



Атмосфера вашої оселі



Компресорно – конденсаторні блоки
Galactic

Technical and Service Handbook

-Design-

-Installation-

-Service-

Models

Base Unit: GUC-76~96Z-H, GUC-114~154Z-H

Combination of Base Unit : GUC-172~620Z-H

Technical and Service Handbook

TC12016003E

IMPORTANT NOTICE

- Equipment manufacturer pursues a policy of continuing improvement in design and performance of products. The right is therefore reserved to vary specifications without notice.
- Equipment manufacturer cannot anticipate every possible circumstance that might involve a potential hazard.
- This cooling only air conditioner is designed for standard air conditioning only. Do not use this cooling only air conditioner for other purpose such as drying clothes, refrigerating foods or for any other cooling process.

- Do not install the unit in the following places. It may cause a fire, deformation, corrosion or failure.
 - * Places where oil (including machinery oil).
 - * Places where a lot of sulfide gas drifts such as in hot spring.
 - * Places where inflammable gas may generate or flow.
 - * Places where strong salty wind blows such as coast regions.
 - * Places with an atmosphere of acidity or alkalinity.
- Do not install the unit in the place where silicon gas drifts. If the silicon gas attaches to the surface of heat exchanger, the fin surface repels water. As a result, drain water splashes outside of the drain pan and splashed water runs inside of electrical box. In the end, water leakage or electrical devices failure may occur.
- Pay attention to the following points when the unit is installed in a hospital or other facilities where electromagnetic wave generates from medical equipment.
 - * Do not install the unit in the place where the electromagnetic wave is directly radiated to the electrical box, remote control cable or remote control switch.
 - * Install the unit at least 3 meters away from electromagnetic wave such as a radio.
- Do not install the unit in the place where the breeze directly catches the animals and plants. It could adversely affect the animals and plants.
- The installer and system specialist shall secure against leakage according to local regulations or standards. The following standards may be applicable, if local regulations are not available. International Organization for Standardization, ISO5149 or European Standard, EN378 or Japan Standard, KHKS0010.
- No part of this manual may be reproduced without written permission.
- It is assumed that this cooling only air conditioner will be operated and serviced by English speaking people. If this is not the case, the customer should be add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or dealer .
- This manual gives a common description and information for this cooling only air conditioner which you operate as well for other models.
- This cooling only air conditioner has been designed for the following temperatures. Operate the cooling only air conditioner within this range.
- This cooling only air conditioner has been designed for the following temperatures. Operate the cooling only air conditioner within this range.

Temperature (°C)

		Maximum	Minimum
Cooling Operation	Indoor	32 DB/23 WB	21 DB/15 WB
	Outdoor	50 DB *	-5 DB *
Heating Operation	Indoor	27 DB	15 DB
	Outdoor	15 WB *	-20 WB *

DB: Dry Bulb, WB: Wet Bulb

* The temperature may change depending on the outdoor unit.

This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

SAFETY SUMMARY

< Signal Words >

- Signal words are used to identify levels of hazard seriousness.
Definitions for identifying hazard levels are provided below with their respective signal words.



: DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



: WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



: CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

: NOTICE is used to address practices not related to personal injury.

NOTE

: NOTE is useful information for operation and/or maintenance.

SAFETY SUMMARY

DANGER

- Do not perform installation work, refrigerant piping work, drain pump, drain piping and electrical wiring connection without referring to our installation manual. If the instructions are not followed, it may result in a water leakage, electric shock or a fire.
- Use the specified non-flammable refrigerant (R410A) to the outdoor unit in the refrigerant cycle. Do not charge material other than R410A into the unit such as hydrocarbon refrigerants (propane or etc.), oxygen, flammable gases (acetylene or etc.) or poisonous gases when installing, maintaining and moving. These flammables are extremely dangerous and may cause an explosion, a fire, and injury.
- Do not pour water into the indoor or outdoor unit. These products are equipped with electrical parts. If poured, it will cause a serious electrical shock.
- Do not open the service cover or access panel for the indoor or outdoor units without turning OFF the main power supply.
- Do not touch or adjust safety devices inside the indoor unit or outdoor units. If these devices are touched or readjusted, it may cause a serious accident.
- Refrigerant leakage can cause difficulty with breathing due to insufficient air. Turn OFF the main switch, extinguish any naked flames and contact your service contractor, if refrigerant leakage occurs.
- Make sure that the refrigerant leakage test should be performed. Refrigerant (Fluorocarbon) for this unit is incombustible, non-toxic and odorless. However if the refrigerant is leaked and is contacted with fire, toxic gas will generate. Also because the fluorocarbon is heavier than air, the floor surface will be filled with it, which could cause suffocation.
- The installer and system specialist shall secure safety against refrigerant leakage according to local regulations or standards.
- Use an ELB (Earth Leakage Breaker). In the event of fault, there is danger of an electric shock or a fire if it is not used.
- Do not install the outdoor unit where there is high level of oil mist, flammable gases, salty air or harmful gases such as sulfur.
- For installation, firmly connect the refrigerant pipe before the compressor starts operating. For maintenance, relocation and disposal, remove the refrigerant pipe after the compressor stops.
- Do not perform a short-circuit of the protection device such as a pressure switch when operating. It may cause a fire and explosion.

SAFETY SUMMARY

⚠ WARNING

- Do not use any sprays such as insecticide, lacquer, hair spray or other flammable gases within approximately one (1) meter from the system.
- If circuit breaker or fuse is often activated, stop the system and contact your service contractor.
- Check that the ground wire is securely connected. If the unit is not correctly grounded, it lead electric shock. Do not connect the ground wiring to gas piping, water piping, lighting conductor or ground wiring for telephone.
- Connect a fuse of specified capacity.
- Before performing any brazing work, check to ensure that there is no flammable material around. When using refrigerant be sure to wear leather gloves to prevent cold injuries.
- Protect the wires, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts and which may lead to a fire.
- Fix the cables securely. External forces on the terminals could lead to a fire.
- Provide a sufficiently strong foundation. If not, the unit may fall down and it may lead to injuries.
- Do not install the unit in a place where oil, vapor, organic solvent and corrosive gas (ammonia, sulfur compound and acid) may be present in quantities. It may cause refrigerant leakage due to corrosion, electrical shock, deteriorated performance and breakage.
- Perform electrical work according to Installation Manual and all the relevant regulation and standards. If the instructions are not followed, an electrical shock and fire may occur due to insufficient capacity and inadequate performance.
- Use specified cables between units and choose the cables correctly. If not, an electrical shock or fire may occur.
- Ensure that the wiring terminals are tightened securely with the specified torques. If not, generating fire or electrical shock at the terminal connection part may occur.

⚠ CAUTION

- Do not step or put any material on the product.
- Do not put any foreign material on the unit or inside the unit.
- Provide a strong and correct foundation so that;
 - a. The outdoor unit is not on an incline.
 - b. Abnormal sound dose not occur.
 - c. The outdoor unit will not fall down due to a strong wind or earthquake.

SAFETY SUMMARY

NOTICE

- Do not install the indoor unit, outdoor unit, remote control switch and cable within approximately 3 meters from strong electromagnetic wave radiators such as medical equipment.
- Supply electrical power to the system to energize the oil heater for 12 hours before startup after a long shutdown.
- Make sure that the outdoor unit is not covered with snow or ice, before operation.
- In some cases, the packaged air conditioner may not be operated normally under the following cases.
 - * In case that electrical power for the packaged air conditioner is supplied from the same power transformer as the device*.
 - * In case that the power source wires for the device* and the packaged air conditioner are located close to each other.

Device*: (Ex) Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor and large-sized switch.
It consumes a large quantity of electrical power.

Regarding the cases mentioned above, surge voltage may be inducted in the power supply wiring for the packaged air conditioner due to a rapid change in power consumption of the device and an activation of switch.

Therefore, check the field regulations and standards before performing electrical work in order to protect the power supply for the packaged air conditioner.

NOTE

- It is recommended that the room will be ventilated every 3 to 4 hours.
- The heating capacity of the heat pump unit is decreased according to the outdoor air temperature. Therefore, it is recommended that auxiliary heating equipment be used in the field when the units is installed in a low temperature region.

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Technical Data

1. Features

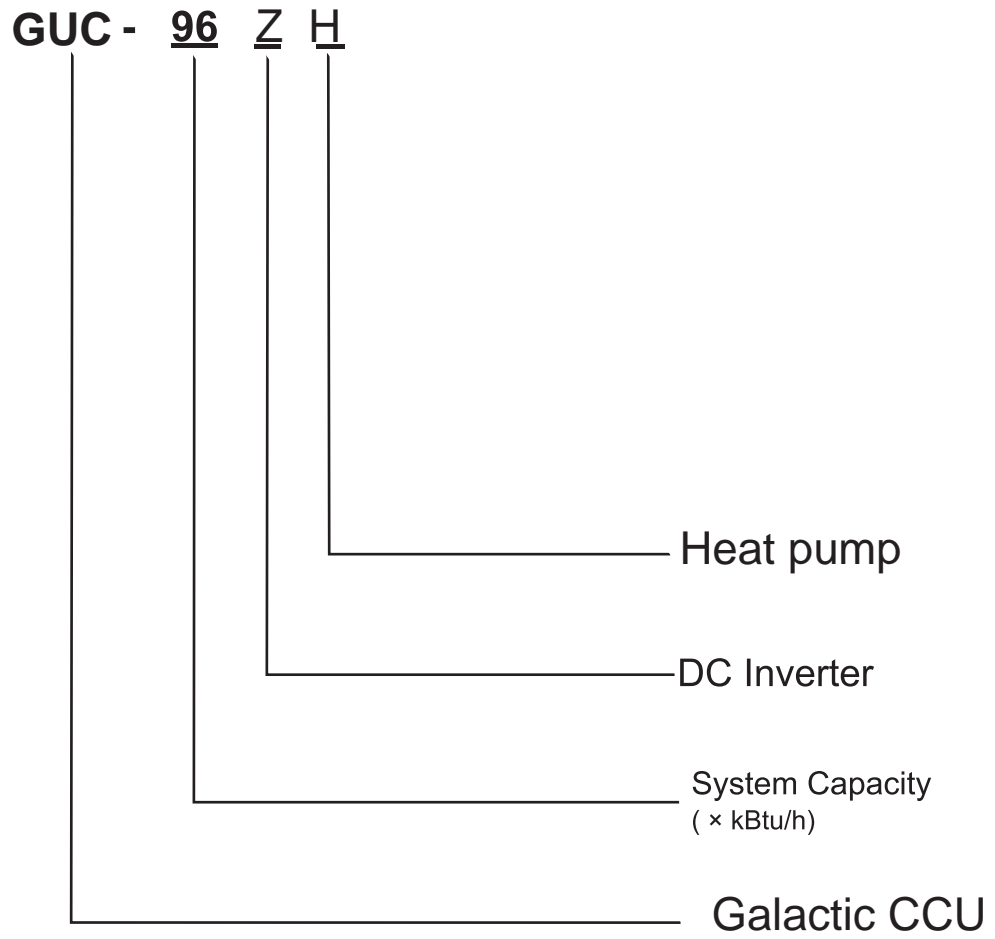
- CCU Galactic inverter-driven multi-split central air conditioning adopts full DC inverter technology.
- Adopt high efficiency DC inverter scroll compressor and variable speed DC fan motors, which can bring extraordinary user experience.
- High efficiency performance, high intelligence and reliable operation.
- High flexibility of installation and maintenance. High intelligent control and management, fulfilling the air-conditioning requirements for different space.
- Various models can serve the government office buildings, factories, shopping malls, schools, hospitals, high-end clubs and many other occasions better, which can improve the environmental quality and create a healthier life.



2. General information

2.1 Model Nomenclature

Outdoor Unit



2.2 Line-Up

Line-Up of Outdoor Unit

< Base Unit >

Capacity(KBtu/h)	76	96	114	136	154
Model	GUC-76Z-H	GUC-96Z-H	GUC-114Z-H	GUC-136Z-H	GUC-154Z-H

< Combination of Base Units > *

Capacity(KBtu/h)	172	190	210	229	250
Model	GUC-172Z-H	GUC-190Z-H	GUC-210Z-H	GUC-229Z-H	GUC-250Z-H
Combination	GUC-76Z-H	GUC-76Z-H	GUC-96Z-H	GUC-114Z-H	GUC-114Z-H
	GUC-96Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-136Z-H

Capacity(KBtu/h)	268	290	307	324	343
Model	GUC-268Z-H	GUC-290Z-H	GUC-307Z-H	GUC-324Z-H	GUC-343Z-H
Combination	GUC-144Z-H	GUC-136Z-H	GUC-154Z-H	GUC-96Z-H	GUC-114Z-H
	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	GUC-114Z-H	GUC-114Z-H
	-	-	-	GUC-114Z-H	GUC-114Z-H

Capacity(KBtu/h)	365	386	404	420	444
Model	GUC-365Z-H	GUC-386Z-H	GUC-404Z-H	GUC-420Z-H	GUC-444Z-H
Combination	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-136Z-H
	GUC-114Z-H	GUC-114Z-H	GUC-136Z-H	GUC-154Z-H	GUC-154Z-H
	GUC-136Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H

Capacity(KBtu/h)	460	480	500	520	540
Model	GUC-460Z-H	GUC-480Z-H	GUC-500Z-H	GUC-520Z-H	GUC-540Z-H
Combination	GUC-154Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H
	GUC-154Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H
	GUC-154Z-H	GUC-114Z-H	GUC-136Z-H	GUC-136Z-H	GUC-154Z-H
	-	GUC-136Z-H	GUC-136Z-H	GUC-154Z-H	GUC-154Z-H

Capacity(KBtu/h)	560	580	600	620
Model	GUC-560Z-H	GUC-580Z-H	GUC-600Z-H	GUC-620Z-H
Combination	GUC-114Z-H	GUC-114Z-H	GUC-136Z-H	GUC-154Z-H
	GUC-136Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H
	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H
	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H

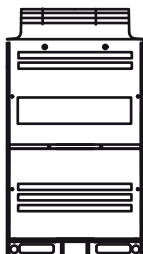
*: Regarding the configuration of outdoor units especially for 172 ~ 620 KBtu/h, combine the specified based units (2 to 4) as shown in the table above.

Combination of Outdoor Unit

< Base Unit >

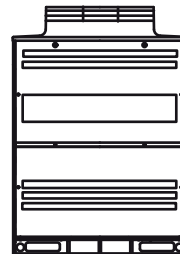
GUC -76* to GUC-96*

• Outer Dimension: H1720 x W950 x D750 mm



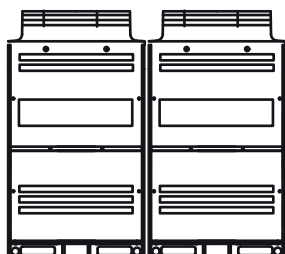
GUC -114* and GUC -154*

• Outer Dimension: H1720 x W1210 x D750 mm

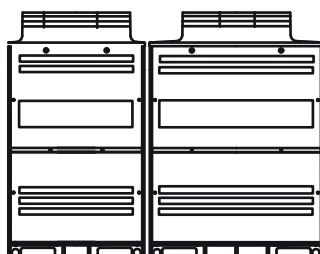


< Combination of Base Units >

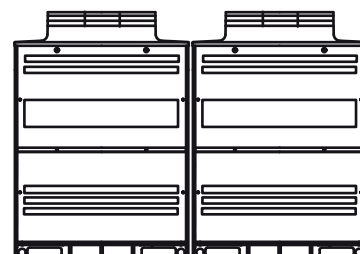
GUC -172*



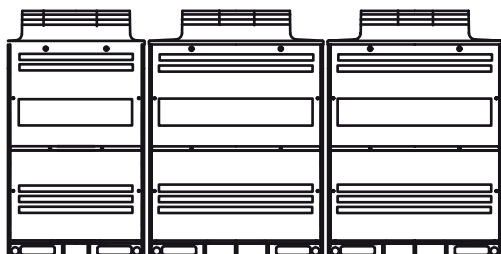
GUC -190* to GUC -210*



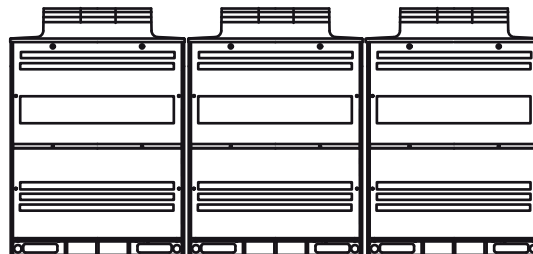
GUC -229* to GUC -307*



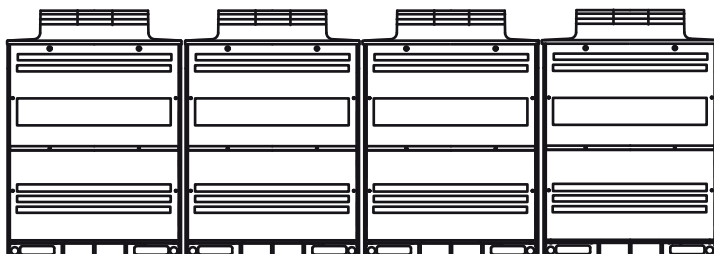
GUC -324*



GUC -343* to GUC -460*



GUC 480* to GUC -620*



2.3 Operating Range

Power Supply

Working Voltage: 90% to 110% of the Rated Voltage

Working Frequency: $\pm 1\%$ of the Rated Frequency

Voltage Imbalance: Within a 3% Deviation from Each Voltage at the Main Terminal of Outdoor Unit

Starting Voltage: Higher than 85% of the Rated Voltage

Temperature Range

This unit has been designed for cooling operation under low ambient temperatures down to -5°C .

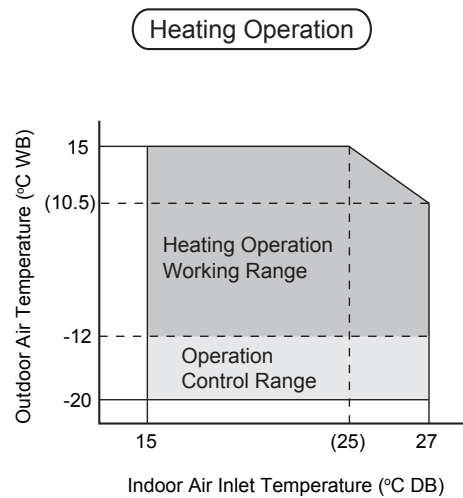
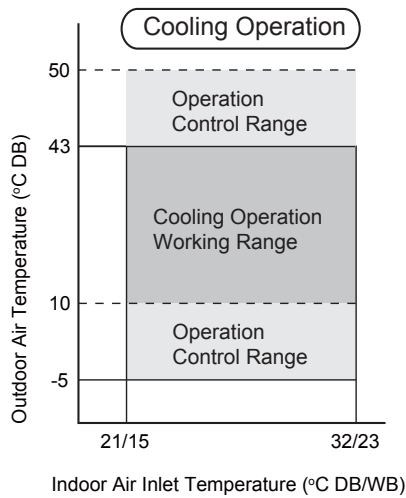
This feature enables cooling to be obtained even in winter on buildings with high internal heat gains due to lighting, people and machines, particularly in areas such as shops, lecture rooms, data processing areas etc.

Temperature (°C)

		Maximum	Minimum
Cooling Operation	Indoor	32 DB/23 WB	21 DB/15 WB
	Outdoor	50 DB *	-5 DB *
Heating Operation	Indoor	27 DB	15 DB
	Outdoor	15 WB *	-20 WB *

DB: Dry Bulb, WB: Wet Bulb

* The temperature may change depending on the outdoor unit.

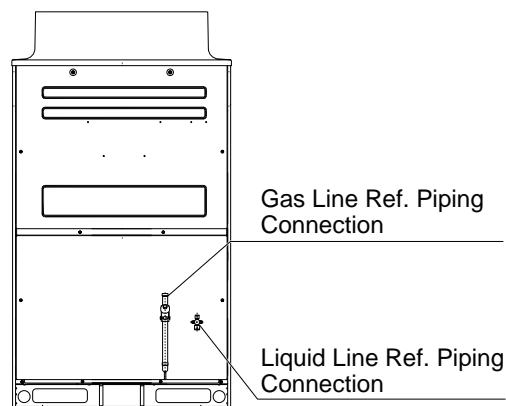
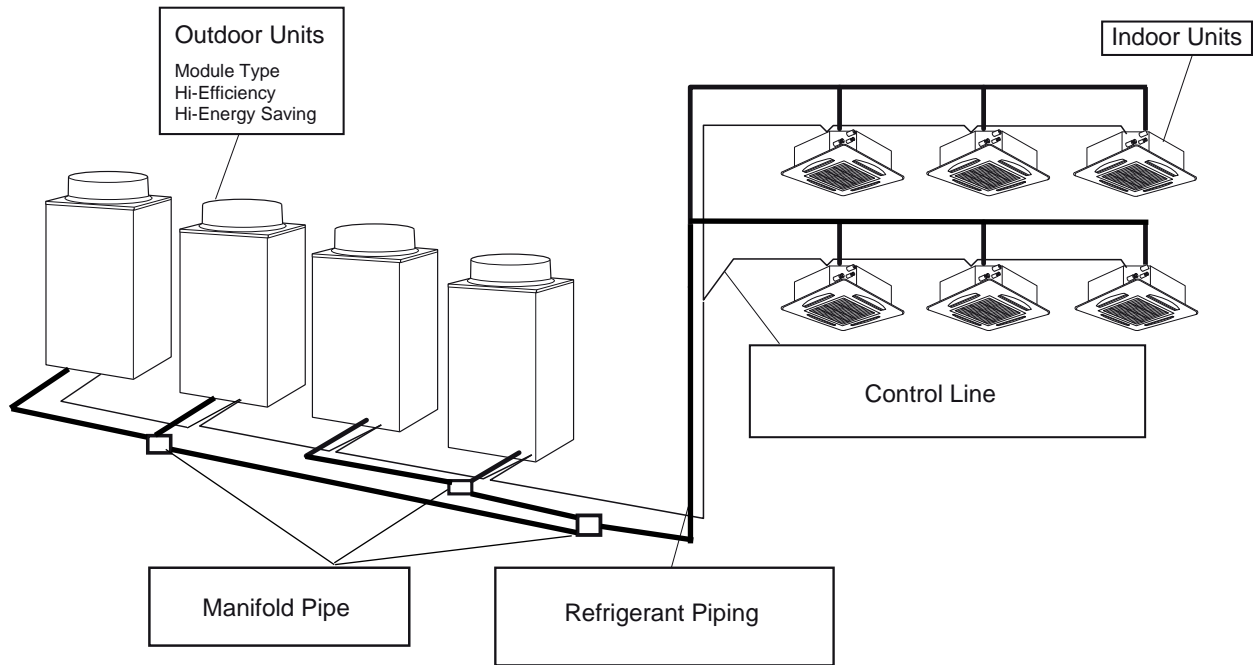


Installation Altitude

This unit has been designed for a installation altitude below 1000m.

System Configuration / Appearance

CCU Galactic offers 5 types of modular outdoor units. By combining units from a wide selection of models, you can create a custom air conditioning environment to satisfy your specific building conditions. Outdoor unit capacity has been extended up to 64HP by combining the base units (max. 4).



Various Indoor Units and Combinations

The following indoor units can be combined with the outdoor unit.

Table 1.1 Indoor Unit Type List

Indoor unit has been added to a total of 13 categories to meet the needs of various types of buildings (5kBTu/h to 96kBTu/h).

Indoor Unit Type	Nominal Power(kBTu/h)																	
	05	07	09	12	14	15	17	18	19	22	24	27	30	38	48	54	76	96
Ceiling Ducted Type (Low Static Pressure)		○	○	○	○		○	○		○	○	○	○	○	○	○	○	○
Ceiling Ducted Type (High Static Pressure)		○	○	○	○		○	○		○	○	○	○	○	○	○	○	○
Low-Height Ceiling Ducted Type		○	○	○	○		○	○		○	○							
Low-Height Ceiling Ducted Type (DC)	○	○	○	○	○		○	○		○	○							
Slim Ceiling Ducted Type		○	○	○	○													
1-Way Cassette Type		○	○	○	○		○			○								
2-Way Cassette Type		○	○	○	○			○			○							
4-Way Cassette Type			○	○	○		○	○		○	○	○	○	○	○	○		
Compact 4-Way Cassette Type	○	○	○	○		○	○		○									
Wall-Mounted Type		○	○	○	○		○	○		○	○							
Ceiling and Floor Type							○	○		○	○	○	○	○	○			
Floor-Concealed Type			○		○			○			○							
Console Type	○	○	○	○		○	○											

○ Available

- The number of connectable indoor unit with the outdoor unit is as follows. Comply with the condition as follows when installing the unit.
- A maximum total capacity of 150% and a minimum total capacity of 50% can be obtained by combination of the indoor units when compared with the nominal outdoor unit capacity.

Combination

Able to Connect a Set of Outdoor Unit with up to 48 Indoor Units

Utilizing an inverter control, a wide range of operation capacity control is also available. A maximum total combination horsepower of 130% and a minimum total combination horsepower of 50% can be chosen by combination of the indoor units when compared with the nominal outdoor unit capacity. Therefore, the new system can meet individual air conditioning requirements in most office buildings

Model (KBtu/h)	Min. Capacity at Individual Operation (KBtu/h)	Max. Number of Connectable I.U.	Recommended Number of Connectable I.U.	Range of Combination Capacity
76	07	13	8	50 to 130%
96		16	10	
114		19	10	
136		23	16	
154		26	16	
172		26	16	
190		33	18	
210		36	20	
229		40	26	
250		43	26	
268		47	32	
290		50	32	
307		53	32	
324		56	32	
343		59	32	
365		64	38	
386		64	38	
404		64	38	
420		64	38	
444		64	38	
460		64	38	
480		64	38	
500		64	38	
520		64	38	
540		64	38	
560		64	38	
580	64	38		
600	64	38		
620	64	38		

NOTES:

1. For the system which all indoor units are operated simultaneously, the total indoor unit capacity should be less or equal to the outdoor unit capacity. If not, poor performance or narrow operation range at overload may occur.
2. For the system which all indoor units are not operated simultaneously, the total indoor unit capacity is available up to 130% against the outdoor unit capacity.

3. Specifications

Model			GUC-76Z-H	GUC-96Z-H	GUC-114Z-H
Power Supply			AC 3Φ, 380~415V/50Hz		
Cooling Operation	Nominal Cooling Capacity	KBtu/h	76.5	95.6	114.3
		kW	22.4	28.0	33.5
	Power Consumption	kW	5.25	7.31	8.57
	EER	-	4.27	3.98	3.84
Heating Operation	Nominal Heating Capacity	KBtu/h	85.3	107.5	128.0
		kW	25.0	31.5	37.5
	Nom.Power Consumption	kW	5.62	7.61	8.89
	Nom.COP	-	4.55	4.30	4.30
Cabinet Color (Munsell Code)		-	Ivory White		
Maximum Sound Pressure Level [Overall A Scale] (Night-Shift)		dB(A)	62 (54)	64 (55)	64 (56)
Outer Dimensions Height x Width x Depth		mm	1,720 x 950 x 750	1,720 x 950 x 750	1,720 x 1,210 x 750
Net Weight		kg	197	197	224
Gross Weight		kg	223	223	248
Refrigerant		-	R410A		
Refrigerant Flow Control		-	Micro-Computer Control Expansion Valve		
Compressor		-	Hermetic (Scroll)		
	Quantity	-	1	1	1
	Input (Pole)	kW	5.25(6)	5.25(6)	6.50(6)
Heat Exchanger		-	Multi-Pass Cross-Finned Tube		
Condenser Fan			Propeller Fan		
	Quantity	-	1	1	1
	Air Flow Rate	m ³ /min	155	170	175
	Motor Output (Pole)	kW	0.75(8)	0.75(8)	0.75(8)
Main Refrigerant Piping	Liquid Line	mm (in.)	Φ9.53 (3/8)	Φ9.53 (3/8)	Φ12.7 (1/2)
	Gas Line	mm (in.)	Φ19.05 (3/4)	Φ22.2 (7/8)	Φ25.4 (1)
Max.Indoor Unit Connectable		-	13	16	19
Refrigerant Charge		kg	6.5	6.5	9.0
Packing Dimensions Height x Width x Depth		mm	1,882 x 1,018 x 828	1,882 x 1,018 x 828	1,882 x 1,278 x 828
Approximate Packing Measurement			1.59	1.59	1.59

NOTES:

- The cooling and heating performances are the values when combined with our specified indoor units.

Cooling Operation Conditions

Indoor Air Inlet Temperature: 27°C DB (80°F DB)
 19.0°C WB (66.2°F WB)
 Outdoor Air Inlet Temperature: 35°C DB (95°F DB)
 Piping Length: 7.5 Meters Piping Lift: 0 Meter

Heating Operation Conditions

Indoor Air Inlet Temperature: 20°C DB (68°F DB)
 Outdoor Air Inlet Temperature: 7°C DB (45°F DB)
 6°C WB (43°F WB)

- The sound pressure is based on the following conditions.
 1 Meter from the unit service cover surface, and 1.5 Meters from floor level.
 The above data is based on the cooling mode.
 The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.
- Except for the specified combination in the table (172~620), there is no other combination of the base unit.
- The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.
- Power supply.
 AC 3 φ, 380~415V/50Hz

Model		GUC-136Z-H	GUC-154Z-H	GUC-172Z-H	
Combination		-	-	GUC-76Z-H GUC-96Z-H	
Power Supply		AC 3Φ, 380~415V/50Hz			
Cooling Operatin	Nominal Cooling Capacity	KBtu/h	136.5	153.5	172.0
		kW	40.0	45.0	50.4
	Power Consumption	kW	11.05	13.16	12.56
	EER	-	3.30	3.26	4.10
Heating Operatin	Nominal Heating Capacity	KBtu/h	153.5	170.6	192.8
		kW	45.0	50.0	56.5
	Nom.Power Consumption	kW	11.08	12.47	13.23
	Nom.COP	-	3.80	3.55	4.41
Cabinet Color (Munsell Code)		-	Ivory White		
Maximum Sound Pressure Level [Overall A Scale] (Night-Shift)		dB(A)	65 (57)	66 (58)	66(57)
Outer Dimensions Height x Width x Depth		mm	1,720 x 1,210 x 750	1,720 x 1,210 x 750	1,720 x 1,900 x 750
Net Weight		kg	227	247	197 + 197
Gross Weight		kg	250	272	223 + 223
Refrigerant		-	R410A		
Refrigerant Flow Control		-	Micro-Computer Control Expansion Valve		
Compressor		-	Hermetic (Scroll)		
	Quantity	-	1	1	1 + 1
	Input (Pole)	kW	7.64 (6)	7.64(6)	5.25 (6) + 5.25 (6)
Heat Exchanger		-	Multi-Pass Cross-Finned Tube		
Condenser Fan		-	Propeller Fan		
	Quantity	-	1	1	1 + 1
	Air Flow Rate	m ³ /min	190	190	155 + 170
	Motor Output (Pole)	kW	0.75 (8)	0.75 (8)	0.75 (8) + 0.75 (8)
Main Refrigerant Piping	Liquid Line	mm (in.)	Φ12.7 (1/2)	Φ12.7 (1/2)	Φ15.88 (5/8)
	Gas Line	mm (in.)	Φ25.4 (1)	Φ28.6 (1-1/8)	Φ28.6 (1-1/8)
Max.Indoor Unit Connectable		-	23	26	26
Refrigerant Charge		kg	9.0	10.5	13.0
Packing Dimensions Height x Width x Depth		mm	1,882 x 1,278 x 828	1,882 x 1,278 x 828	-
Approximate Packing Measurement			2.00	2.00	-

NOTES:

1. The cooling and heating performances are the values when combined with our specified indoor units.

Cooling Operation Conditions

Indoor Air Inlet Temperature: 27°C DB (80°F DB)
19.0°C WB (66.2°F WB)
Outdoor Air Inlet Temperature: 35°C DB (95°F DB)
Piping Length: 7.5 Meters Piping Lift: 0 Meter

Heating Operation Conditions

Indoor Air Inlet Temperature: 20°C DB (68°F DB)
Outdoor Air Inlet Temperature: 7°C DB (45°F DB)
6°C WB (43°F WB)

2. The sound pressure is based on the following conditions.

1 Meter from the unit service cover surface, and 1.5 Meters from floor level.

The above data is based on the cooling mode.

The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.

3. Except for the specified combination in the table (172~620), there is no other combination of the base unit.

4. The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.

5. Power supply.

AC 3φ, 380~415V/50Hz

Model			GUC-190Z-H	GUC-210Z-H	GUC-229Z-H
Combination			GUC-76Z-H GUC-114Z-H	GUC-96Z-H GUC-114Z-H	GUC-114Z-H GUC-114Z-H
Power Supply			AC 3Φ, 380~415V/50Hz		
Cooling Operatin	Nominal Cooling Capacity	KBtu/h	191.1	209.8	228.6
		kW	56.0	61.5	67.0
	Power Consumption	kW	13.82	15.88	17.14
	EER	-	4.01	3.90	3.84
Heating Operatin	Nominal Heating Capacity	KBtu/h	213.3	235.5	256.0
		kW	62.5	69.0	75.0
	Nom.Power Consumption	kW	14.51	16.5	17.78
	Nom.COP	-	4.40	4.30	4.30
Cabinet Color (Munsell Code)		-	Ivory White		
Maximum Sound Pressure Level [Overall A Scale] (Night-Shift)		dB(A)	68 (60)	68 (60)	68 (60)
Outer Dimensions Height x Width x Depth		mm	1,720 x 2,160 x 750	1,720 x 2,160 x 750	1,720 x 2,420 x 750
Net Weight		kg	197 + 224	197 + 224	224 + 224
Gross Weight		kg	223 + 248	223 + 248	248 + 248
Refrigerant		-	R410A		
Refrigerant Flow Control		-	Micro-Computer Control Expansion Valve		
Compressor		-	Hermetic (Scroll)		
	Quantity	-	1 + 1	1 + 1	1 + 1
	Input (Pole)	kW	5.25(6) +6.50 (6)	5.25 (6) +6.50 (6)	6.50 (6) + 6.50 (6)
Heat Exchanger		-	Multi-Pass Cross-Finned Tube		
Condenser Fan			Propeller Fan		
	Quantity	-	1 + 1	1 + 1	1 + 1
	Air Flow Rate	m ³ /min	155 + 175	170 + 175	175 + 175
	Motor Output (Pole)	kW	0.75 (8) + 0.75 (8)	0.75 (8) + 0.75 (8)	0.75 (8) + 0.75 (8)
Main Refrigerant Piping	Liquid Line	mm (in.)	Φ15.88 (5/8)	Φ15.88 (5/8)	Φ15.88 (5/8)
	Gas Line	mm (in.)	Φ28.6 (1-1/8)	Φ28.6 (1-1/8)	Φ28.6 (1-1/8)
Max.Indoor Unit Connectable		-	33	36	40
Refrigerant Charge		kg	15.5	15.5	18.0

NOTES:

1. The cooling and heating performances are the values when combined with our specified indoor units.

Cooling Operation Conditions

Indoor Air Inlet Temperature: 27°C DB (80°F DB)
19.0°C WB (66.2°F WB)
Outdoor Air Inlet Temperature: 35°C DB (95°F DB)
Piping Length: 7.5 Meters

Heating Operation Conditions

Indoor Air Inlet Temperature: 20°C DB (68°F DB)
Outdoor Air Inlet Temperature: 7°C DB (45°F DB)
6°C WB (43°F WB)

2. The sound pressure is based on the following conditions.

1 Meter from the unit service cover surface, and 1.5 Meters from floor level.

The above data is based on the cooling mode.

The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.

3. Except for the specified combination in the table (172~620), there is no other combination of the base unit.

4. The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.

5. Power supply.

AC 3φ, 380~415V/50Hz

Model		GUC-250Z-H		GUC-268Z-H		GUC-290Z-H		
Combination		GUC-114Z-H GUC-136Z-H		GUC-114Z-H GUC-154Z-H		GUC-136Z-H GUC-154Z-H		
Power Supply		AC 3Φ, 380~415V/50Hz						
Cooling Operatin	Nominal Cooling Capacity	KBtu/h	250.8	267.8	290.0			
		kW	73.5	78.5	85.0			
	Power Consumption	kW	19.62	21.73	24.21			
	EER	-	3.53	3.48	3.28			
Heating Operatin	Nominal Heating Capacity	KBtu/h	281.5	298.6	324.1			
		kW	82.5	87.5	95.0			
	Nom.Power Consumption	kW	19.97	21.36	23.55			
	Nom.COP	-	4.01	3.84	3.67			
Cabinet Color (Munsell Code)		-	Ivory White					
Maximum Sound Pressure Level [Overall A Scale] (Night-Shift)		dB(A)	68 (60)	69 (61)	69 (61)			
Outer Dimensions Height x Width x Depth		mm	1,720 x 2,420 x 750	1,720 x 2,420 x 750	1,720 x 2,420 x 750			
Net Weight		kg	224 + 227	224 + 247	227 + 247			
Gross Weight		kg	248 + 250	248 + 272	250 + 272			
Refrigerant		-	R410A					
Refrigerant Flow Control		-	Micro-Computer Control Expansion Valve					
Compressor		-	Hermetic (Scroll)					
		Quantity	-	1 + 1	1 + 1	1 + 1		
		Input (Pole)	kW	6.50 (6) + 7.64 (6)	6.50 (6) + 7.64 (6)	7.64 (6) + 7.64 (6)		
Heat Exchanger		-	Multi-Pass Cross-Finned Tube					
Condenser Fan		-	Propeller Fan					
		Quantity	-	1 + 1	1 + 1	1 + 1		
		Air Flow Rate	m ³ /min	175 + 190	175 + 190	190 + 190		
		Motor Output (Pole)	kW	0.75 (8) + 0.75 (8)	0.75 (8) + 0.75 (8)	0.75 (8) + 0.75 (8)		
Main Refrigerant Piping	Liquid Line	mm (in.)	Φ19.05 (3/4)	Φ19.05 (3/4)	Φ19.05 (3/4)			
	Gas Line	mm (in.)	Φ31.75 (1-1/4)	Φ31.75 (1-1/4)	Φ31.75 (1-1/4)			
Max.Indoor Unit Connectable		-	43	47	50			
Refrigerant Charge		kg	19.5	19.5	21.0			

NOTES:

- The cooling and heating performances are the values when combined with our specified indoor units.

<u>Cooling Operation Conditions</u> Indoor Air Inlet Temperature: 27°C DB (80°F DB) 19.0°C WB (66.2°F WB) Outdoor Air Inlet Temperature: 35°C DB (95°F DB) Piping Length: 7.5 Meters Piping Lift: 0 Meter	<u>Heating Operation Conditions</u> Indoor Air Inlet Temperature: 20°C DB (68°F DB) Outdoor Air Inlet Temperature: 7°C DB (45°F DB) 6°C WB (43°F WB)
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- The sound pressure is based on the following conditions.
1 Meter from the unit service cover surface, and 1.5 Meters from floor level.
The above data is based on the cooling mode.
The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.
- Except for the specified combination in the table (172~620), there is no other combination of the base unit.
- The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.
- Power supply.
AC 3φ, 380~415V/50Hz

Model			GUC-307Z-H	GUC-324Z-H	GUC-343Z-H
Combination			GUC-154Z-H GUC-154Z-H	GUC-96Z-H GUC-114Z-H GUC-114Z-H	GUC-114Z-H GUC-114Z-H GUC-114Z-H
Power Supply			AC 3Φ, 380~415V/50Hz		
Cooling Operatin	Nominal Cooling Capacity	KBtu/h	307.1	327.6	342.9
		kW	90.0	96.0	100.5
	Power Consumption	kW	26.32	24.45	25.71
	EER	-	3.26	3.92	3.84
Heating Operatin	Nominal Heating Capacity	KBtu/h	341.2	363.5	384.0
		kW	100.0	106.5	112.5
	Nom.Power Consumption	kW	24.94	25.39	26.67
	Nom.COP	-	3.55	4.30	4.30
Cabinet Color (Munsell Code)		-	Ivory White		
Maximum Sound Pressure Level [Overall A Scale] (Night-Shift)		dB(A)	69 (62)	70 (63)	70 (63)
Outer Dimensions Height x Width x Depth		mm	1,720 x 2,420 x 750	1,720 x 3,370 x 750	1,720 x 3,630 x 750
Net Weight		kg	247 + 247	197 + 224 + 224	224 + 224 + 224
Gross Weight		kg	272 + 272	223+248+248	248 + 248 + 248
Refrigerant		-	R410A		
Refrigerant Flow Control		-	Micro-Computer Control Expansion Valve		
Compressor		-	Hermetic (Scroll)		
	Quantity	-	1 + 1	1 + 1 + 1	1 + 1 + 1
	Input (Pole)	kW	7.64 (6) + 7.64 (6)	5.25 (6) + 6.50 (6)+6.50(6)	6.50 (6) + 6.50 (6)+6.50 (6)
Heat Exchanger		-	Multi-Pass Cross-Finned Tube		
Condenser Fan			Propeller Fan		
	Quantity	-	1 + 1	1 + 1 + 1	1 + 1 + 1
	Air Flow Rate	m ³ /min	190 + 190	170 + 175 + 175	175 + 175 + 175
	Motor Output (Pole)	kW	0.75 (8) + 0.75 (8)	0.75(8) + 0.75 (8) + 0.75 (8)	0.75 (8) + 0.75 (8) + 0.75 (8)
Main Refrigerant Piping	Liquid Line	mm (in.)	Φ19.05 (3/4)	Φ19.05 (3/4)	Φ19.05 (3/4)
	Gas Line	mm (in.)	Φ31.75 (1-1/4)	Φ31.75 (1-1/4)	Φ38.1 (1-1/2)
Max.Indoor Unit Connectable		-	53	56	59
Refrigerant Charge		kg	21.0	24.5	27.0

NOTES:

1. The cooling and heating performances are the values when combined with our specified indoor units.

Cooling Operation Conditions

Indoor Air Inlet Temperature: 27°C DB (80°F DB)
19.0°C WB (66.2°F WB)
Outdoor Air Inlet Temperature: 35°C DB (95°F DB)
Piping Length: 7.5 Meters

Heating Operation Conditions

Indoor Air Inlet Temperature: 20°C DB (68°F DB)
Outdoor Air Inlet Temperature: 7°C DB (45°F DB)
6°C WB (43°F WB)

2. The sound pressure is based on the following conditions.

1 Meter from the unit service cover surface, and 1.5 Meters from floor level.

The above data is based on the cooling mode.

The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.

3. Except for the specified combination in the table (172~620), there is no other combination of the base unit.

4. The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.

5. Power supply.

AC 3φ, 380~415V/50Hz

Model	GUC-365Z-H		GUC-386Z-H		GUC-404Z-H	
Combination	GUC-114Z-H GUC-114Z-H GUC-136Z-H		GUC-114Z-H GUC-114Z-H GUC-154Z-H		GUC-114Z-H GUC-136Z-H GUC-154Z-H	
Power Supply	AC 3Φ, 380~415V/50Hz					
Cooling Operatin	Nominal Cooling Capacity	KBtu/h	365.1	385.6	404.3	
		kW	107.0	113.0	118.5	
	Power Consumption	kW	28.19	30.3	32.78	
	EER	-	3.62	3.61	3.42	
Heating Operatin	Nominal Heating Capacity	KBtu/h	409.5	426.6	452.1	
		kW	120.0	125.0	132.5	
	Nom.Power Consumption	kW	28.86	30.25	32.44	
	Nom.COP	-	4.10	3.97	3.83	
Cabinet Color (Munsell Code)	-	Ivory White				
Maximum Sound Pressure Level [Overall A Scale] (Night-Shift)	dB(A)	71 (64)	71 (64)	71 (64)		
Outer Dimensions Height x Width x Depth	mm	1,720 x 3,630 x 750	1,720 x 3,630 x 750	1,720 x 3,630 x 750		
Net Weight	kg	224 + 224 + 227	224 + 224 + 247	224 + 227 + 247		
Gross Weight	kg	248 + 248 + 250	248 + 248 + 272	248 + 250 + 272		
Refrigerant	-	R410A				
Refrigerant Flow Control	-	Micro-Computer Control Expansion Valve				
Compressor	-	Hermetic (Scroll)				
	Quantity	-	1 + 1 + 1	1 + 1 + 1	1 + 1 + 1	
	Input (Pole)	kW	6.50 (6) + 6.50 (6)+7.64 (6)	6.50 (6) + 6.50 (6)+7.64 (6)	6.50 (6) + 7.64 (6)+7.64 (6)	
Heat Exchanger	-	Multi-Pass Cross-Finned Tube				
Condenser Fan	-	Propeller Fan				
	Quantity	-	1 + 1 + 1	1 + 1 + 1	1 + 1 + 1	
	Air Flow Rate	m ³ /min	175 + 175 + 190	175 + 175 + 190	175 + 190 + 190	
	Motor Output (Pole)	kW	0.75 (8) + 0.75(8) + 0.75 (8)	0.75 (8) + 0.75 (8) + 0.75 (8)	0.75 (8) + 0.75 (8) + 0.75 (8)	
Main Refrigerant Piping	Liquid Line	mm (in.)	Φ19.05 (3/4)	Φ19.05 (3/4)	Φ19.05 (3/4)	
	Gas Line	mm (in.)	Φ38.1 (1-1/2)	Φ38.1 (1-1/2)	Φ38.1 (1-1/2)	
Max.Indoor Unit Connectable	-	64	64	64		
Refrigerant Charge	kg	28.5	28.5	30.0		

NOTES:

1. The cooling and heating performances are the values when combined with our specified indoor units.

Cooling Operation Conditions

Indoor Air Inlet Temperature: 27°C DB (80°F DB)
19.0°C WB (66.2°F WB)
Outdoor Air Inlet Temperature: 35°C DB (95°F DB)
Piping Length: 7.5 Meters
Piping Lift: 0 Meter

Heating Operation Conditions

Indoor Air Inlet Temperature: 20°C DB (68°F DB)
Outdoor Air Inlet Temperature: 7°C DB (45°F DB)
6°C WB (43°F WB)

2. The sound pressure is based on the following conditions.

1 Meter from the unit service cover surface, and 1.5 Meters from floor level.

The above data is based on the cooling mode.

The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.

3. Except for the specified combination in the table (172~620), there is no other combination of the base unit.

4. The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.

5. Power supply.

AC 3φ, 380~415V/50Hz

Model	GUC-420Z-H		GUC-444Z-H	GUC-460Z-H	
Combination	GUC-114Z-H GUC-154Z-H GUC-154Z-H		GUC-136Z-H GUC-154Z-H GUC-154Z-H	GUC-154Z-H GUC-154Z-H GUC-154Z-H	
Power Supply	AC 3Φ, 380~415V/50Hz				
Cooling Operatin	Nominal Cooling Capacity	KBtu/h	421.1	443.6	460.6
		kW	123.5	130.0	135.0
	Power Consumption	kW	34.89	37.37	39.48
	EER	-	3.40	3.27	3.26
Heating Operatin	Nominal Heating Capacity	KBtu/h	469.2	494.7	511.8
		kW	137.5	145.0	150.0
	Nom.Power Consumption	kW	33.83	36.02	37.41
	Nom.COP	-	3.73	3.63	3.55
Cabinet Color (Munsell Code)	-		Ivory White		
Maximum Sound Pressure Level [Overall A Scale] (Night-Shift)	dB(A)	72 (65)	72 (65)	72 (65)	
Outer Dimensions Height x Width x Depth	mm	1,720 x 3,630 x 750	1,720 x 3,630 x 750	1,720 x 3,630 x 750	
Net Weight	kg	224 + 247 +247	227 + 247 +247	247 + 247 +247	
Gross Weight	kg	248 + 272 + 272	250 + 272 + 272	272 + 272 + 272	
Refrigerant	-	R410A			
Refrigerant Flow Control	-	Micro-Computer Control Expansion Valve			
Compressor	-		Hermetic (Scroll)		
	Quantity	-	1 + 1 + 1	1 + 1 + 1	1 + 1 + 1
	Input (Pole)	kW	6.50(6) + 7.64 (6)+7.64 (6)	7.64 (6) +7.64 (6)+7.64 (6)	7.64 (6) + 7.64 (6)+7.64 (6)
Heat Exchanger	-	Multi-Pass Cross-Finned Tube			
Condenser Fan	-		Propeller Fan		
	Quantity	-	1 + 1 + 1	1 + 1 + 1	1 + 1 + 1
	Air Flow Rate	m ³ /min	175 + 190 + 190	190 + 190 + 190	190 + 190 + 190
	Motor Output (Pole)	kW	0.75 (8) + 0.75 (8) + 0.75 (8)	0.75 (8) + 0.75 (8) + 0.75 (8)	0.75 (8) + 0.75 (8) + 0.75 (8)
Main Refrigerant Piping	Liquid Line	mm (in.)	Φ19.05 (3/4)	Φ19.05 (3/4)	Φ19.05 (3/4)
	Gas Line	mm (in.)	Φ38.1 (1-1/2)	Φ38.1 (1-1/2)	Φ38.1 (1-1/2)
Max.Indoor Unit Connectable	-	64	64	64	
Refrigerant Charge	kg	30.0	31.5	31.5	

NOTES:

1. The cooling and heating performances are the values when combined with our specified indoor units.

Cooling Operation Conditions

Indoor Air Inlet Temperature: 27°C DB (80°F DB)
19.0°C WB (66.2°F WB)

Outdoor Air Inlet Temperature: 35°C DB (95°F DB)
Piping Length: 7.5 Meters Piping Lift: 0 Meter

Heating Operation Conditions

Indoor Air Inlet Temperature: 20°C DB (68°F DB)
Outdoor Air Inlet Temperature: 7°C DB (45°F DB)
6°C WB (43°F WB)

2. The sound pressure is based on the following conditions.

1 Meter from the unit service cover surface, and 1.5 Meters from floor level.

The above data is based on the cooling mode.

The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.

3. Except for the specified combination in the table (172~620), there is no other combination of the base unit.

4. The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.

5. Power supply.

AC 3φ, 380~415V/50Hz

Model		GUC-480Z-H		GUC-500Z-H		GUC-520Z-H	
Combination		GUC-114Z-H GUC-114Z-H GUC-114Z-H GUC-136Z-H		GUC-114Z-H GUC-114Z-H GUC-136Z-H GUC-136Z-H		GUC-114Z-H GUC-114Z-H GUC-136Z-H GUC-154Z-H	
Power Supply				AC 3Φ, 380~415V/50Hz			
Cooling Operatin	Nominal Cooling Capacity	KBtu/h	479.0	498.2	516.9		
		kW	140.4	146.0	151.5		
	Power Consumption	kW	36.76	39.24	41.35		
	EER	-	3.66	3.50	3.49		
Heating Operatin	Nominal Heating Capacity	KBtu/h	534.0	556.2	576.6		
		kW	156.5	163.0	169.0		
	Nom.Power Consumption	kW	37.75	39.94	41.33		
	Nom.COP	-	4.12	3.96	3.90		
Cabinet Color (Munsell Code)		-		Ivory White			
Maximum Sound Pressure Level [Overall A Scale] (Night-Shift)		dB(A)		73 (66)	73 (66)	73 (66)	
Outer Dimensions Height x Width x Depth		mm		1,720 x 4,840 x 750	1,720 x 4,840 x 750	1,720 x 4,840 x 750	
Net Weight		kg		224+224+224+227	224+224+227+227	224+224+227+247	
Gross Weight		kg		248+248+248+250	248+248+250+250	248+248+250+272	
Refrigerant		-		R410A			
Refrigerant Flow Control		-		Micro-Computer Control Expansion Valve			
Compressor		-		Hermetic (Scroll)			
	Quantity	-		1 + 1 + 1 + 1	1 + 1 + 1 + 1	1 + 1 + 1 + 1	
	Input (Pole)	kW		6.50(6)+ 6.50(6)+6.50(6)+7.64(6)	6.50(6)+ 6.50(6)+7.64(6)+7.64(6)	6.50(6)+ 6.50(6)+7.64(6)+7.64(6)	
Heat Exchanger		-		Multi-Pass Cross-Finned Tube			
Condenser Fan				Propeller Fan			
	Quantity	-		1 + 1 + 1 + 1	1 + 1 + 1 + 1	1 + 1 + 1 + 1	
	Air Flow Rate	m ³ /min		175+175+175+190	175+175+190+190	175+175+190+190	
	Motor Output (Pole)	kW		0.75 (8) *4	0.75 (8) *4	0.75 (8) *4	
Main Refrigerant Piping	Liquid Line	mm (in.)		Φ22.2	Φ22.2	Φ22.2	
	Gas Line	mm (in.)		Φ41.3	Φ41.3	Φ41.3	
Max.Indoor Unit Connectable		-		64	64	64	
Refrigerant Charge		kg		36.0	36.0	37.5	

NOTES:

- The cooling and heating performances are the values when combined with our specified indoor units.

Cooling Operation Conditions Indoor Air Inlet Temperature: 27°C DB (80°F DB) 19.0°C WB (66.2°F WB) Outdoor Air Inlet Temperature: 35°C DB (95°F DB) Piping Length: 7.5 Meters	Heating Operation Conditions Indoor Air Inlet Temperature: 20°C DB (68°F DB) Outdoor Air Inlet Temperature: 7°C DB (45°F DB) 6°C WB (43°F WB) Piping Lift: 0 Meter
--	---
- The sound pressure is based on the following conditions.
 1 Meter from the unit service cover surface, and 1.5 Meters from floor level.
 The above data is based on the cooling mode.
 The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.
- Except for the specified combination in the table (172~620), there is no other combination of the base unit.
- The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.
- Power supply.
 AC 3φ, 380~415V/50Hz

Model	GUC-540Z-H		GUC-560Z-H		GUC-580Z-H	
Combination	GUC-114Z-H GUC-114Z-H GUC-154Z-H GUC-154Z-H		GUC-114Z-H GUC-136Z-H GUC-154Z-H GUC-154Z-H		GUC-114Z-H GUC-154Z-H GUC-154Z-H GUC-154Z-H	
Power Supply	AC 3Φ, 380~415V/50Hz					
Cooling Operatin	Nominal Cooling Capacity	KBtu/h	535.7	557.9	574.9	
		kW	157.0	163.5	168.5	
	Power Consumption	kW	43.46	45.94	48.05	
	EER	-	3.48	3.37	3.36	
Heating Operatin	Nominal Heating Capacity	KBtu/h	597.1	622.7	639.8	
		kW	175.0	182.5	187.5	
	Nom.Power Consumption	kW	42.72	44.91	46.3	
	Nom.COP	-	3.84	3.75	3.68	
Cabinet Color (Munsell Code)	-	Ivory White				
Maximum Sound Pressure Level [Overall A Scale] (Night-Shift)	dB(A)	73 (66)	74 (67)	74 (67)		
Outer Dimensions Height x Width x Depth	mm	1,720 x 4,840 x 750	1,720 x 4,840 x 750	1,720 x 4,84 x 750		
Net Weight	kg	224 + 224 + 247 +247	224 + 227 + 247 +247	224 + 247 + 247 +247		
Gross Weight	kg	248 + 248 + 272 + 272	248+ 250+ 272 + 272	248 + 272 + 272 + 272		
Refrigerant	-	R410A				
Refrigerant Flow Control	-	Micro-Computer Control Expansion Valve				
Compressor	-	Hermetic (Scroll)				
	Quantity	-	1 + 1 + 1 + 1	1 + 1 + 1 + 1	1 + 1 + 1 + 1	
	Input (Pole)	kW	6.5(6) *2+ 7.64 (6)*2	6.5(6) + 7.64 (6)*3	5.25 (6) + 7.64 (6)*3	
Heat Exchanger	-	Multi-Pass Cross-Finned Tube				
Condenser Fan	-	Propeller Fan				
	Quantity	-	1 + 1 + 1 + 1	1 + 1 + 1 + 1	1 + 1 + 1 + 1	
	Air Flow Rate	m ³ /min	175 +175 + 190 + 190	175 +190 + 190 + 190	175 +190 + 190 + 190	
	Motor Output (Pole)	kW	0.75 (8) *4	0.75 (8) *4	0.75 (8) *4	
Main Refrigerant Piping	Liquid Line	mm (in.)	Φ22.2 (7/8)	Φ22.2 (7/8)	Φ22.2 (7/8)	
	Gas Line	mm (in.)	Φ41.3 (1-3/4)	Φ44.5 (1-3/4)	Φ44.5 (1-3/4)	
Max.Indoor Unit Connectable	-	64	64	64		
Refrigerant Charge	kg	39.0	39.0	40.5		

NOTES:

- The cooling and heating performances are the values when combined with our specified indoor units.

<u>Cooling Operation Conditions</u> Indoor Air Inlet Temperature: 27°C DB (80°F DB) 19.0°C WB (66.2°F WB) Outdoor Air Inlet Temperature: 35°C DB (95°F DB) Piping Length: 7.5 Meters Piping Lift: 0 Meter	<u>Heating Operation Conditions</u> Indoor Air Inlet Temperature: 20°C DB (68°F DB) Outdoor Air Inlet Temperature: 7°C DB (45°F DB) 6°C WB (43°F WB)
--	---
- The sound pressure is based on the following conditions.
1 Meter from the unit service cover surface, and 1.5 Meters from floor level.
The above data is based on the cooling mode.
The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.
- Except for the specified combination in the table (172~620), there is no other combination of the base unit.
- The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.
- Power supply.
AC 3φ, 380~415V/50Hz

Model		GUC-600Z-H		GUC-620Z-H	
Combination		GUC-136Z-H GUC-154Z-H GUC-154Z-H GUC-154Z-H		GUC-154Z-H GUC-154Z-H GUC-154Z-H GUC-154Z-H	
Power Supply		AC 3Φ, 380~415V/50Hz			
Cooling Operatin	Nominal Cooling Capacity	KBtu/h	597.1	614.2	
		kW	175.0	180.0	
	Power Consumption	kW	50.53	52.64	
		EER	-	3.27	3.26
Heating Operatin	Nominal Heating Capacity	KBtu/h	565.3	682.4	
		kW	195.0	200.0	
	Nom.Power Consumption	kW	48.49	49.88	
		Nom.COP		3.61	3.55
Cabinet Color (Munsell Code)		-	Ivory White		
Maximum Sound Pressure Level [Overall A Scale] (Night-Shift)		dB(A)	74 (67)	74 (67)	
Outer Dimensions Height x Width x Depth		mm	1,720 x 4,840 x 750	1,720 x 4,840 x 750	
Net Weight		kg	227 + 247 + 247 +247	247+ 247 + 247 +247	
Gross Weight		kg	250+ 272 + 272 + 272	272+ 272+ 272 + 272	
Refrigerant		-	R410A		
Refrigerant Flow Control		-	Micro-Computer Control Expansion Valve		
Compressor		-	Hermetic (Scroll)		
	Quantity	-	1 + 1 + 1 + 1	1 + 1 + 1 + 1	
	Input (Pole)	kW	7.64 (6)*4	7.64 (6)*4	
Heat Exchanger		-	Multi-Pass Cross-Finned Tube		
Condenser Fan		-	Propeller Fan		
	Quantity	-	1 + 1 + 1 + 1	1 + 1 + 1 + 1	
	Air Flow Rate	m ³ /min	190 +190 + 190 + 190	190 +190 + 190 + 190	
	Motor Output (Pole)	kW	0.75 (8) *4	0.75 (8) *4	
Main Refrigerant Piping	Liquid Line	mm (in.)	Φ22.2 (7/8)	Φ22.2 (7/8)	
	Gas Line	mm (in.)	Φ44.5 (1-3/4)	Φ44.5 (1-3/4)	
Max.Indoor Unit Connectable		-	64	64	
Refrigerant Charge		kg	40.5	42	

NOTES:

1. The cooling and heating performances are the values when combined with our specified indoor units.

Cooling Operation Conditions

Indoor Air Inlet Temperature: 27°C DB (80°F DB)
19.0°C WB (66.2°F WB)
Outdoor Air Inlet Temperature: 35°C DB (95°F DB)
Piping Length: 7.5 Meters
Piping Lift: 0 Meter

Heating Operation Conditions

Indoor Air Inlet Temperature: 20°C DB (68°F DB)
Outdoor Air Inlet Temperature: 7°C DB (45°F DB)
6°C WB (43°F WB)

2. The sound pressure is based on the following conditions.

1 Meter from the unit service cover surface, and 1.5 Meters from floor level.

The above data is based on the cooling mode.

The above data was measured in an anechoic chamber so that reflected sound should be taken into consideration in the field.

3. Except for the specified combination in the table (172~620), there is no other combination of the base unit.

4. The width of outer dimension, it is the value when each distance between the base outdoor units is specified to 20mm.

5. Power supply.

AC 3φ, 380~415V/50Hz

3.1 Component Data

Outdoor Heat Exchanger and Fan

<Base Unit>

Model			GUC-76Z-H	GUC-96Z-H	GUC-114Z-H	GUC-136Z-H	GUC-154Z-H
Heat Exchanger Type		-	Multi-Pass Cross Finned Tube				
Tube	Material	-	Copper Tube				
	Outer Diameter	mm	7.0	7.0	7.0	7.0	7.0
	Rows	-	2	2	2	2	3
	Number of Tube/Coil	-	136	136	136	136	204
Fin	Material	-	Aluminum				
	Pitch	mm	1.7	1.7	1.7	1.7	1.7
	Maximum Operating Pressure	MPa	4.15	4.15	4.15	4.15	4.15
	Total Face Area	m ²	2.43	2.43	2.80	2.80	2.80
	Number of Coil/Unit	-	1	1	1	1	1
Outdoor Fan		-	Large Diameter Fan (Propeller Fan)				
	Number/Unit	-	1	1	1	1	1
	Outer Diameter	mm	644	644	644	644	644
	Rotation	rpm	750	825	850	900	900
Outdoor Fan Motor		-	Drip-Proof Type Enclosure DC Motor				
	Nominal Output	W	750	750	750	750	750
	Quantity	-	1	1	1	1	1
	Insulation Class	-	E	E	E	E	E

<Combination of Base Unit>

Model			GUC-172Z-H	GUC-190Z-H	GUC-210Z-H	GUC-229Z-H	GUC-250Z-H
Heat Exchanger Type		-	Multi-Pass Cross Finned Tube				
Tube	Material	-	Copper Tube				
	Outer Diameter	mm	7.0	7.0	7.0	7.0	7.0
	Rows	-	2 + 2	2 + 2	2 + 2	2 + 2	3 + 2
	Number of Tube/Coil	-	136 + 136	136 + 136	136 + 136	136 + 136	136 + 136
Fin	Material	-	Aluminum				
	Pitch	mm	1.7	1.7	1.7	1.7	1.7
	Maximum Operating Pressure	MPa	4.15	4.15	4.15	4.15	4.15
	Total Face Area	m ²	2.43 + 2.43	2.43 + 2.80	2.43 + 2.80	2.80 + 2.80	2.80 + 2.80
	Number of Coil/Unit	-	2	2	2	2	2
Outdoor Fan		-	Large Diameter Fan (Propeller Fan)				
	Number/Unit	-	2	2	2	2	2
	Outer Diameter	mm	644 + 644	644 + 644	644 + 644	644 + 644	644 + 644
	Rotation	rpm	750 + 825	750 + 850	825 + 850	850 + 850	850 + 900
Outdoor Fan Motor		-	Drip-Proof Type Enclosure DC Motor				
	Nominal Output	W	750+750	750+750	750+750	750+750	750+750
	Quantity	-	2	2	2	2	2
	Insulation Class	-	E + E	E + E	E + E	E + E	E + E

Outdoor Heat Exchanger and Fan

<Combination of Base Unit>

Model		GUC-268Z-H	GUC-290Z-H	GUC-307Z-H	GUC-324Z-H	GUC-343Z-H	
Heat Exchanger Type	-	Multi-Pass Cross Finned Tube					
Tube	Material	Copper Tube					
	Outer Diameter	mm	7.0	7.0	7.0	7.0	7.0
	Rows	-	2 + 3	2 + 3	3 + 3	2 + 2 + 2	2 + 2 + 2
	Number of Tube/Coil	-	136 + 204	136 + 204	204 + 204	136 + 136 + 136	136 + 136 + 136
Fin	Material	Aluminum					
	Pitch	mm	1.7	1.7	1.7	1.7	1.7
	Maximum Operating Pressure	MPa	4.15	4.15	4.15	4.15	4.15
	Total Face Area	m ²	2.80 + 2.80	2.80 + 2.80	2.80 + 2.80	2.43 + 2.80 + 2.80	2.80 + 2.80 + 2.80
	Number of Coil/Unit	-	2	2	2	3	3
Outdoor Fan	-	Large Diameter Fan (Propeller Fan)					
Outdoor Fan	Number/Unit	-	2	2	2	3	3
	Outer Diameter	mm	644 + 644	644 + 644	644 + 644	644 + 644 + 644	644 + 644 + 644
	Rotation	rpm	850 + 900	900 + 900	900 + 900	825 + 850 + 850	850 + 850 + 850
Outdoor Fan Motor	-	Drip-Proof Type Enclosure DC Motor					
Outdoor Fan Motor	Nominal Output	W	750+750	750+750	750+750+750	750+750+750	750+750+750
	Quantity	-	2	2	2	3	3
	Insulation Class	-	E + E	E + E	E + E	E + E + E	E + E + E

<Combination of Base Unit>

Model		GUC-365Z-H	GUC-386Z-H	GUC-404Z-H	GUC-420Z-H	GUC-444Z-H	GUC-460Z-H	
Heat Exchanger Type	-	Multi-Pass Cross Finned Tube						
Tube	Material	Copper Tube						
	Outer Diameter	mm	7.0	7.0	7.0	7.0	7.0	
	Rows	-	2 + 2 + 2	2 + 2 + 3	2 + 2 + 3	2 + 3 + 3	2 + 3 + 3	3 + 3 + 3
	Number of Tube/Coil	-	136 + 136 + 136	136 + 136 + 204	136 + 136 + 204	136 + 204 + 204	136 + 204 + 204	204 + 204 + 204
Fin	Material	Aluminum						
	Pitch	mm	1.7	1.7	1.7	1.7	1.7	
	Maximum Operating Pressure	MPa	4.15	4.15	4.15	4.15	4.15	
	Total Face Area	m ²	2.80 + 2.80 + 2.80	2.80 + 2.80 + 2.80	2.80 + 2.80 + 2.80	2.80 + 2.80 + 2.80	2.80 + 2.80 + 2.80	2.80 + 2.80 + 2.80
	Number of Coil/Unit	-	3	3	3	3	3	3
Outdoor Fan	-	Large Diameter Fan (Propeller Fan)						
Outdoor Fan	Number/Unit	-	3	3	3	3	3	
	Outer Diameter	mm	644 + 644 + 644	644 + 644 + 644	644 + 644 + 644	644 + 644 + 644	644 + 644 + 644	644 + 644 + 644
	Rotation	rpm	850 + 850 + 900	850 + 850 + 900	850 + 900 + 900	850 + 900 + 900	900 + 900 + 900	900 + 900 + 900
Outdoor Fan Motor	-	Drip-Proof Type Enclosure DC Motor						
Outdoor Fan Motor	Nominal Output	W	750+750+750	750+750+750	750+750+750	750+750+750	750+750+750	750+750+750
	Quantity	-	3	3	3	3	3	3
	Insulation Class	-	E + E + E	E + E + E	E + E + E	E + E + E	E + E + E	E + E + E

Outdoor Heat Exchanger and Fan

<Combination of Base Unit>

Model		GUC-480Z-H	GUC-500Z-H	GUC-520Z-H	GUC-540Z-H	GUC-560Z-H	
Heat Exchanger Type	-	Multi-Pass Cross Finned Tube					
Tube	Material	Copper Tube					
	Outer Diameter	mm	7.0	7.0	7.0	7.0	
	Rows	-	2+2+2+2	2+2+2+2	2+2+2+3	2+2+3+3	2+2+3+3
	Number of Tube/Coil	-	136+136+136+136	136+136+136+136	136+136+136+204	136+136+204+204	136+136+204+204
Fin	Material	Aluminum					
	Pitch	mm	1.7	1.7	1.7	1.7	1.7
	Maximum Operating Pressure	MPa	4.15	4.15	4.15	4.15	4.15
	Total Face Area	m ²	2.8+2.8+2.8+2.8	2.8+2.8+2.8+2.8	2.8+2.8+2.8+2.8	2.8+2.8+2.8+2.8	2.8+2.8+2.8+2.8
	Number of Coil/Unit	-	1+1+1+1	1+1+1+1	1+1+1+1	1+1+1+1	1+1+1+1
Outdoor Fan	-	Large Diameter Fan (Propeller Fan)					
Outdoor Fan	Number/Unit	-	1+1+1+1	1+1+1+1	1+1+1+1	1+1+1+1	1+1+1+1
	Outer Diameter	mm	644+644+644+644	644+644+644+644	644+644+644+644	644+644+644+644	644+644+644+644
	Rotation	rpm	850+850+850+900	850+850+900+900	850+850+900+900	850+850+900+900	850+900+900+900
Outdoor Fan Motor	-	Drip-Proof Type Enclosure DC Motor					
Outdoor Fan Motor	Nominal Output	W	750+750+750+750	750+750+750+750	750+750+750+750	750+750+750+750	750+750+750+750
	Quantity	-	4	4	4	4	4
	Insulation Class	-	E+E+E+E	E+E+E+E	E+E+E+E	E+E+E+E	E+E+E+E

<Combination of Base Unit>

Model		GUC-580Z-H	GUC-600Z-H	GUC-620Z-H	
Heat Exchanger Type	-	Multi-Pass Cross Finned Tube			
Tube	Material	Copper Tube			
	Outer Diameter	mm	7.0	7.0	7.0
	Rows	-	2+3+3+3	2+3+3+3	3+3+3+3
	Number of Tube/Coil	-	136+204+204+204	136+204+204+204	204+204+204+204
Fin	Material	Aluminum			
	Pitch	mm	1.7	1.7	1.7
	Maximum Operating Pressure	MPa	4.15	4.15	4.15
	Total Face Area	m ²	2.8+2.8+2.8+2.8	2.8+2.8+2.8+2.8	2.8+2.8+2.8+2.8
	Number of Coil/Unit	-	1+1+1+1	1+1+1+1	1+1+1+1
Outdoor Fan	-	Large Diameter Fan (Propeller Fan)			
Outdoor Fan	Number/Unit	-	1+1+1+1	1+1+1+1	1+1+1+1
	Outer Diameter	mm	644+644+644+644	644+644+644+644	644+644+644+644
	Rotation	rpm	850+900+900+900	900+900+900+900	900+900+900+900
Outdoor Fan Motor	-	Drip-Proof Type Enclosure DC Motor			
Outdoor Fan Motor	Nominal Output	W	750+750+750+750	750+750+750+750	750+750+750+750
	Quantity	-	4	4	4
	Insulation Class	-	E+E+E+E	E+E+E+E	E+E+E+E

4. Safety and Control Device Setting

Model (kBtu/h)				76	96	114
For Compressor	High Pressure Switches	Type	-	Automatic Reset, Non-Adjustable (each one for each compressor)		
		Cut-Out	MPa	$4.15_{-0.20}^{-0.05}$	$4.15_{-0.20}^{-0.05}$	$4.15_{-0.20}^{-0.05}$
		Cut-in	MPa	$3.20_{-0.20}^{+0.15}$	$3.20_{-0.20}^{+0.15}$	$3.20_{-0.20}^{+0.15}$
	Fuse Capacity		A	40 × 2	40 × 2	40 × 2
	Oil Heater Capacity		W	40 × 2	40 × 2	40 × 2
	CCP Timer		-	Non-Adjustable		
	Setting Time		min	3	3	3
For DC Fan Module Fuse Capacity (380-415V 3N ~ 50Hz)			A	20 × 1	20 × 1	20 × 1

Model (kBtu/h)				136	154
For Compressor	High Pressure Switches	Type	-	Automatic Reset, Non-Adjustable (each one for each compressor)	
		Cut-Out	MPa	$4.15_{-0.20}^{-0.05}$	$4.15_{-0.20}^{-0.05}$
		Cut-in	MPa	$3.20_{-0.20}^{+0.15}$	$3.20_{-0.20}^{+0.15}$
	Fuse Capacity		A	63 × 2	63 × 2
	Oil Heater Capacity		W	40 × 2	40 × 2
	CCP Timer		-	Non-Adjustable	
	Setting Time		min	3	3
For DC Fan Module Fuse Capacity (380-415V 3N ~ 50Hz)			A	20 × 1	20 × 1

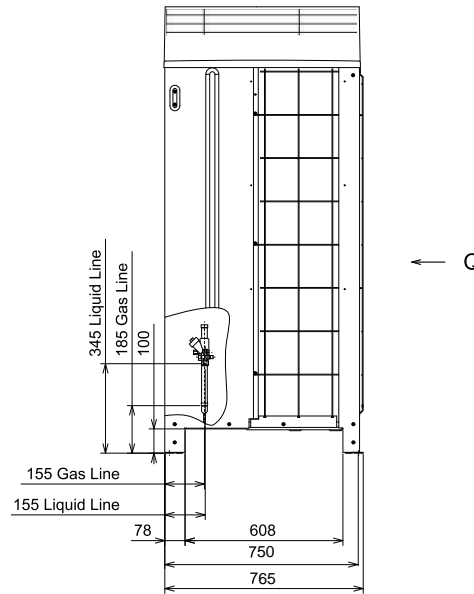
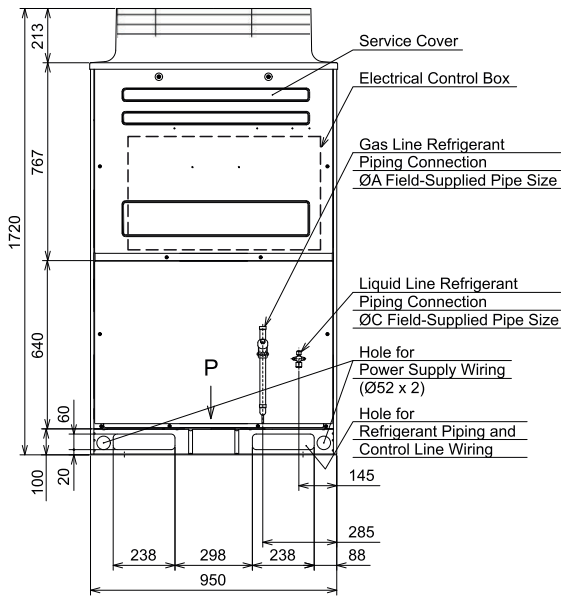
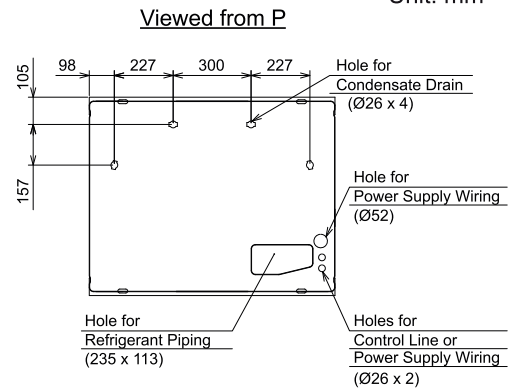
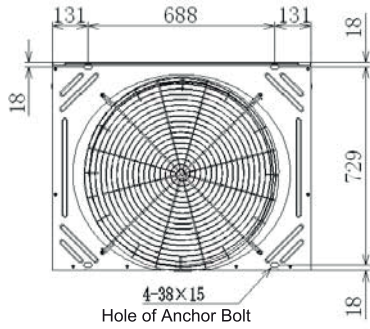
5. Engineering Data

5.1 Dimensional Data and Space Requirements

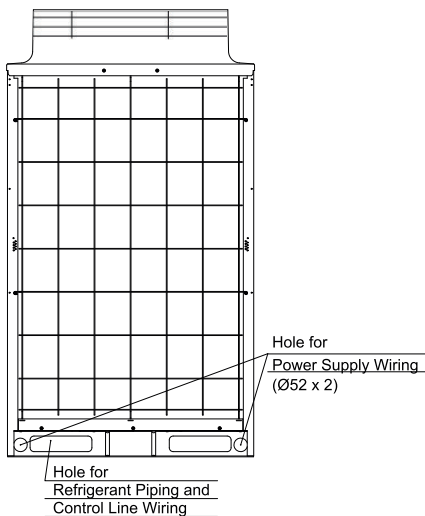
• Dimensional Data

Model: GUC -76*, GUC -96*

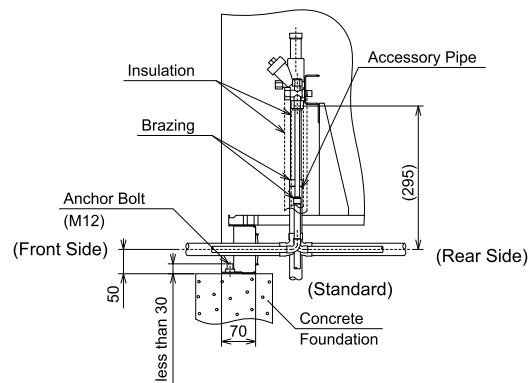
Unit: mm



Viewed from Q



Field Installation (Example)



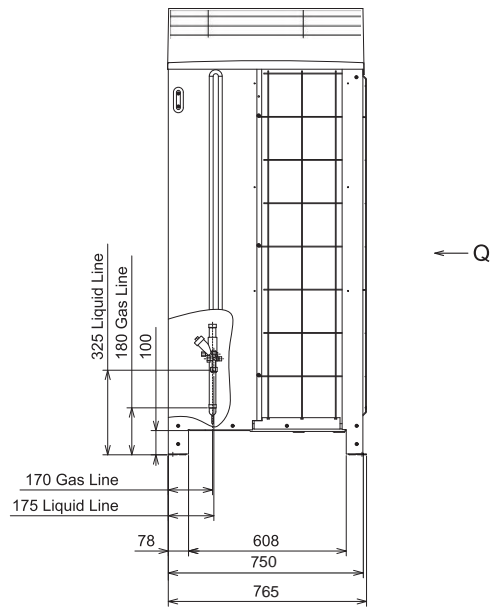
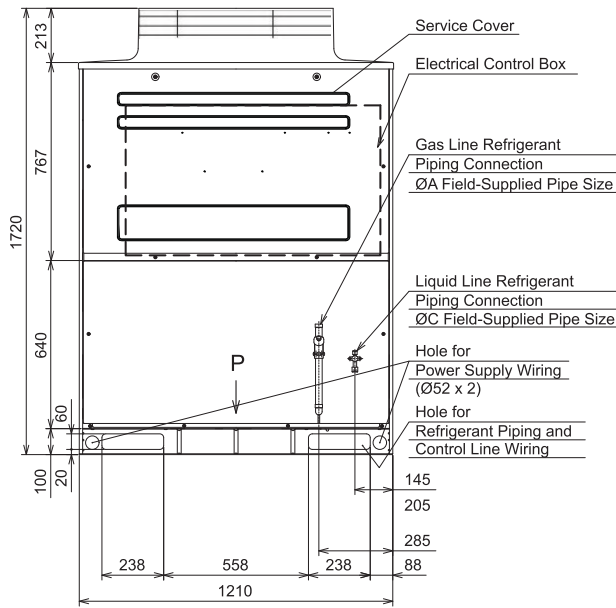
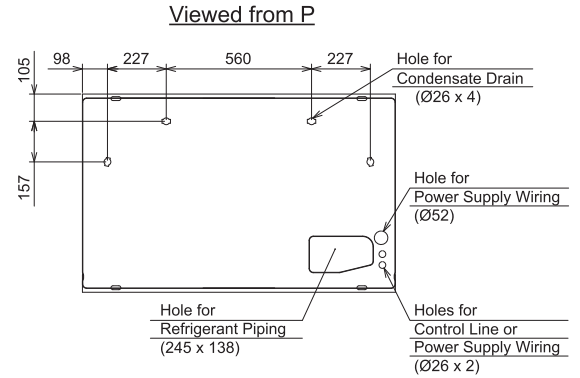
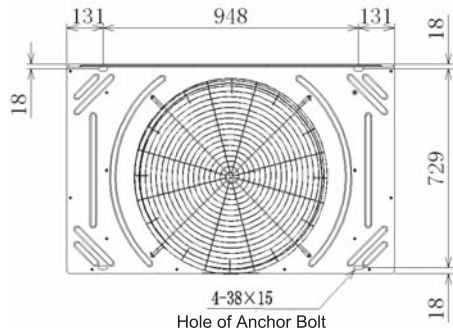
NOTES:

- Drain water is discharged from the unit during the operation.
 - Choose a place where well drainage is available. Provide a groove for drain.
 - Do not provide an upward slope from the unit to avoid reverse flow of the drain. Provide a second drain pan under the outdoor unit, to collect drain water securely.
 - Do not use the drain boss (optional) in a cold area. (Drain water in the drain pipe may be frozen and the drain pipe may crack.)
- The dimensions marked with * indicates the mounting pitch dimension for anchor bolts.

