change to set fan speed when heater thermostat is OFF *Note 5		Fan Speed LL		Set Fan Speed		—
	5	Automatic restart after power outage reset *Note 6		OFF		ON		—
13(23)	0	High Ceiling	Ceiling-mounted built-in multi-flow cassette type, Ceiling suspended cassette type	N		H		S
			Ceiling-suspended type, wall-mounted type	2.7 m or Lower		2.7~3.5 m		—
		Fan speed increase (wall-mounted type)		Standard		Slight Increase		Normal Increase
	1	Air flow direction selection (Change setting when blocking kit is installed) *Note 4		F		T		W
	3	Air flow direction adjustment (Change setting when decorative air outlet panel is installed)		Installed		Not Installed		—
	4	Setting of air flow direction adjustment range		Upward		Standard		Downward
	5	On-site fan speed change by air outlet (When using phase control)		Standard		Option 1		Option 2
	6	External static pressure setting (To be set according to connected duct resistance) (High ceiling setting in the case of FHYK)		Standard (Standard)		High Static Pressure (High Ceiling Setting)		Low Static Pressure



### Notes:

- Setting is made in all units in a group. To set for individual indoor units or to check the setting, use the mode Nos. (with “2” in upper digit) in parentheses ( ).
- The setting position No. is set to “01” at the factory, except for the following cases in which “02” is set.
  - Setting of air flow direction adjustment range
  - Automatic restart after power outage.
  - Remote control thermostat
  - Filter sign indication (only for ceiling-mounted duct type)

3. When installing Sky Air simultaneous operation multi-unit, set to either “twin” or “triple.”  
Only when the factory setting is changed, it is necessary to make a setting using a remote controller.
4. For further details, see the installation instruction.
5. Since drafts may result, carefully select the installation location.
6. When power returns, units resume the settings made before the power outage.

**Caution**

When “auto restart after power outage reset” is set, be sure to turn off air conditioners, then cut off the power supply before conducting maintenance, inspection and other work. If the power supply is cut off with the power switch left ON, air conditioners will automatically start operating when the power supply is turned on.

7. Do not set any items other than those listed in the above table.
8. Functions that indoor units are not equipped with will not be displayed.
9. When returning to normal mode, “88” may be displayed on the LCD section of the remote controller due to initialization operation.

## 2.1.3 Detailed Explanation of Setting Modes

### Ceiling Type Setting Switch for Air Flow Adjustment

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

#### ■ In the Case of FHYC (35 to 71 class)

		No. of Air Outlets Used		
		4-way Outlets	3-way Outlets	2-way Outlets
Ceiling Height	Standard (N)	Lower than 2.7 m	Lower than 3.0 m	Lower than 3.5 m
	High Ceiling ① (H)	Lower than 3.0 m	Lower than 3.3 m	Lower than 3.8 m
	Higher Ceiling ② (S)	Lower than 3.5 m	Lower than 3.5 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

### Filter Sign Setting

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

#### Set Time

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

\*FH(Y)C and FH(Y) only are 1,250 hrs.

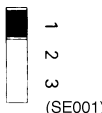
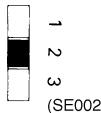
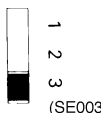
## Wireless Setting (Address and MAIN/SUB Setting)

### Explanation



If several wireless remote controller units are used together in the same room (including the case where both group control and individual remote controller control are used together), be sure to set the addresses for the receiver and wireless remote controller. (For group control, see the attached installation manual for the indoor unit.) If using together with a wired remote controller, you have to change the main/sub setting or the receiver.

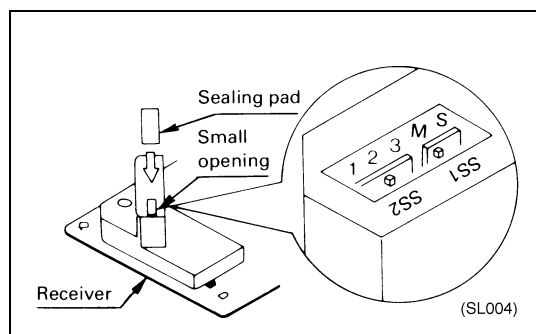
### Setting the Receiver

Through the small opening on the back of the receiver, set the wireless address switch (SS2) on the printed circuit board according to the table below.

Unit No.	No.1	No.2	No.3
Wireless Address Switch (SS2)	 (SE001)	 (SE002)	 (SE003)

When using both a wired and a wireless remote controller for 1 indoor unit, the wired controller should be set to MAIN. Therefore, set the MAIN/SUB switch (SS1) of the receiver to SUB.






	MAIN	SUB
MAIN/SUB Switch (SS1)	 (SE004)	 (SE005)



After completing setting, seal off the opening of the address switch and the MAIN/SUB switch with the attached sealing pad.

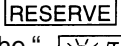

### Setting the Address of Wireless Remote Controller (It is Factory Set to "1")

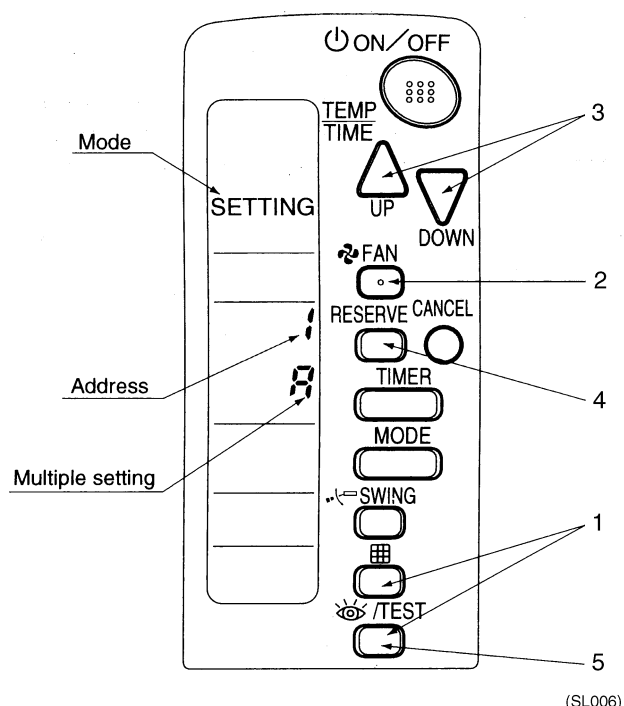
#### <Setting from the remote controller>

1. Hold down the "  " button and the "  /TEST " button for at least 4 seconds, to get the FIELD SET MODE. (Indicated in the display area in the figure at right).
2. Press the "  FAN " button and select a multiple setting (A/b). Each time the button is pressed the display switches between "A" and "b".
3. Press the "  " button and "  " button to set the address.

1 → 2 → 3 → 4 → 5 → 6 (SL041)

Address can be set from 1 to 6, but set it to 1 ~ 3 and to same address as the receiver. (The receiver does not work with address 4 ~ 6.)

4. Press the "  " button to enter the setting.
5. Hold down the "  /TEST " button for at least 1 second to quit the FIELD SET MODE and return to the normal display.



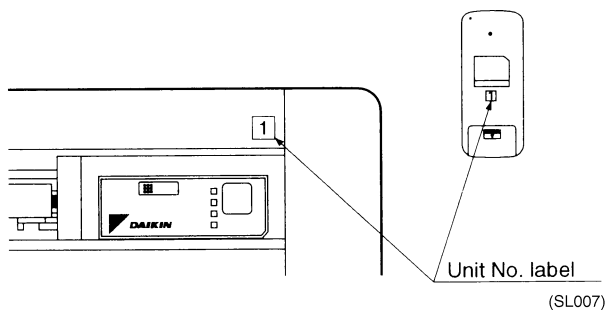
### Multiple Settings A/b

When the indoor is being operating by outside control (central remote controller, etc.), it sometimes does not respond to ON/OFF and temperature setting commands from this remote controller. Check what setting the customer wants and make the multiple setting as shown below.

Remote Controller		Indoor Unit	
Multiple Setting	Remote Controller Display	Controlled by other Air Conditioners and Devices	For other than on Left
A: Standard	All items Displayed.	Commands other than ON/OFF and Temperature Setting Accepted. (1 LONG BEEP or 3 SHORT BEEPS Emitted)	
b: Multi System	Operations Remain Displayed Shortly after Execution.	All Commands Accepted (2 SHORT BEEPS)	

**After Setting**

Stick the Unit No. label at decoration panel air discharge outlet as well as on the back of the wireless remote controller.

**PRECAUTIONS**

Set the Unit No. of the receiver and the wireless remote controller to be equal. If the setting differs, the signal from the remote controller cannot be transmitted.

1. Do not use any settings not listed in the table.
2. For group control with a wireless remote controller, initial settings for all the indoor units of the group are equal. (For group control, refer to the installation manual attached to the indoor unit for group control.)

**Fan Speed OFF when Thermostat is OFF**

When the cool/heat thermostat is OFF, you can stop the indoor unit fan by switching the setting to "Fan OFF."

\* Used as a countermeasure against odor for barber shops and restaurants.

**Setting Table**

Mode No.	First Code No.	Second Code No.	Setting
11(21)	2	01	—
		02	Fan OFF

**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	Ultra-Long-Life Filter (2)

### 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

### Main/Sub Setting when Using 2 Remote Controllers

Set the switch on the remote controller's PC board.

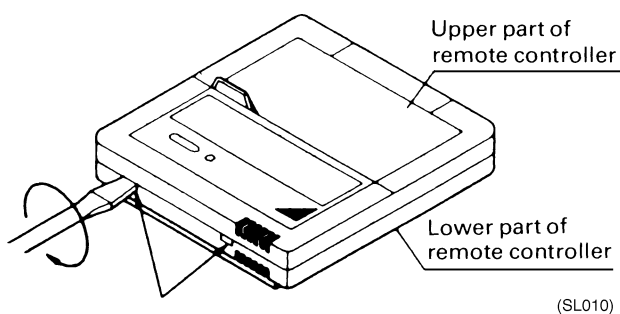
Control by 2 Remote Controllers (controlling 1 indoor unit with 2 remote controllers)

- When using 2 remote controllers, one of either the control panel or the separate remote controller must be set to "MAIN" and the other to "SUB".

(MAIN/SUB CHANGEOVER)

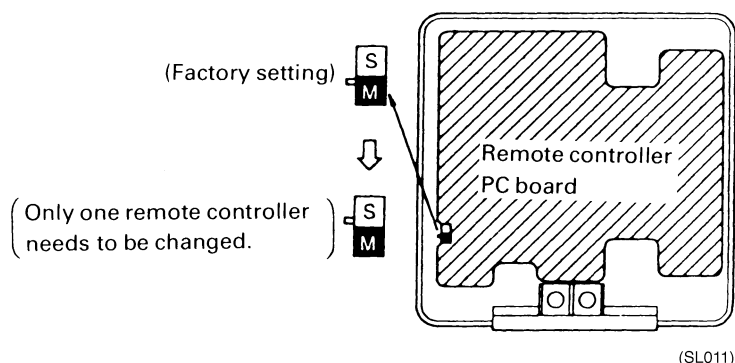
### Procedure

1. Insert a " - " screwdriver into the recess between the upper and lower part of remote controller and, working from the 2 positions, pry off the upper part. (The remote controller PC board is attached to the upper part of remote controller.)



Insert the screwdriver here and gently work off the upper part of remote controller.

2. Turn the **MAIN/SUB CHANGEOVER SWITCH** on one of the two remote controller PC boards to "S". (Leave the switch of the other remote controller set to "M".)



## 2.2 Group Number Setting for Central Remote Control






- When controlled by a central remote controller and an unified ON/OFF controller, the group number setting in each group is required.
- Carry out the setting after the central remote controller, the unified ON/OFF controller, and the indoor units are powered on.

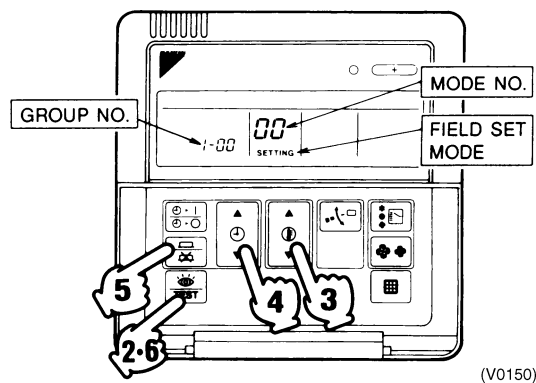
### Group number setting for central remote control by a remote controller

#### <In case of Room Airconditioner>

The number is set by the dip switch on the PC board of interface adaptor for Room Airconditioners.

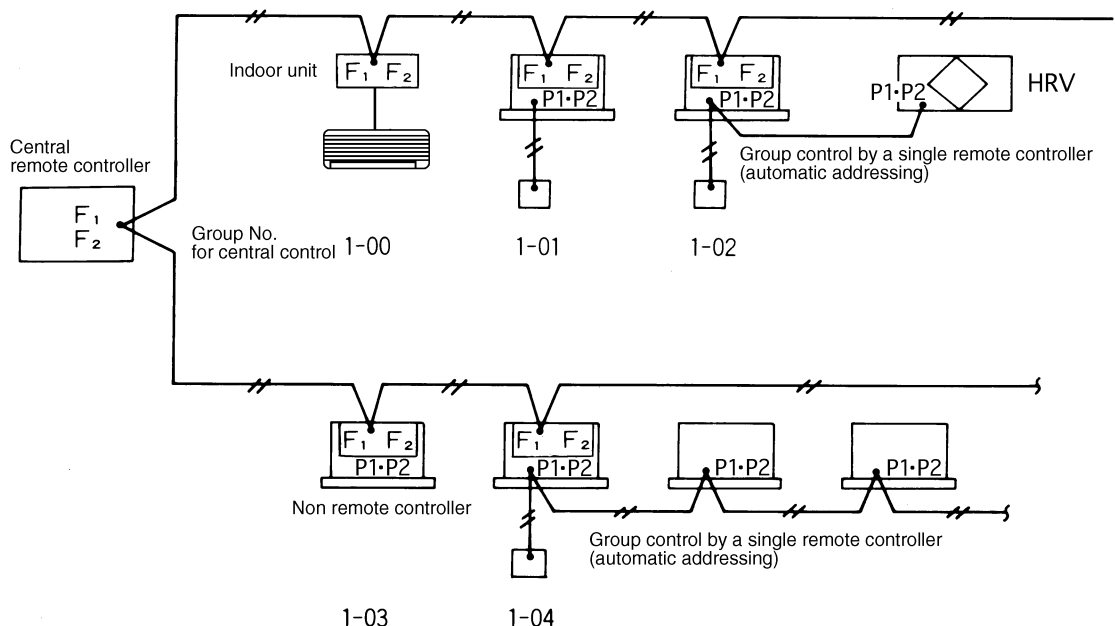
#### <In case of SkyAir>

1. Power onto the indoor units and the unified ON/OFF controller. Make sure if there are any trouble about the installation and the electric wiring or not before the power-on. (when the power is ON, there will sometimes happen the case that it will become the state which once all lumps will turn on before the central control lump will turn on in approx. one minute, rejecting the handling for the control(blinking as repeating two times ON and one time OFF).
2. Hold down “” button for a minimum of 4 seconds, and then the remote controller will enter the FIELD SET MODE.
3. Select the MODE No. “00” with “” button.
4. Use “” button to select the group No. for each group.  
(Group numbers advance in the order of 1-00, 1-01, ... 1-15, 2-00, ... 8-15.)
5. Press “” to set the selected group No.
6. Press “” to return to NORMAL MODE.



(V0150)

#### ■ Group number setting example



#### Note:

1. F1, F2 mark : Interface adaptor for Room Airconditioners or SkyAir.
2. In case of SkyAir without a remote controller, once connect a remote controller with SkyAir to set the group No. for the central remote control and then remove the remote controller.

## 2.3 Interface Adaptor for Room Airconditioner <KRP928A1S>

### Safety Precautions

- Read these Safety Precautions carefully to ensure correct installation.

This manual classifies precautions into WARNINGS and CAUTIONS.

- ⚠ WARNING** : Failure to follow any WARNING is likely to result in death or serious injury.
- ⚠ CAUTION** : Failure to follow any CAUTION may in some cases result in injury or damage to property.

Be sure to follow all the precautions below; they are all important for ensuring safety.

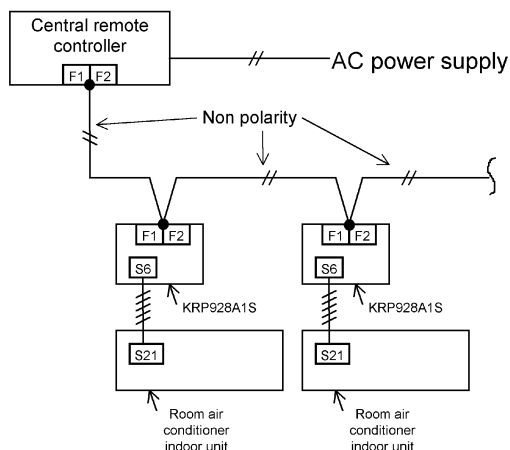
<b>⚠ WARNING</b>
<ul style="list-style-type: none"> <li>• <b>Installation should be left to the dealer or another qualified professional.</b> Improper installation may cause malfunction, electrical shock, or fire.</li> <li>• <b>Install the set according to the instructions given in this manual.</b> Incomplete or improper installation may cause malfunction, electrical shock, or fire.</li> <li>• <b>Be sure to use the supplied or specified parts.</b> Use of other parts may cause malfunction, electrical shock, or fire.</li> <li>• <b>Disconnect power to the connected equipment before starting installation.</b> Failure to do so may cause malfunction, electrical shock, or fire.</li> </ul>
<b>⚠ CAUTION</b>
<ul style="list-style-type: none"> <li>• <b>An earth leakage breaker should be installed.</b> If the breaker is not installed, electrical shock may occur.</li> <li>• <b>Do not install the set in a location where there is danger of exposure to inflammable gas.</b> Gas build up around the unit may cause fire.</li> <li>• <b>To prevent damage due to electrostatic discharge, touch your hand to a nearby the metal object (doorknob, aluminum sash, etc.) before touching this kit to discharge static electricity from your body.</b> Static electricity can damage this kit.</li> </ul>

- After installation is complete, test the operation of the PCB set to check for problems, and explain how to use the set to the end-user.

### 1. Overview and Features

This kit is an interface between central control equipment (central remote controller, unified ON/OFF controller, schedule timer, etc.) and the room air conditioner. Combined with the central control equipment, the set sets the batch on/off operation, timer operation or remote controller operation mode setting, and displays the operational status.

### 2. System Structure and Wiring



### 3. Compatible Models

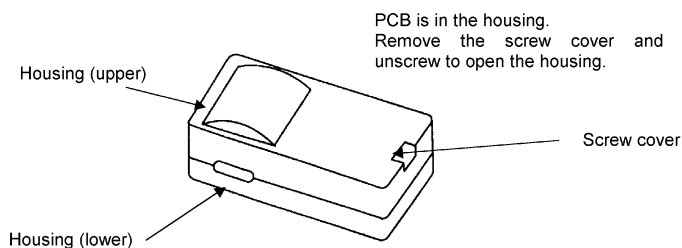
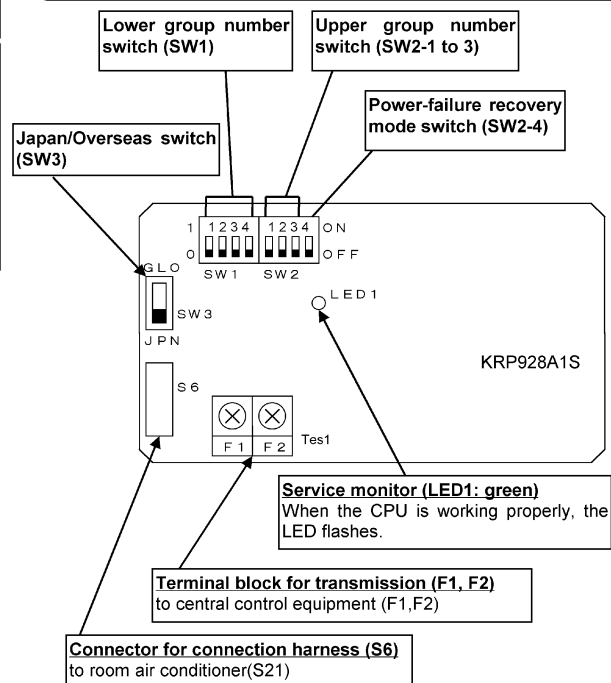
This kit is used with room air conditioners with S21 connector for remote control. But it is not compatible with some models. Please consult your dealer for details.

### 4. Components

This kit includes the following components. Check to ensure that none are missing.

PCB for remote control with housing ( PCB ass'y is included in the housing.)	1 set
Connection harness with connector	1 set
Mounting screws	3 pcs.
Binding band	1 pc.
Double-sided tape	2 pcs.
Installation manual	

### 5. Name and Function of Parts



## 6. Function

(1) The following operations and control functions are possible using this kit with central control equipment.

	Operation and control
1.On/Off	Starts or stops room air conditioner.
2.Operation/Alert monitor	Monitors operational status and malfunctions.
3.Mode select	Cooling/heating can be selected. Ventilation is not possible. About Auto mode, see 7.Setting (1)-③.
4.Temperature setting	20 to 32°C during cooling, 16 to 28°C during heating
5.Remote controller operation mode setting	Selects whether to accept or to reject the operation from the remote controller regarding the operation, stop, mode select and air flow direction. (Last command priority or, remote controller rejection, etc.)
6.Malfunction code display	Displays the contents of a malfunction.
7.Zone control	One or more of air conditioners can be controlled together.

(2) This kit does not support the following controls.

	Operation and control
1.Group control	One or more of air conditioners can be controlled by one remote controller.
2.Monitoring items to the right:	Room temperature, Heat status, Compressor operation status, Indoor fan operation status, Electric heater / humidifier operation status
3.Control items to the right:	Forced thermo OFF, Filter sign display and reset, Air flow and air flow direction settings, Charge control
4.Energy-saving command	Temperature is reduced by 2°C (thermo OFF).
5.Low noise command	Power is saved with reduced operational noise.
6.Demand command	Power is saved with reduced power consumption.

(3) Notes

- 1) This kit cannot be used together with room air conditioner central controllers (KRC72); and PCBs for remote control Adapter (KRP413A1(s) and KRP413A2(S)).
- 2) The functions described above refer to the kit itself. Actual functionality will vary depending on the central control equipment.
- 3) Do not enter zone information for zones containing a heat pump or cooling-only unit, or for equipment other than room air conditioners.
- 4) Cooling/Heating switchover cannot be operated for cooling-only units.

## 7. Settings

(1) Switch settings

### ① Setting group numbers (SW1, SW2-1 to 3)

Group numbers must be set when using a central remote controller and unified ON/OFF controller. Set as shown in the table below. (Numbers in the following ranges can be set: 1-00 to 1-15, 2-00 to 2-15, etc., to a maximum number of 8-15. The same number cannot be set for more than two units.)

SW2 setting	Upper group No.	SW1 setting	Lower group No.	SW1 setting	Lower group No.
1 1 2 3	1 —	1 1 2 3 4	0 0	1 2 3 4	0 8
0 1 2 3	2 —	0 1 2 3 4	0 1	0 1 2 3 4	0 9
1 2 3	3 —	1 2 3 4	0 2	1 2 3 4	1 0
1 2 3	4 —	1 2 3 4	0 3	1 2 3 4	1 1
1 2 3	5 —	1 2 3 4	0 4	1 2 3 4	1 2
1 2 3	6 —	1 2 3 4	0 5	1 2 3 4	1 3
1 2 3	7 —	1 2 3 4	0 6	1 2 3 4	1 4
1 2 3	8 —	1 2 3 4	0 7	1 2 3 4	1 5

### ② Auto restart ON/OFF (SW2-4)

This function determines whether the unit returns to the previous operation mode when recovering from a power failure. When an auto restart ON/OFF jumper is provided in the indoor unit, control from this kit takes priority.

The following status information is stored regardless of on/off state.

- Operation mode
- Set temperature
- Remote controller operation mode

SW2 setting	Setting
ON 4	Operation mode is always off when recovering from power failure. (delivery setting)
OFF 4	Returning to the operation mode prior to power failure

### ③ Settings for overseas and Japanese models (SW3)

This function must be programmed because temperature control in Auto Mode differs between overseas and Japanese models.

SW3	Setting
G L O J P N	When connecting to Japanese models.(delivery setting) Auto Mode cannot be selected from central control equipment. When Auto Mode is selected using the remote controller, cooling or heating is displayed at the central remote control. (At this time, the temperature display is fixed at 25°C.)
G L O J P N	When connecting to overseas models Auto Mode can be selected from central control equipment. When Auto Mode is selected using the remote controller, Auto Cooling or Auto Heating is displayed at the central remote control.

(2) Control code

When the central remote controller is used, control codes and controls of the wireless remote controller for room air conditioners are as follows.

Remote controller operation mode	Control code	Control by remote controller	
		Unified operation, individual operation by central remote controller, or operation controlled by timer	Unified stop, individual stop by central remote controller, or timer stop
ON/OFF control is rejected by remote controller	0 1 3	ON/OFF operation, timer setting is not possible	
	10 11	Only air flow and air direction can be set.	
Only OFF control is accepted by remote controller	2 12~19	Only off operation, air flow and air direction can be set	
Central priority	4	Last command takes priority	Only off operation, air flow and air direction can be set
	5	Last command takes priority	ON/OFF operation, timer setting is not possible
Last command priority	6 7	Last command takes priority	
Timer operation is accepted by remote controller	8 9	Last command takes priority	Only off operation, air flow and air direction can be set
		Last command takes priority	ON/OFF operation, timer setting is not possible

(3) Installing on a wall or an indoor unit

After all settings for this kit are complete, mount the housing with the supplied screws and double-sided tape.

\*Installing on a wall

After the lower part of the housing is fixed with the 3 supplied screws, attach the upper part of the housing in its original position.

\*Installing on the indoor unit

After the upper part of the housing is reattached, mount it on the indoor unit with the supplied double-sided tape.

2P058222



**Note:**

Setting of Centralized Controller  
<DCS301B61, DCS302B61, KRC72>  
Please refer to Operating Installations of each controllers.

## 2.4 Precautions: For RMK140J / RMX140J Outdoor Unit Users

### ■ Applicable model series

\* If you use the indoor unit listed below, and have it connected to the multi-type outdoor unit (RMK140J/RMX140J), be sure to read this precautions.

\* Use the furnished remote controller.

For the ceiling-mounted cassette type, the remote controller is an option.

Choose one of the following remote controllers.

(1) Wired type: BRC1B61 (C)      (2) Wireless type: BRC7C612W (C) (H/P)  
BRC7C613W (C) (C/O)

Outdoor Unit			Cooling only RMK140J	Heat Pump RMX140J
Indoor Unit	Package Air Conditioner	Ceiling-Mounted Cassette Type	FHYC35/50/60/71KV1C, FHYC35/50/60/71KVE	
		Duct-Connected Type	FDYM60/03FV1, FDYM60/03FV1C, FDYM60/03FVAL	
	Room Air Conditioner	Wall-Mounted Type	FTK25/35J FTK50/60H	FTX25/35J FTX50/60H
		Ceiling-Mounted Duct Type	CDK25/35/50/60HA	CDX25/35/50/60HA (J)
		Floor/Ceiling-suspended Dual Type	FLK25/35/50/60H	FLX25/35/50/60H

### ■ Outside air temperature for operation

	Cooling only	Heat pump
Cooling Operation	5 ~ 46 °CDB	-5 ~ 46 °CDB
Heating Operation		-15 ~ 15.5 °CWB

### ■ These cases are not troubles

#### (1) All indoor units

In heating operation, when all indoor units are stopped, the outdoor unit stops its operation automatically after 5 minutes. This is a part of preparation process for the next operation, not a failure.

In heating operation, no warm air may come out temporarily. This is to protect the outdoor unit, not a failure. At this point, "DEFROST" is displayed on the wired-type remote controller.

In simultaneous operation in two or more rooms, when heating operation is performed in one room, cooling operation cannot be performed in other rooms. The mode in the room where operation began first is given priority.

#### (2) Floor/ceiling-suspended dual type units

With the thermostat OFF (\*1), the fan may start/stop automatically; this is not a failure.

#### (3) Skyair indoor units

With the thermostat OFF (\*1), the fan may start/stop automatically; this is not a failure. At this point, "DEFROST" is displayed on the wired-type remote controller.

In heating operation, fan operation cannot be performed.  
If the fan operation is selected, the remote controller will display it as a current mode. However, the fan operation will not be performed.

(\*1) Thermostat OFF: After the room temperature reaches the set temperature, indoor units enter the operation stand-by state.

2P042644-17G



# Part 9

## Service Diagnosis

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The RMK140JAVM specifications are special. Refer to <RMK140JAVM's important points> (on page ii) for the changes in contents.

# 1. Troubleshooting - Split Type Indoor Unit

## 1.1 Troubleshooting with the Operation Lamp

The Operation lamp flashes when any of the following errors is detected.

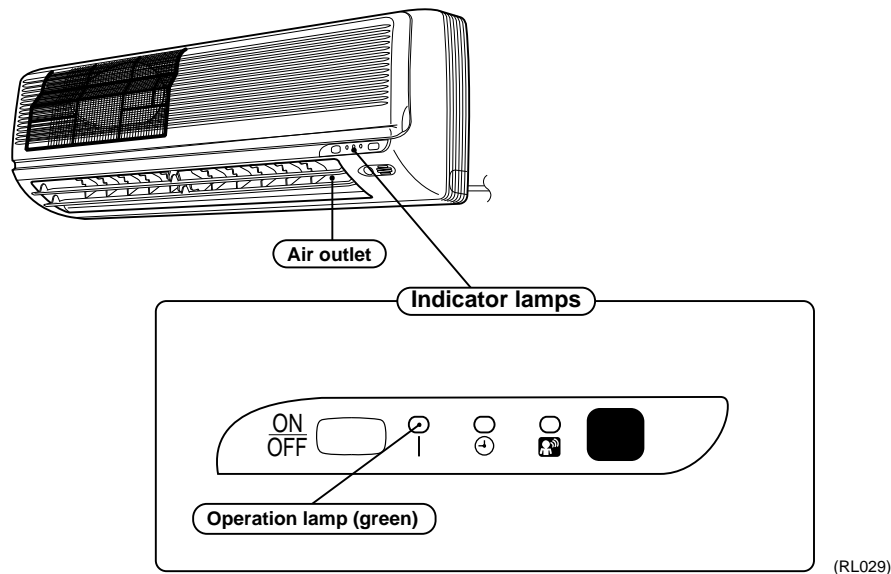
1. When a protection device of the indoor or outdoor unit is activated or when the thermistor malfunctions, disabling equipment operation.

2. When a signal transmission error occurs between the indoor and outdoor units.

In either case, conduct the diagnostic procedure described in the following pages.

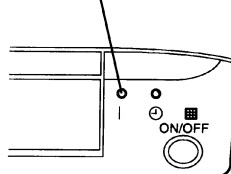
### Location of Operation Lamp

In case of  
FTK(X)25/35J Series



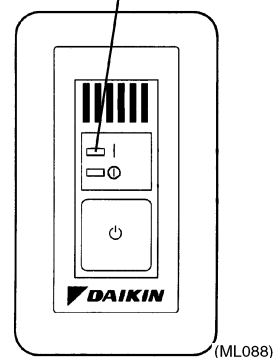
In case of  
FTK50/60H Series  
FTX50/60H Series

OPERATION indicator lamp (green)



In case of  
CDX25~60H Series  
CDX25~60H Series

OPERATION indicator lamp



### Caution:

Operation stops suddenly.( Operation lamp blinks.)

Cause of above trouble could be "Operation mode butting".

Check followings;

Are the operation modes all the same for indoor units connected to Multi system outdoor unit?

If not set all indoor units to the same operation mode and confirm that the operation lamp is not blinking.

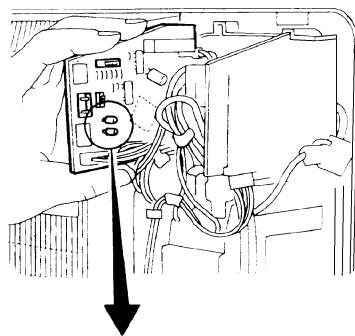
Moreover, when the operation mode is in "Auto", set all indoor unit operation mode to "Cool" or "Heat" and check again if the operation lamp is normal.

If the lamp stops blinking after the above steps, there is no malfunction.

★Operation stops and operation lamp blinks only for indoor unit which the different operation mode is set later. ( The first set operation mode has priority.)

## Troubleshooting with the LED Indication

Indoor Unit  
(For example,  
FTK50/60H Series,  
FTX50/60H Series)



LED A  
LED B

(ML089)

There are green and red LEDs on the PCB. The flashing green LED indicates normal equipment condition, and the OFF condition of the red LED indicates normal equipment condition.  
(Troubleshooting with the green LED)

Even after the error is cancelled and the equipment operates in normal condition, the LED indication remains.

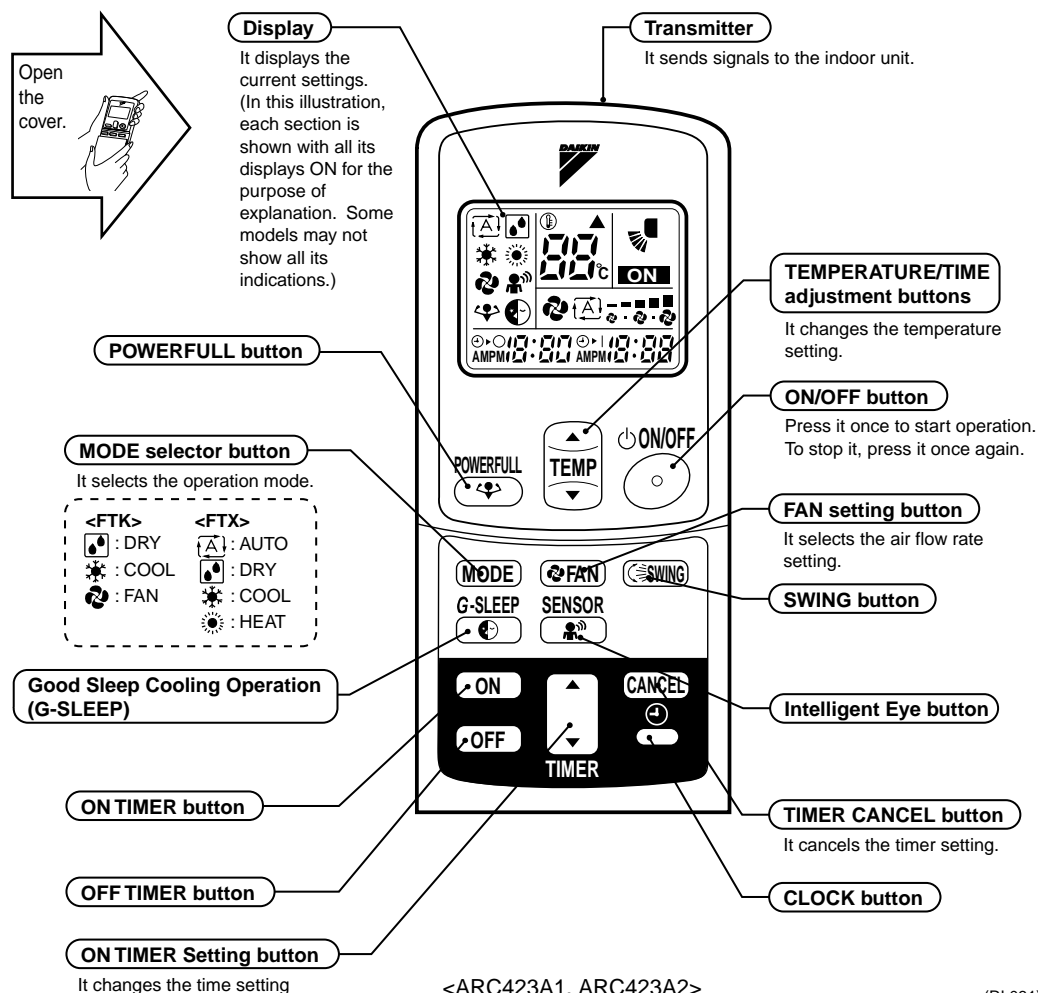
# 1.2 Service Check Function

## 1.2.1 ARC423 Series (FTK(X)25/35J Series)

In the ARC423A series, the temperature display sections on the main unit indicate corresponding codes.

1. When the timer cancel button is held down for 5 seconds, a “00” indication flashes on the temperature display section.

< Cover in open position >



(RL031)

2. Press the timer cancel button repeatedly until a continuous beep is produced.  
 ■ The code indication changes in the sequence shown below, and notifies with along beep.

No.	Code	No.	Code	No.	Code
1	00	11	E7	21	UR
2	U4	12	C7	22	R5
3	F3	13	H8	23	J9
4	E6	14	J3	24	E8
5	L5	15	R3	25	P4
6	R6	16	R1	26	L3
7	E5	17	C4	27	L4
8	LC	18	C5	28	H6
9	C9	19	H9	29	H7
10	U0	20	J6	30	U2



**Note:**

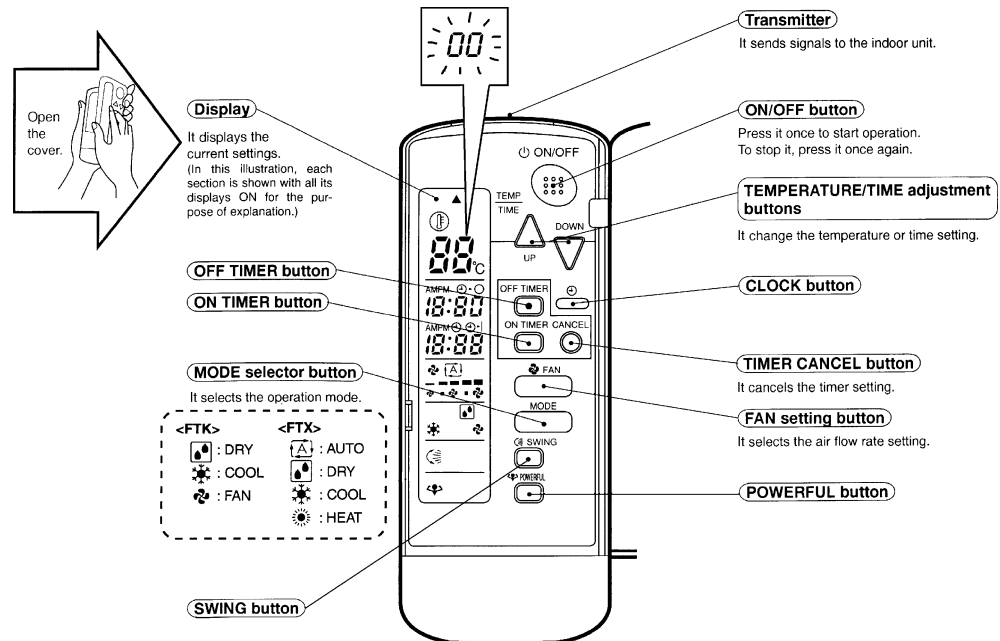
1. A short beep and two consecutive beeps indicate non-corresponding codes.
2. To cancel the code display, hold the timer cancel button down for 5 seconds. The code display also cancels itself if the button is not pressed for 1 minute.

## 1.2.2 ARC417 Series (FTK(X)50/60H Series)

In the ARC417A series, the temperature display sections on the main unit indicate corresponding codes.

1. When the timer cancel button is held down for 5 seconds, a "00" indication flashes on the temperature display section.

< Cover in open position >



(ML091)

2. Press the timer cancel button repeatedly until a continuous beep is produced.
  - The code indication changes in the sequence shown below, and notifies with a long beep.

No.	Code	No.	Code	No.	Code
1	00	11	C4	21	P4
2	E5	12	C5	22	LC
3	H8	13	E0	23	E7
4	U4	14	J3	24	U2
5	R6	15	C9	25	RJ
6	L4	16	J6	26	UF
7	E6	17	J9	27	R1
8	L5	18	U0	28	L3
9	R5	19	UR		
10	F3	20	H9		



**Note:**

1. A short beep and two consecutive beeps indicate non-corresponding codes.
2. To cancel the code display, hold the timer cancel button down for 5 seconds. The code display also cancels itself if the button is not pressed for 1 minute.

# 1.3 Code Indication on the Remote Controller

## 1.3.1 Error Codes and Description of Fault

	Code Indication	Description of Problem
System	<i>00</i>	Normal
	<i>U0</i>	Insufficient gas
	<i>U2</i>	Power factor module abnormality
	<i>U4</i>	Signal transmission error (between indoor and outdoor units)
	<i>U5</i>	Signal transmission error (between indoor unit and remote controller)
Indoor Unit	<i>R1</i>	Faulty indoor unit PCB
	<i>R3</i>	Faulty drainage
	<i>R5</i>	Operation halt due to the freeze protection function or high pressure control
	<i>R6</i>	Fan motor or related abnormality
	<i>C4</i> or <i>C5</i>	Heat exchanger temperature thermistor abnormality
	<i>C9</i>	Room temperature thermistor abnormality
	<i>CR</i>	Discharge air temperature thermistor abnormality
Outdoor Unit	<i>E5</i>	OL activation (IT activation) or High discharge pipe temperature
	<i>E6</i>	Compressor startup error
	<i>F3</i>	Operation halt due to discharge pipe control function
	<i>H8</i>	CT or related abnormality
	<i>H9</i>	Outside air thermistor or related abnormality
	<i>J3</i>	Discharge pipe temperature thermistor or related abnormality
	<i>J6</i>	Heat exchanger temperature thermistor or related abnormality
	<i>J9</i>	Gas pipe temperature thermistor or related abnormality
	<i>L4</i>	Radiation fin temperature rise
	<i>P3</i>	Heat radiation fin thermistor or related abnormality
	<i>P4</i>	Heat radiation fin thermistor or related abnormality
	<i>E0</i>	Protectors Function

## 1.4 Troubleshooting

### 1.4.1 Indoor Units

#### FTK(X)25/35 J Series

- : Not used for troubleshooting

\* : Varies depending on the cases.

Indication on the remote controller	Description of the Fault		Details of fault (Refer to the indicated page.)
<i>00</i> or *	Indoor unit in normal condition (Conduct a diagnosis of the outdoor unit.)		—
<i>R1</i>	Inverter unit - Faulty indoor unit PCB		232
<i>R5</i>	Operation halt due to the freeze protection function or high pressure control (heat pump model only)		233
<i>R6</i>	Faulty fan motor (AC motor stop)	AC motor	235
<i>C4</i>	Heat exchanger temperature thermistor or related abnormality		236
<i>C9</i>	Suction thermistor or related abnormality		236
<i>C8</i>	Discharge thermistor or related abnormality		236
*	Faulty indoor unit PCB		237
			238
* or <i>U4</i>	Faulty power supply or indoor unit PCB		239
<i>U4</i>	Signal transmission error (between indoor and outdoor units)		243

#### FTK(X)50/60H, CDK(X)25~60H Series





























☀: ON, ●: OFF, ⚡: Blinks

Green: Flashes when in normal condition

Red: OFF in normal condition

- : Not used for troubleshooting

\* : Varies depending on the cases.

Indoor Unit LED Indication		Indication on the remote controller	Description of the Fault		Details of fault (Refer to the indicated page.)
Green					
A	B				
		00 or *	Indoor unit in normal condition (Conduct a diagnosis of the outdoor unit.)		—
					
		R5	Operation halt due to the freeze protection function or high pressure control (heat pump model only)		233
					
		R6	Faulty fan motor (AC motor stop)	AC motor	235
					
		C4 or C5	Heat exchanger temperature thermistor or related abnormality		236
					
		C9	Suction thermistor or related abnormality		236
		C8	Discharge thermistor or related abnormality		236
	*	*	Faulty indoor unit PCB		237
					238
	*	* or U4	Faulty power supply or indoor unit PCB		239, 240 241, 242
		U4	Signal transmission error (between indoor and outdoor units)		243
		U5	Signal transmission error (between indoor unit and remote controller)		244

# 1.5 Troubleshooting Detail

## 1.5.1 Faulty PCB

Remote  
Controller  
Display

*A1*

Indoor Unit LED  
Display

Method of  
Malfunction  
Detection

Evaluation of zero-cross detection of power supply by indoor unit.

Malfunction  
Decision  
Conditions

When there is no zero-cross detection in approximately 10 continuous seconds.

Supposed  
Causes

- Faulty indoor unit PCB
- Faulty connector connection

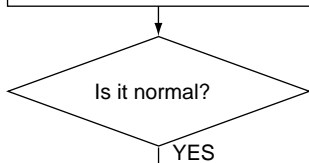
Troubleshooting



**Caution**

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

Connector connection check  
(note).



**Note:**


Connector Nos. vary depending on models.  
Control connector.....S35 and S26

## 1.5.2 Operation Halt Due to the Freeze Protection Function

Remote  
Controller  
Display

*R5*

Indoor Unit LED  
Display

A  B 



**Note:** No LED Display on FTK(X)25/35J Series.

Method of  
Malfunction  
Detection

- High pressure control  
During heating operations, the temperature detected by the indoor heat exchanger thermistor is used for the high pressure control (stop, outdoor fan stop, etc.)
- The freeze protection control (operation halt) is activated during cooling operation according to the temperature detected by the indoor unit heat exchanger thermistor.

Malfunction  
Decision  
Conditions

- High pressure control  
During heating operations, the temperature detected by the indoor heat exchanger thermistor is above 67°C
- Freeze protection

When the indoor unit heat exchanger temperature is below 0°C during cooling operation.

Supposed  
Causes

- Operation halt due to clogged air filter of the indoor unit.
- Operation halt due to dust accumulation on the indoor unit heat exchanger.
- Operation halt due to short-circuit.
- Detection error due to faulty indoor unit heat exchanger thermistor.
- Detection error due to faulty indoor unit PCB.

Troubleshooting

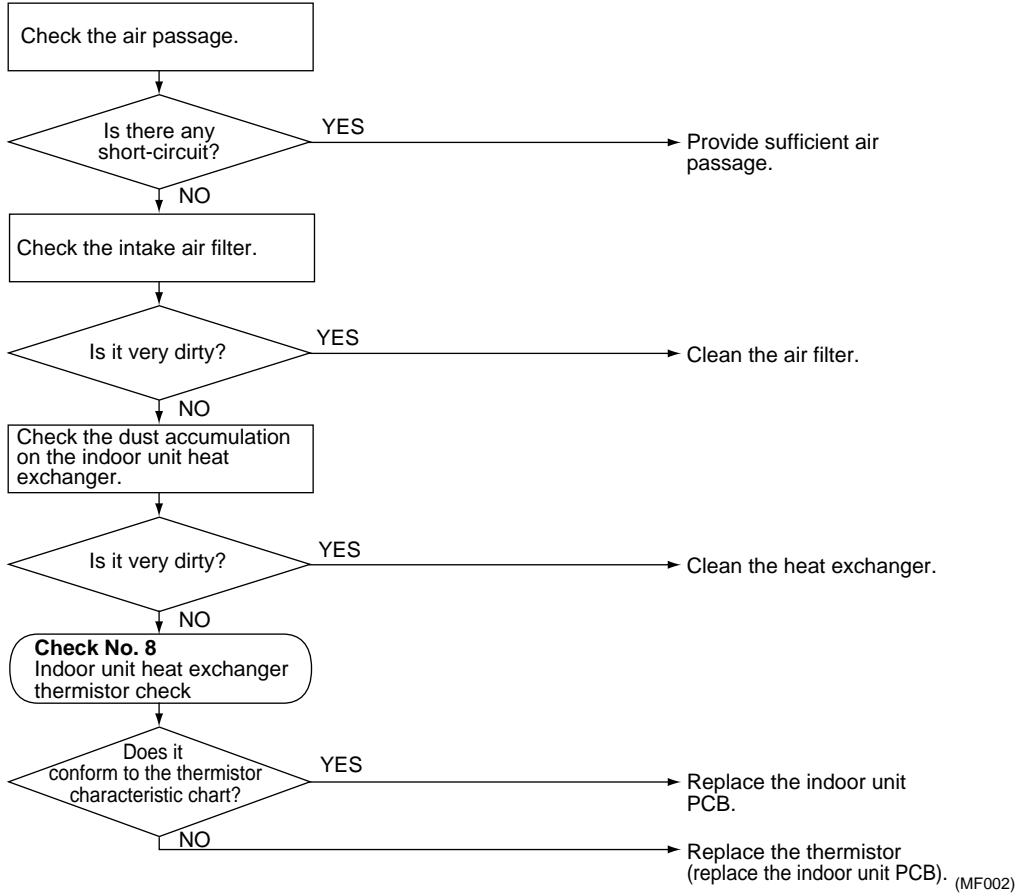


**Check No.8**  
Refer to P.305



**Caution**

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



### 1.5.3 Operation Halt Due to Fan Motor (AC Motor) or Related Abnormality

Remote  
Controller  
Display

RE

Indoor Unit LED  
Display

A  B 



**Note:** No LED Display on FTK(X)25/35J Series.

Method of  
Malfunction  
Detection

The rotation speed detected by the hall IC during fan motor operation is used to determine abnormal fan motor operation.

Malfunction  
Decision  
Conditions

When the detected rotation speed is less than 50% of the HH tap under maximum fan motor rotation demand.

Supposed  
Causes

- Operation halt due to short circuit inside the fan motor winding.
- Operation halt due to breaking of wire inside the fan motor.
- Operation halt due to breaking of the fan motor lead wires.
- Operation halt due to faulty capacitor of the fan motor.
- Detection error due to faulty indoor unit PCB (1).
- Detection error due to faulty indoor unit PCB (2).

Troubleshooting

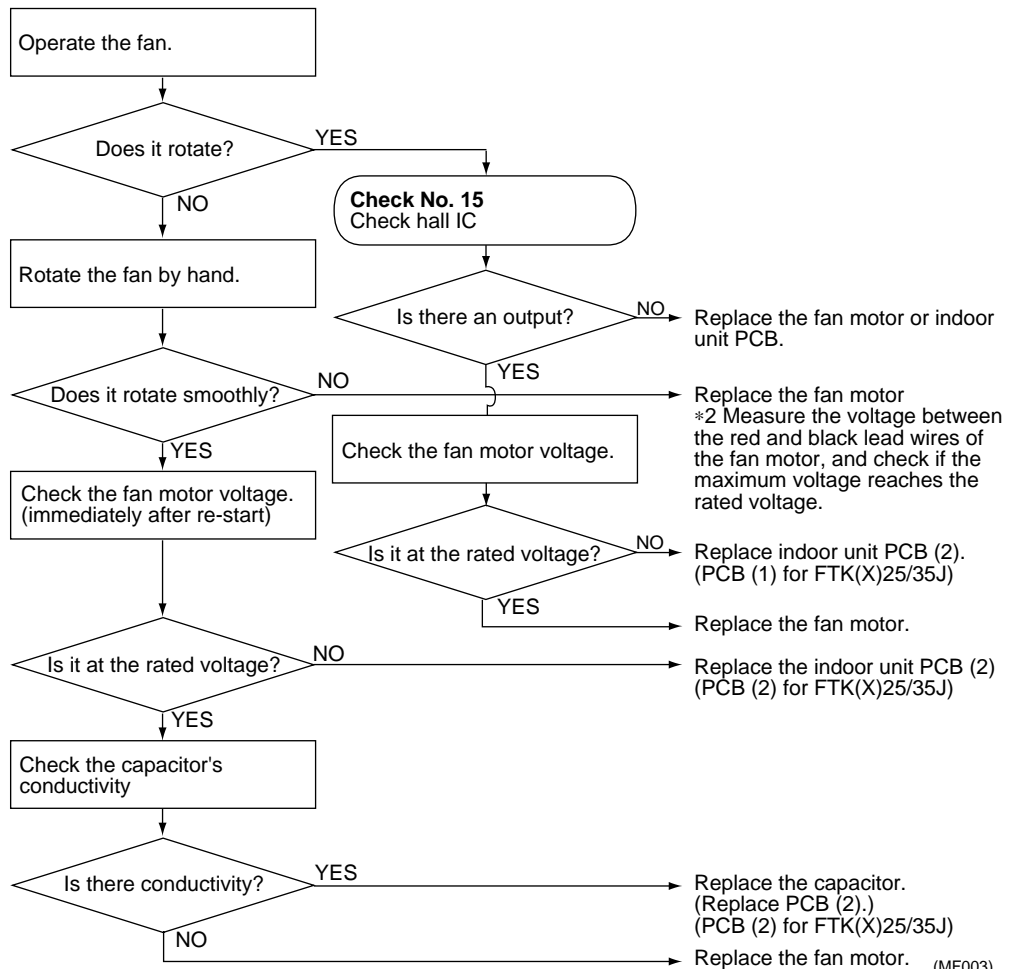


**Check No.15**  
Refer to P.309



**Caution**

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



(MF003)

# 1.5.4 Operation Halt Due to Detection of Thermistor or Related Abnormality

Remote  
Controller  
Display

*E4, E5, E9, E8*

Indoor Unit LED  
Display

A  B 



**Note:** No LED Display on FTK(X)25/35J Series.

Method of  
Malfunction  
Detection

The temperatures detected by the thermistors are used to determine thermistor errors.

Malfunction  
Decision  
Conditions

When the thermistor input is more than 4.96 V or less than 0.04 V during compressor operation\*.

\* (reference)

When above about 212°C (less than 120 ohms) or below about -50°C (more than 1,860 kohms).



**Note:** The values vary slightly in some models.

Supposed  
Causes

- Faulty connector connection
- Faulty thermistor
- Faulty PCB

Troubleshooting



**Check No.8**  
Refer to P.305



**Caution**

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

Check the connector connection.

Is it normal?

NO

Correct the connection.

YES

**Check No. 8**  
Thermistor resistance check

Is it normal?

NO

Replace the thermistor.  
(Replace the indoor unit PCB.)

YES

Replace the indoor unit PCB.

(MF004)

*E4* : Heat exchanger temperature thermistor

*E5* : Heat exchanger temperature thermistor

*E9* : Suction air thermistor


*E8* : Discharge air thermistor

## 1.5.5 Faulty Indoor Unit PCB

Remote  
Controller  
Display

\*

Indoor Unit LED  
Display

A  B \*



**Note:** No LED Display on FTK(X)25/35J Series.

Method of  
Malfunction  
Detection

The proper program operation of the microcomputer is checked by the program.

Malfunction  
Decision  
Conditions

When the microcomputer program does not function properly.

Supposed  
Causes

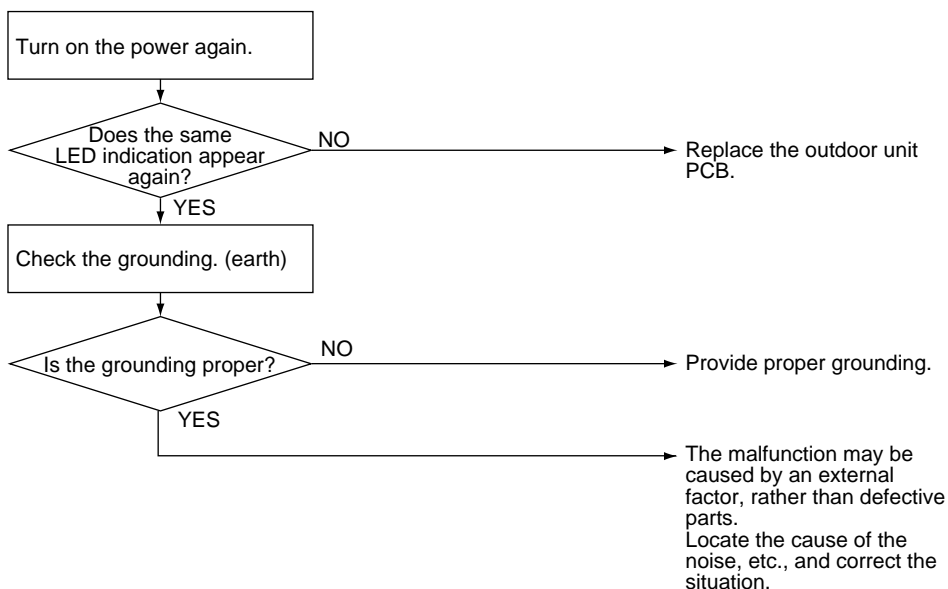
- Microcomputer program is in abnormal condition due to an external factor.
  - \*Noise.
  - \*Momentary voltage drop.
  - \*Momentary power failure, etc.
- Faulty indoor unit PCB.

### Troubleshooting






#### Caution

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



(MF005)

## 1.5.6 Faulty Indoor Unit PCB

Remote Controller Display	*
Indoor Unit LED Display	A  B 
 <b>Note:</b>	No LED Display on FTK(X)25/35J Series.
Method of Malfunction Detection	The condition of the transmission circuit for indoor-outdoor signal transmission is detected.
Malfunction Decision Conditions	When the transmission circuit remains ON.
Supposed Causes	■ Faulty indoor unit PCB
Troubleshooting	Replace the indoor unit PCB.

## 1.5.7 Faulty Power Supply or Indoor Unit PCB (For FTK(X)25/35J)

Remote  
Controller  
Display

\* or U4

Indoor Unit LED  
Display

Method of  
Malfunction  
Detection

1. The proper program operation of the microcomputer is checked by the program.
2. In indoor-outdoor signal communications, the indoor unit determines whether the outdoor unit receives signals properly by detecting signals transmitted by the outdoor unit to the indoor unit.

Malfunction  
Decision  
Conditions

1. When the microcomputer program does not function properly.
2. When the indoor unit determines that the indoor unit does not properly receive signals transmitted by the outdoor unit in indoor-outdoor signal communications.

Supposed  
Causes

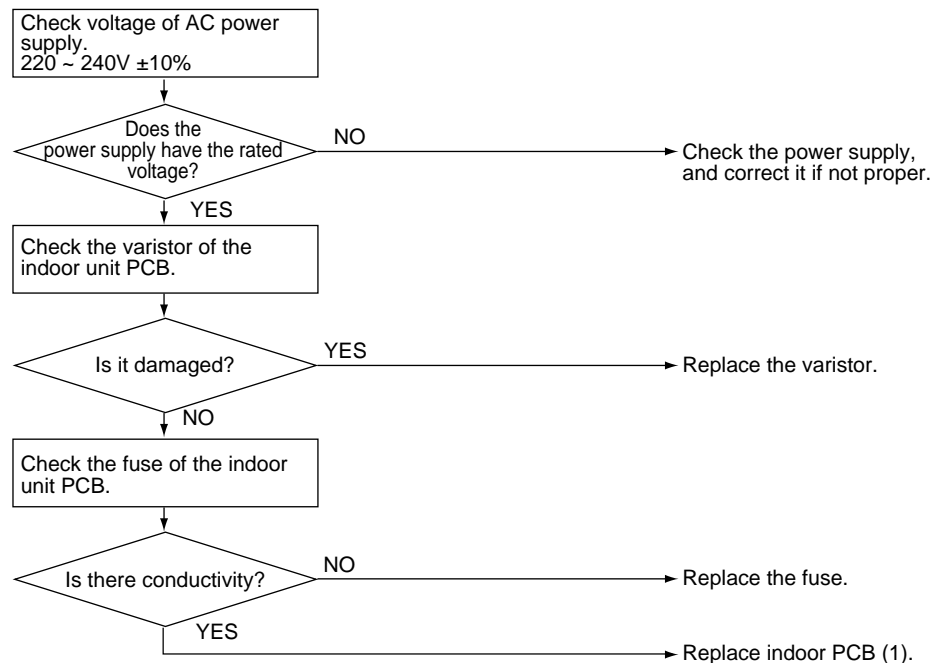
- Display disabled by fault power supply.
- Faulty signal transmitting/receiving circuit in indoor printed circuit boards (1) and (2)
- Microcomputer program is in abnormal condition due to an external factor.
  - Noise.
  - Momentary voltage drop.
  - Momentary power failure, etc.
- Faulty indoor unit PCBs (1) and (2).

### Troubleshooting



#### Caution

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



(MF006)

## 1.5.8 Faulty Power Supply or Indoor Unit PCB (For FTK(X)50/60H, CDK(X)25~60H)

Remote  
Controller  
Display

\* or U4

Indoor Unit LED  
Display

A ● B \*



**Note:** No LED Display on FTK(X)25/35J Series.

Method of  
Malfunction  
Detection

The proper program operation of the microcomputer is checked by the program.

Malfunction  
Decision  
Conditions

When the microcomputer program does not function properly.

Supposed  
Causes

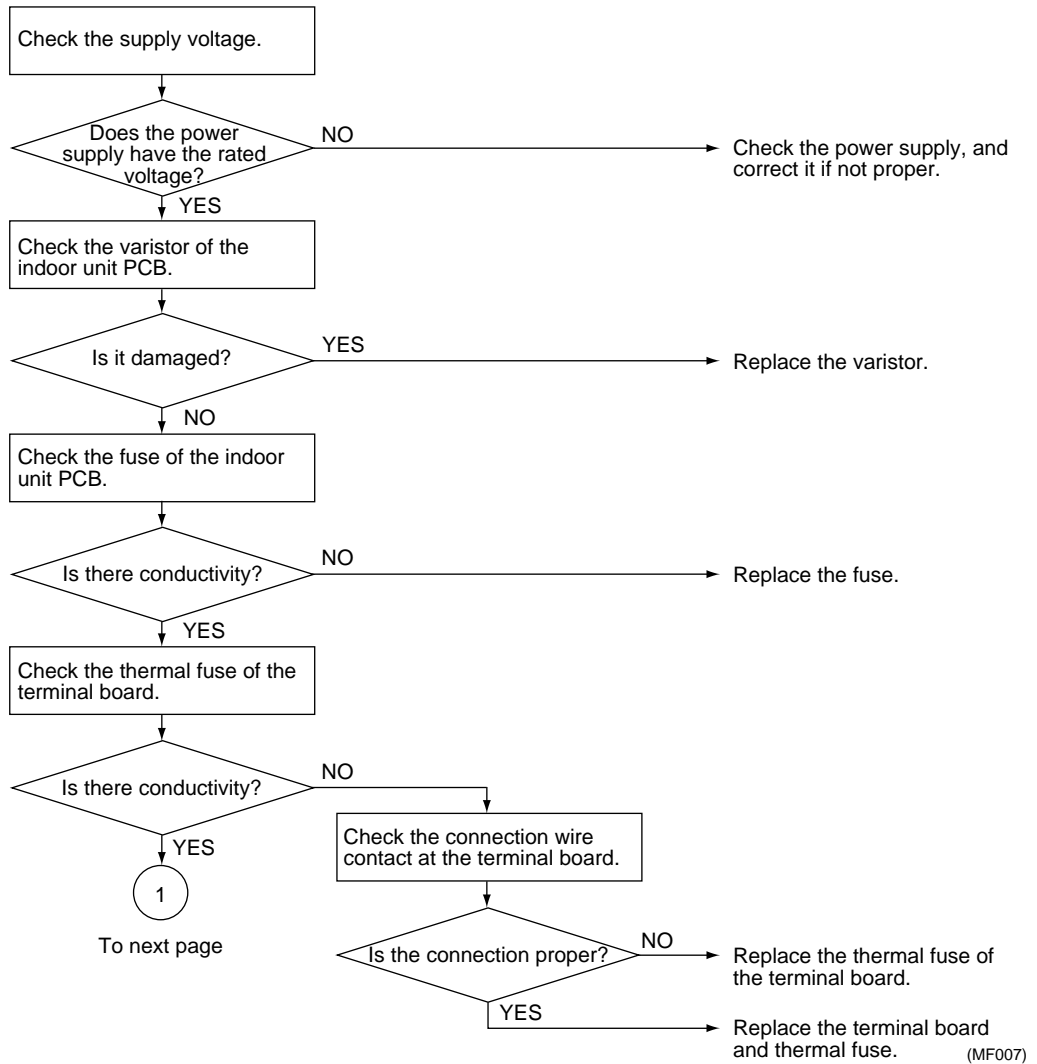
- Display disabled by fault power supply.
- Microcomputer program is in abnormal condition due to an external factor.
  - \*Noise.
  - \*Momentary voltage drop.
  - \*Momentary power failure, etc.
- Faulty indoor unit PCBs (1) and (2).