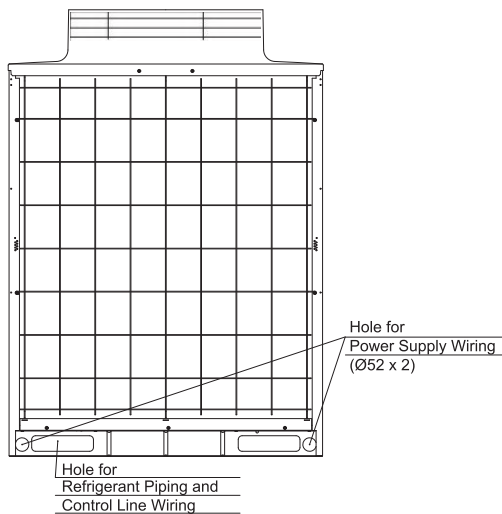
Dimension	A	B	C
Model			
GUC -76*	-	19.05	9.53
GUC -96*	-	22.2	9.53

Model: GUC -114*, GUC -136*, GUC-154*

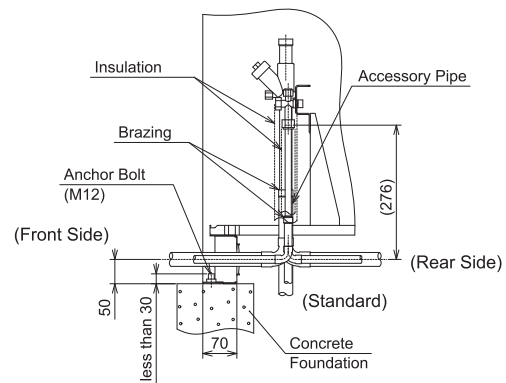
Unit: mm



Viewed from Q



Field Installation (Example)



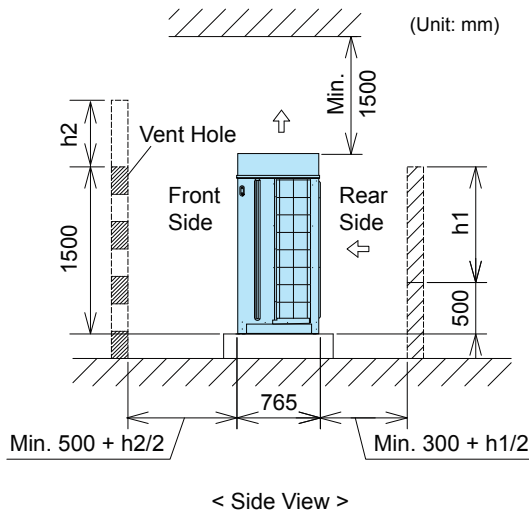
NOTES:

- Drain water is discharged from the unit during the operation.
 - Choose a place where well drainage is available. Provide a groove for drain.
 - Do not provide an upward slope from the unit to avoid reverse flow of the drain. Provide a second drain pan under the outdoor unit, to collect drain water securely.
 - Do not use the drain boss (optional) in a cold area. (Drain water in the drain pipe may be frozen and the drain pipe may crack.)
- The dimensions marked with * indicates the mounting pitch dimension for anchor bolts.

Dimension	A	B	C
Model			
GUC-114*	-	25.4	12.7
GUC-136*	-	25.4	12.7
GUC-154*	-	28.6	12.7

• Service Space

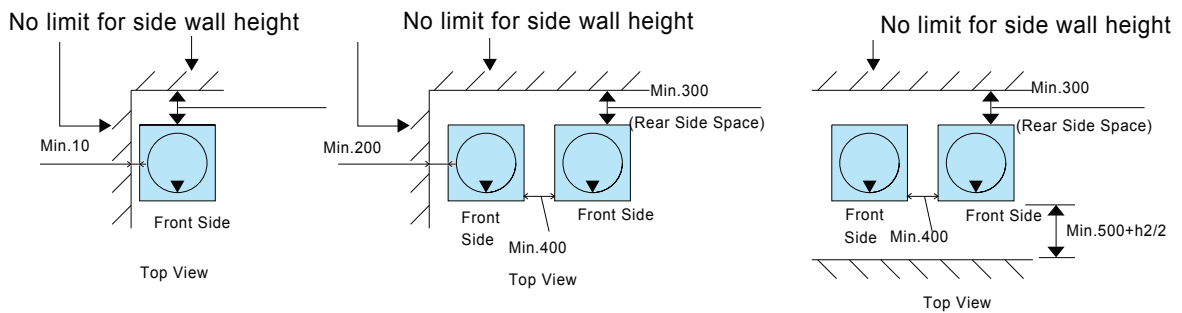
Make the service space when outdoor unit is installed as follows.



- In case of no walls at the front and the rear side of the unit, the space of 500mm for the front side and 300mm for the rear side is required.
- When the wall of front side is higher than 1,500mm, the space of $(500 + h2/2)$ mm for the front side is required.
- When the wall of rear side is higher than 500mm, the space of $(300 + h1/2)$ mm for the rear side is required.
- When install the wall in front of the unit, make the vent hole on the wall.
- When the space to the obstacle above the unit is less than 1,500mm or the space above the unit is closed, set up the duct at the air outlet side in order to prevent short circuit.
- When there are obstacles above the unit, the four (front, rear, right and left) sides of the unit shall be open in principle.

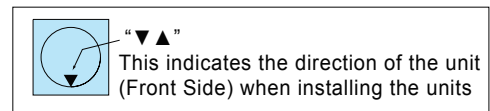
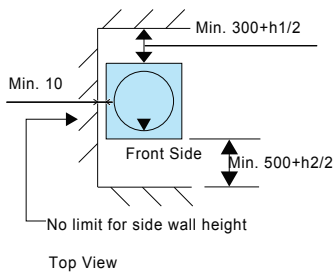
1) Walls on 2 Directions

In case that the units are installed adjacent to tall buildings and there are no walls in 2 directions, the minimum rear side space is 300mm.



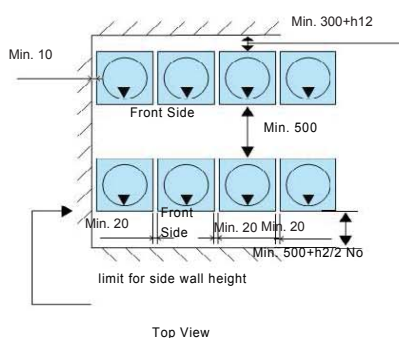
2) Walls on 3 Directions

• Single Installation

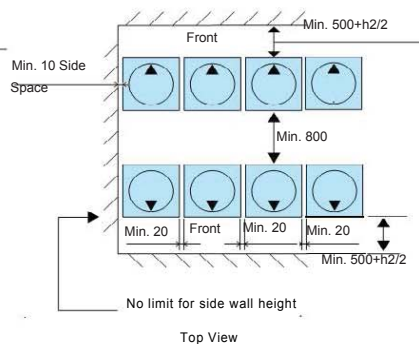


• Multiple / Serial Installation

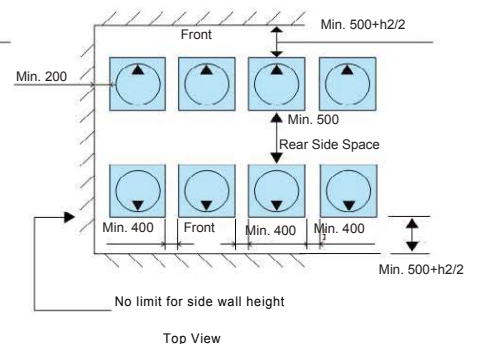
Installation in the Same Direction



Rear to Rear Installation 1

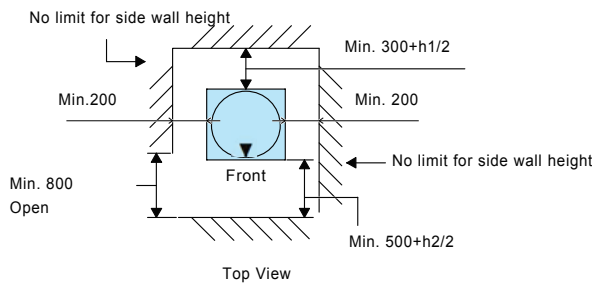


Rear to Rear Installation 2



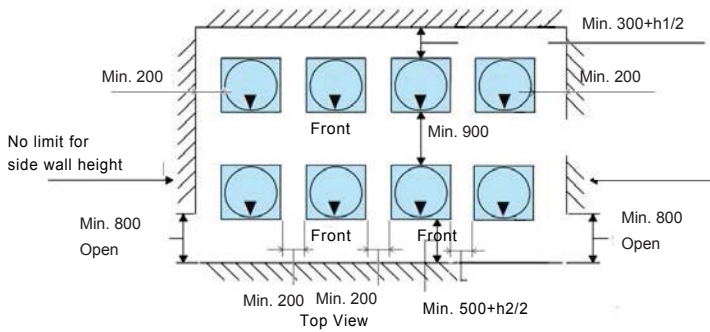
3) Walls on 4 Directions

- Single Installation

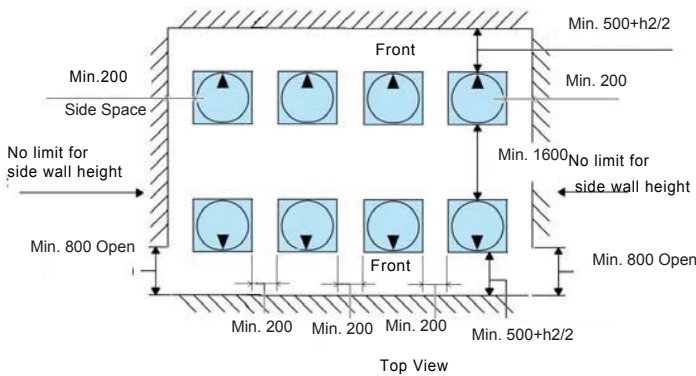


- Multiple / Serial Installation

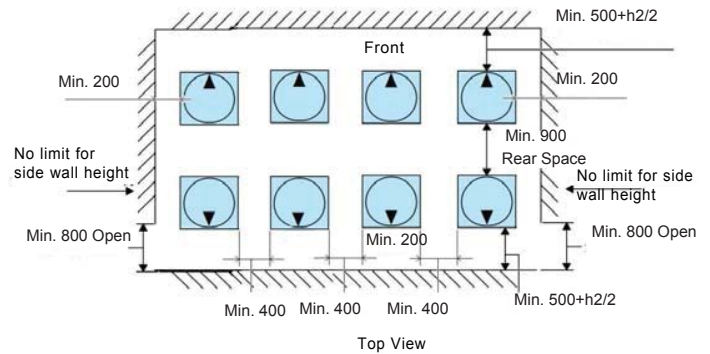
Installation in the Same Direction



Rear to Rear Installation 1

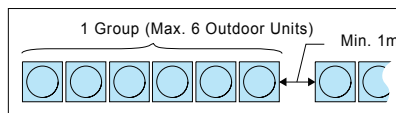


Rear to Rear Installation 2



NOTE

1. Keep the upper side open to prevent mutual interference of inlet and outlet air of each outdoor unit.
2. The figure dimensions are sufficient spaces around outdoor units for operation and maintenance at typical installing conditions as follows. [Operation Mode: Cooling Operation, Outside Temp.: 35°C]
In case that the outdoor unit ambient temperature is higher and also the short circuit is likely to occur compared to the installation condition, find an appropriate dimension by calculating air flow current.
3. For the multiple installation, 1 group allows 6 outdoor units (max.).
The space of 1m between each group is required.



4. Partly open a wall if the unit is surrounded by walls in four directions.

5.2 Refrigerant Piping Design Requirements

Manifold Pipe Selection

- Manifold Pipe (Optional Parts)(Standard Type) <Main Branch >

Item	Operation Type	Applicable Outdoor Unit		Model
		Outdoor Unit (kBtu/ h)	Outdoor Unit Number	
Manifold Pipe	for Cooling Changeover Operation	172 to 229	2	HFQ-M22F
		250 to 307	2	HFQ-M32F
		324 to 386	3	HFQ-M22F+HFQ-M32F
		404 to 460	3	HFQ-M32F+HFQ-M32F
		480 to 620	4	HFQ-M462F+HFQ-M32F+HFQ-M32F

- Manifold Pipe (Optional Parts) < Line Branch >

First Branch

Outdoor Unit (KBtu/h)	Model
76 and 96	HFQ-102F
114 to 154	HFQ-162F
172 to 229	HFQ-242F
250 to 460	HFQ-302F
480 to 620	HFQ-462F

Pipe Diameter and Branch Pipe after First Branch

Total Indoor Unit (KBtu/h)	Gas (φmm)	Liquid (φmm)	Model
Lower than 57	15.88	9.53	HFQ-102F
57 to 86	19.05	9.53	
87 to 114	22.2	9.53	
115 to 154	25.4	12.7	HFQ-162F
155 to 172	28.6	12.7	
173 to 250	28.6	15.88	HFQ-242F
251 to 343	31.75	19.05	HFQ-302F
344 to 460	38.1	19.05	
461 to 540	41.3	22.2	HFQ-462F
541 to 620	44.5	22.2	

Pipe Size

Piping Size of Outdoor Unit

(mm)

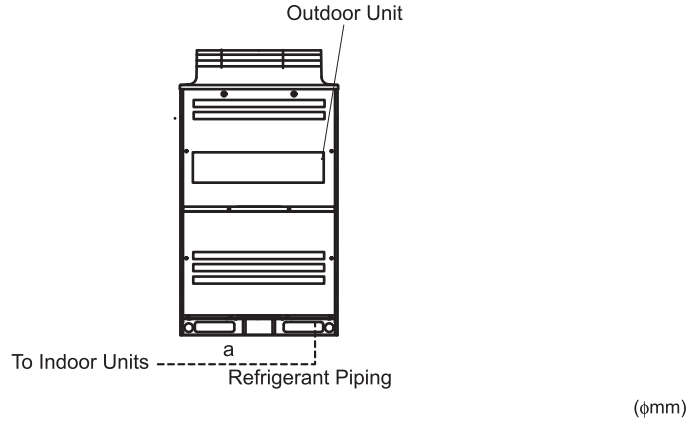
Model (KBtu/h)	Gas	Liquid
76	φ19.05	φ9.53
96	φ22.2	φ9.53
114	φ25.4	φ12.7
136		
154	φ28.6	φ12.7
172	φ28.6	φ15.88
190		
210		
229		
250	φ31.75	φ19.05
268		
290		
307		
324		
343	φ38.1	φ19.05
365		
386		
404		
420		
444		
460	φ41.3	φ22.2
480		
500		
520		
540	φ44.5	φ22.2
560		
580		
600		
620		

Piping Size of Indoor Unit

(mm)

Indoor Unit(KBtu/h)	Gas	Liquid
05 to 14	φ12.7	φ6.35
17 to 18	φ15.88	φ6.35
22 to 54	φ15.88	φ9.53
76	φ19.05	φ9.53
96	φ22.2	φ9.53

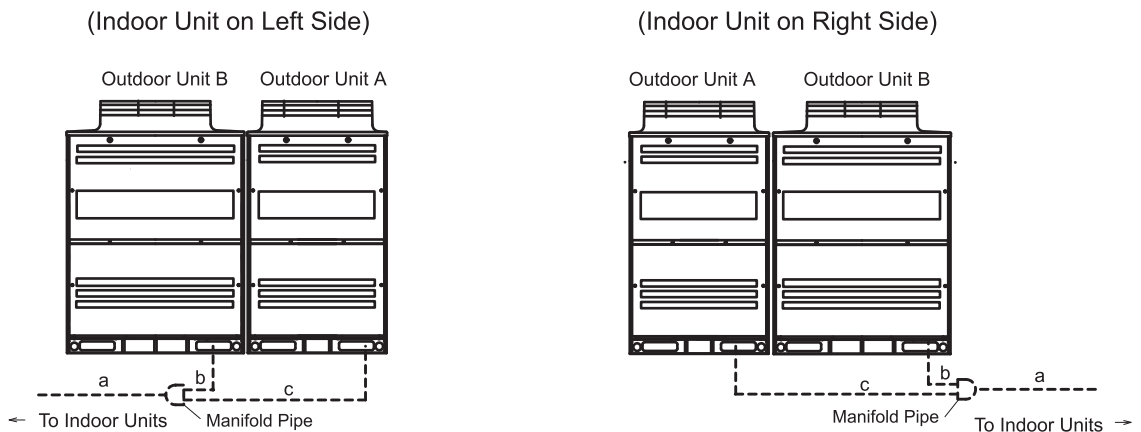
Piping Connection
Piping Size for Base Unit



Model (KBTu/h)		76	96	114	136	154	
Piping Size	a	Gas	19.05	22.2	25.4	25.4	28.6
		Liquid	9.53	9.53	12.7	12.7	12.7

Piping Size for Two Units Combination

< Figure for GUC-210Z-H >



(φmm)

Model		GUC-172Z-H	GUC-190Z-H	GUC-210Z-H	GUC-229Z-H	GUC-250Z-H	GUC-268Z-H	GUC-290Z-H	GUC-307Z-H	
Combination Unit	Outdoor Unit A	GUC-76Z-H	GUC-76Z-H	GUC-96Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-136Z-H	GUC-154Z-H	
	Outdoor Unit B	GUC-76Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-136Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	
Manifold Pipe		HFQ-M22F					HFQ-M32F			
Piping Size	a	Gas	28.6	28.6	28.6	28.6	31.75	31.75	31.75	31.75
		Liquid	15.88	15.88	15.88	15.88	19.05	19.05	19.05	19.05
	b	Gas	22.2	25.4	25.4	25.4	25.4	25.4	28.6	28.6
		Liquid	9.53	12.7	12.7	12.7	12.7	12.7	12.7	12.7
	c	Gas	19.05	19.05	22.2	25.4	25.4	25.4	25.4	28.6
		Liquid	9.53	9.53	9.53	12.7	12.7	12.7	12.7	12.7

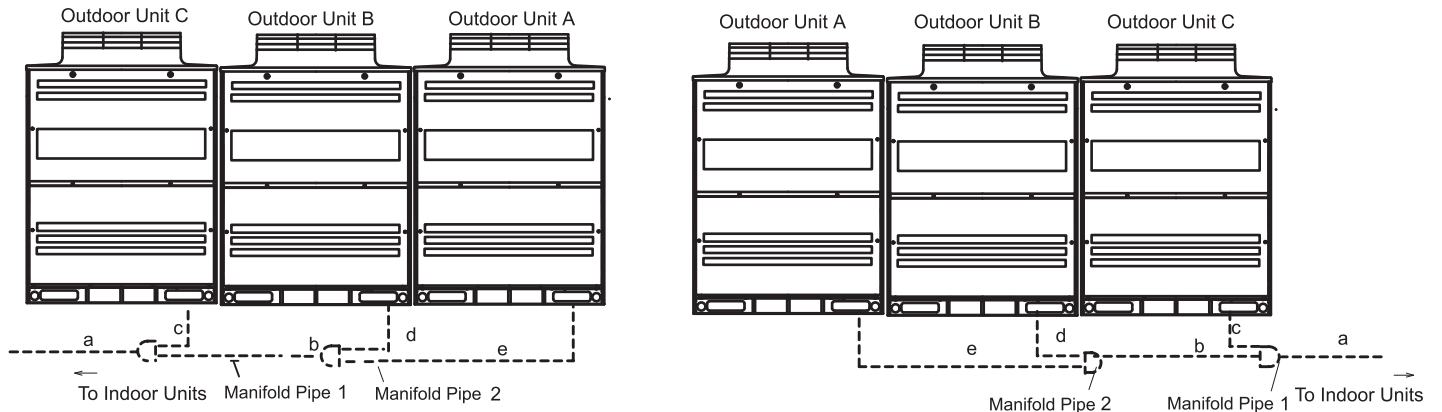
* Perform the installation of the outdoor unit and piping connection according to the figure.
Refer to the table for the outdoor unit model, the Manifold Pipe model and the piping diameter.

Piping Size for Three Units Combination

< Figure for GUC-365

(Indoor Unit on Left Side)

(Indoor Unit on Right Side)



(φmm)

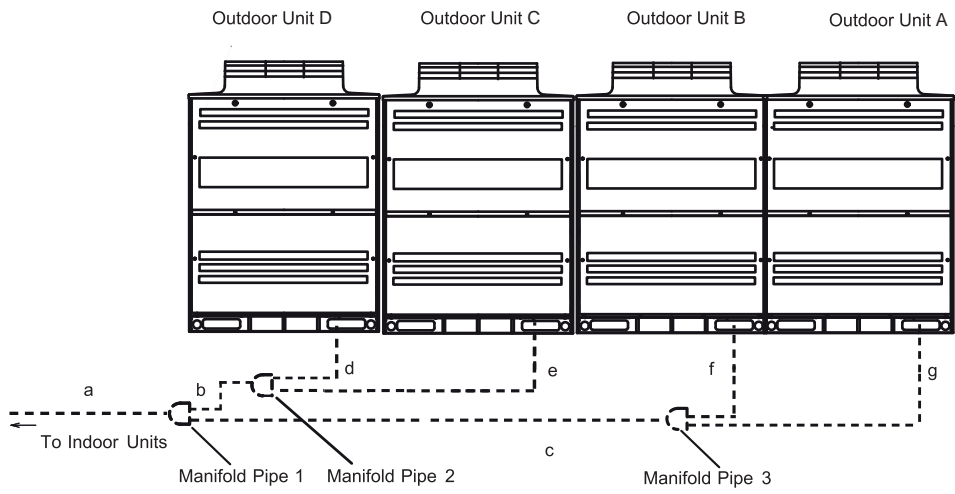
Model		GUC-324Z-H	GUC-343Z-H	GUC-365Z-H	GUC-386Z-H	GUC-404Z-H	GUC-420Z-H	GUC-444Z-H	GUC-460Z-H
Combination Unit	Outdoor Unit A	GUC-96Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-136Z-H	GUC-154Z-H
	Outdoor Unit B	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-136Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H
	Outdoor Unit C	GUC-114Z-H	GUC-114Z-H	GUC-136Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H
Manifold Pipe 1		HFQ-M32F				HFQ-M32F			
Manifold Pipe 2		HFQ-M22F				HFQ-M32F			
Piping Size	a	Gas	31.75	38.1	38.1	38.1	38.1	38.1	38.1
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05	19.05
	b	Gas	28.6	28.6	28.6	28.6	31.75	31.75	31.75
		Liquid	15.88	15.88	15.88	15.88	19.05	19.05	19.05
	c	Gas	25.4	25.4	25.4	28.6	28.6	28.6	28.6
		Liquid	12.7	12.7	12.7	12.7	12.7	12.7	12.7
	d	Gas	25.4	25.4	25.4	25.4	25.4	28.6	28.6
		Liquid	12.7	12.7	12.7	12.7	12.7	12.7	12.7
e	Gas	22.2	25.4	25.4	25.4	25.4	25.4	25.4	
	Liquid	9.53	12.7	12.7	12.7	12.7	12.7	12.7	

* Perform the installation of the outdoor unit and piping connection according to the figure. Refer to the table for the outdoor unit model, the Manifold Pipe model and the piping diameter.

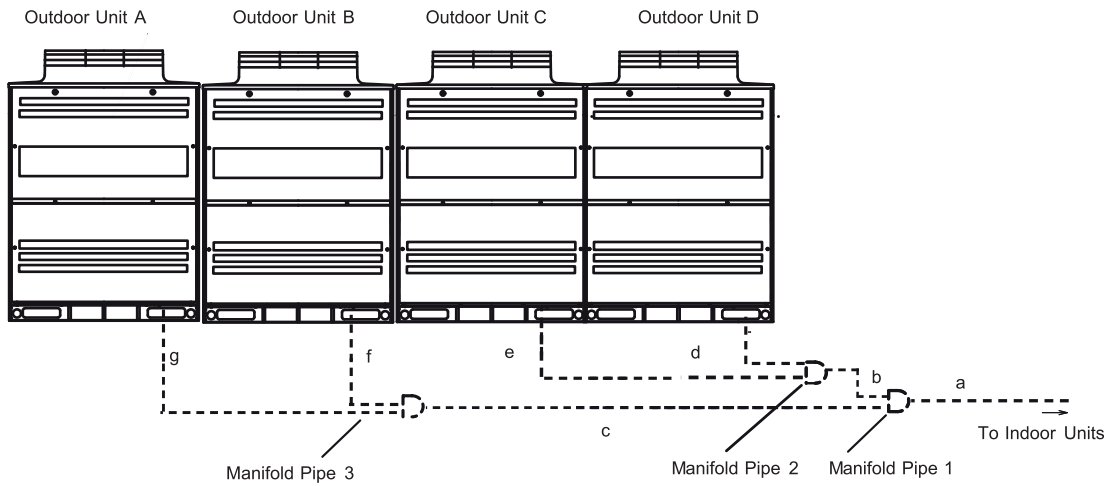
Piping Size for Four Units Combination

< Figure for GUC-540Z-H >

(Indoor Unit at the left side)



(Indoor unit at the right side)



(φmm)

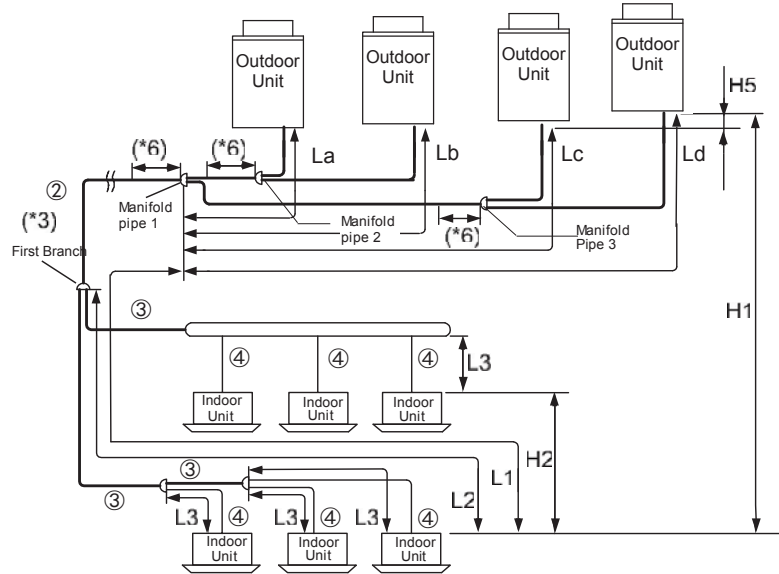
Model		GUC-480Z-H	GUC-500Z-H	GUC-520Z-H	GUC-540Z-H	GUC-560Z-H	GUC-580Z-H	GUC-600Z-H	GUC-620Z-H	
Combination Unit	Outdoor Unit A	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-136Z-H	GUC-154Z-H	
	Outdoor Unit B	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-114Z-H	GUC-136Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	
	Outdoor Unit C	GUC-114Z-H	GUC-136Z-H	GUC-136Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	
	Outdoor Unit D	GUC-136Z-H	GUC-136Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	GUC-154Z-H	
Manifold Pipe 1		HFQ-M462F								
Manifold Pipe 2		HFQ-M32F								
Manifold Pipe 3		HFQ-M32F								
Piping Size	a	Gas	41.3	41.3	41.3	41.3	44.5	44.5	44.5	44.5
		Liquid	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2
	b	Gas	31.75	31.75	31.75	31.75	31.75	31.75	31.75	31.75
		Liquid	19.05	19.05	19.05	19.05	19.05	19.05	19.05	19.05
	c	Gas	28.6	28.6	28.6	28.6	31.75	31.75	31.75	31.75
		Liquid	15.88	15.88	15.88	15.88	19.05	19.05	19.05	19.05
	d	Gas	25.4	25.4	28.6	28.6	28.6	28.6	28.6	28.6
		Liquid	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
	e	Gas	25.4	25.4	25.4	28.6	28.6	28.6	28.6	28.6
		Liquid	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
	f	Gas	25.4	25.4	25.4	25.4	25.4	28.6	28.6	28.6
		Liquid	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
	g	Gas	25.4	25.4	28.6	25.4	25.4	25.4	25.4	28.6
		Liquid	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7

* Perform the installation of the outdoor unit and piping connection according to the figure. Refer to the table for the outdoor unit model, the Manifold Pipe model and the piping diameter.

• Restriction on Pipe Length and Height Difference

- ① Pipe Diameter for Outdoor Unit
- ② Main Pipe Diameter
(Base Unit or Manifold Pipe 1 to First Branch)
[Branch Pipe of First Branch] (*2)

Outdoor Unit (KBtu/h)	Equivalent Piping Length < 100m	
	Gas	Liquid
76	19.05	9.53
96	22.2	9.53
114 and 136	25.4	12.7
154	28.6	12.7
172 to 229	28.6	15.88
250 to 324	31.75	19.05
343 to 460	38.1	19.05
480 to 540	41.3	22.2
540 to 620	44.5	22.2



- ③ [Pipe Diameter after First Branch] (*3)

Total Indoor Unit (KBtu/h)	Gas	Liquid
Lower than 57	15.88	9.53
57 to 86	19.05	9.53
87 to 114	22.2	9.53
115 to 154	25.4	12.7
155 to 172	28.6	12.7
173 to 250	28.6	15.88
251 to 343	31.75	19.05
344 to 460	38.1	19.05
461 to 540	41.3	22.2
541 to 620	44.5	22.2

- ④ [Pipe Diameter between Branch Pipe and Indoor Unit] (*4)

Indoor Unit (KBtu/h)	Gas	Liquid
07 to 14	12.7	6.35 (*5)
17 to 18	15.88	6.35 (*5)
22 to 54	15.88	9.53
76	19.05	9.53
96	22.2	9.53

• Piping Work Conditions

Item	Mark	Allowable Piping Length (*7)	
		≤ the recommended connectable number of Indoor Unit	≥ the recommended connectable number of Indoor Unit
Total Piping Length	Total Liquid Piping Actual Length	≤ 1,000m (*8)	≤ 300m
Maximum Piping Length	Actual Length	≤ 165m	≤ 165m
	Equivalent Length	≤ 190m	≤ 190m
Maximum Piping Length between Branch Pipe of 1st Branch and Each Indoor Unit	L2	≤ 90m	≤ 40m
Maximum Piping Length between Each Branch Pipe and Each Indoor Unit	L3	≤ 40m	≤ 30m
Piping Length between Manifold Pipe 1 and Each Outdoor Unit	La, Lb, Lc, Ld	≤ 10m	≤ 10m
Height Difference between Outdoor Units and Indoor Units	O.U. is Higher	≤ 50m	≤ 50m
	O.U. is Lower	≤ 40m	≤ 40m
Height Difference between Indoor Units	H2	≤ 15m	≤ 15m
Height Difference between Outdoor Units	H5	≤ 0.1m	≤ 0.1m

- (*1): The Manifold Pipe is counted from the indoor unit side (as Manifold Pipe 1).
- (*2): When the maximum length of the equivalent refrigerant pipe (L1) from the outdoor unit/Manifold Pipe 1 to the indoor unit is over 100m, the pipe size of gas/liquid line from the outdoor unit/Manifold Pipe 1 to first branch should be increased one size with the reducer (field-supplied).
- (*3): If the refrigerant piping length is more than 100m, no need to increase the pipe size after first branch. If the Branch Pipe size is larger than the first branch, adjust the Branch Pipe size to the first branch. In case that the selected pipe size after the first branch is larger than the pipe size before the first branch, use the same pipe size as before the branch.
- (*4): The pipe diameter ④ should be the same as the indoor unit piping connection size.
- (*5): When the liquid piping length is longer than 15m, use $\phi 9.53$ pipe and reducer (field-supplied).
- (*6): Keep the direct distance of 500mm or more after the Manifold Pipe.
- (*7): The condition of refrigerant piping installation is different depending on the connected indoor unit quantities.
- (*8): Allowable total piping length may become shorter than 1,000m due to the limitation of maximum additional refrigerant amount.

NOTES:

1. Check the gas pipe and liquid pipe are equivalent in terms of the piping length and piping system.
2. Use a Branch Pipe (system components) for the branch pipe of indoor unit.
3. Install the indoor unit and Branch Pipe according to each "Installation & Maintenance Manual".
4. If the piping length (L3) between each Branch Pipe and each indoor unit is considerably longer than other indoor unit, refrigerant may not flow well and also performance may be deteriorated compared to other models.
(Recommended Piping Length: within 15m)

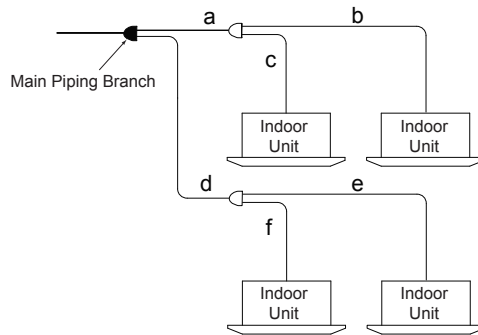
- Piping Branch Restriction

Follow the table below when performing the field-supplied piping work.

Piping Length between Branch Pipe (First Branch) and Each Indoor Unit (L2)	Main Piping Branch *		Indoor Unit Capacity Ratio After Main Branch
	Piping Length After Branch	Number of Main Piping Branch	
≤ 40m	$a+b+c \leq 30m$ or $d+e+f \leq 30m$	without Limit	-
	$a+b+c > 30m$ and $d+e+f > 30m$	within 2	
within 41m to 90m	-	within 1 (Fig.1)	≥ 40% (Fig.2)

NOTE:

* Main Piping Branch: Distribution from One (1) Branch Pipe to Two (2) Branch Pipes
The number of main piping branch depends on the piping length after branch (a to f).



Main piping branches are 2 portions.

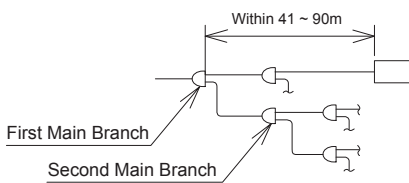


Fig. 1



Indoor unit capacity ratio is less than 40%.

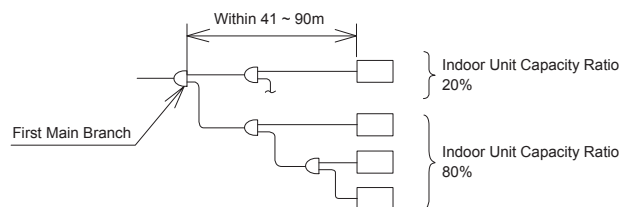


Fig. 2

5.3 Calculation of Actual Capacity

a) Actual Capacity of Outdoor Unit

Maximum Actual Capacity of Outdoor Unit

$$= [\text{Outdoor Unit Capacity at Nominal Temperature} \\ \times \text{Correction Factor According to Total Indoor Unit Capacity}] \\ \times \text{Correction Factor According to Piping Length and Lift} \\ \times \text{Correction Factor According to Temperature Condition}$$

Refer to section 5.4-5.6 for different Correction Factor in detail.

b) Actual Capacity of Each Indoor Unit

Actual Capacity of Each Indoor Unit

$$= \text{Actual Capacity of Outdoor Unit} \\ \times [\text{Each Indoor Unit's Capacity} \\ \div \text{Summation of Each Indoor Unit Capacity}]$$

5.4 Capacity Characteristic Curve

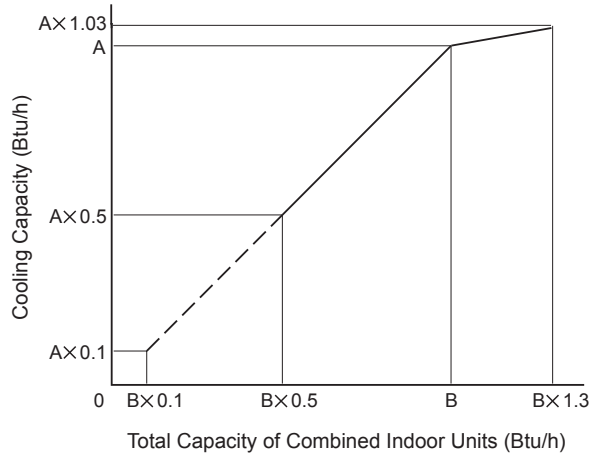
The following charts show the characteristics of outdoor unit capacity which corresponds with total capacity of combined indoor unit, on standard condition with refrigerant piping of horizontal and 7.5m at length.

< Cooling Capacity >

• Condition

Indoor Air Inlet Temperature: 27.0°C DB (80.0°F DB), 19.0°C WB (66.2°F WB)

Outdoor Air Inlet Temperature: 35.0°C DB (95.0°F DB)

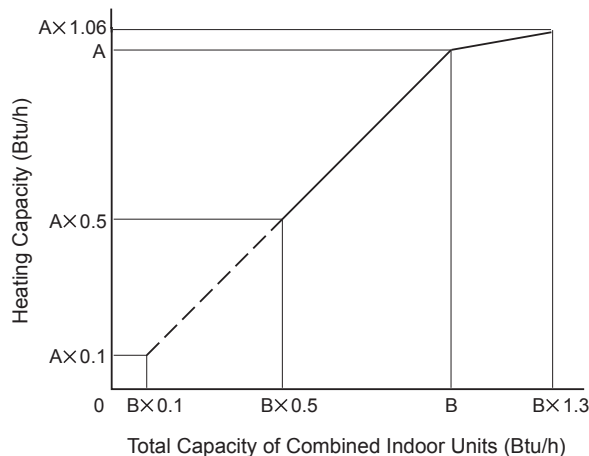


< Heating Capacity >

• Condition

Indoor Air Inlet Temperature: 20.0°C DB (68.0°F DB)

Outdoor Air Inlet Temperature: 7.0°C DB (45.0°F DB), 6.0°C WB (43.0°F WB)



5.5 Capacity Table Under Different Temperature

Cooling Capacity Table of 100% Combination (Dimension: kW)

Table 1. Cooling Capacity Table for GUC-76Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	15.9	21.0	22.4	22.9	24.2	24.7
30.0	15.9	21.0	22.4	22.9	24.2	24.7
35.0	15.9	21.0	22.4	22.9	24.2	24.7
40.0	15.6	20.3	21.5	21.9	22.9	23.2

Table 2. Cooling Capacity Table for GUC-96Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	20.0	26.5	28.0	28.9	30.5	31.2
30.0	20.0	26.5	28.0	28.9	30.5	31.2
35.0	20.0	26.5	28.0	28.9	30.5	31.2
40.0	19.3	25.4	26.6	27.3	28.4	28.8

Table 3. Cooling Capacity Table for GUC-114Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	23.9	31.8	33.5	34.6	36.5	37.3
30.0	23.9	31.8	33.5	34.6	36.5	37.3
35.0	23.9	31.8	33.5	34.6	36.5	36.6
40.0	22.8	30.1	31.2	31.8	32.6	33.0

Table 4. Cooling Capacity Table for GUC-136Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	28.5	38.0	40.0	41.4	43.6	44.6
30.0	28.5	38.0	40.0	41.4	43.6	44.6
35.0	28.5	38.0	40.0	41.4	43.2	43.7
40.0	27.2	36.0	37.2	38.0	39.0	39.5

Table 5. Cooling Capacity Table for GUC-154Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	32.1	42.1	45.0	45.9	48.4	49.5
30.0	32.1	42.1	45.0	45.9	48.4	49.5
35.0	32.1	42.1	45.0	45.5	47.2	47.7
40.0	30.2	39.0	41.0	41.1	41.4	41.6

Table 6. Cooling Capacity Table for GUC-172Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	36.0	47.8	50.4	52.1	54.9	56.1
30.0	36.0	47.8	50.4	52.1	54.9	56.1
35.0	36.0	47.8	50.4	51.6	53.5	54.1
40.0	33.8	44.3	45.9	46.2	47.0	47.3

Table 7. Cooling Capacity Table for GUC-190Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	39.7	53.3	55.9	57.6	60.8	62.1
30.0	39.7	53.3	55.9	57.6	60.8	62.1
35.0	39.7	53.3	55.9	57.6	60.4	61.4
40.0	38.3	50.9	52.6	53.7	55.6	56.4

Table 8. Cooling Capacity Table for GUC-210Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	43.7	58.6	61.5	63.4	66.9	68.3
30.0	43.7	58.6	61.5	63.4	66.9	68.3
35.0	43.7	58.6	61.5	63.4	66.5	67.6
40.0	42.2	56.0	57.9	59.1	61.2	62.1

Table 9. Cooling Capacity Table for GUC-229Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	46.9	63.1	67.0	69.0	72.4	73.6
30.0	46.9	63.1	67.0	69.0	72.4	73.6
35.0	46.9	63.1	67.0	68.5	71.5	72.7
40.0	45.0	59.5	62.0	63.3	65.4	66.2

Table 10. Cooling Capacity Table for GUC-250Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	52.8	70.7	73.5	76.5	80.9	82.8
30.0	52.8	70.7	73.5	76.5	80.9	82.8
35.0	52.8	70.7	73.5	76.5	80.3	81.3
40.0	50.4	67.0	68.9	70.6	72.5	73.4

Table 11. Cooling Capacity Table for GUC-268Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	55.9	74.4	78.5	81.1	85.5	87.4
30.0	55.9	74.4	78.5	81.1	85.5	87.4
35.0	55.9	74.4	78.5	81.1	84.6	85.6
40.0	53.4	70.5	73.0	74.3	76.4	77.4

Table 12. Cooling Capacity Table for GUC-290Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	60.7	80.6	85.0	87.8	92.6	94.6
30.0	60.7	80.6	85.0	87.8	92.6	94.6
35.0	60.7	80.6	85.0	87.4	90.9	91.9
40.0	57.4	75.5	78.2	79.1	80.9	81.6

Table 13. Cooling Capacity Table for GUC-307Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	64.2	85.4	90.0	93.0	98.0	100.2
30.0	64.2	85.4	90.0	93.0	98.0	100.2
35.0	64.2	85.4	90.0	92.1	95.5	96.6
40.0	60.3	79.1	81.9	82.6	84.0	84.5

Table 14. Cooling Capacity Table for GUC-324Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	67.8	90.0	95.0	98.1	103.4	105.7
30.0	67.8	90.0	95.0	98.1	103.4	105.7
35.0	67.8	90.0	95.0	97.2	100.8	101.9
40.0	63.7	83.5	86.5	87.1	88.6	89.1

Table 15. Cooling Capacity Table for GUC-343Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	71.4	95.3	100.5	103.8	109.4	111.9
30.0	71.4	95.3	100.5	103.8	109.4	111.9
35.0	71.4	95.3	100.5	102.8	106.6	107.8
40.0	68.9	88.3	91.9	92.2	93.8	94.3

Table 16. Cooling Capacity Table for GUC-365Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	74.6	100.9	107.0	109.7	114.9	117.2
30.0	74.6	100.9	107.0	109.7	114.9	117.2
35.0	74.6	100.9	107.0	109.2	113.2	114.6
40.0	71.1	94.3	97.7	99.5	102.2	103.4

Table 17. Cooling Capacity Table for GUC-386Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	79.9	106.3	112.0	115.8	122.1	124.7
30.0	79.9	106.3	112.0	115.8	122.1	124.7
35.0	79.9	106.3	112.0	115.3	120.1	121.5
40.0	75.7	99.8	103.3	104.8	107.3	108.3

Table 18. Cooling Capacity Table for GUC-404Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	83.7	112.3	118.5	121.8	128.0	130.8
30.0	83.7	112.3	118.5	121.8	128.0	130.8
35.0	83.7	112.3	118.5	121.0	125.9	127.4
40.0	79.2	104.6	108.3	109.9	112.5	113.5

Table 19. Cooling Capacity Table for GUC-420Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	86.8	116.3	123.5	126.7	133.0	135.9
30.0	86.8	116.3	123.5	126.7	133.0	135.9
35.0	86.8	116.3	123.5	125.6	130.8	132.3
40.0	82.3	108.7	112.5	114.2	116.8	118.0

Table 20. Cooling Capacity Table for GUC-444Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	90.8	122.8	130.0	133.7	140.1	142.8
30.0	90.8	122.8	130.0	133.7	140.1	142.8
35.0	90.8	122.8	130.0	131.7	134.9	136.5
40.0	84.6	112.0	115.8	117.1	119.5	120.4

Table 21. Cooling Capacity Table for GUC-460Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	94.1	127.2	135.0	139.2	145.3	148.1
30.0	94.1	127.2	135.0	139.2	145.3	148.1
35.0	94.1	127.2	135.0	137.2	141.2	142.9
40.0	88.7	117.2	121.3	122.7	125.1	126.0

Table 22. Cooling Capacity Table for GUC-480Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	100.38	133.13	140.40	144.87	152.83	156.18
30.0	100.38	133.13	140.40	144.87	152.83	156.18
35.0	100.06	133.13	140.40	144.87	151.15	153.25
40.0	95.45	126.01	130.76	133.13	136.48	138.16

Table 23. Cooling Capacity Table for GUC-500Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	104.39	138.44	146.00	150.64	158.92	162.41
30.0	104.39	138.44	146.00	150.64	158.92	162.41
35.0	104.05	138.44	146.00	150.64	157.18	159.36
40.0	99.26	131.03	135.98	138.44	141.93	143.67

Table 24 Cooling Capacity Table for GUC-520Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	108.32	143.66	151.50	156.32	164.91	168.53
30.0	108.32	143.66	151.50	156.32	164.91	168.53
35.0	107.97	143.66	151.50	156.32	163.10	165.36
40.0	103.00	135.97	141.10	143.66	147.27	149.08

Table 25. Cooling Capacity Table for GUC-540Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	112.25	148.87	157.00	161.99	170.90	174.65
30.0	112.25	148.87	157.00	161.99	170.90	174.65
35.0	111.89	148.87	157.00	161.99	169.02	171.37
40.0	106.74	140.90	146.22	148.87	152.62	154.50

Table 26. Cooling Capacity Table for GUC-560Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	116.90	155.03	163.50	168.70	177.97	181.88
30.0	116.90	155.03	163.50	168.70	177.97	181.88
35.0	116.52	155.03	163.50	168.70	176.02	178.46
40.0	111.16	146.74	152.27	155.03	158.94	160.89

Table 27. Cooling Capacity Table for GUC-580Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	120.47	159.78	168.50	173.86	183.42	187.44
30.0	120.47	159.78	168.50	173.86	183.42	187.44
35.0	120.09	159.78	168.50	173.86	181.40	183.92
40.0	114.55	151.22	156.93	159.78	163.80	165.81

Table 28. Cooling Capacity Table for GUC-600Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	125.12	165.94	175.00	180.57	190.49	194.67
30.0	125.12	165.94	175.00	180.57	190.49	194.67
35.0	124.72	165.94	175.00	180.57	188.40	191.01
40.0	118.97	157.06	162.99	165.94	170.12	172.21

Table 29. Cooling Capacity Table for GUC-620Z-H

Unit of Capacity: kW

Outdoor Air Inlet Dry Bulb (°C)	Indoor Air Inlet Wet Bulb (°C)					
	16.0	18.0	19.0	20.0	22.0	23.0
25.0	128.70	170.68	180.00	185.73	195.93	200.23
30.0	128.70	170.68	180.00	185.73	195.93	200.23
35.0	128.28	170.68	180.00	185.73	193.78	196.47
40.0	122.37	161.55	167.64	170.68	174.98	177.13

NOTE:

- 1.The table shows the normal value of cooling operation.
In some cases, the value may change due to the compressor protection control.
- 2.The cooling capacity on the table indicates the peak value.
- 3.The value on the table shows when the system is operated under the following conditions.
The indoor unit total capacity: 100% of outdoor unit capacity, The total piping length: 7.5m,
The height difference: 0m.

Heating Capacity Table of 100% Combination (Dimension: kW)

Table 1. Heating Capacity Table for GUC-76Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	19.5	19.5	19.5	19.5	19.5	19.4
-5.0	22.1	22.0	22.0	21.9	21.9	21.5
0.0	24.5	24.3	24.0	23.8	23.4	22.0
5.0	25.9	25.5	24.8	24.4	23.9	22.0
6.0	26.5	25.8	25.0	24.6	23.9	22.0
10.0	28.3	27.0	25.5	24.7	23.9	22.0
15.0	28.3	27.0	25.5	24.7	23.9	22.0

Table 2. Heating Capacity Table for GUC-96Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	22.7	22.7	22.7	22.7	22.6	22.6
-5.0	26.0	26.0	25.9	25.8	25.8	25.6
0.0	28.8	28.7	28.7	28.5	28.4	27.5
5.0	31.8	31.5	31.2	30.8	29.9	27.7
6.0	32.9	32.3	31.5	31.0	30.1	27.7
10.0	34.5	33.8	32.1	31.2	30.1	27.7
15.0	35.7	34.0	32.1	31.2	30.1	27.7

Table 3. Heating Capacity Table for GUC-114Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	24.4	24.4	24.4	24.4	24.3	24.2
-5.0	28.7	28.7	28.7	28.7	28.6	28.4
0.0	33.0	33.0	33.0	32.9	32.8	31.9
5.0	36.9	36.9	36.6	36.2	35.5	33.0
6.0	38.1	38.1	37.5	36.9	35.8	33.0
10.0	40.5	39.6	38.3	37.1	35.8	33.0
15.0	42.5	40.6	38.3	37.1	35.8	33.0

Table 4. Heating Capacity Table for GUC-136Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	32.4	32.4	32.4	32.4	32.3	32.2
-5.0	37.2	37.1	37.0	36.9	36.8	36.6
0.0	41.1	41.0	41.0	40.8	40.5	39.3
5.0	45.4	45.0	44.6	44.0	42.8	39.6
6.0	47.1	46.2	45.0	44.3	43.0	39.6
10.0	49.3	48.3	45.9	44.5	43.0	39.6
15.0	51.0	48.7	45.9	44.5	43.0	39.6

Table 5. Heating Capacity Table for GUC-154Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	35.0	35.0	35.0	35.0	34.9	34.8
-5.0	40.3	40.2	40.1	40.0	39.9	39.7
0.0	45.3	45.2	45.1	44.9	44.6	43.4
5.0	50.2	49.8	49.3	48.8	47.4	44.0
6.0	52.2	51.4	50.0	49.2	47.7	44.0
10.0	54.8	53.7	51.0	49.5	47.7	44.0
15.0	56.7	54.2	51.0	49.5	47.7	44.0

Table 6. Heating Capacity Table for GUC-172Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	39.6	39.6	39.6	39.6	39.4	39.3
-5.0	45.5	45.4	45.3	45.2	45.1	44.9
0.0	51.2	51.1	51.0	50.7	50.4	49.0
5.0	56.7	56.3	55.7	55.2	53.6	49.7
6.0	59.0	58.1	56.5	55.6	54.0	49.7
10.0	61.9	60.6	57.6	55.9	54.0	49.7
15.0	64.1	61.1	57.6	55.9	54.0	49.7

Table 7. Heating Capacity Table for GUC-190Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	43.6	43.6	43.6	43.6	43.5	43.3
-5.0	50.4	50.3	50.3	50.2	50.0	49.4
0.0	57.0	56.8	56.5	56.3	55.8	53.5
5.0	62.3	61.9	60.9	60.1	58.9	54.6
6.0	64.1	63.5	62.5	61.0	59.2	54.6
10.0	68.3	66.1	63.3	61.3	59.2	54.6
15.0	70.2	67.1	63.3	61.3	59.2	54.6

Table 8. Heating Capacity Table for GUC-210Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	51.9	51.9	51.9	51.9	51.8	51.6
-5.0	59.2	59.1	58.9	58.8	58.7	58.1
0.0	65.6	65.3	65.0	64.6	63.9	60.7
5.0	70.8	69.8	68.4	67.6	65.9	60.7
6.0	72.8	71.0	69.0	67.6	65.9	60.7
10.0	76.5	74.7	70.4	68.3	65.9	60.7
15.0	78.2	74.7	70.4	68.3	65.9	60.7

Table 9. Heating Capacity Table for GUC-229Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	53.3	53.3	53.3	53.3	53.1	53.0
-5.0	61.2	61.0	60.9	60.7	60.6	60.3
0.0	67.6	67.5	67.4	67.1	66.7	64.6
5.0	74.6	74.0	73.3	72.4	70.4	65.1
6.0	77.4	76.5	75.0	73.1	70.6	65.1
10.0	81.1	79.5	75.5	73.3	70.6	65.1
15.0	83.9	80.1	75.5	73.3	70.6	65.1

Table 10. Heating Capacity Table for GUC-250Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	56.8	56.8	56.8	56.8	56.6	56.4
-5.0	65.9	65.8	65.7	65.6	65.4	65.0
0.0	74.1	74.0	74.0	73.7	73.3	71.2
5.0	82.3	81.9	81.2	80.2	78.2	72.6
6.0	85.1	84.2	82.5	81.2	78.8	72.6
10.0	89.8	87.9	84.2	81.6	78.8	72.6
15.0	93.5	89.3	84.2	81.6	78.8	72.6

Table 11. Heating Capacity Table for GUC-268Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	63.0	63.0	63.0	63.0	62.8	62.6
-5.0	72.2	72.1	71.9	71.8	71.6	71.3
0.0	80.0	79.8	79.6	79.2	78.8	76.4
5.0	88.2	87.5	86.6	85.6	83.1	77.0
6.0	91.5	89.7	87.5	86.1	83.5	77.0
10.0	95.9	93.9	89.3	86.5	83.5	77.0
15.0	99.2	94.8	89.3	86.5	83.5	77.0

Table 12. Heating Capacity Table for GUC-290Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	67.4	67.4	67.4	67.4	67.2	67.0
-5.0	77.5	77.3	77.1	76.9	76.7	76.3
0.0	86.4	86.2	86.1	85.7	85.1	82.7
5.0	95.6	94.8	93.9	92.8	90.2	83.6
6.0	99.3	97.6	95.0	93.5	90.7	83.6
10.0	104.1	101.9	96.9	94.0	90.7	83.6
15.0	107.7	102.9	96.9	94.0	90.7	83.6

Table 13. Heating Capacity Table for GUC-307Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	70.0	70.0	70.0	70.0	69.8	69.6
-5.0	80.6	80.4	80.2	80.0	79.8	79.4
0.0	90.6	90.4	90.2	89.8	89.2	86.8
5.0	100.4	99.6	98.6	97.6	94.8	88.0
6.0	104.4	102.8	100.0	98.4	95.5	88.0
10.0	109.6	107.3	102.0	98.9	95.5	88.0
15.0	113.3	108.3	102.0	98.9	95.5	88.0

Table 14. Heating Capacity Table for GUC-324Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	74.6	74.6	74.6	74.6	74.3	74.1
-5.0	85.8	85.6	85.4	85.2	85.0	84.6
0.0	96.5	96.3	96.1	95.6	95.0	92.4
5.0	106.9	106.1	105.0	104.0	101.0	93.7
6.0	111.2	109.5	106.5	104.8	101.7	93.7
10.0	116.7	114.2	108.6	105.4	101.7	93.7
15.0	120.7	115.3	108.6	105.4	101.7	93.7

Table 15. Heating Capacity Table for GUC-343Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	78.8	78.8	78.8	78.8	78.5	78.3
-5.0	90.7	90.4	90.2	90.0	89.8	89.3
0.0	102.0	101.7	101.5	101.0	100.3	97.6
5.0	112.9	112.1	110.9	109.8	106.7	99.0
6.0	117.4	115.6	112.5	110.7	107.4	99.0
10.0	123.3	120.7	114.7	111.3	107.4	99.0
15.0	127.5	121.8	114.7	111.3	107.4	99.0

Table 16. Heating Capacity Table for GUC-365Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	82.6	82.6	82.6	82.6	82.3	82.1
-5.0	96.2	96.1	96.0	95.8	95.6	94.9
0.0	108.9	108.8	108.8	108.4	107.9	104.7
5.0	120.0	119.8	119.0	118.0	114.6	105.6
6.0	123.1	121.8	120.0	118.0	114.6	105.6
10.0	131.5	128.7	122.4	118.7	114.6	105.6
15.0	136.0	130.0	122.4	118.7	114.6	105.6

Table 17. Heating Capacity Table for GUC-386Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	83.8	83.8	83.8	83.8	83.5	83.3
-5.0	97.8	97.7	97.6	97.3	97.1	96.4
0.0	111.3	111.2	111.1	110.8	110.2	107.2
5.0	124.0	123.6	122.5	121.3	118.4	110.0
6.0	128.3	127.5	125.0	123.0	119.3	110.0
10.0	135.8	132.9	127.5	123.7	119.3	110.0
15.0	141.7	135.4	127.5	123.7	119.3	110.0

Table 18. Heating Capacity Table for GUC-404Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	88.3	88.3	88.3	88.3	88.0	87.7
-5.0	103.0	102.9	102.8	102.5	102.2	101.6
0.0	117.1	117.0	116.9	116.5	115.9	112.8
5.0	130.5	130.1	128.9	127.6	124.5	115.7
6.0	135.1	134.2	132.5	130.1	125.6	115.7
10.0	142.9	139.8	134.1	130.1	125.6	115.7
15.0	149.1	142.4	134.1	130.1	125.6	115.7

Table 19. Heating Capacity Table for GUC-420Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	94.3	94.3	94.3	94.3	94.0	93.7
-5.0	109.0	108.8	108.6	108.4	108.1	107.4
0.0	122.7	122.5	122.3	121.8	121.0	117.7
5.0	136.0	135.2	134.0	132.5	129.0	119.7
6.0	141.0	139.9	137.5	134.6	129.8	119.7
10.0	148.5	145.4	138.8	134.6	129.8	119.7
15.0	154.2	147.3	138.8	134.6	129.8	119.7

Table 20. Heating Capacity Table for GUC-444Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	98.6	98.6	98.6	98.6	98.3	98.0
-5.0	114.2	113.9	113.7	113.5	113.2	112.5
0.0	129.0	128.8	128.6	128.1	127.3	123.9
5.0	143.3	142.5	141.1	139.7	136.0	126.3
6.0	148.7	147.0	145.0	142.0	137.0	126.3
10.0	156.7	153.3	146.4	142.0	137.0	126.3
15.0	162.6	155.4	146.4	142.0	137.0	126.3

Table 21. Heating Capacity Table for GUC-460Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	102.8	102.8	102.8	102.8	102.5	102.2
-5.0	119.0	118.8	118.5	118.3	118.0	117.3
0.0	134.5	134.2	134.0	133.5	132.7	129.1
5.0	149.3	148.5	147.0	145.5	141.7	131.6
6.0	155.0	153.2	150.0	147.1	142.7	131.6
10.0	163.3	159.8	152.5	147.9	142.7	131.6
15.0	169.4	161.9	152.5	147.9	142.7	131.6

Table 22. Heating Capacity Table for GUC-480Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	109.1	109.1	109.1	109.1	108.8	108.3
-5.0	126.2	125.9	125.9	125.7	125.2	123.7
0.0	142.8	142.3	141.6	140.9	139.6	133.9
5.0	156.0	155.0	152.5	150.5	147.6	136.6
6.0	160.5	159.0	156.5	152.8	148.3	136.6
10.0	170.9	165.4	158.5	153.5	148.3	136.6
15.0	175.9	167.9	158.5	153.5	148.3	136.6

Table 23. Heating Capacity Table for GUC-500Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	113.6	113.6	113.6	113.6	113.3	112.8
-5.0	131.4	131.2	131.2	130.9	130.4	128.8
0.0	148.8	148.3	147.5	146.7	145.4	139.5
5.0	162.5	161.4	158.9	156.8	153.7	142.3
6.0	167.1	165.6	163.0	159.1	154.5	142.3
10.0	178.0	172.3	165.1	159.9	154.5	142.3
15.0	183.2	174.9	165.1	159.9	154.5	142.3

Table 24. Heating Capacity Table for GUC-520Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	117.8	117.8	117.8	117.8	117.5	117.0
-5.0	136.3	136.0	136.0	135.7	135.2	133.6
0.0	154.2	153.7	152.9	152.1	150.8	144.6
5.0	168.5	167.4	164.7	162.6	159.3	147.5
6.0	173.3	171.7	169.0	165.0	160.1	147.5
10.0	184.6	178.7	171.1	165.8	160.1	147.5
15.0	189.9	181.3	171.1	165.8	160.1	147.5

Table 25. Heating Capacity Table for GUC-540Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	121.9	121.9	121.9	121.9	121.7	121.1
-5.0	141.1	140.8	140.8	140.6	140.0	138.3
0.0	159.7	159.2	158.3	157.5	156.1	149.7
5.0	174.4	173.3	170.6	168.3	165.0	152.8
6.0	179.4	177.8	175.0	170.8	165.8	152.8
10.0	191.1	185.0	177.2	171.7	165.8	152.8
15.0	196.7	187.8	177.2	171.7	165.8	152.8

Table 26. Heating Capacity Table for GUC-560Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	127.2	127.2	127.2	127.2	126.9	126.3
-5.0	147.2	146.9	146.9	146.6	146.0	144.3
0.0	166.6	166.0	165.1	164.3	162.8	156.1
5.0	181.9	180.8	177.9	175.5	172.1	159.3
6.0	187.1	185.4	182.5	178.2	172.9	159.3
10.0	199.3	192.9	184.8	179.0	172.9	159.3
15.0	205.1	195.8	184.8	179.0	172.9	159.3

Table 27. Heating Capacity Table for GUC-580Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	130.7	130.7	130.7	130.7	130.4	129.8
-5.0	151.2	150.9	150.9	150.6	150.0	148.2
0.0	171.1	170.5	169.6	168.8	167.3	160.4
5.0	186.9	185.7	182.7	180.4	176.8	163.7
6.0	192.3	190.5	187.5	183.0	177.7	163.7
10.0	204.8	198.2	189.9	183.9	177.7	163.7
15.0	210.7	201.2	189.9	183.9	177.7	163.7

Table 28. Heating Capacity Table for GUC-600Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	135.9	135.9	135.9	135.9	135.6	135.0
-5.0	157.2	156.9	156.9	156.6	156.0	154.1
0.0	178.0	177.4	176.4	175.5	174.0	166.8
5.0	194.4	193.1	190.0	187.6	183.9	170.2
6.0	200.0	198.1	195.0	190.4	184.8	170.2
10.0	213.0	206.1	197.5	191.3	184.8	170.2
15.0	219.1	209.2	197.5	191.3	184.8	170.2

Table 29. Heating Capacity Table for GUC-620Z-H

Unit of Capacity: kW (Correction Factor)

Outdoor Air Inlet Wet Bulb (°C)	Indoor Air Inlet Dry Bulb (°C)					
	16.0	18.0	20.0	21.0	22.0	24.0
-10.0	139.4	139.4	139.4	139.4	139.0	138.4
-5.0	161.3	161.0	161.0	160.6	160.0	158.1
0.0	182.5	181.9	181.0	180.0	178.4	171.1
5.0	199.4	198.1	194.9	192.4	188.6	174.6
6.0	205.1	203.2	200.0	195.2	189.5	174.6
10.0	218.4	211.4	202.5	196.2	189.5	174.6
15.0	224.8	214.6	202.5	196.2	189.5	174.6

NOTE:

- 1.The table shows the normal value of cooling operation. In some cases, the value may change due to the compressor protection control.
- 2.The heating capacity on the table indicates the peak value,which does not include the capacity decrease caused by frost.
- 3.The value on the table shows when the system is operated under the following conditions.
 The indoor unit total capacity: 100% of outdoor unit capacity, The total piping length: 7.5m,
 The height difference: 0m.

5.6 Capacity Correction by Refrigerant Piping Length

< Cooling Capacity >

Correction Factor for Cooling Capacity According to Piping Length

The cooling capacity should be corrected according to the following formula:

$$CCA = CC \times F$$

CCA: Actual Corrected Cooling Capacity

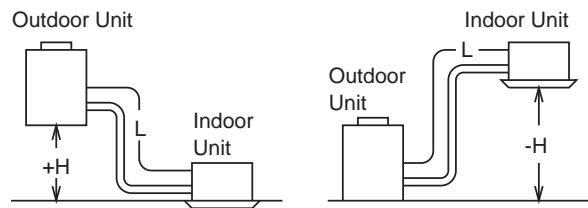
CC: Cooling Capacity in the Performance Table

F: Correction Factor Based on the Equivalent Piping Length

The correction factors are shown in the following figure

Equivalent Piping Length for

- One 90° Elbow is 0.5m.
- One 180° Bend is 1.5m.
- One Branch Pipe is 0.5m.



H: Vertical Distance Between Indoor Unit and Outdoor Unit in Meters

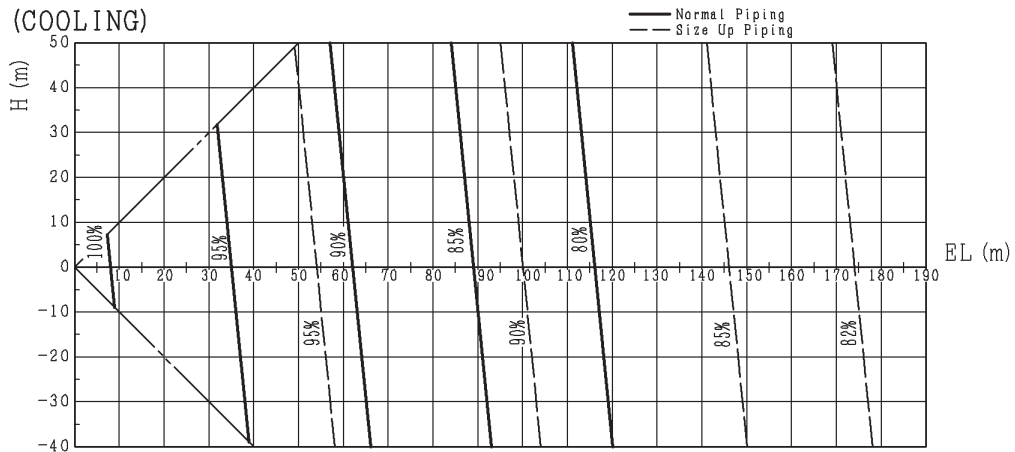
EL: Equivalent Total Distance Between Indoor Unit and Outdoor Unit in Meters (Equivalent One-Way Piping Length)

H>0: Position of Outdoor Unit Higher Than Position of Indoor Unit

L: Actual One-Way Piping Length Between Indoor Unit and Outdoor Unit in Meters

NOTE:

If EL is more than 100m, increase both Liquid Pipe and Gas Pipe by 1 size.



< Heating Capacity >

Correction Factor for Heating Capacity According to Piping Length

The heating capacity should be corrected according to the following formula:

$$HCA = HC \times F$$

HCA: Actual Corrected Heating Capacity

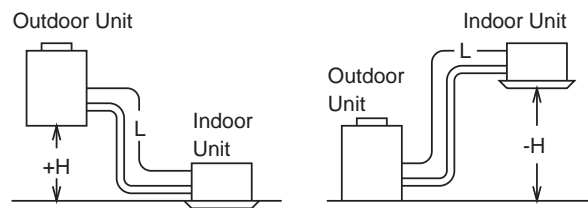
HC: Heating Capacity in the Performance Table

F: Correction Factor Based on the Equivalent Piping Length

The correction factors are shown in the following figure

Equivalent Piping Length for

- One 90° Elbow is 0.5m.
- One 180° Bend is 1.5m.
- One Branch Pipe is 0.5m.



H: Vertical Distance Between Indoor Unit and Outdoor Unit in Meters

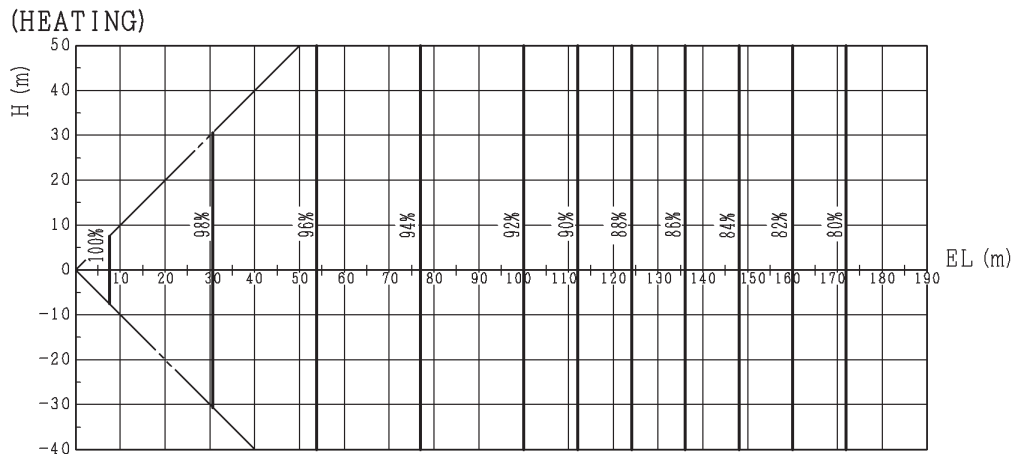
EL: Equivalent Total Distance Between Indoor Unit and Outdoor Unit in Meters (Equivalent One-Way Piping Length)

H>0: Position of Outdoor Unit Higher Than Position of Indoor Unit

L: Actual One-Way Piping Length Between Indoor Unit and Outdoor Unit in Meters

NOTE:

If EL is more than 100m, increase both Liquid Pipe and Gas Pipe by 1 size.



5.7 Electrical Data

< 380-415V/50Hz >

■ Field Minimum Wire Sizes for Power Source

Model (kBtu/h)	Maximum Running Current (A)	Power Source Cable Size	Transmitting Cable Size	Earth Wire Size (mm ²)	ELB		Fuse (A)
		EN60335-1 (mm ²)*1	EN60335-1 (mm ²)*1		Nominal Current (A)	Nominal Sensitive Current (mA)	
76	16.1	4	0.75	4	20	30	20
96	17.0	6	0.75	6	30	30	30
114	23.0	6	0.75	6	40	30	40
136	28.0	10	0.75	10	40	30	40
154	31.0	10	0.75	10	50	30	50

*1 Refer to the NOTES for selection of the power source cable size.

ELB: Earthleakage Breaker.

< 380-415V/50Hz >

Model (kBtu/h)	Unit Main Power			Applicable Voltage		Compressor				Fan Motor			MRC	IPT Cooling/Heating Operation
	VOL	PH	Hz	Maximum	Minimum	PH	STC	Cooling Operation		PH	RNC	OPT		
								RLA	IPT					
76	380~415V	3	50	456	342	3	30	11.10	5.25	1	1.5	0.33	16.1	5.25/5.49
96							30	13.97	5.25		2.1	0.44	17.0	7.03/7.33
114							30	17.66	6.50		2.3	0.49	23.0	8.73/8.72
136							30	23.52	7.64		3.1	0.66	28.0	12.12/11.84
154							30	26.20	7.64		3.1	0.66	31.0	13.80/14.08

VOL: Rated Unit Power Supply Voltage (Plated)(V)

HZ: Frequency (Hz)

STC: Starting Current (A)

RNC: Running Current (A)

PH: Phase (φ)

IPT: Input (kW)

RLA: Rated Current (A)

MRC: Max Running

Current (A)

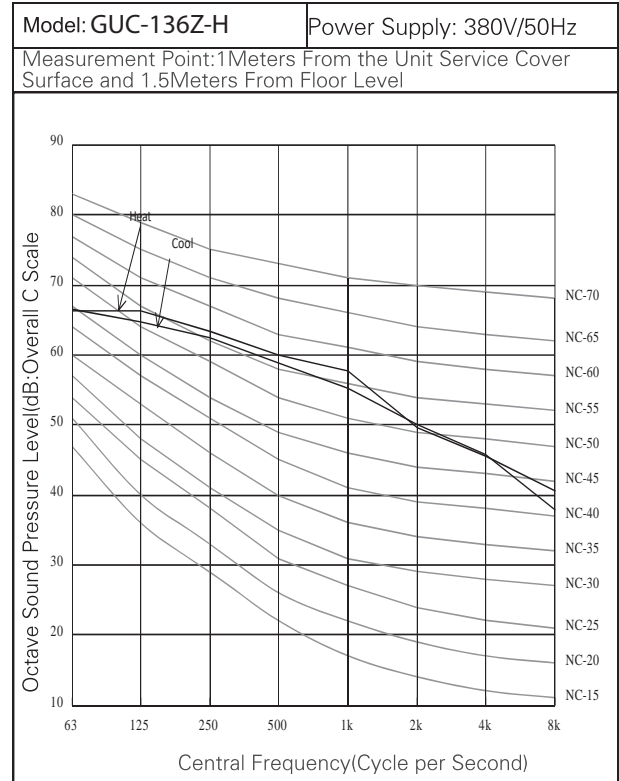
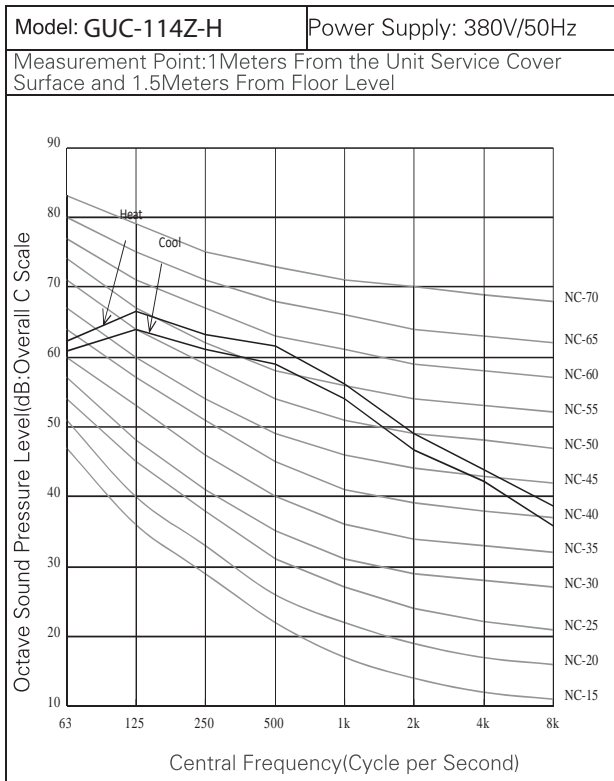
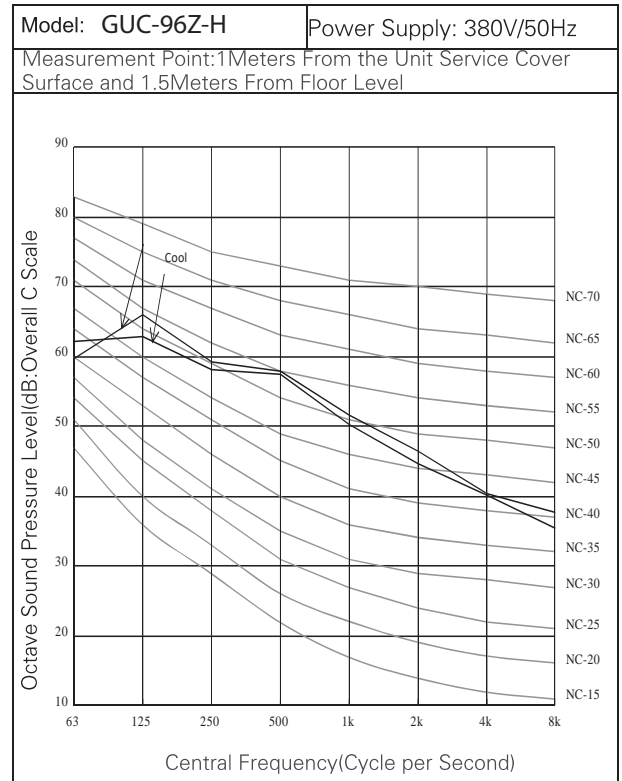
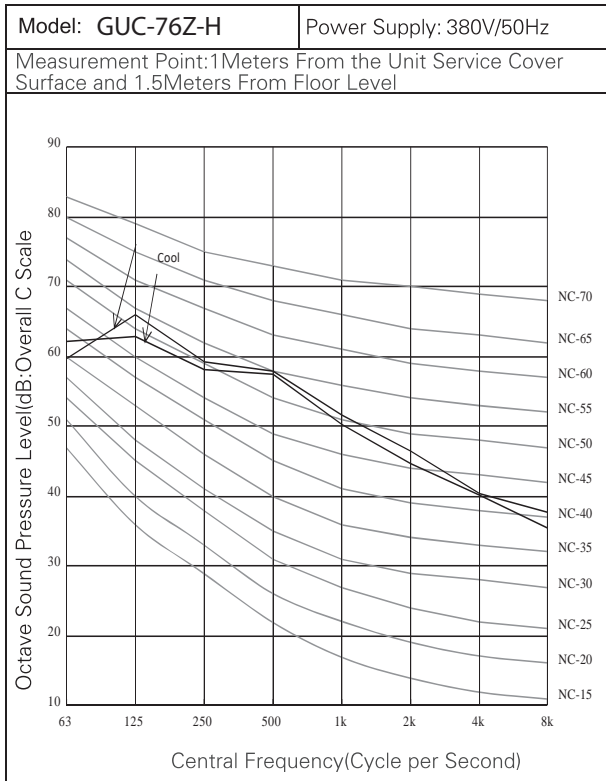
NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) The wire sizes marked with *1 in the above table are selected at the maximum current of the unit according to the European Standard, EN60335-1. Use the wires which are not lighter than the ordinary polychloroprene sheathed flexible cord (code designation H05RN-F).
- 3) Use a shielded cable for the transmitting circuit and connect it to ground.
- 4) In the case that power cables are connected in series, add each unit maximum current and select wires below.

According to EN60335-1	
Current(A)	Wire Size(mm ²)
$i \leq 6$	2.5
$6 < i \leq 10$	2.5
$10 < i \leq 16$	2.5
$16 < i \leq 25$	4
$25 < i \leq 32$	6
$32 < i \leq 40$	10
$40 < i \leq 63$	16
$63 < i$	*2

*2 : In the case that current exceeds 63A, don't make series connection.

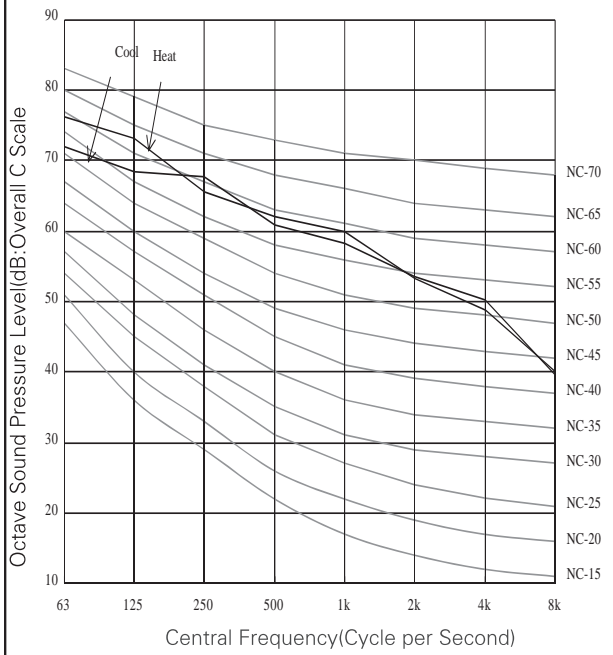
5.8 Sound Data



Model: GUC-154Z-H

Power Supply:380V/50Hz

Measurement Point:1Meters From the Unit Service Cover Surface and 1.5Meters From Floor Level



Installation

6. Checking Product Received

- Upon receiving this product, inspect it for any shipping damage. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct.

7. Necessary Tools and Instruments

No.	Tool	No.	Tool	No.	Tool	No.	Tool
1	Handsaw	6	Copper Pipe Bender	11	Spanner	16	Leveller
2	Phillips Screwdriver	7	Plier	12	Charging Cylinder	17	Clamper for Solderless Terminals
3	Vacuum Pump	8	Pipe Cutter	13	Gauge Manifold	18	Hoist (for Indoor Unit)
4	Refrigerant Gas Hose	9	Brazing Kit	14	Cutter for Wires	19	Ammeter
5	Megohmmeter	10	Hexagon Wrench	15	Gas Leak Detector	20	Voltage Meter

Use tools and measuring instruments only for the new refrigerant R410A which is directly touch to refrigerant.

DANGER

The pressure of refrigerant R410A is 1.4 times higher than that of conventional refrigerant, impurities such as moisture, oxide film, and grease affect easily R410A. Be sure to remove any moisture, dust, different refrigerant or refrigerant oil from the refrigerant cycle.

Therefore, if the specified materials are not used, it may cause explosion, injury, leakage, electrical shock or fire.

NOTICE

Check the design pressure for this product is 4.15MPa.

To avoid accidental mixing of the different refrigerant or different refrigerant oil, the sizes of the charging connections have been changed.

It is necessary to prepare the following tools before performing the installation work.

◇: Interchangeability is available with current R22
 ×: Prohibited

●: only for Refrigerant R410A (No Interchangeability with R22)
 ✦: only for Refrigerant R407C (No Interchangeability with R22)





















Measuring Instrument and Tool		Interchangeability with R22		Reason of Non-Interchangeability and Attention (★: Strictly Required)	Use
		R410A	R407C		
Refrigerant Pipe	Pipe Cutter Chamfering Reamer	◇	◇	-	Cutting Pipe Removing Burrs
	Flaring Tool	◇●	◇	* The flaring tools for R407C are applicable to R22. * If using flaring tube, make dimension of tube larger for R410A. * In case of material 1/2H, flaring is not available.	Flaring for Tubes Dimensional Control for Extruded Portion of Tube after Flaring
	Extrusion Adjustment Gauge	●	-		
	Pipe Bender	◇	◇	* In case of material 1/2H, bending is not available. Use elbow for bend and braze.	Bending
	Expanding Tool	◇	◇	* In case of material 1/2H, expanding of tube is not available. Use socket for connecting tube.	Expanding Tubes
	Torque Wrench	●	◇	* For φ12.7, φ15.88, spanner size is up 2mm.	Connection of Flare Nut
		◇	◇	* For φ6.35, φ9.53, φ19.05, spanner size is the same.	
	Brazing Tool	◇	◇	* Perform correct brazing work.	Brazing for Tubes
	Nitrogen Gas	◇	◇	* Strict Control against Contamin (Blow nitrogen during brazing.)	Prevention from Oxidation during Brazing
Lubrication Oil (for Flare Surface)	●	✦	* Use a synthetic oil which is equivalent to the oil used in the refrigeration cycle. * Synthetic oil absorbs moisture quickly.	Applying Oil to the Flared Surface	
Vacuum Drying Refrigerant Charge	Refrigerant Cylinder	●	✦	* Check refrigerant cylinder color. ★ Liquid refrigerant charging is required regarding zeotropic refrigerant.	Refrigerant Charging
	Vacuum Pump	◇	◇	★ The current ones are applicable. However, it is required to mount a vacuum pump adapter which can prevent from reverse flow when a vacuum pump stops, resulting in no reverse oil flow.	Vacuum Pumping
	Adapter for Vacuum Pump	*●	✦		
	Manifold Valve	●	✦	* No interchangeability is available due to higher pressures when compared with R22. ★ Do not use current ones to the different refrigerant. If used, mineral oil will flow into the cycle and cause sludges, resulting in clogging or compressor failure. Connection diameter is different; R410A: UNF1/2, R407C: UNF7/16.	Vacuum Pumping, Vacuum Holding, Refrigerant Charging and Check of Pressures
	Charging Hose	●	✦		
	Charging Cylinder	×	×	* Use the weight scale.	-
	Weight Scale	◇	◇	-	Measuring Instrument for Refrigerant Charging
Refrigerant Gas Leakage Detector	*●	✦	* The current gas leakage detector (R22) is not applicable due to different detecting method.	Gas Leakage Check	

*: Interchangeability with R407C.

8. Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the outdoor unit.

Table 8.1 Factory-Supplied Accessories

Accessory		76	96	114	136	154
Accessory Pipe	(A) Connection for Refrigerant Gas Pipe	 $\phi 22.2 \rightarrow \phi 19.05$	-	 $\phi 22.2 \rightarrow \phi 25.4$	-	 $\phi 25.4 \rightarrow \phi 28.6$
	(B) Connection for Refrigerant Liquid Pipe	-	-	 $\phi 9.53 \rightarrow \phi 12.7$	-	-
Rubber Bush	For Connection Hole of Power Supply Wire	 x1	 x1	 x1	 x1	 x1
Screw (Spare)		 x3	 x3	 x3	 x3	 x3
Combination Unit Model Label						
Noise Filter		 x1	-	-	-	-

NOTE

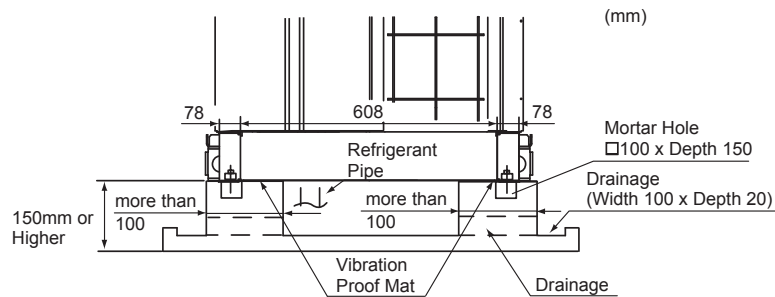
If any of these accessories are not packed with the unit, please contact your contractor.

9. Unit Transportation and Installation

9.1 Installation Location Requirements

- Concrete Foundations

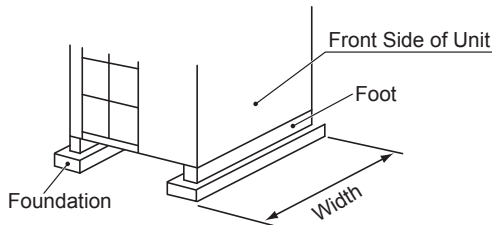
- The height of the foundation should be 150mm higher than the ground level.
- Install a drainage around foundation for smooth drain.



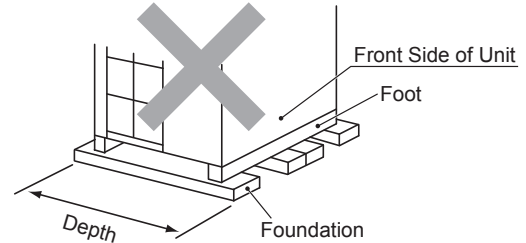
* Provide concrete foundation as shown in the figure.

* Do not provide concrete foundation as shown below. The foot of the outdoor unit may be deformed.

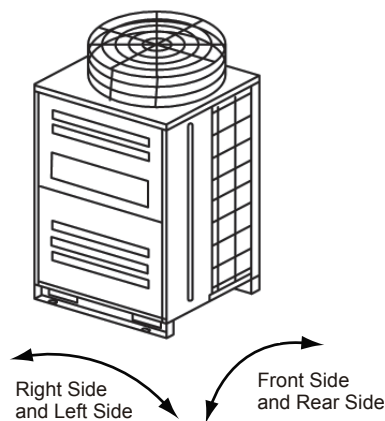
CORRECT



INCORRECT



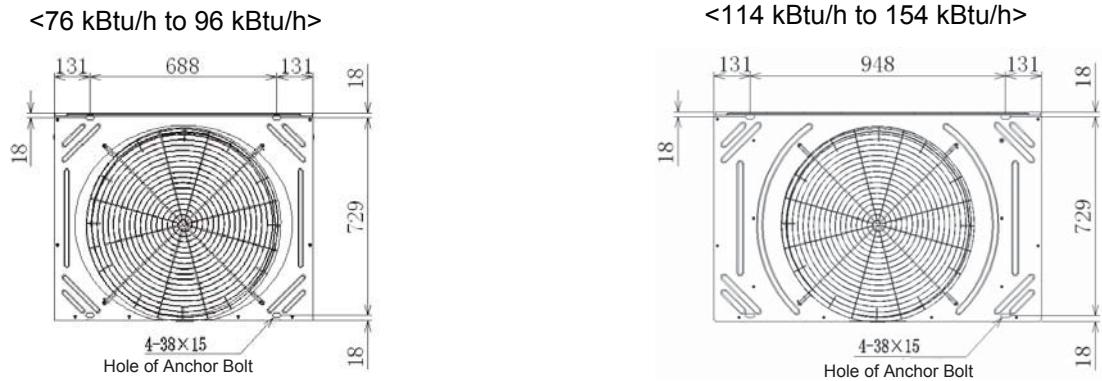
- Install the outdoor unit in the front-rear and right-left direction horizontally. (Use a level gauge.) Check to ensure that the gradient in four directions (front, rear, right and left) is within 10mm.



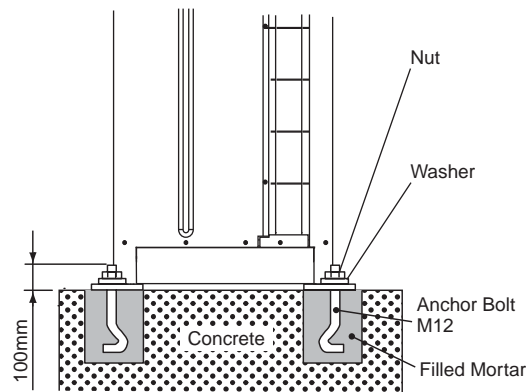
- Provide a strong and correct foundation so that;
 - The outdoor unit is not on an incline.
 - Abnormal sound does not occur.
 - The outdoor unit will not fall down due to a strong wind or earthquake.

- (5) When installing the outdoor unit, fix the unit by anchor bolts (field-supplied). Refer to the following figure regarding the location of fixing holes.

Unit: mm



Secure the outdoor unit with the anchor bolts.



- (6) When installing the unit on a roof or a veranda, drain water sometimes turns to ice on a cold morning. Therefore, avoid draining into an area where people often use because it is slippery.
- (7) When drain piping is necessary for the outdoor unit, use the drain boss set (Optional, DC-01Q). Do not use drain boss and drain pan kit in the cold area. The drain water in the drain pipe may be frozen and then the drain pipe may crack.

9.2 Unit Transportation and Handing

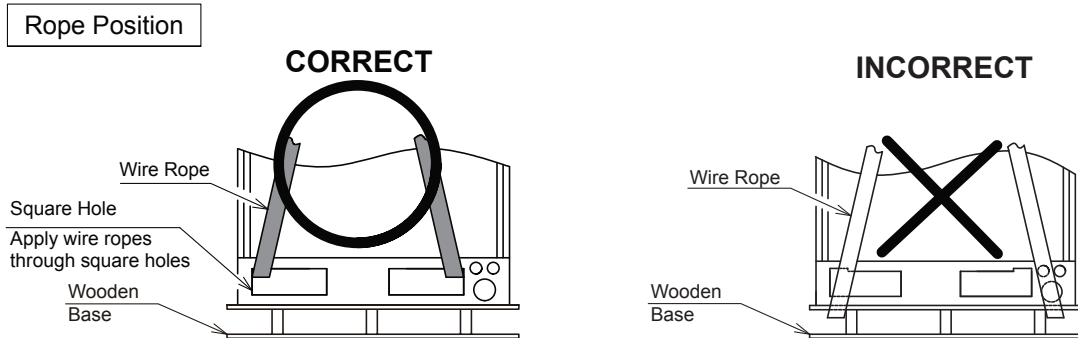
- Transportation

Transport the product as close to the installation location as practical before unpacking.

When using a crane, hang the unit according to the description of the label attached to the outdoor unit.

⚠ DANGER

Do not hang the unit by the ropes at the wooden base.



⚠ CAUTION

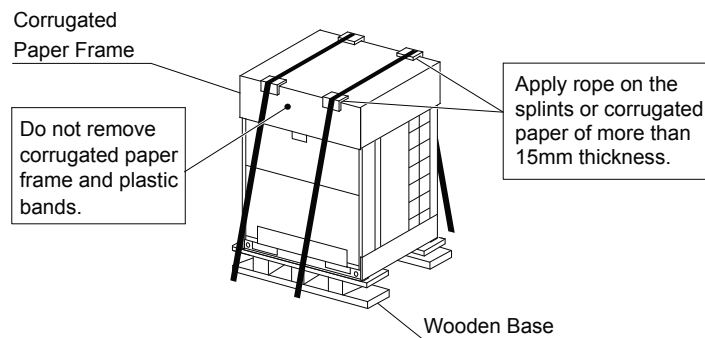
1. Transportation and Storage

The corrugated paper frame is not sufficiently strong, therefore pay attention to the followings in order to prevent the unit deformation.

- Do not step or put any material on the product.
- Apply two lifting wires onto the outdoor unit, when lifting it by crane.
- Do not stack the product when storing.

2. Transportation and Wire Rope

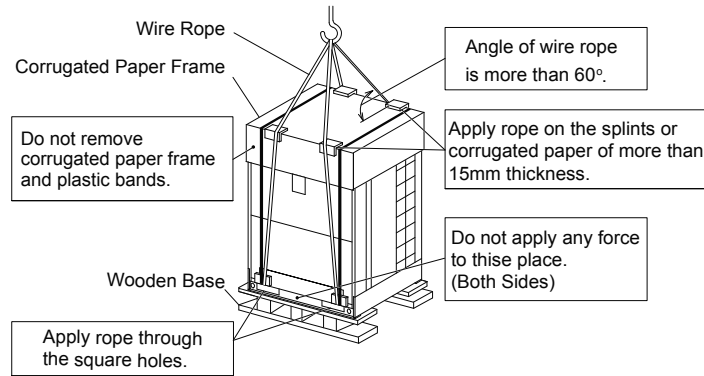
- To protect the unit, do not remove any packing.
- Do not stack or put any material on the product.
- Apply wire ropes on the both side of the unit as shown in the figure.



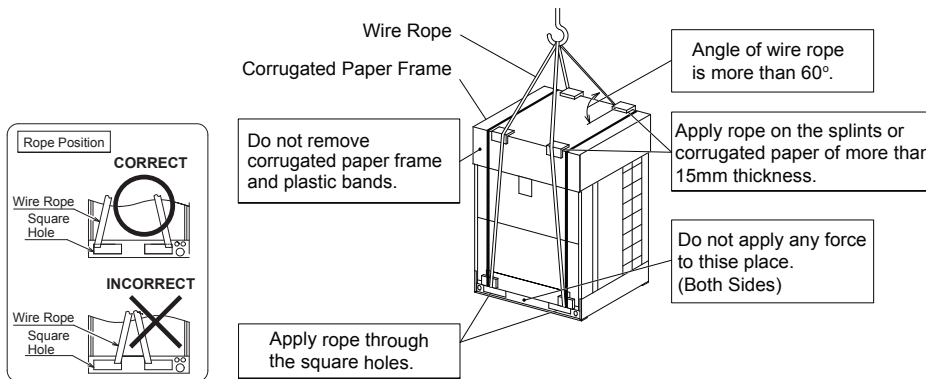
- Hanging Method

When hanging the unit, ensure a balance of the unit, check safety and lift up smoothly.

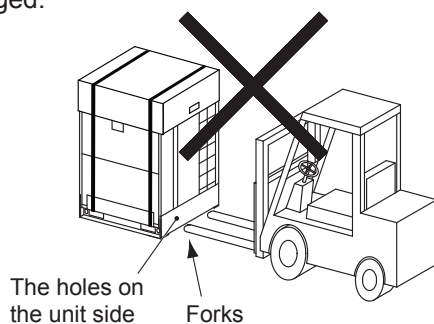
- (1) Do not remove any packing materials.
- (2) Hang the unit under packing condition with two (2) wire ropes, as shown in the following figure.



- (3) Hang the unit without wooden base with two (2) wire ropes, as shown in the following figure.

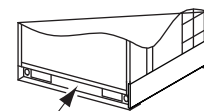


When using forklift, do not insert forks into the holes on the unit side. The unit may be damaged.



Do not apply excessive force to the square holes with forks or other materials. The bottom of the unit may be deformed.

- * Do not push the bottom base by fork.
- * Do not use roller.



Do not apply excessive force. (Both Sides)

NOTE

In case of transportation after unpacking, protect the unit with the splints or cloth.

- Handling of Outdoor Unit

! WARNING

Do not put any foreign material into the outdoor unit and check to ensure that none exists in the outdoor unit before the installation and test run. Otherwise, a fire or failure, etc. may occur.

9.3 Unit Installation

- Installation

- (1) Install the outdoor unit in a dry well ventilated environment.
- (2) Install the outdoor unit where it is in the shade or it will not be exposed to direct sunshine or direct radiation from high temperature heat source.
- (3) Install the outdoor unit where the sound or the discharge air from the outdoor unit does not affect neighbors or surrounding ventilation. The operating sound at the rear or right/left sides is 3 to 6dB(A) higher than the value in the catalog at the front side.
- (4) Install the outdoor unit in a space with limited access to general public.
- (5) Check to ensure that the foundation is flat, level and sufficiently strong.
- (6) Do not install the outdoor unit where dust or other contamination could block the outdoor heat exchanger.
- (7) When installing the outdoor unit in snow-covered areas, mount the field-supplied hoods on the top of the outdoor unit and the inlet side of the heat exchanger.
- (8) Do not install the outdoor unit in a space where a seasonal wind directly blows to the outdoor heat exchanger or a wind from a building space directly blows to the outdoor fan.

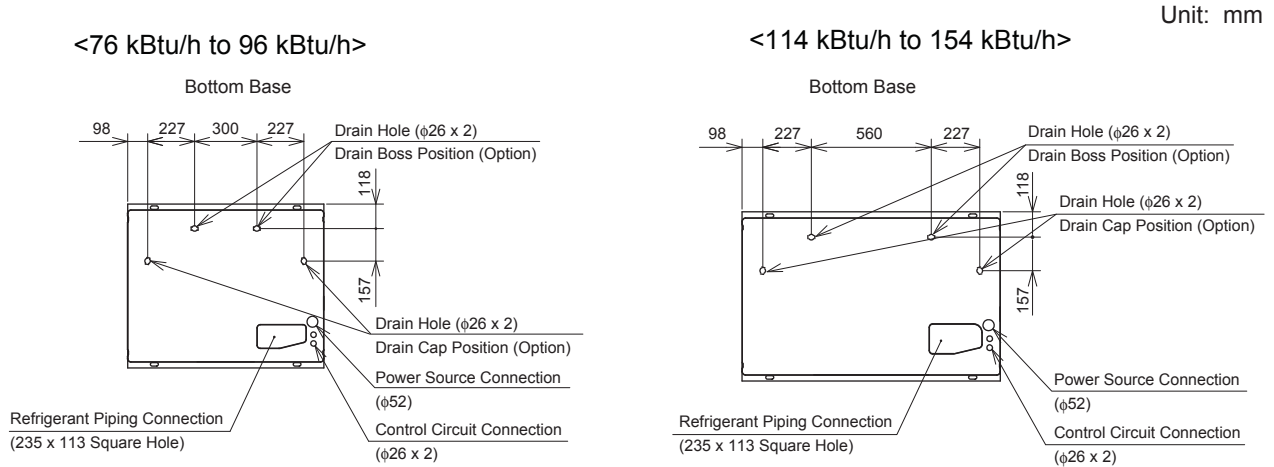
NOTES:

1. Do not install the outdoor unit where there is a high level of oil mist, flammable gases, salty air or harmful gases such as sulphur and an acid or alkaline environment.
2. Do not install the outdoor unit where the electromagnetic wave is directly radiated to the electrical control box.
3. Install the outdoor unit as far as possible, being at least 3 meters from the electromagnetic wave radiator.

- Water Treatment

Pay attention to the followings.

- (1) Choose a place where well drainage is available, or provide a drain ditch.
- (2) Do not install the unit over the walkways. Condensation water may fall on people.
In case of installing the unit in such a place, provide the additional drain pan.
- (3) When drain piping is necessary for the outdoor unit, use the drain boss set (Optional, DC-01Q).



- Drain Boss (Optional, DC-01Q)

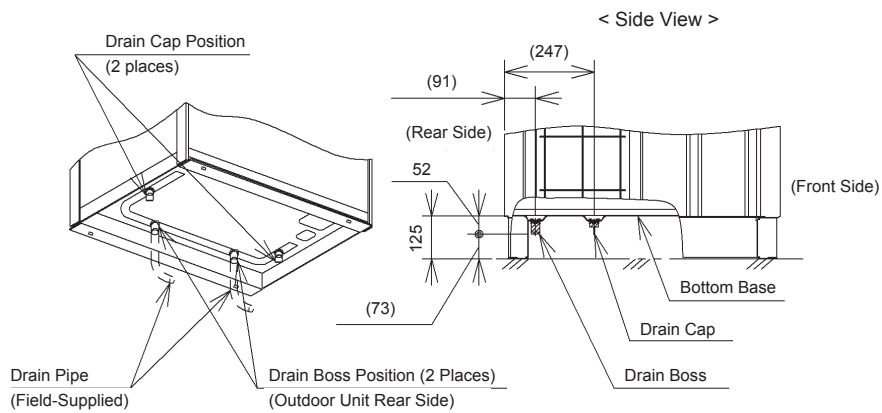
The drain boss is for the drain pipe connection in order to use outdoor unit bottom base as a drain pan.

Component Formation of Drain Boss

Parts Name	Q'ty	Application
Drain Boss	1	Connecting for Drain Piping
Drain Cap	1	Embolization for Drain Hole
Rubber Cap	4	Sealing for Boss and Cap

< Installation Position >

Example:



10. Refrigerant Piping Connection

⚠ DANGER

- Use refrigerant R410A in the refrigerant cycle.
Do not charge oxygen, acetylene or other flammable and poisonous gases into the refrigerant cycle when performing a leakage test or an air-tight test. These types of gases are extremely dangerous and can cause an explosion. It is recommended that compressed air, nitrogen or refrigerant be used for these types of tests.
- Check to ensure that no pressure exists inside the stop valve before removing the flange.

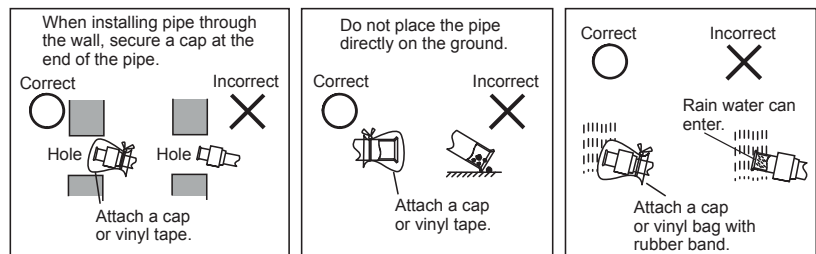
⚠ CAUTION

Ensure to connect the piping among the units in the same refrigerant cycle.

10.1 Piping Materials Requirements

- (1) Prepare locally-supplied copper pipes.
- (2) Select clean copper pipes. Make sure there is no dust and moisture inside of the pipes. Blow the inside of the pipes with nitrogen or dry air, to remove any dust or foreign materials before connecting pipes. Do not use any tools which produce a lot of swarf such as a saw or a grinder.

- Cautions for Refrigerant Pipe Ends



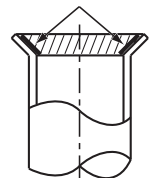
- Cautions for Piping Connection Work

- (1) Connect the indoor/outdoor units with refrigerant pipes. Fix the pipes and pay attention not to contact with weak materials such as ceiling. (Otherwise, abnormal sound may be heard due to the vibration of the piping.)
- (2) Apply refrigerant oil slightly on the sheet surface of the pipe and flare nut before the flaring work. And then tighten the flare nut with the specified tightening torque using two spanners. Perform the flaring work on the liquid piping side before the gas piping side. Check the gas leakage after the flaring work.

NOTE:

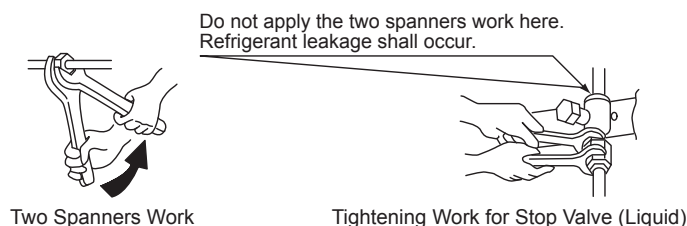
Refrigerant oil is field-supplied.
[Ethereal Oil FVC68D]

Apply Refrigerant Oil.



- (3) In case that temperature and humidity inside the ceiling exceed 27°C/RH80%, apply additional insulation (approx. 10mm thickness) to the accessory insulation. It prevents dew condensation on the surface of the insulation (refrigerant pipe only).
- (4) Perform the air-tight test (4.15MPa for the test pressure).
- (5) Perform cold insulation work by insulating and taping the flare connection and reducer connection. Also insulate all the refrigerant pipes.

- When tightening the flare nut, use two spanners.



Two Spanners Work

Tightening Work for Stop Valve (Liquid)

⚠ CAUTION

Do not apply excessive force to the flare nut when tightening. If applied, the flare nut may crack due to aged deterioration and refrigerant leakage may occur. Use the specified tightening torque.

- Piping Thickness and Material

Use the pipe as below.

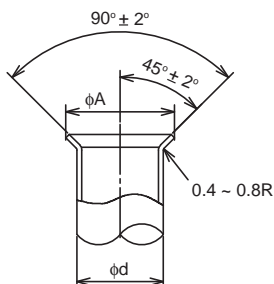
(mm)

Diameter	R410A	
	Thickness	Material
φ6.35	0.8	O material
φ9.53	0.8	O material
φ12.7	0.8	O material
φ15.88	1.0	O material
φ19.05	1.0	1/2H material
φ22.2	1.0	1/2H material
φ25.4	1.0	1/2H material
φ28.6	1.0	1/2H material
φ31.75	1.1	1/2H material
φ38.1	1.35	1/2H material
φ41.3	1.45	1/2H material
φ44.45	1.55	1/2H material

10.2 Flaring and Joint Requirements

- Flaring Dimension

Perform the flaring work as shown below.



(mm)

Diameter (φd)	A ⁺⁰ -0.4
	R410A
6.35	9.1
9.53	13.2
12.7	16.6
15.88	19.7
19.05	(*)

(*) It is impossible to perform the flaring work with 1/2H material. In this case, use an accessory pipe (with a flare).

- Joint Selection

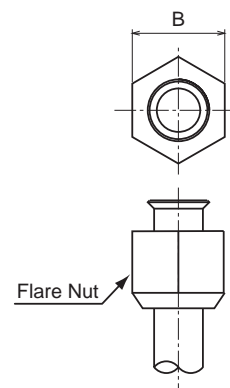
If you use 1/2H material, you can not perform the flaring work. In this case, use a joint selected from the chart below.

< Minimum Thickness of Joint (mm) >

Diameter	R410A
φ6.35	0.5
φ9.53	0.6
φ12.7	0.7
φ15.88	0.8
φ19.05	0.8
φ22.2	0.9
φ25.4	0.95
φ28.6	1.0
φ31.75	1.1
φ38.1	1.35
φ41.3	1.45
φ44.5	1.55

< Flare Nut Dimension B (mm) >

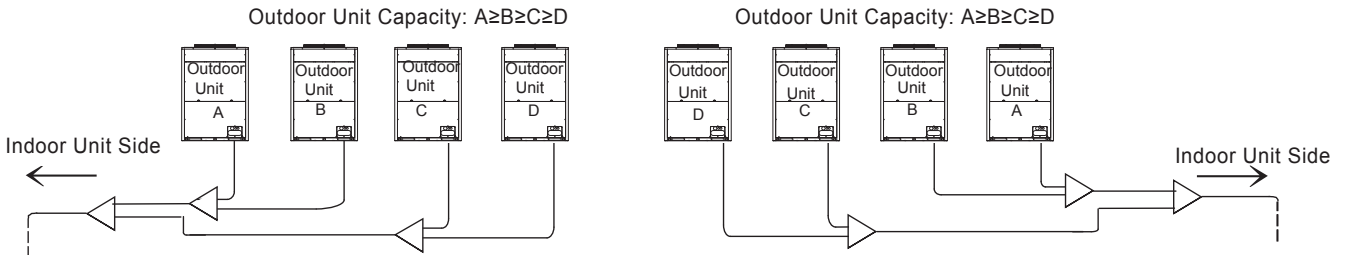
Diameter	R410A
φ6.35	17
φ9.53	22
φ12.7	26
φ15.88	29
φ19.05	36



10.3 Piping Connection Requirements

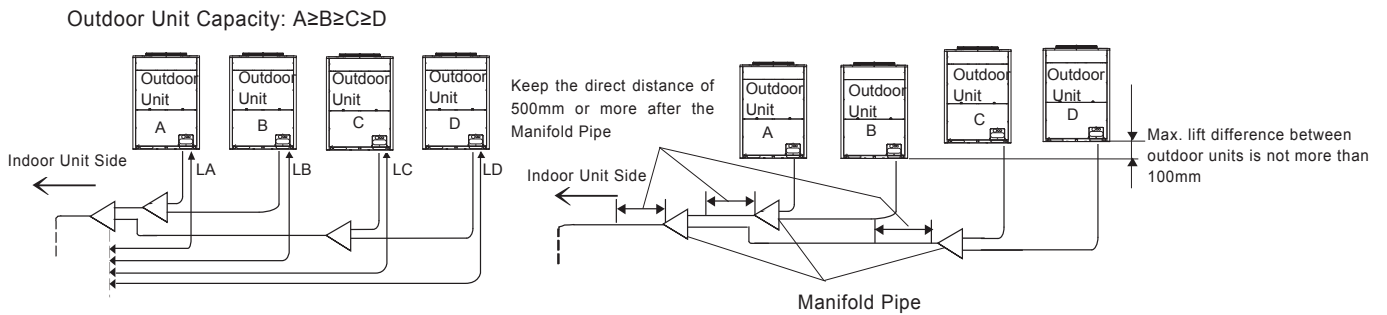
< Outdoor Unit Alignment >

Align the outdoor unit from large capacity as $A > B > C > D$, and outdoor Unit "A" should be located at the indoor unit side.

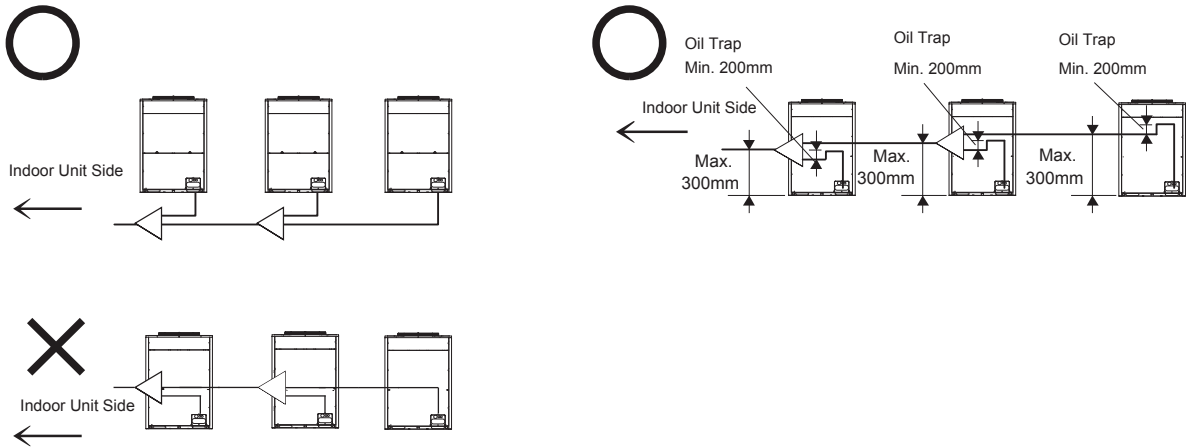


< Piping Work between Outdoor Units >

(1) Piping length between Manifold Pipe (at outdoor unit side) and outdoor unit should be $LA < LB < LC < LD < 10m$.

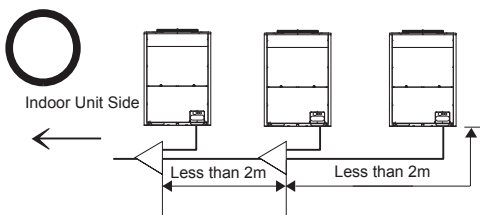


(2) Place the Manifold Pipe lower than the outdoor unit piping connection. In case that the Manifold Pipe is placed higher than the outdoor unit piping connection, keep 300mm (max.) between the Manifold Pipe and the bottom of the outdoor unit. Also, provide the oil trap (min. 200mm) between the Manifold Pipe and the outdoor unit.

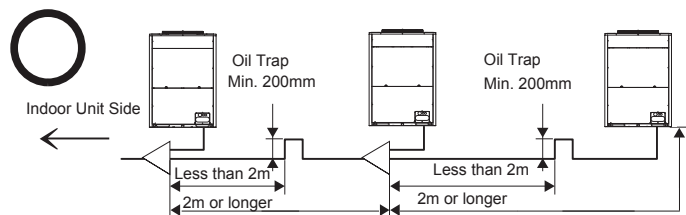


(3) In case that the piping length between outdoor units is 2m or more, the oil trap should be provided for the gas pipe so that accumulation of refrigerant oil may not occur.

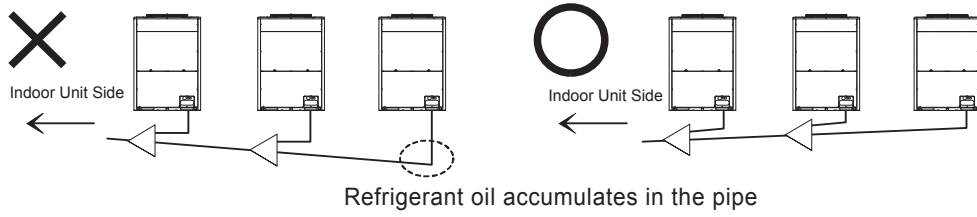
* Less than 2m



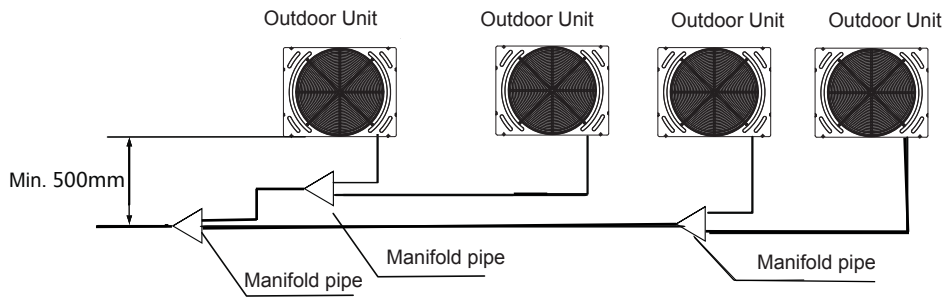
* 2m or longer



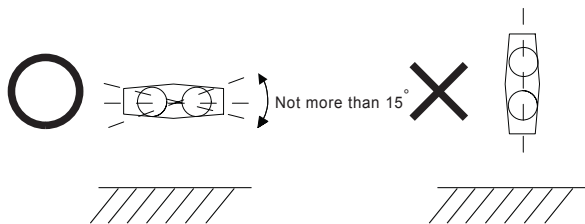
- (4) Place the outdoor unit pipe horizontally or with downward gradient towards the indoor unit side, or refrigerant oil may accumulate in the pipe.



- (5) For servicing, in case that the pipe is placed frontward of the outdoor unit, secure min. 500mm between the outdoor unit and Manifold Pipe. (When the compressor is replaced, a space of min. 500mm is required.)



- (6) Direction of Manifold Pipe
Place the Manifold Pipe vertically towards the ground (within $\pm 15^\circ$) as shown in the figure.



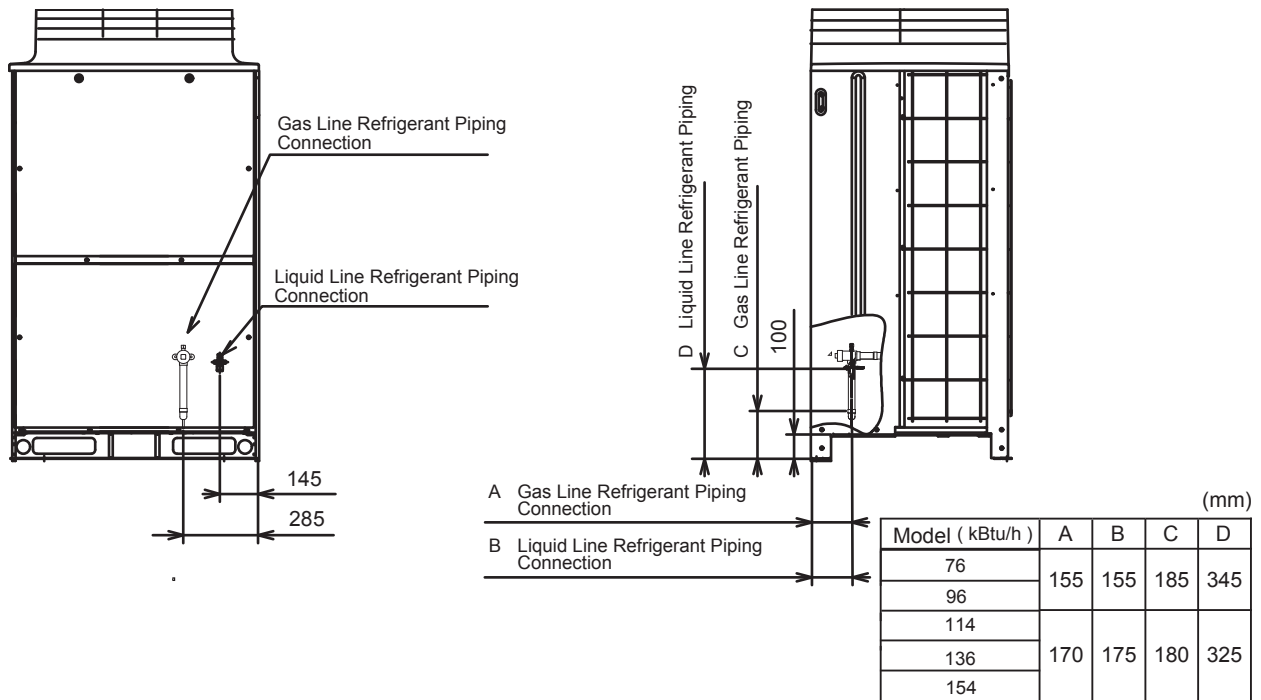
10.4 Piping Connection Procedure

Perform the piping connection work for each outdoor unit.

NOTE:

Ensure that the refrigerant pipe should be connected to the same refrigerant cycle unit.

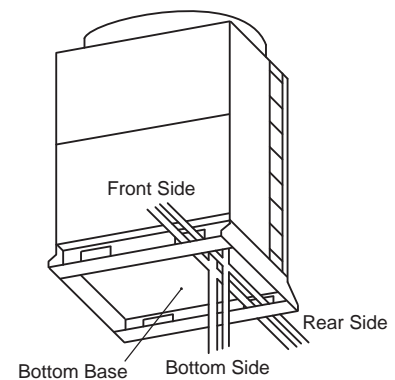
- Prepare the refrigerant pipe in the field for the piping work. Refer to the following figure for the position of piping connection.



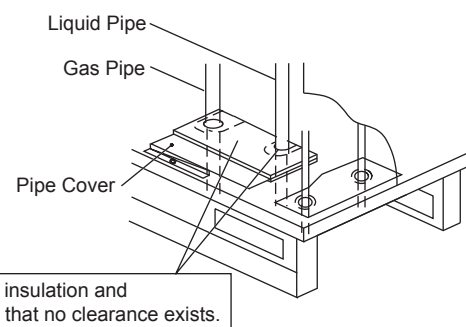
• Piping Direction

Fix the pipes adequately in order to avoid vibration and excessive force to the valve.

- (1) The pipes are available to connect in three directions (front, rear or bottom side) from the bottom base. For the vibration protection, properly fix the piping connection and check that no excessive force applied to the stop valve.



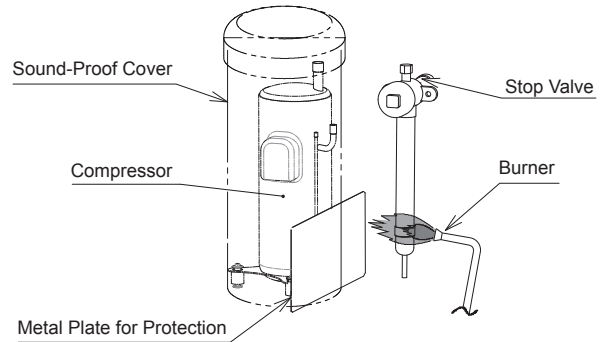
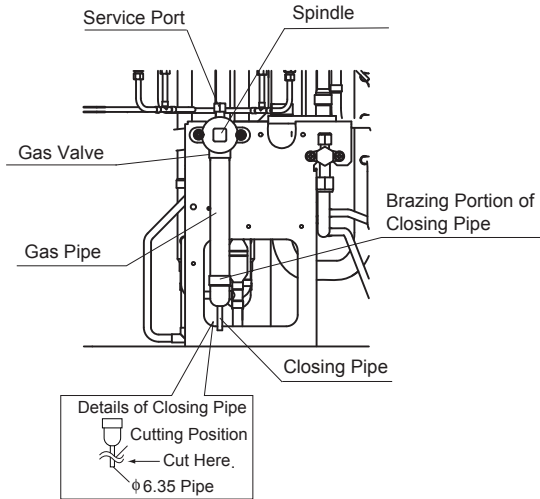
- (2) Operation of the stop valve should be performed according to the contents on next page.
- (3) Connect the pipes according to Section 5.2 and each "Installation & Maintenance Manual".
- (4) Completely seal the penetration part of the bottom pipe with insulation in order to prevent rain water entering into the conduit.



Stop Valve

< Gas Valve >

- (1) Make sure that the all the spindles are closed completely.
 - (2) Connect the charging hose to the service port and release gas from the gas pipe.
 - (3) Cut the end of the closing pipe ($\phi 6.35$) and check that no gas exists inside the gas pipe .
 - (4) Remove the stop valve cover.
 - (5) Remove the closing pipe from the brazing portion by using a burner.
- Pay attention to the flame from the burner not to burn the stop valve body.

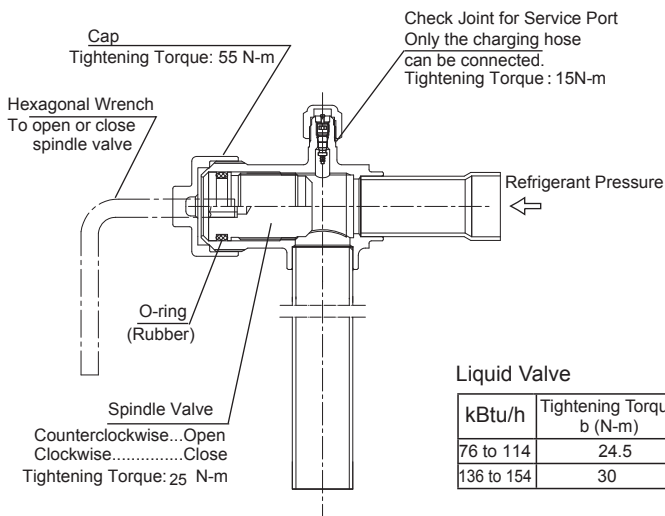


CAUTION

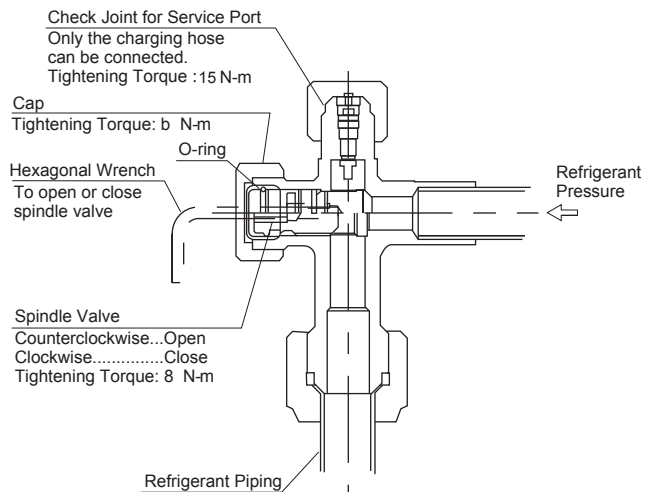
- Ensure that there is no gas inside the pipe when removing the closing pipe. Otherwise, the pipe may be blown out and it may lead to injury.
- Protect the return oil pipe and vibration proof of the compressor with the metal plate when using a burner.

- The details of stop valves are as follows.

< Gas Valve >



< Liquid Valve >



CAUTION

- Do not apply an abnormal big force to the spindle valve at the end of opening. The back seat construction is not provided.
- At the test run, fully open the spindle. If not fully opened, the devices will be damaged.

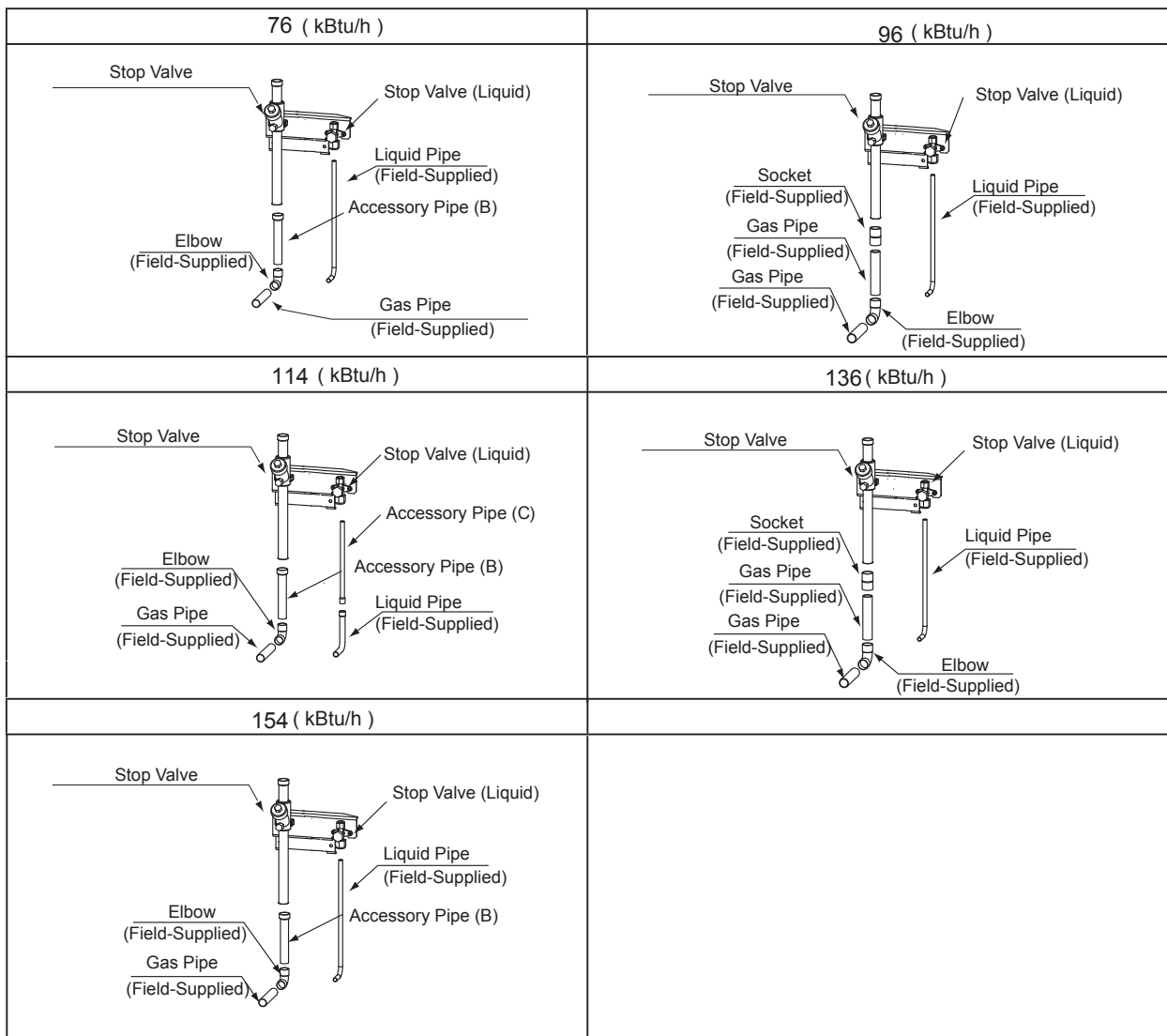
Piping Connection

- (1) Make sure that the stop valves are closed completely.
- (2) Protect the compressor and sound-proof cover with metal plate when brazing the gas pipe. Pay attention to the flame from the burner not to burn the stop valve body.
- (3) Connect the indoor unit and the outdoor unit with refrigerant piping.
Prevent the refrigerant piping from touching weak parts of the building such as wall, ceiling, etc.
(Abnormal sound may occur due to the vibration of the piping.)
- (4) As for the flaring work of the field pipe, use the specified tightening torque in Table 10.3.
Put nitrogen gas into the pipe when brazing.
- (5) Insulate the gas pipe and liquid pipe completely.
- (6) Mount the piping cover equipped with the outdoor unit after the piping connection.
If not, the unit may be damaged due to snow or rain water entering.

Table 10.3 Tightening Work of Flare Nut
Required Tightening Torque (JIS B8607)

Pipe Size	Tightening Torque
φ6.35 (1/4)	14 to 18 (N-m)
φ9.53 (3/8)	34 to 42 (N-m)
φ12.7 (1/2)	49 to 61 (N-m)
φ15.88 (5/8)	68 to 82 (N-m)
φ19.05 (3/4)	100 to 120 (N-m)

• Details of Stop Valve Piping Connection



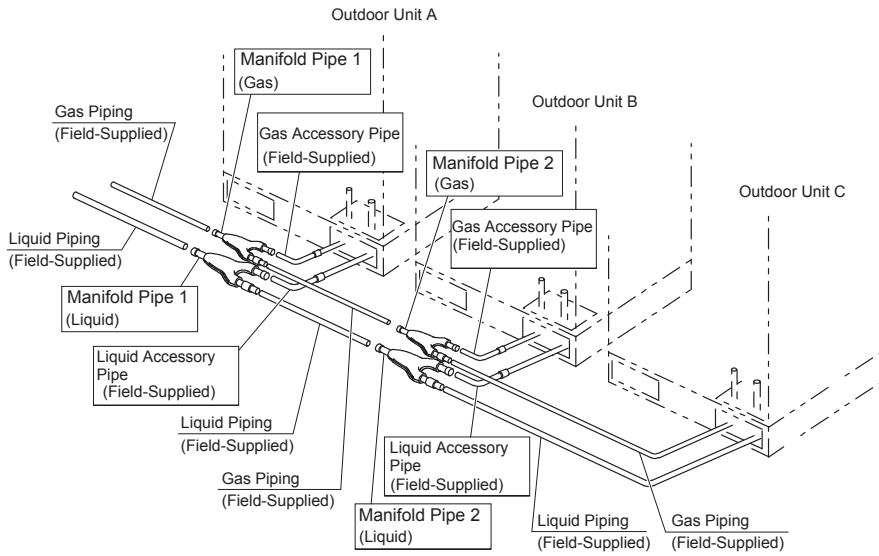
NOTES:

1. Ensure that the closing pipe of the gas stop valve (1 place) is removed firstly.
2. Refer to section 10.2 for the flaring work.

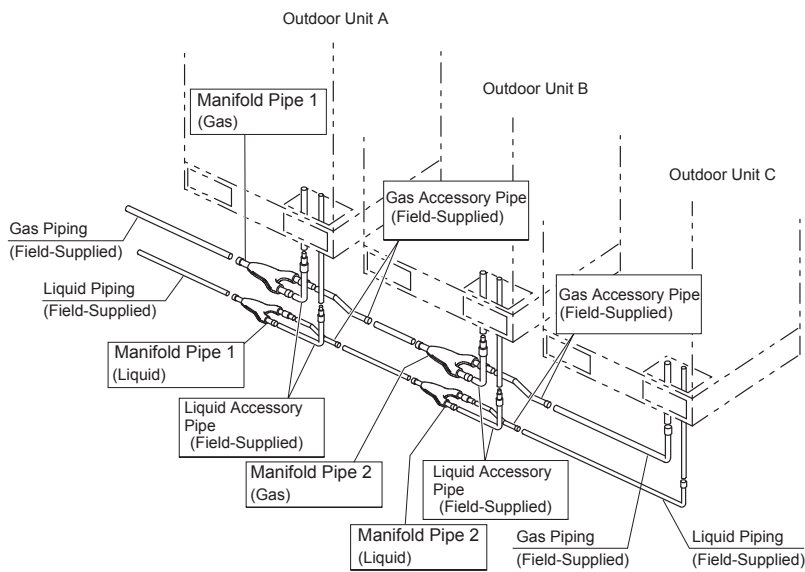
- Manifold Pipe Connection Example

Regarding the piping work for 172 kBtu/h and over, refer to Installation & Maintenance Manual attached to the Manifold Pipe.

< Front Side or Rear Side Piping Connection >



< Downward Piping Connection >



11. Refrigerant Charging

11.1 Refrigerant Piping Air-Tight Test Procedure

(1) Check to ensure that the stop valves are closed completely before air-tight test.

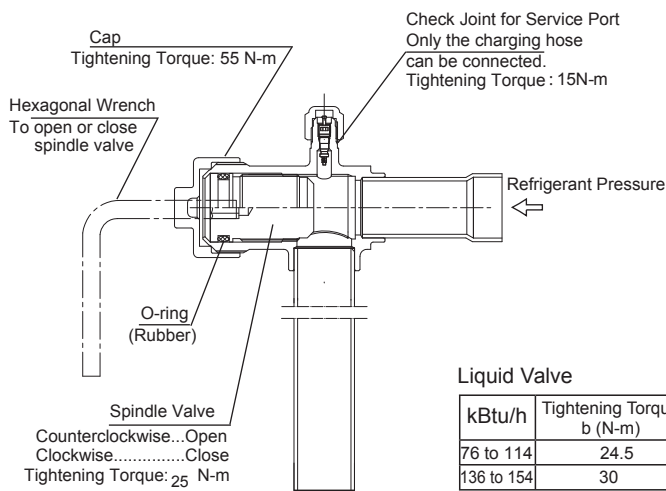
< Tightening Check of Stop Valves >

- a) After connecting the pipe, remove the cap of stop valve for gas and liquid .
Tighten the open-close spindle in the close direction with a torque *1).

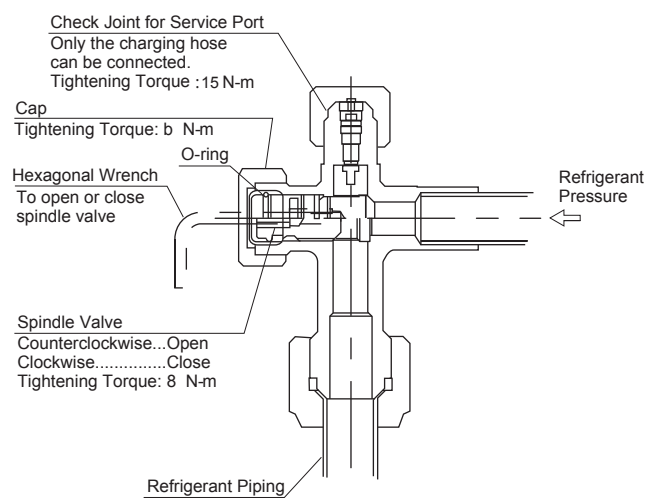
*1)	Stop Valve for Gas	25N.m
	Stop Valve for Liquid	8N.m

b) Perform the air-tight test after the above check.

< Gas Valve >



< Liquid Valve >

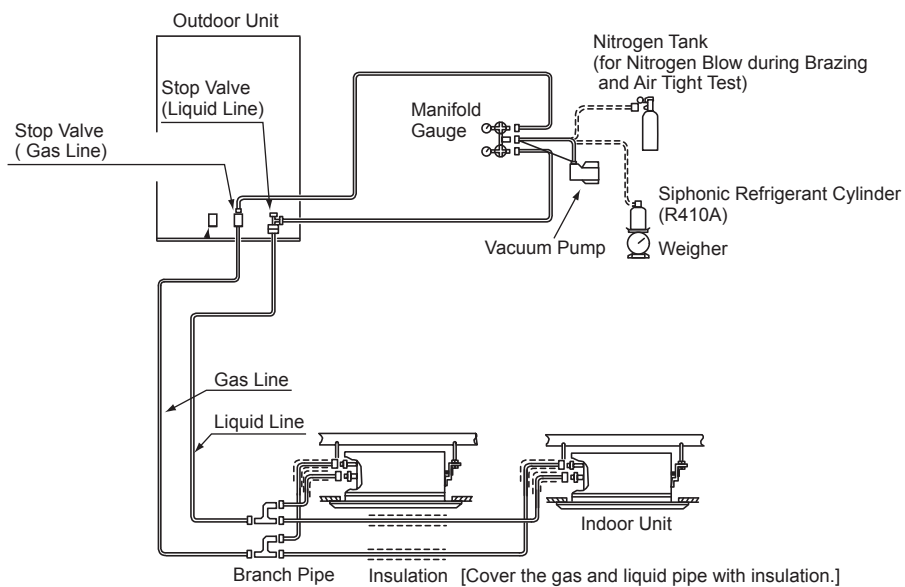
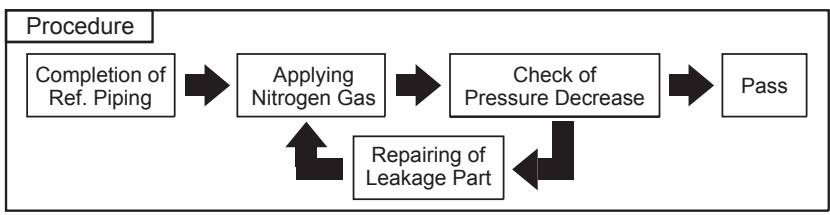


- (2) Connect the indoor unit and the outdoor unit with field-supplied refrigerant piping. Suspend the refrigerant piping at specified points and prevent the refrigerant piping from touching weak parts of the building such as wall, ceiling, etc. (Abnormal sound may occur due to the vibration of the piping. Pay special attention in case of short piping length.)
- (3) Connect the gauge manifold using charging hoses with a vacuum pump or a nitrogen cylinder to the check joints of the liquid line and the gas line stop valves. Perform the air-tight test.
Connect a manifold gauge to the check joints of the liquid and gas stop valves in the outdoor unit. Do not open the stop valves. Apply nitrogen gas pressure of 4.15MPa for Hi-Flexi series.

⚠ DANGER

Be sure to use Nitrogen Gas for air-tight test. If other gases such as oxygen gas, acetylene gas or fluorocarbon gas are accidentally used, it may cause explosion or gas intoxication.

- (4) Check for any gas leakage at the flare nut connections, or brazed parts by gas leakage tester or by use of a foaming agent or gas leak detector.
- (5) Mount the piping cover equipped with the outdoor unit after connecting the pipe.



Vacuum Pumping and Refrigerant Charge

11.2 Vacuuming Procedure

(1) Connect a manifold gauge and vacuum pump to the check joints'.

- * Gas Stop Valve
- Liquid Stop Valve

(2) Continue vacuum pumping work until the pressure reaches -0.1MPa (-756mmHg) or lower for one to two hours.

After vacuum pumping work, stop the manifold valve's valve, stop the vacuum pump and leave it for one hour. Check to ensure that the pressure in the manifold gauge does not increase.

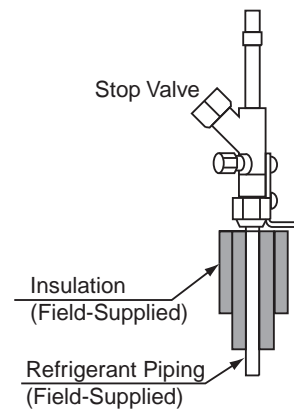
(3) Tighten the cap of check joint (9 to 14N-m for gas valve, 14 to 18N-m for liquid valve) after the vacuum pumping work.

NOTES:

1. If tools or measuring instruments come into contact with the refrigerant, use the tools or the measuring instruments exclusive for R410A.
2. If vacuum degree of -0.1MPa (-756mmHg) is not available, it is considered that there is a gas leakage. Check for any gas leakage once again. If no leakage exists, operate the vacuum pump for one to two hours.

NOTICE

- Insulate the refrigerant pipes as shown in the figure. After connecting the refrigerant piping, seal the refrigerant pipes by using the field-supplied insulation material. Insulate the unions and flare nuts at the piping connections completely. Insulate the liquid piping and gas piping completely to avoid decreasing of performance and dewing on the surface of the pipe.



Insulation on Pipes

11.3 Additional Refrigerant Amount Calculation

Table 11.1 Additional Refrigerant Charge Calculation

Although refrigerant has been charged into this unit, additional refrigerant charge is required according to piping length.

Determine the additional refrigerant quantity according to the following procedure, and charge it into the system. Record the additional refrigerant quantity to facilitate maintenance and servicing activities thereafter.

1. Calculating Method of Additional Refrigerant Charge (W kg)

No.	Symbol	Contents	Additional Charge (kg)																																
1	W1	Additional Refrigerant Charge Calculation for Liquid Piping (W1 kg)																																	
		<table border="1"> <thead> <tr> <th>Pipe Diameter</th> <th>Total Piping Length (m)</th> <th>Refrigerant Amount for 1m Pipe</th> <th>Additional Charge (kg)</th> </tr> </thead> <tbody> <tr> <td>φ22.2</td> <td>m</td> <td>×0.35 =</td> <td></td> </tr> <tr> <td>φ19.05</td> <td>m</td> <td>×0.25 =</td> <td></td> </tr> <tr> <td>φ15.88</td> <td>m</td> <td>×0.16=</td> <td></td> </tr> <tr> <td>φ12.7</td> <td>m</td> <td>×0.11 =</td> <td></td> </tr> <tr> <td>φ9.53</td> <td>m</td> <td>×0.056 =</td> <td></td> </tr> <tr> <td>φ6.35</td> <td>m</td> <td>×0.024 =</td> <td></td> </tr> <tr> <td colspan="3">Total Additional Charge For Liquid Piping =</td> <td></td> </tr> </tbody> </table>		Pipe Diameter	Total Piping Length (m)	Refrigerant Amount for 1m Pipe	Additional Charge (kg)	φ22.2	m	×0.35 =		φ19.05	m	×0.25 =		φ15.88	m	×0.16=		φ12.7	m	×0.11 =		φ9.53	m	×0.056 =		φ6.35	m	×0.024 =		Total Additional Charge For Liquid Piping =			
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		φ9.53		m	×0.056 =																														
φ6.35	m	×0.024 =																																	
Total Additional Charge For Liquid Piping =																																			
		kg																																	
2	W2	Additional Refrigerant Charge Calculation for Indoor Unit (W2 kg) Additional refrigerant charge is 1kg/unit of 76KBtu/h and 96KBtu/h indoor unit. Additional refrigerant charge of less than 76KBtu/h indoor units is not needed.																																	
		76 and 96 Total Indoor Unit Numbers Additional Charge <input type="text"/> × 1.0kg/unit = <input type="text"/>																																	
		kg																																	
3	W3	The Ratio of Indoor Unit Connection Capacity (Indoor Unit Total Capacity/ Outdoor Unit Capacity) Additional Charge Determine the ratio of indoor unit connection capacity.																																	
		<table border="0"> <thead> <tr> <th>Condition</th> <th>Refrigerant Amount</th> </tr> </thead> <tbody> <tr> <td>• I.U.Capacity Ratio is less than 100% :</td> <td>0.0kg</td> </tr> <tr> <td>• I.U.Capacity Ratio is 100~115% :</td> <td>0.5kg</td> </tr> <tr> <td>• I.U.Capacity Ratio is 116~130% :</td> <td>1.0kg</td> </tr> </tbody> </table>		Condition	Refrigerant Amount	• I.U.Capacity Ratio is less than 100% :	0.0kg	• I.U.Capacity Ratio is 100~115% :	0.5kg	• I.U.Capacity Ratio is 116~130% :	1.0kg																								
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• I.U.Capacity Ratio is 116~130% :	1.0kg																																		
		kg																																	
4	W	Calculation of Additional Charge (W kg) = W1 + W2 + W3	kg																																

Note:

Ensure that the total additional charge should not be exceeded the max. additional refrigerant charge quantity as shown in the table below.

< Max. Additional Refrigerant Charge Quantity >

Outdoor Unit (kBtu/h)	76/96	114	136/154	172	190~232	250~460	480~620
Max. Additional Ref. Charge Quantity (kg)	28.0	33.0	38.5	42.0	46.0	52.0	63.0

2. Charging Work

Charge refrigerant (R410A) into the system according to Item 11.4.

3. Record of Additional Charge

Total Oil Charge (COMP.charge) /L

Total refrigerant charge of this system is calculated in the following formula.

Total Ref. Charge = W + Wo
This System = + = kg

Ref. and Oil Charge Amount of O.U. Before Shipment kg

Outdoor Unit (kBtu/h)	W0 (kg)	Total Oil Charge (COMP. oil charge) (L)
76	6.5	5.8(2.3)
96	6.5	5.8(2.3)
114	9.0	5.8(2.3)
136	9.0	7.5(2.3)
154	10.5	7.5(2.3)

Total Additional Charge: W kg
 Total Ref. Charge: kg
 Date of Ref. Charge Work: / /

Note:

- W0 is outdoor unit ref. charge before shipment.
- In case of the combination of the base unit, calculate the total ref. charge before shipment of the outdoor units to be combined.

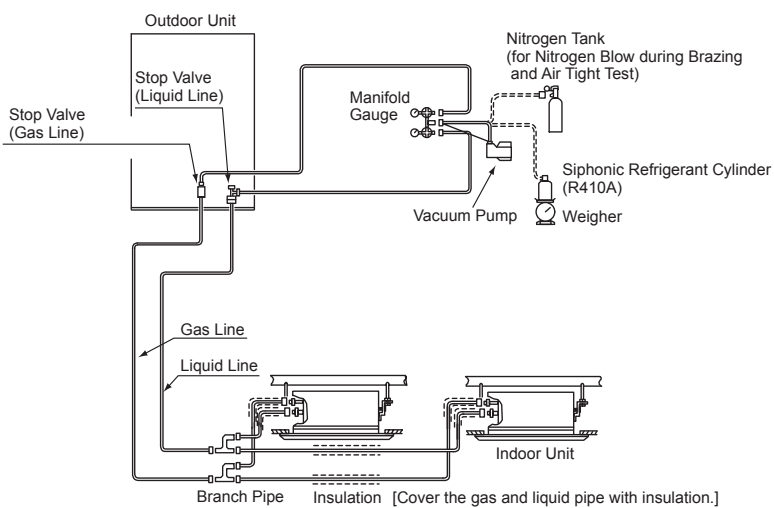
11.4 Additional Refrigerant Charging Procedure

After vacuum pumping work, check that the gas stop valve, and liquid stop valve are fully closed.

Charge the additional refrigerant (refer to Table 11.1) from the check joint of liquid stop valve (Charging Refrigerant Amount Tolerance: 0.5kg).

If the specified refrigerant quantity can not be charged, follow the procedure below.

- (1) Fully open the stop valve for gas' .
- (2) Operate the compressor at the cooling mode and add the refrigerant from the check joint of the liquid stop valve. At this time, the liquid stop valve is slightly opened (Charging Refrigerant Amount Tolerance: 0.5kg).



Charge the correct refrigerant quantity according to Table 11.1. If not, a compressor may be damaged due to an excess or insufficient refrigerant charge.

Refrigerant charge from check joint of gas stop valve may lead to compressor failure. Be sure to charge refrigerant from the check joint of liquid stop valve.

Insulate the liquid piping and gas piping completely to avoid decreasing of performance and dewing on the surface of the pipe.

Insulate the flare nut and union of the piping connection with insulation.

Check to ensure that there is no gas leakage. If a large refrigerant leakage occurs, it will cause difficulty with breathing or harmful gases would occur if a fire was being used in the room.

- Special Attention Regarding Refrigerant Gas Leakage

Pay attention to the critical gas concentration to avoid accidental refrigerant gas leakage before installing air conditioning systems.

$$\frac{\text{Totally Charged Refrigerant Quantity in System (kg)}}{\text{Room Space for each Indoor Unit (m}^3\text{)}} \leq \text{Critical Concentration (kg/m}^3\text{)}$$

0.3 kg/m³

↑

* In case of KHK S 0010, this value should be decided according to the each country's regulation such as ISO5149 and EN378.

In the case that the calculated critical concentration is higher than 0.3kg/m³, take the following actions.

- 1) Provide a gas leakage detector and exhaust fan(s) controlled by its gas leakage detector.
- 2) Provide each effective opening at the wall or door for ventilation to next door so that the critical gas concentration can be maintained lower than the above value.
(Provide an opening more than 0.15% of floor surface at the lower part of a door.)

CAUTION

1. Maximum Permissible Concentration of HFC GAS R410A

The refrigerant R410A is an incombustible and non-toxic gas.

However, if leakage occurs and gas fills a room, it may cause suffocation. The maximum permissible concentration of HFC gas, R410A in air is 0.3kg/m³, according to the refrigeration and air conditioning facility standard (KHK S 0010) by the KHK (High Pressure Gas Protection Association) Japan. Therefore, some effective measure must be taken to lower the R410A concentration in air below 0.3kg/m³, in case of leakage. As for R410A, this consideration is applied similarly.

2. Calculation of Refrigerant Concentration

- (1) Calculate the total quantity of refrigerant R (kg) charged in the system connecting all the indoor units of objective rooms.
- (2) Calculate the room space where this unit is to be installed V (m³) of each objective room.
- (3) Calculate the refrigerant concentration C (kg/m³) of the room according to the following equation.

$$\begin{aligned} & \text{R: Total Quantity of Charged Refrigerant (kg)} \\ & \text{V: Room Space Where This Unit Is to Be Installed (m}^3\text{)} \\ & = \text{C: Refrigerant Concentration} \leq 0.3 \text{ (kg/m}^3\text{)}^* \end{aligned}$$

If local codes or regulations are specified, follow them.

<Example>

Japanese Standard KHK S 0010 C=0.3 (kg/m³)

12. Electrical Wiring Connection

WARNING

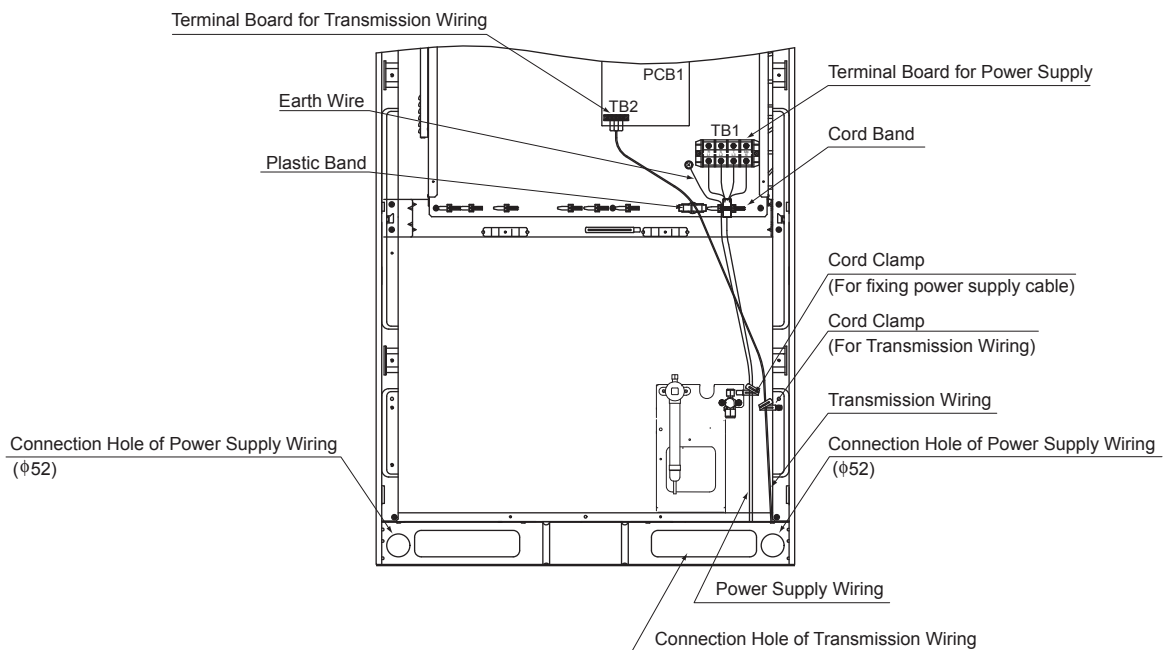
- Turn OFF the main power switch to the indoor unit and the outdoor unit and wait for more than 3 minutes before electrical wiring work or a periodical check is performed.
 - Check to ensure that the indoor fan and the outdoor fan have stopped before electrical wiring work or a periodical check is performed.
 - Protect the wires, electrical parts, etc. from rats or other small animals.
If not protected, rats may gnaw at unprotected parts and which may lead to a fire.
 - Avoid the wirings from touching the refrigerant pipes, plate edges and electrical parts inside the unit. If not do, the wires will be damaged and at the worst, a fire will occur.
 - Use a medium sensing speed type ELB (Earth Leakage Breaker, activation speed of 0.1 sec. or less). If not used, it will cause an electric shock or a fire.
 - Fix the cables securely. External forces on the terminals could lead to a fire.
 - Tighten screws according to the following torque.
 - M4: 1.0 to 1.3 N-m
 - M5: 2.0 to 2.4 N-m
 - M6: 4.0 to 5.0 N-m
 - M8: 9.0 to 11.0 N-m
 - M10: 18.0 to 23.0 N-m
-

12.1 General Check

- (1) Make sure that the field-selected electrical components (main power switches, circuit breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data indicated in the Technical Catalog. Make sure that the components comply with National Electrical Code (NEC).
 - Supply electrical power to each outdoor unit. An ELB, fuse and main switch should be used for each outdoor unit. If not, it will be cause of fire or electrical shock.
 - The power supply for the indoor unit and outdoor unit should be provided separately.
Connect a power supply wiring to each indoor unit group to be connected to the same outdoor unit. (Max. capacity of one indoor unit group is 250KBtu/h.)
- (2) Check to ensure that the power supply voltage is within $\pm 10\%$ of the rated voltage.
If the power supply voltage is too low, the system cannot be started due to the voltage drop.
- (3) Check the size of the electrical wires.
- (4) In some cases, the packaged air conditioner may not be operated normally under the following cases.
 - In case that the packaged air conditioner is supplied with the same power transformer as the device with high electricity consumption*
 - In case that the power source wires for the device* and the packaged air conditioner are located close to each other.

* (ex) Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor and large-sized switch.

For the cases mentioned above, induction surge of the power supply wiring for the packaged air conditioner may occur due to a rapid change in electricity consumption of the device and an activation of switch. Therefore check the field regulations and standards before performing electrical work in order to protect the power supply wiring for the packaged air conditioner.
- (5) Check to ensure that the earth wire of the outdoor unit, indoor unit.



Wiring Connection

12.2 Electrical Wiring Requirements

! WARNING

The ELB (earth leakage breaker), CB and S (main switch) must be installed to the each power source of outdoor unit. If not, it may cause of electrical shock or fire.

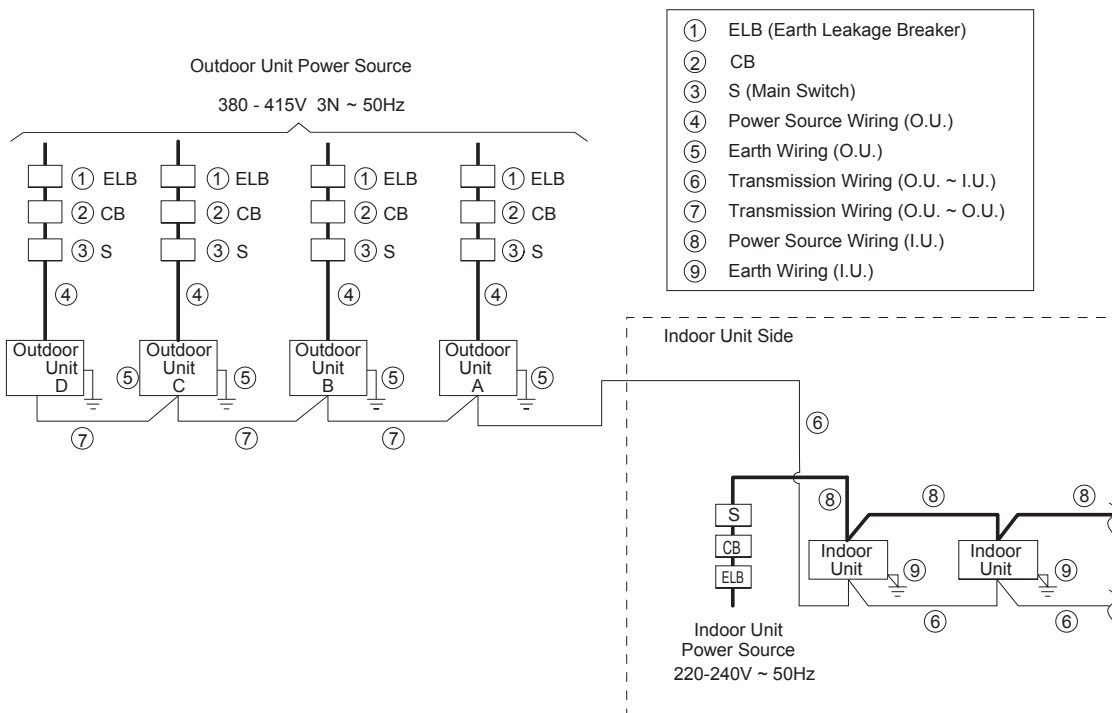
NOTE:

Supply the power source of outdoor units and indoor units respectively.

(1) Power Source Wiring

Supply the power sources to the each outdoor unit respectively.

Power source wiring is fundamentally according to this method.



(2) The recommended wiring, ELB, breaker size are shown as follow

■ Please refer to section 5.7.

 CAUTION

Install a multi-pole main switch with a space of 3.5mm or more between each phase.

NOTES:

1. When the power supply wiring is longer, select the minimum wiring size which the voltage drop is within 2%.
2. Power supply voltage should be satisfied with the followings.
 - Supply Voltage: Rated Voltage within $\pm 10\%$
 - Starting Voltage: Rated Voltage within -15%
 - Operating Voltage: Rated Voltage within $\pm 10\%$
 - Imbalance between Phases: within 3%
3. Do not connect the earth wire to the gas pipe, water pipe, lightning conductor.
 - Gas Pipe: An explosion and ignition may occur when gas leaks.
 - Water Pipe: There is no effect of earth wire when a hard vinyl pipe is used.
 - Lightening Conductor: The earth electric potential abnormally increases when a lightning conductor is used.