## Troubleshooting



### Caution

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



Troubleshooting

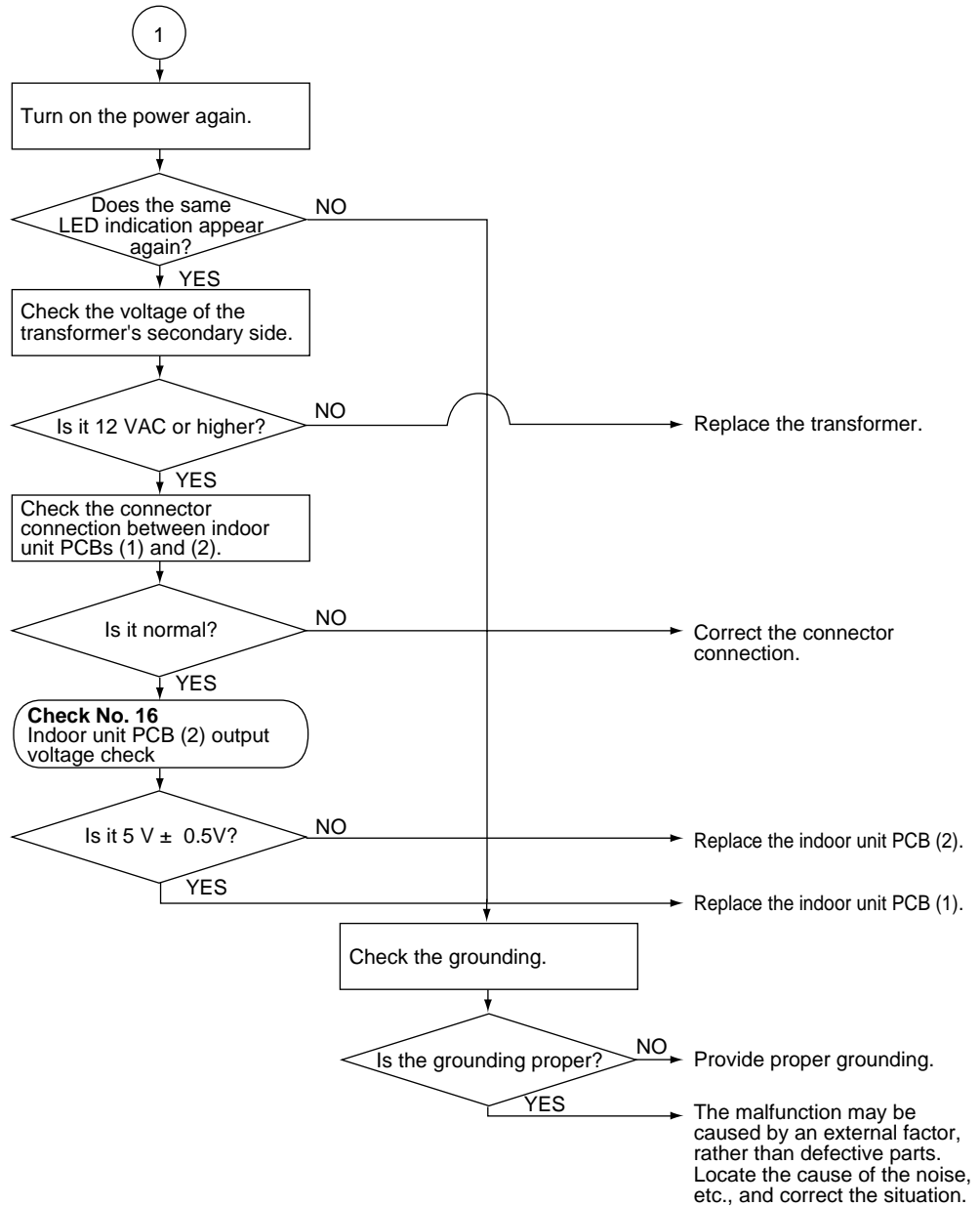


Check No.16  
Refer to P.309



**Caution**

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



(MF008)

## 1.5.9 Signal Transmission Error (Between Indoor and Outdoor Units)

Remote  
Controller  
Display

U4

Indoor Unit LED  
Display

A  B 



**Note:** No LED Display on FTK(X)25/35J Series.

Method of  
Malfunction  
Detection

The data received from the outdoor unit in indoor unit-outdoor unit signal transmission is checked whether it is normal.

Malfunction  
Decision  
Conditions

When the data sent from the outdoor unit cannot be received normally, or when the content of the data is abnormal.

Supposed  
Causes

- Faulty outdoor unit PCB.
- Faulty indoor unit PCB.
- Indoor unit-outdoor unit signal transmission error due to wiring error.
- Indoor unit-outdoor unit signal transmission error due to disturbed power supply waveform.
- Indoor unit-outdoor unit signal transmission error due to breaking of wire in the connection wires between the indoor and outdoor units (wire No. 2).

Troubleshooting



**Check No.13**  
Refer to P.308



**Caution**

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

Check the indoor unit-outdoor unit connection wires.

Is there any wiring error?

YES

Correct the indoor unit-outdoor unit connection wires.

NO

Check the outdoor unit's LED A.

Is LED A flashing?

NO

Diagnose the outdoor unit.

YES

Check the voltage of the indoor unit-outdoor unit connection wires between No. 1 and No. 2, and between No 2 and No. 3.

Is the voltage 0 V?

YES

Replace the connection wires between the indoor and outdoor units.

NO

**Check No. 13**  
Check power supply waveform.

Is there any disturbance?

NO

Replace indoor unit PCBs (1) and (2).  
(PCB (1) for FTK(X)25/35J)

YES

Locate the cause of the disturbance of the power supply waveform, and correct it.

(MF009)

### 1.5.10 Signal Transmission Error (Between Indoor Unit and Remote Controller)

Remote  
Controller  
Display

U5

Indoor Unit LED  
Display

A  B 



**Note:** No LED Display on FTK(X)25/35 J Series.

**Method of  
Malfunction  
Detection**

The data received from the indoor unit in indoor unit-remote controller signal transmission is checked whether it is normal.

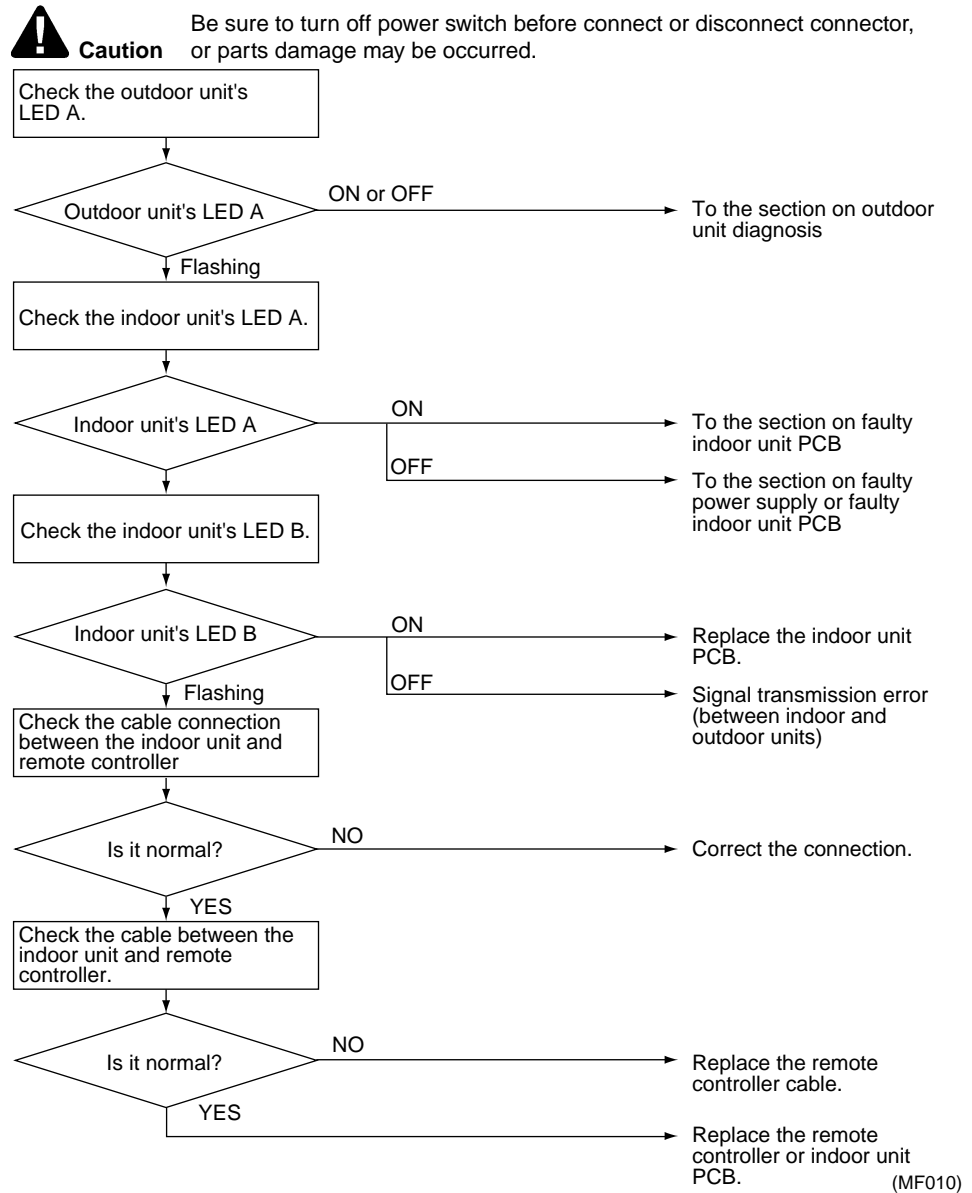
**Malfunction  
Decision  
Conditions**

When the data sent from the outdoor unit cannot be received normally, or when the content of the data is abnormal.

**Supposed  
Causes**

- Faulty outdoor unit PCB.
- Faulty indoor unit PCB.
- Faulty remote controller cable.
- Faulty remote controller.

## Troubleshooting



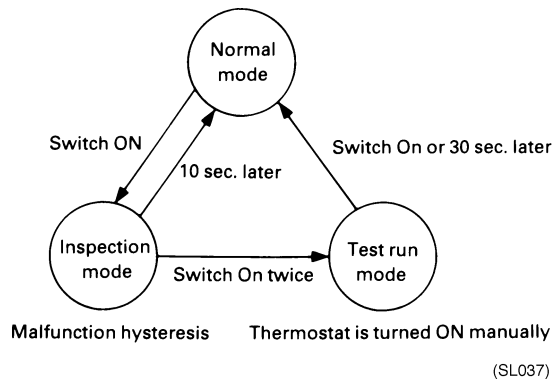
## 2. Troubleshooting - SkyAir Indoor Unit

### 2.1 The INSPECTION/TEST Button

#### Explanation

By turning the remote controller's inspection /test button ON, you can change the mode as shown in the figure on the right.

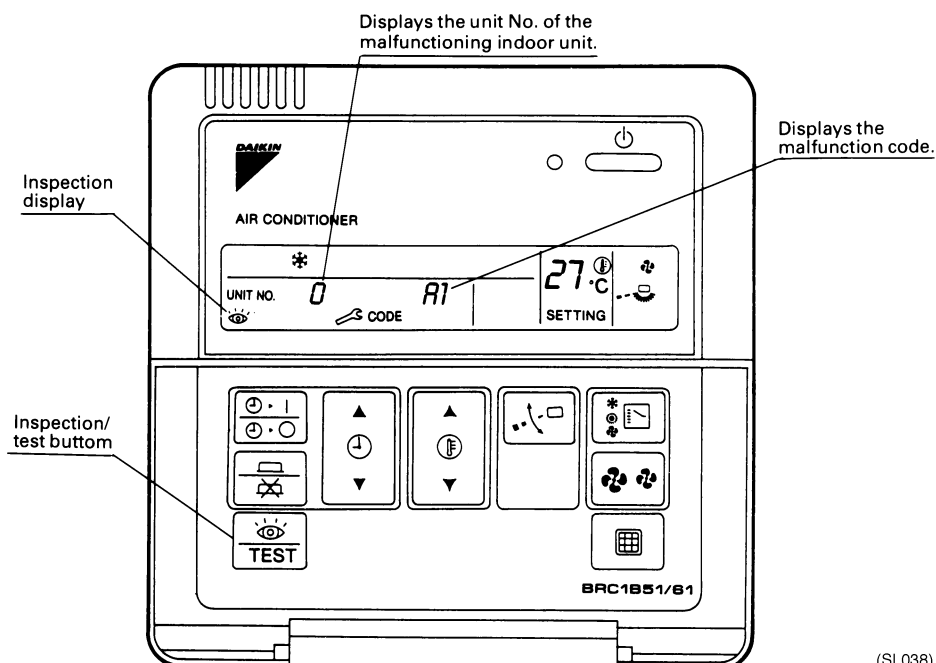
- When in the inspection mode, malfunction contents can be cleared by continuing to press the ON/OFF button for 5 seconds.  
(Let you know completion timing by blinking.)
- To carry out a test run, follow the procedure below.
  1. Open the gas side stop valve all the way
  2. Open the liquid side stop valve all the way.
  3. Energize the crank case heater for 6 hours.
  4. Enter the test run mode.
  5. Continue to operate by the operation switch for 3 minutes.
  6. Enter the normal mode.
  7. Check the functions according to the operation manual.



## 2.2 Self-Diagnosis by Wired Remote Controller

### Explanation

If operation stops due to malfunction, the remote controller's operation LED blinks, and malfunction code is displayed. (Even if stop operation is carried out, malfunction contents are displayed when the inspection mode is entered.) The malfunction code enables you to tell what kind of malfunction caused operation to stop. See page 251 for malfunction code and malfunction contents.



(SL038)

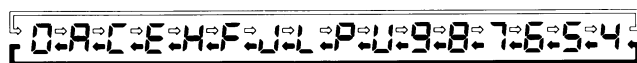
## 2.3 Fault Diagnosis by Wireless Remote Controller

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.)

### Procedure

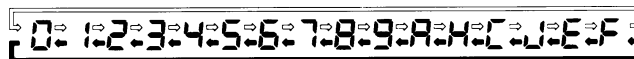
1. Press the INSPECTION/TEST button to select "Inspection."  
The equipment enters the inspection mode. The "Unit" indication lights and the Unit No. display shows flashing "0" indication.
2. Set the Unit No.  
Press the UP or DOWN button and change the Unit No. display until the buzzer (\*1) is generated 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.



⇒ " UP " button    ◀ " DOWN " button

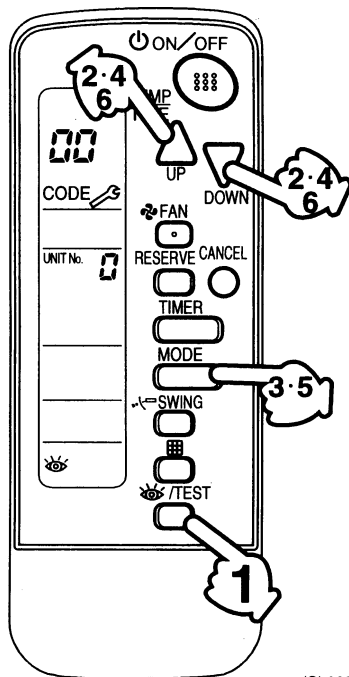
(SE015)

- \*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.



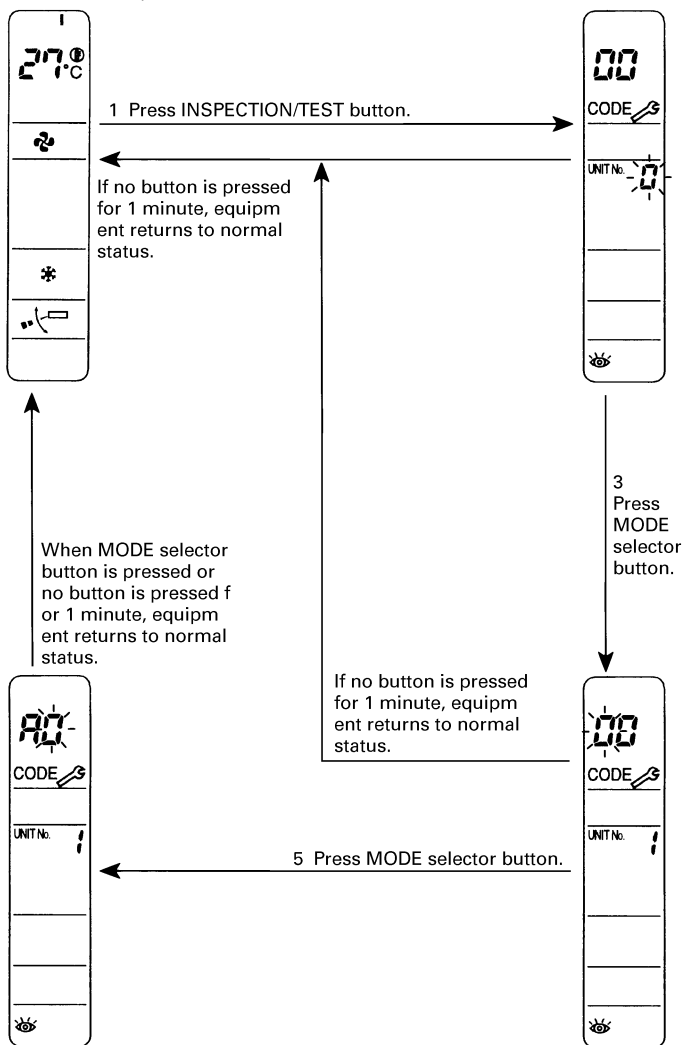
⇒ " UP " button    ◀ " DOWN " button

(SE016)



(SL039)

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



(SL040)

## 2.4 Troubleshooting by LED on the Indoor Unit's

### Foreword

Troubleshooting can be carried out by service monitor LED (green). (Blinks when normal)

☀ : LED on ● : LED off 🌀 : LED blinks — : No connection with troubleshooting

Microcomputer Normal Monitor	Transmission Normal Monitor	Contents/Processing
H1P (LED-A)	H2P (LED-B)	
🌀	🌀	Normal → Outdoor unit
🌀	☀	Failure of indoor unit PC board ass'y
	●	If outdoor unit's LED-A blinks, failure of indoor unit PC board ass'y (Note 1)
☀	—	Failure of indoor unit PC board ass'y (Note 2)
●		Malfunction of power supply or failure of PC board ass'y (Note 2)



#### Note:

1. If LED-B is off, the transmission wiring between indoor and outdoor unit may be incorrect or disconnected. Before performing the previously described troubleshooting, check the transmission wiring.
2. Troubleshoot by turning off the power supply for a minimum of 5 seconds, turning it back on, and then rechecking the LED display.

### General Precautions when Performing Maintenance

1. When disconnecting the fasten terminal from the PC board, hold down the PC board with your finger and do not apply excessive force. Also, do not hold the neck of the fasten terminal and pull the lead wire.
2. Do not use a mega tester on the secondary side (transformer secondary side) of the electronic circuitry.
3. Even when not energized, beware of static electricity when touching parts or pattern. (If handling PC board when dry [winter], be sure to discharge the electrostatic charge by grounding. Do not touch any other grounded metal parts with your fingers.)

## 2.5 Troubleshooting by Remote Controller Display / LED Display

### 2.5.1 Explanation for Symbols

◐ : Blinks   ◑ : On   ● : Off   — : No connection with troubleshooting

◎ : High probability of malfunction

○ : Possibility of malfunction

□ : Low probability of malfunction

— : No possibility of malfunction (do not replace)

### 2.5.2 Malfunction Code and LED Display Table

#### Indoor Unit

Indoor Unit Malfunctions	Indoor Unit LED Display Note 2		Remote Controller Display	Location of Malfunction			Contents of Malfunction	Details of Malfunction (Reference Page)	
	H1P	H2P		Other than PC Board	PC Board				
					Outdoor Unit	Indoor Unit			Remote Controller
			*Note 1	—	—	—	—	Normal → to outdoor unit	—
			A1	—	—	○	—	Failure of indoor unit PC board (For troubleshooting by LED, refer to p.250.)	252
		—							
		—							
			A3	◎	—	—	—	Malfunction of drain water level system	253
			A6	◎	—	□	—	Indoor unit fan motor overload/ overcurrent/ lock	255
			A7	◎	—	□	—	Swing flap motor malfunction / lock	256
			AJ	◎	—	○	—	Failure of capacity setting	257
			C4	◎	—	□	—	Malfunction of heat exchanger temperature sensor system	258
			C9	◎	—	□	—	Malfunction of suction air temperature sensor system	259



**Note:**

1. The asterisk (\*) indicates variety of circumstances.
2. No H2P for dedicated cooling only model 35 ~ 60 class.

## 2.6 Troubleshooting Detail

### 2.6.1 Failure of Indoor Unit PC Board

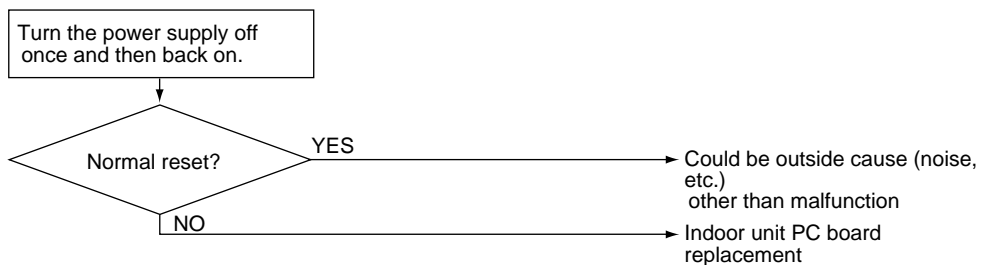
Remote Controller Display	<i>A1</i>
Indoor Unit LED Display	Refer to p.251
Applicable Models	All indoor unit models
Method of Malfunction Detection	Check data from E <sup>2</sup> PROM.
Malfunction Decision Conditions	When data could not be correctly received from the E <sup>2</sup> PROM E <sup>2</sup> PROM : Type of nonvolatile memory. Maintains memory contents even when the power supply is turned off.
Supposed Causes	■ Failure of PC board

#### Troubleshooting



**Caution**

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



(MF011)

## 2.6.2 Malfunction of Drain Water Level System (Float Type)

Remote  
Controller  
Display

*A3*

Applicable  
Models

FHYC

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

- Failure of drain pump
- Improper drain piping work
- Drain piping clogging
- Failure of float switch
- Failure of indoor unit PC board
- Failure of short-circuit connector

# Troubleshooting

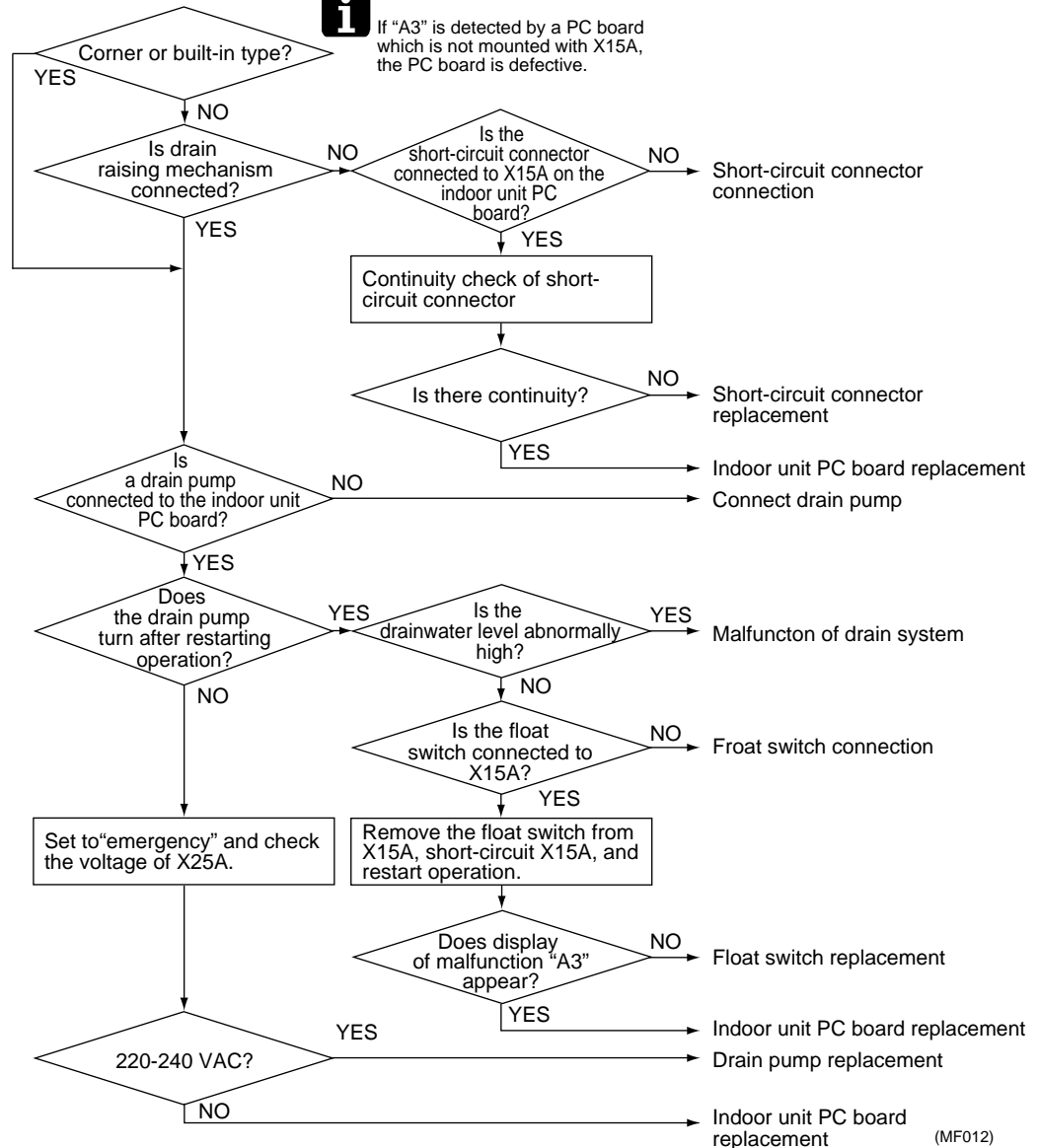


## Caution

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



If "A3" is detected by a PC board which is not mounted with X15A, the PC board is defective.



(MF012)

## 2.6.3 Indoor Unit Fan Motor Lock

Remote  
Controller  
Display

*AE*

Applicable  
Models

FHYC

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

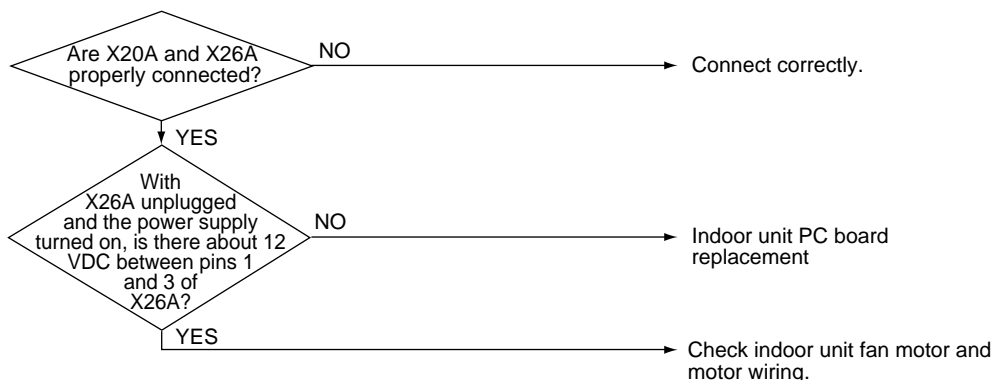
- Failure of indoor unit fan motor
- Broken or disconnected wire
- Failure of contact
- Failure of indoor unit PC board

### Troubleshooting



**Caution**

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



(MF013)

## 2.6.4 Swing Flap Motor Malfunction / Lock

Remote  
Controller  
Display

*A7*

Applicable  
Models

FHYC

Method of  
Malfunction  
Detection

Utilizes ON/OFF of the limit switch when the motor turns.

Malfunction  
Decision  
Conditions

When ON/OFF of the microswitch for positioning cannot be reversed even though the swing flap motor is energized for a specified amount of time (about 30 seconds).

Supposed  
Causes

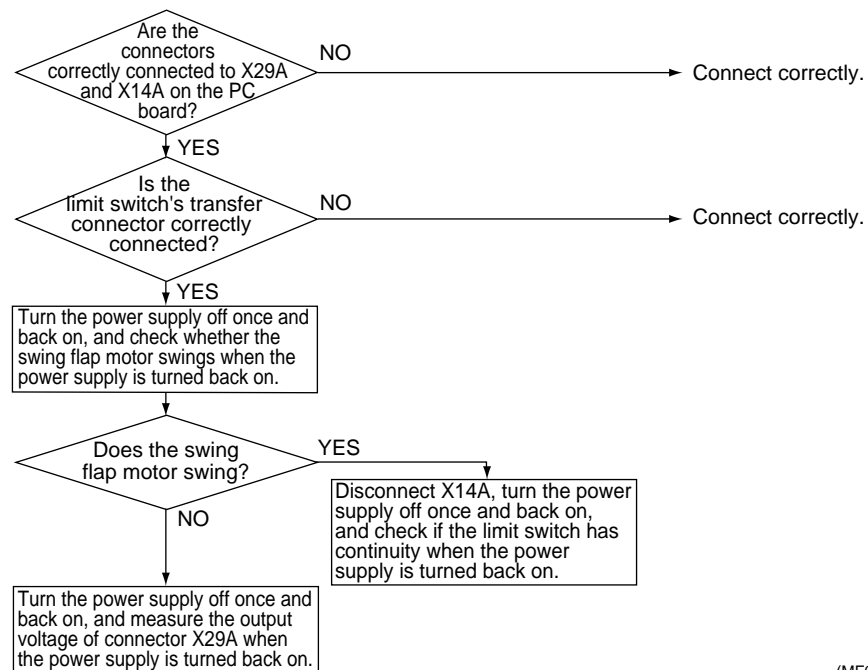
- Failure of motor
- Failure of microswitch
- Failure of connector connection
- Failure of indoor unit PC board

### Troubleshooting



#### Caution

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



(MF014)

## 2.6.5 Failure of Capacity Setting

Remote  
Controller  
Display

*AJ*

Applicable  
Models

FHYC

Method of  
Malfunction  
Detection

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

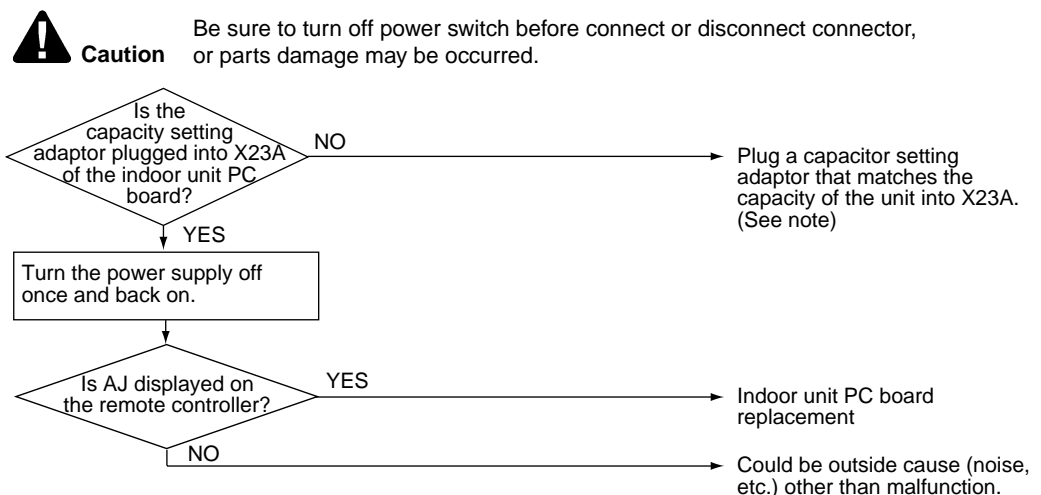
Malfunction  
Decision  
Conditions

Operation and:  
(1)When the capacity code is not contained in the PC board's memory, and the capacity setting adaptor is not connected.  
(2)When a capacity that doesn't exist for that unit is set.

Supposed  
Causes

- Failure of capacity setting adaptor connection
- Failure of indoor unit PC board

Troubleshooting



(MF015)



**Note:** Capacity is factory set in the data IC on the PC board. A capacity setting adaptor that matches the capacity of the unit is required in the following case.  
If the indoor PC board installed at the factory is for some reason changed at the installation site, the capacity will not be contained in the replacement PC board.  
If you connect a capacity setting adaptor to a PC board in which the capacity is memorized, the capacity setting for the PC board will become the capacity setting of the adaptor. (Priority of capacity setting adaptor)

## 2.6.6 Malfunction of Heat Exchange Temperature Sensor System

Remote  
Controller  
Display

C4

Applicable  
Models

All indoor unit models

Method of  
Malfunction  
Detection

Malfunction detection is carried out by temperature detected by heat exchanger sensor.

Malfunction  
Decision  
Conditions

When the heat exchanger thermistor becomes disconnected or short-circuited while the unit is running.

Supposed  
Causes

- Failure of the sensor itself
- Broken or disconnected wire
- Failure of electronic circuitry (indoor unit PC board)
- Failure of connector contact

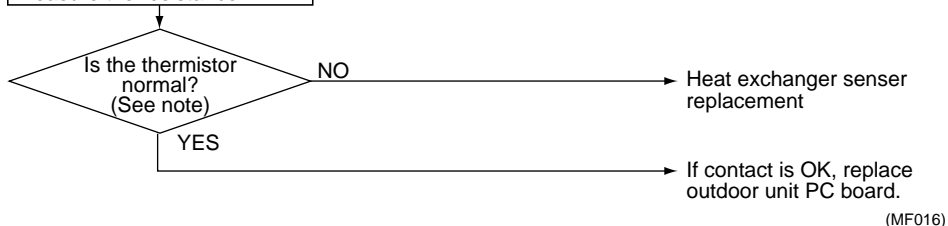
Troubleshooting



**Caution**

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

Disconnect the heat exchange sensor (R2T) from X18A on the indoor unit PC board and measure the resistance.



**Note:**

Measure the resistance while referring to the thermistor temperature and resistance conversion table. Thermistor temperature and resistance conversion table.

Temperature	Suction, heat exchanger(indoor) outdoor air, outdoor unit suction pipe sensor (kΩ)	Temperature	Suction, heat exchanger(indoor) outdoor air, outdoor unit suction pipe sensor (kΩ)
-6.0	90.8	28.0	17.6
-4.0	81.7	30.0	16.2
-2.0	73.5	32.0	14.8
0.0	66.3	34.0	13.6
2.0	59.8	36.0	12.5
4.0	54.1	38.0	11.5
6.0	48.9	40.0	10.6
8.0	44.3	42.0	9.8
10.0	40.2	44.0	9.1
12.0	36.5	46.0	8.4
14.0	33.2	48.0	7.8
16.0	30.2	50.0	7.2
18.0	27.5	52.0	6.9
20.0	25.1	54.0	6.2
22.0	23.0	56.0	5.7
24.0	21.0	58.0	5.3
26.0	19.2		

## 2.6.7 Malfunction of Suction Air Temperature Sensor System

Remote  
Controller  
Display

**C9**

Applicable  
Models

All indoor unit models

Method of  
Malfunction  
Detection

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

Malfunction  
Decision  
Conditions

When the suction air temperature sensor's thermistor becomes disconnected or short-circuited while the unit is running.

Supposed  
Causes

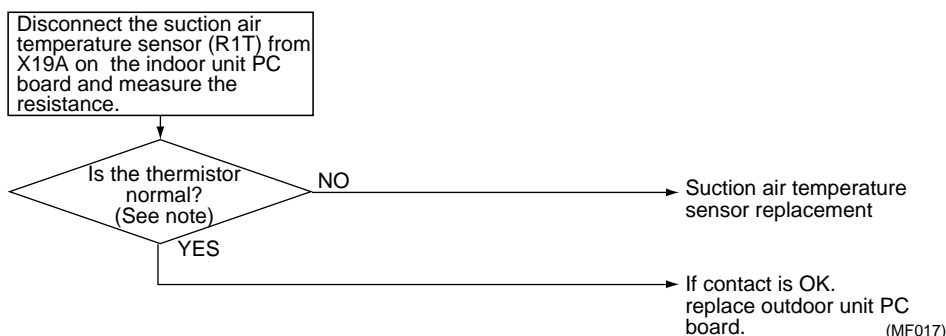
- Failure of the sensor itself
- Broken or disconnected wire
- Failure of indoor unit PC board
- Failure of connector contact

### Troubleshooting



**Caution**

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



**Note:**

Measure the resistance while referring to the thermistor temperature and resistance conversion table. Thermistor temperature and resistance conversion table.

Temperature	Suction, heat exchanger(indoor) outdoor air, outdoor unit suction pipe sensor (kΩ)	Temperature	Suction, heat exchanger(indoor) outdoor air, outdoor unit suction pipe sensor (kΩ)
-6.0	90.8	28.0	17.6
-4.0	81.7	30.0	16.2
-2.0	73.5	32.0	14.8
0.0	66.3	34.0	13.6
2.0	59.8	36.0	12.5
4.0	54.1	38.0	11.5
6.0	48.9	40.0	10.6
8.0	44.3	42.0	9.8
10.0	40.2	44.0	9.1
12.0	36.5	46.0	8.4
14.0	33.2	48.0	7.8
16.0	30.2	50.0	7.2
18.0	27.5	52.0	6.9
20.0	25.1	54.0	6.2
22.0	23.0	56.0	5.7
24.0	21.0	58.0	5.3
26.0	19.2		

# 3. Troubleshooting - Outdoor Unit Related

## 3.1 The Unit Runs but Doesn't Cool (Heat) the Room

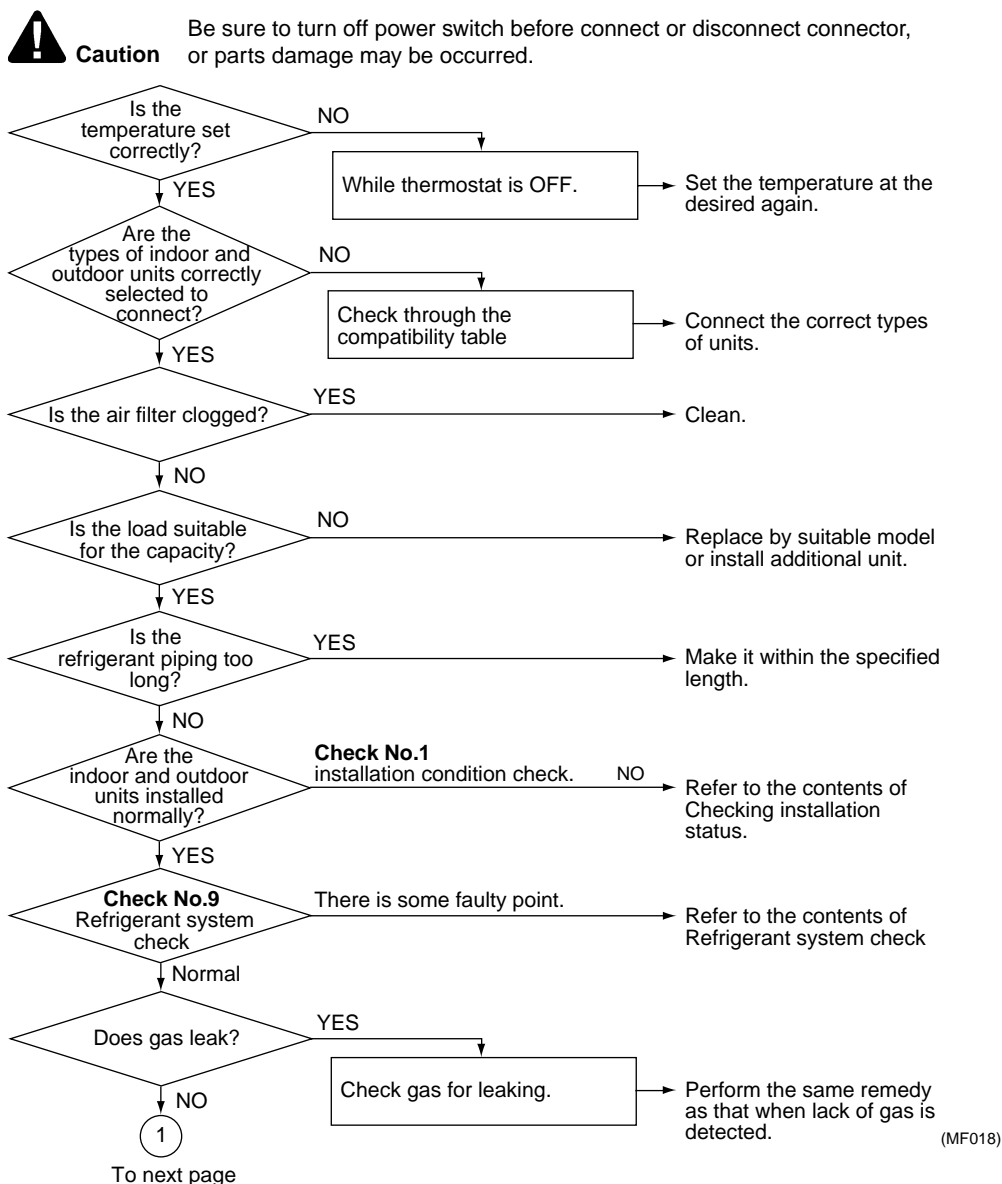
### Supposed Causes

- Incorrect temperature setting
- Unconnectable models
- Clogged air filter
- Improper load for the capacity
- Excessively long refrigerant pipe
- Faulty installation of indoor unit / outdoor unit
- Clogged refrigerant circuit, etc.
- Gas shortage
- Stop valve closed
- EVn malfunction
- EVH malfunction
- EVP malfunction

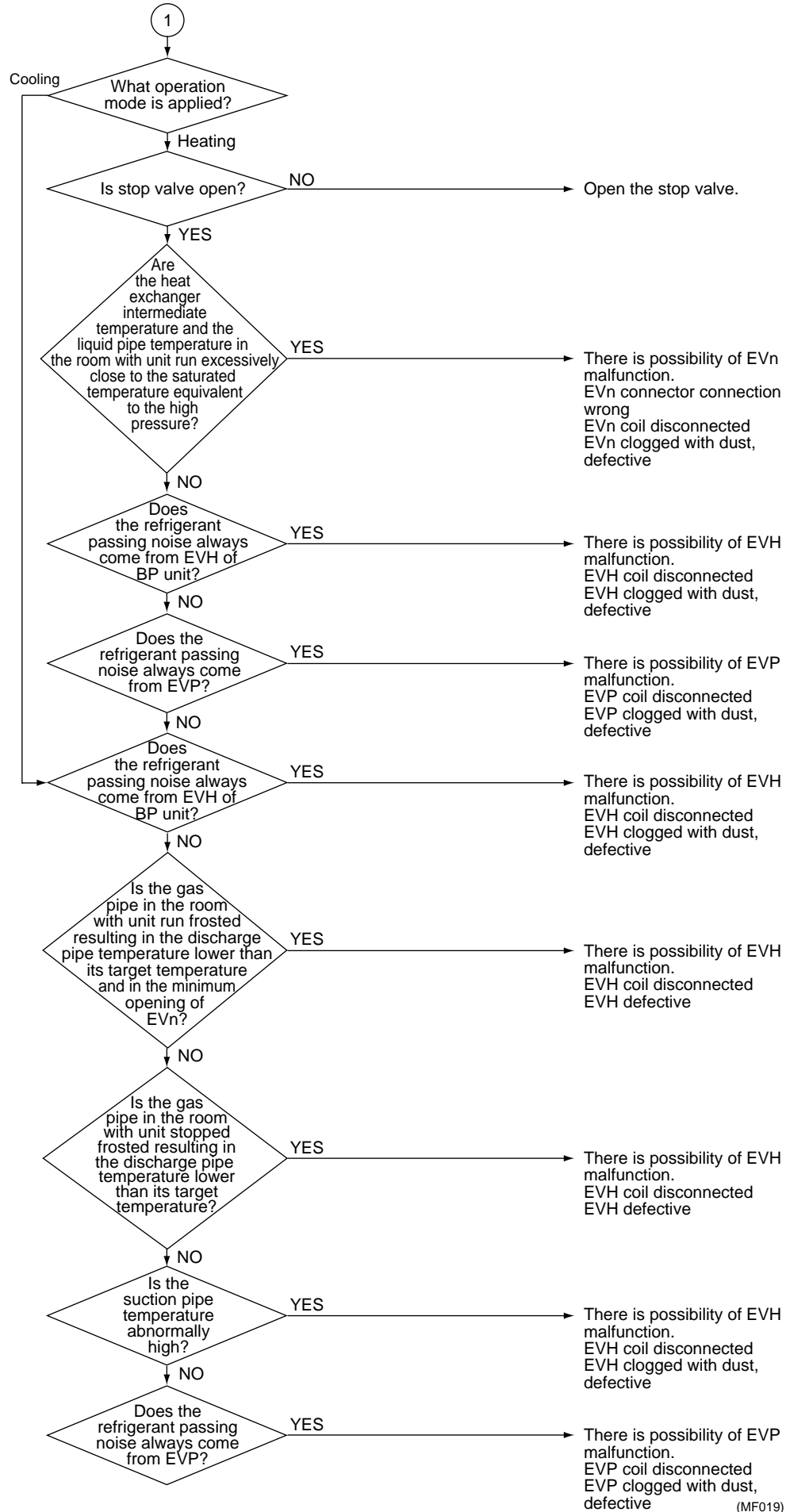
### Troubleshooting

 **Check No.1**  
Refer to P.300

 **Check No.9**  
Refer to P.306



## Troubleshooting



## 3.2 7 Seg. Display on the Outdoor P. C. Board

### TROUBLE DAIGNOSIS

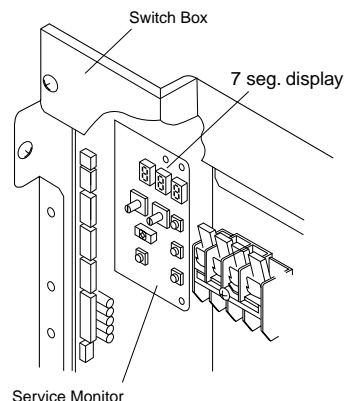
<LED ON OUTDOOR UNIT PCB >

	[ GREEN ]	LED DISPLAY	
		[ Blinking slowly ]	[ ON ] OR  [ OFF ] OR  [ Blinking quickly ]
PCB4	LED (A)H1P	NORMAL	ABNORMAL (Malfunction of control unit)
PCB1	LED H2P		
PCB3	LED H3P		
	LED H4P		

<DIGITAL DISPLAY >

Rotary SW position : Set SW1 to 0, Set SW2 to 0.

DIGITAL DISPLAY	DIAGNOSIS
A5	<b>INDOOR UNNIT</b> : High pressure protector worked, or freeze-up in operating unit (Stop due to peak cut, freeze)
A9	<b>BP UNIT</b> : Malfunction of moving part of electric expansion valve (Y1E ~ Y4E)
E3	<b>OUTDOOR UNIT</b> : Actuation of high pressure switch
E6	<b>OUTDOOR UNIT</b> : Compressor lock
E7	<b>OUTDOOR UNIT</b> : Fan motor lock or OCP (Output Over current Protect)
E8	<b>OUTDOOR UNIT</b> : Inverter input over current protect
E9	<b>OUTDOOR UNIT</b> : Malfunction of moving part of electric expansion valve (Y1E ~ Y3E)
F3	<b>OUTDOOR UNIT</b> : Abnormal discharge pipe temperature
FC	<b>OUTDOOR UNIT</b> : Low pressure drop error
H3	<b>OUTDOOR UNIT</b> : High pressure switch failure
H6	<b>OUTDOOR UNIT</b> : Compressor motor position detection sensor error
H7	<b>OUTDOOR UNIT</b> : Fan motor position detection sensor error
H8	<b>OUTDOOR UNIT</b> : AC current sensor error
H9	<b>OUTDOOR UNIT</b> : Malfunction of thermistor for outdoor air
J3	<b>OUTDOOR UNIT</b> : Discharge pipe thermistor or related abnormaly
J5	<b>OUTDOOR UNIT</b> : Malfunction of suction pipe thermistor
J6	<b>OUTDOOR UNIT</b> : Malfunction of heat exchanger thermistor
J7	<b>OUTDOOR UNIT</b> : Malfunction of heat exchanger liquid thermistor
J8	<b>BP UNIT</b> : Malfunction of liquid pipe thermistor
J9	<b>BP UNIT</b> : Malfunction of gas pipe thermistor
JC	<b>OUTDOOR UNIT</b> : Malfunction of suction pipe pressure sensor



L3	<b>OUTDOOR UNIT</b> : Electric component box over temperature
L4	<b>OUTDOOR UNIT</b> : Radiation fin over temperature
L5	<b>OUTDOOR UNIT</b> : Compressor motor insulation defect, short circuit, power unit short circuit
L7	<b>OUTDOOR UNIT</b> : Total input over current
L8	<b>OUTDOOR UNIT</b> : Compressor overload, compressor motor wire cut
L9	<b>OUTDOOR UNIT</b> : Compressor start up error
LC	<b>OUTDOOR UNIT</b> : Malfunction of transmission between inverter and outdoor control unit
P3	<b>OUTDOOR UNIT</b> : Malfunction of electric component box sensor
P4	<b>OUTDOOR UNIT</b> : Malfunction of power unit temperature sensor
U0	<b>OUTDOOR UNIT</b> : Refrigerant shortage
U2	<b>OUTDOOR UNIT</b> : Power supply insufficient or instantaneous failure
U4	Malfunction of transmission between BP unit and outdoor unit
U6	Malfunction of transmission between indoor unit and BP unit
U7	Malfunction of transmission between fan control unit and outdoor control unit
UA	<b>BP UNIT</b> : Failure of field setting
UH	<b>OUTDOOR UNIT</b> : Malfunction of outdoor control unit

#### <CAUTION>

It is possible to check if the outdoor unit, or a BP unit, is malfunctioning.  
Rotary SW position : Set SW1 to 0, Set SW2 to 1.  
(Digital display is as follows.)

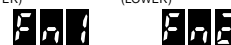
Outdoor unit malfunction :



BP unit malfunction :



DC fan malfunction :



Return SW to original position. : "SW1 to 0, SW2 to 0"

2P060527

## 3.3 Troubleshooting Detail

### 3.3.1 High Pressure Malfunction

#### Outdoor Unit Indication



#### Method of Malfunction Detection

Continuity of the high pressure switch is detected by the safety device circuitry.

#### Malfunction Decision Conditions

When HPS malfunction is generated 4 times, the system shuts down.

(The 4-time counter resets itself when no outdoor unit abnormality occurs within 60-minute cumulative time after the error generation.)

#### Supposed Causes

- Faulty high pressure switch
- Disconnection of high pressure switch's harness
- Faulty connectors connection of high pressure switch
- Dirty indoor unit heat exchanger
- Faulty outdoor unit fan
- Over-charged with refrigerant
- Motorized valve clogged

#### Troubleshooting

**Check No.1**  
Refer to P.300

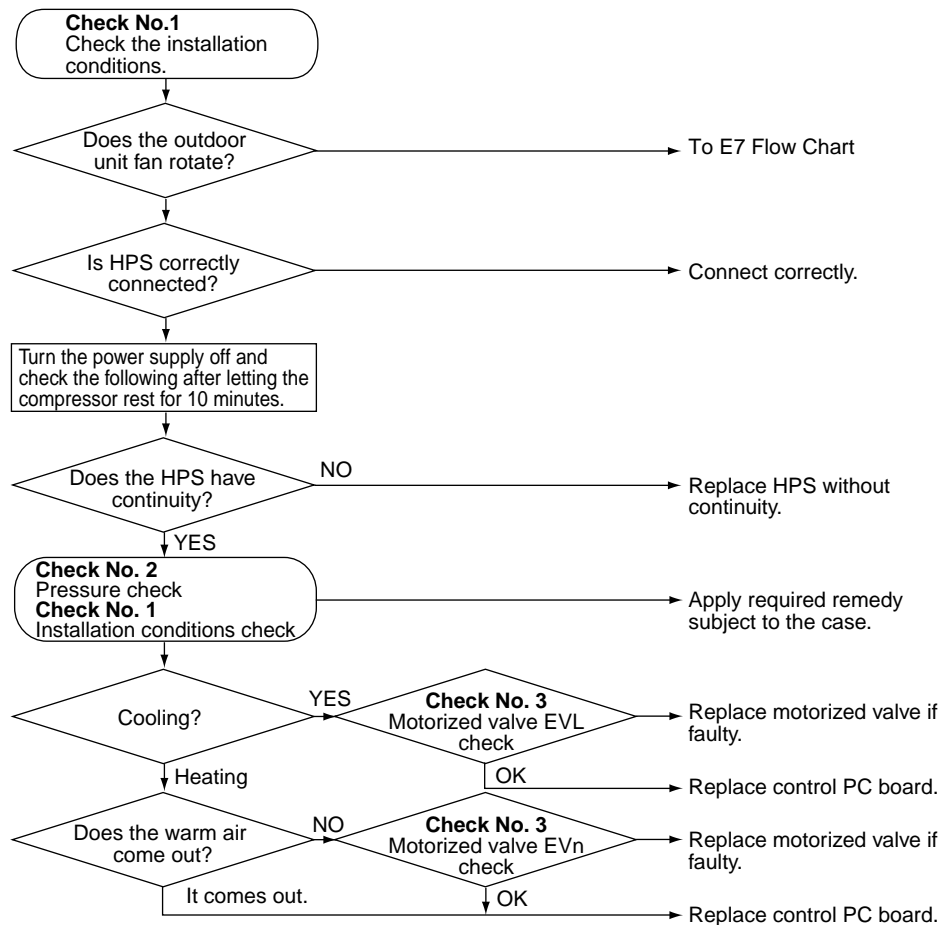
**Check No.2**  
Refer to P.300

**Check No.3**  
Refer to P.301



#### Caution

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



(MF020)

### 3.3.2 Compressor Lock

Outdoor Unit  
Indication

**E6**

Method of  
Malfunction  
Detection

Detection by the position signal waveform when starting the compressor.

Malfunction  
Decision  
Conditions

When the position detected signal coincides with the lock pattern at time of starting the compressor.

- When a compressor lock is generated 4 times, the system shuts down.  
(The 4-time counter resets itself when no outdoor unit abnormality occurs within 60-minute cumulative time after the error generation.)

Supposed  
Causes

- Faulty compressor

Troubleshooting



**Caution**

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

Turn the power supply off once  
and then back on to restart.



(MF021)

### 3.3.3 Fan Lock / Overcurrent

#### Outdoor Unit Indication

E7

#### Method of Malfunction Detection

Fan lock is detected using the voltage signal given to the fan and number of turns of the fan motor.

Overcurrent is detected by the signal from driver.

#### Malfunction Decision Conditions

When the fan ran with 30rpm or less continuously for 6 seconds in the waveform output

When OCP signal was sent from the fan driver

- When a fan lock / overcurrent is generated 4 times, the system shuts down. (The 4-time counter resets itself when no outdoor unit abnormality occurs within 60-minute cumulative time after the error generation.)

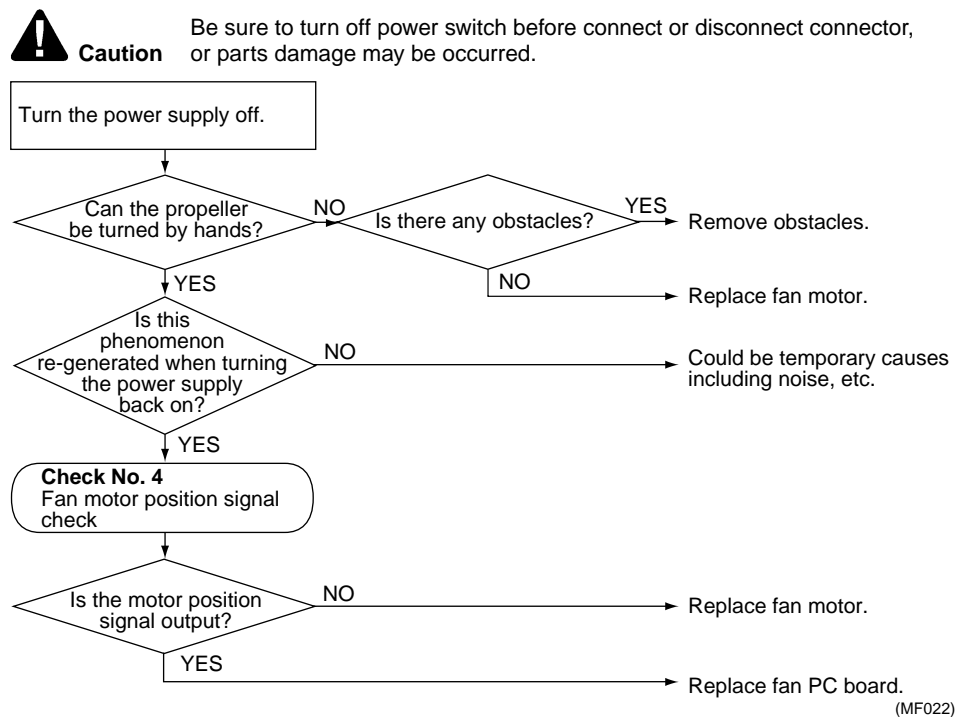
#### Supposed Causes

- Interference by foreign matters with propeller
- Faulty fan PC board
- Faulty fan motor

#### Troubleshooting



**Check No.4**  
Refer to P.301



### 3.3.4 Operation Halt Due to Detection of INV Input Current Error

Outdoor Unit  
Indication

**E8**

Method of  
Malfunction  
Detection

INV input current error is detected using INV input current detected by CT.

Malfunction  
Decision  
Conditions

When the inverter input current of 28A or more continued for 2.5 seconds.

- When an INV input current error is generated 4 times, the system shuts down.  
(The 4-time counter resets itself when no outdoor unit abnormality occurs within 60-minute cumulative time after the error generation.)

Supposed  
Causes

- Faulty wiring connection of filter PC board and control PC board
- Faulty compressor
- Overcurrent due to faulty PC board
- Incorrect detection due to faulty PC board
- Short-circuit

Troubleshooting

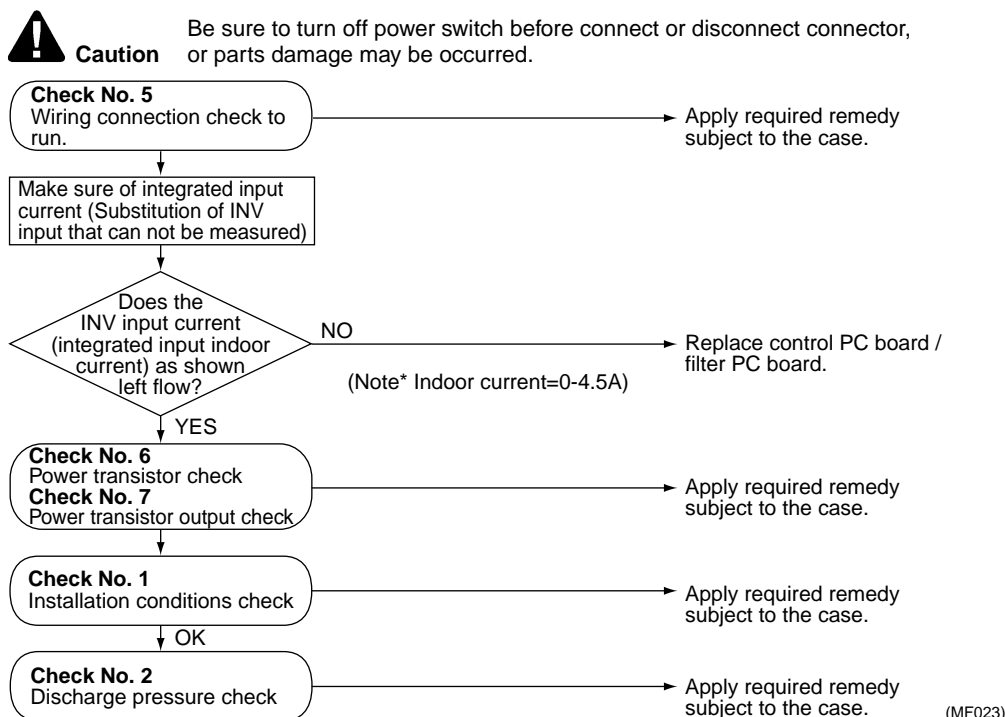
  
**Check No.5**  
Refer to P.302

  
**Check No.6**  
Refer to P.303

  
**Check No.7**  
Refer to P.304

  
**Check No.1**  
Refer to P.300

  
**Check No.2**  
Refer to P.300



### 3.3.5 Malfunction of Electronic Expansion Valve

Outdoor Unit  
Indication

**E9**

Method of  
Malfunction  
Detection

Detection by checking continuity and lack of connector.

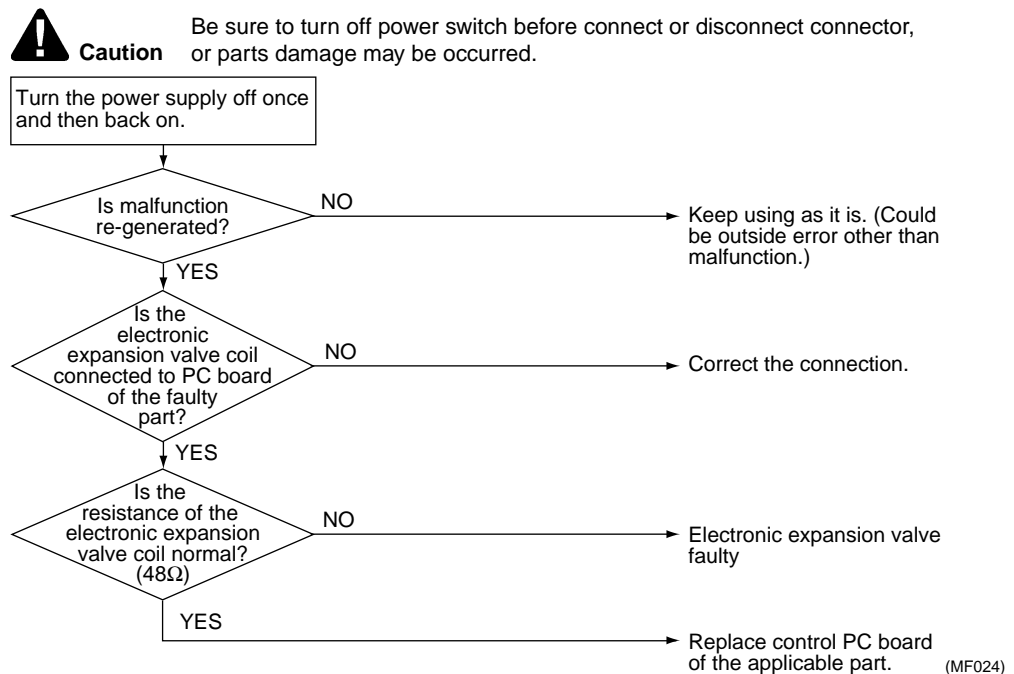
Malfunction  
Decision  
Conditions

Malfunction is determined by no common voltage applied when turning the power supply on.

Supposed  
Causes

- Faulty electronic expansion valve
- Faulty harness of electronic expansion valve
- Incorrect connectors connection of electronic expansion valve
- Outside cause (noise, etc.)

Troubleshooting



**Note:** The applicable part of motorized valve is displayed via rotary switch [01].

### 3.3.6 Operation Halt Due to Discharge Pipe Temperature Control

#### Outdoor Unit Indication

**F3**

#### Method of Malfunction Detection

Discharge pipe temperature control (halt, frequency deviation, etc.) is carried out using temperature detected by the discharge pipe thermistor.