12.3 Electrical Wiring for Outdoor Unit

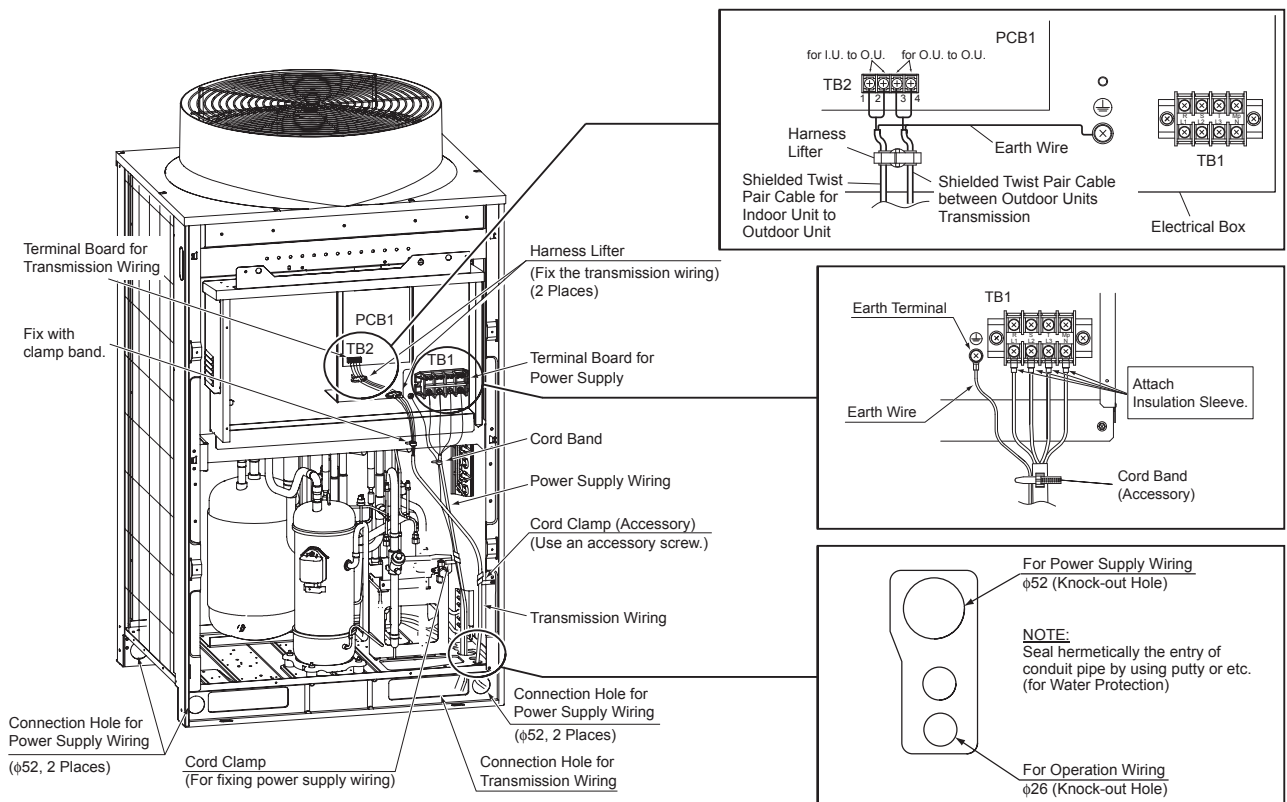
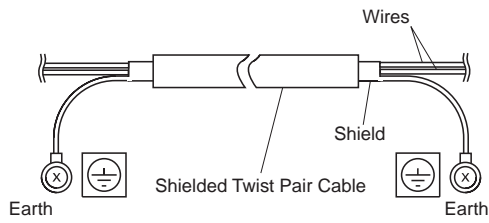
Connect the electrical wirings according to the following figure.

- (1) Connect the power supply wires to L1, L2, L3, and N (for 380-415V) for the three phase power source on the terminal board TB1 and earth wire to the terminal in the electrical control box.
- (2) Connect the transmission wires between the outdoor and indoor units to the TB2 terminals 1 and 2 on the PCB1. As for the transmission wires between outdoor units in the same refrigerant cycle, connect them to the TB2 terminals 3 and 4 on the PCB1.
- (3) Tighten screws for the terminal board according to the following table.

< Required Tightening Torque >

Size	Tightening Torque
M4	1.0 to 1.3 N-m
M5	2.0 to 2.4 N-m
M6	4.0 to 5.0 N-m
M8	9.0 to 11.0 N-m
M10	18.0 to 23.0 N-m

- (4) When installing the unit in Australia, connect the both ends of shielded twist pair cable (remote control switch cable and transmission cable) to the earth as shown below.



CAUTION

Pay attention to the followings to run through the cables under the unit using conduit tube.
(The pipe cover is required to remove before performing piping and wiring works.)

NOTES:

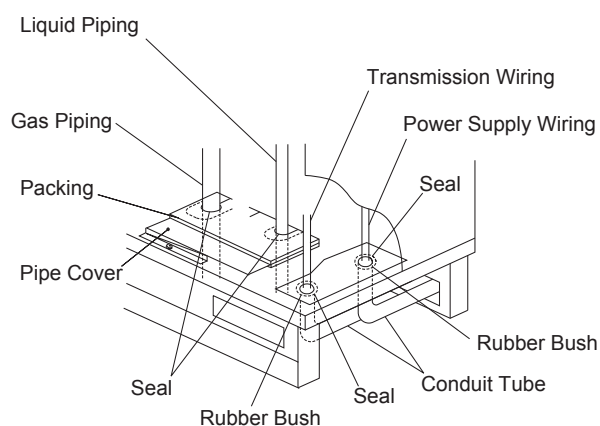
1. Do not lead the power supply wiring and transmission wiring through the same conduit tube. Moreover, keep at least 5cm between the power supply wiring and transmission wiring.
2. Cut cross line at rubber bush (accessory) and securely attach it to the knock-out hole for cable protecting.
3. Attach the pipe cover to avoid entering rats or other small animals into the unit.
4. Avoid the wirings from touching the refrigerant pipes, plate edges and electrical parts inside the unit.
5. Completely seal the end of conduit tube with sealing materials to avoid entering rain into the conduit tube.
6. Make a drain hole at the lowest part of the conduit tube.

CAUTION

Tightly secure the power source wiring using the cord clamp inside the unit.

NOTE

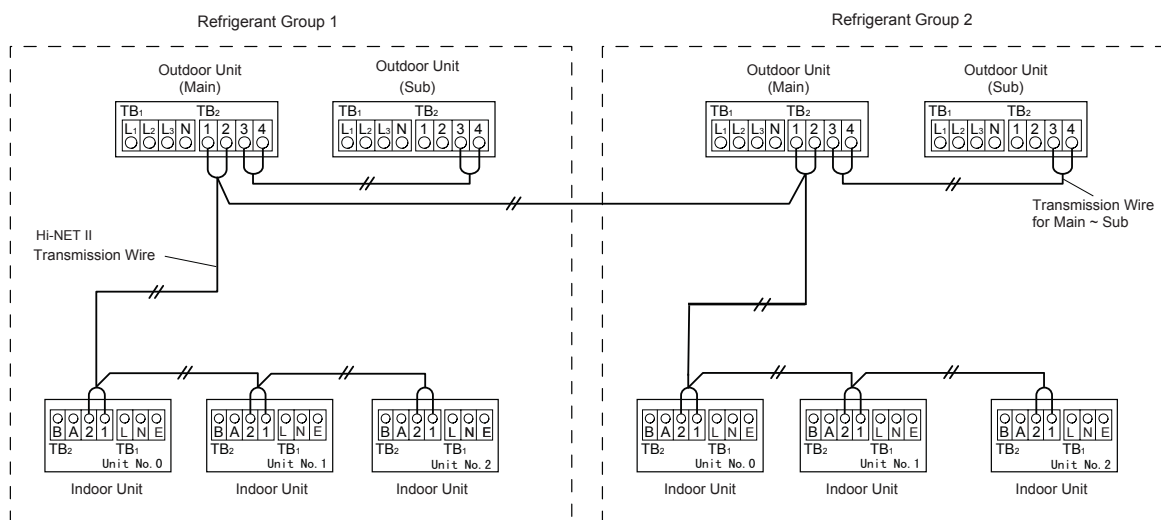
Fix the rubber bushes with adhesive when conduit tubes to the outdoor unit are not used.



12.4 Electrical Wiring of Indoor Unit and Outdoor Unit

- (1) Connect a power supply wiring to each outdoor unit. Connect an ELB, fuse and main switch (S) to each outdoor unit.
- (2) Connect a power supply wiring to each indoor unit group to be connected to the same outdoor unit. (Max. capacity of one indoor unit group is 250 kBTu/h .)
Connect an ELB, fuse and main switch (S) to each indoor unit group.
- (3) Connect the transmission wiring between indoor units and outdoor units, as shown in the following figure.
- (4) Connect the transmission wiring in the same refrigerant cycle unit. (In case that the refrigerant pipe of indoor unit is connected to the outdoor unit, connect the transmission wiring to the same indoor unit.)
Connecting the refrigerant pipe and transmission wiring to the different refrigerant cycle systems may lead to malfunction.
- (5) Use 2-Core lead wires such as shielded twist pair cable for the transmission wiring.
(Do not use 3-Core or over.)
- (6) Use the same kind of cables for the Hi-NET system of the same refrigerant cycle.
- (7) The transmission wiring is required to be separated from the power supply wiring.
Keep at least 5cm between the transmission wiring and the power supply wiring, and also min. 1.5m between the transmission wiring and power supply wiring for other electrical device. If the above is not secured, put the power supply wiring into the metal conduit tube to separate from other wirings.
- (8) Connect the following transmission wiring to the terminals 1 and 2 of TB2 in the outdoor unit A (main unit).
 - between outdoor unit and indoor unit
 - between outdoor unit and indoor unit in other refrigerant cycles
- (9) Do not connect the power supply wiring to the terminal board for transmission wiring (TB2).
Printed circuit board may be damaged.
- (10) Connect the earth wire for the outdoor/indoor. The earth wiring work under the condition of 100Ω (max.) ground resistance should be performed by the qualified person.

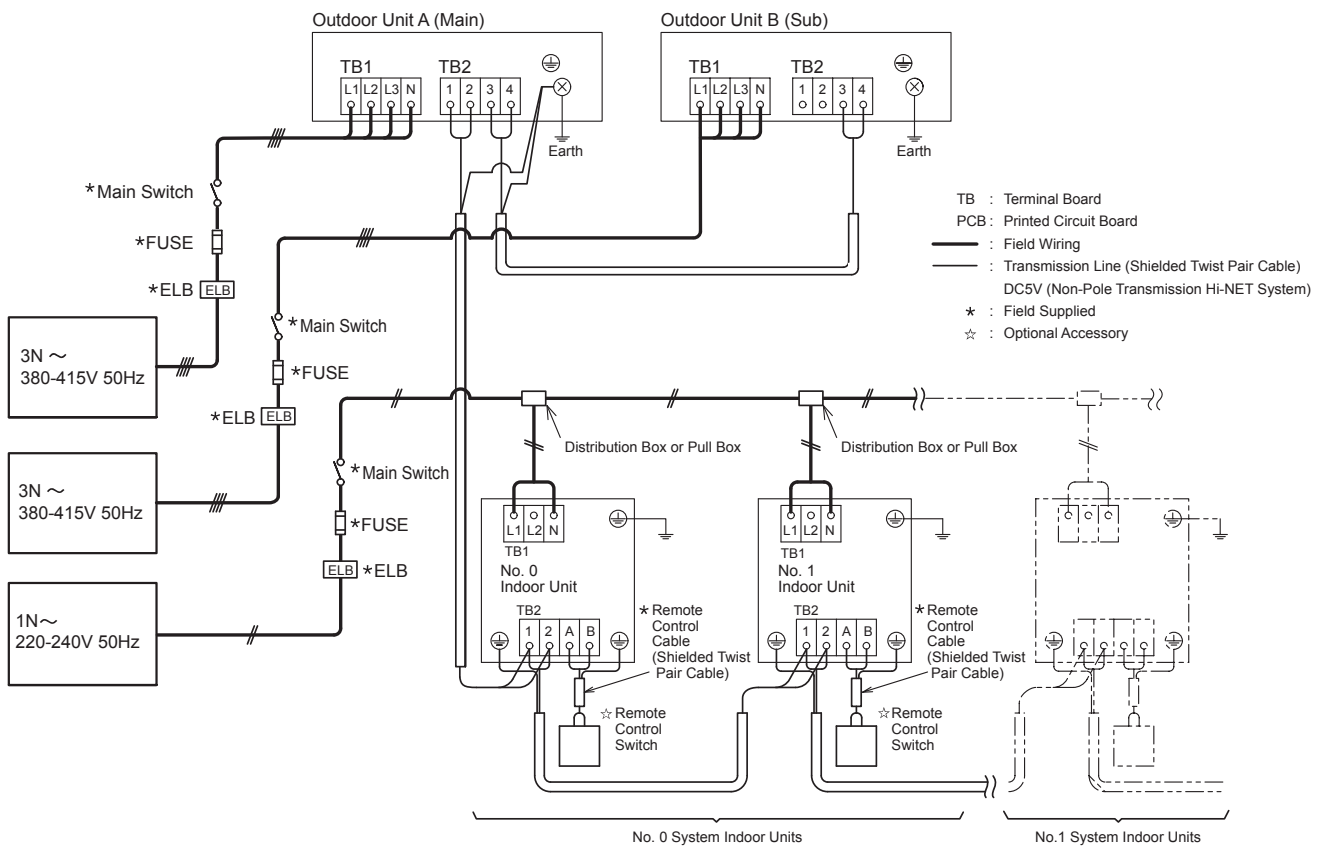
• Transmission Wiring



NOTES:

1. For the combination units (172~620KBtu/h), DSW settings of Main and Sub are required.
2. Alarm occurs if the transmission wires between outdoor units are connected to the terminals 1 and 2 for Hi-NET.
3. In case that alarm is indicated on the LCD of Main outdoor unit, follow the "7-segment" indication of the Main outdoor unit for checking.
4. Perform function setting from Main outdoor unit.
5. Maximum refrigerant groups with one central controller are 64.
Maximum indoor units to be connected are 160.

380-415V 3N~ 50Hz



Instruction for Electrical Wiring Connection

13 Field Setting

TURN OFF all power sources before setting.

Without turning OFF, the switches do not work and the contents of the setting are invalid.

(However, DSW4-No.1, 2, 4 can be operated during power source is ON.)

The mark of “■” indicates the position of dip switches. Set the dip switches according to the following figure.

NOTE

- By using switch DSW4, the unit is started or stopped after 10 to 20 seconds after the switch is operated.
- Number this outdoor unit to distinguish from other outdoor units for service and maintenance. And write the number in the space right.

Arrangement of Dip Switch Setting

Push Switches

DSW1 Ref. Cycle No. Setting

Setting is required.

Setting Before Shipment

DSW1

Tens Digit DSW1

Last Digit DSW8

DSW2 Capacity Setting

No setting is required.

76 96 114

136 154

DSW4 Test Operation and Service Setting

Setting is required.

For Test Operation and Operating Compressor

Setting Before Shipment Test Cooling Operation Test Heating Operation

Compressor Forced Stop

DSW5 Emergency Operation / Test Operation and Service Setting

No setting is required.

Turn ON the dip switch when use the below functions.

Setting Before Shipment

Setting Item	Pin No.
Except No.1 Compressor Operation	1
Refrigerant Amount Judgement	4

DSW6 Outdoor Unit No. Setting

Setting is required.

Single Setting (Setting Before Shipment)

Combination Setting

Unit A (No.0 Unit)	Unit B (No.1 Unit)	Unit C (No.3 Unit)	Unit D (No.4 Unit)

IMPORTANT NOTICE

The outdoor unit is not single, the combination setting is necessary. Be sure to do this setting.

DSW3

No setting is required.

DSW7 Power Supply Setting

Setting is required.

380-415V Unit: 380-415V Setting Before Shipment

380-415V

DSW10 Transmission Setting

Setting is required.

For End Resistance Cancellation

Setting Before Shipment End Resistance Cancellation

If the transmission circuit fuse is short circuited, the printed circuit board PCB1 will be recovered only once by turning DSW10 #2 pin on.

DSW Setting

● **Setting for Transmitting**

It is required to set the outdoor unit Nos., refrigerant cycle Nos. and end terminal resistance for this Hi-NET or Hi-NET II system.

● **Setting of Outdoor Unit No.**

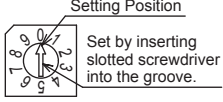
In case of the combination of base unit, set DSW6 as shown below.

Base Unit (Before Shipment)	Combination of Base Unit			
	Unit A (No.0) (Main)	Unit B (No.2)	Unit C (No.3)	Unit D (No.3)
ON OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3 4	ON OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3 4	ON OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3 4	ON OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3 4	ON OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3 4

● **Setting of Refrigerant Cycle No.**

In the same refrigerant cycle, set the same refrigerant cycle No. for the outdoor unit and the indoor units as shown below.

As for setting indoor unit refrigerant cycle No., set the RSW2 and DSW5 on the indoor unit PCB.

	Setting Switch	
	10 digit	1 digit
RSW1	ON OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3 4 5 6	Setting Position 
Outdoor Unit	DSW1	RSW1
Indoor Unit (Hi-NET II)	DSW5	RSW2

Ex.: In Case of Setting Refrigerant Cycle No. 25

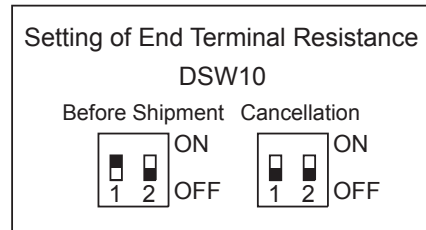


Turn ON No. 2 pin.

Set Dial No.5.

DSW and RSW setting before shipment is 0.
Maximum in setting refrigerant cycle No. is 63.

	Setting Switch	
	10 digit	1 digit
DSW8	ON OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3 4 5 6	ON OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 2 3 4
Outdoor Unit	DSW1	DSW8
Indoor Unit (Hi-NET II)	DSW5	RSW2

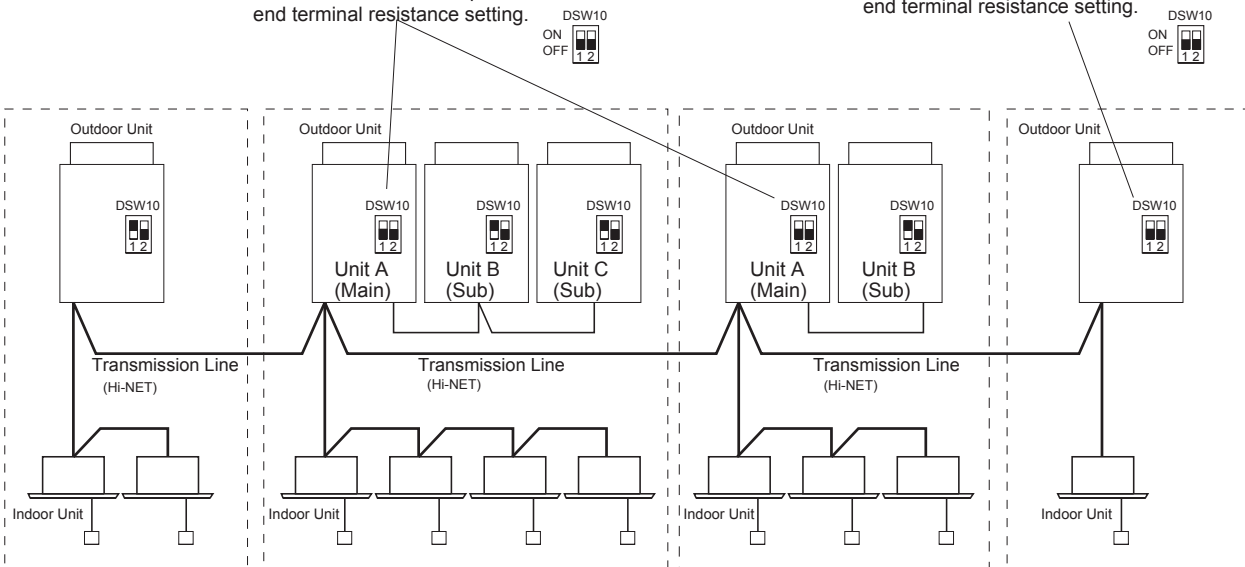


● **Setting of End Terminal Resistance**

Before shipment, No. 1 pin of DSW10 is set at the "ON" side. In the case that the outdoor units quantity in the same Hi-NET is 2 or more, set No. 1 pin at the "OFF" side from the 2nd refrigerant group outdoor unit. If only one outdoor unit is used, no setting is required.

Turn OFF DSW10 No.1 pin for cancel of end terminal resistance setting.

Turn OFF DSW10 No.1 pin for cancel of end terminal resistance setting.



14. Test Run

WARNING

- **Do not operate the system until all the check points have been cleared.**
As for the test run of indoor unit, check “Installation & Maintenance Manual” attached to the indoor unit.
-

14.1 Checklist Before Test Run

- (1) Check to ensure that the refrigerant piping and transmission between outdoor unit and indoor units are connected to the same refrigerant cycle. If not, it will cause an abnormal operation and a serious accident.
Check that the dip switch setting of the refrigerant cycle No. (DSW1 & RSW1 [O.U.], DSW5 & RSW2 [I.U.]) and the unit number (RSW) for the indoor units apply to the system.
Confirm that the dip switch setting on the printed circuit board of the indoor units and the outdoor units are correct. Especially, pay attention to the setting of lift between indoor units and outdoor unit, the refrigerant No. and the end terminal resistance. Refer to the chapter “12. Electrical Wiring Connection”.
- (2) Check to ensure that the electrical resistance is more than 1 megohm, by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired (Refer to “Caution for Insulation Resistance” for details.).
Do not impress the voltage on the terminals for transmission (Outdoor Unit: TB2 1, 2, 3, 4 / Indoor Unit: TB2 1, 2, A, B / HCH Unit: TB2 1, 2, 3, 4).
- (3) Check to ensure that each wire, L1, L2, L3 and N is correctly connected at the power source.
If incorrectly connected, the unit will not operate and the remote control switch will indicate the alarm code “05”. In this case, check and change the phase of the power source according to the attached sheet on the reverse side of the service cover.
- (4) Check to ensure that the switch on the main power source has been ON for more than 12 hours, to warm the compressor oil by the oil heater.
Outdoor units do not operate within 4 hours after power supply (Stoppage Code d1-22). In case of operating within 4 hours, release the protection control as follows:
 1. Supply power to the outdoor unit.
 2. Wait for 30 seconds.
 3. Push PSW5 on the outdoor PCB more than 3 seconds in order to release the d1-22.
In case of using remote control switch for release, push “Air Flow” and “Auto Louver” switch simultaneously for 3 seconds.
- (5) Main Unit Label
In case of the combination of base units, attach the main unit label on a visible spot of the main unit (outdoor unit A), so that the outdoor unit A can be identified easily. Do not attach the main label on the sub unit (outdoor unit B and C).
- (6) Damage
Check to ensure that the unit appearance and inside of the unit is not damaged.
- (7) Fan Motor
Check to ensure that the fan motor runner mounted in the center of the casing. The fan motor should NOT be touched with the casing.
- (8) Screw Parts
Check to ensure that the screws did not loosened due to the vibration during transportation. Check that the screw part is fixed firmly when installing, **especially for the scerw of electrical wiring.**

CAUTION

Caution for Insulation Resistance

If total unit insulation resistance is lower than 1 megohm, the compressor insulation resistance may be low due to retained refrigerant in the compressor. This may occur if the unit has not been used for long periods.

1. Disconnect the cables to the compressor and measure the insulation resistance of the compressor itself. If the resistance value is over 1 megohm, then insulation failure has occurred of other electrical parts.
2. If the insulation resistance is less than 1 megohm, disconnect the compressor cable from the inverter PCB. Then, turn on the main power to apply current to the crankcase heater. After applying current for more than 3 hours, measure insulation resistance again. (Depending on the air conditions, pipe length or refrigerant conditions, it may be necessary to apply the current for a longer period of time.) Check the insulation resistance and reconnect the compressor.

If the leakage breaker is activated, check the recommended size shown in section 12.

NOTICE

1. Confirm that field-supplied electrical components (main switch fuse, fuse-free breaker, earth leakage breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data given in the Technical Catalog of the unit and ensure that the components comply with national and local codes.
2. Use shielded wires ($\geq 0.75\text{mm}^2$) for field wiring to protect electrically noise obstacle. (Total length of shielded wire shall be less than 1000m, and size of shielded wire shall comply with local codes.)
3. Check to ensure that the terminal for power source wiring (terminals "L1" to "L1" and "N" to "N" of each terminal board: AC 380-415V).
If not, some component will be damaged.

14.2 Test Run Procedure

- (1) Check to ensure that the stop valves of the outdoor unit are fully opened, and then start the system. (In case of the combination of base units, check that the stop valves of all the connected outdoor units are fully opened.)
- (2) Perform the test run of indoor units one by one sequentially and then check accordance of the refrigerant piping system and electrical wiring system. (If the multiple indoor units are operated simultaneously, the system can not be inspected the system accordance.)
- (3) Perform the test run according to the following procedure. Ensure that the test run is carried out without any problem.

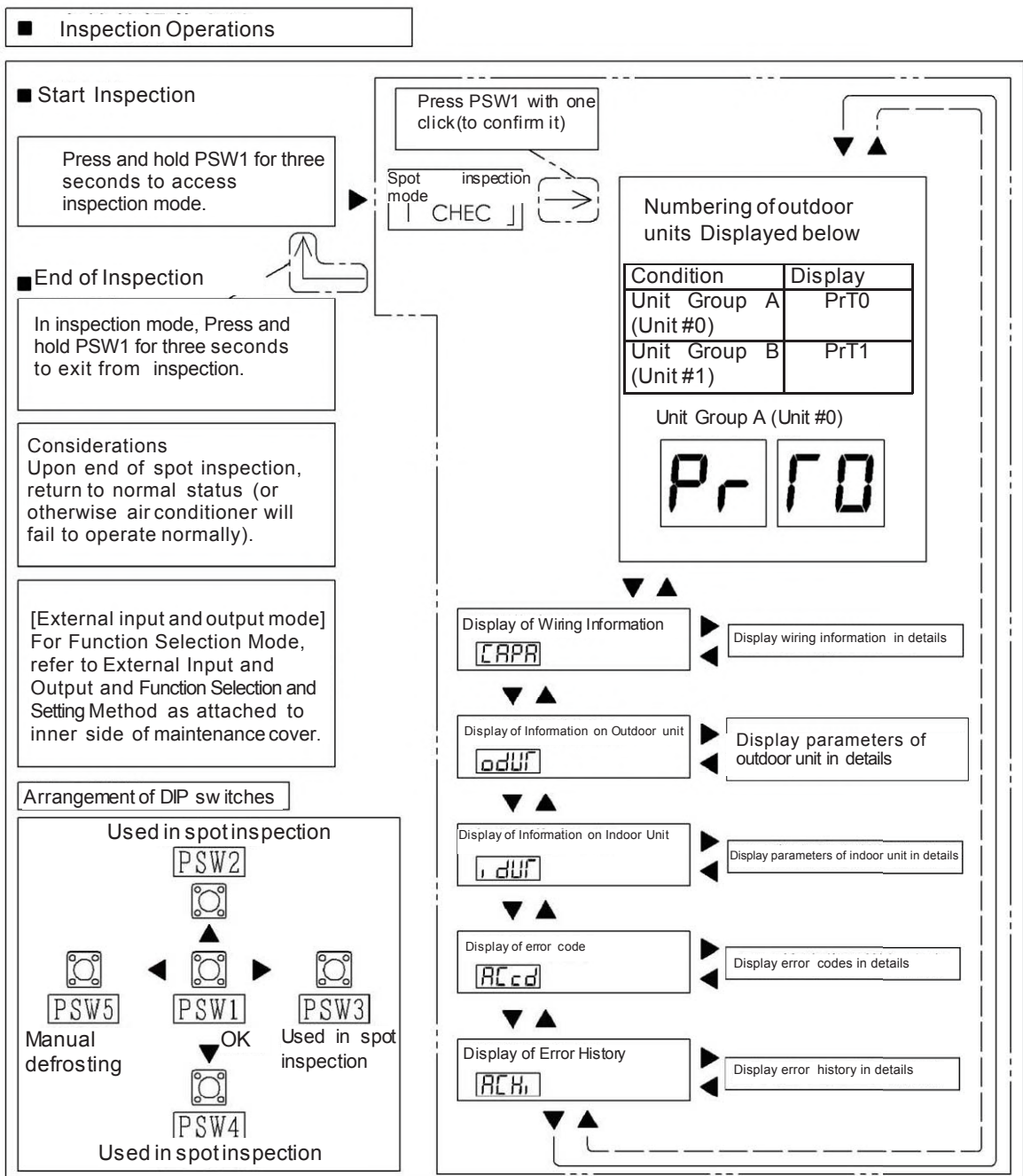
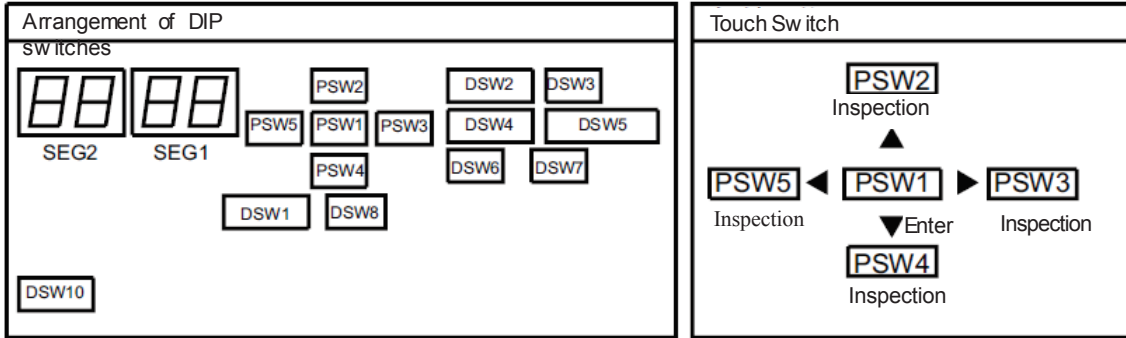
NOTE:

In case of 2-remote control switch (main and sub), firstly perform the test run of the main remote control switch.

14.2.1 Test Run by Remote Control Switch

Inspection Operations

(1) Start inspection: Press and hold PSW1 for three seconds to access Inspection mode "CHEC".



Spot Inspection and Troubleshooting

■ Spot inspection description

a) Wiring information display

Item		7SEG Display		Description
		SEG2	SEG1	
1	Total capacity of outdoor units	0	0P	For Total capacity of modules constituting outdoor unit, see table Capacity of Outdoor Unit.
2	Total of outdoor units	0		Number of modules constituting outdoor unit
3	Capacity of Indoor Unit	,		Total of indoor units connected
4	Number of indoor units connected	,		Total of indoor units connected
5	Refrigeration system number		0A	Number of Refrigeration system for outdoor unit
6	Capacity of Indoor Unit		0P	Capacity of Indoor Unit
7	Total frequency of compressors		Hz	Sum of operating frequency Unit: Hz
8	Compressor duration operation		00	Unit: hours (×10 = actual operation duration)

b) Outdoor unit parameter display

Choose outdoor unit number by pressing PSW4 (▼) and PSW2 (▲)

Unit number	Display
Module A (Unit #0)	od00
Module B (Unit #1)	od01
Module C (Unit #2)	od02
Module D (Unit #3)	od03

View parameter detail by pressing PSW3(◆)


Press PSW4 (▼)/PSW2 (▲) to page down/up.

Press PSW5(●) to return

14.2.2 Test Run from Outdoor Unit Side




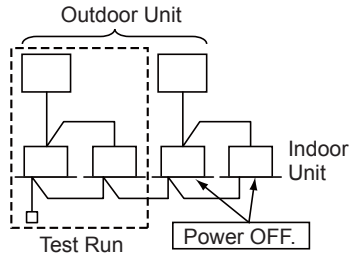
The procedure of test run from the outdoor unit side is indicated below. Setting of this dip switch is available with the power source ON.




Setting of Dip Switch (Before Shipment)

DSW4	
Switch for Setting of Service Operation and Function	
	1. Test Run
	2. COOL/HEAT Setting (ON: Heating Operation)
	3. OFF (Fixed)
	4. Manual Compressor OFF
	5. OFF (Fixed)
	6. OFF (Fixed)

! WARNING

- Do not touch any other electrical parts when operating switches on the PCB.
- Do not attach or detach service cover when the power source for the outdoor unit is ON and the outdoor unit is operated.
- Turn all the dip switches of DSW4 OFF when the test run operation is completed.

	Dip Switch Setting	Operation	Remarks
Test Run	<p>1. Setting of Operation Mode Cool: Set DSW4-2 OFF.</p>  <p>Heat: Set DSW4-2 ON.</p>  <p>2. Starting Test Run Set DSW4-1 ON and the operation is started after a few ~ 20 seconds.</p> <p>When heating operation, leave DSW4-2 at ON.</p> 	<ol style="list-style-type: none"> The indoor unit automatically start to operate when the test run of the outdoor unit is set. The ON/OFF operation can be performed from the remote control switch or DSW4-1 of the outdoor unit. Continuous operation during 2 hours is performed without Thermo-OFF. 	<p>* Take care that the indoor units operate in accordance with the test run operation of the outdoor unit.</p> <p>* The test run is started from the outdoor unit and stopped from the remote control switch, the test run function of the remote control switch is cancelled. However, the test run function of the outdoor unit is not cancelled. Check to ensure that the DSW4-1 of the outdoor unit PCB is turned OFF.</p> <p>* In case that the plural indoor units are connected with one remote control switch, perform the test run operation at each refrigerant system one by one. Then, make sure to turn the power source OFF for the indoor units at other refrigerant system not to operate test run.</p> <div style="text-align: center;">  </div> <p>* The setting of DSW4 is not required for the test run from the remote control switch.</p>

	Dip Switch Setting	Operation	Remarks
Manual OFF of Comp.	1. Setting *Compressor Manual OFF: Set DSW4-4 ON.  2. Reset *Compressor ON: Set DSW4-4 OFF. 	1. When DSW4-4 is ON during compressor operation, the compressor stops to operate immediately and the indoor unit is under the condition of Thermo-OFF. 2. When DSW4-4 is OFF, the compressor starts to operate after the cancellation of 3-minutes guard.	* Do not repeat compressor ON/OFF frequently.
Manual Defrost	1. Manual Defrost Operation Press PSW5 for more than 3 seconds during heating operation, the defrost operation is started after 2 minutes. This function is not available within 5 minutes after starting heating operation. 2. Manual Defrost Operation Completion Defrost operation is automatically ended and the heating operation is restarted.	1. Defrost operation is available regardless of frosting condition and total time of heating operation. 2. Defrost operation is not performed when the temperature of outdoor heat exchanger is higher than 10°C, high pressure is higher than 3.3MPa or Thermo-OFF.	* Do not repeat defrost operation frequently. * When manual defrost operation is accepted by PSW5, the time left before starting defrost operation is indicated at the 7-segment indicator on the PCB.  Time Left (Every 4 Seconds)

When the test run operation is completed, turn all switches of DSW4 OFF.




(1) During the test run mode, the following default indication will appear.

(a) Cooling

(b) Heating

Indoor unit parameter display

Choose outdoor unit number by pressing PSW4 (▼) and PSW2 (▲)

Indoor unit address number	Display
Unit #0	
Unit #1	
↓	↓
Unit #63	

View parameter detail by pressing PSW3 (▶)

Press PSW4 (▼)/PSW2 (▲) to page down/up.

Press PSW5 (◀) to return

(2) If the remote control switch is set to a different mode, the test run function will not start. In this case, perform the following actions before the test run.

Remote Control Switch: STOP

Central Station: STOP and Remote Control Switch is available mode.

COOL/HEAT Changeover Switch: Connector (CN17) of Outdoor PCB is opened.

During the test run mode, do not change the remote control switch setting, the central station setting and cool/heat changeover switch setting.

(3) If an alarm code is indicated during the test run, reset the system by turning the main power supply off then back on. The system should then operate.

14.2.3 Checking at Test Run

(1) Indoor and Outdoor Fan

Inspect that the indoor fan and outdoor fan rotate correctly and the air flow is smooth.

(2) Power Supply Voltage

Check the power supply.

If the power supply is abnormal, contact with electric power company.

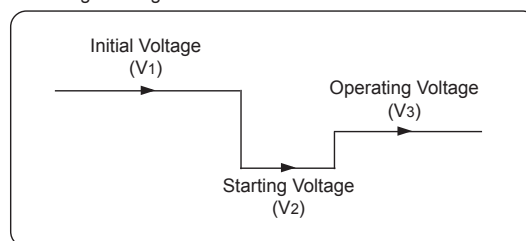
Usually, voltage drop will occur when starting as shown in the figure (V₂).

In order to protect device, comply with the following normal range of the power supply voltage.

<Normal Range of Power Supply Voltage>

- Supply Voltage: Rated Voltage $\leq \pm 10\%$
- Starting Voltage (V₂): Rated Voltage $\geq -15\%$

< Voltage Change >



Operating Voltage (V₃): Rated Voltage $\leq \pm 10\%$
Voltage Imbalance between Phase: $\leq 3\%$

(3) Normal Operating Pressure

Normal operating suction pressure is 0.2 to 1.1MPa and normal operating discharge pressure is 1.0 to 3.5MPa when the refrigerant charge is correct. Check the operation pressure by the test run mode.

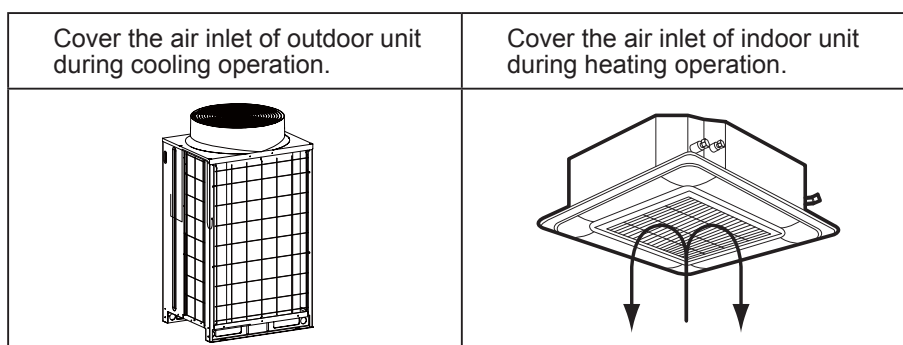
(4) High Pressure Switch

Check the operation pressure of the high pressure switch in the table below.

Refrigerant	Operation Pressure
R410A	4.15MPa

(5) High Pressure Increase Retry (Protection Control)

(a) The high pressure will be increased when the following procedure is performed.



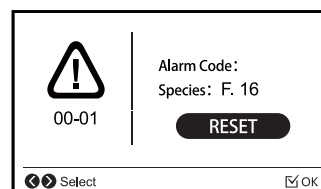
(b) When the high pressure retry control is activated, alarm code “P13” will be indicated on the 7-segment of outdoor unit PCB. If the high pressure retry control occurs 3 times or more within 30 minutes, alarm code “45” will be indicated on the LCD of remote control switch or the 7-segment of outdoor unit PCB.

<Performed from remote control switch HYPE-J01H>

- (a) Alarm code “45” will be indicated.
- The operation lamp will be flashed.

NOTE:

The high pressure may not increase until the high pressure switch is activated due to the temperature condition.



14.3 Checklist During Test Run

Table 14.1 Test Run and Maintenance Record

MODEL:	SERIAL. No.	COMPRESSOR MFG. No.
CUSTOMER'S NAME AND ADDRESS:	DATE:	
THE RESULT OF ALL PERIODIC ROUTINE TESTS:		
1. Is the rotation direction of the indoor fan correct?		<input type="checkbox"/>
2. Is the rotation direction of the outdoor fan correct?		<input type="checkbox"/>
3. Are there any abnormal compressor sounds?		<input type="checkbox"/>
4. Has the unit been operated at least twenty (20) minutes?		<input type="checkbox"/>
5. Check Room Temperature:		
Inlet: No. 1 DB /WB °C, No. 2 DB/WB °C, No. 3 DB/WB °C, No. 4 DB/WB °C		
Outlet: DB /WB °C, DB /WB °C, DB /WB °C, DB /WB °C		
Inlet: No. 5 DB /WB °C, No. 6 DB/WB °C, No. 7 DB/WB °C, No. 8 DB/WB °C		
Outlet: DB /WB °C, DB /WB °C, DB /WB °C, DB /WB °C		
6. Check Outdoor Ambient Temperature:		
Inlet: DB °C, WB °C		
Outlet: DB °C, WB °C		
7. Check Refrigerant Temperature:		8. Check Pressure:
Liquid Temperature: _____ °C		Discharge Pressure: _____ MPa
Discharge Gas Temperature: _____ °C		Suction Pressure: _____ MPa
9. Check Voltage:		
Rated Voltage: _____ V		
Operating Voltage: _____ V, L ₁ -L ₃ _____ V, L ₂ -L ₃ _____ V		
Starting Voltage: _____ V		
Phase imbalance $1n - \frac{V}{V_m} =$ _____		
10. Check Compressor Input Running Current:		
Input: _____ kW		
Running Current: _____ A		
11. Is the refrigerant charge adequate?		<input type="checkbox"/>
12. Do the operation control devices operate correctly?		<input type="checkbox"/>
13. Do the safety devices operate correctly?		<input type="checkbox"/>
14. Has the unit been checked for refrigerant leakage?		<input type="checkbox"/>
15. Is the unit clean inside and outside?		<input type="checkbox"/>
16. Are all cabinet panels fixed?		<input type="checkbox"/>
17. Are all cabinet panels free from rattles?		<input type="checkbox"/>
18. Is the filter clean?		<input type="checkbox"/>
19. Is the heat exchanger clean?		<input type="checkbox"/>
20. Are the stop valves open?		<input type="checkbox"/>
21. Does the drain water flow smoothly from the drain pipe?		<input type="checkbox"/>
22. Do the components of the system change and replace?		<input type="checkbox"/>

Service

All the following content related to "Constant Speed Compressor" does not apply to this product.)

15. General Checking Procedure

15.1 Checking of Electrical Wiring and Power Source

Inspect the following items when abnormality is found during the system activation.

No.	Check Item	Check Method
1	Is power source breaker or fuse blown out?	Check the voltage (secondary side) of the breaker and also check the conductivity of fuse by a tester.
2	Is voltage at secondary side of transformer correct?	Disconnect connection at the secondary side of the transformer and measure voltage by a tester.
3	Is wiring firmly fixed or correctl connected?	<ul style="list-style-type: none"> • Check to ensure that the terminal for power source wiring (terminals “L1” to “L1” and “N” to “N” of each terminal board: AC380-415V) and intermediate wiring (Operating Line: terminals “1” to “1” and “2” to “2” of each terminal board: DC5V) between the indoor unit and the outdoor unit coincide correctly, as figure on the next page. If not, some component will be damaged. • Check the wiring connection to the PCB and especially ensure that the following connections are NOT loosened. <ul style="list-style-type: none"> (a) thermistor connector plug (each) (b) remote control cable connector plug (c) transformer connector plug (d) each connector plug of main power source circuit • Check to ensure that the twist pair cable with shield ($\geq 0.75\text{mm}^2$) are used for intermediate wiring to protect noise obstacle at total length of less than 1000m and size complied with local code. • Check to ensure that the wirings and the breakers are chosen correctly. • All the field wiring and equipment must comply with local code

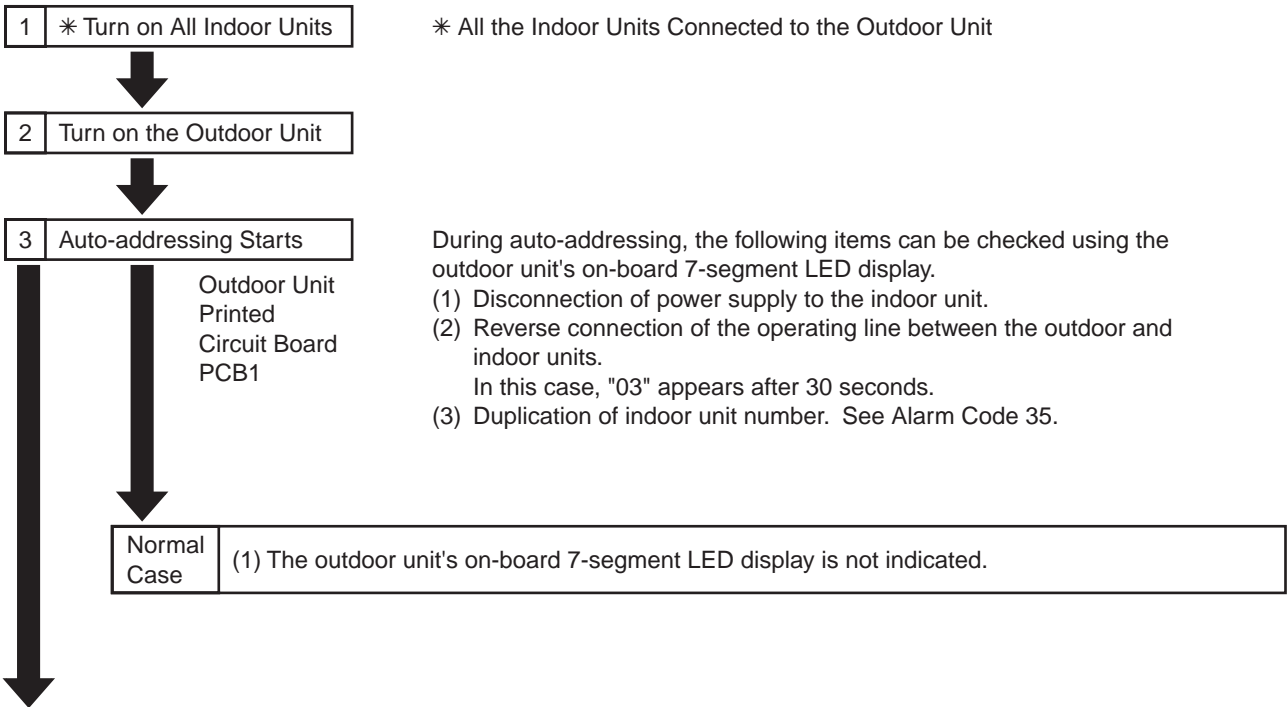
Detailed electrical data and recommended wiring, breaker size, refer to chapter 12.

15.2 Checking of Rotary Switch and Dip Switch Setting

Check to ensure all the rotary switch and dip switch is set correctly according to chapter 13.

15.3 Checking by 7-Segment Display

• Simple Checking by 7-Segment Display



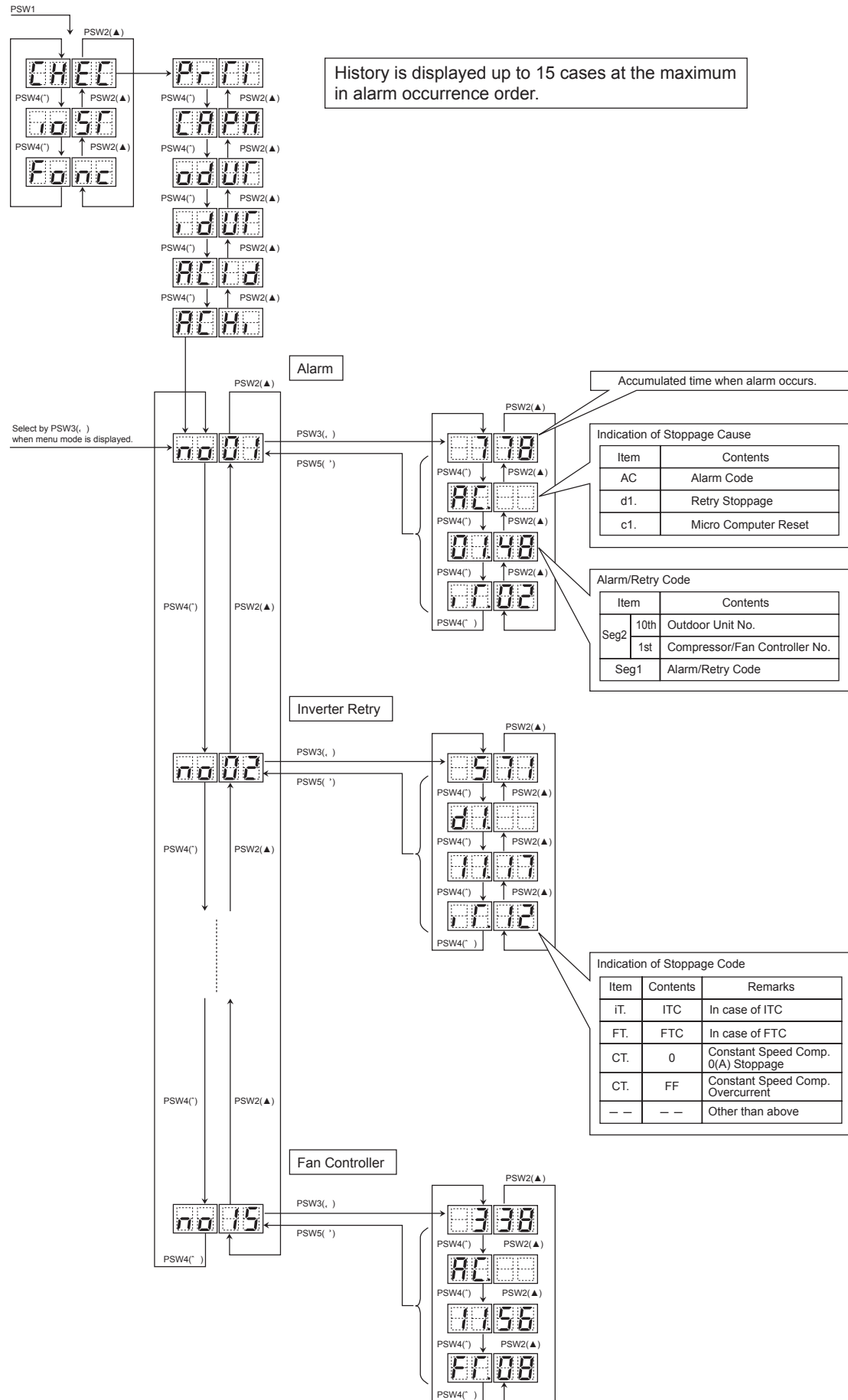
Abnormal Case	<p>(2) The outdoor unit's on-board 7-segment LED display indicates as follows if there is something wrong.</p> <p>(A) Alarm code will be displayed on the 7-segment when alarm is received from indoor unit in normal mode. As for the following alarm codes, however, alarm code will be displayed on the 7-segment when alarm is detected by outdoor unit itself.</p> <ul style="list-style-type: none"> • Alarm Code "03" (Abnormal Transmission between Indoor Unit and Outdoor Unit) • Alarm Code "35" (Incorrect Indoor and Outdoor Unit No. Setting) <p>(B) Alarm code of smaller indoor unit address No. will be displayed when alarm is received from multiple indoor units.</p> <p>(C) The following 7-segment is displayed and flashed every 0.5 seconds.</p>							
	<p style="text-align: center;">Alarm Code</p>							
	<p>(D) SEG1 and SEG2 are as follows.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">7-Segment Display</th> <th style="width: 33%;">Dotted Indication</th> <th style="width: 33%;">Remarks</th> </tr> </thead> <tbody> <tr> <td> <p><In Case of Unit No. 63, Alarm Code "01"></p> <p>SEG2: Indoor Unit No. (0~63) SEG1: Alarm Code</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>SEG2</p> <p>Indoor Unit No.</p> </div> <div style="text-align: center;"> <p>SEG1</p> <p>Alarm Code</p> </div> </div> </td> <td style="text-align: center;"> <p>SEG2</p> <p>In case of "Setting Refrigerant Cycle Group +1"</p> </td> <td> <p>In case of 2-refrigerant cycle group, identify from SEG2 dotted indication.</p> </td> </tr> </tbody> </table>		7-Segment Display	Dotted Indication	Remarks	<p><In Case of Unit No. 63, Alarm Code "01"></p> <p>SEG2: Indoor Unit No. (0~63) SEG1: Alarm Code</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>SEG2</p> <p>Indoor Unit No.</p> </div> <div style="text-align: center;"> <p>SEG1</p> <p>Alarm Code</p> </div> </div>	<p>SEG2</p> <p>In case of "Setting Refrigerant Cycle Group +1"</p>	<p>In case of 2-refrigerant cycle group, identify from SEG2 dotted indication.</p>
7-Segment Display	Dotted Indication	Remarks						
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15.4 Checking of Alarm Code History

Alarm code history is indicated in the following order while the check mode is displayed.

“no01” (latest) ↔ history data ~ “no15” (oldest) ↔ history data

Refer to the figure below as an example.



(1) Register of Alarm Code History

Cause of Stoppage (Alarm Code or Stoppage Code)	Contents	Indication of Alarm Code History					
		Time	*Alarm	Alarm Code			Alarm Code or Stoppage Code
				O.U. Unit No.	Comp. No.	Fan No.	
02	Activation of protection device	Accumulated Time	AC.	○	○		--
03	Abnormality transmitting between indoor units and outdoor units	Accumulated Time	AC.				--
04	Abnormality transmitting between inverter PCB and outdoor PCB	Accumulated Time	AC.	○	○		--
04.	Abnormality transmitting between fan controller and outdoor PCB	Accumulated Time	AC.	○		○	--
05	Abnormality of power source phase	Accumulated Time	AC.	○			--
06	Abnormality of inverter voltage	Accumulated Time	AC.	○	○		iTC
d1-18		Accumulated Time	d1.	○	○		iTC
06.	Abnormality of fan controller voltage	Accumulated Time	AC.	○		○	FTC
07	Decrease in discharge gas superheat	Accumulated Time	AC.	○	○		--
d1-16		Accumulated Time	d1.	○	○		--
08	Increase in discharge gas temperature at the top of compressor	Accumulated Time	AC.	○	○		--
d1-15		Accumulated Time	d1.	○	○		--
0A	Abnormality transmitting between outdoor units	Accumulated Time	AC.				--
0b	Incorrect outdoor unit address setting	Accumulated Time	AC.				--
0c	Incorrect outdoor main unit setting	Accumulated Time	AC.				--
21	Abnormality of high pressure sensor	Accumulated Time	AC.	○			--
22	Abnormality of thermistor for outdoor air temperature	Accumulated Time	AC.	○			--
23	Abnormality of thermistor for discharge gas temp. on top of compressor	Accumulated Time	AC.	○	○		--
24	Abnormality of thermistor for outdoor unit heat exchanger liquid pipe (Te/Tchg)	Accumulated Time	AC.	○		Thermistor Signal Te: E Tchg: C	--
25	Abnormality of thermistor for outdoor unit heat exchanger gas pipe (Tg/TbG)	Accumulated Time	AC.	○		Thermistor Signal TG: G TbG: b	--
29	Abnormality of low pressure sensor	Accumulated Time	AC.	○			--
31	Incorrect capacity setting of indoor unit and outdoor unit	Accumulated Time	AC.				--
35	Incorrect indoor unit No. setting	Accumulated Time	AC.				--
36	Incorrect indoor unit combination	Accumulated Time	AC.				--
38	Abnormality of picking up circuit for protection in outdoor unit	Accumulated Time	AC.	○			--
39	Abnormality of running current at constant speed compressor	Accumulated Time	AC.	○			CT Detected Value
d1-14		Accumulated Time	d1.	○			
3A	Abnormality of outdoor unit capacity	Accumulated Time	AC.				--
3b	Incorrect setting of outdoor unit model combination or voltage	Accumulated Time	AC.				--
3d	Abnormality transmitting between main unit and sub unit(s)	Accumulated Time	AC.				--

* (Details of Alarm)

AC.: Alarm

d1.: Retry

Ci.: Control Information

iTC: Inverter Stoppage Code

FTC: Fan Controller Stoppage Code

Cause of Stoppage (Alarm Code or Stoppage Code)	Contents	Indication of Alarm Code History					
		Time	* Alarm	Alarm Code			Alarm Code or Stoppage Code
				O.U. Unit No.	Comp. No.	Fan No.	
43	Abnormality of low compression ratio	Accumulated Time		○			--
d1-11		Accumulated Time	d1.	○			--
44	Abnormality of low-pressure increase	Accumulated Time	AC.	○			--
d1-12		Accumulated Time	d1.	○			--
45	Abnormality of high-pressure increase	Accumulated Time	AC.	○			--
d1-13		Accumulated Time	d1.	○			--
47	Activation of low-pressure decrease protection device (Vacuum operation protection)	Accumulated Time	AC.	○			--
d1-15		Accumulated Time	d1.	○			--
48	Activation of inverter overcurrent protection device	Accumulated Time	AC.	○	○		iTC
d1-17		Accumulated Time	d1.	○	○		iTC
51	Abnormality of inverter current sensor	Accumulated Time	AC.	○	○		iTC
d1-17		Accumulated Time	d1.	○	○		iTC
53	Inverter error signal detection	Accumulated Time	AC.	○	○		iTC
d1-17		Accumulated Time	d1.	○	○		iTC
54	Abnormality of inverter fin temperatur	Accumulated Time	AC.	○	○		iTC
d1-17		Accumulated Time	d1.	○	○		iTC
55	Inverter failure	Accumulated Time	AC.	○	○		iTC
d1-17		Accumulated Time	d1.	○	○		iTC
57	Activation of fan controller protection device	Accumulated Time	AC.	○		○	FTC
b5	Incorrect setting of indoor unit connection number	Accumulated Time	AC.				--
EE	Compressor protection alarm	Accumulated Time	AC.				--
d1-05	Instantaneous power failure	Accumulated Time	di.				--
d1-18	Abnormality of inverter and other	Accumulated Time	di.				iTC
d1-26	Abnormality of high pressure decrease	Accumulated Time	di.				--
d1-32	Retry stoppage by indoor unit auto address setting	Accumulated Time	di.				--
Control Information	Micro-computer reset by abnormality of inverter transmission	Accumulated Time	Ci.				1
	Micro-computer reset by abnormality of fan controller transmission	Accumulated Time	Ci.				2
	Micro-computer reset by abnormality of indoor unit transmission	Accumulated Time	Ci.				3
	Micro-computer reset by abnormality transmitting between outdoor unit and outdoor unit	Accumulated Time	Ci.				4
	Micro-computer reset for abnormality of control state	Accumulated Time	Ci.				6

* (Details of Alarm)

AC.: Alarm

d1.: Retry

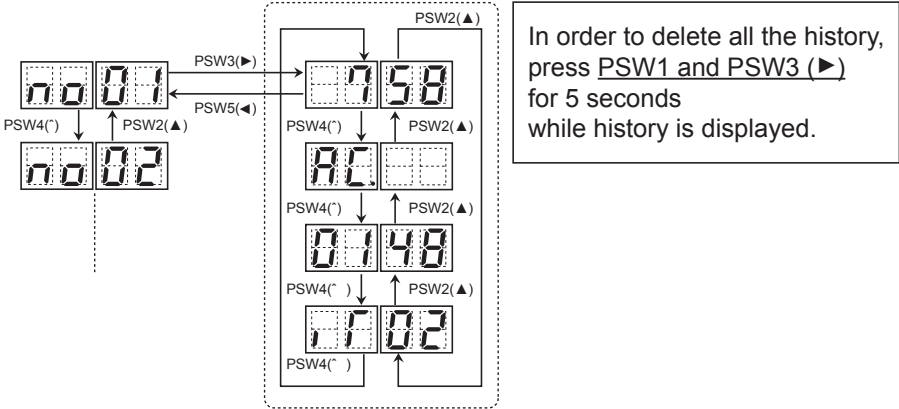
Ci.: Control Information

iTC: Inverter Stoppage Code

FTC: Fan Controller Stoppage Code

(2) Deletion of Alarm Code History

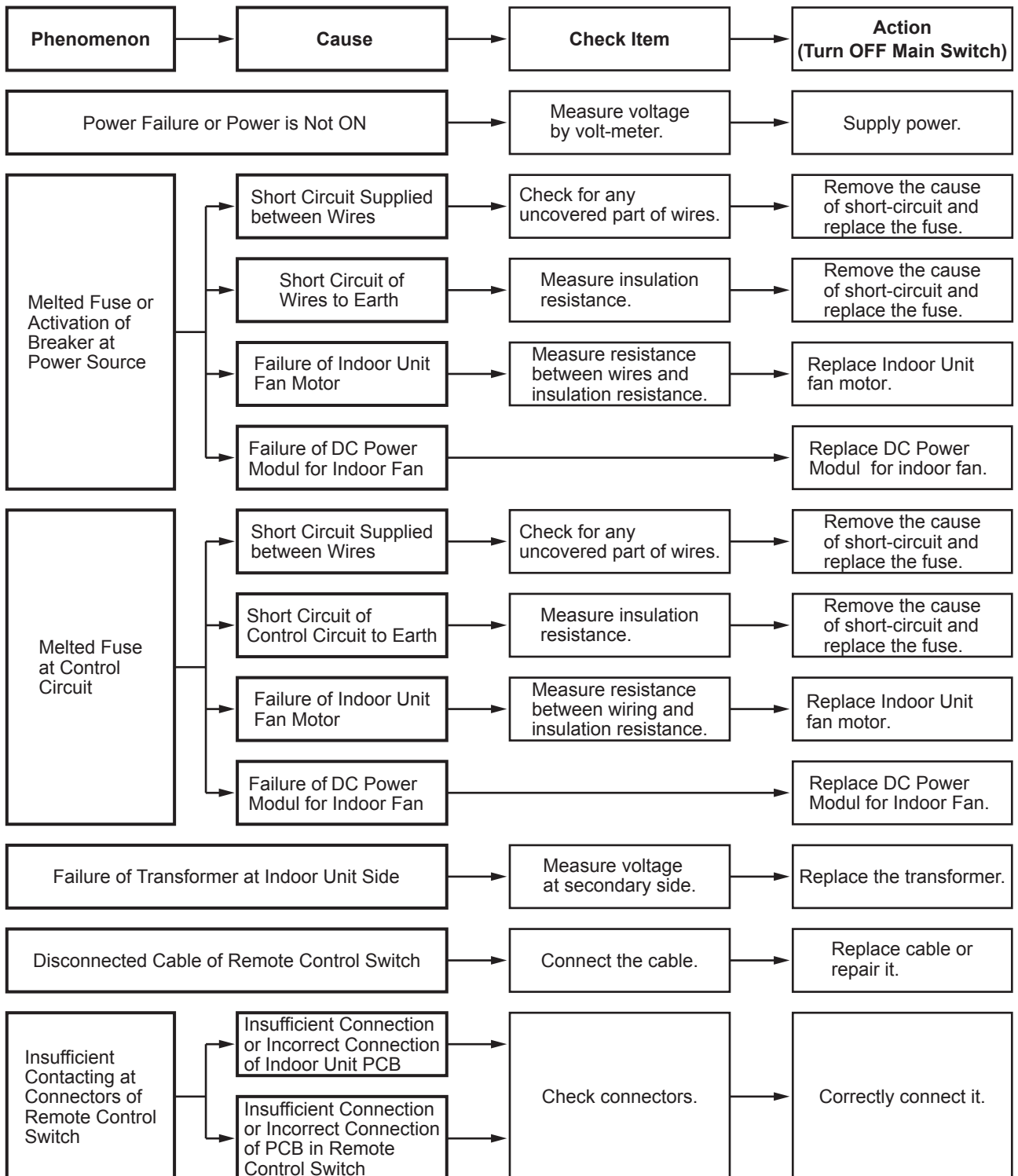
Press PSW1 and PSW3 for 5 seconds to clear the alarm code history while the history data is displayed. (All history can be deleted.)



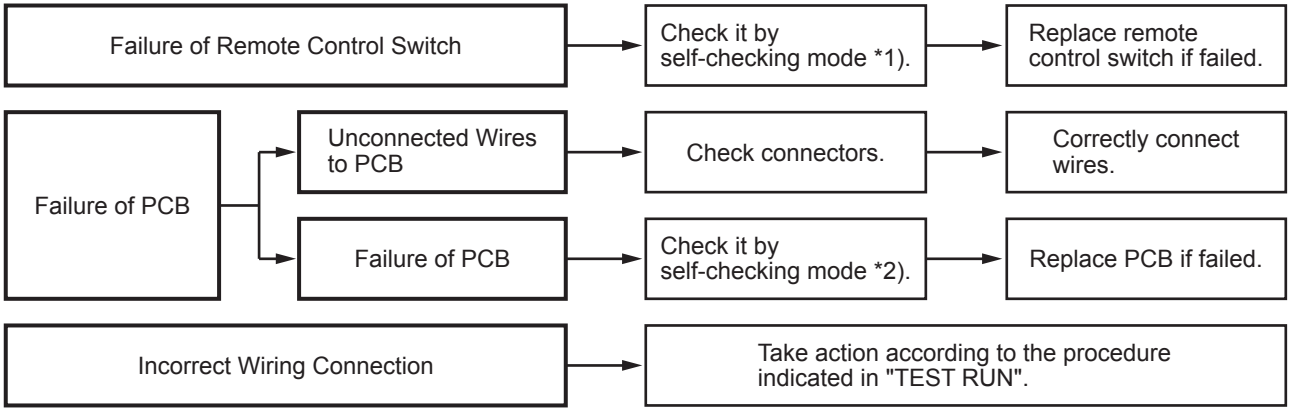
15.5 Failure of Power Supply to Indoor Unit and Remote Control Switch

- Lights and LCD are not Indicated.
- Not Operated

If fuses are melted or a breaker is activated, investigate the cause of over current and take necessary action.



(Failure of Power Supply to Indoor Unit and Remote Control Switch)

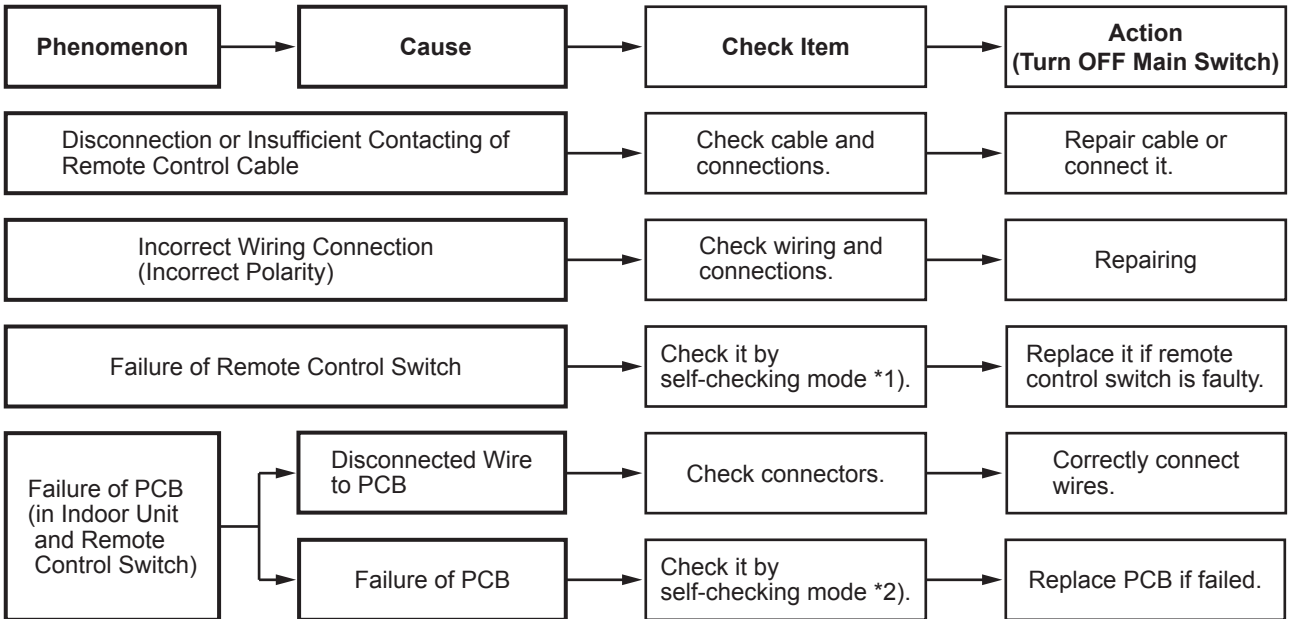


*1): Refer to section 15.7.

*2): Refer to section 15.6.

Abnormal Transmission between Remote Control Switch and Indoor Unit

- “RUN” Lamp on Remote Control Switch:
Flashing every 2 seconds



*1): Refer to section 15.7.

*2): Refer to section 15.6.

15.6 Self-Checking of PCBs using Remote Control Switch

The following troubleshooting procedure is utilized for function test of PCBs in the indoor unit and outdoor unit.

Each "Check Menu" item and its function are explained in the following table.

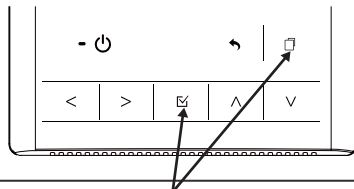
Check menu item	Function
Check 1	Sensor condition of air conditioner will be monitored and indicated.
Check 2	Sensor data of air conditioner prior to alarm occurrence will be indicated.
Alarm Record	Previous alarm record (date, time, alarm code) will be indicated. ※
Species	Model name and manufacturing number will be indicated.
IDU/ODU Diagnosis	The result of PCB check will indicated.
Self Diagnosis	Checking of remote control switch will be carried out.

※ To Erase Alarm Record

Press "☑" when the abnormality record is indicated. After that, the confirmation screen will be displayed.

Select "Yes" and press "☑" so that the alarm record will be deleted.

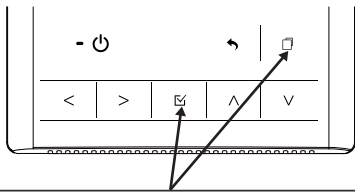
Indication of Check Menu



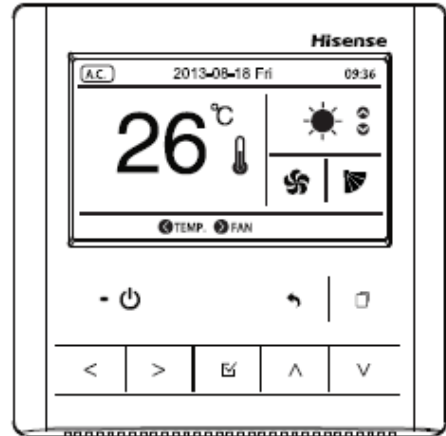
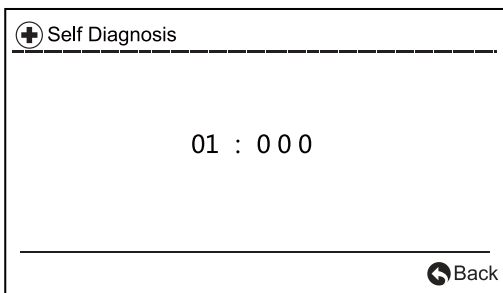
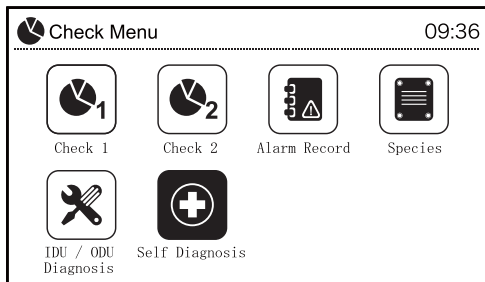
Press and hold "☐" (menu) and "☑" simultaneously for at least 3 seconds during the normal mode. The check menu will be displayed.

Indi-cation	Contents	
00	Normal	
	Abnormality (Open-circuit, Short-circuit, etc.) in circuit for	
01	Intake Air Temp. Thermistor	Indoor Unit PCB
02	Discharge Air Temp. Thermistor	
03	Liquid Pipe Temp. Thermistor	
04	Remote Thermistor Abnormality	
05	Gas Pipe Temp. Thermistor	
06	Remote Sensor	
08	Transmission of Central Station	
0A	EEPROM	
0b	Zero Cross Input Failure	
E E	Transmission of Indoor Unit during This Checking Operation	
07	Transmission of Outdoor Unit	Outdoor Unit PCB
F4	ITO Input Failure	
F5	PSH Input Failure	
F6	Protection Signal Detection Circuit	
F7	Phase Detection	
F8	Transmission of Inverter	
F9	High Pressure Sensor	
Fb	Comp. Discharge Gas Temp. Thermistor	
Fc	Low Pressure Sensor	
Fd	Heat Exchanger Evaporation Temp. Thermistor	
Ff	Ambient Air Temp. Thermistor	

15.7 Self-Checking of Remote Control Switch



Press and hold “☐” (menu) and “☑” simultaneously for at least 3 seconds during the normal mode. The check menu will be displayed.



15.8 Procedure of Checking Other Main Parts

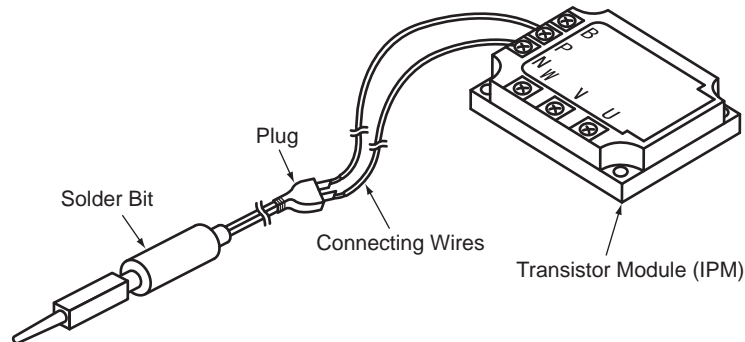
(1) High Voltage Discharge Work for Replacing Parts

⚠ CAUTION

Perform this high voltage discharge work to avoid an electric shock.

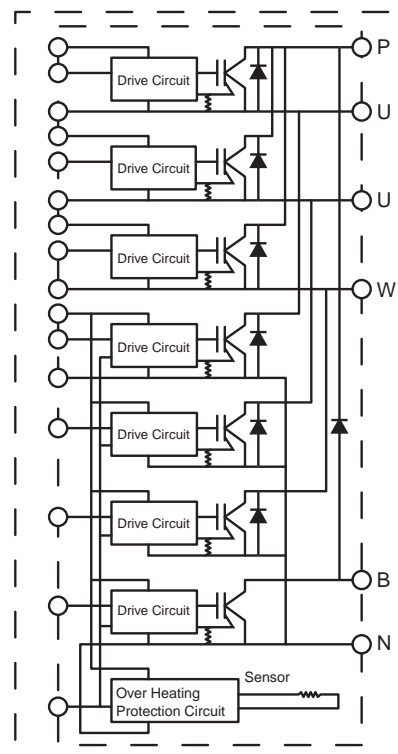
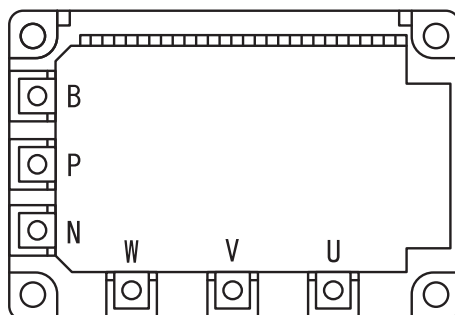
< Procedure >

- Turn OFF the main switches and wait for three minutes. Check to ensure that no high voltage exists. If LED201 is ON after start-up and LED201 is OFF after turning OFF power source, the voltage will decrease lower than DC50V.
- Connect connecting wires to an electrical solder bit
- Connect the wires to terminals, P and N on IPM. ⇒ Discharging is started, resulting in hot solder bit. Pay attention not to short-circuit between terminal P and N.
- Wait for 2 or 3 minutes and measure the voltage once again. Check to ensure that no voltage is charged.



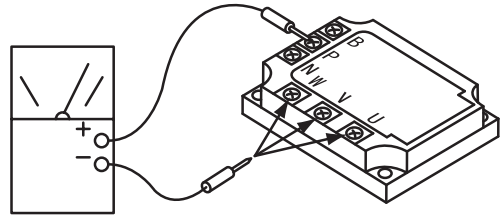
(2) Checking Method of Transistor Module (IPM)

Outer Appearance and Internal Circuit of Transistor Module

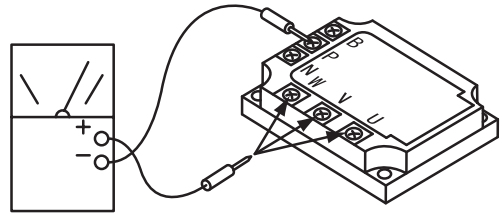


Remove all the terminals of the transistor module before check. If items (a) to (d) are performing and the results are satisfactory, the transistor module is normal. Measure it under 1kΩ range of a tester. Do not use a digital tester.

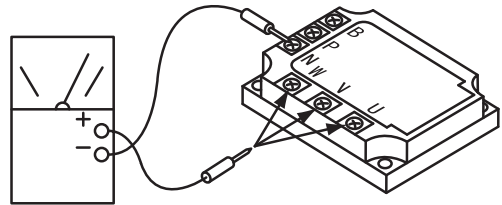
- (a) By touching the + side of the tester to the P terminal of transistor module and the - side of tester to U, V and W of transistor module, measure the resistance. If all the resistances are from 1 to 5kΩ, it is normal.



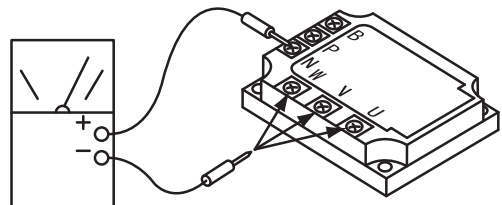
- (b) By touching the - side of the tester to the P terminal of transistor module and the + side of tester to U, V and W of transistor module, measure the resistance. If all the resistances are greater than 100kΩ, it is normal.



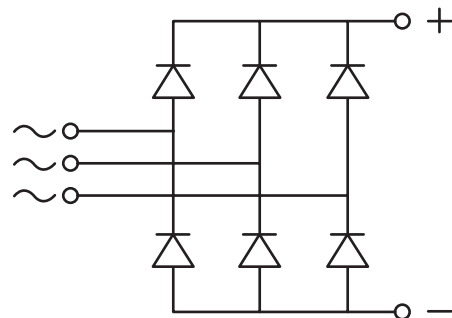
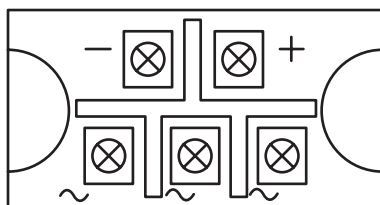
- (c) By touching the - side of the tester to the N terminal of transistor module and the + side of tester to U, V and W of transistor module, measure the resistance. If all the resistances are from 1 to 5kΩ, it is normal.



- (d) By touching the + side of the tester to the N terminal of transistor module and the - side of tester to U, V and W of transistor module, measure the resistance. If all the resistances are greater than 100kΩ, it is normal.

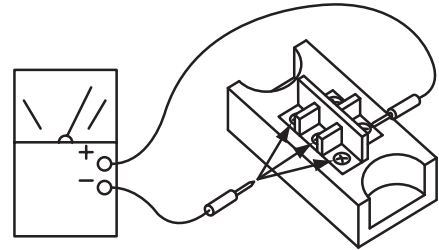


(3) Checking Method of Diode Module (DM)
Outer Appearance and Internal Circuit of Diode Module

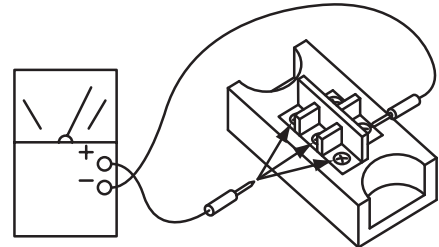


If items (a) to (d) are performing and the results are satisfactory, the diode module is normal. Measure it under 1kΩ range of a tester. Do not use a digital tester.

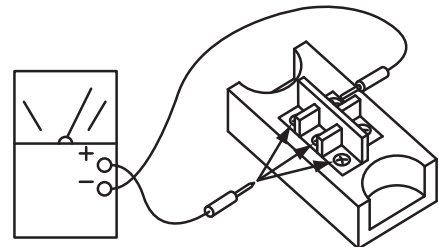
- (a) By touching the + side of the tester to the + terminal of diode module and the - side of tester to the ~ terminals (3 NOs.) of the diode module, measure the resistance. If all the resistances are from 5 to 50kΩ, it is normal.



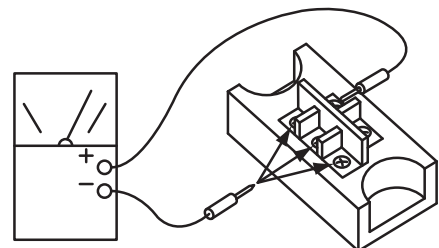
- (b) By touching the - side of the tester to the + terminal of diode module and the + side of tester to the ~ terminals (3 NOs.) of the diode module, measure the resistance. If all the resistances are greater than 500kΩ, it is normal.



- (c) By touching the - side of the tester to the - terminal of diode module and the + side of tester to the ~ terminals (3 NOs.) of the diode module, measure the resistance. If all the resistances are from 5 to 50kΩ, it is normal.



- (d) By touching the + side of the tester to the - terminal of diode module and the - side of tester to the ~ terminals (3 NOs.) of the diode module, measure the resistance. If all the resistances are greater than 500kΩ, it is normal.

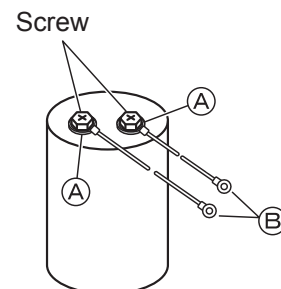


(4) Checking Method of Capacitor

- (a) Check that the screws are connected tightly.
 (b) Check that the capacitor is not tarnished or expanded.

* When checking the capacitor, disconnect the terminals (B). Do not disconnect the terminals (A).

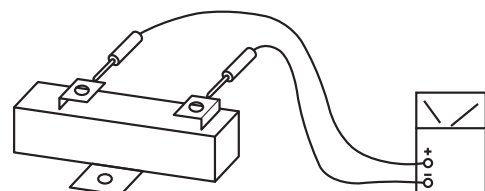
Capacitance	380-415V
For Inverter	4700μF
For Fan Controller	2700μF



(5) Checking Method of Resistor

Measure the both ends of resistor as shown in the fig re. If the resistance is ∞Ω, it is abnormal.

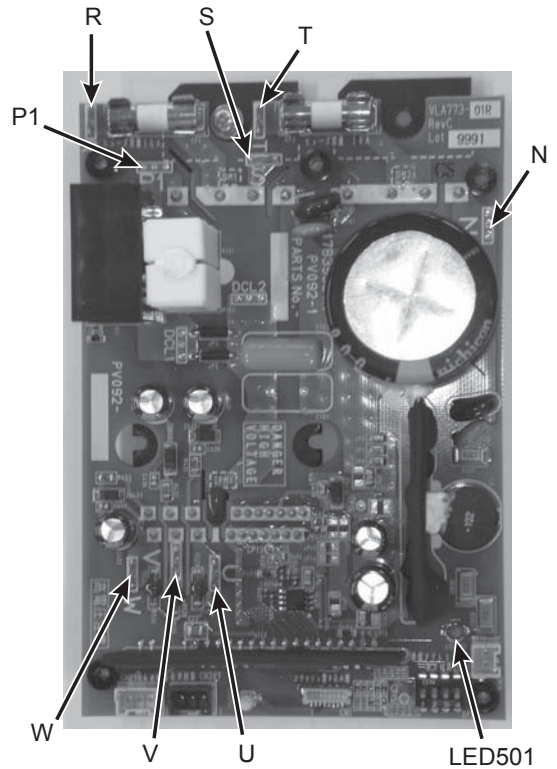
Resistance	380-415V	
For Inverter	RS	-
	RS1	0.5kΩ
	RS2	0.5kΩ
	R1	6.3kΩ
	R2	10.5kΩ



(6) Checking of Fan Controller

- (a) Turn OFF the power source switches before this work.
Also ensure that LED501 (Red) on the fan controller is turned OFF.
If LED501 is ON, electrical shock may occur.
- (b) Disconnect all the wirings connected to the fan controller.
Measure the resistance between terminals using the tester. (Do not use a digital tester.)
When measuring, check the color of tester probe and the terminals to be measured as shown in the table below.

Tester Probe Red (+) - Black (-)	Resistance Range
P1 - R P1 - S P1 - T R - N S - N T - N P1 - U P1 - V P1 - W U - N V - N W - N	1 kΩ and over
R - P1 S - P1 T - P1 N - R N - S N - T U - P1 V - P1 W - P1 N - U N - V N - W	Resistance will gradually increase once after it is between 1700 kΩ to 1900 kΩ. (*)



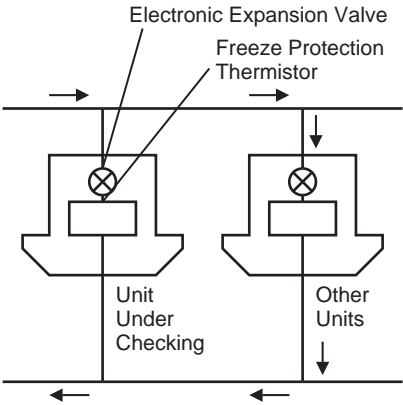
(*) Leave at least 30 seconds when measuring the next terminals.

< DSW Initial Setting >

DSW1			
1	2	3	4
OFF	OFF	OFF	OFF

Regarding DSW setting, do not change from the original setting. Abnormal transmitting and fan controller failure may occur if the setting is changed.

(7) Checking Method of Electronic Expansion Valve

	Indoor Unit Electronic Expansion Valve	Outdoor Unit Electronic Expansion Valve
Locked with Fully Closed	Check for the liquid pipe temperature during heating operation. It is abnormal if the temperature does not increase.	It is abnormal if the liquid pipe pressure does not increase during cooling operation
Locked with Slightly Open	It is abnormal under the following conditions; The temperature of freeze protection thermistor becomes lower than the suction air temperature when the unit under checking is stopped and other units are under cooling operation.	It is abnormal if the liquid pipe pressure does not increase and the outlet temperature of the expansion valve decreases after the cooling operation is started.
Locked with Fully Open		It is abnormal under the following conditions; After heating operation for more than 30 min., the discharge gas temperature of compressor is not 10°C higher than the condensing temperature and there is no other faults such as excessive charge of refrigerant, etc.

(8) Checking of Electrical Coil Parts

Name of Parts	Electrical Wiring Diagram	Wiring No.	Resistance (Ω)
DC Fan Motor for Outdoor Unit (54~96)		White-Black Black-Red Red-White	2.58±0.3 at 20°C
DC Fan Motor for Outdoor Unit(114~154)		White-Black Black-Red Red-White	0.794±5% at 20°C

Name of Parts	Resistance (Ω)
Solenoid Valve for Gas Bypass	1,250 at 20°C
Compressor Motor (for Inverter Compressor)	0.3(380-415V/50Hz,380V/60Hz) at 20°C

(9) Checking of Compressor

CHECK LIST ON COMPRESSOR

CLIENT: _____

MODEL: _____

DATE: _____

Serial No.: _____

Production Date: _____

Checker: _____

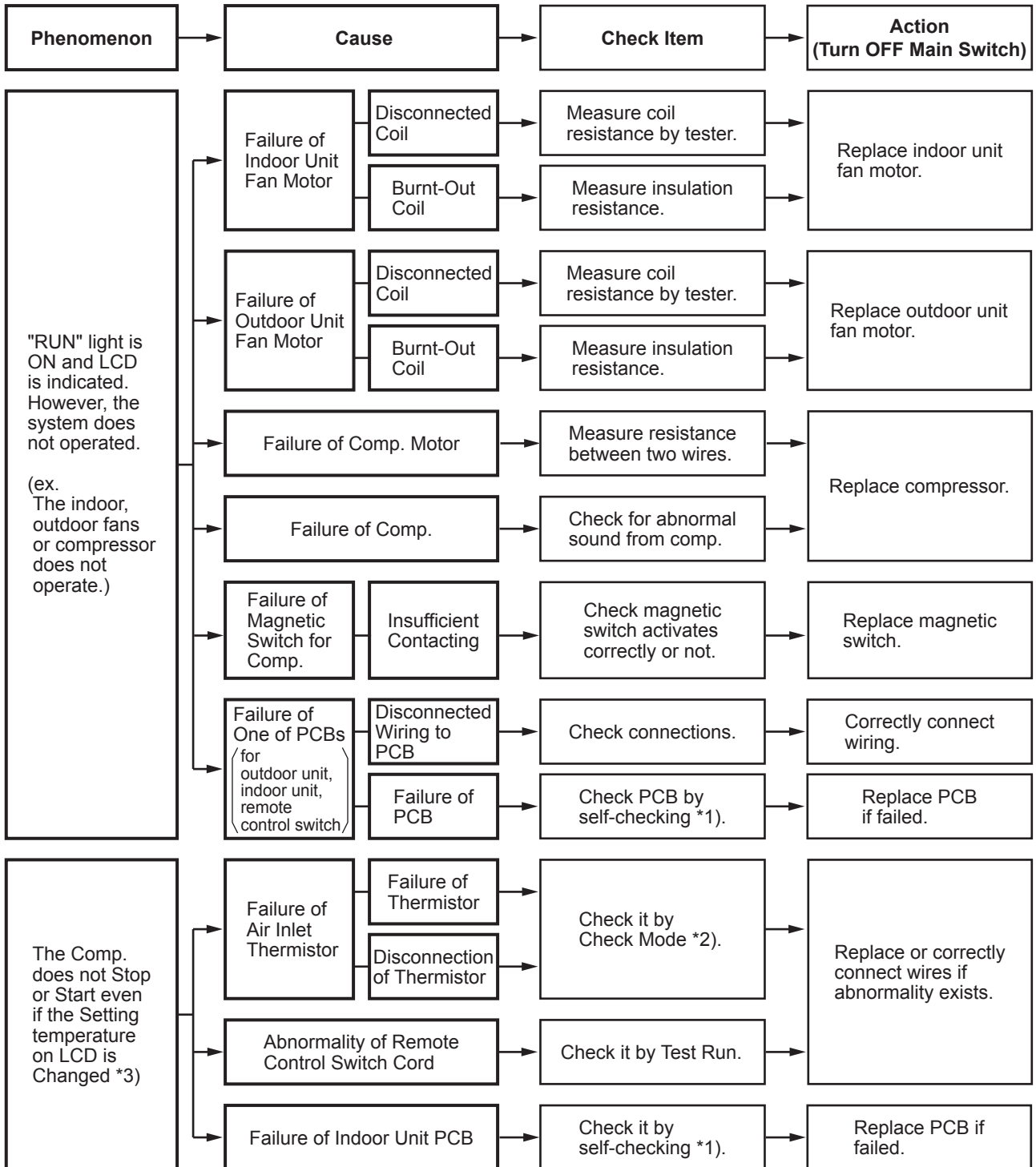
No.	Check Item	Check Method	Result	Remarks
1	Are THM8 and THM9 correctly connected? THM8 and THM9: Discharge Gas Thermistor	(1) Are wires of each thermistor correctly connected by viewing? (2) Check to ensure that 7-segment indication of Td1 is higher than Td2 when No.1 comp. is operating. Td1: Temperature of THM8 Td2: Temperature of THM9		
2	Are thermistor, THM8 and THM9 disconnected?	(1) Check to ensure that thermistor on the top of comp. is correctly mounted by viewing? (2) Check to ensure that actually measured temp. are greatly different from the indication (Td1, Td2) during check mode.		
3	Are connectors for current sensor correctly connected?	(1) Check to ensure that 7-segment indication A1 and A2 are 0 during compressor stopping. (2) Check to ensure that indication A1 and A2 are not 0 during compressor running. (However, A2 is 0 during stopping of No.2 comp.)		
4	Is current sensor faulty?			
5	Is current sensing part on PCB2 faulty?			
6	Is the direction of current sensor (CTU, CTV) reverse?	Check the direction ⇒ by viewing.		
7	Are power source wires, U and V inserted correctly into current sensor?	Check to ensure that wires are correctly inserted.		
8	Are expansion valves (MV1 and MVB) correctly connected?	Check to ensure that MV1 to CN10 and MVB to CN12 are correctly connected.		
9	Are expansion valve coils (MV1 and MVB) correctly mounted?	Check to ensure that each coil is correctly mounted on the valve.		
10	Are the refrigeration cycle and electrical wiring system incorrectly connected?	Check to ensure that refrigerant is flowing into indoor units by operating one refrigerating cycle only from the outdoor unit.		
11	Is opening of expansion valve completely closed (locked)?	Check the following by the check mode of outdoor units. (1) Liquid Pipe Temp. (TL) < Air Intake Temp. (Ti) during Cooling Operation (2) Liquid Pipe Temp. (TL) > Air Intake Temp. (Ti) during Heating Operation		
12	Is opening of expansion valve fully opened (locked)?	Check to ensure that liquid pipe temp. is lower than air intake temp. of stopping indoor unit when other indoor units are operating under cooling operation.		
13	Are the contacts for comp. magnetic switch CMC1 and CMC2 faulty?	Check the surface of each contact by viewing.		
14	Is there any voltage abnormality among L1-L2, L2-L3 and L3-L1?	Check to ensure that voltage imbalance is smaller than 3%. Please note that power source voltage must be within 415V or 380V±10%.		
15	Is the comp. oil acidified during compressor motor burning?	Check to ensure that the oil color is not black.		

Additional Information for “CHECK LIST ON COMPRESSOR”

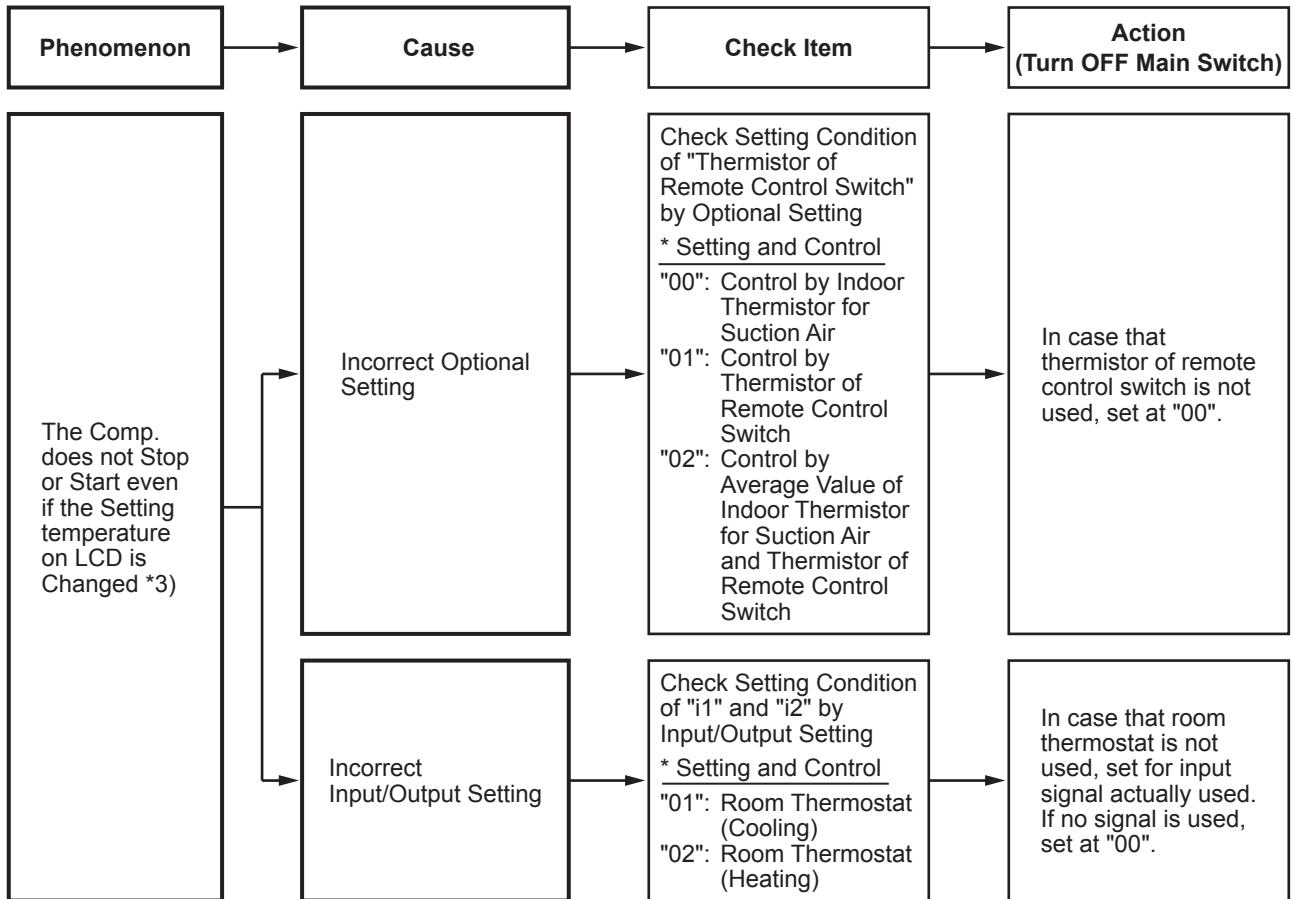
Check Item	Additional Information (Mechanism of Compressor Failure)
1 & 2	The liquid refrigerant return volume to the compressor is controlled by the discharge gas temperature Td1 when only No.1 compressor is operating. If Td1 and Td2 are reversely connected, the liquid refrigerant return volume will become small by detecting the temperatures even if the actual discharge gas temperature is high. Therefore, this abnormal overheating operation will result in insulation failure of the motor winding.
3, 4 & 5	Overcurrent control (operating frequency control) is performed by detecting current by the current sensor. In this case, winding insulation failure will occur, since control is not available in spite of actually high current.
6 & 7	The current sensor checks phase and adjusts output electrical wave in addition to the above mentioned items. If fault occurs, the output electrical wave becomes unstable giving stress to the motor winding, resulting in winding insulation failure.
8 & 9	During a cooling operation, Pd is controlled by fan revolution of outdoor unit, and Td and SH are controlled by MV of each indoor units. During a heating operation, Td and SH are controlled by MV1. If expansion valves are incorrectly connected, correct control is not available, resulting in compressor seizure depending on liquid refrigerant returning conditions or motor winding insulation failure depending on overheating conditions.
10	If the refrigeration cycle and electrical system are incorrectly connected, abnormally low suction pressure operation is maintained or abnormally high discharge pressure operation is maintained, resulting in giving stress to the compressor, since their correct control is not available.
11	ditto
12	The compressor may be locked due to the liquid return operation during the cooling operation.
13	In the case that the contacting resistance becomes big, voltage imbalance among each phase will cause abnormal overcurrent.
14	In this case, overcurrent will occur, efficienc will decrease or the motor winding will be excessively heated.
15	In the case, it will result in motor burning or compressor seizure.

15.9 Abnormalities of Devices

In the case that no abnormality (Alarm Code) is indicated on the remote control switch, and normal operation is not available, take necessary action according to the procedures mentioned below.



(Abnormalities of Devices)



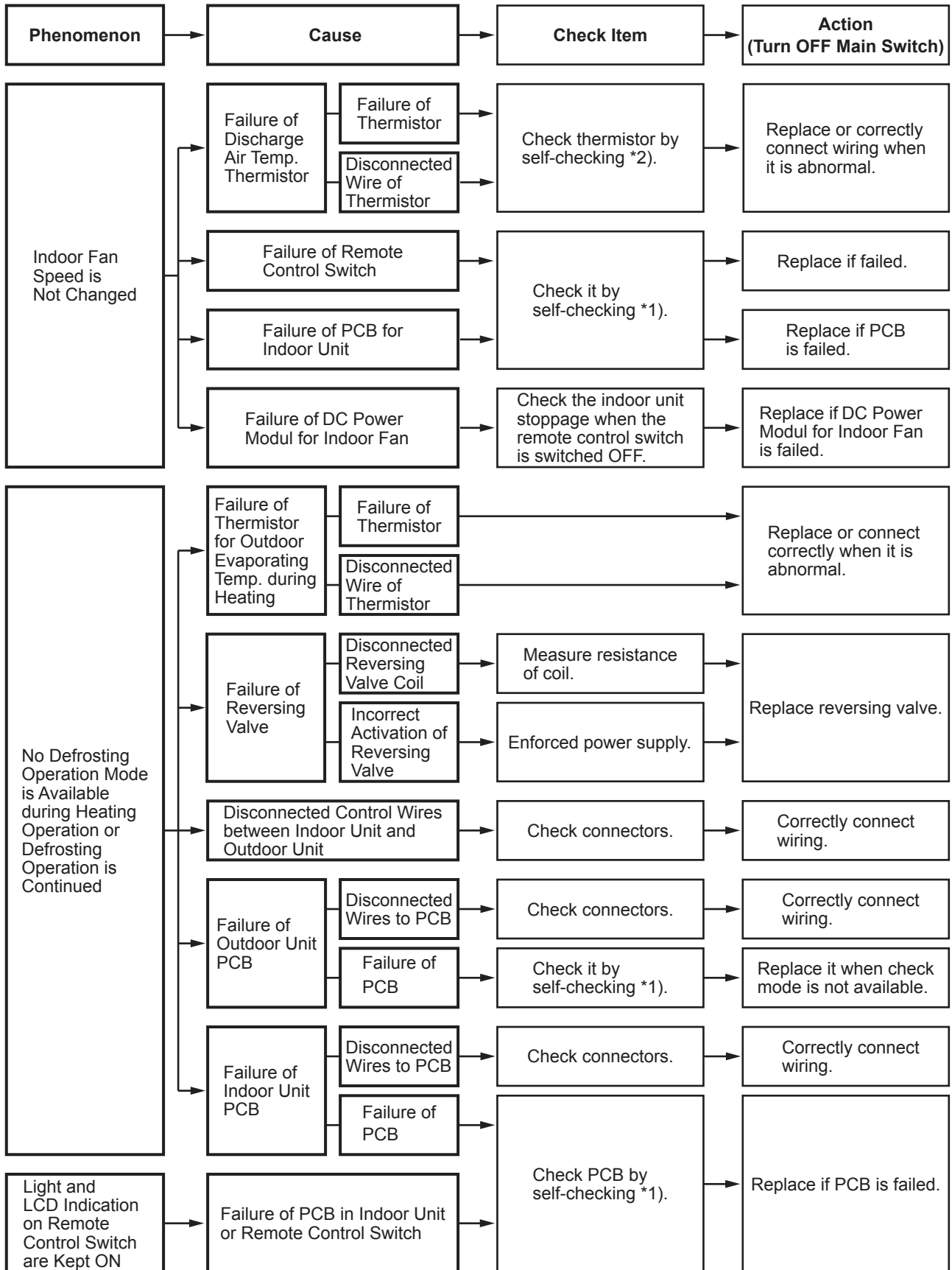
*1): Refer to section 15.6.

*2): Refer to section 16.3.

*3): Even if controllers are normal, the compressor does not operate under the following conditions.

- * Indoor Air Temp. is lower than 19°C or Outdoor Air Temp. is lower than -5°C during cooling operation.
- * Indoor Air Temp. is higher than 30°C or Outdoor Air Temp. is higher than 23°C during heating operation.
- * When a cooling (or heating) operation signal is given to the outdoor unit and a different mode as heating (or cooling) operation signal is given to indoor units.
- * When demand signal or emergency stop signal is given to outdoor unit.

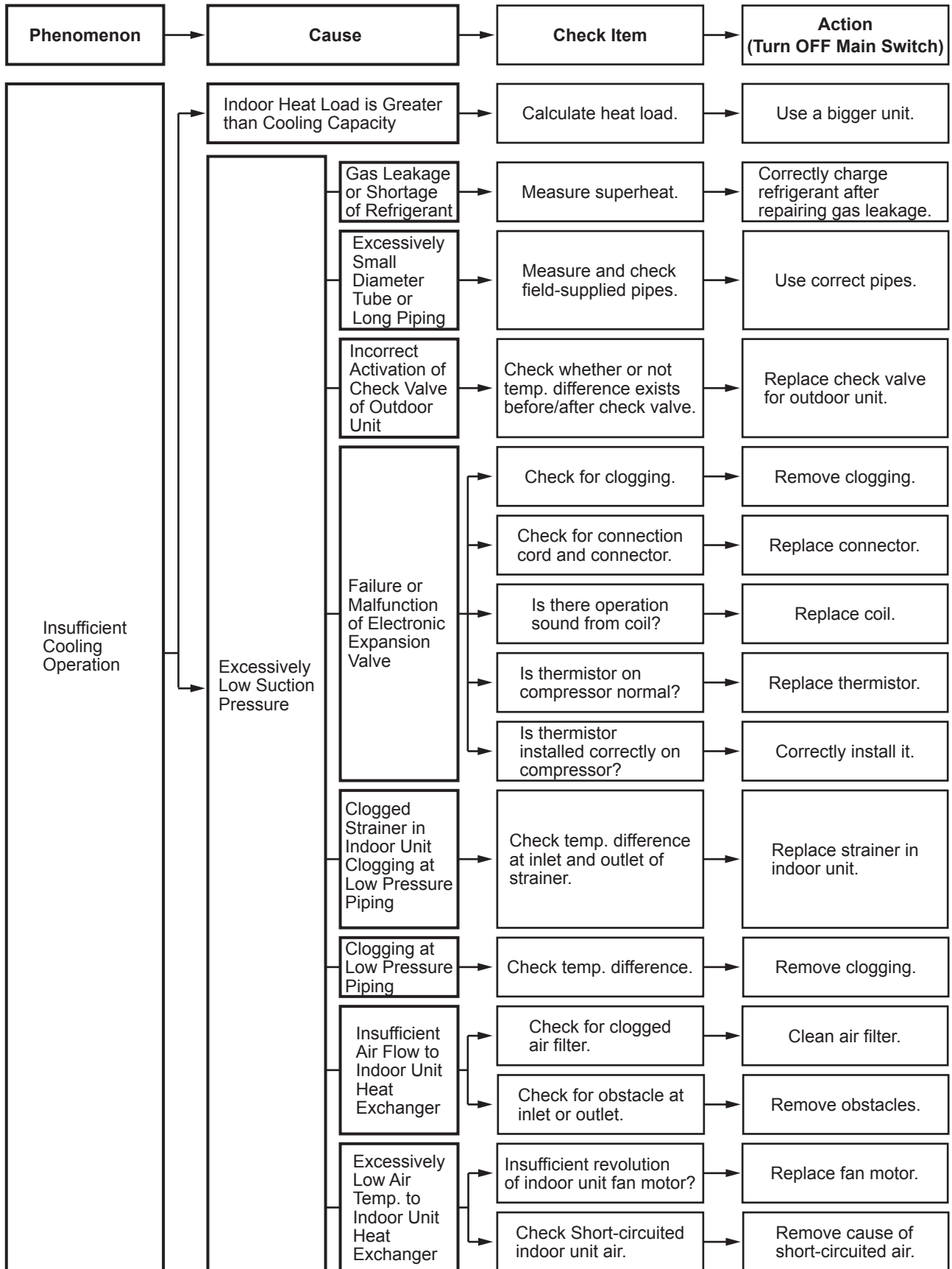
(Abnormalities of Devices)



*1): Refer to section 15.6 and 15.7.

*2): Refer to section 16.3.

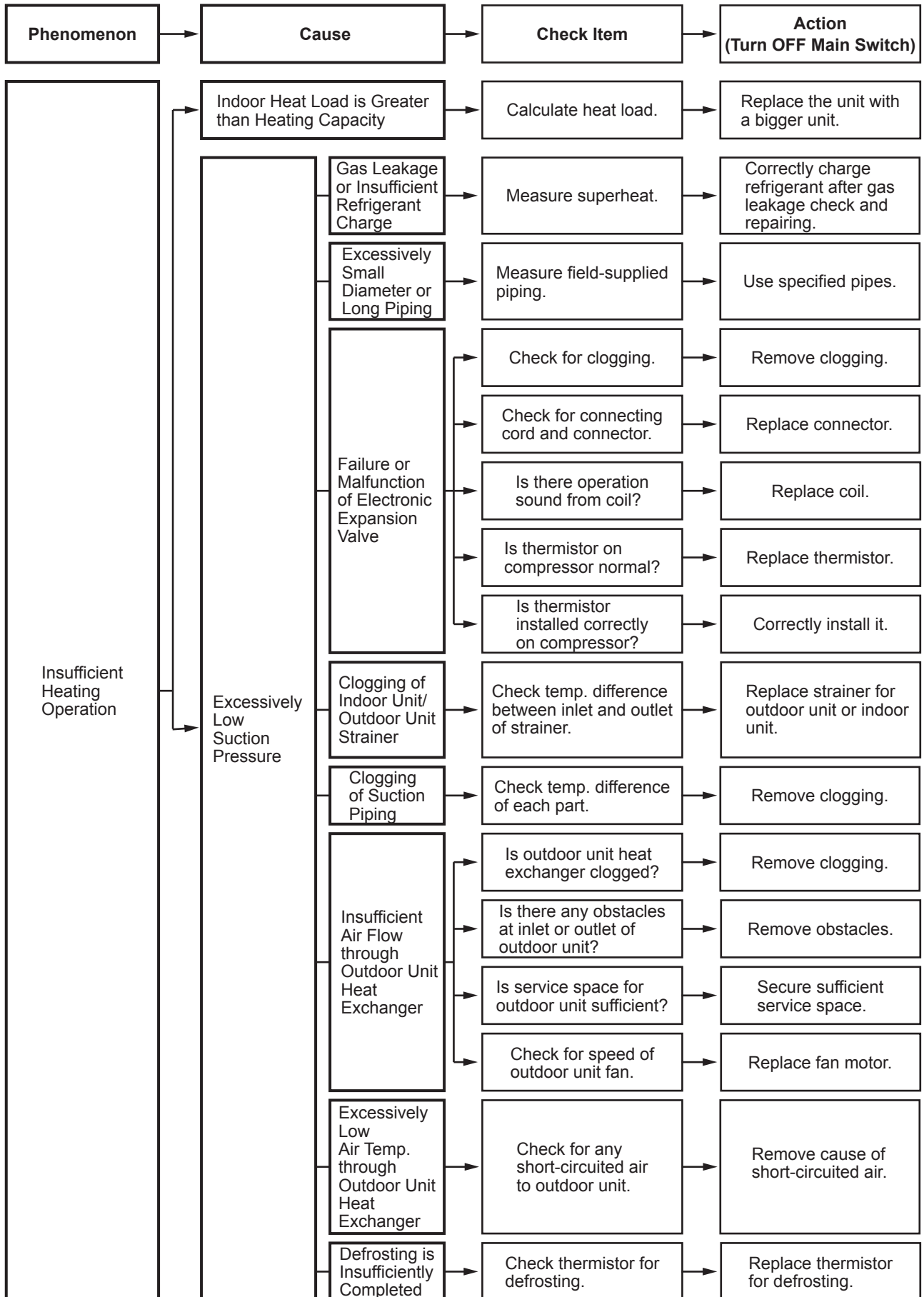
(Abnormalities of Devices)



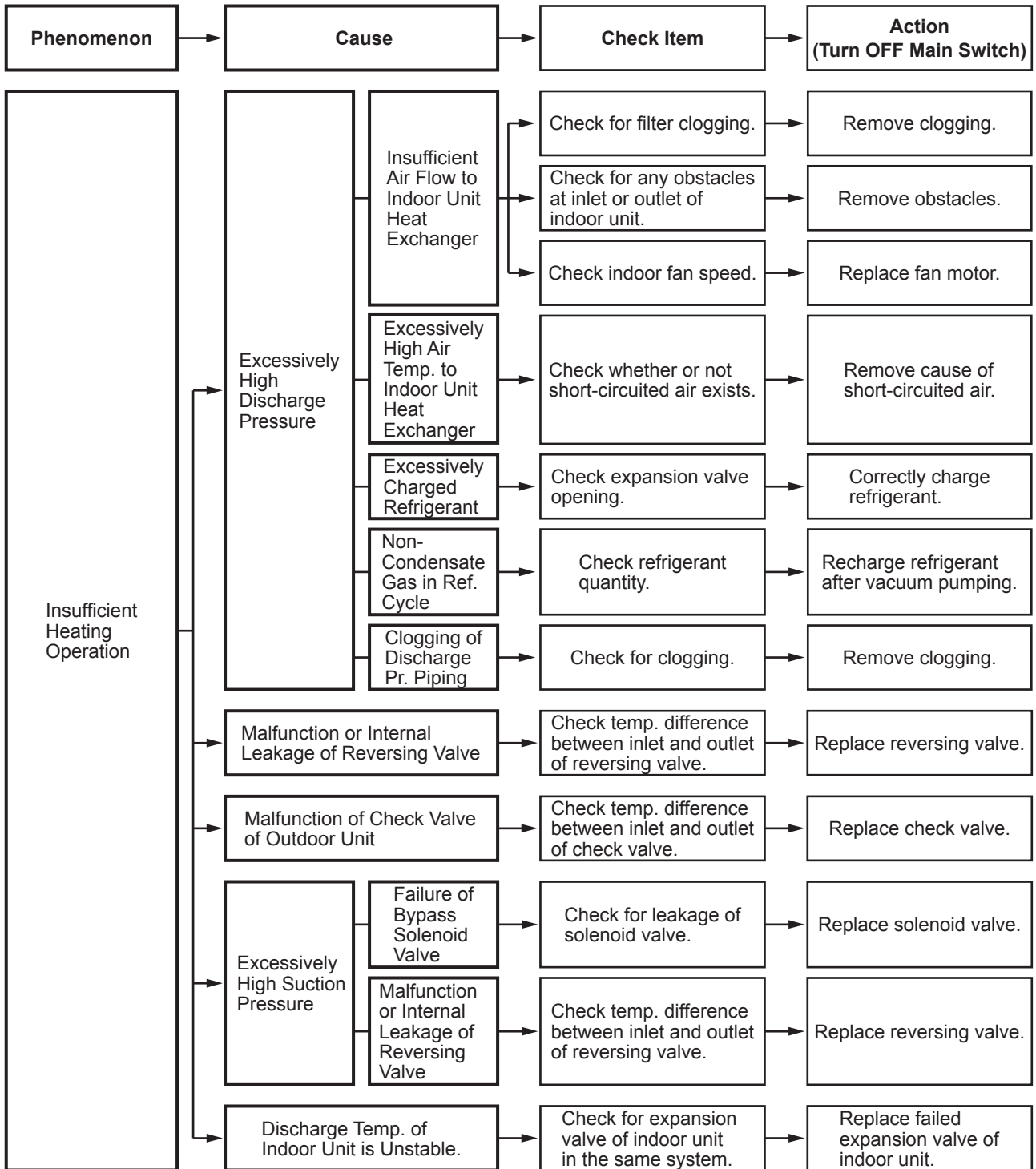
(Abnormalities of Devices)

Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)	
Insufficient Cooling Operation	Excessively High Discharge Pressure	Insufficient Air Flow to Outdoor Unit Heat Exchanger	Check Clogging of Outdoor Unit Heat Exchanger.	Remove clogging.
			Obstacles at inlet or outlet of outdoor unit heat exchanger?	Remove obstacles.
			Is service space for outdoor unit sufficient?	Secure service space.
			Correct Fan Speed?	Replace fan motor.
		Excessively High Air Temp. to Outdoor Unit Heat Exchanger	Short-Circuited Air to Outdoor Unit?	Remove cause of short-circuited air.
			Any Other Heat Load near Outdoor Unit?	Remove heat source.
		Excessively Charged Refrigerant	Check expansion valve opening.	Correctly charge refrigerant.
		Non-Condensed Gas in Cycle	Check each temp. and pressure.	Charge refrigerant after vacuum pumping.
		Clogging of Discharge Piping	Check for clogging.	Remove clogging.
		Failure or Malfunction of Expansion Valve	Check for clogging.	Remove clogging.
	Check for connecting cord and connector.		Replace connector.	
	Is there operation sound from coil?		Replace coil.	
	Is thermistor on compressor normal?		Replace thermistor.	
	Is thermistor installed correctly on compressor?		Correctly install it.	
	Excessively Low Suction Pressure	Malfunction or Internal Leakage of Reversing Valve	Check temp. difference at inlet and outlet of reversing valve.	Replace reversing valve.
			Failure of Bypass Solenoid Valve	Check for leakage of solenoid valve.
Excessively Low Suction Pressure	Malfunction or Internal Leakage of Reversing Valve	Check temp. difference between inlet and outlet of reversing valve.	Replace reversing valve.	
		Discharge Temp. of Indoor Unit is Unstable.	Check for expansion valve of indoor unit in the same system.	Replace failed expansion valve of indoor unit.

(Abnormalities of Devices)



(Abnormalities of Devices)



(Abnormalities of Devices)

Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)	
Cooling or Heating Operation with Abnormal Sound	Foreign Particles Inside of Fan Casing	Check it by viewing.	Remove foreign particles.	
	Indoor Unit Fan Runner is Hitting Casing	Check it by viewing.	Adjust position of fan runner.	
	Outdoor Unit Propeller Fan is Hitting Shroud	Check it by viewing.	Adjust position of propeller fan.	
	Abnormal Sound from Compressor	Faulty Installation	Check each part is tightly fixed.	Tightly fix it.
		Liquid Ref. Compression	Check expansion valve opening.	Ensure superheat.
		Wear or Breakage of Internal Comp. Parts	Abnormal Sound from Inside of Compressor	Replace compressor.
		No Heating by Crankcase Heater	Check resistance. (Crankcase Heater, Fuse)	Replace crankcase heater or fuse.
	Hamming Sound from Magnetic Contactor	Check surface of contacts.	Replace magnetic switch.	
Abnormal Vibration of Cabinets	Check each fixing screws.	Tightly fix it.		
Outdoor Fan is Not Operated When Compressor is Operated	Obstacle at Outdoor Fan	Check obstacles.	Remove obstacles.	
	Watching Condition for Heating Operation	Wait for switching of reversing Valve. (1 to 3 minutes)	In case that reversing Valve is not switched, check for insufficient refrigerant.	
Indoor Fan is Not Operated When Compressor is Operated	Discharge Pressure Does Not Increase Higher than 1.5MPa due to insufficient refrigerant.	Check operation pressure.	Add refrigerant.	
	Disconnected Wiring for Indoor Fan	Check wiring.	Connect wiring correctly.	
	Failure of DC Power Modul for Indoor Fan	Check DC Power Modul for Indoor Fan.	Replace DC Power Modul for Indoor Fan.	

16. Troubleshooting

16.1 Alarm Code Table

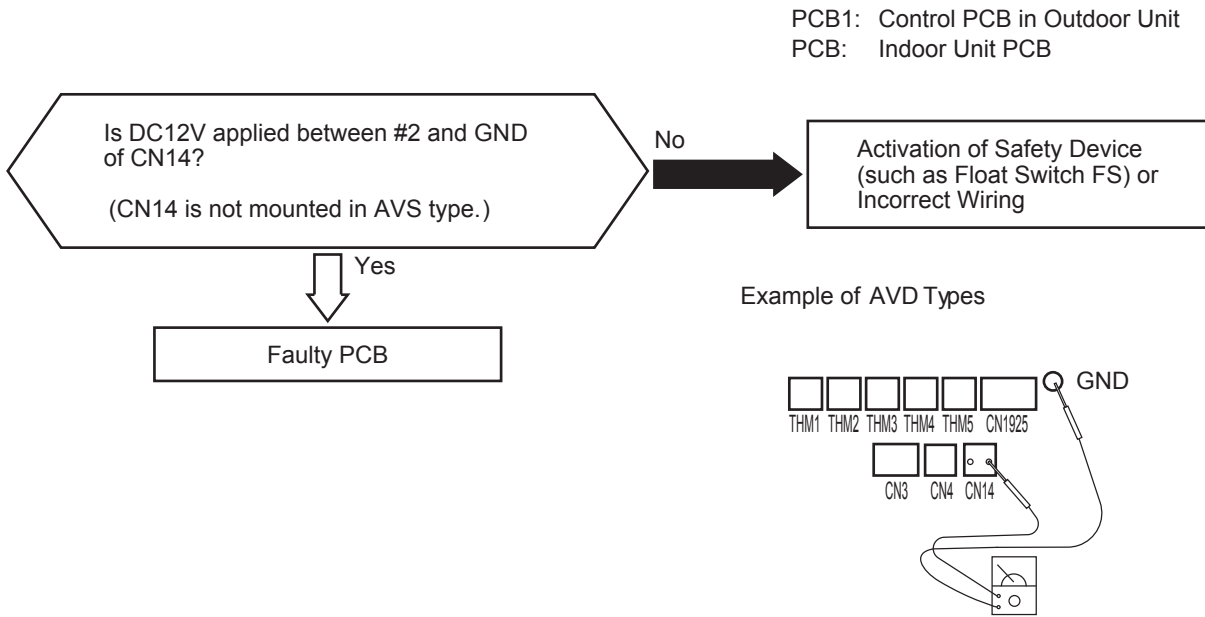
Code	Category	Content of Abnormality	Leading Cause
01	Indoor Unit	Activation of Protection Device (Float Switch)	Activation of Float Switch (High Water Level in Drain Pan, Abnormality of Drain Pipe, Float Switch or Drain Pan)
02	Outdoor Unit	Activation of Protection Device (High Pressure Cut)	Activation of PSH (Pipe Clogging, Excessive Refrigerant, Inert Gas Mixing)
03	Transmission	Abnormality between Indoor and Outdoor	Incorrect Wiring, Loose Terminals, Disconnect Wire, Blowout of Fuse, Outdoor Unit Power OFF
04		Abnormality between Inverter PCB and Outdoor PCB	Inverter PCB - Outdoor PCB Transmission Failure (Loose Connector, Wire Breaking, Blowout of Fuse)
04.		Abnormality between Fan Controller and Outdoor PCB	Fan Controller - Outdoor PCB Transmission Failure (Loose Connector, Wire Breaking, Blowout of Fuse)
05	Supply Phase	Abnormality Power Source Phases	Incorrect Power Source, Connection to Reversed Phase, Open-Phase
06	Voltage	Abnormal Inverter Voltage	Outdoor Voltage Drop, Insufficient Power Capacit
06.		Abnormal Fan Controller Voltage	Outdoor Voltage Drop, Insufficient Power Capacit
07	Cycle	Decrease in Discharge Gas Superheat	Excessive Refrigerant Charge, Failure of Thermistor, Incorrect Wiring, Incorrect Piping Connection, Expansion Valve Locking at Opened Position (Disconnect Connector)
08		Increase in Discharge Gas Temperature	Insufficient Refrigerant Charge, Pipe Clogging Failure of Thermistor, Incorrect Wiring, Incorrect Piping Connection, Expansion Valve Locking at Closed Position (Disconnect Connector)
0A	Transmission	Abnormality between Outdoor and Outdoor	Incorrect Wiring, Breaking Wire, Loose Terminals
0b	Outdoor Unit	Incorrect Outdoor Unit Address Setting	Duplication of Address Setting for Outdoor Units (Sub Units) in Same Refrigerant Cycle System
0C		Incorrect Outdoor Unit Main Unit Setting	Two (or more) Outdoor Units Set as "Main Unit" Exist in Same Refrigerant Cycle System
11	Sensor on Indoor Unit	Inlet Air Thermistor	Incorrect Wiring, Disconnecting Wiring Breaking Wire, Short Circuit
12		Outlet Air Thermistor	
13		Freeze Protection Thermistor	
14		Gas Piping Thermistor	
19	Fan Motor	Activation of Protection Device for Indoor Fan	Fan Motor Overheat, Locking
21	Sensor on Outdoor Unit	High Pressure Sensor	Incorrect Wiring, Disconnecting Wiring Breaking Wire, Short Circuit
22		Outdoor Air Thermistor	
23		Discharge Gas Thermistor on Top of Compressor	
24		—	
25		—	
29		Low Pressure Sensor	

Code	Category	Content of Abnormality	Leading Cause
31	System	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit	Incorrect Capacity Code Setting of Combination Excessive or Insufficient Indoor Unit Total Capacity Code
35		Incorrect Setting of Indoor Unit No.	Duplication of Indoor Unit No. in same Ref. Gr.
36		Incorrect of Indoor Unit Combination	Indoor Unit is Designed for R22
38		Abnormality of Picking up Circuit for Protection in Outdoor Unit	Failure of Protection Detecting Device (Incorrect Wiring of Outdoor PCB)
39	Compressor	Abnormality Running Current at Constant Speed Compressor	Overcurrent, Blowout Fuse, Current Sensor Failure, Instantaneous Power Failure, Voltage Drop, Abnormal Power Supply
3A	Outdoor Unit	Abnormality of Outdoor Unit Capacity	Outdoor Unit Capacity > 1350KBTu/h
3b		Incorrect Setting of Outdoor Unit Models Combination or Voltage	Incorrect Setting of Main and Sub Unit(s) Combination or Voltage
3d		Abnormality Transmission between Main Unit and Sub Unit(s)	Incorrect Wiring, Disconnect Wire, Breaking Wire, PCB Failure
43	Protection Device	Activation of Low Pressure Decrease Protection Device	Defective Compression (Failure of Compressor of Inverter, Loose Power Supply Connection)
44		Activation of Low Pressure Increase Protection Device	Overload at Cooling, High Temperature at Heating, Expansion Valve Locking (Loose Connector)
45		Activation of High Pressure Increase Protection Device	Overload Operation (Clogging, Short-Pass), Pipe Clogging, Excessive Refrigerant, Inert Gas Mixing
46		Activation of High Pressure Decrease Protection Device	
47		Activation of Low Pressure Decrease Protection Device (Vacuum Operation Protection)	Insufficient Refrigerant, Refrigerant Piping, Clogging, Expansion Valve Locking at Open Position (Loose Connector)
48		Activation of Inverter Overcurrent Protection Device	Overload Operation, Compressor Failure
51	Sensor	Abnormal Inverter Current Sensor	Current Sensor Failure
53	Inverter	Inverter Error Signal Detection	Driver IC Error Signal Detection (Protection for Overcurrent, Low Voltage, Short Circuit)
54		Abnormality of Inverter Fin Temperature	Abnormal Inverter Fin Thermistor, Heat Exchanger Clogging, Fan Motor Failure
55		Inverter Failure	Inverter PCB Failure
57	Fan Controller	Activation of Fan Controller Protection	Driver IC Error Signal Detection (Protection for Overcurrent, Low Voltage, Short Circuit), Instantaneous Overcurrent
5A		Abnormality of Fan Controller Fin Temperature	Fin Thermistor Failure, Heat Exchanger Clogging, Fan Motor Failure
5b		Activation of Overcurrent Protection	Fan Motor Failure
5c		Abnormality of Fan Controller Sensor	Failure of Current Sensor (Instantaneous Overcurrent, Increase of Fin Temperature, Low Voltage, Earth Fault, Step-Out)
EE	Compressor	Compressor Protection Alarm (It is can not be reset from remote Controller)	This alarm code appears when the following alarms* occurs three times within 6 hours. *02, 07, 08, 39, 43 to 45, 47
b1	Outdoor Unit No. Setting	Incorrect Outdoor Unit Address Number or Unit Number Setting	Over 64 Number is Set for Address or Refrigerant Cycle.
b5	Indoor Unit No. Setting	Incorrect Indoor Unit Connection Number Setting	More than 17 Non-Corresponding to Hi-NET II Units are Connected to One System.

16.2 Troubleshooting by Alarm Code Alarm Code

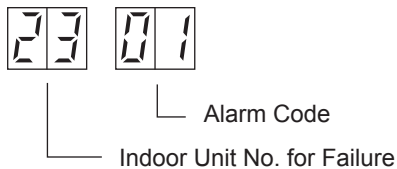
01	Activation of Protection Device in Indoor Unit
----	--

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the contact between #1 and #2 of CN14 is not closed over 120 seconds during the cooling, fan or heating operation.



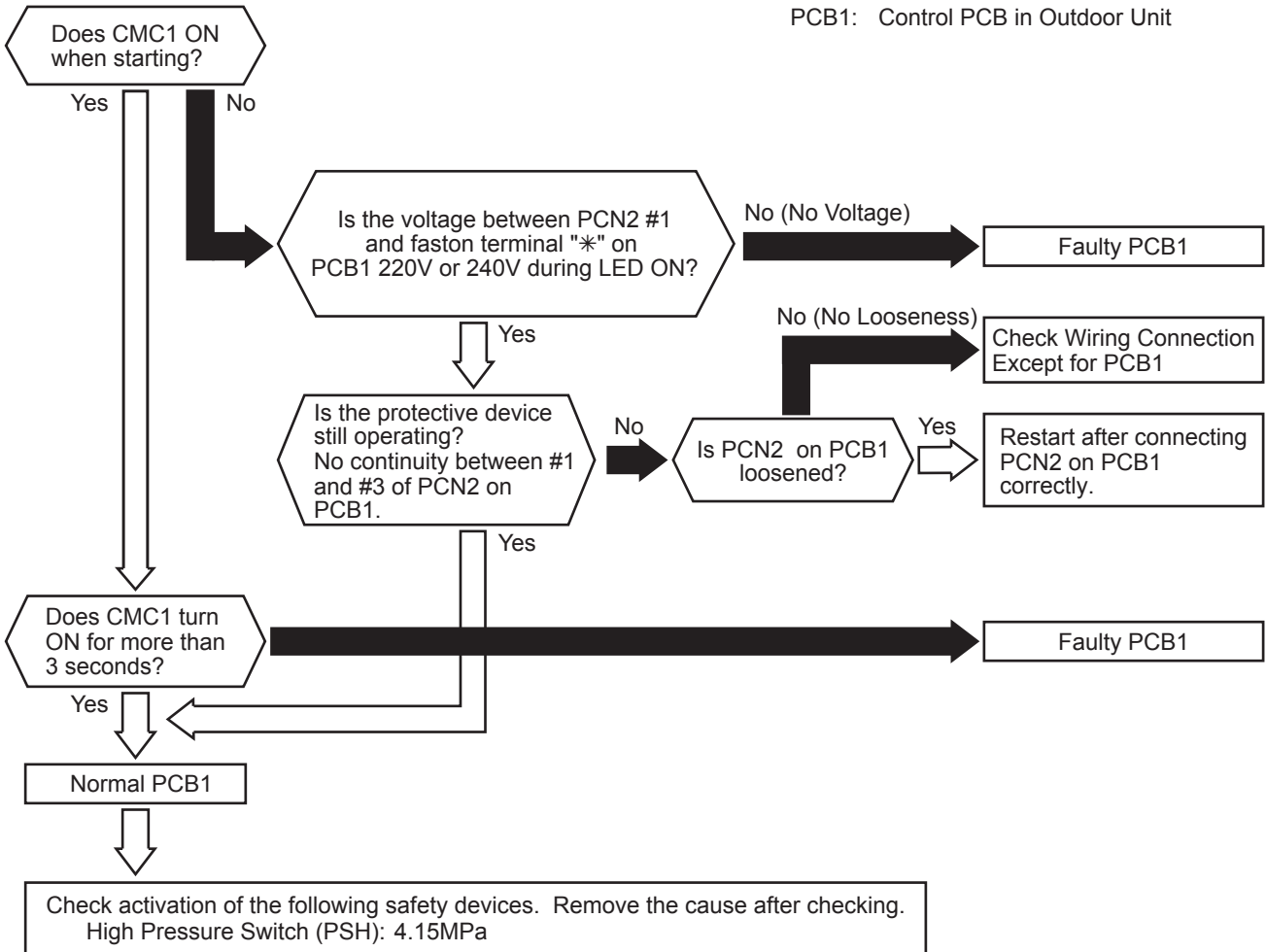
Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)	
Activation of Float Switch	High Drain Level	Clogging of Drainage	Check drain pan.	Remove clogged foreign particles.
	Faulty Float Switch	Fault	Check continuity when drain level is low.	Replace float switch if faulty.
		Faulty Contacting	Measure resistance by tester.	Repair looseness and replace connector.
		Faulty Connection	Check connections.	Repair connection.
Faulty Indoor Unit PCB		Check PCB by self-checking.	Replace it if faulty.	

<Outdoor Unit PCB1 Display Indication>



- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.

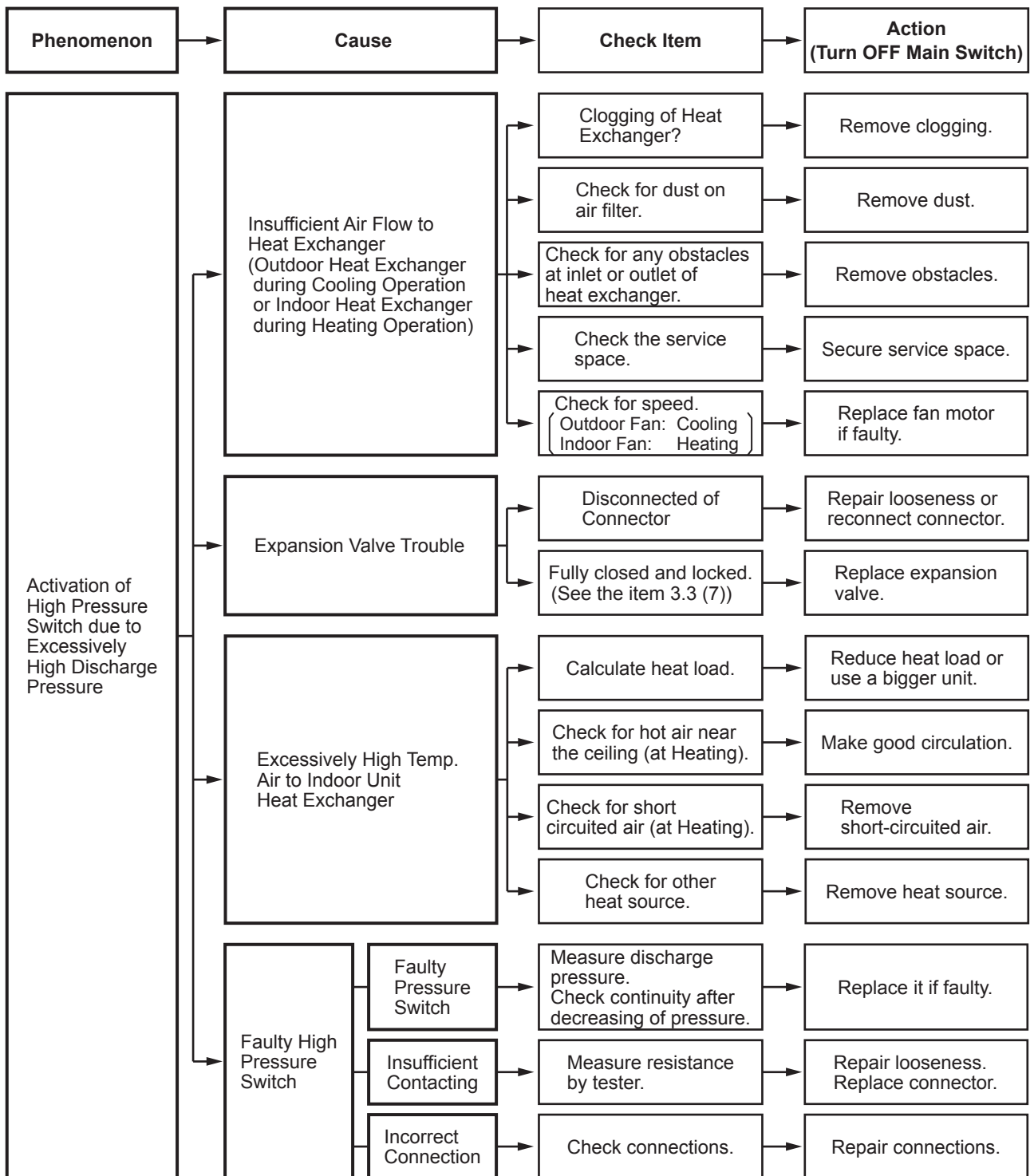
★ This alarm is indicated when one of safety devices is activated during compressor running.

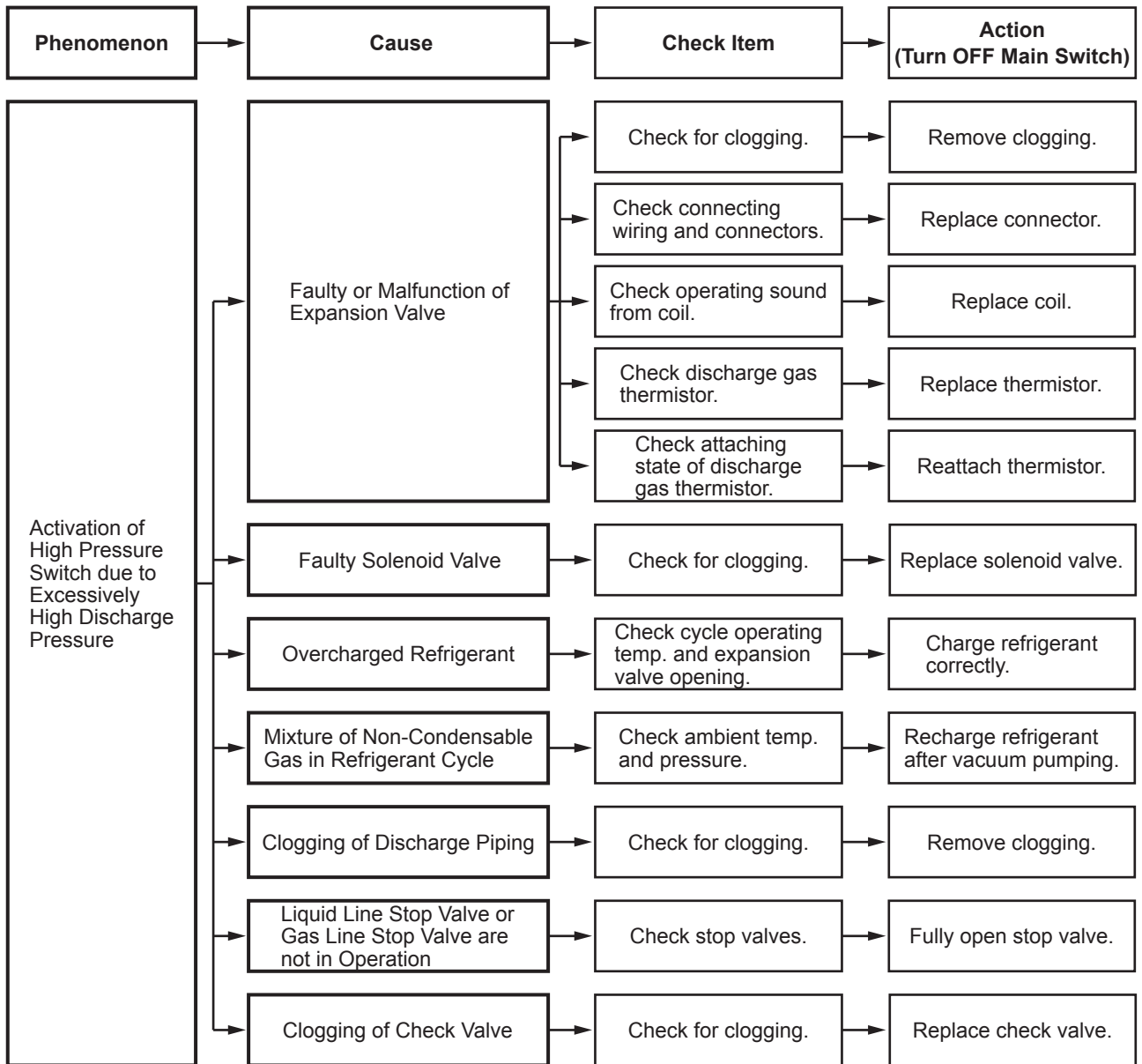


Check Item

Connector for CMC1	Faston Terminal *	Connector for Protection Device
PCN3	380-415V/50Hz N1	PCN2 or PCN16

Model	High Pressure Switch (Connector No.)	
	63H1 (PCN2)	63H2 (PCN16)
76 to 154*	○	-



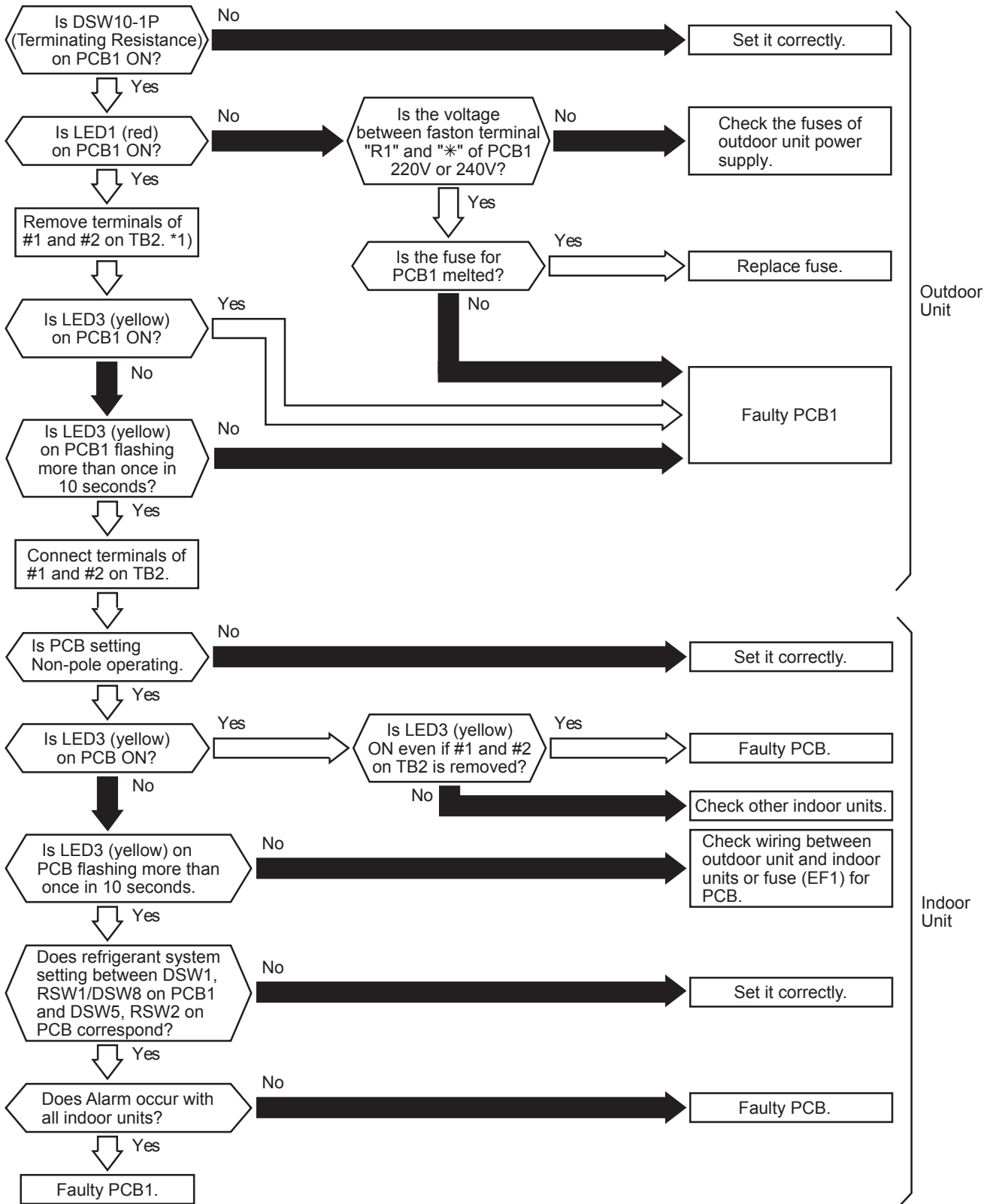


Alarm Code	03	Abnormal Transmitting between Indoor Units and Outdoor Units
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- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, or the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.

- ★ This alarm is indicated when abnormality is maintained for 3 minutes after normal transmitting between indoor units and outdoor unit, and also abnormality is maintained for 30 seconds after the micro-computer is automatically reset.
The alarm is indicated when the abnormal transmitting is maintained for 30 seconds from starting of the outdoor unit.
- ★ Investigate the cause of overcurrent and take necessary action when fuses are melted or the breakers for the outdoor unit are activated.

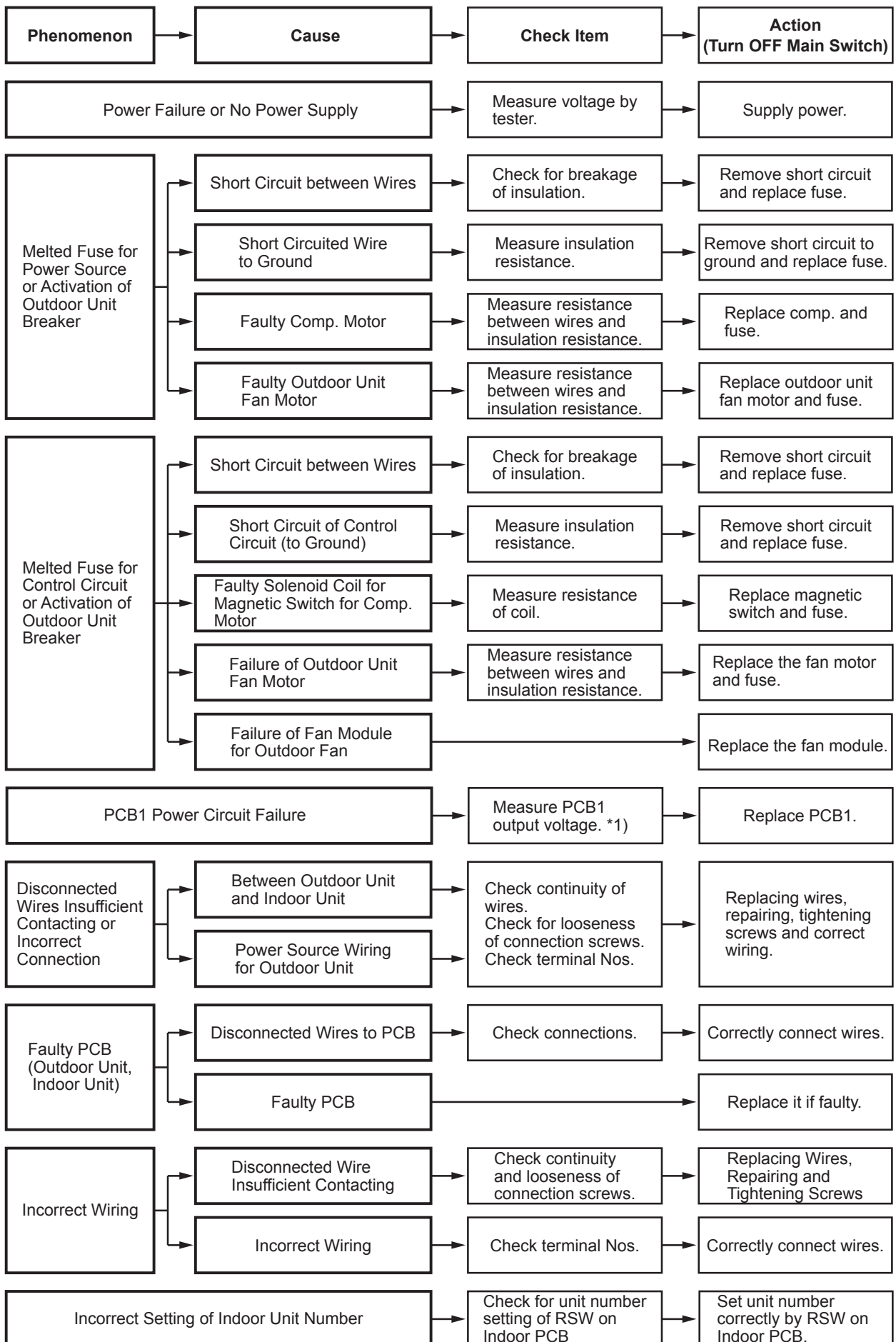
PCB1: Control PCB in Outdoor Unit
 PCB: Indoor Unit PCB



*1): In case that terminating resistance (DSW10-1P) is OFF when Hi-NET Connection is performed.
 Set the terminating resistance to ON when #1 and #2 on TB2 is removed.
 Set the terminating resistance to OFF when #1 and #2 on TB2 is reconnected.

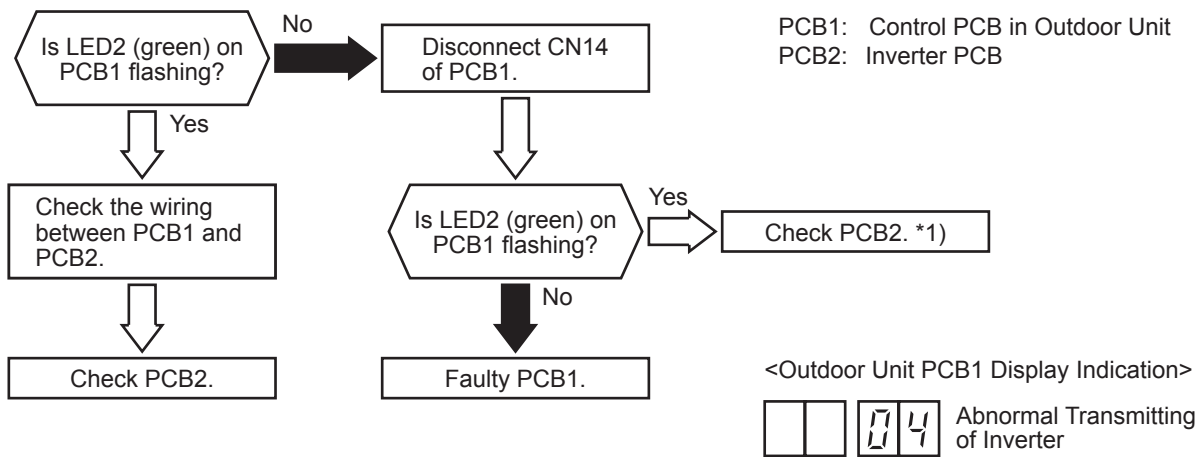
*Check Item

Power Supply	Faston Terminal
380-415V/50Hz	N1



*1): 12VDC between VCC12 and GND2, 5VDC between VCC05 and GND1, 12VDC between VCC12 and GND1, 15VDC between VCC15 and GND1, 24VDC between VCC24 and GND1, 12VDC between VCC12T and GND1

- “RUN” light flashe and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when abnormality is maintained for 30 seconds after normal transmitting between the outdoor unit PCB1 and PCB2, and also abnormality is maintained for 30 seconds after the micro-computer is automatically reset. The alarm is indicated when the abnormal transmitting is maintained for 30 seconds from starting of the outdoor unit.

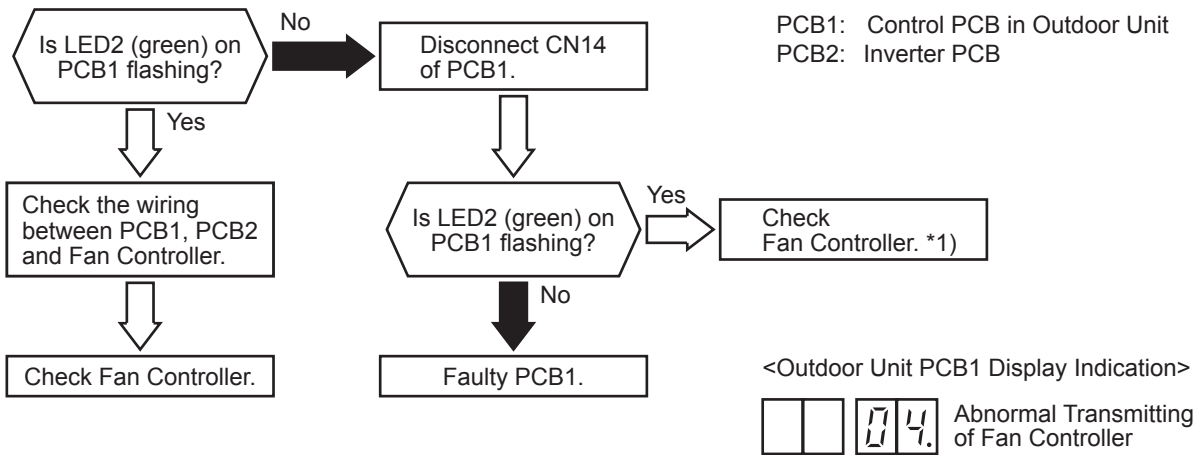


Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Disconnected Wires, Insufficient Contacting or Incorrect Connection	Between PCB1 and PCB2	Check continuity of wires. Check for looseness of connection screws. Check connection No.	Replacing wires, repairing, tightening screws and incorrect wiring.
	Power Source Wiring for Outdoor Unit		
Faulty PCB (PCB1 and PCB2)	Disconnected Wires to PCB	Check connections.	Repair wiring connections.
	Faulty PCB		Replace PCB if faulty.
Faulty Electrical Components (Power Fuse, Resistance)	Melted Power Fuse	Check conductivity of power fuse, power transistor, diode module.	Replace power fuse, power transistor, and diode module.
	Disconnected Incoming Current Limit Resistance	Check resistance of incoming current limit resistance.	Replace incoming current limit resistance.
Incorrect Wiring	Disconnected Wires Insufficient Contacting	Check continuity. Check for looseness of connection screws.	Replacing Wires, Repairing and Tightening Screws
	Incorrect Wiring	Check connection Nos.	Correctly Connect Wires

Alarm Code **04.**

Abnormal Transmitting between Fan Controller and Outdoor PCB

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when abnormality is maintained for 30 seconds after normal transmitting between the outdoor unit PCB1 and fan controller, and also abnormality is maintained for 30 seconds after the micro-computer is automatically reset. The alarm is indicated when the abnormal transmitting is maintained for 30 seconds from starting of the outdoor unit.

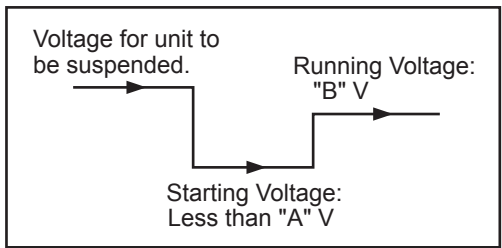
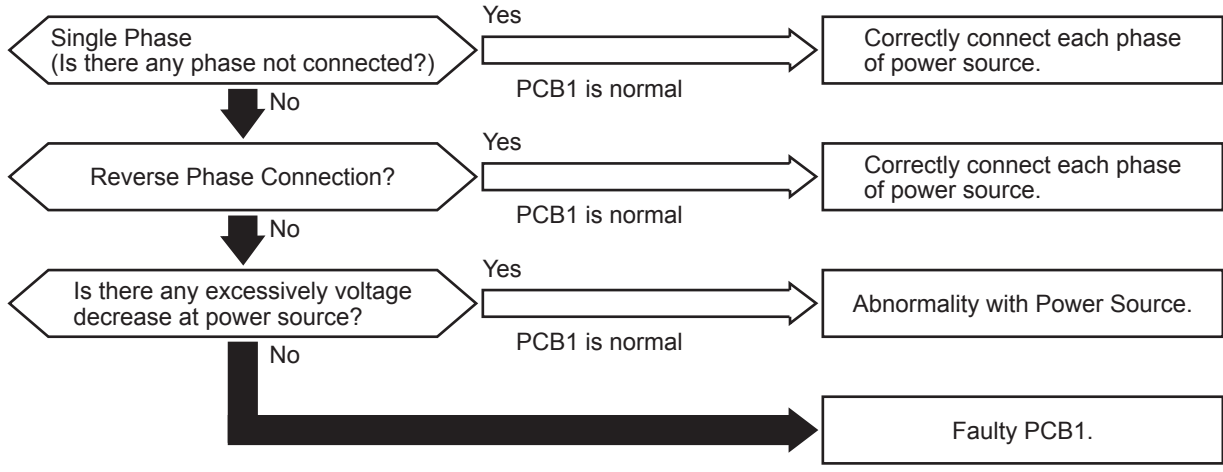


Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Disconnected Wires, Insufficient Contacting or Incorrect Connection	Between PCB1, PCB2 and Fan Controller	Check continuity of wires. Check for looseness of connection screws. Check connection No.	Replacing wires, repairing, tightening screws and incorrect wiring.
	Power Source Wiring for Outdoor Unit		
Faulty PCB (PCB1 and PCB2) Fan Controller	Disconnected Wires to PCB	Check connections.	Repair wiring connections.
	Faulty PCB		Replace PCB if faulty.
	Melted Fuse (Fan Controller)	Check conductivity of fuse.	Replace fan controller. *1)
Faulty Electrical Components (Power Fuse, Resistance)	Melted Power Fuse	Check conductivity of power fuse, power transistor, diode module.	Replace power fuse, power transistor, and diode module.
	Disconnected Incoming Current Limit Resistance	Check resistance of incoming current limit resistance.	Replace incoming current limit resistance.
Incorrect Wiring	Disconnected Wires Insufficient Contacting	Check continuity. Check for looseness of connection screws.	Replacing Wires, Repairing and Tightening Screws
	Incorrect Wiring	Check connection Nos.	Correctly Connect Wires

*1): The fan controller may be damaged if the fuse of fan controller is melted. In that case, replace the fan controller.

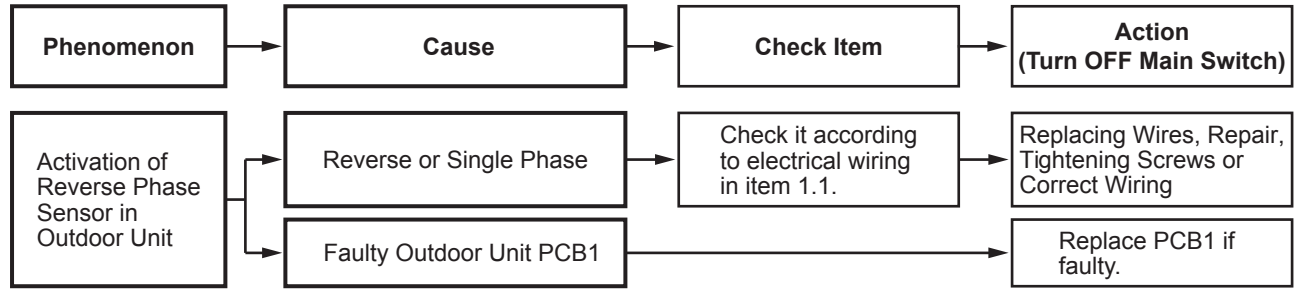
- "RUN" light flashes and "ALARM" is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the main power source phase is reversely connected or one phase is not connected.