#### Malfunction Decision Conditions

- Case where the compressor halts operation when the temperature detected by the discharge pipe thermistor rose to 115°C or higher. (reset when the temperature falls to 85°C or lower.)
- When this is generated 4 times, the system shuts down.
- The error counter resets itself when no compressor abnormality occurs within 60-minute cumulative time after the error generation. (including operation halt due to other errors)

#### Supposed Causes

- Insufficient refrigerant
- Malfunction of 4-way valve
- Faulty discharge pipe thermistor
- Faulty outdoor unit PC board
- Water mixed in the piping at site
- Faulty motorized valve
- Faulty stop valve
- Faulty indoor unit solenoid valve

#### Troubleshooting

  
**Check No.8**  
Refer to P.305

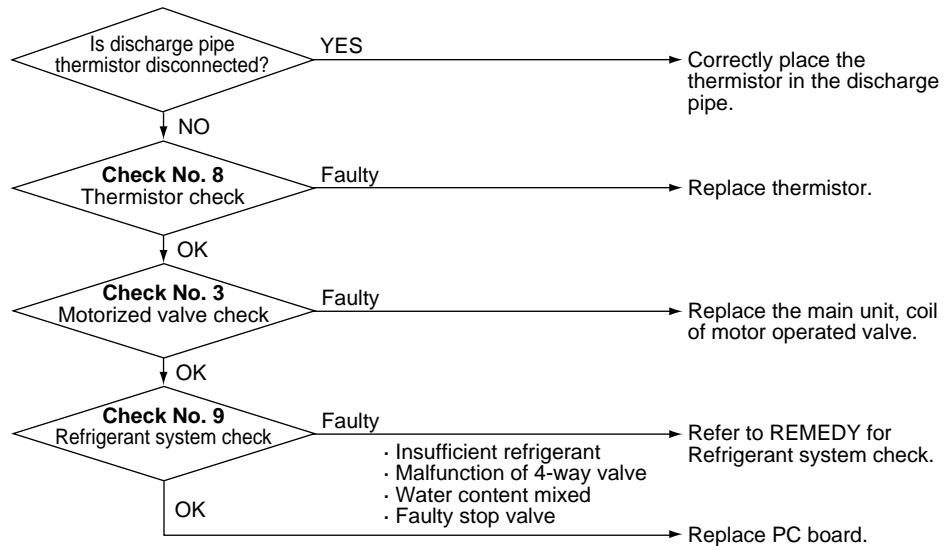
  
**Check No.3**  
Refer to P.301

  
**Check No.9**  
Refer to P.306



#### Caution

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



(MF025)

### 3.3.7 LP Drop Error

#### Outdoor Unit Indication

FC

#### Method of Malfunction Detection

When the value of LP sensor was kept at lower level for a certain time range after the certain time range passed since the compressor started.

#### Malfunction Decision Conditions

When the value of LP sensor was kept at  $0\text{kg/cm}^2 \cdot \text{G}$  or less for a certain time range after TLPGD period (15 seconds when cooling, 150 seconds when heating) passed since the compressor started.

#### Supposed Causes

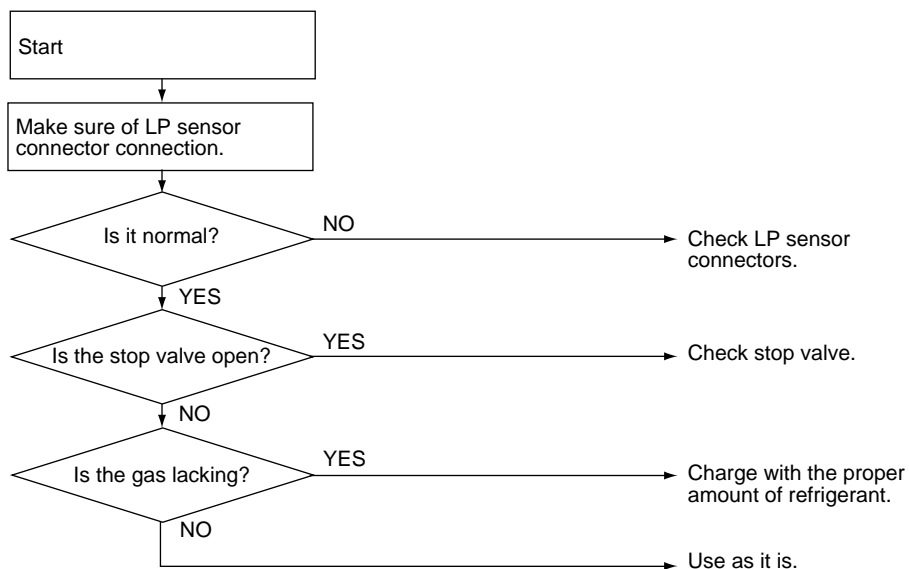
- Malfunction of LP sensor
- Faulty contact of LP sensor connector
- Gas shortage
- Heating operation under low outside air temperature beyond the operative area

#### Troubleshooting



#### Caution

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



(MF026)

### 3.3.8 Malfunction of High Pressure Switch System

Outdoor Unit  
Indication

**H3**

Method of  
Malfunction  
Detection

Continuity of high pressure switch is detected by the safety device circuitry.

Malfunction  
Decision  
Conditions

When the compressor is off, and the high pressure switch doesn't have continuity.

Supposed  
Causes

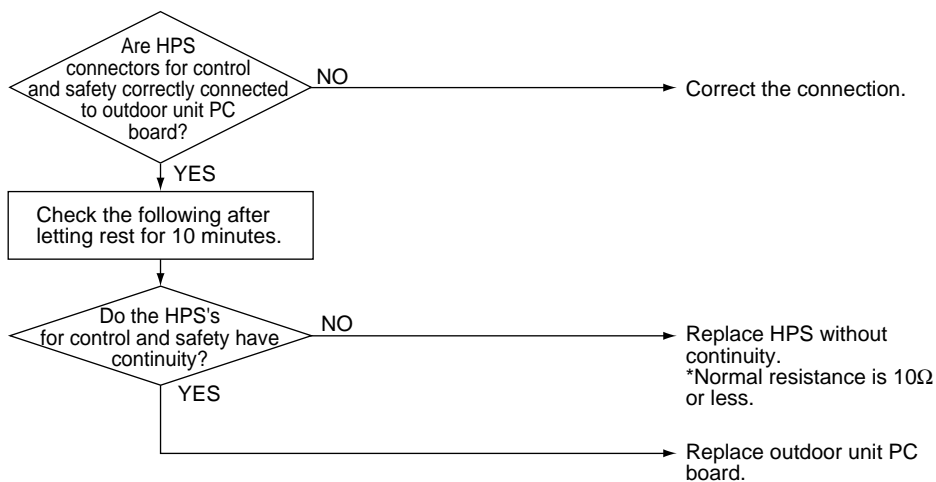
- Faulty high pressure switch
- Disconnection of high pressure switch harness
- Faulty connectors connection of high pressure switch

Troubleshooting



**Caution**

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



(MF027)

### 3.3.9 Operation Halt Due to Faulty Position Detection Sensor

Outdoor Unit  
Indication

**H6**

Method of  
Malfunction  
Detection

Faulty start of the compressor is detected by checking the turning information of the compressor via position detector of electrical parts.

Malfunction  
Decision  
Conditions

When the compressor did not turn in approximately 15 seconds after starting operation.  
Frequency: 4 times  
Clear condition: 60-minute continuous run (normal)

Supposed  
Causes

- Incorrect detection due to disconnected relay of compressor
- Malfunction to start due to faulty compressor
- Malfunction to start due to faulty outdoor unit PC board
- Malfunction to start due to stop valve "closed"
- Incorrect detection due to faulty outdoor unit PC board
- Input voltage error

#### Troubleshooting



Check No.6  
Refer to P.303

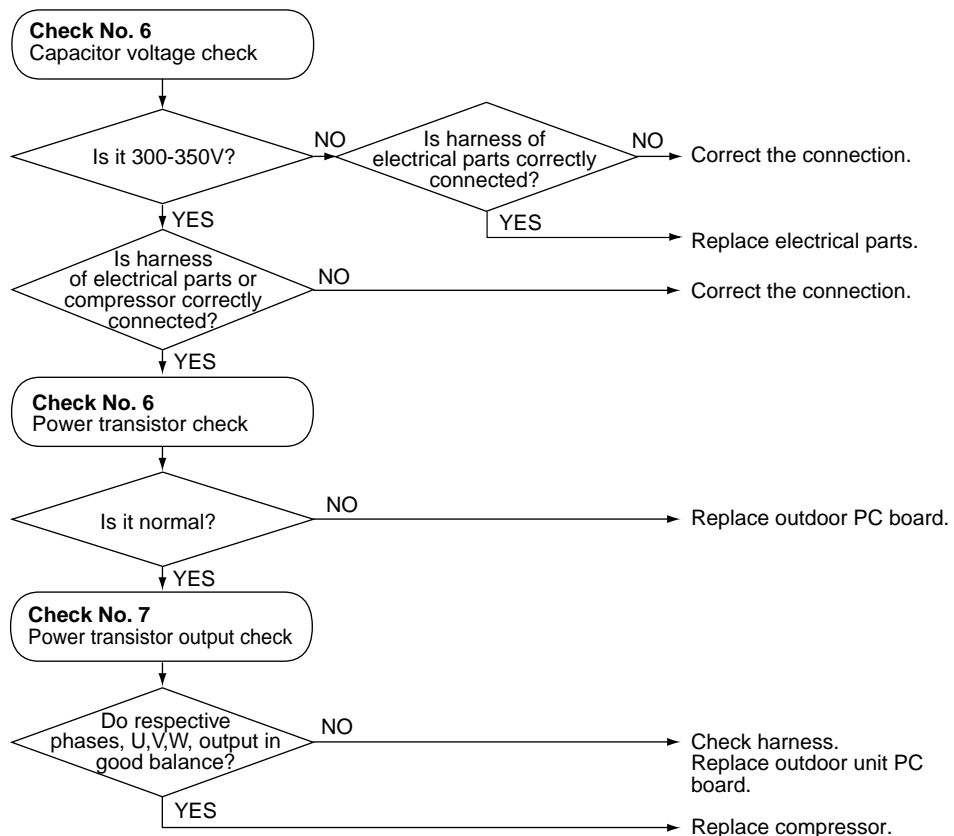


Check No.7  
Refer to P.304



#### Caution

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



(MF028)

### 3.3.10 Fan Position Detection Error

Outdoor Unit  
Indication

H7

Method of  
Malfunction  
Detection

Fan malfunction is detected by checking 3 numbers motor position detection signal.

Malfunction  
Decision  
Conditions

When the same state with 3 numbers motor position detection signal was kept for 5 seconds.

- When a fan malfunction is generated 4 times, the system shuts down.  
(The 4-time counter resets itself when no outdoor unit abnormality occurs within 60-minute cumulative time after the malfunction generation.)

Supposed  
Causes

- Incorrect connectors connection
- Faulty fan PC board
- Faulty fan motor

Troubleshooting

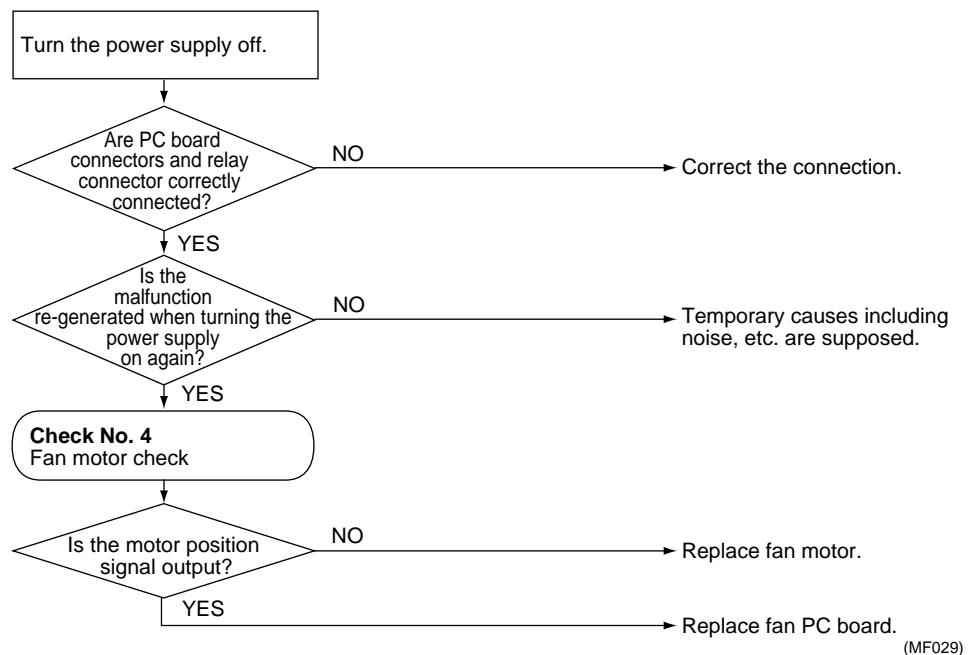


Check No.4  
Refer to P.301



**Caution**

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



### 3.3.11 Operation Halt Due to Detection of CT Error

#### Outdoor Unit Indication

H8

#### Method of Malfunction Detection

CT errors are detected using the compressor's operating frequency and the input current detected by the CT.

#### Malfunction Decision Conditions

When the compressor's rotating speed is 64rps or more and the CT input is 2 A or less.

- When a CT error is generated 4 times, the system shuts down.  
(The 4-time counter resets itself when no outdoor unit abnormality occurs within 60 minutes (cumulative time) after the error generation.)

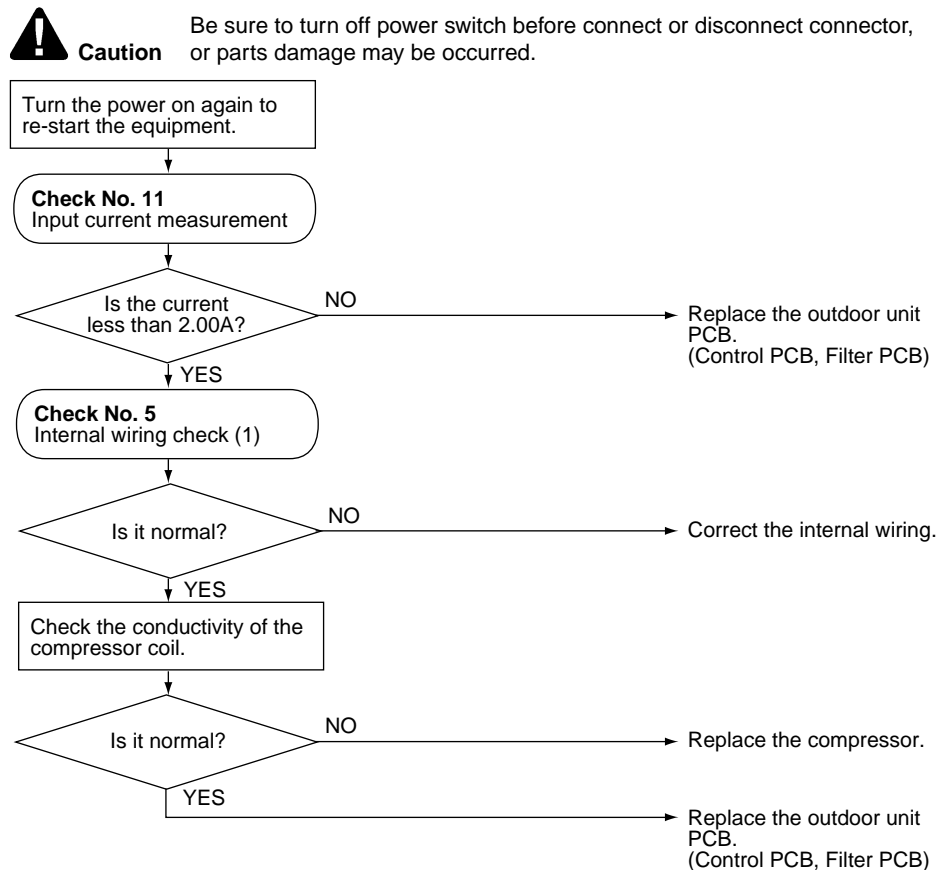
#### Supposed Causes

- Incorrect connectors connection
- Faulty thermistor
- Faulty power transistor
- Breaking of wire or faulty connection of internal wiring
- Faulty reactor
- Faulty PCB

#### Troubleshooting

  
**Check No.11**  
Refer to P.307

  
**Check No.5**  
Refer to P.302



(MF030)

### 3.3.12 Faulty Outside Air Thermistor

Outdoor Unit  
Indication

**H9**

Method of  
Malfunction  
Detection

Malfunction  
Decision  
Conditions

When the outside air temperature sensor became short-circuited or open.

Supposed  
Causes

- Faulty outside air temperature sensor
- Faulty connectors connection of outside air temperature sensor

Troubleshooting



**Caution**

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

Disconnect the thermistor connectors from outdoor unit PC board and measure the resistance of suction air temperature sensor.



	A	B
1	-10°C	117kΩ
2	0°C	67kΩ
3	10°C	40kΩ
4	20°C	25kΩ
5	30°C	16kΩ
6	40°C	10kΩ
7	50°C	7kΩ
8	60°C	5kΩ
9	70°C	3kΩ

### 3.3.13 Faulty Discharge Thermistor

Outdoor Unit  
Indication

**J3**

Method of  
Malfunction  
Detection

Malfunction  
Decision  
Conditions

When the discharge temperature sensor became short-circuited or open.

Supposed  
Causes

- Faulty discharge temperature sensor
- Faulty connectors connection of discharge temperature sensor

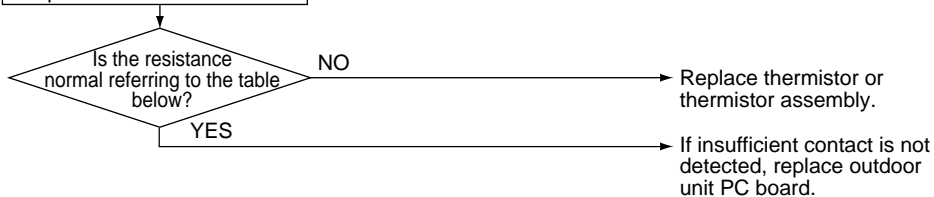
Troubleshooting



**Caution**

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

Disconnect the thermistor connectors from outdoor unit PC board and measure the resistance of discharge temperature sensor.



(MF032)

	A	B
1	-10°C	117kΩ
2	0°C	67kΩ
3	10°C	40kΩ
4	20°C	25kΩ
5	30°C	16kΩ
6	40°C	10kΩ
7	50°C	7kΩ
8	60°C	5kΩ
9	70°C	3kΩ

### 3.3.14 Faulty of Suction Thermistor

Outdoor Unit  
Indication

J5

Method of  
Malfunction  
Detection

Malfunction  
Decision  
Conditions

When the suction temperature sensor became short-circuited or open.

Supposed  
Causes

- Faulty suction temperature sensor
- Faulty connectors connection of suction temperature sensor

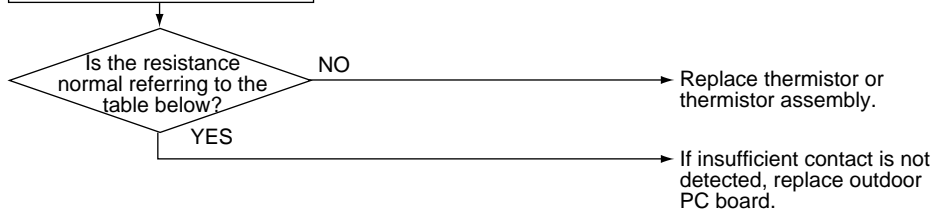
Troubleshooting



**Caution**

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

Disconnect the thermistor connectors from outdoor unit PC board and measure the resistance of suction temperature sensor.



(MF033)

	A	B
1	-10°C	117kΩ
2	0°C	67kΩ
3	10°C	40kΩ
4	20°C	25kΩ
5	30°C	16kΩ
6	40°C	10kΩ
7	50°C	7kΩ
8	60°C	5kΩ
9	70°C	3kΩ

### 3.3.15 Faulty heat exchanger thermistor

Outdoor Unit  
Indication

*JE*

Method of  
Malfunction  
Detection

Malfunction  
Decision  
Conditions

When the heat exchanger temperature sensor became short-circuited or open.

Supposed  
Causes

- Faulty heat exchanger temperature sensor
- Faulty connectors connection of heat exchanger temperature sensor

Troubleshooting



**Caution**

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

Disconnect the thermistor connectors from outdoor unit PC board and measure the resistance of heat exchanger temperature sensor.



(MF034)

	A	B
1	-10°C	117kΩ
2	0°C	67kΩ
3	10°C	40kΩ
4	20°C	25kΩ
5	30°C	16kΩ
6	40°C	10kΩ
7	50°C	7kΩ
8	60°C	5kΩ
9	70°C	3kΩ

### 3.3.16 Faulty of Liquid Pipe Thermistor

Outdoor Unit  
Indication



Method of  
Malfunction  
Detection

Malfunction  
Decision  
Conditions

When the liquid pipe temperature sensor became short-circuited or open.

Supposed  
Causes

- Faulty liquid pipe temperature sensor
- Faulty connectors connection of liquid pipe temperature sensor

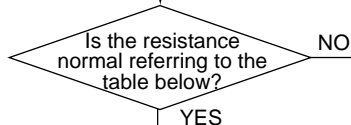
Troubleshooting



**Caution**

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

Disconnect the thermistor connectors from outdoor unit PC board and measure the resistance of liquid pipe temperature sensor.



→ Replace thermistor or thermistor assembly.

→ If insufficient contact is not detected, replace outdoor unit PC board.

(MF035)

	A	B
1	-10°C	117kΩ
2	0°C	67kΩ
3	10°C	40kΩ
4	20°C	25kΩ
5	30°C	16kΩ
6	40°C	10kΩ
7	50°C	7kΩ
8	60°C	5kΩ
9	70°C	3kΩ

### 3.3.17 Faulty BP Liquid Pipe Thermistor

Outdoor Unit  
Indication

*J8*

Method of  
Malfunction  
Detection

Malfunction  
Decision  
Conditions

When the BP liquid pipe temperature sensor became short-circuited or open.

Supposed  
Causes

- Faulty BP liquid pipe temperature sensor
- Faulty connectors connection of BP liquid pipe temperature sensor

Troubleshooting

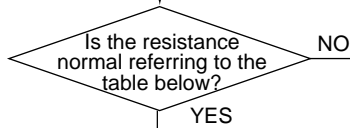


**Caution**

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

Set the rotary switch to [01] and specify the corresponding BP unit.

Disconnect the thermistor connectors from the corresponding BP PC board and measure the resistance of liquid tube temperature sensor.



→ Replace thermistor or thermistor assembly.

→ If insufficient contact is not detected, replace the corresponding PC board.

(MF036)

	A	B
1	-10°C	117kΩ
2	0°C	67kΩ
3	10°C	40kΩ
4	20°C	25kΩ
5	30°C	16kΩ
6	40°C	10kΩ
7	50°C	7kΩ
8	60°C	5kΩ
9	70°C	3kΩ

### 3.3.18 Faulty BP Gas Pipe Thermistor

Outdoor Unit  
Indication

**J9**

Method of  
Malfunction  
Detection

Malfunction  
Decision  
Conditions

When the BP gas pipe temperature sensor became short-circuited or open.

Supposed  
Causes

- Faulty BP gas pipe temperature sensor
- Faulty connectors connection of BP gas pipe temperature sensor

Troubleshooting



**Caution**

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

Set the rotary switch to [01] and specify the corresponding BP unit.

Disconnect the thermistor connectors from the corresponding BP PC board and measure the resistance of gas pipe temperature sensor.

Is the resistance normal referring to the table below?

NO

→ Replace thermistor or thermistor assembly.

YES

→ If insufficient contact is not detected, replace the corresponding PC board.

(MF037)

	A	B
1	-10°C	117kΩ
2	0°C	67kΩ
3	10°C	40kΩ
4	20°C	25kΩ
5	30°C	16kΩ
6	40°C	10kΩ
7	50°C	7kΩ
8	60°C	5kΩ
9	70°C	3kΩ

### 3.3.19 Abnormal LP Error

#### Outdoor Unit Indication



#### Method of Malfunction Detection

1. Error is determined by the LP sensor value when the compressor is off.
2. Error is determined by the LP sensor value in normal operation when the compressor is on.
3. Error is determined by the LP sensor value when a certain time range passed after standby operation at time of starting.

#### Malfunction Decision Conditions

When either of 1-3 conditions mentioned above was satisfied.

#### Supposed Causes

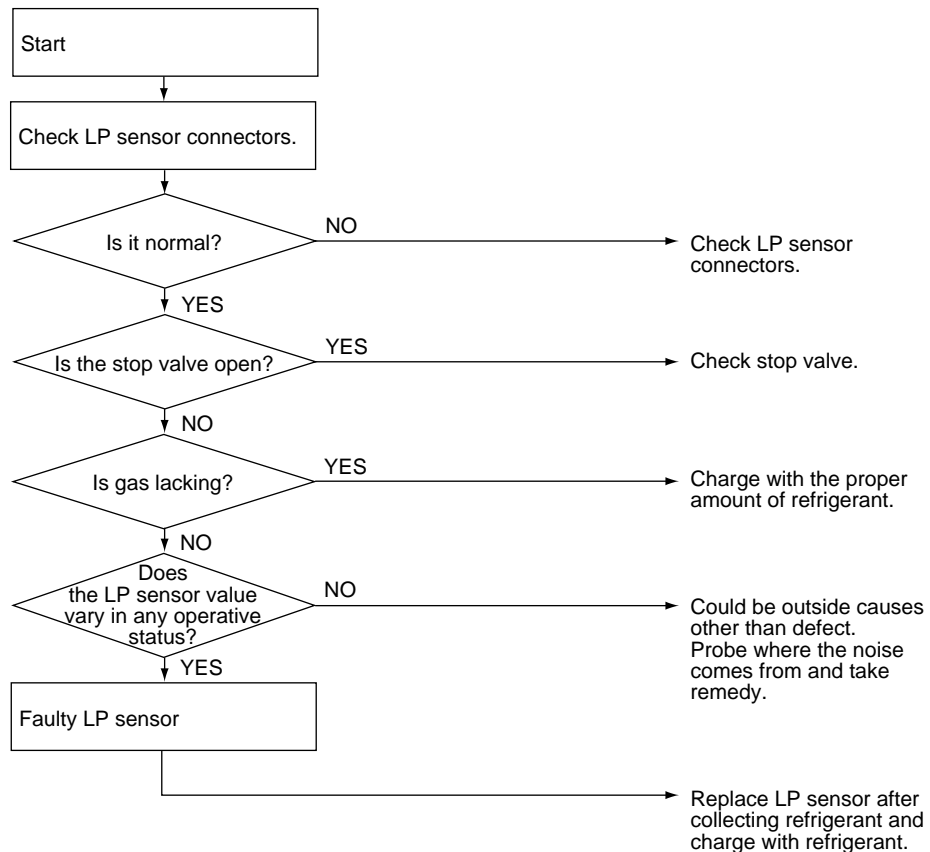
- Defective LP sensor
- Faulty connectors connection of LP sensor
- Possibility of gas shortage
- When cooling: Refrigerant amount 0-20%
- When heating: Refrigerant amount 0-5%

#### Troubleshooting



#### Caution

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



(MF038)

### 3.3.20 Rise in BOX Temperature

Outdoor Unit  
Indication

L3

Method of  
Malfunction  
Detection

Detection of abnormal rise in BOX temperature is carried out by the temperature detected by thermistor.

Malfunction  
Decision  
Conditions

When the detected BOX temperature came to 85°C or higher

- When an abnormal rise in BOX temperature is generated 4 times, the system shuts down. (The 4-time counter resets itself when no outdoor unit abnormality occurs within cumulative 60-minute after the abnormal temperature rise generation.)

Supposed  
Causes

- Incorrect installation
- Abnormally high ambient temperature of electrical parts
- Outside causes other than noise, etc.

Troubleshooting

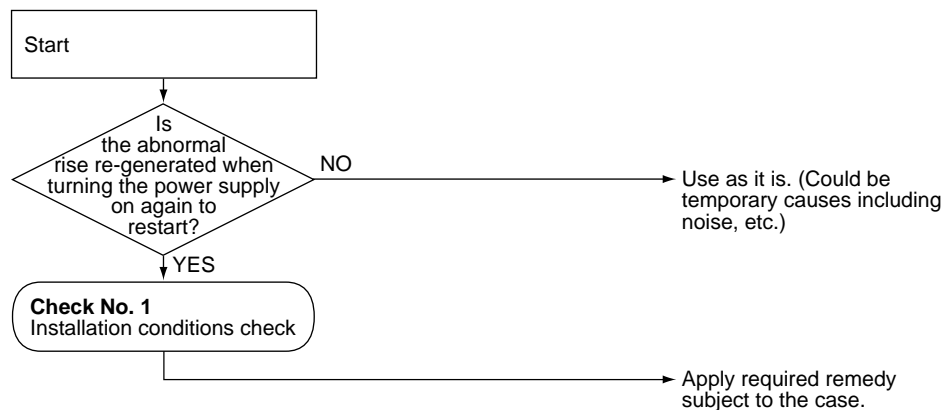


Check No.1  
Refer to P.300



**Caution**

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



(MF039)

### 3.3.21 Abnormal Rise in Fin Temperature

Outdoor Unit  
Indication

L4

Method of  
Malfunction  
Detection

Detection of abnormal rise in fin temperature is carried out by the detected value of fin temperature.

Malfunction  
Decision  
Conditions

When fin temperature came to 92°C or higher

(The 4-time counter resets itself when no outdoor unit abnormality occurs within 60-minute cumulative time after the abnormal rise generation.)

Supposed  
Causes

- Incorrect installation including short-circuit, etc.

Troubleshooting

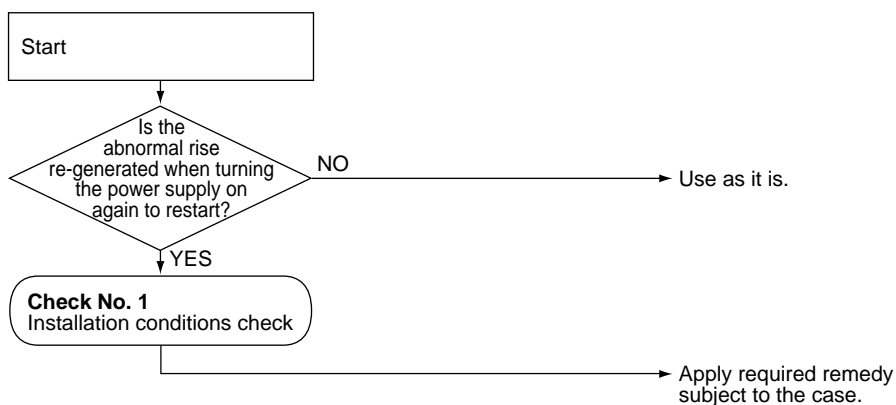


Check No.1  
Refer to P.300



**Caution**

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



(MF040)

### 3.3.22 Operation Halt Due to Detection of Output Overcurrent

**Outdoor Unit  
Indication**

---

**L5**

---

**Method of  
Malfunction  
Detection**

The output overcurrent is detected using amperage that flows through the DC unit of inverter.

---

**Malfunction  
Decision  
Conditions**

- When the output overcurrent was input into microcomputer from the output overcurrent detection circuitry.
- 

**Supposed  
Causes**

- Overcurrent due to faulty power transistor
- Overcurrent due to faulty connection of internal wiring
- Overcurrent due to power supply voltage error
- Overcurrent due to faulty PC board
- Incorrect detection due to faulty PC board
- Overcurrent due to [CLOSED] stop valve
- Overcurrent due to faulty compressor
- Overcurrent due to incorrect site installation
- Faulty indoor unit solenoid valve

## Troubleshooting



**Check No.1**  
Refer to P.300



**Check No.2**  
Refer to P.300



**Check No.6**  
Refer to P.303

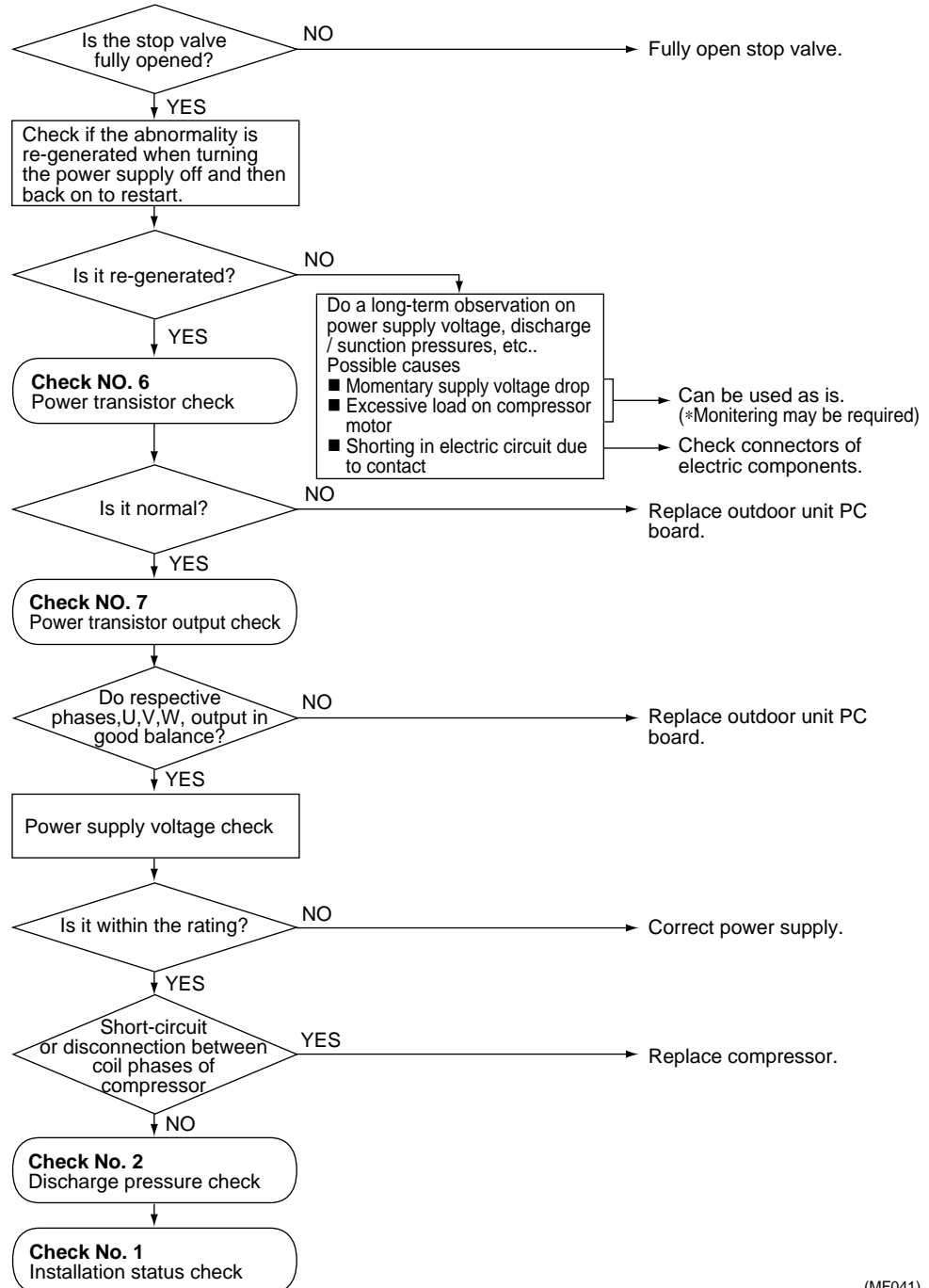


**Check No.7**  
Refer to P.304

**Caution**

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

\*Output overcurrent will be generated due to incorrect connection of internal wiring. When the operation is halted due to output overcurrent after connecting/disconnecting the wiring for replacement of parts, etc., check the wiring again.



(MF041)

### 3.3.23 Integrated Input Current Stop

Outdoor Unit  
Indication

L7

Method of  
Malfunction  
Detection

Abnormality of integrated input current is detected using integrated input current detected by the CT.

Malfunction  
Decision  
Conditions

When the integrated input current of 31A. continued for 2.5 seconds

- When an integrated input error is generated 4 times, the system shuts down.  
(The 4-time counter resets itself when no outdoor unit abnormality occurs within 60-minute cumulative time after the error generation.)

Supposed  
Causes

- Faulty compressor
- Overcurrent due to faulty PC board
- Incorrect detection due to faulty PC board
- Short-circuit

Troubleshooting

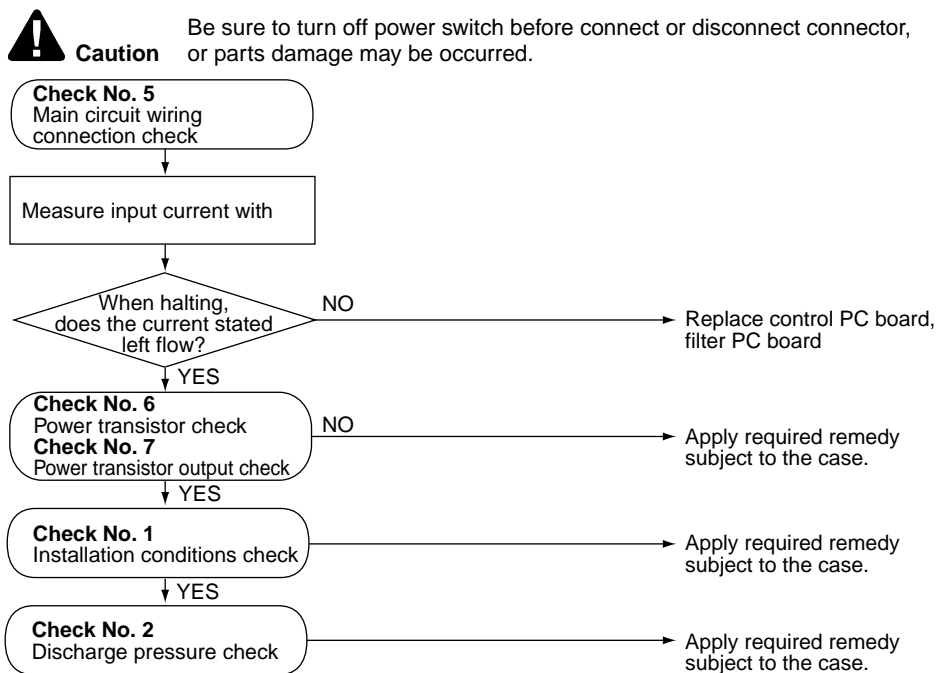
  
Check No.5  
Refer to P.302

  
Check No.6  
Refer to P.303

  
Check No.7  
Refer to P.304

  
Check No.1  
Refer to P.300

  
Check No.2  
Refer to P.300



(MF042)

### 3.3.24 Electronic Thermal

#### Outdoor Unit Indication

LB

#### Method of Malfunction Detection

Electronic thermal is detected using output amperage and operating status.

#### Malfunction Decision Conditions

When the compressor output current of 40A or higher continued for 260 seconds  
When the compressor output current of 50A or higher continued for 5 seconds

- When an electronic thermal error is generated 4 times, the system shuts down.  
(The 4-time counter resets itself when no outdoor unit abnormality occurs for 60-minute cumulative time after the error generation.)

#### Supposed Causes

- Incorrect connectors connection
- Faulty thermistor
- Faulty power transistor
- Disconnection-Faulty connection of internal wiring
- Faulty reactor
- Faulty compressor
- Faulty PC board

#### Troubleshooting

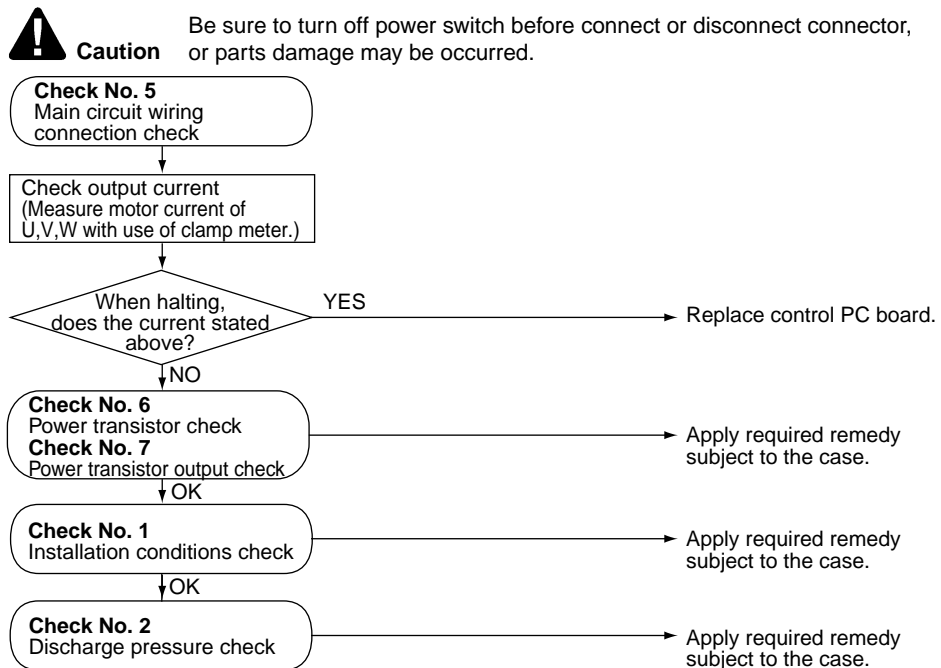
  
**Check No.5**  
Refer to P.302

  
**Check No.6**  
Refer to P.303

  
**Check No.7**  
Refer to P.304

  
**Check No.1**  
Refer to P.300

  
**Check No.2**  
Refer to P.300



(MF043)

### 3.3.25 Stall Prevention

Outdoor Unit  
Indication

L9

Method of  
Malfunction  
Detection

Stall prevention system error is detected using the compressor's output current.

Malfunction  
Decision  
Conditions

- ◆ When the compressor's output current of 33A or higher continued for 0.3 seconds and peak current reached to 65A or higher
- ◆ When the compressor's output current of 33A or higher continued for 5 seconds
- ◆ When failing to changeover the position detecting function
- When a stall prevention error is generated 4 times, the system shuts down.  
(The 4-time counter resets itself when no outdoor unit abnormality occurs within 60-minute cumulative time after the error generation.)

Supposed  
Causes

- Faulty compressor
- Overcurrent due to faulty PC board
- Incorrect detection due to faulty PC board
- Overload due to incorrect installation
- Overload at time of starting including high differential pressure start, etc.

Troubleshooting

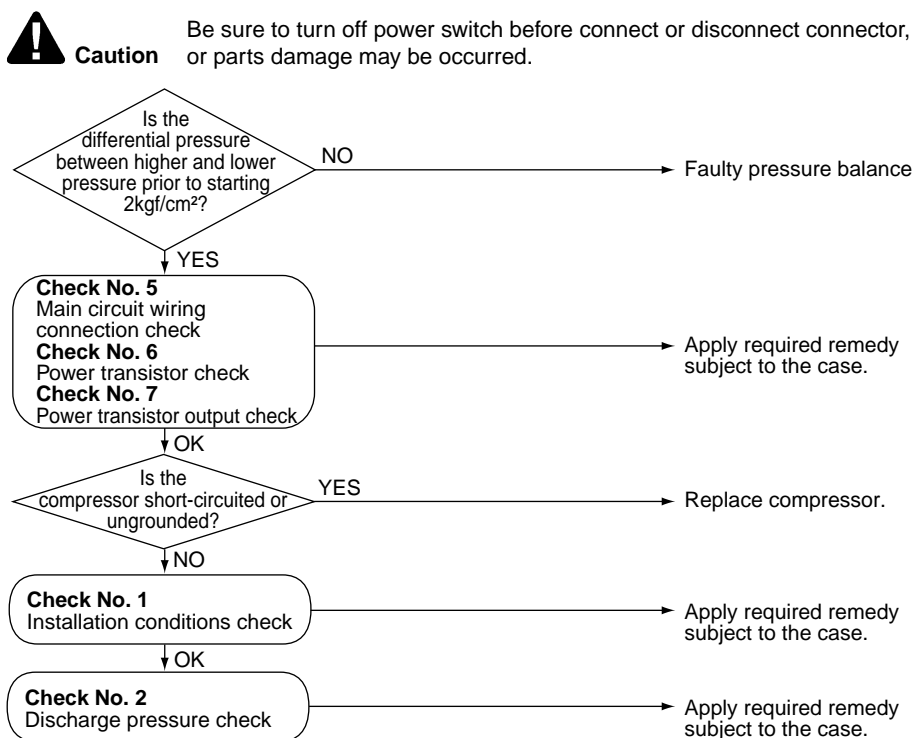
  
Check No.5  
Refer to P.302

  
Check No.6  
Refer to P.303

  
Check No.7  
Refer to P.304

  
Check No.1  
Refer to P.300

  
Check No.2  
Refer to P.300



(MF044)

### 3.3.26 Transmission Error between Microcomputers

Outdoor Unit  
Indication

LE

Method of  
Malfunction  
Detection

Malfunction  
Decision  
Conditions

When the transmission error with INV fan microcomputer continues for 60 seconds

Supposed  
Causes

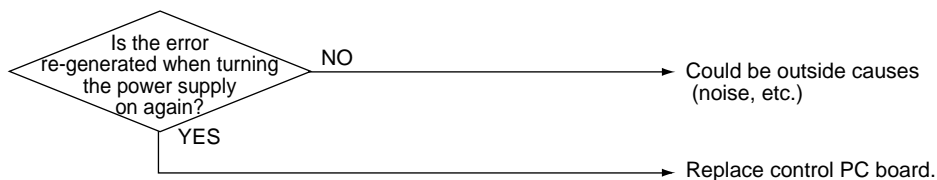
- Faulty fan PC board
- Outside causes (noise, etc.)

Troubleshooting



**Caution**

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



Note: If the error should be caused by wiring connection, etc., fan transmission error (U7) is generated, immediately replace the control PC board.

(MF045)

### 3.3.27 Overvoltage, Low Voltage

Outdoor Unit  
Indication

U2

Method of  
Malfunction  
Detection

Power supply system error is detected using the voltage of inverter DC unit.

Malfunction  
Decision  
Conditions

When, after starting the compressor, the voltage reached to below 210V over 450V before it exceeded 320V, or to below 260V or over 450V after it exceeded 320V once.

- When a power supply system error is generated 4 times, the system shuts down.  
(The 4-time counter resets itself when no outdoor unit abnormality occurs within 60-minute cumulative time after the error generation.)

Supposed  
Causes

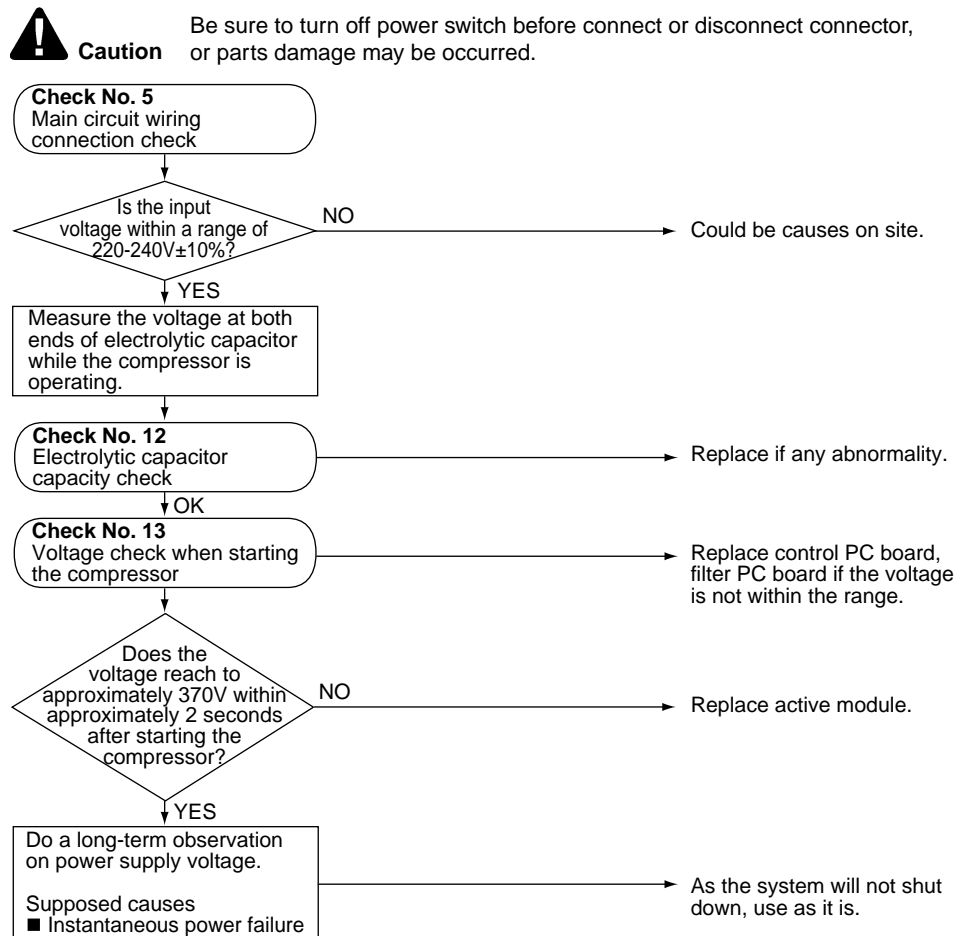
- Electrolytic capacitor malfunction
- PAM module malfunction
- Faulty power transistor
- Disconnection-Faulty connection of internal wiring
- Faulty reactor
- Faulty PC board
- Instantaneous power failure
- Mismatching with power supply of feedback control system

Troubleshooting

  
Check No.5  
Refer to P.302

  
Check No.12  
Refer to P.307

  
Check No.13  
Refer to P.308



(MF046)

### 3.3.28 Transmission Error between Outdoor Unit and BP Unit

Outdoor Unit  
Indication

U4

Method of  
Malfunction  
Detection

Transmission error is detected when the data from BP unit could not be correctly received.

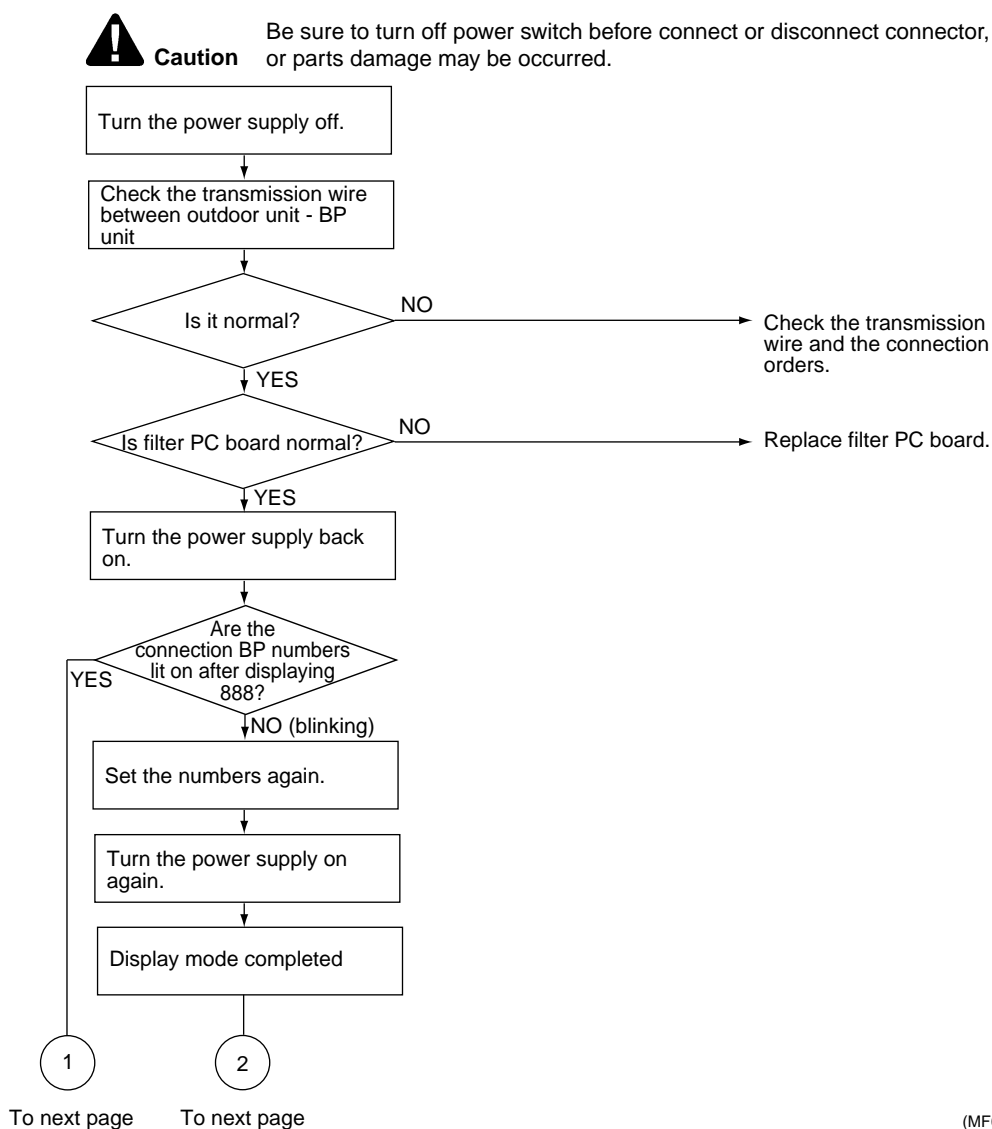
Malfunction  
Decision  
Conditions

When the data from BP unit could not be correctly received continuously for 15 seconds

Supposed  
Causes

- Incorrect connection of transmission wire
- Connection from Side-A of BP is not carried out.
- BP determined numbers are different from actual BP numbers.
- Distortion of power supply wave

Troubleshooting

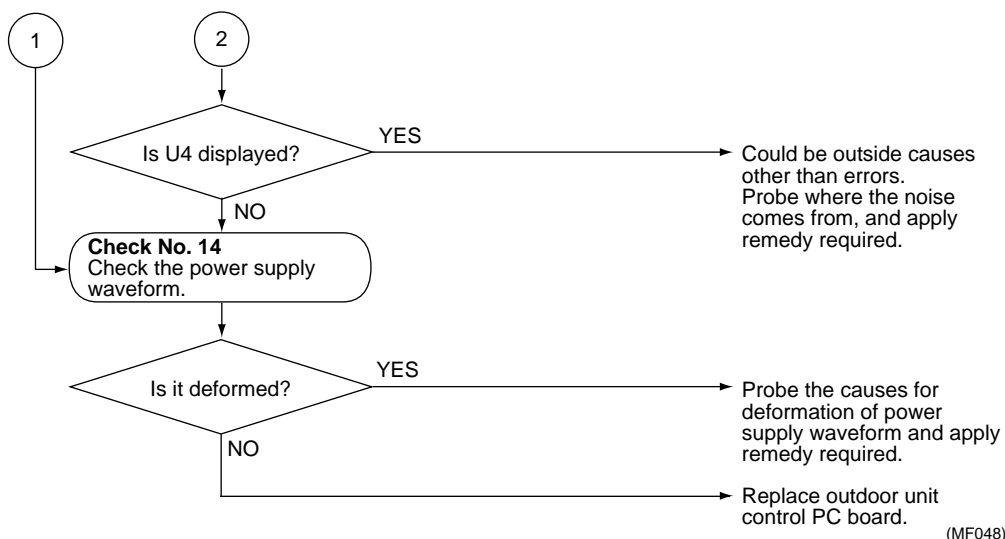


(MF047)

Troubleshooting



**Check No.14**  
Refer to P.308



### 3.3.29 Transmission Error between Indoor Unit and BP Unit

Outdoor Unit  
Indication

U6

Method of  
Malfunction  
Detection

Transmission error is detected when BP unit could not correctly receive the data from BP unit to transmit the data incorrectly to outdoor unit.

Malfunction  
Decision  
Conditions

When BP unit could not correctly receive the data from indoor unit continuously for 15 seconds and transmitted the data incorrectly to outdoor unit.

Supposed  
Causes

- Incorrect connection of transmission wire
- Distortion of power supply waveform

Troubleshooting

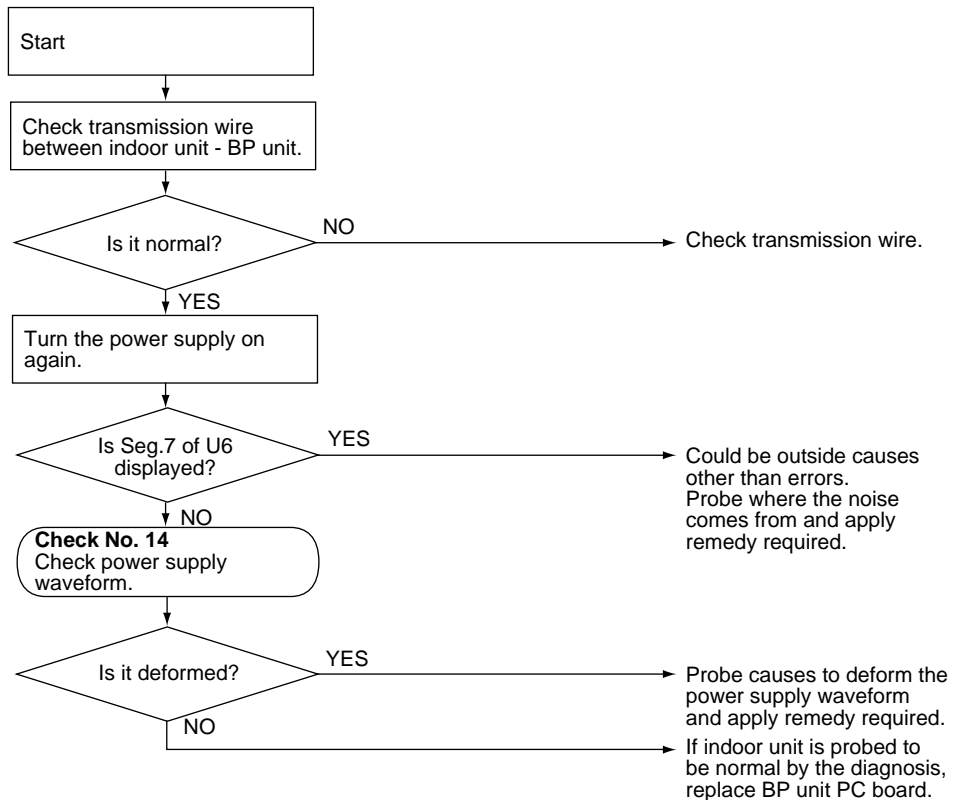


Check No.14  
Refer to P.308



**Caution**

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



(MF049)

### 3.3.30 Transmission Error of DC Fan

Outdoor Unit  
Indication

U7

Method of  
Malfunction  
Detection

Malfunction  
Decision  
Conditions

When transmission error with DC fan microcomputer continued for 60 seconds

Supposed  
Causes

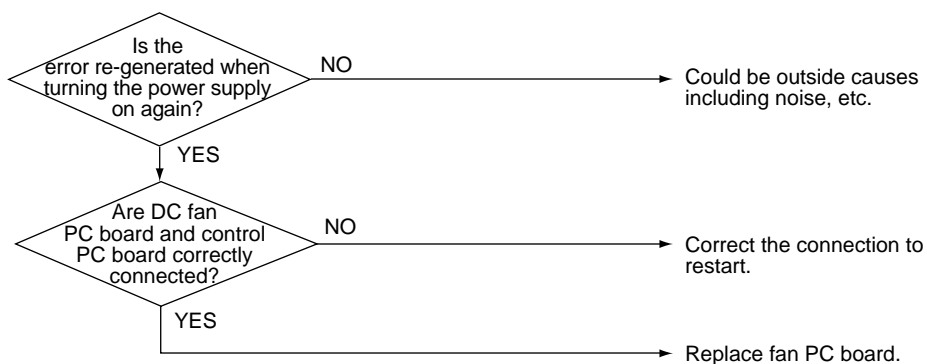
- Incorrect connectors connection
- DC fan microcomputer malfunction
- Outside causes (noise, etc.)
- Malfunction of control PC board receiving circuit

Troubleshooting



**Caution**

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



(MF050)

### 3.3.31 Operation Halt Due to Detection of Gas Shortage

#### Outdoor Unit Indication



#### Method of Malfunction Detection

##### Detection Method 1

Lack of gas is detected using the input current detected by the CT and the compressor's operating frequency.

##### Detection Method 2

Lack of gas is detected using the discharge pipe temperature and the motorized valve opening.

#### Malfunction Decision Conditions

##### Detection Method 1

Input current <  $0.09 \times \text{Compressor's operating frequency} - 3.5$

However, when the above state continued for 7 minutes with the operating frequency > 55(Hz)

##### Detection Method 2

discharge pipe temperature > Target discharge pipe temperature +20°C, that should be continued for 80 seconds or longer with motorized valve full opening.



**Note:**

The target discharge pipe temperature is calculated with the microcomputer.

#### Supposed Causes

- Gas shortage due to refrigerant leak
- Faulty gas shortage sensor
- Input current drop due to faulty compression of the compressor
  - \* Disconnection of thermistor (all thermistors)
  - \* Faulty CT
- Faulty, Disconnected motorized valve
- Incorrect wiring, piping

Troubleshooting



Check No.3  
Refer to P.301

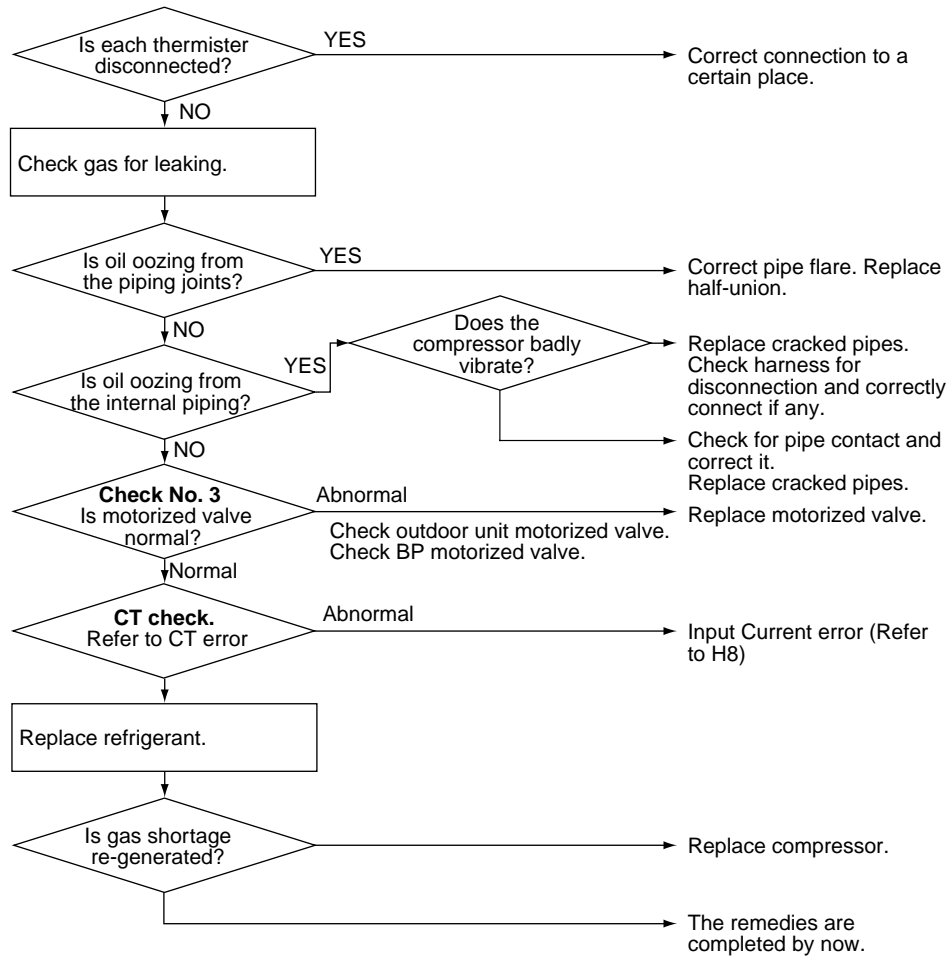


CT Check  
Refer to P.273



**Caution**

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



(MF051)

### 3.3.32 System Malfunction

#### Outdoor Unit Indication

UH

#### Method of Malfunction Detection

Case where other BP or indoor unit connected with other BP malfunctioned

This malfunction means that displayed only on indoor unit connected with normal BP.

- Outdoor unit displays malfunction code of faulty BP.

#### Malfunction Decision Conditions

When the system shut down due to malfunction of BP of other systems.

#### Supposed Causes

- Outdoor unit is not malfunctioning.
- Transmission error by other system's BP and outdoor unit
- Malfunction of other system's thermistor
- Other system's BP malfunction including faulty motorized valve of other system's BP, etc.

#### Troubleshooting



#### Caution

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

Check malfunction code of outdoor unit



Check BP where malfunction is generated.

→ Diagnose faulty BP using malfunction causes.

(MF052)

### 3.3.33 Faulty BOX Thermistor Malfunction

Outdoor Unit  
Indication

P3

Method of  
Malfunction  
Detection

Malfunction of BOX temperature thermistor is detected using the temperature detected by the thermistor.

Malfunction  
Decision  
Conditions

When the detected temperature came to 92°C or higher, or to -30°C or lower

- When BOX thermistor malfunction is detected once, the system shuts down.  
(The 1-time counter automatically resets itself when cause of malfunction is resolved.)

Supposed  
Causes

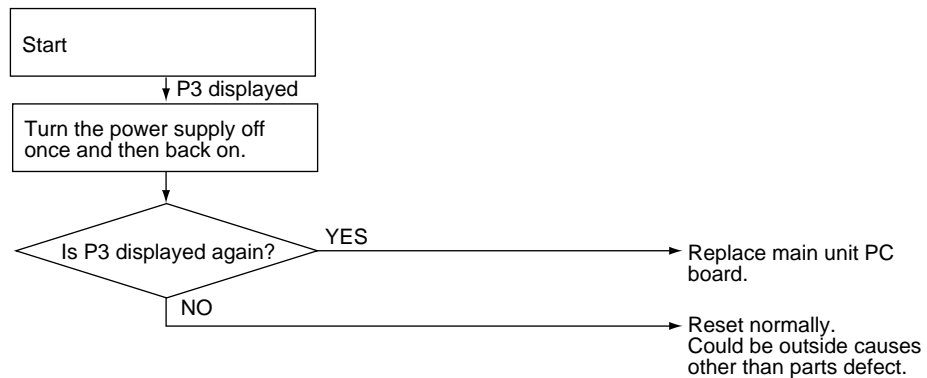
- Faulty main unit PC board

Troubleshooting



**Caution**

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



(MF053)

### 3.3.34 Faulty Fin Thermistor

Outdoor Unit  
Indication

P4

Method of  
Malfunction  
Detection

Faulty fin thermistor is detected using the temperature detected by the fin.

Malfunction  
Decision  
Conditions

When the detected temperature came to 120°C or higher, or to -30°C or lower

- When faulty fin thermistor is detected once, the system shuts down.  
(The 1-time counter automatically resets itself when cause of malfunction is resolved.)

Supposed  
Causes

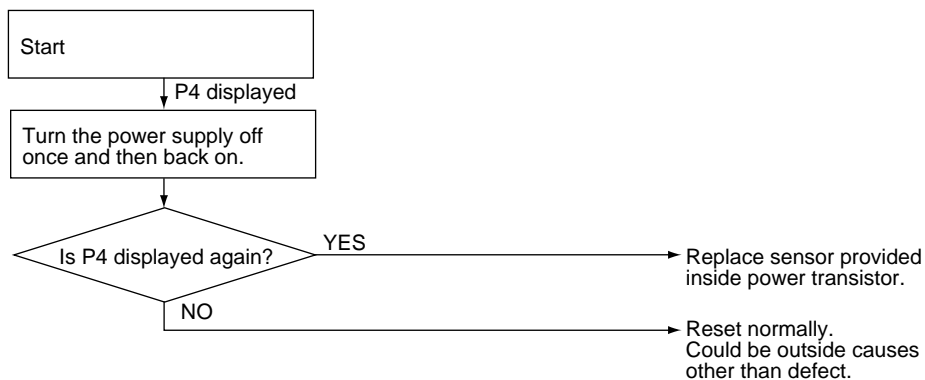
- Faulty sensor provided inside power transistor.

Troubleshooting



**Caution**

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

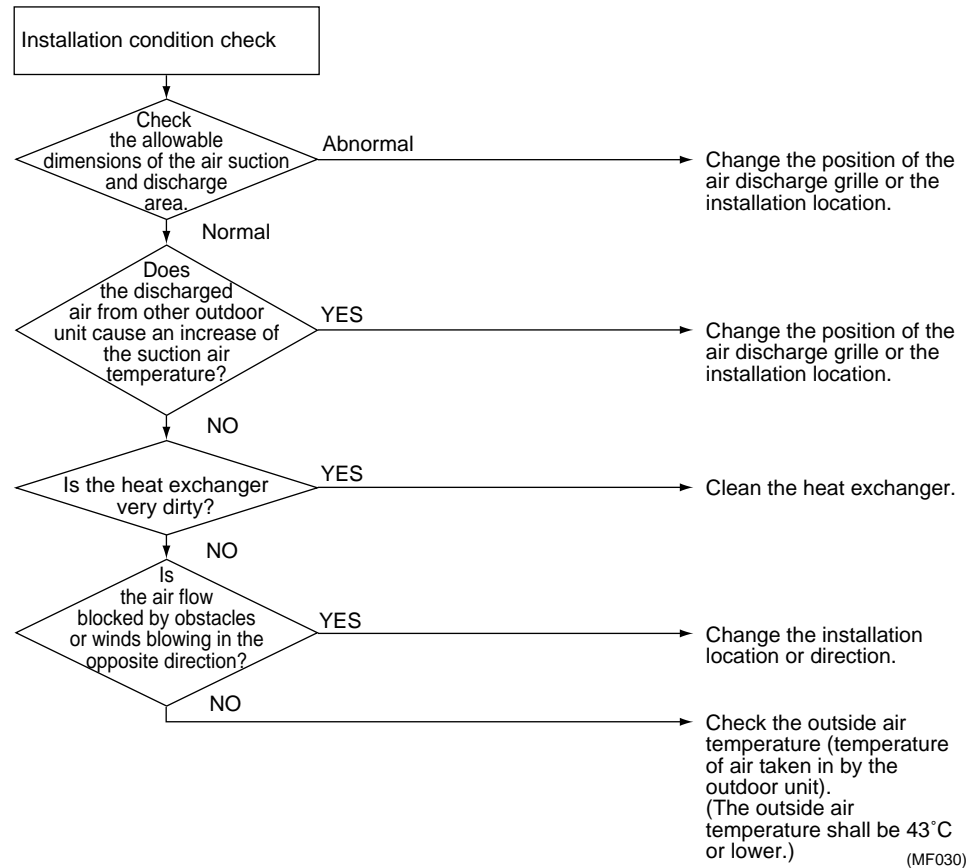


(MF054)

## 3.4 How to Check

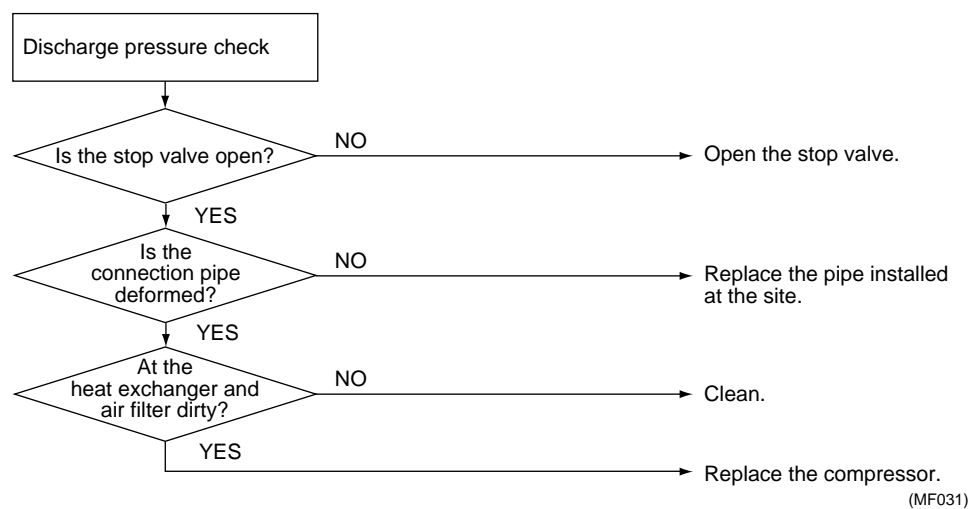
### 3.4.1 Installation Condition Check

#### Check No.1



### 3.4.2 Discharge Pressure Check

#### Check No.2

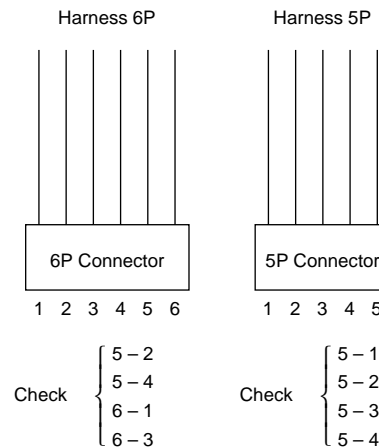


### 3.4.3 Electronic Expansion Valve Check

#### Check No.3

Conduct the followings to check the electronic expansion valve (EV).

1. Check to see if the EV connector is correctly inserted in the PCB. Compare the EV unit and the connector number.
2. Turn the power off and back on again, and check to see if all the EVs generate latching sound.
3. If any of the EVs does not generate latching noise in the above step 2, disconnect that connector and check the conductivity using a tester.  
Check the conductivity between pins 1, 3 and 6, and between pins 2, 4 and 5. If there is no conductivity between the pins, the EV coil is faulty.



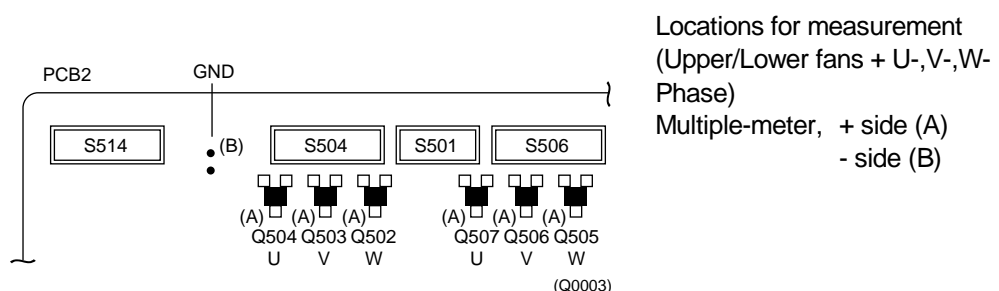
4. If no EV generates latching sound in the above step 2, the outdoor unit PCB is faulty.
5. If the conductivity is confirmed in the above step 2, mount a good coil (which generated latching sound) in the EV unit that did not generate latching sound, and check to see if that EV generates latching sound.  
\*If latching sound is generated, the outdoor unit PCB is faulty.  
\*If latching sound is not generated, the EV unit is faulty.



**Note:** Please note that the latching sound varies depending on the valve type.

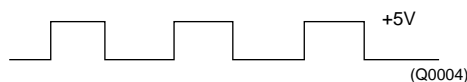
### 3.4.4 Fan Motor Position Signal Check

#### Check No.4



#### Measurement method


1. Turn the power supply on.
2. Check the voltage of U-, V-, W-Phase of the above upper and lower fans with fan rotating.
3. The waveform measured will be as shown below.

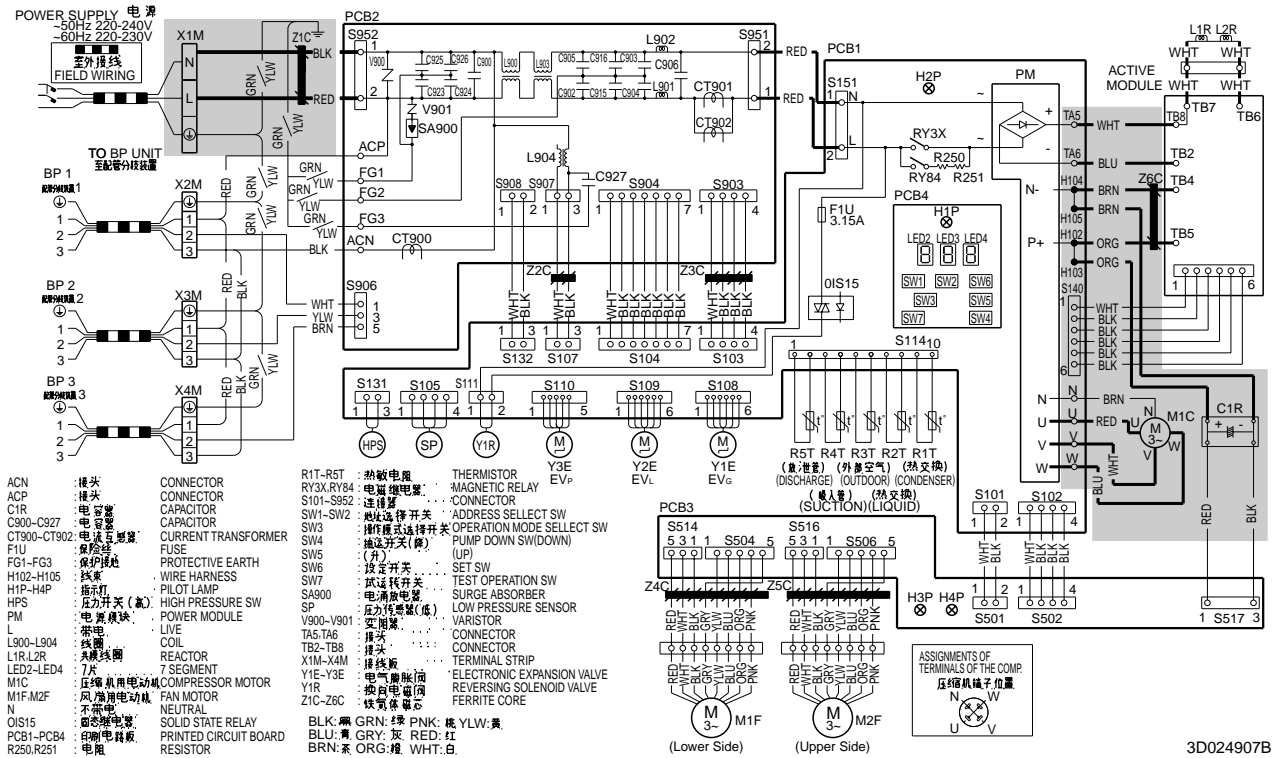


4. It is OK if, as shown above 3, approximately 5V voltage is turned on and off.

### 3.4.5 Internal Wiring Check (1)

#### Check No.5

Check the wiring at the sections marked by the boxes  in the diagram.  
Check for breaking of wire and wiring errors.  
In the case of RMX140JVMC



### 3.4.6 Power Transistor Check (Capacitor Voltage Check)

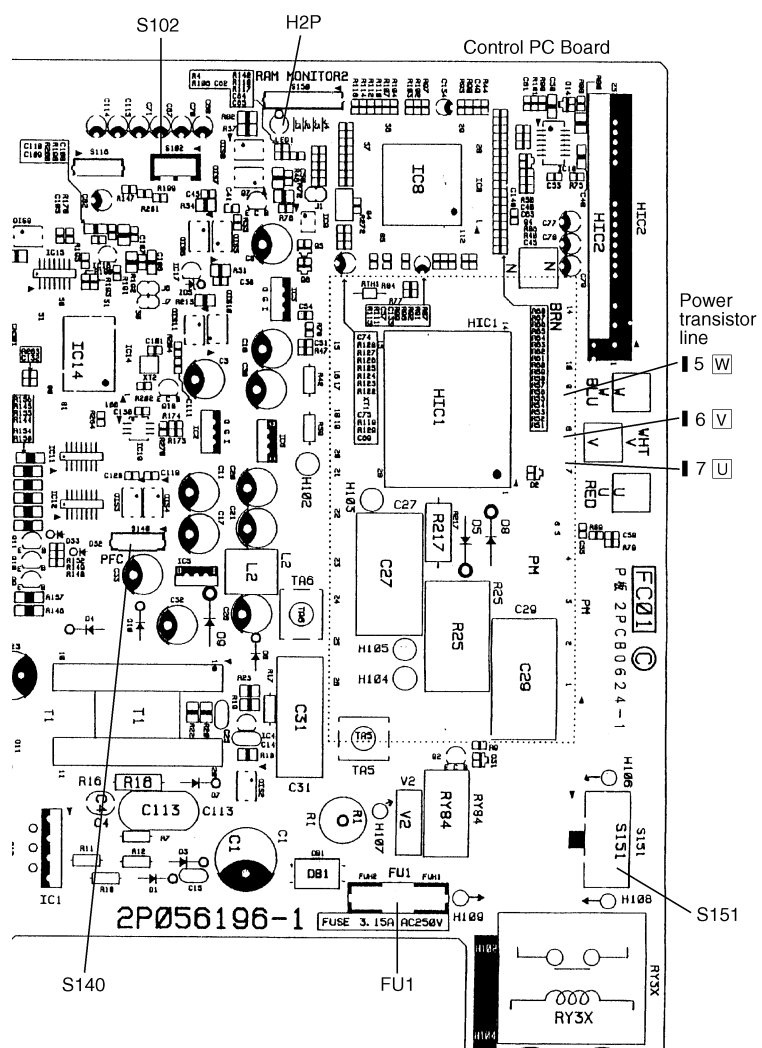
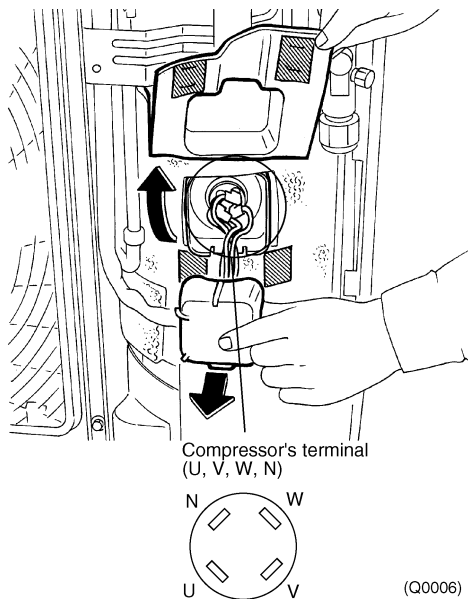
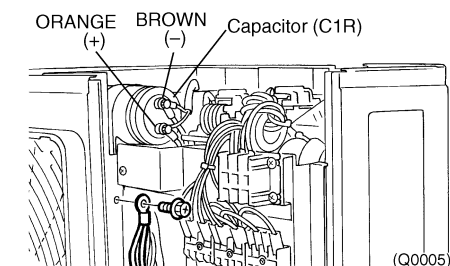
#### Check No.6

#### Power Transistor Check

- Do not touch the charging unit for 10 minutes after turning the breaker off.
  - Even when touching the charging unit after 10 minutes, use a multiple meter to ensure that the power supply voltage of power transistor is 50V or less.
  - Measure U,V,W either on terminals of control PC board on the substrate side or on the compressor terminals.
  - Measure (+),(-) of the power transistor on (+) / (-) section of capacitor as shown in the figure below.
- \* If the resistance value is not normal, replace the control PC board.

#### Capacitor Voltage Check

- Follow the below figure to measure the capacitor voltage with breaker kept ON, while take enough care not to touch the charging unit .



Negative (-) terminal of tester (positive (+) terminal for digital type)	(+) of power transistor	UVW	(-) of power transistor	UVW
Positive (+) terminal of tester (negative (-) terminal for digital type)	UVW	(+) of power transistor	UVW	(-) of power transistor
Normal resistance	$\infty$	Several K $\Omega$ to several M $\Omega$	Several K $\Omega$ to several M $\Omega$	$\infty$
Resistance for NG	0	0 to several $\Omega$	0 to several $\Omega$	0

### 3.4.7 Power Transistor Output Check

**Check No.7**

Measure the output current and voltage of the power transistor.

**Output Current Measurement**

Remove the front panel, and measure the current in the red, yellow and blue wire harness inside the compressor using a clamp meter.

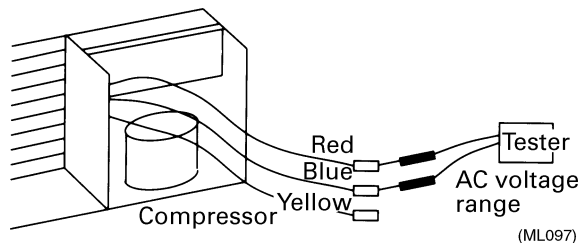
1. Attach the clamp meter to the red, yellow and blue wire harness, and conduct forced cooling operation.
2. When the output frequency has stabilized, measure the output current of each phase.
3. If the current outputs of all the phase are balanced, it is normal.
4. If even one phase is out of balance, replace the outdoor unit PCB.
5. If the compressor stops before the output frequency stabilizes, measure the output voltage.

**Output Voltage Measurement**

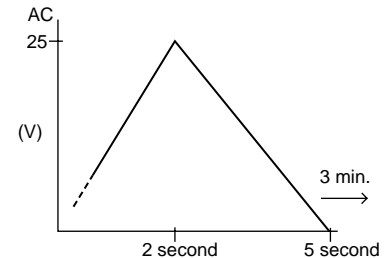
Remove the front panel, and disconnect the red, yellow and blue wire harness inside the compressor from the terminals. Measure the output voltage of the red, yellow and blue wires using a tester.

1. Conduct forced cooling operation with the equipment in the condition shown in Fig.1.
  2. Measure the voltage between the operation start (when the outdoor unit fan starts rotating) to operation halt caused by a stall prevention (about 5 seconds).
  3. Reset the power, and repeat steps (1) to (3) for each phase of U-V, V-W and W-U.
  4. If the voltages of all the phases show results similar to the solid line in the graph shown in Fig.2, the outdoor PCB is normal.
  5. If the voltage of even one phase deviates from the solid line shown in Fig.2, conduct the following test.
- Check the harness between the power transistor and compressor (check items: breaking of wire and wiring errors). If the harness is normal, replace the PCB..

[Fig.1]



[Fig.2]



**Note:**

1. Do not touch the terminals of the red, yellow and blue wires when the power is supplied. (Touching them is very dangerous since a voltage of over 100V is applied.)
2. Do not short-circuit the terminals of the red, yellow, and blue wires.

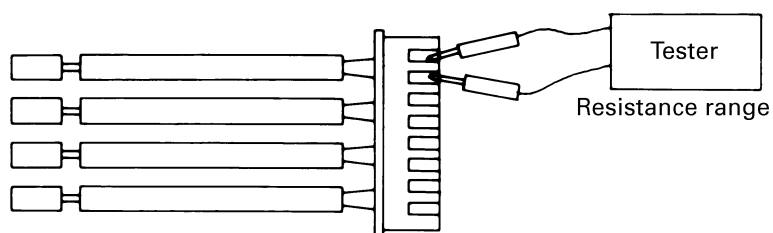
### 3.4.8 Thermistor Resistance Check

#### Check No.8

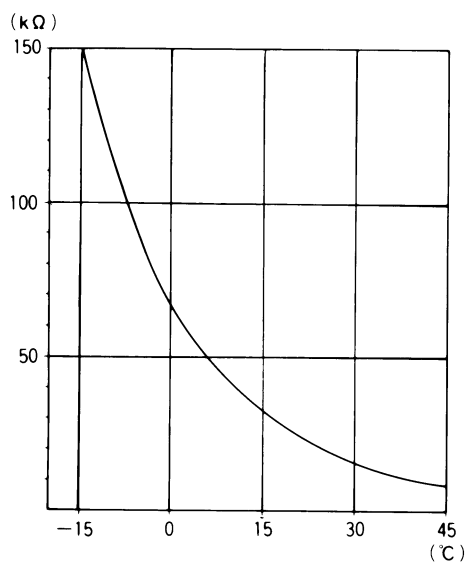
Remove the connectors of the thermistors on the PCB, and measure the resistance of each thermistor using tester.

The relationship between normal temperature and resistance is shown in the graph and the table below.

Thermistor Temperature (°C)	R25°C=20kΩ B=3950
-20	211.0 (kΩ)
-15	150
-10	116.5
-5	88
0	67.2
5	51.9
10	40
15	31.8
20	25
25	20
30	16
35	13
40	10.6
45	8.7
50	7.2



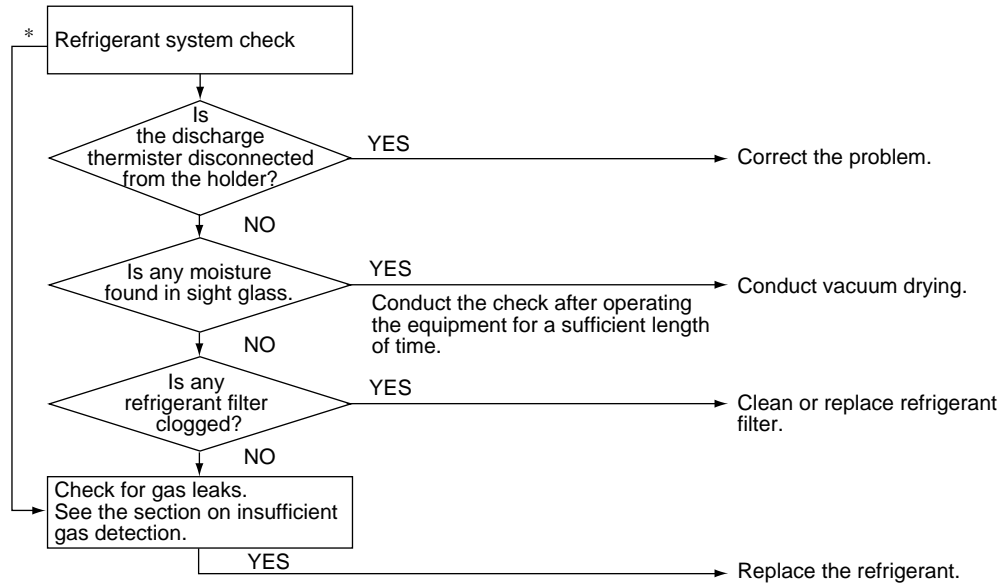
( R25 = 20kΩ 、 B = 3950 )



(ML099)

### 3.4.9 Inverter Units Refrigerant System Check

#### Check No.9



\* Cooling Only System

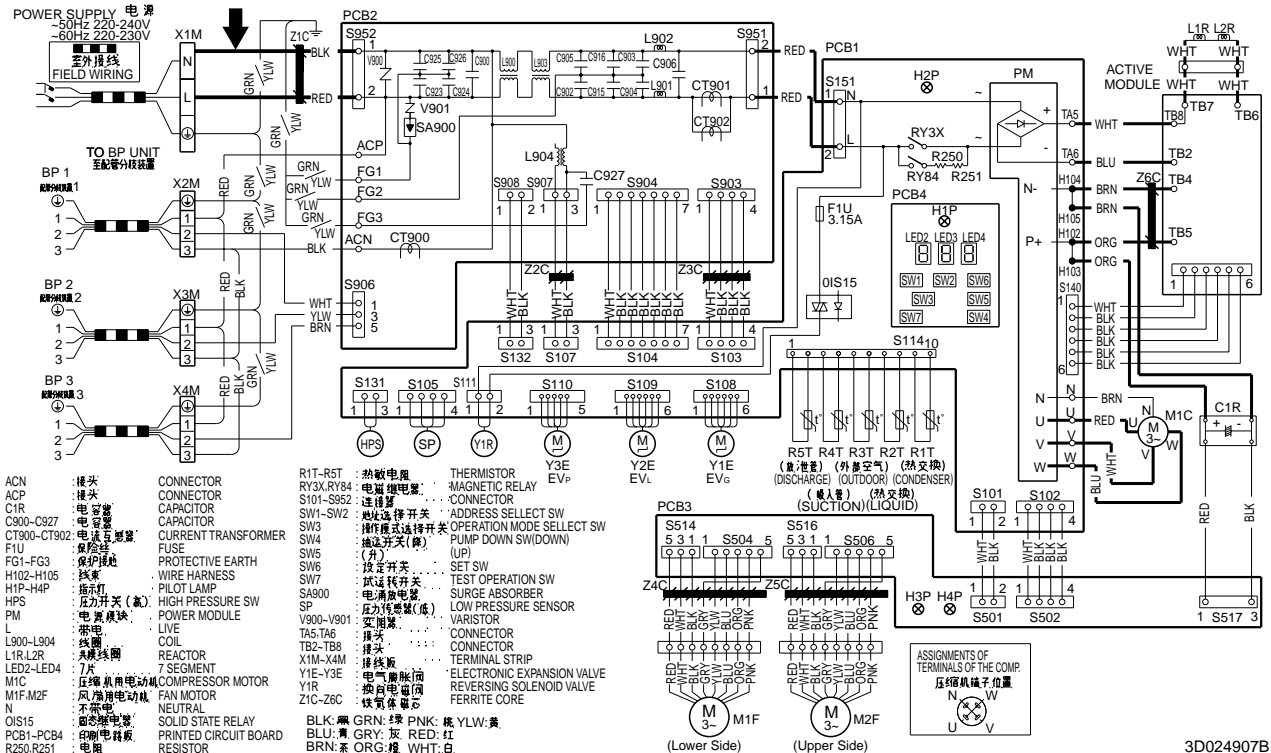
(MF032)

### 3.4.10 Inverter Units Input Current Measurement

#### Check No.10

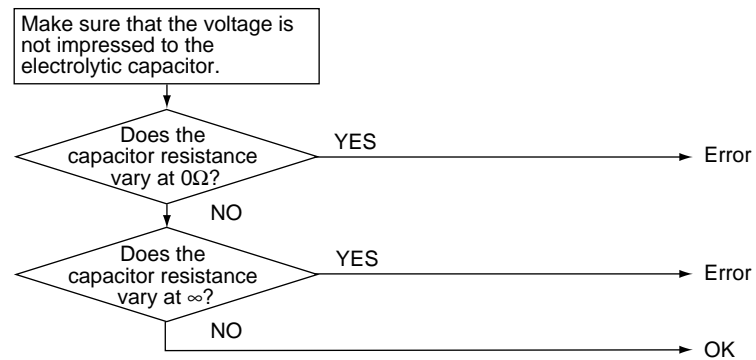
Mount a clamp meter to the red harness indicated by the arrow (➔), and conduct forced cooling operation.

In the case of RMX140JVMC



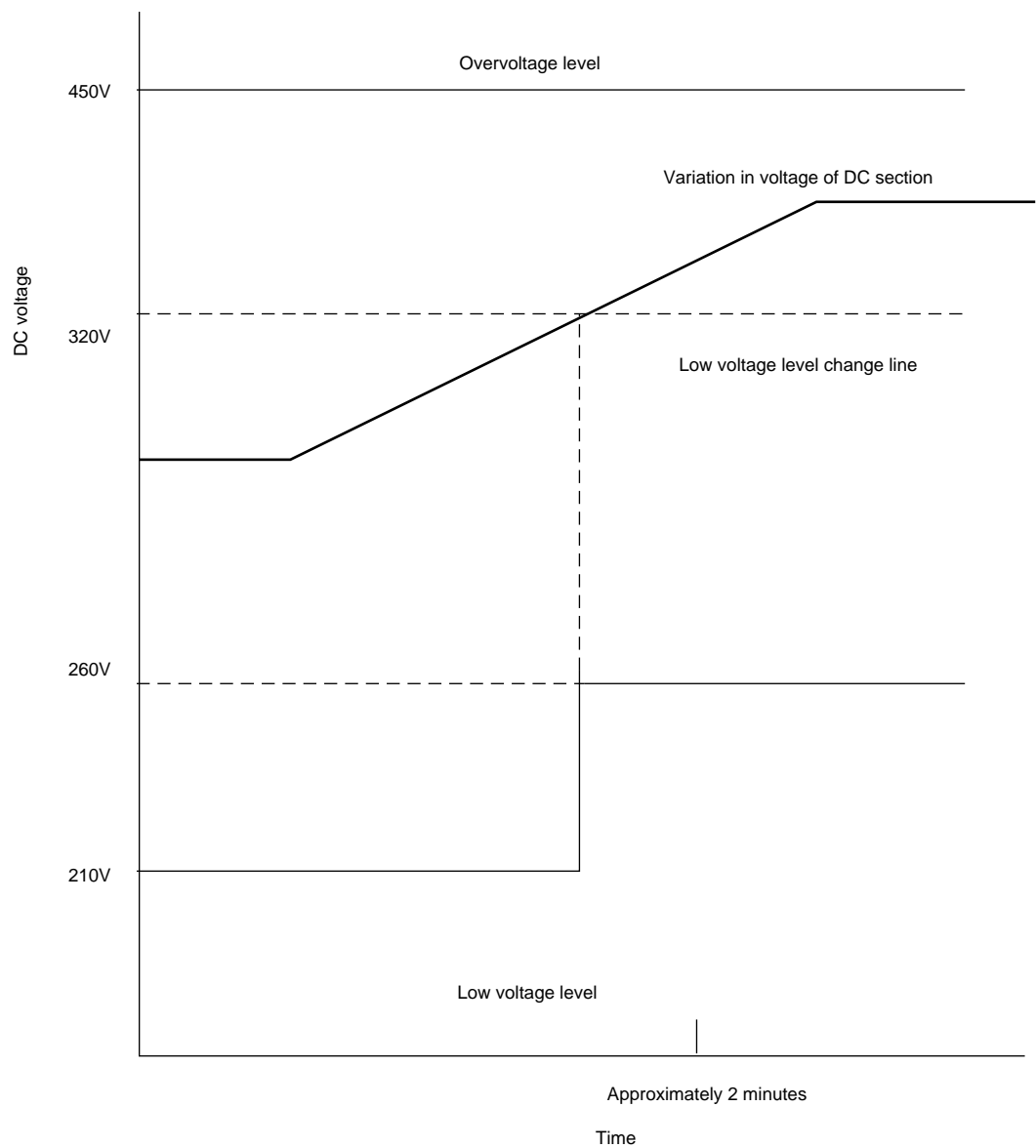
### 3.4.11 Electrolytic Capacitor Capacity Check

#### Check No.11



### 3.4.12 Voltage Check when Starting the Compressor

#### Check No.12



### 3.4.13 Power Supply Waveforms Check

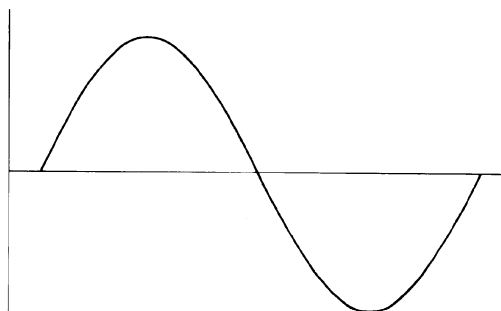
#### Check No.13

Measure the power supply waveform between pins 1 and 3 on the terminal board, and check the waveform disturbance.

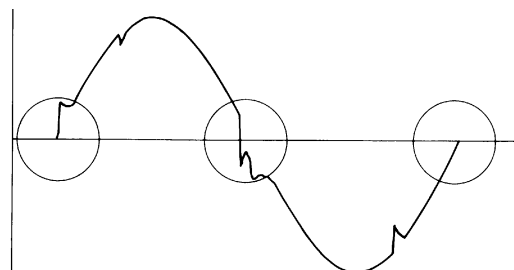
- Check to see if the power supply waveform is a sine wave (Fig.1).
- Check to see if there is waveform disturbance near the zero cross (sections circled in Fig.2)

[Fig.1]

[Fig.2]



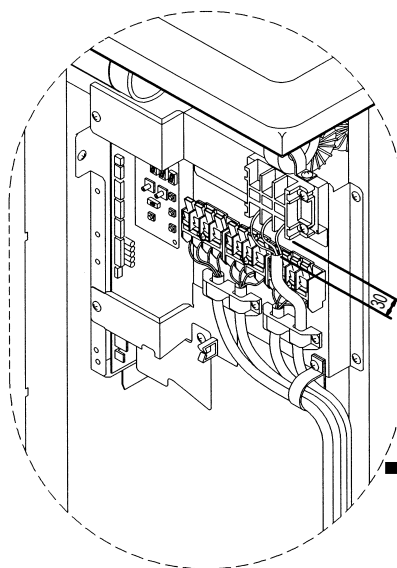
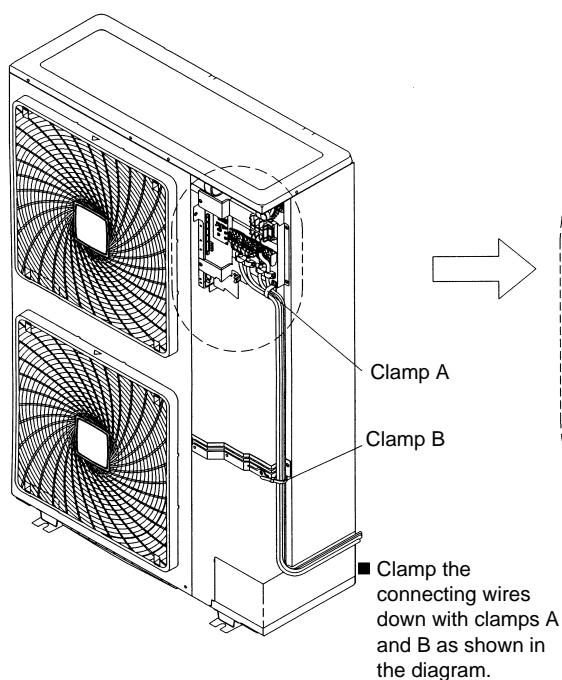
(ML104)



(ML105)

### 3.4.14 Total Operating Current Check

#### Check No.14



- When connecting the power supply cord, do not peel back more than 30mm of the cable insulation from the power supply terminal board, in order to be able to pull the connecting terminal board around.

### 3.4.15 Inverter Units Hall IC Check

#### Check No.15

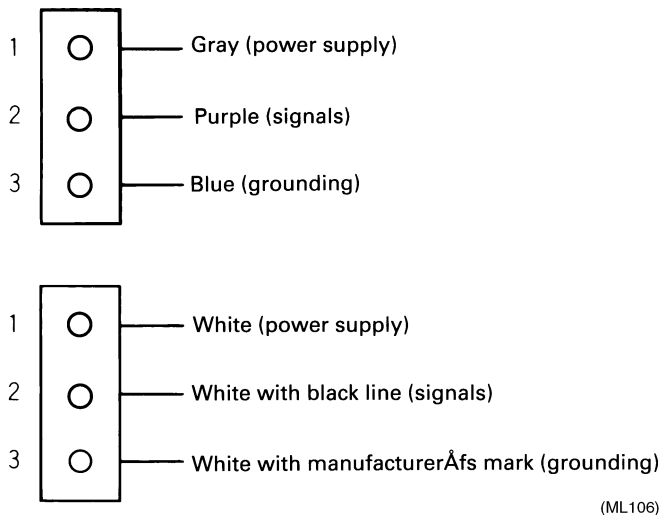
1. Check the connector connection.
2. With the power ON, operation OFF, and the connector connected, check the following.
  - \*Output voltage of about 5 V between pins 1 and 3.
  - \*Generation of 3 pulses between pins 2 and 3 when the fan motor is

Failure of (1) → faulty PCB → Replace the PCB.

Failure of (2) → faulty hall IC → Replace the fan motor.

Both (1) and (2) result → Replace the PCB.

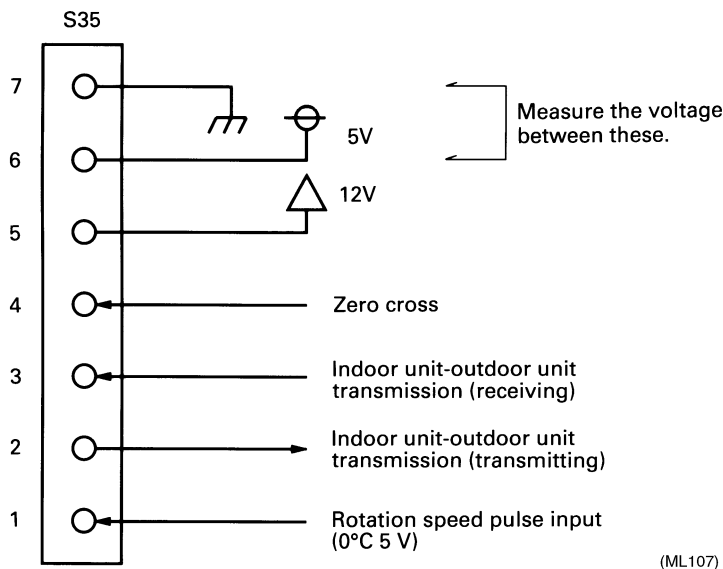
The connector has 3 pins, and there are three patterns of lead wire colors.



### 3.4.16 Inverter Units Indoor Unit PCB (2) Output Voltage Check

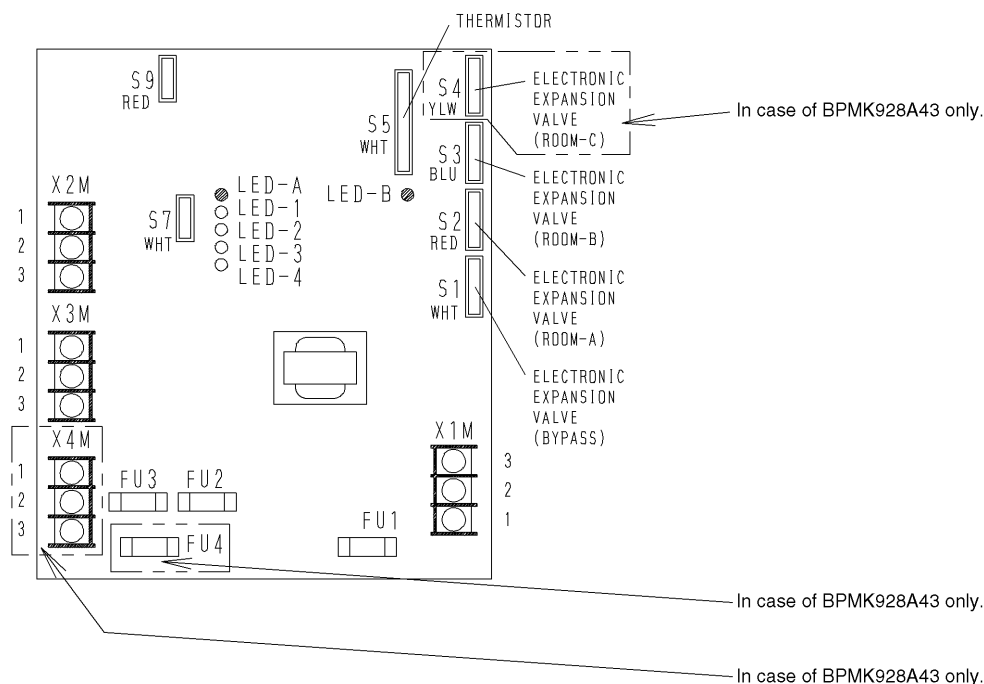
#### Check No.16

1. Check the connector connection (breaking of wire check).
2. With the power On and Off, check the following.
  - Output voltage of about 5 VDC between pins 6 and 7.



## 4. BP Unit Trouble Diagnosis

### 4.1 PCB Parts Layout



3P058760B

### 4.2 LED On Branch Provider Unit (Diagnosis LEDs)

LED-B (GREEN)	DIAGNOSIS
INTERCOMMUNICATION TO OUTDOOR UNIT :NORMAL	
●	NORMAL
⊗	ABNORMALITY → CHECK INTER-UNIT WIRING
●	ABNORMALITY → CHECK INTER-UNIT WIRING

GREEN	NORMALLY FLASHING
RED	NORMALLY OFF
⊗	ON
⊗	FLASH
●	OFF
-	IRRELEVANT

GREEN	RED				DIAGNOSIS
MICROCOMPUTER :NORMAL LED-A	MALFUNTION DETECTION				
	LED-1	LED-2	LED-3	LED-4	
●	●	●	●	●	NORMAL → CHECK INDOOR OR OUTDOOR UNIT
⊗	⊗	⊗	●	●	THERMISTOR ABNORMALITY
⊗	⊗	●	⊗	⊗	HIGH PRESSURE PROTECTOR WORKED, OR FREEZE-UP IN OPERATING UNIT OR STAND-BY UNIT
⊗	⊗	●	●	●	ELECTRONIC EXPANSION VALVE ABNORMALITY
⊗	—	—	—	—	[NOTE 1]
●	—	—	—	—	POWER SUPPLY FAULT OR [NOTE 2]

NOTES 1. TURN THE POWER OFF THEN ON AGAIN,  
IF THE LED DISPLAY RECURS, THE BRANCH  
PROVIDER UNIT PCB IS FAULTY.  
2. TURN THE POWER OFF AND THEN ON AGAIN,  
IF THE LED DISPLAY RECURS, TURN THE  
POWER OFF AND DISCONNECT LINE 2 OF  
INTER-UNIT WIRING FOR ALL UNITS, THEN  
TURN THE POWER ON AGAIN.

<IF LED-A IS OFF :>  
THE BRANCH PROVIDER UNIT PCB IS  
FAULTY.

<IF LED-A IS FLASHING :>  
THE INDOOR UNIT PCB IS FAULTY.  
TURN THE RECONNECT LINE 2 OF  
ALL INTER-UNIT WIRING AND CHECK  
THE DAIGNOSIS BY LEDS ON INDDOR  
UNIT PCB.

3P058760B

# Part 10

## Removal Procedure

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The RMK140JAVM specifications are special. Refer to <RMK140JAVM's important points> (on page ii) for the changes in contents.

# 1. For BPMK928B42 · 43

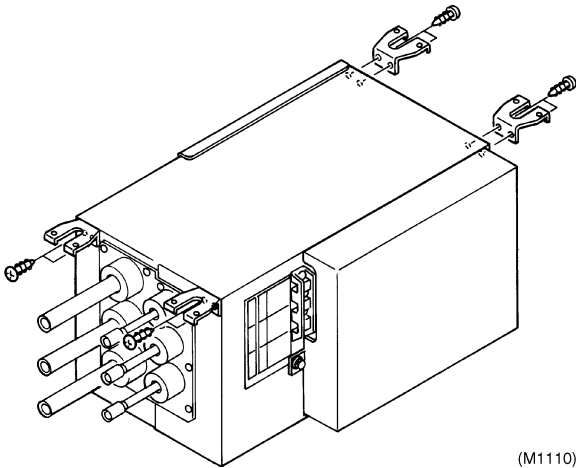
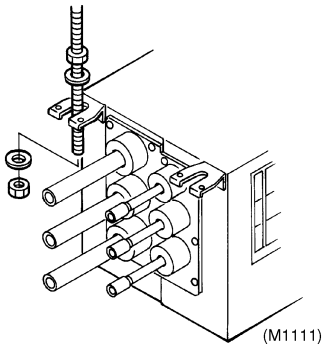
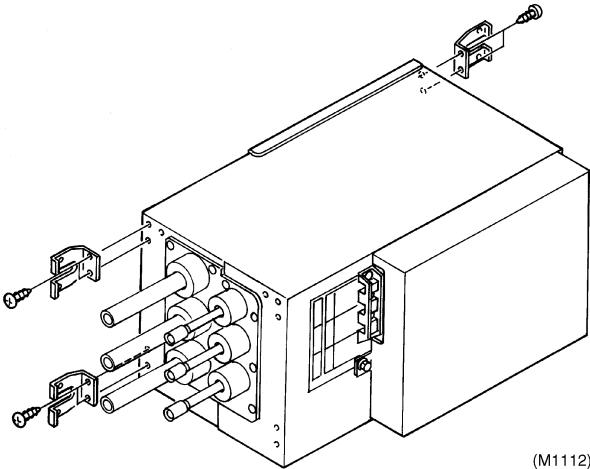
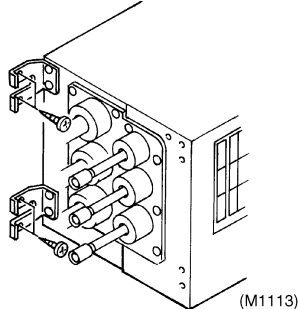
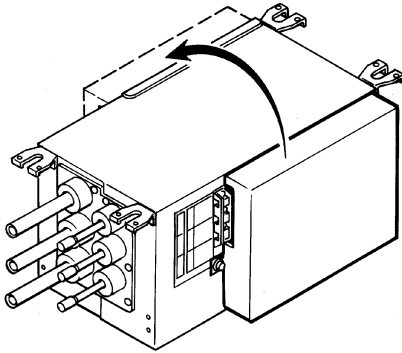
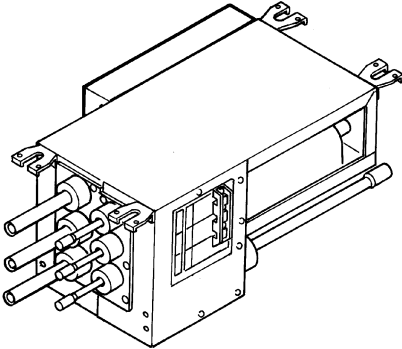
## 1.1 Installation of Indoor Unit

### Procedure



### Warning

Be sure to turn off all power supplies before disassembling work.

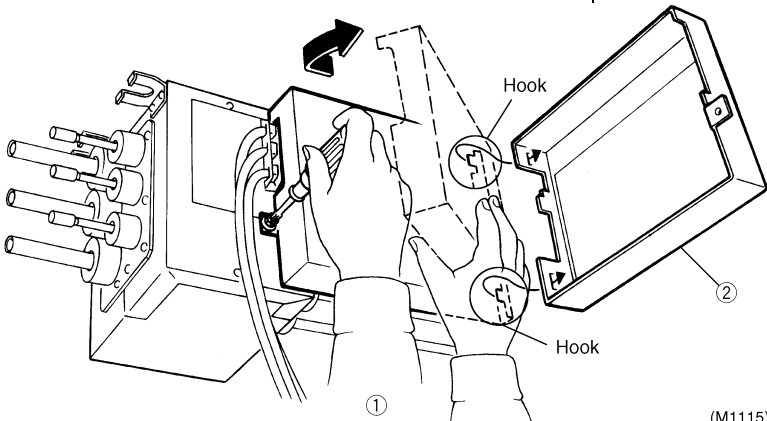
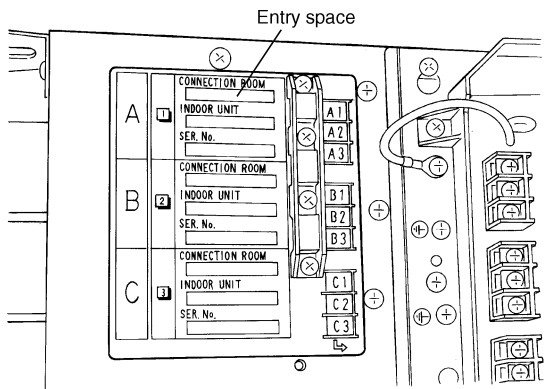
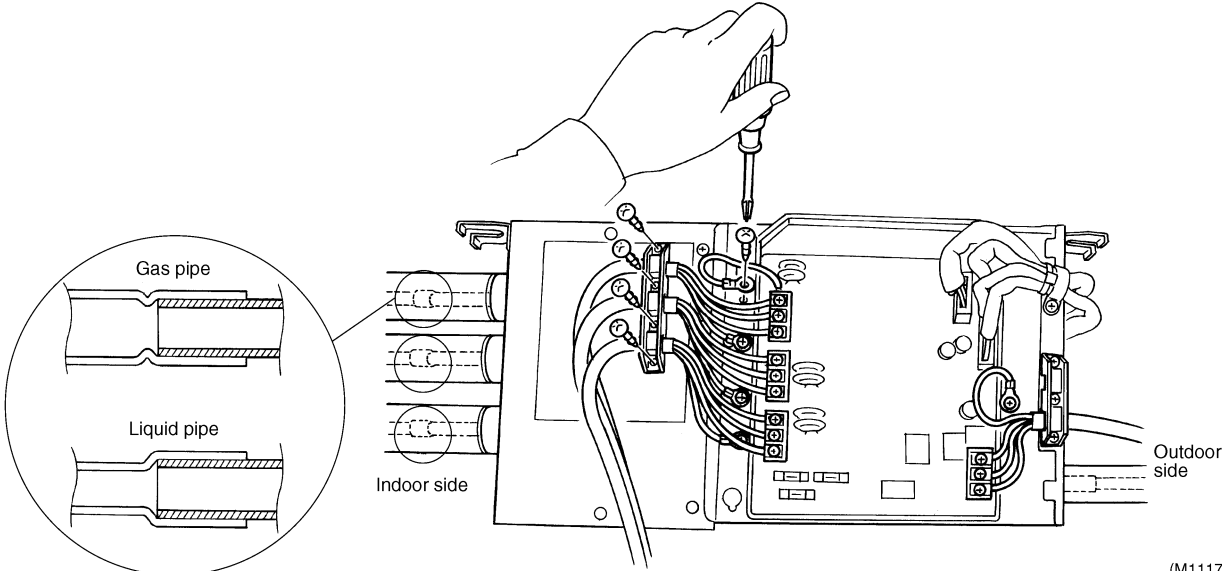
Step	Procedure	Points
1. For ceiling mounting		
1	Screw down the accompanying four fixtures in position.	<p>■ This unit is of drain-free type.</p>  
2. For wall mounting		
1	Screw down the accompanying three fixtures in position.	 
3. Attaching the electrical box		
1	The electrical box can be attached on either side of the unit depending on the piping route.	  <p>■ When attaching the electrical box, be sure to seal up the original screw holes (using aluminium tape or the like.)</p>

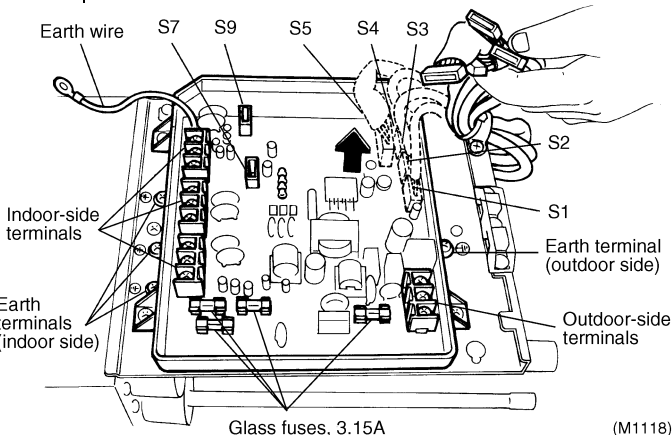
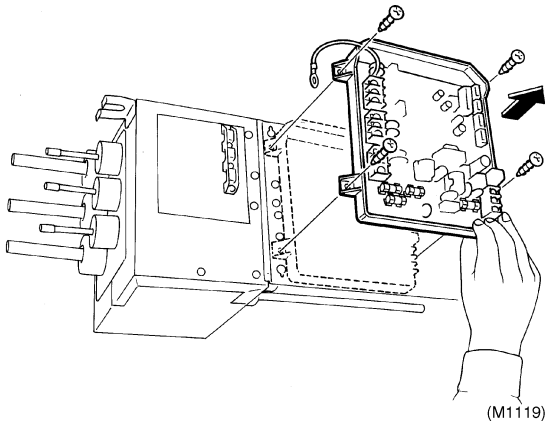
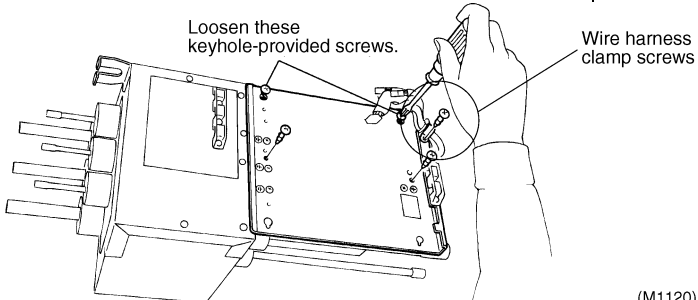
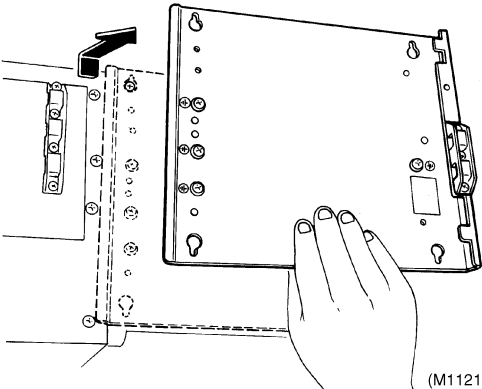
## 1.2 Opening of Electrical Box Cover and Removal of PCB Mount

### Procedure



**Warning** Be sure to turn off all power supplies before disassembling work.

Step	Procedure	Points
1. Opening the electrical box cover		
1	Remove the M5 screw from the electrical box cover.	 <p>(M1115)</p>
2	Open and slide the electrical box cover to the left, and take it out.	 <p>(M1116)</p> <ul style="list-style-type: none"> <li>■ The section C is not provided for the two-room type.</li> <li>■ The sections A, B and C are located from top down whether the electrical box is attached on the left or right side.</li> <li>■ Write down a room number in the entry space for easy setup and servicing.</li> </ul>
3	Disconnect the relay wire harness connectors as well as the earth wire from the PCB.	 <p>(M1117)</p>

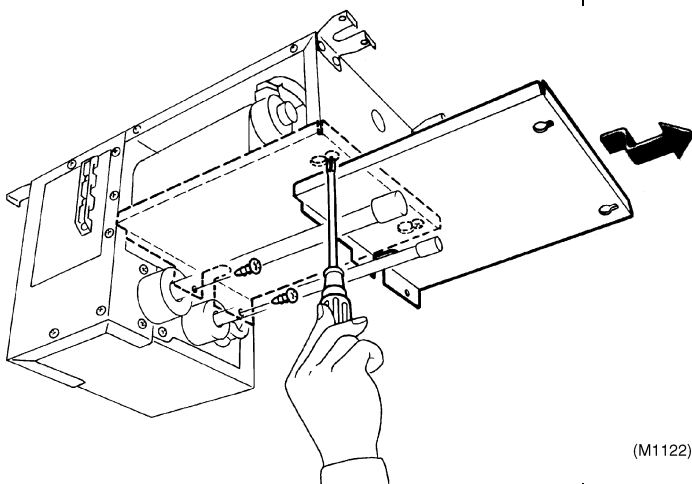
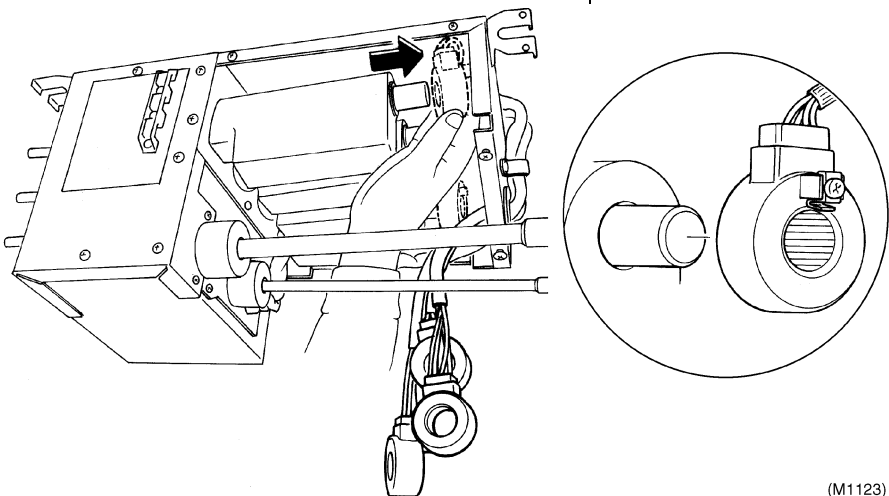
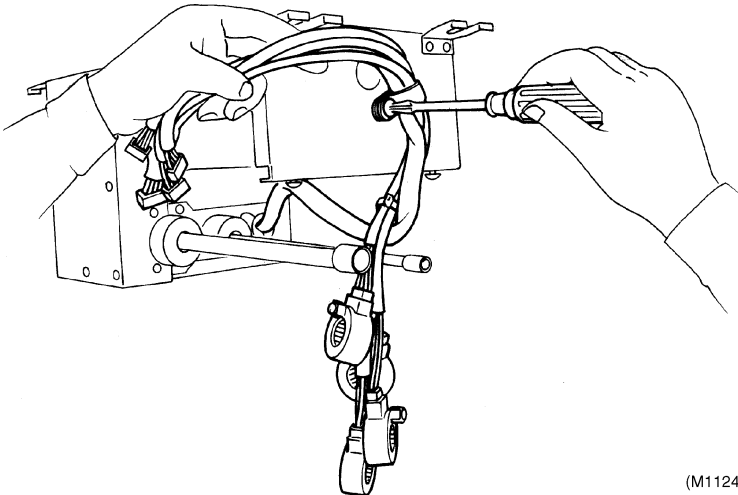
Step	Procedure	Points
2. Removing the PCB		
1	<p>The codes of the connectors on the PCB are as shown at right.</p> 	<ul style="list-style-type: none"> <li>■ The PCB is treated for moisture resistance. Replace the PCB and its mount together, if required.</li> <li>■ The LED (green) lights up while the microcomputer functions.</li> <li>■ Self-diagnostic LEDs <ul style="list-style-type: none"> <li>LED-A (green)</li> <li>LED-1 (red)</li> <li>LED-2 (red)</li> <li>LED-3 (red)</li> <li>LED-4 (red)</li> </ul> </li> </ul> <p>S4: Motorized valve coil (yellow)  S3: Motorized valve coil (blue)  S2: Motorized valve coil (red)  S1: Motorized valve coil (white)</p>
2	<p>Remove the four screws from the PCB.</p> 	
3	<p>Loosen the two keyhole-provided screws and remove the two other screws from the PCB mount.</p>  	

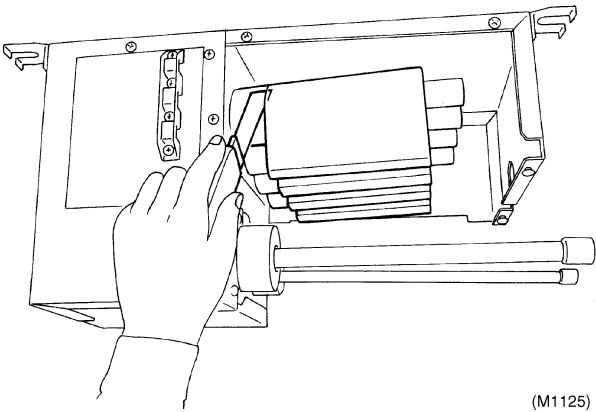
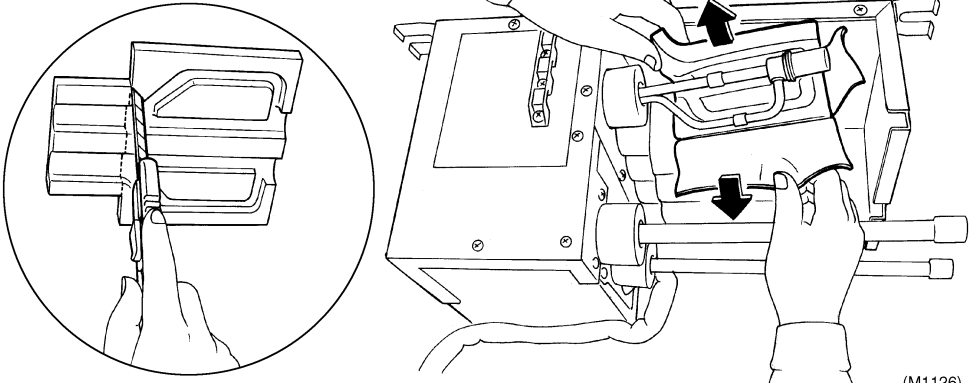
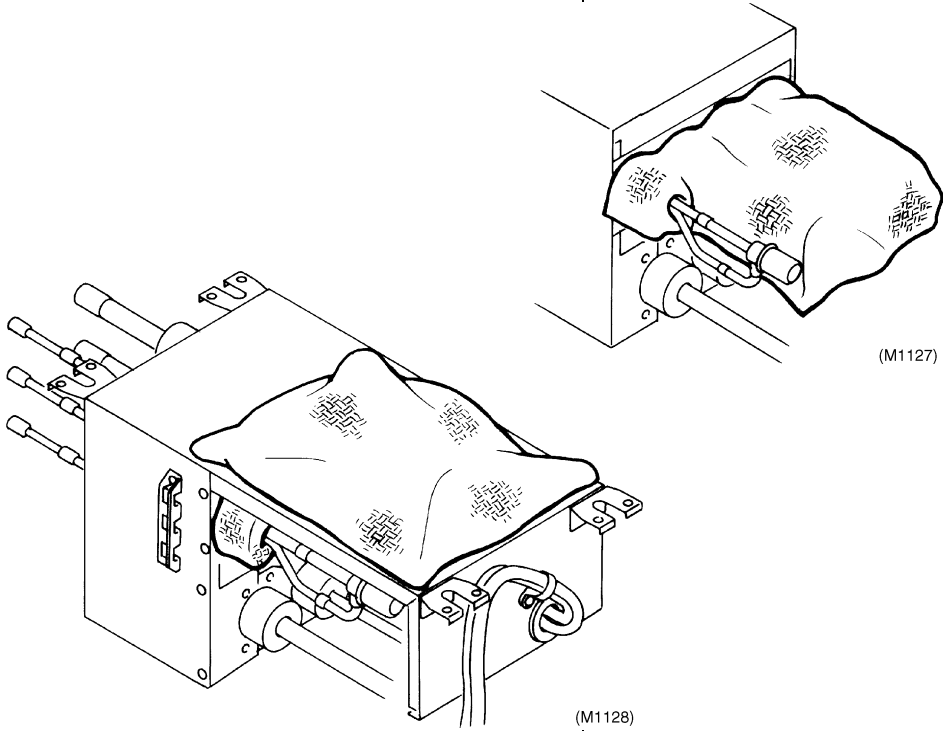
## 1.3 Removal of Motorized Valve

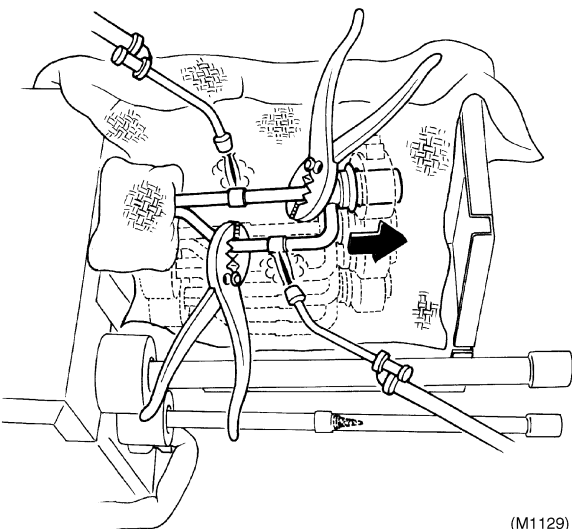
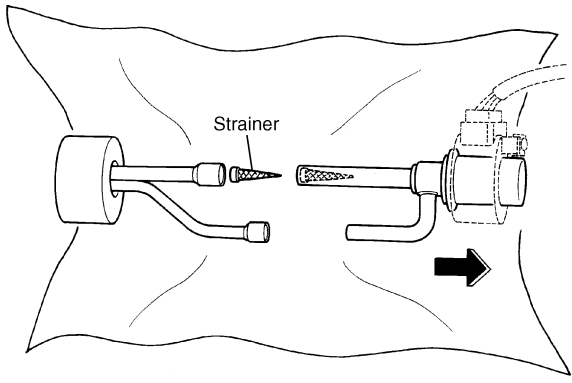
### Procedure



**Warning** Be sure to turn off all power supplies before disassembling work.

Step	Procedure	Points
1. Detaching the bottom panel	 <p>(M1122)</p>	
1 Loosen the two keyhole-provided screws and remove the two other screws from the electrical mounting plate.		
2. Removing the motorized valve coil	 <p>(M1123)</p>	<p>■ When reassembling, make sure the motorized valve coil spring clicks and feels caught.</p>
1 Slide the motorized valve coil to the right and take it out.		
3. Undoing the clamp	 <p>(M1124)</p>	<p>■ The plain, red, blue and yellow markings are provided from the front bottom.</p>
1 Remove the harness clamp from the side.		