PCB1: Control PCB in Outdoor Unit



Check Item

Power Supply	"A"	"B"
380-415V/50Hz	323	342 to 456



Alarm Code

06

Abnormal Inverter Voltage

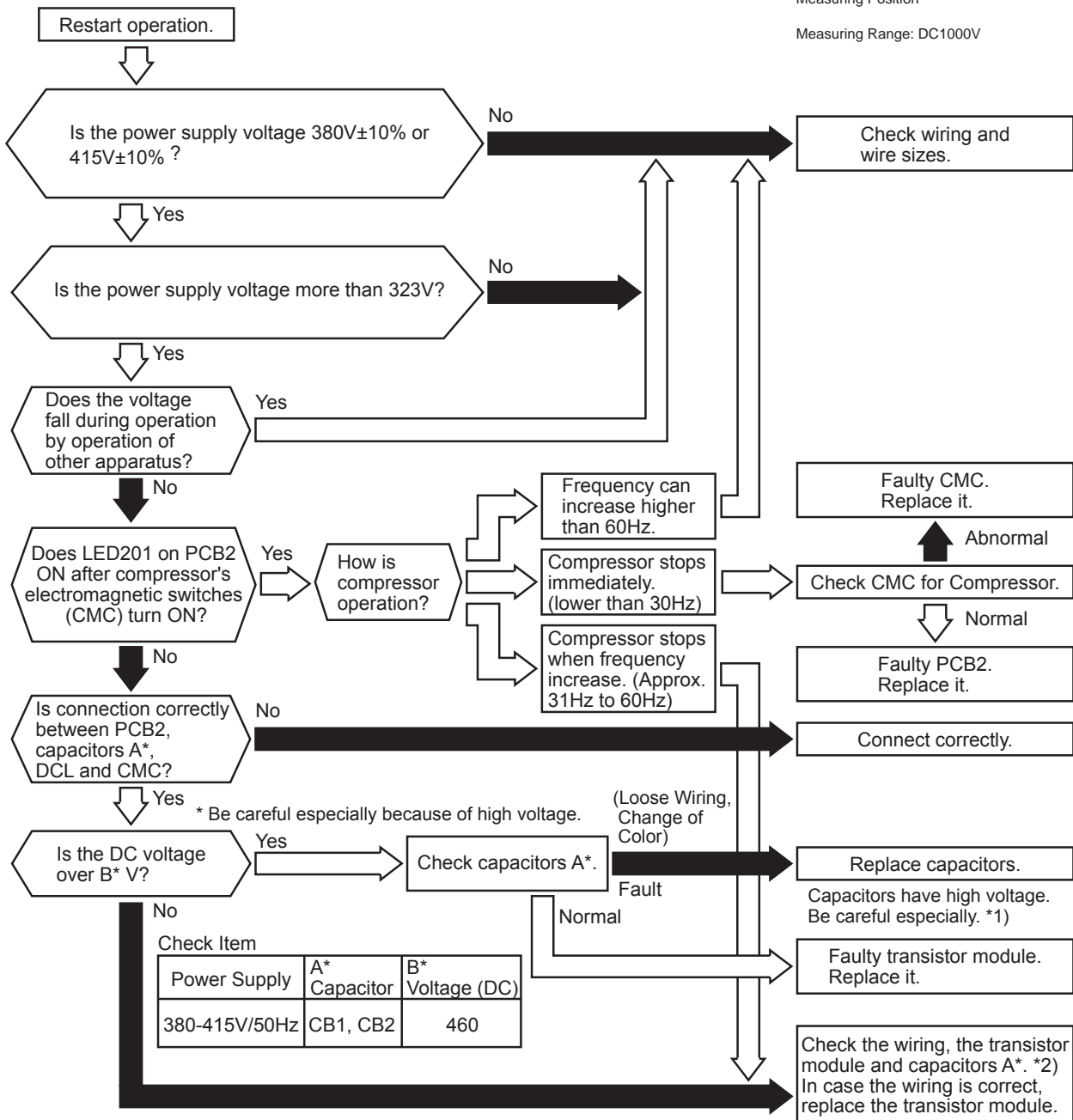
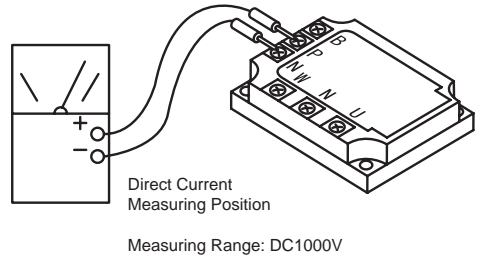
- "RUN" light flashes and "ALARM" is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the alarm code is indicated on the display of the outdoor unit PCB1.

- ★ This alarm is indicated when voltage between terminal "P" and "N" of transistor module (IPM) is insufficient and its occurrence is three times in 30 minutes. In the case that the occurrence is smaller than 2 times, retry is performed.

PCB1: Control PCB in Outdoor Unit
PCB2: Inverter PCB

<Outdoor Unit PCB1 Display Indication>

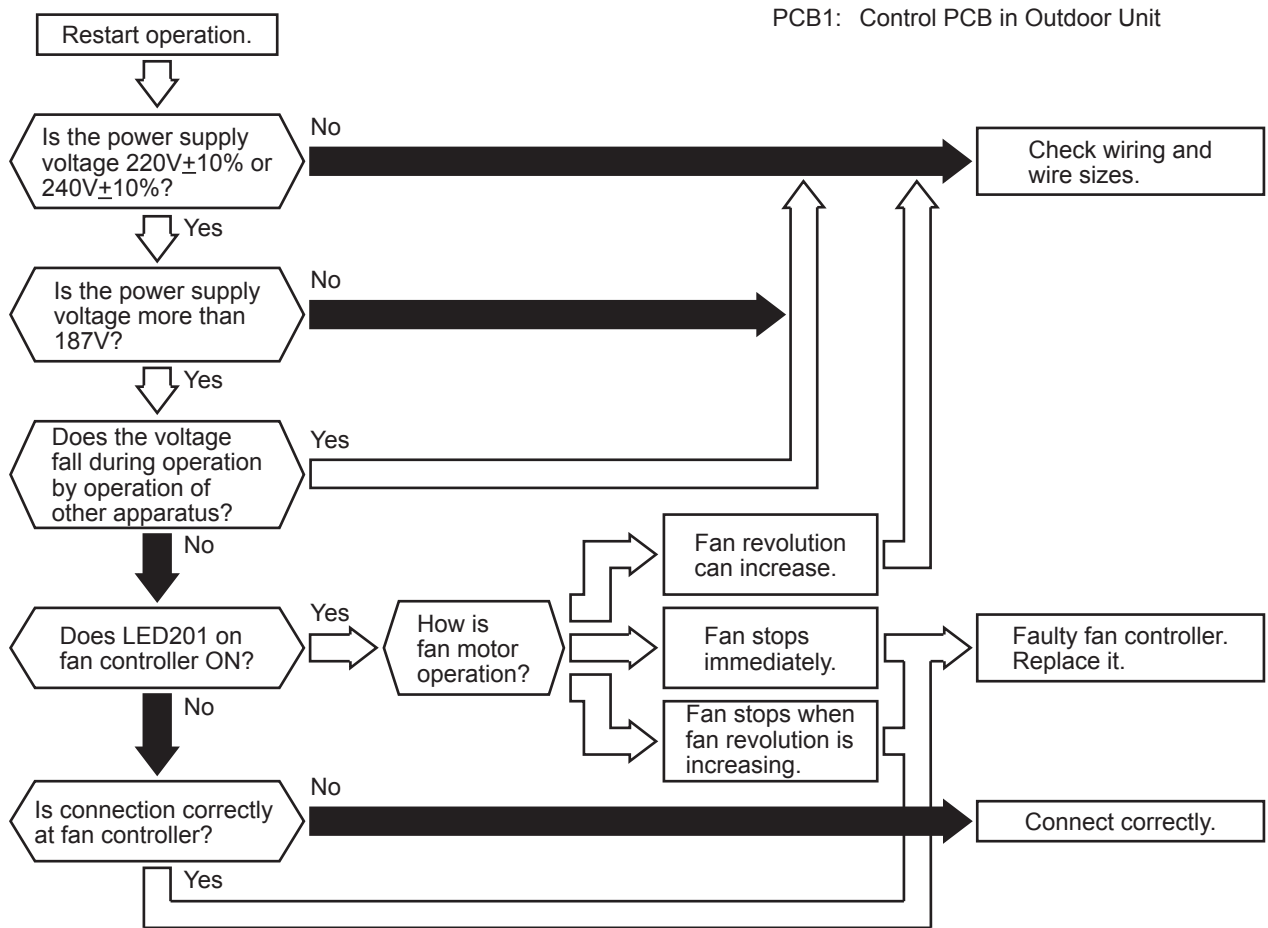
 Abnormal of Inverter



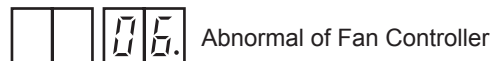
*1): If capacitor has high voltage, perform the high voltage discharge work according to the item 3.3.

*2): Checking procedures of transistor module is indicated in the item 3.3.

- “RUN” light flashe and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the alarm code is indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when voltage between terminal “R” and “S” of Fan Controller is insufficien and its occurrence is three times in 30 minutes. In the case that the occurrence is smaller than 2 times, retry is performed.



<Outdoor Unit PCB1 Display Indication>



NOTES:

- If fan controller has high voltage, perform the high voltage discharge work according to the item 3.3.
- Check the wiring connection according to the checking procedure of fan controller indicated in the item 3.3.

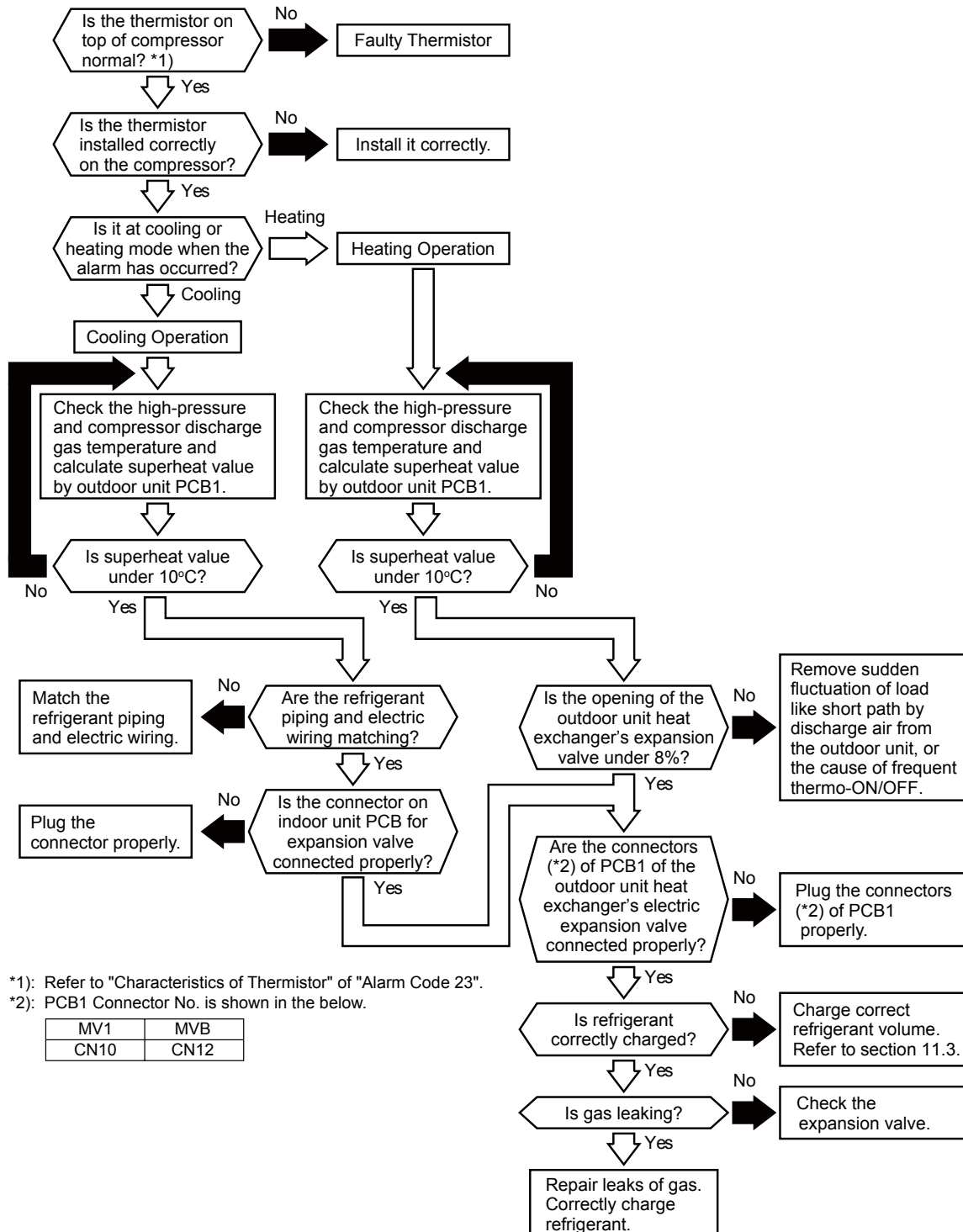
Alarm Code

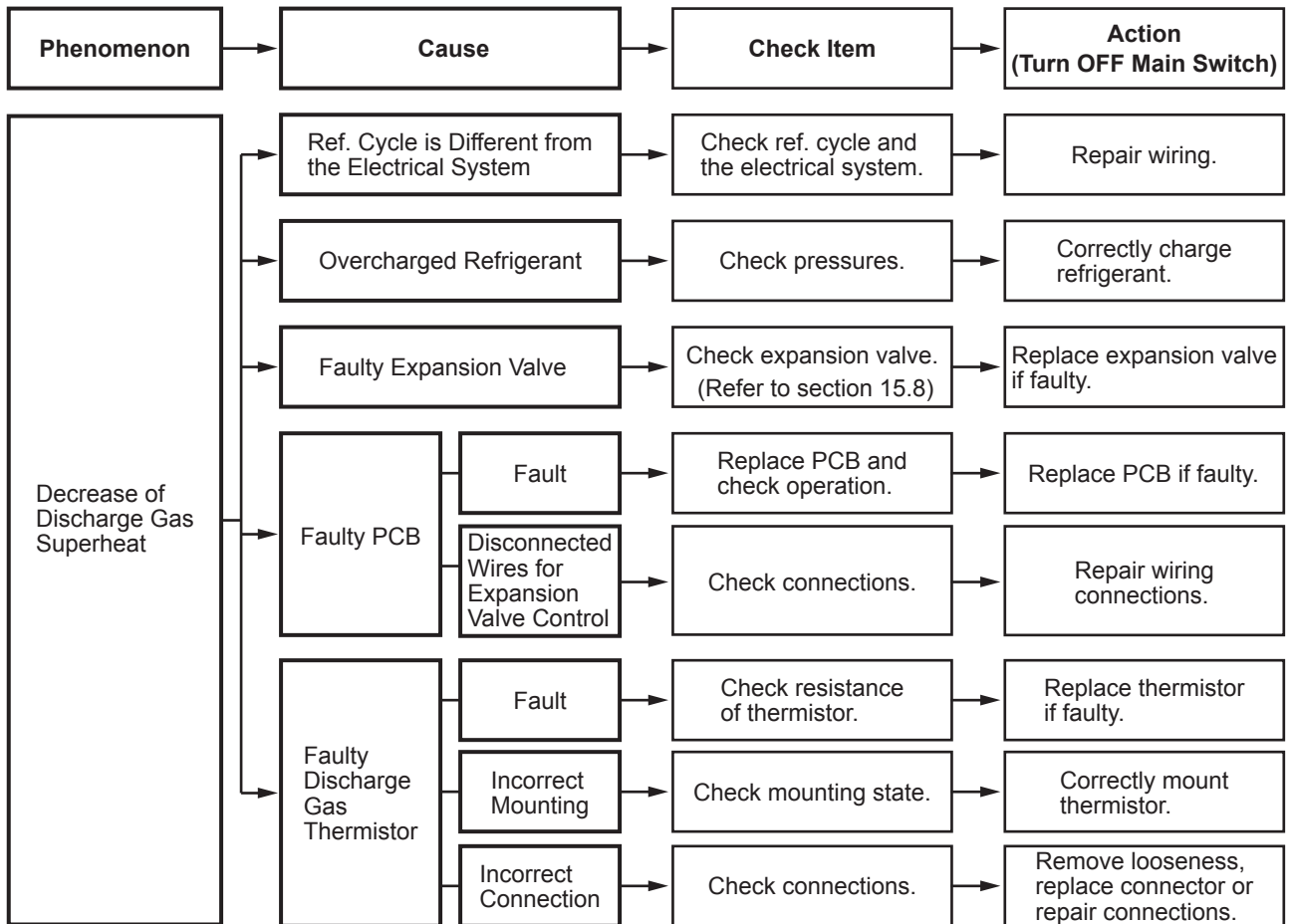
07

Decrease in Discharge Gas Superheat

- "RUN" light flashes and "ALARM" is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ In the case that the discharge gas superheat less than 10 deg. at the top of the compressor is maintained for 30 minutes, retry operation is performed. However, when the alarm occurs twice within two hours, this alarm code is indicated.

PCB1: Control PCB in Outdoor Unit



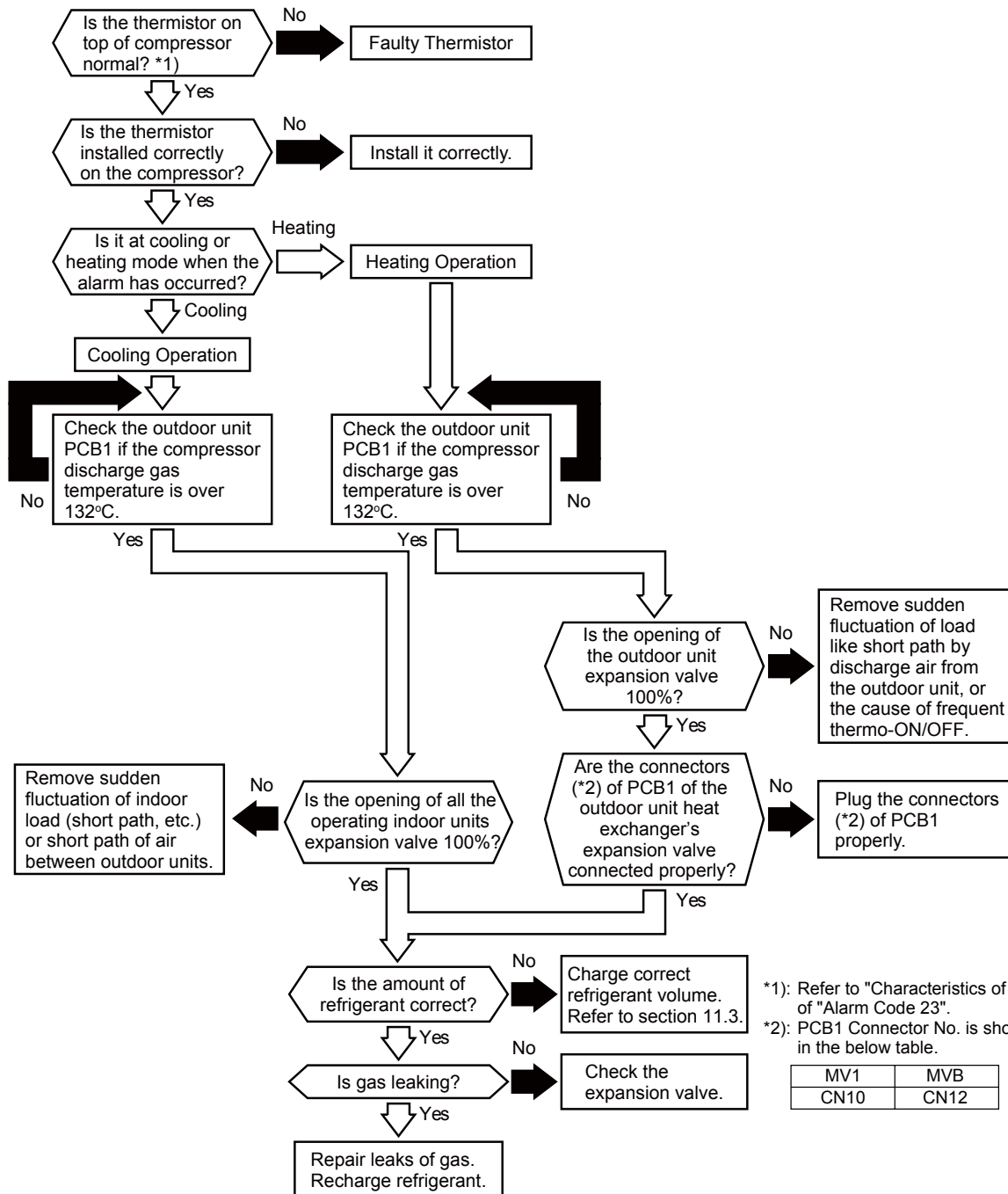


Alarm Code **08**

Increase in Discharge Gas Temperature at the Top of Compressor

- "RUN" light flashes and "ALARM" is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the following conditions occurs three times within one hour;
 (1) The temperature of the thermistor on the top of the compressor is maintained higher than 132°C for 10 minutes, or (2) The temperature of the thermistor on the top of the compressor is maintained higher than 140°C for 5 seconds.

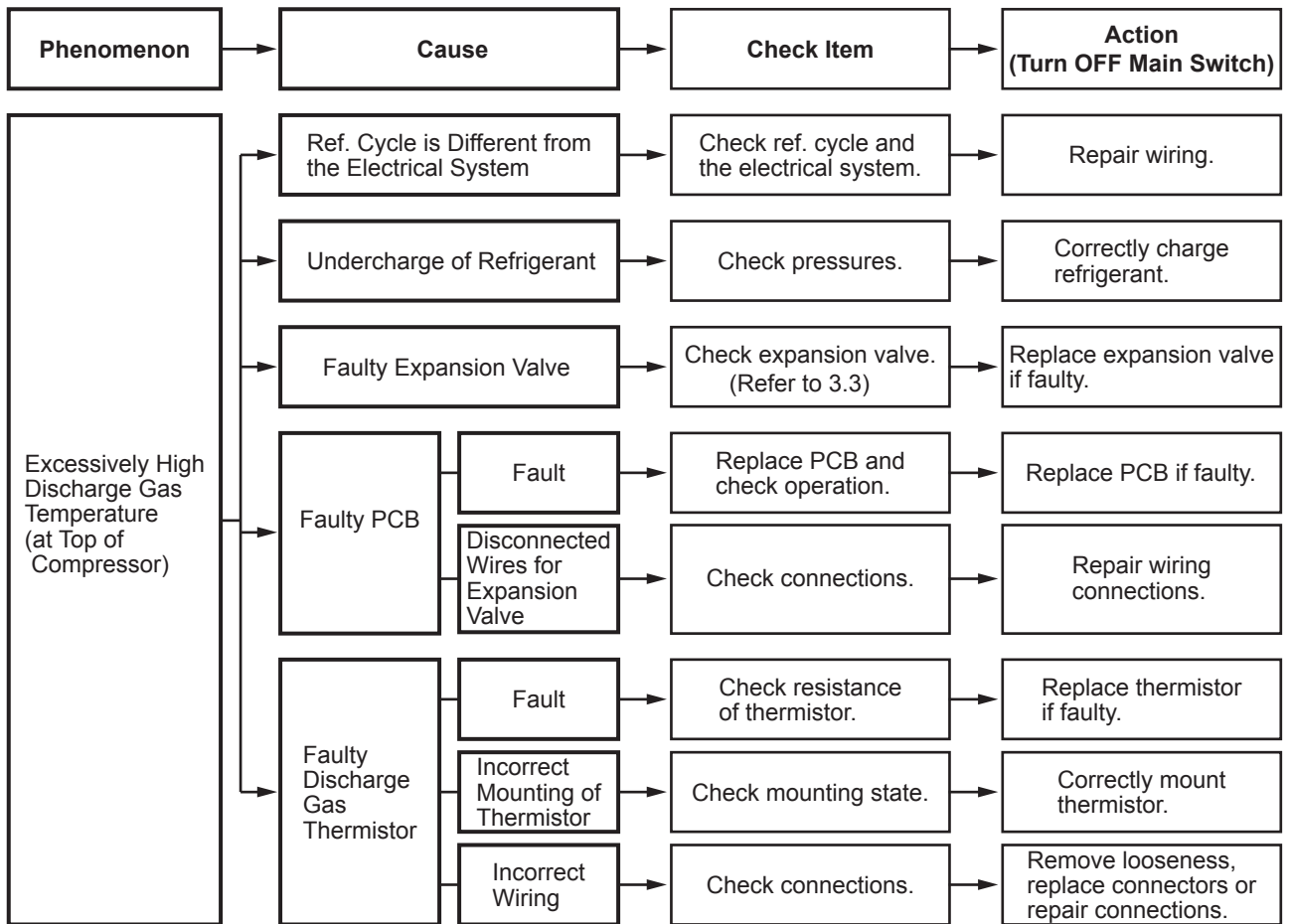
PCB1: Control PCB in Outdoor Unit



*1): Refer to "Characteristics of Thermistor" of "Alarm Code 23".

*2): PCB1 Connector No. is shown in the below table.

MV1	MVB
CN10	CN12



Alarm Code

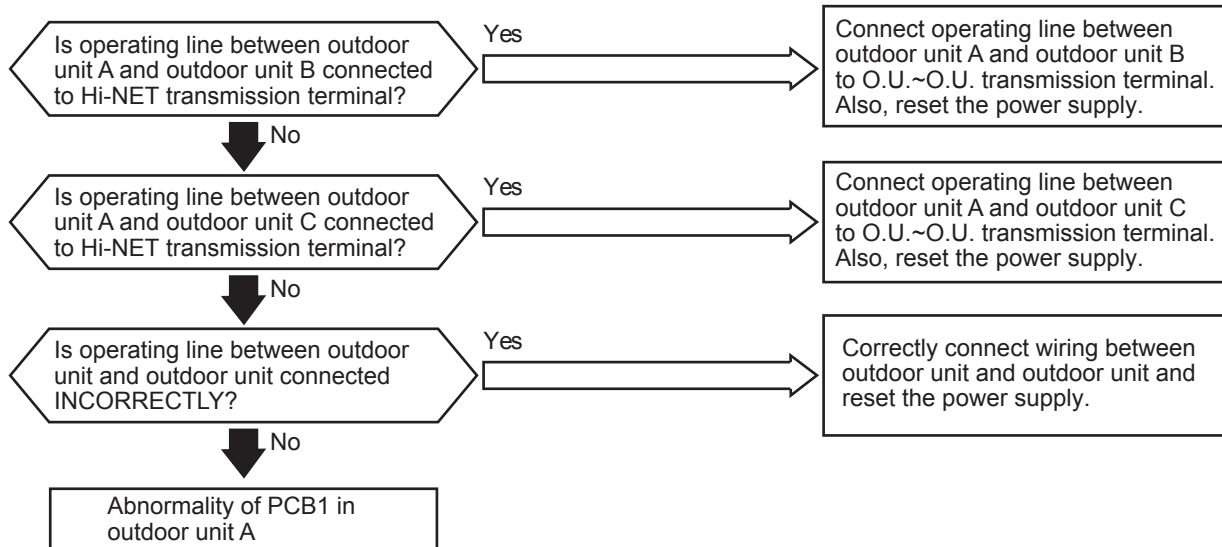
09

Abnormality Transmitting between Outdoor Units

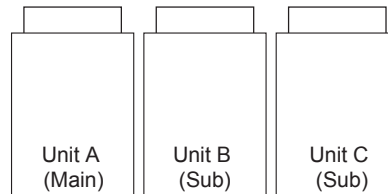
- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.

PCB1: Control PCB in Outdoor Unit

O.U.: Outdoor Unit



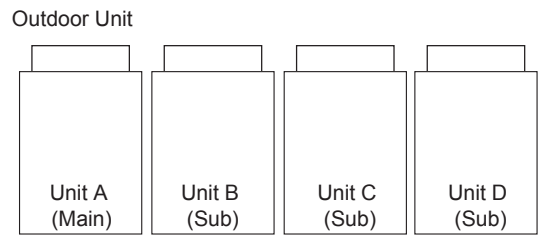
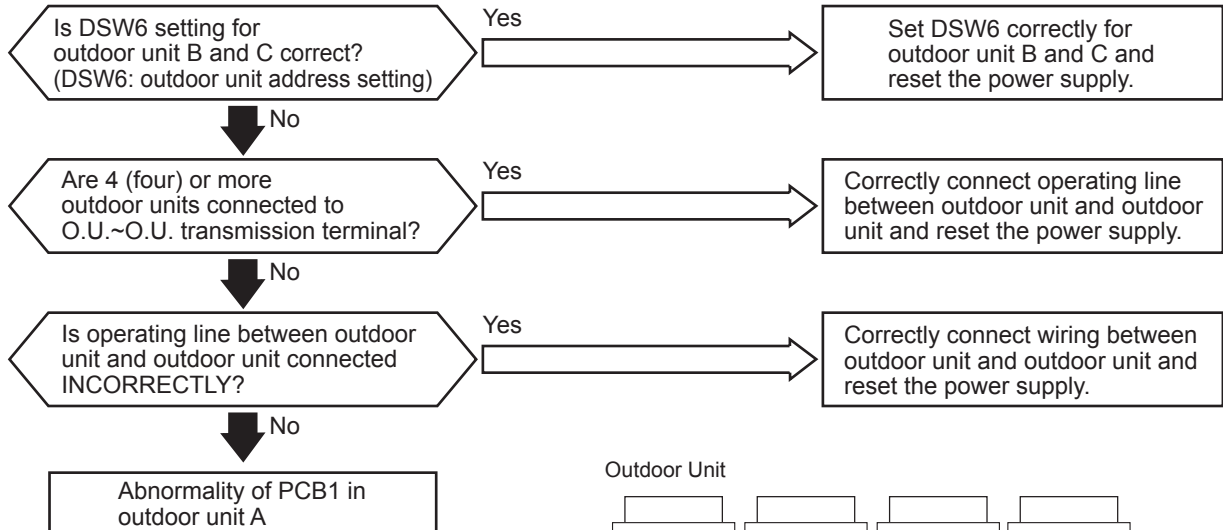
Outdoor Unit



Alarm Code 06	Incorrect Outdoor Unit Address Setting
----------------------	---

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.

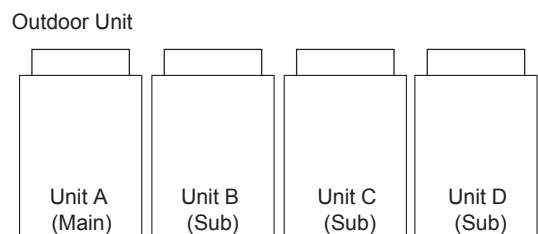
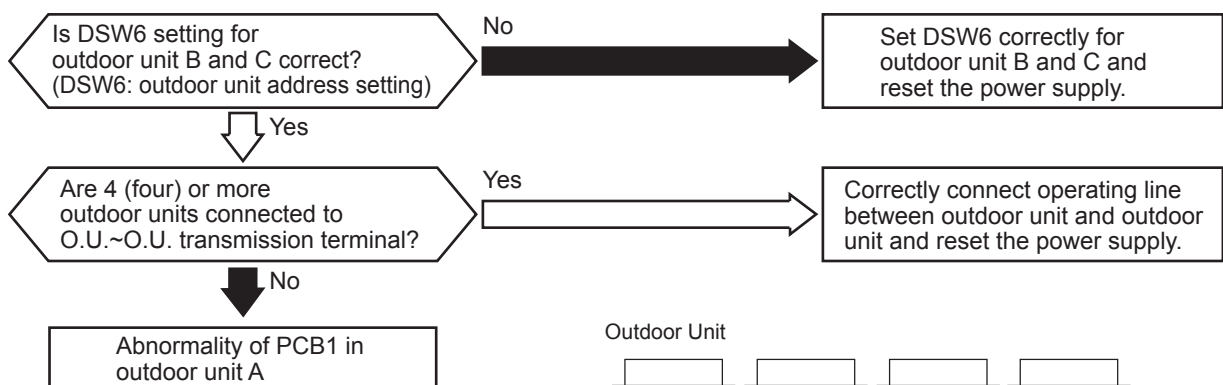
PCB1: Control PCB in Outdoor Unit
O.U.: Outdoor Unit



Alarm Code 07	Incorrect Outdoor Main Unit Setting
----------------------	--

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.

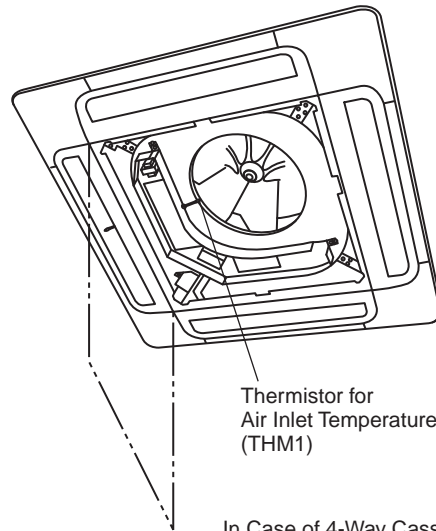
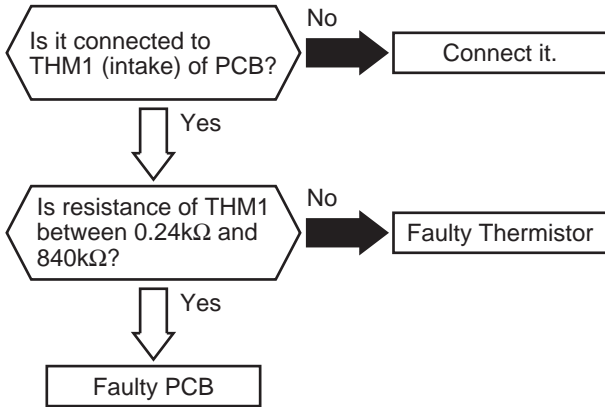
PCB1: Control PCB in Outdoor Unit
O.U.: Outdoor Unit



Alarm Code 11	Abnormality of Thermistor for Indoor Unit Inlet Air Temperature (Air Inlet Thermistor)
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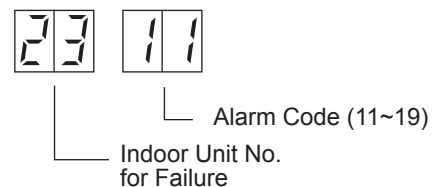
- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the thermistor is short-circuited (less than 0.24 kΩ) or cut (greater than 840 kΩ) during the cooling or heating operation. The system is automatically restarted when the fault is removed.

PCB1: Control PCB in Outdoor Unit
PCB: Indoor Unit PCB



Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty Intake Air Thermistor	Fault	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check connection.	Connect wiring correctly.
Faulty PCB		Replace PCB and check operation.	Replace PCB if faulty.

<Outdoor Unit PCB1 Display Indication>
(Alarm Code 11~19)



NOTE:

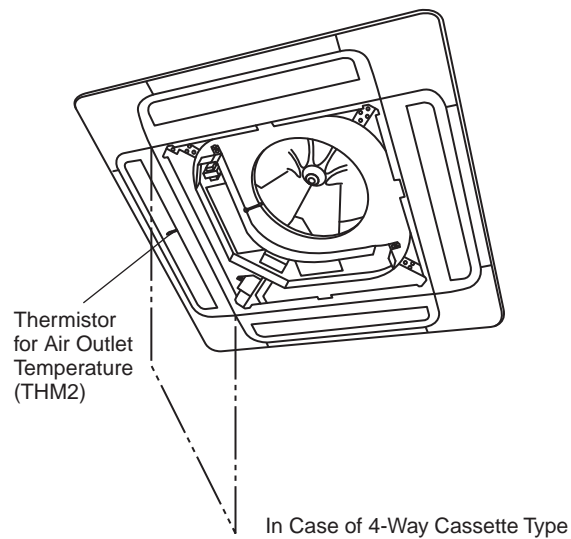
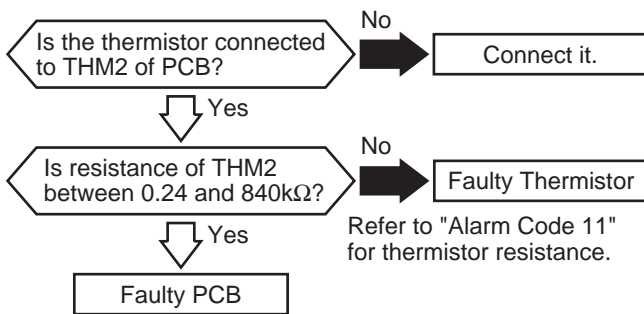
This data is applicable to the following thermistors;

1. Indoor Unit Discharge Air Temperature, 2. Indoor Unit Intake Air Temperature, 3. Indoor Unit Liquid Piping Temperature, 4. Indoor Unit Gas Piping Temperature, 5. Outdoor Air Temperature, 6. Outdoor Unit Liquid Piping Temperature, 7. Outdoor Unit Gas Piping Temperature

Alarm Code	12	Abnormality of Thermistor for Indoor Unit Discharge Air Temperature (Air Outlet Thermistor)
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- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the thermistor is short-circuited (less than 0.24 kΩ) or cut (greater than 840 kΩ) during the cooling or heating operation. The system is automatically restarted when the fault is removed.

PCB1: Control PCB in Outdoor Unit
 PCB: Indoor Unit PCB

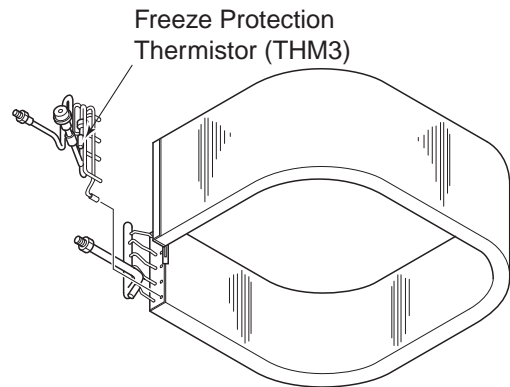
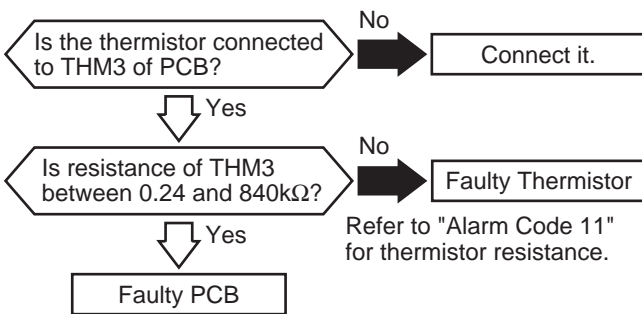


Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty Air Outlet Thermistor	Fault	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to PCB.	Connect wiring correctly.
Faulty PCB		Replace PCB and check operation.	Replace PCB if faulty.

Alarm Code	13	Abnormality of Thermistor for Indoor Unit Heat Exchanger Liquid Refrigerant Pipe Temperature (Freeze Protection Thermistor)
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- "RUN" light flashes and "ALARM" is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the thermistor is short-circuited (less than 0.24 kΩ) or cut (greater than 840 kΩ) during the cooling operation or heating operation. The system is automatically restarted when the fault is removed.

PCB1: Control PCB in Outdoor Unit
 PCB: Indoor Unit PCB



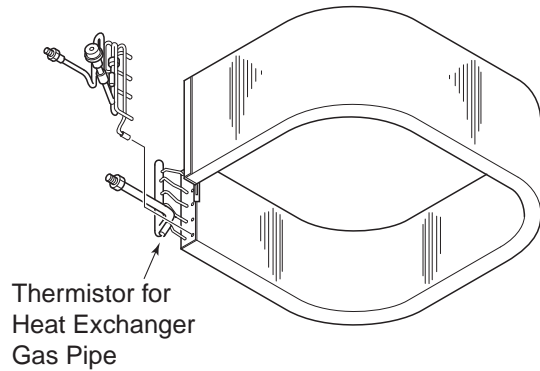
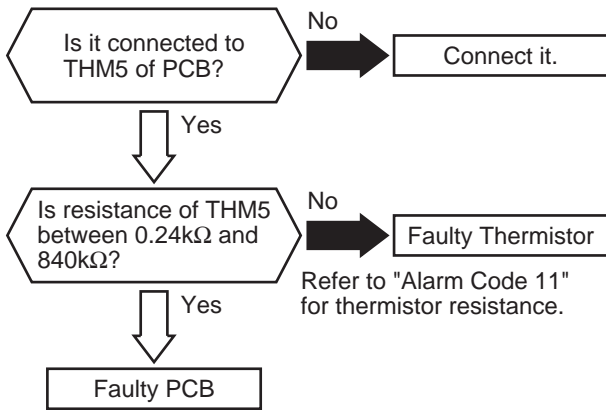
In Case of 4-Way Cassette Type

Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty Freeze Protection Thermistor	Fault	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to PCB.	Connect wiring correctly.
Faulty PCB		Replace PCB and check operation.	Replace PCB if faulty.

Alarm Code 14	Abnormality of Thermistor for Indoor Unit Heat Exchanger Gas Refrigerant Pipe Temperature (Gas Piping Thermistor)
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- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the thermistor is short-circuited (less than 0.24 kΩ) or cut (greater than 840 kΩ) during the cooling or heating operation. The system is automatically restarted when the fault is removed.

PCB1: Control PCB in Outdoor Unit
 PCB: Indoor Unit PCB



In Case of 4-Way Cassette Type

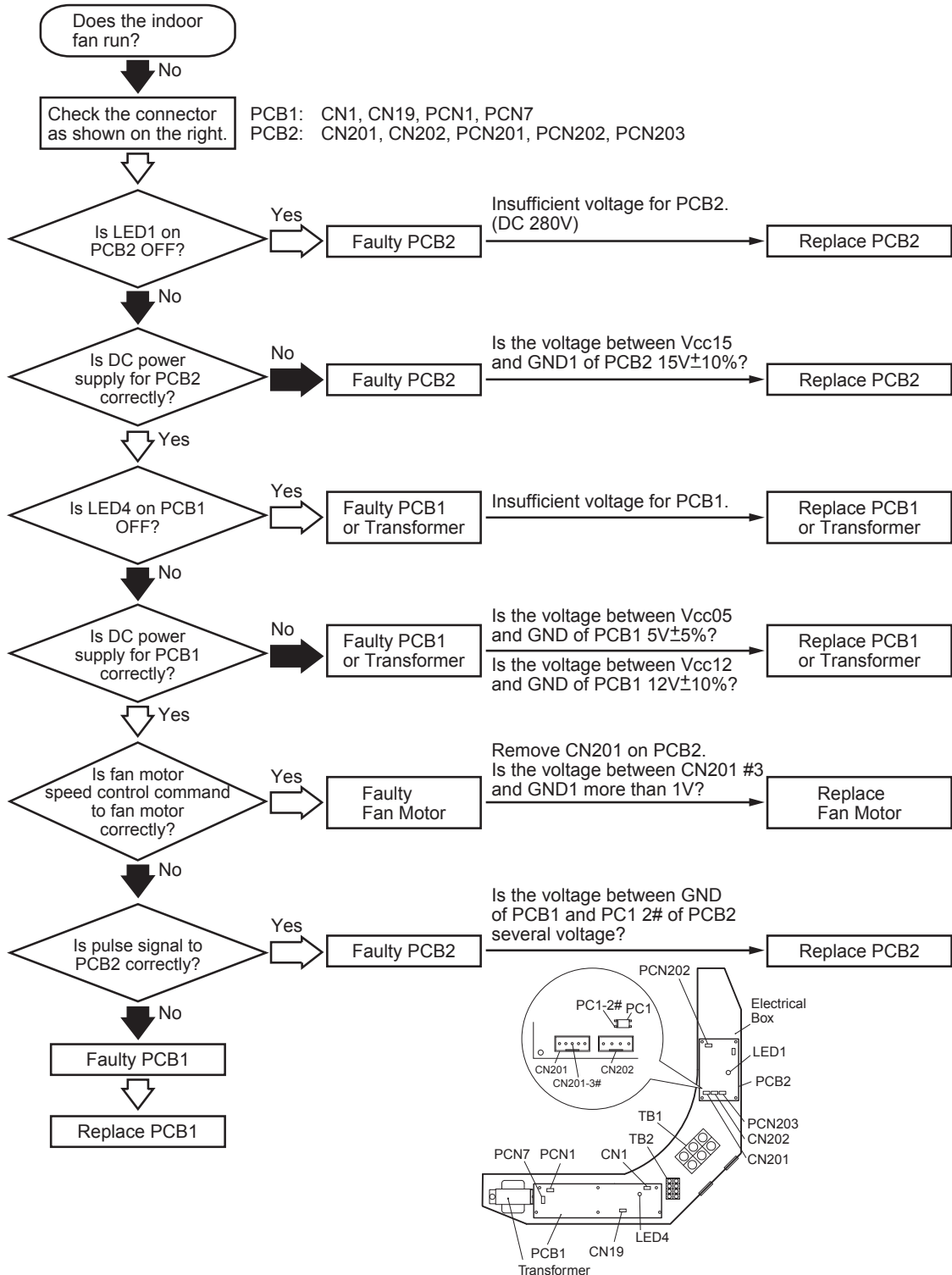
Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty Gas Pipe Thermistor	Fault	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to PCB.	Connect wiring correctly.
Faulty PCB		Replace PCB and check operation.	Replace PCB if faulty.

Alarm Code

19

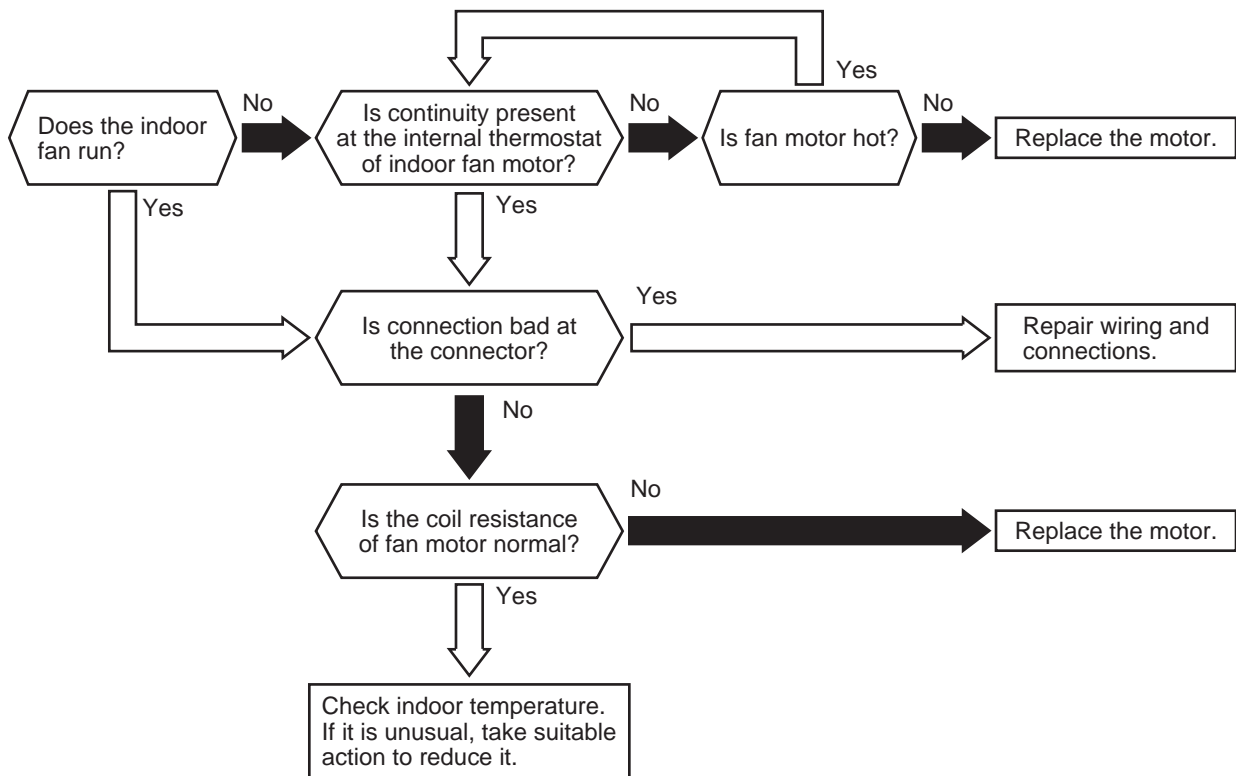
Activation of Protection Device for Indoor Fan Motor (AVC-Model)

- "RUN" light flashes and "ALARM" is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the alarm code is indicated on the display of the outdoor unit PCB.
- ★ This alarm is indicated when the following conditions occurs three times in 30 minutes.
 - * Indoor fan rotates less than 70rpm for 5 seconds during operation.
- ★ Check to ensure that power is OFF before checking the connector connections. If not, PCB and fan motor may be damaged.



- “RUN” light flashe and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and alarm code is indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the temperature of the internal thermostat for the indoor fan motor is higher than 130°C.

PCB1: Control PCB in Outdoor Unit

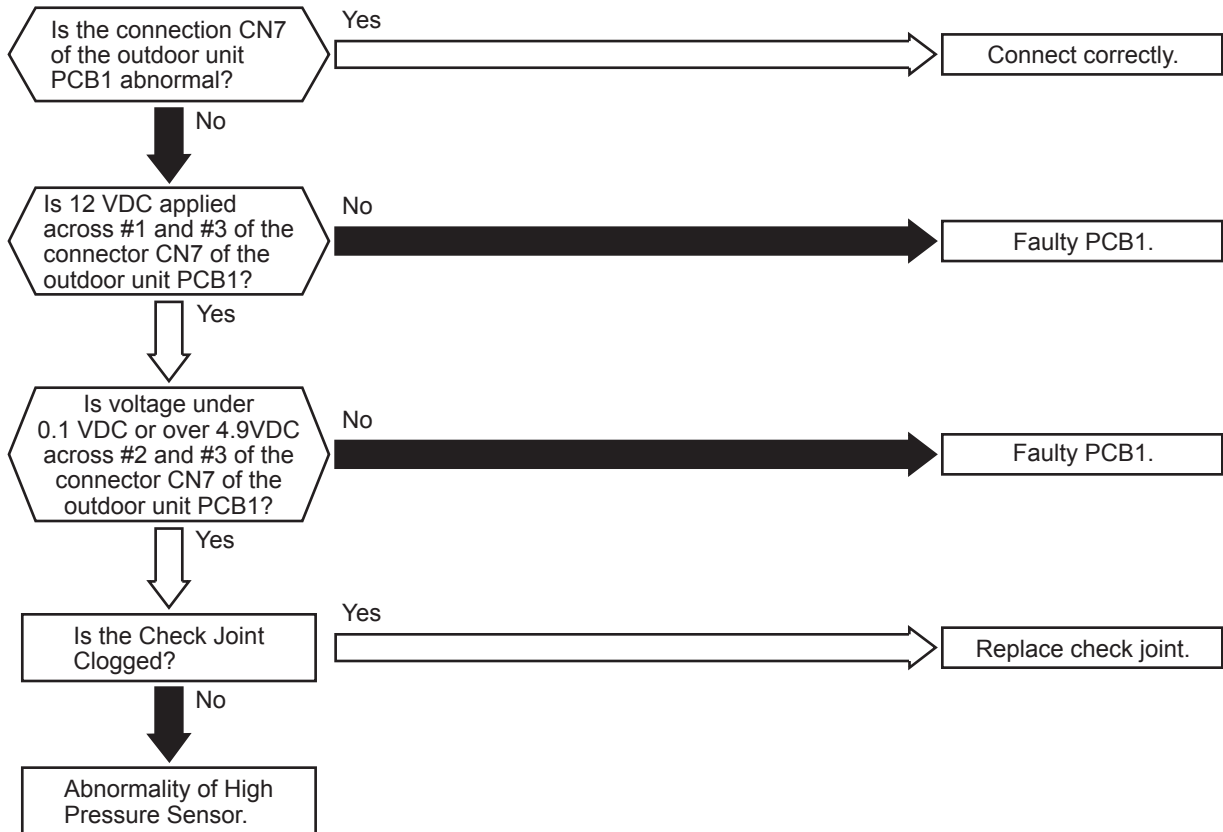


Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)	
Activation of Internal Thermostat for Indoor Unit Fan Motor	Faulty Indoor Unit Fan Motor	Measure coil resistance and insulation resistance.	Replace motor if faulty.	
	Faulty Internal Thermostat	Fault	Check continuity after fan motor temperature decreases to room temp.	Replace fan motor if no continuity.
		Insufficient Contacting	Measure resistance by tester.	Correct looseness. Replace connectors.
		Incorrect Connection	Check connections.	Repair connections.

Alarm Code 21	Abnormality of High Pressure Sensor for Outdoor Unit
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- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the pressure sensor voltage decreases lower than 0.1V or increases higher than 4.9V during running.

PCB1: Control PCB in Outdoor Unit

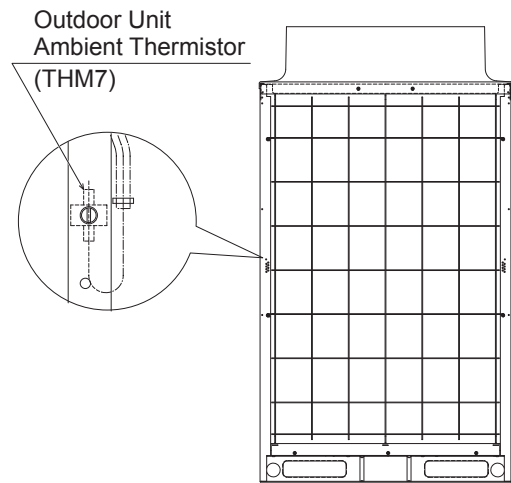
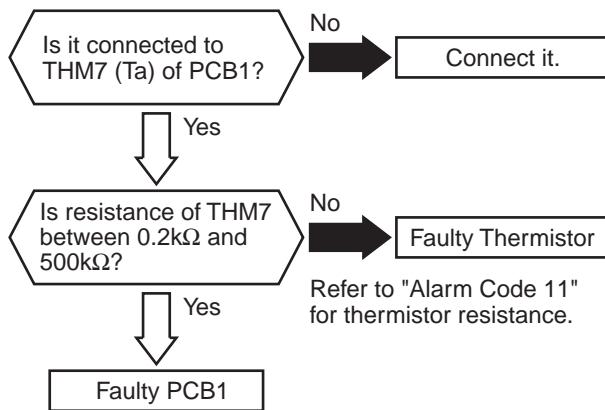


Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty High Pressure Sensor	Fault	Check output voltage is correct.	Replace pressure sensor if faulty.
	Incorrect Connection	Check connections.	Repair wiring and connections.
Faulty PCB1		Replace PCB1 and check operation.	Replace PCB1 if faulty.
Indicated Pressure Value is Excessively High or Low	Malfunction of Pressure Sensor due to Faulty Check Joint	Check for clogging of check joint.	Replace check joint.

Alarm Code 22	Abnormality of Thermistor for Outdoor Air Temperature (Outdoor Unit Ambient Thermistor)
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- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the thermistor is short-circuited (less than 0.2 kΩ) or cut (greater than 500 kΩ) during running.

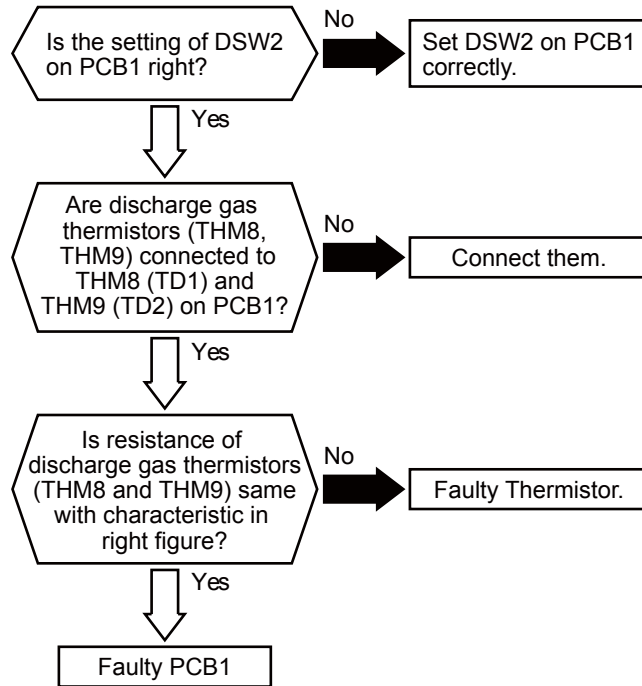
PCB1: Control PCB in Outdoor Unit



Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty Outdoor Unit Ambient Thermistor	Fault	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to PCB1.	Repair wiring and connections.
Faulty PCB1		Replace PCB1 and check operation.	Replace PCB1 if faulty.

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, or the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
If abnormality with the thermistor is found, check all the thermistors as shown below.
- ★ This alarm is indicated when the thermistor is short-circuited (less than 0.9 kΩ) or cut (greater than 5,946 kΩ) during running.

PCB1: Control PCB in Outdoor Unit

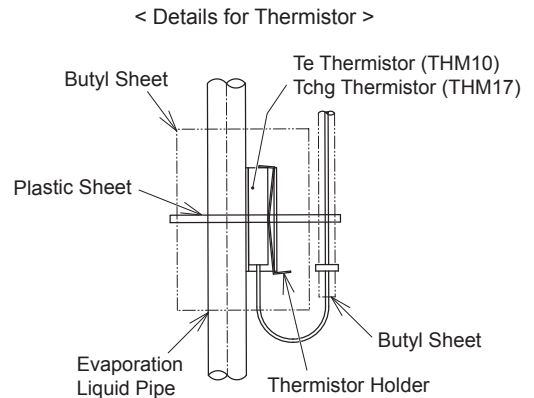
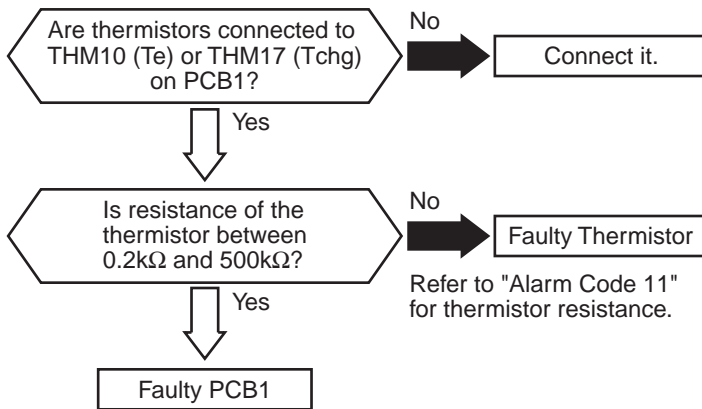


Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty Discharge Gas Thermistor	Fault	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to PCB1.	Repair wiring and connections.
Faulty PCB1		Replace PCB1 and check operation.	Replace PCB1 if faulty.
Incorrect Setting of DSW2 on PCB1		Check setting of DSW2 on PCB1.	Correctly set DSW2 on PCB1.

Alarm Code 24	Abnormality of Thermistor for Outdoor Unit Heat Exchanger Liquid Pipe (Te/Tchg)
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- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
If abnormality with the thermistor is found, check the thermistors as shown below.
- ★ This alarm is indicated when the thermistor is short-circuited (less than 0.2kΩ) or cut (greater than 840kΩ) for 8 minutes during running.

If this thermistor is faulty, this alarm is indicated.



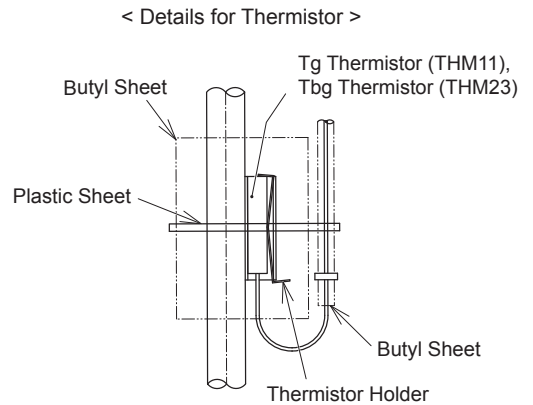
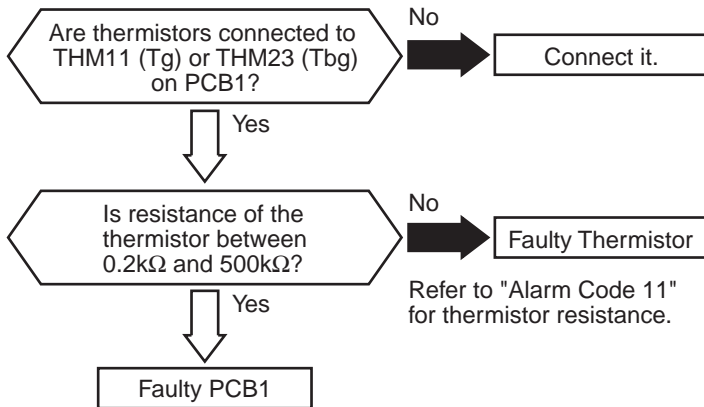
Te: Thermistor for Outdoor Liquid Pipe
 Tchg: Thermistor for Super Cooling Main Line
 PCB1: Control PCB in Outdoor Unit

Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty Outdoor Unit Liquid Pipe Thermistor	Fault	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to PCB1.	Repair wiring and connections.
Faulty PCB1		Replace PCB1 and check operation.	Replace PCB1 if faulty.

Alarm Code 25	Abnormality of Thermistor for Outdoor Unit Heat Exchanger Gas Pipe (Tg/Tbg)
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- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
If abnormality with the thermistor is found, check all the thermistors as shown below.
- ★ This alarm is indicated when the thermistor is short-circuited (less than 0.2kΩ) or cut (greater than 840kΩ) for 8 minutes during running.

If this thermistor is faulty, this alarm is indicated.

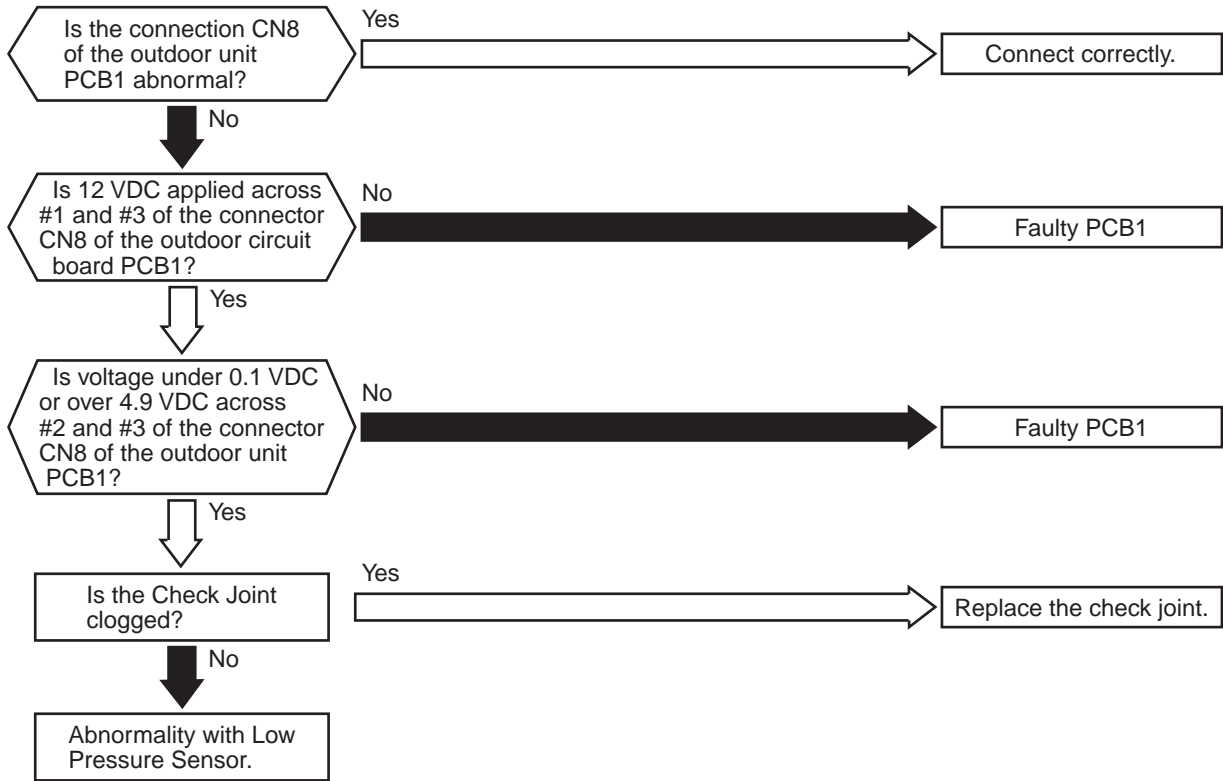


Tg: Thermistor for Outdoor Gas Pipe
 Tbg: Thermistor for Super Cooling Bypass Line
 PCB1: Control PCB in Outdoor Unit

Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty Outdoor Unit Gas Pipe Thermistor	Fault	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to PCB1.	Repair wiring and connections.
Faulty PCB1		Replace PCB1 and check operation.	Replace PCB1 if faulty.

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the pressure sensor voltage decreases lower than 0.1V or increases higher than 4.9V during running.

PCB1: Control PCB in Outdoor Unit

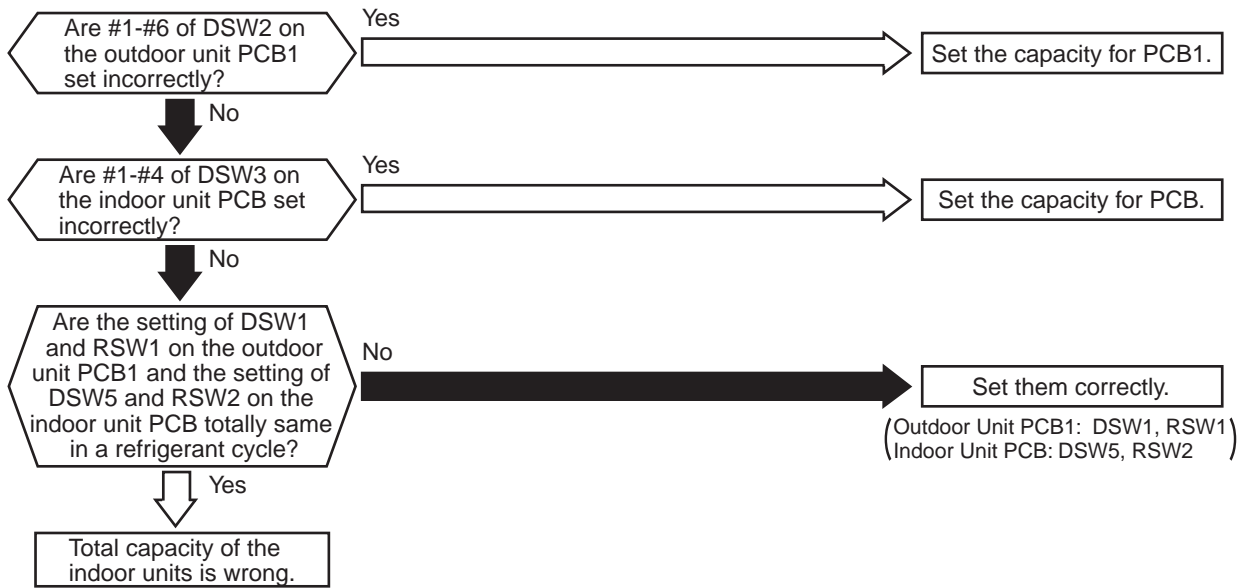


Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty Low Pressure Sensor	Fault	Check output voltage is correct.	Replace pressure sensor if faulty.
	Incorrect Connection	Check connections.	Repair wiring and connections.
Faulty PCB1		Replace PCB1 and check operation.	Replace PCB1 if faulty.
Indicated Pressure Value is Excessively High or Low	Malfunction of Pressure Sensor due to Faulty Check Joint	Check for clogging of check joint.	Replace check joint.

Alarm Code 31	Incorrect Capacity Setting of Indoor Unit and Outdoor Unit
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- “RUN” light flashe and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the capacity setting dip switch, DSW2 on the outdoor unit PCB1, is not set (all the settings from #1 to #6 are OFF) or mis-setting.
- ★ This alarm is indicated when the total indoor unit capacity is smaller than 50% or greater than 130% of the combined outdoor unit capacity.

PCB1: Control PCB in Outdoor Unit
PCB: Indoor Unit PCB



Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Incorrect Capacity Setting of Indoor Unit		Check combination of indoor units and capacity setting on PCB.	Correctly set dip switch, DSW3.
Incorrect Capacity Setting of Outdoor Unit		Check capacity setting on outdoor unit PCB1.	Correctly set dip switch, DSW2.
Total Indoor Unit Capacity Connected to the Outdoor Unit is Beyond Permissible Range		Check outdoor unit model by calculating total indoor units capacity.	Ensure that total indoor unit capacity is from 50% to 130%.
Refrigeration Cycle Setting of Outdoor Unit and Indoor Unit is Different		Check refrigeration cycle setting on outdoor unit PCB1 and indoor unit PCB.	Set them correctly.

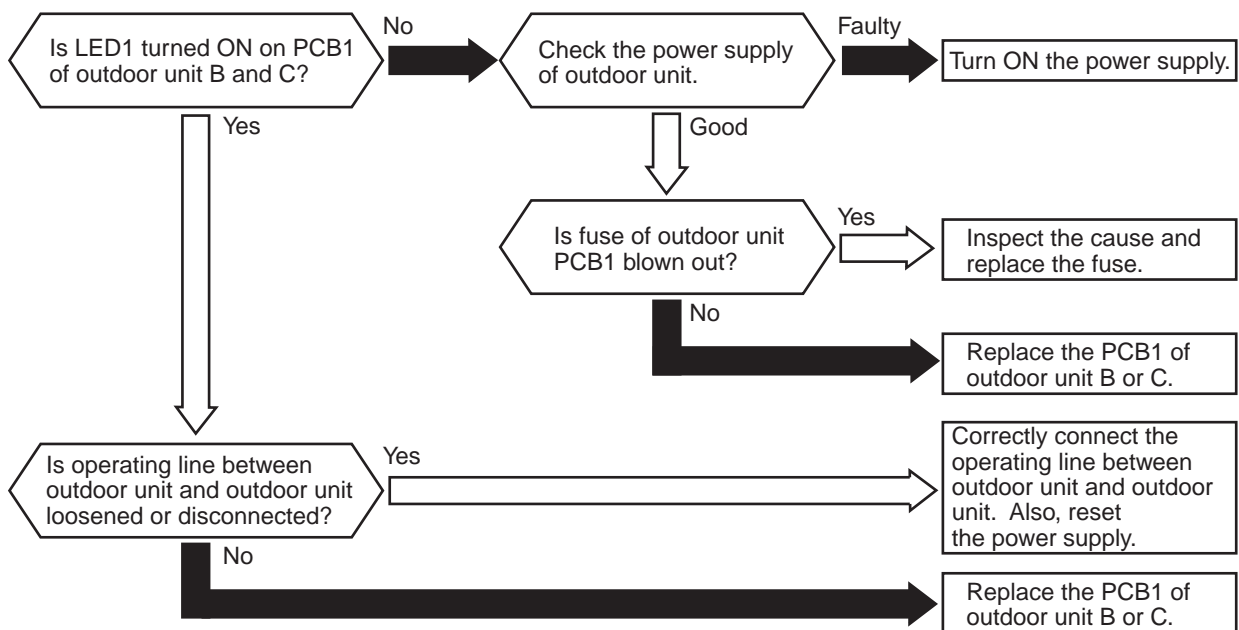
Alarm Code

31

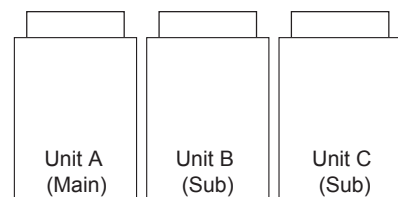
Abnormal Transmitting between Outdoor Units

- "RUN" light flashes and "ALARM" is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the following condition occurs after normal transmitting between outdoor unit and outdoor unit is maintained;
 - Abnormality is maintained for 30 seconds.
 - Abnormality is maintained for 30 seconds even after micro-computer reset (automatically).

PCB1: Control PCB in Outdoor Unit



Outdoor Unit



Alarm Code	35	Incorrect Indoor Unit No. Setting
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- “RUN” light flashe and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the alarm code is indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated 5 minutes after power is supplied to the outdoor unit when the indoor unit No. connected to the outdoor unit is duplicated by setting of DSW and RSW.

Alarm Code	36	Incorrect Indoor Unit Combination
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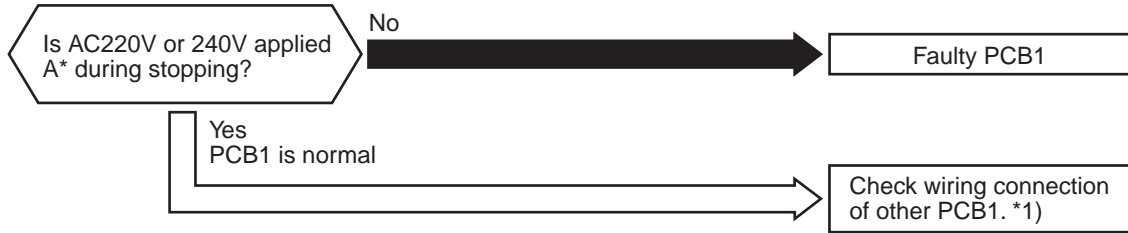
- “RUN” light flashe and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the alarm code is indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the indoor unit connected to outdoor unit is designed for refrigerant R22 type.

PCB1: Control PCB in Outdoor Unit

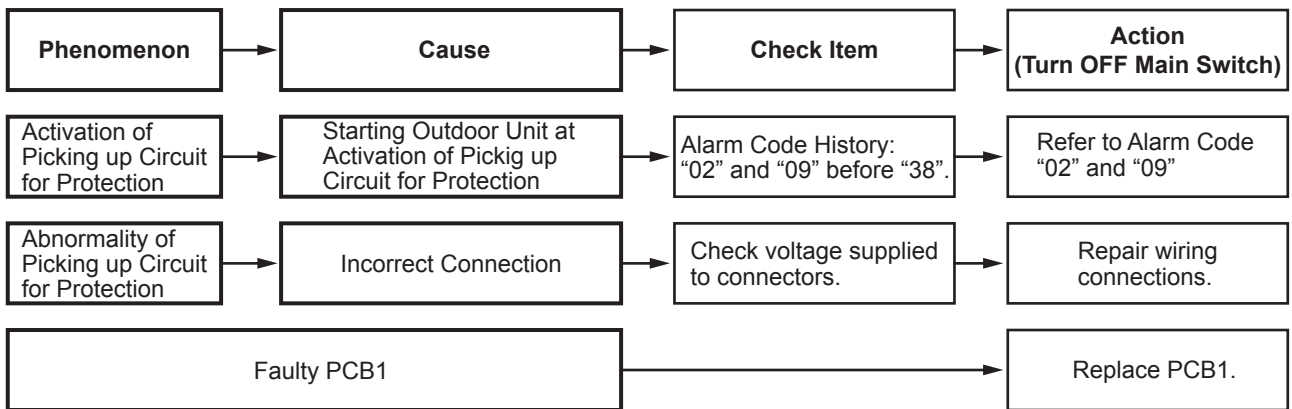
Alarm Code	38	Abnormality of Picking up Circuit for Protection in Outdoor Unit
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- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and the alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when AC 220V or 240V is not detected in A* during inverter compressor stoppage.

PCB1: Control PCB in Outdoor Unit



Power Supply	A*
380-415V/50Hz	Between terminal #3 of PCN2, PCN16 and faston terminal "N1" on PCB1



*1): Check wiring system connecting to PCN2 and PCN16 on PCB1.

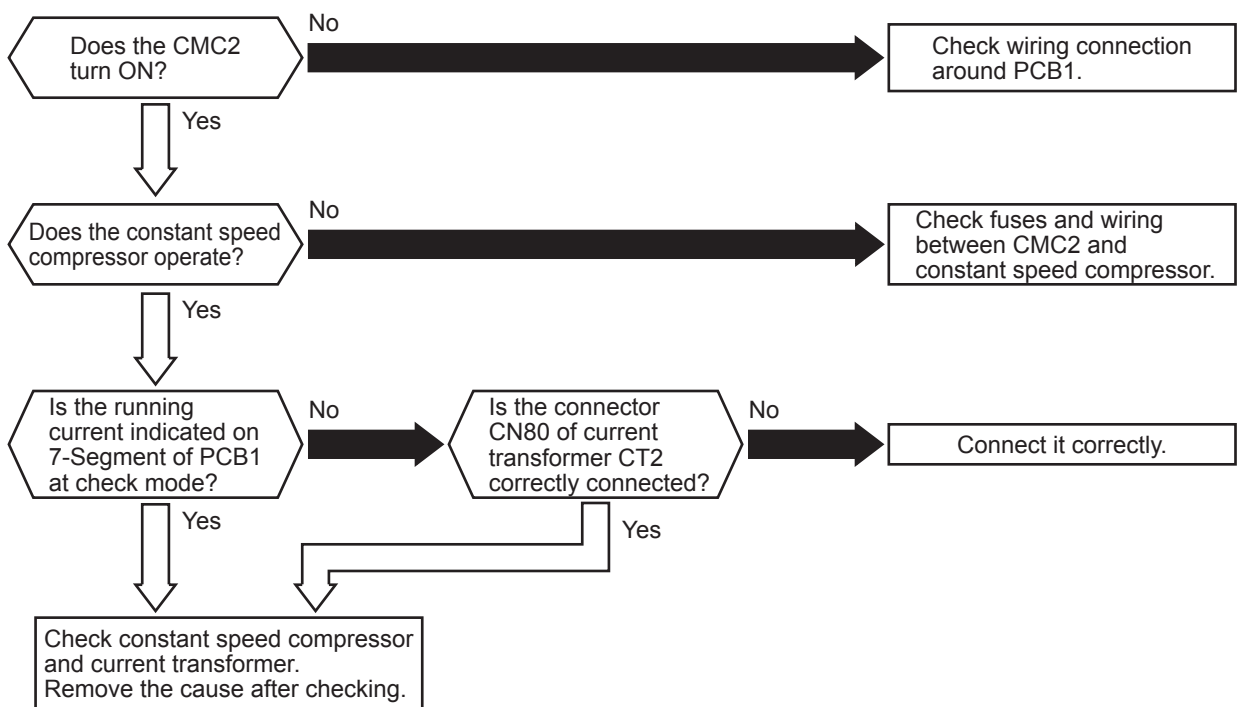
Alarm Code

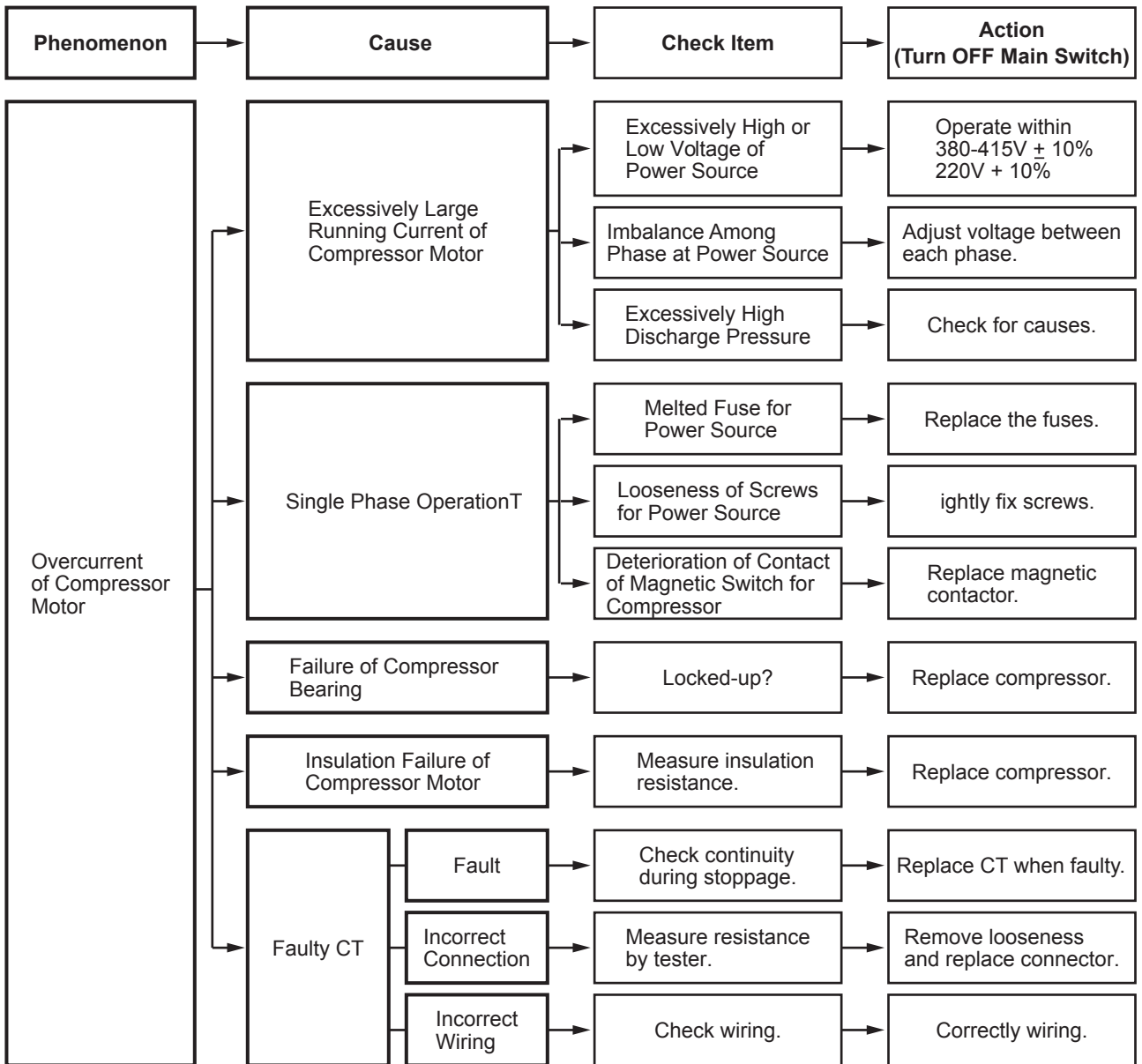
39

Abnormality of Running Current at Constant Speed Compressor

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the following conditions occurs;
- The running current of the constant speed compressor exceeds the value of overcurrent limitation during operating.
 - The running current of the constant speed compressor is detected 0A and retry when 3 minutes are passed after all compressors are stopped, and this phenomenon occurs three times within 30 minutes.

PCB1: Control PCB in Outdoor Unit

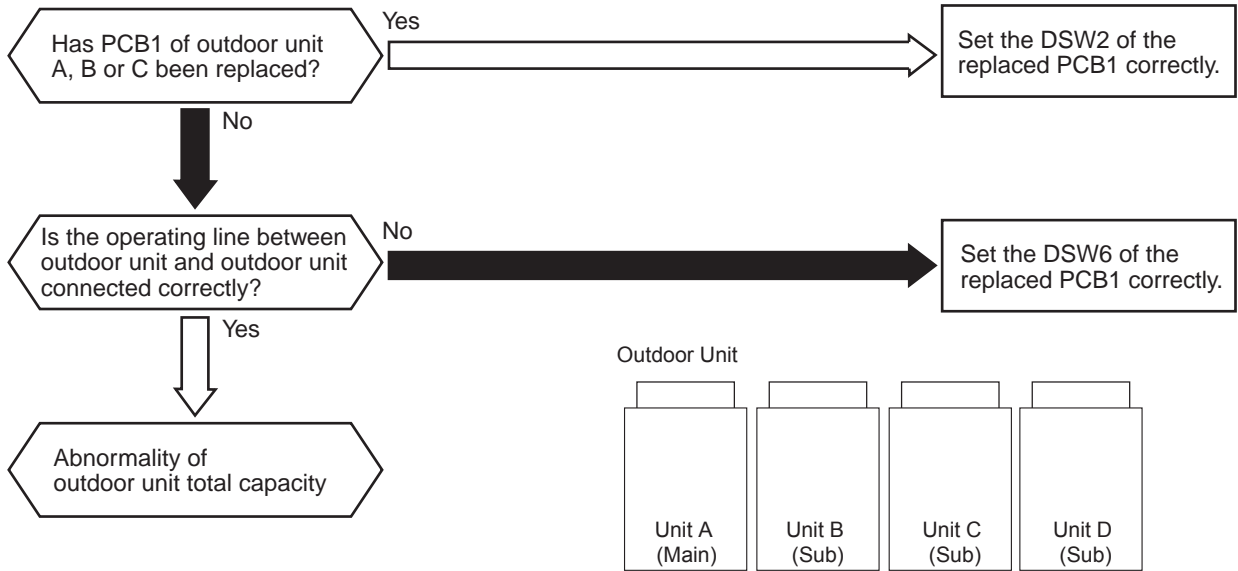




Alarm Code 3A	Abnormality of Outdoor Unit Capacity
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- “RUN” light flashe and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the total capacity of outdoor unit connected to O.U.~O.U. transmission terminal exceeds 54HP.

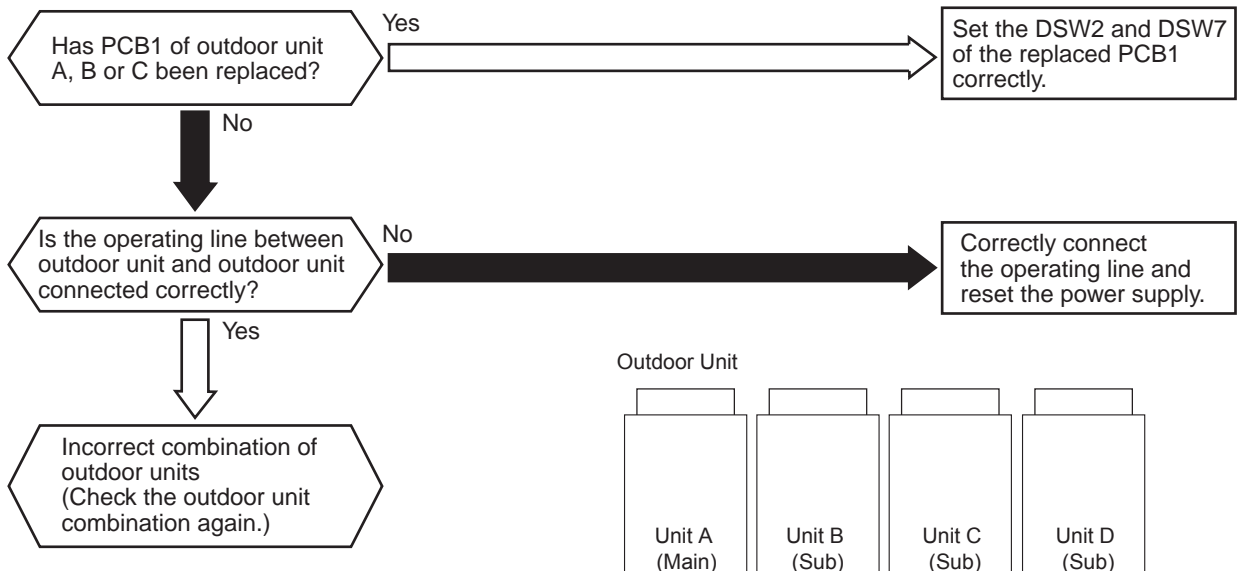
PCB1: Control PCB in Outdoor Unit
O.U. Outdoor Unit



Alarm Code 3B	Incorrect Setting of Outdoor Unit Model Combination or Voltage
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- “RUN” light flashe and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the model setting for outdoor unit connected to O.U.~O.U. transmission terminal is incorrect.

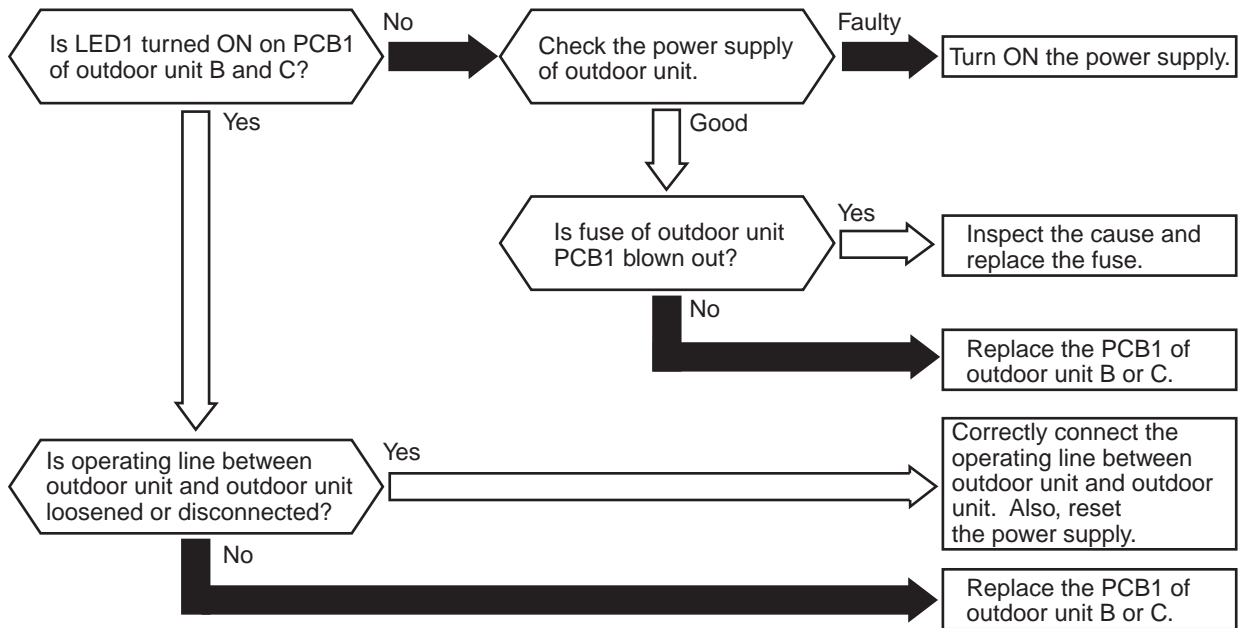
PCB1: Control PCB in Outdoor Unit
O.U. Outdoor Unit



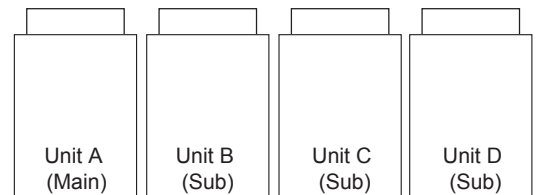
- “RUN” light flashe and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.

- ★ This alarm is indicated when transmission to outdoor unit B or C is NOT maintained for 30 seconds. (Alarm code “31” will be indicated when transmission to all the outdoor units connected to O.U.~O.U. transmission terminal is NOT maintained.)

PCB1: Control PCB in Outdoor Unit
O.U.: Outdoor Unit

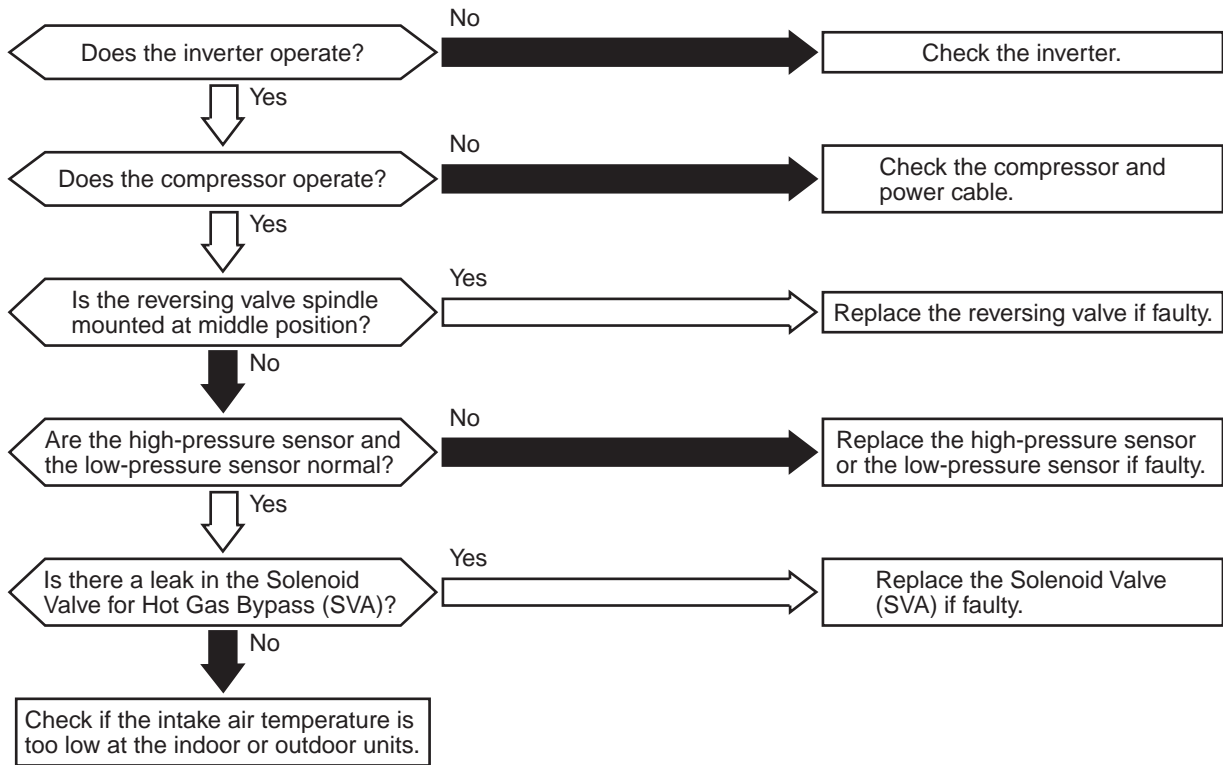


Outdoor Unit



- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when a compression ratio, $\epsilon = \{(Pd + 0.1) / (Ps + 0.06)\}$ is calculated from a discharge pressure (Pd MPa) and suction pressure (Ps MPa) and the condition lower than $\epsilon < 1.8$ occurs more than three times (including three) in one hour.

PCB1: Control PCB in Outdoor Unit

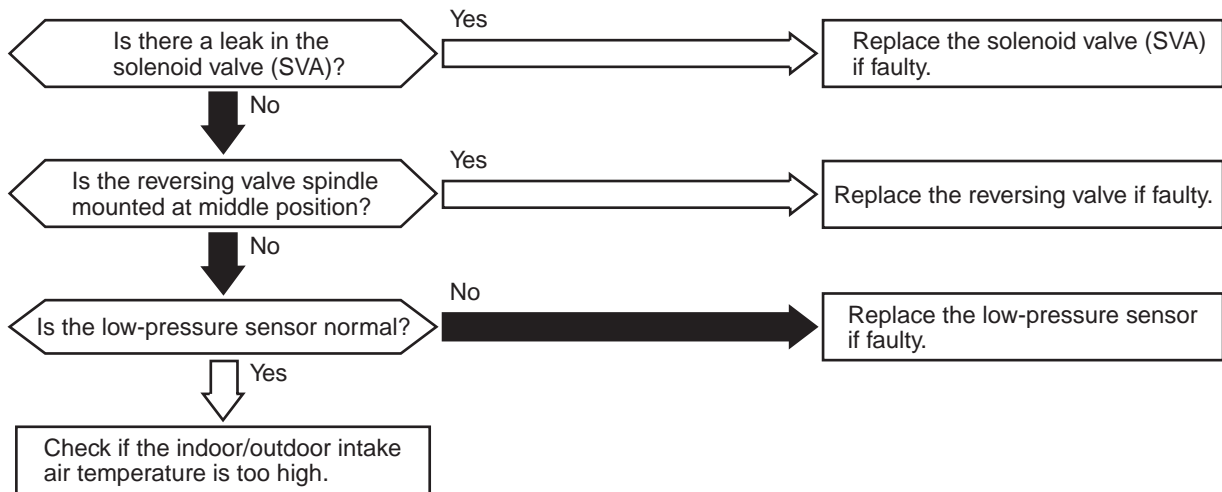


Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Excessively Low Compression Ratio	Inverter is not Functioning	Check inverter.	Repair faulty part.
	Compressor is not Operating	Check compressor.	Replace comp. if faulty.
	Valve Stoppage at Middle Position of Reversing Valve	Measure suction pipe temp. of reversing valve.	Replace reversing valve if faulty.
	Abnormality of High or Low Pressure Sensor	Check connector for PCB1, power source and pressure indication.	Replace sensor if faulty.
	Excessively Low Indoor Intake Air Temperature	Check indoor unit and outdoor unit air temp. thermistor.	Replace thermistor if faulty.
	Leakage from Solenoid Valve (SVA)	Check Solenoid Valve.	Replace SVA if leaking.

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.

★ In case that compressor is operated under the condition that is higher than 1.5MPa of suction pressure (Ps) for 1 minute, all compressors are stopped and retry operation is started after 3 minutes. However this alarm is indicated when same phenomenon is occurred at two times within the next 30 minutes.

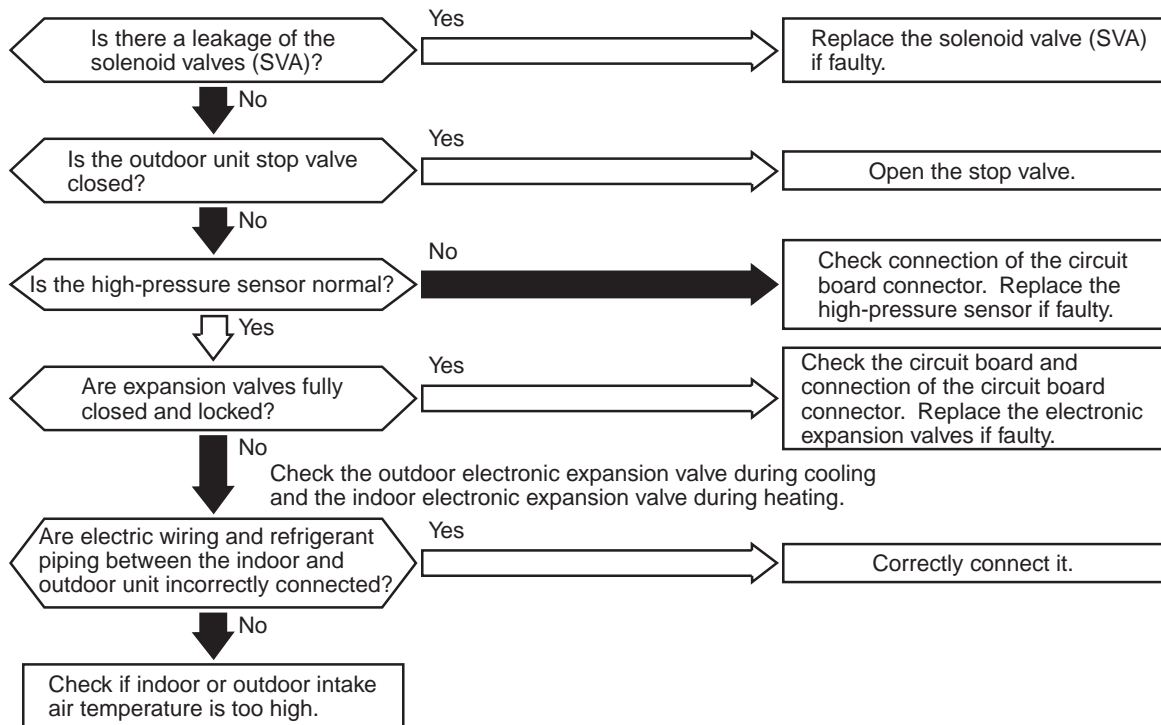
PCB1: Control PCB in Outdoor Unit



Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Excessively Low Suction Pressure	Leakage of Solenoid Valve (SVA)	Check outlet pipe temp. of solenoid valve (SVA).	Check connecting wires. Replace solenoid valve (SVA) if faulty.
	Valve Stoppage at Middle Position of Reversing Valve	Measure suction gas pipe temp. of reversing valve.	Replace reversing valve if faulty.
	Abnormal Suction Pressure Sensor	Check connectors of PCB1 and power source.	Replace sensor if faulty.
	Excessively High Indoor Unit and Outdoor Unit Suction Air Temperature	Check indoor unit and outdoor unit suction air temp. thermistor.	Replace thermistor if faulty.

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ In case that compressor is operated under the condition that is higher than 3.8MPa of discharge pressure (Pd) for 1 minute, all compressors are stopped and retry operation is started after 3 minutes. However this alarm is indicated when same phenomenon is occurred at two times within the next 30 minutes.

PCB1: Control PCB in Outdoor Unit
 PCB: Indoor Unit PCB

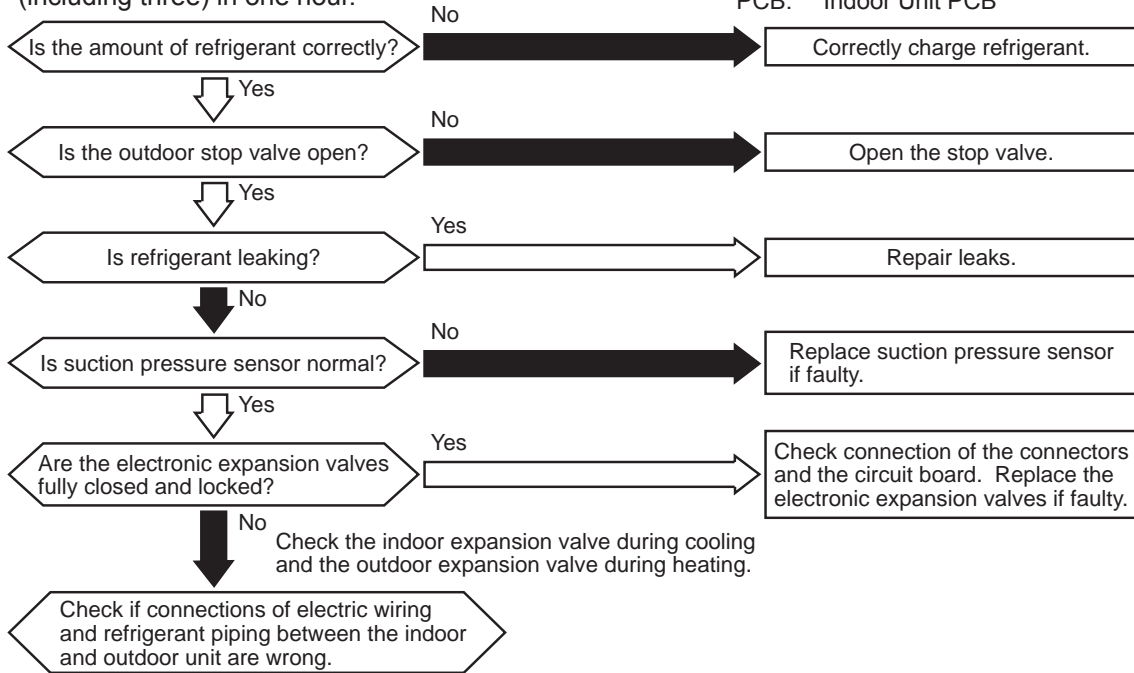


Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Excessively High Discharge Pressure	Leakage of Solenoid Valve (SVA)	Check outlet temp. of solenoid valve (SVA).	Check connection. Replace solenoid valve (SVA) if faulty.
	Closed Stop Valve	Check stop valve.	Open stop valve.
	Abnormal High Pressure Sensor	Check connectors for PCB1.	Replace pressure sensor if faulty.
	Excessively High Indoor Unit and Outdoor Unit Inlet Air Temp.	Check thermistor for indoor unit and outdoor unit inlet air temp.	Replace thermistor if faulty.
	Incorrect Connection between Indoor Unit and Outdoor Unit	Check electrical system and ref. cycle.	Correctly connect.
	Locked Expansion Valve with Fully Closed	Check connector for PCB.	Repair connector for PCB or expansion valve. Replace it if faulty.

Alarm Code	47	Activation of Low Pressure Decrease Protection Device (Vacuum Operation Protection)
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- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when a suction pressure (Ps) is lower than 0.12 MPa for over 12 minutes and its state occurs more than three times (including three) in one hour.

PCB1: Control PCB in Outdoor Unit
PCB: Indoor Unit PCB



Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)	
Excessively Low Suction Pressure (in Vacuum)	Shortage of Ref.	Check ref. charged volume or check for leakage.	Repair leakage and correctly charge.	
	Closed Stop Valve	Check stop valve.	Open stop valve.	
	Abnormal Low or High Pressure Sensor	Check connector for PCB1.	Replace pressure sensor if faulty.	
	Incorrect Connection between Indoor Unit and Outdoor Unit	Check electrical system and ref. cycle.	Correctly connect between indoor unit and outdoor unit.	
	Locked Expansion Valve with Fully Closed	Check connector for PCB.	Repair connector for PCB or expansion valve. Replace it if faulty.	
	Closed Expansion Valve by Disconnecting Td Thermistor	Check Td thermistors for compressors and measure Td thermistor resistance.	Repair or replace Td thermistor.	
	Internal Thermostat for Outdoor Fan is Activated in Heating Operation	Faulty Outdoor Fan Motor	Measure coil resistance and insulation resistance.	Replace outdoor fan motor if faulty.
Faulty Internal Thermostat		Fault	Check for conduction after temperature of outdoor fan motor is decreased.	Replace outdoor fan motor.
		Incorrect Contact	Measure resistance by tester.	Remove looseness and replace connector.
		Incorrect Connection	Check connection.	Connect correctly.

Alarm Code

48

Activation of Inverter Overcurrent Protection Device (1)

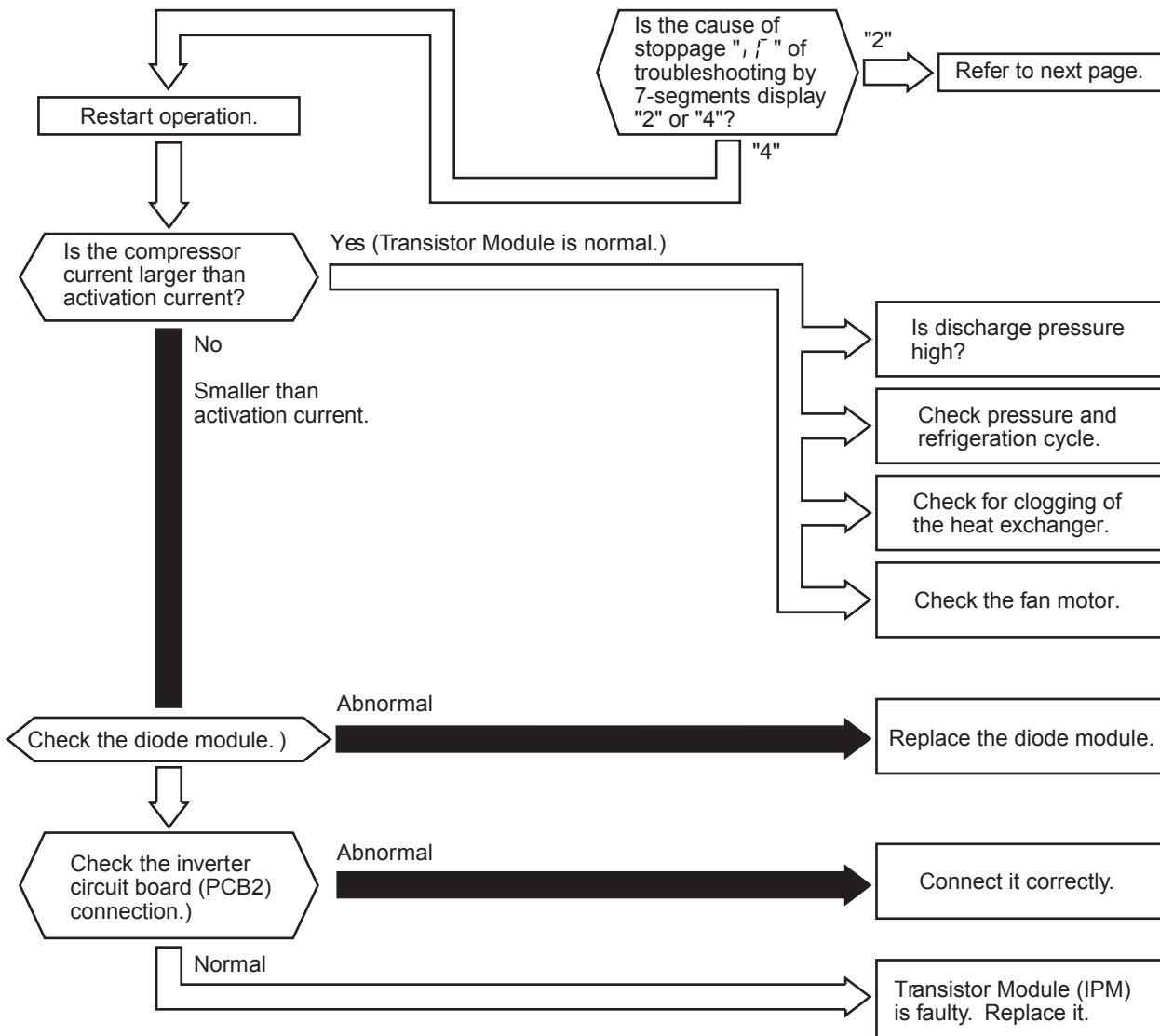
- "RUN" light flashes and "ALARM" is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.

★ This alarm is indicated when inverter electronic thermal protection is activated at six times within 30 minutes. (Retry operation is performed up to the occurrence of five times.)

Conditions of Activation:

Inverter current with 105% of the rated current runs for 30 seconds continuously. or
Inverter current runs intermittently and the accumulated time reaches up to
3 minutes, in 10 minutes.

PCB1: Control PCB in Outdoor Unit
PCB2: Inverter PCB



Alarm Code

48

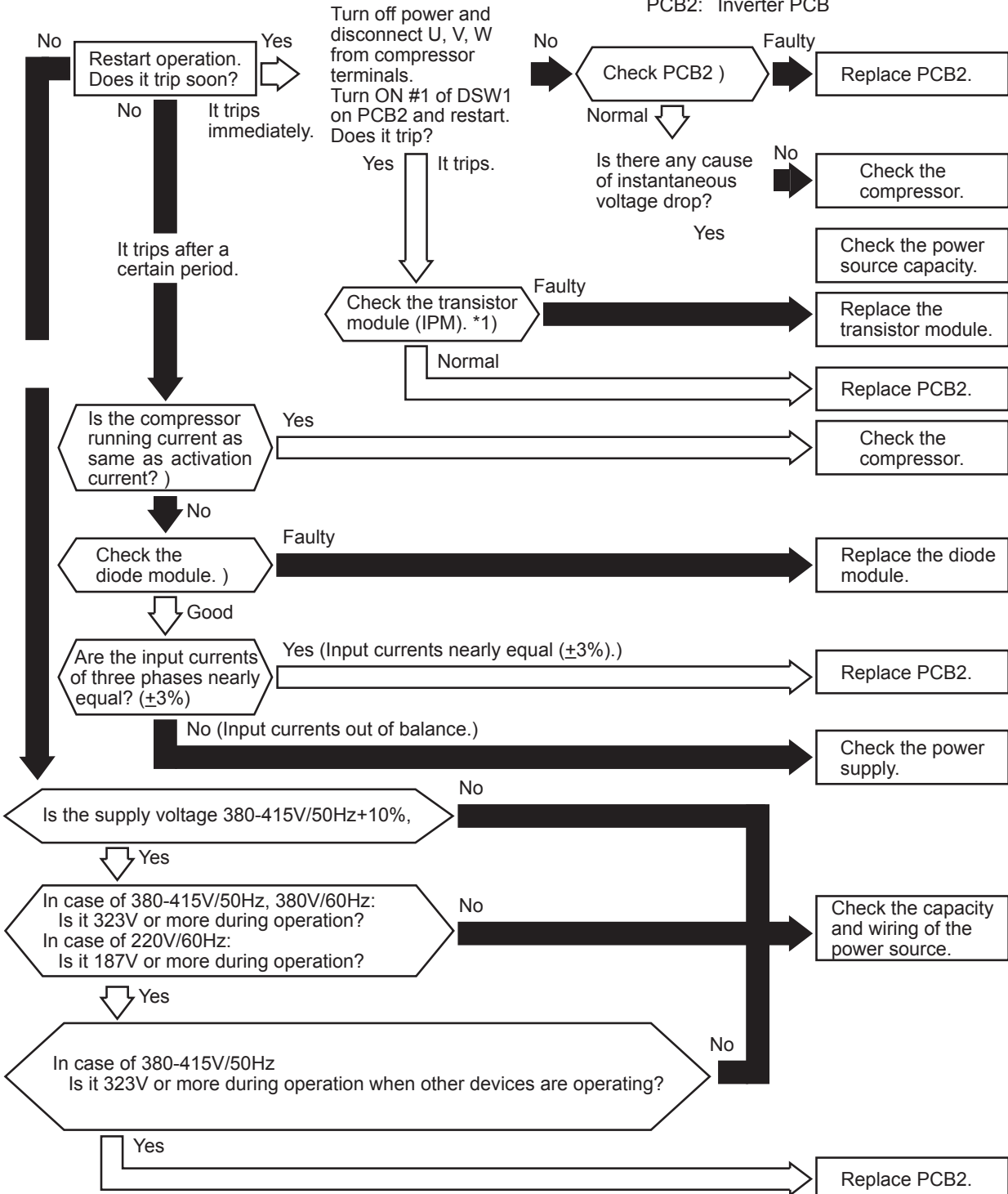
Activation of Inverter Overcurrent Protection Device (2)

- "RUN" light flashes and "ALARM" is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.

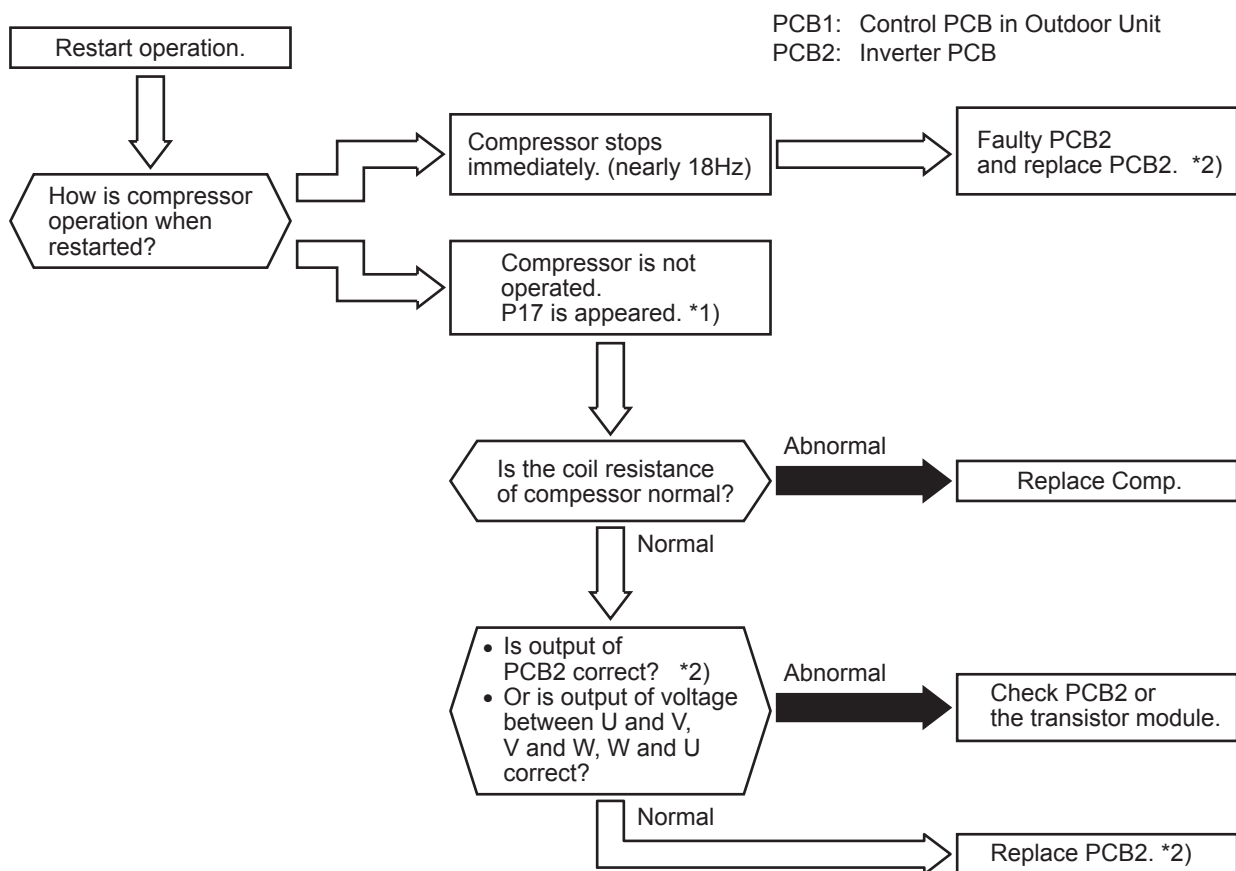
★ This alarm is indicated when instantaneous overcurrent occurs at six times within 30 minutes. (Retry operation is performed up to the occurrence of five times.)

Conditions of Activation: Inverter current with 150% of the rated current

PCB1: Control PCB in Outdoor Unit
PCB2: Inverter PCB



- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ In case that the abnormality of current transformer (0A detecting) occurs three times within 30 minutes, this alarm is indicated at the third time.
(Retry operation is performed up to second time of abnormality occurrence.)
- Condition of Activation: When the frequency of compressor is maintained at 15 to 18Hz after compressor is started, one of the absolute value of running current detected by the current transformer at each phase U+, U-, V+ and V- is less than 1.5A (including 1.5A).



*1): P17 is shown at 7-segment on the outdoor unit PCB1.

*2): Perform the high voltage discharge work by referring to the item 3.3 in *Troubleshooting* before checking and replacing the inverter parts.

- "RUN" light flashes and "ALARM" is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.

★ IPM (Transistor Module) has detecting function of abnormality.
 This alarm is indicated when the transistor module detects the abnormality seven times in 30 minutes.
 (Retry operation is performed up to the occurrence of six times.)

Conditions of Activation:

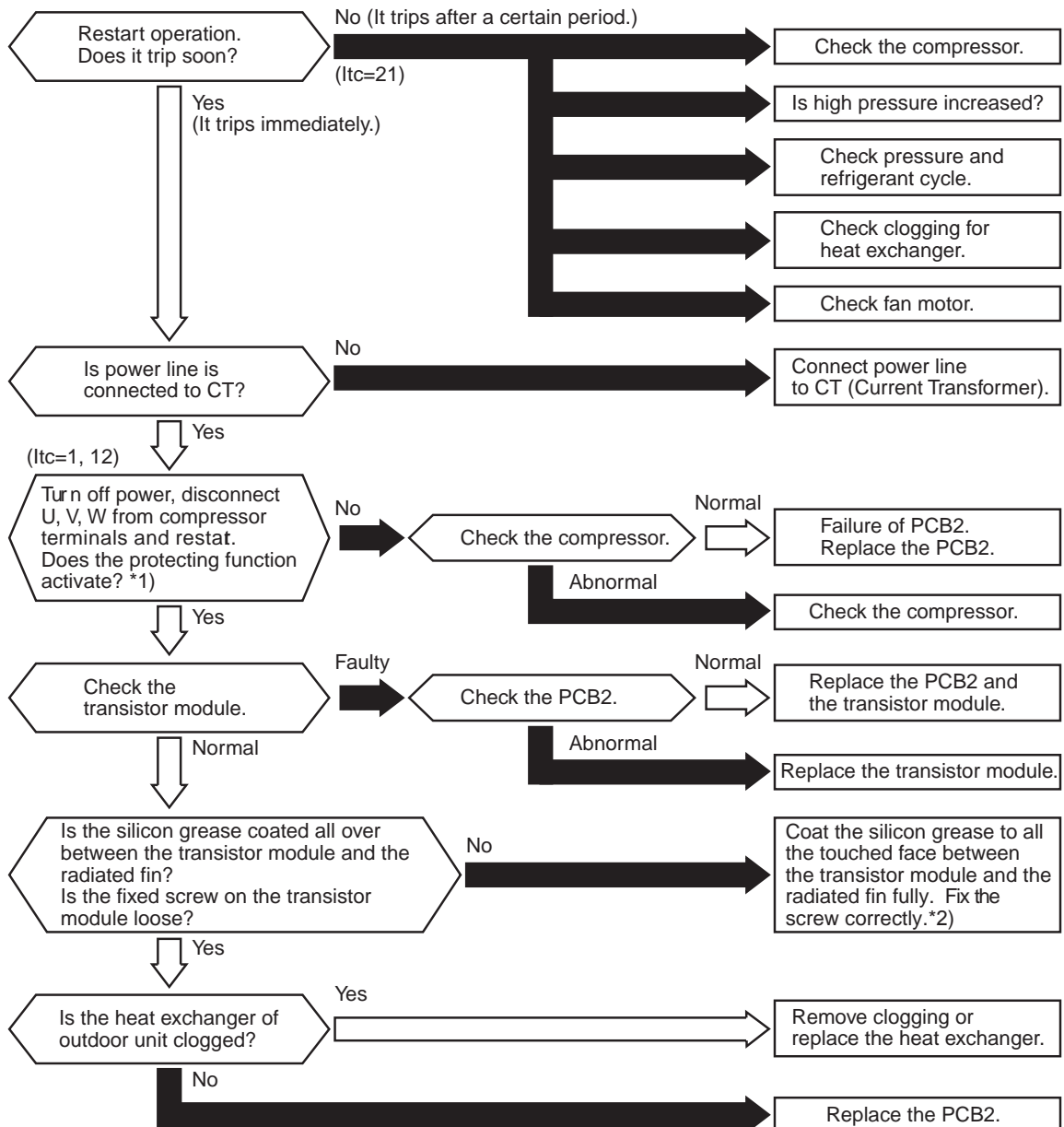
Abnormal Current to the Transistor Module such as Short Circuited or Grounded Abnormal

Temperature of the Transistor Module

Control Voltage Decrease

PCB1: Control PCB in Outdoor Unit

PCB2: Inverter PCB



*1): Turn ON the No.1 switch of the dip switch DSW1 on PCB2 when restarting with disconnecting the terminals of the compressor. After troubleshooting, turn OFF the No.1 switch of the dip switch DSW1 on PCB2.

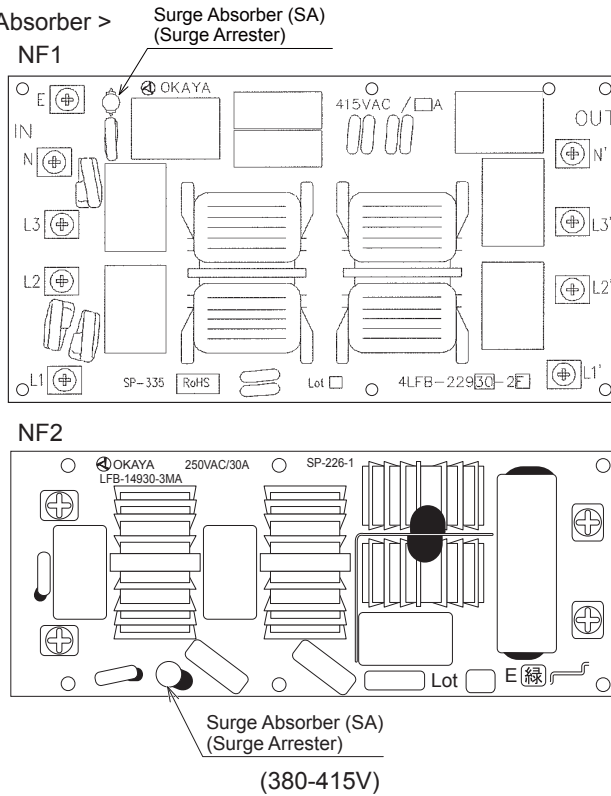
*2): Use the silicon grease provided as accessory.

NOTE:

When the unit is applied the excessive surge current due to lightning or other causes, this alarm code “53” or the inverter stoppage code (IT) “11” will be indicated and the unit can not be operated. In this case, check to ensure the surge absorber/surge arrester (SA) on the noise filter (NF1). The surge absorber may be damaged if the inner surface of the surge absorber is black. In that case, replace the surge absorber.

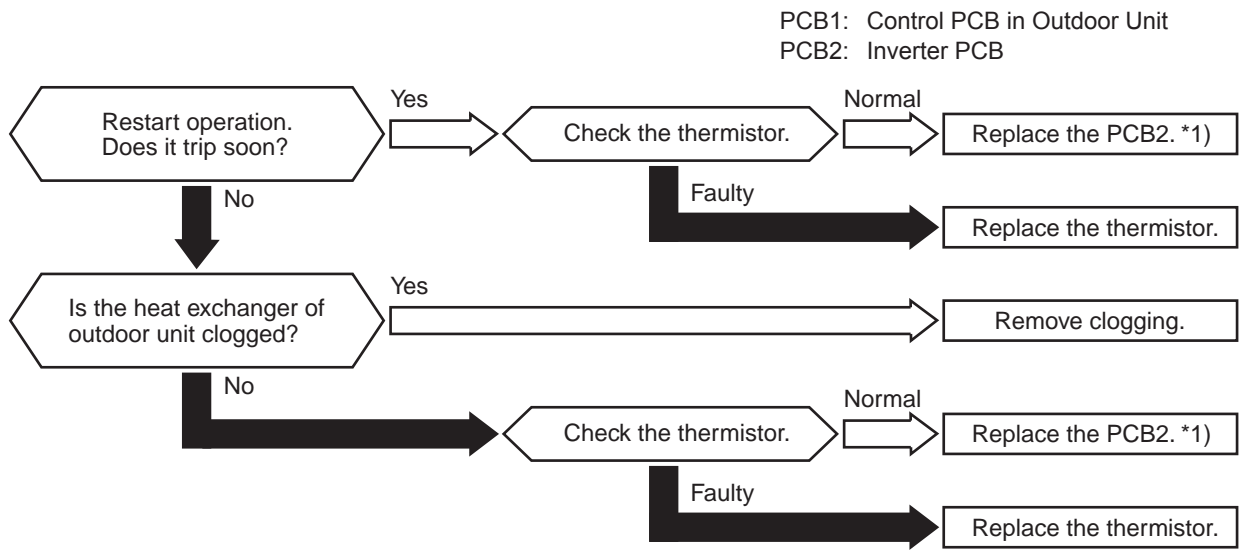
If the inside of the surge absorber is normal, turn OFF the power once and wait for PCB2's LED201 (red) OFF (approx. 5 min.) and turn ON again.

< Position of Surge Absorber >



Alarm Code	54	Abnormality of Inverter Fin Temperature
------------	----	--

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ In case that the abnormality of inverter fin temperature occurs three times within 30 minutes, this alarm is indicated at the third time.
(Retry operation is performed up to second time of abnormality occurrence.)
Conditions of Activation: This alarm is indicated when the temperature of the inverter fin thermistor for Transistor Module is higher than 100°C.



*1): Perform electrical discharge when replacing or checking inverter parts by referring to the item 3.3 in *Troubleshooting*.

Alarm Code	55	Inverter Failure
------------	----	------------------

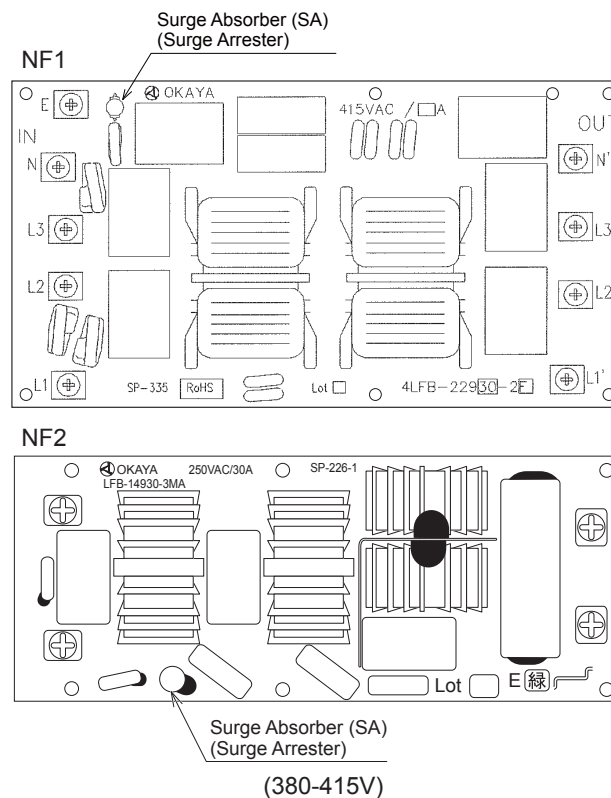
- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the following phenomenon occurs three times in 30 minutes. (Retry operation is performed up to the occurrence of two times.)
 Actual frequency from PCB2 is less than 10Hz (after inverter frequency output from PCB1).
 Conditions of Activation: This alarm is indicated when PCB2 is not performed normally.

PCB1: Control PCB in Outdoor Unit
 PCB2: Inverter PCB



*1): When the unit is applied the excessive surge current due to lightning or other causes, this alarm code “55” or the inverter stoppage code (IT) “11” will be indicated and the unit can not be operated. In this case, check to ensure the surge absorber/surge arrester (SA) on the noise filter (NF1). The surge absorber may be damaged if the inner surface of the surge absorber is black. In that case, replace the surge absorber. If the inside of the surge absorber is normal, turn OFF the power once and wait for PCB2’s LED201 (red) OFF (approx. 5 min.) and turn ON again.

< Position of Surge Absorber >



Alarm Code

57

Activation of Fan Controller Protection

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.

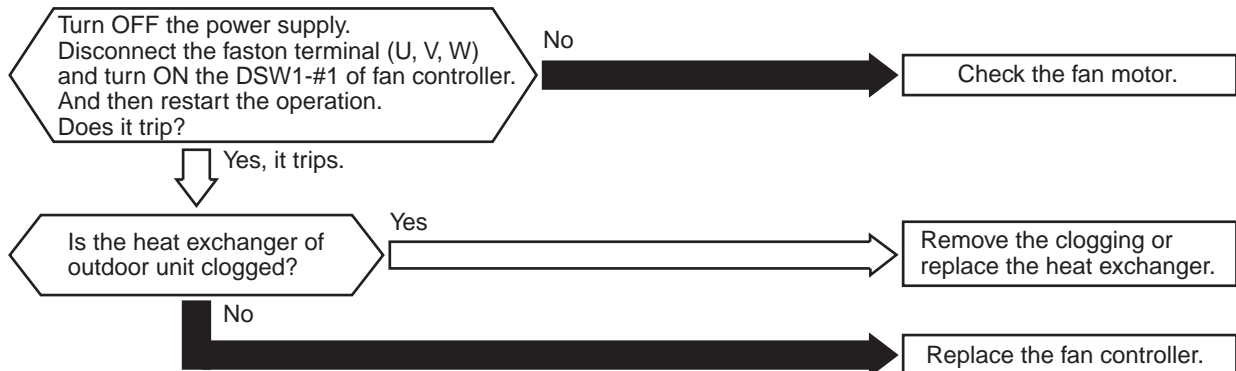
★ IPM (Transistor Module) has detecting function of abnormality.

This alarm is indicated when the abnormality is detected ten times within 30 minutes.
(Retry operation is performed up to the occurrence of nine times.)

Conditions of Activation:

Abnormal Current to the Transistor Module such as Short Circuited or Grounded
or Overcurrent
or Control Voltage Decrease

PCB1: Control PCB in Outdoor Unit

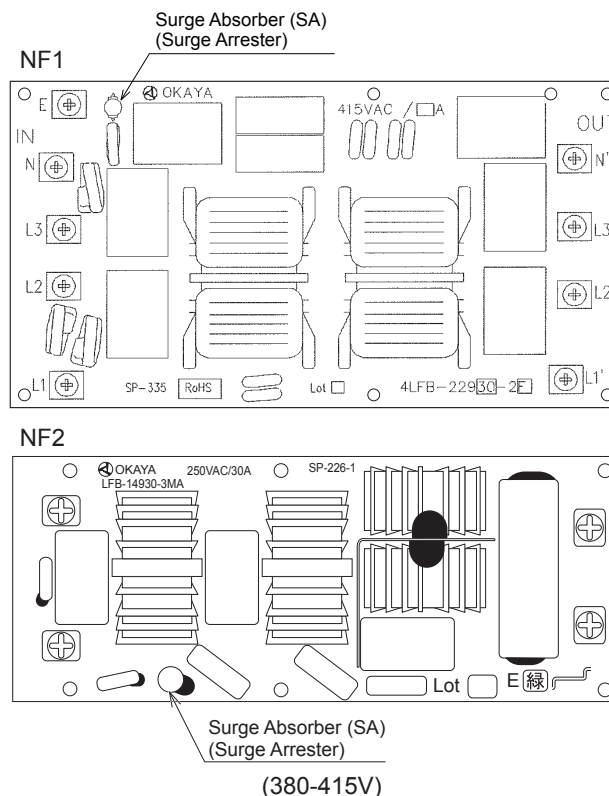


NOTE:

When the unit is applied the excessive surge current due to lightning or other causes, this alarm code “57” or the inverter stoppage code (IT) “11” will be indicated and the unit can not be operated. In this case, check to ensure the surge absorber/surge arrester (SA) on the noise filter (NF1). The surge absorber may be damaged if the inner surface of the surge absorber is black. In that case, replace the surge absorber.

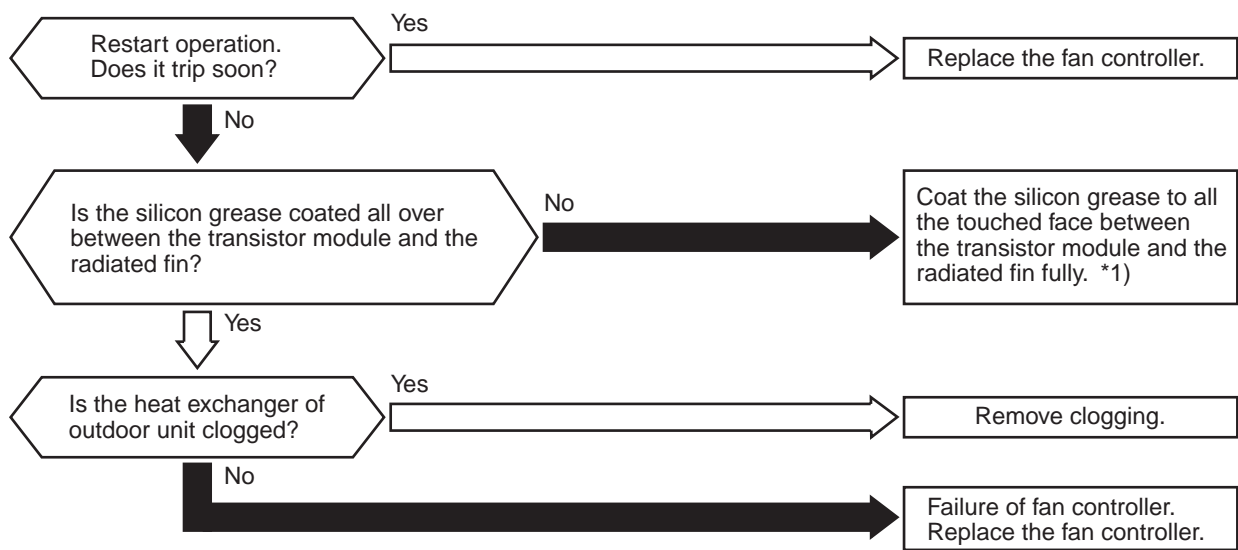
If the inside of the surge absorber is normal, turn OFF the power once and wait for PCB2’s LED201 (red) OFF (approx. 5 min.) and turn ON again.

< Position of Surge Absorber >



- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when the abnormality of fan temperature occurs ten times within 30 minutes. (Retry operation is performed up to the occurrence of nine times.)
 Conditions of Activation: This alarm is indicated when the thermistor temperature inside the transistor module exceeds 90°C.

PCB1: Control PCB in Outdoor Unit



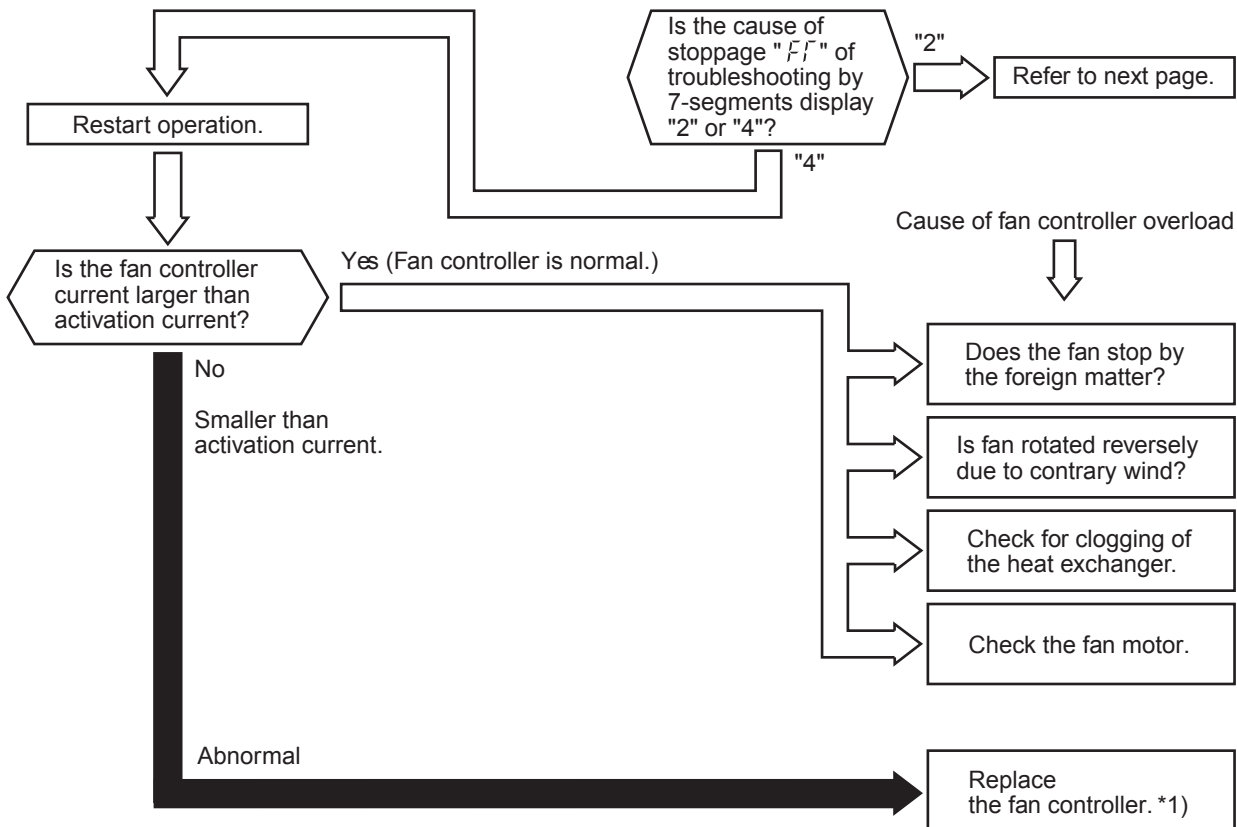
*1): Use the silicon grease provided as accessory.

- "RUN" light flashes and "ALARM" is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when fan controller electronic thermal protection is activated at ten times within 30 minutes.
(Retry operation is performed up to the occurrence of nine times.)

Conditions of Activation:

Electric current with 105% of the rated current runs for 30 seconds continuously.
or
Electric current runs intermittently and the accumulated time reaches up to 3 minutes, in 10 minutes.

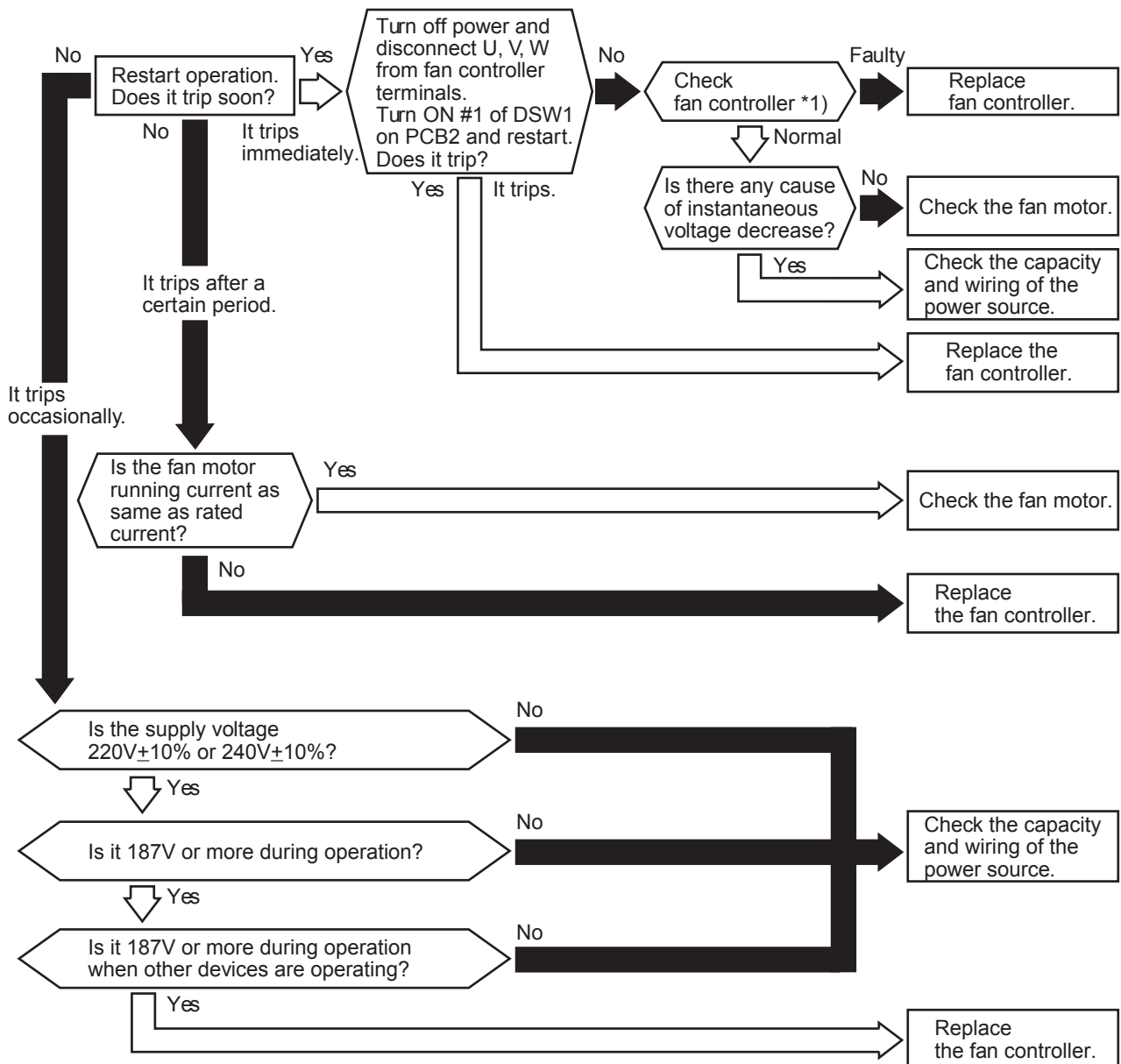
PCB1: Control PCB in Outdoor Unit



*1): Perform electrical discharge when replacing or checking fan controller by referring to the item 3.3 in *Troubleshooting*.

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code are indicated on the display of the outdoor unit PCB1.
- ★ This alarm is indicated when instantaneous overcurrent occurs at ten times within 30 minutes. (Retry operation is performed up to the occurrence of nine times.)
- Conditions of Activation: Fan controller current with 150% of the rated current.

PCB1: Control PCB in Outdoor Unit
PCB2: Inverter PCB



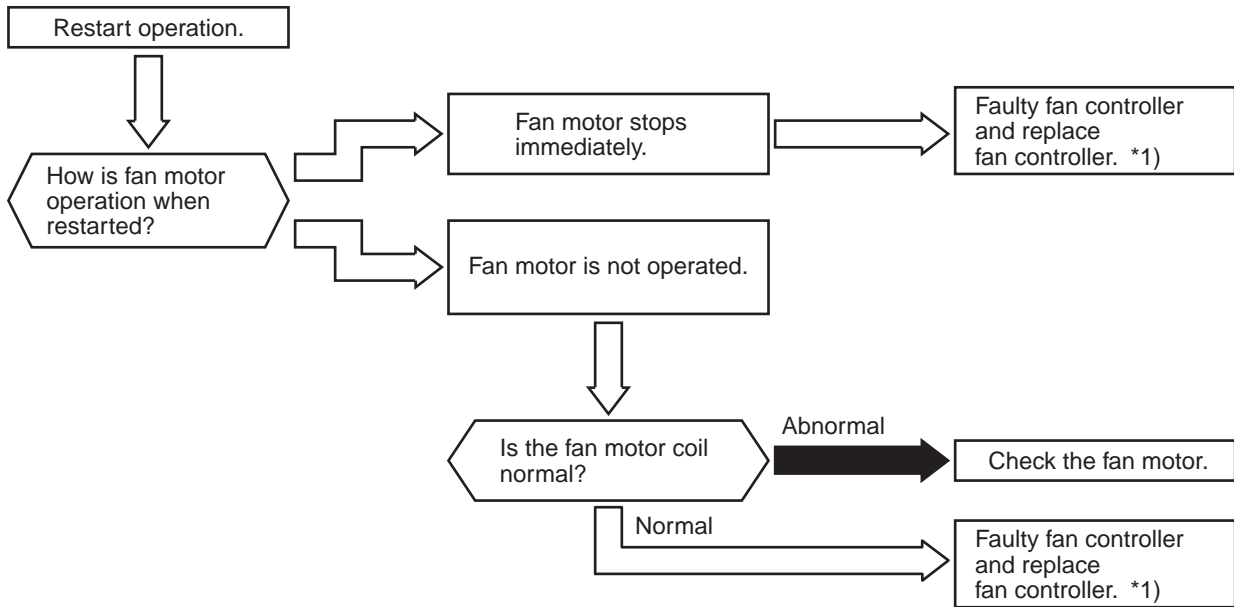
*1): Perform electrical discharge when checking or replacing fan controller by referring to the item 3.3 in Troubleshooting.

Alarm Code	5E	Abnormality of Fan Controller Sensor
------------	----	--------------------------------------

★ Conditions of Activation:

This alarm is indicated when the following condition occurs.

- After fan motor operation is started, fan controller current does NOT exceed 1.5A.
- Before fan motor operation is started, fan controller peak current does NOT exceed 4A.



*1): Perform electrical discharge when checking or replacing fan controller by referring to the item 3.3 in *Troubleshooting*.

Alarm Code	EE	Compressor Protection Alarm
------------	----	-----------------------------

★ This alarm code appears when one of the following alarms occurs three times within 6 hours, which may result in serious compressor damages, if the outdoor unit is continuously operated without removing the cause.

<i>Alarm Code:</i>	<i>Content of Abnormality</i>
02	<i>Activation of Protection Device (High Pressure Cut)</i>
07	<i>Decrease in Discharge Gas Superheat</i>
08	<i>Increase in Discharge Gas Temperature</i>
39	<i>Abnormality of Running Current at Constant Speed Compressor</i>
43	<i>Activation of Low Compression Ratio Protection Device</i>
44	<i>Activation of Low Pressure Increase Protection Device</i>
45	<i>Activation of High Pressure Increase Protection Device</i>
47	<i>Activation of Low Pressure Decrease Protection Device</i>
<i>(Vacuum Operation Protection)</i>	

These alarms are able to be checked by the CHECK Mode 1. Follow the action indicated in each alarm chart.

These alarms are cleared only by turning OFF the main power switch to the system.

However, careful attention is required before starting, since there is a possibility which will result in serious damages to the compressors.

Alarm Code	61	Incorrect Setting of Unit and Refrigerant Cycle No.
------------	----	---

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
 - The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and alarm code is indicated on the display of the outdoor unit PCB.
- ★ This alarm is indicated under the following conditions. Turn off the power source and check for DSW and RSW settings.

Conditions	Action
Unit No. (DSW6 and RSW1) or Refrigerant Cycle No. (DSW5 and RSW2) are set above “64”. Or, more than 2 pins are set at DSW5 and DSW6.	Set Unit No. and Refrigerant Cycle No. below “63”.

Alarm Code	65	Incorrect Indoor Unit Connection No. Setting
------------	----	--

- “RUN” light flashes and “ALARM” is indicated on the remote control switch.
- The unit No., alarm code and the unit code is alternately indicated on the set temperature section, and the unit No. and alarm code is indicated on the display of the outdoor unit PCB1.
(“35” is indicated on the display of the remote control switch.)

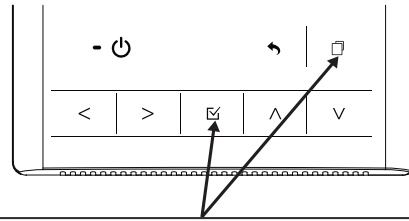
16.3 Troubleshooting in Check Mode by Remote Control Switch

(HYXE-J01H)

Each "Check Menu" item and its function are explained in the following table.

Check menu item	Function
Check 1	Sensor condition of air conditioner will be monitored and indicated.
Check 2	Sensor data of air conditioner prior to alarm occurrence will be indicated.
Alarm Record	Previous alarm record (date, time, alarm code) will be indicated. ※
Species	Model name and manufacturing number will be indicated.
IDU/ODU Diagnosis	The result of PCB check will indicated.
Self Diagnosis	Checking of remote control switch will be carried out.

Indication of Check Menu

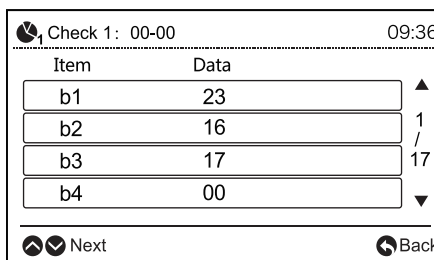
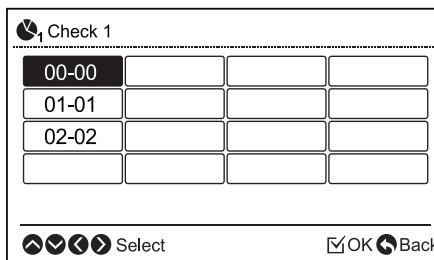
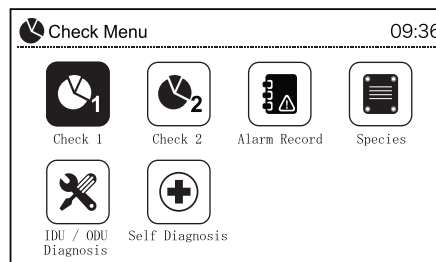


Press and hold "☐" (menu) and "☑" simultaneously for at least 3 seconds during the normal mode. The check menu will be displayed.

※ To Erase Alarm Record

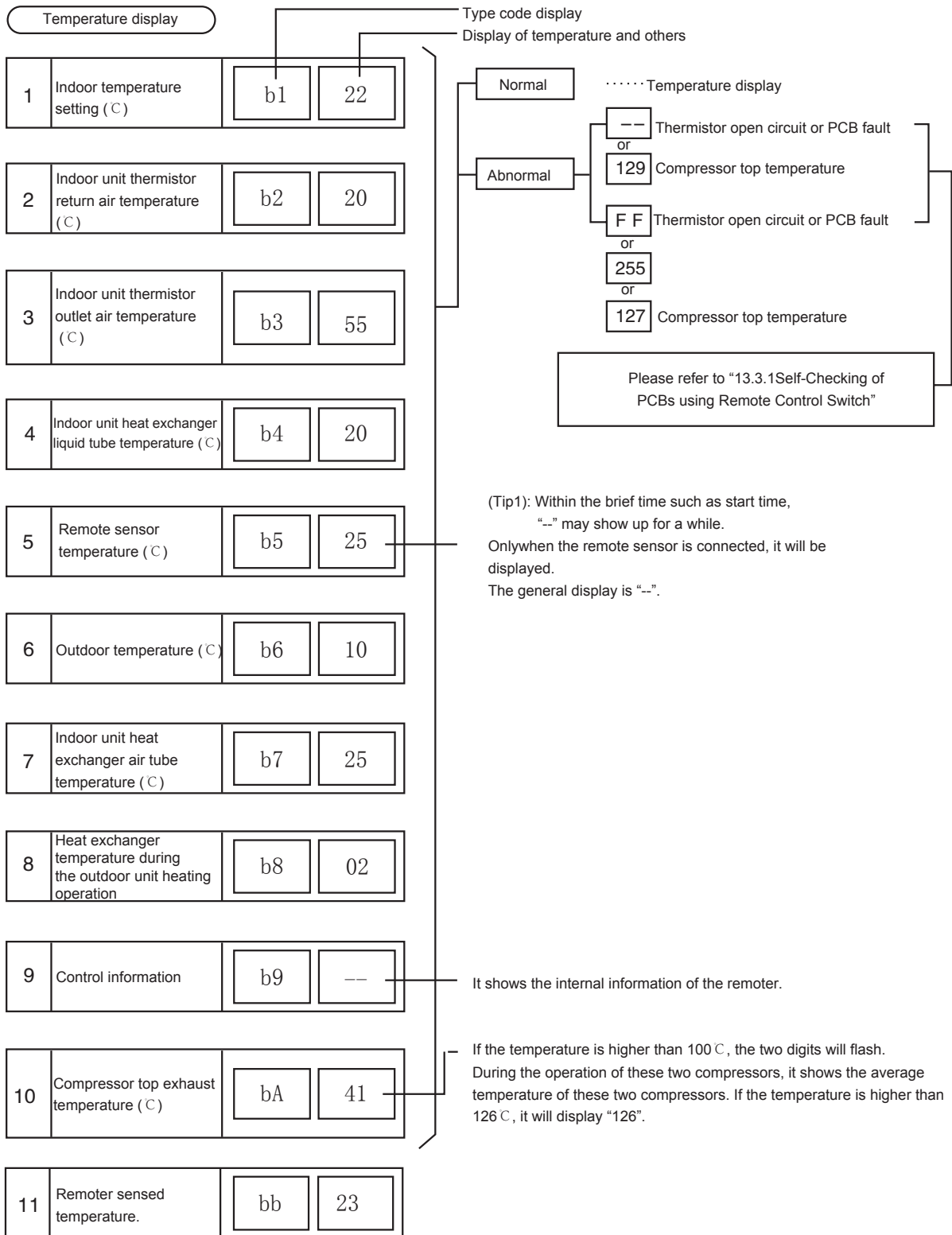
Press "☑" when the abnormality record is indicated. After that, the confirmation screen will be displayed.

Select "Yes" and press "☑" so that the alarm record will be deleted.



16.3.1 Contents of Detection Mode 1

Press check1 button, the next content will be displayed. Press “^” “v” the previous content will be displayed.



(Tip1): Within the brief time such as start time, "--" may show up for a while. Only when the remote sensor is connected, it will be displayed. The general display is "--".

It shows the internal information of the remoter.

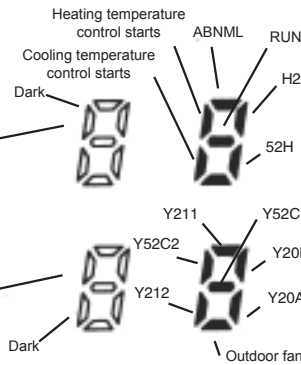
If the temperature is higher than 100°C, the two digits will flash. During the operation of these two compressors, it shows the average temperature of these two compressors. If the temperature is higher than 126°C, it will display "126".

12	Remoter sensed humidity (optional).	bC	00
----	-------------------------------------	----	----

Microcomputer output/ input display

13	Indoor unit microcomputer input/ output.	C1	
----	--	----	--

14	Outdoor unit microcomputer input/ output.	C2	-
----	---	----	---



Symbols with the letter "Y" are PCB relays.

Shutdown cause display

Cause for shutdown	d1	01
--------------------	----	----

Abnormal occurrences counter

Abnormal occurrence times	E1	01
---------------------------	----	----

Indoor unit momentary power failure occurrence times.	E2	00
---	----	----

Remoter and indoor unit transmission error occurrence times	E3	00
---	----	----

Frequency converter abnormal occurrence times	E4	00
---	----	----

Automatic louver state display

Louver sensor	F1	00
---------------	----	----

00	Stop the operation and turn off the power
01	Temperature control switch (Tip1)
02	Alarm (Tip2)
03	Freeze protection, overheat protection
05	Outdoor unit momentary power failure, reset (Tip3)
06	Indoor unit momentary power failure, reset (Tip4)
07	Cease of cooling operation due to low outdoor temperature and cease of heating operation due to high outdoor temperature
09	It needs four-way valves to shift to the shutdown
10	It needs forced shutdown.
11	Restart due to the reduced pressure ratio
12	Restart due to the increased low pressure
13	Restart due to the increased high pressure
15	Restart due to the excessively high exhaust temperature and low air inlet pressure.
16	Restart due to the reduced exhaust superheat
17	Restart due to the tripping of the frequency converter
18	Restart due to the reduced voltage
19	Expansion valve opening change protection
20	Indoor unit run mode shift (Tip5)
21	Forced temperature controlled shutdown
22	Forced temperature controlled shutdown (Preheating)
26	Insufficient high pressure, restart

- (Tip1): Term definition
 Temperature controlled startup: The indoor unit requires the running of the compressor.
 Temperature controlled shutdown: The indoor unit does not require the running of the compressor.
- (Tip2): Even if the poweroff is caused by the "AlarmABNML", "02" will not always be displayed.
- (Tip3): If the communication between the frequency converter PCB and control PCB cannot be carried out within 30 seconds, the outdoor unit will be closed down. In this case, the shutdown is the cause for d1-05 and the alarm code "04" may be displayed.
- (Tip4): If the communication between the indoor unit and outdoor unit cannot be carried out within 3 minutes, the outdoor unit will be closed down. In this case, the shutdown is the cause for d1-06 and the alarm code "03" may also be displayed.
- (Tip5): "20" will be displayed in different modes of the indoor units. It can be numbered to 99. If over 99, "99" will always be displayed.
- (Tip1): If the communication error lasts for 3 minutes, the occurrence times will be added with 1.
- (Tip2): The reserved parameters can be removed with the method indicated in 13.3.1 "Self-Checking of PCBs using Remote Control Switch".

Next page

Compressor pressure/ frequency display

21	Exhaust pressure (high pressure) (0.1MPa)	H1	18
----	---	----	----

22	Air inlet pressure (low pressure) (0.01MPa)	H2	04
----	---	----	----

23	Control information	H3	44
----	---------------------	----	----

It shows the internal information of the remoter. There's no special meaning.

24	Operation frequency (Hz)	H4	44
----	--------------------------	----	----

When two compressors are running together, it displays the total frequency.

Indoor unit capacity display

25	Indoor unit capacity	J1	08
----	----------------------	----	----

Indoor unit capacity is shown as below.

26	Outdoor unit number	J2	U. n
----	---------------------	----	------

27	Cooling system number	J3	01
----	-----------------------	----	----

28	Cooling system number	J4	00
----	-----------------------	----	----

Indoor unit capacity code:

Code	Indoor unit capacity mark	Horsepower
05	18	0.6
06	22	0.8
08	28	1.0
10	36	1.3
11	40	1.5
13	45	1.8
14	50	2.0
16	56	2.3
18	63	2.5
20	71	2.8
22	80	3.0
26	90	3.3
32	112	4.0
40	140	4.5

"n" represents the total quantity of indoor units.

n= 01-16

Expansion valve opening display

29	Indoor unit expansion valve opening (%)	L1	20
----	---	----	----

30	Outdoor unit expansion valve MV1 opening (%)	L2	99
----	--	----	----

J3:01-16 (01, decimal display before delivery (DSW5))

J4:00-0F (00, hexadecimal display before delivery (DSW5))

31	Outdoor unit expansion valve MV2 opening (%)	L3	99
----	--	----	----

In case of the unit without expansion valves, it displays the same digits.

32	Control information	L4	00
----	---------------------	----	----

Estimated current display

	Compressor working current (A)	P1	25
--	--------------------------------	----	----

When several compressors are running at the same time, it displays the total current.
When the inverter compressor is running, it displays the current on the frequency converter side.