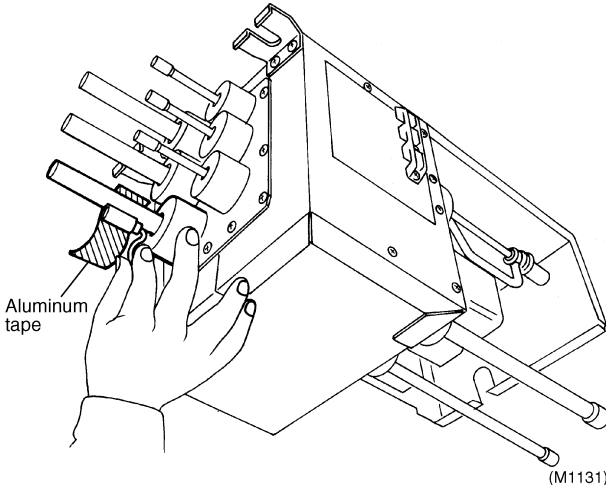
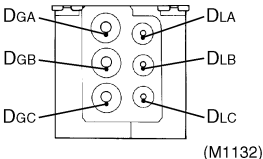
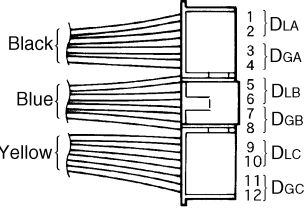
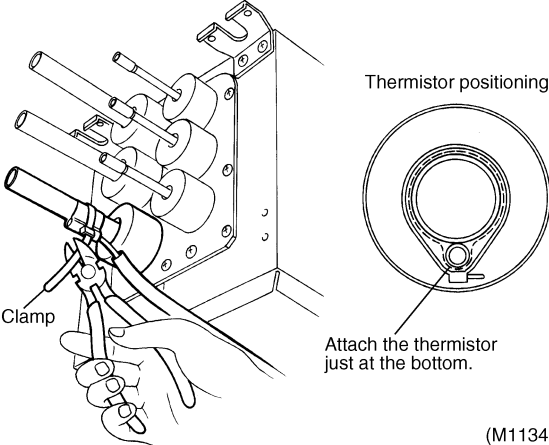
Step	Procedure	Points
4. Dismounting the motorized valve ■ Before taking this procedure, make sure there is no refrigerant gas left in the refrigerant pipes.	 <p>(M1125)</p>	<p><b>⚠ Caution</b></p> <p>Be careful not to get yourself burnt with the motorized valve, pipes and other parts that are heated by the gas welding rod</p> <p>■ When reassembling, place the thermal insulators back into position. Using finishing tape, be sure to join together the cut-off parts.</p>
1	Cut off the thermal insulator.	
2	Remove the tape and open the thermal insulator.	 <p>(M1126)</p>
3	Be careful not to allow flames of a gas welding rod to affect the parts around the motorized valve. To do this, wrap all the thermal insulators with water-wet cloths and place welding protective sheets or iron plates around. Place wet-water cloth over the top of the product too.	 <p>(M1127)</p> <p>(M1128)</p>

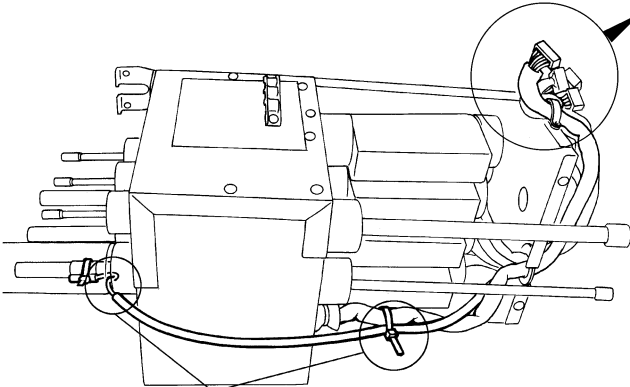
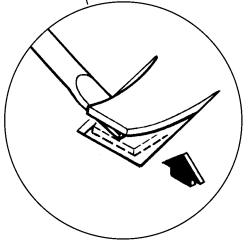
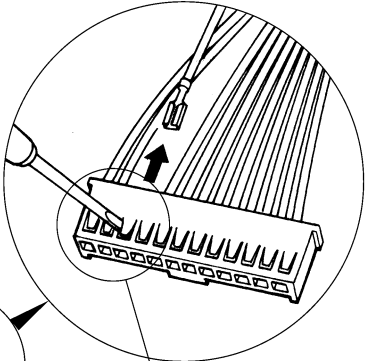
Step		Procedure	Points
4	Heat up the brazed sections of the motorized valve. Using pliers or the like, disconnect the valve.	 <p>(M1129)</p>  <p>(M1130)</p>	<p><b>Reassembling precautions</b></p> <ol style="list-style-type: none"> <li>1. Use non-oxidizing brazing method. If nitrogen gas is not available, braze the parts speedily.</li> <li>2. Avoid deterioration of the packings due to carbonization of oil inside the motorized valve or thermal influence. For this purpose, wrap the motorized valve with wet cloth and splash water over the cloth against becoming too hot (keep it below 120°C).</li> </ol> <ul style="list-style-type: none"> <li>■ In pulling the pipes, be careful not to overtighten them with pliers. The pipes may get deformed.</li> <li>■ The strainer is located inside each motorized valve. When replacing the motorized valve, be sure to change its strainer too. (Otherwise the strainer will get burnt and out of function.)</li> <li>■ Using the outdoor liquid gas shut-off valve, open the indoor line.</li> </ul> <p>If the gas welding machine fails to remove the motorized valve, take the steps below.</p> <ol style="list-style-type: none"> <li>1. Disconnect the brazed pipe sections that are readily easy to separate and join together later.</li> <li>2. With a small copper tube cutter, cut off the internal pipes to easily take out the motorized valve.</li> </ol> <p><b>Note:</b> Never use a hack saw. Cuttings may come into the pipes.</p>

# 1.4 Removal of Thermistor

Procedure

 **Warning** Be sure to turn off all power supplies before disassembling work.

Step	Procedure	Points
<div>■ Disconnect the thermistor harness connector from the PCB.</div> <div>1</div>	<div>Secure a replacement thermistor onto the pipe with aluminium tape.</div> <div>■ Provide thermal insulation from above.</div> <div></div> <div>(M1131)</div>	<div>■ The factory-installed thermistors cannot be replaced.</div> <div>■ Thermistor positions and connector pins</div> <div></div> <div>(M1132)</div> <div><u>Thermistor positions</u></div> <div></div> <div>(M1133)</div> <div><u>Thermistor connector pins</u></div>
<div>2</div>	<div>Tighten the tie-wrap to secure the above tape.</div> <div></div> <div>(M1134)</div>	

Step	Procedure		Points
3	<div>Insert the new thermistor terminal to the thermistor connector.</div> <div><div>■ Align the thermistor terminal with its hole of the connector.</div><div>■ Provide thermal insulation from above.</div></div>	<div><p>Tighten the two clamps.</p></div>	<div><div>■ Pulling the thermistor terminal</div><div></div><div>(M1135)</div><div>Carefully work on the connector without breaking the hook. (Just raise the hook.)</div></div>

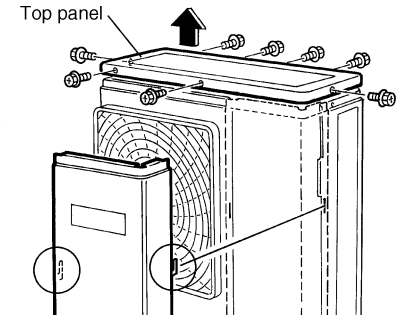
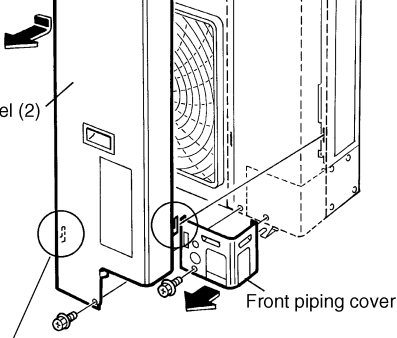
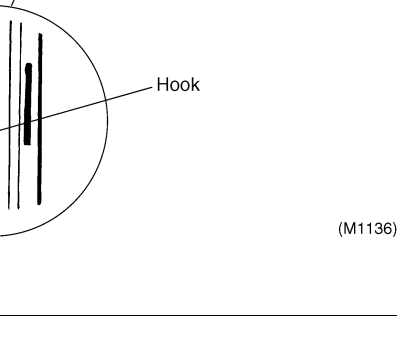
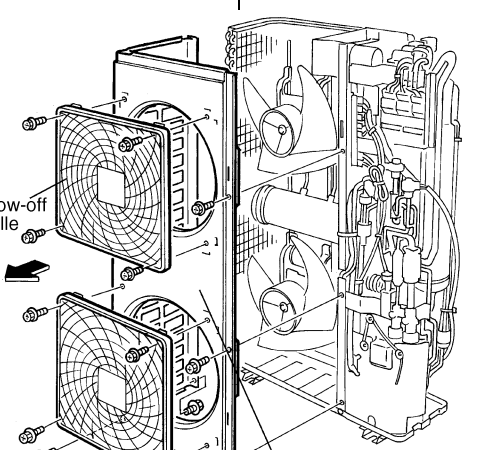
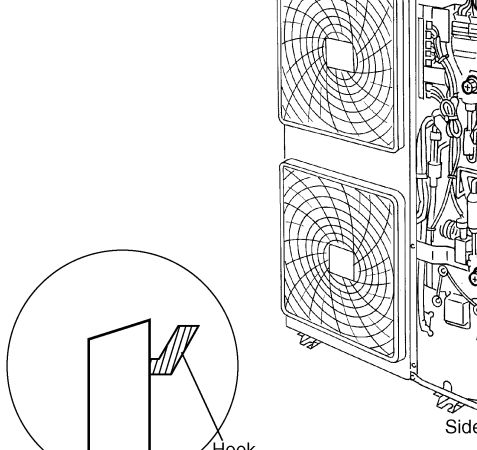
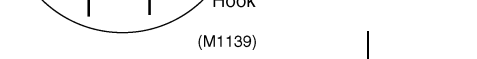
## 2. Outdoor Unit

### 2.1 Removal of Outer Panels

#### Procedure



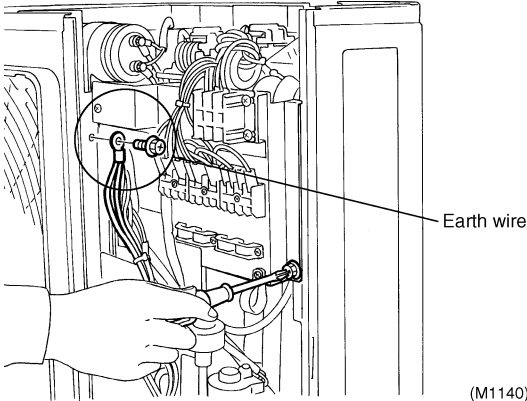
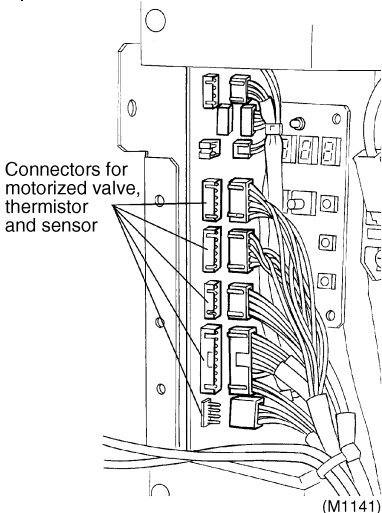
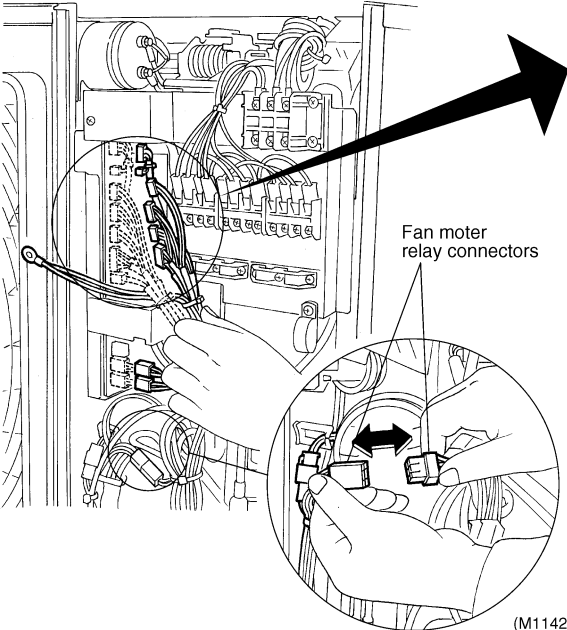
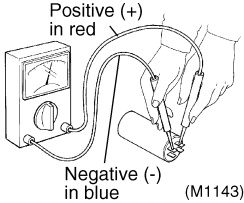
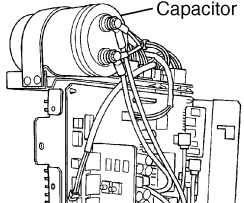
**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
1	Remove the eight screws from the top panel.	<p>■ The front panel can be detached without removing the top panel.</p>   
2	Remove the screw from the front panel. Push down the panel unhooked and detached.	
3	Remove the screw from the front piping cover.	
4	Remove the four screws from the side piping cover.	
5	Remove the outdoor air thermistor first and then the five screws from the side panel.	
6	Remove the four screws from the blow-off grille and release the grille from the four top and bottom hooks.	
7	Remove the five screws from the front panel (1). Push up the panel out of position.	  

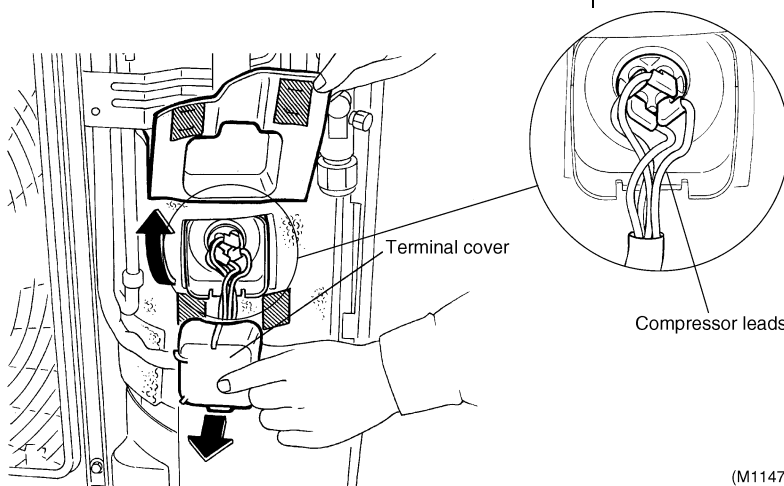
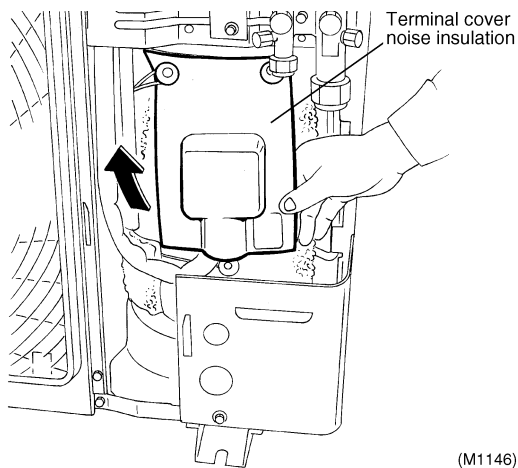
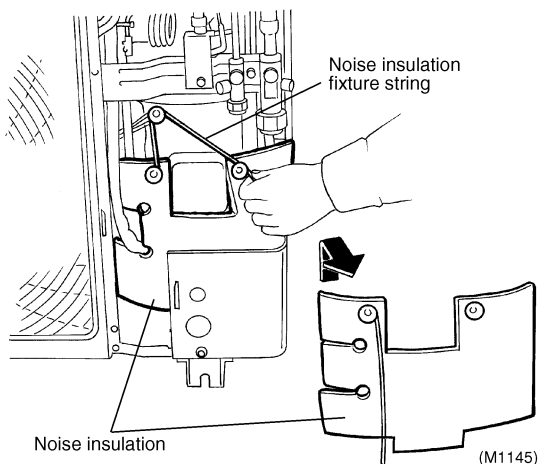
## 2.2 Removal of PCB and Electrical Box

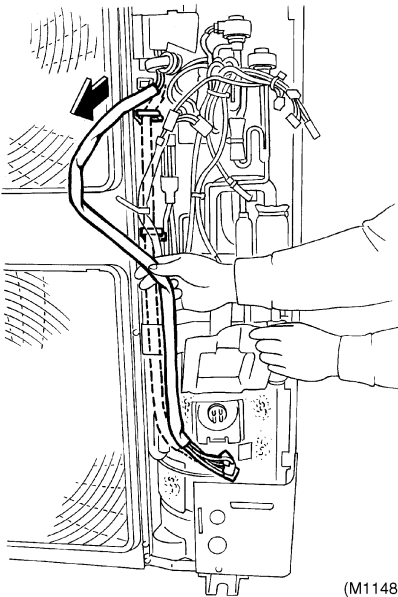
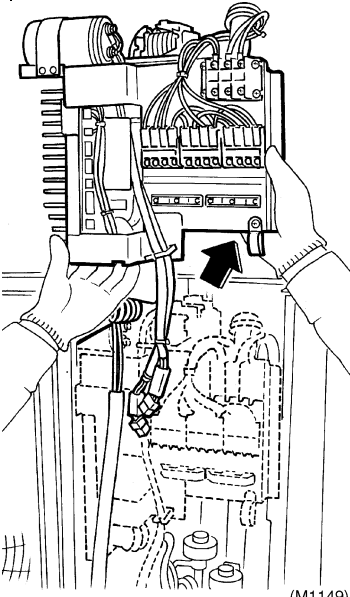
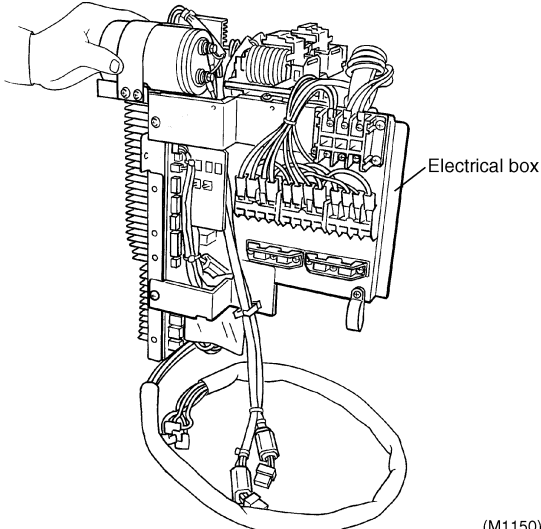
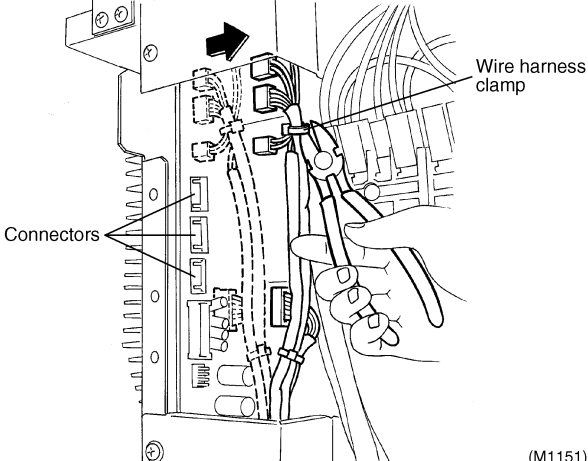
### Procedure

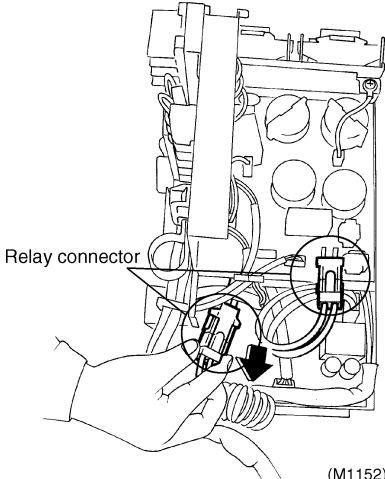
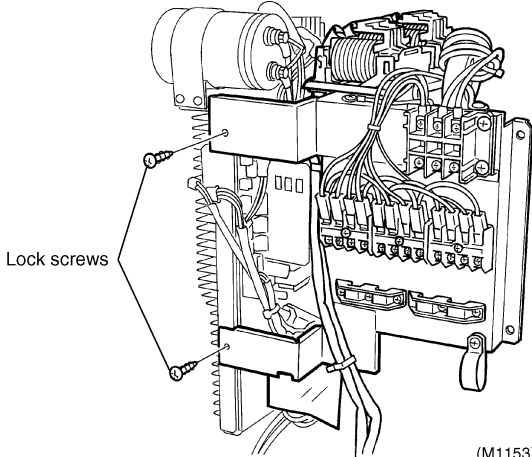
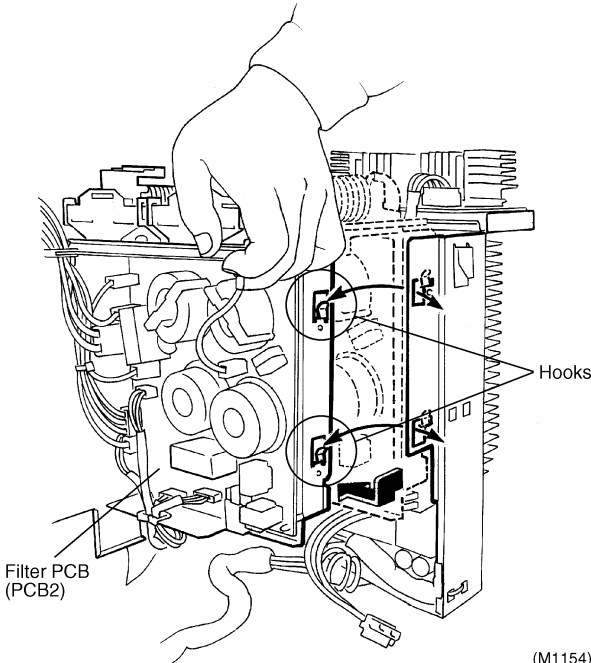
**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

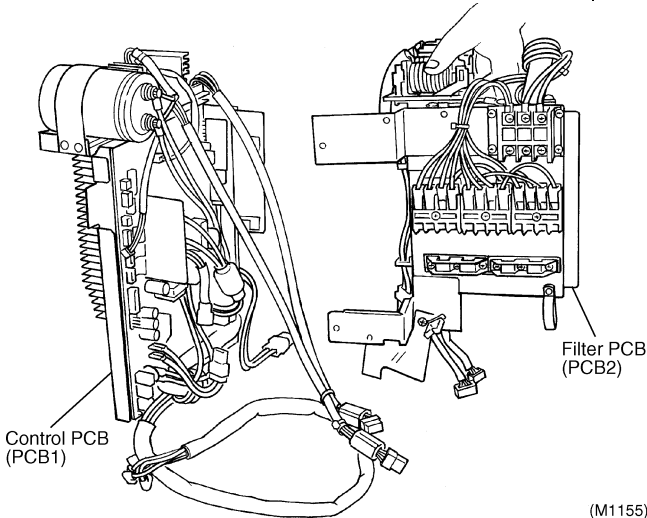
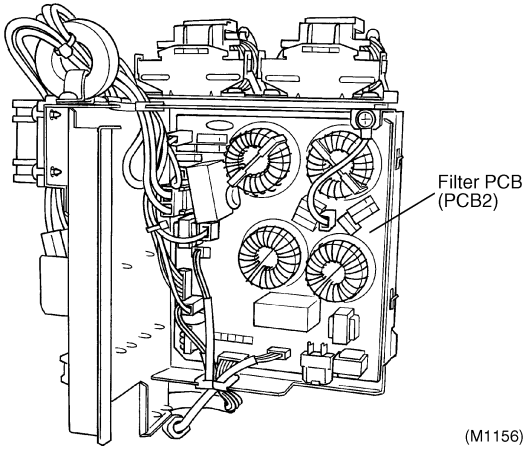
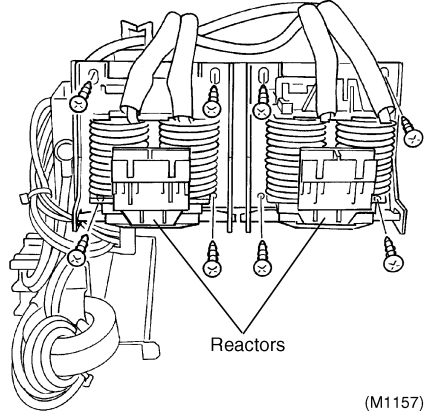
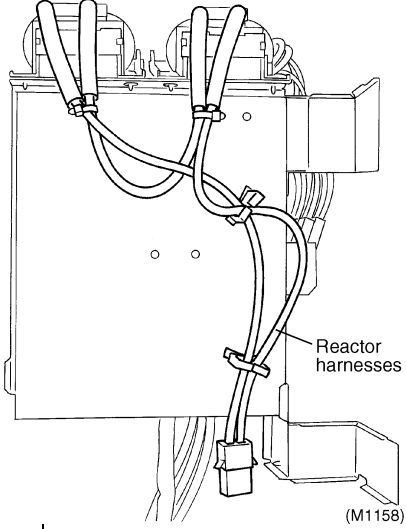
Step	Procedure	Points
<p>■ Detach the top, front and side panels, referring to the instructions in "Removal of Outer Panels".</p> <p>1. Disconnecting the earth wire</p> <p>1 Disconnect all the relay wires.</p> <p>2 Remove the screw from the earth wire. Remove the screw from the electrical box itself.</p>	 <p>Earth wire</p> <p>(M1140)</p>	 <p>Connectors for motorized valve, thermistor and sensor</p> <p>(M1141)</p>
<p>2. Disconnecting the connectors</p> <p>1 Disconnect the following connectors.</p> <p>S108: EVG gas pipe motorized valve (Blue)</p> <p>S109: EVL liquid pipe motorized valve (White)</p> <p>S110: EVP discharge/suction bypass motorized valve (Red)</p> <p>S114: Thermistor harness</p> <p>S105: LP low-pressure sensor</p>	 <p>Fan motor relay connectors</p> <p>(M1142)</p>	<p><b>Warning</b></p> <p><b>Electric Shock</b></p> <ol style="list-style-type: none"> <li>1 Be sure to turn off the power before servicing.</li> <li>2 Do not touch any live parts (high-voltage) for 15 minutes after turning off the power.</li> <li>3 Before handling these parts, make sure the main circuit capacitor (C1) voltage is below DC 50 V and disconnect the fan connectors (CN3, CN4).</li> <li>4 Pay attention to the hot parts. Keep in mind that some parts inside the electrical box are hot.</li> </ol>
<p>3. Disconnecting the relay connectors</p> <p>1 Disconnect the two fan motor relay connectors.</p>	 <p>Positive (+) in red</p> <p>Negative (-) in blue</p> <p>(M1143)</p>  <p>Capacitor</p>	

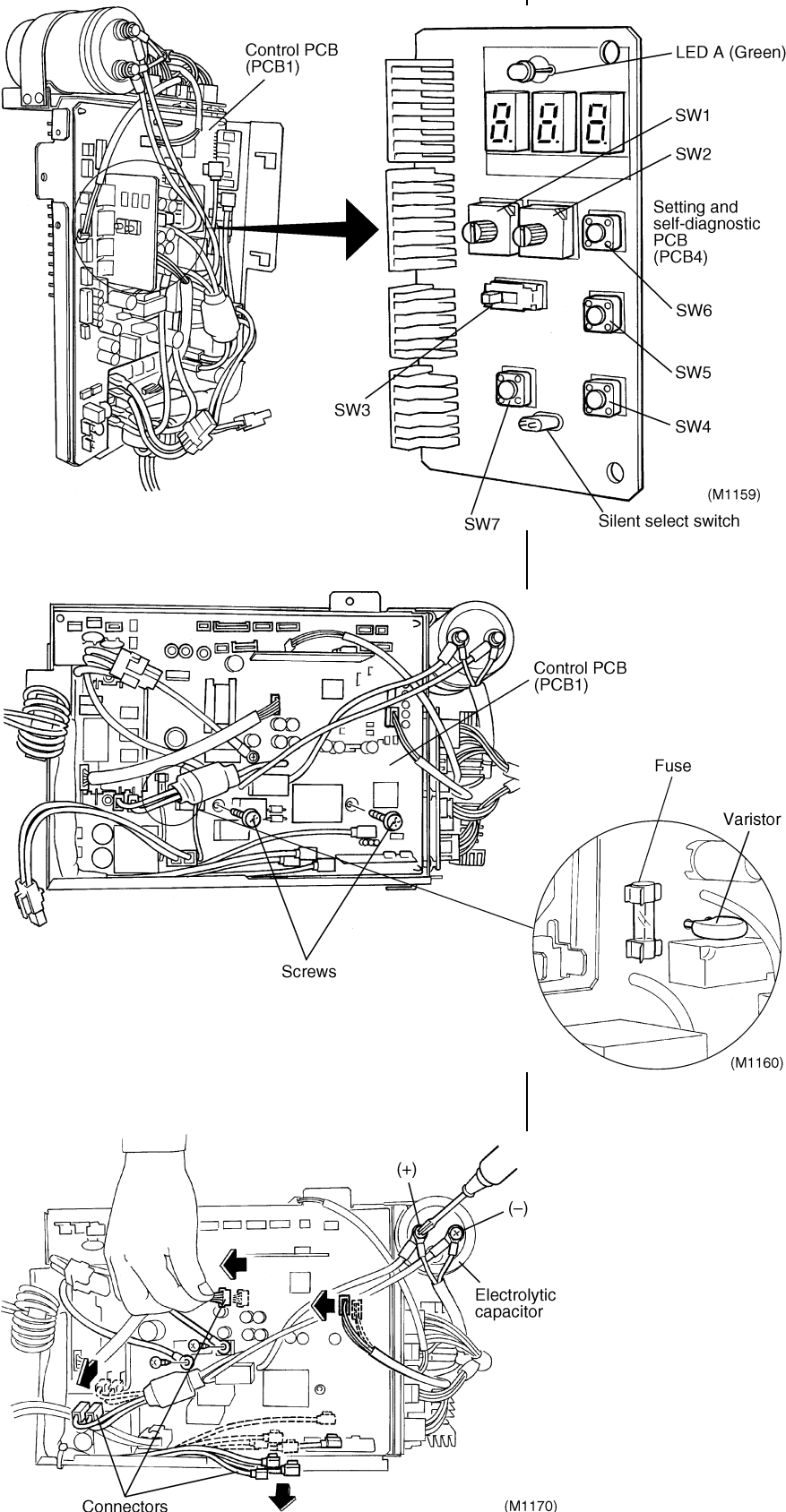
Step	Procedure	Points
4. Disconnecting the compressor leads		
1	Undo the noise insulation fixture string.	<p>■ Handle the sound insulation with enough care. It may damage the pipes around.</p>
2	Pull up the noise insulation.	
3	Open up the terminal cover noise insulation.	
4	Detach the terminal cover.	
5	Disconnect the compressor leads from their terminals.	

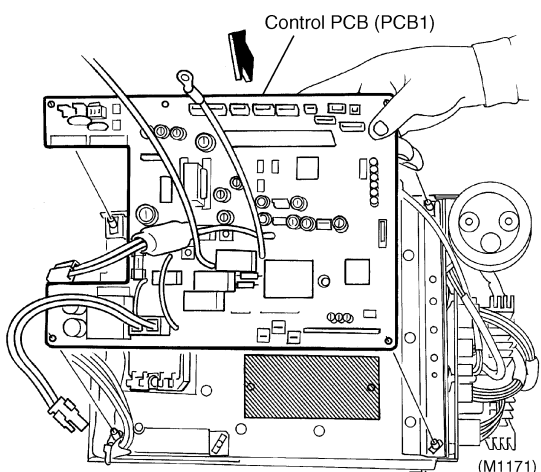
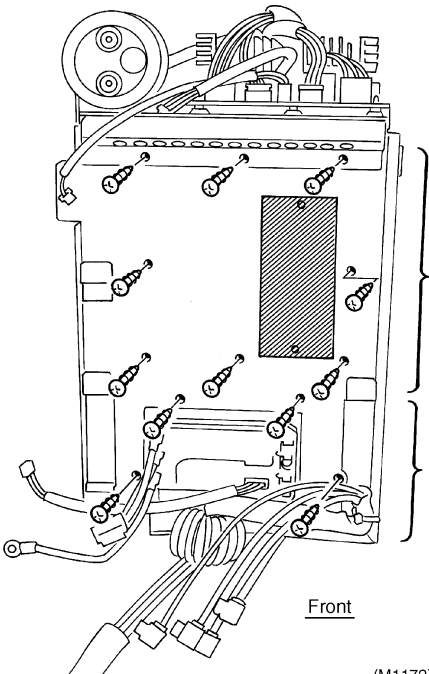
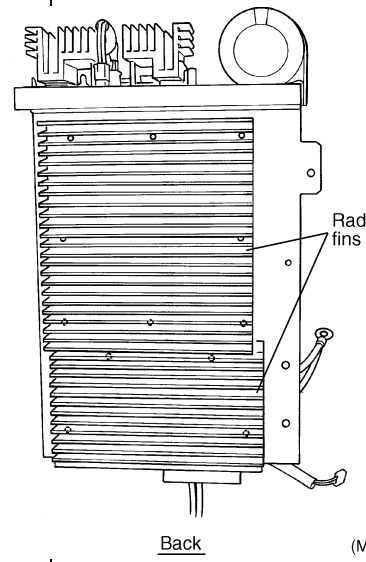
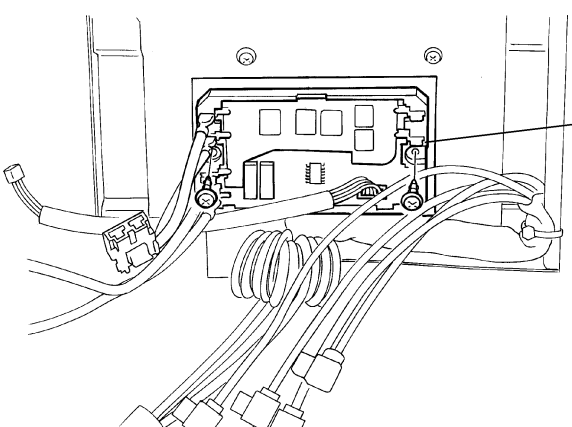


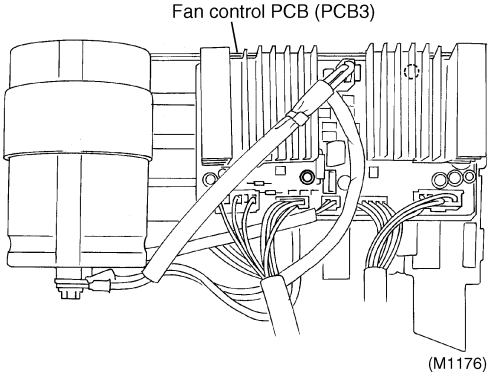
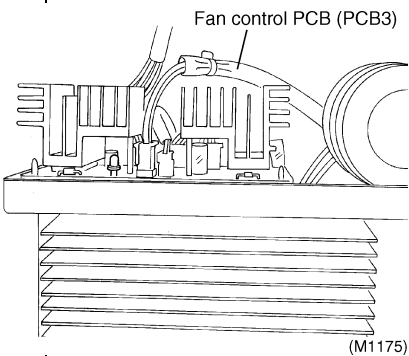
Step	Procedure	Points
5. Detaching the electrical box  1 Remove the screws from the electrical box.  2 Lift the electrical box off the hook at the back, and draw out the box.	 <p>(M1148)</p>  <p>(M1149)</p>  <p>(M1150)</p>	
6. Disassembling the electrical box  1 Disconnect all the connectors.  2 Cut off the clamp at the wire harness.	 <p>(M1151)</p>	<p>■ Make sure to clamp all wire harness after repair work is completed.</p>

Step	Procedure	Points
3	<p>Disconnect the two relay connectors on the side.</p>  <p>(M1152)</p>	
4	<p>Remove the two lock screws from the front section.</p>  <p>(M1153)</p>	
5	<p>Slide the front section to the right and release it off the two hooks at the back.</p>  <p>(M1154)</p>	

Step	Procedure		Points
		 <p>Control PCB (PCB1)</p> <p>Filter PCB (PCB2)</p> <p>(M1155)</p>	
7. Detaching the filter PCB			
1	The filter PCB is located as shown at right.	 <p>Filter PCB (PCB2)</p> <p>(M1156)</p>	
2	Disconnect all the connectors and remove the four locking guard spacers. Take out the filter PCB.		
3	Remove the four screws and take out the reactors.	 <p>Reactors</p> <p>(M1157)</p>	
4	Lay and dress the reactor harnesses.	 <p>Reactor harnesses</p> <p>(M1158)</p>	

Step	Procedure	Points
<p>8. Detaching the control PCB</p> <p>1 The control PCB is located as shown at right.</p> <p>2 The setting and self-diagnostic PCB is located also as shown at right.</p> <p>■ The PCB1 and PCB4 are integrally constructed.</p> <p>3 Disconnect all the connectors. Remove the two screws from the control PCB.</p> <p>4 Remove the two screws from the electrolytic capacitor.</p>	 <p>Control PCB (PCB1)</p> <p>LED A (Green)</p> <p>SW1</p> <p>SW2</p> <p>Setting and self-diagnostic PCB (PCB4)</p> <p>SW6</p> <p>SW5</p> <p>SW4</p> <p>SW3</p> <p>SW7</p> <p>Silent select switch</p> <p>(M1159)</p> <p>Fuse</p> <p>Varistor</p> <p>(M1160)</p> <p>Screws</p> <p>Control PCB (PCB1)</p> <p>Electrolytic capacitor</p> <p>Connectors</p> <p>(M1170)</p>	

Step		Procedure	Points
5	Remove the five locking card spacers and detach the control PCB.	 <p>Control PCB (PCB1)</p> <p>(M1171)</p>	<ul style="list-style-type: none"> <li>■ The back of the PCB has silicone compound applied. Give a slight force in detaching the PCB.</li> <li>■ Be sure to apply fresh silicone compound before attaching the PCB back in place.</li> </ul>
9. Detaching the radiation fins		 <p>Front</p> <p>(M1172)</p>	 <p>Back</p> <p>Radiation fins</p> <p>(M1173)</p>
10. Detaching the active module		 <p>Active module</p> <p>(M1174)</p>	

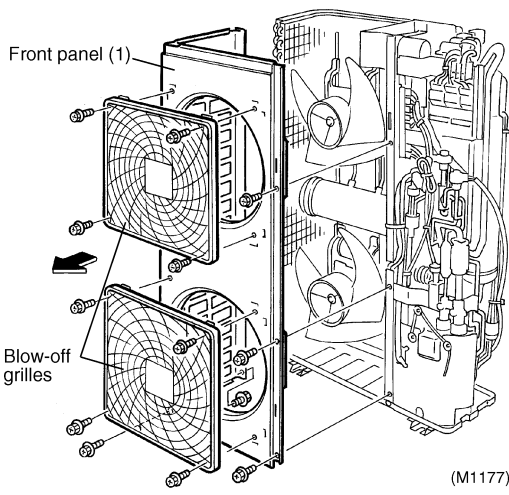
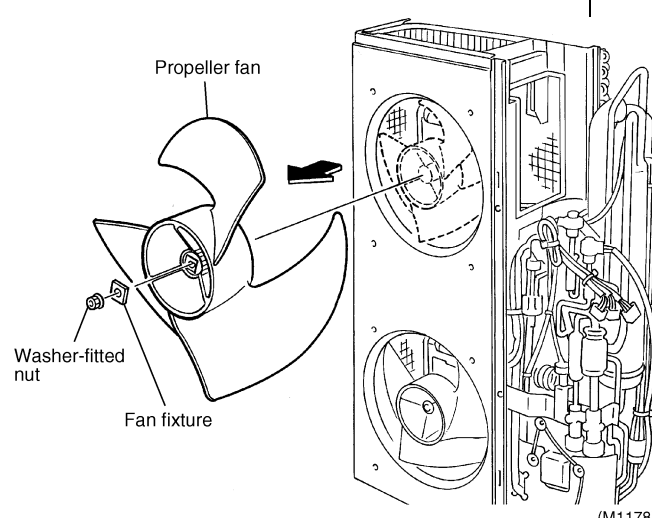
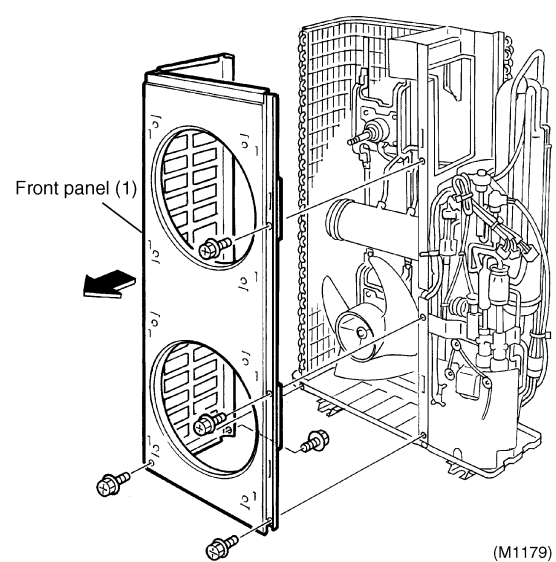
Step	Procedure	Points
11. Detaching the fan control PCB		
1	<p>The fan control PCB is located as shown at right. Remove the four locking card spacers and detach the PCB.</p>	<div><div><p>Fan control PCB (PCB3)</p><p>(M1176)</p></div><div><p>Fan control PCB (PCB3)</p><p>(M1175)</p></div></div>

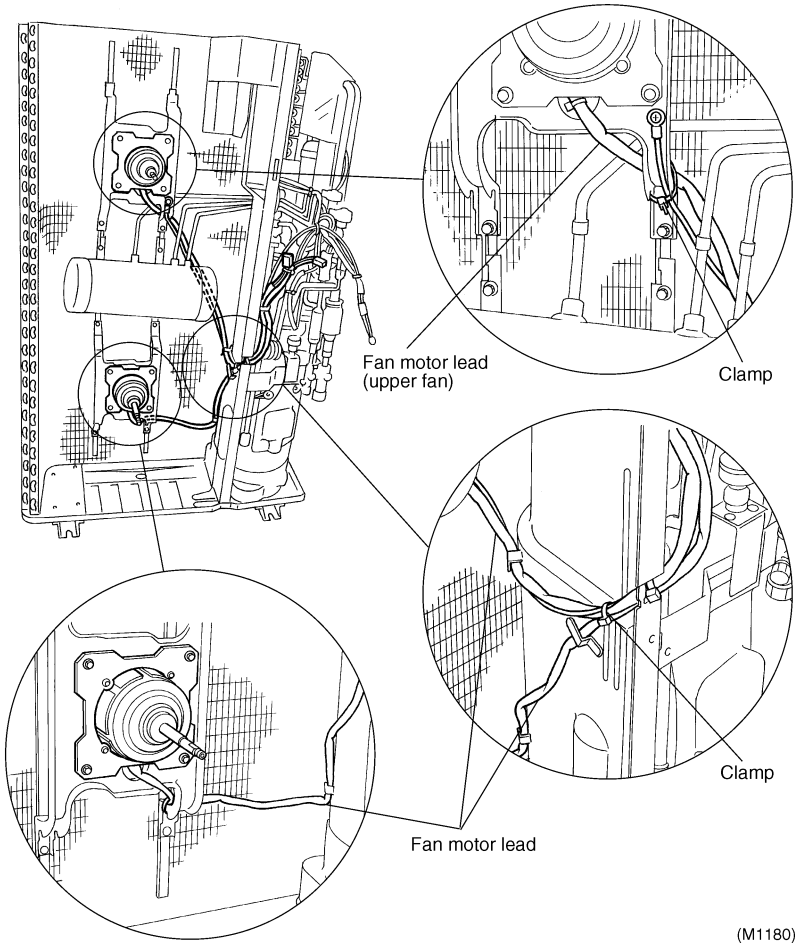
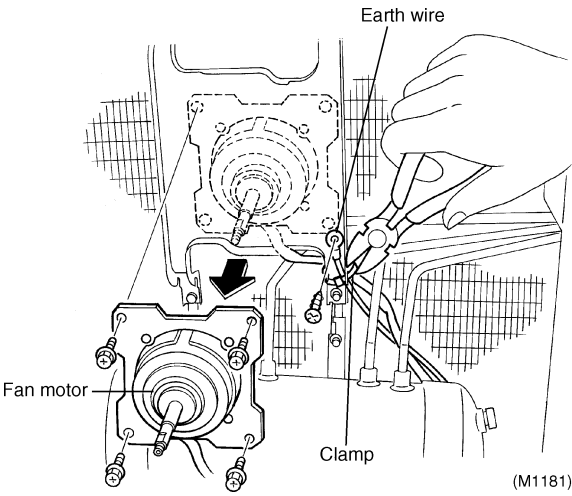
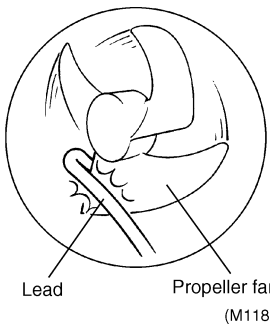
## 2.3 Removal of Propeller Fans and Fan Motors

### Procedure



**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

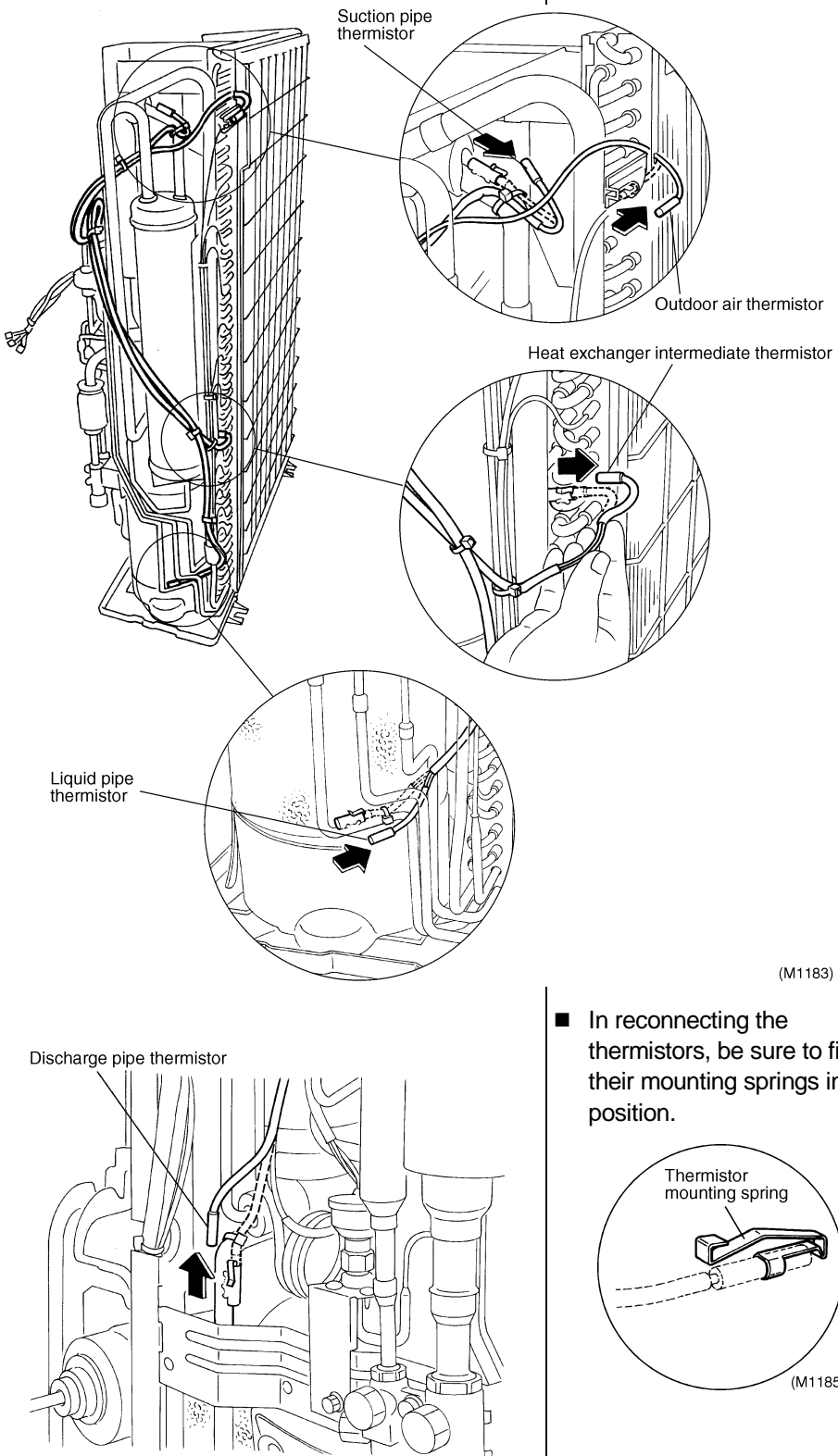
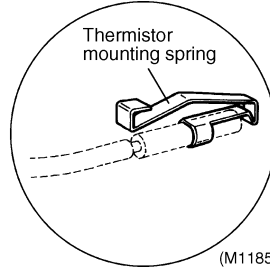
Step	Procedure	Points
<p>■ Detach the front panel, front piping cover, etc., referring to the instructions in "Removal of Outer Panels".</p>	 <p>(M1177)</p>  <p>(M1178)</p>  <p>(M1179)</p>	
<p>1. Detaching the propeller fans</p>		
<p>1 Remove the four blow-off grille lock screws. Undo the four top and bottom hooks to take out the blow-off grilles.</p> <p>2 Remove the washer-fitted nuts and fixtures from the propeller fans.</p> <p>3 Remove the five screws from the front panel (1). Push up the panel out of position.</p>		
		<p>■ To disconnect the fan motor leads, detach the front panel (1) first.</p>

Step	Procedure	Points
2. Dismounting the fan motors		
1 Disconnect the two fan motor relay connectors from the PCB in the electrical box.  2 The fan motor leads are hooked in some locations: one hook for the upper fan and two for the lower fan.  3 Undo the lead tie-wraps first and then the lead clamp off the partition board.  4 Disconnect the earth wire from the upper-motor mount.	 <p>(M1180)</p>	<ul style="list-style-type: none"> <li>■ In disconnecting the connectors, do not pull the leads, but hold the connectors and press the hooks.</li> <li>■ Precaution in mounting the motors: Be sure to secure the motor leads with the clamps. Otherwise the leads may get caught by the fans.</li> </ul>
5 Undo the clamp. 6 Remove the four screws from the fan motor. Then dismount the fan motor.	 <p>(M1181)</p>	 <p>(M1182)</p> <ul style="list-style-type: none"> <li>■ In setting up the fan, put the partition board piece between the tie-wraps A and B and secure the lead.</li> </ul>

## 2.4 Removal of Thermistor

### Procedure

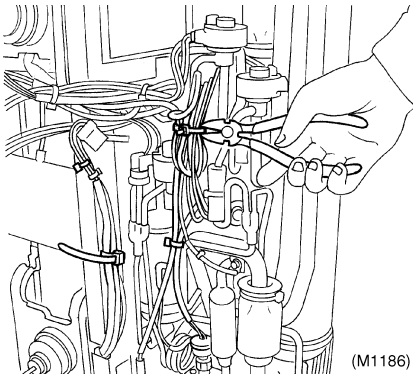
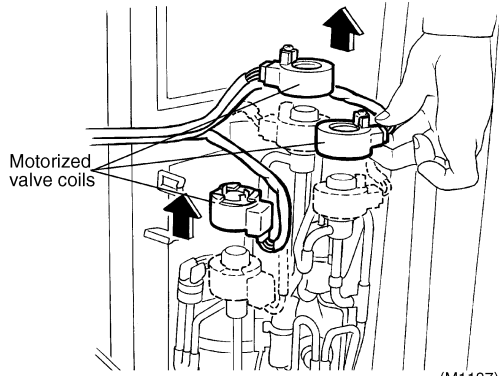
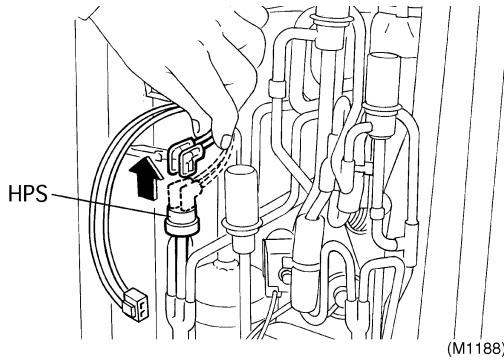
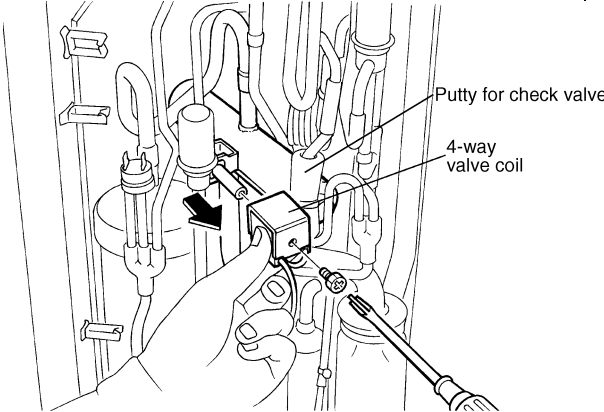
**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

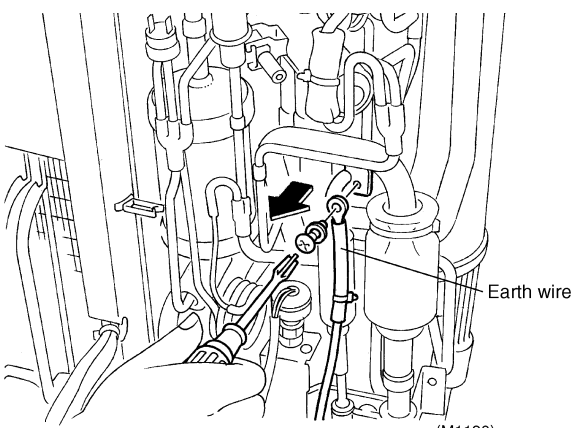
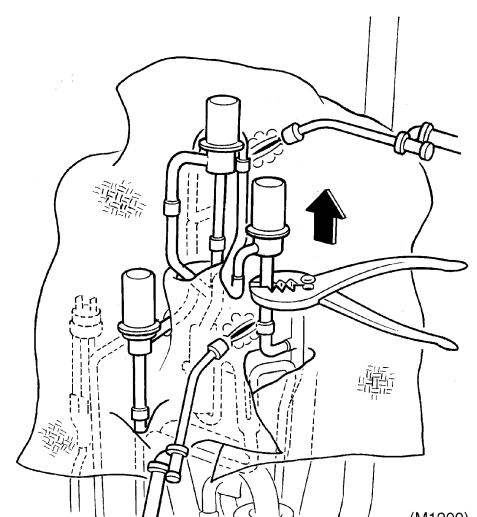
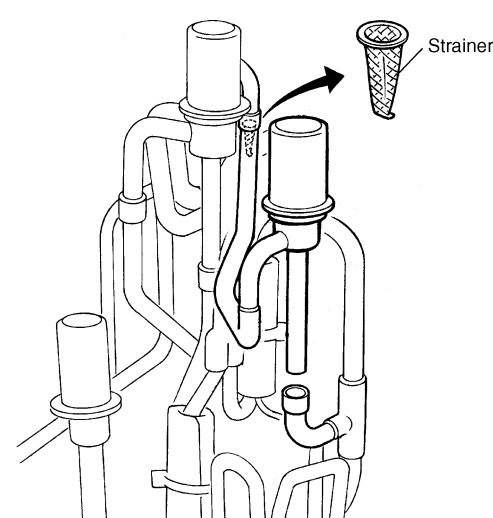
Step	Procedure	Points
<ul style="list-style-type: none"> <li>Detach the top, front panel (2) and side panel, referring to the instructions in "Removal of Outer Panels".</li> <li>Take out the electrical box.</li> </ul>	 <p>Suction pipe thermistor</p> <p>Outdoor air thermistor</p> <p>Heat exchanger intermediate thermistor</p> <p>Liquid pipe thermistor</p> <p>Discharge pipe thermistor</p> <p>(M1183)</p> <p>(M1184)</p>	
1	Disconnect the thermistors from the holders, and pass them out of the through opening of the piping plate.	
2	Undo the two tie-wraps and disconnect the suction pipe thermistor.	
<ul style="list-style-type: none"> <li>In reconnecting the suction pipe thermistor, bend the harness back into its original route and apply the tie-wraps.</li> </ul>		
3	Disconnect the heat exchanger intermediate thermistor.	
4	Disconnect the liquid pipe thermistor.	
5	Disconnect the discharge pipe thermistor.	
		<ul style="list-style-type: none"> <li>In reconnecting the thermistors, be sure to fit their mounting springs into position.</li> </ul>  <p>Thermistor mounting spring</p> <p>(M1185)</p>

## 2.5 Removal of Motorized Valve

### Procedure

**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
<ul style="list-style-type: none"><li>Before taking this procedure, make sure there is no refrigerant gas left in the refrigerant pipes.</li><li>Cut off the wire harness clamp.</li></ul>	 <p>(M1186)</p>	<p><b>Reassembling precautions</b></p> <ol style="list-style-type: none"><li>Use non-oxidizing brazing method. If nitrogen gas is not available, braze the parts speedily.</li><li>Wrap the motorized valve itself with wet cloth. Splash water over the cloth against becoming too hot (keep it below 120°C).</li></ol> <ul style="list-style-type: none"><li>In pulling the pipes, be careful not to overtighten them with pliers. The pipes may get deformed.</li></ul> <p>If the gas welding machine fails to remove the motorized valve, take the steps below.</p> <ol style="list-style-type: none"><li>Disconnect the brazed pipe sections that are readily easy to separate and join together later.</li><li>With a small copper tube cutter, cut off the internal pipes to easily take out the motorized valve.</li></ol> <p><b>Note:</b> Never use a hack saw. Cuttings may come into the pipes.</p>
1. Removing the motorized valve coils	 <p>(M1187)</p>	
<ol style="list-style-type: none"><li>Pull out the three motorized valve coils.</li></ol> <ul style="list-style-type: none"><li>In remounting the motorized valve coils, pay attention to their directions. Orient them so that the harness connections be at the horizontally coming pipes.</li></ul>		
2. Disconnecting the peripheral components	 <p>(M1188)</p>  <p>(M1189)</p>	
<ol style="list-style-type: none"><li>Disconnect the HPS lead.</li></ol> <ol style="list-style-type: none"><li>To protect the 4-way valve coil, detach it out of position.</li><li>Remove the check valve putty at two locations.</li></ol>		

Step		Procedure	Points
4	Disconnect the earth wire.	 <p>(M1190)</p>	<p><b>Warning</b></p> <p>If refrigerant gas leaks during the job, ventilate the room. (Bear in mind that if the refrigerant gas is exposed to open flames, noxious gas may be generated.)</p> <p><b>Caution</b></p> <p>Be careful not to get yourself burnt with the motorized valve, pipes and other parts that are heated by the gas welding rod</p> <p><b>Caution</b></p> <p>Do not allow flames of a gas welding rod to affect the parts around the motorized valve. Place welding protective sheets or iron plates around</p>
5	Disconnect the brazed section of the motorized valve.	 <p>(M1200)</p>	
	<ul style="list-style-type: none"> <li>When replacing the motorized valve, change its strainer too.</li> <li>The strainer is located in the brazed section of the pipe.</li> </ul>	 <p>(M1201)</p>	

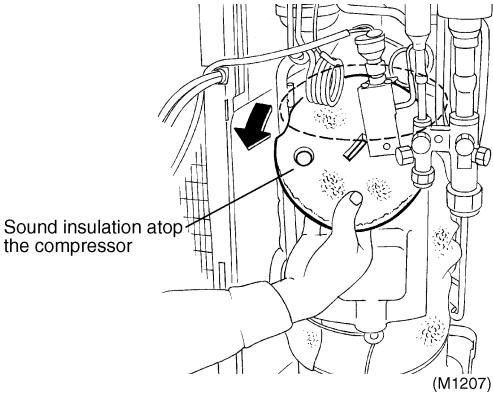
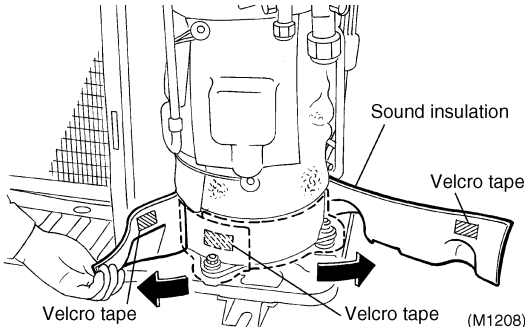
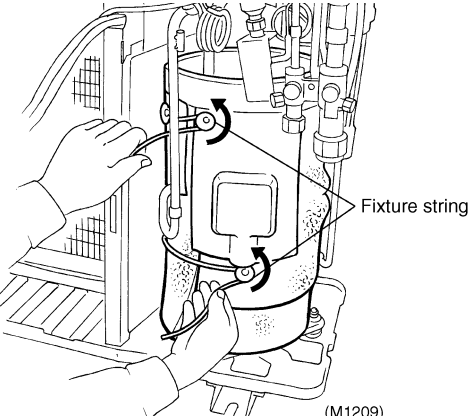
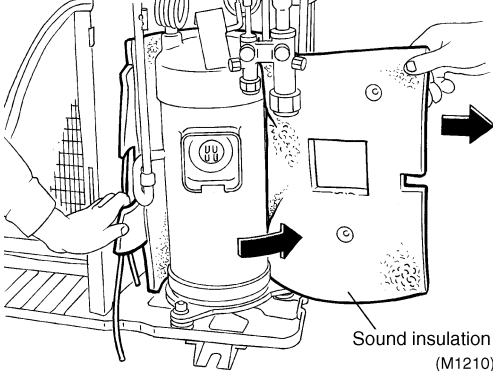
## 2.6 Removal of Sound Insulation

### Procedure



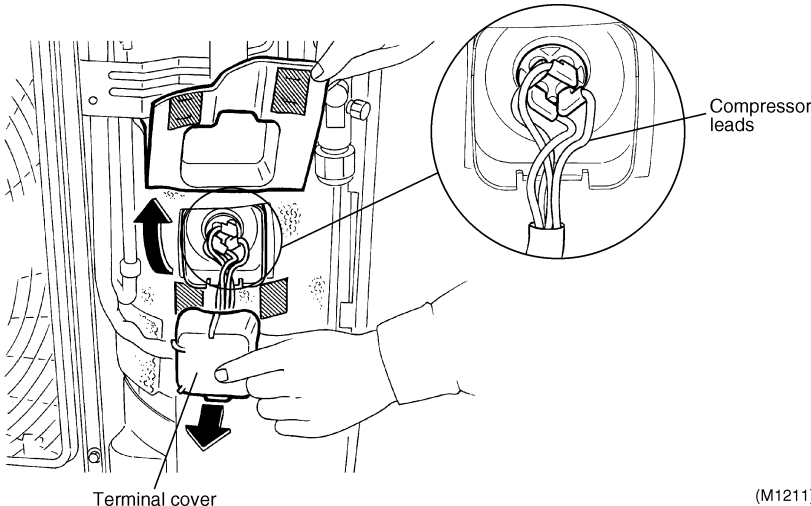
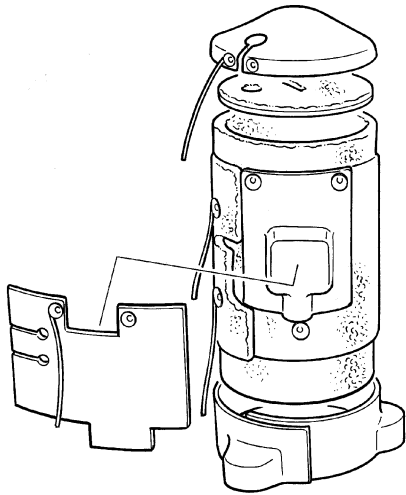
**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
<p>■ Remove the terminal cover and disconnect the compressor leads, referring to the instructions in "Removal of PCB".</p> <p>1. Disconnecting the peripheral components</p> <p>1 Detach the compressor mounting plate.</p> <p>2 Slide up the cover at the back of the partition board. Release the cover off the two hooks.</p> <p>3 Remove the screw from the partition board.</p> <p>4 Open the partition board to the left to easily access the sound insulation.</p>	  	<p>■ The partition board cannot be detached.</p>
<p>2. Detaching the sound insulation</p> <p>1 Undo the sound insulation fixture string.</p> <p>2 Draw out the sound insulation cover and sound insulation from the top of the compressor.</p>	 	

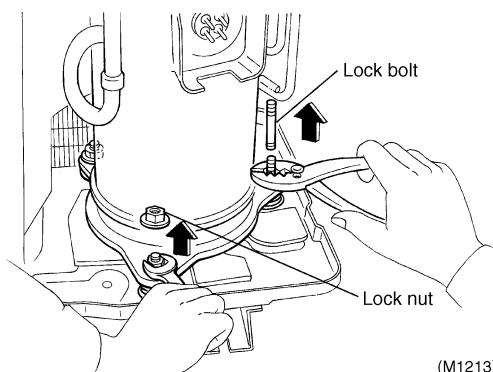
Step	Procedure	Points
3	<p data-bbox="204 674 443 801">Draw out the sound insulation cover from the bottom of the compressor.</p>  <p data-bbox="970 629 1034 651">(M1207)</p>  <p data-bbox="978 1021 1042 1043">(M1208)</p>	
4	<p data-bbox="204 1066 459 1160">Undo the two points of the sound insulation fixture string.</p>  <p data-bbox="866 1503 930 1525">(M1209)</p>	
5	<p data-bbox="204 1559 448 1653">Open the sound insulation and draw it out.</p>  <p data-bbox="962 1951 1026 1973">(M1210)</p>	

## 2.7 Removal of Compressor

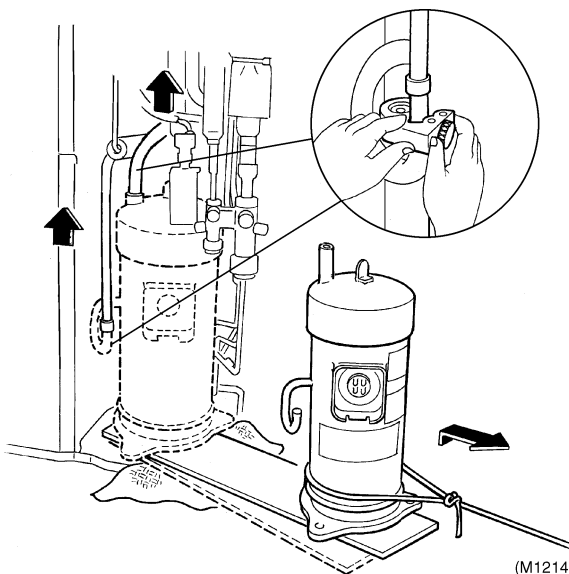
**Procedure**       **Warning**    Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

Step	Procedure	Points
■ Detach the outer panels, electrical box and noise insulation, referring to the instructions in "Removal of Outer Panels" and other procedures.	 <p>(M1211)</p> <p>The sound insulation is in the shape as shown at right.</p> 	
1. Dismounting the compressor		
1 Detach the terminal cover.		
2 Disconnect the compressor leads from their terminals.		

Step	Procedure	Points
3	Remove the three lock nuts from the compressor.	<p>■ Reattach the noise insulation with no gap using the fixture string.</p> <p><b>Warning</b> The compressor's refrigerating machine oil may catch fire. Have wet cloth at hand for quickly putting out the fire.</p>
4	Remove the three lock bolts from the compressor. ■ This is to easily pull out the heavy compressor	
5	Using a pipe cutter, cut off the two points of the compressor suction and discharge pipes. ■ The cut-off points are nearer the compressor than the brazed sections. ■ There is no crankcase heater.	<p><b>Warning</b> If refrigerant gas leaks during the job, ventilate the room. (Bear in mind that if the refrigerant gas is exposed to open flames, noxious gas may be generated.)</p> <p><b>Caution</b> Be careful not to get yourself burnt with the pipes and other parts that are heated by the gas welding rod.</p>
6	Before installing a new compressor, disconnect the brazed sections of the cut-off pipes, using a gas welding rod.	



(M1213)



(M1214)

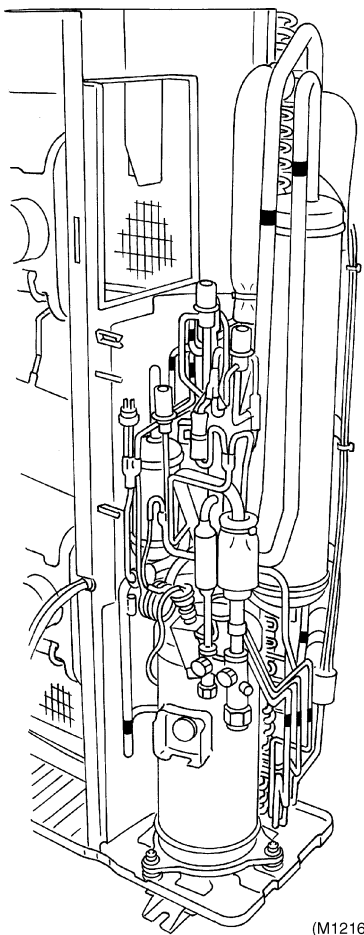
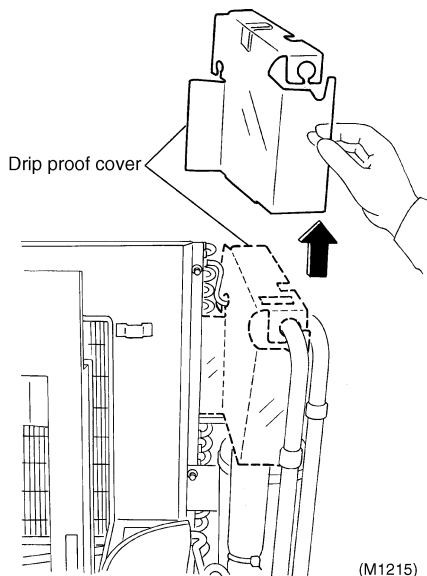
## 2.8 Removal of 4-way Valve

### Procedure

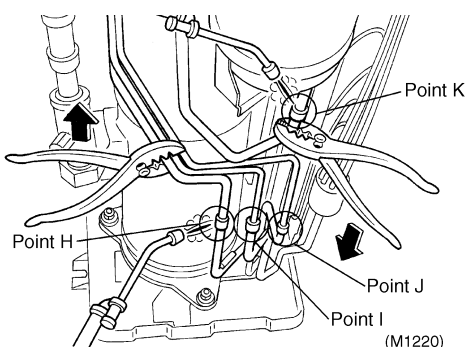
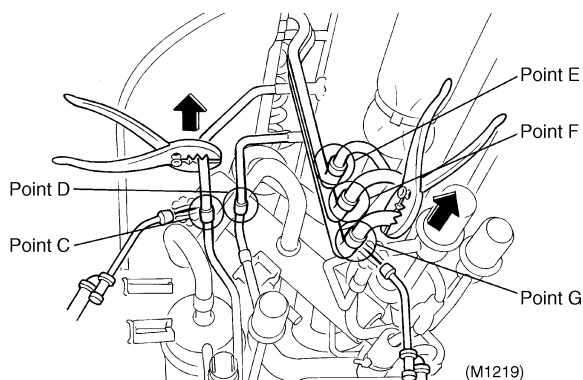
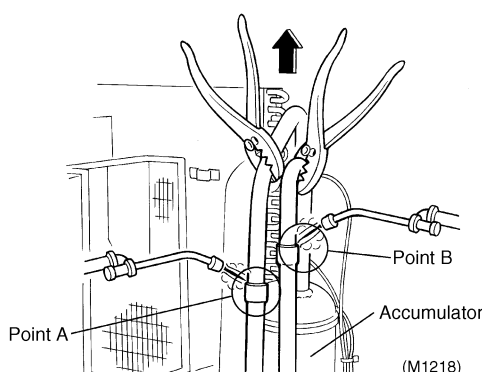
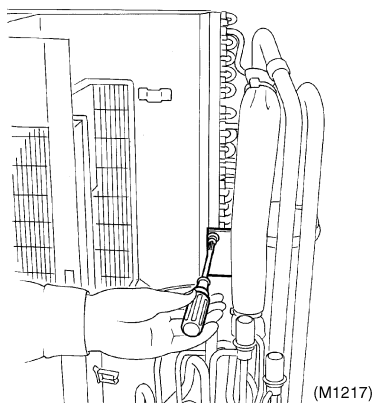


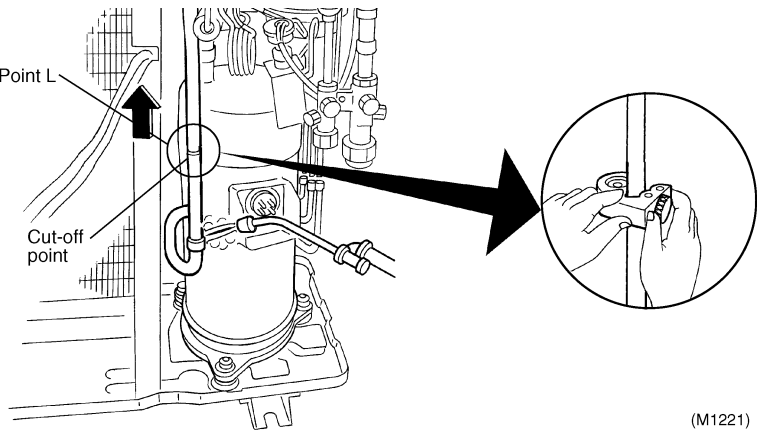
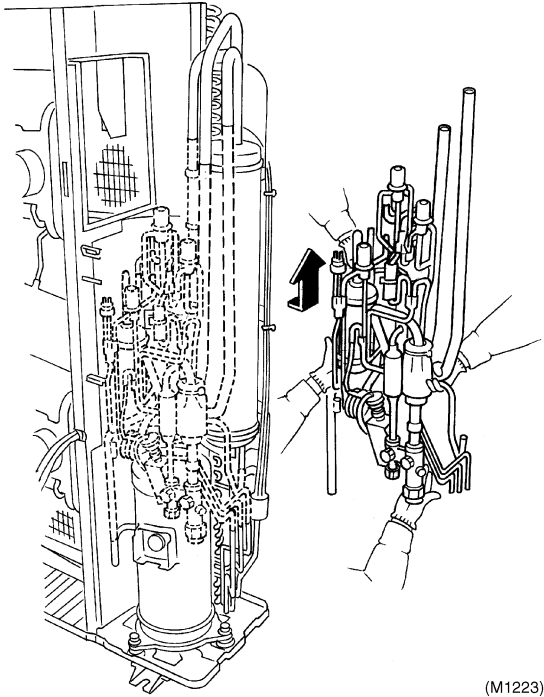
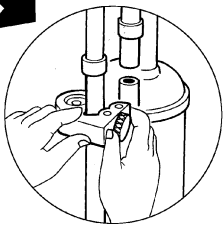
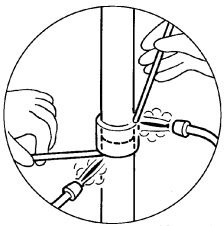
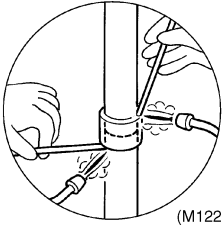
**Warning** Be sure to wait 10 minutes or more after turning off all power supplies before disassembling work.

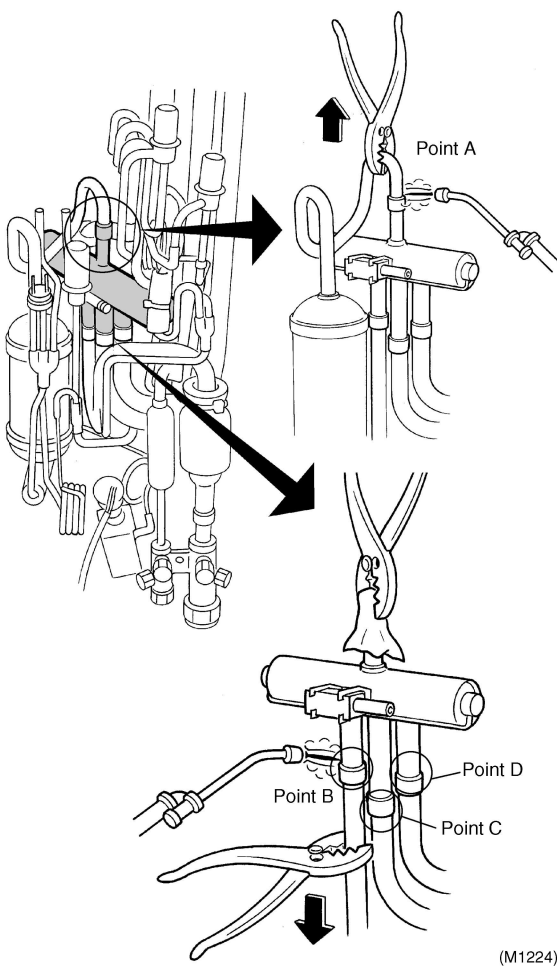
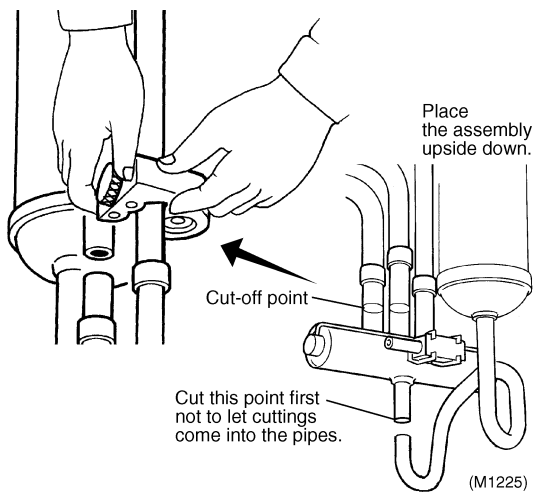
Step	Procedure	Points
<ul style="list-style-type: none"> <li>Before taking this procedure, make sure there is no refrigerant gas left in the refrigerant pipes.</li> <li>Detach the outer panels, electrical box, 4-way valve coil, etc., referring to the instructions in "Removal of Outer Panels" and other procedures.</li> </ul>		
1. Detaching the drip proof cover		
1	Remove the drip proof cover.	<p><b>Warning</b></p> <p>If refrigerant gas leaks during the job, ventilate the room. (Bear in mind that if the refrigerant gas is exposed to open flames, noxious gas may be generated.)</p> <p><b>Caution</b></p> <p>Be careful not to get yourself burnt with the 4-way valve, pipes and other parts that are heated by the gas welding rod.</p>
2	See at right for the refrigerant piping assembly.	



Step	Procedure	Points
3	Remove the lock screw from the piping assembly.	
4	Disconnect the pipes from the accumulator (at points A and B) using a welding machine.	<p><b>Warning</b></p> <p>The compressor's refrigerating machine oil may catch fire. Have wet cloth at hand for quickly putting out the fire.</p> <p><b>Warning</b></p> <p>If refrigerant gas leaks during the job, ventilate the room. (Bear in mind that if the refrigerant gas is exposed to open flames, noxious gas may be generated.)</p>
5	Disconnect the pipes at points C, D, E, F and G using the welding machine.	<p><b>Caution</b></p> <p>Be careful not to get yourself burnt with the pipes and other parts that are heated by the gas welding rod.</p> <p><b>Caution</b></p> <p>Do not allow flames of a gas welding rod to affect the parts around the motorized valve. Place welding protective sheets or iron plates around</p>
6	Also disconnect the pipes at points H, I, J and K using the welding machine.	



Step	Procedure	Points
7	<p>Cut off the compressor's discharge pipe (at point L) with the pipe cutter.</p>  <p>Point L</p> <p>Cut-off point</p> <p>(M1221)</p>	
8	<p>Disconnect the 4-way valve assembly.</p>  <p>(M1223)</p> <p>■ It may be difficult to disconnect the pipes (at points A and B) of the accumulator (discussed in Step (4) above). In such case, use the pipe cutter. When reconnecting the 4-way valve assembly, braze the cut-off point together with a copper tube union.</p>   <p>(Q0007)</p>	<p>■ In reconnecting the 4-way valve assembly, braze the cut-off point together with a copper tube union (Local supply).</p>  <p>(M1222)</p>

Step	Procedure	Points
2. Disconnecting the 4-way valve		
1 Remove the screw.		
2 Get rid of the brazing at points A, B, C and D. Disconnect the 4-way valve assembly.	 <p>(M1224)</p>	<p><b>Reassembling precautions</b></p> <ol style="list-style-type: none"> <li>1 Use non-oxidizing brazing method. If nitrogen gas is not available, braze the parts speedily.</li> <li>2 Avoid deterioration of the packings due to carbonization of oil inside the 4-way valve or thermal influence. For this purpose, wrap the 4-way valve with wet cloth. Splash water over the cloth against becoming too hot (keep it below 120°C).</li> </ol> <p>■ In pulling the pipes, be careful not to overtighten them with pliers. The pipes may get deformed.</p>
When cutting with the small pipe cutter:		
1 Place the refrigerant piping assembly upside down to prevent cuttings from coming into the pipes	 <p>(M1225)</p>	<p>If the gas welding machine fails to remove the 4-way valve, take the steps below.</p> <ol style="list-style-type: none"> <li>1. Disconnect the brazed pipe sections that are readily easy to separate and join together later.</li> <li>2. With a small copper tube cutter, cut off the internal pipes to easily take out the 4-way valve.</li> </ol> <p><b>Note:</b> Never use a hack saw. Cuttings may come into the pipes.</p> <p>■ Be careful not to lose or damage the drip proof cover. Fit it back into position.</p>

### 3. Indoor Unit

#### 3.1 Refer following table for indoor unit removal procedure

Model Number	Service Manual	Page
FTK25 / 35J, FTX25 / 35J, FTXD25 / 35K, FVX25 / 35K	Si12-001	P.176~192
FTKD50 / 60 / 71J, FTXD50 / 60 / 71J, FTK50 / 60H, FTX50 / 60H	Si12-001	P.193~214
FLK25~60H, FLX25~60H, FLK50 / 60J, FLX50 / 60J	Si05-003 * Similer model FL(E)-H	P.50~65
CDK25~60HA, CDX25~60HA, CDX25~60J	Si12-001 * Similer model CDK(X)25~60H	P.215~219
FHYC35~71K	Si-71A	P.127~141
FDYM60 / 03FA	—	—

# Part 11

## Cautions before Operation

1. Installation .....	344
1.1 Outdoor Unit .....	344
1.2 BP Unit .....	346
2. Wiring .....	348
2.1 Outdoor Unit .....	348
2.2 BP Unit .....	350
2.3 Outdoor Unit Rotary Switch Setting.....	352
3. Others .....	354
3.1 Explanation for FTK(X)25/35J Series.....	354
3.2 Explanation for FTK(X)50/60H and CDK(X)25~60H Series.....	357

<p>The RMK140JAVM specifications are special. Refer to &lt;RMK140JAVM's important points&gt; (on page ii) for the changes in contents.</p>
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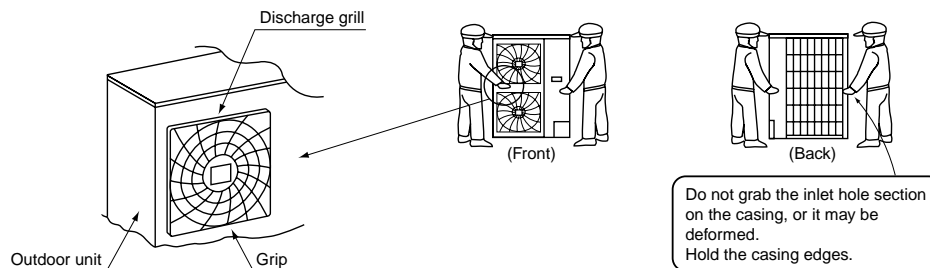
# 1. Installation

## 1.1 Outdoor Unit

### 1 INSTALLATION PROCEDURE

#### 1. Carrying-in

- Take care not to let your hands and other objects touch the rear fins. **⚠ WARNING**  
1. Carry in the equipment slowly, using the grips provided on the sides.



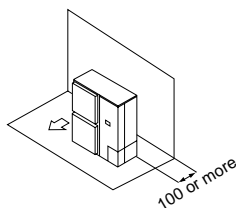
- Always use accessory parts or those of designated specification as parts required for installation.

#### 2. Installation service space

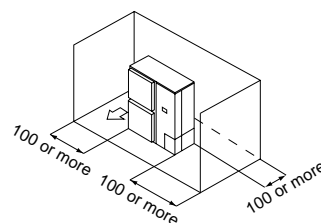
**\* The horizontal coupling and stacking are not allowed.**

##### (A) Where there is an obstacle on the suction side:

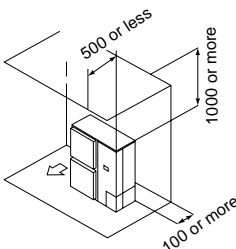
- No obstacle above
- Obstacle on the suction side only



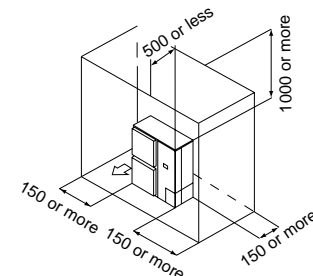
- Obstacle on both sides



- Obstacle above, too
- Obstacle on the suction side, too

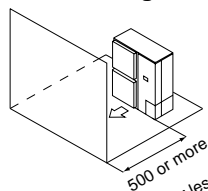


- Obstacle on the suction side, and both sides

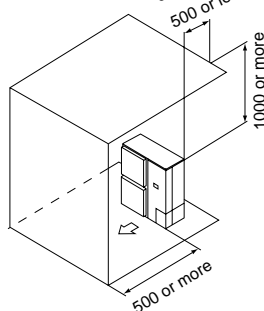


##### (B) Where there is an obstacle on the discharge side:

- No obstacle above

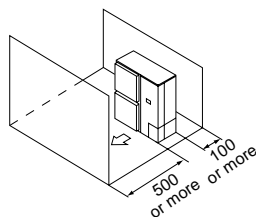


- Obstacle above, too



**(C) Where there are obstacles on both suction and discharge sides:****Pattern 1** Where the obstacles on the discharge side is higher than the unit:

- No obstacle above

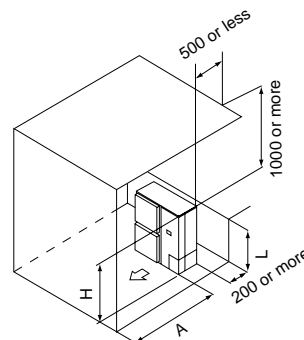


- Obstacle above, too

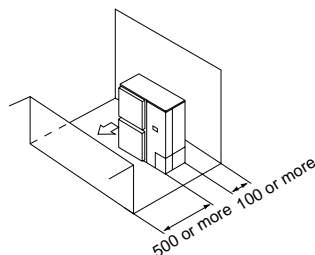
The relations between H, A and L are as follows:

	L	A
$L \leq H$	$0 < L \leq 1/2H$	750
	$1/2H < L$	1000
$H < L$	Set the stand as: $L \leq H$	

Close the bottom of the installation frame to prevent the discharged air from being bypassed.

**Pattern 2** Where the obstacle on the discharge side is lower than the unit:

- No obstacle above

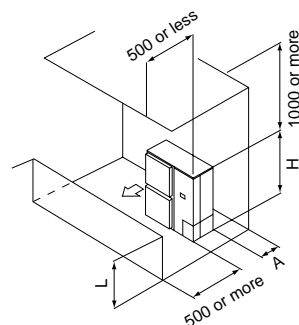
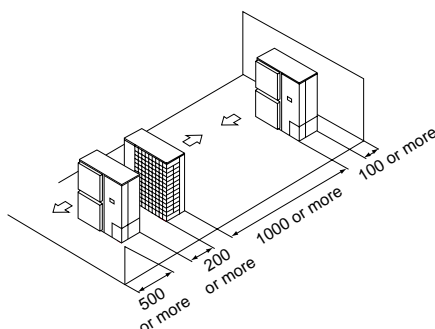


- Obstacle above, too

The relations between H, A and L are as follows:

	L	A
$L \leq H$	$0 < L \leq 1/2H$	100
	$1/2H < L$	200
$H < L$	Set the stand as: $L \leq H$	

Close the bottom of the installation frame to prevent the discharged air from being bypassed.

**(D) Multiple rows of series installation (on the rooftop, etc.)**

## 1.2 BP Unit

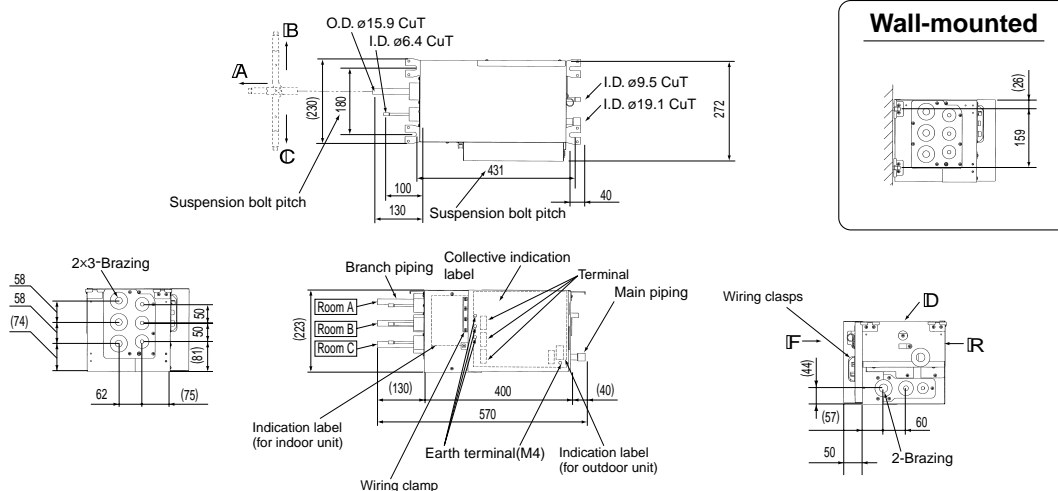
## 1

## INSTALLATION

- This unit may be installed suspended from the ceiling or mounted on the wall.
- **This unit may only be installed vertically, as shown in the diagram below.** (Side D is facing up.) However, it may be freely installed in any direction forward or back, and to the sides.
- Be sure to leave a **600mm square** opening for service and inspection as shown in the diagram below, for both ceiling-suspended installation and wall-mounted installation.
- This unit **"does not require drain treatment"** as it uses internal foam treatment as low-pressure piping insulation.
- This unit may be installed with sides F For R facing forward (servicing direction).
- The piping for the indoor unit may be freely led around in directions A, B, or C.
- The inclination of side D must be within  $\pm 5^{\circ}$  degrees forward or back or to the sides.

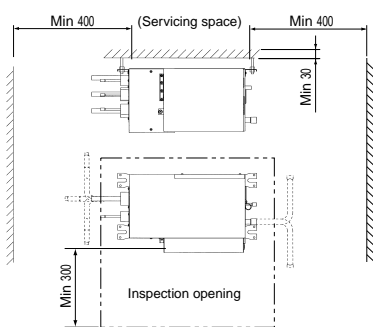
### Three-sided view

**Three-sided view**  
(product dimensions and attachment bolt pitch)



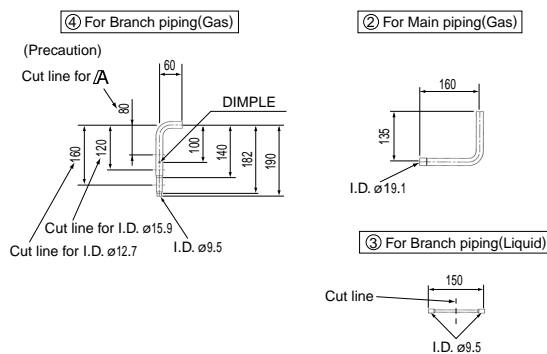
## Installation restrictions

(installation and service space)



Be sure to leave a 600mm square opening for service and maintenance.

## Standard accessories



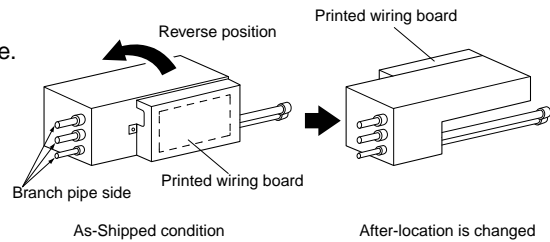
**(Precaution)** Cut the piping on the standard accessories to match the indoor unit's piping diameter.

## 2

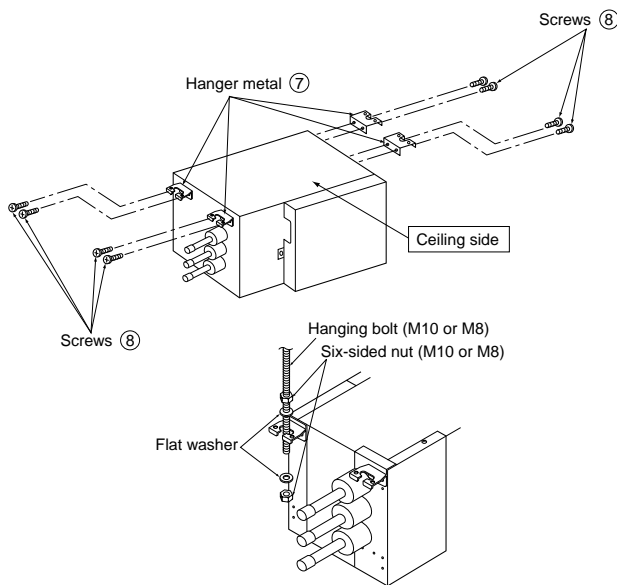
## INSTALLATION OF THE MAIN UNIT

## NOTES:

- This unit has two different installation types: (1) ceiling-suspended type and (2) wall-mounted type.
- Choose the proper installation pattern according to the location of installation.
- The installation location for printed wiring board can be changed. Follow the procedure specified in the "CONNECTING THE WIRING" section to change the location. (Refer to ★ mark)

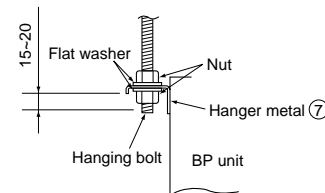


## (1) Ceiling-suspended type

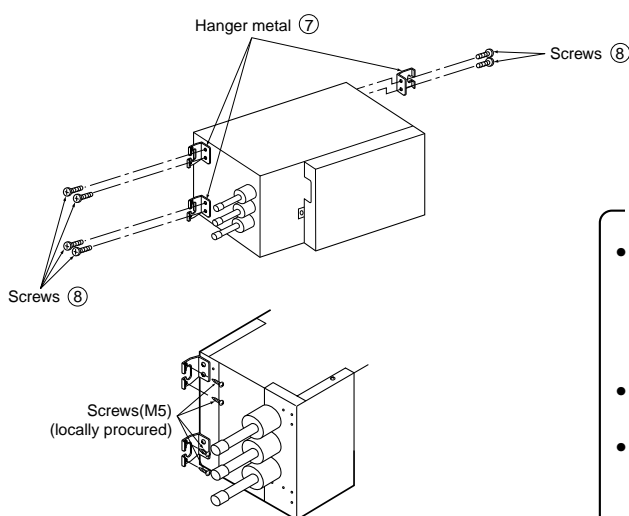


## Procedure

- (1) Fix the furnished hanger metal (7) with two screws (8). (4 locations in total)
  - (2) Using an insert-hole-in-anchor, hang the hanging bolt.
  - (3) Install a hexagon nut and a flat washer (locally-procured) to the hanging bolt as shown in the figure in the left, and lift the main unit to hang on the hanger metal.
  - (4) After checking with a level that the unit is level, tighten the hexagon nut.
- \*The tilt of the unit should be within  $\pm 5^\circ$  in front/back and left/right.



## (2) Wall-mounted type



## Procedure

- (1) Fix the furnished hanger metal (7) with two screws (8). (3 locations in total)
  - (2) After checking with a level that the unit is level, fix the unit with the furnished wood screws (7).
- \*The tilt of the unit should be within  $\pm 5^\circ$  in front/back and left/right.

## CAUTIONS:

- Once a screw-hole on the main unit has had a screw hammered in, make sure to either hammer it again or cover it with aluminum tape. (This is to prevent condensation.)
- Be sure to install the unit with the ceiling-side up.
- Do not install near bedrooms. The sound of refrigerant flowing through the piping may sometimes be audible.

## 2. Wiring

### 2.1 Outdoor Unit

#### 1 ELECTRIC WIRING CONNECTION

##### 1. Connection electric wire treatment (⚠CAUTION)

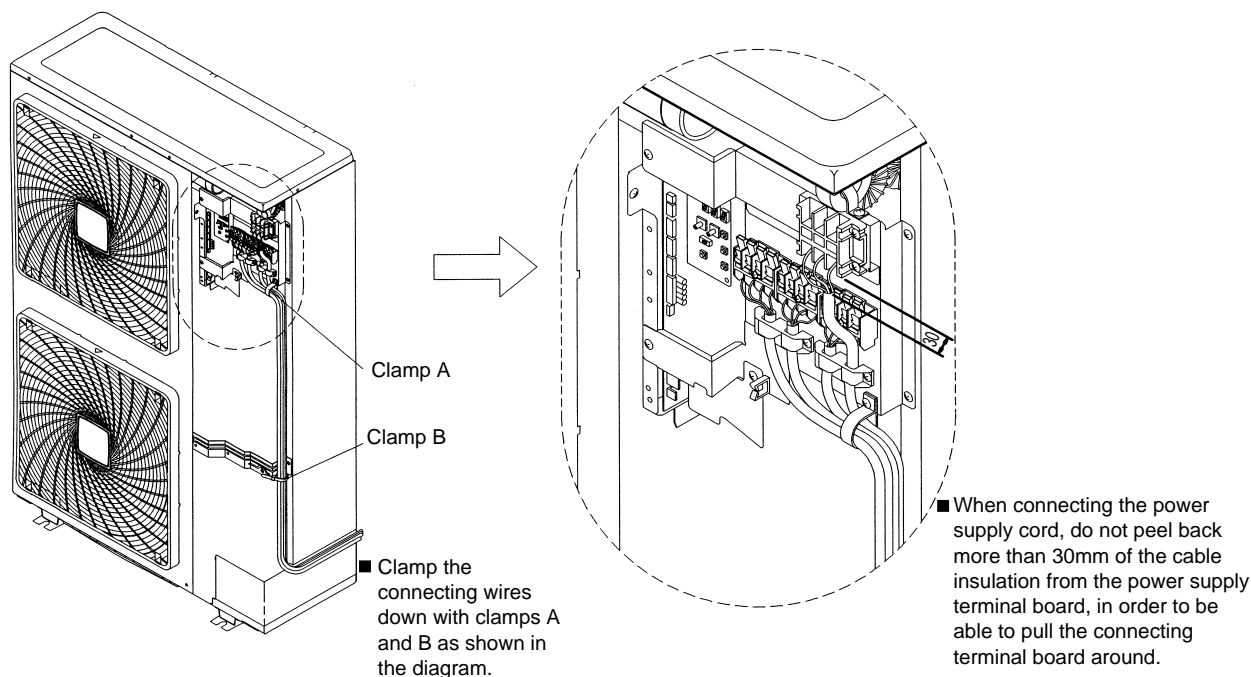
Following are the precautions for inter-unit wiring and power supply wiring.

**Be sure to install an earth leakage breaker and safety breaker.**

- Do not turn ON the safety breaker for the outdoor power supply before all the work is completed.
- Make sure that the wiring and the piping for each room have the same alphabetical code. (BP1, BP2, BP3)
- In double-outdoor-unit installation, be sure that the wirings are connected in the same outdoor-units as pipings are connected.
- On the inter-unit wiring, terminals of each line at the BP side and the outdoor side must have the same number.
- Tighten the terminal screws on the power supply terminal block securely.
- For power supply, be sure to use a dedicated power circuit.
- Fix wires securely over the sheathes with the clamp.
- Connect an earth wire to the earth screw.  
For earthing, follow applicable local standards for electrical installations.
- For inter-unit wiring, do not use a cut wire joined to another on the way. Use wires long enough to cover the entire length.

##### WARNING

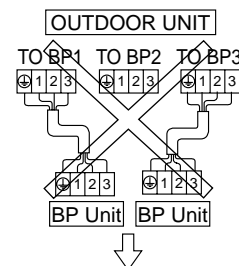
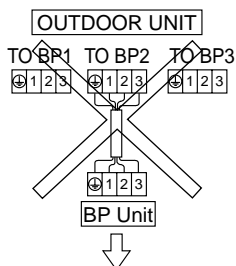
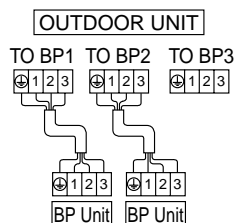
Do not use tapped wires, stand wires, extensioncords, or starbust connections, as they may cause overheating, electrical shock, or fire.



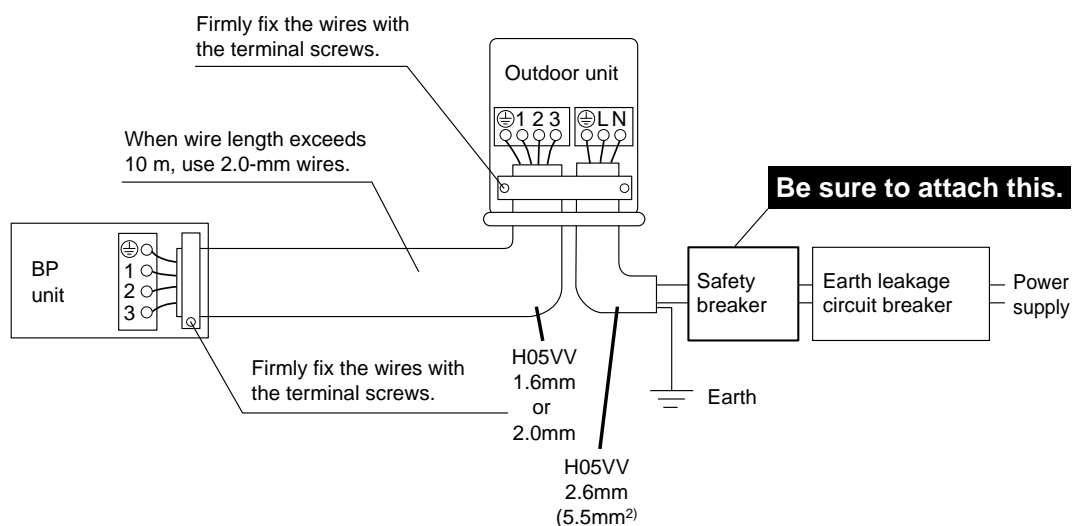
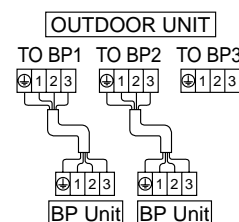
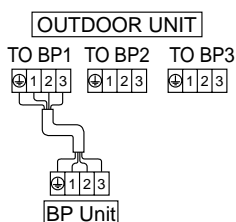
## 2. BP unit connection priority

When connecting to the BP unit, always start the connection with BP1 of the terminal board (at outdoor unit side) in the sequential order.

Improper connection will cause a transmission failure, preventing the operation.



**Make sure numbers  
1, 2, and 3 all match.**



## 2.2 BP Unit

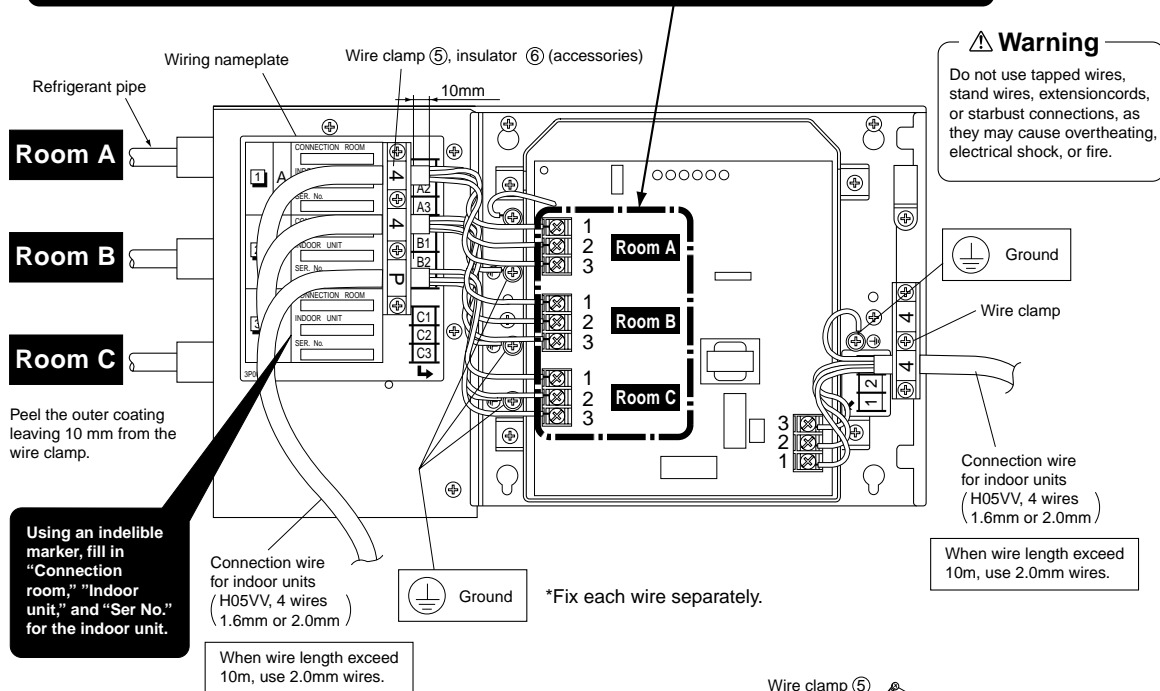
### 1

## CONNECTING THE WIRING

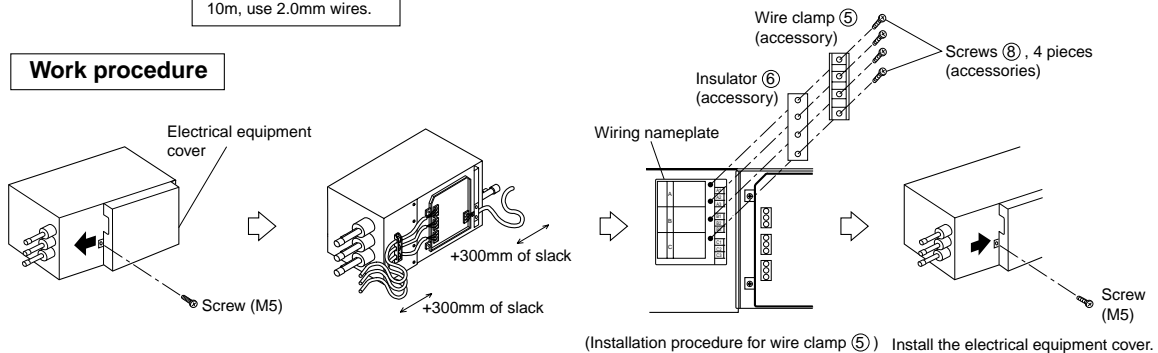
- Connect refrigerant pipes and connection wires to the appropriate ports marked with matching alphabets (A, B, and C) on this unit.
- Follow the instructions on the wiring nameplate to connect the connection wires of indoor/outdoor units to terminal board numbers. (1, 2 and 3) Always fix each ground wire separately with a ground screw. (See the figure below.)
- After completing the wiring, fix the outer coating of wires securely with wire clamps. The wire clamp on indoor unit side is furnished. Follow the procedure below to install.

#### NOTE:

The terminal board numbers are arranged from top to bottom in order of 1, 2, and 3.



#### Work procedure



(1) Remove the electrical cover. Loosen one of the screws, and slide the cover in the direction of the arrow.

(2) Perform wiring. Allow 300 mm for the pulling-out section of harness.

(3) After checking the wiring, fill in "Connection room," "Indoor unit," and "Ser No." of the indoor unit on the wiring nameplate.

(4) Fix the wires completely with wire clamps (2 locations).

(5) In reverse procedure of (1), slide the electrical equipment cover, and fix it with the screw.

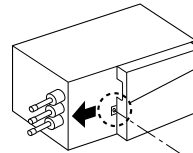
### ★ Procedure for changing the installation location of printed wiring board

If the installation location of printed wiring board needs to be changed because of the installation conditions, perform the following:

#### CAUTIONS:

- Do not turn ON the power until relocation and wiring is completed.
- When supplying power, it will automatically recognize the vertical orientation of the printed wiring board and change the terminal board for the indoor unit in order starting with A, B, and then C from above.

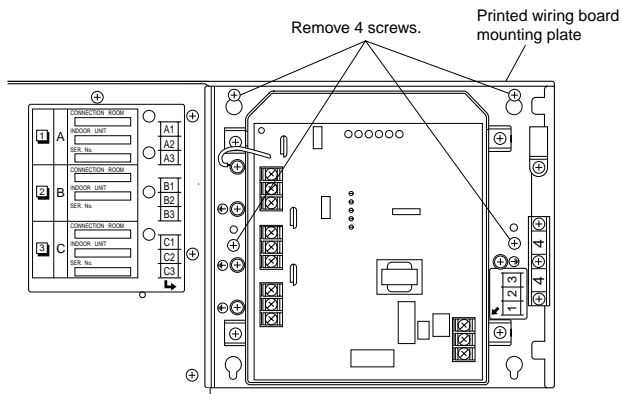
- (1) Remove the electrical equipment cover.  
Loosen the screw, and slide the cover in the direction indicated by the arrow.



Once a screw-hole on the main unit has had a screw hammered in, make sure to cover it with aluminum tape. (This is to prevent condensation.)

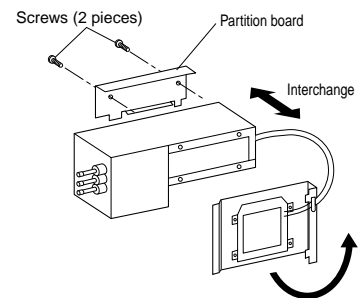
Screw (M5)

- (2) Loosen 4 screws shown in the figure on the below, remove the mounting plate of the printed wiring board.



- (3) Loosen and remove 2 screws fixed on the partition board in the opposite side.

- (4) Interchange the positions of the printed wiring board and partition board, and then fix them with screws.



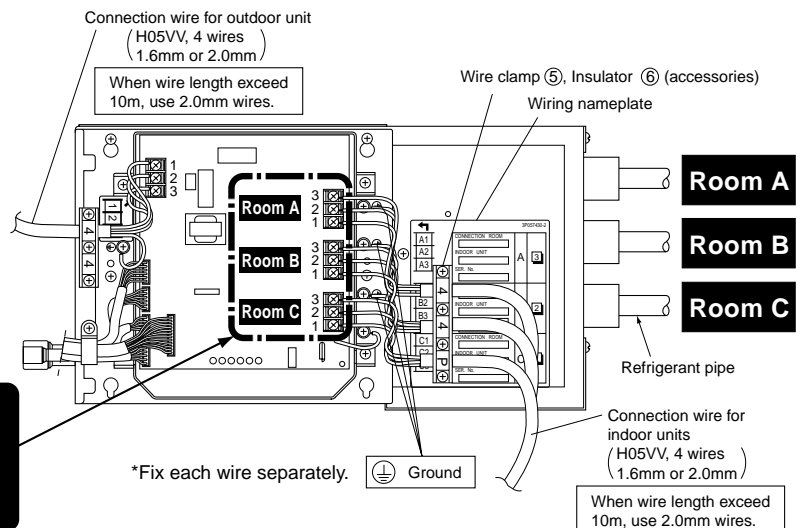
- (5) Follow the instruction on the wiring nameplate to connect the connection wires for indoor/outdoor units in accordance with the terminal board numbers.

#### Warning

Do not use tapped wires, stand wires, extensioncords, or starburst connections, as they may cause overheating, electrical shock, or fire.

#### NOTE:

The terminal board numbers are arranged from top to bottom in order of 3, 2, and 1.

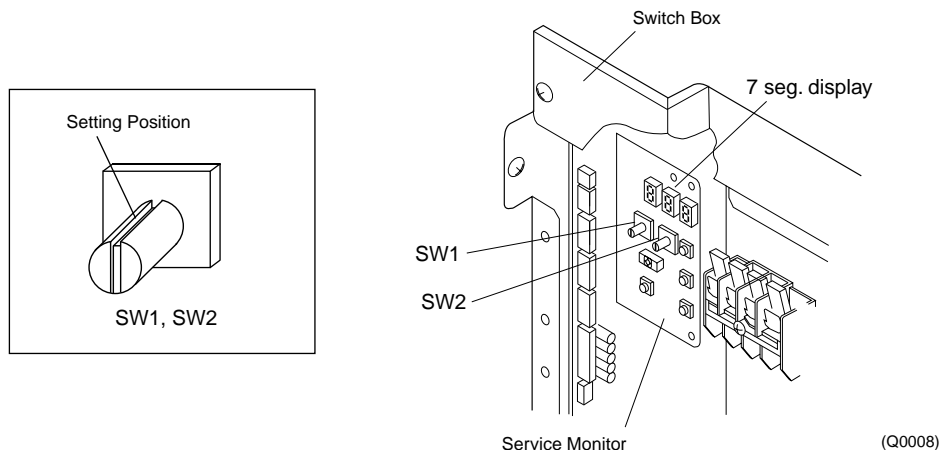


## Operating Test

Follow the "operating test" as described in the manual for installation that comes with outdoor unit.

1P058455B

## 2.3 Outdoor Unit Rotary Switch Setting



\* RAM View Monitor

RSW1	RSW2	Remarks	Unit
0	0	Latest (status) error code	Error code
0	1	Latest (status) error spot	Standard
0	2	Current run mode	Status
0	3	Current 4-way valve	Status
0	4	Current operating frequency (Hz)	Frequency
0	5	Current EVP	EV openness
0	6	Current EVG	EV openness
0	7	Current EVL	EV openness
0	8	Current fan (upper)	Fan rpm
0	9	Current fan (lower)	Fan rpm
1	0	Current input current	Ampere
1	1	Current total input current	Ampere
1	2	Current high pressure (calculated)	Pressure
1	3	Current suction pressure	Pressure
1	4	Current outdoor temperature	Temp. offset 40h
1	5	Current discharge temperature	Temperature
1	6	Current suction temperature	Temp. offset 40h
1	7	Current outdoor heat exchange temperature	Temp. offset 40h
1	8	Current outdoor fluid pipe temperature	Temp. offset 40h
1	9	Current fin temperature	Temperature
2	0	Current box temperature	Temp. offset 40h
2	1	Current BP 1 Room-A motorized valve openness	EV openness
2	2	Current BP 1 Room-B motorized valve openness	EV openness
2	3	Current BP 1 Room-C motorized valve openness	EV openness
2	4	Current BP 2 Room-A motorized valve openness	EV openness
2	5	Current BP 2 Room-B motorized valve openness	EV openness
2	6	Current BP 2 Room-C motorized valve openness	EV openness
2	7	Current BP 3 Room-A motorized valve openness	EV openness
2	8	Current BP 3 Room-B motorized valve openness	EV openness
2	9	Current BP 3 Room-C motorized valve openness	EV openness
3	0		
3	1	Current BP 1 Room-A fluid pipe temperature	Temp. offset 40h
3	2	Current BP 1 Room-B fluid pipe temperature	Temp. offset 40h
3	3	Current BP 1 Room-C fluid pipe temperature	Temp. offset 40h
3	4	Current BP 2 Room-A fluid pipe temperature	Temp. offset 40h
3	5	Current BP 2 Room-B fluid pipe temperature	Temp. offset 40h
3	6	Current BP 2 Room-C fluid pipe temperature	Temp. offset 40h
3	7	Current BP 3 Room-A fluid pipe temperature	Temp. offset 40h
3	8	Current BP 3 Room-B fluid pipe temperature	Temp. offset 40h
3	9	Current BP 3 Room-C fluid pipe temperature	Temp. offset 40h

RSW1	RSW2	Remarks	Unit
4	1	Current BP 1 Room-A gas pipe temperature	Temp. offset 40h
4	2	Current BP 1 Room-B gas pipe temperature	Temp. offset 40h
4	3	Current BP 1 Room-C gas pipe temperature	Temp. offset 40h
4	4	Current BP 2 Room-A gas pipe temperature	Temp. offset 40h
4	5	Current BP 2 Room-B gas pipe temperature	Temp. offset 40h
4	6	Current BP 2 Room-C gas pipe temperature	Temp. offset 40h
4	7	Current BP 3 Room-A gas pipe temperature	Temp. offset 40h
4	8	Current BP 3 Room-B gas pipe temperature	Temp. offset 40h
4	9	Current BP 3 Room-C gas pipe temperature	Temp. offset 40h
5	0		
5	1	Current BP 1 Room-A indoor temperature	Temp. offset 40h
5	2	Current BP 1 Room-B indoor temperature	Temp. offset 40h
5	3	Current BP 1 Room-C indoor temperature	Temp. offset 40h
5	4	Current BP 2 Room-A indoor temperature	Temp. offset 40h
5	5	Current BP 2 Room-B indoor temperature	Temp. offset 40h
5	6	Current BP 2 Room-C indoor temperature	Temp. offset 40h
5	7	Current BP 3 Room-A indoor temperature	Temp. offset 40h
5	8	Current BP 3 Room-B indoor temperature	Temp. offset 40h
5	9	Current BP 3 Room-C indoor temperature	Temp. offset 40h
6	0		
6	1	Current BP 1 Room-A heat exchange temperature	Temp. offset 40h
6	2	Current BP 1 Room-B heat exchange temperature	Temp. offset 40h
6	3	Current BP 1 Room-C heat exchange temperature	Temp. offset 40h
6	4	Current BP 2 Room-A heat exchange temperature	Temp. offset 40h
6	5	Current BP 2 Room-B heat exchange temperature	Temp. offset 40h
6	6	Current BP 2 Room-C heat exchange temperature	Temp. offset 40h
6	7	Current BP 3 Room-A heat exchange temperature	Temp. offset 40h
6	8	Current BP 3 Room-B heat exchange temperature	Temp. offset 40h
6	9	Current BP 3 Room-C heat exchange temperature	Temp. offset 40h
7	0		
7	1	Current BP 1 Room-A $\Delta D$ signal	$\Delta D$ signal
7	2	Current BP 1 Room-B $\Delta D$ signal	$\Delta D$ signal
7	3	Current BP 1 Room-C $\Delta D$ signal	$\Delta D$ signal
7	4	Current BP 2 Room-A $\Delta D$ signal	$\Delta D$ signal
7	5	Current BP 2 Room-B $\Delta D$ signal	$\Delta D$ signal
7	6	Current BP 2 Room-C $\Delta D$ signal	$\Delta D$ signal
7	7	Current BP 3 Room-A $\Delta D$ signal	$\Delta D$ signal
7	8	Current BP 3 Room-B $\Delta D$ signal	$\Delta D$ signal
7	9	Current BP 3 Room-C $\Delta D$ signal	$\Delta D$ signal
8	0		
8	1	Gas short error counter (NGAS)	Counter
8	2	Discharge pipe temperature error counter (NOT)	Counter
8	3	HPS action counter (NHPS)	Counter
8	4	Upper fan lock error counter (NF1LOCK)	Counter
8	5	Upper fan OCP error counter (NF1OCP)	Counter
8	6	Lower fan lock error counter (NF2LOCK)	Counter
8	7	Lower fan OCP error counter (NF2OCP)	Counter
8	8	Supply voltage line error counter (NDC)	Counter
8	9	Output current line electronic thermal anti-stall counter (NTH)	Counter
9	0	Electronic thermal anti-stall counter with position detection waveform (NST)	Counter
9	1	Box temperature rise counter (NBOX)	Counter
9	2	Radiation fin temperature rise counter (NFIN)	Counter
9	3	Compressor lock counter (NCOMP)	Counter
9	4	AC current sensor line error counter (NCT)	Counter
9	5	Total input over-current error counter (NIINT)	Counter
9	6	INV input over-current error counter (NIINV)	Counter
9	7	Anti-freeze action counter (NTOU)	Counter
9	8	Peak cut action counter (NPC)	Counter
9	9	BP indoor anti-freeze error counter (NCOLD HU)	Counter

## 3. Others

### 3.1 Explanation for FTK(X)25/35J Series

#### 3.1.1 Test Run from the Remote Controller (For Heat Pump Model Only)

##### Trial Operation and Testing

1. Measure the supply voltage and make sure that it falls in the specified range.
2. Trial operation should be carried out in either cooling or heating mode.

##### For Heat pump

In cooling mode, select the lowest programmable temperature; in heating mode, select the highest programmable temperature.

- Trial operation may be disabled in either mode depending on the room temperature.
- After trial operation is complete, set the temperature to a normal level (26°C to 28°C in cooling mode, 20°C to 24°C in heating mode).
- For protection, the system disables restart operation for 3 minutes after it is turned off.

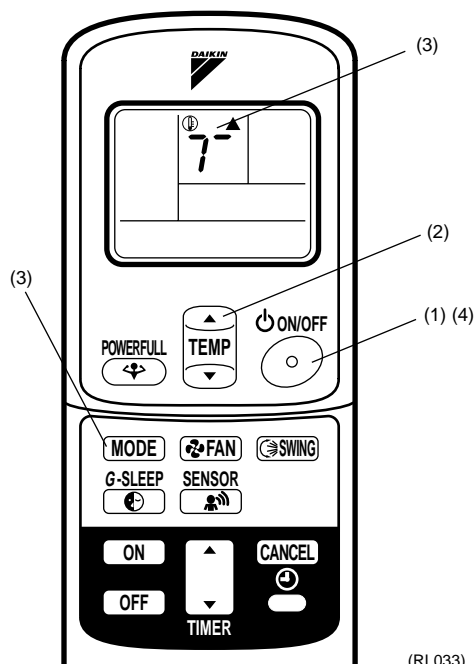
##### For Cooling operation in case of low ambient temperature

Select the lowest programmable temperature.

- Trial operation in cooling mode may be disabled depending on the room temperature. Use the remote control for trial operation as described below.

##### Trial operation from Remote Controller

- (1) Press ON/OFF button to turn on the system.
  - (2) Simultaneously press center of TEMP button and MODE buttons.
  - (3) Press MODE button twice.  
(“T” will appear on the display to indicate that Trial Operation mode is selected.)
  - (4) Trial run mode terminates in approx. 15 minutes and switches into normal mode. To quit a trial operation, press ON/OFF button.
- After trial operation is complete, set the temperature to a normal level (26°C to 28°C).
  - For protection, the machine disables restart operation for 3 minutes after it is turned off.
3. Carry out the test operation in accordance with the Operation Manual to ensure that all functions and parts, such as louver movement, are working properly.
- The air conditioner requires a small amount of power in its standby mode. If the system is not to be used for some time after installation, shut off the circuit breaker to eliminate unnecessary power consumption.
  - If the circuit breaker trips to shut off the power to the air conditioner, the system will restore the original operation mode when the circuit breaker is opened again.



(RL033)

### 3.1.2 Method of Operating Air Conditioners Individually (When Two Units are Installed in One Room) For Cooling Only and Heat Pump Model

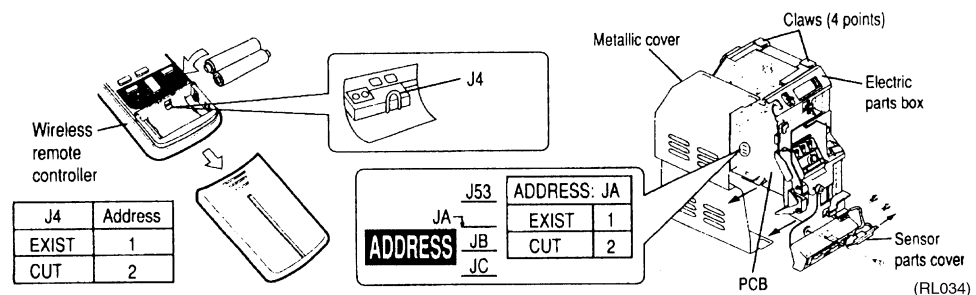
- **How to set the different addresses.**
- When two indoor units are installed in one room, the two wireless remote controllers can be set for different addresses.

#### PCB in the indoor unit

- Remove the front panel.
- Remove the sensor parts cover (2-screws), then remove the electric parts box (1-screw).
- Slide the metallic cover to remove it. (4-claws on the electric parts box.)
- Cut the jumper JA on PCB.

#### Wireless remote controller

- Cut the jumper J4.



### 3.1.3 Centralized Control (For KRC72, KRP413A1S)

For an explanation on usage, see the option handbook. However, do the following when using the KRP413A1S (Contact connection centralized control PC board).

Cut jumper JC on the indoor PC Bord.

(ML112)



**Note :** The power failure recovery function is controlled by the ON signal from the centralized control PC Board. The following may occur if the unit is used without cutting jumper JC.

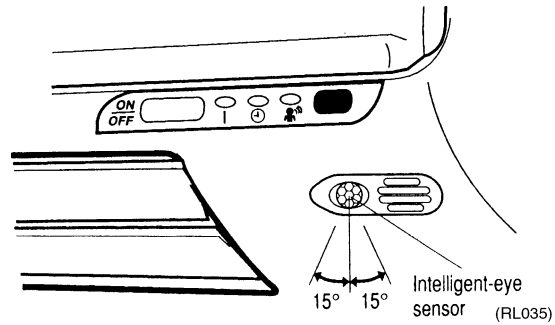
- If the unit was running when a power failure occurred, it may not resume operation after recovering from a power failure.