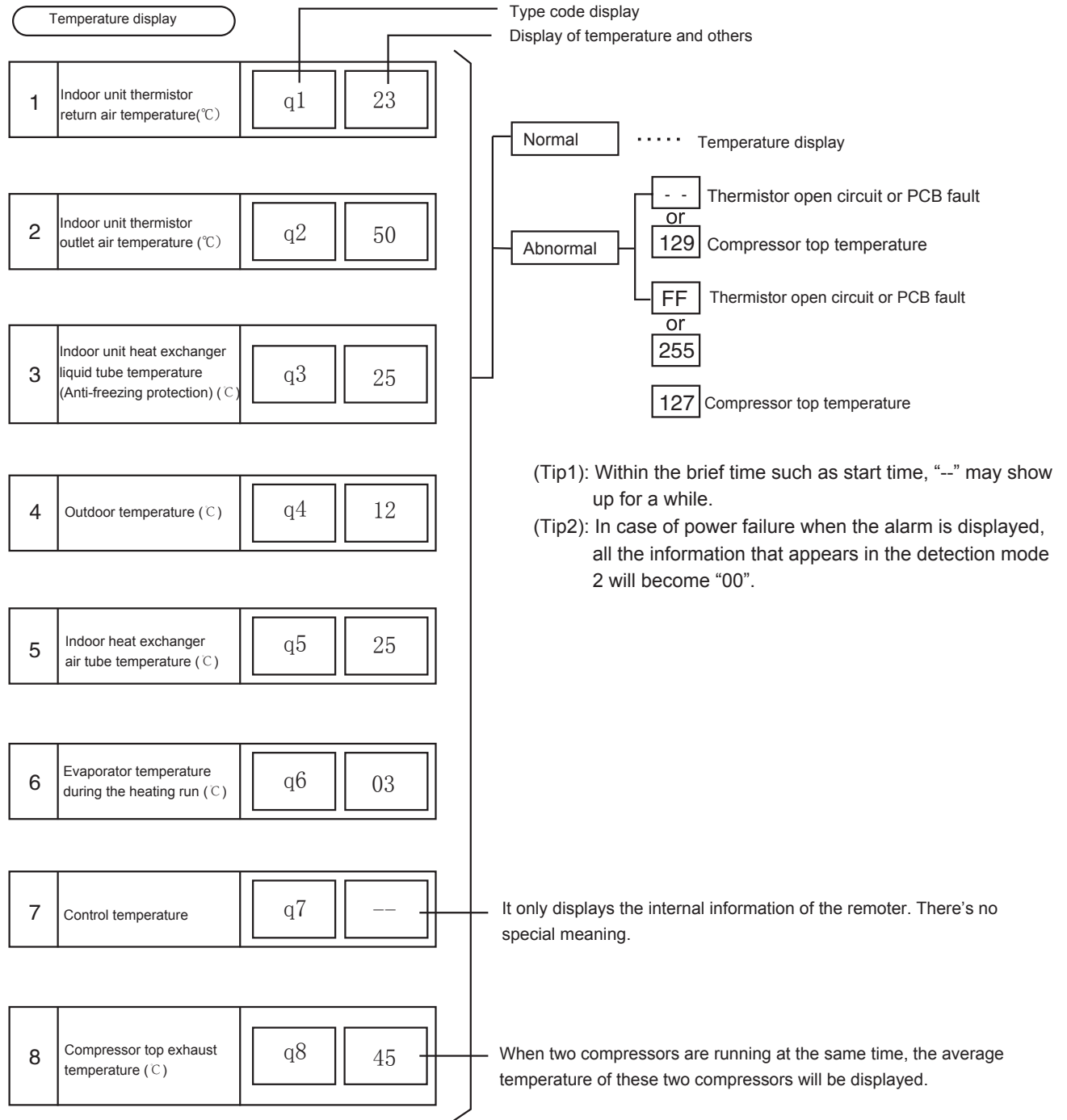
Back to temperature display

Temperature display

16.3.2 Contents of Detection Mode 2

When over three units are connected to one remoter, the updated parameters of the first three indoor units will be displayed.

Press 'check2" button, the next content will be displayed. Press "V" the previous content will be displayed.



Next page

Compressor pressure/ frequency display

9	Exhaust pressure (high pressure) (0.1MPa)	q9	18
---	---	----	----

10	Air inlet pressure (low pressure) (0.1MPa)	qA	04
----	--	----	----

11	Control information	qb	44
----	---------------------	----	----

It displays the internal information of the remoter.
There's no special meaning.

12	Operation frequency (Hz)	qC	44
----	-----------------------------	----	----

When two compressors are running at the same time,
it'll display the total frequency.

Expansion valve opening display

13	Indoor unit expansion valve opening (%)	qd	20
----	--	----	----

14	Outdoor unit expansion valve MV1 opening (%)	qE	99
----	---	----	----

Estimated current display

15	Compressor working current (A)	qF	20
----	-----------------------------------	----	----

When two compressors are running at the same
time, it'll display the total current.

Back to temperature display

Temperature display

● Repairs through the outdoor unit seven segment display

(1) Simple check through the seven segment digital display

1	※ Turn on all the indoor units
---	--------------------------------

※ All the indoor and outdoor units are connected.

2	Turn on the outdoor unit
---	--------------------------

During the automatic addressing, the following items can be checked with the seven segment digital display on the outdoor unit.

3	Start automatic addressing
---	----------------------------

- (1) Poweroff of the indoor unit.
- (2) Reverse connection of operation lines between the outdoor and indoor units.
- (3) Repeated numbers of the indoor units.

Outdoor unit PCB1

(2) Detection method through the outdoor unit seven segment digital display

Through the 7 segment digital display and detection switch (PSW) on the outdoor unit PCB, it is possible to check all the parts and operation conditions of the cooling system. During the data detection, please do not touch other electrical components in addition to the following switch to prevent from electric shock. Please keep the tools from electrical components; otherwise it may damage the electrical components.

16.4 Troubleshooting by 7-Segment Display

Only the authorized person can check with this method. Operating conditions and each part of refrigeration cycle can be checked by 7-segments and push switches on the PCB1 in the outdoor unit.

(1) Before Checking

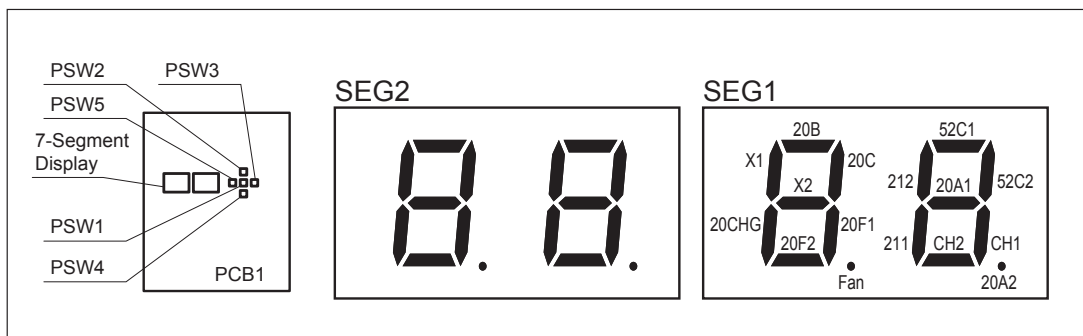
- (a) Turn ON main power source. Wait for more than 20 seconds to start checking.
- (b) Checking Items
 - * Connecting Information
 - * Outdoor Unit Information
 - * Indoor Unit Information
 - * Cause of Alarm Code Information
 - * Alarm Code History Information
- (c) Check the location of 7-segments and push switches.

! WARNING

AC220-240V is applied to PCB and electrical parts. Never touch electrical parts and wires when checking.

(2) Location of Push Switches and 7-segments Display

The push switches and 7-segments display are located on the PCB1.



(3) Protection Control Code on 7-Segment Display

- * Protection control code is displayed on 7-segment during operation when a protection control is activated.
- * Protection control code is displayed while function is working, and goes out when released.
- * When several protection control are activated, code number with higher priority will be indicated (see below for the priority order).

(a) Higher priority is given to protection control related to frequency control than the other.

< Priority Order >

- | | |
|---|---|
| <1> Pressure Ratio Control | <6> Low-Pressure Decrease Protection |
| <2> High-Pressure Increase Protection | <7> Demand Current Control
(Running Current Limit Control) |
| <3> Current Protection | <8> Low-Pressure Increase Protection |
| <4> Inverter Fin Temperature Increase Protection | <9> High-Pressure Decrease Protection |
| <5> Discharge Gas Temperature Increase Protection | |

(b) In relation to retry control, the latest retry code will be indicated unless a protection control related to frequency control is indicated.

Code	Protection Control	Code during Degeneration Control
P01	Pressure Ratio Protection Control	Pc1
P02	High-Pressure Increase Protection	Pc2
P03	Inverter Current Protection	Pc3
P04	Inverter Fin Temperature Increase Protection	Pc4
P05	Discharge Gas Temperature on Top of Compressor Increase Protection	Pc5
P06	Low-Pressure Decrease Protection	Without
P09	High-Pressure Decrease Protection	
P0A	Demand Current Protection Control	
P0d	Low-Pressure Increase Protection	

Code	Retry Control	Code during Degeneration Control
P11	Pressure Ratio Decrease Retry	Without
P12	Low-Pressure Increase Retry	
P13	High-Pressure Increase Retry	
P14	Overcurrent Retry of Constant Speed Compressor	
P15	Discharge Gas Temperature Increase Retry/Low-Pressure Decrease Retry	
P16	Discharge Gas SUPERHEAT Decrease Retry	
P17	Inverter Abnormality Retry	
P18	Abnormal Inverter Voltage Retry/Inverter Failure Retry	
P25	High-Pressure Decrease Retry	

NOTE:

- (1) Retry indication continues for 30 minutes unless a protection control is indicated.
- (2) Retry indication disappears if the stop signal comes from all rooms.
- (3) The protection control code being indicated on 7-segment display is changed to an alarm code when the abnormal operation occurs. Also, the same alarm code is indicated on the remote control switch.
- (4) In case that the degeneration control is activated, the indications Pc1 to Pc5 are indicated instead of P01 to P05.

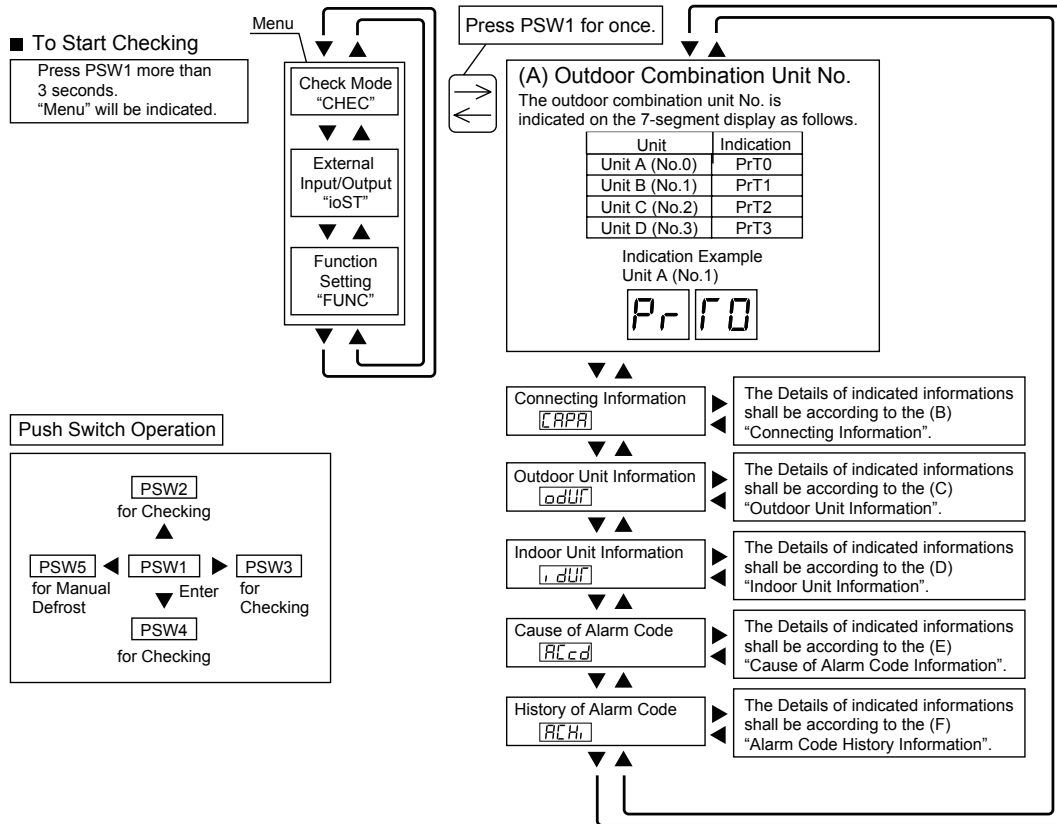
- (4) Activating Condition of Protection Retry Control Code
 Protection Control or Retry Control is performed to prevent the abnormal operation.
 The activating conditions are shown in the table below.

Code	Protection Control	Activating Condition	Remarks				
P01	Pressure Ratio Protection Control	Compression Ratio $\epsilon \geq 8.5$ or Compression Ratio $\epsilon \leq 2.0$	-				
P02	High-Pressure Increase Protection	Discharge Pressure $P_d \geq 3.50$ (at Cooling Mode)	-				
P03	Inverter Current Protection	Inverter Output Current $\geq (a)A$ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>(a)</td> </tr> <tr> <td>380-415V</td> <td>22.5</td> </tr> </table>		(a)	380-415V	22.5	-
	(a)						
380-415V	22.5						
P04	Inverter Fin Temperature Increase Protection	Inverter Fin Temperature $\geq 80^\circ C$	-				
P05	Discharge Gas Temperature Increase Protection	Temperature at the Top of Compressor $T_d \geq 112^\circ C$	-				
P06	Low-Pressure Decrease Protection	Suction Pressure $P_s \leq 0.15MPa$	-				
P09	High-Pressure Decrease Protection	Discharge Pressure $P_d \leq 1.0MPa$	-				
P0A	Demand Current Protection Control	Running Current for Compressor \geq Demand Current Setting Value	Demand Current Setting Value: Upper limit of total running current is set 100%, 80%, 70%, 60% and 40% at normal operation.				
P0d	Low-Pressure Increase Protection	Suction Pressure $\geq 1.3MPa$	-				

Code	Retry Control	Activating Condition	Remarks					
P11	Pressure Ratio Decrease Retry	Pressure Ratio $\epsilon < 1.8$ over 1 min	When activating 3 times in 30 minutes, "43" alarm is indicated.					
P12	Low-Pressure Increase Retry	$P_s > 1.5MPa$ over 1 min	When activating 3 times in 30 minutes, "44" alarm is indicated.					
P13	High-Pressure Increase Retry	$P_d \geq 3.8MPa$ over 2 s	When activating 3 times in 30 minutes, "45" alarm is indicated.					
P14	Overcurrent Retry of Constant Compressor	* $i_{co} < 2.5A$ over 50ms * $i_{co} \geq i_{comax}$ over 50ms i_{co} : Running Current of Constant Compressor i_{comax} : Maximum Current of Constant Compressor <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2">Constant Comp.</td> <td>i_{comax}</td> </tr> <tr> <td>380-415V</td> </tr> <tr> <td></td> <td>15.5A</td> </tr> </table>	Constant Comp.	i_{comax}	380-415V		15.5A	When activating 3 times in 30 minutes, "39" alarm is indicated. it is only for the system which has constant compressor.
Constant Comp.	i_{comax}							
	380-415V							
	15.5A							
P15	Discharge Gas Temperature Increase Retry	Discharge Gas Temperature $\geq 132^\circ C$ over 10 minutes or Discharge Gas Temperature $\geq 140^\circ C$ over 5 seconds	When activating 3 times in 60 minutes, "08" alarm is indicated.					
	Low-Pressure Decrease Retry	$P_s < 0.12MPa$ over 12 minutes	When activating 3 times in 60 minutes, "47" alarm is indicated.					
P16	Discharge Gas SUPERHEAT Decrease Retry	Discharge Gas SUPERHEAT $\leq T_c + 10$ deg. over 30 minutes. T_c : Saturation Temperature	When activating 3 times in 120 minutes, "07" alarm is indicated.					
P17	Inverter Abnormality Retry	Instantaneous Overcurrent	When activating 6 times in 30 minutes, "48" alarm is indicated.					
		Abnormality of Current Sensor	When activating 3 times in 30 minutes, "51" alarm is indicated.					
		IPM Error	When activating 7 times in 30 minutes, "53" alarm is indicated.					
		Fin Temperature $\geq 100^\circ C$	When activating 3 times in 30 minutes, "54" alarm is indicated.					
P18	Abnormal Inverter Voltage Retry	Insufficient Voltage at Inverter Circuit	When activating 3 times in 30 minutes, "06" alarm is indicated.					
		Excessive Voltage at Inverter Circuit	When activating 3 times in 30 minutes, "06" alarm is indicated.					
	Inverter Failure Retry	Actual Inverter Frequency is 0Hz over 3 seconds after Inverter Frequency is outputted.	When activating 3 times in 30 minutes, "55" alarm is indicated.					
P26	High-Pressure Decrease Retry	$P_d < T_a / 130 + 0.1MPa$ over 4 minutes (if $T_a > -13^\circ C$) or $P_d < 1.0MPa$ over 60 minutes T_a : Ambient Temperature	Without Alarm					

Ps: Suction Pressure of Compressor, Pd: Discharge Pressure of Compressor

- (5) Alarm Code
Refer to section 16.1.
- (6) Checking Method by Checking Mode



■ To Cancel Checking Method

Press "PSW1" for more than 3 seconds while "Menu Mode" is displayed.
The indication of LCD will be turned off and condition will return to normal.

NOTICE

Make sure to cancel Checking Mode after checking is completed.

(B) Connecting Information

This information is indicated on the unit A (main unit) only.
Press PSW4 (▼) to forward or press PSW2 (▲) to backward.

Select the outdoor unit No. for indication.
Press PSW3 (▶) for details information of selected unit No..
Press PSW4 (▼) to forward or PSW2 (▲) to backward.
The information will be indicated alternately as "Item"→"Details"
Press PSW5 (◀) for return to Outdoor Unit No. Selection.

Unit	Indication
Unit A (No.0)	oDU0
Unit B (No.1)	oDU1
Unit C (No.2)	oDU2
Unit D (No.3)	oDU3

Details of Indication

Item	7-Segment Display		Details
	SEG2	SEG1	
1 Total Capacity of Connected Outdoor Units	o	CP	Total Capacity of O.U. Combination Refer to "Outdoor Unit Capacity Table".
2 O.U. Constitution Quantities	o	RR	Constitution Quantities of O.U. Combination
3 Total Capacity of Connected Indoor Units	,	CP	Total Capacity of Connected Indoor Units
4 Connected I.U. Number	,	RR	Connected Indoor Unit Number
5 Refrigerant Group		CR	Refrigerant Group Number (0 to 64)
6 Total Capacity of Operated I.U.		oP	Total Capacity of Operated Indoor Units Refer to "Indoor Unit Capacity Table".
7 Total Comp. Frequency		Hz	Unit: Hz
8 Accumulated Operation Time		UU	Unit: Hour (Indication x 10 Hours)

(C) Outdoor Unit Information

Select the outdoor combination unit No. for indication.
When the selection is changed, press PSW4 (▼) to forward or PSW2 (▲) to backward.

Unit	Indication
Unit A (No.0)	0000
Unit B (No.1)	0001
Unit C (No.2)	0002
Unit D (No.3)	0003

Select the outdoor combination unit No. for indication by pressing PSW4 or PSW2.
Press PSW3 (▶) for details information.
Press PSW4 (▼) to forward or PSW2 (▲) to backward.
The information will be indicated alternately as Item → Details
Press PSW5 (◀) for return to Outdoor Combination Unit No. Selection.

Details of Indication

Item	7-Segment Display		Details
	SEG2	SEG1	
1 Outdoor Unit Capacity	CR	0	Unit Capacity Indication Refer to Outdoor Unit Capacity Table
2 Output State of Outdoor Micro-Computer	SC	0	Output State of Outdoor Micro-Computer Indication Refer to Location of Push Switches and 7-Segment Display
3 Running Frequency of Inverter Compressor MC1	H1	0	Running Frequency of INV. Compressor Indication (Hz)
4 Total Number of Running Compressor	CC	0	Total Number of Running Compressor Indication
5 Air Flow Rate	FO	0	Air Flow Rate Indication (0 to 25 Steps)
6 Outdoor Expansion Valve MV1 Opening	E1	0	Outdoor Expansion Valve MV1 Opening Indication (Unit: %)
7 Outdoor Expansion Valve MVB Opening for Bypass	Eb	0	Expansion Valve Opening for Bypass Indication (Unit: %)
8 Discharge Pressure (High)	Pd	0	Unit: MPa Indication of Thermistor Open Circuit: 562 Indication of Thermistor Short Circuit: -062
9 Suction Pressure (Low)	PS	0	Unit: MPa Indication of Thermistor Open Circuit: 225 Indication of Thermistor Short Circuit: -025
10 Ambient Air Temperature (Ta)	ra	0	Unit: °C Indication of Thermistor Open Circuit: -127 Indication of Thermistor Short Circuit: 127
11 Discharge Gas Temperature on the Top of Compressor MC1 (TD1)	rd	10	Unit: °C Indication of Thermistor Open Circuit: 0 Indication of Thermistor Short Circuit: 255
12 Discharge Gas Temperature on the Top of Compressor MC2 (TD2)	rd	20	Unit: °C Indication of Thermistor Open Circuit: 0 Indication of Thermistor Short Circuit: 255
13 Evaporating Temperature TE at Heating	re	0	Unit: °C Indication of Thermistor Open Circuit: -127 Indication of Thermistor Short Circuit: 127
14 Outdoor Heat Exchanger Gas Temperature	rg	0	Unit: °C Indication of Thermistor Open Circuit: -127 Indication of Thermistor Short Circuit: 127
15 Supercooling Temperature	rc	HD	Unit: °C Indication of Thermistor Open Circuit: -127 Indication of Thermistor Short Circuit: 127
16 Supercooling Temperature at Bypass	rb	GD	Unit: °C Indication of Thermistor Open Circuit: -127 Indication of Thermistor Short Circuit: 127
17 Inverter Fin Temperature	rf	0	Unit: °C
18 Fan Controller Fin Temp.	ff	FD	Unit: °C
19 Compressor MC1 Current *1)	R1	0	Unit: A
20 Compressor MC2 Current *1)	R2	0	Unit: A
21 Fan Motor (MFO1) Current *1)	RF	0	Unit: A
22 Accumulated Operation Time of Compressor MC1	UU	10	Unit: Hour (Indication x 10 Hours)
23 Accumulated Operation Time of Compressor MC2	UU	20	Unit: Hour (Indication x 10 Hours) 14HP to 16HP only
24 Accumulated Operation Time of Compressor MC1	cU	10	Unit: Hour (Indication x 10 Hours) Accumulated operation time can be reset. *2)
25 Accumulated Operation Time of Compressor MC2	cU	20	Unit: Hour (Indication x 10 Hours) 14HP to 16HP only Accumulated operation time can be reset. *2)
26 Cause of Inverter Stoppage	r	10	Refer to Inverter Stoppage Cause Table Comp. No. $r10$ O.U. No.
27 Cause of Fan Controller Stoppage	f	10	Refer to Fan Controller Stoppage Cause Table Fan Controller No. $f10$ O.U. No.

*1) The indicated current is reduced value. Use a clamp meter for the accurate current value.

*2) For resetting the accumulated operation time, press PSW1 + PSW3 for 5 seconds while the accumulated data is displayed.

(Example)

NOTE: The outdoor unit No. is indicated on the one digit of SEG1.

● Outdoor Unit Capacity Table

Indication	Capacity (kBTu/h)	Horsepower (HP)
64	76	8.0
80	96	10.0
96	114	12.0
112	136	14.0
128	154	16.0

NOTE:
In case of combination unit, the indication of outdoor unit capacity is total capacity of constitution units.

(D) Indoor Unit Information

This information is indicated on the unit A (main unit) only.
 Select the indoor unit number for the information indication.
 Press PSW4 (▼) to forward or press PSW2 (▲) for backward.

Unit No.	Indication
No.0	, d00
No.1	, d01
↓	↓
No.63	, d63

Select the indoor unit No. for indication.
 Press PSW3 (▶) for details information of selected unit No..
 Press PSW4 (▼) to forward or PSW2 (▲) to backward.
 The information will be indicated alternately as "Item"→"Details"
 Press PSW5 (◀) for return to Indoor Unit No. Selection.

Details of Indication

Item	7-Segment Display		Details
	SEG2	SEG1	
1 Indoor Unit Capacity	CR	00	Unit Capacity Indication Refer to "Indoor Unit Capacity Table".
2 Expansion Valve Opening	, E	00	Unit: %
3 Heat Exchanger Liquid Piping Temp.	FL	00	Unit: °C
4 Heat Exchanger Gas Piping Temp.	FG	00	Unit: °C
5 Air Inlet Temp.	Fi	00	Unit: °C
6 Air Outlet Temp.	FO	00	Unit: °C
7 Unit Stoppage Cause Code	d1	00	Indoor Unit Stoppage Cause Code Indication Refer to "Cause of Indoor Unit Stoppage Table".

(Example)

SEG2	SEG1
FG	00

NOTE: The indoor unit No. is indicated on "SEG1".

● Indoor Unit Capacity Table

Indication	Capacity (kW)	kBtu/h	Indication	Capacity (kW)	kBtu/h	Indication	Capacity (kW)	kBtu/h
5	1.8	6	16	5.6	18	40	14.0	48
6	2.2	7	18	6.3	22	48	16.0	54
8	2.8	9	20	7.1	24	64	22.4	76
10	3.6	12	22	8.0		80	28.0	96
11	4.0		26	9.0	27/30	128	45.0	154
13	4.5	14	32	11.2	38	160	56.0	190
14	5.0	17						

(E) Cause of Alarm Code Information

This information is indicated on the unit A (main unit) only.
 Press PSW4 (▼) to forward or press PSW2 (▲) to backward.
 The indication will be indicated alternately as "Item"→"Details".

Details of Indication

Item	7-Segment Display		Details
	SEG2	SEG1	
1 Alarm Cause Code		RC	Latest O.U. Stoppage Alarm Code Indication Refer to "Alarm Code Table".
2 Degeneracy Control for Pressure Ratio Decrease Protection	C	11	⊠ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.
3 Degeneracy Control for High Pressure Increase Protection	C	13	⊠ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.
4 Degeneracy Control for Inverter Fin Temp. Increase Protection	C	14	⊠ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.
5 Degeneracy Control for Discharge Gas Temp. Increase Protection	C	15	⊠ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.
6 Degeneracy Control for Td SH Decrease Protection	C	16	⊠ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.
7 Degeneracy Control for Overcurrent Protection	C	17	⊠ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.

(F) Alarm Code History Information

This information is indicated on the unit A (main unit) only.
 If history of abnormality exists, it is indicated maximum 15 case in chronological order.
 Press PSW4 (▼) to forward or press PSW2 (▲) for backward.

Select the data No. for indication by pressing PSW4 or PSW2.
 Press PSW3 (▶) for details information.
 Press PSW4 (▼) to forward or PSW2 (▲) to backward.
 Press PSW5 (◀) for return to Combination Unit No. Selection.

Data No.	7-Segment Display	
	SEG2	SEG1
1 (Latest Data)	no	01
↓	↓	↓
15 (Oldest Data)	no	15

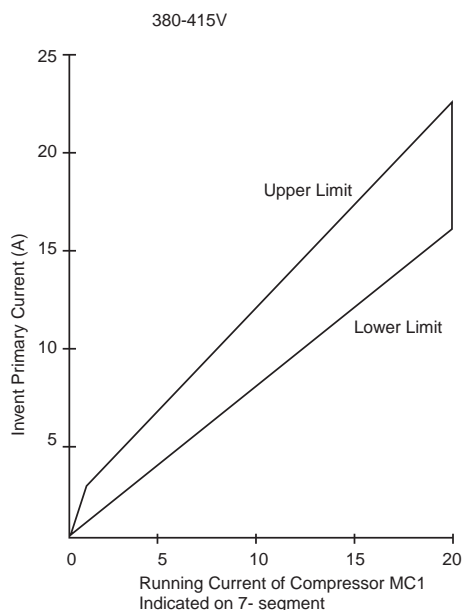
Details of Indication

Item	7-Segment Display		Details
	SEG2	SEG1	
1 Unit Accumulated Operation Time	07	08	O.U. Accumulated Operation Time at Stoppage Unit: Hour (Indication x 10 Hours)
2 Cause of Stoppage	RE		Alarm Stoppage
	d1		Retry Stoppage
	Li		Control Information
3 Alarm/Stoppage Cause Code	01	48	Alarm and Stoppage Cause Code O.U. No. is indicated on 10 digit of SEG2. Compressor and fan controller No. are indicated on one digit of SEG2. Alarm and stoppage code are indicated on SEG1.
4 Abnormal Data Indication	IT	12	Inverter stoppage cause code is indicated when IT code is existing on SEG2.
	FT	12	Fan controller stoppage cause code is indicated when FT code is existing on SEG2.
	CF	0	Stoppage cause of constant speed compressor abnormal current is 0A stoppage.
	CF	FF	Overcurrent Stoppage of Constant Speed Comp.
	--	--	Except for the above.

(7) Running Current of Compressor

● Inverter Primary Current

The inverter primary current is estimated from the running current of the compressor MC1 indicated on 7-segment, as chart below.



● Indicated Running Current of Compressor MC2

The running current of the compressor MC2 is detected by current sensor. (CT2)

● Cause of Inverter Stoppage (Check Item “ iF ”)

Code	Cause
1	IPM Error (Overcurrent, Decrease Voltage, Short Circuit)
2	Instantaneous Overcurrent
3	Abnormal Inverter Fin Temperature
4	Inverter Overcurrent
5	Inverter Voltage Decrease
6	Inverter Voltage Increase
7	Abnormal Inverter Transmission
8	Abnormal Current Sensor
9	Instantaneous Power Failure Abnormal Power Source Phase
11	Micro Computer Reset
12	Earth Fault Detecting
13	Abnormal Power Source Phase
16	Inverter Failure
21	Abnormal Start-up

● Cause of Fan Controller Stoppage (Check Item “ F_i ”)

Code	Cause
1	Driver IC Error
2	Instantaneous Overcurrent
3	Abnormal Inverter Fin Temperature
4	Inverter Overcurrent
5	Fan Controller Voltage Decrease
6	Fan Controller Voltage Increase
7	Abnormal Fan Controller Transmission
8	Abnormal Current Sensor
9	Instantaneous Power Failure
11	Micro Computer Reset
12	Earth Fault Detecting
15	Reverse Rotation
16	Fan Controller Retry
17	Abnormal Control
21	Abnormal Start-up

16.5 Emergency Operation

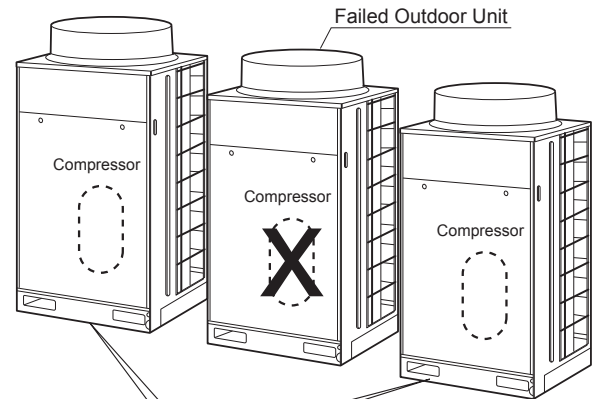
(1) Emergency Mode Operation from Remote Control Switch (Combination module Only)

If compressor is failed, emergency operation mode is available by the remote control switch. Even if the compressor is failed, the air conditioning operation is continuously available until the troubleshooting is performed.

* In case of following alarm code, emergency operation is available.

Inverter Compressor Failure

- 06: Abnormality of Inverter Voltage
- 23: Abnormality of Discharge Gas Thermistor
- 48: Activation of Overcurrent Protection Device
- 51: Abnormality of Inverter Current Sensor
- 53: Inverter Error Signal Detection
- 54: Abnormality of Inverter Fin Temperature



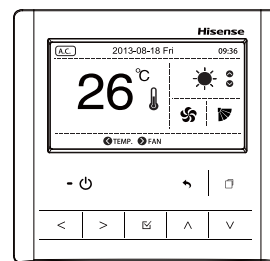
(a) Procedure

By pressing “TEMP.” (V) (A) for 3 seconds simultaneously, emergency mode operation starts. “EMG” can be displayed on the LCD during this operation.

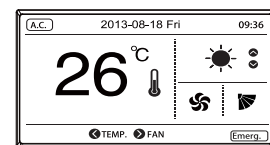
<HYXE-J01H>

(b) Operation Condition

This emergency operation is NOT applicable to all the compressors mounted in the failed outdoor unit.



Emergency Operation Indication

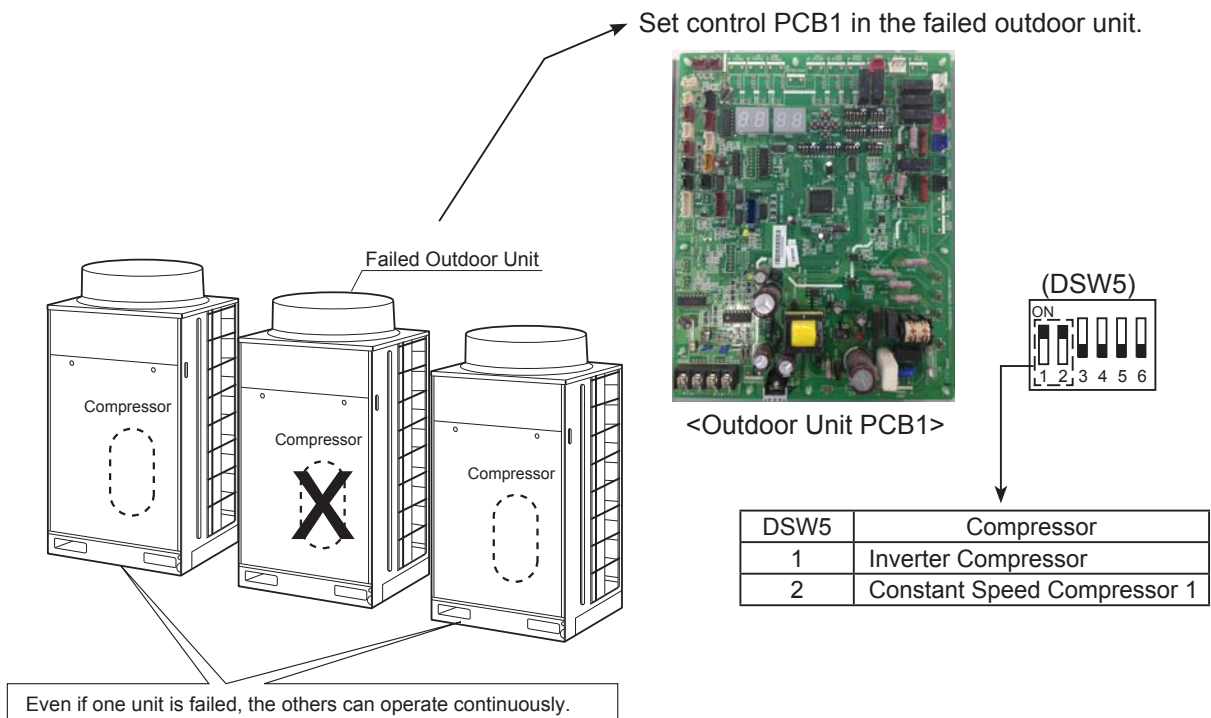


NOTES:

- Emergency operation is available only when all the indoor unit and remote control to be connected are for Hi-NET.
- Emergency operation is available only for when the alarm codes above (*) are indicated.
- The emergency operation is not available for the failures of inverter PCB or fan controller.
- This emergency operation is not a normal operation but a temporary operation until the service people comes. If the alarm is indicated again during the emergency operation, the alarm cannot be canceled.
- Do not perform emergency operation more than 8 hours. If not, the unit may be damaged.

(4) Emergency Mode Operation from Outdoor Unit PCB for Compressor Failure
(Combination module Only)

Turn DSW5-No.1 or No.2 ON to stop the compressor operation. If set, all the compressors in the failed outdoor unit will NOT be operated.



NOTE:

Fully close the stop valves (gas/liquid) in the failed outdoor unit.

• Operation Condition

< Indoor Unit Operation Capacity >

The compressor is forced to stop for compressor protection under the following condition:

Total Capacity of Thermo ON I.U. < 50% of O.U. Capacity and

Total Capacity of Thermo ON I.U. < 96kBtu/h

(A lack of thermo ON indoor unit may lead a constant speed compressor failure because the compressor is operated and stopped repeatedly.)

NOTES:

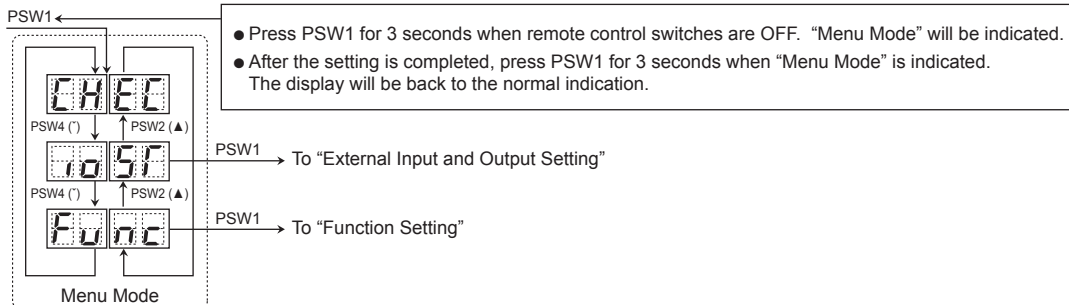
- Measure the insulation resistance of inverter compressor.
Do not perform the emergency operation when the insulation resistance is 0Ω
Other compressor may be damaged because there is a possibility that refrigerant oil may be oxidized.
- Total operating capacity of indoor unit should be 96kBtu/h and over.
(Less than 96kBtu/h: Forced stoppage)
- In this emergency operation, compressor frequency cannot be controlled normally.
Therefore, alarm code "07", "43", "44", "45" or "47" may be indicated on LCD.
- This emergency operation may not provide sufficient cooling and heating capacity.
- This operation is an emergency but a temporary operation when the inverter compressor is damaged.
Therefore, change the new one as soon as possible.
- Turn OFF DSW5-No.1 of outdoor PCB1 after replacing the compressor.
If this setting is not performed, the inverter compressor will be damaged.

17. Optional Function

17.1 Setting Method

Setting PSW on the outdoor unit PCB is required for “External Input and Output Setting” and “Function Setting”. As for units combination, set from the PSW in outdoor unit A. (Setting from the PSW in outdoor unit B and C is invalid.)

< Setting Method >



17.2 External Input and Output Setting

On the outdoor unit PCB, there are three input terminals (CN17, CN18) to receive external signals and two output terminals (CN16) to send signals outwards. Control functions as shown below table are available by setting input and output terminals.

<Input>

Control Function No.	Setting Function for Input
1	Fixing Heating Operation Mode
2	Fixing Cooling Opeation Mode
3	Demand Stoppage
4	Outdoor Fan Motor Start/Stop
5	Forced Stoppage
6	Demand Current Control 40%
7	Demand Current Control 60%
8	Demand Current Control 70%
9	Demand Current Control 80%
10	Demand Current Control 100%
11	Low Noise Setting 1
12	Low Noise Setting 2
13	Low Noise Setting 3
0	No Setting

<Output>

Control Function No.	Setting Function for Output
1	Operation Signal
2	Alarm Signal
3	Compressor ON Signal
4	Defrosting Signal

The following functions have been already set before shipment.

<Input Terminal>

Input Terminal Name	Connector (Pin No.)	Setting Function	Control Function No.
Input 1	CN17 (1-2)	Fixed Heating Operation Mode	1
Input 2	CN17 (2-3)	Fixed Cooling Operation Mode	2
Input 3	CN18 (1-2)	Demand Stoppage	3

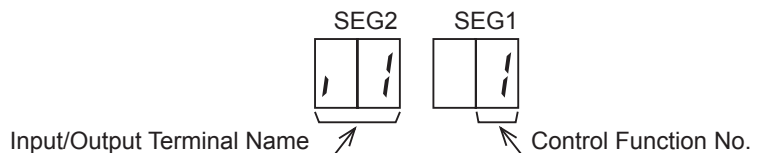
<Output Terminal>

Output Terminal Name	Connector (Pin No.)	Setting Function	Control Function No.
Output 1	CN16 (1-2)	Operation Signal	1
Output 2	CN16 (1-3)	Alarm Signal	2

● Setting of External Input and Output

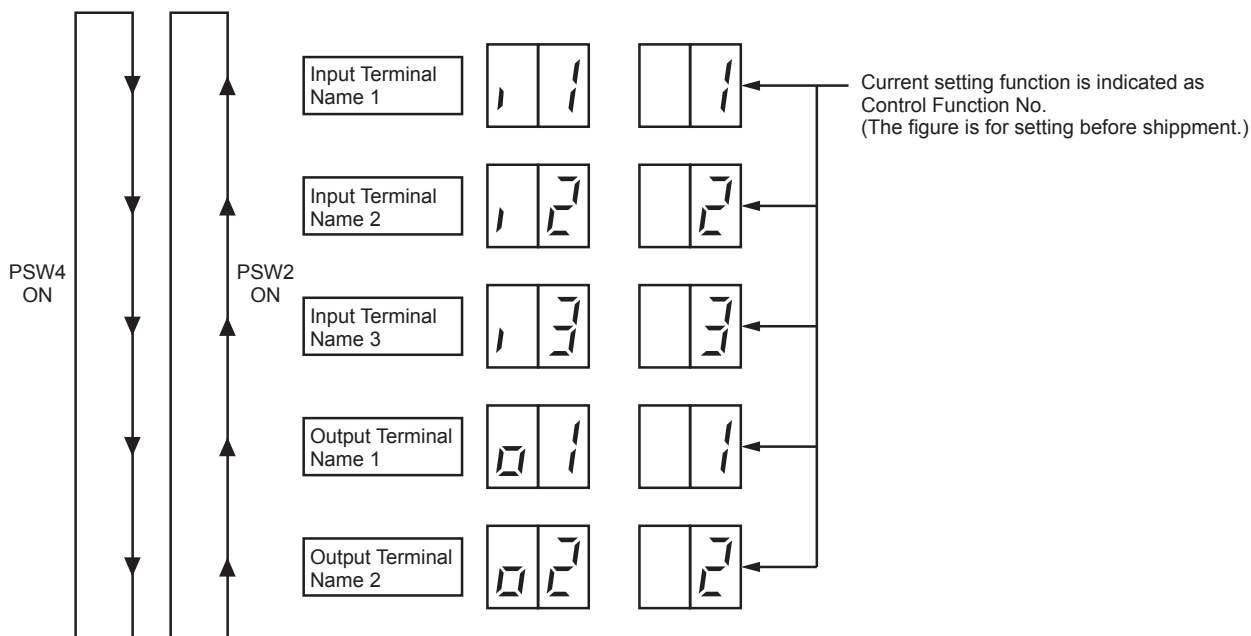
In the case that the setting alteration is required at site, perform the following procedures.

- (1) By selecting “External Input and Output Setting”, the following appears on the 7-segment display.
 (The setting should be performed during the outdoor unit stoppage. Also, set DSW4-#4 of outdoor unit PCB at the “ON” side before performing in order to prevent the compressor activation.)

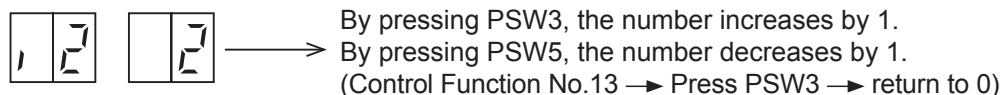


This display indicates that the control function No. 1 (Fixed Heating Operation Mode) is set at input 1.

- (2) By pressing PSW2 or PSW4, input/output terminal name is changed.
 The following shows the display changes when PSW2 or PSW4 are pushed.



- (3) After selecting Input/Output Terminal Name, press PSW3 or PSW5, and then choose Control Function No.



- (4) After selecting the control function No., press PSW1 for 3 seconds. The display will be back to the normal indication. The selected contents are memorized in the outdoor unit PCB and “External Input and Output Setting” is completed. The memorized data is maintained even power source is cut OFF. The electrical wiring diagram for each control functions are described in next item, and the required parts are also indicated in the table 18.1.

- External Input Function Setting

The following signals can be received by the outdoor unit PCB. Refer to the table 18.1 for the required main parts.

17.2.1 **Input** Fixing Heating Operation Mode (Control Function No.1),

Input Fixing Cooling Operation Mode (Control Function No.2)

When the input terminals for the fixing operation mode on the outdoor unit PCB1 are short-circuited, the operation mode can be fixed at the cooling or heating mode

Short-circuit between Terminals 1 and 2 of CN17: Fixed Heating Operation Mode

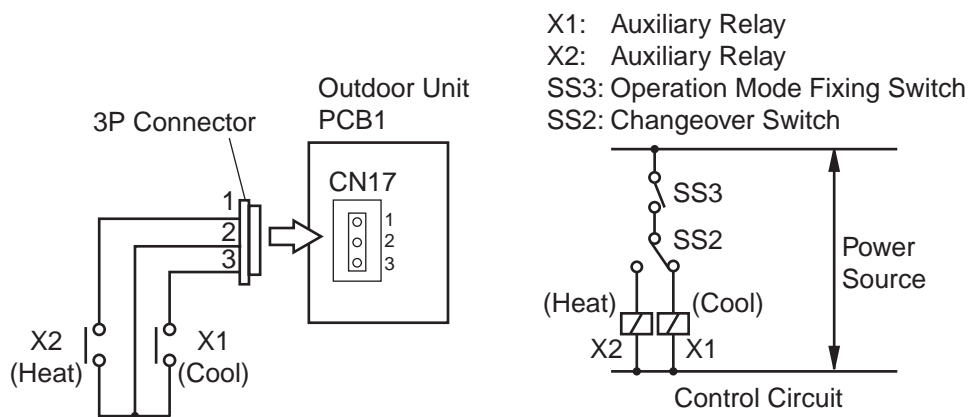
Short-circuit between Terminals 2 and 3 of CN17: Fixed Cooling Operation Mode

During this fixed heating (or cooling) mode, no cooling (or heating) operation is available. The indoor units under the cooling or dry operation (or heating operation) will be changed to the Thermo-OFF condition during this mode, and stoppage code No. "20" is given.

- Setting Example

Fixing Heating Operation at Input 1 (between 1 and 2 pins of CN17)

Fixing Cooling Operation at Input 2 (between 3 and 2 pins of CN17)



Wiring Diagram Example of Fixing Operation Mode

17.2.2 **Input** Demand Stoppage (Control Function No.3)

When the input terminals for demand stoppage on the outdoor unit PCB1 are short-circuited, compressor(s) is stopped. (In this case, the indoor unit(s) is put under Thermo-OFF condition. Cooling operation: Air-flow setting, Heating operation: Lo setting)

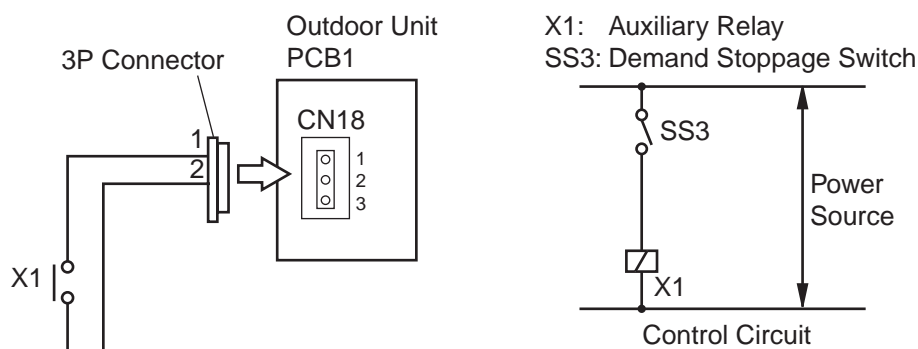
The stoppage code No. "10" is given. By disconnecting the demand switch contact, restarting is available.

NOTE:

When demand control (ON/OFF) is performed, it is recommended that the control (ON/OFF) time is set as appropriate according to the heat load. Also, set the demand control time approximately once in 30 minutes at the minimum in consideration of energy saving.

- Setting Example

Demand Stoppage at Input 3 (between 1 and 2 pins of CN18)



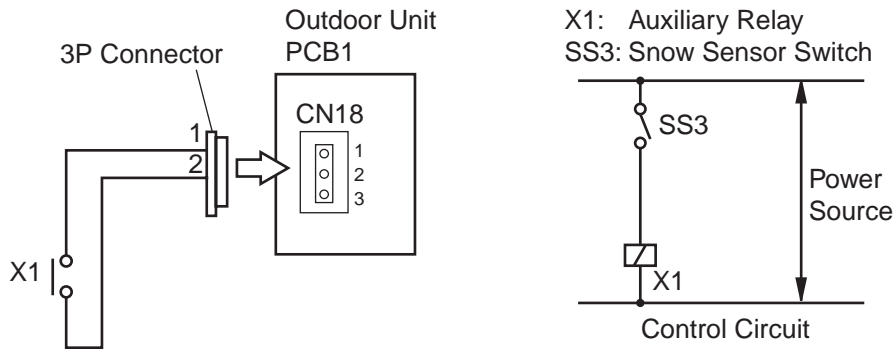
Wiring Diagram Example of Demand Stoppage

17.2.3 **Input** Outdoor Fan Motor Start/Stop (Control Function No.4)7

When the input terminals for the outdoor fan motor start/stop on the outdoor unit PCB1 are short-circuited during compressor stoppage, all the outdoor fan motors are operated at the full speed. However, if the compressor starts compressor operation, the fan operation is changed to the normal operation. If the input terminal is opened, the fan(s) is stopped. This function protects the outdoor units from a condition covered with snow.

This function is available only when the compressor is stopped. Therefore, even if the input signal is sent mistakenly during the normal cooling and heating operation, this function will NOT be available.

- Setting Example
Outdoor Fan Motor Start/Stop at Input 3 (between 1 and 2 pins of CN18)



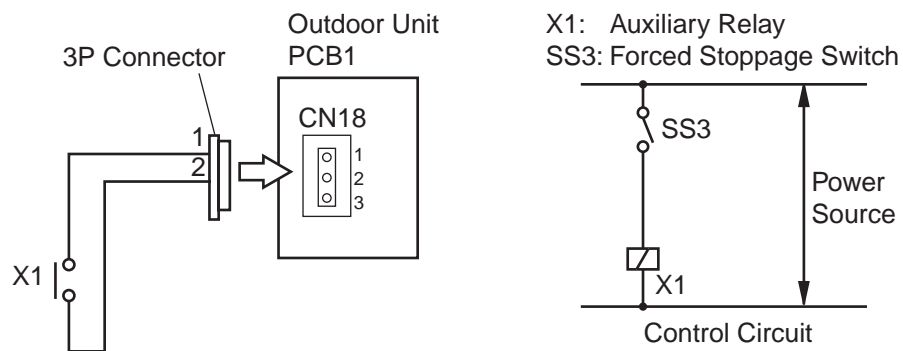
Wiring Diagram Example of Outdoor Fan Motor Start/Stop

17.2.4 **Input** Forced Stoppage (Control Function No.5)

When the input terminals for the forced stoppage on the outdoor unit PCB1 is short-circuited during running, the compressor and the indoor fan motor are stopped. However, the remote control switch display remains at the same mode with the stoppage code No. "10".

In this case, if the input terminals are opened, operation is resumed.

- Setting Example
Forced Stoppage at Input 3 (between 1 and 2 pins of CN18)



Wiring Diagram Example of Forced Stoppage

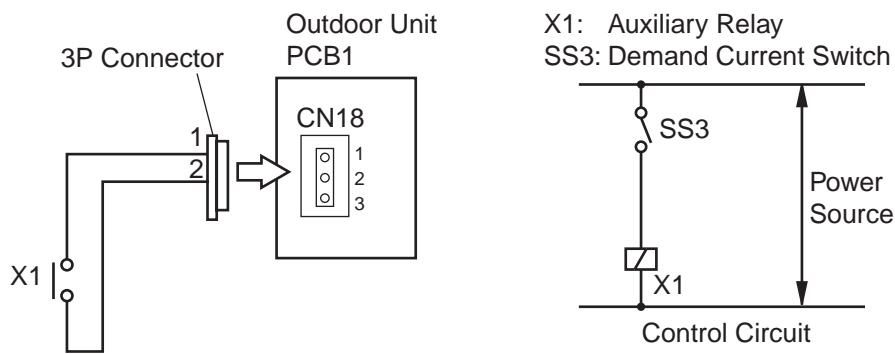
17.2.5 Input Demand Current Control 40, 60, 70, 80, 100% (Control Function No.6 to 10)

When the input terminals for demand current control on the outdoor unit PCB1 are short-circuited, the compressor frequency is controlled that the maximum limit of the outdoor running current is set 100%, 80%, 70%, 60% and 40%.

(The maximum limit of the outdoor unit running current can be selected according to the item "4.2 External Input and Output Setting".)

If the outdoor unit running current increases over the maximum limit, the indoor unit is put under thermo-OFF condition. The stoppage code No. "10" is given. When the input terminal is opened during the demand current control, its control is reset.

- Setting Example
Demand Current Control at Input 3 (between 1 and 2 pins of CN18), Control Function No. 6 to 10



Wiring Diagram Example of Demand Current Control

17.2.6 Input Low Noise Setting 1, 2, 3 (Control Function No.11 to 13)

When the input terminals for low noise setting on the outdoor unit PCB1 are short-circuited, the compressor frequency and outdoor fan rotation frequency are controlled and the operating sound for the outdoor unit will be given as shown in the table below.

The operating sound can be set by selecting the control function No.

NOTE:

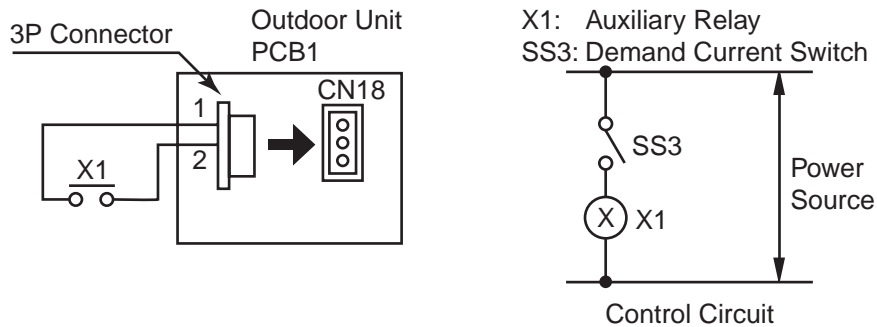
- (a) The outdoor unit capacity will decrease because the compressor frequency and outdoor fan motor frequency forcibly decrease. The operating range will be also restricted.
- (b) In some cases, the operating sound (targeted value) may be temporarily higher than the value in the table below.

<Control Function No. for Low Noise Setting and Operating Sound/Outdoor Unit Capacity>

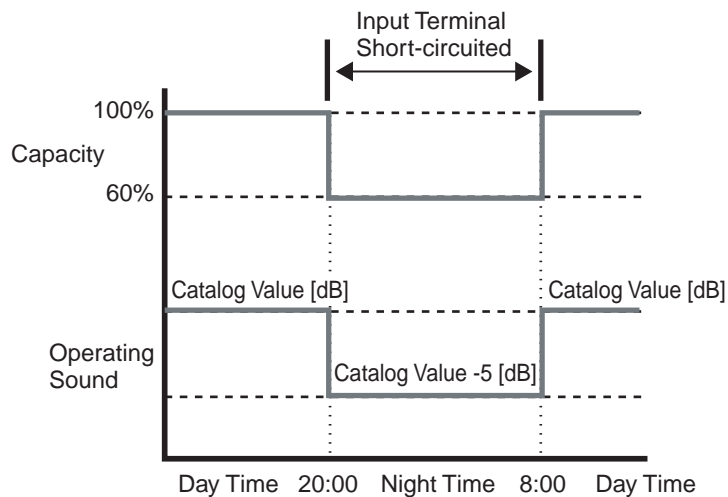
Control Function No.	Operating Sound (Targeted Value)	Outdoor Unit Capacity (Specification Ratio)
No Setting	Catalog Value	100%
11 (Low Noise Setting 1)	Catalog Value -2 [dB]	80%
12 (Low Noise Setting 2)	Catalog Value -5 [dB]	60%
13 (Low Noise Setting 3)	Catalog Value -8 [dB]	40%

• Setting Example

Low Noise Setting at Input 3 (between 1 and 2 pins of CN18), Control Function No. 12



Wiring Diagram Example of Low Noise Setting



[Example] “Low Noise Setting 2” during Night Time Only

Table 17.1 Specifications of Required Main Parts

Parts		Specification	Remarks
Auxiliary Relay (X1, X2)		Mini-Power Relay, MY1F (or 2F) made by OMRON	220V/240V
Changeover Switch (SS2, SS3)		Manual Switch	220V/240V
3 Pin Connector Cord		PCC-1A (Connected to JST Connector, XARP-3)	Five Cords with Connectors as One Set
Electric Wire (Inside of Unit)	Low Volt.	0.3mm ²	lower than 24V
	220/240V	0.5 to 0.75mm ²	
Electric Wire (Outside of Unit)	Low Volt.	0.5 to 0.75mm ²	lower than 24V
	220/240V	2mm ²	

NOTES:

1. Make the wire to the terminals as short as possible.
2. Do not run the wires along high voltage cable. Keep at least 30cm between the wire and the high voltage cable. (crossing is applicable.)
If necessary to run wires along high voltage cable, insert the low voltage cable(s) into metal tube and ground it at one end. If sealed wires are used at the low voltage wire side, ground it at one end of shield wires. The maximum length should be within 70m.

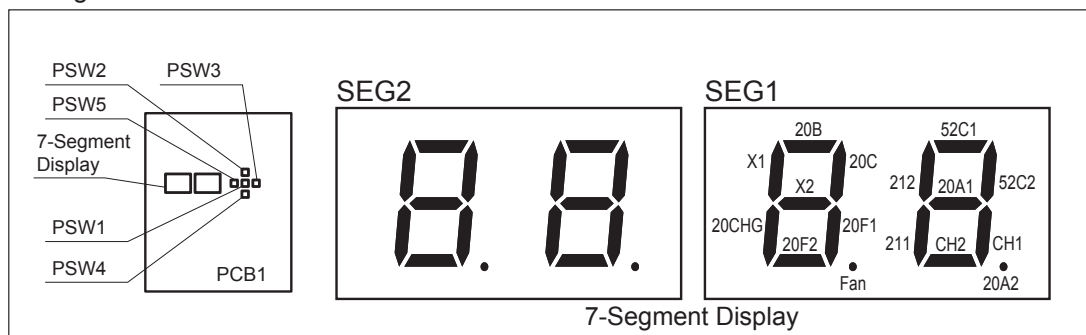
17.3 Function Setting

- (1) The setting should be performed during the outdoor unit stoppage.
Set DSW4-#4 of outdoor unit PCB at the “ON” side before performing in order to prevent the compressor activation.
- (2) Press PSW1 for more than 3 seconds.
“Menu” will be indicated on the 7-segment display. The menu indication is changed by pressing PSW2 or PSW4 and displayed in the following order.



Select the function setting mode indicated “Func” on the 7-segment display.

Arrangement of Push Switches on PCB1



No.	Setting Item	7-Segment		Contents
		SEG2	SEG1	
1	Circular at Heating Function Thermo-off	FA	00	No setting
			01	Indoor fan forced ON and OFF (2 min. ON / 6 min. OFF)
			02	Indoor fan forced ON and OFF (2 min. ON / 13 min. OFF)
			03	Indoor fan forced ON and OFF (2 min. ON / 28 min. OFF)
			04	Indoor fan forced OFF at Heating Function Thermo-off
2	Night-Shift	ni	00	No Setting
			01	Setting of night-shift
3	Cancellation of Outdoor Ambient Temperature Limit	GS	00	No setting
			01	For heating
			02	For cooling
			03	For cooling/heating
4	Defrost for Cold Area (Change of Defrost Condition)	Jo	00	No setting
			01	Condition 2 of defrost operation
			02	Condition 3 of defrost operation
5	SLo (Fan Speed) Defrost Setting	bJ	00	Indoor fan stop when heating operation is activated/during defrost operation
			01	Indoor fan SLo operation during defrost operation
			02	Indoor fan SLo operation when heating operation is activated
			03	Fan operation when heating operation is activated/ Indoor fan SLo operation during defrost operation
6	Cancellation of Hot Start	HT	00	Hot start control is available
			01	Cancellation of hot start
7	Priority Capacity Mode	nU	00	No setting
			01	Change of frequency maximum limit value
			02	Change of current limit value
			03	Change of frequency maximum limit value and current limit value
8	Compressor Frequency Control Target Value for Cooling	He	00	Initial setting (Ps evaporation temperature targeted value 7°C)
			01	Targeted value (2°C)
			02	Targeted value (3°C)
			03	Targeted value (4°C)
			04	Targeted value (5°C)
			05	Targeted value (9°C)
			06	Targeted value (10°C)
			07	Targeted value (11°C)
9	Compressor Frequency Control Target Value for Heating	Hh	00	Initial setting (Ps targeted value 2.85MPa)
			01	Targeted value (2.70MPa)
			02	Targeted value (2.75MPa)
			03	Targeted value (2.80MPa)
			04	Targeted value (2.82MPa)
			05	Targeted value (2.88MPa)
			06	Targeted value (2.90MPa)
			07	Targeted value (2.95MPa)
10	Indoor Expansion Valve Control Target Value for Cooling	SC	00	Initial setting (SH targeted value +5°C)
			01	SH Targeted value 7
			02	SH Targeted value 6
			03	SH Targeted value 4
			04	SH Targeted value 3
11	Indoor Expansion Valve Control Target Value for Heating	SH	00	Initial setting (SC targeted value +5°C)
			01	SC Targeted value 11
			02	SC Targeted value 8
			03	SC Targeted value 2
			04	SC Targeted value -1
12	Indoor Expansion Valve Opening Change for Stoppage Indoor Unit in Heating Mode(MAX)	Si	00	Initial setting (stoppage unit expansion valve opening (100/300 pulse))
			01	Initial setting (stoppage unit expansion valve opening (150~325 pulse))
			02	Expansion valve opening 07~18KBtu: 175 pulse, 22KBtu or over: 300 pulse
			03	Expansion valve opening 07~18KBtu: 100 pulse, 22KBtu or over: 150 pulse
			04	Expansion valve opening 07~18KBtu: 90 pulse, 22KBtu or over: 100 pulse
			05	Expansion valve opening 07~18KBtu: 40 pulse, 22KBtu or over: 40 pulse
13	Indoor Expansion Valve Opening Change for Thermo-OFF Indoor Unit in Heating Mode	So	00	Thermo-OFF unit expansion valve opening (150~325 pulse)
			01	Expansion valve opening 07~18KBtu: 175 pulse, 22KBtu or over: 300 pulse
			02	Expansion valve opening 07~18KBtu: 100 pulse, 22KBtu or over: 150 pulse
			03	Expansion valve opening 07~18KBtu: 40 pulse, 22KBtu or over: 40 pulse

No.	Setting Item	7-Segment		Contents
		SEG2	SEG1	
14	Indoor Expansion Valve Initial Opening of Thermo-ON Indoor Unit in Heating Mode	ci	00	Initial setting
			01	Expansion valve opening (300-650PK)
			02	Expansion valve opening 07~18KBtu: 650pulse, 22KBtu or over: 1000 pulse
			03	Expansion valve opening 07~18KBtu: 950 pulse, 22KBtu or over: 1500 pulse
			04	Expansion valve opening 07~18KBtu: 1440 pulse, 22KBtu or over: 2000 pulse
15	Fine Adjustment of Indoor Expansion Valve Initial Opening in Cooling Mode	cb	00	Initial setting
			01	Cooling operation initial opening -5%
			02	Cooling operation initial opening +3%
			03	Cooling operation initial opening +5%
			04	Cooling operation initial opening +10%
16	Fine Adjustment of Indoor Expansion Valve Initial Opening in Heating Mode	ch	00	Initial setting
			01	Heating operation initial opening -5%
			02	Heating operation initial opening +3%
			03	Heating operation initial opening +5%
			04	Heating operation initial opening +10%
17	Low Noise Setting (In the case of low noise setting,cooling/heating operation range will be restricted.)	db	00	Initial setting
			01	Fan rotation maximum limit 1
			02	Fan rotation maximum limit 2
			03	Fan rotation maximum limit 3
			04	Frequency limit 1
			05	Frequency limit 2
			06	Frequency limit 3
			07	Operation sound value 55dB
			08	Operation sound value 50dB
			09	Operation sound value 45dB
18	Demand Function Setting	dE	00	No demand control
			01	Demand control 40%
			02	Demand control 60%
			03	Demand control 70%
			04	Demand control 80%
			05	Demand control 100%
19	Wave Function Setting	UE	00	No wave function
			01	Minimum limit 40%
			02	Minimum limit 60%
			03	Minimum limit 70%
			04	Minimum limit 80%
20	Cold Draft Protection	Fb	00	Initial setting
			01	Outlet temperature > 10°C
			02	Outlet temperature > 12°C
			03	Outlet temperature > 14°C
21	Not Prepared	FT	00	-
22	Adjustment of Fan Rotation (To avoid a whining sound for the multiple installation.)	Fo	00	Initial setting
			01	Change of fan rotation -15rpm
			02	Change of fan rotation -30rpm
23	Not Prepared	LT	0	-
24	Indoor Expansion Valve Opening Change for Stoppage Indoor Unit in Heating Mode(MIN)	F1	00	Initial setting (stoppage unit expansion valve opening 90 pulse)
			01	Initial setting (stoppage unit expansion valve opening (150~325 pulse))
			02	Expansion valve opening 07~18KBtu: 175 pulse, 22KBtu or over: 300 pulse
			03	Expansion valve opening 07~18KBtu: 100 pulse, 22KBtu or over: 150 pulse
			04	Expansion valve opening 07~18KBtu: 90 pulse, 22KBtu or over: 100 pulse
25	Not Prepared	F2	00	-
26	Not Prepared	F3	00	-
27	Outdoor Fan Motor Stop/Start	F4	00	outdoor fan motor continue run
			01	outdoor fan motor forced OFF and ON(570s OFF / 30s ON)
			02	outdoor fan motor forced OFF and ON(540s OFF / 60s ON)
			03	outdoor fan motor forced OFF and ON(480s OFF / 120s ON)
			04	outdoor fan motor forced OFF and ON(300s OFF / 300s ON)

No.	Setting Item	7-Segment		Contents
		SEG2	SEG1	
28 ~ 32	Indoor Expansion Valve Control for VIP	u1 ~ u5	FF	Initial setting
			00	VIP indoor unit NO.00
			01	VIP indoor unit NO.01
			02	VIP indoor unit NO.02
			~	VIP indoor unit NO.**
			63	VIP indoor unit NO.63
33	AUTO Enter Night-Shift Function	nb	00	Initial setting
			01	after Ta≥Ta(in the past 24 hours) 8 hours,enter Night-Shift Function , 8 hours exit
			02	after Ta≥Ta(in the past 24 hours) 8 hours,enter Night-Shift Function , 9 hours exit
			03	after Ta≥Ta(in the past 24 hours) 8 hours,enter Night-Shift Function , 10 hours exit
34	Height Difference Setting	Hd	00	Initial setting
			01	Height Difference 90M (outdoor unit up) ,frequency will reduce

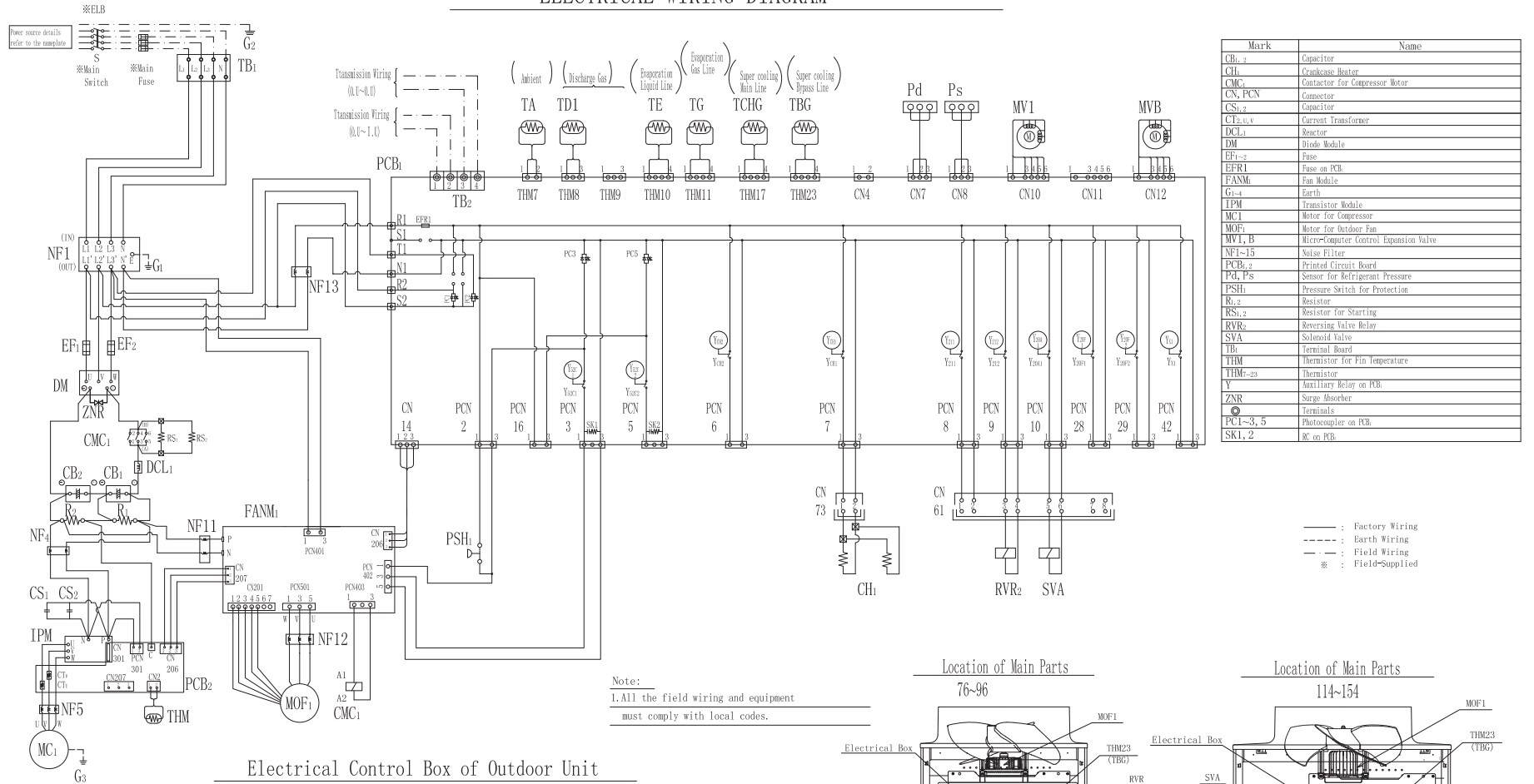
⚠ CAUTION

Test Run should be carried out according to chapter 14 after all the service work is finished.

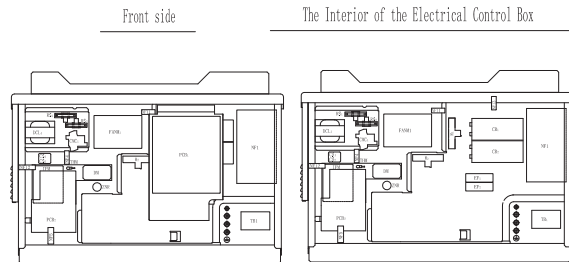
Appendix

Appendix A. Electrical Wiring Diagram

ELECTRICAL WIRING DIAGRAM

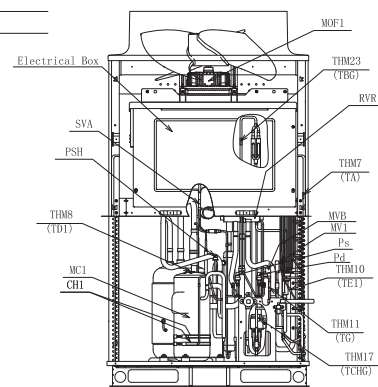


Electrical Control Box of Outdoor Unit



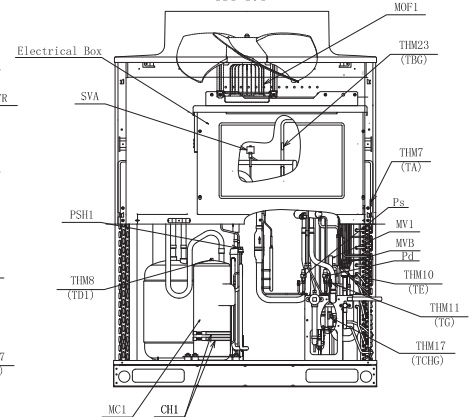
Location of Main Parts

76~96



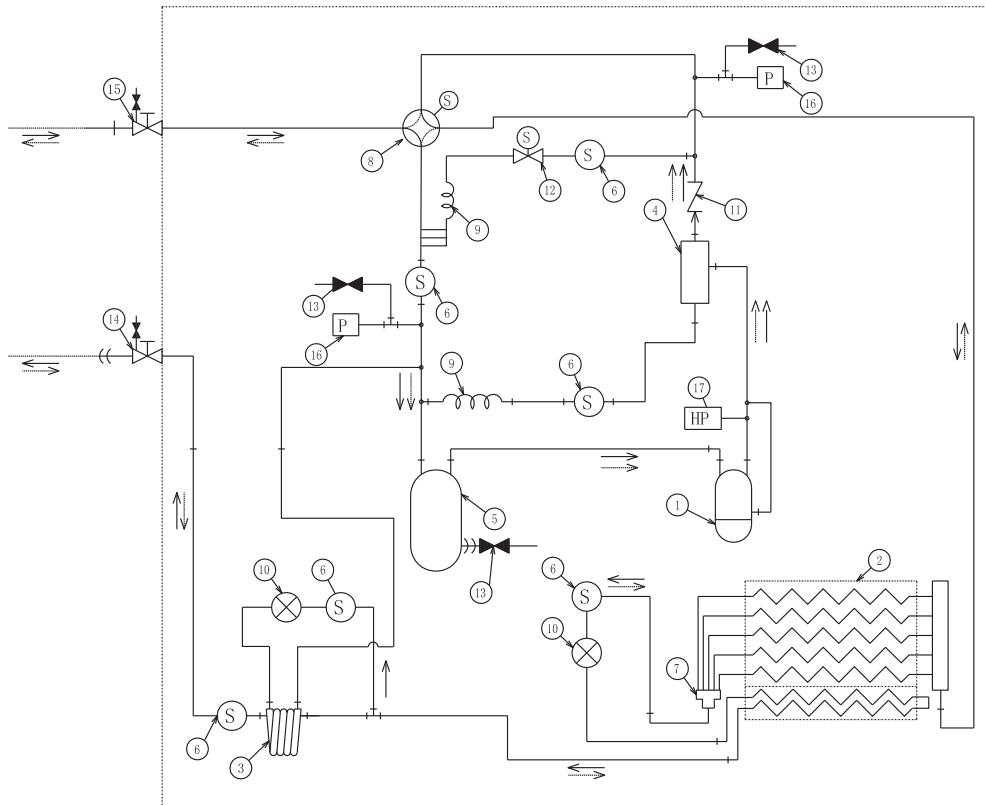
Location of Main Parts

114~154



Appendix B. Refrigeration System Diagram

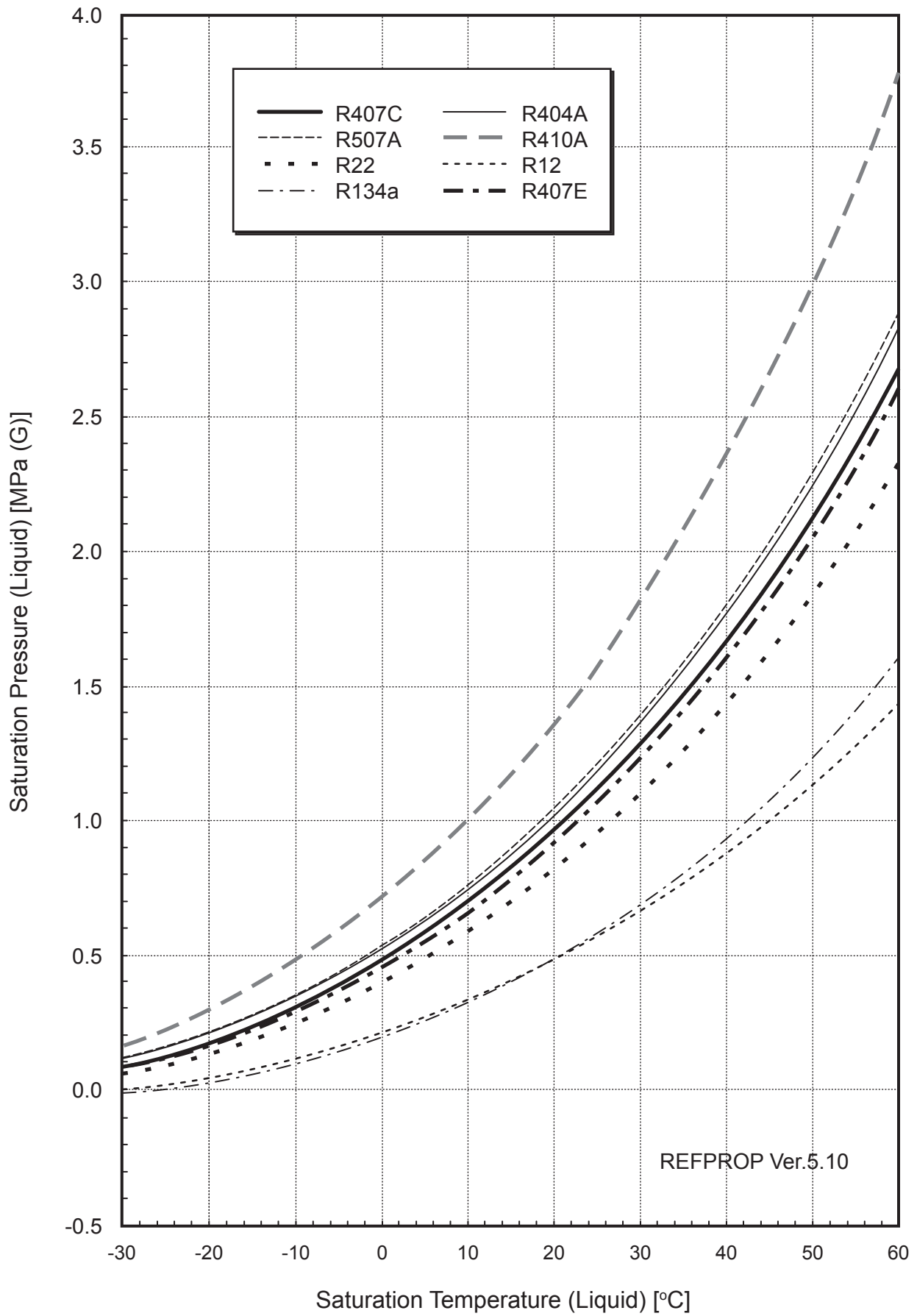
Model: GUC-76Z-H, GUC-96Z-H, GUC-114Z-H, GUC-136Z-H, GUC-154Z-H



- ← : Refrigerant Flow Direction (Cooling)
- ← - - - : Refrigerant Flow Direction (Heating)
- - - : Field Refrigerant Piping
- ⌋ : Flare Connection
- ⊥ : Brazing Connection

Mark	Part Name
1	Compressor
2	Heat Exchanger
3	Double Tube Type Heat Exchanger
4	Oil Separator
5	Accumulator
6	Strainer
7	Distributor
8	Reversing Valve
9	Capillary Tube
10	Micro-Computer Control Expansion Valve
11	Check Valve
12	Solenoid Valve
13	Check Joint
14	Stop Valve for Liquid Line
15	Stop Valve for Gas Line
16	Sensor for Refrigerant Pressure
17	High Pressure Switch for Protection

Appendix C. Saturation Curve for Refrigerant



Appendix D. Mollier Chart for R410A