### 3.1.4 Dry Keep Change-over Switch (All Indoor Models) For Cooling Only and Heat Pump Model

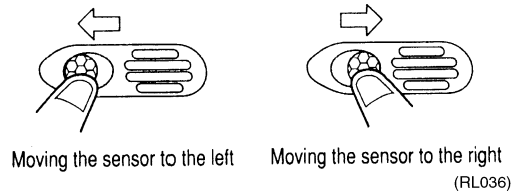
Jumper (On indoor PC Board)	Function	When connected (factory set)	When cut
JC	Power failure recovery function	Auto start	Unit does not resume operation after recovering from a power failure. Timer ON-OFF settings are cleared.
JB	Fan speed setting when compressor is OFF on thermostat.	Fan speed setting ; Remote controller setting	Fan rpm is set to "0" <Fan stop>

### 3.1.5 Adjusting the Angle of the Intelligent-eye Sensor

- Once installation of the indoor unit is complete, adjust the angle of the Intelligent-eye sensor to ensure the detection area properly covers the room.  
(Adjustable angle : 15° to right and left of center)



- Gently push and slide the sensor to adjust the angle. Aim so that the sensor is pointing to the center of the room, or to the part of the room that is most frequently used.



- After adjusting the angle, gently wipe the sensor with a clean cloth, being careful not to scratch the sensor.



#### Caution

- Do not hit or violently push the Intelligent-eye sensor. This can lead to damage and malfunction.
- Do not place large objects near the sensor. Also keep heating units or humidifiers outside the sensor's detection area.

## 3.2 Explanation for FTK(X)50/60H and CDK(X)25~60H Series

### 3.2.1 Test Run from the Remote Controller (For Heat Pump Model Only)

This program is to test the air conditioner independent from the room temperature and the temperature setting (i.e. as the thermostat of the indoor unit is bridged).

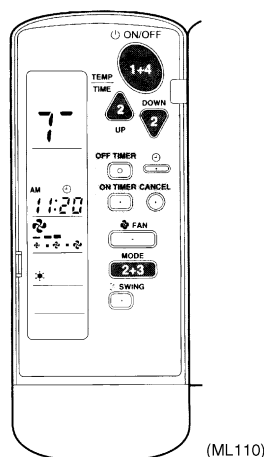
Carry out the test operation in accordance with the operation manual to ensure that all functions and parts, such as louvre movement, are working properly.

Using the remote controller for trial operation

1. Press the ON/OFF button to turn on the system.
2. Simultaneously press DOWN, UP and MODE buttons.
3. Press the MODE button twice. ("7" appears on the display to indicate that the trial operation mode is selected.)
4. Trial run mode terminates in approximately 30 minutes and switches into normal mode. To quit a trial operation, press the ON/OFF button.



**Note:** The air conditioner requires a small amount of power in stand-by mode. If the system is not to be used for some time after installation, shut off the circuit breaker to eliminate unnecessary power consumption.

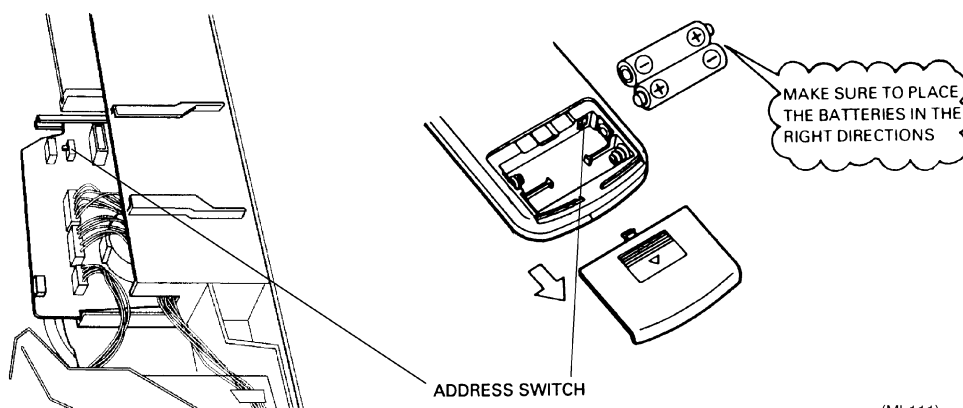


(ML110)

### 3.2.2 Method of Operating Air Conditioners Individually (When Two Units are Installed in One Room) for Cooling Only and Heat Pump Model

Either of the units (including wireless remote controller) needs to be set as follows.

Setting of address switch on wireless remote controller	[1] → [2] [1] : Before delivery
Address switch in door PCB1	[1] → [2]



(ML111)

### 3.2.3 Centralized Control (For KRC72, KRP411A1S and KRP410A11S)

For an explanation on usage, see the option handbook. However, do the following when using the KRP410A11S (Contact connection centralized control PC board).

Cut jumper JC on the indoor PC Bord.

(ML112)



**Note :** The power failure recovery function is controlled by the ON signal from the centralized control PC Board. The following may occur if the unit is used without cutting jumper JC.

- If the unit was running when a power failure occurred, it may not resume operation after recovering from a power failure.

### 3.2.4 Dry Keep Change-over Switch (All Indoor Models) For Cooling Only and Heat Pump Model

Jumper (On indoor PC Board)	Function	When connected (factory set)	When cut
JC	Power failure recovery function	Auto start	Unit does not resume operation after recovering from a power failure. Timer ON-OFF settings are cleared.
JB	Fan speed setting when compressor is OFF on thermostat.	Fan speed setting ; Remote controller setting	Fan rpm is set to "0" <Fan stop>

# Part 12

## Appendix

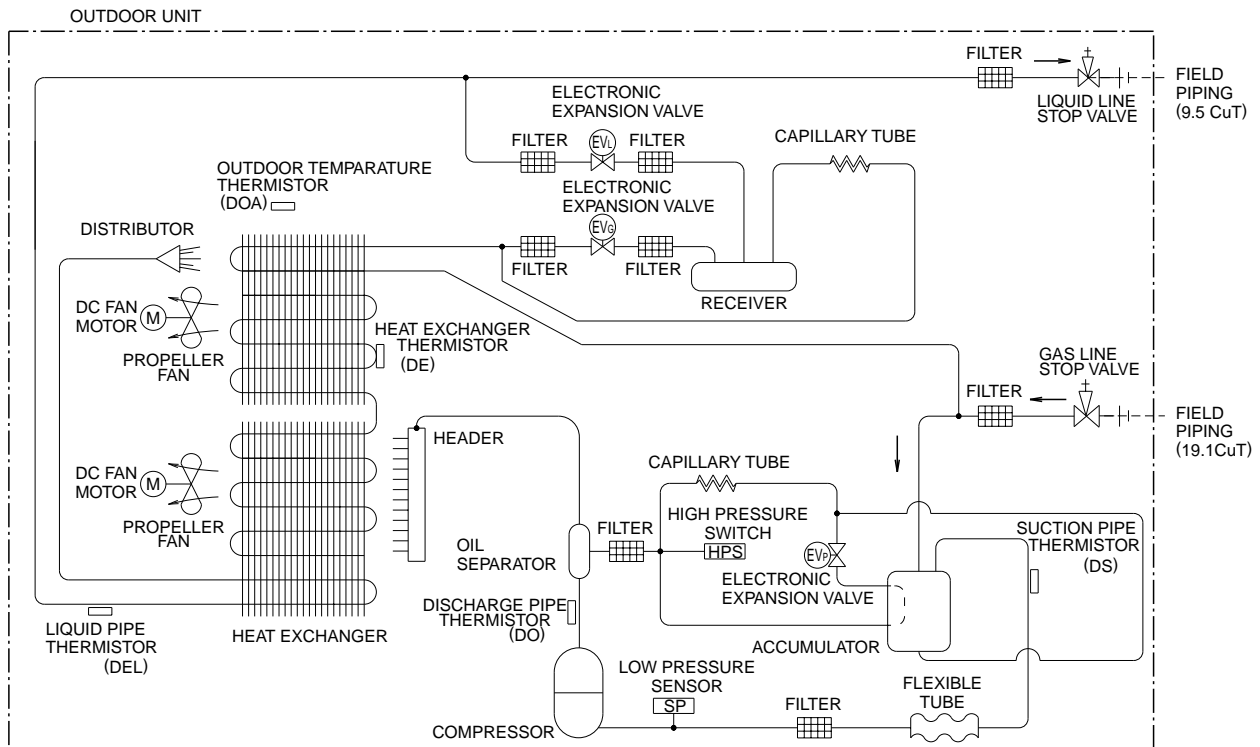
1. Piping Diagrams.....	360
1.1 Outdoor Units .....	360
1.2 BP Units .....	362
1.3 Indoor Units .....	363
2. Wiring Diagrams.....	370
2.1 Outdoor Units .....	370
2.2 BP Units .....	374
2.3 Indoor Units .....	375

The RMK140JAVM specifications are special. Refer to <RMK140JAVM's important points> (on page ii) for the changes in contents.

# 1. Piping Diagrams

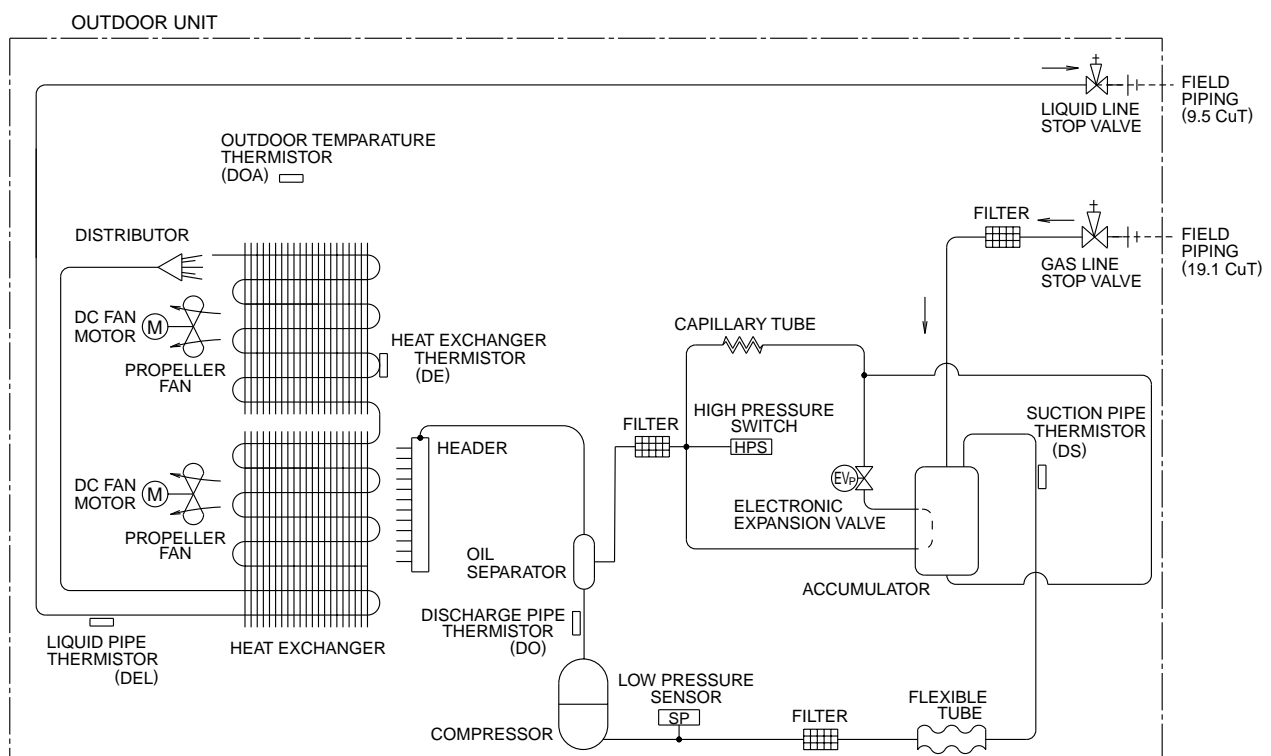
## 1.1 Outdoor Units

### RMK140JVMC9 (8) / RMK140JVMT9 / RMK140JZVMA

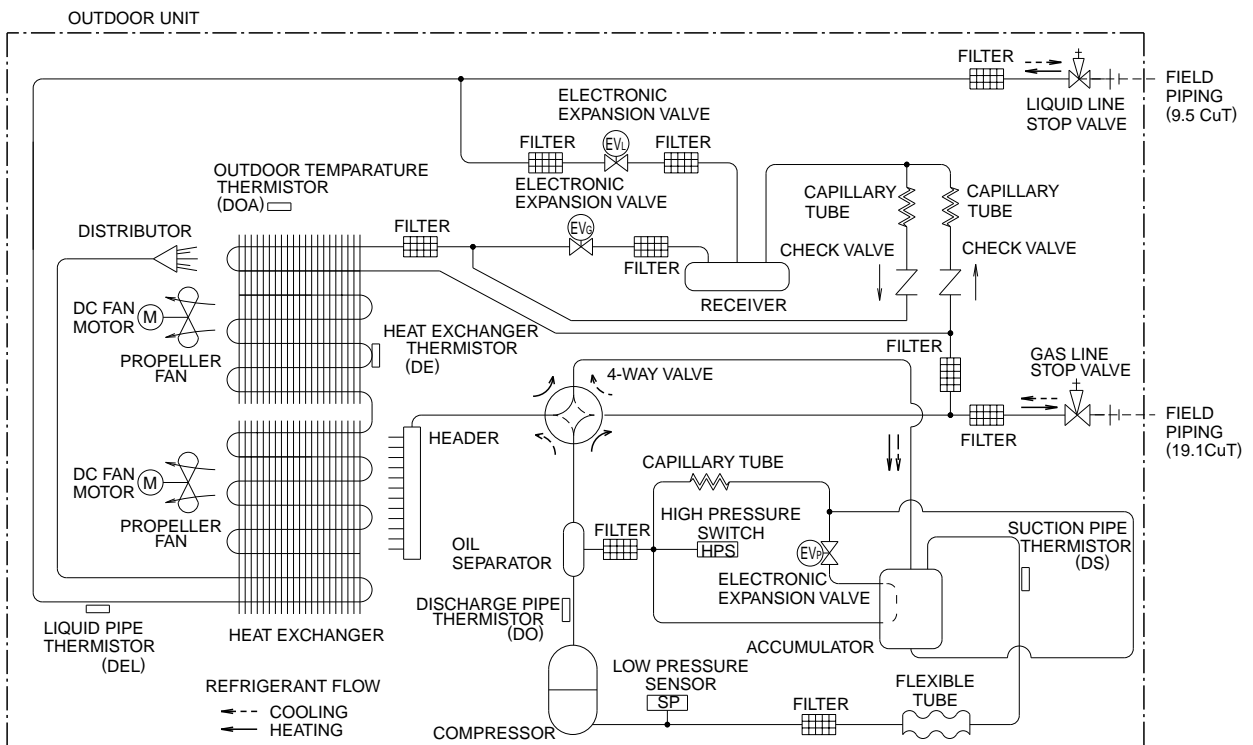


3D024921B

### RMK140JAVM



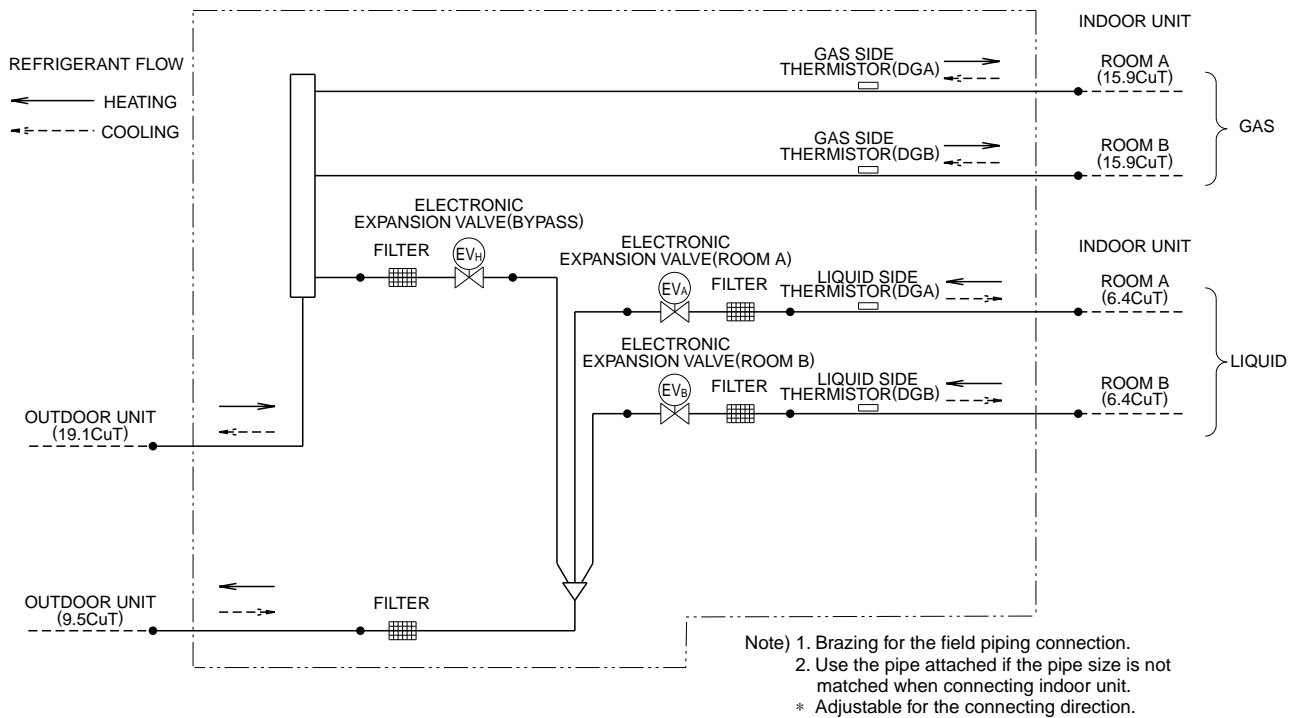
3D032153A

**RMX140JVMC9 (8) / RMX140JVMT9 / RMX140JVMB / RMX140JZVMB**


3D024920C

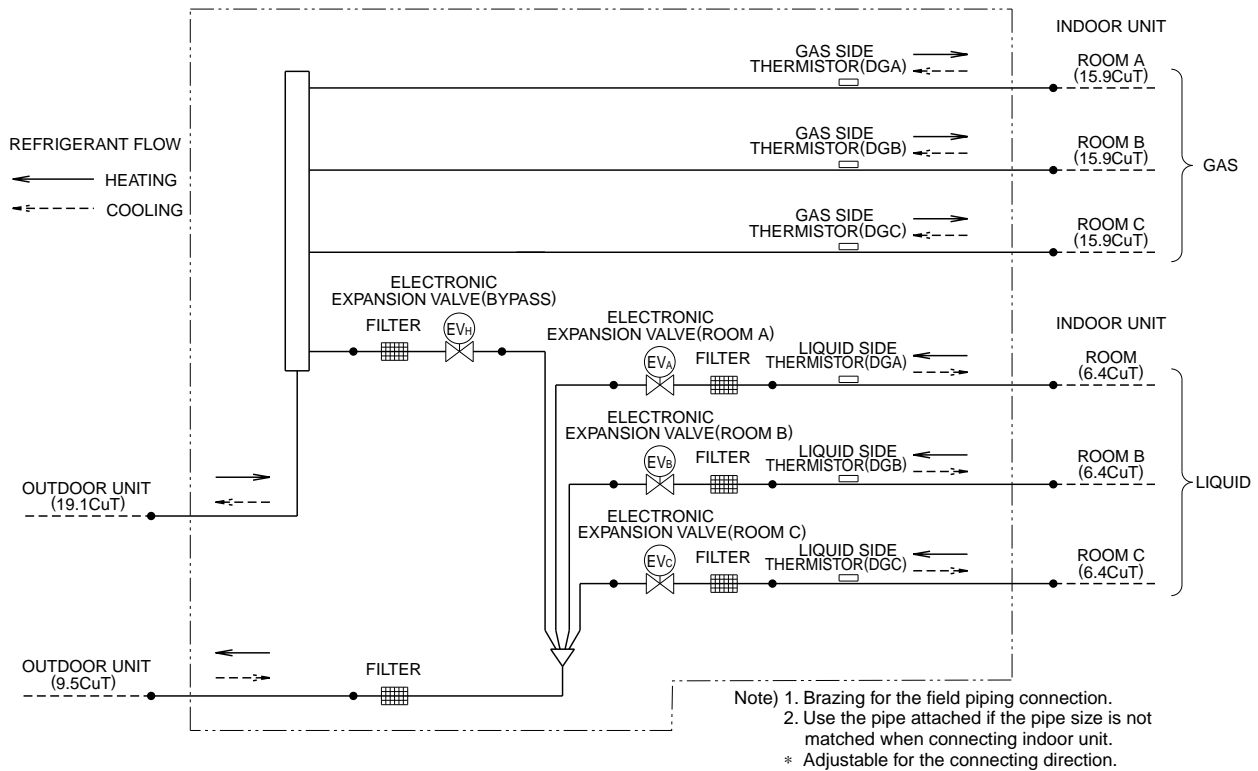
## 1.2 BP Units

### BPMK928B42



C : 3D024825A

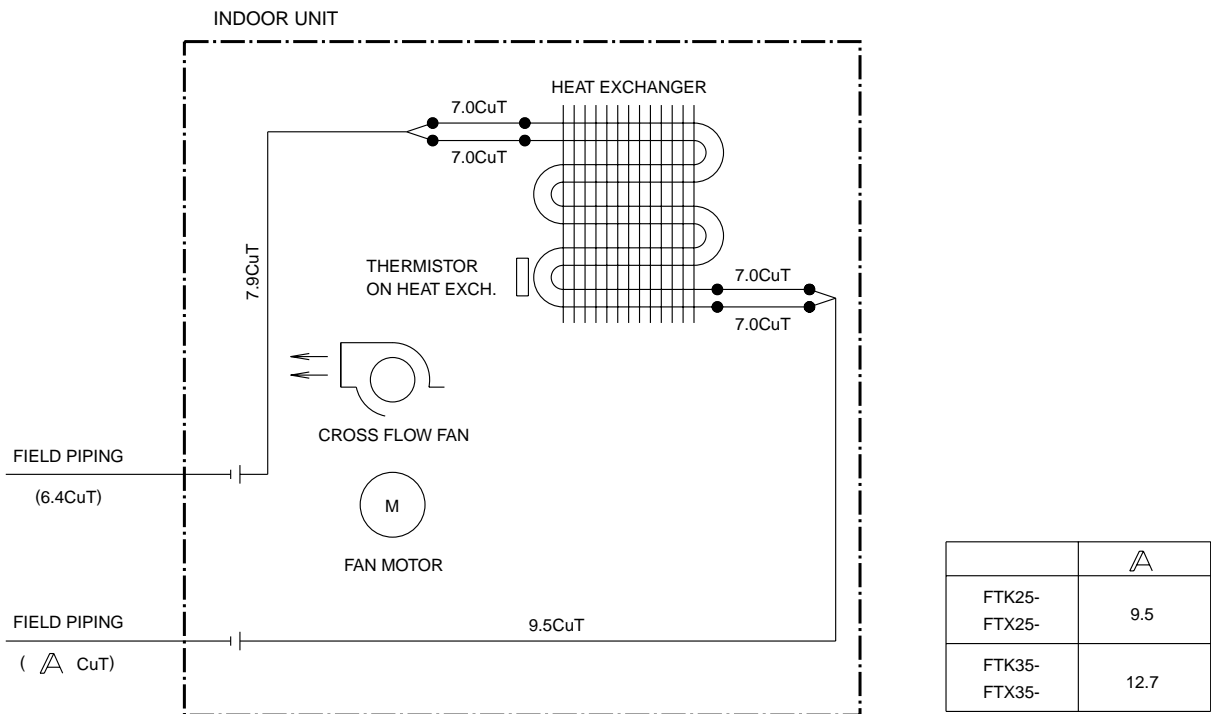
### BPMK928B43



C : 3D024824A

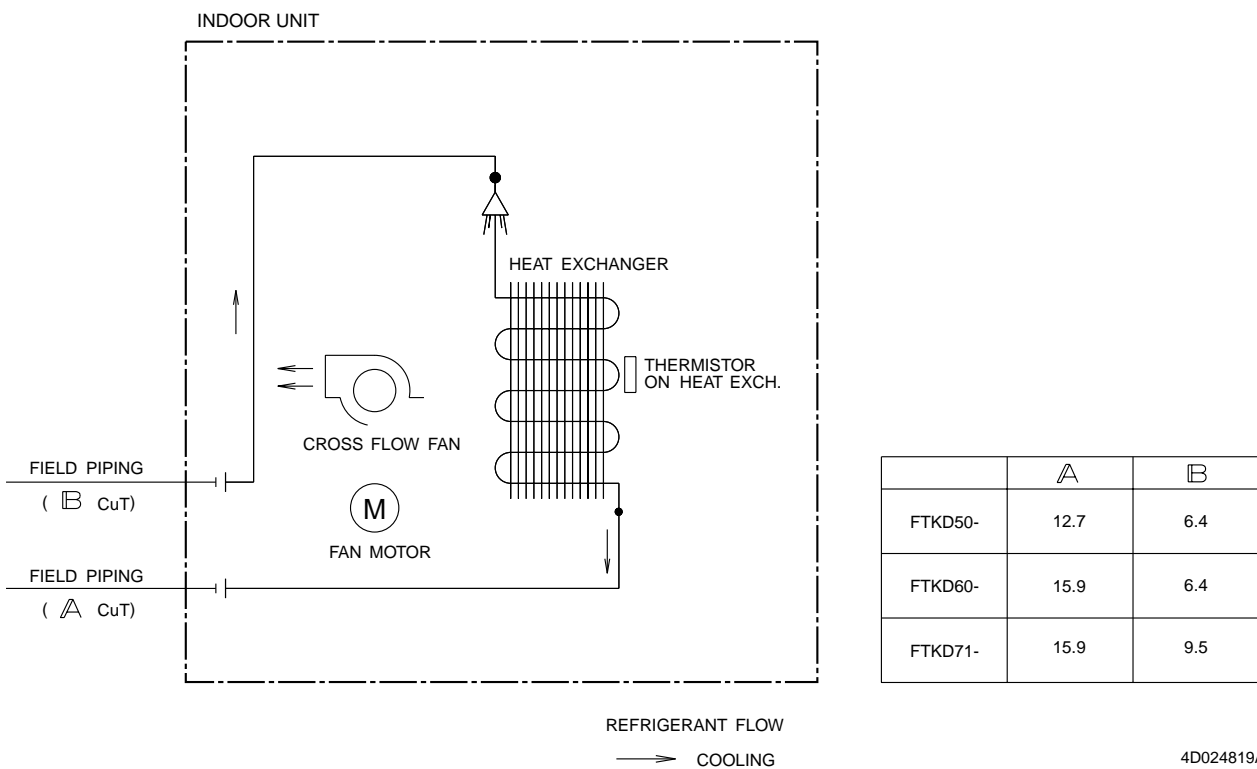
### 1.3 Indoor Units

FTK25 / 35JVE (A) 9, FTX25 / 35JVEA9, FTK25 / 35JVEC, FTX25 / 35JVEC,  
FTK25 / 35JAVET, FTX25 / 35JAVET, FTX25 / 35JAV1NB



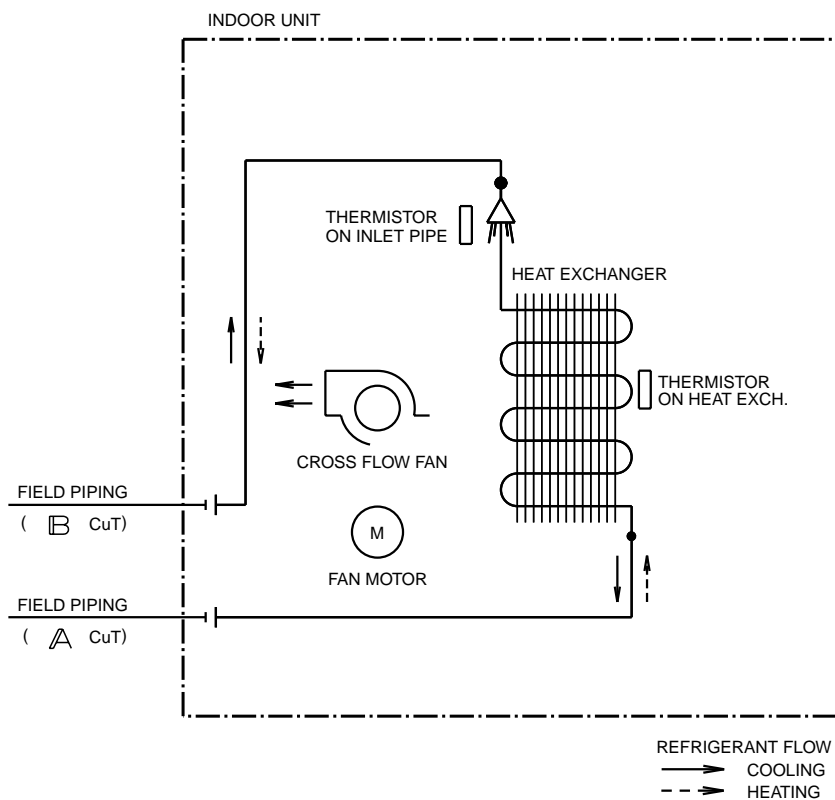
4D019960D

FTKD50 / 60 / 71JVE (A) (9) , FTKD50 / 60 / 71JVET



4D024819A

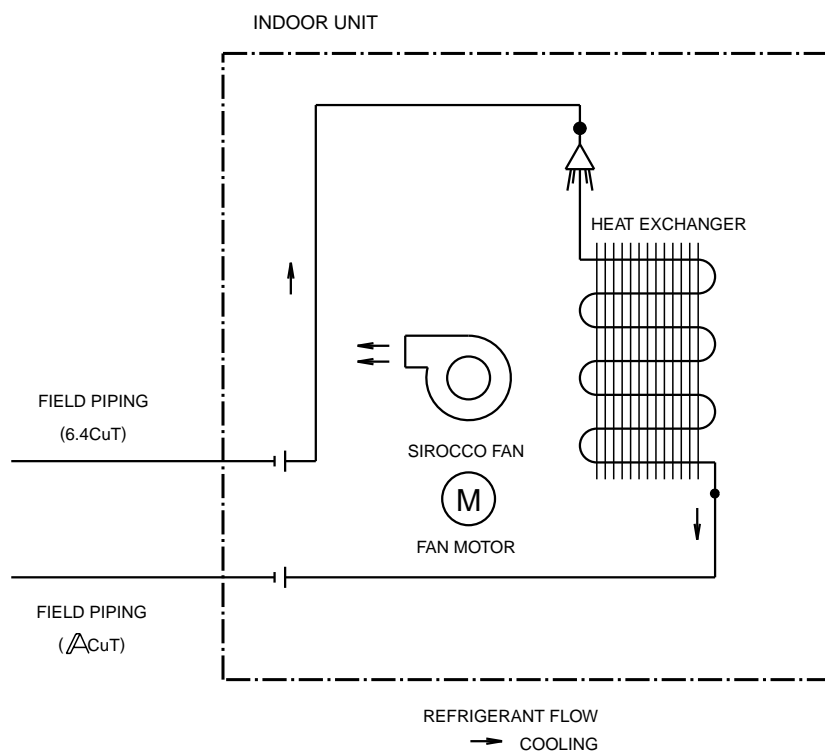
## FTXD50 / 60 / 71JVEA (9) , FTXD50 / 60 / 71JVET, FTXD50 / 60 / 71JV1B



	A	B
FTXD50-	12.7	6.4
FTXD60-	15.9	6.4
FTXD71-	15.9	9.5

4D024820A

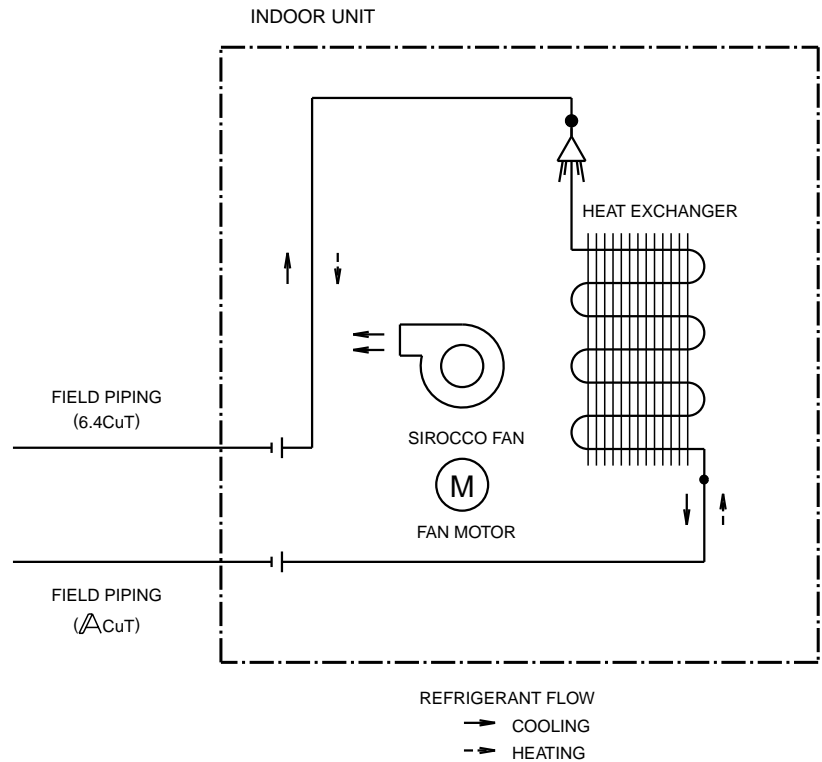
## CDK25 / 35 / 50 / 60HAVE (A) , CDK25 / 35 / 50 / 60HAVEC, CDK25 / 35 / 50 / 60HAVET



	A
CDK25-	9.5
CDK35,50-	12.7
CDK60-	15.9

4D024748

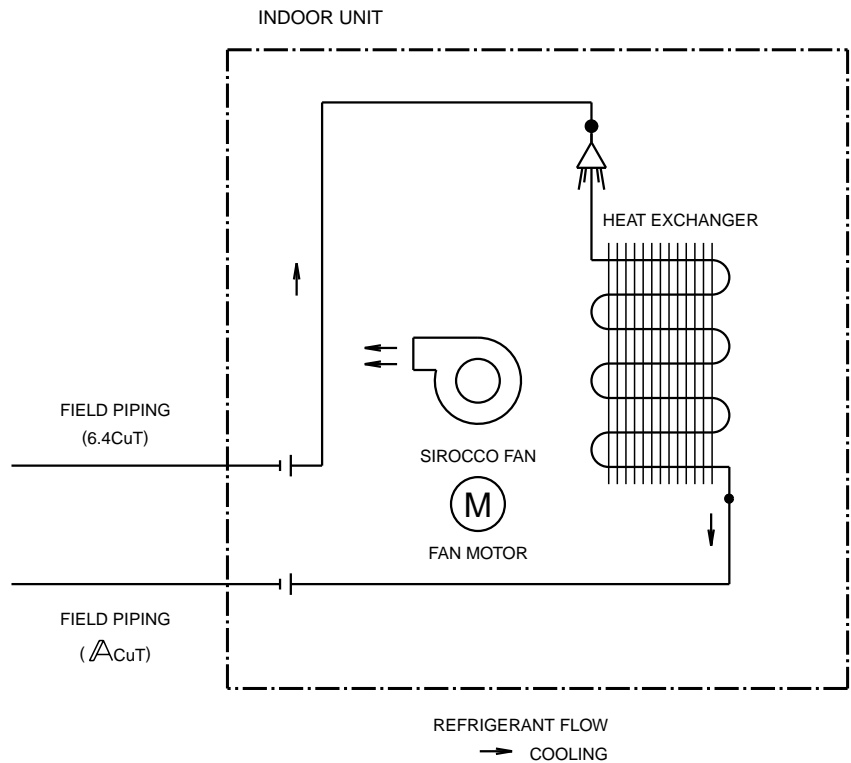
CDX25 / 35 / 50 / 60HAVEA, CDX25 / 35 / 50 / 60HAVEC, CDX25 / 35 / 50 / 60HAV1NB,  
CDX25 / 35 / 50 / 60JV1NB, CDX 25 / 35JVEC



	A
CDX25-	9.5
CDX35,50-	12.7
CDX60-	15.9

4D024749

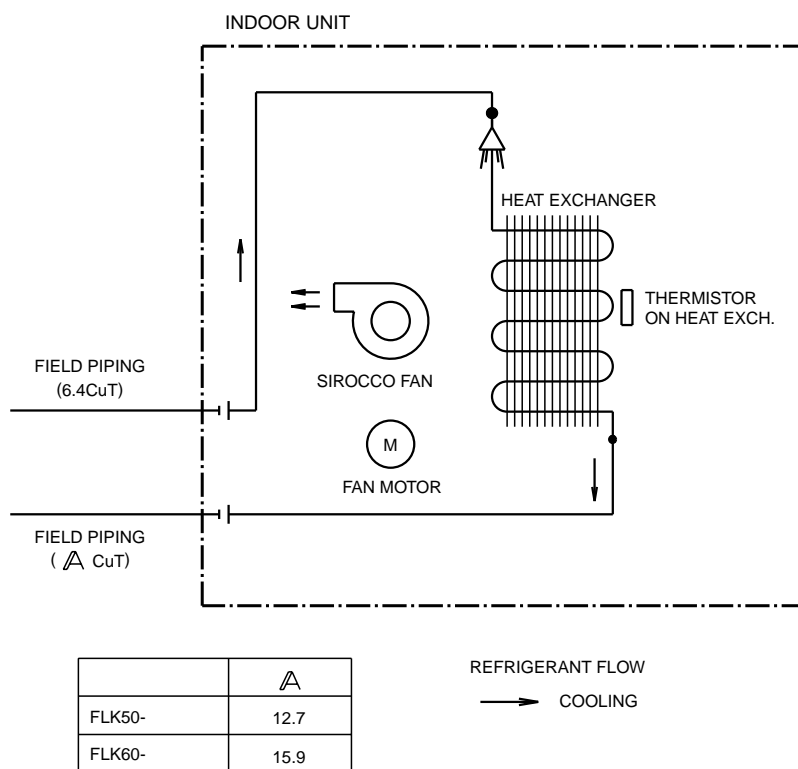
FLK25 / 35 / 50 / 60HVE (A) , FLK25 / 35 / 50 / 60HVEC, FLK25 / 35 / 50 / 60HVET



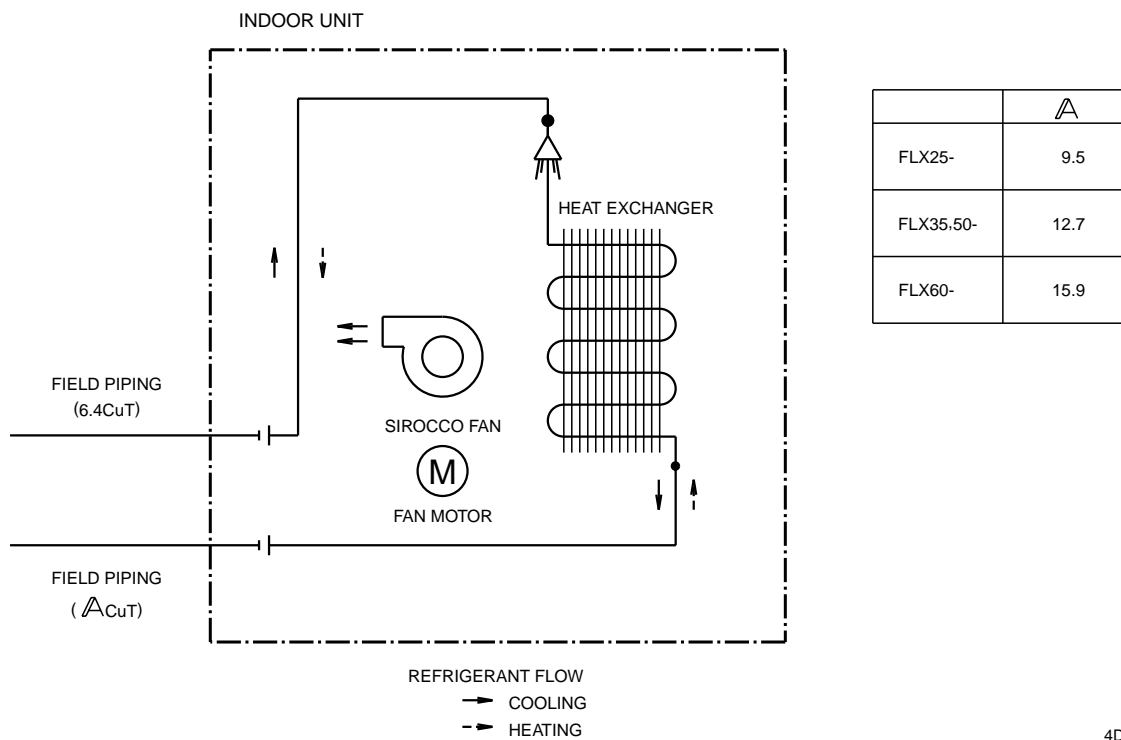
	A
FLK25-	9.5
FLK35,50-	12.7
FLK60-	15.9

4D024774

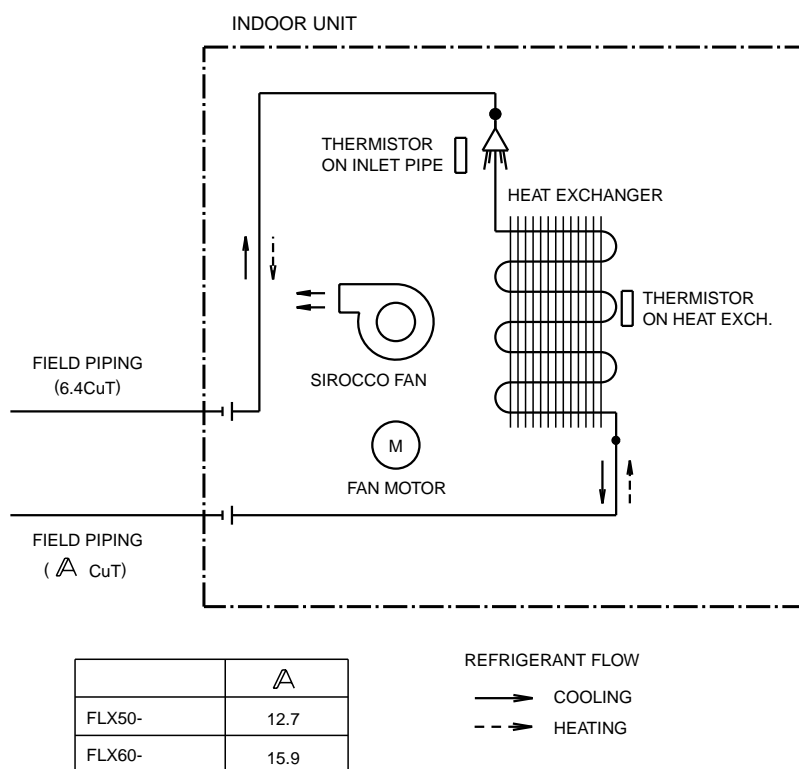
## FLK50 / 60JVEA (9)



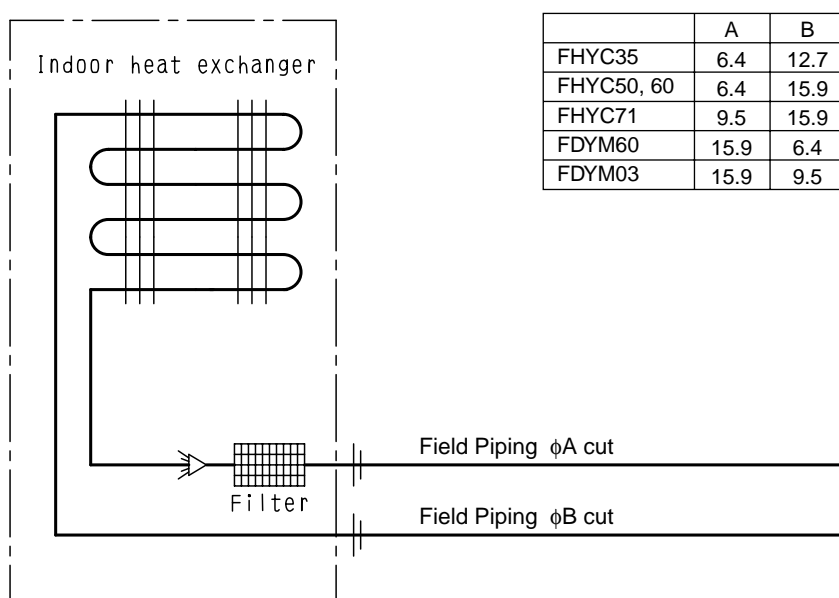
4D024818A

FLX25 / 35HVEA , FLX25 / 35 / 50 / 60HVEC, FLX25 / 35 / 50 / 60HVET,  
FLX25 / 35HV1NB

4D024775

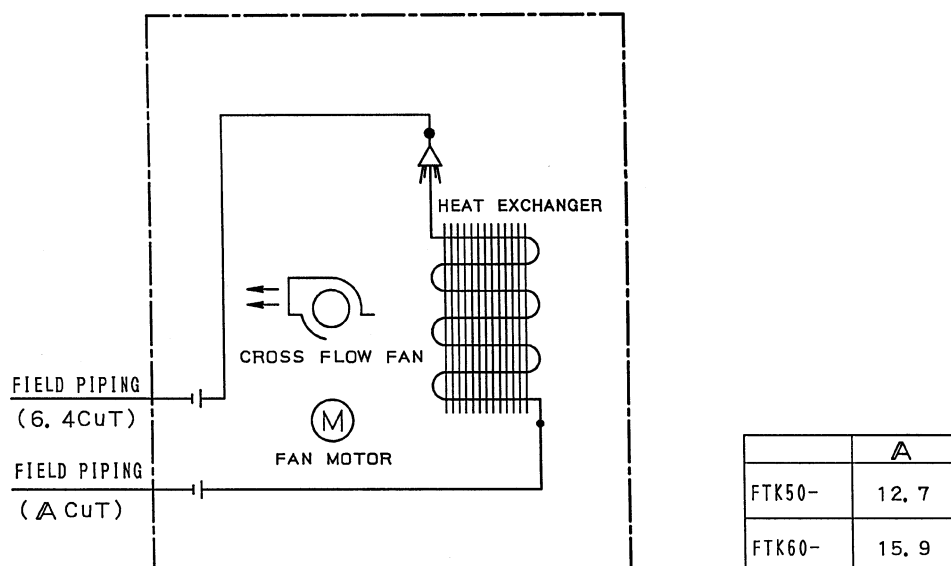
**FLX50 / 60JVEA (9) , FLX50 / 60JV1B**


4D024817A

**FHYC35 / 50 / 60 / 71KVE9, FHYC35 / 50 / 60 / 71KV1C9, FDYM60 / 03FAV1 (C) , FDYM60 / 03FAVAL**


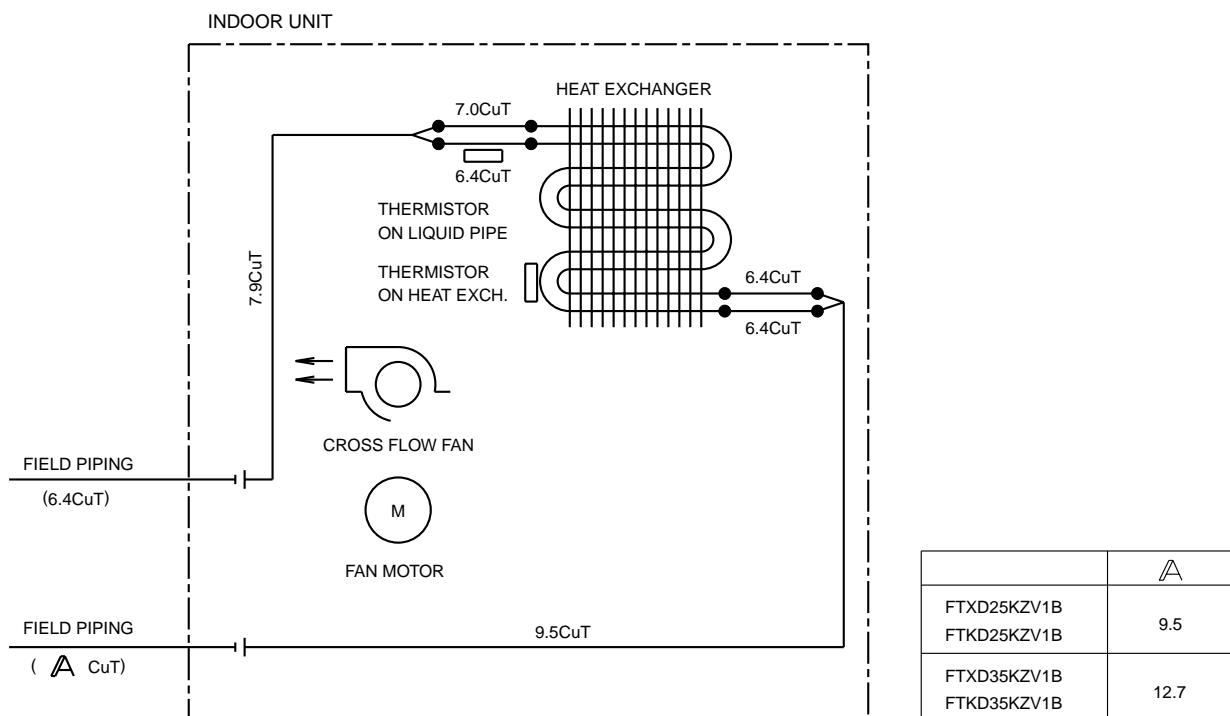
DU427-6109A

## FTK50 / 60HVEC, FTX50 / 60HVEC



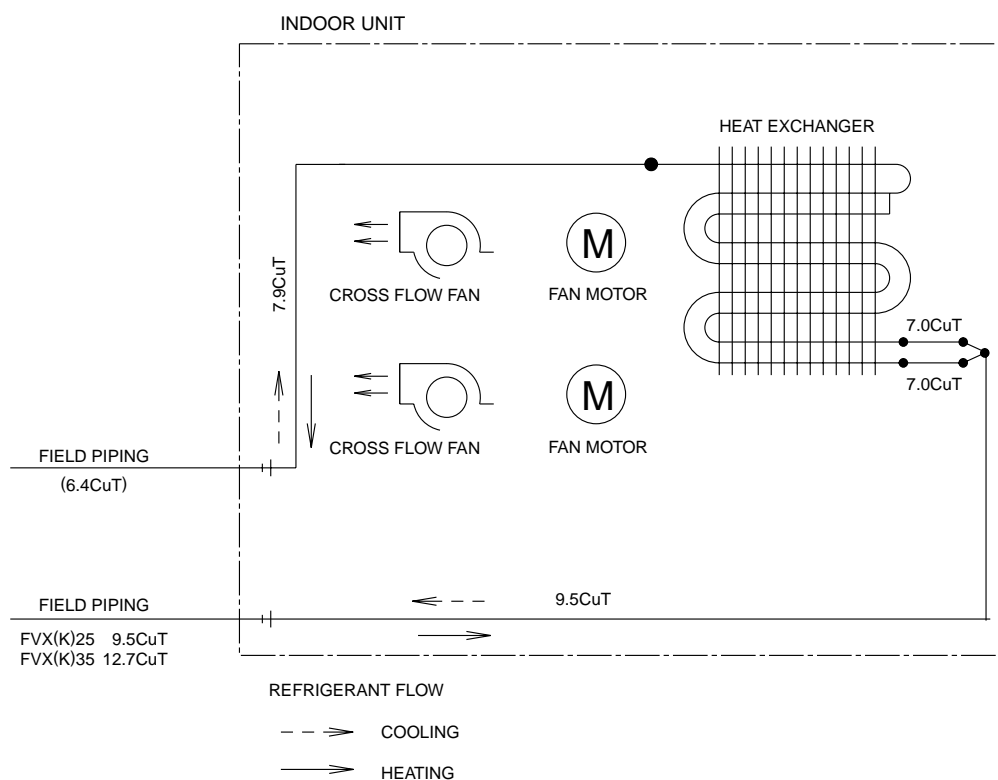
4D013572

## FTXD25 / 35KZV1B



4D029145

## FVX25 / 35KZV1B

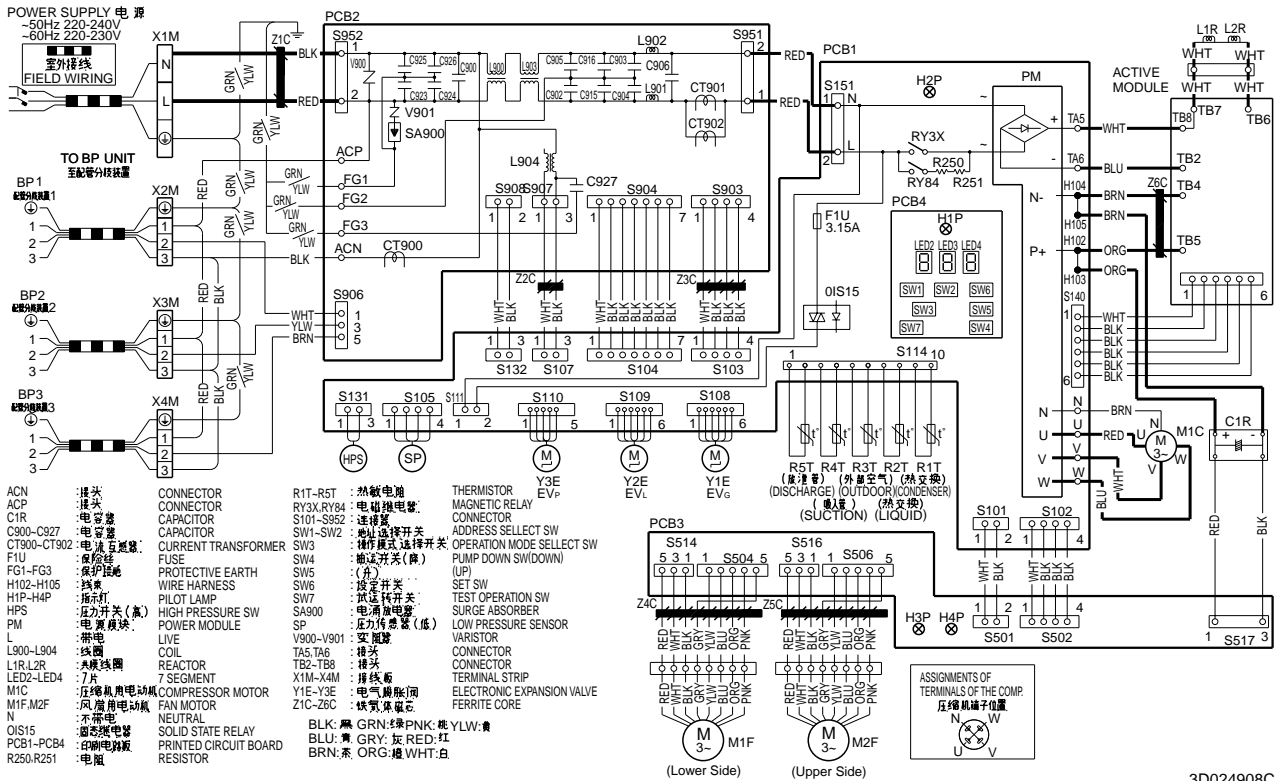


4D028914

# 2. Wiring Diagrams

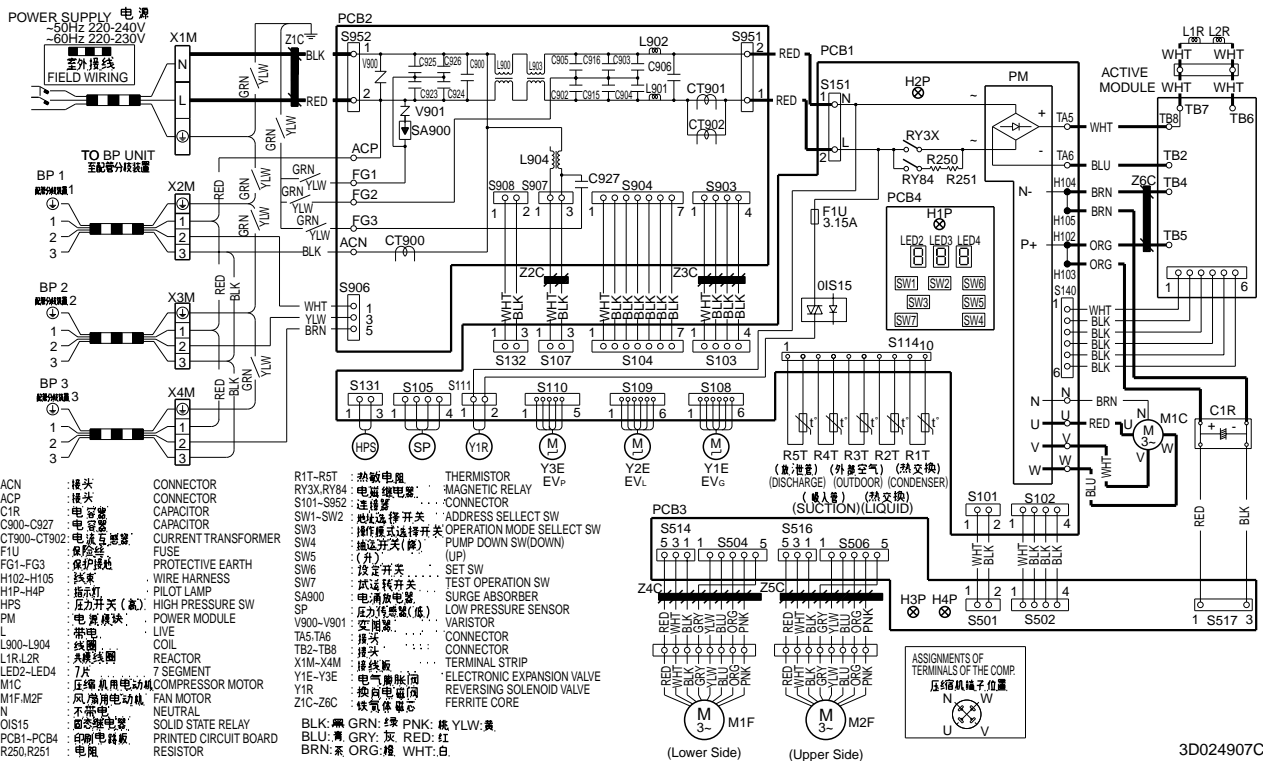
## 2.1 Outdoor Units

### RMK140JVMC9 (8)



3D024908C

### RMX140JVMC9 (8)



3D024907C

**POWER SUPPLY**  
~60Hz 220V  
FIELD WIRING

**TO BP UNIT**

**BP 1**  
① ② ③

**BP 2**  
① ② ③

**BP 3**  
① ② ③

**ACN** :CONNECTOR  
**ACP** :CONNECTOR  
**C1R** :CAPACITOR  
**C900-C927** :CAPACITOR  
**CT900-CT902** :CURRENT TRANSFORMER  
**F1U** :FUSE  
**FG1-FG3** :PROTECTIVE EARTH  
**H102-H105** :WIRE HARNESS  
**H1P-H4P** :PILOT LAMP  
**HPS** :HIGH PRESSURE SW  
**L** :LIVE  
**L900-L904** :COIL  
**L1R, L2R** :REACTOR  
**LED2-LED4** :7 SEGMENT  
**M1C** :COMPRESSOR MOTOR  
**M1F, M2F** :FAN MOTOR  
**N** :NEUTRAL  
**OIS15** :SOLID STATE RELAY  
**PCB1 - PCB4** :PRINTED CIRCUIT BOARD

**R250, R251** :RESISTOR  
**R1T-R5T** :THERMISTOR  
**RY3X, RY84** :MAGNETIC RELAY  
**S101-S952** :CONNECTOR  
**S1W-S2W** :ADDRESS SELECT SW  
**S3W** :OPERATION MODE SELECT SW  
**S4W** :PUMP DOWN SW(DOWN)  
**S5W** : (UP)  
**S6W** :SET SW  
**S7W** :TEST OPERATION SW  
**SA900** :SURGE ABSORBER  
**SP** :LOW PRESSURE SENSOR  
**V900-V901** :VARISTOR  
**TA5, TA6** :CONNECTOR  
**TB2-TB8** :CONNECTOR  
**X1M-X4M** :TERMINAL STRIP  
**Y1E-Y3E** :ELECTRONIC EXPANSION VALVE  
**Z1C-Z6C** :FERRITE CORE

**PCB3**  
**S514** 531 1 **S504** 5  
**S516** 531 1 **S506** 5

**Lower Side**  
**Upper Side**

**ASSIGNMENTS OF TERMINALS OF THE COMP**

3D0246880

**POWER SUPPLY**  
~60Hz 220V  
FIELD WIRING

**TO BP UNIT**

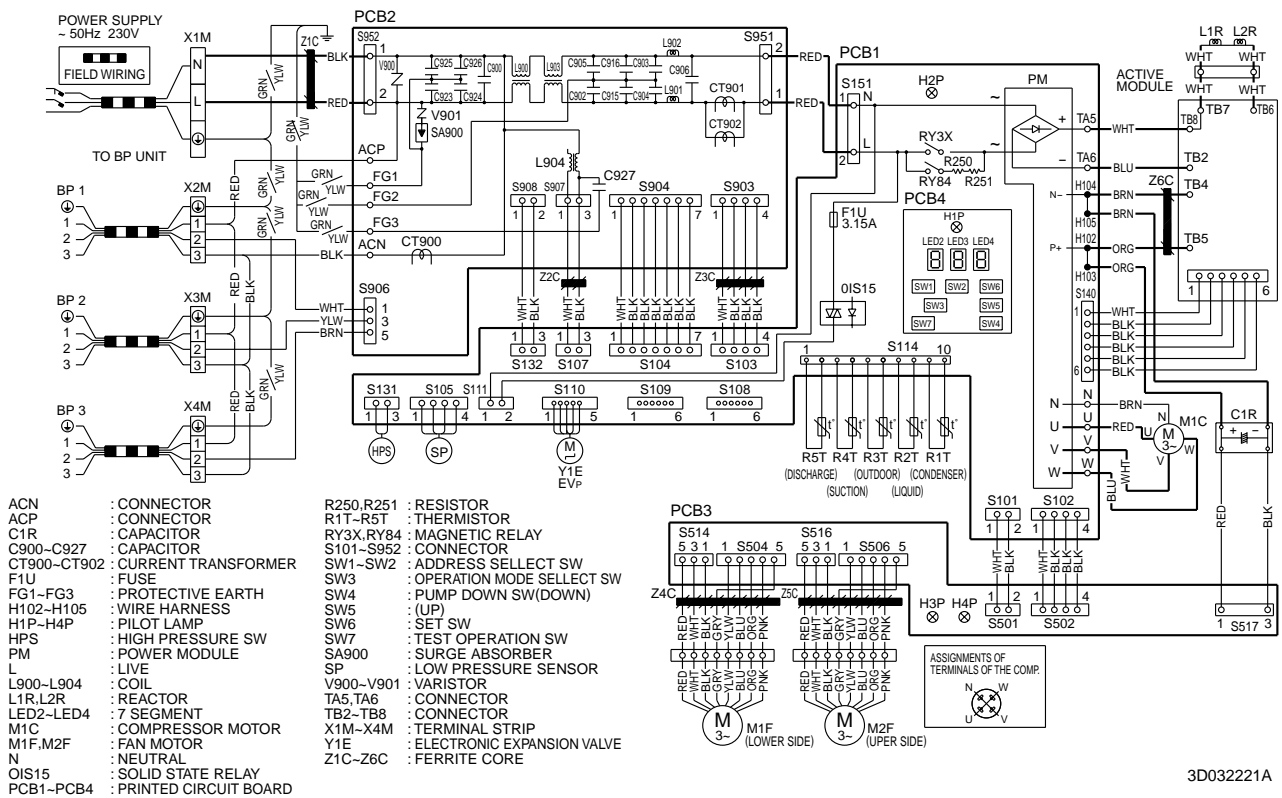
**BP 1**  
④  
1 2 3

**BP 2**  
④  
1 2 3

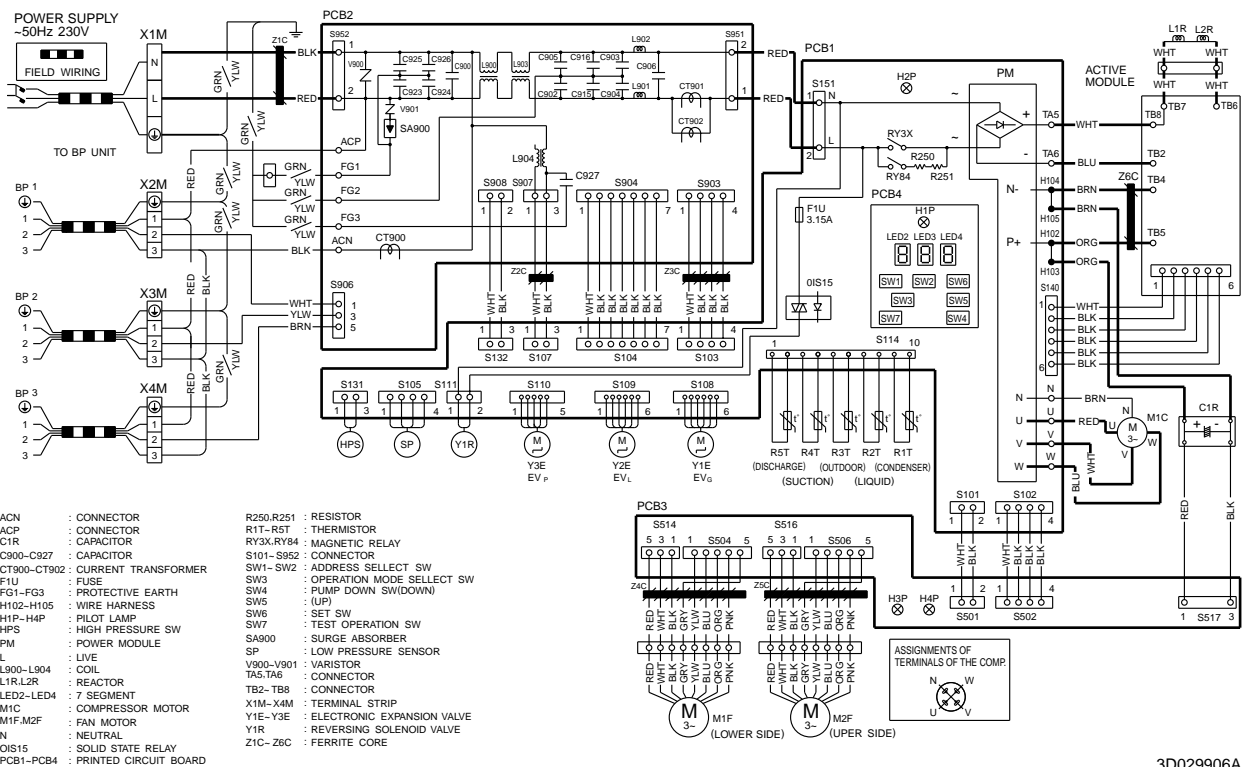
**BP 3**  
④  
1 2 3

**PCB2**  
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S946  
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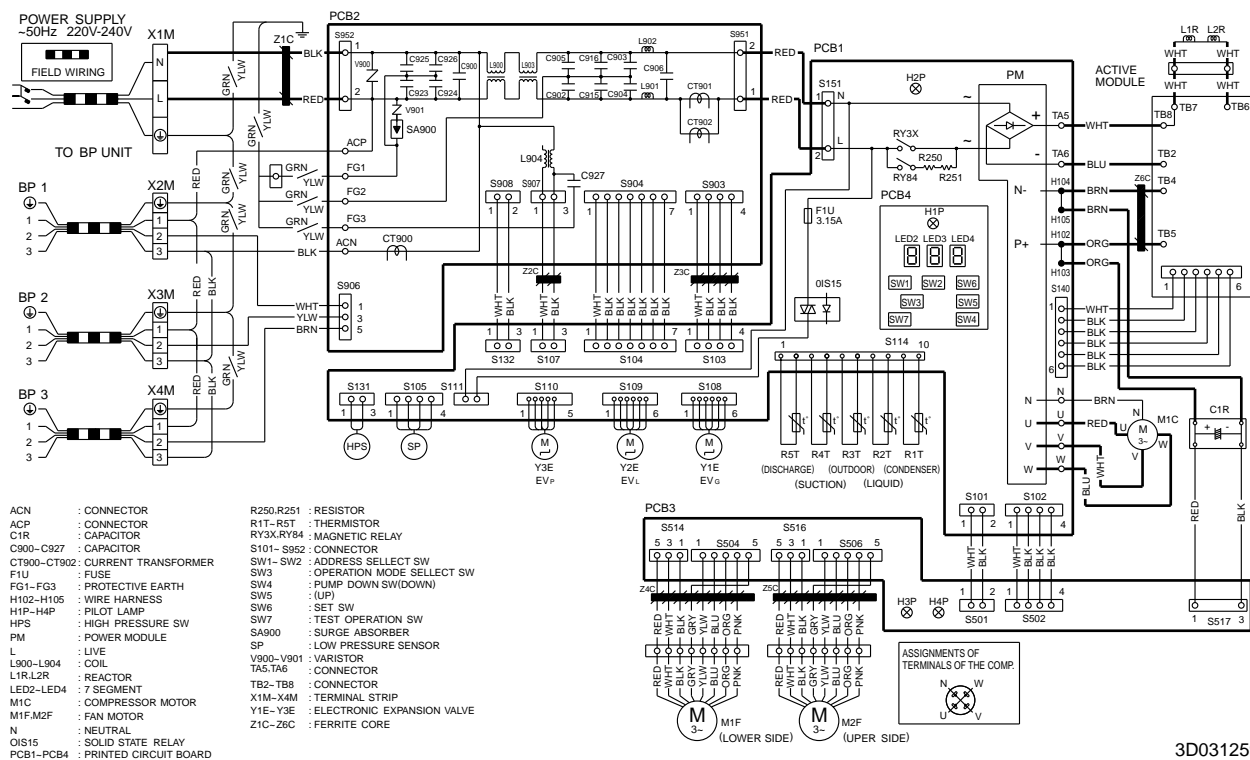
## RMK140JAVM



## RMX140JVMB, RMX140JZVMB

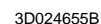


## RMK140JZVMA



3D031259

**BPMK928B42**

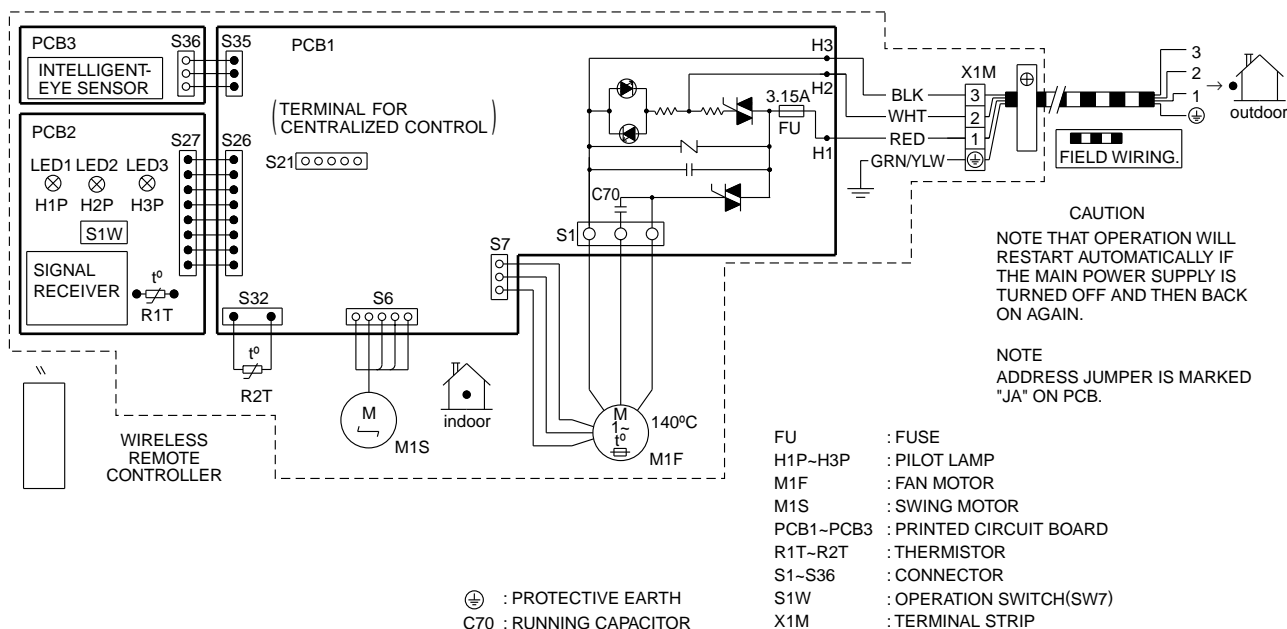


## 3D024654B

## 2.3 Indoor Units

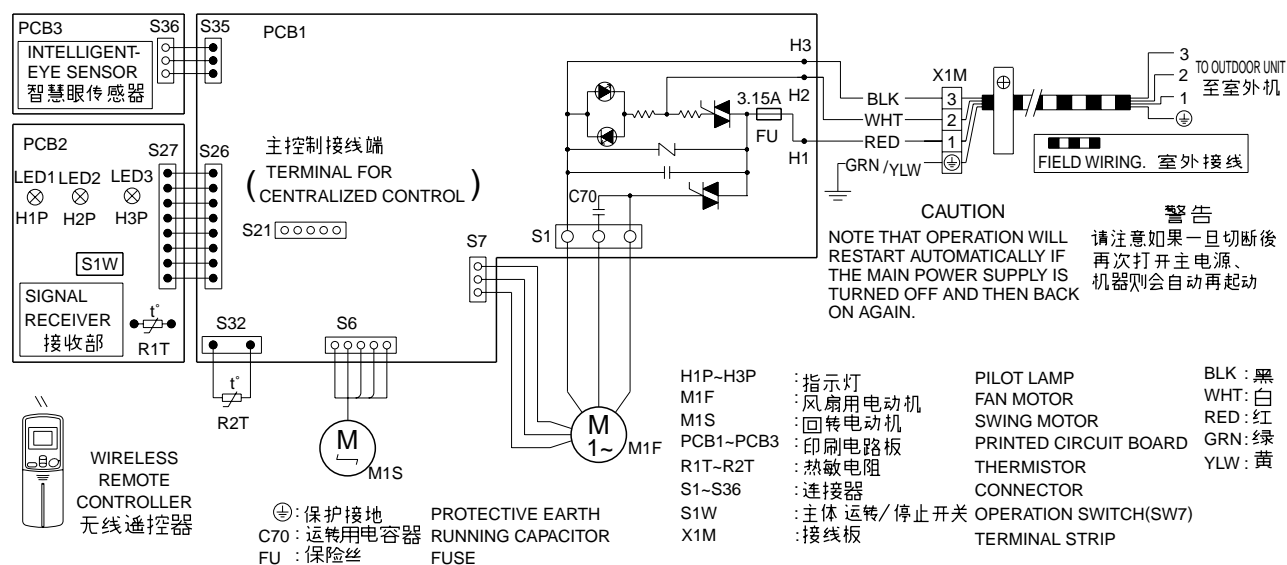
### 2.3.1 Cooling Only

FTK25 / 35JVE (A) 9, FTK25 / 35JAVET



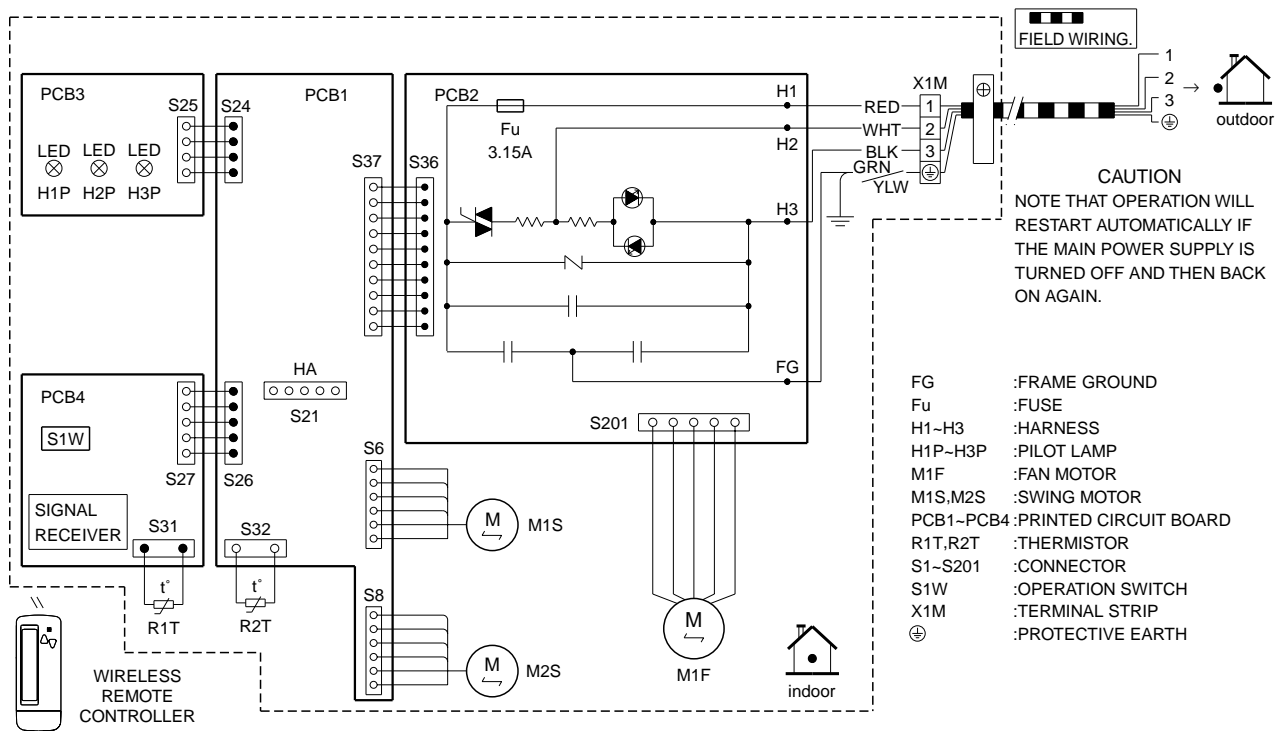
3D020027F

FTK25 / 35JVEC



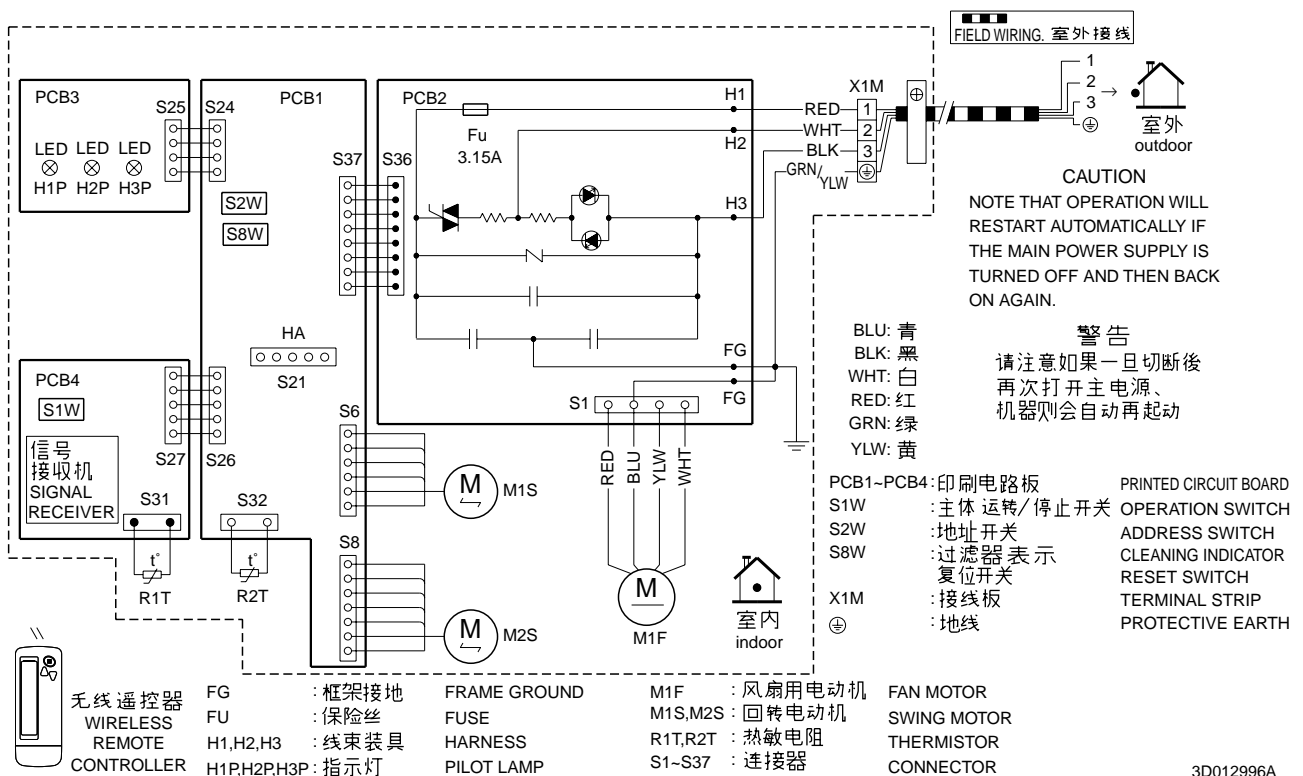
3D020025A

## FTKD50 / 60 / 71JVE (A) (9) , FTKD50 / 60 / 71JVET



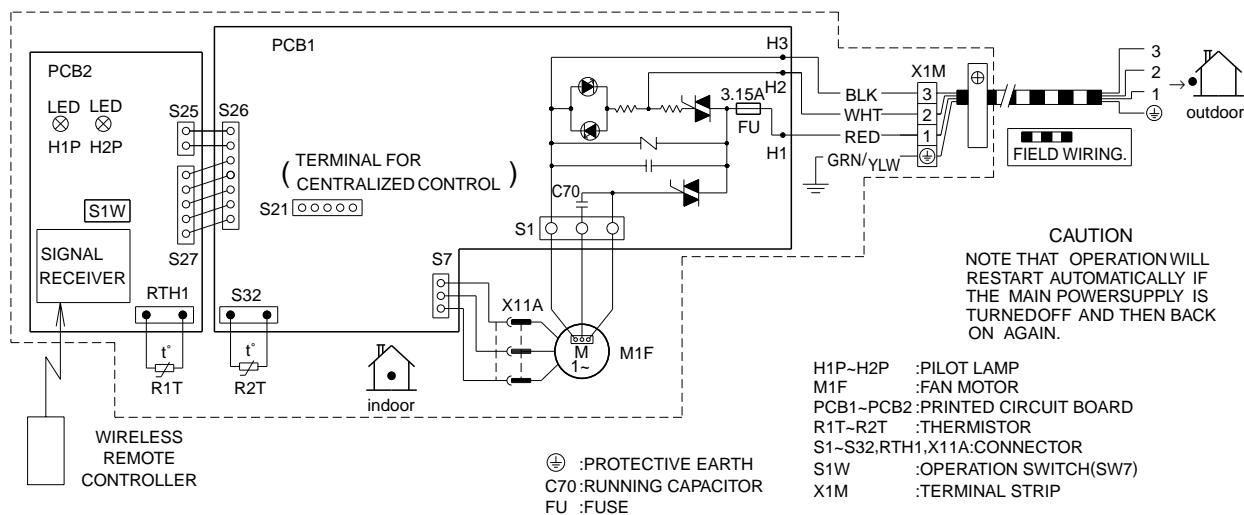
3D025028

## FTK50 / 60HVEC



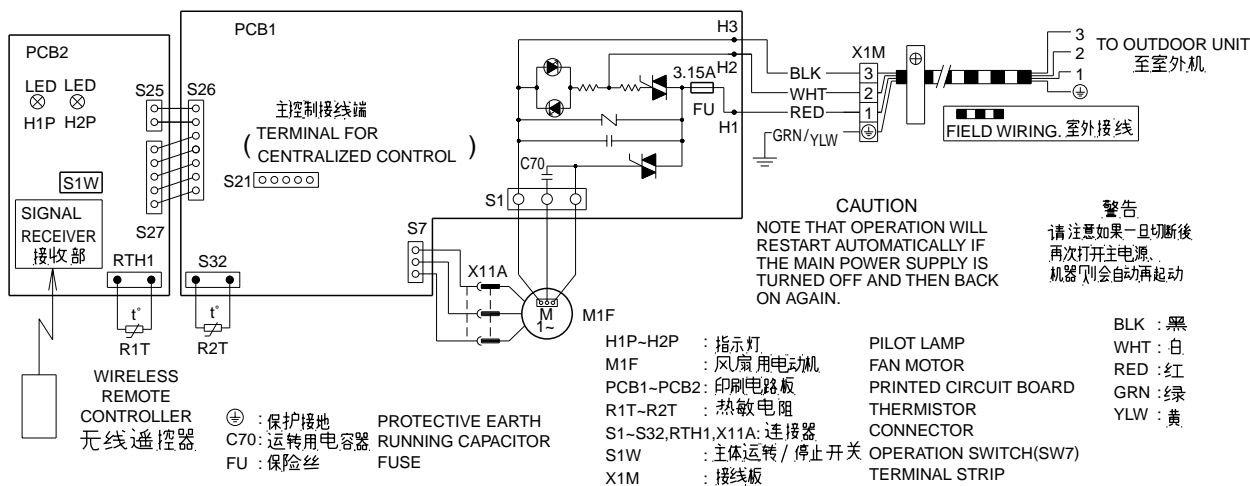
3D012996A

## CDK25 / 35 / 50 / 60HAVE (A) , CDK25 / 35 / 50 / 60HAVET



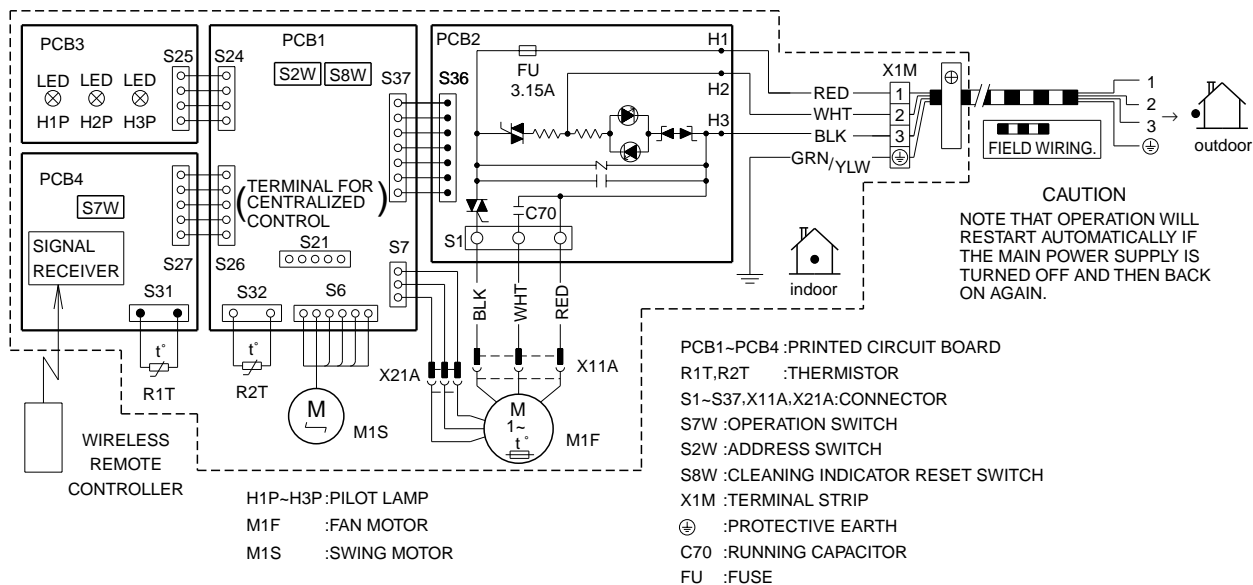
3D024412

## CDK25 / 35 / 50 / 60HAVEC



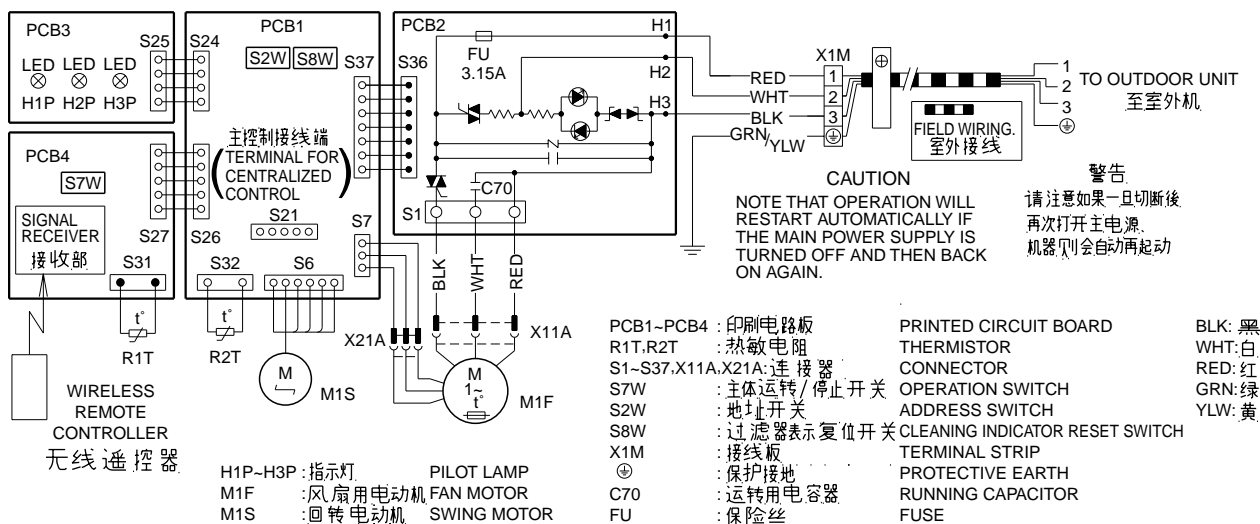
3D024410

## FLK25 / 35 / 50 / 60HVE (A) , FLK25 / 35 / 50 / 60HVET



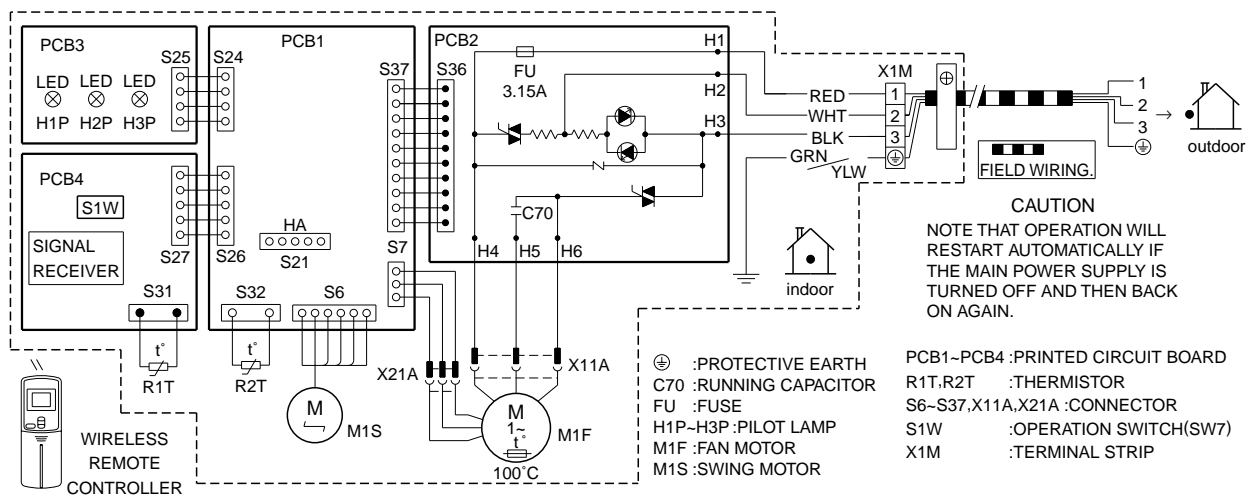
3D024309

## FLK25 / 35 / 50 / 60HVEC



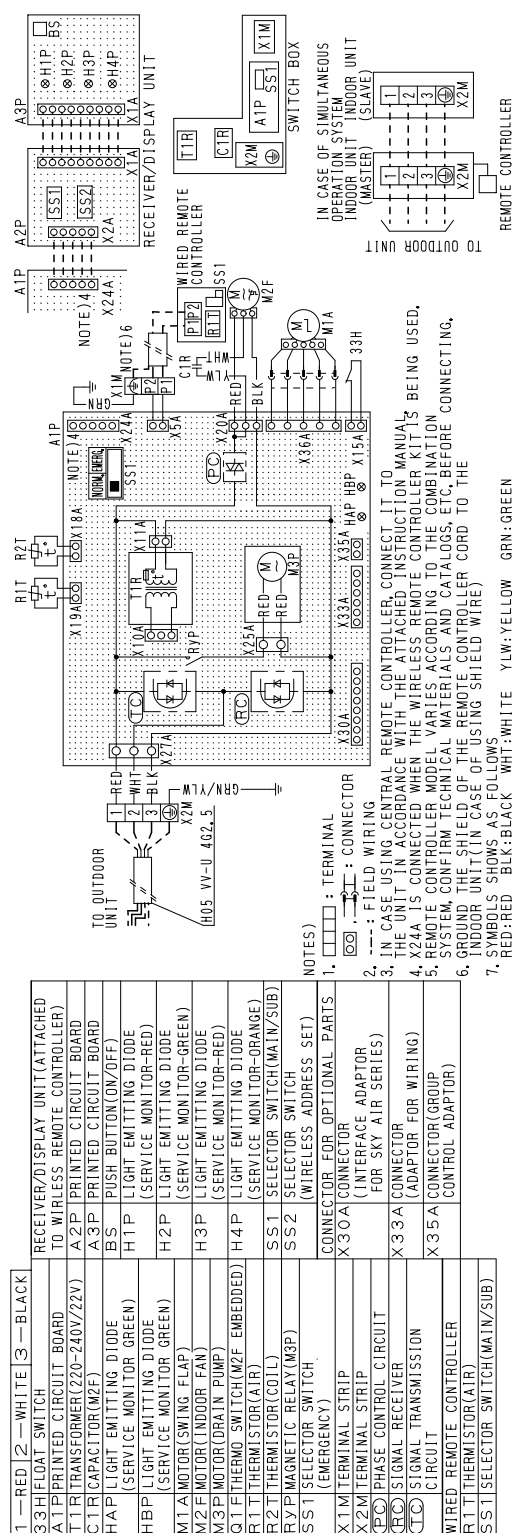
3D024345

## FLK50 / 60JVEA (9)



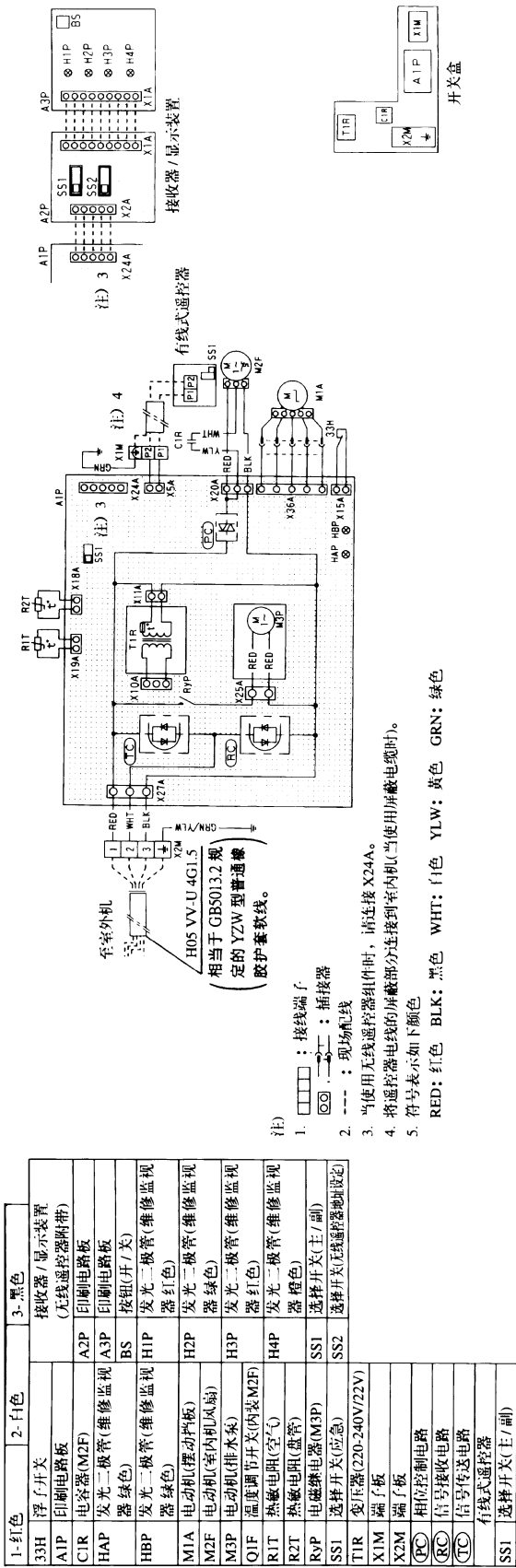
3D025030

**FHYC35 / 50 / 60 / 71KVE9**

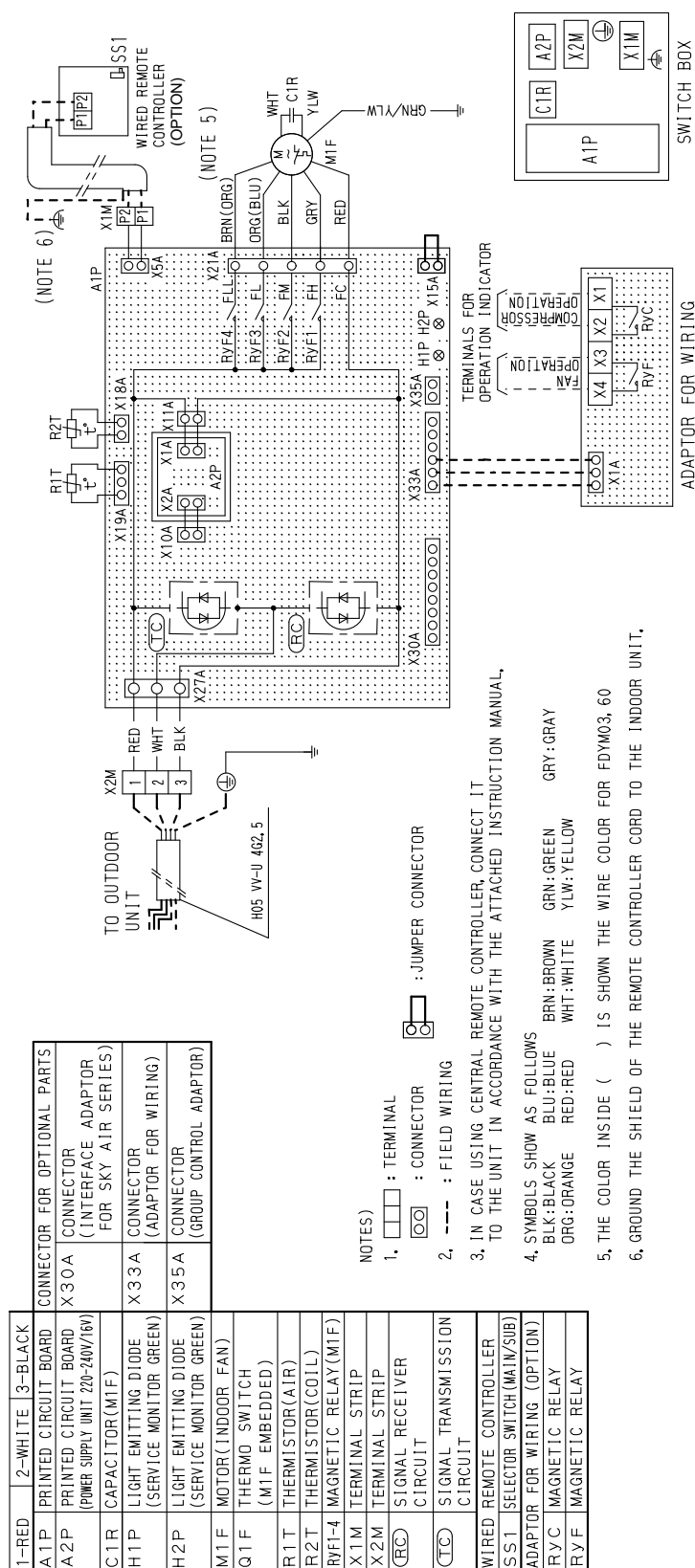


3D005668C

FHYC35 / 50 / 60 / 71KV1C9

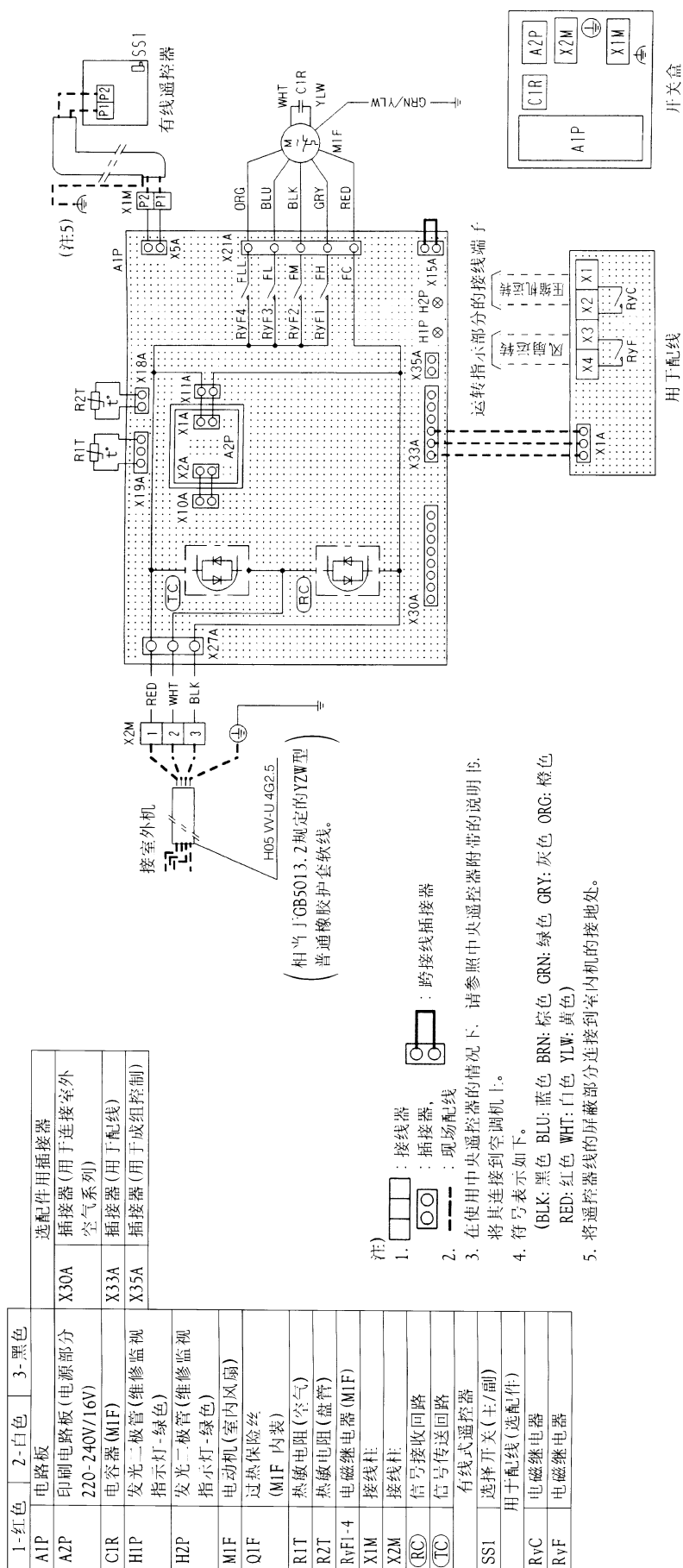


3P014016A

**FDYM60 / 03FAV1**  
**FDYM60 / 03FAVAL**


C : 3D019816D

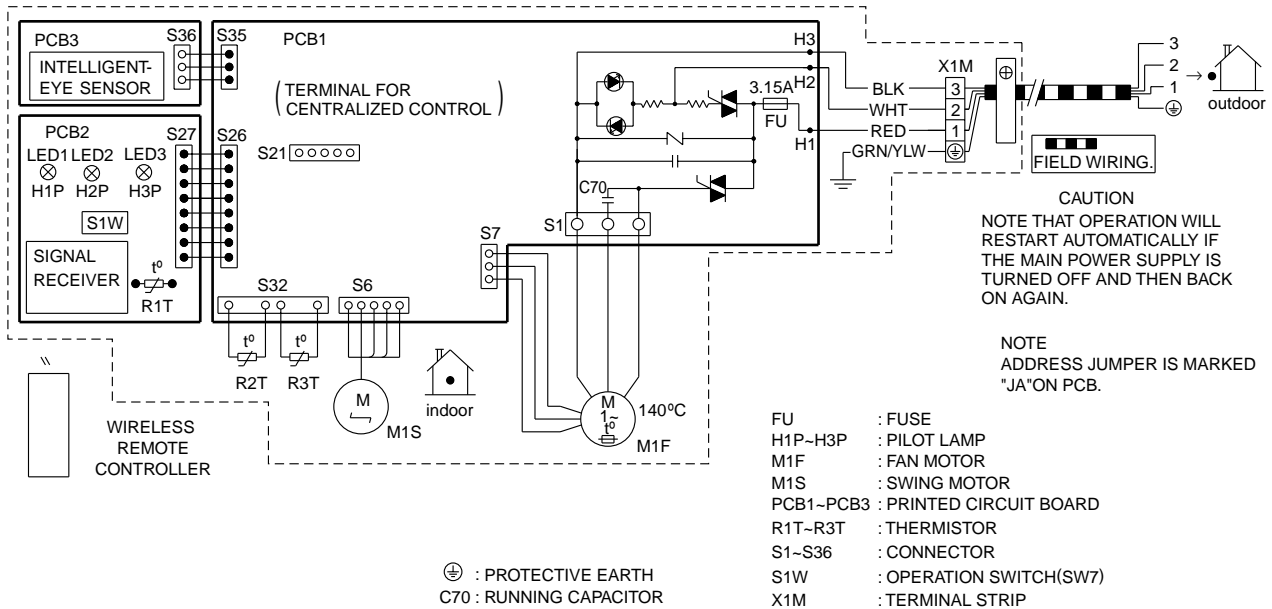
## FDYM60 / 03FAV1C



3D024703

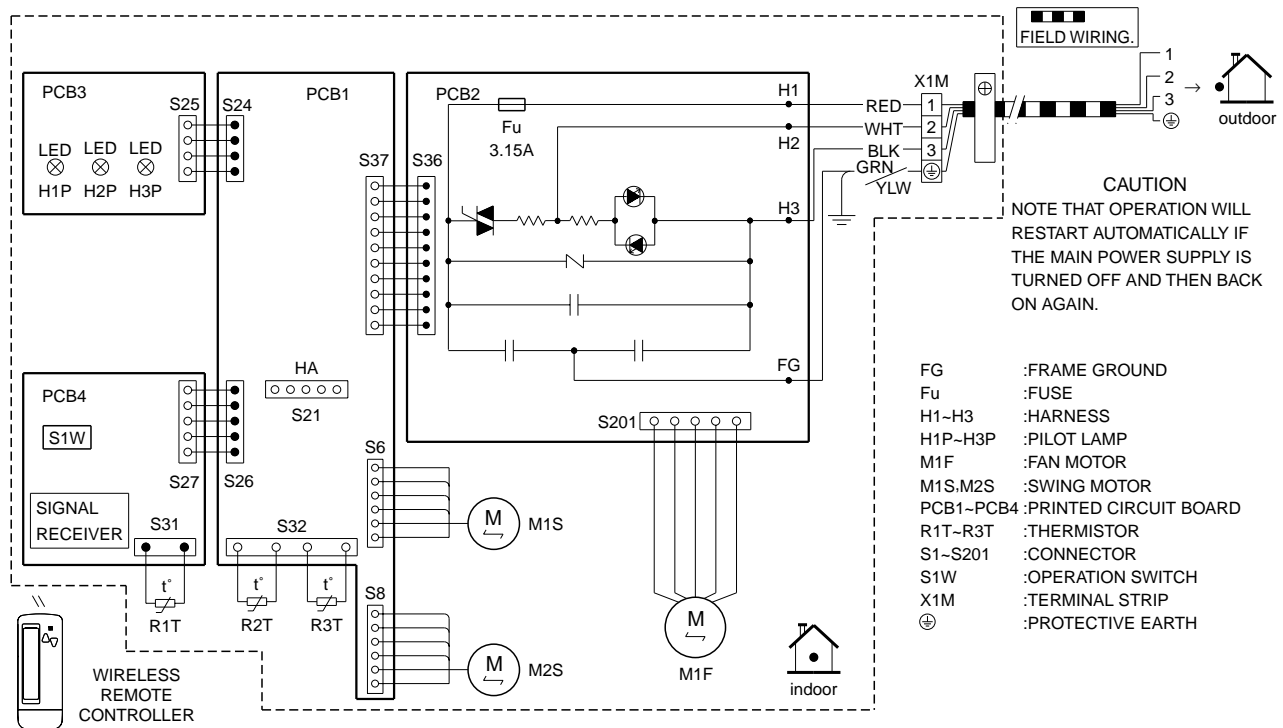
## 2.3.2 Heat Pump

FTX25 / 35JVEA9, FTX25 / 35JAVET, FTX25 / 35JAV1NB, FTXD25 / 35KZV1B

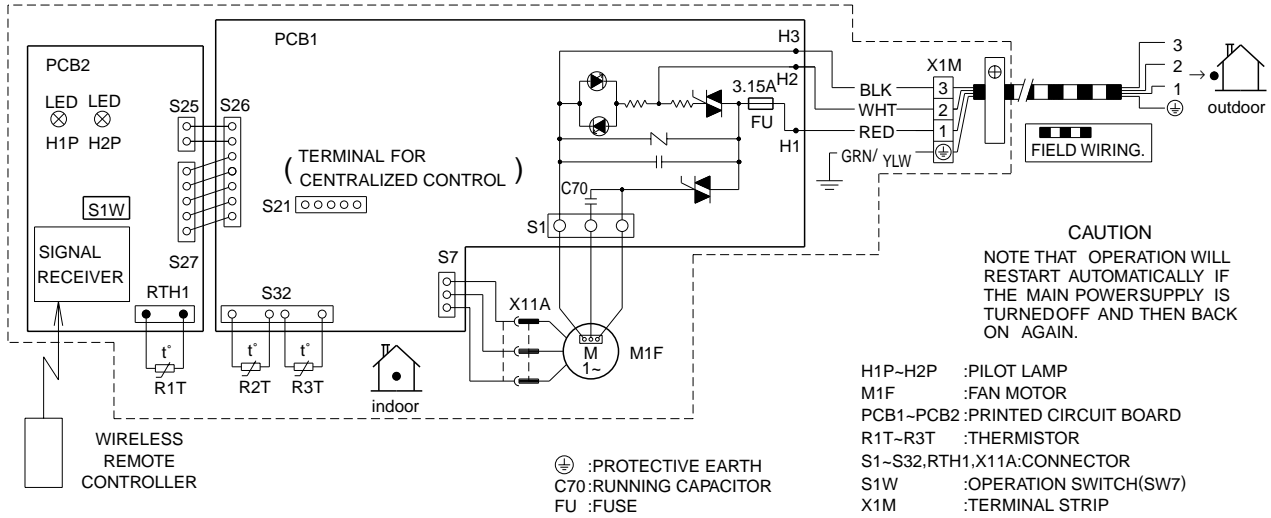


3D020026E

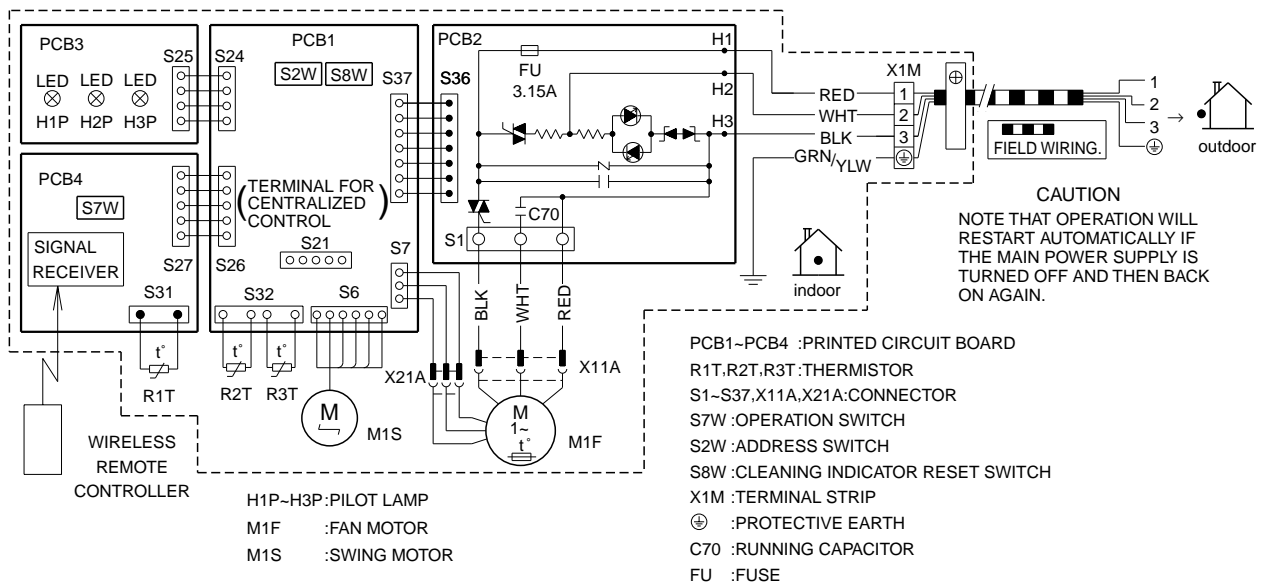
FTXD50 / 60 / 71JVEA (9) , FTXD50 / 60 / 71JVET, FTXD50 / 60 / 71JV1B



3D025027

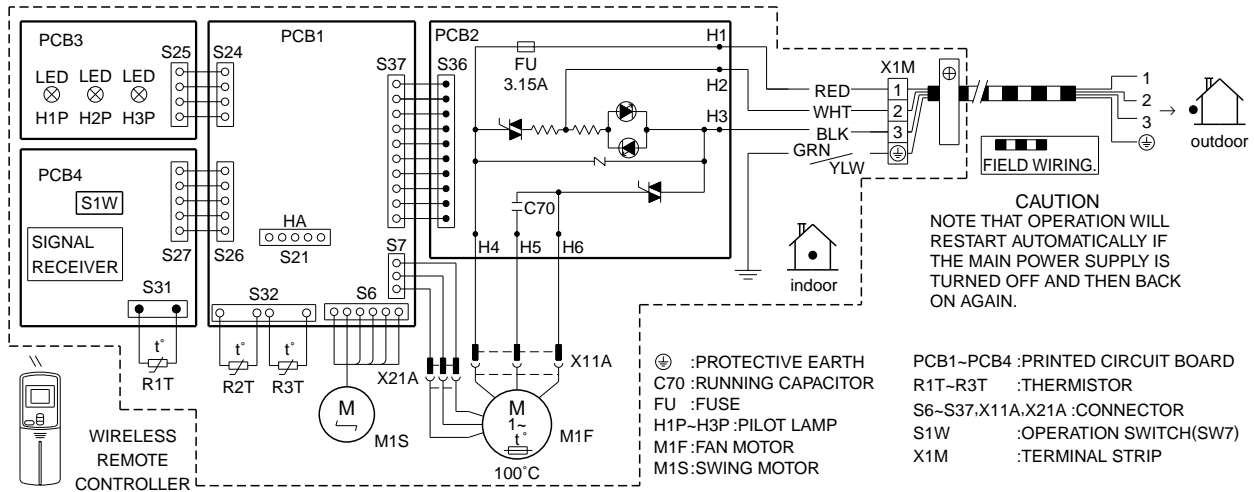
**CDX25 / 35 / 50 / 60HAVEA, CDX25 / 35 / 50 / 60HAV1NB, CDX25 / 35 / 50 / 60JV1NB**


3D024411

**FLX25 / 35HVEA, FLX25 / 35 / 50 / 60HVET, FLX25 / 35HV1NB**


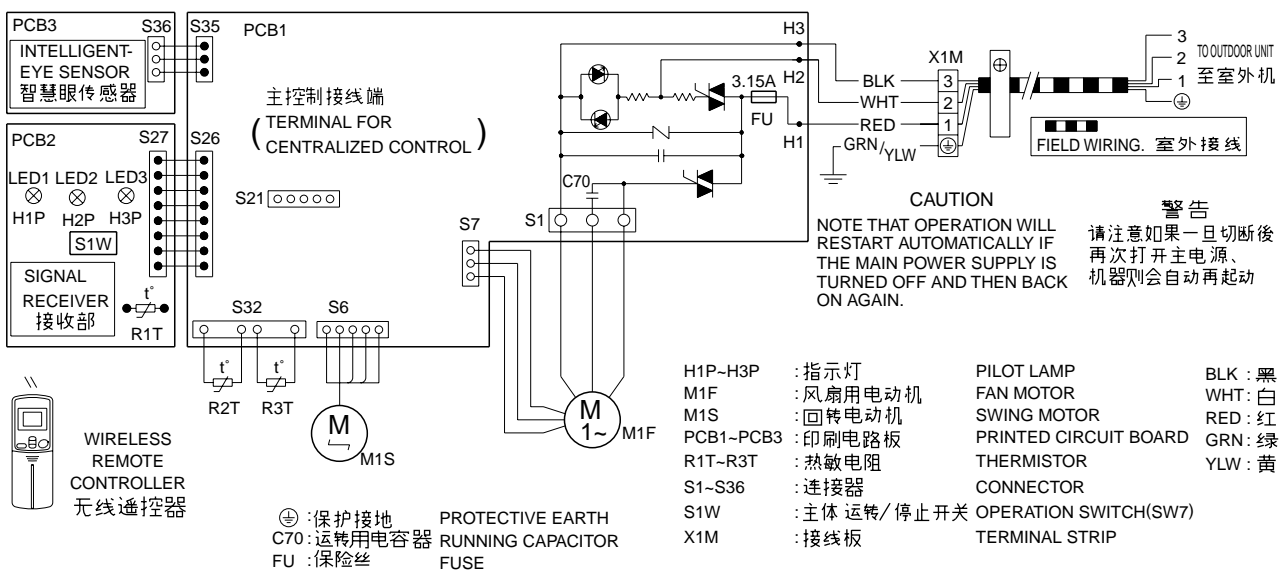
3D024310

## FLX50 / 60JVEA (9) , FLX50 / 60JV1B



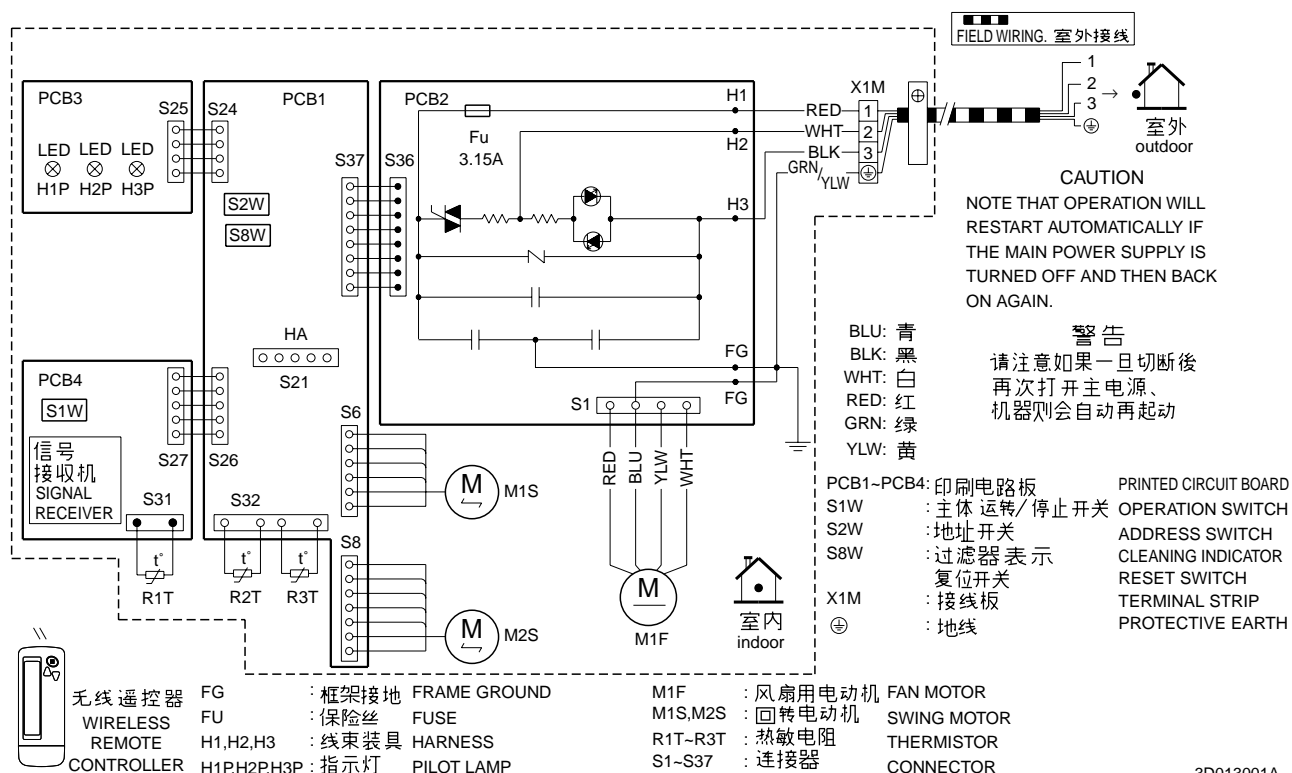
3D025029

## FTX25 / 35JVEC

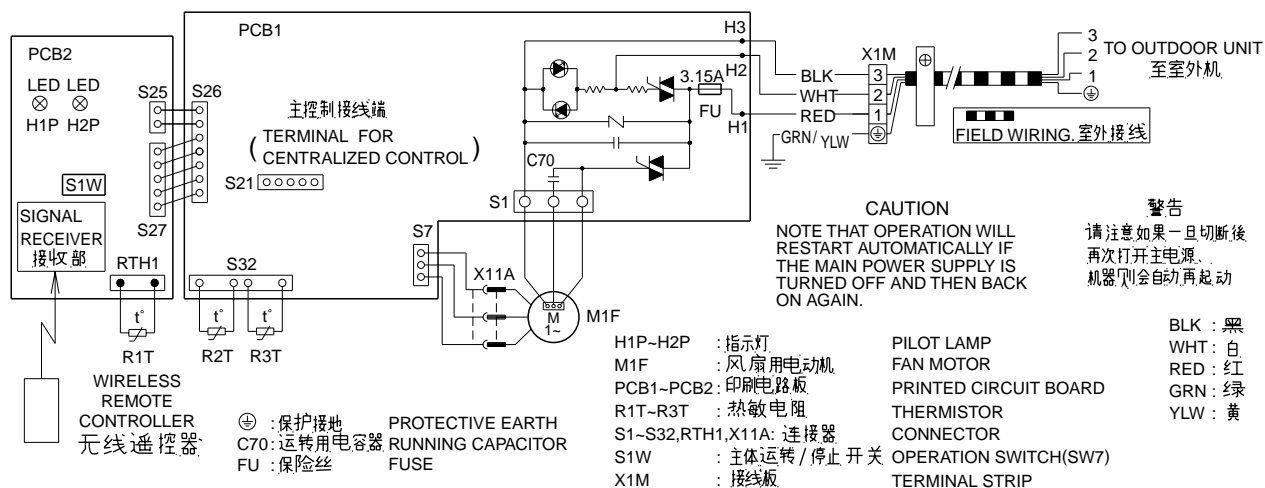


3D020024A

## FTX50 / 60HVEC

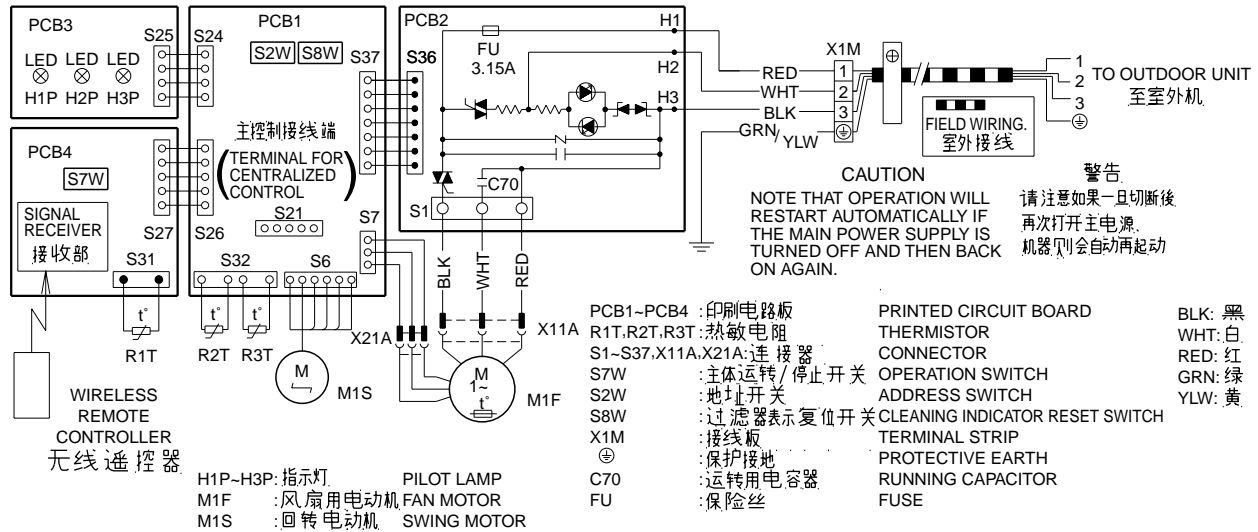


## CDX25 / 35 / 50 / 60HAVEC, CDX25 / 35JVEC



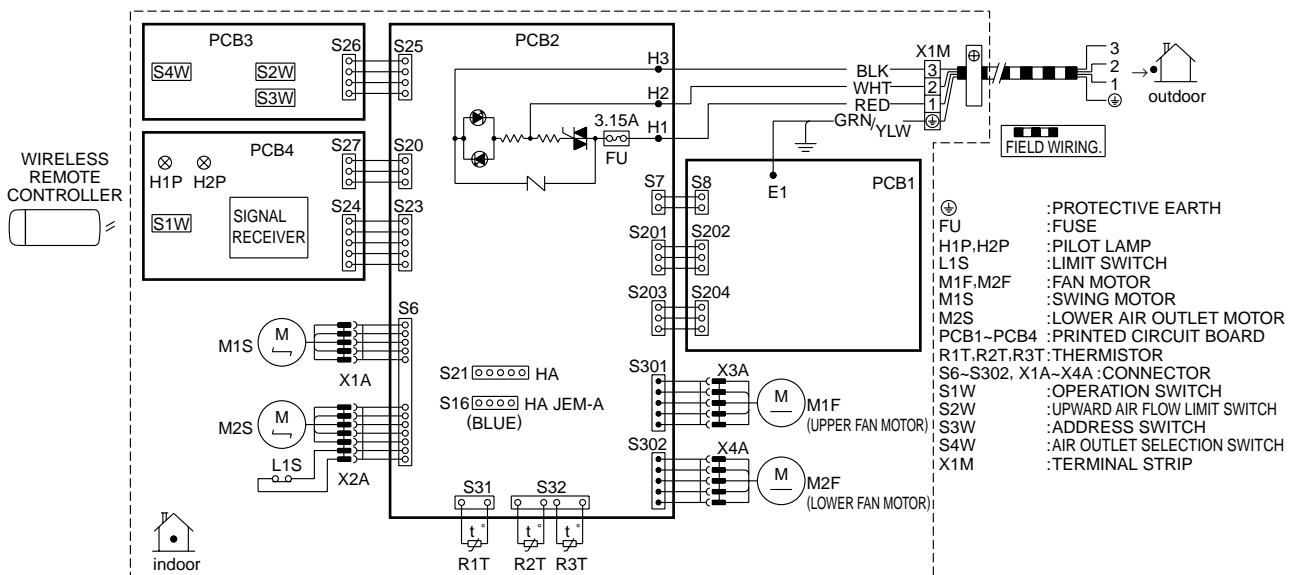
3D024408

## FLX25 / 35 / 50 / 60HVEC



3D024346

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3D028913

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